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05 June 2018  
Helen Ayers  
The City of Hobart  
16 Elizabeth Street, Hobart

## Re: Development Application, 128 Strickland Avenue

Please find enclosed drawings and supporting documents for a development application for a proposed 5 unit development located at 128 Strickland Avenue, South Hobart. The proposed is located in the **General Residential Zone** and is within Overlay Code **116.FRE Bushfire Prone Area**. Careful consideration and initial driveway design work has ensured a safe vehicular movement to all dwellings.

The proposed 5 unit development has been designed in accordance with Hobart City Council Interim Planning Scheme 2015. The design has incorporated sympathetic design principles to minimise impact on neighbouring dwellings by concentrating views and building mass within the General Residential 10.4.2 Building Envelope.

For details of the application and relevant codes **E6.0 Parking and Access Code** and **E7.0 Stormwater Management Code**, and **E1.0 Bushfire-Prone Areas Code**, please refer to the attached.

Attachment List:

1. **Planning Summary**
2. **Traffic Impact Report** by Midson Traffic
3. **Stormwater Management Plan** by A.D Design
4. **Bushfire Hazard Assessment Report** by Rebecca Green & Associates

*Sincerely*  
**Rohan Pace**



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## Planning Summary

### Hobart Interim Planning Scheme 2015 – General Residential Zone

#### 10.4.1 Residential Density for multiple dwellings

##### A1

Multiple Dwellings must have a site area per dwelling of not less than:

- (a) 325m<sup>2</sup>, or

Each proposed dwelling has a site area of no less than 325m<sup>2</sup>

- (b) If within a density area specified in Table 10.4.1 below and shown on the planning scheme maps, that specified for the density area.

n/a

#### 10.4.2 Setback and building envelope for all dwellings

##### A1

Unless within a building area, a dwelling, excluding protrusions (such as eaves, steps, porches, and awnings) that extend not more than 0.6 m into the frontage setback, must have a setback from a frontage that is:

- (a) if the frontage is a primary frontage, at least 4.5 m, or, if the setback from the primary frontage is less than 4.5 m, not less than the setback, from the primary frontage, of any existing dwelling on the site; or

The proposed dwellings are no less than 4.5m from the frontage.

- (b) if the frontage is not a primary frontage, at least 3 m, or, if the setback from the frontage is less than 3 m, not less than the setback, from a frontage that is not a primary frontage, of any existing dwelling on the site; or

n/a

- (c) if for a vacant site with existing dwellings on adjoining sites on the same street, not more than the greater, or less than the lesser, setback for the equivalent frontage of the dwellings on the adjoining sites on the same street; or

n/a

- (d) if the development is on land that abuts a road specified in Table 10.4.2, at least that specified for the road.

n/a

## A2

A garage or carport must have a setback from a primary frontage of at least:

- (a) 5.5 m, or alternatively 1 m behind the façade of the dwelling; or  
  
The proposed garages (except TH5) are setback from the frontage no less than 5.5m. Please refer below for TH5 garage details.
- (b) the same as the dwelling façade, if a portion of the dwelling gross floor area is located above the garage or carport; or  
  
n/a
- (c) 1 m, if the natural ground level slopes up or down at a gradient steeper than 1 in 5 for a distance of 10 m from the frontage.

TH5 has the proposed garage setback from the frontage of 1510mm as the site slope is greater than 1 in 5 for a distance of 10m from the frontage this is compliant with the acceptable solution.

## A3

A dwelling, excluding outbuildings with a building height of not more than 2.4 m and protrusions (such as eaves, steps, porches, and awnings) that extend not more than 0.6 m horizontally beyond the building envelope, must:

- (a) be contained within a building envelope (refer to Diagrams 10.4.2A, 10.4.2B, 10.4.2C and 10.4.2D) determined by:
  - (i) a distance equal to the frontage setback or, for an internal lot, a distance of 4.5 m from the rear boundary of a lot with an adjoining frontage; and
  - (ii) projecting a line at an angle of 45 degrees from the horizontal at a height of 3 m above natural ground level at the side boundaries and a distance of 4 m from the rear boundary to a building height of not more than 8.5 m above natural ground level; and

Please refer to elevation drawings for building envelope diagrams which demonstrate compliancy

- (b) only have a setback within 1.5 m of a side boundary if the dwelling:
  - (i) does not extend beyond an existing building built on or within 0.2 m of the boundary of the adjoining lot; or  
  
n/a
  - (ii) does not exceed a total length of 9 m or one-third the length of the side boundary (whichever is the lesser).

The proposed dwellings which are located within 1.5m of a side boundary do not exceed 9m in length or one third of the boundary.

### 10.4.3 Site Coverage and private open space for all dwellings

#### A1

Dwellings must have:

- (a) a site coverage of not more than 50% (excluding eaves up to 0.6m); and  
  
The total site coverage of the proposal is 35%. 804m<sup>2</sup> of roofed building and a total site area of 2306m<sup>2</sup>
- (b) for multiple dwellings, a total area of private open space of not less than 60m<sup>2</sup> associated with each dwelling, unless the dwelling has a finished floor level that is entirely more than 1.8m above the finished ground level (excluding a garage, carport or entry foyer); and  
  
Each dwelling has no less than 60m<sup>2</sup> of private open space in total, with 24m<sup>2</sup> of the private open space located on the upper floor deck.
- (c) a site area of which at least 25% of the site area is free from impervious surfaces.  
  
The proposal has a total of 54% of impervious surface, which leaves no less than 40% free from impervious surface.

#### A2

A dwelling must have an area of private open space that:

- (a) is in one location and is at least:
  - (i) 24 m<sup>2</sup>; or
  - (ii) 12 m<sup>2</sup>, if the dwelling is a multiple dwelling with a finished floor level that is entirely more than 1.8 m above the finished ground level (excluding a garage, carport or entry foyer); and
- (b) has a minimum horizontal dimension of:
  - (i) 4 m; or
  - (ii) 2 m, if the dwelling is a multiple dwelling with a finished floor level that is entirely more than 1.8 m above the finished ground level (excluding a garage, carport or entry foyer); and
- (c) is directly accessible from, and adjacent to, a habitable room (other than a bedroom); and
- (d) is not located to the south, south-east or south-west of the dwelling, unless the area receives at least 3 hours of sunlight to 50% of the area between 9.00am and 3.00pm on the 21st June; and
- (e) is located between the dwelling and the frontage, only if the frontage is orientated between 30 degrees west of north and 30 degrees east of north, excluding any dwelling located behind another on the same site; and
- (f) has a gradient not steeper than 1 in 10; and
- (g) is not used for vehicle access or parking.

Please refer to site plan and floorplans for drawings with dimensions which show compliancy



#### 10.4.4 Sunlight and Overshadowing for all dwellings

##### A1

A dwelling must have at least one habitable room (other than a bedroom) in which there is a window that faces between 30 degrees west of north and 30 degrees east of north (see Diagram 10.4.4A).

The Living rooms to all proposed dwellings have at least one window to a habitable room at 22.3° West of North, which is within the compliant parameters.

##### A2

A multiple dwelling that is to the north of a window of a habitable room (other than a bedroom) of another dwelling on the same site, which window faces between 30 degrees west of north and 30 degrees east of north (see Diagram 10.4.4A), must be in accordance with (a) or (b), unless excluded by (c):

- (a) The multiple dwelling is contained within a line projecting (see Diagram 10.4.4B):
  - (i) at a distance of 3 m from the window; and
  - (ii) vertically to a height of 3 m above natural ground level and then at an angle of 45 degrees from the horizontal.
- (b) The multiple dwelling does not cause the habitable room to receive less than 3 hours of sunlight between 9.00 am and 3.00 pm on 21st June.
- (c) That part, of a multiple dwelling, consisting of:
  - (i) an outbuilding with a building height no more than 2.4 m; or
  - (ii) protrusions (such as eaves, steps, and awnings) that extend no more than 0.6 m horizontally from the multiple dwelling.

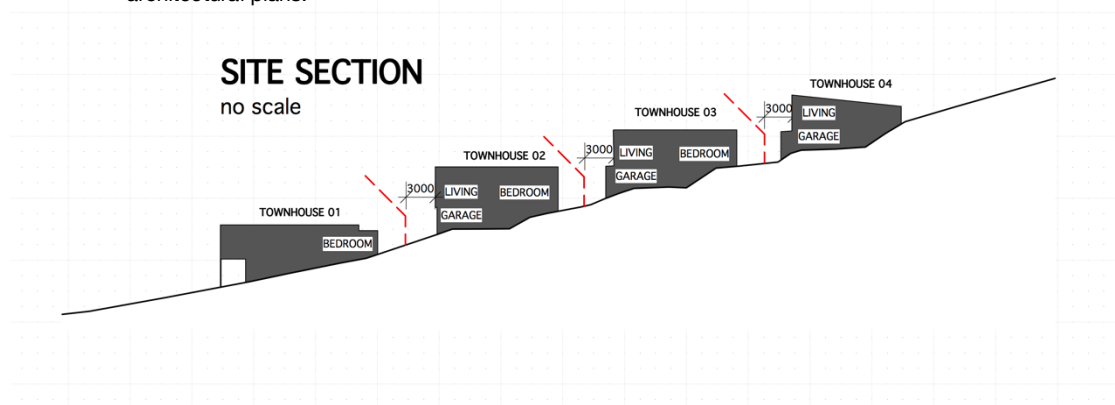
Please refer to sectional diagram drawing below which demonstrate compliancy with this directive.

##### A3

A multiple dwelling, that is to the north of the private open space, of another dwelling on the same site, required in accordance with A2 or P2 of subclause 10.4.3, must be in accordance with (a) or (b), unless excluded by (c):

- (a) The multiple dwelling is contained within a line projecting (see Diagram 10.4.4C):
  - (i) at a distance of 3 m from the northern edge of the private open space; and
  - (ii) vertically to a height of 3 m above natural ground level and then at an angle of 45 degrees from the horizontal.
- (b) The multiple dwelling does not cause 50% of the private open space to receive less than 3 hours of sunlight between 9.00 am and 3.00 pm on 21st June.
- (c) That part, of a multiple dwelling, consisting of:
  - (i) an outbuilding with a building height no more than 2.4 m; or
  - (ii) protrusions (such as eaves, steps, and awnings) that extend no more than 0.6 m horizontally from the multiple dwelling.

Please refer to the diagram below which demonstrates compliance with 10.4.4. Please cross reference with architectural plans.



#### 10.4.5 Width of openings for garages and carports for all dwellings

##### A1

A garage or carport within 12 m of a primary frontage (whether the garage or carport is free-standing or part of the dwelling) must have a total width of openings facing the primary frontage of not more than 6 m or half the width of the frontage (whichever is the lesser).

There are no garages proposed within 12m of the frontage.

#### 10.4.6 Privacy for all dwellings

##### A1

A balcony, deck, roof terrace, parking space, or carport (whether freestanding or part of the dwelling), that has a finished surface or floor level more than 1 m above natural ground level must have a permanently fixed screen to a height of at least 1.7 m above the finished surface or floor level, with a uniform transparency of no more than 25%, along the sides facing a:

- (a) side boundary, unless the balcony, deck, roof terrace, parking space, or carport has a setback of at least 3 m from the side boundary; and
- (b) rear boundary, unless the balcony, deck, roof terrace, parking space, or carport has a setback of at least 4 m from the rear boundary; and
- (c) dwelling on the same site, unless the balcony, deck, roof terrace, parking space, or carport is at least 6 m:
  - (i) from a window or glazed door, to a habitable room of the other dwelling on the same site; or
  - (ii) from a balcony, deck, roof terrace or the private open space, of the other dwelling on the same site.

All proposed decks are no less than 3m of a side boundary, 4m of a rear boundary or 6m to a window to a habitable room of another dwelling on the same site and therefore no privacy screening is provided.

##### A2

A window or glazed door, to a habitable room, of a dwelling, that has a floor level more than 1 m above the natural ground level, must be in accordance with (a), unless it is in accordance with (b):

- (a) The window or glazed door:
  - (i) is to have a setback of at least 3 m from a side boundary; and
  - (ii) is to have a setback of at least 4 m from a rear boundary; and
  - (iii) if the dwelling is a multiple dwelling, is to be at least 6 m from a window or glazed door, to a habitable room, of another dwelling on the same site; and
  - (iv) if the dwelling is a multiple dwelling, is to be at least 6 m from the private open space of another dwelling on the same site.

All proposed windows to habitable rooms are no less than 3m of a side boundary, 4m of a rear boundary or 6m to a window to a habitable room of another dwelling on the same site. (except TH5 & TH2, please refer below)

- (b) The window or glazed door:
  - (i) is to be offset, in the horizontal plane, at least 1.5 m from the edge of a window or glazed door, to a habitable room of another dwelling; or

- (ii) is to have a sill height of at least 1.7 m above the floor level or has fixed obscure glazing extending to a height of at least 1.7 m above the floor level; or
- (iii) is to have a permanently fixed external screen for the full length of the window or glazed door, to a height of at least 1.7 m above floor level, with a uniform transparency of not more than 25%.

There are habitable windows on TH2 & TH5 which are within 6m, however are offset in the horizontal plane by no less than 1.5m. Please refer to site plan for details.

### **A3**

A shared driveway or parking space (excluding a parking space allocated to that dwelling) must be separated from a window, or glazed door, to a habitable room of a multiple dwelling by a horizontal distance of at least:

- (a) 2.5 m; or
- (b) 1 m if:
  - (i) it is separated by a screen of at least 1.7 m in height; or
  - (ii) the window, or glazed door, to a habitable room has a sill height of at least 1.7 m above the shared driveway or parking space, or has fixed obscure glazing extending to a height of at least 1.7 m above the floor level.

All windows within 2.5 metres but no less than 1m, have a sill height of no less than 1.7m above a shared driveway.

#### 10.4.7 Frontage fences for all dwellings

##### A1

A fence (including a free-standing wall) within 4.5 m of a frontage must have a height above natural ground level of not more than:

- (a) 1.2 m if the fence is solid; or
- (b) 1.8 m, if any part of the fence that is within 4.5 m of a primary frontage has openings above a height of 1.2 m which provide a uniform transparency of not less than 30% (excluding any posts or uprights).

There are no fences proposed for this development.

#### 10.4.8 Waste storage for multiple dwellings

##### A1

A multiple dwelling must have a storage area, for waste and recycling bins, that is an area of at least 1.5 m<sup>2</sup> per dwelling and is within one of the following locations:

- (a) in an area for the exclusive use of each dwelling, excluding the area in front of the dwelling; or
- (b) in a communal storage area with an impervious surface that:
  - (i) has a setback of at least 4.5 m from a frontage; and
  - (ii) is at least 5.5 m from any dwelling; and
  - (iii) is screened from the frontage and any dwelling by a wall to a height of at least 1.2 m above the finished surface level of the storage area.

Each proposed dwelling has an allocated space at the rear of the dwelling for bin storage and is accessed through a door from the garage.



**HBV Architects**

**128 Strickland Ave Unit Development  
Traffic Impact Assessment**

**May 2018**

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# 1. Introduction

## 1.1 Background

Midson Traffic were engaged by HPV Architects to prepare a traffic impact assessment for a proposed residential unit development at 128 Strickland Avenue, South Hobart.

## 1.2 Traffic Impact Assessment (TIA)

A traffic impact assessment (TIA) is a process of compiling and analysing information on the impacts that a specific development proposal is likely to have on the operation of roads and transport networks. A TIA should not only include general impacts relating to traffic management, but should also consider specific impacts on all road users, including on-road public transport, pedestrians, cyclists and heavy vehicles.

This TIA has been prepared in accordance with the Department of State Growth (DSG) publication, *A Framework for Undertaking Traffic Impact Assessments*, September 2007. This TIA has also been prepared with reference to the Austroads publication, *Guide to Traffic Management*, Part 12: *Traffic Impacts of Developments*, 2009.

Land use developments generate traffic movements as people move to, from and within a development. Without a clear understanding of the type of traffic movements (including cars, pedestrians, trucks, etc), the scale of their movements, timing, duration and location, there is a risk that this traffic movement may contribute to safety issues, unforeseen congestion or other problems where the development connects to the road system or elsewhere on the road network. A TIA attempts to forecast these movements and their impact on the surrounding transport network.

A TIA is not a promotional exercise undertaken on behalf of a developer; a TIA must provide an impartial and objective description of the impacts and traffic effects of a proposed development. A full and detailed assessment of how vehicle and person movements to and from a development site might affect existing road and pedestrian networks is required. An objective consideration of the traffic impact of a proposal is vital to enable planning decisions to be based upon the principles of sustainable development.

This TIA also addresses E5.0 Road and Railway Assets Code, and E6.0 Parking and Access Code of the Hobart Interim Planning Scheme, 2015.

## 1.3 Statement of Qualification and Experience

This TIA has been prepared by an experienced and qualified traffic engineer in accordance with the requirements of Council's Planning Scheme and The Department of State Growth's, *A Framework for Undertaking Traffic Impact Assessments*, September 2007, as well as Council's requirements.

The TIA was prepared by Keith Midson. Keith's experience and qualifications are briefly outlined as follows:

- 22 years professional experience in traffic engineering and transport planning.
- Master of Transport, Monash University, 2006
- Master of Traffic, Monash University, 2004



- Bachelor of Civil Engineering, University of Tasmania, 1995
- Engineers Australia: Fellow (FIEAust); Chartered Professional Engineer (CPEng); Engineering Executive (EngExec); National Engineers Register (NER)

## **1.4 Project Scope**

The project scope of this TIA is outlined as follows:

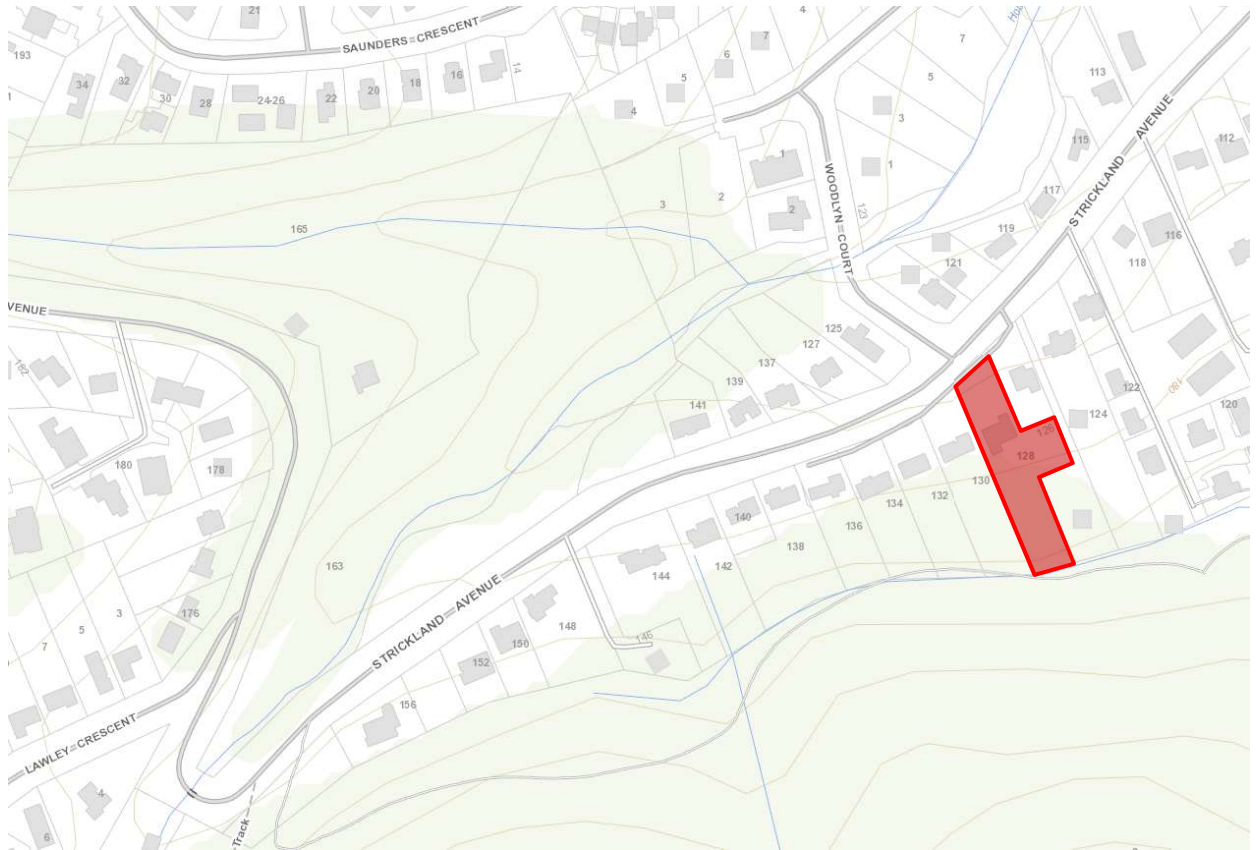
- Review of the existing road environment in the vicinity of the site and the traffic conditions on the road network.
- Provision of information on the proposed development with regards to traffic movements and activity.
- Identification of the traffic generation potential of the proposal with respect to the surrounding road network in terms of road network capacity.
- Review of the parking requirements of the proposed development. Assessment of this parking supply with Planning Scheme requirements.
- Traffic implications of the proposal with respect to the external road network in terms of traffic efficiency and road safety.

## **1.5 Subject Site**

The subject site is located at 128 Strickland Avenue, South Hobart. The site is accessed via a shared right-of-way access that connects to Strickland Avenue.

The subject site and surrounding road network is shown in Figure 1.

**Figure 1 Subject Site & Surrounding Road Network**



*Image Source: LIST Map, DPIPWE*

**Figure 2 Existing Site Access**



## 1.6 Reference Resources

The following references were used in the preparation of this TIA:

- Hobart Interim Planning Scheme, 2015 (Planning Scheme)
- Austroads, *Guide to Traffic Management*, Part 12: *Traffic Impacts of Developments*, 2009
- Austroads, *Guide to Road Design*, Part 4A: Unsignalised and Signalised Intersections, 2009
- DSG, *A Framework for Undertaking Traffic Impact Assessments*, 2007
- Roads and Maritime Services NSW, *Guide to Traffic Generating Developments*, 2002 (RTA Guide)
- Roads and Maritime Services NSW, *Updated Traffic Surveys*, 2013 (Updated RTA Guide)
- Australian Standards, AS2890.1, *Off-Street Parking*, 2004 (AS2890.1:2004)



## 2. Existing Conditions

### 2.1 Transport Network

For the purposes of this report, the transport network consists only of Strickland Avenue. Strickland Avenue is a major collector road that connects between Cascade Road and Huon Road through South Hobart.

**Figure 3 Strickland Avenue**



### 2.2 Road Safety Performance

Crash data can provide valuable information on the road safety performance of a road network. Existing road safety deficiencies can be highlighted through the examination of crash data, which can assist in determining whether traffic generation from the proposed development may exacerbate any identified issues.

Crash data was obtained from the Department of State Growth for a 5+ year period between 1<sup>st</sup> January 2013 and 31 March 2018 for Strickland Avenue between Smithurst Avenue and Lawley Crescent.

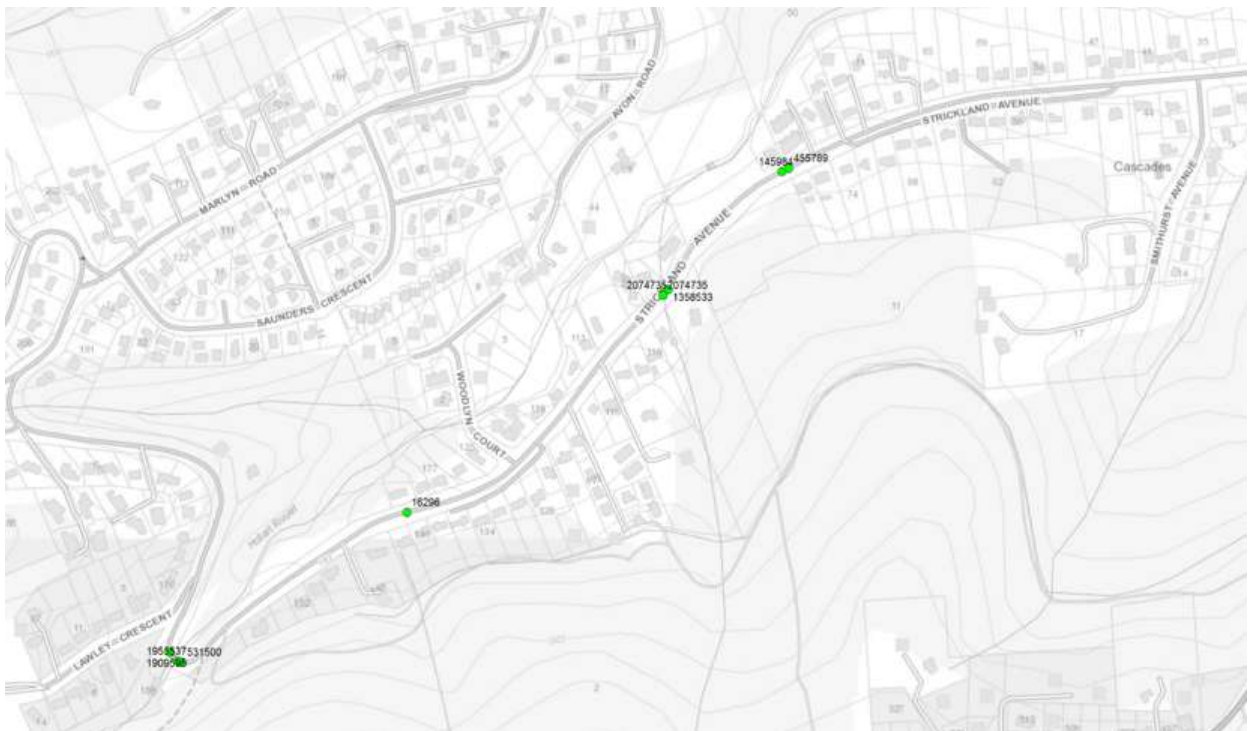
The findings of the crash data is summarised as follows:

- A total of 8 crashes have occurred during this time.
- Severity: 1 involved serious injury; 1 involved first aid at the scene; 6 involved property damage only.
- Crash types: no clear crash trends were evident. The majority of vehicles lost control on the carriageway, resulting in a single vehicle crash. One 'right-rear' collision was noted.

- Vulnerable road users: 1 crash involved a motorcycle losing control on the carriageway resulting in serious injury (Monday 16<sup>th</sup> February 2015 at 7:27pm); 1 crash involved a bicycle losing control on a curve resulting in property damage only (17<sup>th</sup> September 2016 at 9:20am). No crashes involved pedestrians.
- Crash locations: The crash locations are shown in Figure 4. Three crashes were reported on the sharp bend at the crossing of the Hobart Rivulet.
- Day of week: 4 crashes occurred on weekends (2 each Saturdays and Sundays); 4 crashes occurred on weekdays.
- Time of day: 5 crashes were reported between 7:00am and 7:00pm; 2 crashes occurred during the evening; 1 crash occurred early morning (1:55am).

The crash history is considered to be relatively low and typical of a major collector road through a residential area. Importantly, no crashes were reported that involved a vehicle emerging from property access.

**Figure 4 Crash Locations**



*Source: Department of State Growth*

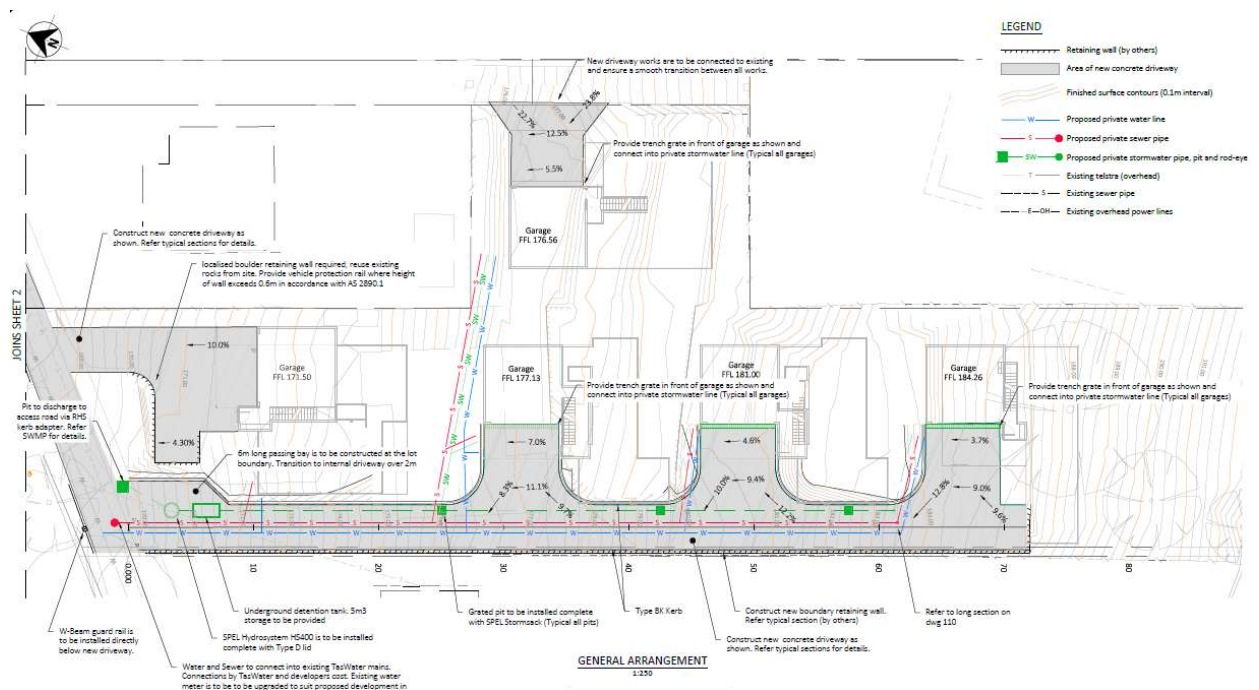
## 3. Proposed Development

### 3.1 Development Proposal

The proposal involves the demolition of the existing dwelling and the development of 5 new units. The proposal is accessed via a right-of-way that connects to Strickland Avenue. The existing dwelling is accessed via an existing driveway access; 1 unit is accessed via an existing right-of-way along the east of the site; and 3 units are accessed via a new driveway along the west of the site.

The proposed development is shown in Figure 5. The driveway access configuration for the development is shown in Figure 6.

**Figure 5 Proposed Development Plans**



## 4. Traffic Impacts

### 4.1 Traffic Generation

Traffic generation rates were sourced from the RMS Guide. The RMS Guide states the following traffic generation rates for medium density residential developments:

- Daily vehicle trips 4 to 5 per dwelling
- Weekday peak hour vehicle trips 0.4 to 0.5 per dwelling

Based on these rates, the traffic generation from the subdivision is likely to be in the order of 25 trips per day, and 3 trips per hour during peak periods.

### 4.2 Trip Distribution

It is likely that the majority of traffic will enter and leave the development to and from the east on Strickland Avenue.

### 4.3 Access Impacts

The proposal will create a new driveway along the western edge of the site. The general access arrangements for the development are shown in Figure 6.

The new driveway, as well as the existing access junction with Strickland Avenue were assessed against the requirements of E5.0, '*Road and Railway Assets Code*' of the Planning Scheme.

**Figure 6 Access Arrangements**



#### 4.4 Road Junction Planning Scheme Requirements

Acceptable Solution A3 of Clause E5.5.1 of the Planning Scheme states "*The annual average daily traffic (AADT) of vehicle movements, to and from a site, using an existing access or junction, in an area subject to a speed limit of 60km/h or less, must not increase by more than 20% or 40 vehicle movements per day, whichever is the greater*".

The proposal will generate less than 40 vehicle movements per day, but the generation is likely to represent more than a 20% increase on the existing volumes at the Strickland Avenue access. The development was therefore assessed against the requirements of Performance Criteria P3, which states:



*"Any increase in vehicle traffic at an existing access or junction in an area subject to a speed limit of 60km/h or less, must be safe and not unreasonably impact on the efficiency of the road, having regard to:*

- (a) the increase in traffic caused by the use;*
- (b) the nature of the traffic generated by the use;*
- (c) the nature and efficiency of the access or the junction;*
- (d) the nature and category of the road;*
- (e) the speed limit and traffic flow of the road;*
- (f) any alternative access to a road;*
- (g) the need for the use;*
- (h) any traffic impact assessment; and*
- (i) any written advice received from the road authority."*

The following is relevant with respect to the proposed subdivision:

- a. The increased traffic generated by the proposed development is likely to be 25 vehicles per day when all units are fully developed and occupied.
- b. All traffic generated by the proposed development will be residential in nature. This is compatible with the existing traffic utilising Strickland Avenue near the subject site.
- c. The right-of-way access servicing the site will operate at a high level of service based on the relatively low traffic volumes on all approaches.
- d. Strickland Avenue is a minor collector road that has a relatively low traffic volume near the site. It provides access to a residential catchment that is relatively stable and closed in nature.
- e. The general urban speed limit of 50-km/h applies to Strickland Avenue.
- f. No alternative access is possible for the proposed development.
- g. Not assessed in this report.
- h. This report documents the findings of a traffic impact assessment.
- i. No written advice has been received by the road authority (Council) relating to the access.

Based on the above assessment, the proposed access meets the requirements of Performance Criteria P3 of Clause E5.5.1 of the Planning Scheme.

## 4.5 Road Junction Sight Distance

Acceptable Solution A1 of Clause E5.6.4 of the Planning Scheme states that sight distances at “*an access or junction must comply with the Safe Intersection Sight Distance shown in Table E5.1*”. The requirements of Table E5.1 are reproduced in Table 1.

**Table 1 Planning Scheme SISD Requirements**

Vehicle Speed	Safe Intersection Sight Distance in metres, for speed limit of:	
	60 km/h or less	Greater than 60 km/h
50	80	90
60	105	115
70	130	140
80	165	175
90		210
100		250
110		290

In this case, the required SISD is 80 metres, noting that the vehicle speed has been assumed to be equal to the legal speed limit.

The available sight distance from the site’s access is shown in Figure 3. The available sight distance was measured to be 90 metres to the west and 150 metres to the east. Note that an existing bush located on the western corner of the access restricts sight distance until the vehicle moves forward onto Strickland Avenue. The measurement of sight distance of 90-metres assumes that the bush has been removed (as recommended in the design plans).

Based on the available sight distances exceeding the minimum Planning Scheme requirements, the access complies with Acceptable Solution A1 of Clause E5.6.4.

## 4.6 Driveway Design

There are several elements of the driveways accessing the proposal that were investigated: the main right-of-way access connecting to Strickland Avenue; the new driveway servicing three units; the access to the existing dwelling; and the access to the new unit along the eastern right-of-way.

### 4.6.1 Number of Accesses

The development provides three separate internal accesses that connect to a single right-of-way fronting onto Strickland Avenue.

The Acceptable Solution A1 if Clause E6.7.1 of the Planning Scheme states “*the number of vehicle access points provided for each road frontage must be no more than 1 or the existing number of vehicle access points, whichever is greater*”.

In this case, the development does not alter the number of access points fronting onto Strickland Avenue, therefore the Acceptable Solution A1 of Clause E6.7.1 is met.

#### **4.6.2 Design of Vehicular Accesses**

Acceptable Solution A1 of Clause E6.7.2 of the Planning Scheme states: *"Design of vehicle access points must comply with all of the following: in the case of non-commercial vehicle access; the location, sight distance, width and gradient of an access must be designed and constructed to comply with section 3 – "Access Facilities to Off-street Parking Areas and Queuing Areas" of AS/NZS 2890.1:2004 Parking Facilities Part 1: Off-street car parking".*

The development proposes a new driveway that services three residential units. The driveway was assessed against the requirements of AS2890.1 for grade. The Australian Standards state the following with regards to domestic driveways:

*"2.6.2 – the maximum gradient of domestic driveways shall be 1 in 4 (25%). The maximum gradient of the associated access driveway across a property line or building alignment shall be 1 in 20 (5%) and across a footpath as specified in Clause 3.3(d).*

*Grade changes across a footpath and within the property shall be designed and checked in accordance with Appendix C to ensure that vehicles will not scrape their undersides when negotiating them. Transitions may be required (see Clause 2.5.3(d)). Checks may be required along both edges of a driveway as well as along the centre line if there are changes in the cross slope at or near a grade change.*

*NOTE: It is recognised that limiting domestic driveway grades to 25 percent maximum may not be practicable in some particularly hilly residential locations. The services of a professionally qualified person with appropriate experience may be required to make a judgement as to whether a particular grade line design is safe and environmentally sustainable."*

The long section of the driveway design is provided in Figure 7. The driveway exceeds the maximum longitudinal grade in several sections, ranging from 25.8% to a maximum of 27.6%. The driveway design therefore does not comply with Acceptable Solution A1:E6.7.2.

The Performance Criteria P1 of Clause E6.7.2 states:

*"Design of vehicle access points must be safe, efficient and convenient, having regard to all of the following:*

- (a) avoidance of conflicts between users including vehicles, cyclists and pedestrians;*
- (b) avoidance of unreasonable interference with the flow of traffic on adjoining roads;*
- (c) suitability for the type and volume of traffic likely to be generated by the use or development;*
- (d) ease of accessibility and recognition for users.*

In this case, the following is relevant with respect to the development:

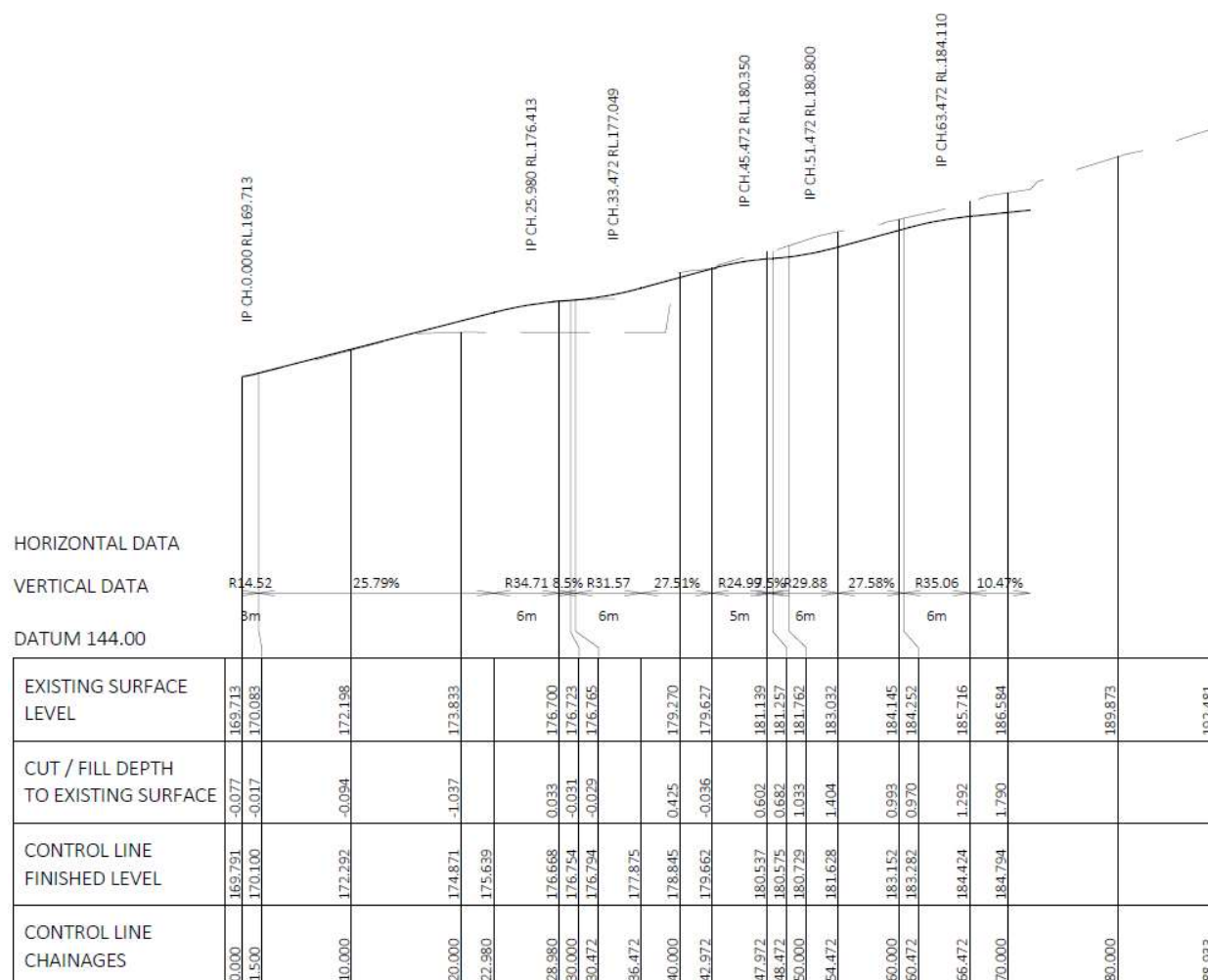
- a. The gradient does not create any significant conflicts between road users.
- b. The gradient does not interfere with the flow of traffic on Strickland Avenue.
- c. The traffic volume utilising the driveway will be very low, peaking at 3 vehicles per hour.
- d. The design of the driveway has straight geometry and will be clearly identifiable as a domestic driveway.

The following is also relevant with respect to the driveway design:

- The gradient exceeds the Australian Standards requirements by no more than 2.6% over a reasonably short section of the driveway's length.
- Transitions are acceptable between the right-of-way access and the driveway, as well as the interface between the driveway and the parking areas associated with each unit.
- The driveway design provides a good compromise for all access and parking areas on the site.
- The driveway should be constructed with rough textured concrete, to provide good traction.
- There is no practical method of reducing the slope of the driveway accesses (longitudinal or cross-section). The overall design appears to provide the best overall design to minimise the gradient at key areas of the site.
- There are many examples of driveways that exceed 25% in the greater Hobart area due to its hilly terrain.

Based on the above, the design of the driveway (gradient) complies with the requirements of Performance Criteria P1:E6.7.2 of the Planning Scheme.

**Figure 7 Driveway Longitudinal Section**

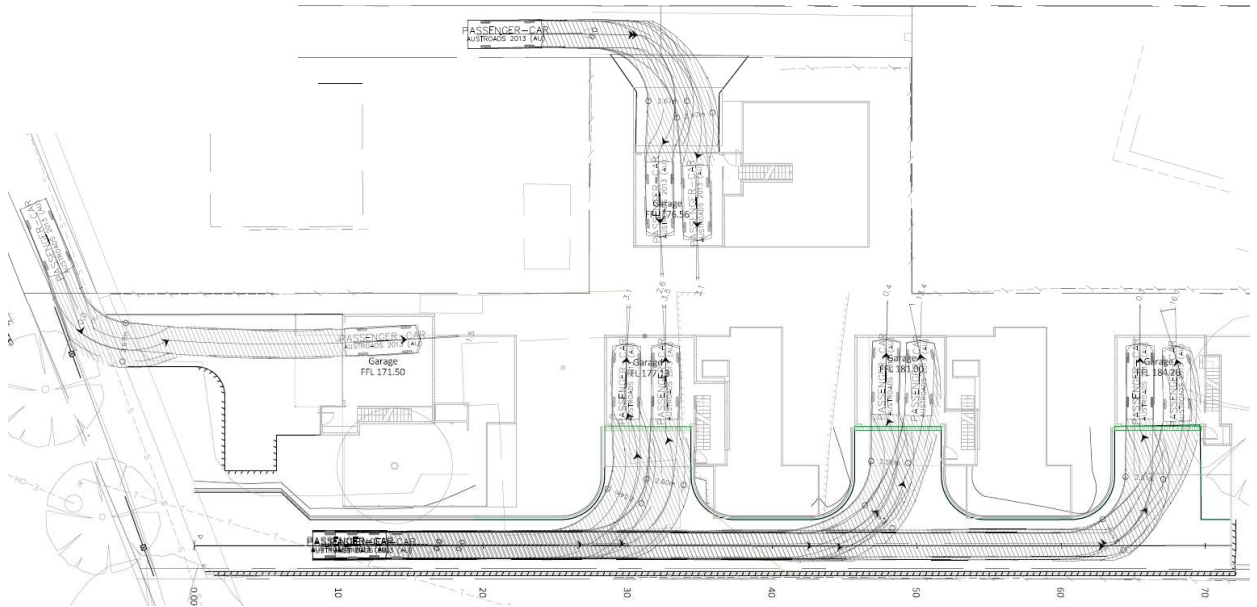


#### 4.6.3 Vehicle Manoeuvring

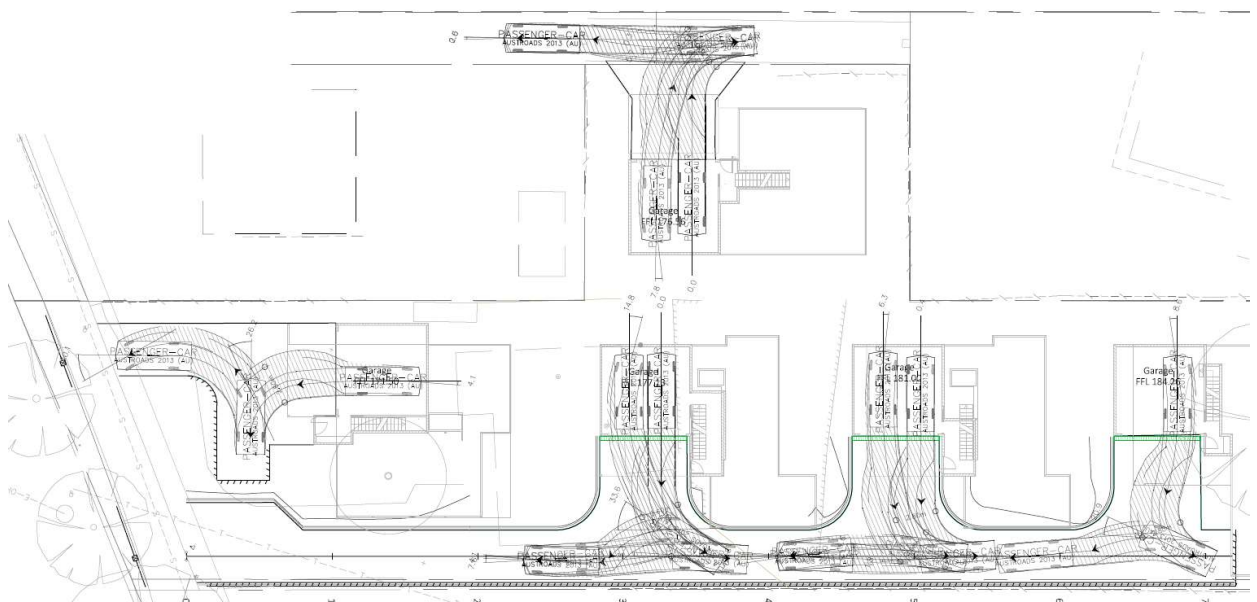
The parking areas were assessed with B85 swept paths in accordance with AS2890.1 requirements. This is shown in Figure 8 and Figure 9 for forward and reverse movements respectively.

It can be seen that all car parking areas are readily accessible for a B85 vehicle, thus complying with the requirements of AS2890.1.

