CITY OF HOBART

AGENDA

CITY PLANNING COMMITTEE MEETING (OPEN)

MONDAY, 4 APRIL 2016

AT 5.00 PM

SUPPLEMENTARY ITEMS

TABLE OF CONTENTS

THEATRE, RECITAL HALL WITH KIOSK/BAR, SALON, TEACHING AND LEARNING SPACES, ROOF DECKS, ROOF TERRACES AND MINOR ROAD WORKS - PLN-16-00135-01 - FILE REF: 5659170/08 & P/29/388

6.2.2 99 SALAMANCA PLACE (ALSO KNOWN AS PRINCES PARK), BATTERY POINT - PUBLIC TOILETS - PLN-16-00085-01 – FILE REF: 1832167 & P/90/889

6.3 GENERAL

6.3.1 HOBART INTERIM PLANNING SCHEME 2015 – PLANNING SCHEME AMENDMENT AND S43A PERMIT APPLICATION – STEVENS FARM DRIVE, WEST HOBART – 5/2016 AMENDMENT – FILE REF: 16/18

6. COMMITTEE ACTING AS PLANNING AUTHORITY

6.1 APPLICATIONS UNDER THE HOBART INTERIM PLANNING SCHEME 2015

6.1.2 40-44 MONTPELIER RETREAT, ADJACENT ROAD RESERVATION, BATTERY POINT - DEMOLITION AND REDEVELOPMENT FOR 31 DWELLINGS - PLN-15-00971-01 – FILE REF: 5669846 & P/40-44/683

100x's
(Council)

The General Manager reports:

"In accordance with the provisions of Part 2 Regulation 8(6) of the Local Government (Meeting Procedures) Regulations 2005, this supplementary matter is submitted for the consideration of the Committee.

Pursuant to Regulation 8(6), I report that:

(a) information in relation to the matter was provided subsequent to the distribution of the agenda;
(b) the matter is regarded as urgent; and
(c) advice is provided pursuant to Section 65 of the Act."

DES-F-0102/52
12/05/2015

HOBART
CITY COUNCIL

APPLICATION UNDER HOBART INTERIM PLANNING SCHEME 2015

Type of Report	Council
Committee:	4 April 2016
Council:	11 April 2016
Expiry Date:	14 April 2016
Application No:	**PLN-15-00971-01**
Address:	**40-44 Montpelier Retreat, Adjacent Road Reservation, Battery Point**
Applicant:	Circa Morris Nunn Architects, IXL Atrium,
	27 Hunter Street, Hobart
Proposal:	**Demolition and Redevelopment for 31 Dwellings**
Representations:	77 plus petition (302 signatures)
Performance criteria:	Development standards and historic heritage code

1. Executive Summary

1.1. Planning approval is sought for demolition and redevelopment for 31 dwellings. The proposal includes:

- Demolition of the existing buildings on the site.
- Two new buildings containing 31 dwellings - one on the corner of Montpelier Retreat and Knopwood Street and the other one fronting James Street.
- The dwellings are comprised of one one-bedroom apartment, 25 two-bedroom apartments, and five three-bedroom apartments.
- The proposal extends over six levels, including basement, ground and floors 1 to 4. The upper level occupies only part of the overall development.
- The Montpelier Retreat/Knopwood Street building is at its highest point at the corner of the respective streets. The building then tapers down to four storeys in height facing Montpelier Retreat and three storeys plus basement facing Knopwood Street.
- The James Street building is two storeys with a pitched roof facing James Street.
- The basement level provides parking spaces for up to 34 vehicles. Bicycle parking is also provided.
- Minor encroachment of a section of ‘user road’ footpath on Montpelier Retreat which is within the developer’s title, and minor encroachment over the Montpelier Retreat and Knopwood Street road reservations for external window shutters are also proposed.

1.2. The proposal relies on performance criteria to satisfy the following standards and codes.

1.2.1. Residential Density for multiple dwellings - Clause 11.4.1 P1.
1.2.2. Setbacks and Building Envelope - Clause 11.4.2 P1
1.2.3. Site coverage and private open space - Clause 11.4.3 P1 and P2.
1.2.4. Sunlight and overshadowing - Clause 11.4.4 P1, P2 and P3.
1.2.5. Privacy Clause - 11.4.6 P2 (windows).
1.2.6. Sign - Clause E17.6.1 P4
1.2.7. Historic Heritage Code Clause E.13.8.2: P1, P2, P3
1.2.8. Historic Heritage Code Clause E.13.8.4 P1, P2, P3, P4, P5, P6, P7, P8, P9

1.3. A total of 77 objections and a petition (302 signatures) objecting to the proposal, were received within the statutory period 12 to 26 February 2016.

1.4. The proposal is recommended for refusal on heritage grounds.

1.5. The final decision is delegated to the Council.

2. Site Detail

3. Proposal

3.1. Planning approval is sought for demolition and redevelopment for 31 dwellings.

- Demolition of the existing buildings on the site.
- Two new buildings, containing 31 dwellings - one on the corner of Montpelier Retreat and Knopwood Street and the other one fronting James Street.
- The dwellings are comprised of one one-bedroom apartment, 25 two-bedroom apartments, and five three-bedroom apartments.
- The proposal extends over six levels, including basement, ground and floors 1 to 4.
- The Montpelier Retreat/Knopwood Street building is at its highest point at the corner of the respective streets. The building then tapers down to four storeys in height facing Montpelier Retreat and five storeys facing Knopwood Street.

- The James Street building is two storeys with a pitched roof facing James Street.
- The basement level provides parking spaces for up to 34 vehicles. Bicycle parking is also provided.
- Minor encroachment of a section of 'user road' footpath on Montpelier Retreat which is within the developer's title, and minor encroachment over the Montpelier Retreat and Knopwood Street road reservations for external window shutters are also proposed..

4. Background

4.1. Council landlord (General Manager) consent was issued dated 17th September 2015 to grant permission for the making of the development application only. A separate approval will be required under Section 14 of the Local Government (Highway) Act 1982 for the closure of the footpath on Montpelier Retreat prior to the commencement of any works (if approved).

4.2. As stated, Council landlord (General Manager) consent is required with respect to the proposed minor encroachment of Montpelier Retreat 'user road' footpath which is within the developer's title, and minor encroachment for external shutters on windows that will be over the Montpelier Retreat and Knopwood Street road reservations.

5. Concerns raised by representors

5.1. A total of 77 representations plus a petition containing 302 signatures were received to the latest of three rounds of advertising. The following table outlines the issues raised by representors over all periods of advertising. Concerns raised with respect to the discretions invoked by the proposal will be addressed in Section 6 of this report.

Scale and height, and density

- Size and height of great detriment to adjacent pub (Preachers): loss of sunny open area with mountain views from courtyard;
- too high;
- too large;
- overdevelopment of site
- density too much
- 'development of this magnitude will greatly impact the area';
- 'Negative visual impact caused by scale, bulk and proportions of the dwelling when viewed from Preachers';
- Loss of mountain views from Preachers;
- Would create precedent;
- Conflict with height and style;
- Objected to on grounds of scale, form and streetscape relationship;
- Far in excess of scale and height of existing development under the Hobart Interim Planning Scheme 2015;
- Do not reflect established character of single and two storey development in the vicinity under the Hobart Interim Planning Scheme 2015;

- While some transition in scale from Hobart Interim Planning Scheme 2015 to the two larger office buildings may be appropriate, those buildings are within a different planning scheme area and not reflective of the intended scale of development on this site;
- The proposal does not 'scale down' from those larger office buildings, and in fact surpasses the height of Knopwood House;
- 'completely out of scale';
- Comparison with density in lower Montpelier Retreat and Salamanca Place is not relevant, as a different scheme applies;
- Density would have detrimental effect on amenity of neighbouring properties and within the site itself;
- Height excessive compared to scale and height south along Montpelier Retreat;
- Building would make uncharacteristic 'strong statement' on exposed corner site;
- 'This is the gateway to Battery Point. Such a large structure should not be envisaged on this piece of land in this historic precinct';
- 'This is the tourist trail to Narryna and Battery Point. No building higher than two storeys should be countenanced on the parcel of land under consideration';
- Too massive;
- Only a low density development should be considered;
- 'will extremely dominate and distort the streetscape';
- Will 'ruin' the gateway to Battery Point';
- The number of units is excessive;
- 'It is important to preserve the integrity of Battery Point and two storeys max is preferable';
- Concern it could create a wind tunnel and it could be oppressive;
- 'black monolith on Montpelier Retreat';
- 'will set precedent well above the two storey limit and destroy the beauty of Battery Point;
- 'high rise precedent';
- Increases number of high rise buildings;
- 'oppressive';
- 'too grandiose for site';
- Would impose 'high density' living on Hobart;
- Do not want to make 'canyons of our streetscapes';
- 'Density and height far too great for site and the height of nearby office buildings should not provide an argument that it has set a precedent for this and future developments'.

Privacy

- Loss of privacy;
- 'great reduction in privacy';
- Would not meet Clause 10.4.2 of the Scheme: unreasonable loss of sunlight and overshadowing on the Preachers lawn dining area and bus';
- Would 'destroy all privacy' to rear of my property (James Street);
- Balconies of proposal would overlook neighbours bathroom.

Overshadowing

- Loss of natural light to neighbouring property;
- Overshadowing of neighbouring property;
- Loss of light and solar heat to neighbouring property;
- Loss of sunshine to Preachers;
- Loss of light all year round;
- Do not believe shade drawings supplied are accurate;
- Small cottages deserve the limited light we get from our small windows;
- 'will totally block out our sun';
- Garden will die through lack of sun';
- Loss of sun to surrounding houses;
- Loss of sun to rear deck;
- Overshadowing will make neighbouring property less attractive to tenants resulting in significant losses to the owner.

Visual intrusion

- Loss of mountain view to neighbouring property;
- Light and privacy must be protected;
- 'we will be looked down on from new development';
- Would ruin views and sunlight for a number of surrounding houses;
- 'disaster for Preachers'.

Traffic and pedestrian flow

- James and Knopwood Streets will not be able to cope with increased population;
- excessive traffic;
- James Street already has enough traffic problems;
- Do not see how James Street can cope with increased demand by so many people;
- Traffic noise will detrimentally effect resident amenity;
- Insufficient parking space provided;
- Proposal will create undue traffic issues;
- Increase in traffic flows on narrow streets adjacent to Narryna;
- Safety concerns due to additional traffic;
- Adding an 'apartment building will add to the chaos';
- Huge traffic impact.

Impact on adjacent business

- 'Preachers Restaurant (No.5 Knopwood Street) derives almost all of its income from the outdoor alfresco area'. 'The proposed development on the adjacent block would have a catastrophic impact on Preachers and would not only destroy the business (and livelihood of its operators) but would also ruin something that has become such a fantastic spot to relax in the sun and enjoy Tasmanian produce with a view of our beautiful mountain';
- 'My understanding is the current interim planning code for the site is two storeys high. We considered this information when deciding to spend $50,000 upgrading the outdoor area. I would have no issue with a two storey development as it would (have a) minor impact on the business, not destroy it'.

Heritage impact

- Does not fit in with heritage buildings in the area;
- Totally out of character with historic Battery Point area;
- Concern at loss of heritage building on site (the corner building). Existing building and fabric remain;
- Possible damage to historic property from traffic vibrations;
- Exterior finishes not sympathetic to surrounding character;
- *'*We believe that the development should be assessed in the context of the Battery Point Heritage precinct in accordance with the local community's wishes'.
- Inconsistent with established pattern within the Precinct and would detract from cultural heritage significance;
- Dramatic impact on Montpelier Retreat and Knopwood Street streetscapes; particularly the building proposed on the corner of those streets;
- Angled roof form uncharacteristic of hipped roof forms prevailing, would detract from heritage values;
- Encroachment of James Street apartments on historic stone boundary wall of Narryna and Narryna itself;
- Severe effect on Narryna complex*;*
- Will spoil tourist enjoyment of Narryna;
- 'nearby historic sites such as Narryna will be compromised';
- 'Proposal fails any test on height, density and, particularly, heritage';
- Increased traffic on narrow streets adjacent to Narryna will impact on heritage setting;
- Building finishes not compatible with nearby heritage;
- Loss of visual curtilage to Narryna due to unsympathetic development;
- Loss of visual curtilage to Narryna as viewed from Hampden Road and within the northern part of the Narryna property;
- The Construction Environmental Management Plan does not include data relating to the geological assessment of the site, concerns at potential blasting and drilling in dolerite: concern at impact on surrounding heritage buildings.

Loss of character

- Proposal 'totally lacks respect for any aspects of Battery Point history, quirkiness and destroys my home';
- 'No longer will one of Hobart's premier tourist meccas be safe from rapacious developers hell-bent on maximising profit at the expense of the community';
- At odds with the character of one of the main 'entry portals' to Battery Point for tourists;
- Adjacent tall buildings not an excuse for allowing further intrusion;
- Design does not reflect neighbourhood character;
- Angled roof form would be unsympathetic to hipped roof forms found elsewhere in the precinct;
- Proposal is not at all sympathetic with residential Battery Point;
- Small cottages in James Street will be compromised by both the scale and increased traffic flow, as will Preachers Cottage in Knopwood Street;
- Will damage Battery Point character;

- Materials, density, massing all non compliant;
- 'proposal fails on all grounds';
- Will impact negatively aesthetically;
- 'eyesore';
- 'totally inconsistent with integrity and cultural heritage' of surroundings;
- 'will greatly diminish the beauty and heritage values that make Battery Point special';
- 'our city will start to look like other cities (and) will lose its special appeal to tourists;
- Loss of Battery Point character;
- 'People live in this area because of the houses and the small community atmosphere. (They) want the exclusivity, the character and the history. (Please) do not take away from what makes Battery Point unique. Please leave Battery Point as it is, beautiful in its rich history, quaint homes and narrow windowing streets';
- 'more aesthetic and imaginative scheme required';
- Angled roof form uncharacteristic of hipped roof form in vicinity;
- Would ruin authenticity of this significant area;
- Site is gateway to historic Battery Point village and 'should not be an overpowering bulky structure which is out of context for residential Battery Point';
- Timber cladding design; would better suit the slopes of kunanyi or the gloomy rainforest hills of the west coast'.

Parking

- Impact on limited parking in this area;
- Lack of visitor parking;
- Increase in demand for street parking;
- Parking impact on Narryna visitors.

Planning Scheme provisions

- Proposal does not comply with heritage provisions under E13.8.2; in terms of values of dwellings on their own allotments;
- Proposal does not comply with heritage provisions under E13.8.4; proposal is more than 7 times the required 350sqm per dwelling, at 46sqm only;
- Proposal does not comply with height provisions under E13.8 A3; up to 6 storeys proposed in a one to two storey area; incompatible with pattern of development within the heritage precinct;
- Proposal does not comply with site coverage provisions under E13.8 A6; 75% as opposed to a 40% allowance;
- Historic Heritage Code E13.8.4 P1: makes reference to 'attached' dwellings, which is considered to be the 'terrace style, conjoined dwellings found elsewhere in the Precinct, rather than the multi storey, modern apartment form proposed';
- Individual dwellings with their own private open space are the preferred form;
- Does not comply with planning provisions on height, heritage or density;
- 'well outside of Planning Scheme provisions';
- 'It's unique planning has preserved the character of this historic precinct'.

Noise impact • Impact from traffic noise, also general noise (air conditioners, garage door operation etc).
Tourism and employment • 'our city will start to look like other cities (and) will lose its special appeal to tourists, (and) will thereby undermine the State economy; • Loss of employment given overshadowing of adjacent business; • Loss of casual employment at 'Preachers'; • 'Will ruin one of the best bars in Hobart'; • Detriment to 'Preachers': 'not just a bar but a social hub for so many young Tasmanians'; • Detriment to family restaurant (loss of sun to 'Preachers'); • Detriment to 'great beer garden' (loss of sun to 'Preachers'); • 'don't jeopardise a locally owned business' ('part of Hobart's evolving food and drink culture') ('Preachers'); • Loss of tourism potential (detriment to 'Preachers'); • Proposal will broaden the commercial region of Salamanca Place into Battery Point; • Potential to impact negatively on Narryna as a listed heritage item and tourist destination.
Other • 'What is there at the moment is an eyesore. However, we would prefer a 4 storey development. On the other hand, anything would be better than what's there'; • We don't want any more apartment blocks in Battery Point; • Structural concern from proposed excavation near boundary; • Concern at no geologist report stating nature of underlying rock and how it will be excavated; • Excavation setback should be minimum of 1.2 metres; • The Construction Environmental Management Plan does not include data relating to the geological assessment of the site, concerns at potential blasting and drilling in dolerite; • 'Concern that Council should request more detailed analysis regarding maximum total concentration and leachable concentration values permitted for waste classification on this site that has been used for heavy industrial machinery for over 100 years'.

Other comment

- 'The current proposal is inappropriate and should be rejected by Council'.
- 'Please ask the applicant and their architect to respect and read your document' (*Hobart Interim Planning Scheme 2015 2015*).
- Precedent of Empress Towers led to former *Battery Point Planning Scheme 1979*, concern at proposed 'despoliation of the area'.

- Proposal is inappropriate and should be rejected by the Council.
- that 6 storey development has 'the potential to minimise sunlight into the surrounding areas'.
- 'Height limits are in place for a good reason, and to think that this could be relaxed by the HCC for a developer whose purpose is to make as much profit as possible, is unthinkable'.
- 'Density and height far too great for site and the height of nearby office buildings should not provide an argument that it has set a precedent for this and future developments';

Suggestions

- 'The building development in order to comply should be two storey near adjacent terraces to James Street, leading down to storey and a half to that side of James and Knopwood Street, single storeyed to the corner of Montpelier Retreat and leading up to a storey and a half as it returns back up Montpelier Retreat. Or a maximum of two storeys, with forms and types sympathetic to those already existing structures'.
- 'Although some degree of exceedance may be acceptable in the context of existing larger Knopwood and Kirksway House buildings in the vicinity, those buildings are within a different planning scheme area. In my opinion any reliance on the scale of those buildings would only be relevant to the extent that the proposal would transition down in scale. The proposal however is in fact substantially higher than those buildings and in my opinion is at least two storeys too high'.
- 'A low density housing development has never been opposed by the local community, (but) this ambit claim is outrageous and should be refused'.
- 'We believe that the development should be assessed in the context of the Battery Point Heritage precinct in accordance with the local community's wishes'.
- Historic Heritage Code E13.8.4 P1: makes reference to 'attached' dwellings, which is considered to be the 'terrace style, conjoined dwellings found elsewhere in the Precinct, rather than the multi storey, modern apartment form proposed'.
- 'What is there at the moment is an eyesore. However, we would prefer a 4 storey development. On the other hand, anything would be better than what's there';
- 'If it must be built, limit it to the 2 storey limit, as elsewhere in Battery Point'.
- 'Anything over 3 storeys would ruin the historical appeal of this village precinct'.
- 'Expect a minimum 1.2 metre side setback from No. 46 Montpelier Retreat and a similar building height to No.46'.

Consultation

There has been ongoing applicant and representor consultation.

The applicant has granted extensions of time to allow for the Council to consider the proposal.

6. Assessment

6.1. The site is located within the Inner Residential Zone of the *Hobart City Interim Planning Scheme 2015*.

6.2. The proposed use is residential which is permitted within the Zone.

6.3. The development has been assessed against:

6.3.1. E13.0 Historic Heritage Code
6.3.2. Part D-11 Inner Residential Zone

6.4. The proposal relies on the following performance criteria to comply with the applicable standards.

6.4.1. Residential Density for multiple dwellings - Clause 11.4.1 P1.
6.4.2. Setbacks and Building Envelope - Clause 11.4.2 P1
6.4.3. Site coverage and private open space - Clause 11.4.3 P1 and P2.
6.4.4. Sunlight and overshadowing - Clause 11.4.4 P1, P2 and P3.
6.4.5. Privacy Clause - 11.4.6 P2 (windows).
6.4.6. Sign - Clause E17.6.1 P4
6.4.7. Historic Heritage Code Clause E.13.8.2: P1, P2, P3
6.4.8. Historic Heritage Code Clause E.13.8.4 P1, P2, P3, P4, P5, P6, P7, P8, P9

6.5. Each performance criteria is dealt with separately below.

6.6. Residential Density for multiple dwellings - Clause 11.4.1 A1: site area 200sqm to 400sqm per dwelling (46.77sqm proposed).

6.6.1. Performance Criteria P1 states site area per dwelling may be less than 200sqm if any of the following applies:
(i) The development contributes to a range of dwelling types and sizes appropriate to the locality;
(ii) The development provides to a specific accommodation need, such as aged care, special needs of student accommodation.

6.6.2. The proposed development would be for dwellings serving general rather than specific accommodation needs. The applicant submission (Planning Consultant Town Planning Report) states as follows.

To meet the Acceptable Solution only seven dwellings could be built. This is simply untenable economically on an inner city site of this value. There is no standard in the Scheme as to how large each of these dwellings could be and therefore the number of dwellings does not ultimately equate to an actual bulk of building.

The proposal contributes to the range of dwelling types available in Battery Point/ Salamanca Place/Sullivans Cove. There is a shortage of residential accommodation in the area and the services and community facilities in the area are more than adequate to accommodate 31 additional households. The apartments are designed with a variety of floor areas, layouts, orientation, outdoor spaces and facilities and will contribute to the range of apartments available in the locality. They will also have the highest environmental credentials so setting a new standard for apartments in Hobart city. The Performance Criteria P1 (a) (i) of Clause 11.4 are therefore met. It is noted that in the vicinity (specifically in Battery Point) the following site area per dwellings exists:

- 13-21 James Street - 5 houses on site area 553m2 = 110.6 m2 per dwelling
- Hampden Road Terraces – 4 houses on site area 401m2 = 100 m2 per dwelling
- Portsea Terrace in Montpelier Retreat – 5 houses (1xtwo storeys and 4 each 3 storeys) on 609m2 = 121m2 per dwelling.

6.6.3. The site is at the northern edge of the Inner Residential Zone under the *Hobart Interim Planning Scheme 2015* (to the other side of Montpelier Retreat and Knopwood Street is the Sullivans Cove Planning Scheme 1997). Multiple level and multi dwelling development exists in close proximity within that Planning Scheme area (Salamanca Square, Salamanca Mews). The site to a degree is considered a transitional one, in terms of an upward change of scale and density at the Scheme boundary towards Salamanca Place and the more distant City Centre. The distance of the site to Salamanca Place itself, is of the order of 200 metres.

6.6.4. The proposal would provide for and enhance the range of dwelling types and sizes available within this reasonably central neighbourhood. The proposal is considered acceptable in terms of performance Criteria P1.

6.7. Clause 11.4.2 Setbacks and Building Envelope Objectives state as follows:

'To control the siting and scale of dwellings to:

(a) provide reasonably consistent separation between dwellings on adjacent sites and a dwelling and its frontage; and

(b) provide consistency in the apparent scale, bulk, massing and proportion of dwellings; and

(c) provide separation between dwellings on adjacent sites to provide reasonable opportunity for daylight and sunlight to enter habitable rooms and private open space'.

6.8. Setbacks and building envelope Clause 11.4.2 A1: states a front setback of 3 metres, or, not less than neighbouring frontage setbacks. A front setback of 0.5m is proposed to the Montpelier Retreat and Knopwood Street frontages, and 2.0 metres to James Street (this being level 00 on DA04 rev B dated 28/8/2015, comprising the lowest level of proposed dwellings). The carpark level on DA03 ref F dated 14/9/2015 would have nil setback to the James Street frontage but would be effectively underground with relation to that frontage. Note: Council landlord (General Manager) consent has been obtained for a section of 'user road' footpath in Montpelier Retreat which is within the developer's title and for external shutters on windows that would be over the Montpelier Retreat and Knopwood Street road reservations.

6.8.1. Clause 11.4.2 P1 states the front setback of a dwelling must (a) be compatible with the relationship of existing buildings to the road in terms of setback in response to slope or other physical constraints of the site, and (b) have regard to streetscape qualities or assist in the integration of the new development into the streetscape.

6.8.2. The applicant submission (Town Planning Report P13) states *'The proposal meets these criteria as the dwellings and other buildings in the block are all (with only slight variations) built to the street alignment or close to the street'.*

6.8.3. The existing former Elliot's building on site is built to the respective Montpelier Retreat and Knopwood Street frontages. The neighbouring building at 5 Knopwood Street is built to the James Street frontage.

6.8.4. Buildings in the vicinity are generally sited at or close to street frontages in this inner residential/fringe city centre location. Office buildings built close to or on the site frontage (the multi storey Kirksway House and Knopwood House) are sited immediately to the north and west within the area of the Sullivans Cove Planning Scheme 1997.

6.8.5. The proposal is considered acceptable in terms of the front setback provision.

6.9. Setbacks and building envelope Clause 11.4.2 A3 states 'The Acceptable Solution does not apply to Heritage Precinct BP1'. Council legal advice is that Clause 11.4.2 A3 is not applicable, as the site is located within BP1.

Consideration of the proposal with respect to setbacks and building envelope is therefore solely under the provisions of the Historic Heritage Code.

6.10. Site coverage and private open space Clause 11.4.3 A1 (a), (b) and (c): respectively; site coverage exceeds 50%, private open space less than 50sqm per dwelling, site area free of impervious surfaces less than 25%.

6.10.1. Site coverage and private open space: Performance Criteria 11.4.3 P1 states as follows:

Dwellings must have:

(a) private open space that is of a size and dimensions that are appropriate for the size of the dwelling and is able to accommodate:

(i) outdoor recreational space consistent with the projected requirements of the occupants and, for multiple dwellings, take into account any communal open space provided for this purpose within the development; and

(ii) operational needs, such as clothes drying and storage;

unless the projected requirements of the occupants are considered to be satisfied by public open space in close proximity; and

(b) reasonable space for the planting of gardens and landscaping.

6.10.2. Nearly all dwellings on site would have outdoor private space. Dwellings 1 to 18 facing Montpelier Retreat would all have decks facing west/northwest with a size of generally upwards of 10 square metres. Dwelling 18 would have a deck area of 50 square metres. In the James Street building, dwellings 19 to 22 would each have a ground level private open area of from 15 to 18 square metres in area. Dwellings 23 to 30 would have west/northwest facing decks again generally upwards of 10 square metres. The sole dwelling with no external space would be No.31 on level 2 of the James Street building. It would be of single bedroom size, with windows/shutters facing east/southeast over James Street.

The applicant submission (Town Planning Report P15) states the proposed central courtyard would be a shared green space. The applicant states the open areas would be suited for operational needs including clothes drying. As an inner city residential development, it is noted that there would be a high degree of site coverage. This would result from the basement carpark covering a large portion of the site beneath both proposed buildings. The 'shared green space' for the use of all residents, would be above (at the lowest residential level).

There is substantial public open space existing in the vicinity, comprising Salamanca Place lawns and nearby open waterfront areas, St David's Park and Princes Park.

6.10.3. The proposal is considered acceptable in terms of Performance Criteria with regard to site coverage and private open space.

6.11. Site coverage and private open space Clause 11.4.3 A2 (a): dwelling 31: no private open space.

6.11.1. Clause 11.4.3 P2 states as follows:

A dwelling must have private open space that:

(a) includes an area that is capable of serving as an extension of the dwelling for outdoor relaxation, dining, entertaining and children's play that is:

(i) conveniently located in relation to a living area of the dwelling; and

(ii) orientated to take advantage of sunlight;

unless the projected requirements of the occupants are considered to be satisfied by communal open space or public open space in close proximity.

6.11.2. As stated previously, the sole dwelling with no external space would be No.31 on level 2 of the James Street building. It would be of single bedroom size, with windows/shutters facing east/southeast over James Street. As stated previously, there is substantial public open space in the vicinity, and some communal open space would be provided on site. Flat 31 is likely to maintain a reasonable standard of amenity.

6.11.3. The proposal is considered acceptable in terms of Performance Criteria with regard open space amenity for dwelling 31.

6.12. Sunlight and overshadowing Clause 11.4.4 A1: habitable rooms facing north.

6.12.1. Sunlight and overshadowing Acceptable Solution A1 states a dwelling must have at least one habitable room window (other than a bedroom) facing within 30 degrees west and 30 degree east of north. Performance Criteria P1 states *'A dwelling must be sited and designed so as to allow sunlight to enter at least one habitable room (other than a bedroom).*

6.12.2. The applicant submission (Town Planning Report P 17) states as follows:

> If the apartments were to be designed to meet the Acceptable Solutions, the building would face away from the main streets being James and Montpelier Retreat. This would be contrary to the streetscape and heritage requirements of the Scheme.
>
> The site is also overshadowed by the tall building to the north across Knopwood Street, so facing apartments to the north would be counterproductive and would not ensure sunlight was achieved.
>
> Facing the apartments to the east and west respectively ensures they can maximise the sunlight penetration to the living areas either morning or afternoon and retain a relationship to their surroundings.

6.12.3. Performance criterion11.4.4 P1 states:

A dwelling must be sited and designed so as to allow sunlight to enter at least one habitable room (other than a bedroom).

6.12.4. The dwellings in the main building (Nos. 1 to 18) and those in the James Street building (Nos. 19-30) would all have living room windows and decks facing west/northwest at the alignment of Montpelier Retreat and James Street. The angle to north would be 58 degrees. The remaining dwelling 31 in the James Street building, would face that frontage in an easterly/south easterly direction with an angle to north of 122 degrees. Dwellings 1 to 30 would capitalise on afternoon sun, although to a degree obscured by the nearby 4 and 6 storey office buildings. Dwelling 31 would face morning sun only. The degree of sun exposure is to a degree considered inevitable with any multiple storey dwelling development of an inner city site, constrained by the surrounding road system and built environment.

6.12.5. The likely amenity of the proposed dwellings is considered to be within reasonable limits. The proposal is considered acceptable in terms of 11.4.4 P1.

6.13. Sunlight and overshadowing Clauses 11.4.4 P2 and P3: state respectively as follows:.

6.13.1. *P2: A multiple dwelling must be designed and sited to not cause unreasonable loss of amenity by overshadowing a window of a habitable room (other than a bedroom), of another dwelling on the same site, that faces between 30 degrees west of north and 30 degrees south of north.*

P3: A multiple dwelling must be designed and sited to not cause unreasonable loss of amenity by overshadowing the private open space, of another dwelling on the same site, required in accordance with A2 or P2 of 11.4.3.

6.13.2. With relation to P2, the applicant submission (Town Planning Report P17) states as follows:

The dwellings are apartments. They are in alignment. They have been designed to catch morning or afternoon sun across the site as best they can when the site is already overshadowed to the north. No one apartment causes a loss of amenity to another apartment in terms of overshadowing.

6.13.3. With relation to P3, the applicant submission (Town Planning Report P17) states as follows:

The east/west orientation of the two buildings with the open space between them maximises the sunlight available to not only the living areas of the apartments but also the open spaces which are directly appurtenant to those living areas.

6.13.4. As previously stated, the dwellings in the main building (Nos. 1 to 18) and those in the James Street building (Nos. 19-30) would all have living room windows and decks facing west/northwest at the alignment of Montpelier Retreat and James Street. Dwelling 31 would face morning sun only. The degree of sun exposure is to a degree considered inevitable with any multiple storey dwelling development of an inner city site, constrained by the surrounding road system and built environment. The standard of amenity to habitable rooms and open space of dwellings within the proposed complex are considered likely to be reasonable, given the constraints of the site, the nature of the proposed development and built surroundings.

6.14. The likely amenity of the proposed dwellings is considered to be within reasonable limits. The proposal is considered acceptable in terms of Clauses 11.4.4 P2 and P3.

6.15. Privacy Clause 11.4.6 P2 (windows): requirement - 3 metres; proposed - less than 3 metres.

6.15.1. Clause 11.4.6 P2 states:

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 screened, or otherwise located or designed, to minimise direct views to:

(a) a window or glazed door, to a habitable room of another dwelling; and

(b) the private open space of another dwelling; and

(c) an adjoining vacant residential lot.

6.15.2. The applicant submission (Town Planning Report P18) states as follows.

(a) There are specific points within the complex where second bedrooms have windows into the same light - well/hanging garden as windows of adjoining units. In all these cases the hanging garden and offset of the windows ensures no direct privacy issues.

(b) The design has ensured that no window of any dwelling looks into the private open space of another dwelling. This is done principally by orientation of the apartments and secondarily by screens and landscaping. Therefore (b) is satisfied.

(c) The site has no adjacent vacant blocks (and is) therefore not applicable. As previously stated the distance between the two apartment buildings is in excess of 8 metres and the balconies and windows all have movable screens to maximise privacy when needed while still maintaining ventilation and outdoor space.

6.15.3. With regard to the main building, dwelling windows would face the respective Montpelier Retreat and Knopwood Street frontages. Facing the neighbouring site at No.5 Knopwood Street (the restaurant) would be screened communal lobby and walkway areas. There would be no side windows facing the neighbouring property at Nos. 46-48 Montpelier Retreat. This section of the proposal is therefore compliant with acceptable solution 11.4.6 A2 and does not rely on any performance criteria.

6.15.4. With regard to the James Street building, main windows would face the street and rearwards. The rear facing windows on the James Street buildings would be set back well in excess of the required 6 metre setback to the rear of the dwellings in the main building. The street and rear-facing windows within the James Street building are therefore compliant with acceptable solution 11.4.6 A2 and do not rely on any performance criteria.

6.15.5. To the part of the north facing wall of the James Street building (facing the neighbouring site at No.5 Knopwood Street (the restaurant/bar)), would be 'vertical timber battens in front of a glazed wall'. It is unclear whether acceptable solution 11.4.6 A2 is intended to have regard to the relationship between habitable room windows overlooking commercial neighbours. However, looking at the wording of that provision, which states:

> *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 or rear boundary; and*
>
> *(ii) 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 anotherdwelling on the same site; and*
>
> *(iii) 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.*
>
> *(b) the window or glazed door:*

(i) is to be offset, in the horizontal plane, at least 1.5m 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%.

it is arguable that the north-facing glazed wall behind vertical timber battens doesn't meet the acceptable solution and therefore warrants assessment against performance criteria 11.4.6 P2 (stated above). Adopting a precautionary approach is recommended and assessment against the performance criterion follows.

6.15.6. There may be some overlooking of the neighbouring commercial property. That building is built up to the side property boundary with a one to two storey side wall abutting the applicant site. There is unlikely to be any excessive impact. Noting that the timber battens will provide a reasonable degree of screening and that the intent of clause 11.4.6 is to *reduce the potential for loss of privacy for dwellings,* this glazing meets performance criterion 11.4.6 P2.

6.15.7. Lastly, with regard to the James Street building, there would be south/southwest facing side windows, facing in the direction of Nos.9-11 James Street. The windows would be over three levels opening from the living and/or bedroom areas of three separate dwellings. The neighbouring dwelling at No.9 James Street has three side facing windows of small size, two at the lower level and one at the upper dormer level. The separation between the applicant and neighbouring walls would be over 5.2 metres. Clause 11.4.6 A2 (b)(i) states a 1.5 metre offset requirement. Based on the submitted plans showing proposed window openings in this wall, there would appear to be an offset of windows although not likely to be as much as 1.5 metres. These windows therefore require assessment against performance criterion 11.4.6 P2.

6.15.8. There may be some overlooking of the neighbouring property at Nos.9-11 James Street. On the other hand, given the likely offset and the overall 5.2 metre separation between walls (given the intervening right of way), impact is not considered likely to be excessive. It is noted that the lower level dwelling on level 01, would have a floor level of less than one metre above ground facing this neighbour. The level 01 windows would therefore comply with 11.4.6 A2.

6.15.9. The proposal is considered acceptable with regard to Privacy Clause 11.4.6.

6.16. Clause E17.6.1 P4 - Sign.

6.16.1. The applicant states the sole sign would be a wall sign facing Knopwood Street, 'backlit', stating 'Elliotts Apartments', with dimensions 150mm (0.15 of a metre) high by approximately two metres long.

6.16.2. Clause E17.3 of the Signs Code defines the proposal as a wall sign.

6.16.3. Clause E.17.6.1 A4 states an illuminated sign must not be located within 30 metres of a residential use.

6.16.4. Clause E.17.6.1 P4 then states:

An illuminated sign within 30 metres of a residential use must not have an unreasonable impact upon the residential amenity of that use caused by light shining into windows of habitable rooms.

6.16.5. The proposal is considered to meet Performance Criteria P4 as it would be of low key deign and illumination, and would face a multi level office building.

6.16.6. Table 17.2 Sign standards states for a wall sign: message on front face only minimal projection from face or height of wall, and sign area no more than 2 square metres.

6.16.7. The proposal would meet the Sign Standards and is considered acceptable.

6.17. Heritage.

6.17.1. The following heritage criteria have been assessed by Council's Senior Cultural Heritage Officer:

6.17.1.1. Historic Heritage Code Clause E.13.8.2: A1, A2, A3: no acceptable solution.

6.17.1.2. Historic Heritage Code Clause E.13.8.4: buildings and works in Heritage Precinct BP1: A1: site area per dwelling not less than 350sqm (46.77sqm proposed).

6.17.1.3. Historic Heritage Code Clause E.13.8.4: buildings and works in Heritage Precinct BP1: A2, A4 and A7: no acceptable solution.

6.17.1.4. Historic Heritage Code Clause E.13.8.4: buildings and works in Heritage Precinct BP1: A3: maximum height 2 storeys (6 storeys).

6.17.1.5. Historic Heritage Code Clause E.13.8.4: buildings and works in Heritage Precinct BP1: A5: rear setback requirement of 5 metres (nil proposed).

6.17.1.6. Historic Heritage Code Clause E.13.8.4: buildings and works in Heritage Precinct BP1: A6: lot coverage would exceed 40%.

6.17.2. The comment of the Council's Senior Cultural Heritage Officer is as follows:

The proposal is similar to the previous application reviewed in 2015. Assessment of the various modifications to that earlier proposal has been undertaken. The conclusion is that, in terms of the Historic Heritage Code, the proposal still fails to meet requisite performance criteria.

There is nothing in the revised scheme which requires modification to the previous appraisal. The comments apply equally to the revised proposal.

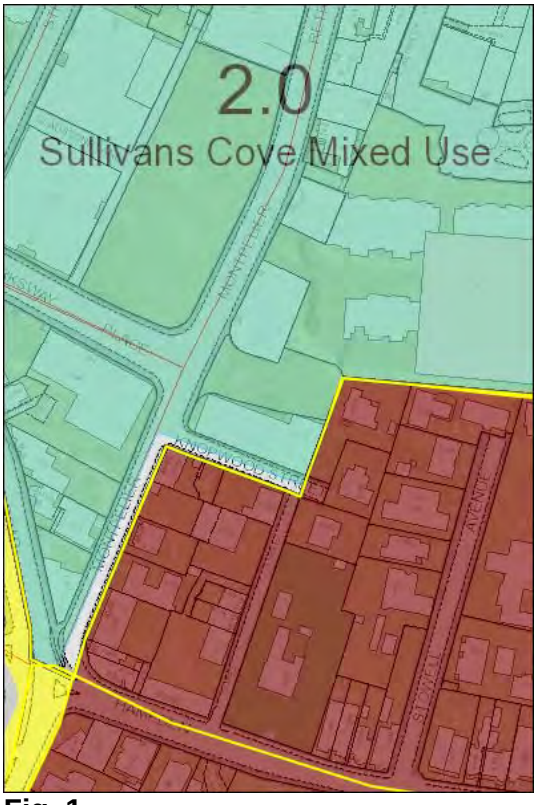


Fig. 1

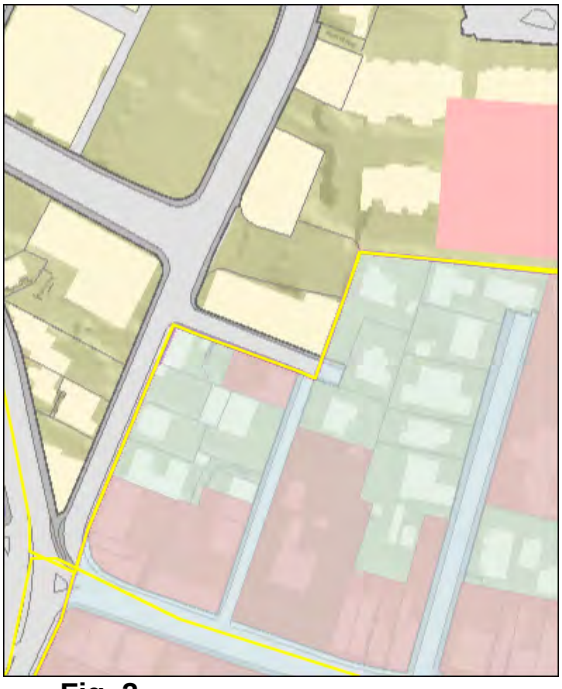


Fig. 2

Fig. 1 shows the planning scheme and zoning boundary; the green is Sullivans Cove Planning Scheme 1997 – Mixed Use Zone, and the brown is Hobart Interim Planning Scheme 2015 – Inner Residential Zone.

Fig. 2 shows the boundary of the Heritage Precinct BP1.

The proposed development is located within the planning area of the Hobart Interim Planning Scheme 2015. The site of the proposed development is wholly contained within the Heritage Precinct BP1.

The application is therefore subject to consideration under the E13.8 of the Historic Heritage Code of the planning scheme (Development Standards for Heritage Precincts) – specifically E13.8.2 (Buildings and Works other than Demolition) and E13.8.4 (Buildings and Works in Heritage Precinct BP1).

The following relevant provisions apply to **Heritage Precincts**:

E13.8.2

Objective:
To ensure that development undertaken within a heritage precinct is sympathetic to the character of the precinct.

Acceptable Solutions	***Performance Criteria***
A1	*P1*
No Acceptable Solution	*Design and siting of buildings and works must not result in detriment to the historic cultural heritage significance of the precinct, as listed in Table E13.2.*
A2	*P2*
No Acceptable Solution	*Design and siting of buildings and works must comply with any relevant design criteria / conservation policy listed in Table E13.2, except if a heritage place of an architectural style different from that characterising the precinct.*
A3	*P3*
No Acceptable Solution	*Extensions to existing buildings must not detract from the historic cultural heritage significance of the precinct.*

A4	*P4*
New front fences and gates must accord with original design, based on photographic, archaeological or other historical evidence.	*New front fences and gates must be sympathetic in design, (including height, form, scale and materials), and setback to the style, period and characteristics of the precinct.*
A5	*P5*
Areas of landscaping between a dwelling and the street must be retained.	*The removal of areas of landscaping between a dwelling and the street must not result in the loss of elements of landscaping that contribute to the historic cultural significance or the streetscape values and character of the precinct.*

The significance of the Heritage Precinct is described in Table E13.2:

BP1

Battery Point

This precinct is significant for reasons including:

1. *The wide variety of architectural styles and historic features ranging from entire streets of 19th century Colonial Georgian cottages, to Victorian, Edwardian and Pre and Post War examples of single and attached houses that are of historic and architectural merit, many of which demonstrate housing prior to mass car ownership.*

2. *It is primarily a residential area with a mix of large substantial homes and smaller workers cottages on separate lots, gardens, an unstructured street layout, and lot sizes that show successive re-subdivision into narrow lots that demonstrate early settlement patterns of Hobart.*

3. *The original and/or significant external detailing, finishes and materials demonstrating a high degree of integrity with a homogenous historic character.*

Specific development standards apply in **Heritage Precinct BP1**:

E13.8.4 Buildings and Works in Heritage Precinct BP1

Objective:

To ensure that development undertaken within Heritage Precinct BP1 is sympathetic to the character of the precinct.

Acceptable Solutions	***Performance Criteria***
A1	*P1*
Site area per dwelling unit in Heritage Precinct BP1 must be not less than 350m2.	*Site area per dwelling may be less if the development does not detract from the pattern of development that is a characteristic of the cultural heritage significance of the precinct in the vicinity of the site.*
A2	*P2*
No acceptable solution.	*Buildings should be close to the street frontage except where the prevailing setback on the same side of the street is substantial, in which case the setback shall conform to the general building line.*
A3	*P3*
Building height (not including the basement or attic floor space with dormer windows) must not be greater than two storeys, or one storey if most buildings on the same side of the street in the immediate vicinity are single storey.	*The height of development must neither be obtrusive in the streetscape nor detract from the pattern of development that is a characteristic of the cultural heritage significance of the precinct in the vicinity of the site.*

A4	*P4*
No acceptable solution.	*Where reasonable and practicable, a dwelling must substantially occupy the width of the frontage of a lot, except where the prevailing setbacks from side boundaries on the same side of the street are substantial and not so as to exclude a driveway or car parking at the side of the building.*
A5	*P5*
The rear setback of the principal building must be at least: *(a) 6 m for lots of up 14 m in width;* *(b) 5 m for lots greater than 14 m in width.*	*The rear setback of the principal building must not detract from the layout pattern of development that contributes to the cultural heritage significance of the precinct and its contribution to private amenity facilitated by the 'house and garden' form of development.*
A6	*P6*
A site where the principal building, excluding the basement, in part or whole is: *(a) not more than one storey in height, or one storey comprising attic floor space with dormer windows, must have a site coverage of not more than 50%;* *(b) two or more storeys must have a site coverage of not more than 40%.*	*The building must not detract from the pattern of development that is a characteristic of the cultural heritage significance of the Precinct in the vicinity of the site.*

A7	*P7*
No acceptable solution.	*Land directly between a dwelling and the street shall not be designed or paved or used for the manoeuvring or parking of vehicles except to gain access.*
A8	*P8*
No acceptable solution.	*Each lot must have not more than one crossing over the footpath per frontage and have a maximum width of 3m unless it can be demonstrated that the crossing and its width is essential and will:* *(a) not detract from the historic cultural heritage significance of the precinct;* *(b) provide a net benefit in parking quantum taking into account any loss in on-street parking required to facilitate the additional or wider access.*
A9	*P9*
Maximum of 1 parking space per dwelling.	*Parking must not detract from the cultural heritage significance or the setting of existing dwellings.*

Characteristics of Precinct

The planning scheme articulates the significance of the Heritage Precinct BP1 (see above). The present suburb of Battery Point evolved from a series of subdivisions in the mid nineteenth century.

The area contains several large houses from the 1830s such as Secheron, Narryna and Stowell, which were built on large estates with access from the primary roadway, Hampden Road, which runs as a spine through the centre of the suburb. When these larger estates were subdivided, the smaller streets such as Kelly Street, South Street and many others were established, with many Georgian style (though Victorian period) cottages, conjoined townhouses and terraces springing up. This pattern of evolution continued into the twentieth century.

The block bounded by Knopwood Street, James Street, Hampden Road and Montpelier Retreat has always been part of Battery Point, and its buildings relate to the pattern of development within the neighbouring streets of Battery Point. The buildings within this block are either single or two-storey, and the majority date from the nineteenth or early twentieth century – much like the remainder of Battery Point. The tallest building within the block, Portsea Terrace, is essentially a two storey structure with a basement.

The characteristics of the precinct and this particular block are starkly contrasted with the nature of the adjoining precinct (and planning area). On the opposite side of Montpelier Retreat is a six storey office structure, while on the opposite side of Knopwood Street is a four storey office building. These buildings represent a dramatic departure from the low level residential scale buildings within the block of the proposed development.

The proposed development relies on the existence of these incompatible structures across the road to justify a significant departure from the standards applying to the subject site.

The development requires an assessment against the criteria applicable to the relevant site, which is within the Battery Point Heritage Precinct (BP1) of the *Hobart Interim Planning Scheme 2015*.

Assessment

E13.8.2

The Objective of E13.8.2 is *"To ensure that development undertaken within a heritage precinct is sympathetic to the character of the precinct."*

Performance criterion P1 states:

> *Design and siting of buildings and works must not result in detriment to the historic cultural heritage significance of the precinct, as listed in Table E13.2.*

The proposed development will result in detrimental impact upon the significance of the precinct by virtue of the height, scale and building form of the proposed structure. The proposed building is far higher than anything nearby within the Heritage Precinct.

Performance criterion P2 states:

> *Design and siting of buildings and works must comply with any relevant design criteria / conservation policy listed in Table E13.2, except if a heritage place of an architectural style different from that characterising the precinct.*

The proposed development represents a significant departure from the design and siting of buildings typically found within the Heritage Precinct.

The significance of the Heritage Precinct is described in Table E13.2:

As stated previously, specific development standards apply in **Heritage Precinct BP1**:

The objective of E13.8.4 (Buildings and Works in Heritage Precinct BP1) is stated as:

> *To ensure that development undertaken within Heritage Precinct BP1 is sympathetic to the character of the precinct.*

The proposed development must be assessed against Performance Criteria including the following:

> *P1*
>
> *Site area per dwelling may be less if the development does not detract from the pattern of development that is a characteristic of the cultural heritage significance of the precinct in the vicinity of the site.*
>
> *P3*
>
> *The height of development must neither be obtrusive in the streetscape nor detract from the pattern of development that is a characteristic of the cultural heritage significance of the precinct in the vicinity of the site.*
>
> *P6*
>
> *The building must not detract from the pattern of development that is a characteristic of the cultural heritage significance of the Precinct in the vicinity of the site.*

Does the development detract from the pattern of development that is a characteristic of the cultural heritage significance <u>of the precinct</u> in the vicinity of the site? (P1) The development represents a significant departure from the pattern of development within the Heritage Precinct. The extent to which it detracts is somewhat reduced by the proximity of incongruous buildings across the road in the Sullivan Cove planning area. However, considering the development site as part of the Battery Point Heritage Precinct BP1 (which it is), the proposed development clearly detracts from the pattern of development within this particular block and the precinct generally within the local vicinity of the site.

Is the height of development obtrusive in the streetscape or does it detract from the pattern of development that is a characteristic of the cultural heritage significance of the precinct in the vicinity of the site? (P3) The height of the proposed development, accentuated by the geometry of the building form, marks a dramatic departure from the pattern of development in the precinct, within the vicinity of the site. In terms of height, the proposed building takes its cues from existing incompatible structures outside the Heritage Precinct, and extends beyond them. The proposed building on the corner of Knopwood [Street] and Montpelier Retreat will be prominent and conspicuous, especially when viewed from those public streets. The photomontages included within the application documents are somewhat deceptive, as the wide camera angle has the effect of reducing the visual impact of distant buildings.

P6 arises from consideration of building height also:

A6	*P6*
A site where the principal building, excluding the basement, in part or whole is: *(a) not more than one storey in height, or one storey comprising attic floor space with dormer windows, must have a site coverage of not more than 50%;* *(b) two or more storeys must have a site coverage of not more than 40%.*	*The building must not detract from the pattern of development that is a characteristic of the cultural heritage significance of the Precinct in the vicinity of the site.*

The proposed development does not meet the acceptable solutions (A6). Does the building detract from the pattern of development that is a characteristic of the cultural heritage significance of the Precinct in the vicinity of the site? (P6) The proposed development is significantly higher than neighbouring buildings within the block and within the Heritage Precinct. The proposed development, by virtue of its height and form detracts from the pattern of development that is a characteristic of the cultural heritage significance of the Precinct in the vicinity of the site.

Conclusion

The proposed development fails to meet critical performance criteria relevant to the location of the subject site within Heritage Precinct BP1. It is as though the application assumes that the development standards associated with the nearby incongruous office buildings apply to the subject site. They don't. This site is within a different planning area, and within a Heritage Precinct. There are specific standards within the planning scheme to protect the character of the Heritage Precinct – which is one of the earliest developed parts of Hobart.

With an understanding of the relevant heritage provisions relating to the subject site, approval of the proposed development in its current form is not warranted.

Reasons for refusal:

1. The proposed development does not meet performance criterion E13.8.2 P1, because the design and siting of the buildings and works will result in detriment to the historic cultural heritage significance of the precinct, as listed in Table E13.2

2. The proposed development does not meet performance criterion E13.8.2 P2 as the design and siting of buildings and works does not comply with relevant design criteria / conservation policy listed in Table E13.2.

3. The proposed development does not meet performance criterion E13.8.4 P1 as the scale and form of the proposed development will detract from the pattern of development that is a characteristic of the cultural heritage significance of Heritage Precinct BP1 precinct in the vicinity of the site.

4. The proposed development does not meet performance criterion E13.8.4 P3 because the height of the proposed development is obtrusive in the streetscape and detracts from the pattern of development that is a characteristic of the cultural heritage significance of Heritage Precinct BP1 in the vicinity of the site.

5. The proposed development does not meet performance criterion E13.8.4 P6 as the height and form of the proposed building detracts from the pattern of development that is a characteristic of the cultural heritage significance of the Heritage Precinct BP1 in the vicinity of the site.

6.18. Historic Heritage Code Clause E.13.8.4: buildings and works in Heritage Precinct BP1: A8 : no acceptable solution.

6.18.1. Clause E.13.8.4 P8 states:

Each lot must have not more than one crossing over the footpath per frontage and have a maximum width of 3 m unless it can be demonstrated that the crossing and its width is essential and will:

(a) not detract from the historic cultural heritage significance of the precinct;

(b) provide a net benefit in parking quantum taking into account any loss in on-street parking required to facilitate the additional or wider access.

6.18.2. A single entrance is proposed.

6.18.3. The Council's Senior Cultural Heritage Officer raises no concern with regard to vehicular access to the site.

6.19. Historic Heritage Code Clause E.13.8.4 A9 requires a maxmimum of 1 parking space per dwelling. 34 spaces would be provided on site for 31 dwellings.

6.19.1. Clause E13.8.4 P9 states:

Parking must not detract from the cultural heritage significance or the setting of existing dwellings.

6.19.2. The Council's Senior Cultural Heritage Officer raises no concern with regard to car parking provision at the site.

7. Discussion

7.1. The proposal is recommended for refusal by the Council's Senior Cultural Heritage Officer under the Historic Heritage Code of the *Hobart Interim Planning Scheme 2015*.

7.2. Setbacks and building envelope Clause 11.4.2 A3 states 'The Acceptable Solution does not apply to Heritage Precinct BP1'. Council legal advice is that Clause 11.4.2 A3 is not applicable, as the site is located within BP1.

Consideration of the proposal with respect to setbacks and building envelope is therefore solely under the provisions of the Historic Heritage Code.

7.3. With relation to the Parking and Access Code (E6), the Council's Development Engineer states conditional acceptance. The officer recommends conditional approval of the proposal overall.

8. Conclusion

8.1. The proposed demolition and redevelopment for 31 dwellings at 40-44 Montpelier Retreat and adjacent road reservation, Battery Point does not satisfy the relevant provisions of the *Hobart Interim Planning Scheme 2015,* and as such is recommend for refusal.

9. Recommendations

That: A. Pursuant to the *Hobart Interim Planning Scheme 2015*, the Council refuse the application for a demolition and redevelopment for 31 dwellings at 40-44 Montpelier Retreat and adjacent road reservation, Battery Point on the following grounds:

1. The proposed development does not meet performance criterion E13.8.2 P1, because the design and siting of the buildings and works will result in detriment to the historic cultural heritage significance of the precinct, as listed in Table E13.2

2. The proposed development does not meet performance criterion E13.8.2 P2 as the design and siting of buildings and works does not comply with relevant design criteria / conservation policy listed in Table E13.2.

3. The proposed development does not meet performance criterion E13.8.4 P1 as the scale and form of the proposed development will detract from the pattern of development that is a characteristic of the cultural heritage significance of Heritage Precinct BP1 precinct in the vicinity of the site.

4. The proposed development does not meet performance criterion E13.8.4 P3 because the height of the proposed development is obtrusive in the streetscape and detracts from the pattern of development that is a characteristic of the cultural heritage significance of Heritage Precinct BP1 in the vicinity of the site.

5. The proposed development does not meet performance criterion E13.8.4 P6 as the height and form of the proposed building detracts from the pattern of development that is a characteristic of the cultural heritage significance of the Heritage Precinct BP1 in the vicinity of the site.

(Richard Bacon)
DEVELOPMENT APPRAISAL PLANNER

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

(Rohan Probert)
SENIOR STATUTORY PLANNER

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Date of Report: 30 March 2016

Attachment(s) Attachment A – Documents and Drawings List
Attachment B – TasWater form Reference No. TWDA 2015/01258-HCC dated 26/8/2015.
Attachment C – Documents and Drawings (including drawings, shadow diagrams, montages)
Attachment D – Amended Proposal Consultant Planners Report - Kate Loveday, January 2016
Attachment E – Architectural Report to Accompany DA Proposal – Circa Morris Nunn, Architects, February 2016

Supporting Document(s) Attachment 1 – photomontage from direction of Sandy Bay Road, submitted 16 March 2016.

Attachment A

Documents and Drawings that comprise
Planning Application Number - PLN-15-00971-01

DEVELOPMENT ADDRESS: **40-44 Montpelier Retreat, Adjacent Road Reservation, BATTERY POINT**

LIST OF DOCUMENTATION:

Description	Drawing Number/Revision/Author/Date, Report Author/Date, Etc	Date of Lodgement to Council
Application Form and owner notification, and Council General Manager consent		17/9/15
Titles		13/8/15
Location Plan	Drawing No: 1413 DA00 Revision No: Drawn by: Date of Drawing: 5/2/16	9/2/16
Site plan	Drawing No: 1413 DA01 Revision No: B Drawn by: Date of Drawing: 5/2/16:	9/2/16
Demolition plan	Drawing No: 1413 DA02 Revision No: D Drawn by: Date of Drawing: 5/2/16	9/2/16
Carpark plan	Drawing No: 1413 DA03 Revision No: G Drawn by: Date of Drawing: 5/2/16	9/2/16
Level 00 plan	Drawing No: 1413 DA04 Revision No: D Drawn by: Date of Drawing: 5/2/16	9/2/16
Level 01 plan	Drawing No: 1413 DA05 Revision No: D Drawn by: Date of Drawing: 5/2/16	9/2/16
Level 02 plan	Drawing No: 1413 DA06 Revision No: D Drawn by: Date of Drawing: 5/2/16	9/2/16
Level 03 + 04 plan	Drawing No: 1413 DA07 Revision No: D Drawn by: Date of Drawing: 5/2/16	9/2/16
Roof plan	Drawing No: 1413 DA08 Revision No: D Drawn by:	9/2/16

	Date of Drawing: 5/2/16	
North elevations	Drawing No: 1413 DA09 Revision No: B Drawn by: Date of Drawing: 5/2/16	9/2/16
East elevation building one	Drawing No: 1413 DA10 Revision No: C Drawn by: Date of Drawing: 5/2/16	9/2/16
South elevation	Drawing No: 1413 DA11 Revision No: C Drawn by: Date of Drawing: 5/2/16	9/2/16
West elevation	Drawing No: 1413 DA12 Revision No: E Drawn by: Date of Drawing: 5/2/16	9/2/16
East elevation building two	Drawing No: 1413 DA13 Revision No: B Drawn by: Date of Drawing: 5/2/16	9/2/16
Cross 01-03	Drawing No: 1413 DA14 Revision No: B Drawn by: Date of Drawing: 5/2/16	9/2/16
Shadow diagrams	Drawing No: 1413 DA15 Revision No: B Drawn by: Date of Drawing: 5/2/16	9/2/16
Montage Knopwood Street	Drawing No: 1413 DA16 Revision No: B Drawn by: Date of Drawing: 5/2/16	9/2/16
Montage James Street	Drawing No: 1413 DA22 Revision No: A Drawn by: Date of Drawing: 5/2/16	9/2/16
Montage corner of Kirksway Place and Montpelier Retreat	Drawing No: 1413 DA17 Revision No: B Drawn by: Date of Drawing: 5/2/16	9/2/16
Detailed section	Drawing No: 1413 DA18 Revision No: A Drawn by: Date of Drawing: 11/2/16	11/2/16
Shadow diagrams	Drawing No: 1413 DA19 Revision No: B B Drawn by: Date of Drawing: 5/2/16	9/2/16
Montage up Montpelier Retreat	Drawing No: 1413 DA20 Revision No: A Drawn by: Date of Drawing: 5/2/16	9/2/16

Montage down Montpelier Retreat	Drawing No: 1413 DA21 Revision No: A Drawn by: Date of Drawing: 5/2/16	9/2/16
Town planning report	Kate Loveday, Planning Consultant, January 2016	28/1/16
Architectural report	Circa Morris Nunn Architects February 2016	11/2/2016
Hydraulic Drawings	Project No: 15E19-3 Drawing No: H50 Revision No: 0 Drawn by: SL Date of Drawing: 28/7/2015	10/8/2015
Hydraulic Drawings	Project No: 15E19-3 Drawing No: H51 Revision No: 1 Drawn by: SL Date of Drawing: 25/8/2015	25/8/2015
Traffic Impact Assessment	Midson Traffic P/L August 2015	10/8/2015
Construction Environmental Management Plan	GES Geo-Environmental Solutions July 2015	18/8/2015
Project Note No.01: sign	Sign detail Job 1413 Project Note: No.01.	13/8/2015
Documentation	Applicant email 10.35am 28/8/2015	28/8/2015
Project Note No.02: shutters	Shutters detail and explanation Job No: 1413 Project note No.02	28/8/2015
Detail Survey	Project No: - Drawing No: Q763U-1 Revision No: - Drawn by: AC/MK PDA Surveyors Date of Drawing: 19/12/2012	28/8/2015
3 x Photograph/photomontages - existing and proposed, including seat, Montpelier Retreat frontage		17/9/2015
Project Note No.3: road reservation	Road reservation explanation Job No: 1413 Project note No.03	14/9/2015
Flythrough animation 1	40-44 Montpelier Retreat - flythrough_1 - 050216	5/2/2016
Flythrough animation 2	40-44 Montpelier Retreat - flythrough_2 - 050216	5/2/2016
Flythrough animation 3	40-44 Montpelier Retreat - flythrough - 3 100216	10/2/2016
Flythrough animation 4	40-44 Montpelier Retreat - flythrough_4 100216	10/2/2016
Flythrough animation 5	40-44 Montpelier Retreat - flythrough_5 100216	10/2/2016

Attachment B

Submission to Planning Authority Notice

Council Planning Permit No.	PLN-15-00971	Council notice date	13/08/2015
TasWater details			
TasWater Reference No.	TWDA 2015/01258-HCC	Date of response	26 Aug. 15
TasWater Contact	Anthony Cengia	Phone No.	(03) 6237 8243
Response issued to			
Council name	HOBART CITY COUNCIL		
Contact details	Development@hobartcity.com.au		
Development details			
Address	40-44 MONTPELIER RTT, BATTERY POINT	Property ID (PID)	5669846
Description of development	31 New apartment + car spaces		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Aldanmark Pty Ltd	15E19-3 Sheet H51	1	25-08-15

Conditions

SUBMISSION TO PLANNING AUTHORITY NOTICE OF PLANNING APPLICATION REFERRAL

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connections / sewerage system and connections to the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.
2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.
3. Prior to commencing construction / use of the development, a boundary backflow prevention device and water meter must be installed to the satisfaction of TasWater.

DEVELOPMENT ASSESSMENT FEES

4. The applicant or landowner as the case may be, must pay a development assessment fee to TasWater for this proposal of:
    a. $629.00 for development assessment as approved by the Economic Regulator and the fees will be indexed as approved by the Economic Regulator from the date of the Submission to Planning Authority Notice for the development assessment fee until the date they are paid to TasWater. Payment is required within 30 days from the date of the invoice.

Advice
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 The developer is responsible for arranging to locate existing TasWater infrastructure and clearly showing it on any drawings. Existing TasWater infrastructure may be located by TasWater (call 136 992) on site at the developer's cost, alternatively a surveyor and/or a private contractor may be engaged at the developers cost to locate the infrastructure.
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			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

Elliott's Apartments

Attachment C

Drawings List

1 Context plan
plan

for planning only

A1

Elliott's
Apartments

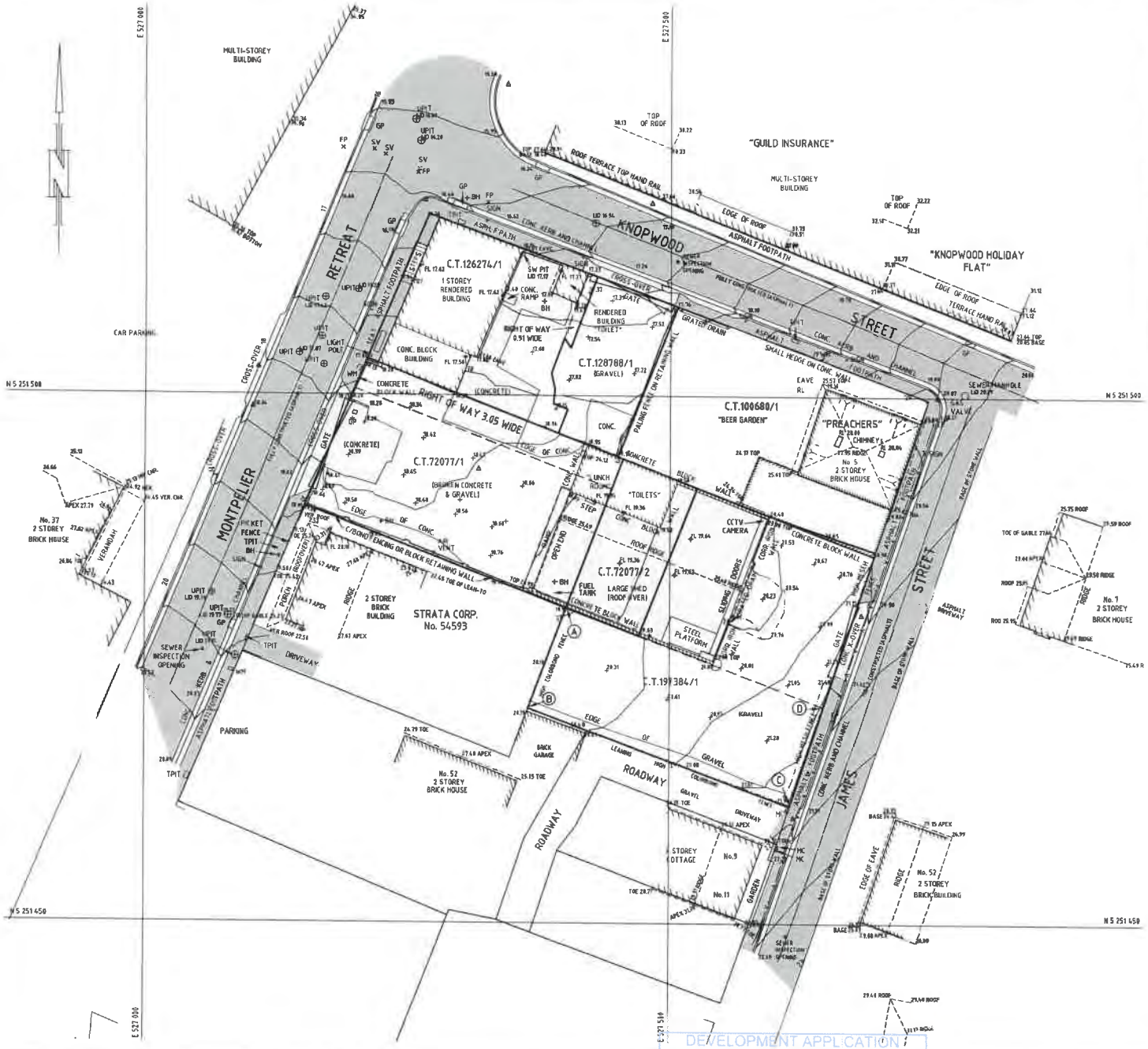
40-44 Montpelier Retreat,
Battery Point TAS.

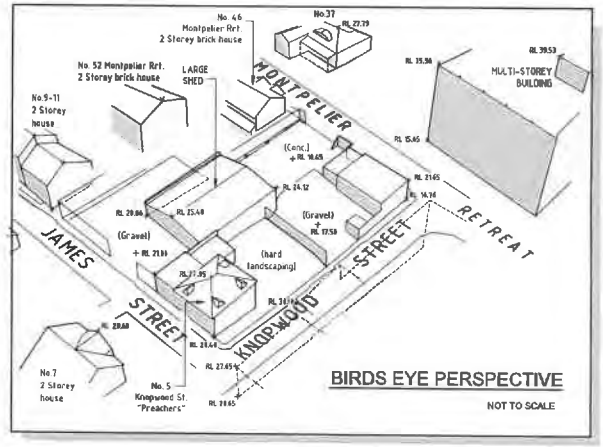
circa morris-nunn architects
Contact

location plan
plan

Development Application
Friday, 5 February 2016

1413 DA00





LEGEND

———	Title boundary
———	Surrounding boundary
—·—·—	Top/toe of bank
— / — / —	Fence (description as shown)
- - - - - -	Roof lines
——V——A——	Overhead powerline

LEGEND continued

GP	Grated Pit
UPIT	Unclassified pit
△	Survey Mark
BH	Monitoring bore hole
FL	Floor level
EP	Power pole
SV	Stop valve
FP	Fire plug

NOTES:

Date of Survey: 10 & 11 December 2012.

Bearing Datum is GDA94 per SPM 972 & SPM 974.

Horizontal Datum is MGA94 per SPM972, with coordinates of
E 526952.012
N 5251546.131 per the LIST.
All other coordinates have been treated as plane from this point.

Vertical datum is AHD per SPM 972 with reputed RL 23.467m.

While reasonable effort has been made to locate all visible above ground services, there may be other services which were not located during survey.

Only those features/points specifically requested by Sam Issa of Issa Group have been located and subsequently shown on this plan.

Prior to any demolition, excavation, final design or construction on this site, a comprehensive site investigation should be undertaken to locate all above and below ground service infrastructure.

All coordinates within this file, although stated to the nearest 0.001 metre, are approximate only and are only within 0.015m of the stated coordinate (horizontally and vertically). As heights of surrounding builds have been located by indirect measurements Accuracy of these points are ±0.100m Horizontally & vertically.

The boundaries shown on this plan are compiled from various old surveys and, as such, are approximate only. The "Preachers" building fronting on to James Street encroaches onto the subject property by up to 470mm also there are some discrepancies between titles at the south-west corner of "Preachers" and subject land. If any works are to be conducted on or near the boundary a re-establishment survey will be required.

The land marked "ABCD" on C.T.197384/1 has a right of carriage way over the ROADWAY adjoining the southern boundary.

Contour Interval 0.250m

Any DTM modeling that is to be done from the accompanying 3D digital file must be done using only the layer TRIANGLE_1 SURFACE to ensure that surface matches that verified by Peacock, Darcey & Anderson. No responsibility is taken for the use or interpretation of this data in any other format.

Some feature levels are not shown on this plan for clarity. These can be found turned on in model space or on the OFF Levels layer.

REV	AMENDMENTS	DRAWN	DATE	APPR.
E				
D				
C				
B				
A				

NOTES:

SCALE 1: 200 (A1) 1: 400 (A3)

SURVEYED	AC
DESIGNED	Q763U
DRAWN	AC / MK
CHECKED	HC
DATE	19 DECEMBER 2012

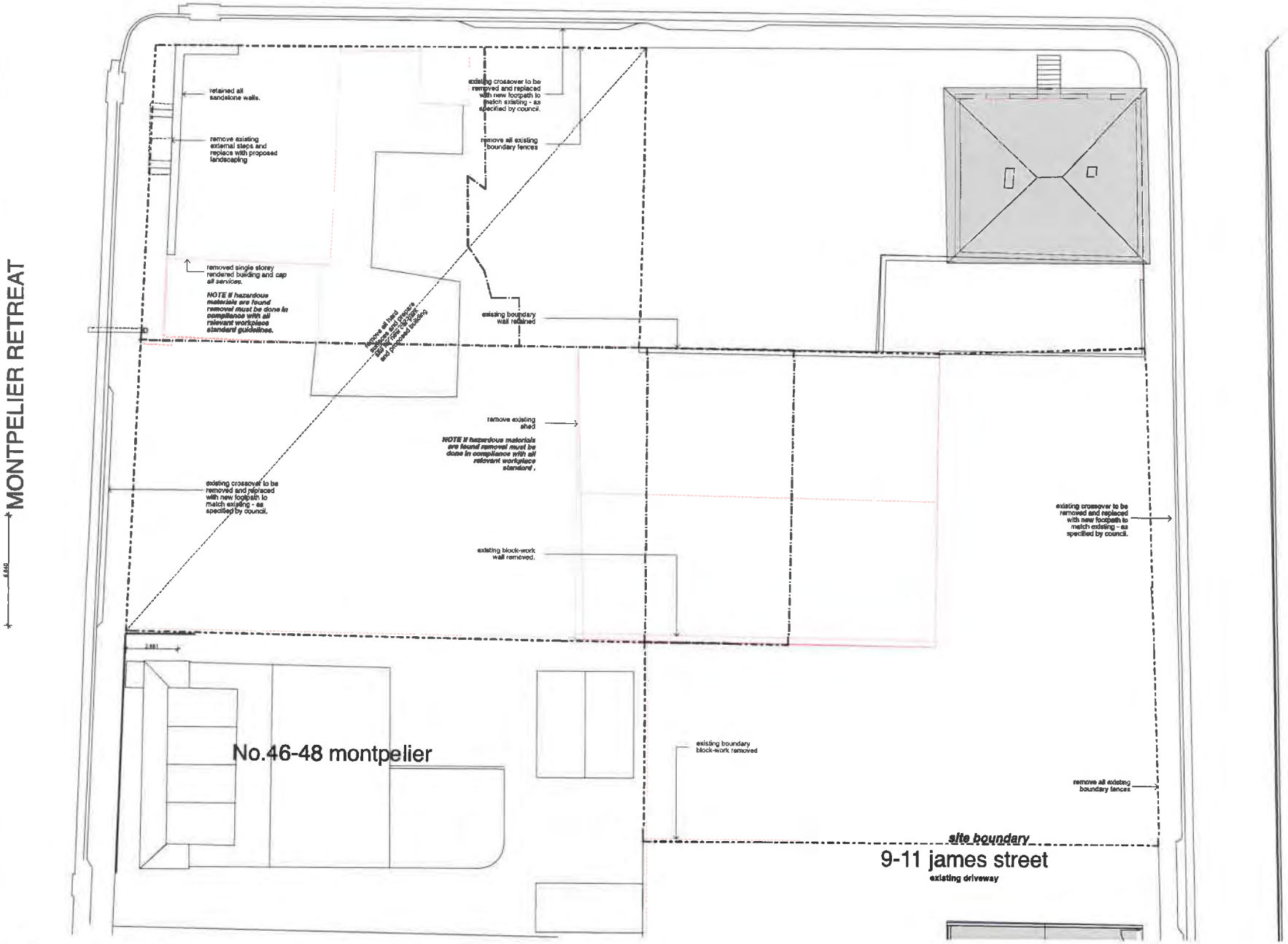
DETAIL SURVEY
40 - 44 MONTPELIER RETREAT, BATTERY POINT
for ISSA GROUP

PDA Surveyors
127 Bathurst Street
Hobart, Tasmania, 7000
www.pda.com.au
Also at Kingston, Launceston & Burnie
PHONE: +61 03 6234 3217
FAX: +61 03 6234 5065
EMAIL: pda.hbt@pda.com.au

SCALE	PAPER
1 : 200	(A1)
JOB NUMBER	DRAWING
Q763U	- 1

KNOPWOOD STREET

MONTPELIER RETREAT



1 demolition plan
plan scale 1:100

for planning only

A1

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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Contact

Demolition Plan

plan

Development Application

Friday, 5 February 2016

site plan 1:200
plan
scale 1:200

for planning only

A1

Elliott's
Apartments

40-44 Montpelier Retreat,
Battery Point TAS.

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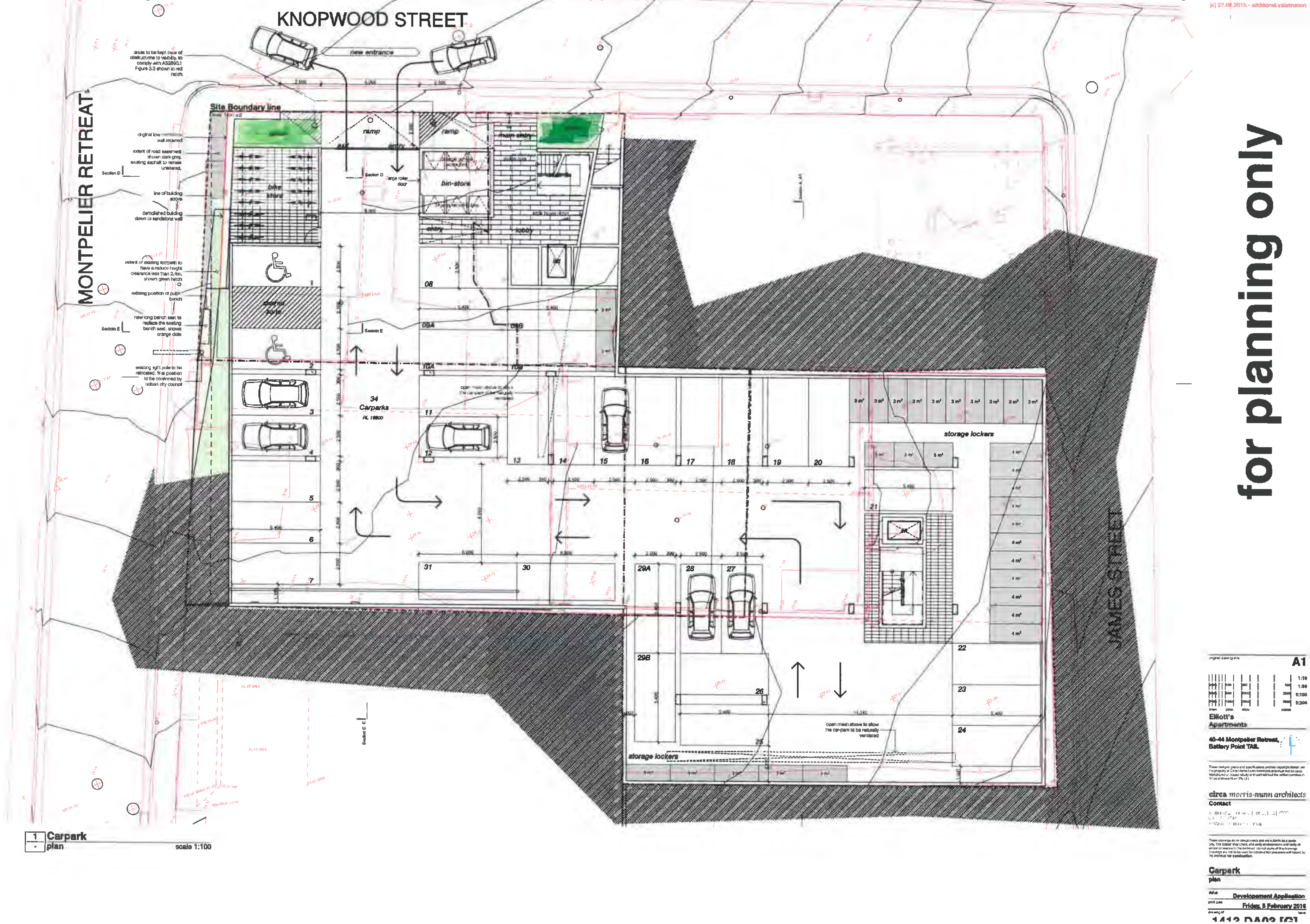
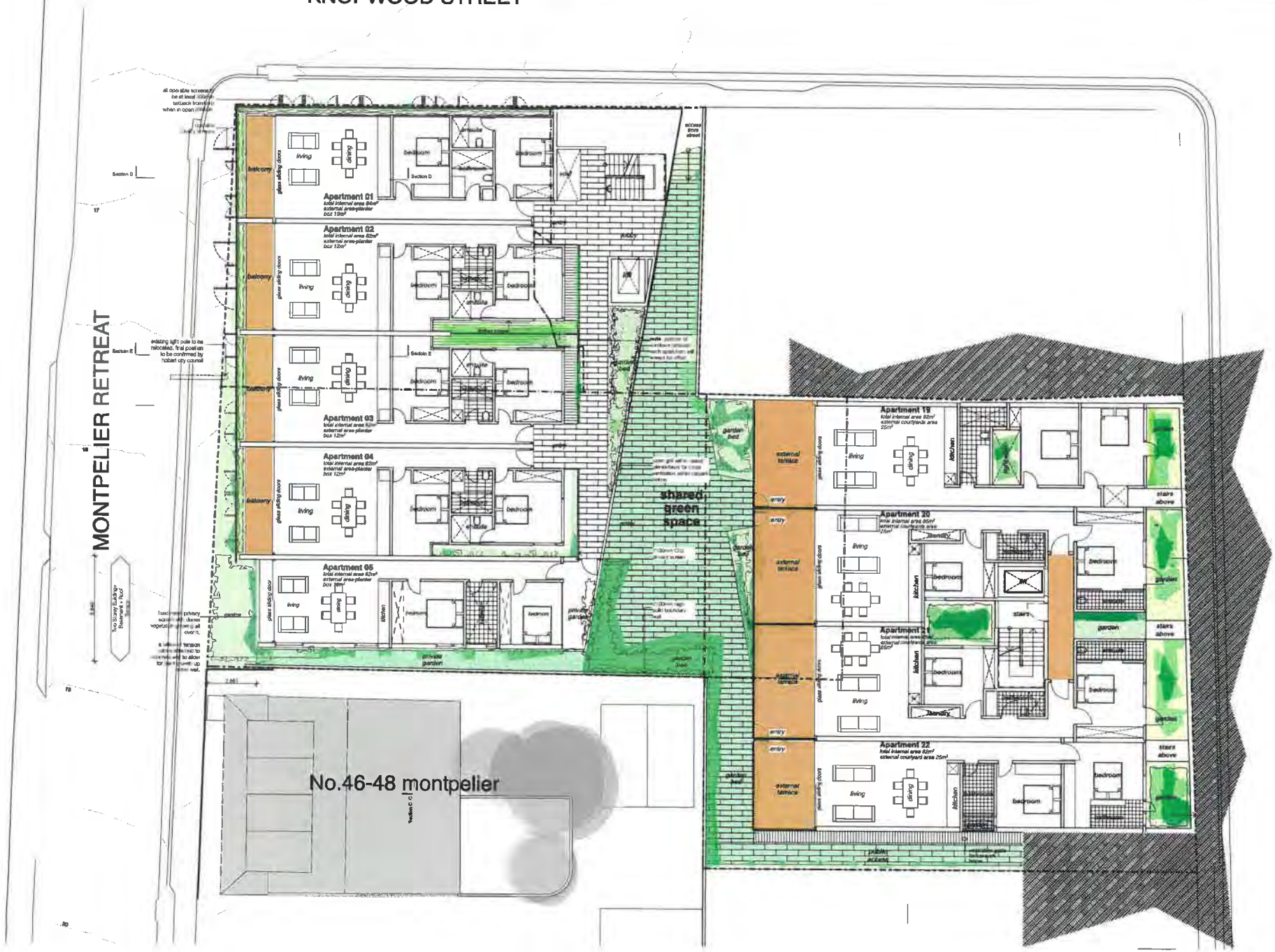
Contact

site
plan

Development Application
Friday, 5 February 2016


KNOPWOOD STREET
new entrance
MONTPELIER RETREAT
JAMES STREET
Site Boundary line
ramp
bike store
bin-store
main entry
lobby
34 Carparks
storage lockers
for planning only
1 Carpark plan
scale 1:100
A1
Elliott's Apartments
40-44 Montpelier Retreat, Battery Point TAS.
circa morris-nunn architects
Carpark plan
Development Application
Friday, 5 February 2016



for planning only

A1

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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Level 00 plan

Development Application

Friday, 5 February 2016

1 first floor plan scale 1:100

for planning only

Section A_A

original drawing size A1

1:10 1:50 1:100 1:200

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40-44 Montpelier Retreat, Battery Point TAS.

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Contact

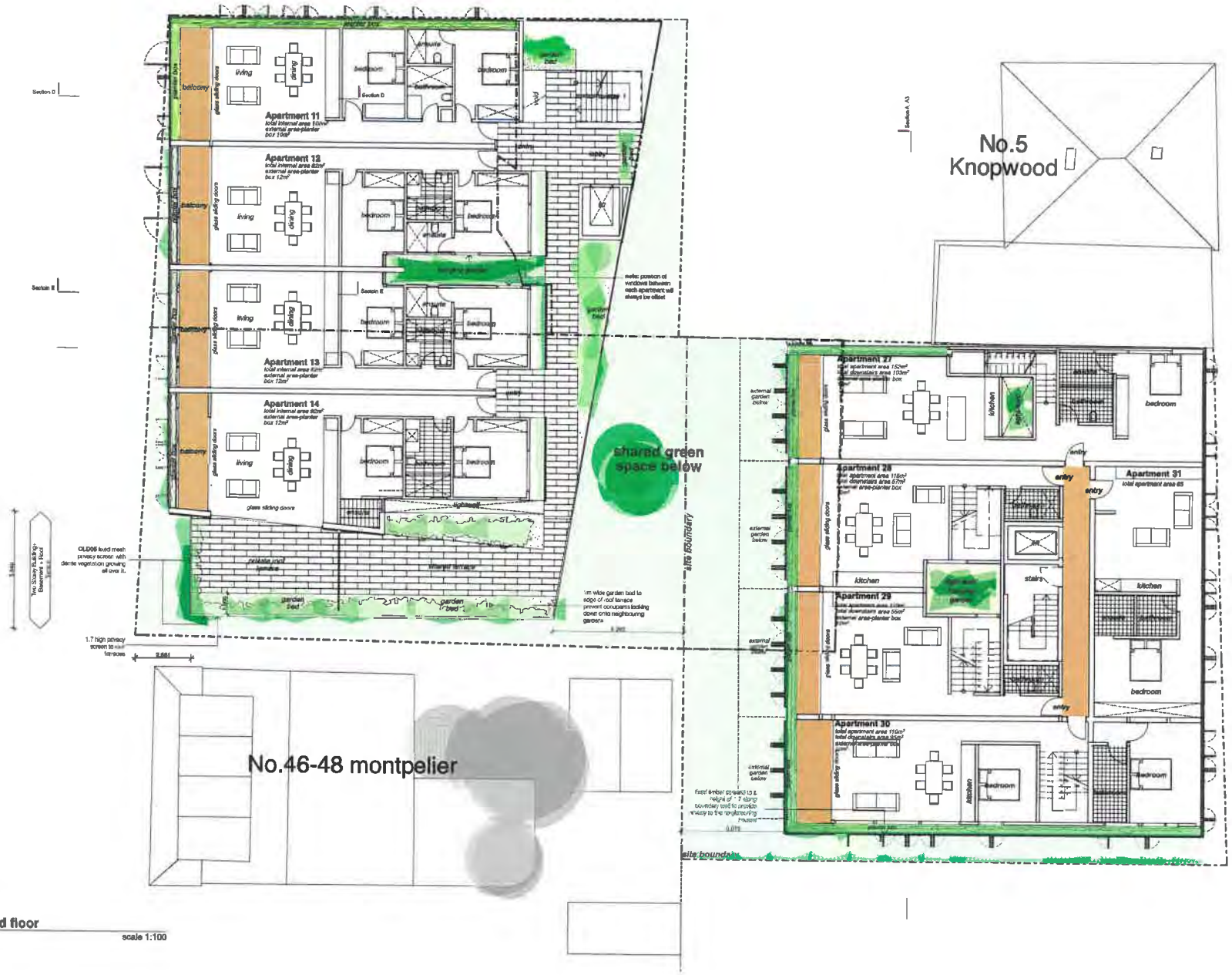
Level 01 plan

status Developement Application

print date Friday, 6 February 2015

drawing no 1413 DA05 [D]

[b] 27.08.2015 - additional information



1 - second floor plan

scale 1:100

for planning only

A1

1:10
1:50
1:100
1:200

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level 02
plan

status Developement Application

print date Friday, 5 February 2016

1413 DA06 [D]

2 4. four floor plan scale 1:100

1 3. thirdfloor plan scale 1:100

A1

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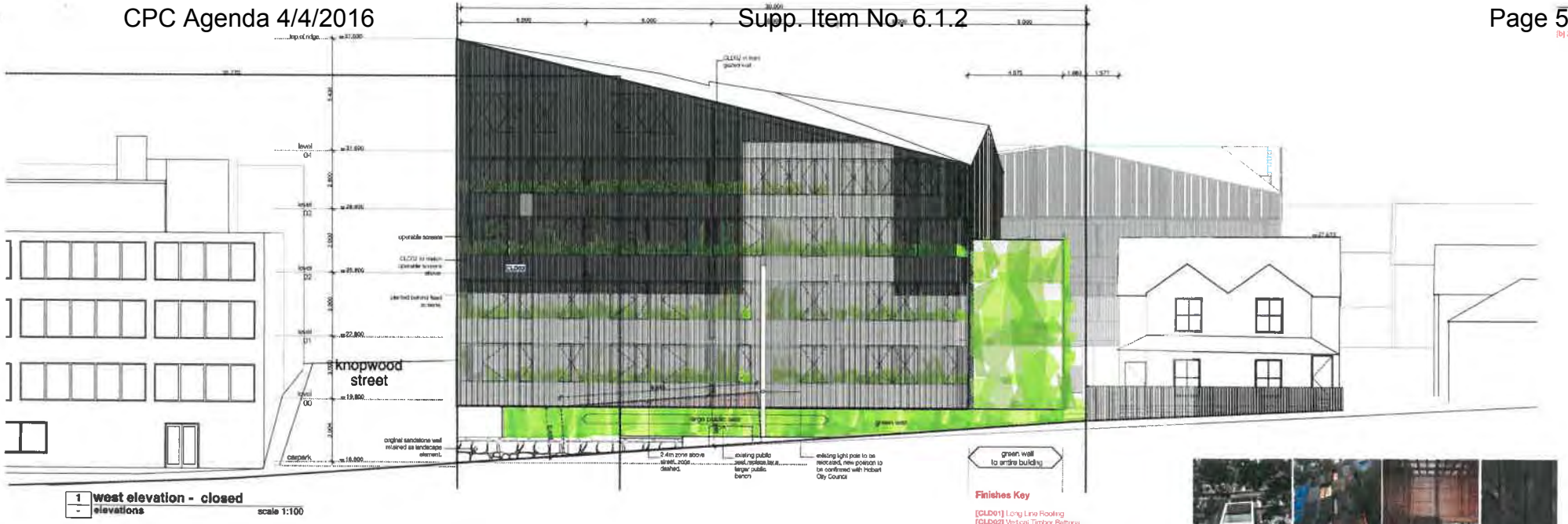
Level 03 + 04 plan

Development Application

Friday, 5 February 2016

1 / - 5. Roof plan scale 1:100

[b] 27.04.2016 - additional information



1 west elevation - closed
- elevations
scale 1:100

Finishes Key

[CLD01] Long Line Roofing
[CLD02] Vertical Timber Battens, Finish, Stained.
[CLD03] perforated sheet metal
[CLD05] X-Tend Mesh - Tension cable systems to support vertical plant growth (transparent when no vegetation is there)

Examples of [CLD02] Timber Battens Screens

Examples of [CLD05] Green Walls

2 west elevation - open
scale 1:100

for planning only

A1

1:10
1:50
1:100
1:200

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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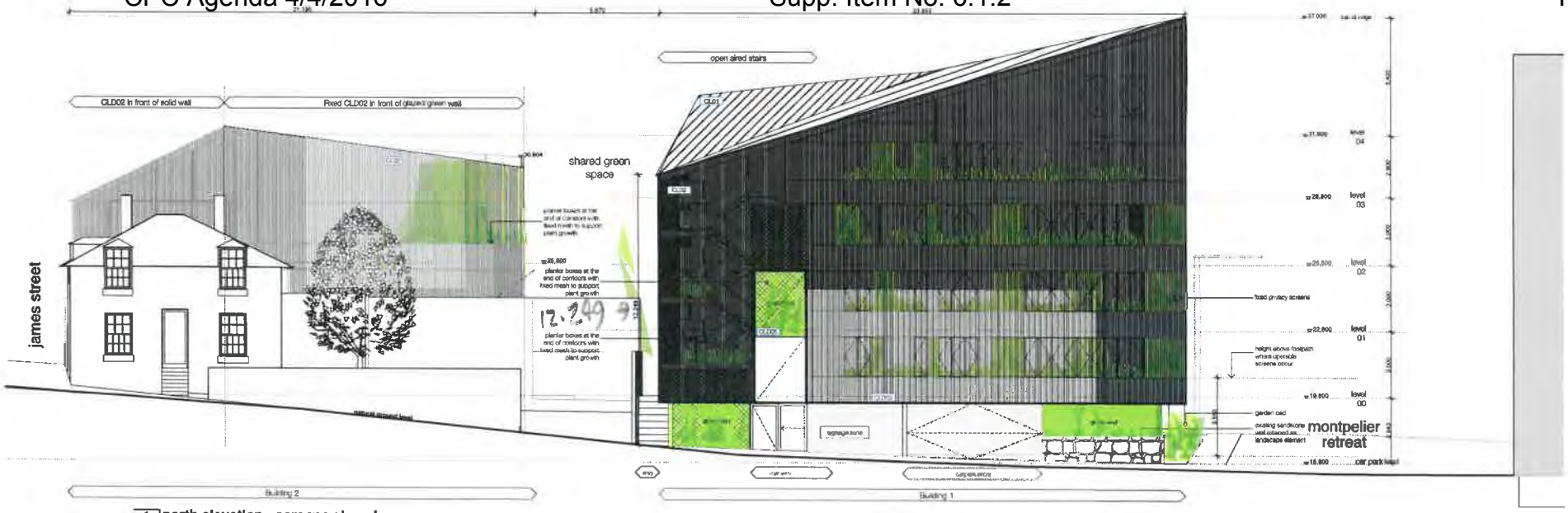
Contact

west elevation
elevations

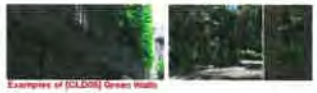
Development Application
Friday, 5 February 2016

1413 DA12 [E]



1 north elevation - screens closed
elevations scale 1:100

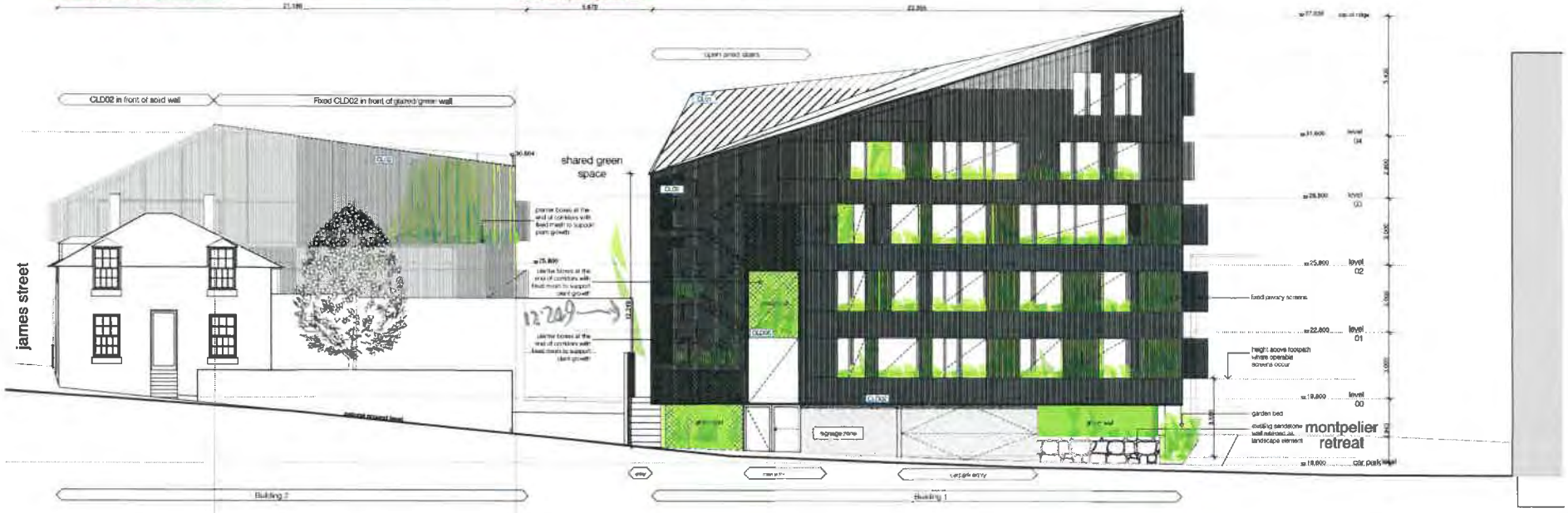
Example of [CLD02] Timber Battens Screens



Examples of [CLD06] Green Walls

Finishes Key

[CLD01] Long Line Roofing
[CLD02] Vertical Timber Battens, Finish, Charred
[CLD03] perforated sheet metal with solid wall behind
[CLD06] X-Tend Mesh - Tension cable system to support vertical plant growth. (Transparent when no vegetation is there)



2 north elevation - screens open
elevations scale 1:100

for planning only

A1

1:10
1:50
1:100
1:200

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40-44 Montpelier Retreat, Battery Point TAS.

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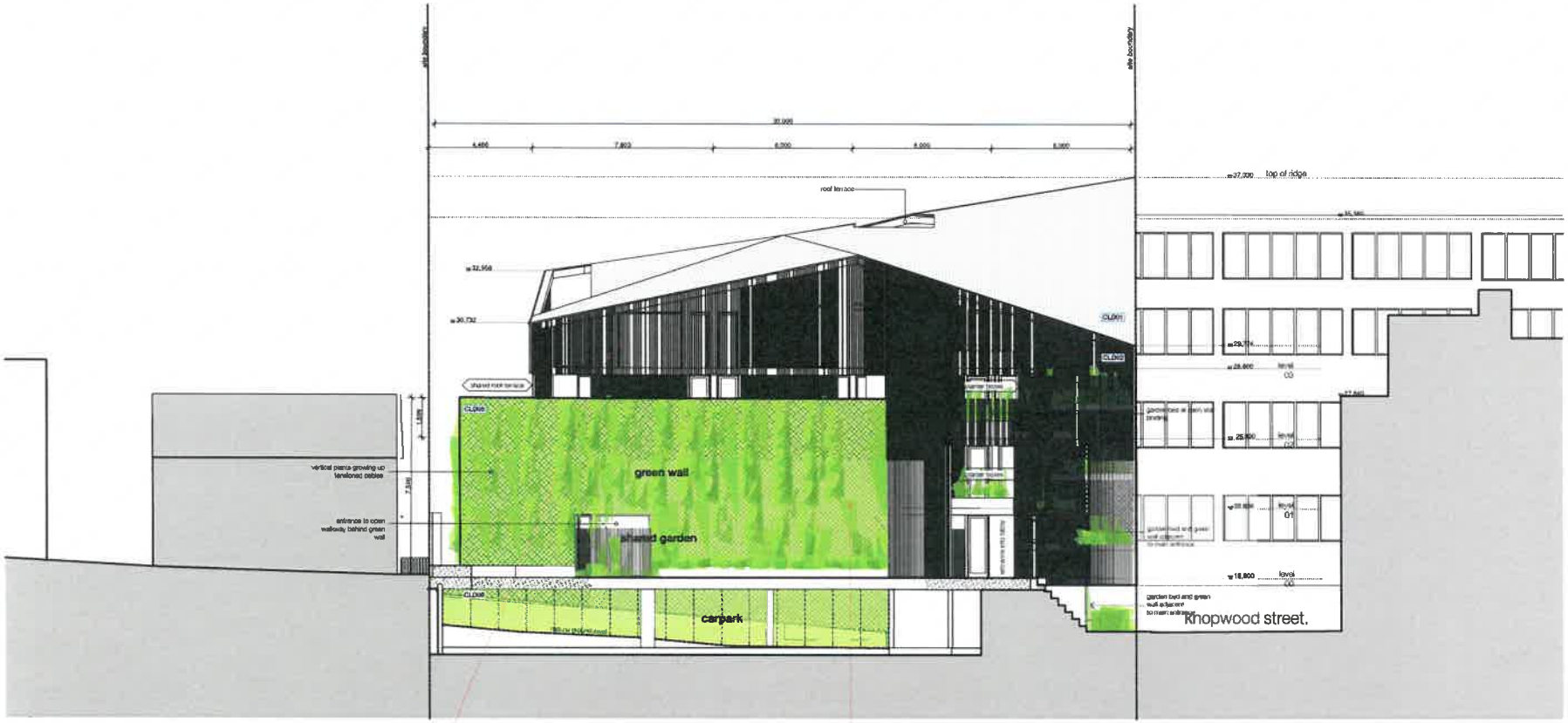
north elevations
elevations

Development Application
Friday, 5 February 2016

1413 DA09 [P]



1 - east elevation building 1
elevations scale 1:100

Finishes Key

[CLD01] Long Line Roofing
[CLD02] Vertical Timber Battens. Finish, Charred.
[CLD03] perforated sheet metal
[CLD06] X-Tend Mesh - Tension cabel system to support vertical plant growth (Transparent when no vegetation is there)

Example of [CLD02] Timber Battens Screens

Examples of [CLD03] Green Walls

for planning only

A1

1:10
1:50
1:100
1:200

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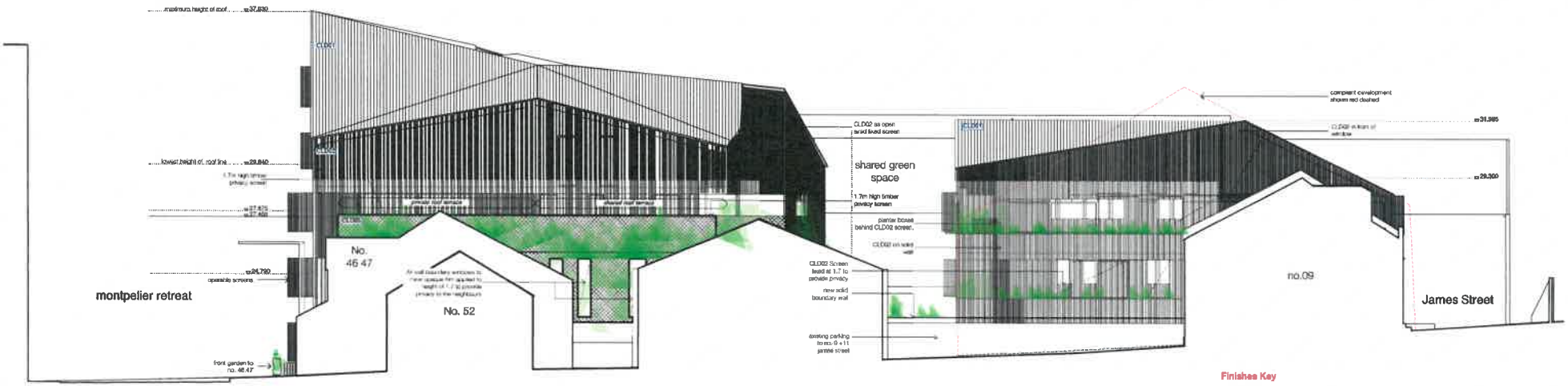
east elevation building one
elevations

Development Application

Friday, 5 February 2016

1413 DA10 [C]

for planning only



1 south elevation - with context
- elevations scale 1:100

Finishes Key

[CLD01] Long Line Roofing
[CLD02] Vertical Timber Battens, Finish, Charred
[CLD03] perforated sheet metal
[CLD06] X-Tend Mesh - Tension cable system to support vertical plant growth (Transparent when no vegetation is there)

CLD05 Vertical Green Wall Examples

CLD02 Timber screen wall examples

A1

1:10
1:50
1:100
1:200

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south elevation
elevations

Development Application
Friday, 5 February 2016

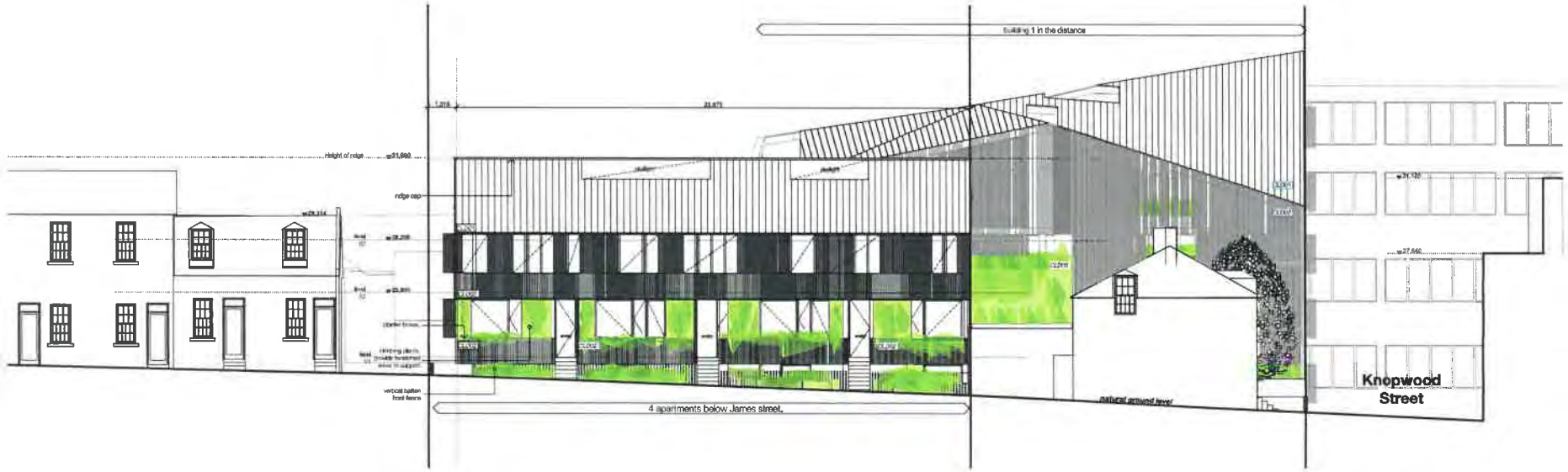
1412 DA11 [C]

revisions

1 east elevation closed
elevations scale 1:100

Finishes Key

[CLD01] Long Line Roofing
[CLD02] Vertical Timber Battens Finish, Clear coat
[CLD03] perforated sheet metal



2 east elevation - open
elevations scale 1:100

for planning only

original drawing size A1

1:100
1:200
1:500
1:1000

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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circa morris-nunn architects

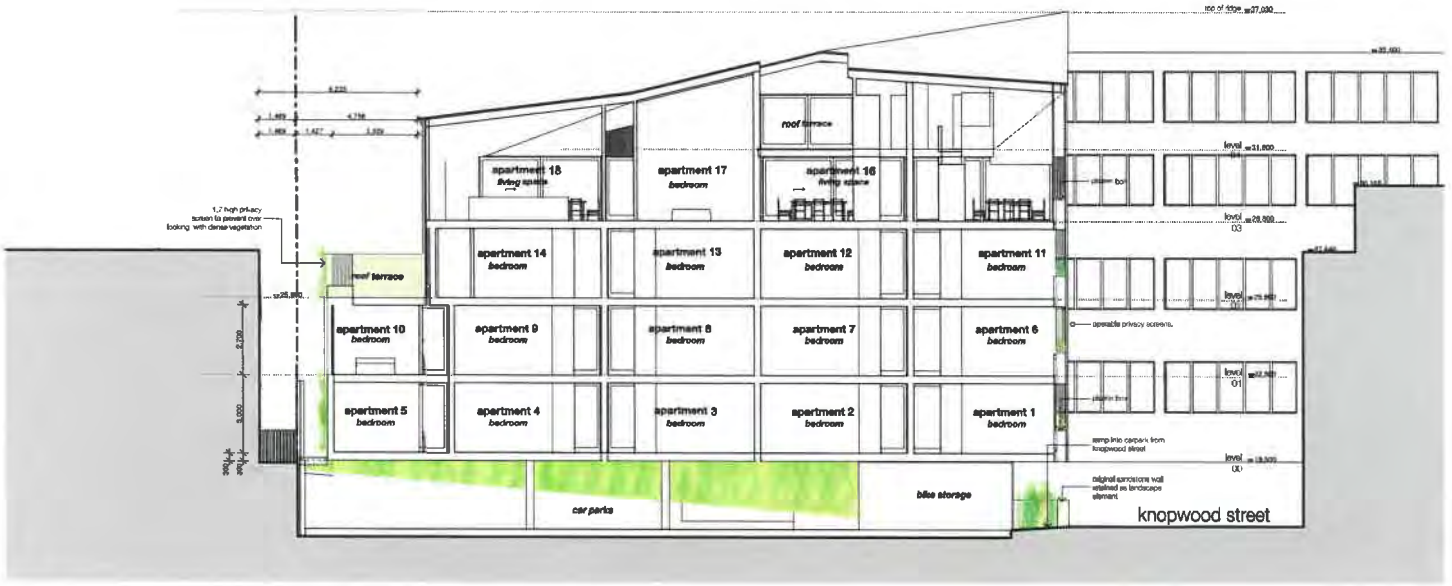
Contact

These drawings are for design intent and are suitable for council approvals only. The builder shall check and verify all dimensions and levels shown thereon on site before the commencement of any work or shop drawings. Drawings are not to be used for construction purposes until issued for that purpose. Do not scale.

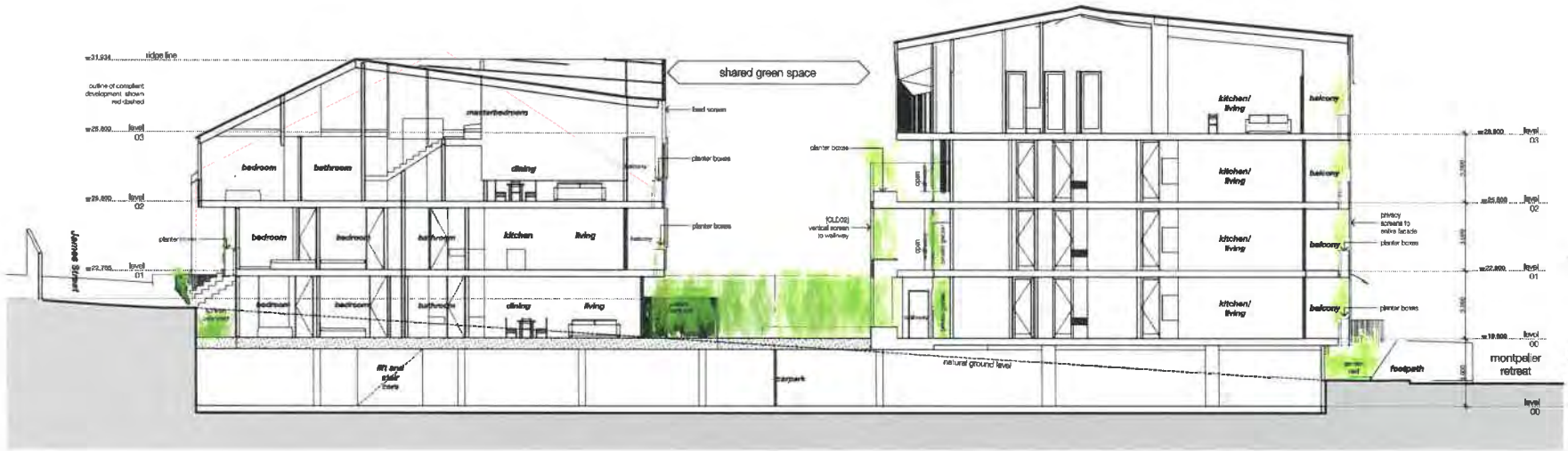
east elevation building two
elevations

status Development Application
date Friday, 5 February 2016
drawing no 1413 DA13 [B]

revisions



01 cross section C-C
- elevations
scale 1:100



02 cross section A-A
- elevations
scale 1:100

for planning only

A1

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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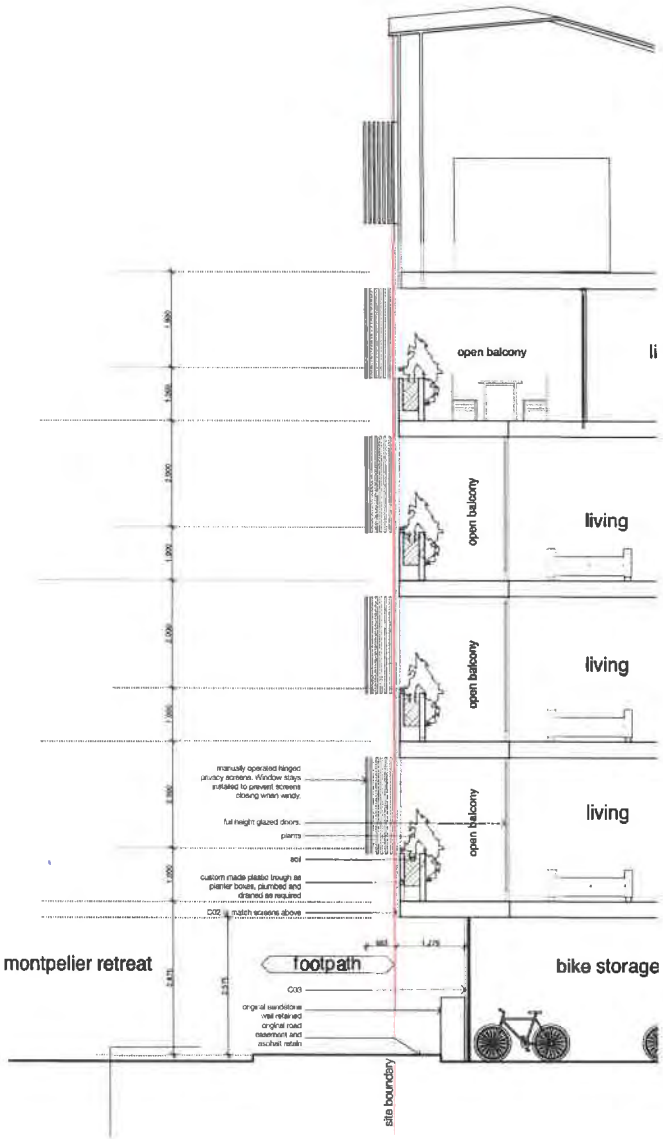
Contact

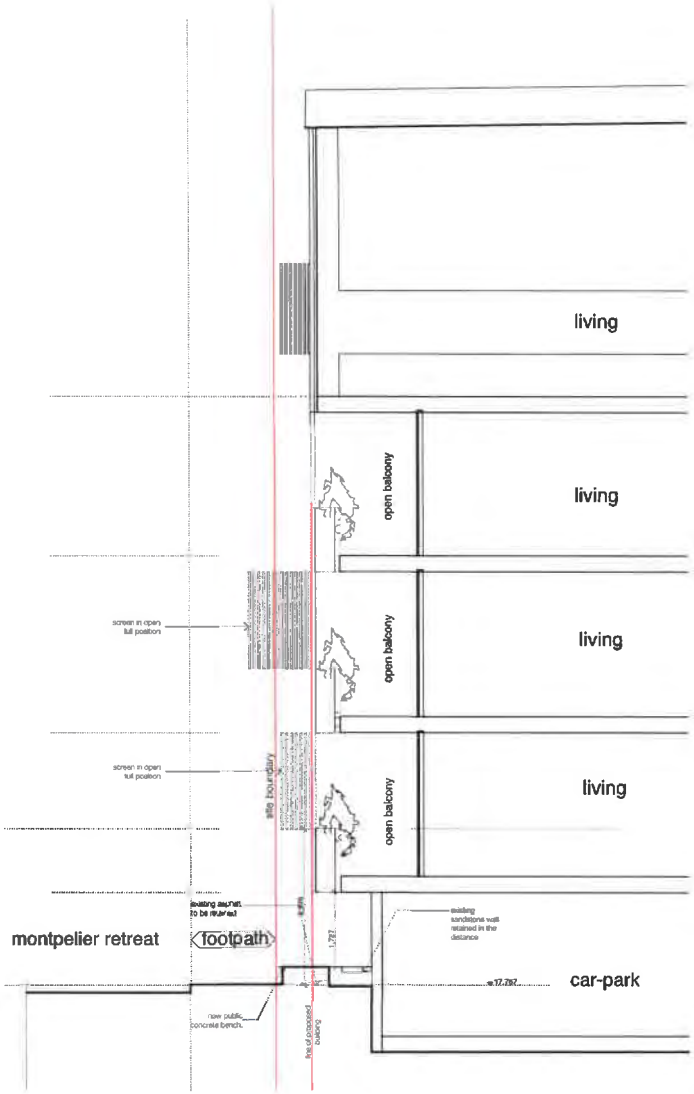
cross 01-03
elevations

Development Application
Friday, 5 February 2016

1413 DA14 [B]



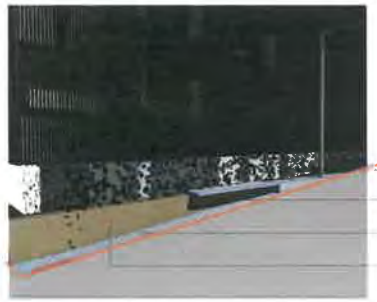
1 - cross section D_D elevations scale 1:50



2 - cross section E-E elevations scale 1:50

3 - Generic Perspective elevations scale 1:385.81

4 - Generic Perspective elevations scale 1:410.87



5 - Generic Perspective elevations scale 1:385.00

revisions

Elliott's Apartments
Ima Group

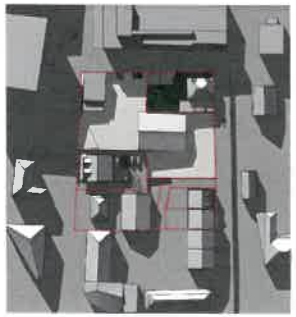
circa morris-nunn architects
Contact

Detailed Section
elevations

A1

Development Application
Thursday, 11 February 2016

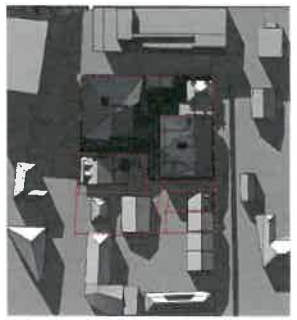

09

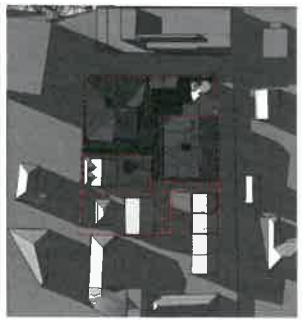

12


3

June


09


12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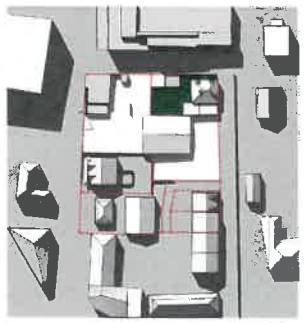
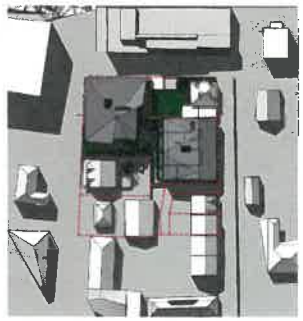
09


12


3

Sep


09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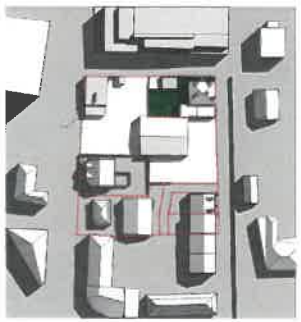
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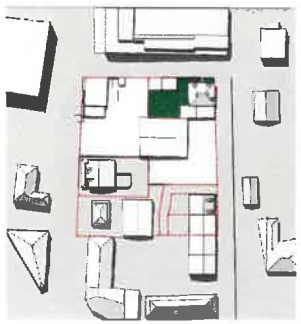
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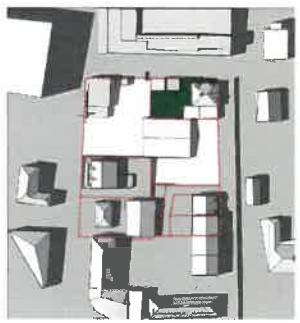
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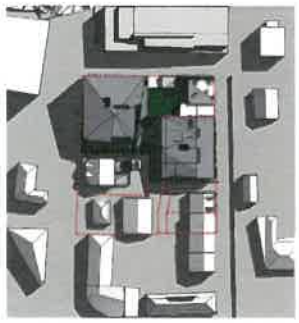
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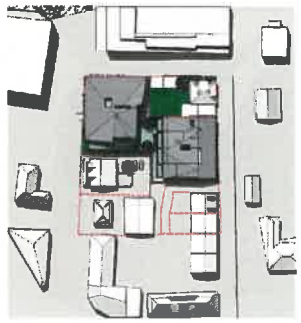
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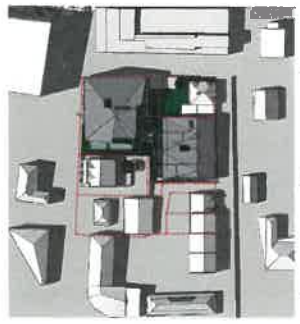
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existing

proposed

for planning only

revisions

Planning Authority Hobart City Council

A1

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS,

circa morris-nunn architects

Contact

shadow diagrams

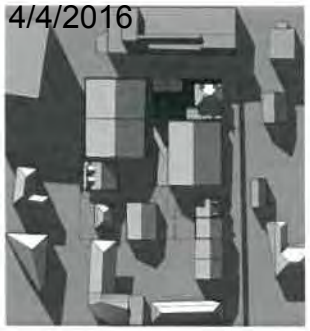
elevations

Development Application

Friday, 5 February 2016

1413 DA15 [B]


09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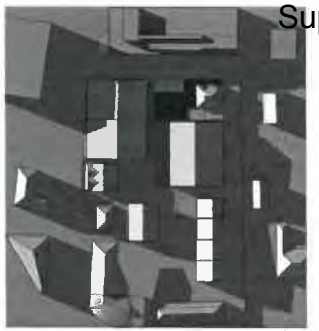
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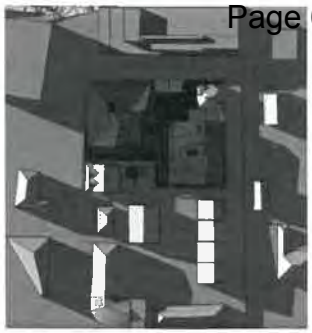
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for planning only


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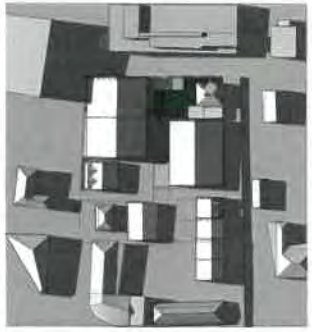
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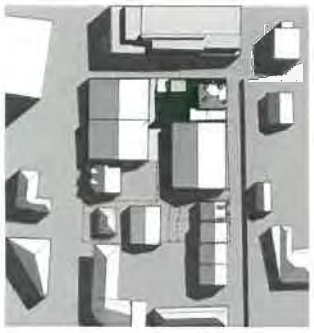
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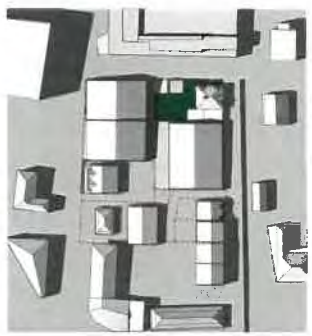
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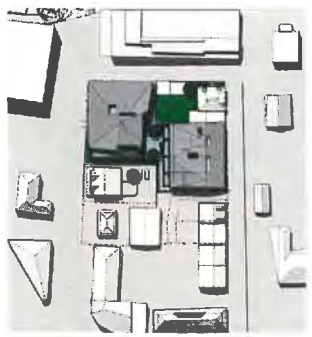
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3

2 storey compliant development

proposed

A1

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

circa morris-nunn architects

Contact

Shadow Diagram elevations

Development Application

Thursday, 11 February 2016

1412 DA10 [B]

revisions

view down knopwood street

Preliminary

original drawing size **A3**

1:10 1:50 1:100 1:200

0mm 2000 4000 10000

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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03 6236 9544
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These drawings show design intent and are suitable as a guide only. The builder shall check and verify all dimensions and verify all errors/ omissions to the Architect. Do not scale off the drawings. Drawings are not to be used for construction purposes until issued by the Architect **for construction.**

Montages
elevations

status **Developement Application**
print date **Friday, 5 February 2016**
drawing n° issue
1413 DA16 [B]

revisions

View down James Street

Preliminary

original drawing size **A3**

1:10 | 1:50 | 1:100 | 1:200

0mm 2000 4000 10000

Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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Montage
elevations

status **Developement Application**
print date **Friday, 5 February 2016**
drawing n° issue
1413 DA22 [A]

View from the corner of kirksway place
and montpelier retreat

revisions

Preliminary

original drawing size **A3**

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Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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Montages
elevations

status **Developement Application**
print date **Friday, 5 February 2016**
drawing n° issue
1413 DA17 [B]

revisions

View up montpelier retreat

Preliminary

original drawing size **A3**

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Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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Montages
elevations

status **Developement Application**
print date **Friday, 5 February 2016**
drawing n° ISSUE
1413 DA20 [A]

revisions

View down montpelier retreat

Preliminary

original drawing size **A3**

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Elliott's Apartments

40-44 Montpelier Retreat, Battery Point TAS.

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Montages
elevations

status **Developement Application**

print date **Friday, 5 February 2016**

drawing n° issue

1413 DA21 [A]

elliott's apartments

montpelier retreat, hobart, tas

existing

elliott's apartments
montpelier retreat, hobart, tas

proposed with existing bench/setback

elliott's apartments

montpelier retreat, hobart, tas

proposed with new bench

AMENDED PROPOSAL : 40-44 MONTPELIER RETREAT

The amendments

The applicant has submitted amended plans following the previous two advertising periods of the application. The design has been modified for the amenity of the immediate adjoining neighbours at 46-48 Montpelier Retreat and 9-11 James Street and to reduce the visual bulk of the building as viewed from Montpelier Retreat adjacent to 46 Montpelier Retreat.

The amendments made are:

- A 5 metre setback from the rear corner boundary of the James Street building to comply with Clause E 13.8.4 A5;
- A 6.318 metre setback of the Montpelier Retreat building from its rear boundary to comply with Clause 13.8.4 A5;
- A 2.476 metre setback of the western corner of the Montpelier Retreat building to reduce visual bulk as viewed along Montpelier Retreat;
- A 1.352 metre setback of the Montpelier building from the dwelling at 46 Montpelier Retreat to reduce visual bulk as viewed from the rear garden;
- Redesign of the Montpelier building to become no higher than two storeys where it is adjacent to 46 Montpelier Retreat; and
- Modification to the architectural screening treatments of the western facades of both buildings to increase visual depth and articulation while maximising screening and plantings to maintain mutual privacy between properties. The whole of the western wall of the Montpelier building will be a green wall with plants grown on tension cables.

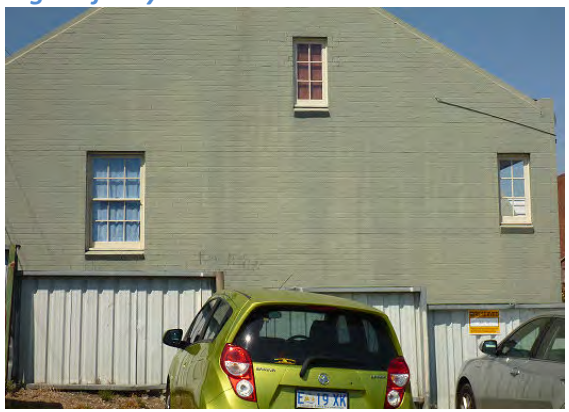
The following report provides comment on the Clauses applicable under the Hobart Interim Planning Scheme 2015. The Stormwater Management Code and Potentially Contaminated Land Code are not revisited here as the application relative to these codes remains the same.

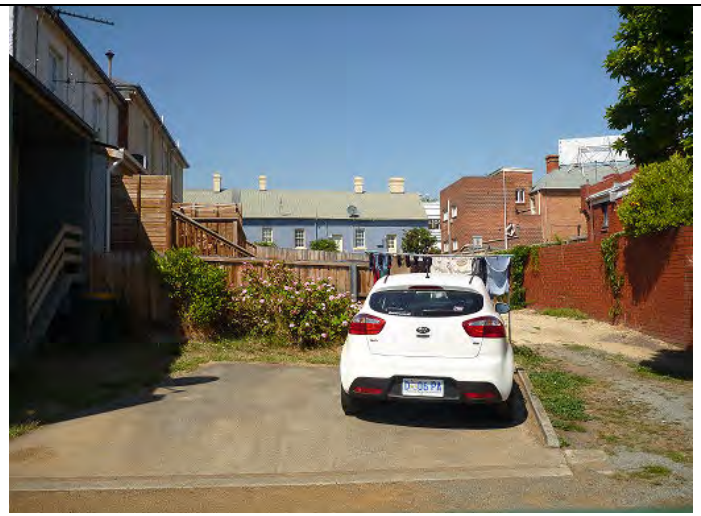
This is an abbreviated assessment only. Even without the above-mentioned Codes, there are 9 applicable clauses and 29 sub-clauses that apply.

The Hobart Interim Planning Scheme 2015

CLAUSE	SUBCLAUSE	DESIGN RESPONSE
11.4.1	**A1 and P1 – Density** *P1 - Site area per dwelling may be:* *(a) less than 200m^2 if any of the following applies:* *(i) the development contributes to a range of dwelling types and sizes appropriate to the locality;* *(ii) the development provides for a specific accommodation need, such as aged care, special needs or student accommodation;*	COMPLIES The proposal provides apartments of high quality with various floor plans and floor areas in an inner city location where apartments are appropriate and necessary.
11.4.2	**A1 and P1 – front setback** *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:* *(b) 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.*	COMPLIES with A1
	A2 and P2 – garage setbacks	Complies with A2 (if applicable)
	A3 and P3 – Building envelope – Not applicable in BP1 *The siting and scale of a dwelling must:* *(a) not cause unreasonable loss of amenity by:* *(i) reduction in sunlight to a habitable room (other than a bedroom) of a dwelling on an adjoining lot; or*	NOT APPLICABLE BUT COMPLIES with P3 The design of the James Street apartments has been undertaken with the principle that the impact of the side view of the building would be no greater in visual bulk than that of a compliant two storey dwelling with a pitched roof.

	(ii) overshadowing the private open space of a dwelling on an adjoining lot; or *(iii) overshadowing of an adjoining vacant lot; or* *(iv) visual impacts caused by the apparent scale, bulk or proportions of the dwelling when viewed from an adjoining lot; and* *(b) provide separation between dwellings on adjoining lots that is compatible with that prevailing in the surrounding area.* Although the applicant is of the view that this clause does not apply in the BP1 precinct as its standards would conflict with those of the Code for BP1 addressed below, the amenity of the neighbouring houses has been considered. Their amenity at present relative to the subject site is low. This is due to the site being an unsealed public car park. **James Street** The adjacent pair of dwellings in James Street are a contemporary pair dwellings of one storey with a second storey partially in the roof made to appear to be of older style. They have a right of way of approximately 4 metres width running along its side boundary that services a number of other properties including a garage for Montpelier Retreat properties. There is no fencing of the rear garden area and it is used for drying of washing and parking of cars. The two dwellings have rear balconies which look to the rear of the site and across to the rear of 52 Montpelier Retreat. The outlook from the side of these properties across the subject site is from one second level window for No. 9 (which appears to be a secondary window to a room facing the street or the rear). The	Drawing no. DA 11 C shows the outline of such a dwelling on the elevation. The Scheme permits a rear setback of 5 metres and full “occupancy” of the street frontage. The apartments have been setback by a minimum of 1.215 metres so creating a 5.26 metre setback in total with the Right of Way. The 5 metre setback has been met. The wall of the apartments has been made of timber screens which will rise to a sill height of 1.7 metres for all windows. There will be planters and landscape systems to soften the appearance of the building and these are not dependent upon the individual owners maintaining them. It will be a landscape system managed for the body corporate as it is an intrinsic part of the architecture. This appearance will be far less in visual bulk than the appearance of for example the site brick walls of the Portsea terraces shown below. 

	other "window style" opening is from the open upper level deck. They look over the subject site towards the 4 storey building in Knopwood Street.  *Right of way next to 9 James Street*  *Side wall of 9 James Street*	There is no unreasonable overlooking. There is no unreasonable loss of sunlight that is caused on the 21st June as the whole block is affected by the 4 storey building and the dwellings in James Street are oriented east to west. The Montpelier apartments have been reduced to two storeys and are a complete green wall design. This is a new form of architecture but one that has been proven in other parts of the world far more severe in climate than Hobart. The building will be encased in a fine mesh trellis which will be planted from above and below to form a living structure. The visual bulk of the two storey wall will be mitigated by the vegetation and the unique appearance that results. There are no overlooking issues from any side windows and the terraces all have planter boxes to ensure occupants cannot look down into the courtyards below. This is a far more sympathetic treatment than a two storey brick wall.  *Examples of two storey side walls in Battery Point*



Rear area of 9-11 James Street

The rear area is not planted with any trees or shrubs and is generally flat and open. The vehicular right of way is not sealed and has a sand and gravel surface. The existing subject site is a public carpark which overlooks this rear area. All people who park in it as they come and go from their cars can see the rear of 9-11 James Street. There is no obvious security between the site and the rear of 9-11 James other than a metal fence.

Two storey side wall in James Street

Side wall of 46 Montpelier Retreat

The proposed development in both James Street and Montpelier Retreat provides a setback from its boundaries similar to the setbacks

Existing view from 9 James Street to the subject site

The rear area of these two dwellings is not a private open space- it is mostly a car park. The area shown on the title which may have been proposed as private open space is used for clothes lines and parking cars. If this area where fenced a private open space could be achieved.

The separation between the new building and this area is over 5 metres. This is a generous separation between dwellings and gardens in Battery Point.

In terms of visual impact the new façade has no greater impact that a compliant two storey building with a 30 degree pitched roof. This is shown dotted on elevation DA 11(C).

Montpelier Retreat

46-48 Montpelier Retreat have rear garden areas immediately adjacent to their back porch. The rest of the site is parking area and

found in Battery Point as a whole. In many instances in Battery Point there are no side boundary setbacks while there are tall side boundary brick walls.

The proposed green building will have a preferable appearance than a two storey brick wall when viewed from all vantage points on the adjacent site at 46 Montpelier Retreat. It will also have a preferable appearance to the rundown semi industrial site which is the existing car park.

	is sealed. No. 46 has no fencing of the area identified on the title and it extends into the carpark area behind. No. 48 has walls around its private open space with dense tree and shrub cover.  *Rear courtyards of 46 – 48 Montpelier Retreat*	

	 ***Example of two storey side walls in Battery Point***	
11.4.3	**A1 and P1 – site coverage** **P1** *Dwellings must have:* *(a) private open space that is of a size and dimensions that are appropriate for the size of the dwelling and is able to accommodate:* *(i) outdoor recreational space consistent with the projected requirements of the occupants and, for multiple dwellings, take into account any communal open space provided for this purpose within the development; and*	COMPLIES with P1 Each apartment has at least one deck, in many cases more than one. All are appropriate to the apartment's size and orientation. The surrounding area has many outdoor recreational opportunities. All apartments will be complete with laundry facilities and drying facilities. The whole complex will be landscaped vertically as well as within the central courtyard as part of the overall design of the building. Each apartment will have balcony and deck planters for individual gardening.

	(ii) operational needs, such as clothes drying and storage; *unless the projected requirements of the occupants are considered to be satisfied by public open space in close proximity; and* *(b) reasonable space for the planting of gardens and landscaping.*	
	A2 and P2 – POS **P2** *A dwelling must have private open space that:* *(a) includes an area that is capable of serving as an extension of the dwelling for outdoor relaxation, dining, entertaining and children's play that is:* *(i) conveniently located in relation to a living area of the dwelling; and* *(ii) orientated to take advantage of sunlight;* *unless the projected requirements of the occupants are considered to be satisfied by communal open space or public open space in close proximity.*	COMPLIES with P2 Each apartment has a balcony or terrace or both. The outdoor areas are accessed from living rooms directly and serve as an extension of the living areas. The outdoor areas have the dimensions to enable outdoor dining, relaxation and children's play. Each deck is oriented to take advantage of the available sunlight and outlook.
11.4.4	**A1 and P1 – sunlight** **P1** *A dwelling must be sited and designed so as to allow sunlight to enter at least one habitable room (other than a bedroom).*	COMPLIES with P1
	A2 and P2 – overshadowing **P2** *A multiple dwelling must be designed and sited to not cause*	COMPLIES with P2

	unreasonable loss of amenity by overshadowing a window of a habitable room (other than a bedroom), of another dwelling on the same site, that faces between 30 degrees west of north and 30 degrees east of north (see diagram 11.4.4A)	
	A3 and P3 – overshadowing **P3** *A multiple dwelling must be designed and sited to not cause unreasonable loss of amenity by overshadowing the private open space, of another dwelling on the same site, required in accordance with A2 or P2 of 11.4.3.*	COMPLIES with P3
11.4.5	**A1 and P1 – Garage openings** **A1** *A garage or carport within 12m 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 6m or half the width of the frontage (whichever is the lesser).*	COMPLIES with A1 - entry to car park area is 6 metres wide.
11.4.6	**A1 and P1 - privacy** **P1** *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 1m above natural ground level, must be screened, or otherwise designed, to minimise overlooking of:* *(a) a dwelling on an adjoining lot or its private open space; or* *(b) another dwelling on the same site or its private open space; or* *(c) an adjoining vacant residential lot.*	COMPLIES with P1 All balconies are screened to minimise overlooking to all dwellings and private open space be it on the same site or on an adjacent site.
	A2 and P2 – privacy	

	P2 *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 screened, or otherwise located or designed, to minimise direct views to:* *(a) a window or glazed door, to a habitable room of another dwelling; and* *(b) the private open space of another dwelling; and* *(c) an adjoining vacant residential lot.*	COMPLIES with P2 All windows are screened or frosted and designed to minimise any direct views to another dwelling or private open space.
	A3 and P3 – privacy from shared driveways	COMPLIES with A3
11.4.7	**A1 and P1 - front fences** **A1** *A fence (including a free-standing wall) within 3m of a frontage must have a height above natural ground level of not more than:* *(a) 1.2m if the fence is solid; or* *(b) 1.5m, if any part of the fence that is within 3m of a primary frontage has openings above a height of 1.2m which provide a uniform transparency of not less than 30% (excluding any posts or uprights).*	COMPLIES with A1 There is only one front fence and this is designed to be a modern metal vertical picket fence consistent with the character of Battery Point without mimicking any heritage style. It is low and due to slope of James Street has a maximum height of 1.2 metres.
11.4.8	**A1 and P1 – waste storage** **P1** *A multiple dwelling development must provide storage, for waste and recycling bins, that is:*	COMPLIES with P1 The waste storage is in the car park and is in a separate area from the dwellings and contained in a separate room contained away from any adjoining property or dwelling.

	(a) capable of storing the number of bins required for the site; and *(b) screened from the frontage and dwellings; and* *(c) if the storage area is a communal storage area, separated from dwellings on the site to minimise impacts caused by odours and noise.*	
E 13.8.2 **Heritage Precincts** Buildings and works	P1 (no acceptable solution) **P1** *Design and siting of buildings and works must not result in detriment to the historic cultural heritage significance of the precinct, as listed in Table E13.2.*	COMPLIES with P1 Montpelier Retreat – The amended plans have the greatest impact on the character of the development when viewed from Montpelier Retreat. The green building creates a modern insert separating 46-48 Montpelier from the new apartments. It creates a strong visual space between the two sites. It is important to keep in mind that the dwellings at 46-48 Montpelier Retreat are not in themselves heritage buildings and their character and architectural merit is not exemplary of the architecture of the Portsea Terrace further up the road. The proposed building is not seen in conjunction with or adjacent to any heritage listed site in Montpelier Retreat and is balanced in scale and form with all the buildings, heritage listed or otherwise in the street which are outside Battery Point and within Sullivans Cove. James Street - The apartments as viewed from James Street have a "low profile". The building will be a darker recessive tone and will have timber and black metal detailing with extensive planting on its walls. This will ensure the wall of Narryna remains the dominate streetscape feature and is balanced by the terrace house grouping of 13-17 James Street. The finishes of the new building will be of the highest quality. Knopwood Street – The only streetscape feature of any heritage significant in Knopwood Street is No. 5 Knopwood. It sits on the corner of the block as one proceeds to and from James Street. Its visual

presence is not disturbed by the proposed James Street apartments as they sit behind a two storey wall at the back of No. 5.

Wall of building on subject site adjacent to 5 Knopwood.

Rear wall of 5 Knopwood Street as viewed from James Street

		The amenity of 5 Knopwood Street and its setting wil be improved by the development. It is presently impaired by a concrete block wall on the subject site. This will become a courtyard with landscaping set with timber slatted facades and hanging gardens. The bus and beer barrel storage and waste bin area is part of the beer garden area and is not part of the subject site.
	P2 (no acceptable solution) **P2** *Design and siting of buildings and works must comply with any relevant design criteria / conservation policy listed in **Table E13.2,** except if a heritage place of an architectural style different from that characterising the precinct.*	See Clauses E 13.2 and E 13.4 : BP1 : Same requirement
	P3 (no acceptable solution) – extensions to existing buildings	Not applicable
	A 4 and P4 – front fences **A4** *New front fences and gates must accord with original design, based on photographic, archaeological or other historical evidence.* **P4** *New front fences and gates must be sympathetic in design, (including height, form, scale and materials), and setback to the style, period and characteristics of the precinct.*	See Clause 11.4.7 above - COMPLIES
	A5 and P5 – front landscaping	Not applicable
E 13.8.4 **Battery Point**	**A1 and P1 – site area per dwelling** ***A1*** *Site area per dwelling unit in Heritage Precinct BP1 must be not less*	COMPLIES with P1 – The density of the development has no impact on the on the pattern of development that is characteristic of the cultural heritage significance of the precinct. The bulk of the building is not

	than 350m$^{2.}$ ***P1*** *Site area per dwelling may be less if the development does not detract from the pattern of development that is a characteristic of the cultural heritage significance of the precinct in the vicinity of the site.* 	viewed from within Battery Point and it cannot be seen or appreciated from the streets of Battery Point. The building is set within an area that is severely compromised by the buildings in Sullivans Cove and a townscape and form balance is created by the proposed buildings. The aim of the architect was to create a strong statement on the corner of the site facing into Sullivan's Cove, delineating and creating a full stop spatially to the area, behind which Battery Point is presented and unfolds as one approaches either along Knopwood Street or along Montpelier Retreat. This site will separate Battery Point and assist to delineate it from its surroundings where at present its boundaries and parameters are not easily defined and are blighted by the existing car park and industrial buildings on site.
	P2 (no acceptable solution) **P2** *Buildings should be close to the street frontage except where the prevailing setback on the same side of the street is substantial, in which case the setback shall conform to the general building line*.	COMPLIES
	A3 and P3 - Building height **A3** *Building height (not including the basement or attic floor space with dormer windows) must not be greater than two storeys, or one storey if most buildings on the same side of the street in the immediate vicinity are single storey.* **P3** *The height of development must neither be obtrusive in the streetscape nor detract from the pattern of development that is a*	COMPLIES with A3 The building is not obtrusive when viewed from any of the streets within the heritage Precinct BP1. The building has been designed to transition to meet the scale of development in both James Street and Montpelier Retreat. The character of Knopwood Street is dominated by a four storey building within Sullivans Cove. It has no streetscape that is characteristic of the "cultural heritage significance" of Battery Point.

	characteristic of the cultural heritage significance of the precinct in the vicinity of the site.	
	P4 – (no acceptable solution) building width **P4** Where reasonable and practicable, a dwelling must substantially occupy the width of the frontage of a lot, except where the prevailing setbacks from side boundaries on the same side of the street are substantial and not so as to exclude a driveway or car parking at the side of the building.	COMPLIES with P4 The proposed two buildings occupy the width of the frontages on all frontages with a setback in James Street and a setback in Montpelier Retreat to minimise impact on adjoining residences. This arrangement is characteristic of the surrounding streets.
	A5 and P5 – rear setback **A5** *The rear setback of the principal building must be at least:* *(a) 6 m for lots of up 14 m in width;* *(b) 5 m for lots greater than 14 m in width.* ***P5*** *The rear setback of the principal building must not detract from the layout pattern of development that contributes to the cultural heritage significance of the precinct and its contribution to private amenity facilitated by the 'house and garden' form of development.*	COMPLIES with A5 and P5 The rear setback is a complex issue when one considers a site which has 3 street frontages. If one looks at the pattern of lots that exist both on site and on adjacent sites, the assessment is further complicated. It is possible there are no rear boundaries from which the rear setback can be assessed. It is however clear that the lots have frontages greater than 14 metres width therefore A5 (b) applies. The rear setback of the two principle buildings has been shown on the plans drawing no DA 01 C with a setback from the rear boundary of the two main lots where they would meet the adjacent lots in Montpelier Retreat and James Street
	A6 and P6 – site coverage ***A6*** *A site where the principal building, excluding the basement, in part or*	COMPLIES with P6 In the vicinity of the site there is a mixed pattern of development, the

	whole is: *(a) not more than one storey in height, or one storey comprising attic floor space with dormer windows, must have a site coverage of not more than 50%;* *(b) two or more storeys must have a site coverage of not more than 40%.* ***P6*** *The building must not detract from the pattern of development that is a characteristic of the cultural heritage significance of the Precinct in the vicinity of the site.*	majority of which is not of heritage significance. There are a number of elements – 5 Knopwood, Narryna and the James St terraces and Portsea Terrace only which contribute to this heritage significance and they do not represent a strong pattern as such. The pattern is in the street layout and orientation of the buildings and their bold and solid form and bulk within narrow streets. The proposed development repairs the subject site to fit in with this pattern with a modern architectural form and similar positioning, also creating a new laneway through the site.
	P7 (no acceptable solution) ***P7*** *Land directly between a dwelling and the street shall not be designed or paved or used for the manoeuvring or parking of vehicles except to gain access.*	COMPLIES
	P8 (no acceptable solution) **P8** *Each lot must have not more than one crossing over the footpath per frontage and have a maximum width of 3 m unless it can be demonstrated that the crossing and its width is essential and will:* *(a) not detract from the historic cultural heritage significance of the precinct;*	COMPLIES The 6 metres width is essential and replaces various crossovers already in existence across the total site therefore creating a net benefit and reduction in crossovers.

	(b) provide a net benefit in parking quantum taking into account any loss in on-street parking required to facilitate the additional or wider access.	
	A9 and P9 – parking **A9** *Maximum of 1 parking space per dwelling.* ***P9*** *Parking must not detract from the cultural heritage significance or the setting of existing dwellings.*	COMPLIES with A9 31 parking spaces provided for 31 apartments.

Kate Loveday B Arch

January 2016

Attachment E

circa morris-nunn architects

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Elliott's Apartments

An Architectural Report to Accompany the DA Proposal

Circa Morris Nunn, Architects
February 2016

Summary of the Proposal

This proposal is to create a new premier residential development in the upper part of Montpelier Retreat, at the edge of central Hobart and Battery Point.

The proposal is centred on the idea that it is possible to create a very 'green' quality residential development on the former Elliott Bros crane hire depot, which is currently used as a carpark in the interim period.

View looking up the middle of Montpelier Retreat from Salamanca Place (with the Sultan Holdings Development included)

The design approach is to create an overall building form that responds to both the scale of the two office buildings on the opposite sides of the street, and conversely also relate to the low scale traditional urban fabric of James Street with its row houses and historic wall which runs along as the side boundary to Narryna, a historic property on Hampden Rd now used as a museum, and a historic cottage on the corner of Knopwood and James, now operating as a wine bar, Preachers.

View of the project from the intersection of Montpelier with Kirksway Place, showing the adjacent office blocks

The proposed development comprises two separate buildings above a podium, which is formed by a semi basement carpark. It comprises:

CARPARK (Ground level Knopwood St Access)
- Main Entry lobby, with stair and lift to upper levels, main building
- Bike Store
- Bin Store
- 34 Carparks, including 3 tandem carparks and two disabled carparks
- Secure storage lockers for each apartment
- Lift and stair access to James St apartments

GROUND FLOOR:
- 5 two bedroom apartments, main building
- 4 two bedroom apartments accessed off central open space between buildings, with rear semi basement courtyard adjacent James St.

FIRST FLOOR:
- 5 two bedroom apartments, main building
- 2 two bedroom apartments accessed off directly off James St
- 2 two bedroom apartments accessed off lobby from James St

SECOND FLOOR:
- 5 two bedroom apartments, main building
- lower level of 2 two bedroom apartments accessed off directly from James St lobby
- lower level of 2 three bedroom apartments accessed off directly from James St lobby
- 1 one bedroom studio apartment accessed off James St lobby
- shared outdoor terrace with BBQ facilities, main building

THIRD FLOOR:
- lower floor of penthouse apartment, main building
- main ground floor of three bedroom apartment, main building
- 1 three bedroom apartment, main building
- upper level of 2 two bedroom James St apartments with internal stairs
- upper level of 2 three bedroom James St apartments with internal stairs

FOURTH FLOOR:
- upper levels of penthouse apartment, main building
- upper storey, three bedroom apartment with outdoor terrace, main building

In summary there are 31 residential apartments (in total) in the proposed complex, comprising:

3 three bedroom apartments and 15 two bed apartments in the main building

2 three bedroom apartments and 10 two bed apartments and 1 single bed studio in the James St building

Each apartment has one carpark, three have 2, and there is a large secure bicycle store to be used by all residents.

The historic cottage (now Preachers) in relation to the existing offices and the proposed apartments

Description of the Proposed New Building

The basic tenet of the design was to try and create a new, high quality residential apartment building at the edge of the Hobart CBD, at the city end of Battery Point that respected its neighbours.

One of the main factors affecting the design was how it could be a visual foil to all its near neighbours, which has perhaps the greatest contrast that any Hobart development could ever have to deal with.

The site is one of extremes, as it is the very edge of Battery Point, with its heritage residential character, and also located on the opposite side of both Montpelier Retreat and Knopwood St are two very banal large commercial office buildings, with absolutely no aesthetic or grace whatsoever.

There is also the historic Georgian house on the corner of Knopwood and James Sts, which had been converted many decades ago into a famous seafood restaurant, initially known as Mures, and currently operated as a boutique pub / wine bar (Preachers), (and as such, it is a commercial property), and slightly further away, with its side boundary on James St is the very important historic property Narryna, now run as a museum.

The difference between the massive looming bulk of Kirksway House, which has no relation to anything other than corporate greed (with an extra story having been added illegally by the developer) and the two-storey scale of Battery Point is the challenge we as architects have tried to apply ourselves to. We have sought to create a development that relates in its massing and overall scale to the change between these two extremes, realizing that whatever the planning guidelines, the physical bulk of the commercial buildings and the historic buildings will always be there, and creating a project that responds to this reality is of paramount importance.

The answer for us was to create a development that comprised two buildings on a podium that is the carparking level. Because of the slope across the site in two directions, the entry to the carpark is on grade at the lowest portion of the site (the corner of Knopwood and Montpelier) and is then cut into the rising hillside.

On top of this podium we have created an inner shared open space. This space is part of a pedestrian route where people can walk through the site from Knopwood St and emerge part way along James St. Above this podium is two separate blocks each with their own lift up from the carpark level. The scale of these two blocks is very different and responds to the immediate surroundings adjacent to each.

Respecting the cultural / heritage values

THE TWO STREETS AND THEIR DIFFERENT CHARACTERISTICS

Montpelier Retreat
The upper part of the slope of Montpelier Retreat is crowned by a collection of residential structures, dominated on the SE side by the Portsea Terraces, a group of historic Victorian terraces, which both accentuate the fall of the land down to Salamanca and also the perspective up to where Battery Point meets Sandy Bay Road.

James Street
James St slopes gently down towards the north from Hampden Road. The site is almost at the lowest end of the street, and the James St Apartments needs to be seen as a natural end to the row of humble 19th century terraced houses that all sit hard on the street.

THE MAIN BUILDING AND MONTPELIER RETREAT

The mass / bulk of the main building is a response to its two neighbouring properties, the office blocks on opposite sides of both Knopwood St and Montpelier Retreat, and as well, the residential buildings that form the upper part of Montpelier Retreat.

Portsea Terrace (with their external stairs up to the front doors) with Kirksway House and the new apartment block.

The new apartment building's form and roof line responds to and accentuates this perspective, and in doing so the resulting mass then also balances out the conflicting heights of the two office buildings themselves.

Of the two offices, the bulk of Kirksway House is by far the most significant (and bulky – both in its size and colour). For this reason, the scale of the main building rises up so that at its highest point it is approximately the height of the roof of Kirksway House, but because the roof is pitched rather than flat, it drops away in two directions to be far closer to the height of the adjacent 2 storey house on Montpelier Retreat, assisted as it is by the fact that the street is rising up the hill at the same time. (Montpelier Retreat elevation below)

There is an existing building on the corner of Knopwood and Montpelier, which we understand may be reasonably old, has been very badly altered, to a point where there is now negligible value in the structure, but the foundation plinth is sandstone whereas the upper walls were brick, now rendered. We intend to retain the stone plinth and use it as part of creating a link with history at street level.

We are firmly of the opinion that if the new urban scale of the area where Montpelier and Knopwood intersect can be made to be visually commensurate with general height/bulk the existing buildings on the opposite sides of each of the aforementioned streets, then a more balanced, overall urban massing in the neighbourhood will be the result, with the new Montpelier Apartments appearing as the crown of the lower portion of Montpelier Retreat, which is wider than the upper portion (and indeed a standard two directional road, as opposed to a one way street).

THE JAMES ST APARTMENTS

The James St Apartments have been specifically designed to respond to the mainly two-storey scale of the cottages which form the remainder of one side of James Street, and on the opposite side, the historic stone wall which is the side boundary to Narryna. Accordingly the profile of the apartments is such that it will look like a series of new 2 storey terrace houses keeping the scale of the facades and most importantly the roof pitch, with the street having a screen/fence and a cantilevered upper storey 'verandah' which aligns with the rest of the cottages.

The James St Apartments are in fact bigger than what they seem. We have used an architectural device that is also found on the historic Portsea Terraces on the upper part of Montpelier Retreat, as a way of giving light and a garden outlook through a rear courtyard garden to the otherwise semi basement Ground Floor apartments in the James Street Building.

View down James Street with the new apartments in context with the rest of the street.

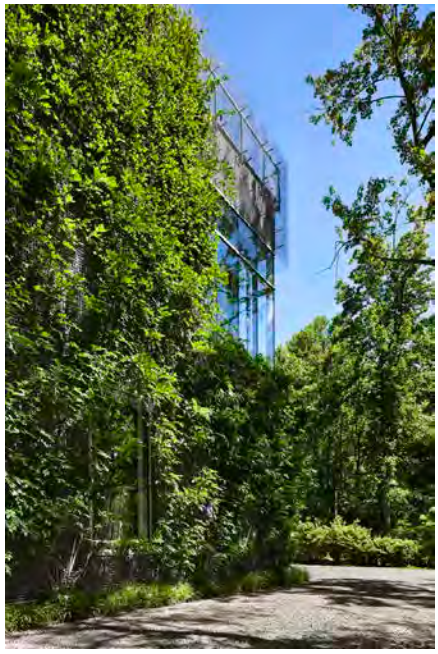
Portsea Terraces have a semi-basement level, and access to the main Ground Floor of all of these terraces is in fact up an external flight of entry stairs, and this architectural detail is what we propose to use too with the entry to the lobby to the new apartments, and also the separate entries to the two end apartments. We believe that having a similar feeling at street level between the two groups of buildings will very much help reinforce the existing urban character of the Battery Point historic precinct.

The development also tries to respect the historic house on the corner of Knopwood and James Sts, which had been converted many decades ago into a famous seafood restaurant, known as Mures, and currently operated as a boutique pub / wine bar (Preachers), and as such, it is a commercial property. 'Preachers' is a stand-alone and apart from one dormer window in the hipped roof, all its walls to James St are completely blank. There is also a flat roof kitchen wing to the rear of the historic cottage, all of which will mean that our new apartment building, although it is built right up to the boundary, will appear quite separate from the massing of the historic cottage cum restaurant / pub.

The External Building Form and Materials

VERTICAL LANDSCAPING

The overall design intent is to produce a high quality urban apartment complex that reflects the natural 'green' values associated with the state. As such we have put great importance on creating a 'living' façade that is animated and variable, with opening and closing shutters, and external decks with integrated planter boxes that will allow vegetation to grow up the exterior of the building, even on upper floors.

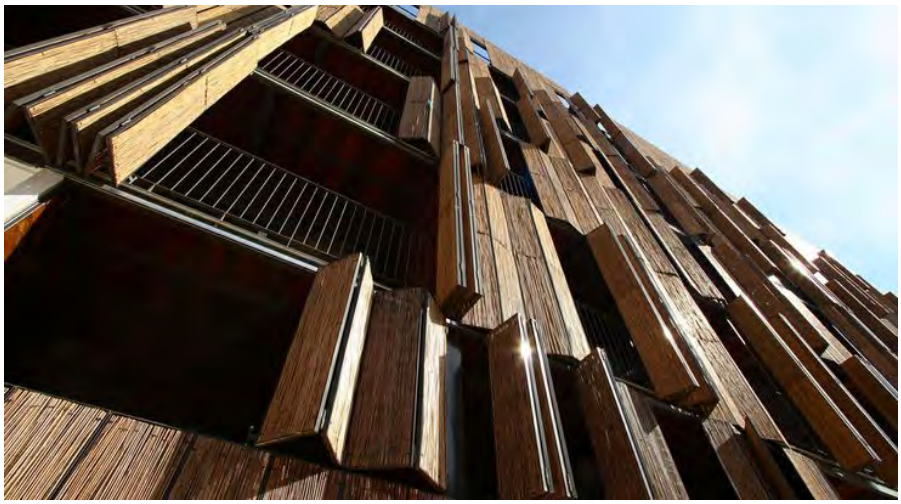


We are very conscious that plants grow slowly and unevenly, and different owners will create different results. Some of the planting will be looked after through the 'body corporate' structure, but the planting on the private balconies of the apartments may be the individual owners own responsibility, although there will be automatic watering / nutrient supplement systems installed.

We have had preliminary conversations with Play St, Landscape Architects, and also with Mark Fountain, Royal Tasmanian Botanical Gardens Director, who are in complete agreement that carefully chosen plants can be obtained to be successful in these conditions. We believe the greenery to the extent that it grows and animates the vertical facades will bring 'life' to the building in a subtle but elegant manner.

THE SHUTTERS / SCREENS

We have tried very earnestly to create a building that is not a static, monolithic block. We intend to do this through the extensive use of operable shutters / screens.



In previous centuries before the invention of air conditioning, climate control was naturally achieved by the use of external screens or shutters, which could be opened or closed from the rooms directly behind them. As different owners / tenants will have different personal wishes, the degree of openness will change from apartment to apartment and at different times of the day and vary during each season.

The design of our shutters / screens has evolved from the fact that they will be used for both a privacy screen and also a fixed frame for growing creepers. The form, material and patterning of the screens have been adapted from traditional Japanese timber screens, which give a delicacy and softness to their traditional architecture. Shou-sugi-ban or "the burning of Japanese cypress – sugi" is an age old Japanese practice, but it has become increasingly popular outside of the islands, and even been used by Australian architects, including our own practice. Traditional Japanese cypress, various types of cedar (Western Red Cedar) and larch are the more commonly used timbers for charred cladding although decking experiments has also seen hardwood used in the process.

The process is relatively simple and involves using either an open fire or jet flame to torch the exterior of timber (around 3-5mm) so that it achieves a charred finish. The process forms a carbon layer on the exterior of the boards which protects the lumber inside and is said to render the wood nearly maintenance free. It has also been suggested that it will make the boards more resistant to

fire, rot and pests, and will have an expected life span of more than 80 – 100 years.

Traditional Japanese timber building and charred timber façade

Proposed Schedule of Finishes

The charred timber will age over time, as it is a natural material. It also will behave differently depending on the species of the timber that is finally chosen. We can therefore only give a guide to the proposed colour palette.

The possible range in colour / texture of different charred timbers.

In Montpelier we have unpainted brick and darker grey roof tones. The new Main Building will essentially have dark grey tones and whites with galvanised prefinished metal as panelling against a background colour of untreated cement sheet. There will be an exposed aggregate / pebble finish on the lower level concrete sections of the new buildings, a palette which we believe will sit well with white painted brick of Preachers and the office buildings.

MAIN BUILDING

Corner Plinth:	Existing sandstone wall revealed by removing render
Carpark wall to Montpelier	Galvanised steel open grille supporting creepers
Entry Folding Door to Carpark	Proprietary mesh Tiltadoor or equal
Signage Wall Adj Carpark	Perforated mesh to match Tiltadoor
Entry Door and Lobby	Clear frameless glass
Low level side walls	Concrete with exposed aggregate

Main façades	Galvanised steel frame (prefabricated and removable) Charred timber lattice screens fixed to frame FC sheet sheeting to external walls
Roof	Colorbond finish metal roof sheeting, Windspray mid grey colour

In James Street we have stone boundary wall of Narryna and painted brick terraces (cream colours and old fashioned blues) with painted metal roofs. .

JAMES ST BUILDING

Plinth / lower ground level:	Precast concrete retaining walls
External stairs	Concrete, trowelled on nonslip, aggregate finish

External fence	Charred timber lattice fixed to steel frame
Entry Door and Lobby	Clear frameless glass
Main façades	Steel frame (prefabricated and removable)
	Charred timber lattice screens fixed to frame
	FC sheet sheeting to external walls
Roof	Colorbond finish metal roof sheeting, mid grey colour

In conclusion, we sincerely believe what we are proposing is achievable for this important site, and we hope this meets with general approval.

We believe this project could help define a new standard in urban apartments in the central Hobart area.

Prof. Robert Morris-Nunn.
Circa Morris Nunn, Architects.

6. COMMITTEE ACTING AS PLANNING AUTHORITY

6.2 APPLICATIONS UNDER THE SULLIVANS COVE PLANNING SCHEME 1997

6.2.1 19-27 CAMPBELL STREET, 29 CAMPBELL STREET, 19 COLLINS STREET, CT.198531/2, ADJACENT ROAD RESERVATIONS, HOBART - PARTIAL DEMOLITION, ALTERATIONS AND EXTENSIONS TO EXISTING BUILDINGS AND NEW DEVELOPMENT FOR EDUCATION CENTRE AND ARTS AND CULTURAL CENTRE, INCLUDING STUDIO THEATRE, RECITAL HALL WITH KIOSK/BAR, SALON, TEACHING AND LEARNING SPACES, ROOF DECKS, ROOF TERRACES AND MINOR ROAD WORKS - PLN-16-00135-01 - FILE REF: 5659170/08 & P/29/388

214x's
(Council)

The General Manager reports:

"In accordance with the provisions of Part 2 Regulation 8(6) of the Local Government (Meeting Procedures) Regulations 2005, this supplementary matter is submitted for the consideration of the Committee.

Pursuant to Regulation 8(6), I report that:

(a) information in relation to the matter was provided subsequent to the distribution of the agenda;
(b) the matter is regarded as urgent; and
(c) advice is provided pursuant to Section 65 of the Act."

DES-F-0102/52
12/05/2015

HOBART
CITY COUNCIL

APPLICATION UNDER SULLIANS COVE PLANNING SCHEME

Type of Report	Council
Committee:	4 April 2016
Council:	11 April 2016
Expiry Date:	11 April 2016
Application No:	**PLN-16-00135-01**
Address:	**19-27 Campbell Street, 29 Campbell Street, 19 Collins Street, CT.198531/2, Adjacent Road Reservations, Hobart**
Applicant:	Terry Lockwood (on behalf of the University of Tasmania), Locked Bag 1365, Launceston
Proposal:	**Partial Demolition, Alterations and Extensions to Existing Buildings and New Development for Education Centre and Arts and Cultural Centre, including Studio Theatre, Recital Hall with Kiosk/Bar, Salon, Teaching and Learning Spaces, Roof Decks, Roof Terraces and Minor Road Works**
Representations:	One (1)
Performance criteria:	Activity Area Controls, Heritage, Archaeology, Building Surfaces, Demolition

1. Executive Summary

1.1. Planning approval is sought for the redevelopment of the site which includes the Theatre Royal and the former Hedberg Garage. The redevelopment will provide facilities including a recital hall, salon and studio theatre that will be used by the University of Tasmania as the Tasmanian College of the Arts and Conservatorium of Music, but which will also be open to the public. The redevelopment is for a single building that will integrate with and extend the existing Theatre Royal and Hedberg Garage buildings.

1.2. The proposal relies on performance criteria to satisfy the following standards and schedules.

1.2.1. Wapping Local Area Plan (Use, Height and Parking)
1.2.2. Heritage
1.2.3. Archaeology
1.2.4. Building Surfaces
1.2.5. Demolition

1.3. One representation to the proposal was received within the statutory advertising period 4 to 21 March 2016.

1.4. The proposal is recommended for approval subject to conditions.

1.5. The final decision is delegated to the Council.

2. Site Detail

2.1. The site is comprised of the Theatre Royal at 29 Campbell Street, the former open air car park at 19-27 Campbell Street, the former Hedberg Garage at 19 Collins Street, and the Collins and Sun Street road reservations adjacent to 19 Collins Street. The site is bounded to the north east by Sun Street, to the north west by Sackville Street, to the south west by Campbell Street and to the south east by Collins Street. The surrounding area contains a mix of uses, with residential dwellings, offices, hospitality and the hospital all in close proximity.

Figure 1: The subject site is highlighted in orange.

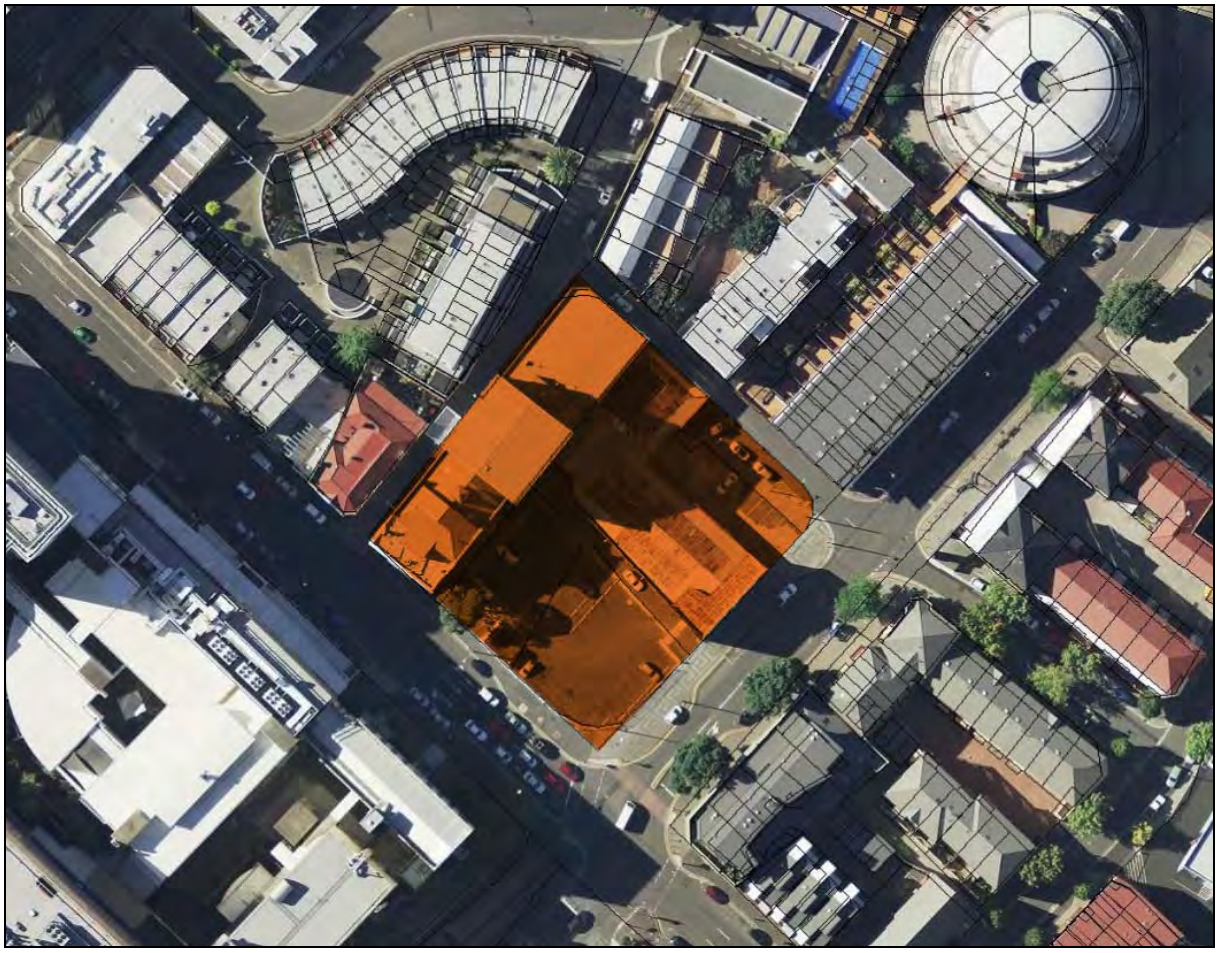


Figure 2: The subject site is highlighted in orange.

Figure 3: The subject site from the corner of Collins and Campbell Street.

Figure 4: The subject site from the corner of Collins and Sun Street.

Figure 5: The rear of the former Hedberg Garage, demonstrating the extent to which this building is being retained/recycled.

Figure 6: The existing Sackville Street elevation of the Theatre Royal.

Figure 7: The Theatre Royal's Campbell Street elevation. The high white and relatively new portion of the building is the flyover.

3. Proposal

3.1. Planning approval is sought for the redevelopment of the site, incorporating the Theatre Royal and the former Hedberg Garage buildings.

3.2. The redevelopment will provide facilities for the University of Tasmania's Tasmanian College of the Arts and Conservatorium of Music, including a recital hall, salon and studio theatre, as well as teaching and learning spaces, offices, meeting rooms and rehearsal spaces.

3.3. The new performance spaces (as well as an improved Theatre Royal) will also be open to the public, and various supporting uses are also proposed including a kiosk, bar and ticketing office.

3.4. The proposed building form is complex in design, described variously by the architects in their development application report (provided at Attachment D) as follows:

> Forms are pushed and pulled to create scaling devices informed by the Theatre Royal and the former Hedberg Garage … the building is an ensemble of volumes that are scaled to respond to the city scale to the south west, stepping down to the residential scale along Collins and Sun Streets …The stepping form of the building allows roofs of lower forms to be used as terraces.

3.5. The building is five levels above Campbell Street and six levels above Collins Street, with a maximum height of RL37.8m. The building is heavily articulated, with visually interesting glazing, outdoor decks and terraces to all frontages except Sackville Street. The highest element of the building is in the middle of the site, setback from the street frontages.

3.6. A variety of materials are used, which in part seek to reference the pulling back of the stage curtain. The materials include metallic opalescent cladding, glazing set within timber openings, concrete and masonry. Trees and greenery are an integral component of the exterior presentation of the building. Items found as part of the archaeological works are also proposed to be incorporated into the external materiality of the building at pedestrian level.

3.7. The Campbell Street elevation of the building has a glass atrium connecting the Theatre Royal to the new building, as well as a five-storey podium and glazing to the entry on the corner of Campbell and Collins Streets.

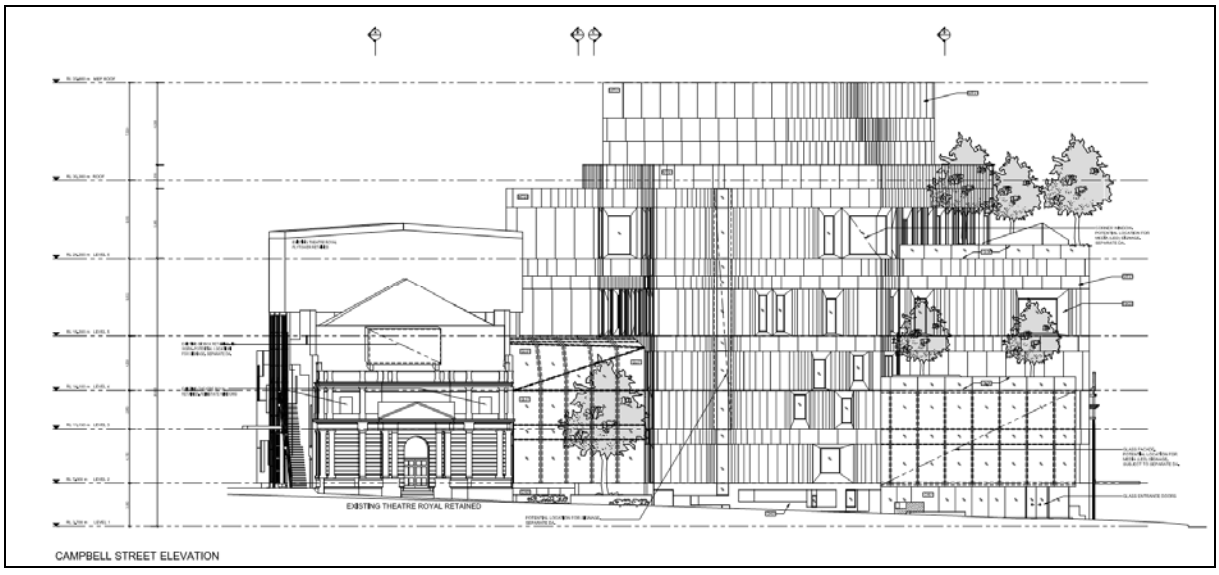


Figure 8: The proposed Campbell Street elevation.

Figure 9: An artist's impression of the Campbell Street elevation.

Figure 10: A montage of the Campbell Street elevation, at night.

Figure 11: A montage of the Campbell Street elevation, at night.

Figure 12: A montage of the Campbell Street elevation, during the day.

Figure 13: montage of the building from the corner of Campbell Street and Collins Street, at night.

Figure 14: montage of the building from the corner of Campbell Street and Collins Street, during the day.

3.8. The Collins Street elevation of the building incorporates a four-storey podium and glazing for the entry on the corner of Campbell and Collins Streets. It also integrates the former Hedberg Garage and back of house vehicle access.

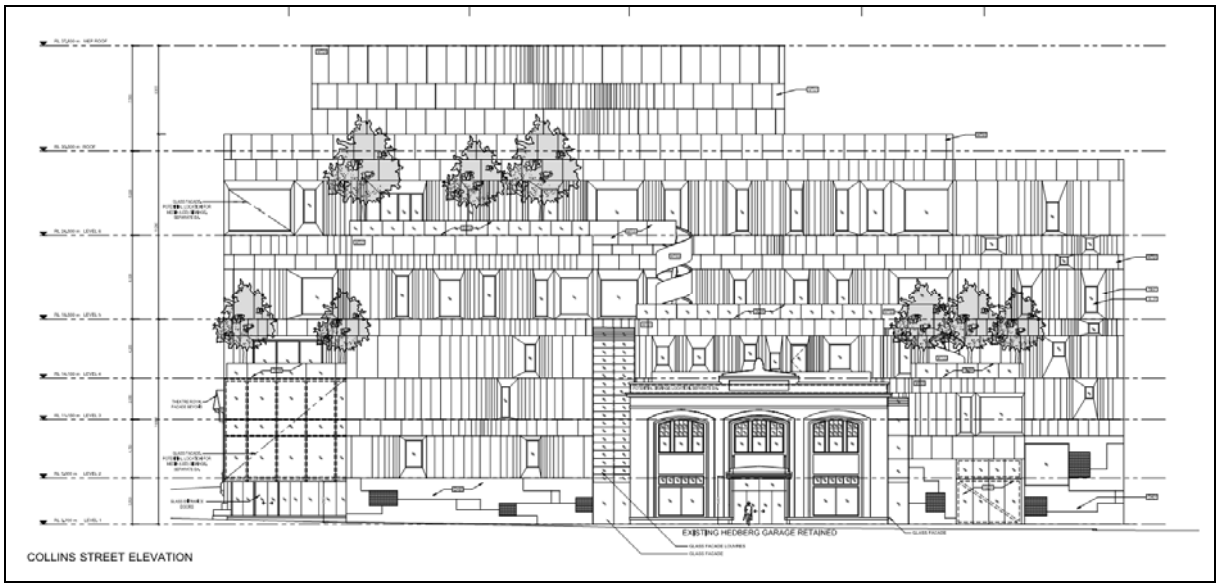


Figure 15: The proposed Collins Street elevation.

Figure 16: An artist's impression of the Collins Street elevation.

Figure 17: A montage of the Collins Street elevation, during the day.

Figure 18: An aerial montage of the Collins Street elevation. Note the outdoor dining shown on Collins Street is indicative only.

Figure 19: A montage from the corner of Collins Street and Sun Street. Note the outdoor dining shown on Collins Street is indicative only.

3.9. The Sun Street elevation of the building comprises back of house facilities, and what appears as an almost hovering four storey element which contains the studio theatre.

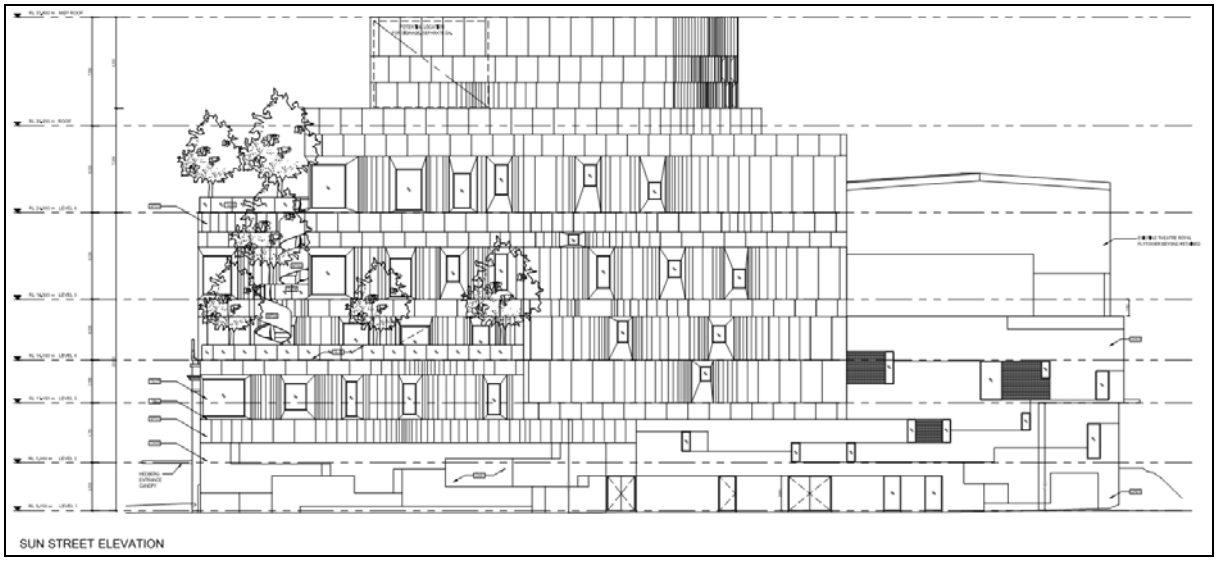


Figure 20: The proposed Sun Street elevation.

Figure 21: An artist's impression of the proposed Sun Street elevation.

3.10. The Sackville Street elevation of the building remains largely unchanged, except for a small portion at the very rear of the Theatre Royal which gets a new three storey addition which provides improved back of house facilities for the Theatre Royal.

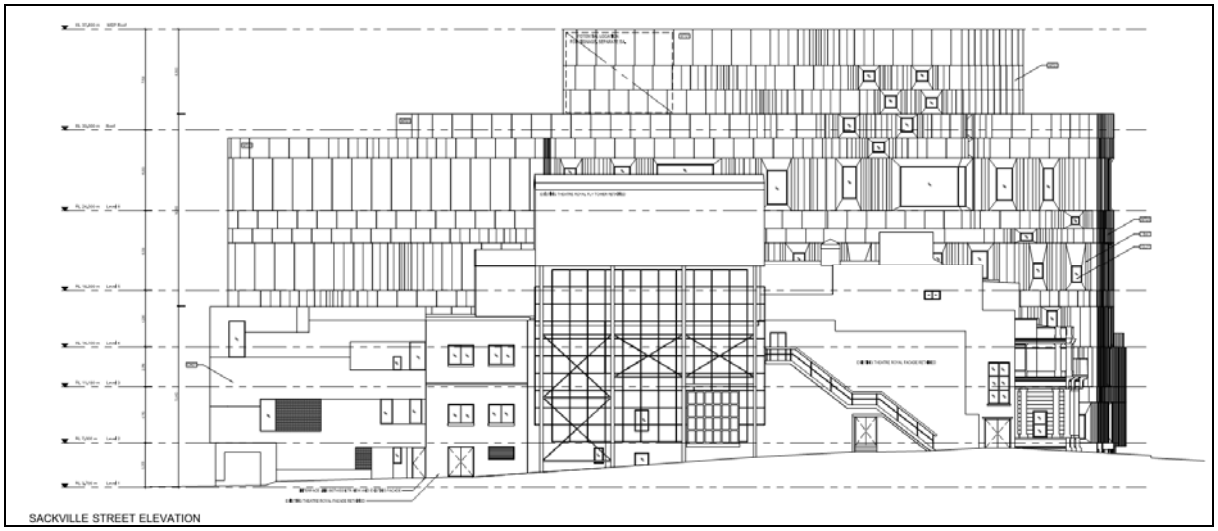


Figure 22: The proposed Sackville Street elevation.

4. Background

4.1. In November 2014 the Council approved early works on the subject site, pursuant to permit PLN-14-00973-01. These works have commenced and are substantially completed.

4.2. More specifically the approved works were:

- To demolish part of the former Hedberg Garage;
- To undertake archaeological, remediation and decontamination works across the site; and
- The installation of temporary stormwater pipes to the Theatre Royal.

4.3. The proposed development was considered by the Urban Design Advisory Panel (the Panel) at its meeting on 14 January 2016. The Panel found as follows:

- The proposal was creative and well considered, particularly regarding the respectful treatment of the Hedberg Garage and the Theatre Royal buildings. The variation of the facades, the use of space and the well considered internal layout have produced a good external result and an attractive exterior of the building. In particular, the Hedberg Garage fits nicely into the facade.

- Concern was raised regarding the vertical element of the new main building abruptly facing onto Campbell Street, when the remainder of the buildings on that street are stepped down to street level. However it was acknowledged the scale of Campbell Street is changing, particularly since the redevelopment of the Royal Hobart Hospital, and that it was preferable to have the bulk of the new building on the Campbell Street side. The development application should address the street levels on Campbell Street in the context of the development and the surrounding streetscape.

- The project could provide for greater activation of Collins Street, particularly with the opening of a cafe from the Hedberg Garage. The Panel noted that one of the critical elements of the proposal will be the distance between the main building and the Theatre Royal, noting that the current proposed distance seems reasonable, while still allowing for the Theatre Royal to be integrated.

- The Panel noted that the development will result in an overall intensification of the site, and that appropriate car parking and traffic management plans will need to form part of the development application. The Panel also noted the importance of acoustic containment measures and limiting noise leakage, particularly regarding the outdoor terrace theatre spaces, given the proximity to a residential area.

- The Panel noted that the finish and quality of materials used will be critical to the overall quality, durability and longevity of the building. The colours and treatments used were also important to ensuring the building blends into the existing streetscape, without looking too stark or bulky. It was also suggested that different materials could be used with respect to the plant room to make it less visible.

- The development application should include lighting images of the building at night, particularly regarding the Collins Street side, as the public will be predominantly using the building at night time. The Panel noted that both Council and the developers will need to have input into lighting and the

street environment of Collins Street as it is a shared space.

- The Panel noted that more work needs to be done in the area of footpath widening, realigning curbing and alterations to car parking arrangements. In particular, more work is required regarding taxi pick up/drop offs and traffic management for the Theatre Royal before and after performances. These are existing issues, which need improving.

- The Panel noted that emergency exits and the use of loading docks were also issues that need to be carefully managed.

- The Panel concluded that it was generally supportive of the proposal before it, noting that the overall result was heavily dependent on the treatments and materials chosen, and the actual delivery of the project.

5. Concerns raised by representors

5.1. The following table outlines the issues raised by representors. All concerns raised with respect to the discretions invoked by the proposal will be addressed in Section 6 of this report.

• What size are the solar panels and will it include battery storage to reduce peak energy demand?
• Will there be a smart energy management system?
• With emergent battery storage technology, is there an opportunity to eliminate the generator backup system in the L1 plant room?
• Does energy efficiency include selection of low energy lighting systems?
• Please provide shadow diagrams for winter.
• What is the actual new building population during a normal teaching day?
• Are there food and beverage uses?
• Does the development envisage outside live performances on the balconies? If so, what hours?
• Has there been any assessment on local wind patterns with regard to the outside terraces vegetation planted on them?
• I understand that because a building is ‘recycled’ within the development there is no need to provide parking. I think this approach is very short sighted. The reports attached to the development application appear to say that the extra numbers onsite during a normal teaching day will be over 1000. To assume local parking can cater for this extra requirement will only build on a future problem. How often are the local parking stations and Dunn Place currently full on 2016 observations? Project this forward to an open facility and what is the expected extra parking requirement within the vicinity of the new building? The current stage of the redevelopment has removed parking for at least 30 vehicles on a daily basis.
• Does the City of Hobart have plans for bicycle paths in the vicinity of the new facility? The way cyclists currently use Campbell Street is unregulated and unsafe, and will only get worse when the new facility adds hundreds of pedestrians to the footpath at peak times.

- What is the bike store capacity?

• Will there be restriction on hours of operation for vehicles using the back of house facilities from Sun Street?
• Will there be restrictions on hours of operation for garbage pickup?
• No mention was made in the report about the frequent traffic down Campbell Street of police, ambulance and fire response vehicles. I realise that there is nothing that can be done or planned for in the new facility but for completeness the report should have recorded this fact.
• What use are traffic volumes from 2004 and how do they relate to projected traffic volumes in 2018/2019.

5.2. Given the representation asked a number of direct questions, the Council's Development Appraisal Officer contacted both the representor to discuss the questions, and the applicant to seek a response to the questions raised. The applicant provided additional information in response the officer's request on 24 March 2016. It is provided at Attachment F.

6. Assessment

The *Sullivans Cove Planning Scheme 1997* is a performance based planning scheme. This approach recognises that there are in many cases a number of ways in which a proposal can satisfy desired environmental, social and economic standards. In some cases a proposal will be 'permitted' subject to specific 'deemed to comply' provisions being satisfied. Performance criteria are established to provide a means by which the objectives of the Planning Scheme may be satisfactorily met by a proposal. Where a proposal relies on performance criteria, the Council's ability to approve or refuse the proposal relates *only* to the performance criteria relied on.

6.1. The site is located within Activity Area 1.0 'Inner City Residential (Wapping)' of the *Sullivans Cove Planning Scheme 1997*.

6.2. Apart from the Theatre Royal, the site is currently not in use. 19-27 Campbell Street was previously used as an open air car park. The proposed uses are Education Centre and Arts and Cultural Centre. Both are discretionary in the Activity Area.

6.3. The proposal has been assessed against;

6.3.1. Parts A and B – Strategic Framework

6.3.2. Part D – Clause 15 – Activity Area Controls

6.3.3. Part E – Schedule 1 – Conservation of Cultural Heritage Values

6.3.4. Part E – Schedule 2 – Urban Form

6.3.5. Part E – Schedule 5 – Traffic, Access and Parking

6.3.6. Part E – Schedule 7 – Demolition

6.3.7. Part E – Schedule 8 – Environmental Management

6.4. The proposal relies on the following performance criteria to comply with the applicable standards;

6.4.1. Activity Area Controls (Wapping Local Area Plan) – clause 15.5

6.4.2. Heritage – clause 22.4.5 and 22.5.5

6.4.3. Archaeology – clause 22.6.5.

6.4.4. Urban Form – clause 23.7.2

6.4.5. Demolition – clause 28.6.

6.5. Each performance criterion is dealt with separately below.

6.6. Activity Area Controls (Wapping Local Area Plan) – clause 15.5

6.6.1. The entirety of the site excluding the Theatre Royal (29 Campbell Street) is located within the area identified in the planning scheme as the Wapping Local Area Plan precinct (the WLAPP). The site is identified as Parcel 4 within the WLAPP.

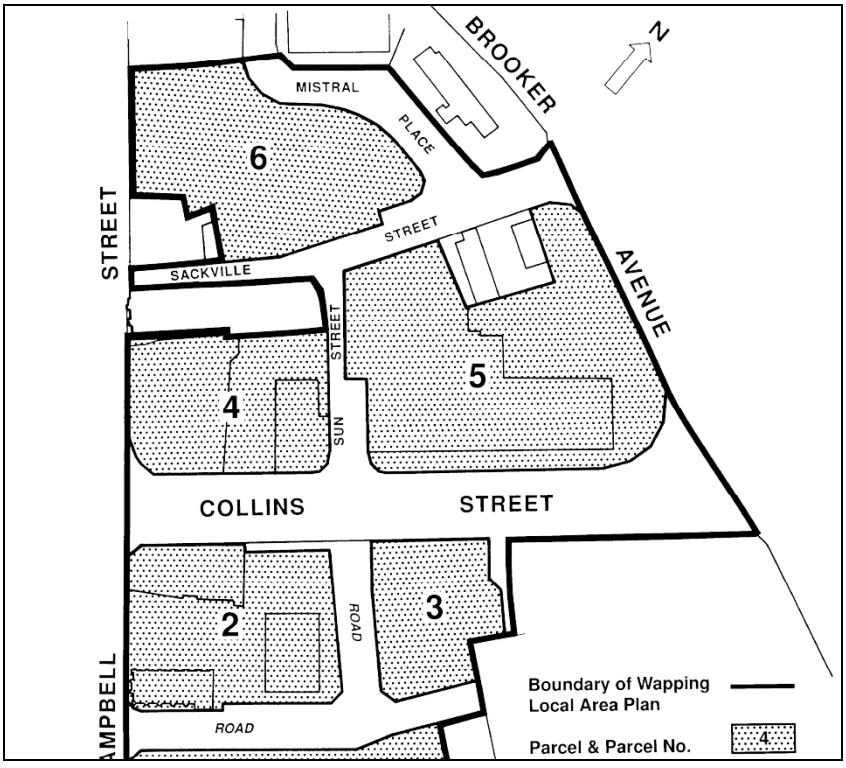


Figure 23: Showing the extent of the Wapping Local Area Plan precinct. The subject site is comprised of Parcel 4 and the adjacent site on Campbell Street, which is the Theatre Royal and which is not in the Wapping Local Area Plan precinct.

6.6.2. Use and development within the WLAPP is controlled by specific provisions in clause 15.5, as well as by the schedules. However the planning scheme makes it clear that if there are any inconsistencies between the schedules and the provisions relating to the WLAPP, the

WLAPP provisions prevail.

6.6.3. The WLAPP provisions relate to subdivision, use, density, height, siting and landscaping, traffic access and parking, heritage and signs. The proposal does not comply with the permitted standards for use and height. It is also arguable that the proposal does not comply with the permitted standards for parking. Each of these three matters is considered separately below.

6.6.4. Use – clause 15.5.7 (b)

6.6.4.1. The proposal includes arts and cultural centre use, and an education centre use. The other uses included in the proposal (i.e. kiosk, bar, function centre) are considered to be ancillary to the two primary uses. If it were not for those two primary uses, the ancillary uses would not be present.

6.6.4.2. Both an arts and cultural centre and an education centre are discretionary uses in the WLAPP. The planning scheme provides the following qualifications:

Education Centre:

Only on Parcel 5 and on Parcel 4 where it can demonstrate a need to be closely linked to the Royal Hobart Hospital for educational and functional synergies and where it also provides for ancillary facilities for the Theatre Royal.

Arts and Cultural Centre:

On Parcel 4 fronting Campbell Street where it includes ancillary facilities for the Theatre Royal or in any building listed in Clause 15.5.12 (Heritage) where it assists in the conservation of that building in line with the Principles in Clause 15.5.12.

6.6.4.3. The site is identified as Parcel 4. Although the education centre is not connected to the Royal Hobart Hospital it is connected with the performing arts and the Theatre Royal. It does contain teaching and learning spaces, so in theory there would be nothing to prevent synergies between the two facilities from occurring.

6.6.4.4. The proposal improves the facilities within the Theatre Royal as well as providing complementary and ancillary facilities within the new building.

6.6.4.5. The qualifications are considered to be met.

6.6.4.6. Clause 15.5.7 (b) also provides guidelines for use. The guidelines provide as follows:

The intention is that commercial activity should be subservient to residential uses throughout the Wapping area and only encouraged on the ground floor fronting streets with an emphasis on Collins Street and the main perimeter streets. However, on some sites, educational, research or cultural uses might be specifically allowed in isolation where:

- *It can be demonstrated that residential development is not feasible nor desirable; or*
- *It assists in the conservation of a heritage building; or*
- *There is a demonstrated need to have functional links to nearby uses not within the Wapping Local Area.*

In all cases the non-residential use must demonstrate that it will not negatively impact on the adjacent or surrounding residential uses or the prospects of development for such uses.

Generally, commercial activity is discouraged in the smaller streets and courtyards.

6.6.4.7. As the qualifications detailed above indicate, the planning scheme clearly envisages that Parcel 4 is not preferred to be for residential use. This is further supported by the WLAPP statement of desired future character which states:

Collins Street has been earmarked as the cultural and commercial spine of the area and commercial uses are encouraged on the ground floor. Parcels 2 and 4 have important roles in forming a gateway and linking Collins Street to the more commercial uses and urban form of the CBD. Additionally some commercial uses may be allowed in existing heritage buildings where this is required to assist in their conservation. Generally though significant commercial activity will only be appropriate at the edges of the Wapping area where high levels of traffic and neighbouring land uses reduce the potential for successful residential development or where they provide a buffer to traffic noise. This may result in a development on Parcel 4 which does not provide any residential component.

6.6.4.8. As such the first dot point above is made out.

6.6.4.9. The proposed uses also result in the retention and recycling of part of the former Hedberg Garage as well as improvements to the Theatre Royal. It is considered the second dot point is also made out.

6.6.4.10. No information has been provided with respect to a demonstrable need for functional links, as per the third dot point. However the 'or' at the end of each dot point indicates that the requirement is to meet one only; it is not a cumulative requirement.

6.6.4.11. It is noted that a concern raised in the objections relates to the impact on residential amenity as a result of the use of the outdoor terraces, the loading bays and garbage delivery. The submitted documentation includes an acoustic memo prepared by acoustic specialists ARUP (provided at Supporting Document Attachment 3), which specifically addresses these issues:

The development includes a number of external terraces with the intent that these will activate the building façade and bring life to the building. Predominately the terraces will be used for flexible outdoor recreation and informal meeting spaces. While the full function of these spaces is yet to evolve, it is likely that they will on occasion be used for functions and performances. In these instances, to minimise the noise nuisance to the adjacent residences it is proposed that the Environmental Management and Pollution Control (Miscellaneous) Noise Regulations would apply.

Currently bump in – bump out deliveries of sets and for performances takes place on Sackville Street and given the nature of this use, these deliveries can take place varying times of the day, evening and night. In the new development, all deliveries (including sets, rubbish collection) will be relocated to a dedicated loading bay along Sun Street. To protect the local residences from noise associated with this loading activity, the loading bay will be fully enclosed.

The location of enclosed loading bay is indicated on the drawings at the end of this document.

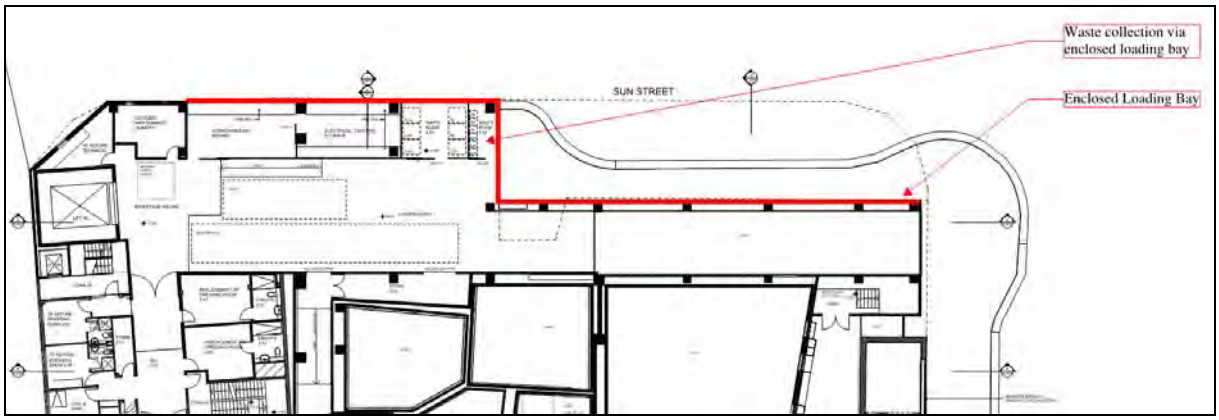


Figure 24: The ARUP plan showing that the rear loading bay and garbage collection bay are both enclosed.

6.6.4.12. The memo also provides the following assessment:

Noise Source	Most Affected Noise Receiver	Applicable Noise Criteria	Predicted Noise Level	Complies with Noise Limit?
Loading Bay	Sun Street Residential Receivers	45 dB(A), external	25 – 30 dB(A)	✓
Mechanical Plant Noise	Sun Street Residential Receivers	40 dB(A), external	35 – 40 dB(A)	✓
	Hospital, upper levels	30 dB(A), internal	30 – 35 dB(A) internal assuming standard double glazing	Marginal exceedence*
Outdoor Spaces when used for events	Collins Street Residential Receivers			To comply with EMPC

*a 3 dB exceedence is considered just noticeable. Quieter mechanical equipment and noise mitigation will be investigated as the design develops.

Figure 25: The ARUP assessment demonstrating the acceptability of noise sources created by the proposed development.

6.6.4.13. Based on this information the proposed impacts that may arise are considered to be acceptable. This conclusion is conditionally supported by the Council's Environmental Development Planner, whose assessment report is provided at Attachment E. With respect to noise the officer concludes:

Reliance on the *Environmental Management and Pollution Control Act 1994* alone to regulate environmental nuisance from the outdoor areas is not considered appropriate. The issue was discussed with Council's Senior Environmental Health Officer, and as a result of those discussions, it is recommended that a condition be applied to any permit granted limiting the use of these areas (for potentially noisy activities) to the hours of 8am to 10pm without the written consent of the Planning Authority.

As the preliminary modelling suggests that proposed noise mitigation measures may not be appropriate to limit noise levels in the new hospital wards to reasonable levels, a further condition is recommended requiring further modelling to demonstrate that noise levels in the new wards are unlikely to exceed 30dB(A) as a result of the mechanical plant under normal operating conditions, prior to the use commencing.

Noise during the construction phase must be addressed in the construction management plan condition.

6.6.4.14. The officer's comments are supported and the suggested conditions have been included below under section 9 Recommendation.

6.6.4.15. As such, the proposed uses are considered acceptable.

6.6.5. Height – clause 15.5.9

6.6.5.1. The permitted height for the site is shown in the figure below:

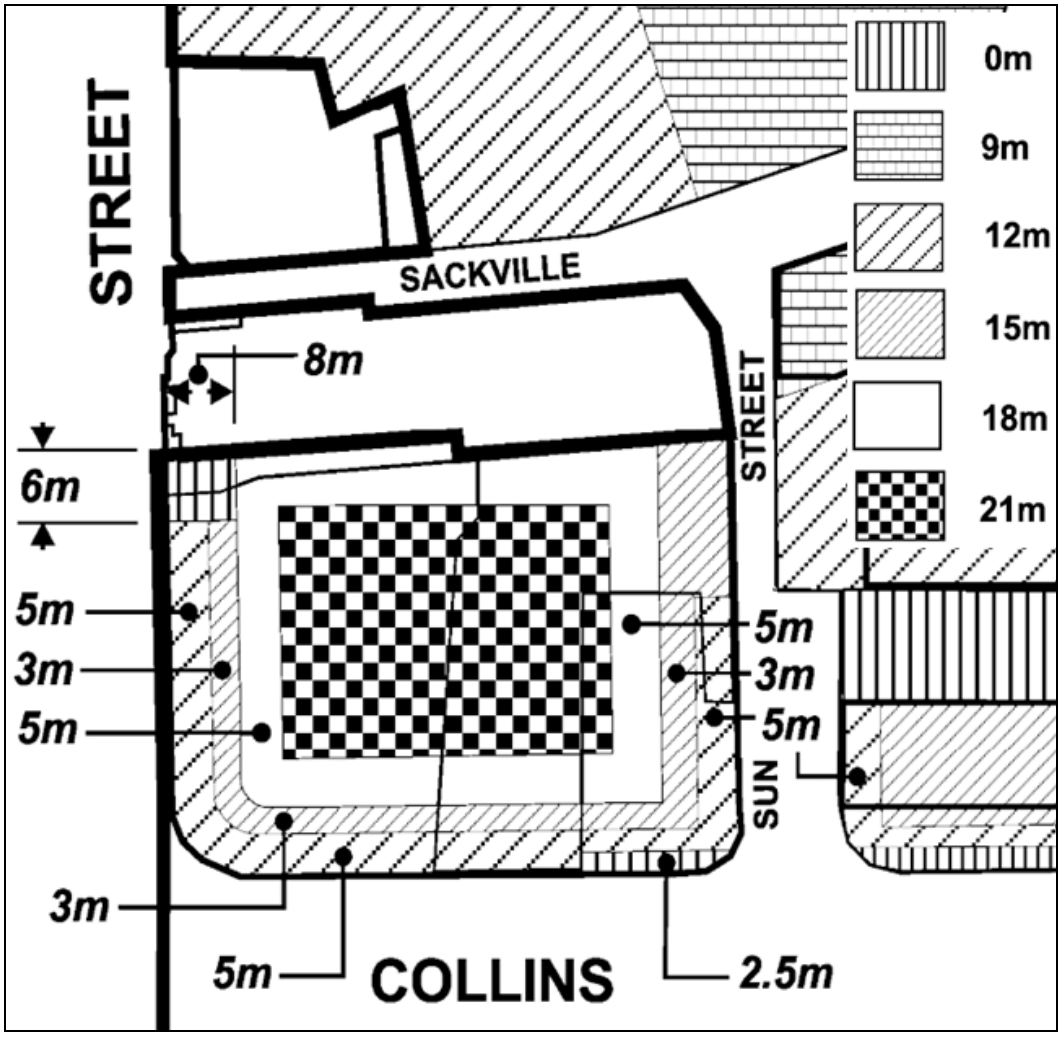


Figure 26: The permitted heights relevant to the subject site as set out by the planning scheme.

6.6.5.2. The figure provides that:

- For the 6m by 8m area between the Theatre Royal and site fronting Campbell Street the permitted height is 0m.
- A small 2.5m wide portion of the site on the corner of Collins and Sun Streets also has a permitted height of 0m.
- For the majority of the site, for the area 5m back from the street front, the permitted height is 12m.
- For the majority of the site, for the area between 5m and 8m setback from the street, the permitted height is 15m.
- For the site, for the area between 8m and 13m setback from the street, and the area 5m setback from the Theatre Royal, the permitted height is 18m.
- For the remainder of the site, which is essentially the middle of the site, the permitted height is 21m.

6.6.5.3. The proposed development exceeds all of the above. Notably, it has a maximum height of RL37.8m to the top of the plant roof, which is in the centre of the site. An RL of 37.8m is approximately:

- 10.9m above the existing Theatre Royal flytower (refer to figure below).
- 32m above the footpath level at the entrance to the Theatre Royal.
- 33.6m above the footpath level at the entrance on the corner of Collins and Campbell Streets.
- 34.1m above the footpath level at the entrance at the former Hedberg Garage

Figure 27: The Theatre Royal's Campbell Street elevation. The high, white and relatively new portion of the building is the flyover, as indicated by the red arrow.

6.6.5.4. Clause 15.5.9 provides the following with respect to development which exceeds the permitted height:

'Development' in excess of the permitted height will only be 'allowed where it can be demonstrated that there is no unreasonable detriment to residential amenity, street amenity, the spatial characteristics of the streets and spaces, heritage values of any building or site, or the quality of the environment.

The set back from the street to which a maximum height applies may be reduced where it can be demonstrated that that there is no unreasonable detriment to residential amenity, street amenity or quality of the environment.

6.6.5.5. The clause goes on to provide the following guidelines

In considering the merit and performance of any 'development' proposal that exceeds the permitted height the following will be taken into consideration:

- *bulk (size and form);*
- *massing (relationship of solid walls to doors, window openings and overall elevational treatment);*
- *privacy;*
- *solar access;*
- *wind effects;*
- *view; and*
- *skyline.*

Particular attention should be given to the ODP including the Wapping Local Area Plan Review – Parcels 4 & 5, December 2001, and the Street Space Character Addendum to the ODP (1996).

The incorporation of features such as lift over-runs, machinery and architectural features that protrude above the eaves or parapet will be expected to reflect the design objectives of this Local Area Plan.

The Planning Authority may also impose conditions relating to the appearance of developments, privacy, solar access and any aspect of construction relevant to the liveability of dwellings.

6.6.5.6. The Ireneinc report (provided at Attachment D) submitted in support of the application provides as follows with respect to height:

The response of the development to the urban setting in terms of bulk, massing and skyline is discussed in more detail in the accompanying Site Development Plan from page 35, particularly in terms of how the building [responds] to the spatial characteristics of the surrounding environment. The development is situated to the south of existing residential development and is not anticipated to have an unreasonable impact on amenity of neighbouring dwellings.

6.6.5.7. The Site Development Plan, prepared by Leigh Woolley (provided at Supporting Document Attachment 1), goes into detail about the performance of the proposed building in an urban form sense. He finds that the proposed building:

- Has a bulk and height that reflects the natural topography of the Cove;
- Has strong continuous upright walls to primary spaces;
- Has a diversity of building heights and volumes;
- Will not be individually prominent; and
- Will create secondary spaces.

6.6.5.8. The submitted documentation also includes shadow diagrams which show that there will be no impact on residential properties to the east of the site on Collins Street until 3pm at the September equinox. That means those residential properties will enjoy no shadowing from the proposed development at least between 9am and 12pm. Shadowing is likely to start sometime between 12pm and 3pm.

6.6.5.9. The representation to the application noted that the shadow diagrams provided were for the equinoxes, not the winter solstice. The applicant has subsequently provided these diagrams on 24 March 2014 at the request of the Council's Development Appraisal Planner. They are provided at Attachment F. They show shadowing to the south eastern end of Collins Street would begin before 12pm midday.

6.6.5.10. It is noted that mechanical plant and the like has been incorporated into the overall design of the building.

6.6.5.11. The proposal is considered to perform well despite it exceeding the permitted height standards. The design of the building – its height, bulk, massing and materiality – is considered to be successful in terms of its impact on spatial characteristics of the adjoining streets and the Cove more generally. The impact on views and the skyline, as detailed in Leigh Woolley's Site Development Plan, is considered acceptable.

6.6.5.12. In terms of impact on residential amenity, the proposal is for a high quality architecturally designed building which is considered to be a positive in an aesthetic sense – certainly an improvement on the previous partially vacant site with a dilapidated former Hedberg Garage. The impact on solar access for the residences at first floor level on Collins Street is likely to be modest and is not considered to be unreasonable. No specific impact on privacy is considered likely to arise (i.e. overlooking or direct views into habitable room windows).

6.6.5.13. The Council's Senior Cultural Heritage Officer has considered the proposal and has supported it. The officer's comments are provided below under paragraph 6.7.2.

6.6.5.14. The proposal is therefore considered to be acceptable in terms of height.

6.6.6. Parking – Clause 15.5.11

6.6.6.1. Clause 15.5.11 provides that in the WLAPP, parking for non-residential uses should be provided at a rate of three spaces per $100m^2$ of floor area. The proposed floor area is $10,140m^2$. This includes the Theatre Royal portion of the development which is not within the WLAPP and is not required to provide any parking. The floor area of that part of the building on the Theatre Royal site has not been specifically provided. The Theatre Royal site area is assumed to be in the order of $3000m^2$. This leaves a floor area of $7140m^2$, which equates to a parking requirement of 215 spaces.

