

13 January 2020

Mr Philip Drew
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RE: BDAR Waiver Report, Lot 3 Skyline Crescent, Bringelly Road Business Hub, Horningsea Park, NSW

Introduction

Sclerophyll Flora Surveys and Research Pty Ltd (Sclerophyll) was commissioned by Bunnings Group Limited to prepare a BDAR Waiver report to support a DA to the NSW Department of Planning, Industry and Environment (DPIE) in relation to the proposed Bunnings Warehouse development of a site described as Lot 3 Skyline Crescent, Horningsea Park, NSW, 2171, situated within the Bringelly Road Business Hub lands. It is understood that approval under the *Environmental Planning and Assessment Act 1979* has been granted for the Bringelly Road Business Hub subdivision.

The Bringelly Road Business Hub site lies within the Liverpool City Council Local Government Area (LGA) and forms part of Western Sydney Parklands estate. It is understood that the Western Sydney Parklands Trust has met its biodiversity offsetting obligations prescribed in the Bringelly Rd Business Hub subdivision approval for the clearing of native vegetation as part of site redevelopment.

This letter report serves as the BDAR Waiver request which would form part of the EIS for the Lot 3 DA. The BDAR Waiver request provides an assessment of impact on biodiversity values from the proposed development to justify the exclusion of a BDAR from the DA.

Desktop Review

Sclerophyll has undertaken a desktop review of the following relevant documents to assist in the preparation of this BDAR Waiver letter report:

- Department of Planning, Industry and Environment (2019). BDAR Waiver Guidance Document (refer **Attachment A**);
- Department of Planning & Environment (2016). *State Significant Development Assessment Report: Bringelly Road Business Hub Bringelly Road, Leppington (SSD 6324)*;
- Department of Planning & Environment (January 2016). *Development Consent (SSD 6324)*;
- Eco Logical Australia (2014). *Flora and Fauna Assessment for the Bringelly Road Business Hub, State Significant Development*. Prepared for Western Sydney Parklands Trust' by Eco Logical Australia, Sutherland;
- Eco Logical Australia (2015). *Biodiversity Offset Strategy and Addendum to the Flora and Fauna Assessment for the Bringelly Road Business Hub, State Significant Development*. Prepared for Western Sydney Parklands Trust by Eco Logical Australia, Sutherland;
- Bunnings Warehouse Design Plans (2019) (refer **Attachment B**); and
- Nearmap Imagery (October 2019) (refer **Attachment C**).

Lot 3 Proposal Description

Bunnings Group Limited propose to operate a 1.7 hectare warehouse facility on Lot 3 of the Bringelly Road Business Hub site, comprising a main warehouse, outdoor nursery, timber and building landscape supply yard and carpark. The reader is referred to the EIS for a full description of the proposal.

Recent nearmap imagery (October 2019) shows the site as vacant, completely devoid of native vegetation following early subdivision works.

DA design plans for the proposed development are provided as **Attachment B**.

Summary of the ELA Biodiversity Reports

A summary of the two biodiversity reports prepared by Eco Logical Australia for the Bringelly Road Business Hub development lands (ELA 2014; 2015) is provided below.

ELA (2014)

A Flora and Fauna Assessment was undertaken by ELA in November 2014 for the Bringelly Road Business Hub development lands which comprised a desktop review, 1 day field survey in July 2014 (to validate existing Cumberland Plain vegetation mapping and to conduct a fauna habitat assessment) and preparation of an impact assessment report. No Threatened flora and fauna species were recorded on the site. The report identified the presence of 1.87 hectares of Grey Box-Forest Red Gum Woodland, listed as a Threatened Ecological Community (TEC) under the TSC and EPBC Acts, with the majority of its extent located on Lots 3 and 4.

ELA (2014) did not record any Threatened flora and fauna species on the development lands although did note that the lands represented potential habitat for a small suite of Threatened microbats and waders. ELA (2014) concluded that the proposed development would not result in significant impacts to any TSC/EPBC listed species and TECs.

ELA (2014) estimated that the removal of the 1.8 hectares of the TEC would require the purchase and retiring of 44 Ecosystem Credits using the NSW offsetting principles and recommended that a formal Biodiversity Offset Strategy (BOS) be prepared to formally quantify offsets required for the development lands.

ELA (2015)

A Biodiversity Offset Strategy (BOS) was prepared by ELA in June 2015 using the BBAM (2014) as the offsetting framework for the Bringelly Road Business Hub development. A total of 3 BBAM (2014) plots were undertaken in January 2015 on Lots 3 and 4, with the field survey biased towards those areas identified by ELA (2014) as supporting the Cumberland Plain Woodland TEC. Targeted surveys were also undertaken for 4 Threatened flora species considered as possible occurrences on the site, these being 1 vine, 1 orchid and 2 shrubs.

Plot data was run through the BBAM (2014) calculator which generated a total of 35 Ecosystem Credits required for offsetting the removal of 1.096 hectares of the Cumberland Plain Woodland TEC on the development lands in the non-biocertified areas. ELA (2015) noted that the 35 Ecosystem Credits would be purchased and retired from an already registered Western Sydney Parklands Trust biobanking site within the South West Growth Centre Biocertification boundary.

It is understood that the Parklands Trust purchased and retired the 35 credits prior to vegetation clearance activity associated with early subdivision works on the Bringelly Rd Business Hub site, in accordance with condition B2 of the approval of SSD 6324 (Schedule 4).

BDAR Waiver Assessment

An assessment of impact on biodiversity values as a result of the proposed development was undertaken based on the criteria prescribed in DPIE (2019). The impact assessment is provided in tabular form as **Attachment D**. Based on the assessment undertaken, we conclude that the development proposed for Lot 3 is unlikely to result in a significant impact on biodiversity values as prescribed in the Biodiversity Conservation Act and Regulations and thus formally request that a BDAR Waiver be issued for the DA.

Assumptions and Limitations

Sclerophyll have prepared this BDAR Waiver request letter report solely through a desktop review and have relied on 2019 nearmap imagery provided by Bunnings Group Limited to determine present site habitats. Sclerophyll has also relied on the verbal advice of Bunnings Group Limited who indicated that the Bringelly Rd Business Hub subdivision approval consent conditions relating to biodiversity offsetting had been met.

Yours faithfully



Isaac Mamott

Director, Principal Botanist

Accredited BAM Assessor (BAAS18008)

Attachment A	BDAR Waiver Guidance Document (DPIE 2019)
Attachment B	Lot 3 DA Design Plans
Attachment C	nearmap imagery (Oct. 2019)
Attachment D	Impact Assessment Tables
Attachment E	Isaac Mamott CV (Sclerophyll Flora)

Attachment A

BDAR Waiver Guidance Document (DPIE 2019)



DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

How to apply for a biodiversity development assessment report waiver

for a Major Project Application



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Cover photo: Green and Golden Bell Frog (*Litoria aurea*) habitat. Dean Portelli/DPIE

This Guide has been prepared by the Department of Planning, Industry and Environment. The Environment, Energy and Science Group and the Planning and Assessment Group have worked collaboratively to provide guidance on the requirements and process for seeking a BDAR waiver for Major Projects.

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Introduction

This guide provides information on when a biodiversity development assessment report (BDAR) under the *Biodiversity Conservation Act 2016* may not be required for State Significant Development (SSD) and State Significant Infrastructure (SSI) applications. It also explains how to lodge an application to waive this requirement with the Department of Planning, Industry and Environment.

Background

SSD and SSI are regulated under the *Environmental Planning and Assessment Act 1979*, which requires proponents to apply to the Minister of Planning for development consent or infrastructure approval, supported by an environmental impact statement (EIS). These applications are also subject to biodiversity assessment requirements under the *Biodiversity Conservation Act 2016* (BC Act).

The BC Act requires that an SSD or SSI application must be accompanied by a biodiversity development assessment report (BDAR) unless the Planning Agency Head (or delegate) and the Environment Agency Head (or delegate) determine that the proposed development is not likely to have any significant impact on biodiversity values.

This determination is referred to here as a BDAR waiver.

What is a biodiversity development assessment report?

A BDAR is a report required under the BC Act and is prepared by a person accredited (under section 6.10 of the BC Act) to apply the biodiversity assessment method (BAM). The BAM is an assessment manual that provides a consistent method for the assessment of biodiversity, including assessing certain impacts on threatened species and threatened ecological communities, their habitats, and impacts on biodiversity values. A BDAR provides guidance on how a proponent can avoid and minimise potential biodiversity impacts and identifies the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity.

In what circumstances is it likely that a biodiversity development assessment report waiver be issued?

A BDAR waiver will only be issued in limited circumstances where it is clearly demonstrated, based on information provided in accordance with this fact sheet, that the proposed development is not likely to have any significant impact on biodiversity values. For example, internal works to an existing building or development on a brownfield site with no threatened species habitat. Development that requires clearing of native vegetation is likely to require a BDAR. If there is doubt regarding potential impacts, or where information is not made available, a BDAR waiver will not be issued.

Note

A BDAR or BDAR waiver is not required if the SSD or SSI is proposed to be carried out on 'biodiversity certified land' as described in Part 8 of the BC Act.

When do I request a waiver?

A BDAR waiver request should be lodged before the SSD or SSI application is made.

For SSD, it is recommended that proponents wishing to request a BDAR waiver do so at the same time a request for Secretary's Environmental Assessment Requirements (SEARS) is made. This will help ensure that proponents are made aware of all relevant biodiversity assessment requirements for the proposed development as early as possible.

For SSI the proponent should lodge a waiver application before applying for approval from the Minister to carry out SSI, which triggers the requirement for the Secretary to prepare environmental assessment requirements. A BDAR waiver application should be lodged and the request determined prior to the SEARs being issued so that the SEARs reflect the biodiversity assessment requirements for the proposal.

Can a biodiversity development assessment report waiver be issued for a concept development application or a staged infrastructure proposal?

Concept development applications for SSD and certain staged infrastructure proposals¹ for SSI trigger the requirement for a BDAR unless the requirement is waived under s7.9(2) of the BC Act.

To apply for a BDAR waiver for a concept development application or staged infrastructure proposal, the concept proposals must be sufficiently defined to enable impacts on biodiversity values to be identified. The proponent will need to address the likely impact of the concept proposals on biodiversity values, including any clearing of native vegetation that is required or likely to be required for the concept proposals. As a minimum, the proponent must identify a development footprint and address the information requirements in Tables 1 and 2 at Attachment A.

Whether a separate BDAR waiver determination is required for subsequent SSD or SSI applications associated with a concept development consent or staged infrastructure approval will depend on whether the subsequent application is consistent with the description of 'proposed development' in the initial waiver determination.

Who should prepare the biodiversity development assessment report waiver application?

The request for a BDAR waiver and the accompanying information (as explained later in this fact sheet) does not need to be prepared by a Biodiversity Assessment Method (BAM) accredited person. However, a **suitably qualified person**² should prepare the BDAR waiver application when one or more biodiversity values are relevant to the proposed development, i.e., one or more biodiversity values are present on the development site or there is potential for direct or indirect impacts on a biodiversity value off-site.

¹ A BDAR or a BDAR waiver determination may not be required for a staged infrastructure application that is for concept approval only, and not also the first stage of the project. In such cases please contact the Department to discuss the biodiversity assessment requirements of the proposal.

² A suitably qualified person is a person with tertiary qualifications in natural sciences including subjects that relate to the observation and description of terrestrial biodiversity and landforms, and at least three years of work experience in environmental assessment including field identification of plant and animal species and habitats.

What information must accompany a biodiversity development assessment report waiver request?

A request for a BDAR waiver is to include the information set out in Table 1 and Table 2 in Attachment A. This includes information on the proponent, site and project and the likely impacts on the biodiversity values.

Proponents must address all of the impacts on biodiversity values to which the biodiversity offsets scheme applies under section 6.3 of the BC Act. Biodiversity values are defined in the BC Act and the Biodiversity Conservation Regulation 2017 (BC Regulation). The BC Regulation (clause 6.1) prescribes additional impacts on biodiversity values to be assessed under the biodiversity offsets scheme. The BDAR waiver request must explain whether each value is relevant to the site and/or the proposed development and provide supporting information to explain the likelihood and extent of any potential impacts, including prescribed impacts.

Impacts to threatened species habitat for non-native vegetation and human-made structures

If the proposed development includes demolition of buildings and/or impacts to other human-made structures, such as water bodies or other derived habitat features, there may be impacts to threatened species. Where relevant, the BDAR waiver request should include the details of potential habitat in non-native vegetation and human-made structures and demonstrate how surveys have been conducted for the presence of threatened species.

For example, to survey for threatened microbats in buildings proposed to be demolished, daytime roost searches should be carried out. A search is to be undertaken by looking for bats or signs of bats in suitable roost habitat during the daytime. All roost searches should use a torch to shine in holes, cracks and crevices, and carry a handheld bat detector to locate bats that may call. If bats are detected, observers must confirm the identity of the species and determine if the roost is a maternity roost. A description of the searches undertaken should be provided in the report.

Note

A BDAR for SSD or SSI does not need to assess the impacts of any clearing of native vegetation and loss of habitat on land classified as '**Category 1 – exempt land**' other than impacts '**prescribed**' in clause 6.1 of the BC Regulation. Therefore, for any part of the proposed development that is on Category 1 – exempt land, only 'prescribed impacts' on biodiversity values are required to be considered in a request for a BDAR waiver.

In such cases proponents must be provided information demonstrating how the relevant parts of the land meet the following criteria for Category 1 land;

- Land cleared of native vegetation as at 1 January 1990 or lawfully cleared after 1 January 1990
- Low conservation grasslands
- Land containing only low conservation groundcover (not being grasslands)
- Native vegetation identified as regrowth in a Property Vegetation Plan under the repealed *Native Vegetation Act 2003*
- Land bio-certified under the *Biodiversity Conservation Act 2016* (BC Act).

Where do I lodge a biodiversity development assessment report waiver request?

The BDAR waiver request can be lodged with the Department of Planning, Industry and Environment (The Department) via the Major Projects website (or via information@planning.nsw.gov.au). All necessary information must be provided with the request in accordance with the information requirements outlined in Attachment A. The Department may contact you if more information is required to process the request.

How long will it take to determine the application?

A BDAR waiver determination will generally be made within 28 days of the request being received.

If a BDAR waiver is not granted, there is no appeal mechanism and a BDAR must be submitted with the SSD/SSI.

Note

Regardless of whether a BDAR is required or not, SSD and SSI proponents may need to undertake a separate biodiversity assessment as part of their project application. The SEARs may outline further biodiversity matters that need to be addressed in the EIS (e.g. aquatic habitat including rivers, wetlands, lakes, estuaries, GWD ecosystems, marine environments; environmental flows, fish passage and water quality; marine protected areas; fish conservation including threatened fish and aquatic flora species protection; marine mammals, wandering sea birds).

If you wish to contact the Department to discuss the specific information requirements that may be relevant to your site, prior to lodging your request for a BDAR waiver you can contact the Department on 1300 305 695.

Attachment A – Information to include with biodiversity development assessment report waiver request

All requests for a BDAR waiver are to include the information requirements set out in Tables 1 and 2 below.

Table 1 Biodiversity development assessment report waiver request information requirements

Admin	- Proponent name and contact details. - Project ID (Information to identify which SSD or SSI project the request relates to and where the project is up to in the assessment process). - Name and ecological qualifications of person completing Table 2.
Site details	- Street address, Lot and DP, local government area. - Description of existing development site, i.e., the area of land that is subject to the proposed development application. If any part of the land is considered 'Category 1– exempt land' information must be provided to demonstrate how the land meets the <u>criteria</u>³ that applies to Category 1 – Exempt Land. - Location map showing the development site in the context of surrounding areas and landscape features. Satellite image of site in context of adjoining sites. - Site Map (to scale, ideally as a spatial shapefile).
Proposed development	- Project Description providing enough information to enable an understanding of the nature and scale of the proposed development and any associated activities (including construction etc.). - Proposed Site Plan.
Impacts on biodiversity values	- Complete Table 2 below on Biodiversity Values. - For each biodiversity value, the proponent must either: - explain why the value is not relevant to the proposed development - where a biodiversity value may be relevant, provide an explanation of how impacts have been avoided and identify the likelihood and extent of any remaining impacts of the proposed development, including impacts prescribed under clause 6.1 of the BC Regulation. - A biodiversity value is not relevant to a proposed development if the value is not present on the development site and there is no potential for direct or indirect impacts on the biodiversity value if it occurs off-site. - Where one or more biodiversity values may be relevant to the proposed development, Table 2 is to be completed by a suitably qualified person with tertiary qualifications in natural sciences including subjects that relate to the observation and description of terrestrial biodiversity and landforms, and at least three years of work experience in environmental assessment including field identification of plant and animal species and habitats. The person does not need to be an accredited person under the BC Act. - Attach any additional information required where biodiversity values are relevant to the site. E.g. Vegetation Map (indicating plant community types), Ecology Reports, Water Quality data, BioNet Atlas, Directory of Important Wetlands (DIWA), migratory bird flyway information.

³ <https://www.lls.nsw.gov.au/sustainable-land-management/facts-sheets2/land-categorisation-and-the-land-management-framework>

Table 2 Impacts of the proposed development on biodiversity values

Attach additional supporting documentation where appropriate.

Biodiversity value	Meaning	Explain and document potential impacts including additional impacts prescribed under the BC Regulation
Vegetation abundance – 1.4(b) BC Regulation	Occurrence and abundance of vegetation at a particular site	Where vegetation is present on the development site, provide a map on digital aerial photography or the best available imagery of the development site showing: • native vegetation (including grasslands and other non-woody vegetation types) and non-native vegetation • the area of land that is directly impacted by the proposed development, including related infrastructure such as roads, pipelines, access tracks, temporary material stockpiles, asset protection zones and powerlines, if applicable. Describe how the proposed development avoids impacts on native vegetation and identify the likelihood and extent of any remaining impacts including removal of isolated or cultivated native plants.
Vegetation integrity 1.5(2)(a) BC Act	Degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near-natural state	Describe the vegetation integrity and any impacts on vegetation integrity of identified plant communities. For example, information on impacts from proposed development to vegetation cover, structure, condition and function. This can include details on the presence of weeds, disturbance, planted native vegetation and species and growth form diversity.
Habitat suitability 1.5(2)(b) BC Act	Degree to which the habitat needs of threatened species are present at a particular site	Identify any threatened species or ecological communities or their habitat on the development site. Describe how the proposed development avoids impacts on habitat suitability and identify the likelihood and extent of any remaining impacts including the impacts of development on the following habitat of threatened species or ecological communities: 1. karst, caves, crevices, cliffs and other geological features of significance 2. rocks 3. human-made structures 4. non-native vegetation (prescribed under clause 6.1(1)(a) of the BC Regulation). Impacts may include the removal or modification (e.g. noise, light, etc.) of the habitat of threatened species or ecological communities.
Threatened species abundance 1.4(a) BC Regulation	Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site	Describe how the proposed development avoids impacts on threatened species abundance and identify the likelihood and extent of any remaining impacts including; • Impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community (prescribed under clause 6.1(1)(f) of the Regulation).