**Figure 8 Vehicle Manoeuvring – Forward Movements**



**Figure 9 Vehicle Manoeuvring – Reverse Movements**





#### 4.6.4 Vehicle Passing Bays

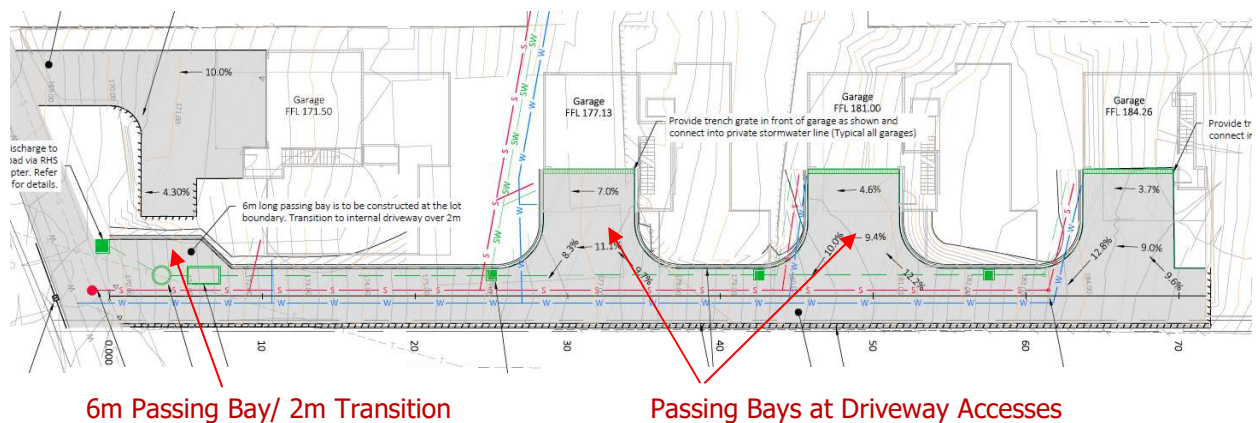
Acceptable Solution A1 of Clause E6.7.3 of the Planning Scheme states that vehicle passing bays must:

*"Be provided if any of the following applies to an access:*

- i. It serves more than 5 car parking spaces;*
- ii. Is more than 30 m long*
- iii. It meets a road serving more than 6000 vehicles per day".*

In this case, the driveway serves more than 5 car parking spaces and is greater than 30 metres in length. Passing bays are provided at three key locations along the driveway as shown in Figure 10. The driveway therefore complies with the requirements of Acceptable Solution A1 of Clause E6.7.3 of the Planning Scheme.

**Figure 10 Driveway Passing Bays**



#### 4.6.5 On-site Turning

Acceptable Solution A1 of Clause E6.7.4 of the Planning Scheme states:

*"On-site turning must be provided to enable vehicles to exit a site in a forward direction, except where the access complies with any of the following:*

- (a) it serves no more than two dwelling units;*
- (b) it meets a road carrying less than 6000 vehicles per day".*

In this case, all parking areas facilitate on-site manoeuvring to enable vehicles to enter and leave in a forward direction. Acceptable Solution A1:E6.7.4 is therefore met.

#### **4.7 Right of Way**

It is noted that the existing right-of-way connecting to the new driveway is narrow and in relatively poor condition. This is shown in Figure 2.

The proposal will reseal the access junction and right-of-way between the subject site and the Strickland Avenue junction. The existing right-of-way will be formalised and widened to 3.6 metres. This width is considered as wide as physically possible due to site constraints (retaining wall and property boundaries, etc).

Vegetation is also proposed to be removed to improve sight distance (as noted in Section 4.5). The vegetation removal will also improve sight distance for vehicles exiting the new driveway to the Strickland Avenue junction – enabling vision for vehicles entering from Strickland Avenue, thus minimising conflict.

These alterations to the existing access are shown in Figure 6.

#### **4.8 Pedestrian Impacts**

The proposed development is likely to generate a relatively low amount of pedestrian movements in the surrounding road network. There are relatively few pedestrian generators such as schools and shops to generate moderate pedestrian trips in the immediate surrounding area.

#### **4.9 Road Safety Impacts**

No significant adverse road safety impacts are foreseen for the proposed development. This is based on the following:

- There is sufficient spare capacity in Strickland Avenue to absorb the relatively insignificant peak hour traffic generated from the proposed development (3 trips per hour).
- The access at Strickland Avenue is existing and will be improved, thus facilitating a higher level of safety for all users.
- The existing road safety performance of the road network near the subject site does not indicate that there are any specific road safety deficiencies that might be exaggerated by the small increase in traffic volume.
- There is adequate sight distance from the access for the prevailing vehicle speeds on Strickland Avenue in accordance Planning Scheme requirements.



## 5. Parking Assessment

### 5.1 Parking Provision

The proposal provides a total of 10 garage spaces and 10 spaces immediately in front of the garage (jockey style spaces). This provides up to 20 parking spaces for the development as a whole.

### 5.2 Planning Scheme Requirements

Acceptable Solution A1 of Clause E6.6.1 of the Planning Scheme states "*The number of on-site car parking spaces must be no less than and no greater than the number specified in Table E6.1*".

Table E6.1 of the Planning Scheme requires 2 spaces for each dwelling and 1 dedicated visitor space per 4 dwellings (rounded up to the nearest whole number). This is a requirement for 12 spaces. The provision of 20 spaces technically exceeds this requirement, therefore the Acceptable Solution A1:E6.6.1 is not met.

The Performance Criteria P1 of Clause E6.6.1 of the Planning Scheme states:

*The number of on-site car parking spaces must be sufficient to meet the reasonable needs of users, having regard to all of the following:*

- (a) *car parking demand;*
- (b) *the availability of on-street and public car parking in the locality;*
- (c) *the availability and frequency of public transport within a 400m walking distance of the site;*
- (d) *the availability and likely use of other modes of transport;*
- (e) *the availability and suitability of alternative arrangements for car parking provision;*
- (f) *any reduction in car parking demand due to the sharing of car parking spaces by multiple uses, either because of variation of car parking demand over time or because of efficiencies gained from the consolidation of shared car parking spaces;*
- (g) *any car parking deficiency or surplus associated with the existing use of the land;*
- (h) *any credit which should be allowed for a car parking demand deemed to have been provided in association with a use which existed before the change of parking requirement, except in the case of substantial redevelopment of a site;*
- (i) *the appropriateness of a financial contribution in lieu of parking towards the cost of parking facilities or other transport facilities, where such facilities exist or are planned in the vicinity;*
- (j) *any verified prior payment of a financial contribution in lieu of parking for the land;*
- (k) *any relevant parking plan for the area adopted by Council;*
- (l) *the impact on the historic cultural heritage significance of the site if subject to the Local Heritage Code;*

*(m) whether the provision of the parking would result in the loss, directly or indirectly, of one or more significant trees listed in the Significant Trees Code.*

In this case the following is relevant with respect to the development:

- a. The car parking demand is likely to be similar to the Planning Scheme requirement. In this case, the supply exceeds the demand and therefore the oversupply will not result in any parking impacts beyond the site. It is further noted that the parking spaces located immediately in front of the garages are not formally marked for parking but provide a convenient parking area for visitors or resident parking.
- b. The oversupply of parking will result in no on-street parking demands imposed on Strickland Avenue.
- c. A bus route travels regularly along Strickland Avenue.
- d. Not applicable as the development has an over-supply of parking.
- e. Not applicable as the development has an over-supply of parking.
- f. Not applicable as the development has an over-supply of parking.
- g. Not applicable as the development has an over-supply of parking.
- h. Not applicable as the development has an over-supply of parking.
- i. Not applicable as the development has an over-supply of parking.
- j. Not applicable as the development has an over-supply of parking.
- k. Not applicable.
- l. Not applicable.
- m. No impact.

Based on the above, the parking provision meets the requirement of Performance Criteria P1:E6.6.1 of the Planning Scheme.

## 6. Conclusions

This traffic impact assessment (TIA) investigated the traffic and parking impacts of a proposed residential unit development at 128 Strickland Avenue, South Hobart.

The key findings of the TIA are summarised as follows:

- The proposal includes the demolition of the existing dwelling and the construction of 5 new units accessed via a right-of-way connecting to Strickland Avenue.
- The existing right-of-way connecting to the new driveway is narrow and in relatively poor condition. The proposal will reseal the access junction and right-of-way between the subject site and the Strickland Avenue junction. The existing right-of-way will be formalised and widened to 3.6 metres. This width is considered as wide as physically possible due to site constraints.
- Vegetation is also proposed to be removed to improve sight distance. The removal of vegetation at this location enables sight distance to comply with Acceptable Solution A1 of Clause E5.6.4 of the Planning Scheme.
- The driveway gradient exceeds the maximum requirement of 25% in accordance with AS2890.1. The maximum gradient ranges from 25.8% to a maximum of 27.6%. In this case the driveway access and parking areas are deemed to be acceptable based on the design of the driveway. The driveway exceeds the maximum value by up to 2.7%, which is relatively common in the Greater Hobart area.
- The parking provision complies with the requirements of Performance Criteria P1 of Clause E6.6.1 of the Planning Scheme.

Based on the findings of this report and subject to the recommendations above, the proposed development is supported on traffic grounds.

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**Document Status**

Revision	Author	Review	Date
0	Keith Midson	Zara Kacic-Midson	10 May 2018
1	Keith Midson	Zara Kacic-Midson	22 May 2018

# Bushfire Hazard Assessment Report & Bushfire Hazard Management Plan

128 Strickland Avenue, South Hobart



**Prepared for (Client)**

W H Ashlin Builder Renovator

11 James Avenue

KINGSTON BEACH TAS 7050

**Assessed & Prepared by**

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Rebecca Green & Associates

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Mobile: 0409 284 422

Version 1

25 April 2018

Job No: RGA-B810

## Executive Summary

The proposed development at 128 Strickland Avenue, South Hobart, is subject to bushfire threat. A bushfire attack under extreme fire weather conditions is likely to subject buildings at this site to considerable radiant heat, ember attack along with wind and smoke.

The site requires bushfire protection measures to protect the buildings and people that may be on site during a bushfire.

These measures include provision of hazard management areas in close proximity to the buildings, implementation of safe egress routes, establishment of a water supply and construction of buildings as described in AS 3959-2009 Construction of Buildings in Bushfire Prone Areas.

Primary responsibilities identified within this report:

Occupier	<ul style="list-style-type: none"> <li>• <input type="checkbox"/> Establish and maintain Hazard Management Areas as described in this report, including egress and access routes.</li> <li>• <input type="checkbox"/> Establish adequate turning facilities for emergency vehicles on site, as described in this report.</li> <li>• <input type="checkbox"/> Construct Townhouse 04 to meet <b>BAL 19</b> (AS3959-2009).</li> <li>• <input type="checkbox"/> The north-western elevations of Townhouse 04 may be constructed to meet <b>BAL 12.5</b> (AS3959-2009) due to shielding.</li> <li>• <input type="checkbox"/> Construct Townhouse 01, 02, 03 and 05 to meet <b>BAL 12.5</b> (AS3959-2009).</li> </ul>
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## Schedule 1 – Bushfire Report

### 1.0 Introduction

The Bushfire Attack Level (BAL) Report and Bushfire Hazard Management Plan (BHMP) has been prepared for submission with a Building Permit Application under the *Building Act 2016 & Regulations 2016*.

The Bushfire Attack Level (BAL) is established taking into account the type and density of vegetation within 100 metres of the proposed building site and the slope of the land; using the simplified method in AS 3959-2009 Construction of Buildings in Bushfire Prone Areas; and includes:

- ☐ The type and density of vegetation on the site,
- ☐ Relationship of that vegetation to the slope and topography of the land,
- ☐ Orientation and predominant fire risk,
- ☐ Other features attributing to bushfire risk.

On completion of assessment, a Bushfire Attack Level (BAL) is established which has a direct reference to the construction methods and techniques to be undertaken on the buildings and for the preparation of a Bushfire Hazard Management Plan (BHMP).

### 1.1 Scope

This report was commissioned to identify the Bushfire Attack Level for the existing property. ALL comment, advice and fire suppression measures are in relation to compliance with the Building Code of Australia and Australian Standards, *AS 3959-2009, Construction of buildings in bushfire-prone areas*.

### 1.2 Limitations

The inspection has been undertaken and report provided on the understanding that:-

1. ☐ The report only deals with the potential bushfire risk, all other statutory assessments are outside the scope of this report.
2. ☐ The report only identifies the size, volume and status of vegetation at the time the site inspection was undertaken and cannot be relied upon for any future development.
3. ☐ Impacts of future development and vegetation growth have not been considered.

**No action or reliance is to be placed on this report; other than for which it was commissioned.**

### 1.3 Proposal

The proposal is for the construction of five new townhouses.

## 2.0 Site Description for Proposal (Bushfire Context)

### 2.1 Locality Plan

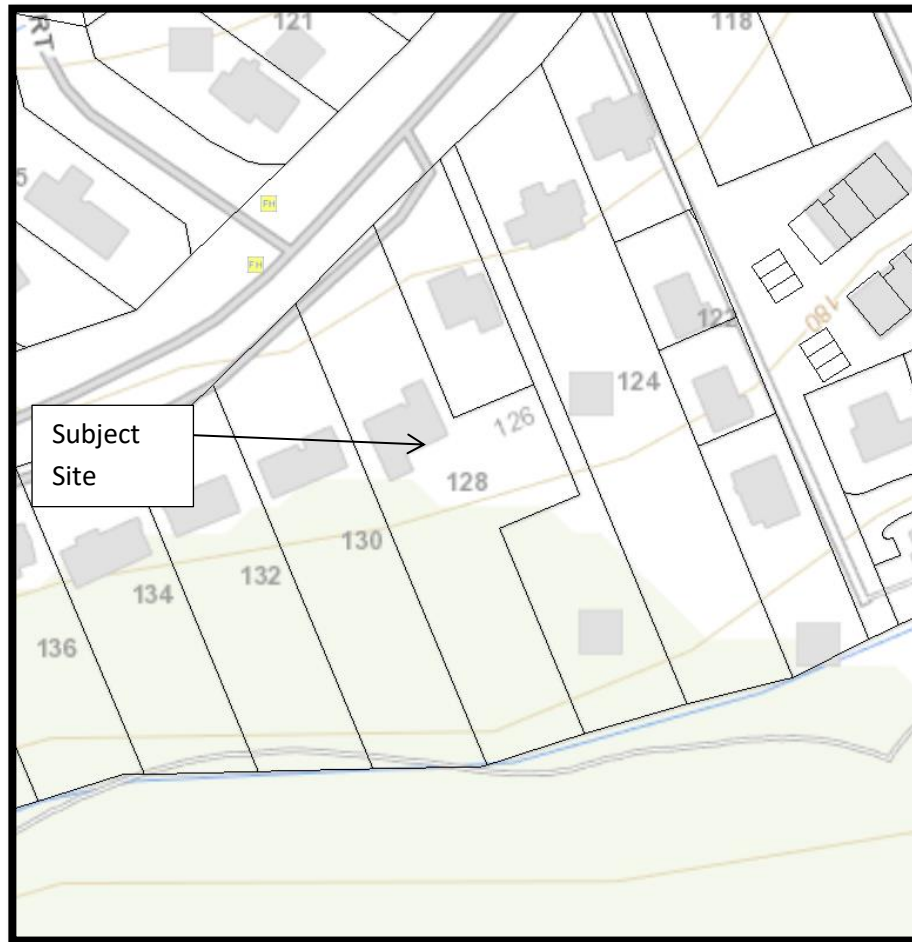


Figure 1: Location Plan of 128 Strickland Avenue, South Hobart

### 2.2 Site Details

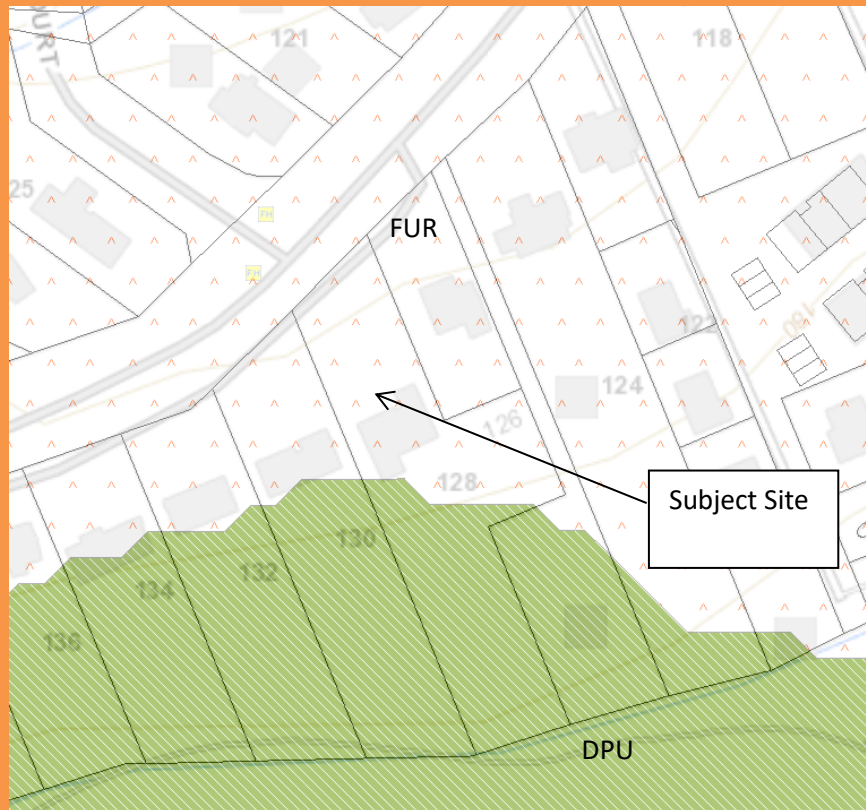
<b>Property Address</b>	128 Strickland Avenue, South Hobart
<b>Certificate of Title</b>	Volume 158907 Folio 2
<b>Owner</b>	Ashlin Developments Pty Ltd
<b>Existing Use</b>	Residential
<b>Type of Proposed Building Work</b>	Construction of five townhouses
<b>BCA Classification</b>	Dwelling – Class 1a
<b>Water Supply</b>	TasWater reticulated supply
<b>Road Access</b>	Street Frontage – Strickland Avenue

### 3.0 Bushfire Site Assessment

#### 3.1 Vegetation Analysis

##### 3.1.1 TasVeg Classification

Reference to Tasmanian Vegetation Monitoring & Mapping Program (TASVEG) indicates the land in and around the property is generally comprising of varying vegetation types including:



Code	Species	Vegetation Group
<b>FUR</b>	<ul style="list-style-type: none"> <li>• □ Urban areas</li> </ul>	Agricultural, urban and exotic vegetation
<b>DPU</b>	<ul style="list-style-type: none"> <li>• □ Eucalyptus pulchella forest and woodland</li> </ul>	Dry eucalypt forest and woodland



### 3.1.2 Site & Vegetation Photos



View looking northeast



View looking southeast





View looking further to southeast



View looking southwest





View looking northwest



Existing access

### 3.2 BAL Assessment – 5 x Townhouses

Vegetation classification AS3959	North <input type="checkbox"/> North-East <input checked="" type="checkbox"/>	South <input type="checkbox"/> South-West <input checked="" type="checkbox"/>	East <input type="checkbox"/> South-East <input checked="" type="checkbox"/>	West <input type="checkbox"/> North-West <input checked="" type="checkbox"/>																								
Group A	<input type="checkbox"/> Forest	<input type="checkbox"/> Forest	<input checked="" type="checkbox"/> Forest	<input checked="" type="checkbox"/> Forest																								
Group B	<input type="checkbox"/> Woodland	<input type="checkbox"/> Woodland	<input type="checkbox"/> Woodland	<input type="checkbox"/> Woodland																								
Group C	<input type="checkbox"/> Shrub-land	<input type="checkbox"/> Shrub-land	<input type="checkbox"/> Shrub-land	<input type="checkbox"/> Shrub-land																								
Group D	<input type="checkbox"/> Scrub	<input type="checkbox"/> Scrub	<input type="checkbox"/> Scrub	<input type="checkbox"/> Scrub																								
Group E	<input type="checkbox"/> Mallee-Mulga	<input type="checkbox"/> Mallee-Mulga	<input type="checkbox"/> Mallee-Mulga	<input type="checkbox"/> Mallee-Mulga																								
Group F	<input type="checkbox"/> Rainforest	<input type="checkbox"/> Rainforest	<input type="checkbox"/> Rainforest	<input type="checkbox"/> Rainforest																								
Group G	<input type="checkbox"/> Grassland	<input type="checkbox"/> Grassland	<input checked="" type="checkbox"/> Grassland	<input type="checkbox"/> Grassland																								
	<input checked="" type="checkbox"/> Managed Land	<input checked="" type="checkbox"/> Managed Land	<input checked="" type="checkbox"/> Managed Land	<input checked="" type="checkbox"/> Managed Land																								
Effective slope (degrees)	<input checked="" type="checkbox"/> Up/0 <sup>0</sup>	<input checked="" type="checkbox"/> Up/0 <sup>0</sup>	<input type="checkbox"/> Up/0 <sup>0</sup>	<input type="checkbox"/> Up/0 <sup>0</sup>																								
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Distance to classified vegetation	Metres >100m Low Threat Vegetation/managed (lots less than 1500sqm (BHAN No 01-2014 Version 3.0))	Metres >100m Low Threat Vegetation/managed (lots less than 1500sqm (BHAN No 01-2014 Version 3.0))	Metres <u>Townhouse 04</u> 0-<13m managed (subject site) 13-<23m grassland >23m forest <u>Townhouse 01,02, 03 &amp; 05</u> >28m grassland >38m forest	Metres <u>Townhouse 01 &amp; 02</u> 70-<90m Forest Townhouse 03, 04 & 05 >100m managed																								
Likely direction of bushfire attack	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																								
Prevailing winds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																								
Exclusions	<table><tr><td>a</td><td>b</td><td>c</td><td>d</td><td><u>e</u></td><td><u>f</u></td></tr></table>	a	b	c	d	<u>e</u>	<u>f</u>	<table><tr><td>a</td><td>b</td><td>c</td><td>d</td><td><u>e</u></td><td><u>f</u></td></tr></table>	a	b	c	d	<u>e</u>	<u>f</u>	<table><tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td><td><u>f</u></td></tr></table>	a	b	c	d	e	<u>f</u>	<table><tr><td>a</td><td>b</td><td>c</td><td>d</td><td><u>e</u></td><td><u>f</u></td></tr></table>	a	b	c	d	<u>e</u>	<u>f</u>
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a	b	c	d	e	<u>f</u>																							
a	b	c	d	<u>e</u>	<u>f</u>																							
BAL Value (FDI 50)	BAL – LOW	BAL – LOW	<u>Townhouse 04</u> BAL-19 <u>Townhouse 01,02, 03 &amp; 05</u> BAL-12.5	<u>Townhouse 01 &amp; 02</u> BAL 12.5 <u>Townhouse 03, 04 &amp; 05</u> BAL-LOW																								

The Bushfire Attack Level shall be classified BAL-LOW where the vegetation is one or a combination of any of the following:

- (a) ☐ Vegetation of any type that is more than 100 metres from the site.
- (b) ☐ Single areas of vegetation less than 1 hectare in area and not within 100m of other areas of vegetation being classified.
- (c) ☐ Multiple areas of vegetation less than 0.25 hectare in area and not within 20 metres of the site, or each other.
- (d) ☐ Strips of vegetation less than 20 metres in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 metres of the site or each other, or other areas of vegetation being classified.
- (e) ☐ Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.
- (f) ☐ Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTE: Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognisable as short-cropped grass for example, to a nominal height of 100mm).

<b>BAL – LOW</b>	<b>The risk is considered to be VERY LOW.</b> There is insufficient risk to warrant any specific construction requirements but there is still some risk.
<b>BAL – 12.5</b>	<b>The risk is considered to be LOW.</b> There is a risk of ember attack. The construction elements are expected to be exposed to a heat flux not greater than 12.5 kW/m <sup>2</sup> .
<b>BAL – 19</b>	<b>The risk is considered to be MODERATE.</b> There is a risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m <sup>2</sup> .
<b>BAL – 29</b>	<b>The risk is considered to be HIGH.</b> There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m <sup>2</sup> .
<b>BAL – 40</b>	<b>The risk is considered to be VERY HIGH.</b> There is a much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40 kW/m <sup>2</sup> .
<b>BAL – FZ</b>	<b>The risk is considered to be EXTREME.</b> There is an extremely high risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/m <sup>2</sup> .



### 3.3 Specified Hazard Management Areas

Hazard management areas are to be established and maintained between the bushfire prone vegetation and the building at a distance equal to, or greater than the separation distance specified for the Bushfire Attack Levels (BAL) in table 2.4.4 of *Australian Standard 3959-2009 Construction of Buildings in Bushfire Prone Areas*.

Where the Hazard Management Areas can be increased around the building and the classified vegetation in accordance with table 2.4.4 of Australian Standard 3959, the risk from bushfire attack can reduce.

#### Townhouse 04

Distance from Predominant vegetation for BAL 19	North/ North-East	South/ South-West	East/ South-East	West/ North-West
	To title boundary	To title boundary	To title boundary (Min. 13m)	To title boundary
	Metres	Metres	Metres	Metres

#### Townhouse 01, 02, 03 & 05

Distance from Predominant vegetation for BAL 12.5	North/ North-East	South/ South-West	East/ South-East	West/ North-West
	To title boundary	To title boundary	To title boundary	To title boundary
	Metres	Metres	Metres	Metres

The separation distance for the SPECIFIED Hazard Management Area is to be shown on the attached Bushfire Hazard Management Plan measured from the external walls (Façade) of the building in metres along the ground to the bushfire hazard vegetation (if applicable).

### 3.4 Outbuildings

Not applicable.

### 3.5 Road Access

Roads are to be constructed to provide vehicle access to the site to assist firefighting and emergency personnel to defend the building or evacuate occupants; and provide access at all times to the water supply for firefighting purposes on the building site.

Private access roads are to be constructed from the entrance to the property cross over with the public road through to the dwelling and water storage area on the site. Private access roads are to be designed, constructed and maintained to a standard not less than Table E4.2B.

<b>Existing</b> Road Access and Driveways	Access via direct road frontage
<b>New</b> Road Access and Driveways	Private access driveway / roads are to be constructed from the entrance of the property cross over at the public road through to the dwelling and on-site dedicated fire fighting water supply (where provided). Private access roads are to be designed, constructed and maintained to a standard not less than specified in Table E4.2B.

**Table E4.2: Standards for Property Access**

The following design and construction requirements apply to property access length is 30 metres or greater or access for a fire appliance to a fire fighting water point:

- (i) ☐ All weather construction;
- (ii) ☐ Load capacity of at least 20 tonnes, including for bridges and culverts;
- (iii) ☐ Minimum carriageway width of 4 metres;
- (iv) ☐ Minimum vertical clearance of 4 metres;
- (v) ☐ Minimum horizontal clearance of 0.5 metres from the edge of the carriageway;
- (vi) ☐ Cross falls of less than 3 degrees (1:20 or 5%);
- (vii) ☐ Dips less than 7 degrees (1:8 or 12.5%) entry and exit angle;
- (viii) ☐ Curves with a minimum inner radius of 10 metres;
- (ix) ☐ Maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed roads; and
- (x) ☐ Terminate with a turning area for fire appliances provided by one of the following:
  - a) ☐ A turning circle with a minimum inner radius of 10 metres;
  - b) ☐ A property access encircling the building; or
  - c) ☐ A hammerhead "T" or "Y" turning head 4 metres wide and 8 metres long.

### 3.6 Water Supply

A building that is constructed in a designated bushfire prone area must provide access at all times to a sufficient supply of water for firefighting purposes on the building site.

The exterior elements of a Class 1 building in a designated Bushfire prone area must be within reach of a 120m long hose (lay) connected to –

- (i) ☐ A fire hydrant with a minimum flow rate of 600L per minute and pressure of 200kpa; or
- (ii) ☐ A stored water supply in a water tank, swimming pool, dam or lake available for firefighting at all times which has the capacity of at least 10,000L for each separate building.

**New**

**Reticulated Water Supply**

Fire hydrants are provided within the road reserve and within 120m hose lay of the dwelling from Strickland Avenue. On site water supply is not required.



It should be recognised that although water supply as specified above may be in compliance with the requirements of the Building Code of Australia, the supply may not be adequate for all firefighting situations.

## **4.0 Layout Options**

Not relevant to this proposal.

## **5.0 Other Planning Provisions**

The north-western elevations of Townhouse 04 may be constructed for the next lower BAL than that determined for the site as the north-western elevations are not exposed to the source of bushfire attack. The north-western (shielded elevations) shall be not less than that required for BAL-12.5 (in accordance with Part 3.5 AS3959-2009).

## 6.0 Conclusions and Recommendations

Mitigation from bushfire is dependent on the careful management of the site by maintaining reduced fuel loads within the hazard management areas and within the site.

**The site has been assessed as requiring buildings (Townhouse 04) to conform to or exceed BAL 19 (except for the shielded north-western elevations to conform to or exceed BAL 12.5) and (Townhouses 01, 02, 03 and 05) to conform to or exceed BAL 12.5 requirements based on AS 3959 – 2009 Construction of Buildings in Bushfire Prone Areas.**

### Access

The driveway is to be constructed/upgraded to meet Table 4.2B. Requirements for Property Access, Director's Determination – Requirements for Building in Bushfire-Prone Areas, Version 2.1.

### Water Supplies

The property has access to a reticulated water supply and is within 120 metres of the existing fire plug, meeting the requirements for Reticulated Water Supply for Fire Fighting, Table 4.3A (A), Director's Determination – Requirements for Building in Bushfire-Prone Areas, Version 2.1.

### Fuel Managed Areas

Hazard Management Areas as detailed within the plan shall be constructed and maintained as detailed in Section 2 of Schedule 2 (where applicable).

## Schedule 2 – Bushfire Hazard Management Plan

### 1.0 Introduction

The Bushfire Hazard Management Plan (BHMP) is developed from the results of a Bushfire Attack Level (BAL) Assessment Report prepared for the site in accordance with Australian Standard 3959. The BHMP provides reference and information to existing and subsequent owners on their responsibilities for the establishment, maintenance and future management of their property to reduce the risk of bushfire attack and includes: -

- ☐ Establishment of a Hazard Management Area in and around the existing and/or proposed buildings,
- ☐ Specifications of Private access road construction,
- ☐ Provision on firefighting water supply,
- ☐ Construction requirements in relation to the Building Code of Australia, dependent on the Bushfire Attack Level and requirements of Australian Standard 3959.
- ☐ Reduction and removal of vegetation and fuel loads in and around the property, buildings and Hazard Management Areas,
- ☐ Ongoing maintenance responsibilities by successive owners for perpetuity.

*A copy of the plan MUST also be provided to ALL current and successive owners to make them aware of their continuing obligations to maintain the plan and protection measures attributed to their property in to the future.*

### 2.0 Hazard Management Areas

The Hazard Management Area (defendable space) is provided between the vegetation and the buildings subject to bushfire risk. The space provides for management of vegetation and reduction in fuel loads in an attempt to:

- ☐ Prevent flame impingement on the dwelling;
- ☐ Provide a defendable space for property protection;
- ☐ Reduce fire spread;
- ☐ Deflect and filter embers;
- ☐ Provide shelter from radiant heat; and
- ☐ Reduce wind speed.

The *Building Act 2016*, requires a hazard management area to be established and maintained between the bushfire prone vegetation and the building at a distance equal to, or greater than the separation distance specified for the Bushfire Attack Levels (BAL) in *AS 3959-2009 Construction of Buildings in Bushfire Prone Areas*.

Refer to the attached BHMP Site Plan in Section 6 of this management plan for specific details on the Hazard Management Area.

## **2.1 Vegetation (Fuel) Management**

Managing an area in a minimum fuel condition generally means a reduction in the amount and altering the arrangement of fuels. Most fine fuels are at or close to the ground, often as part of a grass, litter or shrub layer. If there is enough fuel, when a fire comes these fuels will ignite the trees above or set the bark alight which will burn up into the tree canopy causing the most dangerous of bushfire situation; a crown fire.

To prevent crown fires occurring it is necessary to remove the “ladder of fuel” between the ground and the tree crowns and to make sure the amount of ground fuel is not sufficient to set the crowns alight. Without fire burning below, a crown fire should not be sustained. Further removing continuity and separation of the vegetation canopies both horizontally and vertically will assist.

All vegetation will burn under the influence of bushfire; shrub layers need to be modified to remove tall continuous walls of vegetation and establish clear separation between the ground and the bottom of the tree canopy. Further minimisation of flammable ground litter such as leaves, twigs, bark, ferns and debris will further reduce fuel load with potential to burn or contribute to the growth of a bushfire.

Fuels do not need to be totally removed however fuels close to the building and inside the Hazard Management Area are to be kept to a minimum. As a general practice 5 tonnes per hectare is accepted as being controllable with normal firefighting resources. This can be visualised as grass cut to about 10 centimetres in height or ground litter about 2 centimetres thick. This is considered to be a low fuel level.

## **2.2 Other Risk Management Actions**

Other actions that can be implemented to reduce the bushfire risk in the Hazard Management Areas include:

1. ☐ Establishing non-combustible paths and driveways around buildings.
2. ☐ Establish plantings of low flammability shrub species.
3. ☐ Ensure garden beds and shrubs are established well away from buildings.
4. ☐ Tree planting to be located at the outer edge of the Hazard Management Area and spaced well apart to ensure canopy separation.
5. ☐ Cut lawns short and maintain.
6. ☐ Remove fallen limbs, leaf and bark litter.
7. ☐ Avoid using pine bark and other flammable mulch in gardens.
8. ☐ Prune trees to ensure canopy separation horizontally and vertically, remove low hanging branches to ensure separation from ground litter.
9. ☐ Where the amount of land permits extend the vegetation management in to a secondary hazard management zone.

### **3.0 On-going Site Management and Maintenance**

On-going maintenance is required to the buildings and landscaping within the hazard management area to ensure the continued performance of the bushfire mitigation measures which have been designed into the development for occupant and community protection.

Specified Hazard Management Areas are only a minimum distance required; owners are encouraged to establish a greater management area where land area and opportunity permits. An additional fuel modified buffer zone between the Hazard Management Area and the bushfire vegetation will only improve the protection level and reduce the risk to the property during a bushfire event.

Preparedness comes down to diligent annual maintenance in and around the buildings and Hazard Management Areas particularly during the period of greatest risk; August to February of each year.

#### **Recommendation:**

1. ☐ Locate wood piles or other flammable storage well away from the dwelling.
2. ☐ Solid non-combustible fencing such as steel provides a fire and heat radiation shield to the dwelling.
3. ☐ Metal flywire screens prevent sparks and embers from entering the building.
4. ☐ Seal gaps under floor spaces, roof space, under eaves, external vents, skylights, chimneys and wall cladding.
5. ☐ Remove ladder fuels from the under storey of larger trees. Prune canopies to provide separation.
6. ☐ Rake up leaf litter and vegetation debris. Cut grass and maintain to less than 10cm.
7. ☐ Keep garden beds well away from the dwelling and use non-combustible garden mulches including rock or stones.
8. ☐ Establish plantings of low flammability shrub species.
9. ☐ Seal all gaps in external claddings.
10. ☐ Keep roof gutters clear of leaf litter, bark and similar debris, remove and maintain. Install gutter guards to assist.
11. ☐ Flammable fuels such as gas bottles should be located on the opposite side of the house to the likely direction of a bushfire.
12. ☐ Seal gaps in roofing to prevent the entry of embers.
13. ☐ Surround the dwelling with non-combustible paths.
14. ☐ Outbuildings to be at least 6m from the main dwelling.
15. ☐ Ensure hoses provide coverage to the whole site. Use metal hose fittings.
16. ☐ Flammable fuels and the like to be stored in minimum volumes well away from the dwelling.

### **4.0 Vehicular Access**

Roads are to be constructed to provide vehicle access to the site to assist firefighting and emergency personnel to defend the building or evacuate occupants; and provide access at all times to the water supply for firefighting purposes on the building site.

Private access roads are to be constructed from the entrance to the property cross over with the public road through to the dwelling and water storage area on the site (if applicable). Private access roads are to be designed, constructed and maintained to a standard as recommended below:

**Recommendations:**

The following design and construction requirements apply to property access length is 30 metres or greater or access for a fire appliance to a fire fighting water point:

- (i) ☐ All weather construction;
- (ii) ☐ Load capacity of at least 20 tonnes, including for bridges and culverts;
- (iii) ☐ Minimum carriageway width of 4 metres;
- (iv) ☐ Minimum vertical clearance of 4 metres;
- (v) ☐ Minimum horizontal clearance of 0.5 metres from the edge of the carriageway;
- (vi) ☐ Cross falls of less than 3 degrees (1:20 or 5%);
- (vii) ☐ Dips less than 7 degrees (1:8 or 12.5%) entry and exit angle;
- (viii) ☐ Curves with a minimum inner radius of 10 metres;
- (ix) ☐ Maximum gradient of 15 degrees (1:3.5 or 28%) for sealed roads, and 10 degrees (1:5.5 or 18%) for unsealed roads; and
- (x) ☐ Terminate with a turning area for fire appliances provided by one of the following:
  - a) ☐ A turning circle with a minimum inner radius of 10 metres;
  - b) ☐ A property access encircling the building; or
  - c) ☐ A hammerhead “T” or “Y” turning head 4 metres wide and 8 metres long.

## **5.0 Water Supply**

A building that is constructed in a designated bushfire prone area must provide access at all times to a sufficient supply of water for firefighting purposes on the building site.

**Recommendations:**

The exterior elements of a Class 1 building in a designated Bushfire prone area must be within reach of a 120m long hose (lay) connected to –

- (i) ☐ A fire hydrant with a minimum flow rate of 600L per minute and pressure of 200kPa; or
- (ii) ☐ A stored water supply in a water tank, swimming pool, dam or lake available for fire fighting at all times which has the capacity of at least 10,000L for each separate building.

### **5.1 Reticulated Water Supply**

Where a reticulated water supply via connection to the Local Water Authority system is available the system is to be designed and fire hydrant ground plugs installed in accordance with AS2419.2. Fire plugs to be positioned and or located so the maximum distance from the fire plug to the building is less than 120 metres and have a minimum flow rate of 10 litres/second.



*Note: Water Corporations indicate flow rates and water pressure from existing fire hydrants may fail to comply with minimum specified requirements.*

*It cannot be assumed that access to existing Water Corporation infrastructure and hydrants will meet the standards. Flow testing is to be undertaken prior to any hydraulic design to satisfy that water supply can deliver required flow rates to the subdivision at peak and off-peak times.*

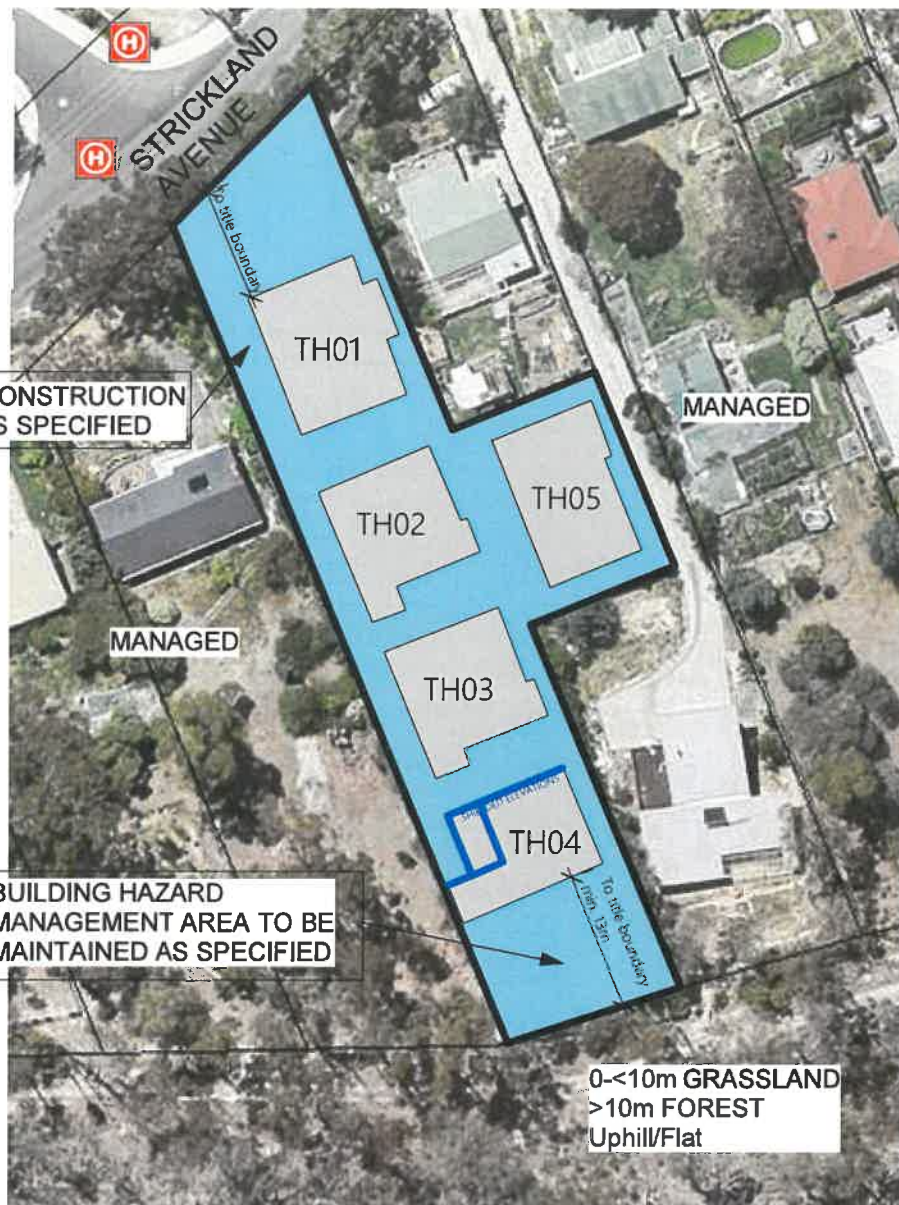
## **5.2 On-Site Dedicated Fire Fighting Water Supply**

Not applicable to this proposal.

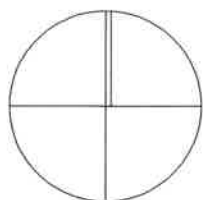
## **Bushfire Hazard Management Site Plan**



Rebecca Green  
& Associates



N



**Access Road:**

Private access roads are to be constructed from the entrance to the property cross-over with the public road through to the dwelling on the site.

- > All-weather construction (minimum)
- > Minimum carriageway width of 4 metres
- > Vegetation must be cleared for a height of 4 metres above the carriageway and 0.5 metres each side of the carriageway
- > Must terminate with a turning area for fire appliances of either a turning circle with a minimum inner radius of 10 metres, a property access encircling the building, or a hammerhead "T" or "Y" turning head 4 metres wide and 8 metres long

**Hazard Management- Vegetation Management:**

Vegetation in the hazard management area (as dimensioned and shown) is to be managed and maintained in a minimum fuel condition

**Fire Fighting Water Supply:**

Fire hydrants - existing fire hydrants are positioned within 120 metres of the building location

## BUSHFIRE HAZARD MANAGEMENT PLAN

**128 Strickland Avenue, South Hobart**

**TOWNHOUSE 04 Bushfire Attack Level - BAL 19,  
BAL 12.5 shielded north-western elevations.**

**TOWNHOUSE 01, 02, 03 & 05 Bushfire Attack Level - BAL 12.5**

**Date: 25 April 2018**

**Form 55**

# CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

To:  Owner /Agent  
 Address  
  Suburb/postcode

Form **55**

## Qualified person details:

Qualified person:   
 Address:  Phone No:   
  Fax No:   
 Licence No:  Email address:

Qualifications and Insurance details:  (description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Speciality area of expertise:  (description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

## Details of work:

Address:  Lot No:   
  Certificate of title No:   
 The assessable item related to this certificate:  (description of the assessable item being certified)  
 Assessable item includes –  
 - a material;  
 - a design  
 - a form of construction  
 - a document  
 - testing of a component, building system or plumbing system  
 - an inspection, or assessment, performed

## Certificate details:

Certificate type:  (description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable item, at any stage, as part of - (tick one)

building work, plumbing work or plumbing installation or demolition work: ☒

or

a building, temporary structure or plumbing installation: ☐

In issuing this certificate the following matters are relevant –

Documents:

Bushfire Hazard Assessment Report &  
Bushfire Hazard Management Plan (Rebecca Green & Associates, 25 April 2018, Job No. RGA-B810)

Relevant

N/A

References:

*Australian Standard 3959-2009*

*Substance of Certificate: (what it is that is being certified)*

1. Assessment of the site Bushfire Attack Level (BAL – 19 for Townhouse 04, except for north-western elevations of the building which may be constructed to BAL-12.5 due to shielding) and (BAL-12.5 for Townhouse 01, 02, 03 & 05) to Australian Standard 3959
2. Bushfire Hazard Management Plan showing BAL-19 and BAL-12.5 solutions.

*Scope and/or Limitations*

**Scope**

This report and certification was commissioned to identify the Bushfire Attack Level for the existing property. All comment, advice and fire suppression measures are in relation to compliance with the *Building Act 2016 & Regulations 2016, Building Code of Australia* and *Australian Standard 3959-2009, Construction of buildings in bushfire-prone areas*.

**Limitations**

The assessment has been undertaken and report provided on the understanding that:-

1. The report only deals with the potential bushfire risk all other statutory assessments are outside the scope of this certificate.
2. The report only identifies the size, volume and status of vegetation at the time the inspection was undertaken and cannot be relied upon for any future development.
3. Impacts of future development and vegetation growth have not been considered.
4. No assurance is given or inferred for the health, safety or amenity of the general public, individuals or occupants in the event of a Bushfire.
5. No warranty is offered or inferred for any buildings constructed on the property in the event of a Bushfire.

