

Wollongong Local Planning Panel Assessment Report | 7 June 2022

WLPP No.	Item 3 - Addendum report to WLPP Item 2 – 26 October 2021
DA No.	DA-2021/136
Proposal	Residential - construction of a dwelling house and pools and Subdivision - Torrens title – two (2) lots
Property	1A Norman Street, Mangerton
Applicant	Ted Switaj
Responsible Team	Development Assessment and Certification - City Centre Major Development Team (NL)
Prior WLPP meeting	26 October 2021

ADDENDUM REPORT

This report should be read in conjunction with the Council Assessing Officer's report as presented to the Wollongong Local Planning Panel on the 26 October 2021

BACKGROUND AND EXECUTIVE SUMMARY

Reason for consideration by Wollongong Local Planning Panel (WLPP)

The proposal was referred to the Panel for determination on 26 October 2021 in accordance with clause 2.19(1)(a) of the Environmental Planning and Assessment Act 1979 and Schedule 2(2) of the Local Planning Panels Direction. The proposal is contentious development that received in excess of 10 objections.

The Panel recommended the application be deferred subject to a number of concerns being addressed and re-referred to the Panel for determination (see **Attachment 4**).

The applicant has supplied amended documentation in response to the Panel recommendations including:

- updated architectural plans (**Attachment 3**),
- photo montage/artists impressions (**Attachment 5**)
- revised stormwater documentation (**Attachment 6**).

It is further noted that prior encroachments of the dwelling and a retaining wall and pergola structure over a Sydney Water easement traversing the western part of the site have now been removed.

The amended plans have been re-notified and assessed by Council staff. It is considered that the changes appropriately address the concerns of the Panel.

The following is the full list of the matters raised by the Panel, the applicant's written response to each matter and comments by Council.

WLPP recommendations and applicant response

The Panel notes that submitted elevations and sections fail to represent the proposal's form, materiality, streetscape and interface with adjoining properties. It is therefore very difficult to discern what commitments are being made in terms of scale, character and design quality. New sections and elevations are therefore required that extend beyond the property boundaries, with clearly drawn and annotated built form elements (such as roofing, fascias, eaves, cappings, downpipes, etc.), materials (including specific building materials, finishes, junctions, jointing etc) and contextual elements (including existing and proposed trees, boundary walls and fences, landscape features, adjoining built form etc). The revised elevations and sections must clearly express precise heights and reduced levels of adjoining gardens and built form as well as the proposed new dwelling and associated gardens.

- The applicant has provided revised sections and elevations (see Drawings 6/12, 6A/12, 6B/12, 09/12 and 10/12 at **Attachment 3**).
- The elevation plans are annotated to identify finishes.
- The sections and elevations extend beyond the property boundary and include levels and significant trees.

Given the sensitivity of the site and extent of development proposed, it is strongly recommended that accurate 3D views are prepared by a skilled design consultant, so as to demonstrate how the built form and courtyards are housed on the site, how boundary conditions are resolved and how discrete roof forms and courtyards achieve an appropriate response to the site's form and landscape features. The views should be taken from a number of key locations, chosen for their impact on public amenity.

- An artist render of the house looking at the site from the north at street level has been prepared as contained at **Attachment 5** and provides an indication of how the building will sit on the site in relation to the end of Norman Street and the adjoining property at 1 Norman Street to the West.
- Artist renders have been provided of the western boundary fence, the southern boundary fence and a view of the western boundary fence viewed looking west from within the site illustrating the fence material and house beyond (see **Attachment 5**).
- The fence renders reflect the recommendation for open style fencing along the boundary to the west.

Further review of the proposed stormwater design reveals that the proposal is likely to result in an increase in volume of stormwater runoff affecting downslope properties. This has not been adequately addressed by the applicant.

The proponent has submitted Stormwater Management Report (Project No. 1755 dated 15 November 2021 prepared by Footprint Sustainable Engineering) and a revised Stormwater Concept Plan (1755-C01-4 dated 15 November 2021) indicating post development discharge of stormwater to the adjoining Council reserve to be 25% less than predevelopment flows (see **Attachment 6**). This has been reviewed by Council's Stormwater Officer who is satisfied the design meets Council requirements subject to appropriate conditions of consent which are contained at **Attachment 7**.

Prior to determination, a report from a qualified engineer experienced in hydraulic and hydrologic design, which addresses the following matters, is to be submitted to Council for assessment.

- a) Details of how the proposal satisfies in the objectives of Chapter E14 of Wollongong DCP 2009.*
- b) Details how the proposed stormwater system satisfies the requirements of Section 9.3.12 "Absorption and Transpiration Disposal Systems" of Chapter E14 of Wollongong DCP 2009.*
- c) Details how the proposed stormwater system satisfies the requirements of Section 9.3.9 "Discharge of Stormwater through Public Reserves" of Chapter E14 of Wollongong DCP 2009.*

Revised stormwater documentation has been provided as noted above. The proposal has been assessed against the relevant controls in Council's DCP and concludes the design is able to maintain existing hydrological conditions to pre-development levels with no increase in either peak flow rates or runoff volumes. This report and the amended plans have been reviewed by Council's Stormwater Officer who has provided a satisfactory referral subject to amended conditions of consent which are contained at **Attachment 7**.

Consultation

The revised documentation was renotified from 25 January to 8 February 2022 and received a further two submissions. The concerns raised are discussed at Table 1 below.

Table 1: Submissions

Concern	Comment
Impacts associated with pergola structure located within the 6m setback to Norman Street including views and encroachment over Sydney Water easement.	The pergola structure as notified is illustrated below

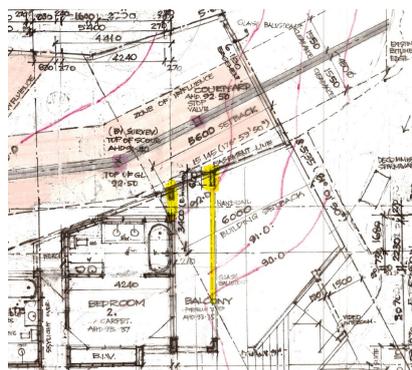


This has since been amended to the following:



The dwelling footprint no longer encroaches and the pergola and retaining wall structure within the front setback within the easement has also been removed.

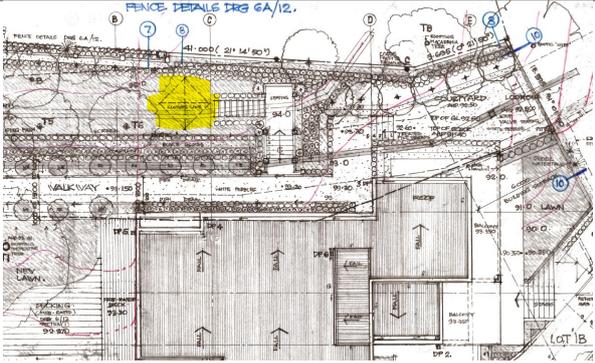
There is however a remaining pergola structure over the level 1 balcony that comes to approximate 3.5m from the front boundary as highlighted in yellow below.



There is no justification for this, and it would have an impact as viewed from the street, public space and adjoining dwellings. It is therefore recommended that this be removed as outlined at revised condition 24 of the consent.

Concern	Comment
The artist impression does not accurately represent the height of the dwelling, specifically the three-storey component and misrepresents the visual impact of what will be a very large dwelling.	<p data-bbox="783 203 1391 344">A variation to the three-storey control in the DCP was previously addressed and supported in the Council officer report to the Panel of 26 October 2021.</p> <p data-bbox="783 365 1391 465">This was not identified as an item that was of concern to the Panel as reflected in their recommendations.</p> <p data-bbox="783 486 1391 586">It is noted the artist render of the dwelling is taken from a vantage point that does not capture the three-storey element in its entirety.</p> <p data-bbox="783 607 1391 786">Notwithstanding, there are limited dwellings or parts of the public domain from which this elevation is viewed, and reasonable separation is provided between any adjoining dwellings and this element of the dwelling.</p> <p data-bbox="783 806 1391 878">Impacts associated with bulk and scale are not considered to be unacceptable.</p>

Concern	Comment
<p>Photo rendering #1: The first artistic rendering is very unclear as to its location on the site. If on the southern boundary it is not consistent with the fence design described in the 'Section and Fence Detail' plan (see Section of Fence 8) and as detailed in the Landscape plan. Nor is it compliant with the proposed DA conditions which required open style palisade style fencing.</p> <p>Photo rendering #2: The second rendering shows open fencing on the western boundary at the southern end. We have no objection to this rendering, however the spacing of vertical fencing elements has not been specified in the Section and Fence Detail plan (see Section of Fence 7).</p>	<p>The artist impression #1 is an oblique view from above of the southern boundary fence (see below)</p> 
<p>From an aesthetic and architectural standpoint, the open palisade fencing design (as specified in the earlier draft DA conditions) along the entire length of the western boundary should be required. This can be clearly seen by looking at the second Photo Montage and any privacy issue dealt with by suitable plantings and has previously been proposed by Council.</p>	<p>Open palisade type fencing was of primary concern on the western boundary adjoining the public pathway.</p> <p>The render looking west towards 1 Norman Street identifies open style palisade fencing as recommended by Council.</p> 
	<p>It is noted the open palisade type fencing does not extend for the full extent of the western boundary as illustrated below.</p>  <p>This is contrary to Council recommendations and condition 16(g) of the draft consent includes the extension of open palisade style fence treatment for the full length of the western boundary. This requirement is to remain.</p>

Concern	Comment
<p>We request that the clothesline be relocated elsewhere so that it is not adjacent to the front door of 1 Norman Street. This has not been included in the Photo Montage image showing the western boundary area.</p>	 <p>The clothesline location does not breach any Council controls and is conveniently located to the dwelling with access to sun. Further, the property is separated from 1 Norman Street by the public walkway and is at a lower grade than the adjoining dwelling house and will mostly be obscured by fencing and landscaping.</p>
<p>The drawing titled Build Over Easement does not show the encroachment over the easement resulting from construction of the courtyard in the northwest corner of the site. Consequently, the encroachment shown on the drawing is greatly understated and not minor as previously indicated by WCC.</p> <p>Note that the document Engineering – Sydney Water Encroaches is not available as a pdf, so cannot be read or commented upon.</p>	<p>The structures over the Sydney Water easement have been removed except for some low-level landscape treatment and retaining walls.</p>
<p>The Bushfire Report for this DA requires that the entire site be managed as an Inner Protection Zone and the requirements to meet this are described in the document ‘Planning for Bushfire Protection 2019’ at Appendix 4-part A4.1.1 on page 107. It is obvious that the proposals in the Landscape plan for planting trees and shrubs are completely non-compliant with this requirement.</p> <p>Our property at 1 Norman Street has been deemed to have an extremely high fire risk rating of Flame Zone and therefore we request that no trees or tall shrubs of any type be planted along the western boundary to minimise our fire risk.</p> <p>By way of example, along the western boundary it is proposed to plant significant numbers of dwarf Cornus Florida (Dogwood). Our internet searching has failed to find a dwarf form of this plant with the standard form growing to 10</p>	<p>The amended landscape plan has been reviewed by Newcastle Bushfire Consulting (see letter dated 8 March 2022) who have confirmed the plan will satisfy the recommendations in the Bushfire Report and Bushfire Safety Authority issued by the RFS, particularly the requirement that the entire site be managed as an inner protection area (IPA).</p> <p>Council’s Landscape Officer has reviewed the proposal and has raised no objection subject to appropriate conditions of consent.</p> <p>Consistency of the photo montages with the landscape plan is not considered to be a determinative factor. The photo montages serve to illustrate the location and finishes of the dwelling and associated retaining walls and structures. Detail of vegetation is considered to be suitably contained in the landscape plan.</p>

Concern	Comment
<p>metres tall and spreading widely. Moreover, it is a non-native plant (along with many other of the selections) unsuited to our native fauna. We therefore regard it as an unsuitable selection that will prevent view sharing to the east and northeast from the public pathway and 1 Norman Street as well as being an environmentally unsuitable choice and a fire hazard.</p> <p>The Artists render of fences and Photo montages drawings depicting the western boundary area of the development shows numbers and types of new plants which bear no relationship to the Landscape Plan and existing trees are missing. This means that these depictions cannot be relied upon to give any reasonable idea of how the finished development will appear. This is despite the report from the WLPP from 21 October requiring that the 'revised elevations and sections must clearly express precise heights and reduced levels of adjoining gardens and built form as well as the proposed new dwelling and associated gardens'.</p>	
<p>From the montage of the front of the proposed development, it is clear that there will be a paved area available for the collection of bins to service 1A and 1B Norman Street as a minimum. This issue has been raised previously and will solve the problem where the bins for 1, 2, 4 and 6 are currently placed in front of 1 Norman Street and fill the turning area (before construction of 1A and 1B Norman St). The very large number of bins in a narrow cul-de-sac is already a hazard and with the prospect of at least 6 additional bins will be unsafe. Large trucks are already accessing this driveway and so this is not an impediment to this proposal.</p>	<p>Council's waste contractor cannot proceed past 1 Norman Street to service bins for the properties located at that end of Norman Street.</p> <p>The truck reverses down Norman Street to that point and collects bins from the southern side of Norman Street adjacent to 1 Norman Street.</p> <p>Ideally, bins would be located adjacent to the subject property however this is not possible in this instance.</p> <p>It is not considered that this is a constraint that would warrant the refusal of the application as it would render Lot 1A Norman Street undevelopable.</p>
<p>The elevation drawings are re-worked versions of the original plans that were submitted previously and fall well short of the requests of the WLPP report dated 21 October 2021 which required new more detailed and expansive sections and elevations, and which will allow a more considered view for assessment. The elevation drawings need to be completely redrawn and re-submitted.</p>	<p>See discussion above.</p>

Concern	Comment
<p>Similarly, the Photo Montages fall well short of the WLPP report's requirements which sought 3D rendering to 'demonstrate how the built form and courtyards are housed on the site, how boundary conditions are resolved and how discrete roof forms and courtyards achieve an appropriate response to the site's form and landscape features. The views should be taken from a number of key locations, chosen for their impact on public amenity.' The drawings need to be resubmitted in accordance with the requests of the WLPP report.</p>	
<p>Impacts to the streetscape, incompatibility of the proposal with the natural and built context and inaccuracy of photo montages in illustrating this impact</p>	<p>With regard to the context, Chapter D1 Character Statements from Wollongong Development Control Plan 2009 contains a description of the current and desired future character of Mangerton as follows:</p> <p><u>Existing Character</u></p> <p><i>Mangerton is situated approximately 1.5 kilometres from the Wollongong City Centre.</i></p> <p><i>Mangerton is a leafy residential suburb which is characterised by predominantly single to two storey weatherboard bungalows and brick dwelling-houses with some pockets of medium density housing in the form of villas, townhouses and walk-up residential flats.</i></p> <p><i>Mangerton also contains a number of streets lined with Brush Box (<i>Lophostemon confertus</i>), Blackbutt (<i>Eucalyptus patens</i>), Turpentine (<i>Syncarpia glomulifera</i>), Hills Fig (<i>Ficus macrocarpa</i> var. <i>hillii</i>) trees, which add to the streetscape and leafy character of the suburb.</i></p> <p><i>A large remnant stand of Spotted Gum (<i>Eucalyptus maculata</i>) trees exists at Mt Drummond, WIN TV station site and the former RAAF site. Cabbage Tree Palms (<i>Livistona australis</i>), Lemon-scented gum (<i>Eucalyptus citridoria</i>), Brush box (<i>Lophostemon confertus</i>), Blackbutt (<i>Eucalyptus pilularis</i>), and Jacaranda (<i>Jacaranda mimosifolia</i>) trees also provide a leafy backdrop to the suburb.</i></p> <p><i>The Illawarra Grammar School (TIGs) is located within the western edge of Mangerton and adjoins the St Therese Catholic primary school on Powell Street.</i></p> <p><u>Desired Future Character</u></p>

Concern	Comment
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Mangerton will remain a low-density residential suburb with a mix of housing types, including detached dwelling-houses as well as some additional medium density villa and townhouse developments occurring within reasonable walking distance to bus stops in the suburb.

The retention of the significant remnant stands of trees is important, in order to maintain the leafy character of Mangerton.

The Illawarra Grammar School (TIGs) will continue to be a base of educational excellence and will be encouraged to maintain or improve its traffic management capabilities around the school.

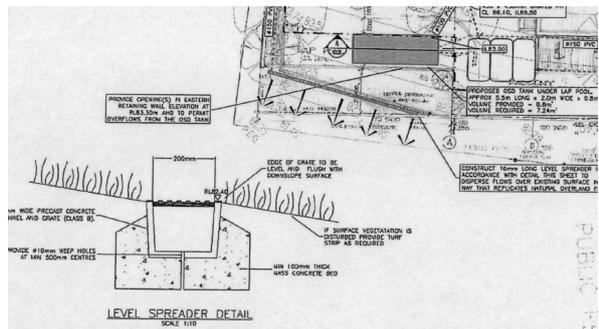
The proposed dwelling is large and modern in design and would be somewhat unique in architectural style compared to other houses along Norman Street. Notwithstanding this, the proposal is not inconsistent with the desired future character outlined above. Significant trees are retained, and the site is generally isolated from the majority of Norman Street due to street alignment, vegetation and fall of the land.

Inadequacy of stormwater report and Council officer assessment of same.

The Stormwater report and concept plan have been prepared by a suitably qualified civil engineer and have been reviewed by Council’s Stormwater Officer with respect to compliance with Council controls for stormwater management.

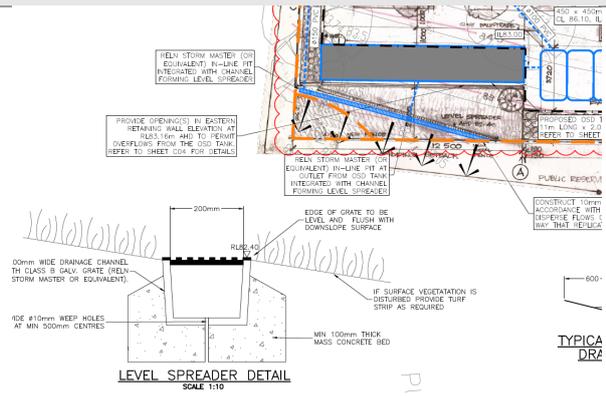
Potential impacts to trees adjacent the level spreader.

It is noted a level spreader was approved under the prior development application for the other dwelling on the site (DA-2017/1719) as illustrated below.



The level spreader will be utilised by the new dwelling and the stormwater analysis has demonstrated that this is fit for purpose.

Concern	Comment
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<p>The proposed landscaping includes a large number of exotics with few natives and will not support local birdlife.</p>	<p>The proposed landscaping has been reviewed by Council’s Landscape Officer and found to be satisfactory with regard to Council controls.</p>
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The site has additionally been excavated down to clay and would provide a poor growing medium.

<p>How can Council provide conditional support for the proposal without confirmation Sydney Water support the encroachment over the easement?</p>	<p>The encroachment of the building over the Sydney Water easement has been removed.</p>
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<p>The proposed non-compliances (no. of storeys and encroachment in 6m front setback) are unjustified given the size of the site.</p>	<p>The variation sought to the number of storeys was discussed in the previous report to the Local Planning Panel who did not raise that as a reason for deferral of the determination.</p>
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The encroachment into the front setback is discussed at Chapter A1 below and has either been addressed in amended plans or is proposed to be addressed via additional conditions.

<p>Development costs will have gone up since the application was lodged.</p>	<p>It is not considered reasonable to require a new cost of works based on the lapsing of time since the original submission.</p>
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<p>View impacts arising from non-compliant setback.</p>	<p>The non-compliant setback is to be largely removed as discussed at Chapter A1 below.</p>
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<p>During recent rainfall, number 2 Norman Street has experienced significant adverse stormwater runoff from the subject property.</p>	<p>This is a matter to be raised with the Certifier for the site or with Council’s regulation and enforcement division or Fair Trading if the certifier does not take appropriate action.</p>
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Conclusion

Subject to the revised plans and conditions of consent the recommendations of the Panel are now considered to have been satisfactorily addressed.

Changes to the plans are considered minor and do not raise any other planning considerations not already previously addressed in the report presented to the Panel. Additional internal and external referrals are satisfactory and additional submissions have been considered.

RECOMMENDATION

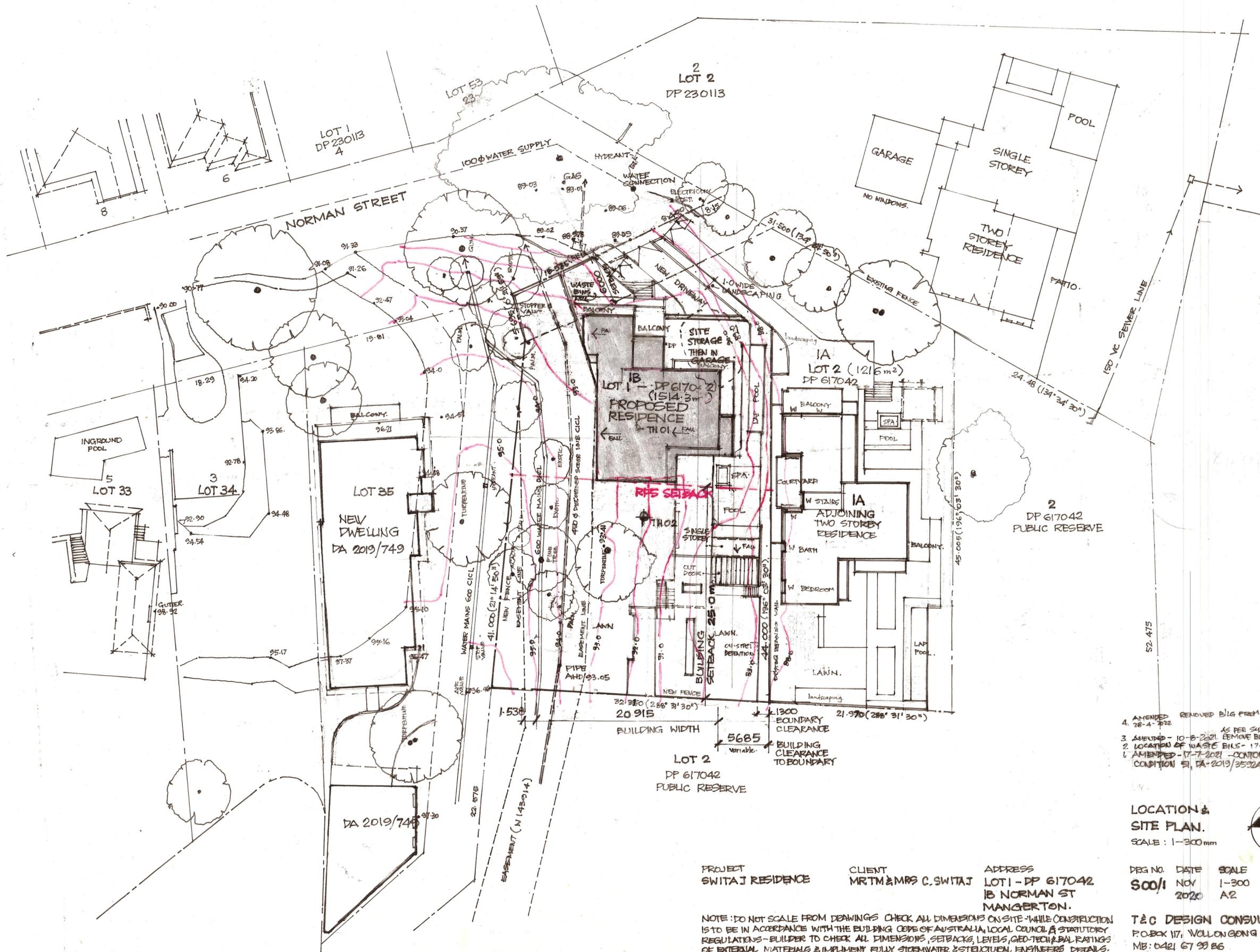
It is recommended that the application be approved subject to the conditions at **Attachment 7**.

ATTACHMENTS

- 1 Aerial photograph
- 2 WLEP zoning map
- 3 Plans
- 4 WLPP recommendation 26 October 2021
- 5 Artist impressions
- 6 Stormwater Plans
- 7 Amended draft conditions of consent

Attachment 1 – Aerial Photograph





1. AMENDED - 17-7-2021 - CONTOURS FOR CONDITION 51, DA-2019/353246.
2. AMENDED - 10-8-2021. REMOVE BE FROM EASEMENT.
3. AMENDED - 10-8-2021. REMOVE BE FROM EASEMENT.
4. AMENDED - 26-4-2022. REMOVE B/LG FROM EASEMENT.

LOCATION & SITE PLAN.
 SCALE : 1-300mm

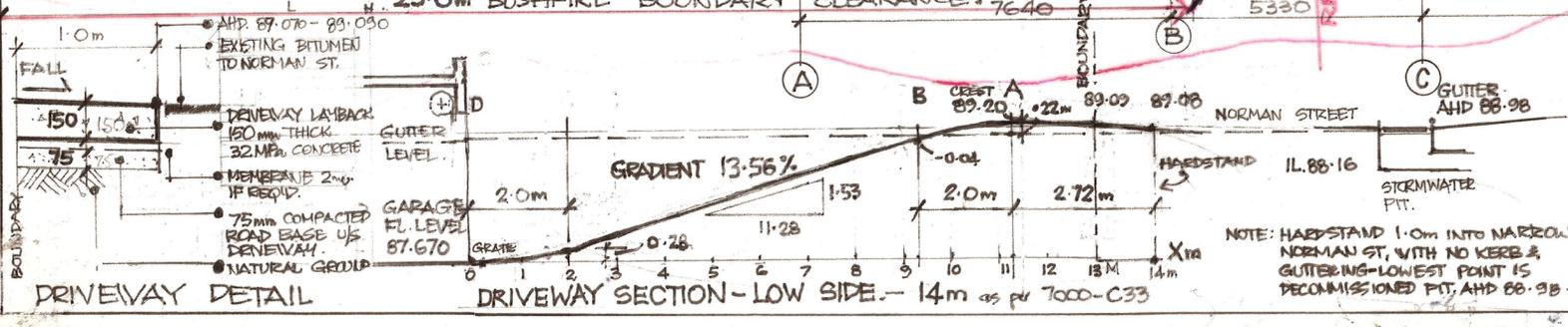
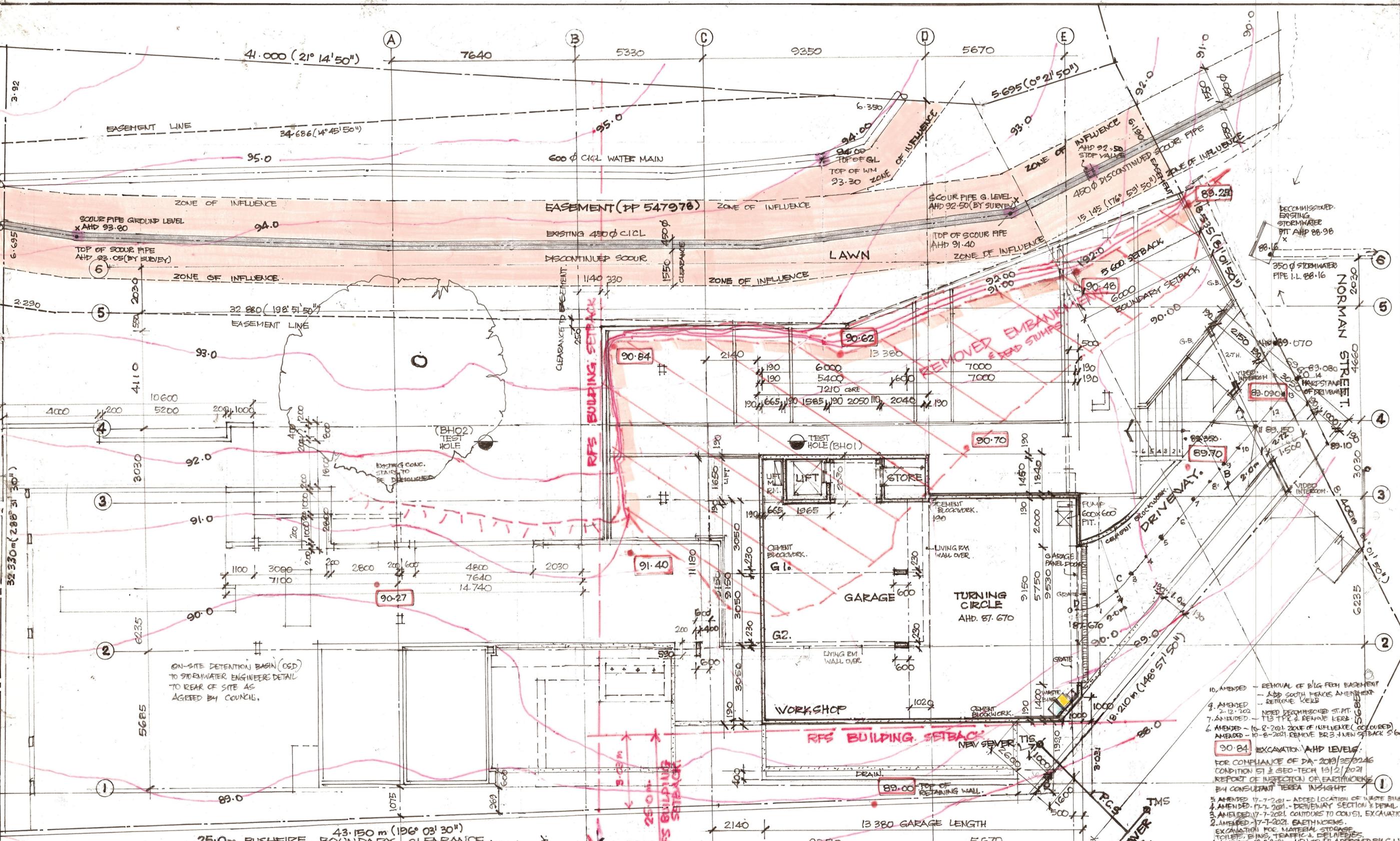


DEG NO.	DATE	SCALE	DRAWN
500/1	NOV 2020	1-300	T SWITAJ A2

PROJECT: SWITAJ RESIDENCE
 CLIENT: MRTM & MRS C. SWITAJ
 ADDRESS: LOT 1 - DP 617042, 1B NORMAN ST, MANGERTON.

NOTE: DO NOT SCALE FROM DRAWINGS. CHECK ALL DIMENSIONS ON SITE WHILE CONSTRUCTION. IS TO BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA, LOCAL COUNCIL & STATUTORY REGULATIONS - BUILDER TO CHECK ALL DIMENSIONS, SETBACKS, LEVELS, GEO-TECH & BAL RATINGS OF EXTERNAL MATERIALS & IMPLEMENT FULLY STORMWATER & STRUCTURAL ENGINEERS DETAILS.

T&C DESIGN CONSULTANTS
 P.O. BOX 117, VOLLON GONG 2520 NEW
 MB: 0421 67 93 86



- 10. AMENDED - REMOVAL OF BIG FECH EASEMENT
- 11. AMENDED - ADD SOUTH FENCE AMENDMENT
- 12. AMENDED - REMOVE KERB
- 13. AMENDED - NOTED DECOMMISSIONED ST. PIT
- 14. AMENDED - TB TR & REPAIR KERB (10)
- 15. AMENDED - 10-8-2021 ZONE OF INFLUENCE (COLOURED)
- 16. AMENDED - 10-8-2021 REMOVE BR3.1 LIVEN SETBACK 5.6m
- 17. AMENDED - EXCAVATION AHD LEVELS
- 18. AMENDED - FOR COMPLIANCE OF DA-2019/353246
- 19. AMENDED - CONDITION 51 & GEO-TECH 19/2/2021
- 20. AMENDED - REPORT OF INSPECTION OF EARTHWORKS
- 21. AMENDED - BY CONSULTANT TERRA INSIGHT.
- 22. AMENDED - 17-7-2021 - ADDED LOCATION OF WASTE BIN
- 23. AMENDED - 17-7-2021 - DRIVEWAY SECTION & DETAIL
- 24. AMENDED - 17-7-2021 - CONTIGUOUS TO CON.SI. EXCAVATION
- 25. AMENDED - 17-7-2021. EARTHWORKS.
- 26. AMENDED - EXCAVATION FOR MATERIAL STORAGE
- 27. AMENDED - TOILETS, BINS, TRAFFIC & DELIVERIES.
- 28. AMENDED - 18-3-2021. - NEW SEWER APPROVED BY S.W.

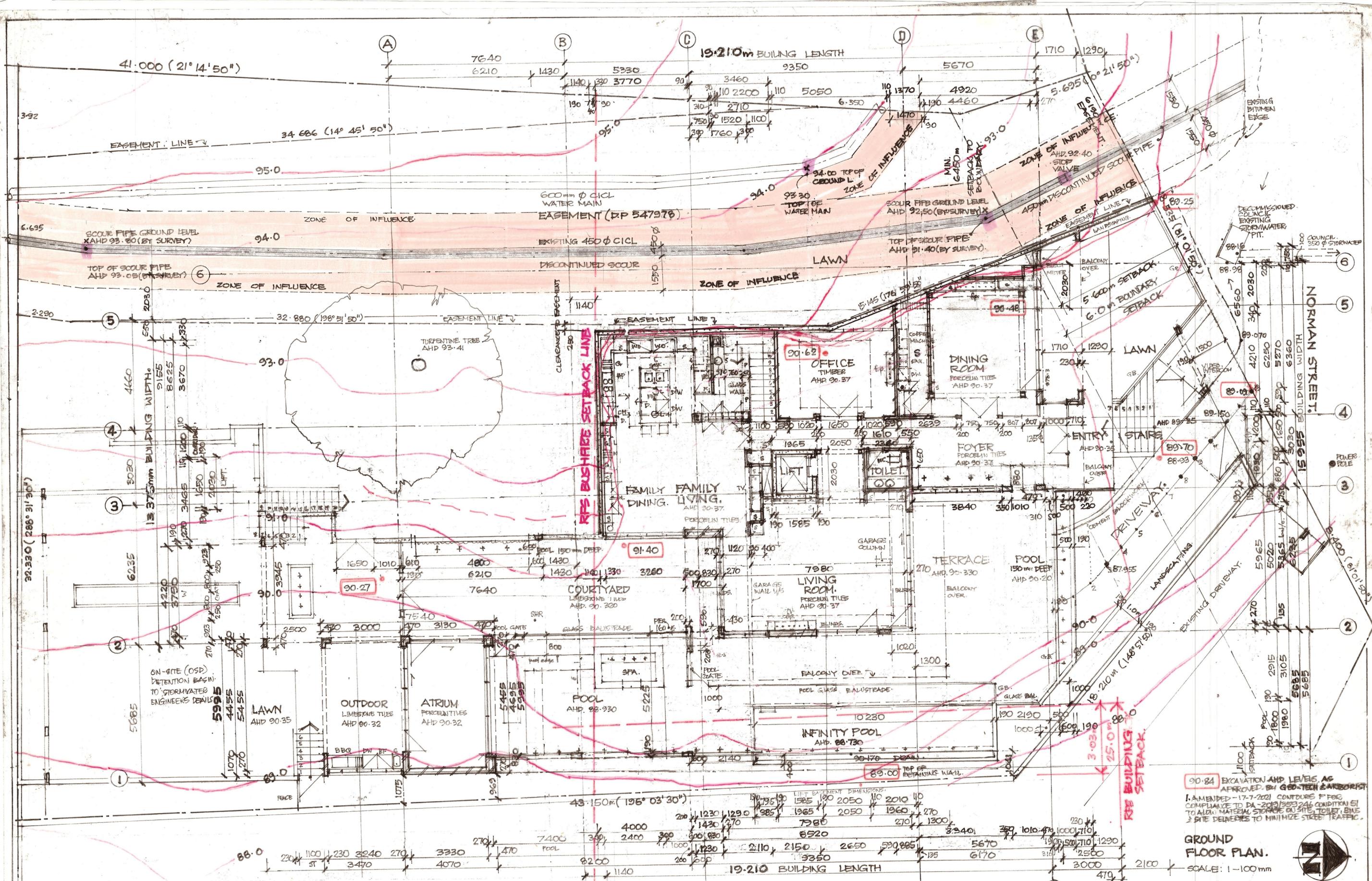
BASEMENT FLOOR PLAN.
SCALE: 1-100mm

PROJECT SWITAJ RESIDENCE
CLIENT MRTM & MRS C. SWITAJ
ADDRESS LOT 1 - DP 617042
1B NORMAN ST.
MANGERTON.