6.6.6.2. The development proposes no onsite parking.

6.6.6.3. The Ireneinc report submits that the proposal is exempt from having to provide parking on the basis that clause 15.5.11 states:

'Uses' and/or 'developments' involving the retention and recycling of the buildings shown in Figure 3c shall be 'exempt' from any requirement to provide car parking either on or off site.

6.6.6.4. Figure 3c shows the former Hedberg Garage building as a 'parking provision exempt building':

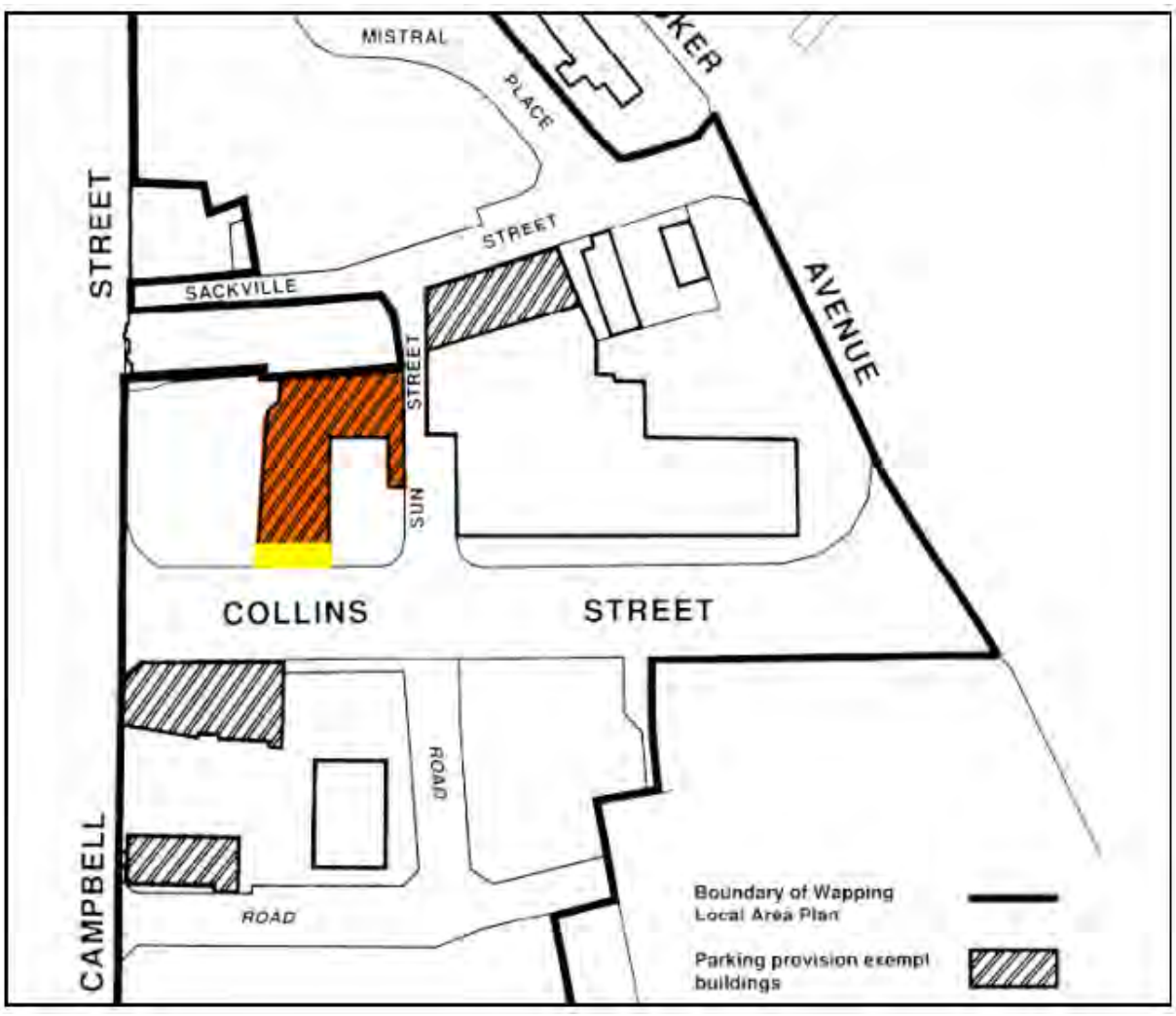


Figure 28: The planning scheme provision setting out those buildings which are parking provision exempt within the Wapping Local Area Plan precinct. The former Hedberg Garage building is highlighted in orange. The extent that is being retained/recycled is approximately shown in yellow.

6.6.6.5. The argument made by the Ireneinc report is that retaining what is essentially just the façade of the former Hedberg Garage is sufficient to gain the benefit of the exemption.

Figure 29: Showing the extent to which the former Hedberg Garage has been retained.

Figure 30: Showing the extent to which the former Hedberg Garage has been retained.

Figure 31: Showing the extent to which the former Hedberg Garage has been retained.

6.6.6.6. The wording of the exemption is ambiguous. It does not make it clear whether it should apply to the retention/recycling of a building in whole, or if retention/recycling in part is sufficient. Certainly the argument made by the Ireneinc report is there to be made. However, given the majority of the building has been demolished, maintaining that the building has been retained and/or recycled is considered to be tenuous and not without risk if accepted.

6.6.6.7. Clause 15.5.11 also separately states as follows:

The parking provision [requirements do] *not apply to buildings shown as parking provision exempt buildings in Figure 3c.*

6.6.6.8. The former Hedberg Garage building as shown in Figure 3c no longer exists, aside from what is essentially a façade. Because the building no longer exists, it is considered clear that this clause cannot apply to the current proposal.

6.6.6.9. It is further noted that the submitted Traffic Impact Assessment (provided at Supporting Document Attachment 2) refers to four car parks which are located in relatively close proximity to the site, and suggests that these facilities could absorb some of the parking demand likely to be generated by the proposed use. However there is no analysis in this report about the actual capacity of these facilities to absorb that demand. Some are privately run, some are Council run. No numbers have been provided on the availability of parking at particular times of day and night. There is no suggestion that the report's author has contacted the car park operators to ascertain this

detail.

6.6.6.10. Therefore, while the facilities may indeed be able to absorb some of the demand, the extent to which that is likely to be so is unclear.

6.6.6.11. On that basis, further consideration of the proposal as if it the exemption were not applicable is considered prudent.

6.6.6.12. Clause 15.5.11 provides Council with the discretion to waive the car parking requirement '*for environmental, streetscape or safety reasons'* if it is satisfied that '*obstruction of roads or pedestrian ways in the area will not be increased*'.

6.6.6.13. No obstructions of roads or pedestrian ways are proposed.

6.6.6.14. If the Council were to require over 200 car parking spaces to be provided this would have a substantial impact on the design of the building, with a strong probability that it would increase its overall height. This is not considered desirable from a streetscape point of view.

6.6.6.15. Not requiring parking to be provided can also be supported on environmental grounds. It encourages people to find alternative ways of getting to the facilities including walking, public transport, bikes or car pooling.

6.6.6.16. It is difficult to say categorically that requiring car parking to be provided would be unsafe.

6.6.6.17. Clause 15.5.11 also provides guidelines with respect to the provision of onsite parking. The guidelines state:

Encouraging inner city living is a primary objective of this Local Area Plan, therefore parking requirements should not be rigidly applied. In instances where site or building configuration makes redevelopment for residential uses difficult or the provision of the required number of parking spaces would result in substantial detriment to residential amenity those requirements should be waived in whole or part.

6.6.6.18. As has been set out above, the planning scheme makes it clear that Parcel 4 is preferred for non-residential use. Requiring the proposal to provide over 200 car parking spaces onsite could also be detrimental to residential amenity – both in terms of the changes to the building design that would necessarily have to take place, as well as to the number of traffic movements to and from the site.

6.6.6.19. The WLAPP provisions provide further guidance with respect to the provision of parking. Clause 15.5.3, which contains the statement of desired future character, provides as follows:

Commensurate with the objectives of sustainable development, good design and visual amenity to cater for an inner city lifestyle, the level of

parking provision should be minimal and located and accessed in a manner that does not diminish the amenity of the streetspaces.

6.6.6.20. It is considered that a parking requirement of over 200 spaces is not minimal, and that requiring that level of parking to be provided would not be consistent with the desired future character of the WLAPP.

6.6.6.21. The Traffic Access and Parking Schedule is also instructive, and applies to the subject site so long as it is not inconsistent with the provisions of the WLAPP.

6.6.6.22. Clause 26.1 of the parking schedule provides that:

It is recognised that requiring car parking to be provided for activities in the Cove is likely to be detrimental to the Cove's urban character and heritage. Consequently, in general, car parking will not be required to be provided on-site for any use or development.

6.6.6.23. Clause 26.2 provides that a proposed development is acceptable so long as it is not unsafe for vehicles and pedestrians. This clause also states that:

Unless particularly specified as a policy objective or requirement for all or part of an Activity Area … developments will not be expected to incorporate on-site vehicle parking.

6.6.6.24. The Council's Manager Traffic Engineering has provided the following comments with respect to parking:

In regards to the traffic impacts of the proposed development, a Traffic Impact Assessment (TIA) has been provided by the applicant (prepared by Howarth Fisher, dated January 2016). There are a number of discrepancies and omissions in the TIA report relating to traffic volumes, parking demand and trip generation however, it is considered that these do not alter the conclusions and recommendations in the report.

The traffic data included in Section 4.3 of the TIA does not appear to be recent (being 12 years old), nor does it accord with the actual traffic volumes in the street. For example, recent SCATS traffic data for Campbell Street (provided in a recent report prepared on behalf of the Royal Hobart Hospital) indicates that weekday traffic volumes are in the order of 12,000 vehicles per day. However, due to the lack of a requirement to provide parking on-site an assessment of the impacts on the traffic network in the immediate vicinity of the site has not been undertaken and therefore the traffic data has not been relied on.

The *Sullivans Cove Planning Scheme 1997* does not require the provision of any onsite car parking for a site that incorporates existing building nor does it specify parking rates required for particular developments. There is no car parking provided on the site and the development relies on the surrounding parking provision (both on-

street and off-street) to support the uses within the building.

The Creative Industries and Performing Arts Development (CIPAD) is proposed to operate in two different modes – as an education facility for the University of Tasmania during weekdays and as performance space at other times. A representation has been received that questions the impact of not providing onsite car parking and this is addressed below.

Education Facility:-
Operating in its "education mode", the development is proposed to cater for 915 university students and 125 staff. The theoretical parking generation (based on the Parking and Access Code in the *Hobart Interim Planning Scheme 2015*) for the education facility would be 91.5 spaces for student parking and 62.5 spaces for staff parking (total of 154 spaces).

However, it is recognised that the University of Tasmania has adopted and is successfully implementing a sustainable transport plan for all of its campuses within Tasmania in order to reduce reliance on private vehicle transport. And the TIA suggests that the location of this new facility within the Hobart CBD will allow for easy access by walking, cycling and public transport and is easily accessible by these non-car modes from the new student accommodation being developed on the corner of Melville St and Elizabeth St.

It is considered that the lack of car parking provision on-site will assist in encouraging students and staff to travel via non-car modes. Commuter parking is provided within easy walking distance on The Domain at a nominal daily cost and other Council-owned and private off-street car parking is also available.

Performance Space:-
There are three separate performance spaces within the CIPAD with 120, 370 and 385 seats in each area (totalling 875 seats). This is additional to the existing 698 seats available with the Theatre Royal.

The theoretical parking generation (based on the Parking and Access Code in the *Hobart Interim Planning Scheme 2015*) for the theatre spaces would be 40, 124 and 128 spaces respectively for the new performance areas (total of 292 spaces if all performance areas are being used concurrently). Staggering the start and finish time of performances would reduce the parking demand and also reduce the peak traffic generation by distributing vehicle traffic movements more evenly across the day.

It would be expected that the majority of performances would occur ... as weekend matinees or during the evening and making use of the car parking spaces available within nearby Council-owned and private off-street car parking and on-street parking during these periods of lower general parking demand in the city.

The TIA indicates that service vehicle access is suitable but does rely on vehicles reversing into the loading dock from Collins Street. Given the low traffic volumes and low travel speed in the street this is considered acceptable. Management of pedestrians on the footpath during this manoeuvring will need to be carefully considered when this activity is undertaken.

Bicycle parking for 54 bicycles is provided on the ground floor (for 24 bikes) and Level 7 (for 30 bikes) of the development – designate for use by students. This assists in addressing the lack of on-site parking provision for cars. Campbell Street is identified as being part of the arterial bicycle network and Council officers are currently developing designs for extending the on-street bicycle lanes along Campbell Street and Argyle Street – recognising that these on-street lanes cannot be installed on Campbell Street until the redevelopment works on the Royal Hobart Hospital site have been completed.

The TIA indicates that two parking spaces will be removed from Sun Street but replaced in Collins Street where redundant vehicle crossovers are removed as part of the development. The proposed new parking spaces are to be designed to comply with AS2890.5 (On-street parking). Plans of the new parking layout are to be provided and approved prior to implementation (to the satisfaction of the Director City Infrastructure) and any changes to the road reserve to accommodate this parking would be at the cost of the developer.

With the removal of on-street car parking in Sun Street, additional signage is required at the intersection of Sun Street and Collins Street advising that the street is suitable only for local access. A plan showing that location and type of signage to be installed shall be provided (to the satisfaction of the Director City Infrastructure) prior to implementation.

A Construction traffic management plan will be required given the likely duration of construction works, the proximity to the CBD and other significant construction sites to ensure that the impact on the road network during construction is assessed and mitigation measures implemented as necessary.

I would be comfortable seeing this development approved on traffic engineering and road safety grounds subject to conditions/advice as set out above.

6.6.6.25. The officer's comments are supported and the suggested conditions included under section 9 Recommendation below.

6.6.6.26. On balance it is considered arguable that the proposed development should be exempt from requiring onsite parking. If that argument is not made out, then it is considered requiring the development to provide over 200 onsite parking spaces would not be consistent with the desired future character of the WLAPP or the Cove more generally. As such, it is considered that discretion should be exercised in favour of

not providing the required number of car parking spaces.

6.7. Heritage and Archaeology – clauses 22.4.5 and 22.5.5 and 22.6.5

6.7.1. The former Hedberg Garage and the Theatre Royal are both heritage listed sites under the planning scheme. A portion of the site on 19-27 Campbell Street, adjacent to the Theatre Royal is also identified as being of archaeological sensitivity.

6.7.2. The proposal has therefore been referred to the Council's Senior Cultural Heritage Office for assessment, and the officer provided the following comments:

This proposal has been developed in close consultation with Council staff and with officers of Heritage Tasmania. The proposal has also been guided by a comprehensive investigation of heritage (including archaeological) factors relevant to the site, including policy documents regarding the adjacent Theatre Royal. The application is accompanied by a thorough Heritage Impact Statement.

The Theatre Royal has operated in some form for nearly 180 years. The present theatre space is over 100 years old (though partly reconstructed after fire). The Theatre Royal is a highly cherished asset. Its continued use depends on the provision of fully-compliant access, better front-of-house facilities (ticketing, toilets, refreshment areas etc.) None of this can be accommodated within the existing building. The adjacent site (the location of the proposed development) provides the only opportunity to solve the various logistical problems of the Theatre Royal.

This fact has been acknowledged in the decision to use the site for the development of a compatible cultural facility, and has influenced the design of the new building.

The statement of heritage impact notes (p. 14):

9.3 This assessment concludes that the general siting and disposition of the Development is provisionally acceptable so far as its relationship with the Theatre Royal, Hedberg Garage and the ADJACENT listed buildings is concerned. This conditional support relies on the quality of the ultimate architectural design, in particular its detail, exterior materials and finishes, scale and three dimensional proportioning of the façade modelling.

The conclusion of the statement of heritage impact reads as follows:

This heritage assessment considers that there is an overriding imperative which underpins the value of this project for the greater good of the Theatre Royal. Specifically it will facilitate the capacity of the building to continue its theatrical use and maintain the criteria for the Tasmanian Heritage Council listing (a), (b), (d) and (f). This assessment considers that the project is acceptable in holistic terms and that its impact upon the heritage values of the site (subject to future design and detailing) does not, on balance, diminish the significance of the place.

I concur with that assessment.

6.7.3. The officer's comments are supported.

6.8. Urban Form (Building Surfaces) – clauses 23.7.2

6.8.1. The planning scheme stipulates that development is permitted where building surfaces to a primary space are:

- *Primarily masonry.*
- *Have a maximum allowable void of 50 percent in all street frontage elevations.*
- *To comprise high quality finishes that reinforce the status as a primary building frontage.*

6.8.2. For buildings fronting secondary spaces the planning scheme provides that building surfaces must be finished so as to be presented in a less detailed and ornate manner than the surface of the building to a primary space, or the surfaces of adjacent buildings to primary spaces.

6.8.3. Campbell Street and Collins Street are identified by the planning scheme as primary spaces. Sun Street and Sackville Street and identified as secondary spaces.

6.8.4. The proposal is considered to satisfy the permitted standard with respect to the secondary spaces. The elevations to Sun and Sackville Streets are less detailed than those elevations to Campbell and Collins Streets.

6.8.5. The proposal does not comply with the permitted standard for primary spaces on the basis that the materials to be used are not primarily masonry.

6.8.6. Clause 27.3.2 provides that where the permitted standard cannot be met the proposal must accord with the objectives of the schedule. The objectives are as follows:

- *The traditional urban pattern of Sullivans Cove is to be conserved. A contemporary adaptation is to be created in development/redevelopment areas.*
- *Views to Sullivans Cove along primary spaces are to be retained, especially to the River Derwent.*
- *Views over the land bounded by Tasman Highway, Brooker Avenue and Liverpool Street from the City and Wapping to the Domain and from the Domain and Tasman Highway to the City are to be retained.*
- *Expression of the Wall of the Cove is to be encouraged where possible.*
- *The bulk and height of buildings must reflect the natural topography of the Sullivans Cove Planning Area, the amphitheatre sloping down to the Cove and the Macquarie Street and Regatta Point Ridges.*
- *A diversity of building heights and volumes will be encouraged within this over-riding pattern, but buildings must have a respectful relationship to each other and to buildings of identified cultural significance within a street.*
- *New buildings must not be individually prominent in terms of contrast with neighbouring buildings by being significantly higher or having a larger apparent size when viewed in street elevation.*
- *New buildings should facilitate the creation of 'secondary spaces' on lots in the Cove. Such spaces should be encouraged where they demonstrably create useable pedestrian environments and facilitate pedestrian movement and views.*
- *New urban gardens are to be encouraged in secondary spaces only.*

6.8.7. The objectives are all relevant to building form (which has been assessed as acceptable against the WLAPP provisions above), but are not obviously applicable to building surfaces. It is noted that the proposed building materials include metallic opalescent cladding, glazing set within timber openings, concrete and masonry. Trees and greenery are an integral component of the exterior presentation of the building. Items found as part of the archaeological works are also proposed to be incorporated into the external materiality of the building at pedestrian level.

6.8.8. The development application report (provided at Attachment D) included the following materials palette:

Figure 32: The proposed materials palette.

6.8.9. The materials to be used are considered to be of a high quality, visually interesting and featuring archaeological items found on the site.

6.9. Demolition – clause 28.6

6.9.1. All demolition in the Cove requires assessment against the performance criterion – both internal and external, and in whole or in part.

6.9.2. The proposal includes partial demolition of some internal elements of the Theatre Royal, and the existing back of house facilities. Note that the demolition of part of the former Hedberg Garage was approved under the early works development application. (refer to Background in section 4 above).

6.9.3. Clause 28.6 provides the following matters to be considered:

- *The impact of the proposed demolition on the character of the Activity Area;*
- *The impact of the proposed demolition on the cultural heritage values of the Cove;*
- *The need to avoid creation of vacant sites and 'lost space' in the Cove.*

6.9.4. The proposed demolition will result in an improved Theatre Royal, and will not create a vacant site or lost space. The Council's Senior Cultural Heritage Officer has indicated support for the proposal.

6.9.5. The proposed demolition is considered acceptable.

7. Discussion

7.1. The proposal is for a substantial redevelopment of the site to accommodate the University of Tasmania's College of Arts and Conservatorium of Music. The proposal includes works to the Theatre Royal as well facilities to support its continued operation.

7.2. The proposal provides substantial community benefit in terms of the performing art facilities that it provides, which will be as much for the public as for University of Tasmania staff and students.

7.3. The design of the proposal is complex and bold. It will be an iconic development in Hobart and indeed Tasmania. Its respectful connection and integration with the Theatre Royal is a highlight, as well as the 'ensemble of volumes' that the building's form presents.

7.4. As the preceding assessment demonstrates, the proposal performs well against the provisions of the planning scheme, particularly with respect to the key discretions of use, height, building materials and parking. An argument could be made that the proposal should be parking exempt.

7.5. One representation to the proposal was received. Concerns were raised about the proposal's energy efficiency, its impact on residential amenity as well as the shortfall of onsite parking provision. The preceding report has addressed the concerns raised.

7.6. The proposal is recommended for approval with conditions.

8. Conclusion

8.1. The proposed Partial Demolition, Alterations and Extensions to Existing Buildings and New Development for Education Centre and Arts and Cultural Centre, including Studio Theatre, Recital Hall with Kiosk/Bar, Salon, Teaching and Learning Spaces, Roof Decks, Roof Terraces and Minor Road Works at 19-27 Campbell Street, 29 Campbell Street, 19 Collins Street, CT.198531/2, Adjacent Road Reservations, Hobart satisfies the relevant provision of the *Sullivans Cove Planning Scheme 1997,* and as such is recommended for approval.

9. Recommendations

That: A. Pursuant to the *Sullivans Cove Planning Scheme 1997*, the Council approve the application for a partial demolition, alterations and extensions to existing buildings and new development for education centre and arts and cultural centre, including studio theatre, recital hall with kiosk/bar, salon, teaching and learning spaces, roof decks, roof terraces and minor road works at 19-27 Campbell Street, 29 Campbell Street, 19 Collins Street, CT.198531/2, Adjacent Road Reservations, Hobart for the reasons outlined in the officer's report and a permit containing the following conditions be issued:

GENERAL

GEN **The use and/or development must be substantially in accordance with the documents and drawings that comprise the Planning Application No. PLN-16-00135-01 outlined in attachment A to this permit except where modified below.**

Reason for condition

To clarify the scope of the permit.

TASWATER

TW **The use and/or development must comply with the requirements of TasWater as detailed in the form Submission to Planning Authority Notice, Reference No. TWDA 2016/00173-HCC dated 07/03/2016 as attached to the permit.**

Reason for condition

To clarify the scope of the permit.

TASMANIAN HERITAGE COUNCIL

THC **The use and/or development must comply with the requirements of the Tasmanian Heritage Council as detailed in the Notice of Heritage Decision, Works Application No. 4964 dated 23 March 2016, as attached to the permit.**

Reason for condition

To clarify the scope of the permit

ENVIRONMENTAL

ENV2 **Sediment, erosion and water quality control measures in accordance with an approved soil and water management plan (SWMP) must be installed, prior to the commencement of work and maintained until such time as all disturbed areas have been stabilised and/or restored or sealed to the Council's satisfaction.**

A SWMP must be submitted and approved, prior to the commencement of work. The SWMP must:

(a) be prepared in accordance with the Soil and Water Management on Building and Construction Sites fact sheets (Derwent Estuary Program, 2008), http://www.hobartcity.com.au/Development/Engineering_Standards_and_Guidelines
(b) Be prepared in accordance with any approved Environmental Site Assessment or contaminated site management plan for the site.
(c) Demonstrate how contaminant transport into groundwater and stormwater infrastructure will be prevented.

All work required by this condition must be undertaken in accordance with the approved SWMP.

Advice: Once the SWMP has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Reason for condition

To avoid the pollution and sedimentation of roads, drains and natural watercourses that could be caused by erosion and runoff from the development.

ENVs1 **To demonstrate site suitability, an environmental site assessment (ESA) in accordance with the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended 2013 is required. The ESA must be submitted and approved prior to the commencement of work on site associated with this permit.**

The ESA must address:
- **the extent of contamination; and**
- **the works undertaken including removal and remediation activities; and**
- **remaining risk with regard to future works or activities onsite**

Upon completion of works on site and prior to the commencement of any uses on site a final ESA report is required which must:

- **Confirm why the site does not pose a risk to human health or the environment; and**
- **Identify remaining risks with regard to future works or activities at the site**

All work required by this condition must be undertaken in accordance with the approved ESA and Final ESA.

Advice: Once the ESA and final ESA have been approved, the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Reason for condition

To ensure that the site is left in a condition that does not pose a risk and that it suitable for any future intended use in terms of contamination issues.

ENVs2 **A construction management plan (CMP) for the construction works must be submitted and approved prior to commencement of works.**

The construction management plan must include:

(i) **A description of all activities proposed to be undertaken on the site during the works, including an indication of stages of works, where relevant, and also including proposed screening of the site and vehicular access points during work;**

(ii) **Proposed hours of construction in accordance with the *Environmental Management and Pollution Control (Noise) Regulations 1994* not exceeding 7.00 am to 6.00 pm Monday to Friday, 8.00 am to 6.00 pm Saturday and 10.00 am to 6.00 pm Sunday and public holidays;**

(iii) **A Dust Management Plan including an air quality protocol to outline measures to minimise impacts from the works on local air quality particularly regarding dust generated from the work;**

(iv) **Identification of potentially noisy works phases, such as operation of rock breakers, explosives or pile drivers if they are to be used, and proposed means to minimise impact on the amenity of neighbouring buildings;**

(v) **Identification and disposal of any potentially contaminated waste and asbestos;**

(vi) **The CMP is to detail measures for dealing with, recording and managing any breaches of the above.**

All work required by this condition must be undertaken in

accordance with the approved construction management plan.

Advice: Once the CMP has been approved, Council will issue a condition endorsement (see general advice on how to obtain condition endorsement

It would be acceptable to incorporate the Soil and Water Management Plan (condition ENV2) and Construction Traffic Management Plan (condition TRFs3) into the Construction Management Plan.

Reason for condition

To ensure minimal impact on the amenity of adjoining properties and members of the public during the construction period.

ENVs3 **The outdoor spaces must not be used for performances, rehearsals, screenings, functions or other organised events between the hours of 10pm and 8am without the prior written consent of the Council.**

Reason for condition

To ensure that activities are managed in a way which will not cause environmental nuisance or material or serious environmental harm.

ENVs4 **Noise mitigation measures must be employed to minimise internal noise levels in the wards of the Royal Hobart Hospital (existing and future) from proposed mechanical plant on the site.**

A noise modelling report demonstrating that noise levels in the wards will be unlikely to exceed 30dB(A) from the mechanical plant under normal operating conditions must be submitted and approved prior to operation of the mechanical plant (operating the plant so it can be tested is permitted). Details of all required mitigation measures to achieve such levels must be included.

The proposed mechanical plant must be operated so that the noise levels identified in the approved noise modelling report are achieved.

Advice: Once the noise modelling report has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Reason for condition

To ensure that activities are managed in a way which will not cause environmental nuisance or material or serious environmental harm.

TRAFFIC

TRFs1 **The proposed new on street parking spaces must comply with AS2890.5 (On-street parking), prior to the commencement of use or the car parking spaces.**

A design of the new on street parking layout must be submitted and approved prior to the commencement of use of the parking spaces. The parking plan must be in accordance with AS2890.5 (On-street parking).

All work required by this condition must be undertaken in accordance with the approved parking plan.

Advice: Once the parking plan has been approved Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Reason for condition

To ensure on street parking is safe

TRFs2 **Signage is required to be erected at the intersection of Sun Street and Collins Street advising that the street is suitable only for local access, prior to commencement of use of the building.**

A signage plan showing the location and type of signage to be installed must be submitted and approved prior to the commencement of use of the building.

All work required by this condition must be undertaken in accordance with the approved signage plan.

Advice: Once the signage plan has been approved Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Reason for condition

To ensure the safety of traffic in the vicinity

TRFs3 **A Construction Traffic Management Plan must be submitted and approved prior to the commencement of works.**

The Construction Management Plan must:

(a) Be prepared by a suitably qualified person;
(b) Outline management of traffic conflicts that may be generated during the work, including but not limited to:
  i. Details of traffic routes for heavy vehicles, including any necessary route or timing restrictions;

ii. **Measures to be employed to ensure traffic volume, acoustic and amenity impacts are minimized;**
iii. **Measures to be employed to ensure works-related traffic, parking and loading have as minimal disruption as possible on adjacent uses;**

All work required by this condition must be undertaken in accordance with the approved Construction Traffic Management Plan.

Advice: Once the Construction Traffic Management Plan has been approved Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Reason for condition

To ensure that the impact on the road network during construction is assessed and mitigation measures implemented as necessary.

ENGINEERING

ENG1 **The cost of repair of any damage to the Council's infrastructure resulting from the implementation of this permit, must be met by the owners within three months of the completion of the development.**

A photographic record of the Council's infrastructure adjacent to the subject site must be provided to the Council prior to any commencement of works.

Note: A photographic record of the Council's infrastructure (e.g. existing property service connection points, roads, buildings, stormwater, footpaths, driveway crossovers and nature strip, including if any, pre existing damage) will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner/developer fails to provide to the Council a photographic record of the Council's infrastructure, then any damage to the Council's infrastructure found on completion of works will be deemed to be the responsibility of the owner.

Reason for condition

To ensure that any of the Council's infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENGr1 **The proposed excavation adjacent to the highway reservation and proposed earth-retaining structures (i.e. retaining walls) supporting the highway reservation must not**

compromise the structural integrity of the adjacent Sun Street, Campbell Street and Sackville Street highway reservations.

Detailed design drawings and structural certificates of the retaining walls supporting the Sun Street, Campbell Street and Sackville Street highway reservations must be submitted and approved, prior to the commencement of work.

The detailed design drawing must:

(a) Be prepared by a suitable qualified and experienced engineer;
(b) Demonstrate that the proposed excavation adjacent to the highway reservation and proposed earth-retaining structures (i.e. retaining walls) supporting the highway reservation will not undermine the stability of the highway reservation;
(c) Demonstrate that the proposed excavation adjacent to the highway reservation and proposed earth-retaining structures (i.e. retaining walls) supporting the highway reservation will be designed in accordance with AS4678, with a design life in accordance with table 3.1 typical application major public infrastructure works;
(d) Take into account any additional surcharge loadings as required by relevant Australian Standards;
(e) take into account and reference accordingly any geotechnical findings;
(f) detail any mitigation measures required.

The structural certificates should note that the vehicle crossing and driveway over the footpath is designed for the anticipated regular heavy vehicle loads.

All work required by this condition must be undertaken in accordance with the approved design drawing and structural certificates.

Advice: Once the design drawing has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Reason for condition

To ensure that the stability and integrity of the Council's highway reservation is not compromised by the development

ENGr2 **The folding night doors on the Collins Street frontage must not encroach onto the road reservation as per section 52 of the Local Government (Highways) Act 1982. The operation of the folding doors must be contained within the property boundary.**

Reason for condition

To ensure the development meets statutory requirements and does not present a hazard to pedestrians on the public footpath.

Part 5 1 **Prior to the commencement of work, the owner(s) of the property must enter into an agreement with the Council pursuant to Part 5 of the *Land Use Planning and Approvals Act 1993* with respect to:**

1. **Building within 1 metre of Council's storm water infrastructure (the Hobart Rivulet). The owner must agree to:**
   (a) **not perform any future works to the structure within 1m of the Rivulet, including replacement of footings or additional overhang, without written permission from the Council; and**
   (b) **remove any minor structures (such as awnings or signs) over the Rivulet chambers at the owner's cost at the Council's request to provide access to Council's infrastructure.**

2. **Works within the identified 1% AEP at 2100 flood extent affecting the land.**

3. **Maintaining all flood mitigation measures and control systems specified in the Flood Management Report.**
4. **The excavation and retaining walls, adjacent to the Sun Street, Campbell Street and Sackville Street highway reservations, the owner must agree to not undertake any works at any time (including building and excavation) that will have any effect on the integrity of any retaining structure adjacent to Sun Street, Campbell Street and Sackville Street, or the road formations themselves or undermine the structural integrity of the highway reservations of Sun Street, Campbell Street and Sackville Street.**

All costs for the preparation and registration of the Part 5 Agreement must be met by the owner.

The owner must comply with the Part 5 Agreement which will be placed on the property title.

Note: Further information with respect to the preparation of a part 5 agreement can be found
http://www.hobartcity.com.au/Development/Planning/Part_5_agreeme

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Reason for condition

To ensure that Council's infrastructure is accessible and protected and that flood risks are mitigated, and to ensure that support for the highway reservation and its infrastructure are retained.

RDSs1 **Sufficient road lighting levels must be maintained for the duration of the works and after completion of the works.**

A lighting plan must be submitted demonstrating that road lighting levels will be maintained for the duration of the works and after completion of the works. The plan must:

(a) Be prepared by a suitably qualified person; and
(b) Demonstrate compliance with the AS 1158 standards for any permanent or temporary lighting arrangement.

All work required by this condition must be undertaken at the developers cost in accordance with the approved lighting plan.

Advice: Once the lighting plan has been approved Council will issue a condition endorsement. (See general advice on how to obtain condition endorsement.)

The pole will remain the property of the Council and must be stored at the Council's depot.

Reason for condition

To ensure that works will comply with the Council's standard requirements.

RDSs2 **Prior to the use of the Sun Street and Collins Street footpaths for construction purposes, any grey pavers which will be effected by the construction works must be must be removed and replaced with a temporary asphalt/concrete seal at the developers cost. The pavers must not be damaged during removal and must be transported to the Council's store by the developer. The pavers are to be reinstated at the conclusion of works at the developer's cost.**

Reason for condition

To protect Council infrastructure.

ENGsw2 **The proposed development must not adversely impact any public infrastructure.**

Digital copies of pre and post CCTV videos and associated reports of all Council stormwater infrastructure within two metres of the site must be undertaken and submitted to the Council prior to the commencement of work and after completion of all work prior to the issue of any Certificate of Completion.

The pre and post construction CCTV will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner fails to provide to the Council a pre construction CCTV video of the Council's infrastructure, then any damage to the Council infrastructure identified in the post construction CCTV will be deemed to be the responsibility of the owner.

Reason for condition

To ensure that any of the Council infrastructure such as the pipes in Sun Street and Campbell Street, and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost

ENGsw2a **Detailed condition assessments, photographic records and associated reports of the Hobart Rivulet from Campbell Street to the eastern side of Sun Street must be undertaken and submitted to the Council prior to the commencement of work and after completion of all work prior to the issue of any Certificate of Completion.**

The pre and post condition assessments will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner fails to provide to the Council a pre construction condition assessment of the Council's infrastructure, then any damage to the Council infrastructure identified in the post construction assessment will be deemed to be the responsibility of the owner.

Advice: Council notes a pre works condition assessment has been provided under a previous permit for this development.

Reason for condition

To ensure that any of the Council infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENGsw3 **The proposed works (including footings and overhangs) must be designed to ensure the protection of and access to, the Hobart Rivulet (including its support structures).**

A detailed design certified by a suitably qualified and experienced engineer must be submitted and approved prior to issue of any consent under the *Building Act 2000*. The detailed design must:

(a) Demonstrate how the design will ensure the protection of the Hobart Rivulet for the entire life of the building
(b) Enable access for maintenance and renewal of the Hobart Rivulet for the entire life of the building
(c) Include certification by a suitably qualified engineer that the works will not impose any loads on the Hobart Rivulet and the works will be entirely structurally independent of the Rivulet and of any other structures such as the Hedberg Façade that may currently load on the Rivulet.
(d) Demonstrate that the proposed awning on the Collins Street frontage is demountable.
(e) Include appropriate sections detailing the relationship between the works and the Rivulet

Prior to issue of any Certificate of Completion, a suitably qualified engineer must confirm the installation of all works within two metres of the Rivulet support structures is in accordance with the certified design and complies with this condition. Should any remediation works be required, these must be carried out at the developer's cost.

All work required by this condition must be undertaken in accordance with the approved design.

Advice: Once the detailed design drawings has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Reason for condition

To ensure the protection of the Council's hydraulic infrastructure.

ENGsw 4 **The Hobart Rivulet walls must be carefully and accurately located onsite.**

Prior to construction of the footings, the Rivulet walls and clearance must be inspected and confirmed by the Council's Project and Development Inspector to ensure the minimum separation is achieved.

The Council's Project and Development Inspector, must be contacted on phone (03) 6238 2967 at least 24 hours prior to the commencement of any works.

Reason for condition

To ensure the protection of the Council's hydraulic infrastructure.

ENGsw5 **The proposed development must not adversely impact the Hobart Rivulet.**

A Construction Management (Rivulet Protection) Report (CM(RP)R) must be submitted and approved prior to commencement of works. The report must:

(a) be prepared by a suitably qualified and experienced engineer
(b) detail the proposed construction methodology and identify all potential risks to the Rivulet during construction including but not limited to construction loading, traffic loading, excavation works, footing construction, vibrations, undermining, flood, and environmental harm
(c) provide treatment measures to eliminate or otherwise mitigate to as low as reasonably practicable all identified risks
(d) include a monitoring regime

The work on site must be undertaken in accordance with the CM(RP)R.

Advice: Once the report has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Reason for condition

To ensure the protection of the Council's hydraulic infrastructure.

ENGsw7 **The site must be drained to the Council's infrastructure taking into account the limited receiving capacity of Council's infrastructure. Any new stormwater connection required must be constructed and existing redundant connections must be sealed by the Council at the owner's expense, prior to issue of a Certificate of Completion.**

Detailed design drawings and calculations must be submitted and approved, prior to issue of any consent under the Building Act 2000. The detailed design drawings must include:

(a) The final Lot boundaries, with each Lot serviced separately by Council infrastructure and all private plumbing contained within each Lot;

(b) the location of the proposed connec tions and all existing connections;
(c) the size and design of the connection(s) such that they are appropriate to s afely service the de velopment given the limited receiving capacity of Council infrastructure (e.g backflow prevention, temporary stormwater storage, overflows);
(d) long-sections of the proposed connection(s) clearly showing any nearby services, cover, size, material and delineation of public and private infrastructure; and
(e) if connecting to the Rivulet, show details such that:
i. intrusion into the ch amber and hydraulic disturbance is minimized
ii. appropriate erosion protection is provided
iii. any backflow prevention required is privately owned and maintained upstream of the public connection point

All work required by this condition must be undertaken in accordance with the approved detailed design drawings.

Advice: Once the detailed design drawings have been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Please note that once the condition endorsement has been issued you will need to contact Council's City Infrastructure Division to initiate an application for service connection.

Reason for condition

To ensure the site is drained adequately.

ENGsw10 **The owner must lodge with the Council security and provide insurance to ensure the protection of the Council's Infrastructure.**

Prior to the issue of any consent pursuant to the *Building Act 2000* or the c ommencement of works (whichever occurs first), the owner must lodge a cash deposit or bank guarantee from an approved financial institution, for a n amount of $100,000 (one hundred thousand dollars) for the prote ction from damage of the Hobart Rivulet during construction of the development, such bond to be released once the works are completed should no damage occur.

Advice: The bond can be paid once the building consent is ready to be issued. The building consent will not be issued until the bond has been paid.

Once the certificate of completion for the development has been issued (or the works are completed) and the post completion survey submitted, please contact the Council's Project and Development Inspector on telephone (03) 6238 2967 to arrange an inspection prior to the release of the Council's infrastructure bond.

The Council's Project and Development Inspector must be contacted at least 24 hours prior to the commencement of any works to locate and inspect public infrastructure within and adjacent to the development site.

Reason for condition

To ensure the protection of the Council's infrastructure.

ENGsw11 **The building must be constructed with appropriate flood mitigation measures to enable a safe environment for all future users of the building.**

A Flood Management Report prepared by a suitably qualified person must be submitted prior to the issue of any consent under the *Building Act 2000*. The report must include:

(a) Details of any physical mitigation measures, such as flood gates and emergency pumps and long term operational and maintenance requirements for these measures;
(b) Details of any operational measures, such as alarm systems and emergency management procedures and long term operational and maintenance requirements;
(c) Details of any post event remediation procedures.

The Flood Management Report is to be included in a Part 5 Agreement on the title.

Council notes the requirements of the *Work Health and Safety Regulation 2012*, *Building Act 2000*, National Construction Code 2016 relating to the potential for flood waters to enter the Building.

Advice: Any flood mitigation measures including monitoring systems that need to be installed within or above Council infrastructure require written permission from Council pursuant to the Hydraulic Services By Law 2008.

Reason for condition

To minimise the impact of flooding on the building and surrounds.

ENGsw12 **The building must be designed by a suitably qualified and accredited engineer such that it is resistant to all likely forces associated with any flooding event as predicted by the Gandy & Roberts Preliminary Flood Report 29 February 2016.**

Certification from an accredited and qualified structural engineer that the proposed structure is designed to resist erosion, deterioration, undermining and likely forces from a flood event is to be submitted prior to the issue of any consent under the Building Act 2000.

Prior to issue of any Certificate of Completion, a suitably qualified engineer must confirm the installation of the building is in accordance with the certified design and complies with this condition. Should any remediation works be required, these must be carried out at the developer's cost.

Reason for condition

To ensure that the risks identified in the Preliminary Flood Report are adequately managed.

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit www.hobartcity.com.au for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council:

- If a condition endorsement is required by a planning condition above, please forward documentation required to satisfy the condition to rfi-information@hobartcity.com.au, clearly identifying the planning permit number, address and the condition to which the documentation relates.

  Once approved, the Council will respond to you via email that the condition/s has been endorsed (satisfied). Detailed instructions can be found at www.hobartcity.com.au/Development/Planning/How_to_obtain_a_condition_endorsement

- Building permit in accordance with the *Building Act 2000*; www.hobartcity.com.au/Development/Building

- Plumbing permit under the *Tasmanian Plumbing Regulations 2014*; www.hobartcity.com.au/Development/Plumbing

- Permit to Open Up and Temporarily Occupy a Highway (for work in the road reserve) http://www.hobartcity.com.au/Transport/Lighting_Roads_Footpaths_and_Street_Cleaning/Roads_and_Footpaths

- Application for registration of a food business must be made and subsequent written approval must be obtained from Council's Environmental Health Unit in accordance with the *Food Act 2003*. The business is to be registered prior to operation.

- Detailed building plans showing all elevations, materials and specifications for food premises fit out are to be submitted to Council's Environmental Health Unit. These plans must comply with the provisions of the Building Code of Australia National Construction Code Tas Part H102 for food premises and have regard to the Food Safety Standards Australia New Zealand (FSANZ).

- Contaminated soil and water are likely to be 'controlled wastes' under the *Environmental Management and Pollution Control (Waste Management) Regulations 2010*. Any 'controlled waste' must be managed, transported and disposed of in accordance with the Regulations. Advice regarding the regulations should be sought from EPA Division of the Department of Primary Industries, Parks, Water and Environment. Information regarding requirements under the Regulations for the disposal of contaminated soil can be found in the EPA Information Bulletin 105 Classification and Management of Contaminated Soil for Disposal.

- Appropriate work health and safety (WHS) measures should be employed during any earthworks to minimise human exposure to potentially-contaminated soil, water, dust and vapours. Work health safety measures should be implemented to reflect the known level of site contamination onsite as described by the Environmental Site Assessment conducted by Coffey (2009) and any other reporting completed since. Work Safe Tasmania or a suitably experienced and qualified WHS practitioner should be consulted for advice if required.

- There is to be no emission, discharge or spillage of any form of lighting or other related illumination that may unreasonably interfere with, or is likely to unreasonably interfere with, a person's enjoyment of the environment in accordance with the *Environmental Management and Pollution Control Act 1994*.

- Any use or development that handles food to be sold (or given away) to the public should seek advice from Council's Manager Environmental Health to ensure compliance with relevant state and national food safety legislation. Please contact Council's

Environmental Health Unit on 6238 2715 to ascertain whether your proposal requires a food business registration.

- It is noted that project specific legislation is proposed to authorise by law the building encroachments onto the public highway. Airspace titles are proposed where the encroaching structure is more than 2.4 metres above the footpath or 4.25 metres above the carriageway. As an alternative to the proposed airspace titles, encroachments where the encroaching structure is more than 2.4 metres above the footpath or 4.25 metres above the carriageway could be authorised in accordance with the provisions of section 75 CA of the *Conveyancing and Law of Property Act 1884*.

- The existing and proposed encroachments of the buildings onto the public highway must be properly authorised by law or the development will be unable to be strata titled as section 5(4) of the *Strata Titles Act 1998* will not be complied with.

- For work within the highway reservation please note development must be in accordance with the Hobart City Council's Highways By –law: http://www.hobartcity.com.au/Council/Legislation

- To ensure compliance with statutory provision, the titles comprising the development site (CT 102526/1, CT 102526/1, CT 53804/1, CT 198531/1 and CT 142953/1) must be adhered prior to the issue of any completion certificate under the *Building Act 2000*.

- To ensure compliance with statutory provisions, public and private rights and interests required to be extinguished as part of the development must be done prior to the issue of any completion certificate under the *Building Act 2000*.

- The statutory highway dedication over lots 2, 3 and 5 (refer to PDA Surveyors Plan R688M 6B dated 29 January 2016) must be closed prior to any construction works on lots 2, 3 and 5. The statutory highway over areas comprised of lots 4, 7, 8 and 10 must be closed prior to the issue of a completion certificate under the Building Act 2000. The statutory highway can be closed via special legislation enacted as an act of Parliament or in accordance with the provisions of section 14 of the *Local Government (Highways) Act 1982*.

- The cost of any alterations to the Council's or third-party infrastructure, including the site's service connection points, incurred as a result of the proposed development works must be met by the owner.

(Ben Ikin)
DEVELOPMENT APPRAISAL PLANNER

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

(Rohan Probert)
SENIOR STATUTORY PLANNER

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Date of Report: 30 March 2016

Attachment(s):

Attachment A – Documents and Drawings List
Attachment B – TasWater form Reference No. TWDA 2016/00173-HCC
Attachment C – Tasmanian Heritage Council's Notice of Heritage Decision, Works Application No. 4964
Attachment D – Documents and Drawings (including architectural plans, landscaping plans, renders, development application report and Ireneinc report)
Attachment E – Environmental Development Planner Report
Attachment F – Information from applicant dated 24 March 2016 addressing questions from representor and including shadow diagrams

Supporting Document(s):

Attachment 1 – Site Development Plan (Leigh Woolley)
Attachment 2 – Traffic Impact Assessment (Howarth Fisher and Associates)
Attachment 3 – Acoustic Memo (ARUP)

Attachment A

Documents and Drawings that comprise
Planning Application Number - PLN-16-00135-01

DEVELOPMENT ADDRESS: **19-27 Campbell Street, 29 Campbell Street, 19 Collins Street, CT.198531/2, Adjacent Road Reservations, HOBART**

LIST OF DOCUMENTATION:

Description	Drawing Number/Revision/Author/Date, Report Author/Date, Etc	Date of Lodgement to Council
Application Form	16-00135	04 February 2016
Title	102527/1, 102526/1, 53804/1, 150207/1, 198531/2, 142953/1, 142953/6, and 7946/1	04 February 2016
Planning report, 48 pages	Author: Jen Welch, Ireneinc Date: 22 December 2015	04 February 2016
Development report, 35 pages	Author, Liminal, WOHA and ARUP Date: 27 January 2016	04 February 2016
Site development plan, 44 pages	Author: Leigh Woolley Date, December 31 2015	04 February 2016
Site development objectives, 55 pages	Author: Leigh Woolley Date: 10 June 2013	04 February 2016
Heritage impact statement, 70 pages	Author: Garry Forward Date: December 2015	04 February 2016
Heritage policy statement, 44 pages	Author: Paul Johnson Date: February 2014	04 February 2016
Theatre Royal Conservation Plan, 187 pages	Author: Australian Construction Services Date: June 1995	04 February 2016
Correspondence with respect to archaeology, 1 page	Author: Jeremy Holloway and Parry Kostoglou Date: 18 February 2016	18 February 2016
Archaeological sensitivity report and method statement, 120 pages	Author: Austral Tasmania Date: 7 May 2014	18 February 2016
Amendments to Austral's Archaeological Method Statement, 2 pages	Author: Tasarc Date: 11 February 2015	18 February 2016
Site contamination assessment, 8 pages	Author: JP Cummings, GES Environmental Date: 21 January 2016	04 February 2016
Traffic report, 29 pages	Author: Joanne Fisher, Howarth Fisher and Associates Date: January 2016	04 February 2016
Preliminary flood report, 78 pages	Author: Gandy and Roberts Date: 29 February 2016	29 February 2016

Letter of support from Theatre Royal, 2 pages	Author: Craig Stephens, Chairman of the Theatre Royal Date: 2 February 2016	04 February 2016
Site plan	Drawing: A1000 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Level 1 demolition plan	Drawing: A1101 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Level 2 demolition plan	Drawing: A1102 Revision – Project: UPA Date: 3/02/2016	04 February 2016
Level 3 demolition plan	Drawing: A1103 Revision – Project: UPA Date: 3/02/2016	04 February 2016
Sub-floor plan	Drawing: A1200 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Level 01 floor plan	Drawing: A1201 Revision: 1 Project: UPA Date: 26/02/2016	29February 2016
Level 02 floor plan	Drawing: A1202 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Level 03 floor plan	Drawing: A1203 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Level 04 floor plan	Drawing: A1204 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Level 05 floor plan	Drawing: A1205 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Level 05A floor plan	Drawing: A1206 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Level 06 floor plan	Drawing: A1207 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016

Level 07 floor plan	Drawing: A1208 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
MEP floor plan	Drawing: A1209 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Roof plan	Drawing: A1210 Revision: 1 Project: UPA Date: 26/02/2016	29 February 2016
Campbell Street elevation	Drawing: A2001 Revision – Project: UPA Date: 22/01/2016	04 February 2016
Collins Street elevation	Drawing: A2002 Revision – Project: UPA Date: 3/02/2016	04 February 2016
Sun Street elevation	Drawing: A2003 Revision – Project: UPA Date: 3/02/2016	04 February 2016
Sackville Street elevation	Drawing: A2004 Revision – Project: UPA Date: 22/01/2016	04 February 2016
Section A	Drawing: A3001 Revision – Project: UPA Date: 22/01/2016	04 February 2016
Section B	Drawing: A3002 Revision – Project: UPA Date: 22/01/2016	04 February 2016
Section C	Drawing: A3003 Revision – Project: UPA Date: 3/02/2016	04 February 2016
Section D	Drawing: A3004 Revision – Project: UPA Date: 22/01/2016	04 February 2016
Section E	Drawing: A3005 Revision : Project: UPA Date: 26/01/2016	29 February 2016
Section F	Drawing: A3006 Revision: 1 Project: UPA Date: 26/01/2016	29 February 2016

Section G	Drawing: A3007 Revision: 1 Project: UPA Date: 26/01/2016	29 February 2016
Section H	Drawing: A3008 Revision: 1 Project: UPA Date: 26/01/2016	29 February 2016
Section I	Drawing: A3009 Revision: 1 Project: UPA Date: 26/01/2016	29 February 2016
Section J	Drawing: A3010 Revision: 2 Project: UPA Date: 02/03/2016	03 March 2016
Section K	Drawing: A3011 Revision: - Project: UPA Date: 26/01/2016	29 February 2016
Section L	Drawing: A3012 Revision: 1 Project: UPA Date: 01/03/2016	02 March 2016
Indicative render Campbell and Collins Streets corner	Date: 27 January 2016	04 February 2016
Indicative render Campbell and Collins Streets corner aerial perspective	Date: 27 January 2016	04 February 2016
Indicative render Collins Street	Date: 27 January 2016	04 February 2016
Indicative render Campbell Street	Date: 27 January 2016	04 February 2016
Indicative render Campbell Street	Date: 27 January 2016	04 February 2016
Indicative render Campbell Street with the Royal Hobart Hospital planning envelope ghosted	Date: 27 January 2016	04 February 2016
Indicative render Campbell Street with the Royal Hobart Hospital planning envelope ghosted	Date: 27 January 2016	04 February 2016
Indicative render Collins Street with the Royal Hobart Hospital planning envelope ghosted	Date: 27 January 2016	04 February 2016
Indicative render Campbell Street Elevation - Indicative Only	Date: 27 January 2016	04 February 2016
Indicative render Collins Street Elevation - Indicative Only	Date: 27 January 2016	04 February 2016
Indicative render Sun Street Elevation - Indicative Only	Date: 27 January 2016	04 February 2016

Indicative render section of Foyers, Courtyard, Loading Dock and Studio Theatre - Indicative Only	Date: 27 January 2016	04 February 2016
Indicative render section of Collins Street Entry, Foyers, City Room, Conservatorium and Theatre Royal Foyer- Indicative Only	Date: 27 January 2016	04 February 2016
Indicative render section of Internal Void, Courtyard and Theatre Royal stage - Indicative Only	Date: 27 January 2016	04 February 2016
Indicative render section of Internal Void, Courtyard and Theatre Royal - Indicative Only	Date: 27 January 2016	04 February 2016
Indicative render section of Foyers and Courtyard facing Theatre Royal heritage wall, Loading Dock and Studio Theatre- Indicative Only	Date: 27 January 2016	04 February 2016
Site services connections to proposed development, ARUP	Drawing: 1 Revision: P01 Project: 232310-00 Date: 22/07/2015	04 February 2016
Landscape plan – site plan (Inspiring Place)	Drawing: L01 Date: January 2016	04 February 2016
Landscape plan (Inspiring pace)	Drawing: L02 Date: January 2016	04 February 2016
Property survey, 3 pages including PDA plan	Author: UTAS and PDA Surveyors	04 February 2016
Document register, 1 page	-	04 February 2016
Correspondence with respect to additional information request, 2 pages	Author: Jeremy Holloway, Liminal Date: 29 February 2016	29 February 2016
ARUP acoustic memo, 13 pages	Author: ARUP Date: 24 February 2016	29 February 2016
Assessment of Archaeological Activity and Operational Management Report, 42 pages	Author: JMG Date: December 2013	29 February 2016
Environmental Site Assessment, 393 pages	Author: Coffey Date: 22 May 2009	29 February 2016
Taswater services plan	Plan: A201 Date: 26/02/2016	29 February 2016
Rivulet survey plan, PDA Surveyors	Drawing: 1 Job no.: S716C Date: 26 November 2014	29 February 2016
ARUP rivulet structural integrity memo, 3 pages	Author: ARUP Date: 25 February 2016	29 February 2016

Attachment B

Submission to Planning Authority Notice

Council Planning Permit No.	PLN-16-00135	Council notice date	11/02/2016
TasWater details			
TasWater Reference No.	TWDA 2016/00173-HCC	Date of response	07/03/2016
TasWater Contact	Phil Papps	Phone No.	(03) 6237 8246
Response issued to			
Council name	HOBART CITY COUNCIL		
Contact details	hcc@hobartcity.com.au		
Development details			
Address	19-27 CAMPBELL ST, HOBART	Property ID (PID)	5659189
Description of development	UTAS (ACIPA) Project Stage 2 - Redevelopment of Theatre Royal & Performing Arts development		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Liminal Architecture	Level 01 Site Services Connections / A201	--	26/02/2016

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized metered water property connection must be provided to service the domestic and fire demands generated by the proposed development in accordance with TasWater standards. If meters and/or other TasWater assets are located within the building TasWater must be provided with a means of unrestricted access for the purposes of meter reading and/or maintenance and repair of those assets.

2. A suitably sized sewerage property connection must be provided to service the waste water discharge generated by the proposed development in accordance with TasWater standards.

3. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.

ASSET CREATION & INFRASTRUCTURE WORKS

4. TasWater's Sewage Pump Station (SPS) in Sun St. does not have spare emergency storage capacity to service the proposed development. The developer must design and construct additional emergency storage capacity sufficient to service the waste water discharge volumes generated by the proposed development.

   Advice: *Prior to finalising the design the developer should contact TasWater to advise the specific emergency storage calculated to service the development. TasWater will then consider this as a strategic opportunity to determine if additional spare capacity should be provided and, if so TasWater will fund any marginal cost over and above the cost of assets required to service the proposed development. The developer will only pay the costs required for the development (in terms of the assets required to support the development).*

5. Plans submitted with the application for Engineering Design Approval must, to the satisfaction of

TasWater show, all existing, redundant and/or proposed property services and mains.

6. Prior to applying for a Permit to Construct new infrastructure the developer must obtain Engineering Design Approval. The application for Engineering Design Approval must include engineering design plans and calculations prepared by a suitably qualified person showing the hydraulic servicing requirements for water and sewerage to TasWater's satisfaction.

7. Prior to works commencing, a Permit to Construct must be applied for and issued by TasWater. All infrastructure works must be inspected by TasWater and be to TasWater's satisfaction.

8. In addition to any other conditions in this permit, all works must be constructed under the supervision of a suitably qualified person in accordance with TasWater's requirements.

9. Prior to the issue of a Certificate of Compliance (Building and Plumbing) all additions, extensions, alterations or upgrades to TasWater's water and sewerage infrastructure required to service the development, generally as shown on the Site Services Connection Plan A201 listed in the Schedule of Drawings and Documents, are to be at the expense of the developer to the satisfaction of TasWater, with live connections performed by Taswater.

10. After testing to TasWater's requirements, of newly created works, the developer must apply to TasWater for connection of these works to existing TasWater infrastructure, at the developer's cost.

11. At practical completion of the water and sewerage works and prior to applying to TasWater for a Certificate of Compliance (Building) and/or (Plumbing), the developer must obtain a Certificate of Practical Completion from TasWater for the works that will be transferred to TasWater. To obtain a Certificate of Practical Completion:

    a) Written confirmation from the supervising suitably qualified person certifying that the works have been constructed in accordance with the TasWater approved plans and specifications and that the appropriate level of workmanship has been achieved;

    b) A request for a joint on-site inspection with TasWater's authorised representative must be made;

    c) Security for the twelve (12) month defects liability period may be required to the value of 10% of the works must be lodged with TasWater. This security must be in the form of a bank guarantee;

    d) As constructed drawings must be prepared by a suitably qualified person to TasWater's satisfaction and forwarded to TasWater.

12. After the Certificate of Practical Completion has been issued a 12 month defects liability period applies to this infrastructure. During this period all defects must be rectified at the developer's cost and to the satisfaction of TasWater. A further 12 month defects liability period may be applied to defects after rectification. TasWater may, at its discretion, undertake rectification of any defects at the developer's cost. Upon completion, of the defects liability period the developer must request TasWater to issue a "Certificate of Final Acceptance". The newly constructed infrastructure will be transferred to TasWater upon issue of this certificate and TasWater will release any security held for the defects liability period.

13. The developer must take all precautions to protect existing TasWater infrastructure. Any damage caused to existing TasWater infrastructure during the construction period must be promptly reported to TasWater and repaired by TasWater at the developer's cost.

14. Ground levels over the TasWater assets and/or easements must not be altered without the written approval of TasWater.

15. A construction management plan must be submitted with the application for TasWater Engineering

Design Approval. The construction management plan must detail how the new TasWater infrastructure will be constructed while maintaining current levels of services provided by TasWater to the community. The construction plan must also include a risk assessment and contingency plans covering major risks to TasWater during any works. The construction plan must be to the satisfaction of TasWater prior to TasWater's Engineering Design Approval being issued.

16. The developer must apply to TasWater for reimbursement for costs for design and construction of eligible works if applicable. To be eligible for reimbursement, costs for which reimbursement is claimed must be determined from a competitive public tender process, with process and reimbursements determined prior to construction, and to the written approval of TasWater. Applicable reimbursements for eligible works are the marginal additional cost between the provision of additional emergency storage capacity required to service the proposed development and the cost to upgrade the Sun St. SPS to meet current guideline requirements and/or provide available capacity for future development.

BOUNDARY TRAP AREA

17. The proposed development is within a boundary trap area and the developer must provide a suitable 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.

TRADE WASTE

18. Prior to the commencement of operation the developer/property owner must obtain Consent to discharge Trade Waste from TasWater.

19. The developer must install appropriately sized and suitable pre-treatment devices prior to gaining Consent to discharge.

20. The Developer/property owner must comply with all TasWater conditions prescribed in the Trade Waste Consent.

DEVELOPMENT ASSESSMENT FEES

21. 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:

    1. $1,061.00 for development assessment.

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

Advice

Trade Waste

Prior to any Building and/or Plumbing work being undertaken, the applicant will be required to make an application to TasWater for a Certificate for Certifiable Work (Building and/or Plumbing). The Certificate for Certifiable Work (Building and/or Plumbing) must accompany all documentation submitted to Council. Documentation must include a floor and site plan with:

- *Location of all pre-treatment devices*
- *Schematic drawings and specification (including the size and type) of any proposed pre-treatment device and drainage design; and*
- *Location of an accessible sampling point in accordance with the TasWater Trade Waste Flow Meter and Sampling Specifications for sampling discharge.*

At the time of submitting the Certificate for Certifiable Work (Building and/or Plumbing) a Trade Waste Application together with the General Supplement form is also required.
If the nature of the business changes or the business is sold, TasWater is required to be informed in order to review the pre-treatment assessment.
The application forms are available at http://www.taswater.com.au/Customers/Liquid-Trade-Waste/Commercial.

General

For information on TasWater development standards, please visit http://www.taswater.com.au/Development/Development-Standards

For information regarding further assessment fees and other miscellaneous fees, please visit http://www.taswater.com.au/Development/Fees---Charges

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

The developer is responsible for arranging to locate existing TasWater infrastructure and clearly showing it on any drawings. Existing TasWater infrastructure may be located by TasWater (call 136 992) on site at the developer's cost, alternatively a surveyor and/or a private contractor may be engaged at the developers cost to locate the infrastructure.

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			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

Attachment C

Tasmanian Heritage Council

Tasmanian Heritage Council
GPO Box 618 Hobart Tasmania 7000
103 Macquarie St, Hobart Tasmania 7000
Tel: 1300 850 332
enquiries@heritage.tas.gov.au
www.heritage.tas.gov.au

PLANNING REF:	PLN-16-00135-01
THC WORKS REF:	4964
REGISTERED PLACE NO:	2191, 2252, 7098 and 10733
FILE NO:	10-03-80THC, 10-03-93THC, 06-27-12THC and 10-91-22THC
APPLICANT:	Terry Lockwood (obo UTAS)
DATE:	23 March 2016

NOTICE OF HERITAGE DECISION

(*Historic Cultural Heritage Act 1995*)

The Place(s):	'Theatre Royal', 29 Campbell Street, Hobart. 'Former Hedberg Bros. Garage and Subsurface archaeological deposits', 19 Collins Street, Hobart. 'Car Park (sub surface archaeological deposits)', 19-27 Campbell Street, Hobart. 'Roadway Wapping Parcel 4 (subsurface archaeological deposits)', 19-27 Campbell Street, Hobart.
Proposed Works:	Minor demolition work, alterations and additions and new multi-storey building development.

Under section 39(6)(b) of the *Historic Cultural Heritage Act 1995* (the Act), the Heritage Council gives notice that it consents to the discretionary permit for works at 19 Collins Street, 19-27 Campbell Street and 29 Campbell Street, Hobart – in accordance with the documentation submitted with Development Application PLN-16-00135-01, advertised on 04/03/2016 – being granted subject to the following conditions:

1. **(i) A revised archaeological method statement must be prepared for any ground disturbance to heritage listed places outside the scope of the method statement prepared for the Stage 1 approval of Works Application 4568. The revised method statement must be consistent with the approach outlined in the Tasmanian Heritage Council's Practice Note No 2 (version 4: November 2014) 'Managing Historical Archaeological Significance in the Works Process'. The revised method statement must be submitted to and signed off by Heritage Tasmania's Works Manager prior to the commencement of any works to the relevant sections of the development site; and,**

   (ii) A final archaeological report must be submitted to Heritage Tasmania, as required under the terms of the approval for the Stage 1 approval of Works Application 4568; and,

   (iii) The development must include provisions for the protection, retention and interpretation of *in situ* archaeological remains,

consistent with the approach outlined in the Tasmanian Heritage Council's Practice Note No 2 (version 4: November 2014) 'Managing Historical Archaeological Significance in the Works Process' and consistent with the relevant undertakings in the 'Amendments to the Archaeological Method Statement – Revision A' dated 11/02/2015 by TASARC. The excavation zones for the construction of the new development, including services, lift wells and footings must be located to minimise potential impacts to the significant archaeological values of the site. The proposed locations and manner of the *in situ* retention of archaeological remains must be documented and submitted to and signed off by Heritage Tasmania's Works Manager prior to the commencement of works; and,

(iv) An interpretation strategy, which includes the public display of in-situ structural remains, archaeological artefacts and the stories they tell, must be prepared by suitably qualified consultants. The strategy must present the history and cultural heritage significance of the site and must be submitted to and signed off by Heritage Tasmania's Works Manager. The endorsed interpretation strategy must be implemented within 12 months of occupation of the new development.

Reason for condition
To ensure that the archaeological values of the heritage listed places are conserved and managed in a way that is consistent with the Tasmanian Heritage Council's current Practice Note No 2.

2. **(i) An extant record of the historic front of house sections of the Theatre Royal that will be altered as part of the development must be completed in accordance with the Tasmanian Heritage Council's Practice Note No 3 (version 2: November 2014) 'Procedure for Recording a Heritage Place'. The extant record must be submitted to and signed off by Heritage Tasmania's Works Manager, prior to the commencement of any demolition or alteration works to the Theatre Royal.**

   (ii) This extant record must include measured drawings that clearly record the construction and details of the structure; in plan, elevation and section drawn to scale 1:50 and details drawn at larger scale as appropriate. Copies of sketch drawings bearing the dimensions taken on site must be provided with the final drafted version of the documentation.

   (iii) This extant record must include photographic prints of high resolution that illustrate the form and detail of the structure both externally and internally, and these prints referenced to a plan of the structure in a manner that clearly shows the camera location/orientation for each image.

(iv) Three print copies of the completed record and one digital version are to be provided to Heritage Tasmania, prior to the commencement of works to the Theatre Royal.

Reason for condition
To provide a record of this heritage building prior to alterations being undertaken.

3. **The Theatre Royal and Hedberg Garage must be protected during the works. A detailed description of the proposed protective measures must be submitted to and signed off by Heritage Tasmania's Works Manager, prior to the commencement of works.**

Reason for condition
To ensure the heritage listed places are protected during the development works.

4. **A detailed scope of the proposed conservation, alterations and demolition work to the Theatre Royal and Hedberg Garage, including the conservation of the garage building's distinct historic internal character, must be submitted to and signed off by Heritage Tasmania's Works Manager, prior to the commencement of works to these buildings.**

Reason for condition
To ensure that the proposed conservation, alterations and demolition work will protect the heritage values of the places.

5. **The proposed canopy to the front entry to the Hedberg Garage is not approved.**

Reason for condition
To clarify the scope of this approval. The proposed canopy is inconsistent with the heritage character of the building.

6. **A digital copy of all plans and specifications submitted in making applications for building permits relating to this development, including the identification by the applicant of any substantial variance from the works documented in PLN-16-00135-01, must be provided to Heritage Tasmania and be to the satisfaction of Heritage Tasmania's Works Manager, prior to the commencement of works.**

Reason for condition
To ensure that works not adequately documented in the Development Application will have an acceptable degree of impact on the place's heritage values, and to assist in the early identification of works that will require a minor amendment to the permit or further Heritage Council approval.

7. **A sample board that illustrates the proposed colours and finishes of the external cladding of the new development must be submitted to and be to the satisfaction of Heritage Tasmania's Works Manager, prior to the commencement of building works.**

Reason for condition
To ensure that the external character of the new development is complementary to the heritage values of the historic buildings on the site.

8. **A communication protocol must be developed and implemented to ensure that all persons working on the site understand and appreciate the heritage values of the site and the obligations arising from the Tasmanian Heritage Register listings and this approval; and evidence that this communication protocol has been developed and that procedures are in place for its communication to all persons working on the site must be provided to Heritage Tasmania's Works Manager, prior to work on the site commencing.**

Reason for condition
To ensure that all persons working on the site are aware of the heritage values of the site and their responsibilities, and to ensure that heritage fabric is protected and conserved during the works.

9. **No permanent signage is be erected or installed on the site without the approval of the Tasmanian Heritage Council.**

Reason for condition
To clarify the scope of this approval. Proposals for new signs will require additional approval.

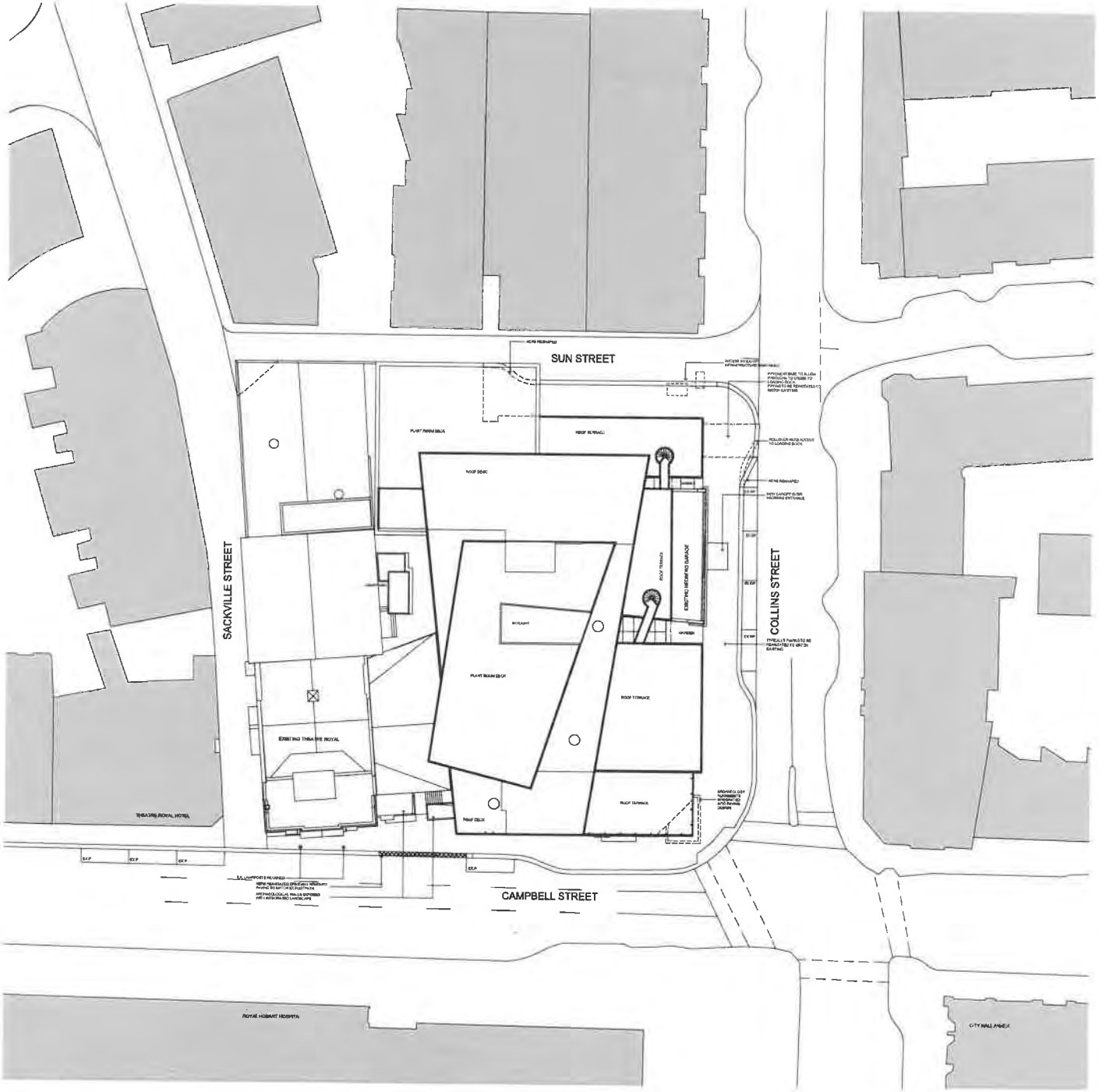
Advice
Consideration should be given to enhancing the external lighting of the Theatre Royal and Hedberg Garage, to ensure that these buildings remain prominent elements in the streetscape at night-time. Heritage Tasmania would be glad to provide more detailed advice in relation to this.

Please ensure the details of this notice, including the conditions and advice, are included in any permit issued, and forward a copy of the permit or decision of refusal to the Heritage Council for our records.

Please contact Deirdre Macdonald on 6165 3712 if you require clarification of any matters contained in this notice.

Brett Torossi
Chair
Under delegation of the Tasmanian Heritage Council

Attachment D



LEGEND

EX P EXISTING CARPARK RETAINED

EX DP EXISTING DISABLED CARPARK REMAINS TO BUT REMOVED BEYOND.

EX PP EXISTING CARPARK RELOCATED & REMAINS TO BUT REMOVED BEYOND

REVISION No. DESCRIPTION DATE

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

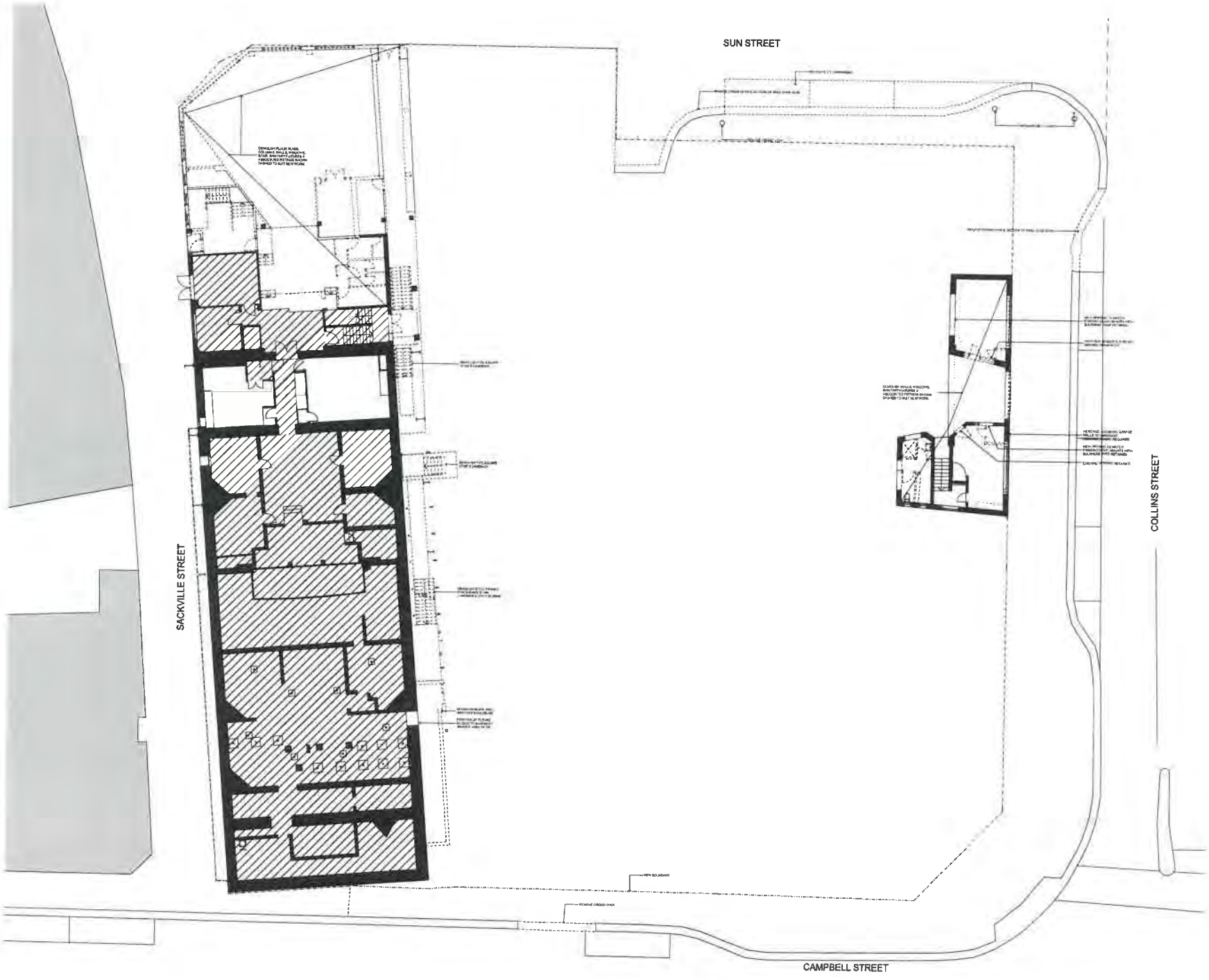
CLIENT
UNIVERSITY OF TASMANIA

TITLE
SITE PLAN

DRAWING No. A1000

REVISION No. 1

DATE
SCALE 1:200
PROJECT CODE UPA
STATUS DEVELOPMENT APPLICATION



WOHA

LEGEND

NEW BOUNDARY

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
LEVEL 1 DEMOLITION PLAN

DRAWING No.
A1101

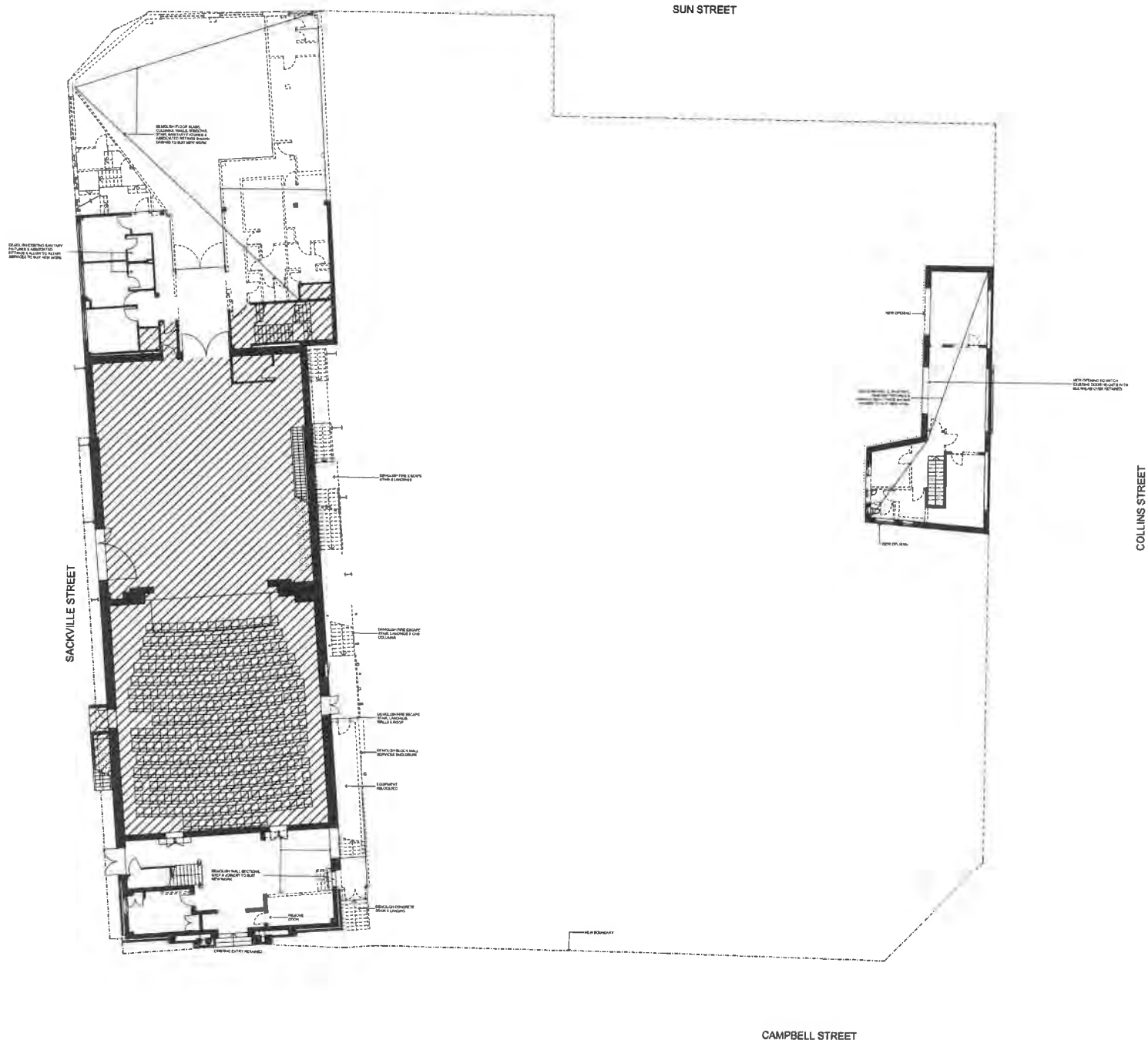
REVISION No.
1

DATE

SCALE
1:100

PROJECT NO.

STATUS
DEVELOPMENT APPLICATION



WOHA

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

LEVEL 2 DEMOLITION PLAN

DRAWING No. A1102

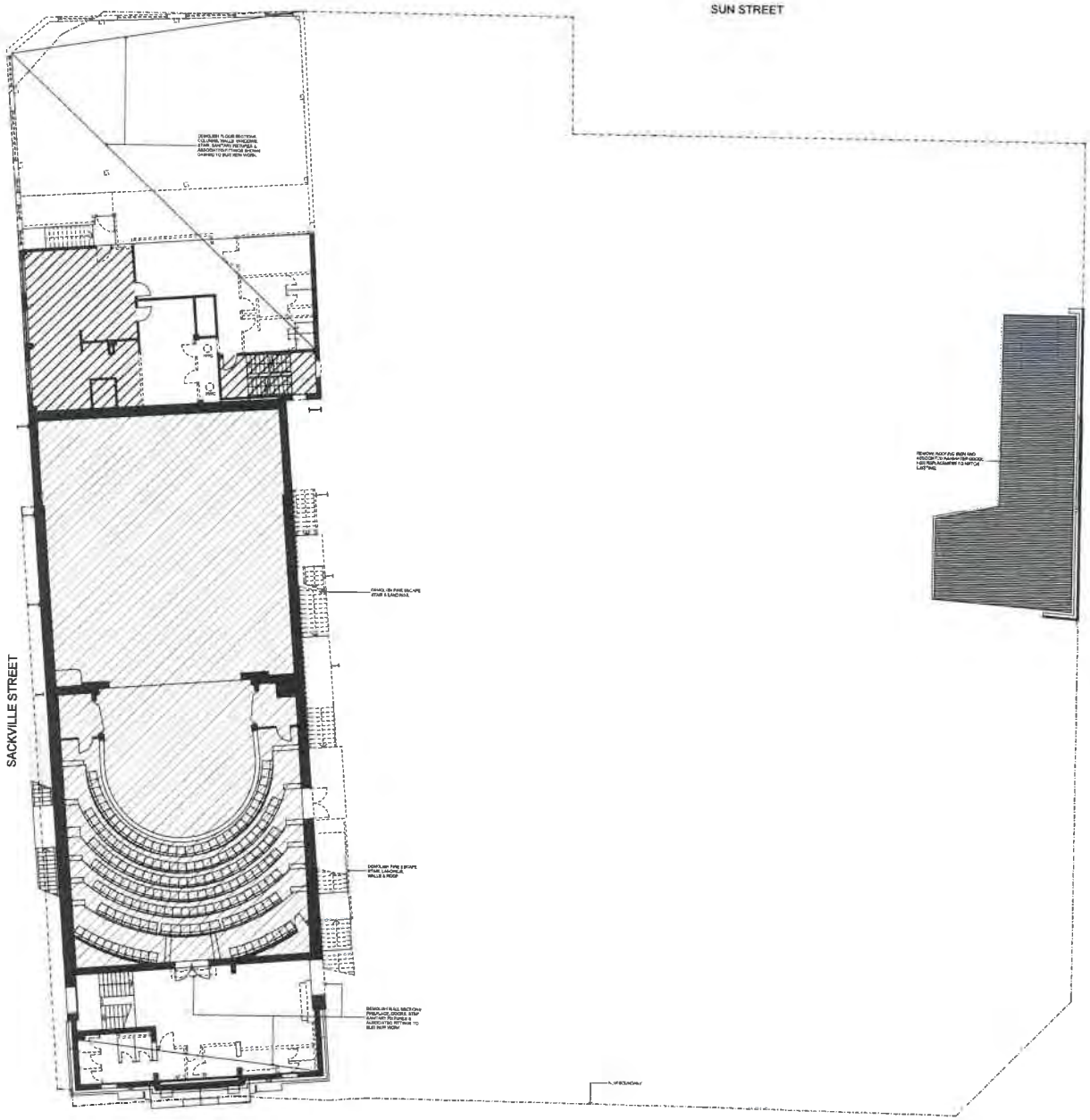
REVISION No. -

DATE

SCALE 1:100

PROJECT CODE

STATUS DEVELOPMENT APPLICATION



WOHA

LEGEND

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

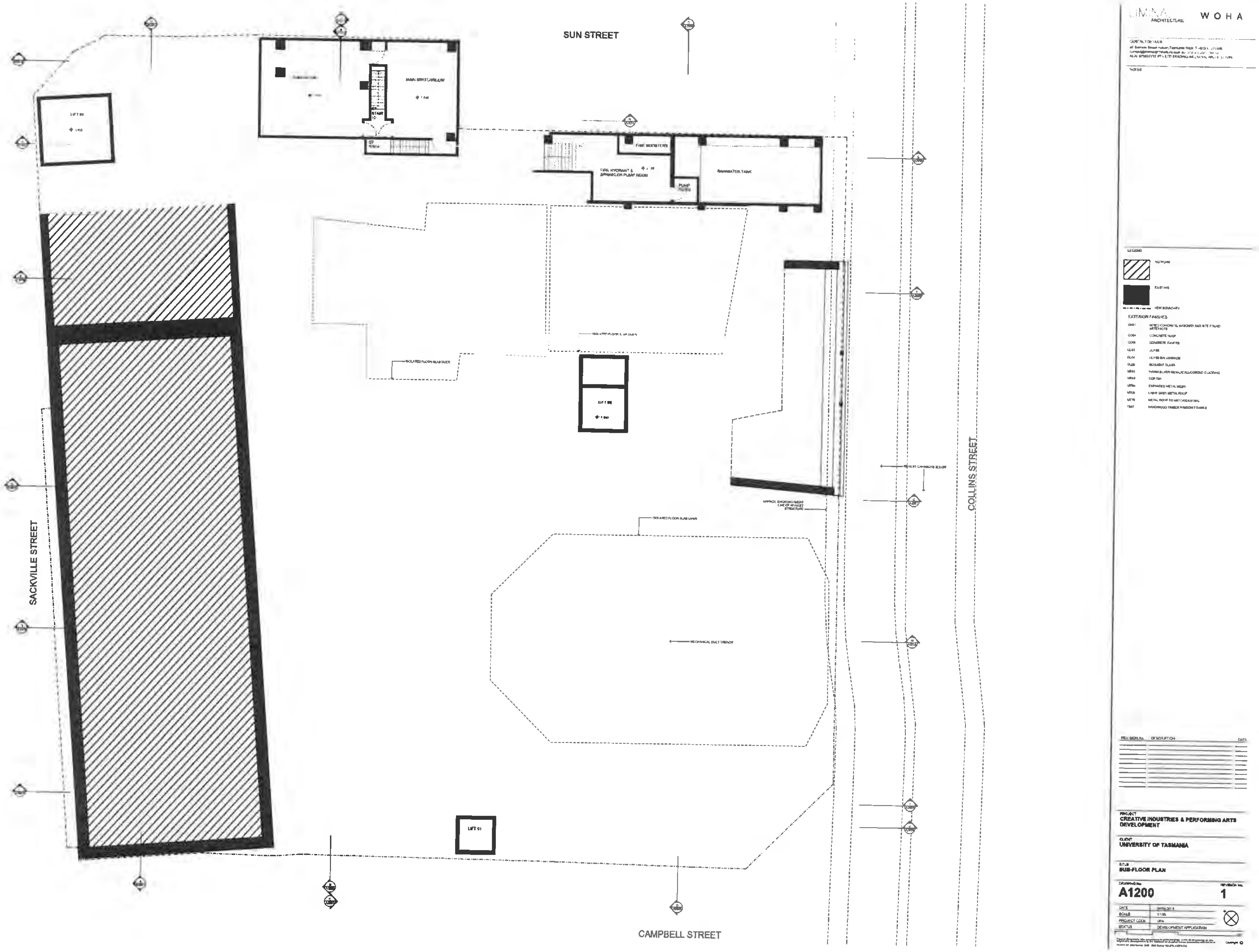
CLIENT
UNIVERSITY OF TASMANIA

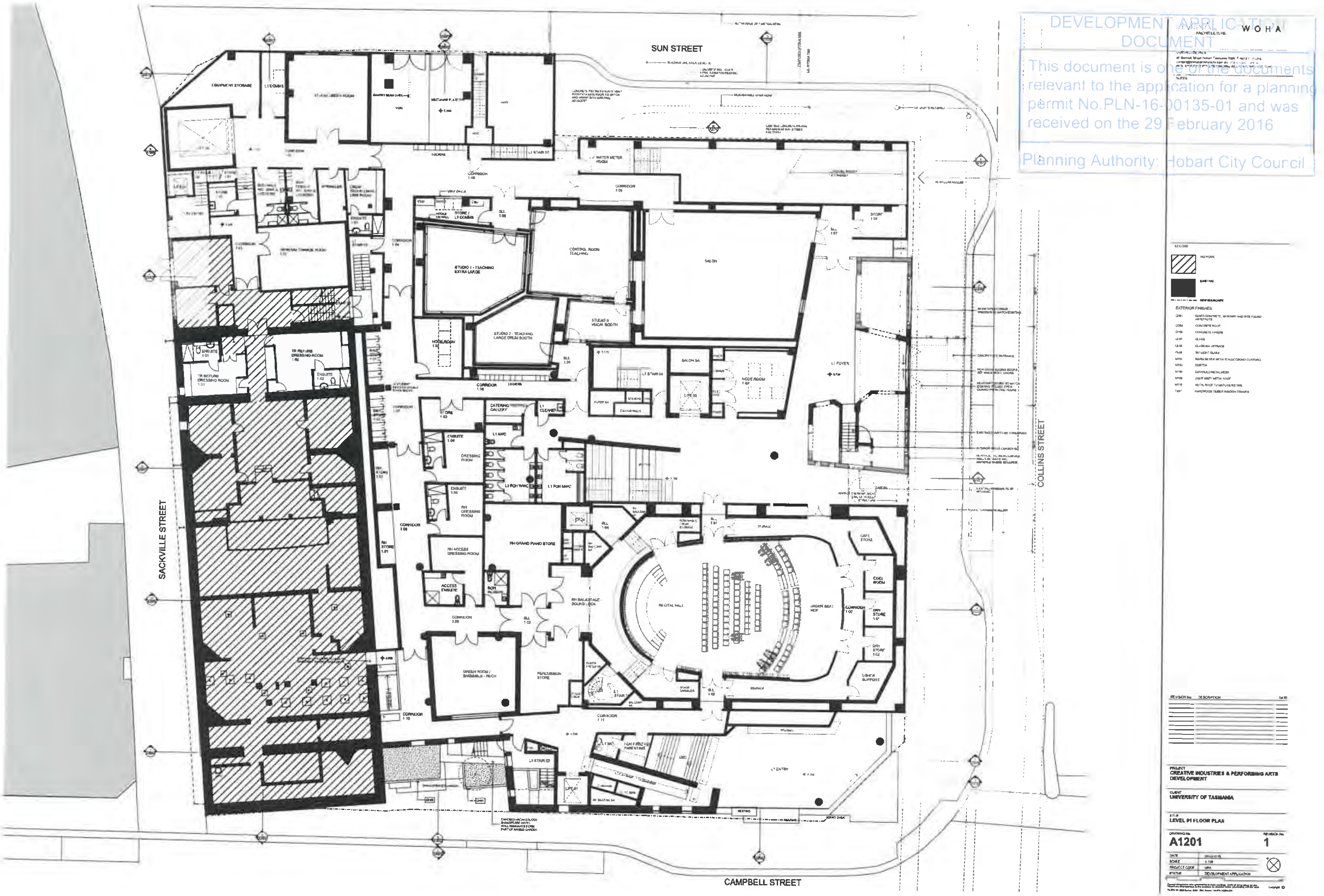
TITLE
LEVEL 3 DEMOLITION PLAN

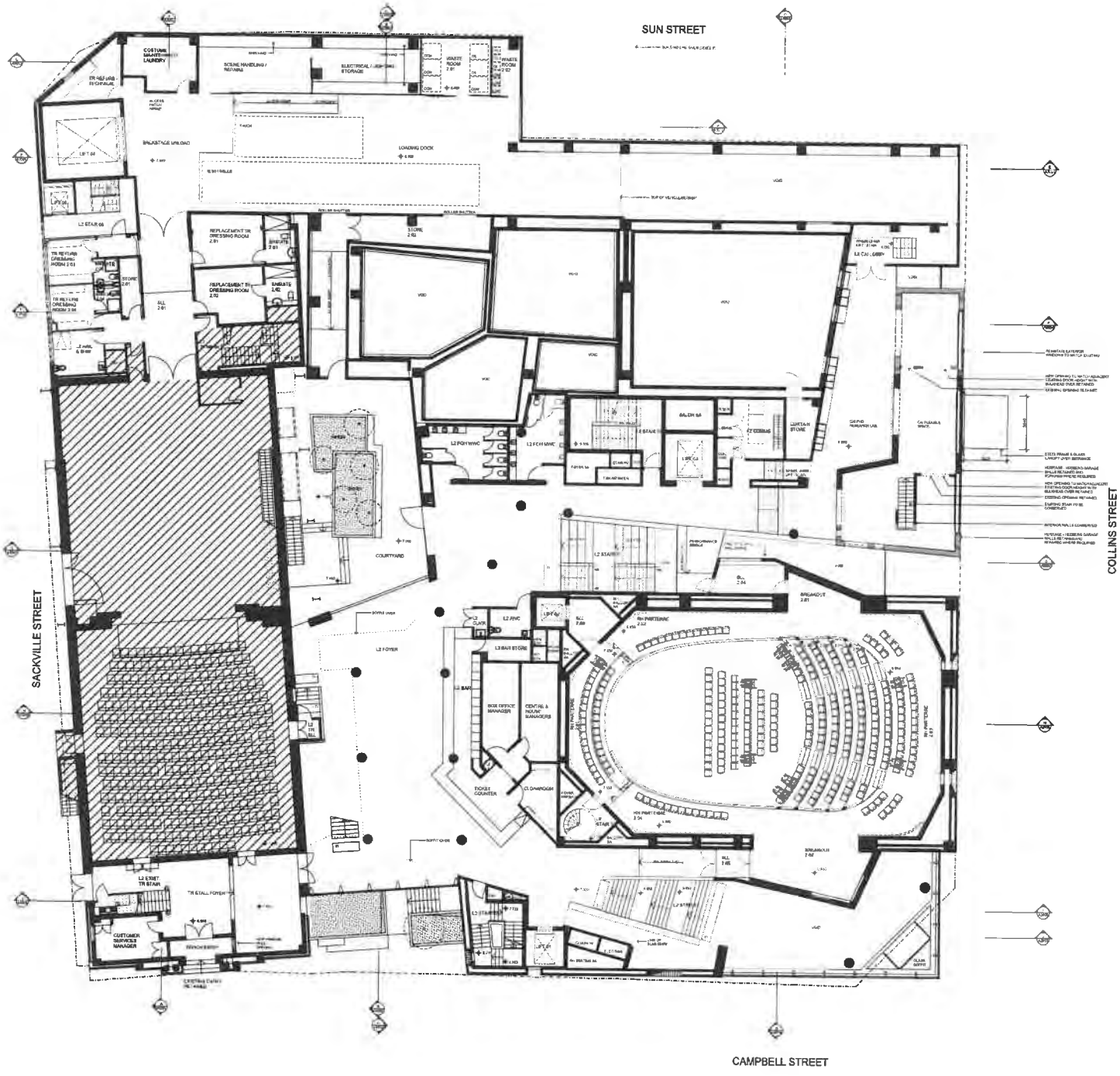
DRAWING No.
A1103

REVISION No.
-

DATE
SCALE
PROJECT CODE
STATUS
DEVELOPMENT APPLICATION


SUN STREET
SACKVILLE STREET
COLLINS STREET
CAMPBELL STREET
MAIN SWITCHROOM
FIRE HYDRANT & SPRINKLER PUMP ROOM
RAINWATER TANK
PUMP
LIFT 01
LIFT 03
WOHA
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT
UNIVERSITY OF TASMANIA
SUB-FLOOR PLAN
A1200
1


DEVELOPMENT APPLICATION DOCUMENT
This document is one of the documents relevant to the application for a planning permit No.PLN-16-00135-01 and was received on the 29 February 2016
Planning Authority: Hobart City Council
WOHA
SUN STREET
SACKVILLE STREET
COLLINS STREET
CAMPBELL STREET
STUDIO 1 - TEACHING EXTRA LARGE
STUDIO 2 - TEACHING LARGE DRUM BOOTH
SALON
RECITAL HALL
L1 FOYER
L1 ENTRY
RH GRAND PIANO STORE
PROJECT CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT
CLIENT UNIVERSITY OF TASMANIA
TITLE LEVEL 01 FLOOR PLAN
A1201
1



WOHA

EXTERIOR FINISHES

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

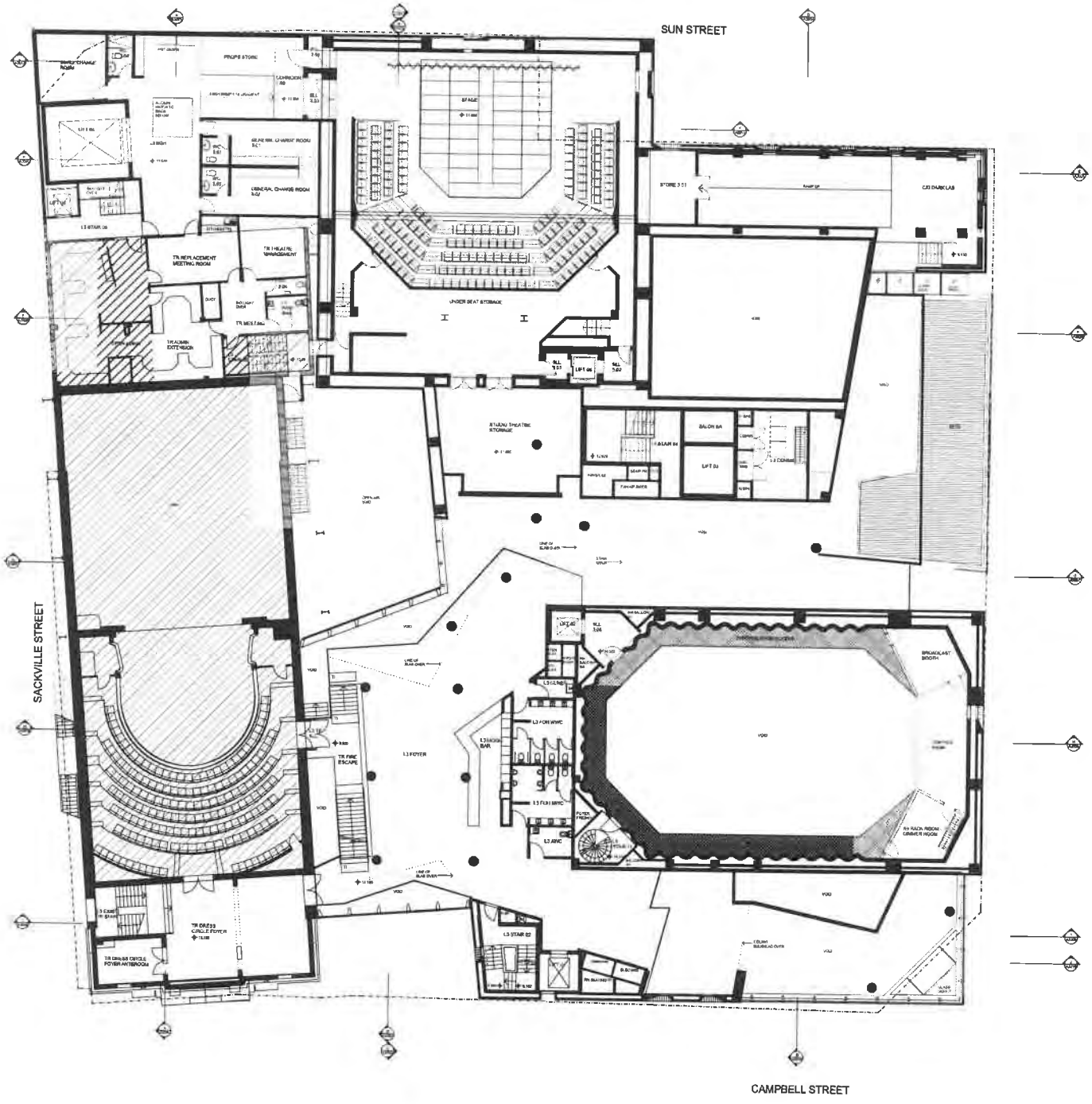
CLIENT
UNIVERSITY OF TASMANIA

TITLE
LEVEL 02 FLOOR PLAN

DRAWING No.
A1202

REVISION No.
1

UNITS
SCALE 1:100
PROJECT CODE
STATUS DEVELOPMENT APPLICATION



WOHA ARCHITECTURE

LEGEND

NO WORKS

EXISTING

NEW BUILDING

EXTERIOR FINISHES

CONC	MIXED CONCRETE, MASONRY AND SITE POURED ARTEFACTS
CONR	CONCRETE ROOF
CONW	CONCRETE FINISH
GLAZ	GLASS
GLBA	GLASS BALUSTRADE
GLSS	SKYLIGHT GLASS
MTBS	PAINTED BESPOKE METALWORK/CLADDING
MTBT	TORTEN
MTPF	EXPANDED METAL MESH
MTWS	LIGHT WEIGHT METAL ROOF
MTRF	METAL ROOF TO MATCH EXISTING
TIMT	HARDWOOD TIMBER WINDOW FRAMES

REVISION No. DESCRIPTION DATE

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

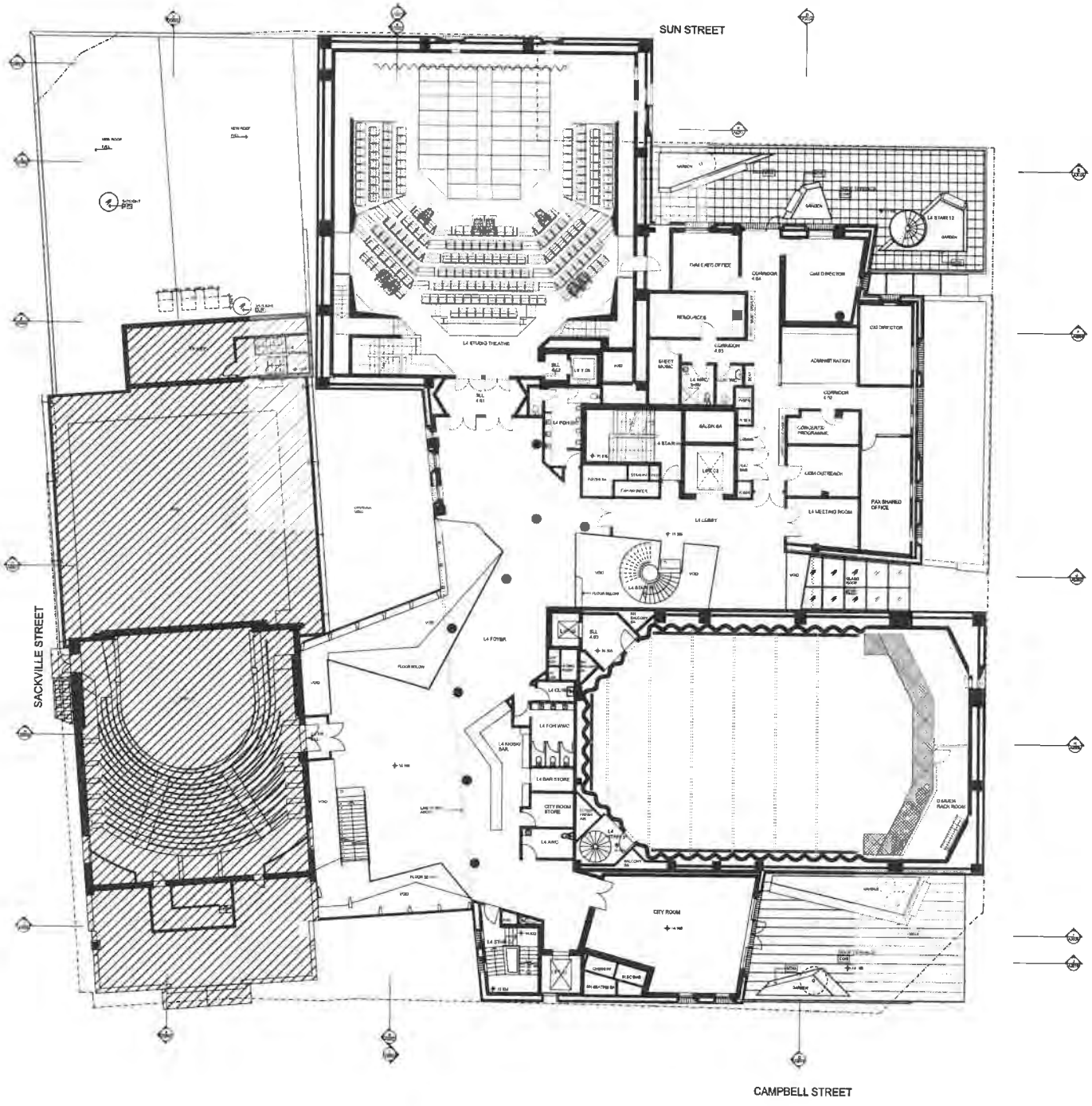
CLIENT
UNIVERSITY OF TASMANIA

TITLE
LEVEL 03 FLOOR PLAN

DRAWING No. A1203

REVISION No. 1

DATE
SCALE 1:100
PRINTED AT CODE
STATUS DEVELOPMENT APPLICATION



WOHA

ARCHITECTURE

EXISTING

NEW BUILDWORK

EXTERIOR FINISHES

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
LEVEL 04 FLOOR PLAN

DRAWING No.
A1204

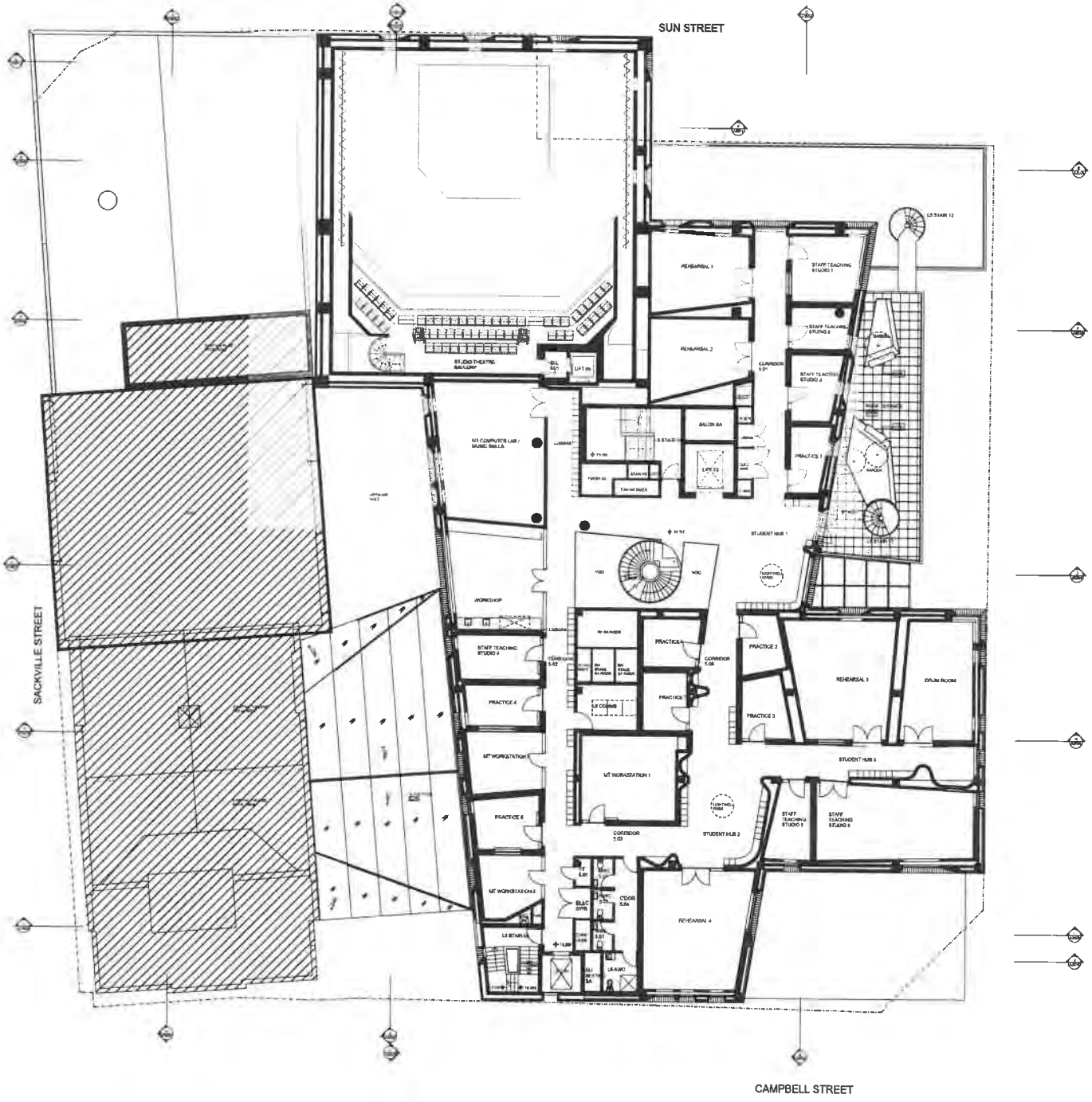
REV VERSION No.
1

DATE

SCALE
1:100

PROJECT CODE

STATUS
DEVELOPMENT APPLICATION



UTAS ARCHITECTURE WOHA

NOTES

LEGEND

NEW WORK

EXISTING

EXTERIOR FINISHES

CR01	MATED CONCRETE, MASONRY AND SITE FOUND APPARATUS
CO04	CONCRETE SLOP
CO07	CONCRETE PAVERS
GL01	GLASS
GL05	GLASS BALUSTRADE
PL03	SKYLIGHT GLASS
MT01	PAINT SILVER METAL CLADDING CLADDING
MT02	CORTEN
MT06	EXPANDED METAL MESH
MT08	LIGHT GREY METAL ROOF
MT15	METAL ROOF / WINDOW SYSTEM
TB01	HARDWOOD TIMBER WINDOW FRAMES

REVISION No.	DESCRIPTION	DATE

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

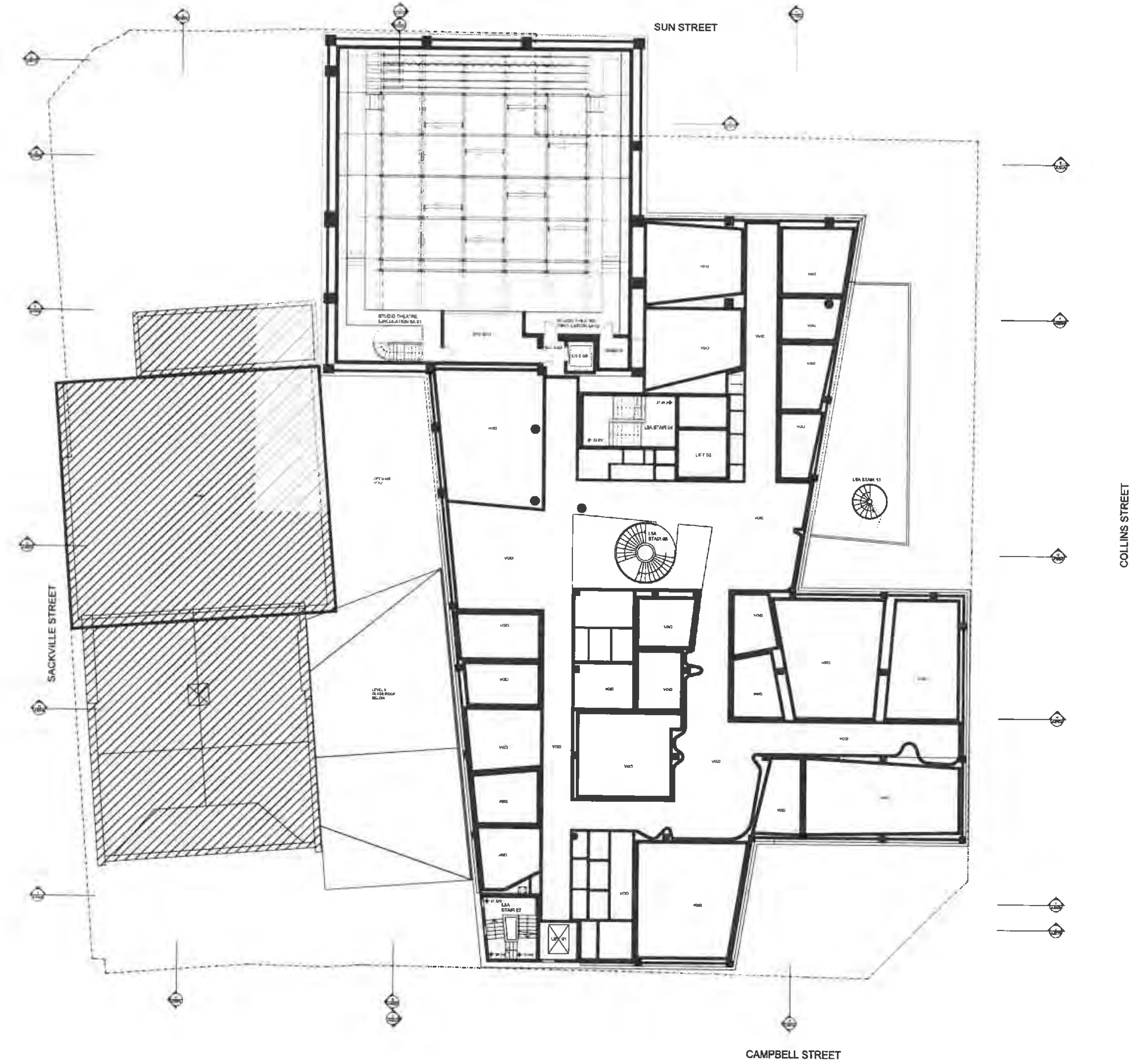
CLIENT
UNIVERSITY OF TASMANIA

TITLE
LEVEL 06 FLOOR PLAN

DRAWING No. A1205

REVISION No. 1

DATE
SCALE 1:100
PROJECT CODE UTA
STATUS DEVELOPMENT APPLICATION



WOHA

LEGEND

EXTERIOR FINISHES

REVISION No.	DESCRIPTION	DATE

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
LEVEL 05A FLOOR PLAN

DRAWING No. **A1206** REVISION No. **1**

SCALE	1:100
PROJECT CODE	UPA
STATUS	DEVELOPMENT APPLICATION

WOHA ARCHITECTURE

EXTERIOR FINISHES

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

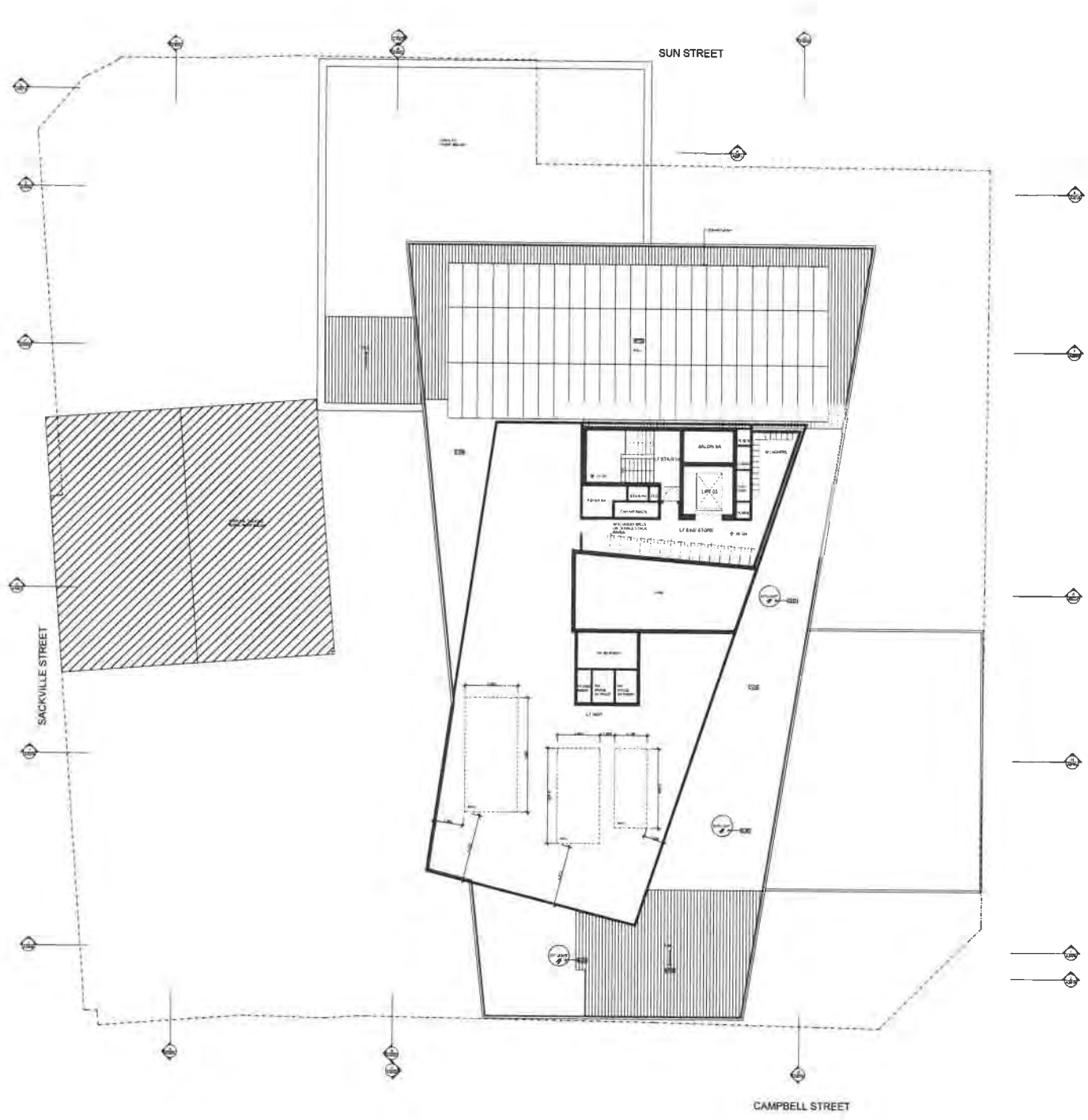
CLIENT
UNIVERSITY OF TASMANIA

TITLE
LEVEL 00 FLOOR PLAN

DRAWING No. A1207

REVISION No. 1

DATE
SCALE 1:100
PROJECT CODE
STATUS DEVELOPMENT APPLICATION



WOHA

LEGEND

EXTERIOR FINISHES

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

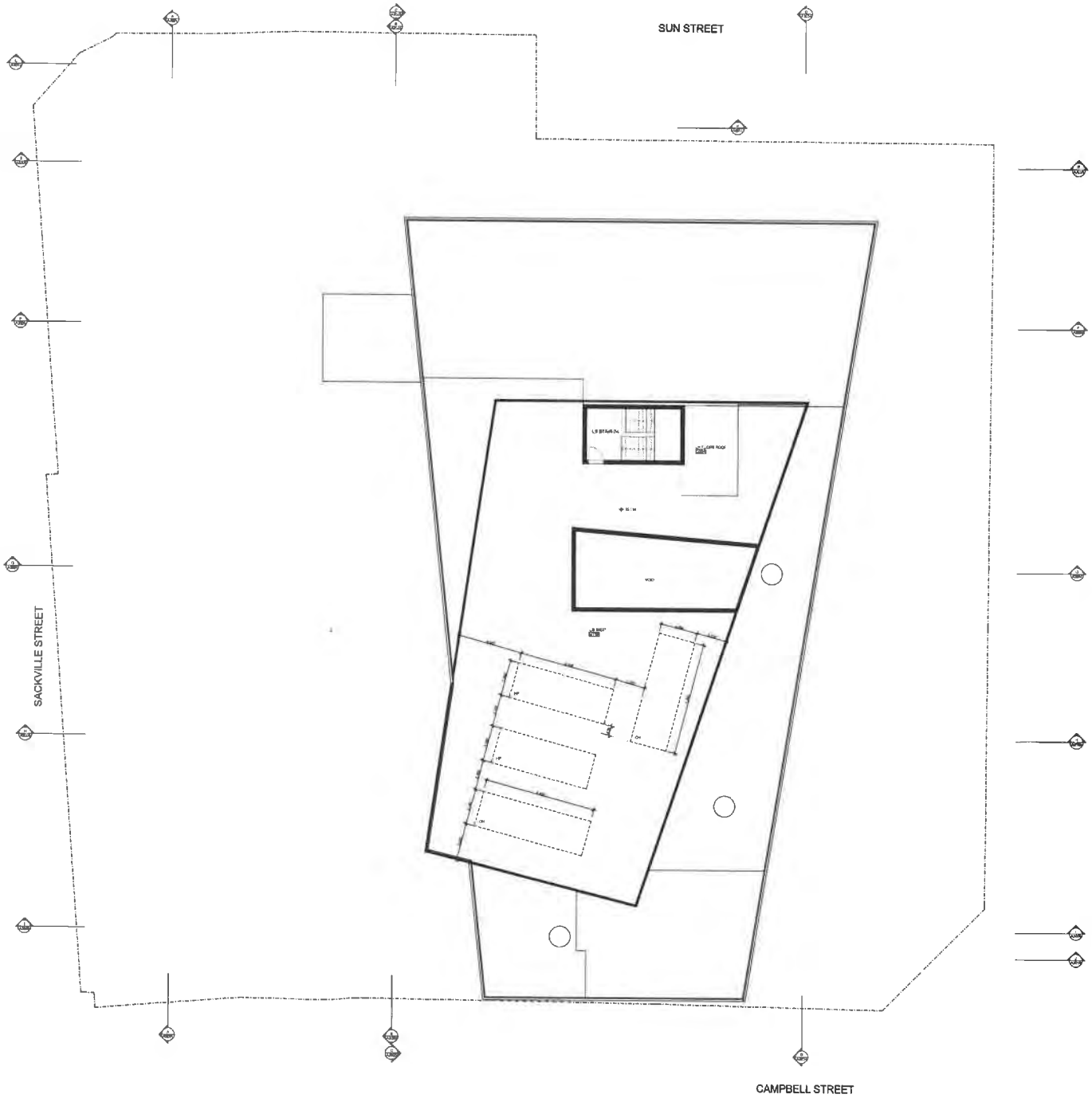
CLIENT
UNIVERSITY OF TASMANIA

TITLE
LEVEL 67 FLOOR PLAN

DRAWING No
A1208

REVISION No.
1

DATE
SCALE 1:100
PROJECT CODE
STATUS DEVELOPMENT APPLICATION



WOHA
ARCHITECTURE

LEGEND

EXISTING

NEW BOUNDARY

EXTERIOR FINISHES

REVISION No. DESCRIPTION DATE

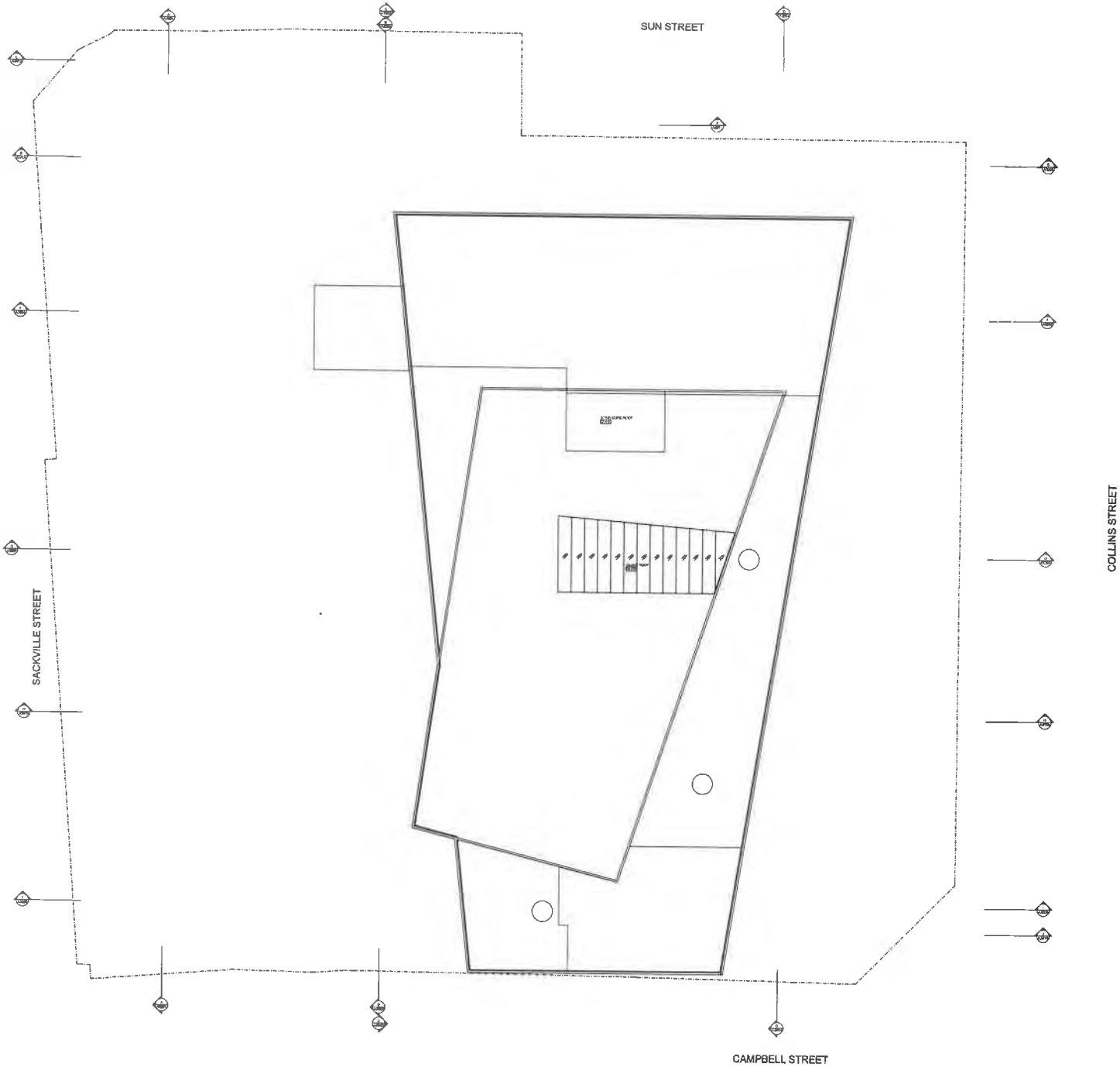
PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
MEP FLOOR PLAN

DRAWING No. REVISION No.
A1209 1

DATE
SCALE 1:100
PROJECT LEADER
STATUS DEVELOPMENT APPLICATION



WOHA ARCHITECTURE

NOTES

LEGEND

EXISTING

NEW BOUNDARY

EXTERIOR FINISHES

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

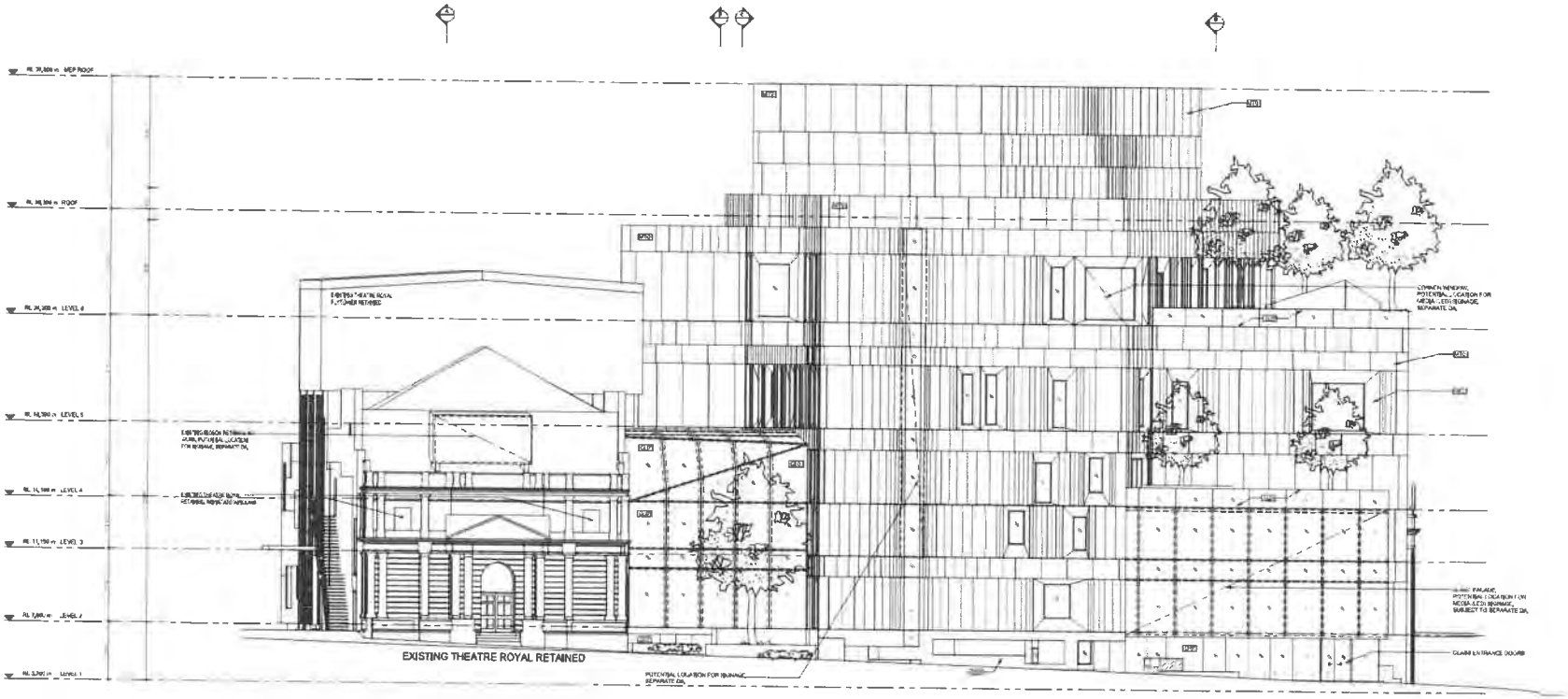
CLIENT
UNIVERSITY OF TASMANIA

TITLE
ROOF PLAN

DRAWING No.
A1210

REVISION No.
1

DATE
SCALE 1:120
PROJECT CODE
STATUS DEVELOPMENT APPLICATION



CAMPBELL STREET ELEVATION

LIMINAL ARCHITECTURE WOHA

CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

UNIVERSITY OF TASMANIA

ELEVATIONS SHEET 01

A2001

COLLINS STREET ELEVATION

LIMINAL ARCHITECTURE WOHA

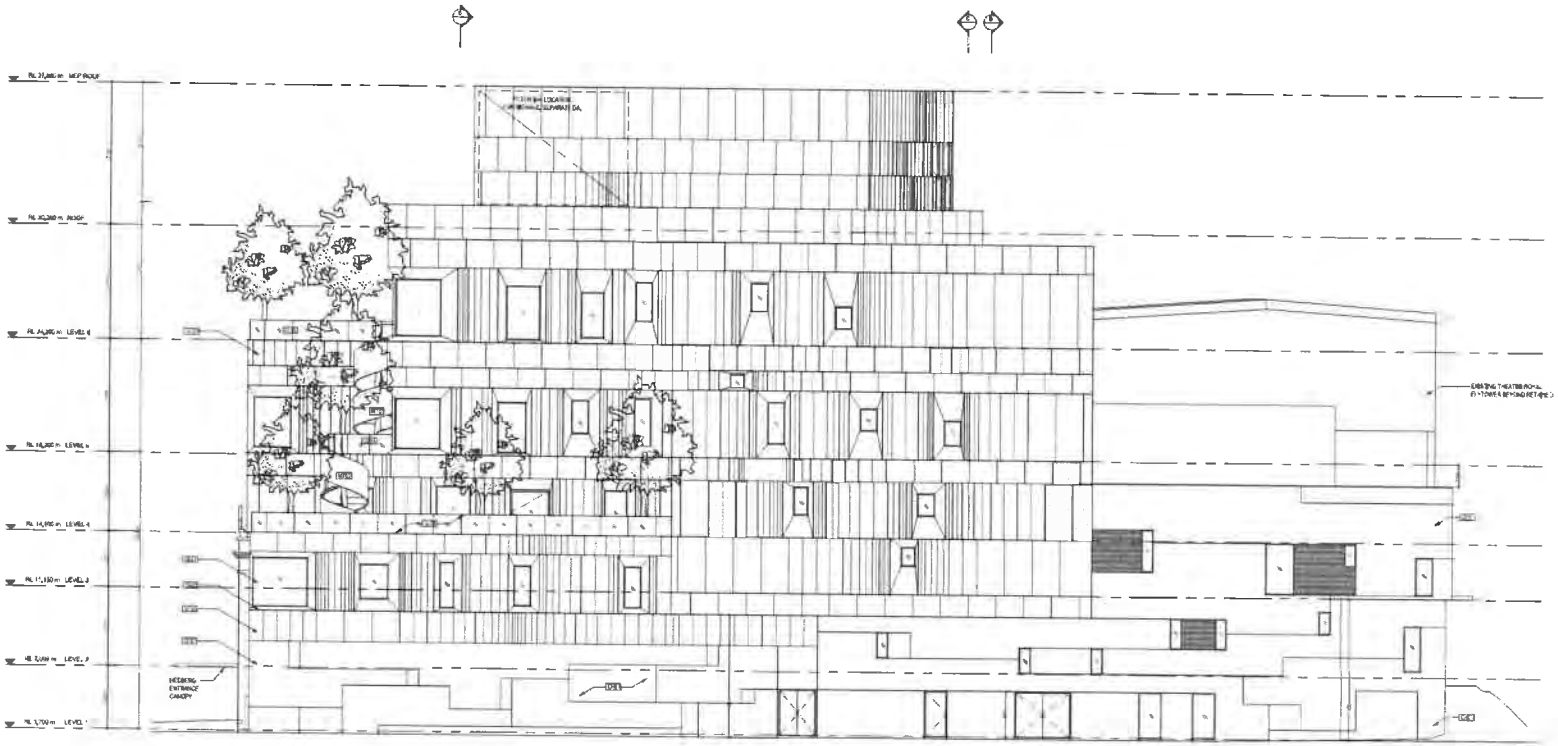
EXTERIOR FINISHES

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
ELEVATIONS SHEET 02

A2002



SUN STREET ELEVATION

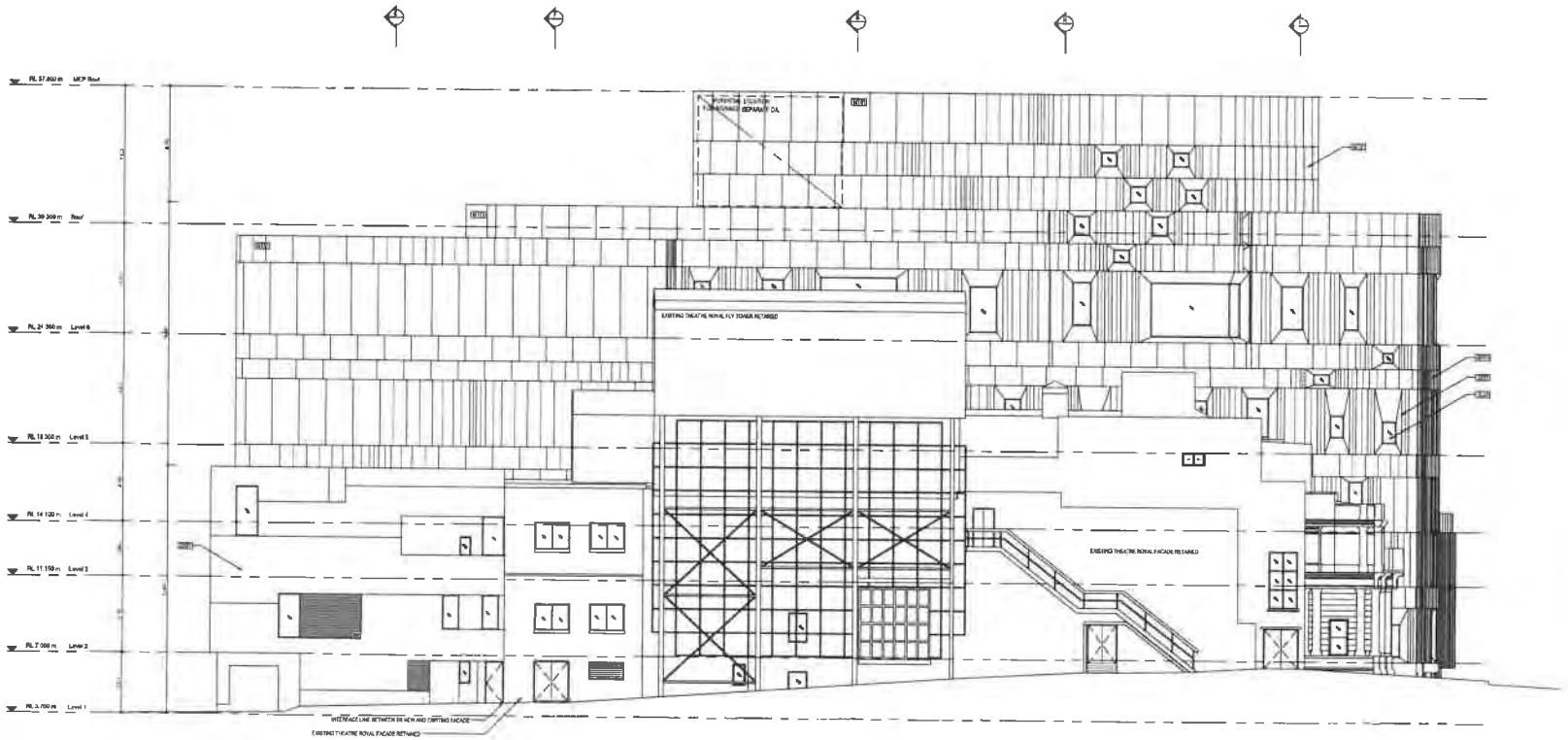
LIMINAL ARCHITECTURE WOHA

CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

UNIVERSITY OF TASMANIA

ELEVATIONS SHEET 03

A2003



SACKVILLE STREET ELEVATION

WOHA
ARCHITECTURE

LEGEND

EXTERIOR FINISHES

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

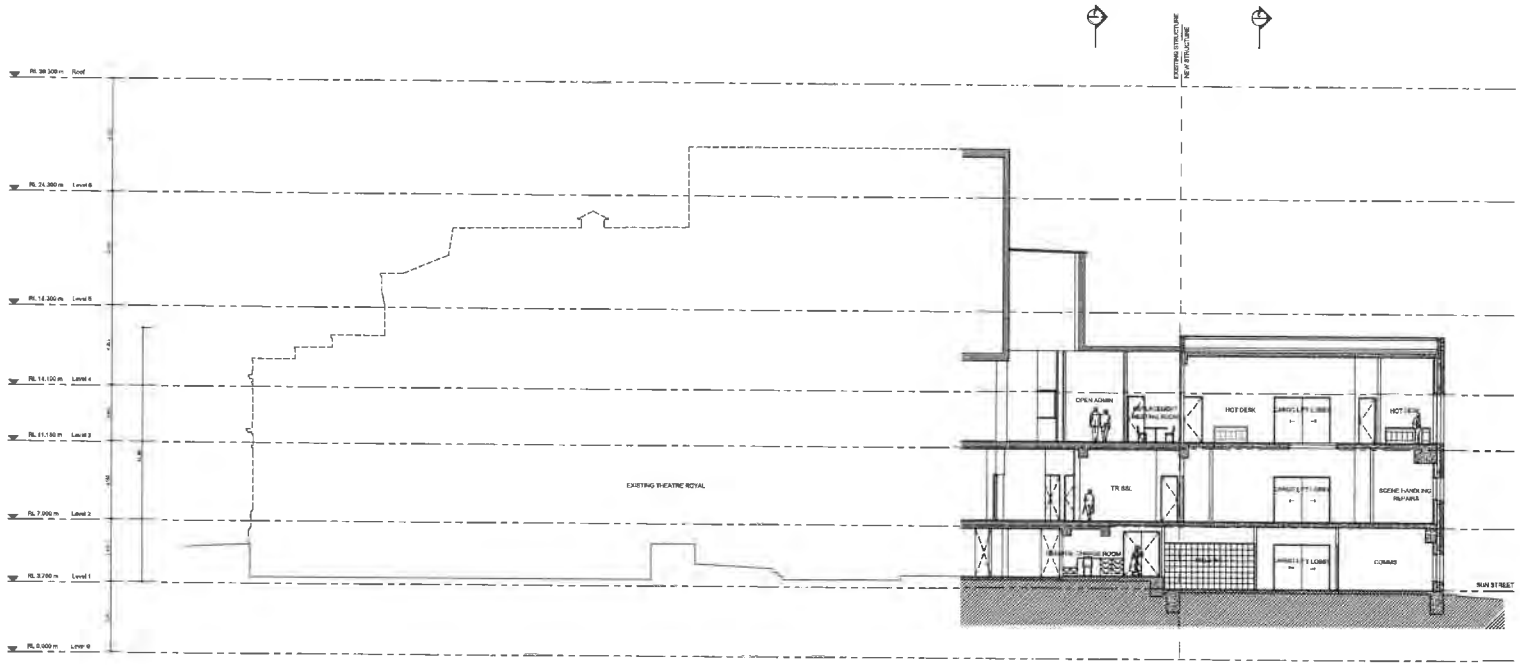
CLIENT
UNIVERSITY OF TASMANIA

TITLE
ELEVATIONS SHEET 04

DRAWING No.
A2004

REVISION No.

DATE
SCALE 1:100
PROJECT CODE UPA
STATUS DEVELOPMENT APPLICATION



WOHA

LEGEND

EXTERIOR FINISHES

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

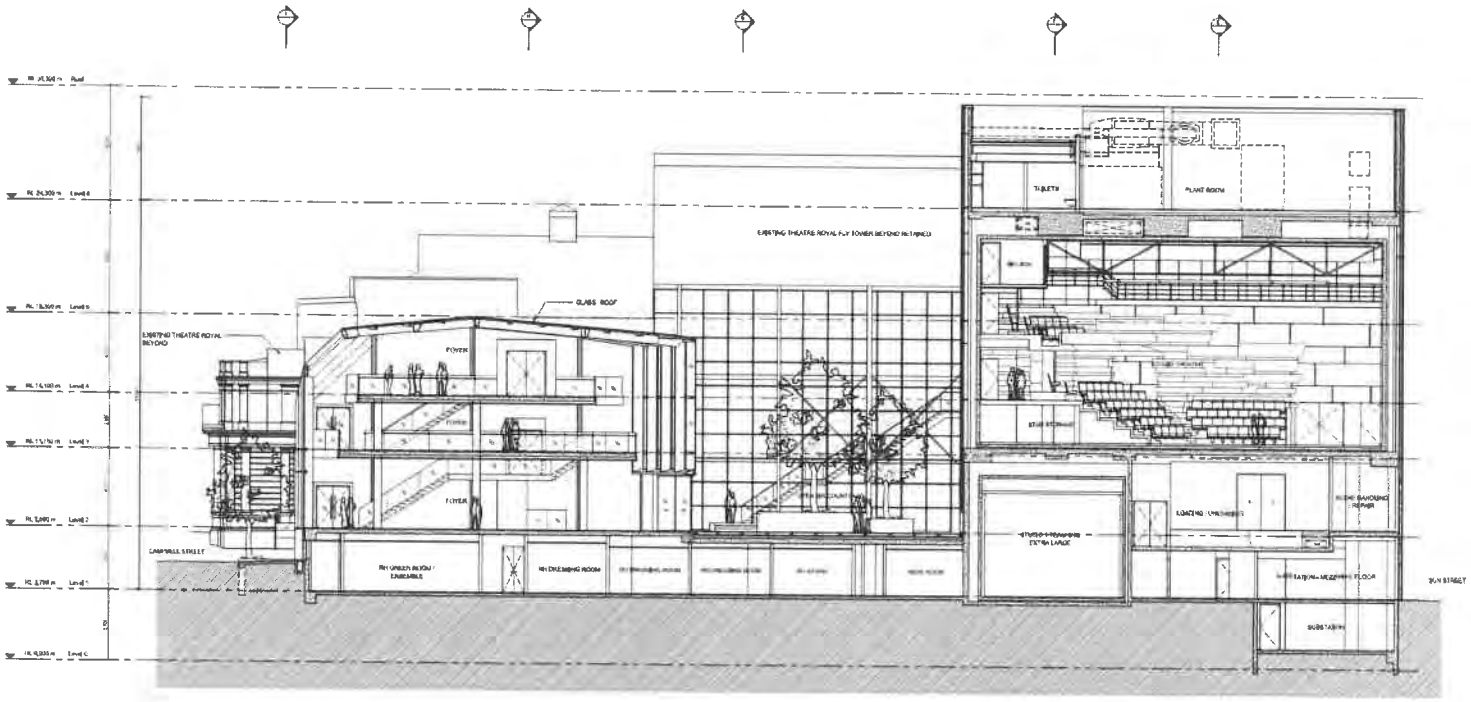
CLIENT
UNIVERSITY OF TASMANIA

TITLE
SECTION A

DRAWING No.
A3001

REVISION No.
-

DATE
SCALE 1:100
PROJECT CODE UPA
STATUS DEVELOPMENT APPLICATION



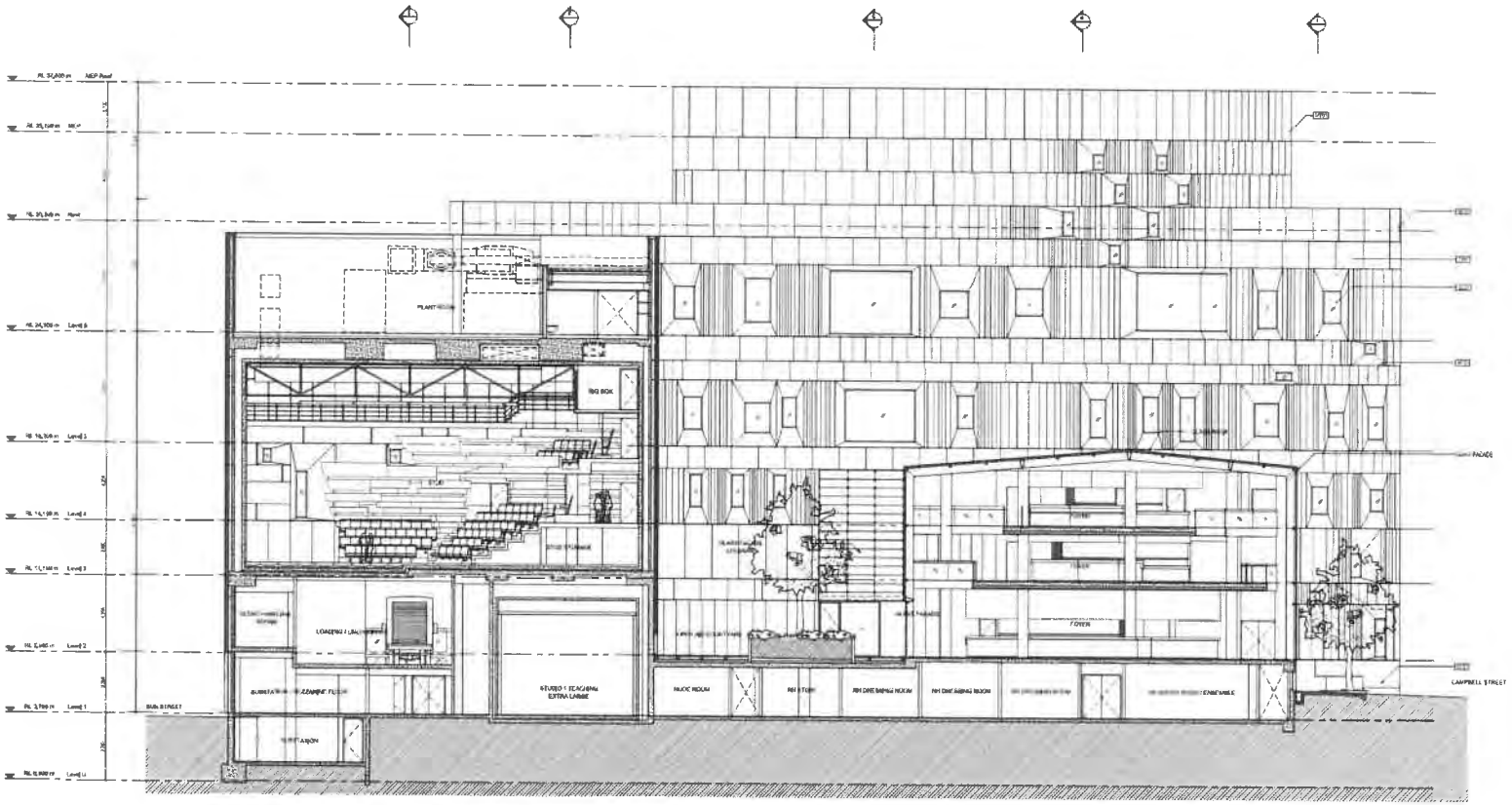
LIMINAL ARCHITECTURE WOHA

CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

UNIVERSITY OF TASMANIA

SECTION B

A3002



LIMINAL ARCHITECTURE WOHA

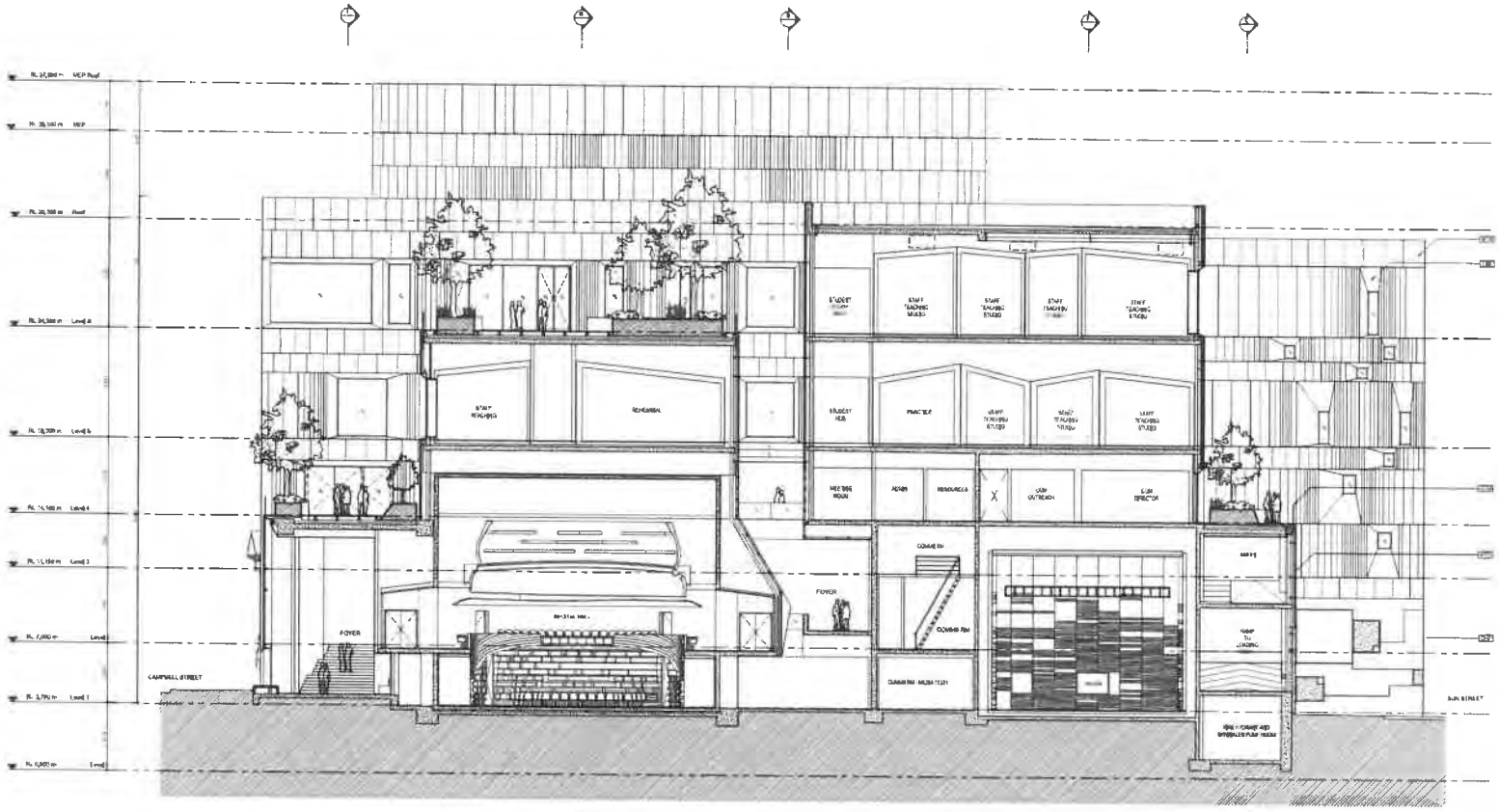
LEGEND

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
SECTION C

A3003



LIMINAL ARCHITECTURE WOHA

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

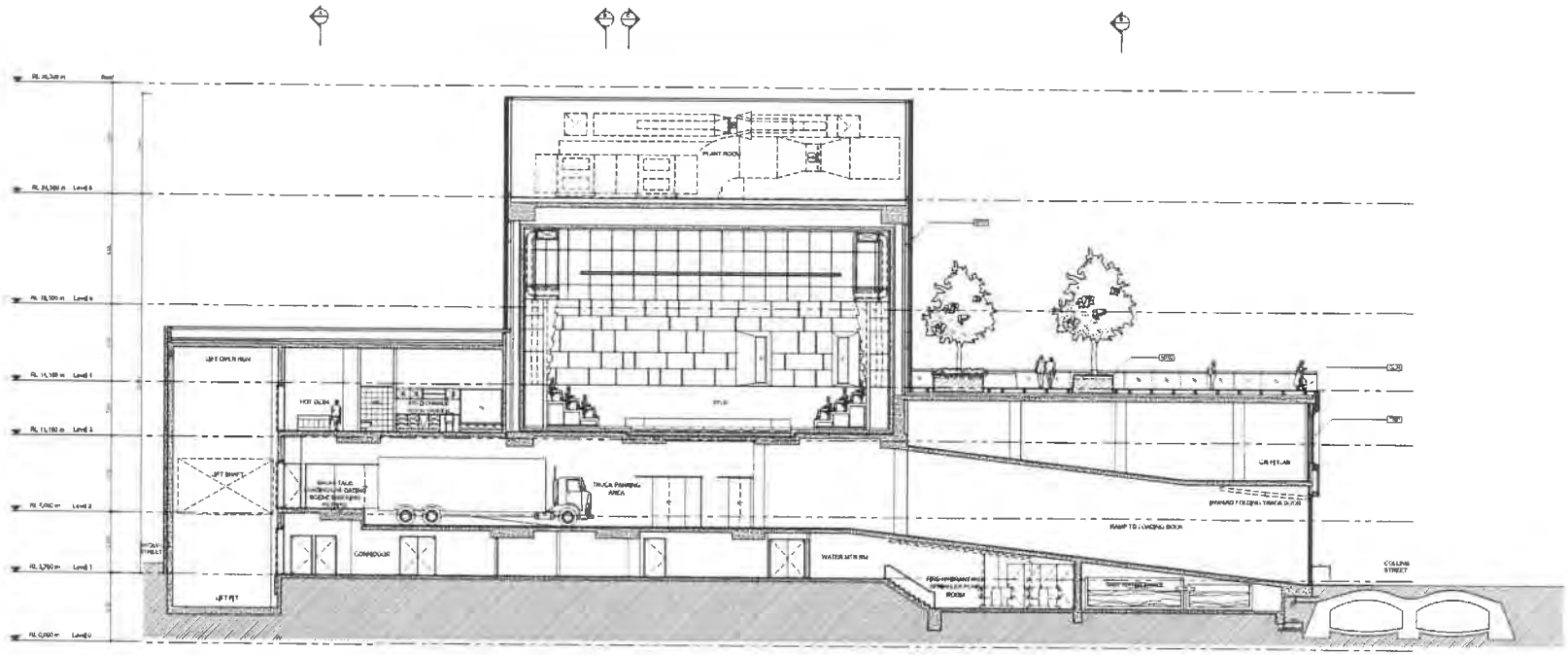
CLIENT
UNIVERSITY OF TASMANIA

TITLE
SECTION D

DRAWING No.
A3004

REVISION No.
-

SCALE
PROJECT NUMBER



LIMINAL ARCHITECTURE WOHA

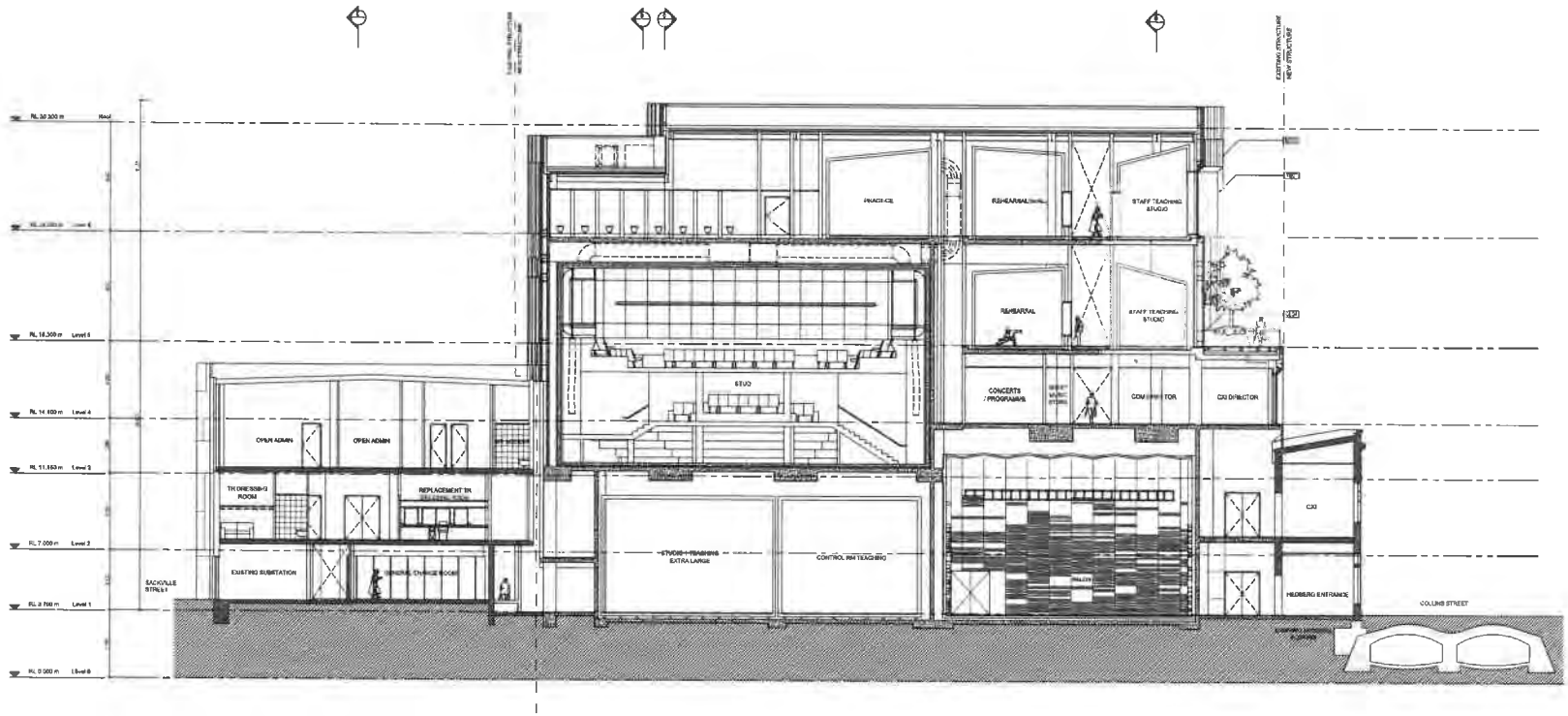
PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
SECTION E

DRAWING No.
A3005

REVISION No.
1



WOHA

ARCHITECTURE

LEGEND

EXTERIOR FINISHES

CM01	MIXED CONCRETE, MASONRY AND SITE FOUND ARTEFACTS
CO04	CONCRETE ROOF
CO06	CONCRETE PAVERS
GL01	GLASS
GL04	GLASS BALUSTRADE
GL05	BRITLEIGHT GLASS
MT01	PERFORATED METAL/ALUCOBOND CLADDING
MT03	LOUVRES
MT05	EXPANDED METAL MESH
MT08	LIGHT GREY METAL ROOF
MT10	METAL ROOF TO MATCH EXISTING
TM1	HARDWOOD TIMBER FINISH/PLYWOOD PANELS

REVISION No.	DESCRIPTION	DATE

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

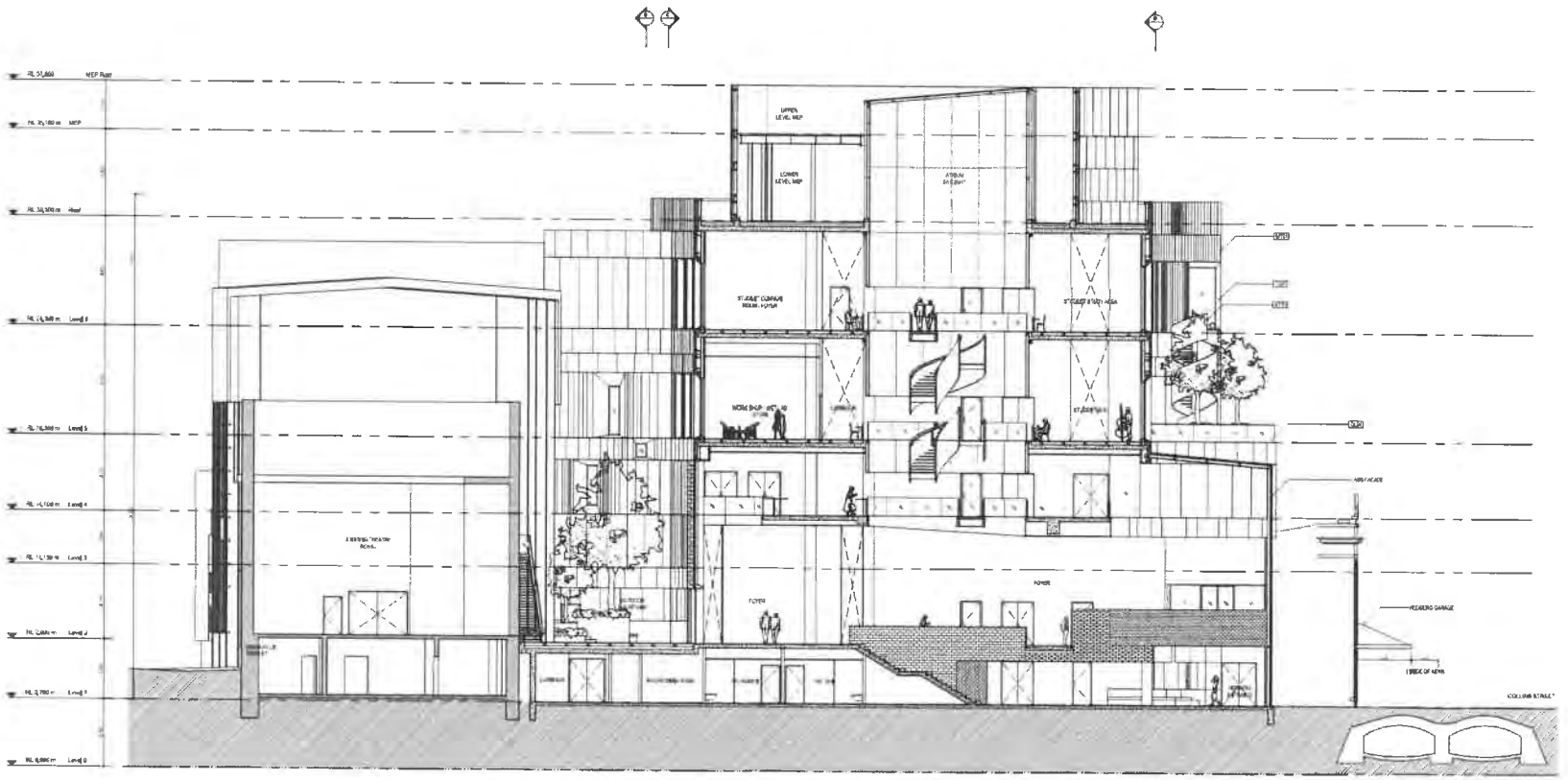
CLIENT
UNIVERSITY OF TASMANIA

TITLE
SECTION F

DRAWING No.
A3006

REVISION No.
1

DATE	
SCALE	1:100
PROJECT CODE	MPA
STATUS	DEVELOPMENT APPLICATION



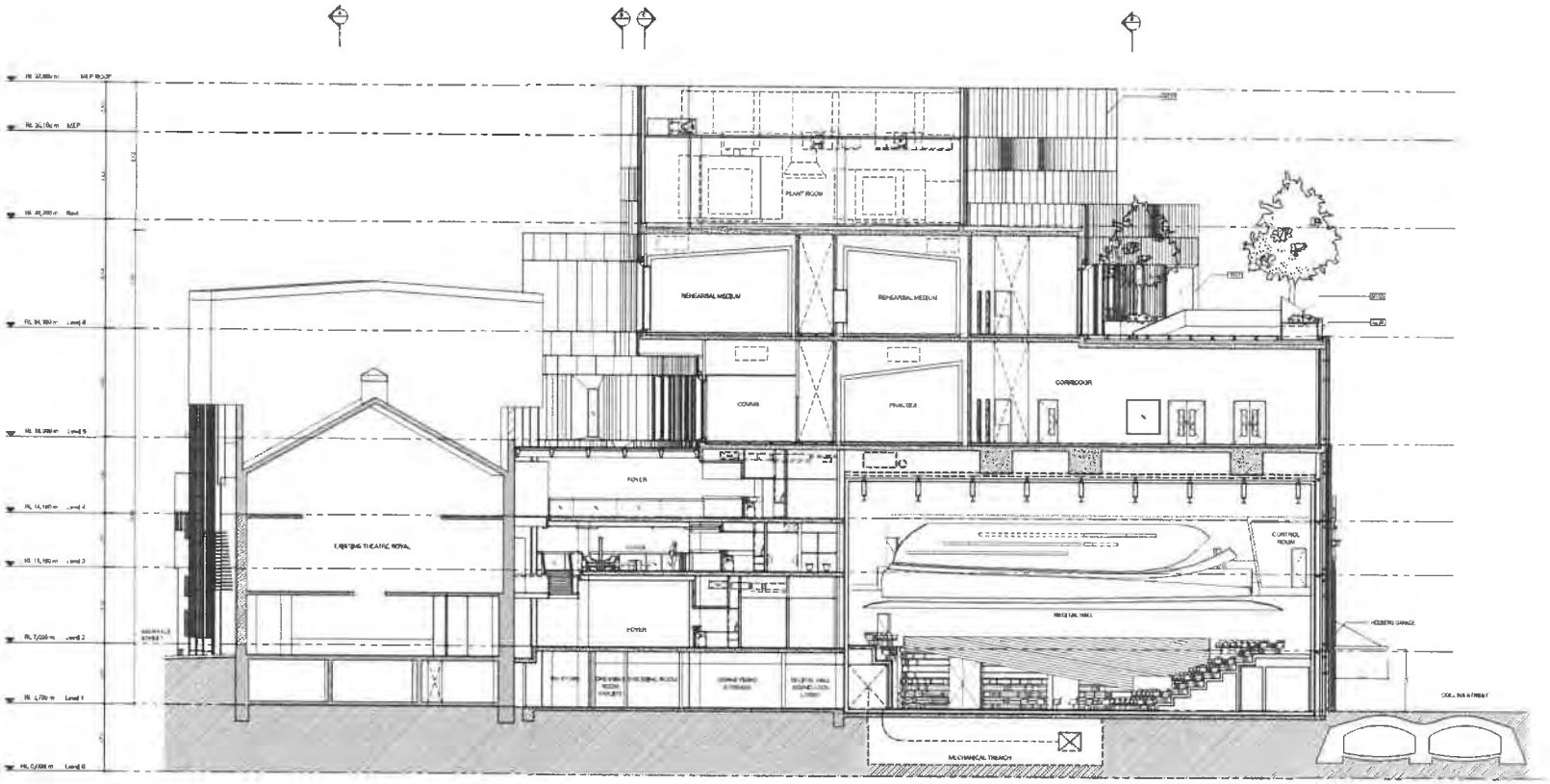
LIMINAL ARCHITECTURE WOHA

CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

UNIVERSITY OF TASMANIA

SECTION G

A3007 1



LIMINAL ARCHITECTURE WOHA

EXTERIOR FINISHES

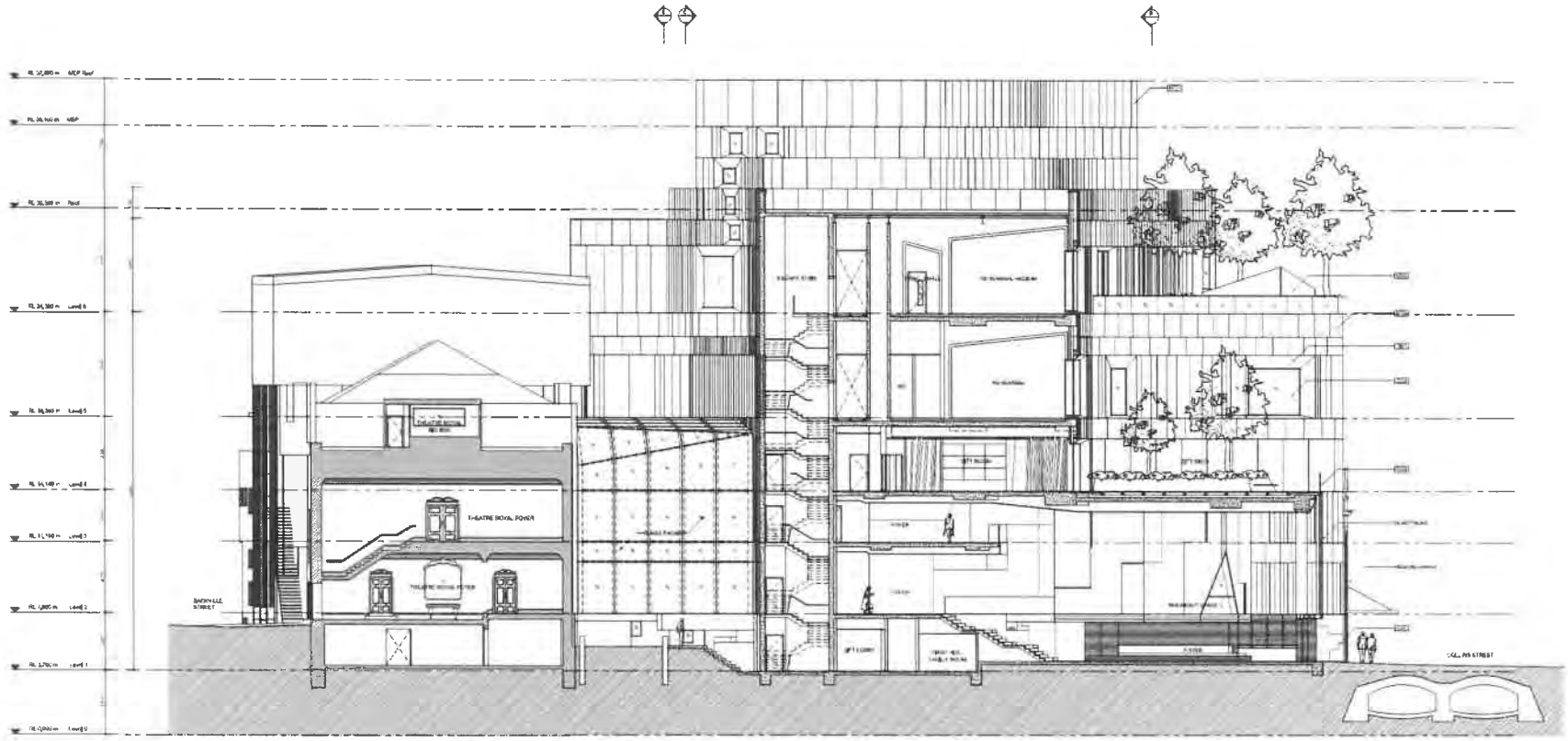
PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

LOCATION
UNIVERSITY OF TASMANIA

TITLE
SECTION H

DRAWING No.
A3008

REVISION No.
1



LIMINAL ARCHITECTURE WOHA

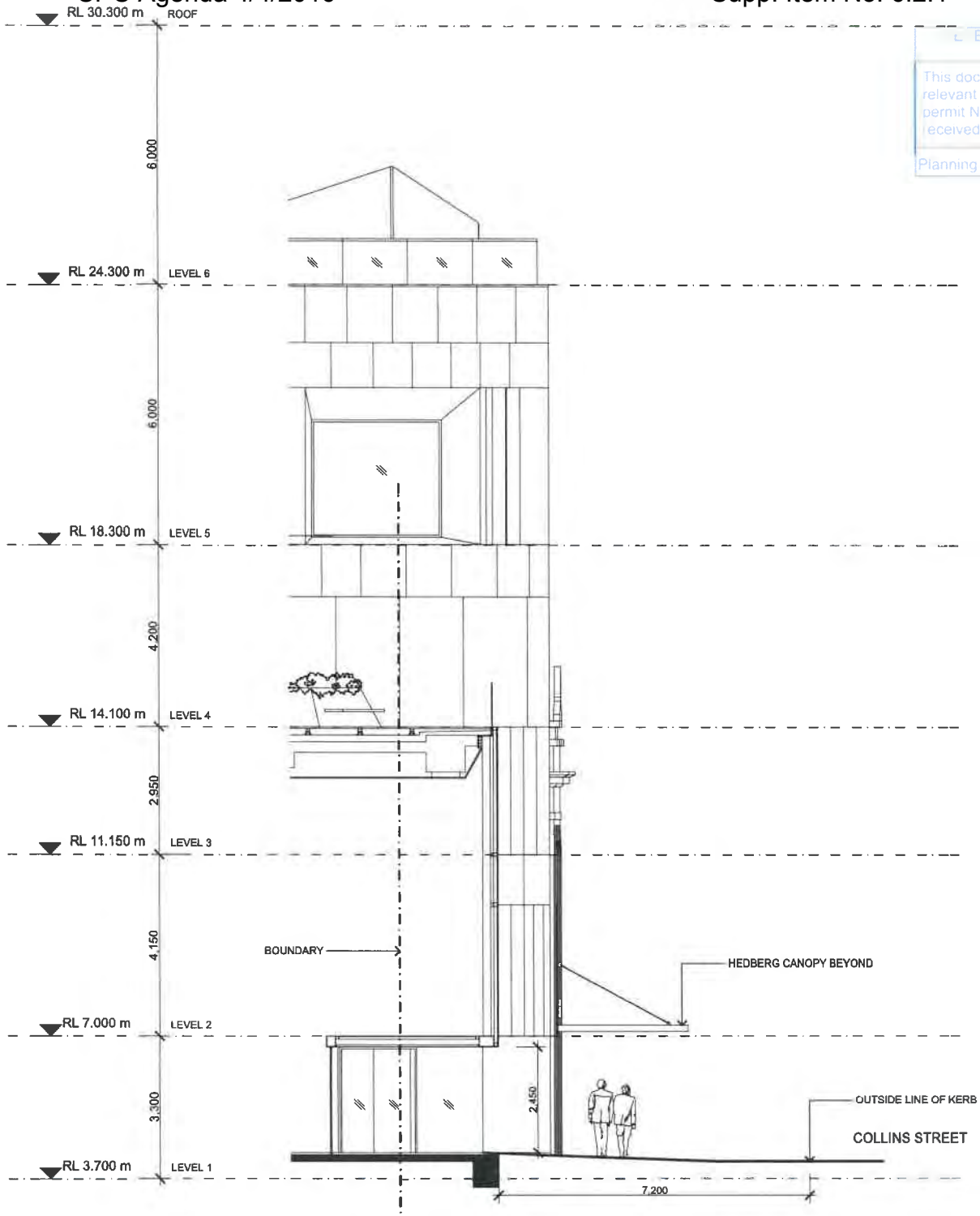
PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
SECTION I

DRAWING No.
A3009

REVISION No. 1



LIMINAL ARCHITECTURE

W O H A

ARUP

CONTACT DETAILS
50 Barrack Street Hobart Tasmania 7000 T +613 62310166
contact@liminalarchitecture.com.au liminalstudio.com.au
ACN 079131712 PTY LTD TRADING AS LIMINAL ARCHITECTURE

LEGEND

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

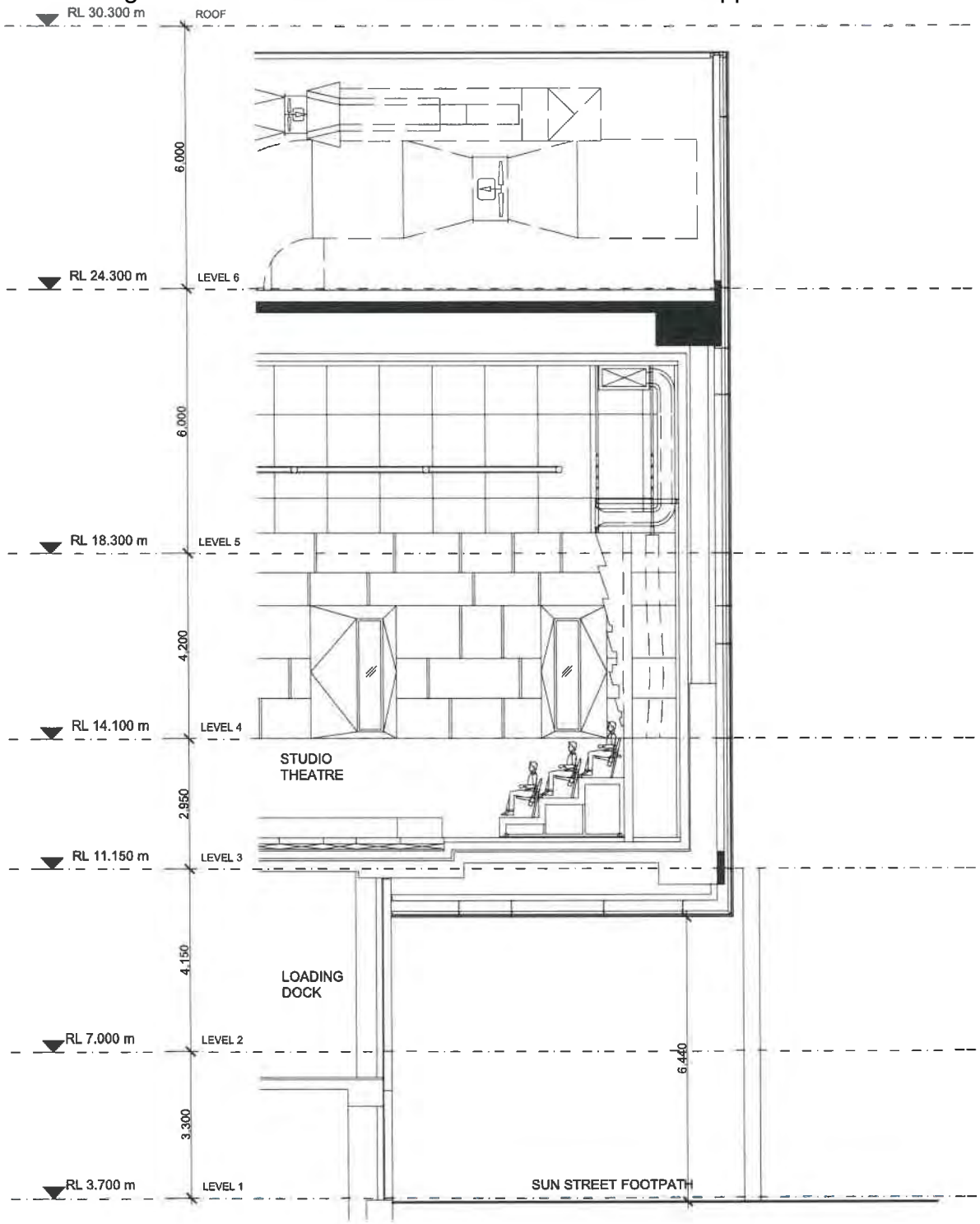
TITLE
ROAD SECTION J

DRAWING No.	REVISION No.
A3010	2

DATE	2/03/2016
SCALE	1:100
CODE	UPA
STATUS	DEVELOPMENT APPLICATION

0 1 3 5M

Figured dimensions take precedence to scale readings. Verify all dimensions on site. Report any discrepancies to the Architect for decision before proceeding with the work.
FILEPATH:
BIM Server: BIM - BIM Server 19/UPA-ACIPA-DA



LIMINAL ARCHITECTURE

W O H A

ARUP

CONTACT DETAILS

60 Barrack Street Hobart Tasmania 7000 T +613 62310166
contact@liminalarchitecture.com.au liminalstudio.com.au
ACN 079131712 PTY LTD TRADING AS LIMINAL ARCHITECTURE

LEGEND

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
ROAD SECTION K

DRAWING No.	REVISION No.
A3011	-

DATE	26/02/2016
SCALE	1:100
CODE	UPA
STATUS	DEVELOPMENT APPLICATION

0 1 3 5M

Figured dimensions take precedence to scale readings. Verify all dimensions on site. Report any discrepancies to the Architect for decision before proceeding with the work.

FILEPATH:
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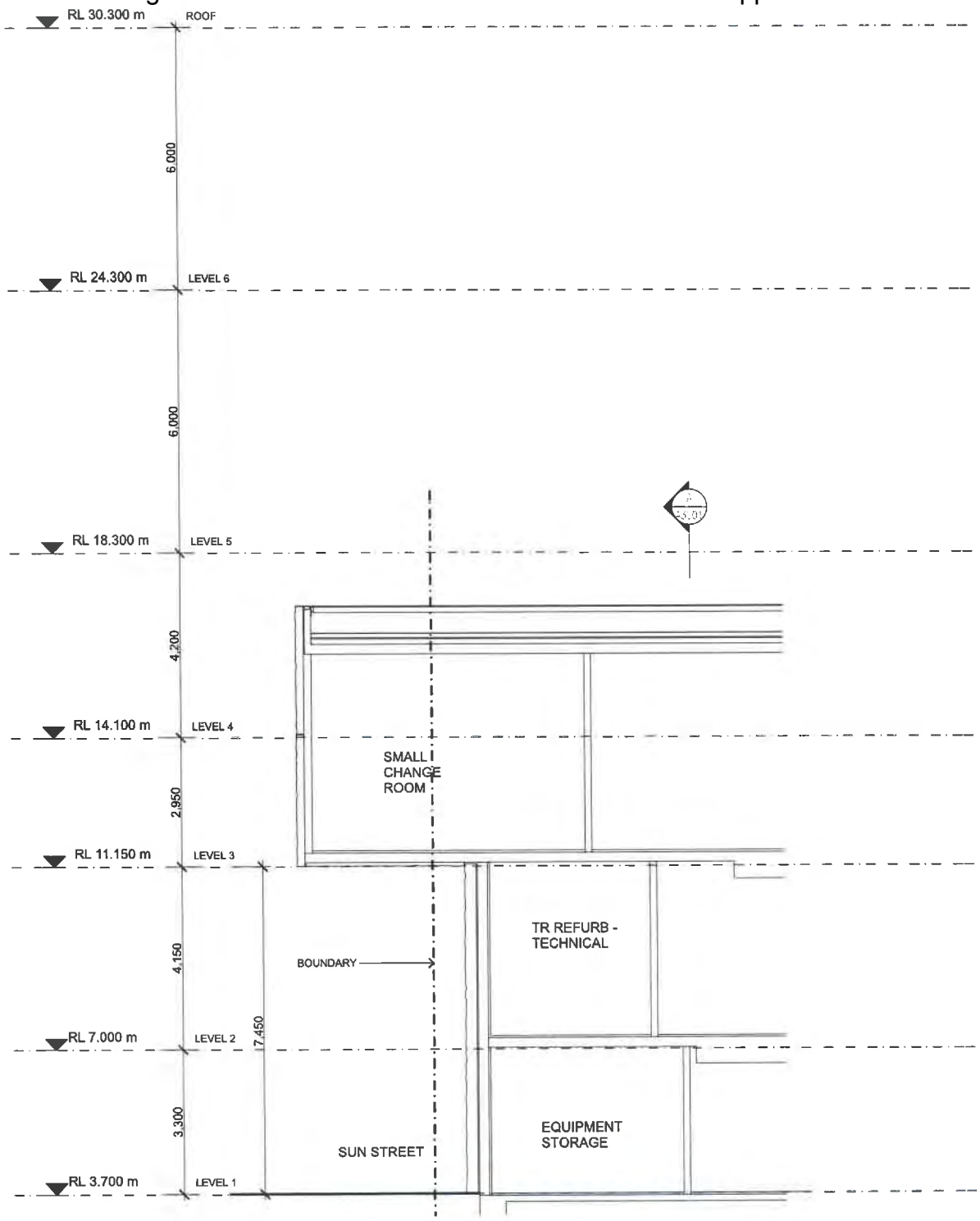

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LEGEND

PROJECT
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

CLIENT
UNIVERSITY OF TASMANIA

TITLE
ROAD SECTION L

DRAWING No. A3012

REVISION No. 1

DATE	1/03/2016
SCALE	1:100
CODE	UPA
STATUS	DEVELOPMENT APPLICATION

0 1 3 6M

Figured dimensions take precedence to scale readings. Verify all dimensions on site. Report any discrepancies to the Architect for decision before proceeding with the work.

FILEPATH:
BIM Server: BIM - BIM Server 19/UPA-ACIPA-DA

Note:

1. Drainage to each bed includes root barrier, protection mat, drainage layer and filter sheet. Drainage layers will be linked to downpipes integrated with the building design.

2. Substrate material to include sandy loam and inorganic filler as a duplex substrate (for beds greater than 800mm depth) or sandy loam for beds less than 600mm depth. The weight of substrates will be considered in the selection of materials to limit the structural loading on the roof decks. Substrate specifications will be developed in consultation with the University of Melbourne.

3 All garden beds will be automatically irrigated via a micro-irrigation system. Each deck/garden will be treated as a separate irrigation zone with its own automatic controller. Netafim low flow, pressure compensating inline drippers will be placed on 300mm centres through out. A performance specification for the irrigation system will be developed with a likely watering demand in the order of 2-4 litres per hour 1-3 times per week. The volume and frequency will be determined by final plant selection.

4. All garden beds will be mulched using dark, well-rotted eucalypt bark.

5. Vegetation has been selected in response to light levels, low moisture and high wind tolerance and sensitivity to on-going maintenance requirements. Plants will be fertilised at the time of planting using a slow release fertiliser.

6. Advanced trees (45 litre minimum) will be used throughout. Trees will be anchored in place at the time of planting.

7. A proprietary edging system will be used in the beds to create distinct planting areas.

8. Planted areas will be subject to a 52-week maintenance contract by the landscape installer during which time basic horticultural tasks will be undertaken and dead, dying or diseased plants replaced.

9. Trees to be of 3-4 meters height at the time of planting.

Level	Name	Light Condition		
		Full sun	Partial sun	Deep shade
1.	Entrance courtyard			X
1.	Collins Street 1			X
1.	Collins Street 2			X
2.	Central courtyard			X
4.	City room terrace		X	
4.	Roof garden	X		
5.	Roof deck		X+	
6.	Roof deck	X		

Acer buergerianum
To be of 3-4 meters height at the time of planting.
8-10 meters at full maturity.

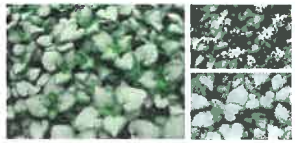
Lagerstroemia indica
To be of 3-4 meters height at the time of planting.
6 meters at full maturity

Hamamelis intermedia

Festuca glauca

Carex comans

Convallaria majalis



Lonicera maackii

Westringia fruticosa

Polystichum polyblepharum

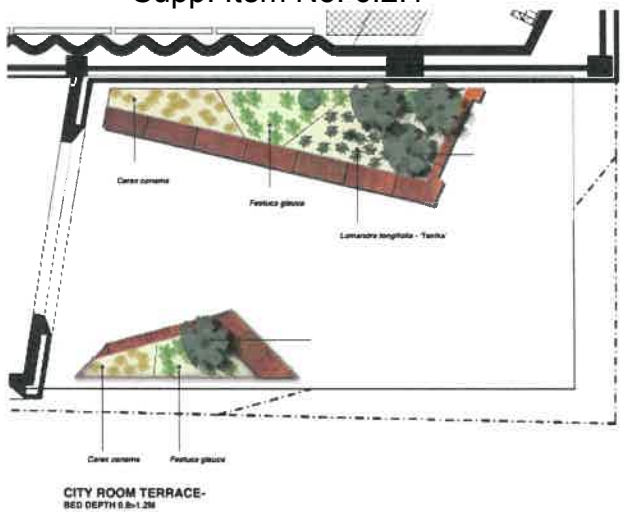
Lomandra longifolia

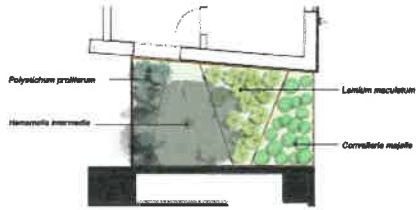
Scale 1:500 @ A0

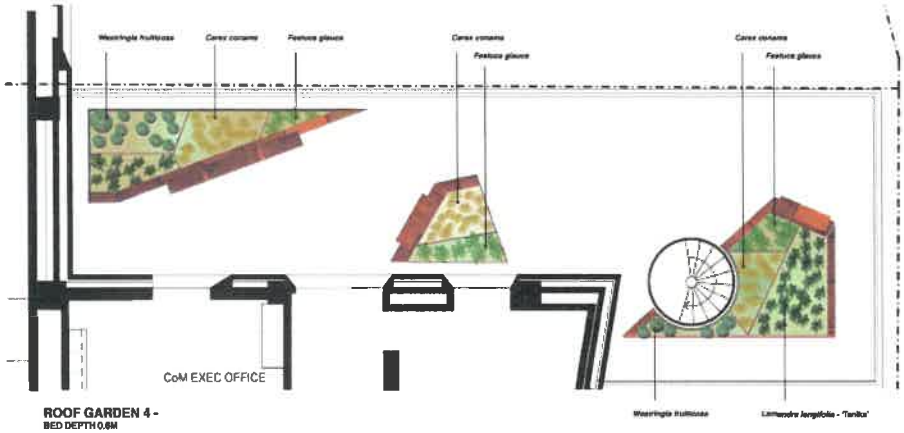
CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

DRAWING L01

LANDSCAPE SITE PLAN JANUARY 2016

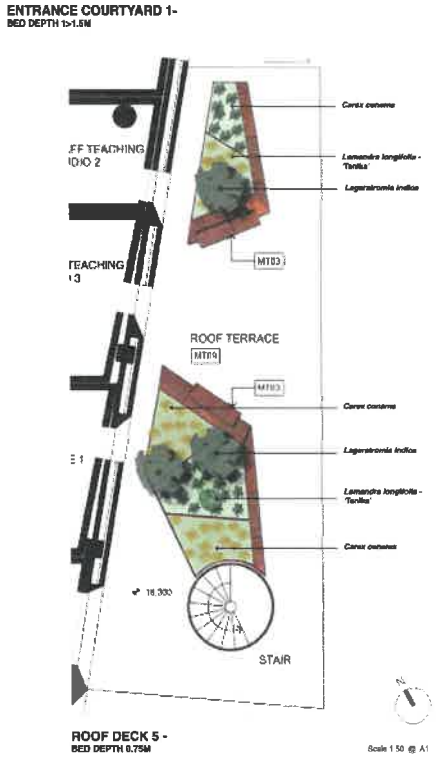






Note:

1. Trees to be of 3-4 meters height at the time of planting.
   Acer buergerianum 8-10 meters at full maturity
   Lagerstromia indica 6 meters at full maturity



CREATIVE INDUSTRIES & PERFORMING ARTS DEVELOPMENT

DRAWING L02 **LANDSCAPE PLAN** JANUARY 2016

Figure 66: Indicative Render of Campbell and Collins Street Corner

CREATIVE INDUSTRIES
AND PERFORMING ARTS DEVELOPMENT

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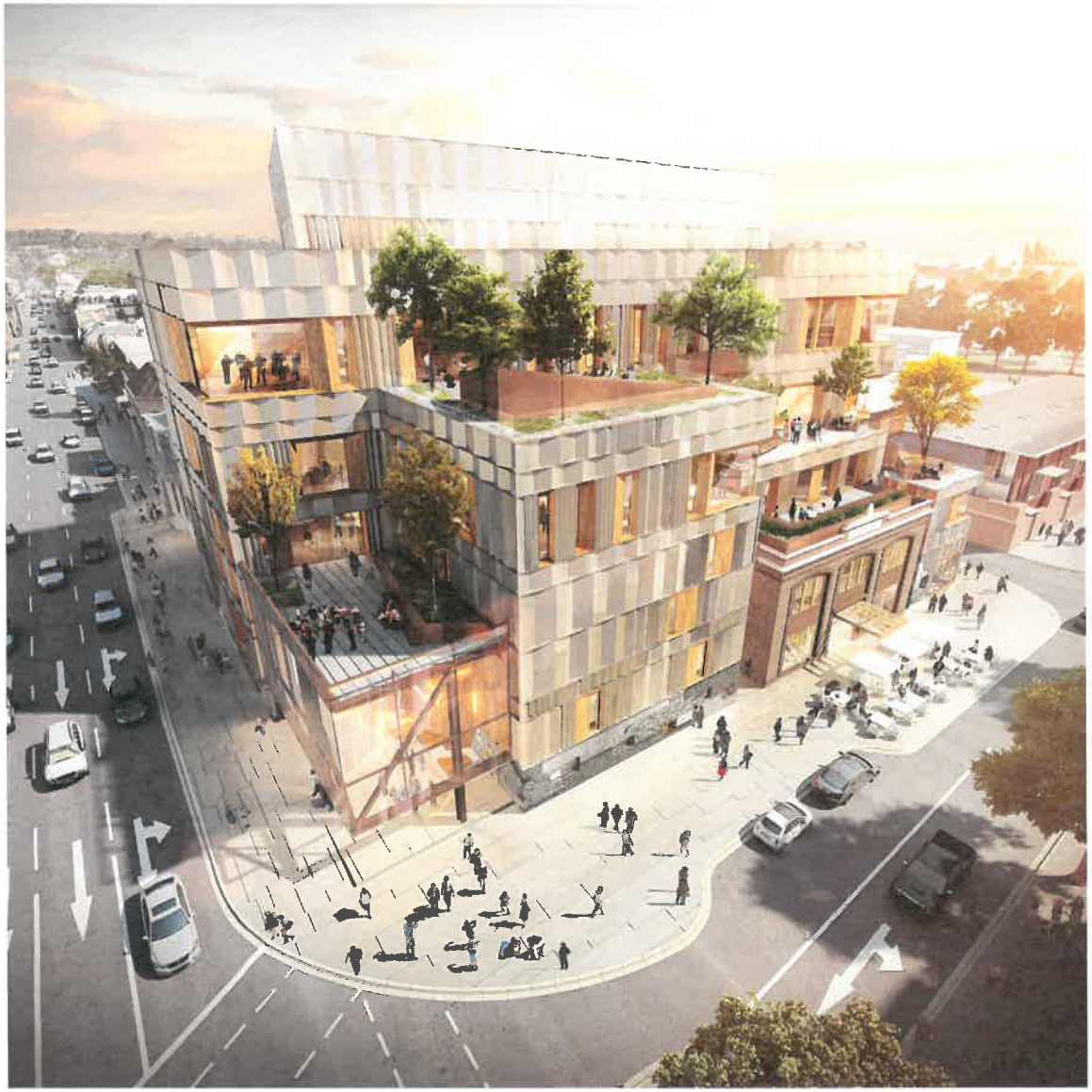

Figure 67: Indicative Render of Campbell and Collins Street corner aerial perspective

Figure 68: Indicative Render Collins Street

Figure 69: Indicative Render Campbell Street

Figure 70: Indicative Render Campbell Street

Figure 71: Perspective of Campbell Street with the Royal Hobart Hospital planning envelope ghosted

Figure 72: Perspective of Campbell Street with the Royal Hobart Hospital planning envelope ghosted

Royal Hobart Hospital planning envelope

Figure 73: Perspective of Collins Street with the Royal Hobart Hospital planning envelope ghosted

Figure 74: Campbell Street Elevation - Indicative Only

Figure 75: Collins Street Elevation - Indicative Only

Figure 76: Sun Street Elevation - Indicative Only

Figure 77: Section of Foyers, Courtyard, Loading Dock and Studio Theatre - Indicative Only

Figure 78: Section of Collins Street Entry, Foyers, City Room, Conservatorium and Theatre Royal Foyer- Indicative Only

Figure 79: Section of Internal Void, Courtyard and Theatre Royal stage - Indicative Only

Figure 80: Section of Internal Void, Courtyard and Theatre Royal - Indicative Only

Figure 81: Section of Foyers and Courtyard facing Theatre Royal heritage wall, Loading Dock and Studio Theatre- Indicative Only

CREATIVE INDUSTRIES AND PERFORMING ARTS DEVELOPMENT
19-29 CAMPBELL STREET AND 19 COLLINS STREET, HOBART

ireneinc & smithstreetstudio
PLANNING & URBAN DESIGN

CREATIVE INDUSTRIES AND PERFOMRING ARTS DEVELOPMENT

19-29 CAMPBELL STREET AND 19 COLLINS STREET, HOBART

Development Application for Submission to Hobart City Council

Last Updated - 22 December 2015
Author - Jen Welch
Reviewed - Jacqui Blowfield

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CONTENTS

1. INTRODUCTION

Ireneinc Planning have been engaged by Liminal Architecture, on behalf of the University of Tasmania (UTAS) to prepare an application for development of the Creative Industries and Performing Arts Development. The development includes the land at 19-29 Campbell Street and 19 Collins Street, Hobart, and involves alterations to the heritage listed Theatre Royal and Former Hedburg Garage.

This application has been prepared considering the following documents:

- Sullivans Cove Planning Scheme 1997
- Hobart Waterfront Urban Design Framework 2004
- Parcel 4 Review, Wapping, Woolley, L. 2001
- Inner City Action Plan

This development application is required to be accompanied with the following documents:

- Property Title
- Application Form
- Crown Consent

The consent of the General Manager is also required, as Council owns some of the land that is subject to the application.

This report is based on the following documentation which also form part of the application:

- Development Application plans, 14/12/2015, Liminal Architecture, WOHA
- *Development Application Report*, Liminal Architecture, WOHA, ARUP
- *Early Works Soil Contamination Site Plan*, 14/07/2014, JMG Engineers and Planners
- *Archaeological Sensitivity Report and Method Statement*, Austral Tasmania, May 2014
- *Heritage Impact Statement*, Forward and Associates, December 2015
- *Site Development Plan*, Leigh Woolley, 2015

1.1 BACKGROUND

The proposal seeks to develop a venue for Creative Industries and Performing Arts, drawing together the University of Tasmania's Conservatorium of Music and the Theatre Royal, and allowing closer integration with the Tasmanian Symphony Orchestra located at the Federation Concert Hall. The building will create a high quality and internationally recognised performance venue and learning centre for the performing arts.

Developing a facility onsite with the Theatre Royal and within 300 metres of the Federation Concert Hall offers a significant opportunity to share world-class performance and rehearsal spaces and other specialist accommodation such as front of house, back of house, and support technology, which can be rationalised and shared collaboratively, thereby allowing higher standard facilities to be provided.

Collaboration will also facilitate establishment of high quality undergraduate and postgraduate performance programmes, heavily focused on practice, and allowing access to professional actors and performers providing regular teaching and master classes, as well as the high standard performance spaces. Students would also be involved in professional productions as part of their practical experience and training[1].

Figure 1: Site Location (source: The LIST)

The collaboration and colocation approach supports a model, which would not otherwise be financially viable if located elsewhere away from these supportive facilities. Similarly, the consolidation of these performance spaces with a teaching space creates a world-class entertainment precinct, which will invigorate and enliven both the Wapping precinct and Hobart city as a whole.

Given the limitation of other potential development sites within the precinct, the proposed site located adjacent to the Theatre Royal not only proves to be a site which is appropriate for redevelopment, but also an important opportunity to provide additional space for the Theatre Royal that have previously been restricted by the area available and limitations within the historic building.

[1] ACIPA Feasibility Study Revision, Liminal Architects, March 2012

An application was approved on the 24 November 2014 for the early works for the site (PLN-14-00973-01). The works are currently being undertaken and include partial demolition, excavation, archaeological investigation and site decontamination.

Figure 2: Aerial Image (Source: The LIST)

2. SITE ANALYSIS

2.1 CERTIFICATES OF TITLE

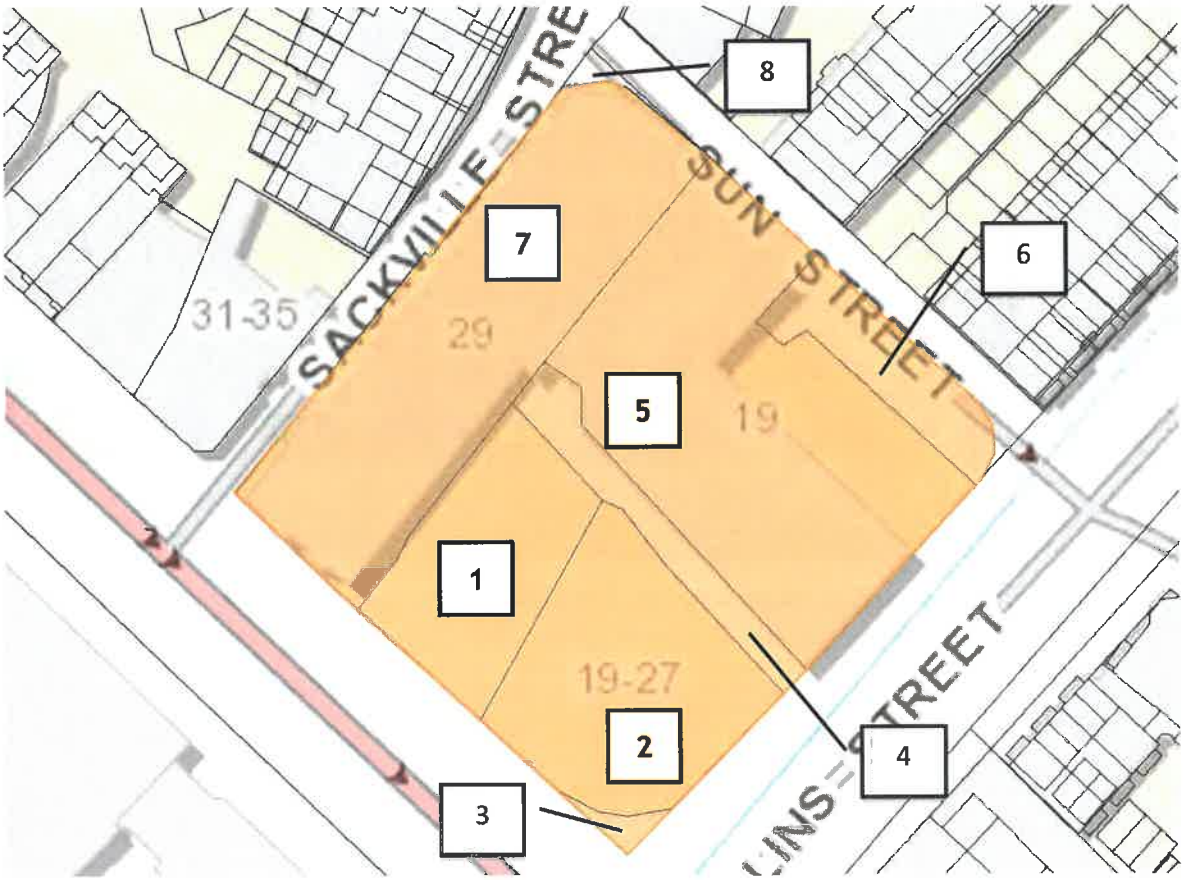


Figure 3: Cadastral Parcels (Source: The LIST)

The subject site is located across several titles, collectively known as Wapping Parcel 4 (WP4) within the Wapping Planning Area. The parcel is made up of the following land titles, the location of which is illustrated in Figure 3:

ADDRESS	TITLE	AREA	LANDOWNER
1. 19-27 Campbell Street	CT102526/1	468m^2	The Crown
2. 19-27 Campbell Street	CT53804/1	646m^2	The Crown
3. Corner of Collins and Campbell Street	CT150207/1		The Crown
4. Right of way off Collins Street	CT198531/2		Owned by HCC in favour of the Theatre Royal site. The right of way is in the process of being expunged.

5.	19 Collins Street, 'The Former Hedberg Bros. Garage'	CT142953/1	1281m^2	The Crown
6.	Road reservation parallel to Sun Street	CT142953/6		HCC
7.	29 Campbell Street 'The Theatre Royal'	CT102527/1		The Crown.
8.	Corner of Sackville Street and Sun Street	CT7946/1		HCC

In addition to these titles development is proposed for an awning over the footpath on Collins Street, which is also owned by HCC.

2.2 SITE DESCRIPTION

The site is the lot bound by Campbell Street, Collins Street, Sun Street and Sackville Street. The site has two existing buildings, the Theatre Royal and the Former Hedberg Garage. Both buildings are listed as heritage places on the Tasmanian Heritage Register as 2191 and 2252 respectively. The remaining parts of the site have previously been utilised as car parking.

Opened in 1837 the Theatre Royale is the oldest continually operating theatre in Australia. The building has an ornate two-storey façade fronting Campbell Street (Figure 4). The rear of the building increases in height having been modified to accommodate the requirements of the theatre. The south-east and north-west elevation have a number of changes to include the necessary services as can be seen in Figure 5 and Figure 7. The rear of the building has recent contemporary additions. The main pedestrian entrance to the theatre steps up from Campbell Street. There is a further public access from Sackville Street to the Backspace Theatre.

Figure 4: The Theatre Royal fronting Campbell Street

The Former Hedberg Bros. Garage (referred to herein as the Hedberg Garage) was an early motor garage and is approved for partial demolition. The two-storey façade to Collins Street (Figure 9) has been retained and is to be incorporated within the proposed development. The images in this section were taken in April of this year prior to the commencement of early works that are currently occurring on the site.

The site has a slight grade to the western corner of the site where the Hobart Rivulet runs under Collins Street. Vehicle access to the sites parking areas is from Collins Street and Sun Street. The Theatre has an existing roller door for loading and deliveries in the northern corner of the site, which relies on vehicle loading from Sackville Street.

Figure 5 (left): southern elevation of the Theatre Royal as seen from the Collin Street.

Figure 6 (right): car park as seen from Campbell Street.

Figure 7 (left): north western elevation of Theatre Royal

Figure 8 (right) northern corner of site looking down Sackville Street.