**No action or reliance is to be placed on this certificate or report; other than for which it was commissioned.**

**I certify the matters described in this certificate.**

Qualified person:

*Signed:*



*Certificate No:*

RG-686/2018

*Date:*

25 April  
2018

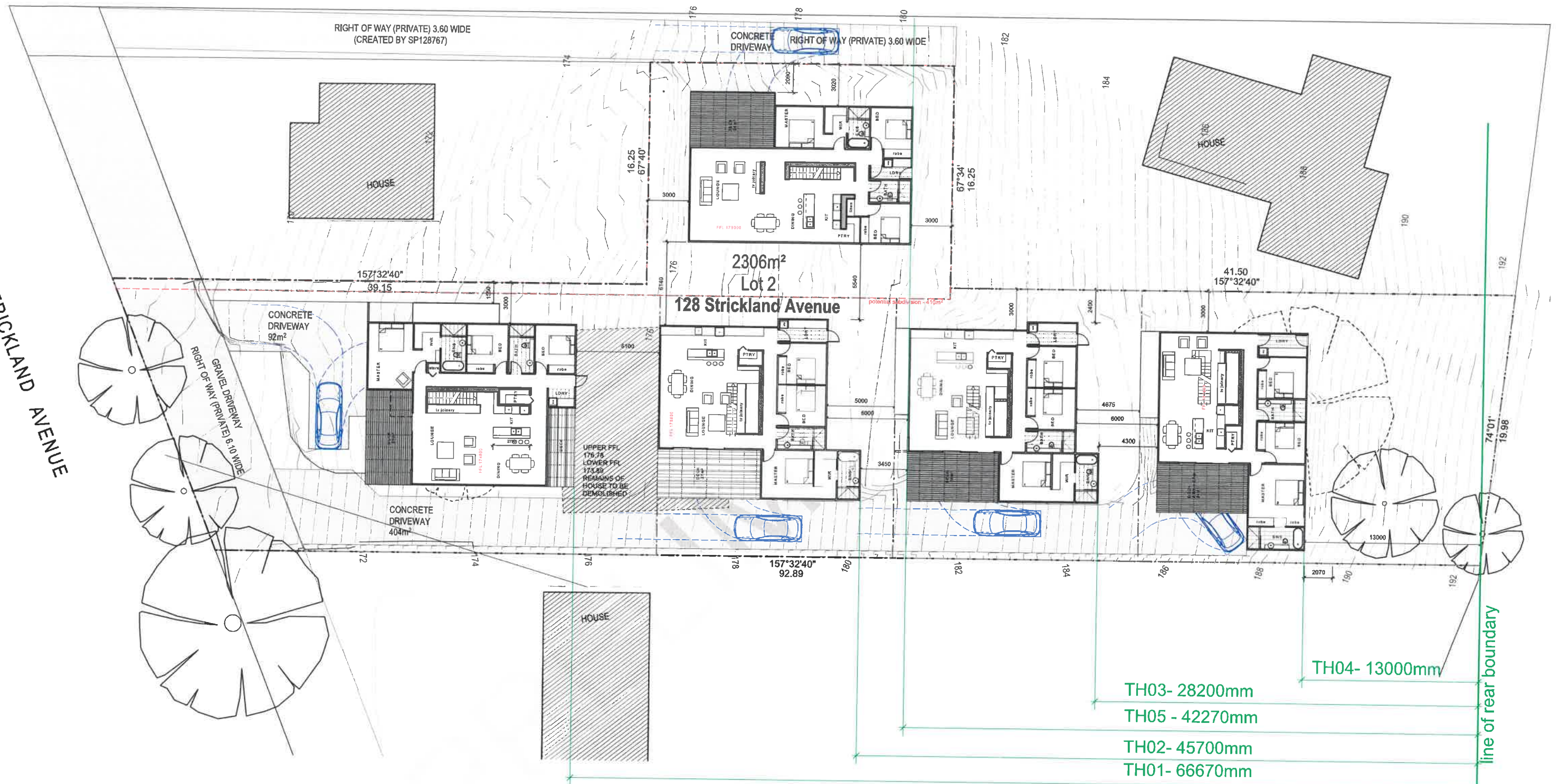
## Attachment 1 – AS3959-2009 Construction Requirements

BAL-LOW	BAL-12.5	BAL-19	BAL-29	BAL-40	BAL-FZ (FLAMEZONE)
<b>SUBFLOOR SUPPORTS</b>	No special construction requirements	No special construction requirements	Enduse on reinforced wall or by steel, bronze or aluminium mesh, non-combustible, with a maximum width of 100 mm and a maximum height of 100 mm. The surface is mounted on a wall or floor with a minimum thickness of 125 mm. The mesh is fixed to the wall or floor with a minimum thickness of 125 mm.	If encased by reinforced wall or floor, 50 mm thick. When used as a base for non-combustible surface, it is tested for a minimum resistance to BS 5503.1.1.	Subfloor supports – enduse on reinforced wall or non-combustible with a minimum thickness of 125 mm or a minimum resistance to BS 5503.1.2.
<b>FLOORS</b>	No special construction requirements	No special construction requirements	Concrete slab on ground, enclosure by external wall, metal mesh is above or below, less than 400 mm above ground level. It is non-combustible, including the resistant timber or protection on the underside with a minimum thickness of 100 mm.	Concrete slab on ground, enclosure by external wall or metal mesh is above or below, less than 400 mm above ground level. It is non-combustible, including the resistant timber or protection on the underside with a minimum thickness of 100 mm.	Concrete slab on ground or enclosure by external wall or a minimum thickness of 125 mm or a minimum resistance to BS 5503.1.1. If not protected by external wall or a minimum thickness of 125 mm, it is tested for a minimum resistance to BS 5503.1.2.
<b>EXTERNAL WALLS</b>	No special construction requirements	As for BAL-19	External walls – If not less than 400 mm above ground level, it is made of non-combustible material. 5 mm fire resistant foil or a thicker resistant material is applied to the external timber.	Non-combustible material (masonry, brick, stone, mud brick, aerated concrete, concrete), timber framed, steel framed with a minimum thickness of 100 mm and clad with 9 mm fire resistant foil or a thicker resistant material. It is tested for a minimum resistance to BS 5503.1.1.	Non-combustible material (masonry, brick, stone, mud brick, aerated concrete, concrete), timber framed or steel framed with a minimum thickness of 100 mm and clad with 9 mm fire resistant foil or a thicker resistant material. It is tested for a minimum resistance to BS 5503.1.2.
<b>EXTERNAL WINDOWS</b>	No special construction requirements	As for BAL-19 except that 4 mm GCR safety glass can be used in place of 45 mm toughened glass.	Protected by heatable shutter, completely screened with steel, bronze or aluminium mesh or 5 mm toughened glass or glass blocks with 400 mm gap, steel, etc. Optional portion screened with frame of metal reinforced PVC-U or heatable insulating shutter.	Protected by heatable shutter, non-combustible or 35 mm solid timber or 400 mm above threshold. Metal or heatable insulating shutter framed with weather strips at base.	Protected by heatable shutter, non-combustible or 35 mm solid timber, metal framed with weather strips at base.
<b>EXTERNAL DOORS</b>	No special construction requirements	As for BAL-19 except that door framing can be achieved by metal (high density) timber.	Protected by heatable shutter, or screened with steel, bronze or aluminium mesh or non-combustible, 35 mm solid timber or 400 mm above threshold. Metal or heatable insulating shutter framed with weather strips at base.	Protected by heatable shutter, non-combustible or 35 mm solid timber, metal framed with weather strips at base.	Protected by heatable shutter or triple fitting with weather strips at base and as per BAL-19.
<b>ROOFS</b>	No special construction requirements	As for BAL-19	Non-combustible covering, roof/wall junction sealed. Opening fitted with non-combustible outer gurnel. Roof to be fully sealed.	Non-combustible covering, roof/wall junction sealed. Opening fitted with non-combustible outer gurnel. Roof to be fully sealed and roof rounded evaporative coolers.	Roof with RL of 30/30/20 or tested for heatable resistance to BS 5503.1.2. Roof/wall junction sealed. Opening fitted with non-combustible outer gurnel. No roof rounded evaporative coolers.
<b>VERANDAS DECKS ETC.</b>	No special construction requirements	As for BAL-19	Enduse on sub-floor space – no special requirement for materials, except within 400 mm of ground. Non-combustible supports or supports as a wall. Decking is made of non-combustible material with a minimum thickness of 200 mm horizontally and 400 mm vertically from a glass element.	Enduse on sub-floor space or non-combustible or heatable resistant timber supports. Decking to be non-combustible.	Enduse on sub-floor space or non-combustible supports. Decking to be non-combustible.

## **Attachment 2 – Proposal Plans**



STRICKLAND AVENUE



TH03- 28200mm

TH05 - 42270mm

TH02- 45700mm

TH01- 66670mm

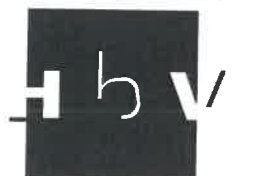
TH04- 13000mm

line of rear boundary

PAPER: A2  
SCALE: 1:200

SITE PLAN

REV	No.	DESCRIPTION	DATE
A	CONCEPT	23.04.2018	
	DETAILS		



HEFFERNAN  
BUTTON  
VOSS  
ARCHITECTS

## References

- (a) Australian Standards, AS 3959-2009, *Construction of buildings in bushfire-prone areas*, Standards Australia, Sydney NSW.
- (b) Resource Management & Conservation Division of the Department Primary Industry & Water September 2006, TASVEG, *Tasmanian Vegetation Map*, Tasmania.
- (c) Tasmanian Government, Land Information System Tasmania, [www.thelist.tas.gov.au](http://www.thelist.tas.gov.au)



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PROJECT

**128 STRICKLAND AVE, SOUTH  
HOBART, TAS**  
Stormwater Management Plan

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CLIENT

**SHARON & WARWICK ASHLIN**

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DATE

May 2018



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**AD Design & Consulting Pty Ltd**

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**Document Status**

Rev No.	Author	Status	Approved for Issue	
			Name	Date
A	DB	For Information	AD	

This document has been prepared in accordance with the scope of services agreed upon between AD Design & Consulting Pty Ltd (ADDC) and the Client. To the best of ADDC's understanding, this document represents the Client's intentions at the time of printing of the document. In preparing this document ADDC has relied upon data, surveys, analysis, designs, plans and other information provided by the client, and other individuals and organisations referenced herein. Except as otherwise stated in this document, ADDC has not verified the accuracy or completeness of such data, surveys, analysis, designs, plans and other information. No responsibility is accepted for use of any part of this document in any other context or for any other purpose by third parties.

## 1.□ Introduction

### 1.1 Background

Sharon & Warwick Ashlin have engaged AD Design & Consulting for preliminary civil design and documentation for a 5-unit strata development at 128 Strickland, South Hobart, Tasmania.

An assessment of the stormwater quantity and quality for the site has been prepared to demonstrate compliance with both the Hobart City Council Planning Scheme 2015 and State guidelines to support a residential development planning application under the Land Use Planning and Approvals Act 1993 and Building Application. This Stormwater Management Plan (SWMP) discusses the impacts associated with stormwater and any proposed infrastructure and mitigation options.

The aim of this SWMP is,

- To calculate the peak discharges from the existing and post-development site conditions and to assess any mitigation (detention) options that may be required to avoid overloading stormwater infrastructure, flooding, erosion and worsening of downstream conditions.
- To apply stormwater quality treatment measures to ensure the water quality objectives for the development are achieved.

### 1.2 Legislative Context

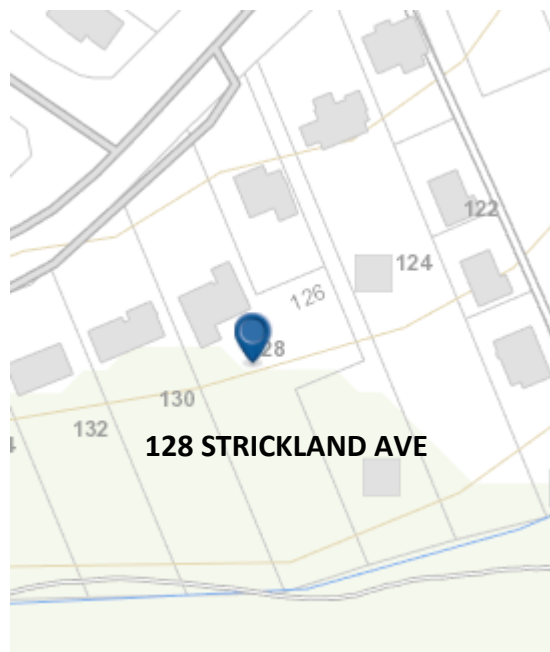
The Tasmanian State Stormwater Strategy provides a method to address recommendations of the Tasmanian State Policy on Water Quality Management 1997 (SPWQM). This emphasises management of stormwater at the source and highlights the importance of managing stormwater in new developments at the design, construction and operational stages. Best practice guidance on stormwater treatment options to achieve these targets are provided in the document Water Sensitive Urban Design - Engineering Procedures: Stormwater for Tasmania (2012).

The Hobart City Council Interim Planning Scheme 2015 (HCCIPS) further addresses the objectives of the State Stormwater Strategy. The HCCIPS Stormwater Management Code E7.0 applies to developments requiring management of stormwater. Applicants may be required to provide a report from a suitably qualified person advising of the suitability of: private and public stormwater systems for a proposed development or use; or a site for an on-site stormwater disposal system. Code E7.0 outlines acceptable stormwater quality and quantity targets.

## 2. □ Site Overview

<b>Land Owner</b>	S & W Ashlin
<b>Location</b>	128 Strickland Avenue, South Hobart, Tas
<b>Municipality</b>	Hobart City Council
<b>Title Reference</b>	158907/2
<b>Planning Controls</b>	Hobart City Council Interim Planning Scheme 2015
<b>Zoning</b>	General Residence
<b>Property Area</b>	2,306 m <sup>2</sup>

**Table 1: Site Details. Source: LIST © State of Tasmania**



**Figure 1: Location Plan. Source: annotated map and aerial from the LIST © State of Tasmania**

### 2.1 Site Observations

A site inspection was conducted on 17<sup>th</sup> April 2018 at 128 Strickland Avenue to investigate existing drainage infrastructure and overland flow paths. The site is located approximately 75 m south of the Hobart Rivulet with frontage onto Strickland Avenue and is referred to as 128 Strickland Avenue, South Hobart. The total area is approximately 0.231 ha and grades south to north. This site has an existing dwelling and outbuilding which are to be demolished and the remainder being manicured lawns and garden.

An existing open drain (cut off drain) is located on the development's southern boundary adjacent to a fire trail which services the flows from an upstream catchment area of approximately 4.837 ha.

Runoff generated within the site flows from higher elevations at the rear (southern) boundary of the development near the cut off drain and flows towards the internal road.

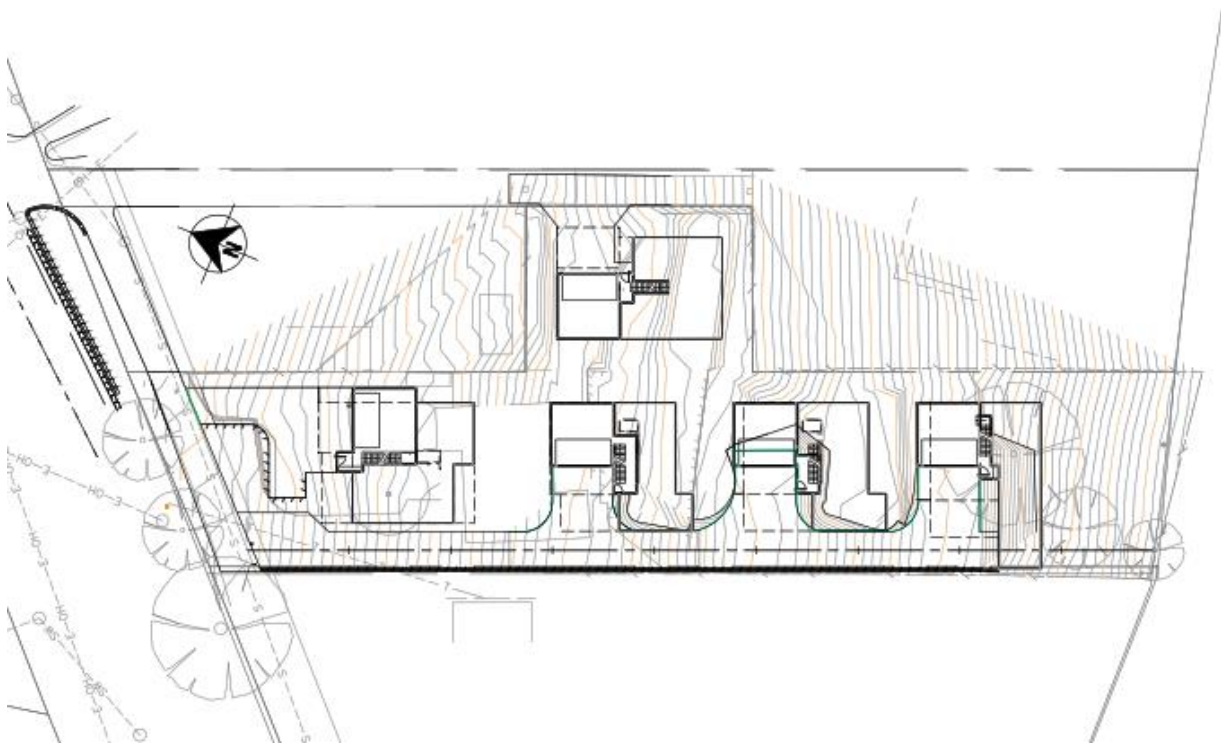


## 2.2 Site Survey

A detailed engineering survey was undertaken by Leary and Cox Surveyors. The area of disturbance for the proposed development covers an area of 0.231 ha. Based on the survey data the maximum elevation within the internal catchment is located on the southern boundary near the fence line at RL 193 m with access into 128 Strickland Avenue having the minimum elevation of RL 170 m.

## 2.3 Proposed Development

The proposed development as stated above is a 5-unit residential development. A detailed overview of the proposed layout and services is shown in Figure 2.



**Figure 2: 5-unit Lot Layout**

## 2.4 Internal Stormwater System & Legal Discharge Point

Stormwater will be collected internally and drained from the site by a combination of a piped network and overland flows paths to convey the 1 % Annual Exceedance Probability (AEP) design storm event off site.

The stormwater layout servicing units 1-5 will consist of 150 mm or larger pipes combined with grated pits complete with SPEL Stormsacks (primary treatment) placed in specific locations to capture all runoff generated from the internal access and hardstand areas along with providing building connections points to service all units within the development. Prior to the end of the combined system there will be a SPEL Hydrosystem HS400 placed online to provide the tertiary treatment prior to discharge off site.

The legal discharge point will be the at the frontage (northern boundary) before the existing internal road driveway in the form of a grated pit. The captured runoff will be conveyed via an underground pipe and discharged to the kerb and then enters the Strickland Avenue road side drainage network discharging into the Hobart Rivulet.

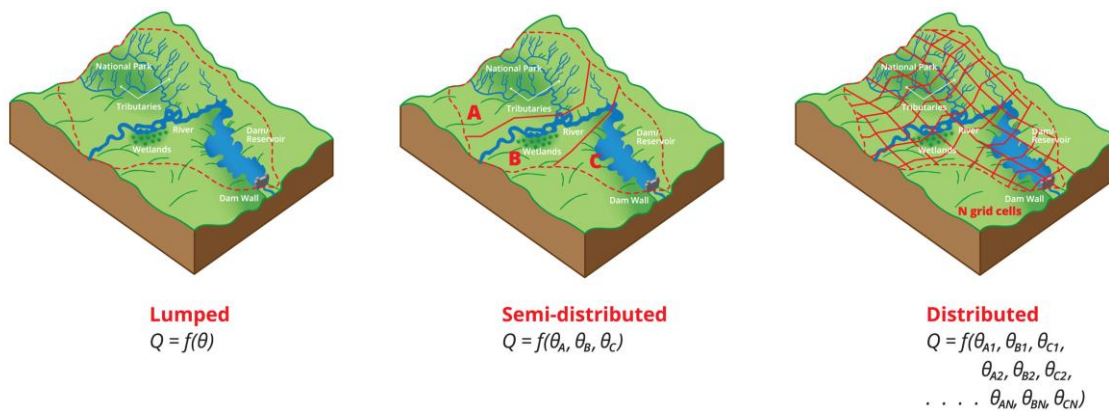


## 3. □ Catchment Hydrology

### 3.1 Methodology

This assessment has been undertaken in accordance with Australian Rainfall and Runoff 2016 (ARR'16) and uses the new 2016 rainfall intensity, frequency and duration (IFD) data, which match the recently released temporal pattern ensembles for ARR'16. Design rainfall events are derived from these and applied within the XPSTORM model.

Rainfall assessment was completed using a lumped catchment approach to a location immediately upstream of the existing internal road. The lumped catchment approach is endorsed by ARR'16 as a suitable method of deriving critical duration design storm events and is described by Figure 3.



**Figure 3: Catchment Modelling Options**

Landuse information, including surface roughness and infiltration capacity, were derived from an assessment of the aerial photography available via LISTmap, historical aerial photography within the Google Maps environment, the Australian Rainfall & Runoff (ARR) Data Hub and a site inspection as mentioned previously.

### 3.2 External and Internal Catchments

The study area is a generally grassed bushland at the upper catchment changing to semi-urban area with a steep change in elevation. The ultimate catchment discharge location is the Hobart Rivulet to the north with the internal drainage as described in the previous sections. The internal (site) catchment area is approximately 0.231 ha with a 4.837 ha external catchment, which have been included in the catchment analysis.

An XPSTORM model was developed to assess the local hydrology, applying Laurenson's Method for hydrologic routing for the design storm temporal patterns. The existing land use is urban lawn and garden apart from the existing dwelling and outbuildings. For modelling purposes, the fraction impervious for the internal catchment area was set to 13 % for existing and 58 % post development.

The contributing lumped catchment area that is used to determine the critical duration and as such the peak flows for all associated sub-catchment areas was interpolated from contour data obtained from the LIST Map data and lidar data. The catchment area defined for the project are shown on Figure 4. Uniform areal distribution of 'point' design storms has been assumed in the hydrological analysis due to the relatively small area of the catchment. No areal reduction factors have been applied to the analysis as the catchment is less than 1 km<sup>2</sup> (100 ha).



**Figure 4: Catchment Extents**

The following table outlines the existing catchment details.

**Table 2: Pre-Development Site Catchment Details**

Location	Area (ha)	Slope (%)	Fraction Impervious (%)	Pervious Area (ha)	Impervious Area (ha)
Internal	0.231	24	13	0.201	0.030
External	4.837	24	2.5	4.716	0.121

The proposed development introduces an increase in impervious areas from new paved road areas, and other typical structures. For the current analysis, these elements have been digitised, to determine the new impervious areas. The changed catchment characteristics are outlined in Table 3.

**Table 3: Post-Developed Site Catchment Details**

Location	Area (ha)	Slope (%)	Fraction Impervious (%)	Pervious Area (ha)	Impervious Area (ha)
Internal	0.231	24	58	0.098	0.133

### 3.3 Rainfall Losses

Methods for modelling the proportion of rainfall that is “lost” to infiltration are outlined in both ARR1987 and ARR2016. The methods are of varying complexity, with the more complex options only suitable if sufficient data are available. The method most typically used for design flood estimation is to apply an initial and continuing loss to the rainfall. The initial loss represents the wetting of the catchment prior to runoff starting to occur, and the continuing loss represents the ongoing infiltration of water into the saturated soils while rainfall continues.

Initial losses of 0 mm and 0 mm and continuing loss rates of 3.4 mm/h and 0 mm/h were adopted for pervious and impervious areas within the internal area of the catchment, respectively. An initial loss of 0 mm and continuing loss rate of 3.4 mm/h was adopted for pervious areas of the bushland external catchment.

### 3.4 Design Rainfall

The rainfall Intensity-Frequency-Duration (IFD) curve and the storm temporal patterns used for the hydrological analysis were obtained from the Bureau of Meteorology for the ARR’16 data. The assessment was completed for the 5 % and 1 % AEP design storm events.

#### 3.4.1 Critical Duration and Peak Flows

The critical rainfall durations have been calculated by applying the ARR’16 ensemble temporal patterns to the lumped catchment which allowed the identification of the critical duration for each AEP. The results of each of the ensembles and with the mean design storm identified for each ensemble are compared to determine the critical storm duration. This critical storm forms the basis and is the design rainfall applied to each smaller catchment (pre-development internal, post development internal, external catchment) to determine their respective peak flows. Figure 5 and Figure 6 show the mean design storm events with the critical storm duration identified for the 5 % and 1 % AEP respectively.

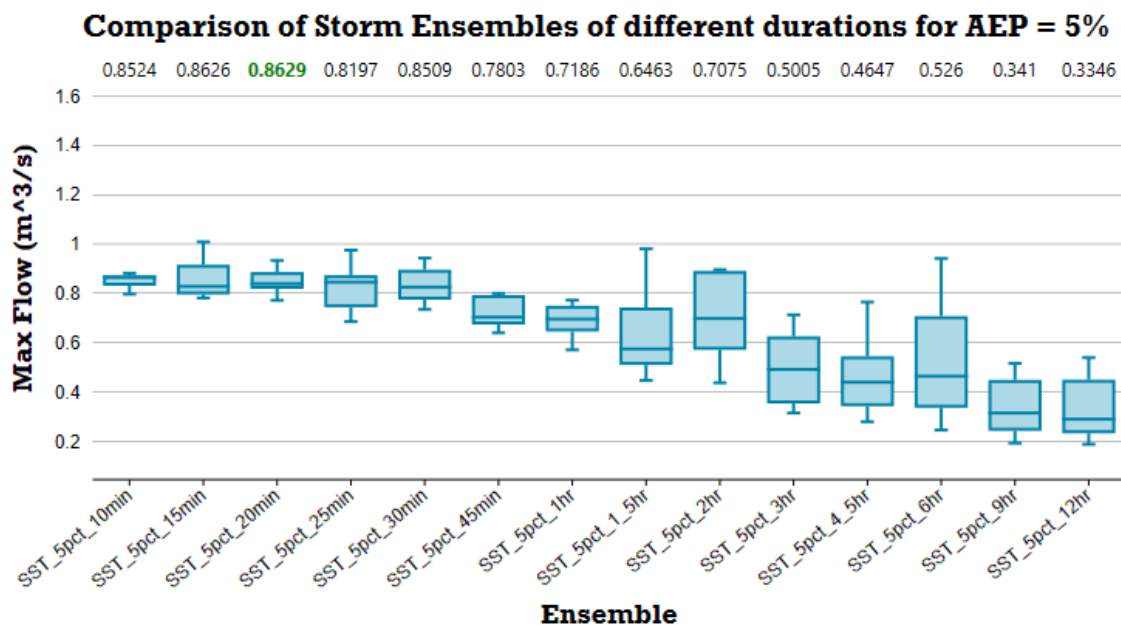
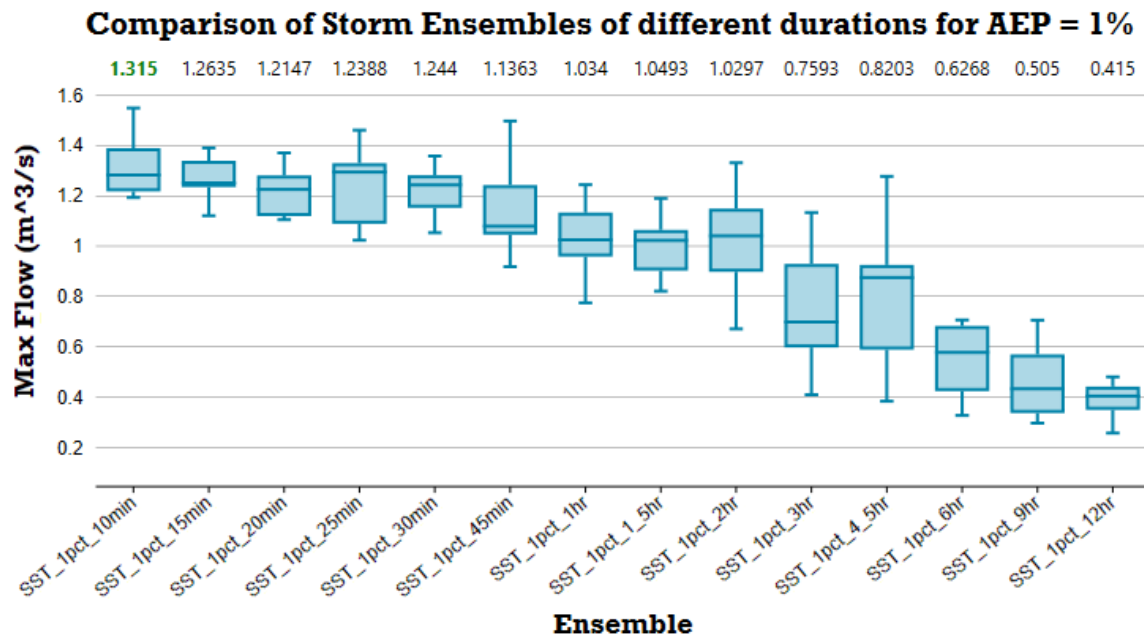


Figure 5: 5 % AEP Mean Design Storm for a Range of Durations for lumped catchment



**Figure 6: 1 % AEP Mean Design Storm for a Range of Durations for lumped catchment**

The above figures indicate that the critical duration for the 5 % AEP ensemble is the 20-minute design storm event with the 1 % AEP ensemble being controlled by the 10-minute duration design storm event. Based on catchment characteristics and engineering judgement it is appropriate to adopt the 30-minute duration for both the 5 % and 1 % AEP design storms.

### 3.5 Stormwater Runoff Detention Requirements

Only stormwater runoff generated from the development is to be detained and treated. The aim is to ensure post-development flows do not exceed pre-development flows by detaining the excess run off volume due to creation of impervious surfaces and releasing gradually into the stormwater network as to not detrimentally effect and overload downstream infrastructure and receiving environments.

**Table 4: Pre- & Post Development Conditions**

Site	Catchment Area (ha)	Fraction Impervious (%)	Pervious Area (ha)	Impervious Area (ha)	Q20 (m³/s)
Pre-Development	0.231	13	0.201	0.03	0.0328
Post-Development	0.231	58	0.098	0.133	0.0377

For the purposes of this report we have calculated the required 5 % AEP critical storm detention volume to be 5 m³. This has been calculated in XPSTORM using a surface area of 10 m² and flow limited to pre-development peak flow of 0.0328 m³/s. See Appendix A for Hydrographs.

It is proposed this excess volume of runoff be detained using a closed underground detention option subject to finalisation in detailed design.

### 3.6 1% AEP Event

There is an external catchment approximately 4.837 ha upstream of the development generating peak flows of 0.458 m<sup>3</sup>/s and 0.675 m<sup>3</sup>/s for the 5 % and 1 % AEP events. This runoff is captured and directed away from the site by an external cut off drain which runs parallel to the southern boundary of the development.

The internal catchment will utilise the shared internal access along the western boundary and driveways as overland flow paths to and convey runoff generated within the catchment in the 1 % AEP event preventing flood inundation and damage.

**Table 5: 1 % AEP Design Event Parameters**

Catchment	Catchment Area (ha)	Fraction Impervious (%)	Pervious Area (ha)	Impervious Area (ha)	Q100 (m <sup>3</sup> /s)
External	4.837	2.5	4.716	0.121	0.675
Internal	0.231	58	0.098	0.133	0.047

#### 3.6.1 Climate Change Factors

ARR recommends applying the RCP 4.5 value in addressing changes due to climate change as such the Q100 flow is estimated to increase by 7.6 % by 2090 resulting to 0.726 m<sup>3</sup>/s and 0.051 m<sup>3</sup>/s respectively.

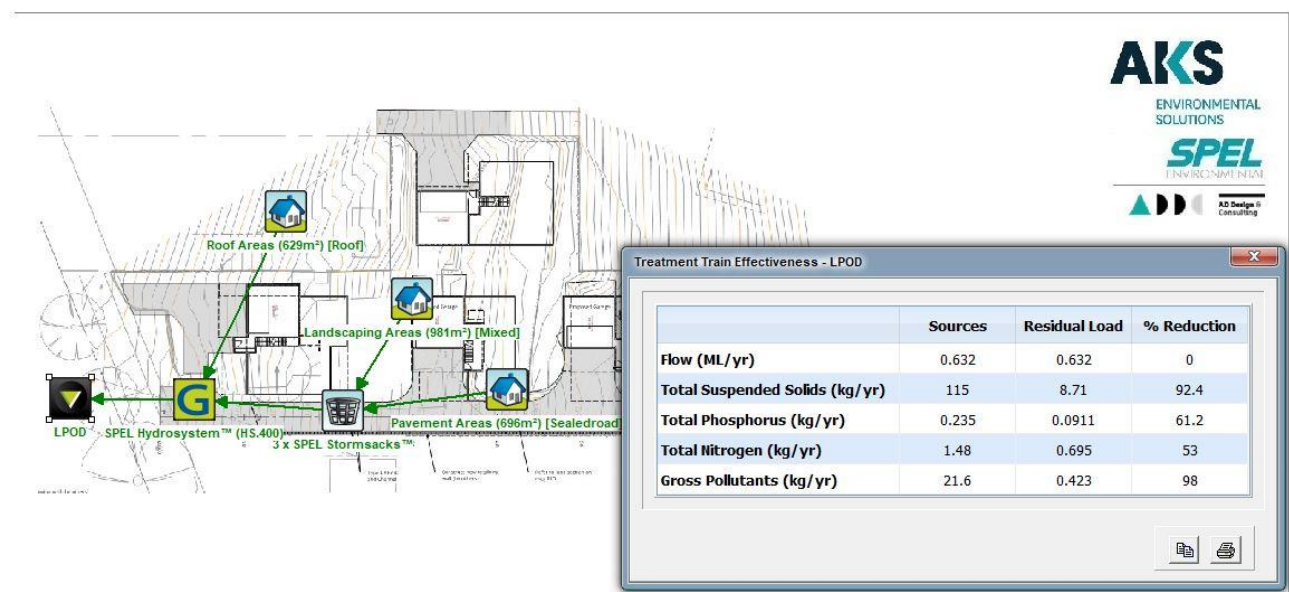


## 4. □ Stormwater Quality

The stormwater quality and treatment are to be achieved using the propriety products from AKS SPEL Environmental Integrated Water Solutions. Refer Appendix B for stormwater quality report.

The treatment train has been designed in MUSIC to ensure compliance with the planning scheme water quality objectives and will provide a cost-effective option for the development in the long term. The proposed treatment system will comprise of the following items:

- □ 3 x SPEL Stormsacks – Primary Treatment; and
- □ 1 x SPEL Hydrosystem (HS.400) – Tertiary Treatment.



**Figure 7: Treatment train to achieve water quality objectives**

## 5.□ Conclusion

This Stormwater Management Plan details the methodology and results of the stormwater quantity and quality aspects for the proposed residential development at 128 Strickland Avenue, South Hobart, Tasmania. The quantity modelling has been completed using XPSTORM in accordance with the requirements of Hobart City Council and Australian Rainfall and Runoff 2016 – where appropriate.

The results of the quantity analysis indicated that the proposed closed detention system can mitigate the peak discharges that will occur in response to the increase of fraction impervious area within the catchment. The preliminary detention design indicates an area of 5 m<sup>3</sup> is required to mitigate the peak discharge for events up to the 5 % AEP design storm event.

The water quality assessment has been completed in MUSIC in accordance with the requirements of Hobart City Council and Melbourne Water guidelines. It is proposed that the site is treated using the specified proprietary products from SPEL Environmental Integrated Water Solutions. This system will be able to treat the internal catchment run off and achieve the outlined water quality objectives.

In conclusion, this stormwater management plan has:

- Provided a legal discharge point for the development into the existing Council stormwater network,
- Provided 1 % AEP overland flow paths to prevent inundation,
- Outlined a feasible stormwater system for the development,
- Mitigated the effects of the development on downstream infrastructure both in terms of peak flows and water quality as required by the HCCIPS Stormwater Management Code E7.0

## Appendix A

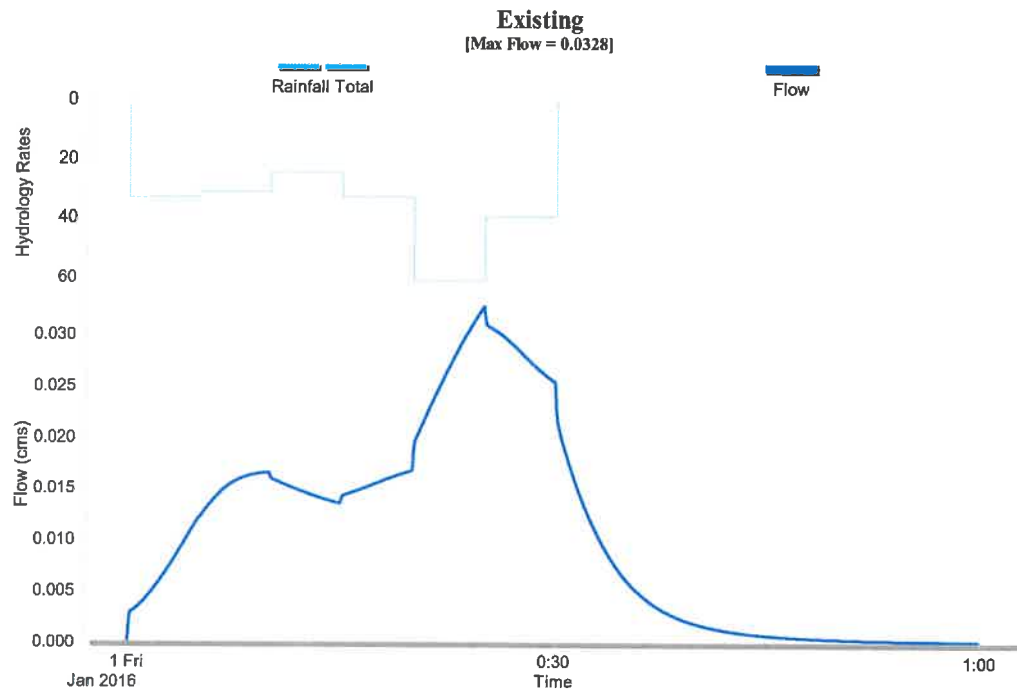


Figure 8: 5 % AEP hydrograph for pre-development site conditions

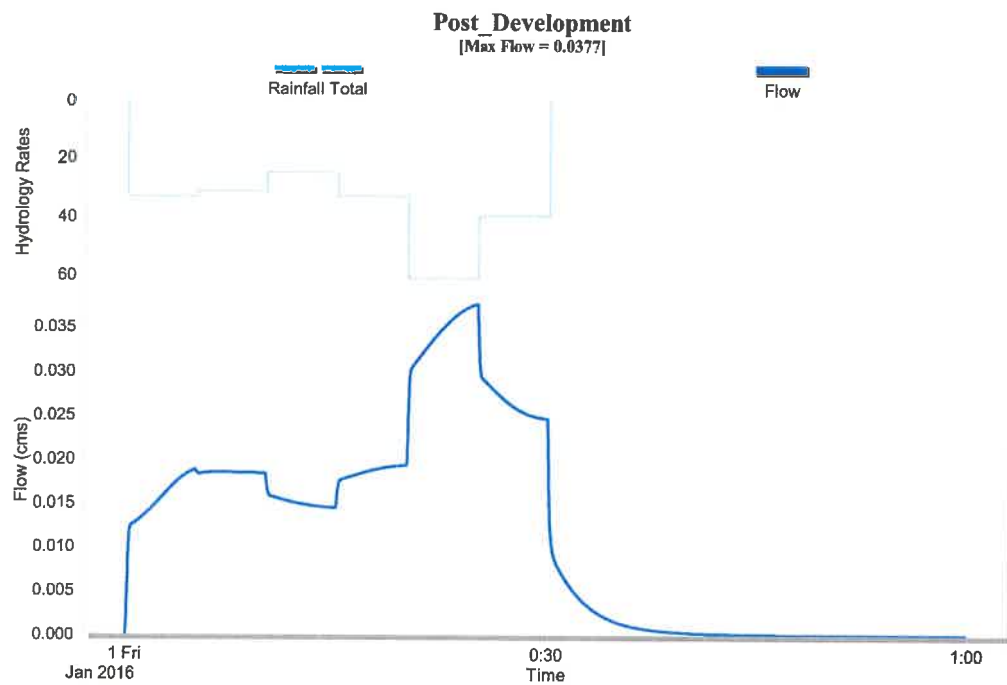


Figure 9: 5 % AEP hydrograph for post development site conditions





## Appendix B

**SPEL Stormwater Management  
Proposal**

**AD Design**

**Proposed Stormwater Plan for  
128 Strickland Ave, Hobart  
South**

**Document No: 58305\_SWMP\_R1**

**Report Date: April 27, 2018**




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Position:	Environmental Division Manager
Signed:	
Date:	27 April 2018

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1	SUBMISSION	26 April 2018	

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## **Confidentiality**

### **Section 1**

# 1 Confidentiality

## 1.1 Conferee

This entire document has been presented to **AD Design** as **commercial-in-confidence** on the basis that it should not be disclosed in any part or whole to any third party without written consent from AKS Environmental.

This document contains:

- **Intellectual Property** – Material and design that are commercially sensitive intellectual property
- **Pricing Schedule** – Information from AKS Environmental and details about commercially sensitive pricing

## 1.2 Request for Information

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## **Executive Summary**

### **Section 2**

## 2 Executive Summary

SPEL Environmental has been commissioned by **AD Design & Consulting** to prepare a Conceptual Stormwater Management Plan (CSMP) for the proposed precinct development located at 128 Strickland Ave, South Hobart.

The stormwater quality modelling was undertaken using the MUSIC version 6.2 software. The modelling results (see **Table 2.1**) indicate the 70%, 80%, 45% and 45% reduction targets for Gross Pollutants (GP), Total Suspended Solids (TSS), Total Phosphorus (TP) and Total Nitrogen (TN) respectively can be achieved.

**Table 2.1: Treatment Train Effectiveness**

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Reduction Target (%)
Flow (ML/yr)	0.632	0.632	0	0
Total Suspended Solids	115	8.71	92.4	80
Total Phosphorus	0.235	0.0911	61.2	45
Total Nitrogen	1.48	0.695	53	45
Gross Pollutants	21.6	0.423	98	70

Stormwater management for the site is achieved using the following devices:

- Three (3) x SPEL Stormsacks
- One (1) x SPEL Hydrosystem (HS.400)

## Overview

### Section 3

## 3 Overview

### 3.1 Company Background

SPEL Environmental is a market leader in the environmental compliance sector since 1991. During that time, we have established many satisfied customers who return to SPEL Environmental when they require new and more advanced technological solutions and services. SPEL Environmental devotes a great deal of time, effort and financial investment to maintain our position as a market leader in a rapidly developing field. We employ the latest industry knowledge and advancements, providing our customers with the most progressive stormwater improvement technology.

SPEL Environmental develops long term partnerships with our clients and providing on-going technical support which include a comprehensive scheduled service and maintenance program. We take pride in delivering quality workmanship and customer satisfaction that has created a market reputation, taking SPEL Environmental to where it is today. In order maintain this vision and standard, we are heavily committed to Australian manufacturing and site water quality testing programs to control and maintain consistent quality.

SPEL Environmental is committed to the health and safety of its people and protecting the environment in which they work. We understand the challenges associated with a project of this nature and the physical environment involved. Our safety, environmental and quality standards apply to all our people, products and services, providing certainty that the client's safety, environmental and quality requirements are adhered to.

### 3.2 Introduction

This report has been prepared by SPEL Environmental to accompany and be considered part of a Development Application (DA) for a proposed precinct development located at 128 Strickland Ave, South Hobart. The site is located within the catchment of the City of Hobart.

### 3.3 Site Locality

The subject site is bounded by Strickland Ave to the north. Situated in the Hobart City Council the site has a total area of 0.23ha (see Figure 3.1).



Figure 3.1 Site Location

### 3.4 Site Layout

The proposed development is presented on Figure 3.2.

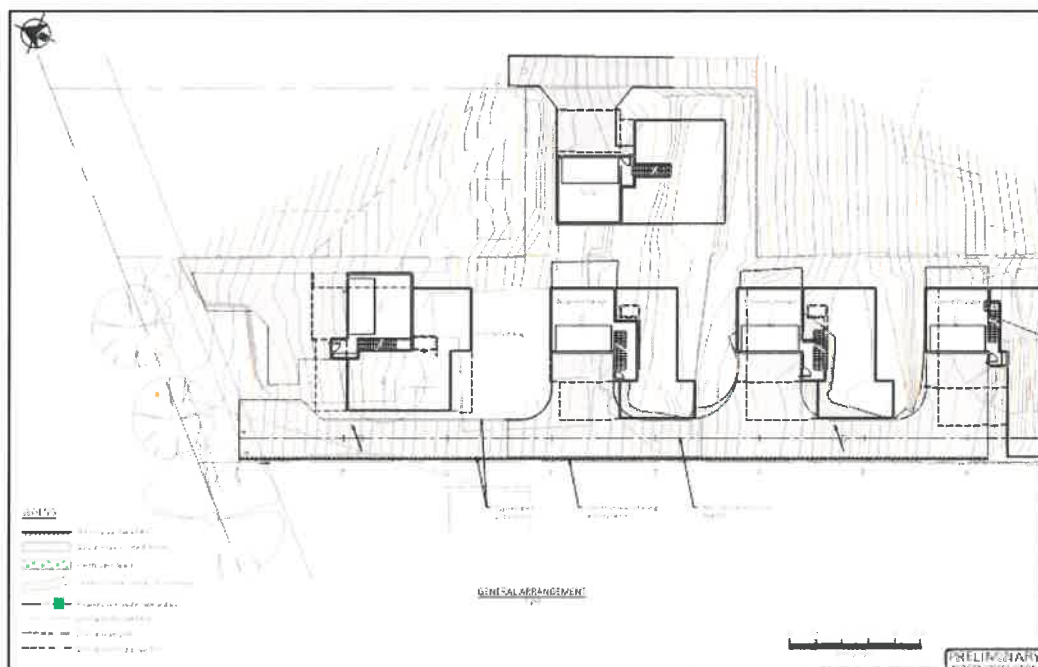


Figure 3.2 Proposed Site Layout

## **Quality Management – Operational Controls**

### **Section 4**

## 4 Quality Management – Operational Controls

### 4.1 Water Quality Objectives

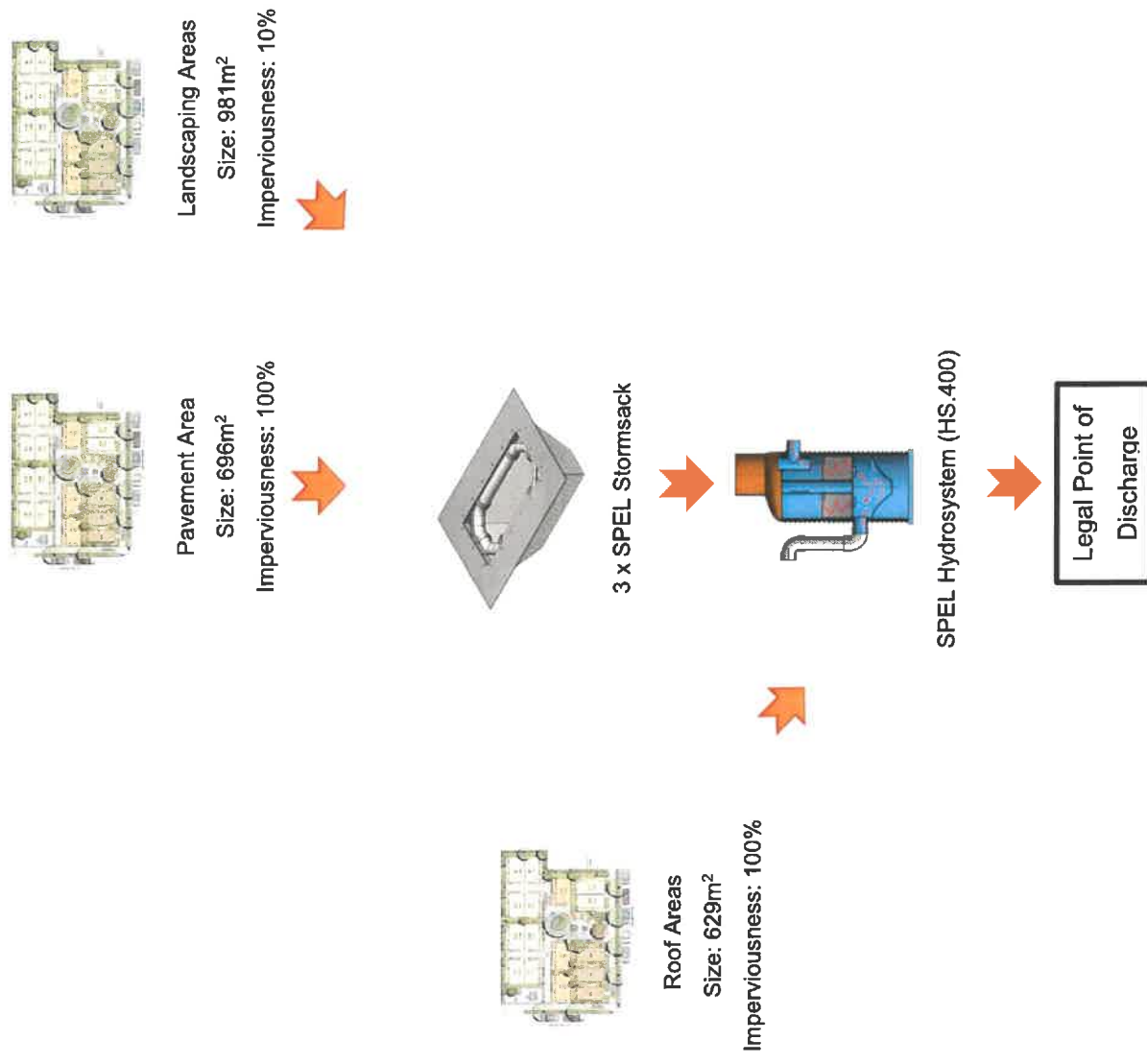
Melbourne Water (2016) requires treatment of stormwater so that annual pollutant loads achieve targets set out in the Best Practice Environmental Management Guidelines (BPEMG). These are:

- 80% reduction in Total Suspended Solids (TSS) from typical urban loads;
- 45% reduction in Total Nitrogen (TN) from typical urban loads;
- 45% reduction in Total Phosphorus (TP) from typical urban loads; and
- 70% reduction in Gross Pollutants (GP) from typical urban loads.