DEG NO 02/12
DATE NOV 2020
SCALE 1-100
DRAWN T. SWITAJ
A2

NOTE: DO NOT SCALE FROM DRAWINGS - CHECK ALL DIMENSIONS ON SITE WHILE CONSTRUCTION IS TO BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA, LOCAL COUNCIL STATUTORY REGULATIONS - BUILDER TO CHECK ALL DIMENSIONS, SETBACKS, LEVELS, GEO-TECH, AND RATINGS OF EXTERNAL MATERIALS & IMPLIMENT FULLY STORMWATER & STRUCTURAL ENGINEERS DETAILS.

NOTE: HARDSTAND 1.0m INTO NARROW NORMAN ST, WITH NO KERB & GUTTERING - LOWEST POINT IS DECOMMISSIONED PIT, AHD 88.98.



90.84 EXCAVATION AND LEVELS AS APPROVED BY GEO-TECH & ARBORIST
 1. AMENDED - 17-7-2021 CONTOURS F F&C COMPLIANCE TO DA-2019/553246 CONDITION 51 TO ALLOW MATERIAL STORAGE ON SITE, TOILET, BMS & SITE DELIVERIES TO MINIMIZE STREET TRAFFIC.

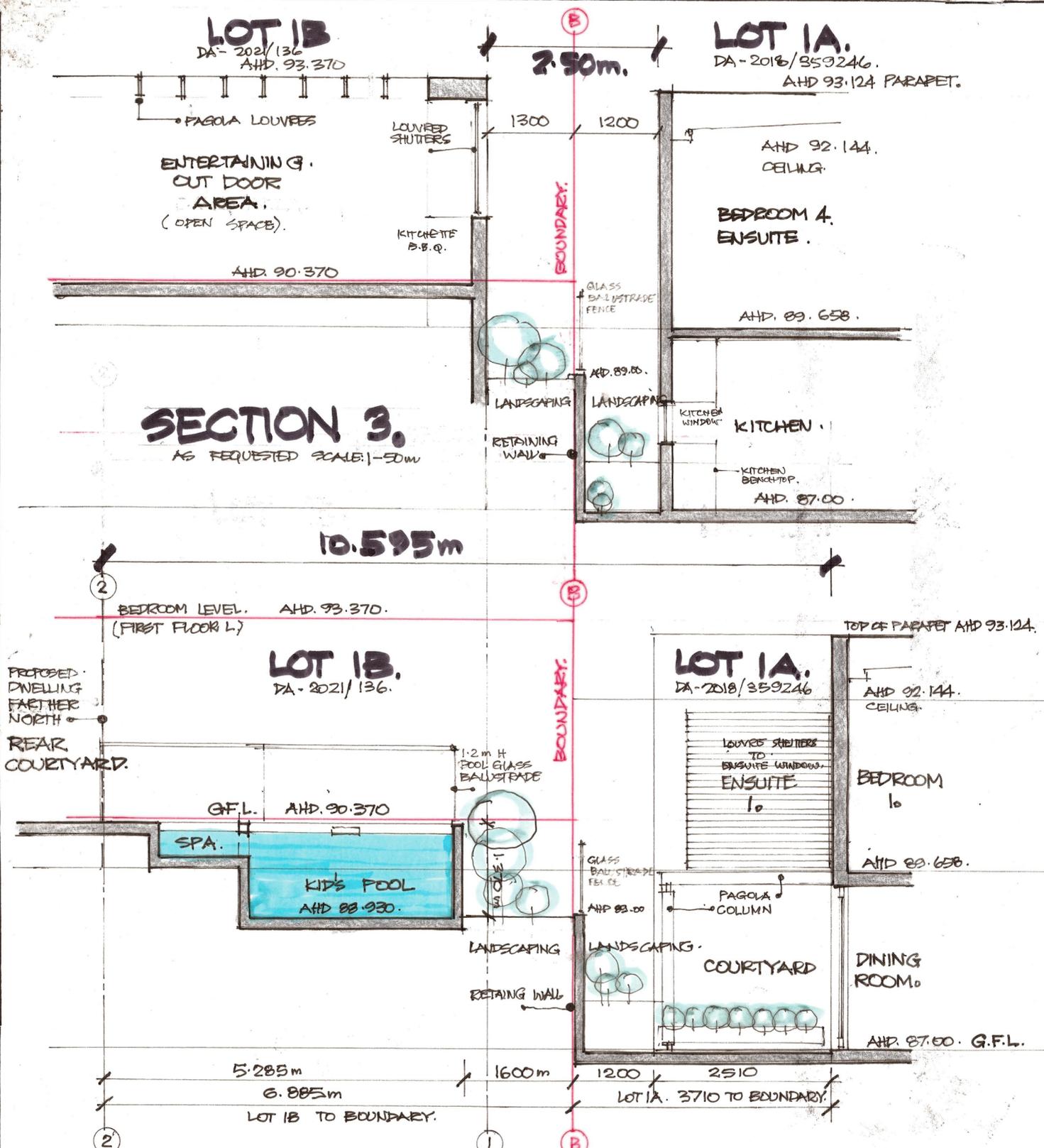
GROUND FLOOR PLAN.
 SCALE: 1-100mm

PROJECT: SWITAJ RESIDENCE
 CLIENT: MR TM & MRS C. SWITAJ
 ADDRESS: LOT 1 - DP 617042 1B NORMAN ST. MANGERTON.
 DEG NO: 03/12
 DATE: NOV 2020
 SCALE: 1-100
 DRAWN: T.SWITAJ
 A2

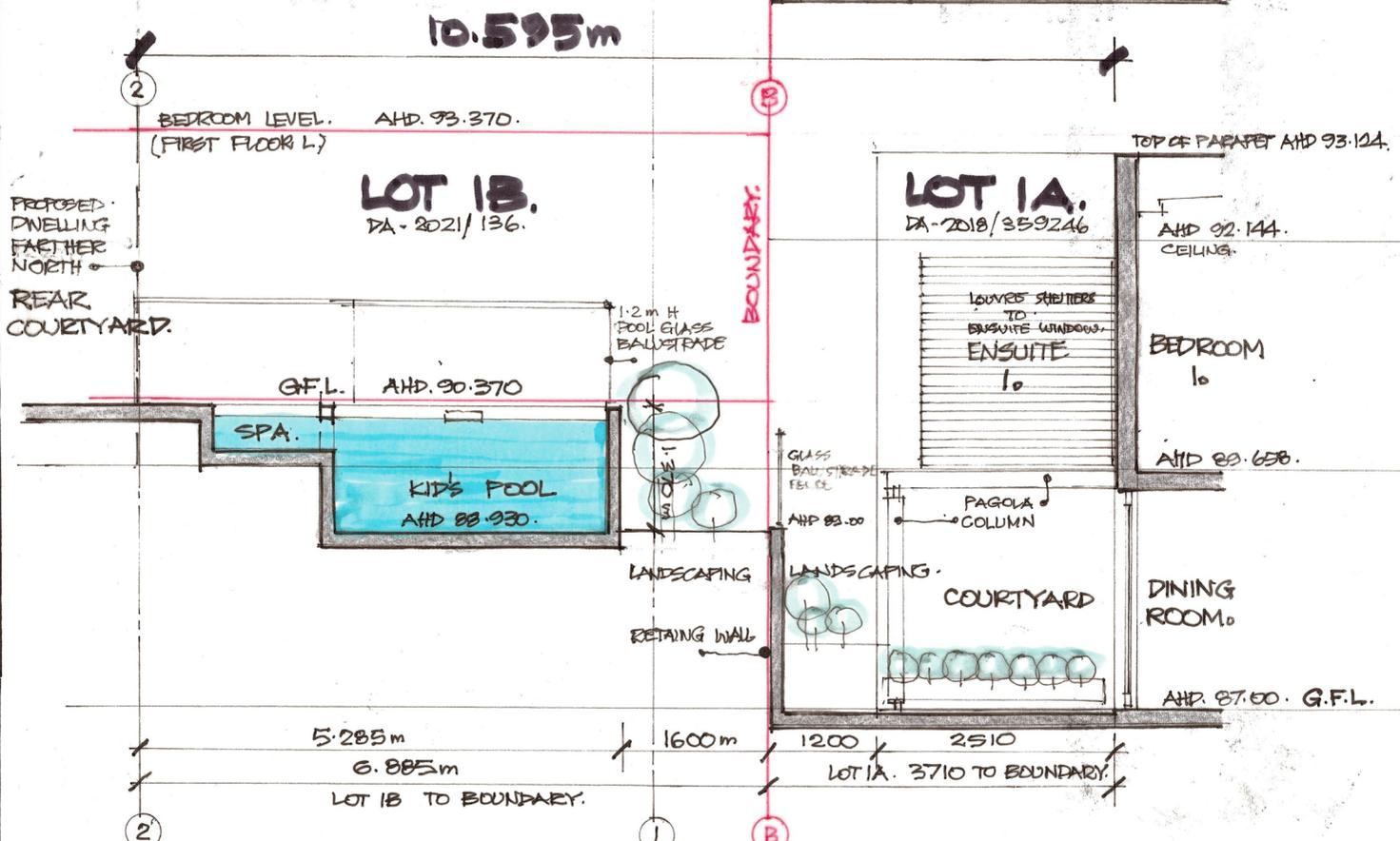
T&C DESIGN CONSULTANTS.
 P.O. BOX 117, WOLLONGONG 2520 NSW
 MB: 0421 6799 86

- 8. AMENDED - 25-4-2022 - REMOVED PART BUILDING FROM EASEMENT. CORRECTED DIMENSIONS.
- 7. AMENDED - 2-12-2021 - REMOVE KERB & SOUTH FENCE ALIGNED.
- 6. AMENDED - T13 TP2 + REMOVE KERB NRY-2471.
- 5. AMENDED - 10-8-2021 ZONE OF INFLUENCE (COLOURED).
- 4. AMENDED DIMENSIONS TO BR3 PER TO SUBMIT WATER.
- 3. AMENDED - 10-8-2021. REMOVE BR3 + NEW SETBACK 5.6m.

NOTE: DO NOT SCALE FROM DRAWINGS - CHECK ALL DIMENSIONS ON SITE, WHILE CONSTRUCTION IS TO BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA, LOCAL COUNCIL, STATUTORY REGULATIONS - BUILDER TO CHECK ALL DIMENSIONS SETBACKS, LEVELS, GEO-TECH, BAL RATINGS OF EXTERNAL MATERIALS & IMPLEMENT FULLY STORM WATER & STRUCTURAL ENGINEERS DETAILS



SECTION 3.
AS REQUESTED SCALE: 1-50mm

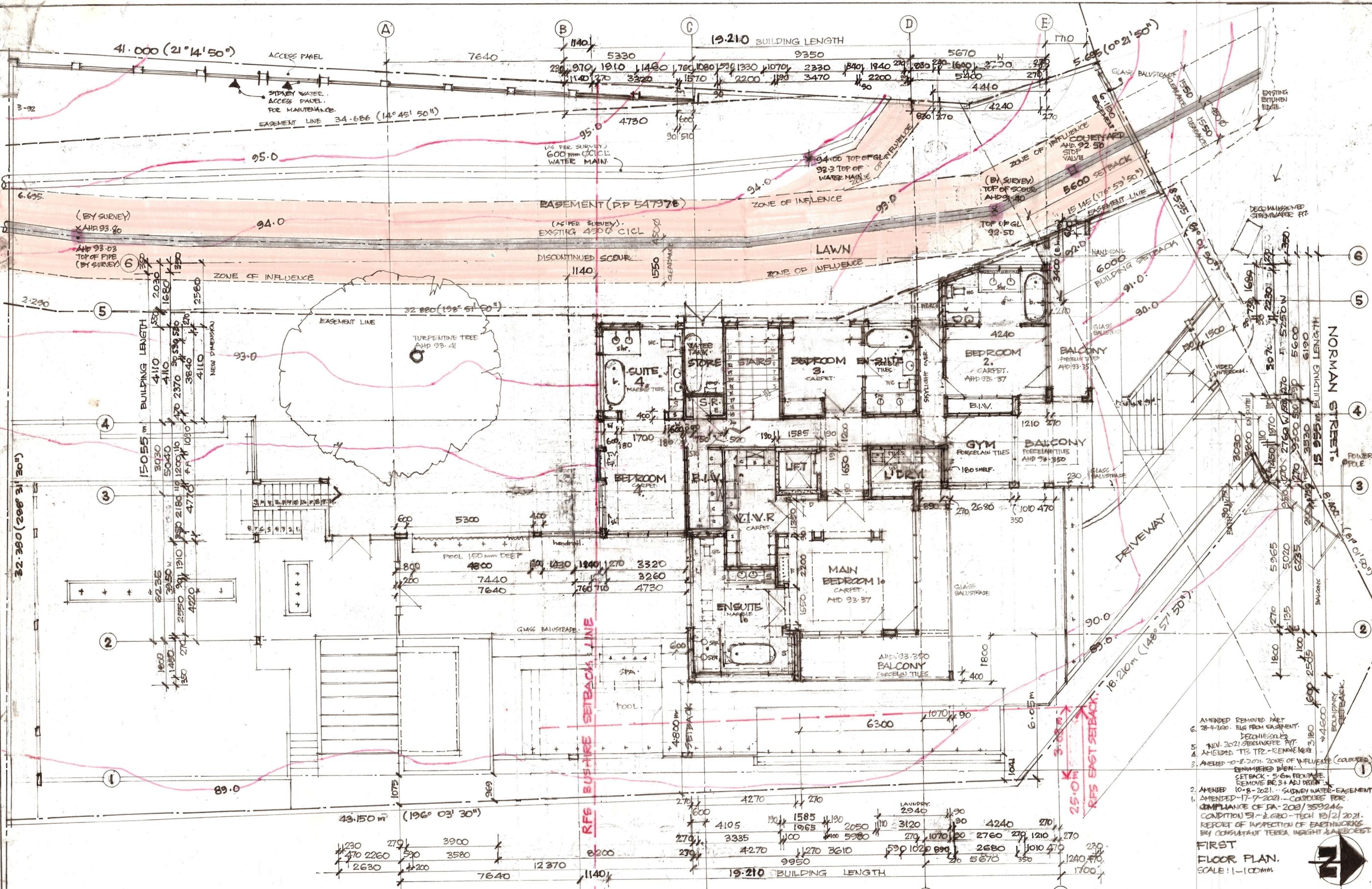


SECTION 1.
AS REQUESTED. SCALE: 1-50mm

ADJOINING LOT 1A & LOT 1B
SECTION 1-2-3.
SCALE: 1-50mm

PROJECT: SWITAJ RESIDENCE
CLIENT: MR TM & MRS C. SWITAJ
ADDRESS: LOT 1 - DP 617042, 1B NORMAN ST., MANGERTON.
DRG NO. DATE: SCALE DRAWN.
3A/12 FEB 1-50m T. SWITAJ
2021. A2

NOTE: DO NOT SCALE FROM DRAWINGS - CHECK ALL DIMENSIONS ON SITE WHILE CONSTRUCTION IS TO BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA, LOCAL COUNCIL, STATISTICAL REGULATIONS - BUILDER TO CHECK ALL DIMENSIONS, SETBACKS, LEVELS, GED-TECH, BAL. RATINGS OF EXTERNAL MATERIALS & IMPLEMENT FULLY STORMWATER & STRUCTURAL ENGINEERS DETAILS.
T & C DESIGN CONSULTANTS
P.O. BOX 117, WOLLONGONG 2520 NSW
MB: 0421 679 986



- 6. AMENDED REMOVED PART 28-4-2020. BIG FROM EASEMENT. DECOMMISSIONED STORMWATER PIT.
- 5. NOV. 2021. STORMWATER PIT.
- 4. AMENDED TRS - KENNEDY.
- 3. AMENDED 10-8-2021. ZONE OF INFLUENCE (COLOURED). REMOVED BLEN. SETBACK - 5.6m FROM DATE. REMOVE BE.3+ ADJ DESIGN.
- 2. AMENDED 10-8-2021. - SUDNEY WATER-EASEMENT.
- 1. AMENDED 17-7-2021. - CASUALTY FOR COMPLIANCE OF DA-208/359246. CONDITION 51 - 2.650-TECH 13/2/2021. REPORT OF INSPECTION OF EARTHWORKS BY CONSULTANT TERESA INGHAM & ASSOCIATES

FIRST FLOOR PLAN.
 SCALE: 1:100MM



PROJECT: SWITAJ RESIDENCE
 CLIENT: MR TM & MRS C. SWITAJ
 ADDRESS: LOT 1 - DP 617042, 1B NORMAN ST., MANGERTON.

DRG NO: 04/12
 DATE: NOV 2020
 SCALE: 1:100
 DRAWN: TSWITAJ
 A2

NOTE: DO NOT SCALE FROM DRAWINGS. CHECK ALL DIMENSIONS ON-SITE, WHILE CONSTRUCTION IS TO BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA, LOCAL COUNCIL STATUTORY REGULATION 3 - BUILDER TO CHECK ALL DIMENSIONS, SETBACKS, LEVELS, GEO-TECH, BAL RATING OF EXTERNAL MATERIALS & INFLUENT FULLY STORMWATER & STRUCTURAL ENG INEERS DETAILS

T&C DESIGN CONSULTANTS
 P O BOX 117, WOLLONGONG 2520 NSW
 MB: 0421 6799 86



TREE LEGEND AS PER SURVEY
C. ROBSON & ASSOCIATES P.L.
LAND & ENGINEERING SURVEYORS.

	BOUNDARY OF SITE CONTOURS AND LEVELS.		TREES TO BE REMOVED: T3, T4, A, B, C
	PROPOSED NEW DWELLING FALL OF ROOF		EASEMENT WITH EX. PIPES (SIDEY WATER)
	EXISTING TREES WITH SURVEYED AND LEVELS		MANAGED GRASS AREA
	EXOTICS & SMALL SHRUBS		POOL

PA-2019/359246 CONDITION 51
& GEO-TECH REPORT 19/2/2021

No	TREE TYPE	AHD. by SURVEYOR	
T1	SYNGARPIA GLOMULIFERA TURPENTINE	AHD 93.41	
T2	CALLISTEMON VIMINALIS WEeping BOTTLEBRUSH	AHD 94.45	
T3	PINUS PATULA MEXICAN WEeping PINE	AHD 94.85	TO BE REMOVED
T4	ACACIA MAIDENII MAIDENS WATTLE	AHD 95.50	TO BE REMOVED
T5	GINKGO BILOBA GINKGO	AHD 94.22	
T6	BRACHYCHITON ACERIFOLIUS ILLAWARRA FLAME TREE	AHD 94.05	
T7	SYNGARPIA GLOMULIFERA TURPENTINE	AHD 95.99	
T8	STENOCAERUS SINDATUS FIREHEED TREE	AHD 93.28	
T9	EUCALYPTUS PILLULARIS BLACK BUTT	AHD 90.50	
T10	EUCALYPTUS PILLULARIS BLACK BUTT	AHD 89.022	
T11	EUCALYPTUS PILLULARIS BLACK BUTT	AHD 87.48	
T12	SYNGARPIA GLOMULIFERA TURPENTINE	AHD 87.03	
T13	SYNGARPIA GLOMULIFERA TURPENTINE	AHD 86.37	
T14	EUCALYPTUS PILLULARIS BLACK BUTT	AHD 89.26	
A	PALM	AHD 94.22	TO BE REMOVED
B	PALM	AHD 95.16	TO BE REMOVED
C	PALM	AHD 93.62	TO BE REMOVED

EARTHWORKS AREA FOR
PA-2019/359246 CONDITION 51
TOILET, BINS, SITE DELIVERIES, STORAGE

90.84 EXCAVATION AND LEVELS
AMENDED - 28-4-2022 - REMOVE PART E/LG FROM EASEMENT PLAN.
- TITLE FROM TREE SURVEY PLAN TO TREE LOCATION
4. AMENDED 16-9-2021 - REAR DECK ADDED-FILL (GENUINE TO TREE)
3. AMENDED 10-8-2021 - REMOVE BC 3 FROM EASEMENT DUE TO STRAY WATER
2. AMENDED 17-7-2021 - CONTOURS (CON. ST. DA 2019/359246)
1. AMENDED 17-7-2021 - TITLE / TREE DESCRIPTION.

TREE LOCATION PLAN
SCALE: 1:200 mm.

DES No. DATE SCALE DRAWN
05/12 NOV 1:200 T.SWITAJ
2020 A2

T&C DESIGN CONSULTANTS
P.O. BOX 117, WOLLONGONG 2520 NSW
NB. 0421 6799 86.

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CLIENT
MRT. M & MRS C. SWITAJ LOT 1B - DP. 617042
18 NORMAN ST.
MANGERTON.

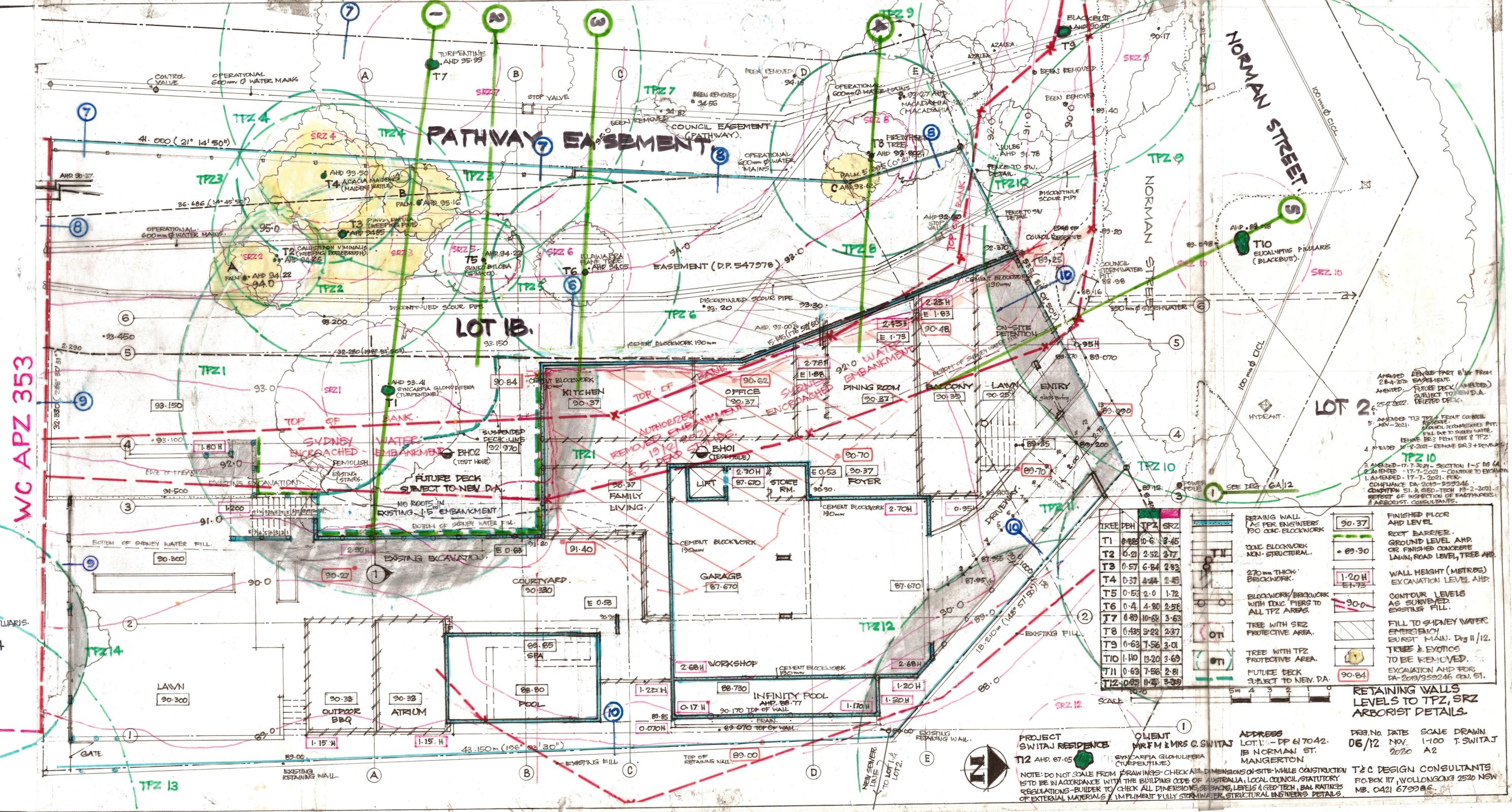
WC APZ 353

WC APZ 352

4 LOT 24.

6 LOT 23

8 LOT 22



WC APZ 353

PUBLIC RESERVE TREES

TREE	DBH	TPZ	SRZ
T13	1.09	13.08	3.62
T14	0.50	6.0	2.66

TREE	DBH	TPZ	SRZ
T1	0.88	10.6	3.45
T2	0.21	2.32	2.17
T3	0.57	6.84	2.83
T4	0.37	4.44	2.43
T5	0.53	2.0	1.72
T6	0.4	4.80	2.58
T7	0.89	10.68	3.63
T8	0.48	5.82	2.37
T9	0.63	7.56	3.01
T10	1.10	13.20	3.69
T11	0.63	7.56	2.81
T12	0.85	11.18	3.39

	RETAINING WALL AS PER ENGINEERS 190 CONC. BLOCKWORK	90.37
	190 CONC. BLOCKWORK NON-STRUCTURAL	89.30
	270mm THICK BRICKWORK	1.20H ET-75
	BLOCKWORK/BRICKWORK WITH 190mm PIERS TO ALL TPZ AREAS	90.0
	TREE WITH SRZ PROTECTIVE AREA	
	TREE WITH TPZ PROTECTIVE AREA	
	FUTURE DECK SUBJECT TO NEV. DA	90.84
	FINISHED FLOOR AND LEVEL	
	ROOT BARRIER - GROUND LEVEL AND/OR FINISHED CONCRETE LAWN, ROAD LEVEL, TREE AND	
	WALL HEIGHT (METRES) EXCAVATION LEVEL AND	
	CONTOUR LEVELS AS SURVEYED. EXISTING FILL	
	FILL TO SYDNEY WATER EMBANKMENT. EUREST MAIN. Dwg 11/12.	
	TREES & EXOTICS TO BE REMOVED. EXCAVATION AND FOR DA-2019/359246 GEN. ST.	

RETAINING WALLS LEVELS TO TPZ, SRZ ARBORIST DETAILS

PROJECT: SWITAJ RESIDENCE
 CLIENT: MR. F. M. & MRS. C. SWITAJ
 ADDRESS: LOT 1B - PP 617042, 1B NORMAN ST. MANGERTON
 PER. No. DATE SCALE DRAWN: 06/12 NOV. 1:00 T. SWITAJ 2020 A2
 T&C DESIGN CONSULTANTS
 PO. BOX 117, WOLLONGONG 2520 NSW
 MB. 0421 679986

AMENDED: REMOVE TREE T14 FROM 28-4-2021 EMBANKMENT SUBJECT TO NEV. DA. DELETED FROM 25-1-2022. (FUTURE DECK (AMENDED) SUBJECT TO NEV. DA. DELETED FROM 25-1-2022.)
 AMENDED: T12 TPZ FROM COUNCIL RESERVE. FUTURE TRANSFORMED PLOT. FILL DUE TO SURVEY WATER. REMOVE SRZ FROM TREE 8 TPZ.
 AMENDED: 17-7-2021 - REMOVE SRZ 3 + REVISED TPZ 10
 AMENDED: 17-7-2021 - SECTION 1-5 D6 GA 2. AMENDED: 17-7-2021 - CONTOUR TO EXCAVATION COMPLIANCE DA-2019-359246 COMPTON ST. & GEO-TECH 13-2-2021. REPORT OF INSPECTION OF EARTHWORKS & ARBORIST CONSULTANTS.



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LOT 35
FLOOR AHD 26.80

PATHWAY EASTMENT
6.0m WIDE

T8

AHP	93.20
DBH	0.435
SRZ	2.37
TPZ	5.22

4 SECTION.

5 SECTION.

NEW FENCE
FLOOR AHD 26.80

PATHWAY EASTMENT

T6

AHP	94.05
DBH	0.40
SRZ	1.72
TPZ	4.80

3 SECTION.
SCALE: 1:100mm

FLOOR AHD 26.8

EXISTING HYDRANT

T5

AHP	94.22
DBH	0.153
SRZ	1.72
TPZ	2.00

2 SECTION.
NOTE: T3, T4 TO BE REMOVED.
SCALE: 1:100mm

T7

AHP	95.99
DBH	0.89
SRZ	3.63
TPZ	10.68

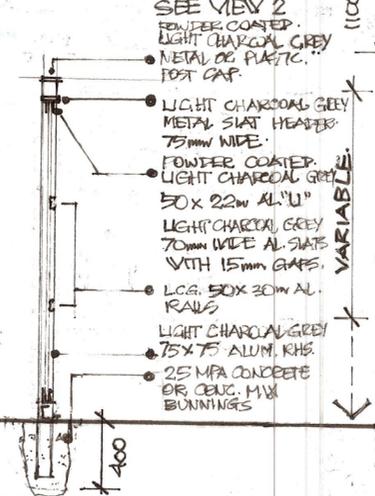
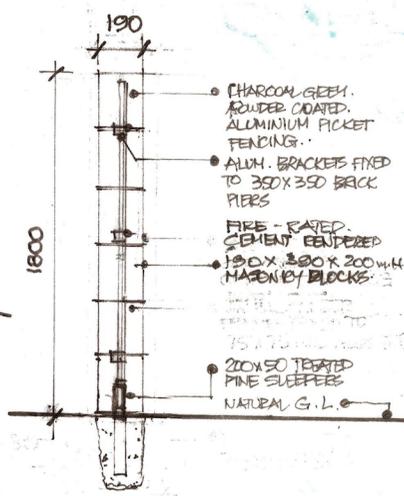
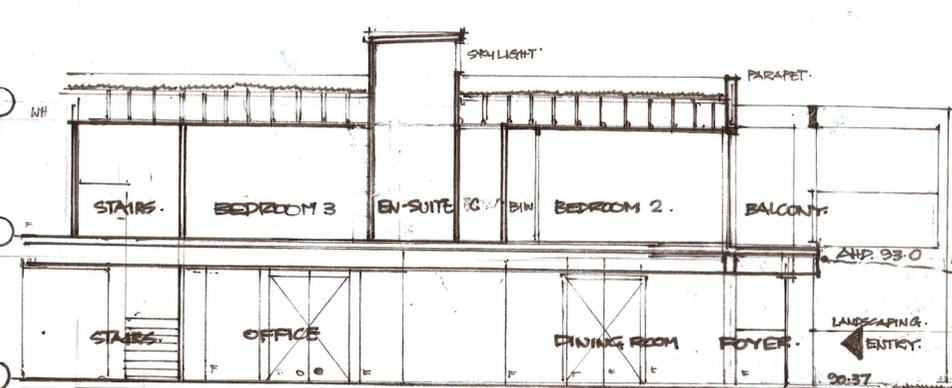
T1

AHP	93.40
DBH	0.885
SRZ	3.45
TPZ	10.60

1 SECTION.
SCALE: 1:100mm

LOT 35

PATHWAY EASTMENT
6.0m

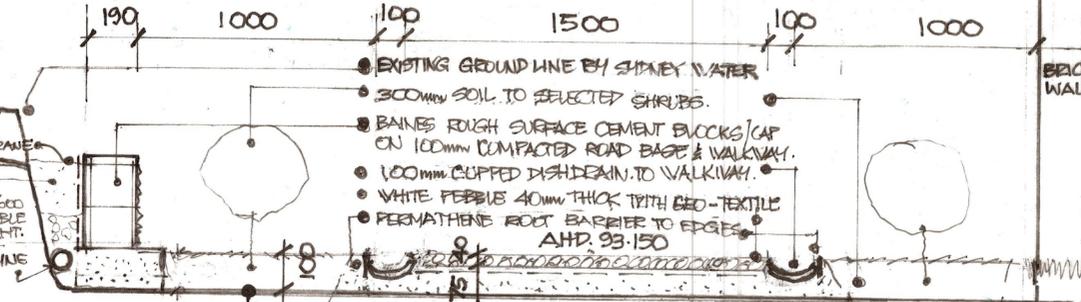


10 SECTION OF FENCE

7 SECTION OF FENCE
SEE DRG 6/12
SCALE: 1:25mm

8 SECTION OF FENCE
SEE DRG 6/12
SCALE: 1:25mm

9 SECTION OF FENCE
SEE DRG. 6/12
SCALE 1:25mm



6 SECTION THRU WALKWAY.
SCALE: 1:20mm
SEE DRG 6/12

PROJECT
SWITAJ RESIDENCE

3. AMENDED 29-4-2022
2. AMENDED - 2-12-2021
1. AMENDED - 10-8-2021. REMOVE BR3 DUE TO SUDNEY WATER.

CLIENT
MRS T.M. & MRS C. SWITAJ

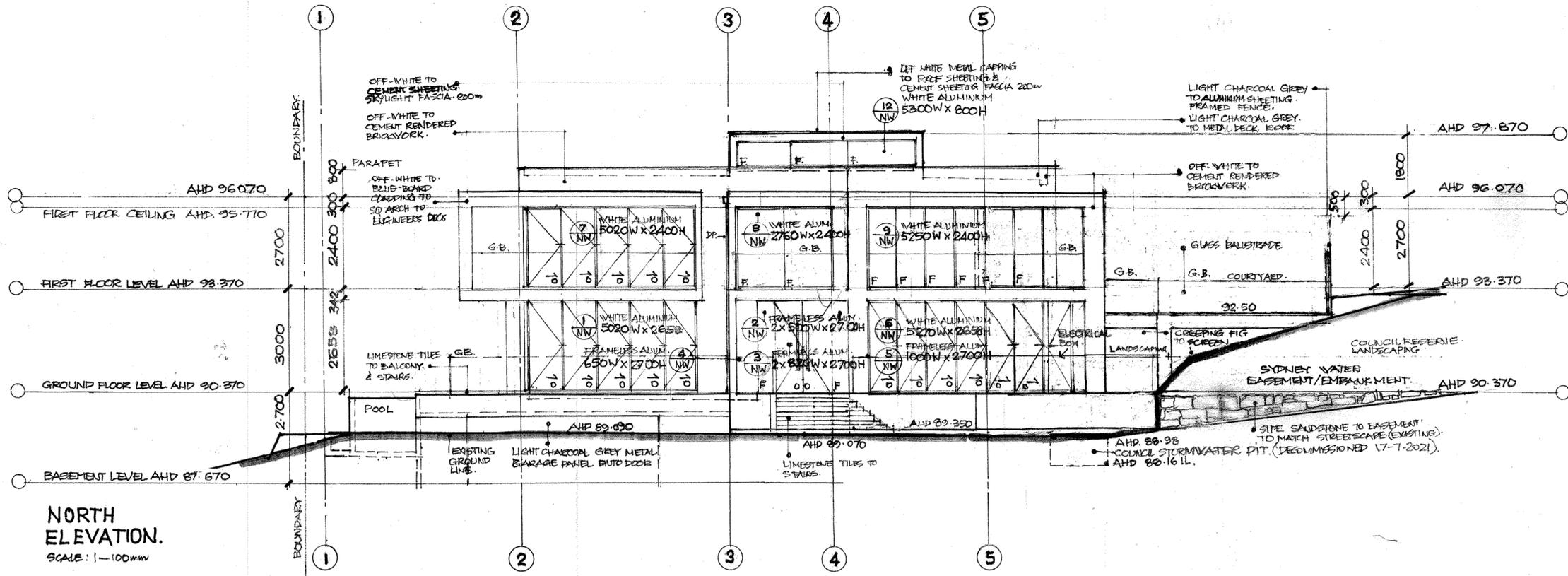
ADDRESS
LOT 1 - DP 617042
1B NORMAN ST.
MANGERTON

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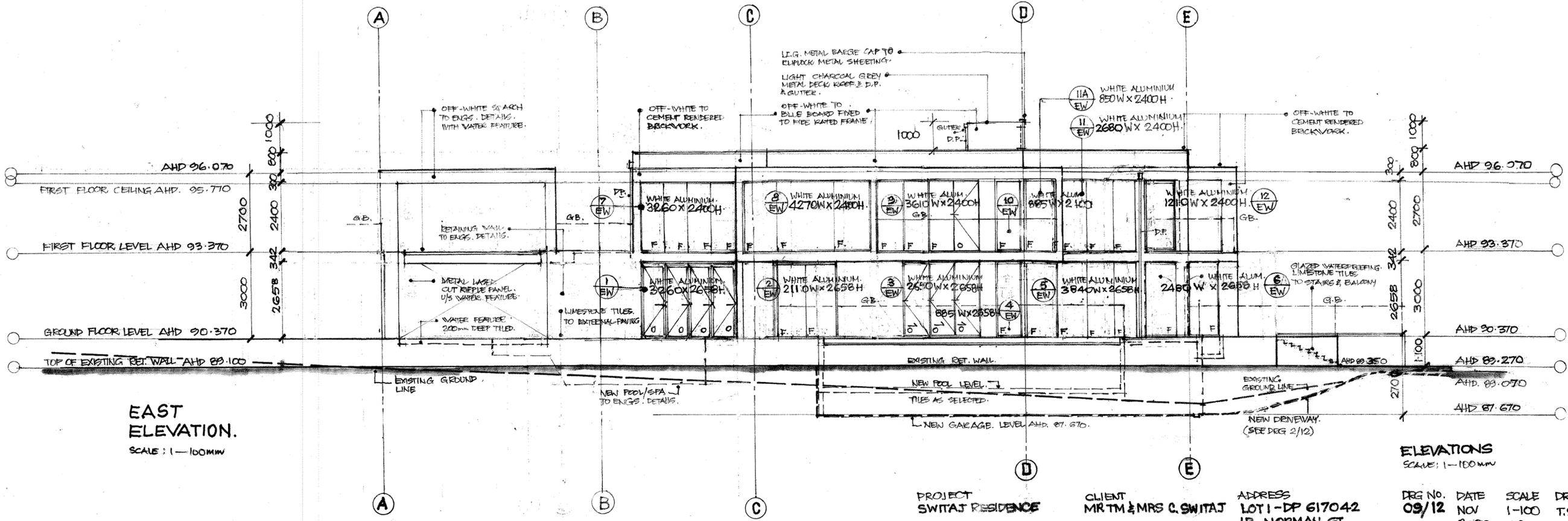
**SECTION 1-5
Fence details 6-10**

DRG. No DATE SCALE DRAWN
6A/12 JULY 1:100 T.SWITAJ
2021 1:25
A2

T & C DESIGN CONSULTANTS
P.O. BOX 117, WOLONGONG 2520 NSW
MB. 0421 675986.