Figure 9 (left): South eastern elevation of Hedberg Garage façade to Collins Street

Figure 10 (right): rear of the Hedberg Garage

2.3 NEIGHBOURHOOD DESCRIPTION

2.3.1 CAMPBELL STREET

The sites longest frontage is to Campbell Street. On the opposite side of the street is the Royal Hobart Hospital Site; this site has been approved for significant redevelopment. The existing hospital buildings are 6-7 storeys opposite the development site and are partially setback from the boundary frontage towards the south eastern edge. The main entry and forecourt for the building are situated on Liverpool Street so that the Campbell Street frontage includes only minor and service entrances to the building. The hospital site is heritage listed but is a mix of utilitarian elements constructed at various times in differing architectural styles.

Figure 11: The Royal Hobart Hospital as seen from Collins Street. Significant redevelopment of the site has been approved adjoining the development site.

The approved hospital redevelopment (PLN-12-00698-01) is subject to the provisions of the *City of Hobart Planning Scheme 1982* and preparations are underway for the commencement of the development. The extensions are situated midway along the Campbell Street lot opposite the development site. The approval includes an 11 storey above ground building with plant over with a finished roof RL of 60.18. The development includes a public entry from Campbell Street connecting internally to the Liverpool entrance of the hospital.

Campbell Street at the frontage of the site is one-way and is currently three lanes wide with a single lane of parking on either side. Action Project Six of Hobart City Council's Inner City Action Plan focuses on developing and enhancing the area as an Educational precinct. It includes specific recommendations for alterations to the street to improve pedestrian access along Campbell Street. To the north west of the site is the two-storey Theatre Royal Hotel. At the corner of Liverpool Street and Campbell Street is the UTAS development for the Menzies Institute. Although not directly neighbouring the site this recent addition of an educational establishment relates to the character and streetscape that the development site is viewed within.

To the south east of the site is City Hall and the Former Barnet Bros. Building. The Former Barnet Bros. has been redeveloped for residential apartments and commercial uses with new building fabric extending above the historic fabric as can be seen in Figure 13. Buildings other than parts of the hospital are generally built to the front boundaries.

Figure 12: Campbell Street looking north west from opposite the site towards the Menzies Institute

Figure 13: Campbell Street looking north west from City Hall including the Former Barnet Bros. Building on the right

2.3.2 COLLINS STREET

Collins Street is the main approach to the site from the city centre. On the southern side of Campbell Street the street is two way with significant width as illustrated in Figure 14. The apparent width of the street is expanded with the open channel for the Hobart Rivulet to south of the Hospital building.

Figure 14: Collins Street looking south west from Campbell Street

On the northern side of Campbell Street, within the Wapping area, Collins Street has received detailed streetscape treatment. Detail includes plantings, street furniture, paving and interpretive elements to distinguish the character of the area and interpret the archaeology and topography of the rivulet. The road is single lane, two-way, with on street parking on either side. This part of Collins Street has less vehicular traffic than Campbell Street and the treatment of the street with narrow points for traffic calming provides increased pedestrian amenity.

Opposite the development site are two heritage buildings the Former HCC/City Motors Garage and the Former Barnet Bros. Garage, which have both been redeveloped for residential and commercial development. These are generally built to three to four storey, extending above the historic facades of the existing buildings.

Figure 15 (left): The former HCC/City Motors Garage on Collins Street

Figure 16 (right): Collins Street looking south west with interpretative elements shown in the road

2.3.3 SACKVILLE STREET

To the north west of the site is Sackville Street. The Theatre Royal Hotel is situated to the north of the development site on the corner with Campbell Street, with the rest of the northern street frontage occupied by residential development. The dwellings are contemporary four-storey buildings as shown in Figure 18, with solid white construction and glass tile masonry at ground level.

To the north of the site at 20 Mistral Place is the heritage listed Former Tasmanian Fur Traders building (Figure 17). The two-storey red brick building has been converted into residential apartments.

Sackville Street is a narrow lane on the boundary of the development site and is closed to vehicular traffic to Campbell Street. The Street predominantly services garage spaces for residential development and the service access at the rear of the Theatre Royal. The surface of the street has been treated differently at the junction with Mistral Place and is used as a shared space for pedestrians and vehicles alike.

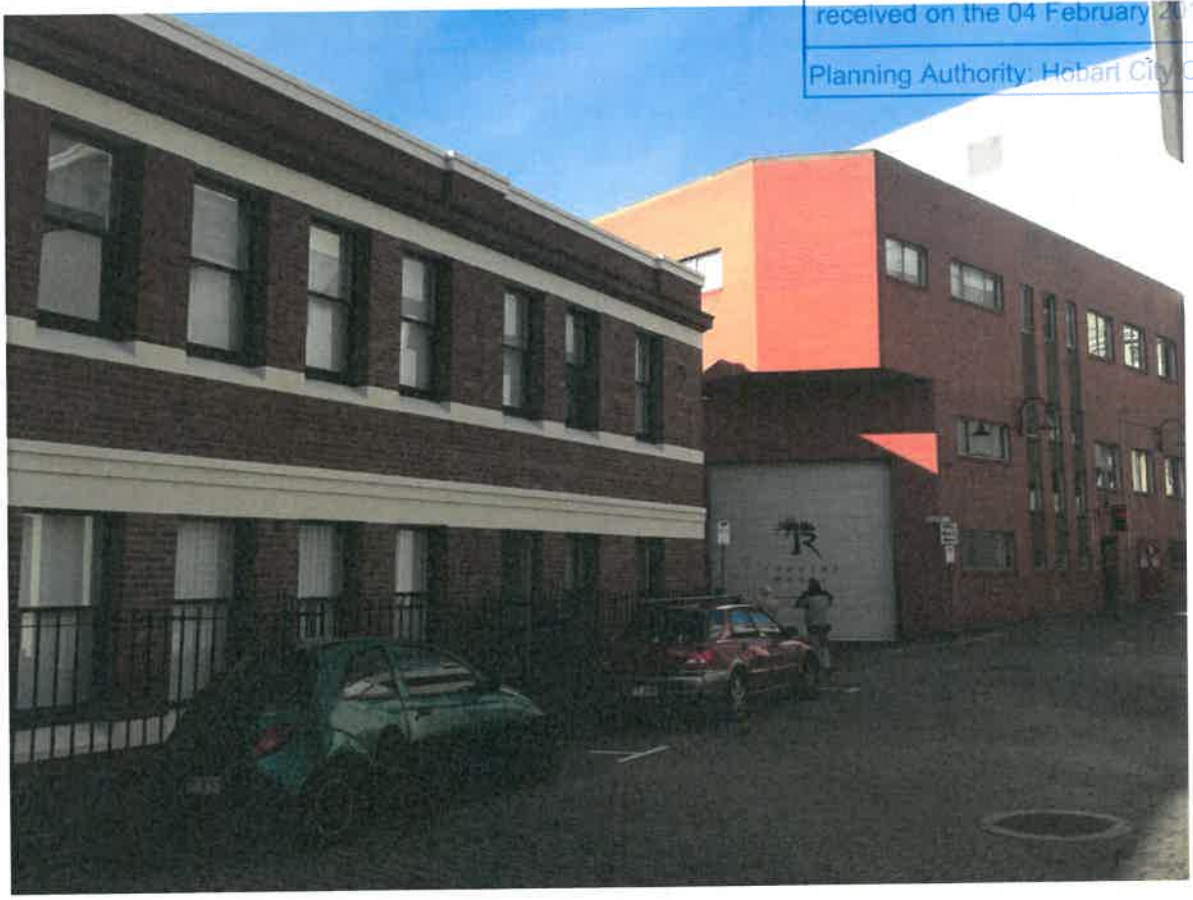


Figure 17: Former Tasmanian Fur Traders building (left) and the rear of the Theatre Royal, Sackville Street

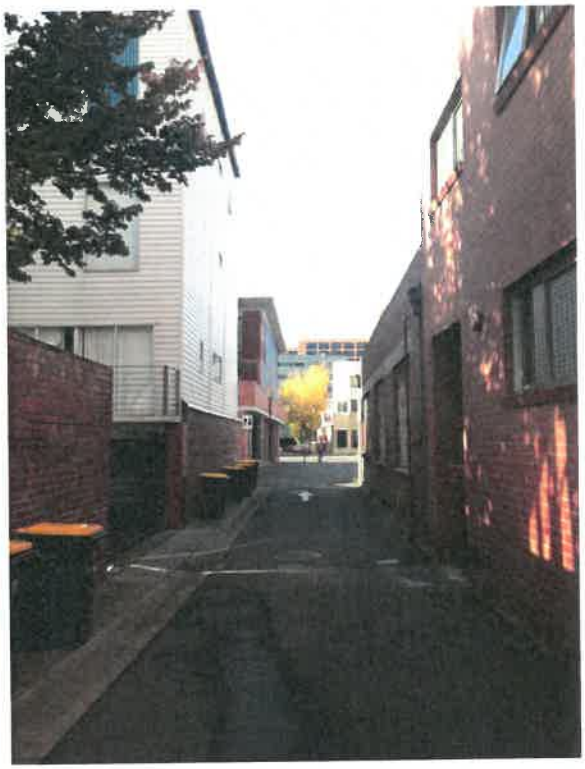


Figure 18 (left): Residential development on the northern side of Sackville Street

Figure 19 (right): looking south east down Sun Street with the development site on the right

2.3.4 SUN STREET

Sun Street is situated to the northeast of the property. Opposite the development site are a variety of residential dwellings up to four floors in height. The street is less than 5m wide at the rear of the Theatre Royal and is used for one-way vehicular and pedestrian access to the dwellings to the north. Sun Street includes an additional title which increases its width and which has been incorporated as part of the development site.

Figure 20: Looking north west along Sun Street from midway along its length

2.4 ADJACENT PLANNING SCHEME

The Campbell Street frontage of the site aligns with the boundary of the Planning Scheme which controls the site, the site shares a boundary with adjacent areas which are within the *Hobart Interim Planning Scheme 2015* (HIPS 2015). A permit has also issued for the development of the hospital neighbouring the site that was approved in response to the *City of Hobart Planning Scheme 1982*. The following provides a description of the relevant characteristics and planning controls, which prevail for the adjacent area.

2.4.1 ZONING

The subject site neighbours the Particular Purpose Zone 10 - Royal Hobart Hospital Campus (shown in yellow in Figure 21). Surrounding the hospital site on all other sides is the Central Business Zone (Dark Blue).

Figure 21: Neighbouring Zoning (HIPS 2015)

The purpose of the zone purpose statements are as follows:

41.1.1 Zone Purpose Statements

41.1.1.1 To recognise the important economic and social role played by the Royal Hobart Hospital and the critical health care benefits to the community in having a strong functioning hospital within easy reach a substantial population.

41.1.1.2 To recognise the central city context within which the hospital is situated and the reality that built form may not be consistent with the scale of development in the surrounding area due to site constraints and the need to ensure that the hospital provides the range of services required by the community.

41.1.1.3 To ensure the facility is primarily used as a hospital with ancillary hospital outpatient facilities and uses which provide services to users of the hospital.

The use standards include those for mechanical noise and external lighting. Development standards are as per the building envelope shown in the following diagrams and for the storage of refuse and equipment. There are no plot ratio requirements within the Zone.

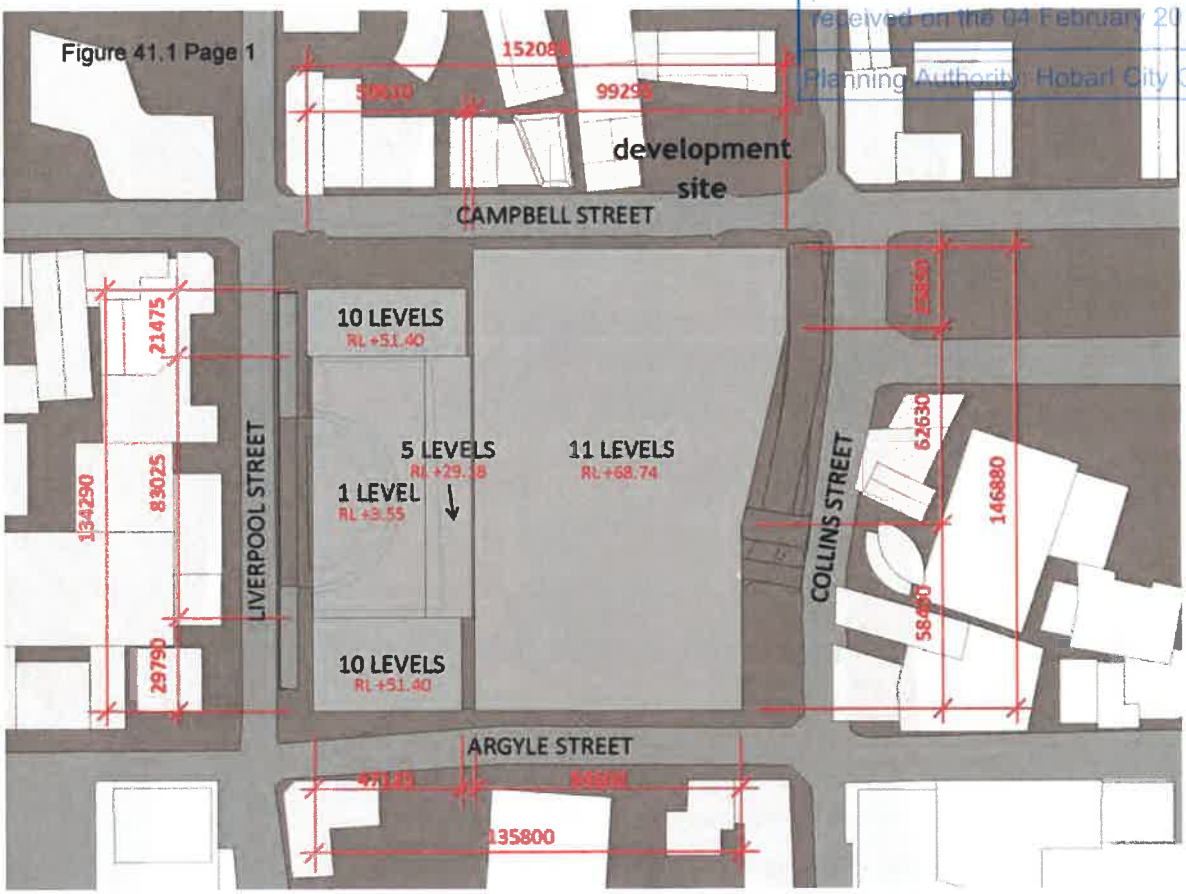


Figure 22: RHH Building Envelope (Fig 41.1 p1, HIPS 2015)

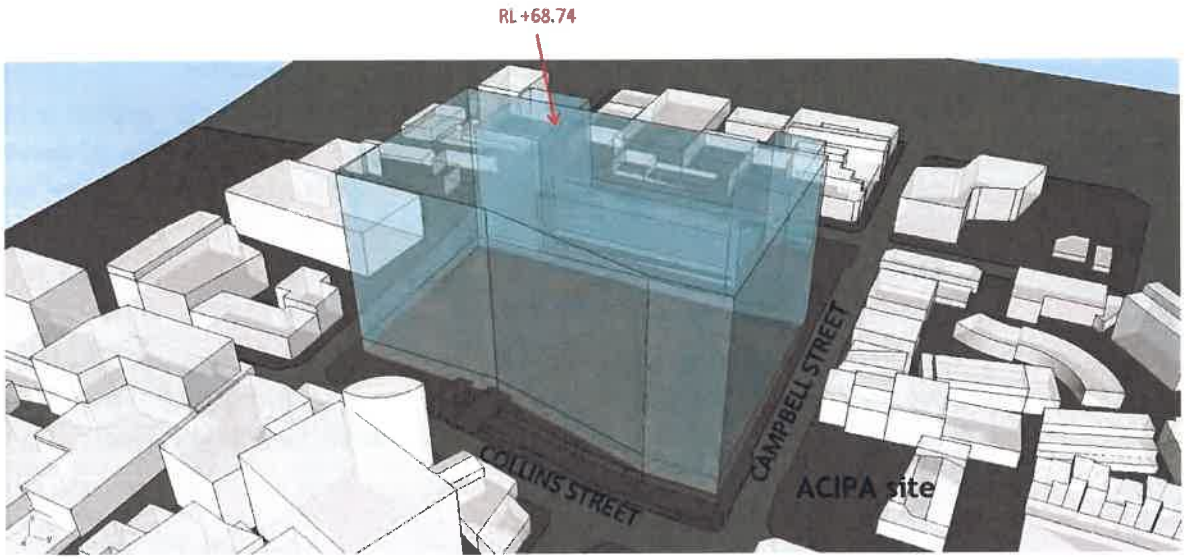


Figure 23: RHH Building Envelope (Fig 41.1 p1, HIPS 2015)

2.4.2 CODES

Development on the neighbouring land is subject to a variety of codes. Of the provisions relevant to maintaining consistency with the Sullivans Cove Planning Scheme are the Parking and Access and Historic Heritage, although other codes would still apply to the development of neighbouring land.

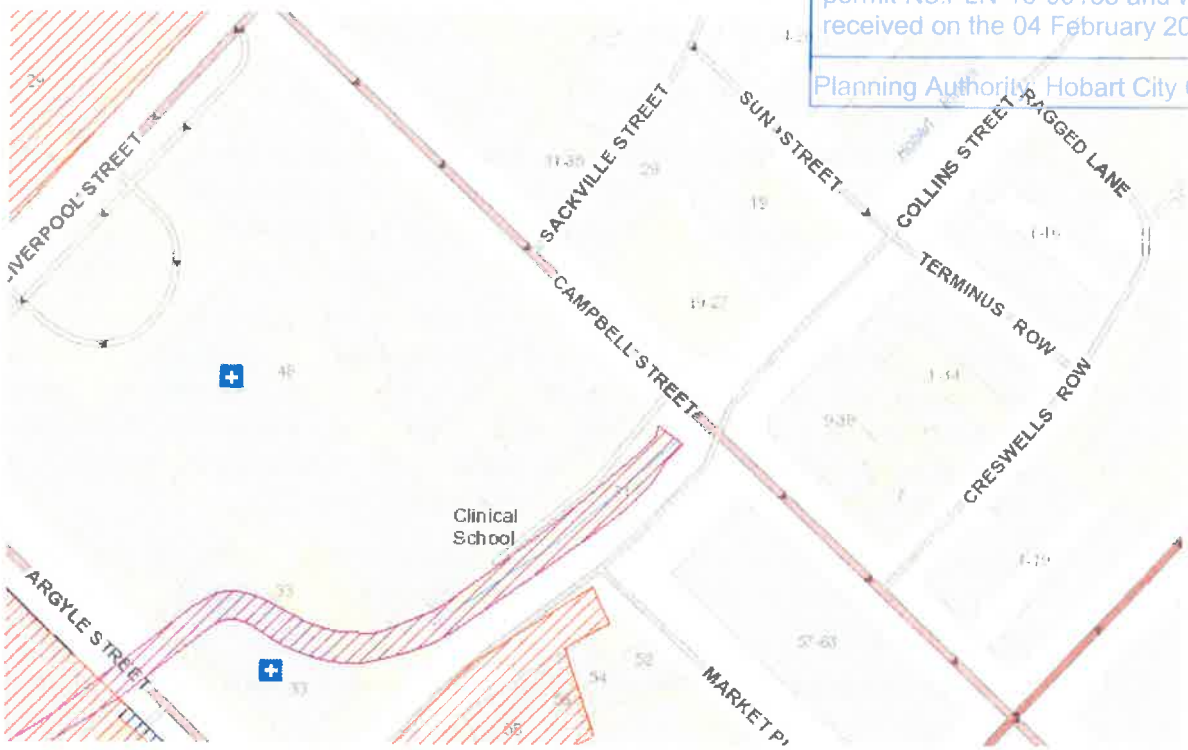


Figure 24: Neighbouring Overlays (HIPS2015)

2.4.3 PARKING AND ACCESS

The Parking and Access Code does not require any parking within the Particular Purpose 10 or the surrounding Central Business Zone, so that pedestrian activity is not compromised through the provision of parking.

2.4.4 HISTORIC HERITAGE

The purpose of the code is:

> *To recognise and protect the historic cultural heritage significance of places, precincts, landscapes and areas of archaeological potential by regulating development that may impact on their values, features and characteristics.*

The Hospital site at 48 Liverpool is listed for the 1938 buildings, sculptures and forecourt. The listed parts of the hospital front Liverpool Street and are separated from the development site. The development of the site would not have any impact on the identified values of the place.

As indicated in hatching on Figure 24, the Hobart Rivulet HR1 is listed as heritage precinct. The Statement of Historic Cultural Heritage Significance for the Hobart Rivulet is as follows:

> *This precinct is significant for reasons including:*
>
> *1. The numerous remaining buildings, complexes, intact infrastructure and archaeological features which demonstrate the importance of the Rivulet in the development of early Hobart industrial activity and settlement.*
>
> *2. The significant former Female Factory complex of structures and features which are contained within an important visual and physical setting.*
>
> *3. The contribution by the Rivulet to the aesthetic and visual qualities of the Precinct and wider Hobart area through its diverse setting and structures along its length.*
>
> *4. Its representation of a multitude of integrated historical themes, a complex history and a wide variety of elements and physical features.*

The development site borders on to the edge of the rivulet culvert.

2.4.5 THE PROPOSED IN RELATION TO THE ADJACENT AREA

In terms of development standards the building envelope of the Hospital exceeds that of the adjacent land. While this bulk is rationalised in the zone purpose statement as being necessary to the critical services it allows for substantially greater development than the height standards of the SCPS.

As discussed in Section 2.3.1 development has been approved for expansion of the Hospital on the corner of Campbell and Collins Street. The development was approved under the *City of Hobart Planning Scheme 1982* and required discretion for the use as a hospital, for a height of 46m and for heritage as it is a listed site adjacent to a number of heritage sites. The overall height of the approved development is a RL of 60.18, based on the revised scheme provisions this means that the site is permitted to be developed a further 8.56m.

Compared to the hospital site the SCPS allows for a maximum height of 21m on the development site, or a maximum RL of 26m, which is substantially less than the permitted development of the neighbouring land.

In terms of parking this is discouraged within the Central Hobart area and the treatment of the site is consistent with this.

3. PROPOSED DEVELOPMENT

3.1 USES

The proposal is for an integrated centre that provides a number of venues to deliver a variety of performance programmes. The components of the building are within both new contemporary forms and the existing heritage fabric of the Theatre Royal and the Hedberg Garage. Key components of the new parts of the development are a Studio Theatre, Recital Hall, education spaces, improved back of house dock and storage, and administrative areas. These are all situated with visual links and circulation that connect with the central foyer and courtyard space, which uses the eastern façade of the Theatre Royal as a feature.

The building envelope also encompasses range of other activities that are necessary to the operation of the activities, including production areas, performers areas, technical support, rehearsal areas, box office, merchandise areas, and services. A number of outside spaces are proposed in addition to the central courtyard including roof decks, and gardens on various levels.

3.2 HISTORIC VALUES

The accompanying Heritage Impact Statement finds that there is an overriding benefit in the values of the project in that it will 'facilitate the capacity of the building to continue its theatrical use' (p. 37)

Archaeological investigations have been undertaken for the site, it is understood that the documentation of these is not yet completed. However, the Development Application Report includes concepts for the integration of the final architectural interpretation of findings.

3.3 BUILDING FORM

The overall building form has been designed with regard to the existing heritage on site and to neighbouring sites. The heritage buildings are separated and distinguished from solid elements of the contemporary development through glazed elements. The overall maximum heights are setback from the primary facades of Collins and Campbell Street. The accompanying Development Application Report includes further detail of the architects design response and the how the proposed development responds to the site context.

3.4 ACCESS

Public pedestrian access to the development is through the main entrance situated on the corner of Collins Street and Campbell Street, the existing foyer to the Theatre Royal, and a further entrance through the Hedburg Garage on Collins Street.

New loading bay facilities have been located internally to improve facilities for the existing theatre and to reduce any impacts to neighbouring residential areas. Bicycle storage is located internally within the building envelope.

3.5 SIGNAGE

No signage is proposed as part of this application; this will be applied for at a later date.

3.6 TITLES

The proposed development requires adhesion of titles and a number of minor boundary adjustments. The existing Theatre Royal façade is not located within the existing site boundary and further alterations are required to the alignment of boundaries on the corners of Campbell Street and Collins Street. It is also proposed to amend the boundary between the development site and the additional road parcel on Sun Street (title: CT142953/6).

4. PLANNING SCHEME PROVISIONS

The site falls within the provisions of the *Sullivans Cove Planning Scheme 1997* (SCPS) (Current 15/09/2015).

The relevant provisions are addressed below.

4.1 ACTIVITY AREA

The site is located in Precinct 1, Inner City Residential (Wapping). The area is described in the planning scheme as 'earmarked for significant redevelopment for residential purposes in the early 1990s as part of the Commonwealth Government's Better Cities Program' (s15.1). The general characteristics state that:

> *Some of the sites abutting the city CBD along Campbell Street might also be suitable for non-residential development where they capitalise on possible synergies with neighbouring land uses such as the hospital, or Theatre Royal or where they complement commercial activity along Collins Street.*

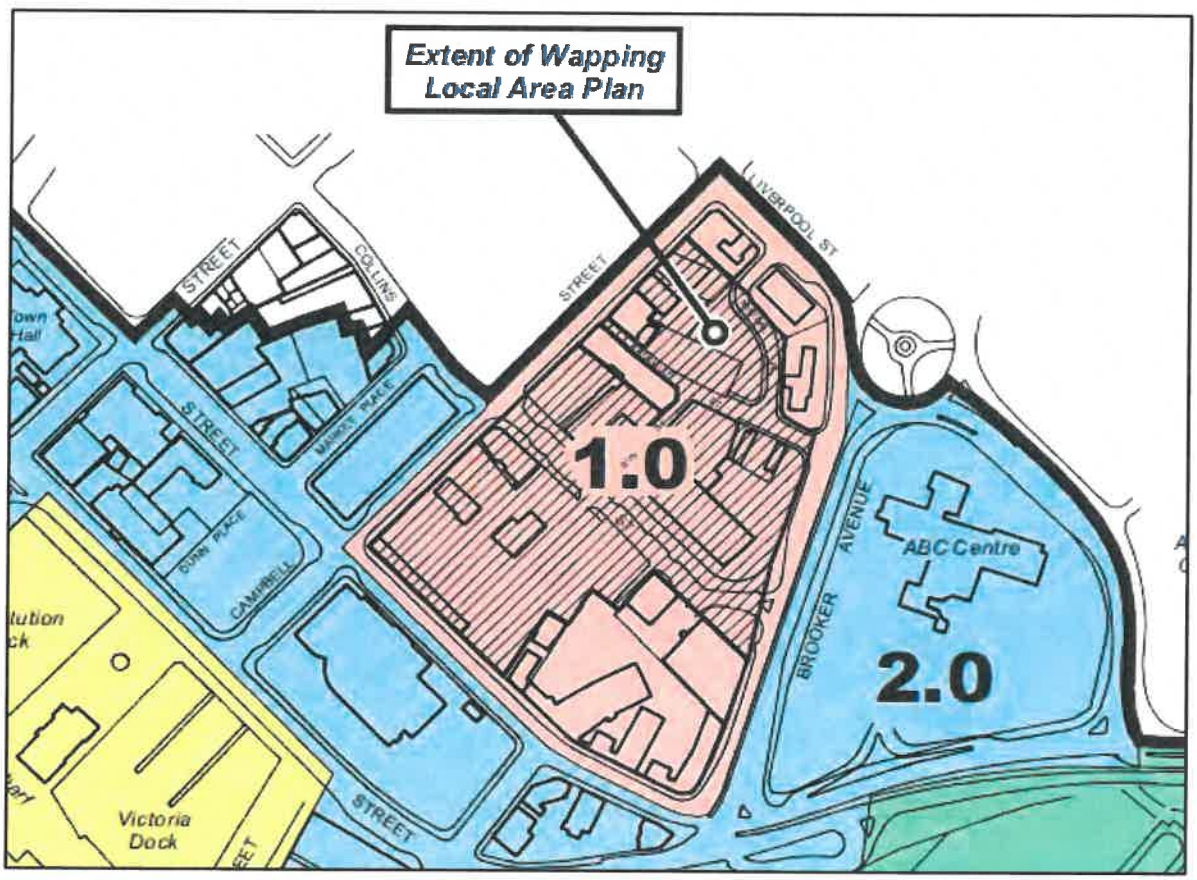


Figure 25: Activity Areas (Source: SCPS)

The following is the proposals response to the objectives of the Activity Area:

OBJECTIVE FROM 15.2	PROPOSAL RESPONSE
To provide for the development of an inner city residential neighbourhood providing quality urban housing for a range of household types and income groups.	The proposal although not residential contributes to the mixed-use nature of the neighbourhood and provides a quality development that will enhance the activities within the area.
To ensure that residential development is the primary focus throughout the Activity Area but allow non-residential uses to be developed on a flexible performance approach based on the amenity and characteristics of specific sites.	The site already contributes to the existing character of the area with the non-residential use of the Theatre Royal. The development is consistent with this established use and is appropriate for the site's location. The development will provide considerable civic amenity to the Hobart area with the additional proposed cultural activities.
To retain and restore where appropriate buildings of cultural significance.	The site includes the Theatre Royal site and the Former Hedberg Garage. The significant heritage values from theses existing buildings are retained in the development. Additionally the proposal, through integration with the University campus and the enhancement and modernisation of its facilities, will safeguards the continued existence of the Theatre as a performance space.
To ensure that building masses and facades appropriately relate to the spaces they form. Streets within the Zone be considered as spaces in their own right.	The building mass and facades have been through significant urban design reviews to ensure that they form an active and engaging interface with the streets that they are located on and that the proportion and massing are appropriate to adjacent streets and building forms.
To encourage architecture of the highest quality which is modern in approach but at the same time incorporate some interpretation of the history of the area as appropriate.	The proposal has been through a vigorous design process to achieve high quality architecture outcomes that integrates contemporary design with the significant cultural heritage elements. The concert hall is intended to provide world-class facilities and the architectural response of the building is consistent with this. The building includes interpretation of the existing archaeology that has been investigated as part of the early works for the site, the Hedburg Garage has been integrated in the development, and the historic use of the Theatre Royal as a performance space has been retained.
To ensure that new development incorporate historic cues, whilst not relying on historical mimicry.	The form of the building has been developed to emphasis the historic buildings on the site and use them as a feature of the new activities on the site. The new development is clearly contemporary.
To facilitate the transition from the CBD by allowing substantial commercial uses on key sites on the main connecting streets (Campbell and Collins Streets) or in places where reasonable residential amenity is unachievable	The development site is a key site with its location on a prominent corner. The Wapping Local Area Plan encourages the site to be used as a gateway linking the site to the commercial uses of the city. The exposure of the site means

because of existing traffic or environmental impacts. These commercial uses must not themselves diminish the amenity of or the potential for adjacent residential development.	that it is well suited for a more public institution and being less appropriate for residential development. The activities of the site are consistent with those already occurring on the site.
To encourage frontages of commercial activity only on the ground floor of buildings abutting streets.	The nature of the development is for activities which span across multiple floors of the building. The use is not primarily commercial in focus, however active uses will be situated at ground level of main streets.
To encourage commercial activity in existing buildings where this is required to assist in their conservation.	No changes are proposed to the activities in existing buildings.
To encourage a mix of uses on the sites in the west and north-west of the Activity Area and fronting Campbell Street.	The proposal fronts Campbell Street and contributes to a mix of uses in the Activity Area.

The developments response has been discussed further in the accompanying Site Development Plan and Development Application Report.

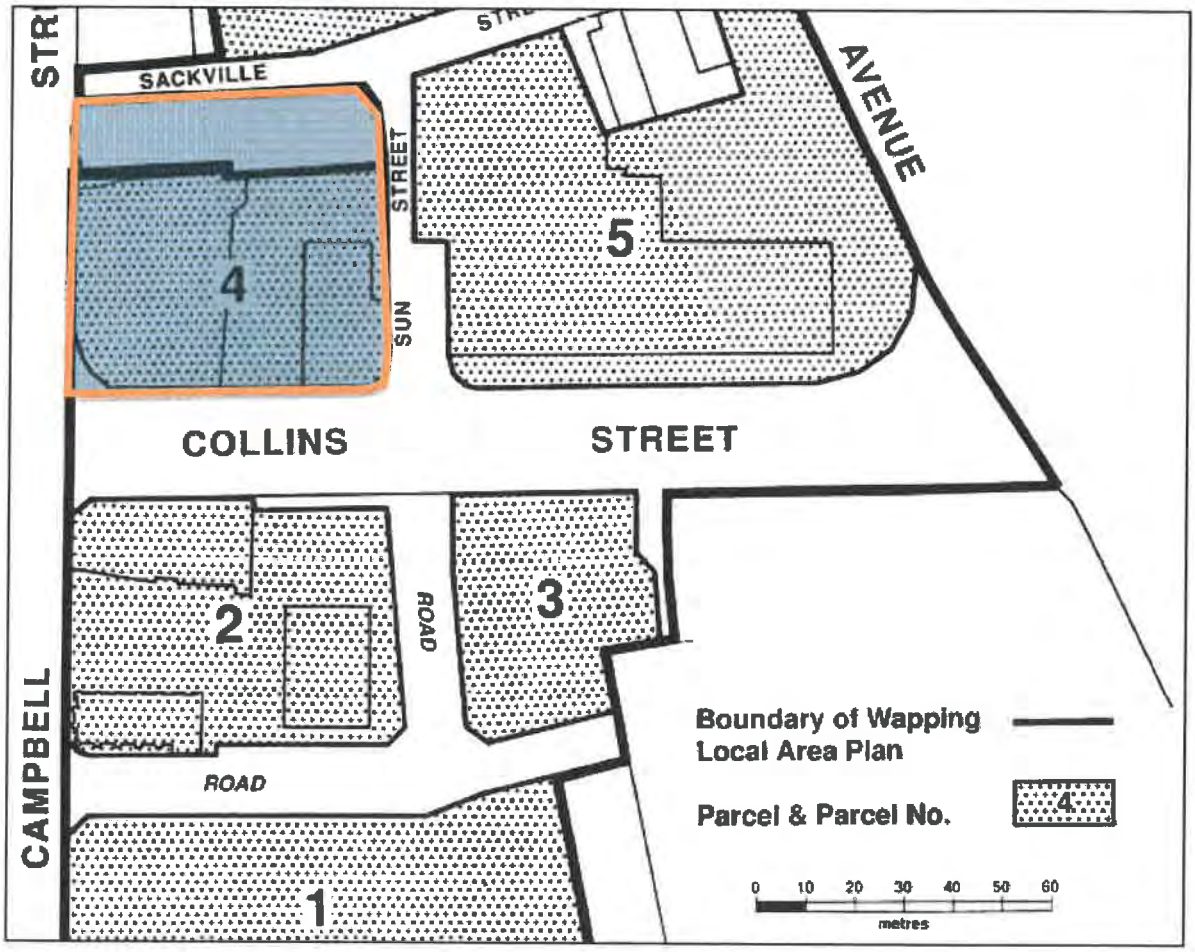


Figure 26: Wapping Local Area Plan (Source: Figure 3a SCPS)

4.2 USE OF LAND

The existing Theatre Royal falls within the following definition:

> *Arts and Cultural Centre: Land used for art and cultural activities which are open to the public, such as a performing arts or literature venue. Also includes an Art Gallery, Museum.*

The proposed activities include expansion of these activities and also the following:

> *Education Centre: Land used for education, such as a primary or secondary school, tertiary institution or university, business college, college of advanced education (TAFE), day seminar facility or employment training centre.*

The development site is predominantly situated within the Wapping Local Area Plan (WLAP), with much of the site within Parcel 4 as illustrated in Figure 26. The Theatre Royal is situated outside of the WLAP. The status of these uses varies depending on whether development is situated within the Wapping Local Area Plan or not as discussed in the following sections.

4.2.1 LAND USE OUTSIDE THE WAPPING LOCAL AREA PLAN

That part of the site situated outside the WLAP is subject to the provisions of 15.3.3 for use and 15.3.6 for effects on the amenity of the WLAP Precinct. The proposed development will result in alterations to the rear of the Theatre Royal that will result in the integration of the Education Centre uses on the site, however much of the site will continue in its current capacity as a Arts and Cultural Centre. Both of these activities are permitted within that part of the site that is not within the WLAP.

A permit is required for development of land outside of the WLAP Precinct and in accordance with 15.4 of the Scheme, which is as follows:

> *15.4.2 All development of land must satisfy the relevant provisions contained within the schedules of this Scheme.*

The Schedules of the Scheme have been addressed in relation to the entire proposal.

4.3 WAPPING LOCAL AREA PLAN

The Local Area Plan is enacted through clause 15.5.2 of the Sullivans Cove Planning Scheme, which states that:

> *"Control over 'use' and 'development' shall be exercised in accordance with the provisions in the Wapping Local Area Plan and the schedule controls of the Scheme. In the event of any inconsistency with any provision or other requirement of the Scheme the provisions of this Local Area Plan take precedence."*

The statement of desired future character states that:

> *"The Wapping area should evolve as a mixed inner city residential, cultural and commercial neighbourhood providing quality urban housing for a range of household types and income groups and some commercial, educational or cultural developments if they are compatible with or are ancillary to the primary residential use.*
>
> *Dwellings and other buildings should be innovative, cost-effective, energy efficient and ecologically sound in terms of materials utilised. A high level of acoustic privacy should be provided commensurate with an inner city lifestyle and the mixed use area. The architecture of buildings should be of the highest quality and modern in approach, but at the same time incorporate some interpretation of the history of the area as appropriate.*
>
> *New development should incorporate historical cues, however historical mimicry should be avoided. Existing structures, structural elements and sites identified in this Plan as having historical and archaeological interest shall be managed so as to conserve their cultural significance in accordance with the guidelines wherever practicable.*
>
> *Collins Street has been earmarked as the cultural and commercial spine of the area and commercial uses are encouraged on the ground floor. Parcels 2 and 4 have important roles in forming a gateway and linking Collins Street to the more commercial uses and*

urban form of the CBD. Additionally some commercial uses may be allowed in existing heritage buildings where this is required to assist in their conservation. Generally though significant commercial activity will only be appropriate at the edges of the Wapping area where high levels of traffic and neighbouring land uses reduce the potential for successful residential development or where they provide a buffer to traffic noise. This may result in a development on Parcel 4 which does not provide any residential component.

Consequently commercial activity in other (minor) streets is discouraged but allowable at ground floor level if in the same ownership as an appurtenant dwelling (eg 'shop top' flat) and is limited in floor area. However, such activity must have no material impact on the residential amenity of that or any other property.

Holiday Units are discouraged in the area except on half of Parcel 1 adjacent to the Woolstore development or on Parcel 4.

Holiday Units are discouraged in the area except where specifically designated by this Plan.

Commensurate with the objectives of sustainable development, good design and visual amenity to cater for an inner city lifestyle, the level of parking provision should be minimal and located and accessed in a manner that does not diminish the amenity of the street spaces.

The proposed development provides appropriately located uses with respect with the linking gateway on Collins Street. The high quality of design and integration of historic cultural heritage within the fabric of the building preserves the heritage values of the place whilst also contributing to the diversity of cultural fabric within the precinct. The quality of architectural design and finishes is consistent with the desired standards.

Improvements to back of house facilities to the rear of the building results overall in advantages to the amenity of neighbouring residential development. The proposal is only neighbouring residential development on the northern side, as the existing Theatre Royal is a permitted and existing use as it is located outside the WLAP on the western edge.

4.3.1 USE

While much of the site is vacant there is existing activities within the Theatre Royal building, which will continue to be used as a theatre. As discussed previously this part of the site is situated outside the WLAP and the proposed uses are permitted on this part of the development site.

New development within that part of the site that is in the WLAP is primarily for a variety of performing arts activities including venues for stage performances and as learning spaces for UTAS. These activities fall within the following use groups with the following discretionary status within table 15.5.7(b) of the Scheme:

USE	CONDITION
Arts and Cultural Centre	*On Parcel 4 fronting Campbell Street where it includes ancillary facilities for the Theatre Royal or in any building listed in Clause 15.5.12 (Heritage) where it assists in the conservation of that building in line with the Principles in Clause 15.5.12.*
Education Centre	*Only on Parcel 5 and on Parcel 4 where it can demonstrate a need to be closely linked to the Royal Hobart Hospital for educational and functional synergies and where it also provides for ancillary facilities for the Theatre Royal.*

The guidelines below the use table identifies that educational uses can be specifically allowed where it can be demonstrated where:

- *It can be demonstrated that residential development is not feasible nor desirable; or*
- *It assists in the conservation of a heritage building; or*
- *There is a demonstrated need to have functional links to nearby uses not within the Wapping Local Area.*

In all cases the non-residential use must demonstrate that it will not negatively impact on the adjacent or surrounding residential uses or the prospects of development for such uses.

The Theatre Royal is the longest continually operating theatre in Australia, opened in 1837. The proposal improves the feasibility of the continued use of the heritage building as a working theatre and assists in its long-term conservation and maintenance. The development of residential development on the vacant part of the development site is not desirable, as this would constrict the activities of the theatre. The activities proposed within the development site have demonstrated functional links with activities outside the Wapping Area, including various arts facilities and UTAS, particularly with the Federation Concert Hall and the Conservatorium of Music.

The surrounding Wapping area has already been successfully developed for a substantial mix of residences since the drafting of the planning scheme and the use of this site will not diminish prospects for the area in achieving development for residential uses. The proposal will positively contribute to the Wapping Area and is consistent with enhancing the commercial spine of Collins Street with a non-residential use.

The proposal will not impact the residential amenity of the area as loading areas are proposed to be situated internally within the building and the building construction has been designed with substantial consideration to acoustic performance as discussed in the accompanying Development Application Report.

The primary use of the site is consolidated with a number of further activities on the site that are ancillary and subservient that would fall within the following definitions:

Eating Establishment: Land used to prepare and sell food for consumption on, or off, the premises. It also includes a Restaurant/Cafe, Take Away Food Premises and Convenience Restaurant.

Exhibition Centre: Land used for the display and public exhibition of goods, information, etc.

Function Centre: Land used, by arrangement, to cater for private functions, and in which food and drink may be served, such as a conference centre or reception centre. It may include entertainment and dancing.

Office: Land used for administration, or clerical, technical, professional or other like business activity, such as an electoral office, government office, or insurance outlet. No goods or materials intended for manufacture, sale, or hire may be stored on the land. It also includes Consulting Rooms.

These uses are consistent with the proposed activities and that the proposal will contribute to achieving the desired future character of the Precinct.

4.3.2 HEIGHT

The envelope to determine the height and the density (scheme provisions 15.5.8 and 15.5.9) of development on the site are as per Figure 27.

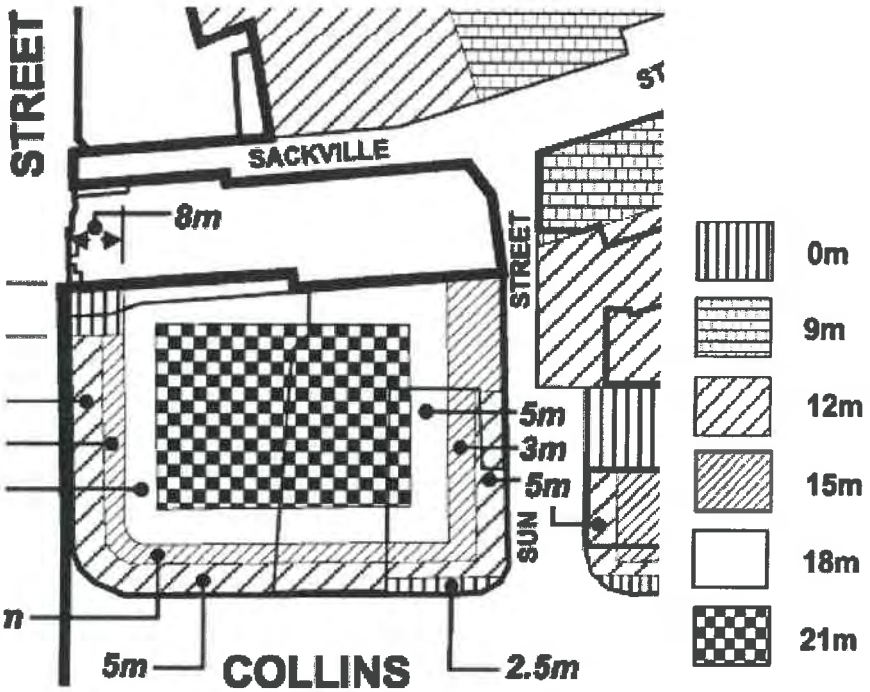


Figure 27: Height Control (Source: SCPS)

The proposal exceeds the deemed to comply height and is required to respond to the following from 15.5.9:

> *'Development' in excess of the 'deemed to comply' height will only be 'allowed where it can be demonstrated that there is no unreasonable detriment to residential amenity, street amenity, the spatial characteristics of the streets and spaces, heritage values of any building or site, or the quality of the environment.*

The response of the development to the urban setting in terms of bulk, massing, and skyline is discussed in more detail in the accompanying Site Development Plan from p 35, particularly in terms of how the building responds to the spatial characteristics of the surrounding environment. The development is situated to the south of existing residential development and is not anticipated to have an unreasonable impact on amenity of neighbouring urban dwellings.

4.3.3 SITING AND LANDSCAPING

Setbacks neighbouring the Hedburg Garage and Theatre Royal are provided on the frontages of the site to distinguish the contemporary and heritage building fabric and to provide views through the buildings. These areas have been landscaped where appropriate and will be detailed to Council's satisfaction.

> *15.5.10 Siting and Landscaping*
>
> *The Planning Authority may impose conditions of approval requiring a setback to the street of up to two metres and to require fencing and landscaping to its satisfaction. The Planning Authority may also impose conditions relating to the appearance of developments, privacy, solar access and any aspect of construction relevant to the liveability of dwellings.*

4.3.4 TRAFFIC, ACCESS AND PARKING

As illustrated in refer Figure 28 those parts of the site that were previously open parking areas are subject to parking requirements of 3 spaces per 100m^2 of floor area for non-residential uses in accordance with 15.5.11. The Theatre Royal is not within the WLAP and does not require parking in accordance with Schedule 5 - Traffic, Access and Parking.

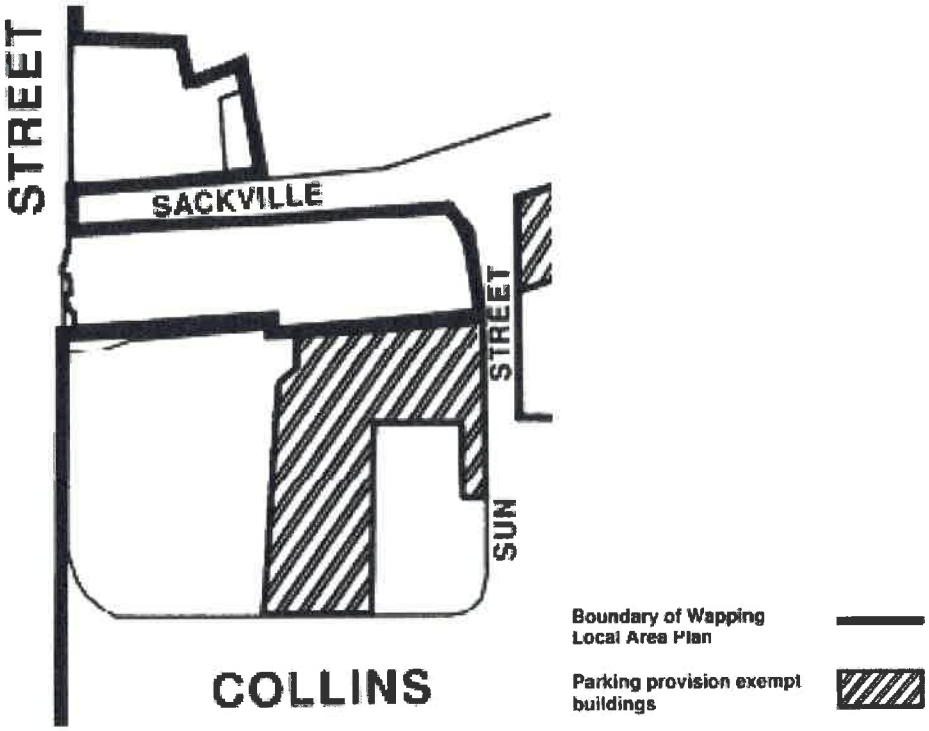


Figure 28: Parking Provision Exempt Buildings (source: SCPS figure 3c)

However, the Guidelines of 15.1.11 include the following statement:

> *'Uses' and/or 'developments' involving the retention and recycling of the buildings shown in Figure 3c shall be 'exempt' from any requirement to provide car parking either on or off site.*

The proposal includes the retention of parts of the Hedburg Garage and reuse of the internal spaces therefore the development is exempt from requiring parking on or off site. No parking has been proposed as part of the development other than those areas for the loading and unloading of vehicles.

On-site parking would be inappropriate and would be detrimental to the capacity of the site to accommodate the proposed activities. The absence of on-site parking is consistent with neighbouring areas of Sullivans Cove and Zones subject to the *Hobart Interim Planning Scheme 2015*.

4.3.5 HERITAGE

The development site includes 21-19 Collins Street 'Former Hedberg Bros. Garage', which is listed within Schedule 1 of the planning scheme. The Theatre Royal although listed, is not situated within the WLAP Precinct. As the works to the Hedburg Garage are for other than conservation of the heritage buildings they are considered in relation to the discretionary provisions for heritage (clause 15.5.12). The development is also adjacent to a number of further heritage buildings, which also require consideration.

'Discretionary' Heritage Provisions

For 'Building or Works' on sites listed in Table 1 of Schedule 1 or shown on Figure 3d of this Local Area Plan which cannot meet the 'deemed to comply' provisions, the height and setback controls set out in Figure 3b and compliance with the following Principles are taken as meeting the criteria for 'Discretionary' building or works listed in Clause 22.4.5 of Schedule 1.

Any 'Building or Works' on sites adjacent to a place listed in Table 1 to Schedule 1 of the Scheme and/or referred to below which cannot meet the 'permitted' requirements of Clause 22.5.4 or the 'deemed to comply' height and setback for that site, shall be considered on the basis of compliance with the following principles and the provisions of Clause 22.5.5 in Schedule 1.

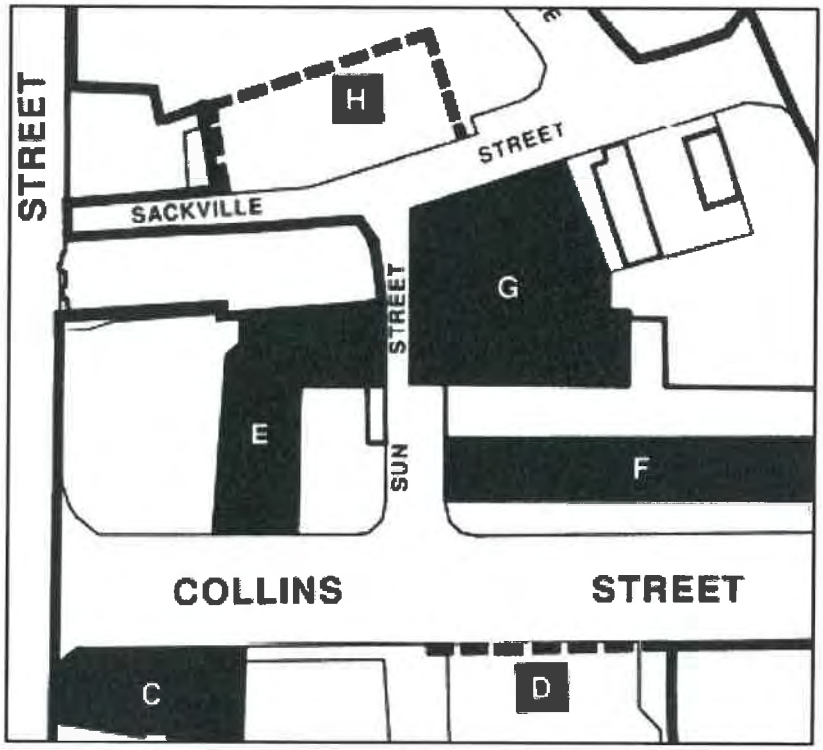


Figure 29: Heritage Guidelines (SCPS Figure 3d)

The provisions that apply to is as follows:

(E) Hedberg Bros. Garage (Parcel 4 and known as 19 Collins Street)

The building is an early and uncommon example of a motor garage, part of the industrialisation of Wapping. It also contributes to the urban streetscape of Collins Street visually and by setting a datum for building alignment. It should be retained but where this is not a feasible proposition and where it limits the achievement of the other intents of this Local Area Plan it may be in part demolished as long as any portion retained is integrated into the new development with integrity and dignity. If any part of this building is to be demolished the building should be recorded in full prior to demolition.

The partial demolition of the Hedberg garage was approved as part of the early works for the site (PlN-14-00973-01). The frontage to Collins Street has been integrated within the proposed development of the site.

The proposal is for the purpose of facilitating the Creative Industries and Performing Arts Development, which is consistent with, and furthers the Statement of Desired Future Character, which identifies Parcel 4 as having an important role in linking Collins Street to other commercial

uses. This is further articulated in the Parcel 4 Review, by Leigh Woolley 2001, which is given statutory relevance in Clause 15.5.6 of the Scheme, which states:

> *"The site is crucial in ensuring the future of the Theatre Royal as it offers the only opportunity to provide essential support and access facilities. Any development must provide these ancillary facilities but the proximity to the theatre also offers some functional and marketing opportunities."*

The approved demolition of the garage was on the basis that it was demonstrated through the massing of the key functions for the UTAS and the Theatre Royal that they would not be capable of being accommodated on the site, within the height and density parameters of the site without at least partial demolition of the Hedberg Garage. Subsequently, The retention of the Hedberg Garage in its entirety limited the achievement of the Local Area Plan, in that the building restricted the ability to construct a performing arts centre and facilities for the Theatre Royal, and meet the urban design parameters of such construction.

The construction of the planning scheme limits the application of provisions for use and development within the Local Area Plan precinct to the LAP and schedules where they apply. Insofar as any inconsistency between these standards, the provisions of the LAP prevails.

The site is adjacent to the following properties listed in Schedule 1 that are situated within the WLAP Precinct as illustrated in Figure 30:

- 9 - 37-49 Campbell Street 'Walls off Sackville St. ('Parcel 6')
- 20 - There is no listing for this site or for the address of 1 Collins Street.
- 22 - 18-26 Former HCC/City Motors Garage - facade
- 23 - 36 Collins Street, 'Former Barnett Bros. Building'
- 9 - 10-16 Sackville Street, 'Former Tasmanian Fur Traders Building'

The principles for these heritage places from 15.5.12 of the WLAP have been reviewed as part of the accompanying Heritage Impact Statement. It was found that the proposed development would not impact on the stated cultural significance of these places, in terns of the neighbouring Barnett Bros. Building, it was found that the retention of the Hedburg Garage would create a dialogue across the street between the buildings.

4.3.6 SIGNAGE

No signage has been proposed as part of this application therefore the provisions of 15.5.13A do not apply.

4.4 CONSERVATION OF CULTURAL HERITAGE VALUES (SCHEDULE 1)

4.4.1 PLACES OF CULTURAL SIGNIFICANCE

The development site includes the following places:

- 8 - 9 Campbell Street, 'Theatre Royal'
- 21 - 19 Collins Street, 'Former Hedberg Bros. Garage'

Places adjacent to the development site include the following:

- 9 - 37-49 Campbell Street 'Walls off Sackville St. ('Parcel 6')
- 20 - There is no listing for this site or for the address of 1 Collins Street.

- 22 - 18-26 Former HCC/City Motors Garage - facade
- 23 - 36 Collins Street, 'Former Barnet Bros. Building'
- 79 - 10-16 Sackville Street, 'Former Tasmanian Fur Traders Building'
- 54 - 57-63 Macquarie Street, 'City Hall'

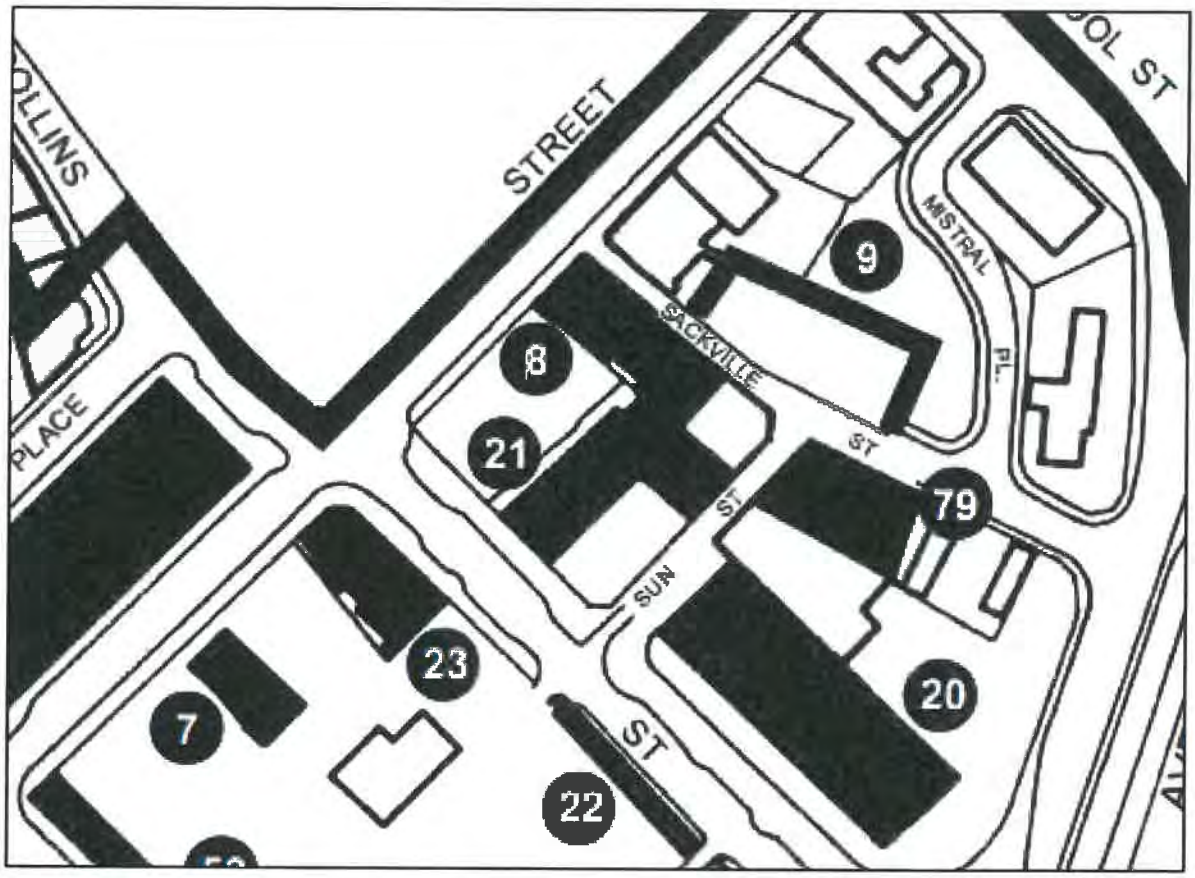


Figure 30: Places of Cultural Significance (SCPS figure 5)

The objectives for the conservation of cultural heritage values (22.1) are as follows:

> *To provide the mechanisms to allow the conservation of heritage values.*
>
> *To provide an incentive for 'building or works' to be carried out in a manner which is compatible with conservation of cultural heritage values.*
>
> *To ensure that the recognisable historic character of Sullivans Cove is not compromised by new development which overwhelms the places of cultural significance, or, by new development which reduces the apparent authenticity of the historic places by mimicking historic forms.*
>
> *To encourage new development to be recognisable as new, but not individually prominent. Such development must reflect a "good neighbour" relationship to places of identified cultural value.*

As the proposed works to the heritage places are for other than conservation works they are required to be assessed in accordance with the following:

> *22.4.5 'Discretionary' 'Building or Works'*
>
> *'Building or works' on places of cultural significance which cannot satisfy the 'deemed to comply' provisions of Clause 22.4.4 may be approved at the discretion of the Planning Authority.*

The following criteria must be taken into consideration in the assessment of all proposals to undertake 'building or works' on places of cultural significance:

'Building or works' must complement and contribute to the cultural significance, character and appearance of the place and its setting;

'Building or works' must be in compliance with the conservation strategy of an approved Conservation Plan, where required and/or provided;

The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any place of cultural significance;

'Building or works' must not reduce the apparent authenticity of places of cultural significance by mimicking historic forms;

'Building or works' may be recognisable as new but must not be individually prominent;

The painting of previously unpainted surfaces is discouraged.

The accompanying HIS finds that the proposed development provides an overriding benefit for the greater good of the Theatre Royal. In this way the development contributes to its ongoing use as a theatre and its associated cultural significance. The HIS further identifies that 'the materials and form do not mimic 19th century masonry construction, thus allowing it to be seen as a symbiotic but separate entity to both the Theatre Royal and the remaining portion of the Hedburg Garage'(HIS, p14)

The development also needs to be assessed in accordance with the following:

22.5.5 'Discretionary' 'Building or Works'

'Building or works' on land which cannot satisfy the 'deemed to comply' provisions of Clause 22.5.4 may be approved at the discretion of the Planning Authority. The following criteria must be taken into consideration in the assessment of all proposals for 'building or works':

'Building or works' adjacent to a place of cultural significance must not dominate that place when viewed from the street or any other public space, or be more prominent in the street than the adjacent place of cultural significance.

The area of a facade of any new building may be permitted to exceed that of the building on an adjacent place of cultural significance where the Planning Authority is satisfied that the visual impact of the apparent disparity of scale is not significant or that historic precedent warrants the scale disparity.

'Building or works' must complement and contribute to the specific character and appearance of adjacent places of cultural significance and the historic character of the Cove generally.

The location, bulk and appearance of 'building or works' must not adversely affect the heritage values of any adjacent or nearby place of cultural significance.

'Building or works' must not reduce the heritage value of any adjacent places of cultural significance by mimicking historic forms.

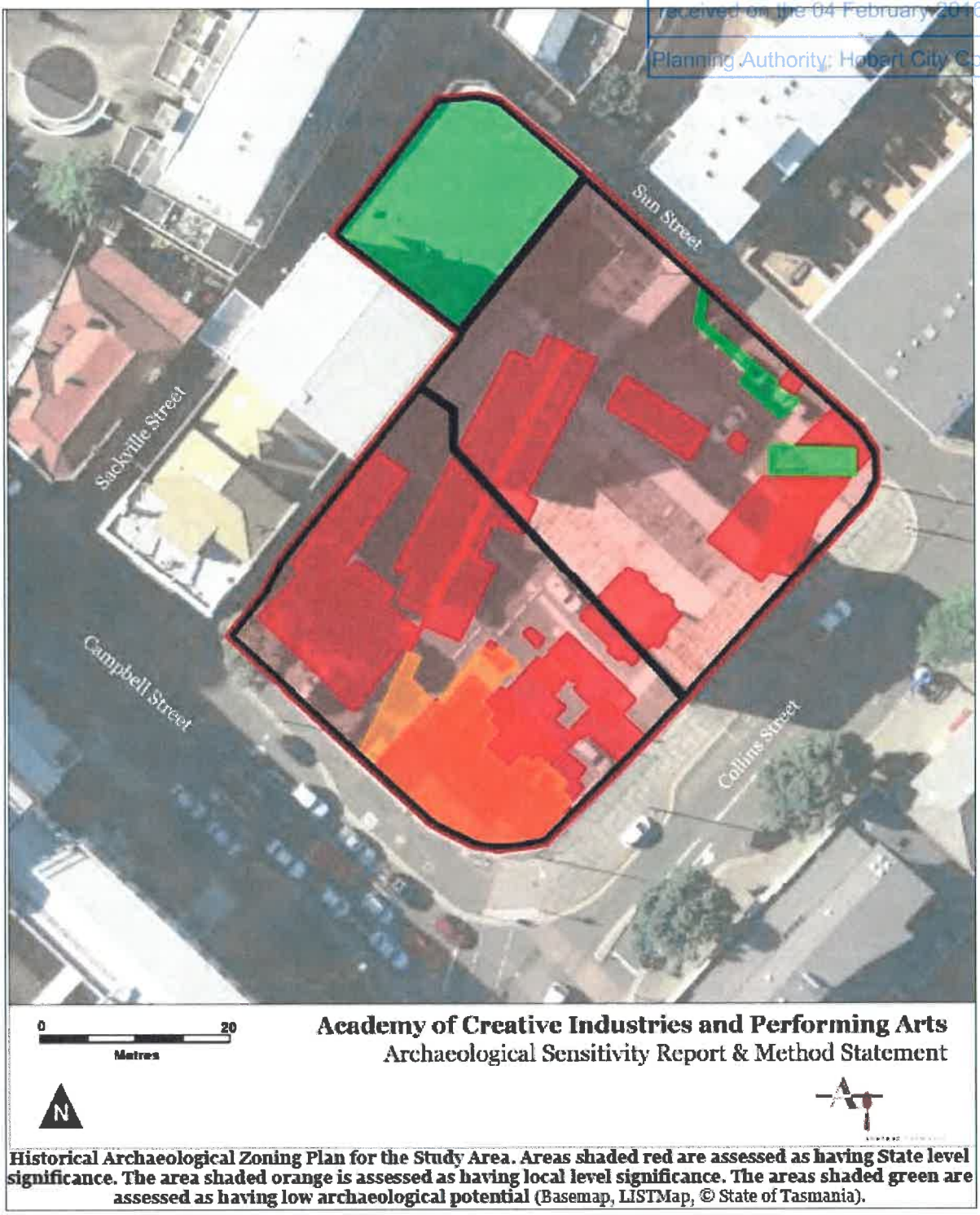
The accompanying Historic Impact Statement finds in Section 9.3 that the development is acceptable in terms of its relationship to adjacent buildings. The accompanying Site Development Plan further finds that in terms of the townscape components 'A respectful relationship to heritage within the lot and adjacent to the property is maintained' (p 33)

4.4.2 PLACES OF ARCHAEOLOGICAL SENSITIVITY

Part of the site are mapped in Figure 5a of the Scheme (shown in: Figure 31) as being Places of Archaeological Sensitivity, however an assessment of the site has found that much of the site is of archaeological interest. The scheme requires that an Archaeological Sensitivity Report be prepared for the site. This report has been prepared by Austral Archaeology and approved as part of the application for early works (PLN-14-00973-01).

The findings of archaeological works as part of the Early Works are currently being finalised. The accompanying Development Application Report provides concepts for how the interpretation of findings will be incorporated into the final architectural detail of the development (section 3.1).

Figure 31: Places of Archaeological Significance (SCPS)



Historical Archaeological Zoning Plan for the Study Area. Areas shaded red are assessed as having State level significance. The area shaded orange is assessed as having local level significance. The areas shaded green are assessed as having low archaeological potential (Basemap, LISTMap, © State of Tasmania).

Figure 32: Archaeological Zoning - Areas of significance (Source: Austral Tasmania)

As the proposal results in excavation of the land it will need to be assessed in relation to the following:

22.6.5 'Discretionary' 'Building or Works'

Having regard to the contents and recommendations of an Archaeological Sensitivity Report accepted by the Planning Authority pursuant to Clause 22.6.3 the following criteria must be taken into consideration in the assessment of all proposals to develop places of cultural

significance listed in Table 2 or that are considered likely to be of archaeological interest or significance:

SCHEME REQUIREMENTS (22.6.5)	PROPOSAL RESPONSE
The likelihood of the proposed 'building or works' resulting in the removal or destruction of items of archaeological significance.	Within the Austral Report it is identified that as bulk excavation will be carried out at the site it is 'more than likely that these works (i.e. proposed development works) will require the removal of all archaeological deposits within the study area, with little or no opportunity for the retention and conservation of archaeological deposits in situ'. Having noted this, the Austral Report includes an Archaeological Method Statement (AMS). The AMS defines a practical strategy for managing and/or mitigating archaeological impacts relating to the site. As stated in the report it addresses the management of historic heritage sites and values, and also the potential for Aboriginal cultural heritage material, which may be found during excavation works. Further development of the site is hence supported given the recommended methods for archaeological investigation, excavation, recording and site operations are undertaken as detailed in the AMS and specifically within the research design prepared to maximise the retrieval of information from the site.
The cultural significance of the site.	In preparation of the Austral Report an investigation of the site history was undertaken and it was concluded that *'...approximately 85% of the study area has high archaeological potential with numerous specific sites of potential within this broader zoning'*. The areas of archaeological potential were documented and mapped as part of the work for the archaeological report as illustrated in Figure 32: Archaeological Zoning - Areas of significance (Source: Austral Tasmania)
Evidence of an adequate archaeological reconnaissance and site sampling prior to the approval or carrying out of works.	The accompanying Method Statement has been prepared on the basis of prior site sampling, and the Early Works have been approved for further archaeological reconnaissance of the site and are currently being undertaken in accordance with the detailed method statement.
The need to reasonably protect potential archaeological significance during the design, and carrying out of works.	It was acknowledged in the approval of the Early Works that the development of the site would result in removal of archaeological deposits. As such the significance is to be assessed as part of a comprehensive investigation into the site.
The need to undertake an archaeological 'watching brief' to be required during the carrying out of works.	A watching brief will not be necessary for this application as the Early Works that are currently underway include a comprehensive assessment of the archaeological attributes of the site.

4.5 URBAN FORM

Schedule 2 of the Scheme applies to the site, however in accordance with 23.3 the provisions of Schedule 1 take precedence.

23.3 Scope

This schedule applies to all new buildings and extension to existing buildings in the Sullivans Cove Planning Area.

The provisions of Schedule 1 - Conservation of Cultural Heritage Values, take precedence over provisions of this Schedule. Height and scale of detailing of development adjacent to Places of Cultural Significance must be such that the place is not compromised by height discrepancies, scale discrepancies or a superficially "historic" or similar appearance.

4.5.1 BUILDING FORM

The provisions of 23.6.1A for a new building have been addressed below; the responses are relevant also to 23.6.1B as the site incorporates existing buildings.

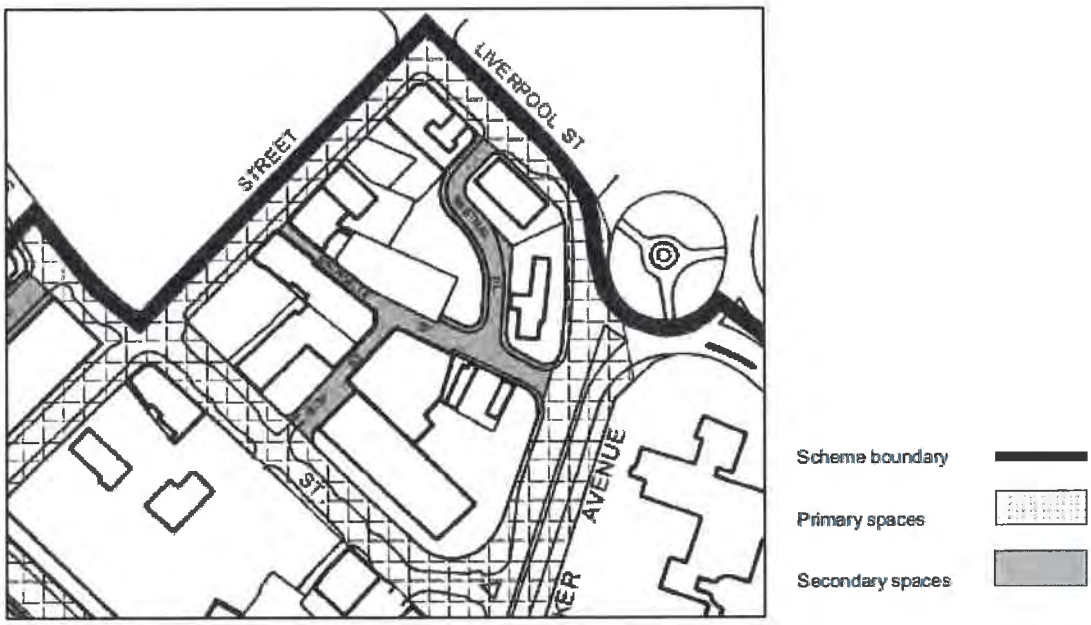


Figure 33: Primary and Secondary Spaces Diagram (SCPS figure 7)

Height

Heights for the development site are determined by the WLAP, which takes precedence over the Schedule, for all but the Theatre Royal.

The height of any development on the Theatre Royal site is identified as discretionary in acc Figure 8 of the Scheme.

Alignment - Primary Space

The development site fronts primary spaces along Collins Street and Campbell Street as illustrated in Figure 33.

Buildings must be built to the street line of all primary street frontages, with walls located on the front property boundary and extending across no less than 90% of the primary street frontage.

Where a new building is located on a corner with two primary street frontages, this requirement must be satisfied for each frontage.

New buildings must not step back adjacent to a Primary Space. The only permissible exceptions to this is in situations where the stepping back is less than 1:20 relative to the

height of the wall on the property boundary and where there is a wall to the boundary at least 12m high.

On Campbell Street the development has an area setback from the boundary distinguishing the new development from the Theatre Royal building, this exceeds 10% of the frontage. Likewise on Collins Street there a smaller setbacks on either side of the Hedburg Garage to distinguish the old from new which would occupy less than 10%, however there are two further building volumes on this frontage that are slightly setback from the property boundary.

The setback next to the Theatre Royal on Campbell Street is to a maximum of 1.8m where the wall height is 12.2m, complying with the setback described. The setbacks on either side of the Hedburg Garage are 4.4m where the height is 13.4m to the left and 10m to the right. Discretion is required in relation to the Alignment with Primary Spaces.

Alignment - Secondary Space

The development site fronts Secondary Spaces on Sun Street and Sackville Street as illustrated in Figure 33.

Where applicable, buildings must also be built to, or align with, the secondary street frontage.

The proposal does not change the existing alignment of the Theatre Royal with Sackville Street, except for minor changes on the corner. The development is built either to or over the boundary to Sun Street. The proposal requires discretion for the alignment to Secondary Spaces.

Plot Ratio

Buildings must comply with the plot ratio standards referred to in Table A to this Schedule...

Table A refers relates the Applicable Plot Ratio to the Permissible Height of the building, however the height of all development on the Theatre Royal site is discretionary. That part of the site that is being developed at the rear of the Theatre Royal is not substantially greater than the existing development at the rear of the site.

Density is also addressed within provision of the WLAP in clause 15.5.8.

Apparent Size

The length of buildings in street edge elevation must not be more than twice the width of the abutting street.

Existing street widths: Campbell Street = 19.5m, Collins Street = 19.5m, Sun Street = 4.3m, Sackville Street = not applicable (the street edge elevation is formed by the Theatre Royal where no change are proposed).

The length of the buildings on all elevations exceeds the width of the abutting street as the development occupies an entire block.

Urban Gardens

Where the construction of a building results in the creation of secondary spaces with public access. These spaces must be fenced at street frontage, landscaped and include facilities for pedestrians as appropriate, such as seating.

The Scheme defines a secondary space as:

Secondary Spaces: Smaller roads, lanes, alleys and ad hoc courts running off the primary spaces shown on Figure 7 as secondary spaces.

The proposal includes a central courtyard space, which will be separated from the public streets by the circulation spaces of the building. These are intended as landscaped spaces to suit the needs of the occupants of the buildings.

Discretion is required in relation to the building alignment and for its apparent size. The development is required to be assessed in relation to the following:

23.6.2 'Discretionary' Buildings

Development which cannot satisfy the 'deemed to comply' provisions' of Clause 23.6.1 may be approved at the discretion of the Planning Authority taking into consideration the Objectives in Clause 23.2.

The relevant objectives of clause 23.2 of the Schedule have been specifically addressed in the accompanying Site Development Plan (from page 35) and indicates that the development responds satisfactorily to the setting and characteristics of the site.

4.5.2 BUILDING SURFACES

The following permitted standards apply to the surfaces of the proposed development:

BUIDING SURFACE	'DEEMED TO COMPLY' PROVISION	PROPOSAL RESPONSE
Building Façade to a Primary Space	*Surfaces must be primarily masonry.* *A maximum allowable void of 50 percent is permissible in all street frontage elevations.* *Surfaces of facades to primary space must comprise high quality finishes that reinforce the status as a primary building frontage.*	The proposed building materials are high quality surface finishes comprised of glazing, timber and metal cladding.
Building Façade to a Secondary Space	*Surface must be finished so as to be presented in a less detailed and ornate manner than the surface of the building to a primary space, or the surfaces of adjacent buildings to primary spaces.*	The Sackville Street elevation will still be largely comprised of the heritage wall of the Theatre Royal. The elevation to Sun Street will be less articulated and detailed than those to primary spaces.
Night-Lighting	*Must accentuate the wall of the building when illuminated, and where appropriate also highlight the landscaping.*	External lighting of the building is not finalised but will be capable of complying with this provision to the satisfaction of Council.

The materials to the Primary Space require Council's discretion.

23.7.2 'Discretionary' Buildings

Development which cannot satisfy the 'deemed to comply' provisions of Clause 23.7.1 may be approved at the discretion of the Planning Authority. The objectives of this Schedule must be taken into consideration in the assessment of all 'discretionary' development.

The relevant objectives of clause 23.2 of the Schedule have been specifically addressed in the accompanying Site Development Plan from page 35.

4.6 PUBLIC URBAN SPACE

The following is an assessment of the proposed development in response to Schedule 3 - Public Urban Space. The site is entirely located within the Public Urban Space Type of the 'Rear of the Cove'. Which is described as follows:

> *An urban area in transition, including the area surrounding Wapping, Collins Street and Market Place.*

4.6.1 CIVIC WORKS AND PUBLIC STREET FURNITURE

The following responds to section 24.4 of the scheme with the table below illustrating which works requires approval:

TYPE OF BUILDING OR WORKS	REAR OF COVE STATUS
Minor Road Works Including Traffic Calming	Permitted
Public Street Furniture Including Tree Planting	Discretionary
Building	Not Applicable

The following definitions are relevant to the proposed civic works.

> *Minor Road Works: Means within the existing road or other public space, all road works involved in the sealing or resealing, upgrading or minor widening of an existing carriageway, including the introduction of kerbs, gutters, footpaths, road signs, traffic control devices, street lighting, traffic calming measures, alterations to the layout and means of traffic control at existing junctions and intersections, and the like, together with pedestrian under and overpasses, but does not involve the construction of any new or additional carriageway or traffic lane and includes all other works not included under Major Road Works .*
>
> *It includes the formation, widening, improvement or alteration of any existing vehicular access by, or on behalf of, the road authority.*
>
> *Public Street Furniture: Street furniture permanently located in roads or other public spaces or furniture which is possible to remove but is removed once every 3 months. Includes but not limited to: street furniture and large landscape items including street trees.*
>
> *Other Public Spaces Land: which is generally available for access by the general public, but not including a road.*

'Minor road works' would be required on Sun Street and Collins Street at the frontage of the building. These works are permitted.

'Public street furniture' is proposed for the garden space neighbouring the entrance to the Theatre Royal, these works are considered discretionary in accordance with the following provision:

> *24.4.6 'Discretionary' Buildings or Works*
>
> *All buildings or works nominated in the table to Clause 24.4.2 as 'D' (Discretionary) require a permit.... The Planning Authority may exercise its discretion to approve, approve with conditions, or refuse any application.*
>
> *In considering such applications, the Planning Authority must satisfy itself that the proposed buildings or works are compatible with the following:*
>
> *The 'Civic Works and Public Street Furniture' Guidelines outlined in Clause 24.4.8.*
>
> *The function of the Public Urban Space as described in Clause 24.4.10.*

The provisions of clause 24.4.9 apply where appropriate.

The proposed works next to the Theatre Royal on Campbell Street are not situated in a Primary or Secondary Space as they are located within the property boundaries so those parts of 24.4.8 that are apply are addressed below.

Amenity and Safety

Positioning civic works must allow for convenient pedestrian movement (minimum 2.5m wide clearance) in designated 'Mixed', 'Pedestrian Movement' or 'Open Space' under Clause 24.4.10.

Sight lines should be provided between pedestrians and drivers and levels of night lighting are to be to the satisfaction of the Planning Authority.

The proposed works are not in any of the designated spaces listed. The proposed garden space will not interrupt pedestrian movement and will allow for a retreat for pedestrians accessing the proposed building along the busy Campbell Street frontage. The area allows for a visual connection through the building to the internal courtyard, likewise lighting will spill from the building into the space. Lighting is capable of being detailed to the satisfaction of Council.

Specific Precinct Guidelines

Public urban space type	*Spatial & Urban Character*	*Civic Works and Public Street Furniture Character*	*Positioning Criteria*
Rear of Cove	*Urban area in transition.* *Historically these areas were irregular, urban and gritty with a failed 1920's grand vision laid over them.*	*Contemporary hard, sparse utilitarian character.* *Secondary spaces more irregular, except Market Place.*	*Regular placing of street furniture, parallel to dominant lines of space.* *Minor irregularity in secondary spaces.*

The urban space created with the garden on Campbell Street is consistent with the irregular spatial characteristics, with cues taken from the façade of the Theatre Royal, which does not follow with the alignment of the street. The civic works proposed are minimal, contemporary and hard in character. The garden space is considered to meet with the preferred design response.

24.4.9 Requirement for a Civic Works and Public Street Furniture Concept Plan

Approval of the following types of 'discretionary' building or works will require preparation and approval of a Civic Works and Public Street Furniture Concept Plan;

Newly created public urban spaces resulting from redevelopment.

Streets undergoing substantial infrastructure replacement.

Public urban spaces resulting from the redevelopment of Dunn Street car park. Road closures.

Before introduction of interpretation or public street furniture other than as replacement.

The accompanying architectural drawings provide a concept plan for the works proposed within the urban space created by the proposed development, which satisfies this provision.

4.7 TRAFFIC, ACCESS AND PARKING (SCHEDULE 5)

Traffic, access and parking requirements have been discussed in the WLAP in section 4.3.4 of this report.

There is no additional parking provided on site other than for the on-site loading area, which is located internally within the building. Use of the existing loading bay on the corner of Sun and Sackville Streets will be discontinued.

4.7.1 TRAFFIC GENERATION

There are a number of benefits of the proposed development in terms of traffic generation. Firstly the number of vehicles accessing the site will be substantially reduced from the situation prior to the early works as vehicle parking will be reduced to a truck and a semi-trailer space that will utilise the internal loading dock. The loading dock will also be of benefit to traffic flows along Sun and Sackville Street as trucks will no longer need to load and circulate within the confined one way street system surrounded by residential dwellings. Additionally, it is proposed that the number of access points on the site is reduced to one from the existing four access points.

The Scheme provides the following guidelines in 26.4.1.

> *Where a development (including subdivision) is approved that involves the provision of on site car parking, servicing or emergency access facilities that will result in a material increase in the volume of vehicular traffic entering or leaving a public road, then provision shall be made to accommodate such additional vehicles and their movement to the satisfaction of the Planning Authority, having regard to traffic safety or amenity as appropriate. Similar provision shall be made for pedestrians.*
>
> *Any development needing or expected to generate a demand for the delivery of people to the site in relatively significant volumes, will be expected to make appropriate provision for accommodating the associated vehicular movement - whether generated by private, public or tourist transport, in a manner consistent with the principles of this schedule.*
>
> *The location and form of any proposed access to an existing public road shall ensure that adequate sight distance in relation to the speed of through traffic is available.*
>
> *The Planning Authority may require certain measures to be carried out at the developer's expense in order to accommodate additional vehicles or pedestrians resulting from an approved development.*
>
> *All access, parking and traffic management works shall be constructed to the Planning Authority's current standards and in accordance with plans approved by the Planning Authority.*

The accompanying TIA identifies a range of transportation choices to the development site, it further identifies that the development will improve pedestrian movement at the frontage of the Theatre Royal with alternative entrances.

4.7.2 ACCESS REQUIREMENTS

Section 26.4.2 of the scheme allows for a Maximum vehicular access width of one 3.0m lane, and a minimum of one 0.6m footway. The proposed Loading Bay entrance is 4.4m wide, no footway is provided as the access is for services only, however three main pedestrian entry points have been provided to the building, which exceed the requirement.

The variation for access width can be considered by Council with regard to the reduced number of accesses to the site. The development results in a substantial reduction, which will improve the general amenity of the surrounding streets.

4.7.3 NATURE OF PARKING

As discussed no parking has been provided on site consistent with the objectives of the Schedule, other than the loading area. In response to section 26.4.4 the nature of this parking area has been located to improve the characteristics of the streetscapes and minimise the developments impacts on the neighbouring residential development. The location of the access from Collins Street provides greater manoeuvring for larger vehicles than the existing loading situation for the Theatre Royal. Recommendations are included in the accompanying TIA for the appropriate management of the vehicle access.

4.7.4 MATTERS TO BE CONSIDERED

The following is in response to 26.5 Matters to be considered:

SCHEME REQUIREMENTS (26.5)	PROPOSAL RESPONSE
Will not interrupt the efficient passage of port related vehicular movements;	Not relevant.
Will not generate vehicular traffic which is detrimental to other vehicle movements in Sullivans Cove;	The number of vehicular movements to the site are for service vehicles only and is capable of being managed so that there is no detriment to other vehicle movements.
Will not utilise a key site identified in Part F, or other land considered appropriate, in a manner that would prevent its use for the provision of public parking purposes. The Planning Authority shall ensure the scope for the provision of significant public parking generated by the development - whether on-site or off-site is explored and evaluated, including the use of part Five Agreements;	The site is not identified as a key site. The Theatre Royal component of the site will not vary from the existing situation, as the building currently has no parking provided. The absence of parking is consistent with the parking requirements of the Wapping Precinct as it is exempt from providing on site car parking in order to retain the historic building on the site. The university has considered the parking generated as part of its integrated network of buildings within the city, which use a variety of transportation types, particularly for bicycles with a substantial designated storage area.
Minimises footpath crossovers and disruption to footpath movements;	The proposed development will reduce the number of crossovers on the footpath by removing those on Sun and Campbell Street and relocating the existing crossover over on Collins Street.
Providing parking, shall do so in accordance with requirements for the design and location of spaces and access as specified in this schedule;	Loading areas have been designed in accordance with requirements.
Providing parking, is designed to complement the form and detail of adjacent buildings and have a continuity of street level activity and/or visual interest;	The loading areas have been located internally within the building to minimise the visual impact on the area. The entrance on the frontage includes a door so as to have a contiguous frontage at street level when not in use.
Providing parking, the vehicle access shall be discrete and where possible located so as to not disrupt traffic flows along streets through queuing; and	The vehicle access is located on Collins Street so as to create minimal disruption to traffic flows. The door at the frontage retains a contiguous street frontage.

Incorporates through-site and cross-block pedestrian links and access to the waterfront unless it can be demonstrated that there is no benefit to the enhancement of pedestrian movement and/or amenity in the Cove.	The site does not provide any linkages as it is a relatively small city block and through access would not be improved with a linkage. The site will reduce vehicular traffic on Sun Street and improve the use of this street as a shared accessway.

4.8 SUBDIVISION (SCHEDULE 6)

The proposal requires minor alterations to the boundaries of the development site, and as such requires approval for subdivision. In accordance with 27.3.1 all subdivision is discretionary.

The proposal for subdivision is only to be approved as part of an application for use or development, and hence has been submitted as part of this application in accordance with 27.5.2. Subdivision is further required to satisfy the following requirements of 27.4:

- *A subdivision must reinforce the pattern of land use, activity and development sought by the provisions of the Scheme.*
- *Except in Activity Area 3.0 a subdivision should allow for interpretation of significant historic subdivision patterns of the site and surrounding land.*
- *Subdivision in advance of the approval of a Site Development Plan for Activity Area 3.0 must demonstrate that it will not be prejudicial to its comprehensive planning and development.*
- *All lots must provide suitable service infrastructure to the satisfaction of the Planning Authority.*
- *The layout and design of all subdivision must be in a manner to maximise energy efficiency and minimise impact on the environment.*
- *The size and shape of lots must preferably be compatible with the existing subdivision characteristics of the Activity Area.*
- *Except in Activity Area 3.0 on land without a frontage to Evans Street or the Tasman Highway proposals to consolidate land must be considered in light of the need to discourage the development and use of buildings with large, undifferentiated floor areas.*
- *The impact of the proposed subdivision on access, traffic movements and volumes must be considered in accordance with the provisions of Schedule 5.*
- *In the planning area there will be no minimum lot requirement.*

The subdivision accommodates the existing location over the boundary line. Otherwise it is for minor changes that will not compromise the functional and spatial characteristics of the land within the Cove.

4.9 DEMOLITION (SCHEDULE 7)

According to 28.1 of the Scheme;

> *'Demolition' refers to the demolition or partial demolition of any building, or works on land.*

In accordance with 28.3.1:

> *A permit is required for all demolition in the Cove. All such demolition is 'discretionary'.*

Partial demolition of the Hedberg Garage was approved as part of the early works application for the site. For demolition is to occur on heritage places the following provisions are required to be addressed.

28.8.1 Where the application involves the demolition of a building on a Place included in Table 1 of Schedule 1 - Conservation of Cultural Heritage Values then the application must satisfy the following:

The requirement of Clause 22.4.3 for the submission of a Conservation Plan, and

The provision of street elevations or 'true perspectives' to show the scale and impact of the demolition on places of cultural significance and the streetscape.

The proposal requires partial demolition of the Theatre Royal; works proposed are outlined in the accompanying HIS. Some of those parts proposed for removal are recent additions that have no particular heritage significance. Further works overcome some of the existing shortfalls of the building and overall will improve the appreciation of the heritage values of the building.

4.10 ENVIRONMENTAL MANAGEMENT (SCHEDULE 8)

The planning scheme makes the following provision in relation to site contamination:

New activities which are proposed on land with a known history of industrial or other use where potential for contamination exists shall be accompanied by an environmental audit including an assessment of site condition.

Contaminated land shall be managed in a manner which is compatible with the intended future use of the area. New activities on known contaminated sites must only be 'permitted' to occur after appropriate clean-up of the site, or where it is clearly demonstrated that the proposed activity will not result in an immediate or likely long term hazard to human health or the environment.

The site history has determined that there are likely areas of contamination on the site, which has been confirmed by the Site Contamination Report accompanying this application. The report accompanied the approved early works application for the site and a number of relevant conditions were included in the planning permit (PLN-14-00973-01).

The scheme requirement specifies that a "clean up" of the site must precede any new activity, or demonstrate that the proposed activity will not cause immediate or long term hazard. The site contamination report recommended removal of the contaminated soil, and therefore this is to occur prior to the occupation of the site. Contamination has been identified within the Hedberg Garage site, and removal of this soil was impossible without disturbance of the concrete slab and surrounding structure.

4.11 KEY SITES

The site is not a Key Site as identified in Figure 11 of Part F of the Scheme, however the Scheme defines a key site as:

A site which is regarded as under utilised and having the potential, through development or redevelopment within 5-10 years of the final approval of the Scheme, to be used for activity which will reinforce the strategic framework of the Scheme and objectives of the Activity Area.

The site is clearly under utilised and the proposed activities are an opportunity to achieve the outcomes of a key site. On this basis, a site development plan has been prepared for the site, consistent with this part of the scheme in order to determine the appropriateness of the proposal.

5. CONCLUSION

This application seeks planning approval for the Creative Industries and Performing Arts Development. This is a substantial development that has been through an extensive design process to ensure that the development meets the requirements not only of the University of Tasmania but the State Government. It is anticipated that development will provide substantial benefits to the cultural and educational sectors in Tasmania with its world-class performance spaces and facilities. Furthermore, the development integrates the new development with the existing historic buildings, and provides for the long term viability of the Theatre Royal as the longest working theatre in Australia.

The proposed development is partially situated within the Wapping Local Area Plan Precinct, while the existing Theatre Royal building is outside the precinct. As such, the proposed activities of Arts and Cultural Centre and Education Centre are permitted in the Activity Area and for those parts of the site within the Wapping Precinct are discretionary. The discretionary uses are considered appropriate in relation to the sites location and in response to the desired future character statement for the Wapping Precinct.

Most of the development site is listed as a place of cultural significance requiring discretion for the proposed works. Based on the accompanying Historic Impact Statement the proposed development is found to have overriding benefits for the greater good of the Theatre Royal in response to the objectives for conservation of cultural heritage values, the heritage provisions of the Wapping Precinct and for demolition works to a listed place.

The site is a place of archaeological sensitivity which triggers discretion, however these works were approved as part a separate application for early works for the site.

The form and finish of the building requires discretion in relation to the height in the Wapping Precinct and a number of provisions in the Urban Form Schedule including street alignment, apparent size and urban gardens. In terms of the Urban Form Schedule the proposal was based on an initial assessment to determine the urban design principles for appropriate development of the site, and intensive design process, which has included a number of iterations. The subsequent Site Development Plan has assessed the development in relation to the relevant objectives for Urban Form and indicates that these have been achieved.

Works are proposed within small Public Urban Spaces created by stepped breaks in the building design, which require Council's discretion. Concepts for landscaping of these areas have been provided as required.

No on-site parking has been proposed however service delivery is provided through an internal loading bay. The absence of parking is considered to be appropriate given the uses proposed, existing theatre, alternative transportation modes to the site available, and areas of bike storage proposed in the building envelope. The development will improve pedestrian access and circulation at the frontage of the Theatre Royal.

The proposed Creative Industries and Performing Arts Development requires discretion in relation to a number of provisions of the Scheme, most significantly heritage and urban form. These have been given substantial attention throughout the rigorous design process in order to ensure that the resulting proposal satisfactorily achieves the principles of the planning scheme.

CREATIVE INDUSTRIES AND PERFORMING ARTS DEVELOPMENT

Development Application (DA) Report

27 January 2016

UNIVERSITY of TASMANIA | 125 years
Tasmanian Government
THEATRE ROYAL
LIMINAL ARCHITECTURE
WOHA
ARUP

DOCUMENT ISSUE

DA 27th January 2016

CONTENTS

APPENDICES

1. DESIGN STATEMENT FOR THE CREATIVE INDUSTRIES AND PERFORMING ARTS DEVELOPMENT

1.1 BACKGROUND

The University of Tasmania (University), along with the Commonwealth and Tasmanian governments are partnering to deliver a cultural and performance development on the corner of Campbell and Collins Streets (Wapping Lot 4), co-located with the Theatre Royal (TR) in Hobart.

Liminal Architecture was awarded the role of Principal Consultant in 2013 and is partnering with internationally acclaimed Singaporean architects WOHA and world leading Arup Acoustics and Theatre. Over the last two years, the design team has worked closely and extensively with client representatives from the TR, University, State Government and the Tasmanian Symphony Orchestra. In addition, potential user groups, members of Tasmania's cultural community, the Hobart City Council and its various departments, the Tasmanian Heritage Council, and aboriginal historian Greg Lehman have also been consulted over this period to ensure the development of the design is respectful of its context and critically, fosters Tasmania's cultural evolution.

The early works component of the project, consisting of demolition, management of soil contamination, and archaeology is close to completion. Progress reports on the archaeological findings have helped influence aspects of the design, allowing for a more authentic approach to the heritage discoveries. The full documented archaeological survey will be available upon completion.

Material selection and building form address the context of the site as well as evoking a sense of the activities that go on within, while creating a considered backdrop to the much loved TR and historically significant former Hedberg Garage (Hedberg). Use of glass to both connect and separate the new with the old, and the integration of the two-storey Hedberg are just two elements of the design to help achieve this.

The Creative Industries and Performing Arts Development (the Development) will incorporate:

- A purpose built home for the Tasmanian College of the Arts' Conservatorium of Music
- State of the art performance spaces for the public to enjoy
- Multiple outdoor garden spaces, stepped rooftop gardens and terraces for collaboration, and taking in city views.
- An interdisciplinary education and research hub to further excel Tasmania's already notable creative industries
- A significant building entrance addressing the important corner of Campbell Street and Collins Street
- Multi-level foyer spaces providing equitable access to all seating levels of the TR with new front of house facilities such as ticketing, expanded bar, catering and toilet amenities
- Refurbishment of the TR's upper foyer to reference its 1911 heritage state where appropriate
- Improved back of house provisions for the TR including a new loading dock, accessible lifts, updated dressing and green rooms, and improved storage.

Liminal Architecture has brought together a world class consultant team to help deliver this significant project including:

Architecture:	Liminal Architecture + WOHA
Interiors:	Liminal Spaces + WOHA
Acoustics + Theatre Design + Audio Visual:	Arup
Urban Design:	Leigh Woolley
Planning:	Irenelnc
Education + Futurist Strategies:	Rubida + Arup
Structural + Civil + Facades:	Arup + Gandy & Roberts
Services + Lighting + Security:	Arup + JMG
Fire Engineering:	Arup + JMG
ESD Strategies + Lifecycle Costings:	Arup + JMG
Heritage:	Forward Consultancy
Graphics, Wayfinding + Signage:	Liminal Graphics
Building Surveyor + Access DDA Compliance:	Pitt + Sherry
Traffic Engineering:	Howarth Fisher
Landscape:	Inspiring Place
Archaeology:	Austral Tasmania
Aboriginal Expertise:	Greg Lehman

The Development is important for Tasmania on a number of levels. Its co-location with the TR will ensure longevity and continued life for the much loved theatre. Without this Development the upgrades needed to ensure the TR can continue to operate well into the future, would be significantly challenged. The site has been earmarked for development for many years. Arguably, it is hard to imagine another neighbour to the TR that would be as sympathetic and complementary as the proposed Development.

The Development will also be responsible for boosting Tasmania's cultural sector and therefore Tasmania's cultural economy, through fuelling creative interdisciplinary education and research, elevating production and performance opportunities through the creation of a thriving, music and performance hub, while also incorporating cutting edge technologies facilitating local and global exchange. The Development will be a first for Tasmania enabling it to compete and be more recognised on the global creative stage.

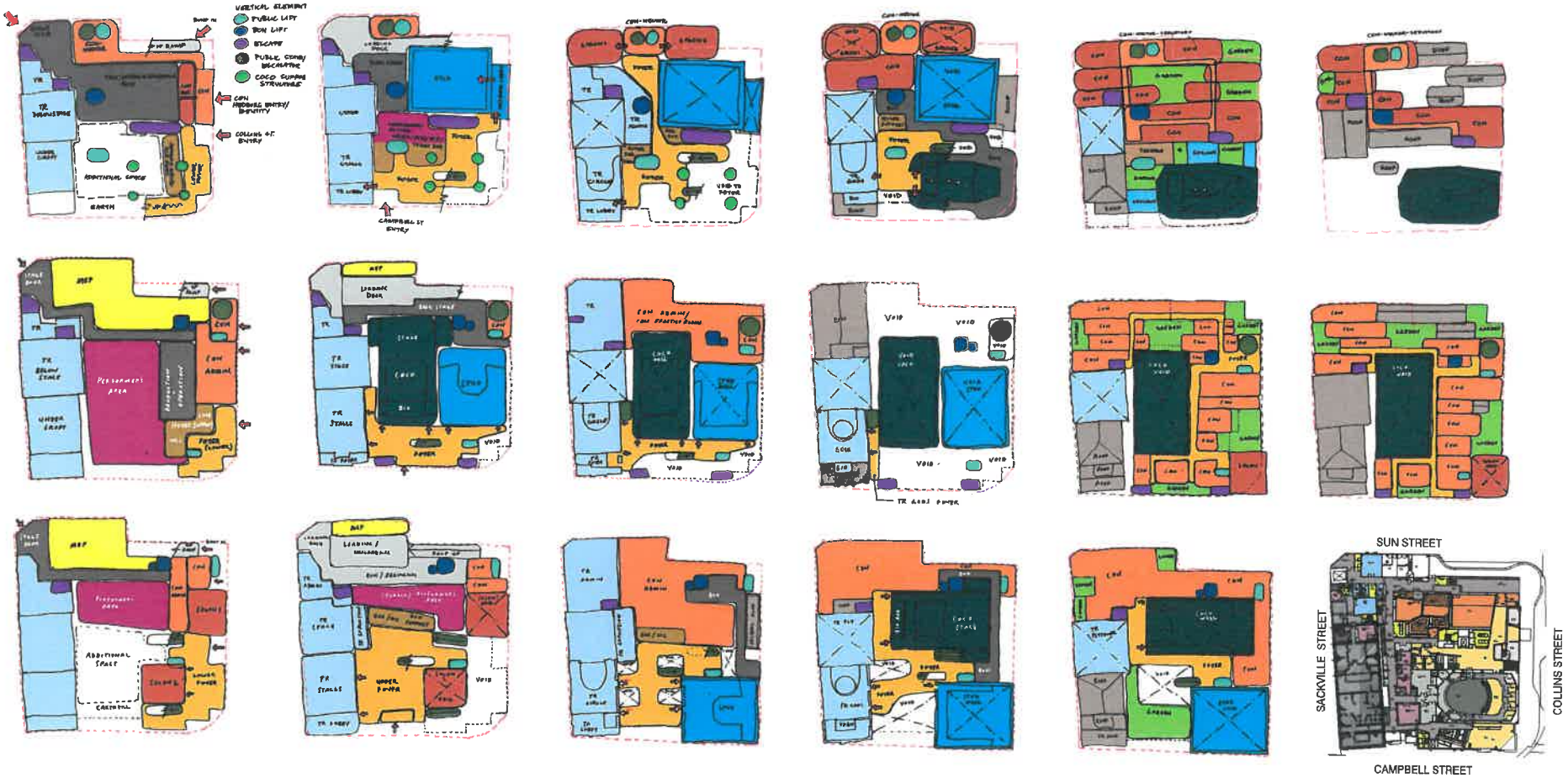
Figure 1: Stakeholder workshops

Figure 2: Project team workshops

1.2 THE JOURNEY

Over the last two years the Development has undergone many iterations. The complexity defined by site constraints, interconnecting with two heritage buildings, an evolving building programme and multiple stakeholders has demanded a rigorous and exhaustive design process to ensure all possibilities have been tested and all elements align. The following is a part record of the programme testing.

Figure 3: Testing the programme requirements



Driving contextual design principles

The following diagrams represent the driving principles that were identified at the beginning of the design process. They have created a framework guiding the development of the project.

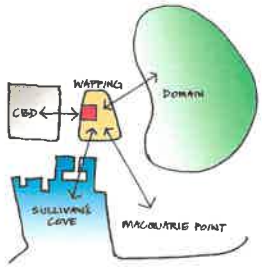


Figure 4: Pivotal Location

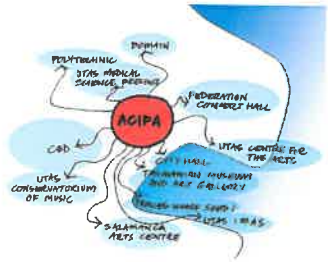


Figure 5: Key node in Hobart's academic and institutional landscape

Figure 6: Visual connections to the CBD

Figure 10: Immersive Technology

Figure 11: Media

Figure 12: Digitally connected performance

The physical location of the Development site creates a significant urban node. It provides a pivotal relationship to the CBD, Domain, Sullivans Cove and Macquarie Point, while also being pivotal in its cultural and University connections. The Development contributes to the urban design of its context and the city fabric through its integration. The project is not a stand-alone silo but rather a significant node that feeds into the network of the city, the University city campus and the cultural landscape.

Connectivity is a key to the Development's vision and success. This project provides a pioneering opportunity for to create a global portal, to be technologically immersive, to create a physical and virtual environment that becomes internationally renowned for advancing and creating educational benchmarks in the performing arts and creative industries, as well as attracting international collaborative opportunities.

Figure 7: Place/Portal - for creativity and global collaboration

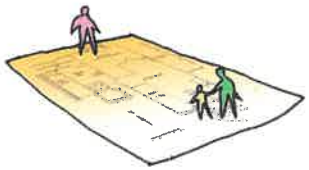


Figure 8: Archaeological Floor

Figure 9: A place to see and be seen

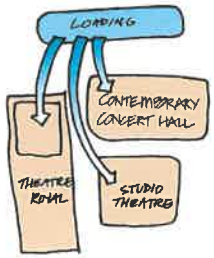


Figure 13: Functional stage access to all three venues

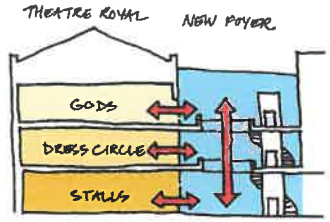


Figure 14: Access to Theatre Royal

Connection to place contributes to one's identity; it is where one can dwell rather than merely reside.

The Development explores 'portal' opportunities to 'place' and the site's evolution. The many guises present a richness that can provide cues for creating a built environment that grows out of its place; regaining a sense of connection to and relationship with its urban surroundings, investing in a sense of place.

The Development's role in the city in itself gives 'permission' to be creative in the way it relates to heritage, the CBD, the Queens Domain and the waterfront of Sullivans Cove. The potential exists to work beyond the constraints of what previously has been defined while looking after the heritage assets and revealing the colourful and layered stories of the site and its connections.

Environments with a distinct sense of place that understand human occupation within the civic scale are welcoming places and entice us to engage with them. A sense of belonging creates successful spaces that encourage gathering, performing, engaging and exhibiting. This sense of belonging and activity will activate a creative heart for the city.

The Development provides opportunity to overcome operational difficulties that compromise TR's front of house, accessibility and toilet amenities and introduce efficiencies that transform back of house and stage access operations.

Shared foyer and hospitality areas will generate a hub of activity and address the front of house operational issues that compromise the TR's use and longevity. Visual and accessibility links between the new building and the TR can celebrate the heritage and charm of the theatre. Exposing the full extent of the TR's heritage wall facing the new building provides opportunities to unravel history. Light-filled foyer spaces will glow enticingly at night, the glass box enclosing the new foyer spaces provides a transparent breathing space between the old and new, is a similar scale to the TR and provides accessible access to all seating levels of the theatre for the first time.

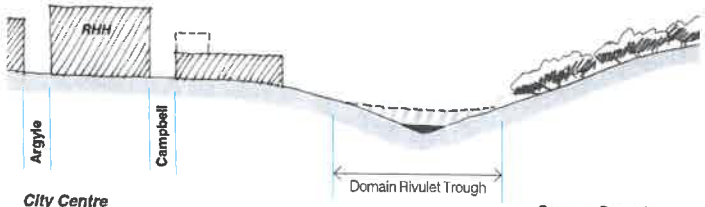


Figure 15: Conceptual massing at edge of urban grid

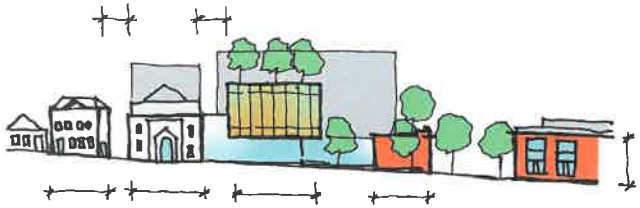


Figure 16: Massing of form that responds to the heritage datums, proportions and

Figure 17: Diversity of scale within the streetscape and the precinct

The complexity of making a large scale building sit comfortably with the low scale TR and Hedberg entails breaking down the scale of the new building through massing and the pushing and pulling of forms. This massing not only addresses the proportion and scale presented by the heritage buildings, but also responds to the transition from the scale of the city (in particular the imposing scale of the proposed extension to the Royal Hobart Hospital) and the residential scale along the North-Eastern end of Collins Street.

Scale, colours, form and materials will respond to the rhythmic expression of the performance and activity from within as well as the urban grain and transitional urban character.

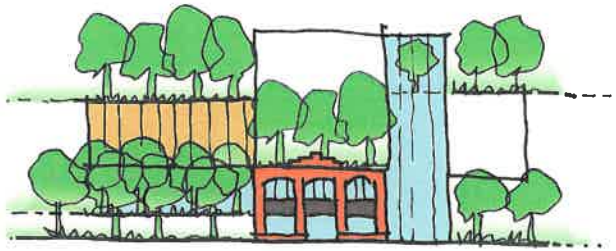


Figure 18: Multiple outdoor green spaces

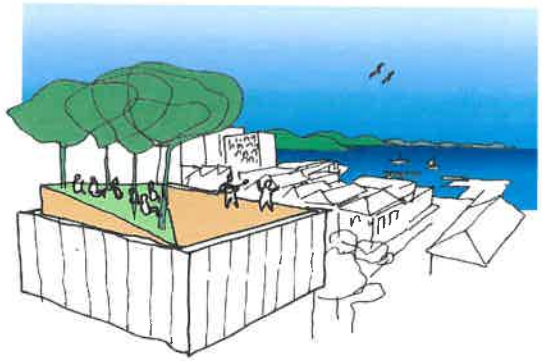


Figure 19: Stepped rooftop gardens and terraces for collaboration and creativity

Green buildings result in happier, healthier, enlivened and welcoming spaces. Reinvesting in a sense of place is integral to creating a sustainable culture. Open research suggests links between health, wellbeing, creative practices and green spaces.

Visual connections to the city's signature vistas and waterfront will be accessible from stepped roof terraces creating positive, activated public spaces.

These driving principles have informed the team's design approach and have guided how the building has materialised.

1.3 DESIGN APPROACH + OUTCOME

The design celebrates the responsibility of being a major public building, yet is respectful of the adjacent residential streetscape, interweaving the urban context and showcasing the heritage fabric within a contemporary framework. The architecture is simultaneously deferential and assertive; big and small. Forms are pushed and pulled to create scaling devices informed by the TR and Hedberg, to contain the building-use programme and to be a good neighbour. The building is expressed as an ensemble of volumes that are scaled to respond to the city scale to the south-west, stepping down to the residential along Collins and Sun Streets. The total new mass is relatively large in relation to the historic buildings, but is dematerialised by a shimmering, metallic cladding that creates a lightweight backdrop to the masonry of the Hedberg and TR. The building implements diminishing devices, but performs with fanfare and flourish. It is also important that the building outwardly evokes a personality that reflects the unique creative use and theatrical endeavours that the hub will be renowned for.

The external metallic cladding performs as an opalescent curtain that drapes the various volumes providing coherence. The draped material interacts with the location of windows through the appearance of pulling back to reveal warm timber openings that dance across the façade, framing the activities within. The stepping form allows roofs of lower forms to be used as terraces for events, teaching, collaboration and activated spaces. On these terraced platforms, bridges, stairs and gardens encourage gathering, spontaneous meetings, collaborative exchange and learning.

A concrete and masonry base grows out of the heritage fabric of the site and grounds the metal clad volumes. The extent of the interlocking base, responds to a horizontal datum set by the TR. Its recessed and protruding expression hosts level changes, recycled materials from the site, viewports into the building, interpretative elements, gardens and seats. Its grain and treatment activates the street at a human scale.

Figure 20: Indicative render showing the massing and scaling of form is influenced by the scale and datums of Hedberg Garage and TR: transitioning from CBD to residential scale and stepping back from Collins Street edge to maximise sunlight.

Perspective of Collins Street looking North-East

Proposed Royal Hobart Hospital envelope shown ghosted

Figure 20: Collins Street view with the Royal Hobart Hospital future planning envelope shown ghosted.

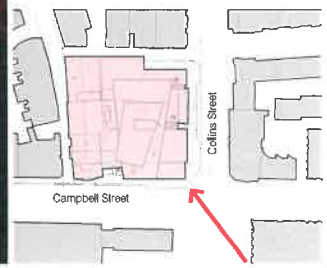


Figure 20a: Keyplan

The internal public spaces wrap around the performance venues and open to the city. They visually and physically link the teaching and performance spaces, encouraging spontaneous interaction and creative activities. The main entry to the new Development, from which all areas, including the TR, can be accessed, is signalled through a double height, glazed entry that anchors the prominent corner. It creates a scaled connection to the TR and Hedberg, while being a beacon at night. The TR retains its traditional entry, and Hedberg provides a differential identity defining the entry to the University.

The main public foyers, are fully glazed accentuating the presence of the TR and for the first time, allowing the south-east sandstone wall of the TR to be appreciated and celebrated, through the removal of the unsympathetic fire escapes and mechanical plant.

Bookending the opposite end of the foyer is the new contemporary Recital Hall which is adjacent the open, vertical, circulation space housing a spiral stair, suspended in the atrium, marking the heart of the building that connects the public areas with the new Conservatorium of Music and the Creative Exchange Institute. The visual connectivity between various levels will promote an active and engaging environment and unique performance opportunities.

The foyers form asymmetrical, cascading platforms over three levels positioned to overlook each other, to connect to the open courtyard at the heart of the complex and to view across the city and Sullivans Cove at Campbell Street's perimeter, allowing visual connectivity between levels and Hobart city.

Patrons, tourists, students, professional artists and performers, lecturers, visiting academics, and international guests will experience a variety of spaces with unique personalities as they move through the building, offering intrigue and stimulation while also being of its place and context.

Figure 22: Sackville and Collins Street section - Showing the porosity of the atrium space and connections to the courtyard. The visual connectivity between levels maximises interaction possibilities and performance opportunities.

Figure 23: Collins Street entry section - Showing corner glazed entry 'box' and stairs up to the principal foyer levels with glass roof over and connection to TR foyers.

Indicative Render of Campbell Street and Collins Street Corner

Figure 24: Corner of Campbell and Collins Streets view - activating the corner at night. The scale of the glass box entry responds to the TR and Hedberg, anchoring the building on the significant corner. (The media facade and external building signage will be part of a separate development application.)

Indicative Render of Campbell Street and Collins Corner aerial perspective

Figure 25: Indicative render showing outdoor platforms, green spaces and stepped forms responding to urban context, heritage scale, and the building's programme.

Indicative Render of Campbell Street

Figure 26: Indicative render showing consideration of material selection and the building form, which creates a backdrop to the much loved TR. The use of glass separates the new from the old.

Perspective of Campbell Street looking South-East

Figure 27: The view down Campbell Street with the Royal Hobart Hospital future planning envelope shown ghosted.

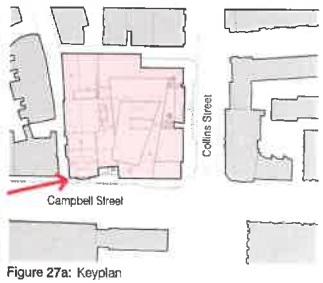


Figure 27a: Keyplan

Perspective of Campbell Street looking South-West

Figure 28: Campbell Street view with the Royal Hobart Hospital future planning envelope shown ghosted.

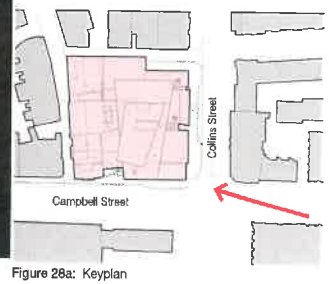


Figure 28a: Keyplan

Section of Collins Street Entry and Theatre Royal Foyers

Figure 29

Section of Studio Theatre, Courtyard + 'Glass Box' Foyers

Figure 30

2. HERITAGE STRATEGY

2.1 HERITAGE CONTEXT

For thousands of years, the Hobart area was home to the Mouheneener band of the South East Tribe, who knew the areas as Nibberloone or Linghe. European use and development of the study area began during the 1820s, evolving to become the very heart of a vibrant waterfront community known as Wapping. By the mid-nineteenth century, the study area had largely reached its peak of development, with a high density of working class housing, commercial buildings and two hotels. Soon after, Wapping began its decline. Economic depression, regular floods and falling property values resulted in Wapping being viewed as an area of social decay, suitable for only commercial and industrial development. Site clearance, substantial filling exercises and some redevelopment took place during the early twentieth century.1

1 Extract from the Archaeological Sensitivity Report and Method Statement prepared by Austral Tasmania , 7 May 2014, p i.

The Development is part of a new chapter in the site's history and will mark a new high point, as a building physically linked to the evolution of Sullivans Cove and culturally embedded in Tasmania's cultural and creative industries. The decline of Wapping, which has left the site under utilised, has had the advantage of preserving traces of earlier periods, uniquely layered over each other, which would otherwise have been lost. The new resurgence of the area is something to be celebrated.

The Heritage Impact Statement, that accompanies this Development Application addresses the site's relationship to the listed buildings adjacent the Development in more detail. The heritage listed buildings that are physically impacted upon by the Development are the TR and Hedberg. The proposal has carefully integrated these important historic references, not only through physical interlinking, which has created improved amenity and therefore longevity for both buildings, but also through the design approach and building articulation.

2.2 ASPECTS OF DESIGN INFLUENCED BY HERITAGE BUILDINGS AND ARCHAEOLOGICAL DEPOSITS

The driver behind the strategy for reflecting upon the heritage of the site and incorporating interpretive layers into the new building is to create a deepened understanding of place, enabling a response that has contemporary relevance while respecting and revealing various layers that have contributed to the evolution of the site.

The intent is to make connections, inspire dialogue and create transformations and foster interpretations. The approach is to engage with and expose heritage layers through conservation, reuse, interpretation and revelation. The new building provides opportunity to add a contemporary layer to this site's evolution that has reinterpreted the past, and to ensure the heritage buildings that abut and exist on the site experience longevity made possible through its adaptive reuse.

Unique to this site is the heritage richness that is informed on a number of different levels through:

- existing heritage listed buildings that the new building connects and interlinks with.

- insitu fragments of archaeology that in some cases pre-date the 1820s.

- materials and artefacts unearthed during the archaeology that give insight to the occupants lives, social conditions and how industry altered the Wapping landscape over the various eras.

Rather than limiting the conservation of heritage elements to static, isolated conserved fragments that are passive and obstruct engagement and contemporary relevance, the overriding idea is to incorporate references and create vignettes that speak of periods across the site's evolution through diverse and engaging means. The varying approaches to celebrate the cultural significance of place include:

1. A design that has used cues from the TR and Hedberg influencing datum markers, scaling devices and composition.
2. Conservation of the TR foyers and adaptive reuse of the two-storey Hedberg which has been unoccupied and under used for many years.
3. The possibility of revealing archaeological deposits insitu through viewing 'portals' or glazed elements.
4. Recognition and interpretation of the various footprints of occupation, which overlay each other and give insight into the evolution of the site over the past 200 years.
5. Interpretation and reuse of recycled materials and artefacts from the site.

While not the focus of this section, the urban strategy and facade expression should be appreciated as an expression of the same philosophy of connection, dialogue, reinterpretation and transformation. The consistent approach is embedded in the project's DNA rather than the heritage being a required overlay disconnected from the design.

As a public building, the Development will encourage the public to experience the genius loci of place integrated with a contemporary, theatrical, state-of-the-art, performance venue and education facility.

Following is an elaboration on the different approaches that see a contemporary building being informed by place and context.

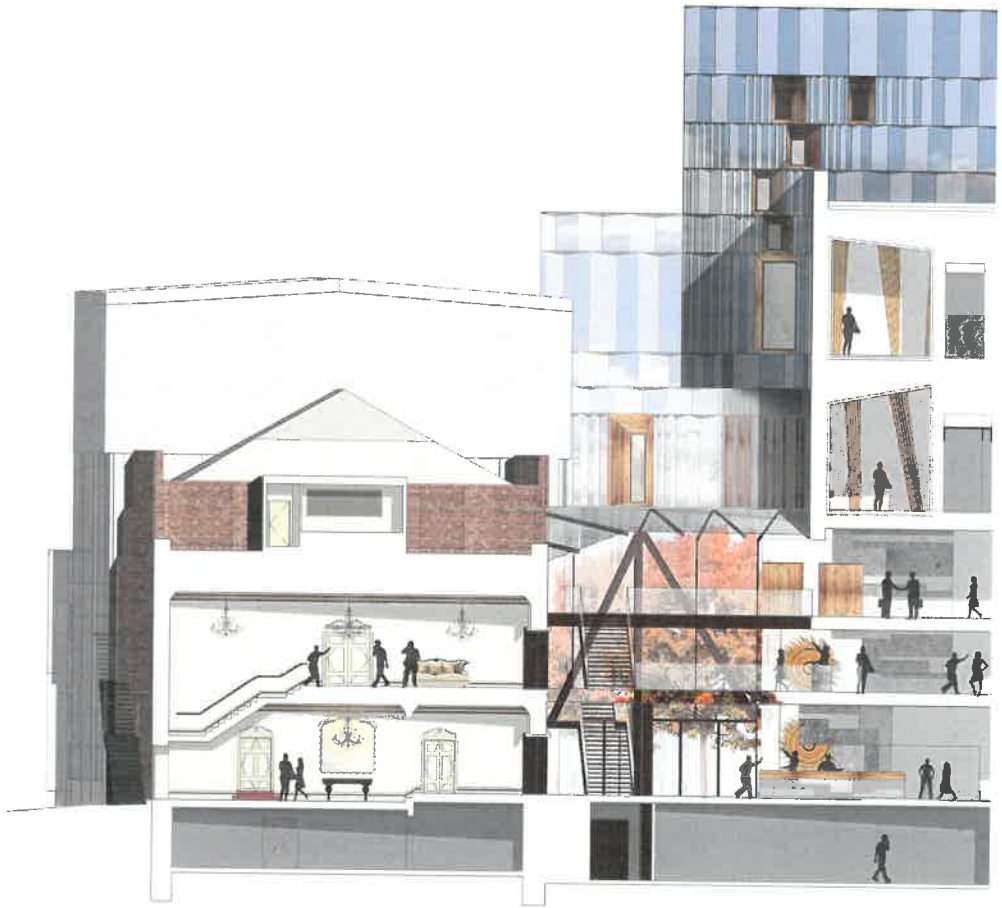


Figure 31: Part section showing the conservation of the TR foyers and interlinking relationship between the Development and TR.

Approach 01:

The TR and Hedberg have influenced the outcomes of the Development on a number of complex levels. Cues have been taken from the heritage-listed buildings to help inform scale, rhythm, massing and materiality, to ensure the Development's design is contextual and good mannered, even though its volumetric requirements are far greater than those of the heritage buildings.

The Development requires a mix of highly technical and large spaces for performance, education and research, with substantial public areas. The non-aligned, existing floor levels of the TR and the Hedberg plus the technical requirements and fixed dimensions of the main spaces of the Development has limited how these venues can be located and integrated on site.

The design has overcome the challenge to satisfy all these requirements while safeguarding and providing opportunities to appreciate and expose elements that help define the heritage significance of the site. The new building provides equitable access to all seating levels of the TR through a predominantly transparent, three level foyer space. This low height, set back, glazed 'box' provides visual transparency and an important scaling device that allows the heritage of the TR to 'breathe' and to be more fully appreciated. The placement of voids between the three levels allows the sandstone and masonry heritage wall to be the predominant feature of the public foyer. The glazed 'box' provides a polite distance between the old and the large, volumetric need of the Development to accommodate an extensive spatial programme while paying its dues to being a significant public building that produces, promotes and celebrates Tasmania's creative culture.

The TR itself is a conglomeration of eras that progress from the 1830's through to the 1980's. To be operating as the oldest theatre in Australia, the theatre through necessity, has undergone renovations and extensions which in many cases have been pragmatic rather than deferential. Directly integrating the new building with the TR, not only provides for equitable access but also allows for the removal of the unsympathetic, concrete block, mechanical plant enclosure, the external steel fire-escapes and the colorbond clad external stairway that climbs three levels and largely obscures the south-eastern heritage sandstone wall. The new foyers are offset from one another and held back from the sandstone/masonry wall to create triple height voids which allow for visual connectivity to each level and appreciation of the TR wall not experienced for a significant amount of time. The foyers and front of house spaces also provide much needed amenity that will ensure operational longevity for the TR, allowing it to maintain its recognition as Australia's oldest operating theatre.

The two storey component of Hedberg is an important anchor in the Collins Street streetscape. The Development politely provides a breathing space around the heritage building, but unlike the TR, the Hedberg is fully integrated into the new development and provides an important differential identity and 'front door' for the University.

Figure 32: TR heritage wall and foyer

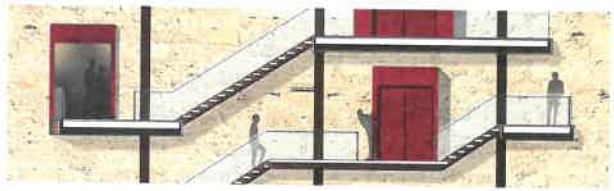


Figure 33: TR heritage wall

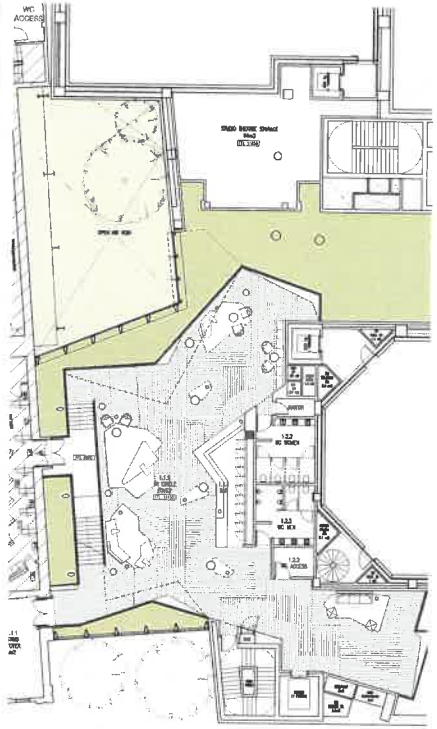


Figure 34: Foyer floor plan - Level 3 Lobby and bar highlighting voids (in green) abutting the TR heritage wall.

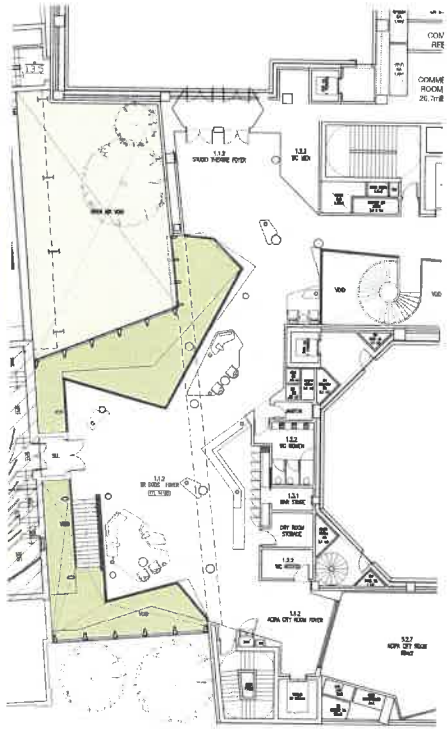


Figure 35: Foyer floor plan - Level 4 Lobby and bar highlighting voids (in green) abutting the TR heritage Wall.

Approach 02:

The existing TR foyers will have the benefit of opening up and referencing their former incarnation prior to the later addition of amenities and bars.

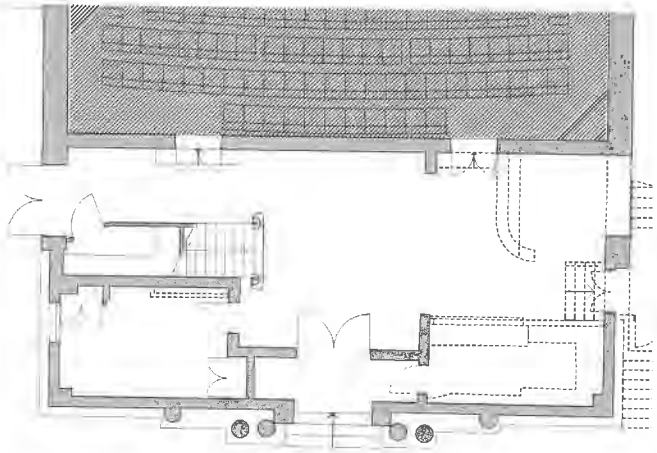


Figure 36: TR - Ground floor plan - demolition

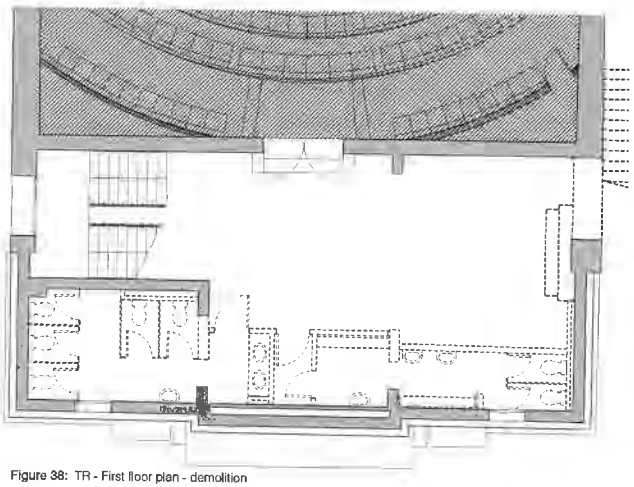


Figure 38: TR - First floor plan - demolition

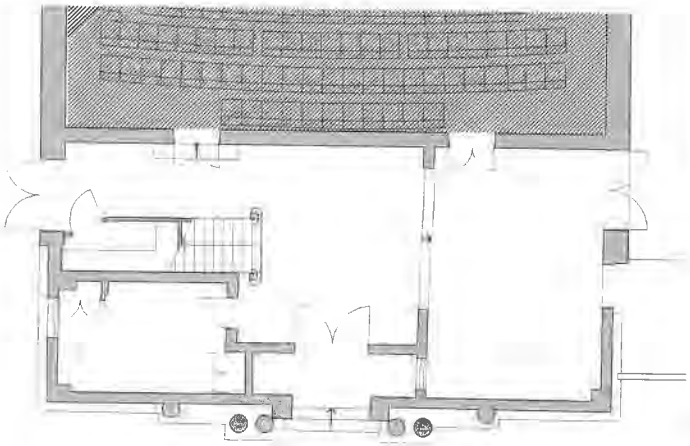


Figure 37: TR- Ground floor plan - proposed

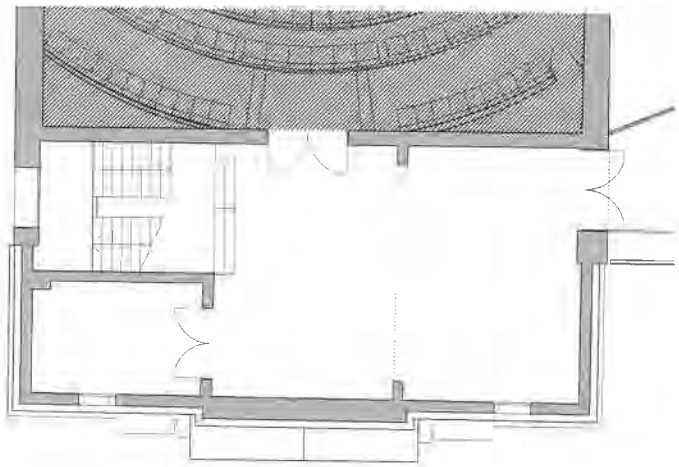


Figure 39: TR - First floor plan - proposed

For the first time in many years, the two storey Hedberg will be resurrected back to life, saving it from further deterioration and becoming derelict. To meaningfully integrate the old and new, the premise behind the treatment to the interior spaces of the two storeyed Hedberg has been to adapt the spaces respectively to accommodate contemporary use, ensuring the original spaces can be read. This is done through conserving lintels or other markers that define the original walls and creation of openings where they are required to make the spaces more useable. Preservation of the language and scale of the internal spaces are conserved to a level that enables the building to be adapted for contemporary use, rather than being an isolated museum object that cannot be used or experienced. At ground level, what was once the showroom for cars is now a 'showroom' for contemporary arts and creative industries marking the entry to the University and providing a social gathering and meeting space. At the upper level the rooms are opened and linked to serve versatile accommodation for the University and to provide access to the upper levels of the new Development. Demarcation between old and new is clearly articulated.

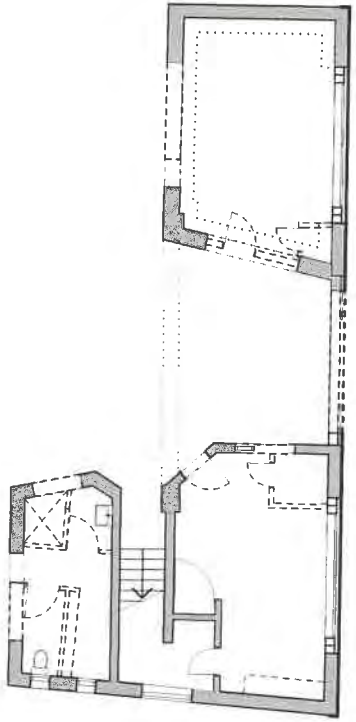


Figure 40: Hedberg Garage - Ground floor plan - demolition

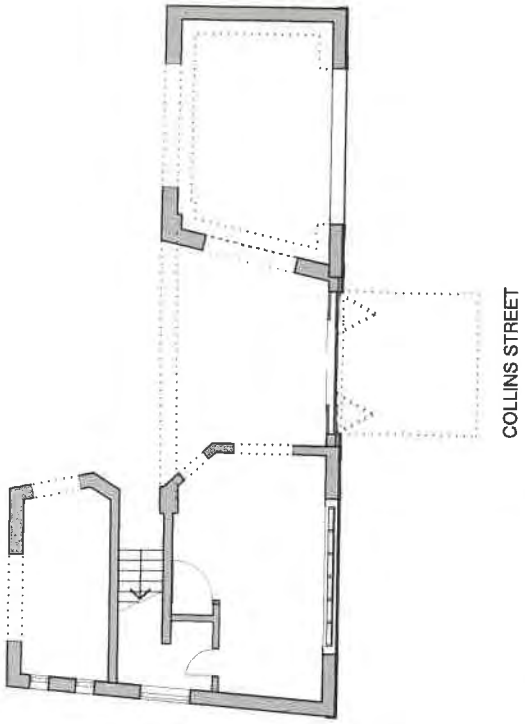


Figure 41: Hedberg Garage - Ground floor plan - proposed

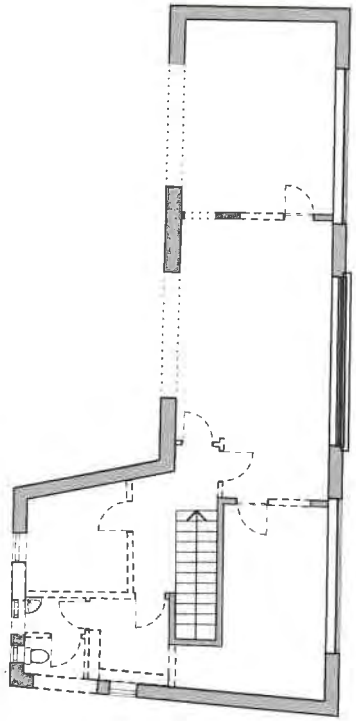


Figure 42: Hedberg Garage - First floor plan - demolition

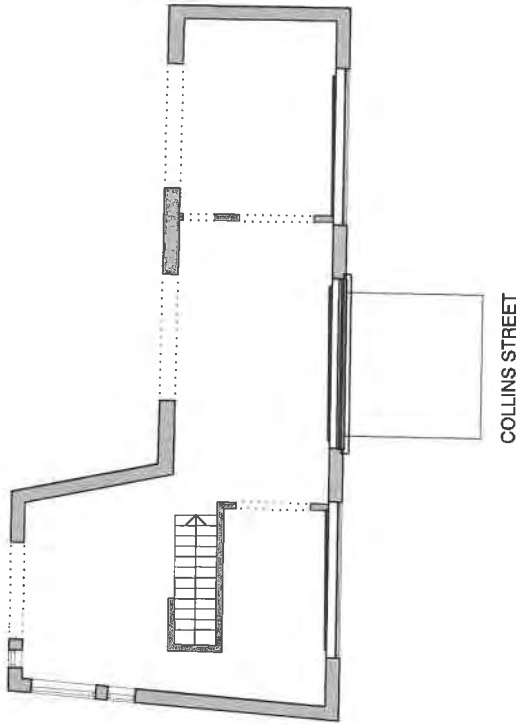
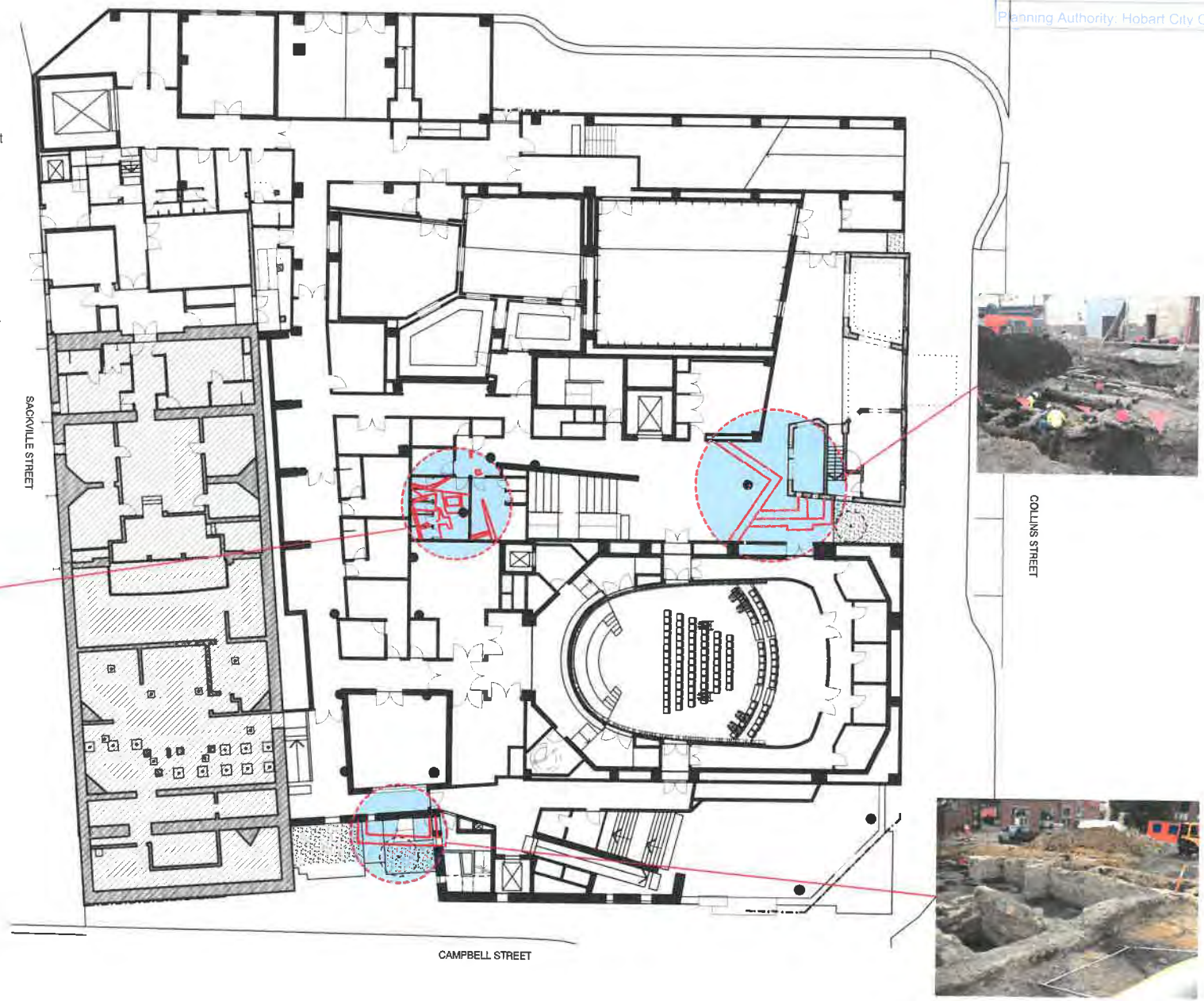


Figure 43: Hedberg Garage - First floor plan - proposed

Approach 03:

The design team will be in a position to ascertain the possible extent of revealing archaeological deposits insitu through viewing 'portals' or glazed elements once the archaeology excavation has been completed and findings fully documented. However, the design allows for accessibility to the undercroft of the auditorium in the TR, which was once the original 'Shades' bar and has responded to a selection of viewing possibilities to footings or remnants of archaeological deposits insitu based on the desktop studies that have been done previously.

One such opportunity is providing protected visual access to the Shakespeare Hotel foundations, which are within the Development's Campbell St garden, obviously named 'Shakespeare's Garden' outside the Campbell Street foyer. The garden is a design device to not only view some of the original footings of the 1830's hotel (formerly Captain Wilson's House) but is also an important device to create a set-back that allows the heritage frontage of TR to be fully appreciated. Other possibilities are within the ground level public foyers and back of house areas.



LEGEND

APPROACH 03:
POSSIBILITY OF INSITU REVEAL OF ARCHAEOLOGICAL DEPOSITS

NO WORK

Figure 44: Archaeological contextual approach

Approach 04:

The floor finish treatments of the ground level foyers will ground the building and connect it to its past. This will be done through the use of materials and patterns that recognise and interpret the various footprints of occupation, which overlay each other and give insight into the evolution of the site over the past 200 years.

Figure 45: Archaeological heritage desktop study overlay

Floor plans and the indicative perspective show ways in which the archeological desktop studies influence the treatment of finishes. Floor finishes to the main entry foyer Hedberg foyer trace the footprints of occupation over the evolution of the site.

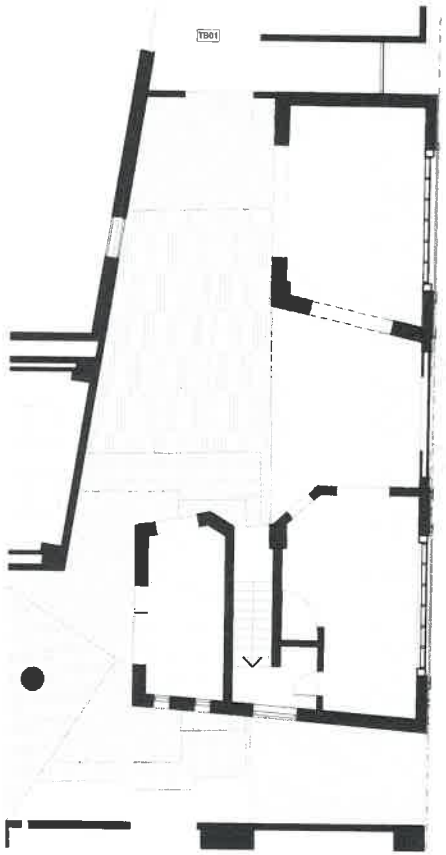


Figure 46: Hedberg - Ground floor plan

Figure 47: Floor finishes used recycled materials to create a 'red carpet' affect and wall finishes reflect footprint layers and provide opportunity for use of artefacts and recycled materials

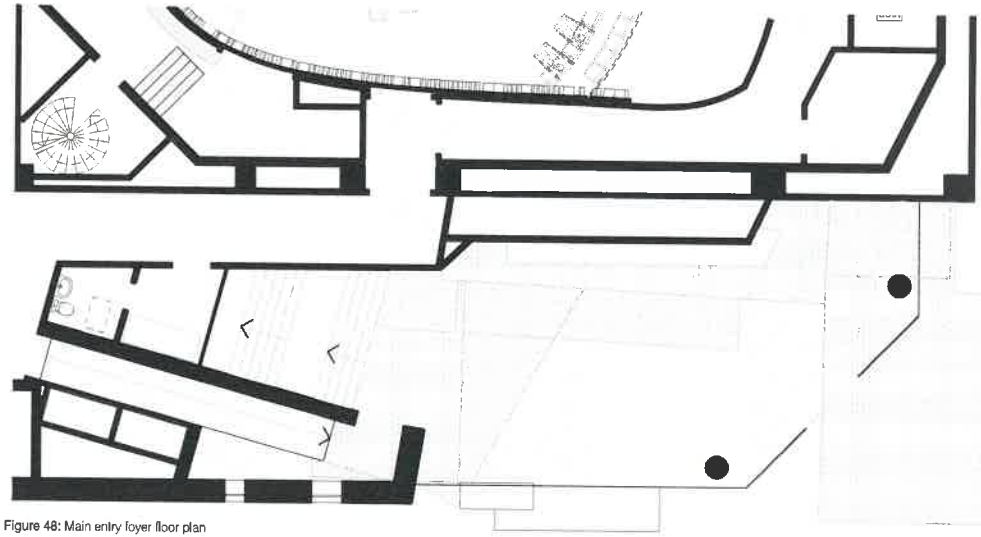


Figure 48: Main entry foyer floor plan

Approach 05:

Elements of lower value and broken artefacts, normally removed, will instead be used interpretatively to tell the story of the place and become part of the fabric of the building. While not rare or particularly worthy of prolonged viewing, they give authenticity and a sense of history through their re-use and connection to their place of origin. Such elements include:

- Bricks from Hedberg - reused in the walls facing the Hedberg entry, in the foyer walls that wrap into the main building and in the floor to trace previous layers of habitation and evolution of the site – acting as the site's 'red carpet' leading to performance venues.
- Doors from Hedberg - re-used in the foyer furniture and cladding.
- Timber trusses from Hedberg - re-used in the glazed connection between Hedberg and the new building.
- Sandstone blocks, lintels, bottles, ceramics and other materials from site - will mark the passage of time and be incorporated into the floors, walls and ceilings where practical, to become part of the building fabric and mark the footprints of the various buildings that occupied the site over time.

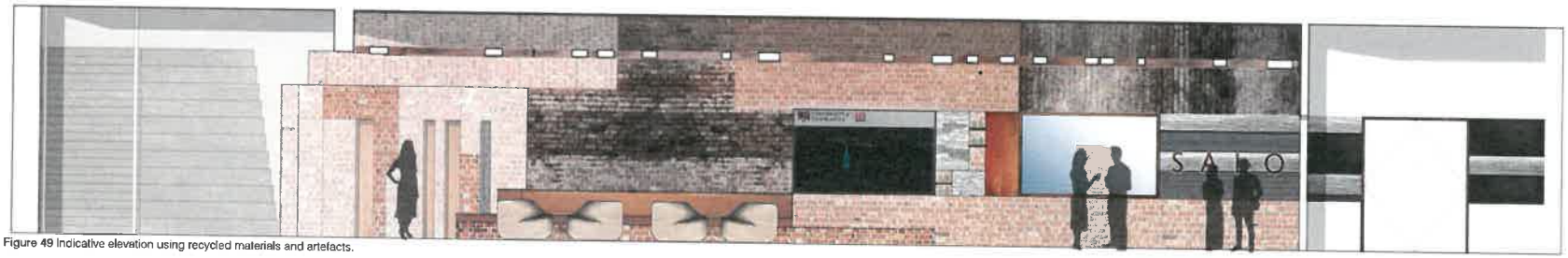


Figure 49 Indicative elevation using recycled materials and artefacts.

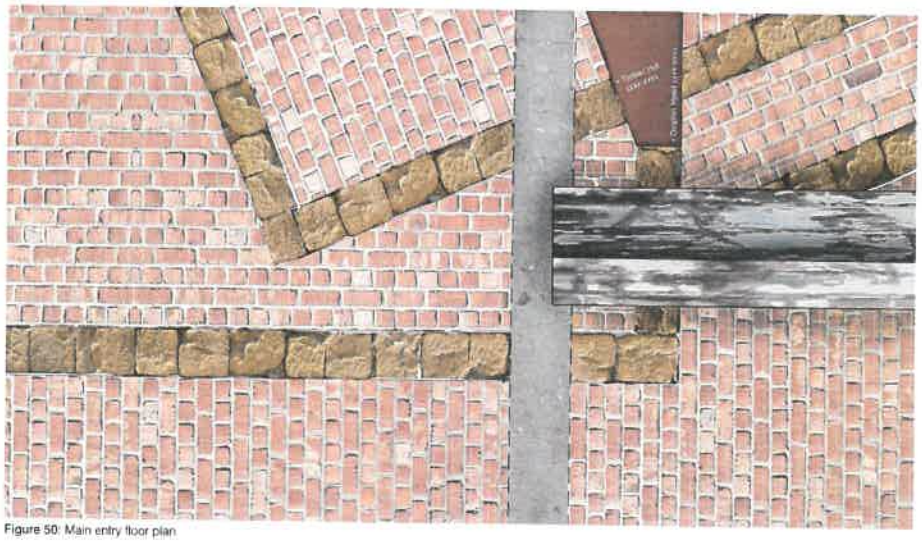


Figure 50: Main entry floor plan

Figure 51: Interpretive examples of how elements revealed though the archaeological excavation could be incorporated

Figure 52: Reuse of artefacts and found materials can add another layer of interpretation.

2.3 ASPECTS OF DESIGN INFLUENCED BY ABORIGINAL HERITAGE

The design team is currently in consultation with an indigenous culture consultant to help inform more deeply relevant aspects of aboriginal cultural and creativity that can influence aspects of the design in a meaningful way, as the archaeology that has been uncovered across the site has not revealed any aboriginal relics or physical evidence of occupation. This confirms the desk-top studies done previously and also supports the theory that due to the area being flood prone and originally being the 'delta' of where the two rivers converged, any artefacts or evidence would have been washed away.

There are clear physical references and research that provide a cohesive understanding of the evolution of the Development's site post-European settlement. However, the site's colonial evolution represents only a small part of the human history story. The challenge is to respectfully balance the interpretation of aboriginal history that is known to extend 40,000 years, with modern European history only being a fraction of that time.

The team's approach to acknowledging human occupation prior to colonial settlement is to interpret how the aborigines of the Mouheneenner clan shared their culture and to celebrate their creativity that is unique to this region. The layers of interpretation need to be significant enough not to be considered token. Given that the Development will be a conduit for contemporary performance and creative exchange, the team's approach is to interpret similar aspects of aboriginal performance, creativity and cultural endeavours in a meaningful way to connect to the present.

The team have identified five aspects of Tasmanian aboriginal culture which can be interpreted within the building; the shimmering opalescence of the aboriginal maireener shell necklaces that are a traditional cultural practice passed from mother to daughter through the generations; Fanny Cochrane Smith's performances in the TR and her recording - the only known recording of the Tasmanian aboriginal language; the leathery references of kelp grown in local waters used to create tough carrying vessels; the unique weave of the traditional baskets and the way storytelling filtered through their everyday activities.

As the team explores these themes, the interpretation of the past will be given contemporary relevance that is specifically linked to the creative industries and performance use of the new Development.

Figure 53

Figure 54

Figure 55

Figure 56

Figure 57

Contemporary interpretations of aboriginal culture, performance and creativity will influence aspects of the design. Images show maireener shell necklaces; Fanny Cochrane Smith being recorded; an extract from John Glover's 'Mt Wellington and Hobart Town from Kangaroo Point' 1934; and traditional basket weaving.

3. ENGINEERING STATEMENTS

3.1 ACOUSTICS + NOISE

Noise Breakout to the Community

Noise emissions from the Development will be controlled to reduce the risk of adversely affecting nearby noise sensitive receivers. Potential noise sources include noise from mechanical plant, deliveries, bump-in and bump-out and other associated operational activities

The nearest noise sensitive receivers include the residential premises at Sun Street to the north-east, upper floor residential premises at Collins Street to the south-east and the Royal Hobart Hospital located on Campbell Street.

The Tasmanian Environmental Protection Policy (Noise) 2009 provides guidance on appropriate noise emission limits. Recommended noise limits in the Policy are informed by the World Health Organisation (WHO) .

Arup has met with Hobart City Council to discuss suitable noise emission limits for this project and the Council has confirmed that the indicator noise levels presented in WHO guidelines would represent optimal targets. The WHO noise levels have therefore formed the basis of the following noise target limits proposed for this development.

Table 1: Noise Target Limits

LOCATION	SOURCE OF NOISE LIMIT	EXTERNAL NOISE LIMIT, Leq 15min, dB(A)	INTERNAL NOISE LIMIT	TIME PERIOD
Residential outdoor living area	WHO guideline	50		Day and evening
Residential dwelling	WHO guideline	45	30 (inside bedrooms)s	Day, evening and night
Hospital	WHO guideline		30* (inside ward rooms)	Day, evening and night

*Design assumes that the new hospital will have a sealed, double glazed façade to achieve the required climate control conditions within the wards and treatment rooms.

The Development incorporates a number of strategies and noise control measures to control noise emissions from this Development to these target limits. These are summarised as follows:

Table 2: Noise Control Measures

NOISE SOURCE	DESCRIPTION	NOISE CONTROL
Mechanical Services	Noise from chillers, air handling units, cooling	Selection of quiet equipment Locating noisy equipment inside the building within high performance acoustic partitions Localised noise barriers Acoustic attenuators Acoustic louvres
Operational Noise	Noise from goods deliveries, waste pickup, loading and unloading of equipment	Locate loading dock within building envelope. Loading dock to enclosed within building with roller door access.
Music Noise	Music and other noise from performance spaces,	Performance venues located within building envelope, enclosed within high performance acoustic constructions

3.2 ENERGY EFFICIENCY

Four key sustainability drivers have been established for this Development. Those key drivers and the sustainable measures employed in the design of the building to address those are outlined below.

Enhance the user experience/attract funding

The University aims to attract and retain high quality students, performers and staff, and appeal to patrons and philanthropists and the building will help do these things by providing high quality spaces and presenting an image that philanthropists as follows:

Focus on improved indoor environment quality including:

- Increasing outside air supply above code requirements
- CO2 control to ensure quality is met
- High acoustic comfort
- Visual and lighting comfort.

Good transport conditions including:

- Provision of cyclist facilities and amenities
- Closeness to public transport and amenities.

Save Money

Money spent operating the building is money that cannot be used for higher value activities within the development. The design of the building provides high quality, functional spaces that have low energy and water costs, and are easy to maintain including:

Reduced energy costs:

- Energy efficiency in mechanical services systems allowing for turn down and shut off to accommodate for variable building use
- CO2 control to ensure energy efficient operation
- Installation of PV panels to reduce peak energy demand.

Low water costs:

- Installation of rainwater tank and connection to amenities and irrigation
- Low flow fixtures and fittings.

A usable and maintainable building:

- Sophisticated commissioning and controls and building tuning
- Detailed metering and monitoring.

Manage risk

The building design and construction approach identifies and manages common risks for buildings of this complexity to ensure the performance outcomes required are met as follows:

A building performing as expected:

- Building tuning and monitoring
- Involvement of Independent Commissioning Agent
- Metering and monitoring
- Building Management
- Building user guides
- Early involvement of Facility Managers
- Climate adaptation plan and response to identified risks.

Responsibility/reputation

The building design and sustainability focus aim to attract and retain high quality students, performers and staff, and attract funding through the following measures:

- Achieving a 5 star green star rating
- Responsible waste management commitment throughout construction and operation
- Responsible approach to energy, water, indoor environment quality and materials.

3.3 WASTE MANAGEMENT

Waste throughout the building will be collected and delivered to two dedicated storage rooms located on level 2 adjacent to the loading dock. The first waste room will allow for 6 x 1100l bins: 4 x general waste, and 2 x co-mingled recycling. The second smaller room will allow for 6 x 240l bins, including 2 x cardboard.

Collection times/empty frequencies will be specified by the users to suite operational requirements. It is envisaged a rear mount bin tipper will be required. It would arrive via the Collins Street service entry door, and ascent the ramp into the secure loading dock area.

Office paper wheelie bins for paper recycling and security shredding will be located on various floors in office and resources areas.

3.4 OPERATING HOURS

The TR will continue to operate with unchanged operating hours between 7.00am and 3.00am depending on performances. The new components of the project will have normal operating hours from 8.00am to 6.00pm for the public which would be extended when performances are in operation from 7.00am to 3.00am.

3.5 RIVULET INTEGRITY

The project team confirm the structural design of the Development will not impact on the existing Hobart Rivulet structure. The design is based on providing footings which do not clash with or impose any additional superimposed loading from the new building on the rivulet. Note we cannot comment on the current loading conditions on the rivulet or impact of traffic loading at the loading dock.

The structural concept for the footing design comprises two solutions to avoiding impact on the rivulet. Where architecturally possible, columns, retaining walls and their respective footings are set back from the site boundary sufficiently to avoid the edge of the rivulet. The superstructure above has cantilevering floor plates in these areas to achieve the desired building extent. Where columns are required at the site boundary, above ground cantilevering footings are proposed. These are supported by piles which are set back from the edge of the rivulet and will be founded on compressible material over the rivulet to ensure that no additional loading is transferred to the rivulet walls. This concept is illustrated by the adjacent sketch Figure 58.

The geotechnical site investigation is currently in progress as part of the Early Works project. The final report is not yet available. However, the proposed footing design has been based on draft information from the site investigation and discussions with geotechnical engineers on footings appropriate for this site. Based on this information, we are confident that the proposed concept for the footings will be confirmed as appropriate once the geotechnical report is completed.

Avoiding damage and monitoring the rivulet during construction will be the responsibility of the contractor. This requirement will be specified in the tender documentation. We note that under the early works contract this monitoring is currently already in place on site. We expect a similar process to be applicable to the major works contract.

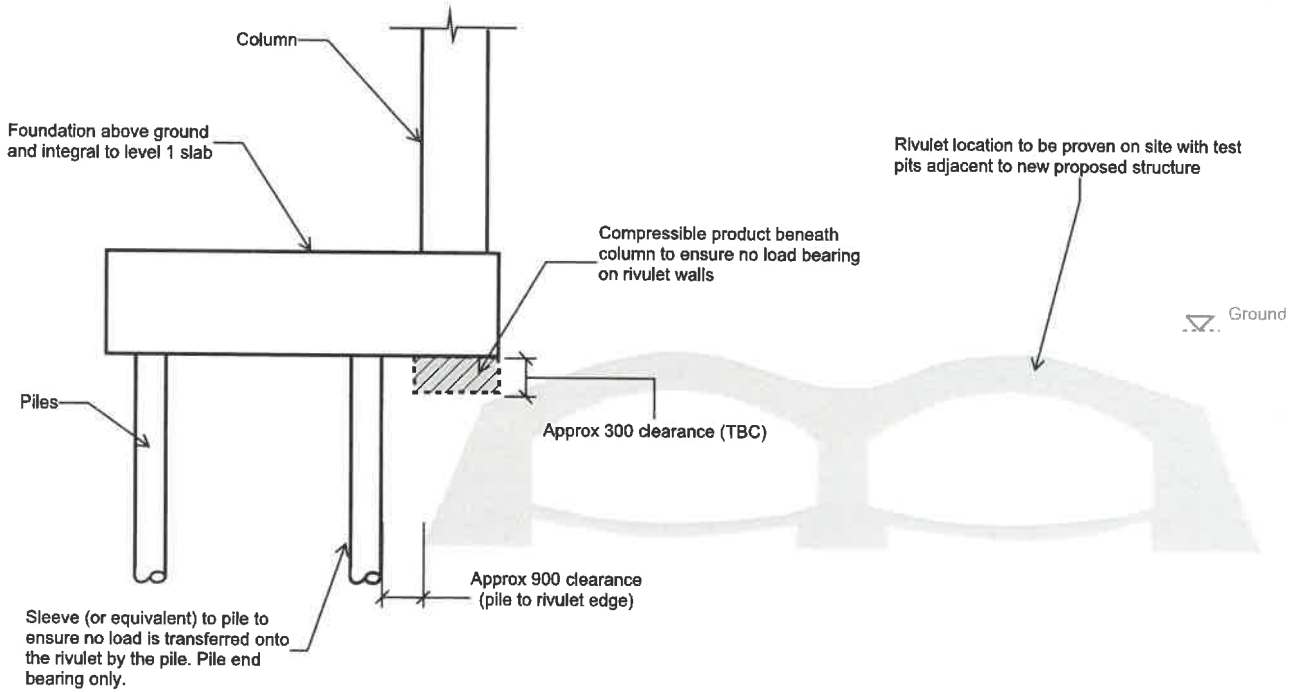


Figure 58

4. BUILDING POPULATION

The population calculation for the development takes into consideration future staff, students and patron numbers for the TR and the University.

The Development has been primarily classed as an 9b Education Facility by the building surveyor, under the definitions of the BCA/NCC, which is also suitable for use by external patrons outside of usual UTAS contact hours.

Functionally the Development is assessed for two types of operational modes:

1. Education Mode:
   The development is used by the University staff and students principally as a learning facility.
2. Performance Mode:
   Portions of the development are used in public performance mode. Facilities include the Recital Hall, Salon, Studio Theatre, Front of House and Back of House support facilities and the three levels of the existing TR. Staff and student numbers in this mode will be limited to learning areas not occupied in performance mode.

TABLE 3: THEATRE ROYAL (TR) POPULATION	
Staff	34
Students	35
Audience	698*
TOTAL A	**767**

TABLE 4: (TR) *AUDIENCE BREAKDOWN	
Stalls	337
Dress Circle	174
Gallery	187
SUB TOTAL B	**698**

TABLE 5: CONSERVATORIUM OF MUSIC (CoM) POPULATION	
Staff	110
Students	915
TOTAL C	**1025**

TABLE 6: PERFORMANCE AREAS SPACES BREAKDOWN	
Salon	120
Recital Hall	370
Studio Theatre	385
City Room	20
SUB TOTAL D	**895**

TABLE 7: (CoM) STUDENT POPULATION IN PUBLIC PERFORMANCE MODE	
Level 1	20
2	30
3	0
4	20
5	70
6	70
TOTAL E	**210**

Total Building Population Calculation - **TOTAL A + TOTAL C = 1792**

Total Population Calculation in Performance Mode - **TOTAL A + SUB TOTAL D = 1662**

Total Population Calculation in Student + Public Performance Mode - **TOTAL A + D + E =1872**

5. CONSTRUCTION STAGING

The anticipated construction sequence has been devised to provide the minimum possible disruption to the on-going operations of the TR. The TR will remain operational throughout any early stages and during the major construction phase A, which sees the majority of the new building constructed. Temporary fire escapes are planned for these stages and will be managed by the principal contractor as part of their construction management plan. The TR will cease operations for a period of time while phase B construction works are carried out.

Figure 59: Existing Fire Evacuation Diagrams

Figure 60: Proposed Fire Evacuation Diagrams - Construction Phase A

Figure 61: Construction Phase B

6. SHADOW DIAGRAMS

22 March / 22 September Equinox @ 9AM

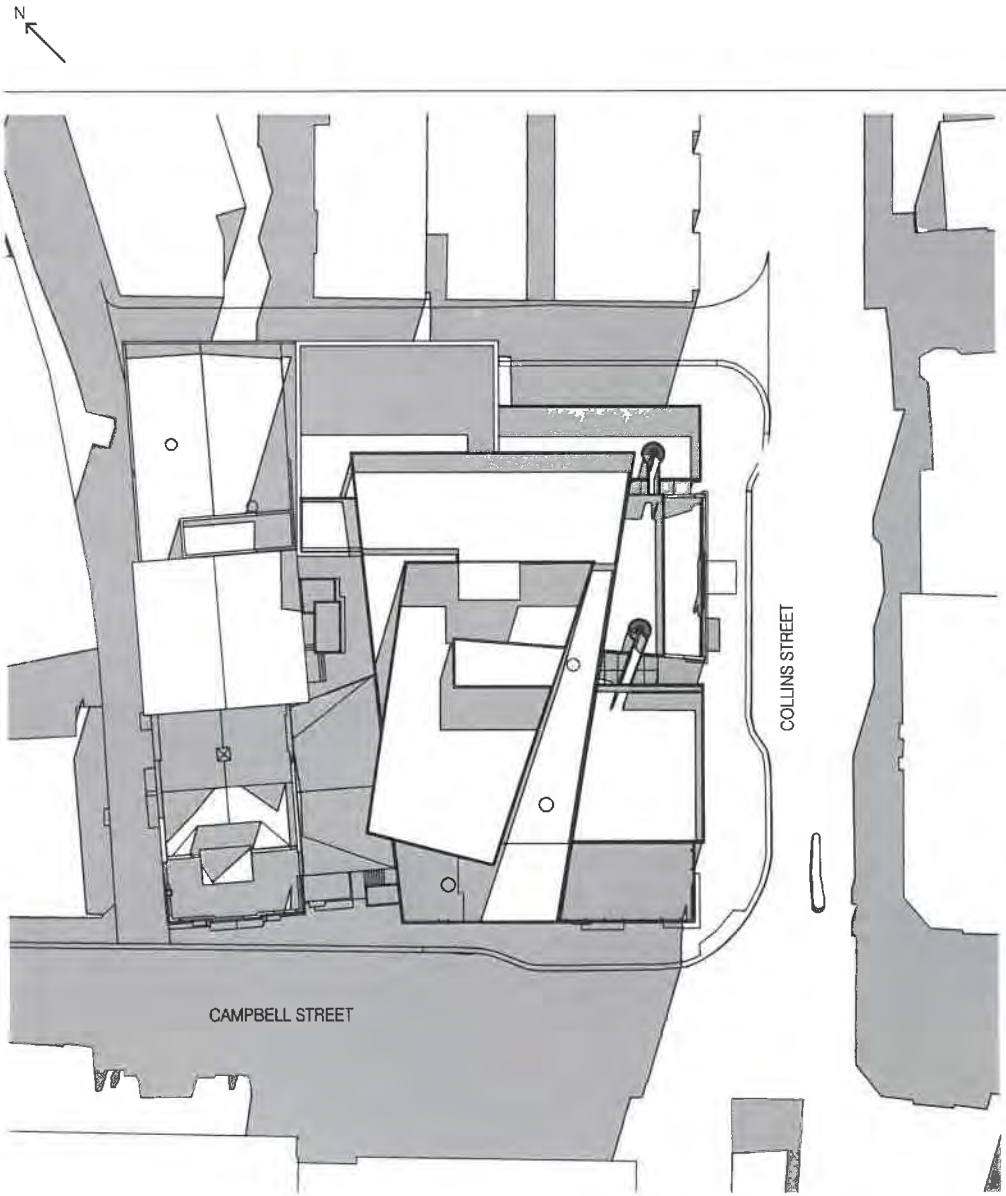


Figure 62

22 March / 22 September Equinox @ Noon

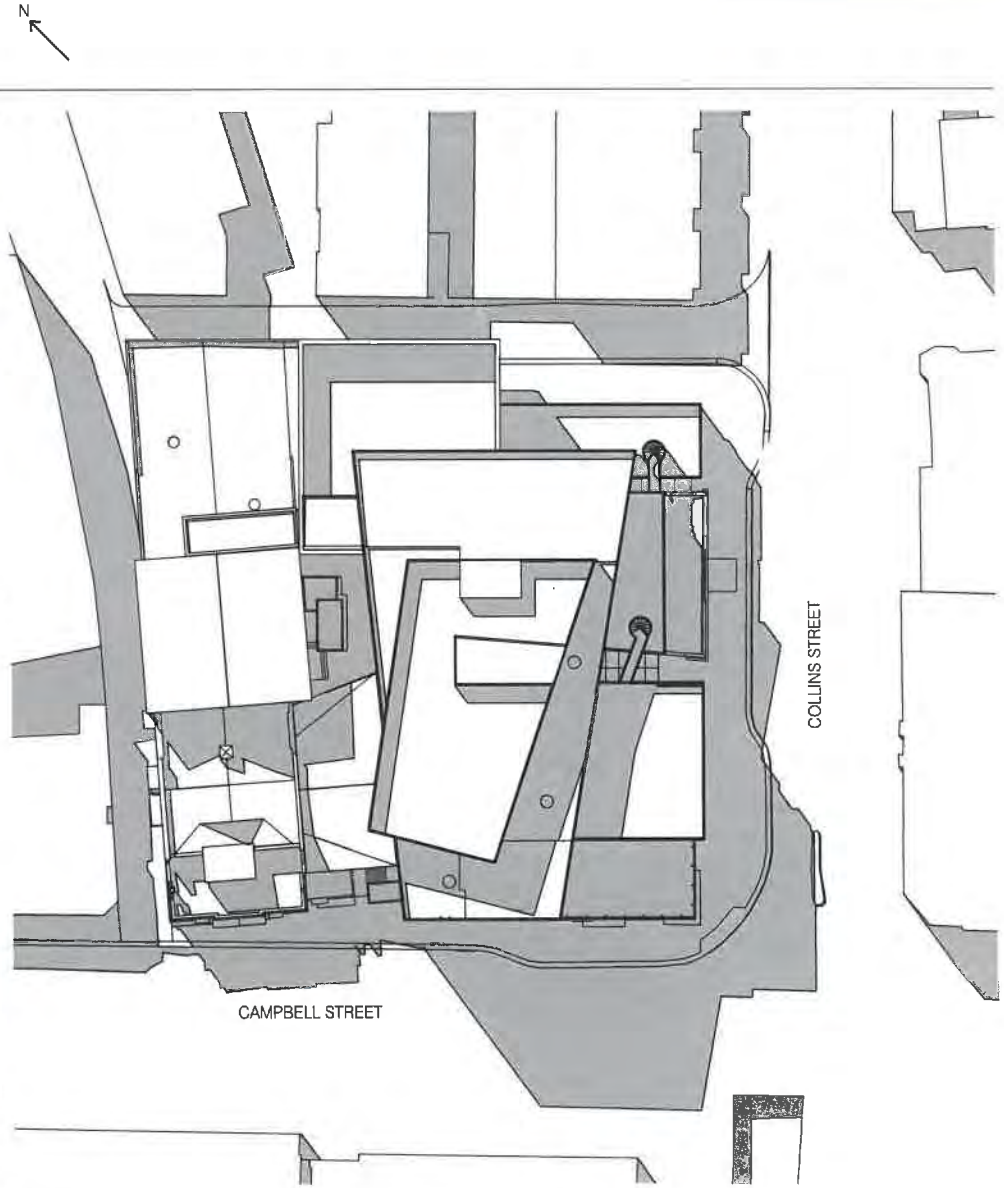


Figure 63

22 March / 22 September Equinox @ 3PM

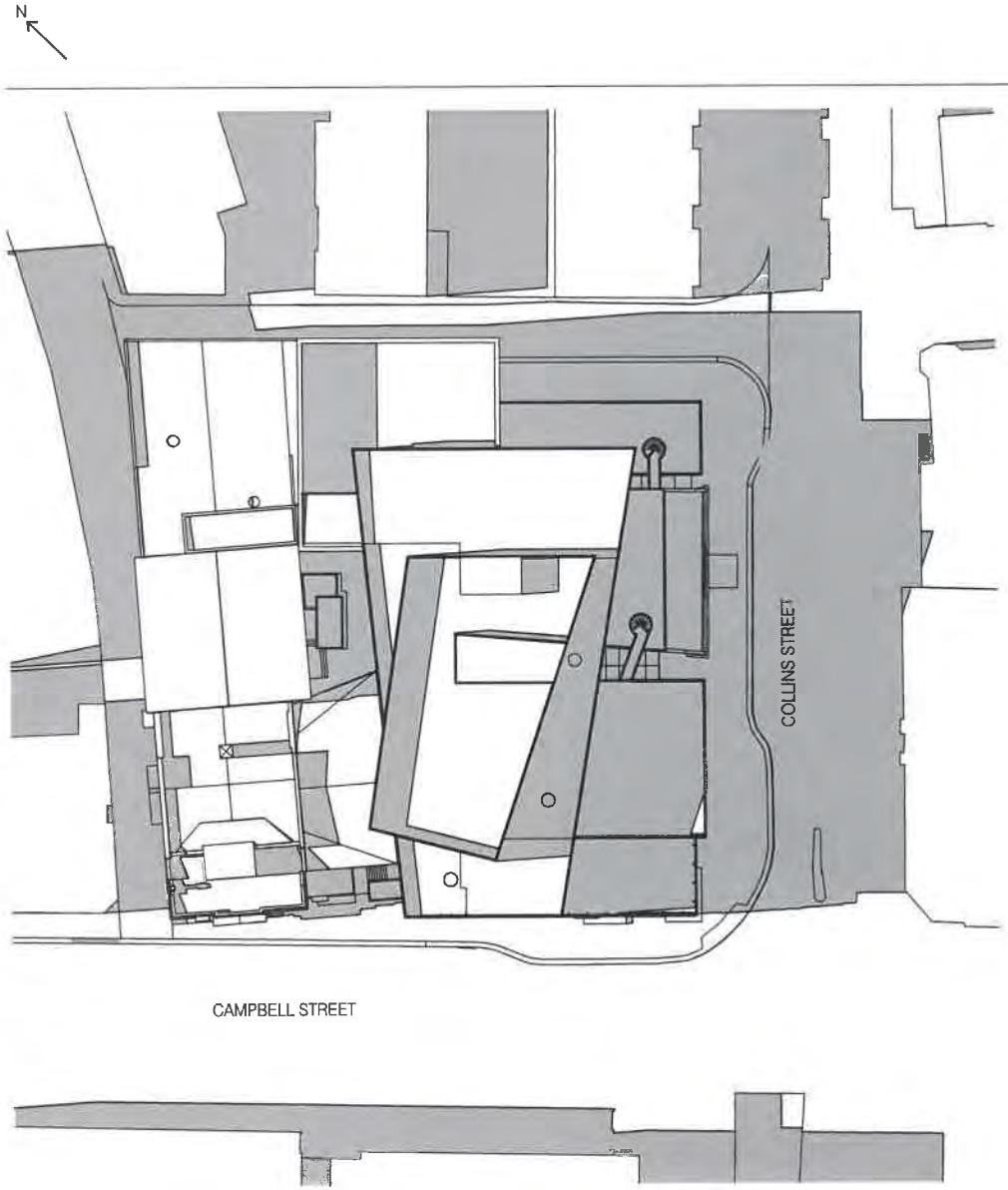
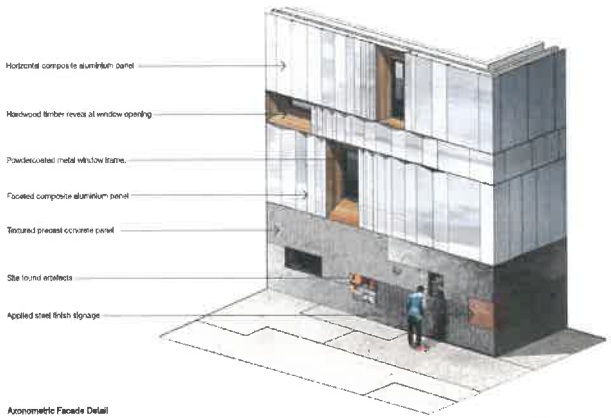
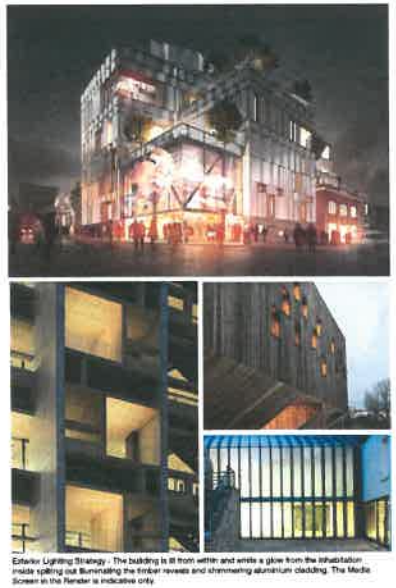


Figure 64

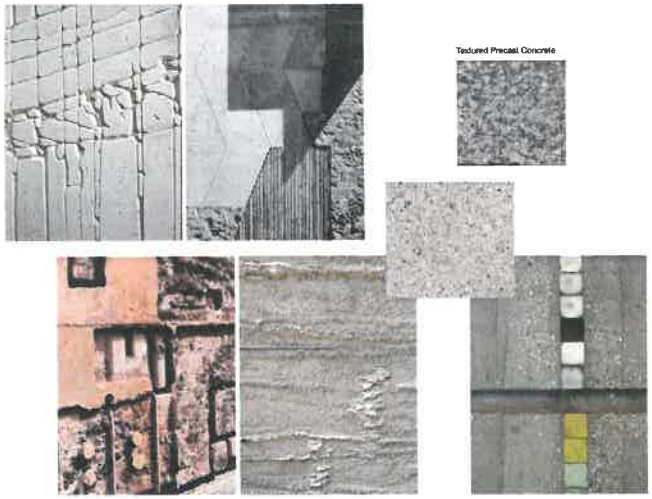
7. EXTERIOR MATERIALS BOARD



Axonometric Facade Detail



Exterior Lighting Strategy - The building is lit from within and emits a glow from the inhabitation inside spilling out illuminating the timber reveals and shimmering aluminium cladding. The Media Screen in the Render is indicative only.



Creative Industries and Performing Arts Development

Project Partners

UNIVERSITY of TASMANIA

Tasmania

THEATRE ROYAL

Primary Consultants

LIMINAL ARCHITECTURE

WOHA

ARUP

Figure 65

Attachment E

HOBART
CITY COUNCIL

PLN-16-00135-01
Application Number

DEVELOPMENT APPRAISAL

ENVIRONMENTAL DEVELOPMENT PLANNER ASSESSMENT

Site Address:	**19-27 & 29 Campbell Street and 19 Collins Street, HOBART**
Proposed Development:	**Academy of Creative Industries & Performing Arts**
Environmental Issues:	**Schedule 8 Environmental Management**
Appraisal Planner:	**Ben Ikin**

Assessment:

Proposal

Approval is sought to develop a performance venue and learning centre for the performing arts. Key components of the development are a Studio Theatre, Recital Hall, education spaces, improved back of house dock and storage, and administrative areas.

The development will also include range of other activities that are necessary to the operation of the activities, including production areas, performers areas, technical support, rehearsal areas, box office, merchandise areas, and services. A number of outside spaces are proposed in addition to the central courtyard including roof decks, and gardens on various levels.

The development will incorporate:

- A purpose built home for the Tasmanian College of the Arts' Conservatorium of Music.
- State of the art performance spaces for the public to enjoy.
- Multiple outdoor garden spaces, stepped rooftop gardens and terraces for collaboration, and taking in city views.
- An interdisciplinary education and research hub to further excel Tasmania's already notable creative industries.
- A significant building entrance addressing the important corner of Campbell Street and Collins Street.
- Multi-level foyer spaces providing equitable access to all seating levels of the TR with new front of house facilities such as ticketing, expanded bar, catering and toilet amenities.
- Refurbishment of the Theatre Royal's upper foyer to reference its 1911 heritage state where appropriate.
- Improved back of house provisions for the TR including a new loading dock, accessible lifts, updated dressing and green rooms, and improved storage.

The Theatre Royal will continue to operate with unchanged operating hours between 7.00am and 3.00am depending on performances. The new components of the project will have normal operating hours from 8.00am to 6.00pm for the public which would be extended when performances are in operation from 7.00am to 3.00am.

Schedule 8 Environmental Management

Schedule 8 Environmental Management applies to the assessment of all permissible 'Level 1' and 'Level 2' activities in the Sullivans Cove Planning Area. A Level 1 activity means an activity which may cause environmental harm and in respect of which a permit under the *Land Use Planning and Approvals Act 1993* is required but does not include a level 2 activity or a level 3 activity. The proposed use/development is considered a Level 1 Activity given the potential for noise and waste emissions that could cause 'environmental harm'.

The Objectives of Schedule 8 are:

- *To ensure that activities are managed in a way which facilitates the ecologically sustainable development of the Cove's natural and physical resources and the maintenance of ecological processes and genetic diversity.*
- *To ensure that activities are managed in a way which will not cause environmental nuisance or material or serious environmental harm*.

Clause 29.5 Environmental Objectives states *'where an activity constitutes either a Permissible 'Level 1' activity or a Permissible 'Level 2' activity within the relevant Activity Area, the following environmental objectives must be satisfied in determining such an application'.*

The environmental objectives are addressed individually below.

Air Quality

Activities shall demonstrate 'Best Practice Environmental Management' in respect to the minimisation and mitigation of all discharges to the atmosphere.

The proposed use/development is unlikely to have any significant impact upon air quality during the operational phase. Indoor air quality would be optimised by increasing outside air supply above code requirements and utilising CO_2 control to ensure quality is met. It should also be noted that the proposal includes the provision of cyclist facilities and amenities which will help to reduce use of polluting vehicles.

There is a risk of impacts upon air quality during the construction phase, primarily from dust generation. It is noted that Council's Environmental Health Unit have recommended a condition requiring the implementation of an approved construction management plan, including control of dust, which is supported.

Energy Efficiency

Use and development must demonstrate measures undertaken to improve energy efficiency in the design, layout and use of new and existing buildings.

The application indicates that the following energy efficiency measures will be incorporated into the development:

- Energy efficiency in mechanical services systems allowing for turn down and shut off to accommodate for variable building use.
- CO_2 control to ensure energy efficient operation.
- Installation of photo voltaic panels to reduce peak energy demand.
- Achieving a 5 star green star rating.

Average building performance under the Green Star system is 2 stars whereas 5 star performance is considered to constitute 'Australian excellence'.

Flora and Fauna

Flora and fauna of significance within the Sullivans Cove Planning Area must be protected. In particular, the habitats of the Derwent Estuary and Sullivans Cove water environment must be protected from the adverse environmental impacts of activities.

The existing site is essentially devoid of natural values, however there could be an impact upon aquatic flora and fauna in Sullivans Cove if contaminated soil or water is allowed to leave the site during the construction phase.

The application included a detailed plan for the management of potentially-contaminated soil and water during the archaeological excavation phase (*Assessment of Archaeological Activity and Operational Management Report*). However, this was limited to the archaeological excavation phase and a similar management plan should be required for the other works.

The construction management plan condition recommended by Council's Environmental Health Unit does not specifically require erosion, sediment and water quality control measures to be approved and implemented, and therefore a separate condition requiring this prior to construction is recommended.

Hazard and Risk

Land within the Cove must be used and developed in a manner which provides a safe working and living environment. In doing so, best practices must be employed in respect to the handling of dangerous goods and all relevant dangerous goods and environmental laws complied with.

The major hazards associated with the proposed use/development are flooding and exposure to contamination. Contamination issues are addressed by Council's Environmental Health Unit and flooding issues are addressed by Council's Environmental Engineering Unit.

Land Contamination

New activities which are proposed on land with a known history of industrial or other use where potential for contamination exists shall be accompanied by an environmental audit including an assessment of site condition.

Contaminated land shall be managed in a manner which is compatible with the intended future use of the area. New activities on known contaminated sites must only be 'permitted' to occur after appropriate clean-up of the site, or where it is clearly demonstrated that the

proposed activity will not result in an immediate or likely long term hazard to human health or the environment.

Contamination issues are addressed by Council's Environmental Health Unit and flooding issues are addressed by Council's Environmental Engineering Unit.

Land Reclamation

Land forming and reclamation activities, where required, shall be carried out in a manner which minimises adverse environmental consequences.

Not applicable.

Noise

Buildings shall be sited and designed having regard to current noise levels in the area as well as their intended use.

Where activities with the potential to generate significant noise are proposed in proximity to residential accommodation and other 'noise sensitive' activities, appropriate measures to mitigate and minimise noise emissions must be undertaken.

New 'noise sensitive' activities such as residential accommodation shall be located and where necessary incorporate acoustic measures to minimise the potentially adverse impacts of existing or likely future activities on nearby land.

A memo addressing noise issues was submitted with the application. The memo indicates that a preliminary noise impact assessment has been undertaken and the findings are summarised in the memo.

The preliminary noise impact assessment identifies that the nearest noise sensitive receivers surrounding the site include:

- Residential premises located at Sun Street and Collins Street.
- The Royal Hobart Hospital located on Campbell Street. It is understood that the proposed hospital redevelopment is likely to be taller than the existing hospital building, and also likely taller than the Development.
- Residential premises located on Sackville Street.

The location of these noise sensitive uses relative the development site are shown in Figure 1 below (reproduced from the ARUP memo).

Figure 1: Nearest noise-sensitive receptors

The *Tasmanian Environmental Protection Policy (Noise) 2009* provides guidance on appropriate noise emission limits based on World Health Organisation (WHO) noise limits. The memo notes that that in the case of a hospital, the WHO guidelines for an internal noise level of 30 dB(A) within ward rooms is a stringent criteria when compared with Australian Standard AS2107 *Acoustics - Recommended design sound levels and reverberation times for building interiors* (35 dB(A)).

The *Environmental Management and Pollution Control (Miscellaneous Noise) Regulations 2014* include noise emission limits from air conditioners. According to the ARUP memo, the night time noise limits for air-conditioners specified in the Regulations is 40 dB(A) measured outside and is more stringent than the WHO guidelines.

The applicable WHO and EMPC Noise Regulations adopted noise criteria are summarised in Table 1 below.

Noise Receiver Location	External Noise Target, dB(A)	Internal Noise Limit, dB(A)	Time Period	Comment
Residential outdoor living area	50	-	Day and evening	Noise limit applies for day and evening time activities only
Residential dwelling	45 **40 for mechanical services noise only**	30 (inside bedrooms)	Day, evening and night	Noise limit applies for activities that may apply any time during the day such as deliveries and mechanical plant noise
Hospital	-	30* (inside ward rooms)	Day, evening and night	

*Design assumes that the new hospital will have a sealed, double glazed façade to achieve the required climate control conditions within the wards and treatment rooms.

Table 1: Adopted noise criteria

The memo identifies the following key sources of noise associated with this development are outlined below:

Mechanical Plant

The majority of the mechanical plant servicing this building will be located on the roof as shown on the attached drawing. The mechanical plant will operate when the building is occupied which will include night time performances…

Loading Bay Deliveries

Currently bump in – bump out deliveries of sets and for performances takes place on Sackville Street and given the nature of this use, these deliveries can take place varying times of the day, evening and night. In the new development, all deliveries (including sets, rubbish collection) will be relocated to a dedicated loading bay along Sun Street. To protect the local residences from noise associated with this loading activity, the loading bay will be fully enclosed…

External Terrace Areas

The development includes a number of external terraces with the intent that these will activate the building façade and bring life to the building. Predominately the terraces will be used for flexible outdoor recreation and informal meeting spaces. While the full function of these spaces is yet to evolve, it is likely that they will on occasion be used for functions and performances. In these instances, to minimise the noise nuisance to the adjacent residences it is proposed that the Environmental Management and Pollution Control (Miscellaneous) (EMPC) Noise Regulations would apply.

The memo includes the following table identifying proposed noise mitigation measures.

Noise Source	Description	Noise Mitigation
Mechanical Plant Noise	Fan and compressor noise	Selection of quiet equipment Locating noisy equipment inside the building within high performance acoustic partitions Noise barriers Acoustic attenuators Acoustic louvres
Loading Bay	Vehicle engines Reversing beepers Handling noise	Fully enclosed loading bay Folding door to Collins Street Locate loading dock within building envelope. Loading dock to be enclosed with folding door
Outdoor Spaces	People talking Music	Predominately the terraces will be used for flexible outdoor recreation and informal meeting spaces during teaching hours. When used for occasional performances, EMPC would apply.

Table 2: Proposed noise mitigation measures

The memo includes the following commentary and table of predicted noise levels:

> *As the design of the building is currently underway, preliminary noise predictions have been undertaken based on the most current mechanical equipment selections to assess compliance with the noise criteria.*
>
> *Compliance with the noise criteria will be reviewed and checked as the design, procurement and installation is finalised.*
>
> *The noise predictions have focused on the worst case scenario, for example mechanical plant compliance with the most onerous (i.e. night time) noise criteria.*
>
> *The predicted level at the most affected noise receiver and compliance with the determining noise criteria is summarised in Table 3. Compliance at the most affected noise receiver indicates compliance at all other locations.*

Noise Source	Most Affected Noise Receiver	Applicable Noise Criteria	Predicted Noise Level	Complies with Noise Limit?
Loading Bay	Sun Street Residential Receivers	45 dB(A), external	25 – 30 dB(A)	✓
Mechanical Plant Noise	Sun Street Residential Receivers	40 dB(A), external	35 – 40 dB(A)	✓
	Hospital, upper levels	30 dB(A), internal	30 – 35 dB(A) internal assuming standard double glazing	Marginal exceedence*
Outdoor Spaces when used for events	Collins Street Residential Receivers			To comply with EMPC

*a 3 dB exceedence is considered just noticeable. Quieter mechanical equipment and noise mitigation will be investigated as the design develops.

The preliminary results suggest that the proposed noise mitigation measures will be appropriate to address all noise emissions from the loading bay and noise emissions from

mechanical plant with regard to the residential premises. The preliminary results suggest that mitigation measures may, or may not, be appropriate for noise emissions from mechanical plant with regard to the hospital. Modelling was not undertaken for noise emissions from use of the outdoor spaces, with the memo suggesting reliance on the provisions of the *Environmental Management and Pollution Control (Noise) Regulations 2014*.

The *Environmental Management and Pollution Control (Noise) Regulations 2014* largely regulate noise from vehicles and machinery, and don't regulate the types of activities likely to occur in the proposed outdoor spaces. The *Environmental Management and Pollution Control Act 2004* includes offences for causing 'environmental harm' which includes 'environmental nuisance'.

Given the objective of the schedule to '*ensure that activities are managed in a way which will not cause environmental nuisance or material or serious environmental harm'*, reliance on EMPCA alone to regulate environmental nuisance from the outdoor areas is not considered appropriate. The issue was discussed with Council's Senior Environmental Health Officer, and as a result of those discussions, it is recommended that a condition be applied to any permit granted limiting the use of these areas (for potentially nosy activities) to the hours of 8am to 10pm without the written consent of the Planning Authority.

As the preliminary modelling suggests that proposed noise mitigation measures may not be appropriate to limit noise levels in the new hospital wards to reasonable levels, a further condition is recommended requiring further modelling to demonstrate that noise levels in the new wards are unlikely to exceed 30dB(A) as a result of the mechanical plant under normal operating conditions, prior to the use commencing.

Noise during the construction phase must be addressed in the construction management plan recommended by Council's Environmental Health Unit.

Waste Minimisation

Activities must demonstrate how the practices and process associated with the activity will reduce as much as possible the amount of waste generated or the amount which requires subsequent treatment, storage or disposal. Activities must address waste minimisation from the source (source reduction) and recycling.

Where appropriate, applications for new activities must include a waste management plan. Activities within roads and other public spaces must incorporate where relevant suitable waste and litter management facilities.

The application indicates the re-use of various existing materials on the site:

- Bricks from the Hedberg Garage.
- Doors from the Hedberg Garage.
- Timber trusses from Hedberg Garage.
- Sandstone blocks, lintels, bottles, ceramics and other materials.

The application that the following waste management facilities will be provided:

> *Waste throughout the building will be collected and delivered to two dedicated storage rooms located on level 2 adjacent to the loading dock. The first waste*

room will allow for 6 x 1100l bins: 4 x general waste, and 2 x co-mingled recycling. The second smaller room will allow for 6 x 240l bins, including 2 x cardboard.

Collection times/empty frequencies will be specified by the users to suite operational requirements. It is envisaged a rear mount bin tipper will be required. It would arrive via the Collins Street service entry door, and ascent the ramp into the secure loading dock area. Office paper wheelie bins for paper recycling and security shredding will be located on various floors in office and resources areas.

Wastewater minimisation will also occur through the use of low flow fixtures and fittings.

Water Quality

Activities shall demonstrate 'Best Practice Environmental Management' in respect to water use and management. Water use and disposal shall be managed in a manner which seeks to minimise off site disposal and which seeks to protect and, where possible, improve ambient water quality. The principles of minimising water sewage and waste water generation and the re-use, recycling and pre-treatment of waste water prior to disposal must be encouraged.

The application proposed the following measures to reduce water use and wastewater disposal:

- Installation of a 45,000L rainwater tank and connection to amenities and irrigation.
- Use of low flow fixtures and fittings.

In regard to the construction phase, the application included a detailed plan for the management of potentially-contaminated soil and water during the archaeological excavation phase (*Assessment of Archaeological Activity and Operational Management Report*). However, this was limited to the archaeological excavation phase and a similar management plan should be required regarding the other works. The construction management plan condition recommended by Council's Environmental Health Unit does not specifically require erosion, sediment and water quality control measures to be approved and implemented, and therefore a separate condition requiring this prior to construction is recommended.

Recommended Conditions:

ENV2 Sediment, erosion and water quality control measures in accordance with an approved soil and water management plan (SWMP) must be installed, prior to the commencement of work and maintained until such time as all disturbed areas have been stabilised and/or restored or sealed to the Council's satisfaction.

A soil and water management plan (SWMP) must be submitted and approved, prior to the commencement of work. The SWMP must:

- be prepared in accordance with the *Soil and Water Management on Building and Construction Sites fact sheets* (Derwent Estuary Program, 2008).

http://www.hobartcity.com.au/Development/Engineering_Standards_and_Guideline All work required by this condition must be undertaken in accordance with the approved soil and water management plan (SWMP).

Advice: Once the soil and water management plan (SWMP) has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Reason for Condition

To avoid the pollution and sedimentation of roads, drains and natural watercourses that could be caused by erosion and runoff from the development.

ENVs1 The outdoor spaces must not be used for performances, rehearsals, screenings, functions or other organised events between the hours of 10pm and 8am without the prior written consent of the Planning Authority.

Reason for condition

To ensure that activities are managed in a way which will not cause environmental nuisance or material or serious environmental harm.

ENVs2 Noise mitigation measures must be employed to minimise internal noise levels from proposed mechanical plant in the wards of the Royal Hobart Hospital (existing and future).

A noise modelling report demonstrating that noise levels in the wards will be unlikely to exceed 30dB(A) as a result of the mechanical plant under normal operating conditions must be submitted and approved prior to operation of the mechanical plant. Details of all required mitigation measures to achieve such levels must be included.

The use/development must be undertaken in accordance with the approved noise modelling report.

Advice: Once the noise modelling report has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Reason for condition

To ensure that activities are managed in a way which will not cause environmental nuisance or material or serious environmental harm.

Recommended Advice:

N/A

60 Barrack Street Hobart Tasmania 7000 T +613 62310166
contact@liminalarchitecture.com.au liminalstudio.com.au

Attachment F

LIMINAL ARCHITECTURE

Thursday, 24 March 2016

Mr Ben Ikin
Hobart City Council
16 Elizabeth Street
HOBART TAS 7000

Dear Ben,

Creative Industries and Performing Arts Development – UPA

We refer to your correspondence dated 22 March 2016 outlining a request for some additional information on the above project. Please find our responses following:

What size are the solar panels and will it include battery storage to reduce peak energy demand?
Exact size of panels is yet to be determined but are likely to be standard solar panel size, approximately 1500 x 750mm, subject to final selection.

Will there be a smart energy management system?
A Building Management System (BMS) will be used to manage and monitor mechanical services, electrical and water usage. The BMS will help to identify trends and monitor energy consumption of the building's end users. Distributed electrical and water meters will be provided.

With emergent battery storage technology is there an opportunity to eliminate the generator backup system in the L1 plant room?
The life support system requirements are too large to be feasibly run off battery systems.

Does energy efficiency include selection of low energy lighting systems?
Low energy lighting systems will be included. To achieve a Green Star rating, which the building is targeting, energy efficiency is a key component which will include energy efficient lighting.

Please provide shadow diagrams for winter.
Refer attached report supplement 6A Shadow Diagrams for the Winter Solstice, including diagrams for 9AM, Noon, 2PM, & 3PM.

What is the actual new building population during a normal teaching day?
1025 persons. Refer DA Report p.29.

What is the bike store capacity?
54 mounted on double stack units.

What use are traffic volumes from 2004 and how do they relate to projected traffic volumes in 2018/2019
Refer attached recent Traffic Volume Data received from Howarth Fisher and Associates.

We trust this addresses your query satisfactorily. If you have any queries please do not hesitate to contact us.

Yours faithfully
LIMINAL ARCHITECTURE

Jeremy Holloway RAIA
Associate

Enclosure
Copies: Terry Lockwood, UTAS; Irene Duckett, IreneInc

6. COMMITTEE ACTING AS PLANNING AUTHORITY

6.2 APPLICATIONS UNDER THE SULLIVANS COVE PLANNING SCHEME 1997

6.2.2 99 SALAMANCA PLACE (ALSO KNOWN AS PRINCES PARK), BATTERY POINT - PUBLIC TOILETS - PLN-16-00085-01 – FILE REF: 1832167 & P/90/889

38x's
(Council)

The General Manager reports:

"In accordance with the provisions of Part 2 Regulation 8(6) of the Local Government (Meeting Procedures) Regulations 2005, this supplementary matter is submitted for the consideration of the Committee.

Pursuant to Regulation 8(6), I report that:

(a) information in relation to the matter was provided subsequent to the distribution of the agenda;
(b) the matter is regarded as urgent; and
(c) advice is provided pursuant to Section 65 of the Act."

DES-F-0102/52
12/05/2015

HOBART
CITY COUNCIL

APPLICATION UNDER SULLIANS COVE PLANNING SCHEME

Type of Report	Council
Committee:	4 April 2016
Council:	11 April 2016
Expiry Date:	11 April 2016
Application No:	**PLN-16-00085-01**
Address:	**99 Salamanca Place (Also Known As Princes Park), Battery Point**
Applicant:	Terroir Pty Ltd, 181 Elizabeth Street, Hobart
Proposal:	**Public Toilets**
Representations:	Nil
Performance criteria:	Heritage, Archaeology, Building Form, Public Urban Space

1. Executive Summary

1.1. Planning approval is sought for new public toilets in Princes Park at its southern entrance on the intersection of Hampden Road, Battery Square and Castray Esplanade. The toilets include specific child facilities. The proposed building is modern in design with a maximum height of 3.3m.

1.2. The proposal relies on performance criteria to satisfy the following standards and codes.

1.2.1. Urban Form (Built Form)

1.2.2. Public Urban Space

1.2.3. Heritage

1.2.4. Archaeology

1.3. No representations to the application were received during the statutory advertising period 3 to 18 March 2016.

1.4. The proposal is recommended for approval subject to conditions.

1.5. The final decision is delegated to the Council.

2. Site Detail

2.1. The site is Princes Park, also known as 99 Salamanca Place. The toilets are proposed to be located close to the park's southern entrance on the junction of Battery Square, Hampden Road and Castray Esplanade.

Figure 1: The red dot and arrow indicated the proposed location of the toilets.

Figure 2: The southern entrance to the park. The toilets will be on the left hand side of the image, just after the entrance.

Figure 2: The location of the proposed toilet is on the right hand side of the image.

3. Proposal

3.1. Planning approval is sought for new public toilets in Princes Park at its southern entrance on the intersection of Hampden Road, Battery Square and Castray Esplanade. The toilets include specific child facilities. The proposed building is modern in design with a maximum height of 3.3m.

Figure 3: A montage of toilets looking from the entrance into the park.

Figure 4: A montage looking across the park at the proposed toilets with the entrance on the left hand side of the image.

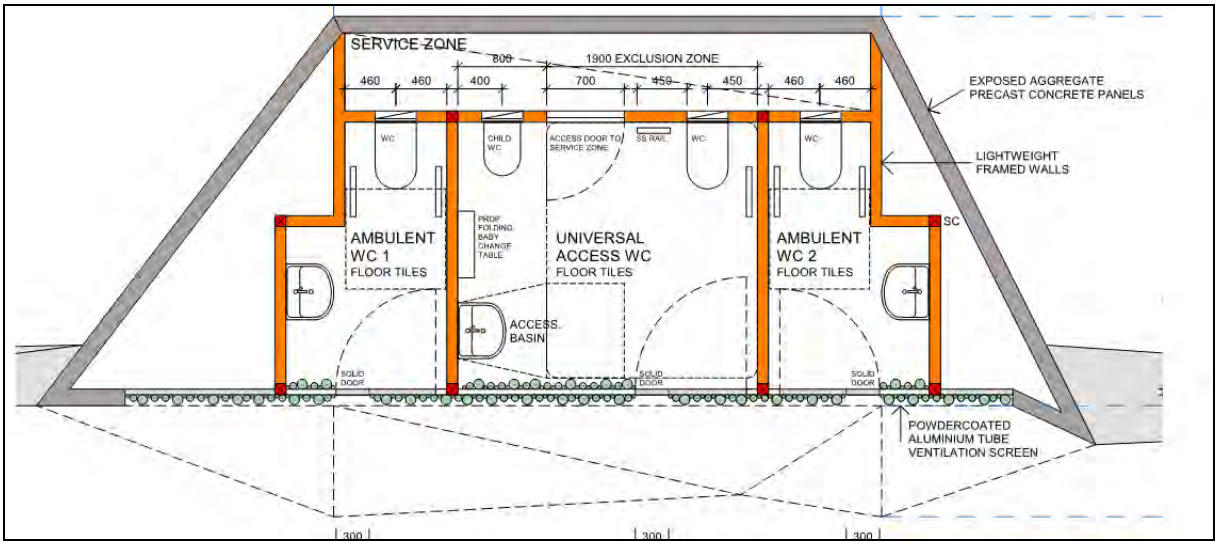


Figure 5: The floor plan of the proposed toilets.

4. Background

4.1. N/A

5. Concerns raised by representors

5.1. No representations to the application were received during the statutory advertising period 3 to 18 March 2016.

6. Assessment

The *Sullivans Cove Planning Scheme 1997* is a performance based planning scheme. This approach recognises that there are in many cases a number of ways in which a proposal can satisfy desired environmental, social and economic standards. In some cases a proposal will be 'permitted' subject to specific 'deemed to comply' provisions being satisfied. Performance criteria are established to provide a means by which the objectives of the Planning Scheme may be satisfactorily met by a proposal. Where a proposal relies on performance criteria, the Council's ability to approve or refuse the proposal relates *only* to the performance criteria relied on.

6.1. The site is located within Activity Area 2.0 Sullivans Cove 'Mixed Use' of the *Sullivans Cove Planning Scheme 1997*.

6.2. The existing use is passive recreation, which is not proposed to change or intensify.

6.3. The proposal has been assessed against;

6.3.1. Parts A and B – Strategic Framework

6.3.2. Part D – Clause 16 – Activity Area Controls

6.3.3. Part E – Schedule 1 – Conservation of Cultural Heritage Values

6.3.4. Part E – Schedule 2 – Urban Form

6.3.5. Part E – Schedule 3 – Public Urban Space

6.3.6. Part E – Schedule 4 – Signs

6.3.7. Part E – Schedule 5 – Traffic, Access and Parking

6.3.8. Part E – Schedule 6 – Subdivision

6.3.9. Part E – Schedule 7 – Demolition

6.3.10. Part E – Schedule 8 – Environmental Management

6.4. The proposal relies on the following performance criteria to comply with the applicable standards;

6.4.1. Heritage – clause 22.4.5

6.4.2. Archaeology – clause 22.6.5.

6.4.3. Urban Form (Building Form) – clause 23.6.2

6.4.4. Public Urban Space (Building or Works) – clause 22.4.6

6.5. Each performance criterion is dealt with separately below.

6.6. Heritage and Archaeology – clause 22.4.5 and 22.6.5

6.6.1. The Council's Senior Cultural Heritage officer engaged an external consultant architect to provide a heritage assessment of the proposal against the provisions of the *Sullivans Cove Planning Scheme 1997*. The consultant architect's report is provided at Attachment E.

6.6.2. The consultant architect has recommended that the proposal be refused. The objections to the proposal are that it is too angular and that it is not setback far enough from a horizontal alignment of the entry structure. As a consequence it is the consultant architect's opinion that the proposal does not meet the following requirements of the heritage schedule of the planning scheme:

Building or works' must compliment and contribute to the cultural significance, character and appearance of the place and its setting

The location, bulk and appearance of 'building and works' must not adversely affect the heritage values of any place of cultural significance

'Building or works' may be recognisable as new but not be individually prominent.

6.6.3. The consultant architect's report provides little analysis to support this conclusion, offering the following:

> The proposal is clearly visible withi (sic) the frame of the entry arbour and obscures the view into the park itself and the landscape beyond … the proposed form, particularly in close proximity to the entry, provides a visual intrusion into the character of the Park … the visual impact of the proposal on the entry [is that its] appearance in this location dominates the entry into the park.

6.6.4. The consultant architect's assessment appears to be that the building will be too visible, based on setback from an arbitrarily determined line and the angularity of the building. There is no analysis of the setback to demonstrate why that alignment is so significant to the cultural values of Princes Park, or why not setting the toilets back from that particularly alignment will mean that the building will be too visible.

6.6.5. There is also no analysis to support the contention that angularity translates into higher visibility or more pronounced visual intrusion.

6.6.6. Furthermore, it is not clear why that visibility is unacceptable in terms of the impact on the cultural values of the site, which are identified by the consultant architect as:

> It is clearly evident that Princes Park is a place of high cultural heritage significance and integrity. The historic military and communications significance, not only has been retained by the formation of the Park and the high standard of its maintenance, but the Park's construction during the Great Depression as a work relief programme, and the protection of the signal station as the result of interest shown by the public in conservation, extends that cultural heritage significance, into the 20th Century as a place of public recreation.

6.6.7. There is simply no articulation at all about how the building form or setback impacts on those values.

6.6.8. Similarly there is no clear articulation how the proposal fails to comply with the identified provisions of the heritage schedule of the planning scheme. More specifically it should have been explicitly stated by the consultant architect how the visibility of the building:

- Does not compliment the cultural significance, character and appearance of the place and its setting; and
- Does not contribute to the cultural significance, character and appearance of the place and its setting; and
- Adversely affects the heritage values of the place due to its location, bulk or appearance; or
- Results in it being individually prominent.

6.6.9. It is pertinent to note that the proposed building is modest in size at 4.5m deep, 9.55m wide and 3.3m height. It is also noted that the main building line of the building is in fact set back in line with the consultant architect's alignment of the entry arbour, with only the roof and low walls projecting beyond that alignment.

6.6.10. It is also pertinent to note the heritage comments in support of the proposal from the applicant, who is also an architect with experience dealing in heritage properties, which are as follows:

The proposed works are located on the western side at the southern end of the pathway (former 'roadway'), and do not alter the path's alignment.

The proposed public convenience works are a modern-day alignment with the "beautility" philosophy by providing functional services (toilets) in a place-sensitive contemporary design to improve the amenity of locals and visitors.

The proposed works are within an existing garden bed and does not impact on the extent or legibility of the terraces and sloping lawns.

The proposal to use bluestone exposed aggregate concrete is a sensitive aesthetic response to the historic stone walls whilst not mimicking or diluting their heritage significance.

6.6.11. Based in particular on the lack of analysis of the proposal against the relevant provisions of the planning scheme, the conclusion presented by the consultant architect is not considered to be well made out. As a result, adopting the recommendation of the consultant architect is considered to place the Council at risk of an appeal. At appeal the evidence provided by the Council's consultant architect would hold the same weight as the evidence of the applicant architect, noting that neither of them is qualified as heritage experts.

6.6.12. As a consequence of the above the consultant architect's conclusion is not supported.

6.6.13. It is finally noted that the Tasmanian Heritage Council has approved the application.

6.7. Urban Form (Building Form) – clause 23.6.2

6.7.1. The proposal is for a public toilet with a maximum height of 3.3m.

6.7.2. The planning scheme provides that the permitted height in Princes Park is at the discretion of Council, and as such is required to be assessed against the objectives of the schedule which are as follows:

- *The traditional urban pattern of Sullivans Cove is to be conserved. A contemporary adaptation is to be created in development/redevelopment areas.*

- *Views to Sullivans Cove along primary spaces are to be retained, especially to the River Derwent.*
- *Views over the land bounded by Tasman Highway, Brooker Avenue and Liverpool Street from the City and Wapping to the Domain and from the Domain and Tasman Highway to the City are to be retained.*
- *Expression of the Wall of the Cove is to be encouraged where possible.*
- *The bulk and height of buildings must reflect the natural topography of the Sullivans Cove Planning Area, the amphitheatre sloping down to the Cove and the Macquarie Street and Regatta Point Ridges.*
- *A diversity of building heights and volumes will be encouraged within this over-riding pattern, but buildings must have a respectful relationship to each other and to buildings of identified cultural significance within a street.*
- *New buildings must not be individually prominent in terms of contrast with neighbouring buildings by being significantly higher or having a larger apparent size when viewed in street elevation.*
- *New buildings should facilitate the creation of 'secondary spaces' on lots in the Cove. Such spaces should be encouraged where they demonstrably create useable pedestrian environments and facilitate pedestrian movement and views.*
- *New urban gardens are to be encouraged in secondary spaces only.*

6.7.3. The proposed 3.3m height is considered modest and acceptable with respect to the above.

6.8. Public Urban Space (Building or Works) – 22.4.6

6.8.1. The proposal is for a new building accommodating a public toilet in Princes Park.

6.8.2. The planning scheme identifies Princes Park as being part of the Cove Slopes, and provides that a new building in the parks of the Cove Slopes is discretionary. As such it must be assessed against the civic works guidelines in clause 24.4.8 and the public urban space type function in clause 24.4.10.