### 4.2 Treatment Train

Based on the site characteristics and the range of available Stormwater Quality Improvement Devices (SQIDs), this study has developed an overall concept that will satisfy the requirements of downstream environmental protection. **Figure 4.1** shows a schematic representation of the proposed treatment train elements.





**Figure 4.1 Treatment Train Schematic**

## 4.2.1 SPEL StormSack – General Information

The SPEL StormSack is an effective at source GPT proven to reduce Gross Pollutants (GP), Total Suspended Solids (TSS), and Nutrients (TN & TP) from developed urban catchments. The SPEL StormSack is designed to rest on the flanges of conventional inlet pits which allows for easy of access during maintenance periods. The general configuration of the SPEL StormSack includes the basic design features outlined in **Appendix 1**.

**Table 4.1: SPEL StormSack Features**

<b>SPEL StormSack Components</b>	<b>Description</b>
Structural Load	The filter sack, frame and support components (such as PE fascia, metal frame, sack support clips, etc.) are engineered to support a dead load when the filter sack is filled to capacity with pollutants.
Filter Sack Mesh Bypass	SPEL uses a 200µm mesh fabric with anti-tear innovation. The integrated bypass is designed to unobstructed runoff greater than treatment flows (first flush). Each StormSack has a treatment flow rate up to 11L/s before bypass.
Frame Type	The SPEL StormSack comes in a Light weight Polyethylene frame for easy installation and removal (see <b>Figure 4.2</b> below).
Filter Sack Liner	A protective filter liner made from HDPE mesh has been integrated into the StormSack design to facilitate maintenance and during operation.
Oil Boom (optional)	Replaceable oil booms are easily fitted for sites with expected hydrocarbon runoff (i.e. Shopping centre carpark and Industrial estates).
Frame Sizes	SPEL StormSacks are designed to fit standard and custom designed inlet pits ranging from 450mm up to 1200mm inlet pits (including retrofits).



**Figure 4.2: General configuration of the 200µm mesh SPEL StormSack**

### 4.2.1.1 Australian Validation and Testing

Rigorous testing of the SPEL StormSack has been conducted locally under tier one (Laboratory) and tier two (field) conditions. QUT has published field test data on the SPEL StormSack which has since been peer-reviewed and published in the MDPI Water Journal August 2015 edition<sup>1</sup>, in accordance with the Water by Design guidelines. SPEL Environmental has committed to on-going testing for the life of the SPEL StormSack and will continue providing published data on future events.

## 4.2.2 SPEL Hydrosystem – General Information

The SPEL Hydrosystem is a tertiary stormwater treatment filtration device targeting known pollutants of concern including Total Suspended Solids (TSS); Nutrients (TP & TN); Gross Pollutants; as well as Heavy Metals (i.e. Cu, Zn, Pb). This specialist stormwater filtration system is installed within conventional concrete manholes, polyethylene and fibreglass shafts. The pre-fabricated and pre-assembled SPEL Hydrosystem is quickly and safely installed using onsite diggers (see Figure 4.3 below). This system is designed for an array of applications with treatment flow rates ranging from 2.5l/s up to 144l/s. The Hydrosystem is designed in an off-line configuration and operates at full treatment flow with a hydraulic fall of 250mm across the system.



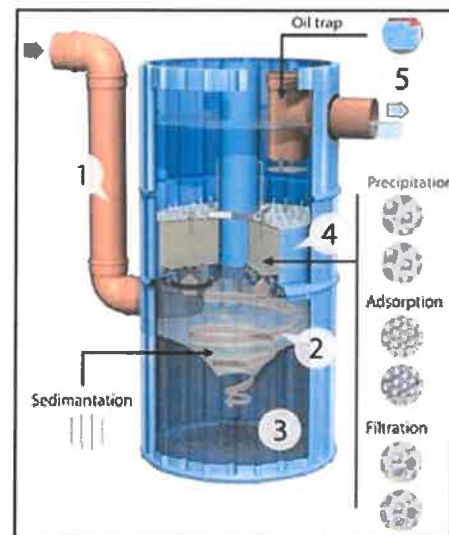
**Figure 4.3: SPEL Hydrosystem (SHS.1000) installation using onsite digger**

### 4.2.2.1 International Validation and Testing

SPEL Hydrosystem have been lab and field tested by several Universities and Institutes across Germany. The German Institute for Structural Engineering (DIBt) granted a general technical approval (Z-84.2-4)<sup>1</sup> passing all test conditions under heavy trafficable conditions. Field test data has been obtained across Germany including Bremer Straße in Hamburg-Harburg<sup>2</sup> reinforcing the above approval.

### Function Principles:

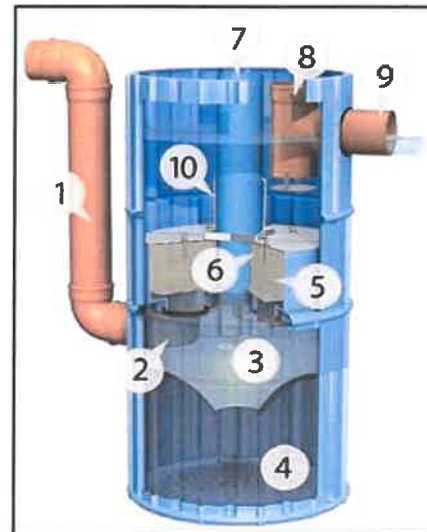
1. The rainwater from the connected area is fed into the basal section of the filter housing. The angled inlet generates a radial flow pattern.
2. The hydrodynamic separator converts turbulent waters into a radial laminar flow pattern, generating particle sedimentation, particularly of the sand fraction.
3. This takes place over an inlet to the lower section of the filter shaft. The sediment is retained in a silt trap chamber below the separator. The silt trap needs to be emptied out at intervals.
4. In the central section of the filter housing is the actual filter,
5. Filter Element: Metal. The filter element filters out the fine materials in an up-flow process and dissolved materials are precipitated and adsorbed. The filter can be backwashed. When exhausted the filter is easily exchanged.
6. The filter element is easily pulled up via shaft openings.
7. Above the filter element is the clean water. It passes via a blockade of light substances and then flows over the outlet into a soak away.



**Schematic of SPEL Hydrosystem Process**

### Product Components:

1. Rainwater Inlet (DN 200).
2. Angled Inlet.
3. Separator Chamber.
4. Silt Trap.
5. Filter Elements (4 No.).
6. Removal Device for Filter Element.
7. Overflow.
8. Blockade of light substances and suction pipe
9. Outlet to storage or to waste.
10. Locking buoyancy control system



**Schematic of SPEL Hydrosystem Components**

## 4.3 Maintenance Procedure

The SPEL treatment train specified above is an engineered stormwater treatment solution for the reduction in TSS, nutrients, gross pollutants and hydrocarbons. The Stormwater Quality Improvement Devices (SQIDs) identified in the stormwater treatment solution will require on-going maintenance for a prescribed period as specified by their respective council/authority. A draft of the proposed treatment train maintenance contract can be seen in **Appendix 2**.

## Quality Analysis - MUSIC

### Section 5

## 5 Quality Analysis – MUSIC

Water quality modelling has been undertaken of the post-development (mitigated) scenario using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software to demonstrate the load based reduction targets are achieved. A stormwater treatment train has been developed and modelled to determine the effectiveness of the proposed system in achieving the relevant water quality objectives.

### 5.1 Rainfall and Evapotranspiration Parameters

Table 5.1 summarized the meteorological and rainfall-runoff data used in the MUSIC model.

**Table 5.1 Meteorological and Rainfall Runoff Data**

Parameter	Value
Rainfall station	94008 - Hobart
Time step	6 minute
Modelling period	1993
Mean annual rainfall (mm)	517 mm
Evapotranspiration	895 mm

### 5.2 Catchment Parameters

Based on the proposed land uses within the development, the subject site has been modelled as an urban source node. The rainfall-runoff parameters and pollutant generation parameters are based on parameters recommended by Melbourne Water (2016) (Tables 5.2 and 5.3).

**Table 5.2 Rainfall Runoff Parameters**

Parameter	All Nodes
Rainfall threshold (mm)	1.0
Soil storage capacity (mm)	120
Initial storage (% capacity)	25
Field capacity (mm)	50
Infiltration capacity coefficient a	200
Infiltration capacity exponent b	1
Initial depth (mm)	10
Daily recharge rate (%)	25
Daily base flow rate (%)	5
Daily deep seepage rate (%)	0

**Table 5.3: Pollutant Export Parameters for Urban Sites**

Catchment ID		Total Suspended Solids [log (mm/L)]		Total Phosphorous [log (mm/L)]		Total Nitrogen [log (mm/L)]	
		Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Hardst and	Storm Flow Concentration	2.2	0.32	-0.45	0.25	0.42	0.19
	Base Flow Concentration	1.1	0.17	-0.82	0.19	0.32	0.12
Roof	Storm Flow Concentration	2.2	0.32	-0.45	0.25	0.42	0.19
	Base Flow Concentration	1.1	0.17	-0.82	0.19	0.32	0.12

### 5.3 Treatment Node Parameters

The following sections describe the modelling parameters applied to MUSIC for each of the treatment nodes included as part of the water quality assessment.

#### 5.3.1 SPEL Stormsack Parameters

A GPT treatment node in MUSIC has been used to simulate the treatment efficiency of the SPEL StormSack based on third party field testing results. The SPEL StormSack treatment node parameters are summarised in Table 5.4.

**Table 5.4 SPEL StormSack Treatment Node Parameters**

Catchment ID	SPEL Stormsack
Are the proposed pollutant reduction efficiencies independently verified using a method suited to local conditions?	Y
Does the data provided include performance results under dry weather flows (to account for potential pollutant leeching?)	Y
Is the assumed high-flow bypass rate consistent with manufacturer specifications?	Y
High Flow by-pass (m <sup>3</sup> /s)	0.033
Low Flow	0.000
TSS Input (mg/L) Output (mg/L)	1000 390
TN Input (mg/L) Output (mg/L)	50 36
TP Input (mg/L) Output (mg/L)	5 2.75
Gross Pollutants Input (mg/L) Output (mg/L)	15 0

#### 5.3.2 SPEL Hydrosystem Parameters

A generic node has been utilized in MUSIC, for the purpose of simulating treatment efficacy of SPEL Hydrosystem and the transform function in the node has been modified based on SPEL Environmental's 2nd and 3rd Party field testing product data.



These test results and papers are available upon request from SPEL Environmental. The SPEL Hydrosystem parameters utilised within MUSIC are summarised in **Table 5.5**.

**Table 5.5: SPEL Hydrosystem Parameters**

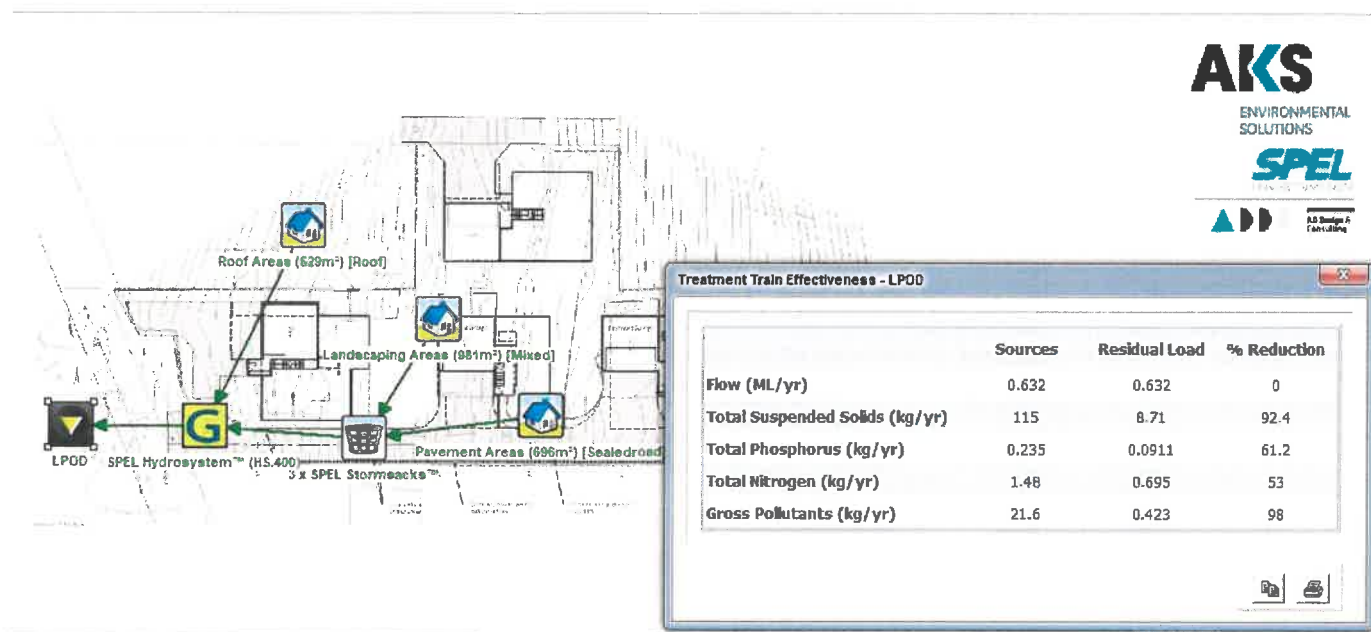
Catchment ID	SPEL Hydrosystem
Are the proposed pollutant reduction efficiencies independently verified using a method suited to local conditions?	Y
Does the data provided include performance results under dry weather flows (to account for potential pollutant leeching?)	Y
Is the assumed high-flow bypass rate consistent with manufacturer specifications?	Y
High Flow by-pass (m <sup>3</sup> /s) (for each separate system)	0.0025
Low Flow	0.000
TSS Input (mg/L) Output (mg/L)	1000 90
TN Input (mg/L) Output (mg/L)	50 26.5
TP Input (mg/L) Output (mg/L)	5 2.95
Gross Pollutants Input (mg/L) Output (mg/L)	15 0

## 5.4 MUSIC Results

Results of the MUSIC modelling for the treatment train effectiveness are summarised in **Table 5.6**. The results indicate the 80%, 45%, 45% and 70% reduction target for TSS, TP, TN and gross pollutants respectively are achieved. A screen capture of the MUSIC modelling results is included as **Figure 5.2**.

**Table 5.6: Treatment Train Effectiveness**

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Reduction Target (%)
Flow (ML/yr)	0.632	0.632	0	0
Total Suspended Solids	115	8.71	92.4	80
Total Phosphorus	0.235	0.0911	61.2	45
Total Nitrogen	1.48	0.695	53	45
Gross Pollutants	21.6	0.423	98	70



**Figure 5.2: Treatment Train Effectiveness & Layout**

## **Summary and Recommendation**

### **Section 6**

## 6 Summary and Recommendation

Based on the water quality assessment using the MUSIC software, it is found that the pollutant reduction targets can be achieved by adopting the SQIDs specified in **Table 6.1**.

**Table 6.1: Recommended Stormwater Quality Improvement Devices**

Stormwater Quality Improvement Device	Quantity
SPEL Stormsacks	3
SPEL Hydrosystem (HS.400)	1

The recommended SQIDs are designed to capture stormwater at the downstream end of the drainage network and treat the runoff prior to discharging into the local waterway. The pollutant reduction targets achieved (as modelled in MUSIC) are summarised in **Table 6.2**.

**Table 6.2: MUSIC modelling results**

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Reduction Target (%)
Flow (ML/yr)	0.632	0.632	0	0
Total Suspended Solids	115	8.71	92.4	80
Total Phosphorus	0.235	0.0911	61.2	45
Total Nitrogen	1.48	0.695	53	45
Gross Pollutants	21.6	0.423	98	70

## References

### Section 7

## 7 References

Melbourne Water (2016). *MUSIC Guidelines – Input Parameters and modelling approaches for MUSIC users in Melbourne Water's service area 2016*

## List of Appendices

**Appendix 1 – SPEL SQID Product Guides**

**Appendix 2 – Draft Treatment Train Maintenance Contract**



## Appendix 1 – SPEL SQID Product Guides



# SPEL Stormsack

At-source Gross Pollutant Trap

[www.spel.com.au](http://www.spel.com.au)



# Stormwater Treatment

An all too common issue with today’s highly impervious landscape is how to meet stormwater regulations with limited budgets and tight space constraints.

SPEL StormSack filtration solutions are highly engineered water quality devices that are deployed directly in the stormwater sewer system to capture contaminants close the surface for ease of maintenance. Easily retrofitted into new or existing structures, SPEL StormSack filtration technology is a decentralized approach to stormwater treatment that essentially repurposes traditional site infrastructure and customizes it to meet specific site water quality goals. In this way, it satisfies important objectives of today’s LID (Low Impact Development) criteria.

From an operations perspective, catch basins with SPEL Stormsack filters are also easier and quicker to clean out because pollutants are trapped just under the grate.

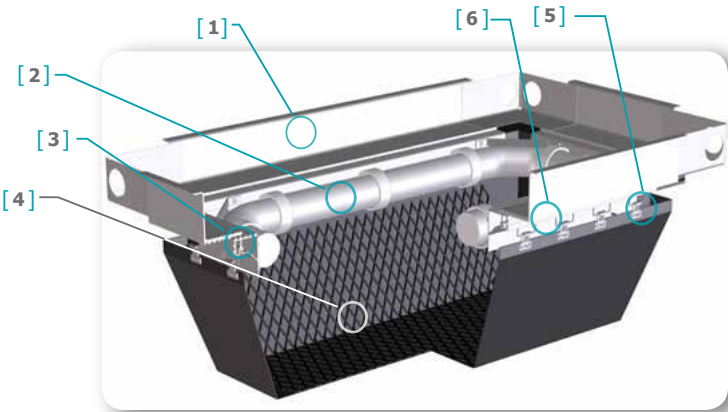
## StormSack

The SPEL StormSack is specifically designed for the capture of gross pollutants: sediment, litter, and oil and grease. Ideally suited for municipal storm drain retrofits, the SPEL StormSack’s unique design allows maintenance to be performed using conventional vacuum suction equipment.



Application	Regulatory Issue	Target Pollutants
Council Storm Drain Retrofits	At-source litter capture	Sediment, Litter, O&G
Commercial/Retail/Residential	Stormwater Compliance	Sediment, Litter, O&G
Litter Prone Urban Areas	Cost effective litter control	Litter ≥ 5 mm
Scrap Metal/Solid Waste/Oil Storage/Etc	Industrial Multi-Sector General Permit	Gross Pollutants, O&G
Part of Treatment Train	Council Stormwater Quality Improvement Targets	Sediment, Litter, O&G
Construction Sediment/Erosion	Sediment Control Plan	Sediment/Erosion Control

Features	
1.	Durable, aluminum frame construction has 15 year service life
2.	Integral oil boom effectively captures oil and grease from spills
3.	Patented dovetailed flange – allows 12cm of length/width field adjustment
4.	Polypropylene netting protects sack from suction hose during maintenance
5.	Steel clip with locking tab holds replaceable filter sack in place
6.	Baffled bypass traps floatables



Standard SPEL Stormsack to suit Pit Sizes
450x450mm
600x600mm
900x600mm
900x900mm

Custom sizes (i.e. 1200x900mm) can be manufactured on short lead times

# Specifications & Details

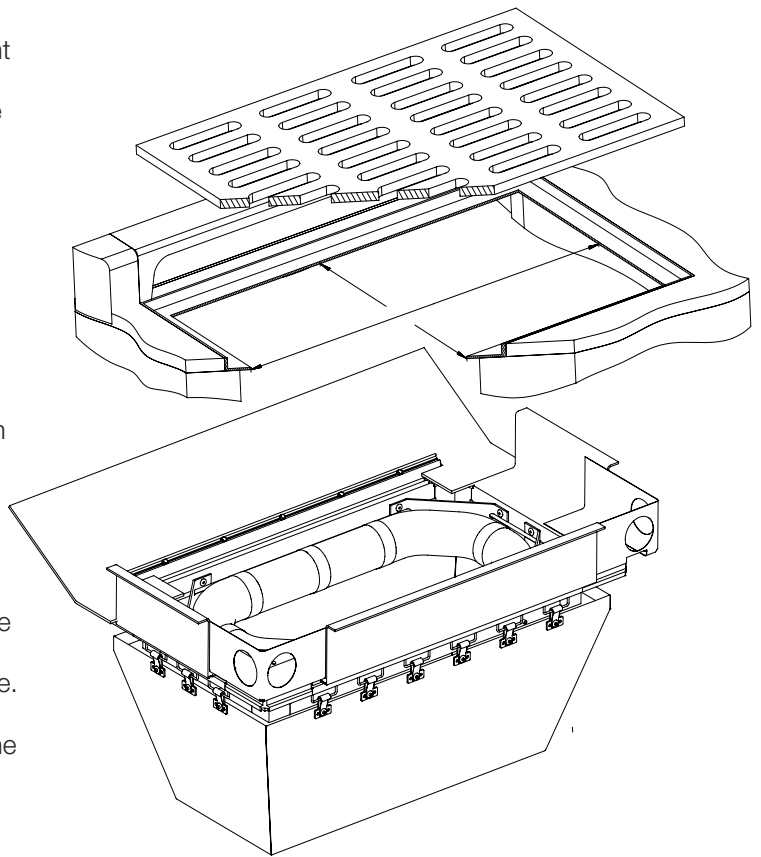
## General Description

This technology is a post developed stormwater treatment system. The SPEL StormSack provides effective filtration of solid pollutants and debris typical of urban runoff, while utilising the existing or new storm drain infrastructure. The StormSack is designed to rest on the flanges of conventional catch basin frames and is engineered for most hydraulic and cold climate conditions.

## Installation And Maintenance

Installation procedures shall include removing the storm grate, cleaning the ledge of debris and solids, measuring catch basin clear opening and adjusting flanges to rest on grate support ledge. Install SPEL StormSack with splash guard under curb opening so the adjustable flanges are resting on the grate support ledge. Install corner filler pieces. Reinstall storm grate directly on support flanges [rise shall be no more than 1/8 inch (3 mm)].

Maintenance: Typically the SPEL StormSack is serviceable from the street level, and therefore maintenance does not require confined space entry into the catch basin structure. The unit is designed to be maintained in place with a vacuum hose attached to a sweeper or a vactor truck. The oil boom is also designed to easily be replaced from the street level. Use only SPEL replaceable parts.



## Products

### Material and Design

- A. Adjustable Flange and Deflector: Aluminum Alloy 6063-T6
- B. Splash Guard: neoprene rubber
- C. Stormsack: woven polypropylene geotextile with US Mesh 20
- D. Corner Filler: Aluminum Alloy 5052-H32
- E. Lifting Tabs: Aluminum Alloy 5052-H32
- F. Replaceable Oil Boom: polypropylene 3 inch (76 mm) diameter
- G. Mesh Liner: HDPE, diamond configuration
- H. Support Hardware: CRES 300 Series

### Typical Performance Characteristics

- A. Debris capacity: 8.5cu. ft. (0.24 m<sup>3</sup>)
- B. Filtered flow rate: 7.3 cfs (207 lps)
- C. Primary baffled bypass flow rate: 4.2cfs (119 lps)
- D. Secondary bypass flow rate: 0.4 cfs (10 lps)
- E. Total bypass flow rate: 4.6 cfs (130 lps)
- F. Oil boom sorption capacity: 376 oz (11 L)

Recommended minimum clearance from bottom of SPEL StormSack to inside bottom of vault is 2 inches (50 mm)  
Typical frame adjustability range of 5 inches (127 mm) in each direction.

## Benefits

- Low cost gross pollutant capture
- Quick & easy installation
- Simple maintenance
- At source capture
- Adjusts to custom pit sizes

## Field Performance

The SPEL Stormsack was introduced to the Australian market in 2012 and field testing is underway at several locations in South-east Queensland. Laboratory testing has shown capture of 99.99% of gross pollutants up to the bypass flow rate.\* Further results will be provided as they become available.





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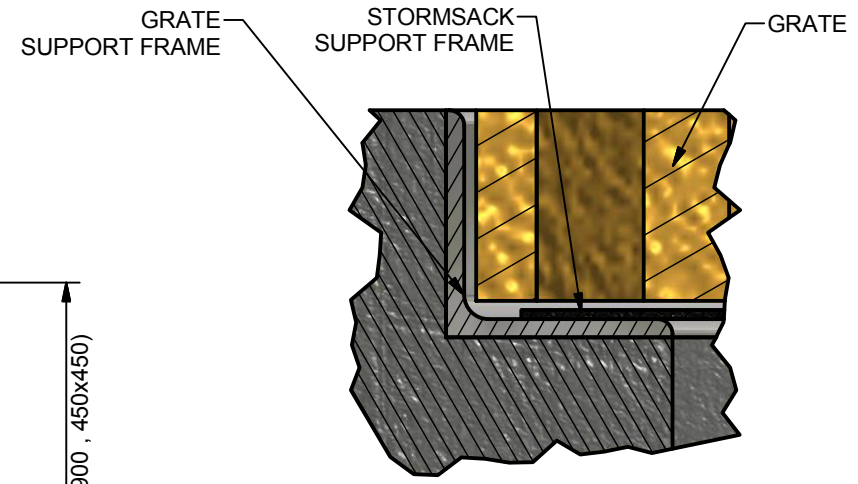
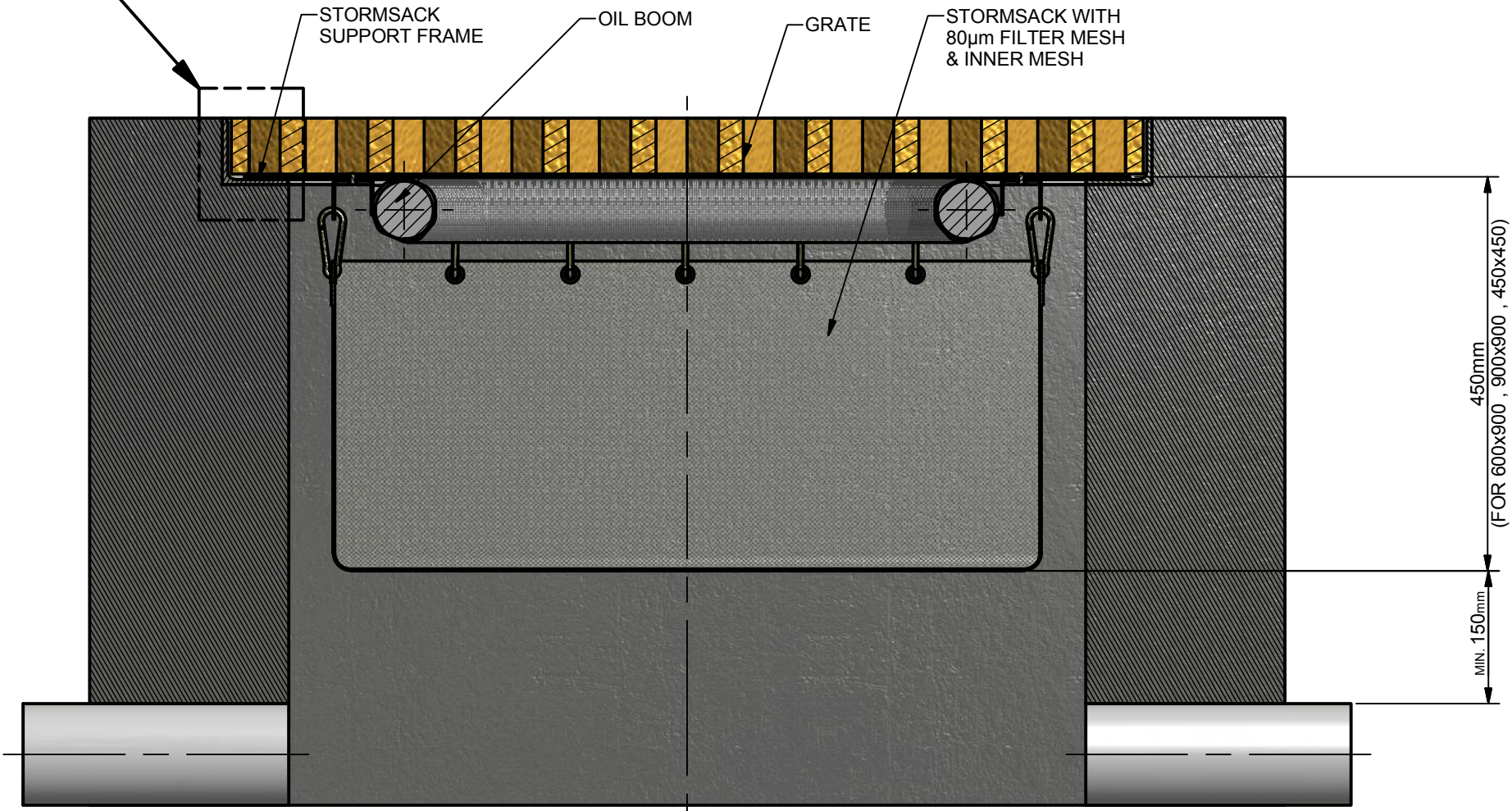
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REV	DESCRIPTION	DESIGNER	CREATION DAT	CHECKED BY
1	INITIAL RELEASE	M.MAKIN	15/10/2015	

DETAIL 'A'



DETAIL 'A'

SECTION VIEW

**NOTE:** BY USING THE STORMSACK THE GRATE WILL BE APPROX. 3-5mm HIGHER

ISSUE FOR APPROVAL  
NOT FOR CONSTRUCTION

TOLERANCE: ALL DIMENSIONS 10mm UNLESS OTHERWISE STATED.

CLIENT:

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Drawn	Date
M.MAKIN	15/10/2015
Check	Date
Verified	Date
Approved	Date
Request No.	

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www.spel.com.au

PROJECT :

TITLE SPEL STORMSACK INSTALLATION GUIDE GRATED PIT

SCALE N.T.S	SIZE A3	SHEET 1	REV 1
CUSTOMER CODE :	DWG No.	SP15-ST10970-S	



# SPELFilter Hydrosystem

Environmentally aware and efficient.

[www.spel.com.au](http://www.spel.com.au)



## The Technology

A specialist rainwater filter, designed for installation within load bearing shafts and chambers of concrete or plastic construction. The pre fitted plastic housing is safe and easy to fit at site.

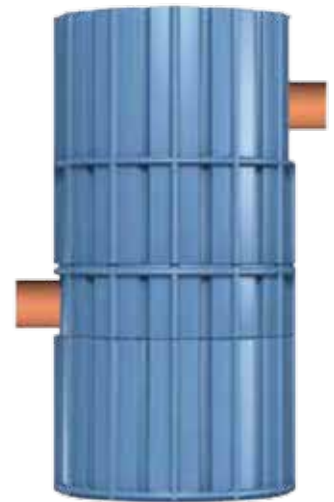
The Hydrosystem 1000 Filter uses an up-flow process. This means there is a minimal head drop between the inlet and the outlet. The cleaned water is of an outstanding water quality. The rainwater is treated within the unit by the following processes: sedimentation, filtration, adsorption and precipitation.

The initial treatment steps take place in the Dynamic Separator, where sedimentation of solid particles occurs within a radial flow regime, characterised by secondary flows.

A settling funnel to the silt trap chamber entrance ensures sediments are not remobilised. Above the separator are the filter inserts, covering the entire diameter of the unit's housing, where the second treatment step takes place.

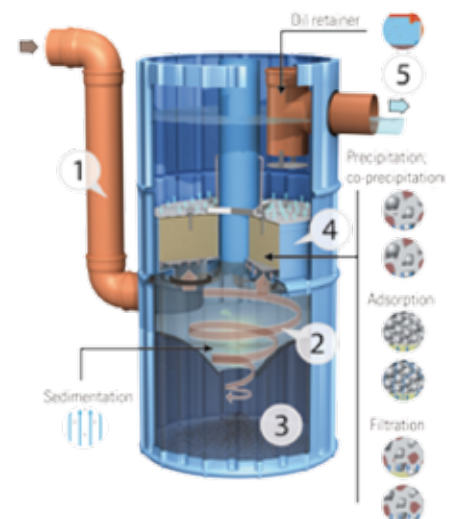
Water flows upwards through the removable filter element. As a result of both the upward flow within the filter element and the fact that the filter remains saturated, the rate of filter clogging by solids is both very limited and slow.

The filter inserts are easy to exchange.



## How it works

1. The stormwater from the drained area is fed into the inlet, which is at the lower end of the shaft. A deflector plate sets up a radial flow.
2. Here, sedimentation of particles, especially the sand fraction and above, takes place in the hydrodynamic separator. This is due to turbulent secondary flows within a radial laminar flow regime.
3. The settleable solids are collected via an opening in the silt trap chamber. This chamber is evacuated periodically, via the by-pass central tube at intervals.
4. Four filter elements are located within the filter shaft. As waters flow upwards the finer particles are filtered out, whilst the dissolved pollutants are precipitated and absorbed. The filter is easily backwashed, and if completely clogged or exhausted, is easily replaced.
5. Clean water above the filter elements passes to discharge via an oil trap assembly. In the event of major spill, free floating oils etc are retained here. Normal concentrations of dissolved oils are retained within the filter elements.



## Technical Data

Stormwater filter complying with DIN 1989-2. Connections: DN 200; the various types of filter elements have different material structures.

Housing material: Polyethylene

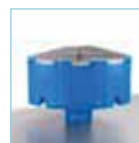
Housing weight: 68 kg

Total weight: 220 to 350 kg depending on filter type

**Packing unit SPEL Hydrosystem 1000:** Pallet: 1 piece

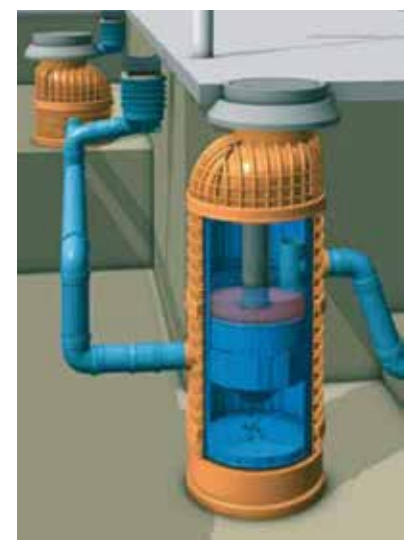
## Accessories 1

SPELFilter element  
Weight per filter element:  
34 kg (roof / traffic)



## Accessories 2

SPELFilter element  
Weight per filter element:  
54 kg (heavy traffic)  
66 kg (metal)



*Example: Installation in a shaft made of plastic*

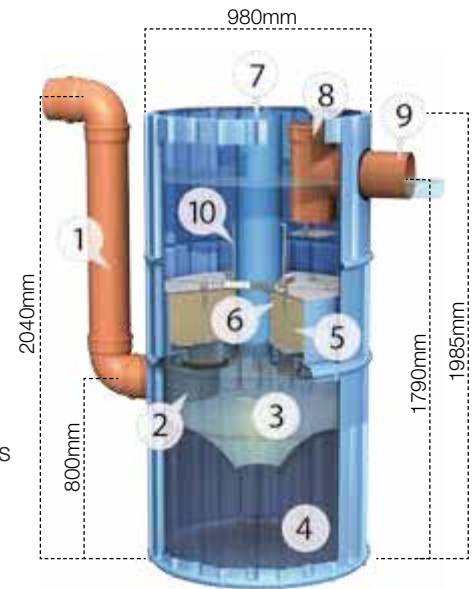


## Example:

The SPEL Hydrosystem 1000 traffic installed in a concrete shaft DN1000.

## Product structure:

1. Stormwater inlet (DN 200)
2. Deflector plate
3. Hydrodynamic separator
4. Silt trap
5. Filter element
6. Extraction aid for filter element
7. Overflow and suction pipe
8. Oil trap
9. Outlet stormwater storage, soakaway system or surface waters
10. Buoyancy restraint for filter elements



The SPEL Hydrosystem is available with various filter types, depending on the usage of the connected area. The Roof type is used for roof areas that do not have a significant proportion of uncoated metals; the Metal type is employed for metal roof areas, and the Traffic type is used for slightly polluted traffic areas.

The Heavy Traffic type is employed for heavily polluted traffic areas and has been granted general technical approval (Z-84.2-4) by the German Institute for Structural Engineering (DIBt). The maximum areas that may be drained depend on the nature of the surfaces. These are given in the following table.

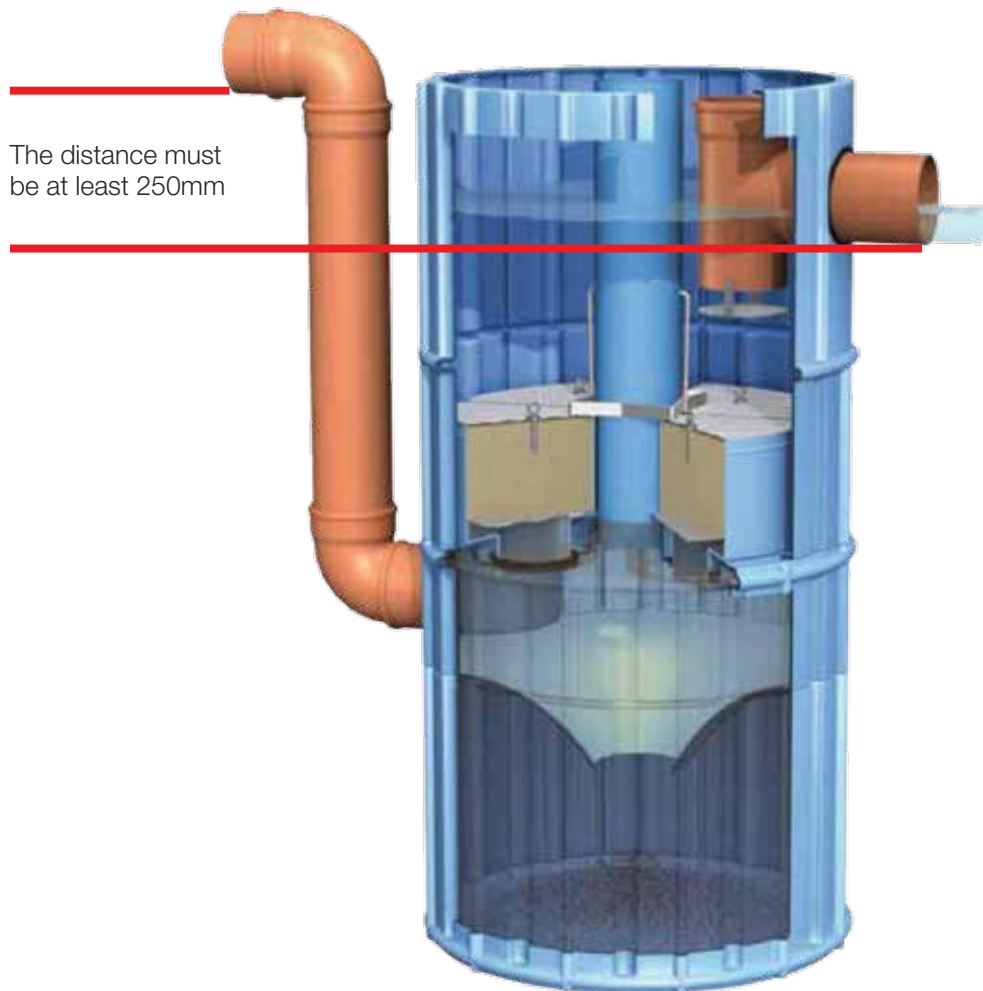
Type	Nature of the surface to be drained	Weight of filter element / piece	Total Weight
Heavy traffic with technical approval (Z-84.2-4)	Highly polluted traffic areas (car parks in front of supermarkets, main roads, HGV access roads)	54kg	300kg
Traffic	Slightly polluted traffic areas (side streets, staff car parks, yards)	34kg	220kg
Roof	Roofs without a significant proportion of uncoated metals (< 50m²)	34kg	220kg
Metal	Roofs made of uncoated metals (copper, zinc, lead)	66kg	350kg

Parameter	Unit	Non Metal Roof	Copper Roof	Zinc Roof	Parking lot, residential street	Main road Distributer	① Aims of LAWA	② Drinking Water	③ Seepage	④ SPEL Hydrosystem
		from to	from to	from to	from to	from to	permissible limit	permissible limit	control value	aim
<b>Physico-chemical parameters</b>							90 Percentile			
electrical conductivity	[uS/cm]	25 270	25 270	25 270	50 2400	110 2400	–	2500	–	< 1500
pH value	[–]	4,7 6,8	4,7 6,8	4,7 6,8	6,4 7,9	6,4 7,9	–	6,5 – 9,5	–	7,0 – 9,5
<b>Nutrients</b>										
phosphorous (P ges)	[mg/l]	0,06 0,50	0,06 0,50	0,06 0,50	0,09 0,30	0,23 0,34	–	–	–	0,20
ammonium (NH <sub>4</sub> )	[mg/l]	0,1 6,2	0,1 6,2	0,1 6,2	0,0 0,9	0,5 2,3	–	0,5	–	0,3
nitrate (NO <sub>3</sub> )	[mg/l]	0,1 4,7	0,1 4,7	0,1 4,7	0,0 16,0	0,0 16,0	–	50,0	–	–
<b>Heavy Metals</b>										
cadmium (Cd)	[µg/l]	0,2 2,5	0,2 1,0	0,5 2,0	0,2 1,7	0,3 13,0	1,0	5,0	5,0	< 1,0
zinc (Zn)	[µg/l]	24 4.880	24 877	1.731 43.674	15 1.420	120 2.000	500	–	500	< 500
copper (Cu)	[µg/l]	6 3.416	2.200 8.500	11 950	21 140	97 104	20	2000	50	< 50
lead (Pb)	[µg/l]	2 493	2 493	4 302	98 170	11 525	50	10	25	< 25
nickel (Ni)	[µg/l]	2 7	2 7	2 7	4 70	4 70	50	20	50	< 20
chromium (Cr)	[µg/l]	2 6	2 6	2 6	6 50	6 50	50	50	50	< 50
<b>Organic Substances</b>										
polynuclear aromatic hydrocarbons (PAK)	[ug/l]	0,4 0,6	0,4 0,6	0,4 0,6	0,2 17,1	0,2 17,1	–	0,1 6 compounds	0,2	< 0,2
petroleum-derived hydrocarbons (MKW)	[mg/l]	0,1 3,1	0,1 3,1	0,1 3,1	0,1 6,5	0,1 6,5	–	–	0,2	< 0,2

① Aims of the German working group on water issues of the Federal States and the Federal Government (LAWA) for surface water, usage as potable water (1998).  
 ② Permissible of the German Drinking Water Ordinance (2001). ③ Control value for seepage of the German Federal Soil Protection Act an Ordinance (1999) according to § 8 1,2. ④ The aims of the system refer to average annual loads.

## Installation

**CAUTION!** Important information, please observe.



### The following is to be checked before installation:

The filter must be installed with a so-called fall. This means that the incoming pipe (stormwater inlet) is led downwards just ahead of the shaft and can be connected to the lower connection as described.

The difference in invert between the incoming pipe and the outlet to discharge must be at least 250mm.



