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TAYLOR CONSTRUCTION GROUP PTY LTD

Salinity Management Plan

11-13 Mannix Parade, Warwick Farm NSW

E25074.E99.Rev1
21 April 2021

Document Control

Report Title:	Salinity Management Plan; 11-13 Mannix Parade, Warwick Farm NSW
Report No:	E25074.E99.Rev1

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Revision	Details	Date	Amended By
0	First Issue	14 April 2021	-
1	Revised	21 April 2021	WH

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1. INTRODUCTION

1.1 Background

Taylor Construction Group Pty Ltd engaged EI Australia (EI) to prepare a Salinity Management Plan (SMP) for 11-13 Mannix Parade, Warwick Farm ('the site').

Located 26km west of the Sydney central business district, within the Local Government Area of Liverpool City Council (**Figure A.1, Appendix A)**, the site covers a total area of 1,283.6m^2 (**Figure A.2, Appendix A**). At the time of drafting this SMP it was comprised of two residential properties.

Site investigations were completed as part of an environmental due diligence process, in accordance with *State Environmental Planning Policy No.55 - Remediation of Land* (SEPP 55), supporting an application to Liverpool City Council to redevelop the land for medium to high density residential use. The presence of saline soils was identified within the site, which subsequently required management during the proposed development.

1.2 Proposed Development

Based on the supplied survey and development plans (**Appendix B**), the proposed development involved demolition of the existing site structures, followed by the construction of a multi-storey, residential (apartment) building, overlying a single level basement. Construction of the basement required bulk excavation of soils across most of the available area, to depths of approximately 3m below ground level (BGL). Retained (deep) soil zones would occur along each of the site boundaries, for landscaping purposes.

1.3 Objective and Scope

The main objective of this plan is to outline appropriate procedures for the management of salinity during the disturbance (excavation and movement) of site soils. To achieve this objective, the scope of the plan includes:

- A review of relevant (hydro)geological, soil landscape and salinity maps for the project area, to determine the landform characteristics and regional setting of the site;
- Review of all previous reports relating to the site, focusing on any salinity-related findings, to determine the site-specific salinity characteristics;
- Review the proposed construction and management plans for the development, to identify the activities of risk that could result in adverse effects to the surrounding environment as a result of saline soils; and
- Detail measures for the management of saline soils during the development, in accordance with relevant legislation and standards.

1.4 Regulatory Framework

The regulatory framework considered for this SMP is identified in **Table 1-1**.

Table 1-1 Regulatory Framework

Legislation / Regulatory Instrument	Requirement
Contaminated Land Management Act 1997 (CLM Act 1997)	Promotes the effective management of contaminated land in NSW by setting out the roles and responsibilities of the EPA and the rules they use.
Environmental Planning and Assessment Act 1979 (EP&A Act 1979)	The EP&A Act 1997 stipulates the regulations and gives rise to state environmental planning policis, to assist regulators with the protection of human and environmental health.
Protection of the Environment Operations Act 1997 (POEO Act 1997)	The objective of the POEO Act 1997 is to achieve the protection, restoration and enhancement of the quality of the environment.
Water Management Act 2000 *Water Act 1912*	Protects the health of rivers, streams and groundwater systems and gives rise to Water Sharing Plans and quality objectives for catchments within the state of NSW. Manages aquifer interference activities which involve: ▪ The penetration of an aquifer; ▪ The interference of water in an aquifer; ▪ The obstruction of water flow or taking of water from an aquifer when carrying out prescribed activities; and ▪ The disposal of water taken from an aquifer.
NSW Office of Water (2012) *NSW Aquifer Interference Policy*	Details the scope of aquifer interference activities and provides specific guidance on the licensing and approval requirements for activities that interfere with aquifers.
State Environmental Planning Policies	*State Environmental Planning Policy No.55 - Remediation of Land* *Sydney Regional Growth Centres 2006*.
National Protection (Assessment of Site Contamination) Measure 1999 / Amendment Measure 2013	Outlines methodology for contaminated land assessment and provides risk-based criteria for ecological and human health receptors of site contamination.
Liverpool City Council Plans and Policies	Provides controls and guidelines for development in the area. Relevant to the site were: ▪ Liverpool Development Control Plan 2008; and ▪ Liverpool Local Environmental Plan 2008.
Relevant Guidelines	DLWC (2002) *Site Investigations for Urban Salinity*. DIPNR (2002) *Salinity Maps of Salinity Potential for Western Sydney* and *Guidelines to Accompany Maps*. DPINR (2003) *Building in a Saline Environment*. DPI (2014) *Salinity Training Manual*. WSROC (2004) *Western Sydney Salinity Code of Practice*.

2. SITE DESCRIPTION

2.1 Property Identification, Location and Physical Setting

The site identification details and associated information are presented in **Table 2-1**. The site locality and layout are shown in **Figures A.1** and **A.2** (**Appendix A**).

Table 2-1 Site Identification

Attribute	Description
Street Address	11-13 Mannix Parade, Warwick Farm NSW
Local Government Area and surrounds.	The site was located within the Local Government Area of Liverpool City Council. McGirr Parade lined the northern boundary and Mannix Parade lined the eastern boundary. Land use activities of the site and surrounds were predominantly residential.
Geographical Coordinates	Geographic co-ordinates for north-eastern corner of site (GDA2020-MGA56): ▪ Easting: 308776.526 ▪ Northing: 6245619.639 (Ref: http://maps.six.nsw.gov.au)
Site Area	1,283.6m^2 (Ref: site survey plan in **Appendix B**)
Site Owner	Taylor Construction Group Pty Ltd
Lot and Deposited Plan (DP)	The site will result in the amalgamation of land legally identified as: ▪ Part of Lot 8 and Lot 26 in DP 36641 (11 Mannix Parade) ▪ Part of Lot 9 and Lot 27 in DP 36641 (13 Mannix Parade).
State Survey Marks	One state survey mark was situated on the corner of Mannix and McGirr Parades, being SS37185 (Ref: http://maps.six.nsw.gov.au)
Current Zoning	R4 – High Density Residential (*Liverpool Local Environmental Plan 2008*)
Current Land Use	Low density residential

2.2 Regional Setting

The topography, geology and landscape information is summarised in **Table 2-2**.

Table 2-2 Regional Setting Information

Attribute	Description
Topography	The site surface is gently sloping to the north / north-east, with a surface elevation of 12.04 meters Australian Height Datum (AHD) in the north eastern corner, increasing to 13.27mAHD in the south western corner (site survey in **Appendix B**).
Site Drainage	Consistent with the general slope of the site, surface water is assumed to flow north-west, towards Brickmakers Creek. This creek drains to Cabramatta Creek, which ultimately discharges into the Georges River.
Regional Geology	The site was underlain by geological formations of the Wianamatta Group (Rwb), consisting of shale, carbonaceous claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff (DMR, 1991).
Soil Landscape	The site overlies a Blacktown (*bt*) resdidual soil landscape, characterised by gently undulating rises on Wianamatta Group shales. Typical landforms include local relief

Attribute	Description
	to 30m and slopes of <5%, and broad rounded crests and ridges with gently inclined slopes. Typical landscapes include cleared eucalypt woodland and tall open (wet sclerophyll) forests (Bannerman and Hazelton, 1990)
Acid Sulfate Soil (ASS) Risk	According to the *Liverpool 1:25,000 Scale Acid Sulfate Soil Risk Map* (Murphy, 1997) and *Liverpool Local Environmental Plan 2008 1:20,000 Scale Acid Sulfate Soils Planning Map (Sheet ASS_010)*, the site lies within area where ASS are not known to occur. Therefore, no management of ASS was warranted.
Salinity Risk	With reference to the DIPNR (2003) *Salinity Potential in Western Sydney Map*, the subject site and its surroundings are in an area of '*Moderate'* salinity potential.
Hydrogeology	Groundwater is present within the porous, fractured shale bedrock and expected to be acidic, saline and of low to moderate productivity. A number of registered groundwater bores are identified within a 500m radius of the site, with the majority of these registered for monitoring purposes. The nearest registered bore was approximately 360m south-east of site; however, the use of this bore was unknown. No bores were registered for domestic or irrigation use, and drillers log information from the closest registered bores typically identified clay soil or silty sand to depths of 18.3-19.0m, underlain by siltstone (shale) bedrock. The potential for viable groundwater abstraction and use of groundwater under these conditions is considered to be low. There is a reticulated water supply in the area and consumption of groundwater is not expected to occur. Use of groundwater is not proposed as part of the current development.
Nearest Surface Water Feature	Brickmakers Creek, located approximately 225m north-west of the site.

3. PREVIOUS INVESTIGATIONS

Investigations of site salinity were included in the following previous reports:

- JK Environments Pty Ltd (JK, 2020) *Preliminary Site Investigation; 11-13 Mannix Parade, Warwick Farm NSW*, *for Taylor Construction Group* (JK Report E33075BDrpt, dated 9 April 2020); and
- EI (2021) *Additional Site Investigation; 11-13 Mannix Parade, Warwick Farm NSW* (EI Australia Report E25074.E03.Rev1, dated 20 April 2021).

A summary of the key findings from each report is provided in **Table 3-1**.

Table 3-1 Summary of Previous Salinity Investigations

Stage	Project Tasks and Findings
JK (2020) PSI	
Key Findings	The investigation included the drilling of seven boreholes (BH1-BH7) to a maximum depth of 1.7m BGL, with logging and sampling of soils to 1.6m BGL. The subsurface conditions of the site were generalised as a thin layer of filling material (0.3-0.5m BGL), overlying residual clays of low permeability and shale bedrock at depth. Laboratory analytical testing for pH, electrical conductivity (EC) and exchangeable sodium percentage (ESP) was performed on representative samples. The pH values ranged from 4.8 to 5.2, indicating (very) strongly acidic conditions. The soils were classified as mildly aggressively towards buried concrete, but non-aggressive towards buried steel. The EC results ranged from 76 µS/cm to 250 µS/cm (EC_e all <2 dS/m). Given their clay-dominant texture, the soils to 1.6m were classified as non-saline. The ESP values ranged from 14.2% to 23.8%. The soils were subsequently classed as sodic to highly sodic.
Conclusion and Recommendation	The soils to <1.6m BGL (at least) were classed as non-saline, sodic to highly sodic and non-aggressive towards buried steel, though mildly aggressive to buried concrete. JK recommended that a salinity management plan (SMP) be prepared for the proposed development (i.e. to be implemented during the bulk excavation phase).
EI (2021) ASI	
Scope	Intrusive investigation was conducted on 30 March 2021, which involved the drilling of two boreholes, identified as BH1M and BH3M (**Figure A.2, Appendix A)**. The bore logs are provided in **Appendix C.** A total of eight natural soil samples were obtained from the boreholes, to a maximum depth of 4m BGL (being 1m beyond the excavation depth of the proposed basement). The samples were analysed for pH, EC, soluble cations (sodium, potassium, calcium and magnesium), soluble anions (chloride, carbonate and sulfate), cation exchange capacity (CEC) and ESP. The analytical results are provided in **Appendix D**.
Key Findings	Based on the available data, the clay loams (BH3M) were non-saline; however, the sandy clays (BH1M) were of a saline nature, the strength of salinity increasing with depth. Of greatest concern was the moderate to high salinities observed for the sandy clays of BH1M, from depths greater than 3m BGL. Such depth was at, or just below, the depth of the proposed basement excavation. Consistent with the JK (2020) investigation findings, all soils (i.e. to 4m BGL) were classed as non-aggressive towards buried steel, but mildly aggressive to buried concrete. Susceptibility of soil to dispersion (i.e. sodicity) was estimated as ESP. All site soils were classified as highly sodic and thus prone to erosion (i.e. ESP >5%).
Conclusion and Recommendation	The sandy clays from 3m BGL onwards were classed as saline (as well as mildly aggressive to buried concrete and highly sodic). EI agreed with the JK recommendation that a SMP be prepared for the proposed development.

4. SALINITY MANAGEMENT FRAMEWORK

Site-specific investigations enable the determination of response levels required for the management of any salinity issues that may result from proposed works. The salinity management procedures prescribed by the Western Sydney Regional Organisation of Councils Ltd (WSROC, 2004) are outlined below. These will apply to the current site.

4.1 Salinity Indicators

Salinity is either a naturally occurring process or a result of human changes to ecosystems (DIPNR, 2005). Exposing saline soils can result in the release of an excess amount of salt into the environment, damaging ecosystems (particularly flora) and urban infrastructure. Typical indicators of salinity at a site are presented in **Table 4-1** below.

Table 4-1 Salinity Indicators

Building Indicators	Ecological Indicators
Crumbling of bricks and mortar (brick fretting)	An accumulation of surface water (waterlogged soil)
An accumulation of white salt crystals	High soil erosion and increased runoff
Damp walls (rising or falling) (tide marks)	"Puffiness" of dry soils or black iron staining
Bleaching of sandstone	Bare soil patches (with or without salt crystals)
Breakdown of render or cement/concrete	Clear waters
Efflorescence (of soil or building materials)	The presence of saline plants (e.g. spiny rush and sea barley grass)
	Yellow, stunted, wilting and/or dead vegetation, or distinct changes in vegetation growth

4.2 Level of Management Response for Salinity

For sites where salinity is identified to be a potential issue, a salinity response plan should be developed, to achieve an appropriate level of salinity resistance during development works. Three levels of management are outlined by WSROC (2004), summarised in **Table 4-2**. The response level for the current site is Level 3.

Table 4-2 Salinity Response Levels

Level	Salinity / Development Requirements	Management Response
1	Small scale (single lot) developments involving low risk activities in areas of 'moderate' salinity, as defined by DIPNR (2002).	Implement the 'Level 1Response Checklist' which focuses on basic techniques and 'good house-keeping' to manage water and dampness.
2	Small scale (single lot) developments involving low risk activities in areas of 'high' salinity, as defined by DIPNR (2002).	Implement the 'Level 2 Response Checklist' which includes suggestions for varying building materials and techniques, with more stringent controls to manage water and dampness.
3	Multiple lot developments / rezoning in areas of 'moderate-high' salinity, as defined by DIPNR (2002), or for developments involving salinity risk activities [1]	Requires a SMP, detailing the site's response related to the proposed development, including controls to protect buildings and infrastructure (including roads and underground services) while maintaining the natural water balance of the surrounding environment.

Note 1 Salinity risk activities encompass quarrying, intensive agriculture, high levels of irrigation, infiltration to soil and/or groundwater from large, artificial water bodies, waste water re-use and/or treatment and major landscaping (including bulk excavations).

5. SALINITY MANAGEMENT STRATEGY

The site is located within an area of moderate salinity potential and intrusive investigations confirmed that moderate to high salinities are present within the sandy clay strata, at depths of and beyond 3m BGL. This SMP applies to such soils, to achieve an appropriate level of salinity resistance when the bulk excavation works reach the maximum prescribed (proposed) depth during basement construction.

5.1 Stormwater and Drainage

Overall, a low risk to surface water was identified. EI expect standard surface water, sediment and erosion controls to be adequate for the management of salinity risk associated with the proposed development. These include:

- Implementation of measures to avoid the offsite migration of stormwater, as detailed by the site-specific stormwater management plans prepared by the client.
- Underground pipes carrying water or liquids such as on-site sewerage systems are to be properly installed, using rubber sealed pipes to minimise the risk of water leakage. Any existing pipes are to be checked for damage and any leaks repaired, to minimise infiltration.
- Basement infrastructure, concrete slabs, foundations and retaining walls should be designed and constructed with sufficient drainage to minimise water logging. The design and layout of retaining walls, driveways, and underground services should be constructed with good drainage and shall not impede natural groundwater flow. The design and construction of these features should meet the required standards and building codes, to ensure current best practice is achieved.
- On site guttering and down pipes for surface water management above ground for the final development should be properly connected to the municipal stormwater collection system, with adequate retention features installed (as required) and shall be regularly maintained.

5.2 Vegetation and Landscaping

Retained (deep) soil areas will surround the proposed new building and basement, to enable landscaping. The following measures apply to these parts of the site (i.e. the boundary lines):

- Areas of established vegetation should be maintained (where possible). In areas of deep soil, mulch should be used and the establishment of salt tolerant plants should be considered. Planting is recommended for the retained (deep) soil zones, to reduce any surface water infiltration.
- Landscaping plans should apply ‘waterwise’ gardening principles, which encourage the use of plants that have lower supplemental water needs and grouping plants by water needs to encourage more efficient water use. However, procedures designed to encourage excessive infiltration through the soil should be avoided.
- Irrigation systems should be properly installed to avoid leakage and smart sprinkler systems should be considered. In addition, watering of open space should be kept to a minimum and over watering must be avoided.

5.3 Construction

Construction activities should be undertaken in accordance with the requirements of the Liverpool DCP 2008, Liverpool LEP 2008 and DPINR (2003), as well as any other standards that may be relevant (e.g. Landcom 2004). EI note for specific requirements for building in

saline environments, both the Building Code of Australia (BCA) and the Australian Standards (AS) relevant for the works should be referred to. With regards to salinity, the site-specific construction requirements should include (but not necessarily be limited to) the following.

5.3.1 Brickwork

- Exposure class masonry units and upgraded mortar classification (M4) should be utilised below the damp proof course.
- Consideration should be made to the use of salt resistant bricks and construction materials throughout the construction as a preventative measure for infrastructure degradation.
- Susceptible construction material, such as porous brickwork or lower quality materials should be avoided.
- Manufacturer's recommendations regarding the suitability for use in saline environments for all bricks and concrete blocks should be followed.

5.3.2 Concrete

- Class N32 concrete or type SR cement with water / cement ratio of 0.5 must be used, with reference to CCA Australia (2005) *Guide for Residential Slabs and Footings in Saline Environments*.
- Proper compaction of the concrete must be achieved.
- Proper curing procedures and duration (minimum 7 days).
- Ensure materials including sand and aggregate are suitable for site conditions.
- Concrete cover over steel reinforcement of minimum 50mm.
- Turbulence of any water flowing over a concrete structure should be minimised.
- For slab on ground construction, a layer of sand of minimum 50mm thickness must be provided under the slab, in accordance with BCA Clause 3.3.3.2.
- Appropriate sub-soil drainage must be installed for slabs, footings, retaining walls and driveways.

5.3.3 Damp Proof Course

- A damp proof course (DPC) should be installed beneath slabs and extend to the outside face of the external edge beam up the finished ground level, in accordance with BCA clause 3.2.2.6.
- Minimum lapping of 200mm at joints with appropriate sealing. Joint seals should be validated (i.e. via air lancing) to ensure satisfactory installation.
- Service penetrations shall be sealed with a close fitting sleeve (i.e. top hat with jubilee clip).
- The DPC materials should be in accordance with AS/NZS 2904 – *Damp-Proof Courses and Flashings.*
- Once installed the DPC must not be breached by any later works or additions such as steps, verandas, walls, rendering, bagging, pointing, paving, or landscaping. Protective boards should be utilised where follow-on trades must work in an area where the DPC has been installed. The importance of the integrity of the DPC should be included within site toolbox talks to reduce the risk of damage.

5.3.4 Earthworks

- Areas of cut and fill should be restricted to the building /basement envelope.
- Appropriate measures are required to control stormwater and sediment resulting from road works or utility/service installation, in accordance with Landcom (2004) and any site specific management plans.

- Existing areas of waterlogging and poor drainage (if present) should be avoided or rectified, with consideration to shrink / swell hazards.
- Erosion / disturbance are to be minimised. Construction techniques should also minimise site disturbance and the exposure of sensitive soil material beyond 3m BGL.
- If extended periods of rain are forecast bare ground should be either:
  - covered with stable fill such are ripped sandstone; or
  - stabilised with lime proportioned to 3% by weight.
- The proposed excavations will expose acidic soils and may require treatment with lime or gypsum in order to make the soils suitable for plant growth.
- Soils designated for off-site disposal must be pre-classified in accordance with the EPA (2014) *Waste Classification Guidelines*. Saline soils cannot be classified / disposed / reused as *excavated natural material* (ENM), as defined under the EPA's *Excavated Natural Material Order 2014*.
- Imported soils (*if required*) should be non-saline.

Importation of Soil for Backfilling / Landscaping Purposes

Where soil is to be imported to the site, the material must be either virgin excavated natural material (VENM), or ENM.

In accordance with the *POEO Act 1997*, VENM must be 'natural material (such as clay, gravel, sand, soil or rock fines) that:

- Has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities; and
- Does not contain any sulfidic ores or soils or any other waste.'

The VENM must be accompanied by a validation certificate from the supplier which adequately certifies that the material is VENM.

In accordance with the *POEO (Waste) Regulation 2014*, ENM is naturally occurring rock and soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

- been excavated from the ground;
- contains at least 98% (by weight) natural material; and
- does not meet the definition of VENM in the *POEO Act 1997*.

ENM does not include:

- material located in a contamination hotspot;
- material that has been processed; or
- material that contains asbestos, actual or potential ASS, or sulfidic ores.

Assuming the material meets the above criteria, confirmation of the ENM classification is carried out by the comparison of contaminant concentrations against the thresholds presented in Table 4 of EPA's *The Excavated Natural Material Order 2014.*

Imported soil will be observed by a suitably qualified and experienced environmental consultant as it is delivered to site to confirm:

- That it appears consistent with the source; and
- That there is no visual or olfactory evidence of contamination such as staining, anthropogenic materials or odours.

In the case that discrepancies exist, the imported material will be refused entry to the site and not considered suitable for use until appropriately validated.

The appointed contractor will provide the Environmental Consultant with copies of dockets pertaining to imported fill soils to confirm the source, type and quantities of materials. These will be included in the validation report.

It is the responsibility of the receiver to ensure that the ENM:

- Meets all chemical and other material requirements as per the ENM Order 2014;
- Is only applied to land as engineering fill or for use in earthworks; and
- Is applied to land within a reasonable period of time after its receipt.

The receiver must keep a record of the quantity of ENM received and the suppliers' name and address for at least six years following receipt.

As part of the EPA resource recovery framework, resource recovery orders and resource recovery exemptions have been established which allow some wastes to be beneficially and safely reused independent of the usual laws that control the application of waste to land. Therefore, where the material is fit for purpose, chemically compliant with the proposed 'Residential A' land use scenario, and approved by the EPA, exempt material may be imported for use on-site.

6. STATEMENT OF LIMITATIONS

This plan has been prepared for the exclusive use of Taylor Construction Group Pty Ltd (the client), being the only intended beneficiary of EI's work. The scope of the plan is limited to that agreed with the client.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

In preparing this plan, EI has used a degree of care and skill ordinarily exercised by reputable members of the environmental industry in Australia, as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section of this report must be read in conjunction with the whole of this report, including its appendices.

The methods and conclusions presented in this report are based on a limited investigation of conditions, with specific sampling locations chosen to be as representative as possible under the given circumstances.

EI's professional opinions are reasonable and based on its professional judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation, observations and/or validation testing during remedial activities. In some cases, further analysis may be required, which may result in a further report with different conclusions.

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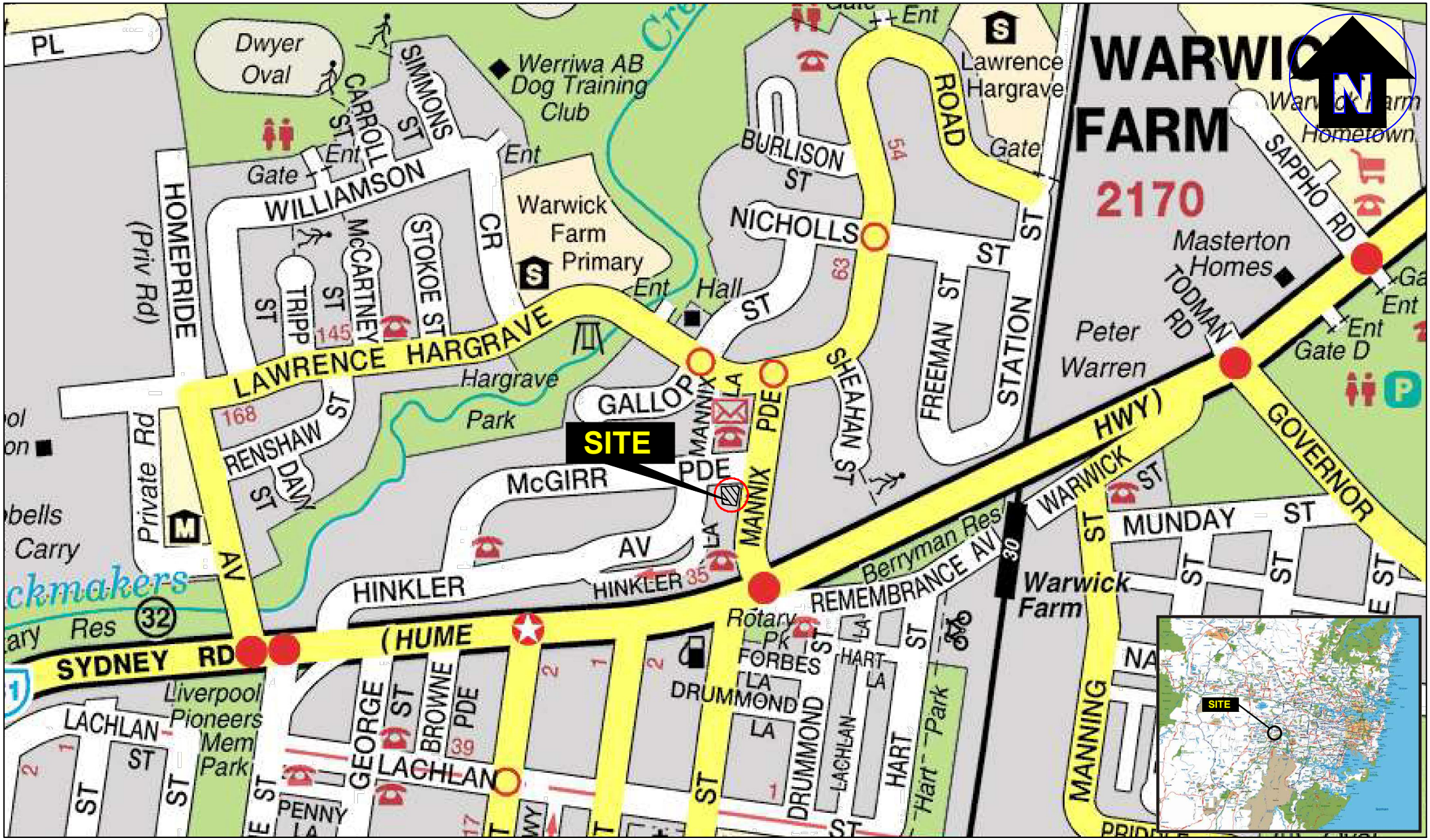
ABBREVIATIONS

AHD	Australian Height Datum
AS	Australian Standard
ASS	Acid Sulfate Soil
BCA	Building Code of Australia
BGL	Below Ground Level
BH	Borehole
CBD	Central Business District
CEC	Cation Exchange Capacity
CLM	Contaminated Land Management
DA	Development Application
DCP	Development Control Plan
DIPNR	Department of Infrastructure, Planning and Natural Resources
DLWC	Department of Land and Water Conservations
DP	Deposited Plan
DPC	Damp Proof Course
EC	Electrical Conductivity
EC_e	Extract Electrical Conductivity
ENM	Excavated Natural Material
EPA	Environment Protection Authority (of New South Wales)
ESP	Exchangeable Sodium Percentage
km	Kilometres
m	Metres
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metres
NATA	National Association of Testing Authorities, Australia
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NSW	New South Wales
pH	Potential Hydrogen (a measure of the acidity or basicity of an aqueous solution)
POEO	Protection of the Environment Operations
SEPP	State Environment Planning Policy
SMP	Salinity Management Plan
VENM	Virgin Excavated Natural Material
WSROC	Western Sydney Regional Organisation of Councils Limited

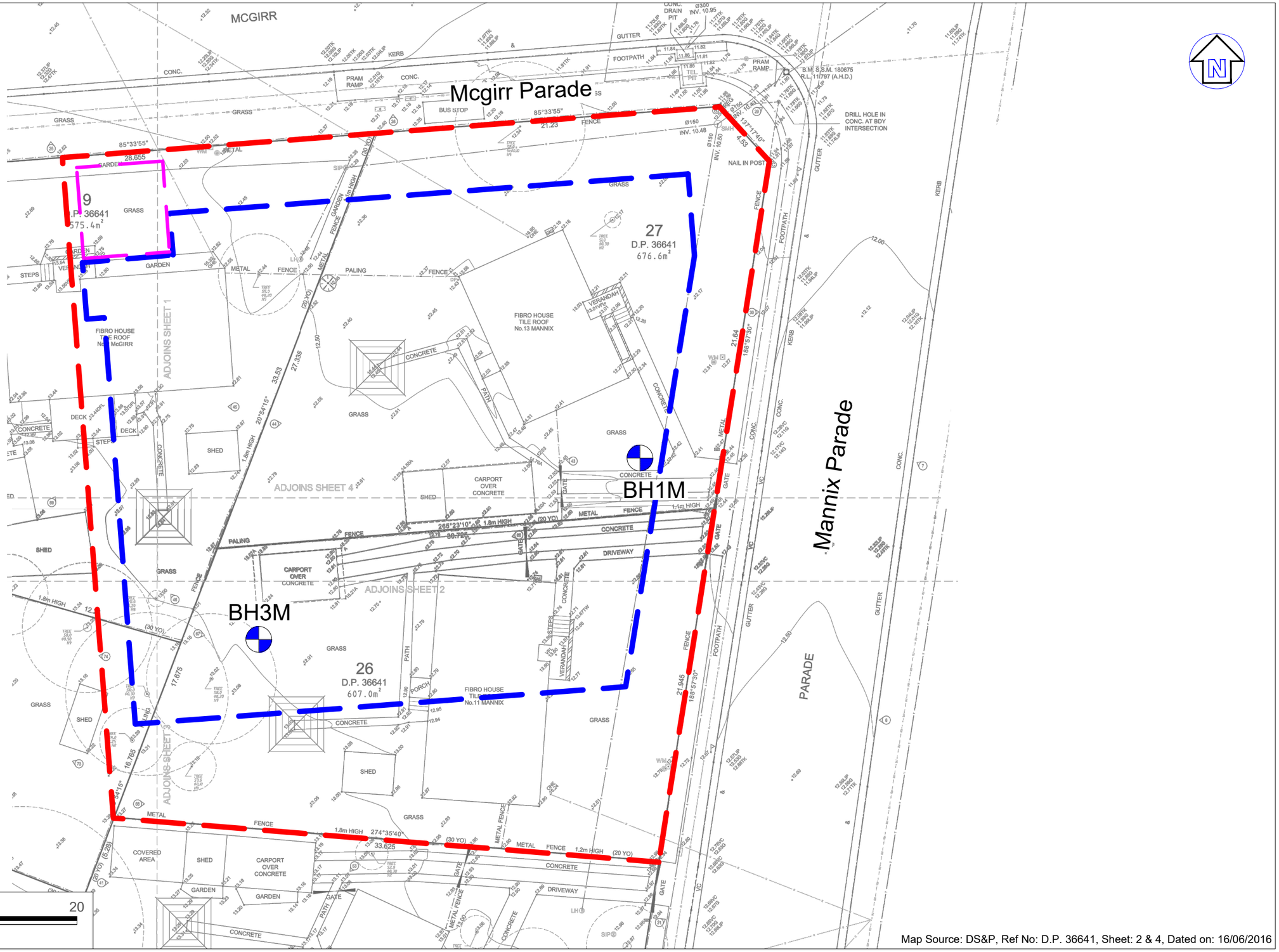
Appendix A – Figures



eiaustralia Practical Solutions for Built Environments Suite 6.01, 55 Miller Street, PYRMONT 2009 Ph (02) 9516 0722 Fax (02) 9518 5088	Drawn:	TM/AM.H	**Taylor Construction Group Pty Ltd** Salinity Management Plan 11-13 Mannix Parade, Warwick Farm NSW Site Locality Plan
	Approved:	AI/SE	
	Date:	14-04-21	
	Scale:	Not To Scale	

Figure:
1

Project: E25074.E99



Map Source: DS&P, Ref No: D.P. 36641, Sheet: 2 & 4, Dated on: 16/06/2016

LEGEND (Note: All locations are approximate)

- Site boundary
- Basement boundary
- OSD Tank location
- Borehole location

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Drawn:	TM/ AM.H
Approved:	AI/SE
Date:	14-04-21

Taylor Construction Group Pty Ltd
Salinity Management Plan
11-13 Mannix Parade, Warwick Farm NSW
Sampling Location Plan

Figure: 2

Project: E25074.E99

Appendix B – Proposed Development

LAHC WARWICK FARM

11-13 MANNIX PARADE, WARWICK FARM

A000 - GENERAL NOTES / SITE CONTEXT			
A001	COVER SHEET / DRAWING LIST	5	12/02/2021
A1000 - GENERAL ARRANGEMENT PLANS			
A1001	SITE PLAN	3	18/12/2020
A1002	SITE DEMOLITION WORKS	1	18/12/2020
A1003	BASEMENT LEVEL FLOOR PLAN	5	12/02/2021
A1004	GROUND LEVEL FLOOR PLAN	8	12/02/2021
A1005	LEVEL 1 FLOOR PLAN	8	12/02/2021
A1006	LEVEL 2 FLOOR PLAN	7	12/02/2021
A1007	LEVEL 3 FLOOR PLAN	7	12/02/2021
A1008	LEVEL 4 FLOOR PLAN	7	12/02/2021
A1009	LEVEL 5 FLOOR PLAN	7	12/02/2021
A1010	ROOF LEVEL PLAN	6	12/02/2021
A1100 - REFLECTED CEILING PLANS			
A1101	BASEMENT LEVEL RCP	5	12/02/2021
A1102	GROUND LEVEL RCP	5	12/02/2021
A1103	LEVEL 1 RCP	5	12/02/2021
A1104	LEVEL 2 RCP	5	12/02/2021
A1105	LEVEL 3 RCP	5	12/02/2021
A1106	LEVEL 4 RCP	5	12/02/2021
A1107	LEVEL 5 RCP	5	12/02/2021
A1300 - CONCRETE SETOUT PLANS			
A1301	BASEMENT LEVEL CONCRETE SETOUT PLAN	2	18/12/2020
A1302	GROUND LEVEL CONCRETE SETOUT PLAN	2	18/12/2020
A1303	LEVEL 1-3 CONCRETE SETOUT PLAN	2	18/12/2020
A1304	LEVEL 4 CONCRETE SETOUT PLAN	2	18/12/2020
A1305	LEVEL 5 CONCRETE SETOUT PLAN	2	18/12/2020
A1306	ROOF CONCRETE SETOUT PLAN	2	18/12/2020
A1400 - COMPARTMENT AND COMPLIAN PLANS			
A1401	BASEMENT COMPARTMENT PLAN	2	12/02/2021
A1402	GROUND FLOOR COMPARTMENT PLAN	1	12/02/2021
A1403	LEVELS 1-3 (TYPICAL) COMPARMENT PLANS	1	12/02/2021
A1404	LEVELS 4-5 (TYPICAL) COMPARMENT PLANS	1	12/02/2021
A2000 - ELEVATIONS			
A2001	NORTH & SOUTH ELEVATIONS	4	18/12/2020
A2002	EAST & WEST ELEVATIONS	4	18/12/2020
A3000 - SECTIONS			
A3001	SECTIONS A & B	4	18/12/2020
A3002	SECTIONS C & D	4	18/12/2020
A3100 - SECTIONS			
A3101	WALL SECTION AA	2	18/12/2020
A3102	WALL SECTION BB	2	18/12/2020
A3103	WALL SECTION DD	1	29/01/2021
A4000 - CONSTRUCTION DETAILS			
A4001	BRICK CORBELLING & BALCONY DETAILS	2	18/12/2020
A4005	MAIL BOX DETAILS	2	18/12/2020
A5000 - VERTICAL CIRCULATION			
A5001	FIRE STAIR	2	18/12/2020
A5003	BALUSTRADE, HANDRAIL & NOSING DETAILS	2	18/12/2020
A5004	ENTRY RAMP AND STAIR DETAILS	1	18/12/2020
A6000 - ROOM LAYOUT			
A6001	BATHROOM LAYOUTS 01	2	18/12/2020
A6003	KITCHEN LAYOUTS 01	2	18/12/2020
A6004	JOINERY	2	12/02/2021
A6005	BICYCLE STORAGE, COMMS & SWITCHROOM	2	18/12/2020
A6006	WASTE / BULKY GOODS & GAS / WATER METER & BOOSTER	2	18/12/2020
A6011	TYPICAL UNIT TYPE 01, 02, 03, 04 & 05	2	18/12/2020
A6012	TYPICAL UNIT TYPE 06, 07 & 08	2	18/12/2020
A6013	TYPICAL UNIT TYPE 09, 10, 11 & 12	2	18/12/2020
A9000 - DOOR AND WINDOW SCHEDULE			
A9001	WALL TYPES SCHEDULE 1	3	18/12/2020
A9001-1	WALL TYPES SCHEDULE 2	3	18/12/2020
A9001-2	WALL TYPES SCHEDULE 3	3	18/12/2020
A9002	DOOR TYPE ELEVATION	2	18/12/2020
A9004	WINDOW / LOUVRE TYPE ELEVATIONS & SCHEDULE	2	18/12/2020
A9007	SIGNAGE SCHEDULE	2	18/12/2020

HYDRAULIC LEGEND

NOTE: REFER TO HYDRAULIC & FIRE ENG. DOCUMENTATION FOR DETAILS.