6.8.3. The civic works guidelines provide:

Context		**Preferred Design Response**	
Public Urban Space Type	Spatial and Urban Character	Civic Works Character	Positioning Criteria
Cove Slopes	Narrow sloping streets.	Hard surfaces, modest utilitarian character.	Views down sloping streets to Sullivans Cove must be respected. Works and furniture should be sited parallel to the direction of views.

6.8.4. The toilets will not impact on the views to Sullivans Cove. They are sited adjacent to the path and within an already vegetated area.

6.8.5. The public urban space type function provides:

The function of this public urban space type is to facilitate outdoor recreation activities. These spaces are set aside for pedestrian activities, and form an important component of the character and functionality of the Cove. The amenity of these spaces if of utmost importance. Such spaces must be protected from the impacts of overshadowing, traffic noise and other disturbances. Such spaces must also be well connected to other pedestrian oriented spaces in the Cove.

6.8.6. The proposal will not compromise outdoor recreational activities in the park, being located in an area of the park that is currently vegetated and not available to be used. By improving the toilets, it is also considered that the park is enhanced as an outdoor recreation facility.

6.8.7. The proposed design of the building is modern and interesting and will enhance pedestrian amenity in terms of its aesthetic contribution to the park. The siting of the toilet will also not compromise pedestrian movements and flows.

6.8.8. The building will not overshadow the parks open spaces.

6.8.9. The proposal complies with the performance criteria.

7. Discussion

7.1. As demonstrated above the proposal is considered to perform well against the provisions of the planning scheme.

7.2. The external consultant architect has provided a heritage assessment of the proposal, and recommended the proposal be refused. The assessment is provided at Attachment E. The assessment is not considered to be supportable based on the lack of assessment of the proposal against the provisions of the planning scheme.

7.3. It is noted that the Tasmanian Heritage Council has approved the application, refer to Attachment C.

7.4. Approval with conditions and advice is recommended.

8. Conclusion

8.1. The proposed Public Toilets at 99 Salamanca Place (also known as Princes Park), Battery Point satisfies the relevant provisions of the *Sullivans Cove Planning Scheme 1997,* and as such is recommended for approval.

9. Recommendations

That: A. Pursuant to the *Sullivans Cove Planning Scheme 1997*, the Council approve the application for Public Toilets at 99 Salamanca Place (also known as Princes Park), Battery Point for the reasons outlined in the officer's report and a permit containing the following conditions be issued:

GENERAL

GEN **The use and/or development must be substantially in accordance with the documents and drawings that comprise the Planning Application No. PLN-16-00085-01 outlined in attachment A to this permit except where modified below.**

Reason for condition

To clarify the scope of the permit.

TASWATER

TW **The use and/or development must comply with the requirements of TasWater as detailed in the form Submission to Planning Authority Notice, Reference No. TWDA 2016/00188-HCC dated 18 February 2016 as attached to the permit.**

Reason for condition

To clarify the scope of the permit.

TASMANIAN HERITAGE COUNCIL

THC **The use and/or development must comply with the requirements of the Tasmanian Heritage Council as detailed in the Notice of Heritage Decision, Works Application No. 4951 dated 21 March 2016, as attached to the permit.**

Reason for condition

To clarify the scope of the permit

ENVIRONMENTAL

ENV1 **Sediment and erosion control measures sufficient to prevent sediment from leaving the site must be installed prior to any disturbance of the site. Sediment controls must be maintained until all areas of disturbance have been stabilized or re vegetated.**

Advice: For further guidance in preparing Soil and Water Management Plans – in accordance with Fact sheet 3 Derwent Estuary Program go to www.hobartcity.com.au development engineering standards and guidelines.

Reason for condition

To avoid the sedimentation of roads, drains, natural watercourses, Council land that could be caused by erosion and runoff from the development, and to comply with relevant State Legislation.

ENGINEERING

ENG1 **The cost of repair of any damage to the Council's infrastructure resulting from the implementation of this permit, must be met by the owners within three months of the completion of the development.**

A photographic record of the Council's infrastructure adjacent to the subject site must be provided to the Council prior to any commencement of works.

Note: A photographic record of the Council's infrastructure (e.g. existing property service connection points, roads, buildings, stormwater, footpaths, driveway crossovers and nature strip, including if any, pre existing damage) will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner/developer fails to provide to the Council a photographic record of the Council's infrastructure, then any damage to the Council's infrastructure found on completion of works will be deemed to be the responsibility of the owner.

Reason for condition

To ensure that any of the Council's infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENGsw7 **The new stormwater connection must be constructed and existing abandon connections sealed by the Council at the owner's expense, prior to the first occupation.**

Detailed design drawings must be submitted and approved, prior to commencement of work. The detailed design drawings must include:

(a) the location of the proposed connection; and
(b) the size of the connection appropriate to satisfy the needs of the development

All work required by this condition must be undertaken in accordance with the approved detailed design drawings.

Advice: Once the detailed design drawing has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Please note that once the condition endorsement has been issued you will need to contact Council's City Infrastructure Unit to initiate an application for service connection.

Reason for condition

To ensure the site is drained adequately

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit www.hobartcity.com.au for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council:

- If a condition endorsement is required by a planning condition above, please forward documentation required to satisfy the condition to rfi-information@hobartcity.com.au, clearly identifying the planning permit number, address and the condition to which the documentation relates.

Once approved, the Council will respond to you via email that the condition/s has been endorsed (satisfied). Detailed instructions can be found at: www.hobartcity.com.au/Development/Planning/How_to_obtain_a_condition_endorsement

- Building permit in accordance with the *Building Act 2000*: www.hobartcity.com.au/Development/Building
- Plumbing permit under the *Tasmanian Plumbing Regulations 2014*: www.hobartcity.com.au/Development/Plumbing
- Permit for the occupation of the public highway for construction or special event (e.g. skip bin, placement of crane, scissor lift etc): http://www.hobartcity.com.au/Transport/Permits/Construction_Activities_Special_Events_in_the_Road_Reservation.
- Permit to Open Up and Temporarily Occupy a Highway (for work in the road reserve): http://www.hobartcity.com.au/Transport/Lighting_Roads_Footpaths_and_Street_Cleaning/Roads_and_Footpaths.
- Temporary parking permits for construction vehicles i.e. residential or meter parking/loading zones: http://www.hobartcity.com.au/Transport/Permits/Parking_Permits

(Ben Ikin)
DEVELOPMENT APPRAISAL PLANNER

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

(Ian Stanley)
MANAGER DEVELOPMENT APPRAISAL

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Date of Report: 31 March 2016

Attachment(s) Attachment A – Documents and Drawings List
Attachment B – TasWater form Reference No. TWDA 2016/00188-HCC
Attachment C – Tasmanian Heritage Council's Notice of Heritage Decision, Works Application No. 4951
Attachment D – Documents and Drawings
Attachment E –Consultant Architect's Heritage Assessment

Attachment A

Documents and Drawings that comprise
Planning Application Number - PLN-16-00085-01

DEVELOPMENT ADDRESS: **99 Salamanca Place (Also Known As Princes Park), BATTERY POINT**

LIST OF DOCUMENTATION:

Description	Drawing Number/Revision/Author/Date, Report Author/Date, Etc	Date of Lodgement to Council
Application Form	16-00085	28 January 2016
Title	163300/1	28 January 2016
Archaeological Sensitivity Report and Method Statement, 64 pages	Author: Austral Tasmania Date: 25 February 2016	25 February 2016
Letter responding to additional information request, 2 pages	Author: Scott Balmforth, Terroir Date: 4 February 2016	10 February 2016
Proposed site plan	Project No: 15200 Drawing No: DA-01 Drawn by: GP Date of Drawing: 19/01/2016	25 January 2016
Proposed floor and roof plan	Project No: 15200 Drawing No: DA-02 Drawn by: GP Date of Drawing: 19/01/2016	25 January 2016
Proposed east and west elevations	Project No: 15200 Drawing No: DA-03 Drawn by: GP Date of Drawing: 19/01/2016	25 January 2016
Proposed north and south elevations and section	Project No: 15200 Drawing No: DA-04 Drawn by: GP Date of Drawing: 19/01/2016	25 January 2016
Reflected ceiling plan and floor tile layout	Project No: 15200 Drawing No: DA-05 Drawn by: GP Date of Drawing: 19/01/2016	25 January 2016
Detailed site plan	Project No: 15E88-4 Sheet No.: C01 Revision: A Drawn by: NM Date of Drawing: 10/02/2016	11 February 2016
Detailed hydraulic plan	Project No: 15E88-4 Sheet No.: H01 Revision: A Drawn by: NM Date of Drawing: 10/02/2016	11 February 2016
Index and notes and overall plan	Project No: 15E88-4 Sheet No.: EN1	11 February 2016

	Revision: A Drawn by: NM Date of Drawing: 10/02/2016	
Location plan	Project No: 15200 Drawing No: DA-00 Drawn by: BT Date of Drawing: 19/01/2016	25 January 2016
Photomontage 1	Project No: 15200 Drawing No: DA-X1 Drawn by: BT Date of Drawing: 19/01/2016	25 January 2016
Photomontage 2	Project No: 15200 Drawing No: DA-X2 Drawn by: BT Date of Drawing: 19/01/2016	25 January 2016

Attachment B

TasWater

Submission to Planning Authority Notice

Council Planning Permit No.	PLN-16-00085	Council notice date	16/02/2016
TasWater details			
TasWater Reference No.	TWDA 2016/00188-HCC	Date of response	18/02/2016
TasWater Contact	Amanda Coleman	Phone No.	6237 8229
Response issued to			
Council name	HOBART CITY COUNCIL		
Contact details	hcc@hobartcity.com.au		
Development details			
Address	99 SALAMANCA PL, BATTERY POINT	Property ID (PID)	5672375
Description of development	Public amenities		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Aldanmark	Site Plan/15E88-4 C01	A	10/02/2016
Aldanmark	Hydraulics/15E88-4 H1	A	10/02/2016

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connections / sewerage system and connections to the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.

2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.

DEVELOPMENT ASSESSMENT FEES

3. The applicant or landowner as the case may be, must pay a development assessment fee to TasWater for this proposal of $197.00 for development assessment as approved by the Economic Regulator and the fees will be indexed as approved by the Economic Regulator from the date of the Submission to Planning Authority Notice for the development assessment fee, until the date they are paid to TasWater. Payment is required within 30 days from the date of the invoice.

Advice

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

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			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

Attachment C

PLANNING REF: PLN-16-00085-01
THC WORKS REF: 4951
REGISTERED PLACE NO: 10540
FILE NO: 10-70-86 THC
APPLICANT: Terrior Architects
DATE: 21 March 2016

NOTICE OF HERITAGE DECISION

(*Historic Cultural Heritage Act 1995*)

The Place: Princes Park, 90 Salamanca Place, Battery Point.
Proposed Works: New Toilet Block.

Under section 39(6)(b) of the *Historic Cultural Heritage Act 1995* (the Act), the Heritage Council gives notice that it consents to the discretionary permit being granted in accordance with the documentation submitted with discretionary permit application PLN-16-00085-01, received by the Tasmanian Heritage Council on 29/01/2016 subject to the following conditions:

1. **Works involving ground disturbance must be monitored in accordance with the recommendations of the "Archaeological Sensitivity Report and Method Statement" prepared by Austral Tasmania (ref: AT0210, dated 25 February 2016) and Part 3.3 of the Tasmanian Heritage Council's Practice Note 2 (version 4, November 2014) "Managing Historical Archaeological Significance in the Works Application Process".**

Reason for condition
That the archaeological values of the site be managed consistent with the Tasmanian Heritage Council's current Practice Note No 2.

Please ensure the details of this notice, including conditions, are included in any permit issued, and forward a copy of the permit or decision of refusal to the Heritage Council for our records.

Please contact Russell Dobie on 1300 850 332 if you require clarification of any matters contained in this notice.

Pete Smith
Director – Heritage Tasmania
Under delegation of the Tasmanian Heritage Council

GENERAL NOTES

DO NOT SCALE FROM THIS DRAWING

CONFIRM ALL DIMENSIONS AND SETOUTS ON SITE PRIOR TO MANUFACTURE & INSTALLATION

ALL WORK IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS

TO BE READ IN CONJUNCTION WITH ENGINEERS DOCUMENTS

LEGEND

Rev Date
Description

sydney Level 2, 79 Myrtle St
Chippendale 2008
Nominated Architect: Gerard Reinmuth 6629
T 02 96982198
F 02 96982353

hobart 181 Elizabeth St
Hobart 7000
Nominated Architect: Scott Balmforth 564
T 03 6234 6372
F 03 6231 4939

TERROIR

Project:
HOBART CITY COUNCIL
PRINCES PARK
PUBLIC CONVENIENCES
Drawing Description:
LOCATION PLAN

Drawn by: BT Checked by: SB Scale:NA

PROJECT NO:	DWG NO:	REV NO:
15200	DA-00	

Drawing Status: DA Issue_19/01/2016

GENERAL NOTES

DO NOT SCALE FROM THIS DRAWING

CONFIRM ALL DIMENSIONS AND SETOUTS ON SITE PRIOR TO MANUFACTURE & INSTALLATION

ALL WORK IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS

TO BE READ IN CONJUNCTION WITH ENGINEERS DOCUMENTS

LEGEND

Rev Date
Description

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TERROIR

Project:
HOBART CITY COUNCIL
PRINCES PARK
PUBLIC CONVENIENCES

Drawing Description:
PHOTOMONTAGE 1

Drawn by: BT Checked by: SB Scale: NA

PROJECT NO: 15200 DWG NO: DA-X1 REV NO:

Drawing Status: DA Issue_19/01/2016

Attachment D

ALL WORK IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS

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LEGEND

Rev	Date Description

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TERROIR

Project:
HOBART CITY COUNCIL
PRINCESS PARK
PUBLIC CONVENIENCES
Drawing Description:
PHOTOMONTAGE 2

Drawn by: BT Checked by: SB Scale: NA

PROJECT NO:	DWG NO:	REV NO:
15200	DA-X2	

Drawing Status: DA Issue_19/01/2016

GENERAL NOTES

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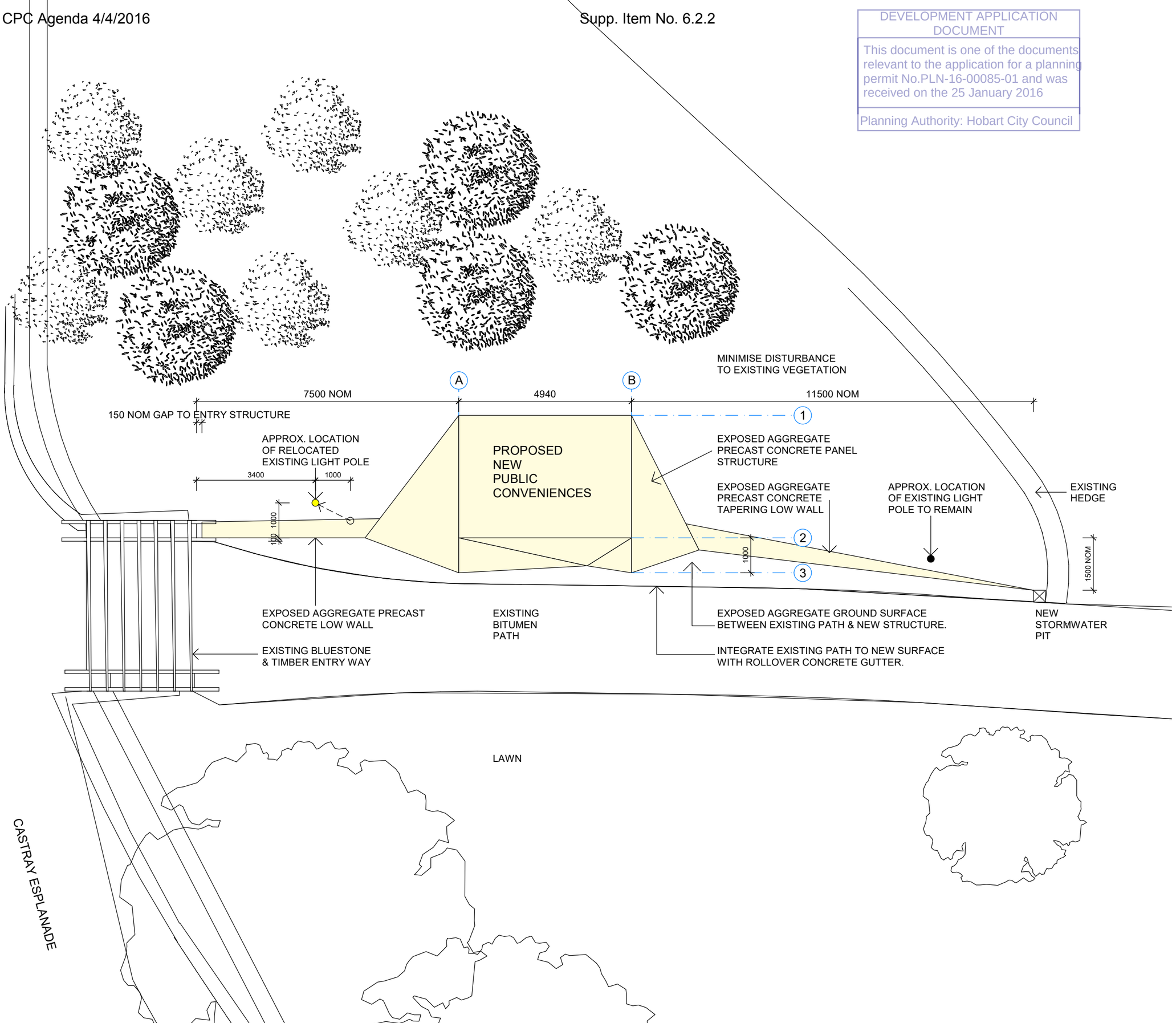
LEGEND



sydney Level 2, 79 Myrtle St
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TERROIR

Project:
HOBART CITY COUNCIL
PRINCES PARK
PUBLIC CONVENIENCES

Drawing Description:
SITE PLAN

Drawn by: GP Checked by: SB Scale:1:100@A3

PROJECT NO:	DWG NO:	REV NO:
15200	DA-01	

Drawing Status: DA ISSUE _ 19.01.2016

GENERAL NOTES

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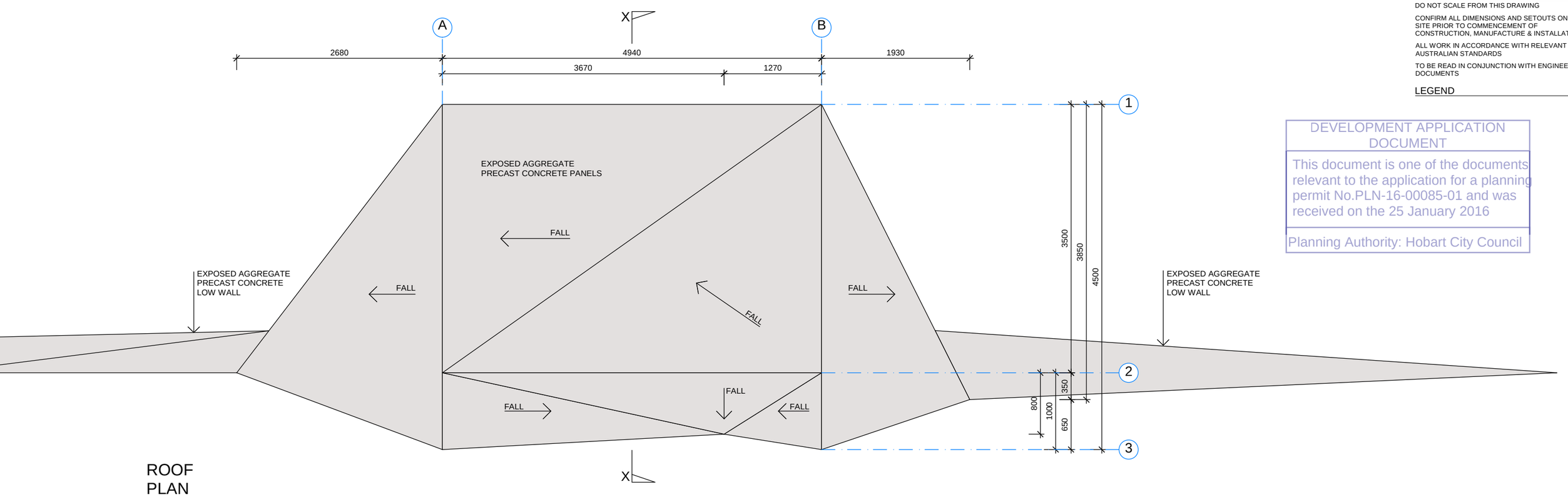
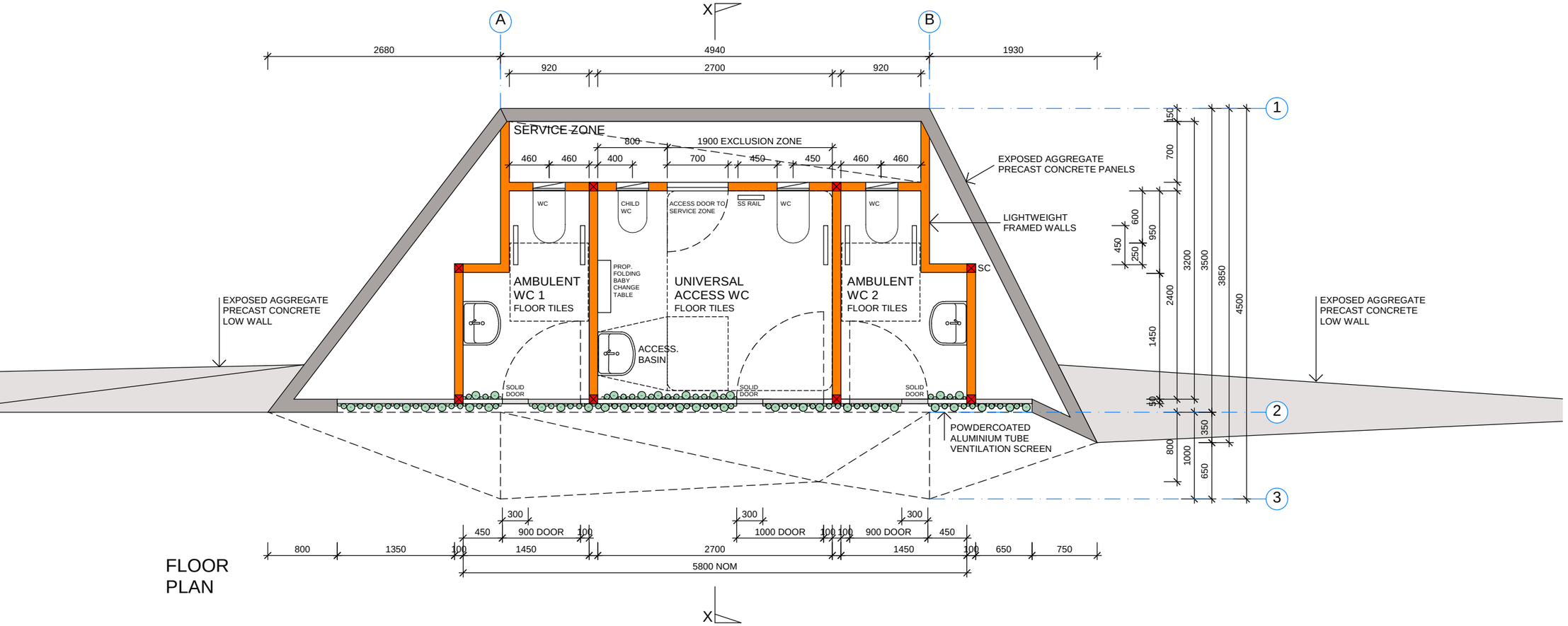
LEGEND



ROOF PLAN



FLOOR PLAN

sydney Level 2, 79 Myrtle St
Chippendale 2008
Nominated Architect: Gerard Reinmuth 6629
T 02 9279 2226
F 02 9279 2227

hobart 181 Elizabeth St
Hobart 7000
Nominated Architect: Scott Balmforth 564
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TERROIR

Project:
HOBART CITY COUNCIL
PRINCES PARK
PUBLIC CONVENIENCES

Drawing Description:
FLOOR PLAN
&
ROOF PLAN

Drawn by: GP Checked by: SB Scale:1:50@A3

PROJECT NO:	DWG NO:	REV NO:
15200	DA-02	

Drawing Status: DA ISSUE _ 19/01/2016

GENERAL NOTES

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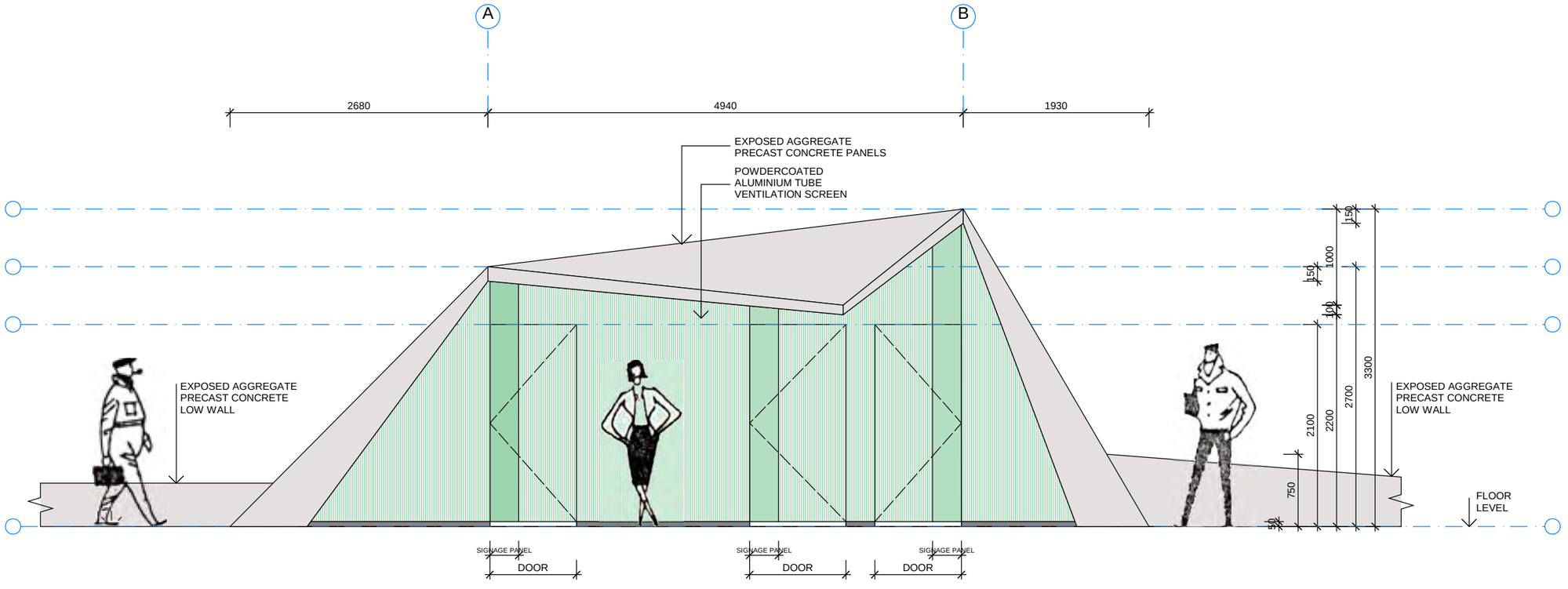
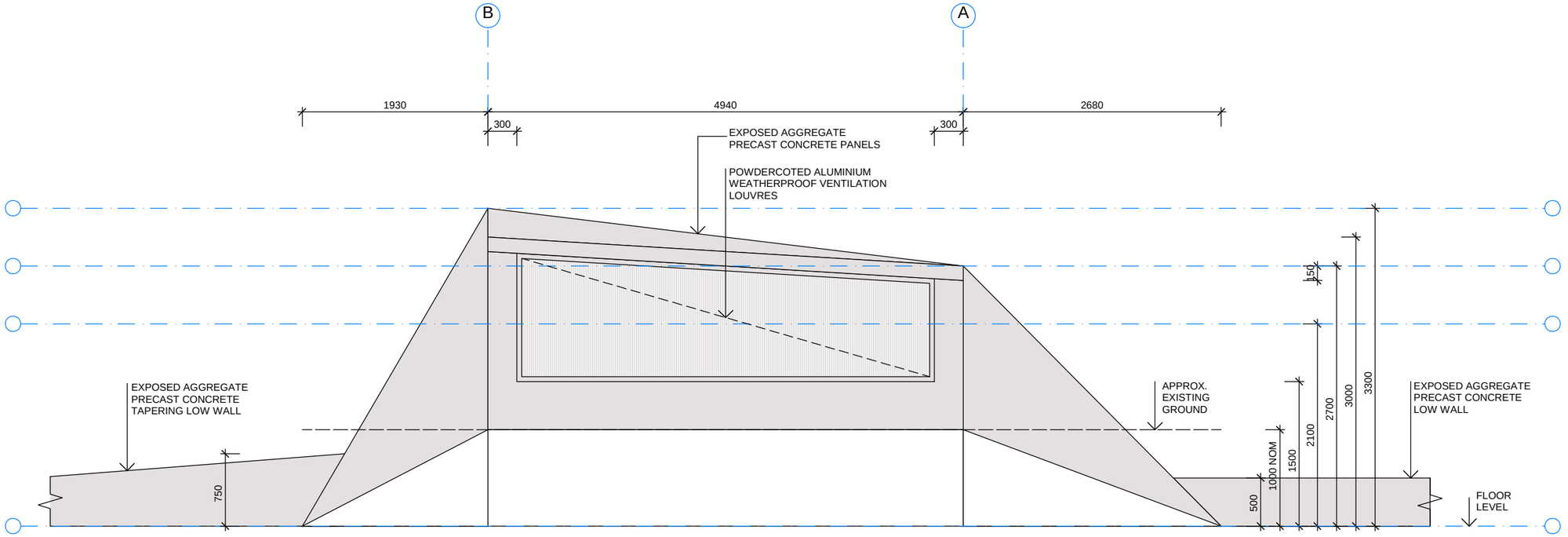
LEGEND



EAST ELEVATION



WEST ELEVATION

DEVELOPMENT APPLICATION DOCUMENT

This document is one of the documents relevant to the application for a planning permit No.PLN-16-00085-01 and was received on the 25 January 2016

Planning Authority: Hobart City Council

sydney Level 2, 79 Myrtle St
Chippendale 2008
Nominated Architect: Gerard Reinmuth 6629
T 02 9279 2226
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TERROIR

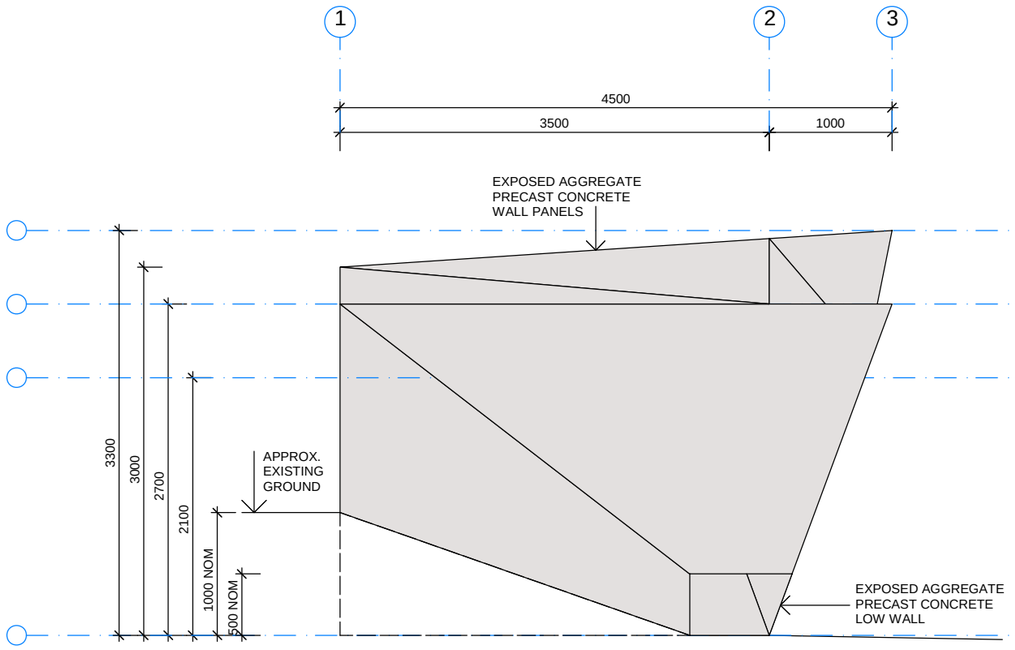
Project:
HOBART CITY COUNCIL
PRINCES PARK
PUBLIC CONVENIENCES

Drawing Description:
EAST & WEST ELEVATIONS

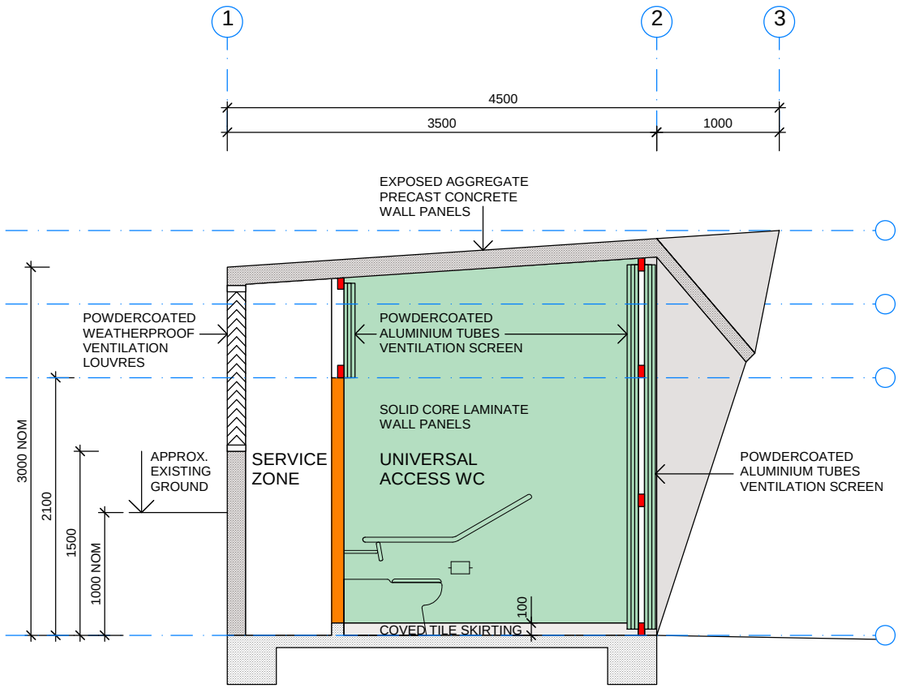
Drawn by: GP Checked by: SB Scale:1:50@A3

PROJECT NO:	DWG NO:	REV NO:
15200	DA-03	

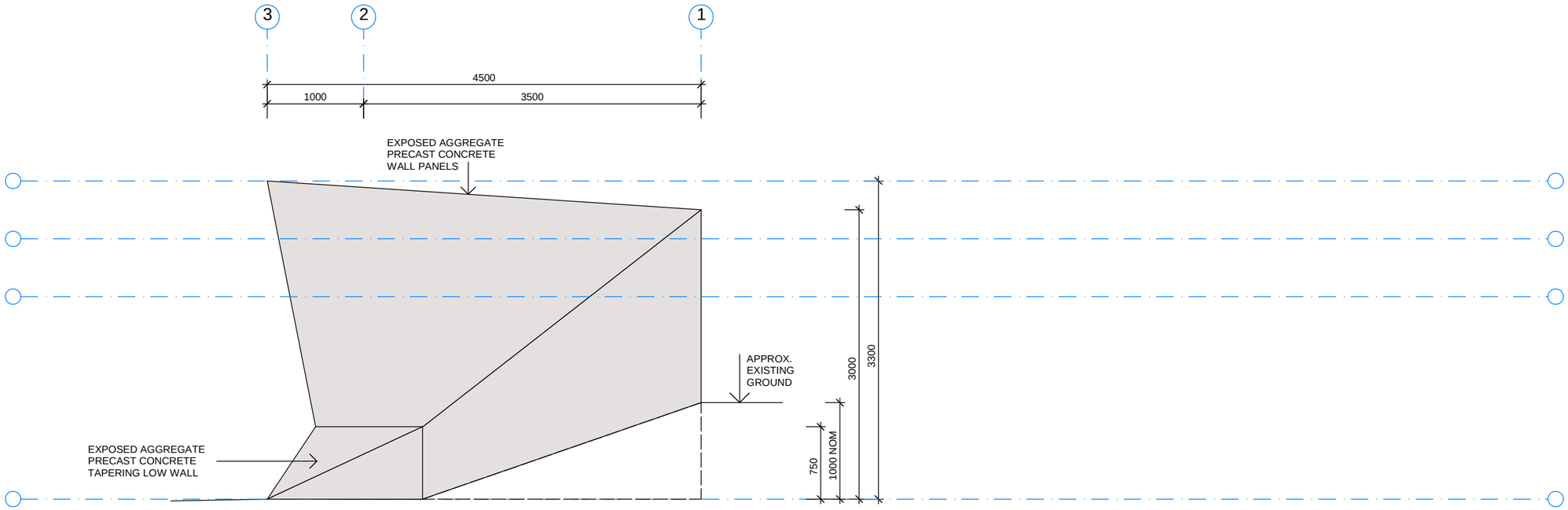
Drawing Status: DA ISSUE _ 19/01/2016



SOUTH ELEVATION



SECTION X



NORTH ELEVATION

GENERAL NOTES

DO NOT SCALE FROM THIS DRAWING

CONFIRM ALL DIMENSIONS AND SETOUTS ON SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION, MANUFACTURE & INSTALLATION

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LEGEND

DEVELOPMENT APPLICATION DOCUMENT

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TERROIR

Project:
HOBART CITY COUNCIL
PRINCES PARK
PUBLIC CONVENIENCES

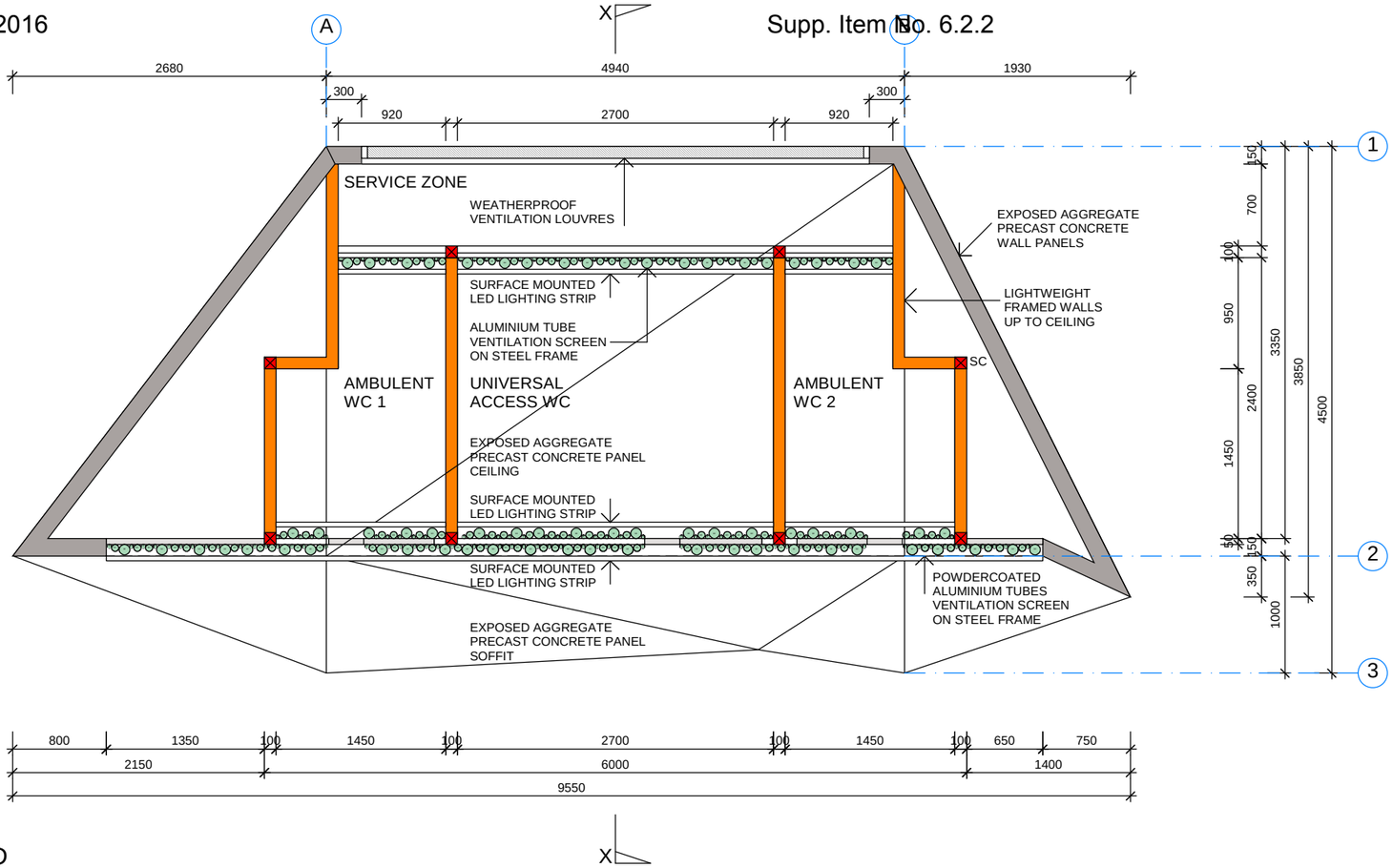
Drawing Description:
NORTH & SOUTH ELEVATIONS
&
SECTION

Drawn by: GP Checked by: SB Scale:1:50@A3

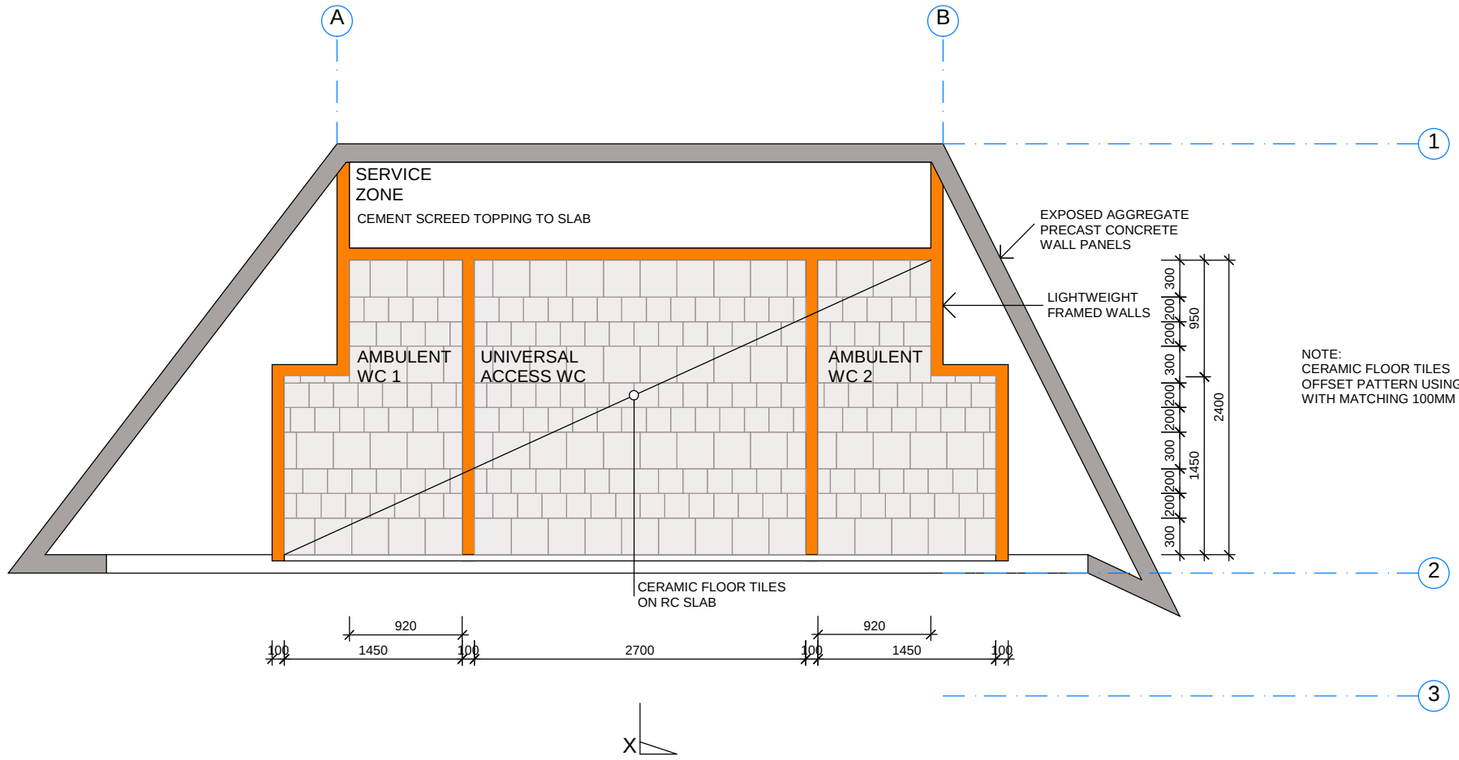
PROJECT NO:	DWG NO:	REV NO:
15200	DA-04	

Drawing Status: DA ISSUE _ 19/01/2016

RELECTED CEILING PLAN



FLOOR TILE LAYOUT



NOTE:
CERAMIC FLOOR TILES
OFFSET PATTERN USING 300 X 300 & 200 X 200 SQUARE TILES.
WITH MATCHING 100MM COVED SKIRTING TILE.

GENERAL NOTES

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LEGEND

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TERROIR

Project:
HOBART CITY COUNCIL
PRINCES PARK
PUBLIC CONVENIENCES

Drawing Description:
REFLECTED CEILING PLAN
&
FLOOR TILE LAYOUT

Drawn by: GP Checked by: SB Scale:1:50@A3

PROJECT NO:	DWG NO:	REV NO:
15200	DA-05	

Drawing Status: DA ISSUE _ 19/01/2016

HCC PRINCES PARK AMENITIES
PRINCES PARK
BATTERY POINT

SHEET	DRAWING	ISSUE	DATE
EN1	INDEX, NOTES AND OVERALL PLAN	A	10/02/2016
C01	DETAILED SITE PLAN	A	10/02/2016
H01	DETAILED HYDRAULIC PLAN	A	10/02/2016

GENERAL NOTES:

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL, HYDRAULIC AND STRUCTURAL DRAWINGS AND SPECIFICATIONS. STANDARDS REFERENCED ARE TO BE THE MOST CURRENT VERSION.
2. THESE DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION UNLESS ENDORSED 'FOR CONSTRUCTION' AND AUTHORISED FOR ISSUE ACCORDINGLY.
3. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH IPWEA/LGAT STANDARD DRAWINGS AND SPECIFICATIONS, AUSTRALIAN STANDARDS, (WSAA SEWERAGE CODE OF AUSTRALIA & WATER SUPPLY CODE OF AUSTRALIA) AND TO THE SATISFACTION OF COUNCIL'S DEVELOPMENT ENGINEER.
4. IPWEA/LGAT STANDARD DRAWINGS TO BE READ IN CONJUNCTION WITH COUNCIL EXCLUSION SHEETS TSD-E01-v1 & TSD-E02-v1.
5. ALL WORKS ARE TO BE MAINTAINED IN A SAFE CONDITION.
6. CONFIRM ALL LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF WORKS
7. CONTRACTOR TO OBTAIN APPROVALS, SERVICE CLEARANCES AND COORDINATE WORK WITH ALL RELEVANT AUTHORITIES PRIOR TO COMMENCEMENT.
8. A "START OF WORKS NOTICE" MUST BE OBTAINED FROM COUNCIL AND TASWATER PRIOR TO ANY WORKS COMMENCING.
9. ANY LEVELS WITH (±) ARE SUBJECT TO 10mm VERTICAL TOLERANCE..
10. ARCHITECTURAL LAYOUT PROVIDED BY TERROIR.

WORKPLACE HEALTH & SAFETY NOTES:

BEFORE THE CONTRACTOR COMMENCES WORK THE CONTRACTOR SHALL UNDERTAKE A SITE SPECIFIC PROJECT PRE-START HAZARD ANALYSIS / JOB SAFETY ANALYSIS (JSA) WHICH SHALL IDENTIFY IN DOCUMENTED FORM;

- THE TYPE OF WORK.
- HAZARDS AND RISKS TO HEALTH AND SAFETY.
- THE CONTROLS TO BE APPLIED IN ORDER ELIMINATE OR MINIMIZE THE RISK POSED BY THE IDENTIFIED HAZARDS.
- THE MANNER IN WHICH THE RISK CONTROL MEASURES ARE TO BE IMPLEMENTED.

THESE ARE TO BE SUBMITTED TO THE SUPERINTENDENT AND/OR OTHER RELEVANT WORKPLACE SAFETY OFFICERS.

FOR THIS PROJECT; POSSIBLE HAZARDS INCLUDE (BUT ARE NOT LIMITED TO):

- EXCAVATION OF ANY TYPE & DEPTHS
- CONTAMINATED SOILS
- CONSTRUCTION IN GROUND WITH HIGH WATER TABLE
- FELLING / LOPPING &/OR REMOVAL OF EXISTING TREES/VEGETATION
- UNDERGROUND STRUCTURES (MANHOLES / SUMPS / ETC)
- CONFINED SPACES
- OVERHEAD POWER LINES
- UNDERGROUND WATER AND SEWER PIPES
- TELECOMMUNICATION CABLES - BOTH UNDERGROUND & OVERHEAD
- WORKING AT HEIGHTS
- TRAFFIC MANAGEMENT

EARTHWORKS & DRIVEWAY NOTES:

1. ALL EARTHWORKS SHALL BE IN ACCORDANCE WITH AS3798 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS".
2. ALL VEGETATION AND TOPSOIL SHALL BE STRIPPED AND GRUBBED IN THE AREA OF PROPOSED WORKS.
3. NEW OR MODIFIED DRIVEWAY CROSSINGS SHALL BE IN ACCORDANCE WITH IPWEA STANDARD DRAWING TSD-R09-v1 AND MUST BE INSPECTED AND APPROVED BY COUNCIL.
4. EXCAVATED AND IMPORTED MATERIAL USED AS FILL IS TO BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
5. FILL MATERIAL SHALL BE WELL GRADED AND FREE OF BOULDERS OR COBBLES EXCEEDING 150mm IN DIAMETER UNLESS APPROVED TO BE OTHERWISE.
6. FILL REQUIRED TO SUPPORT DRIVEWAYS INCLUDING FILL IN EMBANKMENTS THAT SUPPORT DRIVEWAYS SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
   - TOP SOIL AND ORGANIC MATTER SHALL BE STRIPPED TO A MINIMUM OF 100mm.
   - THE SUB GRADE SHALL HAVE A MINIMUM BEARING CAPACITY OF 100 kPa.
   - FILL IN EMBANKMENTS SHALL BE KEYED 150mm INTO NATURAL GROUND.
   - THE FILL SHALL BE COMPACTED IN HORIZONTAL LAYERS OF NOT MORE THAN 200mm.
   - EACH LAYER SHALL BE COMPACTED TO A MINIMUM DENSITY RATIO OF 95% STD, IT IS THE BUILDERS RESPONSIBILITY TO ENSURE THAT THIS IS ACHIEVED.
7. WHERE THE ABOVE REQUIREMENTS CANNOT BE ACHIEVED THE ENGINEER SHALL BE CONSULTED AND THE FORMATION SHALL BE PROOF ROLLED (UNDER SUPERVISION OF THE ENGINEER) TO CONFIRM AN APPROVED BASE.
8. CONCRETE PAVEMENTS SHALL BE CURED FOR A MINIMUM OF 3 DAYS USING A CURRENT BEST PRACTICE METHOD.
9. SAWN CONTROL JOINTS SHALL BE CONSTRUCTED AS SOON AS POSSIBLE WITHOUT RAVELLING THE JOINT, GENERALLY THIS SHALL BE WITHIN 24 HOURS.
10. BATTERS SHALL BE SET TO A SAFE ANGLE OF REPOSE IN ACCORDANCE WITH THE BCA VOL 2 AS INDICATED BELOW:

SOIL TYPE (* REFER BCA 3.2.4)		EMBANKMENT SLOPES H:L	
		COMPACTED FILL	CUT
STABLE ROCK (A*)		2:3	8:1
SAND (A*)		1:2	1:2
SILT (P*)		1:4	1:4
CLAY	FIRM CLAY	1:2	1:1
	SOFT CLAY	NOT SUITABLE	2:3
SOFT SOILS (P)		NOT SUITABLE	NOT SUITABLE

NOTE: WHERE SITE CONDITIONS ARE UNSUITABLE FOR A BATTERED BANK CONSULT THE ENGINEER FOR A SUITABLE RETAINING WALL DESIGN. EMBANKMENTS THAT ARE TO BE LEFT EXPOSED MUST BE STABILISED BY VEGETATION OR SIMILAR WORKS TO PREVENT SOIL EROSION.

DRAINAGE AND SERVICES NOTES:

1. ALL WORKS ASSOCIATED WITH PUBLIC STORMWATER INFRASTRUCTURE IS TO BE CARRIED OUT IN ACCORDANCE WITH IPWEA (TAS) LGAT STANDARD DRAWINGS AND SPECIFICATION AND TO THE SATISFACTION OF COUNCIL.
2. ALL WORKS ASSOCIATED WITH PUBLIC SEWER AND WATER IS TO BE CARRIED OUT IN ACCORDANCE WITH THE WSA PARTS 02 & 03 (WATER AND SEWERAGE CODES OF AUSTRALIA) AND TO THE SATISFACTION OF TASWATER.
3. ALL CONNECTIONS TO EXISTING MAINS TO BE CARRIED OUT BY THE REGULATING AUTHORITY AT COST TO BUILDER UNLESS APPROVED OTHERWISE.
4. HYDRAULIC LAYOUT TO BE COORDINATED WITH OTHER SERVICES. HYDRAULIC LAYOUT AS SHOWN IS NOTIONAL, LAYOUT TO BE CONFIRMED ON SITE.
5. ALL EXISTING SERVICES TO BE LOCATED ON SITE PRIOR TO THE COMMENCEMENT OF WORKS.
6. GENERAL MATERIALS, INSTALLATION & TESTING SHALL COMPLY WITH AS3500 AND THE TASMANIAN PLUMBING CODE.
7. INSTALL ALL AG DRAINS TO THE REQUIREMENTS OF AS3500 AND PART 3.1.2 OF THE BCA
8. PAVEMENT AND HARDSTAND AREAS SHALL FALL AT A MINIMUM OF 1% (1:100) TOWARD AN APPROVED DISCHARGE POINT.
9. ALL PIPE WORK UNDER TRAFFICABLE AREAS, INCLUDING DRIVEWAYS, IS TO BE BACKFILLED WITH COMPACTED FCR.
10. DRAINAGE PIPES TO BE MIN. uPVC CLASS SN4, PIPES UNDER TRAFFICABLE AREAS TO BE SN8 U.N.O.
11. MINIMUM GRADES FOR DRAINAGE PIPES SHALL BE 1% FOR STORMWATER AND 1.65% FOR SEWER U.N.O.
12. MINIMUM COVER FOR DRAINAGE PIPES SHALL BE 300mm FOR STORMWATER AND 500mm FOR SEWER U.N.O.
13. WATER PIPES TO BE MIN. DN20 POLY PN16 AND FITTINGS TO BE MIN. CLASS 16 U.N.O.
14. WATER CONNECTIONS SHALL BE PROVIDED WITH METERAGE AND BACKFLOW PREVENTION AS PER TASWATER STANDARD DRAWING TW-SD-W-20.
15. ALL PIPEWORK TO BE INSPECTED BY COUNCIL PRIOR TO BACKFILL.

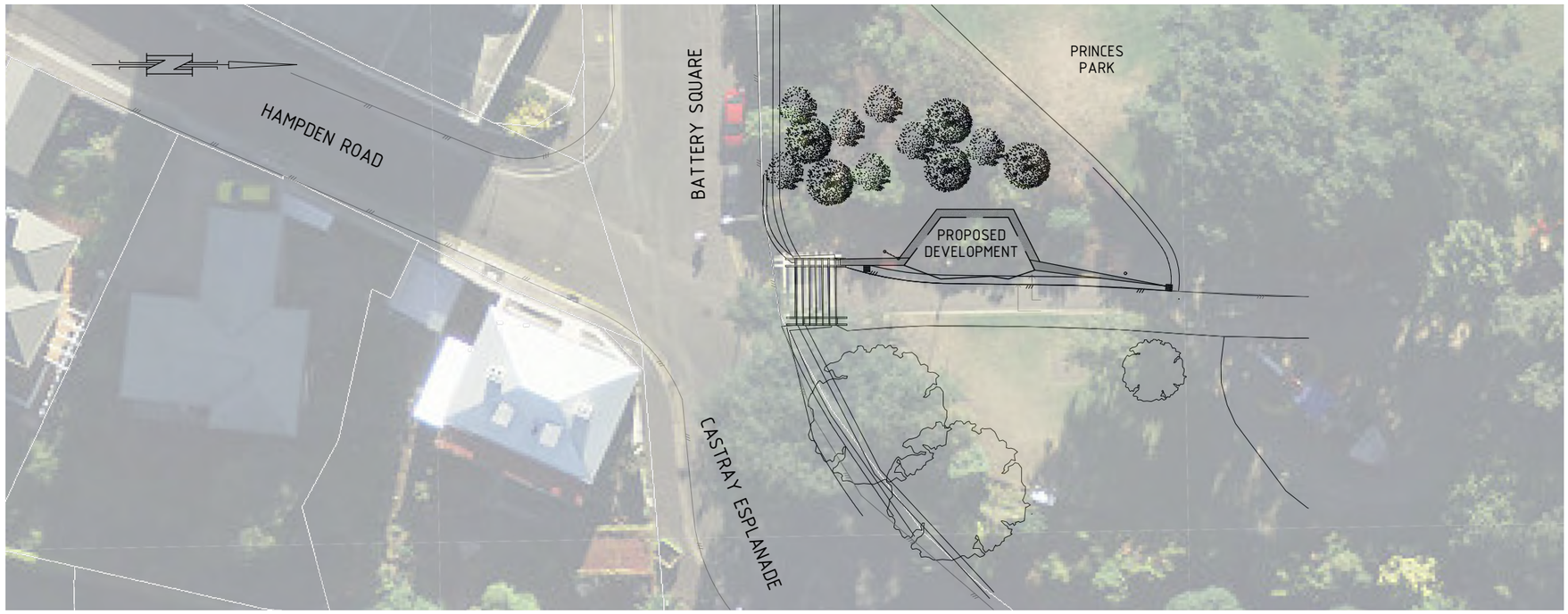
BUILDING HYDRAULICS:

1. ALL MATERIALS AND WORKMANSHIP TO BE DONE IN ACCORDANCE WITH AS3500, THE TASMANIAN PLUMBING CODE AND LOCAL AUTHORITY REQUIREMENTS.
2. ALL DRAINAGE PIPEWORK SHALL BE UPVC CLASS SN6 U.N.O., ALL WASTE AND VENT SHALL BE DWV CLASS PIPE.
3. DURING CONSTRUCTION TEMPORARILY SEAL ALL OPEN ENDS OF PIPES AND VALVES TO PREVENT ENTRY OF FOREIGN MATTER, DO NOT USE RAGS, PAPER OR WOODEN PLUGS.
4. SUPPLY AND INSTALL ALL FIXTURES, VALVES, TAPWARE AND SUNDRY ITEMS AS SCHEDULED WITHIN THE SPECIFICATION.
5. PROVIDE FIRE STOPS AS REQUIRED.
6. CONTRACT DRAWINGS ARE DIAGRAMMATIC AND AS SUCH SHOW THE INTENT OF DESIGN. INSTALLATION TO BE AS PER AS/NZS3500. ALLOW FOR ALL BENDS, OFFSETS AND OTHER MEASURES AS NECESSARY TO AVOID INTERFERENCE WITH THE STRUCTURE AND/OR OTHER BUILDING SERVICES.
7. REFER TO ARCHITECTS DEMOLITION PLAN FOR REMOVAL OF EXISTING FIXTURES AND FITTINGS. THE REMOVAL OF EXISTING PLUMBING FIXTURES SHALL INCLUDE ALL ASSOCIATED WASTE AND VENT PIPES, FLOOR DRAINS, WATER SERVICE PIPEWORK BRACKETS, SUPPORTS, ETC AND SEAL OFF EXISTING SERVICES. SEAL OFF AND MAKE GOOD ALL FLOOR, WALL AND ROOF PENETRATIONS.
8. THE LOCATION OF EXISTING SERVICES WHERE SHOWN ARE APPROXIMATE ONLY AND SHALL BE CONFIRMED ON SITE. WHERE POSSIBLE, DETERMINE LOCATION OF EXISTING POWER, TELSTRA, WATER AND DRAINAGE SERVICES PRIOR TO COMMENCING NEW WORK.
9. ALL PENETRATIONS THROUGH EXISTING SUSPENDED FLOOR SLABS SHALL BE DRILLED TO LOCATIONS APPROVED BY THE STRUCTURAL ENGINEER. DRILL PILOT HOLE PRIOR TO CORE DRILLING TO ENSURE CLEARANCE OF BEAMS AND OTHER SERVICES IN SLAB. ALL PENETRATIONS SHALL BE CORE DRILLED TO SUIT PIPE SIZE. ALLOWANCE FOR 10 MM CLEARANCES SHALL BE MADE FOR FIRE PROOFING.
10. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF FIRE AND SMOKE STOP WALLS. ALL PIPE PENETRATIONS SHALL BE SEALED WITH TWO HOUR FIRE STOP SEALANT. INSTALL FIRE STOP COLLARS TO PVC-U PIPEWORK PASSING THROUGH FLOORS AND FIRE WALLS IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS.
11. PROVIDE SERVICE IDENTIFICATION AND DIRECTION OF FLOW MARKERS TO PIPEWORK IN ACCORDANCE WITH AS1345.
12. MAKE GOOD ALL DISTURBED SURFACES TO MATCH EXISTING.
13. MAINTAIN SERVICES TO EXISTING FIXTURES AT ALL TIMES. WHERE CHANGEOVER IS REQUIRED, LIAISE WITH THE ARCHITECT PRIOR TO THE SHUTTING DOWN OF ANY SERVICE.
14. CONTRACTOR TO PROVIDE ALL DOCUMENTS, APPROVALS, CERTIFICATES, WARRANTIES, LOG BOOKS, ETC. UPON COMPLETION OF WORKS TO THE ARCHITECT. ALL FEES AND INSPECTIONS TO BE INCLUDED AND ARRANGED BY THE CONTRACTOR.
15. REFER TO THE ARCHITECTS DRAWINGS FOR SANITARY FIXTURE AND TAP SELECTIONS. SUPPLY AND FIX ACCESSORIES NECESSARY FOR THE CORRECT INSTALLATION OF THE FIXTURES AND EQUIPMENT.

CIVIL INSPECTIONS / HOLD POINTS:

THE BUILDER IS TO ALLOW TO ENGAGE ALDANMARK ENGINEERS TO UNDERTAKE INSPECTIONS AT THE FOLLOWING HOLD POINTS OF A CIVIL WORKS NATURE:

1. SUBGRADE/FORMATION LEVEL OF DRIVEWAY PAVEMENT INCLUSIVE OF PROOF ROLL
2. BASE OF ROAD PAVEMENT INCLUSIVE OF PROOF ROLL
3. STEEL WORK OF DRIVEWAY PRIOR TO CONCRETE POUR



PLAN
SCALE 1:200 (A1)

HALF SCALE PRINT

DIAL BEFORE YOU DIG www.1100.com.au

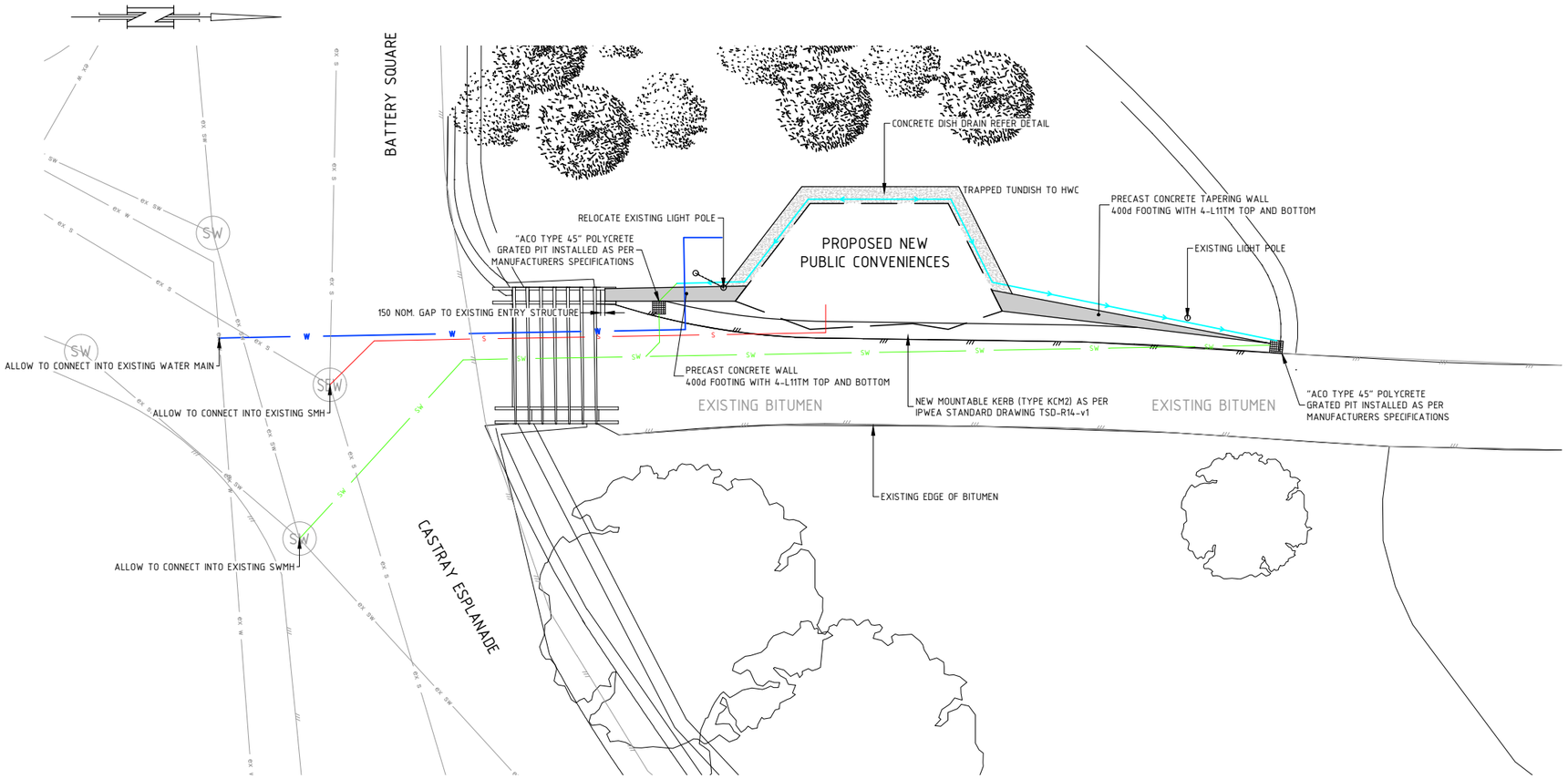
BEWARE OF UNDERGROUND SERVICES
THE LOCATION OF UNDER GROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT LOCATION SHOULD BE PROVEN ON SITE BY THE RELEVANT AUTHORITIES. NO GUARANTEE IS GIVEN THAT ALL SERVICES ARE SHOWN.

REV.	DESCRIPTION	DATE	REV.	DESCRIPTION	DATE
A	PRELIMINARY	10/02/2016			

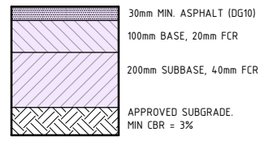
DRAWING DETAILS: 15E88-4 HYD.dwg - NATHAN MOREY - PLOTTED: 10/Feb/2016, 2:15 PM

ALDANMARK Pty. Ltd. CONSULTING ENGINEERS
Level 9, 65 Murray Street
Hobart Tas 7000
P: 03 6234 8666
F: 03 6234 8988
E: mail@aldanmark.com.au
W: www.aldanmark.com.au

CLIENT:	HOBART CITY COUNCIL
ADDRESS:	PRINCES PARK BATTERY POINT
SHEET:	INDEX, NOTES AND OVERALL PLAN
PROJECT:	PRINCES PARK AMENITIES
ISSUE:	PRELIMARY
DRAWN:	NM
APPROVED:	----
SCALE:	1:200
SIZE:	A1
DATE:	10/02/2016
PROJECT No.	15E88-4
SHEET No.	EN1
REV No.	A



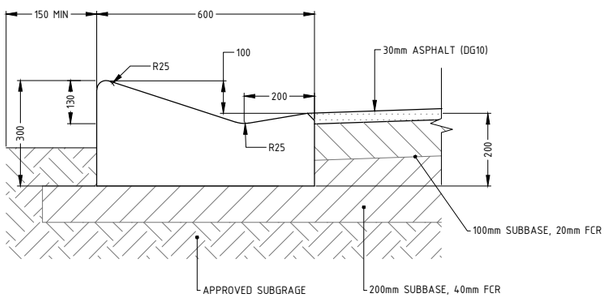
DETAILED SITE PLAN
SCALE 1:100 (A1)



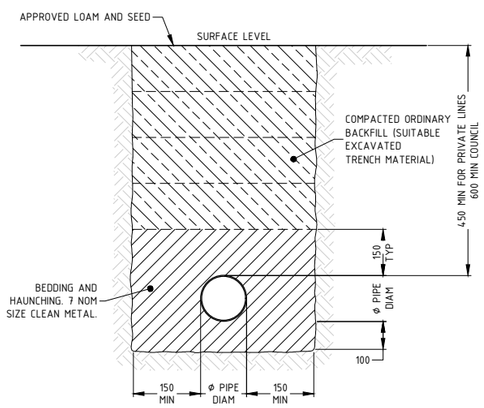
ASPHALT PAVEMENT DETAIL

I.O. = INSPECTION OPENING. I.O.'s WITHIN TRAFFICABLE AREAS TO HAVE CAST IRON COVERS AND CONCRETE SURROUNDS

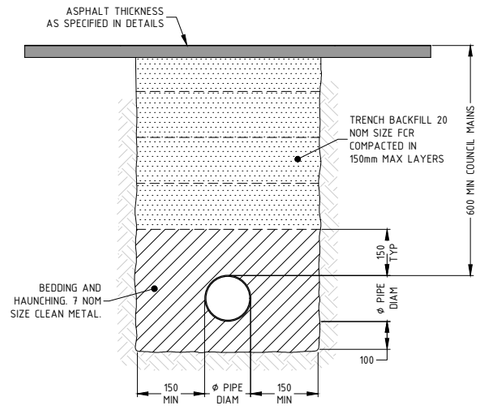
SP = 300x300 SUMP PIT. REFER TO ARCHITECTURAL PLANS FOR ADDITIONAL LANDSCAPING PITS AS REQUIRED.



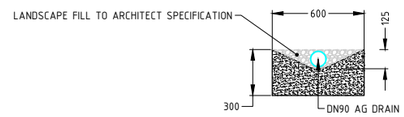
MOUNTABLE KERB AND CHANNEL
SCALE 1:20 (A1)



TYPICAL CROSS SECTION - NON TRAFFICABLE
SCALE 1:10 (A1)



TYPICAL CROSS SECTION - TRAFFICABLE
SCALE 1:10 (A1)



DISH DRAIN DETAIL
SCALE 1:50 (A1)

REV.	DESCRIPTION	DATE	REV.	DESCRIPTION	DATE
A	PRELIMINARY	10/02/2016			

DRAWING DETAILS: 15E88-4 HYD.dwg - NATHAN MOREY - PLOTTED: 10/Feb/2016, 2:15 PM

ALDANMARK Pty. Ltd. CONSULTING ENGINEERS
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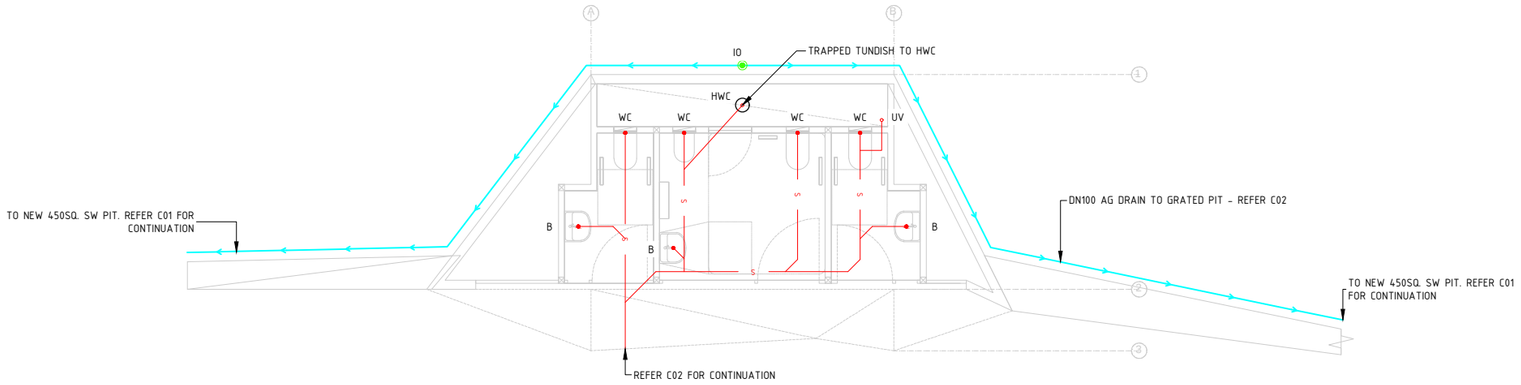
CLIENT:	HOBART CITY COUNCIL	SHEET:	DETAILED SITE PLAN
ADDRESS:	PRINCES PARK BATTERY POINT	PROJECT:	PRINCES PARK AMENITIES
		ISSUE:	PRELIMARY

DRAWN: NM		APPROVED: ----			
SCALE: 1:100	SIZE: A1	DATE: 10/02/2016			
PROJECT No. 15E88-4		SHEET No. C01	REV No. A		



DETAILED INTERNAL DRAINAGE PLAN

SCALE 1:50 (A1)

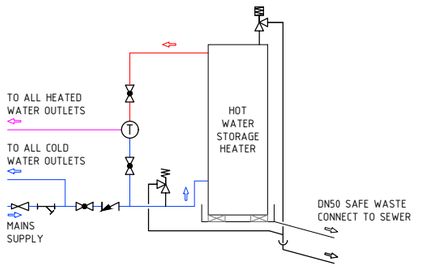
LEGEND:

S	DN100 UPVC SN4 SEWER PIPE UNO
SW	DN100 UPVC SN4 STORMWATER PIPE UNO
	DN90 PVC SLOTTED PIPE UNO
B	BASIN (DN40)
DT	DISCONNECTOR TRAP (DN100)
FW	FLOOR WASTE GULLY (DN80/65)
GD	GRATED CHANNEL DRAIN 'ACO K100 SERIES' WITH GRADED CHANNEL OR EQ.
GP	300sq. x 450d GRATED PIT 'ACO TYPE 33' OR EQ.
GS	300sq. x 4500d GRATED SUMP 'ACO TYPE 33' OR EQ. WITH SEDIMENT TRAP
IO	INSPECTION OPENING
ORG	OVERFLOW RELIEF GULLY (DN100) PROVIDE TAP OVER
S	SINK (DN50)
ST	SAFE TRAY + TUNDISH FOR HWC (DN50)
UV	UPSTREAM VENT (DN50)
WC	WATER CLOSET (DN100)
	TUNDISH (DN40)

NOTE:

UNO = UNLESS NOMINATED OTHERWISE (ON PLAN OR DETAIL)

EQ. = EQUIVALENT

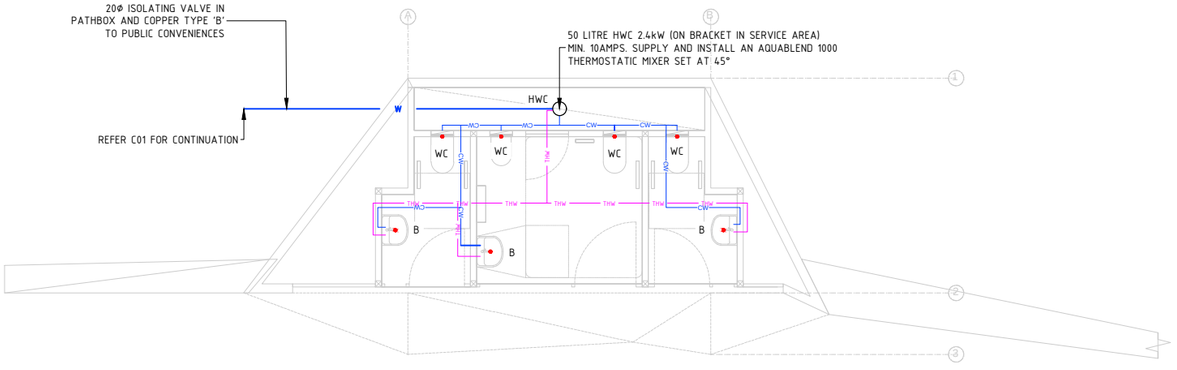


TYPICAL INSTALLATION OF MAINS PRESSURE STORAGE WATER HEATER

NOT TO SCALE

SCHEMATIC LEGEND:

- ISOLATION VALVE
- NON-RETURN VALVE
- PRESSURE REDUCING VALVE
- STRAINER
- PRESSURE AND TEMPERATURE RELIEF VALVE
- PRESSURE LIMITING VALVE
- (T) TEMPERING VALVE



DETAILED WATER PLAN

SCALE 1:50 (A1)

LEGEND:

- BULK WATER SUPPLY
- CW — COLD WATER
- THW — TEMPERED HOT WATER (45° C)
- B — BASIN
- HWC — HOT WATER CYLINDER
- S — SINK
- T — TAP
- WC — WATER CLOSET
- STOP VALVE

NOTE:
UNO = UNLESS NOMINATED OTHERWISE (ON PLAN OR DETAIL)
EQ. = EQUIVALENT

HOT AND COLD WATER NOMINAL DIAMETERS

BRANCH OFF TAKES	MIN. DN20
MAX OFF TAKE LENGTH 6m	DN18
MAX OFF TAKE LENGTH 3m	DN15
MAX OFF TAKE LENGTH 1m	DN10

COPPER PIPES TO AS1432 (HOT AND COLD)
PE-X PIPES TO AS2492 (HOT AND COLD)
HDPE PIPES TO AS/NZS4130 (COLD ONLY)

INSULATION SCHEDULE

HEATED WATER PIPES

TYPE	SIZE RANGE	INSULATION
CIRCULATING LINE	32-40	25mm ROCKWOOL WITH FOIL WRAP
BRANCH LINE OFFTAKE	20-25	19mm BRADFLEX
	18	13mm BRADFLEX

COLD WATER PIPES EXPOSED

TYPE	SIZE RANGE	INSULATION
ALL	>20	13mm BRADFLEX

OTHER COLD WATER PIPES

TYPE	SIZE RANGE	INSULATION
ALL	ALL	NOT REQUIRED

NOTE: WATER PIPES ASSOCIATED DIRECTLY WITH PLANT EQUIPMENT SHALL BE INSULATED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS FOR A TYPICAL INSTALLATION

REV.	DESCRIPTION	DATE	REV.	DESCRIPTION	DATE
A	PRELIMINARY	10/02/2016			

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CLIENT: HOBART CITY COUNCIL	SHEET: DETAILED HYDRAULIC PLAN	DRAWN: NM	APPROVED: ----
ADDRESS: PRINCES PARK BATTERY POINT	PROJECT: PRINCES PARK AMENITITIES	SCALE: 1:50 SIZE: A1	DATE: 10/02/2016
	ISSUE: PRELIMARY	PROJECT No. 15E88-4	SHEET No. H01 REV No. A

DRAWING DETAILS: 15E88-4 HYD.dwg - NATHAN MOREY - PLOTTED: 10/Feb/2016, 2:15 PM

Attachment E

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HERITAGE ASSESSMENT

Proposed Public Conveniences
Princes Park Battery Point

24.03.2016

fig.1 The southern entry to Princes Park. The entry structure and boundary walls were constructed as relief employment during the Great Depression. The proposed public facilities will be seen adjacent the path near the orange warning flags.

1.0 INTRODUCTION

Terroir Pty Ltd have proposed a new public convenience, toilet facility, for the public park known as Princes Park in Battery Point, Hobart, Tasmania.

Paul Johnston Architects have been engaged by the owners of the place, the Hobart City Council (HCC), to provide an evaluation of the proposal against the heritage provisions of the *Sullivans Cove Plannning Scheme 1997* (SCPS).

This assessment has proceeded in accordance with the articles and definitions set out in the SCPS that refer to *The Burra Charter, the Australia ICOMOS Charter for Places of Cultural Significance 2013.* This assessment also makes reference to the *Heritage Impact Guide* of the *State Heritage Office of the Government of Western Australia, Nov 2012.*

No conservation management plan exists for Princes Park.

2.0 SCOPE and LIMITATIONS

Princes Park is listed on Table 1: Places of Cultural Significance with the extent of the Park shown as the place listed, on Figure 5 Places of Cultural Significance, of the SCPS.

Princes park is also listed on Table 2: Places of Archaeological Sensitivity of the SCPS to a similar extent. Historic archaeological heritage has been considered in the report by Austral

Tasmania, *Princes Park Public Conveniences, Archaeological Sensitivity Report and Method Statement, 25 February 2016.*

No statement of significance is contained within the SCPS.

Subsequently, this assessment has been limited to the existing historical information contained in the illustrated site history within the Austral Tasmania report cited above, the previous *Princes Park, Battery Point, Combined Archaeological Sensitivity Report and Method Statement, Hobart City Council , 2 June 2011., Princes Park, Battery Point Historical Archaeological Testing Hobart City Council 31 January 2012.* as well as the Tasmanian Heritage Council Datasheet, Princes Park, THR ID 10540, 19 January 2006. It is the opinion of the author that this information is sufficient to enable an appreciation of the heritage values of the place and facilitate this assessment.

Aboriginal cultural heritage is not considered in this Heritage Assessment.

3.0 SULLIVANS COVE PLANNING SCHEME

Princes Park is a *place of cultural significance* as listed on the SCPS Table 1: Places of Cultural Significance within Schedule 1 – Conservation of Cultural Heritage Values. Schedule 1 (22.1) *applies to conservation of the cultural heritage values of identified places of cultural significance, including spaces, buildings and objects, and conservation of patterns of continuing and historic use.* (SCPS 1997 p67)

Consequently, the proposed development is subject to the applicable clauses with Section 22 of the SCPS.

3.1 objectives

The applicable objectives of Schedule 1 (22.2). are

to ensure that the recognisable historic character of Sullivans Cove is not conpromised by new development which overwhelms the places of cultural significance. or, by new development which reduces the apparent authenticity of the historic places by mimicking historic forms.

to encourage new development to be recognisable as new, but not individually prominent. Such development must reflect a "good neighbour" relationship to places of identified cultural value.

3.2 building or works

No conservation plan exists for the place Princes Park. Subsequently, there are no permitted works that meet the 'deemed to comply' provisions and the proposed works require 'the discretion of the Planning Authority' (22.4.5).

The following criteria are applicable to an assessment of the heritage impact of the proposed works on the place Princes Park:

'Building or works' must compliment and contribute to the cultural significance, character and appearance of the place and its setting

The location, bulk and appearance of 'building and works' must adversely affect the heritage values of any place of cultural significance

'Building or works' must not reduce the apparent authenticity of places of cultural significanc ny mimicking historic forms

'Building or works' may be recognisable as new but not be individually prominent.

4.0 DESCRIPTION OF THE PROPOSAL

The proposed works are the construction of Public Conveniences, or public toilets, at the southern end of the Park near the Battery Square entry where Castray Esplanade becomes Hampden Road. The proposal provides separate male and female ambulant toilet cubicles and a central unisex wheelchair accessible toilet.

The existing toilets, located at the Park entry at Salamanca Place, are to be decommissioned. The works do not include their demolition or removal.

The proposal locates the toilets adjacent the existing path within an existing sloping garden bed. The building footprint is cut into the embankment approximately 4.50 metre with a retaining wall of approximately 1 metre high. Short garden walls extending from the structure, edge the existing path and the main façade aligns with the wall of the entry structure, allowing a 150mm clearance. The north garden wall tapers to meet the edge of the garden bed. The building front elevation aligns with this wall, however, the roof overhang extends 1.00 metre into the path.

The structure, including the extended garden walls, is composed of pre cast concrete panels with exposed aggregate finish. The concrete panels provide both walls and roof to the structure in an angular composition. The internal walls are framed while the front elevation, including doors, are lined in vertical aluminum tubing of various diameter, on a frame with vertical signage panels to each door. Ceramic tiles line the floor internally. Strip lighting is provided along the front façade and an existing external pole lamp is relocated to a osition adjacent the entry structure.

5.0 EXISTING SIGNIFICANCE ASSESSMENTS

5.1 Tasmanian Heritage Register

No statement of significance is provided by the SCPS. The place is, however, listed on the Tasmanian Heritage Register (THR). While the THR datasheet accompanying the listing is only 'intended to provide sufficient information and justification for listing the place on the Heritage Register', and that other heritage values may exist for the place, it forms the basis for an understanding of significance.

The following is the Statement of Significance provided in the datasheet:

The Mulgrave Battery and Signal Station demonstrate the evolution of the Derwent Defence Network and Semaphore System, and the developments in military and communication technology throughout the 19th century.

The site reflects contemporary perceptions of threat and is an excellent example of defence and comunications infrastructure combined. As one of the earliest surviving buildings in Hobart, the Guard House and Signal Station is a representative example of Old Colonial Georgian architecture.

The site of the Mulgrave Battery and Signal Station is valued by the community for its association with defence and communication, and as an historic open space for recreation which makes a significant contribution to the townscape of Battery Point.

The following is the significance assessment against the criteria of the THR.

a) The place is important to the course or pattern of Tasmania's history.

The Mulgrave Battery and Signal Station demonstrate the evolution of the Derwent Defence Network and the Semaphore System, and the changing developments in defence and communications infrastructure from the time of first settlement until the 1880s. The Battery reflects contemporary perceptions of threat to the colony, and the manner in which these were responded to by the colonial administration, the Tasmanian Government, and the Federal Government respectively. The conversion of the dismantled Battery to a park reflects the broader movement towards the improvement of municipal parks and gardens which occurred from the mid 19th century onwards.

b) The place possesses uncommon or rare aspects of Tasmania's history.

The extant structures and subsurface material of the Mulgrave Battery and Signal Station are rare surviving examples of military and communications infrastructure in Tasmania during the 19th century, and the Guard House and Signal Station is one of the earliest surviving buildings in Hobart.

c) The place has the potential to yield information that will contribute to an understanding of Tasmania's history.

No Data Recorded

d) The place is important in demonstrating the principal characteristics of a class of place in Tasmania's history

The Guard House and Signal Station is a representative example of an Old Colonial Georgian building constructed for defence and communications purposes.

e) The place is important in demonstrating a high degree of creative or technical achievement.

No Data Recorded

f) The place has a strong or special association with a particular community or cultural group for social or spiritual reasons.

The Mulgrave Battery and Signal Station have special meaning to the community for their association with the development of defence and communications infrastructure in Tasmania , and as an open space now used for recreation. The site is valued as a significant element in the historic townscape of Battery Point and Sullivans Cove waterfront.

g) The place has a special association with the life or works of a person, or group of persons, of importance in Tasmania's history.

No Data Recorded

h) The place is important in exhibiting particular aesthetic characteristics.
No Data Recorded

Criteria C is incorrect and has been addressed in previous reports on the archaeological potential of Princes Park by Austral Tasmania.

Criterion H) for aesthetics was only introduced to the THR in the 2012 amendment to the Act.

5.2 Register of the National Estate (RNE)

The RNE is a non statutory heritage listing following its removal from the Environment Protection and Biodiversity Conservation Act 1999 (EPBC) in 2012. Princes Park is identified within two RNE listings:

The Old Signal Station, Castray Esp, Battery Point, No. 11340; and
The Battery Point Urban Conservation Area, Battery Point, No.11397

The Statement of Significance for the Battery Point listing was not developed, however, the following statement was provided:

Defined geographical unity which has ensured its preservation as a honogenous hstoric precinct. Wide variety of architectural styles ranging from early 19th Century Colonial Georgian through to Victorian and Edwardian period preserved intact as a continuous townscape.

Contains a significant number of individual buildings of great architectural and historic merit.

6.0 CONDITION and INTEGRITY

Princes Park has been maintained by the Hobart City Council to a high standard.

The built structures from the 19th Century, including the signal station, and subterraneum batteries are in good condition. The entry structures and walling, constructed in the 1930's as an employment program during the Great Depression are in good condition although the perimeter wall on Battery Square appears to be without a railing. Pavements, seating, waste bins, memorials and interpretation panels are all in good condition. The children's playground, which appears to be the most recent addition to the Park, is in good condition.

The existing toilet block, which dates from the early 1960's, is also in good condition with evidence of internal refurbishment.

Consequently, Princes Park, as it was developed from the 1930's, retains its historical integrity.

7.0 THE CULTURAL HERITAGE SIGNIFICANCE OF PRINCES PARK

The cultural heritage significance of Princes Park, relates to its prominent location on the landform overlooking the River Derwent at the entry to Sullivans Cove. Its acquisition for a military gun enplacement in the early establishment of the colony, and its subsequent development during the early 19th Century which included the headquarters of semaphore communication with Port Arthur, is an important aspect of Tasmanian colonial heritage. The origins of Battery Point, recognised as a historic precinct at national level, is directly related to the history of this place.

The preservation of the substantial extant features of this history, including the signal station house, subterraneum magazine, gallery, tunnels and earthworks, have resulted from the initial idea to transform the battery into a reserve for public recreation when the land was transferred from the Crown to the Hobart City Council in 1882, and formally ratified in 1921. The park was established in the 1930's as a relief programme for unemployed workers during the Great Depression with substantial terracing, lawns, tree planting and flower beds. Excavated rock was used in the walls forming the boundary to the park. A children's playground was established. The demolition of the signal station was avoided following public reaction and restored with commemorative plaques identifying the heritage significance of the place.

Public toilets were added to the signal station when it was converted to a caretakers residence in the 1940's and in the 1960's, along with major maintence works, a new toilet building was constructed near the Salamanca Place entrance that remains today.

It is clearly evident that Princes Park is a place of high cultural heritage significance and integrity. The historic military and communications significance, not only has been retained by the formation of the Park and the high standard of its maintenance, but the Park's construction during the Great Depression as a work relief programme, and the protection of the signal station as the result of interest shown by the public in conservation, extends that cultural heritage significance, into the 20th Century as a place of public recreation.

8.0 ASSESSMENT OF THE HERITAGE IMPACT OF THE PROPOSAL

The provision of toilets in public spaces facilitate the continued use of spaces for the enjoyment of the public. The proposed new public conveniences reflect the growing need to cater for a diverse and aging population with increasing need for assistance facilities.

The new toilets should be seen as part of the on going development of Princes Park as a public space of recreation.

The applicant has provided a Heritage Impact Statement, authored by the applicant, at the request of Heritage Tasmania.

The statement suggests that the proposal is

'a modern-day alignment with the "beautility" philosophy by providing functional services (toilets) in a place-sensitive contemporary design to improve the amenity of locals and visitors.'

While the toilets meet a recognised functional requirement, the HIS does not provide an analysis of the 'contemporary design' as 'place sensitive'. The HIS does suggest that,

'The proposed works are located on the western side at the southern end of the pathway (former 'roadway'), and do not alter the path's alignment.'
and
'The proposed works are within an existing garden bed and does not impact on the extent or legibility of the terraces and sloping lawns.'

However, it would not be anticipated that a structure the size of a toilet block would have a detrimental affect on the terraces and lawns, and it would be expected that the existing path alignment would provide the required wheelchair access to the proposed facility.

The HIS suggests that the proposal continues the 'beautification' of the park as historically related with the formation of the park.

The use of concrete with a bluestone aggregate material does provide a contemporary relationship to the bluestone walls that characterise the park, however, no explanation of the relationship of the form of the proposal is provided. In particular, the form of the proposed structure adjacent the existing entry, needs to be carefully considered.

fig2. The entry at the summit of the hill with the entry portal structure covered in vegetation, indicates the historic landscape character of Princes Park.

fig3. The existing toilet building constructed in the early 1960's. Its prominence is alleviated by the adjacent structure behind and its location removeded from the entry and sightlines along the main path

The character of Princes Park is primarily as a landscape with sloping lawns and terraces with planting within garden beds. Structures are few with the signal station on the lower level and the existing toilets situated against an existing two storey dwelling on the edge of the park. Playground equipment, memorials, seating, rubbish bins and signage comprise the majority of built structures within the park. The boundary walling and entry arbours, and associated vegetation, is perhaps the defining character of the built form of Princes Park.

Structures within an open park setting will tend to be prominent as they are viewed from wide vantage points. However, entry points will be most prominent as these are viewed in close proximity to those coming and going.

The proposed structure provides no setback from the horizontal alignment of the entry structure. The angular wall roof elements protrude from the base of walls to project into the alignment of the entry structure. Subsequently, the built form of the proposal is clearly visible withi the frame of the entry arbour and obscures the view into the park itself and the landscape beyond.

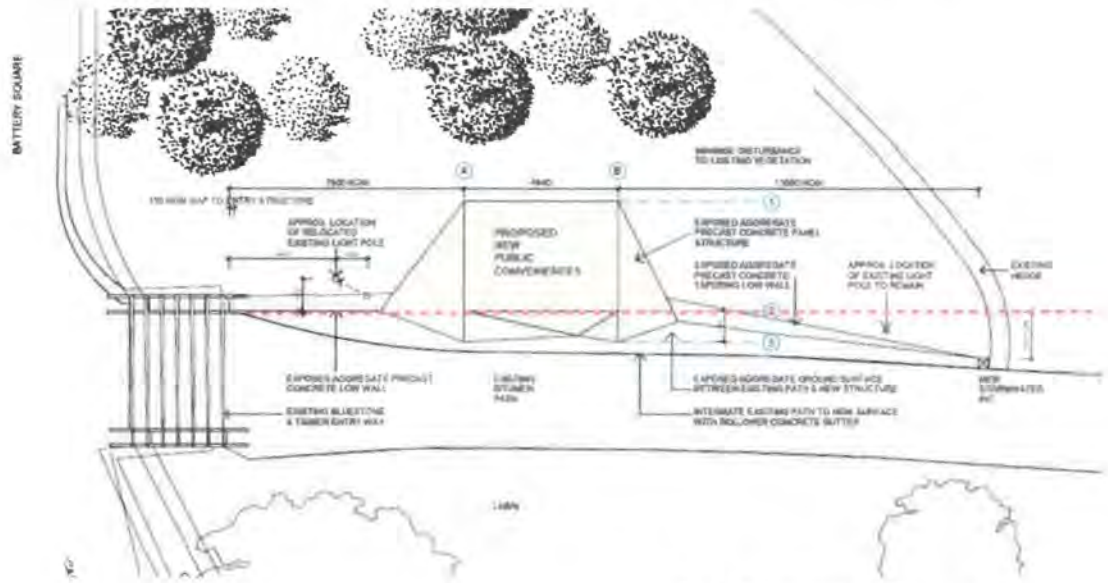


fig 4. site plan detail of the proposed public conveniences.
The red dashed line shows the horizontal alignment with the inner edge of the entry walling.

The angular form of the proposal, has no relationship to the character of Princes Park as defined by the entry structures. Subsequently, the proposed form, particularly in close proximity to the entry, provides a visual intrusion into the character of the Park.

Photomontage 1, clearly demonstrates the visual impact of the proposal on the entry as its appearance in this location dominates the entry into the park.

9.0 CONCLUSION

After considering the application for new public conveniences for Princes Park, it is my opinion that the proposed works do not contribute to the character of the place and its setting as the location, bulk and appearance of the proposed works has an adverse impact on the heritage values of the place, due to its prominence within the Park.
Consequently, in my opinion, the proposal does not meet the following criteria to undertake 'building or works' on places of cultural significance, in accordance with clause 22.4.5. (SCPS p69)

'Building or works' must compliment and contribute to the cultural significance, character and appearance of the place and its setting

The location, bulk and appearance of 'building and works' must adversely affect the heritage values of any place of cultural significance

'Building or works' may be recognisable as new but not be individually prominent.

This opinion is concluded through an understanding of the high level of cultural heritage significance of the place, its character and appearance and a consideration of the location and form of the proposed works.

10.0 RECOMMENDATIONS

It is acknowledged within this assessment that the provision of accessible toilets are a necessary component to the on going use of the Park. In order to facilitate this, consideration should be given to a site analysis of the accessible areas of the Park to determine a place that has least adverse impact of the heritage values of the place. The redevelopment of the existing toilets should be considered in this analysis.

Should the result of this analysis indicate the current place for redevelopment is the most appropriate, then the existing proposal should be recessed further within the embankment to provide a lateral setback from the existing entry structure sufficient to alleviate the prominence of the new works as viewed from the street through the entry. Any new proposal should be accompanied with a landscape plan to integrate the structure within the gardens of the Park. The inclusion of new historical interpretation material should be considered as part of this proposal.

Given the high significance of the place, the analysis of the impact on heritage values and the location of the toilets should be conducted by a heritage professional, and the compilation of previous historical information should be undertaken to form the basis for a Conservation Plan for the place.

6. COMMITTEE ACTING AS PLANNING AUTHORITY

6.3 GENERAL

6.3.1 HOBART INTERIM PLANNING SCHEME 2015 – PLANNING SCHEME AMENDMENT AND S43A PERMIT APPLICATION – STEVENS FARM DRIVE, WEST HOBART – 5/2016 AMENDMENT – FILE REF: 16/18

362x's
(Council)

The General Manager reports:

"In accordance with the provisions of Part 2 Regulation 8(6) of the Local Government (Meeting Procedures) Regulations 2015, this supplementary matter is submitted for the consideration of the Committee.

Pursuant to Regulation 8(6), I report that:

(a) information in relation to the matter was provided subsequent to the distribution of the agenda;
(b) the matter is regarded as urgent; and
(c) advice is provided pursuant to Section 65 of the Act."

TO : General Manager

FROM : Development Planner

DATE : 22 March, 2016

SUBJECT : **HOBART INTERIM PLANNING SCHEME 2015 – PLANNING SCHEME AMENDMENT AND S43A PERMIT APPLICATION – STEVENS FARM DRIVE, WEST HOBART – 5/2016 AMENDMENT**

FILE : 16/18: HCC (p:\planning\amendments\hobart interim planning scheme 2015 amendments\5 of 2016 25 stevens farm drive rezoning & s43a\s33 reporting\council report march 2016.doc)

1. INTRODUCTION

1.1. This report considers an application under the *Land Use Planning and Approvals Act 1993* (LUPAA), from Town Planning Consultant Michael Ball on behalf of Mrs S R Stevens, to amend the Hobart Interim Planning Scheme 2015 by rezoning part of the property at 25 Stevens Farm Drive from Environmental Living to Low Density Residential and Open Space.

1.2. Pursuant to S.43A of the *former provisions* of LUPAA, the planning scheme amendment application is combined with a planning permit application for subdivision of 3 lots plus balance. The applicant's submission in support of the rezoning is provided in ***Attachment A*** and documentation relating to the subdivision is provided in the attachments to the Development Appraisal Planner's report in ***Attachment B.***

2. PROPOSAL

2.1. The proposal is to rezone approximately 5855m^2 of the property at 25 Stevens Farm Drive from Environmental Living to Low Density Residential to enable residential subdivision of the site, and subsequently the Open Space Zone is intended to be applied to an approximately 3,721m^2 portion of land proposed as Public Open Space. The areas proposed to be rezoned are shown on the rezoning/subdivision plans provided by the applicant in ***Attachment A.***

2.2. It is also proposed that planning approval be granted for subdivision of 3 lots plus balance under S.43A of the *former provisions* of LUPAA. The *former provisions* of the Act are defined in Schedule 6 – Savings and transitional provisions of the *Land Use Planning and Approvals Amendment (Tasmanian Planning Scheme Act) 2015* which commenced on 17 December 2015. An assessment of the S.43A Application by a Development Appraisal Planner and the Senior Statutory Planner is provided in ***Attachment** B*.

2.3. In relation to 2.2 above, LUPAA allows for Council, after it has decided to initiate an amendment, to consider a permit application concurrently with the preparation of a requested amendment. Both the amendment and permit application would be advertised for public comment. If Council decides not to initiate the amendment requested there is no need to consider the planning permit application.

3. EXISTING SITUATION

3.1. The land in question is located off Stevens Farm Drive, West Hobart (accessed via Thelma Drive), and also has frontage to Tara Street, South Hobart.

3.2. The land is positioned at the western edge of a previously approved 48 lot subdivision (PLN-08-00243), which is currently in the process of staged development. The subject land was not proposed to be included in the previous subdivision on the basis that previous geotechnical assessments indicated the land may be unsuitable for development. More thorough recent investigations have concluded that the land can conditionally support residential development.

3.3. The site is adjacent to two rivulets - the Ross Rivulet to the west and the Hobart Rivulet to the south. It is adjacent to 4 different zones (Low Density Residential, General Residential, Environmental Living and Open Space). Aside from the area occupied by the two rivulets and associated open space, the site is surrounded on the east, south and west sides by suburban residential development. To the north is bushland and low density residential development.

3.4. The site is almost entirely cleared of vegetation, and has historically been used for farming activities.

3.5. The land slopes south-west with a moderate to steep incline towards the Ross Rivulet. The area proposed to be rezoned has an average slope of approximately 30%.

4. PLANNING SCHEME PROVISIONS

4.1. The subject site is primarily zoned Environmental Living, with some areas of Open Space and Low Density Residential. The current zoning is primarily based on a translation from the zoning under the City of Hobart Planning Scheme 1982 (Rural B Zone and Residential 2 Zone). The areas zoned Open Space were based on the public open space that was provided under the previous subdivision permit for the greater land holding (PLN-08-00243).

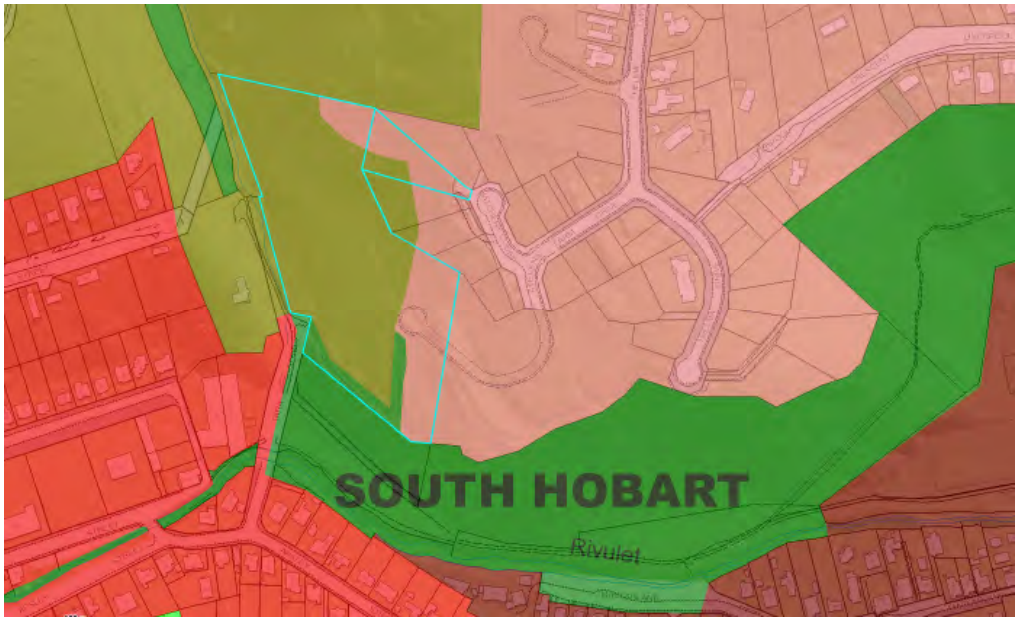


Figure 1: subject site (outlined in blue) showing existing zoning: olive green – Environmental Living Zone; green – Open Space Zone; pink – Low Density Residential Zone.

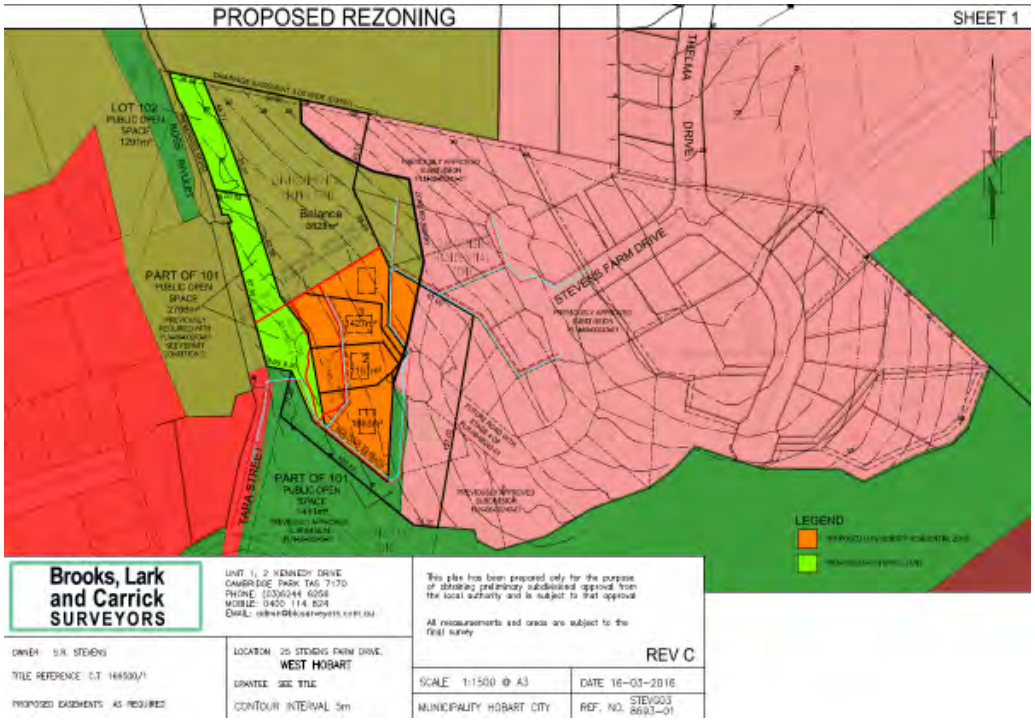


Figure 2: proposed rezoning: Orange – Low Density Residential Zone; light green: Open Space Zone

4.2. The area proposed to be rezoned Low Density Residential is a southern section of the Environmental Living Zone, adjoining the existing Low Density Residential Zone. A strip of land bordering Ross Rivulet is proposed to be zoned Open Space. Some of this strip of land was required as public open space through the previous subdivision permit,

and a section to the north-west of the subject site is proposed as public open space as a result of the current subdivision proposal.

4.3. The Zone Purpose Statements for the Environmental Living Zone are:

14.1.1.1 To provide for residential use or development in areas where existing natural and landscape values are to be retained. This may include areas not suitable or needed for resource development or agriculture and characterised by native vegetation cover, and where services are limited and residential amenity may be impacted on by nearby or adjacent rural activities.

14.1.1.2 To ensure development is reflective and responsive to the natural or landscape values of the land.

14.1.1.3 To provide for the management and protection of natural and landscape values, including skylines and ridgelines.

14.1.1.4 To protect the privacy and seclusion that residents of this zone enjoy.

14.1.1.5 To provide for limited community, tourism and recreational uses that do not impact on natural values or residential amenity.

14.1.1.6 To encourage passive recreational opportunities through the inclusion of pedestrian, cycling and horse trail linkages.

4.4. The Desired Future Character Statements for this zone are as follows:

(a) The areas covered by this zone will continue to be dominated by the natural bushland environment.

(b) Vegetation clearance for new development will be kept to the minimum area required to allow the development to proceed.

(c) Use and development will respect the scale and character of the bushland or rural environment.

(d) Buildings will be unobtrusively sited and not detract from the landscape values of the area.

(e) Building finishes in muted subdued colours will be the predominant finish.

(f) There should be no new non-residential use unless it can be demonstrated that it will not adversely affect the quiet living environment where noise transmission is a particular issue due to the topography and relatively low background noise levels.

4.5. Within the Environmental Living Zone, single dwellings and visitor accommodation are permitted (but multiple dwellings are prohibited). Uses with little impact such as passive recreation and minor utilities are no permit required, and there are a small number of discretionary uses, including (but not limited to) some community meeting and entertainment uses, small scale resource development uses and sports and recreation.

4.6. The minimum lot size for the Environmental Living Zone is 10ha in all areas other than Lenah Valley (where it is 4ha).

4.7. The Zone Purpose Statements for the Low Density Residential Zone are:

12.1.1.1 To provide for residential use or development on larger lots in residential areas where there are infrastructure or environmental constraints that limit development.

12.1.1.2 To provide for non-residential uses that are compatible with residential amenity.

12.1.1.3 To encourage residential development that respects the neighbourhood character.

12.1.1.4 To provide a high standard of residential amenity.

12.1.1.5 To ensure that development respects the natural and conservation values of the land and is designed to mitigate any visual impacts of development on public views.

4.8. The Desired Future Character Statement for the Inner Residential Zone states as follows:

The areas in a bushland setting covered by this zone should continue to develop primarily with detached housing in order to allow substantial retention of natural vegetation and landscaped open space. The use of materials that blend with the colours and textures of the natural vegetation is encouraged. In Lower Sandy Bay development should minimise impacts on the landscape values of the Derwent Estuary.

4.9. Within the Low Density Residential Zone, residential uses (including multiple dwellings) and visitor accommodation are permitted. Single dwellings and a number of low impact uses such as passive recreation and minor utilities are no permit required, and there are a number of discretionary uses including (but not limited to) some community meeting and entertainment uses, domestic animal breeding, boarding or training and sports and recreation.

4.10. The minimum lot size within the Low Density Residential Zone is 1,000m^2 and the maximum 2,500m^2, and the minimum site area per dwelling for multiple dwellings is 1,500m^2.

4.11. The Zone Purpose Statements for the Open Space Zone are:

19.1.1.1 To provide land for open space purposes including for passive recreation and natural or landscape amenity.

19.1.1.2 To encourage open space networks that are linked through the provision of walking and cycle trails.

19.1.1.3 To encourage passive recreational opportunities, and allow for tourist operation uses, which are consistent with the protection of bushland and foreshore values.

4.12. Within the Open Space Zone, there are no permitted uses. No permit required uses are passive recreation, natural and cultural values management and utilities, and there are a number of discretionary uses including (but not limited to) food services, general retail and hire, tourist operation and sports and recreation.

4.13. There are no minimum lot sizes in the Open Space Zone, but subdivision is required to be for public open space, reserves, utilities or for providing for allowable uses.

4.14. The subject site is affected by the Landslide Hazard Area overlay, the Biodiversity Protection Area overlay and the Bushfire Prone Areas Code.

5. DISCUSSION

Justification – Applicant's submission

5.1. The applicant considers that the requested amendment is justified for the following reasons:

5.1.1. The rezoning essentially provides for a minor extension of the residential subdivision previously approved on the adjoining land, which takes advantage of the installed infrastructure, including road, water, sewerage, stormwater, communications and power.

5.1.2. The subject site was not included in the original subdivision plan because of concern regarding land stability, however recent more detailed geological assessments have established the conditional suitability of the land for residential development.

5.1.3. The proposed zone is considered more in keeping with the surrounding residential character of the area (particularly when the existing approved subdivision is developed with housing). The existing cleared and historically farmed landscape of the site is at odds with the natural bushland character described in the Zone Purpose Statements and Desired Future Character Statements of the Environmental Living Zone.

5.1.4. The proposed rezoning provides opportunity to 'correct' the zoning over a number of adjoining approved lots to be more reflective of the residential use of those lots.

5.1.5. The subject site has been cleared of natural bush, having historically being used for grazing, and adequate bushfire hazard management areas are provided within each proposed lot.

5.1.6. Consistency with the Landslide Code can be achieved by compliance with the submitted geotechnical report.

5.1.7. The proposed rezoning is considered to be consistent with the purpose of the Biodiversity Code given the site is cleared and no native flora or fauna will be affected by the rezoning or subsequent subdivision. The area proposed to be zoned Open Space will add to those areas previously taken by Council as Public Open Space in protecting remnant vegetation along the Ross Rivulet.

5.1.8. The proposal is consistent with the Southern Tasmanian Regional Land Use Strategy 2010-2035 (STRLUS). If the subject site is not entirely within the Urban Growth Boundary it is considered to be immediately adjacent to it, and as the resultant subdivision would make more efficient use of services and land and the small scale would have no impact on any residential land release programme, it is considered to be consistent with the guidance provided by the Urban Growth Boundary location.

5.1.9. The proposal meets the objectives of LUPAA and is consistent with relevant State Policies.

Justification – comment

5.2. The applicant has submitted what appear to be some valid reasons as to why rezoning of the subject site from Environmental Living to Low Density Residential and Open Space would be appropriate.

5.3. It is considered that the subject site is well located in terms of available servicing, density of surrounding residential development and proximity

to the city, and the proposed rezoning and subdivision represents an infill opportunity between established residential areas.

5.4. The aspect of the subject site (south-west and in a gully) is not ideal in terms of access to direct sunlight, and subsequently energy efficiency and amenity of residential development on the proposed lots. The aspect is not directly south-facing, however, and should receive more than 3 hours of sunlight between 9am and 3pm on the winter solstice.

The building areas shown on the proposed subdivision are within the higher section of the lots, which should provide for the greatest opportunity to access available sunlight. Indeed, any subdivision arrangement within the subject area would require development in the higher section, given the lower section is excluded from residential development due to land instability.

A Part 5 Agreement currently applies to the title which, among other issues, addresses maximising solar penetration and energy conservation in future development. An amended Part 5 Agreement is proposed to be applied to the subdivided lots which will continue to address this issue (see Development Appraisal Planner's report in ***Attachment B***).

Given these considerations, and balancing the benefits of providing for additional well-serviced residential land within close proximity to the city, the rezoning to allow for a small number of additional lots is considered reasonable.

5.5. Visual impact was a consideration for the previously approved subdivision, and is another issue which is addressed through the Part 5 Agreement (which was intended to reflect the Statement of Desired Future Character applicable to the area under the City of Hobart Planning Scheme 1982). It is considered that the subject land is in fact less visually sensitive than the area that has already been approved for subdivision, as it is located lower on the hill and within a gully. The modified Part 5 Agreement intended to apply to the proposed lots will continue to ensure any potential visual impacts are lessened.

5.6. The proposed rezoning is required to be consistent with the STRLUS, with a relevant consideration being the Urban Growth Boundary which is intended to guide the extent of the spread of urban development. Although the resolution of the map showing the Urban Growth Boundary makes its exact location difficult to determine, it is concluded that the subject site is not contained within the boundary (which appears to follow the line of the previously approved subdivision). Despite this, the land is directly adjacent to the boundary, and it has been confirmed that the boundary is a guidance tool relating to zoning and development rather than an exact demarcation.

Given the proposed zone boundary adjustment is fairly minor and represents 'infill' between existing established residential areas, and the proposed subdivision yield is only for 3 additional lots that utilise existing infrastructure, it is considered the proposal is consistent with the Urban Growth Boundary.

5.7. The proposal is also considered to be consistent overall with the Settlement and Residential Development policies of the STRLUS. With the rezoning of the land being for Low Density Residential located on a Greenfield site, the proposal does not satisfy the STRLUS preference for urban infill development at higher densities, however this is due to site constraints such as topography, landslide and bushfire.

The intent for the application of the Low Density Residential Zone is specifically referenced in SRD 1.6: '*utilise the low density residential zone only where it is necessary to manage land constraints in settlements or to acknowledge existing areas*'. The land in this instance is not capable of supporting higher density development due to site constraints, and therefore it is considered that the proposed zone is the highest order zoning possible for the land. The rezoning does make more residential land available within close proximity to the city and makes efficient use of existing and approved infrastructure, which is encouraged by the STRLUS.

5.8. The submitted documentation, including Geotechnical Report and Bushfire Hazard Management Plan, indicate that the hazards on the site can be managed to allow for residential development (refer to report by the Development Appraisal Planner in ***Attachment B*** for a more detailed appraisal).

5.9. The subject site could be considered to be largely inconsistent with its current zoning (Environmental Living), in that it is cleared land with a history of farming. The strategic intent for the Environmental Living Zone is to provide for limited residential use or development in areas where existing natural or landscape values are to be retained. The Desired Future Character for this zone focuses primarily on retention of bushland, which is not applicable to the subject site given it is not vegetated.

5.10. The Low Density Residential Zone appears to be a suitable zoning given the allowable densities under the zone will account for the demonstrated site constraints and continue the character of development in the remaining subdivided area.

5.11. In terms of the size of the area to be rezoned Low Density Residential, approximately 3.8 dwellings would be permitted (which equates to almost 1 dwelling per lot under the proposed lot arrangement). While

there is discretion under the scheme to vary the permitted site area per dwelling, multiple dwellings are unlikely in this location given the topography and site constraints, which include a significant area that cannot be built on for geotechnical reasons, and sewer and stormwater mains bisecting the proposed lots.

5.12. Although almost the entire extent of 25 Stevens Farm Road is cleared and does not contain significant environmental values, it is considered that the zoning of the balance of the site (primarily Environmental Living) should remain in order to limit further development of the balance lot. The submitted geotechnical report has determined that the area of the balance lot to remain as Environmental Living is not suitable for residential development.

5.13. The area of land proposed to be zoned Open Space reflects Public Open Space required through the previous subdivision approval, as well as an additional contiguous area of public open space offered as part of the current subdivision proposal. Given the additional public open space will continue an open space corridor along the Ross Rivulet and could provide for links between Knocklofty Reserve and Hobart Rivulet Park, Council's Parks Planner is supportive of the rezoning. As such, the application of the zone is appropriate.

5.14. In the submitted planning report, it is suggested that the rezoning also provides an opportunity to 'rectify' the existing extent of the Environmental Living Zone to the north of the subject site so the currently irregular zone boundary follows the rear boundaries of the already approved lots accessed by Hatchery Court.

The current boundary was translated from the extent of the Rural B Zone under the City of Hobart Planning Scheme 1982, which was based on geological considerations. Given there are no specific investigations relating to this zone change, it is not considered that there is sufficient justification to make any further rezoning changes in this respect.

5.15. It is also considered appropriate to remove the Biodiversity Overlay from the area to be rezoned Low Density Residential given that the area is cleared and no native flora or fauna will be affected by the rezoning or subsequent subdivision. This is consistent with the adjoining Low Density Residential Zone where the Biodiversity Overlay is not applied.

Land Use Planning and Approvals Act 1993

5.16. The LUPAA requires that planning scheme amendments must seek to further the objectives of Schedule 1 of the Act and be prepared in accordance with State Policies.

5.17. The objectives of the Act require use and development to occur in a fair, orderly and sustainable manner and for the planning process to facilitate economic development in accordance with the other Schedule 1 objectives.

5.18. It is considered that the proposed amendment meets the objectives of the LUPAA, in particular it:

5.18.1. assists sound strategic planning by not prejudicing the achievement of the relevant Zone Objectives or the STRLUS objectives;

5.18.2. is consistent with the objective to establish a system of planning instruments to be the principal way of setting objectives, policies and controls for the use, development and protection of land;

5.18.3. provides greater flexibility to address changes in local environmental, social and economic circumstances;

5.18.4. allows for a more efficient use of the existing infrastructure and facilities;

5.18.5. is consistent with the objective to provide for the consolidation of approvals for land use and development;

5.18.6. facilitates the integration of compatible and complementary land use activities in a managed and safe environment;

5.18.7. provides for the exercise of greater flexibility to fully consider the capability of the land.

5.19. The relevant State Policy to consider in this case is the State Policy on Water Quality Management. It is considered that the proposed amendment is consistent with the objectives of this policy as a soil and water management plan will be required for future development on the sites and stormwater will be drained to a piped system. The Ross and Hobart Rivulets will be buffered from development by strips of public open space.

5.20. S 32(e) of LUPAA requires that planning scheme amendments must avoid the potential for land use conflicts in adjacent planning scheme areas. The proposed amendment complies with this provision as there is no issue in respect of conflict with future land use and development in Glenorchy or Kingborough.

5.21. S 32(f) of LUPAA requires that planning scheme amendments must have regard to the impact that the use and development permissible under the amendment will have on the use and development of the region as an

entity in environmental, economic and social terms. The size, location and configuration of the land proposed for rezoning is such that it will not have any regional implications.

6. S43A DEVELOPMENT APPLICATION

6.1. The proposed subdivision at 25 Stevens Farm Road has been assessed by a Development Appraisal Planner and the Senior Statutory Planner (see ***Attachment B***). It is recommended that a permit for the development be granted subject to a number of conditions.

7. LEGAL IMPLICATIONS

7.1. The proposed planning scheme amendment and Section 43A Planning Permit Application will be subject to the usual amendment process under the LUPAA.

8. STRATEGIC PLANNING IMPLICATIONS

8.1. The proposed amendments are consistent with the objectives of the Capital City Strategic Plan 2015-2025 in regard to Strategic Objective 2.3 – 'City and regional planning ensures quality design, meets community needs and maintains residential amenity'.

9. FINANCIAL IMPLICATIONS

9.1. The proposed planning scheme amendment should not result in any additional significant Council expenditure.

10. CONSULTATION

10.1 Council's Parks Planner has been consulted.

11. PUBLIC/CUSTOMER IMPLICATIONS

11.1. Council has requested that reports which recommend the initiation of planning scheme amendments address the need to conduct a public meeting or forum to explain the proposed amendments and also outline the explanatory information to be made available. These are addressed below:

11.1.1. It is not considered that a public forum is necessary to explain the proposed amendment to the public as it is relatively simple and self explanatory.

11.1.2. The following information will be made available on the web site: a copy of this report, a copy of the formal amendment document and the applicant's submission.

11.2. Council will have the opportunity to recommend to the Tasmanian Planning Commission modifications or refusal of the permit or amendment after the 28 day public advertising period.

12. CONCLUSION

12.1. This report considers an application under the *Land Use Planning and Approvals Act 1993* (LUPAA), from Town Planning Consultant Michael Ball on behalf of Mrs S R Stevens, to amend the Hobart Interim Planning Scheme 2015 by rezoning part of the property at 25 Stevens Farm Drive from Environmental Living to Low Density Residential and Open Space.

12.2. Pursuant to S.43A of the *former provisions* of LUPAA, the planning scheme amendment application is combined with a planning permit application for subdivision of 3 lots plus balance. The applicant's submission in support of the rezoning is provided in ***Attachment A*** and documentation relating to the subdivision is provided in the attachments to the Development Appraisal Planner's report in ***Attachment B.***

12.3. The proposal is to rezone approximately 5855m^2 of the property at 25 Stevens Farm Drive from Environmental Living to Low Density Residential to enable residential subdivision of the site, and subsequently the Open Space Zone is intended to be applied to an approximately 3,721m^2 portion of land proposed as Public Open Space.

12.4. The area proposed to be rezoned is cleared, well serviced, located close to existing residential areas and to the city centre, and is capable of supporting residential development at low densities. Given these considerations, the Environmental Living Zone is not the most applicable zoning for the subject area.

12.5. The Low Density Residential Zone is an appropriate alternative zone for the subject area as it provides for densities of development that will account for site constraints such as land stability, bushfire and topography.

12.6. The area proposed to be zoned Open Space is considered to be appropriate given it continues a linear section of public open space along Ross Rivulet, and potentially provides for future links between Knocklofty Reserve and Hobart Rivulet Park.

12.7. It is considered that the proposed rezoning is consistent with the provisions of the Southern Tasmanian Regional Land Use Strategy 2010-2035 (STRLUS).

12.8. The proposed amendment and S43A Permit for rezoning at Stevens Farm Drive is recommended for approval.

13. RECOMMENDATION

That

13.1. Report: hcc (p:\planning\amendments\hobart interim planning scheme 2015 amendments\5 of 2016 25 stevens farm drive rezoning & s43a\s33 reporting\council report march 2016.doc) be received and noted.

13.2. Pursuant to Section 34(1) (b) of the former provisions of the Land Use Planning and Approvals Act 1993, Council resolve to initiate the following amendment to the Hobart Interim Planning Scheme 2015:

13.2.1. Rezone part of the property at 25 Stevens Farm Drive, West Hobart from Environmental Living to Low Density Residential and Open Space as indicated on the rezoning/subdivision plans provided in Attachment A and also remove the Biodiversity Overlay from the are to be rezoned Low Density Residential.

13.3. Pursuant to Section 35 of the former provisions of the Land Use Planning and Approvals Act 1993, Council certify that the 5/2016 Amendment to the Hobart Interim Planning Scheme 2015 meets the requirements of Section 32 of the former provisions of the Land Use Planning and Approvals Act 1993 and authorise the Lord Mayor and the General Manager to sign the Instrument of Certification (Attachment C).

13.4. Pursuant to Section 38 of the former provisions of the Land Use Planning and Approvals Act 1993, Council place the 5/2016 Amendment to the Hobart Interim Planning Scheme 2015 on public exhibition for a 28 day period following certification.

13.5. Pursuant to Section 43A of the former provisions of the Land Use Planning and Approvals Act 1993, Council grant a permit for subdivision at 25 Stevens Farm Drive, West Hobart and a permit containing the conditions specified in Attachment B be issued.

(Sarah Crawford)

DEVELOPMENT PLANNER

(Neil Noye)
DIRECTOR CITY PLANNING

Attachments: Attachment A - Applicant's Submission
Attachment B - S43A Development Application Assessment
Attachment C - Instrument of Certification

Attachment A

PROPOSED REZONING

25 STEVENS FARM DRIVE
WEST HOBART

On behalf of

Mrs S R STEVENS

Prepared by; Michael Ball
BSc Hons Grad Dip Urban and Regional Planning
Town Planning Consultant

November 2015

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Mrs S R Stevens seeks an amendment to the City of Hobart Interim Planning Scheme 2015 (the Scheme) as it affects part of her land at 25 Stevens Farm Drive West Hobart. It is proposed to amend the zoning from **Environmental Living (Zone 14)** to **Low Density Residential (Zone 12)** providing for the subdivision of that area for residential purposes consistent with the permit for development on the adjoining area. Concurrently application is made for the subdivision of the area being rezoned for the subdivision of three (3) allotments and balance.

1.2 The application is made under **Sections 33 and 43**A of the **Land Use Planning Approvals Act 1993.**

1.3 A plan designating the area proposed for rezoning and the proposed subdivision has been prepared by Surveyors Brooks Lark and Carrick and is included as Attachment 2.

1.4 Whilst not necessarily part of the amendment being sought by Mrs Stevens an opportunity is presented to correct the zone boundary to more accurately reflect the previously approved lot arrangement.

1.5 No change is necessary to the written part of the Scheme.

2. BACKGROUND

2.1 The subject site forms part of an original title that was historically used as a poultry farm. Since cessation of that use the substantive part of the original farm was rezoned to Residential 2 under the then existing City Of Hobart Planning Scheme 1982 and subsequently approved for subdivision for residential purposes consistent with the new zone. (PLN 08.00243.01 15 May 2009) The subdivision received staged approval and is still in the process of development. (See Figure 1 below)

FIGURE 1 Adjacent residential subdivision in course of construction.

2.2 As a result of construction works associated with the development a more detailed geotechnical survey has been carried out. That survey has indicated that a greater area is available for development than was earlier identified and the proposed rezoning now submitted is a result of that more recent research.

3. SITE DESCRIPTION

3.1 Location

The land is located off Stevens Farm Drive at the top end of Forest Road West Hobart via Thelma Drive. It also has frontage to Tara Street South Hobart as shown on the Location Plan in Figure 3 below.

3.2 Site

The irregular shaped parcel of land is comprised of a single Title of 2.353 ha known as Lot 1 on Plan 169500 (a copy of which is included as Attachment 1) in the ownership of Mrs Stevens.

3.2.1 The land has a moderate to steep slope to the south west towards Ross Rivulet.

3.2.2 It has been generally cleared of vegetation having been historically used for farming purposes including poultry production although the lower flanks adjacent to Ross Rivulet retain some tree coverage as seen in Figure 2.

4. EXISTING SETTLEMENT PATTERN

4.1 The subject site is adjacent to residential areas to the east south and west as seen in Figure 4 below. The completion of the already approved subdivision will result in an almost continuous belt of residential development on an east west axis only broken by the alignments of Ross and Hobart Rivulets.

FIGURE 2. View to the south showing remnant tree coverage. (Taken 4 November 2014 at 8.03am)

5. INFRASTRUCTURE

5.1 The subject site is fully serviced with water, sewerage, stormwater, power and communication infrastructure and falls within Council's refuse and recycling collection district.

FIGURE 3. Location (The List November 2014)

6. PLANNING CONTROL

6.1 Existing Zoning

The subject land is currently zoned **Environmental Living** under the provisions of the **City of Hobart Interim Planning Scheme 2015**

6.2 Existing Zone Purpose

"14.1.1 Zone Purpose Statements

14.1.1.1 To provide for residential use or development in areas where existing natural and landscape values are to be retained. This may include areas not suitable or needed for resource development or agriculture and characterised by native vegetation cover, and where services are limited and residential amenity may be impacted on by nearby or adjacent rural activities.
14.1.1.2 To ensure development is reflective and responsive to the natural or landscape values of the land.
14.1.1.3 To provide for the management and protection of natural and landscape values, including skylines and ridgelines.
14.1.1.4 To protect the privacy and seclusion that residents of this zone enjoy.
14.1.1.5 To provide for limited community, tourism and recreational uses that do not impact on natural values or residential amenity.
14.1.1.6 To encourage passive recreational opportunities through the inclusion of pedestrian, cycling and horse trail linkages."

6.3 **Part 14.1.3** of the Scheme provides the following **Future Character Statements** for the existing zone

"(a) The areas covered by this zone will continue to be dominated by the natural bushland environment.
(b) Vegetation clearance for new development will be kept to the minimum area required to allow the development to proceed.
(c) Use and development will respect the scale and character of the bushland or rural environment
(d) Buildings will be unobtrusively sited and not detract from the landscape values of the area
(e) Building finishes in muted subdued colours will be the predominant finish
(f) There should be no new non residential use unless it can be demonstrated that it will not adversely affect the quiet living environment where noise transmission is a particular issue due to topography and relatively low background noise levels"

FIGURE 4. Overview of site showing existing settlement pattern (Google Earth November 2014)

6.4 Table 14.1 under 14.5 of the Scheme headed Development Standards for Subdivision provides for subdivision in this zone in this area to a minimum lot size of 10ha.

6.5 The clearly the settlement pattern shown in Figure 4 above and the current lot size of the subject site are inconsistent with the existing zone.

6.6 The subject site is affected by the Landslide Hazard Area overlay (Overlay Code 116 LDS) and the Biodiversity Protection Area overlay (Overlay Code 116 BPA) as well as the Bushfire Prone Areas Code under Part E1 of the Scheme.

7. ASSESMENT AGAINST RELEVANT STATE POLICIES

7.1. State Coastal Policy

Whilst the subject site falls within the coastal zone as defined by the State Coastal Policy 1996, the proposal provides for the consolidation of an existing residential settlement and as such is considered consistent with the policy.

7.2. State Policy on the Protection of Agricultural Land

The site is of not one significant agricultural potential nor rated as Class1, 2 or 3 lands.

7.3. State Policy on Water Quality Management

The subject site is fully serviced with sewerage and stormwater infrastructure, it is considered that proposal will not impact on any issue of water quality. The existing alignments of Ross and Hobart Rivulets will be buffered from future residential development by public open space generated by the existing subdivision approval and by any future approval.

8. ASSESSMENT AGAINST THE OBJECTIVES OF THE LAND USE PLANNING AND APPROVALS ACT 1993

8.1 S.32 of LUPAA necessitates an amendment to a Planning Scheme to further the objectives of the Act as set out in Schedule 1.8.2. The following provides consideration of those objectives

PART 1	
(a) To promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity	The area is of little conservation value as a result of past human activity and modification.
(b) To provide for the fair, orderly and sustainable use and development of air, land and water; and	The proposal only involves the use of land. It is consistent with surrounding development and provides the opportunity to more effectively use existing infrastructure and services. It has no negative impacts on either. The development is within the environmental capacity of the land and is consistent with surrounding development. The proposal will have a positive social impact in that it would provide for a reinforcement of resident population in the area allowing for better use of existing economic and social infrastructure
(c) To encourage public involvement in resource management and planning; and	The proposal as submitted would be subject to public consideration in accordance with S.38 of LUPAA.
(d) To facilitate economic development in accordance with the objectives set out in	The proposal facilitates the economic development of the land and provides for economic returns to the community

paragraphs (a), (b) and (c); and	through works associated with the development and ongoing rate returns generated from the lots. Furthermore the increase in population will increase demand for goods and services within the local area.
(e) To promote the sharing of responsibility for resource planning between the different spheres of government, the community and industry in the State.	The proposal of itself cannot deliver this objective however it is not contrary to it.
PART 2	
(a) To require sound strategic planning and coordinated action by State and local government;	The proposed amendment to the Scheme is based on a thorough site and context assessment consistent with sound planning practice. The proposed amendment and future subdivision have been discussed with Council
(b) To establish a system of planning instruments to be the principal way of setting objectives, policies and controls for the use, development and protection of land;	The proposal is consistent with the provisions of the Act as they relate to the amendment of a planning scheme The effect would be to incorporate the proposal within the provisions of the scheme.
(c) To ensure that the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use of land;	The proposal has taken into consideration environmental impacts by limiting the developable area to land already impacted upon by human activity. The proposal consolidates existing residential development ensuring more effective and efficient use of existing physical and social infrastructure.
(d) To require land use and development planning and policy to be easily integrated with environmental, social, economic, conservation and resource management policies at State, regional and municipal levels	The assessment carried out has taken into account all of the matters subject to this objective and is considered consistent with them.
(e) To provide for the consolidation of approvals for land use or development and related matters and to coordinate planning approvals with related approvals	The proposal provides for a concurrent Scheme amendment and subdivision providing for a coordinated assessment.
(f) To secure a pleasant, efficient and safe working, living and recreational environment for all Tasmanians and visitors to Tasmania;	The proposal would clearly provide a safe and efficient living environment. Development of the land will ensure better fire protection for both future and existing residents. The proposal will have no impact on any work or recreation environment.

(g) To conserve those buildings, areas or other places which are of scientific aesthetic, architectural or historical interest, or otherwise of special cultural value;	The subject site has no special interest
(h) To protect public infrastructure and other assets and enable the orderly provision and coordination of public utilities and other facilities for the benefit of the community	The proposal poses no threat to existing infrastructure. In fact it provides an opportunity to both improve and make more effective use of existing infrastructure in a both timely and coordinated manner.
(i) To provide a planning framework which fully considers land capability.	The site is not significant agricultural land or rated as Class 1, 2 or 3 lands. Geological survey and assessment by a suitably qualified environmental officer shows the subject site is capable of supporting residential subdivision.

FIGURE 5. View to the west. (Taken 4 November 2014 at 8.03am)

9. GEOTECHNICAL ASSESSMENT

9.1 A geotechnical report on the subject site has been carried out by William C Cromer P/L a copy of which is included as Attachment 3.

9.2 The report identifies that the subject area can support future residential development as follows

"*From a geotechnical perspective, Stage 4 can conditionally support residential development,*

which is unlikely to cause instability on any other land.
All risks can be acceptably managed by the risk mitigation procedures, and with good hillside construction techniques, recommended in this report.:

FIGURE 6. Land to be retained in the Environmental Living Zone

10. PLANNING ASSESSMENT

10.1 It is proposed that the subject area be rezoned from Environmental Living to Low Density Residential consistent with the area of the Steven's holding that is similarly zoned and in the course of development consistent with the Low Density Residential zone.

10.2 The scheme provides the following Zone Purpose Statements for the proposed zone

"12.1.1.1 To provide for residential use or development on larger lots in residential areas where there are infrastructure or environmental constraints that limit development.
12.1.1.2 To provide for non-residential uses that are compatible with residential amenity.
12.1.1.3 To encourage residential development that respects the neighbourhood character.
12.1.1.4 To provide a high standard of residential amenity.
12.1.1.5 To ensure that development respects the natural and conservation values of the land and is designed to mitigate any visual impacts of development on public views."

10.1 The scheme amendment as proposed essentially provides for a minor extension of the residential subdivision previously approved on the adjoining land. The potential subdivision into a further three lots and balance takes advantage of the infrastructure installed to serve the already approved subdivision including road frontage.

10.2 The subject site was not included in the initial rezoning and subdivision under the then existing planning scheme because of concerns regarding land stability. The recent civil works associated with the adjoining residential subdivision have allowed a more detailed assessment of stability issues and that assessment has established the suitability of the subject area for residential development as detailed in the accompanying geotechnical report. That report

makes certain recommendations regarding the future use of the land for residential purposes. Those recommendations should appropriately be incorporated into any approval of the application to rezone the subject site but more importantly in any future subdivision approval.

10.3 The proposed zone and hence the residential subdivision is considered more in keeping with the surrounding residential character of the area. The existing landscape is one of cleared farmland rather than one of natural bushland as described in the Future Character Statement for the existing zone. That landscape will be further dominated by residential development as the subdivision under the existing permit proceeds.

10.4 The rezoning of the subject site and the subdivision will provide for a more effective and efficient use of the infrastructure that has been constructed as a result of the already approved residential subdivision including road, water, sewerage, stormwater, communications and power.

10.5 The proposed rezoning provides Council with the opportunity to correct the zoning over a number of adjoining lots previously approved for subdivision to more correctly reflect the use of those lots for residential purposes.

10.6 The land proposed for rezoning and subsequent subdivision has been cleared of bush having been historically used for grazing. Adequate areas for hazard management are provided within each of the proposed allotments for fire protection consistent with the Purpose of the Bushfire Prone Areas Code and the Development Standards thereunder.

10.7 Consistency with the Landslide Code is dealt with by the Report of Mr W Cromer attached to this report and referred to in section 9 of this report above.

10.8 The land as previously stated has been cleared of natural bush having been use for farming purposes, no native flora or fauna will be affected by the minor variation to the existing zone boundaries or subsequent subdivision and development. The proposal is considered consistent with the Purpose of the Biodiversity Code. The open Space generated by the proposal will add to those areas previously taken by Council in protecting the areas of remnant vegetation along the Ross Rivulet alignment.

11. CONCLUSION

A straight forward amendment to the scheme as it affects the zoning of the subject site is proposed rezoning the land from Environmental Living to Low Density Residential effectively a minor variation to the existing zone boundaries. The rezoning will result in the potential for a net increase of three (3) building allotments.

The proposed rezoning and concurrent subdivision of the land are considered consistent with the objectives of the Low Density Residential zone, surrounding residential development and there will be no impact on adjacent land uses.

The proposed rezoning is considered consistent with the relevant State Policies and the objectives of the Land Use Planning and Approvals Act 1993.

Overall the proposal is considered to have planning merit and deserves Council's support.

ATTACHMENT 1. COPY OF TITLE

ATTACHMENT 2. GEOLOGICAL SURVEY

ATTACHMENT 3. PROPOSAL PLAN

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
169500	1
EDITION	DATE OF ISSUE
1	14-Aug-2015

SEARCH DATE : 02-Sep-2015
SEARCH TIME : 02.27 PM

DESCRIPTION OF LAND

City of HOBART
Lot 1 on Plan 169500
Derivation : Parts of Lot 2, 4A-0R-18P and Lot 3, 4A-3R-35P (Sec.K) Gtd. to Henry Newman & Whole of Lot 1, 0A-2R-9P (Sec. K) Gtd. to Henry Whittaker
Prior CT 135609/1

SCHEDULE 1

D25738 ASSENT to SUZANNE ROSE STEVENS Registered 12-Sep-2011 at 12.01 PM

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
D3531 BURDENING EASEMENT: a right of drainage (appurtenant to Lots 1 & 2 on Plan 164038) over the Drainage Easement 3.00 wide on Plan 169500 Registered 07-Aug-2012 at noon
C290581 ADHESION ORDER under Section 110 of the Local Government (Building and Miscellaneous Provisions) Act 1993 Registered 23-Apr-2001 at noon (MF:2618/719)
D41506 AGREEMENT pursuant to Section 71 of the Land Use Planning and Approvals Act 1993 Registered 23-Jan-2012 at noon
D119044 MORTGAGE to Australia and New Zealand Banking Group Limited Registered 21-Feb-2014 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

OWNER SUZANNE ROSE STEVENS

FOLIO REFERENCE 135609/1

GRANTEE PART ~~WHOLE~~ OF LOT 2 4A-0R-18P AND PART OF LOT 3 4A-3R-35P SEC. K GTD TO HENRY NEWMAN & WHOLE OF LOT 1 0A-2R-9P GTD TO HENRY WHITTAKER

PLAN OF TITLE

LOCATION CITY OF HOBART

FIRST SURVEY PLAN No.5/75HOB. LO & W/15A LO

COMPILED BY BROOKS LARK & CARRICK SURVEYORS

SCALE 1: 1000 LENGTHS IN METRES

REGISTERED NUMBER **P169500**

APPROVED EFFECTIVE FROM 14 AUG 2015

Alice Rawa
Recorder of Titles

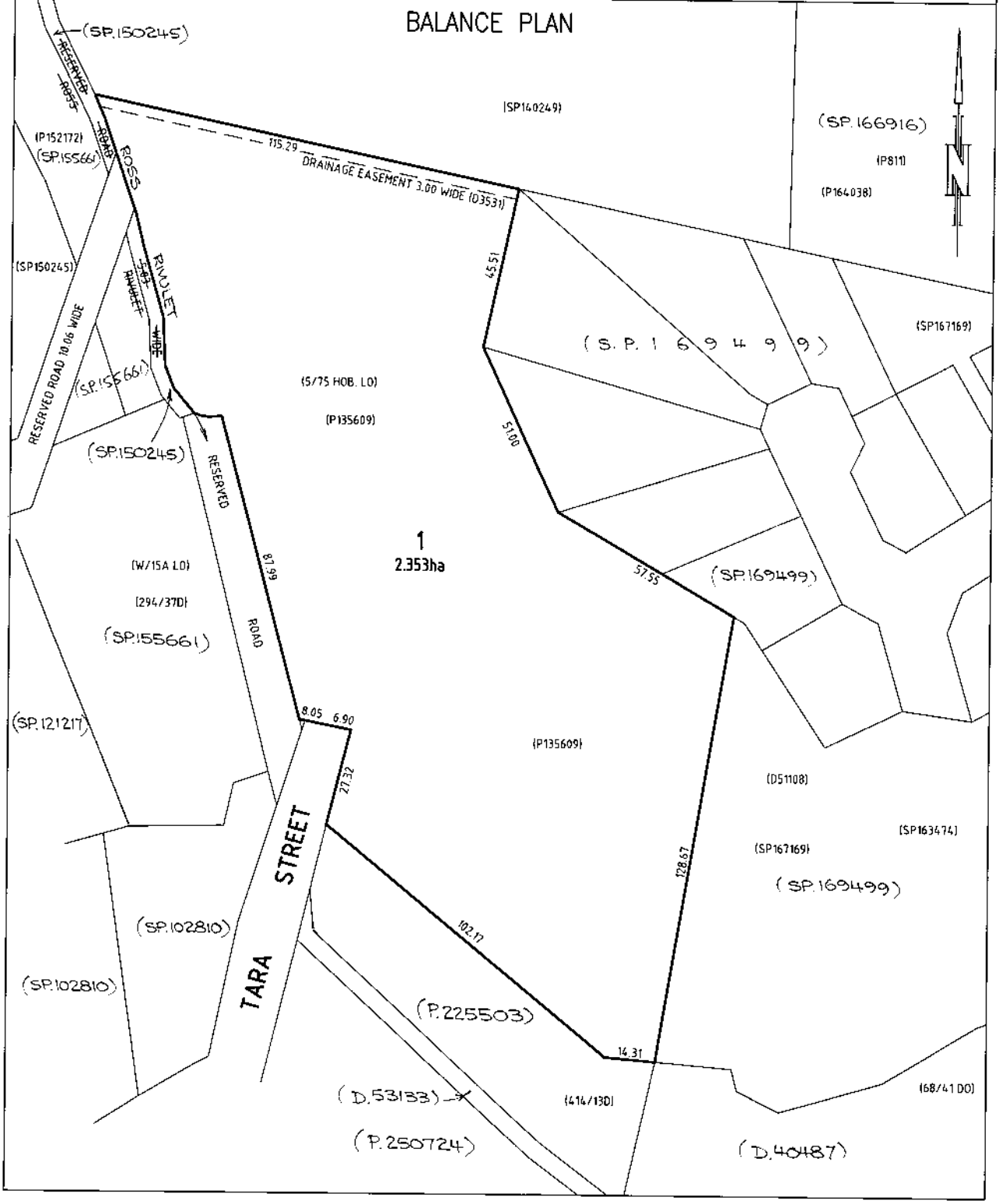
MAPSHEET MUNICIPAL CODE No. 114 (5225)

LAST UPI No.

LAST PLAN No. P.135609

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

BALANCE PLAN



FARM HILL
RESIDENTIAL SUBDIVISION
WEST HOBART

LOT 47
GEOTECHNICAL REPORT
ADDENDUM TO 1995 GEOTECHNICAL REPORT

Cover photo
View looking north and upslope across Lot 47 of the Farm Hill Subdivision, June 2014.

Refer to this report as
Cromer, W. C. (2015). *Farm Hill Residential Subdivision, West Hobart: Lot 47 Geotechnical Report – Addendum to 1995 Geotechnical Report.* Unpublished report for Farm Hill Pty Ltd by William C. Cromer Pty. Ltd., 22 January 2015; 82 pages).

The present report replaces an earlier report of the same title (but different date):

Cromer, W. C. (2014). *Farm Hill Residential Subdivision, West Hobart: Lot 47 Geotechnical Report – Addendum to 1995 Geotechnical Report.* Unpublished report for Farm Hill Pty Ltd by William C. Cromer Pty. Ltd., 15 July 2014; 81 pages).

Minor changes have been made to the Landslide Risk Management (LRM) section in Attachment 10, and in particular, to Table 10.3 and Figure 10.7. Figure 10.6, originally a single event tree, has been amended to Figures 10.6a and 10.6b (two separate event trees).

Important Notes
New geotechnical information is contained in this report. The information may be useful to regulators and geotechnical practitioners. Dissemination of such knowledge ought to be encouraged by practitioners and regulators.

William C Cromer as author will upload this report to his website www.williamccromer.com as a freely downloadable file.

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The local planning or building authority is encouraged to make this report (or a reference to it) available on-line.

William C Cromer Pty Ltd may submit hard or electronic copies of this report to Mineral Resources Tasmania to enhance the geotechnical database of Tasmania.

SUMMARY STATEMENT

This report is an Addendum to a 1995 geotechnical report.

It specifies a building envelope and conditions for residential development on Lot 47 of the Farm Hill Subdivision off Forest Road in West Hobart.

1 INTRODUCTION

1.1 Background

In 1995 Environmental & Technical Services Pty Ltd produced a geotechnical report[1] for G. E. Stevens to support an application to Hobart City Council to rezone 8ha of land off Forest Road in West Hobart from Rural B to Residential 2.

The Farm Hill residential subdivision, currently being developed, is the result (Attachments 1, 2, 3, 4). Lot 47 (Attachment 2) corresponds approximately to the area recommended in Cromer (1995) for low density development because of potential and existing slope stability issues.

The present report should be regarded as an Addendum to the 1995 report. It was commissioned by Farm Hill Pty Ltd to review the 1995 work, to conduct additional site investigations as necessary, and to provide specific recommendations for a building envelope for residential development on Lot 47. This report may accompany an application to rezone Lot 47.

1.2 Scope of current investigations

The present work is in general accordance with AS1726 (1993) *Geotechnical site investigations*. It included:

- a desk top study of satellite imagery (Attachment 3),
- a manipulation of LiDAR digital elevation data[2] (Attachment 8) and
- a review of published landslide maps including landslide hazard bands (Attachments 5 and 6).

Field work for this Addendum was conducted in May and June 2014 and included:

- Site inspection and photography (Attachment 9) of excavator services trenches dug by Farm Hill Pty Ltd principally along the perimeter of Lot 47,
- The digging, logging and photography (Attachment 9) of four excavator trenches totalling over 100m in length,
- Inspection and on-site discussion with Anthony Miner, Principal Geotechnical Engineer from A. S. Miner Geotechnical, and
- Surveying by D. Miller (surveyor) of the headscarps of several landslides along the eastern side of Ross Rivulet (Attachment 7).

2 SITE DESCRIPTION

Except for the results of the current work, all geotechnical aspects of Stages 1 – 4 at Farm Hill environs are comprehensively described in Cromer (1995). Relevant extracts from that report are reproduced here as Attachment 4. The Attachment includes a geotechnical interpretation map.

Recent site and trench photographs are presented in Attachment 9.

[1] Cromer, W. C. (1995). Geotechnical Investigations of land off Forest Road, West Hobart. Unpublished report for G. E. Stevens by Environmental & Technical Services Pty Ltd September 1995.
[2] Provided by A. S. Geotechnical from currently available LiDAR

3 LANDSLIDE RISK MANAGEMENT (LRM)

Attachment 10 is a LRM for Lot 47, in general accordance with the Australian Geomechanics Society (AGS) *Landslide Risk Management* (2007)[3].

Six potential slope movement scenarios were identified in relation to Lot 47. The LRM findings are:

- Current risks to property presented by the six scenarios range from Very Low (Scenario 6) to Moderate (Scenarios 1 – 5).
- Risk treatment is warranted for all of the Moderate risks.
- after development and appropriate risk treatment, consequences to property will be in the Insignificant to Minor range, and risks to property in the Very Low to Moderate range.
- Risk to life is acceptably low for all Scenarios after development, including Scenario 6 (excavations supported by engineered retaining walls behind houses).

The LRM analysis in Attachment 10 includes risk mitigation measures for these scenarios, which are incorporated in the Recommendations in this report.

Also included in Attachment 10 is a checklist of AGS (2007) items to be addressed in LRM, and a certificate of currency of the Professional Indemnity insurance for William C Cromer Pty Ltd.

4 CONCLUSIONS

From a geotechnical perspective, Lot 47 can conditionally support residential development, which is unlikely to cause instability on any other land.

All risks can be acceptably managed by the risk mitigation procedures, and with good hillside construction techniques, recommended in this report.

5 RECOMMENDATIONS

From a geotechnical viewpoint, residential development of Lot 47 at Farm Hill should proceed subject to the following recommendations.

1. Recommendations to create awareness of interested parties

1a. It is important that interested parties know that this (and the 1995) geotechnical work has been done. Approval to develop as proposed should therefore include reference to this report, and indicate that geotechnical and related conditions apply.

1b. The reference to this report shall be as follows:

[3] The five AGS documents are:
AGS (2007a). Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007
AGS (2007b). Commentary on Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007
AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007
AGS (2007d). Commentary on Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007
AGS (2007e). The Australian Geoguides for Slope Management and Maintenance. Australian Geomechanics Vol 42 No 1 March 2007

Cromer, W. C. (2014). *Farm Hill Residential Subdivision, West Hobart: Lot 47 Geotechnical Report – Addendum to 1995 Geotechnical Report.* Unpublished report for Farm Hill Pty Ltd by William C. Cromer Pty. Ltd., 22 January 2015; 82 pages).

1c. The planning authority shall ensure that copies of this report are available to interested parties. It is strongly suggested that this report, or a reference to its availability, be uploaded to the planning authority's website. Interested parties include future AS2870 classifiers of lots. To facilitate availability, both William C. Cromer as author and Farm Hill Pty Ltd hereby give permission for copies of the report to be made by Council, or anybody else. Note however, that hard copies of the report must be reproduced in full, not in part, and must only be copied in colour. No responsibility will be accepted by William C. Cromer Pty. Ltd. or Farm Hill Pty Ltd should stakeholders rely on information provided in black and white copies of this report, or part copies of this report whether in colour or not.

1d. As well as the planning authority, Farm Hill Pty Ltd shall ensure that prospective purchasers of lots in the subdivision are made aware that copies of this report are available.

2. Fundamental geotechnical recommendations

2a. Because Lot 47 includesinvolves moderately steep hillsides and active landslides, the over-riding recommendation is that good hillside engineering practices shall be followed for the development including dwellings and infrastructure. Examples of good and bad engineering practice on hillsides are included in Attachment 11 of this report.

2b. Architects, designers, builders, building inspectors, planning authorities, landowners and occupiers should also be aware of general geotechnical advice and information in the Australian Geomechanics Society publically available Geoguides[4]. These documents include the examples of good and bad hillside construction practices reproduced here in Attachment 11.

3. Restrictions on residential development

3a. Residential development (houses, garages, sheds, swimming pools, access drives and related infrastructure) shall be restricted to the building envelope labelled Area A in Figure 10.5 in Attachment 10, and repeated here as Figure 1.

3.b Residential development shall not occur on Landslide #874 or within a 20m wide buffer zone extending upslope from its headscarp (Areas C and B respectively in Figure 10.5) or on, and downslope to Ross Rivulet from, the steeper, undulating ground on the northern hillsides of Lot 47 (Area D in Figure 10.5 in Attachment 10, and repeated here as Figure 1).

3c. Lots created by subdivision of Lot 47 may include all or some of Areas B, C and D.

4. Recommendations about AS2870 site classification of future houses on Lot 47

4a. The planning authority shall require appropriate site investigations at or near the footprint of all future houses, and their subsequent classification in terms of AS2870 (2011) *Residential slabs and footings*.

4b. AS2870 classifiers should be appropriately qualified in accordance with the Tasmanian Director of Building Control's Certificates of Specialists or Other Persons[5]. They should read this and the 1995 geotechnical report. AS2870 site investigations and classification reports should be sufficiently detailed to allow, where necessary or appropriate, site-specific modifications to the recommendations of this report.

[4] Available on-line at http://australiangeomechanics.org/admin/wp-content/uploads/2010/11/LRM2007-GeoGuides.pdf

[5] See http://www.justice.tas.gov.au/building/publications_folder/Directors_Determination_Certificates_of_Specialists_or_Other_Persons_28_November_2012_.pdf

4c. AS2870 classifiers should anticipate a range of classifications depending on soil reactivity and thickness, depth to bedrock, the likely variability of these factors across house footprints, and the proposed designs of houses.

4d. It is strongly recommended that:

- subsurface investigations for site classification be done by excavator to help distinguish stable sandstone bedrock from floaters (some pockets of bedrock are present in colluvium), and

- footings for all houses in Lot 47 be supported on piers extended into (not onto) demonstrable Triassic sandstone bedrock This will mean footing depth is likely to vary across the footprint of a house.

4e. Footings for houses in soil on slopes steeper than about 15^0 shall be designed to resist lateral (downslope) ground movement.

5. Recommendations to enhance slope stability or reduce the consequences of instability at and near house footprints

5a. Minimise the number and height of excavations, including driveway accesses and house excavations.

5b. Do not unnecessarily overload slopes with excavated rock materials unless the underlying soil profile beneath the fill is first removed, and the fill is placed in a controlled manner. Do not use soil fill as a weight-bearing material unless it is placed in a controlled manner, and avoid oversteepening slopes with it (max. batter 1:2)

5c. Ensure that any weight-bearing fill placement during development is supervised by an appropriately qualified and experienced engineer who considers not only the final properties of the fill, but also any issues (eg consolidation and settlement) potentially affecting pre-existing low strength material on which the new fill might be placed.

5d. For excavations less than 0.8m high, create a batter angle in the soil profile no steeper than 1:2 (vertical: horizontal). Install a surface cut-off drain upslope and divert surface runoff to one or both sides of the excavation. Bedrock exposed in the excavation may be left subvertical, but any loose cobbles, boulders and joint fragments should be removed. Consider shotcreting or other ways to prevent rock falls from exposed bedrock faces, and the use of erosion control blankets and revegetation on battered soil faces.

5e. For excavations higher than 0.8m, install drained, engineered retaining walls on appropriate foundations to a suitable height, and where surface soil remains exposed above the wall, create a batter angle in the soil profile no steeper than 1:2. Bedrock exposed in the excavation behind the wall may be left subvertical, but the wall must be designed to resist lateral movement of material behind it. Install a surface cut-off drain upslope and divert surface runoff to one or both sides of the excavation, to join buried flexible stormwater pipework and hence to Ross Rivulet.

5f. Variations to the specifications in 5e (for example, using steel screen cover on rock faces, placing soil or rock berms, installing steel mesh fencing) are permissible provided they are engineer-designed and certified, the slope stability of the artificially steepened slope is not compromised, and the risks to property and life both remain Acceptable.

5g. The use of lightweight flexible materials is recommended for house construction.

6. Recommendations about surface drainage and services

6a. Control all natural surface runoff and concentrated runoff from roofs, hardstands and rainwater tank overflows. Discharge all water to Council's stormwater system. Avoid discharging drainage over or into excavations.

6b. All subsurface drainage from retaining walls or house pads shall be directed to stormwater pipework and not be permitted to discharge to the ground surface.

6c. Stormwater shall be piped in flexible pipework laid in trenches down (not across) the slope and extended (where unavoidable) through landslide #874 to discharge points in Ross Rivulet. Wherever possible, services from access roads downslope to houses shall be laid in trenches aligned directly up and down the slope, but backfilled with on-site subsoil (not screened gravel) to avoid creating permeable pathways for seepage water to accumulate at house footprints.

6d. Where stormwater or sewer pipes are constructed on grades greater than 15% (8.5^0), they should be constructed with anchors to prevent movement down the slope. Each anchor shall incorporate a pathway to allow seepage water flowing in the pipe bedding material to flow freely past the anchor and not be dammed by it.

7. Recommendation in relation to unexpected subsurface conditions

7a. William C. Cromer Pty Ltd shall be immediately contacted during development should subsurface conditions appear to significantly differ from those expected on the basis of this report.

W. C. Cromer
Principal

This report is and must remain accompanied by the following Attachments

Attachment 1. Location, satellite imagery, cadastral parcels and planning zones (2 pages)
Attachment 2. Subdivisional plan with Lot 47 indicated in green (1 page)
Attachment 3. Historical satellite imagery (3 pages)
Attachment 4. Extracts from 1995 geotechnical report (11 pages)
Attachment 5. Published geology and landslide hazard bands (2 pages)
Attachment 6. Tasmanian Landslide Hazard Maps in relation to the property (4 pages)
Attachment 7. May 2014 surveyed landslide headscarps and investigation trenches on Lot 47 (1 page)
Attachment 8. Topographic, aerial and LiDAR images of Farm Hill, showing May 2014 surveyed headscarps of landslides and 2014 service and investigation trenches (4 pages)
Attachment 9. Site and trench photographs (11 pages)
Attachment 10. Landslide Risk Management (18 pages)
Attachment 11. Examples of good and poor hillside engineering practices (3 pages)

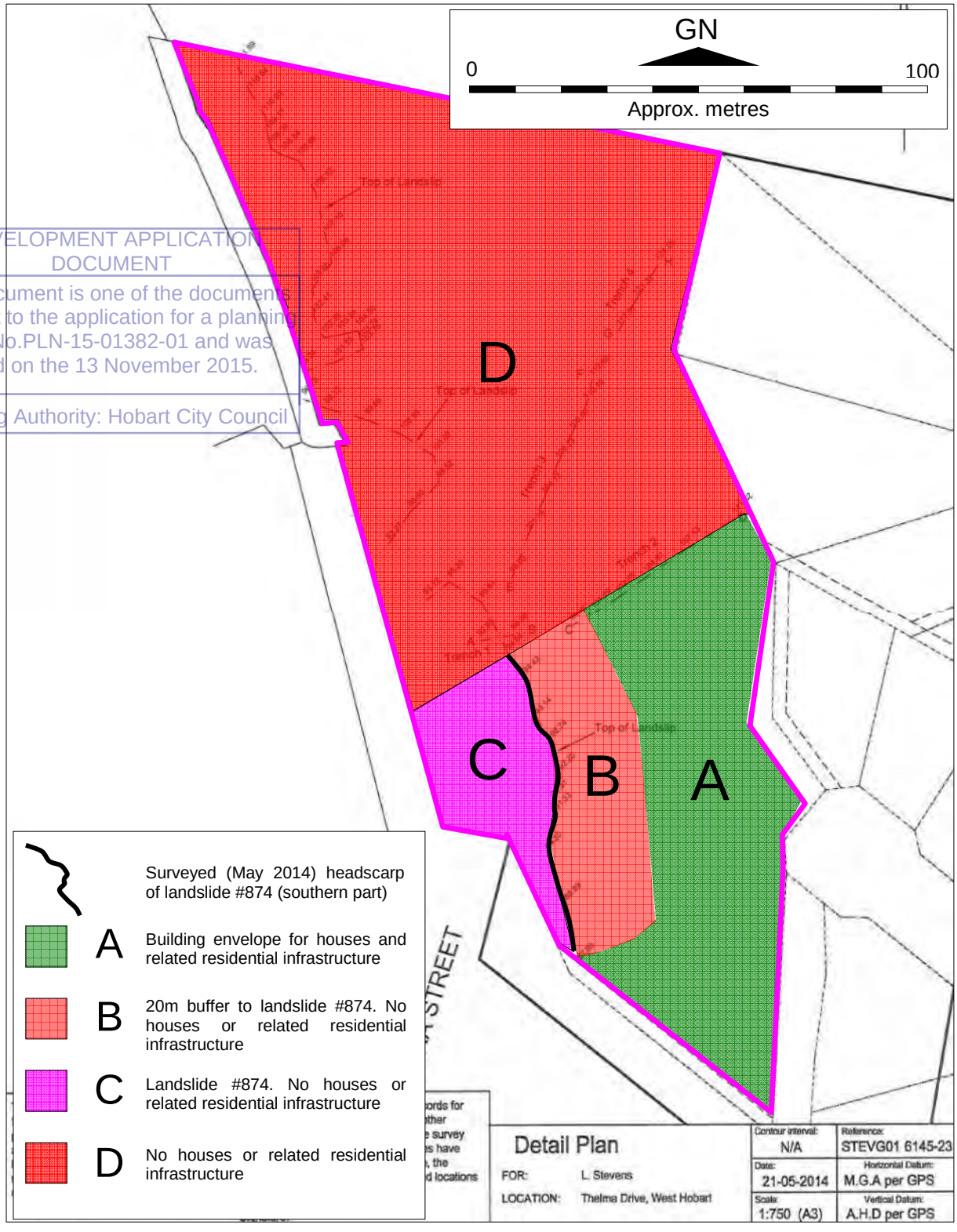


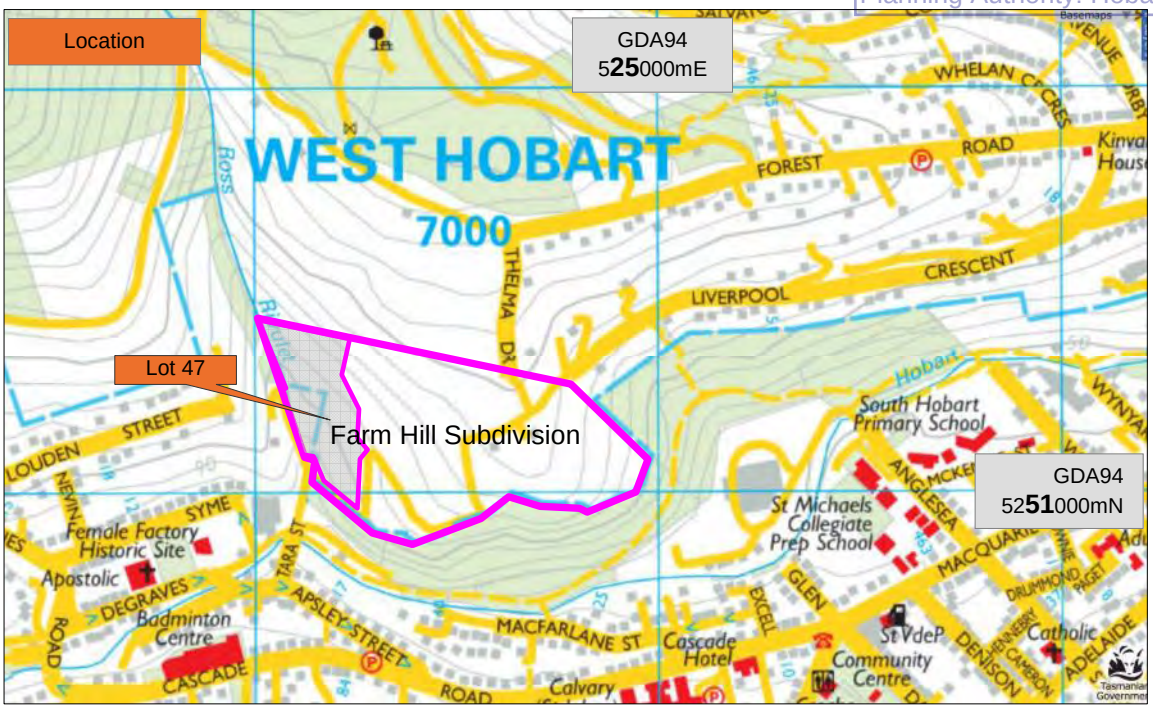
Figure 1. **Recommended building envelope (A) and no-development areas (B, C, D) for residential development of Lot 47 in Stage 4 of the Farm Hill subdivision.**
This diagram also appears as Figure 10.5 in Attachment 10 of this report**.**

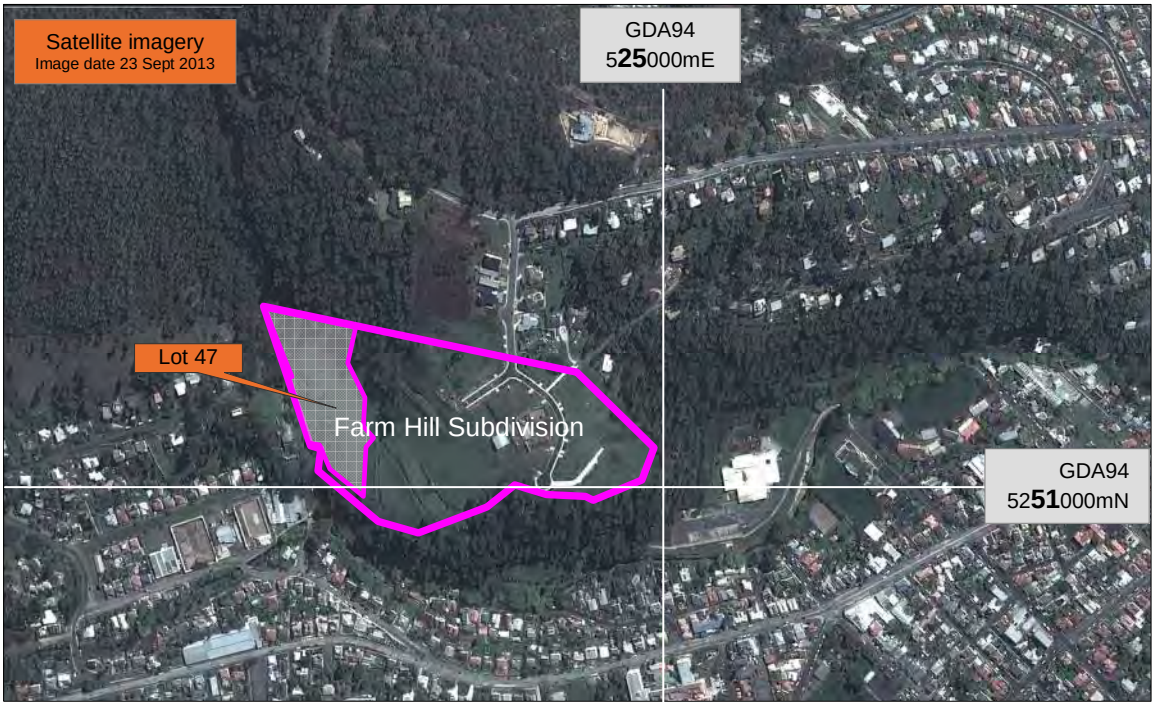
Attachment 1

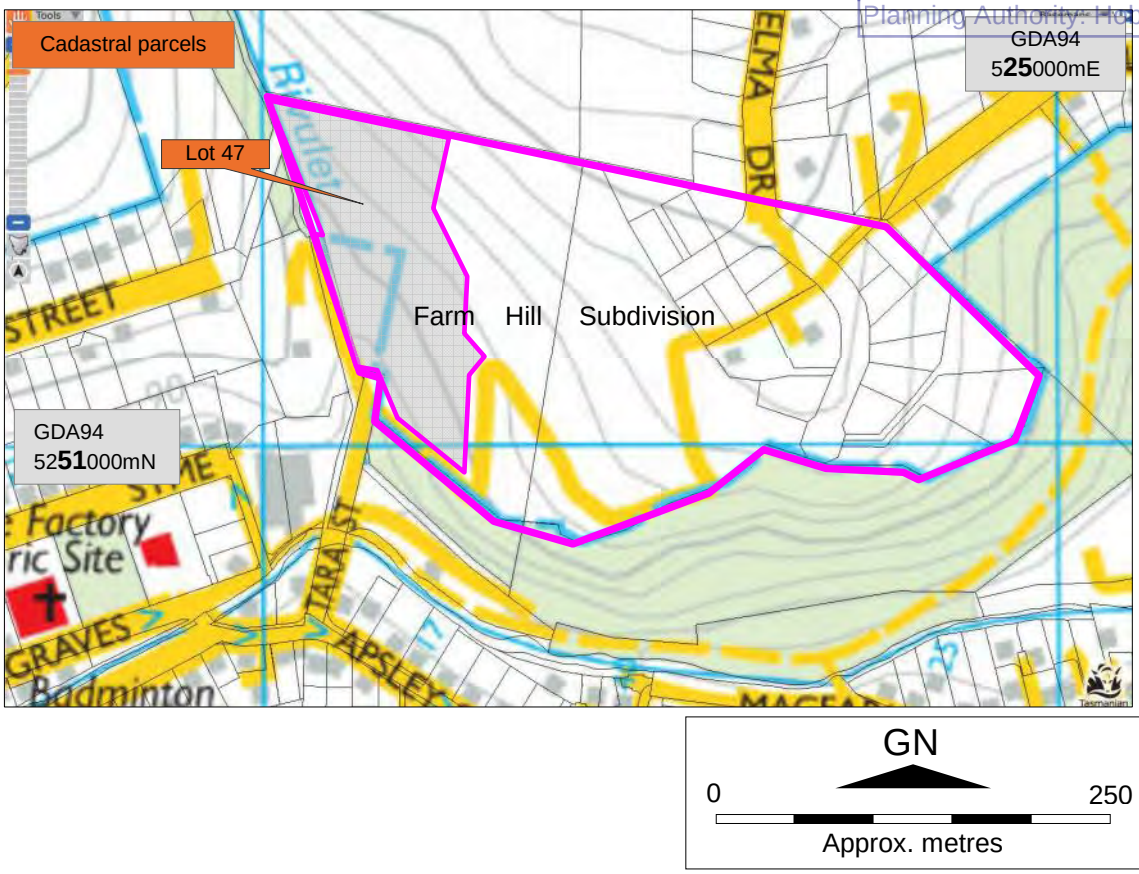
(2 pages)

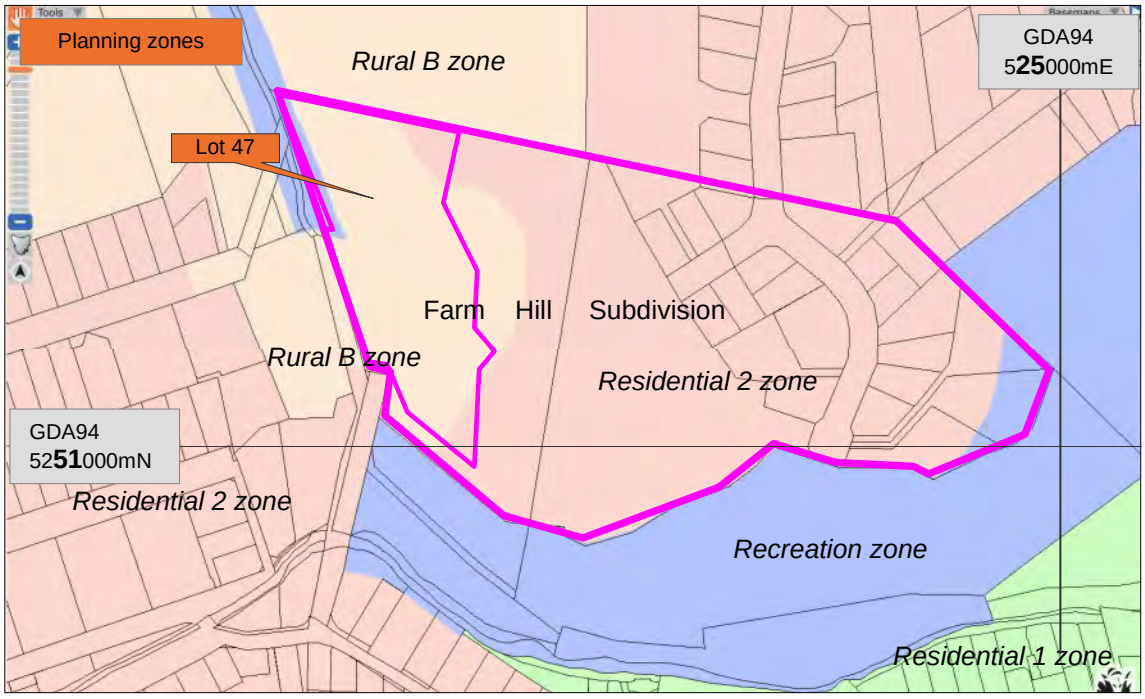
Location, satellite imagery, cadastral parcels and planning zones

Sources www.thelist.tas.gov.au







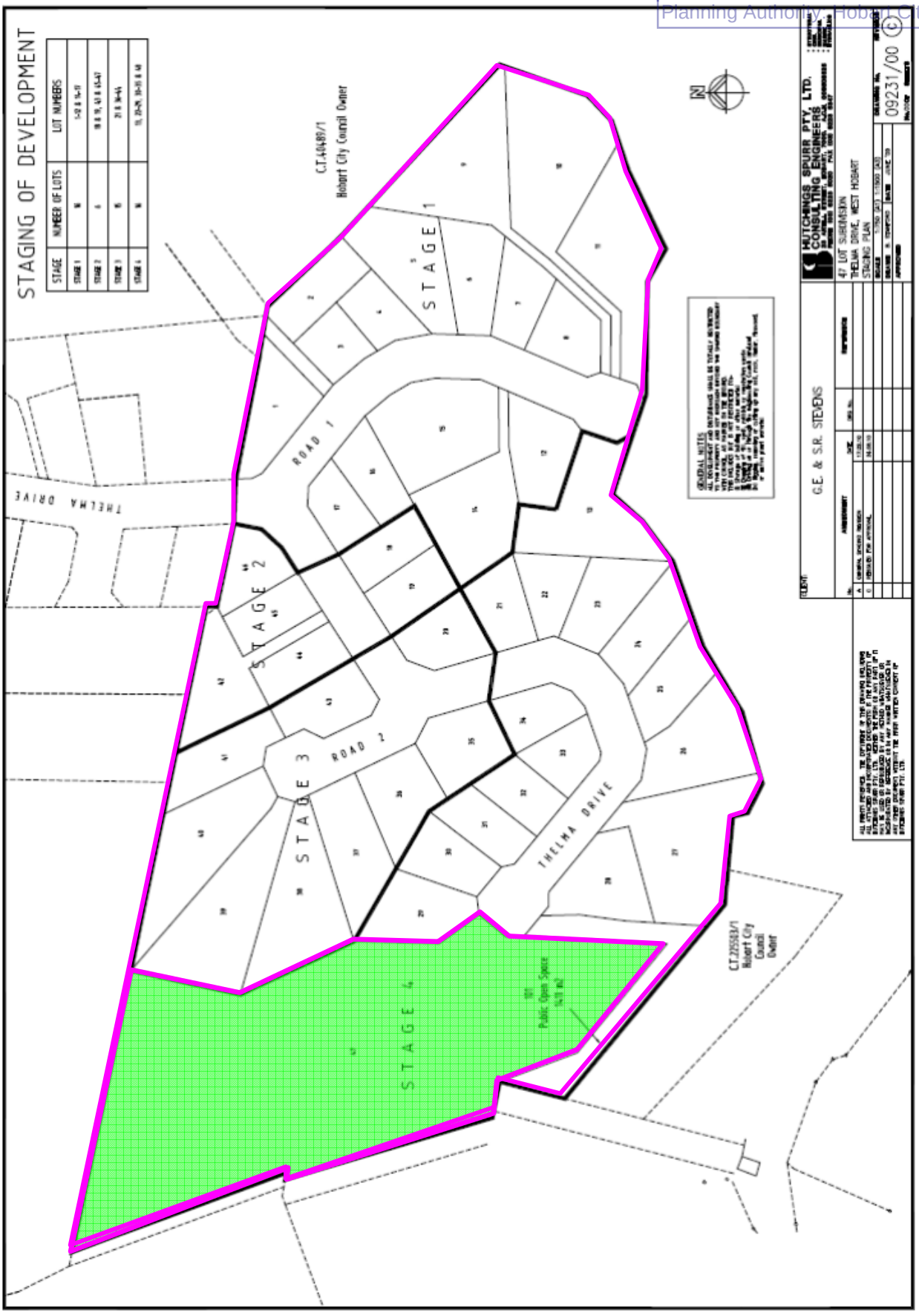


Attachment 2

(1 page)

Subdivisional plan with Lot 47 indicated in green

Source: Hutchins Spurr Pty Ltd Consulting Engineers

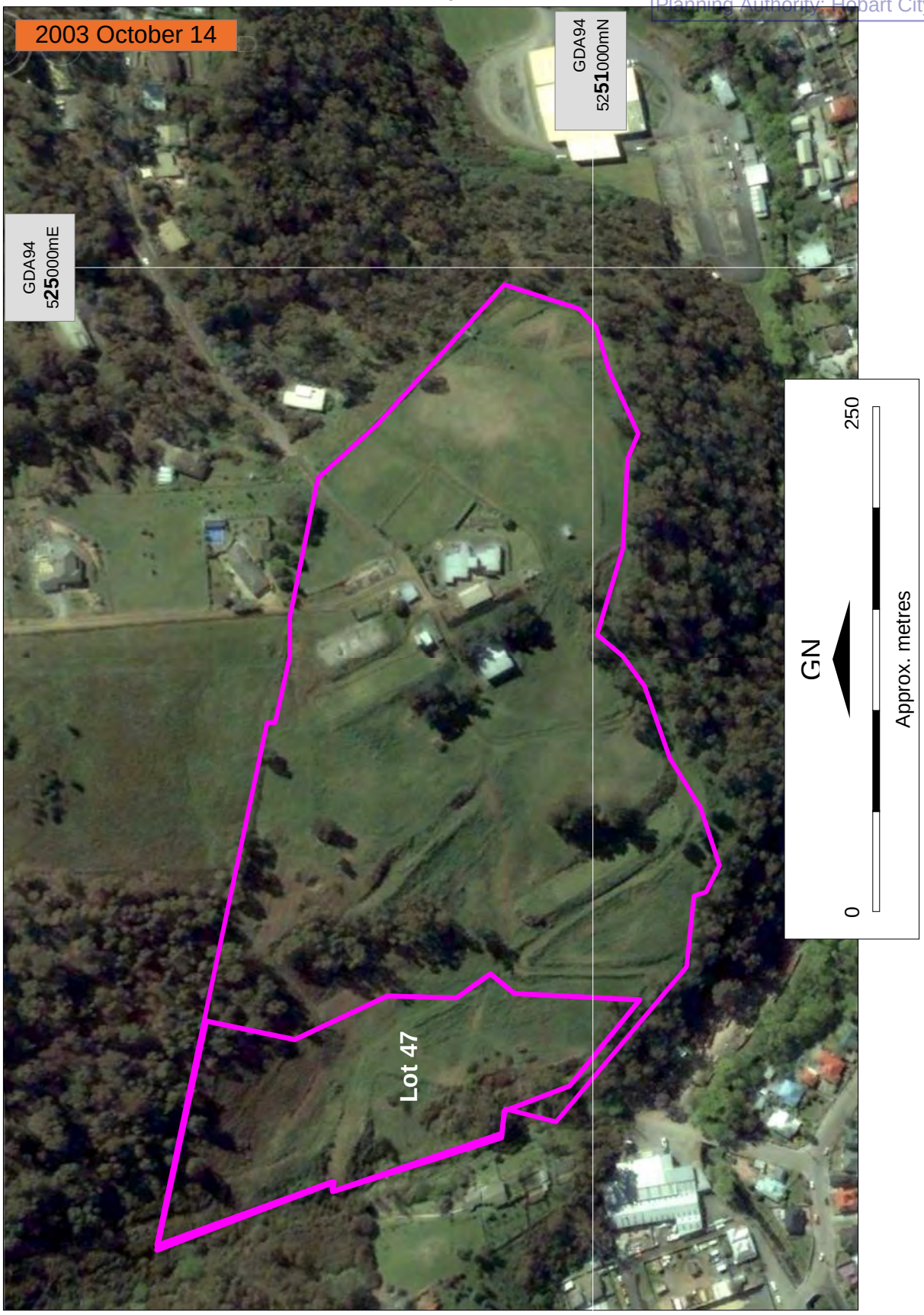


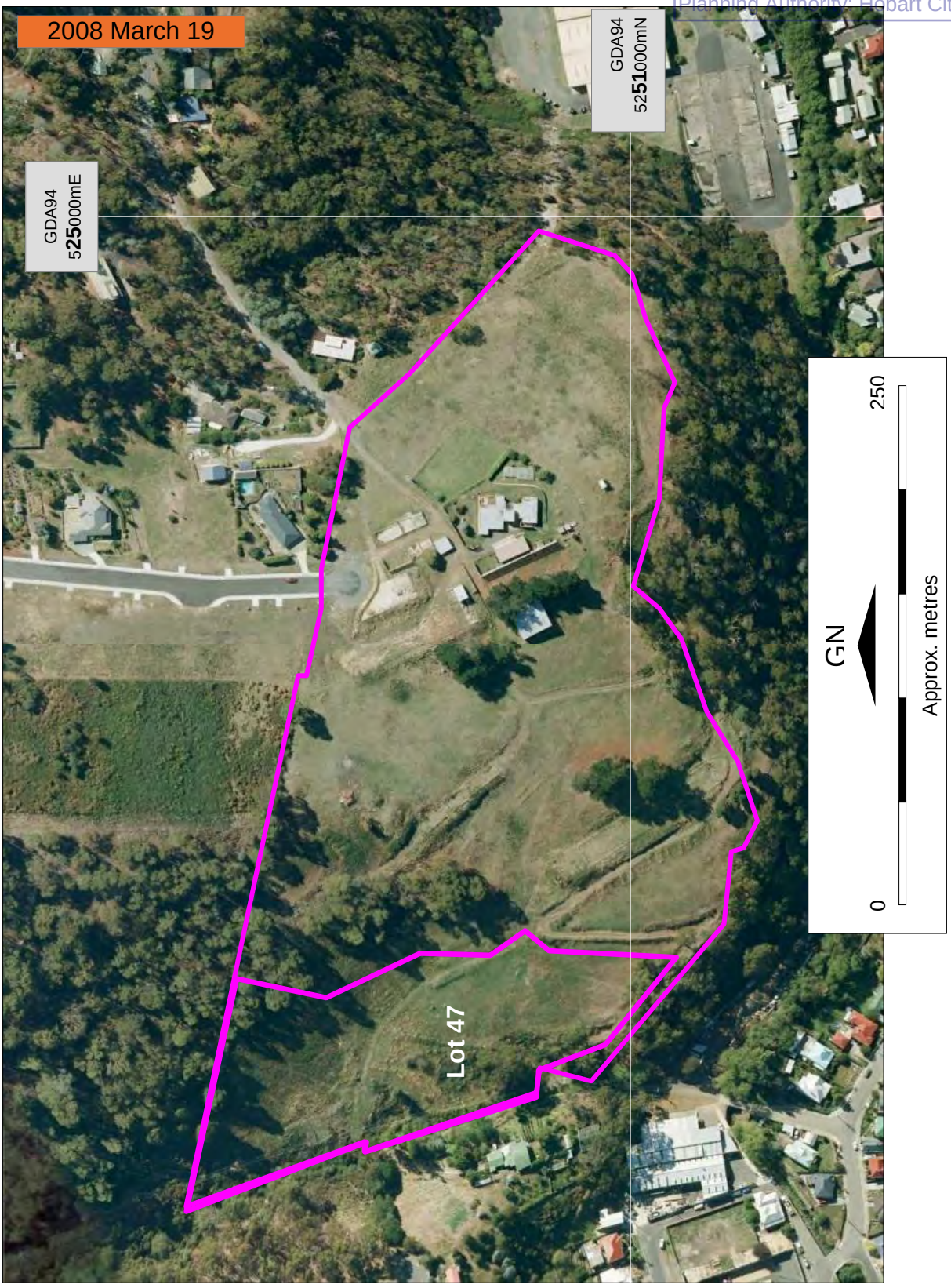
Attachment 3

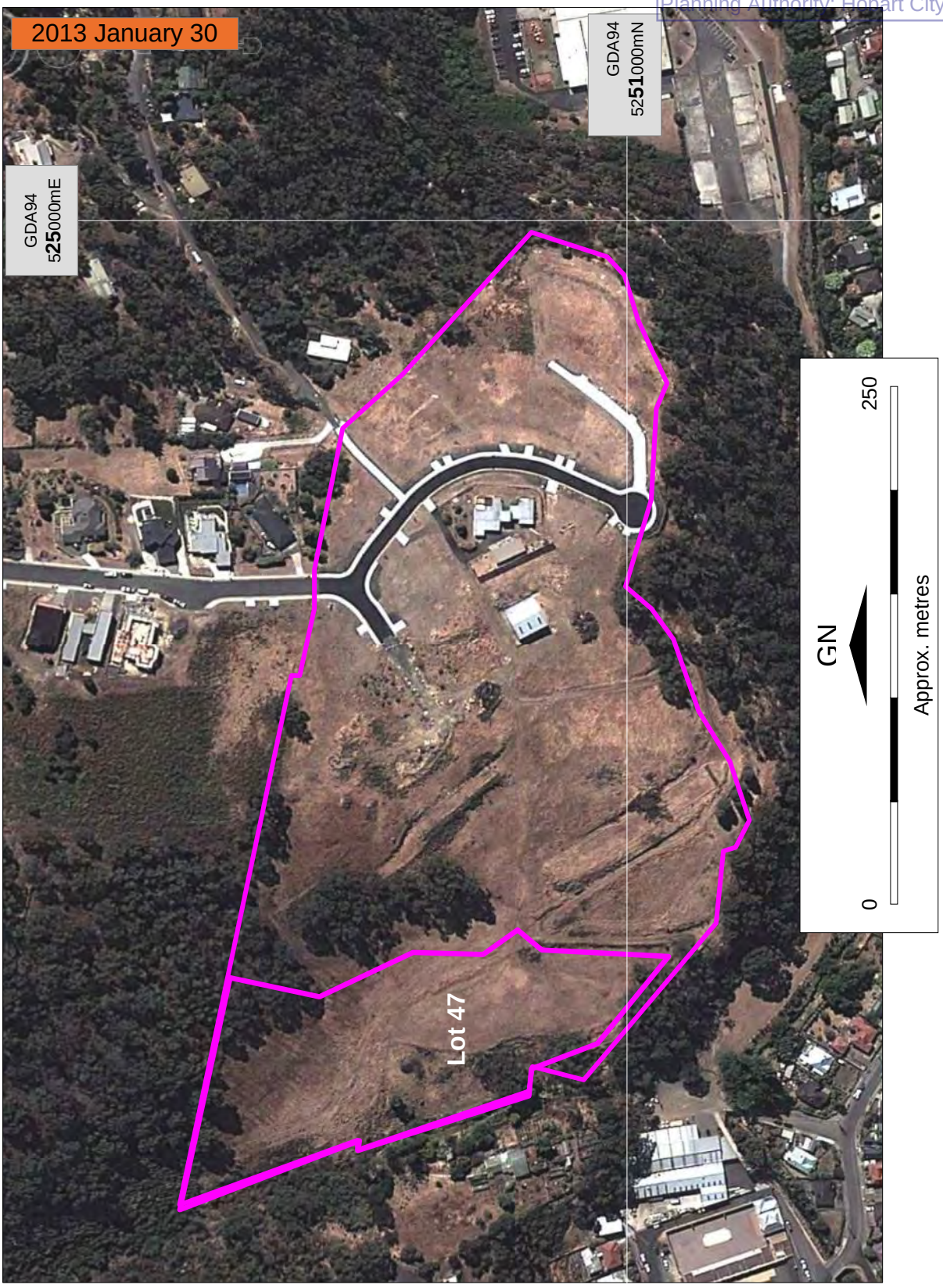
(3 pages)

Historical satellite imagery

Source: Google Earth





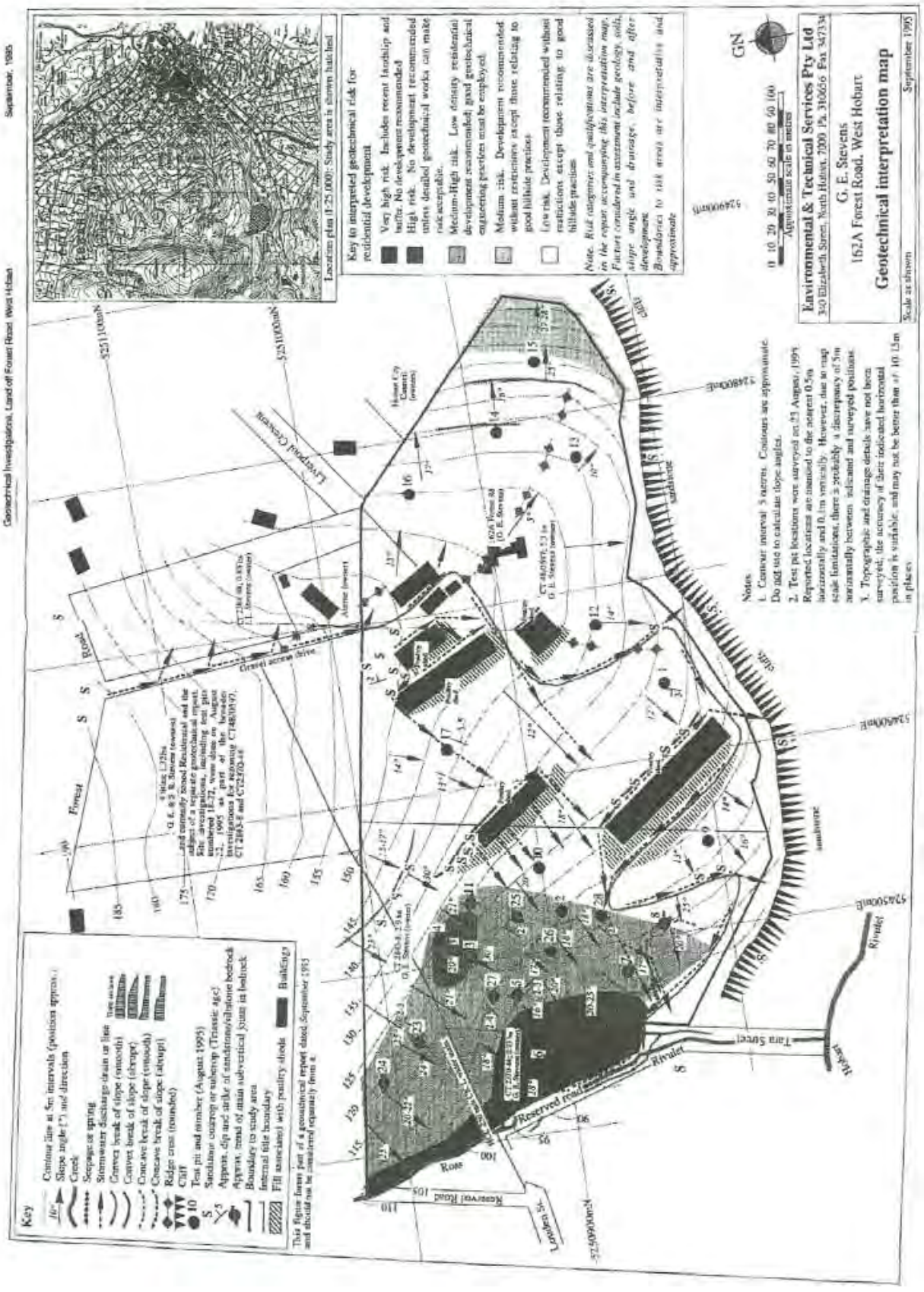


Attachment 4

(11 pages)

Extracts from 1995 geotechnical report

Source: Cromer, W. C. (1995). Geotechnical Investigations of land off Forest Road, West Hobart. Unpublished report for G. E. Stevens by Environmental & Technical Services Pty Ltd September 1995.



2. RESULTS

2.1 TOPOGRAPHY

The property (Figure 2) incorporates the crest and valley sides of a ridge extending downslope from Knocklofty past Forest Road to the southeast, south and southwest. The ridge terminates in a prominent sandstone cliff above the Hobart Rivulet (cover photograph). The western side is bounded by Ross Rivulet, which flows through a low break in the cliff line and joins Hobart Rivulet at Tara Street.

The land is mainly cleared to pasture, with small areas of eucalypts above an understorey of bracken fern (Plates 1 to 4 in Appendix 3). Some of the vegetation is regrowth following the 1967 Hobart bushfires.

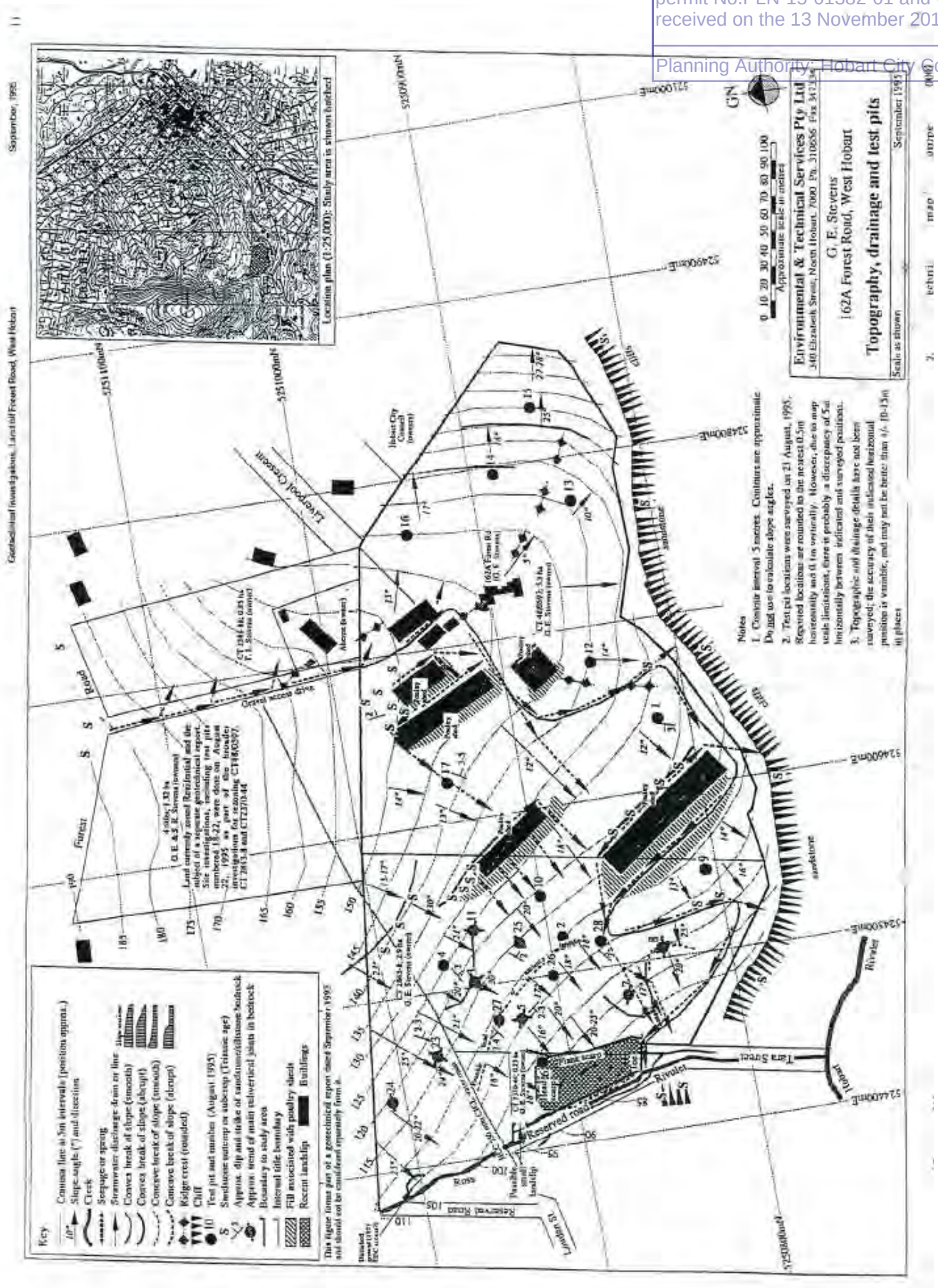
The topography is relatively elevated. In the lower southwestern corner, elevations are about 80 metres above sea level (ASL), rising northwards to about 150 met SL along the northern bounda. The average slope is therefor it 13°. However, local hillside slopes range from gentle to steep. The lowest slope angles (about 5°) are along the crest of the ridge. On most of the valley sides, angles range from about 10 to 15° on the eastern flanks and 15 to 20° on the western side. Some small slope segments exhibit angles around 25 to 30°.

Over the eastern two thirds of the property, hillsides are generally smooth, and show no significant slope disruptions other than those caused by previous fencing and access tracks.

The western third of the property faces southwest towards Ross Rivulet and the Tara Street access (Plates 3 and 4). It is essentially composed of two broadly concave slope segments which join along a subtle change of slope. On the higher ground uphill, slope angles are around 20° to 25°, and locally reach 30°. Downhill from the change of slope, angles are typically 16° to 20°. This feature, incorporating in particular the lower slope segment, is possibly the scar of an ancient landslip, and is discussed further in Section 2.5.1. The landslip referred to in Section 1.2.1, located in the lower southwestern corner, has occurred on slopes of about 18° (Plate 5). A smaller possible landslip is present just upslope from the main slip, in the western corner of CT 2370-44 (Plate 6). About a hundred metres upstream, on both sides of Ross Rivulet, there is disturbed ground possibly related to minor slope failure, although the owner reports that the site was used as an access point for plant and equipment to the nearby HEC transmission line.

Elsewhere on this western third of the property, there are some localised smaller-scale topographic irregularities (Plate 7) suggestive of soil creep or solifluction[2].

[2]Soil creep, solifluction and colluvial movements are common hillside processes, caused by gravity acting on slopes with weathered material. *Soil creep* is the almost imperceptible downslope movement of all or part of the soil profile, sometimes including the weathered bedrock beneath. It may produce small undulations and irregularities on the surface, and cause fences to lean and tree trunks to develop a knee or bend convex down the slope. *Solifluction* is another form of slow mass movement, where the weathered material is almost saturated with water. *Colluvium* is a deposit of accumulated debris on or at the base of slopes. It too may produce surface irregularities and bulges. There is a gradation between all three processes, mainly related to water content, and it may be difficult to distinguish between them. In this report, for the sake of clarity, we have used the term 'soil creep' to mean either soil creep or solifluction or both, because in each case the soil profile appears to have been essentially unaltered. We use the term 'colluvium' separately because we believe we can distinguish such material from soil in the field, typically as a jumbled mass of boulders and smaller bedrock fragments in a friable, usually dry-moist finer-grained matrix.



Other slope disruptions in the same general area may be colluvial[2] in origin (Plate 8), but some are undoubtedly the result of human intervention, including track making, fence building, bulldozer access for an adjacent electrical transmission line, and the installation of a 250 mm water main by the City of Hobart. However, in some instances it is difficult to distinguish between natural and artificial slope disruptions.

2.2 DRAINAGE

2.2.1 Surface drainage

Ross Rivulet is the main drainage line in the immediate area, forming the western boundary to the property. An un-named depression east of the eastern boundary receives some runoff from the land, and also from slopes at the western end of Liverpool Crescent.

Within the property, there are no clearly-defined natural drainage channels. Instead, before development for farming, most runoff evidently discharged as overland flow over the [illegible] line, or to Ross Rivulet and the valley to the east.

Development has disrupted this pattern. Much of the runoff is now diverted to stormwater drains along internal access tracks. Some of it, however, is discharged in an uncontrolled manner from poultry sheds onto adjoining slopes, where it forms temporary drainage lines.

2.2.2 Subsurface drainage

Shallow subsurface drainage is related to natural infiltration of rain, and some is caused by stormwater discharge lines from tracks and poultry sheds. Test pit 28 intersected small amounts of free water at the base of the topsoil along one such line, which further downslope has produced seepages near the toe of the landslip in the southwestern corner.

Naturally occurring subsurface drainage was observed in test pit 23. Test pit 6, located at the head of the landslip and downslope from a small seepage, also intersected small amounts of free water.

It is possible that the 250 mm Council water main constructed through the property about 1973, or the trench containing it (Figure 2), is locally affecting subsurface water conditions near and downslope from it. The trench has the potential to act as a french drain collecting upslope runoff and seepage, and if so, the fractured nature of the bedrock (see below) might allow vertical infiltration of water which may surface downslope. It is also possible that the pipe itself might have leaked or is leaking. We point out that we have no direct evidence of leaks and the link, if any, between cause and effect may be very difficult to reasonably establish. We raise the possibility for future consideration if residential development proceeds.

2.3 GEOLOGY

2.3.1 General comments

According to the Hobart geological map sheet (referred to earlier) the entire property is underlain by interbedded sandstones, siltstones and related rocks of

Triassic age. Our investigations confirm this, and indicate that sandstone, fractured to varying degrees and locally cross-bedded, is the dominant rock type. Near the property, good exposures occur at the top end of Forest Road, in sandstone cliffs along Hobart Rivulet.

The regional dip of the Triassic rocks is shown on the geological map to be northwest at 10° on Louden Street, and 6° west on Forest Road. Within the property, we have measured lesser dips in the range 2 to 4° generally towards the southeast. It is typical of cross-bedded sandstones to exhibit variable dips over short distances.

East of the property, on Liverpool Crescent, the Triassic rocks are in contact with doleritic boulder beds of presumed Tertiary age, but these have no bearing on geological conditions on Mr. Stevens' property.

2.3.2 Bedrock geology

Sandstone bedrock[3] is exposed at several locations on or near the property. It forms the cliff line along the southern boundary near Hobart Rivulet, is exposed in low cliffs at the end of Tara Street, occurs in excavations behind or near several of the poultry sheds (Plates 9 and 10), and appears to crop out in scattered locations elsewhere.

Siltstone, which is locally interbedded with the sandstone, was not observed to crop out, probably because it is less common, and is more susceptible to weathering and erosion.

Evidence that sandstone is the dominant bedrock type beneath the property also comes from the test pit data (Table 1). Sandstone (usually not interbedded with siltstone) was intersected at shallow depth in all but two pits. Siltstone (with minor sandstone) was the dominant rock type in only three of these (Nos. 6, 25 and 26), suggesting that it is present as relatively thin horizons rather than thicker units.

The sandstone is typically fine grained and moderately weathered (harder varieties are only slightly weathered), and orange, orange-brown or light yellow. Usually it is moderately to strongly fractured, with mainly discontinuous, close-spaced, open, moderately rough subvertical joints. Where observable or measurable, the dominant joint directions tend to be southeast, east and northeast - roughly parallel to the varying lines of strike of the cliff line to the south. However, local joint directions are variable, and unpredictable between test pits.

The combination of jointing and bedding surfaces, and the moderate to steep slopes in the western third of the property, is to produce partly dislodged blocks of sandstone in the top half metre or so of the bedrock beneath the soil profile (Plate 9). In some test pits which were dug deep enough, it was observed that this effect tends to decrease with depth within the bedrock. Often, there is a vertically downwards gradation between soil or colluvium containing few sandstone fragments, to the same material with many rock fragments, into strongly fractured bedrock with soil or clay in the joint openings.

[3]Bedrock for the purposes of the present report is defined as sandstone and/or siltstone which is sufficiently unweathered so as not to exhibit soil properties (that is, it cannot be remoulded in the hand either in its natural state or by adding water). It therefore excludes all the soil profile, superficial colluvial material, and any separate or partly dislodged rock fragments of any size at any depth which are substantially enclosed by material with soil properties.

Table 1. Summary of test pit logs

Test pit	Depth dug (m)	Depth to bedrock (m)	Summary log of materials (depths in m)
1	0.8	0.7	0-0.5 sand (SP); 0.5-0.7 clayey sand, sandy clay (SC, CL); 0.7-0.8 sandstone
2	1.0	0.7	0-0.3 silty sand (SP, SM); 0.3-0.7 silty clay, clayey silt, silty sand (SM, [illegible], SP, SM); 0.7-1.0 sandstone
3	2.2	1.3	0-0.4 sand (SP); 0.4-1.2 gravelly sand with boulders (SP, GP); 1.2-2.2 s[illegible]tone
4	2.8	2.6	0-0.5 sand (SP); 0.5-2.6 gravelly silty sand with boulders (SP, SM, GM, CL); 2.6-2.8 sandstone
5	0.9	0.8	0-0.5 sand (SP); 0.5-0.8 sand, gravelly sand and boulders (SP, SM); 0.8-0.9 sandstone
6	5.0	1.1	0-0.9 sand (SP); 0.9-1.1 clay (CH); 1.1-4.0 sand, clayey sand, gravelly sand; 4.0-5.0 siltstone
7	1.1	0.9	0-0.7 sand (SP); 0.7-0.9 sand, clay, cobbles (GP); 0.9-1.1 sandstone
8	1.2	0.7	0-0.3 sand (SP); 0.3-0.7 silty sand (SP, SM, GP); 0.7-1.2 sandstone
9	1.7	1.5	0-0.6 sand (SP); 0.6-1.5 sandy silty clay and clayey silt (CL, CH, SM, SC); 1.5-1.7 sandstone
10	1.5	1.5	0-0.4 sand (SP); 0.4-0.8 clayey silty sand (SC); 0.8-1.5 gravelly clay (CL, CH)
11	1.3	1.1	0-0.4 sand (SP); 0.4-1.1 clayey silt (SM, CL); 1.1-1.3 sandstone
12	0.7	0.6	0-0.6 sand (SP); 0.6-0.7 sandstone
13	1.8	1.6	0-0.5 sand (SP); 0.5-0.8 silty sand (SP); 0.8-1.6 sand (SP); 1.6-1.8 sand[illegible]
14	1.3	1.2	0-0.8 sand (SP); 0.8-1.2 clay (CH); 1.2-1.3 sandstone
15	2.5	2.4	0-1.1 sand (SP); 1.1-1.7 silty sand (SP); 1.7-2.4 clay and sandstone frags (CH); 2.4-2.5 sandstone
16	2.6	2.6	0-0.9 sand (SP); 0.9-1.3 silty sand (SP); 1.3-2.6 clay (CH, CL)
17	1.7	1.6	0-0.8 sand (SP); 0.8-1.6 sand and gravelly sand (SP, SC); 1.6-1.7 sandstone
23	2.2	1.1	0-0.3 sand (SP); 0.3-1.1 sand, silty sand (SP,SM, GM); 1.1-2.2 sandstone
24	1.8	1.0	0-0.3 sand (SP); 0.3-1.0gravelly sand, sand gravel (SP, GW); 1.0-1.8 sandstone
25	2.7	1.2	0-0.5 sand (SP); 0.5-1.2 sandy clay, sandy silty clay (CH, CL); 1.2-2.7 sandstone and siltstone
26	2.2	0.8	0-0.5 sand (SP); 0.5-0.8 clayey sand (SC); 0.8-2.2 siltstone and sandstone
27	2.1	0.7	0-0.3 sand (SP); 0.3-0.7 gravelly clayey sand, sandy clay (CL, SC); 0.7-2.1 sandstone
28	1.7	0.7	0-0.4 sand (SP); 0.4-0.7 sandy clay (CL, CH); 0.7-1.7 sandstone
Aver.	1.9	1.2	

Notes

1. Some soil units are variable in thickness
2. Underlined numbers in 'depth to bedrock' column indicate no bedrock to the indicated depth
3. 'Bedrock' is here defined as sandstone and/or siltstone which is sufficiently unweathered so as not to exhibit soil properties (ie the material cannot be remoulded in the hand with or without adding water). Bedrock therefore excludes the A and B soil horizons, and may or may not include the CB horizon. It excludes colluvial material, and separate or partly dislodged rock fragments of any size at any depth.