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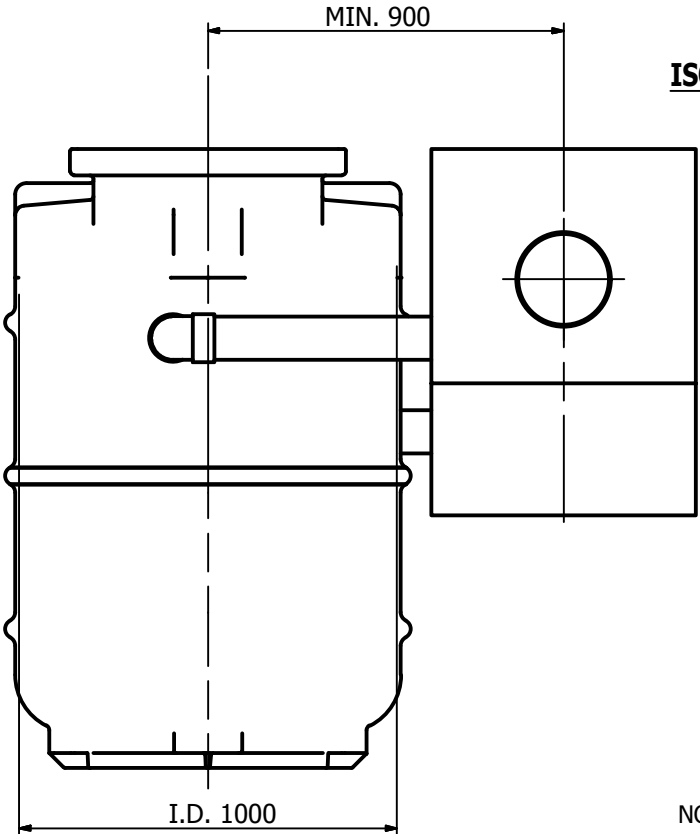
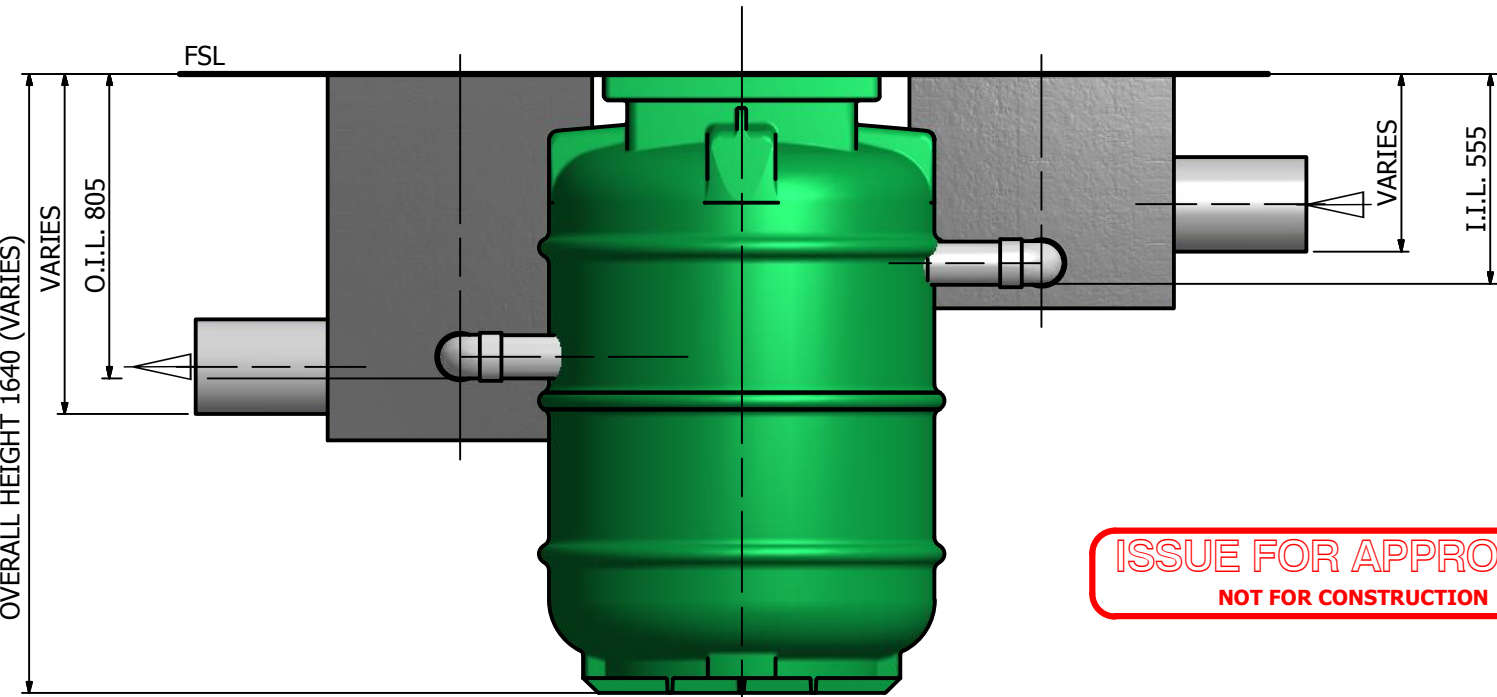
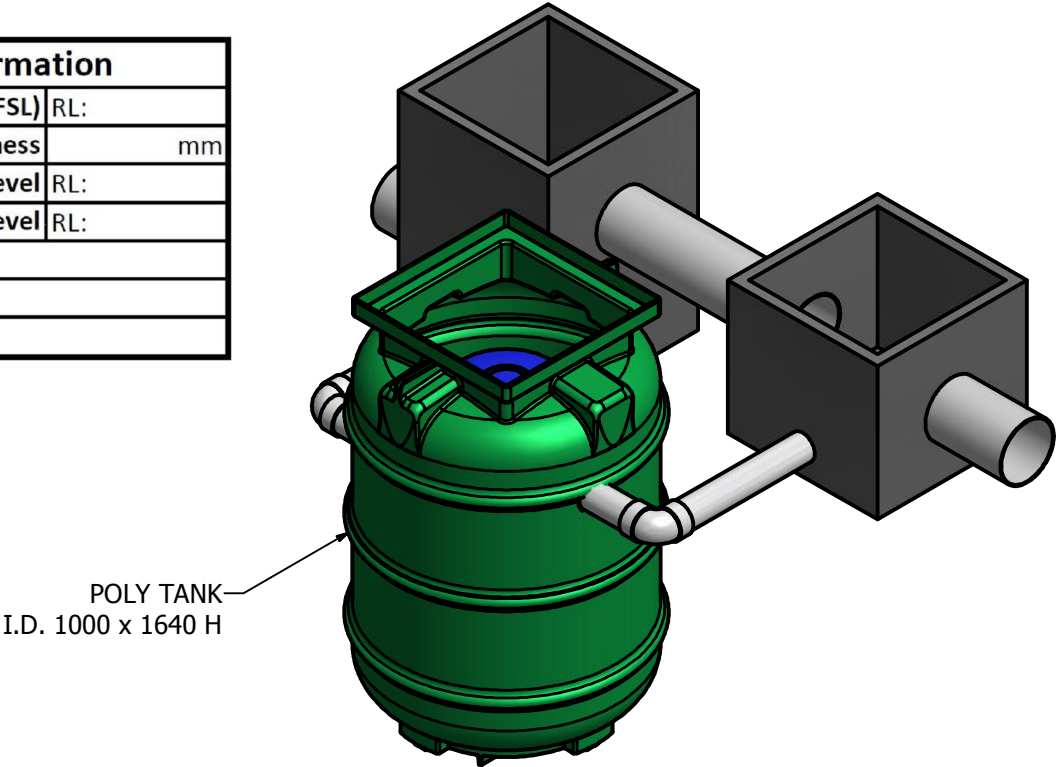
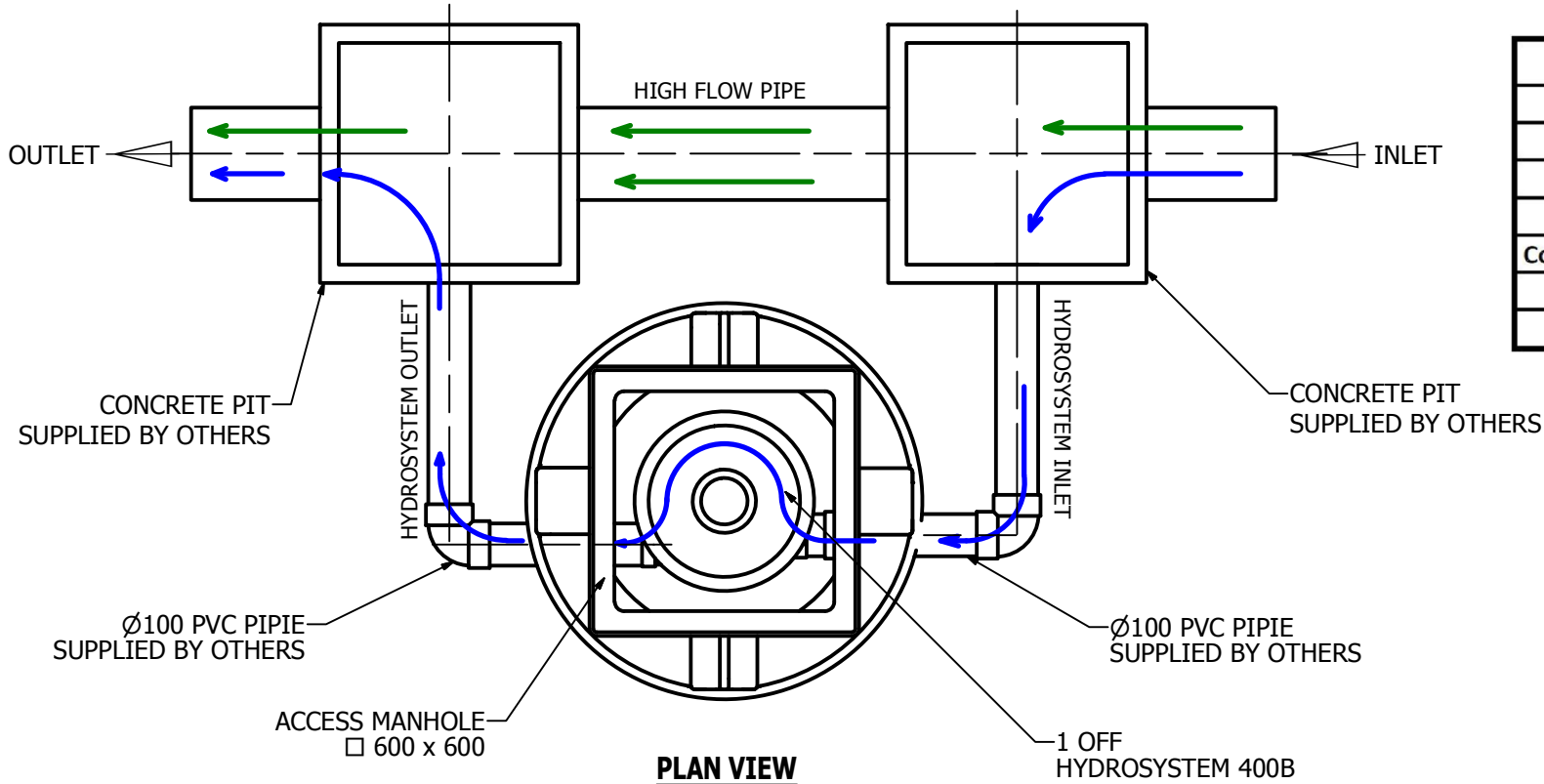
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REV	DESCRIPTION	DESIGNER	DATE	APPROVED
1	INITIAL RELEASE	M.MAKIN	13/09/2016	M.M.

<b>Site Level Confirmation</b>	
Finished Surface Level (FSL)	RL:
Access Cover Thickness	mm
Inlet Invert Level	RL:
Outlet Invert Level	RL:
Company:	
Name:	
Date:	



APPROVED.....	<input type="checkbox"/>
NAME.....	
SIGNED.....	
DATE...../...../.....	

**ISSUE FOR APPROVAL**  
**NOT FOR CONSTRUCTION**

← HIGH FLOW BYPASS  
← TREATMENT FLOW

NOTICE:  
SYSTEM PIPEWORK MUST HAVE AT LEAST  
250 MM OF FALL TO OPERATE CORRECTLY.

TOLERANCE: ALL DIMENSIONS 10mm UNLESS OTHERWISE STATED.

CLIENT:

DISTRIBUTOR :

**AKS**

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M.MAKIN	13/09/2016
Check	Date
Verified	Date
Approved	Date
Request No.	
RN3070	

**SPEL**

ENVIRONMENTAL

INTEGRATED WATER SOLUTIONS

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www.spel.com.au

PROJECT : STANDARD DRAWING			
TITLE SPEL HYDROSYSTEM 400 SHS.100D-400B-01.100.PVC LDPE TANK 1000 DIA. 1 HYDROSYSTEM 400B GENERAL ARRANGEMENT			
SCALE N.T.S	SIZE A3	SHEET 1	REV 1
CUSTOMER CODE : -		DWG No. SP16-HY10580-S	

## Appendix 2 – Draft Treatment Train Maintenance Contract

**SPEL STORMWATER QUALITY TREATMENT DEVICE MAINTENANCE AGREEMENT**

**FOR**

**[CLIENT]**

**Located at 128 Strickland Ave, Hobart South**

This Equipment Maintenance Agreement (the "Maintenance Agreement") is made and effective

**[DATE],**

BETWEEN: AKS Industries Australia Pty Ltd (the "Service Provider"), of  
191 Station Street, Corio VIC 3214 (ABN: 88 151 483 984) hereafter known as AKS

AND: **[EQUIPMENT OWNER]** (the "Client"), of  
**[COMPLETE ADDRESS]**

**SUMMARY**

**This 10 year maintenance contract covers the monitoring and servicing of the SPEL Stormsacks and the  
SPEL Hydrosystem at the [PROJECT NAME OF DEVELOPMENT]  
Located at 128 Strickland Ave, Hobart South**

Where the Client has requested the provision of maintenance and the Service Provider is willing to provide such services as per the terms of this agreement both parties agree to:

**1. WARRANTY:**

SPEL warranty on the SPEL Hydrosystem is 12 months. Goods sold shall only have the benefit of a manufacturer's warranty if the purchaser has complied with the manufacturer's instructions in relation to installation, maintenance and operation of the said goods.

**2. MAINTENANCE CALLS:**

Service Provider agrees to provide maintenance service of one [1] maintenance calls annually and interim calls as required at the installation address specified above on the equipment listed. All charges specified are those currently in effect and are subject to change only at the time of subsequent annual renewal. If the charges are increased, the Client may, as of the effective date of such increase, terminate this Agreement by written notice to the Service Provider. Otherwise, the new charges shall become effective upon the date specified in the renewal invoice. Client calls hereunder are restricted to the normal working hours of the Service Provider.

All service commenced outside of Service Provider's normal working hours will be charged at published rates for service time and expense only.



### 3. SERVICES:

The following services are included:

#### Maintenance Summary

The SPEL Hydrosystem and Stormsacks will be inspected annually. The SPEL Hydrosystem change out maintenance process comprises the removal and replacement of each SPEL Hydrosystem cartridge and the cleaning of the silt out of the vault or manhole with a vacuum truck. In the event these works are required, Client will be notified accordingly. The AKS personnel that enter the tank [if necessary] will be trained in confined space entry

**Life Cycle Cost (LCC)** – The maintenance requirements for the SPEL Hydrosystem is very site specific and actually relates to the sediment load and sediment characteristics.

#### Maintenance Triggers

The basic activities included in the maintenance contract are as follows:

- Visual inspection of the vault and filter conditions annually
- If there is a silt build up, it needs to be vacuumed out accordingly
- TSS accumulation in the filters is what dictates the life cycle of individual filter.

Optimum performance of the equipment covered by this Agreement can be expected only if supplies provided by, or meeting the specifications of Service Provider are used. Service Provider shall have full and free access to the equipment to provide service thereon. If persons other than Service Provider's representatives perform maintenance or repairs, and as a result further work is required by Service Provider to restore the equipment to operating condition, such repairs will be billed at Service Provider's published time and material rates then in effect.

### 4. ANNUAL RATE FOR SERVICES:

ACTIVITY	FREQUENCY [subject to site characteristics]	VALUE [subject to CPI index]
<b>SPEL Stormsack</b> – Visual inspection of each sack, if minimal pollutant it will be emptied into the onsite waste bins. <b>SPEL Hydrosystem</b> - Visual inspection for sediment accumulation	Year 1 & 2 - Every six months Year 3 – 10 – Once per year	\$250+GST per site visit for this project. The ten (10) year total for inspections is \$3,000.00+GST
<b>Silt Removal</b> When required the SPEL Stormsack and SPEL Hydrosystem will need the silt vacuumed out. AKS will supply vacuum truck and labour to maintain the system.	This is dictated by silt condition on the site, detected through the site inspections. AKS have allowed for one (1) maintenance supervision per annum.	AKS supervision will be \$375+GST / visit, additional equipment (Sucker truck ect) will be on a cost plus basis. The ten (10) year total for maintenance (excluding sucker truck) is estimated \$3,750+GST
<b>SPEL Hydrosystem</b> replacement – allowance for one filter change out of each SPEL Hydrosystem throughout a 10 year period (If required)	We estimate the life of the SPEL Hydrosystem to be between 5 – 7 years, subject to silt condition on the site.	The replacement value is \$3,495 per SPEL Hydrosystem including the labour and management for the day.
SUMMARY		
Based on the selection above the, annual rate is \$1,024.50+GSTp.a. This comprises of the above inspection schedule, maintenance and associated reporting spread over the 10 year contract. The annual rate shall be paid in advance as at the renewal date each year. The annual rate shall be indexed by CPI at each annual renewal date (If applicable). Any payment not made by the 30 <sup>th</sup> day of the month shall be considered overdue and in addition to Service Provider's other remedies, Service Provider may levy a late payment charge equal to 4% per month on any overdue amount.		

**5. PAYMENTS:**

For service as specified above on the equipment listed, the undersigned Client agrees to pay in advance the total annual charge specified below to Service Provider, in accordance with the terms specified on the face of the invoice.

There shall be added to the charges provided for in this Agreement amounts equal to any taxes, however designated, levied or based on such charges or on this Agreement, or on the services rendered or parts supplied pursuant hereto, including GST.

**6. BINDING AGREEMENT:**

The undersigned Client represents that he is the owner of the equipment, or that they have the owner's authority to enter into this agreement.

This Agreement is subject to acceptance by Service Provider. It takes effect on the date written above and continues in effect for ten years and will remain in force thereafter, with automatic annual renewal at the indexed rates, until cancelled in writing by either party or at the end of a 10 year period – whichever is earlier.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

**AKS Industries Australia Pty Ltd**  
**ACN 151 483 984**

of 191 Station Street, Corio VIC 3214

CLIENT

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Kurt Jensen – Environmental Division Manager

\_\_\_\_\_  
Client Print Name and Title

**SPEL**

191 Station Street  
Corio VIC 3214

P 03 5274 1336 F 03 5274 9966  
E sales@aksindustries.com.au  
W aksindustries.com.au

ABN 88 151 483 984



22 SALAMANCA SQUARE

HOBART TASMANIA 7004

TELEPHONE 03) 6224 9997

FACSIMILE 03) 6224 9998

EMAIL [hbv@hbvarchitects.com.au](mailto:hbv@hbvarchitects.com.au)

HEFFERNAN BUTTON VOSS

ARCHITECTS

13 July 2018

Adam Smee  
Development Appraisal Planner  
City of Hobart

**Re: Multi-Dwelling Development 128, Strickland Avenue**

I am writing to inform you that I *Rohan Pace*, the applicant for the development application for a multi-dwelling development at 128 Strickland Avenue, has notified the neighbouring properties 124, 126 and 126a Strickland Avenue of the proposed works in the shared access junction as well as the proposed 5 dwellings and that we have lodged for a planning permit.

Yours Sincerely,

Rohan Pace  
Designer

Signed

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0000M0 000000	0000 0
0D000 0	D000000000 0000r00000

SEARCH DATE : 07-Jun-2018

SEARCH TIME : 11.01 AM

## DESCRIPTION OF LAND

City of HOBART

Lot 2 on Sealed Plan 158907

Derivation : Part of 2,000 acres Gtd. to P. Degraives.

Prior CTs 56419/3 and 149643/2

## SCHEDULE 1

M681176 TRANSFER to ASHLIN DEVELOPMENTS PTY LTD Registered  
19-Apr-2018 at 12.01 PM

## SCHEDULE 2

Reservations and conditions in the Crown Grant if any

SP158907 EASEMENTS in Schedule of Easements

SP158907 FENCING PROVISION in Schedule of Easements

SP128767 & SP149643 FENCING COVENANT in Schedule of Easements

E119733 MORTGAGE to National Australia Bank Limited

Registered 19-Apr-2018 at 12.02 PM

## UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations





<p><b>ANNEXURE TO SCHEDULE OF EASEMENTS</b></p> <p>PAGE 2 OF 2 PAGES</p>	<p>Registered Number</p> <p><b>SP158907</b></p>
<p>SUBDIVIDER: H T RICE &amp; L L BLACK FOLIO REFERENCE: 56419/3 &amp; 149643/2</p>	

**Fencing provision**

In respect to the lots on the plan the vendor (Haig Trevor Rice and Lauren Lucette Black) shall not be required to fence

**~~Fencing covenant~~**

~~The owners of the lots on the plan are subject to a fencing covenant created by and set forth in Sealed Plan 149643~~

Signed by the said HAIG TREVOR RICE being a registered proprietor of folios of the Register volume 56419 folio 3 & volume 149643 folio 2 in the presence-

Witness: [Signature]

name: Kate Mavis Goodman

address: 100A Collins St. Hobart.

occupation: Licenced Conveyancer.

)  
)  
[Signature]

Signed by the said LAUREN LUCETTE BLACK being a registered proprietor of folios of the Register volume 56419 folio 3 & volume 149643 folio 2 in the presence-

Witness: [Signature]

name: Kate Mavis Goodman

address: 100A Collins St. Hobart.

occupation: Licenced Conveyancer.

[Signature]

**NOTE:** Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.



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0000M0 00000	0000 0
0D000 0	D000000000 00M000000

SEARCH DATE : 12-Jul-2018

SEARCH TIME : 10.03 AM

## DESCRIPTION OF LAND

City of HOBART

Lot 1 on Diagram 56419 (formerly being 181-36D)

Derivation : Part of 2000 Acres Gtd. to P. Degraives.

Prior CT 2679/72

## SCHEDULE 1

C619023 TRANSFER to KRISTEN JAMES TAYLOR Registered  
09-Mar-2005 at 12.01 PM

## SCHEDULE 2

Reservations and conditions in the Crown Grant if any  
BENEFITTING EASEMENT: Right of carriageway over the roadway  
20 feet wide shown passing through Lot 2 on Diagram  
No. 56419

C805878 AGREEMENT pursuant to Section 71 of the Land Use  
Planning and Approvals Act 1993 Registered  
01-May-2008 at noon

C971134 AMENDMENT of the above Agreement No. C805878 pursuant  
to Section 78 of the Land Use Planning and Approvals  
Act 1993 Registered 03-Jun-2010 at noon

## UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

REGISTERED NUMBER

56419

**D/81/36**

**DIAGRAM FROM ACTUAL SURVEY**  
**P1 CITY OF HOBART**

LOTS 24, 25, 26 PART OF 2000 ACRES GRANTED TO PETER DE VRIES

C.T. 472/38.

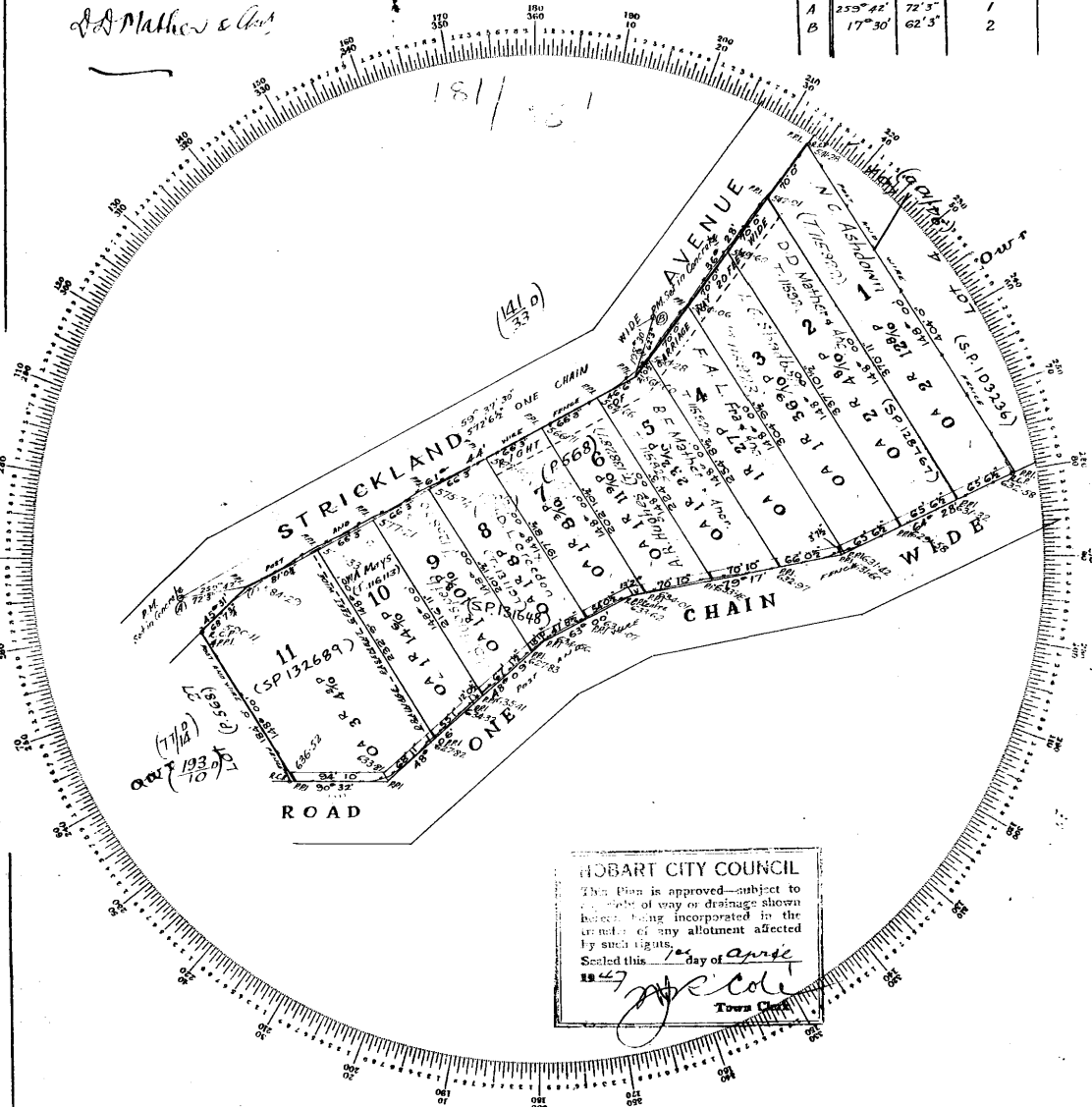
*Ad Mathew & Co.*

Scale 100 Feet to an inch.

REFERENCE TO CORNERS

COR.	BEARING	DISTANCE	FROM
B	55° 37' 30"	572.45	A
A	255° 42'	72.5"	1
B	17° 30'	62.5"	2

INFORMATION TO BE WRITTEN WITHIN THIS SPACE.



**HOBART CITY COUNCIL**  
This Plan is approved—subject to the date of way or drainage shown hereon being incorporated in the records of any allotment affected by such figures.  
Scaled this 12 day of April 1947  
*[Signature]*  
Town Clerk

**Date of Instructions** 12. 10. 46  
**Survey commenced** 12. 10. 46  
**Survey finished** 2. 11. 46  
**Error of close 1 in** See Computations.  
**Plotted by** *M. R. A.*  
**Examined as to boundaries** *[Signature]*  
**Mathematically checked** *[Signature]*  
**Entered on Card by** *[Signature]*

I, **ALFRED OWEN WILLIAMS** of **HOBART**  
Registered Surveyor, of Tasmania, do hereby certify that this plan has been made from surveys executed by me or under my own personal supervision, inspection, and field check, and that both plan and survey are correct, and have been made in accordance with the Land Surveyors' By-law No. 2, dated 8th July, 1946.

*[Signature]*

Authorised Surveyor.

Dated this Seventh day of November, 1946.

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0000M0 000003	0000 0
0D000 3	D000000000 00M000000

SEARCH DATE : 12-Jul-2018

SEARCH TIME : 10.02 AM

## DESCRIPTION OF LAND

City of HOBART

Lot 1 on Sealed Plan 149643

Derivation : Part of 2,000 acres Gtd. to P. Degraives.

Prior CTs 128767/1

## SCHEDULE 1

M371000 TRANSFER to FARIDA ANWAR KHAWAJA Registered  
01-May-2012 at 12.01 PM

## SCHEDULE 2

Reservations and conditions in the Crown Grant if any

SP 149643 EASEMENTS in Schedule of Easements

SP 128767 SP 149643 FENCING COVENANT in Schedule of Easements

D49132 MORTGAGE to MyState Financial Limited Registered

01-May-2012 at 12.02 PM

## UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations









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SEARCH DATE : 12-Jul-2018

SEARCH TIME : 10.01 AM

## DESCRIPTION OF LAND

City of HOBART

Lot 1 on Sealed Plan 158907

Derivation : Part of 2,000 acres Gtd. to P. Degraeves.

Prior CT 149643/2

## SCHEDULE 1

M275321 TRANSFER to NICHOLAS GUST Registered 23-Apr-2010 at 12.01 PM

## SCHEDULE 2

Reservations and conditions in the Crown Grant if any

SP158907 EASEMENTS in Schedule of Easements

SP158907 FENCING PROVISION in Schedule of Easements

SP158907 WATER SUPPLY RESTRICTION

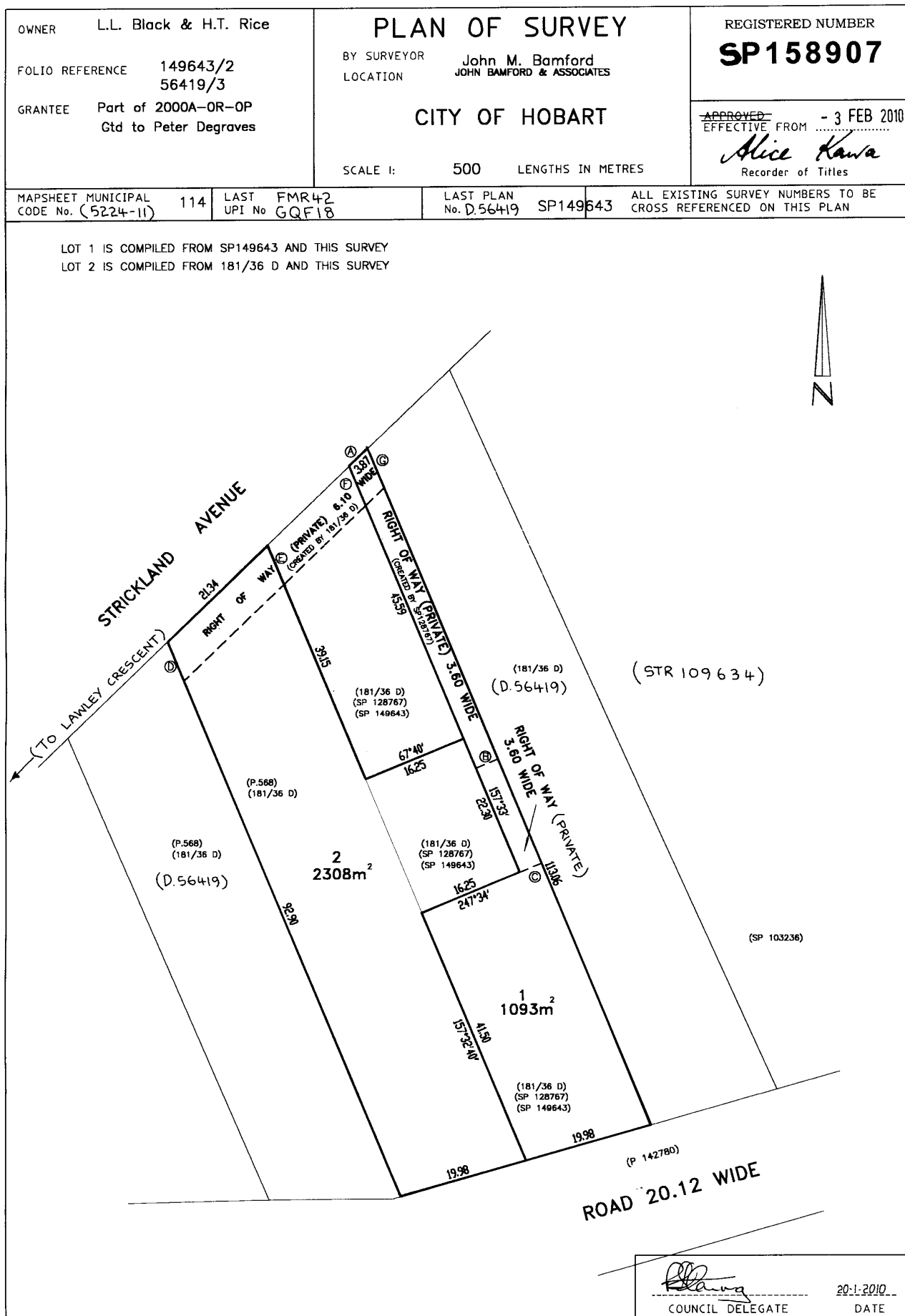
SP128767 & SP149643 FENCING COVENANT in Schedule of Easements

C962027 MORTGAGE to Commonwealth Bank of Australia

Registered 23-Apr-2010 at 12.02 PM

## UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations





<b>ANNEXURE TO SCHEDULE OF EASEMENTS</b> PAGE 2 OF 2 PAGES	Registered Number <b>SP158907</b>
SUBDIVIDER: H T RICE & L L BLACK FOLIO REFERENCE: 56419/3 & 149643/2	

**Fencing provision**

In respect to the lots on the plan the vendor (Haig Trevor Rice and Lauren Lucette Black) shall not be required to fence

**~~Fencing covenant~~**

~~The owners of the lots on the plan are subject to a fencing covenant created by and set forth in Sealed Plan 149643~~

Signed by the said HAIG TREVOR RICE being a registered proprietor of folios of the Register volume 56419 folio 3 & volume 149643 folio 2 in the presence-

Witness: [Signature]

name: Kate Mavis Goodman

address: 100A Collins St. Hobart.

occupation: Licenced Conveyancer.

)  
)  
[Signature]

Signed by the said LAUREN LUCETTE BLACK being a registered proprietor of folios of the Register volume 56419 folio 3 & volume 149643 folio 2 in the presence-

Witness: [Signature]

name: Kate Mavis Goodman

address: 100A Collins St. Hobart.

occupation: Licenced Conveyancer.

[Signature]

**NOTE:** Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.

# 128 STRICKLAND AVENUE - MULTI-DWELLING DEVELOPMENT

## DEVELOPEMENT APPLICATION DRAWINGS



DRAWING	SHEET NUMBER	REVISION
COVER	A0 00	- B
DEMOLITION	A1 00	- A
SITE PLAN LOWER	A1 01	- B
SITE PLAN UPPER	A1 02	- B
FLOOR PLAN DWELLING 1	A1 03	- A
FLOOR PLAN DWELLING 2	A1 04	- A
FLOOR PLAN DWELLING 3	A1 05	- A
FLOOR PLAN DWELLING 4	A1 06	- A
FLOOR PLAN DWELLING 5	A1 07	- B
ELEVATIONS DWELLING 1	A2 01	- A
ELEVATIONS DWELLING 2	A2 02	- A
ELEVATIONS DWELLING 3	A2 03	- A
ELEVATIONS DWELLING 4	A2 04	- A
ELEVATIONS DWELLING 5	A2 05	- B

B	05/07/2018
REV No.	DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
COVER

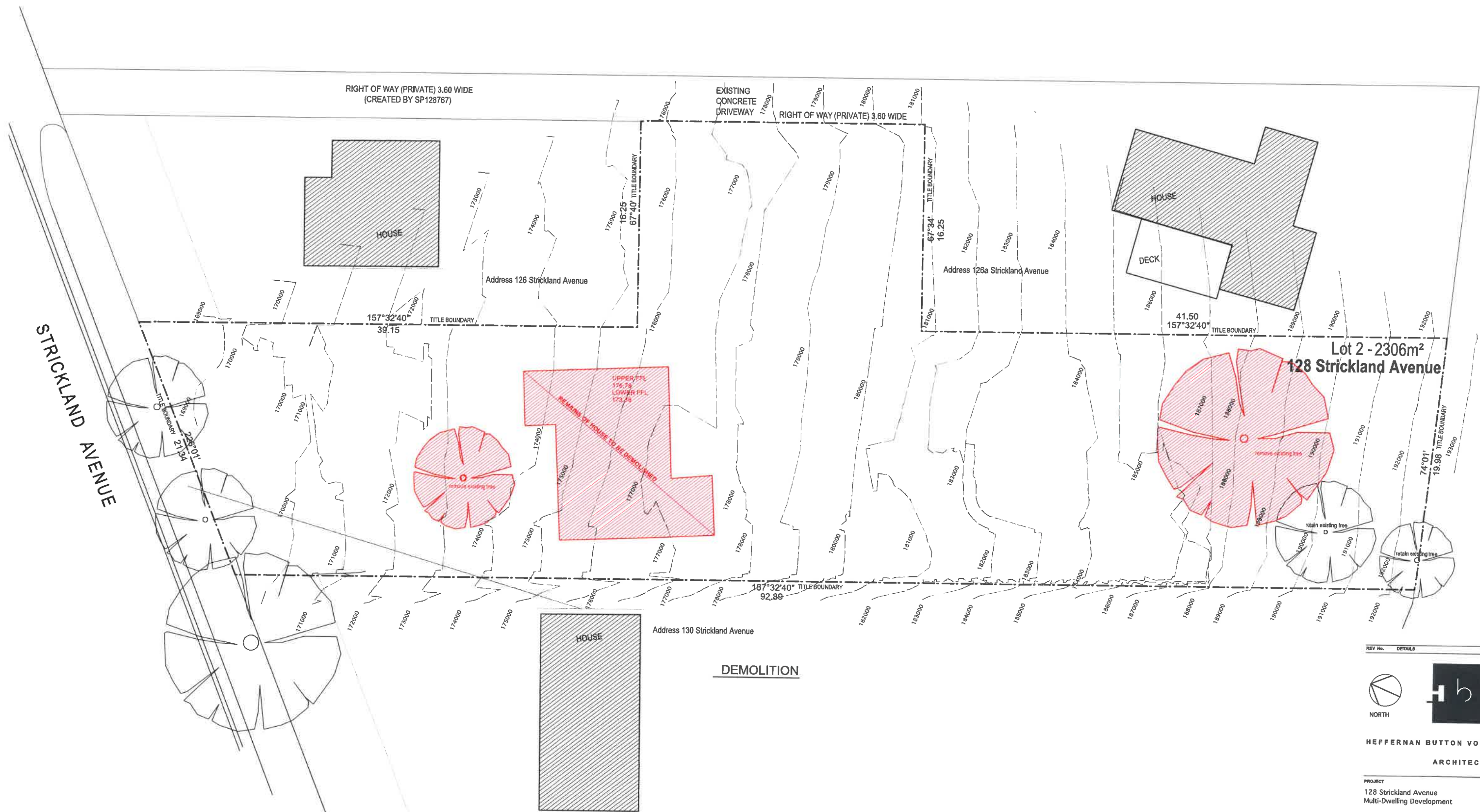
SCALE	DATE
NTS @ A2	JUN 2018
DRAWN	CHECKED
RP	JB

PROJECT No.	DRAWING No.
18.02	A0 00

22 SALAMANCA SQUARE HOBART TASMANIA 7000  
T (03) 5224 8997 E hbv@heffernanbuttonvoss.com.au

scale check 50mm original size





REV No. DETAILS DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
DEMOLITION

SCALE  
1:200 @ A2  
DATE  
JUN 2018

DRAWN  
RP  
CHECKED  
JB

PROJECT No. DRAWING No.

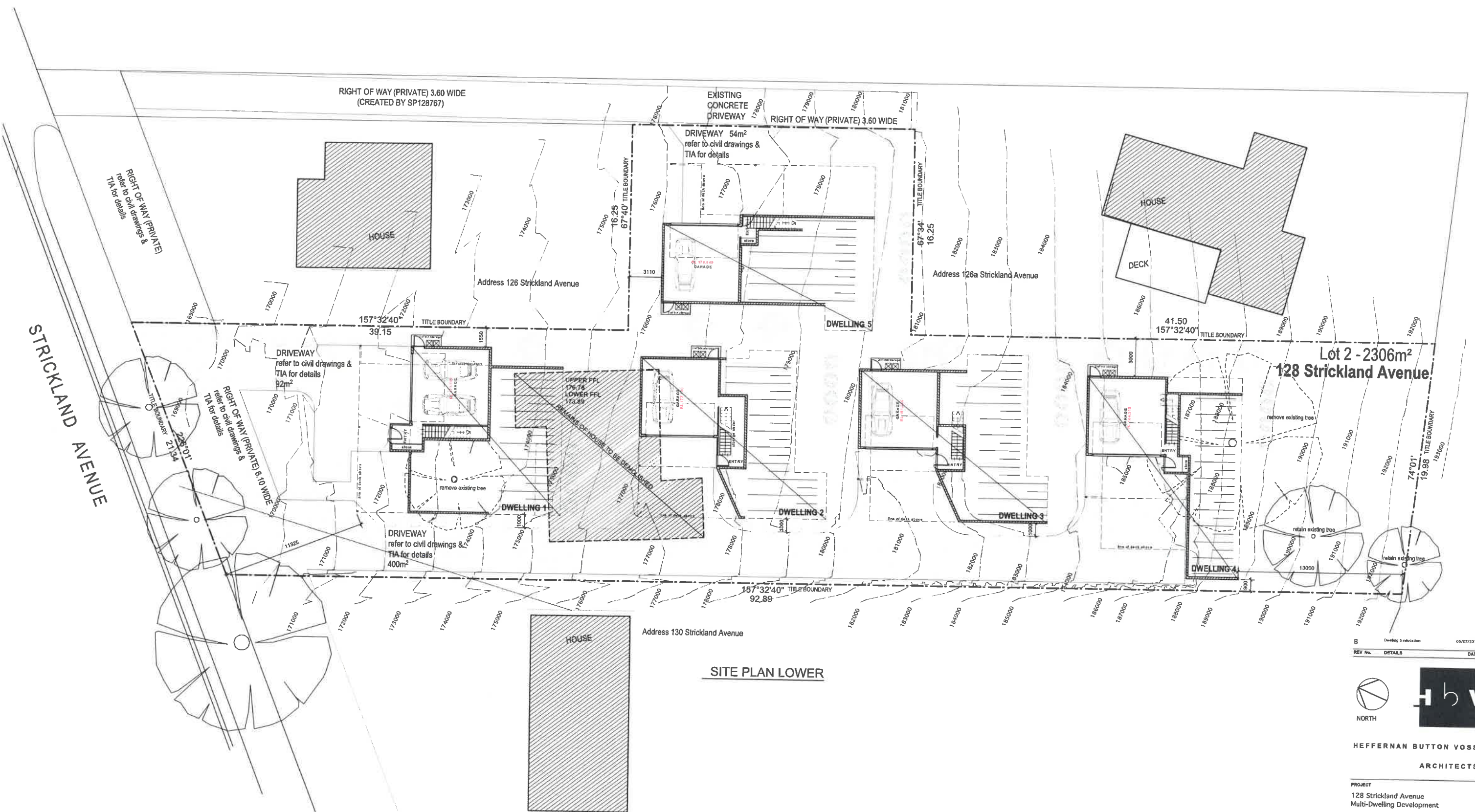
18.02 A1|00

DEVELOPMENT APPLICATION DRAWINGS

22 SALAMANKA SQUARE HOBBART TASMANIA 7000  
T 0318224 9997 E hbv@heffernanbuttonvoss.com.au

scale check 50mm original size





SITE PLAN LOWER

B	Dwelling 5 relocation	05/07/2018
REV No.	DETAILS	DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
SITE PLAN (LOWER)

SCALE 1:200 @ A2	DATE JUN 2018
DRAWN RP	CHECKED JB
PROJECT No.	DRAWING No.

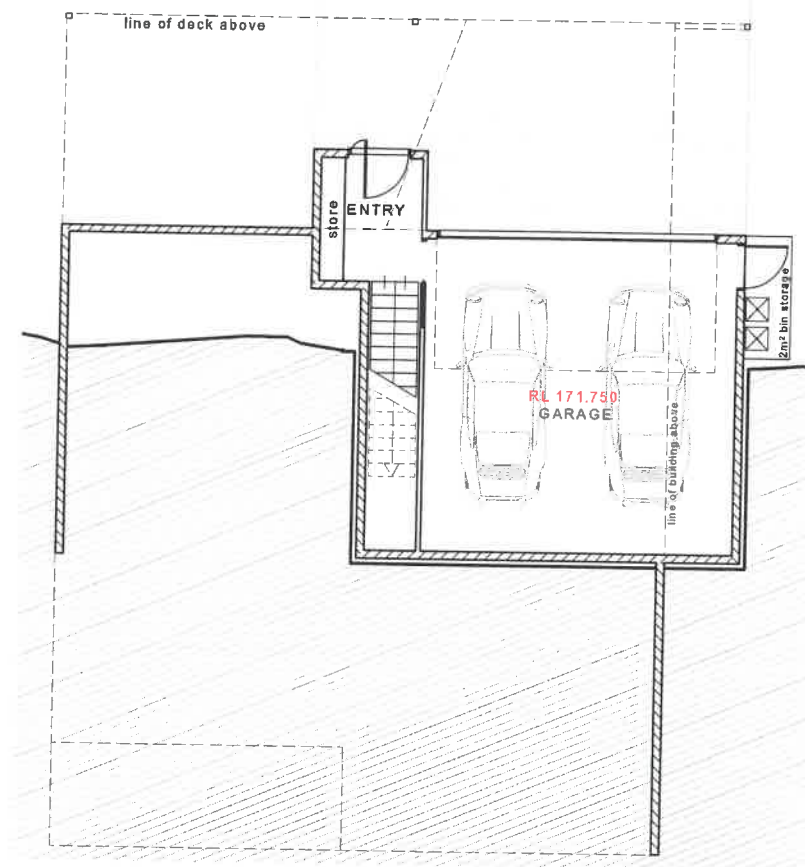
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DEVELOPMENT APPLICATION DRAWINGS

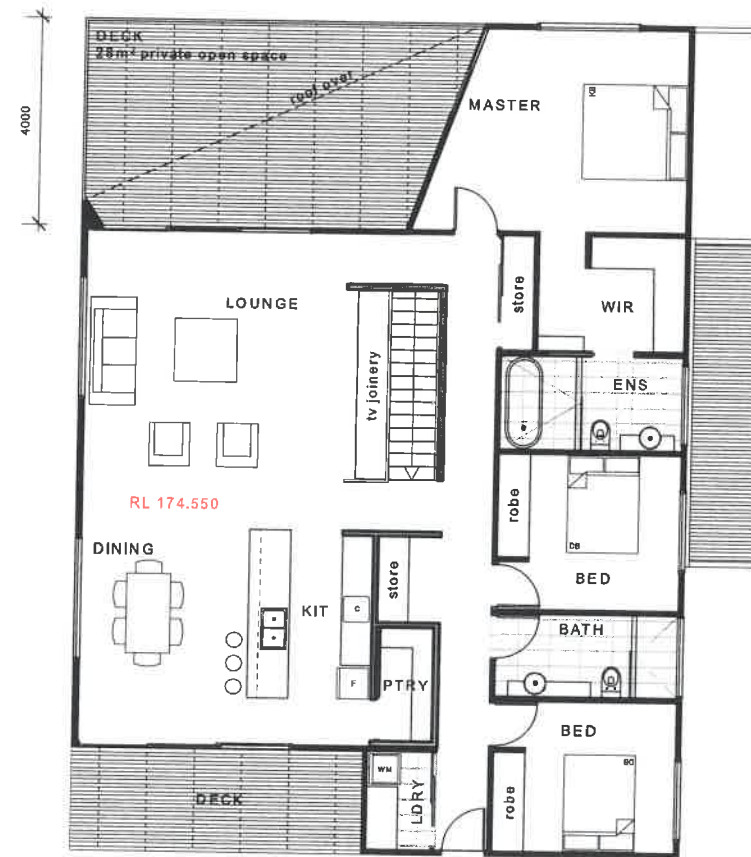
22 BALAMANCE SQUARE HOBART TASMANIA 7906  
T 03 6224 9997 E hbv@hbvarchitects.com.au  
scale check 50mm original size







LOWER FLOOR - 52m2



UPPER FLOOR - 149m2

REV No. DETAILS DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
FLOOR PLAN  
DWELLING 1

SCALE  
1:100 @ A2  
DATE  
JUN 2018  
DRAWN  
RP  
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JB  
PROJECT No.  
DRAWING No.