DESCRIPTION:

- DOWNPIPE
- FLOOR WASTE
- OVERFLOW CHANNELS
- RAIN WATER OUTLET
- FIRE HYDRANT
- EXPOSED SPRINKLER
- SEMI RECESSED CEILING SPRINKLER

LOCATION PLAN

ELECTRICAL FITTINGS LEGEND

NOTE: REFER TO ELECTRICAL ENG. DOCUMENTATION FOR DETAILS.

DESCRIPTION:

- SURFACE MOUNTED LINEAR LIGHT
- SURFACE MOUNTED LINEAR LIGHT W/ EMERGENCY SPITFIRE
- CEILING LIGHT
- CEILING LIGHT
- RECESSED LED EMERGENCY LUMINAIRE
- MOTION DETECTOR
- EXIT SIGN
- CEILING MOUNTED FAN WITH BUILT IN LED LIGHT
- WALL MOUNTED LIGHT
- BLL - BOLLARD LIGHT

GENERAL ABBREVIATIONS:

A/C	A/C CONDENSER UNIT SPACE
BL	BOLLARD
CD	CLOTHES DRYING RACK
CP EX	CARPARK EXHAUST
CJ	CONTROL JOINT
DB	DISTRIBUTION BOARD
DP	DOWNPIPE
F	FRIDGE
FCU	FUTURE SPLIT UNIT
FEX	FIRE EXTINGUISHER
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FW	FLOOR WASTE
GD	GRATED DRAIN
K	KITCHEN
L/D	LIVING / DINING
MJ	MOVEMENT JOINT (WITH THERMAL BREAK FIXING TO SECTION J REQUIRMENTS)
MC	MIRROR CUPBOARD
NBN	NBN BOX
HWU	HOT WATER UNIT
O/F	OVERFLOW CHANNELS
RWO	RAIN WATER OUTLET
S	STORAGR
SWP	STORMWATER PIT

MECHANICAL FITTINGS LEGEND

NOTE: REFER TO ELECTRICAL ENG. DOCUMENTATION FOR DETAILS.

DESCRIPTION:

- EGGCRATE TYPE GRILLE WITH LIGHT
- ACCESS PANEL

CONTRACTOR'S NOTES

1. CONTRACTOR MUST ENSURE WORKS ARE UNDERTAKEN AND COMPLETED TO COMPLY WITH CLIENTS AND TENANTS DESIGN BRIEF/S, SPECIFICATIONS AND ALL AMENDMENTS.
2. ANY DISCREPANCY FOUND WITHIN REID CAMPBELL'S DOCUMENTATION, PLEASE BRING TO THE ATTENTION OF REID CAMPBELL BEFORE COMMENCEMENT OF ANY WORKS.
3. CONTRACTOR TO CONFIRM ALL REQUIRED CONSTRUCTION TOLERANCES PRIOR TO THE COMMENCEMENT OF ANY WORKS.
4. ARCHITECTURAL SKETCHES (ASK) FORM PART OF THE ARCHITECTURAL DOCUMENTATION AND MUST BE READ IN CONJUNCTION WITH ALL OTHER ARCHITECTURAL DOCUMENTATION.
5. CLIENT TO REVIEW ARCHITECTURAL DOCUMENTATION PRIOR TO COMMENCEMENT OF WORKS.
6. CONTRACTOR IS TO ENSURE ALL WORKS ARE COMPLETED AS PER CURRENT CLIENT DESIGN AND CONSTRUCT BRIEF.
7. CONTRACTOR MUST TAKE ALL REASONABLE STEPS TO READ DOCUMENTATION PRIOR TO THE ISSUING OF RFIS.
8. CONTRACTOR MUST CONFIRM THE LOCATION OF ALL EXISTING SERVICES PRIOR TO WORKS, AND COORDINATE ALL NEW WORKS ACCORDINGLY.
9. CONTRACTOR TO ENSURE WORKS ARE COMPLETED TO COMPLY WITH THE RELEVANT AUSTRALIAN STANDARD, NATIONAL CONSTRUCTION CODE AND LEGISLATIVE COMPLIANCE.
10. ALL DRAWING ARE IN COLOUR AND MUST BE PRINTED IN COLOUR TO BE VIEWED CORRECTLY

Notes

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-Report all discrepancies to project manager prior to construction.
-Figured dimensions to be taken in preference to scaled drawings.
-All work is to conform to relevant Australian Standards and other Codes as applicable, together with other Authorities' requirements and regulations.

NSW Registered Architect Mark David Roach, 10332

Issue	Description	Date
1	PRELIMINARY CONSULTANT ISSUE	05/11/2020
2	FINAL ARCHITECTURAL LAYOUTS	18/11/2020
3	TENDER ISSUE	27/11/2020
4	TENDER ISSUE	18/12/2020
5	TENDER ISSUE	12/02/2021

Issued For Tender

Project
LAHC WARWICK FARM
11-13 MANNIX PARADE, WARWICK FARM

Client
TAYLOR

REIDCAMPBELL
Architecture, Interiors, Planning
ACN 002 033 801 ABN 28 317 605 875
Level 15, 124 Walker Street
North Sydney NSW 2060 Australia
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Print Date
12/02/2021 10:58:52 PM

Drawing Title
COVER SHEET / DRAWING LIST

Drawing Number A001 | Issue 5

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NSW Registered Architect Mark David Roach, 10332
NSW Registered Architect James Webb, 10187

Issue	Description	Date
1	FINAL ARCHITECTURAL LAYOUTS	18/11/2020
2	TENDER ISSUE	27/11/2020
3	TENDER ISSUE	18/12/2020

Issued For Tender

0m 4m 8m 12m 16m 20m

SCALE BAR 1:200 @ A1

Project
LAHC WARWICK FARM
11-13 MANNIX PARADE, WARWICK FARM

Client
TAYLOR

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North Point

Drawing Title
SITE PLAN

Drawing Number A1001
Issue 3

MCGIRR PARADE

MANNIX LANE

10
D.P. 36641
499.5m`

9
D.P. 36641
575.4m`

8
D.P. 36641
556.4m`

26
D.P. 36641
607.0m`

27
D.P. 36641
676.6m`

Site Boundary

Notes

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NSW Registered Architect Mark David Roach, 10332
NSW Registered Architect James Webb, 10187

Issue	Description	Date
1	TENDER ISSUE	18/12/2020

- EXISTING BUILDING TO BE DEMOLISHED
- EXISTING TREE TO BE REMOVED
- EXISTING CONCRETE PATH / DRIVEWAY TO BE DEMOLISHED
- EXISTING SEWER MAIN TO BE RELOCATED

0m 2m 4m 6m 8m 10m

SCALE BAR 1:100 @ A1

Project
LAHC WARWICK FARM
11-13 MANNIX PARADE, WARWICK FARM

Client
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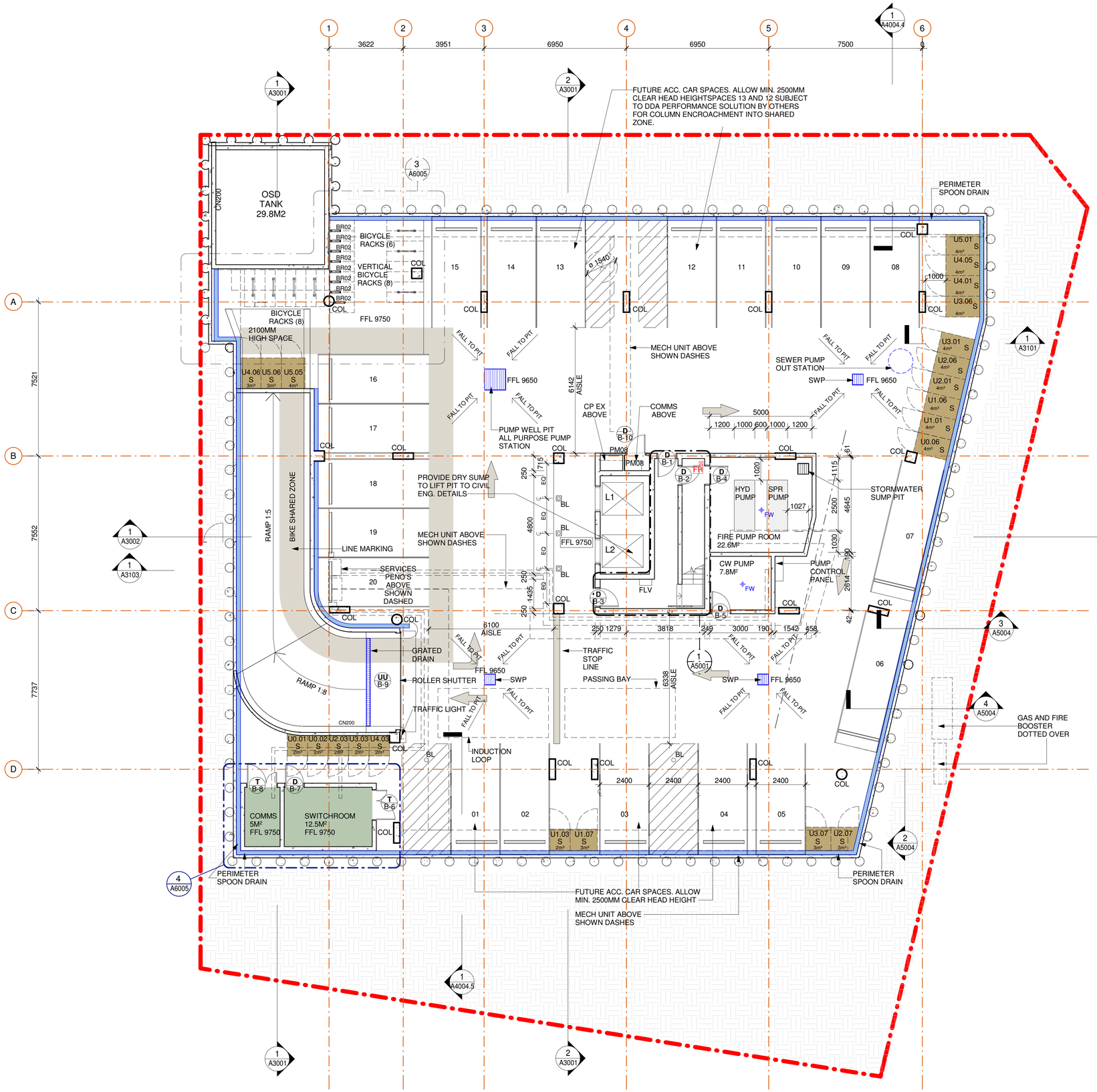
North Point

Drawing Title
SITE DEMOLITION WORKS

Drawing Number A1002
Issue 1



CALCULATIONS

TYPE:	TOTAL NUMBER
STANDARD CAR SPACE	15
DISABLE CAR SPACE	5
BIKE RACK	22

Notes

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NSW Registered Architect Mark David Roach, 10332

Issue	Description	Date
1	PRELIMINARY CONSULTANT ISSUE	05/11/2020
2	FINAL ARCHITECTURAL LAYOUTS	18/11/2020
3	TENDER ISSUE	27/11/2020
4	TENDER ISSUE	18/12/2020
5	TENDER ISSUE	12/02/2021

Issued For Tender

0m 2m 4m 6m 8m 10m

SCALE BAR 1:100 @ A1 ; 1: 200 @ A3

Project
LAHC WARWICK FARM
11-13 MANNIX PARADE, WARWICK FARM

Client
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Drawing Title
BASEMENT LEVEL FLOOR PLAN

Drawing Number A1003
Issue 5

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NSW Registered Architect Mark David Roach, 10332

Issue	Description	Date
1	PRELIMINARY CONSULTANT ISSUE	05/11/2020
2	PRELIMINARY CONSULTANT ISSUE	13/11/2020
3	PRELIMINARY CONSULTANT ISSUE	16/11/2020
4	FINAL ARCHITECTURAL LAYOUTS	18/11/2020
5	GENERAL UPDATE	20/11/2020
6	TENDER ISSUE	27/11/2020
7	TENDER ISSUE	18/12/2020
8	TENDER ISSUE	12/02/2021

Issued For Tender

0m 2m 4m 6m 8m 10m

SCALE BAR 1:100 @ A1 ; 1: 200 @ A3

Project
LAHC WARWICK FARM
11-13 MANNIX PARADE, WARWICK FARM

Client
TAYLOR

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Drawing Title
GROUND LEVEL FLOOR PLAN

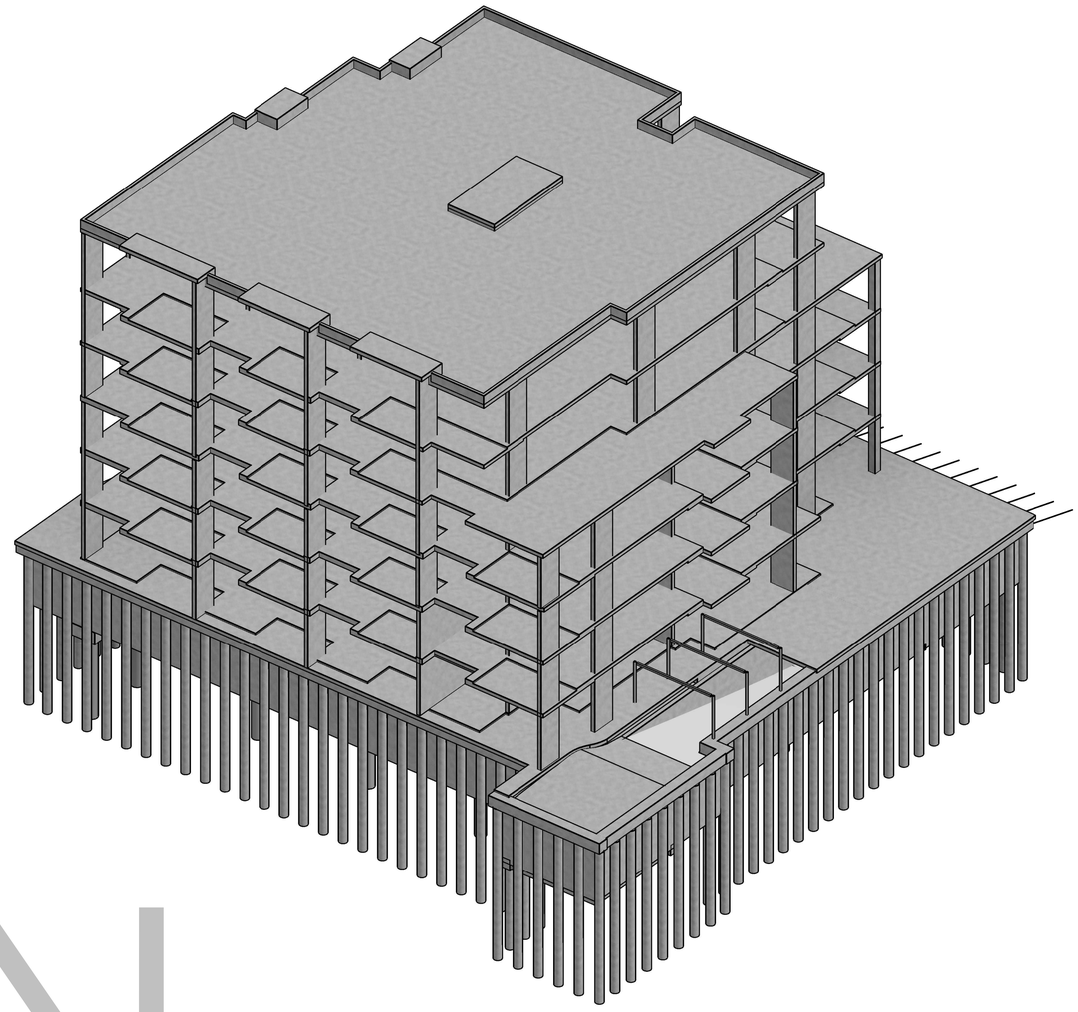
Drawing Number A1004
Issue 8

LAHC WARWICK FARM

11-13 MANNIX PARADE, WARWICK FARM, NSW 2170

20023 - STRUCTURAL DOCUMENTATION

DRG No.	DRAWING TITLE
000	COVER SHEET
001	GENERAL NOTES - SHEET 1
002	GENERAL NOTES - SHEET 2
010	RETENTION NOTES - SHEET 1
011	RETENTION & BULK EXCAVATION PLAN
015	RETENTION ELEVATIONS - SHEET 1
016	RETENTION ELEVATIONS - SHEET 2
020	RETENTION SECTIONS - SHEET 1
027	RETENTION DETAILS - SHEET 1
028	RETENTION DETAILS - SHEET 2
030	FOUNDATION PLAN
048	FOUNDATION TYPICAL DETAILS - SHEET 1
049	FOUNDATION TYPICAL DETAILS - SHEET 2
090	BASEMENT 1 - GENERAL ARRANGEMENT PLAN
091	BASEMENT 1 - RAMP PART PLAN
100	GROUND FLOOR - GENERAL ARRANGEMENT PLAN
106	GROUND FLOOR - TRANSFER LOADING PLAN
110	LEVEL 1 - GENERAL ARRANGEMENT PLAN
120	LEVEL 2 - GENERAL ARRANGEMENT PLAN
130	LEVEL 3 - GENERAL ARRANGEMENT PLAN
140	LEVEL 4 - GENERAL ARRANGEMENT PLAN
150	LEVEL 5 - GENERAL ARRANGEMENT PLAN
160	ROOF - GENERAL ARRANGEMENT PLAN
200	LOADING PLANS - SHEET 1
201	LOADING PLANS - SHEET 2
800	INSITU CONCRETE COLUMN TYPICAL DETAILS - SHEET 1
820	CORE KEY PLANS
825	STAIR AND LIFT CORE ELEVATIONS - SHEET 1
826	STAIR AND LIFT CORE ELEVATIONS - SHEET 2
850	IN-SITU WALL KEY PLANS & ELEVATION
877	IN-SITU WALL DETAILS - SHEET 1
878	IN-SITU WALL DETAILS - SHEET 2
879	IN-SITU WALL DETAILS - SHEET 3
950	TYPICAL SLAB ON GROUND DETAILS - SHEET 1
951	TYPICAL SLAB ON GROUND DETAILS - SHEET 2
960	TYPICAL SUSPENDED SLAB DETAILS - SHEET 1
961	TYPICAL SUSPENDED SLAB DETAILS - SHEET 2
962	TYPICAL SUSPENDED SLAB DETAILS - SHEET 3
965	TYPICAL POST TENSIONING DETAILS - SHEET 1
966	TYPICAL POST TENSIONING DETAILS - SHEET 2
970	R.C. STAIR DETAILS - SHEET 1
980	TYPICAL MASONRY DETAILS - SHEET 1
981	TYPICAL MASONRY DETAILS - SHEET 2



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STRUCTURAL ENGINEERING

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Rev	Description	Eng	Draft	Date
1	WORK IN PROGRESS ISSUE	MA	PAC	18.11.20
2	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
3	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

WEBBER DESIGN
STRUCTURAL ENGINEERING

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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

COVER SHEET

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
	PAC	PW

JOB No.	DRAWING No.	REV.
20023	S-WEB-000	3

A1 0 1 2 3 4 5 6 7 8 9 10

PRINT TIME: 18/12/2020 11:17:27 AM C:\Users\Peter\Documents\W\20\20023 - LAHC Warwick Farm NSW - Central - STRUCTURAL_peter21UEEP.rvt

GENERAL

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS DRAWINGS.
2. THESE ENGINEERING DRAWINGS HAVE BEEN PREPARED FROM INFORMATION AVAILABLE AT THE TIME, AS INFORMATION MAY BE SUBJECT TO CHANGE PRIOR TO OR DURING CONSTRUCTION, THE CONTRACTOR IS REQUESTED TO ADVISE THE ENGINEER WHERE DIFFERENCES OCCUR.
3. THESE DRAWINGS SHALL NOT BE USED FOR FINAL SET OUT OF THE PROJECT UNLESS SPECIFICALLY STATED.
4. ALL WORKS SHALL COMPLY WITH THE CURRENT, RELEVANT SAA CODES AND THE BUILDING CODE OF AUSTRALIA. THE FOLLOWING RELEVANT STANDARDS SHALL BE READ AS PART OF THESE GENERAL NOTES AND COPIES SHALL BE KEPT ON SITE WITH THE CONTRACTUAL DOCUMENTS:

   AS 1554 - SAA WELDING CODE (ALL PARTS)
   AS 1684 - SAA NATIONAL TIMBER FRAMING CODE (ALL PARTS)
   AS 1720 - SAA TIMBER CODE (ALL PARTS)
   AS 2870 - SAA RESIDENTIAL SLABS AND FOOTINGS
   AS 3600 - SAA CONCRETE STRUCTURES CODE
   AS 3610 - SAA FORMWORK FOR CONCRETE CODE
   AS 3700 - SAA MASONRY STRUCTURES CODE
   AS 3798 - SAA GUIDELINES FOR EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS
   AS 4100 - SAA STEEL STRUCTURES CODE
   AS 4600 - SAA COLD-FORMED STEEL STRUCTURE
   NCC 2019 - NATIONAL CONSTRUCTION CODE
5. ALL STRUCTURAL WORK SHOWN ON THESE DRAWINGS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER
6. PERIODICAL INSPECTIONS ARE REQUIRED TO BE PERFORMED BY A DULY APPOINTED INSPECTOR FROM "WEBBER DESIGN PTY. LTD.". THESE INSPECTIONS ARE REQUIRED TO BE PERFORMED IN ACCORDANCE WITH SCOPE OF INSPECTIONS IN SPECIFICATIONS PREPARED. THE INSPECTING ENGINEER IS RESPONSIBLE FOR PERFORMING MONITORING INSPECTIONS ONLY AND NOT SITE WORKS SUPERVISION, WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR TO PROVIDE A MINIMUM OF 24 HOURS NOTICE PRIOR TO INSPECTION.
7. SPECIFICATIONS OR INSTRUCTIONS ON DRAWINGS TAKE PRECEDENCE OVER THESE NOTES.
8. DO NOT SCALE FROM DRAWINGS.
9. DESIGN PARAMETERS ADOPTED FOR THIS PROJECT ARE AS FOLLOWS:

WIND LOADS

REGION	A2
TERRAIN CATEGORY	3
SHIELDING Ms	1
GUST WIND SPEED Vu	46m/s
TOPOGRAPHY Mt	1.0
IMPORTANCE MI	1.0

EARTHQUAKE LOADS (AS1170.2007)

SITE SUB CLASS	Ce
HAZARD FACTOR Z	0.08
BCA IMPORTANCE LEVEL	2.0
PROBABILITY FACTOR, Kp	1.0
EDC	II

SUPERIMPOSED DEAD LOADS (kPa)

RESIDENTIAL	1.0
NON-ACCESSIBLE ROOF	2.0
TERRACES	2.0
BALCONIES	1.5
CARPARK	0.5
BATHROOMS / WET AREAS	2.0
CORRIDOR / FIRE STAIR	0.5
COURTYARD / LANDSCAPE	2.0
SUBSTATION	TBC

LIVE LOADS (kPa)

RESIDENTIAL	1.5
NON-ACCESSIBLE ROOF	1.5
TERRACES	4.0
BALCONIES	2.0
CARPARK	2.5
BATHROOMS / WET AREAS	1.5
CORRIDOR / FIRE STAIR	4.0
COURTYARD / LANDSCAPE	4.0, OR 18.0 (PER METRE OF SOIL DEPTH - WHERE APPLICABLE)
SUBSTATION	TBC

FIRE RATING LIMIT (FRL) FOR STRUCTURAL ADEQUACY

RESIDENTIAL	90 MIN.
CARPARK	120 MIN.

EXPOSURE CLASSIFICATION

A2 INTERNAL
B2 EXTERNAL
B1 SURFACES IN CONTACT WITH THE GROUND

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE AND ADJACENT STRUCTURES IN A STABLE CONDITION. NO PART OF THESE STRUCTURES SHALL BE OVERSTRESSED UNDER CONSTRUCTION ACTIVITIES.
11. ALL PROPS AND FORMWORK FOR FLOOR BEAMS AND SLABS SHALL BE REMOVED BEFORE CONSTRUCTION OF ANY MASONRY WALLS OR PARTITIONS ON THE FLOOR.
12. ALL NON LOAD-BEARING WALLS SHALL BE KEPT 20mm CLEAR OF THE UNDERSIDE OF SLABS AND BEAMS UNLESS NOTED OTHERWISE.
13. CONTRACTOR SHALL RECORD ALL VARIATIONS TO THE DRAWINGS AND BE RESPONSIBLE FOR PRODUCING AS-BUILD DRAWINGS AT THE COMPLETION OF THE WORK AS REQUIRED.
14. NO PENETRATION, DRILLING OR CHASING IN STRUCTURAL ELEMENTS IS PERMITTED WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
15. ALL PROPRIETARY PRODUCTS SPECIFIED ON THESE DRAWINGS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS. ALTERNATIVE EQUIVALENT PRODUCTS MAY ONLY BE USED WITH THE APPROVAL OF THE ENGINEER.
16. CONTRACTOR SHALL SUBMIT TO THIS OFFICE CONSTRUCTION METHODOLOGY, INCLUSIVE OF ALL TEMPORARY ERECTION STRUCTURE PRIOR TO THE COMMENCEMENT OF STEEL INSTALLATION.
17. IT IS A REQUIREMENT THAT ALL BUILDING MATERIALS USED AND INSTALLED ON THE PROJECT MUST BE COMPLIANT WITH THE NATIONAL CONSTRUCTION CODE, THE BUILDING CODE OF AUSTRALIA, THE AUSTRALIAN STANDARDS AND ANY OTHER APPLICABLE LAWS OR REGULATIONS.

BULK EXCAVATION:

1. ALL LEVELS, BATTERS, CONTOUR LINES AND LOCATIONS OF EXISTING SERVICES SHOWN ON PLAN ARE INDICATIVE ONLY AND SHALL BE VERIFIED ON SITE. REFER TO ARCHITECTURAL AND SURVEY PLANS FOR DETAILS.
2. THE CONTRACTOR IS TO NOTIFY ALL SERVICE AUTHORITIES AND ARRANGE FOR DISCONTINUANCE OF SERVICES OR SUPPLY AS APPLICABLE AND CARRY OUT ALL DISCONNECTION OR SEALING OFF OF SERVICES AND DRAINS AS REQUIRED. SERVICES OR SUPPLY LINES THAT ARE TO BE RETAINED SHALL REMAIN UNDAMAGED AND GIVEN ALL NECESSARY PROTECTION AS REQUIRED.
3. THE CONTRACTOR SHALL PROVIDE EFFECTIVE DIVERSION OR REMOVAL OF ALL SURFACE WATER FROM THE PREPARED SUB-GRADE.
4. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED ENVIRONMENTAL TREATMENT OF RUNOFF FROM THE CONSTRUCTION SITE.
5. THE BULK EXCAVATION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE BULK EXCAVATION PLAN.
6. EXCESS EXCAVATIONS SHALL NOT BE PAID FOR AS EXTRA EXCAVATION UNLESS AUTHORISED BY THE SUPER INTENDENT OR THE ENGINEER. EXCESS EXCAVATION SHALL BE FILLED BY THE CONTRACTOR WITH 3% CEMENT STABILISED SAND.
7. BULK EXCAVATION BATTERS AROUND THE PERIMETER OF THE SITE ARE TO BE 1V:1.5.H UNLESS OTHERWISE NOTED.

FOUNDATIONS:

1. THE FOUNDATION IS DESIGNED BASED ON **FINAL** GEOTECHNICAL REPORT NUMBER **20/0955** BY **STS GEOTECHNIQUES** DATED **APRIL 2020**. **STS GEOTECHNIQUES** SHALL BE ENGAGED TO QUALIFY AND ASSESS THE SUITABILITY OF THE FOUNDATION MATERIAL PRIOR TO PLACING CONCRETE.
2. THE BUILDER TO STUDY AND IMPLEMENT ALL RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT AND OTHER RELEVANT RECOMMENDATIONS FROM BUILDING TECHNOLOGY FILE 18 (FORMERLY KNOWN AS CSIRO NOTE 10-9).
3. REFER GEOTECHNICAL REPORT FOR SITE CLASSIFICATION IN ACCORDANCE WITH AS 2870.
4. EXISTING ADJACENT FOOTINGS SHALL NOT BE UNDERMINED. NEW FOOTING FOUNDING DEPTH SHALL MATCH, BUT NOT EXCEED, ADJACENT FOOTING FOUNDING DEPTH. IN THE EVENT THAT UNDERPINNING IS REQUIRED PLEASE CONTACT THIS OFFICE.
5. ANY EXCAVATION WORKS FOR CONSTRUCTION OF FOOTINGS OR RETAINING WALLS SHALL NOT ENCROACH BEYOND 45° LINE OF INFLUENCE.
6. UNLESS NOTED OTHERWISE, WHEREVER A NEW FOOTING IS LOCATED CLOSE TO AN EXCAVATION, BATTER, EXISTING FOOTING, EXISTING SERVICE OR NEW SERVICE WHICH IS DEEPER THAN THE NEW FOOTING; THE EXCAVATION FOR THE NEW FOOTING SHALL BE DEEPENED AND BACKFILLED WITH BLINDING CONCRETE AS SPECIFIED. THE ENGINEER SHALL BE NOTIFIED IF IN DOUBT.
7. THE STRUCTURAL DESIGN HAS BEEN UNDERTAKEN BASED ON THE FOOTING ALLOWABLE BEARING PRESSURES RECOMMENDED BY THE GEOTECHNICAL REPORT.
8. THE SITE SHALL BE STRIPPED, TRIMMED AND GENERALLY PREPARED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT. IN ALL CASES THE SITE SHALL BE STRIPPED OF ALL VEGETATION IN BUILDING AREAS. NO VEGETATION OR ORGANIC MATTER SHALL EXIST IN THE SOIL STRATA BELOW FOOTINGS OR GROUND LEVEL.
9. THE CONTRACTOR IS TO ALLOW FOR ANY ADDITIONAL INVESTIGATIONS AND MATERIAL TESTING DEEMED NECESSARY TO FURTHER ESTABLISH SITE CONDITIONS TO ACHIEVE THE REQUIRED FOUNDATION PARAMETERS.
10. ALL FOUNDATION MATERIALS SHALL BE VERIFIED BY TESTING AT THE EXPENSE OF THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO THE PLACEMENT OF MEMBRANE, REINFORCEMENT OR CONCRETE.
11. UNLESS OTHERWISE NOTED, THE SITE SHALL BE FILLED WITH APPROVED WELL GRADED SAND.
12. NO EXCAVATED MATERIAL FROM SITE SHALL BE SUITABLE FOR BACKFILL WITHOUT PRIOR GEOTECHNICAL ENGINEERS APPROVAL.
13. COMPACT FOUNDATION MATERIAL AND BACKFILL IN LAYERS NOT EXCEEDING 300mm INTERMEDIATE LAYERS TO 95% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289. PROVIDE COMPACTION TEST RESULTS PRIOR TO PROCEEDING.
14. COMPACTION METHODOLOGY SHALL BE VERIFIED BY THE CONTRACTOR TO CAUSE NO DAMAGE TO ADJACENT STRUCTURES.
15. LOWEST LEVEL FOOTINGS SHALL BE POURED FIRST. NO HEIGHT EXCEEDING HALF THE CLEAR DISTANCE BETWEEN FOOTINGS WITH DIFFERENT LEVEL IS PERMITTED.
16. ALL FOOTINGS TO BE LOCATED CENTRALLY UNDER WALLS AND COLUMNS UNLESS OTHERWISE NOTED.
17. BLINDING CONCRETE OF 15MPa SHALL BE PROVIDED TO BACKFILL IN ANY NECESSARY OVER EXCAVATION TO ACHIEVE THE REQUIRED BEARING CAPACITY.
18. PRIOR TO PLACING CONCRETE, ALL FOUNDATIONS ARE TO BE FREE OF WATER OR LOOSE DELETERIOUS MATERIAL.
19. FOOTINGS ARE TO BE FOUNDED 100mm INTO THE NOMINATED MATERIAL UNLESS OTHERWISE NOTED AND PROVIDED WITH A 50mm BLINDING LAYER OF 15MPa CONCRETE.
20. RAFT SLABS AND SLABS ON GROUND SHALL BE UNDERLAIN BY HEAVY DUTY SEALED POLYTHENE VAPOUR BARRIER.
21. BORED PIERS AND PILES ARE TO BE CONSTRUCTED TO WITHIN 75mm OF THE DESIGNATED PLAN LOCATION. TRUE VERTICALITY OF PILES SHALL BE 1/100 OF THE TOTAL LENGTH OF THE PILE. THE CONTRACTOR SHALL ALLOW FOR AND PROVIDE TEMPORARY LINERS AS REQUIRED TO AVOID COLLAPSE IN THE BORED HOLE.
22. ALL GROUND SLABS ARE TO BE UNDERLAIN BY A 50mm MINIMUM DEPTH LEVELLING SAND BED ON ADEQUATE SUBGRADE MATERIAL (50mm CRUSHED ROCK OR TO GEOTECHNICAL ENGINEERS RECOMMENDATIONS.