The siltstone encountered in some of the pits tends to be more weathered and more easily excavatable than the sandstone. It is typically finely laminated and cut by closer-spaced, discontinuous joints and partings along bedding surfaces.

On the western third of the property, a fairly consistent feature of the near-surface sandstone and siltstone is the presence of clay, sandy clay or clayey sand linings on many joint and bedding surfaces. These materials have apparently been deposited from soil seepage water percolating through the fractures, since they can occasionally be observed to fill wedge-shaped openings between dislodged blocks at or below the base of the soil profile, tapering into bedrock.

The clayier linings are interpreted as having implications for possible past instability, and current slope stability. Evidence from test pits suggests they are more common on the western third of the property and generally in the area inferred to be a possible ancient landslip. Clay linings were not observed in test pits 1, 9, and 12 to 16, and were only a minor feature of pits 8, 17, 24 and 27. Three of the last four are located on the periphery of the shallow valley covering most of CT 2843-8, and with the exception of pit 27 (near the centre of the valley) all the remainder are on the eastern two thirds of the property.

The clayier linings are usually moist or wet, and consist of dark grey high plasticity clay. Their thickness typically varies from less than one to ten millimetres. They tend to be discontinuous; most do not exceed the joint spacings in length (although they may be offset at joint intersections), and none was observed to extend the full length of test pits. However, several could be traced across the width of pits (about 0.8 metres) and occasionally along bedding surfaces or joints for up to a metre or so.

Clay linings on joints and bedding surfaces in sandstones are not confined to the study area. Similar features were observed in sandstones in outcrops along Forest Road, and also near the end of Salvator Road further north. In two to three metre high road cuts on Forest Road, their development is laterally irregular, and their occurrence and thickness appears to decrease with depth below a metre or so.

2.3.3 Colluvium

Material interpreted as colluvium (weathered detritus which accumulates on or at the base of slopes) was observed in test pits 3 (Plate 8), 4, 10 and 24, and possibly pit 6. There is no clear evidence that it is present in pit 6 (at the head of the landslip), although the hummocky ground immediately downslope is probably at least partly colluvial since colluvium is exposed in the road cutting at the toe of the slip.

The colluvium overlies sandstone or siltstone bedrock in all but one (No. 10) of the four or possibly five test pits in which it was exposed. In pit 10, the excavator was close to refusal at 1.5 metres in dense colluvium.

The detailed texture of the colluvium is not consistent between these pits. However, in all cases it comprises fragments, cobbles or boulders (collectively called 'clasts') of sandstone or siltstone, or both in varying proportions, in a matrix of sand, gravel, minor clay and silt. Textures include gravelly sand with 40-50% sandstone clasts in pit 3, gravelly silty sand with occasional sandstone clasts in pit 4, a gravelly clay with up to 90% sandstone and siltstone clasts in pit 10, and gravelly sand with a similar proportion of sandstone clasts in pit 24.

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The colluvium was dry in pit 10, but moist to locally wet in the other three. Generally, its plasticity is low, reflecting the predominantly sandy topsoils of the property.

2.4 SOILS

2.4.1 General comments

The soils over the study area comprise duplex (two-layered), mainly residual[4] profiles on bedrock, with fairly consistent textures broadly typical of soils developed on Triassic rocks elsewhere in Tasmania.

The duplex profiles generally comprise A and B horizons (topsoil and subsoil), either resting directly on bedrock or overlying a zone of weathered rock (the CB horizon). Some profiles are not duplex but uniform in texture, where the subsoil appears to be missing or only poorly developed. In some cases, the sandy topsoil may have accumulated or been redistributed by wind transport.

The average depth of the soil profile (A+B horizons) is about 0.7 metres in the western third of the property, but significantly greater at 1.4 metres in the eastern third near pits 13-16.

Soils are described in detail in the test pit logs in Appendix 2.

2.4.2 Topsoil (A horizon)

The topsoil is typically loose, moist and friable, averaging 0.4 to 0.5 metres thick (range 0.3 to 0.7 metres) in the western part of the property, but one metre thick (range 0.5 to 1.7 metres) on the broad ridge to the east. It usually consists of a dark grey surface sand or silty sand about 0.2 metres thick (the A1 horizon) grading to a yellowish brown, grey brown or light grey sandy A2 horizon averaging 0.3 metres thick. Sandstone gravel and coarser fragments may be present, sometimes up to boulder size.

Sometimes, the A horizon rests on bedrock or colluvial material, and a B horizon is absent.

2.4.3 Subsoil (B horizon)

Where present, the subsoils over the property average about 0.3 metres thick (range 0.2 to 0.7 metres). They tend to be clay- or silt-enriched to varying degrees compared to the topsoils. Texturally they include non-plastic or low plasticity silty sand or clayey silt, and moderate to high plasticity silty clay or clay. Sandstone gravel, or fragments and boulders may be present.

2.4.4 Weathered bedrock (CB horizon)

In some test pits, weathered sandstone or siltstone exists beneath the B horizon. It is most easily recognised by its texture (mainly sand, silt or sandy silt) in conjunction

[4]Residual soils have developed mainly from the weathering of the rocks directly below them, with little or no contribution from materials further upslope.

with relict bedding and joints. In some cases (for example, in pit 6) it is difficult to distinguish from the B horizon, or colluvial material.

2.5 SLOPE INSTABILITY

2.5.1 General comments

As discussed in Section 2.1, there is surface evidence of slope instability on the western third of the property. This evidence takes the form of topographic or slope irregularities at various scales. Some of it is supported by observations in test pits and other exposures around the site.

On the larger scale, the slightly concave shape of the hillside over most of CT 2843-8 has the appearance of being formed by slope movements in the past. This mode of formation is probably shared by many other similar shaped hillsides in metropolitan Hobart.[5]

On the hillside are smaller-scale topographic irregularities. As discussed, some of these are man-made, and we have been able to distinguish most (but probably not all) of these from natural features by studying several sets of aerial photographs dating from the late 1940's.

Similar features above the same bedrock types have been observed along the hillside below Louden Street to the west, and we have noted a possible, fairly large landslip east of the property boundary at the western end of Liverpool Crescent. In both areas, residential development has encroached near or onto the inferred unstable ground.

On a smaller scale, the natural slope disruptions within the study area are several metres or tens of metres in surface extent, and from 0.5 metres to about 2 to 3 metres in vertical dimension. They have been interpreted as *soil creep* (bulges on soil-covered slopes caused by slow downslope movement of soil), *colluvial* movement (loose, mainly dry debris moving slowly downslope) and *landslips* (the relatively more rapid downslope movement of soil or debris, usually by sliding on low-strength material). The processes are facilitated by the presence of subsurface water, and their surface expressions may be difficult to distinguish from one another.

We observed no obvious surface evidence of instability on the eastern two thirds of the property.

2.5.2 Soil creep and colluvium

Probable soil creep was observed as low, subdued bulges (Plate 7) above the surrounding surface in several places on the western third of the property. Two of these, on slopes of about 17-18°, were further explored by test pitting (pits 2 and 7). It appeared that slow movement of the soil profile was or is occurring at a depth of about 0.7 metres on weathered bedrock (CB horizon) where relict joints and bedding planes contain moist clay linings.

[5] It is important to note that the inferred former instability of these areas was probably related to climatic conditions different from those now prevailing. Contributory factors might have included abundant precipitation on sparsely vegetated slopes - conditions thought to have existed at low altitudes in a colder, wetter climate during or at the close of the last glacial epoch at least 12,000 to 15,000 years ago. Generally, such failed slopes probably now exhibit better stability since unstable material has moved downslope (thus flattening out the slope profile), and the now humid climate has produced a stabilising vegetation cover.

In pits 3 to 6, 8, and 23 to 28, all dug in the same general area, the CB horizon was not identified, and in all cases, soil creep appeared to be absent. The CB horizon (where it contains moist clay linings) is therefore implicated in soil creep. Other areas of soil creep upslope from pits 27 and 11, identified from surface expression but not tested by pitting, are possibly also underlain by similar materials.

Test pits 3, 4, 10 and 24 exposed materials inferred to be colluvial in origin. Pits 3 and 4 were dug below and on a fairly prominent surface bulge (Plate 8) extending perhaps 30 to 40 metres along the slope, with an elevation of up to several metres. Aerial photographs indicate that it was present before excavations for the nearby pipeline trench, and so is a natural feature.

The colluvium in pits 10 and 24 shows no obvious surface expression.

2.5.3 Recent landslips

A landslip (Plate 5) has occurred on the extreme lower corner of the study area, covering almost all of CT 2370-44 and extending eastwards onto part of CT 2843-8. Aerial photographs do not sho vious signs of slope movemen 1947 and 1967, but some surface irregularities (implying movement) had developed by 1973. The slip appears to be bulging over the nearby access track in the 1975, 1982 and 1984 photographs. A head scarp is visible in the 1984 photograph, and by 1986 the landslip appears to attained its present shape.

We infer from this evidence that while incipient movement may have occurred earlier, noticeable movement took place sometime between 1967 and 1973, that it probably continued until about 1986, and that little or no significant movement has occurred since.

Verbal reports from the owner and a neighbour support these tentative conclusions. They have indicated that movement definitely occurred after the 1967 bushfires (when a house on the site burned down), and probably in the early 1970's.

The area is currently grassed and shrubby, and supports a few moderately sized eucalypts, suggesting that the average rate of movement has been relatively slow.

The head and eastern flank of the landslip is an obvious, arcuate scarp in sandy soil, averaging about one metre high. The toe is a bulge of colluvial debris - mainly silty gravelly sand with some clay and many sandstone boulders - up to about three metres high along the nearby access track. Internal features include hummocky ground and small arcuate steps.

Test pit 6 was dug at the head of the slip, into and beneath the exposed scarp and for several metres downslope. The total depth was 5 metres from the top of the scarp. The pit was sited to investigate the nature of the materials immediately behind and within the failed material, and to attempt to identify the location and materials on which movement had taken place.

The pit revealed a one metre thick soil profile of sandy topsoil and clayey subsoil, which although dislocated and draped across the scarp, was otherwise continuous across it. The base of the soil was wet. Immediately beneath it was a moist, friable to medium dense zone of mixed sand, clayey sand and gravelly sand three metres thick. This layer contains sandstone fragments, and relict bedding and discontinuous fractures containing moist grey clay or sandy clay linings. However, there was no evidence of continuous clay linings which might have acted as a single failure surface. The bedding appears to dip at shallow angles north into the slope

behind. Very minor seepage issued from a depth of three metres. At the base of the unit is a thin horizon of fractured blocky sandstone.

This three metre thick unit is interpreted as weathered bedrock (the CB horizon).

The CB horizon overlies weathered siltstone bedrock, also containing clay linings on joints and bedding laminae. A seepage estimated at about 20 L/hour was issuing from a depth of 4.8 metres.

Landslip movement is inferred to have taken place throughout the mass of the CB unit, and possibly also the underlying siltstone, as numerous small slippages along bedding surfaces and joints, on lubricated clay linings. In this respect, the mechanism is similar to that suspected for the CB horizon in pits 2 and 7, where soil creep has occurred.

The cause of slipping on this 18° slope is very probably excess water entering the site. Observations which might help explain why this slope has recently failed (whereas nearby steeper ones have not) possibly include but may not be restricted to

- the thicker-than-normal CB horizon containing clay linings,
- disturbance related to the residential dwelling on the site for many years, including cut and fill, and possibly uncontrolled discharge of sewage, stormwater and garden water (aerial photographs show a small orchard upslope from the site),
- the burning down and demolition of the house in February 1967, possibly leaving leaking or running water pipes at a time when soil conditions were dry and cracked in places,
- the burning off of vegetation on the slope during the 1967 bushfires, and
- the installation of the council water main some forty metres upslope. As discussed in Section 2.2.2, there is no direct evidence that the trench promotes vertical, and then downslope, infiltration of seepages and runoff, or that the pipe itself is leaking. As far as has been ascertained so far, the date of its installation in 1973 may not be inconsistent with the onset of slippage.

There are two other small areas upstream from this landslip, on the eastern bank of Ross Rivulet, which might also be landslips. If so, they have probably failed due to erosion of their toes by the rivulet. The first is in the corner of CT 2370-44 and is evident in aerial photographs taken in 1967. The second, not obvious in photographs, is some 50 metres further upstream. This site was used by the HEC in 1977 as an access point to work on a nearby transmission line, and may be wholly artificial.

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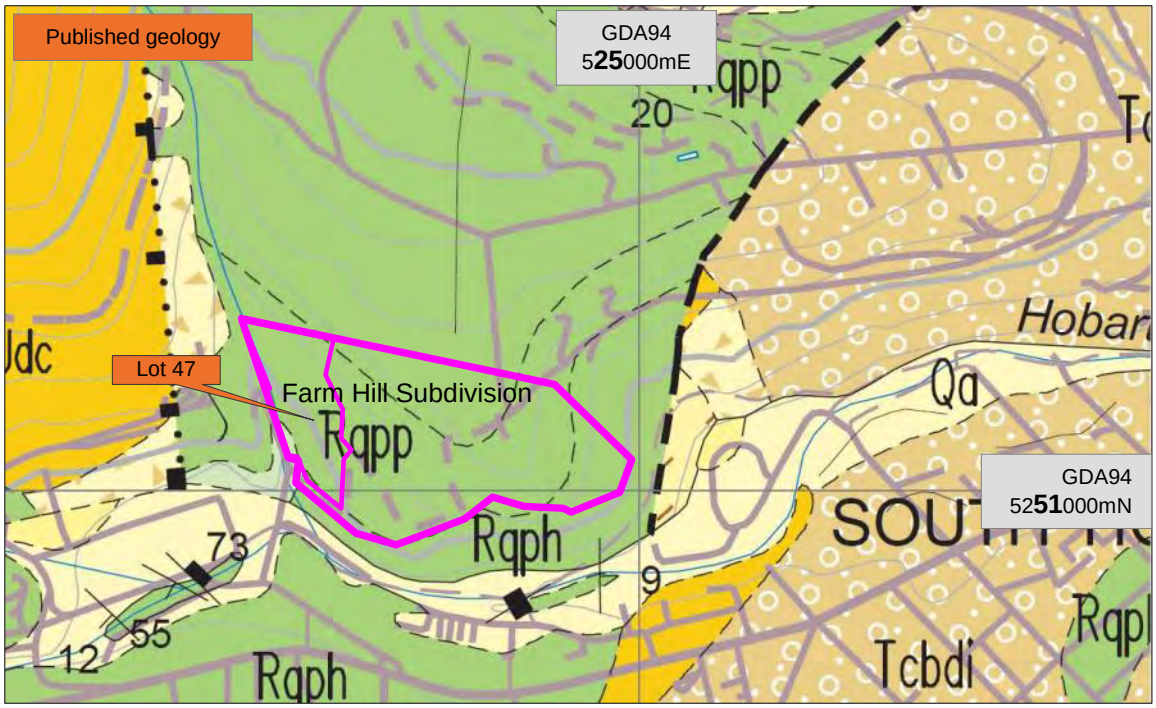
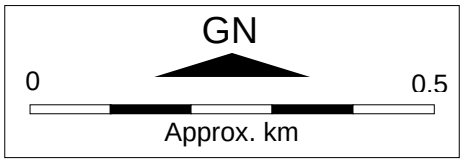
Attachment 5

(2 pages)

Published geology and landslide hazard bands

Source: Mineral Resources Tasmania and www.thelist.tas.gov.au

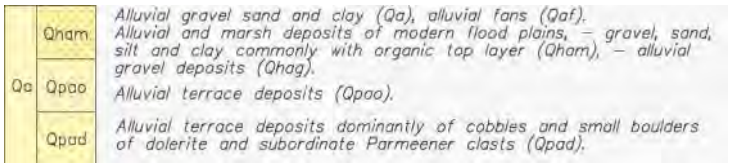


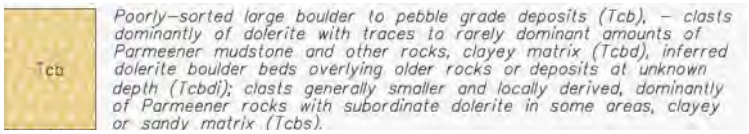


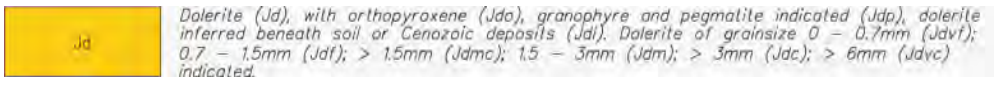
Source for geology

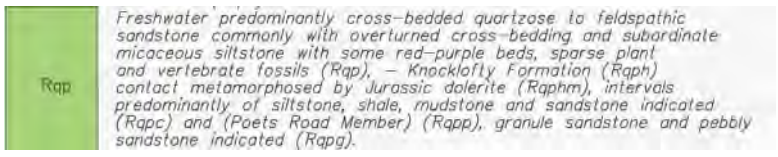
Forsyth, S. M., and Clarke, M. J. (compilers) 1999. Digital Geological Atlas 1:25,000 Scale Series. Sheet 5225 Hobart. Mineral Resources Tasmania

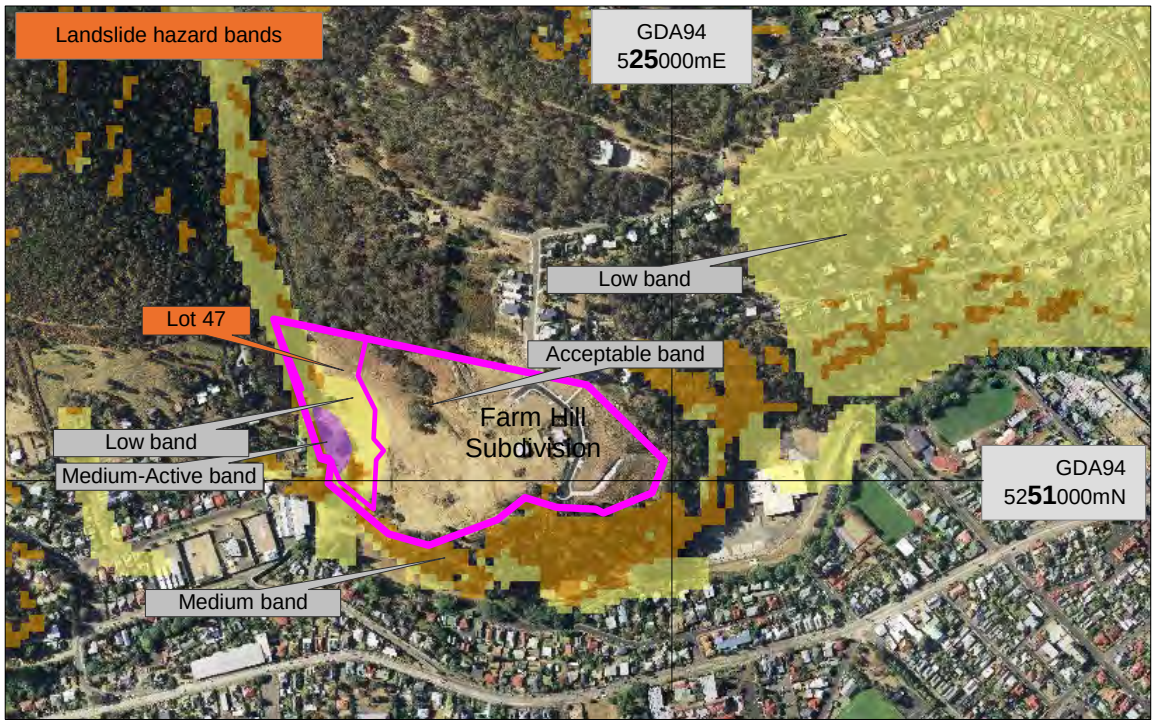
Key to rock types

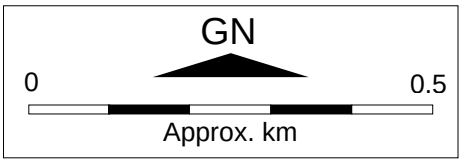












Acceptable band
A landslide is a rare event based on current understanding of the hazard, but it may occur in some exceptional circumstances.

Low band
The area may include landslide features but their activity is unknown, and they have been judged by MRT to rank of lesser risk than those in higher bands.

Medium band
The area has known landslide features, or is within a landslide susceptibility zone, or has legislated controls to limit disturbance of adjacent unstable areas.

Medium-active band
The area has known recently active landslide features.

High band
The site is within a declared Landslip A area.

Attachment 6

(4 pages)

Tasmanian Landslide Hazard Maps in relation to the property

Notes

This Attachment shows the subject land in relation to four landslide hazard maps issued by Mineral Resources Tasmania. A portion of each map covering the property, and part of the Key to the map, are shown.

The maps are:

- Map 1: Landslide Inventory and Geomorphology
- Map 3: Potential Debris Flow Hazard
- Map 4: Potential Rockfall Hazard
- Map 5: Potential Deep Seated Landslide Hazard

Map 2, not shown here, is the geological map of the area, which is reproduced instead in Attachment 4.

The following extract from the explanatory notes to Map 5 explains the purpose and limitations of the maps.

Deep Seated Landslide Hazard

Background, Aim and Purpose

Large tracts of land throughout Tasmania are subject to slope instability and about 60 houses have been destroyed by landslides since the 1950s. Fortunately only minimal loss of life has occurred in this time but such events are highly traumatic to those directly affected and the financial cost to individuals, organisations and the State runs into many millions of dollars. Recent disasters such as the Thredbo Landslide in New South Wales, serve to remind society of the potential for loss of life even from relatively small landslides. Fortunately, landslide damage can be avoided when ground conditions are properly understood before construction proceeds and, in already developed areas, this understanding can be used to mitigate the hazard through various measures.

Regional landslide hazard maps are produced to provide an insight into the natural hazards that may potentially affect the area concerned. Mineral Resources Tasmania, in partnership with the Hobart City Council has produced the first of a new landslide hazard map series in Tasmania, using Hobart as a pilot study area. The information provided is in the public domain and anyone is free to use it provided they read and understand the caveats for use.

Hazard and Risk

According to the joint Australian/New Zealand Standard (AS/NZS 4360:1999) risk is defined as the chance of something happening that will impact upon objectives. It is measured in terms of consequences and likelihood.

The definition of risk is often expressed by the following equation:

RISK = Hazard x Vulnerability x Elements at Risk

A hazard is defined as a source of potential harm or a situation with a potential to cause loss. A hazard, such as a landslide can be measured in terms of location, volume (or area), type, velocity and likelihood with time. Vulnerability refers to the susceptibility and resilience of structures, community and the environment to the hazard. The 'elements at risk' refers to the number of those structures, people, etc exposed to the hazard.

A hazard map attempts to portray the processes operating in an area, conveying all or some of the hazard parameters, generally in a qualitative to semi-quantitative manner. Because of the uncertainties involved, the translation of regional hazard maps into risk maps is challenging and seldom precise. An indication of the likely risk level is provided for each hazard at a regional scale but this will vary in detail. However, provided the limitations of the maps are understood, hazard maps can be used for many purposes in order to achieve the overall goal of safe and resilient communities.

Caveats for Use

The following caveats shall apply to the maps.

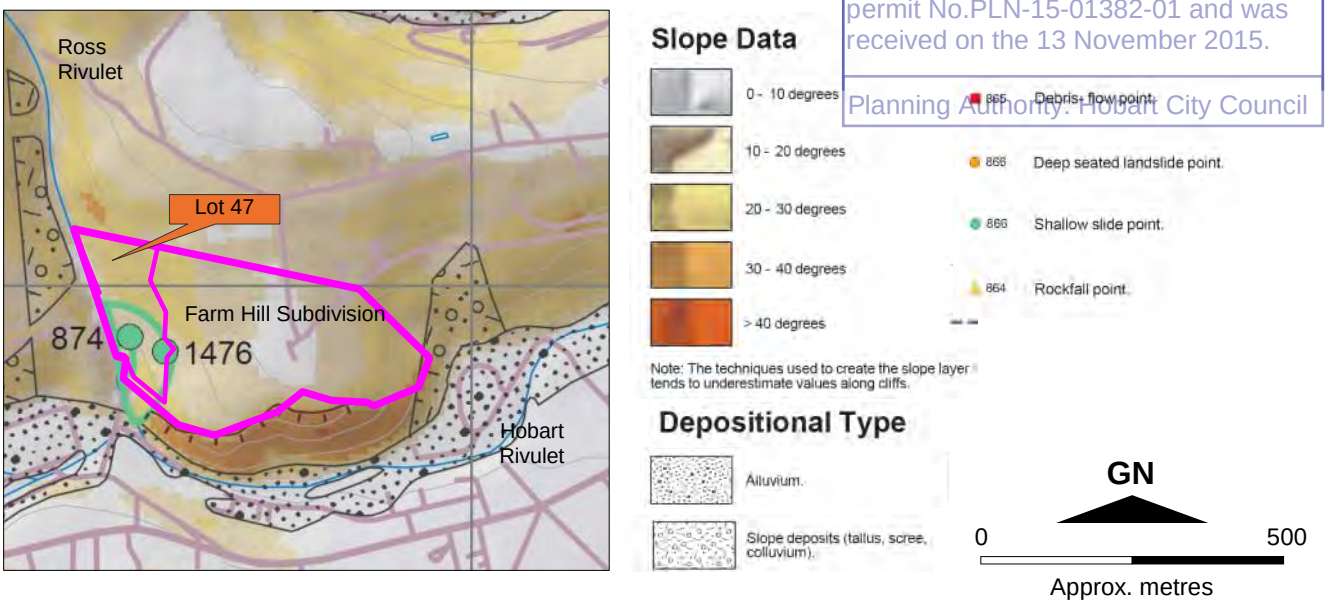
- The hazards identified are based on imperfect knowledge of ground conditions and models to represent our current understanding of the landslide process. As this knowledge improves our perception of the hazard and the depiction of the zones on the map may also change.
- These maps can be used as a guide (or flag) to the need for specific assessment in potential hazard areas.
- Planning decisions should not be made solely on the basis of the hazard zones delineated on the map.
- The scale limitations of the data should be considered at all times as exceeding this limit could lead to inaccurate decisions about the hazard.
- Specific assessment of landslide hazard and risk should be undertaken by suitably qualified and experienced practitioners in the fields of engineering geology and geotechnical engineering.
- Practitioners undertaking specific assessments should read the text and appendices attached to the maps and obtain a thorough understanding of the methodology and limitations of the maps.
- Areas where no hazard is shown can still have issues with slope instability.
- Anthropogenic influence on slopes cannot be predicted and the occurrence of slope instability resulting from the influence of human actions is specifically excluded from these maps.
- The identification and performance of cut and filled slopes have not been specifically considered in map production and their scale is such that they often cannot be resolved on the maps. The presence of such slopes should always be considered in specific assessments.

Map 1. Landslide Inventory and Geomorphology.

Mazengarb, C. (2004). Map 1, Hobart – Landslide Inventory and Geomorphology. Tasmanian Landslide Hazard Series. Mineral Resources Tasmania

Two known shallow landslides (Nos. 874 and 1476) occupy the southern and southwestern half of Lot 47 on the Farm Hill Subdivision. Slope angles on Lot 47 are in the 20 – 30° range.

Landslide Inventory and Geomorphology (grid is AMG66)

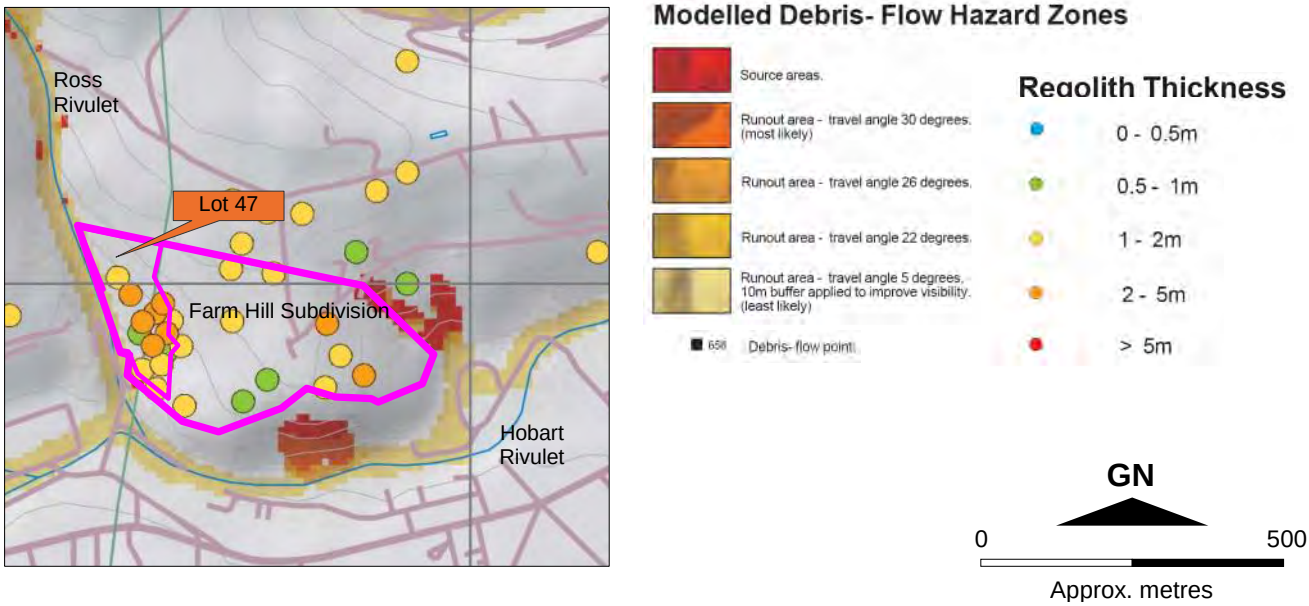


Map 3. Potential Debris Flow Hazard

Mazengarb, C. (2004). Map 3, Hobart – Potential Debris Flow Hazard. Tasmanian Landslide Hazard Series. Mineral Resources Tasmania

Most watercourses in the area have the potential to generate debris flows at their sources, with associated runouts. Test pit data from Cromer (1995) have been used to indicate regolith thicknesses (up to 5m) on the Farm Hill Subdivision.

Potential Debris Flow Hazard (grid is AMG66)

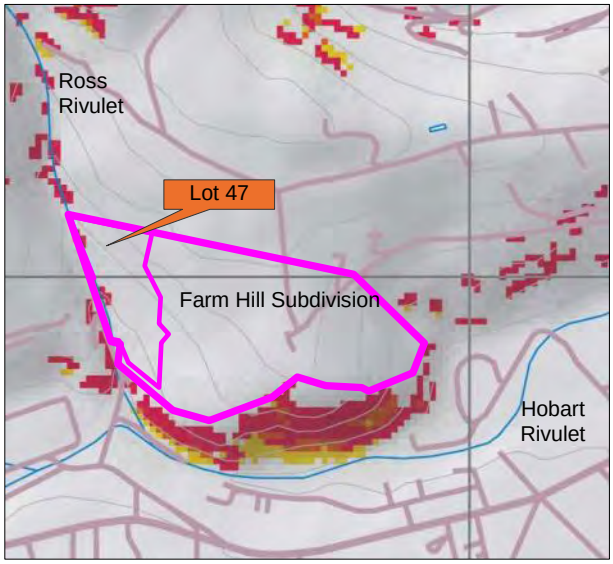


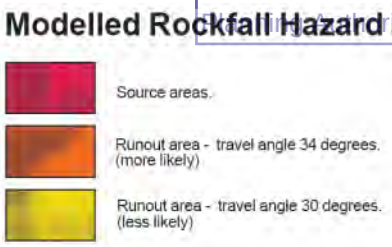
Map 4. Potential Rockfall Hazard

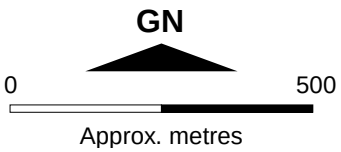
Mazengarb, C. (2004). Map 4, Hobart – Potential Rockfall Hazard. Tasmanian Landslide Hazard Series. Mineral Resources Tasmania

The course of Ross Rivulet, and the sandstone cliff sections bordering Hobart Rivulet, have the potential to generate rockfalls.

Potential Rockfall Hazard (grid is AMG66)





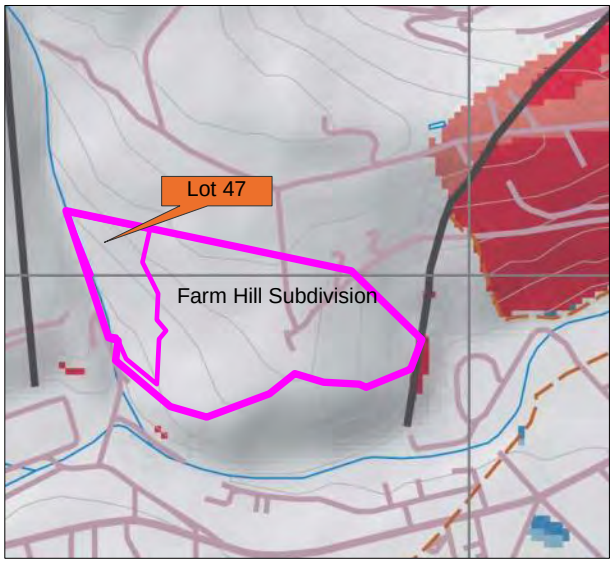


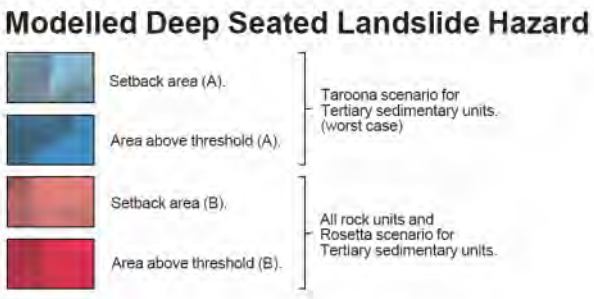
Map 5. Potential Deep Seated Landslide Hazard

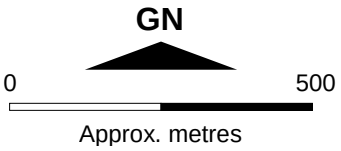
Mazengarb, C. (2004). Map 5, Hobart – Potential Deep Seated Landslide Hazard. Tasmanian Landslide Hazard Series. Mineral Resources Tasmania

The subject land is adjacent to, but not shown to be at direct risk of, potential deep seated landsliding.

Potential Deep Seated Landslide Hazard (grid is AMG66)





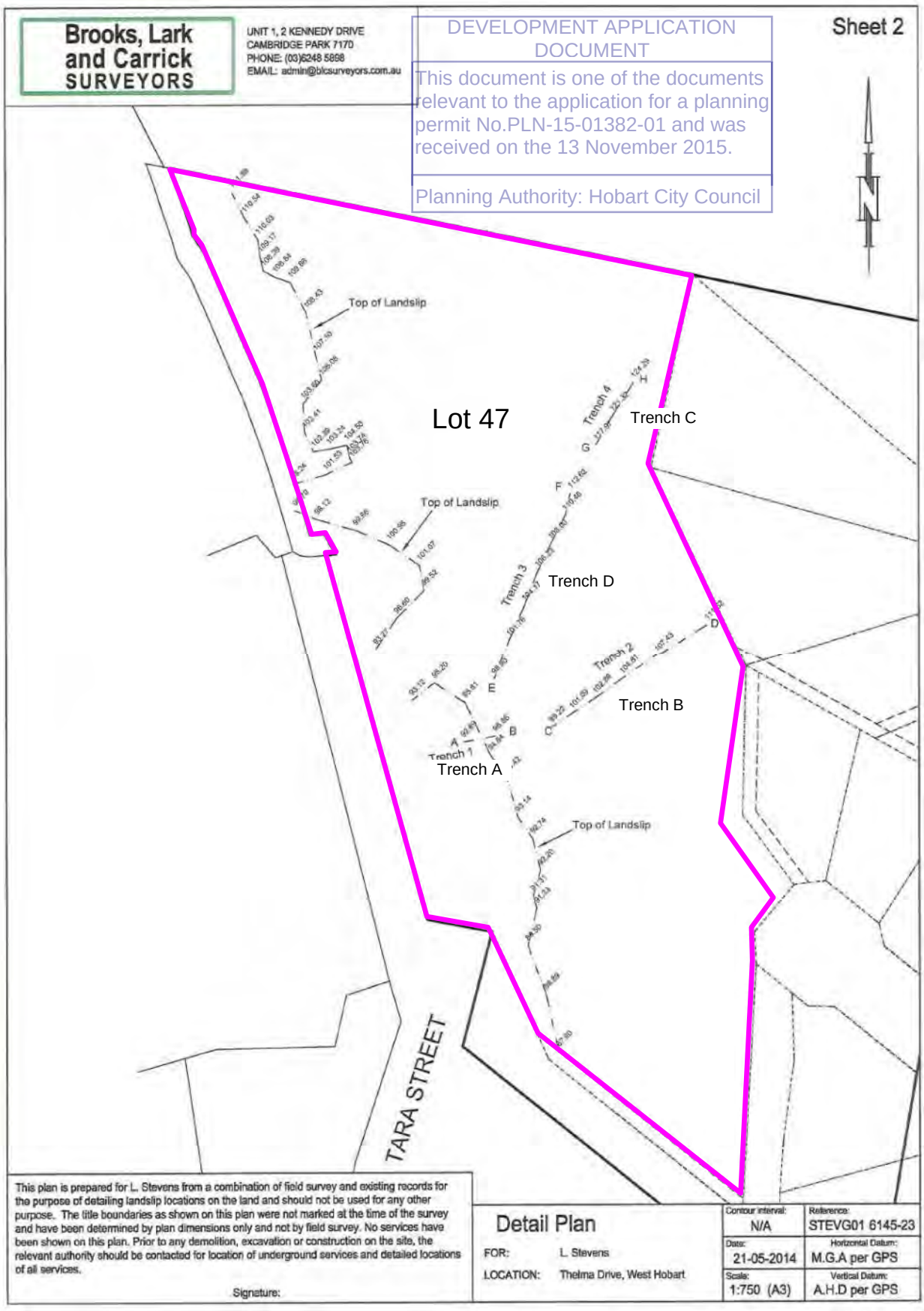


Attachment 7

(1 page)

May 2014 surveyed landslide headscarps and investigation trenches on Lot 47

Source: Brooks, Lark and Carrick Surveyors. Landslide survey points selected by William C Cromer.

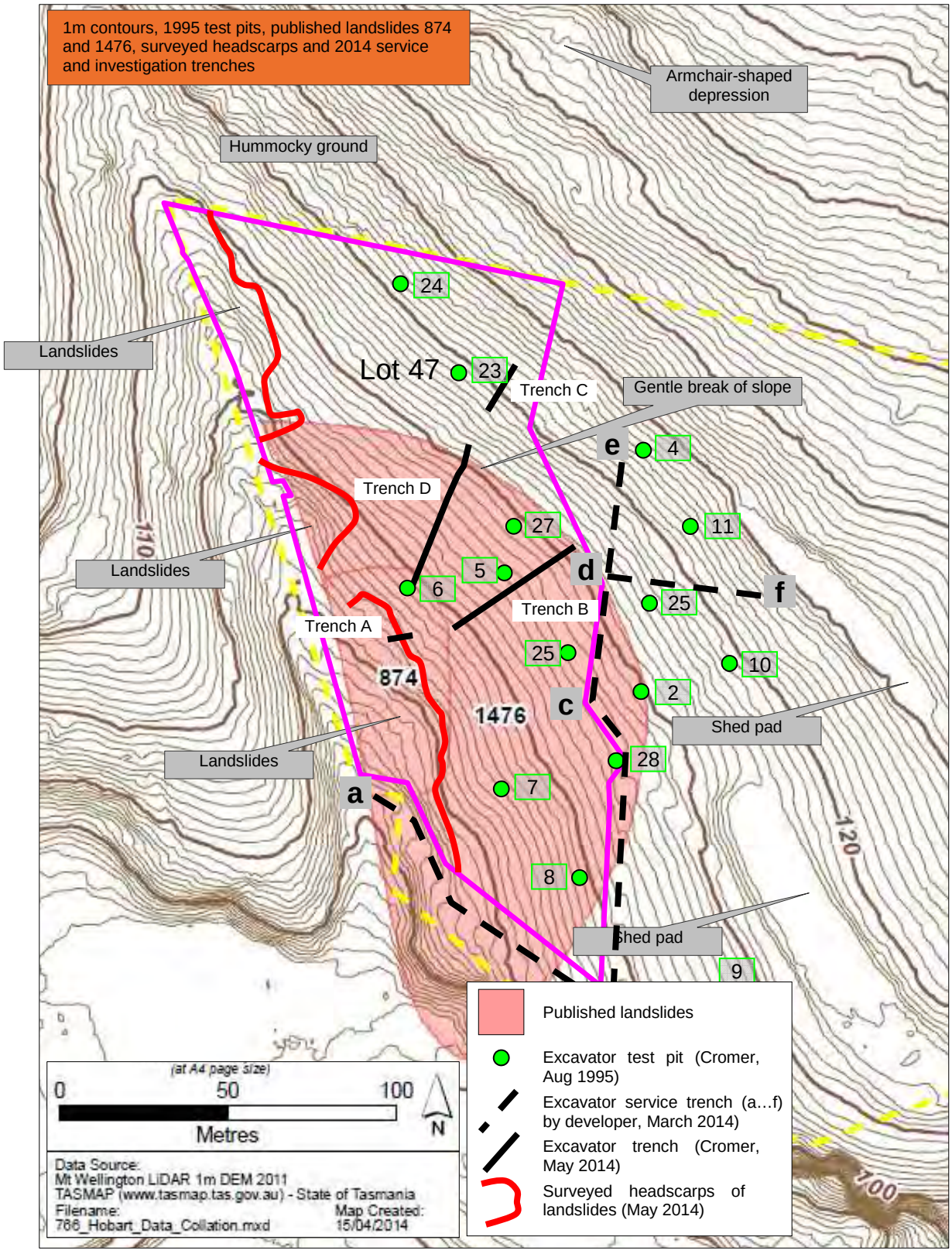


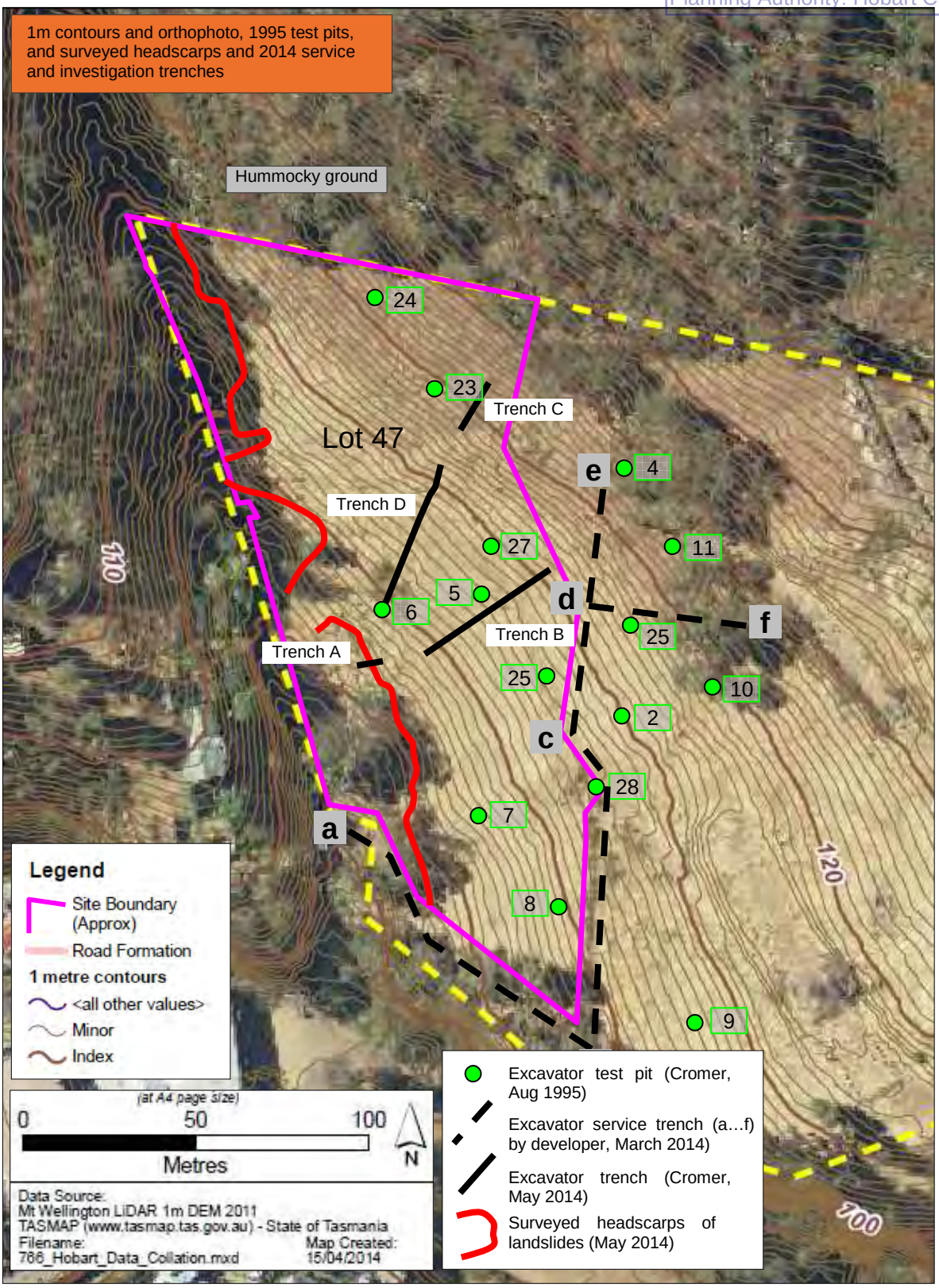
Attachment 8

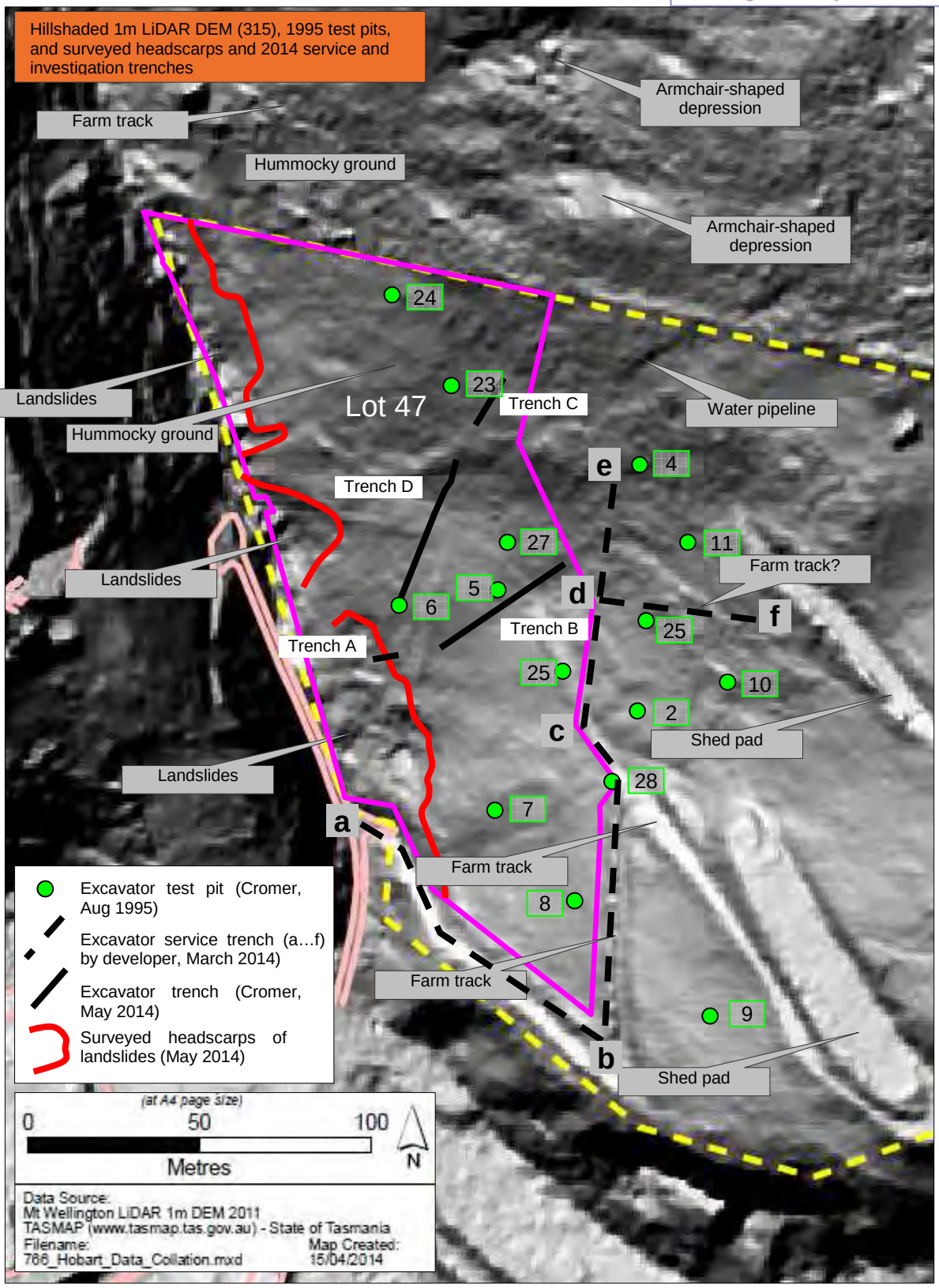
(5 pages)

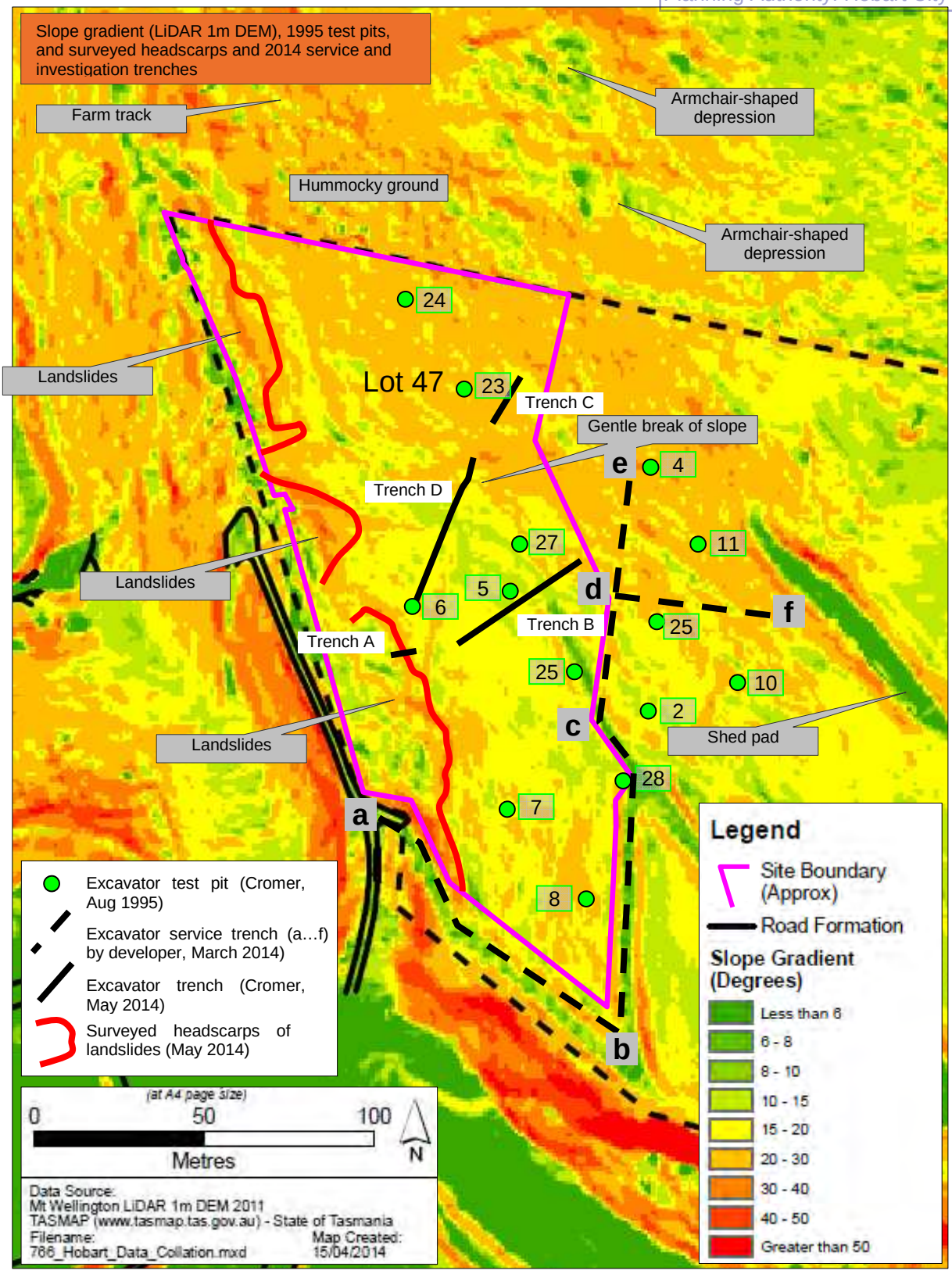
Topographic, aerial and LiDAR images of Lot 47 at Farm Hill, showing May 2014 surveyed headscarps of landslides and 2014 service and investigation trenches

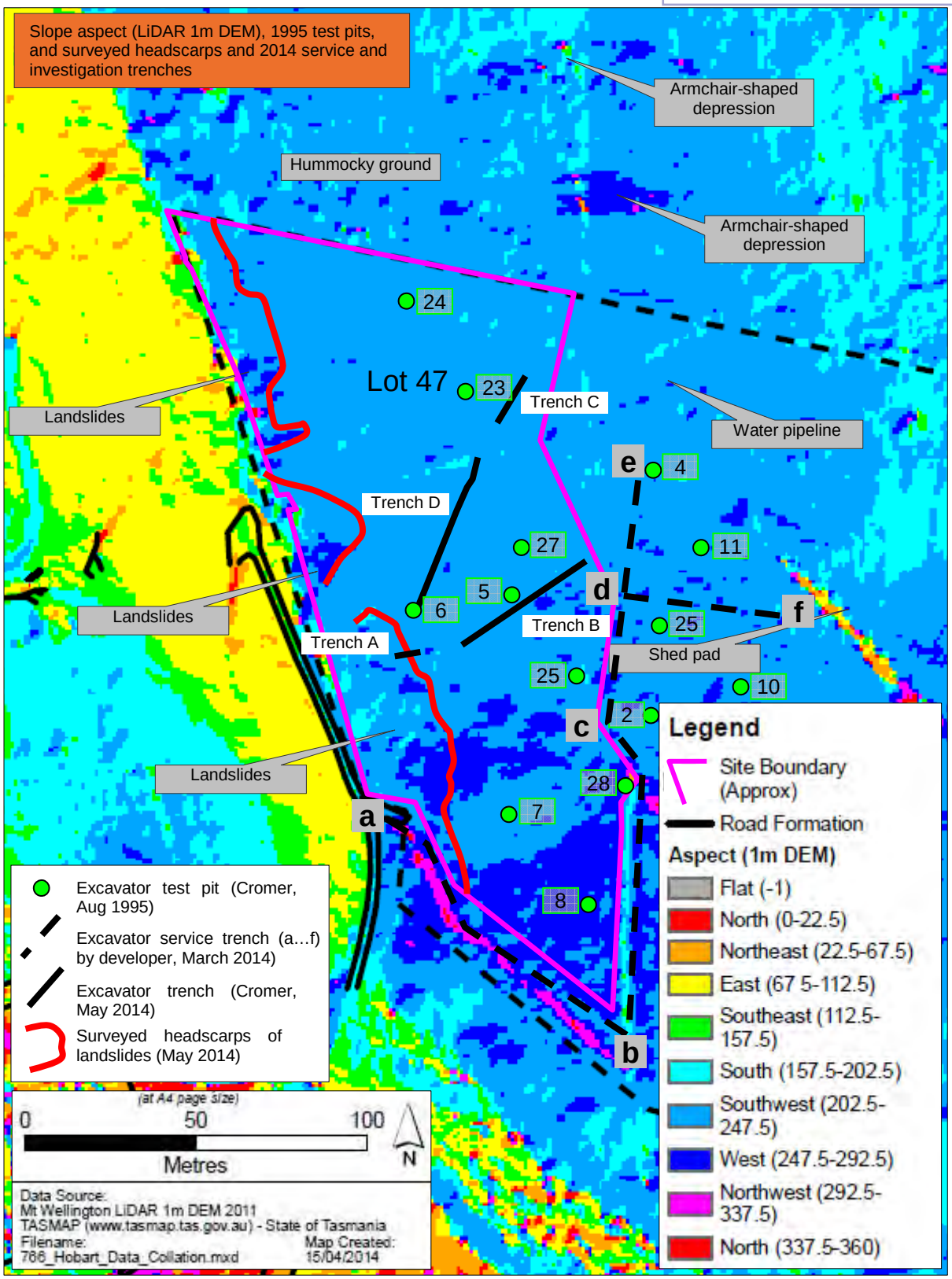
Source: adapted from a. s. miner geotechnical











Attachment 9

(22 pages)

Site and trench photographs

The staff is graduated in 1m long white and yellow segments. The numbers are decimetres.

Plate 1 (above). View north from Wellerslie Park in South Hobart to Lot 47 on the Farm Hill Subdivision in April 2014, showing service trenches (right) and investigation trenches B and D ("V"-shaped).

Plate 2 (below). View southeast from the northwestern corner of Lot 47 at Farm Hill, over 25 – 30^0 slopes in the foreground, towards service trenches a….f (see Attachment 7).

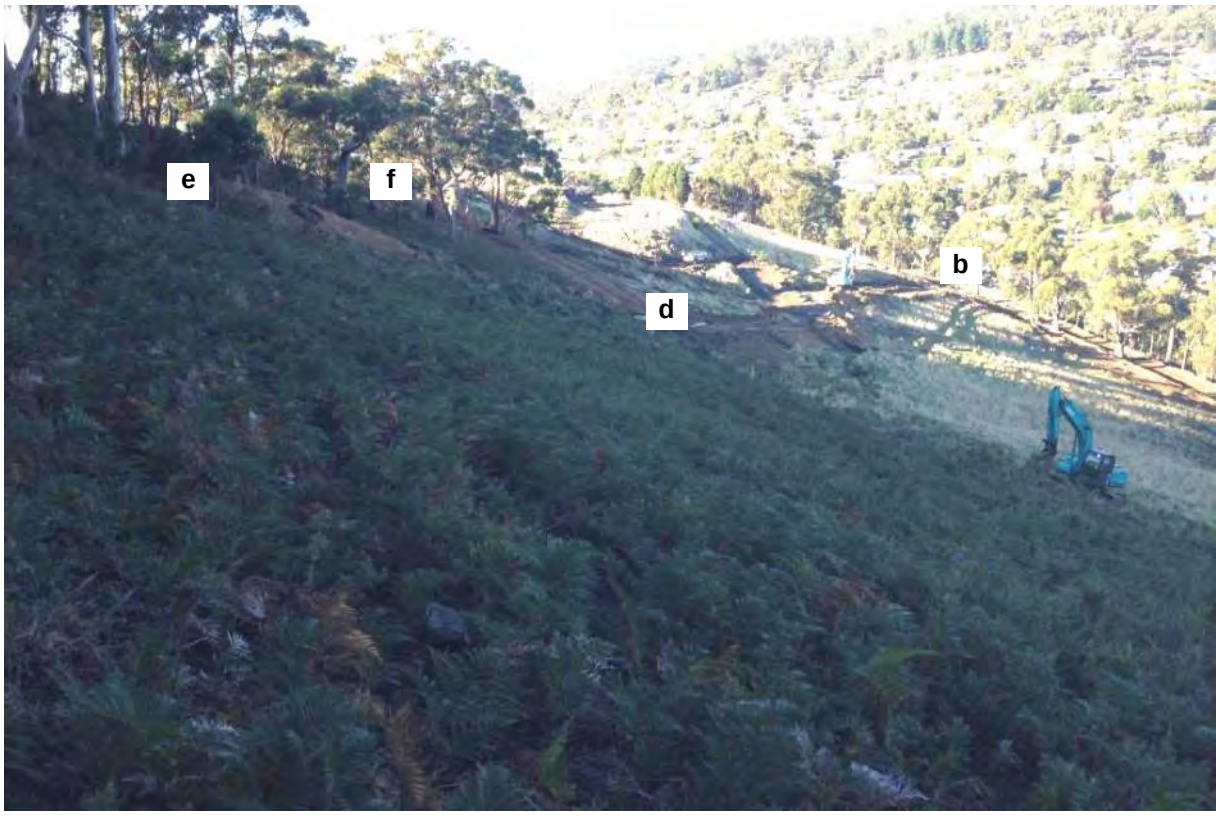


Plate 3 (above). View south southeast from the northwestern corner of Lot 47 at Farm Hill, over 25 – 30^0 slopes in the foreground, towards service trenches a….f (see Attachment 7). The higher edge of the tree line in the centre of the photo marks the headscarp of landslide #874 (see Map 1 of Attachment 5).

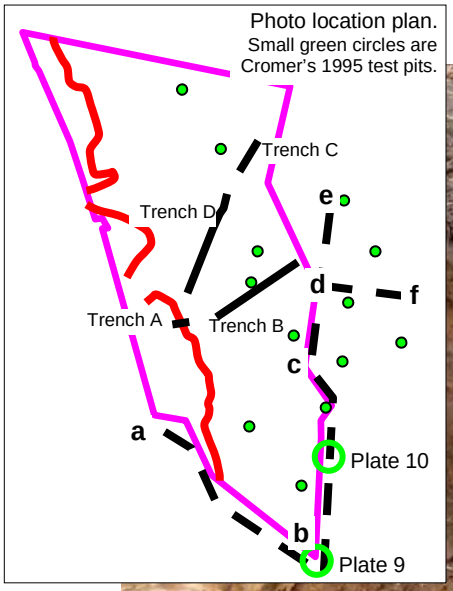
Plate 4 (below). View northwest and downslope to the lower, southwestern corner of Lot 47. The higher edge of the tree line in the right middle ground marks the headscarp of landslide #874 (see Map 1 of Attachment 5).

Plate 5 (above). View north over Lot 47 from its lower, southern boundary. The higher edge of the tree line in the left middle ground marks the headscarp of landslide #874 (see Map 1 of Attachment 5). Investigation trenches A,B, C and D are indicated.

Plate 6 (below). View northeast and upslope over Lot 47 from its lower, southern boundary. Investigation trenches B, C and D are indicated. Service trench a….f is partly shown.

Plate 7 (above). View north over Lot 47 from its lower, southern boundary.

Plate 8 (below). View northwest and downslope in March 2014 towards the service trench a….f. Lot 47 is the grassy slope in the background. The higher edge of the tree line in the left middle ground marks the headscarp of landslide #874 (see Map 1 of Attachment 5).



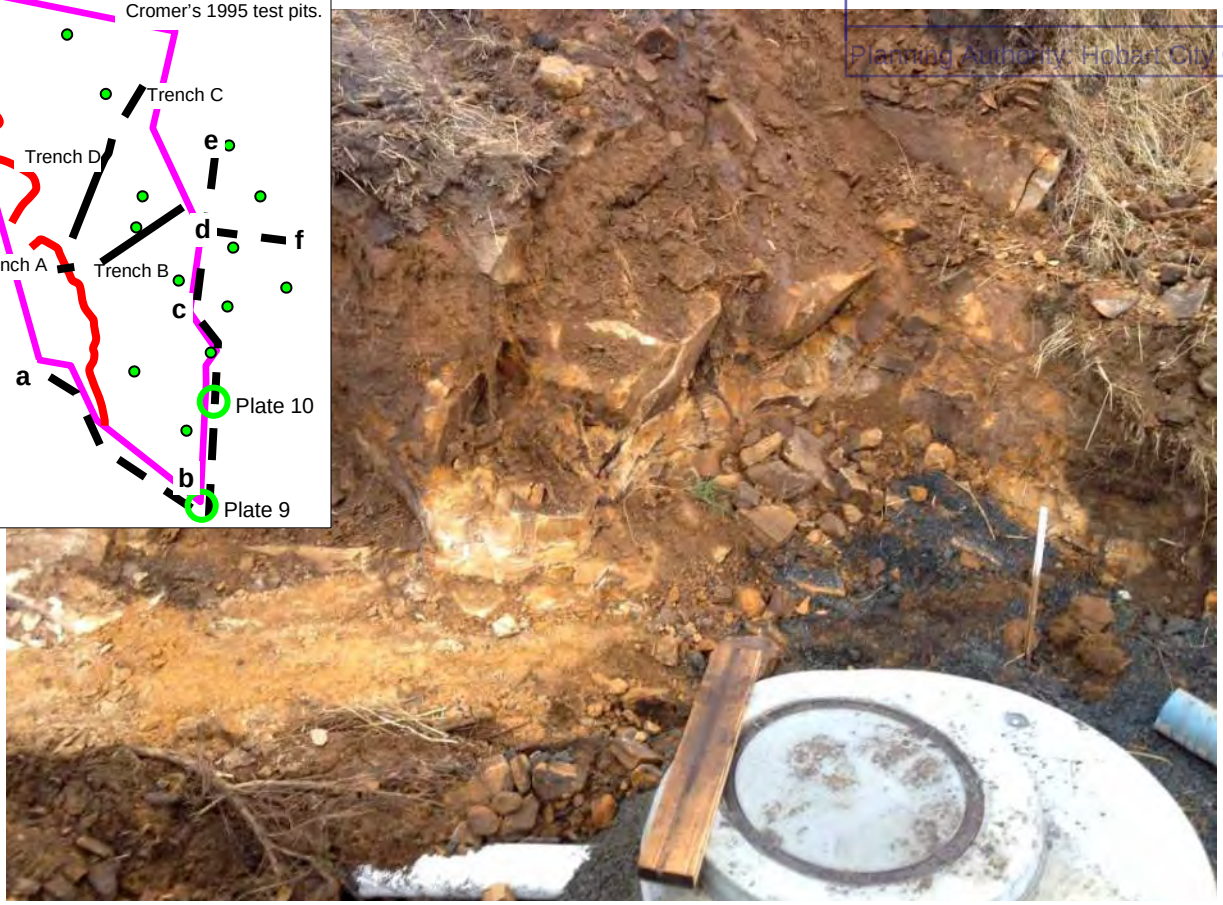
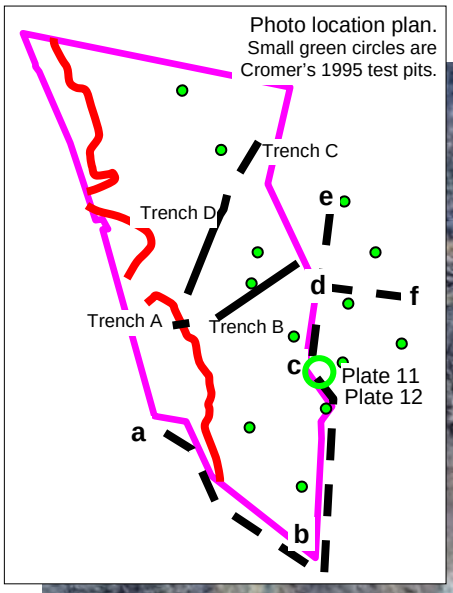


Plate 9 (above). Service trench abcdef at b, 28 March 2014. Subhorizontal Triassic sandstone bedrock exposed at depths less than 0.5m.

Plate 10 (below). Service trench abcdef between b and c. Subhorizontal Triassic sandstone bedrock exposed at depths less than 1m.



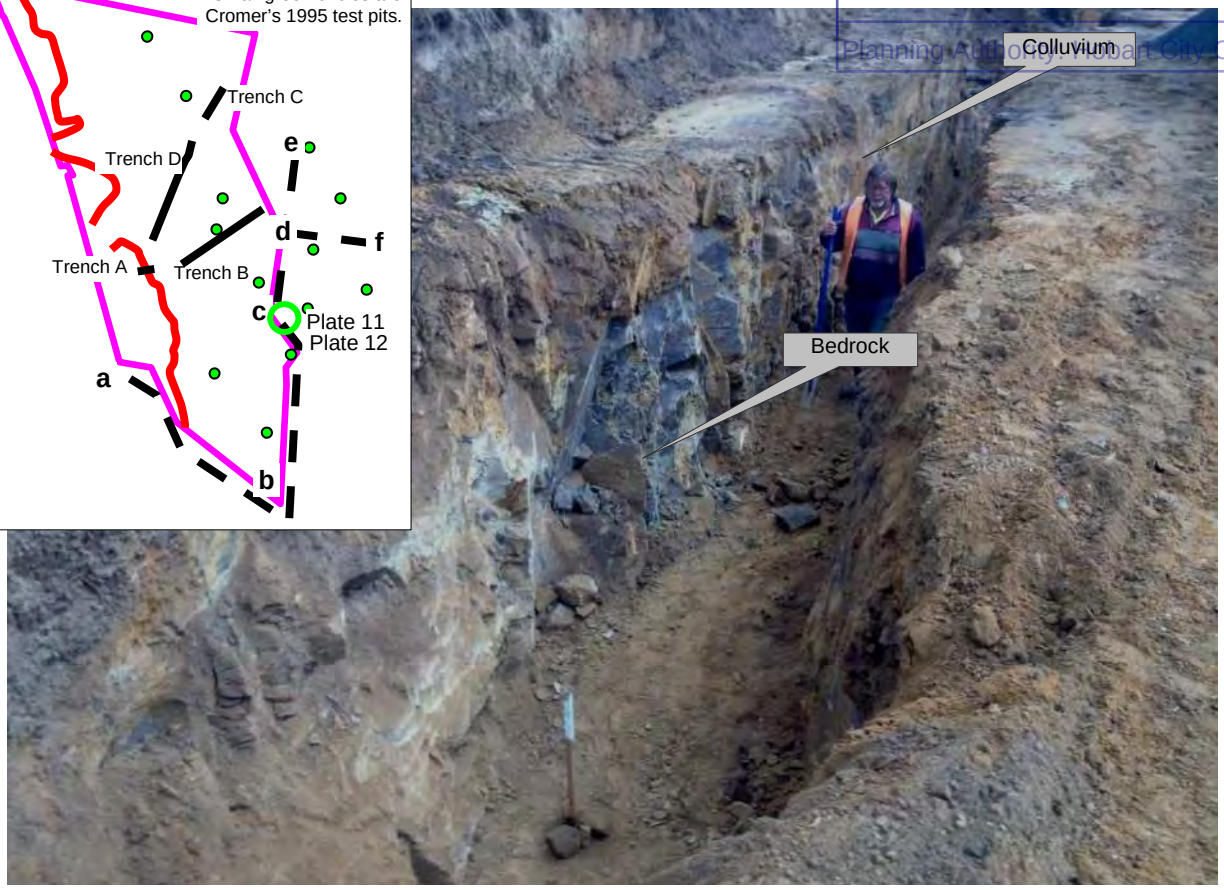


Plate 11 (above). Service trench abcdef at c. Subhorizontal Triassic sandstone bedrock exposed at depths less than 1m, but bedrock is interspersed with zones of colluvium comprising dry, friable to dense non-plastic to low plasticity sandy gravel-gravelly sand and clayey varieties.

Plate 12 (below). Service trench abcdef at c, but opposite side of trench to that in Plate 11.

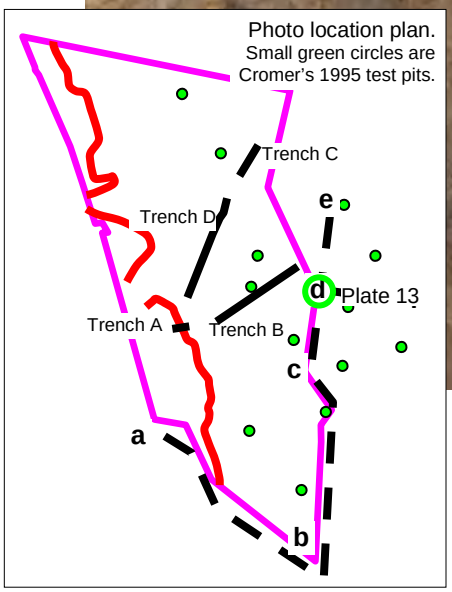
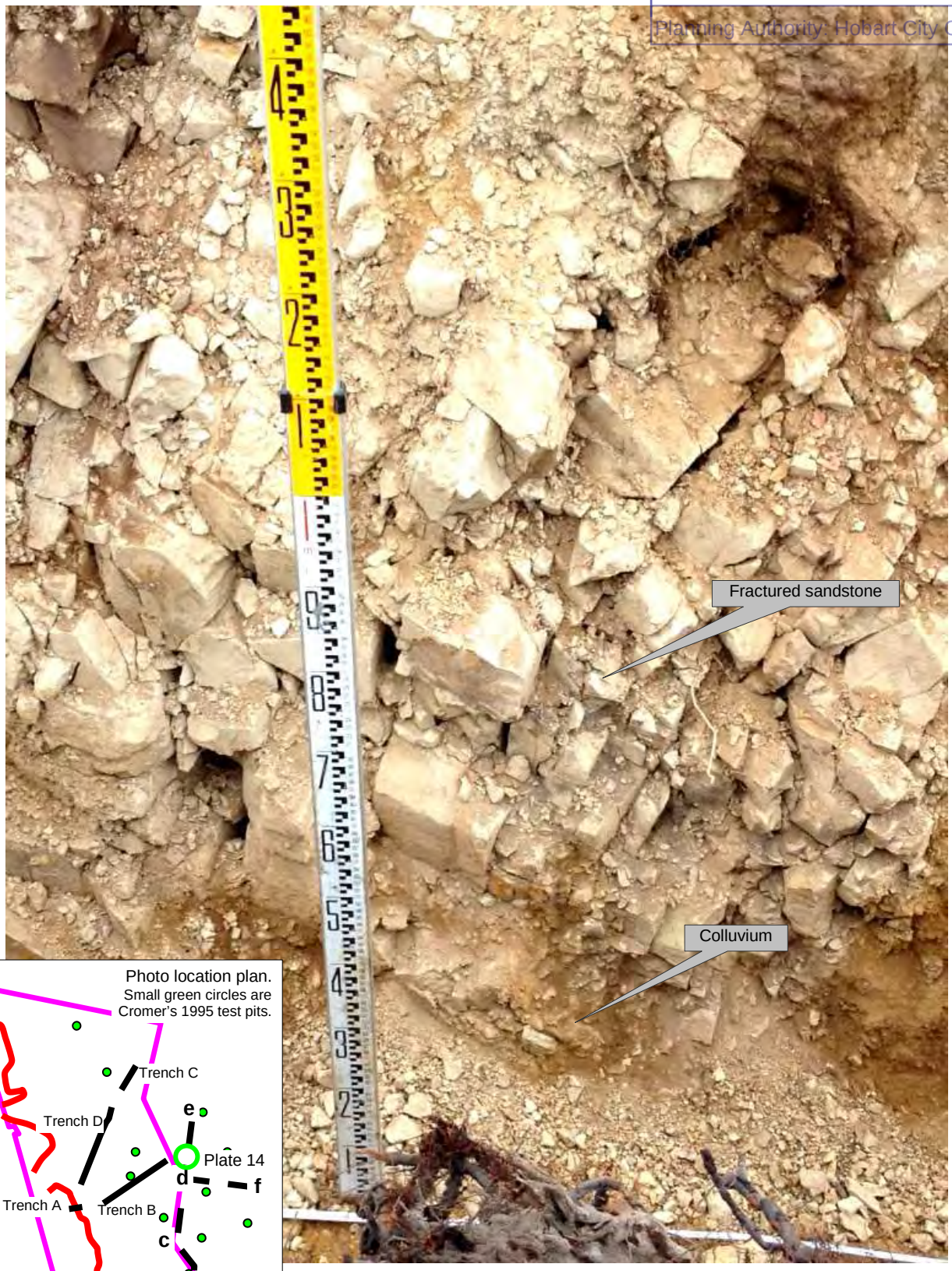


Plate 13. Service trench abcdef at d, looking upslope to e. The profile is mainly dry non-plastic colluvium, interspersed with patches of strongly fractured sandstone which may be in-situ bedrock, and other patches of strongly fractured sandstone underlain by colluvial material and therefore not in-situ.



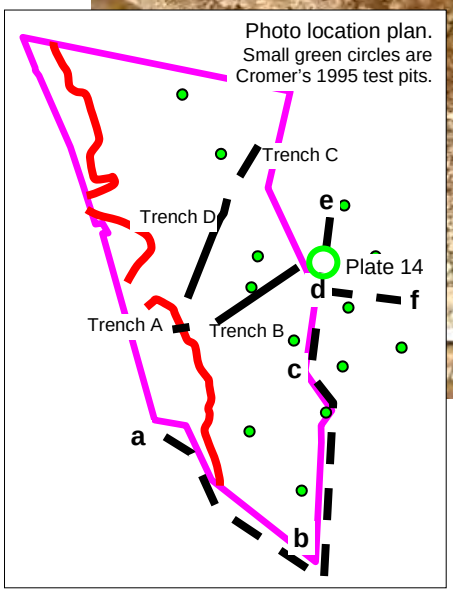
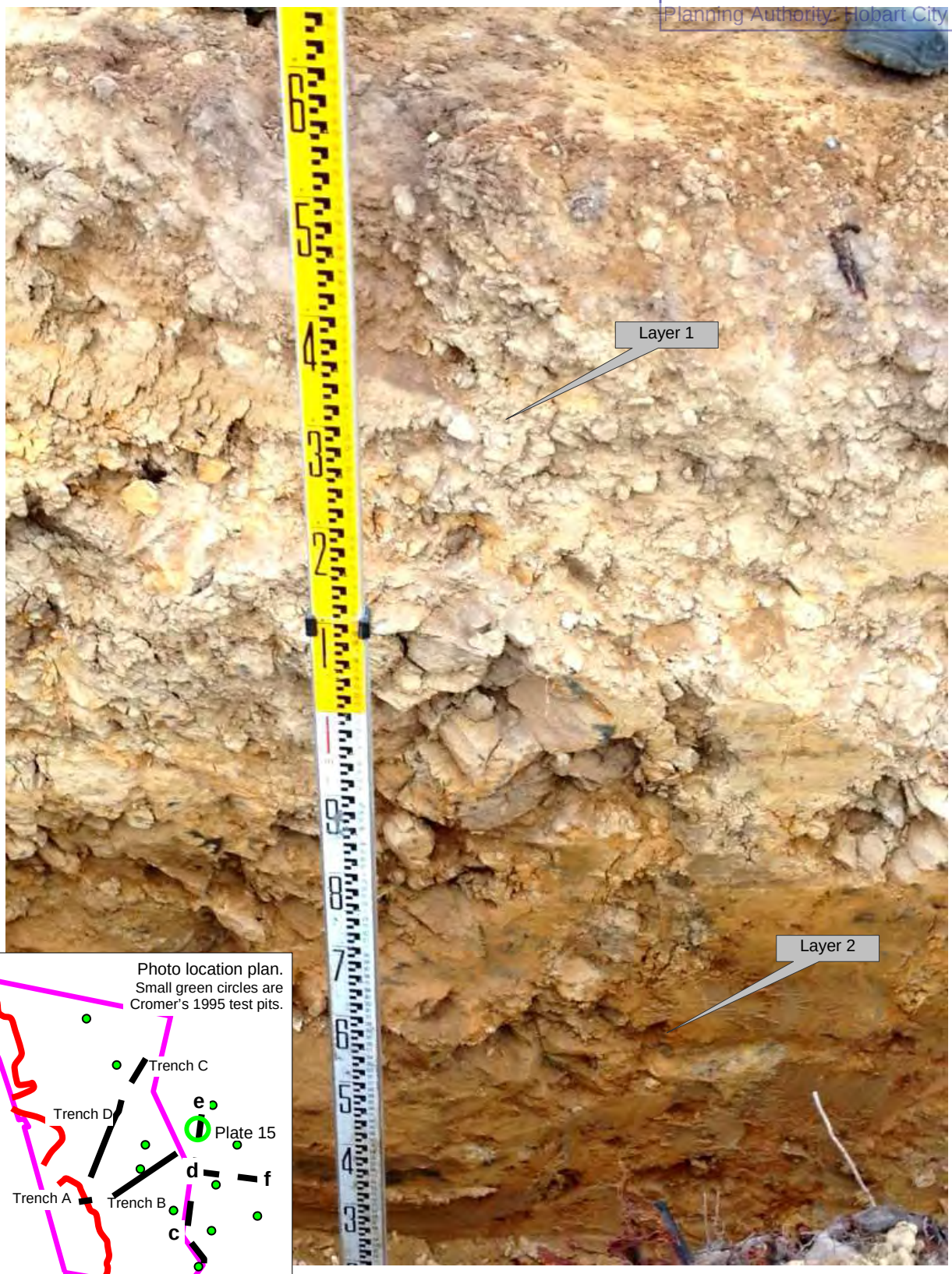


Plate 14. Service trench abcdef between d and e. A patch of strongly fractured sandstone showing joint alignment (and therefore minor bulk disruption and probably minimal downslope transport) is underlain by colluvial material.



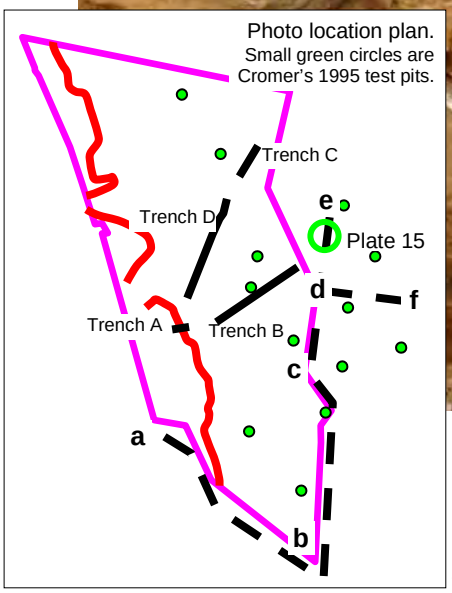


Plate 15. Service trench abcdef between d and e. The colluvium on this slope may locally display two episodes of colluvial development and downslope movement (Layer 2 then Layer 1), or it has undergone illuviation of finer material (orange) from Layer 1 to Layer 2 to form a duplex (two-layered) profile. If the latter, it implies a fair degree of slope stability over an extended time period.

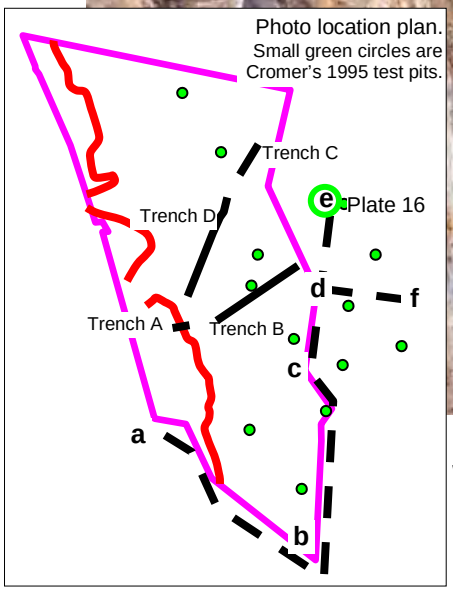


Plate 16. Service trench abcdef at e, looking downslope to d. It is not clear whether the fractured sandstone exposed in the services trench at this location (and locally elsewhere along it) is in-situ or not.

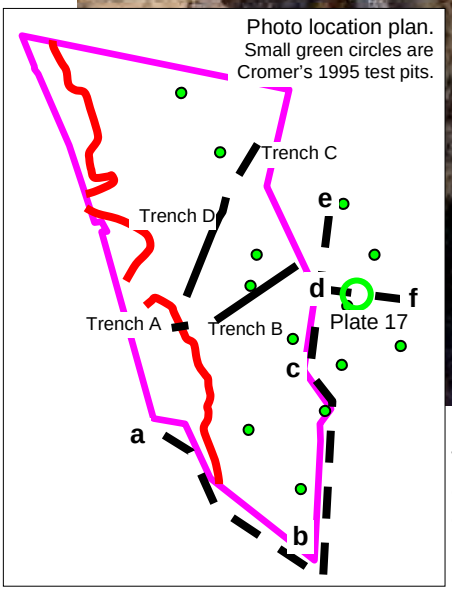


Plate 17. Service trench abcdef between d and f, looking upslope towards f. The fractured sandstone exposed in the services trench at this location appears to be in-situ. A narrow fault zone about 0.5m wide crosses the trench at an oblique angle (arrowed).

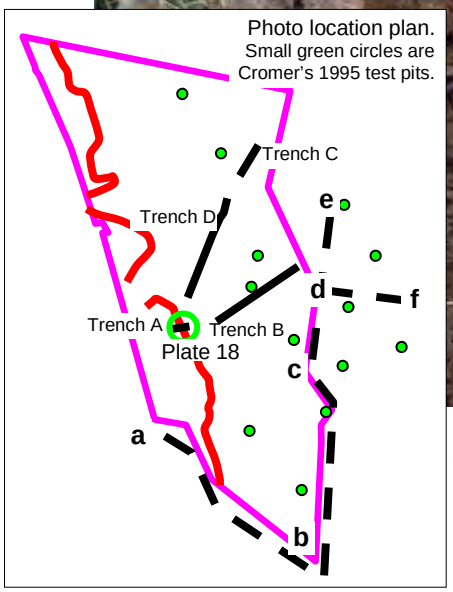
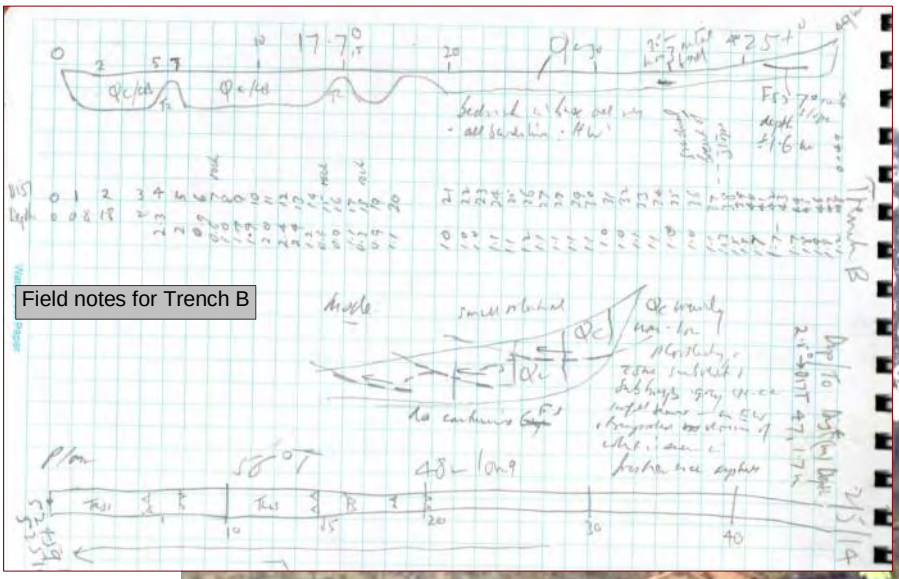
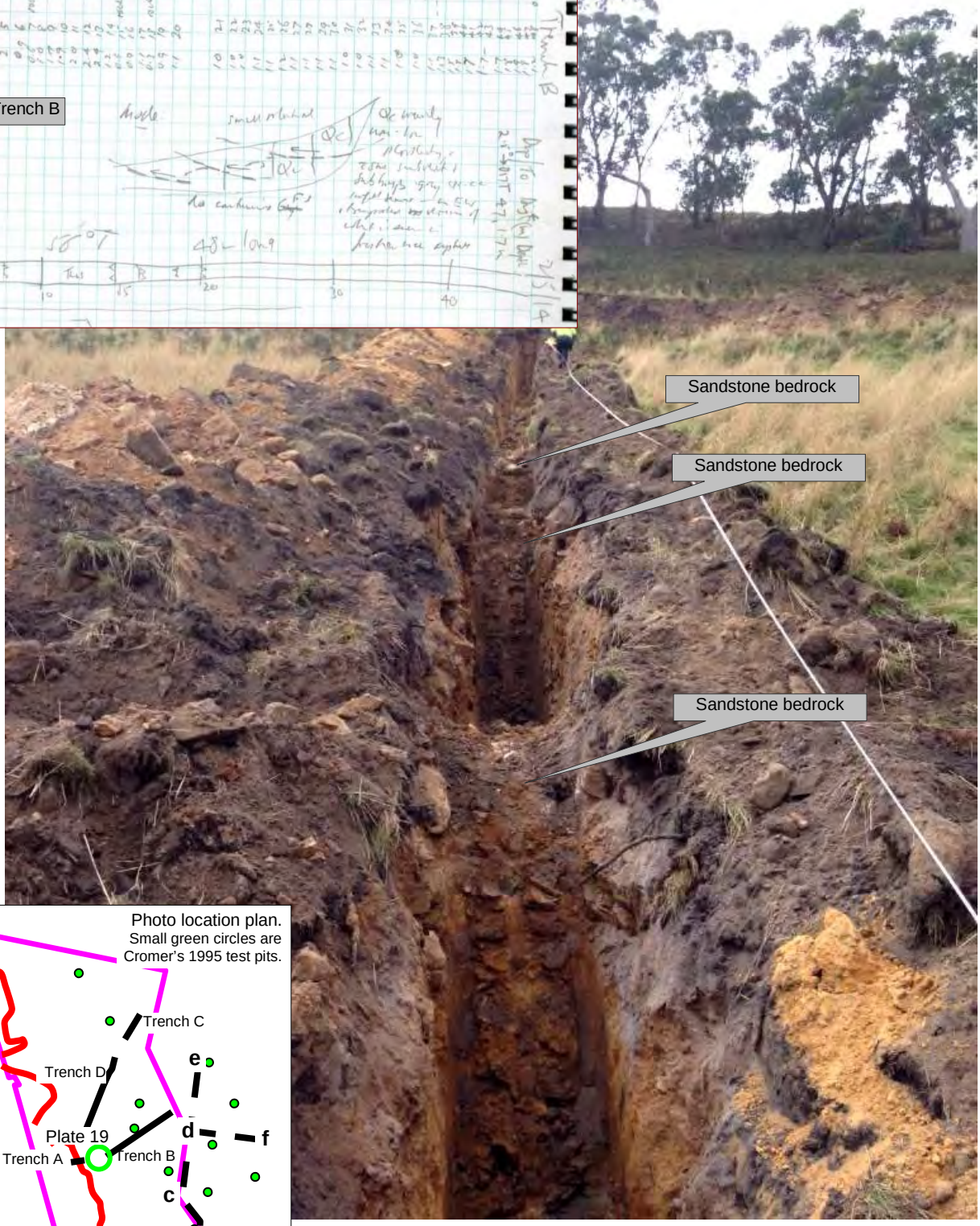


Plate 18. Investigation trench A, about 8m long, was dug across the headscarp of landslide #874. The failure surface was probably close to the camera, but not apparent. Colluvium overlies highly weathered siltstone bedrock, exposed in the base of the trench, and dipping 11^0 to 260^0T.



Field notes for Trench B



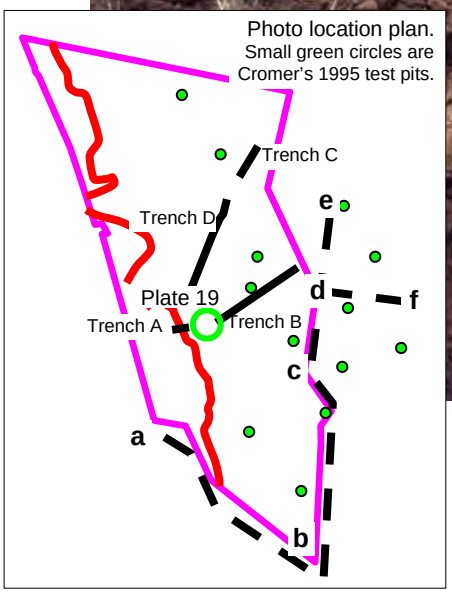


Plate 19. Investigation trench B, about 48m long, looking upslope. The slope is colluvium of variable thickness, but highly weathered sandstone bedrock was exposed along the full length of the trench at depths ranging from as shallow as 0.5m (as indicated) to about 1.8m. The dip on the bedrock is less than 5^0 to the north (into the slope).

Plate 20 (left). Investigation trench B, upslope end, showing finely bedded, highly weathered sandstone and siltstone bedrock dipping 3^0 to 017^0T. Colluvium (with some bedded sandstone) overlies the bedrock, and the boundary (red line) between them, although not very obvious, is inferred to dip towards and up to the camera in a scallop shape (the geology pick is on the boundary).

Plate 21 (below). Detail of the end of Trench B, showing grey-blue, high plasticity clay coatings several millimetres thick on a dipping joint surface. Slipping on these coatings is a likely mode of localised failure for the colluvial cover.

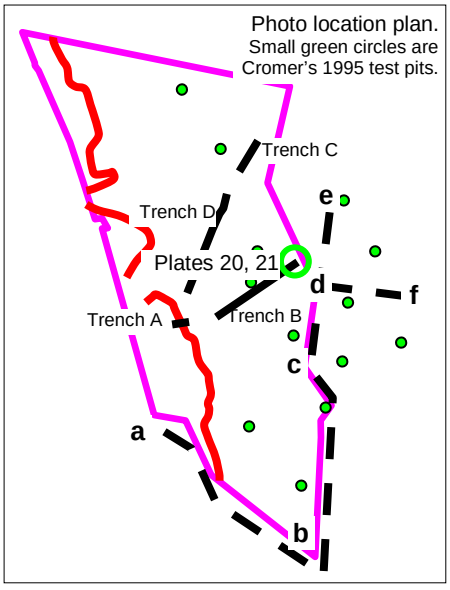


Photo location plan.
Small green circles are Cromer's 1995 test pits.

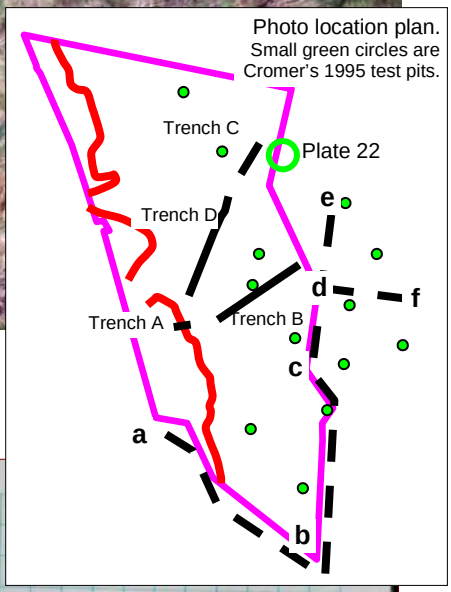
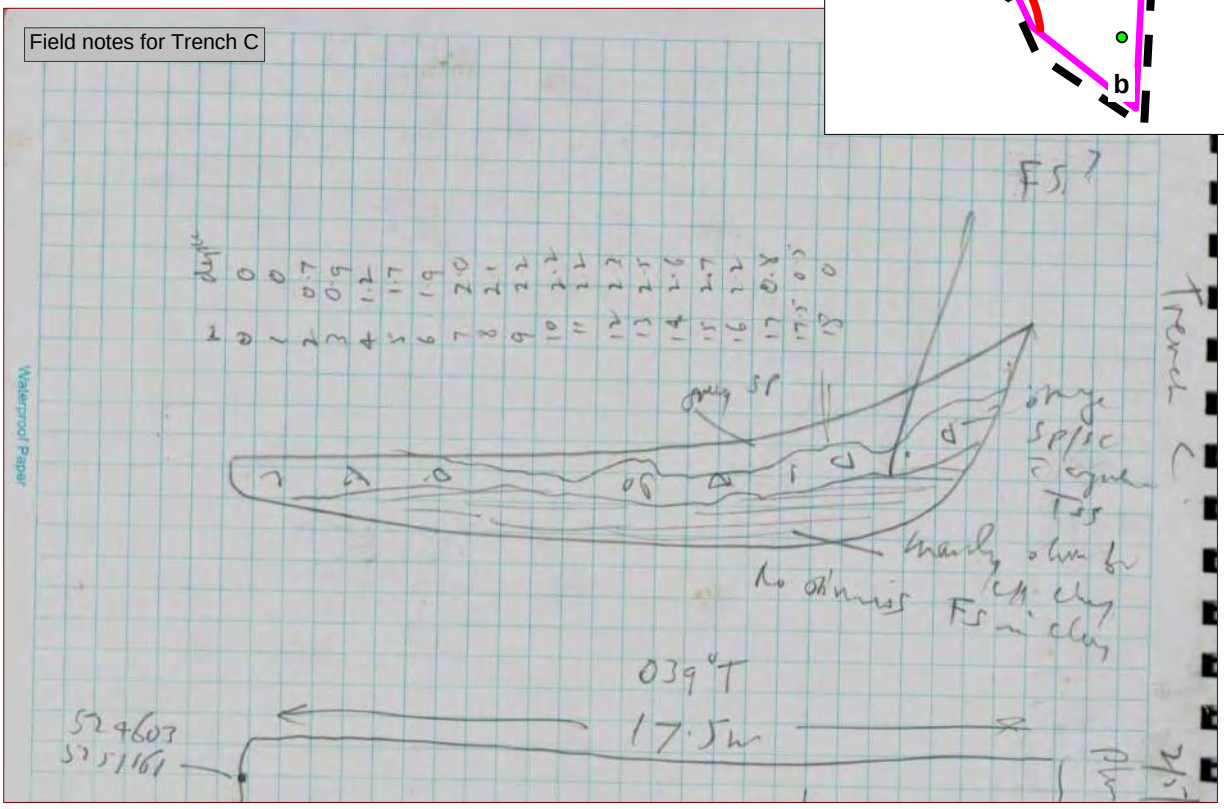
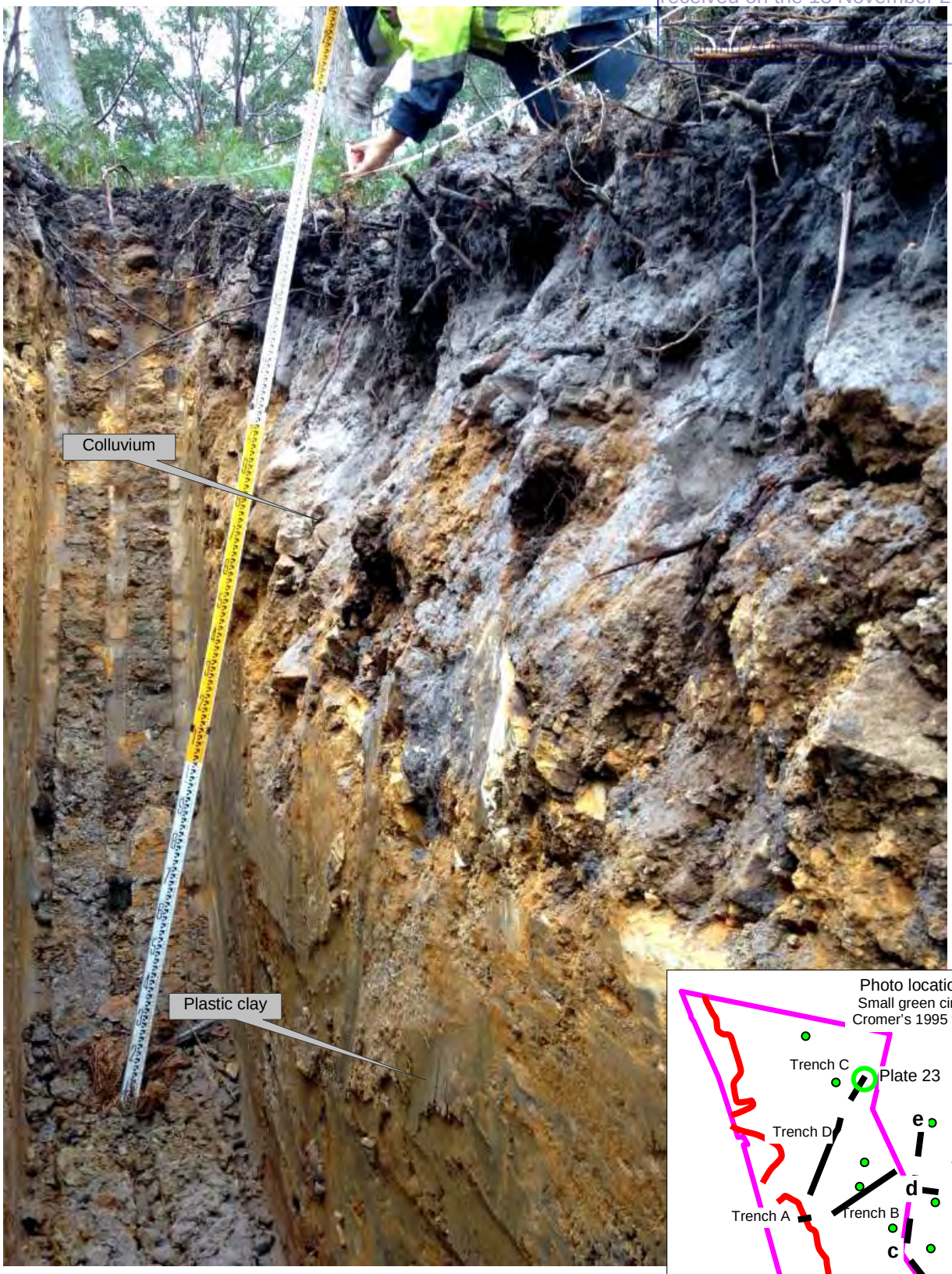


Plate 22 (above). View west at Trench C, 17.5m long. This excavation up to 2.6m deep exposed colluvial materials over high plasticity clay, with no bedrock.

Field notes for Trench C





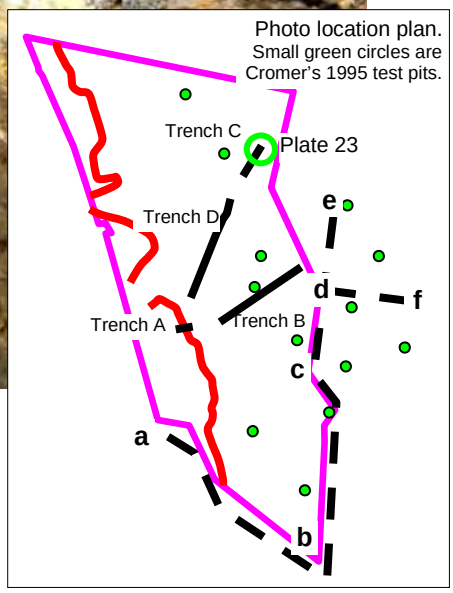
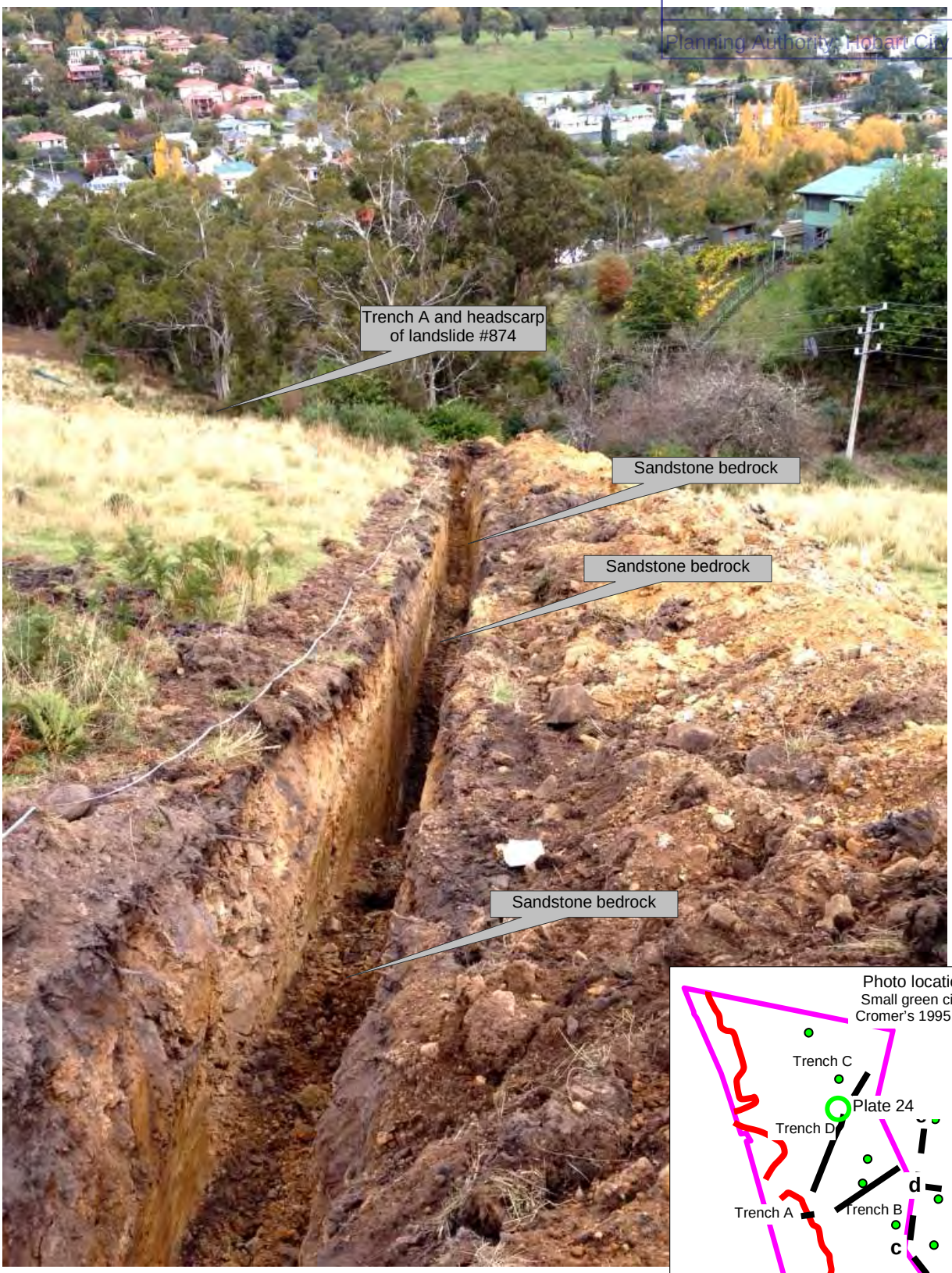


Plate 23. View north northwest at the higher end of Trench C, 17.5m long. This excavation up to 2.6m deep exposed colluvial materials over high plasticity clay, with no bedrock.



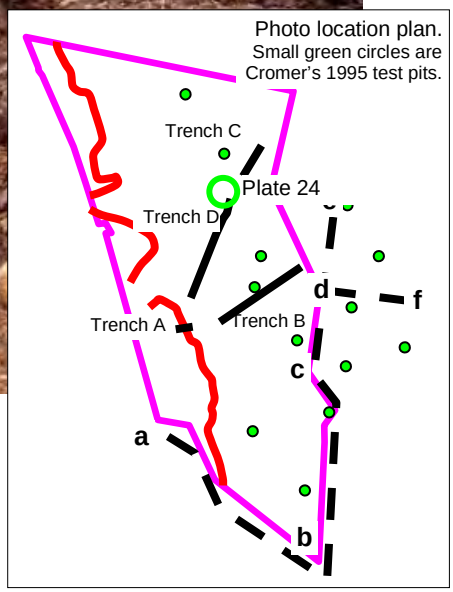


Plate 24. View downslope and along investigation trench D. Note bedrock highs in floor of trench, with colluvial material on top, and surrounding.

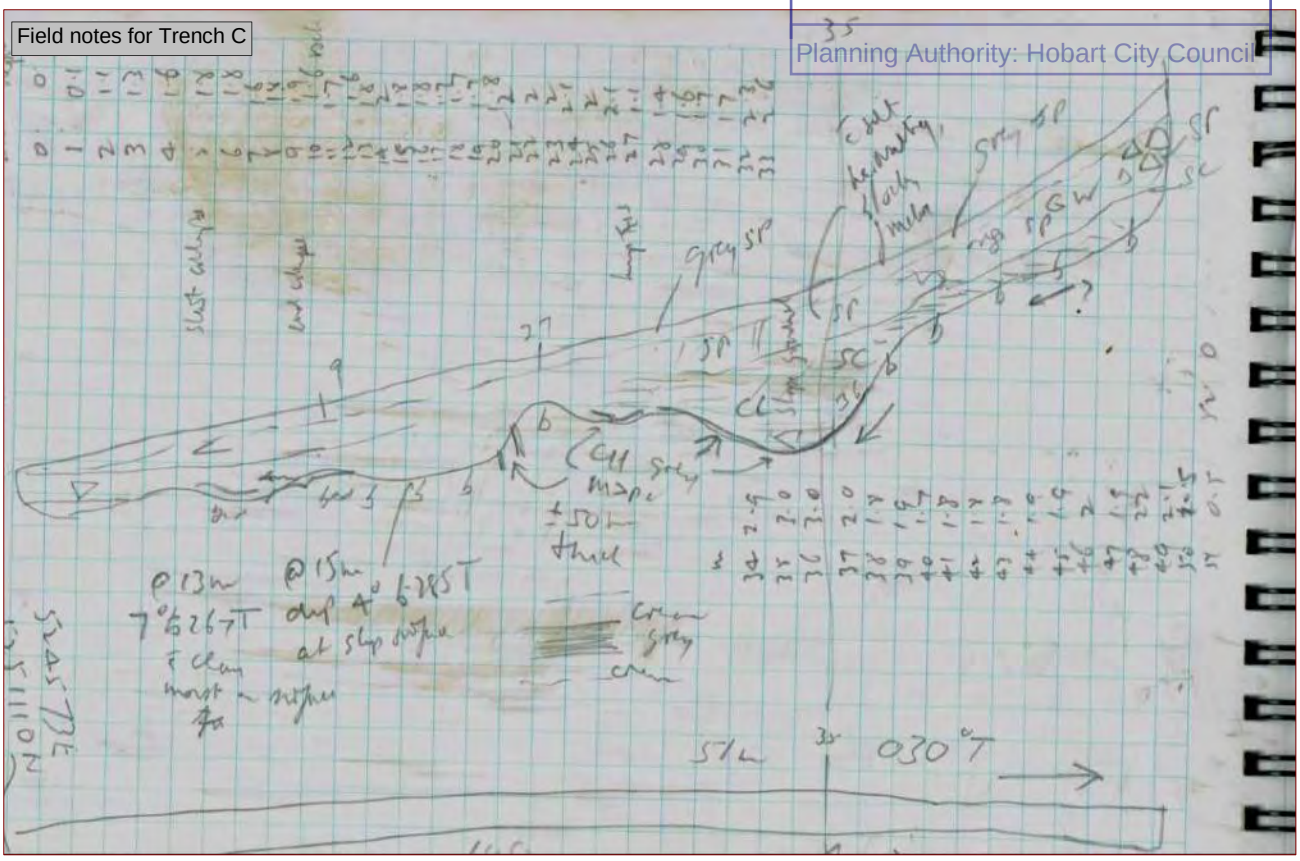
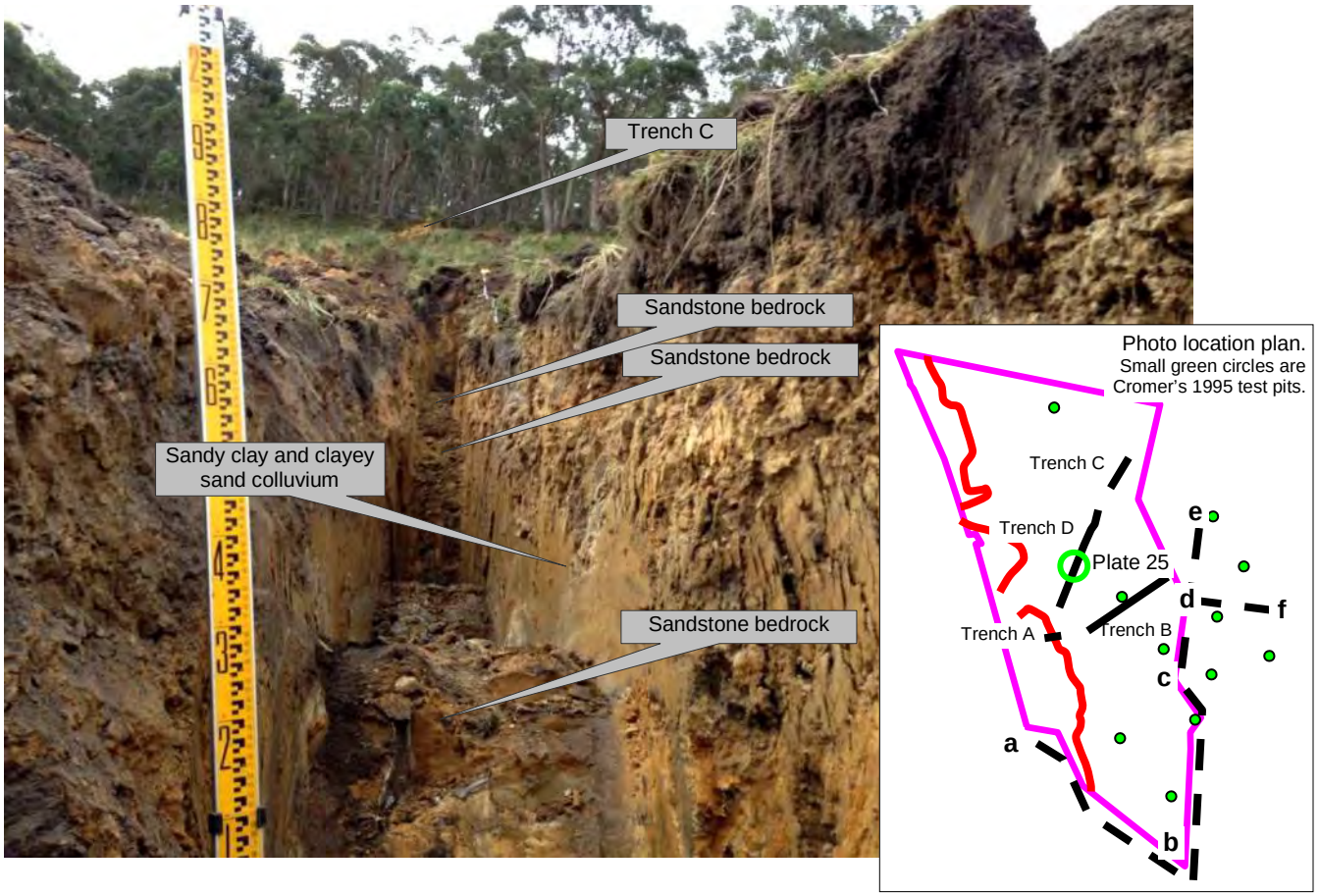


Plate 25 (below). View upslope and along investigation trench D. Note bedrock highs in floor of trench, with colluvial material on top, and surrounding. Bedrock dips measured in Trench D were: 4^0 to 285^0T, 7^0 to 267^0T.



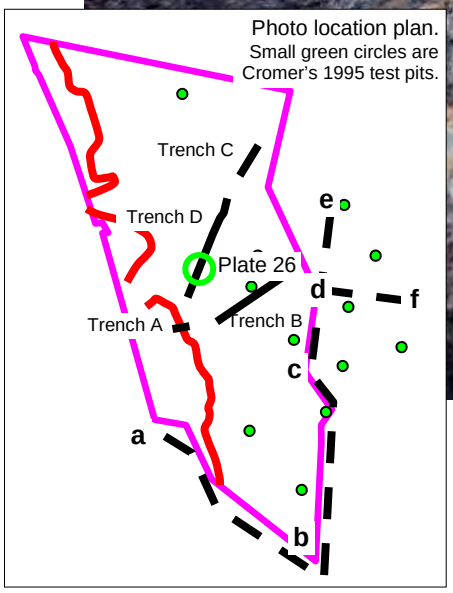


Plate 26. View upslope and along investigation trench D, showing finely bedded sandstone bedrock in floor of trench, with colluvial material on top. Local movement of colluvium over the bedrock is facilitated by grey clayey horizons on the colluvium-bedrock interface (indicated by pencil), and also probably by clayey coatings on subhorizontal joints in the bedrock itself (inset photo; the striations on the clay are finger marks).

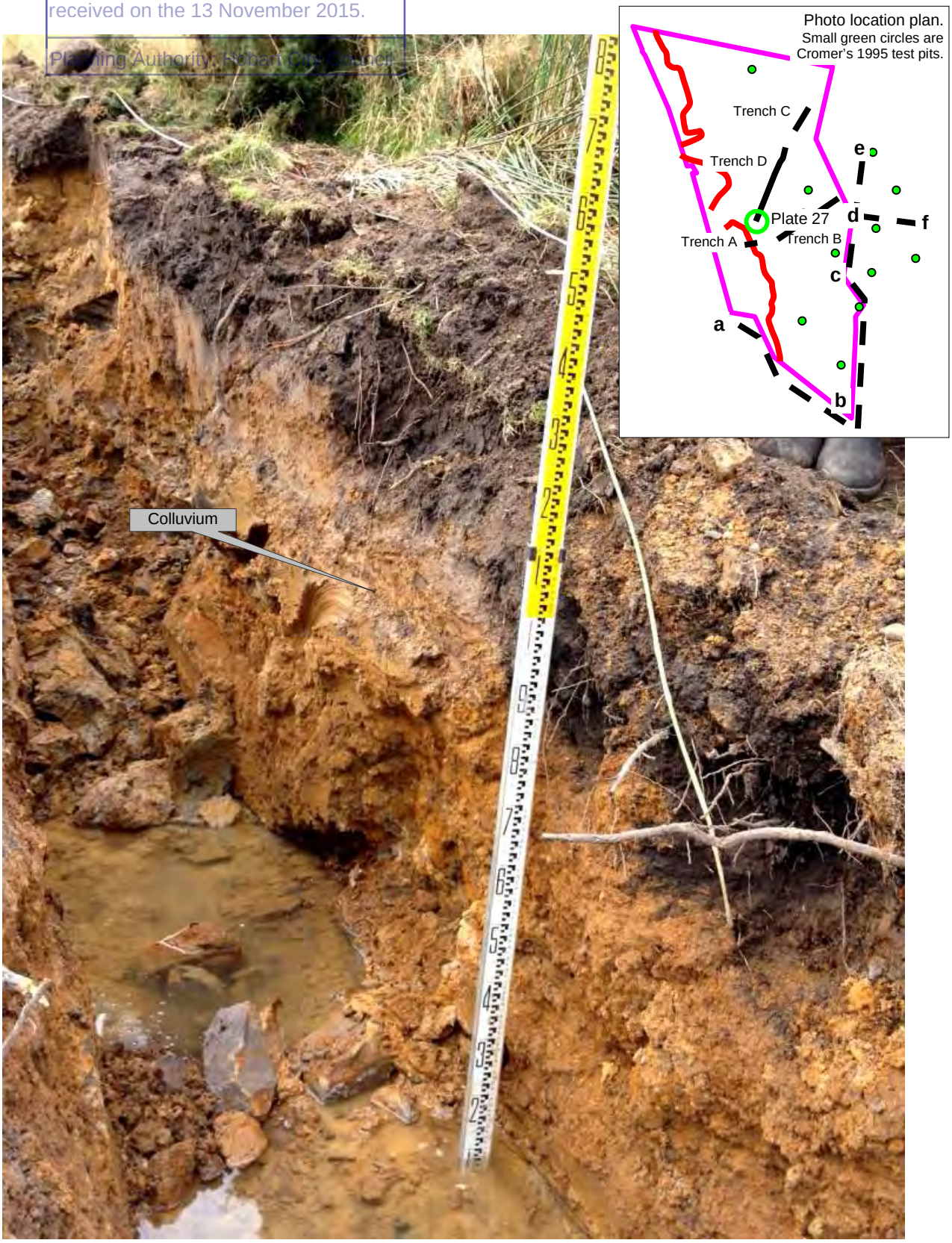


Plate 27. Shallow seepage water issued from, and accumulated at, the lower end of investigation trench D. Shown here are colluvial materials beneath organic-enriched sands soil, near the headscarp of published landslide #874. This seepage was the only instance noted in the trenches, although Cromer (1995) noted minor seepages in nearby test pit 6 at a depth of 3, and 20Lmin seepages at 4.8m

Plate 28. Triassic sandstone with joints coated with high plasticity grey clay are very common on the Farm Hill subdivision and neighbouring areas. This photograph of the cutting at the junction of Thelma Road and Forest Hill Road shows mainly subvertical, clay-lined joints, but subhorizontal and dipping ones, too. Some joint coatings taper to less than a millimetre thick, and it is inferred that they were emplaced in the liquid or semi-liquid state, filling open fractures. The origin of the clay is unclear – perhaps it represents clay enriched (B-horizons) which have been mobilised under wet conditions (cold? less vegetation cover?) and slope instability.

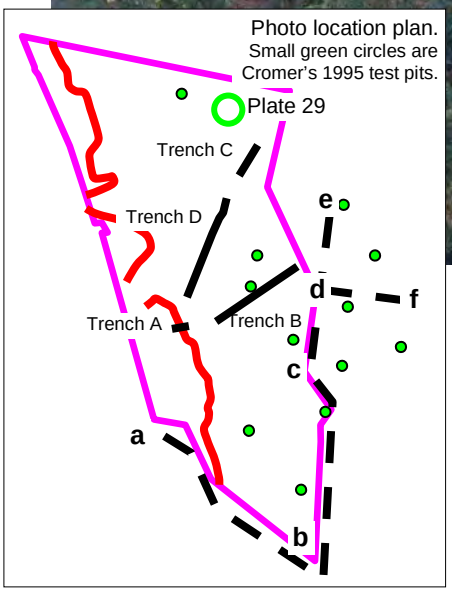


Plate 29. Curved tree trunks near the higher, northern boundary to Stage 4 suggest episodes of downslope soil movement.

Attachment 10

(13 pages)

Landslide Risk Management

This Attachment addresses slope stability (landslide) issues for Lot 47 at Farm Hill in accordance with Australian Geomechanics Society (AGS) Landslide Risk Management (2007)[6]. The process is depicted in Figure 10.1.

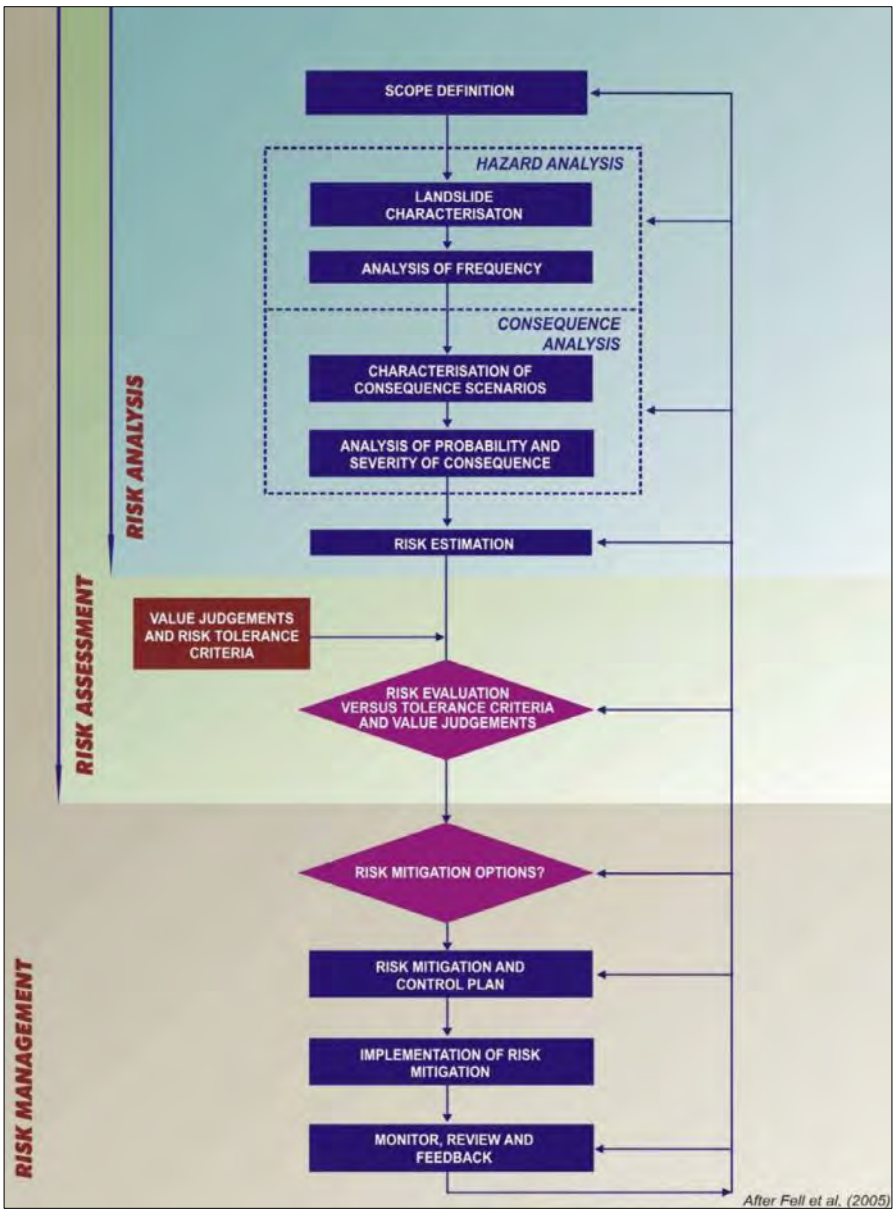


Figure 10.1. Framework for Landslide Risk Management
Source: Reproduced without amendment from AGS (2007a). Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007

[6] The five AGS documents are:
AGS (2007a). Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007
AGS (2007b). Commentary on Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007
AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007
AGS (2007d). Commentary on Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007
AGS (2007e). The Australian Geoguides for Slope Management and Maintenance. Australian Geomechanics Vol 42 No 1 March 2007

LANDSLIDE RISK MANAGEMENT (LRM)

Preliminary

Desktop review of slope instability

Unpublished evidence

Information relating to potential or actual slope instability on and adjacent to Lot 47 at Farm Hill was discussed in detail in my 1995 report[7], and some of it is included here as extracts in Attachment 4. The 1995 report also included a copy of an earlier unpublished letter[8] to G Stevens by the then Division of Mines & Mineral Resources, briefly describing a landslide on the lower, southwestern portion of the land.

The report described:

- the existing landslide,
- a larger and more subtle topographic feature surrounding the existing landslide and extending north and east on adjacent slopes, interpreted as a possible landslide, and
- several smaller landslides bordering the eastern side of Ross Rivulet.

I am unaware of any other unpublished reports relating to slope stability issues in the neighbourhood of the development.

Published evidence

The 1995 report resulted in the first landslide features listed above being added to the landslide database maintained by the Division of Mines & Mineral Resources, and then early this century onto landslide hazard and related maps maintained by its successor, Mineral Resources Tasmania (MRT). The original smaller landslide (Weldon, 1990) became #874, and the larger feature #1476[9].

The MRT Landslide Hazard Maps (Attachment 6, this report) show:

- The two known shallow landslides (#874 and #1476) occupy the southern and southwestern half of Lot 47 on the Farm Hill Subdivision. Slope angles are in the 20 – 30^0 range.
- Most watercourses in the area have the potential to generate debris flows at their sources, with associated runouts. Test pit data from Cromer (1995) have been used to indicate regolith thicknesses (up to 5m) on the Farm Hill Subdivision.
- The course of Ross Rivulet, and the sandstone cliff sections bordering Hobart Rivulet, have the potential to generate rockfalls.
- The subject land is adjacent to, but not shown to be at direct risk of, potential deep seated landsliding.

More recently, landslide hazard band maps covering all of Tasmania have been released by the Department of Premier and Cabinet, using data provided by MRT, and are available at www.thelist.tas.gov.au. The landslide hazard banding for Farm Hill and environs, reproduced here in Attachment 5, shows landslide #874 as in the "Medium – Active band, with enclosing landslide #1476 in the Low to Medium band, and the balance of Lot 47 in the Acceptable band.

[7] Cromer, W. C. (1995). Geotechnical Investigations of Lands off Forest Road, West Hobart. Unpublished report for G. E. Stevens by Environmental & Technical Services Pty Ltd September 1995.

[8] Weldon, B. D. (1990). 4 Tara Street – proposed subdivision. Letter re landslide, signed by M. R. Hargreaves as Acting Director of Mines to G. Stevens, 162A Forest Road, 28 September 1990, 1 page.

[9] Both can be viewed on the MRT landslide map at http://www.mrt.tas.gov.au/Viewer/Exposure/E3?REQUEST=Entry&PRJ=Geohazards_Public&MODE=mrt&DELETE_DEFAULT=Y&SID=98545043&REQUEST=Entry&reload=1

Field evidence
Field evidence:

- confirms the presence of translational landslide #874, which appears to have not undergone any noticeable movement since the mid-1980s, and possibly earlier,
- confirms the presence of a series of small-scale translational landslides upslope from #874, on the eastern bank of Ross Rivulet,
- suggests that the larger feature #1476 might never have been a shallow translational landslide. Extensive trenching in 2014, described by the photographs in Attachment 9 of this report, shows the hillside comprises non-plastic or low plasticity colluvium of variable thickness (0.5 to 1.5m) over subhorizontal sandstone bedrock. Local thin lenses and horizons of moist, high plasticity clay occur in places on the bedrock/colluvium interface and probably promote small scale translational downslope movement, which may result in subtle surface undulations but nothing more significant, and
- includes the observation that the higher, steeper slopes of Lot 47 show undulating ground (and Trench C exposed over 2m of colluvial clay); these slopes may be run-out material from a previously un-mapped, relatively old and now probably inactive, moderately-sized armchair-shaped depression (shown in Attachment 8) upslope from Lot 47. On these steep slopes near the higher, northern property boundary, curved tree trunks indicate sporadic downslope soil movement (see Plate 29 in Attachment 9).

Site investigations
Addressed in the Attachments to this report.

Site plans
See Attachments 2, 3, 5, 7 and 8.

Site sections (natural scale) and slope variations

Figures 10.1a, 10.2a and 10.3a (this Attachment) are natural-scale NE – SW cross sections at three locations through the hillside including Lot 47 at Farm Hill. Figures 10.1b, 10.2b and 10.3b show the variation in slope angles down the hillside, calculated from 1m LiDAR contours for each 5m of horizontal distance. Each of these slope graphs highlights slope irregularities not readily apparent in the natural-scale cross sections. A key feature of the slopes are surface undulations with amplitudes mostly in the 0.5 – 1m range (locally up to 3m) and downslope lengths in the 5 – 50m range, which indicate shallow translational slope instability. These surface undulations are less developed on Section line 3.

The captions to all Figures are self-explanatory.

Conceptual hydrogeological model for Lot 47

Figure 10.4 (this Attachment) is a conceptual hydrogeological model for a generalised NE – SW hillside slope across Lot 47. It depicts various modes of potential slope instability, not all of which are observed or feasible.

Status of landslide #874
Landslide #874 is regarded here as an active[10], small-medium sized, rotational-translational, shallow, slow-moving earth slide. There has been no noticeable movement of it for about 30 years. The main hazard associated with possible Lot 47 residential development is upslope regression of the headscarp. Recent investigations have established that similar, smaller landslides extend upslope along the eastern side of Ross Rivulet, the full western side of the Farm Hill property boundary.

Status of landslide #1476
The trenching associated with residential development, and investigation trenches A – D, suggest Landslide #1476, as published, does not exist. Instead, the hillside is characterised by

[10] "Active" means movement has occurred since European occupation.

a variable-thickness (0.5 – 1.5m thick) veneer of colluvial soils over an undulating, shallow surface of subhorizontal Triassic sandstone bedrock. Minor, localised, very small scale (metres), very slow translational movement is probably occurring where thin discontinuous lenses of high plasticity clay occur – in colluvium, at the colluvium/bedrock interface, and in joints in the upper levels of the bedrock. The landslide should be removed from published maps and databases[11].

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Hazard Analysis

Landslide characterisation

Refer to Figure 10.5 and Table 10.1 (this Attachment) for a description of the main forms of landslide movement.

Figure 10.4 schematically shows six potential forms or scenarios (numbered red circles) of landslide movement in relation to Lot 47, under current and post development conditions. The post development conditions relate to oversteepening of existing slopes for vehicle access and house sites, and the use of uncontrolled fill, which increase the likelihood of small scale instability (Scenario 6).

The scenarios are:

Scenario 1: Rotational or translational failure
Deep-seated, in bedrock; failure surface irregular; deeper than 5m; large-scale; slow moving; potentially affecting whole hillside

Scenario 2: Rotational or translational failure
Shallow, in colluvial clays on steeper northern slopes; failure surface shallower than 5m; medium scale; slow moving; potentially affecting perhaps 25 – 50% of slope, including run-out.

Scenario 3: Translational failure
Shallow, in colluvial soils on adjoining land on steeper northern slopes; failure surface shallower than 2m; medium scale; the hazard relates to runout of failed material onto the steeper northern parts of Lot 47; slow to rapid movement

Scenario 4 Rotational or translational failure
Upslope regression of landslide #874; small scale; shallow, in colluvial soils over bedrock; failure surface less than 2m deep; slow moving.

Scenario 5 Translational failure
On clay horizons at the colluvium/bedrock interface; very small scale; very slow moving

Scenario 6 Rotational or translational failure
Very small scale failure after development, involving a range of forms including collapse of soil in excavations, or fill used beneath houses, driveways, terraces, etc; slow to rapid moving

Movements of earth and/or debris are possible.

Frequency analysis

Table 10.2 (this Attachment) lists the potential occurrence and subjective likelihood of the six identified forms of slope instability on Lot 47, under current and post development conditions.

[11] An informal request has been made to Mineral Resources Tasmania in this regard.

Figure 10.1a Hillside Section 1 — Natural scale

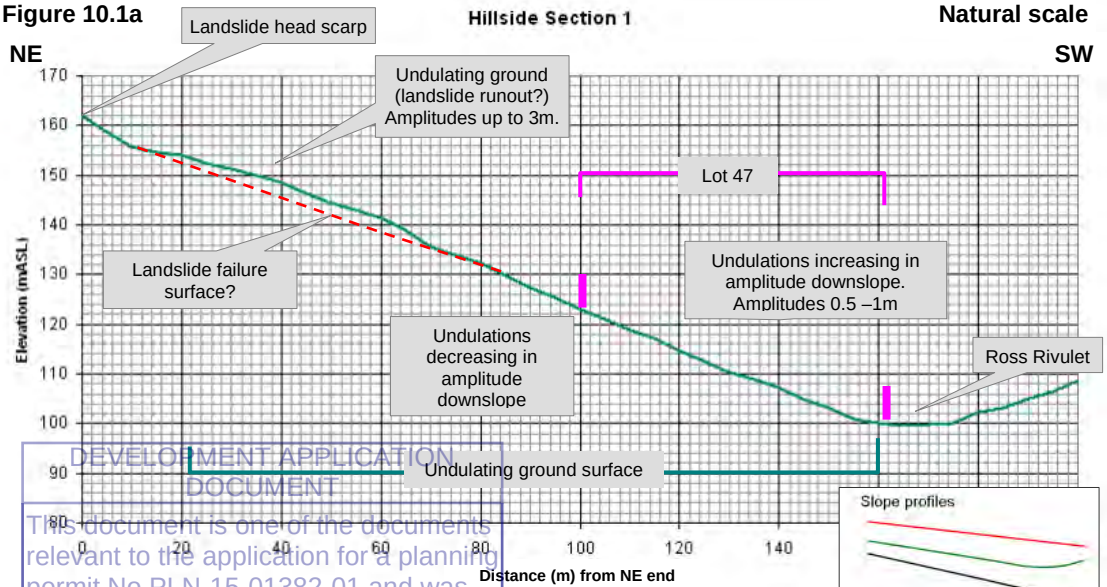
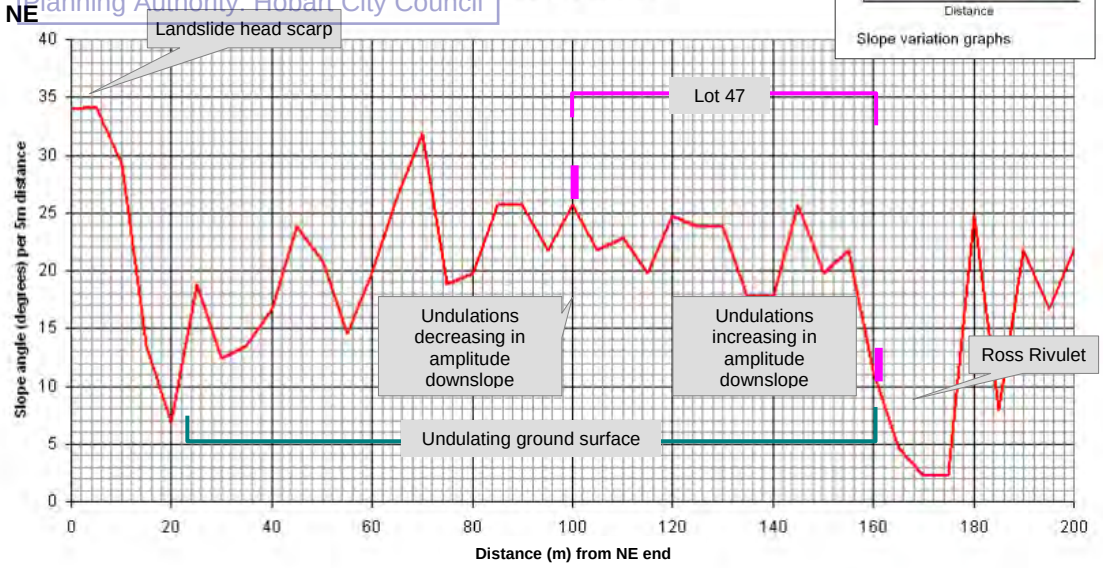


Figure 10.1b Slope Angle Variation



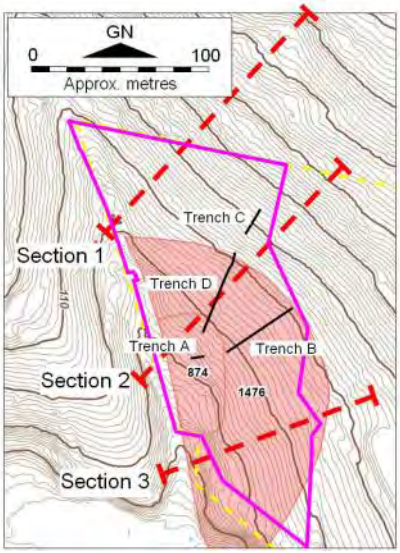
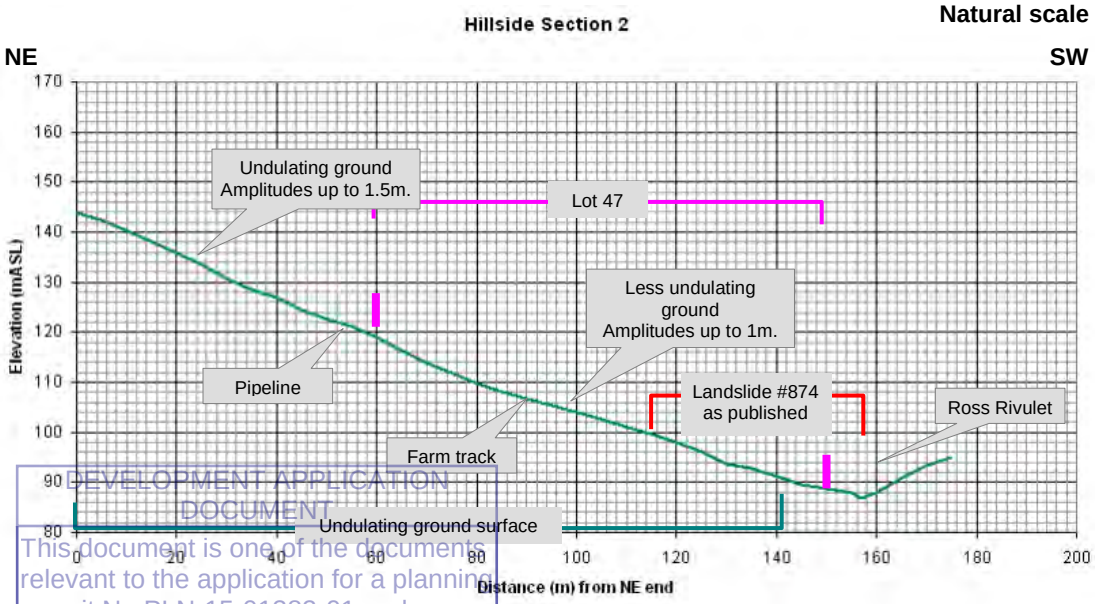
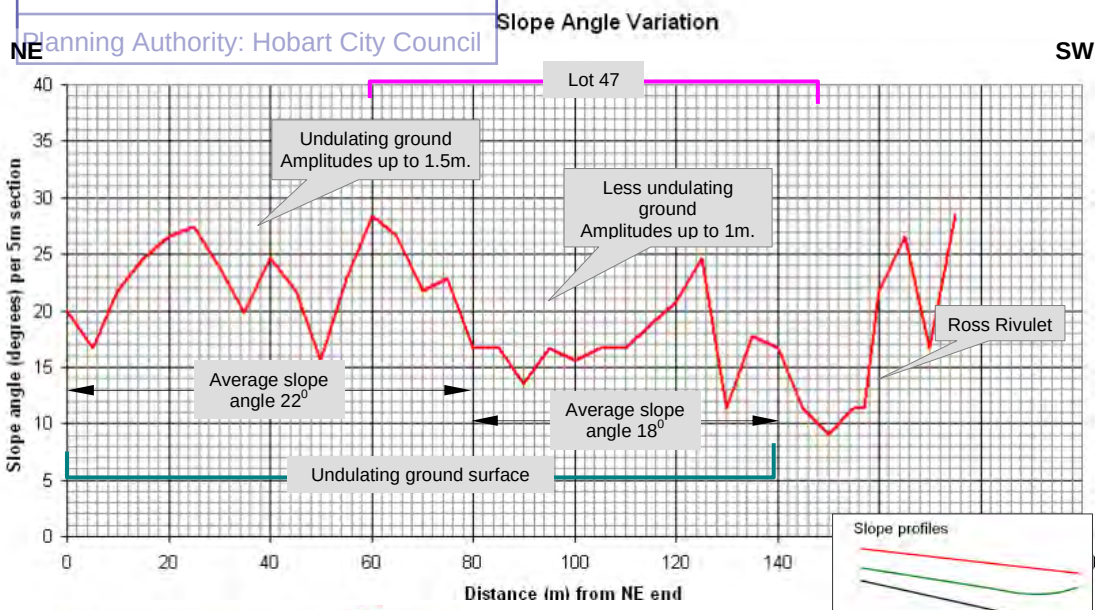
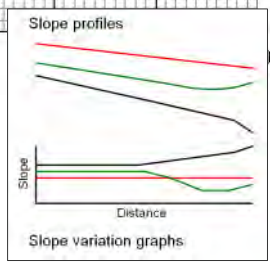


Figure 10.1a. This 200m NE – SW natural-scale section through the northwestern corner of Lot 47 and the hillside above it shows the previously unmapped landslide on higher ground, and an undulating surface on the slopes leading down to Ross Rivulet. The average slope angle is 22^0.

Figure 10.1b shows variations in slope angle, calculated each 5m (the graph for a uniformly dipping slope would be a horizontal line).
The undulations in the ground surface are readily apparent, Amplitudes downslope from the landslide are up to 3m (landslide runout?), but decrease downslope to about 0.5m before increasing towards Ross Rivulet to 0.5 – 1m. Slope angles are steep (35^0) at the headscarp of the landslide, and again on segments of undulating ground to distances up to 80m (landslide runout?), but then remain in the 20 – 25^0 range until the edge of Ross Rivulet.







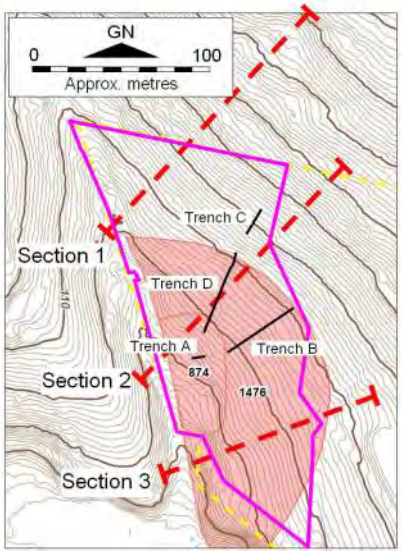


Figure 10.2a. This 175m NE – SW natural-scale section through the north-central part of Lot 47 and the hillside above it shows an undulating surface on the slopes leading down to Ross Rivulet. The average slope angle above the farm track (at a gentle break of slope) is 23^0, and 18^0 below it.

Figure 10.2b shows the variations in slope angle, calculated each 5m (the graph for a uniformly dipping slope would be a horizontal line).
The undulations in the ground surface are readily apparent, and decrease in magnitude downslope.

Figure 10.3a **Natural scale**

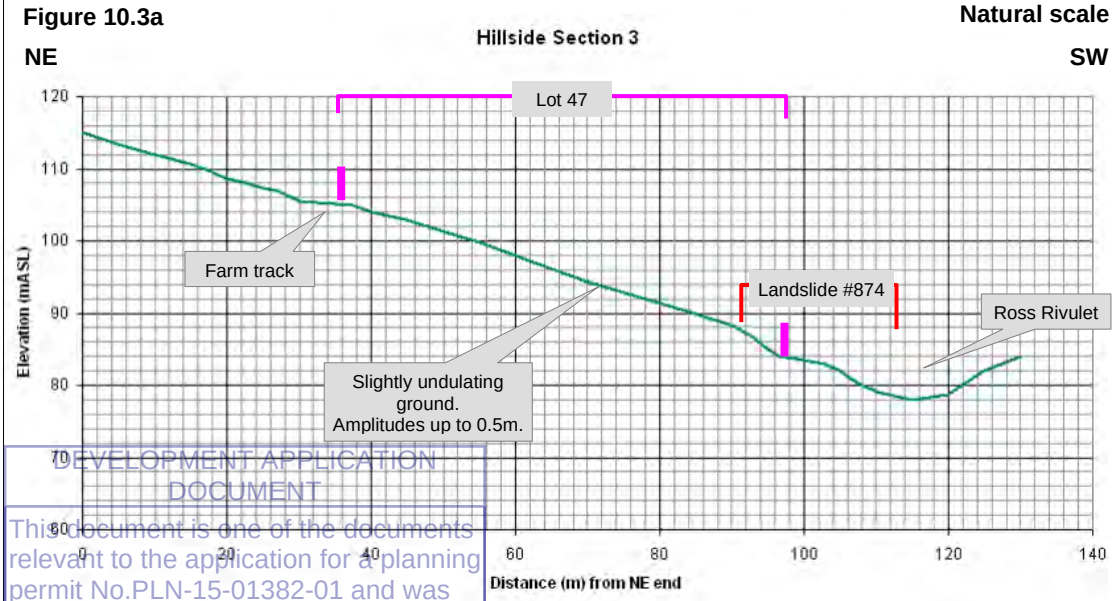
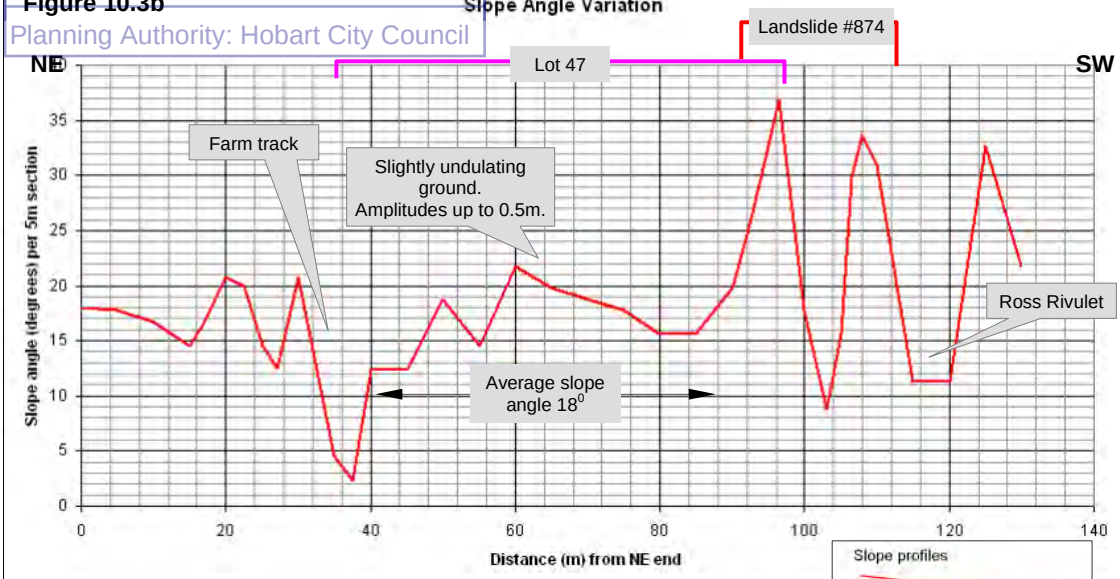
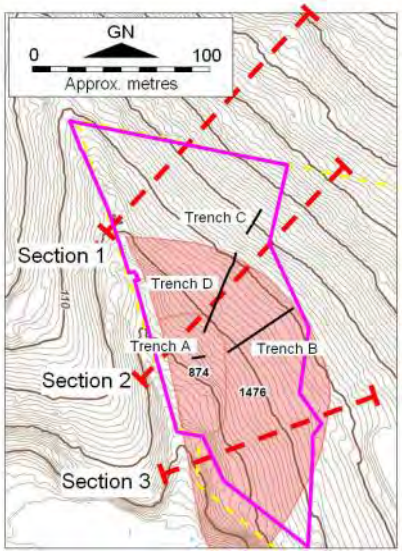


Figure 10.3b





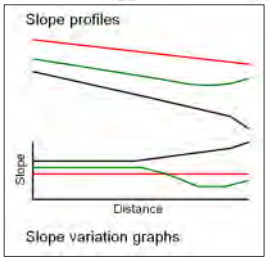


Figure 10.3a. This 130m NE – SW natural-scale section through the southern part of Lot 47 shows a slightly undulating surface between the farm track, and landslide #874 leading down to Ross Rivulet. The average slope angle below the farm track is 18^0.

Figure 10.3b shows the variations in slope angle, calculated each 5m (the graph for a uniformly dipping slope would be a horizontal line). Surface undulations upslope from landslide #874 are less apparent than on adjacent slopes to the north, and are up to about 0.5m in amplitude.

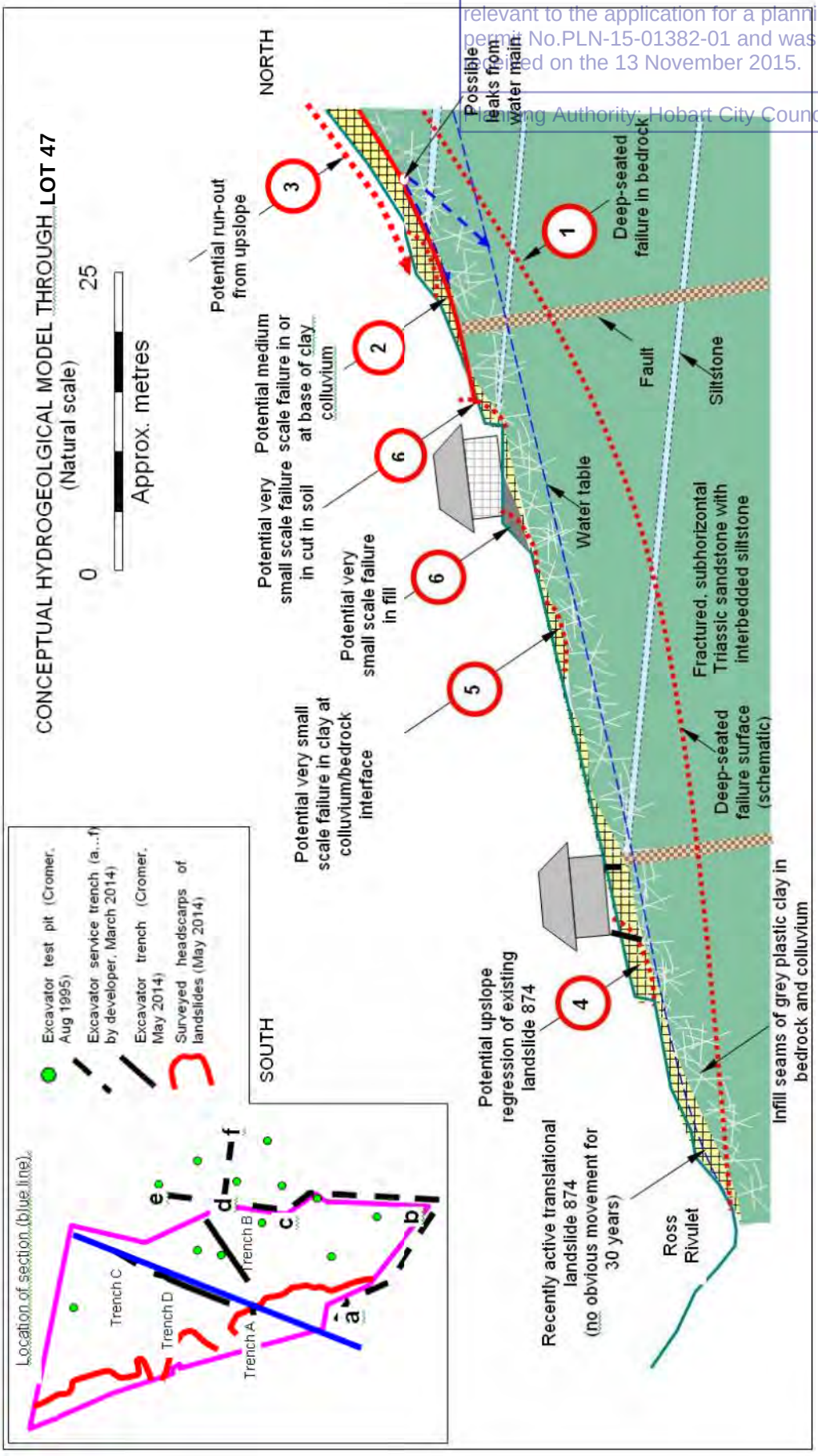


Figure 10.4. Conceptual hydrogeological model through Lot 47 at Farm Hill, based on all geotechnical evidence presented in this report. Five landslide scenarios are indicated by the numbered red circles. Scenarios 1 – 4 are pre- and post-development; scenario 5 is post-development.

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

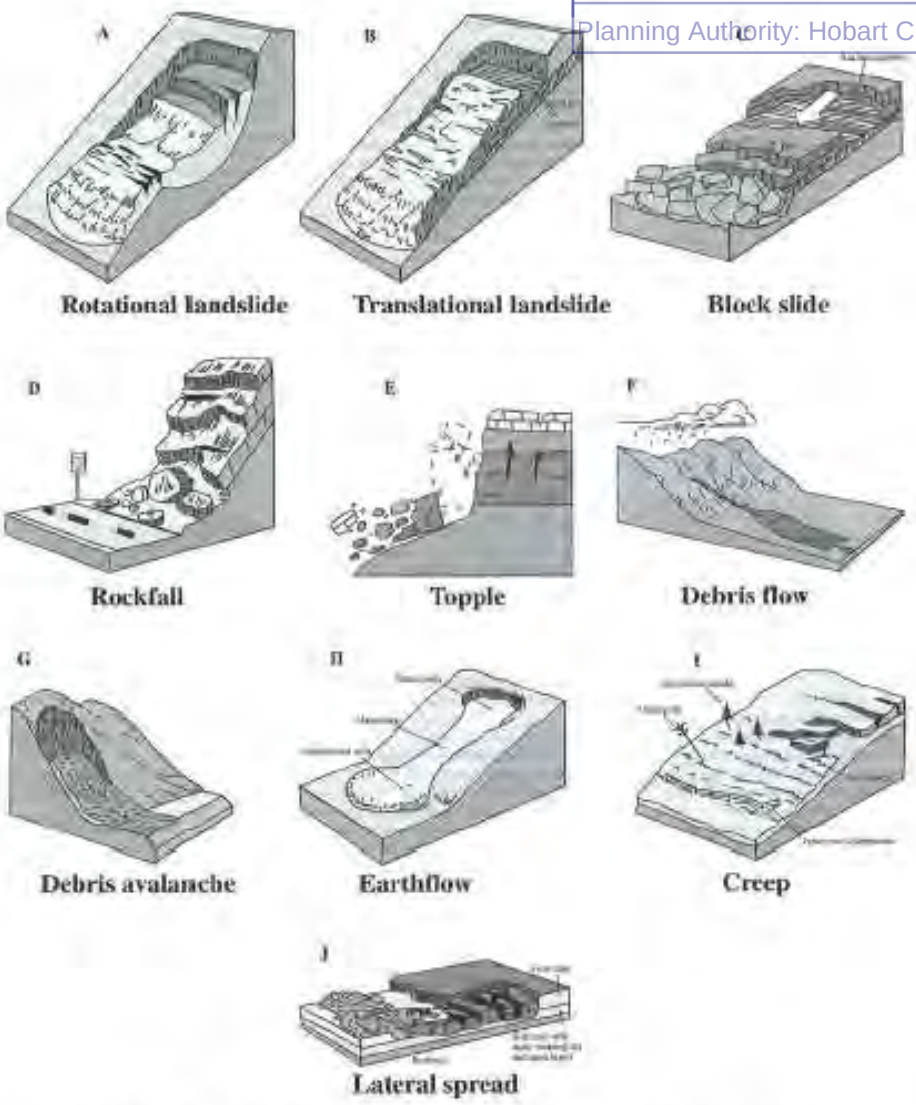


Figure B1: These schematics illustrate the major types of landslide movement.
(From US Geological Survey Fact Sheet 2004-3072, July 2004, with kind permission for reproduction.)

The nomenclature of a landslide can become more elaborate as more information about the movement becomes available. To build up the complete identification of the movement, descriptors are added in front of the two-term classification using a preferred sequence of terms. The suggested sequence provides a progressive narrowing of the focus of the descriptors, first by time and then by spatial location, beginning with a view of the whole landslide, continuing with parts of the movement and finally defining the materials involved. The recommended sequence, as shown in Table B2, describes activity (including state, distribution and style) followed by descriptions of all movements (including rate, water content, material and type). Definitions of the terms in Table B2 are given in Cruden & Varnes (1996).

Figure 10.5 Main types of landslide movement
Source: From Appendix B of AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007

Consequence analysis and qualitative risk to property estimation – before and after treatment

Table 10.3 (this Attachment) is a consequence analysis and risk to property assessment for the six scenarios shown in Figure 10.4 and listed in Table 10.2. Falls, Topples, Spreads, Flows and deep-seated failures are Barely Credible under current circumstances, but Falls and Topples might become Possible after development if excavations into colluvium and/or bedrock are made for house sites (Scenario 6). The likelihoods of the remaining Rotational and translational landslides (Scenarios 1 – 5) are judged Possible, with consequences to property Medium to Insignificant. Consequences are reduced after treatment, but Risks to property remain mostly Moderate after treatment.

Scenario 6 also potentially arises (during and) after development with the use of uncontrolled fill (eg for access drives and house sites).

Table 10.1 Main types of landslide movement

Source: From Appendix B of AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007

TYPE OF MOVEMENT		TYPE OF MATERIAL		
		BEDROCK	ENGINEERING SOILS	
			Predominantly Coarse	Predominantly Fine
FALLS		Rock fall	Debris fall	Earth fall
TOPPLES		Rock topple	Debris topple	Earth topple
SLIDES	ROTATIONAL	Rock slide	Debris slide	Earth slide
	TRANSLATIONAL			
LATERAL SPREADS		Rock spread	Debris spread	Earth spread
FLOWS		Rock flow (Deep creep)	Debris flow (Soil creep)	Earth flow
COMPLEX	Combination of two or more principle types of movement			

Table 10.2 Landslide characterisation in relation to the current proposal

	Field Evidence	Actual or potential size	Potential speed	Water content	Current likelihood	Likelihood after development	Scenarios in Figure 10.4
Falls							
Rock fall	None	Small	Extremely rapid	Dry	Barely credible	Possible	6
Debris fall	None	Small	Extremely rapid	Dry to wet	Barely credible	Possible	6
Earth fall	None	Small	Extremely rapid	Dry to wet	Barely credible	Possible	6
Topples							
Rock topple	None	Small	Extremely rapid	Dry	Barely credible	Possible	6
Debris topple	None	Small	Extremely rapid	Dry	Barely credible	Possible	6
Earth topple	None	Small	Extremely rapid	Dry	Barely credible	Possible	6
Rotational or translational landslide							
Rock slide	None	Small	Slow to Rapid	Dry to moist	Barely credible	Barely credible	
Debris slide	None	Small to large	Slow to Rapid	Moist to wet	Possible	Possible	1 – 5
Earth slide	Yes	Small	Slow to Rapid	Moist to wet	Possible	Possible	1 – 5
Lateral spread							
Rock spread	None	Small	Slow	Dry to moist	Barely credible	Barely credible	
Debris spread	None	Small to medium	Slow	Moist to wet	Rare	Rare	
Earth spread	None	Small to medium	Slow	Moist to wet	Rare	Rare	
Flows							
Rock flow	None	Small to medium	Rapid	Dry to moist	Rare	Rare	
Debris flow	None	Small to large	Very rapid	Moist to wet	Rare	Rare	
Earth flow	None	Small to large	Very rapid	Moist to wet	Rare	Rare	
Complex	None	Small to large	Slow to rapid	Dry to moist	Rare	Rare	

Table 10.3 Qualitative consequences and risks to property for landslide scenarios on Lot 47 before and after treatment

		Before treatment				After treatment		
	Scenarios in Figure 10.4	Likelihood	Consequences to property	Risk to property	Proposed treatment	Likelihood	Consequences to property	Risk to property
Falls								
Rock fall	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Debris fall	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Earth fall	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Topples								
Rock topple	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Debris topple	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Earth topple	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Rotational or translational landslide								
Rock slide		Barely credible	Major	Very low				
Debris slide	1	Barely credible	Major	Very low				
	2	Possible	Medium	Moderate	No building	Possible	Insignificant	Low
	3	Possible	Medium	Moderate	No building	Possible	Insignificant	Low
	4	Possible	Medium	Moderate	House setback	Unlikely	Minor	Low
	5	Possible	Insignificant	Low	None	Possible	Insignificant	Low
	6	Possible	Medium	Moderate	Various	Unlikely	Minor	Low
Earth slide	1	Barely credible	Major	Very low				
	2	Possible	Medium	Moderate	No building	Possible	Insignificant	Low
	3	Possible	Medium	Moderate	No building	Possible	Insignificant	Low
	4	Possible	Medium	Moderate	House setback	Unlikely	Minor	Low
	5	Possible	Insignificant	Low	None	Possible	Insignificant	Low
	6	Possible	Medium	Moderate	Various	Unlikely	Minor	Low
Lateral spread								
Rock spread		Barely credible	Major	Very low				
Debris spread		Rare	Major	Low				
Earth spread		Rare	Major	Low				
Flows								
Rock flow		Rare	Major	Low				
Debris flow		Rare	Major	Low				
Earth flow		Rare	Major	Low				
Complex		Rare	Major	Low				

Note 1. These six after-development scenarios relate to excavations in colluvium and bedrock at house and similar sites, where cuts might expose several metres of materials and present possible hazards where none existed before.

Qualitative risk to life estimation – before development

No current slope instability scenarios present unacceptable risks to life.

Quantitative risk to life estimation – after development

Recommended risk treatments for development on Lot 47 are presented later in this Attachment. After development, it is expected that risks to life presented by most scenarios will remain acceptable. The exception is Scenario 6, which includes small-scale hazards present before development, with acceptably low risk to life. But some Scenario 6 hazards are created by development – in particular, cut and fill may potentially give rise to small-scale, rapid (earth and) rock falls from unsupported excavations which might be present at the rear of houses. The individual most at risk is assumed to be a child. This after-development scenario (considered as three separate "sub-scenarios" 6a, 6b and 6c depending on the size of the rock fall), is shown before treatment in the event tree in Figure 10.6a, and after treatment (an engineered, drained retaining wall) in Figure 10.6b.

The risks to life for the untreated scenarios in Figure 10.6a are similar, and are in the 0.7 – 1E-04 range. On the Societal Risk Graph in Figure 10.7, they plot near the Broadly Acceptable – Tolerable boundary for a single life. The risks to life for the treated scenarios in Figure 10.6b are in the 1E-07 – 3E-06 range. On the Societal Risk Graph in Figure 10.7, they plot well into the Broadly Acceptable area, and no further treatments are required.

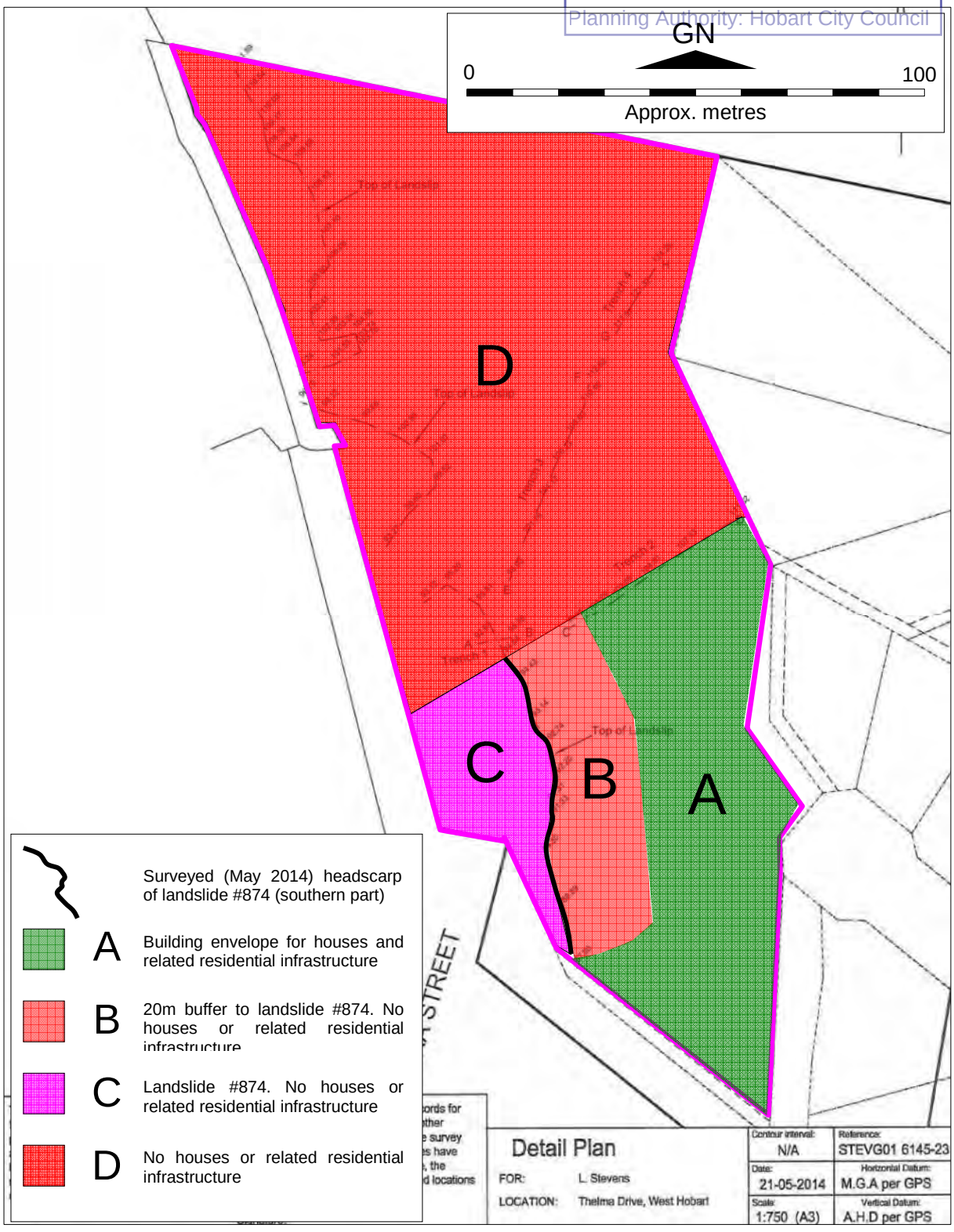


Figure 10.5 **Recommended building envelope (A) and no-development areas (B, C, D) for subdivision and residential development of Lot 47 of the Farm Hill subdivision.**

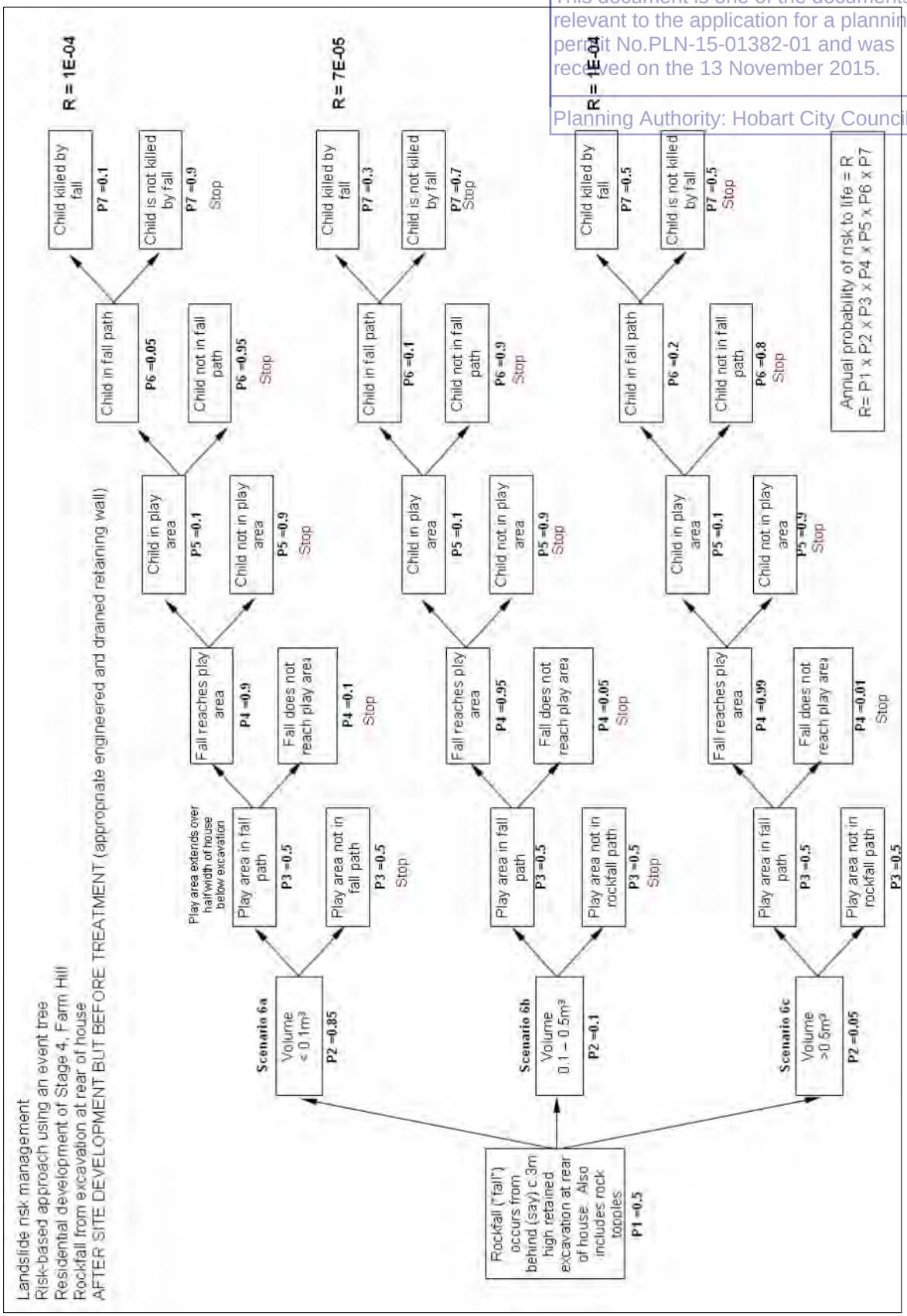


Figure 10.6a **Event tree setting out steps in assessing quantitative risk to life to a child playing at the base of an unsupported earth/rock face at the rear of a house on a property in Lot 47 of the Farm Hill subdivision (Scenario 6 in Table 10.3). Risks are shown at right of the tree, and are compared to acceptability criteria in the Societal Risk Graph in Figure 10.7. These levels of risk should be treated or monitored. Compare them to the risks after appropriate treatment in Figure 10.6b.**

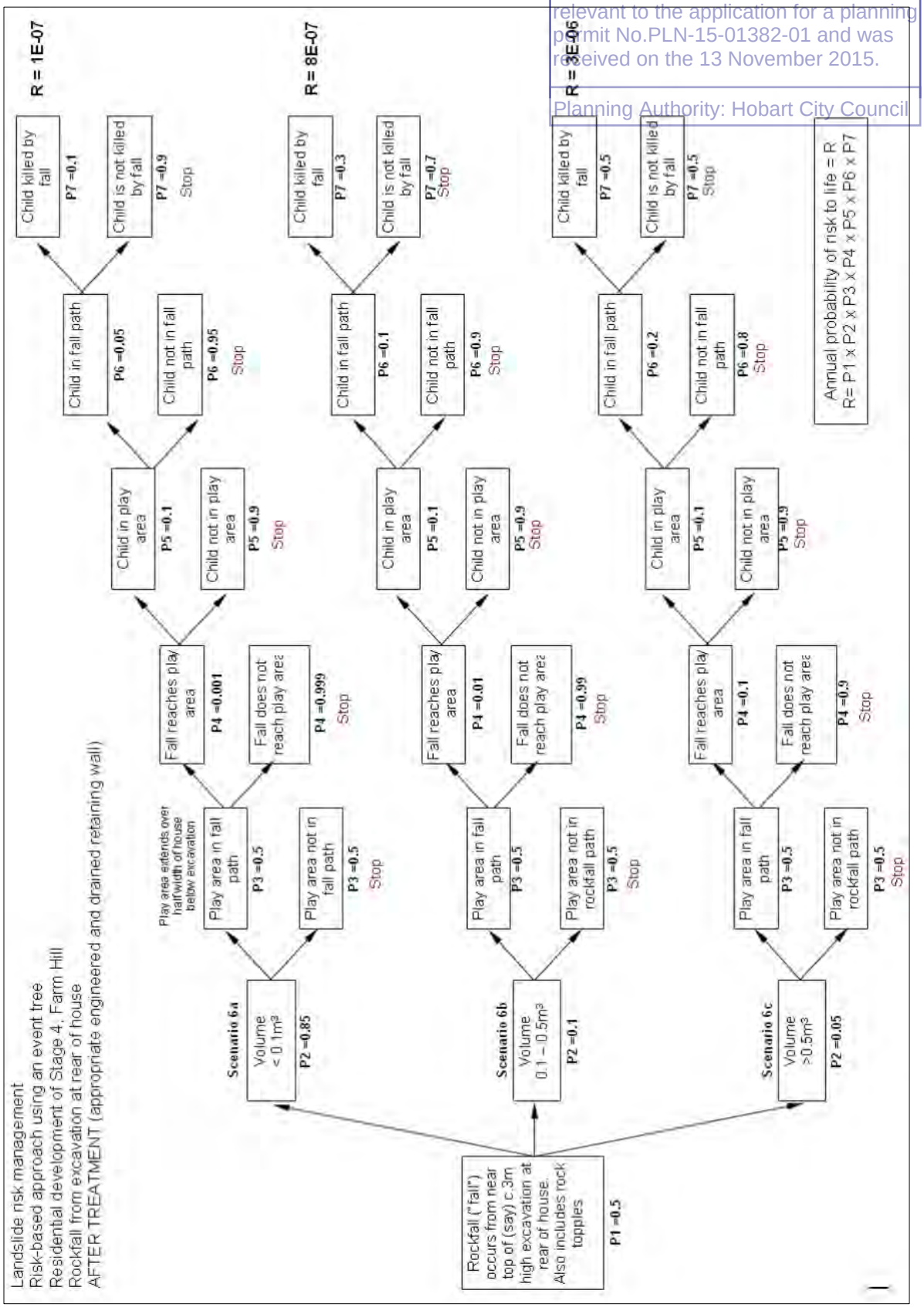


Figure 10.6b **Event tree setting out steps in assessing quantitative risk to life to a child playing at the base of the same earth/rock face as in Figure 10.6a, but now supported by a drained, engineered retaining wall. Risks are shown at right of the tree, and are compared to acceptability criteria in the Societal Risk Graph in Figure 10.7. These levels of risk are acceptable.**

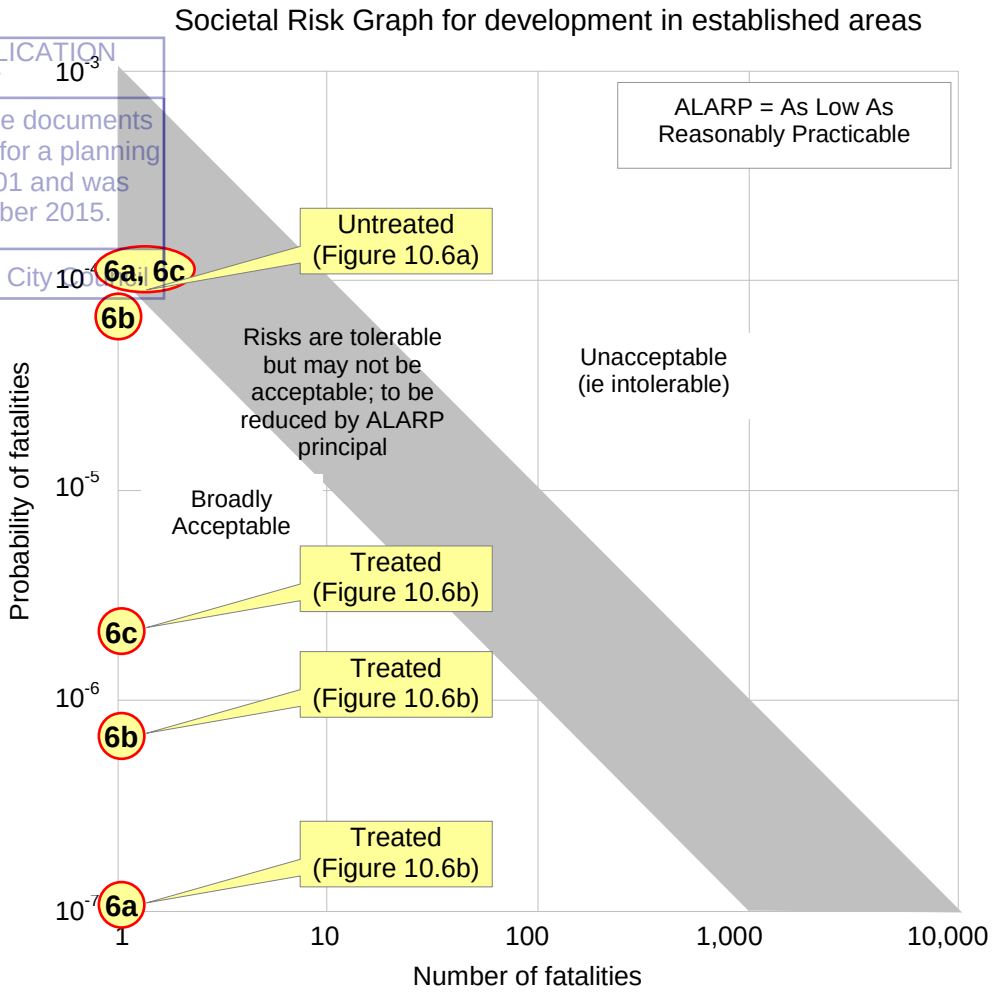


Figure 10.7 **Societal Risk Graph showing the estimated individual risks for a rock fall from an unsupported excavation at the rear of a house, and from the same excavation after risk treatment – supported by a drained, engineered retaining wall.**

General comments on suggested risk mitigation actions

Accepting the risk

Risks to property assessed as Moderate or above (Scenarios 2, 3, 4 and 6) ought not to be Accepted, but instead should be treated.

Risk to an individual life for untreated Scenario 6, as Broadly Acceptable – Tolerable for the person most at risk, becomes Acceptable after treatment (installing an engineered retaining wall).

Avoiding the risk

Avoiding the risk by not developing parts of Lot 47 is possible and acceptable. This treats Scenarios 2 and 3. Creating a buffer between landslide #864 and upslope development treats Scenario 4. Avoiding the risk of Scenario 6 by not excavating at house sites on hillsides is preferred, but not essential.

Reducing the frequency of the risk

Reducing the frequency of the risk by not excavating at house sites on hillsides is preferred, but not essential. Reducing the frequency can be achieved by retaining walls and reducing batter angles in oversteepened soil exposures.

Reducing the consequences of the risk

Reducing the consequences of the Scenario 6 risk can be achieved by reducing batter angles, and/or installing drained, engineered retaining walls, on all artificially steepened cuts.

Monitoring the risk
Unnecessary

Transferring or postponing the risk
Unnecessary

Suggested risk mitigation plan

General comment
Developers and property owners ought to be familiar with the examples of good and bad hillside construction practices outlined in the AGS Geoguides cited earlier, and included here in Attachment 11.

Site-specific recommendations
For the specific development of Lot 47 considered in this report, all the good hillside construction practices in Attachment 11 apply, together with the following (most of which are intended to treat identified risks):

Restricted area for residential development of Lot 47
Residential development (houses, garages, sheds, swimming pools, access drives and related infrastructure) shall be restricted to the building envelope labelled Area A in Figure 10.5.

Residential development shall not occur on Landslide #874 or within a 20m wide buffer zone extending upslope from its headscarp (Areas C and B respectively in Figure 10.5) or on, and downslope to Ross Rivulet from, the steeper, undulating ground on the northern hillsides of Lot 47 (Area D in Figure 10.5).

Excavations
Minimise the number and height of excavations, including driveway accesses and house excavations.

For excavations less than 0.8m high, create a batter angle in the soil profile no steeper than 1:2. Install a surface cut-off drain upslope and divert surface runoff to one or both sides of the excavation. Bedrock exposed in the excavation may be left subvertical, but any loose cobbles, boulders and joint fragments should be removed. Consider the use of erosion control blankets and revegetation on battered soil faces

For excavations higher than 0.8m, install drained, engineered retaining walls on appropriate foundations to a suitable height, and where surface soil remains exposed above the wall, create a batter angle in the soil profile no steeper than 30^0. Bedrock exposed in the excavation behind the wall may be left subvertical, but the wall must be designed to resist lateral movement of material behind it. Install a surface cut-off drain upslope and divert surface runoff to one or both sides of the excavation.

Variations to these specifications (for example, steel screen cover on rock faces, soil or rock berms, steel mesh fencing) are permissible provided they are engineer-designed and certified, the slope stability of the artificially steepened slope is not compromised, and the risks to property and life both remain Acceptable.

Use of fill
Where its use is unavoidable, fill shall be placed after the underlying soil is first removed, with unsupported batter angles no steeper than 1:2. Its use as a weight-bearing material should be avoided unless it is placed in a controlled manner.

Surface drainage
Control all natural surface runoff and concentrated runoff from roofs, hardstands and rainwater tank overflows. Discharge to Council's stormwater system. Avoid discharging drainage over or into excavations.

Stormwater shall be piped in flexible pipework laid in trenches down (not across) the slope and extended (where unavoidable) through landslide #874 to discharge points in Ross Rivulet. Wherever possible, services from access roads downslope to houses shall be laid in trenches aligned directly up and down the slope, but backfilled with on-site subsoil (not screened gravel) to avoid creating permeable pathways for seepage water to accumulate at house footprints.

Subsurface drainage
All subsurface drainage from retaining walls or house pads shall be directed to stormwater pipework and not be permitted to discharge to the ground surface.

House foundations
All house sites shall be investigated and classified in accordance with AS2870:2011 *Residential slabs and footings*, and by a suitably qualified practitioner (or practitioners) having due regard to the slope stability issues discussed in this report. AS2870 classifications should refer to this report. Hobart City Council shall ensure this report, or a reference to it, is available on line for all stakeholders.

It is strongly recommended that (a) subsurface investigations for site classification be done by excavator to help distinguish stable sandstone bedrock from floaters (some pockets of bedrock are present in colluvium), and (b) footings for all houses in Lot 47 be supported on piers extended into (not onto) demonstrable Triassic sandstone bedrock This will mean footing depth is likely to vary across the footprint of a house.

Adherence of this LRM to AGS (2007)

Table 10.4 lists the items required by AGS (2007c) to be addressed in LRM. Comments are included as to the relevance of the item to the current job, whether or not it has been addressed, and if not, why not. (The column "Adequacy in relation to job" is included and retained for the use of peer reviewers)

Table 10.4 Checklist for this landslide risk management

		AGS (2007) reference					
Item		2007c	2007d	Relevance to this job	Addressed in geotech report?	Adequacy in relation to job	Comments
Desktop		5.1	C5.1	Essential	Yes		Attachments 1, 2, 3,4, 5, 6 of this report. Includes review of historic satellite imagery, www.thelist.tas.gov.au topo and cadastre maps, MRT1:25,000 geology map, landslide hazard bands, landslide hazard maps
Site investigations	Inspection	5.2.2	Tables C1, C2	Essential	Yes		Several times in May and June 2014
	mapping (geomorphic)	5.2.2	Tables C1, C2	Essential	Yes		1995 report by W.C. Cromer
	mapping (geology)	5.2.2	Tables C1, C2	Essential	Yes		
	boreholes	5.2.3	Tables C1, C2		No		Test pits 1995; 100+m trenches May 2014
	test pits	5.2.3	Tables C1, C2	Either or both desirable to essential	Yes		1995 report by W.C. Cromer
	groundwater levels etc	5.2.4	Tables C1, C2	Desirable	No		No groundwater encountered except at lower endd of Trench D. No other data available. Relied on first principles re groundwater occurrence.
	cross sections	5.2.5	Tables C1, C2	Essential	Yes		See Attachment 10
	slope processes	5.2.6, 5.2.7	Tables C1, C2	Essential	Yes		1995 report by W.C. Cromer
	landslide location(s)	5.2.7	Tables C1, C2	Essential	Yes		1995 report by W.C. Cromer, Attachments
	conceptual geotech model	5.2.7	Tables C1, C2	Essential	Yes		See Attachment 10
Site plan		5.1		Essential	Yes		Several Attachments

Table 10.4 (continued)

RISK MANAGEMENT / RISK ASSESSMENT / RISK ANALYSIS / HAZARD ANALYSIS	Landslide characterisation	History of movement: current movement, velocity	5.3	Table C1(4)	Essential	Yes	
		Geotechnical characterisation	5.3, Tables B1, B2, Fig B3	Table C1(5)	Essential	Yes	
		Landslide mechanisms, dimensions	5.3, Tables B1, B2, Fig B3	Table C1(6)	Essential	Yes	
		Shear mechanisms; strength of rupture surface	5.3, Tables B1, B2, Fig B3	Table C1(7)	Desirable	No	
		Assessment of stability	5.3, Tables B1, B2, Fig B3	Table C1(8)	Essential	Yes	
		Assessments of deformation, travel distance	5.3, Tables B1, B2, Fig B3	Table C1(9)	Desirable	Yes	
	Frequency analysis	Historical analysis	5.4.1b)	5.4.1(ii)	Essential	Yes	
		Empirical ranking method	5.4.1c)		Discretionary	No	
		geology/geomorphology	5.4.1d)				
		Rainfall/slope analysis	5.4.1e)	5.4.1(iii)			
		Probabilistic analysis	5.4.1f)				
		"Degree of belief"	5.4.1g)	5.4.1(iv)			
		Explanation of applied logic to frequency analysis					
		Use of event tree	5.4.1h), i)	5.4.1(v)			
		Est of annual probability	5.4.2a), b), c)	5.4.2a), b), c)	Essential	Yes	
CONSEQUENCE ANALYSIS	Consequence anal	Elements at risk	6.1		Essential	Yes	See Attachment 10
		Temporal spatial probability	6.2	C6.2	Essential	Yes	
		Consequence to property	6.3	C6.3	Essential	Yes	
		Consequence to people	6.4	C6.4	Essential	Yes	
	Risk estimation	Quantitative risk estimation to property	7.1	C7.1	Discretionary	No	
		Quantitative risk estimation to life	7.1	C7.1	Essential	Yes	
		Semi quantitative and qualitative risk estimation to property	7.2	C7.2	Essential	Yes	
		Risk matrix for property loss	7.3	C7.3	Discretionary	No	
	Risk assess	Risk evaluation against tolerable criteria for property loss	8.1, 8.2	C8.1, C8.2	Discretionary	No	
		Risk evaluation against tolerable criteria for loss of life	8.1, 8.2	C8.1, C8.2	Essential	Yes	
	Risk mitigation	Accept the risk	9.1.1a)	C9.1	Discretionary	Yes	
		Avoid the risk	9.1.1b)	C9.1	Discretionary	Yes	
		Reduce the frequency	9.1.1c)	C9.1	Discretionary	Yes	
		Reduce the consequences	9.1.1d)	C9.1	Discretionary	Yes	
		Monitor the risk	9.1.1e)	C9.1	Discretionary	Yes	
		Transfer the risk	9.1.1f)	C9.1	Discretionary	Yes	
		Postpone the decision	9.1.1g)	C9.1	Discretionary	Yes	
		Risk mitigation plan	9.1.3		Essential	Yes	

Certificate of currency for Professional Indemnity Insurance

A copy of the certificate of currency for PI insurance for William C Cromer Pty Ltd is included here as Figure 10.8.

Figure 10.8 Certificate of currency for PI insurance for William C Cromer Pty Ltd

Certificate Of Currency

Liberty International Underwriters

This Certificate confirms that the undermentioned Policy is effective on the date of issue and in accordance with the details shown:

Class of Insurance	Professional Indemnity Insurance
Policy Number	MI-BN-SPC-03-110365
Named Insured	WILLIAM C. CROMER PTY. LTD.
Policy Period	From: 31 August 2013 at 4:00pm local standard time To: 31 August 2014 at 4:00pm local standard time
Limit of Liability	$1,000,000
Excess	$10,000
Policy Wording	LIU AUS OQS PI Construction Consultants Policy Wording (03-11)
Retroactive Date	31 August 2004
Authorised by Liberty	LIBERTY MUTUAL INSURANCE COMPANY A.B.N. 61 086 083 605
Date Of Issue	31 August 2013

This Certificate:
- Is issued as a matter of information only and confers no rights upon the holder
- Does not amend, extend or alter the coverage afforded by the policy listed
- Is only a summary of the cover provided
- Reference must be made to the current policy wording for full details
- Is current at the date of issue only

Level 1
145 Eagle Street
Brisbane QLD 4000

PO Box 7077
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Telephone: +61 7 3235 8800
Facsimile: +61 7 3235 8888
Website: www.liuaustralia.com.au

Liberty International Underwriters is a trading name of Liberty Mutual Insurance Company (ABN 61 086 083 605). Incorporated in Massachusetts, U.S.A. (The liability of members is limited)

Attachment 11

(3 pages)

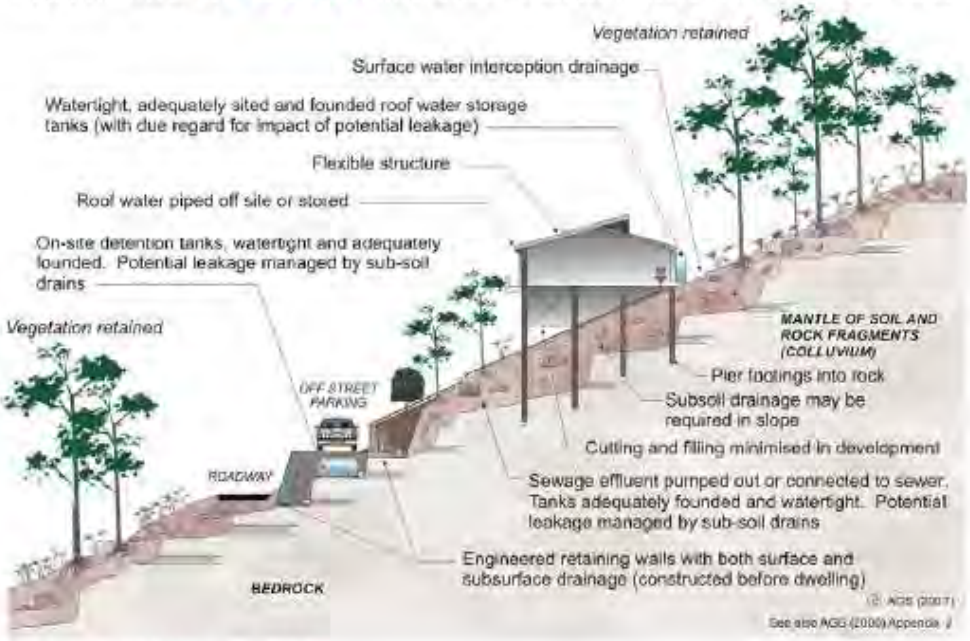
Examples of good and poor hillside engineering practices

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.

EXAMPLES OF GOOD HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF POOR HILLSIDE CONSTRUCTION PRACTICE

WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.

APPENDIX G - SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

	GOOD ENGINEERING PRACTICE	*POOR ENGINEERING PRACTICE*
ADVICE		
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified, experienced geotechnical practitioner at early stage of planning and before site works.	Prepare detailed plan and start site works before geotechnical advice.
PLANNING		
SITE PLANNING	Having obtained geotechnical advice, plan the development with the risk arising from the identified hazards and consequences in mind.	Plan development without regard for the Risk.
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork, timber or steel frames, timber or panel cladding. Consider use of split levels. Use decks for recreational areas where appropriate.	Floor plans which require extensive cutting and filling. Movement intolerant structures.
SITE CLEARING	Retain natural vegetation wherever practicable.	Indiscriminately clear the site.
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts, fills, retaining walls and drainage. Council specifications for grades may need to be modified. Driveways and parking areas may need to be fully supported on piers.	Excavate and fill for site access before geotechnical advice.
EARTHWORKS	Retain natural contours wherever possible.	Indiscriminatory bulk earthworks.
CUTS	Minimise depth. Support with engineered retaining walls or batter to appropriate slope. Provide drainage measures and erosion control.	Large scale cuts and benching. Unsupported cuts. Ignore drainage requirements
FILLS	Minimise height. Strip vegetation and topsoil and key into natural slopes prior to filling. Use clean fill materials and compact to engineering standards. Batter to appropriate slope or support with engineered retaining wall. Provide surface drainage and appropriate subsurface drainage.	Loose or poorly compacted fill, which if it fails, may flow a considerable distance including onto property below. Block natural drainage lines. Fill over existing vegetation and topsoil. Include stumps, trees, vegetation, topsoil, boulders, building rubble etc in fill.
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may have unacceptable risk. Support rock faces where necessary.	Disturb or undercut detached blocks or boulders.
RETAINING WALLS	Engineer design to resist applied soil and water forces. Found on rock where practicable. Provide subsurface drainage within wall backfill and surface drainage on slope above. Construct wall as soon as possible after cut/fill operation.	Construct a structurally inadequate wall such as sandstone flagging, brick or unreinforced blockwork. Lack of subsurface drains and weepholes.
FOOTINGS	Found within rock where practicable. Use rows of piers or strip footings oriented up and down slope. Design for lateral creep pressures if necessary. Backfill footing excavations to exclude ingress of surface water.	Found on topsoil, loose fill, detached boulders or undercut cliffs.
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable. Provide with under-drainage and gravity drain outlet where practicable. Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side.	
DRAINAGE SURFACE	Provide at tops of cut and fill slopes. Discharge to street drainage or natural water courses. Provide general falls to prevent blockage by siltation and incorporate silt traps. Line to minimise infiltration and make flexible where possible. Special structures to dissipate energy at changes of slope and/or direction.	Discharge at top of fills and cuts. Allow water to pond on bench areas.
SUBSURFACE	Provide filter around subsurface drain. Provide drain behind retaining walls. Use flexible pipelines with access for maintenance. Prevent inflow of surface water.	Discharge roof runoff into absorption trenches.
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems; absorption trenches may be possible in some areas if risk is acceptable. Storage tanks should be water-tight and adequately founded.	Discharge sullage directly onto and into slopes. Use absorption trenches without consideration of landslide risk.
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability. Revegetate cleared area.	Failure to observe earthworks and drainage recommendations when landscaping.
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant	
SITE VISITS	Site Visits by consultant may be appropriate during construction/	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER'S RESPONSIBILITY	Clean drainage systems; repair broken joints in drains and leaks in supply pipes. Where structural distress is evident see advice. If seepage observed, determine causes or seek advice on consequences.	

PROPOSED REZONING

SHEET 1

LOT 102
PUBLIC OPEN SPACE
1291m²

PART OF 101
PUBLIC OPEN SPACE
2766m²
(PREVIOUSLY REQUIRED WITH PLN-08-00243-01 SEE PERMIT CONDITION 2)

PART OF 101
PUBLIC OPEN SPACE
1411m²
PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

Balance
8828m²

1
1663m²

2
1157m²

3
1427m²

DRAINAGE EASEMENT 3.00 WIDE (D3531)

RESERVED ROAD

ROSS RIVULET

THELMA DRIVE

LIVERPOOL CRESCENT

STEVENS FARM DRIVE

TARA STREET

ENVIRONMENTAL LIVING ZONE

LOW DENSITY RESIDENTIAL ZONE

OPEN SPACE ZONE

ZONE BOUNDARY

GEOTECH ZONE BOUNDARY B-01

GEOTECH ZONE BOUNDARY A-01

GEOTECH ZONE BOUNDARY B

GEOTECH ZONE BOUNDARY C-D

BUILDING SETBACK

PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

FUTURE ROAD WITH STAGE 4 OF PLN-08-00243-01

Stevens Farm Knoll

LEGEND

PROPOSED LOW DENSITY RESIDENTIAL ZONE

PROPOSED OPEN SPACE ZONE

Brooks, Lark and Carrick SURVEYORS

UNIT 1, 2 KENNEDY DRIVE
CAMBRIDGE PARK TAS 7170
PHONE: (03)6244 6256
MOBILE: 0400 114 824
EMAIL: admin@blcsurveyors.com.au

This plan has been prepared only for the purpose of obtaining preliminary subdivisional approval from the local authority and is subject to that approval

All measursements and areas are subject to the final survey

REV C

OWNER S.R. STEVENS

TITLE REFERENCE C.T. 169500/1

PROPOSED EASEMENTS AS REQUIRED

LOCATION 25 STEVENS FARM DRIVE, **WEST HOBART**

GRANTEE SEE TITLE

CONTOUR INTERVAL 5m

SCALE 1:1500 @ A3

DATE 16-03-2016

MUNICIPALITY HOBART CITY

REF. NO. STEVG03 8693-01

Brooks, Lark and Carrick SURVEYORS

UNIT 1, 2 KENNEDY DRIVE
CAMBRIDGE PARK TAS 7170
PHONE: (03)6248 5898
MOBILE: 0400 114 824
EMAIL: admin@blcsurveyors.com.au

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REV C

OWNER S.R. STEVENS

TITLE REFERENCE C.T. 169500/1

PROPOSED EASEMENTS AS REQUIRED

LOCATION 25 STEVENS FARM ROAD, **WEST HOBART**

GRANTEE SEE TITLE

CONTOUR INTERVAL 5m

SCALE 1:500 @ A3

DATE 16-03-2016

MUNICIPALITY HOBART CITY

REF. NO. STEVG03 8693-01

PROPOSED REZONING

SHEET 2

PART OF 101
PUBLIC OPEN SPACE
2766m²
(PREVIOUSLY REQUIRED WITH PLN-08-00243-01 SEE PERMIT CONDITION 2)

ENVIRONMENTAL LIVING ZONE

GEOTECH ZONE BOUNDARY A-D

GEOTECH ZONE BOUNDARY B-D

GEOTECH ZONE BOUNDARY C-D

GEOTECH ZONE BOUNDARY B-C

Balance
8828m²

3
1427m²

2
1157m²

1
1663m²

10m x 15m Rectangle

PROPOSED NEW SEWER & STORMWATER MAINS & CONNECTIONS

PROPOSED NEW SEWER & STORMWATER MAINS & CONNECTIONS

EXISTING SEWER & STORMWATER MAINS

PROPOSED PIPELINE & SERVICES EASEMENT & DRAINAGE EASEMENT 3.00 WIDE

R-O-W 'A' 4.00 WIDE

R-O-W 'B' 4.00 WIDE

BUILDING SETBACK LINE (NO BUILDING SOUTH WEST OF THIS SETBACK)

EXISTING SEWER & STORMWATER MAINS

PROPOSED WATER MAIN

PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

PROPOSED NEW WATER CONNECTIONS TO LOT FRONTAGES

FUTURE ROAD WITH STAGE PLN-08-00243-01

LOW DENSITY RESIDENTIAL ZONE

OPEN SPACE ZONE

PART OF 101
PUBLIC OPEN SPACE
1411m²
PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

TARA STREET

NOTE:
1. R-O-W 'A' 4.00 WIDE TO BENEFIT LOT 3, & R-O-W 'B' 4.00 WIDE TO BENEFIT BALANCE LOT.

MICHAEL BALL
TOWN PLANNER

3rd February 2016

The General Manager
Hobart City Council
GPO Box 503
HOBART TAS 7001

Dear Sir

25 STEVENS FARM DRIVE – SCHEME AMENDMENT & SUBDIVISION APPLICATION NO. PLN-15-01382-01

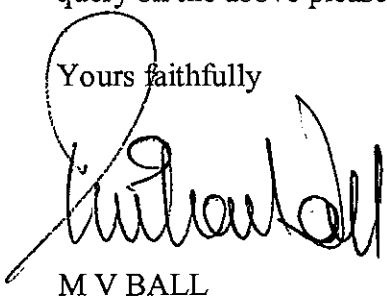
I refer to your letter of 14th December 2015 requesting further information on the above proposal and provide the following in response.

1. Firstly I refer to telephone discussions with Mr McIllhenny of your office. It is difficult to determine if the subject site is within the Urban Growth Boundary of the Southern Tasmanian Regional Land Use Strategy 2010-2035 (STRLUS) because of the nature of the map within that document. It is my opinion that if it is not totally within the boundary it is immediately adjacent to it. I understand from discussions with the Executive Commissioner of the Tasmanian Planning Commission Mr Alomes that the Urban Growth Boundary was not to be interpreted as a necessarily exact boundary but rather one that should give guidance particularly when considering rezonings in areas adjacent to the boundary as is in this instance. In support of this application it is submitted that the proposal does not generate a need for any extension of services and will utilise existing infrastructure and consolidates residential development in an area already established for such use. In fact the proposal makes more effective and efficient use of services generally. Further the proposal generates a minimal increase in lot yield over and above an existing residential development and will have no impact on any residential land release programme. In my opinion the proposal is consistent with the intent of STRLUS.
2. See attached documentation from Hutchins Spurr P/L
3. See attached documentation from Hutchins Spurr P/L
4. See attached documentation from Hutchins Spurr P/L
5. See attached documentation from Hutchins Spurr P/L
6. See attached documentation from Hutchins Spurr P/L
7. See attached documentation from Mr J Nickerson.
8. See attached revised plans prepared by Surveyor Miller.
9. See attached correspondence from Mr W Cromer.

mob 0417 567 268
email michaelball7@bigpond.com

I trust the above fulfil your request for further information however should you have any query on the above please do not hesitate to contact me.

Yours faithfully



M V BALL
BSc Hons Grad Dip Urban and Regional Planning

Attachment B

HOBART
CITY COUNCIL

APPLICATION UNDER HOBART INTERIM PLANNING SCHEME 2015

Type of Report	Council
Committee:	4 April 2016
Council:	11 April 2016
Expiry Date:	13 April 2016
Application No:	**PLN-15-01382-01**
Address:	**25 Stevens Farm Drive, West Hobart**
Applicant:	Michael Ball
Proposal:	**Scheme amendment & Subdivision (3 additional lots and balance)**
Representations:	N/A
Performance criteria:	Subdivision standards; ways and public open space; bushfire prone areas code; landslide code

1. Executive Summary

1.1. Planning approval is sought for a subdivision of three additional lots and balance facilitated by a proposal to rezone land currently zoned Environmental Living under the *Hobart Interim Planning Scheme 2015*. This report considers the proposed subdivision against the standards of the proposed zone.

- The lots extend from the end of a cul-de-sac approved as part of Stage 4 of the Stevens Farm Drive development.

1.2. The proposal relies on performance criteria to satisfy the following standards and codes.

1.2.1. Subdivision standards (Low Density Residential Zone).

1.2.2. Subdivision standards (Open Space Zone).

1.2.3. Ways and public open space

1.2.4. Landslide code.

1.3. As this application is a combined s43A rezoning application, public notification is not required at this point in the assessment process.

1.4. The proposal is recommended for approval subject to conditions.

1.5. The final decision is delegated to the Council.

2. Site Detail

Image 1: Aerial view of the subject property and surrounds.

2.1. 25 Stevens Farm Road is a large, 2.35 hectare sloping lot with a westerly orientation (Image 1, Plate 1). The property lies at the western end of the subdivision of 19 Thelma Drive which is currently under construction in stages. The subject site has previously been cleared of the majority of native vegetation and has existed primarily as open pasture for some time. Native vegetation grows along the site's western boundary adjacent to a creek line.

Plate 1: A view to the north across the sloping site. The gravel path to the right is a previously approved public open space link.

3. Proposal

3.1. Planning approval is sought for a subdivision of three additional lots and balance facilitated by a proposal to rezone land currently zoned Environmental Living under the *Hobart Interim Planning Scheme 2015* to Low Density Residential and Open Space Zoning. This report considers the proposed subdivision against the standards of the proposed zones.

3.2. The lots extend from the end of a cul-de-sac approved as part of Stage 4 of the Stevens Farm Drive development (Plate 2).

Plate 2: Access would extend from a single shared crossover from the head of the existing cul-de-sac.

3.3. Physical access to the lots has been detailed as extending from a single cross-over at the head of the cul-de-sac (Plate 2), with a shared/part-shared access driveway arrangement between the lots.