		• Impacts on threatened species, for example, microbats, associated with the demolition of human-made structures (prescribed by 6.1 (1) a (iii) of the Regulation). • Impacts on threatened species habitat associated with non-native vegetation (prescribed by 6.1 (1) a (iv) of the Regulation). • Impacts on threatened species habitat associated with non-natural water bodies (prescribed by 6.1 (1) a (iii) of the Regulation). For example, threatened frogs such as the green and golden bell frog in landfill areas, drains and brick pits.
Habitat connectivity 1.4(c) BC Regulation	Degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range	Identify whether the development site contributes to habitat connectivity. Describe how the proposed development avoids impacts on habitat connectivity and identify the likelihood and extent of any remaining impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range (prescribed under clause 6.1(1)(b) of the BC Regulation).
Threatened species movement 1.4(d) BC Regulation	Degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle	Describe how the proposed development avoids impacts on threatened species movement and identify the likelihood and extent of any remaining impacts of development on movement of threatened species that maintains their lifecycle (prescribed under clause 6.1(1)(c) BC Regulation).
Flight path integrity 1.4(e) BC Regulation	Degree to which the flight paths of protected animals over a particular site are free from interference	Identify whether flight paths of protected animals occur over the development site. Protected animals are animals of a species listed or referred to in Schedule 5 of the BC Act. They include any species of birds, mammals, amphibians or reptiles that are native to Australia or that periodically or occasionally migrate to Australia. Describe how the proposed development avoids impacts on flight path integrity and identify the likelihood and extent of any remaining impacts. Note: The impacts of wind turbine strikes on protected animals are prescribed under clause 6.1(1)(e) of the BC Regulation. It is, therefore, unlikely that a BDAR waiver would be issued for a proposed wind farm.
Water sustainability 1.4(f) BC Regulation	Degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site	Describe how the proposed development avoids impacts on water sustainability and identify the likelihood and extent of any remaining impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining or other development) (prescribed under clause 6.1(1)(d) of the BC Regulation).

Attachment B
Lot 3 DA Design Plans

PROPOSED FACILITY

DRAWING LIST

DRAWING NO.	DRAWING TITLE
C011994.06-DA 10	DRAWING LIST & GENERAL NOTES
C011994.06-DA 20	EROSION AND SEDIMENT CONTROL PLAN
C011994.06-DA 25	EROSION AND SEDIMENT CONTROL DETAILS
C011994.06-DA 41	STORMWATER DRAINAGE PLAN - SHEET 1
C011994.06-DA 42	STORMWATER DRAINAGE PLAN - SHEET 2
C011994.06-DA 45	STORMWATER DRAINAGE DETAILS - SHEET 1
C011994.06-DA 46	STORMWATER DRAINAGE DETAILS - SHEET 2
C011994.06-DA 51	FINISHED LEVELS PLAN - SHEET 1
C011994.06-DA 52	FINISHED LEVELS PLAN - SHEET 2

GENERAL NOTES:

- G1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- G2 ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.
- G3 ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE. ENGINEER'S DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS. ENGINEER'S DRAWINGS ISSUED IN ANY ELECTRONIC FORMAT MUST NOT BE USED FOR DIMENSIONAL SETOUT. REFER TO THE ARCHITECT'S DRAWINGS FOR ALL DIMENSIONAL SETOUT INFORMATION.
- G4 DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.
- G5 UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.
- G6 ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH ACCEPTABLE SAFETY STANDARDS & APPROPRIATE SAFETY SIGNS SHALL BE INSTALLED AT ALL TIMES DURING THE PROGRESS OF THE JOB.
- G7 DRAWING TO BE READ IN CONJUNCTION WITH ENGINEERING REPORT CO11994.01-05.rpt

ELECTRONIC INFORMATION NOTES:

1. THE ISSUED DRAWINGS IN HARD COPY OR PDF FORMAT TAKE PRECEDENCE OVER ANY ELECTRONICALLY ISSUED INFORMATION, LAYOUTS OR DESIGN MODELS.
2. THE CONTRACTOR'S DIRECT AMENDMENT OR MANIPULATION OF THE DATA OR INFORMATION THAT MIGHT BE CONTAINED WITHIN AN ENGINEER-SUPPLIED DIGITAL TERRAIN MODEL AND ITS SUBSEQUENT USE TO UNDERTAKE THE WORKS WILL BE SOLELY AT THE DISCRETION OF AND THE RISK OF THE CONTRACTOR.
3. THE CONTRACTOR IS REQUIRED TO HIGHLIGHT ANY DISCREPANCIES BETWEEN THE DIGITAL TERRAIN MODEL AND INFORMATION PROVIDED IN THE CONTRACT AND/OR DRAWINGS AND IS REQUIRED TO SEEK CLARIFICATION FROM THE SUPERINTENDENT.
4. THE ENGINEER WILL NOT BE LIABLE OR RESPONSIBLE FOR THE POSSIBLE ON-GOING NEED TO UPDATE THE DIGITAL TERRAIN MODEL, SHOULD THERE BE ANY AMENDMENTS OR CHANGES TO THE DRAWINGS OR CONTRACT INITIATED BY THE CONTRACTOR.

EROSION CONTROL NOTES

ALL CONTROL WORK INCLUDING DIVERSION BANKS AND CATCH DRAINS, V-DRAINS AND SILT FENCES SHALL BE COMPLETED DIRECTLY FOLLOWING THE COMPLETION OF THE EARTHWORKS.

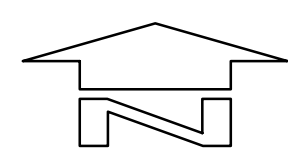
1. SILT FENCES AND SILT FENCE RETURNS SHALL BE ERRECTED CONVEX TO THE OUTCLOSURE TO POND WATER.
2. HAY BALE BARRIERS AND GEOFABRIC FENCES ARE TO BE CONSTRUCTED TO TOE OF BATTER, PRIOR TO COMMENCEMENT OF EARTHWORKS, IMMEDIATELY AFTER CLEARING OF VEGETATION AND BEFORE REMOVAL OF TOP SOIL.
3. ALL TEMPORARY EARTH BERMS, DIVERSION AND SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED AND MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
4. CUT WATER IS TO BE DIVERTED AWAY FROM DISTURBED GROUND AND INTO THE DRAINAGE SYSTEM.
5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND PROVIDING ON GOING ADJUSTMENT TO EROSION CONTROL MEASURES AS REQUIRED DURING CONSTRUCTION.
6. ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING, TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE, APPROVED LOCATION.
7. ALL FINAL EROSION PREVENTION MEASURES INCLUDING THE ESTABLISHMENT OF GRASSING ARE TO BE MAINTAINED UNTIL THE END OF THE DEFECTS LIABILITY PERIOD.
8. ALL EARTHWORKS AREAS SHALL BE ROLLED ON A REGULAR BASIS TO SEAL THE EARTHWORKS.
9. ALL FILL AREAS ARE TO BE LEFT WITH A BUND AT THE TOP OF THE SLOPE AT THE END OF EACH DAYS EARTHWORKS. THE HEIGHT OF THE BUND SHALL BE A MINIMUM OF 200MM.
10. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND HYDROMULCHED WITHIN 10 DAYS OF COMPLETION OF FORMATION.
11. AFTER REVEGETATION OF THE SITE IS COMPLETE AND THE SITE IS STABLE IN THE OPINION OF A SUITABLY QUALIFIED PERSON ALL TEMPORARY WORK SUCH AS SILT FENCE, DIVERSION DRAINS ETC SHALL BE REMOVED.
12. ALL STOCKPILE STOCKPILES ARE TO BE SUITABLY COVERED TO THE SATISFACTION OF THE SITE MANAGER TO PREVENT WIND AND WATER EROSION.
13. ANY AREA THAT IS NOT APPROVED BY THE CONTRACT ADMINISTRATOR FOR CLEARING OR DISTURBANCE BY THE CONTRACTOR'S ACTIVITIES SHALL BE CLEARLY MARKED AND SIGN POSTED, FENCED OFF OR OTHERWISE APPROPRIATELY PROTECTED AGAINST ANY SUCH DISTURBANCE.
14. ALL STOCKPILE SITES SHALL BE SITUATED IN AREAS APPROVED FOR SUCH USE BY THE SITE MANAGER. A 6m BUFFER ZONE SHALL EXIST BETWEEN STOCKPILE SITES AND ANY STREAM OR FLOW PATH. ALL STOCKPILES SHALL BE ADEQUATELY PROTECTED FROM EROSION AND CONTAMINATION OF THE SURROUNDING AREA BY USE OF THE MEASURES APPROVED IN THE EROSION AND SEDIMENTATION CONTROL PLAN.
15. ACCESS AND EXIT AREAS SHALL INCLUDE SHAKE-DOWN OR OTHER METHODS APPROVED BY THE SITE MANAGER FOR THE REMOVAL OF SOIL MATERIALS FORM MOTOR VEHICLES.
16. THE CONTRACTOR IS TO ENSURE RUNOFF FROM ALL AREAS WHERE THE NATURAL SURFACE IS DISTURBED BY CONSTRUCTION, INCLUDING ACCESS ROADS, DEPOT AND STOCKPILE SITES, SHALL BE FREE OF POLLUTANTS BEFORE IT IS EITHER DISPERSED TO STABLE AREAS OR DIRECTED TO NATURAL WATERCOURSES.
17. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SLOPES, CROWNS AND DRAINS ON ALL EXCAVATIONS AND EMBANKMENTS TO ENSURE SATISFACTORY DRAINAGE AT ALL TIMES WATER SHALL NOT BE ALLOWED TO POND ON THE WORKS UNLESS SUCH PONDING IS PART OF AN APPROVED ESCP / SWMP.

SITE PREPARATION NOTES:

1. ALL EARTHWORKS SHALL BE COMPLETED GENERALLY IN ACCORDANCE WITH THE GUIDELINES SPECIFIED BY PSM3312-0035 REV D DATED 11 MAY 2017
2. EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY REALSERVE SURVEYORS AND GEOMAT ENGINEERING PTY LTD.
3. STRIP ANY TOP SOIL OR DELETERIOUS MATERIAL AND DISPOSE OF FROM SITE OR STORE AS DIRECTED.
4. COMPLETE CUT TO FILL EARTHWORKS TO ACHIEVE THE REQUIRED LEVELS AS INDICATED ON THE DRAWINGS WITHIN A TOLERANCE OF $\pm 0mm$ - $\pm 10mm$ THROUGH BUILDING PAD/S/PAVEMENT/S AND $\pm 0mm$ - $\pm 20mm$ ELSEWHERE. PREPARE STEEP BATTERS TO RECEIVE FILL BY CONSTRUCTING BENCHING TO FACILITATE FILL PLACEMENT AND COMPACTION.
5. AREAS TO RECEIVE FILL (THAT ARE NOT ON BENCHMARK BATTERS) AND AREAS IN CUT SHALL BE PROOF ROLLED TO IDENTIFY ANY SOFT HEAVING MATERIAL. SOFT MATERIAL SHALL BE BOXED OUT AND REMOVED PRIOR TO FILL PLACEMENT. PROOF ROLLING TO BE INSPECTED BY A GEOTECHNICAL ENGINEER OR THE EARTHWORKS DESIGNER.
7. SITE WON FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
8. IMPORTED FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
9. ALL ENGINEERED FILL PARTICLES SHALL BE ABLE TO BE INCORPORATED WITHIN ONE AND A HALF (1.5) TIMES THE SIZE OF THE PARTICLES SHALL BE RETAINED ON THE 37.5 MM SIEVE. ENGINEERED FILL SHALL BE ABLE TO BE TESTED IN ACCORDANCE WITH THE STANDARD COMPACTION METHOD (AS1289 5.4.1) OR HILF TEST METHOD (AS1289 5.7.1). THESE METHODS REQUIRE LESS THAN 20% RETAINED ON THE 37.5 MM SIEVE. WHERE BETWEEN 20% AND 30% OF PARTICLES ARE RETAINED ON THE 37.5 MM SIEVE THE ABOVE TEST METHODS SHALL STILL BE ADOPTED AND TEST REPORTS ANNOTATED APPROPRIATELY. THESE REQUIREMENTS SHOULD BE MET BY THE MATERIAL AFTER PLACEMENT AND COMPACTION
10. ALL THE EARTHWORKS UNDERTAKEN AND THE SUBGRADE CONDITION IN THE CUT AREAS (IN THE STATED PERIOD) ARE DOCUMENTED IN THE REPORTS AND HAVE BEEN UNDERTAKEN IN ACCORDANCE WITH THE SPECIFICATION.
11. PRIOR TO ANY EARTHWORKS, EROSION CONTROL AS OUTLINED IN THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE COMPLETED.
12. EXISTING ROCK, IF ANY, SHALL BE REMOVED BY HEAVY ROCK BREAKING OR RIPPING.
13. MATCH EXISTING LEVELS AT BATTER INTERFACE.
14. CONTRACTOR TO MATCH EXISTING LEVELS AT THE INTERFACE OF EARTHWORKS AND EXISTING SURFACE AT BATTER LOCATION OR WHERE NO RETAINING WALLS ARE PRESENT. ANY DISCREPANCY BETWEEN DESIGN AND EXISTING LEVELS TO BE REFERRED TO THE ENGINEER FOR DIRECTION OR ADJUSTMENTS TO DESIGN LEVELS.

STORMWATER DRAINAGE NOTES:

1. ALL STORMWATER WORKS TO BE COMPLETED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS3500 3/2003 PLUMBING AND DRAINAGE, PART 3: STORMWATER DRAINAGE.
2. THE MINOR (PIPED) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 20 YEAR ARI STORM EVENT AND THE MAJOR (OVERLAND) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 100 YEAR ARI STORM EVENT.
3. ANTICIPATED PAYMENT LEVELS SHALL BE AS INDICATED ON FINISHED LEVELS PLANS DASI & DAS2
4. PIT SIZES SHALL BE AS INDICATED IN THE SCHEDULE WHILE PIPE SIZES AND DETAILS ARE PROVIDED ON PLAN.
5. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED BY SURVEY PRIOR TO COMMENCING WORKS ON SITE.
6. ALL STORMWATER PIPES Ø375 OR GREATER SHALL BE CLASS 2 REINFORCED CONCRETE WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.
7. ALL PIPES UP TO AND INCLUDING Ø300 TO BE UPVC GRADE SN6 UNO.
8. PIPES Ø300 AND NOMINALLY 1000mm OR IN SERVICE LOADING CONDITIONS ONLY. CONTRACTOR IS TO MAKE ANY NECESSARY ADJUSTMENTS REQUIRED FOR CONSTRUCTION CONDITIONS.
9. ALL CONCRETE PITS GREATER THAN 1000mm DEEP SHALL BE REINFORCED USING N12-200 EACH WAY CENTERED IN WALL AND BASE. LAP MINIMUM 300mm WHERE REQUIRED. ALL CONCRETE FOR PITS SHALL BE $f'c \geq 25$ MPa. PRECAST PITS MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
10. IN ADDITION TO ITEM 6 ABOVE, ALL CONCRETE PITS GREATER THAN 3000mm DEEP SHALL HAVE WALLS AND BASE THICKNESS INCREASED TO 200mm.
11. PIPES SHALL BE LAID AS PER PIPE LAYING DETAILS. PARTICULAR CARE SHALL BE TAKEN TO ENSURE THAT THE PIPE IS FULLY AND EVENLY SUPPORTED. RAM AND PACK FILLING AROUND AND UNDER BACK OF PIPES AND PIPE FAUCETS, WITH NARROW EGGED RAMMERS OR OTHER SUITABLE TAMPING DETAILS.
12. WHERE PIPE LINES ENTER PITS, PROVIDE 2m LENGTH OF STOCKING WRAPPED SLOTTED Ø100 uPVC TO EACH SIDE OF PIPE.
13. ALL SUBSOL DRAINAGE LINES SHALL BE Ø100 SLOTTED uPVC WITH ANTI-SUBSOL FILTER WITH 100mm WIDE GRANULAR FILTER UNLESS NOTED OTHERWISE. LAY SUBSOL LINES TO MATCH FALLS OF LAND AND/OR 1 IN 200 MINIMUM. PROVIDE CAPPED CLEANING EYE (RODDING POINT) AT UPSTREAM END OF LINE AND AT 30m MAX. CTS. PROVIDE SUBSOL LINES TO ALL PAYMENT/ LANDSCAPED INTERFACES, TO REAR OF RETAINING WALLS (AS NOMINATED BY STRUCTURAL ENGINEER) AND AS SHOWN ON PLAN.
14. ALL PIPE GRADES 1 IN 100 MINIMUM UNO.
15. PROVIDE STEP IRONS IN PITS DEEPER THAN 1000mm.
16. MIN 600 COVER TO PIPE OBVERT BENEATH ROADS & MIN. 400 COVER BENEATH LANDSCAPED AREAS.
17. PIT COVERS IN TRAFFICABLE PAVEMENT SHALL BE CLASS D 'HEAVY DUTY', THOSE IN CONTAINER PAVEMENT SHALL BE CLASS G 'HEAVY DUTY', AND THOSE LOCATED IN NON-TRAFFICABLE AREAS SHALL BE CLASS B 'MEDIUM DUTY' UNO.
18. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
19. DOWN PIPES (DP) TO BE AS PER HYDRAULIC ENGINEERS DETAILS WITH CONNECTED TO MATCH DP SIZE UNO. ON PLAN, PROVIDE CLEANING EYE AT GROUP LEVEL.
20. PIPE LENGTHS NOMINATED ON PLAN OR LONGSECTIONS ARE MEASURED FROM CENTER OF PITS TO THE NEAREST 0.5m AND NOT REPRESENT ACTUAL LENGTH. THE CONTRACTOR IS TO ALLOW FOR THIS.