PILING

1. ALL PILES SHALL BE DESIGNED IN INSTALLED IN ACCORDANCE WITH CURRENT SAA CODES AS 1170, AS 2159 AND AS 3600.
2. THE PILING CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL PILES ARE INSTALLED TO THE REQUIREMENTS OF;
   - STRUCTURAL DRAWINGS
   - PILING SPECIFICATION
   - AUSTRALIAN STANDARDS: AS 1170 (SAA LOADING CODE), AS 2159 (SAA PILING CODE), AS 3600 (SAA CONCRETE STRUCTURES CODE) AND AS 4100 (SAA STEEL STRUCTURES)
   - GEOTECHNICAL INVESTIGATION REPORT.
3. ALL PILES SHALL BE DESIGNED TO ACCOMMODATE A LOAD ECCENTRICITY OF 75mm DUE TO INSTALLATION TOLERANCES ON SITE.
4. THE PILING CONTRACTOR SHALL SUBMIT ALL PILING AND RETENTION DETAILS AND DESIGN CALCULATION TO THE ENGINEER FOR REVIEW. ALLOW MINIMUM OF 5 WORKING DAYS FOR REVIEW PRIOR TO SITE COMMENCEMENT.
5. PILES SHALL BE TESTED IN ACCORDANCE WITH THE SPECIFICATION. PILE TESTS TO BE CARRIED OUT AS FOLLOWS:
   - DYNAMIC TESTING 5%
   - CAPWAP 2%
6. THE PILING CONTRACTOR IS RESPONSIBLE FOR SETTING OUT PILE LOCATIONS.
7. ALL PILE DESIGNS MUST INCORPORATE AN ALLOWANCE FOR ANY DOWN-DRAG DUE TO SOFT SOIL CONSOLIDATION WHERE APPLICABLE.
8. PILES ARE TO BE MONITORED FOR UPWARD HEAVE MOVEMENTS WHERE APPLICABLE. PILES WITH SIGNIFICANT MOVEMENT MAY REQUIRE TO BE RE-DRIVEN.
9. THE DESIGN OF PROPRIETARY BOUNDARY RETENTION SYSTEMS SHALL ENSURE THE SAFETY AND STABILITY OF THE SITE AND ADJACENT STRUCTURES AT ALL TIMES.
10. PILING CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE PRESENCE OF ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF ANY WORKS.

FORMWORK:

1. DESIGN OF FORMWORK AND SUPPORTING STRUCTURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR IN ACCORDANCE WITH AS 3610.
2. REFER OTHER CONSULTANTS DOCUMENTATION FOR ADDITIONAL FIXING REQUIREMENTS.
3. MINIMUM STRIPPING TIMES:
   WALLS AND COLUMNS 7 DAYS
   GENERAL FLOOR 14 DAYS
4. FORMWORK SHALL BE DESIGNED, ERECTED, SUPPORTED, BRACED AND MAINTAINED TO SAFELY SUPPORT ALL VERTICAL AND LATERAL LOADS THAT WILL BE APPLIED UNTIL SUCH LOADS CAN BE SUPPORTED BY THE CONCRETE STRUCTURE.
5. BACK PROP SLABS AND BEAMS TO ENGINEERS APPROVAL FOR A MINIMUM OF 28 DAYS AFTER CASTING.
6. STRIPPING AND BACK PROPPING TIMES MAY BE REDUCED UPON RECEIPT OF STRENGTH TEST RESULTS AT THE DISCRETION OF THE ENGINEER.
7. PRE-CAMBER ALL FORMWORK:
   SLABS AND BEAMS SPAN / 600
   CANTILEVERS SPAN / 200
8. ENSURE DECK IS CLEANED OF ALL DEBRIS PRIOR TO CONCRETING.
9. CONTRACTOR SHALL PROVIDE SOLEBOARDS TO ALL SUPPORT SYSTEM LEGS BEARING ON GROUND OR SUSPENDED FLOOR AND ENSURE THAT THE GROUND OR SUSPENDED FLOOR IS CAPABLE OF SUPPORTING THE MAXIMUM DESIGN LEG LOAD.
10. CONTRACTOR SHALL MONITOR FORMWORK DURING CONCRETE PLACEMENT AND ADJUST FORMWORK IF REQUIRED.
11. CONTRACTOR TO VERIFY THAT ALL PROPRIETARY MANUFACTURED FORMWORK (PROPS, FRAMES, JACKS AND BRACING ETC.) TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

CONCRETE:

1. CONTRACTOR IS TO ENSURE THAT ALL CONCRETE ELEMENTS ARE CONSTRUCTED TO THE MINIMUM SIZE SHOWN ON DRAWINGS.
2. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE APPLIED FINISHES.
3. APPROVED INTERNAL VIBRATORS SHALL BE USED TO COMPACT CONCRETE. CAVITY FILL SHALL BE RODDED.
4. ALL CONCRETE IS TO BE CURED FOR 14 DAYS MINIMUM AFTER POURING OR APPROVED PROPRIETARY SYSTEM. UNLESS OTHERWISE NOTED. SLABS SHALL BE THOROUGHLY WETTED, THEN COVERED FOR A MINIMUM OF 7 DAYS WITH 0.2MM THICK POLYTHENE SHEETING, WHICH SHALL BE SECURELY FIXED AGAINST TRAFFIC AND WIND AND OVERLAPPED 300MM MINIMUM AT JOINTS.
5. CONCRETE SHALL BE READY MIXED BY AN APPROVED SUPPLIER AS BELOW (UNLESS NOTED OTHERWISE):

ELEMENT	SLUMP (mm)	MAX. COURSE AGGREGATE (mm)	MIN. f'c AT 28 DAYS (MPa)
PAD FOOTINGS	80	20	N50
STRIP FOOTINGS	80	20	N50
SLAB ON GROUND INTERNAL	80	20	N32
SLAB ON GROUND EXTERNAL	80	20	N32
CAVITY FILLS	100	10	N20
WALLS	80	20	(REFER SCHEDULE)
COLUMNS	80	20	(REFER SCHEDULE)
INT. SUSPENDED SLABS, BEAMS AND STAIRS	60	20	N40 FOR R.C (REFER SCHEDULE) S40 FOR P.T. (REFER SCHEDULE)
EXT. SUSPENDED SLABS, BEAMS AND STAIRS	60	20	N40

6. TYPE 'GP' PORTLAND CEMENT SHALL BE USED UNLESS OTHERWISE NOTED.
7. ADMIXTURES SHALL NOT ADVERSELY AFFECT THE SPECIFIED CONCRETE PROPERTIES. DO NOT USE ADMIXTURES UNLESS APPROVED BY THE ENGINEER. THE USE OF CALCIUM CHLORIDE, CHLORIDE ADMIXTURES AND SILICA FUME OR FLY ASH AS CEMENT SUBSTITUTES ARE NOT PERMITTED.
8. UNLESS NOTED OTHERWISE, CONCRETE STRENGTH SHALL BE GRADE N32 WITH:
   MINIMUM CEMENT CONTENT OF 320kg/m³
   MAXIMUM WATER CONTENT OF 165l/m³
   COARSE AGGREGATE SIZE OF 20mm, AND
   MAXIMUM SHRINKAGE AT 56 DAYS 600 MICROSTRAINS
9. FOR HIGH STRENGTH CONCRETE (f'c EXCEEDING 40MPa), THE MIX DESIGN SHALL INCLUDE THE FOLLOWING:
   LOW WATER / CEMENT RATIO
   LOW CREEP
   LOW SHRINKAGE (i.e. 600 AVERAGE MICROSTRAINS AT 56 DAYS)
   LOW HEAT HYDRATION
   SUPER-PLASTICISERS ADDITIVES TO INCREASE SLUMP
   SUPPLEMENTARY CEMENTITIOUS MATERIALS SUCH AS SILICA FUME,
   FLY ASH AND GROUND GRANULATED BLAST FURNACE SLAG.
10. CURING IS ESSENTIAL TO PREVENT SELF DESICCATION IN EARLY AGE OF THE CONCRETE.
11. DETAILS OF ALL PROPOSED MIX DESIGNS SHALL BE FORWARDED TO THE ENGINEER PRIOR TO INCORPORATION IN THE WORKS.
12. CAST CONCRETE TO JOINTS SHOWN ON DRAWINGS OR OTHERWISE APPROVED BY THE ENGINEER IN A HIT / MISS PATTERN.
13. THE ENGINEER SHALL BE NOTIFIED WHENEVER THE CURRENT AMBIENT TEMPERATURE OR THE TEMPERATURE FORECAST FOR THE DAY OF THE CONCRETE POUR EXCEEDS 35 DEGREES. ENGINEER AT HIS / HER DISCRETION MAY OR MAY NOT PERMIT CONCRETE BE POURED DURING THAT DAY.
14. ALL COMPONENTS CAST INTO CONCRETE SHALL BE HOT DIP GALVANISED.
15. CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER 7 AND 28 DAY COMPRESSIVE STRENGTH TEST FOR EVERY 50m³ DELIVERED OR DELIVERY TO SITE. CONCRETE TESTING SHALL COMPLY WITH THE REQUIREMENTS OF AS 1379.
16. PROPOSED LOCATION OF CONSTRUCTION JOINT SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
17. DURING PLACEMENT, CONCRETE FALL HEIGHT SHALL BE RESTRICTED TO
   GENERALLY - 1800mm
   FOR WALLS EQUAL TO OR GREATER THAN 200mm THICK - 2700mm
18. TOLERANCE CLASSES TO CONCRETE SURFACES SHALL BE DETERMINED BY A STRAIGHT EDGE PLACED ANYWHERE ON THE SURFACE IN ANY DIRECT AS FOLLOWS:
   CLASS A MAXIMUM DEVIATION FROM 3m STRAIGHT EDGE 3mm
   CLASS B MAXIMUM DEVIATION FROM 3m STRAIGHT EDGE 6mm
   CLASS C MAXIMUM DEVIATION FROM 6m STRAIGHT EDGE 6mm
19. CONCRETE WORKS REQUIRING WATERPROOFING SHALL INCLUDE WATERPROOF ADMIXTURE AS PER MANUFACTURERS RECOMMENDATIONS.
20. CONCRETE SURFACE SHALL BE FINISHED TO BE COMPLIANT WITH THE SPECIFIC REQUIREMENTS FOR ANY APPLIED SURFACE FINISHES INCLUDING CARPET TILES, VINYL FLOOR, TILES, ADHESIVES, OTHER SURFACE APPLICATION, ETC. REFER ARCHITECTURAL SPECIFICATION FOR EXTENT AND FINAL SLAB FINISH REQUIREMENTS.

REINFORCEMENT:

1. REINFORCEMENT IS TO BE MANUFACTURED IN ACCORDANCE WITH AS/NZS 4671 AND AS 1302 AND SHALL BE FIXED AS SHOWN ON REINFORCING PLAN.
2. MATERIAL IS INDICATED BY THE FOLLOWING SYMBOLS

R10	DENOTES 10mm DIAMETER HOT ROLLED PLAIN ROUND BAR
N12	DENOTES 12mm DIAMETER HOT ROLLED DEFORMED BAR
SL82	DENOTES SQUARE WELDED WIRE FABRIC
RL918	DENOTES RECTANGULAR WELDED WIRE FABRIC
4-L12TM	DENOTES 4 MAIN WIRES OF 12mm TRENCH MESH
N	DEFORMED BAR OF GRADE 500
R	ROUND BAR OF GRADE 250
L	LOW DUCTILITY BAR OF GRADE 500
SL	SQUARE WELDED WIRE OF GRADE 500
RL	RECTANGULAR WELDED WIRE MESH OF GRADE 500

3. THE BAR SIZE INDICATED BY A NUMBER AFTER THE ABOVE SYMBOL, WHICH INDICATES THE BAR DIAMETER IN MILLIMETERS. REFER TO NOTE 2 ABOVE FOR EXAMPLE.
4. GRADE 500 REINFORCEMENT TEST CERTIFICATES SHALL BE AVAILABLE FOR WEBBER DESIGN PTY. LTD. FOR APPROVAL PRIOR TO FIXING UPON REQUEST.
5. COVER TO REINFORCEMENT TO BE (UNLESS NOTED OTHERWISE):

TYPE	INTERNAL FACES	EXTERNAL FACES
FOOTINGS / PILE CAPS	-	50
COLUMNS	30	40
WALLS	30	40
RETAINING WALLS	50	50
BEAMS	35	40
SUSPENDED SLABS	25	40
SLABS ON GROUND	30	40
PRECAST	20	30

6. HOOKS AND COGS SHALL COMPLY WITH AS 3600 UNLESS OTHERWISE SHOWN. SLOPES OF CRANKS ARE NOT TO EXCEED 1 IN 6.
7. REINFORCE SLAB RE-ENTRANT CORNERS WITH 2N16 x 1500 BARS PLACED AT 45 DEGREES TIED TO THE INSIDE OF THE REINFORCEMENT.
8. MINIMUM LAPS FOR:
   MESH OVERLAP 2 OUTERMOST TRANSVERSE BARS
   N & R BARS 50 BAR DIAMETERS UNLESS NOTED OTHERWISE
9. REINFORCEMENT SHOWN DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION
10. ALL REINFORCEMENT SHALL BE SECURELY SUPPORTED IN ITS CORRECT POSITION DURING CONCRETING AT 800mm MAXIMUM WIDTH FOR BARS AND 600mm MAXIMUM WIDTHS FOR MESH. BAR CHAIRS IN REINFORCED CONCRETE ARE TO BE IN ACCORDANCE WITH AS / NZS 2425:2015
11. MOVE AFFECTED REINFORCEMENT TO EITHER SIDE OF HOLES IN SLAB UNLESS NOTED OTHERWISE.
12. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL ESTABLISH A WELDING PROCEDURE SUBMITTED TO THE ENGINEER FOR APPROVAL. ALL WELDING OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH AS 1554 PART 3.
13. ALL WELDING TO BE CARRIED OUT BY A QUALIFIED AUSTRALIAN SUPERVISOR, WELDING QUALIFICATION TO BE PRESENTED UPON REQUEST. MAXIMUM WELD SIZE TO BE 4 CFW EACH PASS, WITH E48XX ELECTRODE. THE CONTRACTOR SHALL ENGAGE A WELDING INSPECTOR TO INSPECT THE PROCEDURE AND SITE WELDS.
14. REINFORCEMENT IS NOT PERMITTED TO BE HEATED ABOVE 400 DEGREES
15. NO WELDS PERMITTED WITHIN 50mm OF BAR BENDS.
16. ABBREVIATIONS USED IN DRAWINGS:

EW	EACH WAY
NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
CTR	CENTRAL
T	TOP
B	BOTTOM
LG	BAR LENGTH (NOT INCLUDING COG)
CTS	CENTRES
REINF.	REINFORCEMENT
SEC.	SECONDARY

17. SAFETY MESH TO BE SUPPLIED FOR DEPTHS GREATER THAN 350mm AND INSTALLED AS REQUIRED ONSITE.

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DO NOT SCALE DRAWINGS, USE FIGURED DIMENSIONS

Rev.	Description	Eng.	Draft.	Date
1	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
2	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20

2

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

WEBBER DESIGN
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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

GENERAL NOTES - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW

JOB No.	DRAWING No.	REV.
20023	S-WEB-001	2

PRINT TIME: 18/12/2020 11:17:28 AM C:\Users\Pete\Documents\WD20\20023 - LAHC Warwick Farm NEW - Central - STRUCTURAL_pete@UEEP.rvt

WEBBER DESIGN

A1 0 1 2 3 4 5 6 7 8 9 10

TENDER NOTES:

1. ALL DRAWINGS ARE CURRENTLY BEING COORDINATED WITH ARCHITECT AND SERVICES ENGINEER. BUILDER SHALL MAKE ALLOWANCE WHERE NECESSARY OR RAISE QUERIES FOR CLARIFICATION.

2. SERVICES PENETRATIONS TO BE COORDINATED WITH SERVICES ENGINEER. WHERE RELOCATION IS NOT POSSIBLE, BUILDER SHALL MAKE ALLOWANCE FOR STRUCTURAL REDESIGN AS DEEMED NECESSARY. NO SETDOWN HAS BEEN ALLOWED FOR. IF REQUIRED, ADDITIONAL CONCRETE DEPTH, REINFORCEMENT AND CONCRETE STRENGTH MAY BE REQUIRED.

3. REFER TO ARCHITECT FOR ALL ARCHITECTURAL FACADE TREATMENT.

4. BUILDER SHALL MAKE ADDITIONAL ALLOWANCE FOR CONSTRUCTION SEQUENCE/JOINTS/POUR STRIPS, ADDITIONAL REINFORCEMENT AND ADDITIONAL LOADING CAPACITY. THESE DOCUMENTATIONS ARE FOR THE BASE BUILDING STRUCTURAL REQUIREMENTS ONLY. ANY CONSTRUCTION RELATED WORKS, REDESIGN AND COST ARE EXCLUDED. BUILDER TO MAKE NECESSARY ALLOWANCE AS REQUIRED.

5. ALTERNATIVE METAL DECK COMPOSITE FORMWORK SHALL BE IN EQUIVALENT TO DECK SPECIFICATION NOMINATED. CERTIFICATES OF COMPLIANCE SHALL BE PROVIDED PRIOR TO CONSTRUCTION.

6. ADDITIONAL BUILDING MAINTENANCE ACCESS SYSTEM FIXING AND LOADING REQUIREMENT SHALL BE REVIEWED AND ALLOWED FOR.

7. REFER ARCHITECTURAL FOR OTHER SECONDARY STRUCTURAL STEEL (NON-BASE BUILDING RELATED) SUCH AS HAMPER TRUSS, CEILING FRAME, BALUSTRADES, ARCHITECTURAL FEATURE WALL, FENCE. WHERE NOT DOCUMENTED, BUILDER SHALL MAKE ADEQUATE ALLOWANCE.

8. EDGE TREATMENTS (Eg. PRECAST, SLAB THICKENINGS, LIGHTWEIGHT FACADE, CAST-IN PFC EDGE, ETC.) TO ALL SUSPENDED RESIDENTIAL SLABS ARE CURRENTLY BEING REVIEWED ALONG WITH ITS CORRESPONDING CANTILEVER SPAN. THE EXTERNAL COLUMNS MAY NEED TO BE ADJUSTED TO SUIT SLAB THICKNESS NOMINATED ALTERNATIVELY, CANTILEVER SPAN WILL NEED TO BE THICKENED WITH REVISED SPECIFICATION. TRANSFER SLAB AND BEAM SHALL BE REVIEWED ACCORDINGLY.

9. ALL ARCHITECTURAL FACADES ARE BEING COORDINATED AND UNDER REVIEW FOR ADEQUATE STRUCTURAL CAPACITY, STRUCTURAL SUPPORT AND PANEL BREAK UPS. BUILDER TO MAKE ALLOWANCE AS NECESSARY FOR TRANSPORTATION AND REDESIGN.

10. THE CLIENT REQUIRES ALL ADDITIONAL DOCUMENTATION WHICH RELATES TO BULDERS ALTERNATIVE STRUCTURAL SOLUTION, NON BASE STRUCTURE RELATED SECONDARY STEELWORK SHALL BE CARRIED OUT BY WEBBER DESIGN AND ADDITIONAL CERTIFICATION COST BY OTHERS SHALL BE BORNE BY THE BUILDER.

POST TENSIONING:

1. THE POST TENSIONING CONTRACTOR / INSTALLER IS TO ENSURE ALL STRESSING EQUIPMENT SHALL POSSESS CURRENT CALIBRATION CERTIFICATES, AVAILABLE TO THE ENGINEER UPON REQUEST.

2. ALL POST TENSIONING AND PRE-STRESSED WORKS SHALL BE IN ACCORDANCE WITH AS 3600 AS A MINIMUM.

3. ALL CABLE DRAPES ARE SHOWN TO THE UNDERSIDE OF THE DUCT, DIMENSIONS TO LIVE AND DEAD ENDS ARE MEASURED TO THE CENTRE OF CONCRETE DEPTH.

   (a) TENDONS SHALL BE PROFILED AND LOCATED IN ACCORDANCE WITH THE DRAWING USING CHAIR SUPPORTS OR SIMILAR OF THE SPECIFIED HEIGHTS. TENDONS SUPPORTS SHALL BE SUPPLIED AND INSTALLED TO A VERTICAL TOLERANCE OF ± 2.0mm.

   (b) SUPPORT CHAIRS SHALL BE EVENLY SPACED BETWEEN HIGH POINTS AND AT A NOMINAL MAXIMUM SPACING OF 1200mm.

   (c) SPECIFIED PROFILE HEIGHTS ARE GIVEN FROM SOFFIT OF SLAB/BEAM TO:
   - UNDERSIDE OF DUCT ALONG TENDON LENGTH (U.N.O)
   - CENTRE LINE OF ANCHOR AT END ANCHORAGES (U.N.O.)

4. ALL BAND & EDGE TENDONS ARE TO HAVE ONIONED DEAD ENDS WITH THE FREE LENGTH OF THE STRAND TAPED AND GREASED TO ENSURE LOAD TRANSFER TO THE DEAD END ANCHORAGE.

5. ALL PRE-STRESSING CABLES TO CONSIST OF SUPER STRESS RELIEVED LOW RELAXATION STRANDS (TO AS1311) SHALL BE:

   12.7mm STRANDS
   - 184kN MINIMUM BREAKING LOAD
   - MAXIMUM JACKING LOAD = 85% OF BREAKING LOAD = 156 kN/STRAND
   - STRESS PER STRAND - JACKING FORCE:
     25% = 39kN (24 HOURS MAX. OR 7MPa)
     100% = 156 kN (7 DAYS OR 22MPa)

   15.2mm STRANDS
   - 250kN MINIMUM BREAKING LOADS
   - MAXIMUM JACKING LOAD 85% = OF BREAKING LOAD = 212kN / STRAND
   - STRESS PER STRAND - JACKING FORCE:
     25% = 53kN (24 HOURS MAX. OR 9MPa)
     100% = 212 kN (7 DAYS OR 25MPa)

6. STRESS ALL STRANDS 25% AT 24 HOURS AND THEN 100% WHEN CONCRETE STRENGTH REACHES 25MPa.

7. THE END OF ALL STRANDS SHALL BE SPRAY PAINTED (OR SIMILAR) 100mm FROM ANCHORAGE SO THAT THE EXTENSION CAN BE CLEARLY SEEN BY THE ENGINEER.

8. TENDON EXTENSIONS SHALL BE MEASURED TO THE ACCURACY OF 3mm. THE STRANDS SHALL NOT BE CUT AND DUCTS CONTAINING TENDONS GROUTED UNTIL THE ENGINEER APPROVES THE STRANDS EXTENSIONS. A MINIMUM OF 24 HOURS NOTICE IS REQUIRED PRIOR TO THE ENGINEERS APPROVAL.

9. THE SPECIALIST CONTRACTOR SHALL BE RESPONSIBLE FOR THE PERFORMANCE OF ANCHORAGES AND SUPPLY ANY ADDITIONAL ZONE REINFORCEMENT DEEMED NECESSARY.

10. THE STRESSING CONTRACTOR SHALL SUBMIT 2 COPIES OF THE SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL SETTING OUT:

    a. PROPOSED ORDER OF STRESSING
    b. DETAILS OF ALL INTERMEDIATE DRAPES
    c. DETAILS OF ALL ANCHORAGES

11. TENDON PROFILES GENERALLY SHALL BE PARABOLIC WITHIN SPANS U.N.O. SLAB TENDON PROFILES SHALL BE HORIZONTAL OVER BAND BEAMS. REFER TO PLANS FOR CHAIR HEIGHTS.

12. TENDON ANCHORAGE POSITIONS (IN PLAN) SHALL BE AS PER SETOUT ON DRAWINGS (TOLERANCE ±20mm). MINOR DEVIATIONS FROM SPECIFIED PLAN ALIGNMENT MAY BE ALLOWED BETWEEN ANCHORAGES (TOLERANCE ± 100mm), HOWEVER REFER ANY DISCREPANCIES AND/OR OBSTACLES TO BUILDER/DESIGN ENGINEER FOR DIRECTION PRIOR TO TENDON INSTALLATION.

13. TENDON PROFILE AND/OR ALIGNMENT SHALL HAVE PRIORITY OVER OTHER REINFORCEMENT OR CAST IN ITEMS (CONDUITS ETC)

14. TOTAL JACKING FORCE = 156 kN/STRAND (85% OF THE STRAND BREAKING LOAD)

15. DUCT TO BE 19mm FLAT DUCT FOR SLAB POST TENSIONING. 75mm OR 90mm WIDE DEPENDING ON NUMBER AND SIZE OF STANDS.

16. STRAND EXTENSIONS TO BE FORWARDED TO THIS OFFICE FOR APPROVAL WHERE DESIGNED BY WEBBER DESIGN.

17. RECORD AND REVIEW STRAND EXTENSIONS ON COMPLETION OF STRESSING. SUBMIT FINAL EXTENSIONS TO THIS OFFICE PRIOR TO PROCEEDING WITH FURTHER WORK.

18. TENDON GROUTING SHALL BE CONDUCTED WITHIN 14 DAYS OF APPROVAL OF FINAL EXTENSIONS.

19. CONCRETE SAMPLES FOR TRANSFER STRENGTH TESTS SHALL BE SITE CURED UNDER CONDITIONS CONSISTENT WITH THE CONCRETE POUR. (TYPICALLY AIR CURED).

20. WHERE DRAPE IS DEEMED CLASHING, ADJUST SLAB TENDONS LOCALLY TO ACHIEVE NOMINATED DRAPE. REFER WEBBER DESIGN FOR CLARIFICATION IF IN DOUBT.

21. IF IN DOUBT WITH THE QUALITY OF THE CONCRETE AT TIME OF STRESSING, REFER TO ENGINEER FOR DIRECTION AND ADVICE.

22. POST TENSION TO COMPLY WITH FOLLOWING CRACK CONTROL REQUIREMENTS (U.N.O. ON PLAN):

- INTERNAL AREAS	MODERATE
- EXTERNAL AREAS (BALCONIES, TERRACES, ROOF)	STRONG
- AREAS IN CONTACT WITH GROUND	STRONG

DESIGN AND CONSTRUCTION POST TENSIONING FLOOR SLAB AND BEAM DESIGN BRIEF:

1. THE SUSPENDED FLOOR SLABS ARE A DESIGN AND CONSTRUCT COMPONENT. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, CERTIFICATION, CONSTRUCTION AND PRICING ASPECTS OF THIS COMPONENT. ANY RATES SUPPLIED ARE INDICATIVE ONLY AND SHOULD BE VERIFIED BY THE CONTRACTOR BASED ON THEIR PREFERRED DESIGN.

2. THE CONTRACTOR IS RESPONSIBLE FOR ALL SUSPENDED FLOOR SLABS AND ROOF SLAB, EXCLUDING SLAB TO LIFT OVERRUN.

3. COMPUTATIONS SHALL BE SUBMITTED TO WEBBER DESIGN FOR REVIEW AND APPROVAL. COMPUTATIONS PROVIDED SHALL BE REFERENCED WITH PAGES AND IN ITS ENTIRETY. IF DESIGN INPUT AND OUTPUT IS LIMITED DUE TO LIMITATION OF DESIGN SOFTWARE, THE SOFTWARE FILE SHALL BE PROVIDED AS PART OF THE SUBMISSION.

4. SHOP DRAWINGS SHOWING COMPLETE TENDON PROFILES, POST TENSIONING DETAILS, ANCHOR DETAILS AND ADDITIONAL REINFORCEMENT REQUIRED FOR CONSTRUCTION MUST BE SUBMITTED WITH THE COMPUTATIONS FOR REVIEW AND APPROVAL BY WEBBER DESIGN.

5. THE CONCRETE PROFILE SHOWN HEREIN REPRESENTS A COORDINATED STRUCTURE. THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE HOWEVER THE SUPERINTENDENT IS NOT BOUND TO ANY ALTERNATIVE.

GENERAL DESIGN CRITERIA:

THE DESIGN SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS AND SPECIFIC PROJECT REQUIREMENTS.
IN ADDITIONAL THE DESIGN SHALL COMPLY WITH THE RELEVANT STRUCTURAL ITEMS NOTED BELOW:

1. THE POST TENSIONING CONTRACTOR SHALL ENSURE POTENTIAL INTERNAL FORCES AND CRACKS INDUCED BY PRESTRESSING, SHRINKAGE, AND/OR TEMPERATURE ARE CONTROLLED IN THE VICINITY OF RESTRAINING ELEMENTS AND MAKE PROVISION FOR MOVEMENT AND SHRINKAGE AS REQUIRED THROUGHOUT, INCLUDING MOVEMENT JOINTS, POUR STRIPS, LOW SHRINKAGE CONCRETE MIX ETC.

2. NO COLUMN STIFFNESS SHOULD BE USED IN THE SLAB AND BEAM DESIGN.

3. SLABS TO BE CHECKED FOR PUNCHING WITH MOMENT DERIVED WITH 100% COLUMN STIFFNESS. PT CONTRACTOR TO MAKE ALLOWANCE FOR SHEAR HEAD REINFORCEMENT (WHERE REQUIRED) TO SATISFY PUNCHING SHEAR REQUIREMENTS.

4. Ieff TO Igross MAX RATIO TO BE DETERMINED BY THE DESIGNER BUT IN NO INSTANCE SHALL BE GREATER THAN 0.7 FOR THE SLAB AND BEAM CALCULATIONS.

5. DEFLECTION CRITERIA SHALL GENERALLY BE IN ACCORDANCE WITH AS3600 SUBJECT TO THE FOLLOWING, MAXIMUM LONG TERM DEFLECTIONS SHALL GENERALLY BE LIMITED TO:
   - TYPICAL SLAB AND BEAMS -- SPAN/250 OR 20mm MAXIMUM, CANTILEVERS --SPAN/125 OR 15mm MAXIMUM.
   - SLABS AND BEAMS SUPPORTING BRITTLE ELEMENTS -- SPAN/500, CANTILEVER -- SPAN/250 INCREMENTAL.
   - TRANSFER SLABS AND BEAMS -- SPAN/1000 OR 10mm MAXIMUM.
   - DIFFERENTIAL DEFLECTION BETWEEN FLOORS TO BE LIMITED TO SPAN/500 OR 15mm AT FACADE LOCATIONS.

6. POST TENSIONING CONTRACTOR SHALL ALLOW FOR LIVE LOAD PATTERNING FOR CANTILEVERS AND AREAS WITH LOCALIZED OR HIGH LIVE LOADS (LOADING DOCK AND CAR PARK) IN ACCORDANCE WITH AS3600.

7. REFER LOADING DRAWINGS FOR ALL GENERAL IN-SERVICE APPLIED LOADS. ALL ADDITIONAL APPLIED LOADS (BLOCK WALLS, PRECAST PANELS ETC) SHALL BE ADDITIONAL AS PER THE ARCHITECTS DRAWINGS.

8. ALL SPECIFIC TRANSFER LOADS SHALL BE DETERMINED BY THE DESIGN ENGINEER AND SUBMITTED TO WEBBER DESIGN FOR REVIEW AND APPROVAL WITH THE COMPUTATIONS. ANY ADDITIONAL LATERAL LOAD SHALL BE ALLOWED FOR ACCORDINGLY. (REFER WEBBER DESIGN FOR CONFIRMATION)

9. POST TENSIONING CONTRACTOR SHALL COORDINATE ALL SLAB SERVICE PENETRATIONS FOR TENDON AND REINFORCEMENT LAYOUT.

10. ALL MOVEMENT JOINTS AND DETAILING SHALL BE BY THE DESIGN ENGINEER AND BE CO-ORDINATED WITH THE ARCHITECT WHERE APPLICABLE.

11. ALL POST TENSION SLABS AND BEAMS ARE TO BE EDGE STRESSED (ACCESSIBILITY, POUR SEQUENCE AND SITE CONDITIONS PENDING) SHOULD PAN STRESSING BE REQUIRED, BUILDER TO COORDINATE WITH POST-TENSION CONTRACTOR.

12. PT CONTRACTOR TO MAKE ALLOWANCE FOR STRUCTURAL INTEGRITY REINFORCEMENT IN ACCORDANCE WITH CL9.2.2 OF AS3600-2018 FOR ALL SLABS AND BEAMS

13. PT CONTRACTOR TO PROVIDE A MINIMUM P/A OF 1.4MPA (AFTER FINAL LOSSES) TO ALL INTERNAL CONCRETE SLABS AND BEAMS, AND 2.0 MPa (AFTER FINAL LOSSES) TO ALL EXTERNAL AREAS (BALCONIES, TERRACES, EXPOSED ROOFS, ETC.) PLUS SL82 TOP MESH U.N.O.

14. ALL EXPOSED SLABS/BEAMS CRACK WIDTH TO BE LIMITED TO 0.3MM MAX

15. REFER TO ARCHITECT'S DRAWINGS FOR ALL SETDOWN, STEPS, HOBS, KERBS DRIP GROOVES, FALLS AND RECESSES U.N.O. SLAB THICKNESSESS SHOWN ARE MINIMUM.

16. ALL HOBS ARE NON-STRUCTURAL. TYP. UNO.

17. BUILDER TO COORDINATE LOCATION OF CONSTRUCTION JOINT WITH APPOINTED SLAB DESIGNER.

18. SAFETY MESH IS TO BE SUPPLIED FOR DEPTHS GREATER THAN 350MM AND INSTALLED AS REQUIRED ONSITE. ENSURE ALLOWANCE IS MADE FOR SAFETY MESH.