3.4. As part of the proposed subdivision 1291sq.m of land would be transferred as public open space to adjoin previously approved public open space extending from the end of Tara Street, at the western boundary of the site.

3.5. The proposed Lots 1 to 3 are entirely within the Low Density Residential Zone. The proposed Balance Lot is initially zoned Low Density Residential, before being predominantly zoned Environmental Living.

4. Background

4.1. The proposal is an extension to Stage 4 of the previously approved subdivision of 19 Thelma Drive, which was originally approved by the Council in May 2009.

5. Concerns raised by representors

5.1. N/A

6. Assessment

The *Hobart Interim Planning Scheme 2015* is a performance based planning scheme. To meet an applicable standard, a proposal must demonstrate compliance with ***either*** an acceptable solution ***or*** a performance criterion. Where a proposal complies with a standard by relying on one or more performance criteria, the Council may approve or refuse the proposal on that basis. The ability to approve or refuse the proposal relates ***only*** to the performance criteria relied on.

6.1. The site is located within the Low Density Residential, Environmental Living and Open Space Zones of the *Hobart Interim Planning Scheme 2015*.

6.2. No use is proposed, however the proposed lots are intended to facilitate residential development.

6.3. The proposal has been assessed against;

6.3.1.	Part D12	Low Density Residential Zone
6.3.2.	Part D14	Environmental Living Zone
6.3.3.	Part D19	Open Space Zone
6.3.4.	E1.0	Bushfire prone areas code
6.3.5.	E3.0	Landslide code
6.3.6.	E6.0	Parking and access code
6.3.7.	E7.0	Stormwater management code
6.3.8.	E10.0	Biodiversity code

6.4. Assessment of the proposal focuses primarily on the Low Density Residential Zone, as each proposed lot and the balance indicate that future development can be confined to this zone. The proposed public open space lot is subject to the standards of the Open Space Zone.

6.5. The proposal relies on the following performance criteria to comply with the applicable standards;

6.5.1. Lot Design – Part D 12.5.1 P2; P4
6.5.2. Ways and Public Open Space – Part D 12.5.3 P1
6.5.3. Subdivision standards (Open Space Zone) – Part D 19.5.1 P2; P3
6.5.4. Bushfire prone areas code – Part E 1.6.1.1 P1
6.5.5. Landslide code – Part E 3.8.1 P1

6.6. Each performance criterion is dealt with separately below.

6.7. Lot Design: Building Area – Part D 12.5.1

6.7.1. A 10m x 15m rectangular building envelope is proposed upon each lot and the balance.

6.7.2. The acceptable solution for Part D 12.5.1 A2 states: Each lot must be designed to accommodate a minimum 10m x 15m rectangular building area that is clear of the frontage, side and rear boundary setbacks; is not subject to any codes of the planning scheme; is clear of title restrictions such as easements and restrictive covenants; has an average slope of no more than 1 in 5.

6.7.3. The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.7.4. The corresponding Performance Criteria in Part D 12.5.1 P2 states:

The design of each lot must contain a building area able to satisfy all of the following:

(a) is reasonably capable of accommodating residential use and development;

(b) meets any applicable standards in codes in this planning scheme;

(c) enables future development to achieve reasonable solar access, given the slope and aspect of the land;

(d) minimises the requirement for earth works, retaining walls, and cut and fill associated with future development;

6.7.5. The proposed lots provide a sufficiently-sized building area in accordance with the minimum size in the acceptable solution.

Each building area would be subject to the biodiversity, bushfire prone areas, landslide hazard and stormwater management codes of the *Hobart Interim Planning Scheme 2015*. Where assessed against applicable performance criteria in the assessment of this proposal these codes are discussed in greater detail elsewhere in this report, however with appropriate future development proposals the lots are unlikely to generate any impediment to these codes being able to be met.

Although each lot and in turn each building area would have a reasonable slope, all would allow for future residential development to receive reasonable solar access with appropriate design. Previous shade studies prepared at the time of the original 19 Thelma Drive subdivision indicate that although the west-facing slope would be subject to measurable levels of shade due to orientation and surrounding topography, the area now subject to this assessment would still receive reasonable levels of sunlight, even on the shortest day of the year. Shadow would persist until mid morning and occur again by mid afternoon, so the period without shade would not be significant, however it would be sufficient for the lots to receive the minimum three hours sunlight between 9am and 3pm on June 21.

Earthworks, retaining walls and cut and fill could all be reasonably minimised through appropriate design. There is little doubt that some earthworks will be necessary to accommodate future development however depending on design, it is possible that such works could relate primarily to the access into the lots, which has been detailed as extending from a single shared crossover. Based on the siting of the proposed building envelopes in the front halves of the lots as they front the road, the length of the access can be reduced accordingly. Proposing a shared/part-shared access and driveway arrangement also allows for fewer physical accesses and therefore a more efficient use of the site in terms of the extent of disturbance. This is especially beneficial on a steep site where substantial cutting and/or filling might normally be required to achieve acceptable grades, so to do away with separate accesses and driveways for each lot by utilising a shared arrangement is a superior outcome.

6.7.6. The proposal complies with the performance criterion.

6.8. Lot Design: Frontage – Part D 12.5.1 P3

6.8.1. Two of the lots (including the balance) have the characteristics of an internal lot. Lots 1 and 2 are not internal lots and as such are subject to D 12.5.1 A3/P3.

6.8.2. The acceptable solution for Part D 12.5.1 A3 requires a 30m frontage.

6.8.3. The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.8.4. The corresponding Performance Criteria in Part D 12.5.1 P3 states:

The frontage of each lot must provide opportunity for reasonable vehicular and pedestrian access and must be no less than:

6m.

6.8.5. Both non-internal lots meet the minimum 6m frontage – Lot 1: 7.4m, Lot 2: 6.0m.

6.8.6. The proposal complies with the performance criterion.

6.9. Lot Design: Internal Lots – Part D 12.5.1 P4

6.9.1. Lot 3 and the balance lot meet the definition of internal lots.

6.9.2. The acceptable solution for Part D 12.5.1 A4 requires that no lot is an internal lot.

6.9.3. The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.9.4. The corresponding Performance Criteria in Part D 12.5.1 P4 states:

An internal lot must satisfy all of the following:

(a) access is from a road existing prior to the planning scheme coming into effect, unless site constraints make an internal lot configuration the only reasonable option to efficiently utilise land;

(b) it is not reasonably possible to provide a new road to create a standard frontage lot;

(c) the lot constitutes the only reasonable way to subdivide the rear of an existing lot;

(d) the lot will contribute to the more efficient utilisation of living land;

(e) the amenity of neighbouring land is unlikely to be unreasonably affected by subsequent development and use;

(f) the lot has access to a road via an access strip, which is part of the lot, or a right-of-way, with a width of no less than 3.6m;

(g) passing bays are provided at appropriate distances along the access strip to service the likely future use of the lot;

(h) the access strip is adjacent to or combined with no more than three other internal lot access strips and it is not appropriate to provide access via a public road;

(i) a sealed driveway is provided on the access strip prior to the sealing of the final plan.

(j) the lot addresses and provides for passive surveillance of public open space and public rights of way if it fronts such public spaces.

6.9.5. The proposed internal lots would share reciprocal rights-of-way over each other's access strips. Given the topography of the site, the sharing of one access which is aligned with the contours would allow for a reduction in the extent of disturbance required and this represents an efficient utilisation of the land. The access strips are both sufficient in width at 4.13m each and combined would allow for a passing bay to be accommodated, although with a length less than 30m there would be no requirement for such under the parking and access code of the *Hobart Interim Planning Scheme 2015*. Given the layout of the proposed lots, amenity impact would not be an issue.

6.9.6. The proposal complies with the performance criterion.

6.10. Ways and Public Open Space – Part D 12.5.1 P1

6.10.1. A 1291sq.m area is proposed to be transferred as public open space as part of the subdivision.

6.10.2. There are no acceptable solutions for public open space under the acceptable solutions of Part D 12.5.1 A1.

6.10.3. The proposal cannot comply with an acceptable solution; therefore assessment against the performance criterion is relied on.

6.10.4. The corresponding Performance Criteria in Part D 12.5.1 P1 states:

The arrangement of ways and public open space within a subdivision must satisfy all of the following:

(a) connections with any adjoining ways are provided through the provision of ways to the common boundary, as appropriate;

(b) connections with any neighbouring land with subdivision potential is provided through the provision of ways to the common boundary, as appropriate;

(c) connections with the neighbourhood road network are provided through the provision of ways to those roads, as appropriate;

(d) new ways are designed so that adequate passive surveillance will be provided from development on neighbouring land and public roads as appropriate;

(e) topographical and other physical conditions of the site are appropriately accommodated in the design;

(f) the route of new ways has regard to any pedestrian & cycle way or public open space plan adopted by the Planning Authority;

(g) new ways or extensions to existing ways must be designed to minimise opportunities for entrapment or other criminal behaviour including, but not limited to, having regard to the following:

(i) the width of the way;

(ii) the length of the way;

(iii) landscaping within the way;

(iv) lighting;

(v) provision of opportunities for 'loitering';

(vi) the shape of the way (avoiding bends, corners or other opportunities for concealment).

6.10.5. The proposed public open space area has been reviewed by the Council's Park Planners as being appropriate as it continues an open space corridor along the Ross Rivulet. The following comments have been provided:

> The subdivision is contingent on a rezoning of the subject land to (in part) Low Density Residential and (in part) Open Space.
>
> The proposed boundaries of the Open Space zoning are based on the proposed subdivision. The rezoning is generally supported by the Open Space Group as it continues an open space corridor along the Ross Rivulet.
>
> The subdivision proposes the creation of three addition lots, and one additional1,291m^2 lot of Public Open Space (Lot 102). The proposed POS is adjacent to an existing area of POS that is to be transferred to the City as part of an earlier subdivision of adjoining land (Stage 4 of PLN 08-00243).
>
> The land now proposed as POS continues a 20m wide corridor running approximately 70m up the eastern side of the Ross Rivulet. With future investment on behalf of the City, this corridor could be developed as an open space connection between Forest Road (adjoining Knocklofty Reserve) and the Hobart Rivulet Park.
>
> The development of a recreation connection along the Ross Rivulet is supported by the *Hobart Rivulet Strategic Master Plan* (2011).
>
> Earlier concepts proposed to provide a much larger lot for POS extending eastward up the hill side. However, preliminary officer feedback did not support this larger area due to limited demand in the area, slope and aspect of the land, and documented land instability issues.
>
> The current application proposed to transfer a much smaller POS area, with a much larger balance lot – of which much cannot be developed due land instability.
>
> The area proposed as POS does contain the top of a historic landslip (i.e. 30 years ago). Specific building envelopes and buffer areas are recommended by the geotechnical engineer to protect any future development on the proposed building lots.
>
> Residential development on the balance lot immediately above the proposed POS is restricted to a building enveloped some 40m south of the proposed POS.

Servicing the three additional lots proposed appears to require infrastructure to be installed through adjoining land designated to be transferred to the City (under Stage 4 of PLN 08-00243).

As such, it is recommended that the engineering drawings for such services should also be approved by the Director Parks and City Amenity (as well as Directory City Infrastructure as would normally be the case) in the relevant condition concerning approval of final engineering plans.

6.10.6. The proposal complies with the performance criterion.

6.11. Subdivision standards (Open Space Zone) – Part D 19.5.1 P2

6.11.1. The proposed public open space lot has no direct frontage to a road.

6.11.2. The acceptable solutions for frontage under Part D 19.5.1 A2 require no less than 15m frontage for each lot.

6.11.3. The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.11.4. The corresponding performance criteria under Part D 19.5.1 P2 states:

The frontage of each lot must be capable of adequately serving the intended purpose.

6.11.5. The proposed public open space lot lies adjacent to an existing public open space lot required as part of the 19 Thelma Drive subdivision approval, and once transferred would likely be adhered to create one combined open space lot. Frontage to the overall area would be gained from Tara Street and it is considered that the overall area would therefore have appropriate frontage and also access to serve the intended purpose.

6.11.6. The proposal complies with the performance criterion.

6.12. Subdivision standards (Open Space Zone) – Part D 19.5.1 P3

6.12.1. A public open space lot is proposed.

6.12.2. There are no acceptable solutions under Part D.19.5.1 A3 for public open space lots.

6.12.3. The proposal cannot comply with an acceptable solution; therefore assessment against the performance criterion is relied on.

6.12.4. The corresponding performance criteria in Part D 19.5.1 P3 are identical to those under Part D 12.5.1 P1 and as such the matters have already been considered.

6.12.5. The proposal complies with the performance criterion.

6.13. Bushfire prone areas code – Part E 1.6.1.1 P1

6.13.1. Lots are proposed without certification of insufficient increase in risk and building areas have not been shown for the two new lots to be zoned as 'Open Space'

6.13.2. The acceptable solutions under Part E 1.6.1.1 A1 require either certification from the TFS or an accredited person that there is an insufficient increase in risk from bushfire to warrant the provision of hazard management areas as part of a subdivision or otherwise lots are shown with building areas and appropriate hazard management areas.

6.13.3. The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.13.4. The corresponding performance criteria in Part E 1.6.1.1 P1 state:

A proposed plan of subdivision shows adequate hazard management areas in relation to the building areas shown on lots within a bushfire-prone area taking into consideration:

(a) the dimensions of hazard management areas;

(b) a bushfire risk assessment of each lot at any stage of staged subdivision;

(c) the nature of the bushfire-prone vegetation including the type, fuel load, structure and flammability;

(d) the topography, including site slope;

(e) any other potential forms of fuel and ignition sources;

(f) separation distances from the bushfire-prone vegetation not unreasonably restricting subsequent development; and

(g) any advice from the TFS.

6.13.5. This aspect of the proposal has been assessed in detail by the Council's Environmental Development Planner who has deemed the proposal to be acceptable in this regard.

6.13.6. The proposal complies with the performance criterion.

6.14. Landslide code – Part E 3.8.1 P1

6.14.1. The proposal involves subdivision in a landslide hazard area.

6.14.2. There are no acceptable solutions in this circumstance under Part E 3.8.1 A1.

6.14.3. The proposal does not comply with the acceptable solution; therefore assessment against the performance criterion is relied on.

6.14.4. The corresponding performance criteria in Part E 3.8.1 P1 state:

Subdivision of a lot, all or part of which is within a Landslide Hazard Area must be for the purpose of one of the following:

(a) separation of existing dwellings;

(b) creation of a lot for the purposes of public open space, public reserve or utilities;

(c) creation of a lot in which the building area, access and services are outside the High Landslide Hazard Area and the landslide risk associated with the subdivision is either:

(i) acceptable risk, or

(ii) capable of feasible and effective treatment through hazard management measures, so as to be tolerable risk.

6.14.5. The proposal indicates that the proposed lots and their building areas, access and services are clear of the identified landslide hazard area. Previous geotechnical investigations for the area have resulted in a risk management plan for the lots with site specific recommendations. This aspect of the proposal has been assessed in detail by the Council's Environmental Development Planner.

6.14.6. The proposal complies with the performance criterion.

7. Discussion

7.1. The proposed subdivision presents a reasonably low lot yield and maintains areas of open space, including the majority of the balance lot. Building areas have been identified, and as such future development of the lots will be limited.

7.2. The proposed subdivision is a logical progression of the previous subdivision of 19 Thelma Drive and demonstrates an acceptable level of compliance with applicable Scheme standards.

7.3. Additional assessment by the Council's Environmental Development Planner, Surveying Services Manager, Environmental, Road and Development Engineers have been carried out with the recommendation in each case being that the proposal be approved with conditions.

8. Conclusion

8.1. The proposed Scheme amendment & subdivision at 25 Stevens Farm Drive satisfies the relevant provision of the *Hobart Interim Planning Scheme 2015,* and as such is recommended for approval.

9. Recommendations

That: Pursuant to the *Hobart Interim Planning Scheme 2015*, the Council approve the application for a Scheme amendment and subdivision at 25 Stevens Farm Drive, West Hobart for the reasons outlined in the officer's report and a permit containing the following conditions be issued:

GENERAL

GEN **The use and/or development must be substantially in accordance with the documents and drawings that comprise the Planning Application No. PLN-15-01382-01 outlined in attachment A to this permit except where modified below.**

Reason for condition

To clarify the scope of the permit.

TASWATER

TW **The use and/or development must comply with the requirements of TasWater as detailed in the form Submission to Planning Authority Notice, Reference No. TWDA 2015/01851-HCC dated 18 March 2016 as attached to the permit.**

Reason for condition

To clarify the scope of the permit.

PLANNING

ENVIRONMENTAL

ENV1 **Sediment and erosion control measures sufficient to prevent sediment from leaving the site must be installed prior to any disturbance of the site. Sediment controls must be maintained until all areas of disturbance have been stabilized or revegetated**.

Advice: For further guidance in preparing Soil and Water Management Plans in accordance with Fact Sheet 3 Derwent Estuary Program go to www.hobartcity.com.au development engineering standards and guidelines.

Reason for condition

To avoid the sedimentation of roads, drains, natural watercourses, Council land that could be caused by erosion and runoff from the development, and to comply with relevant State Legislation.

ENVS1 **Prior to sealing the final plan, evidence must be provided that demonstrates whether the existing fire hydrant shown on the submitted bushfire hazard management plan has been designed to be capable of delivering a flow rate of 600L per minute and a minimum pressure of 200kPa in accordance with AS2419.1 Fire Hydrant Installations – Part 1: System design, installation and commissioning.**

Reason for condition

To ensure what requirements of the bushfire hazard management plan are to be met by future owners.

ENV 4 **An amended bushfire hazard management plan must be submitted to the Council for approval, prior to sealing of the final plan. The amended bushfire hazard management plan must:**

- **not include the notation 'existing fire hydrant to be verified by TasWater that it complies with E1.6.1 A1(b)…';**
- **clarify whether a static water supply must be utilised in accordance with E1.6.3 A2(c) of the Bushfire-Prone Areas Code; and**
- **clarify whether a static water supply in accordance with E1.6.3 A2(d) of the Bushfire-Prone Areas Code is acceptable as a fire-fighting water supply for future dwellings on the residential lots.**

All work required by this condition must be undertaken in accordance with the approved bushfire hazard management plan.

Advice: Once the amended bushfire hazard management plan has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement).

Reason for condition

To ensure the use and/or development is consistent with the provisions of the Bushfire-Prone Areas Code and/or that the Bushfire Report and Bushfire Hazard Management Plan are consistent.

ENV 8 **All relevant landslide risk mitigation measures recommended in section 5 of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015 must be implemented, unless varied by the recommendations of the stormwater and sewer services letter from WC Cromer P/L dated 2 February 2016.**

Reason for condition

To reduce the risk to life and property, and the cost to the community, caused by landslides

ENVS2 **Prior to the commencement of works, comprehensive and detailed engineering designs prepared by an accredited Civil Engineer/Civil Designer for the subdivision works including drainage, services, earthworks, retaining structures and roads must be submitted and approved. The design documents must demonstrate compliance with all relevant risk mitigation recommendations in section 5 of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015 or the recommendations of the stormwater and sewer services letter from WC Cromer P/L dated 2 February 2016.**

The submitted design documents must be certified by both a Civil Engineer/Civil Designer and Geotechnical Engineer/Engineering Geologist as being in accordance with all relevant recommendations in section 5 of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015 or the recommendations of the stormwater and sewer services letter from WC Cromer P/L dated 2 February 2016 and that all recommendations of the report or letter relevant to the subdivision works have been fully incorporated into the design documents using Form B1 *Structural/Civil/Geotechnical Engineering Declaration – Subdivision Design Documents* (copy attached).

Reason for condition

To ensure the recommended landslide risk mitigation measures are appropriately integrated into the subdivision design.

ENVS3 **Following completion of the subdivision works and prior to sealing the final plan, certification by a geotechnical engineer or engineering geologist (as specified in the Director of Building Control's determination *Certificates of Specialists or Other Persons*) that all relevant recommended landslide risk mitigation measures in section 5 of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015 or the recommendations of the stormwater and sewer services letter from WC Cromer P/L dated 2 February 2016 have been fully complied with must be submitted to Council using Form G1 *Geotechnical Declaration Subdivision Works* (copy attached).**

Reason for condition

To ensure the recommended landslide risk mitigation measures are appropriately implemented in the subdivision works.

ENVS4 **Lots 1, 2, 3 and the balance lot must be subject to a restrictive covenant in favour of the Hobart City Council preventing development including the erection of buildings or structures, landscaping, earthworks or vegetation clearing without the prior, written consent of the Hobart City Council, in the following areas:**

- **west of the line marked 'geotech zone boundary A-B' on the proposed Plan of Subdivision by Brooks, Lark and Carrick Surveyors dated 16 March 2016;**
- **north west of the line marked 'geotech zone boundary B-D' on the proposed Plan of Subdivision by Brooks, Lark and Carrick Surveyors dated 16 March 2016; and**
- **north west of the line marked 'geotech zone boundary A-D' on the proposed Plan of Subdivision by Brooks, Lark and Carrick Surveyors dated 16 March 2016.**

The covenant must include the following words:

The owner or owners of lots 1, 2, 3 and the balance lot on the plan covenant with the Hobart City Council to the intent that the burden of this covenant may run with and bind the covenantor's lots and any part thereof and the benefit shall be in favour of the Hobart City Council, to observe the following stipulation:

Not without the written consent of the Hobart City Council to erect or permit to be erected any building or structure or carry out any landscaping, earthworks or vegetation clearing within the area marked ABC…etc on the plan.

Reason for condition

To ensure that only the land subject to an acceptable level of geotechnical risk is developed.

SURVEY

SURV 1 **The applicant is to submit to the Council a copy of the Surveyor's survey notes at the time of lodging the final plan.**

Reason for condition

To enable the Council to accurately update cadastral layers on the corporate Geographic Information System.

SURV 2 **The final plan and schedule of easements must be submitted for approval by the Council in accordance with section 89 of the *Local Government (Building & Miscellaneous Provisions) Act 1993*.**

Reason for condition

To ensure that the subdivision/boundary adjustment is carried out in accordance with the Councils requirements under the provisions of Part 3 of the *Local Government (Building & Miscellaneous Provisions) Act 1993*.

SURV 3 **The final plan and schedule of easements must be submitted for approval by the Council under section 89 *Local Government (Building & Miscellaneous Provisions) Act 1993*.**

The final plan and schedule of easements must provide easements to the satisfaction of the council:

- **Over any storm water, water or sewer mains passing through the lots on the final plan, in favour of the Hobart City Council and/or TasWater). (minimum width of 2m, or 3m if they cover 2 pipes)**
- **Over any existing or proposed private right of ways, drainage and/or service easements in favour of the lots they are required to serve.**

Reason for condition

To ensure that there are no impediments to the provision of public and private services and access to the lots.

SURV 5 **The approved Public Open Space is to be transferred in fee simple to the Council at nominal consideration.**

Prior to the sealing of the final plan an executed and stamp duty assessed Land Titles Office transfer instrument is to be forwarded to the Council together with a cheque made payable to the Land Titles Office for the associated Land Titles Office registration fees.

Reason for condition

To ensure that titles to proposed public open space lots issue in the Council

SURV 12 **Lots 1, 2, 3 & the balance lot on the final plan are to be notated in accordance with the provisions of section 83(5)(a)(ii) of the *Local Government (Building & Miscellaneous Provisions) Act 1993*, to the effect that the Hobart City Council cannot provide a means of gravity reticulated stormwater disposal from the whole of the lots.**

The final plan must be submitted for approval by Council. The final plan must be notated to the satisfaction of Council.

Any specified reduced level that may be required is to be provided by the owner's Registered Land Surveyor who must supply the invert level (on State Datum) of the stormwater connection constructed to serve each Lot.

Reason for condition

To ensure that the restriction in the Council's ability to provide a means of gravity reticulated stormwater disposal is noted on the final plan.

SURV 13 **The final plan is to be notated in accordance with the provisions of section 83(7) (b) of the *Local Government (Building & Miscellaneous Provisions) Act 1993* to the effect that the Tasmanian Water and Sewerage Corporation cannot provide a means of gravity reticulated sewerage disposal from the whole of the lots on the plan.**

The final plan must be submitted for approval by the Council.

The final plan must be notated to the satisfaction of the Council.

The specified reduced level that may be required is to be provided by the owner's Registered Land Surveyor who must supply the invert level (on State Datum) of the sewer connection constructed to serve the lots.

Reason for condition

To ensure that the limitation in TasWater's ability to provide a means of gravity reticulated sewerage disposal from the lots is noted on the final plan.

SURVs$_1$ **The balance lot is to be shown as a lot on the final plan.**

Reason for condition

To enable servicing and building restrictions affecting the balance lot to be notated on the final plan

ENGINEERING

ENG1 **The cost of repair of any damage to the Council's infrastructure resulting from the implementation of this permit, must be met by the owners within 30 days of the completion of the development.**

A photographic record of the Council's infrastructure adjacent to the subject site must be provided to the Council prior to any commencement of works.

A photographic record of the Council's infrastructure (e.g. existing property service connection points, roads, buildings, stormwater, footpaths, driveway crossovers and nature strip, including if any, pre existing damage) will be relied upon to establish the extent of damage caused to the Council's infrastructure during construction. In the event that the owner/developer fails to provide to the Council a photographic record of the Council's infrastructure, then any damage to the Council's infrastructure found on completion of works will be deemed to be the responsibility of the owner.

Reason for condition

To ensure that any of the Council's infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENGs1 **Prior to the sealing of the final plan, alterations to the armco guard rail or equally along the back of the footpath must be undertaken in strict accordance with the manufacturer's recommendations and to the Councils satisfaction.**

Reason for condition

To ensure that all works are carried out to the Council's standards.

ENG1a **The cost of any alterations to the Council's or third-party infrastructure, including the site's service connection points, incurred as a result of the proposed development works must be met by the owner.**

Reason for condition

To ensure that any of the Council infrastructure and/or site-related service connections affected by the proposal will be altered and/or reinstated at the owner's full cost.

ENG14 **The subdivision must provide adequate services to meet existing development and maximize future development potential prior to sealing of the final plan.**

Engineering drawings must be submitted and approved prior to commencement of work on the site. The engineering drawings must;

a) **be checked and certified by a suitably qualified and experienced engineer;**

b) **be in accordance with LGAT -Tasmanian Standard Drawings and Subdivision Guidelines 2013,**

c) **Clearly distinguish between public and private infrastructure**

All work required by this condition must be undertaken in accordance with the approved construction drawings.

Advice: Once the construction drawings have been approved the Council will issue a condition endorsement.

Note: The guidelines and standards are available at http://www.hobartcity.com.au/Development/Engineering_Standards_and_Guidelines

Reason for condition

To ensure that the subdivision of land provides adequate services to meet the projected needs of future development.

ENGsw8 **The new stormwater system must be constructed prior to the sealing of the final plan.**

Engineering drawings must be submitted and approved, prior to commencement of work. The engineering drawings must:

a) be certified by a qualified and experienced civil engineer.

b) show in both plan and long-section the proposed stormwater main, including, but not limited to, connections, flows, velocities, hydraulic grade lines, clearances, cover, gradients, sizing, material, pipe class, adequate working platforms around manholes easements and inspection openings.

c) Include the associated calculations and catchment area plans. The stormwater system (including defined overland flow paths) must cater for all 1% AEP flows as at 2100 (ie including climate change loading) from a fully developed catchment. The main itself must be sized to accommodate at least the 5% AEP flows from a fully-developed catchment.

All work required by this condition must be undertaken in accordance with the approved engineered drawings

Advice: Once the engineered drawings has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Please note that once the condition endorsement has been issued you will need to contact Council's City Infrastructure Unit to obtain a permit to construct public infrastructure.

Reason for condition

To ensure Council's hydraulic infrastructure meets acceptable standards.

ENGs2 **All driveways that will be shared or subject to Right of Way must be designed, constructed and sealed (generally in accordance with Hutchings Spurr engineering drawing 14544/01), to the satisfaction of the Council, prior to the sealing of the final plan.**

Reason for condition

In the interests of vehicle user safety and the amenity of the development.

ENGs3 **Any construction of public infrastructure (which will be taken over by the Council) must be carried out either by the Council or by a Council-approved private contractor in strict accordance with the conditions set out in the document "*Guidelines for Public Infrastructure Construction by the Private Sector",* with a maintenance period of 12 months. A copy of this document is appended to the permit. Note that live works such as connections to existing hydraulic mains or abandonment of existing connections are to be carried out by the Council at the owner's cost.**

Reason for condition

To ensure that public works are carried out to the required standards.

ENGs4 **Where all approved works (public infrastructure) have been completed and prior to the sealing of the final plan, the owner must lodge with the Council security in the form of a cash deposit or bank guarantee from an approved financial institution, equal to 5% of the contract value of the works. This bond will be released after 12 months, should no maintenance works on public infrastructure be required. This will be demonstrated by a final inspection by Council, and submission of a recorded CCTV inspection and associated report of any new public stormwater infrastructure, taken no more than one month before the end of the maintenance period. Where remedial works are to be undertaken, the bond will not be released until the works are completed to the satisfaction of the Director City Infrastructure.**

Upon the expiry of the maintenance period and submission of the CCTV, please contact the Council's Project and Development Inspector on telephone 6238 2967 to arrange an inspection prior to the release of the security bond.

Reason for condition

To ensure that public works are carried out to the required standards.

PART 5 AGREEMENT

Part 5 1 **The owner shall enter into a Part 5 Agreement pursuant to the *Land Use Planning and Approvals Act 1993* with the Council, prior to the sealing of the final plan, such that for any future development of each new lot will be required to address the following criteria: -**

(i) Energy conservation should be promoted by requiring developments to provide and protect solar access to living areas and private open spaces and by mitigating the effects of cold winds;

(ii) **The Precinct will be developed primarily for residential purposes, predominantly with detached houses not exceeding two storeys and sited with regard to the views and solar access of neighbouring properties. Clusters of dwellings may be considered on sites where visual impact can be minimised by appropriate landscaping, particularly when viewed from Huon Road and other areas to the south and east; and**

(iii) **The visual impact of residential development will be minimised through the use of suitable landscaping and non-reflective finishes on roofing materials. The use of highly reflective external surfaces is to be discouraged. External finishes may be natural or untreated, or where colours are used they should be darker hues.**

All costs for the preparation and registration of the Part 5 Agreement must be met by the owner(s).

The owner(s) must comply with the Part 5 Agreement which will be placed on the property titles.

Reason for condition

To minimise the visual and environmental impact of the proposed subdivision and ensure consistency with previous stages of the overall subdivision.

Part 5 2 **The owner must enter into an agreement with the Council pursuant to Part 5 of the *Land Use Planning and Approvals Act 1993* with respect to implementation of the final approved bushfire hazard management plan and implementation of the geotechnical recommendations prior to sealing of the final plan.. The agreement must be registered on the titles for these lots at the time of issue.**

The agreement must:

- **require that the final, approved bushfire hazard management plan specified in 'ENV 4' above must be implemented prior to occupation of the first dwelling on the lots, and be maintained for the life of all dwellings on the lots;**
- **include a copy of the final, approved bushfire hazard management plan specified in condition 'ENV 4' above.**
- **require that the foundation design for future dwellings be based on investigation and classification in accordance with AS2870 *Residential Slabs and Footings*;**
- **require that development on the lots be in accordance with recommendations 2 to 7 in section 5 of the submitted geotechnical report addendum by WC Cromer P/L dated 22 January 2015; and**

- **include a copy of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015.**

All costs for the preparation and registration of the Part 5 Agreement must be met by the owner(s).

The owner(s) must comply with the Part 5 Agreement which will be placed on the property title.

Note: Further information with respect to the preparation of a part 5 agreement can be found at
http://www.hobartcity.com.au/Development/Planning/Part_5_agreements

Reason for condition

To ensure that future use/development of land is subject to acceptable levels of risk from bushfire and landslide.

Part 5 3 **The owner(s) of the land that will become lots 1, 2, 3, 101, 102 and the balance lot must arrange for the existing Part 5 Agreement applying to the owners of the land to be brought to an end prior to registration of the new Part 5 Agreement referred to in condition 'Part 5 2' above.**

All costs associated with the ending of the Part 5 Agreement must be met by the owner.

Reason for condition

To ensure that contradictory Part 5 Agreement requirements do not apply to the land

Part 5 4 **The owner(s) of the property must enter into an agreement with the Council pursuant to Part 5 of the *Land Use Planning and Approvals Act 1993* with respect to the following prior to the sealing of the final plan:**

- **The inability to gravity reticulate storm water from the entirety of the Lots. The owner must agree that no impervious areas or buildings whose roof cannot drain via gravity to the existing stormwater connection shall be constructed on the proposed Lots.**

All costs for the preparation and registration of the Part 5 Agreement must be met by the owner.

The owner must comply with the Part 5 Agreement which will be placed on the property title.

Note: Further information with respect to the preparation of a part 5 agreement can be found
http://www.hobartcity.com.au/Development/Planning/Part_5_agreements

Reason for condition

To ensure that the restrictions on the site are managed appropriately.

ADVICE

The following advice is provided to you to assist in the implementation of the planning permit that has been issued subject to the conditions above. The advice is not exhaustive and you must inform yourself of any other legislation, by-laws, regulations, codes or standards that will apply to your development under which you may need to obtain an approval. Visit www.hobartcity.com.au for further information.

Prior to any commencement of work on the site or commencement of use the following additional permits/approval may be required from the Hobart City Council.

- If a condition endorsement is required by a planning condition above, please forward documentation required to satisfy the condition to rfi-information@hobartcity.com.au, clearly identifying the planning permit number, address and the condition to which the documentation relates.

  Once approved, the Council will respond to you via email that the condition/s has been endorsed (satisfied). Detailed instructions can be found at www.hobartcity.com.au/Development/Planning/How_to_obtain_a_condition_endorsement

- Building permit in accordance with the *Building Act 2000*; www.hobartcity.com.au/Development/Building

- Plumbing permit under the *Tasmanian Plumbing Regulations 2014*; www.hobartcity.com.au/Development/Plumbing

-
- Permit for the occupation of the public highway for construction or special event (e.g. placement of crane, scissor lift etc) http://www.hobartcity.com.au/Transport/Permits/Construction_Activities_Special_Events_in_the_Road_Reservation

- Permit to Open Up and Temporarily Occupy a Highway (for work in the road reserve) http://www.hobartcity.com.au/Transport/Lighting_Roads_Footpaths_and_Street_Cleaning/Roads_and_Footpaths

Tasmanian Standard Drawings can be accessed on the Local Government Association Tasmania web site
http://www.lgat.tas.gov.au/webdata/resources/files/LGAT%20Standard%20Drawings%20Release%20Version%20Dec%202013.pdf

(Cameron Sherriff)
DEVELOPMENT APPRAISAL PLANNER

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

(Ian Stanley)
MANAGER DEVELOPMENT APPRAISAL

As signatory to this report, I certify that, pursuant to Section 55(1) of the Local Government Act 1993, I hold no interest, as referred to in Section 49 of the Local Government Act 1993, in matters contained in this report.

Date of Report: 31 March 2016

Attachment(s)
Attachment A – Documents and Drawings List
Attachment B – TasWater form Reference No. TWDA 2015/01851-HCC
Attachment C – Proposed Rezoning/Subdivision Layout Plans
Attachment D – Rezoning report
Attachment E – Geotechnical Investigation
Attachment F – Geotechnical Investigation Addendum
Attachment G – Access Details/Long and Cross Sections
Attachment H – Bushfire Hazard Management Plan, Certification documents and Form 55.
Attachment I – Additional supporting correspondence from Applicant.
Attachment J – Geotechnical comment on proposed alignment of stormwater and sewer services.
Attachment K – Environmental Development Planner Assessment Report

ATTACHMENT A

Documents and Drawings that comprise
Planning Application Number - PLN-15-01382-01

DEVELOPMENT ADDRESS: **25 Stevens Farm Drive, WEST HOBART**

LIST OF DOCUMENTATION:

Description	Drawing Number/Revision/Author/Date, Report Author/Date, Etc	Date of Lodgement to Council
Application Form		19 November 2015
Title	CT 169500/1	13 November 2015
Owner's consent to lodge		13 November 2015
Rezoning report	Author: Michael Ball Date: November 2015	13 November 2015
Plan of Subdivision/Rezoning	Drawing No: STEVG03 8693-01 Sheet 2 Rev: C Drawn By: Brooks, Lark and Carrick Date: 16-03-2016	17 March 2016
Plan of Subdivision/Rezoning (Part site)	Drawing No: STEVG03 8693-01 Sheet 2 Rev: C Drawn By: Brooks, Lark and Carrick Date: 16-03-2016	17 March 2016
Geotechnical Report	Author: W. C. Cromer Date: September 1995	13 November 2015
Geotechnical Report Addendum	Author: W. C. Cromer Date: 2015	13 November 2015
Geotechnical comment on proposed alignment of stormwater and sewer services	Author: W. C. Cromer Date: 2 February 2016	03 February 2016
Covering Letter re: Additional Information	Author: Michael Ball Date: 03 February 2016	03 February 2016
Covering Letter re: Additional Information	Author: Michael Ball Date: 24 February 2016	24 February 2016
Bushfire Hazard Management Plan; Certificate of Compliance; Form 55	Drawing No: 06-2016 1/1 Drawn By: Pinnacle Drafting & Design Date: 17/02/2016 & 03/02/2016	17 February 2016 & 03 February 2016
Access Details – Site Plan	Drawing No: 14544/01 Drawn By: Hutchings Spurr Pty Ltd Date: Jan 2016	03 February 2016
Access to Lots 1 & 2	Drawing No: 14544/02 Drawn By: Hutchings Spurr Pty Ltd	03 February 2016

	Date: Jan 2016	
Access to Lot 3 & Balance	Drawing No: 14544/01 Drawn By: Hutchings Spurr Pty Ltd Date: Jan 2016	03 February 2016

Submission to Planning Authority Notice

Council Planning Permit No.	PLN-15-01382	Council notice date	20/11/2015
TasWater details			
TasWater Reference No.	TWDA 2015/01851-HCC	Date of response Amended	3 Dec 2015 18 March 2016
TasWater Contact	Greg Clausen	Phone No.	(03) 6237 8242
Response issued to			
Council name	HOBART CITY COUNCIL		
Contact details	hcc@hobartcity.com.au		
Development details			
Address	25 STEVENS FARM DR, WEST HOBART	Property ID (PID)	2032321
Description of development	Rezoning and subdivision of three lots plus balance		

Schedule of drawings/documents

Prepared by	Drawing/document No.	Revision No.	Date of Issue
Brooks, Lark and Carrick	Proposed Rezoning, Scale 1:500).	C	16-03-2016

Conditions

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56S(2) TasWater makes the following submission(s):

1. TasWater does not object to the draft amendment to planning scheme.

Pursuant to the *Water and Sewerage Industry Act* 2008 (TAS) Section 56P(1) TasWater imposes the following conditions on the permit for this application:

CONNECTIONS, METERING & BACKFLOW

1. A suitably sized water supply with metered connections and sewerage system and connections to each lot of the development must be designed and constructed to TasWater's satisfaction and be in accordance with any other conditions in this permit.
2. Any removal/supply and installation of water meters and/or the removal of redundant and/or installation of new and modified property service connections must be carried out by TasWater at the developer's cost.

ASSET CREATION & INFRASTRUCTURE WORKS

3. Plans submitted with the application for Engineering Design Approval must, to the satisfaction of TasWater show, all existing, redundant and/or proposed property services and mains.
4. Prior to applying for a Permit to Construct to construct new infrastructure the developer must obtain from TasWater formal Engineering Design Approval for new TasWater infrastructure. The application for Engineering Design Approval must include engineering design plans prepared by a suitably qualified person showing the hydraulic servicing requirements for water and sewerage to TasWater's satisfaction.
5. Prior to works commencing, a Permit to Construct must be applied for and issued by TasWater. All infrastructure works must be inspected by TasWater and be to TasWater's satisfaction.
6. In addition to any other conditions in this permit, all works must be constructed under the supervision of a qualified engineer in accordance with TasWater's requirements.
7. Prior to the issue of a Consent to Register a Legal Document all additions, extensions, alterations or

upgrades to TasWater's water and sewerage infrastructure required to service the development, generally as shown on the plan titled "Proposed Rezoning", are to be at the expense of the developer and performed by Taswater or a contractor approved by TasWater, to the satisfaction of TasWater.

8. After testing, to TasWater's requirements, of newly created works, the developer must apply to TasWater for connection of these works to existing TasWater infrastructure, at the developer's cost.

9. At practical completion of the infrastructure water and sewerage works and prior to TasWater issuing a Consent to a Register Legal Document, the developer must obtain a Certificate of Practical Completion from TasWater for the works that will be transferred to TasWater. After the Certificate of Practical Completion has been issued, a 12 month defects liability period applies to this infrastructure. During this period all defects must be rectified at the developer's cost and to the satisfaction of TasWater. A further 12 month maintenance period may be applied to defects after rectification. TasWater may, at its discretion, undertake rectification of any defects at the developer's cost. The maintenance period will be deemed to be complete on issue of a "Certificate of Final Acceptance" from TasWater. To obtain a Certificate of Practical Completion:

   a) Written confirmation from a qualified engineer certifying that the works have been constructed in accordance with the TasWater approved plans and specifications and that the appropriate level of workmanship has been achieved.

   b) A request for a joint on-site inspection with TasWater's authorised representative must be made.

   c) Security for the twelve (12) month defects liability period to the value of 10% of the works must be lodged with TasWater. This security must be in the form of a bank guarantee.

   d) As Constructed Drawings must be prepared by a qualified Surveyor to TasWater's satisfaction and forwarded to TasWater.

10. Upon completion, to TasWater's satisfaction, of the defects liability period the newly constructed infrastructure will be transferred to TasWater and the developer must request TasWater to issue a "Certificate of Final Acceptance".

11. The developer must take all precautions to protect existing TasWater infrastructure. Any damage caused to existing TasWater infrastructure during the construction period must be promptly reported to TasWater and repaired by TasWater at the developer's cost.

12. Ground levels over the TasWater assets and easements must not be altered without the written approval of TasWater.

FINAL PLANS, EASEMENTS & ENDORSEMENTS

13. Prior to the Sealing of the Final Plan of Survey, the developer must obtain a Consent to Register a Legal Document from TasWater and the certificate must be submitted to the Council as evidence of compliance with these conditions when application for sealing is made;

14. Pipeline easements must be created over proposed pipelines on TasWater's standard pipeline easement conditions. Pipeline easement width, location of easements relative to pipes, and terms and conditions must be to TasWater's satisfaction.

DEVELOPMENT ASSESSMENT FEES

15. The applicant or landowner as the case may be, must pay a development assessment and Consent to Register a Legal Document fee to TasWater for this proposal of:

   a. $240.00 for development assessment; and

   b. $130.00 for Consent to Register a Legal Document as approved by the Economic Regulator and the fees will be indexed as approved by the Economic Regulator from the date of:

      a. The Submission to Planning Authority Notice for the development assessment fee; and

      b. The Consent to Register a Legal Document for the Legal Document until the date they are

paid to TasWater; and payment is required within 30 days from the date of the invoice.
Advice
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 The developer is responsible for arranging to locate existing TasWater infrastructure and clearly showing it on any drawings. Existing TasWater infrastructure may be located by TasWater (call 136 992) on site at the developer's cost, alternatively a surveyor and/or a private contractor may be engaged at the developers cost to locate the infrastructure.
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			
Phone	13 6992	Email	development@taswater.com.au
Mail	GPO Box 1393 Hobart TAS 7001	Web	www.taswater.com.au

Brooks, Lark and Carrick SURVEYORS

UNIT 1, 2 KENNEDY DRIVE
CAMBRIDGE PARK TAS 7170
PHONE: (03)6248 5898
MOBILE: 0400 114 824
EMAIL: admin@blcsurveyors.com.au

This plan has been prepared only for the purpose of obtaining preliminary subdivisional approval from the local authority and is subject to that approval

All measursements and areas are subject to the final survey

REV C

OWNER S.R. STEVENS

TITLE REFERENCE C.T. 169500/1

PROPOSED EASEMENTS AS REQUIRED

LOCATION 25 STEVENS FARM ROAD, **WEST HOBART**

GRANTEE SEE TITLE

CONTOUR INTERVAL 5m

SCALE 1:500 @ A3

DATE 16-03-2016

MUNICIPALITY HOBART CITY

REF. NO. STEVG03 8693-01

PROPOSED REZONING

SHEET 2

PART OF 101
PUBLIC OPEN SPACE
2766m²
(PREVIOUSLY REQUIRED WITH PLN-08-00243-01 SEE PERMIT CONDITION 2)

ENVIRONMENTAL LIVING ZONE

GEOTECH ZONE BOUNDARY A-D

GEOTECH ZONE BOUNDARY B-D

GEOTECH ZONE BOUNDARY C-D

GEOTECH ZONE BOUNDARY B-C

Balance
8828m²

3
1427m²

2
1157m²

1
1663m²

10m x 15m Rectangle

PROPOSED NEW SEWER & STORMWATER MAINS & CONNECTIONS

PROPOSED PIPELINE & SERVICES EASEMENT & DRAINAGE EASEMENT 3.00 WIDE

R-O-W 'A' 4.00 WIDE

R-O-W 'B' 4.00 WIDE

EXISTING SEWER & STORMWATER MAINS

PROPOSED NEW SEWER & STORMWATER MAINS & CONNECTIONS

BUILDING SETBACK LINE (NO BUILDING SOUTH WEST OF THIS SETBACK)

EXISTING SEWER & STORMWATER MAINS

PROPOSED WATER MAIN

PROPOSED NEW WATER CONNECTIONS TO LOT FRONTAGES

F.H

SHC

PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

FUTURE ROAD WITH STAGE PLN-08-00243-01

ZONE BOUNDARY

LOW DENSITY RESIDENTIAL ZONE

OPEN SPACE ZONE

PART OF 101
PUBLIC OPEN SPACE
1411m²
PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

TARA STREET

NOTE:
1. R-O-W 'A' 4.00 WIDE TO BENEFIT LOT 3, & R-O-W 'B' 4.00 WIDE TO BENEFIT BALANCE LOT.

PROPOSED REZONING

SHEET 1

LOT 102
PUBLIC OPEN SPACE
1291m²

PART OF 101
PUBLIC OPEN SPACE
2766m²
(PREVIOUSLY REQUIRED WITH PLN-08-00243-01 SEE PERMIT CONDITION 2)

PART OF 101
PUBLIC OPEN SPACE
1411m²
PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

Balance
8828m²

3
1427m²

2
1157m²

1
1663m²

BUILDING SETBACK

DRAINAGE EASEMENT 3.00 WIDE (D3531)

RESERVED ROAD

ROSS RIVULET

ENVIRONMENTAL LIVING ZONE

LOW DENSITY RESIDENTIAL ZONE

ZONE BOUNDARY

GEOTECH ZONE BOUNDARY B-D

GEOTECH ZONE BOUNDARY A-D

GEOTECH ZONE BOUNDARY C-D

PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

FUTURE ROAD WITH STAGE 4 OF PLN-08-00243-01

PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

PREVIOUSLY APPROVED SUBDIVISION PLN-08-00243-01

THELMA DRIVE

STEVENS FARM DRIVE

LIVERPOOL CRESCENT

TARA STREET

OPEN SPACE ZONE

OPEN SPACE ZONE

Stevens Farm Knoll

LEGEND

PROPOSED LOW DENSITY RESIDENTIAL ZONE

PROPOSED OPEN SPACE ZONE

Brooks, Lark and Carrick SURVEYORS

UNIT 1, 2 KENNEDY DRIVE
CAMBRIDGE PARK TAS 7170
PHONE: (03)6244 6256
MOBILE: 0400 114 824
EMAIL: admin@blcsurveyors.com.au

This plan has been prepared only for the purpose of obtaining preliminary subdivisional approval from the local authority and is subject to that approval

All measursements and areas are subject to the final survey

REV C

OWNER S.R. STEVENS

TITLE REFERENCE C.T. 169500/1

PROPOSED EASEMENTS AS REQUIRED

LOCATION 25 STEVENS FARM DRIVE, **WEST HOBART**

GRANTEE SEE TITLE

CONTOUR INTERVAL 5m

SCALE 1:1500 @ A3

DATE 16-03-2016

MUNICIPALITY HOBART CITY

REF. NO. STEVG03 8693-01

Attachment D

PROPOSED REZONING

25 STEVENS FARM DRIVE
WEST HOBART

On behalf of

Mrs S R STEVENS

Prepared by; Michael Ball
BSc Hons Grad Dip Urban and Regional Planning
Town Planning Consultant

November 2015

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Mrs S R Stevens seeks an amendment to the City of Hobart Interim Planning Scheme 2015 (the Scheme) as it affects part of her land at 25 Stevens Farm Drive West Hobart. It is proposed to amend the zoning from **Environmental Living (Zone 14)** to **Low Density Residential (Zone 12)** providing for the subdivision of that area for residential purposes consistent with the permit for development on the adjoining area. Concurrently application is made for the subdivision of the area being rezoned for the subdivision of three (3) allotments and balance.

1.2 The application is made under **Sections 33 and 43**A of the **Land Use Planning Approvals Act 1993.**

1.3 A plan designating the area proposed for rezoning and the proposed subdivision has been prepared by Surveyors Brooks Lark and Carrick and is included as Attachment 2.

1.4 Whilst not necessarily part of the amendment being sought by Mrs Stevens an opportunity is presented to correct the zone boundary to more accurately reflect the previously approved lot arrangement.

1.5 No change is necessary to the written part of the Scheme.

2. BACKGROUND

2.1 The subject site forms part of an original title that was historically used as a poultry farm. Since cessation of that use the substantive part of the original farm was rezoned to Residential 2 under the then existing City Of Hobart Planning Scheme 1982 and subsequently approved for subdivision for residential purposes consistent with the new zone. (PLN 08.00243.01 15 May 2009) The subdivision received staged approval and is still in the process of development. (See Figure 1 below)

FIGURE 1 Adjacent residential subdivision in course of construction.

2.2 As a result of construction works associated with the development a more detailed geotechnical survey has been carried out. That survey has indicated that a greater area is available for development than was earlier identified and the proposed rezoning now submitted is a result of that more recent research.

3. SITE DESCRIPTION

3.1 Location

The land is located off Stevens Farm Drive at the top end of Forest Road West Hobart via Thelma Drive. It also has frontage to Tara Street South Hobart as shown on the Location Plan in Figure 3 below.

3.2 Site

The irregular shaped parcel of land is comprised of a single Title of 2.353 ha known as Lot 1 on Plan 169500 (a copy of which is included as Attachment 1) in the ownership of Mrs Stevens.

3.2.1 The land has a moderate to steep slope to the south west towards Ross Rivulet.

3.2.2 It has been generally cleared of vegetation having been historically used for farming purposes including poultry production although the lower flanks adjacent to Ross Rivulet retain some tree coverage as seen in Figure 2.

4. EXISTING SETTLEMENT PATTERN

4.1 The subject site is adjacent to residential areas to the east south and west as seen in Figure 4 below. The completion of the already approved subdivision will result in an almost continuous belt of residential development on an east west axis only broken by the alignments of Ross and Hobart Rivulets.

FIGURE 2. View to the south showing remnant tree coverage. (Taken 4 November 2014 at 8.03am)

5. INFRASTRUCTURE

5.1 The subject site is fully serviced with water, sewerage, stormwater, power and communication infrastructure and falls within Council's refuse and recycling collection district.

FIGURE 3. Location (The List November 2014)

6. PLANNING CONTROL

6.1 Existing Zoning

The subject land is currently zoned **Environmental Living** under the provisions of the **City of Hobart Interim Planning Scheme 2015**

6.2 Existing Zone Purpose

"14.1.1 Zone Purpose Statements

14.1.1.1 To provide for residential use or development in areas where existing natural and landscape values are to be retained. This may include areas not suitable or needed for resource development or agriculture and characterised by native vegetation cover, and where services are limited and residential amenity may be impacted on by nearby or adjacent rural activities.
14.1.1.2 To ensure development is reflective and responsive to the natural or landscape values of the land.
14.1.1.3 To provide for the management and protection of natural and landscape values, including skylines and ridgelines.
14.1.1.4 To protect the privacy and seclusion that residents of this zone enjoy.
14.1.1.5 To provide for limited community, tourism and recreational uses that do not impact on natural values or residential amenity.
14.1.1.6 To encourage passive recreational opportunities through the inclusion of pedestrian, cycling and horse trail linkages."

6.3 **Part 14.1.3** of the Scheme provides the following **Future Character Statements** for the existing zone

"(a) The areas covered by this zone will continue to be dominated by the natural bushland environment.
(b) Vegetation clearance for new development will be kept to the minimum area required to allow the development to proceed.
(c) Use and development will respect the scale and character of the bushland or rural environment
(d) Buildings will be unobtrusively sited and not detract from the landscape values of the area
(e) Building finishes in muted subdued colours will be the predominant finish
(f) There should be no new non residential use unless it can be demonstrated that it will not adversely affect the quiet living environment where noise transmission is a particular issue due to topography and relatively low background noise levels"

FIGURE 4. Overview of site showing existing settlement pattern (Google Earth November 2014)

6.4 Table 14.1 under 14.5 of the Scheme headed Development Standards for Subdivision provides for subdivision in this zone in this area to a minimum lot size of 10ha.

6.5 The clearly the settlement pattern shown in Figure 4 above and the current lot size of the subject site are inconsistent with the existing zone.

6.6 The subject site is affected by the Landslide Hazard Area overlay (Overlay Code 116 LDS) and the Biodiversity Protection Area overlay (Overlay Code 116 BPA) as well as the Bushfire Prone Areas Code under Part E1 of the Scheme.

7. ASSESMENT AGAINST RELEVANT STATE POLICIES

7.1. State Coastal Policy

Whilst the subject site falls within the coastal zone as defined by the State Coastal Policy 1996, the proposal provides for the consolidation of an existing residential settlement and as such is considered consistent with the policy.

7.2. State Policy on the Protection of Agricultural Land

The site is of not one significant agricultural potential nor rated as Class1, 2 or 3 lands.

7.3. State Policy on Water Quality Management

The subject site is fully serviced with sewerage and stormwater infrastructure, it is considered that proposal will not impact on any issue of water quality. The existing alignments of Ross and Hobart Rivulets will be buffered from future residential development by public open space generated by the existing subdivision approval and by any future approval.

8. ASSESSMENT AGAINST THE OBJECTIVES OF THE LAND USE PLANNING AND APPROVALS ACT 1993

8.1 S.32 of LUPAA necessitates an amendment to a Planning Scheme to further the objectives of the Act as set out in Schedule 1.8.2. The following provides consideration of those objectives

PART 1	
(a) To promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity	The area is of little conservation value as a result of past human activity and modification.
(b) To provide for the fair, orderly and sustainable use and development of air, land and water; and	The proposal only involves the use of land. It is consistent with surrounding development and provides the opportunity to more effectively use existing infrastructure and services. It has no negative impacts on either. The development is within the environmental capacity of the land and is consistent with surrounding development. The proposal will have a positive social impact in that it would provide for a reinforcement of resident population in the area allowing for better use of existing economic and social infrastructure
(c) To encourage public involvement in resource management and planning; and	The proposal as submitted would be subject to public consideration in accordance with S.38 of LUPAA.
(d) To facilitate economic development in accordance with the objectives set out in	The proposal facilitates the economic development of the land and provides for economic returns to the community

paragraphs (a), (b) and (c); and	through works associated with the development and ongoing rate returns generated from the lots. Furthermore the increase in population will increase demand for goods and services within the local area.
(e) To promote the sharing of responsibility for resource planning between the different spheres of government, the community and industry in the State.	The proposal of itself cannot deliver this objective however it is not contrary to it.
PART 2	
(a) To require sound strategic planning and coordinated action by State and local government;	The proposed amendment to the Scheme is based on a thorough site and context assessment consistent with sound planning practice. The proposed amendment and future subdivision have been discussed with Council
(b) To establish a system of planning instruments to be the principal way of setting objectives, policies and controls for the use, development and protection of land;	The proposal is consistent with the provisions of the Act as they relate to the amendment of a planning scheme The effect would be to incorporate the proposal within the provisions of the scheme.
(c) To ensure that the effects on the environment are considered and provide for explicit consideration of social and economic effects when decisions are made about the use of land;	The proposal has taken into consideration environmental impacts by limiting the developable area to land already impacted upon by human activity. The proposal consolidates existing residential development ensuring more effective and efficient use of existing physical and social infrastructure.
(d) To require land use and development planning and policy to be easily integrated with environmental, social, economic, conservation and resource management policies at State, regional and municipal levels	The assessment carried out has taken into account all of the matters subject to this objective and is considered consistent with them.
(e) To provide for the consolidation of approvals for land use or development and related matters and to coordinate planning approvals with related approvals	The proposal provides for a concurrent Scheme amendment and subdivision providing for a coordinated assessment.
(f) To secure a pleasant, efficient and safe working, living and recreational environment for all Tasmanians and visitors to Tasmania;	The proposal would clearly provide a safe and efficient living environment. Development of the land will ensure better fire protection for both future and existing residents. The proposal will have no impact on any work or recreation environment.

(g) To conserve those buildings, areas or other places which are of scientific aesthetic, architectural or historical interest, or otherwise of special cultural value;	The subject site has no special interest
(h) To protect public infrastructure and other assets and enable the orderly provision and coordination of public utilities and other facilities for the benefit of the community	The proposal poses no threat to existing infrastructure. In fact it provides an opportunity to both improve and make more effective use of existing infrastructure in a both timely and coordinated manner.
(i) To provide a planning framework which fully considers land capability.	The site is not significant agricultural land or rated as Class 1, 2 or 3 lands. Geological survey and assessment by a suitably qualified environmental officer shows the subject site is capable of supporting residential subdivision.

FIGURE 5. View to the west. (Taken 4 November 2014 at 8.03am)

9. GEOTECHNICAL ASSESSMENT

9.1 A geotechnical report on the subject site has been carried out by William C Cromer P/L a copy of which is included as Attachment 3.

9.2 The report identifies that the subject area can support future residential development as follows

"*From a geotechnical perspective, Stage 4 can conditionally support residential development,*

which is unlikely to cause instability on any other land.
All risks can be acceptably managed by the risk mitigation procedures, and with good hillside construction techniques, recommended in this report.:

FIGURE 6. Land to be retained in the Environmental Living Zone

10. PLANNING ASSESSMENT

10.1 It is proposed that the subject area be rezoned from Environmental Living to Low Density Residential consistent with the area of the Steven's holding that is similarly zoned and in the course of development consistent with the Low Density Residential zone.

10.2 The scheme provides the following Zone Purpose Statements for the proposed zone

"12.1.1.1 To provide for residential use or development on larger lots in residential areas where there are infrastructure or environmental constraints that limit development.
12.1.1.2 To provide for non-residential uses that are compatible with residential amenity.
12.1.1.3 To encourage residential development that respects the neighbourhood character.
12.1.1.4 To provide a high standard of residential amenity.
12.1.1.5 To ensure that development respects the natural and conservation values of the land and is designed to mitigate any visual impacts of development on public views."

10.1 The scheme amendment as proposed essentially provides for a minor extension of the residential subdivision previously approved on the adjoining land. The potential subdivision into a further three lots and balance takes advantage of the infrastructure installed to serve the already approved subdivision including road frontage.

10.2 The subject site was not included in the initial rezoning and subdivision under the then existing planning scheme because of concerns regarding land stability. The recent civil works associated with the adjoining residential subdivision have allowed a more detailed assessment of stability issues and that assessment has established the suitability of the subject area for residential development as detailed in the accompanying geotechnical report. That report

makes certain recommendations regarding the future use of the land for residential purposes. Those recommendations should appropriately be incorporated into any approval of the application to rezone the subject site but more importantly in any future subdivision approval.

10.3 The proposed zone and hence the residential subdivision is considered more in keeping with the surrounding residential character of the area. The existing landscape is one of cleared farmland rather than one of natural bushland as described in the Future Character Statement for the existing zone. That landscape will be further dominated by residential development as the subdivision under the existing permit proceeds.

10.4 The rezoning of the subject site and the subdivision will provide for a more effective and efficient use of the infrastructure that has been constructed as a result of the already approved residential subdivision including road, water, sewerage, stormwater, communications and power.

10.5 The proposed rezoning provides Council with the opportunity to correct the zoning over a number of adjoining lots previously approved for subdivision to more correctly reflect the use of those lots for residential purposes.

10.6 The land proposed for rezoning and subsequent subdivision has been cleared of bush having been historically used for grazing. Adequate areas for hazard management are provided within each of the proposed allotments for fire protection consistent with the Purpose of the Bushfire Prone Areas Code and the Development Standards thereunder.

10.7 Consistency with the Landslide Code is dealt with by the Report of Mr W Cromer attached to this report and referred to in section 9 of this report above.

10.8 The land as previously stated has been cleared of natural bush having been use for farming purposes, no native flora or fauna will be affected by the minor variation to the existing zone boundaries or subsequent subdivision and development. The proposal is considered consistent with the Purpose of the Biodiversity Code. The open Space generated by the proposal will add to those areas previously taken by Council in protecting the areas of remnant vegetation along the Ross Rivulet alignment.

11. CONCLUSION

A straight forward amendment to the scheme as it affects the zoning of the subject site is proposed rezoning the land from Environmental Living to Low Density Residential effectively a minor variation to the existing zone boundaries. The rezoning will result in the potential for a net increase of three (3) building allotments.

The proposed rezoning and concurrent subdivision of the land are considered consistent with the objectives of the Low Density Residential zone, surrounding residential development and there will be no impact on adjacent land uses.

The proposed rezoning is considered consistent with the relevant State Policies and the objectives of the Land Use Planning and Approvals Act 1993.

Overall the proposal is considered to have planning merit and deserves Council's support.

ATTACHMENT 1. COPY OF TITLE

ATTACHMENT 2. GEOLOGICAL SURVEY

ATTACHMENT 3. PROPOSAL PLAN

G. E. STEVENS
162A FOREST ROAD, WEST HOBART

GEOTECHNICAL INVESTIGATIONS OF LAND OFF FOREST ROAD, WEST HOBART

W. C. Cromer
Environmental & Technical Services Pty. Ltd.
Hobart, September 1995

1995055

2 of 3

SUMMARY

This report describes geotechnical investigations undertaken in August 1995 on about eight hectares of land off Forest Road in West Hobart. The investigations were carried out so as to form part of an application by the owner to the City of Hobart for rezoning of the land from *Rural B* to *Residential 2*. Their aim was to assess whether any geotechnical factors might need to be considered for future residential development.

The property is currently a poultry farm, located on a broad and topographically prominent ridge overlooking the Hobart Rivulet and South Hobart. Slope angles vary from gentle to steep. The land is wholly underlain by subhorizontal Triassic-age sandstones and siltstones, generally at depths less than about a metre beneath a mainly duplex (two-layered) soil profile.

The potential for slope instability on the western third of the property has been identified as the main geotechnical issue in relation to possible future residential development. This area is a broadly concave and segmented hillside, suggestive of possible ancient slope movement. Within it, a landslip has developed, probably since about the early 1970's, on 18° slopes in the lower, western corner. A smaller area of disturbed ground interpreted as a possible landslip also occurs nearby. Elsewhere in the immediate vicinity, there is local evidence of soil creep and development of colluvium on 18° to 30° slopes.

The balance of the land, comprising the eastern two thirds, is generally on gentle to moderate (but locally steep) slopes which show no obvious evidence of slope instability.

In terms of the interpreted risk of slope instability, the property has been classified into five categories, including *very high risk* (on and immediately adjacent to the recent landslips), *high risk* (on a small topographic bulge of colluvium on 30° slopes), *medium - high risk* (generally on adjacent 18° to 30° slopes), and *low risk* (on remaining slopes where soils are generally thin and there is no apparent evidence of slope instability).

This range of risk categories is probably applicable to many other areas, some of which have been developed for residential purposes, along the western side of the Derwent Estuary.

From a geotechnical viewpoint, the application for rezoning to *Residential 2* should be approved, subject to the following general recommendations:

- No development should occur in the *very high risk* area. However, subdivisional access may be constructed past the toe of the existing landslip provided adequate, engineered, drained retaining structures are in place, and remedial drainage works are employed in and above the landslip.

- No development should occur in the *high risk* area unless more detailed geotechnical investigations show that with appropriate geotechnical works the risk to development can be made acceptable.

- A limitation should be placed on the number of houses in the *medium - high risk* area. We suggest these houses be spaced out across the area

at not more than one dwelling per 0.3 to 0.4 ha. Good general and site-specific geotechnical engineering practices must be followed, particularly in relation to drainage and stormwater control, and retaining walls. Investigations for AS2870 site classifications will need to incorporate appropriate subsurface work to clarify potentially changing conditions. In particular, we suggest that footings will need to be founded not in soil or on bedrock, but at least 0.5 metres, and preferably one metre, into bedrock, to reduce the potential to dislodge joint blocks bounded by clay linings.

- Unrestricted residential development should be permitted in the areas shown as *medium risk* and *low risk*. However, since these include slopes of varying degrees, it is recommended that good geotechnical engineering practices be followed.

CONTENTS

APPENDICES

1. Geotechnical report from the Division of Mines and Mineral Resources, September 1990
2. Engineering logs of test pits
3. Site and test pit photographs
4. Notes about this report, assessment flow chart for geotechnical investigations, and notes on risk assessment and recommended hillside practices

1. INTRODUCTION

1.1 PURPOSE OF THE INVESTIGATIONS

Mr. G. E. Stevens owns and operates the Derwent Hatchery at 162A Forest Road, West Hobart (Figure 1). The land covers some 8 hectares and is currently zoned *Rural B* under the City of Hobart Planning Scheme. The owner intends to apply for a rezoning of the property to *Residential 2*.

A geotechnical appraisal of the property was requested, to determine whether any factors should be considered in relation to the intended rezoning application and the potential residential subdivision which might follow.

This report describes the geotechnical investigations carried out in August 1995 in relation to land on the three separate titles comprising the property: Conveyance 48/0597 of 5.3 hectares, CT 2843-8 of 2.8 hectares, and CT 2370-44 of 0.2 hectares. All are owned by G. E. Stevens.

1.2 PREVIOUS GEOTECHNICAL INVESTIGATIONS

1.2.1 Division of Mines and Mineral Resources

We are aware of one previous, brief report concerning geotechnical conditions on Mr. Stevens' property. In September 1990, the Division of Mines and Mineral Resources commented on possible subdivision on CT 2843-8 and CT 2370-44 in relation to a small landslip which had developed some years earlier on the latter title.

The one-page report is reproduced in Appendix 1. It briefly described the landslip, soils and geology of the site, and recommended no development in the immediate vicinity without more detailed studies. It also contained general comments on drainage controls, access routes and retaining walls should subdivision proceed.

We have also been verbally informed by the Division that some years ago, it carried out separate site investigations on or near Louden Street to the west of Mr. Stevens' property. The details of this work were not viewed by us, but we understand they include recommendations for development on steep land subject to soil creep.

In the course of our investigations we have also referred to two maps[1] prepared by the Division . The first is the geological map of Hobart, at a scale of 1:50,000 and dating from 1972. The second is an engineering geology map of Greater Hobart, published in 1990 at a scale of 1:25,000. Each provides a regional view, but neither is at a large enough scale, or is sufficiently detailed, for site-specific investigations.

[1] Leaman, D. E. (1972). Geological Atlas 1:50,000 Series. *Hobart*. Tasmania Department of Mines; and Hofto, P. J. (1990). *Engineering Geology Greater Hobart Area* (Map 1). Div. of Mines and Mineral Resources.

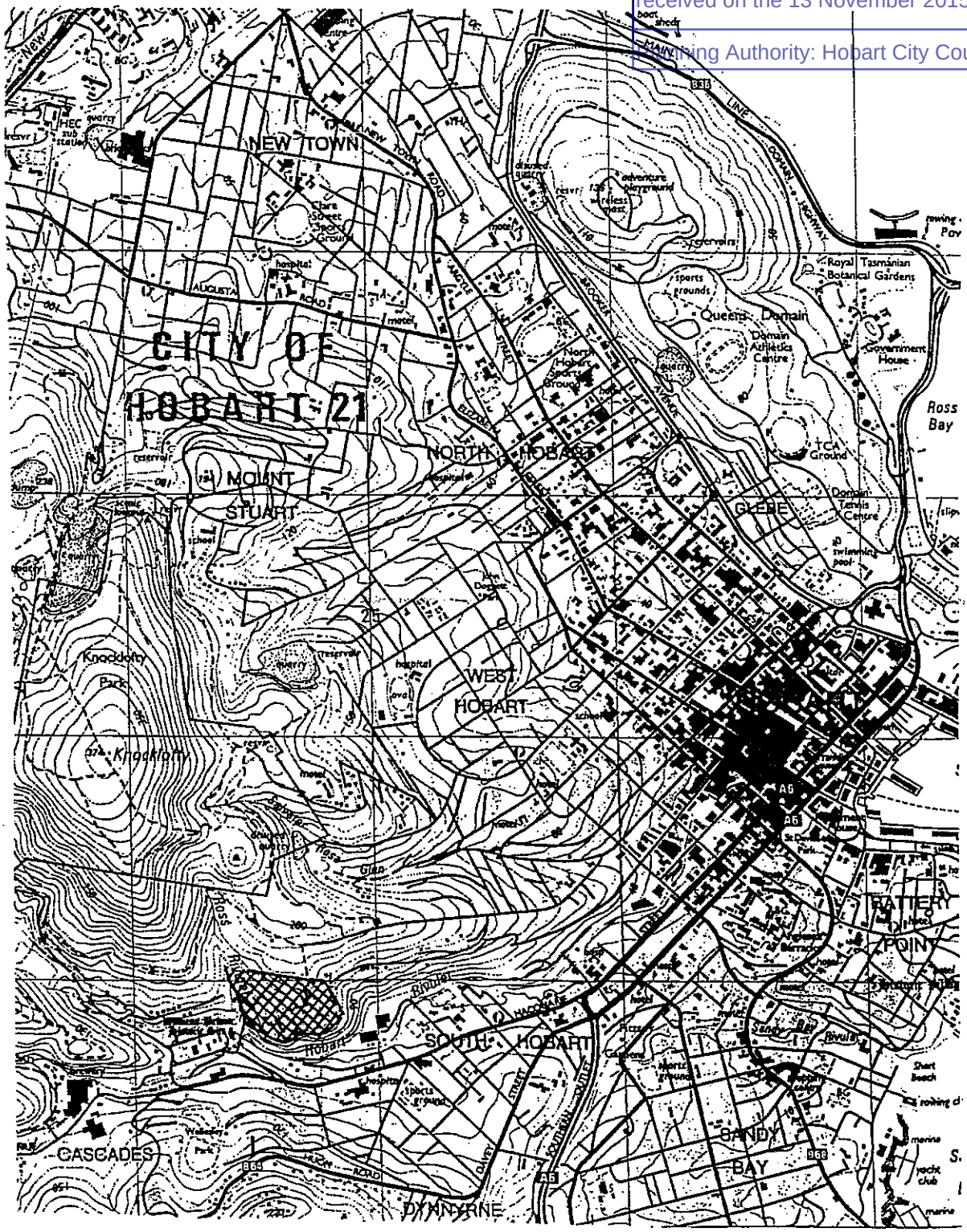


Figure 1. Location map of the proposal (1:25000), shown by the hatched area

1.2.2 Environmental & Technical Services Pty. Ltd (ETS)

We have produced several reports in the past few years relating to development and geotechnical conditions on Liverpool Crescent, to the east of Mr. Stevens' property. All of these were concerned with rock types which are different to, and absent from, the current proposal. Accordingly, they are not particularly relevant to the present investigations.

1.3 SCOPE AND LIMITATIONS OF CURRENT INVESTIGATIONS

The current investigations included:

- on-site discussions and inspections with the owner, and his surveyor and land planner,
- a review of available maps and reports pertaining to the area,
- an inspection of aerial photography of the property and environs, using photographs (or enlargements) taken in 1947, 1967, 1973, 1974, 1975, 1977, 1982, 1984, 1986, 1990, 1993 and 1995 (scales varied from 1:12,500 (1986) to 1: 700 (1982)),
- surface inspection and mapping of the topography, drainage, and exposed soils and bedrock of the property,
- surface inspection of the soils and geology of the surrounding area, in particular exposures at the western end of Liverpool Crescent, along Forest Road, and in Tara and Louden Streets,
- subsurface investigations comprising the digging, logging and photographing of 28 excavator test pits,
- a site inspection with a representative of the Division of Mines and Mineral Resources,
- collating and interpreting field data, including the compilation of a geotechnical fact map, and
- interpreting all available data to assess the general suitability of the area for possible residential development.

The property was briefly inspected on 8 June, 1995. Initial mapping was conducted on August 1, and test pits 1 to 17 were dug on 2 August, 1995. During subsequent discussions with the owner, and his surveyor and land planner, it was decided to expand the test pit coverage to further clarify subsurface conditions. Accordingly, the site was revisited on 22 August, 1995, when a further eleven pits were dug. Five of them were sited on an adjoining title, also owned by Mr. Stevens, but not the subject of the rezoning application. They are possibly to be incorporated in a future report unrelated to the current rezoning issue, and have therefore not been included in the present report.

With respect to the limitations of the investigations, geotechnical reports are inherently interpretative documents restrained to varying degrees by the type and amount of available data, and the experience of the investigator.

For the current report, subsurface information has been derived from existing exposures and test pits. Some of the exposures included several long excavations behind or near some of the poultry sheds, revealing soil and bedrock over a total length of 150 metres or more. These are equivalent to many test pits with respect to the information they provide.

Test pits were dug generally in areas where exposures were absent. We believe the number and location of pits are appropriate for the degree of detail required for the

current scope of work, and, combined with other exposures, are judged sufficient to adequately describe geotechnical site conditions and support our recommendations relating to the rezoning application and possible residential development. Nevertheless, it is unavoidable that inferences about subsurface conditions need to be made between data points. It is thus possible that where information is not available, conditions might differ from those expected, or observed elsewhere. In particular, although we have presented interpreted geotechnical boundaries as lines on maps, these must be regarded in most instances as approximate, inferred and gradational.

More comments on the limitations of geotechnical reports are included in Appendix 4.

1.4 PRESENTATION OF RESULTS

Most of this report is a description of features of the property relevant to an understanding of geotechnical issues, gained from field and office investigations. The latter portion is a discussion and interpretation of results, and recommendations arising from the interpretations.

Information collected from the investigations is also incorporated in the geotechnical fact map (Figure 2), and Appendices 2 and 3 which summarise the test pit information. Appendix 3 also contains photographs of various aspects of the property.

Conclusions and recommendations arising from the investigations are also summarised in the geotechnical interpretation map in Figure 3.

2. RESULTS

2.1 TOPOGRAPHY

The property (Figure 2) incorporates the crest and valley sides of a ridge extending downslope from Knocklofty past Forest Road to the southeast, south and southwest. The ridge terminates in a prominent sandstone cliff above the Hobart Rivulet (cover photograph). The western side is bounded by Ross Rivulet, which flows through a low break in the cliff line and joins Hobart Rivulet at Tara Street.

The land is mainly cleared to pasture, with small areas of eucalypts above an understorey of bracken fern (Plates 1 to 4 in Appendix 3). Some of the vegetation is regrowth following the 1967 Hobart bushfires.

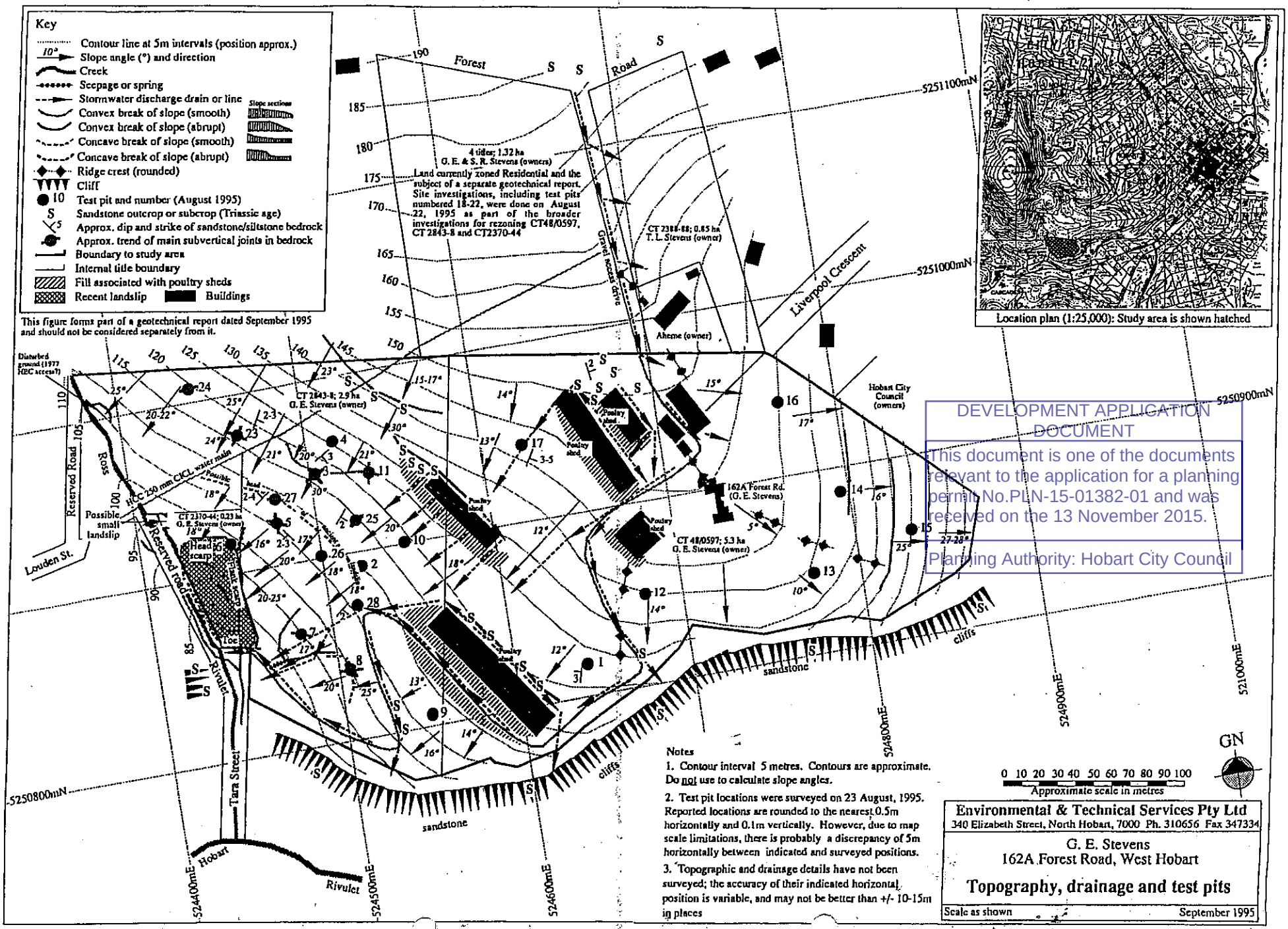
The topography is relatively elevated. In the lower southwestern corner, elevations are about 80 metres above sea level (ASL), rising northwards to about 150 metres ASL along the northern boundary. The average slope is therefore about 13°. However, local hillside slopes range from gentle to steep. The lowest slope angles (about 5°) are along the crest of the ridge. On most of the valley sides, angles range from about 10 to 15° on the eastern flanks and 15 to 20° on the western side. Some small slope segments exhibit angles around 25 to 30°.

Over the eastern two thirds of the property, hillsides are generally smooth, and show no significant slope disruptions other than those caused by previous fencing and access tracks.

The western third of the property faces southwest towards Ross Rivulet and the Tara Street access (Plates 3 and 4). It is essentially composed of two broadly concave slope segments which join along a subtle change of slope. On the higher ground uphill, slope angles are around 20° to 25°, and locally reach 30°. Downhill from the change of slope, angles are typically 16° to 20°. This feature, incorporating in particular the lower slope segment, is possibly the scar of an ancient landslip, and is discussed further in Section 2.5.1. The landslip referred to in Section 1.2.1, located in the lower southwestern corner, has occurred on slopes of about 18° (Plate 5). A smaller possible landslip is present just upslope from the main slip, in the western corner of CT 2370-44 (Plate 6). About a hundred metres upstream, on both sides of Ross Rivulet, there is disturbed ground possibly related to minor slope failure, although the owner reports that the site was used as an access point for plant and equipment to the nearby HEC transmission line.

Elsewhere on this western third of the property, there are some localised smaller-scale topographic irregularities (Plate 7) suggestive of soil creep or solifluction[2].

[2]Soil creep, solifluction and colluvial movements are common hillside processes, caused by gravity acting on slopes with weathered material. *Soil creep* is the almost imperceptible downslope movement of all or part of the soil profile, sometimes including the weathered bedrock beneath. It may produce small undulations and irregularities on the surface, and cause fences to lean and tree trunks to develop a knee or bend convex down the slope. *Solifluction* is another form of slow mass movement, where the weathered material is almost saturated with water. *Colluvium* is a deposit of accumulated debris on or at the base of slopes. It too may produce surface irregularities and bulges. There is a gradation between all three processes, mainly related to water content, and it may be difficult to distinguish between them In this report, for the sake of clarity, we have used the term 'soil creep' to mean either soil creep or solifluction or both, because in each case the soil profile appears to have been essentially unaltered. We use the term 'colluvium' separately because we believe we can distinguish such material from soil in the field, typically as a jumbled mass of boulders and smaller bedrock fragments in a friable, usually dry-moist finer-grained matrix.



Other slope disruptions in the same general area may be colluvial[2] in origin (Plate 8), but some are undoubtedly the result of human intervention, including track making, fence building, bulldozer access for an adjacent electrical transmission line, and the installation of a 250 mm water main by the City of Hobart. However, in some instances it is difficult to distinguish between natural and artificial slope disruptions.

2.2 DRAINAGE

2.2.1 Surface drainage

Ross Rivulet is the main drainage line in the immediate area, forming the western boundary to the property. An un-named depression east of the eastern boundary receives some runoff from the land, and also from slopes at the western end of Liverpool Crescent.

Within the property, there are no clearly-defined natural drainage channels. Instead, before development for farming, most runoff evidently discharged as overland flow over the cliff line, or to Ross Rivulet and the valley to the east.

Development has disrupted this pattern. Much of the runoff is now diverted to stormwater drains along internal access tracks. Some of it, however, is discharged in an uncontrolled manner from poultry sheds onto adjoining slopes, where it forms temporary drainage lines.

2.2.2 Subsurface drainage

Shallow subsurface drainage is related to natural infiltration of rain, and some is caused by stormwater discharge lines from tracks and poultry sheds. Test pit 28 intersected small amounts of free water at the base of the topsoil along one such line, which further downslope has produced seepages near the toe of the landslip in the southwestern corner.

Naturally occurring subsurface drainage was observed in test pit 23. Test pit 6, located at the head of the landslip and downslope from a small seepage, also intersected small amounts of free water.

It is possible that the 250 mm Council water main constructed through the property about 1973, or the trench containing it (Figure 2), is locally affecting subsurface water conditions near and downslope from it. The trench has the potential to act as a french drain collecting upslope runoff and seepage, and if so, the fractured nature of the bedrock (see below) might allow vertical infiltration of water which may surface downslope. It is also possible that the pipe itself might have leaked or is leaking. We point out that we have no direct evidence of leaks and the link, if any, between cause and effect may be very difficult to reasonably establish. We raise the possibility for future consideration if residential development proceeds.

2.3 GEOLOGY

2.3.1 General comments

According to the Hobart geological map sheet (referred to earlier) the entire property is underlain by interbedded sandstones, siltstones and related rocks of

Triassic age. Our investigations confirm this, and indicate that sandstone, fractured to varying degrees and locally cross-bedded, is the dominant rock type. Near the property, good exposures occur at the top end of Forest Road, in sandstone cliffs along Hobart Rivulet.

The regional dip of the Triassic rocks is shown on the geological map to be northwest at 10° on Louden Street, and 6° west on Forest Road. Within the property, we have measured lesser dips in the range 2 to 4° generally towards the southeast. It is typical of cross-bedded sandstones to exhibit variable dips over short distances.

East of the property, on Liverpool Crescent, the Triassic rocks are in contact with doleritic boulder beds of presumed Tertiary age, but these have no bearing on geological conditions on Mr. Stevens' property.

2.3.2 Bedrock geology

Sandstone bedrock[3] is exposed at several locations on or near the property. It forms the cliff line along the southern boundary near Hobart Rivulet, is exposed in low cliffs at the end of Tara Street, occurs in excavations behind or near several of the poultry sheds (Plates 9 and 10), and appears to crop out in scattered locations elsewhere.

Siltstone, which is locally interbedded with the sandstone, was not observed to crop out, probably because it is less common, and is more susceptible to weathering and erosion.

Evidence that sandstone is the dominant bedrock type beneath the property also comes from the test pit data (Table 1). Sandstone (usually not interbedded with siltstone) was intersected at shallow depth in all but two pits. Siltstone (with minor sandstone) was the dominant rock type in only three of these (Nos. 6, 25 and 26), suggesting that it is present as relatively thin horizons rather than thicker units.

The sandstone is typically fine grained and moderately weathered (harder varieties are only slightly weathered), and orange, orange-brown or light yellow. Usually it is moderately to strongly fractured, with mainly discontinuous, close-spaced, open, moderately rough subvertical joints. Where observable or measurable, the dominant joint directions tend to be southeast, east and northeast - roughly parallel to the varying lines of strike of the cliff line to the south. However, local joint directions are variable, and unpredictable between test pits.

The combination of jointing and bedding surfaces, and the moderate to steep slopes in the western third of the property, is to produce partly dislodged blocks of sandstone in the top half metre or so of the bedrock beneath the soil profile (Plate 9). In some test pits which were dug deep enough, it was observed that this effect tends to decrease with depth within the bedrock. Often, there is a vertically downwards gradation between soil or colluvium containing few sandstone fragments, to the same material with many rock fragments, into strongly fractured bedrock with soil or clay in the joint openings.

[3]Bedrock for the purposes of the present report is defined as sandstone and/or siltstone which is sufficiently unweathered so as not to exhibit soil properties (that is, it cannot be remoulded in the hand either in its natural state or by adding water). It therefore excludes all the soil profile, superficial colluvial material, and any separate or partly dislodged rock fragments of any size at any depth which are substantially enclosed by material with soil properties.

Table 1. Summary of test pit logs

Test pit	Depth dug (m)	Depth to bedrock (m)	Summary log of materials (depths in m)
1	0.8	0.7	0-0.5 sand (SP); 0.5-0.7 clayey sand, sandy clay (SC, CL); 0.7-0.8 sandstone
2	1.0	0.7	0-0.3 silty sand (SP, SM); 0.3-0.7 silty clay, clayey silt, silty sand (SM, CL, SP, SM); 0.7-1.0 sandstone
3	2.2	1.3	0-0.4 sand (SP); 0.4-1.2 gravelly sand with boulders (SP, GP); 1.2-2.2 sandstone
4	2.8	2.6	0-0.5 sand (SP); 0.5-2.6 gravelly silty sand with boulders (SP, SM, GM, CL); 2.6-2.8 sandstone
5	0.9	0.8	0-0.5 sand (SP); 0.5-0.8 sand, gravelly sand and boulders (SP, SM); 0.8-0.9 sandstone
6	5.0	1.1	0-0.9 sand (SP); 0.9-1.1 clay (CH); 1.1-4.0 sand, clayey sand, gravelly sand; 4.0-5.0 siltstone
7	1.1	0.9	0-0.7 sand (SP); 0.7-0.9 sand, clay, cobbles (GP); 0.9-1.1 sandstone
8	1.2	0.7	0-0.3 sand (SP); 0.3-0.7 silty sand (SP, SM, GP); 0.7-1.2 sandstone
9	1.7	1.5	0-0.6 sand (SP); 0.6-1.5 sandy silty clay and clayey silt (CL, CH, SM, SC); 1.5-1.7 sandstone
10	1.5	1.5	0-0.4 sand (SP); 0.4-0.8 clayey silty sand (SC); 0.8-1.5 gravelly clay (CL, CH)
11	1.3	1.1	0-0.4 sand (SP); 0.4-1.1 clayey silt (SM, CL); 1.1-1.3 sandstone
12	0.7	0.6	0-0.6 sand (SP); 0.6-0.7 sandstone
13	1.8	1.6	0-0.5 sand (SP); 0.5-0.8 silty sand (SP); 0.8-1.6 sand (SP); 1.6-1.8 sandstone
14	1.3	1.2	0-0.8 sand (SP); 0.8-1.2 clay (CH); 1.2-1.3 sandstone
15	2.5	2.4	0-1.1 sand (SP); 1.1-1.7 silty sand (SP); 1.7-2.4 clay and sandstone frags (CH); 2.4-2.5 sandstone
16	2.6	2.6	0-0.9 sand (SP); 0.9-1.3 silty sand (SP); 1.3-2.6 clay (CH, CL)
17	1.7	1.6	0-0.8 sand (SP); 0.8-1.6 sand and gravelly sand (SP, SC); 1.6-1.7 sandstone
23	2.2	1.1	0-0.3 sand (SP); 0.3-1.1 sand, silty sand (SP,SM, GM); 1.1-2.2 sandstone
24	1.8	1.0	0-0.3 sand (SP); 0.3-1.0gravelly sand, sand gravel (SP, GW); 1.0-1.8 sandstone
25	2.7	1.2	0-0.5 sand (SP); 0.5-1.2 sandy clay, sandy silty clay (CH, CL); 1.2-2.7 sandstone and siltstone
26	2.2	0.8	0-0.5 sand (SP); 0.5-0.8 clayey sand (SC); 0.8-2.2 siltstone and sandstone
27	2.1	0.7	0-0.3 sand (SP); 0.3-0.7 gravelly clayey sand, sandy clay (CL, SC); 0.7-2.1 sandstone
28	1.7	0.7	0-0.4 sand (SP); 0.4-0.7 sandy clay (CL, CH); 0.7-1.7 sandstone
Aver.	**1.9**	**1.2**	

Notes

1. Some soil units are variable in thickness
2. Underlined numbers in 'depth to bedrock' column indicate no bedrock to the indicated depth
3. 'Bedrock' is here defined as sandstone and/or siltstone which is sufficiently unweathered so as not to exhibit soil properties (ie the material cannot be remoulded in the hand with or without adding water). Bedrock therefore excludes the A and B soil horizons, and may or may not include the CB horizon. It excludes colluvial material, and separate or partly dislodged rock fragments of any size at any depth.

The siltstone encountered in some of the pits tends to be more weathered and more easily excavatable than the sandstone. It is typically finely laminated and cut by closer-spaced, discontinuous joints and partings along bedding surfaces.

On the western third of the property, a fairly consistent feature of the near-surface sandstone and siltstone is the presence of clay, sandy clay or clayey sand linings on many joint and bedding surfaces. These materials have apparently been deposited from soil seepage water percolating through the fractures, since they can occasionally be observed to fill wedge-shaped openings between dislodged blocks at or below the base of the soil profile, tapering into bedrock.

The clayier linings are interpreted as having implications for possible past instability, and current slope stability. Evidence from test pits suggests they are more common on the western third of the property and generally in the area inferred to be a possible ancient landslip. Clay linings were not observed in test pits 1, 9, and 12 to 16, and were only a minor feature of pits 8, 17, 24 and 27. Three of the last four are located on the periphery of the shallow valley covering most of CT 2843-8, and with the exception of pit 27 (near the centre of the valley) all the remainder are on the eastern two thirds of the property.

The clayier linings are usually moist or wet, and consist of dark grey high plasticity clay. Their thickness typically varies from less than one to ten millimetres. They tend to be discontinuous; most do not exceed the joint spacings in length (although they may be offset at joint intersections), and none was observed to extend the full length of test pits. However, several could be traced across the width of pits (about 0.8 metres) and occasionally along bedding surfaces or joints for up to a metre or so.

Clay linings on joints and bedding surfaces in sandstones are not confined to the study area. Similar features were observed in sandstones in outcrops along Forest Road, and also near the end of Salvator Road further north. In two to three metre high road cuts on Forest Road, their development is laterally irregular, and their occurrence and thickness appears to decrease with depth below a metre or so.

2.3.3 Colluvium

Material interpreted as colluvium (weathered detritus which accumulates on or at the base of slopes) was observed in test pits 3 (Plate 8), 4, 10 and 24, and possibly pit 6. There is no clear evidence that it is present in pit 6 (at the head of the landslip), although the hummocky ground immediately downslope is probably at least partly colluvial since colluvium is exposed in the road cutting at the toe of the slip.

The colluvium overlies sandstone or siltstone bedrock in all but one (No. 10) of the four or possibly five test pits in which it was exposed. In pit 10, the excavator was close to refusal at 1.5 metres in dense colluvium.

The detailed texture of the colluvium is not consistent between these pits. However, in all cases it comprises fragments, cobbles or boulders (collectively called 'clasts') of sandstone or siltstone, or both in varying proportions, in a matrix of sand, gravel, minor clay and silt. Textures include gravelly sand with 40-50% sandstone clasts in pit 3, gravelly silty sand with occasional sandstone clasts in pit 4, a gravelly clay with up to 90% sandstone and siltstone clasts in pit 10, and gravelly sand with a similar proportion of sandstone clasts in pit 24.

The colluvium was dry in pit 10, but moist to locally wet in the other three. Generally, its plasticity is low, reflecting the predominantly sandy topsoils of the property.

2.4 SOILS

2.4.1 General comments

The soils over the study area comprise duplex (two-layered), mainly residual[4] profiles on bedrock. with fairly consistent textures broadly typical of soils developed on Triassic rocks elsewhere in Tasmania.

The duplex profiles generally comprise A and B horizons (topsoil and subsoil), either resting directly on bedrock or overlying a zone of weathered rock (the CB horizon). Some profiles are not duplex but uniform in texture, where the subsoil appears to be missing or only poorly developed. In some cases, the sandy topsoil may have accumulated or been redistributed by wind transport.

The average depth of the soil profile (A+B horizons) is about 0.7 metres in the western third of the property, but significantly greater at 1.4 metres in the eastern third near pits 13-16.

Soils are described in detail in the test pit logs in Appendix 2.

2.4.2 Topsoil (A horizon)

The topsoil is typically loose, moist and friable, averaging 0.4 to 0.5 metres thick (range 0.3 to 0.7 metres) in the western part of the property, but one metre thick (range 0.5 to 1.7 metres) on the broad ridge to the east. It usually consists of a dark grey surface sand or silty sand about 0.2 metres thick (the A1 horizon) grading to a yellowish brown, grey brown or light grey sandy A2 horizon averaging 0.3 metres thick. Sandstone gravel and coarser fragments may be present, sometimes up to boulder size.

Sometimes, the A horizon rests on bedrock or colluvial material, and a B horizon is absent.

2.4.3 Subsoil (B horizon)

Where present, the subsoils over the property average about 0.3 metres thick (range 0.2 to 0.7 metres). They tend to be clay- or silt-enriched to varying degrees compared to the topsoils. Texturally they include non-plastic or low plasticity silty sand or clayey silt, and moderate to high plasticity silty clay or clay. Sandstone gravel, or fragments and boulders may be present.

2.4.4 Weathered bedrock (CB horizon)

In some test pits, weathered sandstone or siltstone exists beneath the B horizon. It is most easily recognised by its texture (mainly sand, silt or sandy silt) in conjunction

[4]Residual soils have developed mainly from the weathering of the rocks directly below them, with little or no contribution from materials further upslope.

with relict bedding and joints. In some cases (for example, in pit 6) it is difficult to distinguish from the B horizon, or colluvial material.

2.5 SLOPE INSTABILITY

2.5.1 General comments

As discussed in Section 2.1, there is surface evidence of slope instability on the western third of the property. This evidence takes the form of topographic or slope irregularities at various scales. Some of it is supported by observations in test pits and other exposures around the site.

On the larger scale, the slightly concave shape of the hillside over most of CT 2843-8 has the appearance of being formed by slope movements in the past. This mode of formation is probably shared by many other similar shaped hillsides in metropolitan Hobart.[5]

On the hillside are smaller-scale topographic irregularities. As discussed, some of these are man-made, and we have been able to distinguish most (but probably not all) of these from natural features by studying several sets of aerial photographs dating from the late 1940's.

Similar features above the same bedrock types have been observed along the hillside below Louden Street to the west, and we have noted a possible, fairly large landslip east of the property boundary at the western end of Liverpool Crescent. In both areas, residential development has encroached near or onto the inferred unstable ground.

On a smaller scale, the natural slope disruptions within the study area are several metres or tens of metres in surface extent, and from 0.5 metres to about 2 to 3 metres in vertical dimension. They have been interpreted as *soil creep* (bulges on soil-covered slopes caused by slow downslope movement of soil), *colluvial* movement (loose, mainly dry debris moving slowly downslope) and *landslips* (the relatively more rapid downslope movement of soil or debris, usually by sliding on low-strength material). The processes are facilitated by the presence of subsurface water, and their surface expressions may be difficult to distinguish from one another.

We observed no obvious surface evidence of instability on the eastern two thirds of the property.

2.5.2 Soil creep and colluvium

Probable soil creep was observed as low, subdued bulges (Plate 7) above the surrounding surface in several places on the western third of the property. Two of these, on slopes of about 17-18°, were further explored by test pitting (pits 2 and 7). It appeared that slow movement of the soil profile was or is occurring at a depth of about 0.7 metres on weathered bedrock (CB horizon) where relict joints and bedding planes contain moist clay linings.

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[5] It is important to note that the inferred former instability of these areas was probably related to climatic conditions different from those now prevailing. Contributory factors might have included abundant precipitation on sparsely vegetated slopes - conditions thought to have existed at low altitudes in a colder, wetter climate during or at the close of the last glacial epoch at least 12,000 to 15,000 years ago. Generally, such failed slopes probably now exhibit better stability since unstable material has moved downslope (thus flattening out the slope profile), and the now humid climate has produced a stabilising vegetation cover.

In pits 3 to 6, 8, and 23 to 28, all dug in the same general area, the CB horizon was not identified, and in all cases, soil creep appeared to be absent. The CB horizon (where it contains moist clay linings) is therefore implicated in soil creep. Other areas of soil creep upslope from pits 27 and 11, identified from surface expression but not tested by pitting, are possibly also underlain by similar materials.

Test pits 3, 4, 10 and 24 exposed materials inferred to be colluvial in origin. Pits 3 and 4 were dug below and on a fairly prominent surface bulge (Plate 8) extending perhaps 30 to 40 metres along the slope, with an elevation of up to several metres. Aerial photographs indicate that it was present before excavations for the nearby pipeline trench, and so is a natural feature.

The colluvium in pits 10 and 24 shows no obvious surface expression.

2.5.3 Recent landslips

A landslip (Plate 5) has occurred on the extreme lower corner of the study area, covering almost all of CT 2370-44 and extending eastwards onto part of CT 2843-8. Aerial photographs do not show obvious signs of slope movement in 1947 and 1967, but some surface irregularities (implying movement) had developed by 1973. The slip appears to be bulging over the nearby access track in the 1975, 1982 and 1984 photographs. A head scarp is visible in the 1984 photograph, and by 1986 the landslip appears to attained its present shape.

We infer from this evidence that while incipient movement may have occurred earlier, noticeable movement took place sometime between 1967 and 1973, that it probably continued until about 1986, and that little or no significant movement has occurred since.

Verbal reports from the owner and a neighbour support these tentative conclusions. They have indicated that movement definitely occurred after the 1967 bushfires (when a house on the site burned down), and probably in the early 1970's.

The area is currently grassed and shrubby, and supports a few moderately sized eucalypts, suggesting that the average rate of movement has been relatively slow.

The head and eastern flank of the landslip is an obvious, arcuate scarp in sandy soil, averaging about one metre high. The toe is a bulge of colluvial debris - mainly silty gravelly sand with some clay and many sandstone boulders - up to about three metres high along the nearby access track. Internal features include hummocky ground and small arcuate steps.

Test pit 6 was dug at the head of the slip, into and beneath the exposed scarp and for several metres downslope. The total depth was 5 metres from the top of the scarp. The pit was sited to investigate the nature of the materials immediately behind and within the failed material, and to attempt to identify the location and materials on which movement had taken place.

The pit revealed a one metre thick soil profile of sandy topsoil and clayey subsoil, which although dislocated and draped across the scarp, was otherwise continuous across it. The base of the soil was wet. Immediately beneath it was a moist, friable to medium dense zone of mixed sand, clayey sand and gravelly sand three metres thick. This layer contains sandstone fragments, and relict bedding and discontinuous fractures containing moist grey clay or sandy clay linings. However, there was no evidence of continuous clay linings which might have acted as a single failure surface. The bedding appears to dip at shallow angles north into the slope

behind. Very minor seepage issued from a depth of three metres. At the base of the unit is a thin horizon of fractured blocky sandstone.

This three metre thick unit is interpreted as weathered bedrock (the CB horizon).

The CB horizon overlies weathered siltstone bedrock, also containing clay linings on joints and bedding laminae. A seepage estimated at about 20 L/hour was issuing from a depth of 4.8 metres.

Landslip movement is inferred to have taken place throughout the mass of the CB unit, and possibly also the underlying siltstone, as numerous small slippages along bedding surfaces and joints, on lubricated clay linings. In this respect, the mechanism is similar to that suspected for the CB horizon in pits 2 and 7, where soil creep has occurred.

The cause of slipping on this 18° slope is very probably excess water entering the site. Observations which might help explain why this slope has recently failed (whereas nearby steeper ones have not) possibly include but may not be restricted to

- the thicker-than-normal CB horizon containing clay linings,
- disturbance related to the residential dwelling on the site for many years, including cut and fill, and possibly uncontrolled discharge of sewage, stormwater and garden water (aerial photographs show a small orchard upslope from the site),
- the burning down and demolition of the house in February 1967, possibly leaving leaking or running water pipes at a time when soil conditions were dry and cracked in places,
- the burning off of vegetation on the slope during the 1967 bushfires, and
- the installation of the council water main some forty metres upslope. As discussed in Section 2.2.2, there is no direct evidence that the trench promotes vertical, and then downslope, infiltration of seepages and runoff, or that the pipe itself is leaking. As far as has been ascertained so far, the date of its installation in 1973 may not be inconsistent with the onset of slippage.

There are two other small areas upstream from this landslip, on the eastern bank of Ross Rivulet, which might also be landslips. If so, they have probably failed due to erosion of their toes by the rivulet. The first is in the corner of CT 2370-44 and is evident in aerial photographs taken in 1967. The second, not obvious in photographs, is some 50 metres further upstream. This site was used by the HEC in 1977 as an access point to work on a nearby transmission line, and may be wholly artificial.

3. DISCUSSION

3.1 IDENTIFIED GEOTECHNICAL ISSUES RELATING TO REZONING

In relation to the rezoning application, we have identified slope stability on the western third of the property as the main geotechnical issue potentially affecting future residential development.

Other factors such as drainage and stormwater control, and foundation conditions for houses, are related issues which are able to be addressed within the broader aspect of slope stability.

The following Section outlines our approach to slope stability risk assessment, and presents our conclusions in relation to the present investigations.

3.2 SLOPE STABILITY

3.2.1 General comments

Significant factors which affect slope stability include slope angle, site geology and soils, the presence or absence of water, and the effects of human activities. Although risk generally increases with increasing water content and slope angle, assessing the relative influence of these and other factors is not easy, and estimating the risk of instability is necessarily subjective, to some degree.

The concept of geotechnical *risk* and risk *acceptability* is central to slope stability assessments. Risk of slope instability is always present, to varying degrees, on any sloping ground.

Our approach to slope stability risk assessment in this instance has focussed on field evidence. Essentially, it involved inspection of surface and subsurface ground conditions, supported by office interpretation[6].

3.2.2 Classification of risk of slope instability

We typically use a five-tiered classification of geotechnical risk based on easily observable field criteria, slightly modified from that listed in Appendix 4. The risk relates to the probability of damage to houses and other structures. The risk categories are:

- *Very low risk*, on areas of shallow soils and flat or very gently sloping topography,

[6]Laboratory testing was not attempted of the clay linings (the material of most interest for slope stability analysis) in weathered bedrock. There are two reasons for this. First, within the degree of accuracy required for analysis it is possible to estimate their material characteristics from previous experience in similar materials. Second, it was difficult to sample enough representative material from any single site. With respect to slope stability analysis, we are wary in this instance of placing too great an emphasis on this tool. Most methods available require an assumption of a continuous failure surface, which is not supported by our site investigations.

- *Low risk*, on areas of flat or sloping ground with no evidence of instability,
- *Medium risk*, on steep soil-covered slopes or where there is evidence of possible soil creep,
- *High risk*, on slopes of any angle with active soil creep and/or minor slips, or rockface instability, or evidence of possible past landslips, and
- *Very high risk*, on slopes of any angle with evidence of active or recognisable past landslips, or rockface failure.

Field observations might indicate that some sites or areas are more appropriately described by a combination of two categories (e.g. *medium - high*) to better reflect the perceived risk.

The very high risk category essentially corresponds to the proscriptive zone designated as landslip 'A' under Division 6 of the *Local Government (Building and Miscellaneous Provisions) Act* 1993, and Division 3 of the Building Regulations (1994). Such a zone is regarded as having inherent instability, where actual slipping has occurred[7]. Under the Act, building is largely prohibited in landslip 'A' zones. Our very high risk category implies no such legal conditions, and in that sense is less restrictive than the landslip 'A' zone.

Our high risk category may incorporate the landslip 'B' zone of the Act. 'B' zones usually (but not always) envelop 'A' zones, and exhibit similar topographic and geological features but no clear evidence of landslips. Risk is lower in 'B' zones, and they are suitable for building subject to development practices appropriate for the site conditions.

The development[8] implications in relation to slope stability for each risk category have been adopted as follows:

- *Very low risk*: No restrictions are needed; good geotechnical engineering practices[9] are required.
- *Low risk*: No restrictions are needed; good geotechnical engineering practices suitable for hillsides are required.
- *Medium risk*: Restrictions may be needed; good geotechnical engineering practices suitable for hillsides are required.

[7]The landslip 'A' zone, and in this case also our very high risk category, is defined as encompassing the actual area within an identifiable landslip, and a buffer zone surrounding it. The buffer may be of any width, appropriate to site conditions. It recognises that the boundary to a landslip may be broader and more gradational than evidence suggests, that areas immediately adjacent to failed land are sometimes in stress due to shearing and a reduction in support, and that the size of the landslip might therefore increase with time unless adequately controlled.

[8]In this report 'development' means residential building and related subdivisional works such as roads, trenches and underground services.

[9]Good geotechnical engineering practices, particularly on hillsides, are those development or management activities which have due regard to the site and environs, and the subsurface materials beneath, and not simply to the structures which may be imposed upon it. Their general aim is to maintain or improve existing site conditions so as to minimise the risk of structural or environmental nuisance or damage. They include but are not necessarily restricted to planning, house design, site clearing, access and earthworks generally, retaining walls, foundations, drainage and landscaping. These and other practices, as well as those considered to be poor practices, are listed and described in Appendix 4., where they are simply termed 'engineering practices'. We prefer to add the descriptor 'geotechnical' to emphasise the importance of subsurface conditions.

- *High risk*: Development restrictions and/or geotechnical engineering works are required.
- *Very high risk*: Unsuitable for development unless major geotechnical engineering works are done.

In terms of acceptability of the assessed geotechnical risk after development, we grade the categories as follows:

- *Very low risk*: Acceptable
- *Low risk*: Acceptable
- *Medium risk*: No higher than usually accepted
- *High risk*: May be higher than usually accepted depending on extent of restrictions and any geotechnical engineering works required, and
- *Very high risk*: Likely to be unacceptable

3.2.3 Classification of risk on the property

Figure 3 summarises the risk of slope instability on the property. This map shows five categories of risk - *very high, high, medium - high, medium* and *low* - based on our interpretation of surface topography, and in accordance with the classification scheme described above. The different risks relate to the differing probability of structural damage to residential dwellings under *current* site conditions, and also *after* development provided good geotechnical engineering practices are followed.[10] No *very low risk* category is recognised because no part of the area is flat or very gently sloping.

Surface factors considered in classifying the risk categories include slope angle, and topographic irregularities of various scales interpreted as the result of downslope movement, including the known landslip.

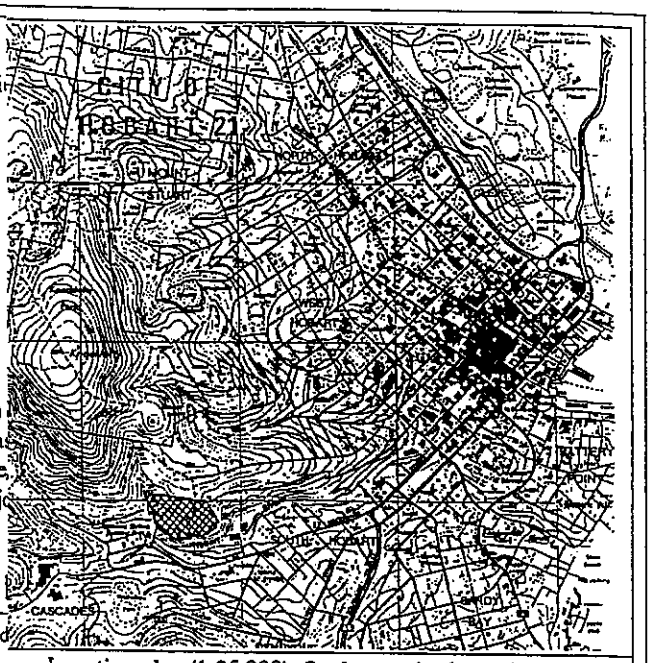
Supportive and independent evidence for adopting the four categories has been derived from examination of soil and rock exposures over the site, and from the 23 test pits dug. The *subsurface* observations we have used to help distinguish between risk categories include: the depth to bedrock, the relative degree of development of clay-lined joints and bedding surfaces, the presence or absence of the CB horizon (weathered bedrock), the moisture content of the materials, and the presence or absence of material inferred to be colluvial.

Classed as *very high risk* are the present landslip, the nearby smaller inferred landslip, a small area of disturbed ground further upstream, and a buffer zone of varying width around all of these (which reflects the changing topography, drainage, soils and geology).

A small area surrounding pits 3 and 4 is classed as *high risk* because of the distinct topographic irregularity on 30° slopes, and the presence of underlying material interpreted as colluvium.

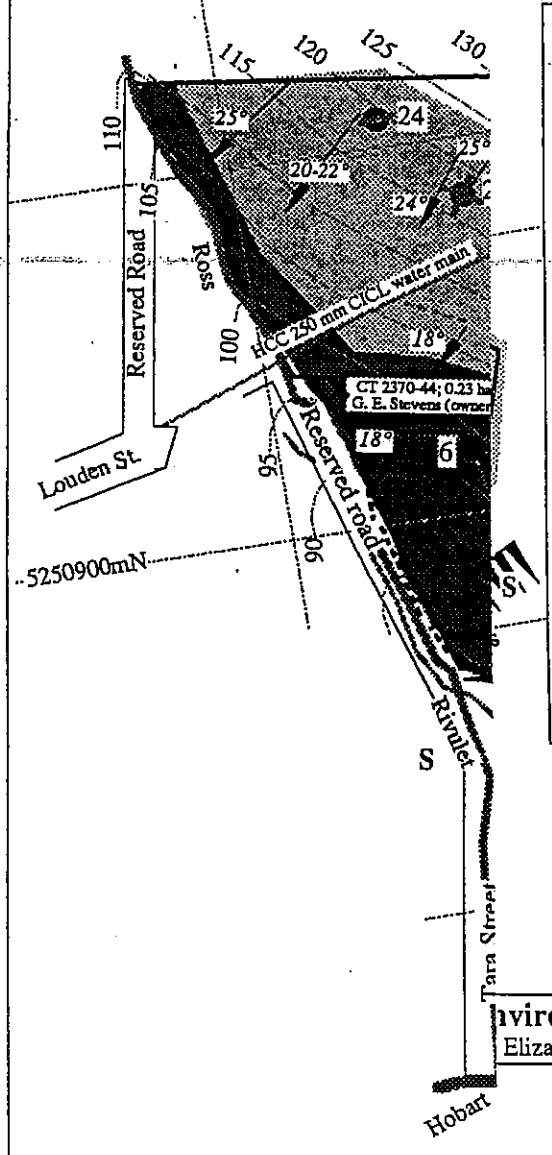
[10] The slope stability of an area can be enhanced by good geotechnical engineering practices.

Key
- Contour line at 5m intervals (positi
- 10° Slope angle (°) and direction
- Creek
- Seepage or spring
- Stormwater discharge drain or line
- Convex break of slope (smooth)
- Convex break of slope (abrupt)
- Concave break of slope (smooth)
- Concave break of slope (abrupt)
- Ridge crest (rounded)
- Cliff
- 10 Test pit and number (August 1995)
- S Sandstone outcrop or subcrop (Tria
- 5 Approx. dip and strike of sandstone
- Approx. trend of main subvertical j
- Boundary to study area
- Internal title boundary
- Fill associated with poultry sheds



Location plan (1:25,000): Study area is shown hatched

This figure forms part of a geotechnical report dated and should not be considered separately from it.



Key to interpreted geotechnical risk for residential development

- Very high risk. Includes recent landslip and buffer. No development recommended
- High risk. No development recommended unless detailed geotechnical works can make risk acceptable.
- Medium-High risk. Low density residential development recommended; good geotechnical engineering practices must be employed.
- Medium risk. Development recommended without restrictions except those relating to good hillside practices
- Low risk. Development recommended without restrictions except those relating to good hillside practices

Note. Risk categories and qualifications are discussed in the report accompanying this interpretation map. Factors considered in assessment include geology, soils, slope angle and drainage, before and after development.

Boundaries to risk areas are interpretative and approximate

GN

0 10 20 30 40 50 60 70 80 90 100
Approximate scale in metres

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Geotechnical interpretation map

as shown September 1995

Environmental & Technical Services Pty. Ltd. echnical interpretation map of the property (1:2000)

An arcuate area upslope from and partly surrounding the very high risk zone is classed as *medium - high risk* because of the moderate to steep (18° to 30°) soil-covered slopes, the localised presence of soil creep and colluvium, the broadly concave topography suggestive of past slope movements, and (from test pit evidence) the relatively more common occurrence of clay-lined fractures in the CB horizon and upper part of the underlying bedrock than in areas upslope to the east and north. We class as *medium* risk a small area on steep soil-covered slopes in the lower eastern corner of the property, where clear evidence of slope instability is not apparent.

All other parts of the property are regarded as of *low risk*, because we have observed no obvious surface evidence of slope instability, and (in test pits) noted either the absence or relatively minor occurrence of clay-lined fractures in the CB horizon or bedrock. Some local slopes in this area are steep, but generally smooth, and there is evidence of bedrock close to the surface.

We stress that the boundaries to these areas are approximate and inferred.

3.3 FOUNDATION CONDITIONS FOR RESIDENTIAL DEVELOPMENT

The City of Hobart will require that, on a lot-by-lot basis, each future house site on the property be classified in terms of AS2870 (Residential Slabs and Footings) prior to building approval. This provides an opportunity to add important subsurface information to that presented here, and perhaps to modify interpretation details.

It is critical that those engaged in future site classification are aware of, and have reviewed, this report.

4. RECOMMENDATIONS

Our principal recommendation is that the application for rezoning of the property to *Residential 2* should be approved from a geotechnical viewpoint. This recommendation is made subject to the following restrictions, consistent with the development implications listed for the various risk categories in Section 3.2.2:

- No development should occur in the *very high risk* area. However, subdivisional access may be constructed past the toe of the existing landslip provided adequate, engineered, drained retaining structures are in place, and remedial drainage works are employed in and above the landslip.

- No development should occur in the *high risk* area unless more detailed geotechnical investigations show that with appropriate geotechnical works the risk to development can be made acceptable.

- A limitation should be placed on the number of houses in the *medium - high risk* area. We suggest these houses be spaced out across the area at not more than one dwelling per 0.3 to 0.4 ha. Good general and site-specific geotechnical engineering practices must be followed, particularly in relation to drainage and stormwater control, and retaining walls. Investigations for AS2870 site classifications will need to incorporate appropriate subsurface work to clarify potentially changing conditions. In particular, we suggest that footings will need to be founded not in soil or on bedrock, but at least 0.5 metres, and preferably one metre, into bedrock, to reduce the potential to dislodge joint blocks bounded by clay linings.

- Unrestricted residential development should be permitted in the areas shown as *medium risk* and *low risk*. However, since these include slopes of varying degrees, it is recommended that good geotechnical engineering practices be followed.

The details required for good engineering practices will depend on the locations of lot boundaries, the overall housing density of adjacent areas, access roads and drives and locations of service trenches, and can be refined at a later stage of planning. However, they should in general encompass the practices listed in Appendix 4, with particular attention paid to the appropriate control of stormwater.

It is important to place the risk classifications, and the site restrictions we pose for some of them, in context. In our view, there are probably numerous developed and undeveloped areas of metropolitan Hobart, particularly on the western side of the Derwent River, which under our classification scheme would rank as medium to high risk from a slope stability viewpoint.

Finally, should residential development proceed, we strongly recommend that this report be made available, in full, to all interested parties. In particular, we are concerned that AS2870 classifiers are made aware of its existence, and have the opportunity to view it.

APPENDIX 1.

Copy of the 1990 report on CT 2370-44 and adjacent land, by the Division of Mines and Mineral Resources

TASMANIA

Department of Resources & Energy

DIVISION OF MINES & MINERAL RESOURCES

PO Box 56
ROSNY PARK
Tasmania 7018
Hobart Hill Road
ROSNY PARK
Ph (002) 30 8333
Fax (002) 44 2117

Enquiries: B.D. Weldon
Phone: 30 8325
Your ref:
Our file: BDW34.90:AT

G Stevens
162A Forest Rd
WEST HOBART TAS 7004

Dear Sir

4 TARA STREET - PROPOSED SUBDIVISION

Further to your telephone conversation with Mr Weldon on 28th September 1990, the following report is provided.

The area is mapped by Leaman (1972) as Triassic age quartz sandstone with minor mudstone. A cliff of sandstone occurs on the southern boundary east of Tara Street. Massive quartz sandstone outcrops elsewhere on the property.

The soil cover is mostly sand with some clay. The soil cover is not expected to be thick and in situ rock should be found at relatively shallow depth on the majority of the property. Mr Stevens reported that fence post holes usually encounter rock at shallow depth.

A landslide has occurred near the Tara Street frontage. Here the soil cover is much thicker. This may be associated with undercutting of the sandstone cliff. Thicker accumulations of materials eroded from upslope are also expected at the base of slopes. Without further detailed investigations, the landslide prevents building in the area delineated on the accompanying plan. The north eastern boundary of the delineated area roughly corresponds to a subtle change in slope. This change is thought to indicate a variation in the subsurface conditions.

Access to lot 1 should be off the reserved road which is located at the end of Tara Street. This will not require road or track making on the landslide mass or immediately adjacent to it. Access to the balance of CT 2843-8 is already provided by a track. This track undercuts the toe of the landslide and further cutting into the bank should be avoided. If development of the balance of CT 2843-8 proceeds, it is recommended that the existing cut batter slope of the track be retained by a structure designed by a competent geotechnical engineer.

Household sullage, stormwater and septic effluents should not be allowed to discharge onto the slope immediately in front of any residence constructed on the lots. These waters should be piped across the slope and discharged in an area away to the side of the residence.

Yours faithfully

M.R. Hargreaves
ACTING DIRECTOR OF MINES

LAUNCESTON SMITHTON

PEACOCK, DARCEY & ANDERSON PTY LTD
AUTHORISED SURVEYORS

HOBART 7000
TELEPHONE (002) 34 3717
FAX NO. (002) 34 5085

SURVEYORS

PROPOSED SUBDIVISION

G.E. STEVENS
of C.T. 2843-8, C.T. 2370-44
Proposed Easements AS REQUIRED

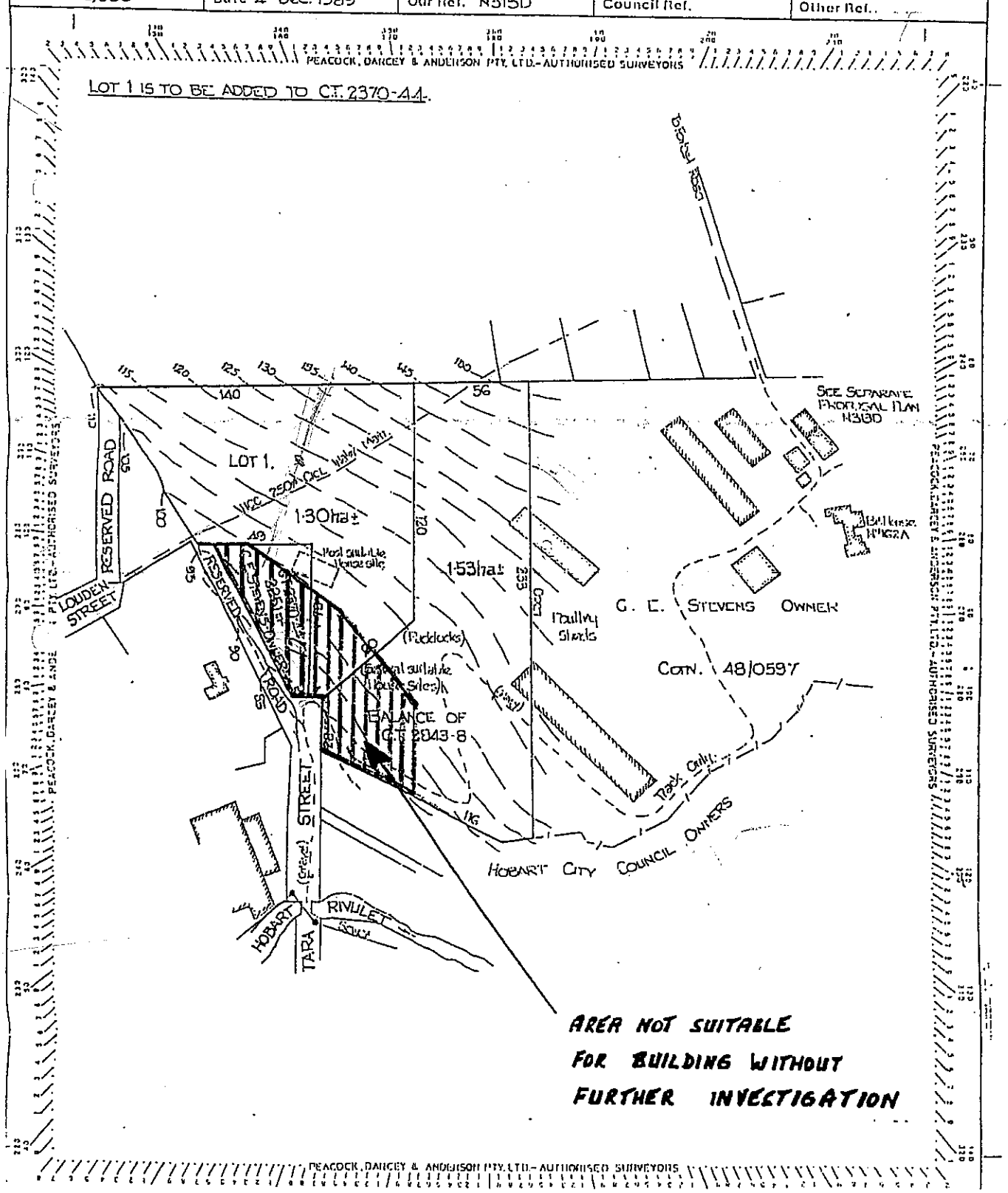
Location 4 TARA STREET, SOUTH HOBART
Municipality CITY OF HOBART
Grantee LOT 2 & LOT 3 H. NEWMAN

This plan has been prepared only for the purpose of obtaining preliminary Subdivision approval from the Local Authority and the information shown hereon should be used for no other purpose
All measurements and areas are subject to final survey.

Scale 1:2,000 | Date 4th Dec. 1989 | Our Ref. N315D | Council Ref. | Other Ref.

PEACOCK, DARCEY & ANDERSON PTY. LTD.–AUTHORISED SURVEYORS

LOT 1 IS TO BE ADDED TO C.T. 2370-44.



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APPENDIX 2.

Engineering logs of test pits.

Test pits 1 to 17 were dug on August 2, 1995. Test pits 18 to 28 were dug on August 22, 1995. Pits 18 to 22 have been omitted since they were located on adjoining land not the subject of the current rezoning application.

The cross section of the test pit shown at the bottom of each page is an attempt to show the relationships between the various soil and rock units, but it should be regarded as schematic and not necessarily an accurate representation.

Environmental & Technical Services Pty. Ltd.
340 Elizabeth Street, Hobart, Tasmania, 7000 Phone 002 310656

Excavation no. 1
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

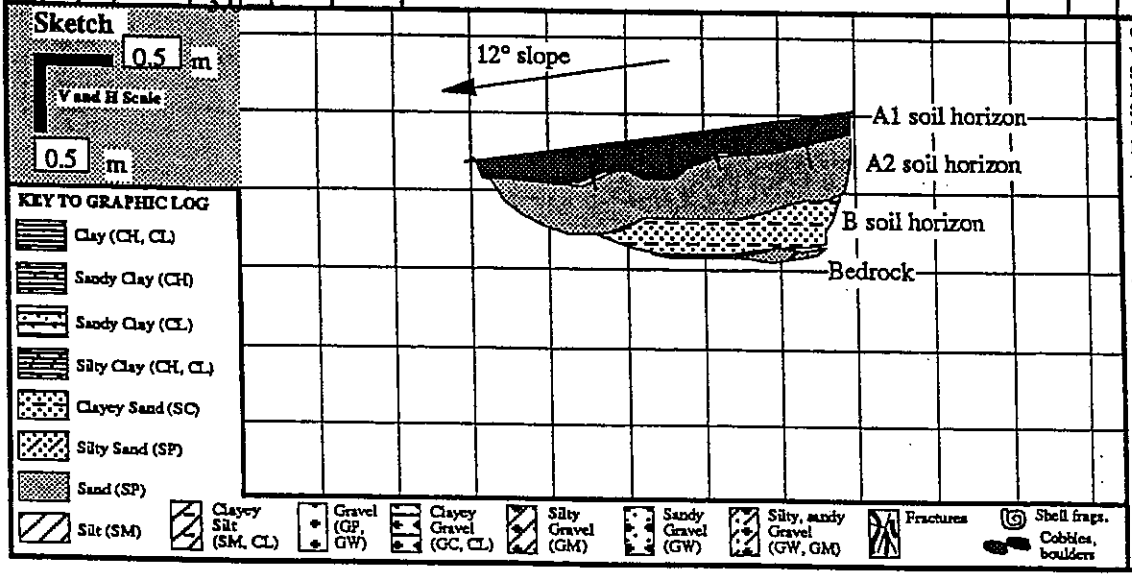
Coordinates AMG 524642mE; 5250815mN
R.L. 125.3mAHD
Excavation dimensions (m)
Depth 0.8
Length 2.5
Width 0.8

Exposure type Test pit
Equipment Hitachi 7 tonne excavator; 600mm bucket, 4 teeth
Operator James Jacobson (P. Sutcliffe-contractor)

Pit started August 2, 1995
Pit finished August 2, 1995
Logged by W. C. Cromer
Checked by W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa 100 200 400	Structure, geology or interpretation
	None needed	GNE	None taken		0.0		SP	SAND: dark grey; fine-med. grained; trace silt; many roots	M	L		A1 soil horizon
							SP	SAND: yellowish brown; fine-med. grained; trace clay and silt, and occasional angular sandstone fragments to 50mm near base	M	MD		A2 soil horizon
					0.5		SC CL	Clayey SAND and sandy CLAY: olive yellow; lowplasticity; clay content variable	M	MD -D		B soil horizon
								SANDSTONE: orange grey; MW; mod. fractured				Bedrock
					1.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 0.8m				App. dip 2-3° to 220°M
					1.5							
					2.0							
					2.5							
					3.0							

Sketch



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
No Resistance
Refusal

Environmental & Technical Services Pty. Ltd.
340 Elizabeth Street, Hobart, Tasmania, 7000 Phone 002 310656

Excavation no. 2
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524522mE; 5250894mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 107.4mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

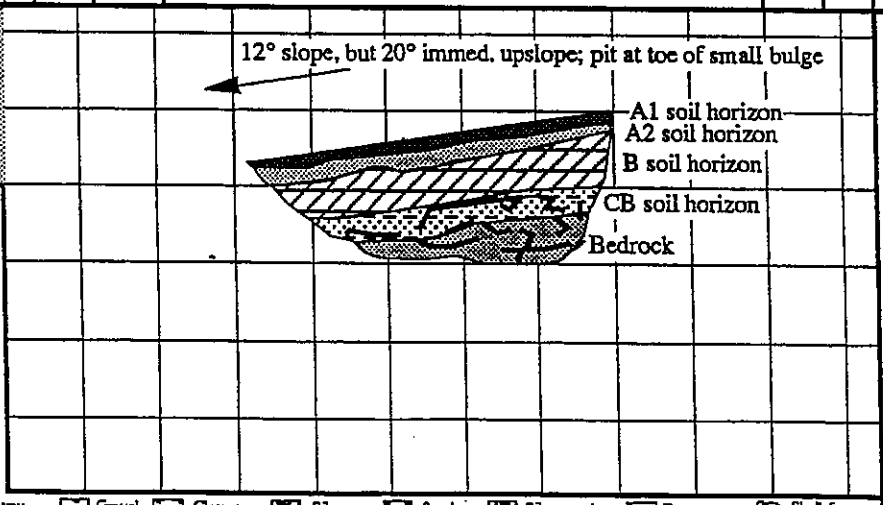
Excavation dimensions (m)
Depth 1.0
Length 2.5
Width 0.8

Logged by W. C. Cromer
Operator James Jacobson (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (Soil type, colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa 100 200 300	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP/SM	Silty SAND and sandy SILT: dark grey to brown; fine-med. grained; many roots	M-W	L		A1 soil horizon
									M	MD		A2 soil horizon
							SP/SM	Silty SAND: light brown; fine-med. grained; gravelly, with well-graded angular sandstone fragments to 25mm; gradational base	D-M	VSt		B soil horizon
							SM, CL loc SP	Silty CLAY and clayey SILT: yellowish brown; blocky coarse pedality; variable texture; low plasticity	M	Fb -St		CB soil horizon
					1.0		SP SM loc. CH	Silty SAND: orange brown and light yell. brown; trace-some clay; with irregularly orientated (sub-vert. to sub-horiz) infill seams of dark grey CH clay (M>PL) at spacings of c.50mm				Bedrock
					1.5			SANDSTONE: light olive green and yellowish orange; SW-MW; subhorizontally bedded; strongly and irreg. fractured at top, with discontinuous, irregularly orientated close-spaced mod. smooth joints lined with dark grey CH clay (M>PL) locally up to 2 cm thick; some inclined down slope and subparallel to bedding				
					2.0							
					2.5			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.0 m				
					3.0							

Sketch

0.5 m V and H Scale 0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

Environmental & Technical Services Pty. Ltd.
340 Elizabeth Street, Hobart, Tasmania, 7000 Phone 002 310656

Excavation no. 3
Sheet 1 of 1

Engineering Log — Excavation

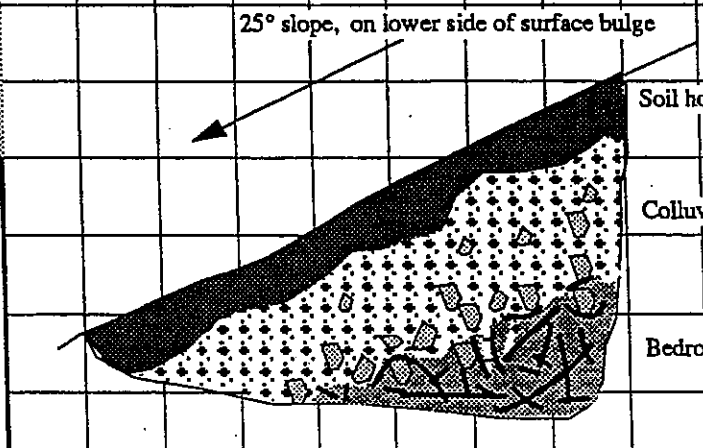
Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524504mE; 5250954mN **Exposure type** Test pit **Pit started** August 2, 1995
R.L. 114.5mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995
Excavation dimensions (m) **Logged by** W. C. Cromer
Depth 2.2 **Checked by** W. C. Cromer
Length 3.5 **Operator** James Jacobson (P. Sutcliffe-contractor)
Width 0.8

Penetration	Support	Water	notes / sample / tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (Soil type: colour; plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency / density index	hand penetrometer kPa (100, 200, 400)	Structure, geology or interpretation
	None needed	GNE	None taken				SP	SAND: dark grey; fine-med. grained; trace silt; many roots	M	L		Soil horizon
					0.5		SP GP	Gravelly SAND: light yellowish brown; unit is of irregular thickness (1-1.4m), consisting of 40-50% (loc. 90%) of angular yellow brown sandstone gravel, cobbles and boulders in matrix of fine-medium yellow-brown sand with trace silt; platy alignment of clasts near base, with local accumulation of brown moist to wet clay and gravelly clay (CL, CH) at base	M-W M	VL -L		Colluvium
					1.0 1.5 2.0			SANDSTONE: mainly orange-yellow; SW-MW; strongly fractured, with mostly iregularly orientated, discontinuous close-spaced mod. smooth joints lined with grey wet CH clay to1-2mm thick; some joint blocks dislodged at top 0.5m, with wedge-shaped brown sand and gravelly (GC, CH) clay infills up to 150mm wide tapering with depth				Bedrock Dip is 2-3° to 130°M; Main subvertical joint directions are 050°M and 140°M
					2.5 3.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 2.2 m				

Sketch

0.5 m
V and H Scale
0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags. Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
No Resistance
Refusal

Environmental & Technical Services Pty. Ltd.
340 Elizabeth Street, Hobart, Tasmania, 7000 Phone 002 310656

Excavation no. 4
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524516mE; 5250969mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 123.4mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

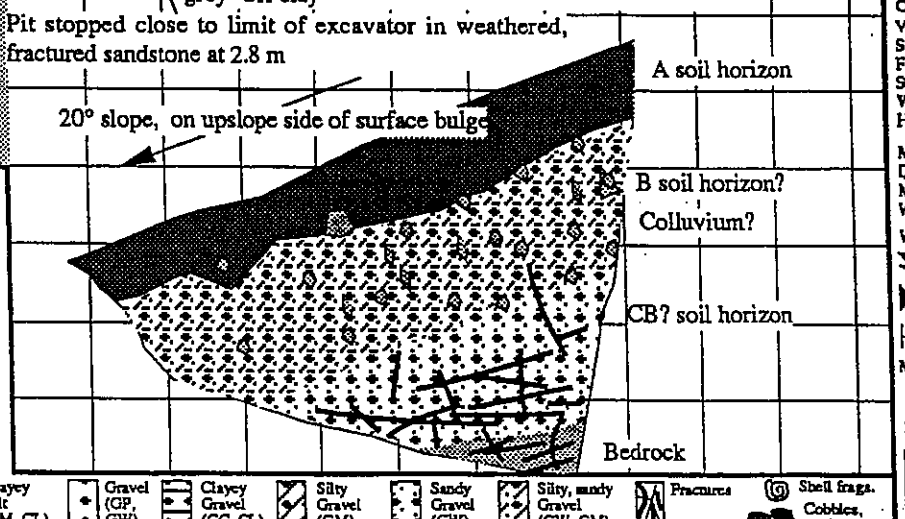
Excavation dimensions (m)
Depth 2.8
Length 3.5
Width 0.8

Logged by W. C. Cromer
Operator James Jacobson (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials: Soil type - colour, plasticity or particle characteristics, secondary and minor components	moisture condition	consistency density index	hand penetrometer kPa 100 200 300 400	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to light grey-brown below 0.3m; fine-med. grained; trace silt; irreg. thicness 0.5-0.8m; occas. subrounded sandstone pebbles; many roots	M	L		A1 soil horizon A2 soil horizon
					1.0		SP SM GM CL	Gravelly silty SAND: dark brownish yellow; locally sand or clayey sand; fine-medium grained;; strongly and irregularly fractured; irregular thickness; occas. sandstone fragments; clay content increases to base (locally CH)	M M> PL	D St- VSt		B soil horizon? Colluvium?
					1.5		SP GP	SAND and gravelly SAND: variably orange yellow, with grey CH clay lining in discontinuous irregularly orientated closely spaced defects (relict joints?)	M	D		CB? soil horizon
					2.5			SANDSTONE: orange-brown; EW; subhorizontal; strongly fractured, with close-spaced, irregularly orientated, mod. smooth joints lined in most cases with grey CH clay				Bedrock? Dip and joint orientations not measured pit unsafe and not entered.
					3.0							

Sketch

0.5 m
V and H Scale
0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
No Resistance
Refusal

Environmental & Technical Services Pty. Ltd.
340 Elizabeth Street, Hobart, Tasmania, 7000 Phone 002 310656

Excavation no. 5
Sheet 1 of 1

Engineering Log — Excavation

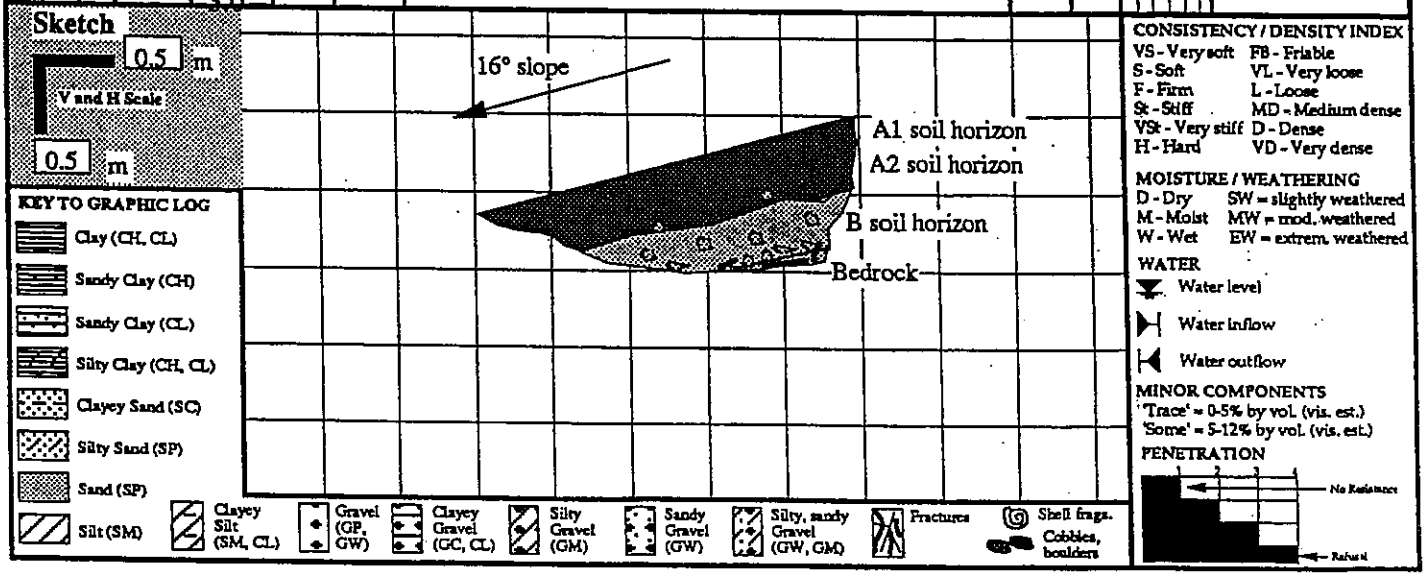
Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524479mE; 5250922mN
R.L. 102.2mAHD
Excavation dimensions (m)
Depth 0.9
Length 2.5
Width 0.8

Exposure type Test pit
Equipment Hitachi 7 tonne excavator; 600mm bucket, 4 teeth
Operator James Jacobson (P. Sutcliffe-contractor)

Pit started August 2, 1995
Pit finished August 2, 1995
Logged by W. C. Cromer
Checked by W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to light grey below 0.3m; fine-med. grained; trace silt; many roots; irregular thickness; occas. sandstone pebbles to 20mm	M-W	L		A1 soil horizon A2 soil horizon
							SC GM	SAND: yellowish brown and orange; fine-med. grained; trace clay and silt; gravelly at base with up to 75% well-graded angular sandstone fragments to 150mm; some grey CH clay on defects (relict joints?)	M	L-MD		B soil horizon
					1.0							Bedrock
					1.5			SANDSTONE: orange brown and olive grey; subhorizontal; MW; mod. fractured, with discontinuous, grey CH clay (M>PL) linings on bedding planes and mod. smooth-mod rough irregularly orientated joints				Dip 2-3° to 200°M; Main subvertical joints trend 280°M, 340°M
					2.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 0.9m				
					2.5							
					3.0							



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340 Elizabeth Street, Hobart, Tasmania, 7000 Phone 002 310656

Excavation no. 6
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

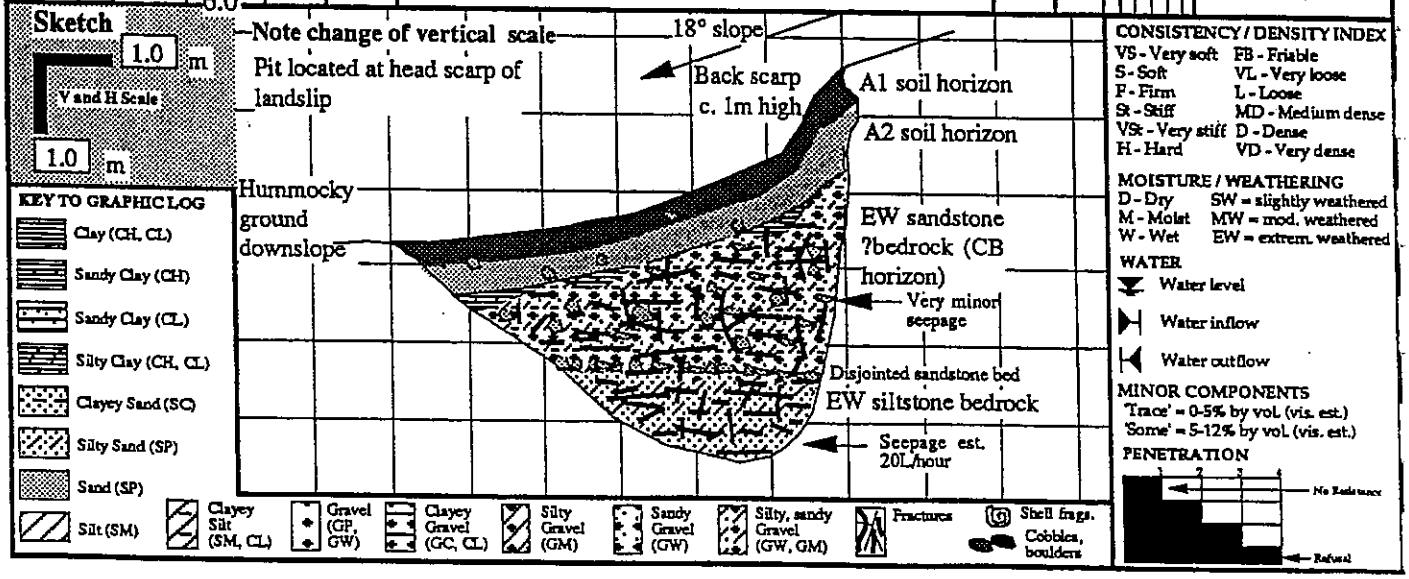
Coordinates AMG 524453mE; 5250912mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 93.1 mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

Excavation dimensions (m)
Depth 5.0
Length 4.0
Width 2.5

Logged by W. C. Cromer
Operator James Jacobson (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (soil type, colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed		None taken				SP	SAND: dark grey grading to light grey below 0.5m; fine-med. grained; trace silt; many roots; irregular thickness; occas. sandstone fragments to 150mm	D	L		A1 soil horizon A2 soil horizon
					1.0		CH	CLAY: mottled orange brown and grey blue; locally sandy; discontinuous; high plasticity	W	St		B soil horizon
					2.0		Var .SP SC GW GC CL CH SM	SAND, clayey SAND and gravelly SAND: mainly orange with dark grey streaks and patches; variable texture (clayier at top); occas. roots; trace-some silt; fractured, with relict bedding and EW sandstone fragments; fracturing irregular, discontinuous, close-spaced; bedding subhorizontal, and probably dipping N into slope; relict joint surfaces mod. smooth to mod. rough, commonly lined with grey sandy clay (CH, M>PL) 1-5mm thick; also some larger irregular patches of grey CH clay. Local very minor seepage at 3m. Disjointed, fractured harder sandstone horizon at base	M	Fb-MD		EW sandstone ?bedrock (CB horizon)
			Very minor		3.0							
			Est. 20L/hr		4.0			SILTSTONE: olive yellow, orange and dark grey; EW; some sand; finely laminated, irregularly fractured, with discontinuous, grey CH clay (M>PL) linings on laminae and mod. smooth-mod rough joints. Seepage near base.	M-W	D		EW siltstone bedrock
					5.0			Pit stopped close to excavator refusal in weathered, fractured siltstone at 5.0m below top of head scarp. No continuous slippage surface apparent.				
					6.0							



Environmental & Technical Services Pty. Ltd.
340 Elizabeth Street, Hobart, Tasmania, 7000 Phone (02) 310656

Excavation no. 7
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524484mE; 5250865mN **Exposure type** Test pit **Pit started** August 2, 1995

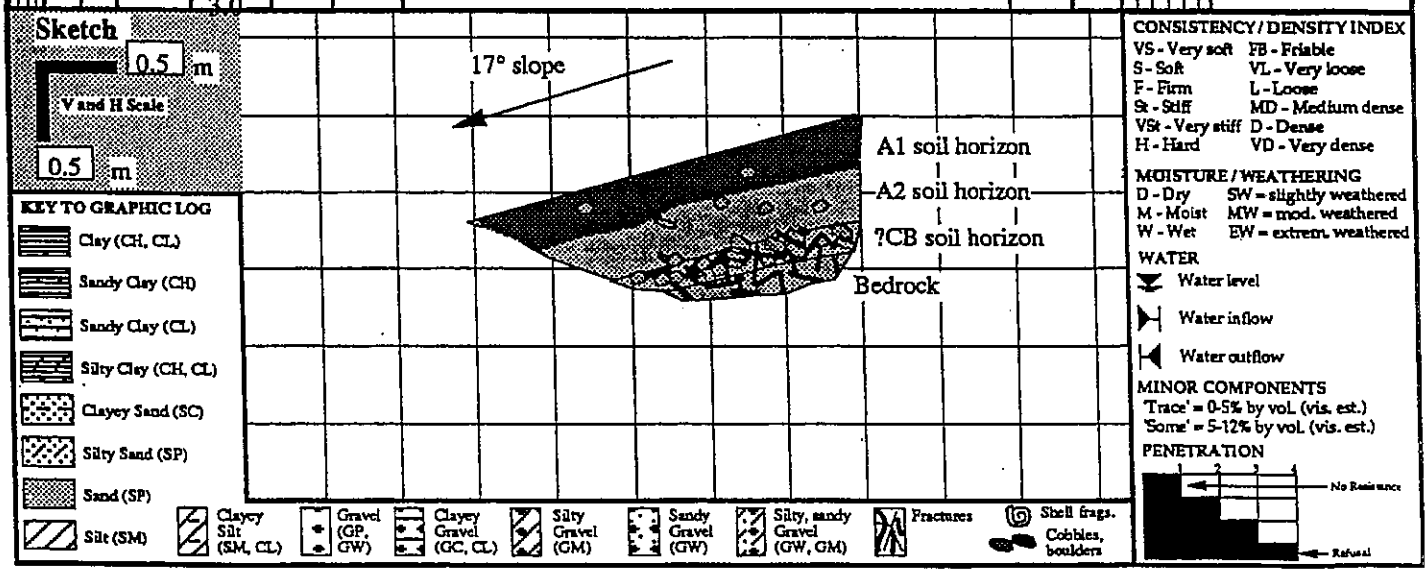
R.L. 93.8mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

Excavation dimensions (m)
Depth 1.1
Length 2.5
Width 0.8

Operator James Jacobson (P. Sutcliffe-contractor)

Logged by W. C. Cromer
Checked by W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials: Soil type: colour, plasticity or particle characteristics, secondary and minor components	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to pinkish brown below 0.3m; fine-med. grained; many roots; trace silt; occas. sandstone cobbles to 300mm	M	L		A1 soil horizon A2 soil horizon
					1.0		GP	SAND/CLAY/ROCK: orange grey; consists of up to 70% sandstone fragments to 150mm in mainly sand matrix, with relict irregularly oriented and discontinuous joints; occas. patches and linings of dark grey CH clay (M>PL)	M; M>PL	Fb-MD		?CB soil horizon
					1.5			SANDSTONE: orange brown; SW-MW; subhorizontally bedded; strongly and irreg. fractured at top, with discontinuous, iregularly orientated close-spaced mod. smooth joints lined with dark grey CH clay (M>PL) locally up to 2-5 mm thick; some inclined down slope and subparallel to probable bedding				Bedrock Dip reading not possible; Main subvertical joint direction 095°M. Spacing 100-200mm on subvertical joints, and about 50mm parallel to bedding
					2.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.1 m				
					2.5							
					3.0							



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Excavation no. 8
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524506mE; 5250835mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 95.4mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

Excavation dimensions (m)
Depth 1.2
Length 2.5
Width 0.8

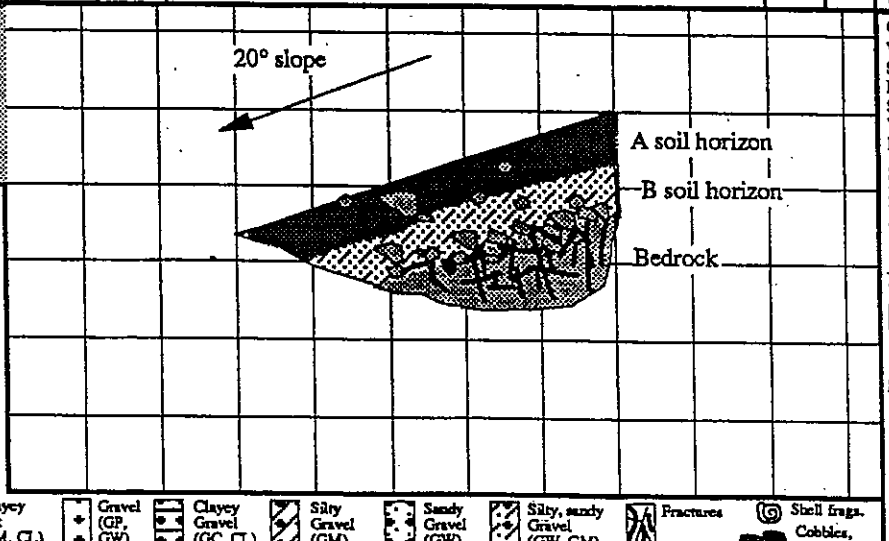
Operator James Jacobson (P. Sutcliffe-contractor)

Logged by W. C. Cromer
Checked by W. C. Cromer

Penetration	Support	Water	notes samples tests	metres RL	Depth	Graphic log	USCS Symbol	Materials (Soil type: colour; plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken				SP	SAND: dark grey; fine-med. grained; many roots; trace silt; occas. sandstone cobbles to 100mm	M	L		A soil horizon
				0.5			SP SM GP	Silty SAND: light orange brown; fine-medium grained; trace clay; up to 40% angular sandstone fragments to 200mm increasing to base; variable thickness	M	Fb-MD		B soil horizon
				1.0				SANDSTONE: light yellow orange; SW-MW; subhorizontally bedded; strongly and irreg. fractured at top, with discontinuous, subvertical close-spaced mod. smooth joints occas. lined with dark grey CH clay (M<PL) locally up to 2 cm thick				Bedrock Dip 2-3° to 165°M; Main subvertical joint directions 080°M and 120°M. Spacing 100-150mm on subvertical joints
				1.5				Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.2 m				
				2.0								
				2.5								
				3.0								

Sketch

0.5 m V and H Scale 0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

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Excavation no. 9
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524550mE; 5250808mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 105.6mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

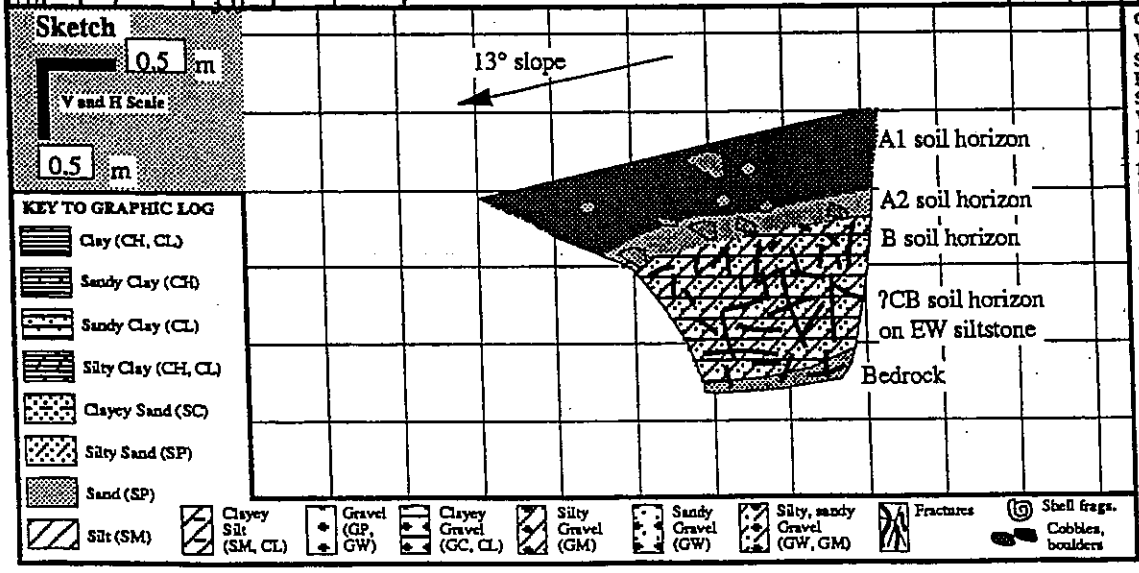
Excavation dimensions (m)
Depth 1.7
Length 2.5
Width 0.8

Operator James Jacobson (P. Sutcliffe-contractor)

Logged by W. C. Cromer
Checked by W. C. Cromer

Penetration	Support	Water	notes samples etc	metres Depth	Graphic log	USCS Symbol	Materials — Soil type: colour, plasticity or particle characteristics, secondary and minor components	moisture condition	consistency / density index	hand penetrometer kPa 100 200 400	Structure, geology or interpretation
	None needed	GNE	None taken	0.5		SP	SAND: dark grey grading to light pinkish brown below 0.5m; fine-med. grained; many roots; trace silt; 10% sandstone cobbles to 500mm	M	L		A1 soil horizon A2 soil horizon
				1.0		CL CH SM SC	Sandy silty CLAY and clayey SILT: mottled and patchy light orange brown, yellowish red and grey; relict joints visible - mainly irregular, close spaced, subvertical; local grey CH clay patches and linings, espec. towards base; var. plasticity (low-high)	M<> PL	Fb-VSt		B soil horizon ?CB soil horizon on EW siltstone
				1.5			SANDSTONE: light yellow orange; SW; subhorizontally bedded; mod. fractured				Bedrock
				2.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.7 m				
				2.5							
				3.0							

Sketch



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags. Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

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Excavation no. 10
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

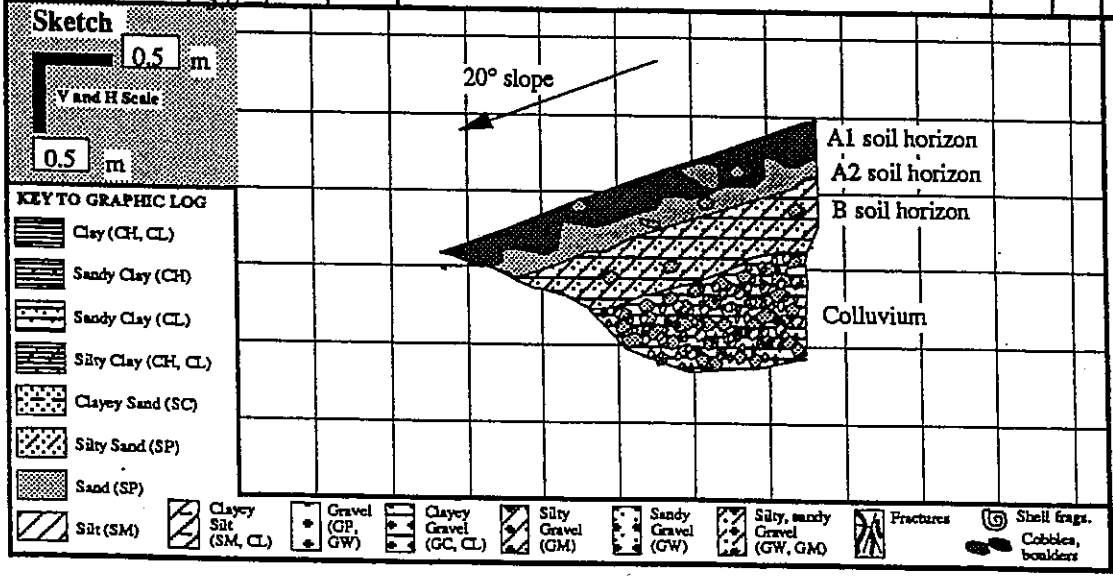
Coordinates AMG 524545mE; 5250902mN
R.L. 114.7mAHD
Excavation dimensions (m)
Depth 1.5
Length 2.5
Width 0.8

Exposure type Test pit
Equipment Hitachi 7 tonne excavator; 600mm bucket, 4 teeth
Operator James Jacobson (P. Sutcliffe-contractor)

Pit started August 2, 1995
Pit finished August 2, 1995
Logged by W. C. Cromer
Checked by W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa 100 200 300 400	Structure, geology or interpretation
None needed	None needed	GNE	None taken		0.0		SP	SAND: dark grey grading to light grey below 0.2m; fine-med. grained; many roots; trace silt; occas. sandstone cobbles to 200mm above 0.2m, to 50mm below 0.2m	D-M	L		A1 soil horizon A2 soil horizon
					0.5		SC	Clayey silty SAND: light brown with yellow/orange patches; low plasticity; occas. sandstone fragments to 100mm	M	MD -D		B soil horizon
					1.0		Matrix CL-CH, GC	Gravelly CLAY and Clayey GRAVEL: light yellowish orange and olive yellow/brown; consists of 40-50% well-graded angular sandstone clasts from 50-150mm, and up to 40% smaller angular siltstone fragments, in a brownish matrix of mod-high plasticity clay (M<<PL)	D	Fb -VD		Colluvium
					1.5			Pit stopped close to excavator refusal in breccia at 1.5m				
					2.0							
					2.5							
					3.0							

Sketch



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

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Excavation no. 11
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

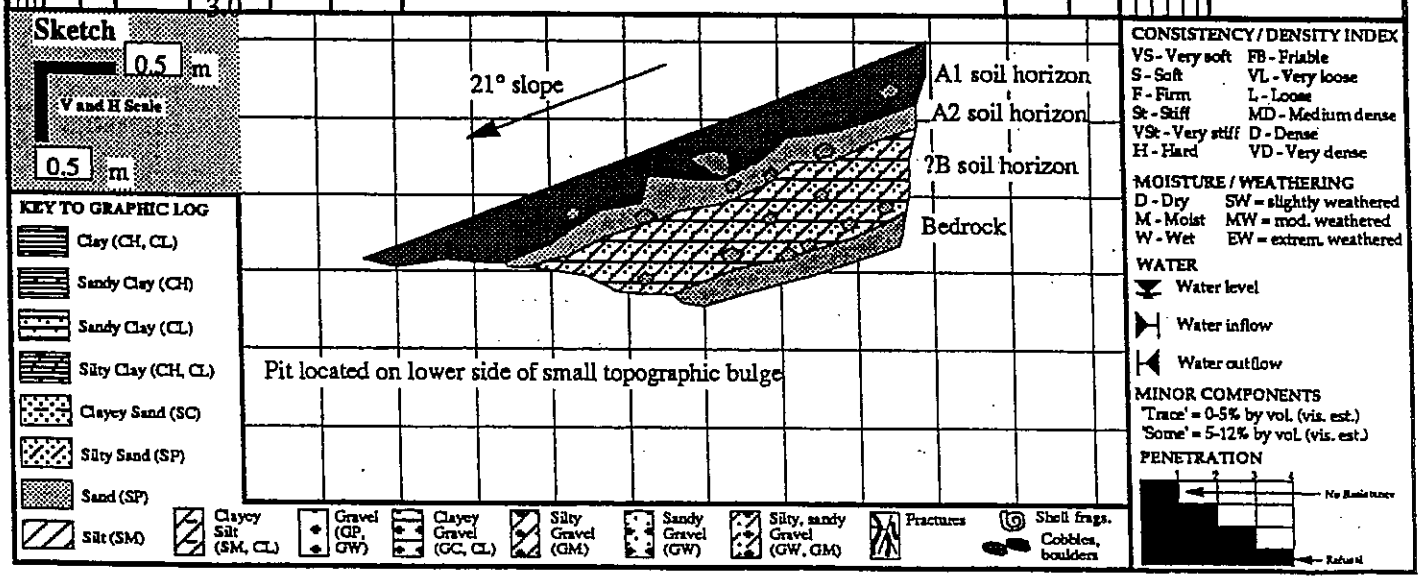
Coordinates AMG 524530mE; 5250942mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 117.9mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

Excavation dimensions (m)
Depth 1.3
Length 4.0
Width 0.8

Logged by W. C. Cromer
Operator James Jacobson (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to light grey below 0.3m; fine-med. grained; many roots; trace silt; occas. sandstone cobbles to 150mm	M	L		A1 soil horizon A2 soil horizon
					1.0		SM CL	Clayey SILT: yellowish brown; fractured; many fine roots; occas. sandstone fragments to 75mm near base; low plasticity; trace-some sand	M	MD		?B soil horizon
					1.5			SANDSTONE: yellowish orange; MW; subhorizontally bedded; strongly and irreg. fractured, with discontinuous, subvertical close-spaced mod. smooth joints lined in top 0.5m or so with dark grey and brown CH clay (M<PL) 1-2mm thick				Bedrock Dip 2-3° to 165°M; Main subvertical joint directions 180°M and 260°M. Spacing about 150mm on subvertical joints.
					2.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.3 m				
					2.5							
					3.0							



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Excavation no. 12
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

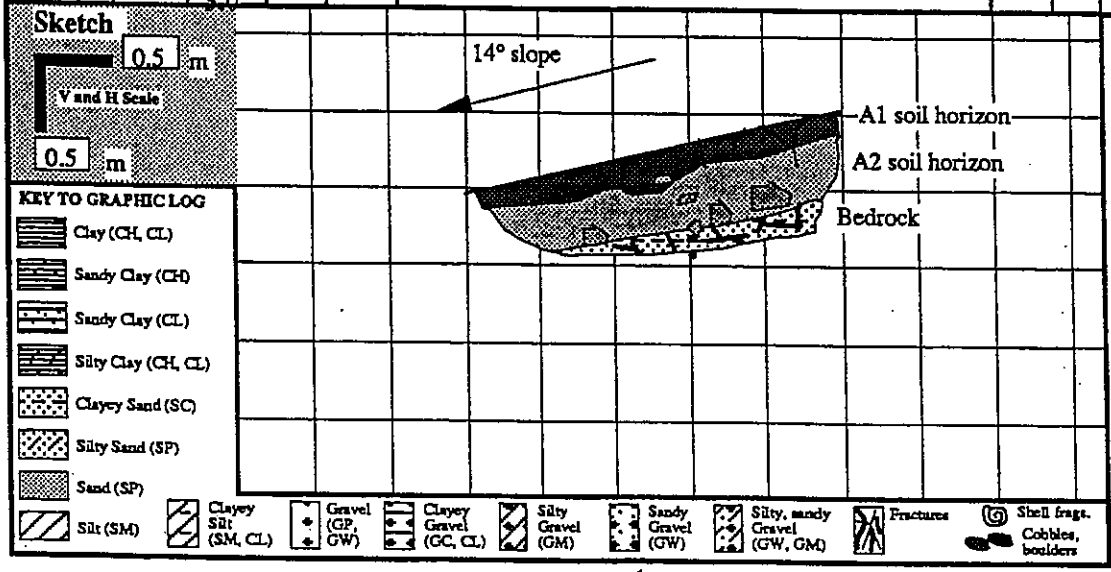
Coordinates AMG 524680mE; 5250849mN
R.L. 136.0mAHD
Excavation dimensions (m)
Depth 0.7
Length 2.5
Width 0.8

Exposure type Test pit
Equipment Hitachi 7 tonne excavator; 600mm bucket, 4 teeth
Operator James Jacobson (P. Sutcliffe-contractor)

Pit started August 2, 1995
Pit finished August 2, 1995
Logged by W. C. Cromer
Checked by W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic Log	USCS Symbol	Materials (soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey 0-0.2m, light brownish grey 0.2-base; fine-med. grained; trace silt; many roots near top; variable thickness; occas. sandstone boulders to 0.5m	D	L		A1 soil horizon A2 soil horizon
					1.0			SANDSTONE: orange yellow; MW; mod. and irregularly fractured, with occas. silt and sand infillings in open defects				Bedrock
					1.5			Pit stopped close to excavator refusal in weathered, fractured sandstone at 0.7m				
					2.0							
					2.5							
					3.0							

Sketch



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell fragt.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

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Excavation no. 13
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524771mE; 5250837mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 135.1mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

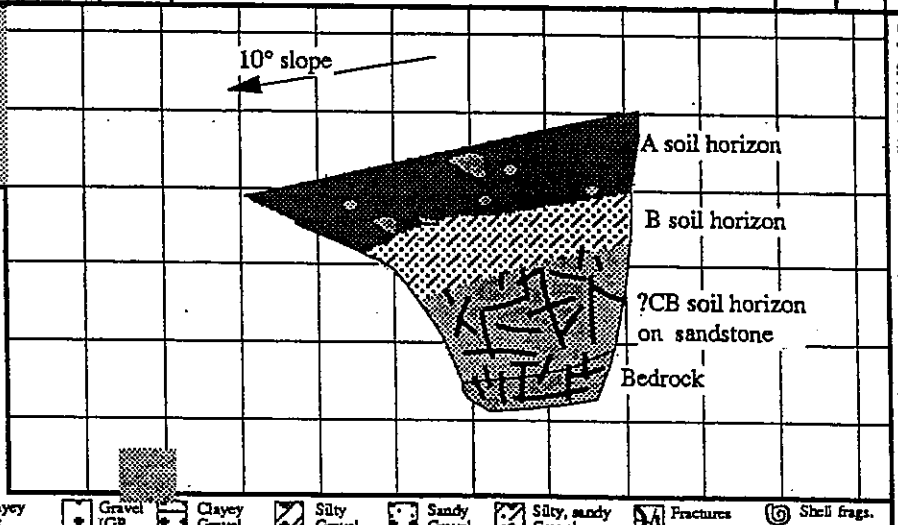
Excavation dimensions (m)
Depth 1.8
Length 2.5
Width 0.8

Operator James Jacobson (P. Sutcliffe-contractor) **Logged by** W. C. Cromer **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials: Soil type, colour, plasticity or particle characteristics, secondary and minor components	moisture condition	consistency density index	hand penetrometer kPa 100 200 400	Structure, geology or interpretation
None needed	Gl Tb	None taken			0.0		SP	SAND: dark grey grading to light grey, brown at base; fine-med. grained; many roots; trace silt; occas. sandstone fragments to 75mm	M	L		A soil horizon
					0.5		SP	Silty SAND: olive brown; grad. base; irreg. thickness	M	MD		B soil horizon
					1.0		SP	SAND: mottled and patchy orange and grey; mainly EW relict angular fragments of orange sandstone ('corestones') with dark grey CH clay (M>PL) infillings of relict joints; joints subhorizontal and subvertical, and orientated irregularly	D-M	D		?CB soil horizon on sandstone
					1.5			SANDSTONE: orange, light olive grey and cream; MW; subhorizontally bedded; mod. and irregularly fractured				Bedrock
					2.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.8 m				
					2.5							
					3.0							

Sketch

V and H Scale 0.5 m / 0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

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Excavation no. 14
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

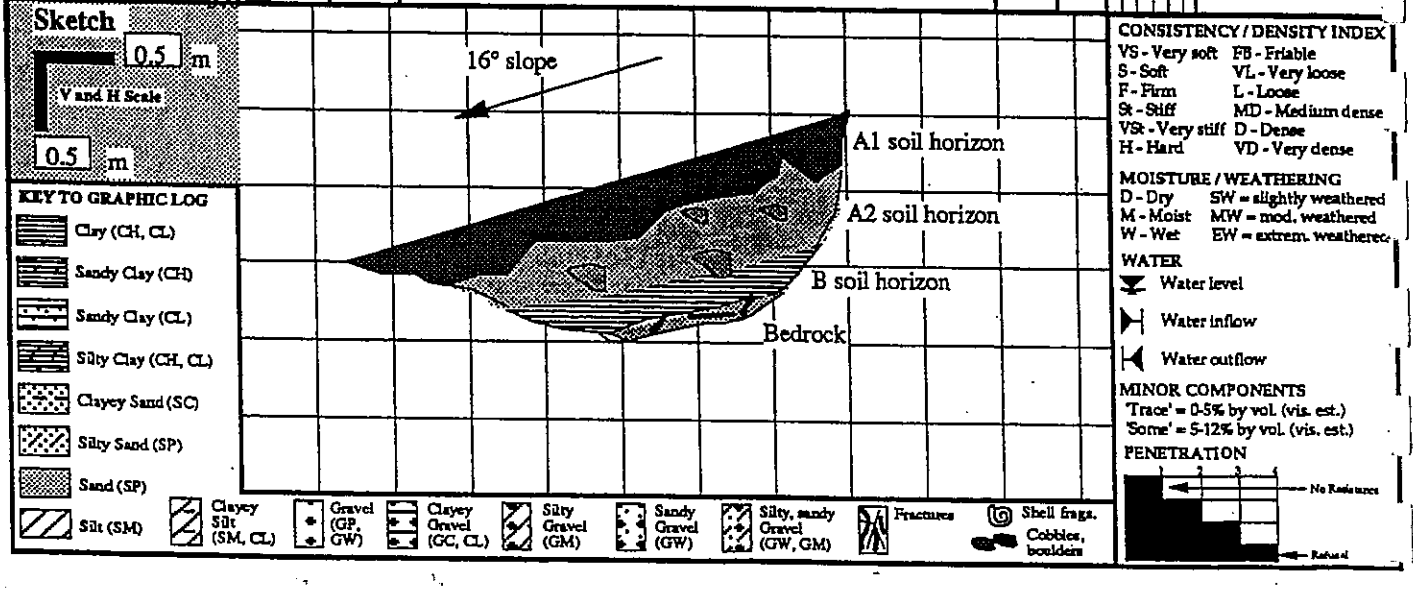
Coordinates AMG 524795mE; 5250887mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 133.4mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

Excavation dimensions (m)
Depth 1.3
Length 2.5
Width 0.8

Operator James Jacobson (P. Sutcliffe-contractor) **Logged by** W. C. Cromer **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to light grey, and orange brown below 0.4m; fine-med. grained; many roots; trace silt; occas. sandstone fragments to 100mm towards base	M	L-Fb		A1 soil horizon A2 soil horizon
					1.0		CH	CLAY: mottled olive grey and orange; high plasticity	M< PL	VSt		B soil horizon
					1.5			SANDSTONE: orange brown; MW; subhorizontally bedded; mod. and irregularly fractured				Bedrock
					2.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.3 m				
					2.5							
					3.0							



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Excavation no. 15
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524832mE; 5250856mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 120.6mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

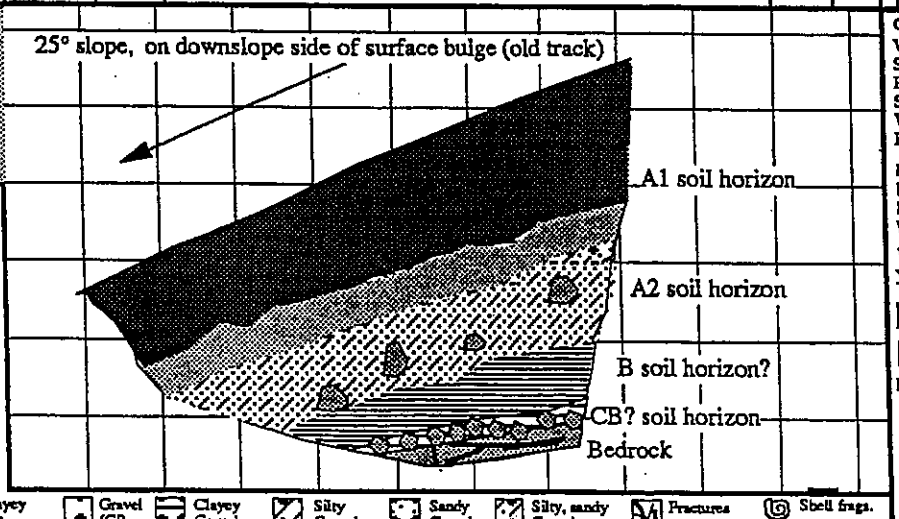
Excavation dimensions (m)
Depth 2.5
Length 3.5
Width 0.8

Logged by W. C. Cromer
Operator James Jacobson (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to light grey at base; fine-med. grained; trace silt	M	L		A1 soil horizon
					1.0		SP	Silty SAND: light yellowish brown; fine-medium grainedoccas. sandstone fragments; trace clay content increases to base	M	Fb -MD		A2 soil horizon
					1.5		CH	CLAY: dark grey flecked and mottled with light orange brown; high plasticity; strongly fractured to produce irregular coarse blocky structure	M< PL	VSt		B soil horizon?
					2.0		CH, GC	BRECCIA: grey cream sandstone fragments in grey clay matrix	M<>PL	D		CB? soil horizon
								SANDSTONE: orange-brown; subhorizontal; fractured,				Bedrock?
					2.5			Pit stopped close to excavator refusal in weathered, fractured sandstone at 2.5 m				
					3.0							Dip and joint orientations not measured; pit not entered.

Sketch

0.5 m
V and H Scale
0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
No Resistance
Refusal

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Excavation no. 16
Sheet 1 of

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524774mE; 5250937mN **Exposure type** Test pit **Pit started** August 2, 1995

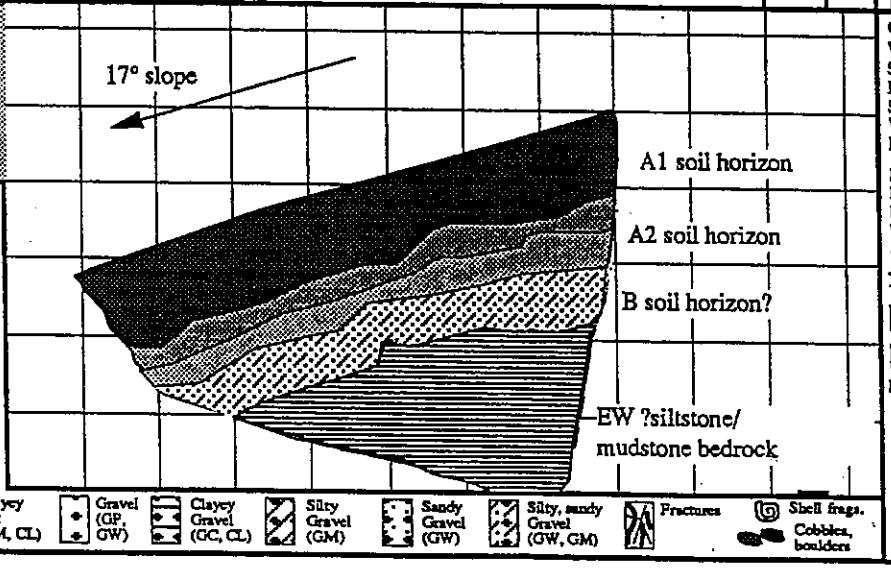
R.L. 141.2mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

Excavation dimensions (m)
Depth 2.6
Length 3.5
Width 0.8

Logged by W. C. Cromer
Operator James Jacobson (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa 100 200 300	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey 0-0.6, bright orange 0.6-0.8, grading to light grey at base; fine-med. grained; trace silt	M	L		A1 soil horizon
									D	MD		
									M	L		A2 soil horizon
					1.0		SP	Silty SAND: yellowish orange fine-medium grained	D-M	MD-D		B soil horizon
					1.5		CH CL	Silty CLAY: yellowish orange mottled with light grey ; moderate plasticity; irregularly fractured to produce coarse blocky structure; some patches of dark grey CH clay	M<>PL	VSt		CB soil horizon? EW siltstone/ mudstone bedrock?
					2.0							
					2.5			Pit stopped close to limit of excavator in clay at 2.6m				
					3.0							

Sketch
0.5 m
V and H Scale
0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
No Resistance
Refusal

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Excavation no. 17
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524625mE; 5250941mN **Exposure type** Test pit **Pit started** August 2, 1995

R.L. 104.1mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 2, 1995

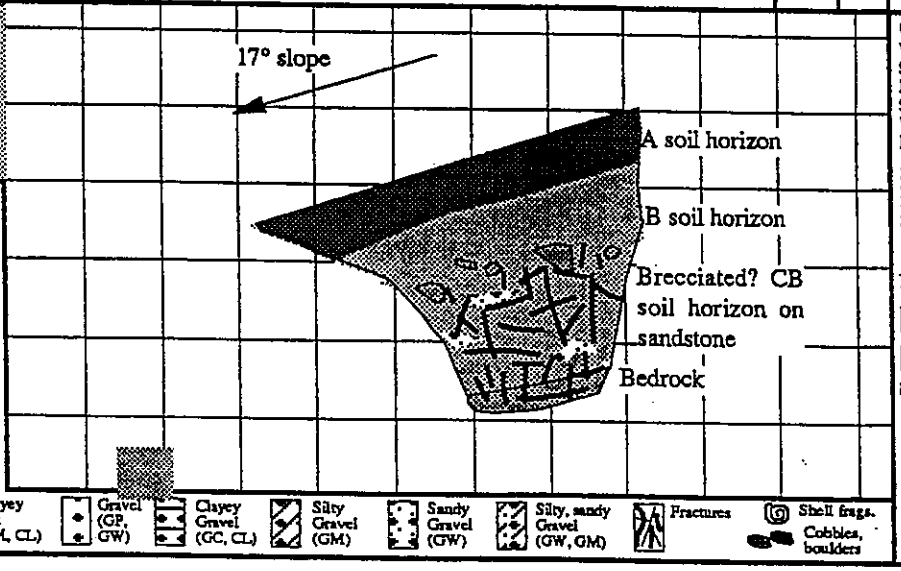
Excavation dimensions (m)
Depth 1.7
Length 2.5
Width 0.8

Logged by W. C. Cromer
Operator James Jacobson (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.0		SP	SAND: dark grey ; fine-med. grained; many roots; trace silt	M	L		A soil horizon
					0.5		SP	SAND: yellowish orange; fine-med. grained; trace silt; occas. orange EW sandstone fragments to 100mm near base	M	L		B soil horizon
					1.0		SP SC	SAND and gravelly SAND: orange yellow with grey patches and streaks; trace clay and silt, with 10-15% well-graded angular sandstone fragments to 150 mm; some relict subvertical and subhorizontal joints mostly with moist to wet grey CH clay and CL sandy clay linings up to 5 mm thick	D-M	D		Brecciated? CB soil horizon on sandstone
					1.5			SANDSTONE: orange with light grey streaks; MW-EW; subhorizontally bedded, dipping 3-5° to 090°M; mod. and irregularly fractured with some discontinuous, very thin (<1mm) grey CH clay linings on subvertical defects and subhorizontal bedding surfaces	loc. W			Bedrock
					2.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.7 m				
					2.5							
					3.0							

Sketch

0.5 m V and H Scale 0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FR - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
No Resistance
Refusal

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Excavation no. 18
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524690mE; 5251016mN **Exposure type** Test pit **Pit started** August 22, 1995

R.L. 159.6mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995

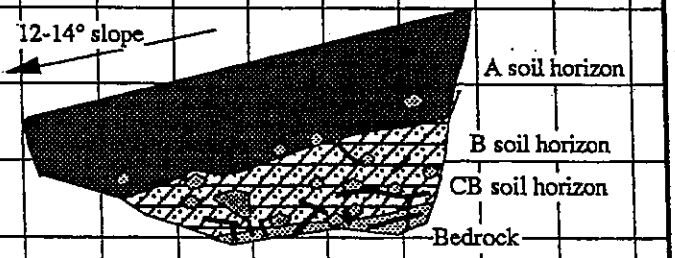
Excavation dimensions (m)
Depth 1.4
Length 2.5
Width 0.8

Operator Phillip Saunders (P. Sutcliffe-contractor) **Logged by** W. C. Cromer **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres RL / depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency / density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken	0.5		SP	SAND: dark grey grading to brown; fine-med. grained; many roots; trace silt; 10% angular sandstone cobbles to 100mm; trace clay near base	M	L		A soil horizon
				1.0		SM GM CL	Clayey sandy SILT: brown; contains 10-20% well-graded yellow/brown sandstone fragments to 50mm; mod. consolidated; gravelly at base, with some irregular CH clay seams	M loc. wet at base	D		B soil horizon CB soil horizon
				1.5			SANDSTONE: light yellowish grey and brown; MW; subhorizontally bedded; strongly and irreg. fractured, with discontinuous, subvertical close-spaced mod. smooth joints ; defects and local bedding surfaces lined with M-W brown clayey silt (CL) mainly 1-2mm thick, locally 10 mm thick				Dip 2-3° to c.180°M; Main subvertical joint directions 060°M, 100°M and 180°M. Spacing about 150mm on subvertical j
				2.0			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.4 m				
				2.5							
				3.0							

Sketch

0.5 m
V and H Scale
0.5 m



Pit located on lower side of small topographic bulge

KEY TO GRAPHIC LOG

Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX

VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING

D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

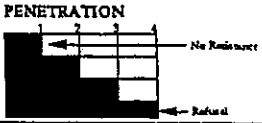
WATER

Water level
Water inflow
Water outflow

MINOR COMPONENTS

'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION



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Excavation no. 19
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524623mE; 5251023mN **Exposure type** Test pit **Pit started** August 22, 1995

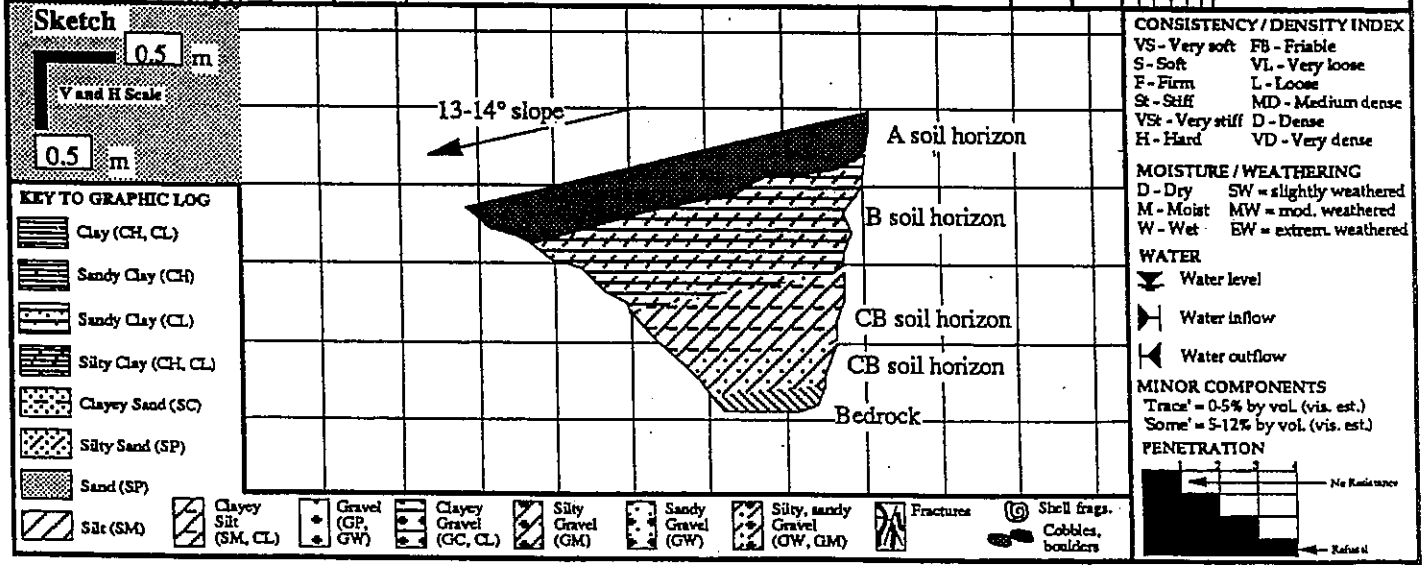
R.L. 158.0mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995

Excavation dimensions (m)
Depth 1.9
Length 2.5
Width 0.8

Logged by W. C. Cromer
Operator Phillip Saunders (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS symbol	Materials (Soil type, colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa (25, 50, 100, 200, 400)	Structure, geology or interpretation
None needed	None needed	GNE	None taken		0.0		SP	SAND: dark grey grading to light yellowish grey; fine-med. grained; many roots; trace silt		Fb -L		A soil horizon
					0.5		CH	Silty CLAY: mainly mottled yellow/brown and orange; pedal to 0.6m; mod-high plasticity; locally irregularly fractured with dark grey (CH) clay linings on defects; gradational base	M <> PL	VSt		B soil horizon
					1.0		CL	Clayey SILT: mainly mottled yellow/brown and orange; trace sand increasing to base; low plasticity; trace mica	M	Fb -D		CB soil horizon
					1.5		SM	Sandy SILT: orange and grey; finely laminated; harder with depth	D			CB soil horizon
					2.0			Sandy SILTSTONE: light grey and orange; finely laminated; MW; subhorizontally bedded; no clay linings	D			Bedrock Dip 2-3° to c.180°M; No subvertical fractures
					2.5			Pit stopped at required depth in weathered siltstone at 1.9 m				
					3.0							

Sketch



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
No Resistance
Refusal

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Excavation no. 20
Sheet 1 of 1

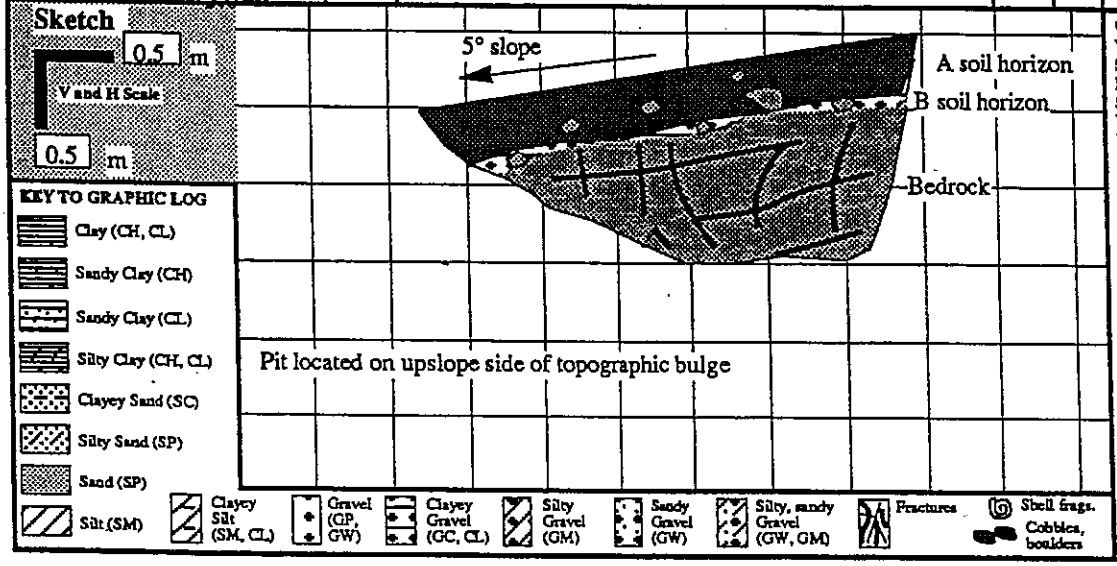
Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524640mE; 5251063mN **Exposure type** Test pit **Pit started** August 22, 1995
R.L. 169.9mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995
Excavation dimensions (m) Depth 1.3, Length 2.5, Width 0.8 **Logged by** W. C. Cromer
Operator Phillip Saunders (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L. / Depth	Graphic Log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency / density index	hand penetrometer kPa (150, 300, 450)	Structure, geology or interpretation
None needed	GNE	None taken		0.0		SP	SAND: dark grey grading to light grey; fine-med. grained; many roots; trace silt; 10% angular sandstone cobbles to 100mm; var. thickness	M	Fb		A soil horizon
				0.5		GM	Gravelly CLAY: olive grey and brown; mod. plasticity; 20-30% angular sandstone fragments to 25-50mm	M< PL	VSt		B soil horizon
				1.0			SANDSTONE: mainly orange with olive grey patches; MW; subhorizontally bedded; irreg. fractured, with occas. discontinuous, subvertical mod. smooth joints ; some defects and local bedding surfaces lined with M-W brown clayey sand (SC)				Bedrock Dip 2-3° to c.140°M; Main subvertical joint direction trends 230°M
				1.5			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.3 m				
				2.0							
				2.5							
				3.0							

Sketch



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft; S - Soft; F - Firm; St - Stiff; VSt - Very stiff; H - Hard
FB - Friable; VL - Very loose; L - Loose; MD - Medium dense; D - Dense; VD - Very dense

MOISTURE / WEATHERING
D - Dry; M - Moist; W - Wet
SW = slightly weathered; MW = mod. weathered; EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

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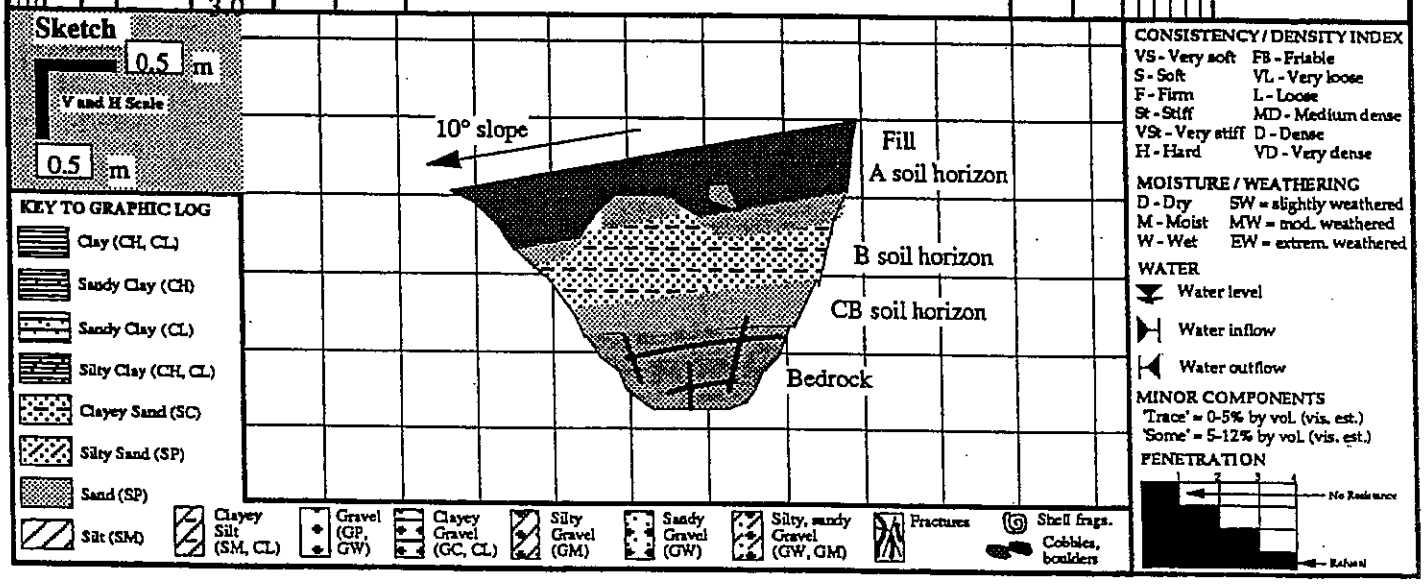
Excavation no. 21
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524680mE; 5251112mN **Exposure type** Test pit **Pit started** August 22, 1995
R.L. 177.8mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995
Excavation dimensions (m) Depth 1.9, Length 2.5, Width 0.8 **Operator** Phillip Saunders (P. Sutcliffe-contractor) **Logged by** W. C. Cromer **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (Soil type: colour; plasticity or particle characteristics; secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to light grey, light olive brown below 0.5m; fine-med. grained; many roots; trace silt; occas. sandstone fragments to 150mm	D-M	L		Fill A soil horizon
					1.0		SC CL	Clayey SAND: olive brown; low plasticity; loc. sandy clay	M-W	MD		B soil horizon
							SP	SAND: brown with orange patches; trace-some silt	M	MD		CB soil horizon
					1.5			Silty SANDSTONE: orange with light yellow patches; EW; occas. dark grey CL-CH clay linings on subhorizontal bedding surfaces and some irregular joint surfaces				Bedrock Dip 5° to 060°M
					2.0 2.5 3.0			Pit stoppedclose to excavator refusal in silty sandstone at 1.9 m				



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Excavation no. 22
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524626mE; 5251131mN **Exposure type** Test pit **Pit started** August 22, 1995

R.L. 180.1mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995

Excavation dimensions (m)
Depth 1.3
Length 2.5
Width 0.8

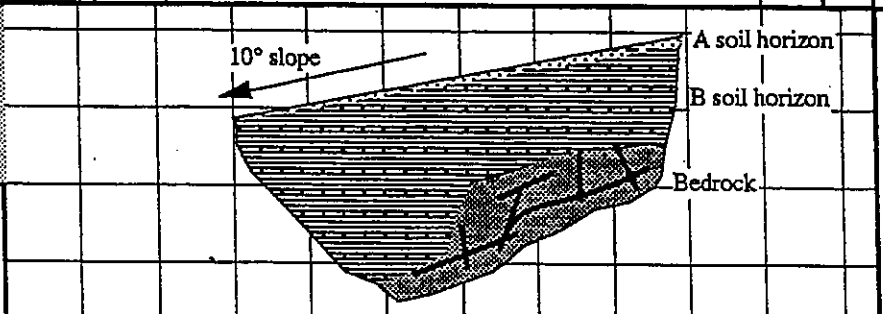
Operator Phillip Saunders (P. Sutcliffe-contractor) **Logged by** W. C. Cromer **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa 100 200 300	Structure, geology or interpretation
	None needed	GNE	None taken		0.0		SP,SC	SAND and clayey SAND: olive brown; fine-med. grained	M-W	MD		A soil horizon
							CH	CLAY and sandy CLAY: olive brown; pedal; blocky fracture, with occas. dark grey (CH) clay linings on irregular discontinuous defects; high plasticity; sand content increases to base	M< PL loc. wet	VSt -H		B soil horizon
					0.5							
					1.0			SANDSTONE: mainly orange; MW; subhorizontally bedded; mod. and irreg. fractured, with discontinuous, subvertical mod. smooth joints; defects and local bedding surfaces lined with wet dark grey clay (CH) up to 3mm thick				Bedrock Dip 2-3° to 180°M; Main subvertical joint direction 040°M. Spacing about 0.3m on subvertical joints
					1.5			Pit stopped close to excavator refusal in weathered, fractured sandstone at 1.0-1.3 m (bedrock stepped)				
					2.0							
					2.5							
					3.0							

Sketch

0.5 m V and H Scale

0.5 m



KEY TO GRAPHIC LOG

Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX

VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING

D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER

Water level
Water inflow
Water outflow

MINOR COMPONENTS

'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION

1 2 3 4
No Resistance
Refusal

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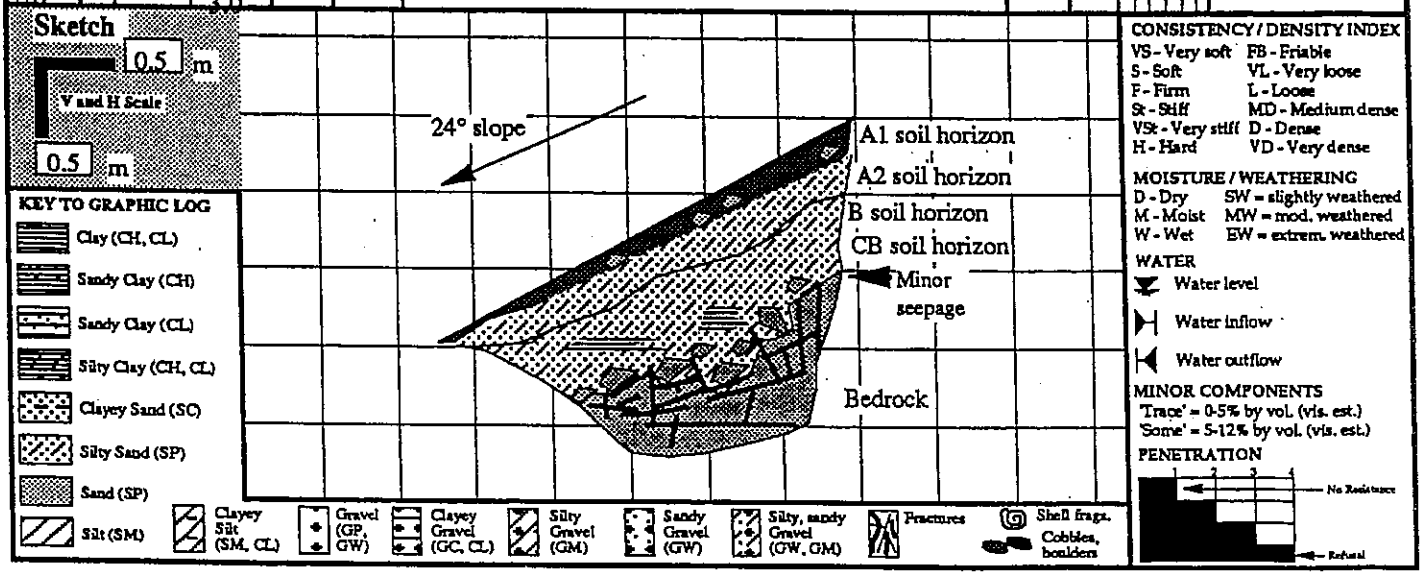
Excavation no. 23
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524465mE; 5250983mN **Exposure type** Test pit **Pit started** August 22, 1995
R.L. 113.8mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995
Excavation dimensions (m) Depth 2.2, Length 3.0, Width 0.8 **Operator** Phillip Saunders (P. Sutcliffe-contractor) **Logged by** W. C. Cromer **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres RL	metres Depth	Graphic log	USCS Symbol	Materials (soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	Cmpl.	None taken		0.0		SP	SAND: dark grey; fine-med. grained; many root trace silt; occas. sandstone fragments to 50mm; var. thickness	M	L		A1 soil horizon
					0.5		SP CL	Silty SAND: olive yellow and pink; low plasticity; trace clay, loc. clayey sand; irregular base	M-W	L,Fb MD		A2 soil horizon
			Minor seepage		1.0		SP SM GM	Silty SAND and sandy SILT: olive grey; occas. layers of silty sandy gravel near base; with up to 50% angular sandstone fragments to 100mm; locally CH clay matrix	M W	L-MD		B soil horizon CB soil horizon
					1.5			SANDSTONE: mainly orange with grey and light grey patches; SW; subhorizontal; mod.-strongly fractured; joints mod. rough to mod. smooth, subvertical, discontinuous; most but not all joint defects and bedding surfaces lined with dark grey CH clay (M>PL, loc. wet) from 1-10mm thick.				Bedrock Dips 2-3° to 100°M; Main subvertical joint directions are 170-190°M and 270°M; spacing 100-200mm
					2.0			Pit stopped close to excavator refusal in fractured, relatively massive sandstone at 2.2 m				
					2.5							
					3.0							



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Excavation no. 24
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

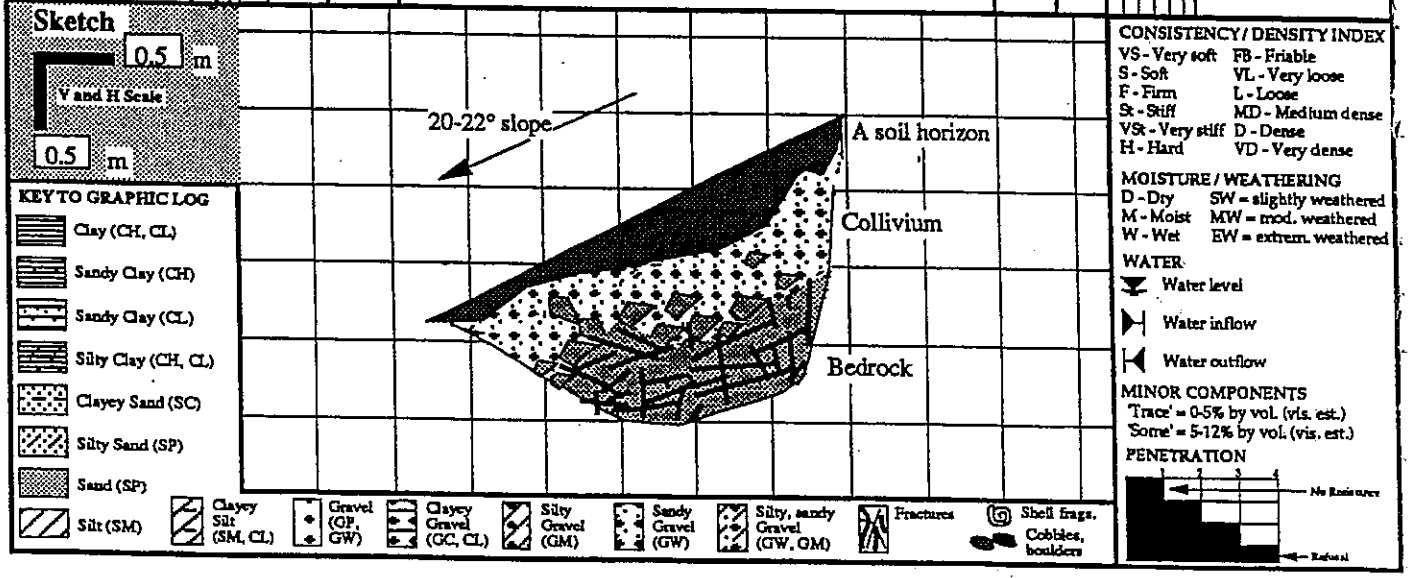
Coordinates AMG 524445mE; 5251010mN **Exposure type** Test pit **Pit started** August 22, 1995

R.L. 115.9mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995

Excavation dimensions (m)
Depth 1.8
Length 3.0
Width 0.8

Logged by W. C. Cromer
Operator Phillip Saunders (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres Depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken	0		SP	SAND: dark grey; fine-med. grained; many roots; trace silt; var. thickness	M	L		A soil horizon
				0.5		SP GW	Gravelly SAND and sandy GRAVEL: light brown; gravel well-graded fine-coarse sandstone, with locally up to 80-90% angular light yellow sandstone fragments to 200mm	M	Fb		Colluvium
				1.0			SANDSTONE: light yellow, brown and orange; SW; subhorizontal; irregularly fractured; joints mod. rough to mod. smooth, subvertical, and also inclined 50-70° to 090°M; occas. joint defects and bedding surfaces lined with discontinuous thin (<1mm) dark grey CH clay (M>PL, loc. wet) or olive grey clayey sand (SC)				Bedrock Dip not obtained; Main subvertical joint direction is 060°M
				1.5							
				2.0			Pit stopped close to excavator refusal in fractured, relatively massive sandstone at 1.8 m				
				2.5							
				3.0							



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Excavation no. 25
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524522mE; 5250922mN **Exposure type** Test pit **Pit started** August 22, 1995

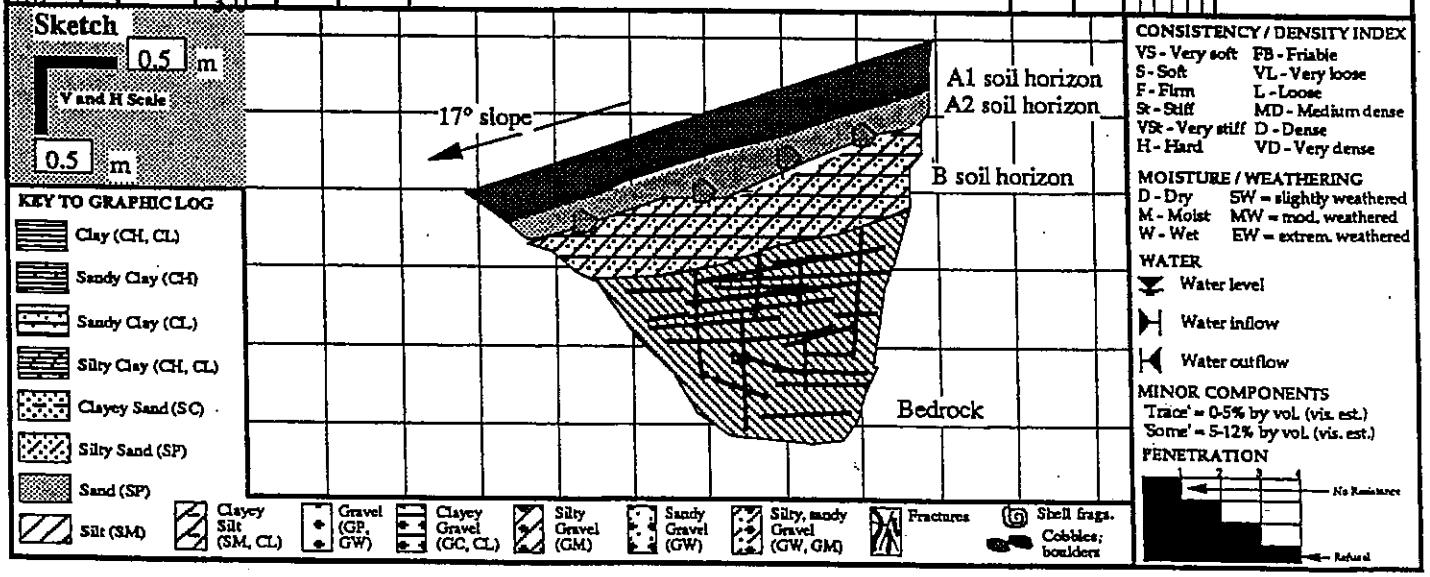
R.L. 111.4mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995

Excavation dimensions (m)
Depth 2.7
Length 2.5
Width 0.8

Operator Phillip Saunders (P. Sutcliffe-contractor)

Logged by W. C. Cromer
Checked by W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials: Soil type: colour, plasticity or particle characteristics, secondary and minor components	moisture condition	consistency density index	hand penetrometer kPa (FR 100 200 400)	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to light pinkish grey below 0.3m; fine-med. grained; many roots; trace silt; below 0.3m, occas. angular sandstone fragments to 100mm	M	L		A1 soil horizon A2 soil horizon
					1.0		CH CL	Sandy CLAY and sandy silty CLAY: mottled olive grey, orange and dark grey; trace-some fine-medium sandstone gravel, and ;occas. sandstone fragments to 150mm; low-mod. plasticity; sand content increases with depth; locally coarsely pedal near top, with thin clay skins on ped surfaces	M ◇ PL	St MD		B soil horizon
					1.5 2.0 2.5			SANDSTONE and SILTSTONE: variably orange and cream; MW; finely bedded, with dark grey streaks and patches on bedding laminae and joints; main joints subvertical, mod. spaced; discontinuous linings of dark grey CH clay (<1 to 3 mm thick) common on closely spaced laminae and local bedding surfaces	D loc. M>PL in defects			Bedrock Dip 2-3° to c.120°M; Main subvertical joint direction is 030°M; spacing 0.2->0.5m
					3.0			Pit stopped at required depth in weathered siltstone and sandstone at 2.7 m				



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Excavation no. 26
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524500mE; 5250903mN **Exposure type** Test pit **Pit started** August 22, 1995

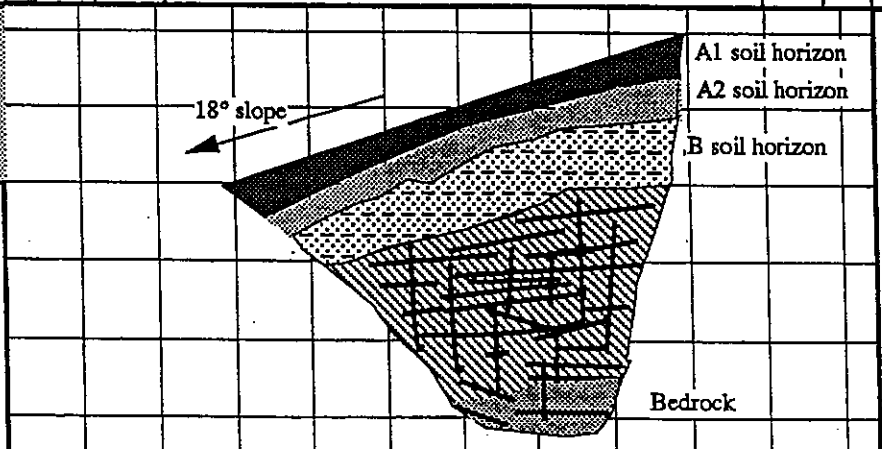
R.L. 103.4mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995

Excavation dimensions (m)
Depth 2.2
Length 2.5
Width 0.8

Logged by W. C. Cromer
Operator Phillip Saunders (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials (soil type, colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken		0.5		SP	SAND: dark grey grading to light brownish grey below 0.2m; fine-med. grained; many roots; trace silt; variable thickness	M	L		A1 soil horizon A2 soil horizon
							SC	Clayey SAND: light yellowish brown; low plasticity; clay increases to sharp, irregular base	M W	L MD		B soil horizon
					1.0 1.5 2.0			SILTSTONE and SANDSTONE: mainly light olive yellow on fresh surfaces; MW; subhorizontal; finely bedded; irregularly and strongly fractured, with close spaced joints; main joints subvertical; some local discontinuous linings of dark grey CH clay (<1 to 3 mm thick) on laminae and local bedding surfaces. Sandstone increases near base, MW,; finely bedded, with grey clay (CH, M>PL) on some bedding surfaces				Bedrock Dip and joint directions not measured
					2.5 3.0			Pit stopped at required depth in weathered siltstone and sandstone at 2.2 m				

Sketch
0.5 m
V and H Scale
0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
FB - Friable
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense

MOISTURE / WEATHERING
D - Dry
M - Moist
W - Wet
SW = slightly weathered
MW = mod. weathered
EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

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Excavation no. 27
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524484mE; 5250940mN **Exposure type** Test pit **Pit started** August 22, 1995

R.L. 106.6mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995

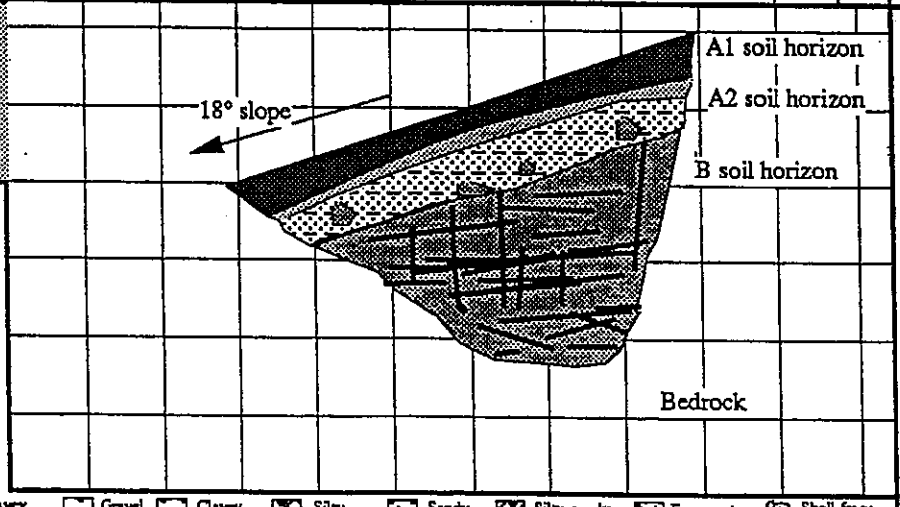
Excavation dimensions (m)
Depth 2.1
Length 2.5
Width 0.8

Operator Phillip Saunders (P. Sutcliffe-contractor) **Logged by** W. C. Cromer **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L. / Depth	Graphic log	USCS Symbol	Materials (Soil type: colour, plasticity or particle characteristics, secondary and minor components)	moisture condition	consistency / density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	GNE	None taken	0.0		SP	SAND: dark grey grading to light brown/grey below 0.2m; fine-med. grained; many roots; trace silt; variable thickness	M	L		A1 soil horizon / A2 soil horizon
				0.5		SC CL	Gravelly clayey SAND and sandy CLAY: light brown; pedal, cloddy, low plasticity; locally with some angular sandstone fragments near base	M / W	L / MD		B soil horizon
				1.0 – 2.0			SANDSTONE: mainly orange with patches of cream and dark grey; MW; subhorizontal; irregularly fractured, with wide spaced joints; main joints subvertical; minor local discontinuous linings (1-2mm thick) of dark grey CH clay or SC clayey sand on defects and bedding surfaces.				Bedrock Dip 2-4° to 280°M; Main subvertical joint direction is 090°M; spacing 0.5m; other joints dip 70° to 200°M
				2.5			Pit stopped close to refusal in sandstone at 2.1 m				
				3.0							

Sketch

V and H Scale 0.5 m / 0.5 m



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
1 2 3 4
No Resistance
Refusal

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Excavation no. 28
Sheet 1 of 1

Engineering Log — Excavation

Project G. E. Stevens **Location** 162A Forest Road, West Hobart

Coordinates AMG 524514mE; 5250873mN **Exposure type** Test pit **Pit started** August 22, 1995

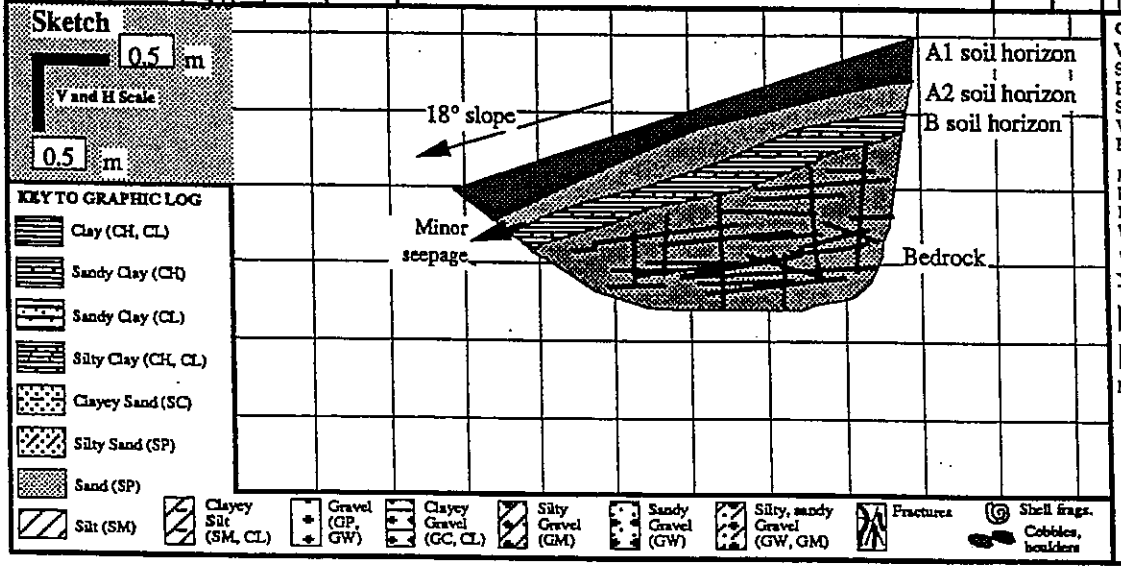
R.L. 102.9mAHD **Equipment** Hitachi 7 tonne excavator; 600mm bucket, 4 teeth **Pit finished** August 22, 1995

Excavation dimensions (m)
Depth 1.7
Length 2.5
Width 0.8

Logged by W. C. Cromer
Operator Phillip Saunders (P. Sutcliffe-contractor) **Checked by** W. C. Cromer

Penetration	Support	Water	notes samples tests	metres R.L.	metres Depth	Graphic log	USCS Symbol	Materials: Soil type: colour, plasticity or particle characteristics, secondary and minor components	moisture condition	consistency density index	hand penetrometer kPa	Structure, geology or interpretation
	None needed	Minor	None taken		0.0		SP	SAND: dark grey grading to light brown below 0.2m; fine-med. grained; many roots; trace silt; variable thickness	M W	L		A1 soil horizon A2 soil horizon
					0.5		CL CH	Sandy CLAY: mottled orange and grey--brown; variable (low-high) plasticity; sand increases to base	W	VSt		B soil horizon
					1.0			SANDSTONE: variably orange with patches of cream and dark grey; MW; subhorizontal; irregularly fractured, with wide spaced joints; main joints subvertical; local discontinuous linings (1-5mm thick) of dark grey CH clay or SC clayey sand on defects and bedding surfaces.				Bedrock Dip 1-2° to 140°M but variable
					1.5							
					2.0			Pit stopped close to refusal in sandstone at 1.7 m				
					2.5							
					3.0							

Sketch



KEY TO GRAPHIC LOG
Clay (CH, CL)
Sandy Clay (CH)
Sandy Clay (CL)
Silty Clay (CH, CL)
Clayey Sand (SC)
Silty Sand (SP)
Sand (SP)
Silt (SM)
Clayey Silt (SM, CL)
Gravel (GP, GW)
Clayey Gravel (GC, CL)
Silty Gravel (GM)
Sandy Gravel (GW)
Silty, sandy Gravel (GW, GM)
Fractures
Shell frags.
Cobbles, boulders

CONSISTENCY / DENSITY INDEX
VS - Very soft FB - Friable
S - Soft VL - Very loose
F - Firm L - Loose
St - Stiff MD - Medium dense
VSt - Very stiff D - Dense
H - Hard VD - Very dense

MOISTURE / WEATHERING
D - Dry SW = slightly weathered
M - Moist MW = mod. weathered
W - Wet EW = extrem. weathered

WATER
Water level
Water inflow
Water outflow

MINOR COMPONENTS
'Trace' = 0-5% by vol. (vis. est.)
'Some' = 5-12% by vol. (vis. est.)