SITE PLAN
N.T.S

FOR DEVELOPMENT APPLICATION

[illegible]

PROVIDE 1m RETURNS TO SILT FENCE AT 30m MAX. INTERVALS.
TYPICAL (N.S.O.P.)

-  - SILT FENCE ONLY
-  - SILT FENCE WITH CATCH DRAIN
-  - DIVERSION DRAIN
-  - OVERLAND FLOW PATH

FOR SEDIMENT & EROSION CONTROL DETAILS REFER TO DRAWING
C011994.06-DA25.
SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND
CONSTRUCTION, MANAGING URBAN STORMWATER-THE BLUE BOOK'.
CAPACITY BASED UPON 5 DAY RAINFALL DEPTH AT 85th PERCENTILE
INTENSITY [24.4mm].

APPROXIMATE AREA OF DISTURBED SITE = 4.6ha

SEDIMENT BASIN 1:
CATCHMENT AREA = 4.097ha
REQUIRED BASIN VOLUME = 750m³
BASE DIMENSIONS (L X W) = 14m x 23.0m
TOP DIMENSIONS (L X W) = 23.0m x 32.0m
MAX SIDE SLOPE = 1V:3H
DEPTH = 1.5m
PROVIDED BASIN VOLUME = 772m³

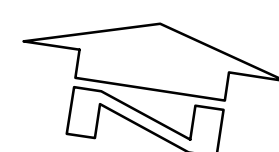
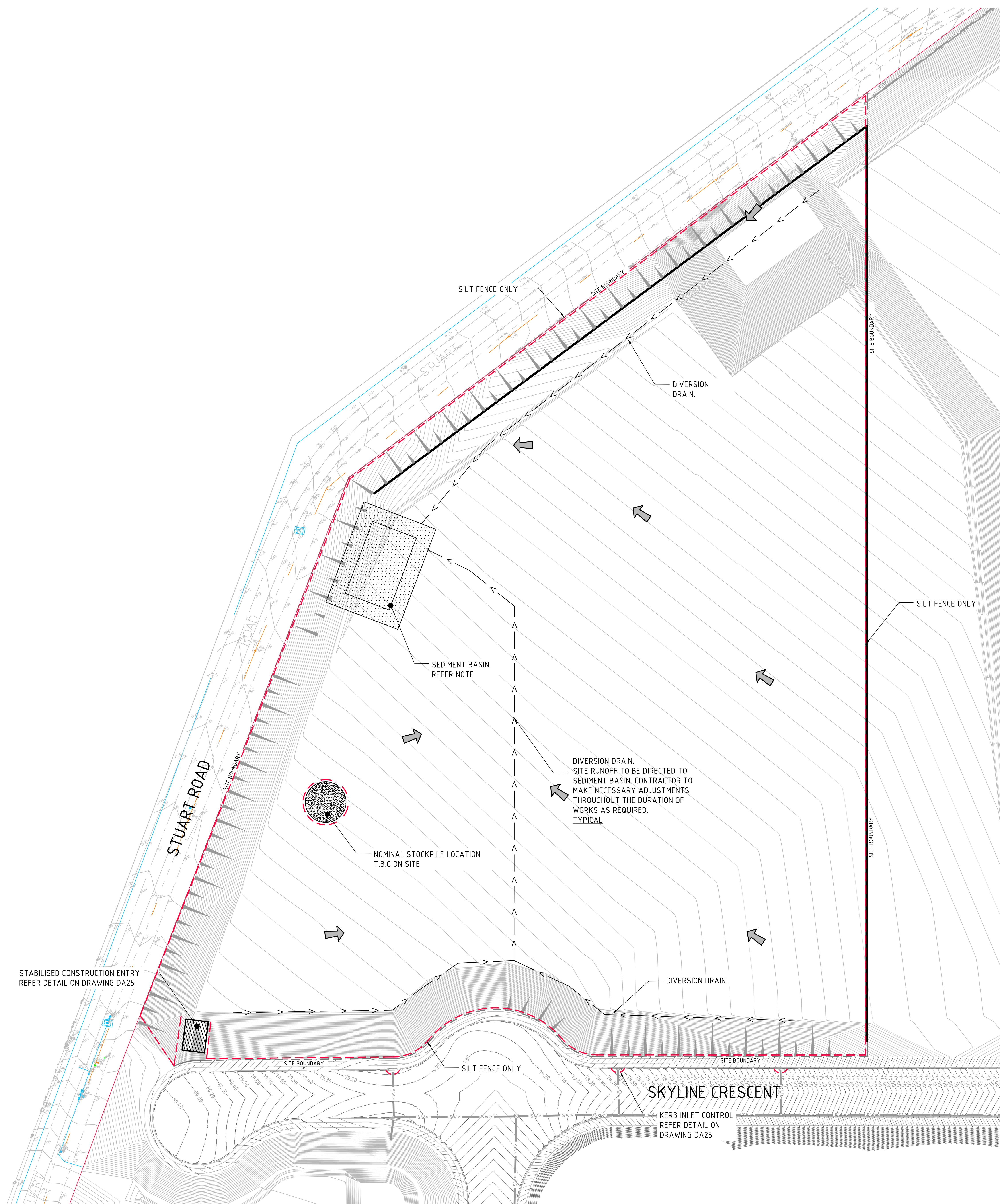
SEDIMENTATION BASINS TO COLLECT RUN-OFF IN EXTREME RAINFALL EVENTS. COLLECTED RUN-OFF TO BE ASSESSED BY A QUALIFIED LABORATORY FOR DOUSING RATES OF ALUM OR GYPSUM TO ENSURE COAGULATION OF SEDIMENTS PRIOR TO WATER BEING DISCHARGED TO COUNCIL STORMWATER SYSTEM.

EACH BASIN IS TO HAVE A MARKER PLACED AS PER THE DETAIL TO INDICATE WHEN SEDIMENT IS TO BE REMOVED. REMOVED SEDIMENT IS TO BE CLASSED AND DEWATERED PRIOR TO REMOVAL FROM SITE.

ALLOWANCE TO BE MADE DURING BENCHING OF SITE TO ENSURE RUN-OFF IS DIRECTED TO SEDIMENTATION BASINS.

NOTES:

1. ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
2. ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES)



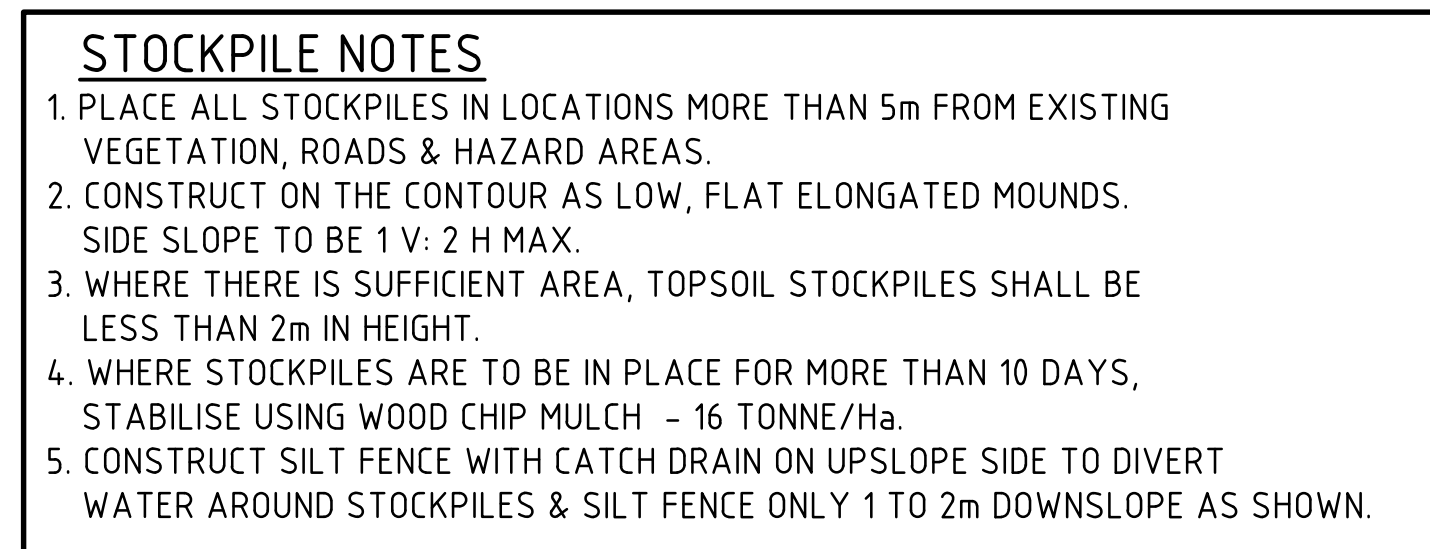
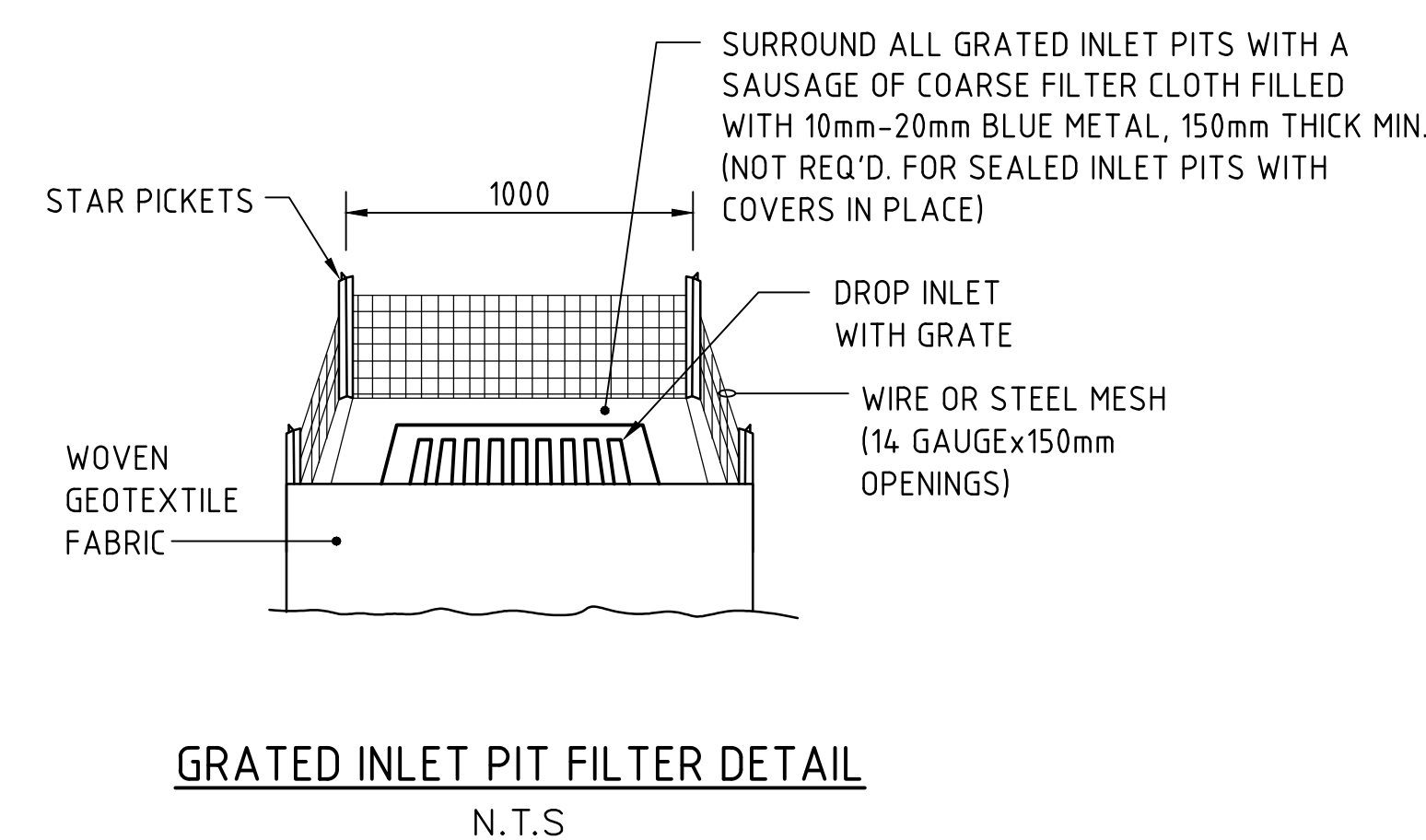
EROSION & SEDIMENT CONTROL PLAN
SCALE 1:500