19. PROVIDE WATERPROOF SHEET MEMBRANE TO ALL EXTERNAL SLABS TO ARCHITECT'S AND CONTRACTOR'S DETAILS U.N.O.

STRUCTURAL STEEL:

1. REFER TO ARCHITECTS DRAWINGS FOR ANY ADDITIONAL INCIDENTAL AND SECONDARY STEELWORK REQUIRED NOT SHOWN ON STRUCTURAL DRAWINGS.

2. UNLESS OTHERWISE NOTES ALL STRUCTURAL STEEL SHALL BE:
   - GRADE 300 PLUS FOR UB, UC, WB, WC, PFC, ANGLES, FLATS AND HOT ROLLED PLATES
   - GRADE 350 FOR RHS, CHS AND SHS

3. BOLTS SHALL BE
   - 8.8/S HIGH STRENGTH STRUCTURAL BOLTS OF STRESS GRADE 8.8 TO AS 1252 TIGHTENED TO A SNUG TIGHT CONDITION
   - 8.8/TB HIGH STRENGTH STRUCTURAL BOLTS OF STRESS GRADE 8.8 TO AS 1252 FULLY TENSIONED TO AS 4100 AS A BEARING JOINT
   - 8.8/TF HIGH STRENGTH STRUCTURAL BOLTS OF STRESS GRADE 8.8 TO AS 1252 FULLY TENSIONED TO AS 4100 AS A FRICTION JOINT
   - 4.6/S COMMERCIAL GRADE BOLTS TO STRESS GRADE 4.6 TO AS 1252 TIGHTENED TO A SNUG TIGHT CONDITION

4. ALL WELDS SHALL BE 6mm CONTINUOUS FILLET FROM E48XX ELECTRODES, ALL WELDS SHALL BE CATEGORY SP UNLESS NOTED OTHERWISE.

5. ALL CLEATS AND GUSSETS SHALL BE 10mm PLATE UNLESS NOTED OTHERWISE.

6. ALL EXPOSED STEELWORK SHALL BE HOT DIP GALVANISED UNLESS NOTED OTHERWISE.

7. ALL HOLLOW SECTIONS SHALL BE FULLY SEALED USING 5mm PLATES UNLESS NOTED OTHERWISE. PROVIDE BLOW HOLES TO ALL GALVANISED SECTIONS.

8. SHOP DRAWINGS TO BE SUBMITTED FOR DOCUMENTATION COMPLIANCE REVIEW PRIOR TO FABRICATION. ALL 5 WORKING DAYS FOR REVIEW. REVIEW DOES NOT INCLUDE CHECKING OF DIMENSIONS.

9. ALL PRE-CAMBERS TO BE NATURAL CAMBER WITH UNIFORM CURVE TO BE UPWARDS.

10. STEELWORK SHALL BE IN ONE LENGTH, UNLESS OTHERWISE APPROVED. REFER TO DRAWINGS FOR ALL SPLICE LOCATIONS.

11. ALL HOLES SHALL BE 2mm OVERSIZED IN CLEATS, 10mm OVERSIZED FOR H.D. BOLT DIAMETERS IN BASE PLATES WITH 50x50x6.0 MINIMUM WASHERS.

12. USE WASHERS UNDER ALL NUTS.

13. ALL BOLTS TO BE GRADE 8.8/S, SNUG TIGHTENED UNLESS NOTED OTHERWISE.

14. ALL MEMBERS SHALL BE ERECTED FREE FROM TWISTS AND DISTORTIONS.

15. ALL SEATING AND BASE PLATES SHALL BE FULLY GROUTED WITH NON-SHRINK GROUT WITH PROPRIETARY DRY PACK SYSTEM.

16. ALL COLD FORMED STEEL TO CONFORM WITH AS/NX 4600 AND MANUFACTURERS SPECIFICATIONS.

17. PURLIN & GIRT BOLTS AND CLEAT PLATES AS PER MANUFACTURERS RECOMMENDATIONS.

18. UNLESS NOTED OTHERWISE, FIX HANGING STRAPS, RODS, BRACES AND THE LIKE FOR DUCTWORK, CONDUITS, PIPES ETC. TO PURLIN WEBS ONLY.

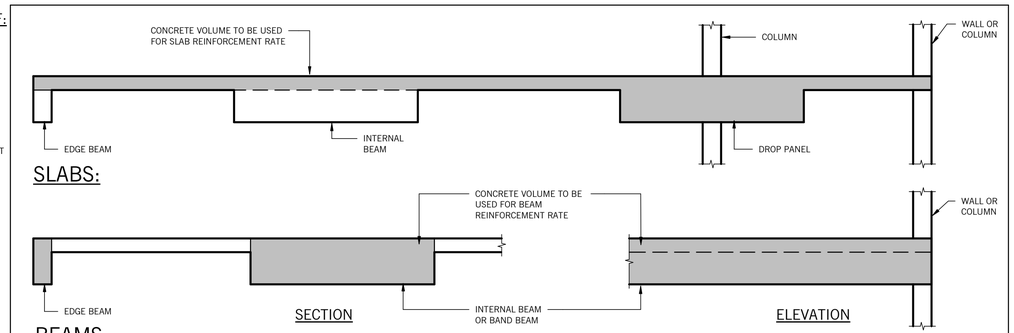
19. ARCHITECTURAL / OTHER SERVICES FIXINGS AND REQUIREMENTS ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS.

20. MINIMUM BRIDGING REQUIREMENTS FOR STEEL PURLINS SHALL BE 2 ROWS IN END SPANS AND 1 ROW IN INTERNAL SPANS FOR ANY SPANS MORE THAN 2500mm UNLESS NOTED OTHERWISE.

21. ALL ROOF BRACING TO BE HOOK BOLTED TO THE WEB OF THE PURLINS AND BRACED WITH 10mm DIAMETER HOOK BOLTS.

22. ALL WALL AND ROOF BRACING TO BE INSTALLED PRE-TENSIONED, FREE FROM DISTORTIONS AND DEVIATIONS. ALL RODS TO HAVE TURNBUCKLES OR SIMILAR DEVICE.

23. CONTRACTOR SHALL SUBMIT TO THIS OFFICE CONSTRUCTION METHODOLOGY, INCLUSIVE OF ALL TEMPORARY ERECTION STRUCTURE PRIOR TO THE COMMENCEMENT OF STEEL INSTALLATION.



WALLS, COLUMNS:

METHOD OF MEASURING REINFORCEMENT:

THE FOLLOWING CONCRETE VOLUMES ARE TO BE USED IN CONJUNCTION WITH OUR NOMINATED REINFORCEMENT RATES NOTED IN kg/m³ FOR PARTICULAR STRUCTURAL ELEMENTS TO CALCULATE REQUIRED STEEL TONNAGE OF BASIC REINFORCEMENT.

THE REINFORCEMENT RATE NOTES APPLY THROUGH INTERSECTING ELEMENTS. IN SIMPLE IT IS DESIGNED THAT WAY, DRAWN THAT WAY, CONSTRUCTED THAT WAY AND IS TO BE MEASURED THAT WAY.

THE RATES QUOTED IN OUR DOCUMENTATION DO NOT INCLUDE THE FOLLOWING ITEMS WHICH SHOULD BE ALLOWED FOR SEPARATELY BY THE CONTRACTOR AND/OR SUBCONTRACTOR.

- ROLLING MARGIN.
- PULL OUT BARS.
- REID BAR CONNECTORS OR SIMILAR.
- P.T. ANTI BURST REINFORCEMENT.
- P.T. ADDITIONAL REINFORCEMENT FOR PAN STRESSING IN LIEU OF EDGE STRESSING. AN ADDITIONAL ALLOWANCE OF 20 kg/PAN SHOULD BE ALLOWED.
- CAST IN FERRULES OR ASSOCIATED REINFORCING REQUIRED FOR ANY FACADE ELEMENTS.
- BAR CHAIRS.
- SAFETY MESH TO PENETRATIONS OR ANY ADDITIONAL WALK MESH.
- TRIMMERS TO SERVICES PENETRATION.
- CONSTRUCTION JOINT REINFORCEMENT. AN ALLOWANCE OF 20 kg/m OF ADDITIONAL REINFORCEMENT TO THE SLAB SHOULD BE USED WHERE THE JOINT IS LOCATED AT APPROXIMATELY QUARTER SPAN IN A LOW STRESS AREA. BEAM CONSTRUCTION JOINT REQUIREMENTS ARE ADDITIONAL AND SUBJECT TO FINAL DESIGN.
- BUILDERS EQUIPMENT REQUIREMENT SUCH AS LOADING BAYS, ALIMAK, BOOM PUMP, CRANE BASE, BINS ETC.
- THE CONTRACTOR SHALL ALLOW FOR ADDITIONAL REINFORCEMENT IF REQUIRED FOR ANY CONSTRUCTION JOINTS,
- TEMPORARY PENETRATIONS REQUIRED IN SLABS DURING CONSTRUCTION.

METHOD OF MEASURING POST TENSIONING

THE FULL SLAB AREA DEFINED BY THE BUILDING PERIMETER INCLUSIVE OF PENETRATIONS, LIFT CORES, ETC. IS TO BE USED IN CONJUNCTION WITH OUR NOMINATED P.T. RATES NOTED IN kg/m² TO CALCULATE REQUIRED P.T. TONNAGE.

FOR SPECIFIC BEAMS OR SLABS WHERE NOTED ACTUAL CABLE AND STRAND NUMBERS SHOULD BE USED AND ARE ADDITIONAL TO THE NOMINATED kg/m² RATES.

STEEL FRAMING TENDER NOTE:

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL DRAWINGS BY THE STEEL FABRICATOR TO ENSURE AN ACCURATE APPROACH TO ALL MAJOR AND SECONDARY STEEL ITEMS ARE PRICED. NOT ALL SECONDARY STEEL IS NOTED ON THE STRUCTURAL DRAWINGS.

MASONRY:

1. ALL WORKMANSHIP TO BE IN ACCORDANCE WITH AS 3700.

2. THE DESIGN OF UNCONFINED COMPRESSIVE STRENGTH OF MASONRY SHALL BE AS FOLLOWS WITH RESPECTIVE MORTAR MIX (CEMENT:LIME:SAND):

- INFILL BLOCK WALLS	15MPa	1:1:6
- LOAD-BEARING BLOCK WALLS	15MPa	1:0.25:3
- INFILL BRICK WALLS	40MPa	1:1:6
- LOAD-BEARING BRICK WALLS	40MPa	1:0.25:3

3. NO MORTAR ADMIXTURES ARE PERMITTED WITHOUT PRIOR APPROVAL BY THE ENGINEER.

4. NO CHASES ARE ALLOWED FOR LOAD-BEARING MASONRY WITHOUT PRIOR APPROVAL BY THE ENGINEER.

5. MORTAR JOINTS SHALL BE 10mm THICK WITH MAXIMUM TOOLED DEPTH OF 3mm UNLESS NOTED OTHERWISE.

6. CLEAN-OUT HOLES SHALL BE PROVIDED AT THE BASE OF ALL CORES OR CAVITIES WHICH ARE TO BE GROUTED OR FILLED.

7. REINFORCING STEEL SHALL BE SECURELY FIXED IN POSITION BEFORE GROUTING.

8. ALL MORTAR OBSTRUCTIONS SHALL BE REMOVED FROM CORE AND CAVITIES WALL PRIOR TO GROUTING.

9. GROUT SHALL BE THOROUGHLY COMPACTED USING A PLAIN BAR.

10. ALL GROUT FOR INFILL (BOND BEAMS, CORE FILLING, CAVITY FILLING, ETC) SHALL BE
    - fc=20MPa MINIMUM
    - MORTAR MIX (CEMENT:LIME:SAND) OF 1:0.25:3
    - 10mm AGGREGATE
    - MINIMUM CEMENT CONTENT OF 300kg/m³
    - MAXIMUM SLUMP TO BE 230mm
    - FILLED IN 1000mm MAXIMUM LIFTS.

11. CONTROL JOINTS SHALL BE PLACED IN ALL MASONRY WALLS AT 4000mm MAXIMUM VERTICALLY AND 8000mm MAXIMUM HORIZONTALLY AT LOCATIONS AS SHOWN ON THE ARCHITECTURAL DRAWING AND:
    - AT MAJOR CHANGES IN WALL HEIGHT
    - AT CHANGES IN WALL THICKNESS OTHER THAN FOR PIERS AND BUTTRESSES
    - AT CONTROL JOINTS IN FOOTING, FLOOR SLABS AND ROOF SLABS.
    - AT CHASES AND RECESSES FOR PIPES, COLUMNS, FIXTURES, ETC.
    - AT ONE OR BOTH SIDES OF WALL OPENING
    - NEAR WALL INTERSECTIONS
    - NEAR RETURN ANGLES IN "L", "T" AND "U" SHAPED STRUCTURES. THE BUILDER SHALL SUBMIT TO THE ENGINEER DRAWINGS OF PROPOSED CONTROL JOINT LOCATIONS AND LAYOUT FOR REVIEW AND COMMENT PRIOR TO THE START OF LAYING BLOCKS AND BRICKS.

12. WALL TIES SHALL BE PROVIDED AT 600mm MAXIMUM HORIZONTALLY AND VERTICALLY WITH 300mm MAXIMUM FROM EDGE OF WALL AND SHALL CONSIST OF 3.1mm DIAMETER, GALVANISED WIRE UNLESS NOTED OTHERWISE ON THE DRAWINGS.

13. ALL MASONRY IS TO BE FIXED TO ADJOINING CONCRETE AND/OR STEEL SUPPORTING MEMBERS BY MFA 3/3 MASONRY ANCHORS (OR EQUIVALENT) AT 600mm MAXIMUM VERTICALLY AND MFA 4/M MASONRY ANCHORS (OR EQUIVALENT) AT 1000mm MAXIMUM HORIZONTALLY UNLESS NOTED OTHERWISE.

14. MASONRY IS NOT TO BE ERECTED OFF SUSPENDED WORK UNTIL FORMWORK AND FALSEWORK SYSTEMS PROVIDING SUPPORT HAS BEEN REMOVED.

15. NO ATTACHMENTS (e.g. SIGNAGE, AWNINGS, FLAG POLES, BALUSTRADE) TO MASONRY WALL ARE PERMITTED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.

16. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE THE DESIGN OF ALL BRACING, PROPPING AND NEEDLING REQUIRED FOR THE MASONRY WORKS.

17. REFER TO MANUFACTURERS SPECIFICATIONS FOR MASONRY ANCHOR INSTALLATION REQUIREMENTS.

18. THE OBSERVATION OF CONSTRUCTION OF NON LOAD-BEARING MASONRY WALLS / PARTITIONS AND OTHER NON LOAD-BEARING ELEMENTS IS NOT INCLUDED IN THE ENGINEERS SCOPE OF WORKS.

WATERPROOFING NOTE:-

CONCRETE IN WALLS, FLOOR SLABS EXPOSED TO EXTERNAL WEATHER AND BASE OF ALL PITS TO CONTAIN WATERPROOFING ADDITIVE, E.G. XYPEX ADMIX C-1000NF OR EQUIVALENT, TO MANUFACTURERS RECOMMENDATIONS. APPLY A SLURRY COAT OF WATERPROOFING ADDITIVES TO CONSTRUCTION JOINTS. ALSO REFER TO MANUFACTURERS RECOMMENDATIONS. ALL CONSTRUCTION JOINTS AND PIT WALL BASES TO CONTAIN A CONTINUOUS WATERSTOP TO BASE OF WALL, E.G. HYDROTITE WATERSTOP CJ0725-3K OR EQUIVALENT.

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DO NOT SCALE DRAWINGS, USE FIGURED DIMENSIONS

Rev.	Description	Eng.	Draft.	Date
1	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
2	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20

2

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
CONCRETE COLUMNS	S-WEB-800-819
IN-SITU WALLS	S-WEB-820-879
PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

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CLIENT

TAYLOR

PROJECT

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WARWICK FARM, NSW 2170

TITLE

GENERAL NOTES - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-002	2

PRINT TIME: 18/12/2020 11:17:30 AM C:\Users\PaterI\Documents\WI220023 - LAHC Warwick Farm NSW - Central - STRUCTURAL_peterI2JCEP.rvt

WEBBER DESIGN

A1 0 1 2 3 4 5 6 7 8 9 10

SITE RETENTION SPECIFICATION:

GENERAL REQUIREMENTS:

PRELIMINARIES:-

SURVEY POINTS SHALL BE ESTABLISHED ON THE ADJACENT BUILDINGS WALLS AT FOUR (4) MIN. LOCATIONS. THE LOCATION AND LEVEL OF THESE POINTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER & MONITORED BY A LICENSED SURVEYOR AT MAXIMUM WEEK INTERVALS INITIALLY (MAY BE ADJUSTED AS PROJECT PROCEEDS). DATE AND RESULTS SHALL BE PROGRESSIVELY ADDED TO A SURVEY PLAN, AND COPIES FORWARDED TO THE ENGINEER AT EACH STAGE. THE TOP OF SOLDIERS SHALL BE LOCATED BY SURVEY UPON INSTALLATION, AND AT REGULAR INTERVALS DURING THE PROJECT. ANY MOVEMENT DETECTED SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

CONSTRUCTION SEQUENCE SOLDIER SHORING WALL:-

1. DRILL HOLES TO THE SETOUT AND DEPTHS SHOWN ON PLANS, ELEVATIONS AND SECTIONS. PLACE REINFORCEMENT CAGE AND POUR SOLDIERS. NOTE SOLDIERS MAY NEED TO BE CONSTRUCTED IN HIT 1 MISS 1 SEQUENCE DEPENDENT ON GEOTECHNICAL ADVICE.
2. CONSTRUCT CAPPING BEAMS
3. EXCAVATE WITHIN SITE TO A LEVEL 500mm BELOW TOP ANCHOR LOCATION.
4. DRILL, INSTALL AND STRESS ANCHORS (REFER GROUND ANCHORS NOTES).
5. EXCAVATE BETWEEN SOLDIERS TO THE BACK OF THE INFILL WALL, DRILL AND EPOXY TIE BARS. REFER DETAIL.
6. INSTALL STRIP DRAINS.
7. SPRAY INFILL WALL PANELS. (REFER SPECIFICATION FOR SPRAY MIX DETAILS, PROCEDURES ETC.) MAXIMUM HEIGHT UNRESTRAINED SHALL BE 1.5m.
8. REPEAT STEPS 3 THROUGH 7 AS REQUIRED
9. MINIMUM THREE MONTHS AFTER POURING BRACING FLOOR SLAB, CLEAN OUT REBATES AT SUSPENDED BASEMENTS AND GROUT AS SHOWN ON DETAIL. WHEN GROUT HAS ATTAINED STRENGTH OF (f'c) 40MPa, GROUND ANCHORS SHALL BE DE-STRESSED, ANCHOR HEADS REMOVED.

TOLERANCE FOR PIERS/SOLDIERS:-

1. PIERS SHALL BE CENTRED WITHIN 25mm OF THE "DESIGN CENTRE" AS INDICATED ON THE PLANS.MAXIMUM "OUT OF PLUMB" OF PIERS SHALL BE 25mm.
2. SOLDIERS SHALL BE SET OUT BY STRINGLINE SO THAT INTERNAL FACES ARE TRUE TOPOSITION AND LINE. MAXIMUM OUT OF POSITION "ALONG WALL" (AT INITIAL SURFACE LEVEL) SHALL BE 25mm.
3. PIERS SHALL BE CENTRED SUCH THAT THE EXTERIOR FACE OF THE SOLDIER/PANEL DOES NOT PROJECT OVER THE ADJOINING PROPERTY.

GROUND ANCHORS:-

1. CONTRACTOR IS TO CONFIRM LOCATION & DEPTH OF EXISTING BUILDING FOOTINGS, BASEMENTS & EXISTING SERVICES PRIOR TO COMMENCEMENT OF ANCHOR WORKS TYPICAL.
2. GROUND ANCHORS ARE EACH TO BE DESIGNED IN ACCORDANCE WITH AS. 1481 FOR A WORKING LOAD AS SHOWN IN THE SCHEDULE. THE DESIGN AND DETAILS ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCEMENT ON SITE. REFER ALSO TO RECOMMENDATION PROVIDED BY SOIL INVESTIGATION REPORT.
3. ANCHORS SHALL CONSIST OF LOW RELAXATION STRESS RELIEVED SUPERGRADE STEEL STRAND TO AS. 1313 AND ANCHORAGES SHALL CONFORM TO AS. 1314.
4. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY "ACTUAL" ANCHOR LENGTH BY TEST ANCHORS ETC., AND TO PROOF LOAD EACH ANCHOR AS PER NOTE BELOW.
5. PRIOR TO ANY DRILLING OPERATIONS, THE CONTRACTOR SHALL ACQUAINT HIMSELF WITH ALL ADJACENT UNDERGROUND SERVICES AND ENSURE THAT NONE OF THESE ARE DISRUPTED BY GROUND ANCHORS. ALL APPROPRIATE APPROVALS, PERMITS AND AGREEMENTS SHALL BE OBTAINED BEFORE COMMENCEMENT OF THE WORK.
6. ANCHORS SHALL BE STRESSED AT THE APPROPRIATE STAGES OF THE CONSTRUCTION SEQUENCE, PROVIDED THAT AT LEAST THREE DAYS HAVE ELAPSED AFTER GROUTING THE ANCHORAGE LENGTH. SUFFICIENT STRAND SHALL BE LEFT PROJECTING FROM THE ANCHORAGE TO ENABLE ANY SUBSEQUENT STRESSING.
7. EACH ANCHOR SHALL BE PROOF LOADED - IE. STRESSED TO 150% OF THE WORKING LOAD, HELD FOR FIVE MINUTES, AND SLOWLY EASED BACK. THE ANCHOR SHALL THEN BE STRESSED TO WORKING LOAD AND LOCKED OFF. ANY ANCHOR WHICH FAILS TO HOLD THE LOAD SHALL BE REMOVED AND REPLACE WITH ANOTHER ANCHOR. SUCH WORK SHALL BE CARRIED OUT IN THE PRESENCE OF THE ENGINEER. CONTRACTOR SHALL KEEP ON SITE AN ADEQUATE SUPPLY OF ANCHOR CABLES, GROUT ETC. FOR EMERGENCY USE.
8. THE CONTRACTOR SHALL KEEP ON SITE AN ADEQUATE SUPPLY OF ANCHOR CABLES, GROUT ETC. FOR EMERGENCY USE.
9. THE CONTRACTOR SHALL REGULARLY MONITOR THE STRESS IN THE ANCHORS TO ENSURE NO MAJOR LOSSES ARE OCCURRING. IF STRESS LOSSES ARE DETECTED THEY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
10. GROUT FOR GROUND ANCHORS SHALL BE NEAT PORTLAND CEMENT/WATER MIX WITH "METHOCELL" ADDED TO MANUFACTURERS SPECIFICATION. MAXIMUM WATER/CEMENT RATIO = 0.50. THE GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF S20MPa AT THREE (3) DAYS. GROUT CYLINDERS SHALL BE TAKEN ON THE BASIS OF ONE SAMPLE (TWO CYLINDERS) FOR EVERY TEN ANCHORS AND TESTED ON THE DAY OF STRESSING. THE GROUT SHALL BE MIXED IN A HIGH SPEED IMPELLER TYPE MACHINE.
11. SITE RECORDS (DATES AND DETAILS) SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE FOLLOWING STAGES:
    - ANCHOR INSTALLATION (NOTE FREE LENGTH/ANCHOR LENGTH PROVIDED)
    - ANCHOR GROUTING
    - STRESSING /PROOF LOADING AND CONFIRMATION OF ACCEPTABLE ANCHOR PERFORMANCE
    - MONITORING (NOTE ACTUAL ANCHOR LOADS)

BULK EXCAVATION:-

1. THE GEOTECHNICAL ENGINEER SHALL BE CONTACTED TO PROVIDE SUPERVISION OF EXCAVATIONS ADJACENT TO EXISTING BUILDINGS/PAVEMENTS TO PREVENT DAMAGE OR INSTABILITY.
2. THE BUILDER SHALL BE RESPONSIBLE FOR VIBRATION CONTROLS DURING EXCAVATION.
3. REFER TO THE GEOTECHNICAL ENGINEER TO CONFIRM THE REQUIREMENTS FOR EXCAVATION OF THE BASEMENT MATERIAL.
4. WHERE BASEMENT IS AT WATER TABLE LEVEL THE BUILDER IS TO PROVIDE MOVABLE SHIELDS FOR VERTICAL SIDED DRIVES THROUGH BATTERED AND BENCHED EXCAVATION LEVELS. STABILITY CHECKS ARE TO BE PROVIDED FOR EXCAVATIONS GREATER THAN 600mm. THE GEOTECHNICAL ENGINEER SHALL BE CONTACTED TO PROVIDE SUPERVISION AND FURTHER RECOMMENDATION AS REQUIRED.
5. THE BASE OF THE EXCAVATION SHALL BE GRADED / DRAINED TO SUMPS AND PUMPED AS REQUIRED TO MAINTAIN THE EXCAVATION FREE OF SURFACE WATER. THE SUMPS ARE TO BE FITTED WITH SILT TRAPS. DO NOT PUMP ANY MUD OR SLUDGE INTO COUNCIL DRAINS. THE INITIAL EXCAVATION MAY BE CARRIED OUT TO LEVELS SHOWN ON THE DRAWINGS WITH THE FINAL TRIMMING TO DESIGN LEVELS PRIOR TO POURING BASE SLABS.
6. REDUCED LEVELS NOTED ARE MINIMUM EXCAVATION LEVELS TO ACHIEVE THE NOMINATED FINISHED FLOOR LEVELS. CONSIDERATION SHOULD BE GIVEN TO FOUNDING CONDITIONS WHEN NOMINATING THE INITIAL BULK EXCAVATION LEVELS.

GEOTECHNICAL ENGINEER SUPERVISION NOTE:-

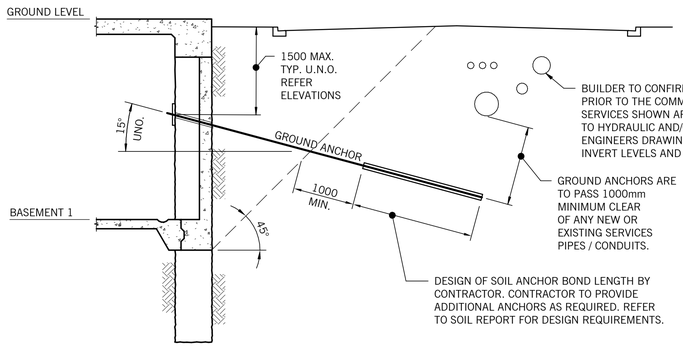
1. THE CONTRACTOR SHALL PAY ALL FEES REQUIRED FOR ADDITIONAL GEOTECHNICAL SERVICES.
2. ALL EXCAVATIONS ADJOINING AN EXISTING BUILDING ALONG A SITE BOUNDARY OR EXCAVATIONS WHICH MAY UNDERMINE AN ADJOINING BUILDING MUST BE CONDUCTED UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER.
3. GEOTECHNICAL ENGINEER TO PROVIDE SUPERVISION OF EXCAVATION TO PREVENT DAMAGE TO EXISTING BUILDING ON ADJOINING SITE BOUNDARY.
4. THE BUILDER SHALL BE RESPONSIBLE FOR VIBRATION CONTROLS DURING EXCAVATION WORKS.
5. WHERE BASEMENT IS AT WATER TABLE LEVEL THE BUILDER IS TO PROVIDE MOVABLE SHIELDS FOR VERTICAL SIDED DRIVES THROUGH BATTERED AND BENCHED EXCAVATION LEVELS. STABILITY CHECK TO BE PROVIDED FOR EXCAVATION GREATER THAN 2000mm THE GEOTECHNICAL ENGINEER SHALL BE CONTACTED TO PROVIDE SUPERVISION AND FURTHER RECOMMENDATION AS REQUIRED.
6. AS EXCAVATION PROCEEDS FOR RETENTION SYSTEM ADJACENT TO THE EXISTING BUILDING OR ON ADJOINING BOUNDARY, THE GEOTECHNICAL ENGINEER SHALL PROVIDE SUPERVISION TO THE EXCAVATION. IF THERE IS A TENDENCY OF INSTABILITY DURING THE EXCAVATION WORKS. THE GEOTECHNICAL ENGINEER SHALL PROVIDE FURTHER SPECIFICATION AND RECOMMENDATION FOR THE EXCAVATION TO PROCEED.
7. REFER TO GEOTECHNICAL NOTES FROM S-WEB-001 FOR GEOTECHNICAL REPORT REFERENCE.

SHOTCRETE NOTES:

1. GENERAL
   THE CONCRETE IN THE PANELS OF THE RETAINING WALLS MAY BE PLACED BY THE SHOTCRETING PROCESS.
2. DEFINITIONS
   THE FOLLOWING DEFINITIONS EXPLAIN THE MEANING OF CERTAIN WORDS AND TERMS AS USED IN THIS SPECIFICATION:
   - SPRAYED CONCRETE - IS A MIXTURE OF CEMENT, AGGREGATE AND WATER PROJECTED AT HIGH VELOCITY FROM A NOZZLE INTO PLACE TO PRODUCE A DENSE HOMOGENEOUS MASS.
   - SHOTCRETE - IS A TERM USED FOR SPRAYED CONCRETE WHERE THE MAXIMUM AGGREGATE SIZE IS NOT MORE THAN 20mm.
   - REBOUND - IS A TERM USED FOR ALL MATERIAL HAVING PASSED THROUGH THE NOZZLE WHICH DOES NOT CONFORM TO THE DEFINITION OF SPRAYED CONCRETE.
   - NOZZLE - IS THE ATTACHMENT AT THE END OF THE HOSE FROM WHICH THE MATERIAL IS JETTED AT HIGH VELOCITY.
   - NOZZLEMAN - IS THE WORKMAN WHO MANIPULATES THE NOZZLE. THE NOZZLEMAN MAINTAINS CONSISTENCY, AND MAKES THE FINAL DISPOSITION OF THE MATERIAL.
3. MIX DESIGN
   MIX PROPORTIONS SHALL BE DESIGNED BY THE CONTRACTOR AND SHALL BE TO THE APPROVAL OF THE SUPERINTENDENT. ALL CONCRETE SHALL BE OBTAINED FROM AN APPROVED CONCRETE SUPPLIER AND SHALL BE PREMIXED AND DELIVERED TO SITE IN ACCORDANCE WITH AS 1379. WHERE ADMIXTURES ARE APPROVED BY THE SUPERINTENDENT FOR ADDITION TO THE MIX TO ALTER THE SETTING RATE OF THE CEMENT, THE FOLLOWING SETTING TIMES AND STRENGTHS SHALL APPLY UNLESS OTHERWISE STATED.
   (a) INITIAL SET OF CEMENT/ADMIXTURE PASTE - 3 MINS.
   FINAL SET OF CEMENT/ADMIXTURE PASTE - 12 MINS.
   (b) 8 HOUR STRENGTH OF CONCRETE - 3 MPa
   24 HOUR STRENGTH OF CONCRETE - 10 MPa
   ALL CONSTITUENTS SHALL BE UNIFORMLY DISPERSED THROUGHOUT THE MIX.
4. QUALIFICATIONS OF OPERATORS
   ALL OPERATORS SHALL BE TO THE APPROVAL OF THE ENGINEER. PRIOR TO COMMENCEMENT OF SPRAYING, THE CONTRACTOR SHALL CERTIFY TO THE ENGINEER THAT THE FOREMAN, NOZZLEMAN AND DELIVERY EQUIPMENT OPERATIVES HAVE COMPLETED SATISFACTORY WORK IN SIMILAR CAPACITIES ELSEWHERE. WHERE REQUIRED BY THE ENGINEER THE OPERATOR SHALL SPRAY PRE-CONSTRUCTION PANELS WHICH SHALL BE APPROVED BY THE ENGINEER BEFORE THE OPERATORS ARE EMPLOYED ON THE WORKS. SUCH PANELS MAY ALSO BE USED BY THE ENGINEER TO ASSESS THE COMPETENCE OF OPERATORS OR TRAINEES FOR WHOM SUCH CERTIFICATION IS NOT AVAILABLE.
5. PLANT
   THE CONTRACTOR SHALL STATE THE NUMBERS AND TYPE OF PLANT WHICH HE PROPOSES TO USE FOR THE CONSTRUCTION OF THE WORKS.
6. SUBSTRATE PREPARATION
   THE SURFACE SHALL BE COMPACT, TRIMMED AND GRADED AS REQUIRED AND DAMP BEFORE THE APPLICATION OF SPRAYED CONCRETE. NATURAL SURFACES MUST BE SUFFICIENTLY COHESIVE TO PREVENT EROSION WHEN THE SPRAYED CONCRETE IS APPLIED.
7. SPRAYING PROCEDURE
   NO CONCRETE SHALL BE SPRAYED IN AIR TEMPERATURES LESS THAN 5 DEGREES CELSIUS. FRESHLY SPRAYED CONCRETE SHALL BE PROTECTED FROM RAIN OR WATER TILL THE SURFACE IS OF SUFFICIENT HARDNESS TO PREVENT DAMAGE. SPRAYING SHALL BE DISCONTINUED IF WIND OR AIR CURRENTS CAUSE SEPARATION OF THE NOZZLE STREAM DURING PLACEMENT. DURING STARTING OR STOPPING OF THE SPRAYING OPERATION OR WHENEVER SPRAYING IS IRREGULAR, THE NOZZLE SHALL BE DIRECTED AWAY FROM THE WORKS. ALL CORNERS AND ANY AREAS WHERE REBOUND CANNOT ESCAPE OR BE BLOWN FREE, SHALL BE FILLED PRIOR TO GENERAL SPRAYING, REBOUND SHALL NOT BE WORKED INTO THE CONSTRUCTION OR RE-USED IN THE WORKS. GUIDES SHALL BE SET UP TO ESTABLISH FINISHED SURFACES. THESE GUIDES SHALL BE TO THE APPROVAL OF THE ENGINEER PRIOR TO SPRAYING. SPRAYED CONCRETE SHALL BE APPLIED SO THAT IT NEITHER SAGS NOR SLUMPS. SPRAYED CONCRETE SHALL BE TROWELLED TO A SMOOTH SURFACE. MAXIMUM DEVIATION FROM A 1m STRAIGHT EDGE SHALL BE 10mm. FULL RECORDS OF ALL MATERIALS DELIVERED TO THE SPRAYED CONCRETE MIXER SHALL BE KEPT AND MADE AVAILABLE TO THE CONSTRUCTION MANAGER,
8. JOINTS
   THE POSITION AND TYPE OF ALL CONSTRUCTION JOINTS SHALL BE APPROVED BY THE ENGINEER.
9. QUALITY CONTROL
   TESTING OF SHOTCRETE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE SPRAYED CONCRETE MANUAL "RECOMMENDED PRACTICE SPRAYED CONCRETE" CLAUSE A12 OF THE REFERENCE SPECIFICATION PREPARED BY THE CONCRETE INSTITUTE OF AUSTRALIA.