NORTH ELEVATION.
SCALE: 1-100mm



EAST ELEVATION.
SCALE: 1-100mm

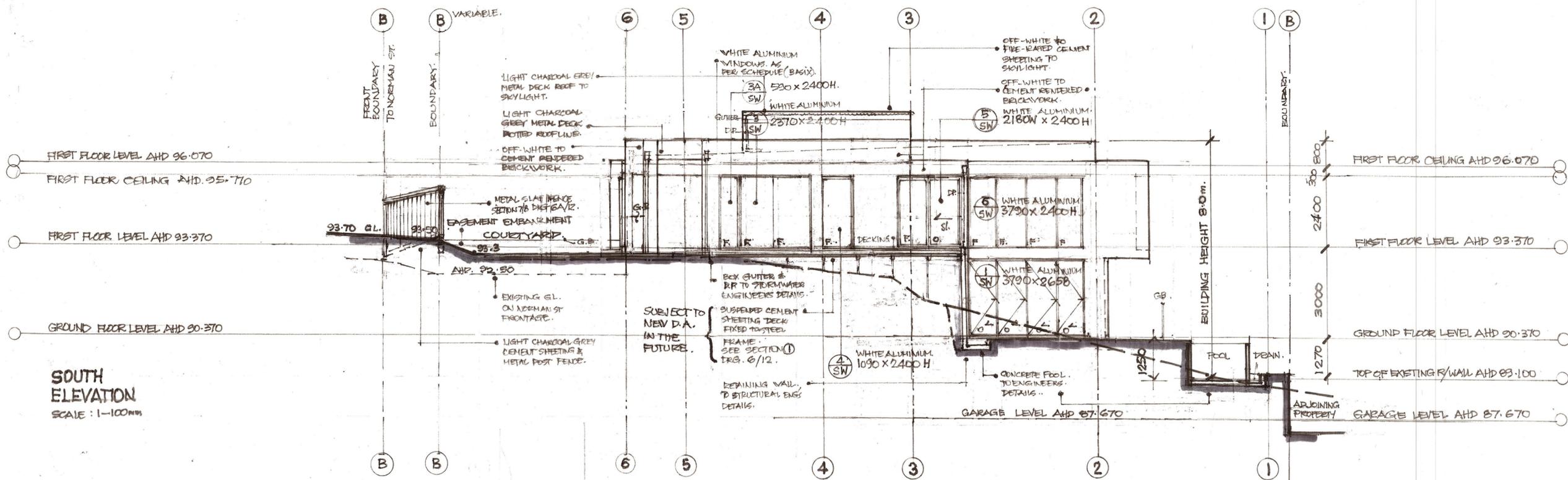
ELEVATIONS
SCALE: 1-100mm

PROJECT: SWITAJ RESIDENCE
 CLIENT: MR TM & MRS C. SWITAJ
 ADDRESS: LOT 1 - DP 617042, 1B NORMAN ST., MANGERTON
 DRG No. 09/12
 DATE NOV 2020
 SCALE 1-100
 DRAWN T. SWITAJ
 A2

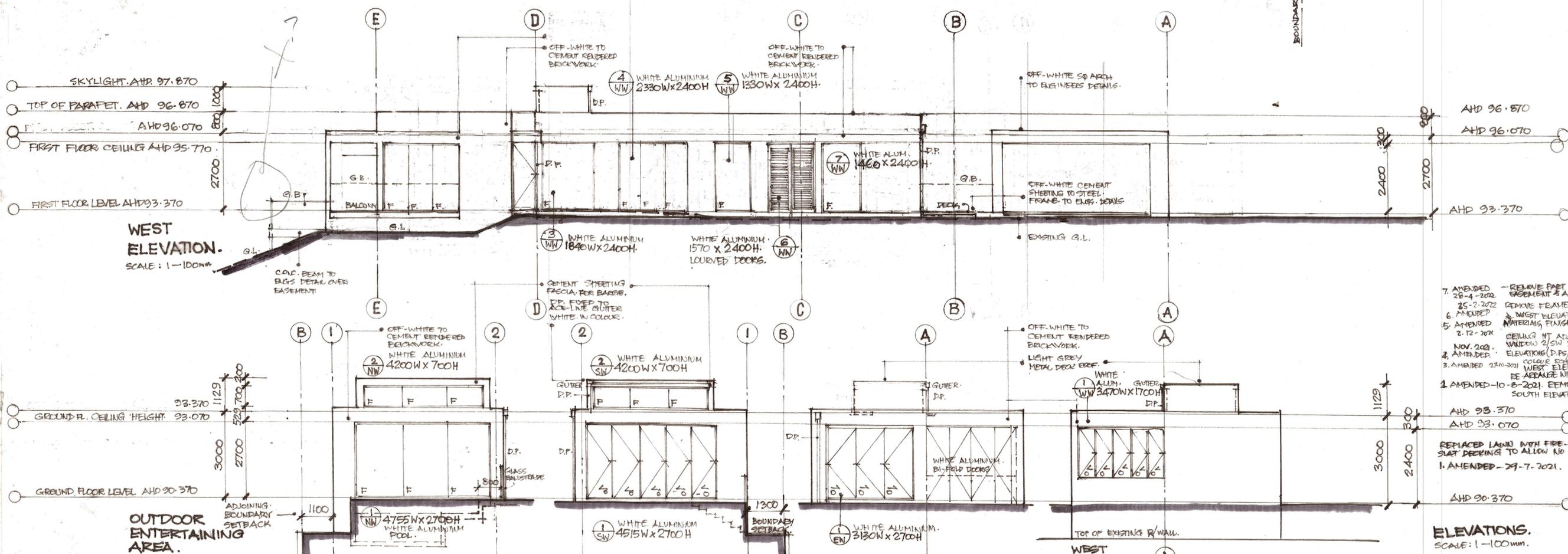
- 5. AMENDED 25-2-2022 REMOVE FRAME TO FRONT COURTYARD MATERIALS, FINISHES, COLOUR SELECTION
- 4. AMENDED 2-12-2021 MATERIALS, FINISHES, COLOUR SELECTION
- 3. AMENDED 27-10-2021 MATERIALS, FINISHES, COLOUR SELECTION
- 2. AMENDED 27-10-2021 COLOUR SCHEDULE TO ELEVATIONS
- 1. AMENDED 10-8-2021 REMOVE BR 3 AND W 9

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 MB 042 67 93 86



SOUTH ELEVATION
SCALE: 1-100mm



WEST ELEVATION
SCALE: 1-100mm



NORTH ELEVATION
SCALE: 1-100mm

SOUTH ELEVATION
SCALE: 1-100mm

EAST ELEVATION
SCALE: 1-100mm

OUTDOOR ENTERTAINING AREA
SCALE: 1-100mm

- 7. AMENDED 28-4-2022 - REMOVE PART 6/16 FROM GROUND & ALTER WEST ELEVATION SOUTH
- 25-2-2022 REMOVE FRAME FROM SOUTH ELEVATION
- 6. AMENDED 2.12.2021 WEST ELEVATION MATERIALS FINISHES, COLOUR SELECTION
- 5. AMENDED 2.12.2021 CEILING HT ADJUSTED PER ROOM PLAN WINDOW 2/SW DELETED TO BE DESIGNED
- 4. AMENDED NOV. 2021 ELEVATIONS (D.P.S) FINISHES COLOUR SCHEDULE TO ELEVATIONS WEST ELEVATION 1/2 TO SW. BE ABOVE WINDOWS TO BE 2
- 3. AMENDED 27-10-2021 WEST ELEVATION 1/2 TO SW. BE ABOVE WINDOWS TO BE 2
- 2. AMENDED 10-8-2021 REMOVE BR 3 ON SOUTH ELEVATION/EXTEND COURTYARD

- AHD 96.870
- AHD 96.070
- AHD 93.370
- AHD 93.070
- AHD 90.370

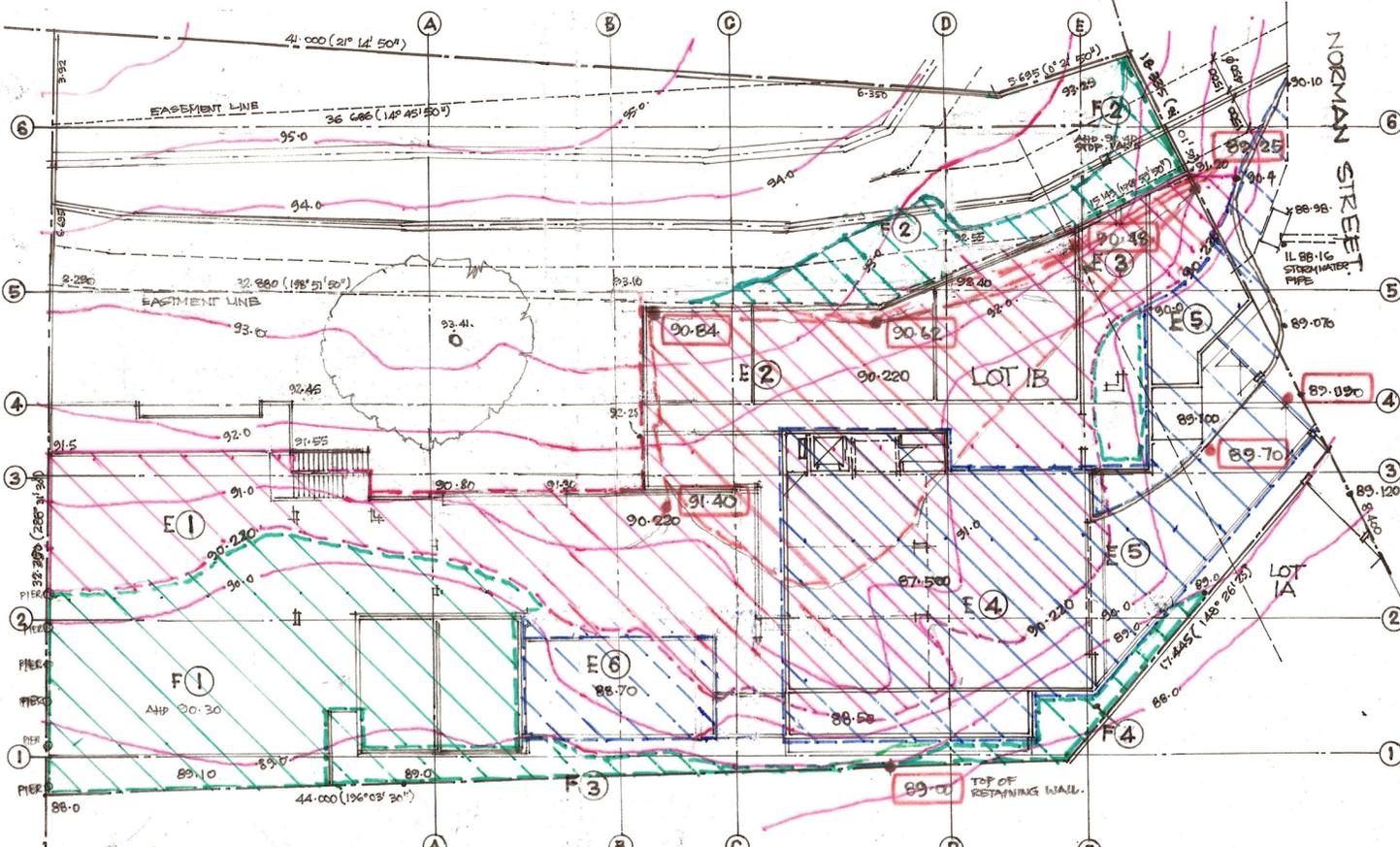
ELEVATIONS
SCALE: 1-100mm

PROJECT: SWITAJ RESIDENCE
CLIENT: MRS M & MRS C. SWITAJ
ADDRESS: LOT 1 - DP 617042, 18 NORMAN ST, MANGERTON

DRG NO: 10/12
DATE: NOV 2020
SCALE: 1-100
DRAWN: T. SWITAJ
A2

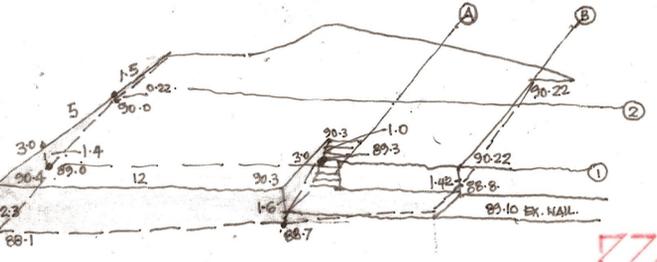
T&C DESIGN CONSULTANTS
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MB: 0421 67 99 86

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EXCAVATION & FILL PLAN.
SCALE: 1:200mm

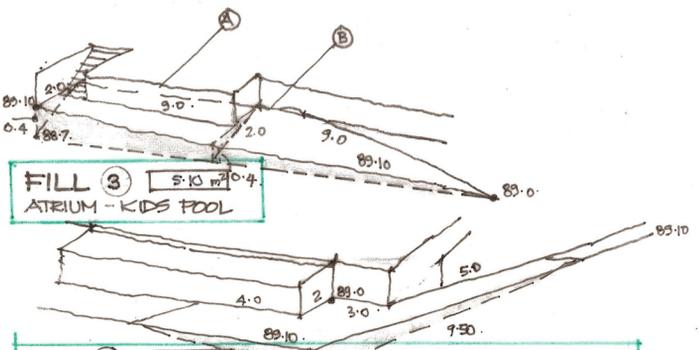
STAGE III
FILL AS REQUIRED.



FILL 1 193.62 m²
REAR LAWN & BBQ

FILL 2 16.44 m²
BEDROOM 3 - LOCKOUT

EXCAVATION & FILL SCHEDULE.				
No.	EXCAVATION.	AREA	X cm ³	TOTAL cm ³
①	REAR LAWN & BBQ	E1	48.79 cm ³	849.93 cm ³
②	GROUND FLOOR	E2	307.81 cm ³	
③	FRONT DINING/LAWN	E3	103.00 cm ³	
④	GARAGE	E4	311.74 cm ³	
⑤	DRIVEWAY, POOL.	E5	58.59 cm ³	
⑥		E6	20.00 cm ³	
①	SITE FILL	F1	247.19 cm ³	388.44 m ³
②	REAR LAWN & BBQ	F2	52.15 cm ³	
③	BEDROOM 3	F3	5.10 cm ³	
④	POOL	F4	9.00 cm ³	
⑤	LAP POOL, LANDSCAPING, RECYCLE	F5	75.00 cm ³	
REMOVAL OF FILL		FR1		461.49 cm ³
REMOVAL OF FILL CONDITION E1 PA-2019/355246		FR2		157.59 cm ³
BALANCE OF FILL TO REMOVE.		FR1		303.90 cm ³

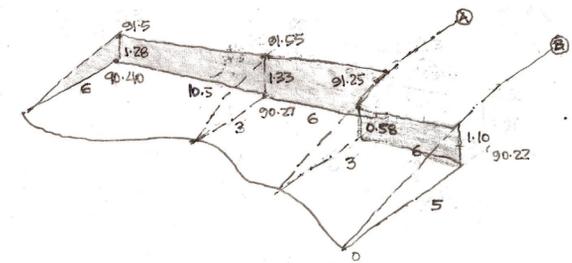


FILL 3 5.13 m² 0.4
ATRIUM - KIDS POOL

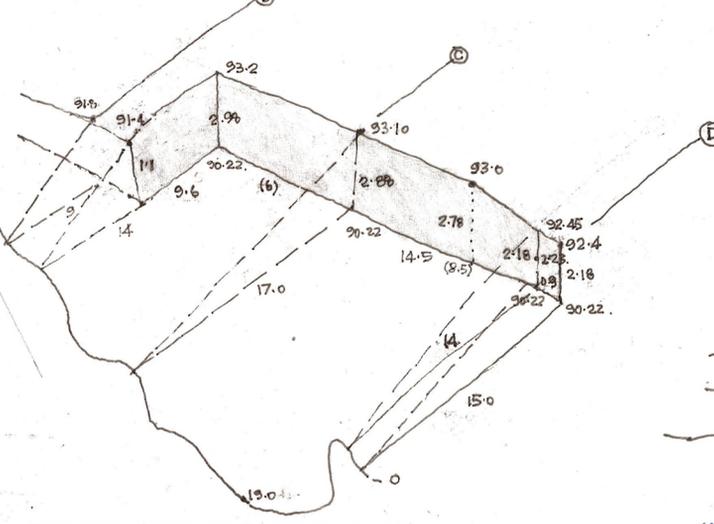
FILL 4 9.0 m²
LAP POOL - GARAGE ENTRY.

FILL 5 RECYCLE SOIL FOR LANDSCAPING 75.00 cm³

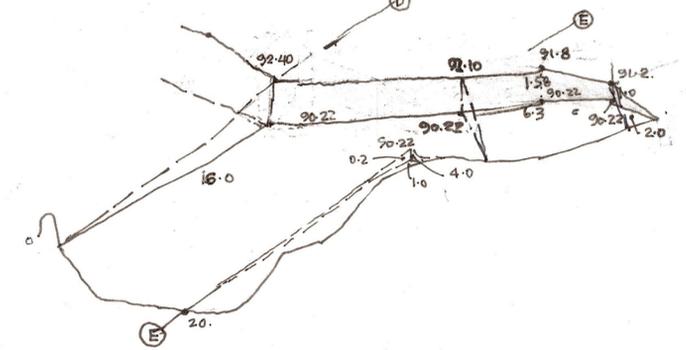
STAGE I
EXCAVATION



EXCAVATION 1 48.79 m²
REAR LAWN

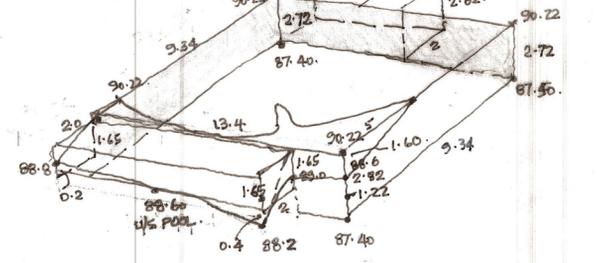


EXCAVATION 2 307.81 cm³
KITCHEN-CELLAR-OFFICE

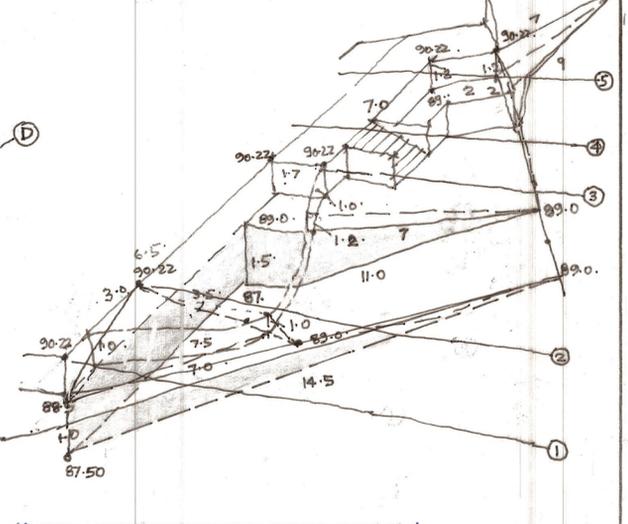


EXCAVATION 3 96.3 m²
REMOVAL DINING - TERRACE

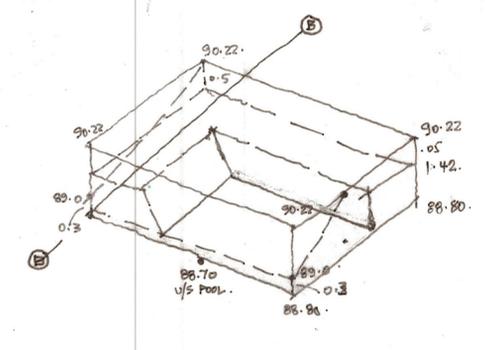
STAGE II
EXCAVATION



EXCAVATION 4 311.74 m²
GARAGE & WORKSHOP & STORE ROOM.



EXCAVATION 5 58.59 m²
DRIVEWAY



EXCAVATION 6 20.0 m²
KIDS POOL

4. AMENDED 28-4-2020 ADJUSTED EXC ③ ADD 1.26 cm³ OF FILL DUE TO STORMWATER & SUDENEY WATER.
3. AMENDED 10-8-2021 ADD FILL TO FRONT COURTYARD.
2. AMENDED 17-7-2021 - CONDITION E1, PA-2019/355246 EXCAVATION/REMOVE TRAFFIC FROM NORMAN STREET.
1. AMENDED 17-7-2021 REDUCED FILL TO TB TPZ ② FILL.

EXCAVATION & FILL PLAN.
SCALE: 1:200mm

PROJECT: SWITAJ RESIDENCE
CLIENT: MR/TM & MRS C. SWITAJ
ADDRESS: LOT 1 - PP 617042 'B NORMAN ST. MANGERTON

DRG NO. DATE SCALE DRAWN
12/12 NOV 1:200 T. SWITAJ
2020 A2

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T&C DESIGN CONSULTANTS
PO BOX 117, WOLLONGONG 2520. NSW
MB: 0421 67 99 86

ATTACHMENT 4

DETERMINATION AND STATEMENT OF REASONS

WOLLONGONG CITY COUNCIL – WOLLONGONG LOCAL PLANNING PANEL (WLPP)

DATE OF DETERMINATION	26 October 2021
PANEL MEMBERS	Robert Montgomery (Chair), Brendan Randles, Helena Miller, Trish McBride (Community Representative)

Public meeting held at Wollongong City Council, Level 9 Function Room, 41 Burelli Street, Wollongong on 26 October 2021 opened at 5:00pm and closed at 7:54pm.

MATTER DETERMINED

DA-2021/136 – Lot 1 DP 617042, 1A Norman Street, Mangerton (as described in detail in schedule 1).

PUBLIC SUBMISSIONS

The Panel was addressed by six submitters.

The Panel heard from the applicant.

PANEL CONSIDERATION AND DECISION

The Panel considered the matters listed at item 7, and the material presented at the meeting and the matters observed at site inspections listed at item 8 in Schedule 1.

The Panel determined to defer the development application as described in Schedule 1 to provide the applicant with an opportunity to address the matters detailed in the below reasons for the decision, by submission of additional information and plans.

The decision was unanimous. The additional information and any amendments are to be referred to a future Panel for determination.

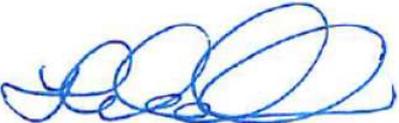
REASONS FOR THE DECISION

The reasons for the decision of the Panel were:

- The Panel notes that submitted elevations and sections fail to represent the proposal's form, materiality, streetscape and interface with adjoining properties. It is therefore very difficult to discern what commitments are being made in terms of scale, character and design quality.

New sections and elevations are therefore required that extend beyond the property boundaries, with clearly drawn and annotated built form elements (such as roofing, fascias, eaves, cappings, downpipes, etc.), materials (including specific building materials, finishes, junctions, jointing etc) and contextual elements (including existing and proposed trees, boundary walls and fences, landscape features, adjoining built form etc). The revised elevations and sections must clearly express precise heights and reduced levels of adjoining gardens and built form as well as the proposed new dwelling and associated gardens.
- Given the sensitivity of the site and extent of development proposed, it is strongly recommended that accurate 3D views are prepared by a skilled design consultant, so as to demonstrate how the built form and courtyards are housed on the site, how boundary conditions are resolved and how discrete roof forms and courtyards achieve an appropriate response to the site's form and landscape features. The views should be taken from a number of key locations, chosen for their impact on public amenity.
- Further review of the proposed stormwater design reveals that the proposal is likely to result in an increase in volume of stormwater runoff affecting downslope properties. This has not been adequately addressed by the applicant.

- Prior to determination, a report from a qualified engineer experienced in hydraulic and hydrologic design, which addresses the following matters, is to be submitted to Council for assessment.
 - a) Details of how the proposal satisfies in the objectives of Chapter E14 of Wollongong DCP 2009.*
 - b) Details how the proposed stormwater system satisfies the requirements of Section 9.3.12 “Absorption and Transpiration Disposal Systems” of Chapter E14 of Wollongong DCP 2009.*
 - c) Details how the proposed stormwater system satisfies the requirements of Section 9.3.9 “Discharge of Stormwater through Public Reserves” of Chapter E14 of Wollongong DCP 2009.*

PANEL MEMBERS	
 <p>Robert Montgomery (Chair)</p>	 <p>Brendan Randles</p>
 <p>Helena Miller</p>	 <p>Trish McBride (Community Representative)</p>

SCHEDULE 1		
1	DA NO.	DA-2021/136
2	PROPOSED DEVELOPMENT	Residential - Torrens title subdivision and construction of a dwelling house and pools
3	STREET ADDRESS	1A Norman Street, Mangerton
4	APPLICANT/OWNER	Ted Switaj
5	REASON FOR REFERRAL	Contentious development receiving in excess of 10 submissions
6	RELEVANT MANDATORY CONSIDERATIONS	<ul style="list-style-type: none"> • Environmental planning instruments: <ul style="list-style-type: none"> ○ State Environmental Planning Policy No 55 – Remediation of Land ○ State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 ○ Wollongong Local Environment Plan 2009 • Wollongong Section 94A Development Contributions Plan • Draft environmental planning instruments: None applicable to the proposal. • Development control plans: <ul style="list-style-type: none"> ○ Wollongong Development Control Plan 2009 • Provisions of the <i>Environmental Planning and Assessment Regulation 2000</i>: N/A • Coastal zone management plan: N/A • The likely impacts of the development, including environmental impacts on the natural and built environment and social and economic impacts in the locality • The suitability of the site for the development • Any submissions made in accordance with the <i>Environmental Planning and Assessment Act 1979</i> or regulations • The public interest, including the principles of ecologically sustainable development
7	MATERIAL CONSIDERED BY THE PANEL	<ul style="list-style-type: none"> • Council assessment report dated 26 October 2021 • Written submissions during public exhibition: 31 • Verbal submissions at the public meeting: six
8	SITE INSPECTIONS BY THE PANEL	Virtual Site inspection 26 October 2021. Attendees: <ul style="list-style-type: none"> ○ <u>Panel members</u>: Robert Montgomery (Chair), Brendan Randles, Helena Miller, Trish McBride (Community Representative) ○ <u>Council assessment staff</u>: Nigel Lamb
9	COUNCIL RECOMMENDATION	Deferred commencement
10	DRAFT CONDITIONS	Attached to the council assessment report

ATTACHMENT 5

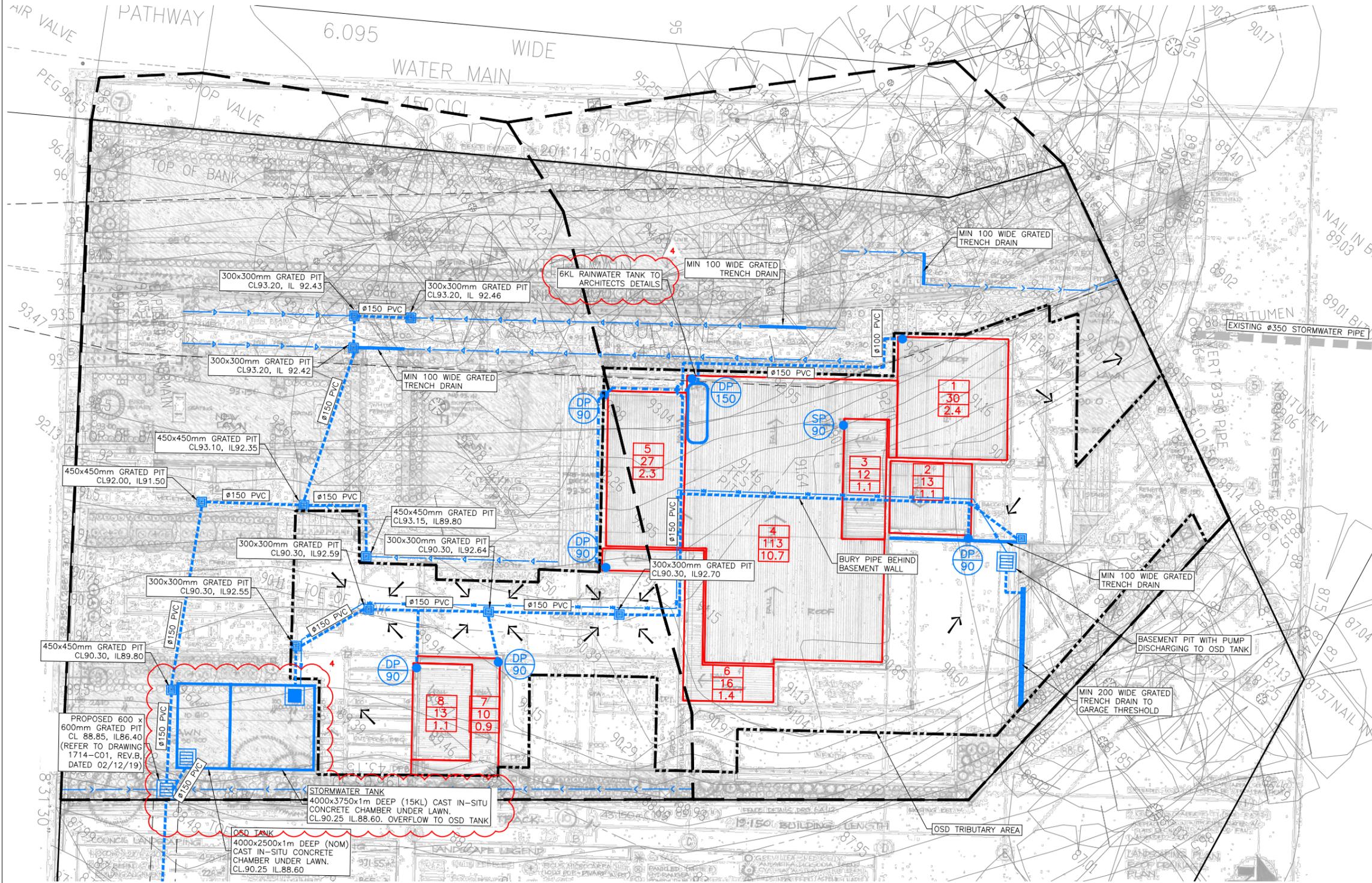












- ### STORMWATER NOTES
- EXISTING SERVICES SHOWN ON THESE PLANS ARE NOT GUARANTEED COMPLETELY CORRECT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORKS AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST AS REQUIRED.
 - SEDIMENT AND EROSION CONTROLS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE REQUIREMENTS OF MANAGING URBAN STORMWATER: SOIL AND CONSTRUCTION HANDBOOK.
 - ALL DRAINAGE WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AS3500.3
 - UNLESS OTHERWISE NOTED ALL DRAINAGE PIPES TO BE A MINIMUM OF DN90 AND LAID AT A MINIMUM GRADIENT OF 1%
 - PVC PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AS2566.2 (2002).
 - MINIMUM PIPE COVER TO BE 300mm IN LANDSCAPED AREAS AND 450mm UNDER DRIVEWAYS AND TRAFFICABLE AREAS UNO.
 - ALL PITS TO BE PRE-CAST CONCRETE OR POLYCRETE OR APPROVED EQUIVALENT.
 - ALL PITS COVERS TO BE CLASS B UNO
 - FOR LOCATION OF SUBSOIL DRAINAGE REFER TO ARCHITECTS DRAWINGS.
 - ALL BOX GUTTERS SHALL BE A MINIMUM 250mm WIDE x 200mm DEEP
 - A MINIMUM VERTICAL DIMENSION OF 600mm BETWEEN THE UNDERSIDE OF THE GUTTER AND THE TOP OF THE RAINWATER TANK IS REQUIRED TO ENSURE SUFFICIENT HYDRAULIC GRADE LINE IS MAINTAINED.
 - FLOW RATES SPECIFIED HEREON HAVE BEEN CALCULATED BASED ON A 100 YEAR ARI 5 MINUTE INTENSITY OF 297mm/hr.

- ### LEGEND
- PROPOSED STORMWATER PIPE
 - PROPOSED ROOFWATER PIPE TO RAINWATER TANK
 - PROPOSED GRATED TRENCH DRAIN
 - PROPOSED EARTH SWALE
 - PROPOSED DISH DRAIN (CONCRETE)
 - ROOF CATCHMENT NUMBER
ROOF CATCHMENT AREA (m²)
100yr ARI FLOW RATE (l/s)
 - PROPOSED DOWNPIPE LOCATION AND SIZE
 - PROPOSED DOWNPIPE AND SPREADER LOCATION AND SIZE
 - OSD TRIBUTARY AREA
 - EXISTING CATCHMENT AREA
 - PROPOSED DIRECTION OF FALL ON HARDSTAND AREAS



ISSUE	DESCRIPTION	DATE
4	STORMWATER TANK ADDED, RAINWATER TANK SIZE INCREASED	15/11/21
3	BEDROOM OVER SYDNEY WATER EASEMENT REMOVED	07/09/21
2	RE-ISSUED FOR DEVELOPMENT APPLICATION	05/08/21
1	FOR DEVELOPMENT APPLICATION	16/11/20

FOR DEVELOPMENT APPLICATION
NOT FOR CONSTRUCTION

FOOTPRINT (NSW) PTY. LTD. AUTHORISE THE USE OF THIS DRAWING ONLY FOR THE PURPOSE DEMONSTRATED BY THE STATUS STAMP SHOWN ABOVE.