FOR DEVELOPMENT APPLICATION

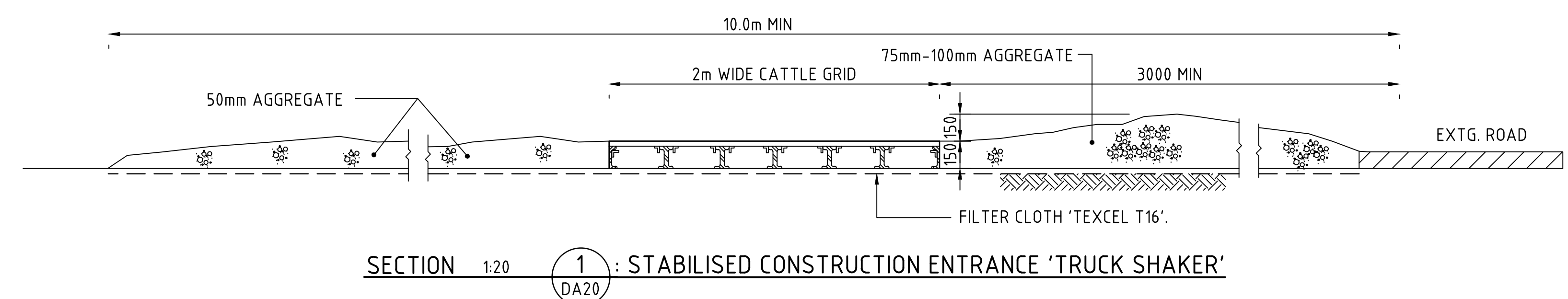
5m 0 10 20 30 40 50m

SCALE 1:500 AT A0 SIZE SHEET

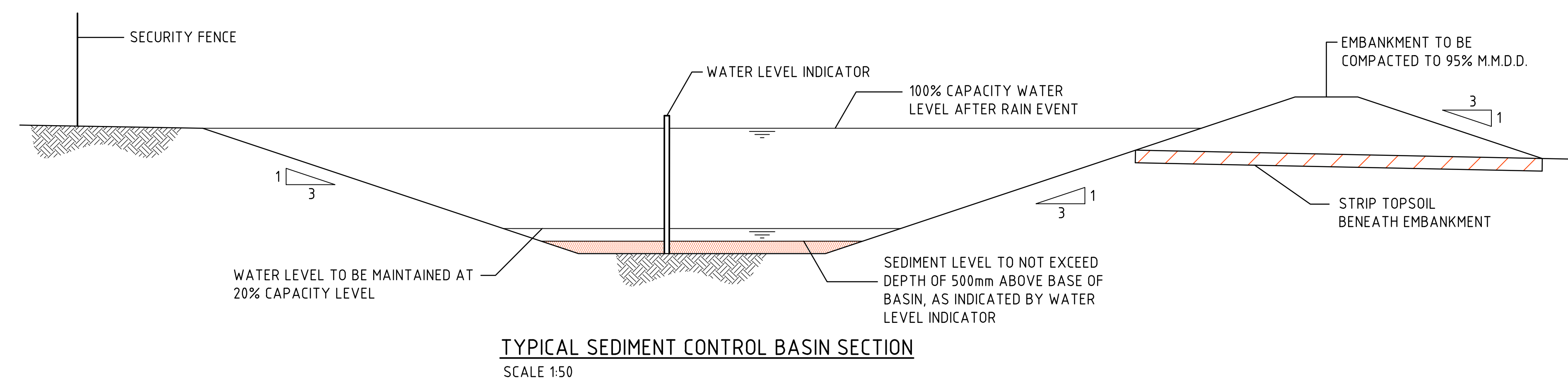
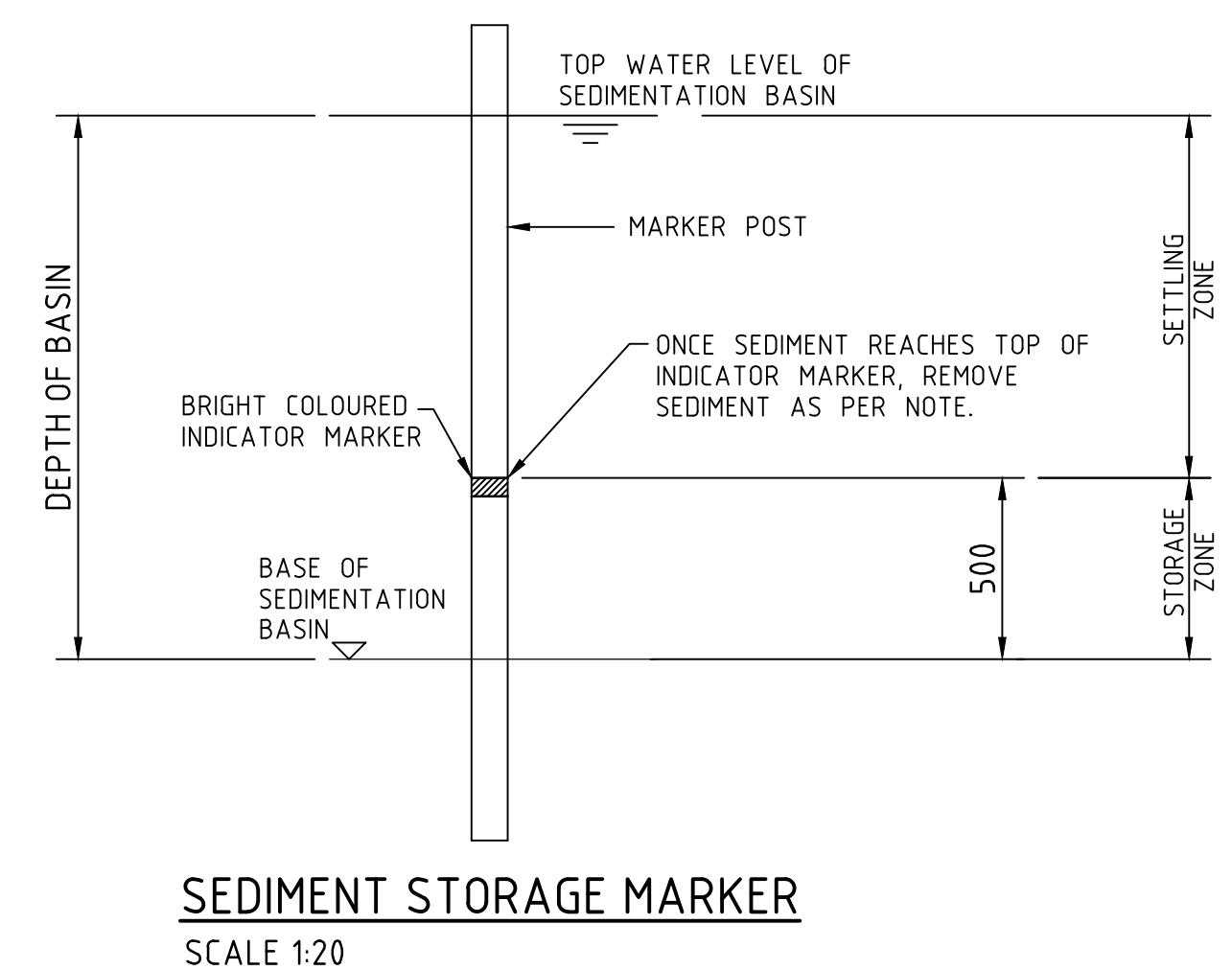
ISSUED FOR DEVELOPMENT APPLICATION 16.05.19 C ISSUED FOR DEVELOPMENT APPLICATION 19.09.19 B ISSUED FOR INFORMATION 04.09.19 A AMENDMENTS DATE ISSUE AMENDMENTS DATE ISSUE AMENDMENTS DATE ISSUE										CLIENT MICHAEL CARR ARCHITECT 88 TOPE STREET SOUTH MELBOURNE VIC 3205 PH: (03) 9645 5635										ARCHITECT BUNNINGS CARR ARCHITECT 88 TOPE STREET SOUTH MELBOURNE VIC 3205 PH: (03) 9645 5635										CLIENT BUNNINGS warehouse										PROJECT BUNNINGS WAREHOUSE LOT 3, BRINGELLY ROAD HORNINGSEA PARK, NSW										 Costin Roe Consulting Pty Ltd. Consulting Engineers 124 002 546 448 Level 1, 8 Windmill Street Melish Bay, Sydney NSW 2000 Tel: (02) 9251-7999 Fax: (02) 9241-3721 Email: mail@costinroe.com.au ©										Costin Roe Consulting PRECISION COMMUNICATION ACCOUNTABILITY										DRAWING TITLE EROSION & SEDIMENT CONTROL PLAN										DRAWING NO C01194.06-DA20										ISSUE									
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The diagram illustrates the installation of a Star Picket Barrier. It shows a line of star-shaped pickets driven into the ground. The area immediately behind the pickets is labeled 'DISTURBED AREA', while the area in front of them is labeled 'UNDISTURBED AREA'. An arrow indicates the 'DIRECTION OF FLOW' towards the barrier. A callout specifies: '15m STAR PICKETS AT 3000 CTS. MAX. DRIVEN 700 MM. INTO GROUND'.



TYPICAL OPEN DRAIN & SILT FENCE
SCALE 1:20

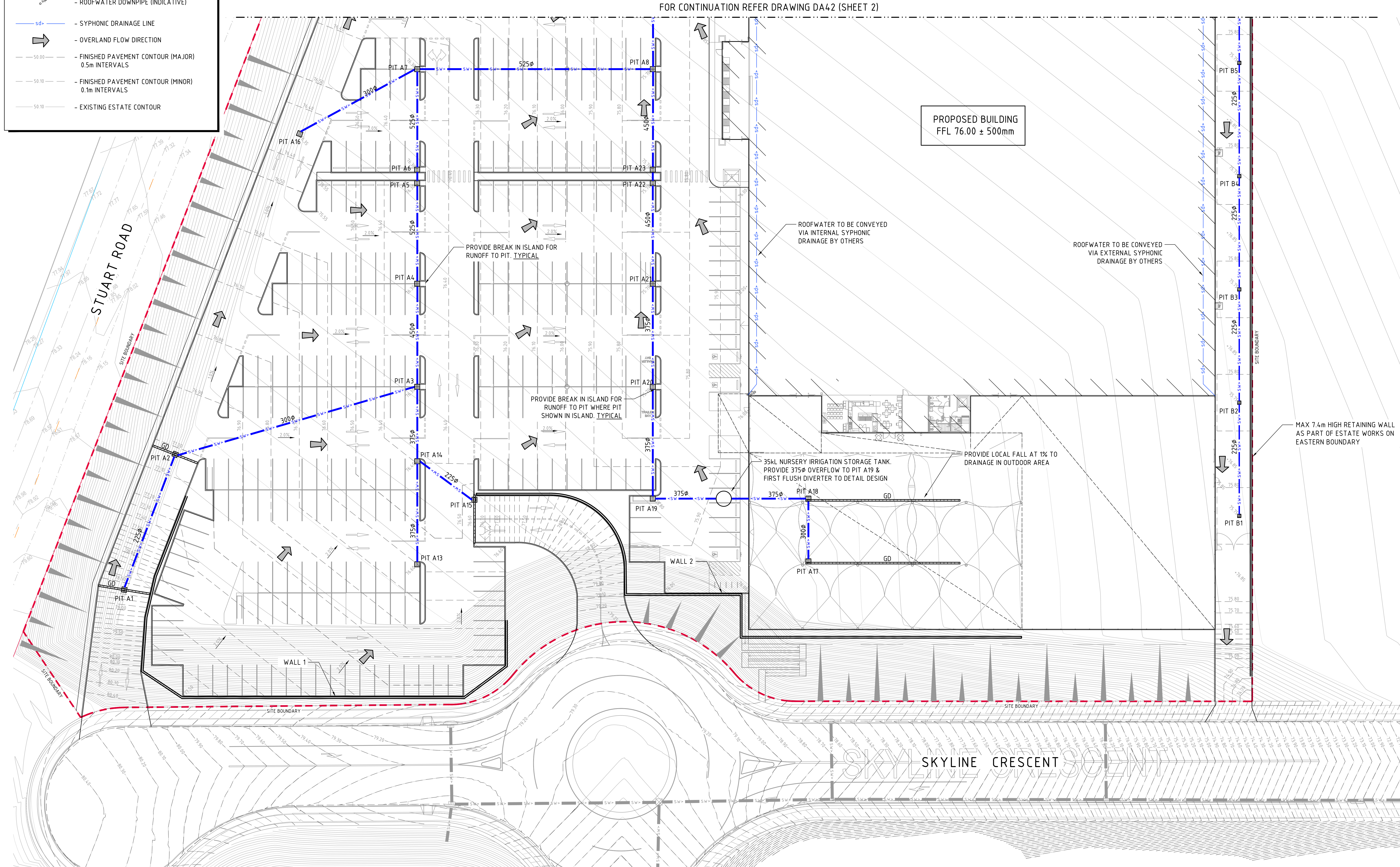


			CLIENT			PROJECT						Costin Roe Consulting Pty Ltd. Consulting Engineers 434 402 444 444 Level 1, 8 Windmill Street Walsh Bay, Sydney NSW 2000 Tel: (02) 9251-7699 Fax: (02) 9241-3721 email: mail@costinroe.com.au ©			Costin Roe Consulting PRECISION COMMUNICATION ACCOUNTABILITY			DRAWING TITLE EROSION & SEDIMENT CONTROL DETAILS		
ARCHITECT MICHAEL CARR ARCHITECT 88 TOPE STREET SOUTH MELBOURNE VIC 3205 PH: (03) 9645 5635			 BUNNINGS WAREHOUSE LOT 3, BRINGELLY ROAD HORNINGSEA PARK, NSW			Level 1, 8 Windmill Street Walsh Bay, Sydney NSW 2000 Tel: (02) 9251-7699 Fax: (02) 9241-3721 email: mail@costinroe.com.au ©			DRAWING NO C011994.06-DA25											
ISSUED FOR DEVELOPMENT APPLICATION 16.05.19 C ISSUED FOR DEVELOPMENT APPLICATION 13.09.19 B ISSUED FOR INFORMATION 04.09.19 A			AMENDMENTS DATE DATE DATE AMENDMENTS AMENDMENTS AMENDMENTS			DESIGNED DRAWN DATE CHECKED M.W. M.W. A.S. SIGNED			CAD REVISION C011994.06-DA25									ISSUE		

LEGEND:
LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON A PLAN OF SURVEY SY073409.001 BY LAND PARTNERS SURVEYORS 14/11/17 AND COSTIN ROE CONSULTING ESTATE DESIGN LEVELS.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED DRAINAGE LINE
- EXISTING ESTATE DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- SYPHONIC DRAINAGE LINE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- EXISTING ESTATE CONTOUR



PIT SCHEDULE - A

PIT No.	GRATE RL	TYPE	SIZE	COMMENT
PIT A1	78.60	S.G.G.P	900x900	
PIT A2	77.03	S.G.G.P	900x900	
PIT A3	76.30	S.G.G.P	900x900	
PIT A4	76.30	S.G.G.P	900x900	
PIT A5	76.30	S.G.G.P	900x900	
PIT A6	76.30	S.G.G.P	900x900	
PIT A7	76.30	S.G.G.P	900x900	
PIT A8	75.70	S.G.G.P	900x900	
PIT A9	75.70	S.G.G.P	900x900	
PIT A10	75.70	S.G.G.P	900x900	
PIT A11	75.77	S.J.P	900x900	
PIT A12	75.78	S.J.P	1200x1200	
PIT A13	76.60	S.G.G.P	900x900	
PIT A14	76.40	S.G.G.P	900x900	
PIT A15	76.60	S.G.G.P	900x900	
PIT A16	76.35	S.G.G.P	900x900	
PIT A17	75.90	S.G.G.P	900x900	
PIT A18	75.90	S.G.G.P	900x900	
PIT A19	75.80	S.G.G.P	900x900	
PIT A20	75.70	S.G.G.P	900x900	
PIT A21	75.70	S.G.G.P	900x900	
PIT A22	75.70	S.G.G.P	900x900	
PIT A23	75.70	S.G.G.P	900x900	

PIT SCHEDULE - B & C

PIT No.	GRATE RL	TYPE	SIZE	COMMENT
PIT B1	75.75	S.G.G.P	900x900	
PIT B2	75.75	S.G.G.P	900x900	
PIT B3	75.75	S.G.G.P	900x900	
PIT B4	75.75	S.G.G.P	900x900	
PIT B5	75.75	S.G.G.P	900x900	
PIT B6	75.75	S.G.G.P	900x900	
PIT B7	75.75	S.G.G.P	900x900	
PIT B8	75.96	S.G.G.P	900x900	
PIT B9	75.80	S.G.G.P	900x900	
PIT B10	75.80	S.G.G.P	900x900	
PIT B11	75.60	S.J.P	900x900	
PIT B12	75.35	S.G.G.P	900x900	
PIT B13	75.48	S.J.P	900x900	
PIT B14	75.73	S.G.G.P	900x900	
PIT B15	75.75	S.G.G.P	900x900	
PIT B16	75.75	S.G.G.P	900x900	
PIT B17	75.70	S.G.G.P	900x900	
PIT C1	75.72	S.G.G.P	900x900	
PIT C2	73.90	S.G.G.P	900x900	
PIT C3	71.90	S.G.G.P	900x900	
PIT C4	69.50	S.G.G.P	900x900	
PIT C5	67.20	S.G.G.P	900x900	

STORMWATER DRAINAGE NOTES:
REFER TO DRAWING C011994.06-DA10 FOR STORMWATER DRAINAGE NOTES

LEVELS NOTE:
LEVELS SHOWN TO BE +/- 500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON A PLAN OF SURVEY SY073409.001 BY LAND PARTNERS SURVEYORS 14/11/17 AND COSTIN ROE CONSULTING ESTATE DESIGN LEVELS.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED DRAINAGE LINE
- EXISTING ESTATE DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- SYPHONIC DRAINAGE LINE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- EXISTING ESTATE CONTOUR

PIT SCHEDULE:

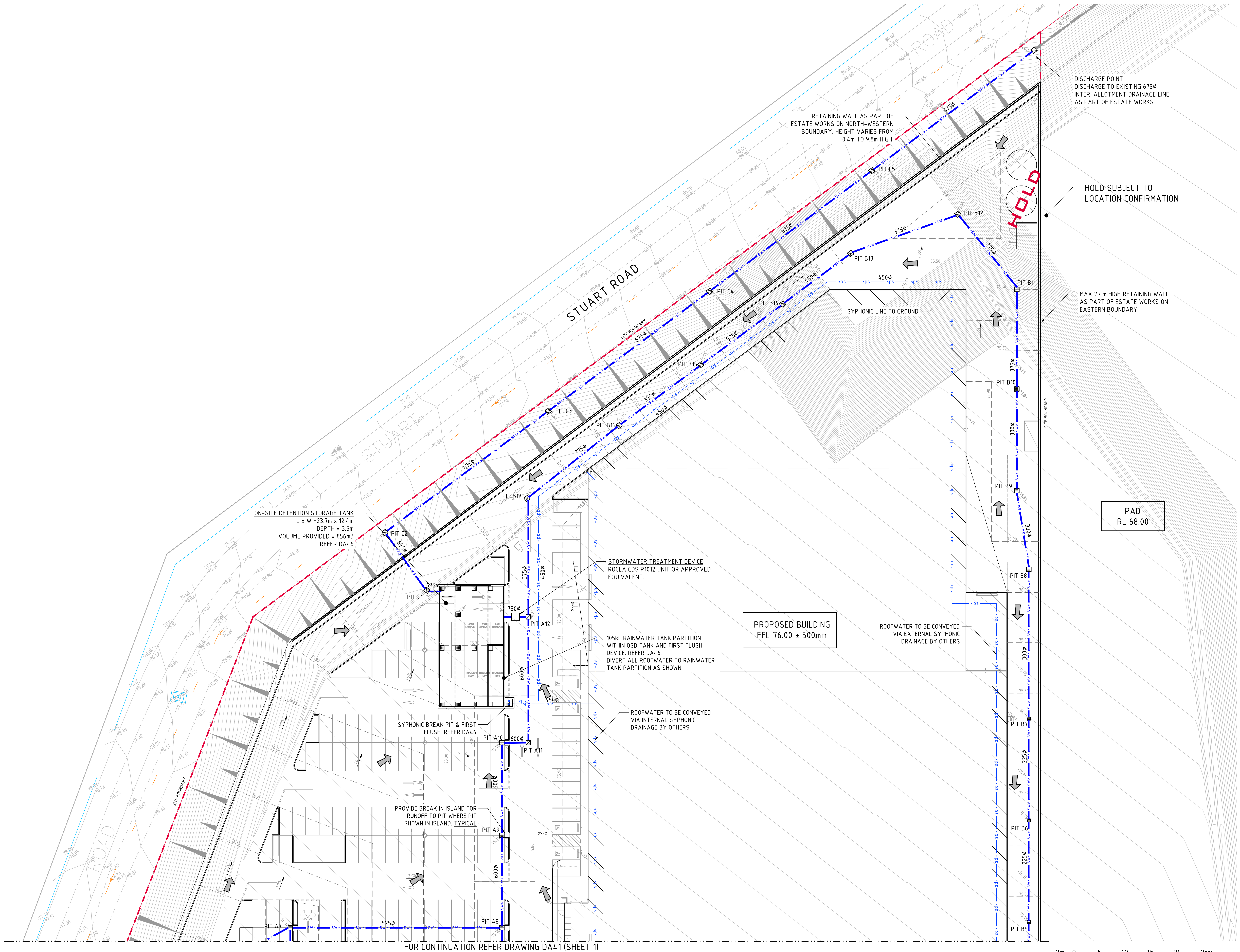
REFER TO DRAWING DA41 FOR PIT SCHEDULE.

STORMWATER DRAINAGE NOTES:

REFER TO DRAWING C011994.06-DA10 FOR STORMWATER DRAINAGE NOTES

LEVELS NOTE:

LEVELS SHOWN TO BE +/-500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.