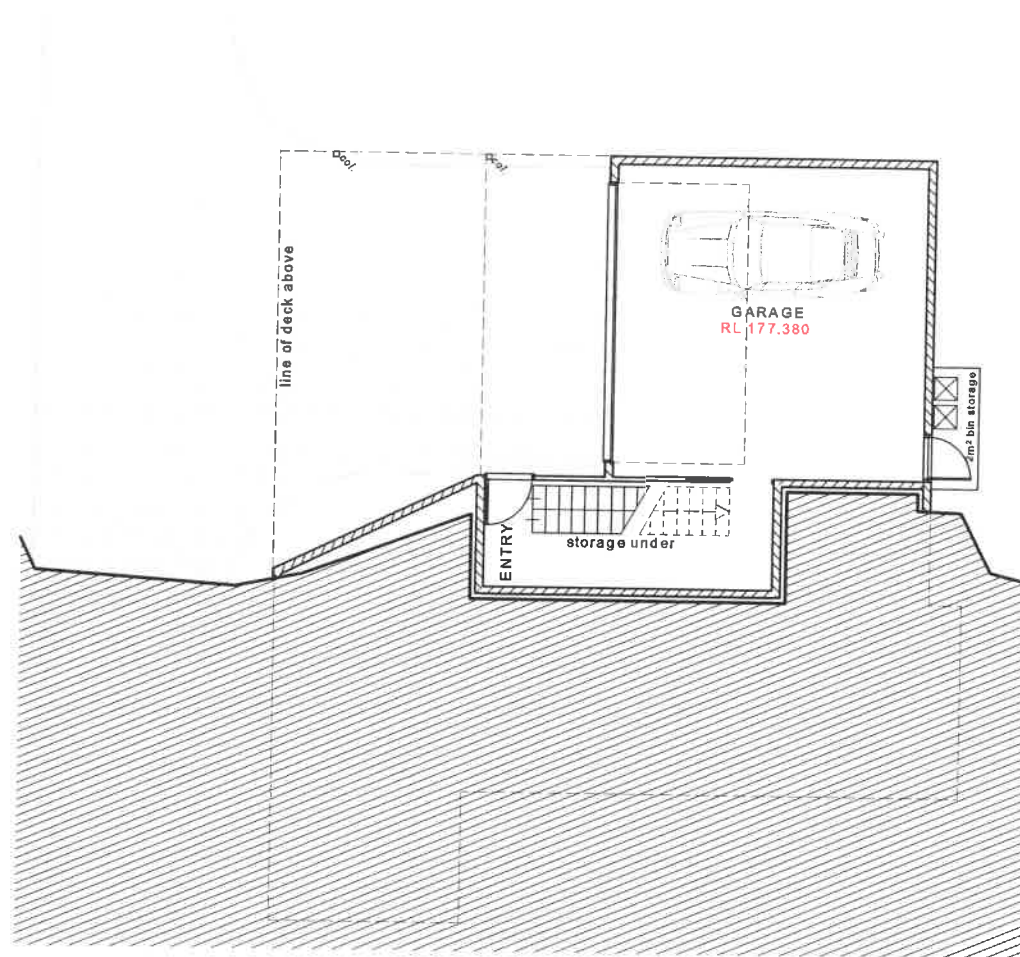
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T (05) 8224 9997 E hov@hbaarchitects.com.au

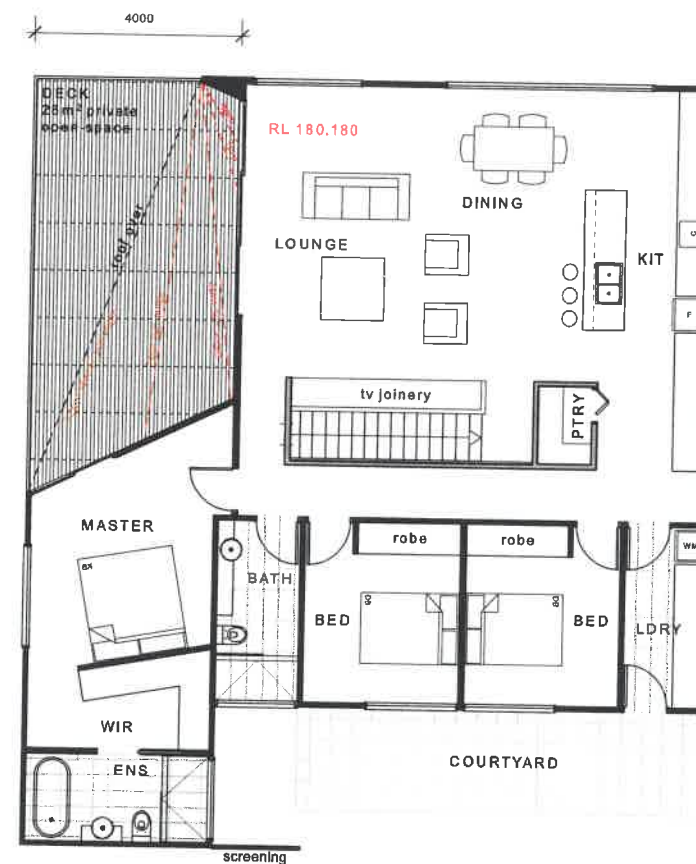
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DEVELOPMENT APPLICATION DRAWINGS





LOWER FLOOR - 53m<sup>2</sup>



UPPER FLOOR - 144m<sup>2</sup>

REV No. DETAILS DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
FLOOR PLAN  
DWELLING 2

SCALE  
1:100 @ A2

DATE  
JUN 2018

DRAWN  
RP

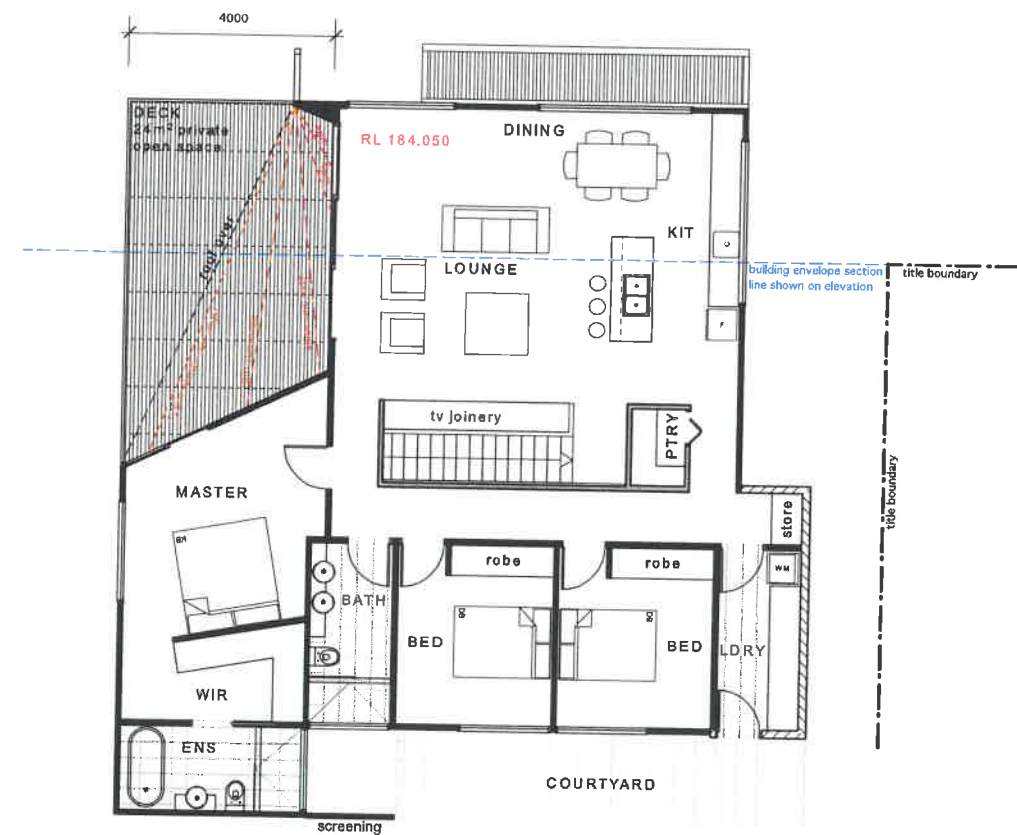
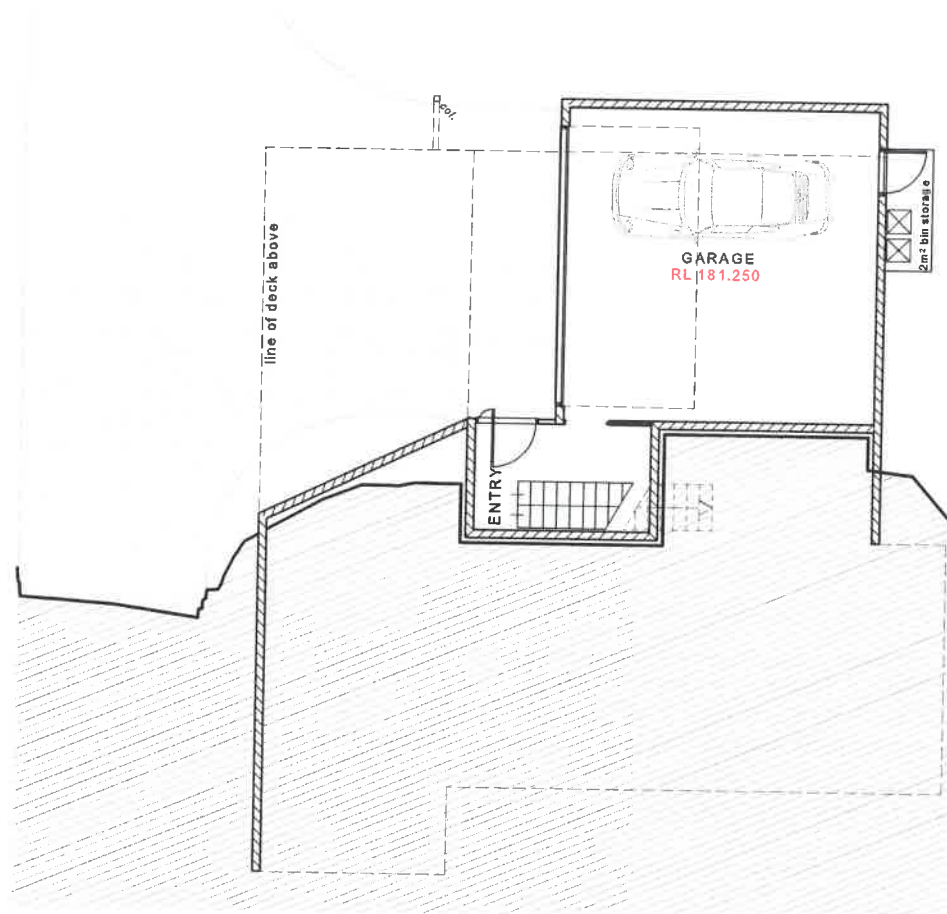
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JB

PROJECT No.  
18.02

DRAWING No.  
A1/04

22 SALAMANCA SQUARE HOBART TASMANIA 7500  
T (03) 8224 9997 E hbv@heffernanbuttonvoss.com.au

scale check 50mm original size



REV No. DETAILS DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
FLOOR PLAN  
DWELLING 3

SCALE  
1:100 @ A2 DATE  
JUN 2018

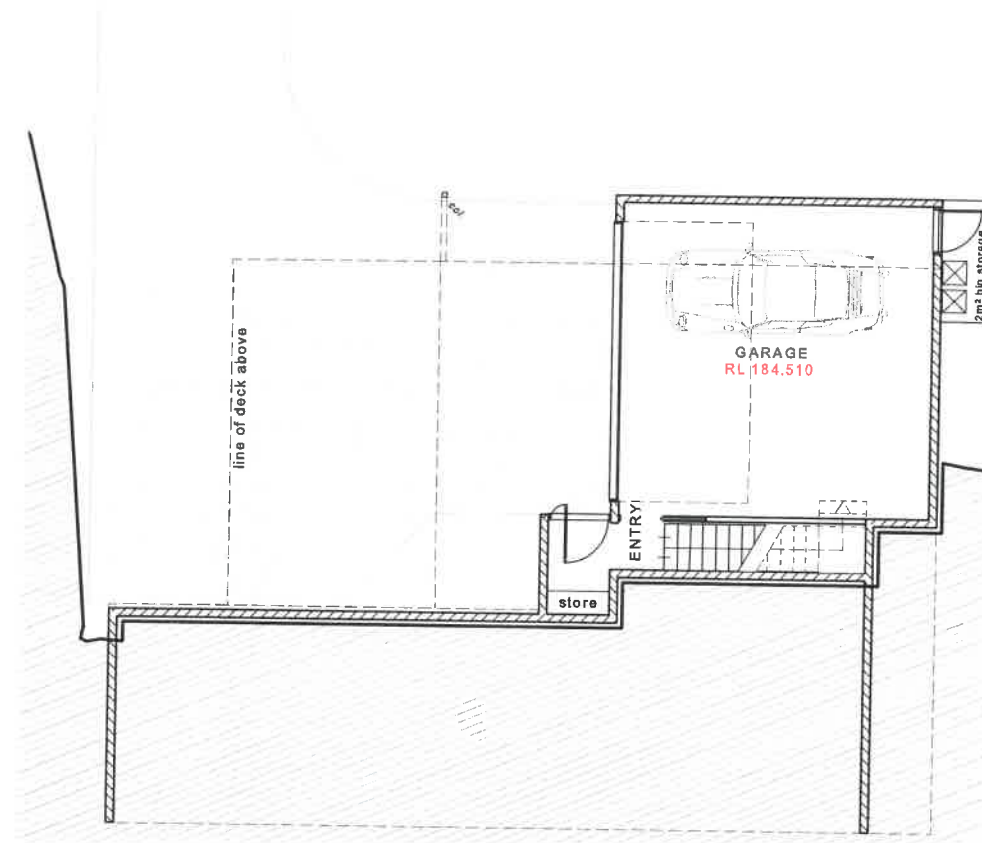
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RP CHECKED  
JB

PROJECT No. DRAWING No.  
18.02 A1/05

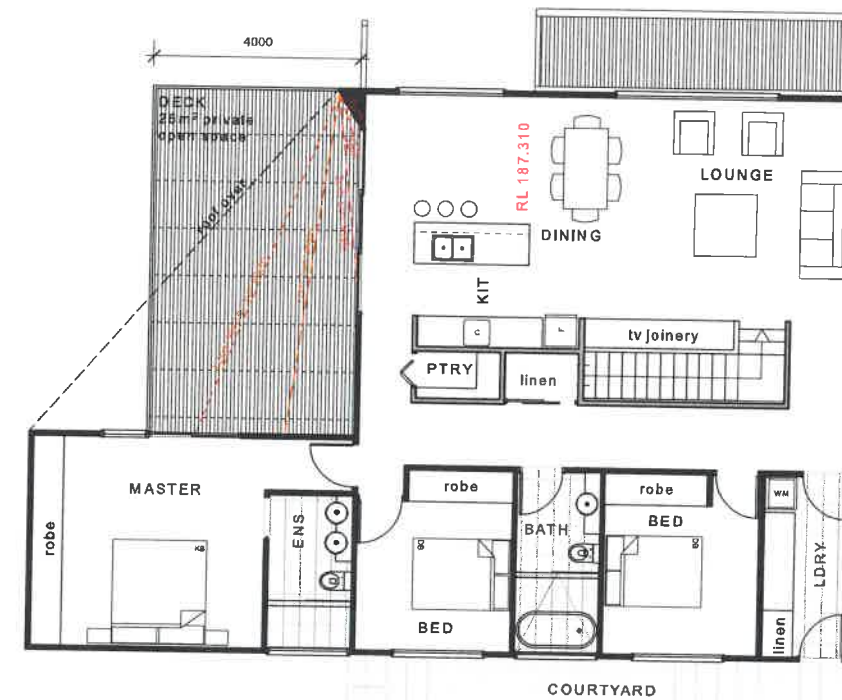
22 SALAMANCA SQUARE HOBART TASMANIA 7000  
T (03) 6224 9997 E hbv@hbv architects.com.au

scale check 50mm original size

DEVELOPMENT APPLICATION DRAWINGS



LOWER FLOOR - 48m<sup>2</sup>



UPPER FLOOR - 132m<sup>2</sup>

REV No. DETAILS DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
FLOOR PLAN  
DWELLING 4

SCALE  
1:100 @ A2

DATE  
JUN 2018

DRAWN  
RP

CHECKED  
JB

PROJECT No.  
18.02

DRAWING No.  
A1|06

22 SALAMANCA SQUARE HOBART TASMANIA 7500  
T 03 6234 9997 E hbv@hbuttonvoss.com.au

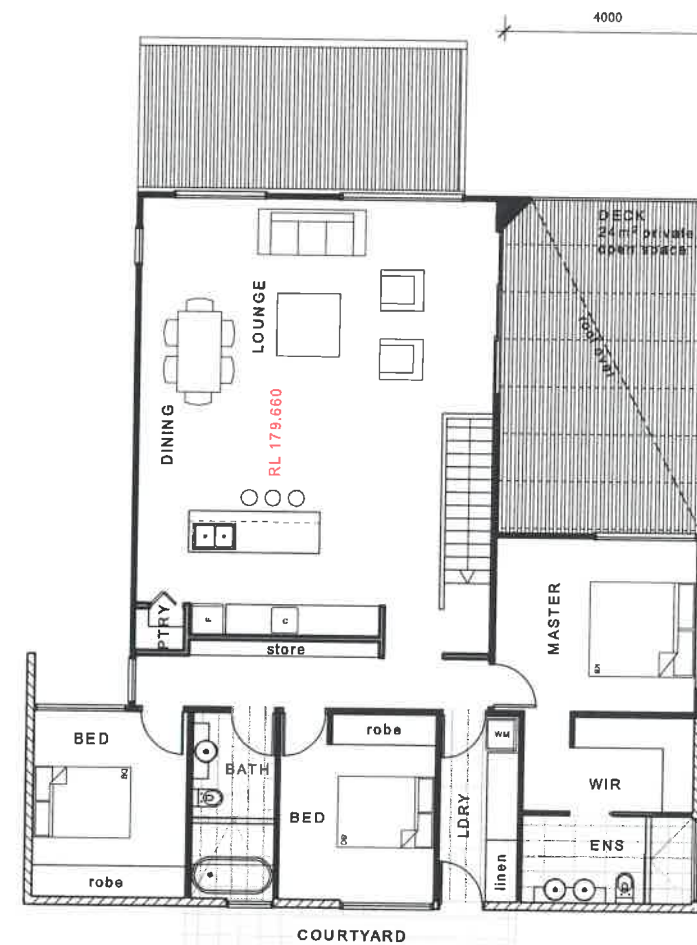
scale check 50mm original size

DEVELOPMENT APPLICATION DRAWINGS





LOWER FLOOR - 43m2



UPPER FLOOR - 134m2

B	Dwelling 5 relocation	05/07/2018
REV No.	DETAILS	DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

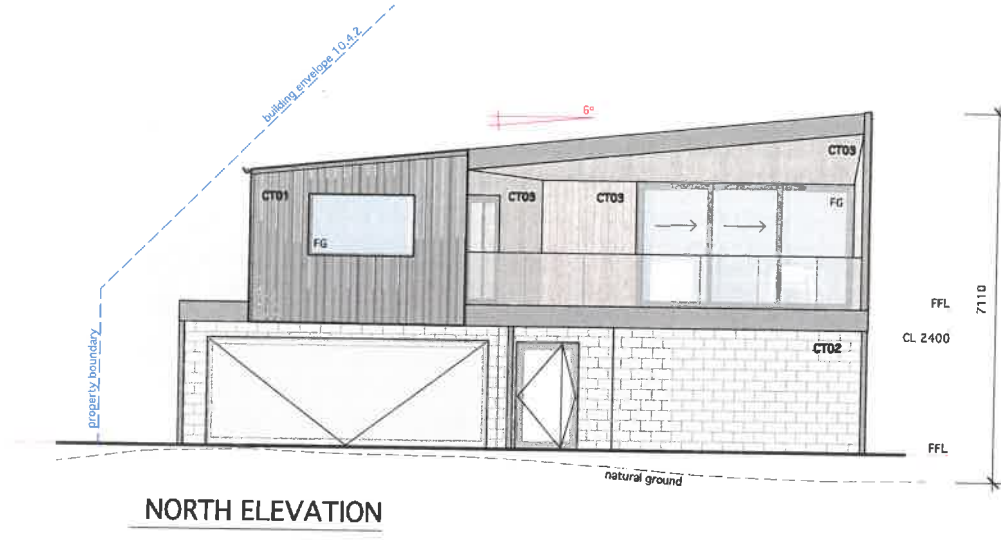
DRAWING  
FLOOR PLAN  
DWELLING 5

SCALE 1:100 @ A2	DATE JUN 2018
DRAWN RP	CHECKED JB
PROJECT No. 18.02	DRAWING No. A1/07

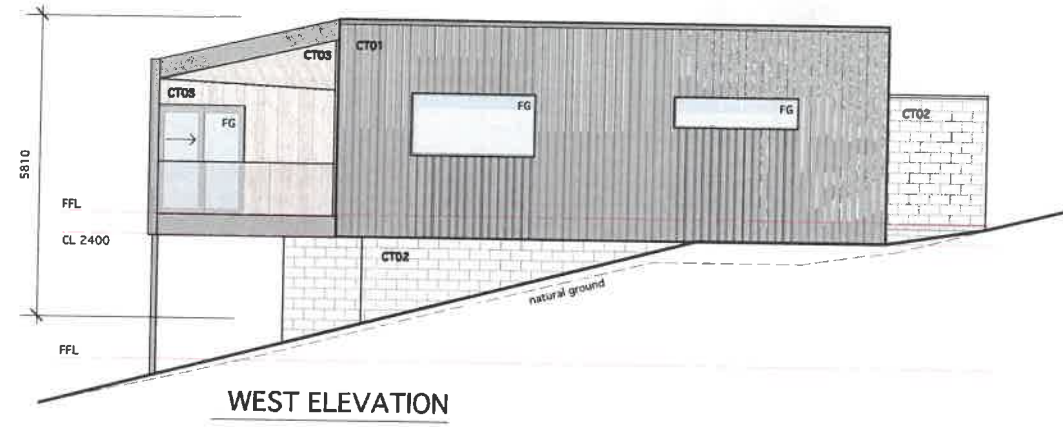
22 SALAMANCA SQUARE HOBART TASMANIA 7000  
T: (03) 8234 9987 E: hbv@hbvarchitects.com.au

scale check 50mm original size

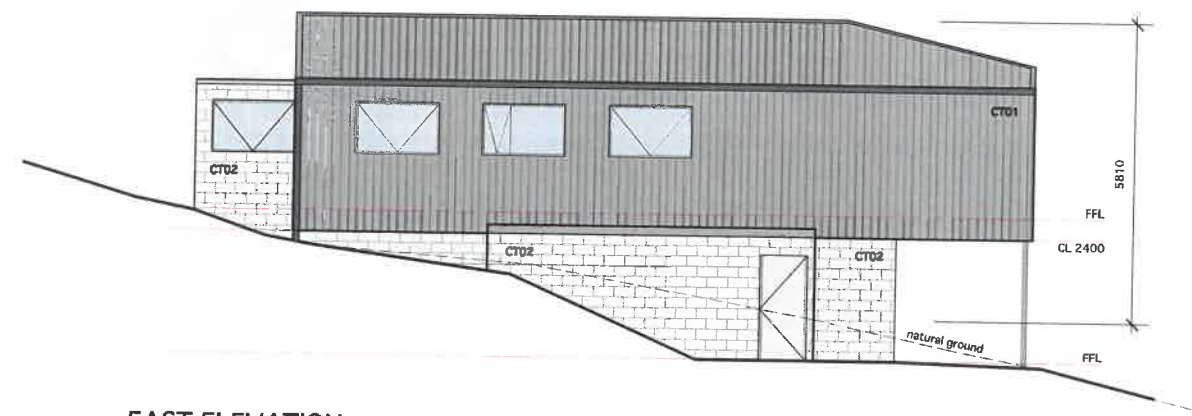
DEVELOPMENT APPLICATION DRAWINGS



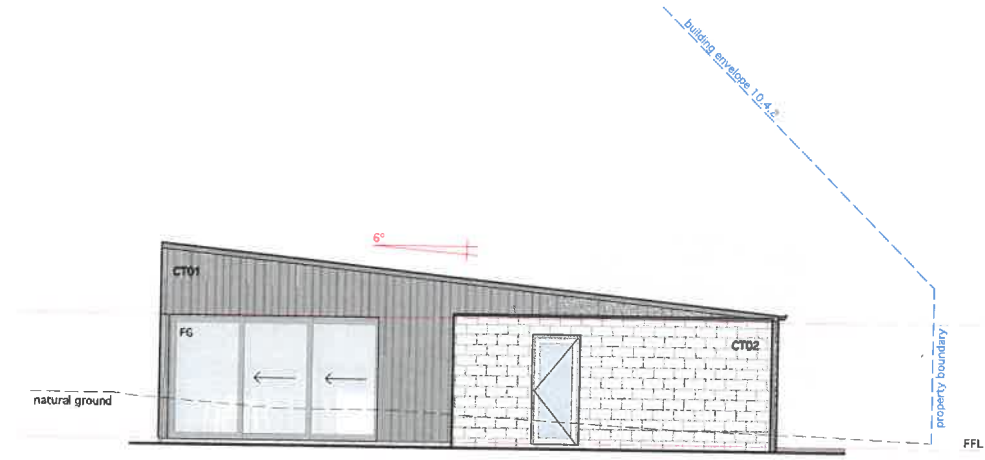
NORTH ELEVATION



WEST ELEVATION



EAST ELEVATION



SOUTH ELEVATION

**COLOUR SCHEDULE:**  
(or similar approved)

MONUMENT	CONCRETE BLOCK	SHALE GREY	NATURAL TIMBERS
----------	----------------	------------	-----------------

**CLADDING SCHEDULE:**

CT01	- COLORBOND® MAXLINE 340, installed to manufacturer's specifications, MONUMENT® MATT
CT02	- Concrete Block, natural finish
CT03	- Silvertop Ash timber cladding (BAL 12.5 or higher), clear coat finish

DEVELOPMENT APPLICATION DRAWINGS

REV No. DETAILS DATE

**h b v**

HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
ELEVATIONS  
DWELLING 1

SCALE  
1:100 @ A2

DATE  
JUN 2018

DRAWN  
RP

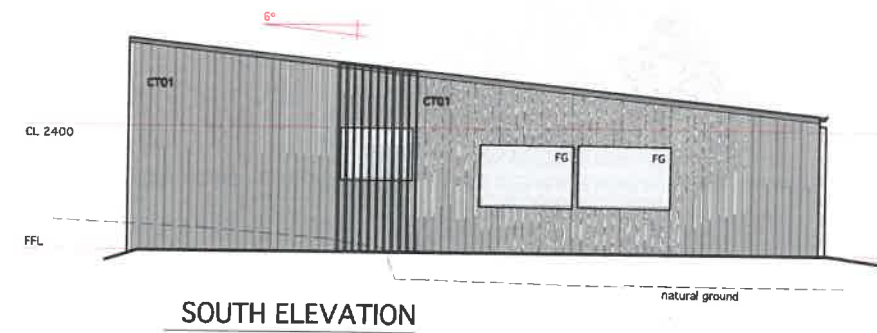
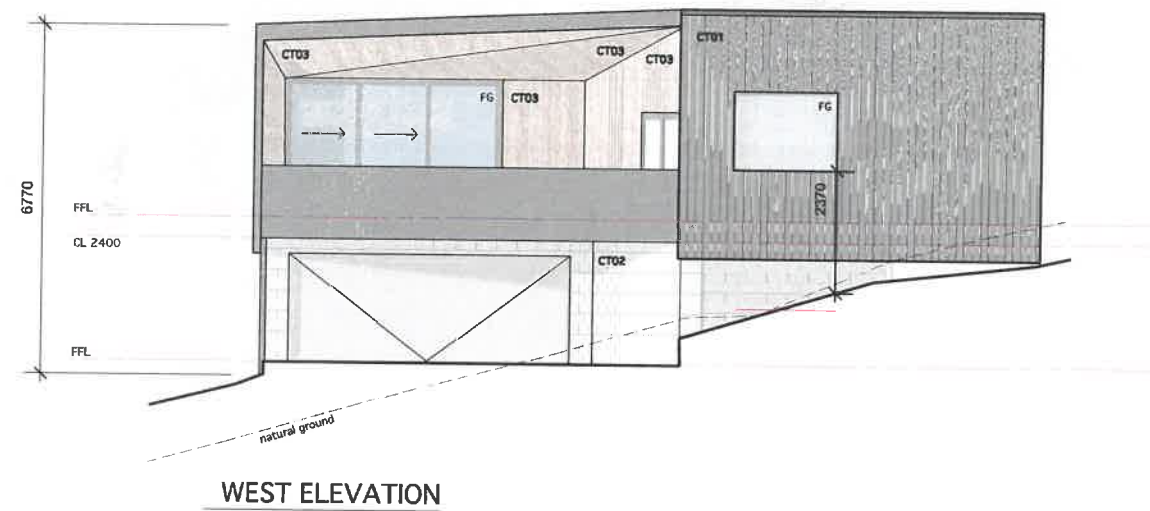
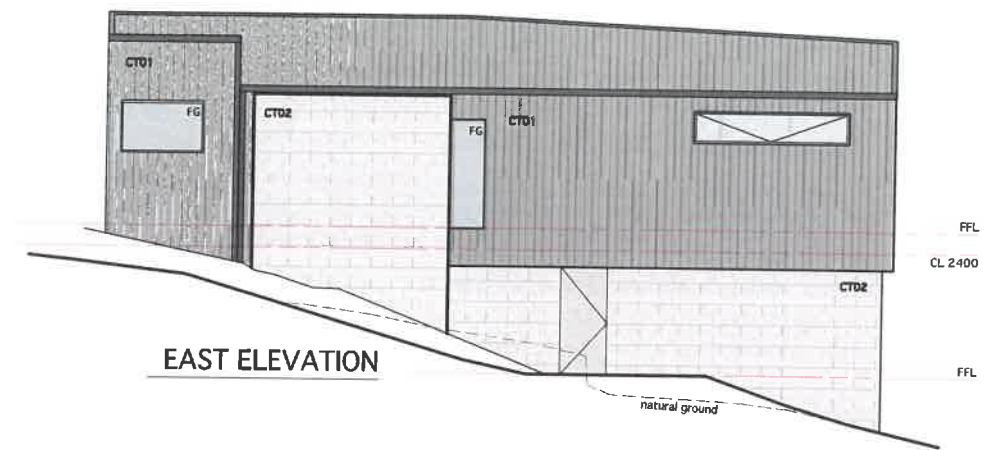
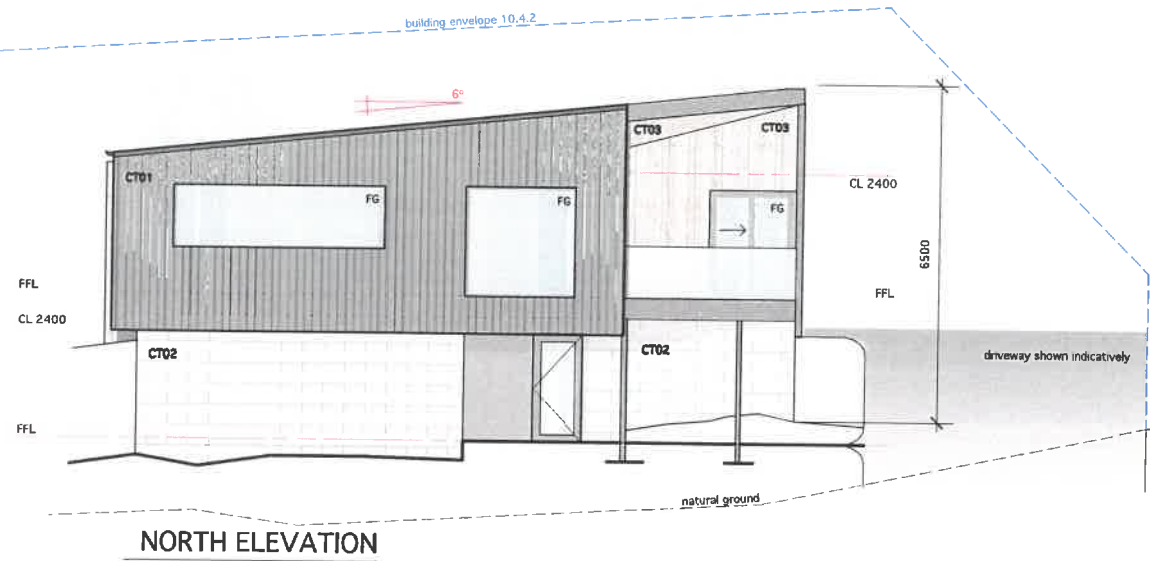
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PROJECT No.  
18.02

DRAWING No.  
A2/01

23 SALAMANCA SQUARE HOBART TASMANIA 7500  
T: 03 9422 9997 E: hbv@hbvarchitects.com.au

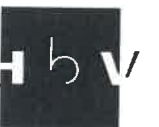
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COLOUR SCHEDULE: (or similar approved)	
	
MONUMENT	CONCRETE BLOCK
	
SHALE GREY	NATURAL TIMBERS
CLADDING SCHEDULE:	
CT01	- COLORBOND® MAXLINE 340, installed to manufacturer's specifications, MONUMENT® MATT
CT02	- Concrete Block, natural finish
CT03	- Silvertop Ash timber cladding (BAL 12.5 or higher), clear coat finish

DEVELOPMENT APPLICATION DRAWINGS

REV No. DETAILS DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
ELEVATIONS  
DWELLING 2

SCALE  
1:100 @ A2 DATE  
JUN 2018

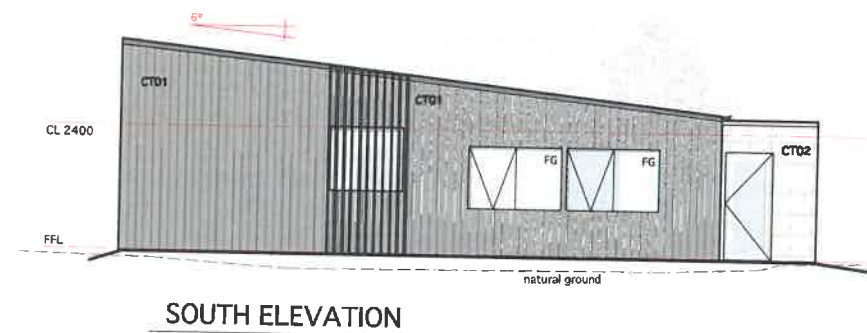
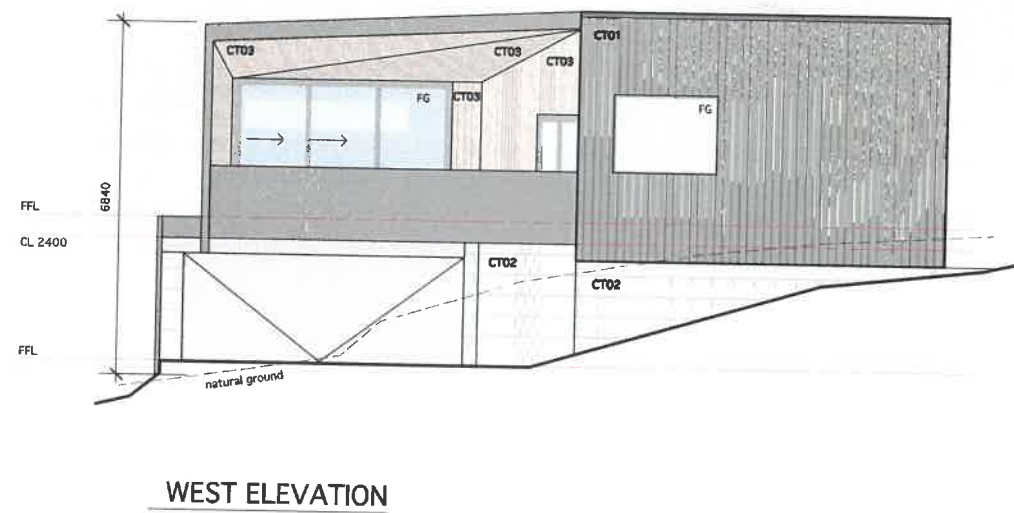
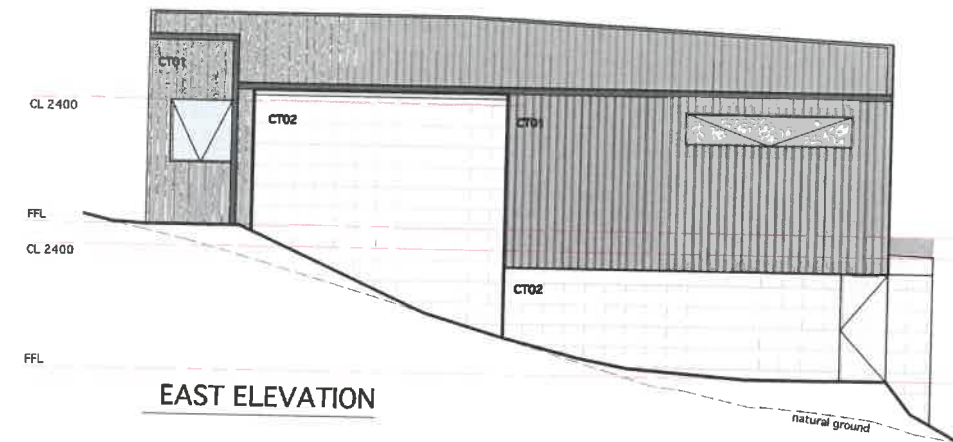
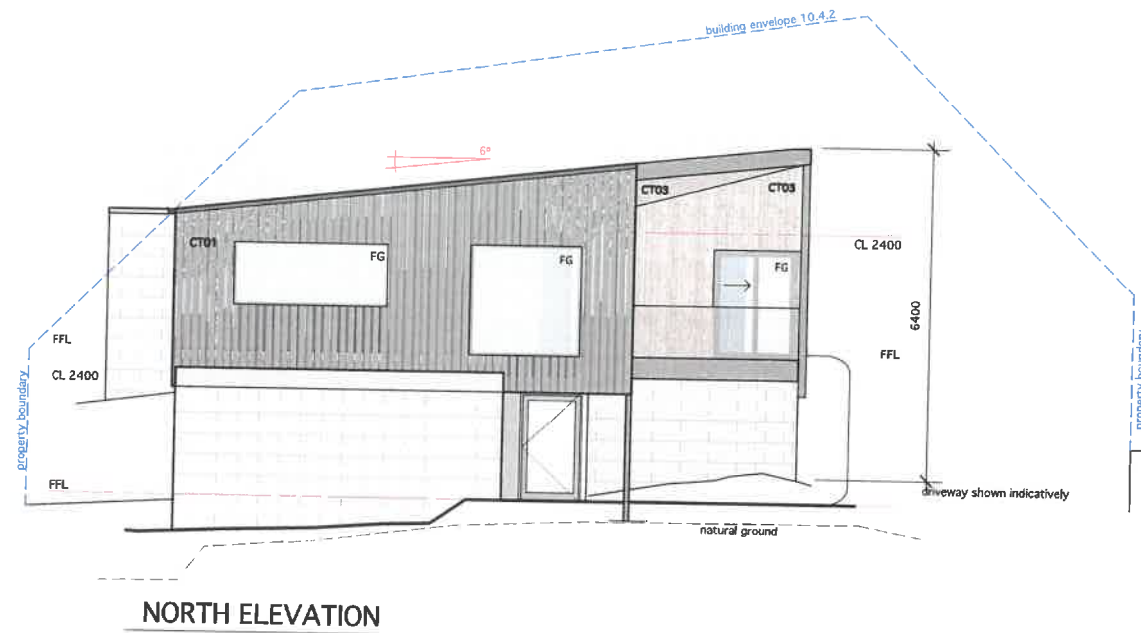
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RP CHECKED  
JB





PROJECT No. DRAWING No.  
18.02 A2/02

23 SALAMANCA SQUARE HOBART TASMANIA 7006  
T (03) 8224 9997 E hbv@hbvarchitects.com.au

scale check 50mm original size





COLOUR SCHEDULE: (or similar approved)	
	
MONUMENT	CONCRETE BLOCK
	
SHALE GREY	NATURAL TIMBERS
CLADDING SCHEDULE:	
CT01	- COLORBOND® MAXLINE 340, installed to manufacturer's specifications, MONUMENT® MATT
CT02	- Concrete Block, natural finish
CT03	- Silvertop Ash timber cladding (BAL 12.5 or higher), clear coat finish

DEVELOPMENT APPLICATION DRAWINGS

REV No. DETAILS DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
ELEVATIONS  
DWELLING 3

SCALE  
1:100 @ A2

DATE  
JUN 2018

DRAWN  
RP

CHECKED  
JB

PROJECT No.  
18.02

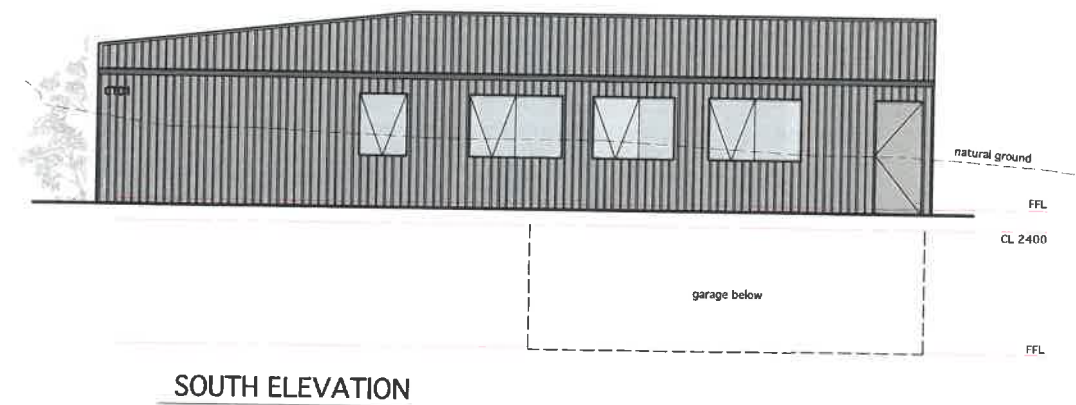
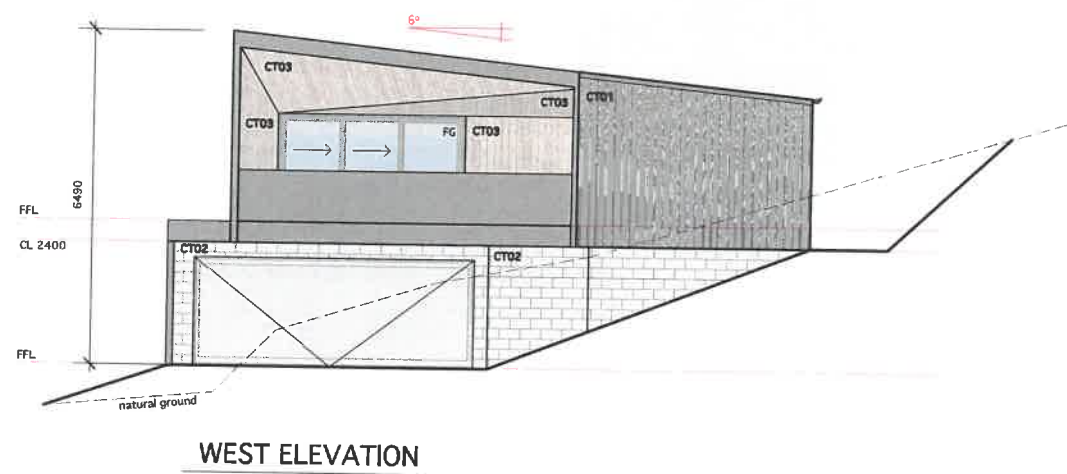
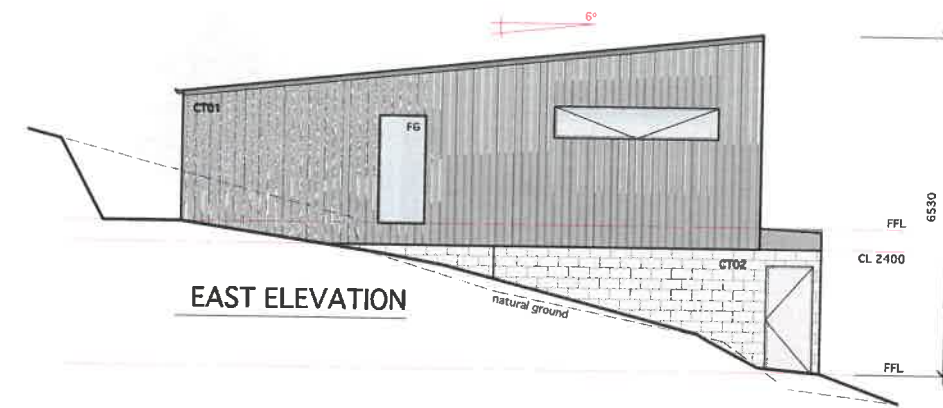
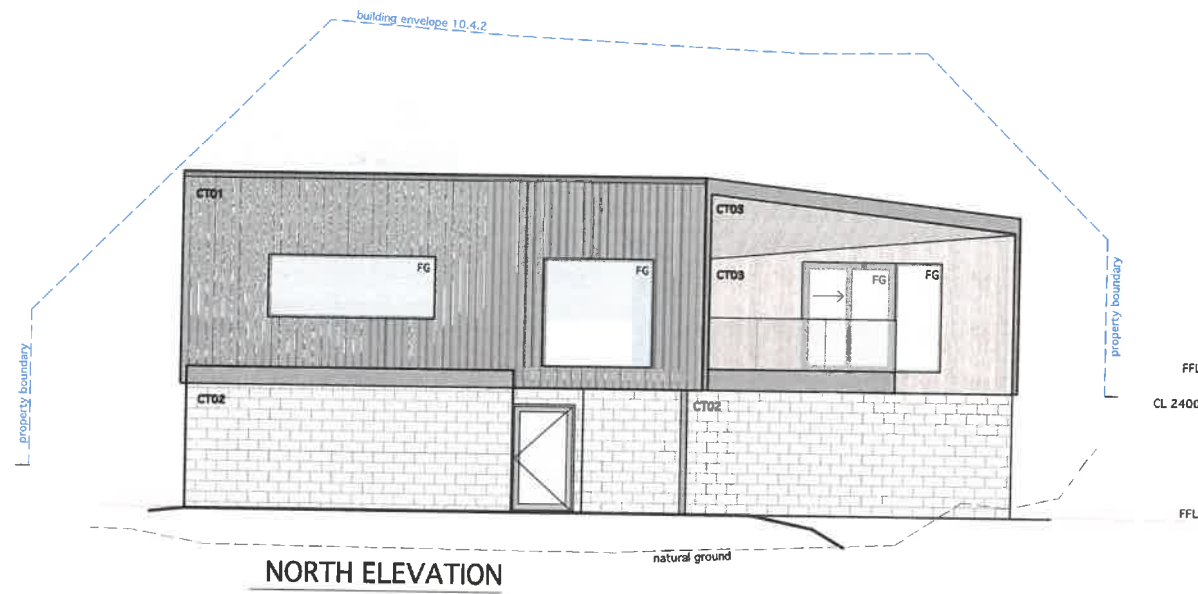
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A2/03





22 SALAMANKA SQUARE  
T (03) 4224 9997

110@ART  
E 110@ART

TASMANIA 7000  
E 110@ART

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COLOUR SCHEDULE: (or similar approved)	
	
MONUMENT	CONCRETE BLOCK
	
SHALE GREY	NATURAL TIMBERS
CLADDING SCHEDULE:	
CT01	- COLORBOND® MAXLINE 340, installed to manufacturer's specifications, MONUMENT® MATT
CT02	- Concrete Block, natural finish
CT03	- Silvertop Ash timber cladding (BAL 12.5 or higher), clear coat finish

DEVELOPMENT APPLICATION DRAWINGS

REV No. DETAILS DATE



HEFFERNAN BUTTON VOSS  
ARCHITECTS

PROJECT  
128 Strickland Avenue  
Multi-Dwelling Development

DRAWING  
ELEVATIONS  
DWELLING 4

SCALE  
1:100 @ A2

DATE  
JUN 2018

DRAWN  
RP

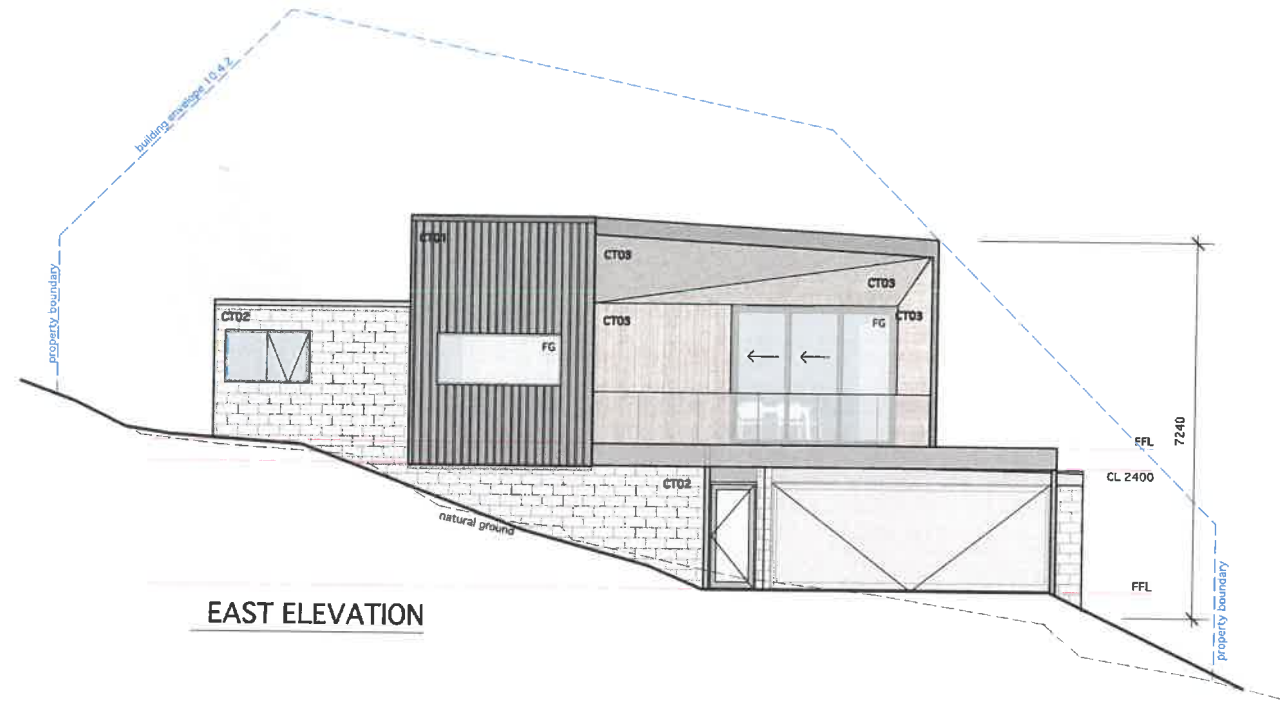
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PROJECT No.  
18.02