SCALES ORIGINAL
1:200 A3

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SURVEYOR: ROBSON
DATUM: AHD
AZIMUTH: LOCAL
DRAWN: AB
DESIGNED: AB
DESIGNED DATE: NOV '20
CHECKED: AB

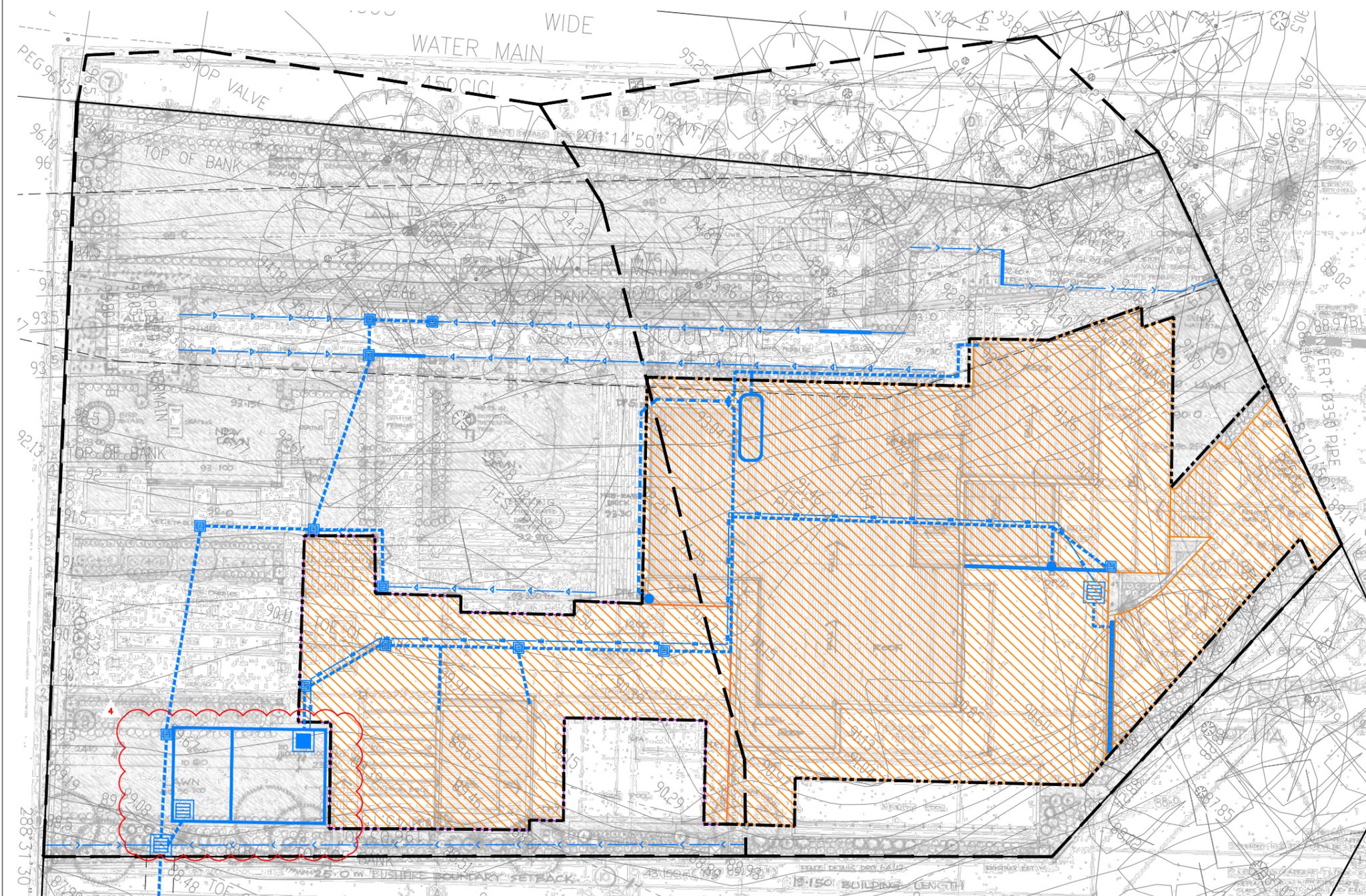
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LOT 1B NORMAN STREET, MANGERTON
PROPOSED DUAL OCCUPANCY AND TWO LOT SUBDIVISION
CONCEPT STORMWATER PLAN

DRAWING NO.
1755-C01

ISSUE.
4

SHEET 1 OF 3



LEGEND

- OSD IMPERVIOUS AREA
- OSD TRIBUTARY AREA
- EXISTING CATCHMENT AREA

OSD CALCULATIONS

INPUT PARAMETERS			
Tributary Area	575 m ²	Tributary Area	0.0575 ha
Pre-dev. Impervious Area	0 m ²	Pre-dev. % Imp.	0.0 %
Post-dev. Impervious Area	575 m ²	Post-dev. % Imp.	100.0 %
Rainfall Intensity (I _r ⁵⁰)	102 mm/hr		

STEP 1			(Formula)
F _{1.5}	1.00		$(y = -1.59E-05x^2 + 0.0043x + 0.9890)$
F _{1.00}	1.00		$(y = -1.54E-05x^2 + 0.0033x + 0.9938)$
F ₂	1.12		$(y = 0.0388x^2 - 0.1696x + 1.1308)$
F ₃	0.19		$(y = -1.3E-05x^2 + 0.0032x)$
F ₄	0.49		$(y = x^{0.2306})$
PSD ₅	17.56 L/s		$(=F1.5 * F2 * 2.67 * (Area/10000) * I_r^{50})$
PSD ₁₀₀	30.71 L/s		$(=F1.00 * F2 * 4.67 * (Area/10000) * I_r^{50})$
SSR ₅	3.27 m ³		$(=F3 * F4 * 2.25 * PSD_5 / F2)$
SSR ₁₀₀	5.72 m ³		$(=F3 * F4 * 2.25 * PSD_{100} / F2)$

STEP 2			(Formula)
F _{1.5}	1.00		$(y = -1.59E-05x^2 + 0.0043x + 0.9890)$
F _{1.00}	1.00		$(y = -1.54E-05x^2 + 0.0033x + 0.9938)$
F ₂	1.12		$(y = 0.0388x^2 - 0.1696x + 1.1308)$
F ₃	0.00		$(y = -1.3E-05x^2 + 0.0032x)$
F ₄	0.49		$(y = x^{0.2306})$
PSD ₅	17.56 L/s		$(=F1.5 * F2 * 2.67 * (Area/10000) * I_r^{50})$
PSD ₁₀₀	30.71 L/s		$(=F1.00 * F2 * 4.67 * (Area/10000) * I_r^{50})$
SSR ₅	0.00 m ³		$(=F3 * F4 * 2.25 * PSD_5 / F2)$
SSR ₁₀₀	0.00 m ³		$(=F3 * F4 * 2.25 * PSD_{100} / F2)$

FINAL VALUES			(Formula)
PSD ₅	17.56 L/s		(As in STEP 1)
PSD ₁₀₀	30.71 L/s		(As in STEP 1)
SSR ₅	3.27 m ³		(STEP 1 - STEP 2)
SSR ₁₀₀	5.72 m ³		(STEP 1 - STEP 2)

NOTE: OSD TANK SIZE PROPOSED HAS BEEN INCREASED TO 10m³ TO ASSIST IN OFFSETTING ADDITIONAL FLOWS BEING DIVERTED TOWARDS THE PROPOSED LEVEL SPREADER ON LOT 1A. REFER TO SHEET C03 FOR HYDRAULIC CALCULATION SUMMARY.



ISSUE	DESCRIPTION	DATE
4	STORMWATER TANK ADDED, RAINWATER TANK SIZE INCREASED	15/11/21
3	BEDROOM OVER SYDNEY WATER EASEMENT REMOVED	07/09/21
2	RE-ISSUED FOR DEVELOPMENT APPLICATION	05/08/21
1	FOR DEVELOPMENT APPLICATION	16/11/20

FOR DEVELOPMENT APPLICATION
NOT FOR CONSTRUCTION

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SCALES	ORIGINAL
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CLIENT:	TED SWITAJ

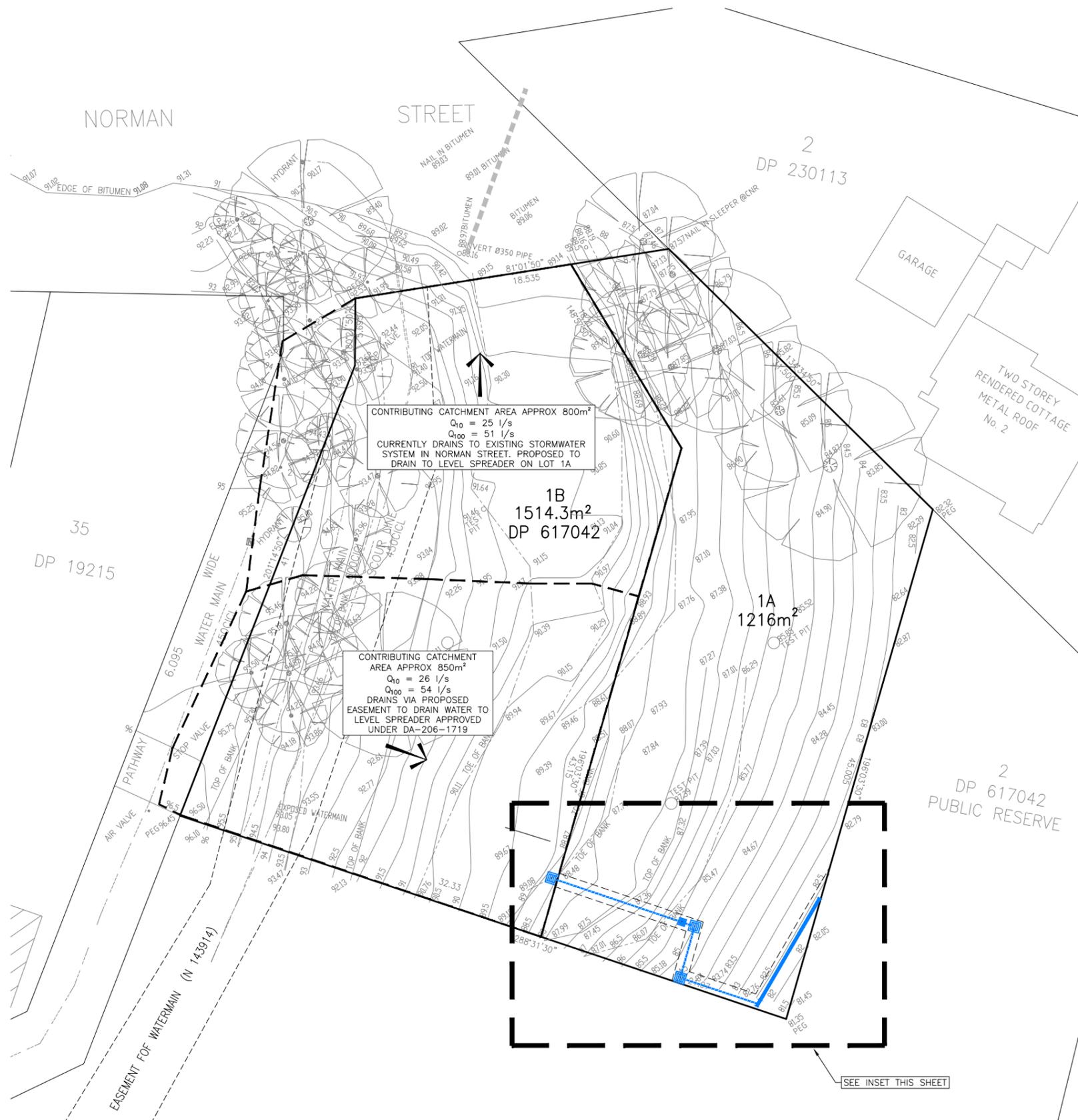
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DATUM:	AHD
AZIMUTH:	LOCAL
DRAWN:	AB
DESIGNED:	AB
DESIGNED DATE:	NOV '20
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LOT 1B NORMAN STREET, MANGERTON
PROPOSED DUAL OCCUPANCY AND TWO LOT SUBDIVISION

OSD CALCULATIONS

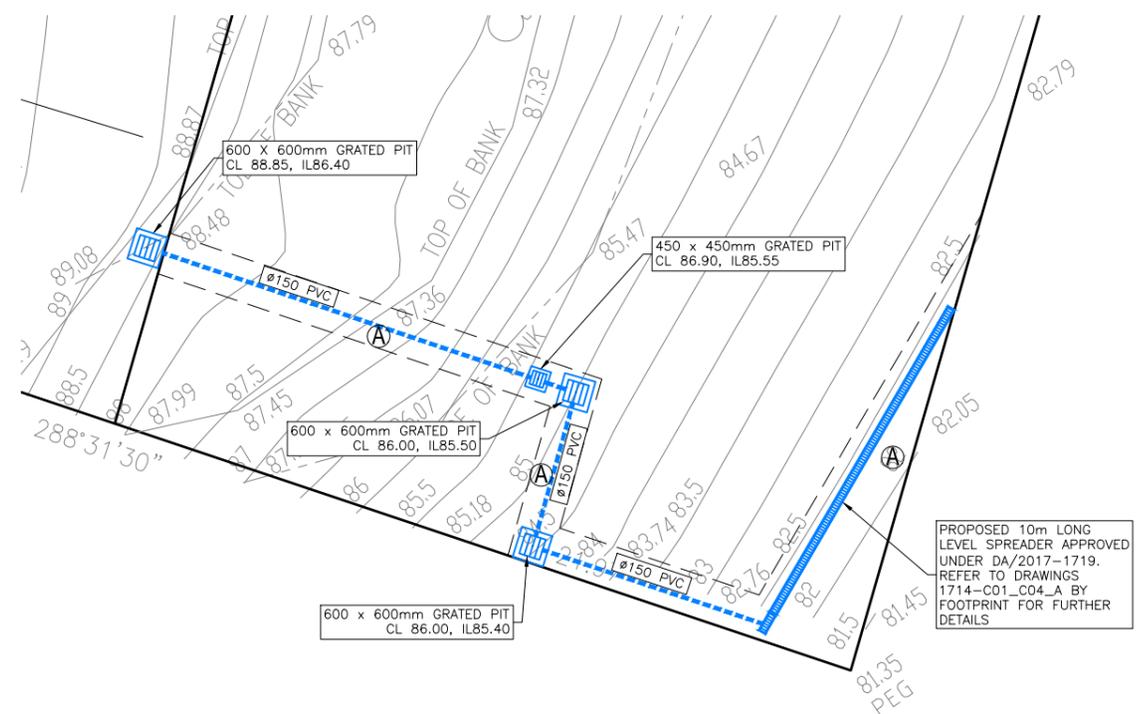
DRAWING NO.	1755-C02
ISSUE.	4
SHEET	2 OF 3



CONTRIBUTING CATCHMENT AREA APPROX 800m²
 Q₁₀ = 25 l/s
 Q₁₀₀ = 51 l/s
 CURRENTLY DRAINS TO EXISTING STORMWATER SYSTEM IN NORMAN STREET. PROPOSED TO DRAIN TO LEVEL SPREADER ON LOT 1A

CONTRIBUTING CATCHMENT AREA APPROX 850m²
 Q₁₀ = 26 l/s
 Q₁₀₀ = 54 l/s
 DRAINS VIA PROPOSED EASEMENT TO DRAIN WATER TO LEVEL SPREADER APPROVED UNDER DA-206-1719

OVERALL PLAN
 SCALE 1:400 © A3

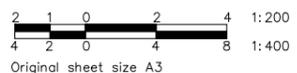


Ⓐ PROPOSED EASEMENT TO DRAIN WATER 1.2m WIDE AND VARIABLE

INSET PLAN
 SCALE 1:200 © A3

HYDRAULIC MODELLING SUMMARY FOR FLOWS ARRIVING AT PROPOSED LEVEL SPREADER FROM DEVELOPMENT ON BOTH LOTS 1A AND 1B

PARAMETER	PRE-DEVELOPMENT	POST DEVELOPMENT
AREA	1730m ²	2530m ²
0.2EY	72 l/s	54 l/s
1% AEP	147 l/s	112 l/s



ISSUE	DESCRIPTION	DATE
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2	RE-ISSUED FOR DEVELOPMENT APPLICATION	03/08/21
1	FOR DEVELOPMENT APPLICATION	16/11/20

FOR DEVELOPMENT APPLICATION
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LOT 1B NORMAN STREET, MANGERTON
 PROPOSED DUAL OCCUPANCY AND TWO LOT SUBDIVISION
 SUBDIVISION STORMWATER PLAN

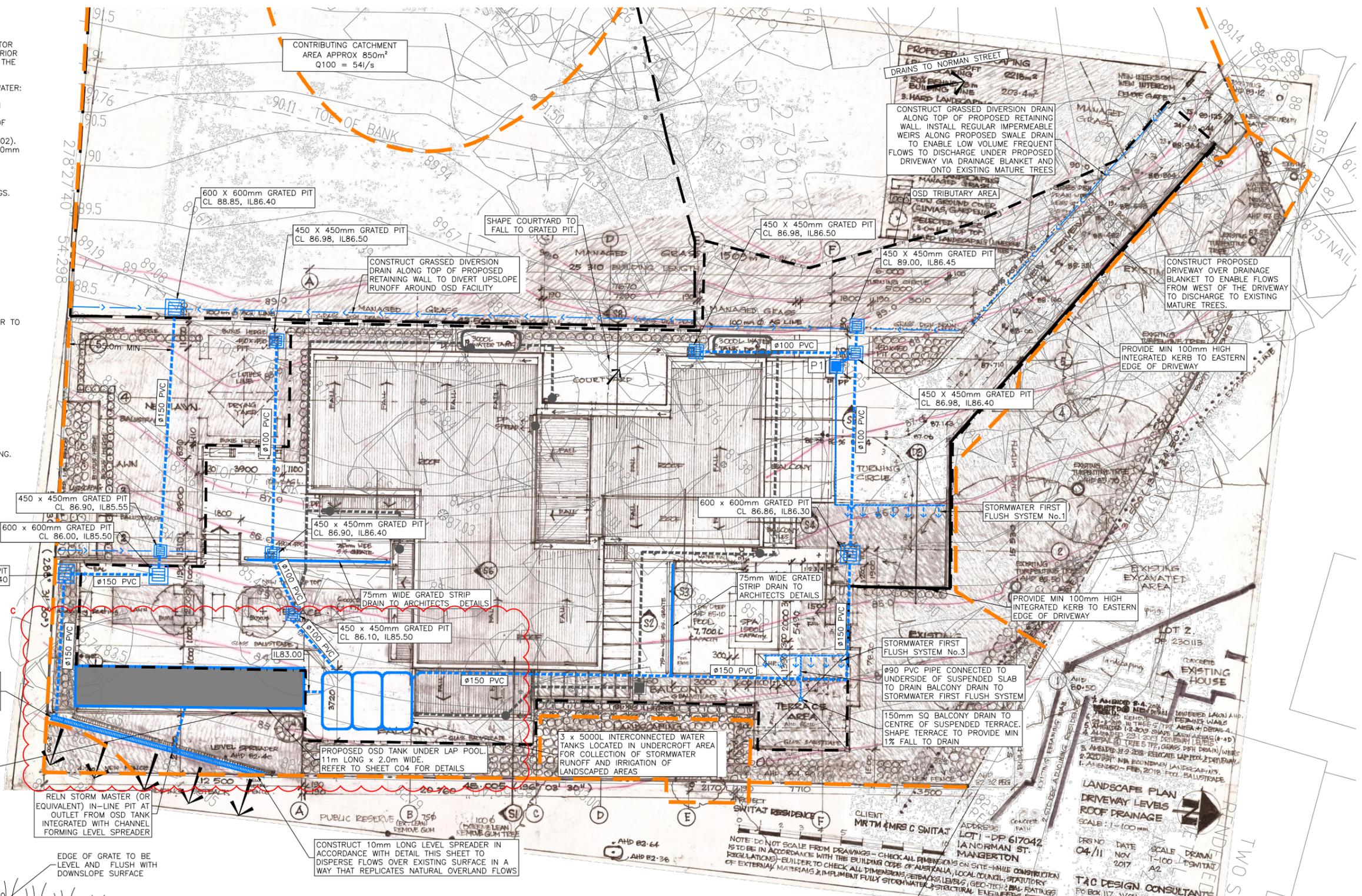
DRAWING NO.	1755-C03
ISSUE.	4
SHEET	3 OF 3

STORMWATER NOTES

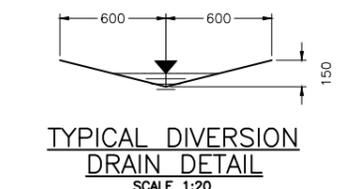
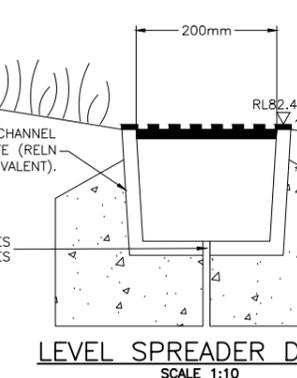
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- ALL PITS COVERS TO BE CLASS B UNO
- FOR LOCATION OF SUBSOIL DRAINAGE REFER TO ARCHITECTS DRAWINGS.

LEGEND

- PROPOSED STORMWATER PIPE
- PROPOSED GRATED TRENCH DRAIN
- PROPOSED STORMWATER FIRST FLUSH SYSTEM. REFER TO SHEET C02 FOR DETAILS
- DIVERSION DRAIN
- OSD TRIBUTARY AREA
- PROPOSED ROOFWATER DRAINAGE SYSTEM (REFER SHEET C02 FOR DETAILS)
- TEMPORARY CONSTRUCTION/TREE PROTECTION FENCING. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS



PROVIDE OPENING(S) IN EASTERN RETAINING WALL ELEVATION AT RL83.16m AHD TO PERMIT OVERFLOWS FROM THE OSD TANK. REFER TO SHEET C04 FOR DETAILS



DIVERSION DRAIN CALCULATIONS

PARAMETER	VALUE
CATCHMENT AREA (m ²)	850
1% AEP FLOW (l/s)	7
SLOPE (%)	0.5
MANNING'S n	0.025
MAXIMUM FLOW DEPTH (m)	0.075

LANDSCAPE PLAN DRIVEWAY LEVELS ROOF DRAINAGE
SCALE: 1:100mm

DATE: 04/11/2017
SCALE: A2

TAC DESIGN CONSULTANTS
PO BOX 117, WOLLONGONG 2520, NSW
MB 0421 67 99 66

ISSUED FOR CONSTRUCTION

SCALES	ORIGINAL	SURVEYOR:	ROBSON
1:200	A3	DATUM:	AHD
		AZIMUTH:	LOCAL
CLIENT:	TED SWATJ	DRAWN:	AB
		DESIGNED:	AB
		DESIGNED DATE:	NOV '17
		CHECKED:	AB

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1A NORMAN STREET, MANGERTON
PROPOSED DWELLING
STORMWATER DRAINAGE PLAN

DRAWING NO.	1714-C01
ISSUE	C
SHEET	1 OF 4

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ISSUE	DESCRIPTION	DATE
C	OSD TANK INCREASED, RAINWATER TANKS CHANGED TO S/WATER TANKS	15/11/21
B	TREE PROTECTION FENCING ADDED	02/12/19
A	ISSUED FOR CONSTRUCTION	04/09/19

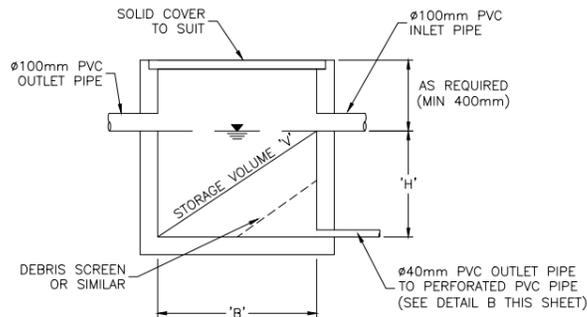
ROOF GUTTER NOTES:

1. ALL BOX GUTTERS SHALL BE A MINIMUM 200mm WIDE x 200mm DEEP
2. A MINIMUM VERTICAL DIMENSION OF 600mm BETWEEN THE UNDERSIDE OF THE GUTTER AND THE TOP OF THE RAINWATER TANK IS REQUIRED TO ENSURE SUFFICIENT HYDRAULIC GRADE LINE IS MAINTAINED.
3. FLOW RATES SPECIFIED HEREON HAVE BEEN CALCULATED BASED ON A 100 YEAR ARI 5 MINUTE INTENSITY OF 297mm/hr.

LEGEND

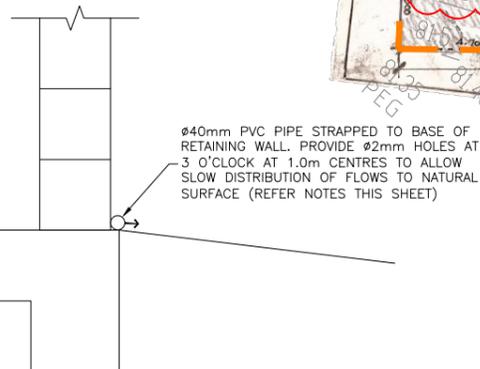
- PROPOSED STORMWATER PIPE
- PROPOSED RAINWATER FIRST FLUSH SYSTEM. REFER TO DETAILS THIS SHEET.
- | |
|------|
| 1 |
| 142 |
| 11.8 |

 ROOF CATCHMENT NUMBER
ROOF CATCHMENT AREA (m²)
100yr ARI FLOW RATE (l/s)
- PROPOSED DOWNPIPE LOCATION AND SIZE
- PROPOSED STORMWATER DRAINAGE SYSTEM (REFER TO SHEET C01 FOR DETAILS)
- TEMPORARY CONSTRUCTION/TREE PROTECTION FENCING. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS



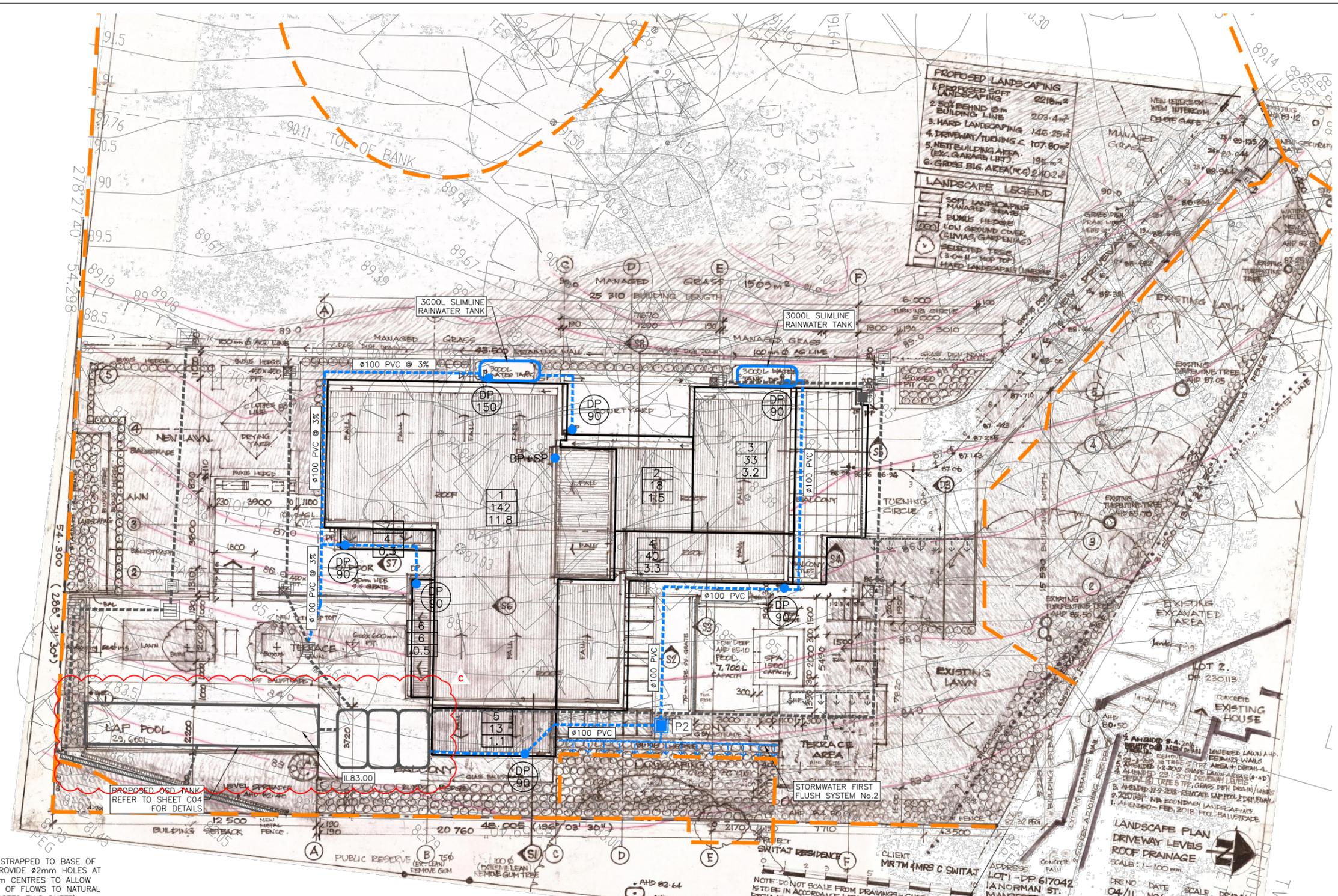
FIRST FLUSH PIT DETAILS

PIT	VOLUME 'V' (m ³)	B (mm)	H (mm)
P1 (C01)	0.25	600x600	750
P2	0.50	900x900	600



FIRST FLUSH SYSTEM NOTES:

1. THE PRIMARY PURPOSE OF THE PROPOSED FIRST FLUSH SYSTEMS IS TO DISTRIBUTE WATER WHICH WOULD OTHERWISE BE REMOVED FROM THE SOIL PROFILE BY THE PROPOSED DEVELOPMENT BACK INTO THE SOIL PROFILE TO AID IN THE MAINTENANCE OF TREE HEALTH FOR THOSE TREES SITUATED DOWNSLOPE OF THE SITE.
2. THE FIRST FLUSH SYSTEM IS DESIGNED TO COLLECT THE FIRST 10mm OF RUNOFF FROM THE CONTRIBUTING CATCHMENT AREAS SHOWN IN BLUE ON ARCHITECTURAL DRAWING 1D/11 AND RETAIN THIS FOR SLOW RELEASE. THE SYSTEM WILL ALSO PROVIDE CONTINUING FLOWS EQUIVALENT TO APPROXIMATELY 2.5mm/hr FROM THE CONTRIBUTING CATCHMENT DURING RAINFALL EVENTS.
3. THESE FLOWS ARE AIMED AT REPLICATING THE UPTAKE OF WATER BY THE SOIL PROFILE THAT WOULD NATURALLY OCCUR DURING A RAINFALL EVENT OVER THOSE AREAS SHOWN IN GREEN ON ARCHITECTURAL DRAWING 1D/11 AND WHICH THE PROPOSED DEVELOPMENT WOULD OTHERWISE REMOVE FROM THE SOIL PROFILE.