INTERFACE BETWEEN NEW AND EXISTING ADJACENT STRUCTURES:

1. THE PILING CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AN APPROVED BOND BREAKER OR MEMBRANE BETWEEN EXISTING & PROPOSED FOOTINGS.



TYPICAL GROUND ANCHOR SECTION AT EXISTING SERVICES LOCATION

NOT TO SCALE

NOTE: REFER TO RETENTION ELEVATIONS FOR NUMBER OF ANCHORS AND LOCATIONS. ALSO REFER TO RETENTION DETAILS AND SECTIONS FOR ANCHOR REQUIREMENTS.

NOTES

1. REFER TO GEOTECH FOR ANCHOR DESIGN AND PARAMETERS.
2. ALL ANCHORS TO BE PROOF TESTED TO 1.5 TIMES THE WORKING LOAD.

REFERENCE NOTE:

REFER TO RETENTION DRAWING FOR SHOTCRETE WALL TYPES AND MAXIMUM VERTICAL DRIVES REFER RETENTION ELEVATIONS FOR NUMBER OF ANCHORS AND LOCATIONS. ALSO REFER TO RETENTION DETAILS & SECTION FOR ANCHOR REQUIREMENTS.

EXISTING SERVICES NOTES:

LOCATION AND LEVELS OF EXISTING SERVICES SHOWN INDICATIVELY ONLY. EXACT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORK. REFER ALSO TO ALL SERVICES (IE. HYDRAULIC, CIVIL) FOR FURTHER DETAILS TYPICAL.

ENSURE FIRST GROUND ANCHOR IS MINIMUM 1000mm BELOW INVERT LEVEL OF LOWEST ADJACENT SERVICE.

PRIOR TO COMMENCEMENT OF TEMPORARY SOIL ANCHOR INSTALLATION SUBCONTRACTOR TO CONFIRM LOCATION & EXTENT OF EXISTING SERVICES SO AS TO ENSURE TEMPORARY SOIL ANCHORS FALL BELOW ANY EXISTING SERVICES WHEN INSTALLED.

WATERPROOFING NOTE:

CONCRETE IN WALLS, FLOOR SLABS EXPOSED TO EXTERNAL WEATHER AND BASE OF ALL PITS TO CONTAIN WATERPROOFING ADDITIVE TO MANUFACTURERS RECOMMENDATIONS. APPLY A SLURRY COAT OF WATERPROOFING ADDITIVES TO CONSTRUCTION JOINTS. ALSO REFER TO MANUFACTURERS RECOMMENDATIONS. ALL CONSTRUCTION JOINTS AND PIT WALL BASES TO CONTAIN A CONTINUOUS WATERSTOP TO BASE OF WALL.

WATER DRAINAGE NOTE:

BASE EXCAVATION SHALL BE GRADED / DRAINED TO SUMPS AND PUMPED AS REQUIRED TO MAINTAIN THE EXCAVATION FREE OF SURFACE WATER. BULK EXCAVATION TO BE SUITABLY DRAINED INTO SUMPS FITTED WITH SILT TRAPS. DO NOT PUMP ANY MUD OR SLUDGE INTO COUNCIL DRAINS. INITIAL EXCAVATION MAY BE CARRIED OUT TO LEVELS SHOWN ON THIS DRAWINGS WITH THE FINAL TRIMMING TO DESIGN LEVELS PRIOR TO POURING BASE SLAB.

CONSTRUCTION MANAGEMENT NOTE:

CONSTRUCTION MANAGEMENT PLAN IS TO BE PROVIDED TO THE LOCAL COUNCIL FOR APPROVAL BY THE BUILDER/CONTRACTOR. THIS PLAN IS TO COVER TRAFFIC MOVEMENTS TO AND FROM SITE, PEDESTRIAN SAFETY, NUISANCE MANAGEMENT AND NOISE / DUST CONTROL. REFER TO COUNCIL FOR REQUIREMENTS.

BOND BREAKER NOTE:

THE PILING CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AN APPROVED BOND BREAKER OR MEMBRANE BETWEEN EXISTING & PROPOSED FOOTINGS.

EXISTING FOOTINGS NOTE:

CONTRACTOR IS TO CONFIRM LOCATION & DEPTH OF EXISTING BUILDING FOOTINGS, BASEMENTS & EXISTING SERVICES PRIOR TO COMMENCEMENT OF ANCHOR WORKS TYPICAL.

DEWATERING:

THE CONTRACTOR SHALL PROVIDE ALL PUMPS, SPEARS, SUMPS ETC. AS NECESSARY TO EFFECTIVELY DEWATER THE SITE BELOW THE LOWEST EXCAVATION LEVEL TO PERMIT CONSTRUCTION. ALL DEWATERING WORKS, PERMITS AND DISCHARGE SHALL BE BY THE CONTRACTOR IN ACCORDANCE WITH THE RELEVANT STANDARDS, GEOTECHNICAL AND HYDROLOGICAL CONSULTANTS AND LOCAL AUTHORITIES REQUIREMENTS. DEWATERING SHALL CONTINUE UNTIL ALL STORMWATER PITS, SUMPS AND PUMPS HAVE BEEN COMMISSIONED AND WRITTEN APPROVAL OF THIS OFFICE. MONITORING OF ADJACENT PROPERTIES SHOULD COMMENCE BEFORE DEWATERING COMMENCES. THE CONTRACTOR SHALL ENGAGE THE GEOTECHNICAL AND HYDROLOGICAL CONSULTANTS AS REQUIRED FOR FURTHER ADVICE IF REQUIRED.

SURVEY MONITORING NOTE:

BUILDER TO PROVIDE SURVEY MONITORING POINTS ALONG RETENTION WALLS. THESE ARE TO BE MONITORED AND CHECKED FORTNIGHTLY. A RECORD OF THE FINDINGS/READINGS ARE TO BE KEPT ON SITE FOR VIEWING BY COUNCIL AS REQUIRED.

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1	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
2	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20

2

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
CONCRETE COLUMNS	S-WEB-800-819
IN-SITU WALLS	S-WEB-820-879
PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

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TAYLOR

PROJECT

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TITLE

RETENTION NOTES - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-010	2

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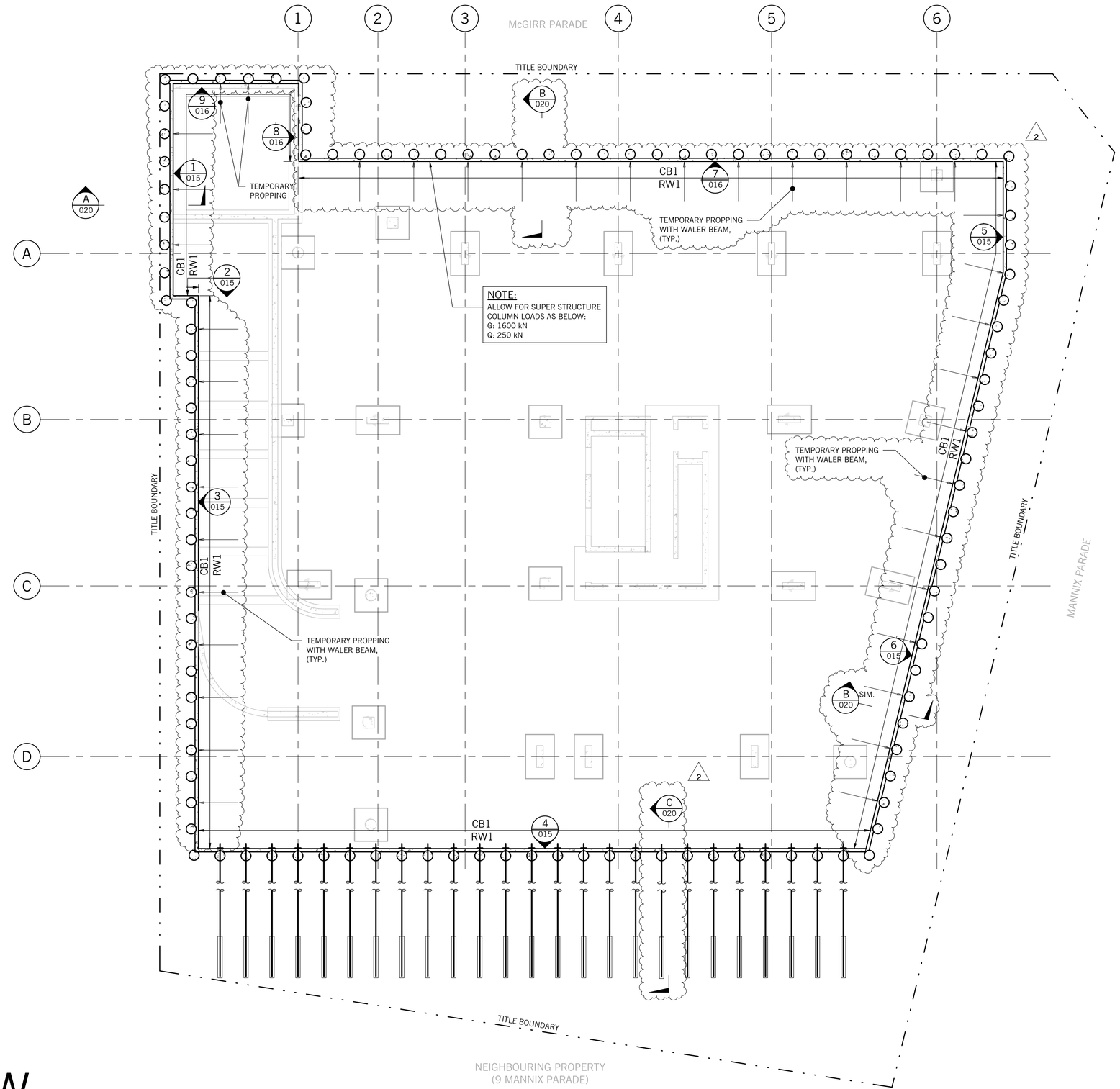

RETENTION & BULK EXCAVATION PLAN

SCALE: 1 : 100

CAPPING BEAM SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
CB1	600d x 600w	40	200	CAPPING BEAM TO WIDEN TO SUIT AS-BUILT PILES. REFER TO ELEVATIONS FOR CAPPING BEAM TYPE AND EXTENTS.

NOTE:
INTERMEDIATE ANCHORS COULD BE REMOVED USING A WALER BEAM. D&C CONTRACTOR TO CONFIRM PREFERRED METHOD.

DESIGN CRITERIA

1. REFER TO STS GEOTECHNICS (APRIL 2020) GEOTECHNICAL REPORT FOR GEOTECHNICAL DESIGN PARAMETERS.
2. DESIGN SURCHARGE TO BE 20 kPa MIN. OR TO SUIT ADJOINING BUILDINGS SURCHARGE.
3. RETENTION WALL HORIZONTAL DEFLECTION TO BE ≤20mm (SHORT / LONG TERM)
4. D & C PILE DESIGN TO INCORPORATE ADDITIONAL ECCENTRIC LOAD IMPOSED AS A RESULT OF PILING OFFSET.

NOTE:

1. REFER TO SECTIONS ON DRG S-WEB-020 FOR ANCHOR DETAILS AND DRG S-WEB-028 FOR TYPICAL DETAILS AND SPECIFICATIONS.
2. GROUND ANCHORS TO BOUNDARIES AS SHOWN ON PLAN.
3. ALL RETENTION PILES TO BE SOCKETED BELOW BASEMENT EXCAVATION/LINE OF INFLUENCE AS PER GEOTECHNICAL RECOMMENDATIONS.
4. QUALIFIED GEOTECHNICAL ENGINEER TO INSPECT AND CONFIRM SOCKET FOUNDING MATERIAL PRIOR TO CONCRETING.
5. INTERNAL TEMPORARY PROPPING TO BE DESIGNED BY D&C CONTRACTOR.

BASEMENT CONSTRUCTION PHILISOPHY:

AS PER THE LATEST GEOTECHNICAL REPORT(STS GEOTECHNICS, APRIL 2020), THE BASEMENT SLAB AND LOWER RETENTION WALLS ARE STRUCTURALLY DESIGNED WITH AN EFFECTIVE DRAINAGE SYSTEM (DESIGNED BY OTHERS) WITH NO RESULTANT HYDROSTATIC PRESSURE BOTH DURING CONSTRUCTION AND THE LIFETIME OF THE STRUCTURE.
THEY HAVE NOT BEEN DESIGN AS A LIQUID RETAINING STRUCTURE AND AS SUCH RELIES ON A WATERPROOF MEDIUM (MEMBRANE, WATERPROOF ADDITIVES OR SIMILAR) TO STOP WATER PERMEATING THROUGH THE CONCRETE OR POTENTIAL CRACKS IN THE STRUCTURE. A WATERPROOFING CONSULTANT SHOULD BE ENGAGED TO ADVISE ON ALL WATERPROOFING REQUIREMENTS INCLUDING POTENTIAL MEMBRANES, CONCRETE ADDITIVES AND DETAILING OF ALL COLD JOINTS TO PILES, SHOTCRETE WALLS, SLABS, FOUNDATIONS AND WALLS.

- ALL DETAILING OF MEMBRANES, WATER STOPS, ETC MADE HEREIN ARE INDICATIVE ONLY AND PENDING TO FURTHER SPECIALIST ADVICE.
- ALLOWANCE FOR POTENTIAL 50mm BLINDING LAYER TO BASEMENT SLAB SHOULD BE MADE PENDING CONFIRMATION OF THE WATERPROOFING SYSTEM ADOPTED AND SPECIFIC REQUIREMENTS.
- ALLOW FOR WATERPROOF ADMIXTURE IN CONCRETE BELOW THE WATERTABLE.
- POUR STRIP AND POUR SIZE TO BE CONSIDERED IN CONJUNCTION WITH WATERPROOFING STRATEGY ALONG WITH ADDITIONAL REINFORCEMENT TO CONTROL CRACK WIDTH.

TEMPORARY SHORING NOTE

BUILDER TO PROVIDE TEMPORARY SHORING FOR EXCAVATION AND CONCRETING AS NECESSARY WITH TEMPORARY WORKS REMOVED AND FOOTPATH REINSTATED ON COMPLETION TO AUTHORITY APPROVAL.

NOTE:

1. ALL BORED PIER EMBEDMENT DEPTH TO CONTRACTORS DESIGN TO ACHIEVE WORKING CAPACITY NOMINATED IN SCHEDULE. REFER SOIL REPORT FOR DESIGN PARAMETERS.
2. RETENTION PIER SOCKETS ADJOINING COLUMNS / WALLS FOOTINGS TO BE INCREASED BY EXCAVATION DEPTH OF PROPOSED ADJOINING FOOTINGS.

IMPORTANT GROUND ANCHOR NOTE:

PRIOR TO COMMENCEMENT OF TEMPORARY SOIL ANCHOR INSTALLATION BUILDER TO CONFIRM LOCATION AND EXTENT OF EXISTING SERVICES TO ENSURE TEMPORARY SOIL ANCHORS FALL BELOW ANY EXISTING SERVICES WHEN INSTALLED.

RETENTION WALL AND PILE SCHEDULE (T.B.C. BY D&C CONTRACTOR)	
TYPE	RW1
PILE SIZE	450mm DIA. ◯
PILE REINFORCEMENT	200 kg/m³
PILE CENTRE	1200mm MAX.
PILE CONCRETE GRADE	N50
SHOTCRETE WALL THICKNESS	150mm MIN.
SHOTCRETE WALL REINFORCEMENT	65 kg/m³
SHOTCRETE WALL CONCRETE GRADE	N40
PILE EMBEDMENT	REFER GEOTECHNICAL REPORT

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2	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20

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R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

BULK EARTHWORKS & RETENTION LEGEND

x SFL 10.62	STRUCTURAL / CONCRETE LEVEL
x BE 10.62	BULK EARTHWORKS LEVEL
x NSL 10.62	NATURAL SURFACE LEVEL
x EX P 10.62	EXISTING PAVEMENT LEVEL
x EX IL 10.62	EXISTING INVERT LEVEL OF SERVICE PIPE.
	PROPOSED BATTER FOR BULK EXCAVATION.
SM	PROPOSED SURVEY MONITORING POINT ADJACENT TO EXISTING CONDITIONS.
	GROUND ANCHOR THROUGH RETENTION. REFER TO DETAILS.
TP	DENOTES TEST PIT LOCATION
BHx	DENOTES BORE HOLE LOCATION

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Status

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WARWICK FARM, NSW 2170

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RETENTION & BULK EXCAVATION PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-011	2

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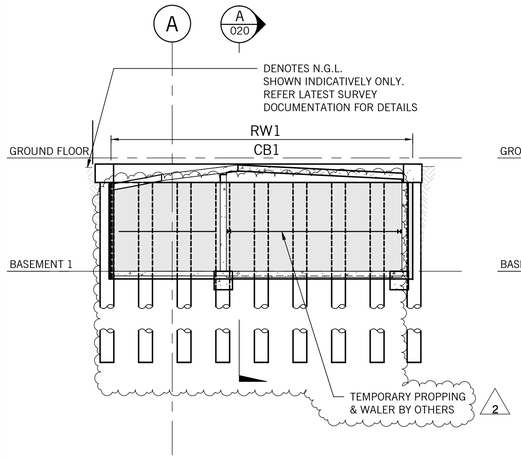

ELEVATION 1 / 011
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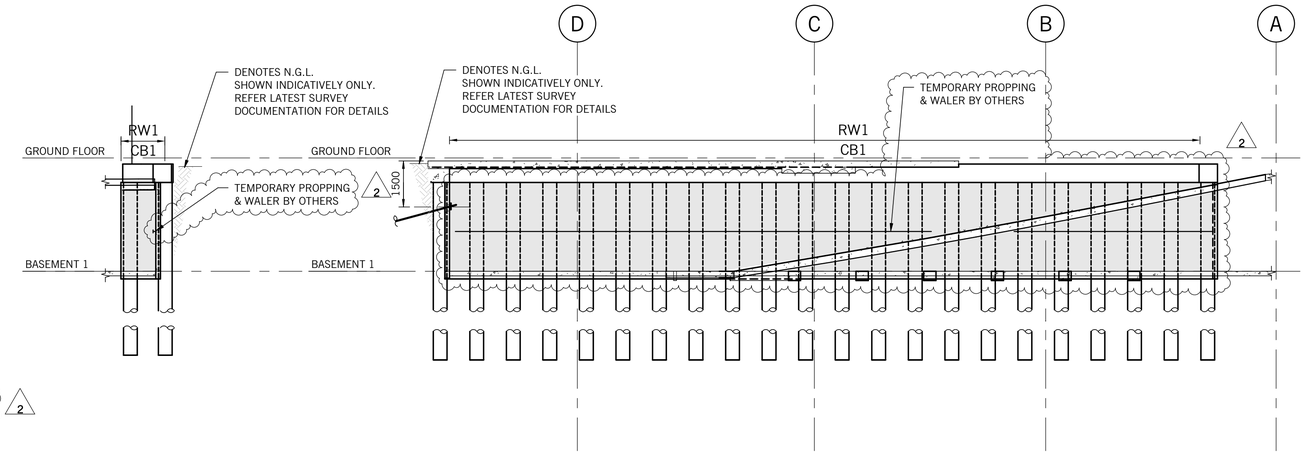

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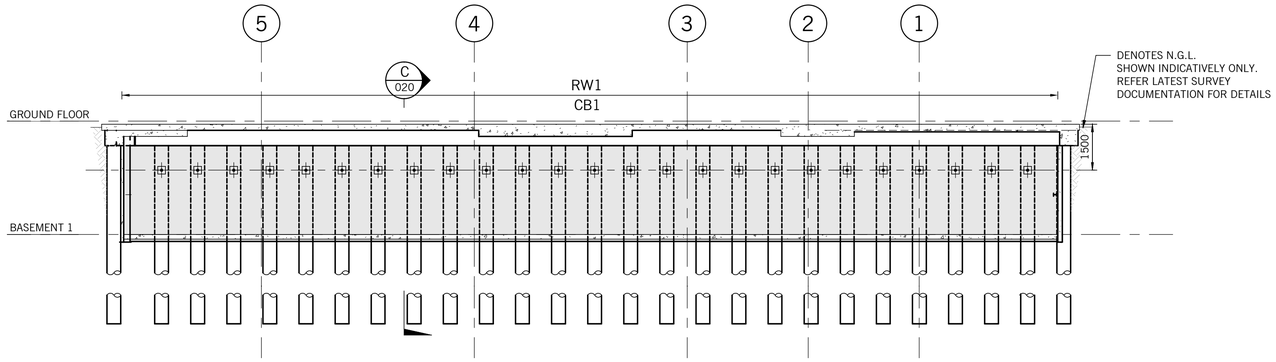
ELEVATION 3 / 011
SCALE: 1 : 100



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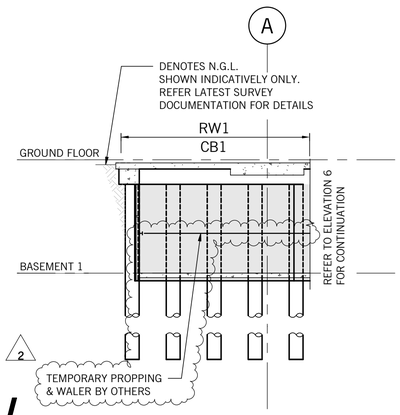

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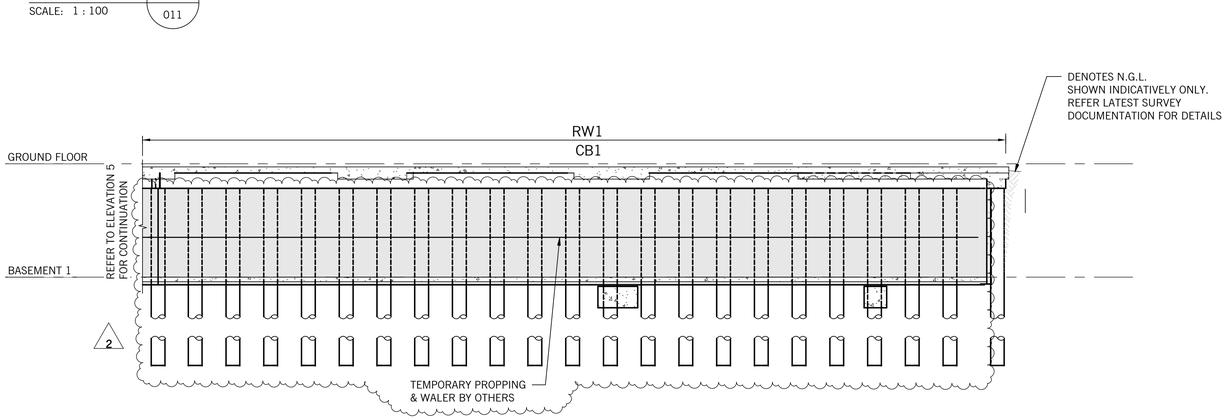

ELEVATION 6 / 011
SCALE: 1 : 100

GROUND / SOIL ANCHORAGE LOADS		
MARK	ANCHORAGE CAPACITY	REMARKS
GA	BY D & C CONTRACTOR	GROUND ANCHOR (BORED PILES)

NOTE:
1. 2 No. SOIL ANCHORS, MAXIMUM 750 mm APART MAY BE USED TO ACHIEVE NOMINATED SOIL ANCHOR WORKING LOADS.
2. ALLOWANCE IS TO BE MADE FOR THE INSTALLATION OF A SECOND TOP GROUND ANCHOR IN THE EVENT THAT ONE GROUND ANCHOR CANNOT RESIST THE WORKING LOAD. CONTINGENCY OF SECOND ANCHOR TO BE TENDERED FOR.
3. PILING CONTRACTOR TO CONFIRM No. OF TOP ANCHORS WHEN ON SITE.
4. THE GROUND / SOIL ANCHOR LOADS NOMINATED ARE SAFE WORKING LOADS AT 15 DEGREES INCLINATION AND THAT ANCHOR CONTRACTOR TO ACCOUNT FOR ANY INCREASE IN ANCHOR LOADS DUE TO VARYING INCLINATION OR SKEWING OF ANCHORS AS REQUIRED BY SITE CONTOURS.

RETENTION NOTES:-
1. THE FIRST ROW OF ANCHORS ARE TO BE 1500mm BELOW FOOTPATH SURFACE IN ACCORDANCE WITH COUNCIL REQUIREMENTS U.N.O.
2. ANCHOR FREE LENGTHS ARE TO BE GROUTED UPON COMPLETION OF RETENTION SYSTEM GROUND AND MEZZANINE SLABS CONSTRUCTION. ALL ANCHORS ARE TO BE DE-STRESSED AFTER FLOORS ARE BUILT, IN ACCORDANCE WITH RETENTION PROCEDURE NOTES ON DRAWING S-WEB-005
3. REDUCED LEVELS (R.L.'S) OF GROUND ANCHORS ARE TO BE CONFIRMED BY THE BUILDER ON SITE.
4. INTERNAL TEMPORARY PROPPING TO BE DESIGNED BY D&C CONTRACTOR. REFER S-WEB-011 FOR INDICATIVE LOCATIONS.
5. PILE EMBEDMENTS SHOWN INDICATIVE ONLY. ALL EMBEDMENTS TO BE CONFIRMED BY D&C CONTRACTOR.

NOTES:-
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2. EXISTING ADJACENT BUILDING FOUNDATION TO BE CONFIRMED AND REPORTED TO WEBBER DESIGN PRIOR TO CONSTRUCTION
3. BUILDER TO CONFIRM UNDERGROUND SERVICES BEFORE COMMENCEMENT OF WORKS.
4. SERVICES SHOWN ARE INDICATIVE ONLY.
5. REFER TO EXISTING SURVEY, HYDRAULIC AND/OR CIVIL AND ALL SERVICE ENGINEERS DRAWINGS FOR EXISTING SERVICE INVERT LEVELS AND EXTENTS.

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POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

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Status

STRUCTURAL DRAWING

WEBBER DESIGN
STRUCTURAL ENGINEERING
MELBOURNE OFFICE:
LEVEL 2, 31 QUEEN STREET
MELBOURNE, VIC, AUSTRALIA 3000
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SYDNEY OFFICE:
SUITE 301, LEVEL 3, 19A BOUNDARY STREET
RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

RETENTION ELEVATIONS - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-015	2

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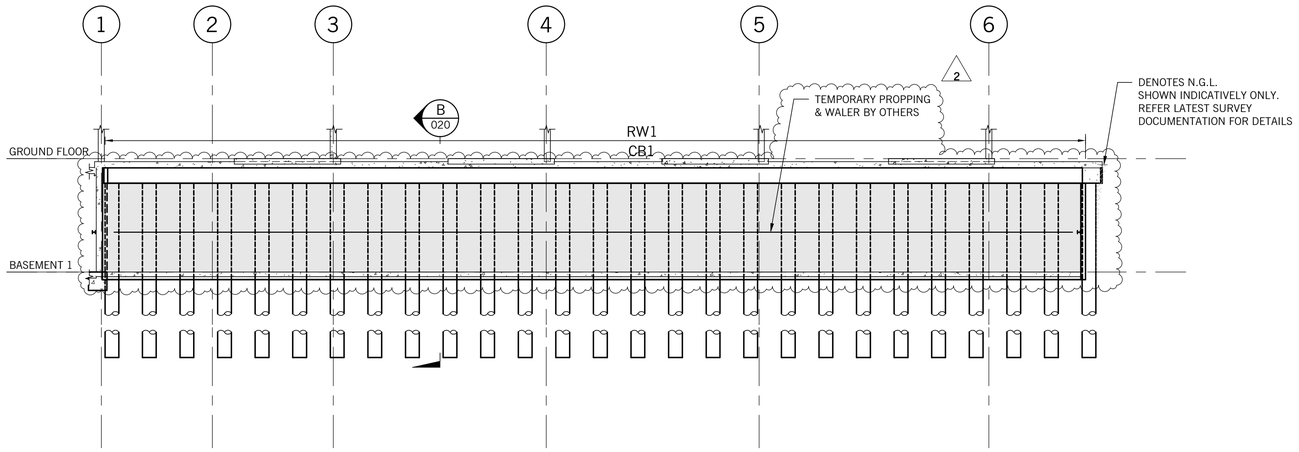

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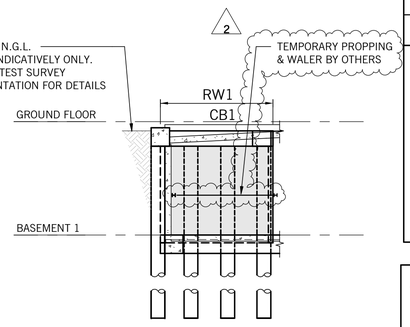

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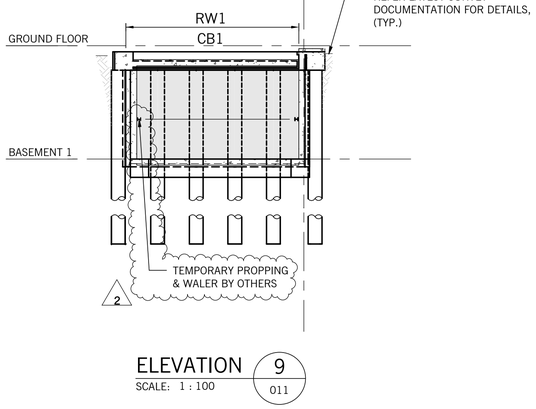

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GROUND / SOIL ANCHORAGE LOADS		
MARK	ANCHORAGE CAPACITY	REMARKS
GA	BY D & C CONTRACTOR	GROUND ANCHOR (BORED PILES)

NOTE:
1. 2 No. SOIL ANCHORS, MAXIMUM 750 mm APART MAY BE USED TO ACHIEVE NOMINATED SOIL ANCHOR WORKING LOADS.
2. ALLOWANCE IS TO BE MADE FOR THE INSTALLATION OF A SECOND TOP GROUND ANCHOR IN THE EVENT THAT ONE GROUND ANCHOR CANNOT RESIST THE WORKING LOAD. CONTINGENCY OF SECOND ANCHOR TO BE TENDERED FOR.
3. PILING CONTRACTOR TO CONFIRM No. OF TOP ANCHORS WHEN ON SITE.
4. THE GROUND / SOIL ANCHOR LOADS NOMINATED ARE SAFE WORKING LOADS AT 15 DEGREES INCLINATION AND THAT ANCHOR CONTRACTOR TO ACCOUNT FOR ANY INCREASE IN ANCHOR LOADS DUE TO VARYING INCLINATION OR SKEWING OF ANCHORS AS REQUIRED BY SITE CONTOURS.