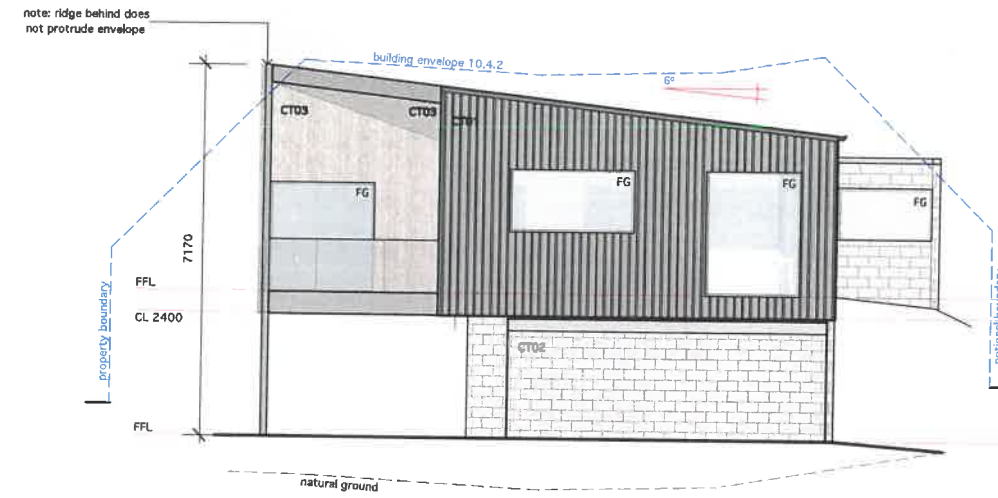
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22 SALAMANCA SQUARE HOBART TASMANIA 7500  
T 034224 9997 E hbv@hbvarchitects.com.au

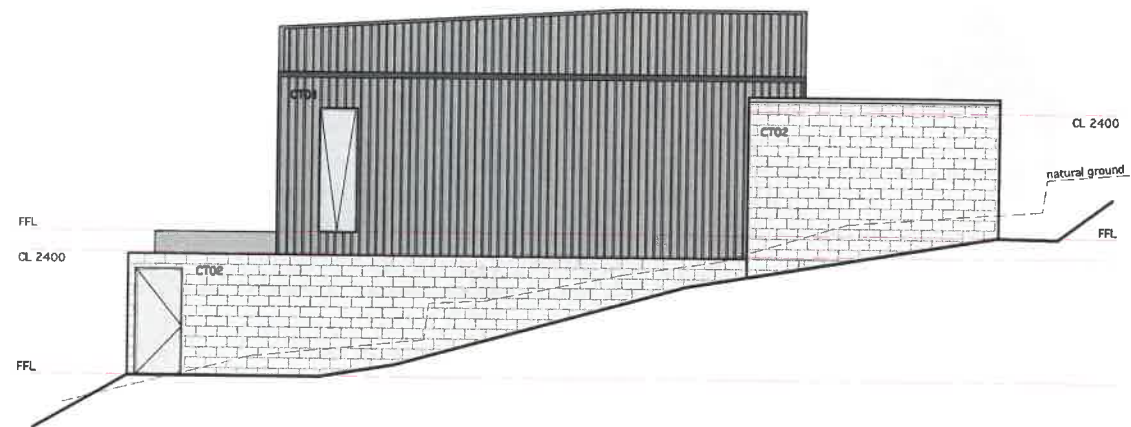
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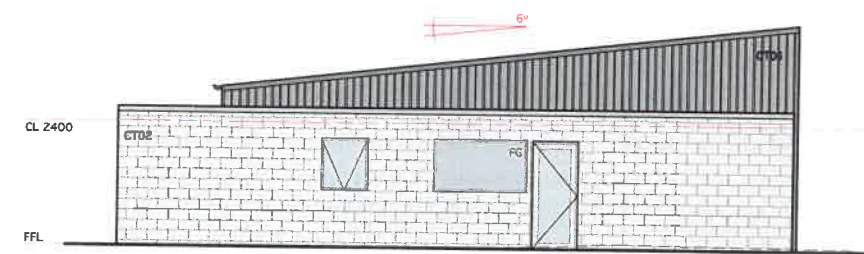
**EAST ELEVATION**







**NORTH ELEVATION**



**WEST ELEVATION**



**SOUTH ELEVATION**

COLOUR SCHEDULE: (or similar approved)	
	
MONUMENT	CONCRETE BLOCK
	
SHALE GREY	NATURAL TIMBERS
CLADDING SCHEDULE:	
CT01	- COLORBOND® MAXLINE 340, installed to manufacturer's specifications, MONUMENT® MATT
CT02	- Concrete Block, natural finish
CT03	- Silvertop Ash timber cladding (BAL 12.5 or higher), clear coat finish

**DEVELOPMENT APPLICATION DRAWINGS**

B	Dwelling 5 elevation	05/07/2018
REV No.	DETAILS	DATE



**HEFFERNAN BUTTON VOESS  
ARCHITECTS**

**PROJECT**  
128 Strickland Avenue  
Multi-Dwelling Development

**DRAWING**  
ELEVATIONS  
DWELLING 5

SCALE	DATE
1:100 @ A2	JUN 2018

DRAWN	CHECKED
RP	JB

PROJECT No.	DRAWING No.
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**18.02 A2|05**

23 SALAMANCA SQUARE HOBART TASMANIA 7000  
T (03) 4224 9987 E hbu@heffernanbuttonvoess.com.au

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7/08/2018

City of Hobart  
GPO Box 503, Hobart  
Tasmania 7000

Attention: Manager of Development Services

Dear Sir/ Madam,

**RE: REQUEST FOR FURTHER INFORMATION – APPLICATION NO. PLN-18-419  
5 UNIT DEVELOPMENT – 128 STRICKLAND AVE, SOUTH HOBART**

In reference to your request for further information dated the 26th July 2018 regarding the above-mentioned development application, please refer to the below table addressing each item.

Should you have any further queries, please contact me with the details noted below.

Yours sincerely,

Tom Norman – Civil Engineer  
AD Design & Consulting Pty Ltd

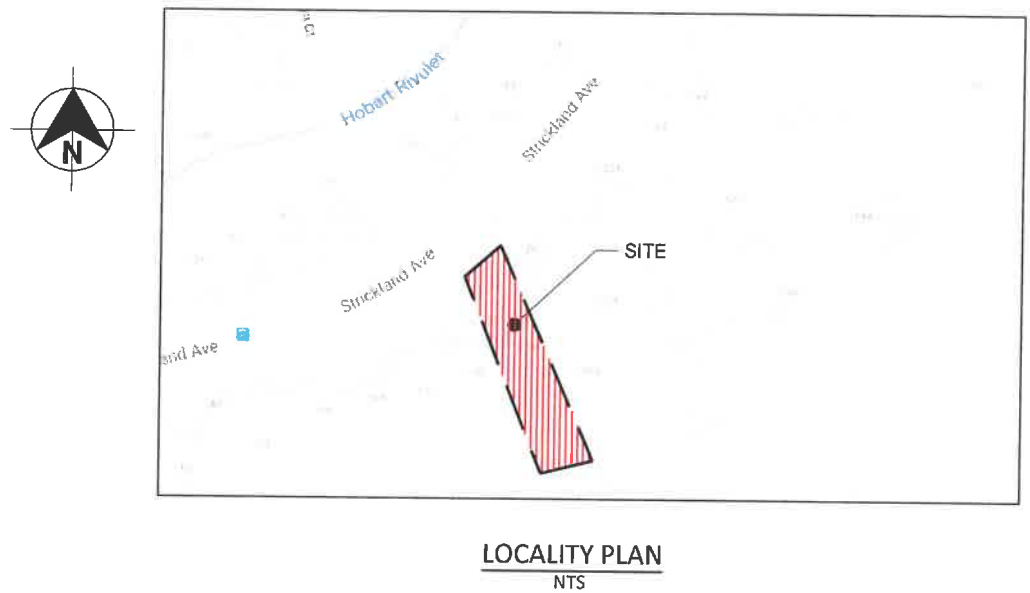
[tom@addconsulting.com.au](mailto:tom@addconsulting.com.au)  
0402 592 454

Item	Description	Response
PA 3	<p>Design of access, driveway, turning area and parking spaces must satisfy either Acceptable Solutions or Performance Criteria for each clause of the Hobart Interim Planning Scheme 2015 (HIPS 2015). Documentation submitted to date does not satisfy the Acceptable Solution or provide sufficient information to support assessment under Performance Criteria.</p> <p>In order to satisfy the permitted Acceptable Solution in the Parking and Access Code (clause E.6.7.3 A1) with respect to vehicular passing areas, please demonstrate the following:</p> <ul style="list-style-type: none"> <li>Please clarify how passing bays outside Unit 2 and Unit 3 will not conflict with the proposed visitor parking spaces proposed for these dwellings</li> </ul> <p>The applicant may wish to submit information for assessment as Performance Criteria under these clause(s) of HIPS 2015 instead of meeting the Acceptable Solution requirements. Performance Criteria documentation must have regard to all points listed under the Performance Criteria and is a discretionary assessment by Council.</p>	Please refer to Midson Traffic Supporting Documents
PA 5.1	<p>Design of access, driveway, turning area and parking spaces must satisfy either Acceptable Solutions or Performance Criteria for each clause of the Hobart Interim Planning Scheme 2015 (HIPS 2015). Documentation submitted to date does not satisfy the Acceptable Solution or provide sufficient information to support assessment under Performance Criteria for clause E6.7.5.</p> <p>In order to satisfy the permitted Acceptable Solution in the Parking and Access Code (clause E.6.7.5 A1) please demonstrate the following:</p> <ul style="list-style-type: none"> <li>Dimensioned car parking spaces to AS/NZS 2890.1:2004, ensuring angle car parking spaces comply with Figure 2.2 (90 degree parking spaces for User Class 1a (residential) require 5.4m long x 2.4m wide spaces, with an additional side clearance from obstructions of 300mm for doors as per Figure 5.2), and parallel car parking spaces comply with Figure 2.5;</li> <li>A maximum gradient of a car parking module (car parking spaces and aisles) of 5%;</li> <li>A maximum gradient for domestic driveway of 25%, noting that a domestic driveway as defined in AS2890.1 is limited to service a property comprising of three or less domestic units;</li> </ul>	Please refer to Midson Traffic Supporting Documents

	<ul style="list-style-type: none"> <li>• A maximum gradient of circulation roadways for private / residential use of 25% (limited to 20m lengths with 10m between lengths over 20%).</li> <li>• Grade transitions of at least 2.0m in length are required where summit grade changes exceed 12.5 % and sag grades exceed 15% in accordance with AS/NZS 2890.1:2004 Section 2.5.3(d) &amp; (e);</li> <li>• Please note the Traffic Impact Assessment states that onsite turning can be achieved for all parking spaces. Please indicate this for the visitor parking spaces.</li> <li>• Please note: full structural engineered design drawings are not required for the planning assessment.</li> <li>• For further information regarding driveway, access and parking design see these guidelines.</li> </ul> <p>The applicant may wish to submit information for assessment as Performance Criteria under these clause(s) of HIPS 2015 instead of meeting the Acceptable Solution requirements. Performance Criteria documentation must have regard to all points listed under the Performance Criteria and is a discretionary assessment by Council.</p>	
SW 1	<p>A site plan to demonstrate how stormwater from the proposed development (including roofed areas and impervious surfaces - driveways etc) will be disposed of via gravity to public stormwater infrastructure.</p> <p>Advice: The current drawing states "Pit to discharge to access road via RHS kerb adapter. Refer SWMP for details", and the Stormwater Management Plan States in Section 2.4 "The legal discharge point will be the at the frontage (northern boundary) before the existing internal road driveway in the form of a grated pit. The captured runoff will be conveyed via an underground pipe and discharged to the kerb and then enters the Strickland Avenue road side drainage network discharging into the Hobart Rivulet. "Please provide a plan showing the proposed works, clearly differentiating private and public works proposed. Please contact Council's Stormwater Engineer to determine a stormwater discharge design that is likely to be supported by Council City Infrastructure, as discharging to a road spoon drain is not a standard connection and a penetration of the existing Council retaining wall may not be appropriate.</p>	<p>The legal point of discharge has been updated.</p> <p>A new public stormwater main will be extended up the shared access to 128 Strickland Ave's property boundary. The development's stormwater connection will connect with this public main.</p> <p>Please see updated drawing C060, C061 and C080.</p>

Trees General	<p>It is noted that the General Arrangement Plan C061 Rev C has two annotations:</p> <ol style="list-style-type: none"> <li>Existing vegetation to be removed - with an arrow pointing to the road reserve.</li> <li>Under no circumstances are trees to be removed or modified - as a General Note.</li> </ol> <p>Council's Parks and City Amenity Division requires the first note to be amended to the effect: That this vegetation will be managed by Council to achieve the necessary sight distances. The vegetation will not all need to be removed, and replanting and management of ground covers will be necessary.</p>	<p>Tree and vegetation protection note has been updated.</p> <p>Please see updated drawing C061.</p>
Parks 1	<p>A scaled and dimensioned site plan demonstrating the following:</p> <ul style="list-style-type: none"> <li>the location of all existing vegetation on the road reserve land including indicative canopies of all trees; and</li> <li>measures to be taken to protect the road reserve vegetation by all parties during and after construction, including pegging out of the top side road reserve boundary.</li> </ul>	<p>Vegetation protection notes and tree locations have been updated.</p> <p>Please see updated drawing C060 and C061.</p>

5 UNIT RESIDENTIAL DEVELOPMENT  
128 STRICKLAND AVE, SOUTH HOBART  
FOR  
WH. ASHLIN BUILDER & RENOVATOR  
DA APPROVAL



DRAWING LIST		
DRG. NO.	TITLE	REV
000	COVER SHEET	B
001	GENERAL NOTES	A
060	GENERAL ARRANGEMENT SHEET 1	B
061	GENERAL ARRANGEMENT SHEET 2	D
065	VEHICLE MOVEMENTS PLAN 1	A
066	VEHICLE MOVEMENTS PLAN 2	A
067	VEHICLE MOVEMENTS PLAN 3	A
068	VEHICLE MOVEMENTS PLAN 4	A
069	VEHICLE MOVEMENTS PLAN 5	A
080	DRAINAGE LONGITUDINAL SECTION	A
110	LONGITUDINAL DRIVEWAY SECTION	A
120	TYPICAL SECTIONS	A

Rev No	Date	Revision Note	Drn	Ver.	App.
B	06/08/18	RESPONSE TO RFI DATED 26/07/18	TN	AD	
A	08-05-18	FOR APPROVAL	CP	AD	



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Client	Project	SUBJECT TO FINAL VERIFICATION AND APPROVAL			NOT FOR CONSTRUCTION		
		Drawn	Signed	Date	Drawing Title	Project No.	
		Designed	Signed	Date		1811	
		Checked	Signed	Date		Scale	Sheet Size
		Approved	Signed	Date		Drawing No.	Rev
WH. ASHLIN BUILDER & RENOVATOR		5 UNIT RESIDENTIAL DEVELOPMENT 128 STRICKLAND AVE, SOUTH HOBART			COVER SHEET	C000	R

## PROJECT NOTES

### General

1. These notes have been prepared as a guide to relevant codes, regulations and standards for use by the contractor during the construction process.
2. LGAT Standard drawings are to be read in conjunction with Kingborough Councils exclusions to the specifications and drawings. Works are to be carried out to the satisfaction of the manager of engineering services of Hobart City Council.
3. The Council and all service authorities shall be notified, in writing, seven days prior to commencement of the works. all existing services in the vicinity of the works are to be located prior to commencement.
3. Workmanship and materials to comply with requirements of S.A.A codes, building code of Australia and by-laws and ordinances of relevant building authorities. all codes referred to are those current (as amended) at commencement of contract.
4. Prior to commencement of the works, the contractor shall provide the superintendent the following information.
  - (a) Source of quarry material.
  - (b) Optimum moisture content and maximum modified dry density of the fine crushed rock (FCR), to be used from NATA approved laboratory.
  - (c) If the source of the quarry material is changed during the course of the works, new test results shall be provided.
5. On completion, the contractor is responsible for the removal of all rubbish and spoil from the site.
6. Implement soil and water management procedures to avoid erosion, contamination and sedimentation of site, surrounding areas and drainage systems.
7. All services are to be located prior to commencement of works.
8. All levels are to be confirmed prior to commencement of works.
9. All levels are to Australian height datum (A.H.D).

### Approvals

1. The Contractor is responsible for ensuring that start work notices are in place for all works.
2. The Contractor shall not commence construction within a road reserve until the following requirements are met:
  - 2.1. The 'Permit to carry out works within a council road reservation' has been issued by Council; and
  - 2.2. All traffic management has been prepared in accordance with AS 1742.3
3. Refer to Council permit for full disclosure of permit conditions.

## Stormwater

1. All branches are to be capped.
2. For backfill under roads and driveways is to be placed and compacted in 150mm layers.
3. All stormwater lot connections to be 150mm.
4. 2x65dn weepholes to be placed in all manholes and seps with no subsoil drain connections.
5. Lot connections are to raised to the surface and capped with an io riser, box painted to council requirements.

## Stormwater

6. All stormwater connection work must be undertaken by a licenced plumbing contractor and inspected by councils plumbing surveyor prior to backfilling.
7. The connection to the existing sotmwater main is to be undertaken by council at the developers cost. the contractor will submit a "private works authority request" to council.

Sewerage

1. All sewer works are to be in accordance with wsa 02-2002-2.3mrwa ed 1.0 ad taswater's supplement.
2. All maintenance structures are to be in accordance with sew-1300 series
3. All lot connections must be in accordance with sew-1106. i.o's must be raised to surface and protected with a poly cover to taswater approval.
4. All sewer pipes must be dn150upvc sn8.
5. All public sewer works must be tested and inspected by taswater prior to backfill.
6. New connections to existing sewer are to be undertaken by taswater at developers expense.

Water

1. All water works are to be in accordance with wsa 03-2011-3.1 mrwa ed 2.0 and taswater's supplement.
2. Property connections are to be in accordance with tw-sd-w-20 with meter with integral dual check valve, gate valve and pvc box as specified by taswater
3. Detector tape is to be installed over all non-metallic water mains
4. All water works must be tested and inspected by taswater prior to backfill
5. New connections to mains to be undertaken by taswater at developers expense

## Roads

1. All works are to be carried out in accordance with LGAT and DSG standards. Any departures from the standards requires the prior approval of the Superintendent and Council Municipal Engineer.
2. The Contractor must supply to the Superintendent a schedule and plan of testing to be carried out on pavement & backfill material and this is to be approved by the Superintendent before any works can commence.
3. All batters shall be 1 in 4 unless otherwise stated.
4. All footpaths to be 100 thick, N25 concrete in accordance with TSD-R11-v1. thickening at vehicle crossovers in accordance with TSD-R09-v1.
5. All kerb and channel, kerb only, edge strips, and concrete inverts to be constructed in accordance with TSD-R14-v1. All concrete to be 25MPa and have a minimum cement content to be 280 kg/m<sup>3</sup>.
6. For all filling and backfilling requirements, refer to Earthworks section.

Private plumbing work

1. All private plumbing work requires a plumbing application to council.
2. The private plumbing needs a designer who is either an accredited building practitioner in the category of designer or a plumbing certifier licensed in the class of the work being designed.
3. A designer of plumbing work is to ensure there is sufficient information in their design to enable assessment of compliance with codes and regulations and be sufficiently detailed for a plumber to carry out the work.
4. All private plumbing work is to be undertaken by a licensed plumbing contractor and inspected by the council plumbing inspector prior to backfilling.

## Vegetation management


1. Minimize disturbance to construction footprint.
2. Stabilize disturbed areas as soon as possible with grass or gravel.
3. Cordon off vegetated areas for protection.
4. Keep excavation clear of drip lines.
5. If root cutting is unavoidable trim roots neatly to minimize infection.
6. Consult arborist on significant trees.
7. Any salvaged plants to be kept wet and replanted asap.
8. Avoid working in wet weather to avoid over-compaction of soils.
9. Minimize size and movements of machinery.
10. Compaction relief at end of the job.

### Services Constructed in Embankment Fill

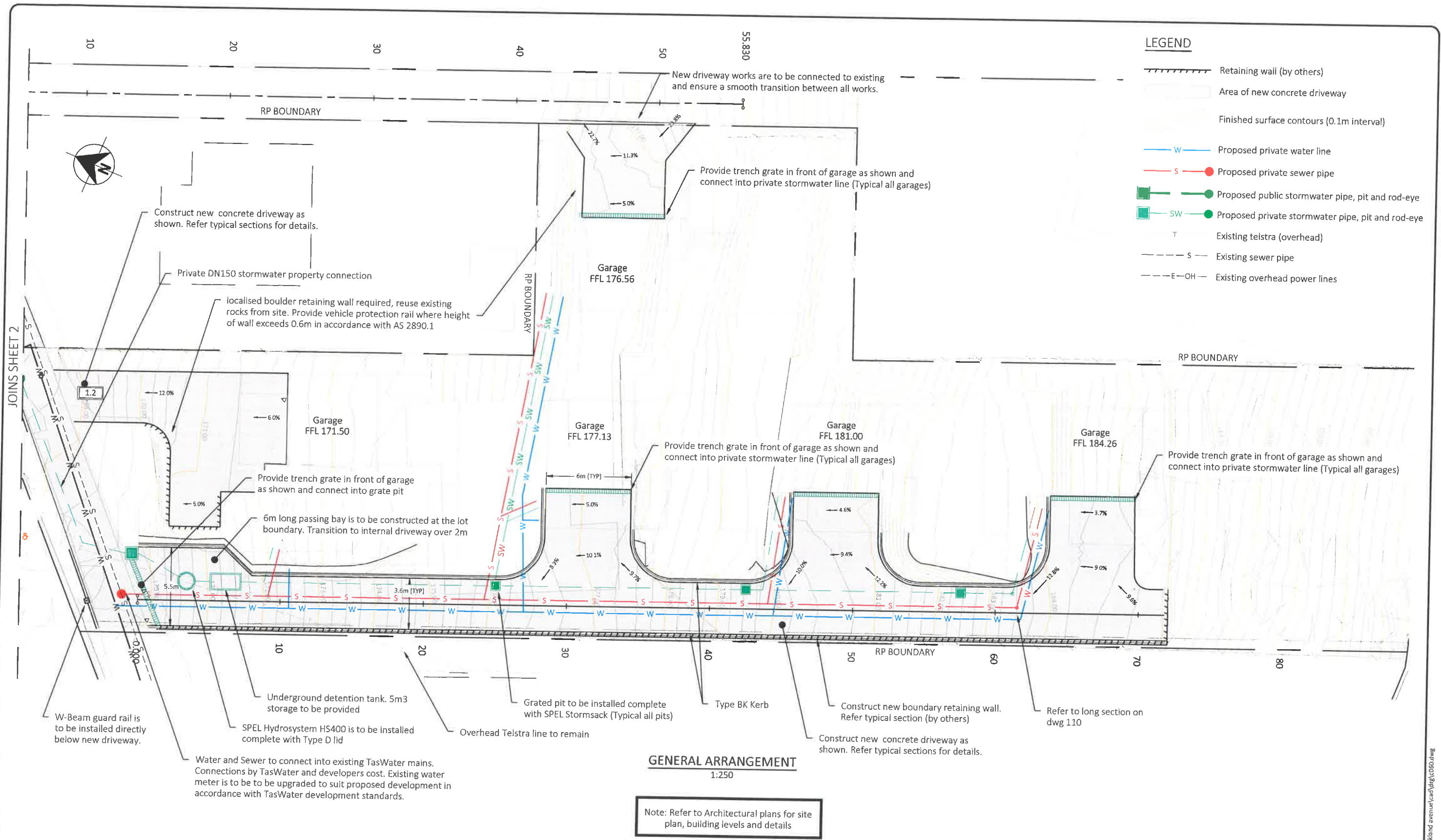
Where the location of water or sewer requiring fill or construction in an embankment, along the route of the type shown in the design drawings. Note that all earthworks are to be constructed in accordance with AS3798.

Proceed as follows:

1. Prepare the foundation for the fill by cleaning away all debris, vegetation, organic material and topsoil for the full width of the fill area.
2. compact the cleared soil surface to not less than 95% of it's standard maximum dry density (AS3798).
3. Place the fill in layers not exceeding 200mm thickness and compact each layer to not less than 95% of it's standard maximum dry density (AS3798). Bring the compacted fill level up to a height of at least 300mm above the design level of the top of the pipe.
4. Place the remainder of the fill in layers not exceeding 300mm thickness and compact each layer to not less than 95% of it's standard maximum dry density (AS3798).

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								WH. ASHLIN BUILDER & RENOVATOR		5 UNIT RESIDENTIAL DEVELOPMENT 128 STRICKLAND AVE, SOUTH HOBART		Designed Signed Date			COVER SHEET			Project No. 1811					
												Checked Signed Date						Scale		Sheet Size A3			
												Approved Signed Date						Drawing No. C001		Rev A			
A		08-05-18		FOR APPROVAL		CP		AD															
Rev No		Date		Revision Note		Drn		Ver.		App.													

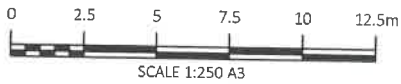




- LEGEND**
- Retaining wall (by others)
  - Area of new concrete driveway
  - Finished surface contours (0.1m interval)
  - W Proposed private water line
  - S Proposed private sewer pipe
  - Proposed public stormwater pipe, pit and rod-eye
  - SW Proposed private stormwater pipe, pit and rod-eye
  - T Existing telstra (overhead)
  - S Existing sewer pipe
  - E-OH Existing overhead power lines

**GENERAL ARRANGEMENT**  
1:250

Note: Refer to Architectural plans for site plan, building levels and details



Rev No	Date	Revision Note	Drn	Ver.	App.
B	06/08/18	RESPONSE TO RFI DATED 26/07/18	TN	AD	
A	08-05-18	FOR APPROVAL	CP	AD	



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Client	WH. ASHLIN BUILDER & RENOVATOR	Project	5 UNIT RESIDENTIAL DEVELOPMENT 128 STRICKLAND AVE, SOUTH HOBART
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Drawn	Signed	Date
Designed	Signed	Date
Checked	Signed	Date
Approved	Signed	Date

SUBJECT TO FINAL VERIFICATION AND APPROVAL		
Drawing Title		
GENERAL ARRANGEMENT PLAN SHEET 1		

**PRELIMINARY**  
NOT FOR CONSTRUCTION

Project No.  
1811

Scale

Drawing No.  
C060

Sheet Size  
A3

Rev  
B

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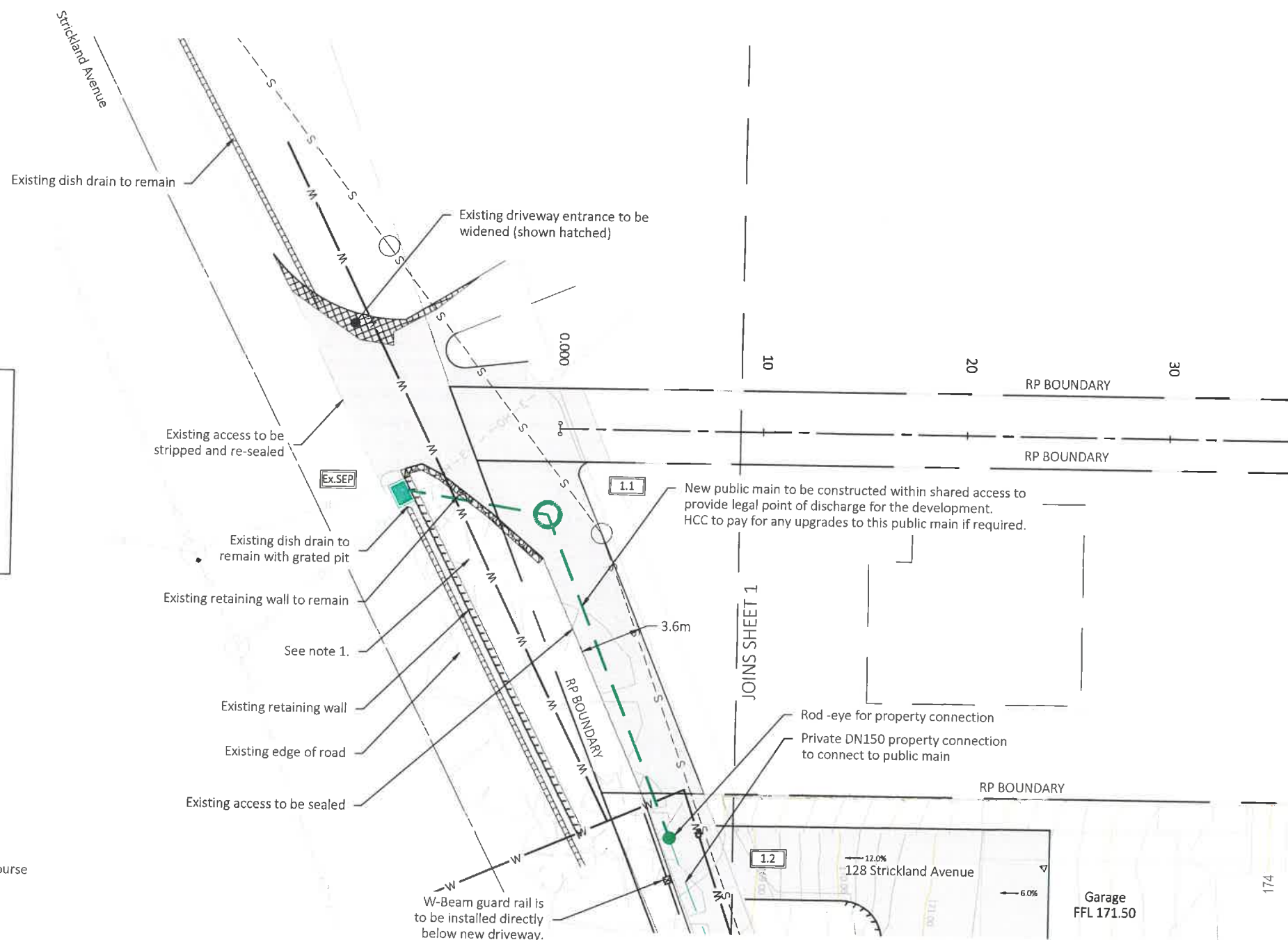


### Note:

1. Vegetation in road reserve to be modified by Parks and City Amenity Division, City of Hobart to achieve required sight distances as per TIA prepared by Midson Traffic.
2. The top side of the road reserve boundary is to be pegged by a registered land surveyor prior to construction to ensure protection of council land. Please note works outlined in items 1. and 2. are to be undertaken at the developers cost.

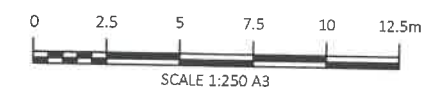
### LEGEND

- Retaining wall (by others)
- Area of new 2 coat seal with 200mm base course
- Finished surface contours (0.1m interval)
- Proposed water line
- Proposed sewer pipe and rod-eye
- Proposed public stormwater pipe, pit and rod-eye
- Proposed private stormwater pipe, pit and rod-eye
- Existing telstra (overhead)
- Existing sewer pipe
- Existing overhead power lines



### DRIVEWAY INTERSECTION CONCEPT

1:250



SCALE 1:250 A3

SUBJECT TO FINAL VERIFICATION AND APPROVAL

**PRELIMINARY**  
**NOT FOR CONSTRUCTION**

Rev No	Date	Revision Note	Drn	Ver.	App.
D	06/08/18	RESPONSE TO RFI DATED 28/07/18	TN	AD	
C	18-06-18	NOTE ADDED	TN	AD	
B	13-06-18	AMENDMENTS BASED ON COUNCIL RFI	TN	AD	
A	08-05-18	FOR APPROVAL	CP	AD	

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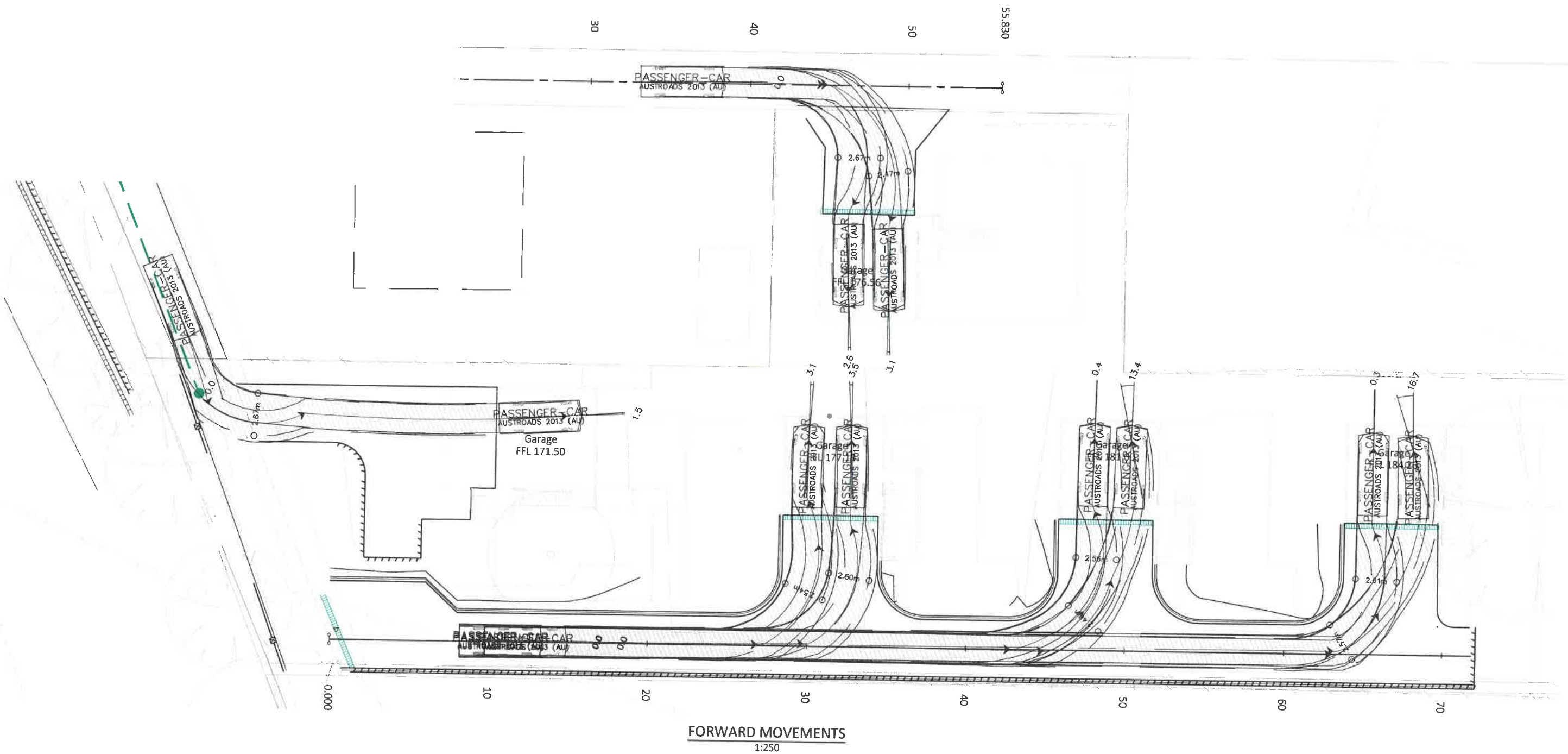
Project  
**5 UNIT RESIDENTIAL DEVELOPMENT**  
**128 STRICKLAND AVE, SOUTH HOBART**

Drawn	Signed	Date
Designed	Signed	Date
Checked	Signed	Date
Approved	Signed	Date

Drawing Title  
**GENERAL ARRANGEMENT PLAN**  
**SHEET 2**

Project No. 1811	Sheet Size A3
Scale	Rev D
Drawing No. C061	





Rev No	Date	Revision Note	Drn	Ver.	App.
A	08-05-18	FOR APPROVAL	CP	AD	

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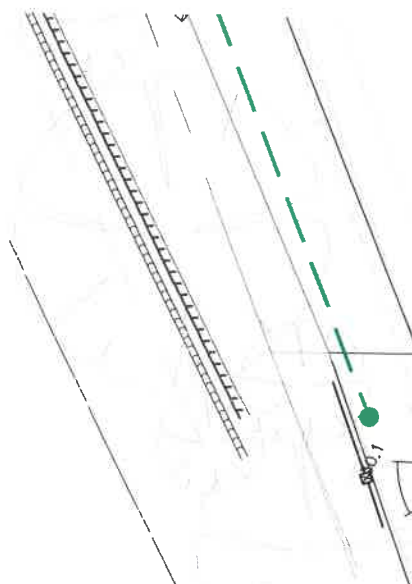
Client  
**WH. ASHLIN  
BUILDER & RENOVATOR**

Project  
**5 UNIT RESIDENTIAL DEVELOPMENT  
128 STRICKLAND AVE, SOUTH HOBART**

Drawn	Signed	Date
Designed	Signed	Date
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Approved	Signed	Date

Drawing Title  
**VEHICLE TURNING MOVEMENTS**

PRELIMINARY NOT FOR CONSTRUCTION	
Project No. 1811	Sheet Size A3
Scale	Rev A
Drawing No. C065	



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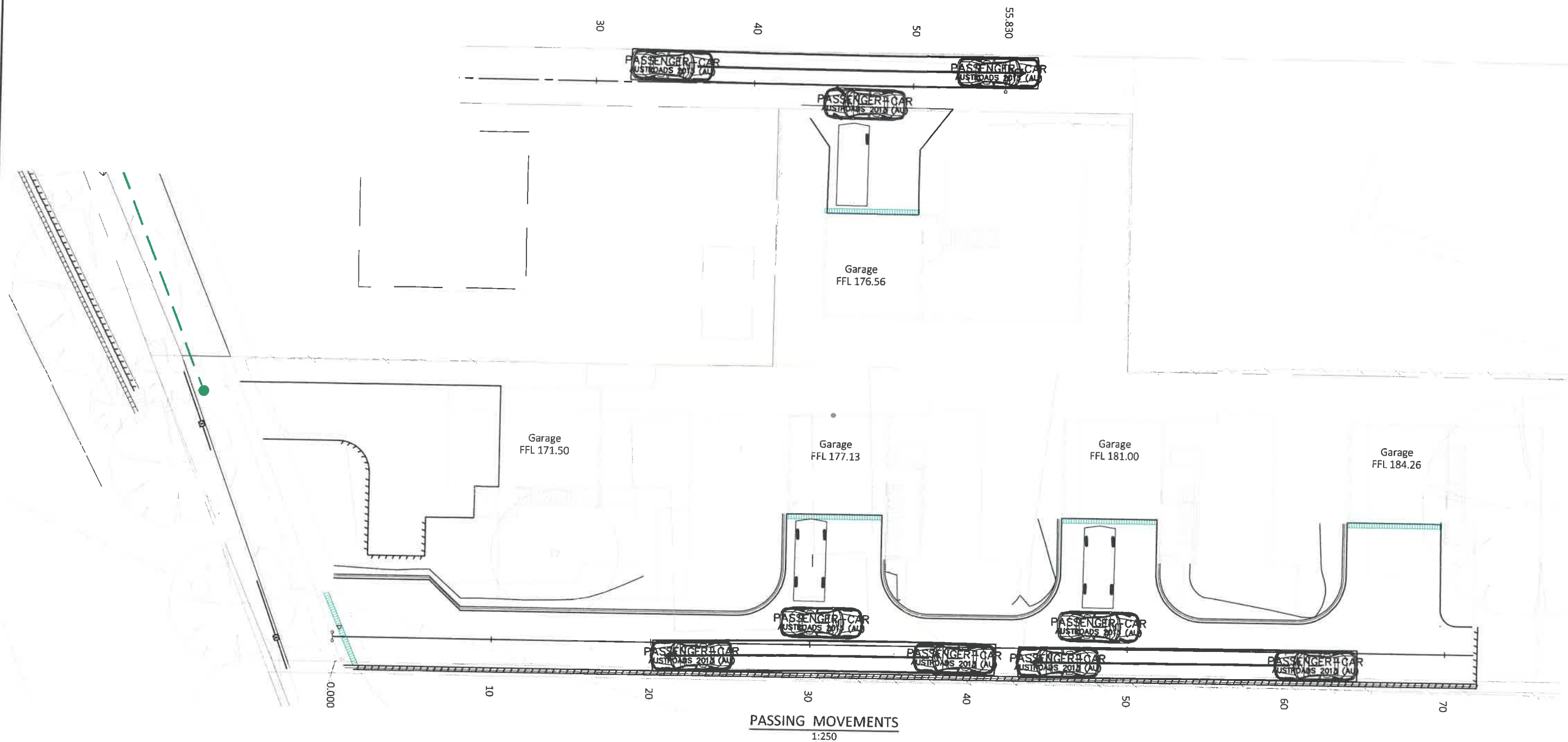
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Drawing No. C066		Rev A



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Client  
**WH. ASHLIN  
BUILDER & RENOVATOR**

Project  
**5 UNIT RESIDENTIAL DEVELOPMENT  
128 STRICKLAND AVE, SOUTH HOBART**

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Designed	Signed	Date
Checked	Signed	Date
Approved	Signed	Date

SUBJECT TO FINAL VERIFICATION AND APPROVAL  
Drawing Title  
**VEHICLE TURNING MOVEMENTS**

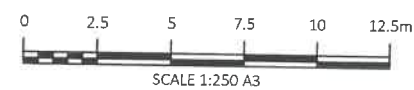
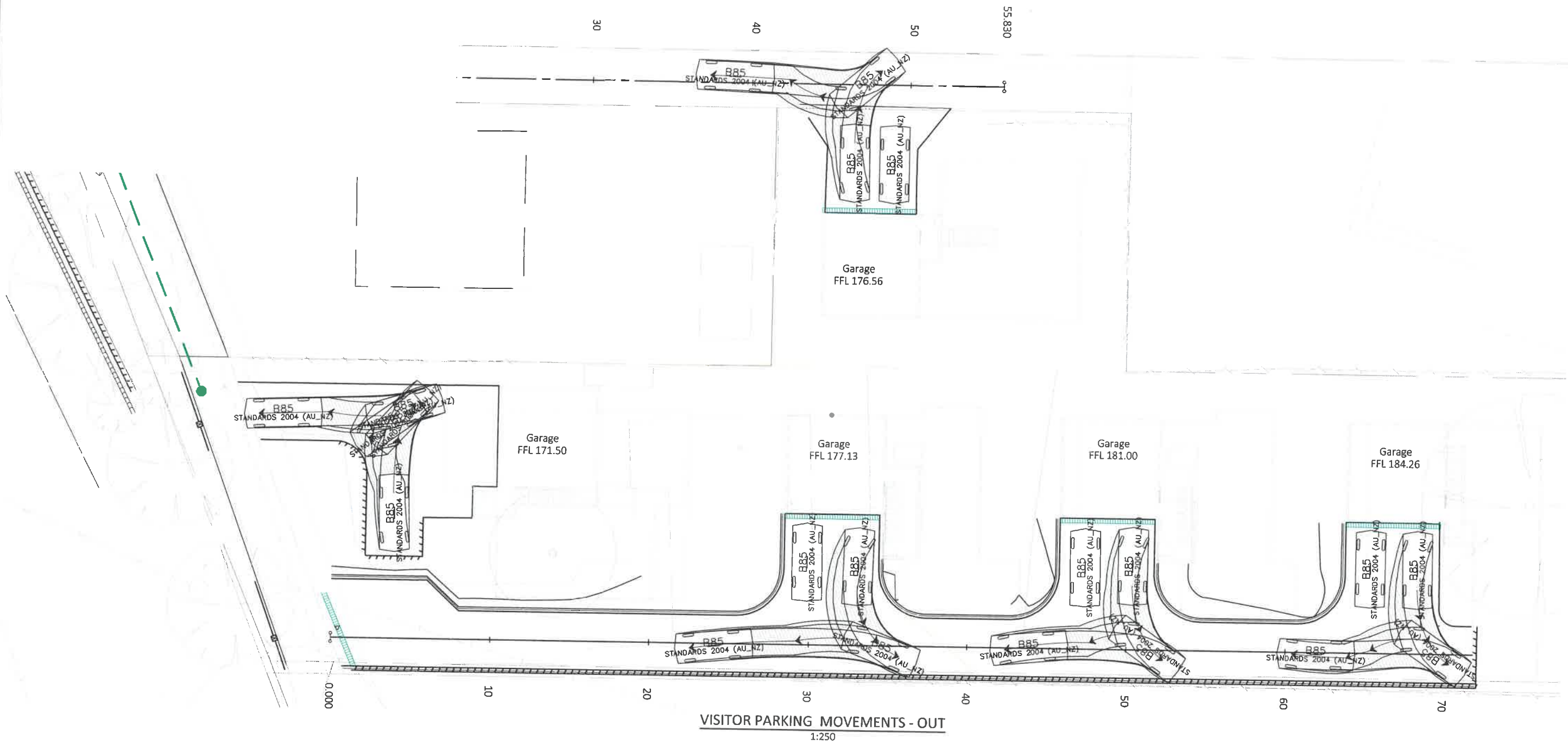
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Project No.  
1811