FOR CONTINUATION REFER DRAWING DA41 (SHEET 1)

STORMWATER DRAINAGE PLAN - SHEET 2
SCALE 1:250

FOR DEVELOPMENT APPLICATION

2m 0 5 10 15 20 25m
SCALE 1:250 AT A0 SIZE SHEET

ISSUED FOR DEVELOPMENT APPLICATION	04.11.19	F
REVISED AS CLOUDED	30.10.19	E
ISSUED FOR DEVELOPMENT APPLICATION	16.09.19	D
ISSUED FOR DEVELOPMENT APPLICATION	17.09.19	C
ISSUED FOR INFORMATION	04.09.19	B
ISSUED FOR INFORMATION	23.08.19	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE	AMENDMENTS	DATE	ISSUE
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ARCHITECT
MICHAEL CARR ARCHITECT
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SOUTH MELBOURNE VIC 3205
PH: (03) 9645 5635

CLIENT
BUNNINGS
warehouse

PROJECT
BUNNINGS WAREHOUSE
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HORNINGSEA PARK, NSW

CONSULTANT
AUSTALIA

Costin Roe Consulting Pty Ltd.
Consulting Engineers
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email: mail@costinroe.com.au

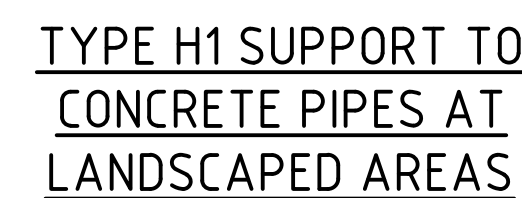
Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

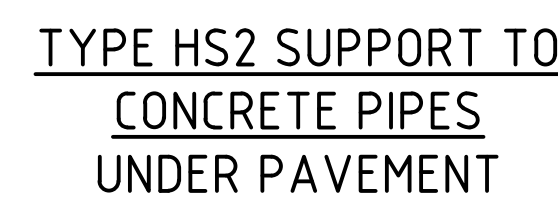
DRAWING TITLE
STORMWATER DRAINAGE PLAN
SHEET 2

DRAWING No C011994.06-DA42

ISSUE
F



PIPE LAYING DETAILS



D ≤ 1350, MAX FILL = 4.0m
D > 1350, MAX FILL = 3.0m

SIDE ZONE WIDTH	
PIPE SIZE	t (mm)
$\leq 900\phi$	150
1050 ϕ	175
1200 ϕ	200
1350 ϕ	225
1500 ϕ	250
1650 ϕ	275
1800 ϕ	300

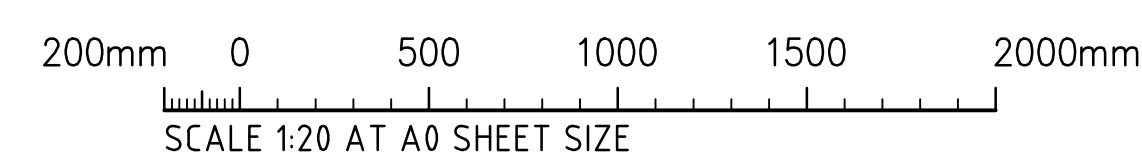
REFER TO ENGINEER FOR TRENCH
WIDTHS FOR PIPE SIZES GREATER
THAN 1800Ø



(ADOPT IN CONCRETE PAVEMENT FOR SGGP's & SJP's,
WHERE PITS ARE LOCATED IN THE CORNER OF SLAB
PANELS OR ADJACENT TO SLAB PANEL JOINTS)

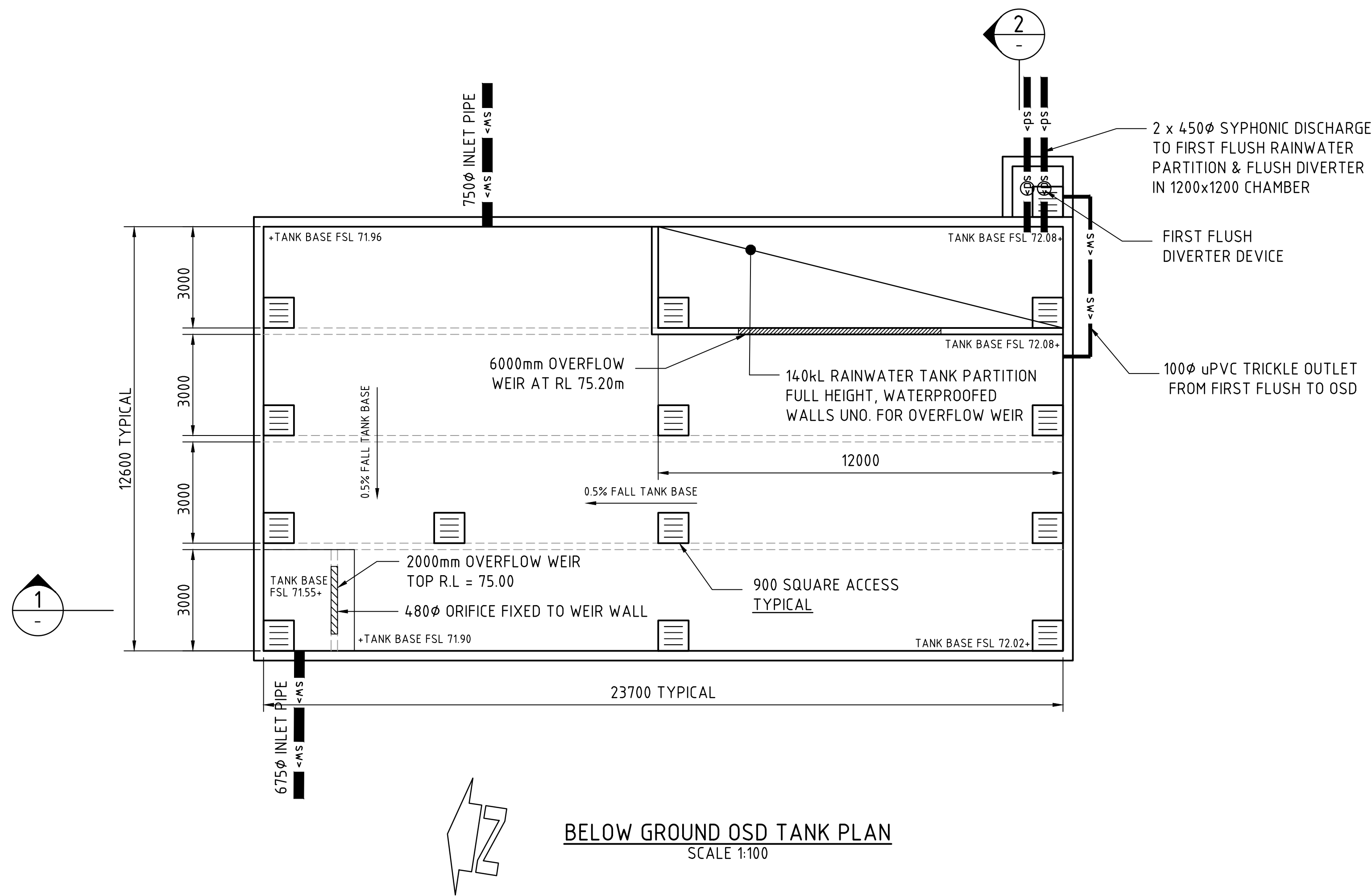


(ADOPT IN CONCRETE PAVEMENTS FOR SGGP's & SJP's, WHERE JOINTS ARE NOT LOCATED WITHIN PROXIMITY OF THE GRATE)



FOR DEVELOPMENT APPLICATION

ISSUED FOR DEVELOPMENT APPLICATION 16.09.19 C ISSUED FOR DEVELOPMENT APPLICATION 13.09.19 B ISSUED FOR INFORMATION 04.09.19 A AMENDMENTS DATE ISSUE AMENDMENTS DATE ISSUE										ARCHITECT MICHAEL CARR ARCHITECT 88 TOPE STREET SOUTH MELBOURNE VIC 3205 PH: (03) 9645 5635 CLIENT 										PROJECT BUNNINGS WAREHOUSE LOT 3, BRINGELLY ROAD SOUTH MELBOURNE, VIC 3205 DESIGNED DRAWN DATE CHECKED DATE SIZE SCALE CAD FILE										COSTIN ROE CONSULTING PTY LTD. Consulting Engineers Level 1, 8 Windmill Street Wahla Bay, Sydney NSW 2000 Tel: (02) 9251-7999 Fax: (02) 9241-3721 Email: mail@costinroe.com.au 										DRAWING TITLE STORMWATER DRAINAGE DETAILS SHEET 1 DRAWING NO C011994-06-DA45 ISSUE									
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OSD TANK DETAILS

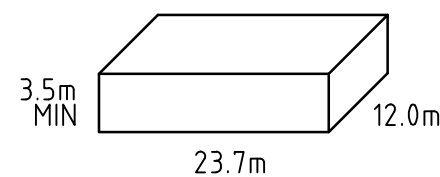
SITE AREA
TOTAL SITE AREA 40 970m²

TOTAL SITE AREA DRAINING TO STORAGE (90% IMPERVIOUS) 39 000m²

STORAGE

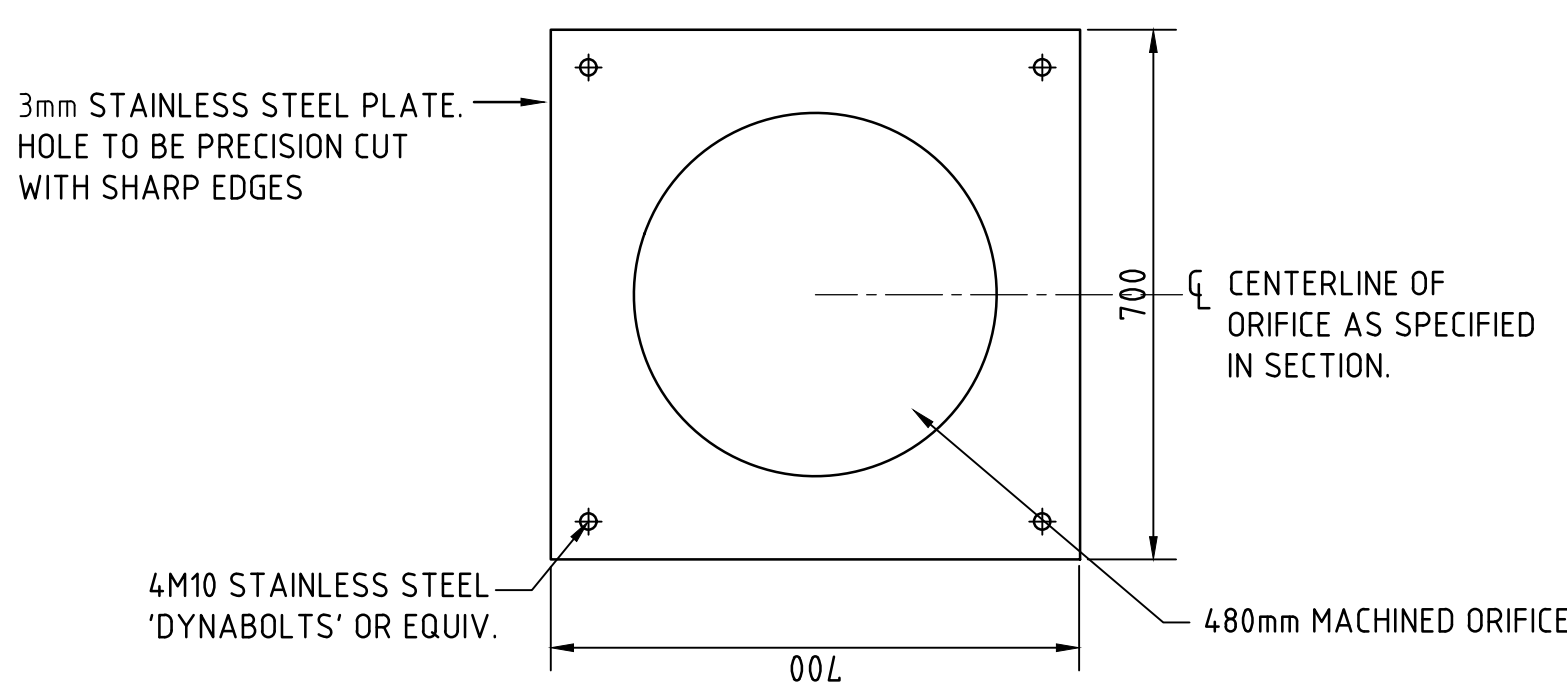
ORIFICE Ø 480mm
VOLUME PROVIDED 856m³

INTERNAL TANK DIMENSIONS (INC. HIGH FLOW CHAMBERS)



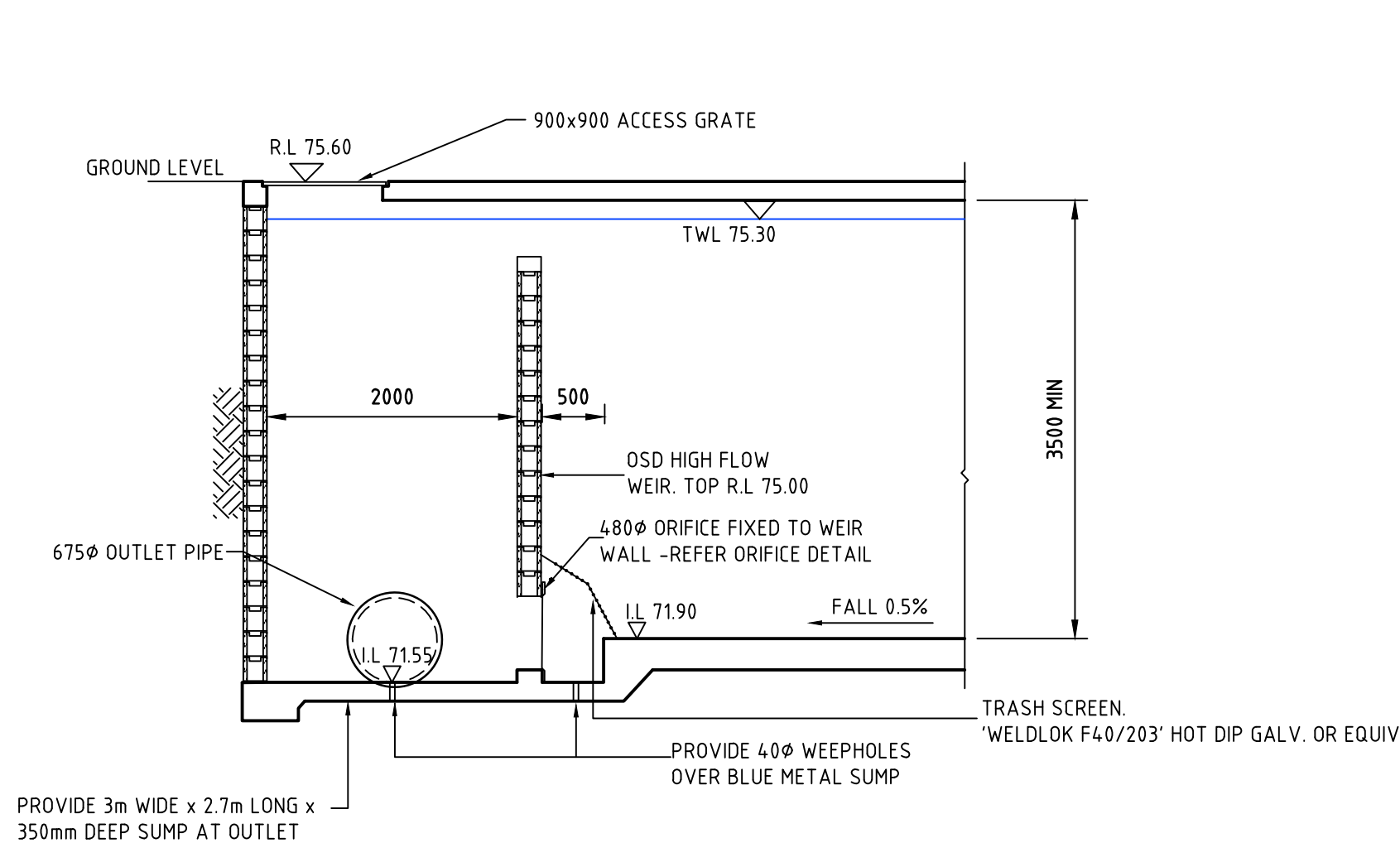
OSD HYDRAULIC DETAILS

STORM A.R.I. EVENT	STORM DURATION	PRE-DEVELOPMENT FLOW (m3/s)	POST-DEVELOPMENT FLOW (UN-ATTENUATED) (m3/s)	POST-DEVELOPMENT FLOW (ATTENUATED) (m3/s)	OSD TANK WATER DEPTH (mm)	OSD TANK STORAGE VOLUME (m3)
5 YEAR	1 HOUR	0.849	1.09	0.699	1950	470
20 YEAR	2 HOURS	1.39	1.57	0.827	2830	680
100 YEAR	2 HOURS	1.81	2.10	1.49	3400	820



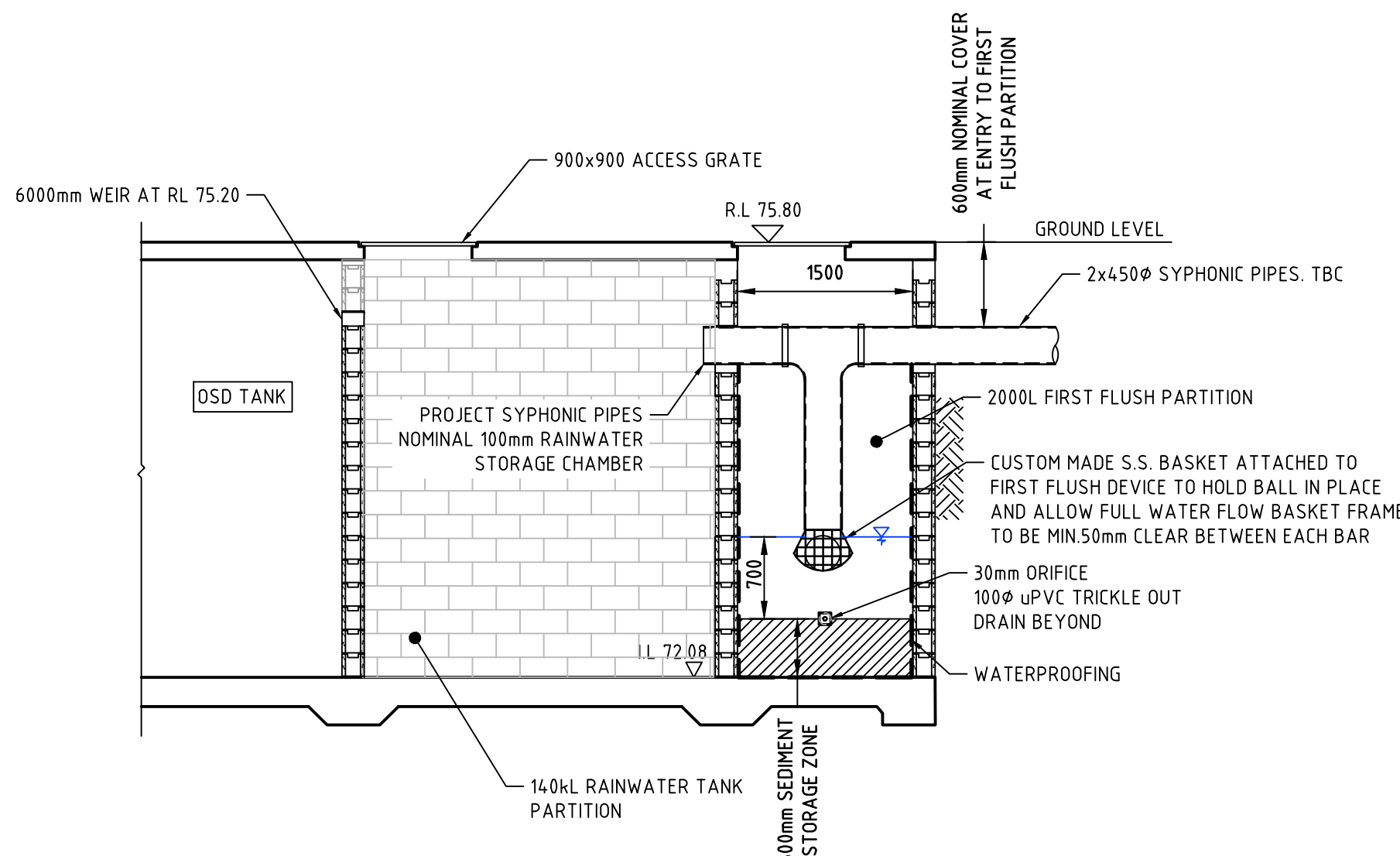
ORIFICE PLATE DETAIL

1:10



SECTION 1:50

1



SECTION 2:150

2

NOTE:

STRUCTURAL DESIGN OF TANK BY STRUCTURAL ENGINEER IN DETAIL DESIGN STAGE.