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MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

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STRUCTURAL DRAWING

WEBBER DESIGN
STRUCTURAL ENGINEERING
MELBOURNE OFFICE:
LEVEL 2, 31 QUEEN STREET
MELBOURNE, VIC, AUSTRALIA 3000
T: +61 3 9614 7155
SYDNEY OFFICE:
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T: +61 2 9690 2488

CLIENT
TAYLOR

PROJECT
LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE
RETENTION ELEVATIONS - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-016	2

PRINT TIME: 18/12/2020 11:17:39 AM C:\Users\Peter\Documents\W\20\20023 - LAHC Warwick Farm NSW - Central - STRUCTURAL_peter2.0.UEEP.rvt

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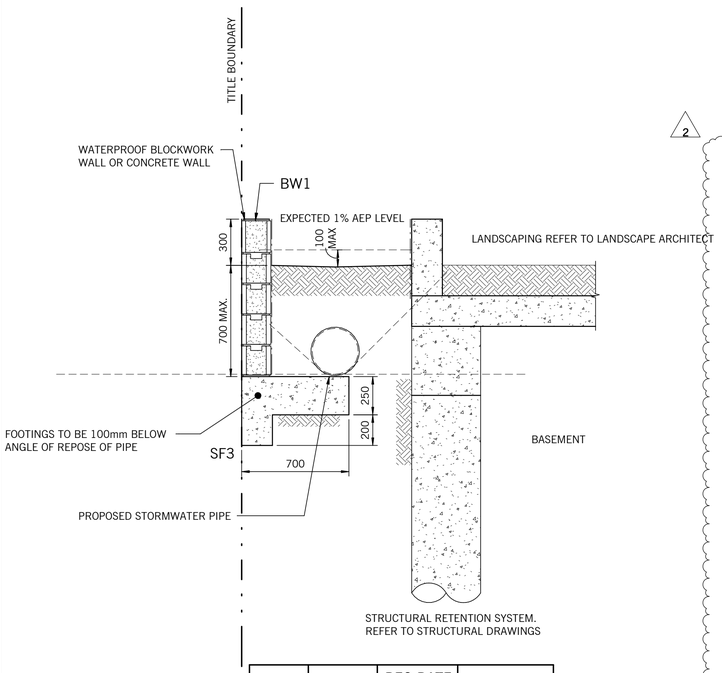
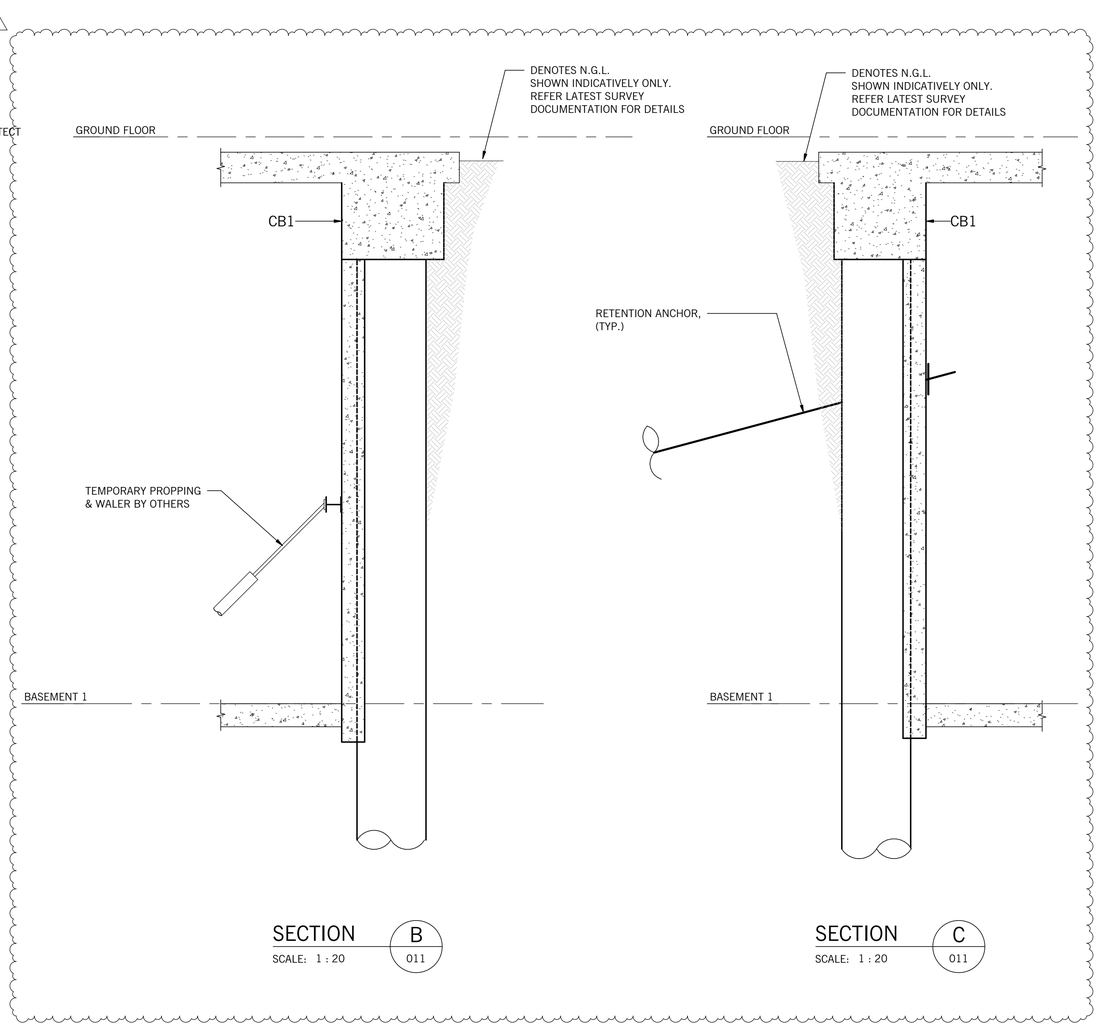


MARK	f'c (MPa)	REO RATE (kg/m^3)	REMARKS
SF3	32	50	STRIP FOOTING

SECTION A
SCALE: 1 : 20
011



SECTION B
SCALE: 1 : 20
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SECTION C
SCALE: 1 : 20
011

GROUND / SOIL ANCHORAGE LOADS		
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GA	BY D & C CONTRACTOR	GROUND ANCHOR (BORED PILES)

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SYDNEY OFFICE:
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TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

RETENTION SECTIONS - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
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JOB No.	DRAWING No.	REV.
20023	S-WEB-020	2

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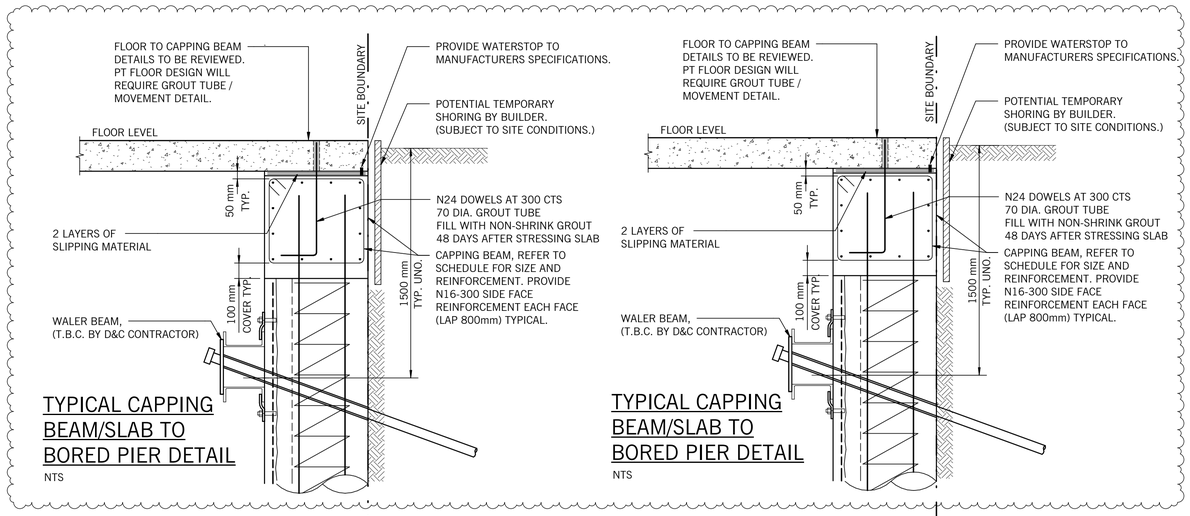
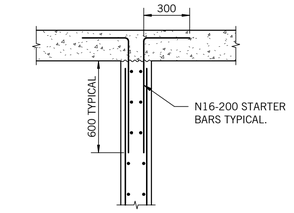
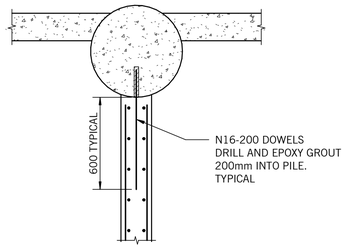




R.C. WALL TO RETENTION WALL DETAIL
SCALE 1:20



R.C. WALL TO RETENTION WALL DETAIL
SCALE 1:20

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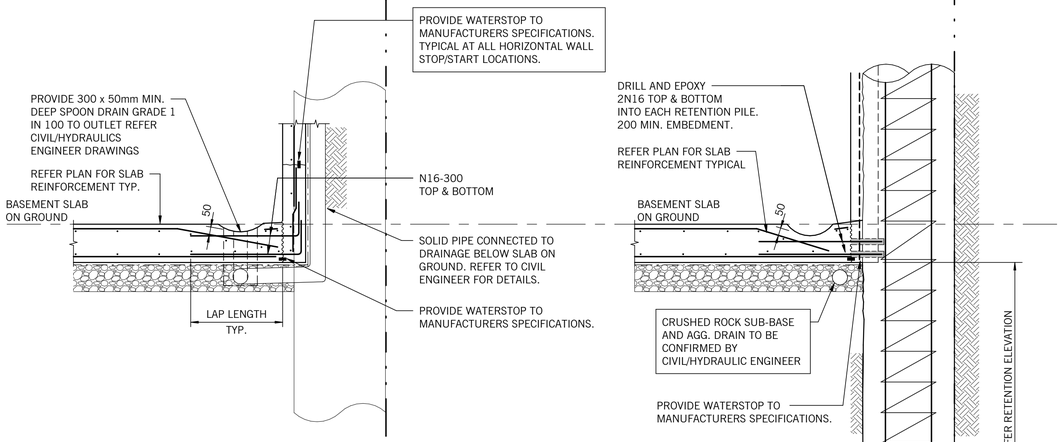

TYPICAL SHOTCRETE WALL SECTION
NTS

TYPICAL BORED PILE SECTION
NTS

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STEEL DETAILS	S-WEB-990-991

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STRUCTURAL ENGINEERING
MELBOURNE OFFICE:
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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

RETENTION DETAILS - SHEET 1

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NOV 2020	MA/BT	AC
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1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-027	2

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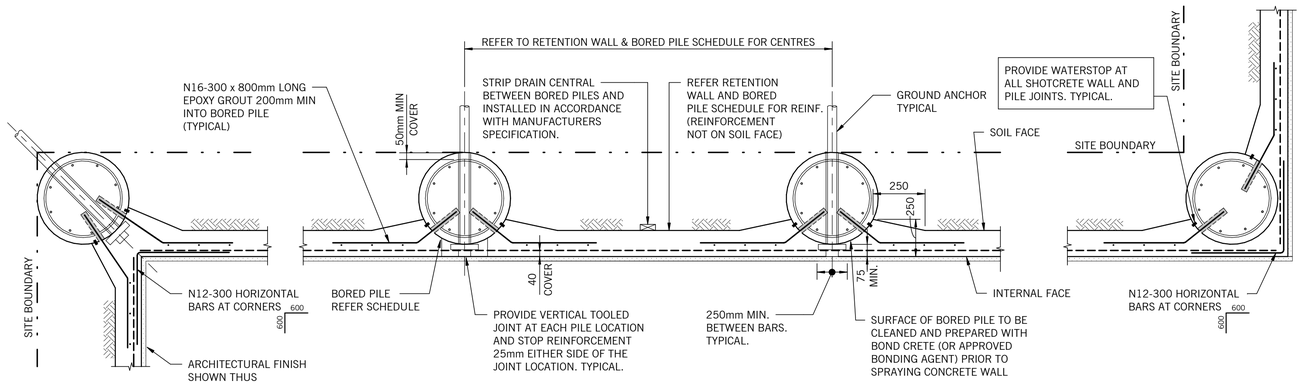


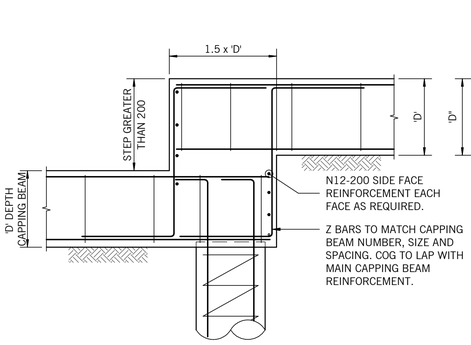
SHOTCRETE WALL - 1200mm MAXIMUM VERTICAL DRIVES

NTS

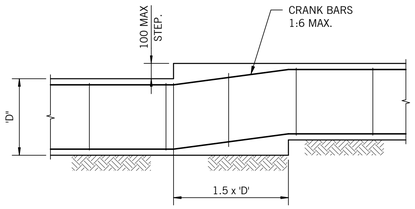
TYPICAL SOLDIER PILE WALL PLAN DETAILS

NOTE

1. REFER SCHEDULE FOR PILE DIAMETER AND REINFORCEMENT.
2. PROVIDE WATERPROOF ADDITIVE TO SHOTCRETE WALLS. APPLICATION TO MANUFACTURERS SPECIFICATIONS.
3. BUNDLE PILE REINFORCEMENT AS REQUIRED TO ACHIEVE ANCHOR PENETRATION
4. THE PILING CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AN APPROVED BOND BREAKER OR MEMBRANE BETWEEN EXISTING FOOTINGS AND RETENTION SYSTEM.
5. THE CONTRACTOR IS TO HAVE APPROVAL FROM THE GEOTECHNICAL ENGINEER ON THE MAXIMUM VERTICAL DRIVES PRIOR TO COMMENCING RETENTION WORK.
6. THE CONTRACTOR SHALL INSTALL "ABELFLEX" BETWEEN BORED PILES AND CONCRETE SLAB OR BEAM INTERFACE. (STARTER BARS NOT REQUIRED BETWEEN BORED PILES AND CONCRETE SLAB OR BEAM INTERFACE U.N.O.)
7. REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION REGARDING BULK EXCAVATION , BATTERS , ETC.

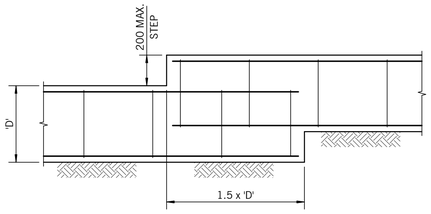


STEP GREATER THAN 200mm



SECTION

STEP 100mm MAXIMUM



SECTION

STEP LESS THAN 200mm

TYPICAL CAPPING BEAM STEP

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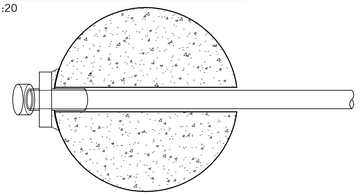
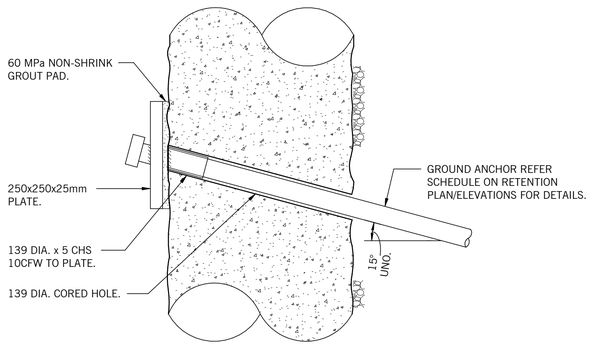


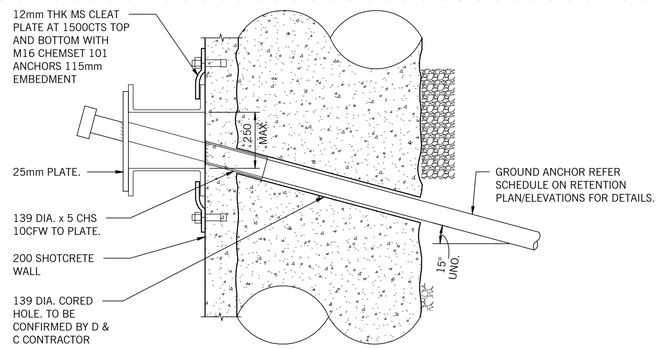
PLAN VIEW



SECTIONAL VIEW

TYPICAL ANCHORAGE DETAIL WITHOUT WALER BEAM AT EACH PILE

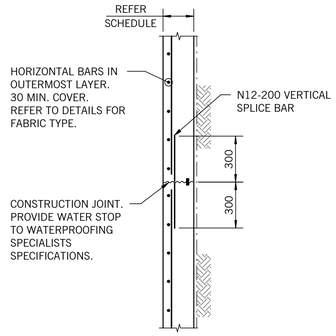
NTS (BORED PILE)



SECTIONAL VIEW

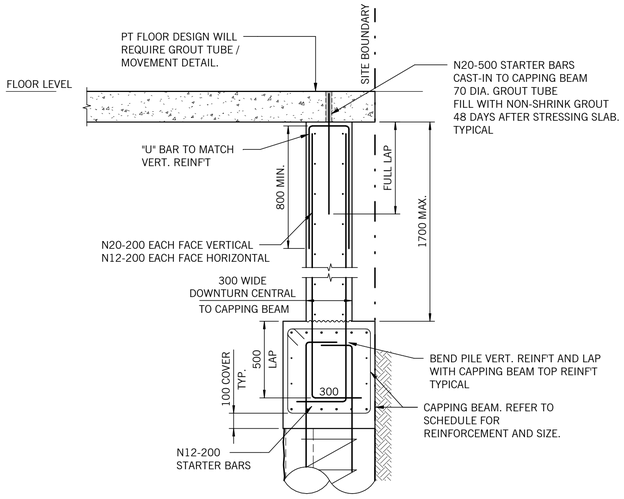
TYPICAL ANCHORAGE DETAIL WITH WALER BEAM

NTS (BORED PILE)



TYPICAL SHOTCRETE WALL SPLICING DETAIL

SCALE 1:20



TYPICAL SLAB TO CAPPING BEAM DOWNTURN/FOLD

NTS

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
CONCRETE COLUMNS	S-WEB-800-819
IN-SITU WALLS	S-WEB-820-879
PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

WEBBER DESIGN
STRUCTURAL ENGINEERING
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T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

RETENTION DETAILS - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-028	2

2

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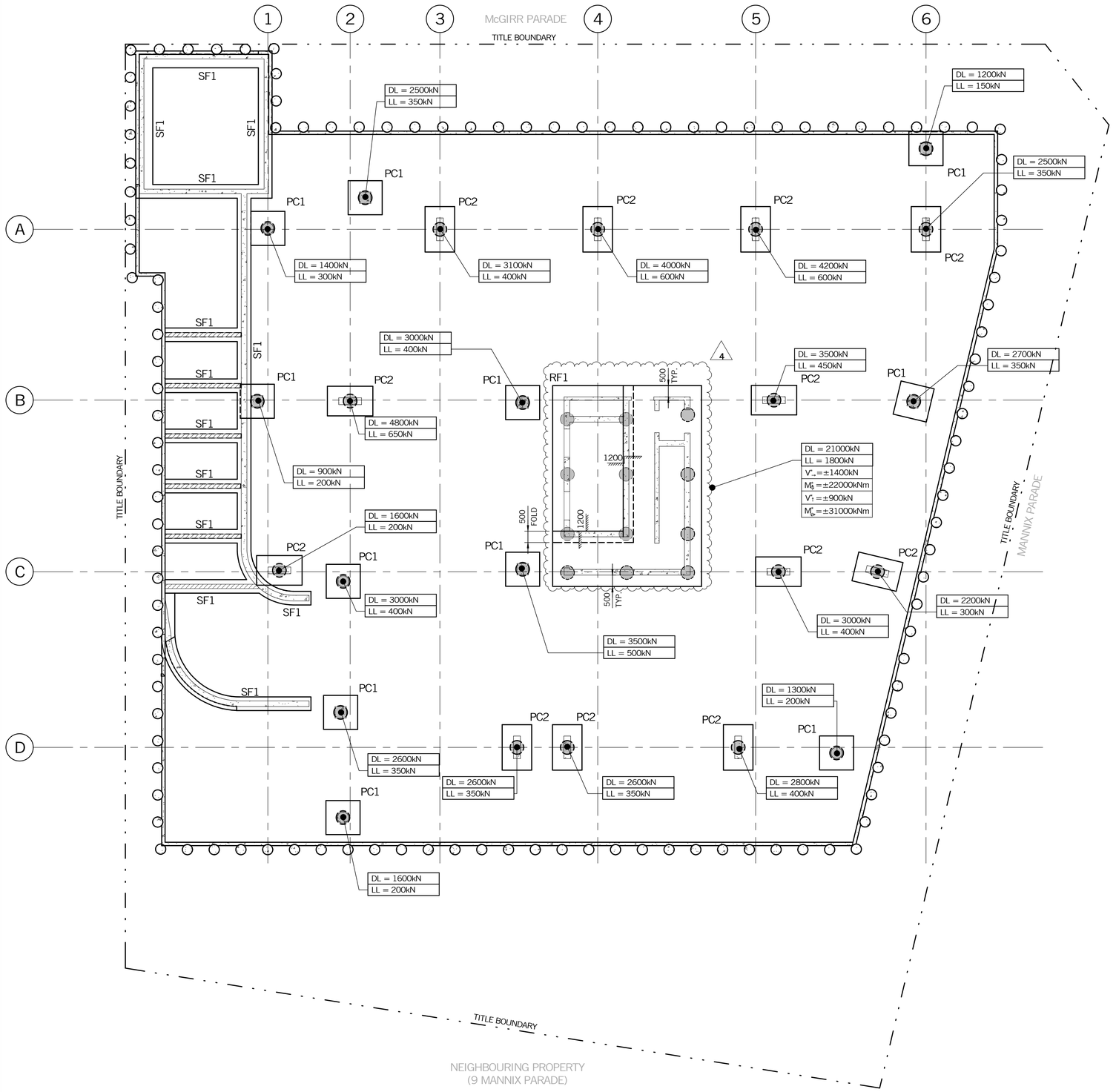

FOUNDATION PLAN
SCALE: 1 : 100

FOUNDATION SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
PC1	700d x 1500 x 1500	50	160	PILE CAP WITH BP1
PC2	700d x 2000 x 1300	50	160	PILE CAP WITH BP1
RF1	800d x AS NOTED ON PLAN	50	130	CORE RAFT
SF1	600d x 600w	40	110	STRIP FOOTING

BORED PIER SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
BP1	750 DIA.	50	N/A	PILE BY D&C CONTRACTOR

NOTES:

1. ALL BORED PIERS TO BE FOUNDED INTO UNDERLYING BEDROCK AS PER GEOTECHNICAL REPORT RECOMMENDATIONS. BORED PIERS D&C BY OTHERS.
2. ALL BORED PIER EMBEDMENT DEPTH TO CONTRACTOR'S DESIGN TO ACHIEVE WORKING CAPACITY NOMINATED IN DESIGN PARAMETERS IN LATEST GEOTECHNICAL REPORT.
3. ALL COLUMNS TO BE CONCENTRIC TO THE PAD FOOTING U.N.O.
4. GEOTECHNICAL ENGINEER TO INSPECT FOOTING EXCAVATIONS AND / OR BORED PIER HOLE DRILLING TO CONFIRM THAT THE FOOTINGS AND PIERS ARE FOUNDED OR SOCKETED ADEQUATELY INTO THE FOUNDING MATERIALS THAT SATISFY THE DESIGN ALLOWABLE BEARING PRESSURES.
5. REFER TO DRAWING S-WEB-030 FOR FOUNDATION LOADS.

BASEMENT CONSTRUCTION PHILISOPHY:

AS PER THE LATEST GEOTECHNICAL REPORT(STS GEOTECHNICS, APRIL 2020), THE BASEMENT SLAB AND LOWER RETENTION WALLS ARE STRUCTURALLY DESIGNED WITH AN EFFECTIVE DRAINAGE SYSTEM (DESIGNED BY OTHERS) WITH NO RESULTANT HYDROSTATIC PRESSURE BOTH DURING CONSTRUCTION AND THE LIFETIME OF THE STRUCTURE.
THEY HAVE NOT BEEN DESIGN AS A LIQUID RETAINING STRUCTURE AND AS SUCH RELIES ON A WATERPROOF MEDIUM (MEMBRANE, WATERPROOF ADDITIVES OR SIMILAR) TO STOP WATER PERMEATING THROUGH THE CONCRETE OR POTENTIAL CRACKS IN THE STRUCTURE. A WATERPROOFING CONSULTANT SHOULD BE ENGAGED TO ADVISE ON ALL WATERPROOFING REQUIREMENTS INCLUDING POTENTIAL MEMBRANES, CONCRETE ADDITIVES AND DETAILING OF ALL COLD JOINTS TO PILES, SHOTCRETE WALLS, SLABS, FOUNDATIONS AND WALLS.

- ALL DETAILING OF MEMBRANES, WATER STOPS, ETC MADE HEREIN ARE INDICATIVE ONLY AND PENDING TO FURTHER SPECIALIST ADVICE.
- ALLOWANCE FOR POTENTIAL 50mm BLINDING LAYER TO BASEMENT SLAB SHOULD BE MADE PENDING CONFIRMATION OF THE WATERPROOFING SYSTEM ADOPTED AND SPECIFIC REQUIREMENTS.
- ALLOW FOR WATERPROOF ADMIXTURE IN CONCRETE BELOW THE WATERTABLE.
- POUR STRIP AND POUR SIZE TO BE CONSIDERED IN CONJUNCTION WITH WATERPROOFING STRATEGY ALONG WITH ADDITIONAL REINFORCEMENT TO CONTROL CRACK WIDTH.

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Rev.	Description	Eng.	Draft.	Date
1	WORK IN PROGRESS ISSUE	MA	PAC	18.11.20
2	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
3	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20
4	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	05.02.21

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
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WEBBER DESIGN
STRUCTURAL ENGINEERING
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11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

FOUNDATION PLAN

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NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW

JOB No.	DRAWING No.	REV.
20023	S-WEB-030	4

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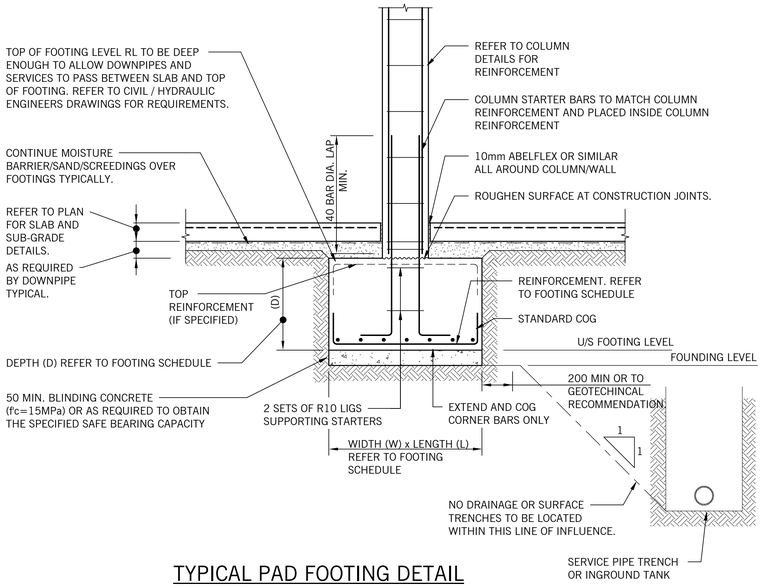
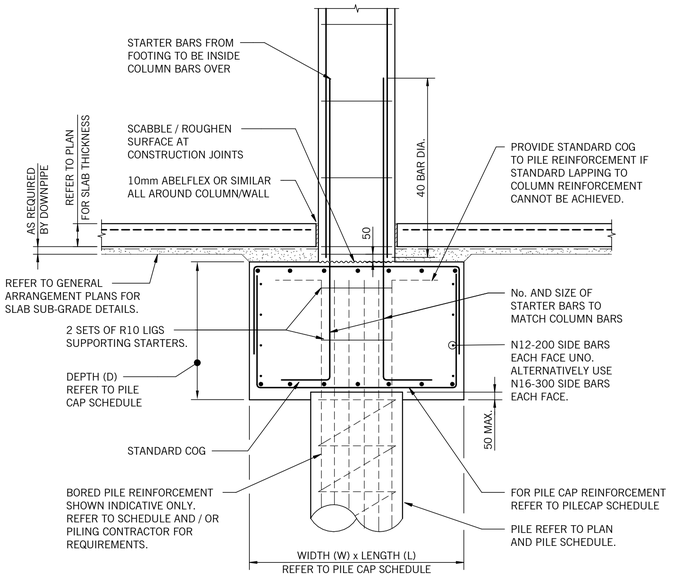


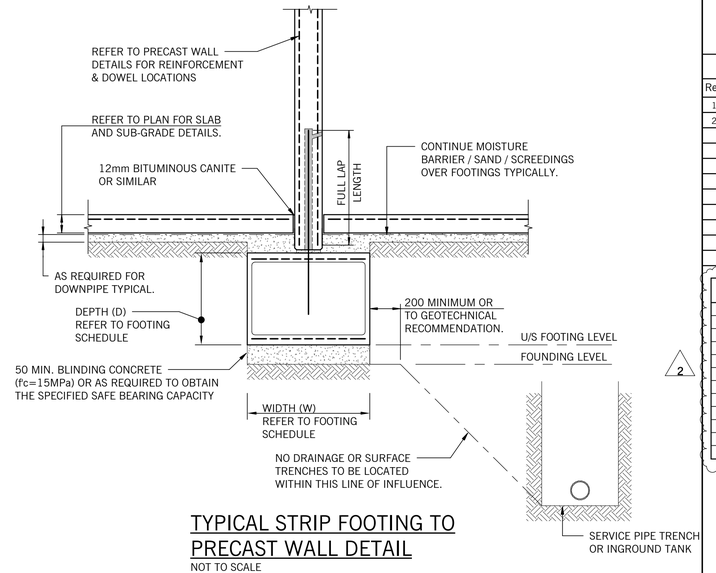
TYPICAL PAD FOOTING DETAIL

NOT TO SCALE



TYPICAL PILE CAP DETAIL

NOT TO SCALE

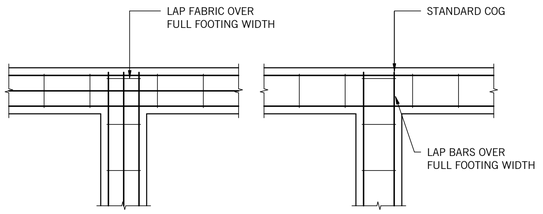


TYPICAL STRIP FOOTING TO PRECAST WALL DETAIL

NOT TO SCALE

NOTES:

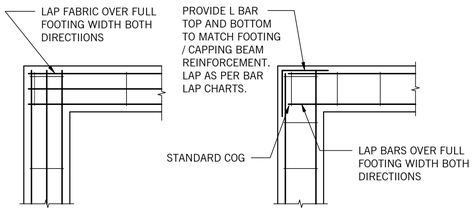
1: FOR REINFORCEMENT, DIMENSIONS ETC. REFER TO FOOTING SCHEDULE.
2: FOR LEVEL TO UNDERSIDE OF FOOTINGS, REFER TO FOOTING PLAN OR FOOTING SCHEDULE.
3: OVERBREAK BELOW FOOTINGS TO BE FILLED WITH BLINDING CONCRETE TO UNDERSIDE OF FOOTING.
4: OVERBREAK AROUND FOOTINGS TO BE FILLED WITH CONCRETE OF THE SAME GRADE AS FOOTINGS.
5: DETAILS ABOVE APPLY UNLESS SHOWN OTHERWISE ON THE DRAWINGS.
6: REFER ALSO TO STANDARD NOTES ON DRAWING S-WEB-001 (2)



TRENCH MESH PLAN — REINFORCING BARS PLAN

TYPICAL STRIP FOOTING / CAPPING BEAM INTERSECTION DETAIL

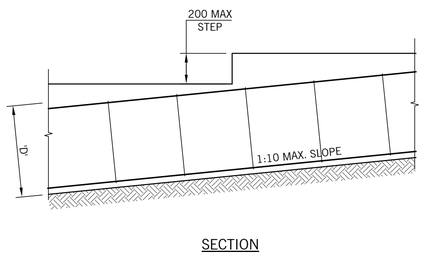
NOT TO SCALE



TRENCH MESH PLAN — REINFORCING BARS PLAN

TYPICAL STRIP FOOTING / CAPPING BEAM CORNER DETAIL

NOT TO SCALE



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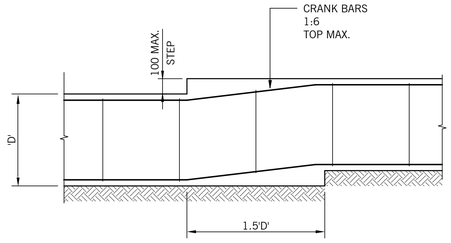

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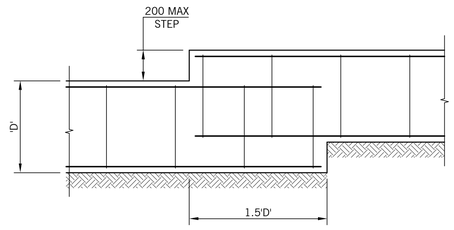

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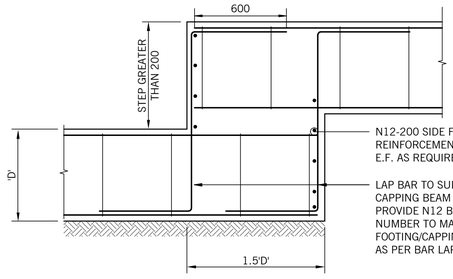

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TYPICAL STEP IN STRIP FOOTING / CAPPING BEAM DETAILS

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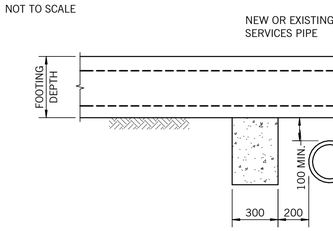
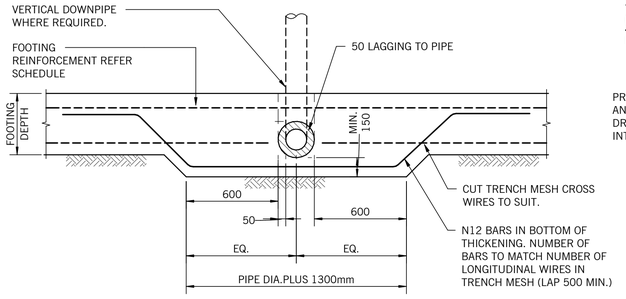


UNDER FOOTING

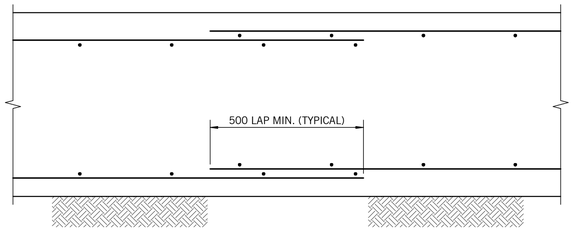


THROUGH FOOTING

SERVICES PENETRATION

NTS

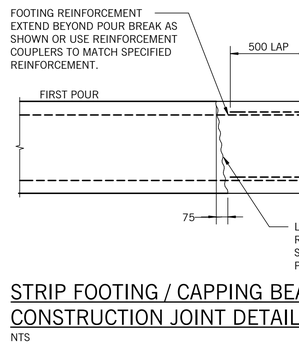
X 048 Sim



TYPICAL FABRIC REINFORCEMENT SPLICE DETAIL FOR STRIP FOOTING

N.T.S

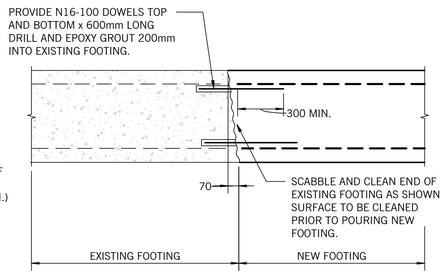
NOTE:
BOTTOM REINFORCEMENT SHOWN, TOP REINFORCEMENT SIMILAR



STRIP FOOTING / CAPPING BEAM CONSTRUCTION JOINT DETAIL

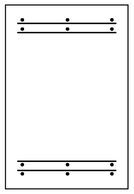
NTS

ENG TO CONFIRM



NEW TO EXISTING FOOTING DETAIL

NTS



SECTION X 048
SCALE: 1 : 10

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Status

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WEBBER DESIGN
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CLIENT: TAYLOR

PROJECT: LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE: FOUNDATION TYPICAL DETAILS - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:10, 1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-048	2

PRINT TIME: 18/12/2020 11:17:46 AM C:\Users\Peter\Documents\WD20023 - LAHC Warwick Farm NSW - Centre - STRUCTURAL_peterZCLIEFP.rvt

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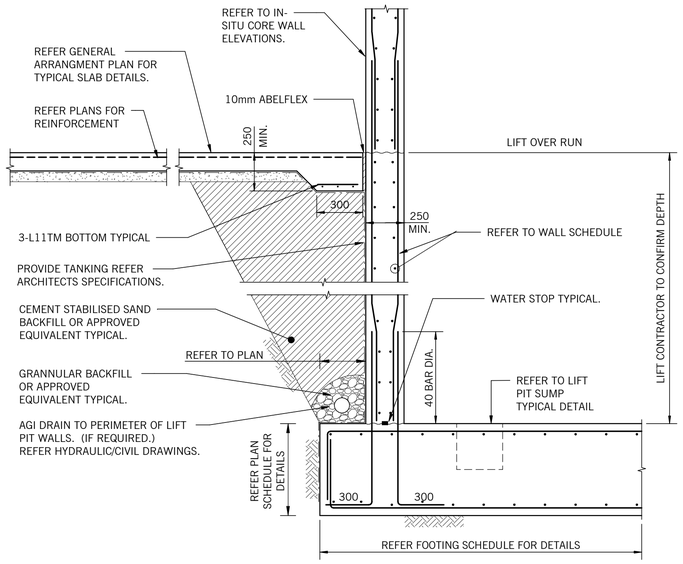
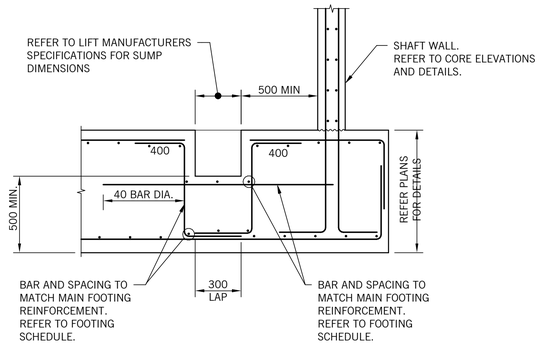




LIFT SUMP DETAIL

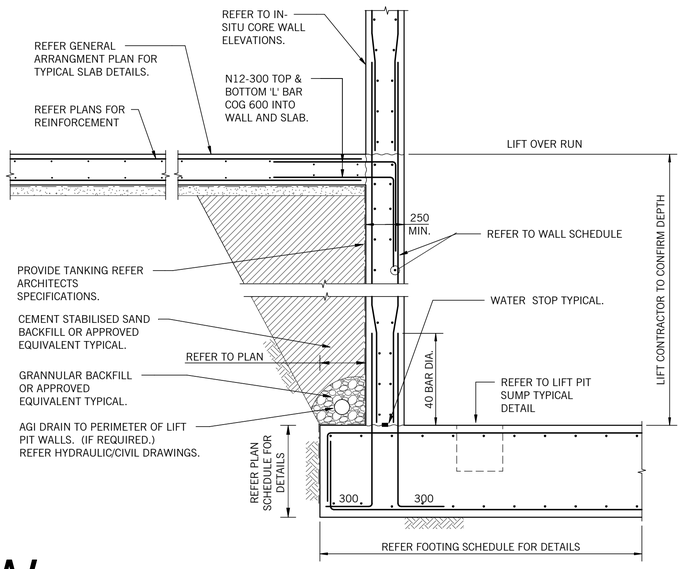
SCALE 1:20

LIFT PIT NOTES:

1. ALL LIFT PIT ELEMENTS ie..CONCRETE WALLS, PILE CAPS,CAPPING BEAM AND BASE OF ALL PITS (AS APPLICABLE) TO CONTAIN WATERPROOFING ADDITIVE TO MANUFACTURERS RECOMMENDATIONS.
2. ALL PIT WALL BASES TO CONTAIN A CONTINUOUS WATERSTOP TO BASE OF WALL.
3. PROVIDE BLINDING CONCRETE TO FULL EXTENT OF EXCAVATED PIT (AS REQUIRED.)