ISSUE	DESCRIPTION	DATE
C	OSD TANK INCREASED, RAINWATER TANKS CHANGED TO S/WATER TANKS	15/11/21
B	TREE PROTECTION FENCING ADDED	02/12/19
A	FOR CONSTRUCTION	04/09/19

ISSUED FOR CONSTRUCTION

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SCALES ORIGINAL
1:200 A3

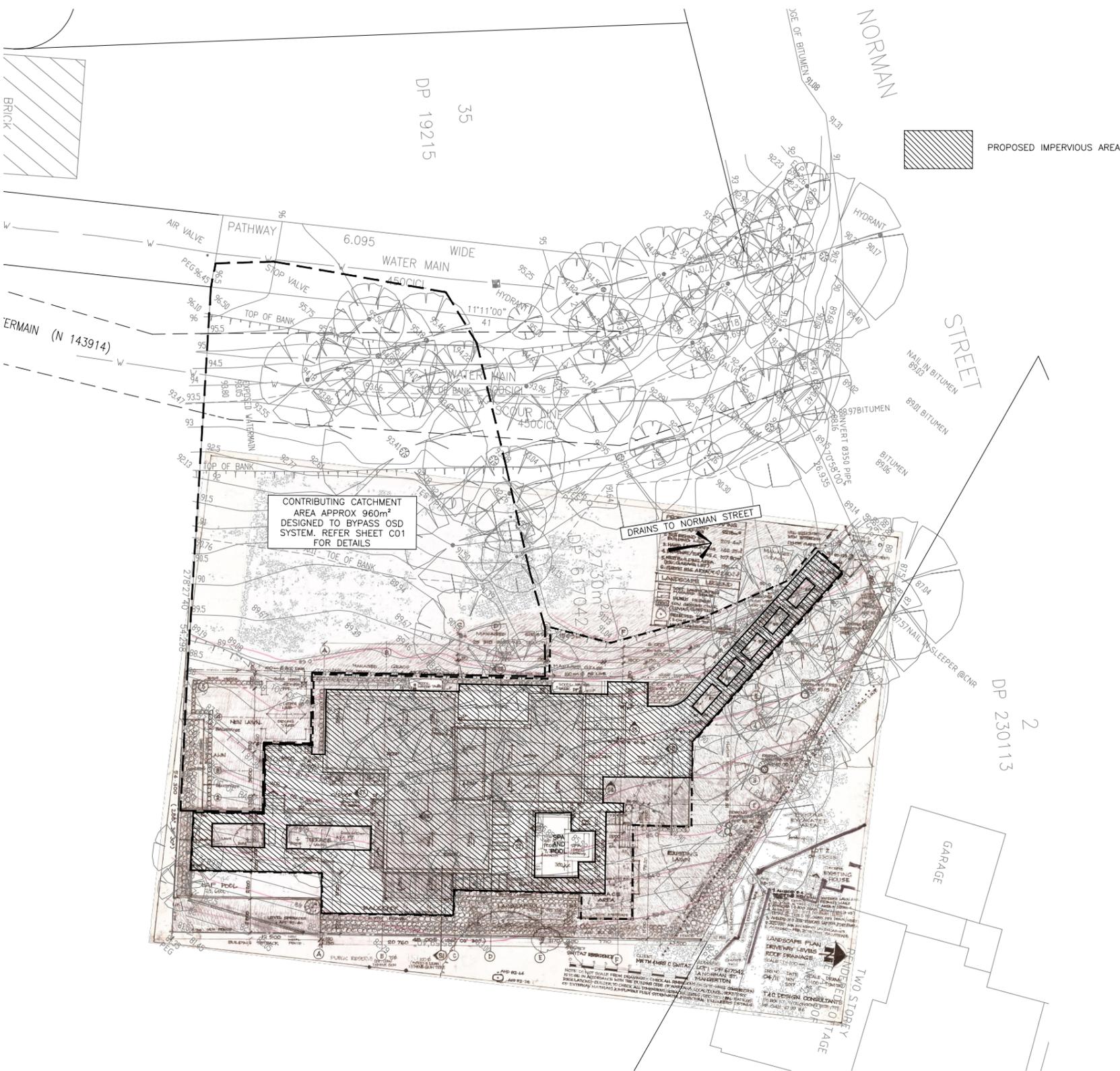
CLIENT: TED SWATJ

SURVEYOR: ROBSON
DATUM: AHD
AZIMUTH: LOCAL
DRAWN: AB
DESIGNED: AB
DESIGNED DATE: NOV '17
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1A NORMAN STREET, MANGERTON
PROPOSED DWELLING
ROOFWATER DRAINAGE PLAN

DRAWING NO. 1714-C02
ISSUE C
SHEET 2 OF 4



WCC OSD Policy Calculation
(as per methodology presented in Chapter E14 of the Wollongong DCP2009)

INPUT PARAMETERS			
Tributary Area	770 m ²	Tributary Area	0.0770 ha
Pre-dev. Impervious Area	0 m ²	Pre-dev. % Imp.	0.0 %
Post-dev. Impervious Area	547 m ²	Post-dev. % Imp.	71.0 %
Rainfall intensity (I _{1.50})	102 mm/hr		

STEP 1			(Formula)
F1 ₅	1.00		(y = -1.59E-05x ² + 0.0043x + 0.9890)
F1 ₁₀₀	1.00		(y = -1.54E-05x ² + 0.0033x + 0.9938)
F2	1.12		(y = 0.0388x ² - 0.1696x + 1.1308)
F3	0.16		(y = -1.3E-05x ² + 0.0032x)
F4	0.53		(y = x ^{0.2506})
PSD ₅	23.44 L/s		(=F1 ₅ *F2*2.67*(Area/10000)*I _{1.50})
PSD ₁₀₀	41.01 L/s		(=F1 ₁₀₀ *F2*4.67*(Area/10000)*I _{1.50})
SSR ₅	4.01 m ³		(=F3*F4*2.25*PSD ₅ /F2)
SSR ₁₀₀	7.02 m ³		(=F3*F4*2.25*PSD ₁₀₀ /F2)

STEP 2			(Formula)
F1 ₅	1.00		(y = -1.59E-05x ² + 0.0043x + 0.9890)
F1 ₁₀₀	1.00		(y = -1.54E-05x ² + 0.0033x + 0.9938)
F2	1.12		(y = 0.0388x ² - 0.1696x + 1.1308)
F3	0.00		(y = -1.3E-05x ² + 0.0032x)
F4	0.53		(y = x ^{0.2506})
PSD ₅	23.44 L/s		(=F1 ₅ *F2*2.67*(Area/10000)*I _{1.50})
PSD ₁₀₀	41.01 L/s		(=F1 ₁₀₀ *F2*4.67*(Area/10000)*I _{1.50})
SSR ₅	0.00 m ³		(=F3*F4*2.25*PSD ₅ /F2)
SSR ₁₀₀	0.00 m ³		(=F3*F4*2.25*PSD ₁₀₀ /F2)

FINAL VALUES			(Formula)
PSD ₅	23.44 L/s		(As in STEP 1)
PSD ₁₀₀	41.01 L/s		(As in STEP 1)
SSR ₅	4.01 m ³		(STEP 1 - STEP 2)
SSR ₁₀₀	7.02 m ³		(STEP 1 - STEP 2)



ISSUE	DESCRIPTION	DATE
C	OSD TANK INCREASED, RAINWATER TANKS CHANGED TO S/WATER TANKS	15/11/21
B	TREE PROTECTION FENCING ADDED	02/12/19
A	ISSUED FOR CONSTRUCTION	04/09/19

FOR DEVELOPMENT APPLICATION
ISSUED FOR

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1:400	A3	DATUM:	AHD
		AZIMUTH:	LOCAL
		DRAWN:	AB
		DESIGNED:	AB
		DESIGNED DATE:	NOV '17
		CHECKED:	AB

CLIENT: TED SWATJ

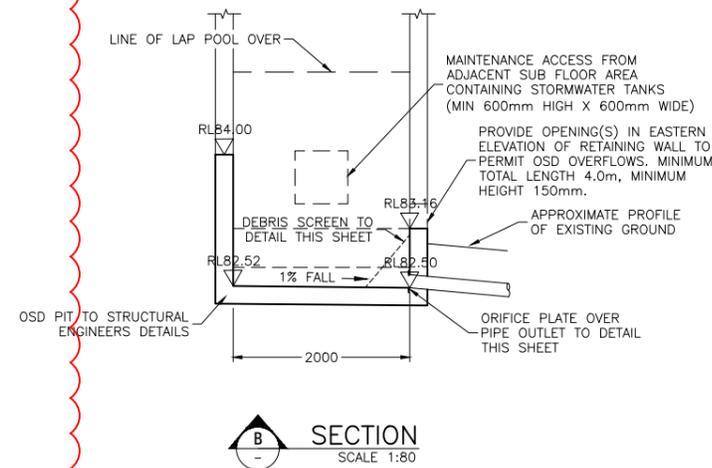
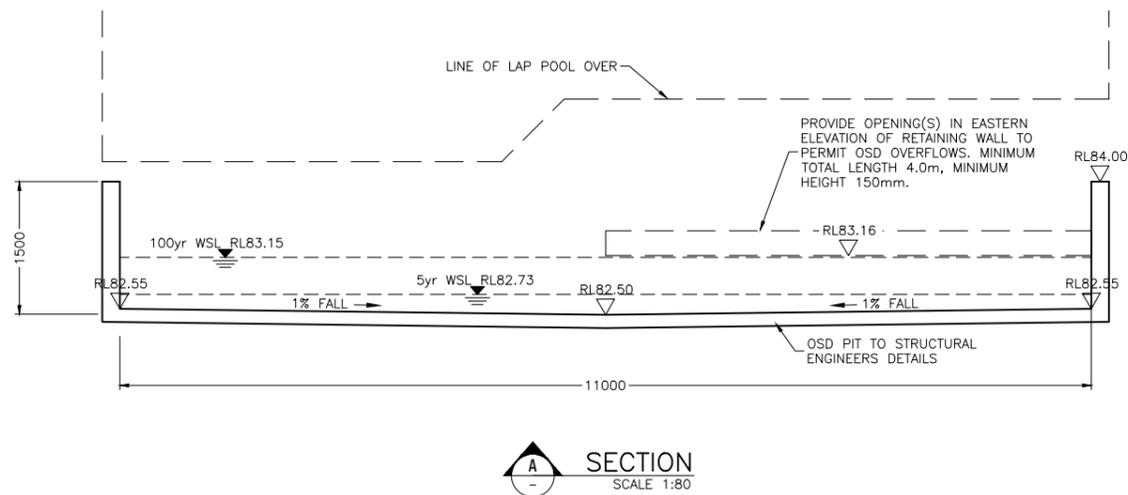
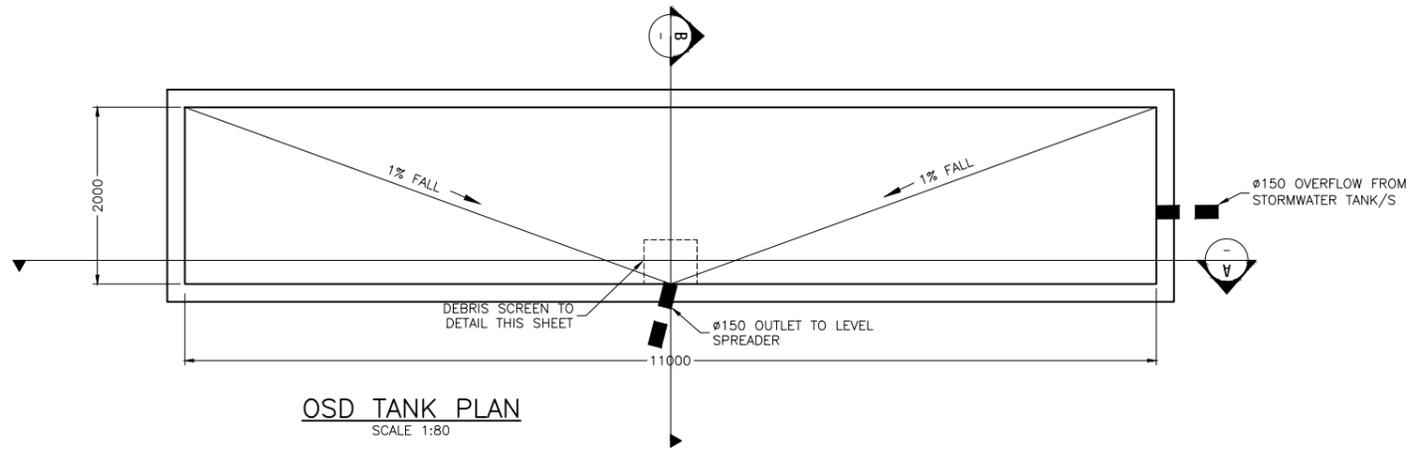
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1A NORMAN STREET, MANGERTON
PROPOSED DWELLING
ON-SITE DETENTION CALCULATIONS

DRAWING NO. 1714-C03
ISSUE. C
SHEET 3 OF 4

OSD MAINTENANCE SCHEDULE

MAINTENANCE ACTION	FREQUENCY	PERFORMED BY	PROCEDURE
INSPECT AND REMOVE ANY BLOCKAGE AT ORIFICE	SIX MONTHLY	OWNER	REMOVE DEBRIS SCREEN TO INSPECT ORIFICE. SEE PLAN FOR LOCATION OF DISCHARGE OUTLET PIT.
INSPECT SCREEN AND CLEAN	SIX MONTHLY	OWNER	REMOVE SCREEN IF REQUIRED TO CLEAN IT.
INSPECT PIT SUMP AND REMOVE ANY SEDIMENT/SLUDGE	SIX MONTHLY	OWNER	REMOVE SCREEN AND REMOVE SEDIMENT/SLUDGE BUILD-UP AND CHECK ORIFICE CLEAR.
INSPECT STORAGE AREAS AND REMOVE DEBRIS/MULCH/LITTER LIKELY TO CAUSE BLOCKAGE	SIX MONTHLY	OWNER	REMOVE DEBRIS AND FLOATABLE MATERIAL LIKELY TO BE CARRIED TO GRATES.
INSPECT OVERFLOW WEIR AND REMOVE ANY BLOCKAGE	SIX MONTHLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND OPEN COVER TO VENTILATE UNDERGROUND STORAGE. ENSURE WEIR IS CLEAR OF BLOCKAGES.
INSPECT OUTLET PIPE AND REMOVE ANY BLOCKAGES	SIX MONTHLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND SCREEN. VENTILATE UNDERGROUND STORAGE. CHECK ORIFICE AND REMOVE ANY BLOCKAGES IN OUTLET PIPE. FLUSH OUTLET PIPE TO CONFIRM IT DRAINS FREELY.
CHECK ATTACHMENT OF ORIFICE PLATE TO WALL OF PIT (GAPS LESS THAN 5mm)	ANNUALLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND SCREEN. ENSURE PLATE IS MOUNTED SECURELY, TIGHTEN FIXINGS/SEAL GAPS AS REQUIRED.
CHECK ATTACHMENT OF SCREEN TO WALL OF PIT	ANNUALLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND SCREEN. ENSURE FIXINGS SECURE. REPAIR AS REQUIRED.
CHECK SCREEN FOR CORROSION	ANNUALLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND EXAMINE SCREEN FOR RUST OR CORROSION, ESPECIALLY AT CORNERS AND WELDS. REPAIR OR REPLACE AS REQUIRED.
INSPECT PIT WALLS FOR CRACKS OR SPALLING	ANNUALLY	MAINTENANCE CONTRACTOR	REMOVE GRATE TO INSPECT INTERNAL WALLS AND REPAIR AS REQUIRED.
CHECK ORIFICE DIAMETER CORRECT AND RETAINS SHARP EDGE	FIVE YEARLY	MAINTENANCE CONTRACTOR	COMPARE DIAMETER AGAINST DIAMETER AS ENGRAVED ON ORIFICE PLATE. ENSURE EDGE IS NOT PITTED OR DAMAGED. REPLACE AS REQUIRED.



OSD FACILITY
DA-2017/1719
 THIS STRUCTURE IS AN ON-SITE DETENTION FACILITY, BEING PART OF THE STORMWATER DRAINAGE SYSTEM, AND IS NOT TO BE TAMPERED WITH OR MODIFIED IN ANY WAY WITHOUT THE PRIOR CONSENT OF COUNCIL.

CORROSION RESISTANT PLAQUE DETAIL

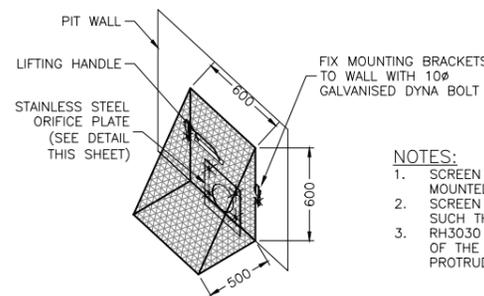
- NOTES:
 1. PLAQUE TO BE MADE OF CORROSION RESISTANT MATERIAL.
 2. PLAQUE TO BE MOUNTED ON OR IN CLOSE PROXIMITY TO THE OSD TANK.

ORIFICE SIZING CALCULATIONS

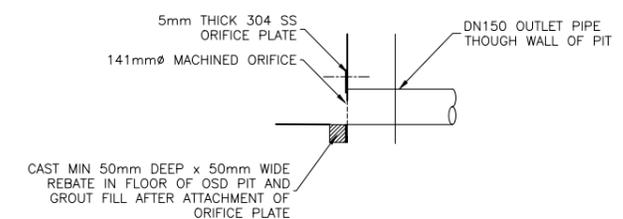
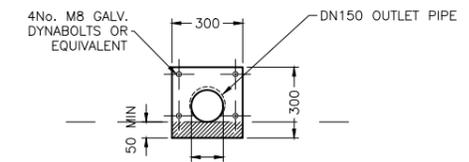
ORIFICE EQUATION $Q = CA(2gh)^{0.5}$
 FOR CIRCULAR ORIFICES THIS EQUATION CAN BE RE-EXPRESSED IN TERMS OF 'D' AND ASSUMING A COEFFICIENT OF DISCHARGE OF 0.61 AS FOLLOWS:
 $D^2 = 0.471 \times Q / h^{0.5}$
 THEREFORE $D^2 = 0.471 \times 0.02344 / 0.310^{0.5} = 0.019829m$
 AND $D = 0.019829^{0.5} = 0.140m$

WEIR SIZING CALCULATIONS

PONDED ELEVATION FOR SSR5 = 82.73m AHD
 ORIFICE SIZE FOR PSD5 (23.44l/s) = 141mm
 FLOW THROUGH ORIFICE AT RL83.16m AHD = 32.4l/s
 FLOW OVER WEIR = 41.0 - 32.4l/s = 8.6l/s
 WEIR LENGTH = 4m (ASSUMED)
 DEPTH OF FLOW OVER WEIR = 11mm
 MAXIMUM PONDED LEVEL = 83.16+0.011 = 83.17m



- NOTES:
 1. SCREEN TO BE CONSTRUCTED FROM MAXI-MESH RH3030 MOUNTED IN 25x25x3mm EQUAL ANGLE FRAME.
 2. SCREEN TO BE HOT DIPPED GALVANISED AFTER FABRICATION SUCH THAT ALL WELDS ARE CORROSION PROTECTED.
 3. RH3030 MESH TO BE POSITIONED SUCH THAT THE LONG AXIS OF THE MESH IS TO BE POSITIONED HORIZONTALLY AND THE PROTRUDING LIP IS UPPERMOST.



ORIFICE PLATE DETAIL
 NOT TO SCALE

ISSUE	DESCRIPTION	DATE
C	OSD TANK INCREASED, RAINWATER TANKS CHANGED TO S/WATER TANKS	15/11/21
B	TREE PROTECTION FENCING ADDED	02/12/19
A	ISSUED FOR CONSTRUCTION	04/09/19

FOR DEVELOPMENT APPLICATION
 ISSUED FOR

FOOTPRINT (NSW) PTY. LTD. AUTHORISE THE USE OF THIS DRAWING ONLY FOR THE PURPOSE DEMONSTRATED BY THE STATUS STAMP SHOWN ABOVE.

SCALES	ORIGINAL	SURVEYOR:	CONSTRUCTION
1:400	A3	CONSTRUCTION	AHD
		LOCAL	LOCAL
		AB	AB
		DESIGNED:	AB
		DESIGNED DATE:	NOV '17
		CHECKED:	AB

footprint
 sustainable engineering
 a. 15 meehan drive
 kiama downs nsw 2533
 p. 02 4237 6770
 f. 02 4237 8962

1A NORMAN STREET, MANGERTON
 PROPOSED DWELLING
 ON-SITE DETENTION DETAILS

DRAWING NO.
1714-C04
ISSUE.
C
SHEET 4 OF 4



Lot 1B Norman Street Mangerton

Stormwater Management Report

Project No. 1755

Date: 15 November 2021

Prepared for:
Ted Switaj

Footprint (NSW) Pty Ltd
 15 Meehan Drive
 Kiama Downs, NSW 2533, Australia
 ACN 131 571 929 ABN 44 131 571 929
Phone: 02 4237 6770
Mobile: 0430 421 661
 Email: ashley@footprinteng.com.au

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APPENDICES

APPENDIX A

Stormwater Plans

APPENDIX B

MUSIC Catchments and Landuse

1.0 INTRODUCTION

Footprint (NSW) Pty. Ltd. (*Footprint*) has been commissioned by the owner of 1A Norman Street, Mangerton to prepare a stormwater management report to address issues raised by the Wollongong Local Planning Panel (WLPP) in its assessment of a Development Application (DA-2021/136) for the construction of a dwelling house on the subject property.

The stormwater related issues raised by the WLLP include:

1. Further review of the proposed stormwater design reveals that the proposal is likely to result in an increase in volume of stormwater runoff affecting downslope properties. This has not been adequately addressed by the applicant.
2. Prior to determination, a report from a qualified engineer experienced in hydraulic and hydrologic design, which addresses the following matters, is to be submitted to Council for assessment.
 - a. Details of how the proposal satisfies the objectives of Chapter E14 of the Wollongong DCP 2009.
 - b. Details how the proposed stormwater system satisfies the requirement of Section 9.3.12 "Absorption and Transpiration Disposal Systems" of Chapter E14 of Wollongong DCP 2009.
 - c. Details how the proposed stormwater system satisfies the requirement of Section 9.3.9 "Discharge of Stormwater through Public Reserves" of Chapter E14 of Wollongong DCP 2009.

2.0 SUBJECT SITE

2.1. Site Description

The subject site is described as 1A Norman Street, Mangerton (Lot 1, DP617042) and comprises an area of 2,730 square meters.

The site abuts a large area of public reserve on its eastern and southern boundaries, Norman Street and existing residential development (2 Norman Street) on its northern boundary and an existing public pathway on its western boundary.

Detail survey shows that elevation over the subject site ranges from approximately RL96.5m AHD in the south-western corner to RL81.3m AHD in the south-eastern corner with the site typically falling in a west to east direction.

Development Application DA-2017/1719 was approved by the Land and Environment Court in July 2019 for the construction of a residential dwelling and swimming pools on the lower portion of the property (herein after referred to as Lot 1A) and construction of that dwelling has commenced.

Development Application DA-2021/136 seeks approval for the construction of a dwelling house and swimming pools to the residual portion of the land (herein after referred to as Lot 1B) and subdivision to create two Torrens Title lots.

Prior to the commencement of works on Lot 1A, the site was vacant and consisted of a combination of grass land and trees. Some rock outcropping is also visible in the centre of the site.

An aerial image of the subject site with survey contours at 0.5m interval overlaid and showing the proposed future subdivision boundaries separating Lots 1A and 1B is shown in Figure 1.



Figure 1: Subject Site

3.0 STORMWATER MANAGEMENT

3.1. Approach

The stormwater management approach for both the approved development on Lot 1A and the proposed development on Lot 1B is similar in that:

- Roof areas are to be discharged to rainwater tanks and the stored water used for internal uses.
- Hard landscaped areas are to be discharged to stormwater tanks and the stored water used for irrigation of landscaped areas (lawns and gardens)
- Stormwater runoff from all hardstand (roofs and hard landscaped areas) is to be discharged into on-site detention (OSD) tanks to limit peak discharges from the site.
- Stormwater disposal from each site is to be by means of a 10m long level spreader (transpiration disposal system) located in the south-eastern corner of Lot 1A
- In addition, Lot 1A provides for the first flush of stormwater runoff from some hard landscaped areas at the front of the dwelling, including the driveway, to be discharged onto the downslope landscaped areas to ensure existing trees within the adjacent public reserve are not adversely impacted due to the change in hydrology that might otherwise occur.

Plans of the proposed stormwater systems for each development are included in Appendix A.

3.2. On-site Detention

3.2.1. OSD Requirement – WDCCP2009

The OSD requirement for Lot 1B was calculated using the methodology outlined in Chapter E14 of the Wollongong DCP 2009 based on the measurement of relevant areas from the architectural drawings in AutoCAD.

OSD calculations, including extent of impervious area and OSD tributary are provided on Drawing 1755-C02 in Appendix A.

To satisfy Chapter E14 of the Wollongong DCP 2009 the OSD requirements shown in Table 1 apply to the development.

Table 1: Lot 1B OSD Requirements – WDCP 2009

Storm Event	PSD	SSR
5yr ARI	17.56 l/s	3.27m ³
100 yr ARI	30.71 l/s	5.72m ³

3.2.2. OSD Provision

Drawing 1755-C03 indicates the intention to divert some runoff currently draining to Norman Street to the level spreader in Lot 1A and hence into the public reserve. Council indicated a preference for this approach due to the existing 350mm diameter pipe draining the existing surface inlet pit at the frontage of the property apparently being decommissioned.

To assess the performance of the OSD systems in attenuating peak flows a DRAINS model was constructed which included both Lots 1A and 1B as shown in Figure 2.

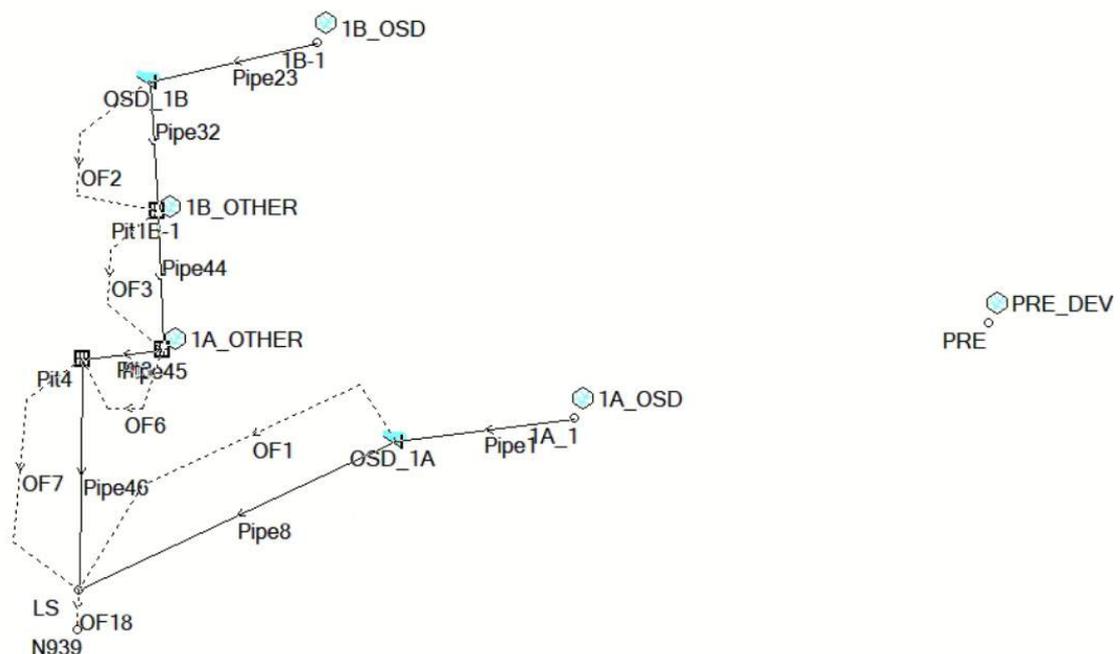


Figure 2: DRAINS Model Configuration

The DRAINS model included the following:

- Predevelopment catchment of 1730m² representing the area of Lot 1A draining to the OSD tank on that Lot (880m²) and area of Lot 1B currently draining to the public reserve through Lot 1A (850m²). The catchment area was modelled as 100% pervious.
- Post development catchments totalling 2,530m² (as for pre-development catchment area plus the additional 800m² currently draining to Norman Street). The catchments included:
 - 1B_OSD – Area within Lot 1B draining to the OSD tank. 620m² @ 95% impervious.
 - 1B_OTHER – Area within Lot 1B bypassing OSD tank. 1,040m² @ 100% pervious.
 - 1A_OSD - Area within Lot 1A draining to the OSD tank. 770m² @ 71% impervious.
 - 1A_OTHER - Area within Lot 1A bypassing OSD tank. 100m² @ 100% pervious.
- 10m³ OSD tank on Lot 1B containing 100mm orifice
- 33m³ OSD tank on Lot 1A containing 140mm orifice

The model was run in full unsteady (premium) hydraulic mode for storm events ranging from 5 minutes to 1 hours for the 0.2EY (5yr ARI) and 1% AEP storm events and the results are summarised in Table 2.

Table 2: Hydraulic Modelling Summary for flows arriving at level spreader

Storm Event	Pre-Development	Post Development
0.2EY	72 l/s	54 l/s
1% AEP	147 l/s	112 l/s

The results indicate that post development flows being discharged into the public reserve via the level spreader will be in the order of 25% less than pre-development flows.

3.3. Runoff Volume

To assess the change in runoff volume being discharged to the public reserve because of the proposed development on both Lots 1A and 1B a water balance model was built using MUSIC.

3.3.1. Model Inputs

3.3.1.1. Rainfall Data

Pluviograph (6 minute) rainfall data from Port Kembla (Station 068131 – BHP Central Lab) for the period 1970 -1980 was adopted for the model as it is the most reliable source of data in the Illawarra region and is close to the subject site.

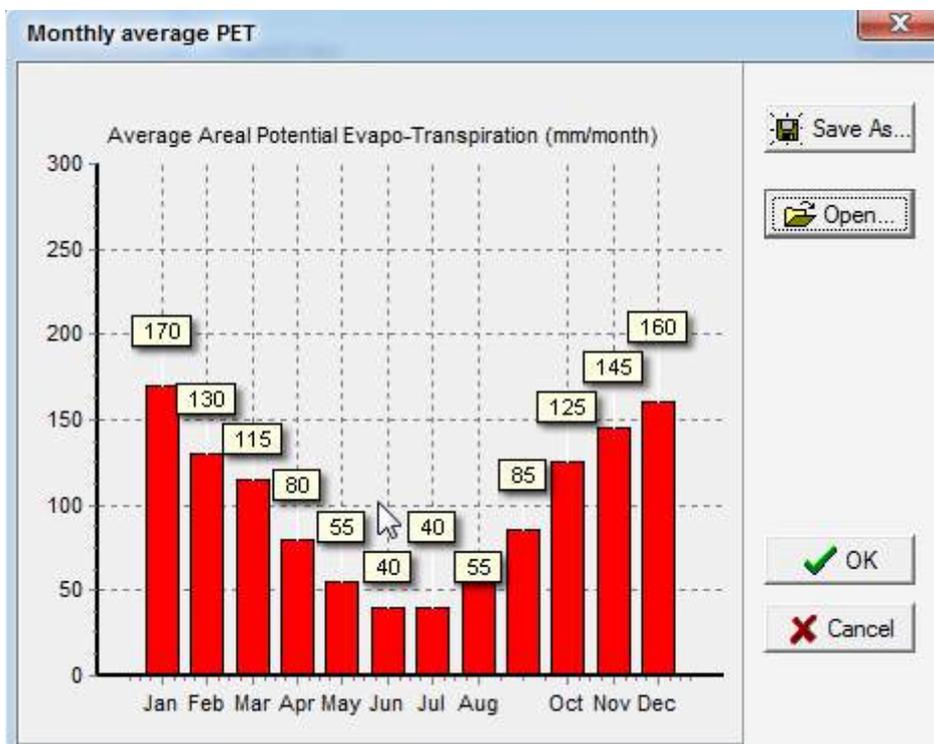
The selected period of data was reviewed for completeness and found to contain no significant data gaps.

Given the length of the record to be used and the nature of the “comparative” assessment to be undertaken (i.e. using the same rainfall template to assess both pre and post development scenarios) the data is considered to be of suitable quality and integrity.

3.3.1.2. Potential Areal Evapotranspiration

Monthly potential areal evapotranspiration (PET) values were interpolated from the Bureau of Meteorology climate atlas and are shown below.

The annual PET adopted in the model equates to 1,200mm/annum which accords with the Bureau’s annual PET map.



3.3.2. Hydrological Parameters

MUSIC uses a watershed model similar in nature to the tipping bucket type model developed originally by Boughton. The values provided in Table 3 were adopted for use in the model:

Table 3: Values of Hydrological Parameters Adopted in MUSIC

Parameter	Value Adopted	Justification or source of data
Rainfall threshold	0.3mm	Value adopted for roofs based on Table 4.3 – Using MUSIC in the Sydney Drinking Water Catchment, Water NSW (2019)
	1.5mm	Value adopted for hardstand areas based on Table 4.3 of Water NSW (2019)
	10mm	Value adopted for those hardstand areas within Lot 1A draining to the proposed first flush system described in Section 3.1 as per design of that system
	50mm	Value adopted for pools to represent overflows from these areas being discharged to sewer as per authority requirements (i.e. value ensure minimal stormwater overflows from these areas)
Soil storage capacity	120mm/m	Default MUSIC Values adopted in the absence of site specific geotechnical information. It should be noted that due to the nature of the assessment being undertaken (i.e. a comparative assessment) the adoption of MUSIC default values is considered appropriate as the same data is being used to assess both pre and post development scenarios.
Field Capacity	80mm/m	
Daily baseflow rate	25%	
Daily groundwater recharge rate	5%	
Daily deep seepage rate	0%	
Infiltration parameter a	200mm/d	
Infiltration parameter b	1.0	

3.3.2.1. Water Re-use

Water collected in both the rainwater and stormwater tanks on each lot was assumed to be re-used for both internal uses and irrigation of landscaped areas on both lots.

The following assumptions were made with respect to re-use amounts:

- Internal reuse of 0.47KL/day/dwelling based on toilet and laundry uses for a 4-bedroom house in accordance with Table 4.3 of Water NSW (2019).
- External re-use of 146KL/year and 180KL/year for Lots 1A and 1B respectively based on extrapolation of the external use rate provided in Table 4.3 of Water NSW (2019). Assuming that the 55KL/year specified in the guideline is applied to a typical 600m² lot where 1/3 of the lot is assumed to be landscaped gives an irrigation depth of 275mm/year (i.e. 55KL/year divided by 200m² = 275mm/m²/year). Extrapolating this over the irrigable areas for Lot 1A (532m²) and Lot 1B (654m²) gives the re-use volumes adopted for each lot.

3.3.3. Model Configuration

The MUSIC model contained both pre-development and post development nodes to enable the change in runoff volume resulting from the development to be assessed. Catchment and land-use areas used in the model are shown on Drawings 1755-SK01 and 1755-SK02 in Appendix B, whilst the model configuration is shown in Figure 3.

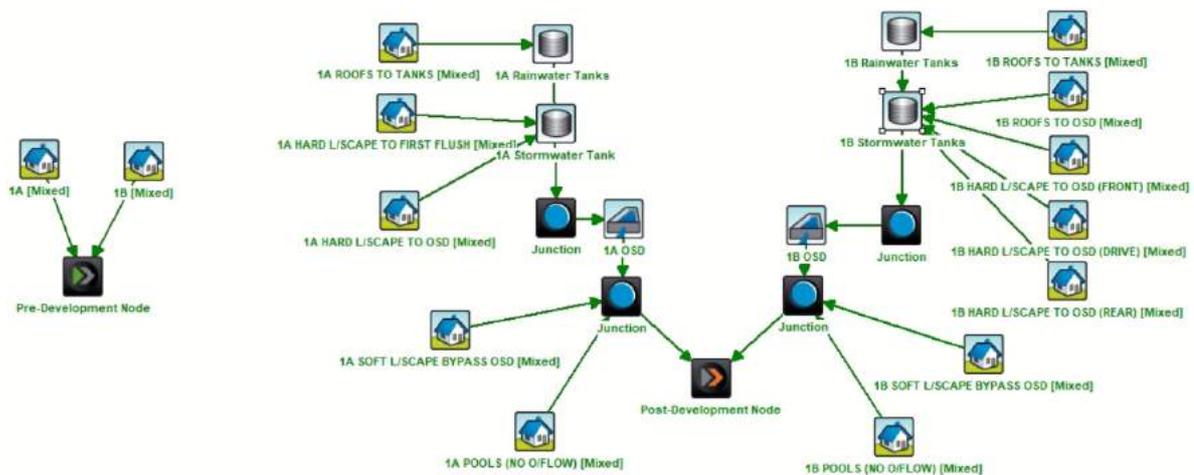


Figure 3: MUSIC Model configuration

3.3.4. Results

The results of the modelling are provided in Table 4 and indicate that, based on the assumption made, the proposed development will not result in any increase in runoff volume compared to the pre-development level. Whilst there will be a marked increase in impervious surfaces proposed as part of the development the capture and re-use of this water for internal (toilet flushing and laundry) and external (garden watering) uses ensures that the amount of stormwater runoff does not exceed pre-development levels.

Table 4: Hydraulic Modelling Summary for flows arriving at level spreader

Development Scenario	Runoff Volume
Pre-Development	1.28 ML/year
Post Development (no re-use)	1.65 ML/year
Post Development (with re-use)	1.28 ML/year

4.0 ASSESSMENT AGAINST WOLLONGONG DCP 2009

An assessment of the proposed development against the objectives of Chapter E14 (Stormwater Management) of the Wollongong DCP 2009 has shown that the proposed stormwater management system satisfies the objectives as demonstrated in Table 5.

Table 5: Assessment Against Chapter E14 Objective of the WDCP 2009

Objective	Response
a) Achieve a uniform standard of stormwater drainage design for all developments	The proposed development complies with the DCP and incorporates on-site detention and disposal via a level spreader which is an approved method of disposal under the DCP. The method of stormwater management in not inconsistent with other similar developments within the LGA.
b) Reduce peak flows from sites into Council's stormwater drainage system	The proposed development does not discharge into Council's stormwater drainage system. Notwithstanding the modelling undertaken indicates that there will be a reduction in peak flows from the site following the proposed development due to the incorporation of oversized OSD tanks.
c) Reduce probability of downstream flooding	Modelling conducted as part of the investigations reveals that the proposed development will result in both a reduction in peak flows and runoff volumes and therefore the probability of downstream flooding will be reduced.

<p>d) Minimise the potential impacts of new development and redevelopment in areas affected by local overland stormwater run-off or flooding, such that no increase in stormwater peak flows occurs downstream</p>	<p>The subject site is located near the top of a ridge and is not affected by overland stormwater runoff or flooding. Notwithstanding the modelling undertaken indicates that there will be a reduction in peak flows from the site following the proposed development due to the incorporation of oversized OSD tanks.</p>
<p>e) Minimise stormwater run-off volumes</p>	<p>Modelling conducted as part of the investigations reveals that the proposed development will result in a reduction in runoff volume.</p>
<p>f) reduce peak run-off flows from urban developments and minimising imperious areas, wherever practicable</p>	<p>Modelling conducted as part of the investigations reveals that the proposed development will result in both a reduction in peak flows and runoff volumes. Impervious areas have been minimised where practicable through the adoption of permeable pathways and paving (i.e. gravel paths) in lieu of hardstand paving throughout landscaped areas.</p>
<p>g) Minimise the drainage infrastructure cost of development</p>	<p>The cost of the proposed stormwater drainage infrastructure is proportionate to the cost of the proposed development.</p>
<p>h) Increase public convenience and public safety as well as protection of property</p>	<p>The proposed stormwater management system will not adversely impact existing public convenience, safety or property.</p>

The proposed level spreader (transpiration disposal system) satisfies clauses 9.3.9 and 9.3.12 of Chapter E14 of the Wollongong DCP 2009 on the following basis:

- The proposed method of disposal consists of a transpiration disposal system which is aligned with the existing site contours in order to disperse runoff over the existing ground surface in a way that replicates natural overland flows.