100mm 0 200 400 600 800 1000mm
SCALE 1:10 AT A0 SHEET SIZE

500mm 0 1 2 3 4 5m
SCALE 1:50 AT A0 SHEET SIZE

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT A0 SHEET SIZE

FOR DEVELOPMENT APPLICATION

			ARCHITECT			CLIENT			PROJECT						Costin Roe Consulting Pty Ltd. Consulting Engineers ACN 882 068 448			Costin Roe Consulting			DRAWING TITLE					
									BUNNINGS WAREHOUSE						STORMWATER DRAINAGE DETAILS											
									LOT 3, BRINGELLY ROAD						SHEET 2											
									HORNINGSEA PARK, NSW																	
																										
ISSUED FOR DEVELOPMENT APPLICATION			16.09.19			C																				
ISSUED FOR DEVELOPMENT APPLICATION			19.09.19			B																				
ISSUED FOR INFORMATION			04.09.19			A																				
AMENDMENTS			DATE			ISSUE			AMENDMENTS			DATE			ISSUE			AMENDMENTS			DATE			ISSUE		

LEGEND:
LEVELS DATUM IS AHD.

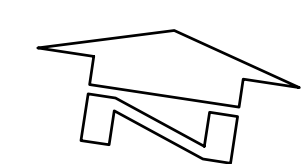
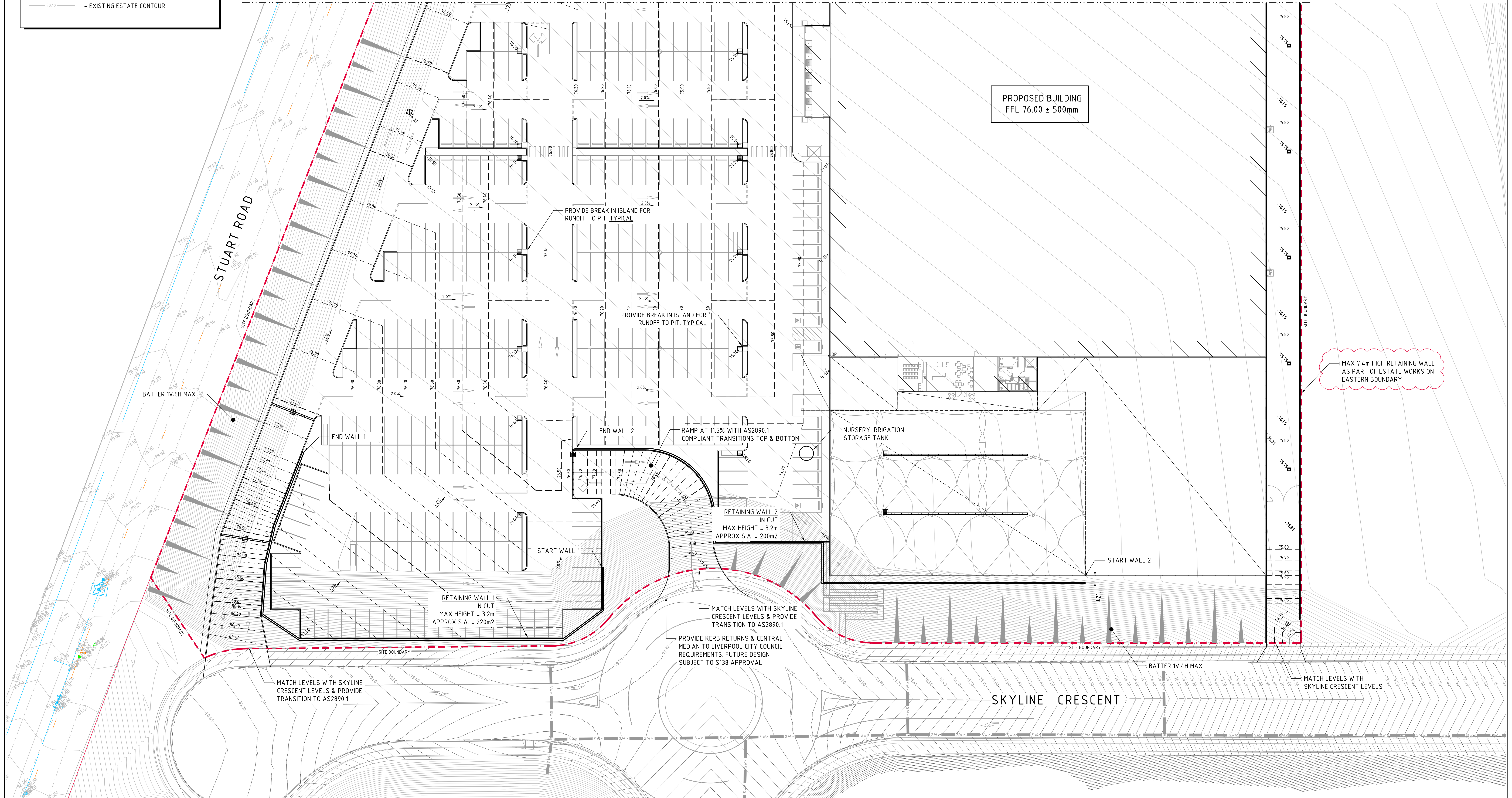
EXISTING SITE LEVELS AND DETAILS BASED ON A PLAN OF SURVEY SY073409.001 BY LAND PARTNERS SURVEYORS 14/11/17 AND COSTIN ROE CONSULTING ESTATE DESIGN LEVELS.

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- EXISTING ESTATE CONTOUR

FINISHED LEVEL NOTES:
REFER TO DRAWING C013730.00-DA10 FOR FINISHED LEVEL NOTES

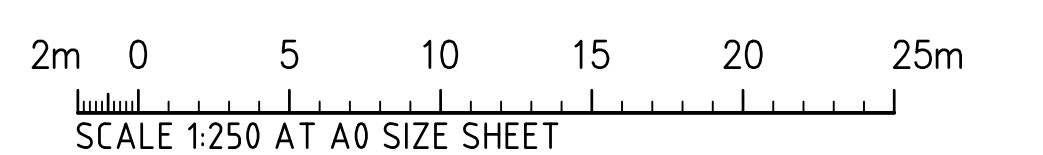
LEVELS NOTE:
LEVELS SHOWN TO BE +/-500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.

FOR CONTINUATION REFER DRAWING DA52 (SHEET 2)



FINISHED LEVELS PLAN - SHEET 1
SCALE 1:250

FOR DEVELOPMENT APPLICATION



REVISED AS CLOUDED	30.10.19	E
ISSUED FOR DEVELOPMENT APPLICATION	16.09.19	D
ISSUED FOR DEVELOPMENT APPLICATION	15.09.19	C
ISSUED FOR INFORMATION	04.09.19	B
ISSUED FOR INFORMATION	23.08.19	A
AMENDMENTS	DATE	ISSUE

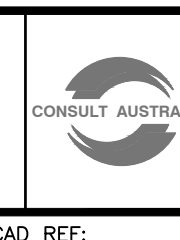
AMENDMENTS	DATE	ISSUE	AMENDMENTS	DATE	ISSUE
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ARCHITECT
MICHAEL CARR ARCHITECT
88 TOPE STREET
SOUTH MELBOURNE VIC 3205
PH: (03) 9645 5635



CLIENT

PROJECT
BUNNINGS WAREHOUSE
LOT 3, BRINGELLY ROAD
HORNINGSSEA PARK, NSW



Costin Roe Consulting Pty Ltd.
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email: mail@costinroe.com.au ©

Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE
**FINISHED LEVELS PLAN
SHEET 1**

DRAWING No **C011994.06-DA51**

ISSUE
E

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON A PLAN OF SURVEY SY0734/09.001 BY LAND PARTNERS SURVEYORS 14/11/17 AND COSTIN ROE CONSULTING ESTATE DESIGN LEVELS.

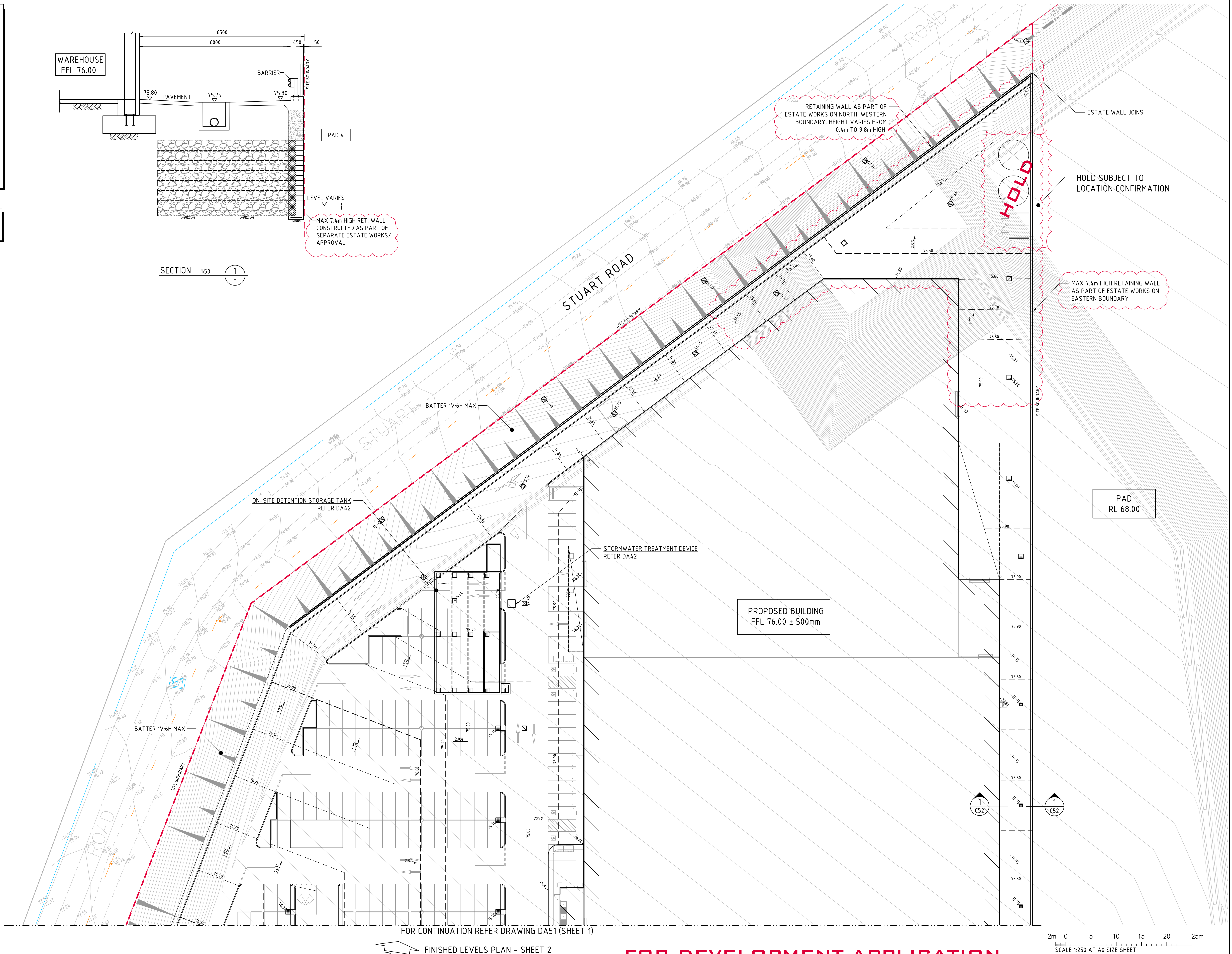
- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- EXISTING ESTATE CONTOUR

FINISHED LEVEL NOTES:

REFER TO DRAWING C013730.00-DA10 FOR FINISHED LEVEL NOTES

LEVELS NOTE:

LEVELS SHOWN TO BE +/-500mm FROM THOSE SHOWN. FINAL LEVELS SUBJECT TO FINAL GEOTECHNICAL INVESTIGATIONS, ARCHITECTURAL LAYOUT AND ACHIEVING A CUT TO FILL EARTHWORKS BALANCE OVER THE PROPERTY.



FOR CONTINUATION REFER DRAWING DA51 (SHEET 1)

FINISHED LEVELS PLAN - SHEET 2
SCALE 1:250

FOR DEVELOPMENT APPLICATION

2m 0 5 10 15 20 25m
SCALE 1:250 AT A0 SIZE SHEET

REVISED AS CLOUDED	30.10.19	F
ISSUED FOR DEVELOPMENT APPLICATION	16.09.19	E
REVISED AS CLOUDED	13.09.19	D
ISSUED FOR DEVELOPMENT APPLICATION	13.09.19	C
ISSUED FOR INFORMATION	04.09.19	B
ISSUED FOR INFORMATION	23.08.19	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE	AMENDMENTS	DATE	ISSUE
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ARCHITECT
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88 TOPE STREET
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PH: (03) 9645 5635

CLIENT
BUNNINGS
warehouse

PROJECT
BUNNINGS WAREHOUSE
LOT 3, BRINGELLY ROAD
HORNINGSEA PARK, NSW

CONSULTING AUSTRALIA

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Consulting Engineers
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Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE
FINISHED LEVELS PLAN
SHEET 2

DRAWING No C011994.06-DA52

ISSUE
F



SITE CONTEXT PLAN
1:2000@A0

16.09.2019	P1	ISSUED FOR DEVELOPMENT APPLICATION	CY
DATE	REV	AMENDMENT	BY

CONTRACTOR TO CHECK ALL DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK OR PREPARING ANY SHOP DRAWINGS

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Email admin@mcararchitect.com.au

CLIENT:
BUNNINGS
warehouse

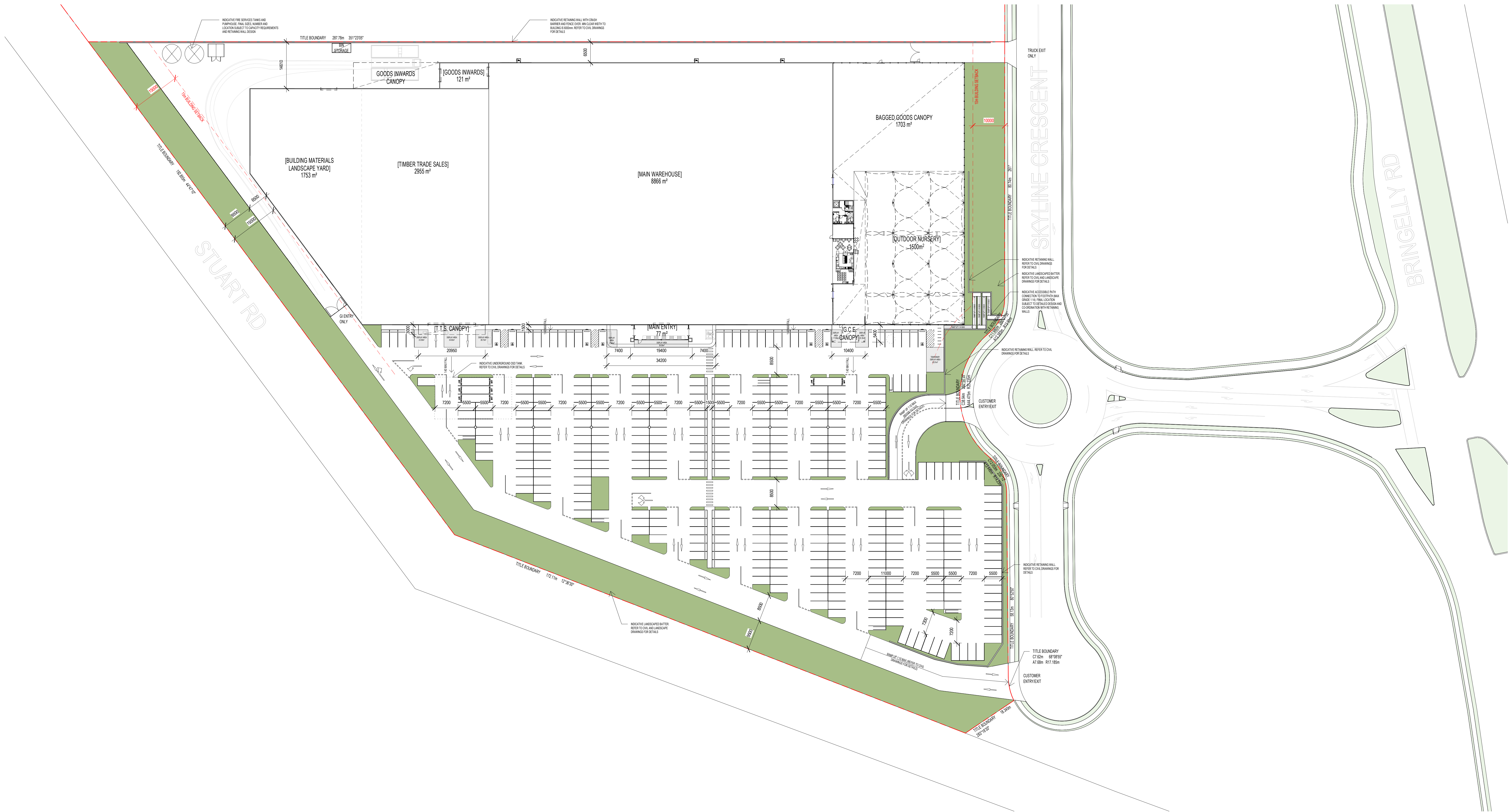
PROJECT:
**BUNNINGS WAREHOUSE
LOT 3 (BRINGELLY ROAD
BUSINESS HUB), SKYLINE DRIVE
HORNINGSEA PARK NSW 2171**