TYPICAL SLAB ON GROUND LIFT PIT DETAIL - IN-SITU WALLS OVER

SCALE 1:20



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1. ALL LIFT PIT ELEMENTS ie..CONCRETE WALLS, PILE CAPS,CAPPING BEAM AND BASE OF ALL PITS (AS APPLICABLE) TO CONTAIN WATERPROOFING ADDITIVE TO MANUFACTURERS RECOMMENDATIONS.
2. ALL PIT WALL BASES TO CONTAIN A CONTINUOUS WATERSTOP TO BASE OF WALL.
3. PROVIDE BLINDING CONCRETE TO FULL EXTENT OF EXCAVATED PIT (AS REQUIRED.)

TYPICAL SUSPENDED SLAB LIFT PIT DETAIL - IN-SITU WALLS OVER

SCALE 1:20

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STRUCTURAL ENGINEERING
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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

FOUNDATION TYPICAL DETAILS - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW

JOB No.	DRAWING No.	REV.
20023	S-WEB-049	2

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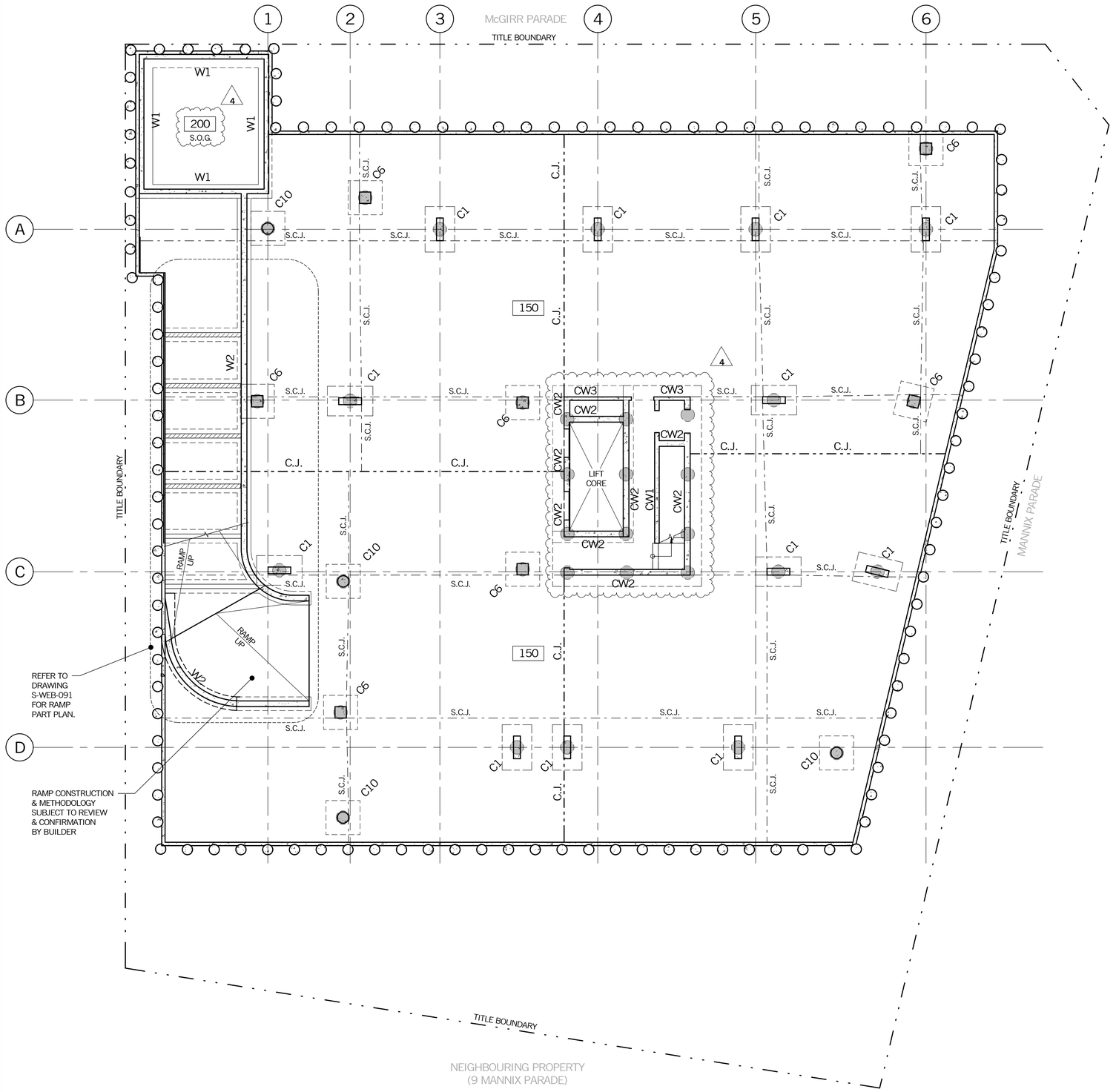

BASEMENT 1 - GENERAL ARRANGEMENT PLAN

SCALE: 1 : 100

BASEMENT 1 - SLAB SCHEDULE				
THICKNESS	f'c (MPa)	REINF. RATE (kg/m³)	P.T. RATE (kg/m²)	REMARKS
150	40	40	N/A	SLAB ON GROUND
200*	40	40	N/A	R.C. RAMP SLAB
200	40	110	N/A	BONDEK SLAB

BASEMENT 1- CONCRETE COLUMN SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
C1	300 x 1000	65	190	INSITU CONCRETE COLUMN
C6	500 x 500	65	150	INSITU CONCRETE COLUMN
C10	500 DIA.	65	170	INSITU CONCRETE COLUMN

BASEMENT 1 - WALL SCHEDULE				
MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
BW1	190	20	60	CORE FILLED BLOCKWORK
CW1	200	50	220	INSITU CONCRETE CORE WALL
CW2	250	50	180	INSITU CONCRETE CORE WALL
CW3	150	50	180	INSITU CONCRETE CORE WALL
W1	200	40	220	INSITU CONCRETE WALL
W2	250	40	180	INSITU CONCRETE WALL

NOTES:

1. ALL PENETRATIONS TO BE REVIEWED AND RESOLVED.
2. ALL SERVICES PENETRATIONS TO BE CO-ORDINATED AND APPROVED BY WEBBER DESIGN.
3. REBATES AND CAST IN PLATES FOR STRUCTURAL STEEL WORK AND FACADE TO BE CO-ORDINATED WITH ARCHITECT.
4. CONTRACTOR SHALL ALLOW FOR CONSTRUCTION JOINTS AS REQUIRED.
5. REFER TO ARCHITECT'S DRAWINGS FOR CAR CRASH BARRIER REQUIREMENTS.

BASEMENT CONSTRUCTION PHILISOPHY:

AS PER THE LATEST GEOTECHNICAL REPORT(STS GEOTECHNICS, APRIL 2020), THE BASEMENT SLAB AND LOWER RETENTION WALLS ARE STRUCTURALLY DESIGNED WITH AN EFFECTIVE DRAINAGE SYSTEM (DESIGNED BY OTHERS) WITH NO RESULTANT HYDROSTATIC PRESSURE BOTH DURING CONSTRUCTION AND THE LIFETIME OF THE STRUCTURE.
THEY HAVE NOT BEEN DESIGN AS A LIQUID RETAINING STRUCTURE AND AS SUCH RELIES ON A WATERPROOF MEDIUM (MEMBRANE, WATERPROOF ADDITIVES OR SIMILAR) TO STOP WATER PERMEATING THROUGH THE CONCRETE OR POTENTIAL CRACKS IN THE STRUCTURE. A WATERPROOFING CONSULTANT SHOULD BE ENGAGED TO ADVISE ON ALL WATERPROOFING REQUIREMENTS INCLUDING POTENTIAL MEMBRANES, CONCRETE ADDITIVES AND DETAILING OF ALL COLD JOINTS TO PILES, SHOTCRETE WALLS, SLABS, FOUNDATIONS AND WALLS.

- ALL DETAILING OF MEMBRANES, WATER STOPS, ETC MADE HEREIN ARE INDICATIVE ONLY AND PENDING TO FURTHER SPECIALIST ADVICE.
- ALLOWANCE FOR POTENTIAL 50mm BLINDING LAYER TO BASEMENT SLAB SHOULD BE MADE PENDING CONFIRMATION OF THE WATERPROOFING SYSTEM ADOPTED AND SPECIFIC REQUIREMENTS.
- ALLOW FOR WATERPROOF ADMIXTURE IN CONCRETE BELOW THE WATERTABLE.
- POUR STRIP AND POUR SIZE TO BE CONSIDERED IN CONJUNCTION WITH WATERPROOFING STRATEGY ALONG WITH ADDITIONAL REINFORCEMENT TO CONTROL CRACK WIDTH.

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Rev.	Description	Eng.	Draft.	Date
1	WORK IN PROGRESS ISSUE	MA	PAC	18.11.20
2	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
3	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20
4	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	05.02.21

GENERAL ARRANGEMENT LEGEND

- xx* -DENOTES SLAB/BAND BEAM THICKNESS
- C1 (6) -DENOTES COLUMN OVER
- -DENOTES WALL OVER
- -DENOTES LOAD BEARING ELEMENT UNDER
- -DENOTES LOAD BEARING ELEMENT UNDER & OVER
- -DENOTES BLOCK WALL OVER
- S.C.J. -DENOTES SAWCUT JOINT
- C.J. -DENOTES CONSTRUCTION JOINT
- STEP -DENOTES SLAB SETDOWN. REFER TO ARCH. DETAILS FOR ALL LEVELS.

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

WEBBER DESIGN
STRUCTURAL ENGINEERING
MELBOURNE OFFICE:
LEVEL 2, 31 QUEEN STREET
MELBOURNE, VIC, AUSTRALIA 3000
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SYDNEY OFFICE:
SUITE 301, LEVEL 3, 19A BOUNDARY STREET
RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

BASEMENT 1 - GENERAL ARRANGEMENT PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-090	4

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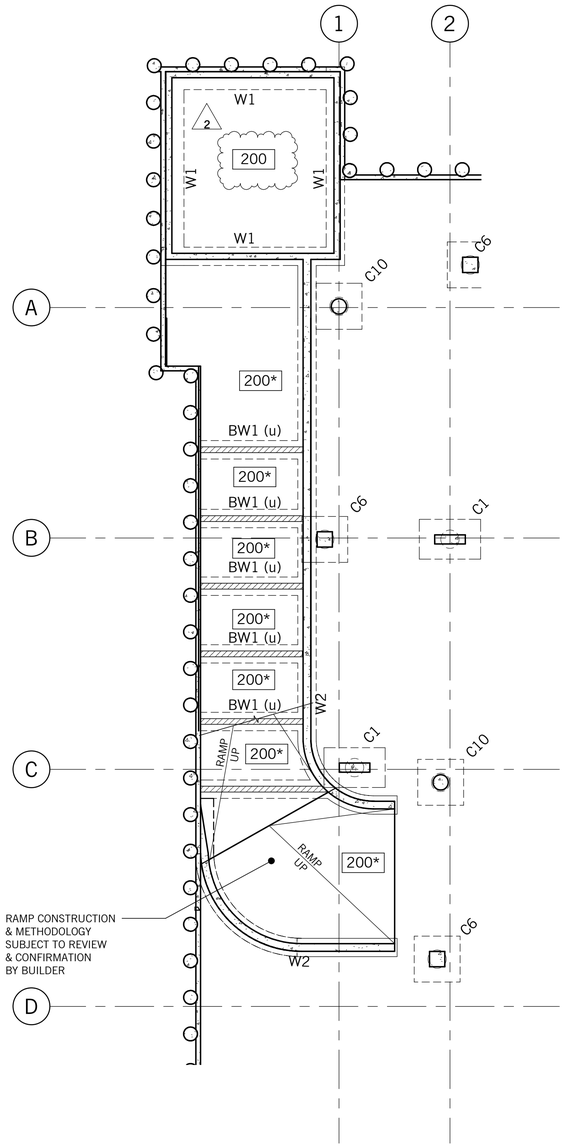

BASEMENT 1 - RAMP PART PLAN

SCALE: 1 : 100

BASEMENT 1 RAMP - SLAB SCHEDULE

THICKNESS	f'c (MPa)	REINF. RATE (kg/m³)	P.T. RATE (kg/m²)	REMARKS
200*	40	40	N/A	R.C. RAMP SLAB
200	40	110	N/A	BONDEK SLAB

BASEMENT 1 - WALL SCHEDULE

MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
BW1	190	20	60	CORE FILLED BLOCKWORK
CW1	200	50	220	INSITU CONCRETE CORE WALL
CW2	250	50	180	INSITU CONCRETE CORE WALL
CW3	150	50	180	INSITU CONCRETE CORE WALL
W1	200	40	220	INSITU CONCRETE WALL
W2	250	40	180	INSITU CONCRETE WALL

NOTES:

1. ALL PENETRATIONS TO BE REVIEWED AND RESOLVED.
2. ALL SERVICES PENETRATIONS TO BE CO-ORDINATED AND APPROVED BY WEBBER DESIGN.
3. REBATES AND CAST IN PLATES FOR STRUCTURAL STEEL WORK AND FACADE TO BE CO-ORDINATED WITH ARCHITECT.
4. CONTRACTOR SHALL ALLOW FOR CONSTRUCTION JOINTS AS REQUIRED.
5. REFER TO ARCHITECT'S DRAWINGS FOR CAR CRASH BARRIER REQUIREMENTS.

BASEMENT CONSTRUCTION PHILISOPHY:

AS PER THE LATEST GEOTECHNICAL REPORT(STS GEOTECHNICS, APRIL 2020), THE BASEMENT SLAB AND LOWER RETENTION WALLS ARE STRUCTURALLY DESIGNED WITH AN EFFECTIVE DRAINAGE SYSTEM (DESIGNED BY OTHERS) WITH NO RESULTANT HYDROSTATIC PRESSURE BOTH DURING CONSTRUCTION AND THE LIFETIME OF THE STRUCTURE.
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- ALL DETAILING OF MEMBRANES, WATER STOPS, ETC MADE HEREIN ARE INDICATIVE ONLY AND PENDING TO FURTHER SPECIALIST ADVICE.
- ALLOWANCE FOR POTENTIAL 50mm BLINDING LAYER TO BASEMENT SLAB SHOULD BE MADE PENDING CONFIRMATION OF THE WATERPROOFING SYSTEM ADOPTED AND SPECIFIC REQUIREMENTS.
- ALLOW FOR WATERPROOF ADMIXTURE IN CONCRETE BELOW THE WATERTABLE.
- POUR STRIP AND POUR SIZE TO BE CONSIDERED IN CONJUNCTION WITH WATERPROOFING STRATEGY ALONG WITH ADDITIONAL REINFORCEMENT TO CONTROL CRACK WIDTH.

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1	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
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DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
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IN-SITU WALLS	S-WEB-820-879
PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

WEBBER DESIGN
STRUCTURAL ENGINEERING
MELBOURNE OFFICE:
LEVEL 2, 31 QUEEN STREET
MELBOURNE, VIC, AUSTRALIA 3000
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SYDNEY OFFICE:
SUITE 301, LEVEL 3, 19A BOUNDARY STREET
RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

BASEMENT 1 - RAMP PART PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-091	2

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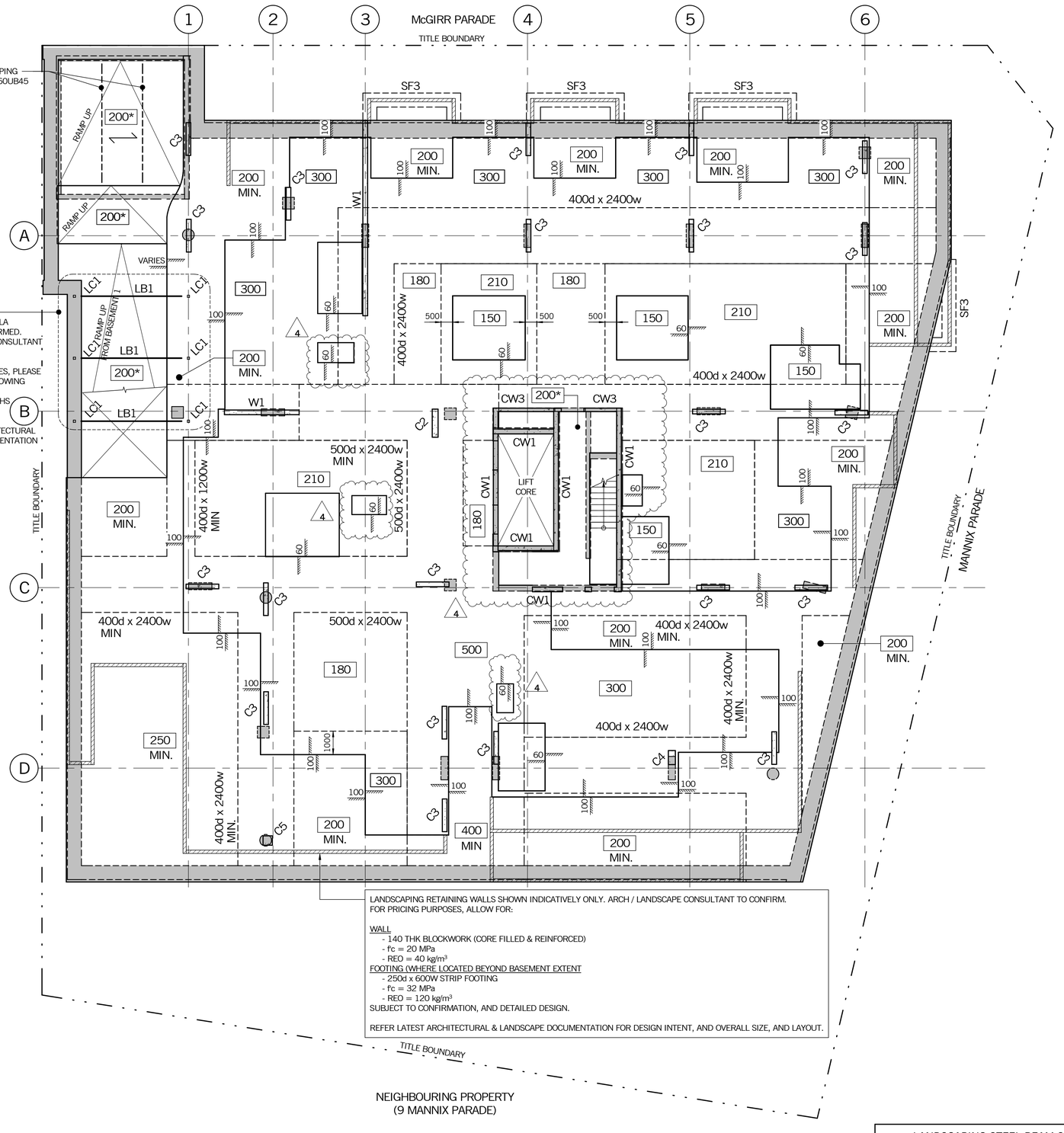

LANDSCAPING RETAINING WALLS SHOWN INDICATIVELY ONLY. ARCH / LANDSCAPE CONSULTANT TO CONFIRM.
FOR PRICING PURPOSES, ALLOW FOR:

WALL
- 140 THK BLOCKWORK (CORE FILLED & REINFORCED)
- f'c = 20 MPa
- REO = 40 kg/m^3

FOOTING (WHERE LOCATED BEYOND BASEMENT EXTENT
- 250d x 600W STRIP FOOTING
- f'c = 32 MPa
- REO = 120 kg/m^3

SUBJECT TO CONFIRMATION, AND DETAILED DESIGN.

REFER LATEST ARCHITECTURAL & LANDSCAPE DOCUMENTATION FOR DESIGN INTENT, AND OVERALL SIZE, AND LAYOUT.

GROUND FLOOR - GENERAL ARRANGEMENT PLAN

SCALE: 1 : 100

GROUND FLOOR SLAB SCHEDULE

THICKNESS	f'c (MPa)	REINF. RATE (kg/m^3)	P.T. RATE (kg/m^2)	REMARKS
150	40	40	1.8	P.T. SLAB BY D&C CONTRACTOR
180	40	40	1.8	P.T. SLAB BY D&C CONTRACTOR
200	40	60 + SL82 MESH TOP THROUGHOUT	5.0	P.T. SLAB BY D&C CONTRACTOR
200*	40	130	N/A	BONDEK SLAB
200*	40	130	N/A	R.C. RAMP SLAB
210	40	40	2.5	P.T. SLAB BY D&C CONTRACTOR
250	40	60 + SL82 MESH TOP THROUGHOUT	2.8	P.T. SLAB BY D&C CONTRACTOR
300	40	40	5.5	P.T. SLAB BY D&C CONTRACTOR

GROUND FLOOR - CONCRETE BEAM SCHEDULE

SIZE	f'c (MPa)	REINF. RATE (kg/m^3)	P.T. TENDONS (kg/m^2)	REMARKS
400d x 2400w	40	40	7.0	P.T. BEAM BY D&C CONTRACTOR
500d x 2400w	40	65	10.5	P.T. BEAM BY D&C CONTRACTOR
400d x 1200w	40	40	8.5	P.T. BEAM BY D&C CONTRACTOR

GROUND FLOOR - CONCRETE COLUMN SCHEDULE

MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m^3)	REMARKS
C2	250 x 1200	50	230	INSITU CONCRETE COLUMN
C3	200 x 1400	50	250	INSITU CONCRETE COLUMN
C4	300 x 600	50	210	INSITU CONCRETE COLUMN
C5	400 x 400	50	210	INSITU CONCRETE COLUMN

GROUND FLOOR - WALL SCHEDULE

MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m^3)	REMARKS
CW1	200	50	220	INSITU CONCRETE CORE WALL
CW2	250	50	180	INSITU CONCRETE CORE WALL
CW3	150	50	180	INSITU CONCRETE CORE WALL
W1	200	50	220	INSITU CONCRETE WALL
W2	250	40	180	INSITU CONCRETE WALL

NOTES:

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2. ALL SERVICES PENETRATIONS TO BE CO-ORDINATED AND APPROVED BY WEBBER DESIGN.
3. REBATES AND CAST IN PLATES FOR STRUCTURAL STEEL WORK AND FACADE TO BE CO-ORDINATED WITH ARCHITECT.
4. CONTRACTOR SHALL ALLOW FOR CONSTRUCTION JOINTS AS REQUIRED.

POST TENSIONED SLAB NOTES:

THE SUSPENDED FLOOR SLABS ARE A DESIGN AND CONSTRUCT COMPONENT.
REFER TO DRAWING S-WEB-001 & S-WEB-002 FOR DESIGN AND CONSTRUCTION POST-TENSIONING FLOOR SLAB AND DESIGN BRIEF AND GENERAL DESIGN & LOADING CRITERIA

GENERAL NOTES:

- ALL CONCRETE SLABS AND BEAMS TO BE POST-TENSIONED U.N.O. PT AND REINFORCEMENT TO BE DESIGNED BY PT CONTRACTOR.
- THE POST TENSIONING CONTRACTOR SHALL ENSURE POTENTIAL INTERNAL FORCES AND CRACKS INDUCED BY PRESTRESSING, SHRINKAGE, AND/OR TEMPERATURE ARE CONTROLLED IN THE VICINITY OF RESTRAINING ELEMENTS AND MAKE PROVISION FOR MOVEMENT AND SHRINKAGE AS REQUIRED THROUGHOUT, INCLUDING MOVEMENT JOINTS, POUR STRIPS, LOW SHRINKAGE CONCRETE MIX ETC.
- NO COLUMN STIFFNESS SHOULD BE USED IN THE SLAB AND BEAM DESIGN.
- SLABS TO BE CHECKED FOR PUNCHING SHEAR WITH MOMENT DERIVED WITH 100% COLUMN STIFFNESS. PT CONTRACTOR TO MAKE ALLOWANCE FOR SHEAR HEAD REINFORCEMENT (WHERE REQUIRED) TO SATISFY PUNCHING SHEAR REINFORCEMENTS
- Ieff TO Igross MAX RATIO TO BE DETERMINED BY THE DESIGNER BUT IN NO INSTANCE SHALL BE GREATER THAN 0.7 FOR THE SLAB AND BEAM CALCULATIONS.
- PT CONTRACTOR TO MAKE ALLOWANCE FOR STRUCTURAL INTEGRITY REINFORCEMENT IN ACCORDANCE WITH CL9.2.2 OF AS3600-2018 FOR ALL SLABS AND BEAMS.
- PT CONTRACTOR TO PROVIDE A MINIMUM P/A OF 1.4MPA (AFTER FINAL LOSSES) TO ALL INTERNAL CONCRETE SLABS AND BEAMS, AND 2.0MPa (AFTER FINAL LOSSES) TO ALL EXTERNAL AREAS (BALCONIES, TERRACES, EXPOSED ROOFS, ETC.) PLUS SL82 TOP MESH U.N.O.
- ALL EXPOSED SLABS/BEAMS CRACK WIDTH TO BE LIMITED TO 0.3mm MAX.

EXPOSURE CLASSIFICATION
- A2 INTERNAL
- B1 EXTERNAL
- B1 SURFACES IN CONTACT WITH THE GROUND

FIRE RATING
- RESIDENTIAL -- 90 MINUTES FRL
- CARPARK -- 120 MINUTES FRL

SERVICEABILITY
- TOTAL LONG TERM DEFLECTION -- SPAN / 250 OR 25mm MAXIMUM, CANTILEVER -- SPAN / 125 OR 15mm MAXIMUM
- TRANSFER SLABS & BEAMS -- SPAN/1000 OR 10mm MAXIMUM
- INCREMENTAL DEFLECTION LIMITS FOR SLABS AND BEAMS SUPPORTING BRITTLE ELEMENTS -- SPAN/500, CANTILEVER -- SPAN/125
- DIFFERENTIAL DEFLECTION BETWEEN FLOORS TO BE LIMITED TO SPAN/500 OR 15mm MAXIMUM AT FACADE LOCATIONS

LANDSCAPING STEEL BEAM SCHEDULE

MARK	MEMBER SIZE	REMARKS
LB1	100 x 6 SHS	STEEL BEAM

LANDSCAPING STEEL COLUMN SCHEDULE

MARK	MEMBER SIZE	REMARKS
LC1	100 x 6.0 SHS	STEEL COLUMN

GROUND FLOOR - LANDSCAPE FOOTING SCHEDULE

MARK	f'c (MPa)	REINF. RATE (kg/m^3)	REMARK
SF3	32	50	STRIP FOOTING

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1	WORK IN PROGRESS ISSUE	MA	PAC	18.11.20
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4	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	05.02.21

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
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R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

GENERAL ARRANGEMENT LEGEND

- xx* -DENOTES SLAB/BAND BEAM THICKNESS
- Cx (c) -DENOTES COLUMN OVER
- -DENOTES WALL OVER
- -DENOTES LOAD BEARING ELEMENT UNDER
- -DENOTES LOAD BEARING ELEMENT UNDER & OVER
- -DENOTES BLOCK WALL OVER
- S.C.J. -DENOTES SAWCUT JOINT
- C.J. -DENOTES CONSTRUCTION JOINT
- STEP -DENOTES SLAB SETDOWN. REFER TO ARCH. DETAILS FOR ALL LEVELS.