- It should be noted that whilst discharge to Norman Street is possible from approximately half of the site Council has indicated a preference to discharge to the level spreader in Lot 1A due to the existing stormwater pipe in Norman Street being decommissioned.
- A level spreader is an approved means of disposal under the DCP where discharge cannot be made to the street drainage system as was selected in preference to an absorption disposal system due to the shallow depth to bedrock on the site.
- The proposed device is located with minimal setback to the public reserve boundary in accordance with Clause 9.3.12 f) which permits zero setback in such circumstances.
- The proposed level spreader is consistent with the recommendations of the geotechnical report which permitted the discharge of overflows from the tanks to properly engineered infiltration pits on the sites lower slopes or to Council stormwater system or natural drains.

5.0 CONCLUSION

The modelling undertaken demonstrates that the proposed stormwater management system consisting of on-site detention, rainwater and stormwater storage tanks is able to maintain existing hydrological conditions to pre-development levels with no increase in either peak flow rates or runoff volumes.

The proposed stormwater management approach is consistent with and satisfies the requirements of Chapter E14 of the Wollongong DCP 2009.

APPENDIX A

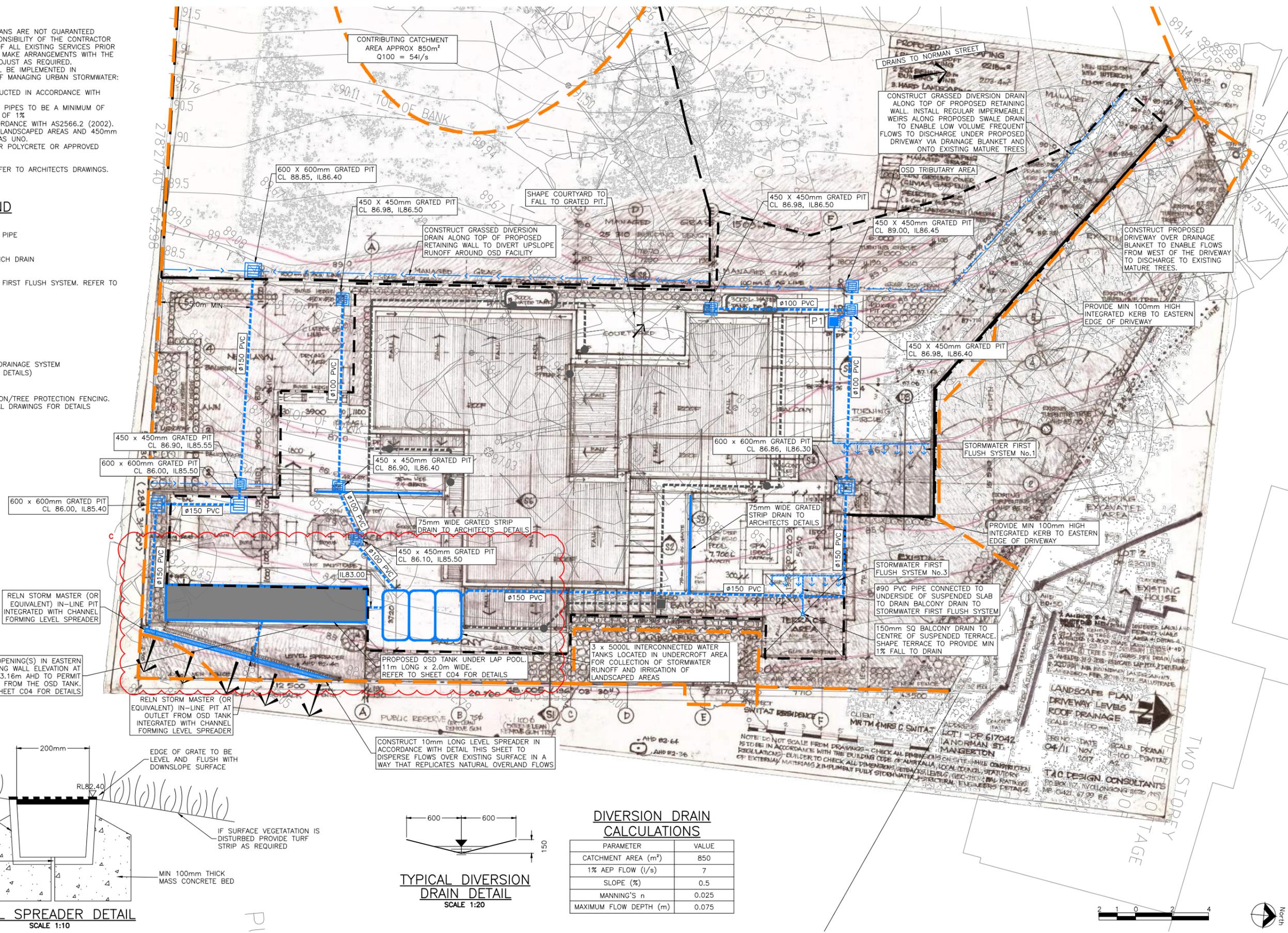
Stormwater Plans

STORMWATER NOTES

- EXISTING SERVICES SHOWN ON THESE PLANS ARE NOT GUARANTEED COMPLETELY CORRECT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORKS AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST AS REQUIRED.
- SEDIMENT AND EROSION CONTROLS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE REQUIREMENTS OF MANAGING URBAN STORMWATER: SOIL AND CONSTRUCTION HANDBOOK.
- ALL DRAINAGE WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AS3500.3
- UNLESS OTHERWISE NOTED ALL DRAINAGE PIPES TO BE A MINIMUM OF DN90 AND LAID AT A MINIMUM GRADIENT OF 1%
- PVC PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AS2566.2 (2002).
- MINIMUM PIPE COVER TO BE 300mm IN LANDSCAPED AREAS AND 450mm UNDER DRIVEWAYS AND TRAFFICABLE AREAS UNO.
- ALL PITS TO BE PRE-CAST CONCRETE OR POLYCRETE OR APPROVED EQUIVALENT.
- ALL PITS COVERS TO BE CLASS B UNO
- FOR LOCATION OF SUBSOIL DRAINAGE REFER TO ARCHITECTS DRAWINGS.

LEGEND

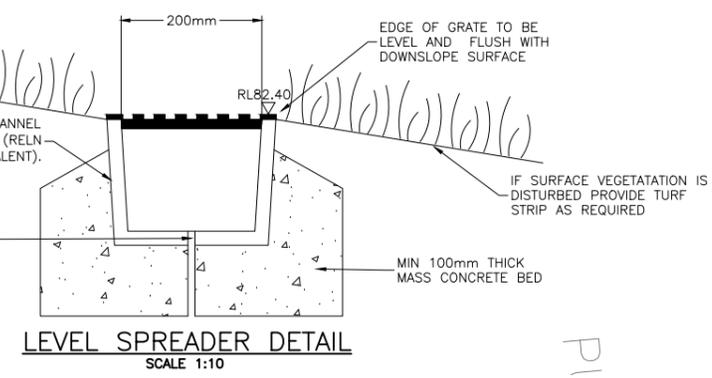
- PROPOSED STORMWATER PIPE
- PROPOSED GRATED TRENCH DRAIN
- PROPOSED STORMWATER FIRST FLUSH SYSTEM. REFER TO SHEET C02 FOR DETAILS
- DIVERSION DRAIN
- OSD TRIBUTARY AREA
- PROPOSED ROOFWATER DRAINAGE SYSTEM (REFER SHEET C02 FOR DETAILS)
- TEMPORARY CONSTRUCTION/TREE PROTECTION FENCING. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS



PROVIDE OPENING(S) IN EASTERN RETAINING WALL ELEVATION AT RL83.16m AHD TO PERMIT OVERFLOWS FROM THE OSD TANK. REFER TO SHEET C04 FOR DETAILS

RELN STORM MASTER (OR EQUIVALENT) IN-LINE PIT INTEGRATED WITH CHANNEL FORMING LEVEL SPREADER

CONSTRUCT 10mm LONG LEVEL SPREADER IN ACCORDANCE WITH DETAIL THIS SHEET TO DISPERSE FLOWS OVER EXISTING SURFACE IN A WAY THAT REPLICATES NATURAL OVERLAND FLOWS



TYPICAL DIVERSION DRAIN DETAIL
SCALE 1:20

DIVERSION DRAIN CALCULATIONS

PARAMETER	VALUE
CATCHMENT AREA (m ²)	850
1% AEP FLOW (l/s)	7
SLOPE (%)	0.5
MANNING'S n	0.025
MAXIMUM FLOW DEPTH (m)	0.075

ISSUE	DESCRIPTION	DATE
C	OSD TANK INCREASED, RAINWATER TANKS CHANGED TO S/WATER TANKS	15/11/21
B	TREE PROTECTION FENCING ADDED	02/12/19
A	ISSUED FOR CONSTRUCTION	04/09/19

ISSUED FOR CONSTRUCTION

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SCALES ORIGINAL A3
1:200

CLIENT: TED SWATUJ

SURVEYOR: ROBSON
DATUM: AHD
AZIMUTH: LOCAL
DRAWN: AB
DESIGNED: AB
DESIGNED DATE: NOV '17
CHECKED: AB

footprint
sustainable engineering
a. 15 meehan drive
kiama downs nsw 2533
p. 02 4237 6770
f. 02 4237 8962

1A NORMAN STREET, MANGERTON
PROPOSED DWELLING
STORMWATER DRAINAGE PLAN

DRAWING NO. 1714-C01
ISSUE C
SHEET 1 OF 4

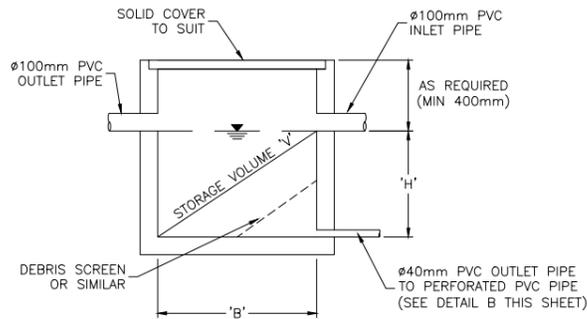
ROOF GUTTER NOTES:

1. ALL BOX GUTTERS SHALL BE A MINIMUM 200mm WIDE x 200mm DEEP
2. A MINIMUM VERTICAL DIMENSION OF 600mm BETWEEN THE UNDERSIDE OF THE GUTTER AND THE TOP OF THE RAINWATER TANK IS REQUIRED TO ENSURE SUFFICIENT HYDRAULIC GRADE LINE IS MAINTAINED.
3. FLOW RATES SPECIFIED HEREON HAVE BEEN CALCULATED BASED ON A 100 YEAR ARI 5 MINUTE INTENSITY OF 297mm/hr.

LEGEND

- PROPOSED STORMWATER PIPE
- PROPOSED RAINWATER FIRST FLUSH SYSTEM. REFER TO DETAILS THIS SHEET.
- | |
|------|
| 1 |
| 142 |
| 11.8 |

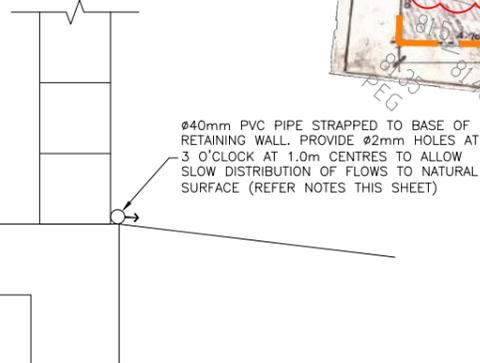
 ROOF CATCHMENT NUMBER
ROOF CATCHMENT AREA (m²)
100yr ARI FLOW RATE (l/s)
- PROPOSED DOWNPIPE LOCATION AND SIZE
- PROPOSED STORMWATER DRAINAGE SYSTEM (REFER TO SHEET C01 FOR DETAILS)
- TEMPORARY CONSTRUCTION/TREE PROTECTION FENCING. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS



DETAIL A – FIRST FLUSH PIT
NO TO SCALE

FIRST FLUSH PIT DETAILS

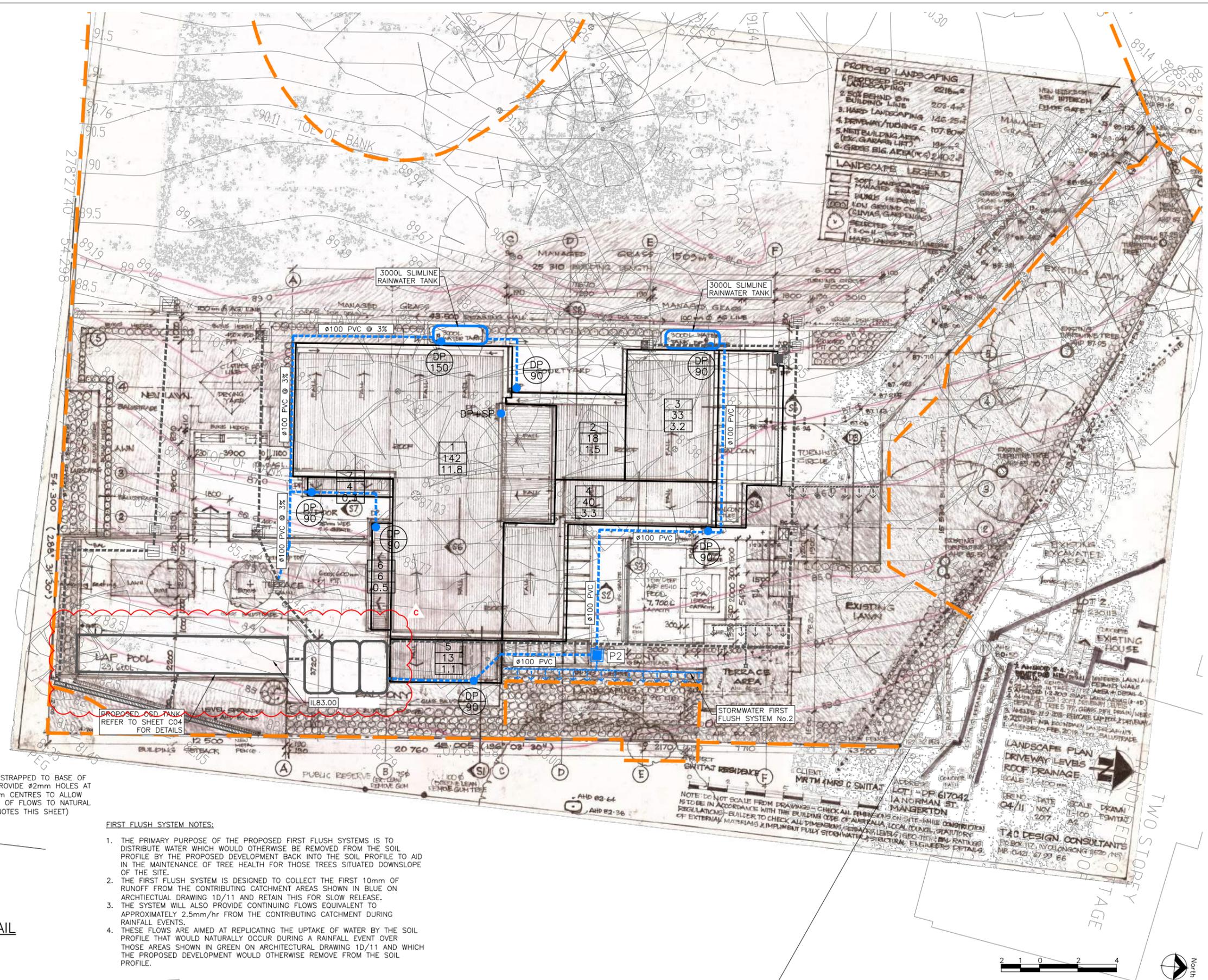
PIT	VOLUME 'V' (m ³)	B (mm)	H (mm)
P1 (C01)	0.25	600x600	750
P2	0.50	900x900	600



DETAIL B – PERFORATED PVC PIPE DETAIL
NO TO SCALE

FIRST FLUSH SYSTEM NOTES:

1. THE PRIMARY PURPOSE OF THE PROPOSED FIRST FLUSH SYSTEMS IS TO DISTRIBUTE WATER WHICH WOULD OTHERWISE BE REMOVED FROM THE SOIL PROFILE BY THE PROPOSED DEVELOPMENT BACK INTO THE SOIL PROFILE TO AID IN THE MAINTENANCE OF TREE HEALTH FOR THOSE TREES SITUATED DOWNSLOPE OF THE SITE.
2. THE FIRST FLUSH SYSTEM IS DESIGNED TO COLLECT THE FIRST 10mm OF RUNOFF FROM THE CONTRIBUTING CATCHMENT AREAS SHOWN IN BLUE ON ARCHITECTURAL DRAWING 1D/11 AND RETAIN THIS FOR SLOW RELEASE. THE SYSTEM WILL ALSO PROVIDE CONTINUING FLOWS EQUIVALENT TO APPROXIMATELY 2.5mm/hr FROM THE CONTRIBUTING CATCHMENT DURING RAINFALL EVENTS.
3. THESE FLOWS ARE AIMED AT REPLICATING THE UPTAKE OF WATER BY THE SOIL PROFILE THAT WOULD NATURALLY OCCUR DURING A RAINFALL EVENT OVER THOSE AREAS SHOWN IN GREEN ON ARCHITECTURAL DRAWING 1D/11 AND WHICH THE PROPOSED DEVELOPMENT WOULD OTHERWISE REMOVE FROM THE SOIL PROFILE.



PROPOSED LANDSCAPING

1. PROPOSED SOFT LANDSCAPING 2216m²
2. SOFT BEHIND 5m BUILDING LINE 203.4m²
3. HARD LANDSCAPING 146.25m²
4. DRIVEWAY/TUING C. 107.80m²
5. NEW BUILDING AREA (EX. GARAGE LIFT) 192m²
6. GRASS BIG AREA (NO. 2) 102.2m²

LANDSCAPE LEGEND

- SOFT LANDSCAPE MANAGED GRASS
- BUNKER HERDS
- LOW GROUND COVER (LIVIAS, GAZELLAS)
- SELECTED TREES (3.0-11.0M TOP HARD LANDSCAPING)

LANDSCAPE PLAN
DRIVEWAY LEVELS
ROOF DRAINAGE
SCALE 1:500

DATE: 04/11/2017
SCALE: 1:500
DRAWN: J. SWITAT
CHECKED: J. SWITAT

T40 DESIGN CONSULTANTS
PO BOX 117, NYONGONG 9620 (NSW)
NP: 0421 67 99 66

ISSUE	DESCRIPTION	DATE
C	OSD TANK INCREASED, RAINWATER TANKS CHANGED TO S/WATER TANKS	15/11/21
B	TREE PROTECTION FENCING ADDED	02/12/19
A	FOR CONSTRUCTION	04/09/19

ISSUED FOR CONSTRUCTION

FOOTPRINT (NSW) PTY. LTD. AUTHORISE THE USE OF THIS DRAWING ONLY FOR THE PURPOSE DEMONSTRATED BY THE STATUS STAMP SHOWN ABOVE.

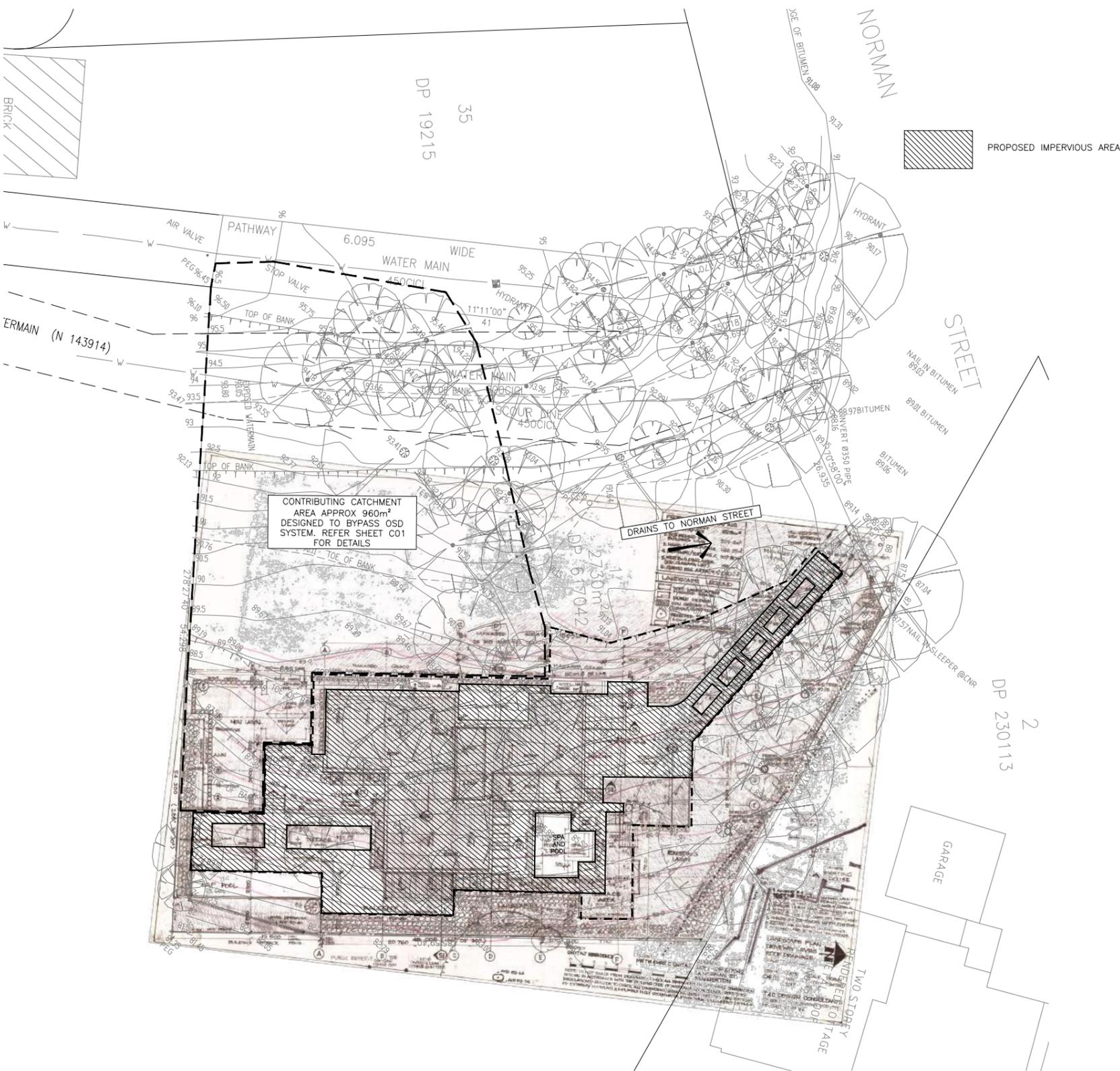
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1:200	A3	DATUM:	AHD
		AZIMUTH:	LOCAL
		DRAWN:	AB
		DESIGNED:	AB
		DESIGNED DATE:	NOV '17
		CHECKED:	AB

CLIENT: TED SWATJ

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sustainable engineering
a. 15 meehan drive
kiama downs nsw 2533
p. 02 4237 6770
f. 02 4237 8962

1A NORMAN STREET, MANGERTON
PROPOSED DWELLING
ROOFWATER DRAINAGE PLAN

DRAWING NO.	1714-C02
ISSUE.	C
SHEET	2 OF 4



WCC OSD Policy Calculation
(as per methodology presented in Chapter E14 of the Wollongong DCP2009)

INPUT PARAMETERS			
Tributary Area	770 m ²	Tributary Area	0.0770 ha
Pre-dev. Impervious Area	0 m ²	Pre-dev. % Imp.	0.0 %
Post-dev. Impervious Area	547 m ²	Post-dev. % Imp.	71.0 %
Rainfall Intensity (I ₁ ⁵⁰)	102 mm/hr		

STEP 1			
		(Formula)	
F1 ₅	1.00	(y = -1.59E-05x ² + 0.0043x + 0.9890)	
F1 ₁₀₀	1.00	(y = -1.54E-05x ² + 0.0033x + 0.9938)	
F2	1.12	(y = 0.0388x ² - 0.1696x + 1.1308)	
F3	0.16	(y = -1.3E-05x ² + 0.0032x)	
F4	0.53	(y = x ^{0.2506})	
PSD ₅	23.44 L/s	(=F1 ₅ *F2*2.67*(Area/10000)*I ₁ ⁵⁰)	
PSD ₁₀₀	41.01 L/s	(=F1 ₁₀₀ *F2*4.67*(Area/10000)*I ₁ ⁵⁰)	
SSR ₅	4.01 m ³	(=F3*F4*2.25*PSD ₅ /F2)	
SSR ₁₀₀	7.02 m ³	(=F3*F4*2.25*PSD ₁₀₀ /F2)	

STEP 2			
		(Formula)	
F1 ₅	1.00	(y = -1.59E-05x ² + 0.0043x + 0.9890)	
F1 ₁₀₀	1.00	(y = -1.54E-05x ² + 0.0033x + 0.9938)	
F2	1.12	(y = 0.0388x ² - 0.1696x + 1.1308)	
F3	0.00	(y = -1.3E-05x ² + 0.0032x)	
F4	0.53	(y = x ^{0.2506})	
PSD ₅	23.44 L/s	(=F1 ₅ *F2*2.67*(Area/10000)*I ₁ ⁵⁰)	
PSD ₁₀₀	41.01 L/s	(=F1 ₁₀₀ *F2*4.67*(Area/10000)*I ₁ ⁵⁰)	
SSR ₅	0.00 m ³	(=F3*F4*2.25*PSD ₅ /F2)	
SSR ₁₀₀	0.00 m ³	(=F3*F4*2.25*PSD ₁₀₀ /F2)	

FINAL VALUES			
PSD ₅	23.44 L/s	(As in STEP 1)	
PSD ₁₀₀	41.01 L/s	(As in STEP 1)	
SSR ₅	4.01 m ³	(STEP 1 - STEP 2)	
SSR ₁₀₀	7.02 m ³	(STEP 1 - STEP 2)	

ISSUE	DESCRIPTION	DATE
C	OSD TANK INCREASED, RAINWATER TANKS CHANGED TO S/WATER TANKS	15/11/21
B	TREE PROTECTION FENCING ADDED	02/12/19
A	ISSUED FOR CONSTRUCTION	04/09/19

FOR DEVELOPMENT APPLICATION
ISSUED FOR

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SCALES ORIGINAL
1:400 A3

CLIENT: TED SWATJ

SURVEYOR: CONSTRUCTION
DATUM: AHD
AZIMUTH: LOCAL
DRAWN: AB
DESIGNED: AB
DESIGNED DATE: NOV '17
CHECKED: AB

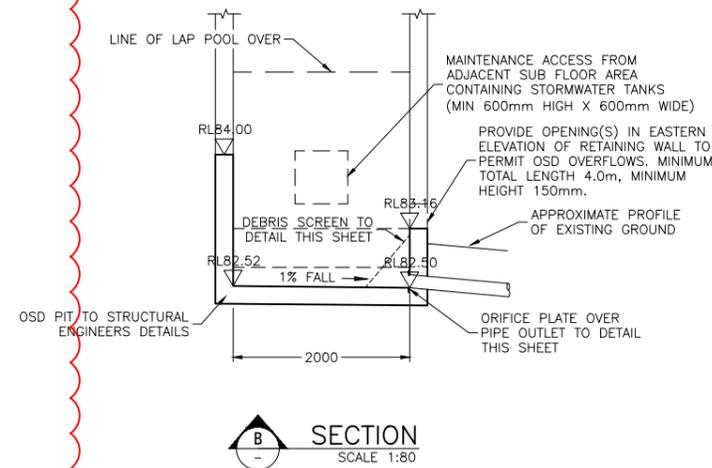
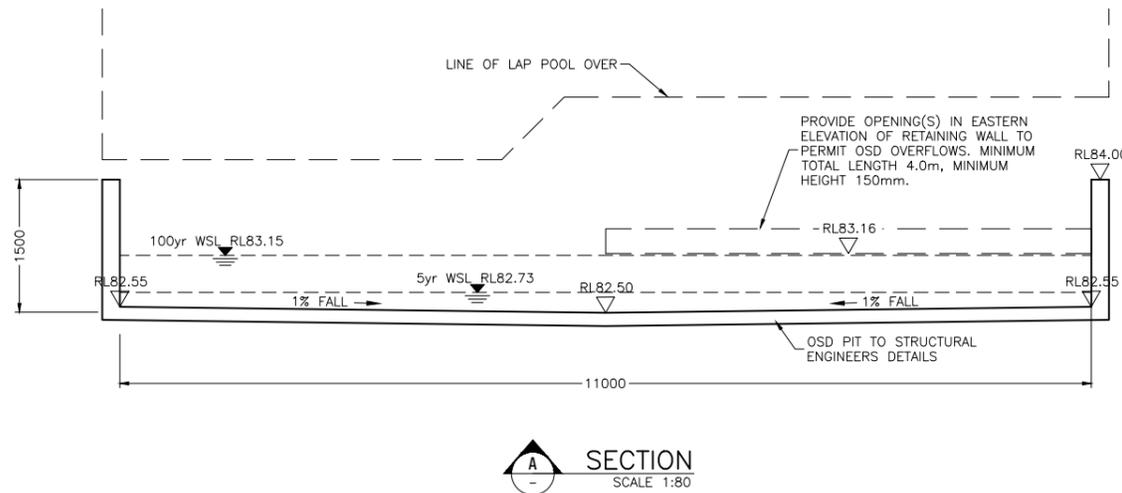
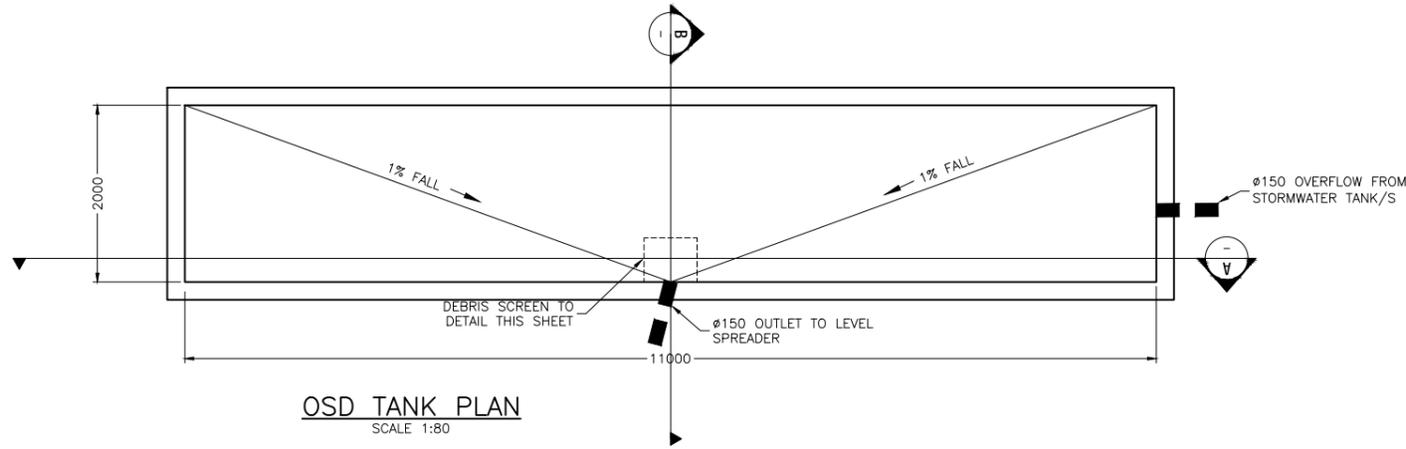
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a. 15 meehan drive
kiama downs nsw 2533
p. 02 4237 6770
f. 02 4237 8962

1A NORMAN STREET, MANGERTON
PROPOSED DWELLING
ON-SITE DETENTION CALCULATIONS

DRAWING NO.
1714-C03
ISSUE.
C
SHEET 3 OF 4

OSD MAINTENANCE SCHEDULE

MAINTENANCE ACTION	FREQUENCY	PERFORMED BY	PROCEDURE
INSPECT AND REMOVE ANY BLOCKAGE AT ORIFICE	SIX MONTHLY	OWNER	REMOVE DEBRIS SCREEN TO INSPECT ORIFICE. SEE PLAN FOR LOCATION OF DISCHARGE OUTLET PIT.
INSPECT SCREEN AND CLEAN	SIX MONTHLY	OWNER	REMOVE SCREEN IF REQUIRED TO CLEAN IT.
INSPECT PIT SUMP AND REMOVE ANY SEDIMENT/SLUDGE	SIX MONTHLY	OWNER	REMOVE SCREEN AND REMOVE SEDIMENT/SLUDGE BUILD-UP AND CHECK ORIFICE CLEAR.
INSPECT STORAGE AREAS AND REMOVE DEBRIS/MULCH/LITTER LIKELY TO CAUSE BLOCKAGE	SIX MONTHLY	OWNER	REMOVE DEBRIS AND FLOATABLE MATERIAL LIKELY TO BE CARRIED TO GRATES.
INSPECT OVERFLOW WEIR AND REMOVE ANY BLOCKAGE	SIX MONTHLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND OPEN COVER TO VENTILATE UNDERGROUND STORAGE. ENSURE WEIR IS CLEAR OF BLOCKAGES.
INSPECT OUTLET PIPE AND REMOVE ANY BLOCKAGES	SIX MONTHLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND SCREEN. VENTILATE UNDERGROUND STORAGE. CHECK ORIFICE AND REMOVE ANY BLOCKAGES IN OUTLET PIPE. FLUSH OUTLET PIPE TO CONFIRM IT DRAINS FREELY.
CHECK ATTACHMENT OF ORIFICE PLATE TO WALL OF PIT (GAPS LESS THAN 5mm)	ANNUALLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND SCREEN. ENSURE PLATE IS MOUNTED SECURELY, TIGHTEN FIXINGS/SEAL GAPS AS REQUIRED.
CHECK ATTACHMENT OF SCREEN TO WALL OF PIT	ANNUALLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND SCREEN. ENSURE FIXINGS SECURE. REPAIR AS REQUIRED.
CHECK SCREEN FOR CORROSION	ANNUALLY	MAINTENANCE CONTRACTOR	REMOVE GRATE AND EXAMINE SCREEN FOR RUST OR CORROSION, ESPECIALLY AT CORNERS AND WELDS. REPAIR OR REPLACE AS REQUIRED.
INSPECT PIT WALLS FOR CRACKS OR SPALLING	ANNUALLY	MAINTENANCE CONTRACTOR	REMOVE GRATE TO INSPECT INTERNAL WALLS AND REPAIR AS REQUIRED.
CHECK ORIFICE DIAMETER CORRECT AND RETAINS SHARP EDGE	FIVE YEARLY	MAINTENANCE CONTRACTOR	COMPARE DIAMETER AGAINST DIAMETER AS ENGRAVED ON ORIFICE PLATE. ENSURE EDGE IS NOT PITTED OR DAMAGED. REPLACE AS REQUIRED.



OSD FACILITY
DA-2017/1719

THIS STRUCTURE IS AN ON-SITE DETENTION FACILITY, BEING PART OF THE STORMWATER DRAINAGE SYSTEM, AND IS NOT TO BE TAMPERED WITH OR MODIFIED IN ANY WAY WITHOUT THE PRIOR CONSENT OF COUNCIL.

CORROSION RESISTANT PLAQUE DETAIL

- NOTES:
1. PLAQUE TO BE MADE OF CORROSION RESISTANT MATERIAL.
 2. PLAQUE TO BE MOUNTED ON OR IN CLOSE PROXIMITY TO THE OSD TANK.