ARCHITECTURAL
DRAWING TITLE:
SITE CONTEXT PLAN

SCALE: 1:2000@A0
DATE: JUNE 2019
FILE:
DESIGNED: -
DRAWN: CY
CHECKED: AZ

PROJECT No:
18139
VERIFICATION:
THIS DRAWING HAS BEEN REVIEWED &
VERIFIED BY:
DRAWING No:
TP-00

REVISION:
P1



SITE PLAN
1:500@A0

AREA SCHEDULE	
MAIN WAREHOUSE	8,866m ²
GOODS INWARDS	121m ²
AMENITIES	165m ²
MAIN ENTRY	77m ²
TOTAL WAREHOUSE AREA	9,233m ²
OUTDOOR NURSERY	1,500m ²
BAGGED GOODS CANOPY	1,703m ²
TOTAL NURSERY AREA	3,203m ²
TIMBER TRADE SALES	2,955m ²
BMLY	1,753m ²
TOTAL TIMBER TRADE AREA	4,708m ²
TOTAL RETAIL AREA	17,144m ²
GFA	17,258m ²
TOTAL LAND AREA	49,888m ²
SITE COVERAGE AREA	17,596m ²
SITE COVERAGE %	42.95%

CARPARK SCHEDULE	
STANDARD CARPARKS (INCL. STAFF)	362
DISABLED CARPARKS	7
TRAILER BAYS	4
TOTAL SITE CARPARKS	373
TROLLEY BAYS	6
BICYCLE PARKS	12

19.07.2019	P4	UPDATED ROAD DETAILS AND BIKE PARKING ADDED	CY
16.07.2019	P3	TITLE BOUNDARY ADJUSTED, REVISED TO TRAFFIC AND RACKPLAN	CY
02.07.2019	P2	GENERAL AMENDMENTS	CY
28.06.2019	P1	PRELIMINARY ISSUE	CY
DATE	REV	AMENDMENT	BY

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ARCHITECT:
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Email admin@mcaarchitect.com.au



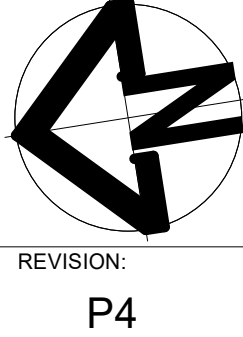
CLIENT:
BUNNINGS WAREHOUSE
LOT 3 (BRINGELLY ROAD BUSINESS HUB), SKYLINE DRIVE
HORNINGSEA PARK NSW 2171

ARCHITECTURAL

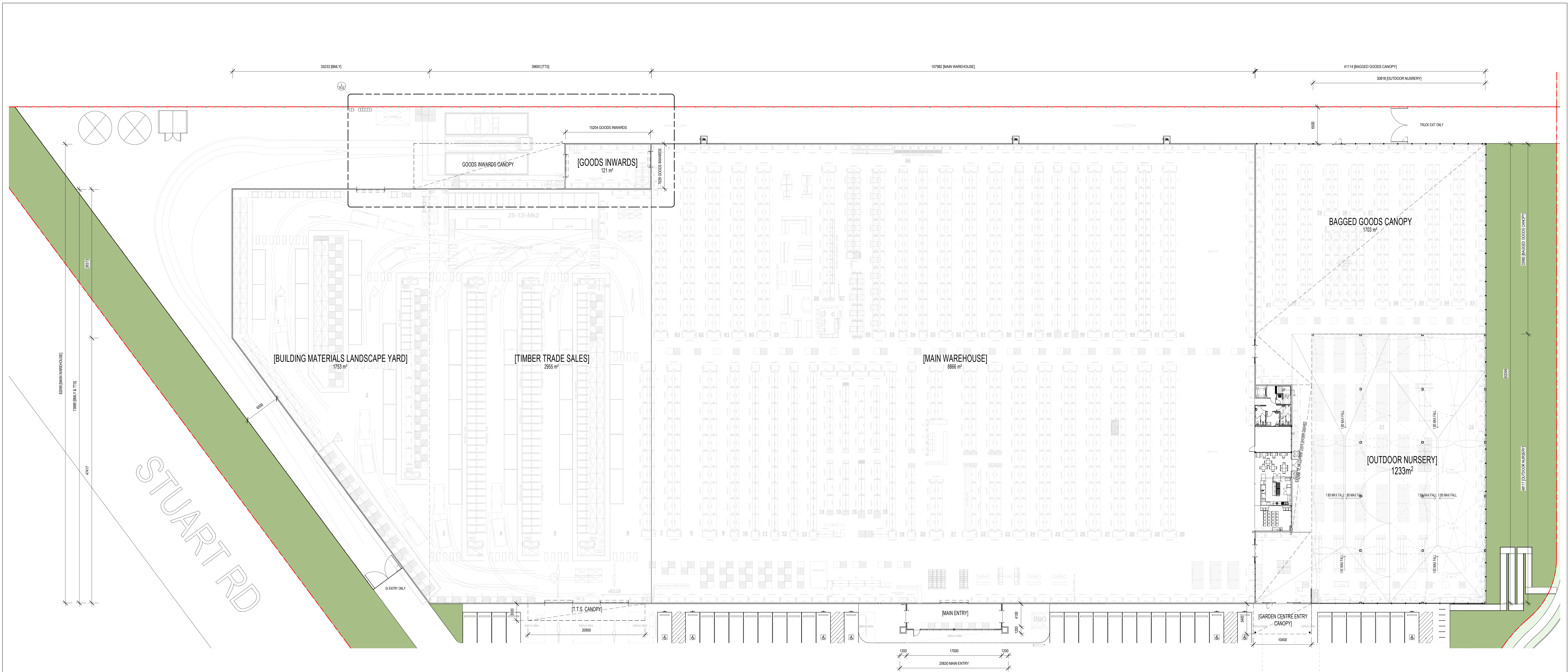
DRAWING TITLE:
SITE PLAN

SCALE: As indicated@ A0
DATE: JUNE 2019
FILE:
DESIGNED: -
DRAWN: CY
CHECKED: AZ

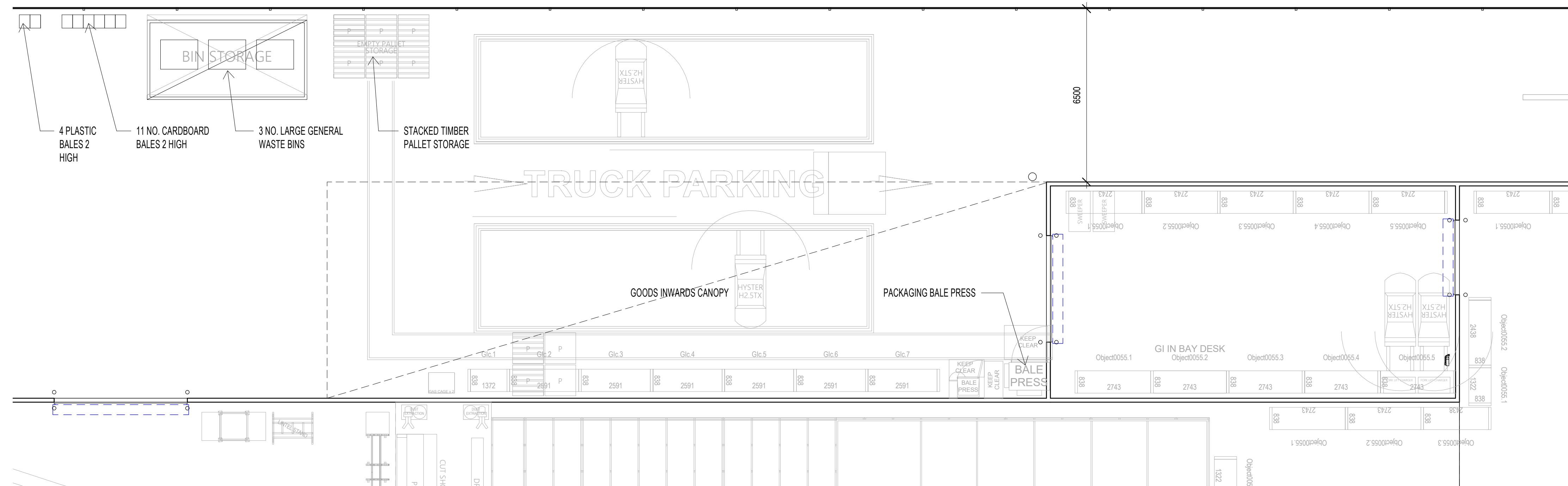
PROJECT No:
18139
VERIFICATION: THIS DRAWING HAS BEEN REVIEWED & VERIFIED BY:
DRAWING No:
TP-01



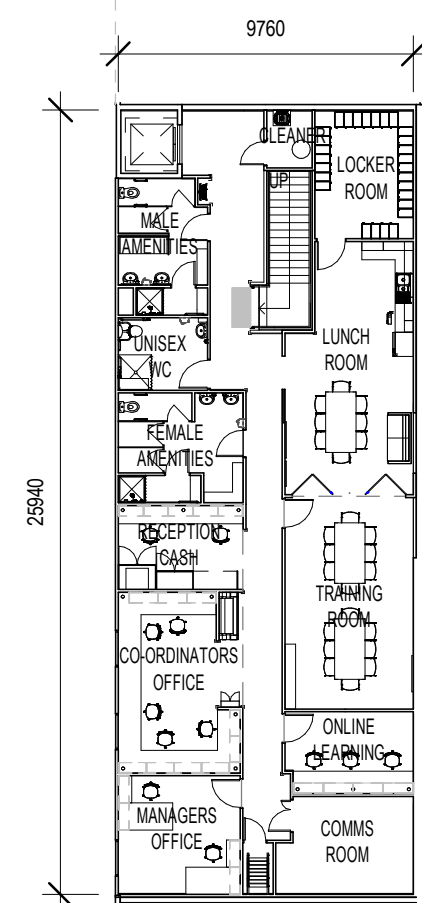
REVISION:
P4



OVERALL FLOOR PLAN
1:250@ A0



WASTE MANAGEMENT PLAN
1:100@ A0



MEZZANINE LEVEL
1:250@ A0

16.09.2019	P4	ISSUED FOR DEVELOPMENT APPLICATION	CY
19.07.2019	P3	UPDATED ROAD DETAILS AND BIKE PARKING ADDED	CY
16.07.2019	P2	REVISED TO VARIOUS PLAN	CY
02.07.2019	P1	PRELIMINARY ISSUE	CY
DATE	REV	AMENDMENT	BY

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DIMENSIONS ON SITE BEFORE
COMMENCING ANY WORK OR
PREPARING ANY SHOP
DRAWINGS

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PRELIMINARY

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Email admin@mcararchitect.com.au

CLIENT:
**BUNNINGS
warehouse**

PROJECT:
**BUNNINGS WAREHOUSE
LOT 3 (BRINGELLY ROAD
BUSINESS HUB), SKYLINE DRIVE
HORNINGSEA PARK NSW 2171**

ARCHITECTURAL

DRAWING TITLE:
OVERALL FLOOR PLAN

SCALE: As indicated@ A0
DATE: JUNE 2019
FILE:
DESIGNED:
DRAWN: CY
CHECKED: AZ

PROJECT No:
18139
VERIFICATION: THIS DRAWING HAS BEEN REVIEWED &
VERIFIED BY:
DRAWING No:
TP-02

REVISION:
P4



18.09.2019	P3	ISSUED FOR DEVELOPMENT APPLICATION	CY
18.07.2019	P2	REVISED TO RACKPLAN	CY
02.07.2019	P1	PRELIMINARY ISSUE	CY
DATE	REV	AMENDMENT	BY

UNLESS OTHERWISE AGREED
THIS DRAWING AND THE
INTELLECTUAL PROPERTY
CONTAINED HERE ON
REMAINS THE PROPERTY :-

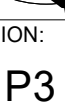
88 Tope Street, South Melbourne 3206
Ph 03 9645 5635 Fax 03 9686 4064
Email admin@mcarchitect.com.au

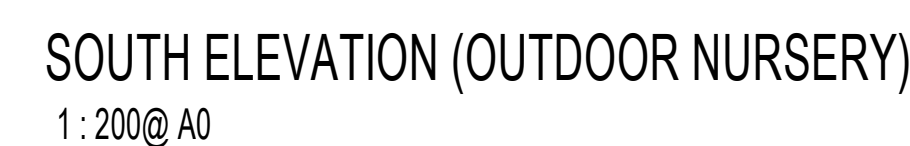


DRAWING TITLE:
ROOF PLAN

CHECKED:

TR 03





WALL SCHEDULE

CONTRACTOR TO CHECK ALL
DIMENSIONS ON SITE BEFORE
COMMENCING ANY WORK OR
PREPARING ANY SHOP
DRAWINGS

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CONTAINED HERE ON
REMAINS THE PROPERTY :-



SCALE: 1 : 200 @ A0	PROJECT No.	
DATE: JUNE 2019	18139	
FILE:	VERIFICATION: THIS DRAWING HAS BEEN REVIEWED & VERIFIED BY:	
DESIGNED:		
DRAWN: CY	DRAWING No.	REVISION:
CHECKED: AZ	TP-04	P3

Attachment C
nearmap imagery (Oct. 2019)

Date: Thu, 24 Oct 2019

Notes:



Attachment D
Impact Assessment Tables

BDAR Waiver Requirements (DPIE 2019) - Table 1

Information Requirement Heading	Information Requirement List	Proponent's Response
Admin	- Proponent name and contact details. - Project ID (Information to identify which SSD or SSI project the request relates to and where the project is up to in the assessment process). - Name and ecological qualifications of person completing Table 2.	Bunnings Group Limited, Philip Drew (Development Approvals Manager), 02 9846 7334 or 0413 098 609. Project ID = SSD 6324 Stage 2 DA for Bunnings Warehouse, Lot 3 Bringelly Rd Business Hub, Skyline Crescent, Horningsea Park, NSW 2171. Isaac Mamott, Director/Principal Botanist, Sclerophyll Flora Surveys and Research Pty Ltd. BAM Accredited Assessor (BAAS 18008). Isaac's CV is provided as Attachment E.
Site details	- Street address, Lot and DP, local government area. - Description of existing development site, ie, the area of land that is subject to the proposed development application. - Location map showing the development site in the context of surrounding areas and landscape features. Satellite image of site in context of adjoining sites.	Bunnings Warehouse, Lot 3 Bringelly Rd Business Hub, Skyline Crescent, Horningsea Park, NSW 2171. Liverpool City Council LGA. Total proposed retail area for Lot 3 = 17,144m² Total area of Lot 3 = 40,000 m² A site location map is provided as Attachment B.
Proposed development	- Project Description providing enough information to enable an understanding of the nature and scale of the proposed development and any associated activities (including construction etc). - Proposed Site Plan.	The Lot 3 Bringelly Rd Business Hub proposal is understood by Sclerophyll to comprise the construction and operation of a new Bunnings warehouse facility which includes the following main features; - Main warehouse (8866m²); - Outdoor nursery (3203m²); - Timber trade sales area (2955m²); - Building materials landscape yard (1753m²); - Internal roadways and car parking for staff and customers; - Signage; and

Information Requirement Heading	Information Requirement List	Proponent's Response
		Site landscaping. Proposed Site plans are provided as Attachment B.
Impacts on biodiversity values	- Complete TABLE 2 below on Biodiversity Values. - For each biodiversity value, the proponent must either: i. explain why the value is not relevant to the proposed development; or ii. where a biodiversity value may be relevant, provide an explanation of how impacts have been avoided and identify the likelihood and extent of any remaining impacts of the proposed development, including impacts prescribed under clause 6.1 of the BC Regulation. - A biodiversity value is not relevant to a proposed development if the value is not present on the development site AND there is no potential for direct or indirect impacts on the biodiversity value if it occurs off-site. - Where one or more biodiversity values may be relevant to the proposed development, TABLE 2 is to be completed by a suitably qualified person with tertiary qualifications in natural sciences including subjects that relate to the observation and description of terrestrial biodiversity and landforms, and at least three years of work experience in environmental assessment including field identification of plant and animal species and habitats The person does not need to be an accredited person under the BC Act. - Attach any additional information required where biodiversity	Refer Table 2 completed below.

Information Requirement Heading	Information Requirement List	Proponent's Response
	values are relevant to the site. E.g. Vegetation Map (indicating plant community types), Ecology Reports, Water Quality data, BioNet Atlas, Directory of Important Wetlands (DIWA), migratory bird flyway information.	