PENETRATION
No Resistance
Refusal

APPENDIX 3.

Site and test pit photographs

Test pits 1 to 17 were dug on 2 August, 1995. Test pits 18 to 28 were dug on 22 August, 1995. Pits 18 to 22 have been omitted since they were located on adjoining land not the subject of the current rezoning application.

The photographs for test pit 13 is not available.

Where present, the red and white scale is 0.5 metres long, graduated in 10 cm long sections.

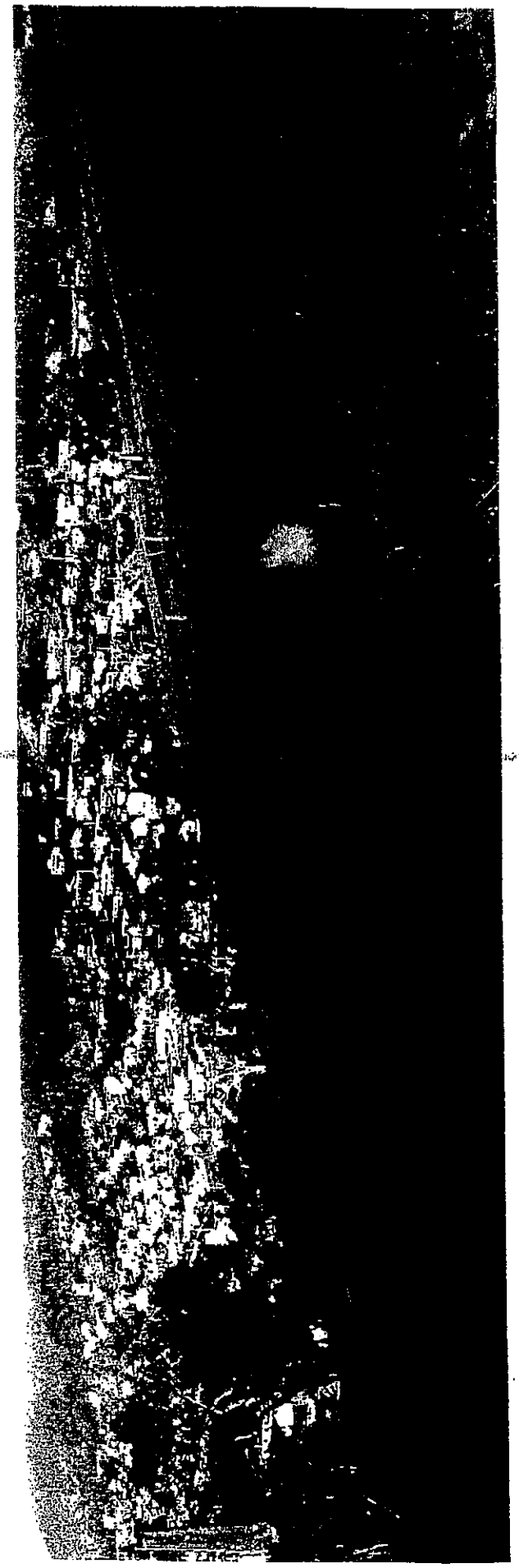


Plate 1. View southwest from the end of Liverpool Crescent over the eastern corner of the property towards South Hobart.

Plate 2. View northwest from the access track on the southwestern side of the property. The post-1967 landslip is on the left, partly hidden by trees and scrub. Other surface irregularities on a smaller scale include inferred soil creep (centre middleground) and colluvial mounds (centre background, on bracken-covered slope).

Plate 3. View northwest from the same access track, over the western portion of the property. The eucalypts on the left are standing in the landslip. Slopes on the grassed area average 18° to 20°, and from 20° to 30° on the bracken-covered hillside above.

Plate 4. View east from the eastern end of Louden Str[illegible] over the western side of the property. The broken fence [illegible] is the boundary to CT 2370-44. The landslip is in the lower right. A smaller landslip has occurred in the central foreground

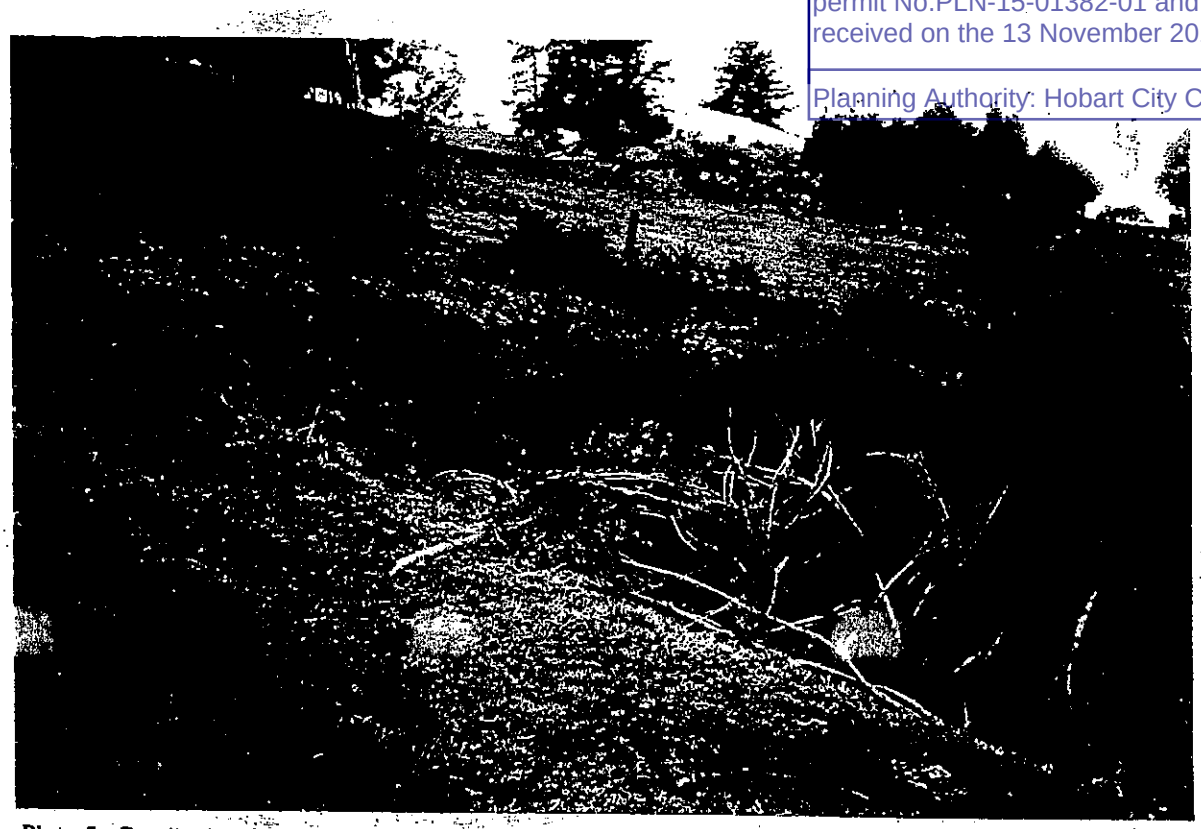


Plate 5. Detail of the head of the landslip, on 18° slopes. Test pit 6 was dug in the centre of the photo, on the exposed scarp partly visible behind the flowering gorse bush.

Plate 6. Detail of a small landslip some 20 to 30 metres upslope from the main slide, on the steep eastern bank of Ross Rivulet (left).

Plate 7. A small surface irregularity interpreted as soil creep or solifluction at the site of test pit 2.

Plate 8. A surface irregularity interpreted as formed by colluvial movement at the site of test pit 3. The slope angle above the excavator is 30°.

Plate 9. Subhorizontal, jointed Triassic-age sandstone exposed near the poultry shed above test pit 11.

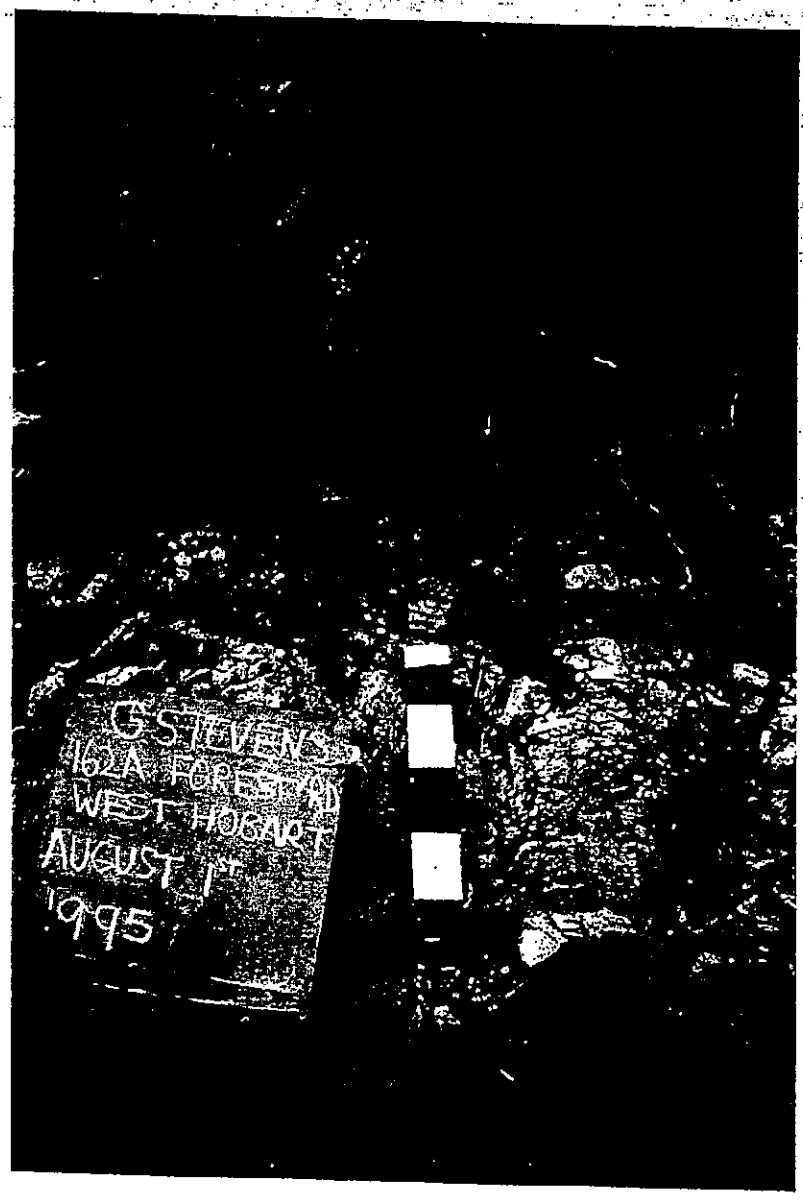
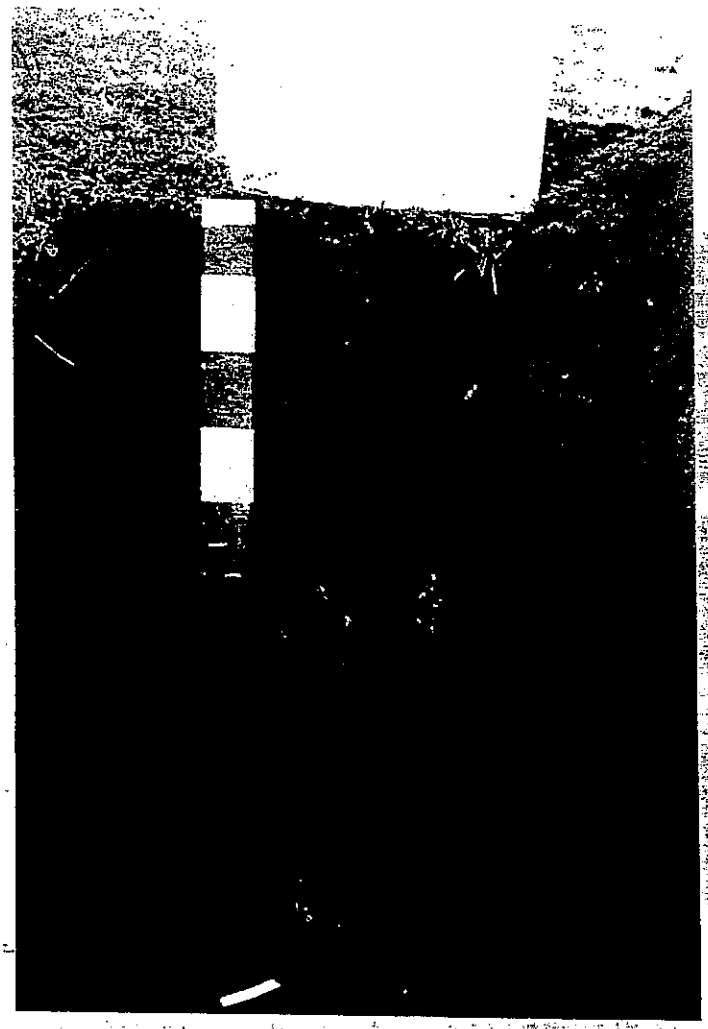
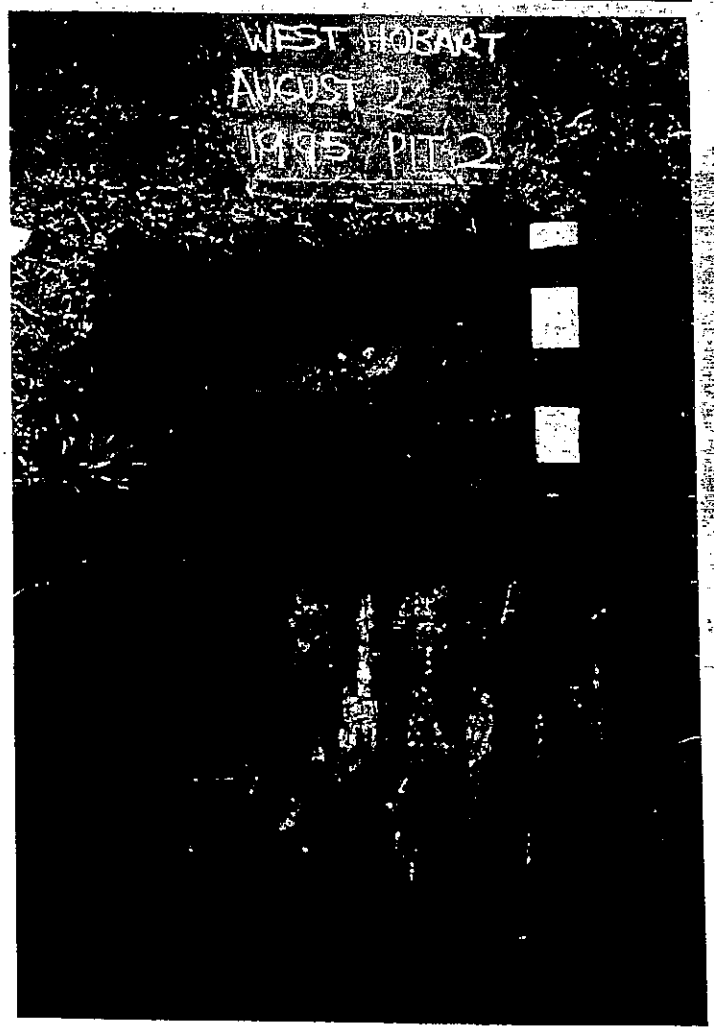
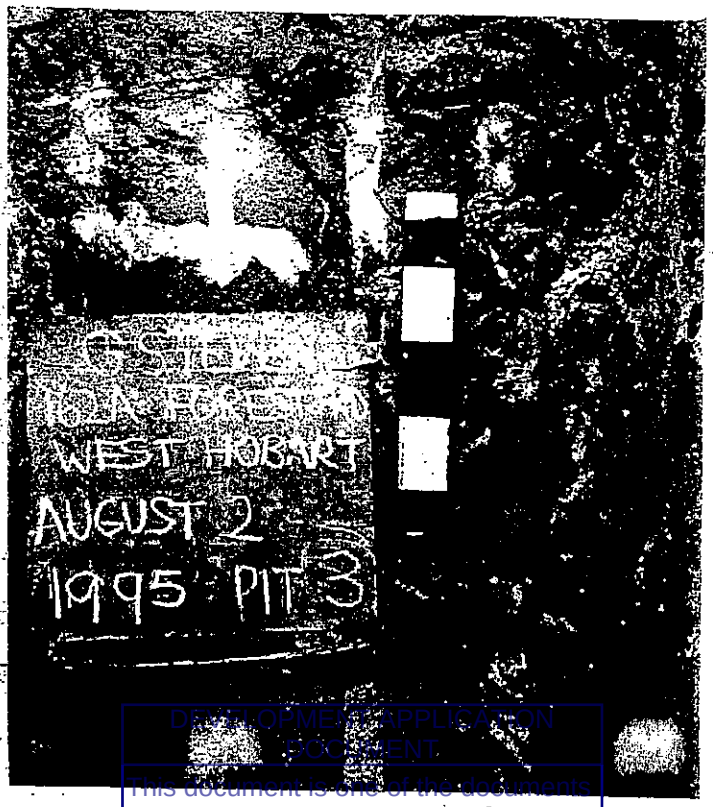


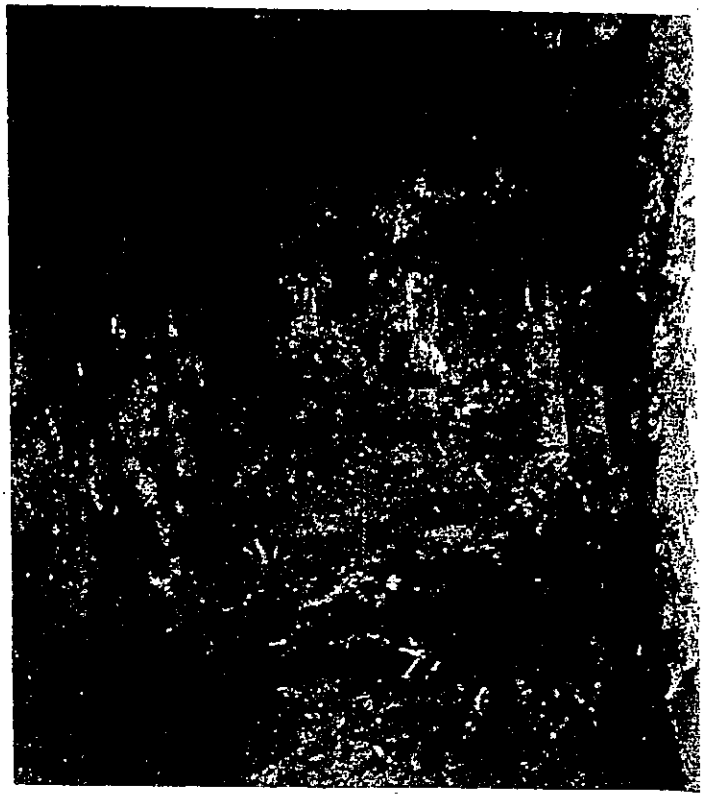
Plate 10. Detail of Plate 9.



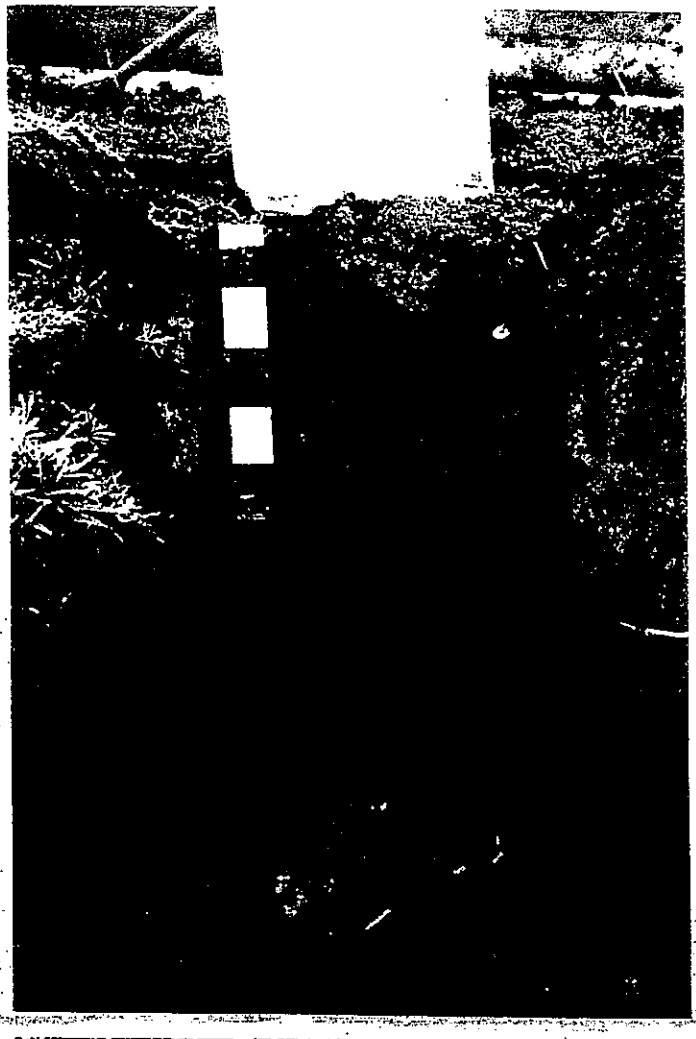


Plates 11-13. - Test pits 1 and 2. - The detail of test pit 2 (below) shows grey clay patches and joint linings in the CB horizon between the B soil horizon.

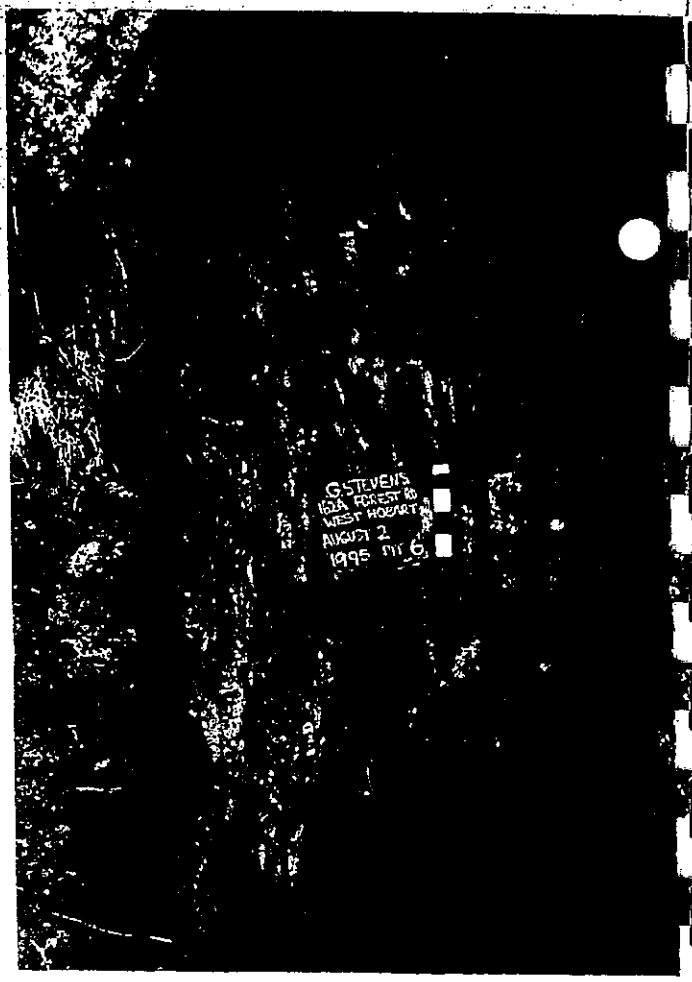


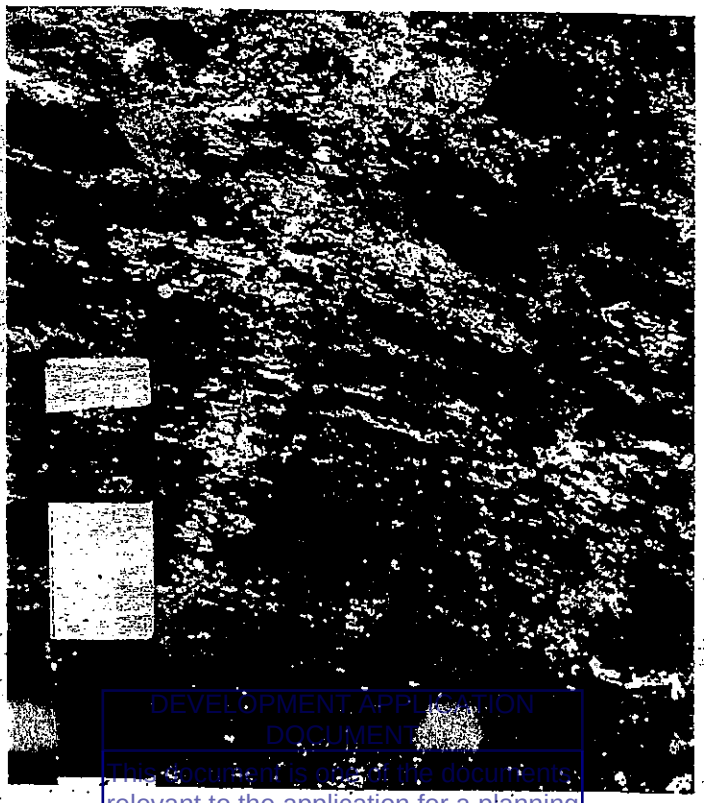


Plates 14-17. Test pits 3 and 4. The detail of test pit 3 (above) shows a brown wedge of sand and gravelly clay filling in the space between neighbouring sandstone boulders. This material is interpreted as colluvium. The detail of test pit 4 (below) shows similar material, with clay linings on defects.

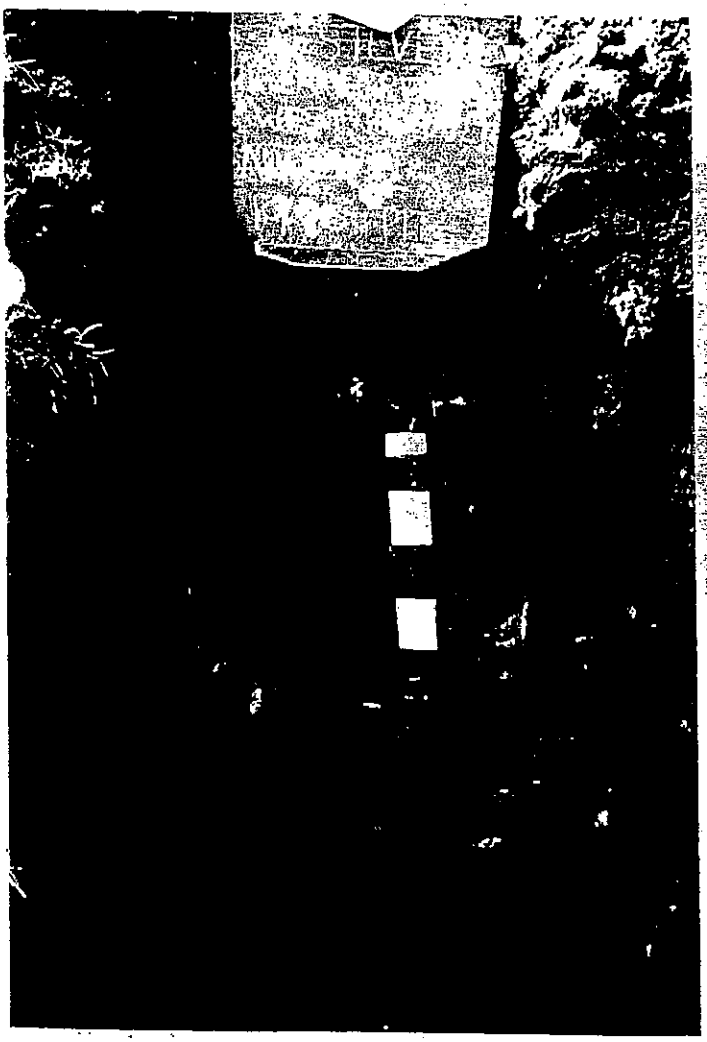


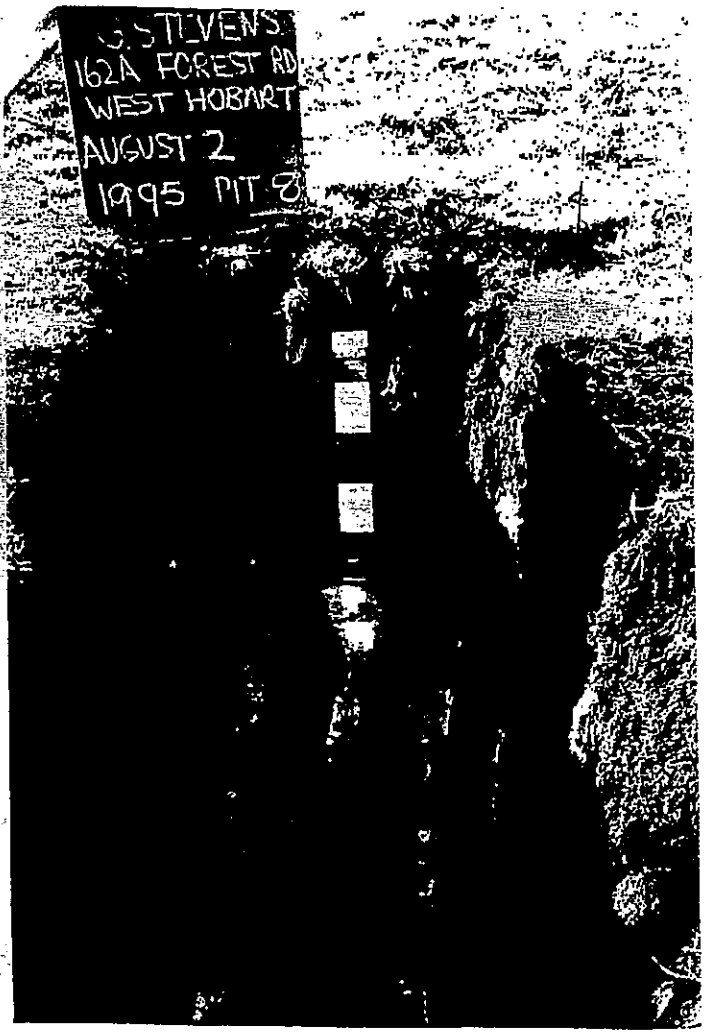
Plates 18-21. Test pits 5 and 6. The detail of test pit 5 (above) shows thin, discontinuous clay linings on bedding planes. Test pit 6 was dug at the heel of the landslip to a depth of 5 metres. The material to the base of the blackboard in the photograph below is inferred to be weathered bedrock (CB horizon. The dark grey patches and streaks are clay linings on relict joints and bedding.

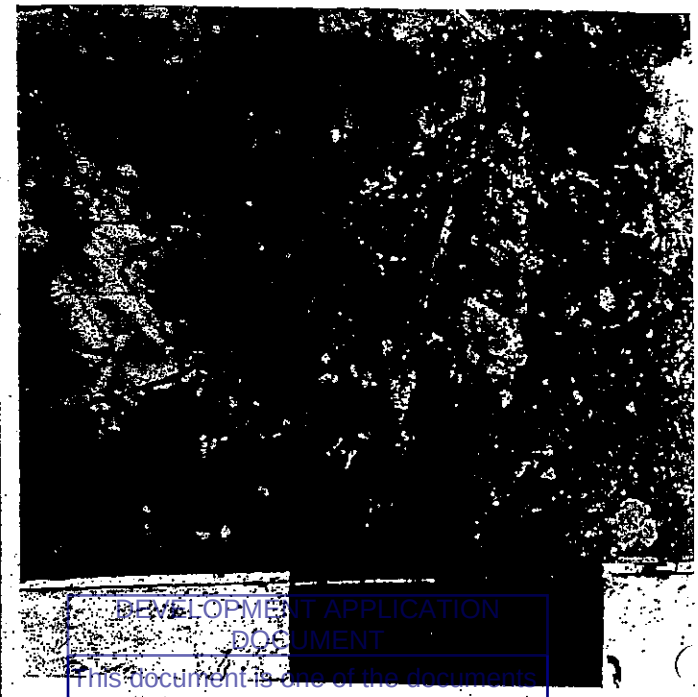




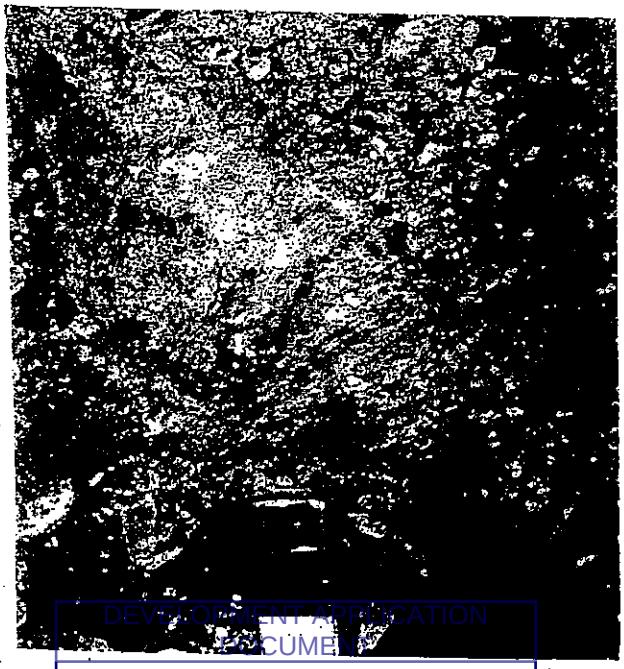
Plates 22-25. Test pits 6, 7 and 8. The photo to the left is a detail near the base of the CB horizon in pit 6, and the photo above is a detail of the weathered siltstone bedrock at the base of the pit.



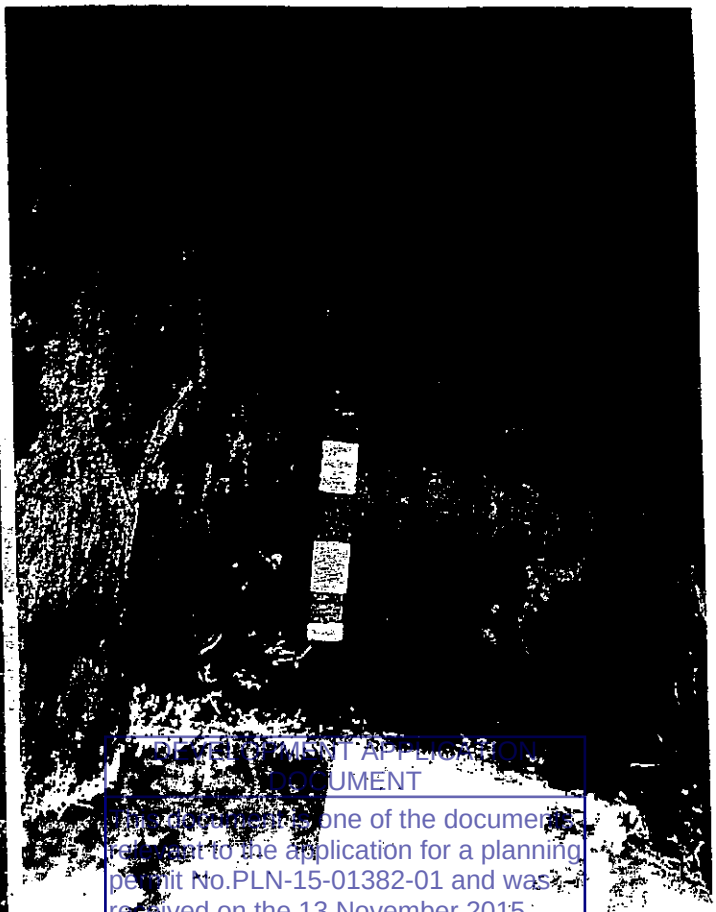


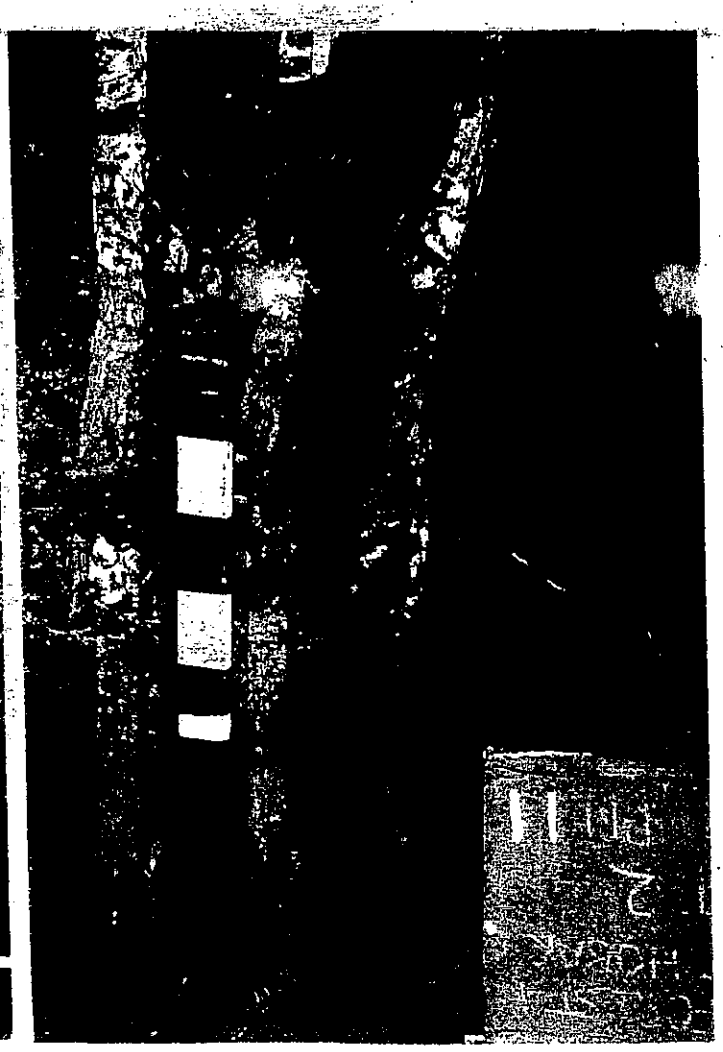


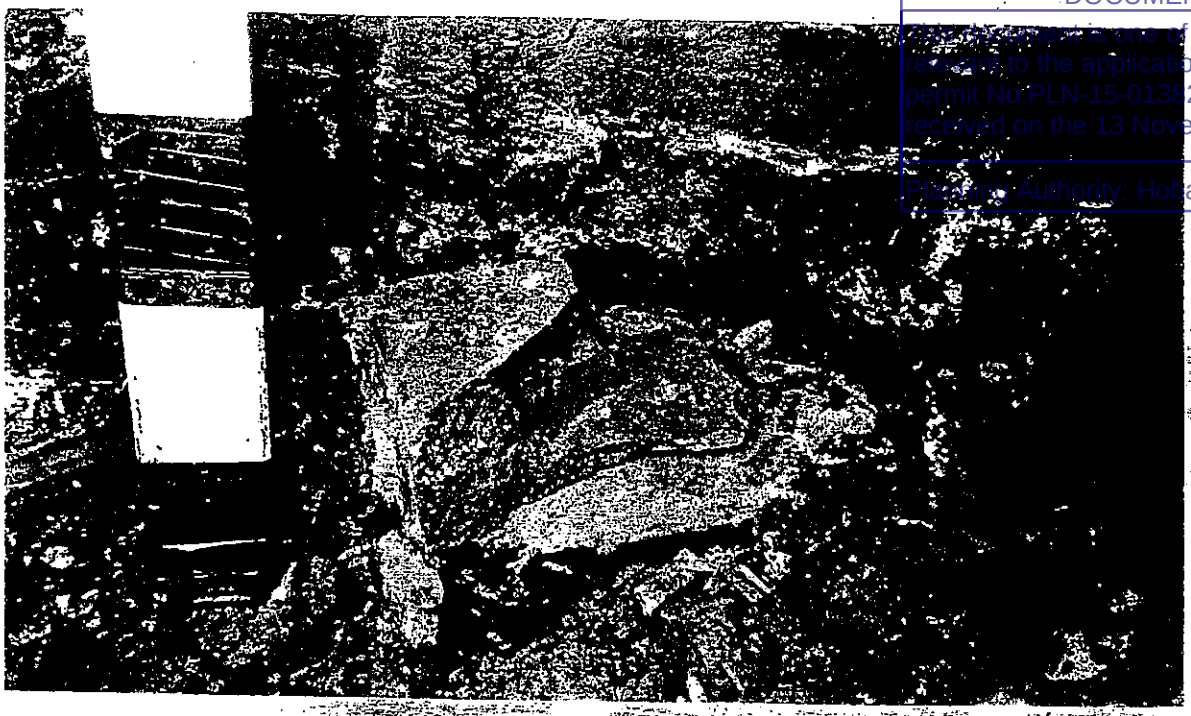
Plates 26-28. Test pits 9 and 10. The photo above is a detail of material interpreted as colluvium near the base of test pit 10.

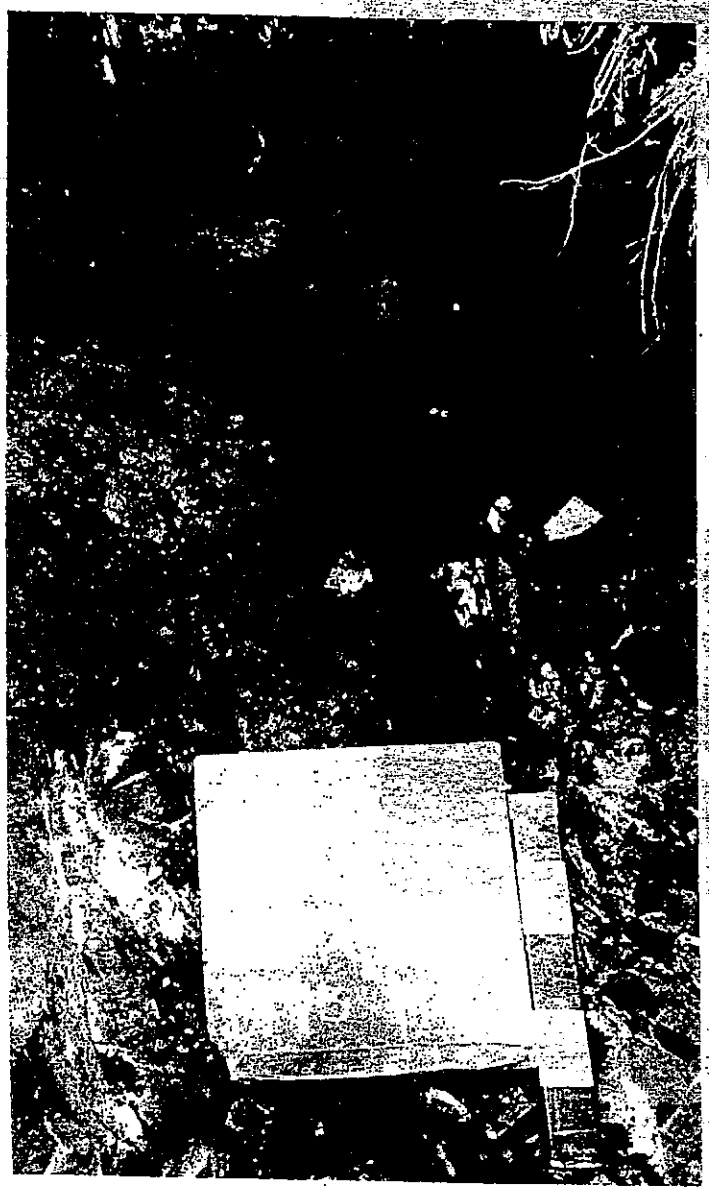


Plates 33-36. Test pits 16, 17 and 23. Grey clay linings well-developed on joints and bedding surfaces in pit 23 (left below).

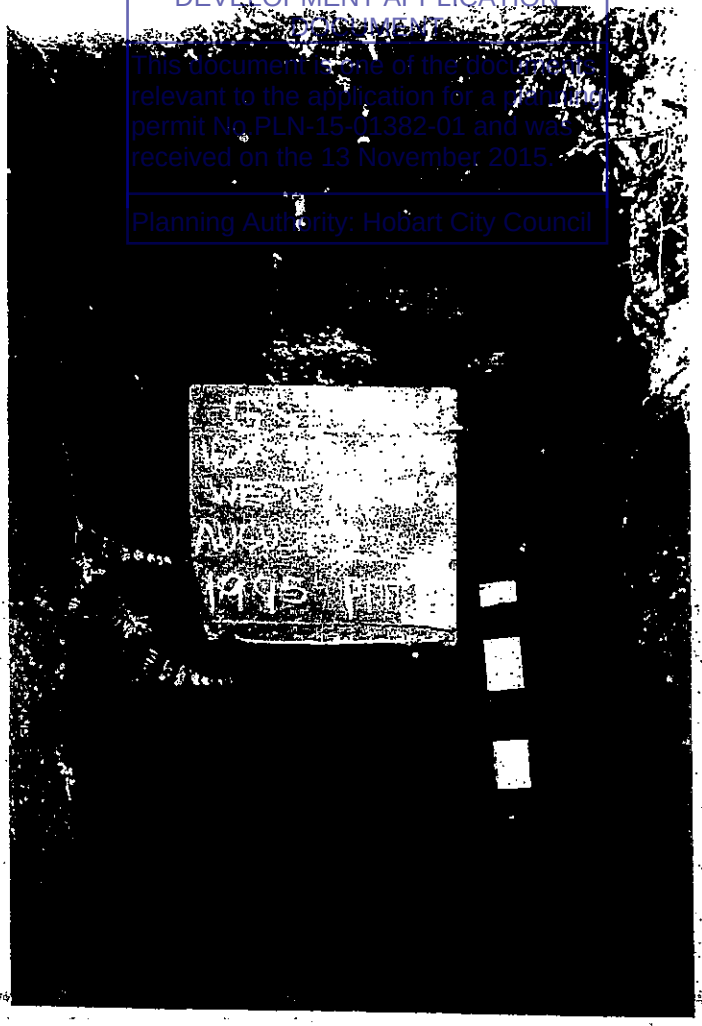




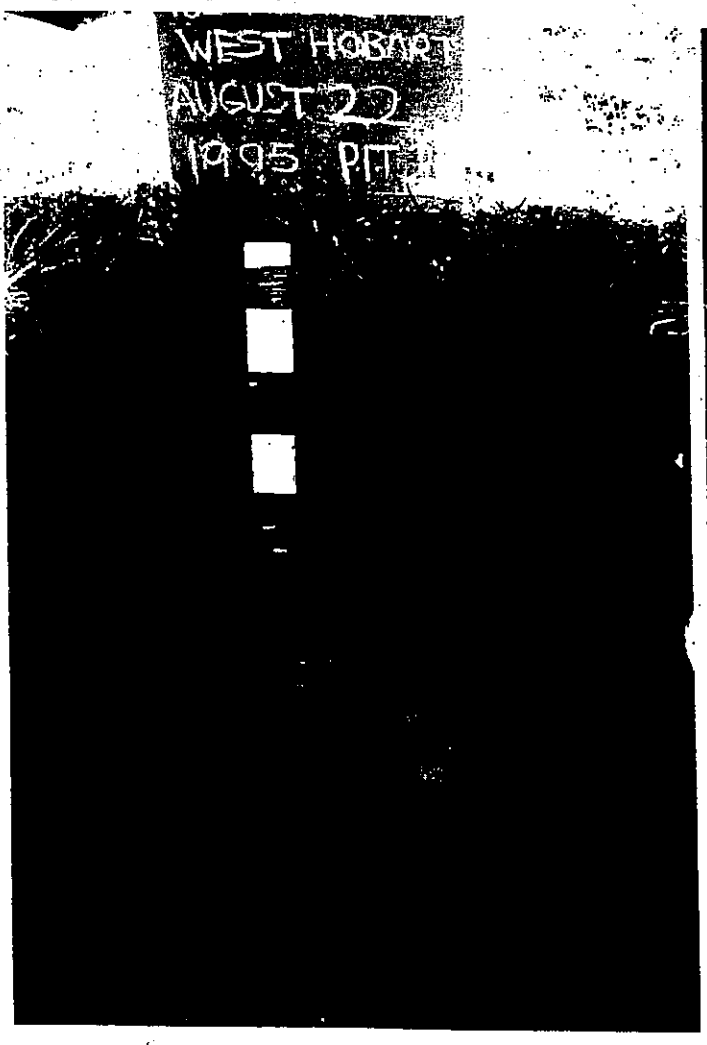




Plates 37 and 38. Plate 37 (above) is a detail of test pit 23, showing an angular sandstone fragment lubricated on a discontinuous, moist to wet grey clay lining. Similar material lines the subvertical joint at the back.



Plates 39-42. Test pits 25 and 26. Grey clay linings are evident as streaks and patches in the detailed photos (above and below) of both pits.



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Notes about this report

These notes are included to help interpret the report in relation to classification systems and field procedures.

Geological and geotechnical reports are interpretative rather than factual documents, inherently restricted by the nature of the information available. They are based on generally incomplete surface observations, and from limited subsurface data collected from indirect geophysical methods or more directly from test pits or bores. The latter sample only a small portion of the subsurface. The information is supplemented by experience and knowledge of local geology.

Classification methods

This report describes and classifies soil materials based on Australian Standard AS 1726 — the *SAA Site Investigation Code* which incorporates the Unified Soil Classification System (USCS). The accompanying *Explanatory Notes for Engineering Logs* describes some of the data usually collected.

In the USCS System, materials are described independant of origin and solely in terms of particle size, grading and plasticity (and where necessary on the amount of organic matter present). To use the System, soil materials must be disturbed and remoulded by hand, often by adding water.

Coarse-grained soils (sand and gravel) and *fine-grained soils* (silt and clay) are recognised. The particle size ranges are:

Soil classification	USCS Symbol	Particle size
Clay	C	less than 0.002 mm
Silt	M	0.002 - 0.06 mm
Sand	S	0.06 - 2.00 mm
Gravel	G	2.00-60 mm

The USCS System does not apply to materials where more than 50% of particles are larger than 60 mm. These include cobbles (60 - 200 mm) and boulders (>200 mm).

Descriptive subdivisions include W (well-graded), P (poorly-graded), M (with silt), L (low plasticity) and H (high plasticity).

Modifying adjectives (eg. Silty CLAY, Clayey GRAVEL) are used only when a secondary component exceeds 12%. Dual names (eg. Clayey GRAVEL — Gravely CLAY, GC - CH) as distinct from dual symbols (eg. GRAVEL, GP - GC) are used only when primary and secondary components are present in almost equal proportions. Visual estimates of particle proportions are imprecise.

Minor components are present up to 12%: "trace" describes a component in the 0 - 5% range (usually just detectable by eye or feel), and the word "some" implies a proportion in the range 5 - 12%. These two words thus have specific meanings.

Penetration Tests

These are carried out on both non-cohesive and cohesive soils, and may include the Standard Penetration Test (SPT) and Hand Penetrometer Testing.

In the SPT, a 50 mm diameter split-tube sampler is driven by a 63 kg hammer falling 760 mm in three successive 150 mm depth increments. The 'N' value is taken as the number of blows for the last 300 mm. If full penetration is obtained, the results are reported in the form:

3, 7, 9 N = 16

If the test is not completed because of hard ground, results are reported as:

10, 25/50 mm

Indicating ten blows for the first 150 mm and 25 for the next 50 mm.

Hand penetrometer testing may be of various types. The *Perth Sand Penetrometer* test involves driving a 16 mm diameter flat-ended steel rod with a 9 kg hammer dropping 600 mm. The *Cone or Scala Penetrometer* uses a 16 mm rod with a 20 mm diameter cone end, and a 9 kg hammer falling 510 mm. The simple Hand Penetrometer, used mainly for cohesive soils, involves pushing by hand a 5 mm flat-ended steel rod 10 mm into the tested material, and reading the reactive effort off a graduated, spring-loaded scale. Readings in kPa are roughly twice that of the undrained shear strength.

Bore or test pit logs

The logs presented here are interpretative. Their reliability and the resultant interpretation is related to the experience of the consultant, the overall density of test pits or bores, and to the methods used to gain the subsurface information.

The most reliable information is obtained from open test pits, followed by continuous sampling from bores. Samples from auger drilling are grossly disturbed and can give only an indication of significant changes in materials.

Groundwater

Groundwater levels reported in logs and in the report may be misleading. Water, although present, may not be observed at all if the material yields it too slowly to a test pit or bore. Some water levels may be perched by a relatively impermeable material above a true, more permanent water table. Others may change seasonly or more rapidly in response to weather and climate. Some drilling methods which use water as a drilling fluid may affect the natural water level.

More reliable water levels can be obtained by installing casing in holes, or leaving test pits open, and recording water levels over days, weeks or longer periods.

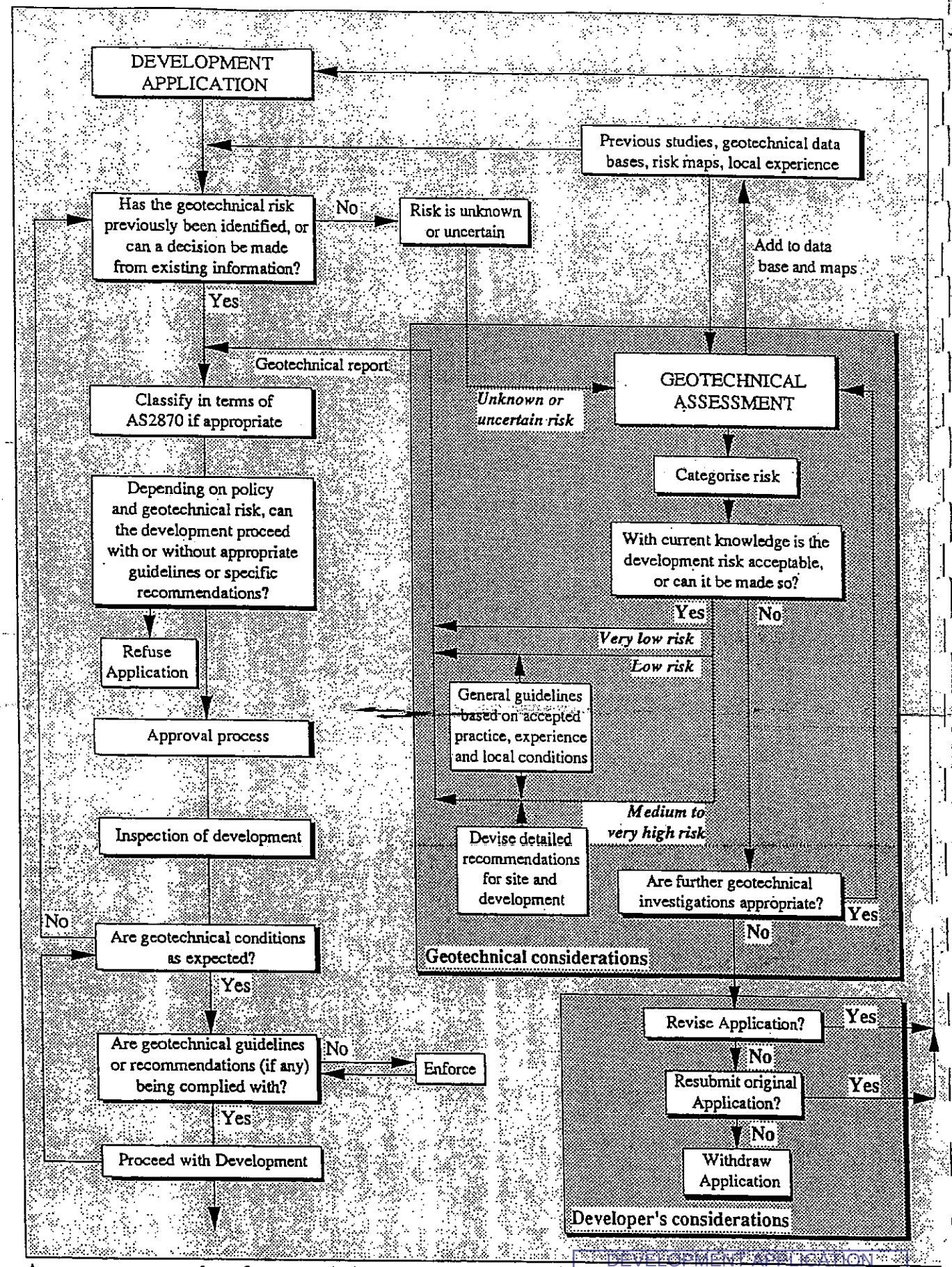
Geological and Geotechnical Reports

The results and interpretations contained in reports refer only to the site conditions at the time of investigation, and to the brief supplied by the client. Every professional care is taken to carry out the work in accordance with current geological and geotechnical practice, and to interpret and present the results in a way which satisfies the client's instructions. No responsibility can therefore be taken for

- unexpected variations in ground conditions, the chances of which decrease as the sampling density increases
- changes in policy or interpretation of policy by statutory or other authorities
- unexpected activities of contractors, including but not limited to those activities brought about by commercial pressures

We strongly recommend that we be immediately notified if site conditions are encountered which seem to differ from those expected from the information contained in the report.

Should the information in this report be used for tendering purposes, we also strongly recommend that the complete report be made available.



Assessment procedure for geotechnical risk in relation to developments

The geotechnical risk categories very low - low - medium - high - very high are based on those described by Walker *et. al.* in 'Geotechnical Risks Associated with Hillside Development', *Australian Geomechanics News, 1985 (10). They have been broadened include all geotechnical aspects which may affect development, such as expansive soils, tunnel erosion and general foundati conditions.*

October 1992

Environmental & Technical Services Pty. Ltd.

CLASSIFICATION OF RISK OF SLOPE INSTABILITY

INTRODUCTION

In the Sydney Basin, which includes Wollongong to Newcastle and inland to Lithgow, there are many naturally occurring slopes which are the result of weathering and downslope transport of a mantle of soil and rock fragments. These may be unstable and will continue to move at varying rates, usually only appreciable over very long periods of time. However, on some sites the rate is fast enough to have a significant effect upon hillside development. Natural factors that effect the rate are:

- geology.
- nature and extent of the mantle of soil and rock fragments.
- groundwater.
- slope gradient and topography.
- vegetation.

Unstable rock slopes also occur.

ASSESSMENT PROCEDURE

The risk of slope instability should be assessed by an experienced geotechnical consultant. An assessment would normally include:

- study of geological and topographic maps supplemented by the consultant's experience in the area.
- consideration of information made available by the client about the site and its surrounding area (including previous instability, building distress and drainage problems) and development proposals.
- visual appraisal of the site and surrounding area including signs of instability, soil and rock exposures, seepage and vegetation.
- collection of basic geological measurements from the site to produce a geological sketch model.
- consideration of possible effects of high rainfall.

The assessment applies to the site at the time of the inspection.

Although the assessment is predominantly deductive and incorporates judgement based on experience, in many cases it will be sufficient to enable development to proceed. On very high, high and some medium risk sites geotechnical investigation will be required to confirm the assessment and define development options. The scope of any investigation depends upon the risk of instability and the proposed development and will involve subsurface investigations and possibly soil testing to improve the geotechnical consultant's understanding of the site.

DEVELOPMENT

Building techniques are available to enable development of many higher risk sites. Inappropriate development on the site and neighbouring properties can cause slope failure and serious damage. Inappropriate development includes:

- unsupported excavation or placement of fill.
- excessive removal of vegetation.
- introduction of water to the slope.
- surface footings founded on the mantle of soil and rock fragments.

The owner's decision to develop the site involves an acceptance of a level of risk following development as assessed by the consultant. Even with suitable hillside construction techniques some minor cracking may occur.

Some sites may be unsuitable for economic development.

Other engineering constraints unrelated to slope instability may apply.

CLASSIFICATION

The following table has been produced to provide both a simplified classification which can be readily understood by a lay person and to provide a uniform language for geotechnical consultants.

RISK OF INSTABILITY	EXPLANATION	IMPLICATIONS FOR DEVELOPMENT
VERY HIGH	Evidence of active or past landslip or rockface failure; extensive instability may occur.	Unsuitable for development unless major geotechnical work can satisfactorily improve the stability. Extensive geotechnical investigation necessary. Risk after development may be higher than usually accepted.
HIGH	Evidence of active soil creep or minor slips or rockface instability; significant instability may occur during and after extreme climatic conditions.	Development restrictions and/or geotechnical works required. Geotechnical investigation necessary. Risk after development may be higher than usually accepted.
MEDIUM	Evidence of possible soil creep or a steep soil covered slope; significant instability can be expected if the development does not have due regard for the site conditions.	Development restrictions may be required. Engineering practices suitable to hillside construction necessary. Geotechnical investigation may be needed. Risk after development generally no higher than usually accepted.
LOW	No evidence of instability observed; instability not expected unless major site changes occur.	Good engineering practices suitable for hillside construction required. Risk after development normally acceptable.
VERY LOW	Typically shallow soil cover with flat to gently sloping topography.	Good engineering practices should be followed.

This table is an extract from GEOTECHNICAL RISKS ASSOCIATED WITH HILLSIDE DEVELOPMENT as presented in Australian Geomechanics News, Number 10, December, 1985, which discusses the matter more fully.

SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

ADVICE	GOOD ENGINEERING PRACTICE	POOR ENGINEERING PRACTICE
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified, experienced geotechnical consultant at early stage of planning and before site works.	Prepare detailed plan and start site works before geotechnical advice.
PLANNING		
SITE PLANNING	Having obtained geotechnical advice, plan the development with the Risk of Instability and Implications for Development in mind.	Plan development without regard for the Risk of Instability.
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork, timber or steel frames, timber or panel cladding. Consider use of split levels. Use decks for recreational areas where appropriate.	Floor plans which require extensive cutting and filling. Movement intolerant structures.
SITE CLEARING	Retain natural vegetation wherever practicable.	Indiscriminately clear the site.
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts, fills, retaining walls and drainage. Council specifications for grades may need to be modified. Driveways and parking areas may need to be fully supported on piers.	Excavate and fill for site access before geotechnical advice.
EARTHWORKS	Retain natural contours wherever possible.	
CUTS	Minimise depth. Support with engineered retaining walls or batter to appropriate slope. Provide drainage measures and erosion control.	Large scale cuts and benching. Unsupported cuts. Ignore drainage requirements.
FILLS	Minimise height. Strip vegetation and topsoil and key into natural slopes prior to filling. Use and compact clean fill materials. Batter to appropriate slope or support with engineered retaining wall. Provide surface drainage and appropriate subsurface drainage.	Loose or poorly compacted fill. Block natural drainage lines. Fill over existing vegetation and topsoil. Include stumps, trees, vegetation, topsoil, boulders, building rubble etc in fill.
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may become unstable. Support rock faces where necessary.	Disturb or undercut detached blocks or boulders.
RETAINING WALLS	Engineer design to resist applied soil and water forces. Found on rock where practicable. Provide subsurface drainage within wall backfill and surface drainage on slope above. Construct wall as soon as possible after cut/fill operation.	Construct a structurally inadequate wall such as sandstone flagging, brick or unreinforced blockwork. Lack of subsurface drains and weepholes.
FOUNDATIONS	Support on or within rock where practicable. Use rows of piers or strip foundations oriented up and down slope. Design for lateral creep pressures. Backfill foundation excavations to exclude ingress of surface water.	Found on topsoil, loose fill, detached boulders or undercut cliffs.
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable. Provide with under-drainage and gravity drain outlet where practicable. Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side.	
DRAINAGE		
SURFACE	Provide at tops of cut and fill slopes. Discharge to street drainage or natural water courses. Provide generous falls to prevent blockage by siltation and incorporate silt traps. Line to minimise infiltration and make flexible where possible. Special structures to disipate energy at changes of slope and/or direction.	Discharge at top of fills and cuts. Allow water to pond on bench areas.
SUBSURFACE	Provide filter around subsurface drain. Provide drain behind retaining walls. Use flexible pipelines with access for maintenance. Prevent inflow of surface water.	
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems; absorption trenches may be possible in some low risk areas. Storage tanks should be water-tight and adequately founded.	Discharge sullage directly onto and into slopes.
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability. Revegetate cleared area.	Failure to observe earthworks and drainage recommendations when landscaping.
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant.	
SITE VISITS	Site Visits by consultant may be appropriate during construction.	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER'S RESPONSIBILITY	Clean drainage systems; repair broken joints in drains and leaks in supply pipes. Where structural distress is evident seek advice. If seepage observed, determine cause or seek advice on consequences.	

This table is an extract from GEOTECHNICAL RISKS ASSOCIATED WITH HILLSIDE DEVELOPMENT as presented in Australian Geomechanics News, Number 10, December, 1985, which discusses the matter more fully.

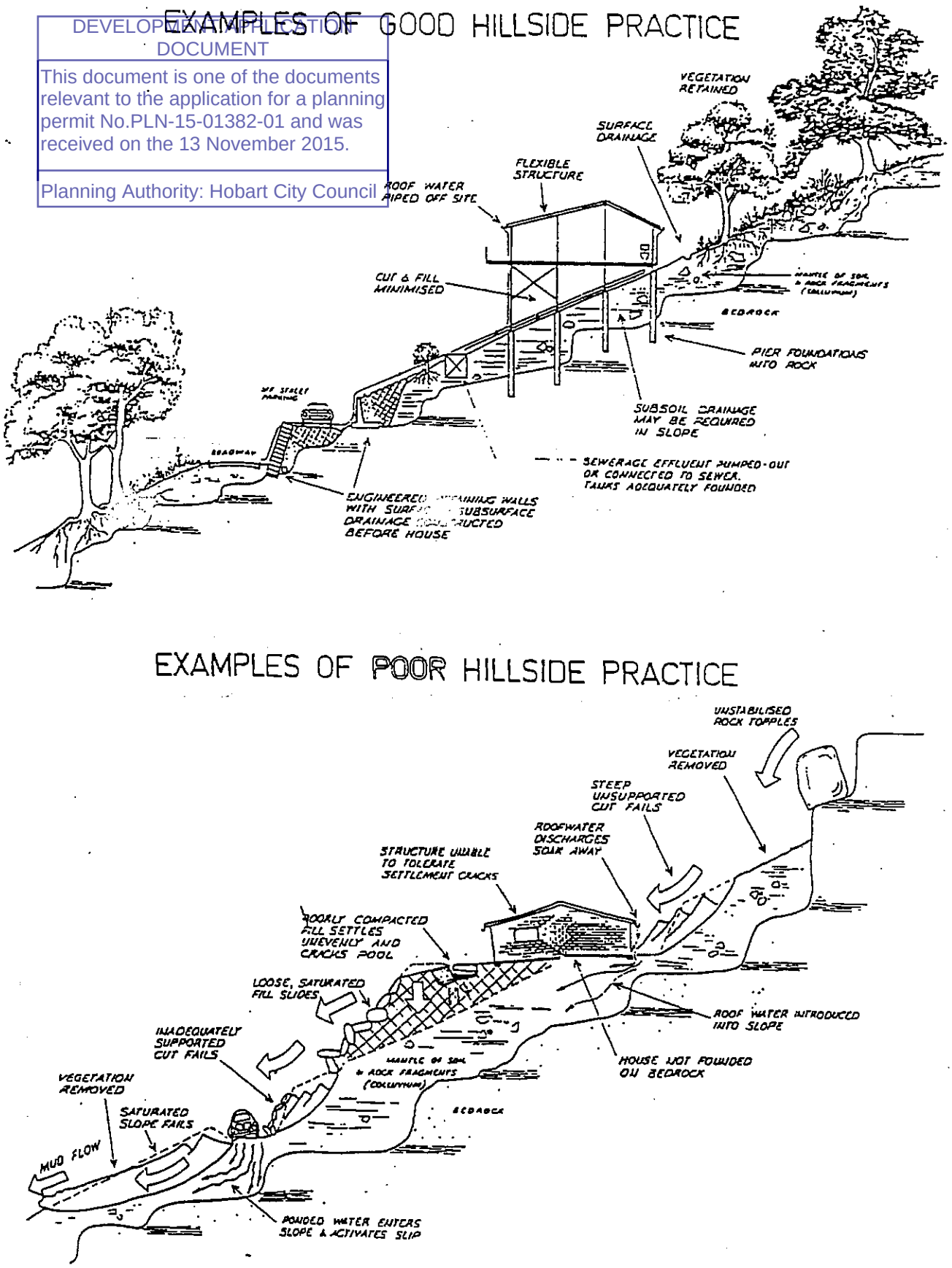
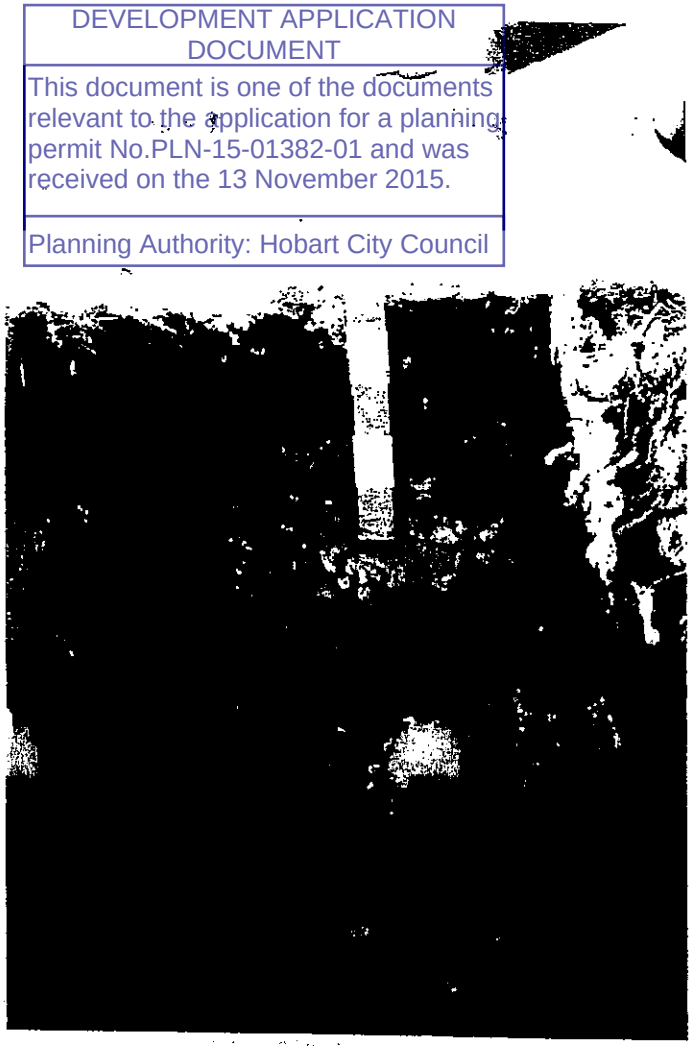
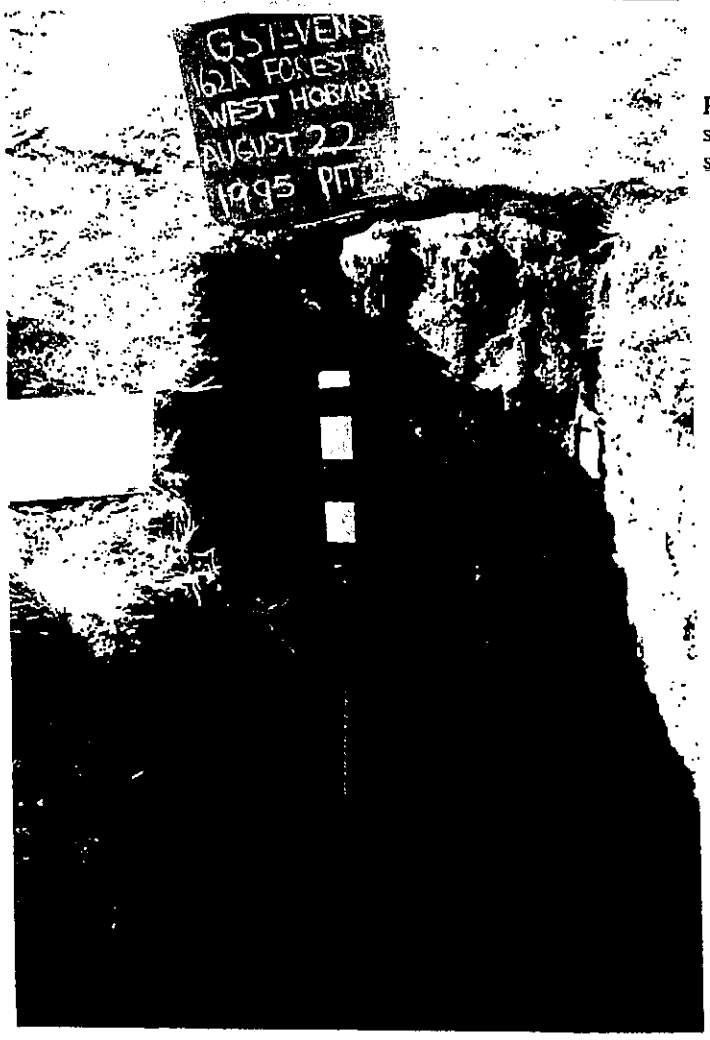


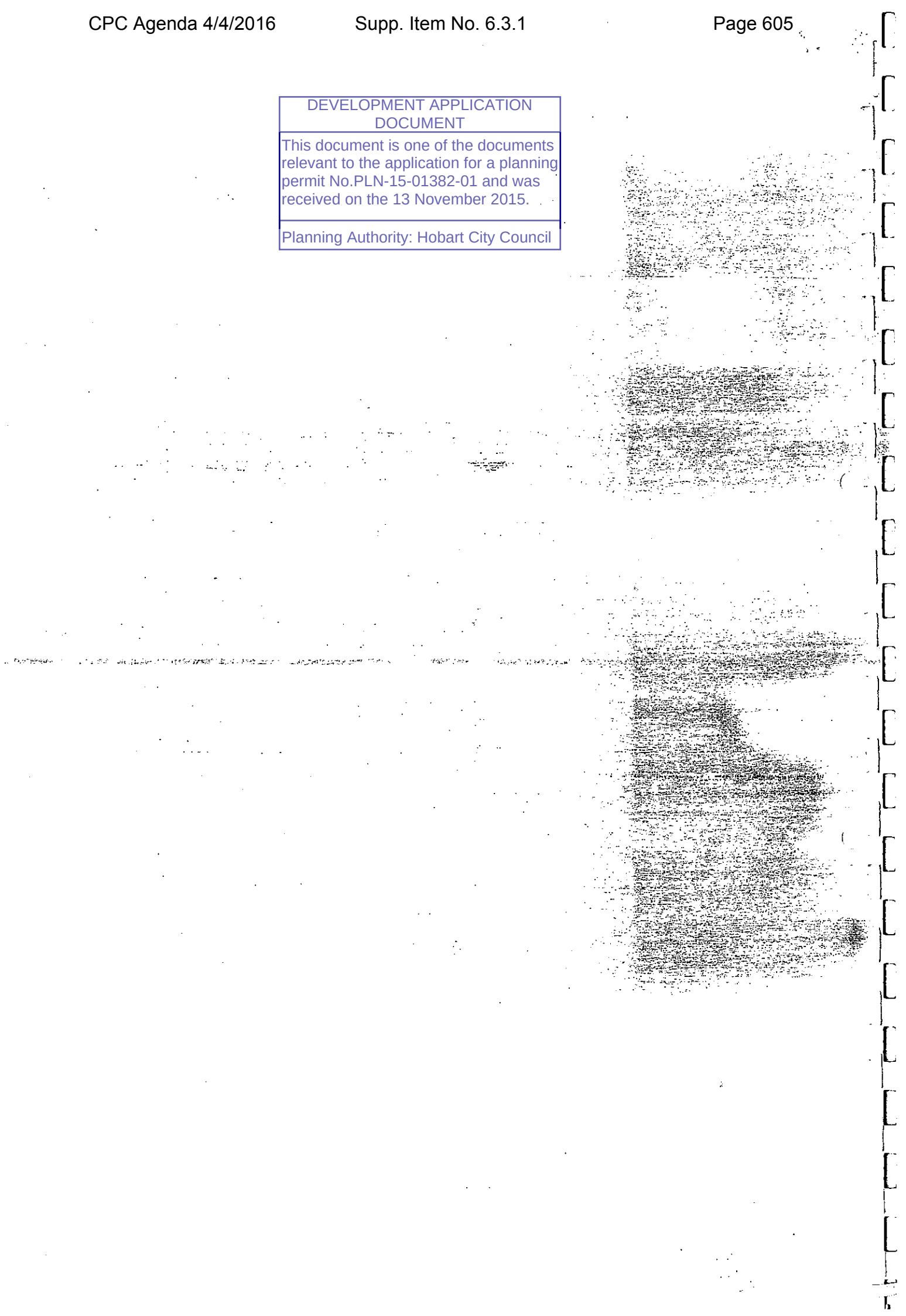
FIGURE 2 Illustrations of Good and Poor Hillside Practice

This figure is an extract from GEOTECHNICAL RISKS ASSOCIATED WITH HILLSIDE DEVELOPMENT as presented in Australian Geomechanics News, Number 10, December, 1985, which discusses the matter more fully.





Plates 43-45. Test pits 27 and 28. Clay has lined subhorizontal bedding surfaces and inclined joints in weathered sandstone in pit 27 (top left and above), and pit 28.



APPENDIX 4.

Notes about this report, assessment flow chart for geotechnical investigations, and notes on risk assessment and recommended hillside practices

FARM HILL
RESIDENTIAL SUBDIVISION
WEST HOBART

LOT 47
GEOTECHNICAL REPORT
ADDENDUM TO 1995 GEOTECHNICAL REPORT

Cover photo
View looking north and upslope across Lot 47 of the Farm Hill Subdivision, June 2014.

Refer to this report as
Cromer, W. C. (2015). *Farm Hill Residential Subdivision, West Hobart: Lot 47 Geotechnical Report – Addendum to 1995 Geotechnical Report.* Unpublished report for Farm Hill Pty Ltd by William C. Cromer Pty. Ltd., 22 January 2015; 82 pages).

The present report replaces an earlier report of the same title (but different date):

Cromer, W. C. (2014). *Farm Hill Residential Subdivision, West Hobart: Lot 47 Geotechnical Report – Addendum to 1995 Geotechnical Report.* Unpublished report for Farm Hill Pty Ltd by William C. Cromer Pty. Ltd., 15 July 2014; 81 pages).

Minor changes have been made to the Landslide Risk Management (LRM) section in Attachment 10, and in particular, to Table 10.3 and Figure 10.7. Figure 10.6, originally a single event tree, has been amended to Figures 10.6a and 10.6b (two separate event trees).

Important Notes
New geotechnical information is contained in this report. The information may be useful to regulators and geotechnical practitioners. Dissemination of such knowledge ought to be encouraged by practitioners and regulators.

William C Cromer as author will upload this report to his website www.williamccromer.com as a freely downloadable file.

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The local planning or building authority is encouraged to make this report (or a reference to it) available on-line.

William C Cromer Pty Ltd may submit hard or electronic copies of this report to Mineral Resources Tasmania to enhance the geotechnical database of Tasmania.

SUMMARY STATEMENT

This report is an Addendum to a 1995 geotechnical report.

It specifies a building envelope and conditions for residential development on Lot 47 of the Farm Hill Subdivision off Forest Road in West Hobart.

1 INTRODUCTION

1.1 Background

In 1995 Environmental & Technical Services Pty Ltd produced a geotechnical report[1] for G. E. Stevens to support an application to Hobart City Council to rezone 8ha of land off Forest Road in West Hobart from Rural B to Residential 2.

The Farm Hill residential subdivision, currently being developed, is the result (Attachments 1, 2, 3, 4). Lot 47 (Attachment 2) corresponds approximately to the area recommended in Cromer (1995) for low density development because of potential and existing slope stability issues.

The present report should be regarded as an Addendum to the 1995 report. It was commissioned by Farm Hill Pty Ltd to review the 1995 work, to conduct additional site investigations as necessary, and to provide specific recommendations for a building envelope for residential development on Lot 47. This report may accompany an application to rezone Lot 47.

1.2 Scope of current investigations

The present work is in general accordance with AS1726 (1993) *Geotechnical site investigations*. It included:

- a desk top study of satellite imagery (Attachment 3),
- a manipulation of LiDAR digital elevation data[2] (Attachment 8) and
- a review of published landslide maps including landslide hazard bands (Attachments 5 and 6).

Field work for this Addendum was conducted in May and June 2014 and included:

- Site inspection and photography (Attachment 9) of excavator services trenches dug by Farm Hill Pty Ltd principally along the perimeter of Lot 47,
- The digging, logging and photography (Attachment 9) of four excavator trenches totalling over 100m in length,
- Inspection and on-site discussion with Anthony Miner, Principal Geotechnical Engineer from A. S. Miner Geotechnical, and
- Surveying by D. Miller (surveyor) of the headscarps of several landslides along the eastern side of Ross Rivulet (Attachment 7).

2 SITE DESCRIPTION

Except for the results of the current work, all geotechnical aspects of Stages 1 – 4 at Farm Hill environs are comprehensively described in Cromer (1995). Relevant extracts from that report are reproduced here as Attachment 4. The Attachment includes a geotechnical interpretation map.

Recent site and trench photographs are presented in Attachment 9.

[1] Cromer, W. C. (1995). Geotechnical Investigations of land off Forest Road, West Hobart. Unpublished report for G. E. Stevens by Environmental & Technical Services Pty Ltd September 1995.
[2] Provided by A. S. Geotechnical from currently available LiDAR

3 LANDSLIDE RISK MANAGEMENT (LRM)

Attachment 10 is a LRM for Lot 47, in general accordance with the Australian Geomechanics Society (AGS) *Landslide Risk Management* (2007)[3].

Six potential slope movement scenarios were identified in relation to Lot 47. The LRM findings are:

- Current risks to property presented by the six scenarios range from Very Low (Scenario 6) to Moderate (Scenarios 1 – 5).
- Risk treatment is warranted for all of the Moderate risks.
- after development and appropriate risk treatment, consequences to property will be in the Insignificant to Minor range, and risks to property in the Very Low to Moderate range.
- Risk to life is acceptably low for all Scenarios after development, including Scenario 6 (excavations supported by engineered retaining walls behind houses).

The LRM analysis in Attachment 10 includes risk mitigation measures for these scenarios, which are incorporated in the Recommendations in this report.

Also included in Attachment 10 is a checklist of AGS (2007) items to be addressed in LRM, and a certificate of currency of the Professional Indemnity insurance for William C Cromer Pty Ltd.

4 CONCLUSIONS

From a geotechnical perspective, Lot 47 can conditionally support residential development, which is unlikely to cause instability on any other land.

All risks can be acceptably managed by the risk mitigation procedures, and with good hillside construction techniques, recommended in this report.

5 RECOMMENDATIONS

From a geotechnical viewpoint, residential development of Lot 47 at Farm Hill should proceed subject to the following recommendations.

1. Recommendations to create awareness of interested parties

1a. It is important that interested parties know that this (and the 1995) geotechnical work has been done. Approval to develop as proposed should therefore include reference to this report, and indicate that geotechnical and related conditions apply.

1b. The reference to this report shall be as follows:

[3] The five AGS documents are:
AGS (2007a). Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007
AGS (2007b). Commentary on Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007
AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007
AGS (2007d). Commentary on Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007
AGS (2007e). The Australian Geoguides for Slope Management and Maintenance. Australian Geomechanics Vol 42 No 1 March 2007

Cromer, W. C. (2014). *Farm Hill Residential Subdivision, West Hobart: Lot 47 Geotechnical Report – Addendum to 1995 Geotechnical Report.* Unpublished report for Farm Hill Pty Ltd by William C. Cromer Pty. Ltd., 22 January 2015; 82 pages).

1c. The planning authority shall ensure that copies of this report are available to interested parties. It is strongly suggested that this report, or a reference to its availability, be uploaded to the planning authority's website. Interested parties include future AS2870 classifiers of lots. To facilitate availability, both William C. Cromer as author and Farm Hill Pty Ltd hereby give permission for copies of the report to be made by Council, or anybody else. Note however, that hard copies of the report must be reproduced in full, not in part, and must only be copied in colour. No responsibility will be accepted by William C. Cromer Pty. Ltd. or Farm Hill Pty Ltd should stakeholders rely on information provided in black and white copies of this report, or part copies of this report whether in colour or not.

1d. As well as the planning authority, Farm Hill Pty Ltd shall ensure that prospective purchasers of lots in the subdivision are made aware that copies of this report are available.

2. Fundamental geotechnical recommendations

2a. Because Lot 47 includesinvolves moderately steep hillsides and active landslides, the over-riding recommendation is that good hillside engineering practices shall be followed for the development including dwellings and infrastructure. Examples of good and bad engineering practice on hillsides are included in Attachment 11 of this report.

2b. Architects, designers, builders, building inspectors, planning authorities, landowners and occupiers should also be aware of general geotechnical advice and information in the Australian Geomechanics Society publically available Geoguides[4]. These documents include the examples of good and bad hillside construction practices reproduced here in Attachment 11.

3. Restrictions on residential development

3a. Residential development (houses, garages, sheds, swimming pools, access drives and related infrastructure) shall be restricted to the building envelope labelled Area A in Figure 10.5 in Attachment 10, and repeated here as Figure 1.

3.b Residential development shall not occur on Landslide #874 or within a 20m wide buffer zone extending upslope from its headscarp (Areas C and B respectively in Figure 10.5) or on, and downslope to Ross Rivulet from, the steeper, undulating ground on the northern hillsides of Lot 47 (Area D in Figure 10.5 in Attachment 10, and repeated here as Figure 1).

3c. Lots created by subdivision of Lot 47 may include all or some of Areas B, C and D.

4. Recommendations about AS2870 site classification of future houses on Lot 47

4a. The planning authority shall require appropriate site investigations at or near the footprint of all future houses, and their subsequent classification in terms of AS2870 (2011) *Residential slabs and footings*.

4b. AS2870 classifiers should be appropriately qualified in accordance with the Tasmanian Director of Building Control's Certificates of Specialists or Other Persons[5]. They should read this and the 1995 geotechnical report. AS2870 site investigations and classification reports should be sufficiently detailed to allow, where necessary or appropriate, site-specific modifications to the recommendations of this report.

[4] Available on-line at http://australiangeomechanics.org/admin/wp-content/uploads/2010/11/LRM2007-GeoGuides.pdf

[5] See http://www.justice.tas.gov.au/building/publications_folder/Directors_Determination_Certificates_of_Specialists_or_Other_Persons_28_November_2012_.pdf

4c. AS2870 classifiers should anticipate a range of classifications depending on soil reactivity and thickness, depth to bedrock, the likely variability of these factors across house footprints, and the proposed designs of houses.

4d. It is strongly recommended that:

- subsurface investigations for site classification be done by excavator to help distinguish stable sandstone bedrock from floaters (some pockets of bedrock are present in colluvium), and

- footings for all houses in Lot 47 be supported on piers extended into (not onto) demonstrable Triassic sandstone bedrock This will mean footing depth is likely to vary across the footprint of a house.

4e. Footings for houses in soil on slopes steeper than about 15^0 shall be designed to resist lateral (downslope) ground movement.

5. Recommendations to enhance slope stability or reduce the consequences of instability at and near house footprints

5a. Minimise the number and height of excavations, including driveway accesses and house excavations.

5b. Do not unnecessarily overload slopes with excavated rock materials unless the underlying soil profile beneath the fill is first removed, and the fill is placed in a controlled manner. Do not use soil fill as a weight-bearing material unless it is placed in a controlled manner, and avoid oversteepening slopes with it (max. batter 1:2)

5c. Ensure that any weight-bearing fill placement during development is supervised by an appropriately qualified and experienced engineer who considers not only the final properties of the fill, but also any issues (eg consolidation and settlement) potentially affecting pre-existing low strength material on which the new fill might be placed.

5d. For excavations less than 0.8m high, create a batter angle in the soil profile no steeper than 1:2 (vertical: horizontal). Install a surface cut-off drain upslope and divert surface runoff to one or both sides of the excavation. Bedrock exposed in the excavation may be left subvertical, but any loose cobbles, boulders and joint fragments should be removed. Consider shotcreting or other ways to prevent rock falls from exposed bedrock faces, and the use of erosion control blankets and revegetation on battered soil faces.

5e. For excavations higher than 0.8m, install drained, engineered retaining walls on appropriate foundations to a suitable height, and where surface soil remains exposed above the wall, create a batter angle in the soil profile no steeper than 1:2. Bedrock exposed in the excavation behind the wall may be left subvertical, but the wall must be designed to resist lateral movement of material behind it. Install a surface cut-off drain upslope and divert surface runoff to one or both sides of the excavation, to join buried flexible stormwater pipework and hence to Ross Rivulet.

5f. Variations to the specifications in 5e (for example, using steel screen cover on rock faces, placing soil or rock berms, installing steel mesh fencing) are permissible provided they are engineer-designed and certified, the slope stability of the artificially steepened slope is not compromised, and the risks to property and life both remain Acceptable.

5g. The use of lightweight flexible materials is recommended for house construction.

6. Recommendations about surface drainage and services

6a. Control all natural surface runoff and concentrated runoff from roofs, hardstands and rainwater tank overflows. Discharge all water to Council's stormwater system. Avoid discharging drainage over or into excavations.

6b. All subsurface drainage from retaining walls or house pads shall be directed to stormwater pipework and not be permitted to discharge to the ground surface.

6c. Stormwater shall be piped in flexible pipework laid in trenches down (not across) the slope and extended (where unavoidable) through landslide #874 to discharge points in Ross Rivulet. Wherever possible, services from access roads downslope to houses shall be laid in trenches aligned directly up and down the slope, but backfilled with on-site subsoil (not screened gravel) to avoid creating permeable pathways for seepage water to accumulate at house footprints.

6d. Where stormwater or sewer pipes are constructed on grades greater than 15% (8.5^0), they should be constructed with anchors to prevent movement down the slope. Each anchor shall incorporate a pathway to allow seepage water flowing in the pipe bedding material to flow freely past the anchor and not be dammed by it.

7. Recommendation in relation to unexpected subsurface conditions

7a. William C. Cromer Pty Ltd shall be immediately contacted during development should subsurface conditions appear to significantly differ from those expected on the basis of this report.

W. C. Cromer
Principal

This report is and must remain accompanied by the following Attachments

Attachment 1. Location, satellite imagery, cadastral parcels and planning zones (2 pages)
Attachment 2. Subdivisional plan with Lot 47 indicated in green (1 page)
Attachment 3. Historical satellite imagery (3 pages)
Attachment 4. Extracts from 1995 geotechnical report (11 pages)
Attachment 5. Published geology and landslide hazard bands (2 pages)
Attachment 6. Tasmanian Landslide Hazard Maps in relation to the property (4 pages)
Attachment 7. May 2014 surveyed landslide headscarps and investigation trenches on Lot 47 (1 page)
Attachment 8. Topographic, aerial and LiDAR images of Farm Hill, showing May 2014 surveyed headscarps of landslides and 2014 service and investigation trenches (4 pages)
Attachment 9. Site and trench photographs (11 pages)
Attachment 10. Landslide Risk Management (18 pages)
Attachment 11. Examples of good and poor hillside engineering practices (3 pages)

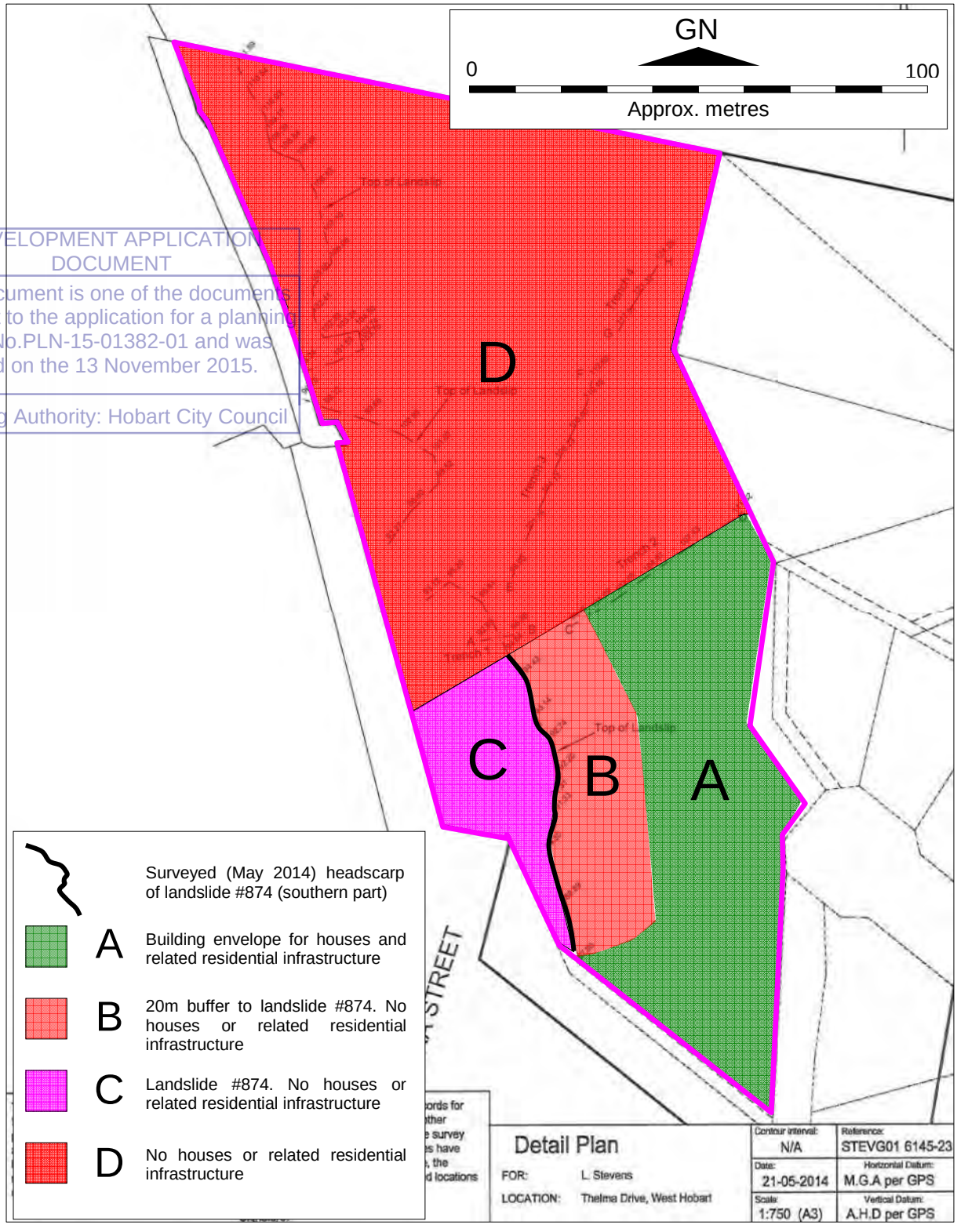


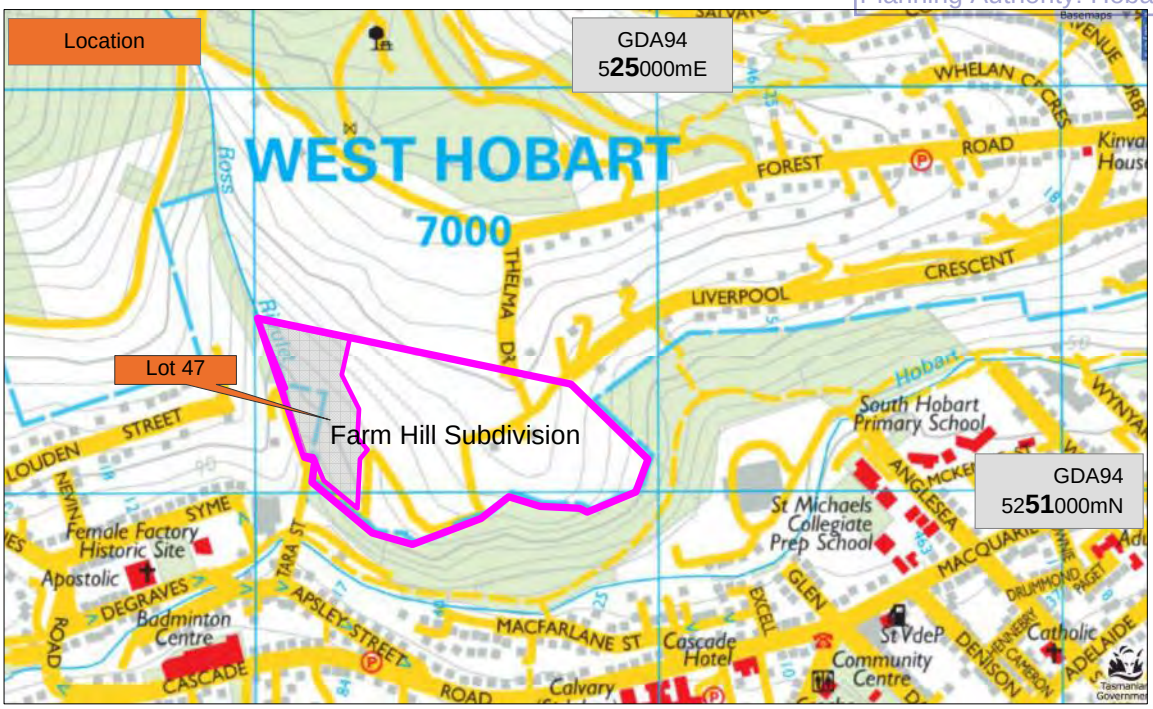
Figure 1. **Recommended building envelope (A) and no-development areas (B, C, D) for residential development of Lot 47 in Stage 4 of the Farm Hill subdivision.**
This diagram also appears as Figure 10.5 in Attachment 10 of this report**.**

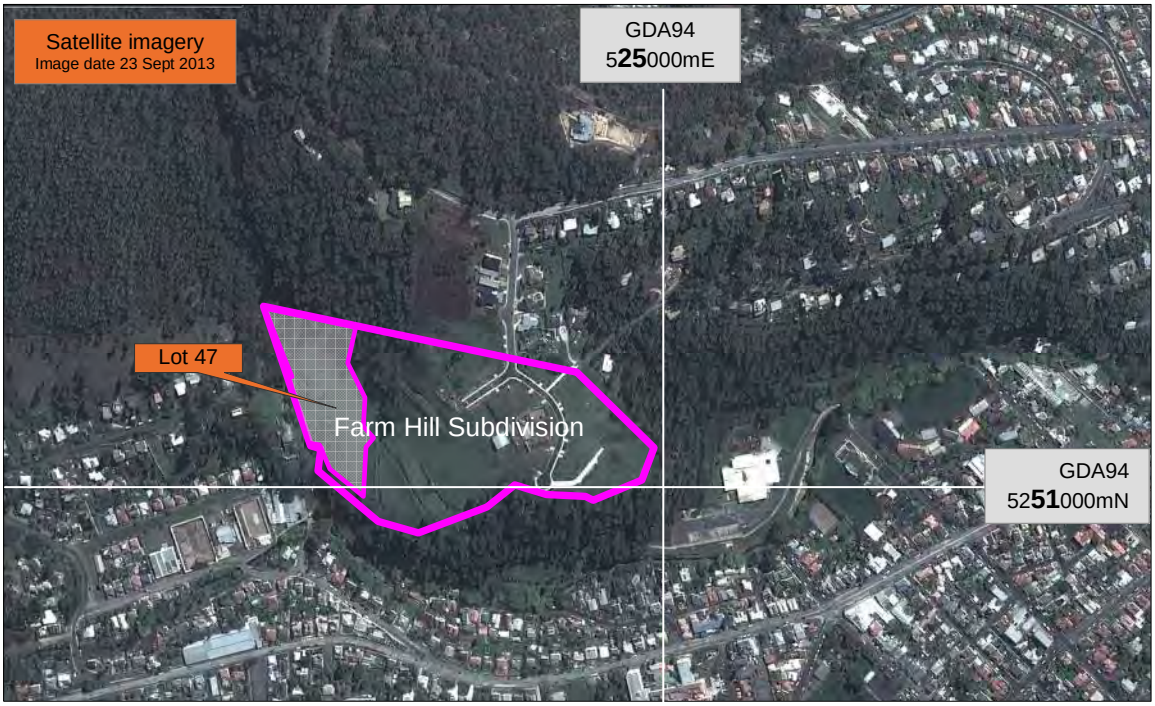
Attachment 1

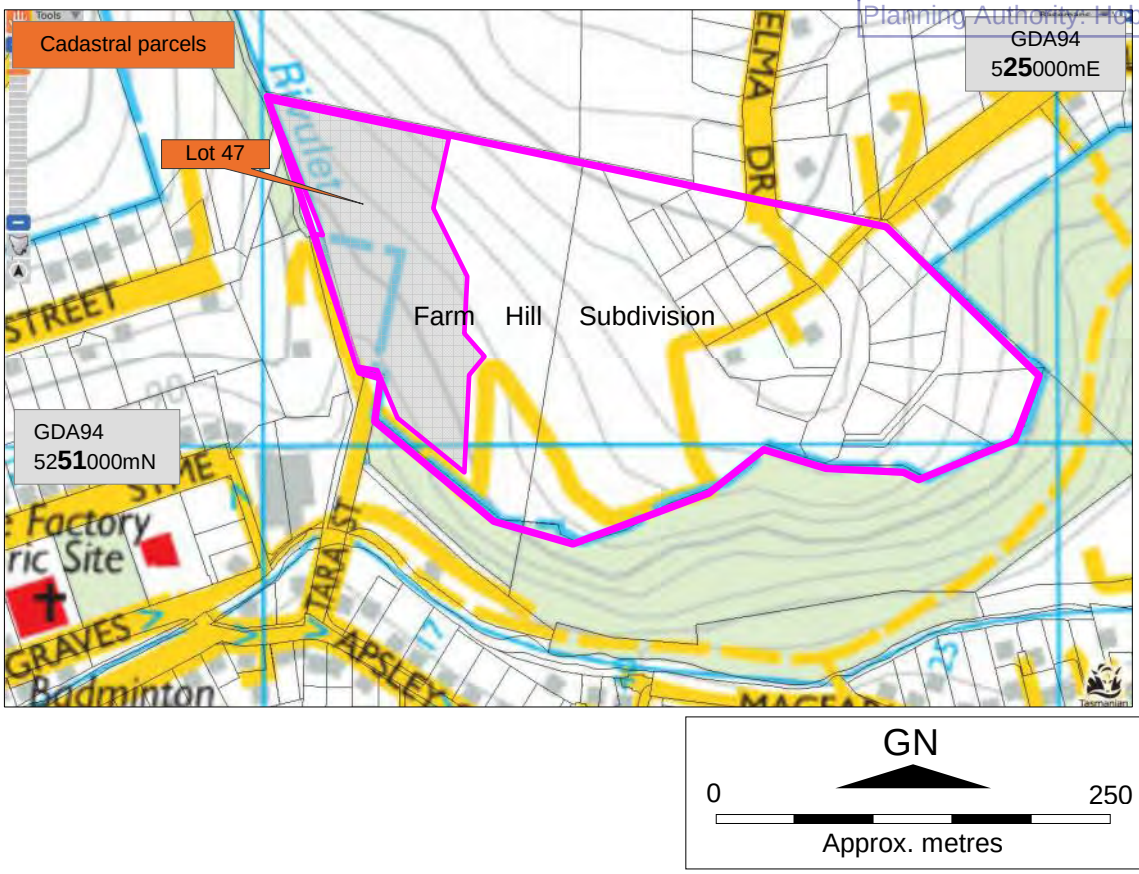
(2 pages)

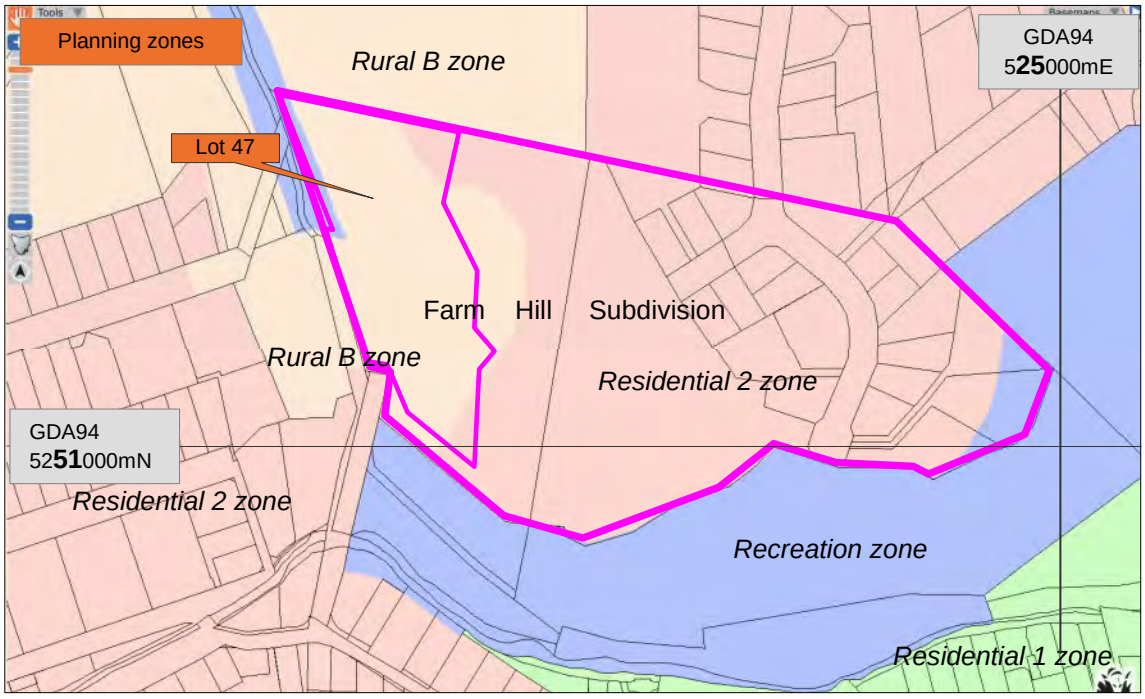
Location, satellite imagery, cadastral parcels and planning zones

Sources www.thelist.tas.gov.au







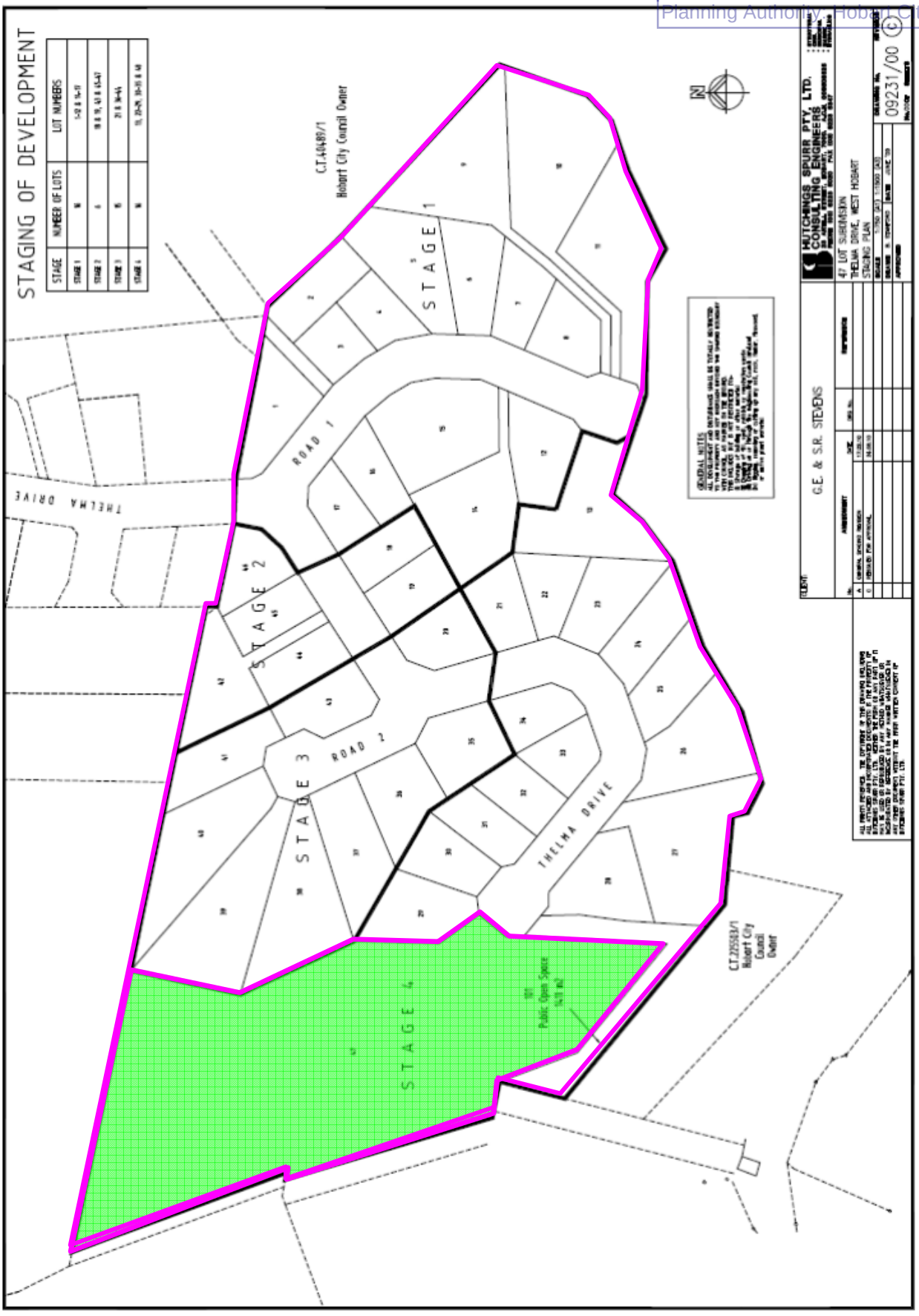


Attachment 2

(1 page)

Subdivisional plan with Lot 47 indicated in green

Source: Hutchins Spurr Pty Ltd Consulting Engineers

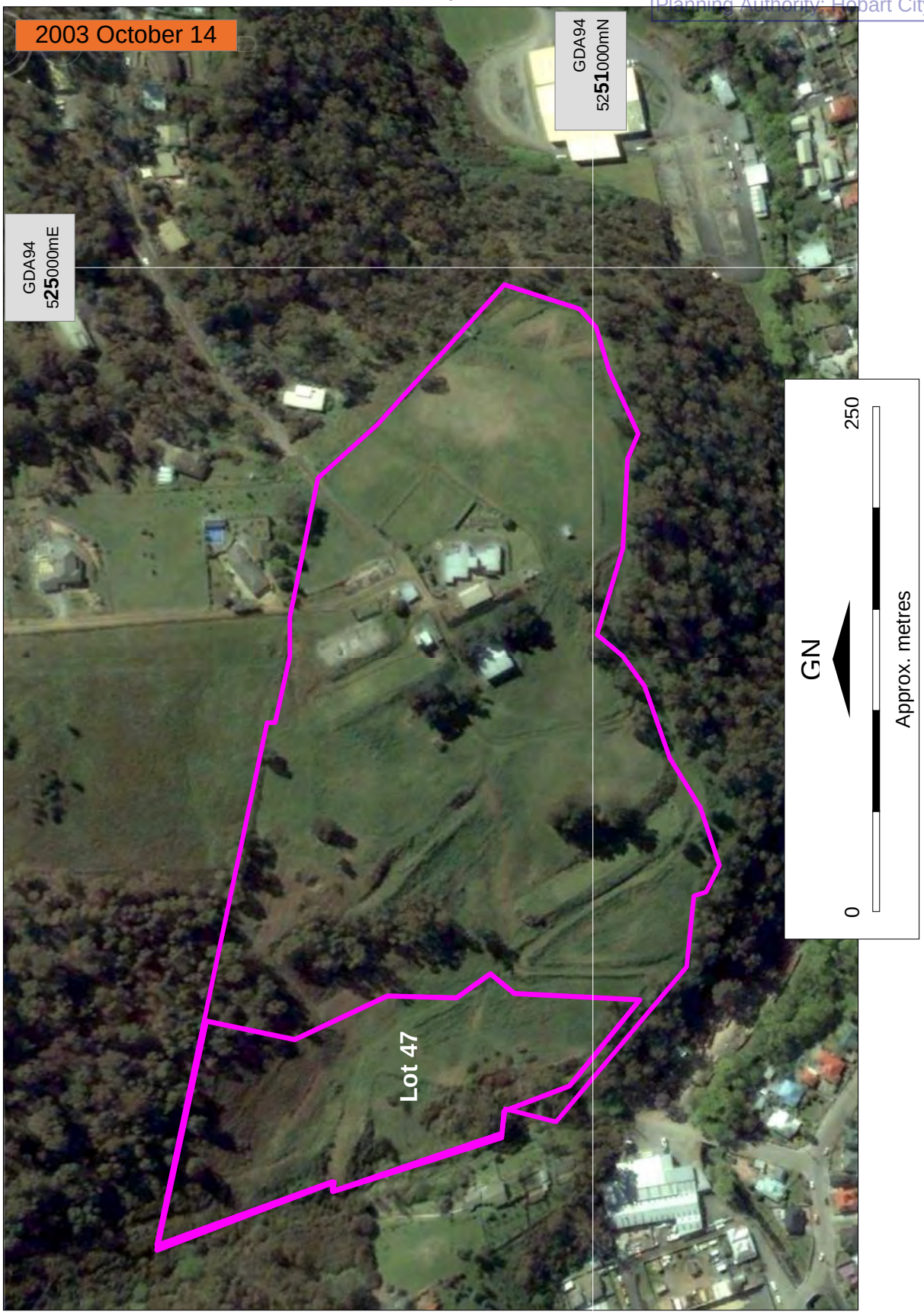


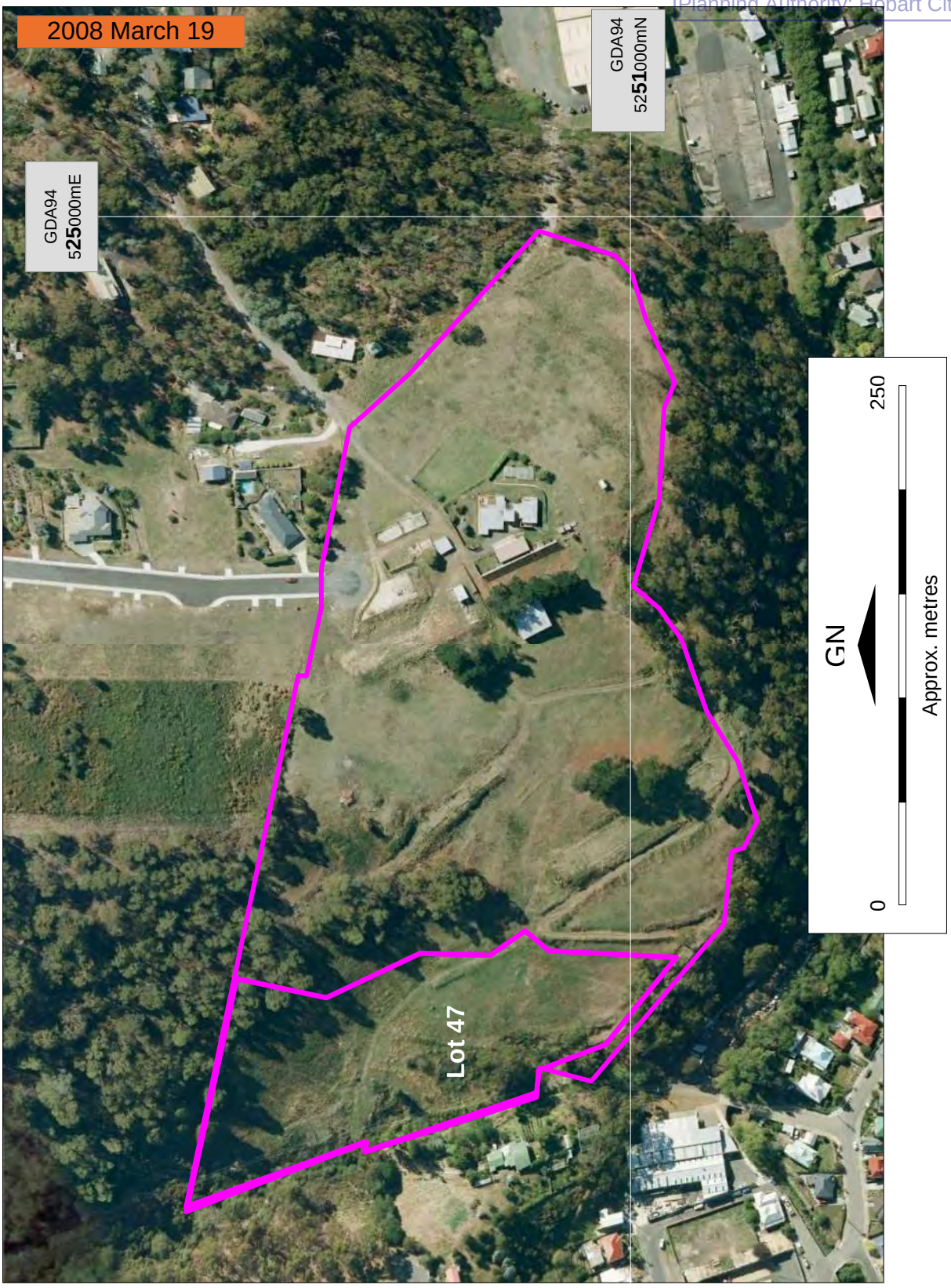
Attachment 3

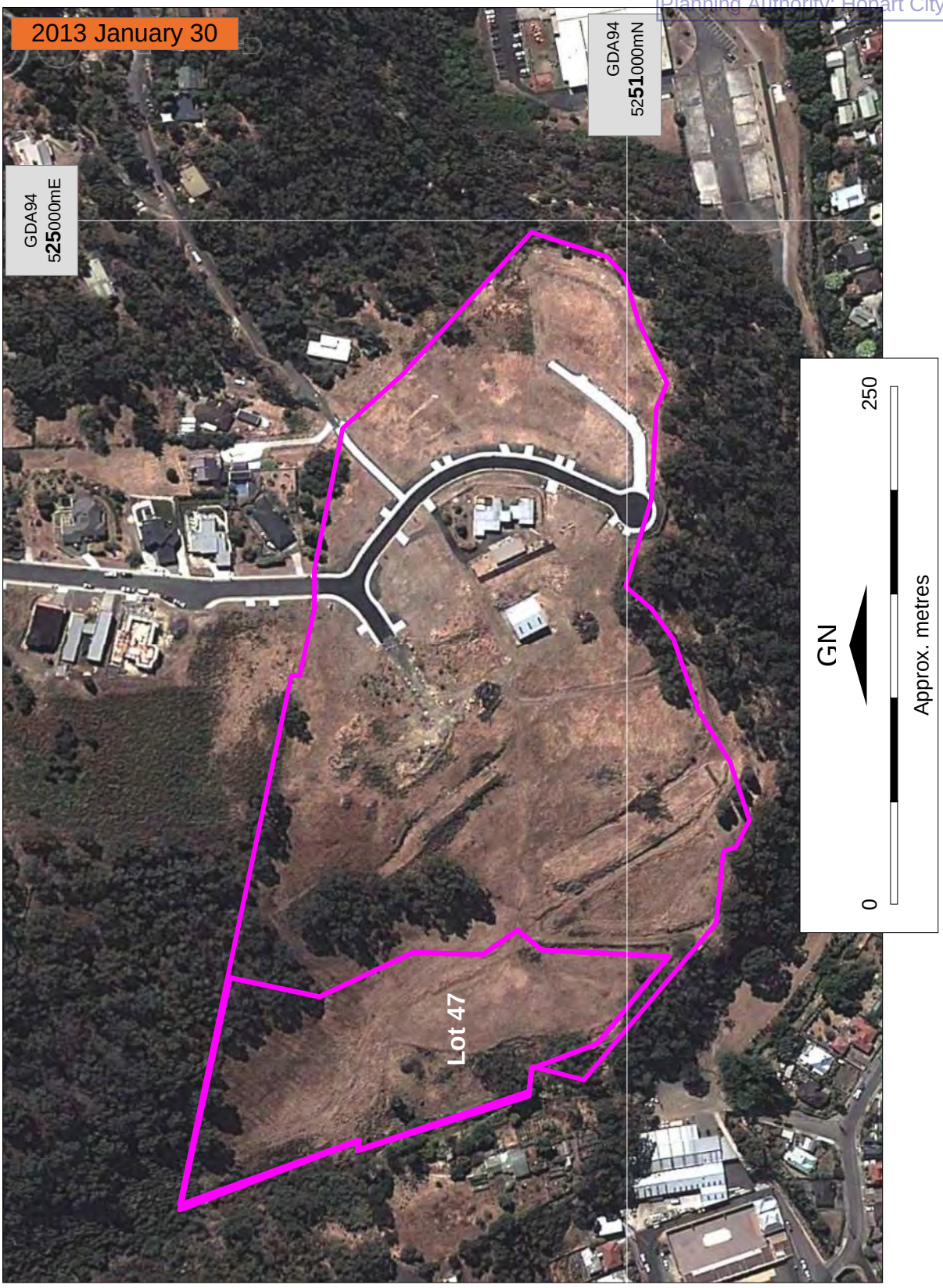
(3 pages)

Historical satellite imagery

Source: Google Earth





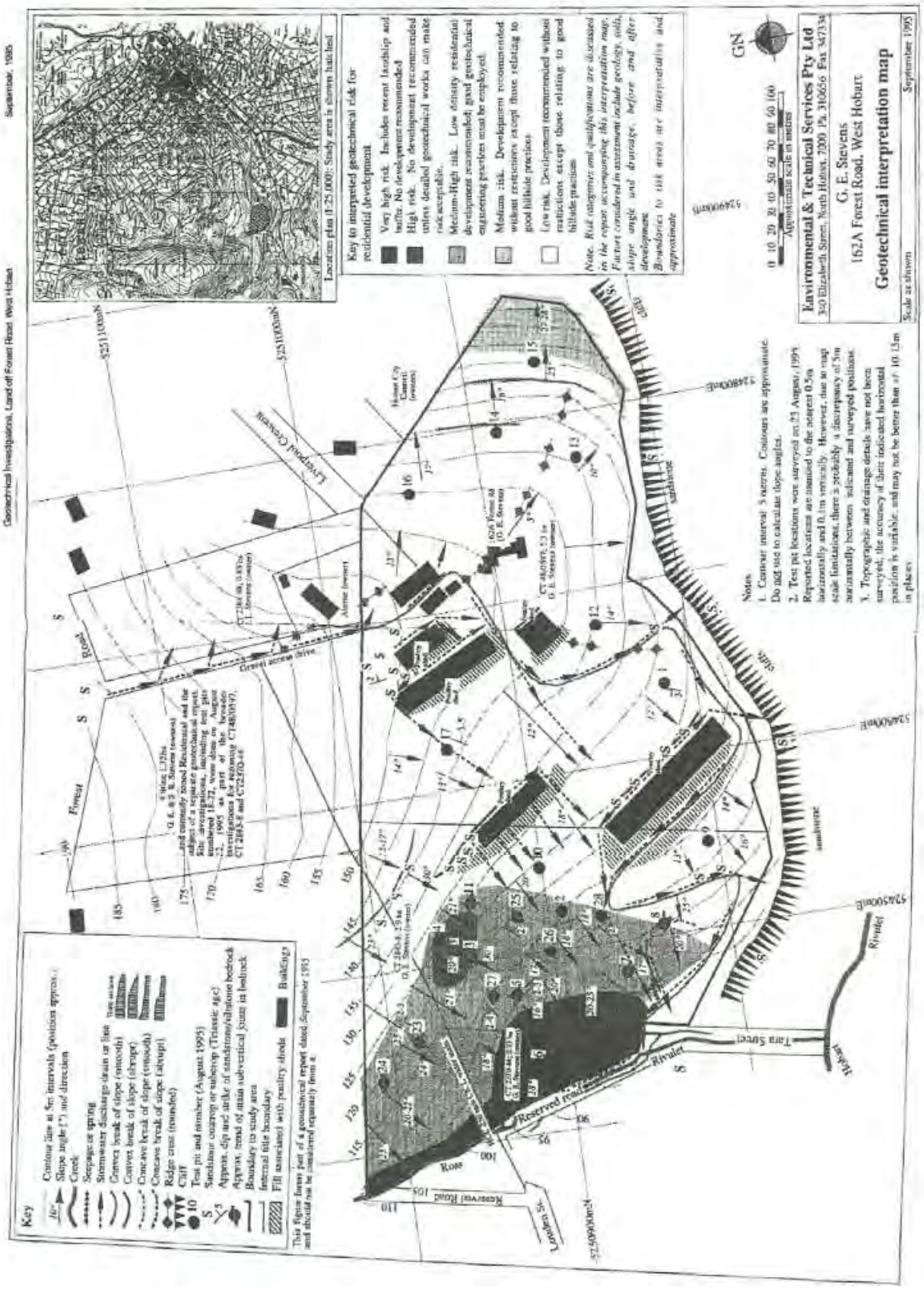


Attachment 4

(11 pages)

Extracts from 1995 geotechnical report

Source: Cromer, W. C. (1995). Geotechnical Investigations of land off Forest Road, West Hobart. Unpublished report for G. E. Stevens by Environmental & Technical Services Pty Ltd September 1995.



2. RESULTS

2.1 TOPOGRAPHY

The property (Figure 2) incorporates the crest and valley sides of a ridge extending downslope from Knocklofty past Forest Road to the southeast, south and southwest. The ridge terminates in a prominent sandstone cliff above the Hobart Rivulet (cover photograph). The western side is bounded by Ross Rivulet, which flows through a low break in the cliff line and joins Hobart Rivulet at Tara Street.

The land is mainly cleared to pasture, with small areas of eucalypts above an understorey of bracken fern (Plates 1 to 4 in Appendix 3). Some of the vegetation is regrowth following the 1967 Hobart bushfires.

The topography is relatively elevated. In the lower southwestern corner, elevations are about 80 metres above sea level (ASL), rising northwards to about 150 met SL along the northern bounda. The average slope is therefor it 13°. However, local hillside slopes range from gentle to steep. The lowest slope angles (about 5°) are along the crest of the ridge. On most of the valley sides, angles range from about 10 to 15° on the eastern flanks and 15 to 20° on the western side. Some small slope segments exhibit angles around 25 to 30°.

Over the eastern two thirds of the property, hillsides are generally smooth, and show no significant slope disruptions other than those caused by previous fencing and access tracks.

The western third of the property faces southwest towards Ross Rivulet and the Tara Street access (Plates 3 and 4). It is essentially composed of two broadly concave slope segments which join along a subtle change of slope. On the higher ground uphill, slope angles are around 20° to 25°, and locally reach 30°. Downhill from the change of slope, angles are typically 16° to 20°. This feature, incorporating in particular the lower slope segment, is possibly the scar of an ancient landslip, and is discussed further in Section 2.5.1. The landslip referred to in Section 1.2.1, located in the lower southwestern corner, has occurred on slopes of about 18° (Plate 5). A smaller possible landslip is present just upslope from the main slip, in the western corner of CT 2370-44 (Plate 6). About a hundred metres upstream, on both sides of Ross Rivulet, there is disturbed ground possibly related to minor slope failure, although the owner reports that the site was used as an access point for plant and equipment to the nearby HEC transmission line.

Elsewhere on this western third of the property, there are some localised smaller-scale topographic irregularities (Plate 7) suggestive of soil creep or solifluction[2].

[2]Soil creep, solifluction and colluvial movements are common hillside processes, caused by gravity acting on slopes with weathered material. *Soil creep* is the almost imperceptible downslope movement of all or part of the soil profile, sometimes including the weathered bedrock beneath. It may produce small undulations and irregularities on the surface, and cause fences to lean and tree trunks to develop a knee or bend convex down the slope. *Solifluction* is another form of slow mass movement, where the weathered material is almost saturated with water. *Colluvium* is a deposit of accumulated debris on or at the base of slopes. It too may produce surface irregularities and bulges. There is a gradation between all three processes, mainly related to water content, and it may be difficult to distinguish between them. In this report, for the sake of clarity, we have used the term 'soil creep' to mean either soil creep or solifluction or both, because in each case the soil profile appears to have been essentially unaltered. We use the term 'colluvium' separately because we believe we can distinguish such material from soil in the field, typically as a jumbled mass of boulders and smaller bedrock fragments in a friable, usually dry-moist finer-grained matrix.

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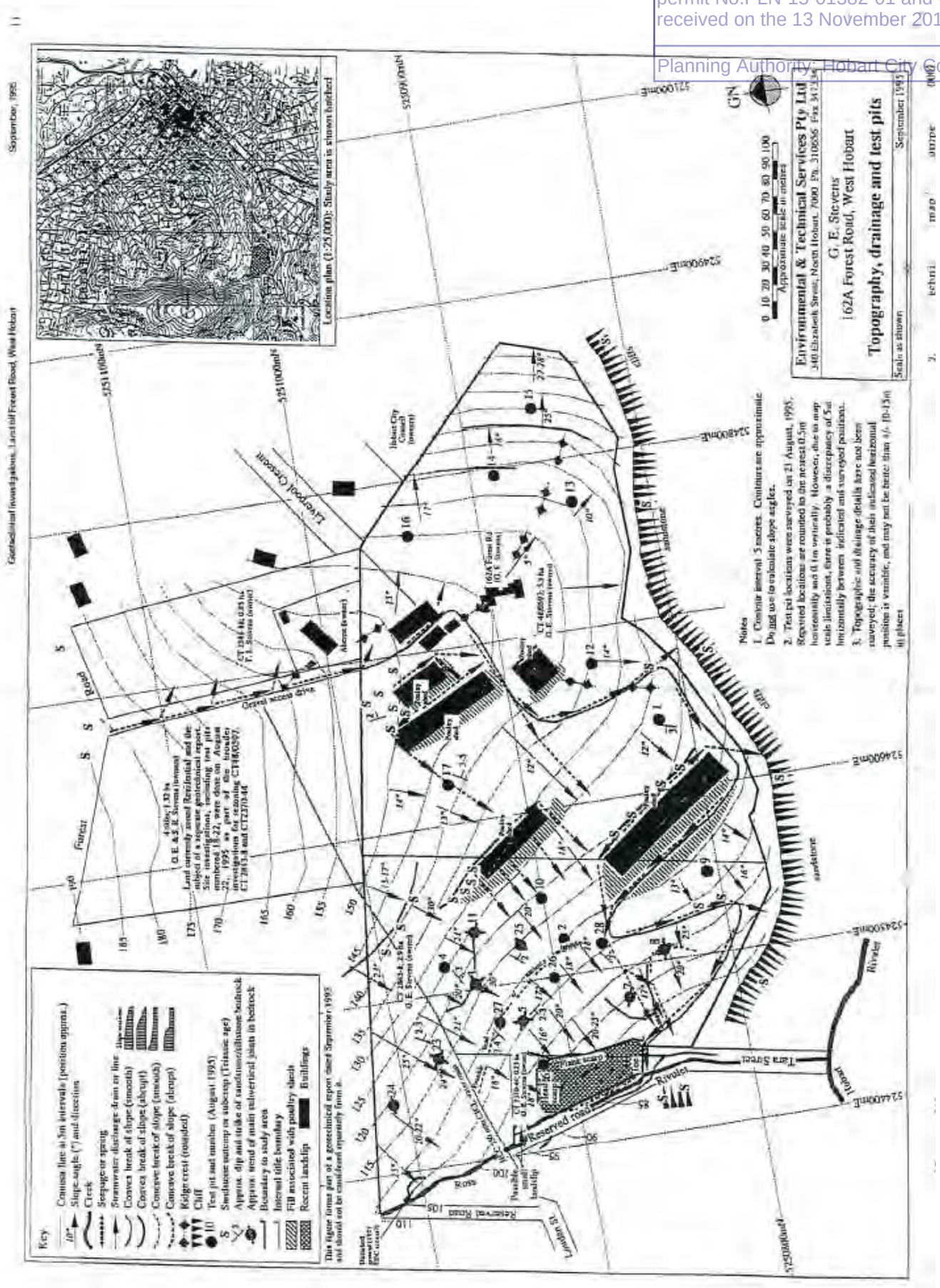

Other slope disruptions in the same general area may be colluvial[2] in origin (Plate 8), but some are undoubtedly the result of human intervention, including track making, fence building, bulldozer access for an adjacent electrical transmission line, and the installation of a 250 mm water main by the City of Hobart. However, in some instances it is difficult to distinguish between natural and artificial slope disruptions.

2.2 DRAINAGE

2.2.1 Surface drainage

Ross Rivulet is the main drainage line in the immediate area, forming the western boundary to the property. An un-named depression east of the eastern boundary receives some runoff from the land, and also from slopes at the western end of Liverpool Crescent.

Within the property, there are no clearly-defined natural drainage channels. Instead, before development for farming, most runoff evidently discharged as overland flow over the [illegible] line, or to Ross Rivulet and the valley to the east.

Development has disrupted this pattern. Much of the runoff is now diverted to stormwater drains along internal access tracks. Some of it, however, is discharged in an uncontrolled manner from poultry sheds onto adjoining slopes, where it forms temporary drainage lines.

2.2.2 Subsurface drainage

Shallow subsurface drainage is related to natural infiltration of rain, and some is caused by stormwater discharge lines from tracks and poultry sheds. Test pit 28 intersected small amounts of free water at the base of the topsoil along one such line, which further downslope has produced seepages near the toe of the landslip in the southwestern corner.

Naturally occurring subsurface drainage was observed in test pit 23. Test pit 6, located at the head of the landslip and downslope from a small seepage, also intersected small amounts of free water.

It is possible that the 250 mm Council water main constructed through the property about 1973, or the trench containing it (Figure 2), is locally affecting subsurface water conditions near and downslope from it. The trench has the potential to act as a french drain collecting upslope runoff and seepage, and if so, the fractured nature of the bedrock (see below) might allow vertical infiltration of water which may surface downslope. It is also possible that the pipe itself might have leaked or is leaking. We point out that we have no direct evidence of leaks and the link, if any, between cause and effect may be very difficult to reasonably establish. We raise the possibility for future consideration if residential development proceeds.

2.3 GEOLOGY

2.3.1 General comments

According to the Hobart geological map sheet (referred to earlier) the entire property is underlain by interbedded sandstones, siltstones and related rocks of

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Triassic age. Our investigations confirm this, and indicate that sandstone, fractured to varying degrees and locally cross-bedded, is the dominant rock type. Near the property, good exposures occur at the top end of Forest Road, in sandstone cliffs along Hobart Rivulet.

The regional dip of the Triassic rocks is shown on the geological map to be northwest at 10° on Louden Street, and 6° west on Forest Road. Within the property, we have measured lesser dips in the range 2 to 4° generally towards the southeast. It is typical of cross-bedded sandstones to exhibit variable dips over short distances.

East of the property, on Liverpool Crescent, the Triassic rocks are in contact with doleritic boulder beds of presumed Tertiary age, but these have no bearing on geological conditions on Mr. Stevens' property.

2.3.2 Bedrock geology

Sandstone bedrock[3] is exposed at several locations on or near the property. It forms the cliff line along the southern boundary near Hobart Rivulet, is exposed in low cliffs at the end of Tara Street, occurs in excavations behind or near several of the poultry sheds (Plates 9 and 10), and appears to crop out in scattered locations elsewhere.

Siltstone, which is locally interbedded with the sandstone, was not observed to crop out, probably because it is less common, and is more susceptible to weathering and erosion.

Evidence that sandstone is the dominant bedrock type beneath the property also comes from the test pit data (Table 1). Sandstone (usually not interbedded with siltstone) was intersected at shallow depth in all but two pits. Siltstone (with minor sandstone) was the dominant rock type in only three of these (Nos. 6, 25 and 26), suggesting that it is present as relatively thin horizons rather than thicker units.

The sandstone is typically fine grained and moderately weathered (harder varieties are only slightly weathered), and orange, orange-brown or light yellow. Usually it is moderately to strongly fractured, with mainly discontinuous, close-spaced, open, moderately rough subvertical joints. Where observable or measurable, the dominant joint directions tend to be southeast, east and northeast - roughly parallel to the varying lines of strike of the cliff line to the south. However, local joint directions are variable, and unpredictable between test pits.

The combination of jointing and bedding surfaces, and the moderate to steep slopes in the western third of the property, is to produce partly dislodged blocks of sandstone in the top half metre or so of the bedrock beneath the soil profile (Plate 9). In some test pits which were dug deep enough, it was observed that this effect tends to decrease with depth within the bedrock. Often, there is a vertically downwards gradation between soil or colluvium containing few sandstone fragments, to the same material with many rock fragments, into strongly fractured bedrock with soil or clay in the joint openings.

[3]Bedrock for the purposes of the present report is defined as sandstone and/or siltstone which is sufficiently unweathered so as not to exhibit soil properties (that is, it cannot be remoulded in the hand either in its natural state or by adding water). It therefore excludes all the soil profile, superficial colluvial material, and any separate or partly dislodged rock fragments of any size at any depth which are substantially enclosed by material with soil properties.

Table 1. Summary of test pit logs

Test pit	Depth dug (m)	Depth to bedrock (m)	Summary log of materials (depths in m)
1	0.8	0.7	0-0.5 sand (SP); 0.5-0.7 clayey sand, sandy clay (SC, CL); 0.7-0.8 sandstone
2	1.0	0.7	0-0.3 silty sand (SP, SM); 0.3-0.7 silty clay, clayey silt, silty sand (SM, [illegible], SP, SM); 0.7-1.0 sandstone
3	2.2	1.3	0-0.4 sand (SP); 0.4-1.2 gravelly sand with boulders (SP, GP); 1.2-2.2 s[illegible]tone
4	2.8	2.6	0-0.5 sand (SP); 0.5-2.6 gravelly silty sand with boulders (SP, SM, GM, CL); 2.6-2.8 sandstone
5	0.9	0.8	0-0.5 sand (SP); 0.5-0.8 sand, gravelly sand and boulders (SP, SM); 0.8-0.9 sandstone
6	5.0	1.1	0-0.9 sand (SP); 0.9-1.1 clay (CH); 1.1-4.0 sand, clayey sand, gravelly sand; 4.0-5.0 siltstone
7	1.1	0.9	0-0.7 sand (SP); 0.7-0.9 sand, clay, cobbles (GP); 0.9-1.1 sandstone
8	1.2	0.7	0-0.3 sand (SP); 0.3-0.7 silty sand (SP, SM, GP); 0.7-1.2 sandstone
9	1.7	1.5	0-0.6 sand (SP); 0.6-1.5 sandy silty clay and clayey silt (CL, CH, SM, SC); 1.5-1.7 sandstone
10	1.5	1.5	0-0.4 sand (SP); 0.4-0.8 clayey silty sand (SC); 0.8-1.5 gravelly clay (CL, CH)
11	1.3	1.1	0-0.4 sand (SP); 0.4-1.1 clayey silt (SM, CL); 1.1-1.3 sandstone
12	0.7	0.6	0-0.6 sand (SP); 0.6-0.7 sandstone
13	1.8	1.6	0-0.5 sand (SP); 0.5-0.8 silty sand (SP); 0.8-1.6 sand (SP); 1.6-1.8 sand[illegible]
14	1.3	1.2	0-0.8 sand (SP); 0.8-1.2 clay (CH); 1.2-1.3 sandstone
15	2.5	2.4	0-1.1 sand (SP); 1.1-1.7 silty sand (SP); 1.7-2.4 clay and sandstone frags (CH); 2.4-2.5 sandstone
16	2.6	2.6	0-0.9 sand (SP); 0.9-1.3 silty sand (SP); 1.3-2.6 clay (CH, CL)
17	1.7	1.6	0-0.8 sand (SP); 0.8-1.6 sand and gravelly sand (SP, SC); 1.6-1.7 sandstone
23	2.2	1.1	0-0.3 sand (SP); 0.3-1.1 sand, silty sand (SP,SM, GM); 1.1-2.2 sandstone
24	1.8	1.0	0-0.3 sand (SP); 0.3-1.0gravelly sand, sand gravel (SP, GW); 1.0-1.8 sandstone
25	2.7	1.2	0-0.5 sand (SP); 0.5-1.2 sandy clay, sandy silty clay (CH, CL); 1.2-2.7 sandstone and siltstone
26	2.2	0.8	0-0.5 sand (SP); 0.5-0.8 clayey sand (SC); 0.8-2.2 siltstone and sandstone
27	2.1	0.7	0-0.3 sand (SP); 0.3-0.7 gravelly clayey sand, sandy clay (CL, SC); 0.7-2.1 sandstone
28	1.7	0.7	0-0.4 sand (SP); 0.4-0.7 sandy clay (CL, CH); 0.7-1.7 sandstone
Aver.	1.9	1.2	

Notes

1. Some soil units are variable in thickness
2. Underlined numbers in 'depth to bedrock' column indicate no bedrock to the indicated depth
3. 'Bedrock' is here defined as sandstone and/or siltstone which is sufficiently unweathered so as not to exhibit soil properties (ie the material cannot be remoulded in the hand with or without adding water). Bedrock therefore excludes the A and B soil horizons, and may or may not include the CB horizon. It excludes colluvial material, and separate or partly dislodged rock fragments of any size at any depth.

The siltstone encountered in some of the pits tends to be more weathered and more easily excavatable than the sandstone. It is typically finely laminated and cut by closer-spaced, discontinuous joints and partings along bedding surfaces.

On the western third of the property, a fairly consistent feature of the near-surface sandstone and siltstone is the presence of clay, sandy clay or clayey sand linings on many joint and bedding surfaces. These materials have apparently been deposited from soil seepage water percolating through the fractures, since they can occasionally be observed to fill wedge-shaped openings between dislodged blocks at or below the base of the soil profile, tapering into bedrock.

The clayier linings are interpreted as having implications for possible past instability, and current slope stability. Evidence from test pits suggests they are more common on the western third of the property and generally in the area inferred to be a possible ancient landslip. Clay linings were not observed in test pits 1, 9, and 12 to 16, and were only a minor feature of pits 8, 17, 24 and 27. Three of the last four are located on the periphery of the shallow valley covering most of CT 2843-8, and with the exception of pit 27 (near the centre of the valley) all the remainder are on the eastern two thirds of the property.

The clayier linings are usually moist or wet, and consist of dark grey high plasticity clay. Their thickness typically varies from less than one to ten millimetres. They tend to be discontinuous; most do not exceed the joint spacings in length (although they may be offset at joint intersections), and none was observed to extend the full length of test pits. However, several could be traced across the width of pits (about 0.8 metres) and occasionally along bedding surfaces or joints for up to a metre or so.

Clay linings on joints and bedding surfaces in sandstones are not confined to the study area. Similar features were observed in sandstones in outcrops along Forest Road, and also near the end of Salvator Road further north. In two to three metre high road cuts on Forest Road, their development is laterally irregular, and their occurrence and thickness appears to decrease with depth below a metre or so.

2.3.3 Colluvium

Material interpreted as colluvium (weathered detritus which accumulates on or at the base of slopes) was observed in test pits 3 (Plate 8), 4, 10 and 24, and possibly pit 6. There is no clear evidence that it is present in pit 6 (at the head of the landslip), although the hummocky ground immediately downslope is probably at least partly colluvial since colluvium is exposed in the road cutting at the toe of the slip.

The colluvium overlies sandstone or siltstone bedrock in all but one (No. 10) of the four or possibly five test pits in which it was exposed. In pit 10, the excavator was close to refusal at 1.5 metres in dense colluvium.

The detailed texture of the colluvium is not consistent between these pits. However, in all cases it comprises fragments, cobbles or boulders (collectively called 'clasts') of sandstone or siltstone, or both in varying proportions, in a matrix of sand, gravel, minor clay and silt. Textures include gravelly sand with 40-50% sandstone clasts in pit 3, gravelly silty sand with occasional sandstone clasts in pit 4, a gravelly clay with up to 90% sandstone and siltstone clasts in pit 10, and gravelly sand with a similar proportion of sandstone clasts in pit 24.

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The colluvium was dry in pit 10, but moist to locally wet in the other three. Generally, its plasticity is low, reflecting the predominantly sandy topsoils of the property.

2.4 SOILS

2.4.1 General comments

The soils over the study area comprise duplex (two-layered), mainly residual[4] profiles on bedrock, with fairly consistent textures broadly typical of soils developed on Triassic rocks elsewhere in Tasmania.

The duplex profiles generally comprise A and B horizons (topsoil and subsoil), either resting directly on bedrock or overlying a zone of weathered rock (the CB horizon). Some profiles are not duplex but uniform in texture, where the subsoil appears to be missing or only poorly developed. In some cases, the sandy topsoil may have accumulated or been redistributed by wind transport.

The average depth of the soil profile (A+B horizons) is about 0.7 metres in the western third of the property, but significantly greater at 1.4 metres in the eastern third near pits 13-16.

Soils are described in detail in the test pit logs in Appendix 2.

2.4.2 Topsoil (A horizon)

The topsoil is typically loose, moist and friable, averaging 0.4 to 0.5 metres thick (range 0.3 to 0.7 metres) in the western part of the property, but one metre thick (range 0.5 to 1.7 metres) on the broad ridge to the east. It usually consists of a dark grey surface sand or silty sand about 0.2 metres thick (the A1 horizon) grading to a yellowish brown, grey brown or light grey sandy A2 horizon averaging 0.3 metres thick. Sandstone gravel and coarser fragments may be present, sometimes up to boulder size.

Sometimes, the A horizon rests on bedrock or colluvial material, and a B horizon is absent.

2.4.3 Subsoil (B horizon)

Where present, the subsoils over the property average about 0.3 metres thick (range 0.2 to 0.7 metres). They tend to be clay- or silt-enriched to varying degrees compared to the topsoils. Texturally they include non-plastic or low plasticity silty sand or clayey silt, and moderate to high plasticity silty clay or clay. Sandstone gravel, or fragments and boulders may be present.

2.4.4 Weathered bedrock (CB horizon)

In some test pits, weathered sandstone or siltstone exists beneath the B horizon. It is most easily recognised by its texture (mainly sand, silt or sandy silt) in conjunction

[4]Residual soils have developed mainly from the weathering of the rocks directly below them, with little or no contribution from materials further upslope.

with relict bedding and joints. In some cases (for example, in pit 6) it is difficult to distinguish from the B horizon, or colluvial material.

2.5 SLOPE INSTABILITY

2.5.1 General comments

As discussed in Section 2.1, there is surface evidence of slope instability on the western third of the property. This evidence takes the form of topographic or slope irregularities at various scales. Some of it is supported by observations in test pits and other exposures around the site.

On the larger scale, the slightly concave shape of the hillside over most of CT 2843-8 has the appearance of being formed by slope movements in the past. This mode of formation is probably shared by many other similar shaped hillsides in metropolitan Hobart.[5]

On the hillside are smaller-scale topographic irregularities. As discussed, some of these are man-made, and we have been able to distinguish most (but probably not all) of these from natural features by studying several sets of aerial photographs dating from the late 1940's.

Similar features above the same bedrock types have been observed along the hillside below Louden Street to the west, and we have noted a possible, fairly large landslip east of the property boundary at the western end of Liverpool Crescent. In both areas, residential development has encroached near or onto the inferred unstable ground.

On a smaller scale, the natural slope disruptions within the study area are several metres or tens of metres in surface extent, and from 0.5 metres to about 2 to 3 metres in vertical dimension. They have been interpreted as *soil creep* (bulges on soil-covered slopes caused by slow downslope movement of soil), *colluvial* movement (loose, mainly dry debris moving slowly downslope) and *landslips* (the relatively more rapid downslope movement of soil or debris, usually by sliding on low-strength material). The processes are facilitated by the presence of subsurface water, and their surface expressions may be difficult to distinguish from one another.

We observed no obvious surface evidence of instability on the eastern two thirds of the property.

2.5.2 Soil creep and colluvium

Probable soil creep was observed as low, subdued bulges (Plate 7) above the surrounding surface in several places on the western third of the property. Two of these, on slopes of about 17-18°, were further explored by test pitting (pits 2 and 7). It appeared that slow movement of the soil profile was or is occurring at a depth of about 0.7 metres on weathered bedrock (CB horizon) where relict joints and bedding planes contain moist clay linings.

[5] It is important to note that the inferred former instability of these areas was probably related to climatic conditions different from those now prevailing. Contributory factors might have included abundant precipitation on sparsely vegetated slopes - conditions thought to have existed at low altitudes in a colder, wetter climate during or at the close of the last glacial epoch at least 12,000 to 15,000 years ago. Generally, such failed slopes probably now exhibit better stability since unstable material has moved downslope (thus flattening out the slope profile), and the now humid climate has produced a stabilising vegetation cover.

In pits 3 to 6, 8, and 23 to 28, all dug in the same general area, the CB horizon was not identified, and in all cases, soil creep appeared to be absent. The CB horizon (where it contains moist clay linings) is therefore implicated in soil creep. Other areas of soil creep upslope from pits 27 and 11, identified from surface expression but not tested by pitting, are possibly also underlain by similar materials.

Test pits 3, 4, 10 and 24 exposed materials inferred to be colluvial in origin. Pits 3 and 4 were dug below and on a fairly prominent surface bulge (Plate 8) extending perhaps 30 to 40 metres along the slope, with an elevation of up to several metres. Aerial photographs indicate that it was present before excavations for the nearby pipeline trench, and so is a natural feature.

The colluvium in pits 10 and 24 shows no obvious surface expression.

2.5.3 Recent landslips

A landslip (Plate 5) has occurred on the extreme lower corner of the study area, covering almost all of CT 2370-44 and extending eastwards onto part of CT 2843-8. Aerial photographs do not sho[w] obvious signs of slope movemen[t] 1947 and 1967, but some surface irregularities (implying movement) had developed by 1973. The slip appears to be bulging over the nearby access track in the 1975, 1982 and 1984 photographs. A head scarp is visible in the 1984 photograph, and by 1986 the landslip appears to attained its present shape.

We infer from this evidence that while incipient movement may have occurred earlier, noticeable movement took place sometime between 1967 and 1973, that it probably continued until about 1986, and that little or no significant movement has occurred since.

Verbal reports from the owner and a neighbour support these tentative conclusions. They have indicated that movement definitely occurred after the 1967 bushfires (when a house on the site burned down), and probably in the early 1970's.

The area is currently grassed and shrubby, and supports a few moderately sized eucalypts, suggesting that the average rate of movement has been relatively slow.

The head and eastern flank of the landslip is an obvious, arcuate scarp in sandy soil, averaging about one metre high. The toe is a bulge of colluvial debris - mainly silty gravelly sand with some clay and many sandstone boulders - up to about three metres high along the nearby access track. Internal features include hummocky ground and small arcuate steps.

Test pit 6 was dug at the head of the slip, into and beneath the exposed scarp and for several metres downslope. The total depth was 5 metres from the top of the scarp. The pit was sited to investigate the nature of the materials immediately behind and within the failed material, and to attempt to identify the location and materials on which movement had taken place.

The pit revealed a one metre thick soil profile of sandy topsoil and clayey subsoil, which although dislocated and draped across the scarp, was otherwise continuous across it. The base of the soil was wet. Immediately beneath it was a moist, friable to medium dense zone of mixed sand, clayey sand and gravelly sand three metres thick. This layer contains sandstone fragments, and relict bedding and discontinuous fractures containing moist grey clay or sandy clay linings. However, there was no evidence of continuous clay linings which might have acted as a single failure surface. The bedding appears to dip at shallow angles north into the slope

behind. Very minor seepage issued from a depth of three metres. At the base of the unit is a thin horizon of fractured blocky sandstone.

This three metre thick unit is interpreted as weathered bedrock (the CB horizon).

The CB horizon overlies weathered siltstone bedrock, also containing clay linings on joints and bedding laminae. A seepage estimated at about 20 L/hour was issuing from a depth of 4.8 metres.

Landslip movement is inferred to have taken place throughout the mass of the CB unit, and possibly also the underlying siltstone, as numerous small slippages along bedding surfaces and joints, on lubricated clay linings. In this respect, the mechanism is similar to that suspected for the CB horizon in pits 2 and 7, where soil creep has occurred.

The cause of slipping on this 18° slope is very probably excess water entering the site. Observations which might help explain why this slope has recently failed (whereas nearby steeper ones have not) possibly include but may not be restricted to

- the thicker-than-normal CB horizon containing clay linings,
- disturbance related to the residential dwelling on the site for many years, including cut and fill, and possibly uncontrolled discharge of sewage, stormwater and garden water (aerial photographs show a small orchard upslope from the site),
- the burning down and demolition of the house in February 1967, possibly leaving leaking or running water pipes at a time when soil conditions were dry and cracked in places,
- the burning off of vegetation on the slope during the 1967 bushfires, and
- the installation of the council water main some forty metres upslope. As discussed in Section 2.2.2, there is no direct evidence that the trench promotes vertical, and then downslope, infiltration of seepages and runoff, or that the pipe itself is leaking. As far as has been ascertained so far, the date of its installation in 1973 may not be inconsistent with the onset of slippage.

There are two other small areas upstream from this landslip, on the eastern bank of Ross Rivulet, which might also be landslips. If so, they have probably failed due to erosion of their toes by the rivulet. The first is in the corner of CT 2370-44 and is evident in aerial photographs taken in 1967. The second, not obvious in photographs, is some 50 metres further upstream. This site was used by the HEC in 1977 as an access point to work on a nearby transmission line, and may be wholly artificial.

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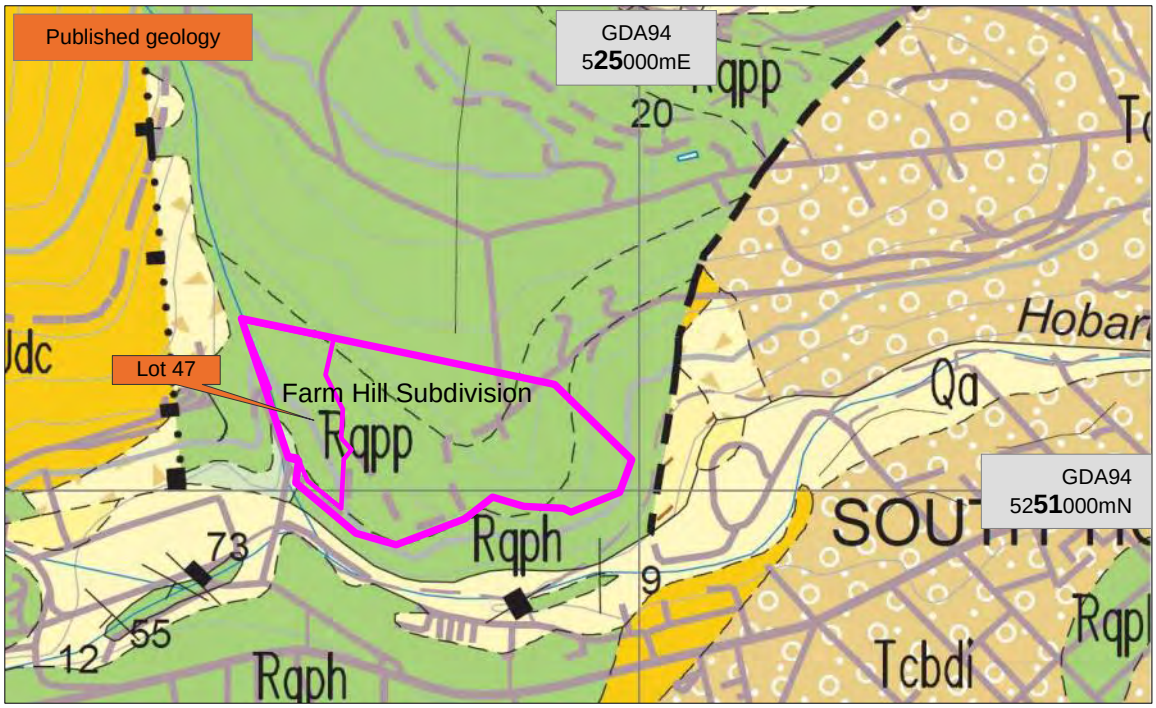
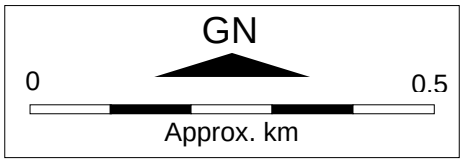
Attachment 5

(2 pages)

Published geology and landslide hazard bands

Source: Mineral Resources Tasmania and www.thelist.tas.gov.au

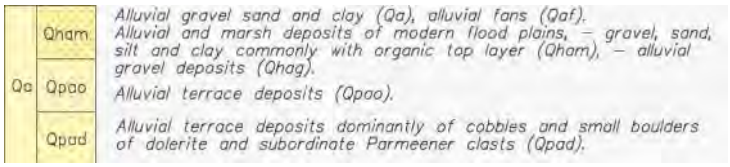




Source for geology

Forsyth, S. M., and Clarke, M. J. (compilers) 1999. Digital Geological Atlas 1:25,000 Scale Series. Sheet 5225 Hobart. Mineral Resources Tasmania

Key to rock types



Alluvial gravel sand and clay (Qa), alluvial fans (Qaf). Alluvial and marsh deposits of modern flood plains, – gravel, sand, silt and clay commonly with organic top layer (Qham), – alluvial gravel deposits (Qhag).

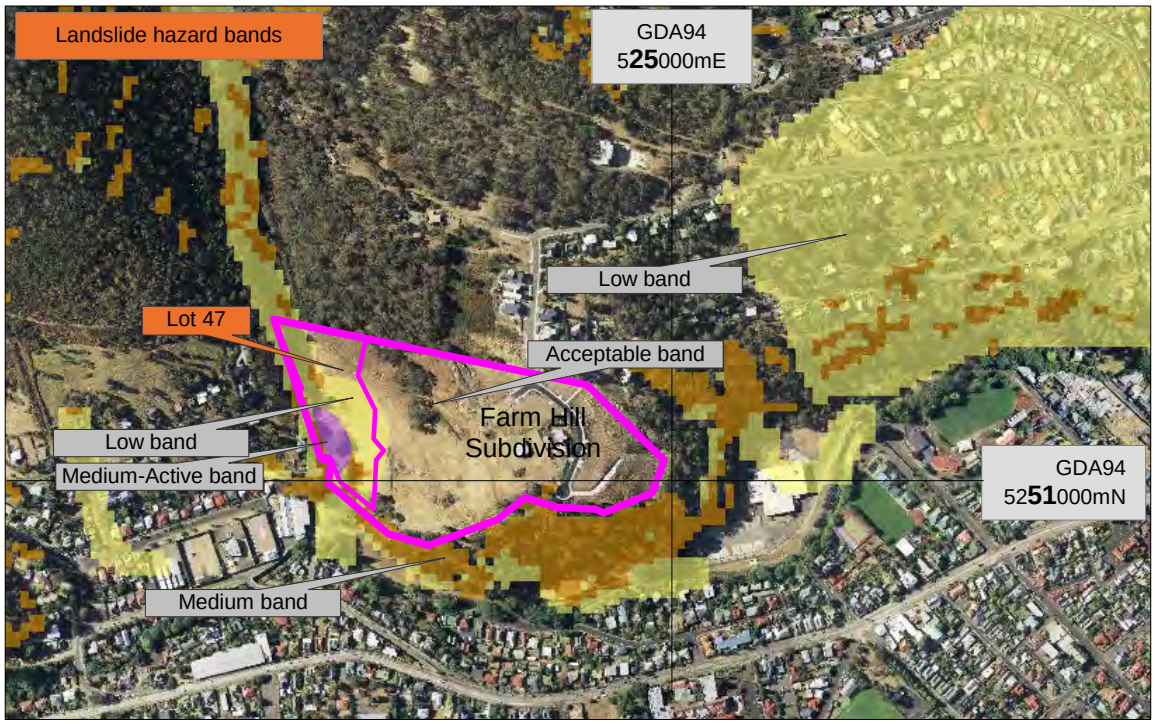
Alluvial terrace deposits (Qpao).

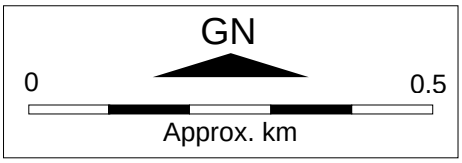
Alluvial terrace deposits dominantly of cobbles and small boulders of dolerite and subordinate Parmeener clasts (Qpad).

Poorly–sorted large boulder to pebble grade deposits (Tcb), – clasts dominantly of dolerite with traces to rarely dominant amounts of Parmeener mudstone and other rocks, clayey matrix (Tcbd), inferred dolerite boulder beds overlying older rocks or deposits at unknown depth (Tcbdi); clasts generally smaller and locally derived, dominantly of Parmeener rocks with subordinate dolerite in some areas, clayey or sandy matrix (Tcbs).

Dolerite (Jd), with orthopyroxene (Jdo), granophyre and pegmatite indicated (Jdp), dolerite inferred beneath soil or Cenozoic deposits (Jdi). Dolerite of grainsize 0 – 0.7mm (Jdvf); 0.7 – 1.5mm (Jdf); > 1.5mm (Jdmc); 1.5 – 3mm (Jdm); > 3mm (Jdc); > 6mm (Jdvc) indicated.

Freshwater predominantly cross–bedded quartzose to feldspathic sandstone commonly with overturned cross–bedding and subordinate micaceous siltstone with some red–purple beds, sparse plant and vertebrate fossils (Rqp), – Knocklofty Formation (Rqph) contact metamorphosed by Jurassic dolerite (Rqphm), intervals predominantly of siltstone, shale, mudstone and sandstone indicated (Rqpc) and (Poets Road Member) (Rqpp), granule sandstone and pebbly sandstone indicated (Rqpg).





Acceptable band
A landslide is a rare event based on current understanding of the hazard, but it may occur in some exceptional circumstances.

Low band
The area may include landslide features but their activity is unknown, and they have been judged by MRT to rank of lesser risk than those in higher bands.

Medium band
The area has known landslide features, or is within a landslide susceptibility zone, or has legislated controls to limit disturbance of adjacent unstable areas.

Medium-active band
The area has known recently active landslide features.

High band
The site is within a declared Landslip A area.

Attachment 6

(4 pages)

Tasmanian Landslide Hazard Maps in relation to the property

Notes

This Attachment shows the subject land in relation to four landslide hazard maps issued by Mineral Resources Tasmania. A portion of each map covering the property, and part of the Key to the map, are shown.

The maps are:

- Map 1: Landslide Inventory and Geomorphology
- Map 3: Potential Debris Flow Hazard
- Map 4: Potential Rockfall Hazard
- Map 5: Potential Deep Seated Landslide Hazard

Map 2, not shown here, is the geological map of the area, which is reproduced instead in Attachment 4.

The following extract from the explanatory notes to Map 5 explains the purpose and limitations of the maps.

Deep Seated Landslide Hazard

Background, Aim and Purpose

Large tracts of land throughout Tasmania are subject to slope instability and about 60 houses have been destroyed by landslides since the 1950s. Fortunately only minimal loss of life has occurred in this time but such events are highly traumatic to those directly affected and the financial cost to individuals, organisations and the State runs into many millions of dollars. Recent disasters such as the Thredbo Landslide in New South Wales, serve to remind society of the potential for loss of life even from relatively small landslides. Fortunately, landslide damage can be avoided when ground conditions are properly understood before construction proceeds and, in already developed areas, this understanding can be used to mitigate the hazard through various measures.

Regional landslide hazard maps are produced to provide an insight into the natural hazards that may potentially affect the area concerned. Mineral Resources Tasmania, in partnership with the Hobart City Council has produced the first of a new landslide hazard map series in Tasmania, using Hobart as a pilot study area. The information provided is in the public domain and anyone is free to use it provided they read and understand the caveats for use.

Hazard and Risk

According to the joint Australian/New Zealand Standard (AS/NZS 4360:1999) risk is defined as the chance of something happening that will impact upon objectives. It is measured in terms of consequences and likelihood.

The definition of risk is often expressed by the following equation:

RISK = Hazard x Vulnerability x Elements at Risk

A hazard is defined as a source of potential harm or a situation with a potential to cause loss. A hazard, such as a landslide can be measured in terms of location, volume (or area), type, velocity and likelihood with time. Vulnerability refers to the susceptibility and resilience of structures, community and the environment to the hazard. The 'elements at risk' refers to the number of those structures, people, etc exposed to the hazard.

A hazard map attempts to portray the processes operating in an area, conveying all or some of the hazard parameters, generally in a qualitative to semi-quantitative manner. Because of the uncertainties involved, the translation of regional hazard maps into risk maps is challenging and seldom precise. An indication of the likely risk level is provided for each hazard at a regional scale but this will vary in detail. However, provided the limitations of the maps are understood, hazard maps can be used for many purposes in order to achieve the overall goal of safe and resilient communities.

Caveats for Use

The following caveats shall apply to the maps.

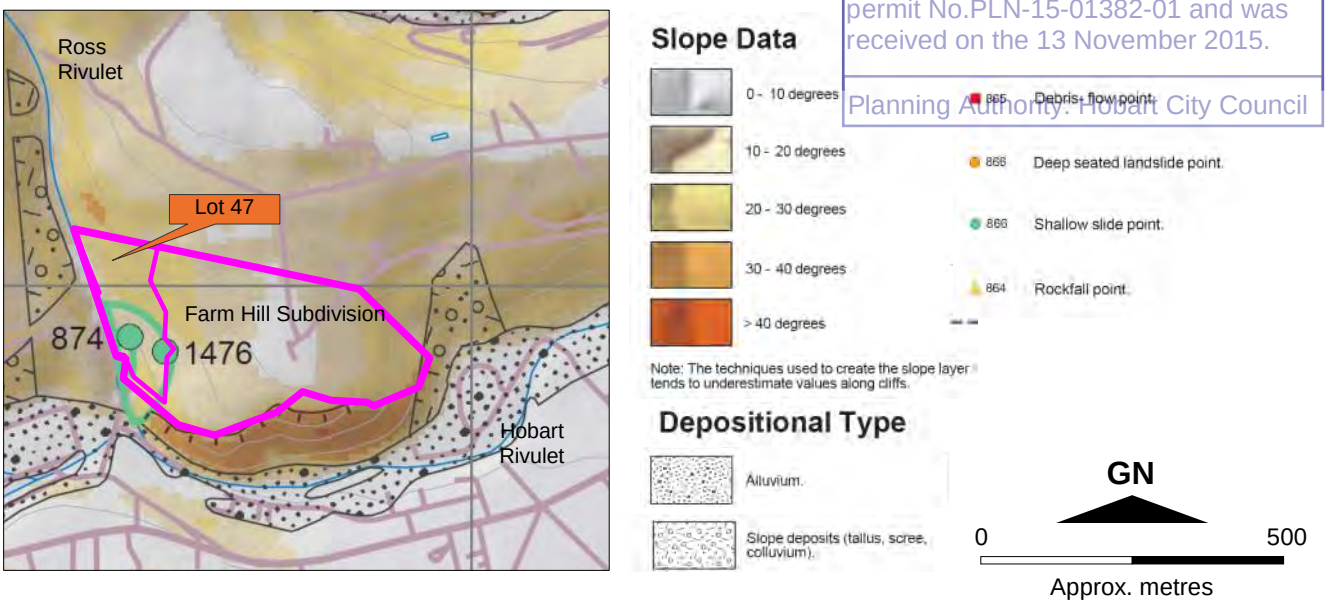
- The hazards identified are based on imperfect knowledge of ground conditions and models to represent our current understanding of the landslide process. As this knowledge improves our perception of the hazard and the depiction of the zones on the map may also change.
- These maps can be used as a guide (or flag) to the need for specific assessment in potential hazard areas.
- Planning decisions should not be made solely on the basis of the hazard zones delineated on the map.
- The scale limitations of the data should be considered at all times as exceeding this limit could lead to inaccurate decisions about the hazard.
- Specific assessment of landslide hazard and risk should be undertaken by suitably qualified and experienced practitioners in the fields of engineering geology and geotechnical engineering.
- Practitioners undertaking specific assessments should read the text and appendices attached to the maps and obtain a thorough understanding of the methodology and limitations of the maps.
- Areas where no hazard is shown can still have issues with slope instability.
- Anthropogenic influence on slopes cannot be predicted and the occurrence of slope instability resulting from the influence of human actions is specifically excluded from these maps.
- The identification and performance of cut and filled slopes have not been specifically considered in map production and their scale is such that they often cannot be resolved on the maps. The presence of such slopes should always be considered in specific assessments.

Map 1. Landslide Inventory and Geomorphology.

Mazengarb, C. (2004). Map 1, Hobart – Landslide Inventory and Geomorphology. Tasmanian Landslide Hazard Series. Mineral Resources Tasmania

Two known shallow landslides (Nos. 874 and 1476) occupy the southern and southwestern half of Lot 47 on the Farm Hill Subdivision. Slope angles on Lot 47 are in the 20 – 30° range.

Landslide Inventory and Geomorphology (grid is AMG66)

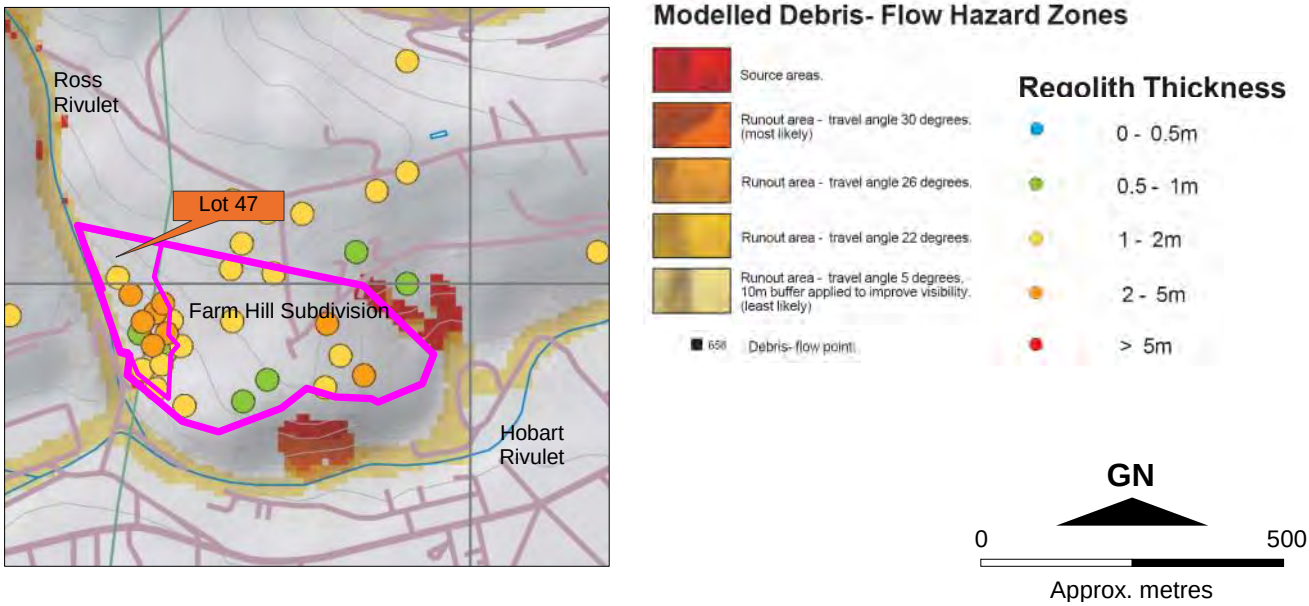


Map 3. Potential Debris Flow Hazard

Mazengarb, C. (2004). Map 3, Hobart – Potential Debris Flow Hazard. Tasmanian Landslide Hazard Series. Mineral Resources Tasmania

Most watercourses in the area have the potential to generate debris flows at their sources, with associated runouts. Test pit data from Cromer (1995) have been used to indicate regolith thicknesses (up to 5m) on the Farm Hill Subdivision.

Potential Debris Flow Hazard (grid is AMG66)

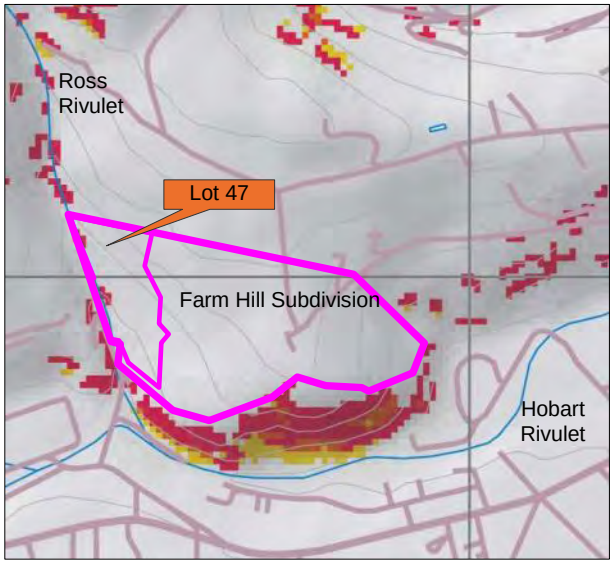


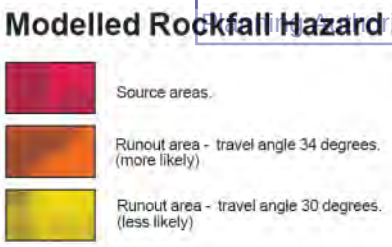
Map 4. Potential Rockfall Hazard

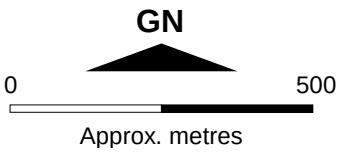
Mazengarb, C. (2004). Map 4, Hobart – Potential Rockfall Hazard. Tasmanian Landslide Hazard Series. Mineral Resources Tasmania

The course of Ross Rivulet, and the sandstone cliff sections bordering Hobart Rivulet, have the potential to generate rockfalls.

Potential Rockfall Hazard (grid is AMG66)





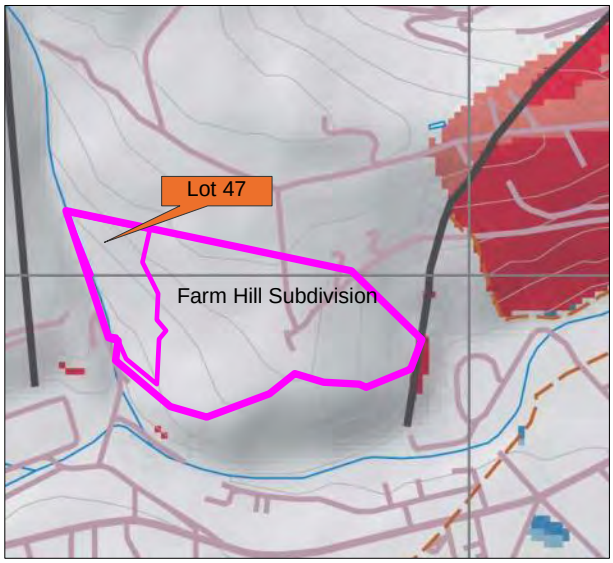


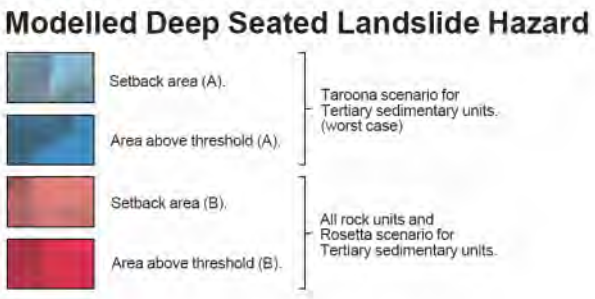
Map 5. Potential Deep Seated Landslide Hazard

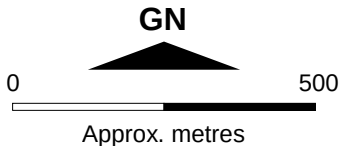
Mazengarb, C. (2004). Map 5, Hobart – Potential Deep Seated Landslide Hazard. Tasmanian Landslide Hazard Series. Mineral Resources Tasmania

The subject land is adjacent to, but not shown to be at direct risk of, potential deep seated landsliding.

Potential Deep Seated Landslide Hazard (grid is AMG66)





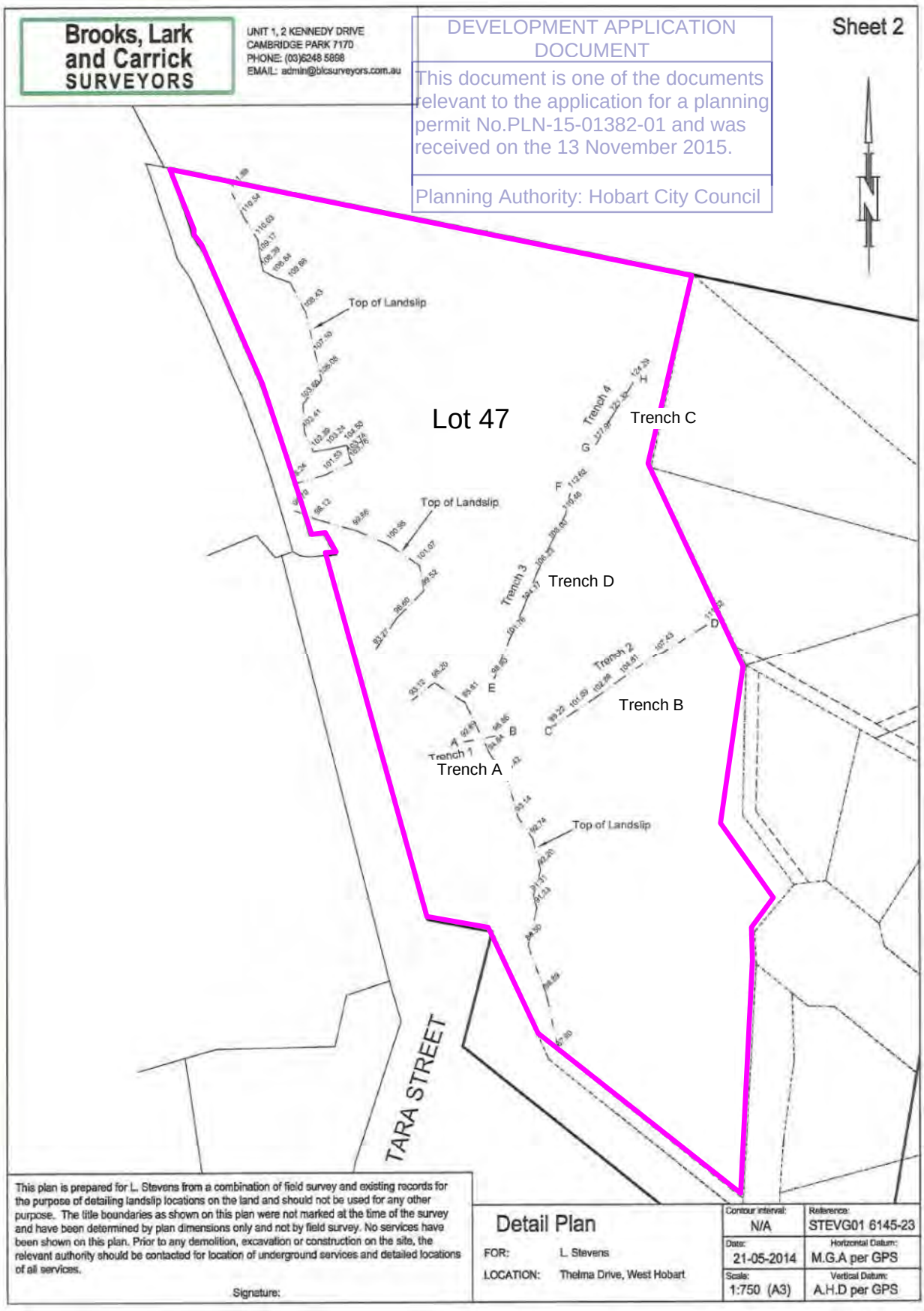


Attachment 7

(1 page)

May 2014 surveyed landslide headscarps and investigation trenches on Lot 47

Source: Brooks, Lark and Carrick Surveyors. Landslide survey points selected by William C Cromer.

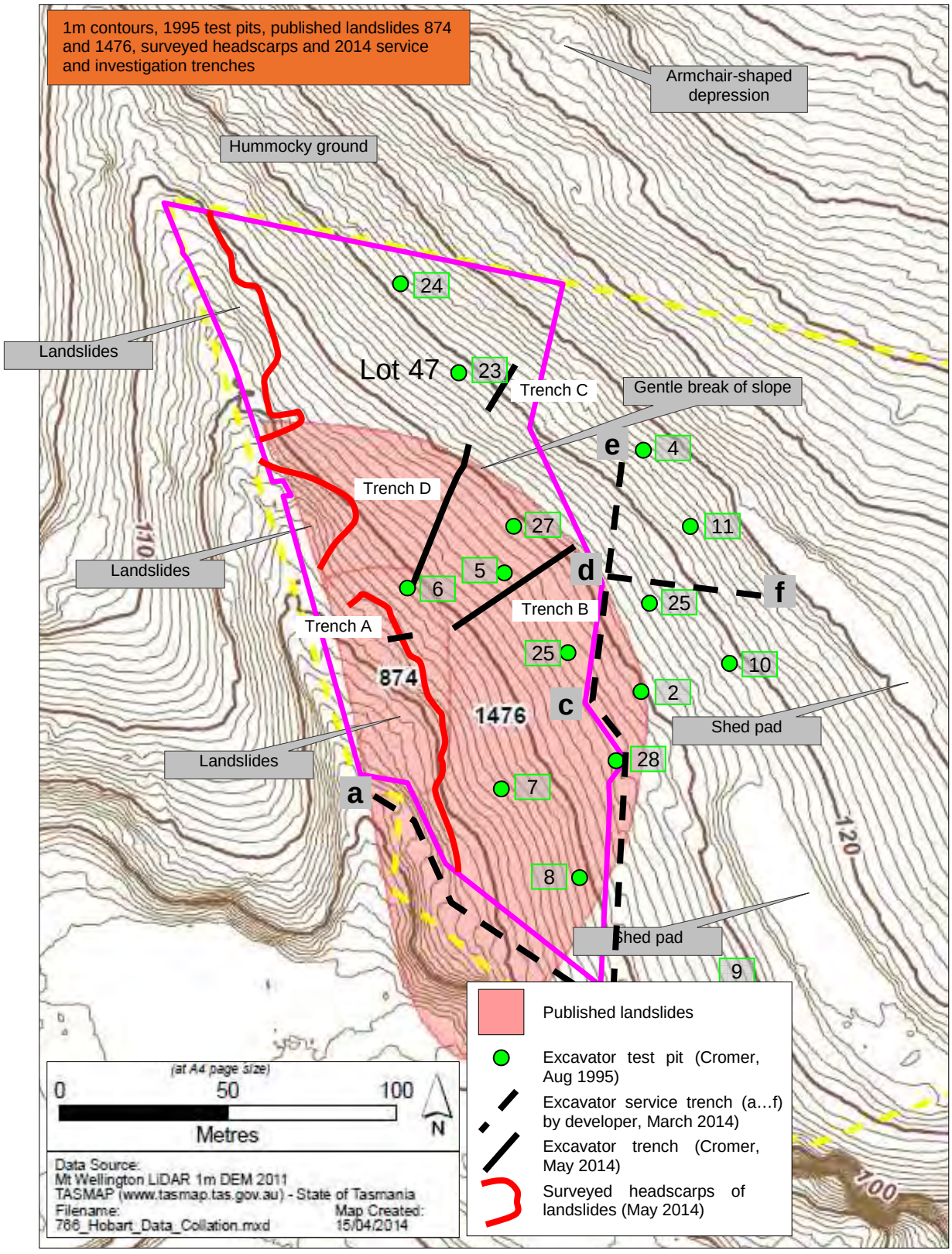


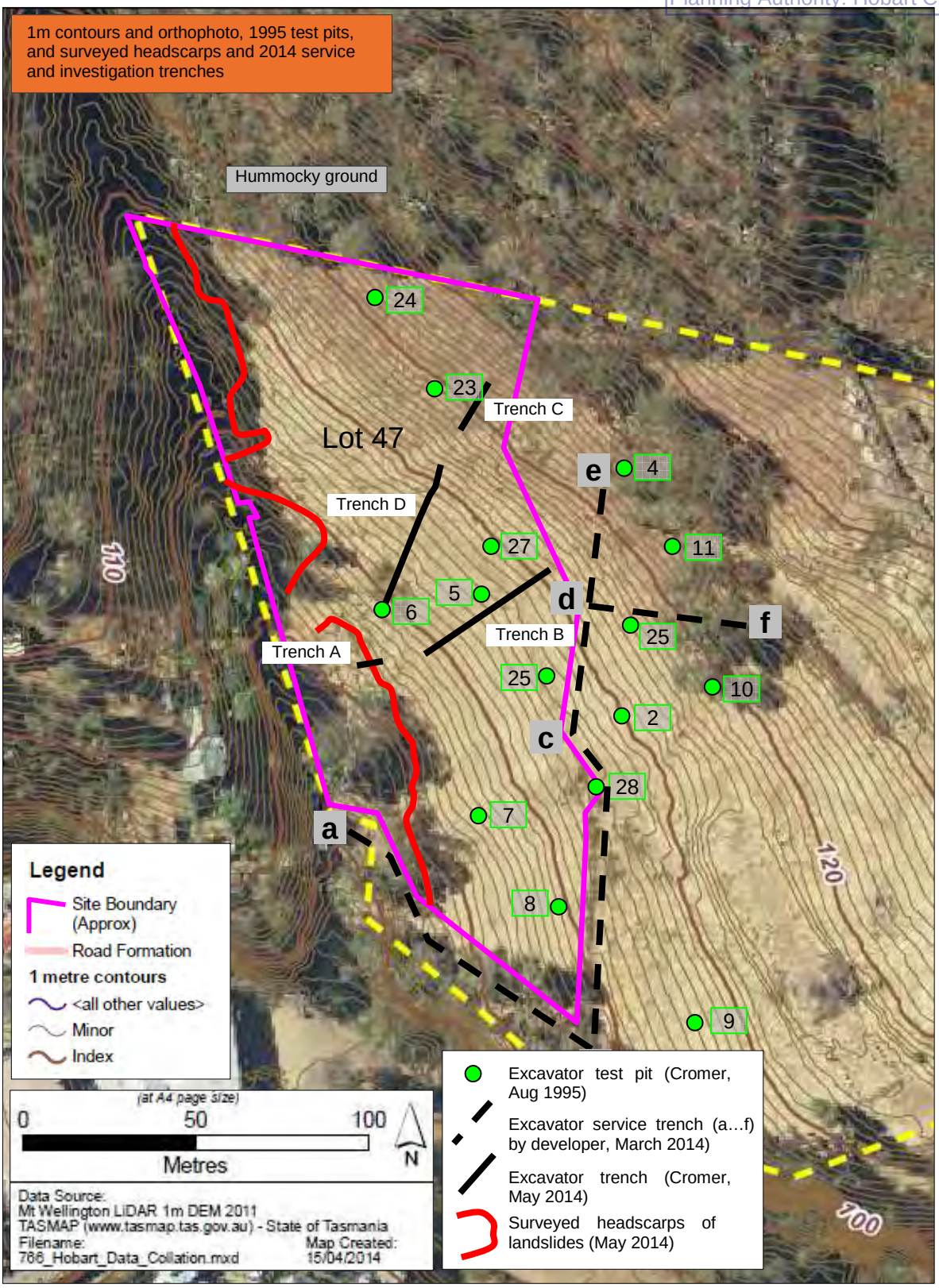
Attachment 8

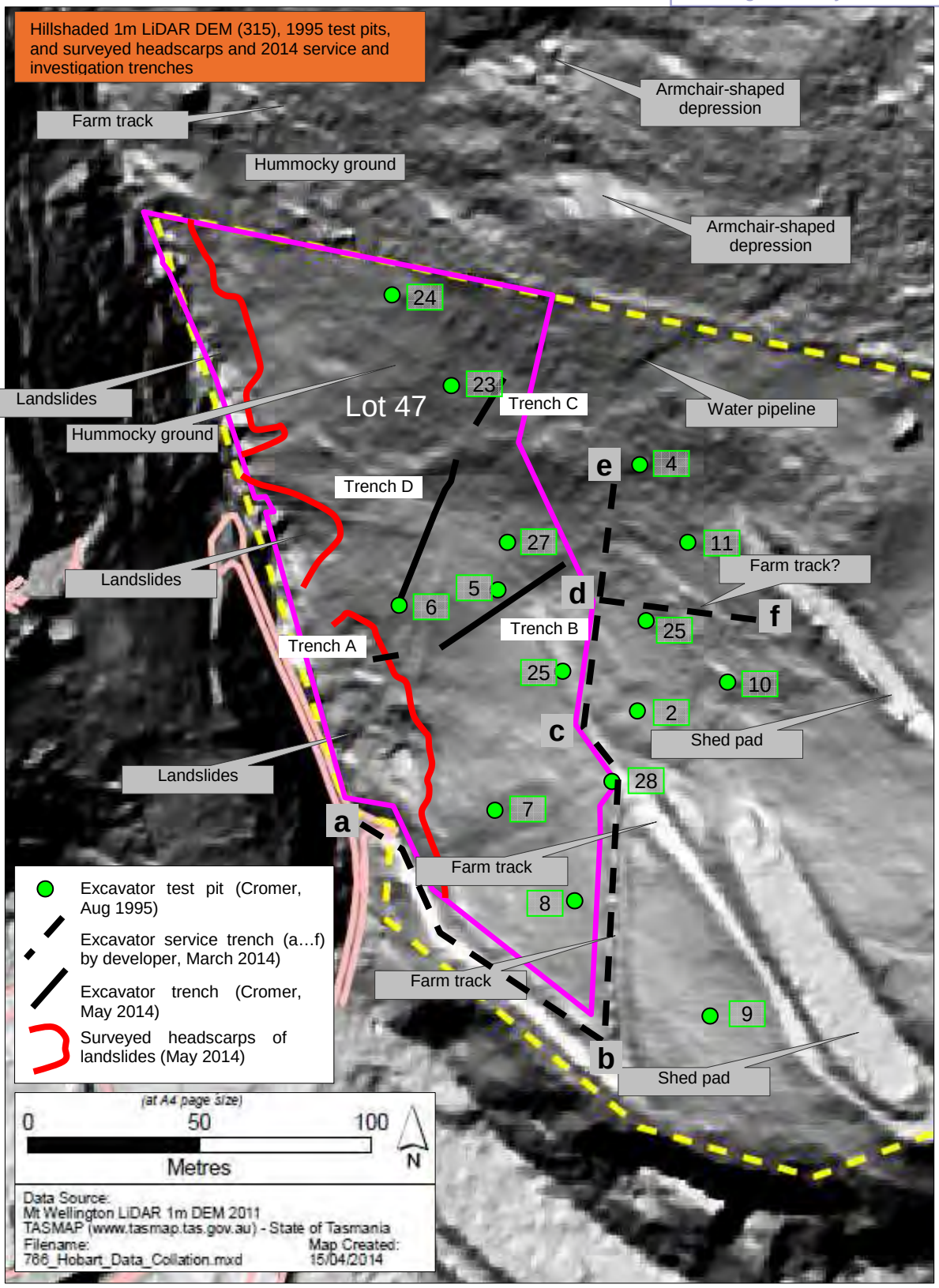
(5 pages)

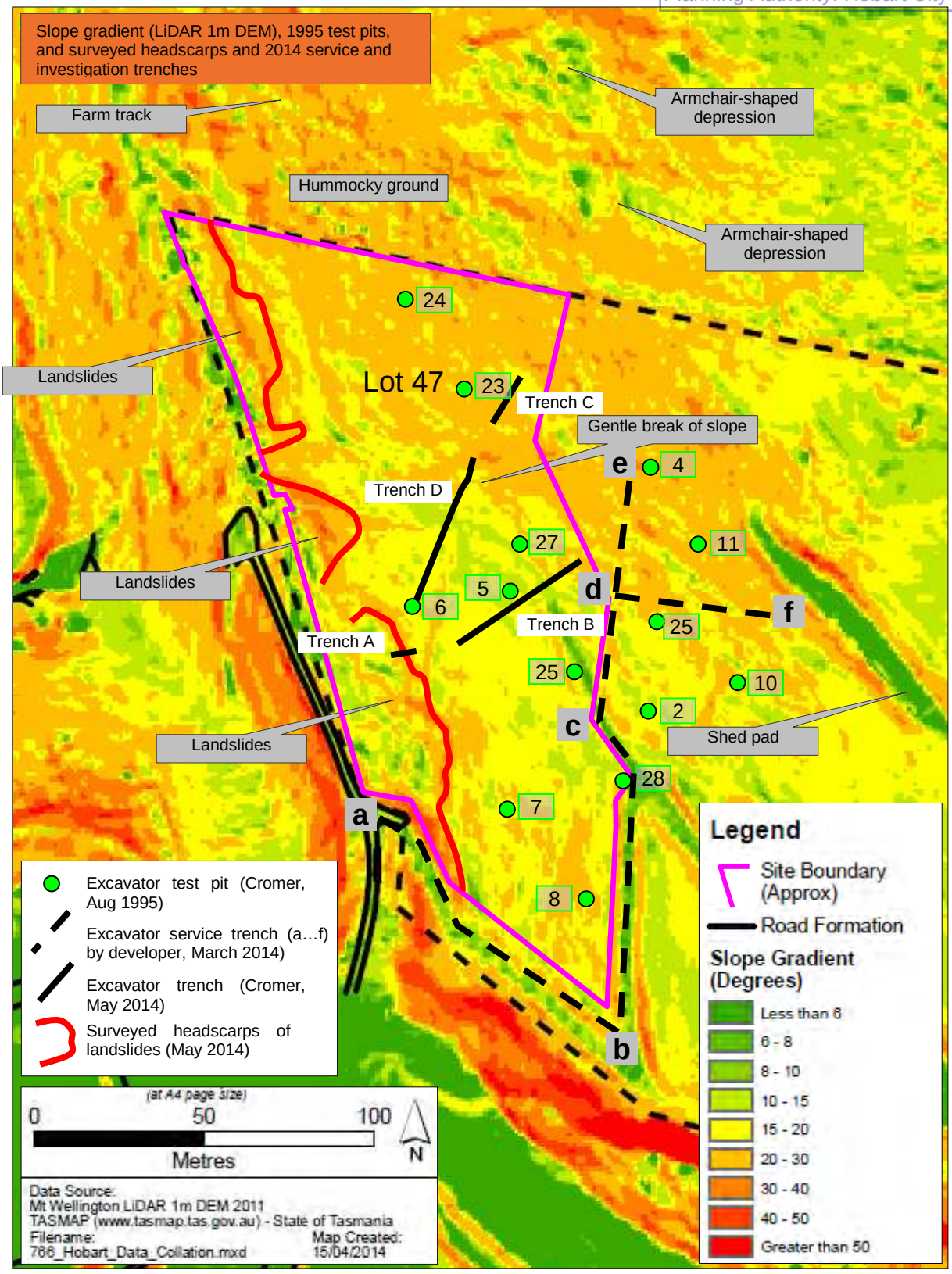
Topographic, aerial and LiDAR images of Lot 47 at Farm Hill, showing May 2014 surveyed headscarps of landslides and 2014 service and investigation trenches

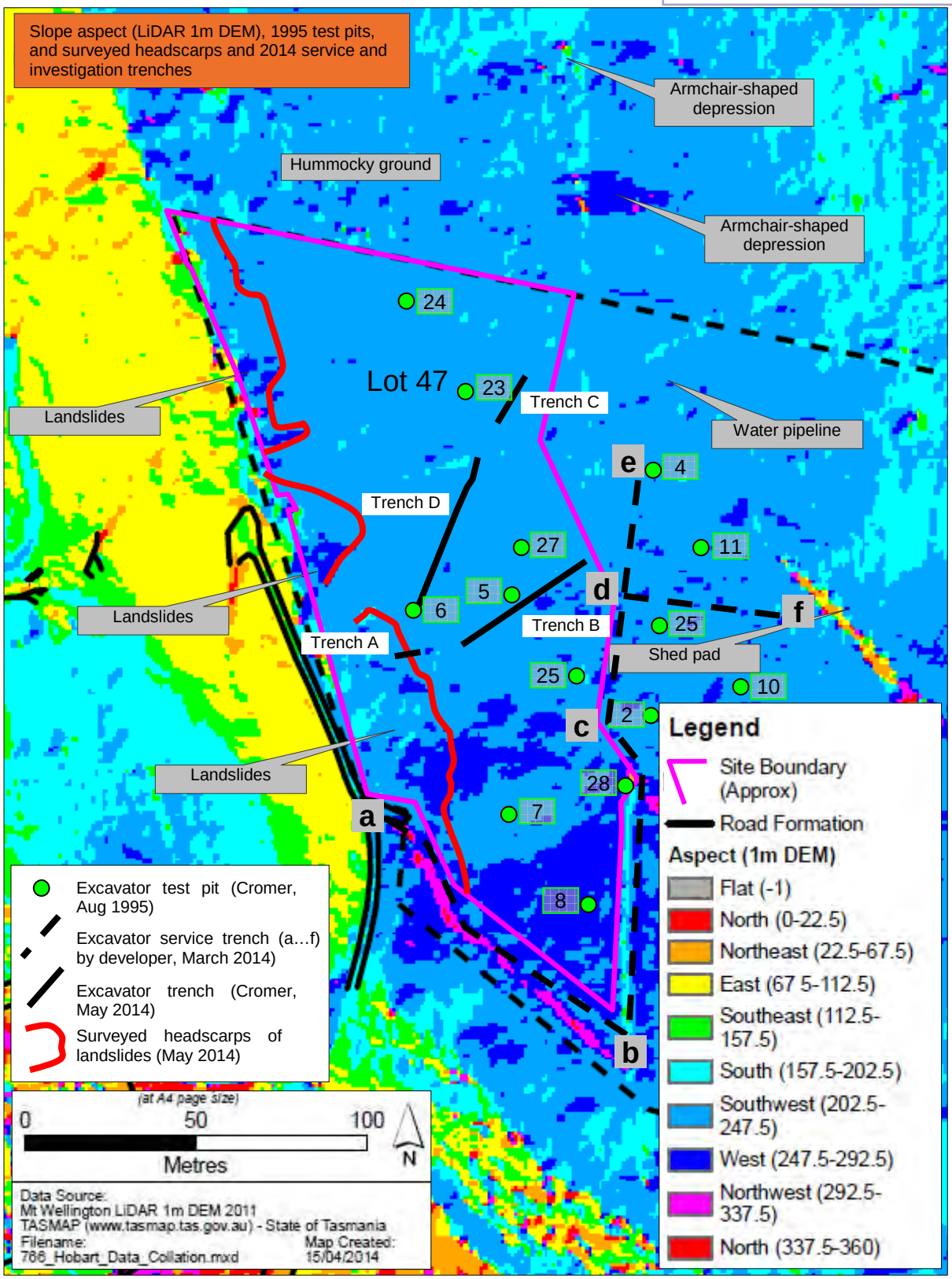
Source: adapted from a. s. miner geotechnical











Attachment 9

(22 pages)

Site and trench photographs

The staff is graduated in 1m long white and yellow segments. The numbers are decimetres.