ORIFICE SIZING CALCULATIONS

ORIFICE EQUATION $Q = CA(2gh)^{0.5}$

FOR CIRCULAR ORIFICES THIS EQUATION CAN BE RE-EXPRESSED IN TERMS OF 'D' AND ASSUMING A COEFFICIENT OF DISCHARGE OF 0.61 AS FOLLOWS:

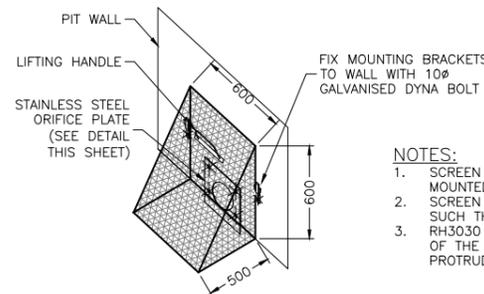
$$D^2 = 0.471 \times Q / h^{0.5}$$

THEREFORE $D^2 = 0.471 \times 0.02344 / 0.310^{0.5} = 0.019829m$

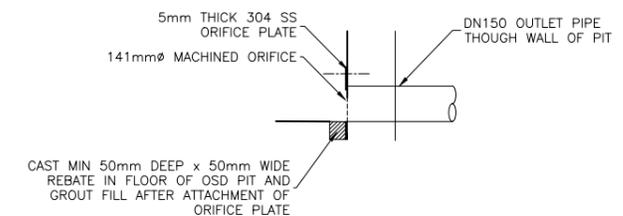
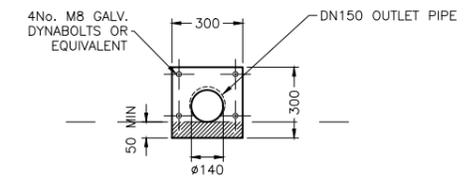
AND $D = 0.019829^{0.5} = 0.140m$

WEIR SIZING CALCULATIONS

PONDED ELEVATION FOR SSR5 = 82.73m AHD
ORIFICE SIZE FOR PSD5 (23.44l/s) = 141mm
FLOW THROUGH ORIFICE AT RL83.16m AHD = 32.4l/s
FLOW OVER WEIR = 41.0 - 32.4l/s = 8.6l/s
WEIR LENGTH = 4m (ASSUMED)
DEPTH OF FLOW OVER WEIR = 11mm
MAXIMUM PONDED LEVEL = 83.16+0.011 = 83.17m



- NOTES:
1. SCREEN TO BE CONSTRUCTED FROM MAXI-MESH RH3030 MOUNTED IN 25x25x3mm EQUAL ANGLE FRAME.
 2. SCREEN TO BE HOT DIPPED GALVANISED AFTER FABRICATION SUCH THAT ALL WELDS ARE CORROSION PROTECTED.
 3. RH3030 MESH TO BE POSITIONED SUCH THAT THE LONG AXIS OF THE MESH IS TO BE POSITIONED HORIZONTALLY AND THE PROTRUDING LIP IS UPPERMOST.



ORIFICE PLATE DETAIL
NOT TO SCALE

ISSUE	DESCRIPTION	DATE
C	OSD TANK INCREASED, RAINWATER TANKS CHANGED TO S/WATER TANKS	15/11/21
B	TREE PROTECTION FENCING ADDED	02/12/19
A	ISSUED FOR CONSTRUCTION	04/09/19

FOR DEVELOPMENT APPLICATION
ISSUED FOR

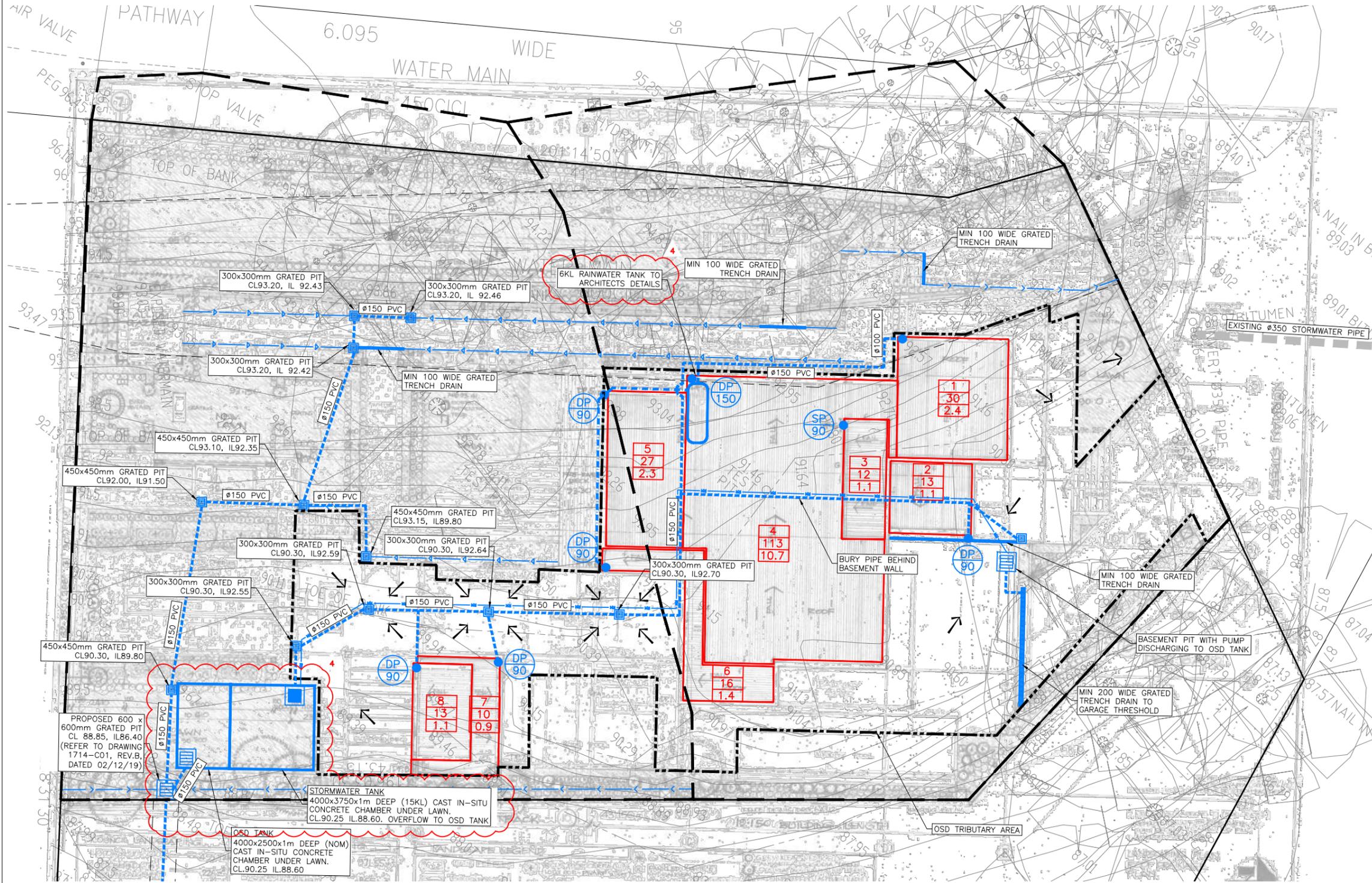
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SCALES	ORIGINAL	SURVEYOR:	CONSTRUCTION
1:400	A3		
CLIENT:		TED SWATUJ	
		DATUM:	AHD
		AZIMUTH:	LOCAL
		DRAWN:	AB
		DESIGNED:	AB
		DESIGNED DATE:	NOV '17
		CHECKED:	AB

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sustainable engineering
a. 15 meehan drive
kiama downs nsw 2533
p. 02 4237 6770
f. 02 4237 8962

1A NORMAN STREET, MANGERTON
PROPOSED DWELLING
ON-SITE DETENTION DETAILS

DRAWING NO.
1714-C04
ISSUE.
C
SHEET 4 OF 4



- ### STORMWATER NOTES
- EXISTING SERVICES SHOWN ON THESE PLANS ARE NOT GUARANTEED COMPLETELY CORRECT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORKS AND MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST AS REQUIRED.
 - SEDIMENT AND EROSION CONTROLS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE REQUIREMENTS OF MANAGING URBAN STORMWATER: SOIL AND CONSTRUCTION HANDBOOK.
 - ALL DRAINAGE WORKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AS3500.3
 - UNLESS OTHERWISE NOTED ALL DRAINAGE PIPES TO BE A MINIMUM OF DN90 AND LAID AT A MINIMUM GRADIENT OF 1%
 - PVC PIPES SHALL BE INSTALLED IN ACCORDANCE WITH AS2566.2 (2002).
 - MINIMUM PIPE COVER TO BE 300mm IN LANDSCAPED AREAS AND 450mm UNDER DRIVEWAYS AND TRAFFICABLE AREAS UNO.
 - ALL PITS TO BE PRE-CAST CONCRETE OR POLYCRETE OR APPROVED EQUIVALENT.
 - ALL PITS COVERS TO BE CLASS B UNO
 - FOR LOCATION OF SUBSOIL DRAINAGE REFER TO ARCHITECTS DRAWINGS.
 - ALL BOX GUTTERS SHALL BE A MINIMUM 250mm WIDE x 200mm DEEP
 - A MINIMUM VERTICAL DIMENSION OF 600mm BETWEEN THE UNDERSIDE OF THE GUTTER AND THE TOP OF THE RAINWATER TANK IS REQUIRED TO ENSURE SUFFICIENT HYDRAULIC GRADE LINE IS MAINTAINED.
 - FLOW RATES SPECIFIED HEREON HAVE BEEN CALCULATED BASED ON A 100 YEAR ARI 5 MINUTE INTENSITY OF 297mm/hr.

- ### LEGEND
- PROPOSED STORMWATER PIPE
 - PROPOSED ROOFWATER PIPE TO RAINWATER TANK
 - PROPOSED GRATED TRENCH DRAIN
 - PROPOSED EARTH SWALE
 - PROPOSED DISH DRAIN (CONCRETE)
 - ROOF CATCHMENT NUMBER
ROOF CATCHMENT AREA (m²)
100yr ARI FLOW RATE (l/s)
 - PROPOSED DOWNPIPE LOCATION AND SIZE
 - PROPOSED DOWNPIPE AND SPREADER LOCATION AND SIZE
 - OSD TRIBUTARY AREA
 - EXISTING CATCHMENT AREA
 - PROPOSED DIRECTION OF FALL ON HARDSTAND AREAS



ISSUE	DESCRIPTION	DATE
4	STORMWATER TANK ADDED, RAINWATER TANK SIZE INCREASED	15/11/21
3	BEDROOM OVER SYDNEY WATER EASEMENT REMOVED	07/09/21
2	RE-ISSUED FOR DEVELOPMENT APPLICATION	05/08/21
1	FOR DEVELOPMENT APPLICATION	16/11/20

FOR DEVELOPMENT APPLICATION
NOT FOR CONSTRUCTION

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SCALES ORIGINAL
1:200 A3

CLIENT: TED SWITAJ

SURVEYOR: ROBSON
DATUM: AHD
AZIMUTH: LOCAL
DRAWN: AB
DESIGNED: AB
DESIGNED DATE: NOV '20
CHECKED: AB

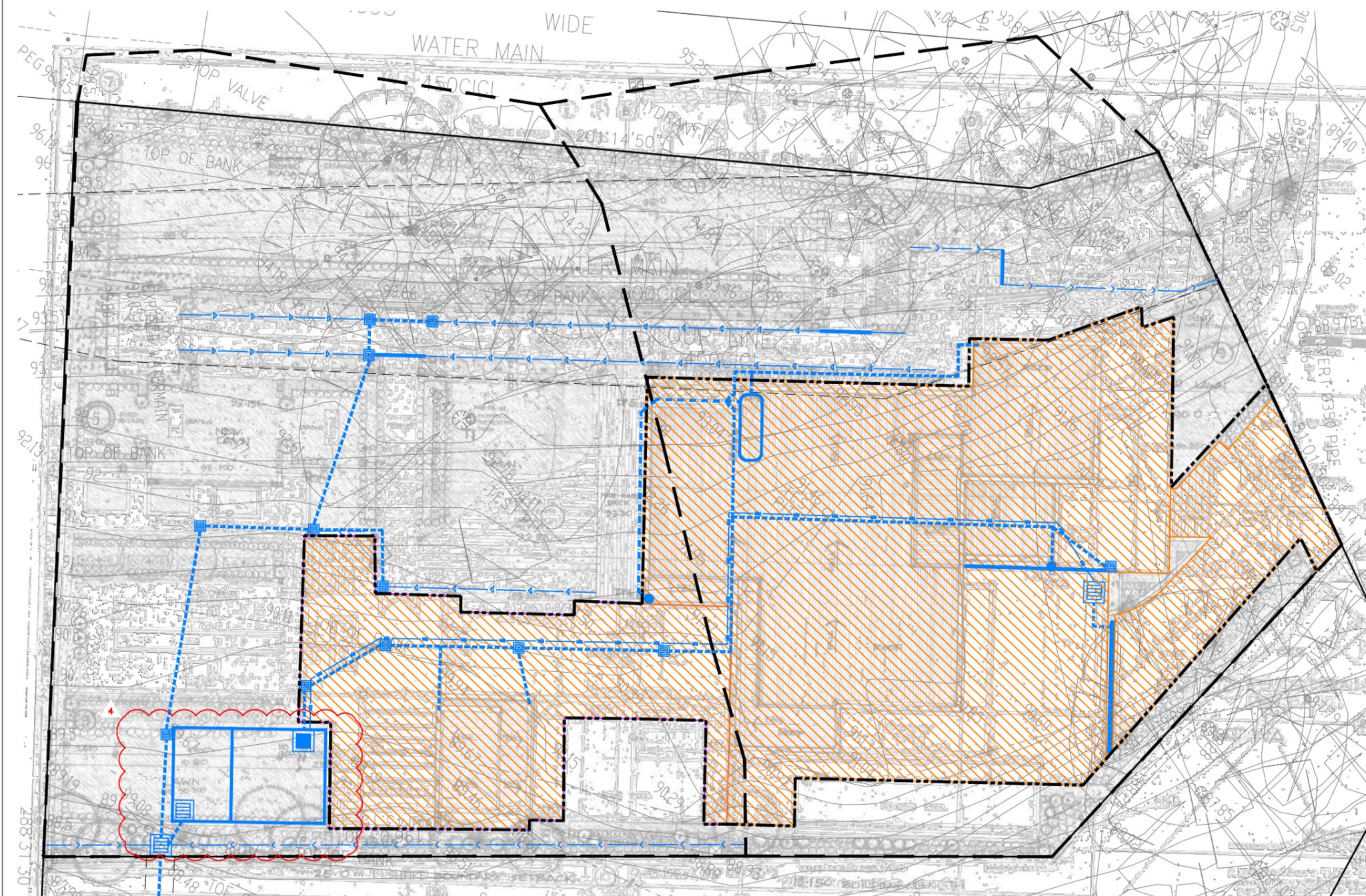
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a. 15 meehan drive
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p. 02 4237 6770
f. 02 4237 8962

LOT 1B NORMAN STREET, MANGERTON
PROPOSED DUAL OCCUPANCY AND TWO LOT SUBDIVISION
CONCEPT STORMWATER PLAN

DRAWING NO.
1755-C01

ISSUE.
4

SHEET 1 OF 3



LEGEND

- OSD IMPERVIOUS AREA
- OSD TRIBUTARY AREA
- EXISTING CATCHMENT AREA

OSD CALCULATIONS

INPUT PARAMETERS			
Tributary Area	575 m ²	Tributary Area	0.0575 ha
Pre-dev. Impervious Area	0 m ²	Pre-dev. % Imp.	0.0 %
Post-dev. Impervious Area	575 m ²	Post-dev. % Imp.	100.0 %
Rainfall Intensity (I _r ⁵⁰)	102 mm/hr		

STEP 1			(Formula)
F1 ₅	1.00		$(y = -1.59E-05x^2 + 0.0043x + 0.9890)$
F1 ₁₀₀	1.00		$(y = -1.54E-05x^2 + 0.0033x + 0.9938)$
F2	1.12		$(y = 0.0388x^2 - 0.1696x + 1.1308)$
F3	0.19		$(y = -1.3E-05x^2 + 0.0032x)$
F4	0.49		$(y = x^{0.2206})$
PSD ₅	17.56 L/s		$(=F1_5 * F2^2 * 2.67 * (Area/10000) * I_r^{50})$
PSD ₁₀₀	30.71 L/s		$(=F1_{100} * F2^2 * 2.67 * (Area/10000) * I_r^{50})$
SSR ₅	3.27 m ³		$(=F3 * F4^2 * 2.25 * PSD_5 / F2)$
SSR ₁₀₀	5.72 m ³		$(=F3 * F4^2 * 2.25 * PSD_{100} / F2)$

STEP 2			(Formula)
F1 ₅	1.00		$(y = -1.59E-05x^2 + 0.0043x + 0.9890)$
F1 ₁₀₀	1.00		$(y = -1.54E-05x^2 + 0.0033x + 0.9938)$
F2	1.12		$(y = 0.0388x^2 - 0.1696x + 1.1308)$
F3	0.00		$(y = -1.3E-05x^2 + 0.0032x)$
F4	0.49		$(y = x^{0.2206})$
PSD ₅	17.56 L/s		$(=F1_5 * F2^2 * 2.67 * (Area/10000) * I_r^{50})$
PSD ₁₀₀	30.71 L/s		$(=F1_{100} * F2^2 * 2.67 * (Area/10000) * I_r^{50})$
SSR ₅	0.00 m ³		$(=F3 * F4^2 * 2.25 * PSD_5 / F2)$
SSR ₁₀₀	0.00 m ³		$(=F3 * F4^2 * 2.25 * PSD_{100} / F2)$

FINAL VALUES			(Formula)
PSD ₅	17.56 L/s		(As in STEP 1)
PSD ₁₀₀	30.71 L/s		(As in STEP 1)
SSR ₅	3.27 m ³		(STEP 1 - STEP 2)
SSR ₁₀₀	5.72 m ³		(STEP 1 - STEP 2)

NOTE: OSD TANK SIZE PROPOSED HAS BEEN INCREASED TO 10m³ TO ASSIST IN OFFSETTING ADDITIONAL FLOWS BEING DIVERTED TOWARDS THE PROPOSED LEVEL SPREADER ON LOT 1A. REFER TO SHEET C03 FOR HYDRAULIC CALCULATION SUMMARY.

ISSUE	DESCRIPTION	DATE
4	STORMWATER TANK ADDED, RAINWATER TANK SIZE INCREASED	15/11/21
3	BEDROOM OVER SYDNEY WATER EASEMENT REMOVED	07/09/21
2	RE-ISSUED FOR DEVELOPMENT APPLICATION	05/08/21
1	FOR DEVELOPMENT APPLICATION	16/11/20

FOR DEVELOPMENT APPLICATION
NOT FOR CONSTRUCTION

FOOTPRINT (NSW) PTY. LTD. AUTHORISE THE USE OF THIS DRAWING ONLY FOR THE PURPOSE DEMONSTRATED BY THE STATUS STAMP SHOWN ABOVE.

SCALES	ORIGINAL
1:200	A3
CLIENT:	TED SWITAJ

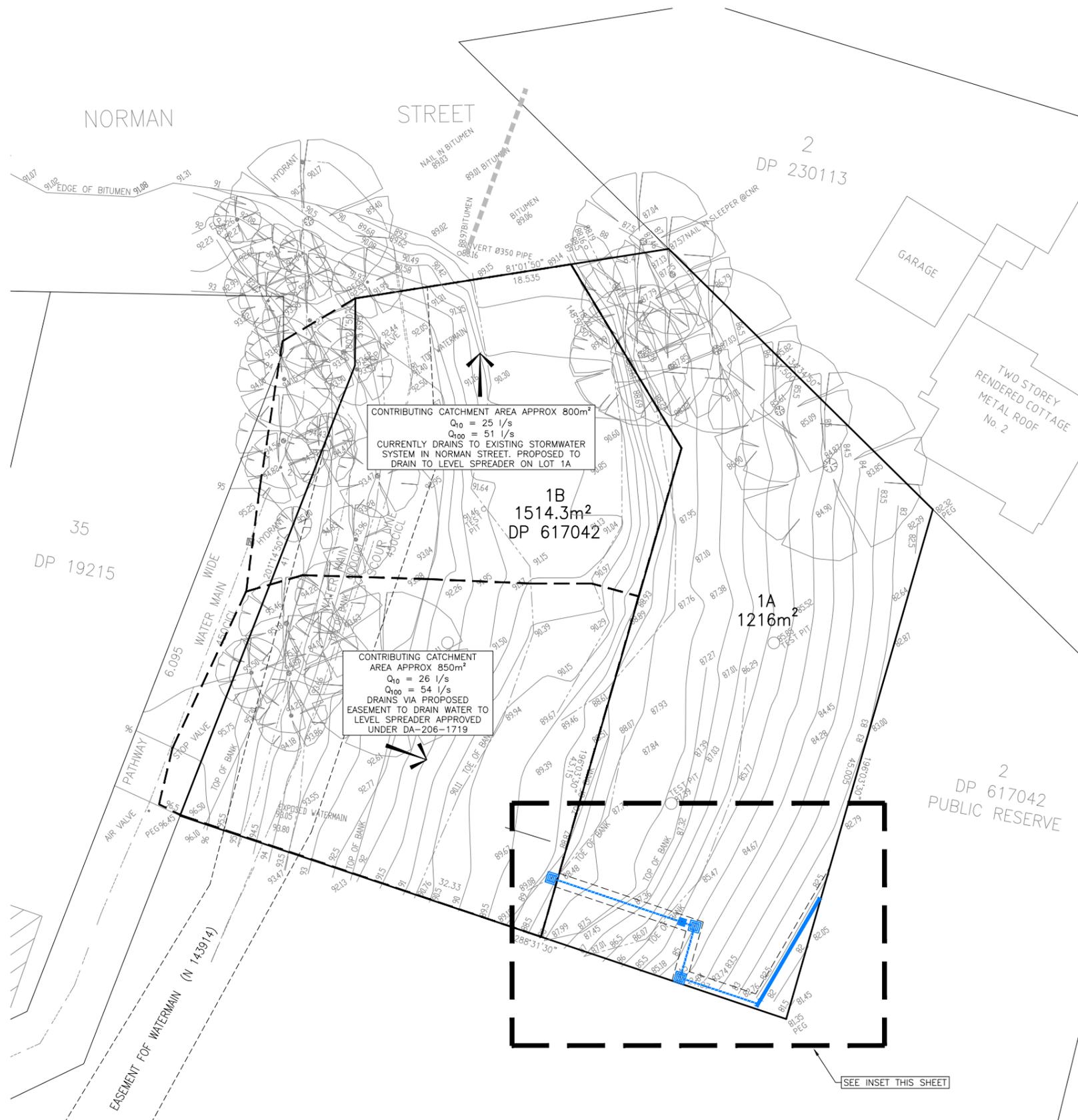
SURVEYOR:	ROBSON
DATUM:	AHD
AZIMUTH:	LOCAL
DRAWN:	AB
DESIGNED:	AB
DESIGNED DATE:	NOV '20
CHECKED:	AB

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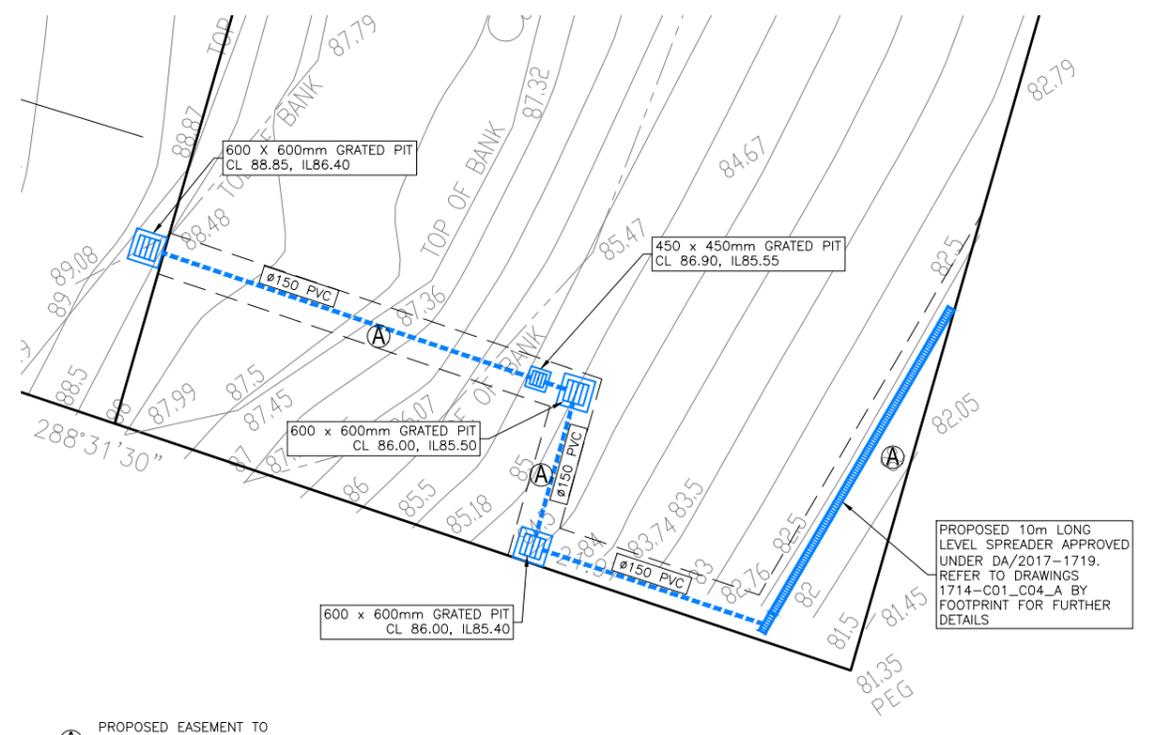
LOT 1B NORMAN STREET, MANGERTON
PROPOSED DUAL OCCUPANCY AND TWO LOT SUBDIVISION

OSD CALCULATIONS

DRAWING NO.	1755-C02
ISSUE.	4
SHEET	2 OF 3



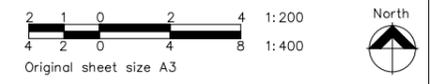
OVERALL PLAN
 SCALE 1:400 © A3



INSET PLAN
 SCALE 1:200 © A3

HYDRAULIC MODELLING SUMMARY FOR FLOWS ARRIVING AT PROPOSED LEVEL SPREADER FROM DEVELOPMENT ON BOTH LOTS 1A AND 1B

PARAMETER	PRE-DEVELOPMENT	POST DEVELOPMENT
AREA	1730m ²	2530m ²
0.2EY	72 l/s	54 l/s
1% AEP	147 l/s	112 l/s



ISSUE	DESCRIPTION	DATE
4	STORMWATER TANK ADDED, RAINWATER TANK SIZE INCREASED	15/11/21
3	BEDROOM OVER SYDNEY WATER EASEMENT REMOVED	07/09/21
2	RE-ISSUED FOR DEVELOPMENT APPLICATION	03/08/21
1	FOR DEVELOPMENT APPLICATION	16/11/20

**FOR DEVELOPMENT APPLICATION
 NOT FOR CONSTRUCTION**

FOOTPRINT (NSW) PTY. LTD. AUTHORISE THE USE OF THIS DRAWING ONLY FOR THE PURPOSE DEMONSTRATED BY THE STATUS STAMP SHOWN ABOVE.

SCALES ORIGINAL
1:200 A3

CLIENT: TED SWITAJ

SURVEYOR: ROBSON
 DATUM: AHD
 AZIMUTH: LOCAL
 DRAWN: AB
 DESIGNED: AB
 DESIGNED DATE: NOV '20
 CHECKED: AB

footprint
 sustainable engineering
 a. 15 meehan drive
 kiama downs nsw 2533
 p. 02 4237 6770
 f. 02 4237 8962

LOT 1B NORMAN STREET, MANGERTON
 PROPOSED DUAL OCCUPANCY AND TWO LOT SUBDIVISION

SUBDIVISION STORMWATER PLAN

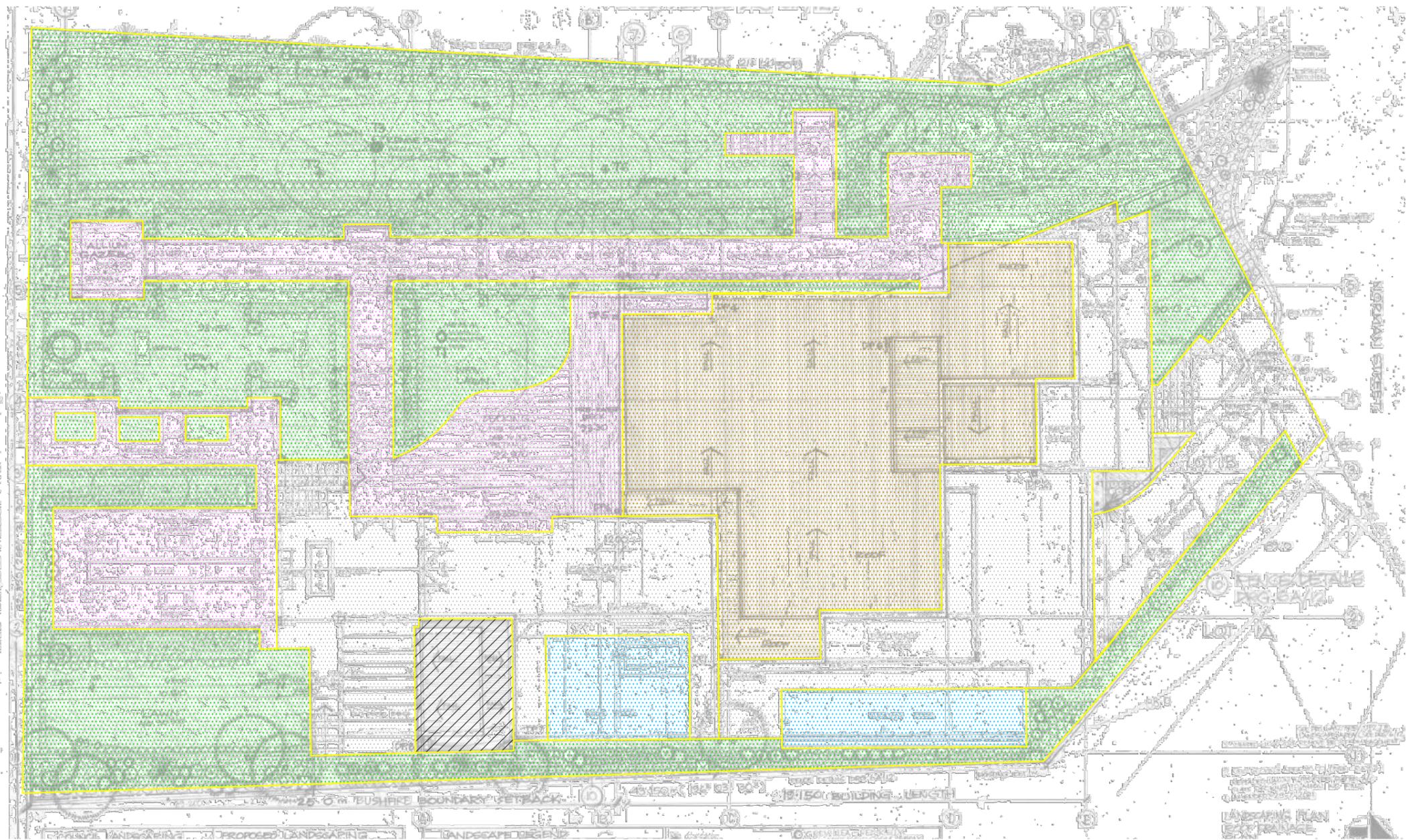
DRAWING NO.
1755-C03

ISSUE.
4

SHEET 3 OF 3

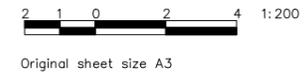
APPENDIX B

MUSIC Catchments and Landuse



LEGEND

-  ROOF AREA TO RAINWATER TANKS (215m²)
-  ROOF AREA TO STORMWATER TANKS (23m²)
-  HARD LANDSCAPING TO STORMWATER TANKS (318m²)
-  LANDSCAPED – PLANTED (654m²)
-  LANDSCAPED – OTHER (252m²)
-  POOLS (52m²)



1	FOR DEVELOPMENT APPLICATION	15/11/21
ISSUE	DESCRIPTION	DATE

**FOR DEVELOPMENT APPLICATION
NOT FOR CONSTRUCTION**

FOOTPRINT (NSW) PTY. LTD. AUTHORISE THE USE OF THIS DRAWING ONLY FOR THE PURPOSE DEMONSTRATED BY THE STATUS STAMP SHOWN ABOVE.

SCALES	ORIGINAL
1:200	A3
CLIENT:	TED SWITAJ

SURVEYOR:	ROBSON
DATUM:	AHD
AZIMUTH:	LOCAL
DRAWN:	AB
DESIGNED:	AB
DESIGNED DATE:	NOV '20
CHECKED:	AB

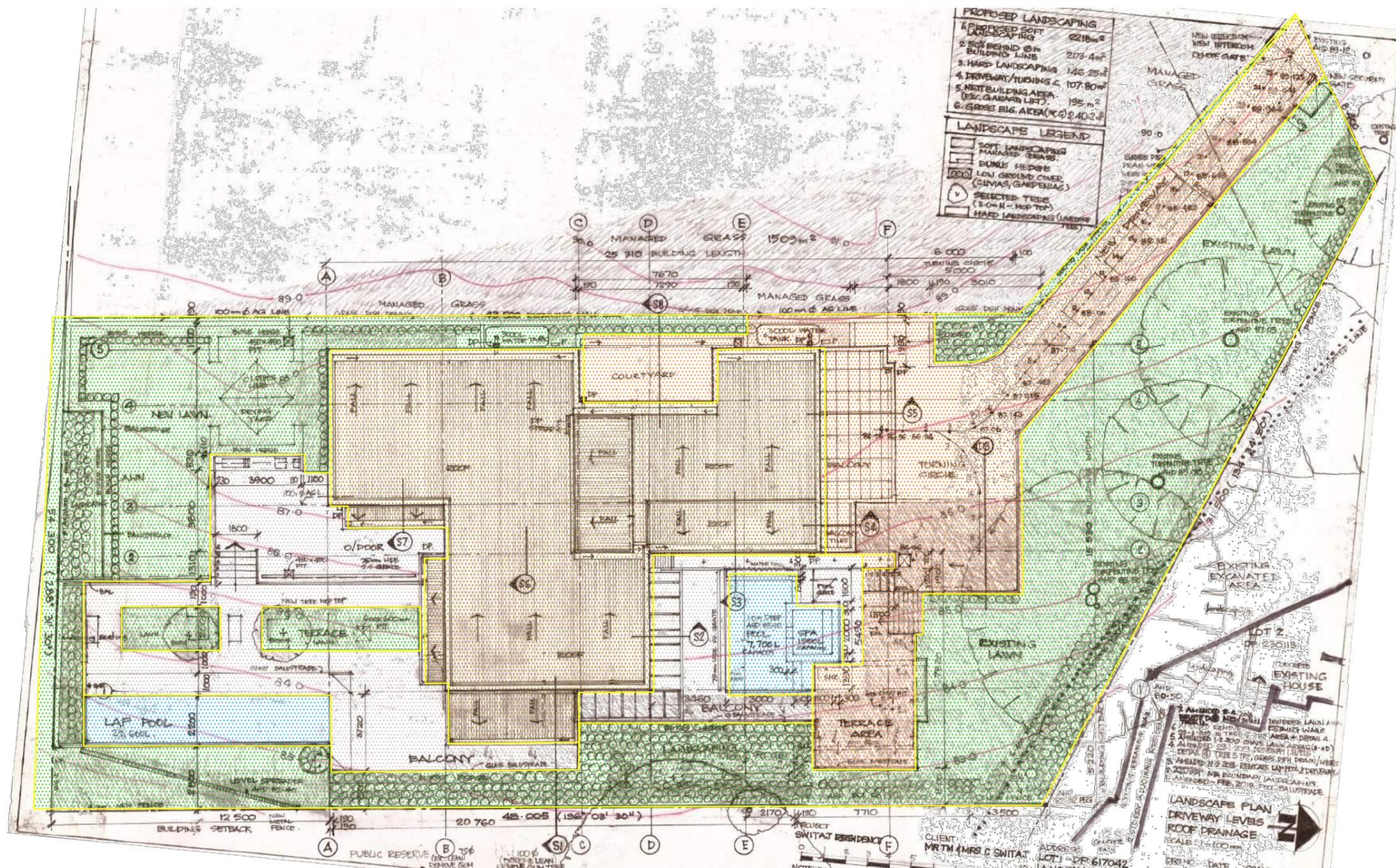


footprint
sustainable engineering
a. 15 meehan drive
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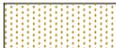
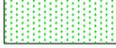
LOT 1B NORMAN STREET, MANGERTON
PROPOSED DUAL OCCUPANCY AND TWO LOT SUBDIVISION

LOT 1B MUSIC CATCHMENTS AND LANDUSE

DRAWING NO.	1755-SK01
ISSUE.	1
SHEET	1 OF 2



LEGEND

-  ROOF AREA TO RAINWATER TANKS (256m²)
-  HARD LANDSCAPING TO FIRST FLUSH SYSTEM (211m²)
-  HARD LANDSCAPING TO STORMWATER TANKS (169m²)
-  LANDSCAPED - PLANTED (532m²)
-  POOLS (48m²)



Original sheet size A3



FOR DEVELOPMENT APPLICATION		
NOT FOR CONSTRUCTION		
1	FOR DEVELOPMENT APPLICATION	15/11/21
ISSUE	DESCRIPTION	DATE

FOR DEVELOPMENT APPLICATION
NOT FOR CONSTRUCTION

FOOTPRINT (NSW) PTY. LTD. AUTHORISE THE USE OF THIS DRAWING ONLY FOR THE PURPOSE DEMONSTRATED BY THE STATUS STAMP SHOWN ABOVE.