BDAR Waiver Information Requirements - Table 2 (DPIE 2019)

Biodiversity Value	Meaning	Relevant (✓ or NA)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate	Proponent's Response
Vegetation abundance - 1.4(b) BC Regulation	Occurrence and abundance of vegetation at a particular site	✓	Where vegetation is present on the development site, provide a map on digital aerial photography or the best available imagery of the development site showing: - native vegetation (including grasslands and other non-woody vegetation types) and non-native vegetation, and - the area of land that is directly impacted by the proposed development, including related infrastructure such as roads, pipelines, access tracks, temporary material stockpiles, asset protection zones and powerlines, if applicable. Describe how the proposed development avoids impacts on native vegetation and identify the likelihood and extent of any remaining impacts including removal of isolated or cultivated native plants.	Based on nearmap imagery of Lot 3 Bringelly Rd (October 2019) provided to Sclerophyll by Bunnings Group Limited, the subject site (Lot 3) appears to be completely devoid of native vegetation and potential Threatened species habitat. It is understood that native vegetation previously present on Lot 3 was cleared as part of Stage 1 early subdivision works and was subject to biodiversity offsetting in association with the Western Sydney Parklands Trust (as per the Bringelly Rd Business Hub subdivision approval). As such, there is no remaining native vegetation or Threatened species habitat on Lot 3 as part of the Stage 2 Bunnings Warehouse DA. The October 2019 nearmap imagery of Lot 3 and the greater Bringelly Rd Business Hub site is provided as Attachment C.
Vegetation integrity 1.5(2)(a) BC Act	Degree to which the composition, structure and function of	✓	Describe the vegetation integrity and any impacts on vegetation integrity of identified plant communities.	Refer Proponent's response for 1.4(b) above.

Biodiversity Value	Meaning	Relevant (✓ or NA)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate	Proponent's Response
	vegetation at a particular site and the surrounding landscape has been altered from a near natural state.			
Habitat suitability 1.5(2)(b) BC Act	Degree to which the habitat needs of threatened species are present at a particular site	✓	Identify any threatened species or ecological communities or their habitat on the development site. Describe how the proposed development avoids impacts on habitat suitability and identify the likelihood and extent of any remaining impacts including the impacts of development on the following habitat of threatened species or ecological communities: (i) karst, caves, crevices, cliffs and other geological features of significance (ii) rocks (iii) human made structures (iv) non-native vegetation Impacts may include the removal or	Refer Proponent's response for 1.4(b) above. Lot 3 does not presently support any Threatened species habitat and thus the proposed DA will not impact upon any Threatened species habitats nor any native ecological communities.

Biodiversity Value	Meaning	Relevant (✓ or NA)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate	Proponent's Response
			modification (eg. noise, light etc) of the habitat of threatened species or ecological communities.	
Threatened species abundance 1.4(a) BC Regulation	Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site	✓	Describe how the proposed development avoids impacts on threatened species abundance and identify the likelihood and extent of any remaining impacts, including: - impacts of vehicle strikes on threatened species; - impacts on microbats as a result of demolition of human made structures; - impacts on Threatened species habitat associated with non native vegetation; - impacts on Threatened species habitat associated with non natural waterbodies (eg. Green and Golden Bell Frog in brickpits and drains).	Refer Proponent's response to 1.5(2)(b) above for a discussion on Threatened species occurrence and abundance on Lot 3.
Habitat connectivity 1.4(c) BC Regulation	Degree to which a particular site connects different areas of	✓	Identify whether the development site contributes to habitat connectivity. Describe how the proposed development avoids impacts on habitat connectivity and	Lot 3 is presently completely devoid of native vegetation and Threatened species habitat and thus the proposed development would not be expected to adversely impact upon habitat connectivity of local flora and fauna species and plant communities.

Biodiversity Value	Meaning	Relevant (✓ or NA)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate	Proponent's Response
	habitat of threatened species to facilitate the movement of those species across their range		identify the likelihood and extent of any remaining impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range (prescribed under clause 6.1(1)(b) of the BC Regulation).	
Threatened species movement 1.4(d) BC Regulation	Degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle	✓	Describe how the proposed development avoids impacts on threatened species movement and identify the likelihood and extent of any remaining impacts of development on movement of threatened species that maintains their lifecycle (prescribed under clause 6.1(1)(c) BC Regulation).	The proposed development avoids impacts on Threatened species movement given the absence of any Threatened species habitat present on the subject site.
Flight path integrity 1.4(e) BC Regulation	Degree to which the flight paths of protected animals over a particular site are free from interference	✓	Identify whether flight paths of protected animals occur over the development site. Protected animals are animals of a species listed or referred to in Schedule 5 of the BC Act. They include any species of birds, mammals, amphibians or reptiles that are native to Australia or that periodically or occasionally migrate to Australia. Describe how the proposed development avoids impacts on flight	The proposed Bunnings Warehouse facility would not be expected to impact significantly upon the flight path integrity of western Sydney resident/transitory/migratory bird and bat populations given the nature of the proposed facility, its location within an urbanised environment and the absence of any intact fauna habitats on Lot 3.

Biodiversity Value	Meaning	Relevant (✓ or NA)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate	Proponent's Response
			path integrity and identify the likelihood and extent of any remaining impacts.	
Water sustainability 1.4(f) BC Regulation	Degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site.	✓	Describe how the proposed development avoids impacts on water sustainability and identify the likelihood and extent of any remaining impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining or other development) (prescribed under clause 6.1(1)(d) of the BC Regulation).	The subject site is presently devoid of any natural water bodies (eg. creeklines, rivers, wetlands) and thus the proposed development will not impact upon any naturally occurring aquatic habitats. The urbanisation of the Horningsea Park locality and surrounding residential suburbs has also likely led to a marked reduction in water quality of local watercourses (eg. Cabramatta Creek, Kemps Creek) and habitat for Threatened species through siltation, increased nutrient loads and weed invasion. Stormwater management measures detailed as part of the Bringelly Rd Business Hub approved subdivision and Stage 2 Bunnings DA would be expected to minimise any further degradation of offsite local water bodies and associated Threatened species habitat.

Attachment E

Isaac Mamott CV (Sclerophyll Flora)

CURRICULUM VITAE FOR ISAAC MAMOTT

TERTIARY QUALIFICATIONS

Bachelor of Science (Botany/Zoology) – York University – Toronto, Canada (1984-1988)

Bachelor of Arts (Economics) – York University (1988-1990)

LICENCES, ACCREDITATIONS AND CERTIFICATIONS

OEH Scientific Investigation Licence (Licence No. SL101408)

BAM Accredited Assessor (BAAS18008)

Certified Practicing Ecological Consultant (CPEC No. 7; NSW ECA)

AREAS OF EXPERTISE:

Isaac has been a Consultant Botanist and Restoration Ecologist in NSW for the last 18 years, having gained specialist expertise in:

- Baseline flora and targeted Threatened flora species surveys;
- Vegetation (PCT) mapping and classification;
- GIS Mapping (ESRI arcmap v10.6);
- Statistical analysis (PRIMER v6, some R packages) to validate ecological survey results;
- Survey, impact assessment and mitigation reporting (flora and fauna);
- BAM Assessments (BDARs/BSSARs);
- Vegetation Management/Restoration Plans;
- Expert Ecologist for Land and Environment Court proceedings;
- Flora Monitoring Programs (including survey design and reporting);
- Technical Peer Review.

SELECTED PROJECT EXPERIENCE:

NSW North Coast

- Commissioned as an Expert Ecologist in Land and Environment Court Proceedings by DPIE and NSW Crown Solicitors Office in relation to biodiversity offsetting disputes associated with a large residential rezoning proposal at Cobaki Lakes, NSW (west Tweed Heads). Commission involved desktop review, field surveys, preparation of expert reports, attendance at hearings. DPIE achieved a favourable outcome as part of the court proceedings.
- Vegetation survey of former Arakwal lands at Cape Byron, NSW. Survey recorded several types of Littoral Rainforest (on medisedimentary clays) and Threatened *Cryptocarya foetida* and *Syzygium moorei*. Plot data was entered into the BAM calculator to determine offset requirements (prepared for pitt&sherry on behalf of private client, January 2018).
- Currently undertaking long term vegetation and fauna monitoring and restoration works associated with 3 major landholdings in Forster, NSW, in relation to land and environment court prosecutions. The project involves annual monitoring surveys of swamp sclerophyll EECs, *Asperula asthenes* populations and Squirrel Glider populations and the preparation of annual monitoring reports, for Bombala Investments and OEH Newcastle (August 2015-present).
- Undertook targeted surveys and mapping for the Critically Endangered terrestrial orchid,

Genoplesium littorale (syn. *Corunastylis littoralis*) over a 2 year period (2012, 2013) across the Holocene dunefields at North Tuncurry, Booti Booti National Park and across the Nabiac (Pleistocene) Sandbeds at Minimbah, NSW, as part of one of the State's largest proposed rezonings for UrbanGrowth NSW. Isaac also co-ordinated a pollination study for the species.

- Undertook 73 full floristic botanical plots in the Port Stephens LGA and prepared updated vegetation mapping to assist Australia Koala Foundation in updating Koala habitat planning maps for the Anna Bay section of the LGA. Preparation of vegetation and Koala habitat map report for Port Stephens Council, March, 2011. Dunal, floodplain, conglomerate, bedrock and estuarine vegetation communities were represented in the flora survey and mapping project.
- Biobank surveys, mapping and Credit Calculator assessments were undertaken on thirteen **(13) major Midcoast Water forested landholdings** in the Great Lakes and Greater Taree LGAs between 2010 and 2013. Biobank survey and vegetation mapping results were used to prepare Vegetation Management/Revegetation Plans for all 12 large landholdings, detailing native vegetation and noxious weed mapping and control methods, Threatened flora species and EEC management, site access management, grazing management and large scale revegetation of disturbed areas through seed collection, tubestock and virocell propagation, planting design, outplanting, maintenance, monitoring and completion criteria. Project funding issues precluded our Superintendency of the implementation of the Plans.
- API, flora survey, mapping and assessment of a proposed 40 km transmission line easement from **Koolkhan to Maclean** (north of Grafton) through coastal lowland and coastal foothill dry and wet sclerophyll forest communities (+600 hectares of bushland in study area). Threatened species recorded and addressed included the Threatened *Melaleuca irbyana* and *Centranthera conchinchinensis*. A total of 4 Coastal Floodplain EECs were recorded and mapped. Report prepared as part of a Flora and fauna Study for Country Energy (June 2008).
- Survey and mapping of the **endangered forb, *Lindernia alsinoides***, on the site proposed for a major, new wastewater treatment plant at Pacific Palms, NSW. Results of the survey and mapping project were used to prepare a **salvage and translocation plan** for the Threatened species with project management of its implementation also taking place. Several reports prepared for Midcoast Water, June 2008.

Hunter/Northern Tablelands

- BBAM assessment and preparation of a BAR for a new major public hospital (SSI) at Metford in the lower Hunter Valley. BAM assessment recorded Lower Hunter Spotted Gum Ironbark Forest EEC (prepared for pitt&sherry on behalf of Health Infrastructure NSW, February 2018).
- Preparation of a **Mine Rehabilitation Plan** for Daracon's hard rock quarry at Ardglenn, NSW in the Upper Hunter LGA as well as for 3 greenfield 'offset' sites adjoining the quarry. The Rehabilitation/Revegetation Plan included detailed methods for the restoration of natural grasslands and box-gum woodlands on the offset sites as well as costings and performance and completion criteria, assessment and reporting. Report prepared for Daracon Quarries and Insite Planning, September 2010.
- Vegetation survey and mapping of a partially forested **1000 hectare rural property 'Glen Almond'** on the Northern Tablelands, east of Nundle and preparation of detailed Revegetation Management Plan to reforest substantial areas of steep, former grazing lands. Rehabilitation options included seed collection and tubestock propagation, aerial hydroseeding, aerial direct seeding and pasture burns. Report prepared for Midcoast Water (2012);
- Vegetation survey and mapping of **RAAF Base Williamstown** including surrounding buffer zones, as part of a fire management study. Report prepared for Department of Defence October

2005. Large areas of coastal dune forests, wet heathlands, swamp woodlands were surveyed and mapped. Threatened taxa recorded included large remnants of *Eucalyptus parramattensis* subsp. *decadens* and *Rulingia prostrata*. Also included a supplementary report on appropriate fire regimes for each of the vegetation types recorded.

Sydney Basin/Blue Mountains

- Commissioned as a sub-consultant Botanist to EMM Consulting to assist with Threatened Flora surveys for the Burrawang to Avon Tunnel (BAT) water infrastructure proposal for WaterNSW (Sept.-Dec. 2019).
- Commissioned as a sub-consultant Botanist to RPS Australia in a multi-week vegetation monitoring program of the endangered Newnes Plateau shrub and hanging swamps, as part of RPS's annual monitoring program for Centennial Coal. Threatened flora populations surveyed on the plateau included *Boronia deanei*, *Persoonia hindii* and the ROTAP *Almaleea incurvata*. (September-October 2016).
- Senior Project Botanist for major proposed expansion of an underground coal mine at **Mt Airlie and Mt Genowlan in the Capertee Valley**, NSW, as part of a large ecology field team, over a 2 year period (2012-2014), for Centennial Coal. Baseline vegetation surveys and vegetation mapping was undertaken in the sandstone pagoda complex and on the steep sandstone escarpment slopes over a project application area exceeding 2000 hectares. Threatened flora species recorded and mapped included *Prostanthera stricta*, *Eucalyptus cannonii*, *Grevillea obtusiflora*, *Persoonia marginata* and *Pultenaea* sp. Genowlan Point. As a project team botanist, Isaac also participated in vegetation surveys and mapping of specific areas in Gardens of Stone National Park to assist in assessing potential impacts to predicted watertable drawdown areas.
- Preparation of Species Impact Statement (SIS) (principal author) for proposed **Port Botany Expansion EIS** for Sydney Ports Corporation. SIS involved baseline vegetation surveys and mapping of coastal dune heath and EEC Saltmarsh, impact assessment on the estuary's shorebird assemblage and detailed rehabilitation measures to reconfigure the estuary to restore shorebird and saltmarsh habitat. Principal author of a Species Impact Statement (SIS) for proposed road upgrade of Mona Vale Road West, Ingleside/Terrey Hills, NSW. SIS report focused on impacts and offsetting in relation to *Microtis angusii*, *Grevillea caleyi*, **Eastern Pygmy Possum** and **Duffys Forest EEC** (Dec 2015 – April 2016). Also undertook biobank assessments for potential offset sites in Duffys Forest, NSW.
- Baseline and targeted vegetation survey and mapping of 400 hectares of **Moorebank Defence Lands** to assist site redevelopment planning. Report prepared for Department of Defence and GHD Group (formerly Egis Consulting), May 2003. Sigplants recorded and mapped included *Persoonia nutans*, *Acacia pubescens*, *Grevillea parviflora* var *parviflora* and Castlereagh Woodland complex (EECs);
- Commissioned as a consultant botanist by Cumberland Ecology to undertake a baseline flora survey of the **Queen Victoria Hospital site at Wentworth Falls**, NSW, as part of a land capabilities assessment, November 2014. The survey recorded populations of the Threatened taxa, *Persoonia acerosa* and *Pultenaea glabra* as well as the Threatened Blue Mountains Sedge Swamps.

NSW Southern Tablelands

- Conducted BAM plots and Threatened flora surveys and mapping across the northern portion of Kosciuszko National Park as part of Snowy2 biodiversity surveys, October 2018-April 2019 (sub-consultant Botanist to EMM Consulting).

- Flora survey and mapping of Threatened Natural Temperate Grasslands at the 1,000 hectare **Rock Flat Creek** site on the Cooma Plains for a proposed windfarm. Report prepared for Pacific Hydro Pty Ltd, June 2002. Large areas of *Poa sieberiana* and *Austrostipa-Rytidosperma* grasslands were surveyed and mapped.
- Ecological survey and assessment of 2000 hectare site for a proposed Crookwell II windfarm on the **Great Divide at Crookwell, NSW**. Report prepared for Gamesa Pty Ltd, June 2004. Threatened Natural Temperate Grasslands, Yellow Box Woodlands as well as other Tablelands grassy woodlands were addressed in the report.

Slopes and Plains of New South Wales

- Flora survey and assessment of proposed solar farm on Namoi River floodplain at Gunnedah, NSW. Vegetation communities comprised river red gum-yellow box woodlands and poplar box woodlands (prepared for pitt&sherry on behalf of Photon Engineering, February 2018).
- Baseline and targeted terrestrial flora surveys and assessment of Chenopod Shrubland, Black Box and River Red Gum Floodplain Woodland and Dry Lake Bed Herbland/Grassland in **Kinchega National Park, Menindee Lakes, NSW**, as part of EIS investigations for proposed structural works on Menindee Lakes Scheme. Report prepared for State Water and DEC (NPWS), October 2003 – July 2005. A component of the project also comprised the preparation of a proposed revegetation plan associated with construction of a major new channel from Lake Cawndilla to the Darling River, with the restoration of a long, linear corridor of Bluebush shrubland, Black Box Woodlands and Acacia shrublands required.

CURRENT MEMBERSHIPS:

- Practising Member - Ecological Consultants Association of NSW (NSW ECA). Isaac served on the ECA Council from 2014-2018.
- Member - Ecological Society of Australia (ESA).

SELECTED PUBLICATIONS

- Mamott, I (2012) Notes on a Threatened plant of the NSW North Coast, *Centranthera cochinchinensis* (Swamp Foxglove). Consulting Ecology Vol. 28, February 2012.
- Mamott, I (2013) Notes on a Threatened shrub, *Grevillea parviflora subsp. parviflora*, on the lower NSW North Coast. Consulting Ecology Vol. 30, February 2013.
- Mamott, I (2013) Notes on a Threatened shrub, *Allocasuarina simulans* and a Threatened tree population, *Eucalyptus seeana*, on the NSW mid north coast. Consulting Ecology Vol.31, August 2013.
- Mamott, I (2011) Notes on an Endangered orchid, *Diuris flavescens*, and forb, *Lindernia alsinoides*, of the NSW Mid North Coast. Consulting Ecology Vol. 26, February 2011.
- Mamott, I (2011) Notes on a Threatened forb, *Asperula asthenes*, and shrub, *Melaleuca groveana*, on the NSW Mid North Coast. Consulting Ecology Vol. 27, August 2011.
- Mamott, I (2012) Notes on a critically endangered orchid, *Genoplesium littorale* (syn. *Corunastylis littoralis*) on the NSW Mid North Coast. Consulting Ecology Vol. 29, August 2012.
- Mamott, I (2016) Notes on seed provenance, restoration and plant adaptation in the face of climate change in Australia. Consulting Ecology Vol. 36, February 2016.
- Mamott, I (in prog.) Salvage and relocation of an Endangered forb, *Lindernia alsinoides*.