Plate 1 (above). View north from Wellerslie Park in South Hobart to Lot 47 on the Farm Hill Subdivision in April 2014, showing service trenches (right) and investigation trenches B and D ("V"-shaped).

Plate 2 (below). View southeast from the northwestern corner of Lot 47 at Farm Hill, over 25 – 30^0 slopes in the foreground, towards service trenches a….f (see Attachment 7).

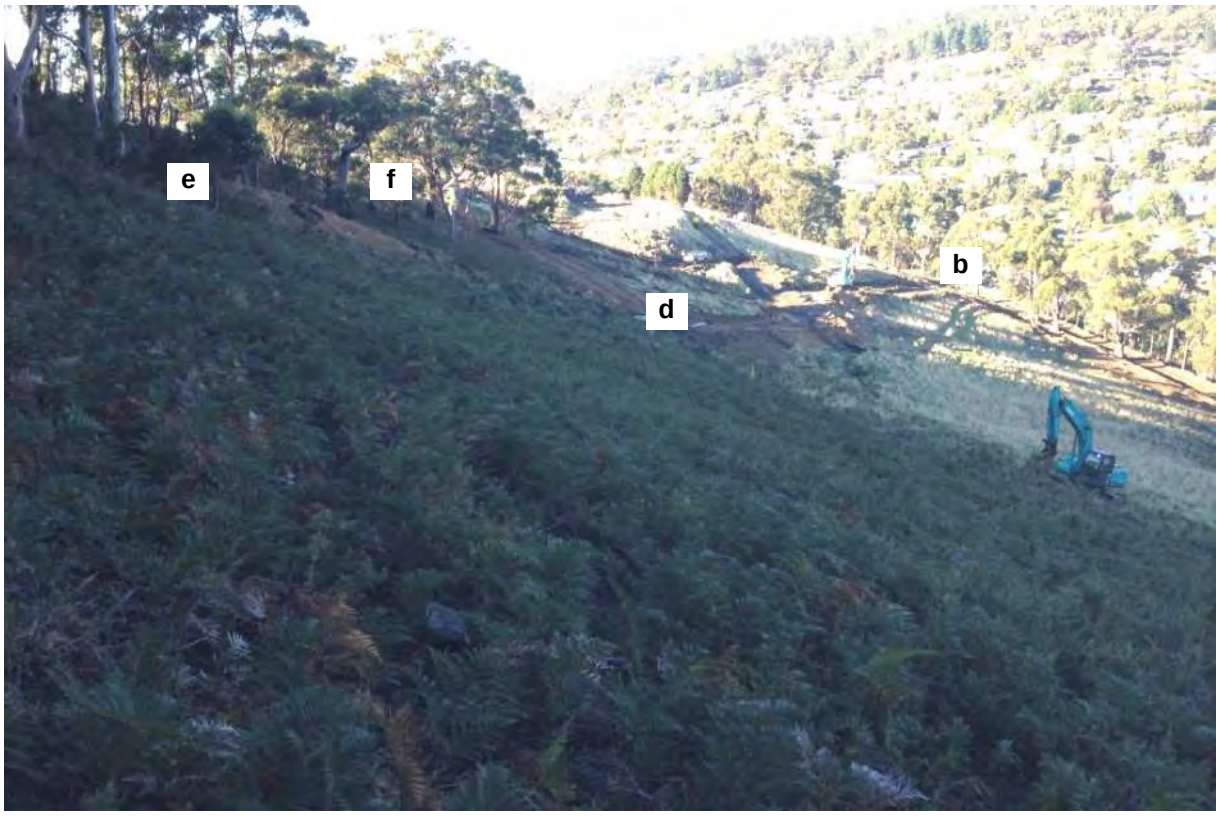


Plate 3 (above). View south southeast from the northwestern corner of Lot 47 at Farm Hill, over 25 – 30^0 slopes in the foreground, towards service trenches a….f (see Attachment 7). The higher edge of the tree line in the centre of the photo marks the headscarp of landslide #874 (see Map 1 of Attachment 5).

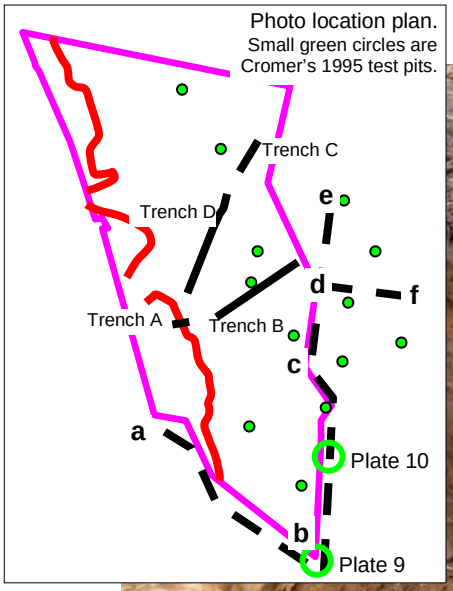
Plate 4 (below). View northwest and downslope to the lower, southwestern corner of Lot 47. The higher edge of the tree line in the right middle ground marks the headscarp of landslide #874 (see Map 1 of Attachment 5).

Plate 5 (above). View north over Lot 47 from its lower, southern boundary. The higher edge of the tree line in the left middle ground marks the headscarp of landslide #874 (see Map 1 of Attachment 5). Investigation trenches A,B, C and D are indicated.

Plate 6 (below). View northeast and upslope over Lot 47 from its lower, southern boundary. Investigation trenches B, C and D are indicated. Service trench a….f is partly shown.

Plate 7 (above). View north over Lot 47 from its lower, southern boundary.

Plate 8 (below). View northwest and downslope in March 2014 towards the service trench a….f. Lot 47 is the grassy slope in the background. The higher edge of the tree line in the left middle ground marks the headscarp of landslide #874 (see Map 1 of Attachment 5).



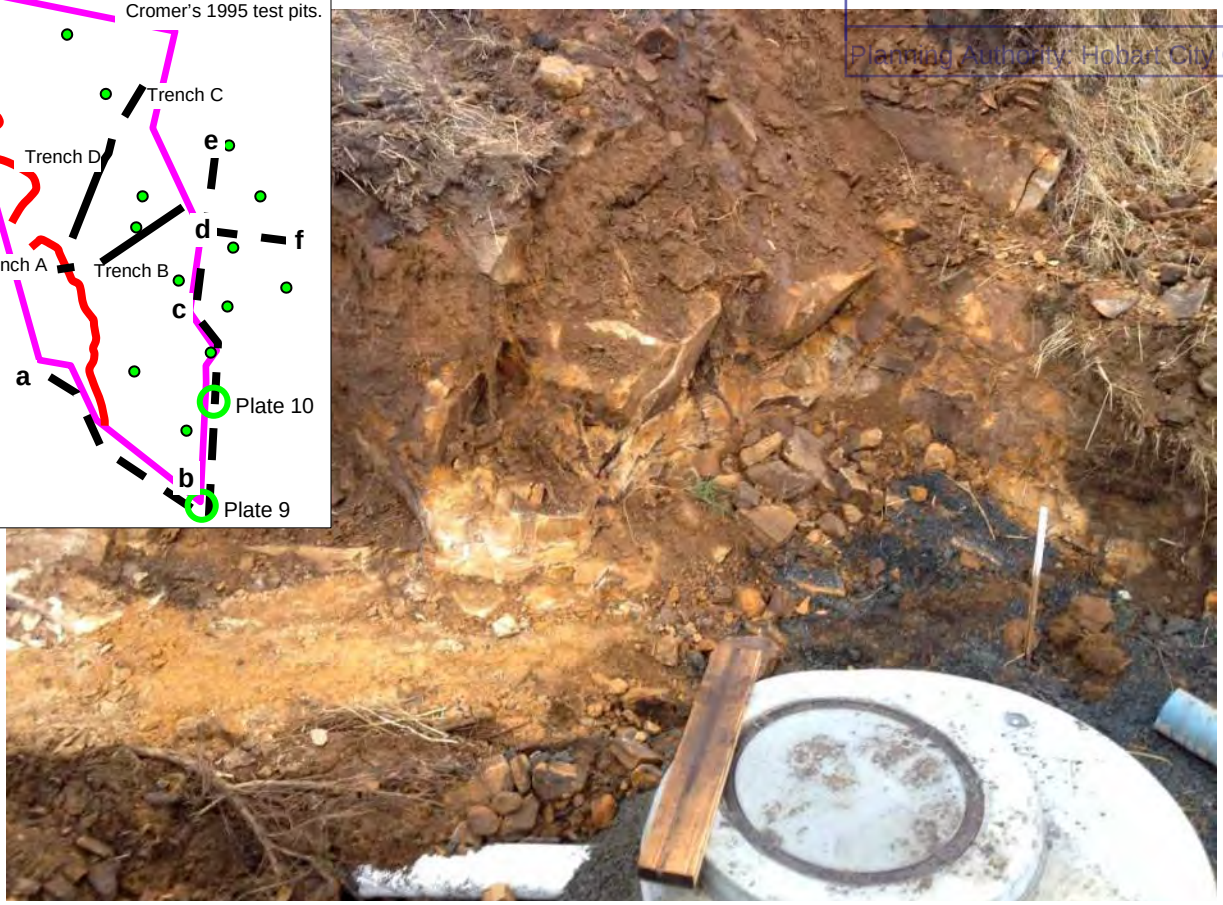
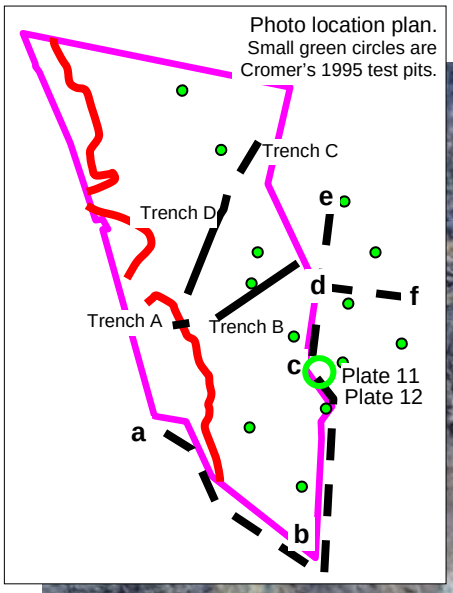


Plate 9 (above). Service trench abcdef at b, 28 March 2014. Subhorizontal Triassic sandstone bedrock exposed at depths less than 0.5m.

Plate 10 (below). Service trench abcdef between b and c. Subhorizontal Triassic sandstone bedrock exposed at depths less than 1m.



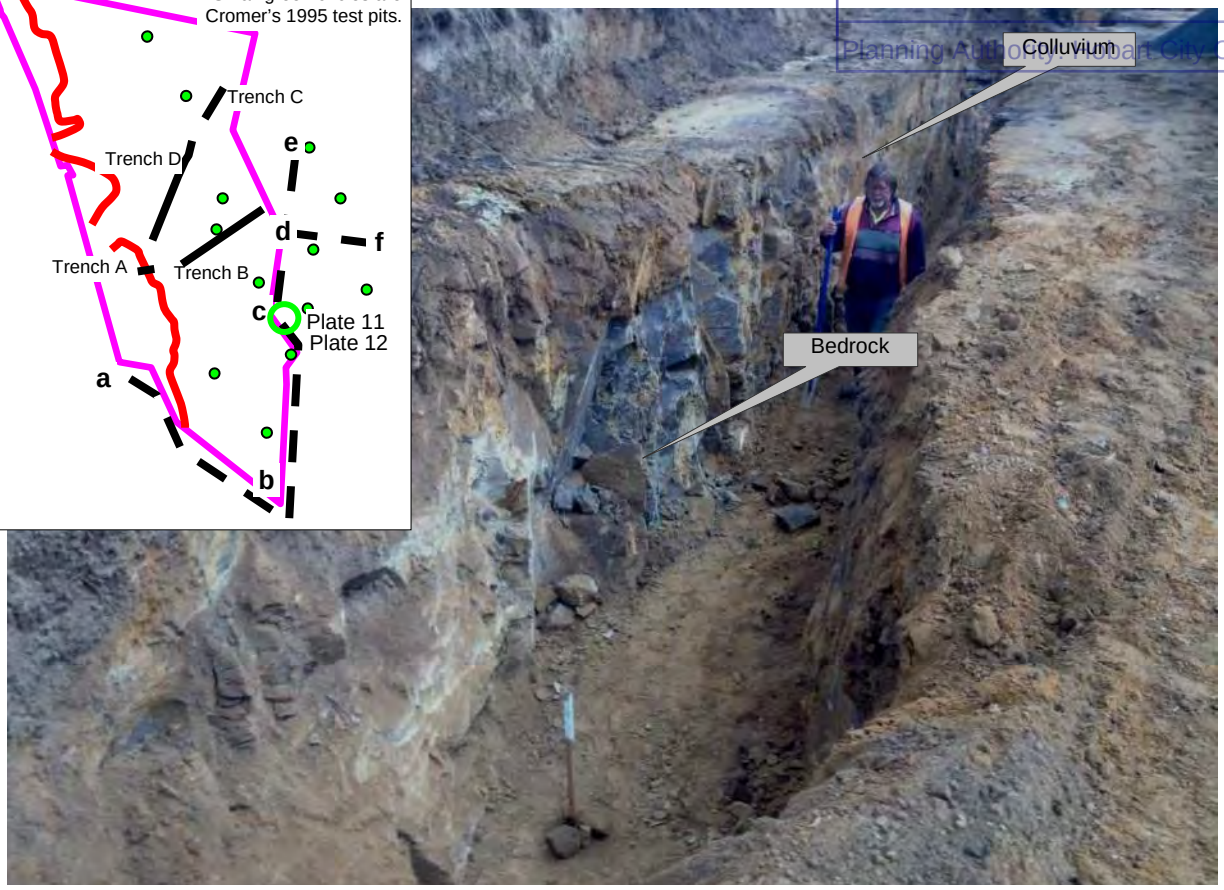


Plate 11 (above). Service trench abcdef at c. Subhorizontal Triassic sandstone bedrock exposed at depths less than 1m, but bedrock is interspersed with zones of colluvium comprising dry, friable to dense non-plastic to low plasticity sandy gravel-gravelly sand and clayey varieties.

Plate 12 (below). Service trench abcdef at c, but opposite side of trench to that in Plate 11.

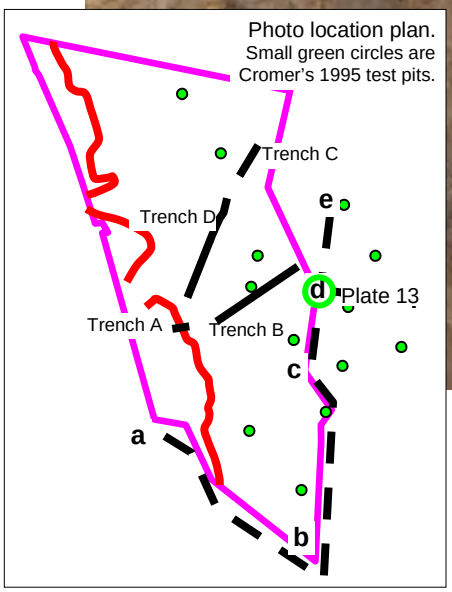
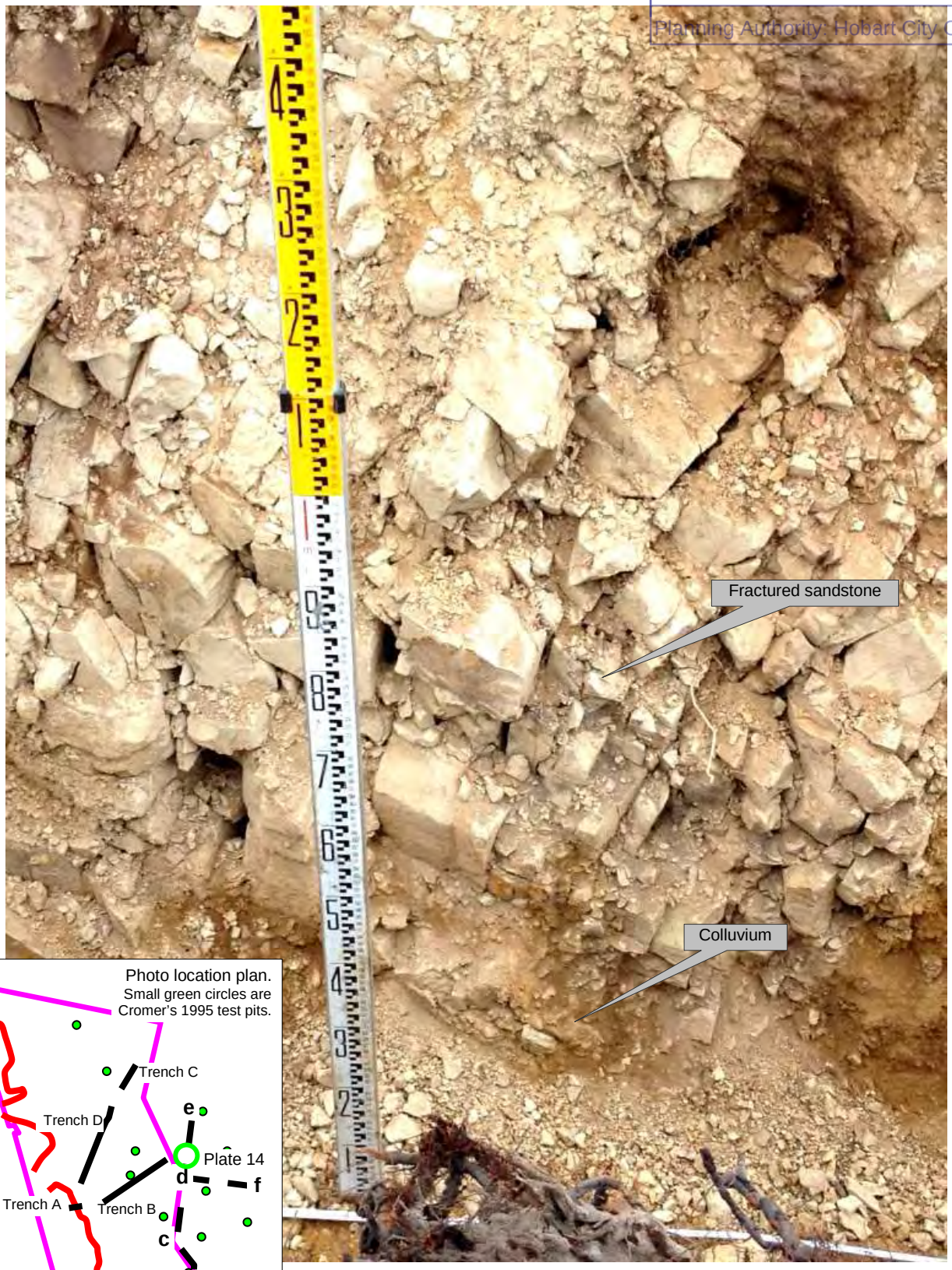


Plate 13. Service trench abcdef at d, looking upslope to e. The profile is mainly dry non-plastic colluvium, interspersed with patches of strongly fractured sandstone which may be in-situ bedrock, and other patches of strongly fractured sandstone underlain by colluvial material and therefore not in-situ.



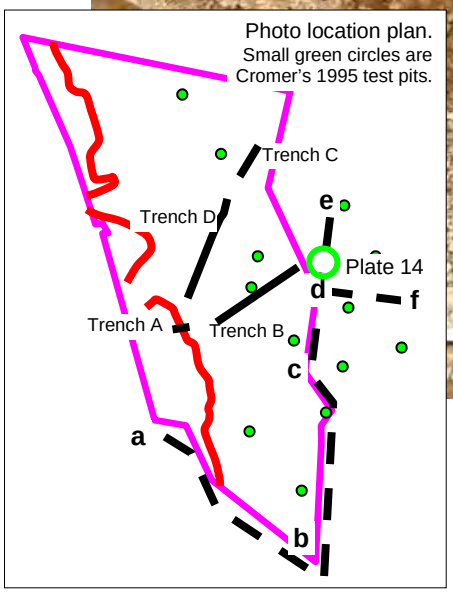
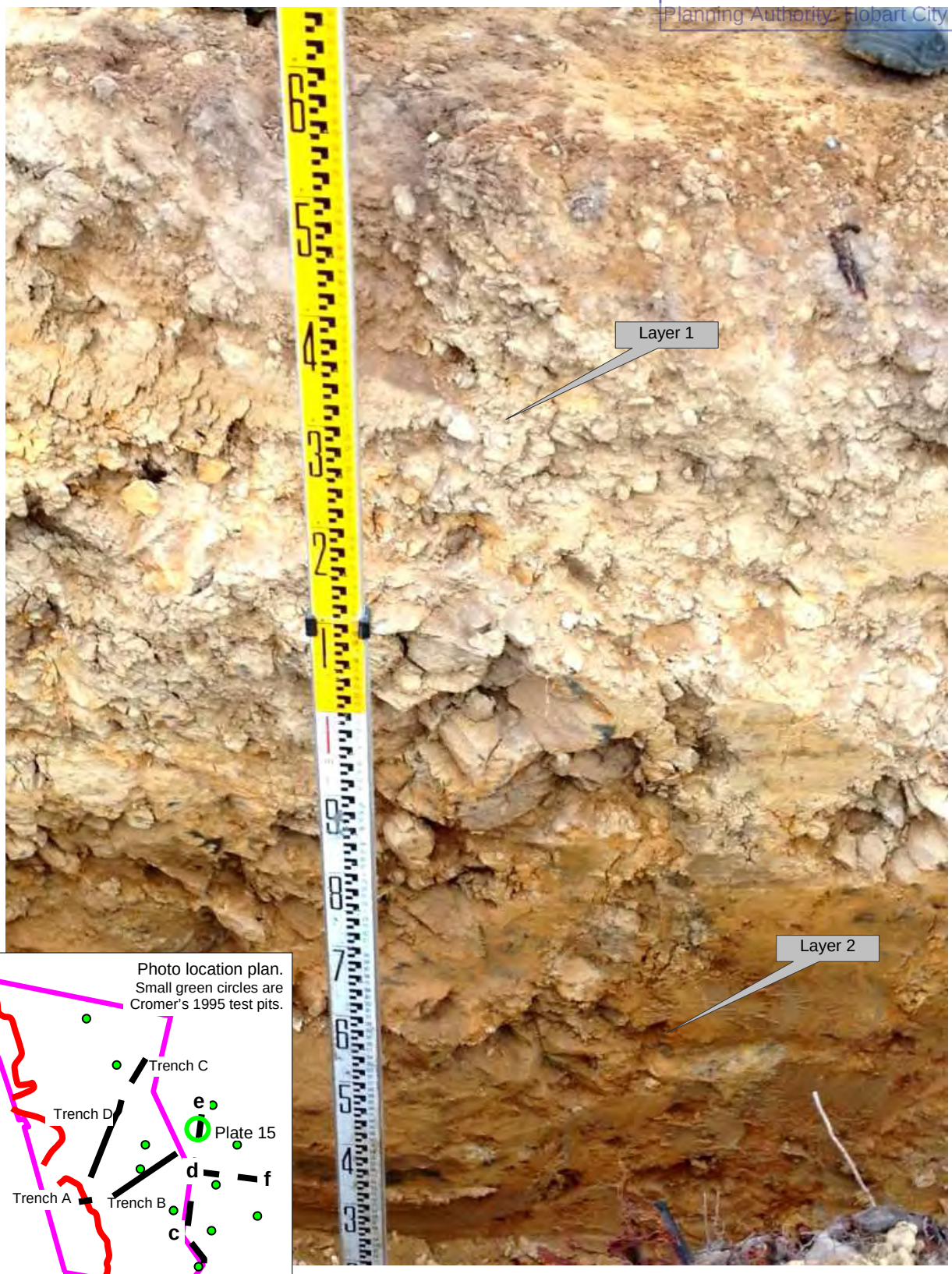


Plate 14. Service trench abcdef between d and e. A patch of strongly fractured sandstone showing joint alignment (and therefore minor bulk disruption and probably minimal downslope transport) is underlain by colluvial material.



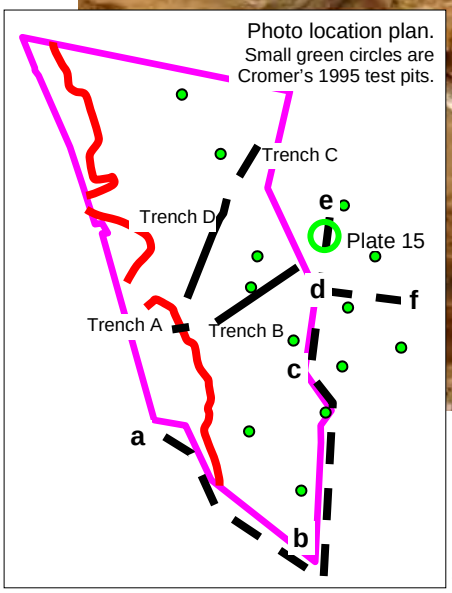


Plate 15. Service trench abcdef between d and e. The colluvium on this slope may locally display two episodes of colluvial development and downslope movement (Layer 2 then Layer 1), or it has undergone illuviation of finer material (orange) from Layer 1 to Layer 2 to form a duplex (two-layered) profile. If the latter, it implies a fair degree of slope stability over an extended time period.

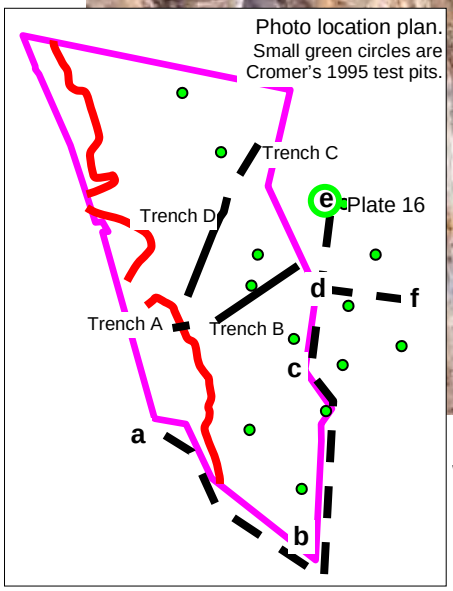


Plate 16. Service trench abcdef at e, looking downslope to d. It is not clear whether the fractured sandstone exposed in the services trench at this location (and locally elsewhere along it) is in-situ or not.

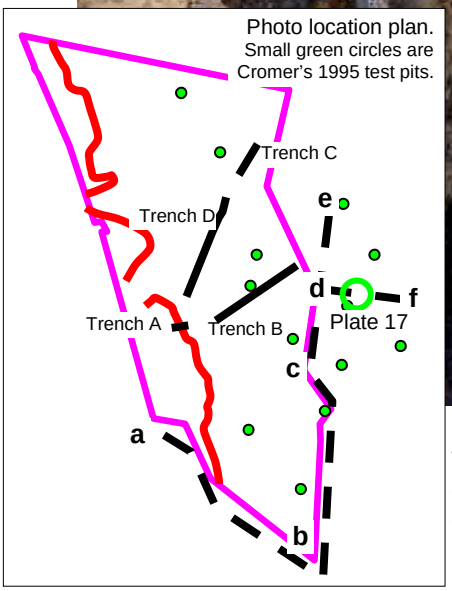


Plate 17. Service trench abcdef between d and f, looking upslope towards f. The fractured sandstone exposed in the services trench at this location appears to be in-situ. A narrow fault zone about 0.5m wide crosses the trench at an oblique angle (arrowed).

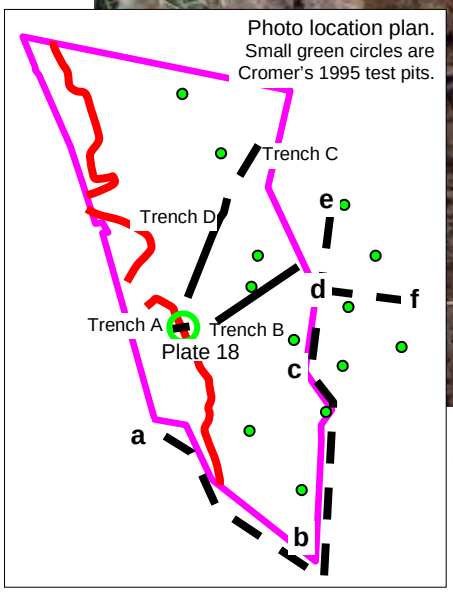
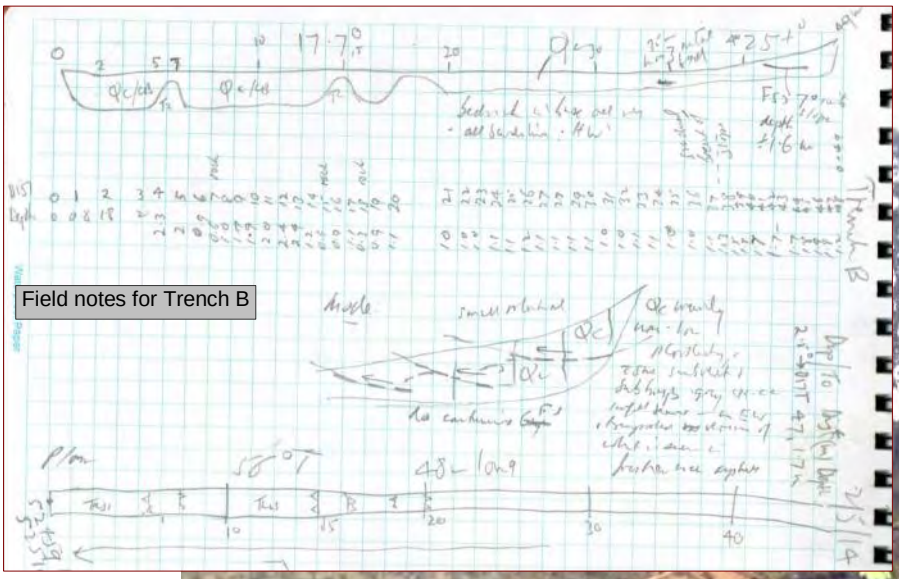
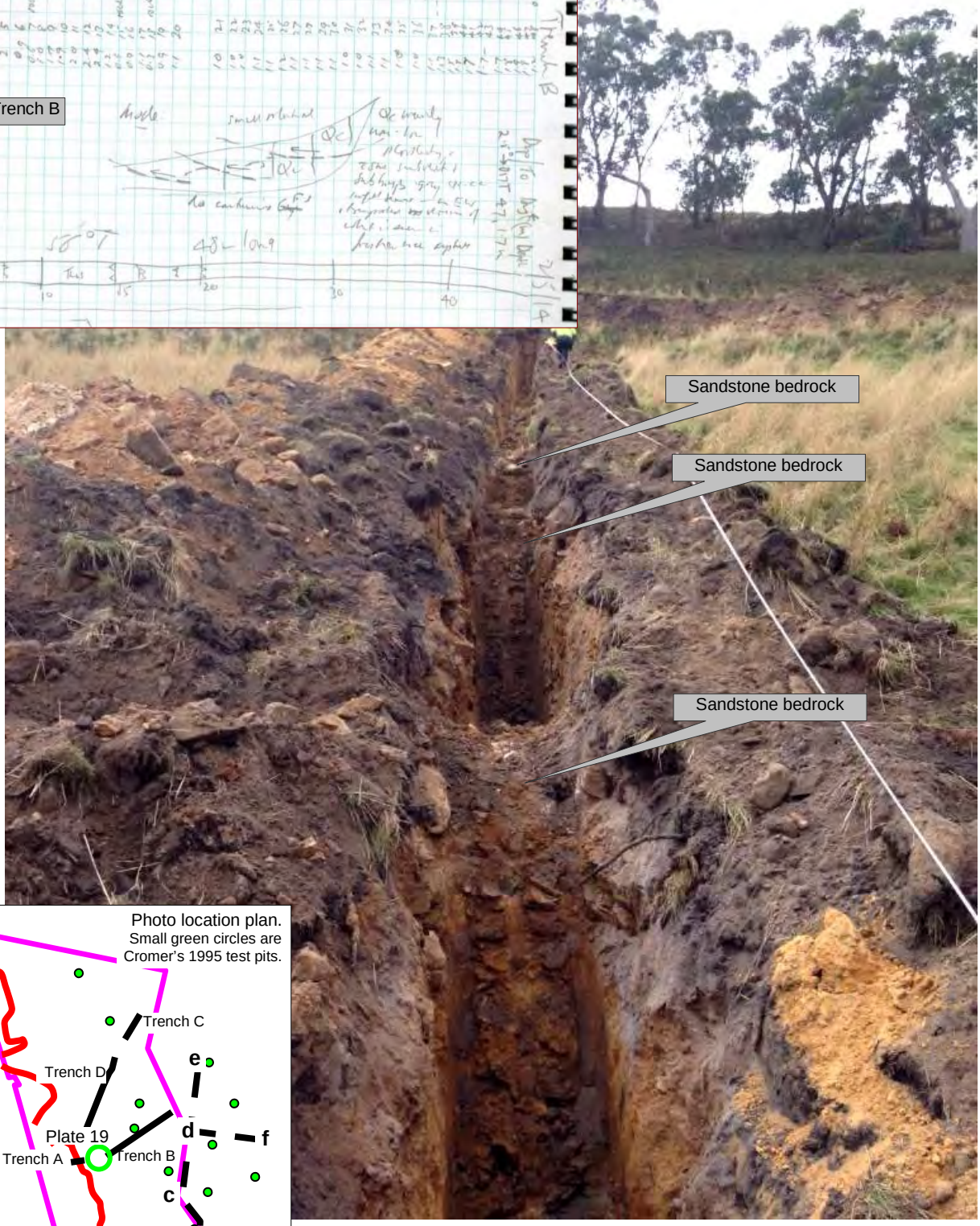


Plate 18. Investigation trench A, about 8m long, was dug across the headscarp of landslide #874. The failure surface was probably close to the camera, but not apparent. Colluvium overlies highly weathered siltstone bedrock, exposed in the base of the trench, and dipping 11^0 to 260^0T.



Field notes for Trench B



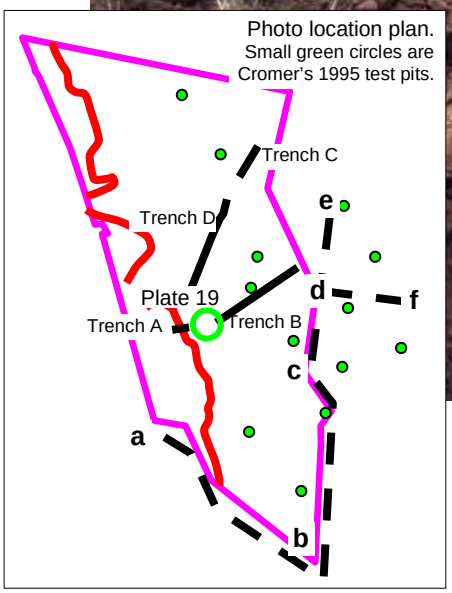


Plate 19. Investigation trench B, about 48m long, looking upslope. The slope is colluvium of variable thickness, but highly weathered sandstone bedrock was exposed along the full length of the trench at depths ranging from as shallow as 0.5m (as indicated) to about 1.8m. The dip on the bedrock is less than 5^0 to the north (into the slope).

Plate 20 (left). Investigation trench B, upslope end, showing finely bedded, highly weathered sandstone and siltstone bedrock dipping 3^0 to 017^0T. Colluvium (with some bedded sandstone) overlies the bedrock, and the boundary (red line) between them, although not very obvious, is inferred to dip towards and up to the camera in a scallop shape (the geology pick is on the boundary).

Plate 21 (below). Detail of the end of Trench B, showing grey-blue, high plasticity clay coatings several millimetres thick on a dipping joint surface. Slipping on these coatings is a likely mode of localised failure for the colluvial cover.

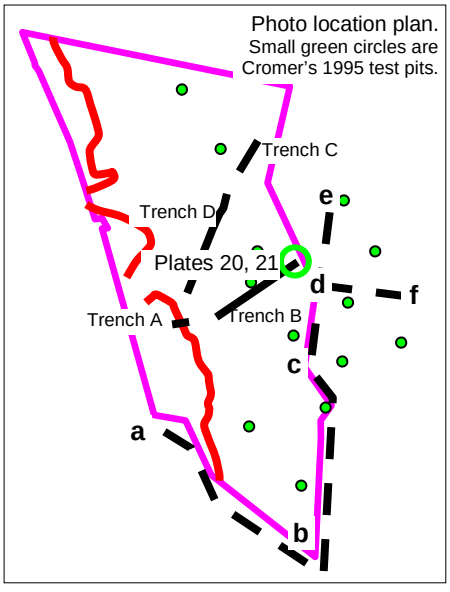


Photo location plan.
Small green circles are Cromer's 1995 test pits.

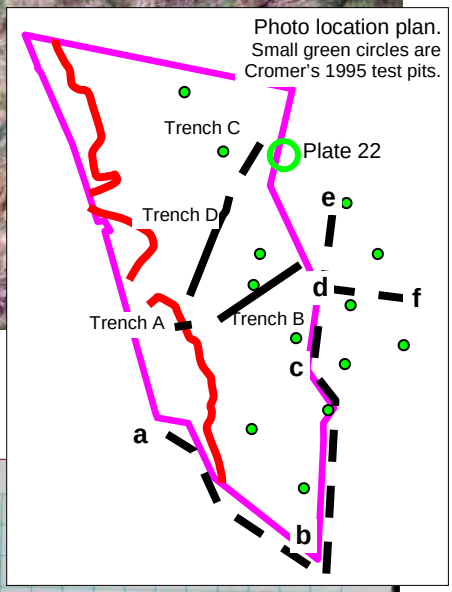
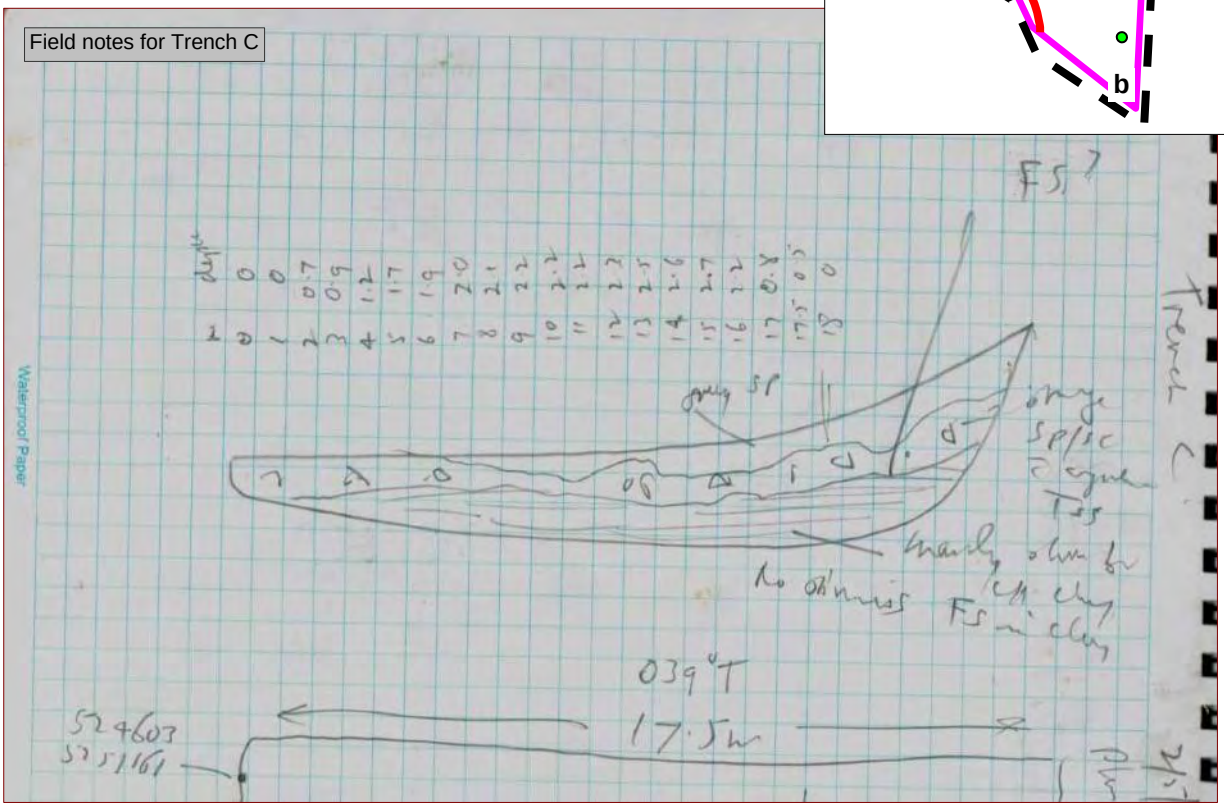
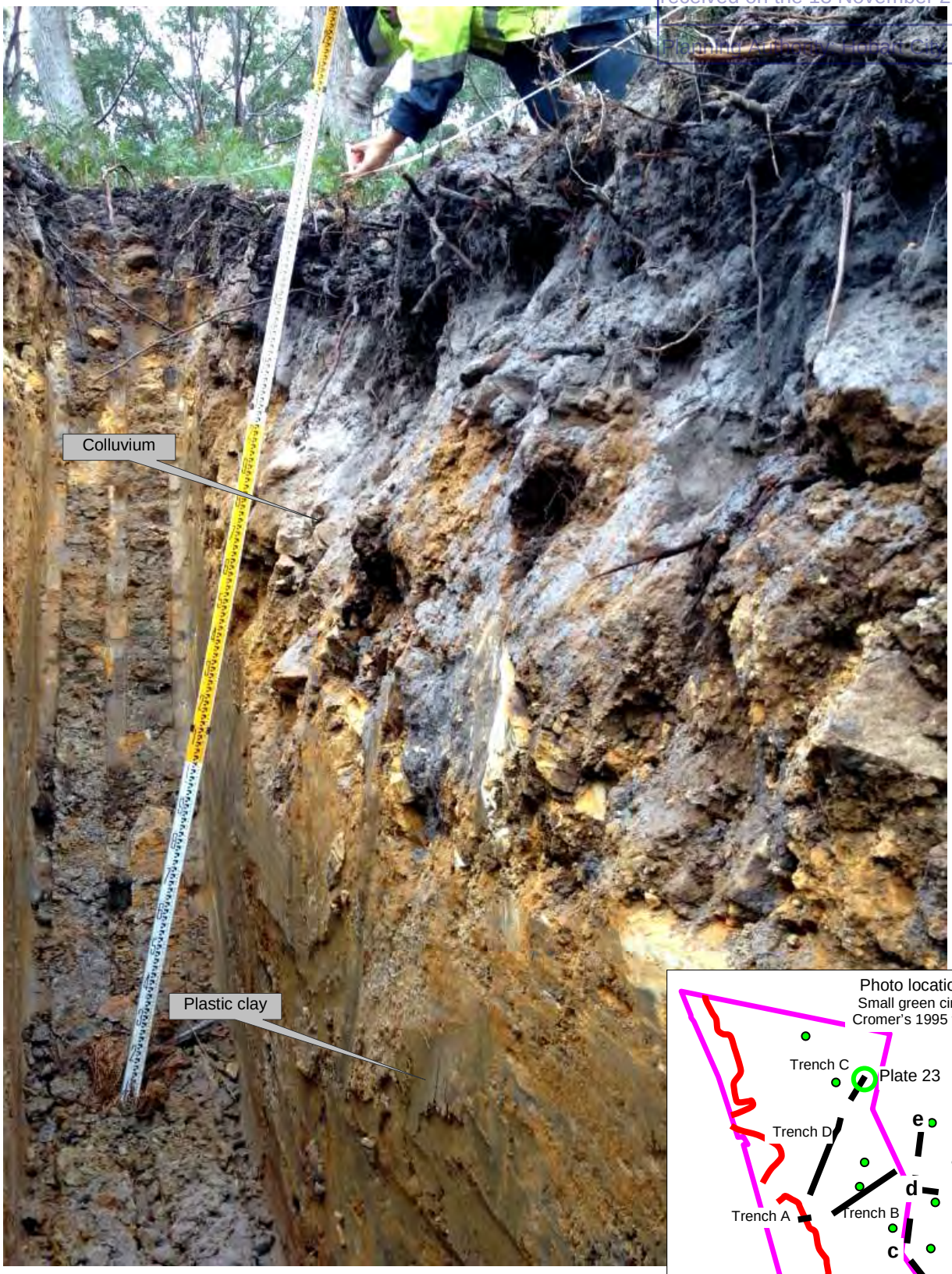


Plate 22 (above). View west at Trench C, 17.5m long. This excavation up to 2.6m deep exposed colluvial materials over high plasticity clay, with no bedrock.

Field notes for Trench C





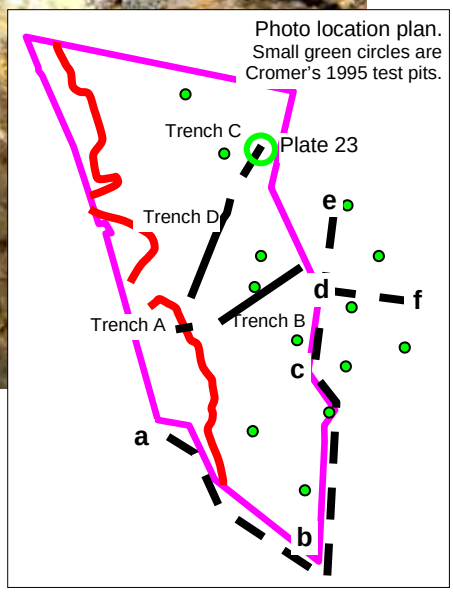
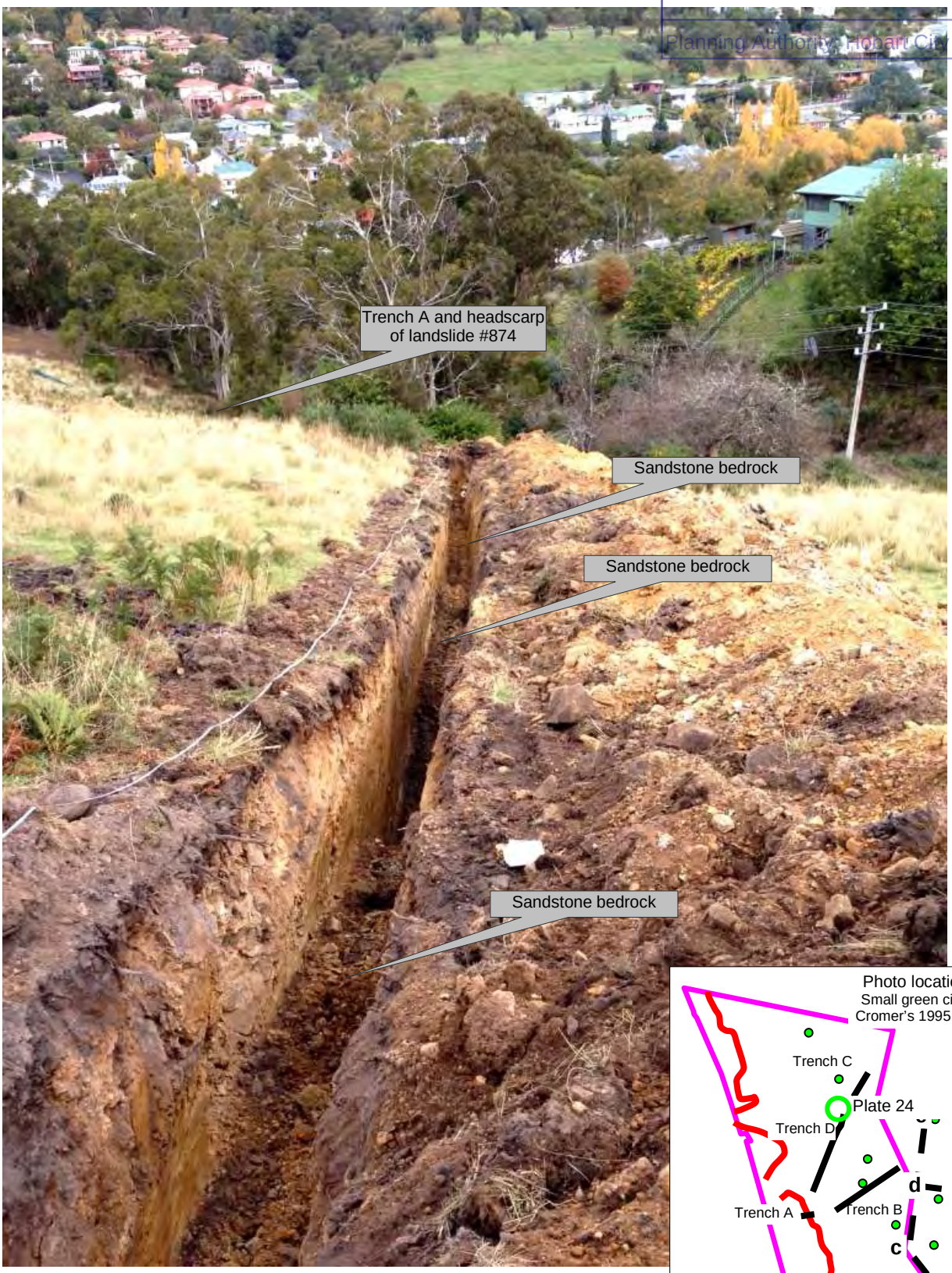


Plate 23. View north northwest at the higher end of Trench C, 17.5m long. This excavation up to 2.6m deep exposed colluvial materials over high plasticity clay, with no bedrock.



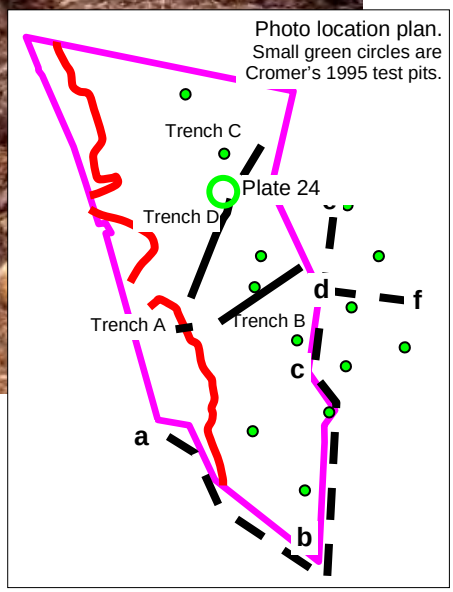


Plate 24. View downslope and along investigation trench D. Note bedrock highs in floor of trench, with colluvial material on top, and surrounding.

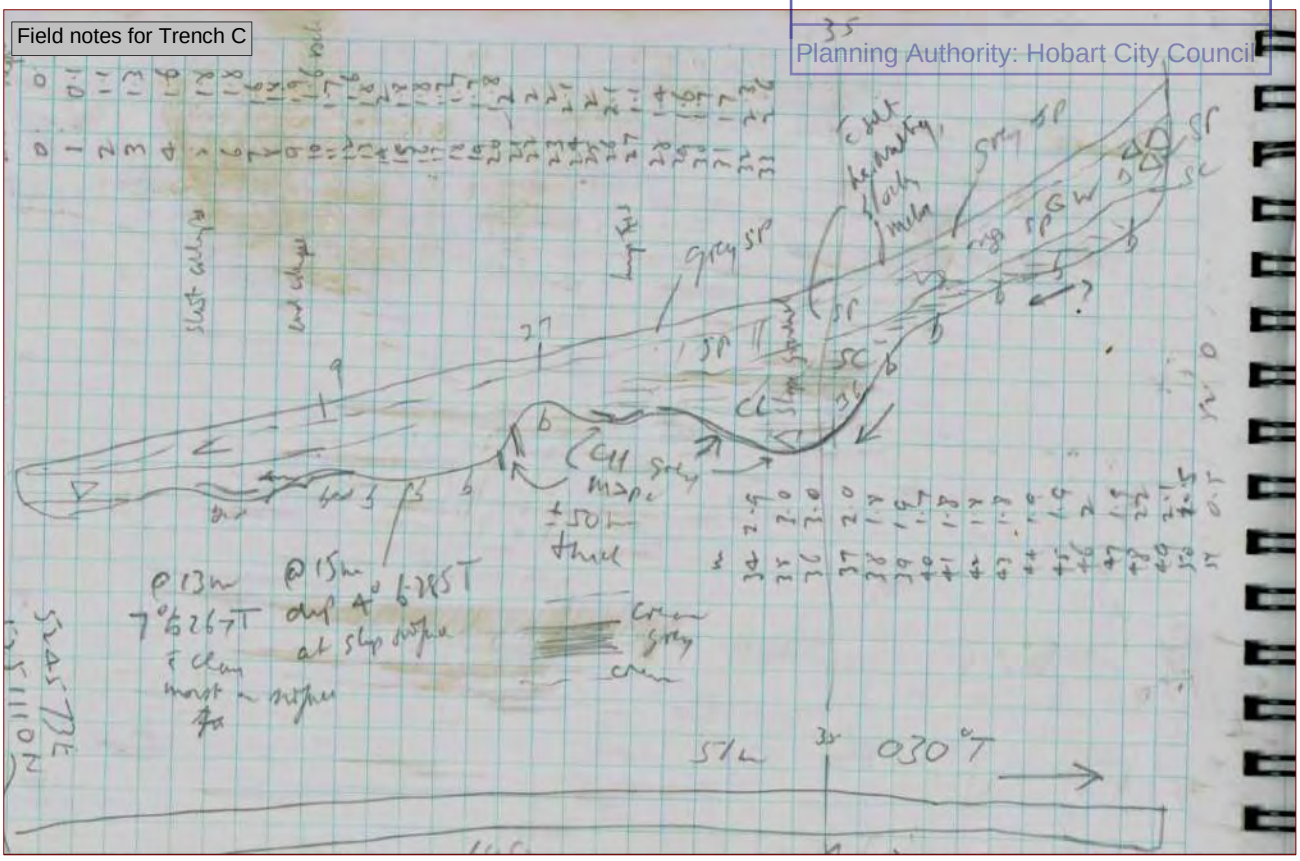
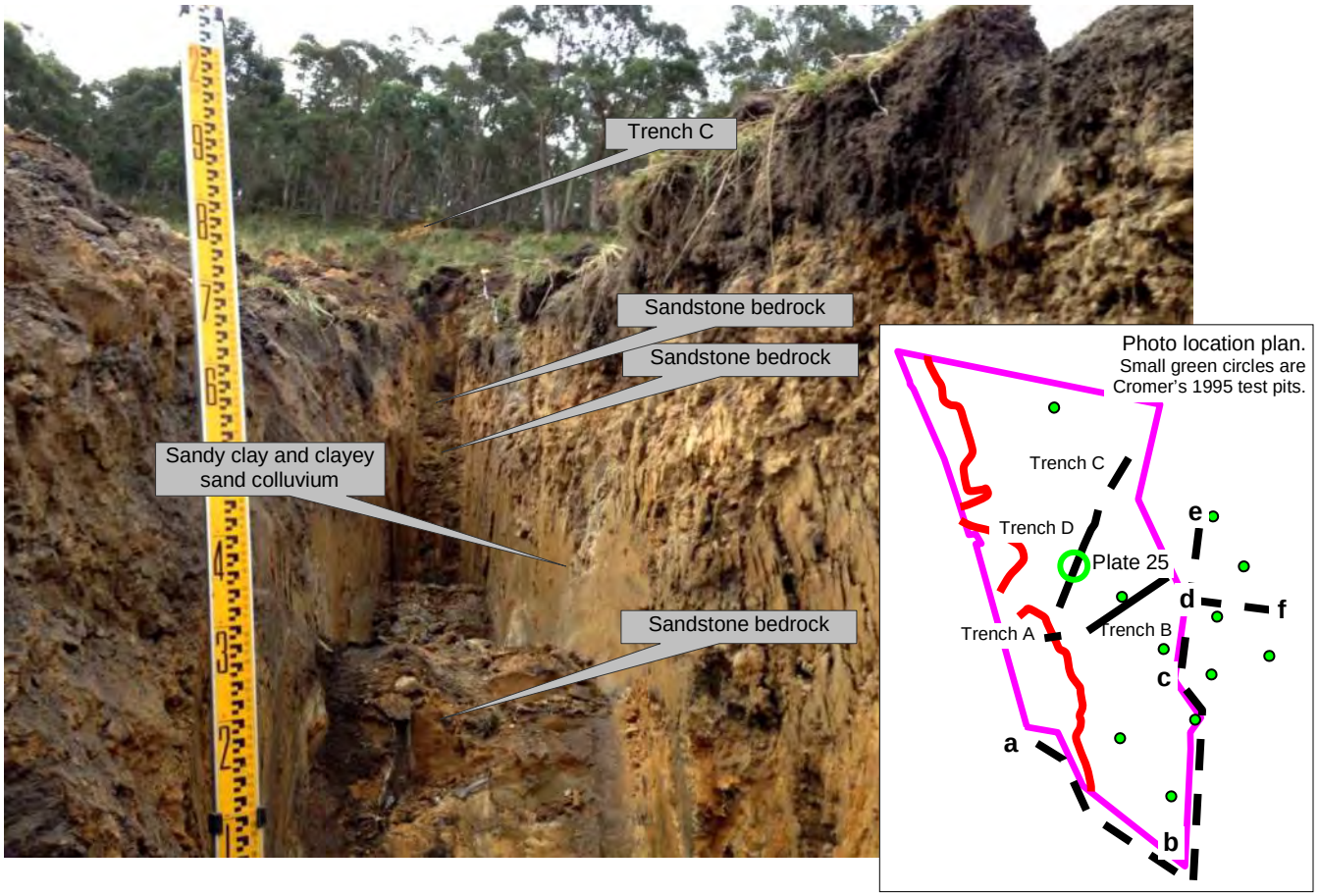


Plate 25 (below). View upslope and along investigation trench D. Note bedrock highs in floor of trench, with colluvial material on top, and surrounding. Bedrock dips measured in Trench D were: 4^0 to 285^0T, 7^0 to 267^0T.



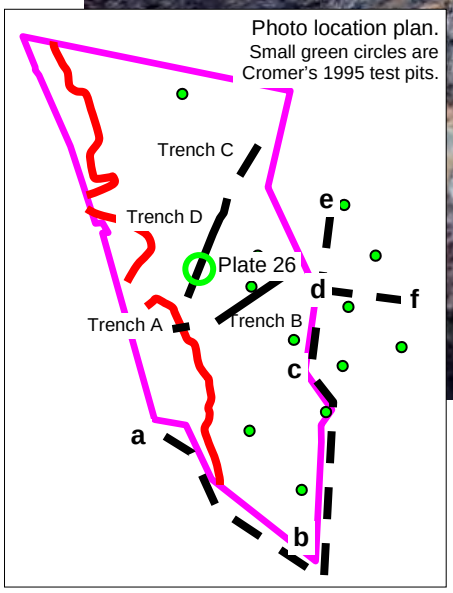


Plate 26. View upslope and along investigation trench D, showing finely bedded sandstone bedrock in floor of trench, with colluvial material on top. Local movement of colluvium over the bedrock is facilitated by grey clayey horizons on the colluvium-bedrock interface (indicated by pencil), and also probably by clayey coatings on subhorizontal joints in the bedrock itself (inset photo; the striations on the clay are finger marks).

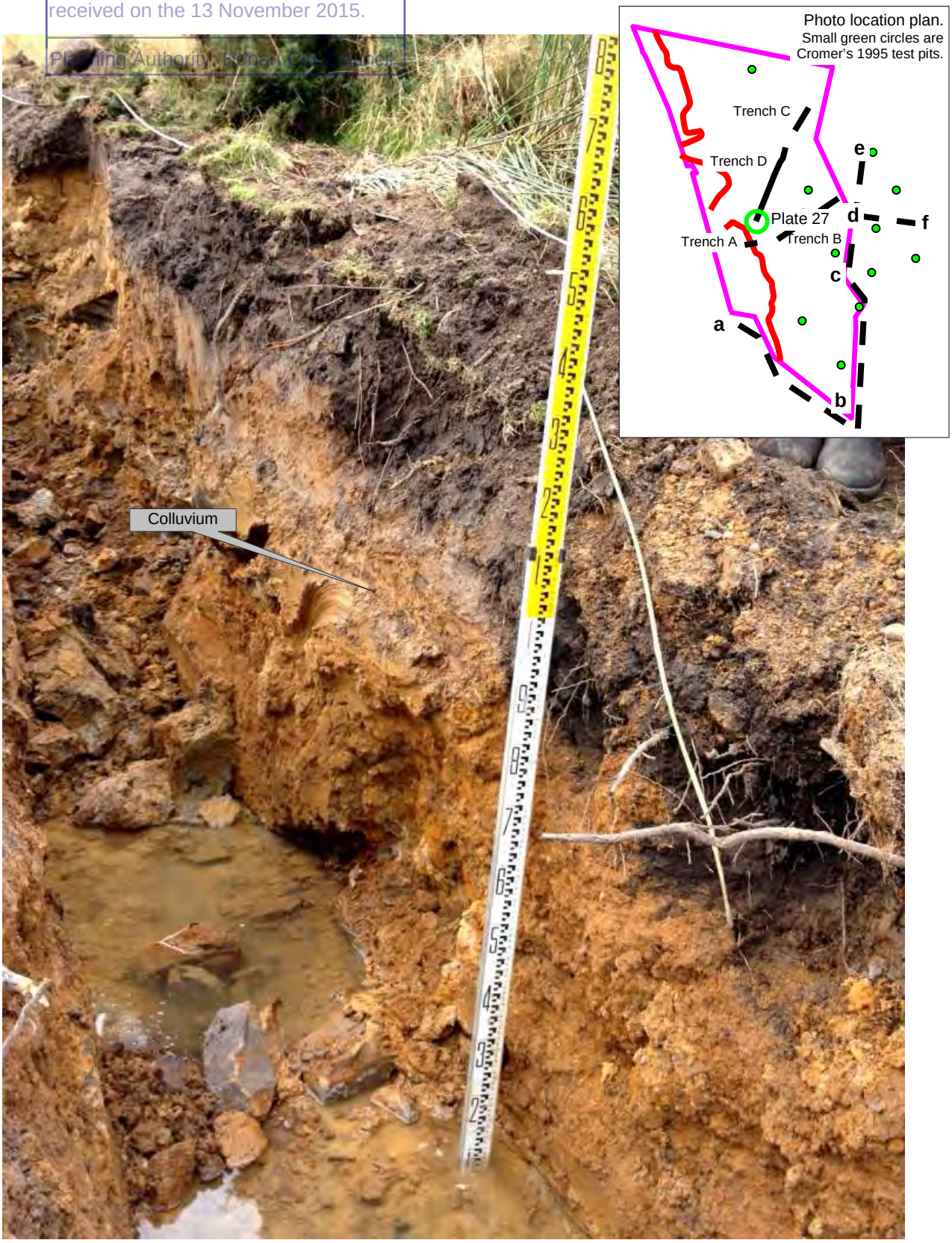


Plate 27. Shallow seepage water issued from, and accumulated at, the lower end of investigation trench D. Shown here are colluvial materials beneath organic-enriched sands soil, near the headscarp of published landslide #874. This seepage was the only instance noted in the trenches, although Cromer (1995) noted minor seepages in nearby test pit 6 at a depth of 3, and 20Lmin seepages at 4.8m

Plate 28. Triassic sandstone with joints coated with high plasticity grey clay are very common on the Farm Hill subdivision and neighbouring areas. This photograph of the cutting at the junction of Thelma Road and Forest Hill Road shows mainly subvertical, clay-lined joints, but subhorizontal and dipping ones, too. Some joint coatings taper to less than a millimetre thick, and it is inferred that they were emplaced in the liquid or semi-liquid state, filling open fractures. The origin of the clay is unclear – perhaps it represents clay enriched (B-horizons) which have been mobilised under wet conditions (cold? less vegetation cover?) and slope instability.

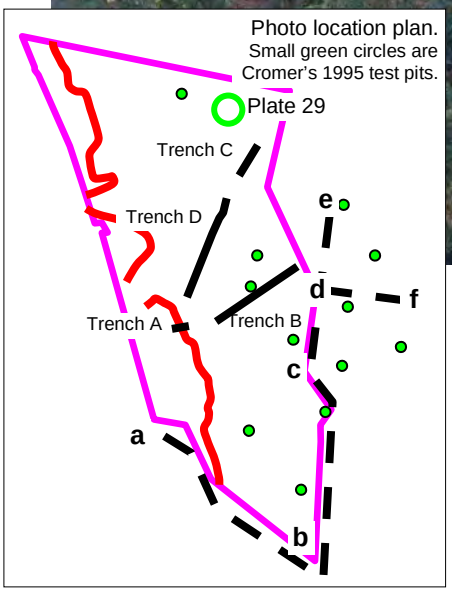


Plate 29. Curved tree trunks near the higher, northern boundary to Stage 4 suggest episodes of downslope soil movement.

Attachment 10

(13 pages)

Landslide Risk Management

This Attachment addresses slope stability (landslide) issues for Lot 47 at Farm Hill in accordance with Australian Geomechanics Society (AGS) Landslide Risk Management (2007)[6]. The process is depicted in Figure 10.1.

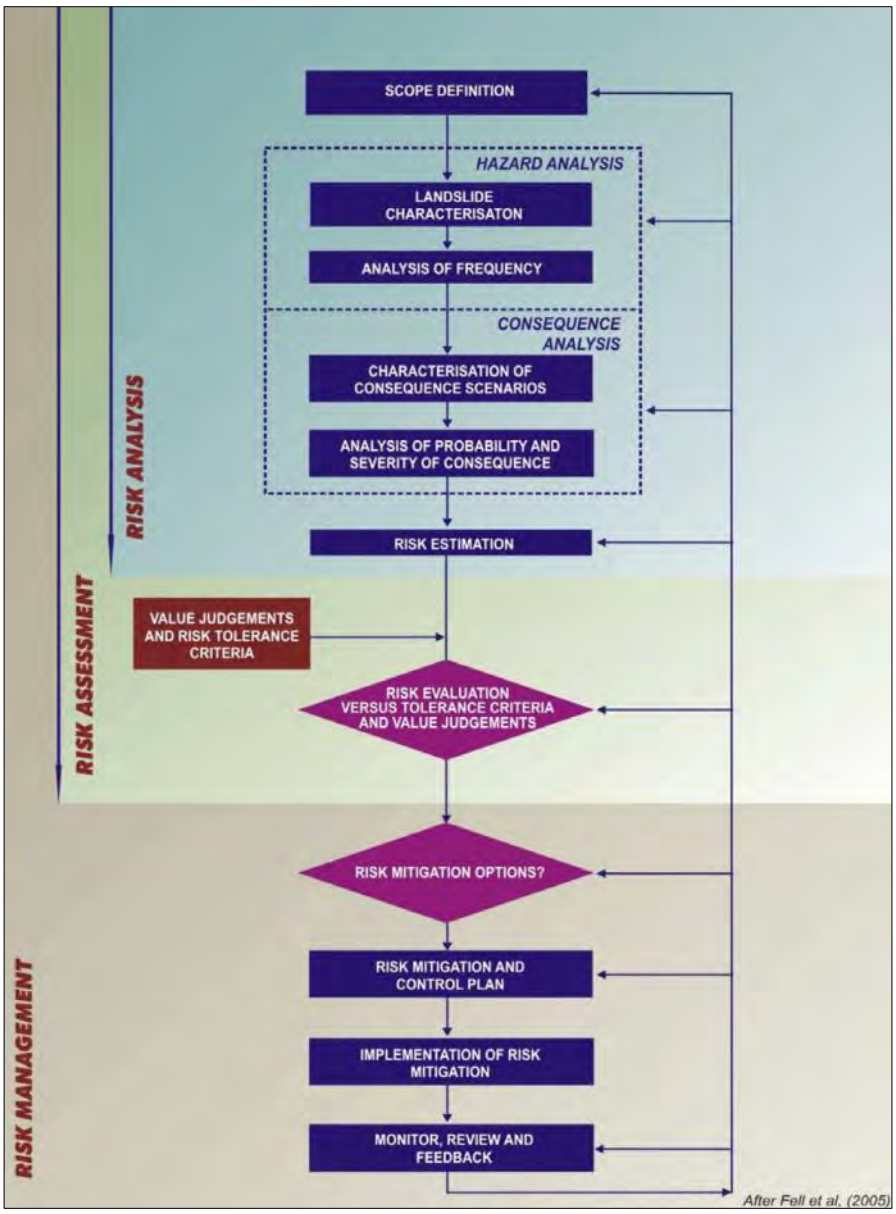


Figure 10.1. Framework for Landslide Risk Management
Source: Reproduced without amendment from AGS (2007a). Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007

[6] The five AGS documents are:
AGS (2007a). Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007
AGS (2007b). Commentary on Guideline for Landslide Susceptibility, Hazard and Risk Zoning. Australian Geomechanics, Vol 42 No 1 March 2007
AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007
AGS (2007d). Commentary on Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007
AGS (2007e). The Australian Geoguides for Slope Management and Maintenance. Australian Geomechanics Vol 42 No 1 March 2007

LANDSLIDE RISK MANAGEMENT (LRM)

Preliminary

Desktop review of slope instability

Unpublished evidence

Information relating to potential or actual slope instability on and adjacent to Lot 47 at Farm Hill was discussed in detail in my 1995 report[7], and some of it is included here as extracts in Attachment 4. The 1995 report also included a copy of an earlier unpublished letter[8] to G Stevens by the then Division of Mines & Mineral Resources, briefly describing a landslide on the lower, southwestern portion of the land.

The report described:

- the existing landslide,
- a larger and more subtle topographic feature surrounding the existing landslide and extending north and east on adjacent slopes, interpreted as a possible landslide, and
- several smaller landslides bordering the eastern side of Ross Rivulet.

I am unaware of any other unpublished reports relating to slope stability issues in the neighbourhood of the development.

Published evidence

The 1995 report resulted in the first landslide features listed above being added to the landslide database maintained by the Division of Mines & Mineral Resources, and then early this century onto landslide hazard and related maps maintained by its successor, Mineral Resources Tasmania (MRT). The original smaller landslide (Weldon, 1990) became #874, and the larger feature #1476[9].

The MRT Landslide Hazard Maps (Attachment 6, this report) show:

- The two known shallow landslides (#874 and #1476) occupy the southern and southwestern half of Lot 47 on the Farm Hill Subdivision. Slope angles are in the 20 – 30^0 range.
- Most watercourses in the area have the potential to generate debris flows at their sources, with associated runouts. Test pit data from Cromer (1995) have been used to indicate regolith thicknesses (up to 5m) on the Farm Hill Subdivision.
- The course of Ross Rivulet, and the sandstone cliff sections bordering Hobart Rivulet, have the potential to generate rockfalls.
- The subject land is adjacent to, but not shown to be at direct risk of, potential deep seated landsliding.

More recently, landslide hazard band maps covering all of Tasmania have been released by the Department of Premier and Cabinet, using data provided by MRT, and are available at www.thelist.tas.gov.au. The landslide hazard banding for Farm Hill and environs, reproduced here in Attachment 5, shows landslide #874 as in the "Medium – Active band, with enclosing landslide #1476 in the Low to Medium band, and the balance of Lot 47 in the Acceptable band.

[7] Cromer, W. C. (1995). Geotechnical Investigations of Lands off Forest Road, West Hobart. Unpublished report for G. E. Stevens by Environmental & Technical Services Pty Ltd September 1995.

[8] Weldon, B. D. (1990). 4 Tara Street – proposed subdivision. Letter re landslide, signed by M. R. Hargreaves as Acting Director of Mines to G. Stevens, 162A Forest Road, 28 September 1990, 1 page.

[9] Both can be viewed on the MRT landslide map at http://www.mrt.tas.gov.au/Viewer/Exposure/E3?REQUEST=Entry&PRJ=Geohazards_Public&MODE=mrt&DELETE_DEFAULT=Y&SID=98545043&REQUEST=Entry&reload=1

Field evidence
Field evidence:

- confirms the presence of translational landslide #874, which appears to have not undergone any noticeable movement since the mid-1980s, and possibly earlier,
- confirms the presence of a series of small-scale translational landslides upslope from #874, on the eastern bank of Ross Rivulet,
- suggests that the larger feature #1476 might never have been a shallow translational landslide. Extensive trenching in 2014, described by the photographs in Attachment 9 of this report, shows the hillside comprises non-plastic or low plasticity colluvium of variable thickness (0.5 to 1.5m) over subhorizontal sandstone bedrock. Local thin lenses and horizons of moist, high plasticity clay occur in places on the bedrock/colluvium interface and probably promote small scale translational downslope movement, which may result in subtle surface undulations but nothing more significant, and
- includes the observation that the higher, steeper slopes of Lot 47 show undulating ground (and Trench C exposed over 2m of colluvial clay); these slopes may be run-out material from a previously un-mapped, relatively old and now probably inactive, moderately-sized armchair-shaped depression (shown in Attachment 8) upslope from Lot 47. On these steep slopes near the higher, northern property boundary, curved tree trunks indicate sporadic downslope soil movement (see Plate 29 in Attachment 9).

Site investigations
Addressed in the Attachments to this report.

Site plans
See Attachments 2, 3, 5, 7 and 8.

Site sections (natural scale) and slope variations

Figures 10.1a, 10.2a and 10.3a (this Attachment) are natural-scale NE – SW cross sections at three locations through the hillside including Lot 47 at Farm Hill. Figures 10.1b, 10.2b and 10.3b show the variation in slope angles down the hillside, calculated from 1m LiDAR contours for each 5m of horizontal distance. Each of these slope graphs highlights slope irregularities not readily apparent in the natural-scale cross sections. A key feature of the slopes are surface undulations with amplitudes mostly in the 0.5 – 1m range (locally up to 3m) and downslope lengths in the 5 – 50m range, which indicate shallow translational slope instability. These surface undulations are less developed on Section line 3.

The captions to all Figures are self-explanatory.

Conceptual hydrogeological model for Lot 47

Figure 10.4 (this Attachment) is a conceptual hydrogeological model for a generalised NE – SW hillside slope across Lot 47. It depicts various modes of potential slope instability, not all of which are observed or feasible.

Status of landslide #874
Landslide #874 is regarded here as an active[10], small-medium sized, rotational-translational, shallow, slow-moving earth slide. There has been no noticeable movement of it for about 30 years. The main hazard associated with possible Lot 47 residential development is upslope regression of the headscarp. Recent investigations have established that similar, smaller landslides extend upslope along the eastern side of Ross Rivulet, the full western side of the Farm Hill property boundary.

Status of landslide #1476
The trenching associated with residential development, and investigation trenches A – D, suggest Landslide #1476, as published, does not exist. Instead, the hillside is characterised by

[10] "Active" means movement has occurred since European occupation.

a variable-thickness (0.5 – 1.5m thick) veneer of colluvial soils over an undulating, shallow surface of subhorizontal Triassic sandstone bedrock. Minor, localised, very small scale (metres), very slow translational movement is probably occurring where thin discontinuous lenses of high plasticity clay occur – in colluvium, at the colluvium/bedrock interface, and in joints in the upper levels of the bedrock. The landslide should be removed from published maps and databases[11].

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Hazard Analysis

Landslide characterisation

Refer to Figure 10.5 and Table 10.1 (this Attachment) for a description of the main forms of landslide movement.

Figure 10.4 schematically shows six potential forms or scenarios (numbered red circles) of landslide movement in relation to Lot 47, under current and post development conditions. The post development conditions relate to oversteepening of existing slopes for vehicle access and house sites, and the use of uncontrolled fill, which increase the likelihood of small scale instability (Scenario 6).

The scenarios are:

Scenario 1: Rotational or translational failure
Deep-seated, in bedrock; failure surface irregular; deeper than 5m; large-scale; slow moving; potentially affecting whole hillside

Scenario 2: Rotational or translational failure
Shallow, in colluvial clays on steeper northern slopes; failure surface shallower than 5m; medium scale; slow moving; potentially affecting perhaps 25 – 50% of slope, including run-out.

Scenario 3: Translational failure
Shallow, in colluvial soils on adjoining land on steeper northern slopes; failure surface shallower than 2m; medium scale; the hazard relates to runout of failed material onto the steeper northern parts of Lot 47; slow to rapid movement

Scenario 4 Rotational or translational failure
Upslope regression of landslide #874; small scale; shallow, in colluvial soils over bedrock; failure surface less than 2m deep; slow moving.

Scenario 5 Translational failure
On clay horizons at the colluvium/bedrock interface; very small scale; very slow moving

Scenario 6 Rotational or translational failure
Very small scale failure after development, involving a range of forms including collapse of soil in excavations, or fill used beneath houses, driveways, terraces, etc; slow to rapid moving

Movements of earth and/or debris are possible.

Frequency analysis

Table 10.2 (this Attachment) lists the potential occurrence and subjective likelihood of the six identified forms of slope instability on Lot 47, under current and post development conditions.

[11] An informal request has been made to Mineral Resources Tasmania in this regard.

Figure 10.1a Hillside Section 1 **Natural scale**

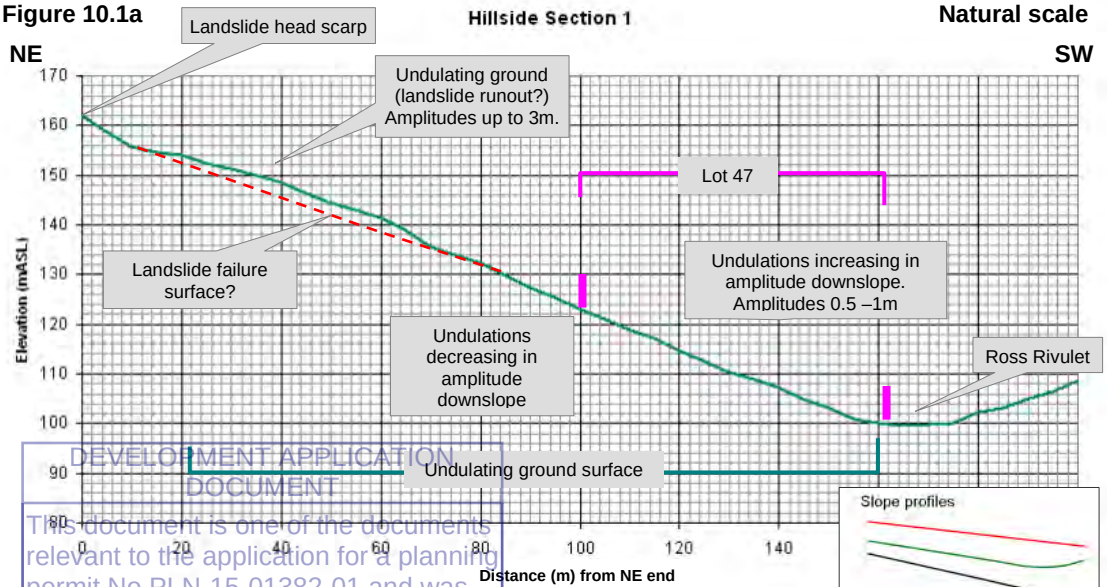
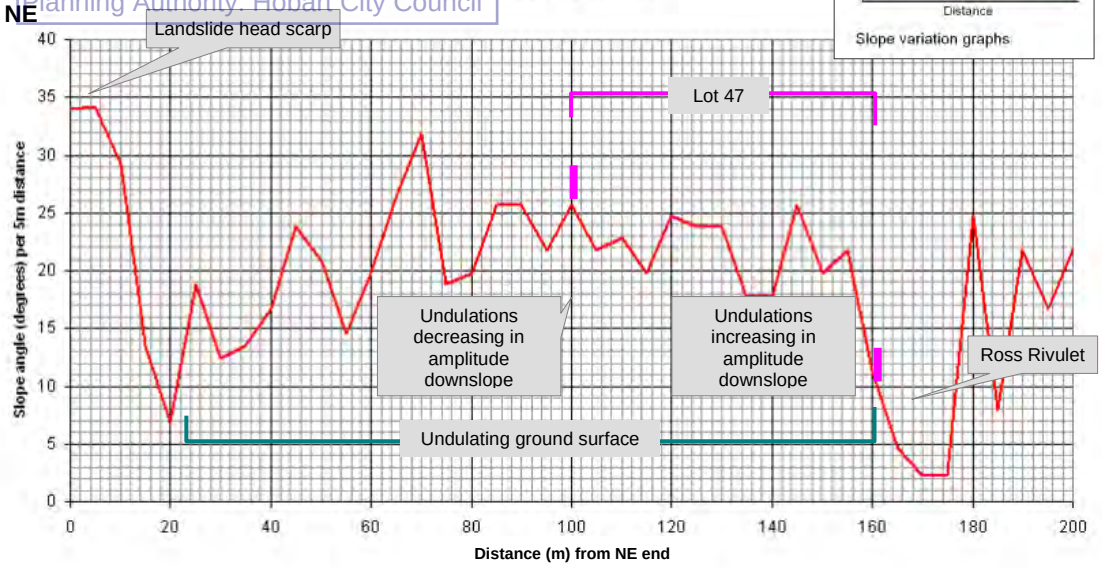


Figure 10.1b Slope Angle Variation



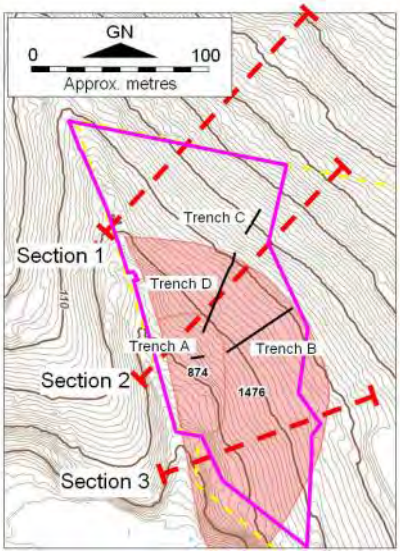
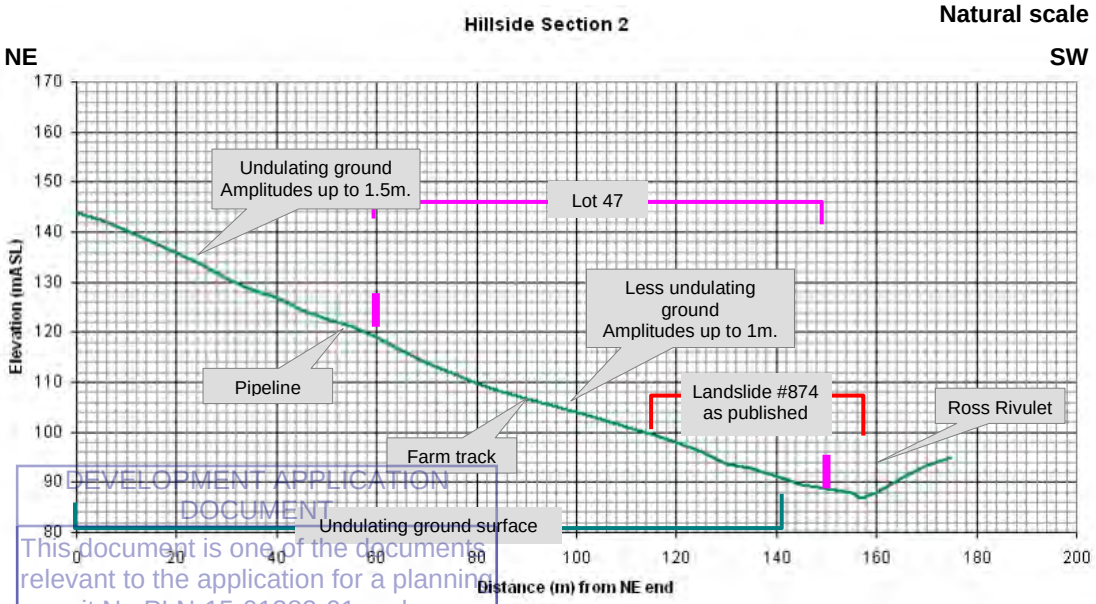
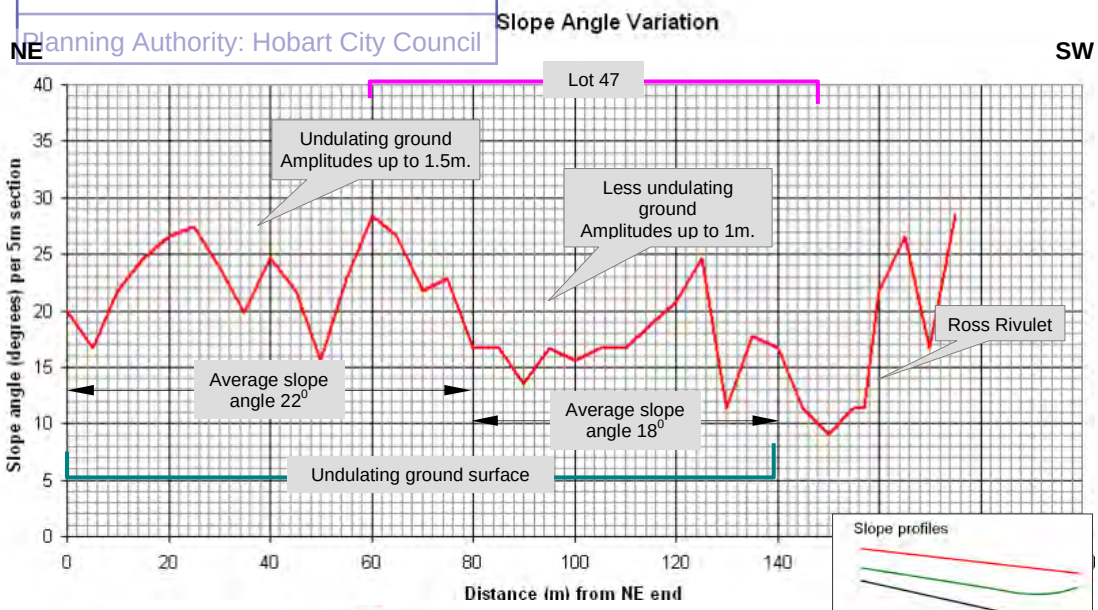
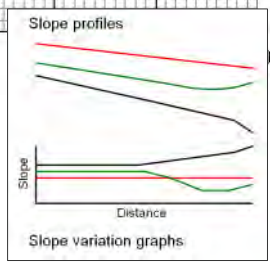


Figure 10.1a. This 200m NE – SW natural-scale section through the northwestern corner of Lot 47 and the hillside above it shows the previously unmapped landslide on higher ground, and an undulating surface on the slopes leading down to Ross Rivulet. The average slope angle is 22^0.

Figure 10.1b shows variations in slope angle, calculated each 5m (the graph for a uniformly dipping slope would be a horizontal line).
The undulations in the ground surface are readily apparent, Amplitudes downslope from the landslide are up to 3m (landslide runout?), but decrease downslope to about 0.5m before increasing towards Ross Rivulet to 0.5 – 1m. Slope angles are steep (35^0) at the headscarp of the landslide, and again on segments of undulating ground to distances up to 80m (landslide runout?), but then remain in the 20 – 25^0 range until the edge of Ross Rivulet.







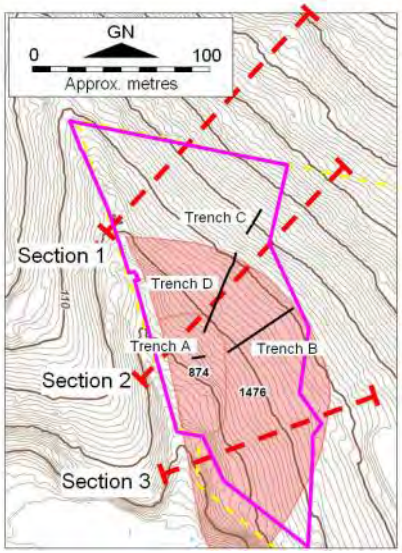


Figure 10.2a. This 175m NE – SW natural-scale section through the north-central part of Lot 47 and the hillside above it shows an undulating surface on the slopes leading down to Ross Rivulet. The average slope angle above the farm track (at a gentle break of slope) is 23^0, and 18^0 below it.

Figure 10.2b shows the variations in slope angle, calculated each 5m (the graph for a uniformly dipping slope would be a horizontal line).
The undulations in the ground surface are readily apparent, and decrease in magnitude downslope.

Figure 10.3a **Natural scale**

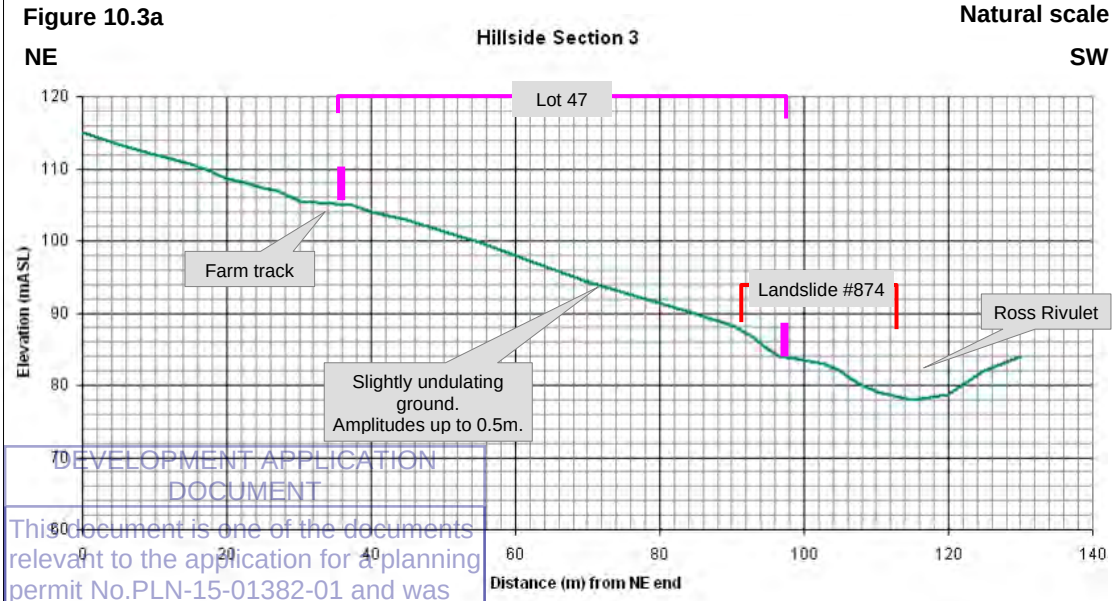
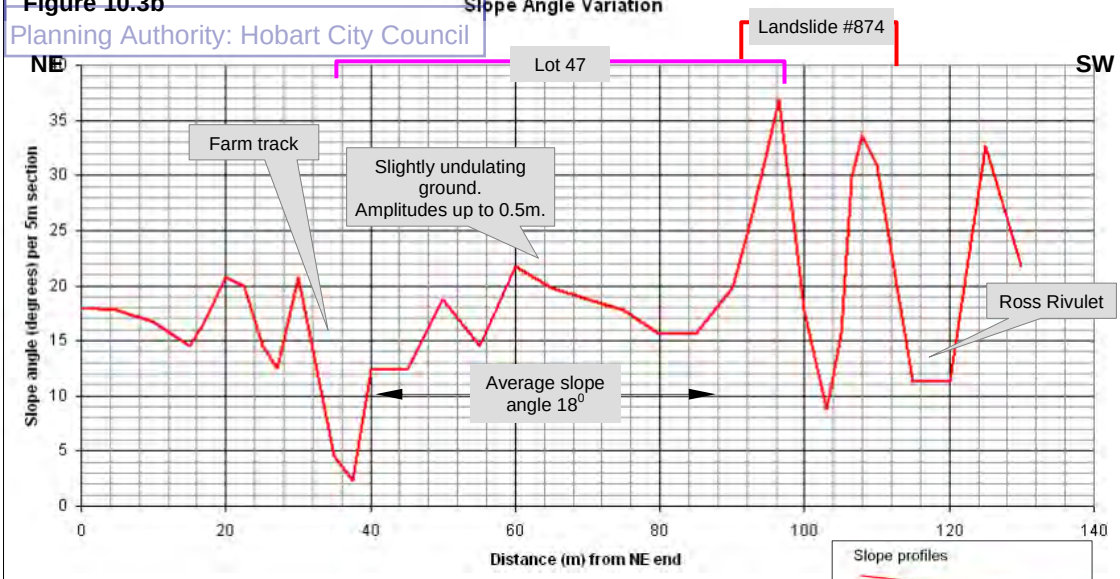
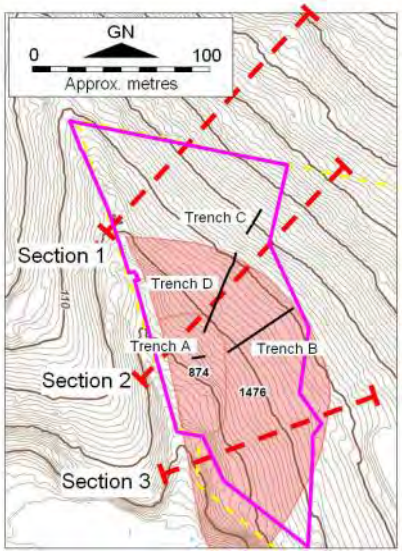


Figure 10.3b





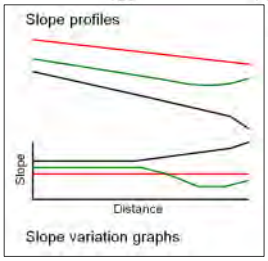


Figure 10.3a. This 130m NE – SW natural-scale section through the southern part of Lot 47 shows a slightly undulating surface between the farm track, and landslide #874 leading down to Ross Rivulet. The average slope angle below the farm track is 18^0.

Figure 10.3b shows the variations in slope angle, calculated each 5m (the graph for a uniformly dipping slope would be a horizontal line). Surface undulations upslope from landslide #874 are less apparent than on adjacent slopes to the north, and are up to about 0.5m in amplitude.

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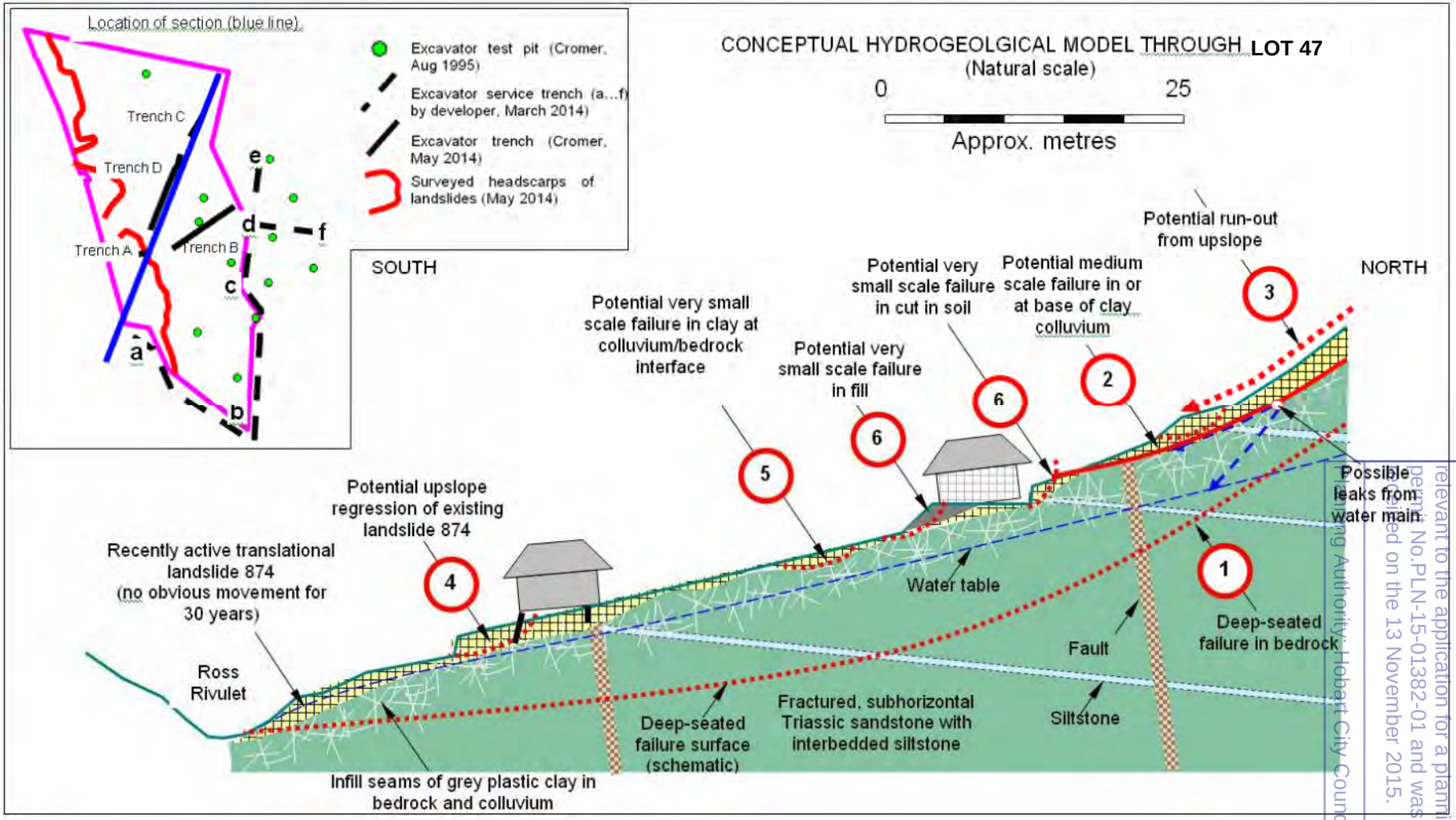

Figure 10.4. Conceptual hydrogeological model through Lot 47 at Farm Hill, based on all geotechnical evidence presented in this report. Five landslide scenarios are indicated by the numbered red circles. Scenarios 1 – 4 are pre- and post-development; scenario 5 is post-development.

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

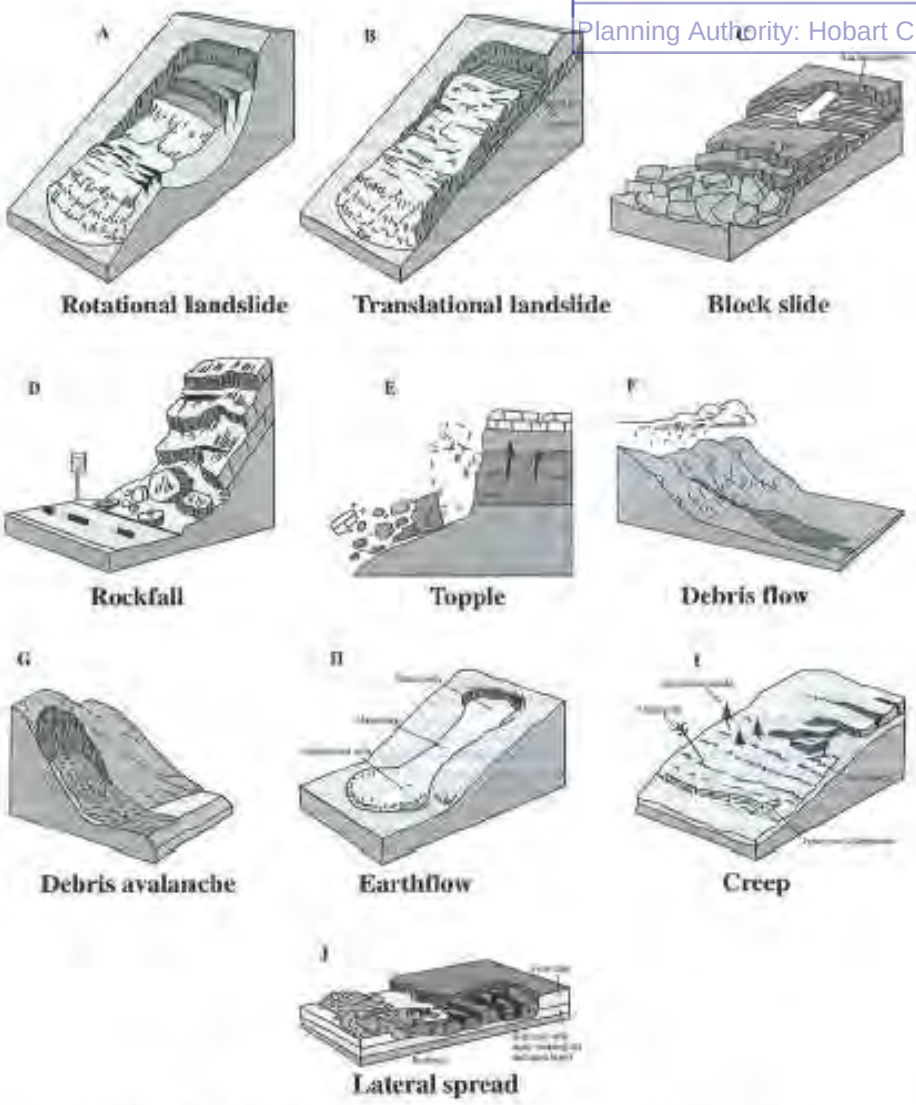

Figure B1: These schematics illustrate the major types of landslide movement.
(From US Geological Survey Fact Sheet 2004-3072, July 2004, with kind permission for reproduction.)

The nomenclature of a landslide can become more elaborate as more information about the movement becomes available. To build up the complete identification of the movement, descriptors are added in front of the two-term classification using a preferred sequence of terms. The suggested sequence provides a progressive narrowing of the focus of the descriptors, first by time and then by spatial location, beginning with a view of the whole landslide, continuing with parts of the movement and finally defining the materials involved. The recommended sequence, as shown in Table B2, describes activity (including state, distribution and style) followed by descriptions of all movements (including rate, water content, material and type). Definitions of the terms in Table B2 are given in Cruden & Varnes (1996).

Figure 10.5 Main types of landslide movement
Source: From Appendix B of AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007

Consequence analysis and qualitative risk to property estimation – before and after treatment

Table 10.3 (this Attachment) is a consequence analysis and risk to property assessment for the six scenarios shown in Figure 10.4 and listed in Table 10.2. Falls, Topples, Spreads, Flows and deep-seated failures are Barely Credible under current circumstances, but Falls and Topples might become Possible after development if excavations into colluvium and/or bedrock are made for house sites (Scenario 6). The likelihoods of the remaining Rotational and translational landslides (Scenarios 1 – 5) are judged Possible, with consequences to property Medium to Insignificant. Consequences are reduced after treatment, but Risks to property remain mostly Moderate after treatment.

Scenario 6 also potentially arises (during and) after development with the use of uncontrolled fill (eg for access drives and house sites).

Table 10.1 Main types of landslide movement

Source: From Appendix B of AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007

TYPE OF MOVEMENT		TYPE OF MATERIAL		
		BEDROCK	ENGINEERING SOILS	
			Predominantly Coarse	Predominantly Fine
FALLS		Rock fall	Debris fall	Earth fall
TOPPLES		Rock topple	Debris topple	Earth topple
SLIDES	ROTATIONAL	Rock slide	Debris slide	Earth slide
	TRANSLATIONAL			
LATERAL SPREADS		Rock spread	Debris spread	Earth spread
FLOWS		Rock flow (Deep creep)	Debris flow (Soil creep)	Earth flow
COMPLEX	Combination of two or more principle types of movement			

Table 10.2 Landslide characterisation in relation to the current proposal

	Field Evidence	Actual or potential size	Potential speed	Water content	Current likelihood	Likelihood after development	Scenarios in Figure 10.4
Falls							
Rock fall	None	Small	Extremely rapid	Dry	Barely credible	Possible	6
Debris fall	None	Small	Extremely rapid	Dry to wet	Barely credible	Possible	6
Earth fall	None	Small	Extremely rapid	Dry to wet	Barely credible	Possible	6
Topples							
Rock topple	None	Small	Extremely rapid	Dry	Barely credible	Possible	6
Debris topple	None	Small	Extremely rapid	Dry	Barely credible	Possible	6
Earth topple	None	Small	Extremely rapid	Dry	Barely credible	Possible	6
Rotational or translational landslide							
Rock slide	None	Small	Slow to Rapid	Dry to moist	Barely credible	Barely credible	
Debris slide	None	Small to large	Slow to Rapid	Moist to wet	Possible	Possible	1 – 5
Earth slide	Yes	Small	Slow to Rapid	Moist to wet	Possible	Possible	1 – 5
Lateral spread							
Rock spread	None	Small	Slow	Dry to moist	Barely credible	Barely credible	
Debris spread	None	Small to medium	Slow	Moist to wet	Rare	Rare	
Earth spread	None	Small to medium	Slow	Moist to wet	Rare	Rare	
Flows							
Rock flow	None	Small to medium	Rapid	Dry to moist	Rare	Rare	
Debris flow	None	Small to large	Very rapid	Moist to wet	Rare	Rare	
Earth flow	None	Small to large	Very rapid	Moist to wet	Rare	Rare	
Complex	None	Small to large	Slow to rapid	Dry to moist	Rare	Rare	

Table 10.3 Qualitative consequences and risks to property for landslide scenarios on Lot 47 before and after treatment

		Before treatment				After treatment		
	Scenarios in Figure 10.4	Likelihood	Consequences to property	Risk to property	Proposed treatment	Likelihood	Consequences to property	Risk to property
Falls								
Rock fall	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Debris fall	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Earth fall	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Topples								
Rock topple	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Debris topple	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Earth topple	6	Barely credible	Minor	Very low	Various	Possible Note 1	Insignificant	Very low
Rotational or translational landslide								
Rock slide		Barely credible	Major	Very low				
Debris slide	1	Barely credible	Major	Very low				
	2	Possible	Medium	Moderate	No building	Possible	Insignificant	Low
	3	Possible	Medium	Moderate	No building	Possible	Insignificant	Low
	4	Possible	Medium	Moderate	House setback	Unlikely	Minor	Low
	5	Possible	Insignificant	Low	None	Possible	Insignificant	Low
	6	Possible	Medium	Moderate	Various	Unlikely	Minor	Low
Earth slide	1	Barely credible	Major	Very low				
	2	Possible	Medium	Moderate	No building	Possible	Insignificant	Low
	3	Possible	Medium	Moderate	No building	Possible	Insignificant	Low
	4	Possible	Medium	Moderate	House setback	Unlikely	Minor	Low
	5	Possible	Insignificant	Low	None	Possible	Insignificant	Low
	6	Possible	Medium	Moderate	Various	Unlikely	Minor	Low
Lateral spread								
Rock spread		Barely credible	Major	Very low				
Debris spread		Rare	Major	Low				
Earth spread		Rare	Major	Low				
Flows								
Rock flow		Rare	Major	Low				
Debris flow		Rare	Major	Low				
Earth flow		Rare	Major	Low				
Complex		Rare	Major	Low				

Note 1. These six after-development scenarios relate to excavations in colluvium and bedrock at house and similar sites, where cuts might expose several metres of materials and present possible hazards where none existed before.

Qualitative risk to life estimation – before development

No current slope instability scenarios present unacceptable risks to life.

Quantitative risk to life estimation – after development

Recommended risk treatments for development on Lot 47 are presented later in this Attachment. After development, it is expected that risks to life presented by most scenarios will remain acceptable. The exception is Scenario 6, which includes small-scale hazards present before development, with acceptably low risk to life. But some Scenario 6 hazards are created by development – in particular, cut and fill may potentially give rise to small-scale, rapid (earth and) rock falls from unsupported excavations which might be present at the rear of houses. The individual most at risk is assumed to be a child. This after-development scenario (considered as three separate "sub-scenarios" 6a, 6b and 6c depending on the size of the rock fall), is shown before treatment in the event tree in Figure 10.6a, and after treatment (an engineered, drained retaining wall) in Figure 10.6b.

The risks to life for the untreated scenarios in Figure 10.6a are similar, and are in the 0.7 – 1E-04 range. On the Societal Risk Graph in Figure 10.7, they plot near the Broadly Acceptable – Tolerable boundary for a single life. The risks to life for the treated scenarios in Figure 10.6b are in the 1E-07 – 3E-06 range. On the Societal Risk Graph in Figure 10.7, they plot well into the Broadly Acceptable area, and no further treatments are required.

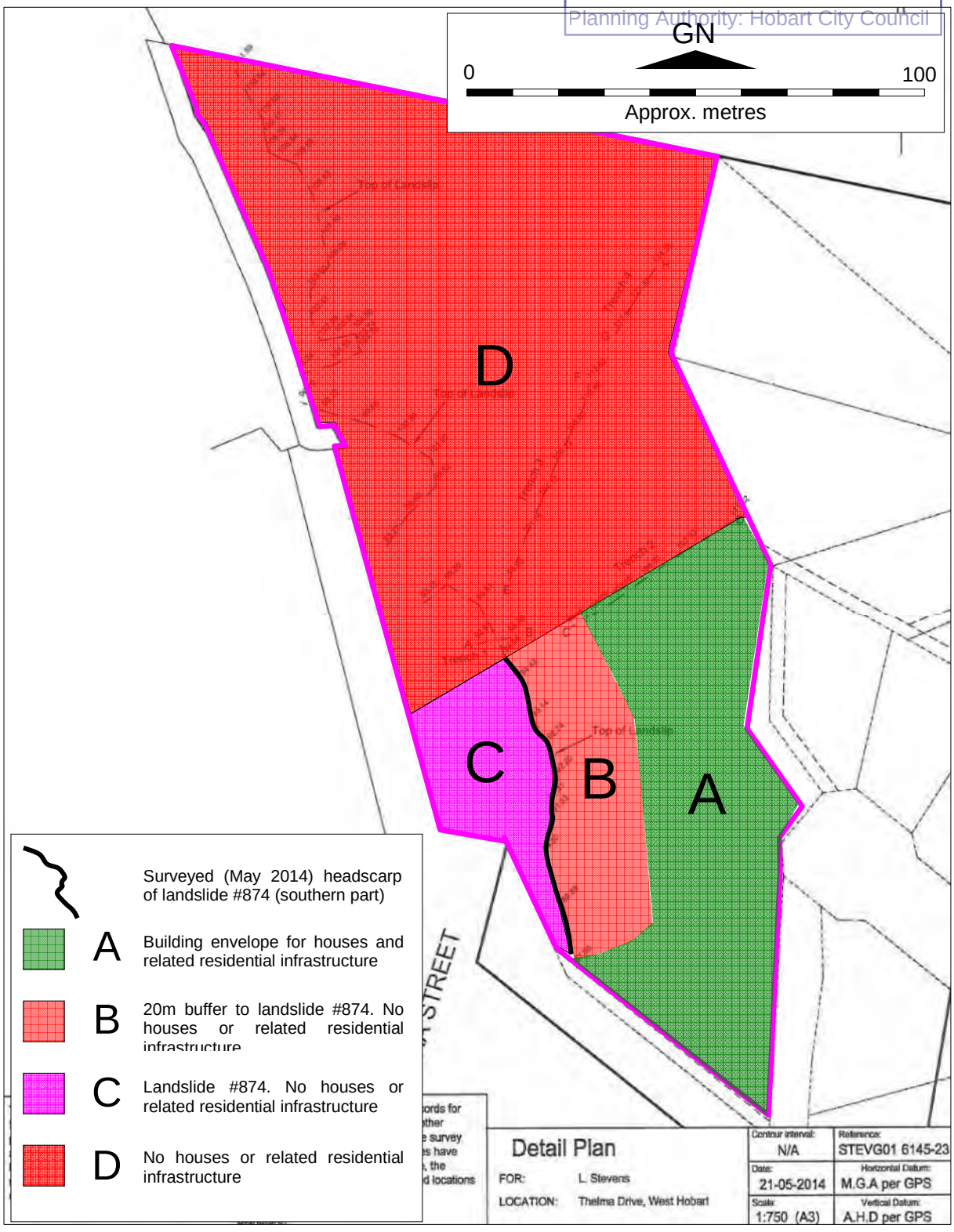

Figure 10.5 **Recommended building envelope (A) and no-development areas (B, C, D) for subdivision and residential development of Lot 47 of the Farm Hill subdivision.**

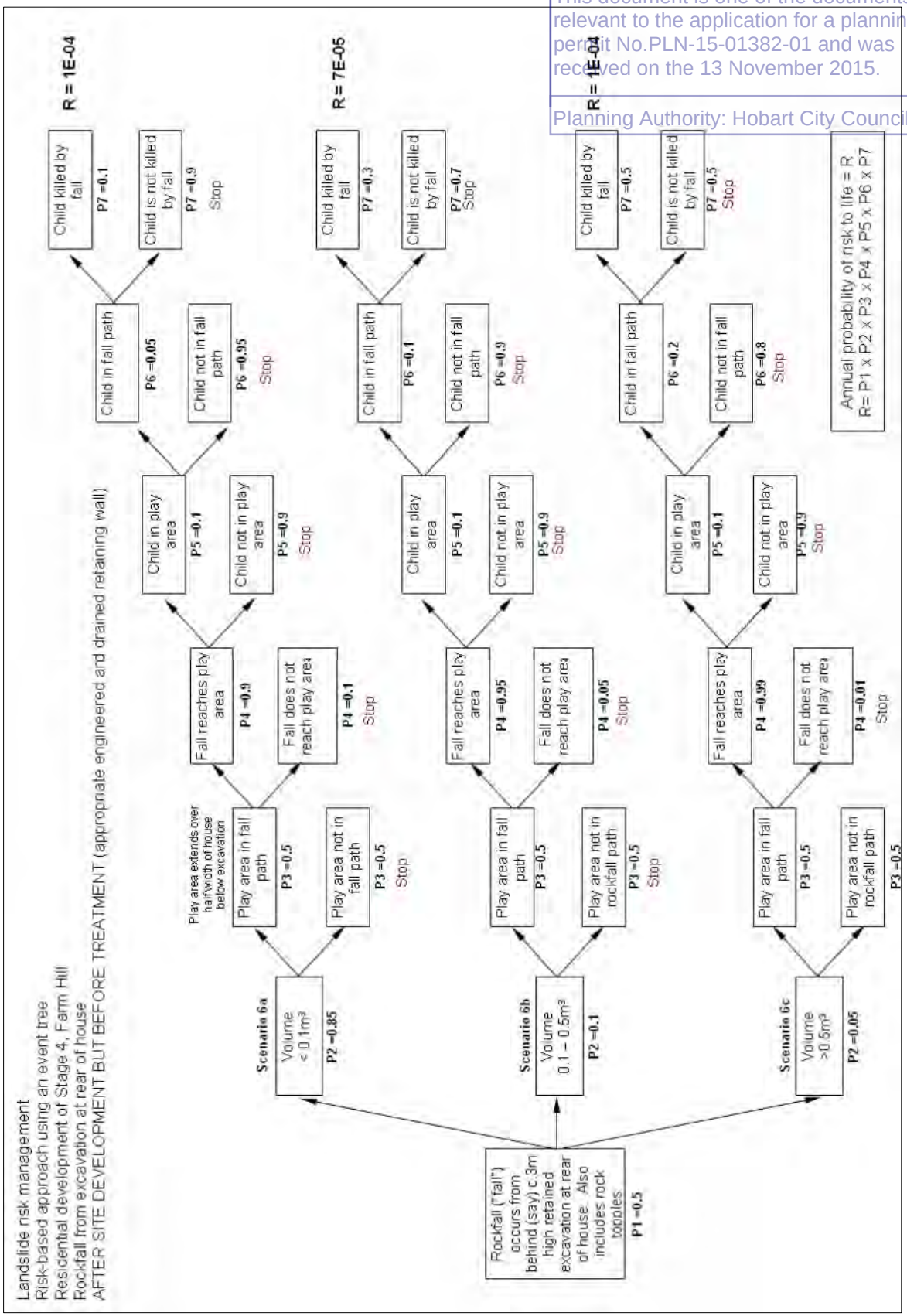

Figure 10.6a **Event tree setting out steps in assessing quantitative risk to life to a child playing at the base of an unsupported earth/rock face at the rear of a house on a property in Lot 47 of the Farm Hill subdivision (Scenario 6 in Table 10.3). Risks are shown at right of the tree, and are compared to acceptability criteria in the Societal Risk Graph in Figure 10.7. These levels of risk should be treated or monitored. Compare them to the risks after appropriate treatment in Figure 10.6b.**

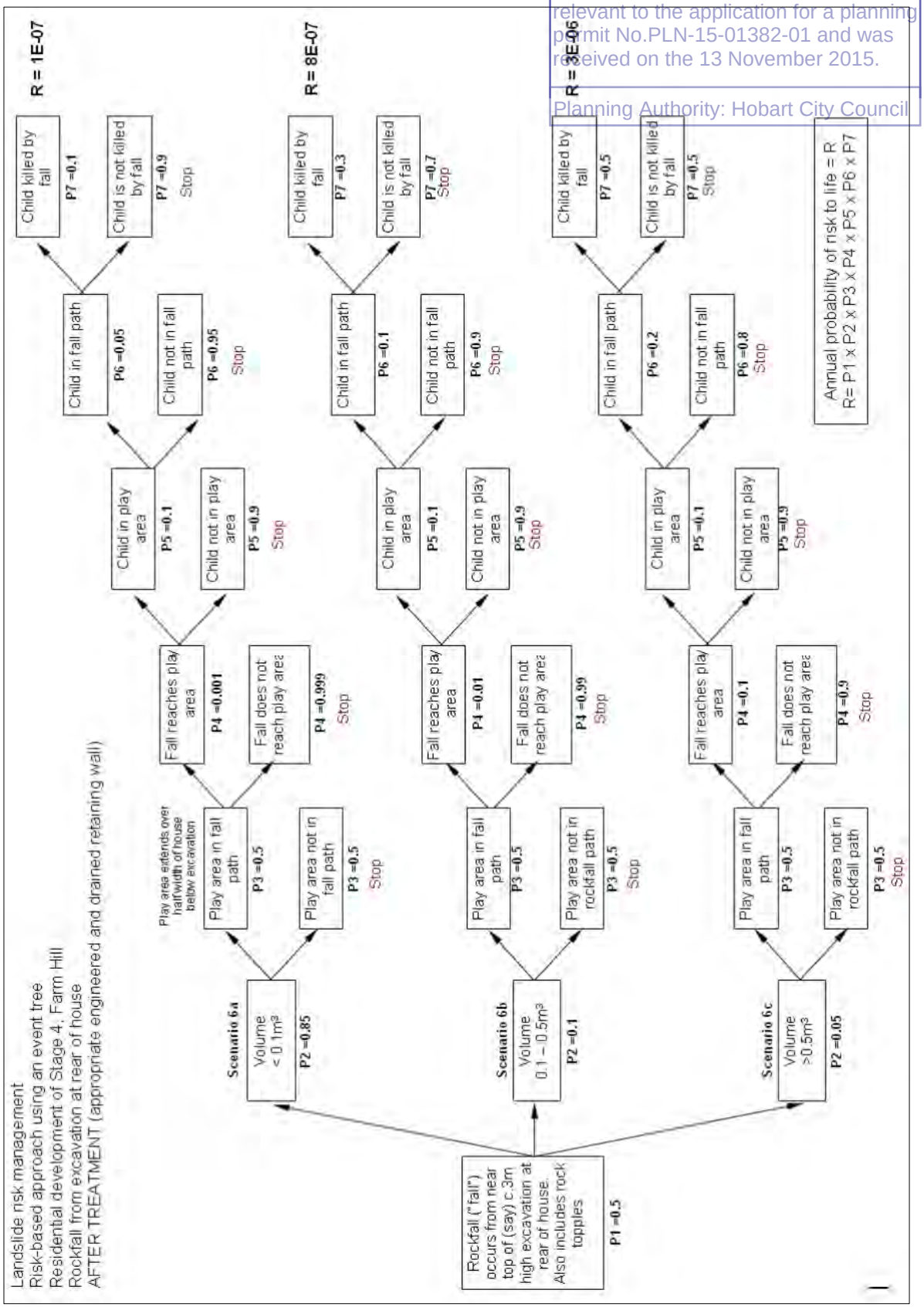

Figure 10.6b **Event tree setting out steps in assessing quantitative risk to life to a child playing at the base of the same earth/rock face as in Figure 10.6a, but now supported by a drained, engineered retaining wall. Risks are shown at right of the tree, and are compared to acceptability criteria in the Societal Risk Graph in Figure 10.7. These levels of risk are acceptable.**

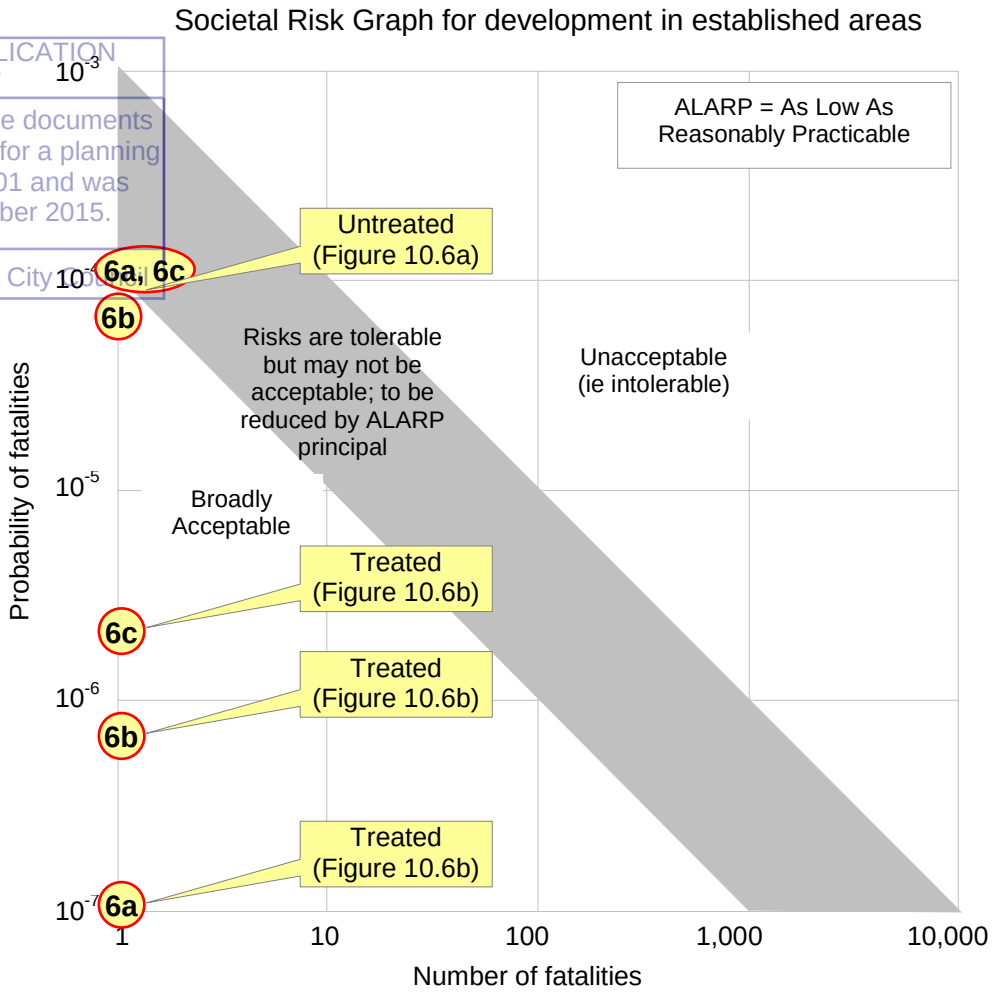

Figure 10.7 **Societal Risk Graph showing the estimated individual risks for a rock fall from an unsupported excavation at the rear of a house, and from the same excavation after risk treatment – supported by a drained, engineered retaining wall.**

General comments on suggested risk mitigation actions

Accepting the risk

Risks to property assessed as Moderate or above (Scenarios 2, 3, 4 and 6) ought not to be Accepted, but instead should be treated.

Risk to an individual life for untreated Scenario 6, as Broadly Acceptable – Tolerable for the person most at risk, becomes Acceptable after treatment (installing an engineered retaining wall).

Avoiding the risk

Avoiding the risk by not developing parts of Lot 47 is possible and acceptable. This treats Scenarios 2 and 3. Creating a buffer between landslide #864 and upslope development treats Scenario 4. Avoiding the risk of Scenario 6 by not excavating at house sites on hillsides is preferred, but not essential.

Reducing the frequency of the risk

Reducing the frequency of the risk by not excavating at house sites on hillsides is preferred, but not essential. Reducing the frequency can be achieved by retaining walls and reducing batter angles in oversteepened soil exposures.

Reducing the consequences of the risk

Reducing the consequences of the Scenario 6 risk can be achieved by reducing batter angles, and/or installing drained, engineered retaining walls, on all artificially steepened cuts.

Monitoring the risk
Unnecessary

Transferring or postponing the risk
Unnecessary

Suggested risk mitigation plan

General comment
Developers and property owners ought to be familiar with the examples of good and bad hillside construction practices outlined in the AGS Geoguides cited earlier, and included here in Attachment 11.

Site-specific recommendations
For the specific development of Lot 47 considered in this report, all the good hillside construction practices in Attachment 11 apply, together with the following (most of which are intended to treat identified risks):

Restricted area for residential development of Lot 47
Residential development (houses, garages, sheds, swimming pools, access drives and related infrastructure) shall be restricted to the building envelope labelled Area A in Figure 10.5.

Residential development shall not occur on Landslide #874 or within a 20m wide buffer zone extending upslope from its headscarp (Areas C and B respectively in Figure 10.5) or on, and downslope to Ross Rivulet from, the steeper, undulating ground on the northern hillsides of Lot 47 (Area D in Figure 10.5).

Excavations
Minimise the number and height of excavations, including driveway accesses and house excavations.

For excavations less than 0.8m high, create a batter angle in the soil profile no steeper than 1:2. Install a surface cut-off drain upslope and divert surface runoff to one or both sides of the excavation. Bedrock exposed in the excavation may be left subvertical, but any loose cobbles, boulders and joint fragments should be removed. Consider the use of erosion control blankets and revegetation on battered soil faces

For excavations higher than 0.8m, install drained, engineered retaining walls on appropriate foundations to a suitable height, and where surface soil remains exposed above the wall, create a batter angle in the soil profile no steeper than 30^0. Bedrock exposed in the excavation behind the wall may be left subvertical, but the wall must be designed to resist lateral movement of material behind it. Install a surface cut-off drain upslope and divert surface runoff to one or both sides of the excavation.

Variations to these specifications (for example, steel screen cover on rock faces, soil or rock berms, steel mesh fencing) are permissible provided they are engineer-designed and certified, the slope stability of the artificially steepened slope is not compromised, and the risks to property and life both remain Acceptable.

Use of fill
Where its use is unavoidable, fill shall be placed after the underlying soil is first removed, with unsupported batter angles no steeper than 1:2. Its use as a weight-bearing material should be avoided unless it is placed in a controlled manner.

Surface drainage
Control all natural surface runoff and concentrated runoff from roofs, hardstands and rainwater tank overflows. Discharge to Council's stormwater system. Avoid discharging drainage over or into excavations.

Stormwater shall be piped in flexible pipework laid in trenches down (not across) the slope and extended (where unavoidable) through landslide #874 to discharge points in Ross Rivulet. Wherever possible, services from access roads downslope to houses shall be laid in trenches aligned directly up and down the slope, but backfilled with on-site subsoil (not screened gravel) to avoid creating permeable pathways for seepage water to accumulate at house footprints.

Subsurface drainage
All subsurface drainage from retaining walls or house pads shall be directed to stormwater pipework and not be permitted to discharge to the ground surface.

House foundations
All house sites shall be investigated and classified in accordance with AS2870:2011 *Residential slabs and footings*, and by a suitably qualified practitioner (or practitioners) having due regard to the slope stability issues discussed in this report. AS2870 classifications should refer to this report. Hobart City Council shall ensure this report, or a reference to it, is available on line for all stakeholders.

It is strongly recommended that (a) subsurface investigations for site classification be done by excavator to help distinguish stable sandstone bedrock from floaters (some pockets of bedrock are present in colluvium), and (b) footings for all houses in Lot 47 be supported on piers extended into (not onto) demonstrable Triassic sandstone bedrock This will mean footing depth is likely to vary across the footprint of a house.

Adherence of this LRM to AGS (2007)

Table 10.4 lists the items required by AGS (2007c) to be addressed in LRM. Comments are included as to the relevance of the item to the current job, whether or not it has been addressed, and if not, why not. (The column "Adequacy in relation to job" is included and retained for the use of peer reviewers)

Table 10.4 Checklist for this landslide risk management

		AGS (2007) reference					
Item		2007c	2007d	Relevance to this job	Addressed in geotech report?	Adequacy in relation to job	Comments
Desktop		5.1	C5.1	Essential	Yes		Attachments 1, 2, 3,4, 5, 6 of this report. Includes review of historic satellite imagery, www.thelist.tas.gov.au topo and cadastre maps, MRT1:25,000 geology map, landslide hazard bands, landslide hazard maps
Site investigations	Inspection	5.2.2	Tables C1, C2	Essential	Yes		Several times in May and June 2014
	mapping (geomorphic)	5.2.2	Tables C1, C2	Essential	Yes		1995 report by W.C. Cromer
	mapping (geology)	5.2.2	Tables C1, C2	Essential	Yes		
	boreholes	5.2.3	Tables C1, C2		No		Test pits 1995; 100+m trenches May 2014
	test pits	5.2.3	Tables C1, C2	Either or both desirable to essential	Yes		1995 report by W.C. Cromer
	groundwater levels etc	5.2.4	Tables C1, C2	Desirable	No		No groundwater encountered except at lower endd of Trench D. No other data available. Relied on first principles re groundwater occurrence.
	cross sections	5.2.5	Tables C1, C2	Essential	Yes		See Attachment 10
	slope processes	5.2.6, 5.2.7	Tables C1, C2	Essential	Yes		1995 report by W.C. Cromer
	landslide location(s)	5.2.7	Tables C1, C2	Essential	Yes		1995 report by W.C. Cromer, Attachments
	conceptual geotech model	5.2.7	Tables C1, C2	Essential	Yes		See Attachment 10
Site plan		5.1		Essential	Yes		Several Attachments

Table 10.4 (continued)

RISK MANAGEMENT / RISK ASSESSMENT / RISK ANALYSIS / HAZARD ANALYSIS / CONSEQUENCE ANALYSIS	Landslide characterisation	History of movement: current movement, velocity	5.3	Table C1(4)	Essential	Yes	
		Geotechnical characterisation	5.3, Tables B1, B2, Fig B3	Table C1(5)	Essential	Yes	
		Landslide mechanisms, dimensions	5.3, Tables B1, B2, Fig B3	Table C1(6)	Essential	Yes	
		Shear mechanisms; strength of rupture surface	5.3, Tables B1, B2, Fig B3	Table C1(7)	Desirable	No	
		Assessment of stability	5.3, Tables B1, B2, Fig B3	Table C1(8)	Essential	Yes	
		Assessments of deformation, travel distance	5.3, Tables B1, B2, Fig B3	Table C1(9)	Desirable	Yes	
	Frequency analysis	Historical analysis	5.4.1b)	5.4.1(ii)	Essential	Yes	
		Empirical ranking method	5.4.1c)		Discretionary	No	
		geology/geomorphology	5.4.1d)				
		Rainfall/slope analysis	5.4.1e)	5.4.1(iii)			
		Probabilistic analysis	5.4.1f)				
		"Degree of belief"	5.4.1g)	5.4.1(iv)			
		Explanation of applied logic to frequency analysis					
		Use of event tree	5.4.1h), i)	5.4.1(v)			
		Est of annual probability	5.4.2a), b), c)	5.4.2a), b), c)	Essential	Yes	
	Consequence anal	Elements at risk	6.1		Essential	Yes	See Attachment 10
		Temporal spatial probability	6.2	C6.2	Essential	Yes	
		Consequence to property	6.3	C6.3	Essential	Yes	
		Consequence to people	6.4	C6.4	Essential	Yes	
	Risk estimation	Quantitative risk estimation to property	7.1	C7.1	Discretionary	No	
		Quantitative risk estimation to life	7.1	C7.1	Essential	Yes	
		Semi quantitative and qualitative risk estimation to property	7.2	C7.2	Essential	Yes	
		Risk matrix for property loss	7.3	C7.3	Discretionary	No	
	Risk assess	Risk evaluation against tolerable criteria for property loss	8.1, 8.2	C8.1, C8.2	Discretionary	No	
		Risk evaluation against tolerable criteria for loss of life	8.1, 8.2	C8.1, C8.2	Essential	Yes	
	Risk mitigation	Accept the risk	9.1.1a)	C9.1	Discretionary	Yes	
		Avoid the risk	9.1.1b)	C9.1	Discretionary	Yes	
		Reduce the frequency	9.1.1c)	C9.1	Discretionary	Yes	
		Reduce the consequences	9.1.1d)	C9.1	Discretionary	Yes	
		Monitor the risk	9.1.1e)	C9.1	Discretionary	Yes	
		Transfer the risk	9.1.1f)	C9.1	Discretionary	Yes	
		Postpone the decision	9.1.1g)	C9.1	Discretionary	Yes	
		Risk mitigation plan	9.1.3		Essential	Yes	

Certificate of currency for Professional Indemnity Insurance

A copy of the certificate of currency for PI insurance for William C Cromer Pty Ltd is included here as Figure 10.8.

Figure 10.8 Certificate of currency for PI insurance for William C Cromer Pty Ltd

Certificate Of Currency

Liberty International Underwriters

This Certificate confirms that the undermentioned Policy is effective on the date of issue and in accordance with the details shown:

Class of Insurance	Professional Indemnity Insurance
Policy Number	MI-BN-SPC-03-110365
Named Insured	WILLIAM C. CROMER PTY. LTD.
Policy Period	From: 31 August 2013 at 4:00pm local standard time To: 31 August 2014 at 4:00pm local standard time
Limit of Liability	$1,000,000
Excess	$10,000
Policy Wording	LIU AUS OQS PI Construction Consultants Policy Wording (03-11)
Retroactive Date	31 August 2004
Authorised by Liberty	LIBERTY MUTUAL INSURANCE COMPANY A.B.N. 61 086 083 605
Date Of Issue	31 August 2013

This Certificate:
- Is issued as a matter of information only and confers no rights upon the holder
- Does not amend, extend or alter the coverage afforded by the policy listed
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Website: www.liuaustralia.com.au

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Attachment 11

(3 pages)

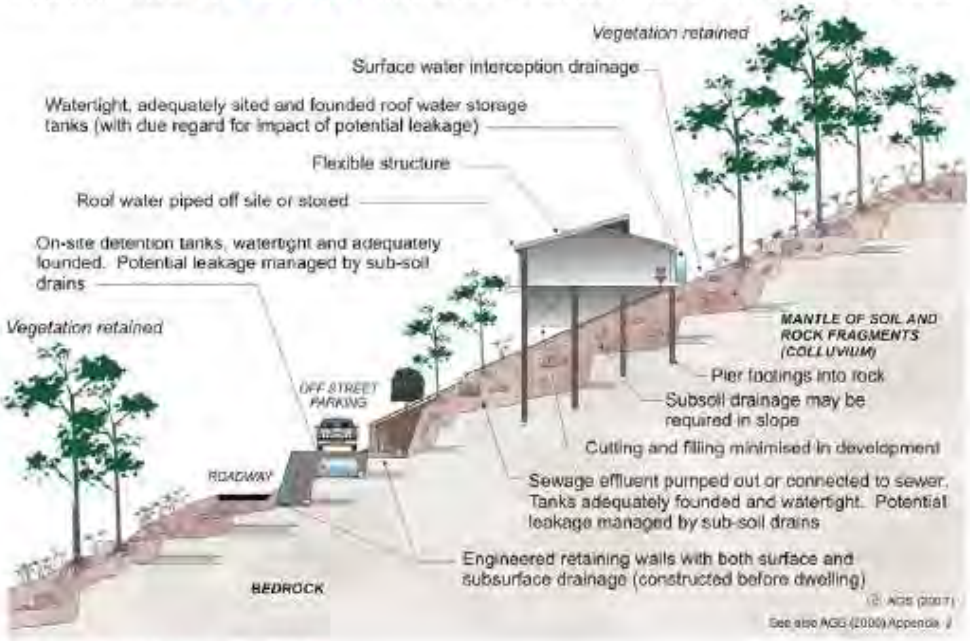
Examples of good and poor hillside engineering practices

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.

EXAMPLES OF GOOD HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF POOR HILLSIDE CONSTRUCTION PRACTICE

WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

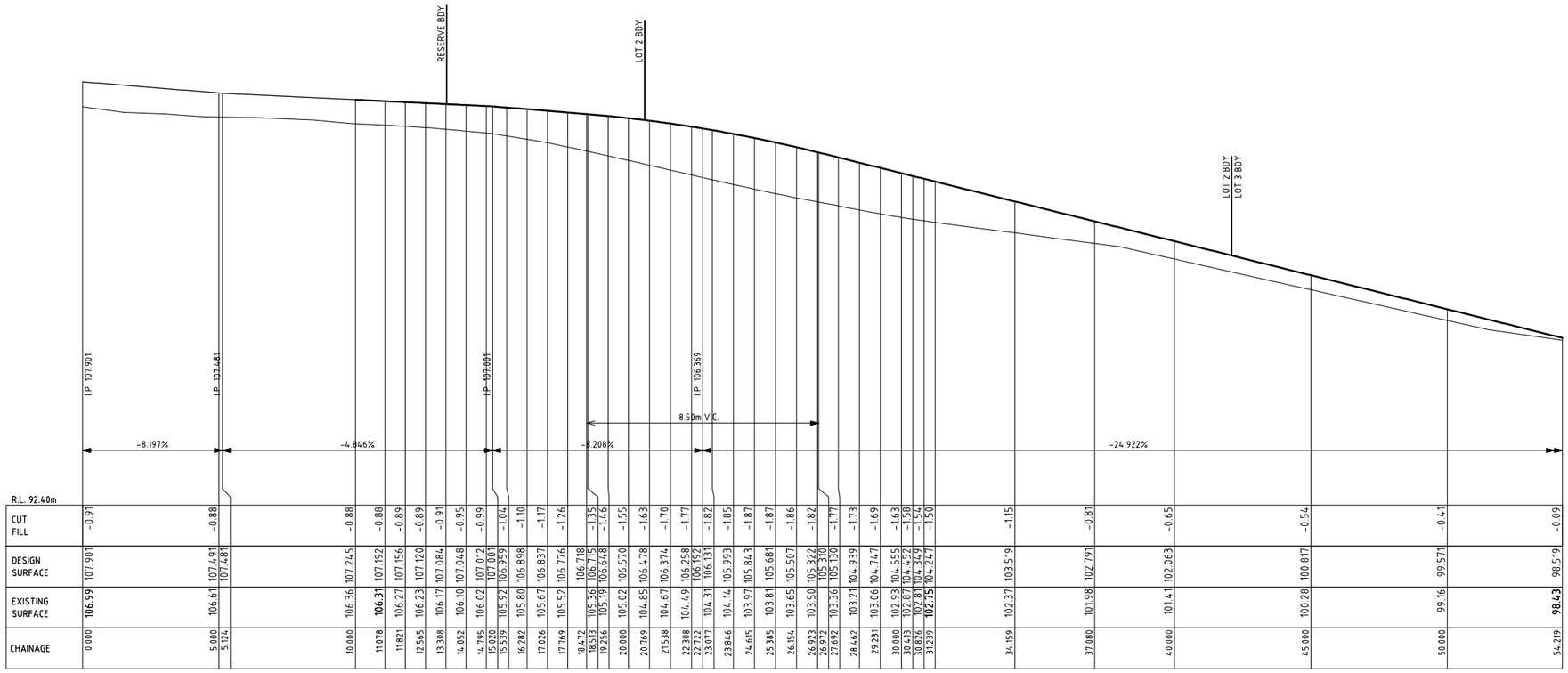
- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.

APPENDIX G - SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

	GOOD ENGINEERING PRACTICE	*POOR ENGINEERING PRACTICE*
ADVICE		
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified, experienced geotechnical practitioner at early stage of planning and before site works.	Prepare detailed plan and start site works before geotechnical advice.
PLANNING		
SITE PLANNING	Having obtained geotechnical advice, plan the development with the risk arising from the identified hazards and consequences in mind.	Plan development without regard for the Risk.
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork, timber or steel frames, timber or panel cladding. Consider use of split levels. Use decks for recreational areas where appropriate.	Floor plans which require extensive cutting and filling. Movement intolerant structures.
SITE CLEARING	Retain natural vegetation wherever practicable.	Indiscriminately clear the site.
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts, fills, retaining walls and drainage. Council specifications for grades may need to be modified. Driveways and parking areas may need to be fully supported on piers.	Excavate and fill for site access before geotechnical advice.
EARTHWORKS	Retain natural contours wherever possible.	Indiscriminatory bulk earthworks.
CUTS	Minimise depth. Support with engineered retaining walls or batter to appropriate slope. Provide drainage measures and erosion control.	Large scale cuts and benching. Unsupported cuts. Ignore drainage requirements
FILLS	Minimise height. Strip vegetation and topsoil and key into natural slopes prior to filling. Use clean fill materials and compact to engineering standards. Batter to appropriate slope or support with engineered retaining wall. Provide surface drainage and appropriate subsurface drainage.	Loose or poorly compacted fill, which if it fails, may flow a considerable distance including onto property below. Block natural drainage lines. Fill over existing vegetation and topsoil. Include stumps, trees, vegetation, topsoil, boulders, building rubble etc in fill.
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may have unacceptable risk. Support rock faces where necessary.	Disturb or undercut detached blocks or boulders.
RETAINING WALLS	Engineer design to resist applied soil and water forces. Found on rock where practicable. Provide subsurface drainage within wall backfill and surface drainage on slope above. Construct wall as soon as possible after cut/fill operation.	Construct a structurally inadequate wall such as sandstone flagging, brick or unreinforced blockwork. Lack of subsurface drains and weepholes.
FOOTINGS	Found within rock where practicable. Use rows of piers or strip footings oriented up and down slope. Design for lateral creep pressures if necessary. Backfill footing excavations to exclude ingress of surface water.	Found on topsoil, loose fill, detached boulders or undercut cliffs.
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable. Provide with under-drainage and gravity drain outlet where practicable. Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side.	
DRAINAGE SURFACE	Provide at tops of cut and fill slopes. Discharge to street drainage or natural water courses. Provide general falls to prevent blockage by siltation and incorporate silt traps. Line to minimise infiltration and make flexible where possible. Special structures to dissipate energy at changes of slope and/or direction.	Discharge at top of fills and cuts. Allow water to pond on bench areas.
SUBSURFACE	Provide filter around subsurface drain. Provide drain behind retaining walls. Use flexible pipelines with access for maintenance. Prevent inflow of surface water.	Discharge roof runoff into absorption trenches.
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems; absorption trenches may be possible in some areas if risk is acceptable. Storage tanks should be water-tight and adequately founded.	Discharge sullage directly onto and into slopes. Use absorption trenches without consideration of landslide risk.
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability. Revegetate cleared area.	Failure to observe earthworks and drainage recommendations when landscaping.
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant	
SITE VISITS	Site Visits by consultant may be appropriate during construction/	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER'S RESPONSIBILITY	Clean drainage systems; repair broken joints in drains and leaks in supply pipes. Where structural distress is evident see advice. If seepage observed, determine causes or seek advice on consequences.	

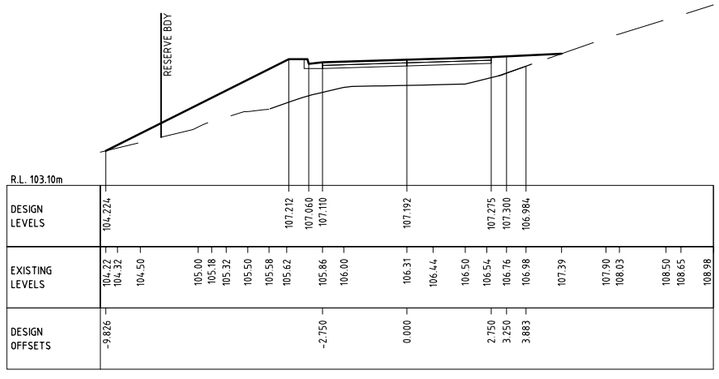
Attachment G



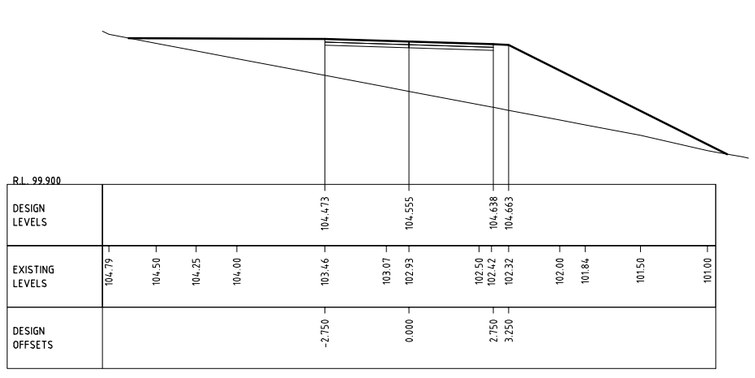
LONGITUDINAL SECTION

LOTS 1 & 2

SCALES: HORIZ 1: 100 (A1)
VERT 1: 100 (A1)



Ch 11.078



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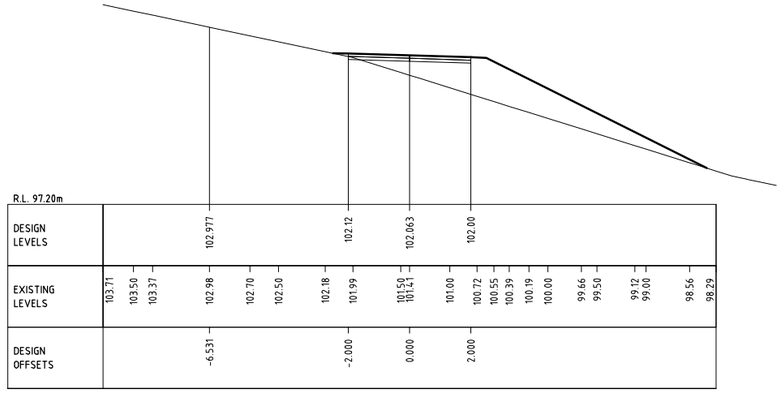

Ch 40.000

FOR PLANNING PERMIT ASSESSMENT ONLY

CLIENT: G.E. & S.R. STEVENS

No.	AMENDMENT	DATE	DRG No.	REFERENCE

HUTCHINGS SPURR PTY. LTD.
CONSULTING ENGINEERS
23 ANTILL STREET, HOBART, 7000. A.C.N. 009508525
PHONE (03) 6223 5020 FAX (03) 6223 5347

^ STRUCTURAL
^ CIVIL
^ MUNICIPAL
^ MARINE
^ HYDRAULICS

LOT 47
THELMA DRIVE, WEST HOBART
ACCESS TO LOTS 3 & BALANCE

SCALE 1:500 (A1) 1:1000 (A3)
DRAWN B. STANFORD DATE JAN '16
APPROVED

DRAWING No. 14544/03 REVISION
No. 3 OF 3SHEETS

BALALNCE

3

2

1

4.0m

48.78

40

36.98

7.50m R

32.26

40

9.51m

20

40

PROPOSED STORMWATER

PROPOSED SEP

4.0m

8.50m R

6.10m

11.46

31.24

30

40

R.O.W.

R.O.W.

RETAINING WALL

ALL EXISTING SERVICE CONNECTIONS WITHIN THE ROAD RESERVE TO HAVE HEAVY DUTY LIDS IF REQUIRED BY NEW ACCESS

WIDEN AN EXISTING CROSS-OVER IN ACCORDANCE WITH TSD-R14-v1 (TYPE KC)

GUARD RAIL INSTALLED AS PER TSD-R28-v1

THELMA DRIVE

ROAD 2

80

FOR PLANNING PERMIT ASSESSMENT ONLY

DEVELOPMENT APPLICATION DOCUMENT

This document is one of the documents relevant to the application for a planning permit No. PLN-15-01382-01 and was received on the 03 February 2016.

Planning Authority: Hobart City Council

CLIENT: G.E. & S.R. STEVENS

No.	AMENDMENT	DATE	DRG No.	REFERENCE

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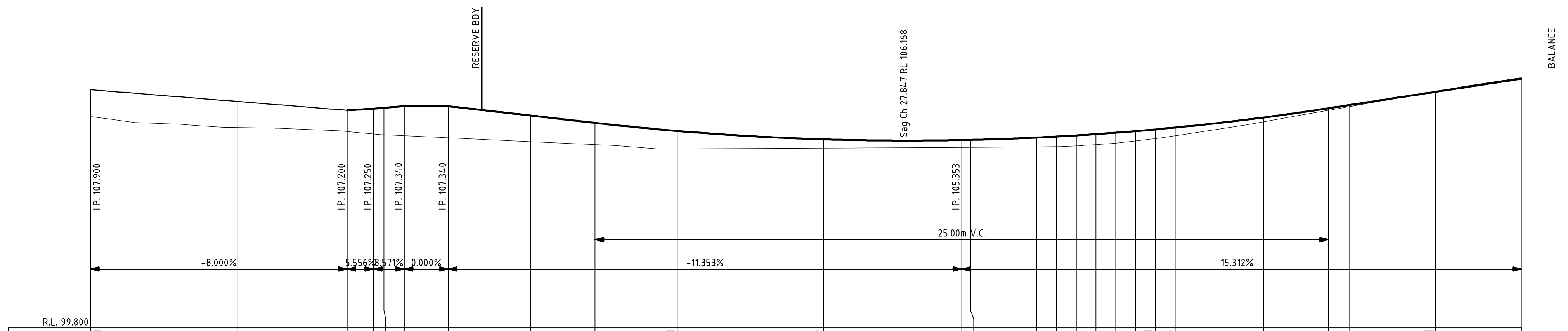
PHONE (03) 6223 5020 FAX (03) 6223 5347
^ STRUCTURAL ^ CIVIL ^ MUNICIPAL ^ MARINE ^ HYDRAULICS

LOT 47
THELMA DRIVE, WEST HOBART
4 LOT SUBDV. – ACCESS DETAILS

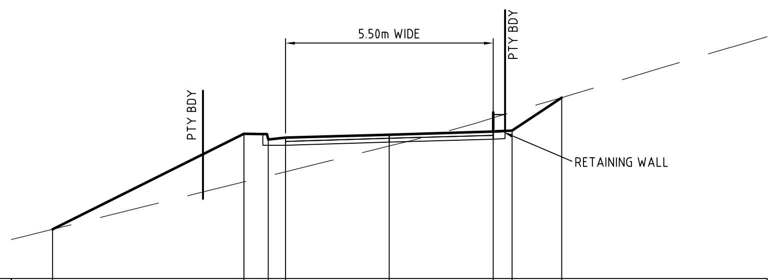
SCALE 1:20 (A1) 1:40 (A3)
DRAWN B. STANFORD DATE JAN '16
APPROVED

DRAWING No. 14544/01 REVISION
No. 1 OF 3SHEETS



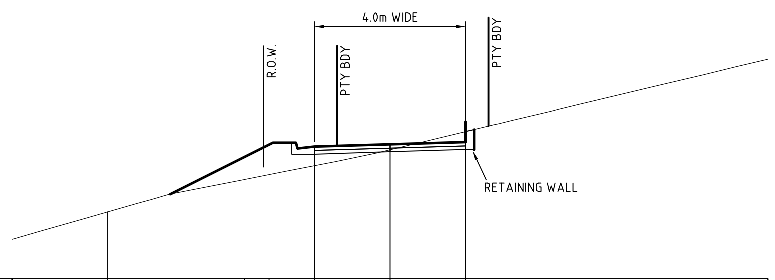
CHAINAGE	CUT FILL	DESIGN SURFACE	EXISTING SURFACE
0.000	-0.91	107.900	106.99
5.000	-0.89	107.500	106.61
8.750		107.200	
9.650		107.250	
10.000	-0.92	107.280	106.36
10.700		107.340	
12.200		107.340	
15.000	-0.89	107.022	106.13
17.204		106.772	
20.000	-0.61	106.496	105.89
25.000	-0.30	106.211	105.91
29.704		106.186	
30.000	-0.25	106.193	105.94
32.256	-0.32	106.271	105.95
32.931	-0.35	106.306	105.96
33.606	-0.35	106.345	105.99
34.281	-0.36	106.389	106.03
34.956	-0.36	106.437	106.08
35.631	-0.34	106.491	106.15
36.307	-0.31	106.549	106.24
36.982	-0.28	106.613	106.33
40.000	-0.15	106.955	106.81
42.204		107.267	
42.928	-0.05	107.378	107.33
45.856	+0.01	107.826	107.84
48.784	+0.04	108.275	108.31

LONGITUDINAL SECTION
LOTS 3 & BALANCE
SCALES: HORIZ 1: 100 (A1)
VERT 1: 100 (A1)



DESIGN LEVELS	103.703, 106.231, 106.079, 106.129, 106.211, 106.294, 106.319, 107.194
EXISTING LEVELS	103.50, 103.70, 103.88, 104.00, 104.38, 104.50, 104.88, 105.00, 105.23, 105.37, 105.50, 105.87, 105.91, 106.00, 106.21, 106.50, 106.65, 106.80, 107.00, 107.19, 107.50, 108.00, 108.50, 108.81
DESIGN OFFSETS	-8.906, -2.750, 0.000, 2.750, 3.250, 4.562

Ch 25.000



DESIGN LEVELS	105.167, 106.975, 106.823, 106.895, 106.955, 107.015
EXISTING LEVELS	104.50, 104.66, 105.00, 105.17, 105.39, 105.50, 105.63, 106.00, 106.13, 106.24, 106.50, 106.73, 106.81, 107.00, 107.34, 107.47, 107.59, 107.83, 108.00, 108.31, 108.50, 108.79, 109.00, 109.21
DESIGN OFFSETS	-7.466, -2.000, 0.000, 2.000

Ch 40.000

FOR PLANNING PERMIT ASSESSMENT ONLY

CLIENT: G.E. & S.R. STEVENS

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PHONE (03) 6223 5020 FAX (03) 6223 5347
^ STRUCTURAL ^ CIVIL ^ MUNICIPAL ^ MARINE ^ HYDRAULICS

LOT 47
THELMA DRIVE, WEST HOBART
ACCESS TO LOTS 1 & 2

SCALE AS SHOWN
DRAWN B. STANFORD DATE JAN '16
APPROVED
DRAWING No. 14544/02 REVISION
No. 2 OF 3SHEETS

Attachment H

DEVELOPMENT OVERVIEW

THE PROPOSAL IS FOR A 3 LOT SUBDIVISION AND BALANCE ON STEVENS FARM DRIVE. THE PROPOSAL IS FOR A CONTINUATION OF STEVENS FARM DRIVE WHICH WILL PROVIDE COMPLAINT ACCESS. NEW SERVICES AND WATER SUPPLY WILL BE PROVIDED TO THE SUBDIVISION WHICH WILL BE COMPLIANT WITH CODE OBJECTIVES. THE LAND SURROUNDING THE SUBDIVISION IS LOW DENSITY RESIDENTIAL TO THE EAST, ENVIROMENTAL LIVING TO THE WEST AND GENERAL RESIDENTIAL TO THE SOUTH WEST AND OPEN SPACE TO THE SOUTH. LAND TO THE NORTH AND EAST IS CLEARED. LAND TO THE WEST ACROSS ROSS RIVULET IS A DWELLING WITH EUCALYPTS WITH LOW UNDERGROWTH. THE SUBDIVISION TO THE SOUTH IS BORDERED BY A EUCALYPTUS WOODLAND WITH MATURE TREES AND LOW SCRUB TO THE UNDERSTOREY. THIS VEGETATION POSES A SIGNICANT BUSHFIRE RISK TO THE DEVELOPMENT AND A BUILDING AREA AND BUSHFIRE HAZARD MANAGEMENT AREA ARE PROVIDED TO CREATE SEPERATION FROM THE RISK AND FUTURE DEVELOPMENT.

TITLE REFERENCES	1/169500
USE OF SITE	VACANT LOT
LOT AREA(S)	1663m², 1157m², 1427m², 8828m²
ZONING OF SITE	ENVIROMENTAL LIVING & LOW DENSITY RES.
PROPOSED USE	RESIDENTIAL SUBDIVISION

DISTANCE TO CLASSIFIED VEGETATION

FDI TASMANIA = 50

NORTH	+50m	N/A
EAST	+100m	N/A
SOUTH	+18m	WOODLAND
WEST	+19m	WOODLAND

SLOPE UNDER CLASSIFIED VEGETATION

NORTH	UPSLOPE
EAST	UPSLOPE
SOUTH	3-4° DOWNSLOPE
WEST	3-4° DOWNSLOPE

BAL

NORTH	12.5
EAST	BAL LOW
SOUTH	19
WEST	19

CONCLUSION

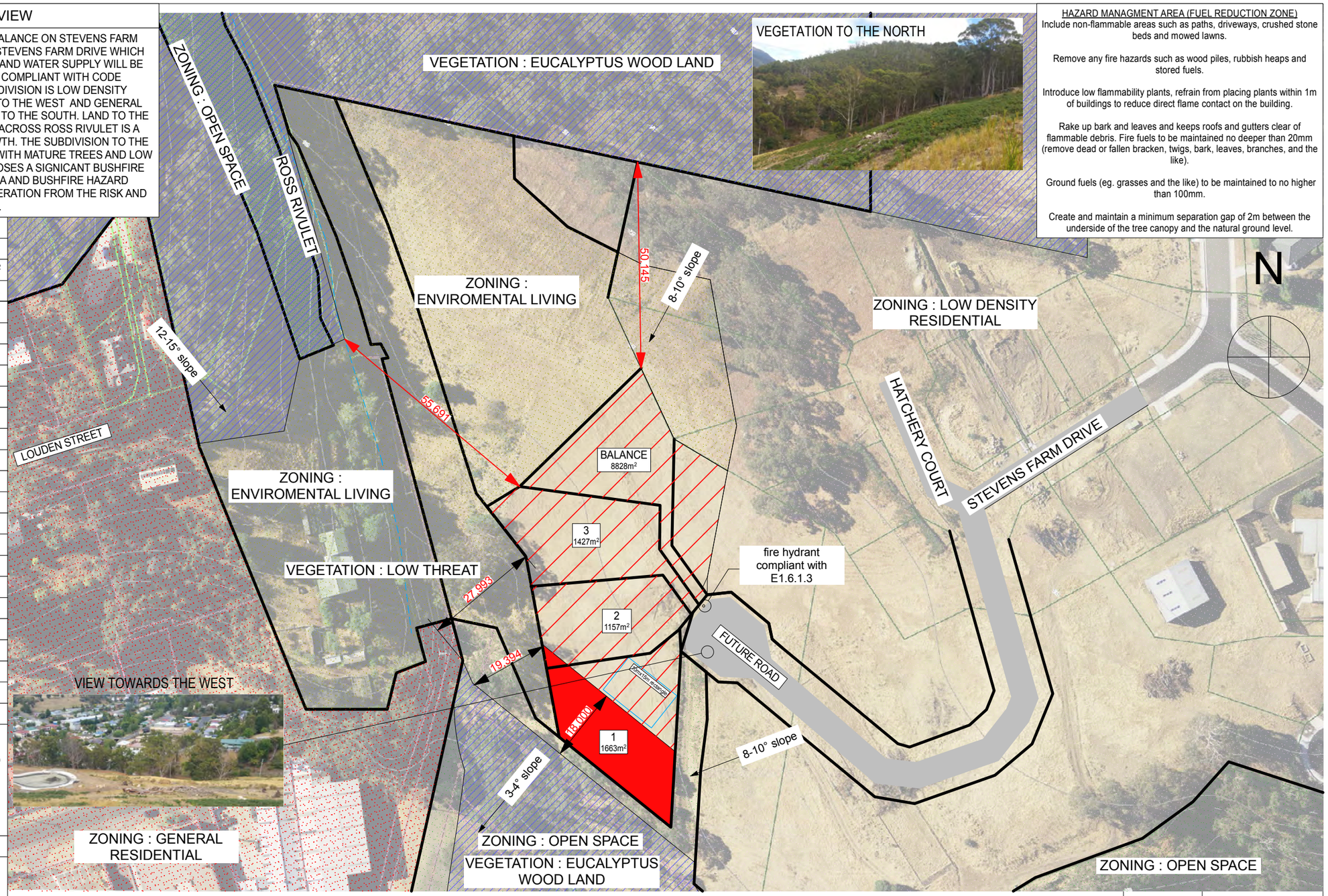
BAL LOW IN ACCORDANCE WITH E1.6.4.1

RECOMMENDATIONS

THE DEVELOPMENT IS COMPLIANT WITH THE BUSHFIRE PRONE AREAS CODE WITH THE ATTACHED CONDITIONS: A BUILDING OUTLINE IS TO BE INCLUDED ON THE TITLE FOR LOT 1 WITH A 15m OFFSET FROM THE SOUTHWEST BOUNDARY WICH CONTINUES THROUGH TO LOT 2 CORNER. ALL LOTS ARE TO BE MAINTAINED AS A HAZARD MANAGMENT AREA AND COMPLY WITH PROVISIONS SET OUT ON THIS PLAN.

DISCLAIMER

THE BUSHFIRE ATTACK LEVEL ASSESSMENT IS UNDERTAKEN IN ACCORDANCE WITH AS 3959-2009. AERIAL PHOTOGRAPHY AND A SITE VISIT WAS UNDERTAKEN IN DETERMINING THE BUSHFIRE ATTACK LEVEL. A SEPERATE BAL ASSESSMENT MUST BE COMPLETED FOR ANY FUTURE DWELLINGS ON THE LOTS.



HAZARD MANAGMENT AREA (FUEL REDUCTION ZONE)

Include non-flammable areas such as paths, driveways, crushed stone beds and mowed lawns.

Remove any fire hazards such as wood piles, rubbish heaps and stored fuels.

Introduce low flammability plants, refrain from placing plants within 1m of buildings to reduce direct flame contact on the building.

Rake up bark and leaves and keeps roofs and gutters clear of flammable debris. Fire fuels to be maintained no deeper than 20mm (remove dead or fallen bracken, twigs, bark, leaves, branches, and the like).

Ground fuels (eg. grasses and the like) to be maintained to no higher than 100mm.

Create and maintain a minimum separation gap of 2m between the underside of the tree canopy and the natural ground level.

BUSHFIRE THREAT

HAZARD MANAGMENT AREA

BUILDING OUTLINE SETBACK FROM BUSHFIRE THREAT

BUSHFIRE HAZARD MANAGEMENT PLAN

Proposal:	Subdivision	Scale: 1:1000, 1:17.50	Job No: 06-2016	Pg No: 1/1
Client:	Michael Ball	Date: 18/01/16	Engineer:	
Address:	26 Stevens Farm Drive West Hobart 7000	Drawn: Jason	Building Surveyor:	

PINNACLE DRAFTING & DESIGN. CC6073Y 2 Kennedy Drv, Cambridge 7170 P: 03 6248 4743 F: 03 6248 4745 E: jason.alb@bigpond.com

pinnacle DRAFTING&DESIGN

Tasmania Fire Service

Attachment 1: Certificate of Compliance to the Bushfire-prone Area Code under Planning Directive No 5

Code E1 – Bushfire-prone Areas Code

Certificate under s51(2)(d) *Land Use Planning and Approvals Act 1993*

Office Use
Date Received
Permit Application No
PID

1. Land to which certificate applies[1]	
Name of planning scheme or instrument:…Planning Directive 5..(The Scheme)	

Use or Development Site **Street Address** **26 STEVENS FARM DRIVE, WEST HOBART 7000**	**Certificate of Title / PID** **1/169500**
Land that is not the Use or Development Site relied upon for bushfire hazard management or protection **Street Address** **NONE**	**Certificate of Title / PID**

2. **Proposed Use or Development** *(provide a description in the space below)* **3 LOT SUBDIVISION WITH BALANCE**	

- ❑ Vulnerable Use
- ❑ Hazardous Use
- x Subdivision
- ❑ New Habitable Building on a lot on a plan of subdivision approved in accordance with Bushfire-prone Areas Code.
- ❑ New habitable on a lot on a pre-existing plan of subdivision)
- ❑ Extension to an existing habitable building
- ❑ Habitable Building for a Vulnerable Use

[1] If the certificate relates to bushfire management or protection measures that rely on land that is not in the same lot as the site for the use or development described, the details of all of the applicable land must be provided.

3. Documents relied upon[2]

	Document or certificate description:
x	***Description of Use or Development[3] (Proposal or Land Use Permit Application)*** ***Documents, Plans and/or Specifications*** *Title: Proposed Subdivision (drawings)* *Author: Brooks, Lark & Carrick Surveyors* *Date*: 14/09/15 *Pages:* 2
❑	***Bushfire Report[4]*** *Title:* *Author:* *Date*:
x	***Bushfire Hazard Management Plan[5]*** *Title: BAL Assessment* *Author: Pinnacle Drafting & Design (Jason Nickerson)* *Date*: 18/01/16
❑	***Other documents***

[2] List each document that is provided or relied upon to describe the use or development, or to assess and manage risk from bushfire, including its title, author, date, and version.

[3] Identify the use or development to which the certificate applies by reference to the documents, plans, and specifications to be provided with the permit application to describe the form and location of the proposed use or development. For habitable buildings, a reference to a nominated plan indicating location within the site and the form of development is required.

[4] If there is more than one Bushfire Report, each document must be identified by reference to its title, author, date and version.

[5] If there is more than one Bushfire Hazard Management Plan, each document must be identified by reference to its title, author, date and version

4. Nature of Certificate[6]

	Applicable Standard	Assessment Criteria	Compliance Test: Certificate of Insufficient Increase in Risk		Compliance Test: Certified Bushfire Hazard Management Plan		Reference to applicable Bushfire Risk Assessment or Bushfire Hazard Management Plan[7]
❑	**E1.4 – Use or development exempt from this code**						
	E1.4. **(identify which exemption applies)** **E1.4 (b) – Outbuilding – which is a non-habitable building** **Proposed Carport complies with this objective**	-	No specific measures required because the use or development is consistent with the objective for each of the applicable standards identified in this Certificate	❑	Not Applicable		
❑	**E1.5.1 - *Vulnerable Use***						
	E1.5.1.1 – location on bushfire-prone land	A2	Not Applicable		Tolerable level of risk and provision for evacuation : Sample Evacuation Plan to be incorporated and approved by Fire Department.	❑	
❑	**E1.5.2 - *Hazardous Use***						
	E1.5.2.1 – location on bushfire-prone land	A2	Not Applicable		Tolerable level of risk from exposure to dangerous substances, ignition potential, and contribution to intensify fire	❑	
x	***E1.6.1 - Subdivision***						
	E1.6.1.1 - Hazard Management Area	A1	No specific measure for hazard management	❑	Provision for hazard management areas in accordance with BAL 19 Table 2.4.4 AS3959	X	
	E1.6.1.2 - Public Access	A1	No specific public access measure for fire fighting	❑	Layout of roads and access is consistent with objective	x	

[6] The certificate must indicate by placing a ✓ in the corresponding ❑ for each applicable standard and the corresponding compliance test within each standard that is relied upon to demonstrate compliance to Code E1

[7] Identify the Bushfire Risk Assessment report or Bushfire Hazard Management Plan that is relied upon to satisfy the compliance test

	E1.6.1.3 - Water Supply	A1 Reticulated water supply	No specific water supply for fight fighting	❑	Not Applicable		
		A2 Non-reticulated water supply	No specific water supply measure for fight fighting	❑	Water supply is consistent with objective	x	
❑	**E1.6.2 - *Habitable Building on lot on a plan of subdivision approved in accordance with Code***						
	E1.6.2.1 - Hazard Management Area	A1	No specific measure for hazard management	❑	Provision for hazard management areas in accordance with BAL 19 Table 2.4.4 AS3959 and managed consistent with objective	❑	
	E1.6.2.2 – Private Access	A1	No specific private access for fire fighting	❑	Private access is consistent with objective	❑	
		A2	Not Applicable		Private access to static water supply is consistent with objective	❑	
	E1.6.2.3 - Water Supply	A1	No specific water supply measure for fight fighting	❑	Water supply is consistent with objective	❑	
❑	**E1.6.3 - *Habitable Building* (pre-existing lot)**						
	E1.6.3.1 - Hazard Management Area	A1	No specific measure for hazard management	❑	Provision for hazard management is consistent with objective; or	x	
					Provision for hazard management areas in accordance with BAL 29 Table 2.4.4 AS3959 and managed consistent with objective	❑ ❑	
	E1.6.3.2 - Private Access	A1	No specific private access measure for fire fighting	❑	Private access is consistent with objective	x	
		A2	Not applicable		Private access to static water supply is consistent with objective	x	
	E1.6.3.3 - Water Supply	A1	No specific water supply measure for fight fighting	❑	Water supply is consistent with objective	x	

❑	**E1.6.4 - *Extension to Habitable Building***						
	E1.6.4.1 – hazard management	A1	No specific hazard management measure	❑	Provision for hazard management is consistent with objective; or	❑	
					Provision for hazard management areas in accordance with BAL 12.5 Table 2.4.4 AS3959 and managed consistent with objective	❑ ❑	

❑	**E1.6.5 – *Habitable Building for Vulnerable Use***						
	E1.6.5.1 – hazard management	A1	No specific measure for hazard management	❑	Bushfire hazard management consistent with objective; or Provision for hazard management areas in accordance with BAL 12.5 Table 2.4.4 AS3959 and managed consistent with objective	❑	

5. Bushfire Hazard Practitioner – Accredited Person

Name	Jason Nickerson	Phone No:	6248 4743
Address:	2/2 Kennedy Drive Cambridge 7170	Fax No:	6248 4745
		Email address:	Jason.alb@bigpond.com
Fire Service Act 1979 Accreditation No:	BFP-134	Scope:	1,2,3a & 3b

6. Certification

I, Jason Nickerson certify that in accordance with the authority given under the Part 4A of the Fire Service Act 1979 –

The use or development described in this certificate is exempt from application of Code E1 – Bushfire-Prone Areas in accordance with Clause E1.4(b) because there is an insufficient increase in risk to warrant specific measures for bushfire hazard management and/or bushfire protection in order to be consistent with the objective for all of the applicable standards identified in Section 4 of this Certificate	❑

or

There is an insufficient increase in risk to warrant specific measures for bushfire hazard management and/or bushfire protection in order for the use or development described to be consistent with the objective for each of the applicable standards identified in Section 4 of this Certificate.	❑

and/or

The Bushfire Hazard Management Plan/s identified in Section 4 of this certificate is/are in accordance with the Chief Officer's requirements and can deliver an outcome for the use or development described that is consistent with the objective and the relevant compliance test for each of the applicable standards identified in Section 4 of this Certificate	X

Signed

Date 18/01/16

CERTIFICATE OF SPECIALIST OR OTHER PERSON (BUILDING WORK)

Regulation 16

Form **55**

To: Michael Ball *Owner /Agent*

Address

Suburb/postcode

Certifier details:

From: Jason Nickerson

Address: 2/2 Kennedy Drive

Cambridge 7170

Phone No: 6248 4743

Fax No: 6248 4745

Accreditation No: BFP-134 *(if applicable)*

Email address: Jason.alb@bigpond.com

Or qualifications and Insurance details: Accredited to report on bushfire hazards under Part IVA of the ***Fire Service Act 1979.*** *(description from Column 3 of Schedule 1 of the Director of Building Control's Determination)*

Speciality area of expertise: Analysis of hazards in bushfire-prone areas *(description from Column 4 of Schedule 1 of the Director of Building Control's Determination)*

Details of work:

Address: 26 Stevens Farm Drive

West Hobart 7000

Lot No: 1

Certificate of title No: 169500

The work related to this certificate: Bushfire Hazard Assessment *(description of the work or part work being certified)*

Certificate details:

Certificate type: Bushfire Hazard Management Plan *(description from Column 1 of Schedule 1 of the Director of Building Control's Determination)*

✓

This certificate is in relation to an application for a new building permit. ***OR*** x

This certificate is in relation to any stage of building work before completion.

In issuing this certificate the following matters are relevant –

Documents: Bushfire Hazard Management Plan– by Pinnacle Drafting- dated 18/01/16

References: AS3959-2009

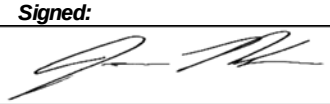
Substance of Certificate: ***(what it is that is being certified)***

The BAL Assessment for construction requirements for the proposed subdivision concluded that the subject site was a BAL 19 classification.

Scope and/or Limitations

This certificate is subject to the requirements and recommendations outline in the Bushfire Hazard Management Plan

I certify the matters described in this certificate.

	Signed:	***Date:***	***Certificate No.***
Certifier:		18/01/16	06-2016

Attachment I

MICHAEL BALL
TOWN PLANNER

3rd February 2016

The General Manager
Hobart City Council
GPO Box 503
HOBART TAS 7001

Dear Sir

25 STEVENS FARM DRIVE – SCHEME AMENDMENT & SUBDIVISION APPLICATION NO. PLN-15-01382-01

I refer to your letter of 14th December 2015 requesting further information on the above proposal and provide the following in response.

1. Firstly I refer to telephone discussions with Mr McIllhenny of your office. It is difficult to determine if the subject site is within the Urban Growth Boundary of the Southern Tasmanian Regional Land Use Strategy 2010-2035 (STRLUS) because of the nature of the map within that document. It is my opinion that if it is not totally within the boundary it is immediately adjacent to it. I understand from discussions with the Executive Commissioner of the Tasmanian Planning Commission Mr Alomes that the Urban Growth Boundary was not to be interpreted as a necessarily exact boundary but rather one that should give guidance particularly when considering rezonings in areas adjacent to the boundary as is in this instance. In support of this application it is submitted that the proposal does not generate a need for any extension of services and will utilise existing infrastructure and consolidates residential development in an area already established for such use. In fact the proposal makes more effective and efficient use of services generally. Further the proposal generates a minimal increase in lot yield over and above an existing residential development and will have no impact on any residential land release programme. In my opinion the proposal is consistent with the intent of STRLUS.
2. See attached documentation from Hutchins Spurr P/L
3. See attached documentation from Hutchins Spurr P/L
4. See attached documentation from Hutchins Spurr P/L
5. See attached documentation from Hutchins Spurr P/L
6. See attached documentation from Hutchins Spurr P/L
7. See attached documentation from Mr J Nickerson.
8. See attached revised plans prepared by Surveyor Miller.
9. See attached correspondence from Mr W Cromer.

mob 0417 567 268
email michaelball7@bigpond.com

I trust the above fulfil your request for further information however should you have any query on the above please do not hesitate to contact me.

Yours faithfully

M V BALL
BSc Hons Grad Dip Urban and Regional Planning

William C Cromer Pty Ltd
ABN 48 009 531 613
Environmental, engineering and groundwater geologist

2 February 2016

Mr M Ball
Planning Consultant
michaelball7@bigpond.com

Copy to
Ms Leanne Stevens
leanne@emergico.com

Dear Mr Ball

25 Stevens Farm Drive – Scheme Amendment and Subdivision Application
Geotechnical comment on proposed alignment of stormwater and sewer services

Background

I refer to the letter to you dated 14 December 2015 from Hobart City Council requesting further information in relation to the above proposed scheme amendment and subdivision proposal. You asked in particular for me to respond to Item 9 of Council's letter, reproduced below.

> 9. The proposed stormwater and sewer main alignment running across the slope right at the top of the landslip does not appear to be in accordance with the recommendations in Cromer's Farm Hill Residential Subdivision, West Hobart: Lot 47 Geotechnical Report – Addendum to 1995 Geotechnical Report. Please provide confirmation from William Cromer that the proposed public infrastructure alignment is suitable. If the servicing layout is altered (e.g moved to the bottom of Zone A), clearly show any unserviced areas of the proposed Lots.
>
> *Advice: Council also notes the stormwater and sewer mains layout shown as existing differ slightly from Council records.*
>
> *Council prefers no new connections to the creek, and advises that additional connections will trigger the Waterways Code of the Planning Scheme.*

In relation to stormwater and sewer services, pages 7 and 8 of my geotechnical report[1] referred to by Council contained the following recommendations

> **6. Recommendations about surface drainage and services**
>
> 6a. Control all natural surface runoff and concentrated runoff from roofs, hardstands and rainwater tank overflows. Discharge all water to Council's stormwater system. Avoid discharging drainage over or into excavations.
>
> 6b. All subsurface drainage from retaining walls or house pads shall be directed to stormwater pipework and not be permitted to discharge to the ground surface.
>
> 6c. Stormwater shall be piped in flexible pipework laid in trenches down (not across) the slope and extended (where unavoidable) through landslide #874 to discharge points in Ross Rivulet.
>
> Wherever possible, services from access roads downslope to houses shall be laid in trenches aligned directly up and down the slope, but backfilled with on-site subsoil (not screened gravel) to avoid creating permeable pathways for seepage water to accumulate at house footprints.
>
> 6d. Where stormwater or sewer pipes are constructed on grades greater than 15% (8.5^0), they should be constructed with anchors to prevent movement down the slope. Each anchor shall incorporate a pathway to allow seepage water flowing in the pipe bedding material to flow freely past the anchor and not be dammed by it.

[1] Cromer, W. C. (2015). *Farm Hill Residential Subdivision, West Hobart: Lot 47 Geotechnical Report – Addendum to 1995 Geotechnical Report.* Unpublished report for Farm Hill Pty Ltd by William C. Cromer Pty. Ltd., 15 March 2015; 82 pages).

I have been provided with a proposal plan (ref STEVG03 8693-01 REV A) by surveyors Brooks, Lark and Carrick dated 29 January 2016. A part of the plan showing Lots 1, 2, 3 and Balance (8828m^2) is reproduced here as Figure 1. This plan is a revision (REV A) of an earlier one which showed a pipeline services easement along the headscarp of the landslide, and which was referred to in Item 9 of Council's letter referenced above.

The revised plan shows the services easement located along the top side of the buffer zone around the landslide.

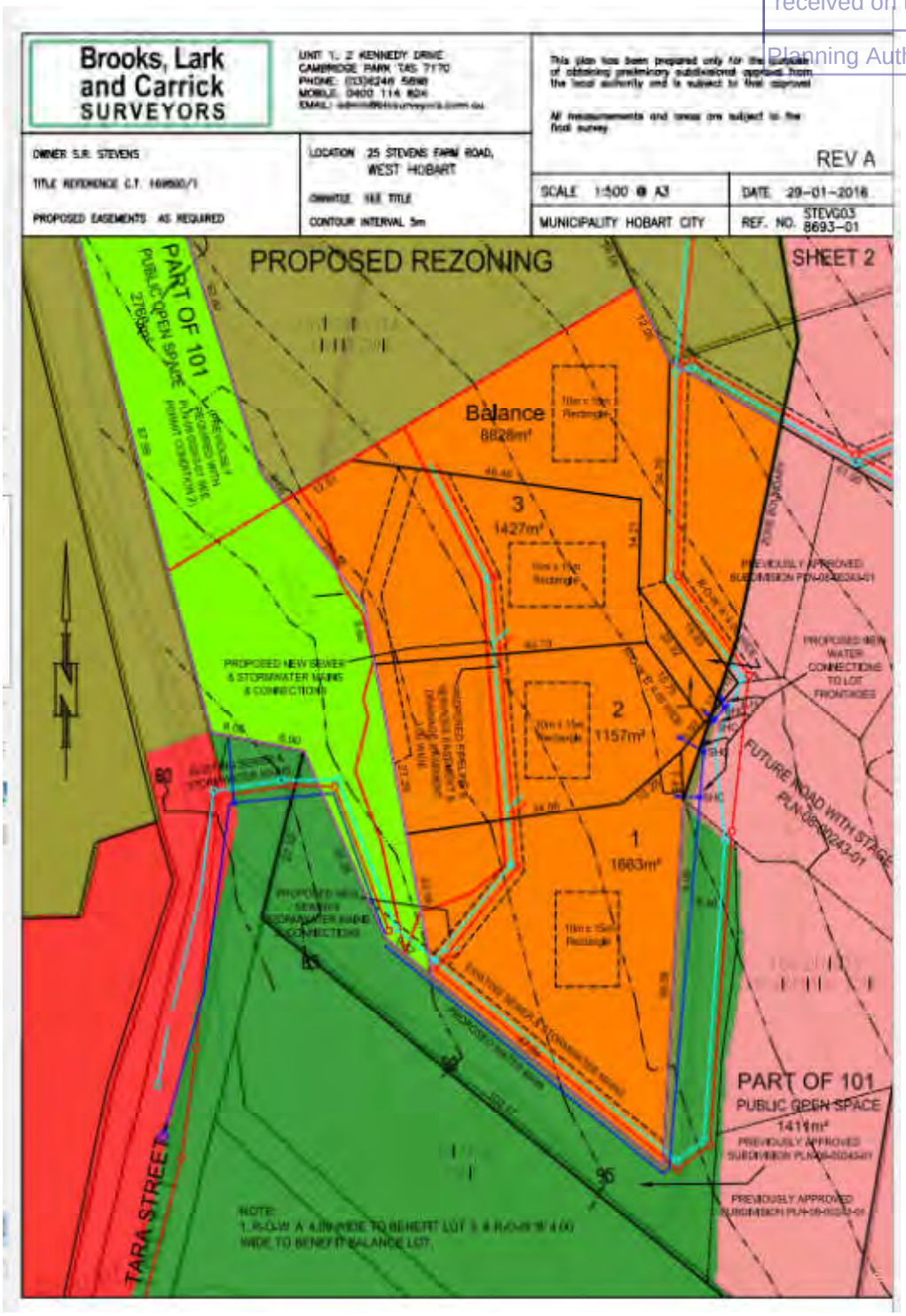


Figure 1. Proposal plan (ref STEVG03 8693-01 REV A) by surveyors Brooks, Lark and Carrick dated 29 January 2016, showing proposed lots 1, 2, 3, Balance, and the proposed pipeline services easement along the buffer zone around the landslide.

Comment

While my report recommendation 6c above required service trenches down and not across the slope, it will be permissible to lay services in the easement as shown in Figure 1 provided that (1) all pipework used is flexible HDPE PN16 of appropriate diameters, (2) all trenches are backfilled and tamped with on-site or off-site clayey subsoil (not screened gravel) to surface to avoid seepage water accumulating in them and perhaps migrating downslope, and (3) trenches are inspected for compliance of (1) and (2) by a suitably qualified person during pipework installation.

W. C. Cromer

Principal

DES-F-0102/33
20/05/2015

Attachment K

HOBART
CITY COUNCIL

PLN-15-01382-01
Application Number

DEVELOPMENT APPRAISAL

ENVIRONMENTAL DEVELOPMENT PLANNER ASSESSMENT

Site Address: **25 Stevens Farm Drive, WEST HOBART**
Proposed Development: **Subdivision and Rezoning (40T)**
Codes Applying: **Bushfire; Landslide; Biodiversity; Waterway**
Appraisal Planner: **Cameron Sherriff / Sarah Crawford**

Code Application:

Code	Applies?	Exempt?	Permitted?	Discretionary?
Bushfire-Prone Areas	Yes	No	No	Yes
Landslide	Yes	No	No	Yes
Biodiversity	Yes	Yes		
Waterway & Coastal Protection	Yes	Yes		

Assessment:

Approval is sought to:

- re-zone part of the land from 'Environmental Living' to 'Open Space';
- re-zone part of the land from 'Environmental Living' to 'Low Density Residential';
- subdivide the new land zoned 'Open Space' into two new lots; and
- subdivide the new land zoned 'Low Density Residential' into four new residential lots.

Three of the four new residential lots would be wholly zoned 'Low Density Residential' with lot sizes ranging from 1157m^2 to 1663m^2. The fourth residential lot (8828m^2) would be partially zoned 'Low Density Residential' with the majority retained in the 'Environmental Living' zone.

The proposal is essentially an extension of the subdivision approved under planning permit PLN-08-00243. The land is subject to Part 5 Agreement D41506 as a result of the earlier subdivision approval.

The land proposed to be zoned 'Low Density Residential' has a south-westerly aspect and steep slope (approximately 17°). The land has been cleared of all significant vegetation other than a couple of Eucalyptus trees in the southern corner of the site.

Bushfire-Prone Areas Code

The land is within a bushfire-prone area and the standards of the Bushfire-Prone Areas Code are applicable to the proposed subdivision.

A Bushfire Hazard Management Plan (BHMP) prepared by an accredited bushfire hazard practitioner was submitted with the application. The BHMP specifies:

- building areas for each of the new residential lots;
- an 8m-wide hazard management area along the south-western boundary of proposed Lot 1;
- verification that an existing fire hydrant has been designed to be capable of delivering a minimum flow rate of 600L/minute and a minimum pressure of 200kPa, or the provisions of static water supplies of at least 10,000L per habitable building; and
- that the proposed accesses shown on access plan 14544/01 are compliant with the standards for subdivision access.

Figure 1: Building areas (east of blue line) and hazard management area (south of red line) for proposed residential land

The relevant provisions of the Code are contained in section E1.6.1 'Development standards for subdivision'. With regard to E1.6.1.1 'Subdivision: Provision of hazard management areas', the proposal does not comply with either of the acceptable solutions as the bushfire hazard practitioner has not certified insufficient increase in risk and because building areas have not been shown for the two new lots to be zoned 'Open Space'.

The related performance criterion, P1, states the following:

> *A proposed plan of subdivision shows adequate hazard management areas in relation to the building areas shown on lots within a bushfire-prone area taking into consideration:*
>
> *(a) the dimensions of hazard management areas;*
>
> *(b) a bushfire risk assessment of each lot at any stage of staged subdivision;*
>
> *(c) the nature of the bushfire-prone vegetation including the type, fuel load, structure and flammability;*
>
> *(d) the topography, including site slope;*
>
> *(e) any other potential forms of fuel and ignition sources;*
>
> *(f) separation distances from the bushfire-prone vegetation not unreasonably restricting subsequent development; and*
>
> *(g) any advice from the TFS.*

While there is only one formal 8m-wide HMA along the south-western boundary of proposed Lot 1, the accredited practitioner has classified adjacent land to the west, north and east as 'low threat vegetation' under AS3959 for distances of 38-100m from the proposed building area boundaries. The practitioner has assumed the vegetation on this land will continue to be managed in a low fuel state and has not required formal hazard management areas over this land.

The bushfire hazard practitioner has indicated that bushfire attack levels (BALs) for future dwellings within the specified building areas will be a maximum of BAL-19 which is consistent with the acceptable solution and will not unreasonably restrict subsequent development. The proposed hazard management areas are therefore considered adequate and in accordance with the performance criterion.

With regard to E1.6.1.2 'Subdivision: Public access', the proposal complies with acceptable solution A1(b) as the bushfire hazard practitioner has certified the proposed roads, fire trails and private accesses as being consistent with the objective. Acceptable solution A2 is not applicable as no new 'roads' are proposed. It should also be noted that the proposed private accesses appear to meet the main requirements of Table E3.

With regard to E1.6.1.3 'Subdivision: Provision of water supply for fire fighting purposes', it is unclear whether the proposal complies with acceptable solution A1(b) as the results of fire hydrant testing have not been submitted to demonstrate compliance with the required minimum flow rates and pressures. However, the submitted BHMP specifies that the flow rate and pressure of the nearby hydrant must be verified, and if not compliant, static water supplies must be provided. There is no performance criterion for A1.

Acceptable solution A2 is applicable if the existing fire hydrant does not have the required minimum pressure and flow rates. The BHMP complies with acceptable solution A2(b) as it has been certified as consistent with the relevant objective.

The BHMP demonstrates that the proposal will either comply with acceptable solution A1 or A2, whichever is relevant. However, it would be preferable if verification of the flow rate and pressure from the existing hydrant were undertaken by the subdivider so that each future lot developer does not need to have the hydrant tested. A condition to this effect is recommended.

Landslide Code

Part of the land is within a landslide hazard area and the standards of the Landslide Code apply to the proposed subdivision (refer to Figure 2 below). The majority of the land intended for residential development falls within the 'low' hazard band (yellow), however there are also small areas of 'medium' (orange) and 'medium-active' (pink).

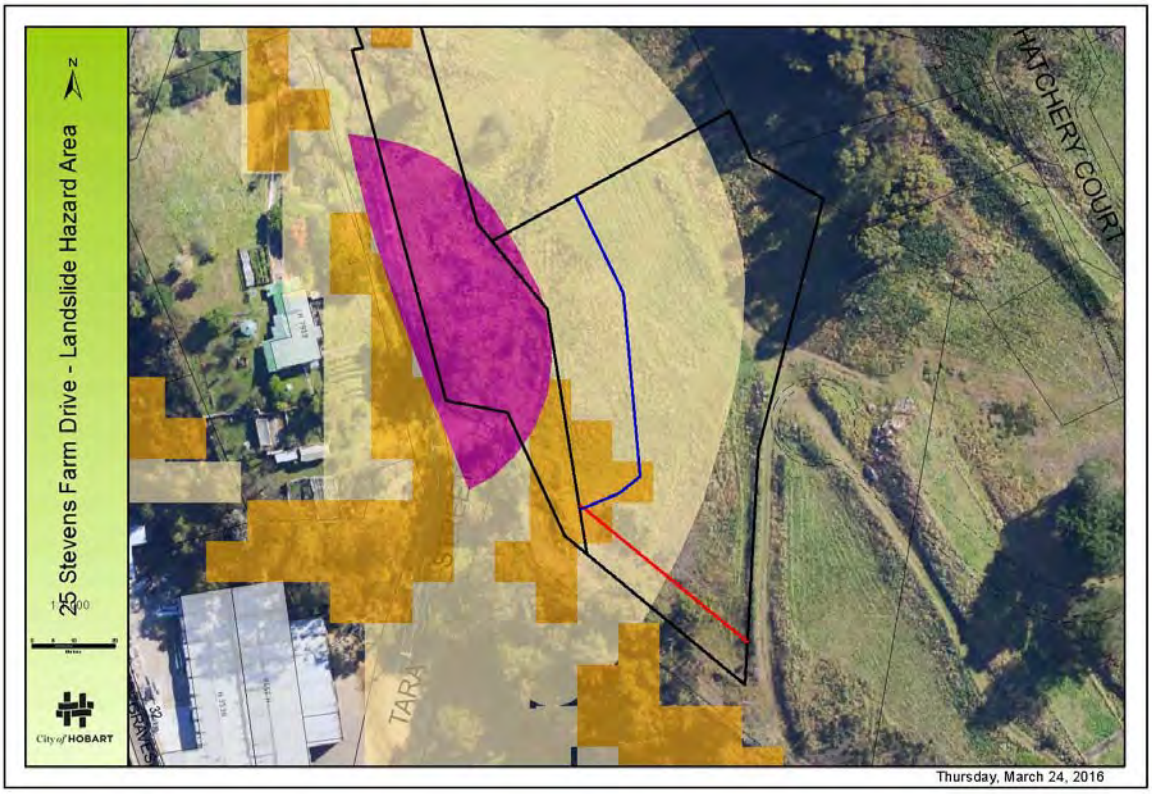


Figure 2: Landslide hazard bands and landslide building envelope (east of blue line)

The land was subject to geotechnical assessment as part of the application for the existing subdivision (Cromer, 1995). That assessment identified one definite and two possible historical landslides on the western slope down to Ross Rivulet. Slope stability on the western third of the property was identified as the main geotechnical issue potentially affecting future residential development of the land.

The 1995 geotechnical assessment classified the land into five categories with the following associated recommendations:

- Low risk – Development recommended without restrictions except those relating to good hillside engineering practices.
- Medium risk - Development recommended without restrictions except those relating to good hillside engineering practices.
- Medium-High risk – Low density residential development recommended. Good hillside engineering practices must be employed.
- High risk – No development recommended unless detailed geotechnical engineering practices are employed.

- Very high risk – No development recommended.

The approximate extent of the high and very high risk areas from the 1995 report is shown in Figure 3 below.

Figure 3: High and very high landslide hazard areas (1995)

The original, approved subdivision largely excludes the high and very high risk areas.

A comprehensive and detailed addendum to the 1995 report, based on further investigation and modelling, has been provided by WC Cromer P/L to support the current rezoning and subdivision proposal.

The landslide risk assessment contained in the addendum identifies the landslide risks as 'very low' to 'moderate' without risk mitigation measures being applied, and as 'very low' to 'low' with the implementation of recommended risk mitigation measures. The addendum concludes the following:

> *From a geotechnical perspective, Lot 47 can conditionally support residential development, which is unlikely to cause instability on any other land.*
>
> *All risks can be acceptably managed by the risk mitigation procedures, and with good hillside construction techniques, recommended in this report.*

A number of risk mitigation recommendations are contained in section 5 of the addendum report. Key recommendations include:

- Good hillside engineering practices must be employed.

- Residential development (houses, garages, sheds, swimming pools, access drives and related infrastructure) must be restricted to the identified building envelope.
- AS2870 site classifications and foundation designs must be undertaken for all future houses.
- Minimise excavations with cuts adequately retained.
- Engineering supervision of any fill placement.
- Stormwater directed to Council mains.
- Specific requirements for sewer and stormwater pipe design and installation.

The residential development envelope is reproduced as Figure 4 below and the approximate area shown in Figure 2 above (east of blue line).

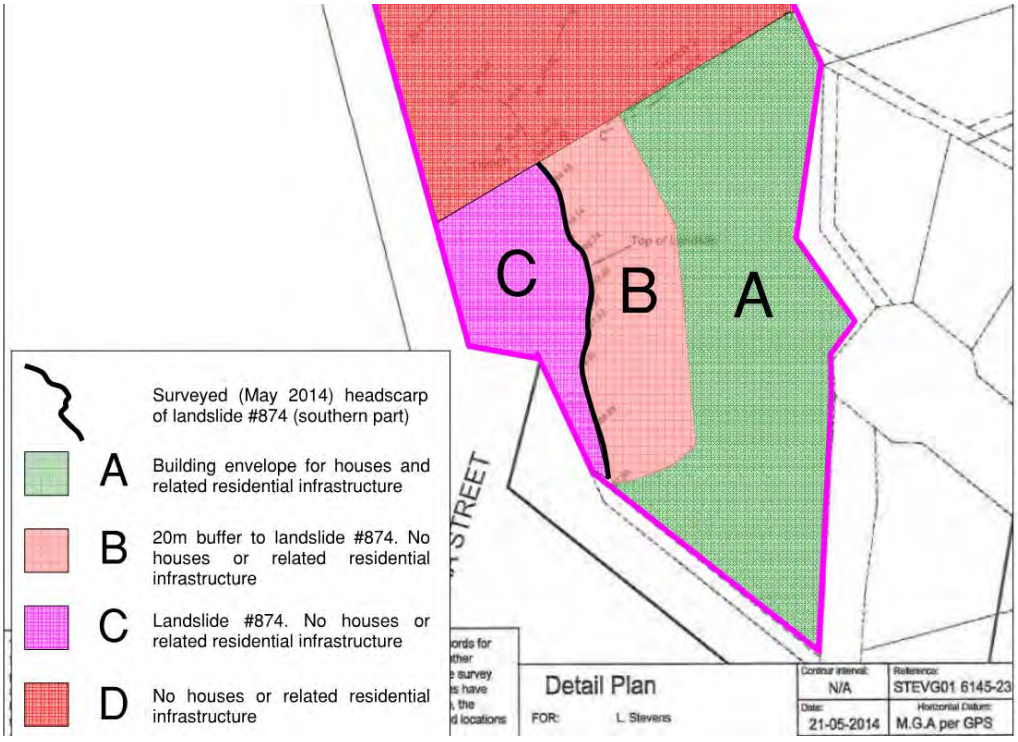


Figure 4: Excerpt from Figure 1. Recommended building envelope (A) and no-development areas (B, C, D)

A further letter was provided by WC Cromer regarding the proposed alignment of the sewer and stormwater mains (across slope) which were inconsistent with recommendation 6C of the addendum report (down slope). The letter indicates that the proposed alignment is acceptable subject to specific design and inspection requirements.

The relevant standards of the Landslide Code are contained in section E3.7.3 'Major Works' and E3.8.1 'Subdivision'. 'Major works' are triggered by the proposed ground disturbance associated with the hazard management area, driveways and hydraulic services.

With regard to E3.7.3 'Major Works', there is no acceptable solution. The related performance criterion, P1, states the following:

Major works must satisfy all of the following:

(a) no part of the works is in a High Landslide Hazard Area;

(b) the landslide risk associated with the works is either:

(i) acceptable risk; or

(ii) capable of feasible and effective treatment through hazard management measures, so as to be tolerable risk.

No major works would occur within a high landslide hazard area. The submitted addendum report demonstrates that the landslide risk associated with the works is capable of feasible and effective treatment through hazard management measures, so as to be tolerable risk. A new Part 5 Agreement is recommended to ensure future development of the lots is consistent with these recommendations, without the need for further assessment.

Additional conditions are recommended for geotechnical certification of the design drawings and completed works to ensure the recommendations of the geotechnical report (or addendum letter) are properly implemented.

With regard to E3.8.1 'Subdivision', there is no acceptable solution for A1. The related performance criterion, P1, states the following:

Subdivision of a lot, all or part of which is within a Landslide Hazard Area must be for the purpose of one of the following:

(a) separation of existing dwellings;

(b) creation of a lot for the purposes of public open space, public reserve or utilities;

(c) creation of a lot in which the building area, access and services are outside the High Landslide Hazard Area and the landslide risk associated with the subdivision is either:

(i) acceptable risk, or

(ii) capable of feasible and effective treatment through hazard management measures, so as to be tolerable risk.

The subdivision would not occur within a high landslide hazard area. The submitted addendum report demonstrates that the landslide risk associated with the subdivision is capable of feasible and effective treatment through hazard management measures, so as to be tolerable risk. A new Part 5 Agreement is recommended to ensure future development of the lots is consistent with these recommendations, without the need for further assessment.

Acceptable Solution A2 states '*subdivision is not prohibited by the zone standards*'. The proposed subdivision must be assessed as if the proposed rezoning has been approved. The Development Appraisal Planner would not recommend approval of the application if the proposed subdivision does not comply with the standards for the new zonings.

An additional condition requiring the sewer and stormwater mains to be designed and constructed in accordance with the specifications in the letter from WC Cromer is also recommended.

<u>Biodiversity Code</u>

The land is within the Biodiversity Protection Area specified in the Biodiversity Code refer to Figure 5 below). The proposed subdivision would result in the loss of some native vegetation (through the installation of roads and service mains and establishment of the proposed hazard management area) and therefore the Biodiversity Code is applicable.

The land supports some native grasses and ferns and a single living Eucalypt along the proposed south-western boundary (refer to Figure 6 below).

Figure 5: Biodiversity Protection Area (green overlay)

Figure 6: Photo of only living tree within proposed residential area along south-western boundary (centre right of photo)

Based on an analysis of aerial photography, the vast majority of the proposed residential land has been previously cleared within the preceding 10 years and therefore clearing of these areas is exempt from the Code standards pursuant to exemption clause E10.4.1(n). The only vegetation that appears older than 10 years is the surviving Eucalyptus tree.

Exemption clause E10.4.1(m) exempts the clearance of vegetation up to an area of 100m^2 provided that none of the vegetation communities of high or moderate biodiversity value are affected. The canopy area of the surviving Eucalypt has been estimated as 70m^2 as is not a component of native vegetation community (due to the disturbed understorey) and its clearance would therefore be exempt.

The proposal is therefore considered exempt from the standards of the Biodiversity Code. It should be noted that the tree will not necessarily have to be removed to implement the proposed bushfire hazard management area.

Waterway and Coastal Protection Code

The Waterway and Coastal Protection Code applies because development (subdivision) is proposed within the waterway and coastal protection area of Ross Rivulet (10m from top of banks). However, the proposal is exempt from the standards of the Code pursuant to exemption clause E11.4.1(b) as clearing of vegetation or soil disturbance are not proposed within the waterway and coastal protection area.

Recommended Conditions:

ENVS$_1$ Prior to sealing the Plan of Subdivision, evidence must be provided that demonstrates whether the existing fire hydrant shown on the submitted bushfire hazard management plan has been designed to be capable of delivering a flow rate of 600L per minute and a minimum pressure of 200kPa

in accordance with AS2419.1 *Fire Hydrant Installations – Part 1: System design, installation and commissioning.*

Reason for condition

To ensure the requirements of the bushfire hazard management plan are clear for future owners.

ENV 4 An amended bushfire hazard management plan must be submitted to the Planning Authority for approval, prior to sealing of the Plan of Subdivision. The amended bushfire hazard management plan must:

- not include the notation 'existing fire hydrant to be verified by TasWater that it complies with E1.6.1 A1(b)…';
- clarify whether a static water supply must be utilised in accordance with E1.6.3 A2(c) of the Bushfire-Prone Areas Code; and
- clarify whether a static water supply in accordance with E1.6.3 A2(d) of the Bushfire-Prone Areas Code is acceptable as a fire-fighting water supply for future dwellings on the residential lots.

All work required by this condition must be undertaken in accordance with the approved bushfire hazard management plan.

Advice: Once the amended bushfire hazard management plan has been approved the Council will issue a condition endorsement (see general advice on how to obtain condition endorsement)

Reason for condition

To ensure the use and/or development is consistent with the provisions of the Bushfire-Prone Areas Code and/or that the Bushfire Report and Bushfire Hazard Management Plan are consistent.

ENV 8 All relevant landslide risk mitigation measures recommended in section 5 of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015 must be implemented, unless varied by the recommendations of the stormwater and sewer services letter from WC Cromer P/L dated 2 February 2016.

Reason for condition

To reduce the risk to life and property, and the cost to the community, caused by landslides

$ENVS_2$ Prior to the commencement of works, comprehensive and detailed engineering designs prepared by an accredited Civil Engineer/Civil Designer for the subdivision works including drainage, services, earthworks, retaining structures and roads must be submitted and approved. The design

documents must demonstrate compliance with all relevant risk mitigation recommendations in section 5 of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015 or the recommendations of the stormwater and sewer services letter from WC Cromer P/L dated 2 February 2016.

The submitted design documents must be certified by both a Civil Engineer/Civil Designer and Geotechnical Engineer/Engineering Geologist as being in accordance with all relevant recommendations in section 5 of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015 or the recommendations of the stormwater and sewer services letter from WC Cromer P/L dated 2 February 2016 and that all recommendations of the report or letter relevant to the subdivision works have been fully incorporated into the design documents using Form B1 *Structural/Civil/Geotechnical Engineering Declaration – Subdivision Design Documents* (copy attached).

Reason for condition

To ensure the recommended landslide risk mitigation measures are appropriately integrated into the subdivision design.

ENVS$_3$ Following completion of the subdivision works and prior to sealing the Plan of Subdivision, certification by a geotechnical engineer or engineering geologist (as specified in the Director of Building Control's determination *Certificates of Specialists or Other Persons*) that all relevant recommended landslide risk mitigation measures in section 5 of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015 or the recommendations of the stormwater and sewer services letter from WC Cromer P/L dated 2 February 2016 have been fully complied with must be submitted to Council using Form G1 *Geotechnical Declaration Subdivision Works* (copy attached).

Reason for condition

To ensure the recommended landslide risk mitigation measures are appropriately implemented in the subdivision works.

ENVS$_4$ Lots 1, 2, 3 and the balance lot must be subject to a restrictive covenant in favour of the Hobart City Council preventing development including the erection of buildings or structures, landscaping, earthworks or vegetation clearing without the prior, written consent of the Hobart City Council, in the following areas:

- west of the line marked 'geotech zone boundary A-B' on the proposed Plan of Subdivision by Brooks, Lark and Carrick Surveyors dated 16 March 2016;
- north west of the line marked 'geotech zone boundary B-D' on the proposed Plan of Subdivision by Brooks, Lark and Carrick Surveyors dated 16 March 2016; and
- north west of the line marked 'geotech zone boundary A-D' on the proposed Plan of Subdivision by Brooks, Lark and Carrick Surveyors dated 16 March 2016.

The covenant must include the following words:

> *The owner or owners of lots 1, 2, 3 and the balance lot on the plan covenant with the Hobart City Council to the intent that the burden of this covenant may run with and bind the covenantor's lots and any part thereof and the benefit shall be in favour of the Hobart City Council, to observe the following stipulation:*
>
> *Not without the written consent of the Hobart City Council to erect or permit to be erected any building or structure or carry out any landscaping, earthworks or vegetation clearing within the area marked ABC…etc on the plan.*

Reason for condition

To ensure that only the land subject to an acceptable level of geotechnical risk is developed.

Part 5 1 The owner(s) of the land that will become lots 1, 2, 3 and the balance lot must enter into an agreement with the Planning Authority pursuant to Part 5 of the *Land Use Planning and Approvals Act 1993* with respect to implementation of the final approved bushfire hazard management plan and implementation of the geotechnical recommendations prior to sealing of the Plan of Subdivision. The agreement must be registered on the Titles for these lots at the time of issue.

The agreement must:

- require that the final, approved bushfire hazard management plan specified in condition x above must be implemented prior to occupation of the first dwelling on the lots, and be maintained for the life of all dwellings on the lots;
- include a copy of the final, approved bushfire hazard management plan specified in condition x above
- require that the foundation design for future dwellings be based on investigation and classification in accordance with AS2870 *Residential Slabs and Footings*;
- require that development on the lots be in accordance with recommendations 2 to 7 in section 5 of the submitted geotechnical report addendum by WC Cromer P/L dated 22 January 2015; and
- include a copy of the geotechnical report addendum by WC Cromer P/L dated 22 January 2015.

All costs for the preparation and registration of the Part 5 Agreement must be met by the owner(s).

The owner(s) must comply with the Part 5 Agreement which will be placed on the property title.

Note: Further information with respect to the preparation of a part 5 agreement can be found at http://www.hobartcity.com.au/Development/Planning/Part_5_agreements

Reason for condition

To ensure that future use/development of land is subject to acceptable levels of risk from bushfire and landslide.

Part 5 2 The owner(s) of the land that will become lots 1, 2, 3, 101, 102 and the balance lot must arrange for the existing Part 5 Agreement applying to the owners of the land to be brought to an end prior to registration of the new Part 5 Agreement referred to in condition x above.

All costs associated with the ending of the Part 5 Agreement must be met by the owner.

Reason for condition

To ensure that contradictory Part 5 Agreement requirements do not apply to the land

Recommended Advice:

N/A

Attachment C

City of HOBART

HOBART INTERIM PLANNING SCHEME 2015

5/2016 AMENDMENT

INSTRUMENT OF CERTIFICATION

It is hereby certified that draft Amendment 5/2016 to the Hobart Interim Planning Scheme 2015 meets the requirements specified in section 32 of the *former provisions* of the Land Use Planning and Approvals Act 1993.

The Common Seal of the Hobart City
Council is fixed hereon, pursuant to
Council's resolution of ?? 2016
in the presence of:

……..Lord Mayor

……..General Manager

Date: .....