SCALES	ORIGINAL	SURVEYOR:	ROBSON
1:200	A3	DATUM:	AHD
		AZIMUTH:	LOCAL
CLIENT:	TED SWITAJ	DRAWN:	AB
		DESIGNED:	AB
		DESIGNED DATE:	NOV '20
		CHECKED:	AB

footprint
sustainable engineering
a. 15 meehan drive
kiama downs nsw 2533
p. 02 4237 6770
f. 02 4237 8962

LOT 1B NORMAN STREET, MANGERTON
PROPOSED DUAL OCCUPANCY AND TWO LOT SUBDIVISION

LOT 1A MUSIC CATCHMENTS AND LANDUSE

DRAWING NO.	1755-SK02
ISSUE	1
SHEET	2 OF 2

Attachment 7 – Draft consent

The development application has been determined by granting **deferred commencement** consent subject to the following conditions:

- (i) The Development Consent shall not operate until Council has been satisfied as to the following matters:
 - a **Out of Scope Building Approval**
The proposal must meet Sydney Water requirements for building adjacent to Sydney Water Assets. This requires the developer to submit an Out of Scope Building Approval application via a Water service Coordinator and obtain approval from Sydney Water.
 - b **Survey Plan**
A survey plan for the site prepared by a registered surveyor is to be prepared clearly identifying the site boundaries, building footprint, location and top and bottom of all retaining walls, Sydney Water easement, stormwater drainage, and location of trees on and adjoining the site required to be protected by this consent.
 - c **Construction Management Plan**
A Construction Management Plan is to be prepared and submitted to the Principal Certifier (PC) and Council prior to the issue of the Construction Certificate. The plan must include but not be limited to traffic management, stormwater and erosion control, dust minimisation, project construction methodology, materials handling such as concrete pumping and placement and loading zones.
- (ii) The developer must satisfy Council, within 12 months of the date shown on the top of this consent, that the matters specified in condition number (i) have been complied with. Failure to satisfy Council within that time period will lapse this development consent.
- (iii) If compliance with the matters contained in condition number (i) results in a substantial variation to the development approved deferred commencement, a new development application must be submitted.

Once Council is satisfied that the matters contained in condition number (i) have been complied with and the developer has been notified in writing of such compliance, the following conditions shall apply in respect of the approved development:

The development proposed is integrated development and approval is required from the approval bodies listed below:

NSW Rural Fire Service (RFS)

Pursuant to Section 100B of the Environmental Planning and Assessment (EP&A) Act 1979 – requirements imposed by the NSW RFS dated 2 July 2021 as attached shall form part of this Notice of Determination.

Conditions imposed by Council as part of this Integrated Development Consent are:

Approved Plans and Specifications

- 1 The development shall be implemented substantially in accordance with the details and specifications set out on:

Location & Site Plan S00/1-4 dated 28 April 2022 prepared by T & C Design Consultants

Basement Floor Plan 02/12-10 undated prepared by T & C Design Consultants

Ground Floor Plan 03/12-8 dated 25 April 2022 prepared by T & C Design Consultants

Adjoining Lot 1A & Lot 1B Section 1-2-3 3A/12 dated February 2021 prepared by T & C Design Consultants

First Floor Plan 04/12-6 dated 28 April 2020 prepared by T & C Design Consultants

Tree Location Plan 05/12-5 dated 28 April 2022 prepared by T & C Design Consultants

Retaining Walls/Levels to TPZ, SRZ/Arborist Details 06/12-6 dated 28 April 2022 prepared by T & C Design Consultants

SECTION 1-5 Fence details 6-10 6A/12-3 dated 28 April 2022 prepared by T & C Design Consultants

Elevations (North and East) 09/12-5 dated 25 February 2022 prepared by T & C Design Consultants

Elevations (South, West and Outdoor Dining) 10/12-7 dated 28 April 2022 prepared by T & C Design Consultants

Excavation & Fill Plan 12/12-4 dated 28 April 2022 prepared by T & C Design Consultants

Landscaping Plan/Roof Drainage Plan 07/12-9 dated 28 April 2022 prepared by T & C Design Consultants

and any details on the application form, and with any supporting information received, except as amended by the conditions specified and imposed hereunder.

General Matters

2 Geotechnical

- a All work is to be in accordance with the geotechnical recommendations contained in the report dated 29 January 2021 by Terra Insight and any subsequent geotechnical report required to address unanticipated conditions encountered during construction.
- b Foundation systems are to be designed for Class P soils with all footings to be founded within the underlying weathered bedrock as recommended by the geotechnical consultant.
- c Articulation jointing is to be provided in masonry construction as recommended by the geotechnical consultant.
- d All excavations for foundations are to be inspected by the geotechnical consultant and certified that the ground has been suitably prepared for the placement of footings.
- e Any cuts or fills greater than 0.6m are to be structurally retained in compliance with the geotechnical advice.

3 Building Work - Compliance with the Building Code of Australia

All building work must be carried out in compliance with the provisions of the Building Code of Australia.

4 Construction Certificate

A Construction Certificate must be obtained from Council or a Registered Certifier prior to work commencing.

A Construction Certificate certifies that the provisions of Clauses 139-147 of the Environmental Planning and Assessment Regulation 2000 have been satisfied, including compliance with all relevant conditions of Development Consent and the Building Code of Australia.

Note: The Certifier must cause notice of its determination to be given to the consent authority, and to the Council, by forwarding to it, within two (2) days after the date of the determination, the plans and documentation referred to in clause 142 (2) of the Environmental Planning and Assessment Regulation 2000.

5 Occupation Certificate

An Occupation Certificate must be issued by the PC prior to occupation or use of the development. In issuing an Occupation Certificate, the PC must be satisfied that the requirements of section 6.9 of the Environmental Planning and Assessment Act 1979, have been complied with as well as all of the conditions of the Development Consent.

6 Tree Retention/Removal

The developer shall retain the existing tree(s) indicated within the Arboriculture Consultancy Australia, dated January 2021 consisting of tree(s) numbered 1, 2, 5, 6 (on the subject site) and 7, 8, 9, 10, 11, 12, 13 and 14 on the adjacent sites.

Any branch pruning, which has been given approval, must be carried out by a qualified arborist in accordance with Australian Standard AS 4373:2007.

All tree protection measures are to be installed in accordance with Australian standard AS 4970:2009 Protection of Trees on development Sites.

All recommendations in the Aboricultural Impact Assessment by Arboriculture Consultancy Australia, dated January 2021 are to be implemented including and not restricted to: remedial tree pruning, dead wood removal, fencing and signage, sediment buffer, stem protection, establishing tree protection zones and watering and root hormone application if required.

This consent permits the removal of trees numbered 3 and 4, and the exempt tree species nominated as A, B and C as indicated within the Arboriculture Consultancy Australia, dated January 2021. No other trees shall be removed without prior written approval of Council.

Prior to the Issue of the Construction Certificate

7 Fence Footing Type Western Boundary

Due to the number of significant trees located along the western boundary on the subject and the adjacent sites, footings for fence posts shall be limited to pad footings no greater than 300mm diameter. Brick piers and/or strip footings shall not be permitted. This requirement shall be reflected on the Construction Certificate documentation.

8 Photovoltaic Panels

Photovoltaic panels required to be installed to meet BASIX requirements must be flat mounted if on the roof in order to remain under the maximum height permitted for the site.

9 Basement Car Park

The basement car park is to be rearranged to swap the space identified as workshop with the car space identified as G1 on the Basement Floor Plan to facilitate manoeuvring.

10 Present Plans to Sydney Water

Approved plans must be submitted online using Sydney Water Tap, available through www.sydneywater.com.au to determine whether the development will affect Sydney Water's sewer and water mains, stormwater drains and/or easements, and if further requirements need to be met.

The PC must ensure that Sydney Water has issued an approval receipt prior to the issue of a Construction Certificate.

Visit www.sydneywater.com.au or telephone 13 20 92 for further information.

11 Section 73 Compliance Certificate

A Section 73 Compliance Certificate under the Sydney Water Act 1994 must be obtained from Sydney Water Corporation. Application must be made through an authorised Water Servicing Coordinator. Please refer to the “Builders and Developers” section of the web site www.sydneywater.com.au then search to “Find a Water Servicing Coordinator”. Alternatively, telephone 13 20 92 for assistance.

Following application, a “Notice of Requirements” will advise of water and sewer infrastructure to be built and charges to be paid. Please make early contact with the Coordinator, since building of water/sewer infrastructure can be time consuming and may impact on other services and building, driveway or landscape design.

The Notice of Requirements must be submitted to the PC prior to issue of the Construction Certificate.

12 Endeavour Energy Requirements

The submission of documentary evidence from Endeavour Energy to the PC is required confirming that satisfactory arrangements have been made with Endeavour Energy for the provision of electricity supplies to the development, prior to the release of the Construction Certificate.

Note: Applications should be made to Customer Connections – South Coast, Endeavour Energy
PO Box 811 Seven Hills NSW 1730.

13 **Telecommunications**

The submission of documentary evidence from an approved telecommunications carrier to the PC confirming that underground telecommunication services are available for this development is required prior to the issue of the Construction Certificate.

- 14 The parking dimensions, internal circulation, aisle widths, kerb splay corners, head clearance heights, ramp widths and grades of the car parking areas are to be in conformity with the current relevant Australian Standard AS 2890.1, except where amended by other conditions of this consent. Details of such compliance are to be reflected on the Construction Certificate plans.

15 **Structures Adjacent to Driveway**

Any proposed structures adjacent to the driveway shall comply with the requirements of the current relevant Australian Standard AS 2890.1 (figure 3.2 and 3.3) to provide for adequate pedestrian and vehicle sight distance. This includes, but is not limited to, structures such as signs, letterboxes, retaining walls, dense planting etc. This requirement shall be reflected on the Construction Certificate plans.

- 16 A final Landscape Plan is to be prepared prior to the release of the Construction Certificate. The final Landscape Plan shall address the following requirements:

- a planting of indigenous plant species native to the Illawarra Region such as: *Syzygium smithii* (syn *Acmena smithii*) Lilly pilly, *Archontophoenix cunninghamiana* Bangalow palm, *Backhousia myrtifolia* Grey myrtle, *Elaeocarpus reticulatus* Blueberry ash, *Glochidion ferdinandii* Cheese tree, *Livistona australis* Cabbage palm tree, *Syzygium paniculatum* Brush cherry.
A further list of suitable suggested species may be found in Wollongong Development Control Plan 2009 – Chapter E6: Landscaping;
- b a schedule of proposed planting, including botanic name, common name, expected mature height and staking requirements as well as number of plants and pot sizes;
- c the location of all proposed and existing overhead and underground service lines. The location of such service lines shall be clear of the dripline of existing and proposed trees; and
- d any proposed hard surface under the canopy of existing trees shall be permeable and must be laid such that the finished surface levels match the existing level. Permeable paving is to be installed in accordance with the manufacturer's recommendations.
- e Removal of the proposed kerb and gutter in Norman Street road reserve adjacent to the front property boundary.
- f Removal of the retaining wall to the front property boundary (see Section 9 of Section 1-5 Fence details 6-10 6A12 dated July 2021 prepared by T&C Design Consultants) and replacement with a fence that complies with Wollongong Development Control Plan 2009, Chapter B1 section 4.9.
- g Fencing running along the full extent of the western boundary is to be open palisade type fencing.

The completion of the landscaping works as per the final approved Landscape Plan is required, prior to the issue of Occupation Certificate.

- 17 The submission of certification from a suitably qualified and experienced landscape designer and drainage consultant to the PC prior to the release of the Construction Certificate, confirming that the landscape plan and the drainage plan are compatible.

- 18 The implementation of a landscape maintenance program in accordance with the approved Landscape Plan for a minimum period of 12 months to ensure that all landscape work becomes well established by regular maintenance. Details of the program must be submitted with the Landscape Plan to the PC prior to release of the Construction Certificate.

19 **Tree Protection and Management**

The existing trees are to be retained upon the subject property and any trees on adjoining properties shall not be impacted upon during the excavation or construction phases of the development. This

will require the installation and maintenance of appropriate tree protection measures, including (but not necessarily limited to) the following:

- a Installation of Tree Protection Fencing - A one (1) metre high exclusion fence must be installed around the extremity of the dripline of the tree/trees to be retained prior to any site works commencing. The minimum acceptable standard is a 3 strand wire fence with star pickets at 1.8 metre centres. This fence must be maintained throughout the period of construction to prevent any access within the tree protection area. Details of tree protection and its locations must be indicated on the architectural and engineering plans to be submitted to the PC prior to release of the Construction Certificate.
- b Mulch Tree Protection Zone: Areas within a Tree Protection Zone are to be mulched with minimum 75 mm thick 100% recycled hardwood chip/leaf litter mulch.
- c Irrigate: Areas within the Tree Protection Zone are to be regularly watered in accordance with the arborist's recommendations.

20 **Property Addressing Policy Compliance**

Prior to the issue of any Construction Certificate, the developer must ensure that any site addressing complies with Council's **Property Addressing Policy** (as amended). Where appropriate, the developer must also lodge a written request to Council's **Infrastructure Systems & Support – Property Addressing** (propertyaddressing@wollongong.nsw.gov.au), for the site addressing prior to the issue of the Construction Certificate. Please allow up to 3-5 business days for a reply. Enquiries regarding property addressing may be made by calling 4227 8660.

21 **Dilapidation Survey**

A dilapidation survey and report shall be submitted to the PC.

The dilapidation survey and report shall accurately reflect the condition of existing public and private infrastructure in the adjacent street(s) fronting the lots as well as properties adjoining the site.

The report shall outline measures for the protection of existing public and private infrastructure during the works.

Any damage to infrastructure items or private property which is caused by the developer shall be repaired to the satisfaction of the PC prior to the issue of the Occupation Certificate.

22 **Development Contributions**

Pursuant to Section 4.17 of the Environmental Planning and Assessment Act 1979 and the Wollongong City-Wide Development Contributions Plan, a monetary contribution of \$9,750.00 (subject to indexation) must be paid to Council towards the provision of public amenities and services, prior to the release of any associated Construction Certificate.

This amount has been calculated based on the estimated cost of development and the applicable percentage rate.

The contribution amount will be subject to indexation until the date of payment. The formula for indexing the contribution is:

$$\text{Contribution at time of payment} = \$C \times (\text{CP2}/\text{CP1})$$

Where:

\$C is the original contribution as set out in the Consent

CP1 is the Consumer Price Index; All Groups CPI; Sydney at the time the consent was issued

CP2 is the Consumer Price Index; All Groups CPI; Sydney at the time of payment

Details of CP1 and CP2 can be found in the Australian Bureau of Statistics website – Catalogue No. 6401.0 - Consumer Price Index, Australia.

The following payment methods are available:

METHOD	HOW	PAYMENT TYPE
Online	http://www.wollongong.nsw.gov.au/applicationpayments Your Payment Reference: 1305216	<ul style="list-style-type: none"> • Credit Card
In Person	Wollongong City Council Administration Building - Customer Service Centre Ground Floor 41 Burelli Street, WOLLONGONG	<ul style="list-style-type: none"> • Cash • Credit Card • Bank Cheque
PLEASE MAKE BANK CHEQUE PAYABLE TO: Wollongong City Council (Personal or company cheques are not accepted)		

A copy of the Wollongong City-Wide Development Contributions Plan and accompanying Fact Sheet may be inspected or obtained from the Wollongong City Council Administration Building, 41 Burelli Street, Wollongong during business hours or on Council's web site at www.wollongong.nsw.gov.au

23 **Stormwater Drainage Design**

A detailed drainage design for the development must be submitted to and approved by the PC prior to the release of the Construction Certificate. The detailed drainage design must satisfy the following requirements:

- a Be prepared by a suitably qualified civil engineer in accordance with Chapter E14 of Wollongong City Council's Development Control Plan 2009, Subdivision Policy, conditions listed under this consent, and generally in accordance with the Stormwater Concept Plans, prepared by Footprint Engineering, Reference Nos. 1755-C01, 1755-C02, 1755-C03, revision 4, dated 15/11/2021 and Stormwater Drainage Plan 1714-C01, 1714-C02, 1714-C03 and 1714-C04 revision C dated 15/11/2021.
- b Include details of the method of stormwater disposal. Stormwater from the development must be piped to Stormwater from the development must be piped be piped to a level spreader via an on-site detention system.
- c Engineering plans and supporting calculations for the stormwater drainage system are to be prepared by a suitably qualified engineer and be designed to ensure that stormwater runoff from upstream properties is conveyed through the site without adverse impact on the development or adjoining properties. The plan must indicate the method of disposal of all stormwater and must include rainwater tanks, existing ground levels, finished surface levels on all paved areas, estimated flow rates, invert levels and sizes of all pipelines.
- d Overflow paths shall be provided to allow for flows of water in excess of the capacity of the pipe/drainage system draining the land, as well as from any detention storage on the land. Blocked pipe situations with 1 in 100 year ARI events shall be incorporated in the design. Overflow paths shall also be provided in low points and depressions. Each overflow path shall be designed to ensure no entry of surface water flows into any building and no concentration of surface water flows onto any adjoining property. Details of each overflow path shall be shown on the detailed drainage design.

24 **Building Setback Encroachment to Norman Street**

The pergola structure above the balcony to Bedroom 2 is to be removed. This may be replaced with an eave extending no further than 500mm from the glass line of the bedroom. This is to be detailed on the Construction Certificate.

Prior to the Commencement of Works

25 **Appointment of PC**

Prior to commencement of work, the person having the benefit of the Development Consent and a Construction Certificate must:

- a Appoint a PC and notify Council in writing of the appointment irrespective of whether Council or a Registered Certifier is appointed; and

- b notify Council in writing of their intention to commence work (at least two days notice is required).

The PC must determine when inspections and compliance certificates are required.

26 **Residential Building Work – Compliance with the Requirements of the Home Building Act 1989**

Building work involving residential building work within the meaning of the Home Building Act 1989 must not be carried out unless the PC for the development to which the work relates:

- a in the case of work to be done by a licensee under that Act:
 - i has been informed in writing of the licensee’s name, contractor license number and contact address details (in the case of building work undertaken by a contractor under the Home Building Act 1989); and
 - ii is satisfied that the licensee has complied with the requirements of Part 6 of the Home Building Act 1989; or
- b in the case of work to be done by any other person:
 - i has been informed in writing of the persons name, contact address details and owner-builder permit number; and
 - ii has been given a declaration signed by the property owner(s) of the land that states that the reasonable market cost of the labour and materials involved in the work is less than the amount prescribed for the purposes of the definition of owner-builder work in Section 29 of the Home Building Act 1989 and is given appropriate information and declarations under paragraphs (a) and (b) whenever arrangements for the doing of the work are changed in such a manner as to render out of date any information or declaration previously given under either of those paragraphs.

Note: A certificate issued by an approved insurer under Part 6 of the Home Building Act 1989 that states that the specific person or licensed contractor is the holder of an insurance policy issued for the purposes of that Part of the Act is, for the purposes of this condition, sufficient evidence that the person has complied with the requirements of that Part of the Act.

27 **Sign – Supervisor Contact Details**

Before commencement of any work, a sign must be erected in a prominent, visible position:

- a stating that unauthorised entry to the work site is not permitted;
- b showing the name, address and telephone number of the PC for the work; and
- c showing the name and address of the principal contractor in charge of the work site and a telephone number at which that person can be contacted at any time for business purposes.

This sign shall be maintained while the work is being carried out and removed upon the completion of the construction works.

28 **Temporary Toilet/Closet Facilities**

Toilet facilities are to be provided at or in the vicinity of the work site on which work involved in the erection or demolition of a building is being carried out at the rate of one toilet for every 20 persons or part of 20 persons employed at the site.

Each toilet provided must be:

- a a standard flushing toilet; and
- b connected to either:
 - i the Sydney Water Corporation Ltd sewerage system or
 - ii an accredited sewage management facility or
 - iii an approved chemical closet.

The toilet facilities shall be provided on-site, prior to the commencement of any works.

- 29 **Structural Engineer’s Details**
Structural engineer’s details for all structurally designed building works such as reinforced concrete footings, reinforced concrete slabs and structural steelwork must be submitted to the PC, prior to the commencement of any works on the site.
- 30 **Enclosure of the Site**
The site must be enclosed with a suitable security fence to prohibit unauthorised access, to be approved by the PC. No building work is to commence until the fence is erected.
- 31 **Temporary Sediment Fences**
Temporary sediment fences (eg haybales or geotextile fabric) must be installed on the site, prior to the commencement of any excavation, demolition or construction works in accordance with Council’s guidelines. Upon completion of the development, sediment fencing is to remain until the site is grassed or alternatively, a two (2) metre strip of turf is provided along the perimeter of the site, particularly lower boundary areas.
- 32 **All-weather Access**
An all-weather stabilised access point must be provided to the site to prevent sediment leaving the site as a result of vehicular movement. Vehicular movement should be limited to this single accessway.
- 33 **Supervising Arborist – Tree Inspection and Installation of Tree Protection Measures**
Prior to the commencement of any demolition, excavation or construction works, the supervising arborist must certify in writing that tree protection measures have been inspected and installed in accordance with the arborist’s recommendations and relevant conditions of this consent.
- 34 **Certification from Arborist - Adequate Protection of Trees to be Retained**
A qualified arborist is required to be engaged for the supervision of all on-site excavation or land clearing works. The submission of appropriate certification from the appointed arborist to the PC is required which confirms that all trees and other vegetation to be retained are protected by fencing and other measures, prior to the commencement of any such excavation or land clearing works.
- 35 **Dilapidation Report**
The developer shall submit a Dilapidation Report recording the condition of the existing streetscape, street trees and adjoining reserve prior to work commencing and include a detailed description of elements and photographic record.
- 36 **Works in Road Reserve - Minor Works**
Approval, under Section 138 of the Roads Act must be obtained from Wollongong City Council’s Development Engineering Team prior to any works commencing or any proposed interruption to pedestrian and/or vehicular traffic within the road reserve caused by the construction of this development.

The application form for Works within the Road Reserve – Section 138 Roads Act can be found on Council’s website. The form outlines the requirements to be submitted with the application, to give approval to commence works under the roads act. It is advised that all applications are submitted and fees paid, five (5) days prior to the works within the road reserve are intended to commence. The Applicant is responsible for the restoration of all Council assets within the road reserve which are impacted by the works/occupation. Restoration must be in accordance with the following requirements:
- a All restorations are at the cost of the Applicant and must be undertaken in accordance with Council’s standard document, “Specification for work within Council’s road reserve”.
 - b Any existing damage within the immediate work area or caused as a result of the work/occupation, must also be restored with the final works.
- 37 **Tree Protection**
Prior to commencement of any work on the site, including any demolition, all trees not approved for removal as part of this consent that may be subjected to impacts of this approved development must be protected in accordance with Section 4 of the Australian Standard Protection of Trees on Development Sites (AS 4970:2009).

Tree protection zones must be established prior to the commencement of any work associated with this approved development.

No excavation, construction activity, grade changes, storage of materials stockpiling, siting of works sheds, preparation of mixes or cleaning of tools is permitted within Tree Protection Zones.

During Demolition, Excavation or Construction

38 **Piping of Stormwater to Existing Stormwater Drainage System**

Stormwater for the land must be piped to the on-site detention and then level spreader as shown in the supporting stormwater concept plan.

39 **Copy of Consent to be in Possession of Person carrying out Tree Removal**

The Developer/Applicant must ensure that any person carrying out tree removal is in possession of this development consent and/or the approved landscape plan, in respect to the tree(s) which has/have been given approval to be removed in accordance with this consent.

40 **Restricted Hours of Construction Work**

The developer must not carry out any work, other than emergency procedures, to control dust or sediment laden runoff outside the normal working hours, namely, 7.00 am to 5.00 pm, Monday to Saturday, without the prior written consent of the PC and Council. No work is permitted on public holidays or Sundays.

Allowable construction activity noise levels must be within the limits identified in the NSW EPA Interim Construction Noise Guidelines (ICNG) July 2009. ICNG are also applied for blasting, rock hammer and drilling, external plant and equipment.

<https://www.environment.nsw.gov.au/resources/noise/09265cng.pdf>

Any request to vary these hours shall be submitted to the **Council** in writing detailing:

- a the variation in hours required (length of duration);
- b the reason for that variation (scope of works);
- c the type of work and machinery to be used;
- d method of neighbour notification;
- e supervisor contact number;
- f any proposed measures required to mitigate the impacts of the works.

Note: The developer is advised that other legislation may control the activities for which Council has granted consent, including but not limited to, the Protection of the Environment Operations Act 1997.

41 **Excavation/Filling/Retaining Wall Structures**

Any proposed filling on the site must not:

- a encroach onto the adjoining properties, and
- b adversely affect the adjoining properties with surface run-off.

42 All proposed cut and filling works must be adequately retained with all battered slopes being no steeper than 2H: 1V and comply with Council's "Policy for Development on Sloping Sites".

43 **Provision of Waste Receptacle**

The developer must provide an adequate receptacle to store all waste generated by the development, pending disposal. The receptacle must be regularly emptied and waste must not be allowed to lie or accumulate on the property other than in the receptacle. Consideration should be given to the source separation of recyclable and re-usable materials.

44 **BASIX**

All the commitments listed in each relevant BASIX Certificate for the development must be fulfilled in accordance with Clause 97A(2) of the Environmental Planning & Assessment Regulation 2000.

A relevant BASIX Certificate means:

- A BASIX Certificate that was applicable to the development when this development consent was granted (or, if the development consent is modified under section 4.55 of the Environmental Planning & Assessment Act 1979, a BASIX Certificate that is applicable to the development when this development consent is modified); or
- if a replacement BASIX Certificate accompanies any subsequent application for a Construction Certificate, the replacement BASIX Certificate; and
- BASIX Certificate has the meaning given to that term in the Environmental Planning & Assessment Regulation 2000.”

45 **No Adverse Run-off Impacts on Adjoining Properties**

The design and construction of the development shall ensure there are no adverse effects to adjoining properties, as a result of flood or stormwater run-off. Attention must be paid to ensure adequate protection for buildings against the ingress of surface run-off.

Allowance must be made for surface run-off from adjoining properties. Any redirection or treatment of that run-off must not adversely affect any other property.

Prior to the Issue of the Occupation Certificate

46 **BASIX**

An Occupation Certificate must not be issued unless accompanied by the BASIX Certificate applicable to the development. The PC must not issue the final Occupation Certificate unless satisfied that selected commitments have been complied with as specified in the relevant BASIX Certificate. NOTE: Clause 154B of the Environmental Planning and Assessment Regulation 2000 provides for independent verification of compliance in relation to certain BASIX commitments.

Prior to the Issue of the Subdivision Certificate

47 **Existing Easements**

All existing easements must be acknowledged on the final subdivision plan.

48 **Existing Restriction as to Use**

All existing restriction on the use of land must be acknowledged on the final subdivision plan.

49 **Encroaching Pipes**

A minimum one (1) metre wide easement to drain water shall be created over any encroaching drainage pipes.

For all drainage easements proposed over the subject lots, a works as executed/survey plan of all stormwater drainage within the site is to be submitted with the Subdivision Certificate Application to confirm this.

50 **Encroaching Services**

A minimum one (1) metre wide easement for services must be created over any encroaching utility service.

51 **88B Instrument Easements/Restrictions**

Any easements or restrictions required by this consent must nominate Wollongong City Council as the authority to vary, modify or release/extinguish the easements or restrictions. The form of the easement(s) or restriction(s) created as a result of this consent must be in accordance with the standard format for easements and restrictions as accepted by NSW Land Registry Services.

52 **Final Documentation Required Prior to Issue of Subdivision Certificate**

The submission of the following information/documentation to the PC, prior to the issue of a Subdivision Certificate:

- Completed Subdivision Certificate application form and fees in accordance with Council's fees and charges;
- Certificate of Practical completion from Wollongong City Council or a PC (if applicable);
- Administration sheet prepared by a registered surveyor;

- d Section 88B Instrument covering all necessary easements and restrictions on the use of any lot within the subdivision;
- e Final plan of Subdivision prepared by a registered surveyor plus one (1) equivalent size paper copies of the plan;
- f Original Subdivider/Developer Compliance Certificate pursuant to Section 73 of the Water Board (Corporatisation) Act 1994 from Sydney Water;
- g Original Notification of Arrangement (for Torrens subdivision) or Original Supply Offer (for Strata subdivision) from an Endeavour Energy regarding the supply of electricity to the proposed allotments;
- h Original Compliance Certificate from Telstra or another Telecommunications Service Provider which confirms that the developer has consulted with the Provider with regard to the provision of telecommunication services for the development.
- i Payment of section 94 fees (Pro rata) (if applicable).
- j The developer must obtain a minimum 1.2 metre wide easement to drain stormwater over Lot 2 DP 617042 and into level spreader for the purpose of stormwater disposal to benefit Lot 1 DP 617042. The easement alignment, width, and extent must be sufficient to enable access, construction, and repair of the proposed pipeline and outlet wholly within the easement, and shall encompass the full extent of the proposed pipe, pits, and proposed level spreader. Evidence that the easement has been registered with the NSW Land Registry Services and engineering certification that the easement alignment, width, and extent satisfies the requirements of this condition.

Operational Phases of the Development/Use of the Site

- 53 **Backwash of Swimming Pool Water**
The discharge of water from the pool should only be carried out after chlorine levels in the water have been depleted. Swimming pool water should not be discharged to a watercourse.
- 54 **Swimming Pool Filtration Motor**
The operation of the swimming pool filtration motor shall be restricted to the following hours of operation:

Monday to Friday - 7:00 am to 8:00 pm.
Saturdays, Sundays and Public Holidays - 8:00 am to 8:00 pm.

The equivalent continuous noise level ($L_{Aeq(15min)}$) of the swimming pool filtration motor shall not exceed 5dB(A) above the background noise level ($L_{A90(15min)}$) at the most affected point(s) along any boundary of the property.
- 55 **Swimming Pool – Discharging Water**
Discharge and/overflow pipe from the swimming pool and filtration unit must be connected to the sewer where available. All backwash water from the filtration unit is to be similarly disposed.
- 56 The pool excavations are not to conflict with the position of household drainage trenches or lines, the position of which must be ascertained before pool excavation commences.



NSW RURAL FIRE SERVICE

Wollongong City Council
Locked Bag 8821
WOLLONGONG DC NSW 2500

Your reference: (CNR-18284) DA-2021/136
Our reference: DA20210218000656-Original-1

ATTENTION: Kathy Nicolis

Date: Friday 2 July 2021

Dear Sir/Madam,

Integrated Development Application
s100B - Subdivision - Torrens Title Subdivision
1A Norman Street MANGERTON NSW 2500, 1//DP617042

I refer to your correspondence dated 17/02/2021 seeking general terms of approval for the above Integrated Development Application.

The New South Wales Rural Fire Service (NSW RFS) has considered the information submitted. General Terms of Approval, under Division 4.8 of the *Environmental Planning and Assessment Act 1979*, and a Bush Fire Safety Authority, under section 100B of the *Rural Fires Act 1997*, are now issued subject to the following conditions:

Asset Protection Zones

The intent of measures is to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting fire fighting activities. To achieve this, the following conditions shall apply:

1. From the start of building works and in perpetuity, the entire property must be managed as an inner protection area (IPA).

Construction Standards

The intent of measures is that buildings are designed and constructed to withstand the potential impacts of bush fire attack. To achieve this, the following conditions shall apply:

2. Construction of the northern elevation must comply with section 3 and section 6 (BAL 19) Australian Standard AS3959-2018 *Construction of buildings in bush fire-prone areas* or NASH Standard (1.7.14 updated) *National Standard Steel Framed Construction in Bushfire Areas - 2014* as appropriate and Section 7.5 of *Planning for Bush Fire Protection 2019*.

3. Construction of the eastern, southern and western elevations must comply with section 3 and section 7 (BAL 29) Australian Standard AS3959-2018 *Construction of buildings in bush fire-prone areas* or NASH Standard (1.7.14

1

Postal address

NSW Rural Fire Service
Locked Bag 17
GRANVILLE NSW 2142

Street address

NSW Rural Fire Service
4 Murray Rose Ave
SYDNEY OLYMPIC PARK NSW 2127

T (02) 8741 5555
F (02) 8741 5550
www.rfs.nsw.gov.au



updated) *National Standard Steel Framed Construction in Bushfire Areas – 2014* as appropriate and Section 7.5 of *Planning for Bush Fire Protection 2019*.

4. The pool cabana area shall be constructed in accordance with Australian Standard AS3959-2018 *Construction of buildings in bush fire-prone areas* clause 3.2.1, and the entire pool cabana and awning is to be constructed of non-combustible materials.

Water and Utility Services

The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building. To achieve this, the following conditions shall apply:

5. Water, electricity and gas are to comply with Table 7.4a of *Planning for Bush Fire Protection 2019*.

General Advice – Consent Authority to Note

This Bush Fire Safety Authority is issued subject to the performance solution prepared by Phil Couch of Newcastle Bushfire Consulting dated 11 November 2020, and applies only to this development and site.

For any queries regarding this correspondence, please contact Stephen Dubois on 1300 NSW RFS.

Yours sincerely,

Nika Fomin
Manager Planning & Environment Services
Built & Natural Environment



NSW RURAL FIRE SERVICE

BUSH FIRE SAFETY AUTHORITY

Subdivision - Torrens Title Subdivision
1A Norman Street MANGERTON NSW 2500, 1//DP617042
RFS Reference: DA20210218000656-Original-1
Your Reference: (CNR-18284) DA-2021/136

This Bush Fire Safety Authority is issued on behalf of the Commissioner of the NSW Rural Fire Service under s100b of the Rural Fires Act (1997) subject to the attached General Terms of Approval.

This authority confirms that, subject to the General Terms of Approval being met, the proposed development will meet the NSW Rural Fire Service requirements for Bush Fire Safety under *s100b of the Rural Fires Act 1997*.

Nika Fomin

Manager Planning & Environment Services
Built & Natural Environment

Friday 2 July 2021