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C067

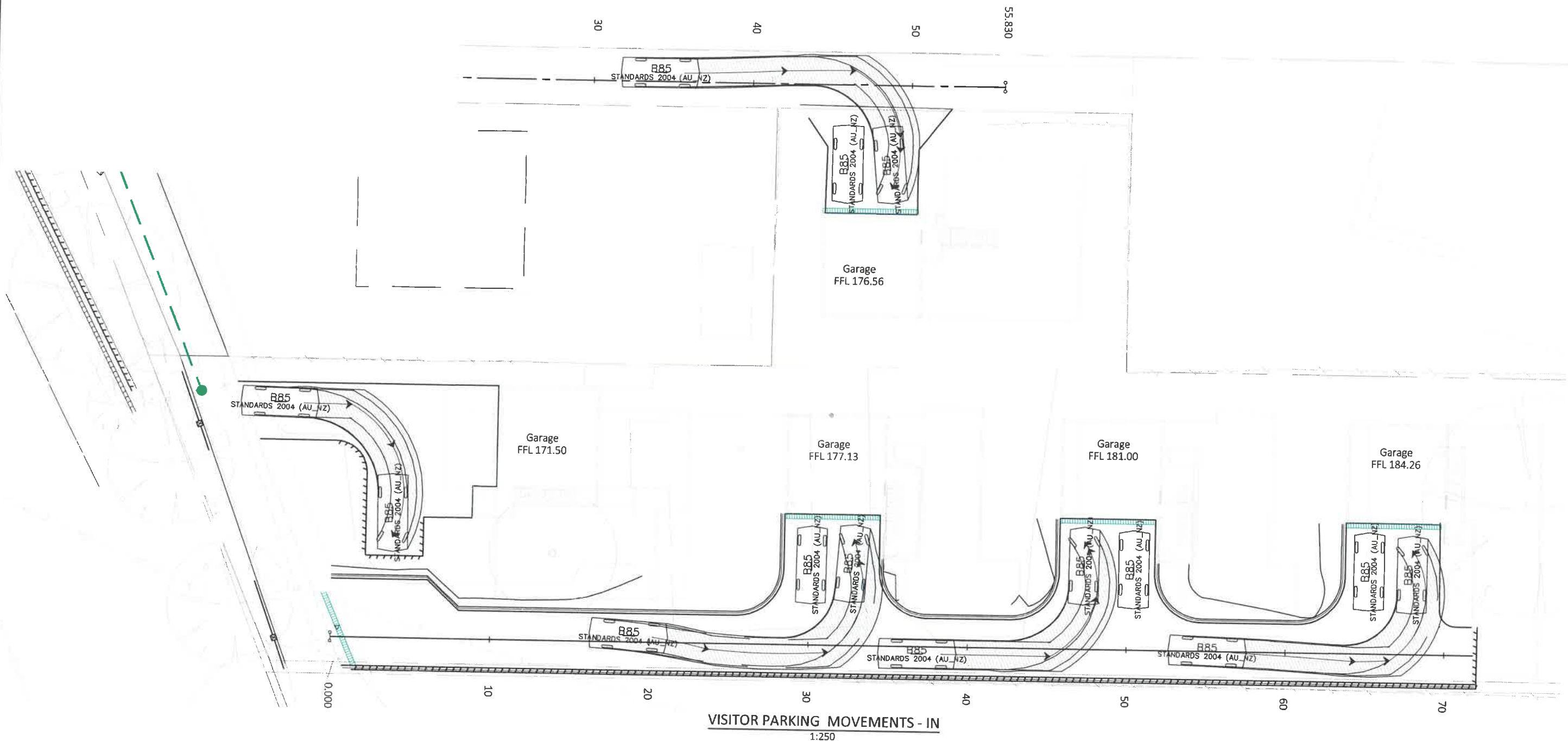
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**5 UNIT RESIDENTIAL DEVELOPMENT  
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SUBJECT TO FINAL VERIFICATION AND APPROVAL

Drawing Title  
**VEHICLE TURNING MOVEMENTS**

**PRELIMINARY  
NOT FOR CONSTRUCTION**

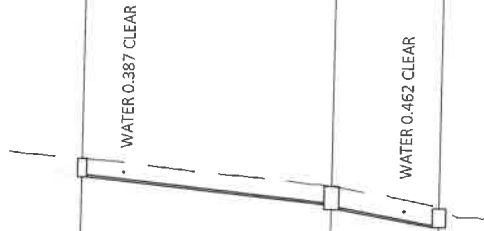
Project No.  
1811

Scale  
A3

Drawing No.  
C069

Rev  
A


STRUCTURE NAME	1.2	1.1	EX SEP
STRUCTURE DESCRIPTION	ROD EYE CLASS B COVER	LGAT MANHOLE REFER TSD-SW-02-V1 1050mm DIA, CLASS D COVER	EXISTING SIDE ENTRY PIT



PIPE SIZE (mm)	150	150
PIPE TYPE	PVC	PVC
PIPE GRADE (%)	9.48%	14.96%
PIPE SLOPE (1 in X)	10.5	6.7
PIPE FLOW (cumecs)		
CAPACITY FLOW (cumecs)		
FULL PIPE VELOCITY (m/s)		
NORMAL DEPTH VELOCITY (m/s)		
DATUM RL	128.000	
HGL ELEVATION	0.000	0.000
DEPTH TO INVERT	1.245	1.261
INVERT LEVEL OF DRAIN	167.269	165.659
DESIGN (& EXISTING) SURFACE LEVEL	168.514	166.920
CHAINAGE	0.000	16.989

LINE 1

Rev No	Date	Revision Note	Drn	Ver.	App.
A	06/08/18	ISSUED IN RESPONSE TO COUNCIL RFI	TN	AD	



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WH. ASHLIN BUILDER & RENOVATOR	5 UNIT RESIDENTIAL DEVELOPMENT 128 STRICKLAND AVE, SOUTH HOBART

Drawn	Signed	Date
Designed	Signed	Date
Checked	Signed	Date
Approved	Signed	Date

Drawing Title  
DRAINAGE LONG SECTION  
SHEET 1

**PRELIMINARY**  
**NOT FOR CONSTRUCTION**

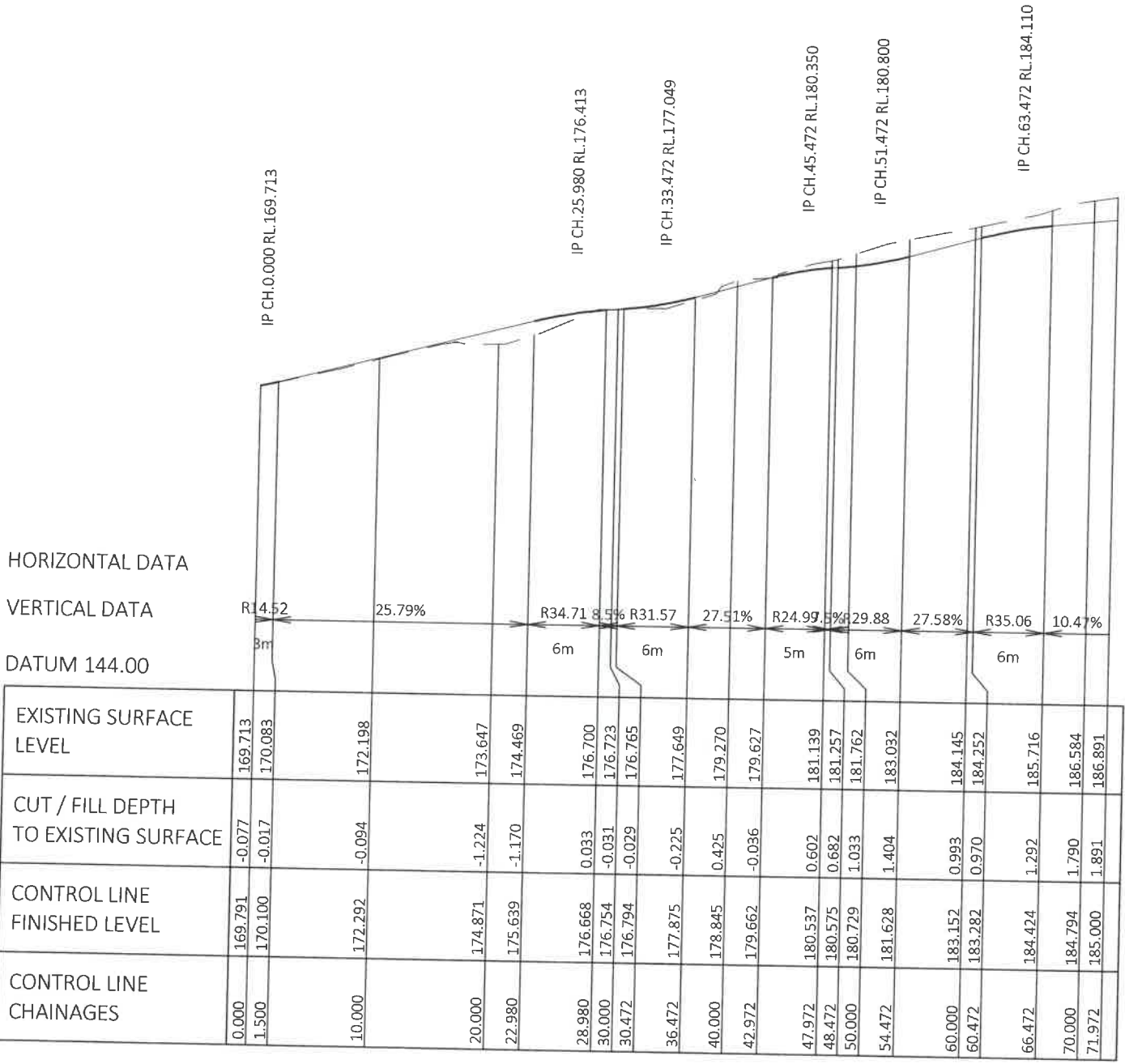
Project No.  
1811

Scale  
HORIZ 1:500  
VERT 1:500

Sheet Size  
A3

Drawing No.  
C080

Rev  
A



MC01 - LONGITUDINAL SECTION

HORIZONTAL 1:500

VERTICAL 1:500

Rev No

Date

Revision Note

CP

AD

Drn

Ver.

App.

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Client

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Project

5 UNIT RESIDENTIAL DEVELOPMENT  
128 STRICKLAND AVE, SOUTH HOBART

Drawn

Signed

Date

Designed

Signed

Date

Checked

Signed

Date

Approved

Signed

Date

Drawing Title

DRIVEWAY LONGITUDINAL SECTION

SUBJECT TO FINAL VERIFICATION AND APPROVAL

PRELIMINARY

NOT FOR CONSTRUCTION

Project No.

1811

Scale

1:500

Sheet Size

A3

Drawing No.

C110

Rev

A

PIOTTED: 8/6/2018 5:22:46 PM

d:\projects\1811-128 strickland avenue\cad\dr\c110.dwg

HORIZONTAL DATA  
VERTICAL DATA  
DATUM 141.00

EXISTING SURFACE LEVEL	166.795		168.830		170.866		172.901		174.937		174.986		177.406		178.901
CUT / FILL DEPTH TO EXISTING SURFACE	0.000		-0.013		-0.025		-0.038		-0.050		-0.039		-0.051		0.000
CONTROL LINE FINISHED LEVEL	166.795		168.843		170.891		172.939		174.987		175.026		177.456		178.901
CONTROL LINE CHAINAGES	0.000		10.000		20.000		30.000		40.000		40.189		50.000		55.830

MC02 - LONGITUDINAL SECTION  
HORIZONTAL 1:500  
VERTICAL 1:500



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PRELIMINARY  
NOT FOR CONSTRUCTION

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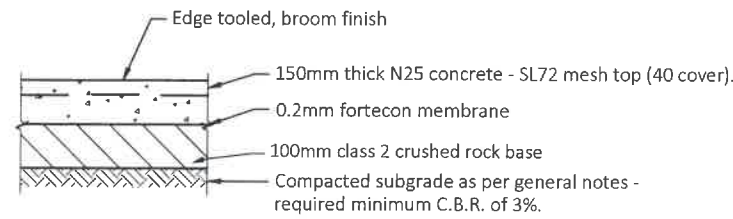
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BUILDER & RENOVATOR

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5 UNIT RESIDENTIAL DEVELOPMENT  
128 STRICKLAND AVE, SOUTH HOBART

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Approved	Signed	Date

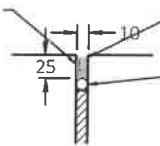
Drawing Title  
DRIVEWAY LONGITUDINAL SECTION

Project No. 1811	Sheet Size A3
Scale 1:500	Rev A
Drawing No. C111	



TYPICAL DETAIL FOR NEW CONCRETE  
N.T.S.

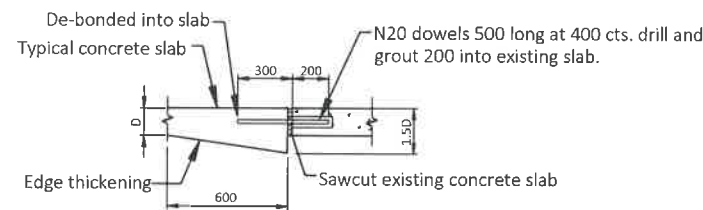
Seal joint with a heavy duty low modulus, trafficable polyurethane sealant. Sealant to be installed in accordance with manufacturer's instructions approximately 30 days after pour.



Remove arrises with carborundum stone and H.D low modulus polyurethane sealant. Provide foam backing rod under sealant. Bond breaking tape to sealant manufacturer's recommendations may be used in lieu of backing rod.

TYPICAL JOINT SEAL FOR DOWELED JOINTS

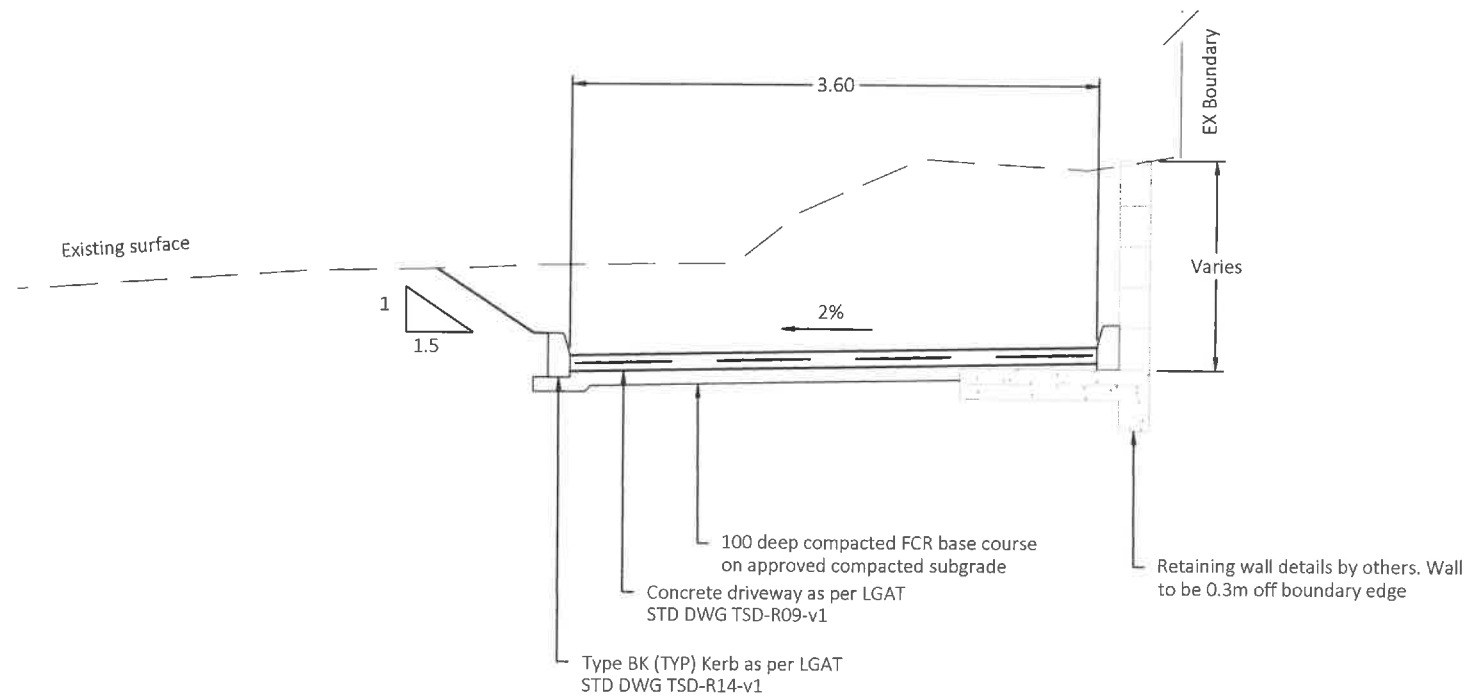
Remove arrises with carborundum stone. Seal joint as per typical detail



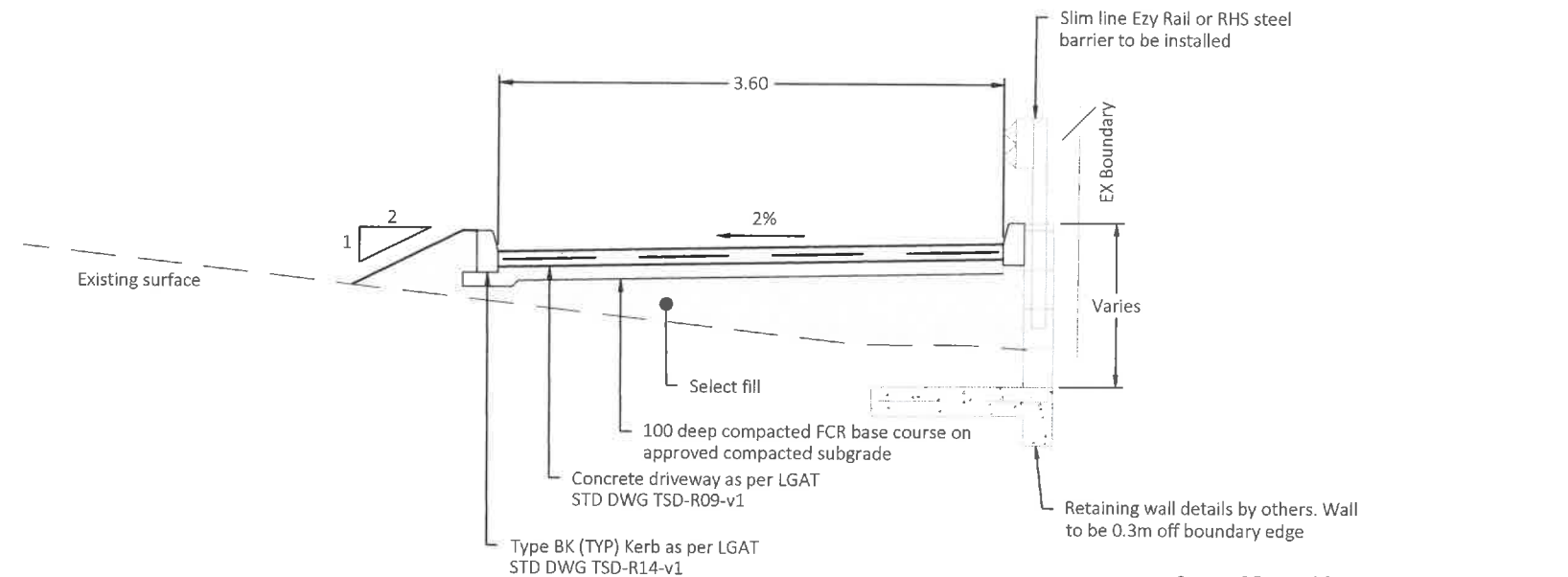
TYPICAL DETAIL FOR NEW CONCRETE PAVEMENT ABUTTING EXISTING CONCRETE  
N.T.S.

#### NOTES: RE SAWCUTTING

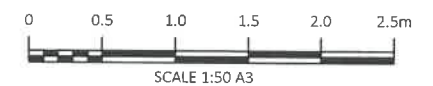
1. Slab must be sawcut as soon as practicable after finishing of the slab without causing damage to the sawcut edges - usually 12-24 hours.
2. Slabs must not be poured if the temperture exceeds 32°C.
3. Hot weather placing (25°C and over) may require slab to be sawcut as soon as 5-6 hours after pouring.
4. Any slab bay in which shrinkage cracks occur due to late sawcutting must be removed and replaced by the builder/contractor.



TYPICAL SECTION IN CUT  
1:50



TYPICAL SECTION IN FILL  
1:50



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BUILDER & RENOVATOR**

Project  
**5 UNIT RESIDENTIAL DEVELOPMENT  
128 STRICKLAND AVE, SOUTH HOBART**

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Designed	Signed	Date
Checked	Signed	Date
Approved	Signed	Date

SUBJECT TO FINAL VERIFICATION AND APPROVAL  
Drawing Title  
**DRIVEWAY LONGITUDINAL SECTION**

PRELIMINARY NOT FOR CONSTRUCTION	
Project No. 1811	Sheet Size A3
Scale 1:50	Rev A
Drawing No. C120	





Keith Midson  
Midson Traffic Pty Ltd  
18 Earl Street  
Sandy Bay TAS 7005  
0437 366 040

7 August 2018

Rohan Pace  
HBV Architects  
22 Salamanca Square  
Hobart TAS 7000

Dear Rohan,

### **128 Strickland Ave – Response to Council RFI**

This letter has been prepared in response to Council's request for further information in their letter dated 26<sup>th</sup> July.

Council have requested the following in relation to traffic and parking:

*PA3: Scaled and dimensioned plan(s) demonstrating on site vehicular passing areas along the vehicular access driveway, or a design that ensures safe, efficient and convenient access.*

*To satisfy Hobart Interim Planning Scheme 2015 clauses E6.7.3 Acceptable Solution A1 the scaled and dimensioned design drawings must include:*

- *Plan view of vehicular passing areas including vehicle swept paths demonstrating that the proposed passing areas do not conflict with car parking areas (visitor parking spaces).*

*Where the design drawing(s) do not comply with the above clauses, provide a certification by a suitably qualified engineer that the design provides for a safe, efficient and convenient access. This will then be assessed under performance criteria of the Hobart Interim Planning Scheme 2015.*

And;

*PA5.1: Scaled and dimensioned plan(s) showing the layout of car parking spaces, turning areas, driveway and access designed to comply with AS/NZS 2890.1:2004 or a design which ensures that parking areas enable safe, easy and efficient use.*

*To satisfy Hobart Interim Planning Scheme 2015 clauses E6.7.5 Acceptable Solution A1 and AS/NZS 2890.1:2004 Section 2 , scaled and dimensioned design drawings must include:*

- *Plan view showing a dimensioned layout of the proposed twenty (20) car parking space(s) (including visitor parking spaces);*
- *Plan view and long section along the proposed centreline of the circulation roadway servicing Unit 5, including transitions at change of grades, where required to comply with AS/NZS 2890.1:2004 Section 2.5.3(d);*



- *Plan view showing gradient of the parking area for the visitor parking spaces (both parallel to angle of parking and in other directions);*
- *Plan view showing turning paths into and out of the visitor parking spaces.*

*Where the design drawing(s) do not comply with the above clause and/or AS/NZS 2890.1:2004 provide a certification by a suitably qualified engineer that the design provides for a safe and efficient access, this will then be assessed under Performance Criteria of the Hobart Interim Planning Scheme 2015.*

## **1. Response to PA3**

Acceptable Solution A1 of Clause E6.7.3 of the Planning Scheme is reproduced as follows:

Vehicular passing areas must:

- (a) be provided if any of the following applies to an access:
  - (i) it serves more than 5 car parking spaces;
  - (ii) is more than 30 m long;
  - (iii) it meets a road serving more than 6000 vehicles per day;
- (b) be 6 m long, 5.5 m wide, and taper to the width of the driveway;
- (c) have the first passing area constructed at the kerb;
- (d) be at intervals of no more than 30 m along the access.

The driveway provides informal vehicle passing bays along its length through the utilisation of the visitor passing bays. This is shown in Figure 1.

A number of key points are relevant (referring to Figure 1):

- Vehicle passing within Passing Bay 1 relates only to vehicles travelling to the southernmost property only. Both vehicles that are travelling in opposing directions would be accessing the property at the southern end of the driveway (one entering and one exiting). Furthermore, as this section of the driveway does not service more than 5 parking spaces, there are no passing bay requirements for this driveway.
- A formal passing bay is located at the beginning of the driveway. At this location, vehicles entering the driveway can view any vehicles exiting and can stop to enable them to pass.
- The driveway containing passing bays 2 and 3 contains a total of 9 parking spaces (assuming 1 visitor space in front of the garages) and therefore the requirement for passing bays is triggered under E6.7.3. The available width does not meet the requirements of Acceptable Solution A1 (which requires 5.5 metres). Figure 1 demonstrates that cars travelling in opposing directions can pass each other when a car is parked in front of the garage (visitor parking).
- It is noted that at times when a car is not parked in the visitor parking spaces, that there is available width in accordance with the requirements of Acceptable Solution A1 of Clause E6.7.3 of the Planning Scheme. It is further noted that there is a lower likelihood of both visitor parking spaces being occupied at the same times as two cars are travelling in both directions along the driveway is very low. For this to occur, it would likely be due to vehicle movements in the southernmost dwelling as all spaces would be occupied in the dwellings at passing bays 2 and 3 (and hence unlikely to have any further demands).

Based on the findings above, the driveway does not fully comply with the requirements of the Acceptable Solution A1 of Clause E6.7.3 of the Planning Scheme. The Performance Criteria P1 states:

Vehicular passing areas must be provided in sufficient number, dimension and siting so that the access is safe, efficient and convenient, having regard to all of the following:

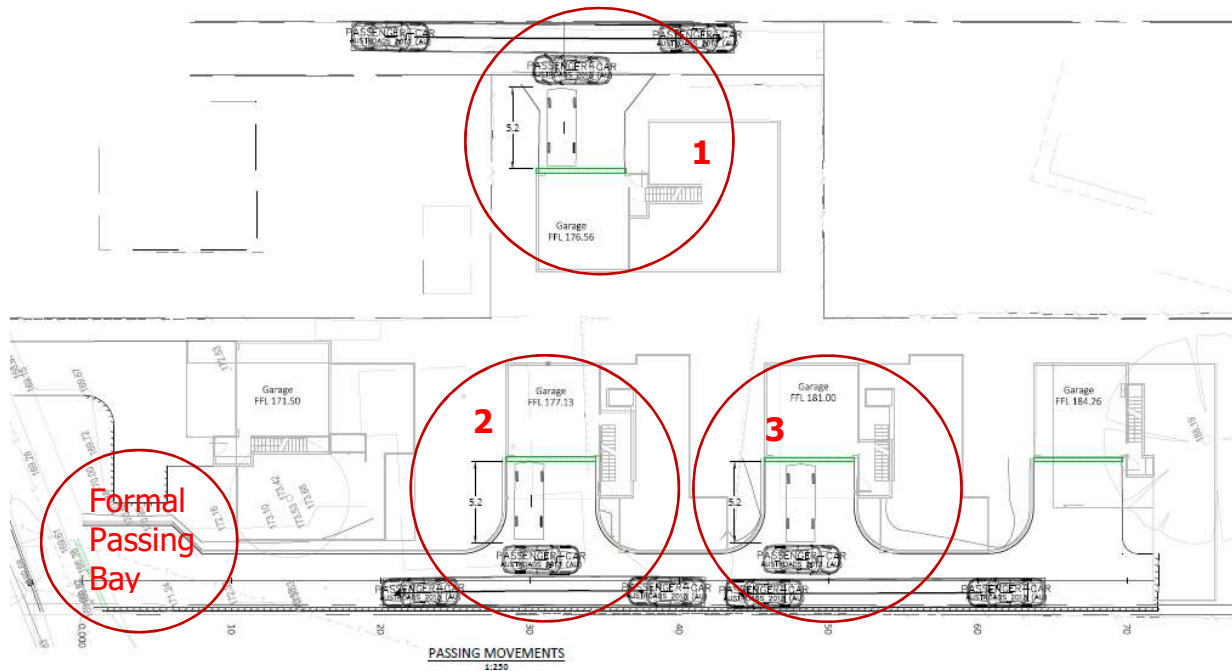
- (a) avoidance of conflicts between users including vehicles, cyclists and pedestrians;
- (b) avoidance of unreasonable interference with the flow of traffic on adjoining roads;
- (c) suitability for the type and volume of traffic likely to be generated by the use or development;
- (d) ease of accessibility and recognition for users.

In this case, the driveway is a very low speed and low volume environment. Traffic generation will be very low (and will progressively reduce along the length of the driveway). Sight distance is very good along the full length of the driveway. The following is therefore relevant with respect to the Performance Criteria P1:

- a. Conflicts will be easily avoided due to the low speed and low volume environment. Whilst the driveway width is narrow, there is sufficient space for pedestrians, cyclists and vehicles to avoid conflict (in the case of vehicles, the use of the driveways for passing bays as documented above and shown in Figure 1).
- b. The function and use of the driveway will not have any significant detrimental impact on the flow of traffic on Strickland Avenue.
- c. The use of the driveway is exclusively residential in nature. Traffic generation is therefore relatively low during peak periods. The design of the driveway is suitable with the proposed residential use.
- d. The driveway has a straight alignment and only provides access to the proposed residential dwellings. It will therefore be easily recognisable by users and have ease of accessibility.

Based on the above findings, the driveway meets the requirements of Performance Criteria P1 of Clause E6.7.3 of the Planning Scheme.

**Figure 1 Vehicle Passing Areas**



## **2. Response to PA5.1**

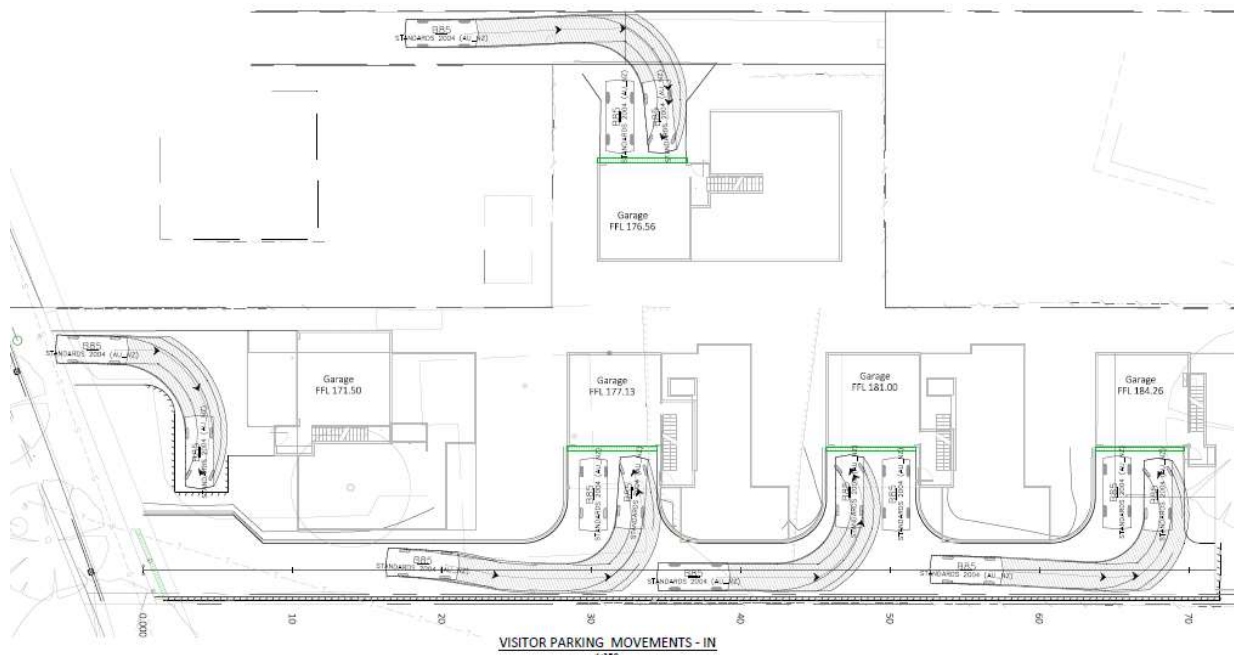
Scaled and dimensioned drawings of the layout of car parking spaces, turning areas, driveway and access have been provided to Council by AD Design and Consulting.

It is noted that 20 car parking spaces are not formally proposed. The proposal includes 2 formal garage spaces per dwelling, plus up to two spaces located immediately in front of the garage (up to 20 spaces). The development requires 12 spaces to comply with Acceptable Solution A1 of Clause E6.6.1 of the Planning Scheme. It is more likely that one visitor space would be utilised for each dwelling, resulting in 15 parking spaces. This is shown in Figure 1.

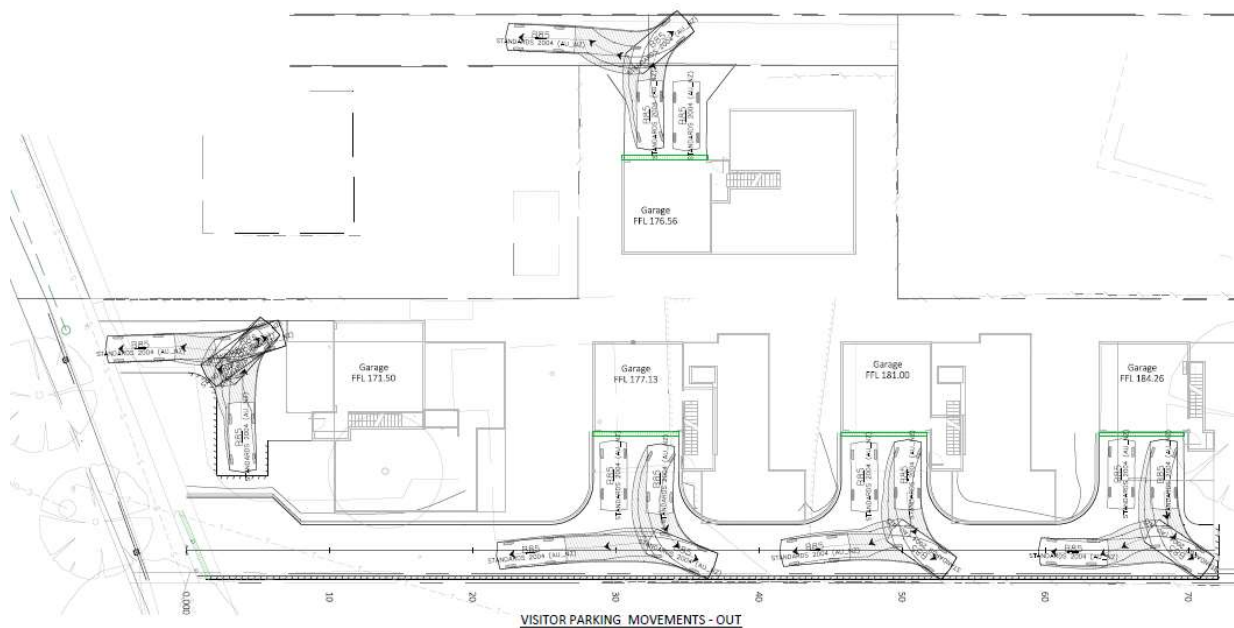
### ***Visitor Parking Manoeuvring***

The manoeuvres into and out of these spaces are shown in Figure 2 and Figure 3. It can be seen that whilst the spaces do not comply with the requirements of AS2890.1 (notably the aisle width is less than 5.8m), the spaces are accessible to facilitate vehicles to enter and exit the site in a forward direction. Note that the movements shown in Figures 2 and 3 are when two visitor vehicles are parked in front of the garage. Normally only one vehicle would be expected in this area, and the manoeuvring associated with one vehicle entering and exiting is easier due to the increased space width available for the manoeuvres.

**Figure 2 Visitor Space Entry Manoeuvres**



**Figure 3 Visitor Space Exit Manoeuvres**



### ***Gradient of Visitor Parking Areas***

The gradient of the visitor parking areas is shown in Figure 4. It can be seen that the maximum cross-fall gradient varies between 9.0% and 11.3%.

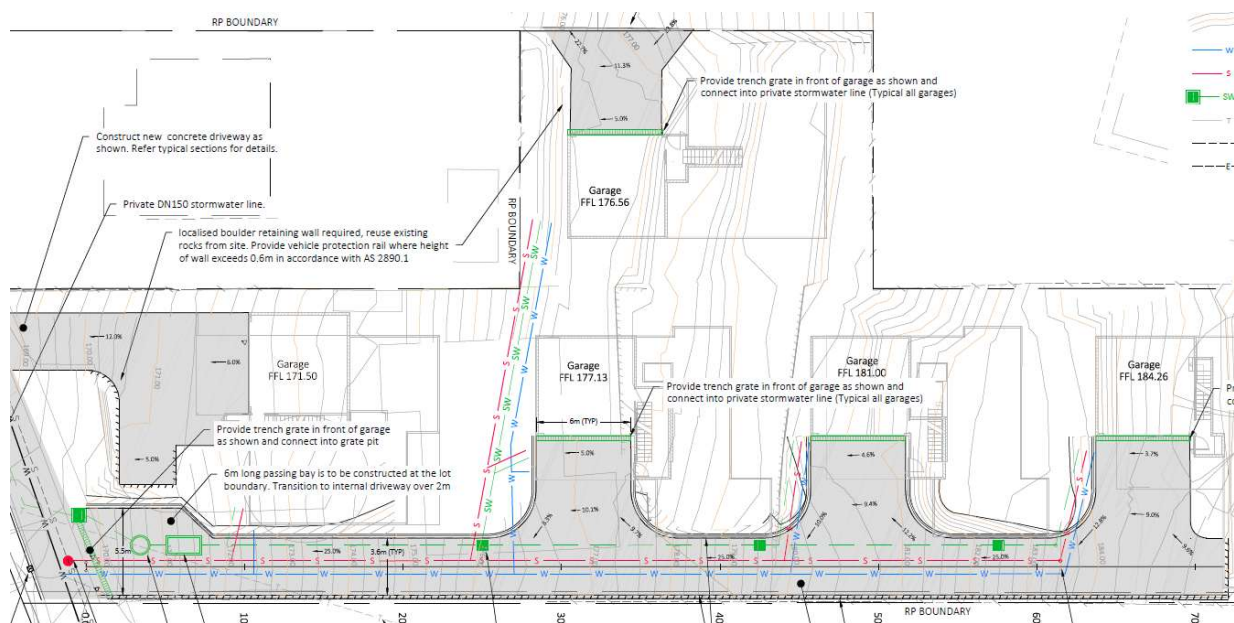
Section 2.4.6 of AS2890.1 states that the maximum grades within a car park shall be:

- Measured parallel to the angle of parking      1 in 20 (5%)
- Measured in any other direction                  1 in 16 (6.25%)

In this case the parking space is located within the driveway and exceeds the Australian Standards requirements by up to 5%. The parking space is for a private residence and therefore will have a relatively low turnover and will be used by users who will have a high degree of familiarity with the site. It is reasonably common for residential parking spaces in the Greater Hobart area to have gradients that are similar. It is also noted that many of Hobart's streets have similar or greater gradients and permit on-street parking.

Due to site constraints associated with the site, it is not considered possible to modify the driveway to reduce the gradients. It is important to note that the area utilised by visitor parking is significantly less steep than the adjacent access driveway.

**Figure 4 Gradient of Visitor Parking Areas**



### ***Driveway Long Section and Gradient***

The residential properties within the development are accessed by three separate driveways. Two driveways service one dwelling each, and one driveway services three dwellings.

The driveway that services three residential units was assessed against the requirements of AS2890.1 for grade. The Australian Standards state the following with regards to domestic driveways (noting that the driveway only services 3 domestic units and is therefore considered a 'domestic driveway' under AS2890.1):

*"2.6.2 – the maximum gradient of domestic driveways shall be 1 in 4 (25%). The maximum gradient of the associated access driveway across a property line or building alignment shall be 1 in 20 (5%) and across a footpath as specified in Clause 3.3(d).*

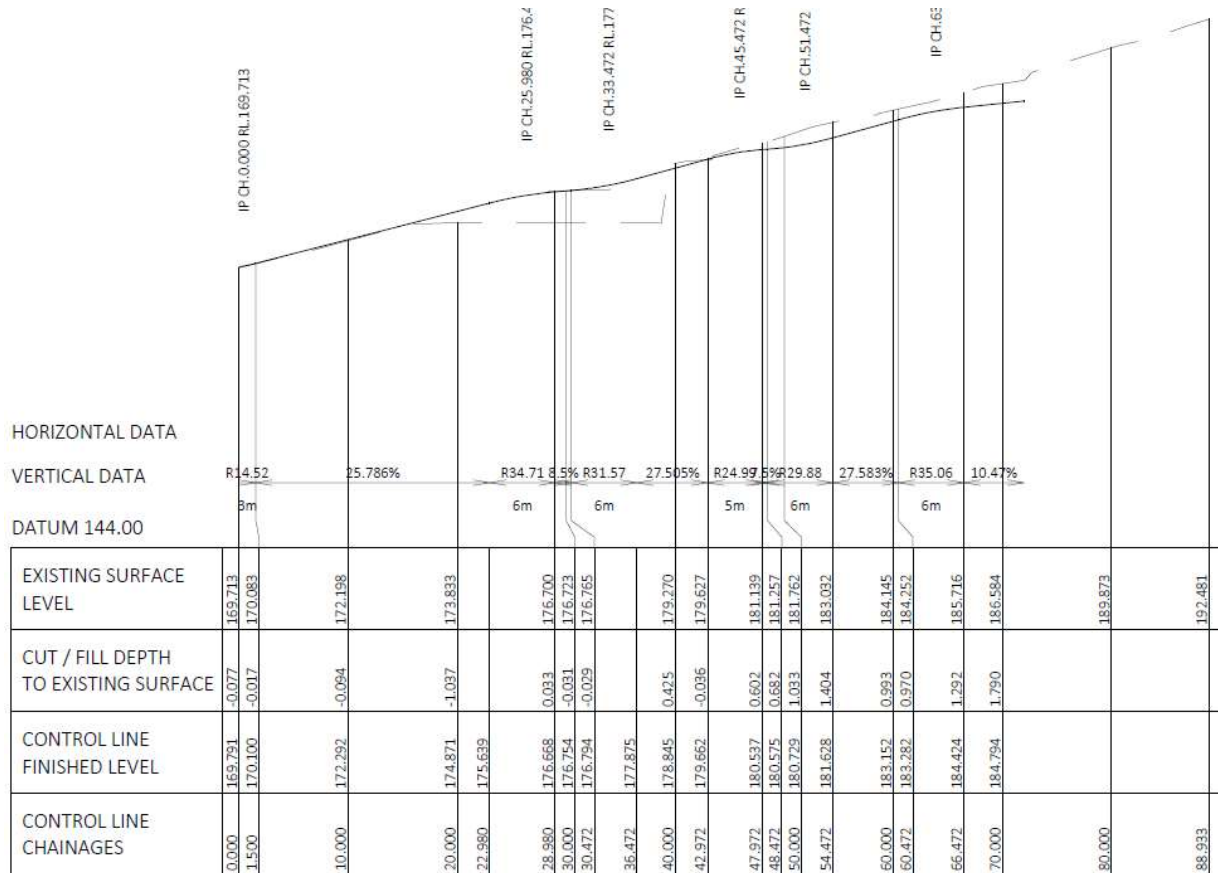
*Grade changes across a footpath and within the property shall be designed and checked in accordance with Appendix C to ensure that vehicles will not scrape their undersides when negotiating them. Transitions may be required (see Clause 2.5.3(d)). Checks may be required along both edges of a driveway as well as along the centre line if there are changes in the cross slope at or near a grade change.*



*NOTE: It is recognised that limiting domestic driveway grades to 25 percent maximum may not be practicable in some particularly hilly residential locations. The services of a professionally qualified person with appropriate experience may be required to make a judgement as to whether a particular grade line design is safe and environmentally sustainable."*

The modified driveway long section is shown in Figure 5. As noted in the TIA, the driveway exceeds 25% in several short length sections by up to 2.6%. The driveway was assessed against the Performance Criteria P1 of Clause E6.7.2 of the Planning Scheme in Section 4.6.2 of the TIA (pages 15 and 16) – this assessment is still relevant.

**Figure 5 Driveway Long Section**





### **3. Certification**

Based on the assessment contained in this report, I am satisfied that the car parking layout of the proposed development at 128 Strickland Avenue provides adequate provision for vehicle manoeuvring and safety with regard to normal operation of the site.

Please contact me on 0437 366 040 if you require any further information.

Yours sincerely,



Keith Midson BE MTraffic MTransport FIEAust CPEng EngExec NER

**DIRECTOR**

**Midson Traffic Pty Ltd**

## Submission to Planning Authority Notice

Council Planning Permit No.	PLN-18-419	Council notice date	4/07/2018
<b>TasWater details</b>			
TasWater Reference No.	TWDA 2018/01111-HCC	Date of response	13 July 2018
TasWater Contact	Greg Clausen	Phone No.	(03) 6237 8242
<b>Response issued to</b>			
Council name	HOBART CITY COUNCIL		
Contact details	coh@hobartcity.com.au		
<b>Development details</b>			
Address	128 STRICKLAND AVE, SOUTH HOBART	Property ID (PID)	3011688
Description of development	Multiple dwellings		
<b>Schedule of drawings/documents</b>			
Prepared by	Drawing/document No.	Revision No.	Date of Issue
AD Design and Consulting	General Arrangement Plan Sheet 1	A	08-05-18
TasWater	Infrastructure Plan		13 July 2018
<b>Conditions</b>			
<p>Pursuant to the <i>Water and Sewerage Industry Act 2008 (TAS)</i> Section 56P(1) TasWater imposes the following conditions on the permit for this application:</p> <p><b>CONNECTIONS, METERING &amp; BACKFLOW</b></p> <ol style="list-style-type: none"> <li>1. A suitably sized water supply with metered connections to each dwelling unit must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.</li> <li>2. Any removal/supply and installation of water meters must be carried out by TasWater at the developer's cost.</li> <li>3. Prior to commencing construction of the development, any water connection utilised for construction must have a water meter installed, to the satisfaction of TasWater.</li> </ol> <p><b>BOUNDARY TRAP AREA</b></p> <ol style="list-style-type: none"> <li>4. The proposed development is within a boundary trap area and the developer must provide a boundary trap that prevents noxious gases or persistent odours back venting into the property's sanitary drain. The boundary trap must be contained within the property boundaries and the property owner remains responsible for the ownership, operation and maintenance of the boundary trap.</li> </ol> <p><b>ASSET CREATION &amp; INFRASTRUCTURE WORKS</b></p> <ol style="list-style-type: none"> <li>5. The TasWater water main shown in pink on the TasWater Infrastructure Plan must be upsized to DN100 by TasWater at the developer's full cost.</li> </ol> <p><b>Advice:</b> The water supply infrastructure on the south west side (ie on the development side) of Strickland Avenue, including road crossing is only DN50. Upsize of the road crossing will ensure that the development will cause not diminution of service to other properties serviced by the DN50 mains.</p>			

## DEVELOPMENT ASSESSMENT FEES

6. The applicant or landowner as the case may be, must pay a development assessment and Consent to Register a Legal Document fee to TasWater, as approved by the Economic Regulator and the fees will be indexed, until the date they are paid to TasWater, as follows:

- a. \$351.28 for development assessment; and

The payment is required within 30 days of the issue of an invoice by TasWater.

## Advice

### General

For information on TasWater development standards, please visit

<http://www.taswater.com.au/Development/Development-Standards>

For application forms please visit <http://www.taswater.com.au/Development/Forms>

### Service Locations

Please note that the developer is responsible for arranging to locate the existing TasWater infrastructure and clearly showing it on the drawings. Existing TasWater infrastructure may be located by a surveyor and/or a private contractor engaged at the developers cost to locate the infrastructure.

A copy of the GIS is included in email with this notice and should aid in updating of the documentation.

The location of this infrastructure as shown on the GIS is indicative only.

- A permit is required to work within TasWater's easements or in the vicinity of its infrastructure. Further information can be obtained from TasWater
- TasWater has listed a number of service providers who can provide asset detection and location services should you require it. Visit [www.taswater.com.au/Development/Service-location](http://www.taswater.com.au/Development/Service-location) for a list of companies
- TasWater will locate residential water stop taps free of charge
- Sewer drainage plans or Inspection Openings (IO) for residential properties are available from your local council.

## Declaration

The drawings/documents and conditions stated above constitute TasWater's Submission to Planning Authority Notice.

### Authorised by



**Jason Taylor**

Development Assessment Manager

## TasWater Contact Details

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