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

WEBBER DESIGN
STRUCTURAL ENGINEERING
MELBOURNE OFFICE:
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MELBOURNE, VIC, AUSTRALIA 3000
T: +61 3 9614 7155
SYDNEY OFFICE:
SUITE 301, LEVEL 3, 19A BOUNDARY STREET
RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

GROUND FLOOR - GENERAL ARRANGEMENT PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-100	4

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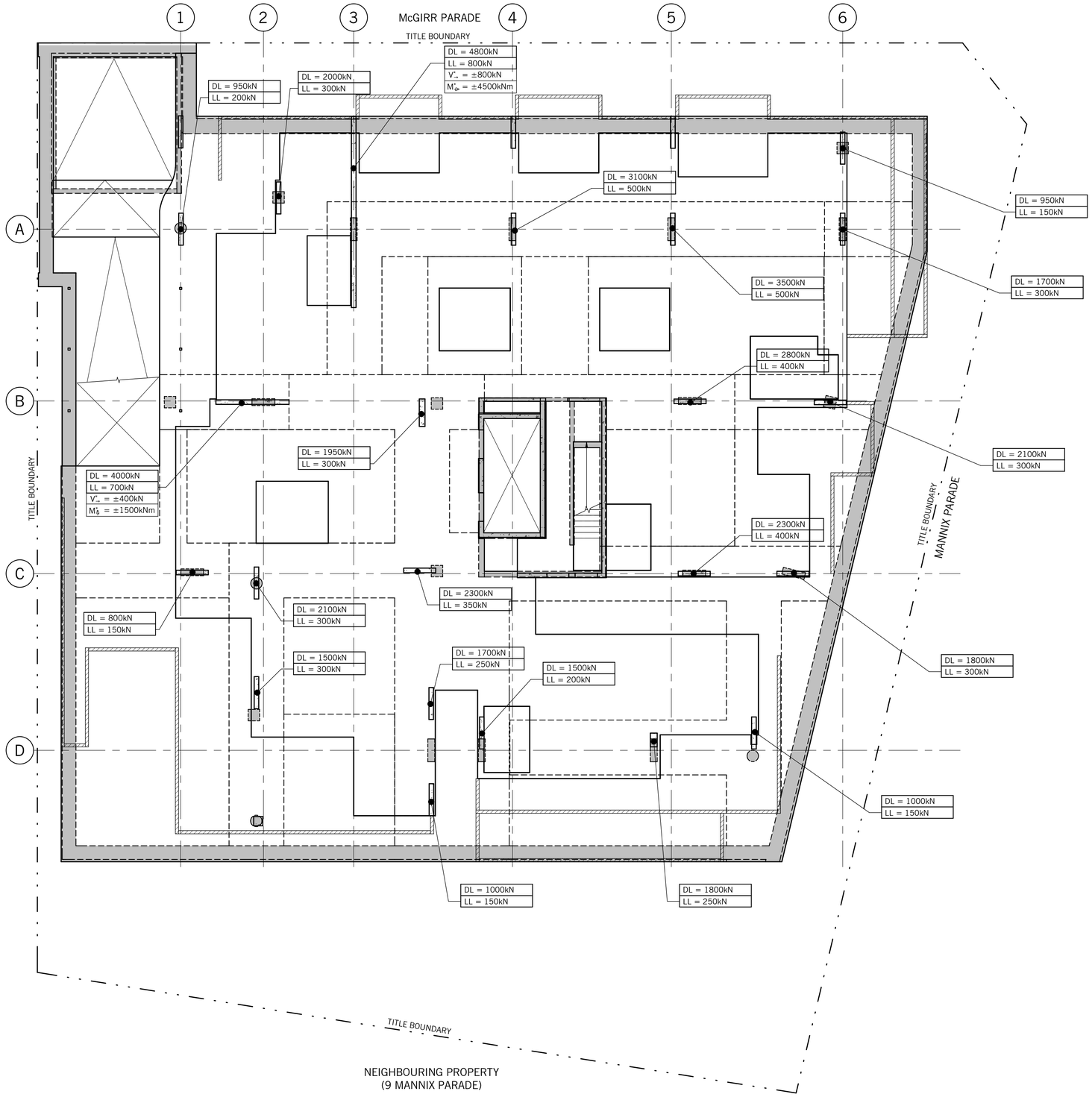

NEIGHBOURING PROPERTY
(9 MANNIX PARADE)

GROUND FLOOR - `TRANSFER LOADING PLAN
SCALE: 1 : 100

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2

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
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PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

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T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

GROUND FLOOR -
TRANSFER LOADING PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-106	2

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WEBBER DESIGN

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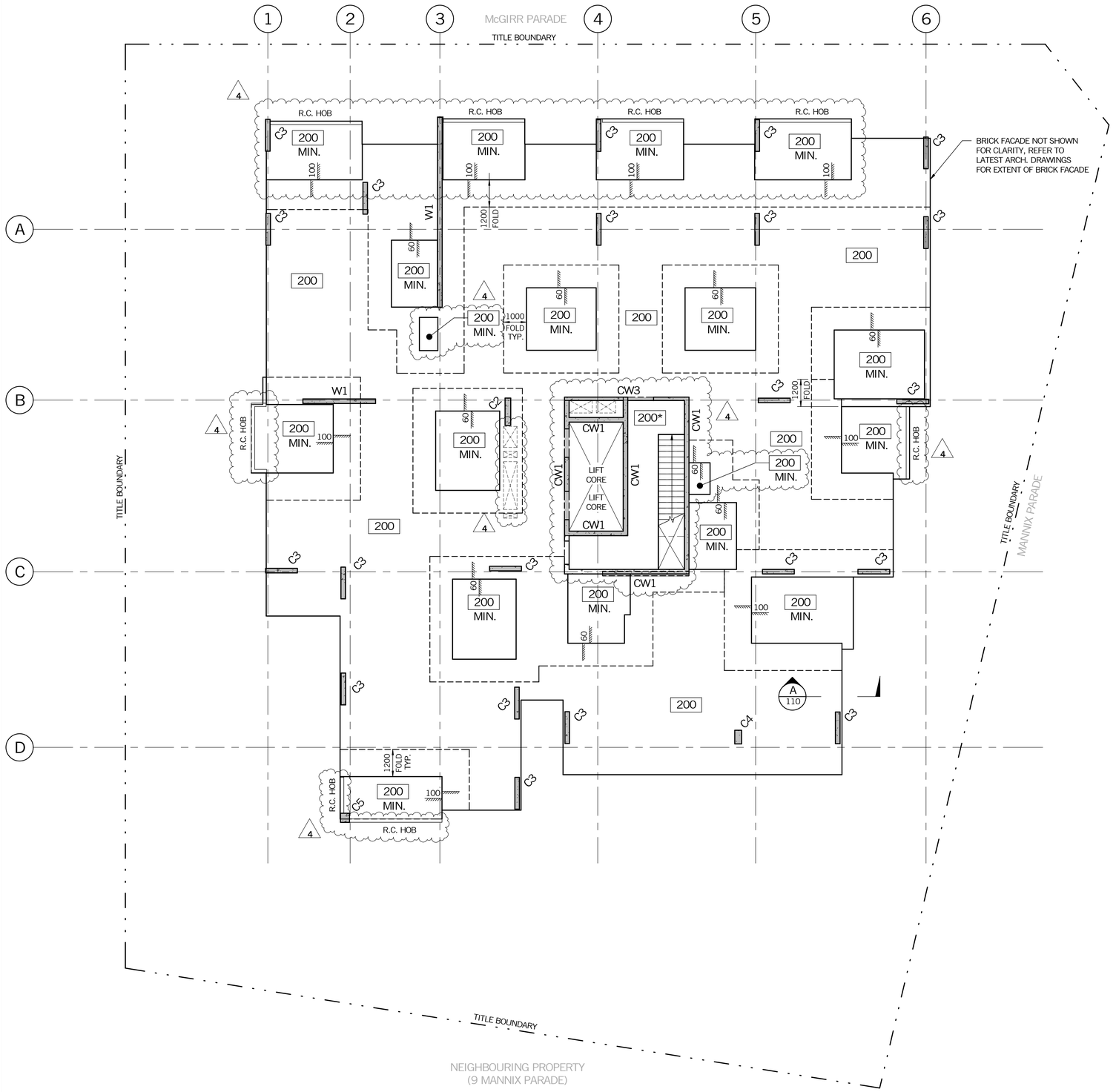

LEVEL 1 - GENERAL ARRANGEMENT PLAN

SCALE: 1 : 100

LEVEL 1 - SLAB SCHEDULE				
THICKNESS	f'c (MPa)	REINF. RATE (kg/m³)	P.T. RATE (kg/m²)	REMARKS
200	40	45	4.8	P.T. SLAB BY D&C CONTRACTOR, ADDITIONAL SL82 MESH TOP TO EXTERNAL AREAS
200*	40	130	N/A	R.C. CORE SLAB

LEVEL 1 - CONCRETE COLUMN SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
C2	250 x 1200	50	230	INSITU CONCRETE COLUMN
C3	200 x 1400	50	250	INSITU CONCRETE COLUMN
C4	300 x 600	50	210	INSITU CONCRETE COLUMN
C5	400 x 400	50	210	INSITU CONCRETE COLUMN

LEVEL 1 - WALL SCHEDULE				
MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
CW1	200	50	220	INSITU CONCRETE CORE WALL
CW3	150	50	180	INSITU CONCRETE CORE WALL
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W2	250	40	180	INSITU CONCRETE WALL

NOTES:

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2. ALL SERVICES PENETRATIONS TO BE CO-ORDINATED AND APPROVED BY WEBBER DESIGN.
3. REBATES AND CAST IN PLATES FOR STRUCTURAL STEEL WORK AND FACADE TO BE CO-ORDINATED WITH ARCHITECT.
4. CONTRACTOR SHALL ALLOW FOR CONSTRUCTION JOINTS AS REQUIRED.

POST TENSIONED SLAB NOTES:

THE SUSPENDED FLOOR SLABS ARE A DESIGN AND CONSTRUCT COMPONENT.
REFER TO DRAWING S-WEB-001 & S-WEB-002 FOR DESIGN AND CONSTRUCTION POST-TENSIONING FLOOR SLAB AND DESIGN BRIEF AND GENERAL DESIGN & LOADING CRITERIA

GENERAL NOTES:

- ALL CONCRETE SLABS AND BEAMS TO BE POST-TENSIONED U.N.O.
  PT AND REINFORCEMENT TO BE DESIGNED BY PT CONTRACTOR.
- SLABS TO BE MINIMUM 200mm THICK, f'c = 40MPa AND
  POST- TENSION BY OTHERS U.N.O.
- THE POST TENSIONING CONTRACTOR SHALL ENSURE POTENTIAL INTERNAL FORCES AND CRACKS INDUCED BY PRESTRESSING, SHRINKAGE, AND/OR TEMPERATURE ARE CONTROLLED IN THE VICINITY OF RESTRAINING ELEMENTS AND MAKE PROVISION FOR MOVEMENT AND SHRINKAGE AS REQUIRED THROUGHOUT, INCLUDING MOVEMENT JOINTS, POUR STRIPS, LOW SHRINKAGE CONCRETE MIX ETC.
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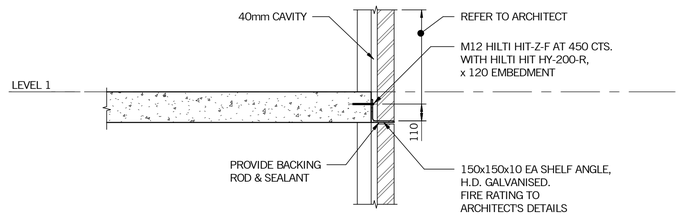
- SLABS TO BE CHECKED FOR PUNCHING SHEAR WITH MOMENT DERIVED WITH 100% COLUMN STIFFNESS. PT CONTRACTOR TO MAKE ALLOWANCE FOR SHEAR HEAD REINFORCEMENT (WHERE REQUIRED) TO SATISFY PUNCHING SHEAR REINFORCEMENTS
- Ieff TO Igross MAX RATIO TO BE DETERMINED BY THE DESIGNER BUT IN NO INSTANCE SHALL BE GREATER THAN 0.7 FOR THE SLAB AND BEAM CALCULATIONS.
- PT CONTRACTOR TO MAKE ALLOWANCE FOR STRUCTURAL INTEGRITY REINFORCEMENT IN ACCORDANCE WITH CL9.2.2 OF AS3600-2018 FOR ALL SLABS AND BEAMS.
- PT CONTRACTOR TO PROVIDE A MINIMUM P/A OF 1.4MPA (AFTER FINAL LOSSES) TO ALL INTERNAL CONCRETE SLABS AND BEAMS, AND 2.0MPa (AFTER FINAL LOSSES) TO ALL EXTERNAL AREAS (BALCONIES, TERRACES, EXPOSED ROOFS, ETC.) PLUS SL82 TOP MESH U.N.O.
- ALL EXPOSED SLABS/BEAMS CRACK WIDTH TO BE LIMITED TO 0.3mm MAX.

EXPOSURE CLASSIFICATION
- A2 INTERNAL
- B1 EXTERNAL
- B1 SURFACES IN CONTACT WITH THE GROUND

FIRE RATING
- RESIDENTIAL -- 90 MINUTES FRL
- CARPARK -- 120 MINUTES FRL

SERVICEABILITY
- TOTAL LONG TERM DEFLECTION -- SPAN / 250 OR 25mm MAXIMUM, CANTILEVER -- SPAN / 125 OR 15mm MAXIMUM
- TRANSFER SLABS & BEAMS -- SPAN/1000 OR 10mm MAXIMUM
- INCREMENTAL DEFLECTION LIMITS FOR SLABS AND BEAMS SUPPORTING BRITTLE ELEMENTS -- SPAN/500, CANTILEVER -- SPAN/125
- DIFFERENTIAL DEFLECTION BETWEEN FLOORS TO BE LIMITED TO SPAN/500 OR 15mm MAXIMUM AT FACADE LOCATIONS



SECTION A 110

SCALE: 1 : 20

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Rev.	Description	Eng.	Draft.	Date
1	WORK IN PROGRESS ISSUE	MA	PAC	18.11.20
2	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
3	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20
4	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	05.02.21

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
CONCRETE COLUMNS	S-WEB-800-819
IN-SITU WALLS	S-WEB-820-879
PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

GENERAL ARRANGEMENT LEGEND

- xx* -DENOTES SLAB/BAND BEAM THICKNESS
- Cx (o) -DENOTES COLUMN OVER
- -DENOTES WALL OVER
- -DENOTES LOAD BEARING ELEMENT UNDER
- -DENOTES LOAD BEARING ELEMENT UNDER & OVER
- -DENOTES BLOCK WALL OVER
- S.C.J. -DENOTES SAWCUT JOINT
- C.J. -DENOTES CONSTRUCTION JOINT
- STEP -DENOTES SLAB SETDOWN. REFER TO ARCH. DETAILS FOR ALL LEVELS.

ISSUED FOR TENDER

Status

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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

LEVEL 1 - GENERAL ARRANGEMENT PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20, 1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-110	4

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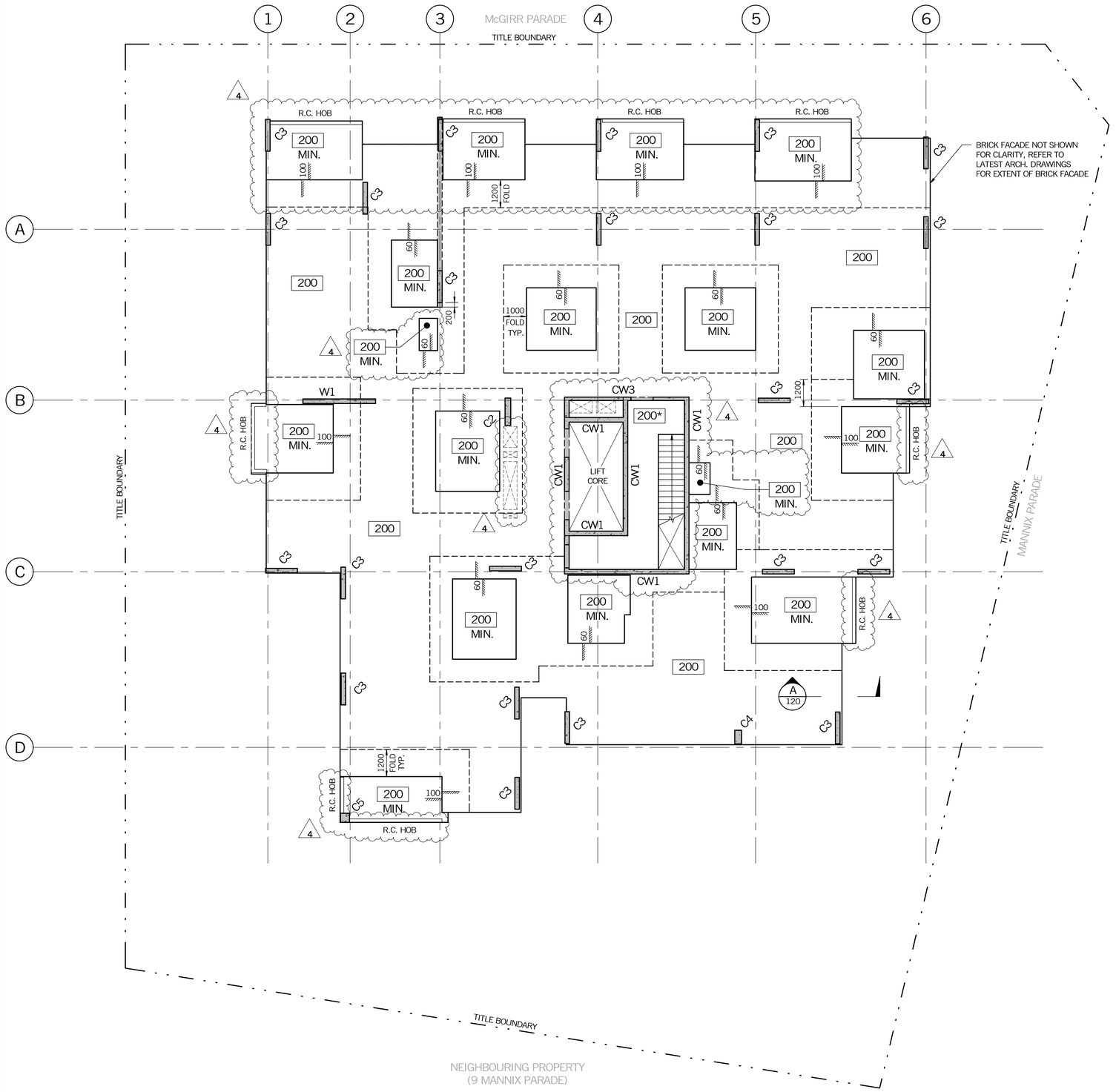

LEVEL 2 - GENERAL ARRANGEMENT PLAN

SCALE: 1 : 100

LEVEL 2 - SLAB SCHEDULE				
THICKNESS	f'c (MPa)	REINF. RATE (kg/m³)	P.T. RATE (kg/m²)	REMARKS
200	40	45	4.8	P.T. SLAB BY D&C CONTRACTOR. ADDITIONAL SL82 MESH TOP TO EXTERNAL AREAS
200*	40	130	N/A	R.C. CORE SLAB

LEVEL 2 - CONCRETE COLUMN SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
C2	250 x 1200	50	230	INSITU CONCRETE COLUMN
C3	200 x 1400	50	250	INSITU CONCRETE COLUMN
C4	300 x 600	50	210	INSITU CONCRETE COLUMN
C5	400 x 400	50	210	INSITU CONCRETE COLUMN

LEVEL 2 - WALL SCHEDULE				
MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
CW1	200	50	220	INSITU CONCRETE CORE WALL
CW3	150	50	180	INSITU CONCRETE CORE WALL
W1	200	50	220	INSITU CONCRETE WALL
W2	250	40	180	INSITU CONCRETE WALL

NOTES:

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2. ALL SERVICES PENETRATIONS TO BE CO-ORDINATED AND APPROVED BY WEBBER DESIGN.
3. REBATES AND CAST IN PLATES FOR STRUCTURAL STEEL WORK AND FACADE TO BE CO-ORDINATED WITH ARCHITECT.
4. CONTRACTOR SHALL ALLOW FOR CONSTRUCTION JOINTS AS REQUIRED.

POST TENSIONED SLAB NOTES:

THE SUSPENDED FLOOR SLABS ARE A DESIGN AND CONSTRUCT COMPONENT.
REFER TO DRAWING S-WEB-001 & S-WEB-002 FOR DESIGN AND CONSTRUCTION POST-TENSIONING FLOOR SLAB AND DESIGN BRIEF AND GENERAL DESIGN & LOADING CRITERIA

GENERAL NOTES:

- ALL CONCRETE SLABS AND BEAMS TO BE POST-TENSIONED U.N.O. PT AND REINFORCEMENT TO BE DESIGNED BY PT CONTRACTOR.
- SLABS TO BE MINIMUM 200mm THICK, f'c = 40MPa AND POST- TENSION BY OTHERS U.N.O.
- THE POST TENSIONING CONTRACTOR SHALL ENSURE POTENTIAL INTERNAL FORCES AND CRACKS INDUCED BY PRESTRESSING, SHRINKAGE, AND/OR TEMPERATURE ARE CONTROLLED IN THE VICINITY OF RESTRAINING ELEMENTS AND MAKE PROVISION FOR MOVEMENT AND SHRINKAGE AS REQUIRED THROUGHOUT, INCLUDING MOVEMENT JOINTS, POUR STRIPS, LOW SHRINKAGE CONCRETE MIX ETC.
- NO COLUMN STIFFNESS SHOULD BE USED IN THE SLAB AND BEAM DESIGN.
- SLABS TO BE CHECKED FOR PUNCHING SHEAR WITH MOMENT DERIVED WITH 100% COLUMN STIFFNESS. PT CONTRACTOR TO MAKE ALLOWANCE FOR SHEAR HEAD REINFORCEMENT (WHERE REQUIRED) TO SATISFY PUNCHING SHEAR REINFORCEMENTS
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EXPOSURE CLASSIFICATION
- A2 INTERNAL
- B1 EXTERNAL
- B1 SURFACES IN CONTACT WITH THE GROUND

FIRE RATING
- RESIDENTIAL -- 90 MINUTES FRL
- CARPARK -- 120 MINUTES FRL

SERVICEABILITY
- TOTAL LONG TERM DEFLECTION -- SPAN / 250 OR 25mm MAXIMUM, CANTILEVER -- SPAN / 125 OR 15mm MAXIMUM
- TRANSFER SLABS & BEAMS -- SPAN/1000 OR 10mm MAXIMUM
- INCREMENTAL DEFLECTION LIMITS FOR SLABS AND BEAMS SUPPORTING BRITTLE ELEMENTS -- SPAN/500, CANTILEVER -- SPAN/125
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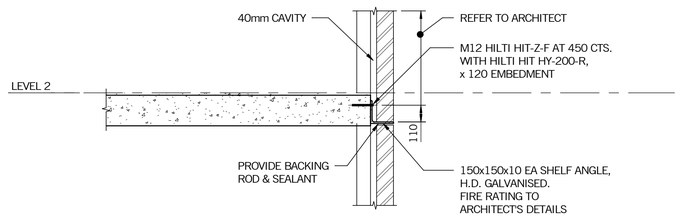

SECTION A

SCALE: 1 : 20 — 120

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Rev.	Description	Eng.	Draft.	Date
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2	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
3	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20
4	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	05.02.21

DRAWING REFERENCE	REFERENCE No.
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GENERAL NOTES	S-WEB-001-002
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STEEL DETAILS	S-WEB-990-991

GENERAL ARRANGEMENT LEGEND

- xx* -DENOTES SLAB/BAND BEAM THICKNESS
- C# (xx) -DENOTES COLUMN OVER
- -DENOTES WALL OVER
- -DENOTES LOAD BEARING ELEMENT UNDER
- -DENOTES LOAD BEARING ELEMENT UNDER & OVER
- -DENOTES BLOCK WALL OVER
- S.C.J. -DENOTES SAWCUT JOINT
- C.J. -DENOTES CONSTRUCTION JOINT
- STEP -DENOTES SLAB SETDOWN. REFER TO ARCH. DETAILS FOR ALL LEVELS.

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

WEBBER DESIGN
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SYDNEY OFFICE:
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RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

LEVEL 2 - GENERAL ARRANGEMENT PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20, 1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-120	4

PRINT TIME: 5/02/2021 3:59:43 PM C:\Users\peter\Documents\W2020\23 - LAHC Warwick Farm NSW - Central_STRUCTURAL_peter2UEEF.rvt

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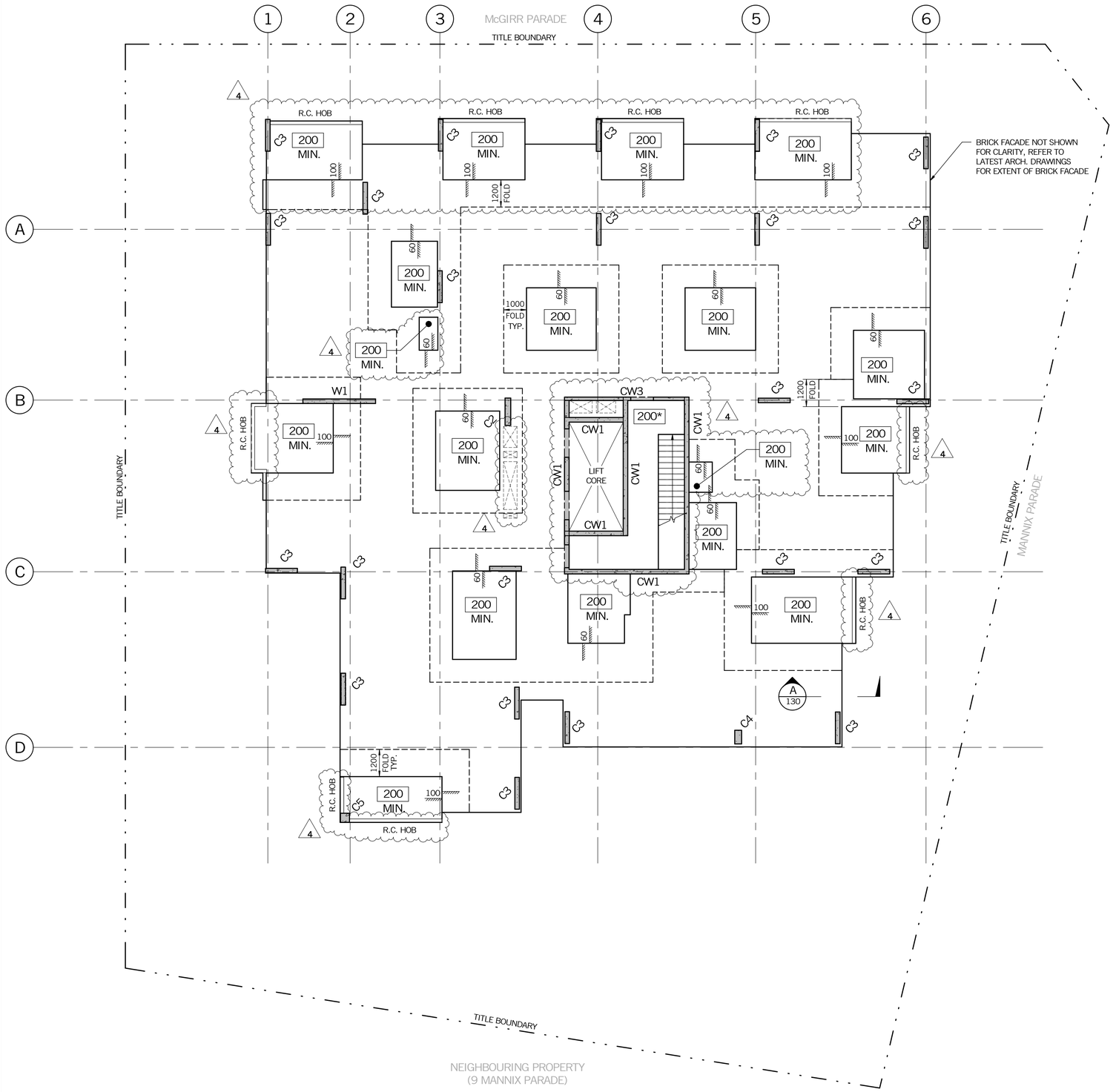

LEVEL 3 - GENERAL ARRANGEMENT PLAN

SCALE: 1 : 100

LEVEL 3 - SLAB SCHEDULE				
THICKNESS	f'c (MPa)	REINF. RATE (kg/m³)	P.T. RATE (kg/m²)	REMARKS
200	40	45	4.8	P.T. SLAB BY D&C CONTRACTOR, ADDITIONAL SL82 MESH TOP TO EXTERNAL AREAS
200*	40	130	N/A	R.C. CORE SLAB

LEVEL 3 - CONCRETE COLUMN SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
C2	250 x 1200	50	230	INSITU CONCRETE COLUMN
C3	200 x 1400	50	250	INSITU CONCRETE COLUMN
C4	300 x 600	50	210	INSITU CONCRETE COLUMN
C5	400 x 400	50	210	INSITU CONCRETE COLUMN

LEVEL 3 - WALL SCHEDULE				
MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
CW1	200	50	220	INSITU CONCRETE CORE WALL
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W2	250	40	180	INSITU CONCRETE WALL

NOTES:

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EXPOSURE CLASSIFICATION
- A2 INTERNAL
- B1 EXTERNAL
- B1 SURFACES IN CONTACT WITH THE GROUND

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- RESIDENTIAL -- 90 MINUTES FRL
- CARPARK -- 120 MINUTES FRL

SERVICEABILITY
- TOTAL LONG TERM DEFLECTION -- SPAN / 250 OR 25mm MAXIMUM, CANTILEVER -- SPAN / 125 OR 15mm MAXIMUM
- TRANSFER SLABS & BEAMS -- SPAN/1000 OR 10mm MAXIMUM
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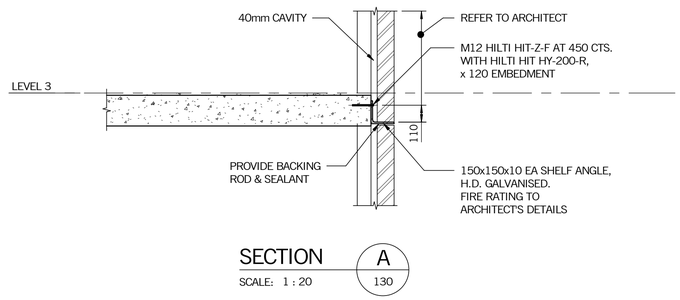

SECTION A/130

SCALE: 1 : 20

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GENERAL ARRANGEMENT LEGEND

- xx* -DENOTES SLAB/BAND BEAM THICKNESS
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- C.J. -DENOTES CONSTRUCTION JOINT
- STEP -DENOTES SLAB SETDOWN. REFER TO ARCH. DETAILS FOR ALL LEVELS.

ISSUED FOR TENDER

Status

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RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

LEVEL 3 - GENERAL ARRANGEMENT PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20, 1:100	PAC	PW

JOB No.	DRAWING No.	REV.
20023	S-WEB-130	4

PRINT TIME: 5/02/2021 3:59:37 PM
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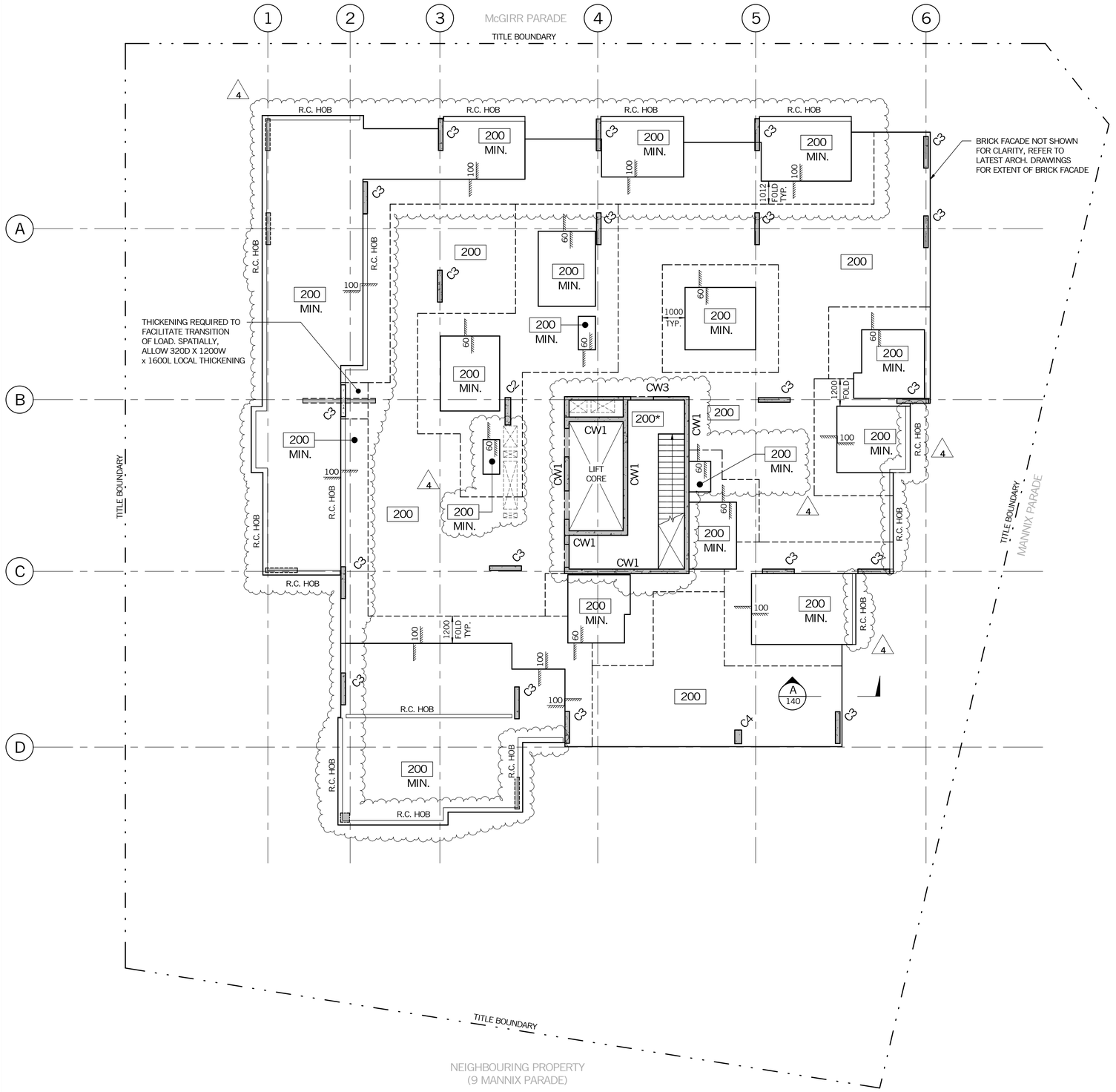

LEVEL 4 - GENERAL ARRANGEMENT PLAN

SCALE: 1 : 100

LEVEL 4 - SLAB SCHEDULE				
THICKNESS	f'c (MPa)	REINF. RATE (kg/m³)	P.T. RATE (kg/m²)	REMARKS
200	40	45	4.8	P.T. SLAB BY D&C CONTRACTOR, ADDITIONAL SL82 MESH TOP TO EXTERNAL AREAS
200*	40	130	N/A	R.C. CORE SLAB

LEVEL 4 - CONCRETE COLUMN SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
C2	250 x 1200	40	160	INSITU CONCRETE COLUMN
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C4	300 x 600	40	160	INSITU CONCRETE COLUMN

LEVEL 4 - WALL SCHEDULE				
MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
CW1	200	40	180	INSITU CONCRETE CORE WALL
CW3	150	40	180	INSITU CONCRETE CORE WALL
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GENERAL NOTES:

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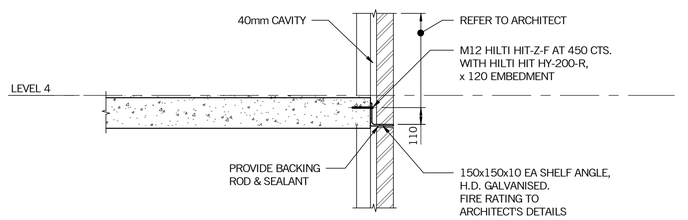
- ALL EXPOSED SLABS/BEAMS CRACK WIDTH TO BE LIMITED TO 0.3mm MAX.

EXPOSURE CLASSIFICATION
- A2 INTERNAL
- B1 EXTERNAL
- B1 SURFACES IN CONTACT WITH THE GROUND

FIRE RATING
- RESIDENTIAL -- 90 MINUTES FRL
- CARPARK -- 120 MINUTES FRL

SERVICEABILITY
- TOTAL LONG TERM DEFLECTION -- SPAN / 250 OR 25mm MAXIMUM, CANTILEVER -- SPAN / 125 OR 15mm MAXIMUM
- TRANSFER SLABS & BEAMS -- SPAN/1000 OR 10mm MAXIMUM
- INCREMENTAL DEFLECTION LIMITS FOR SLABS AND BEAMS SUPPORTING BRITTLE ELEMENTS -- SPAN/500, CANTILEVER -- SPAN/125
- DIFFERENTIAL DEFLECTION BETWEEN FLOORS TO BE LIMITED TO SPAN/500 OR 15mm MAXIMUM AT FACADE LOCATIONS



SECTION A/140

SCALE: 1 : 20

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Rev.	Description	Eng.	Draft.	Date
1	WORK IN PROGRESS ISSUE	MA	PAC	18.11.20
2	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
3	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20
4	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	05.02.21

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
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IN-SITU WALLS	S-WEB-820-879
PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

GENERAL ARRANGEMENT LEGEND

- xx* -DENOTES SLAB/BAND BEAM THICKNESS
- CX (C) -DENOTES COLUMN OVER
- -DENOTES WALL OVER
- -DENOTES LOAD BEARING ELEMENT UNDER
- -DENOTES LOAD BEARING ELEMENT UNDER & OVER
- -DENOTES BLOCK WALL OVER
- S.C.J. -DENOTES SAWCUT JOINT
- C.J. -DENOTES CONSTRUCTION JOINT
- STEP -DENOTES SLAB SETDOWN. REFER TO ARCH. DETAILS FOR ALL LEVELS.

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

LEVEL 4 - GENERAL ARRANGEMENT PLAN

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20, 1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-140	4

PRINT TIME: 5/02/2021 3:59:31 PM
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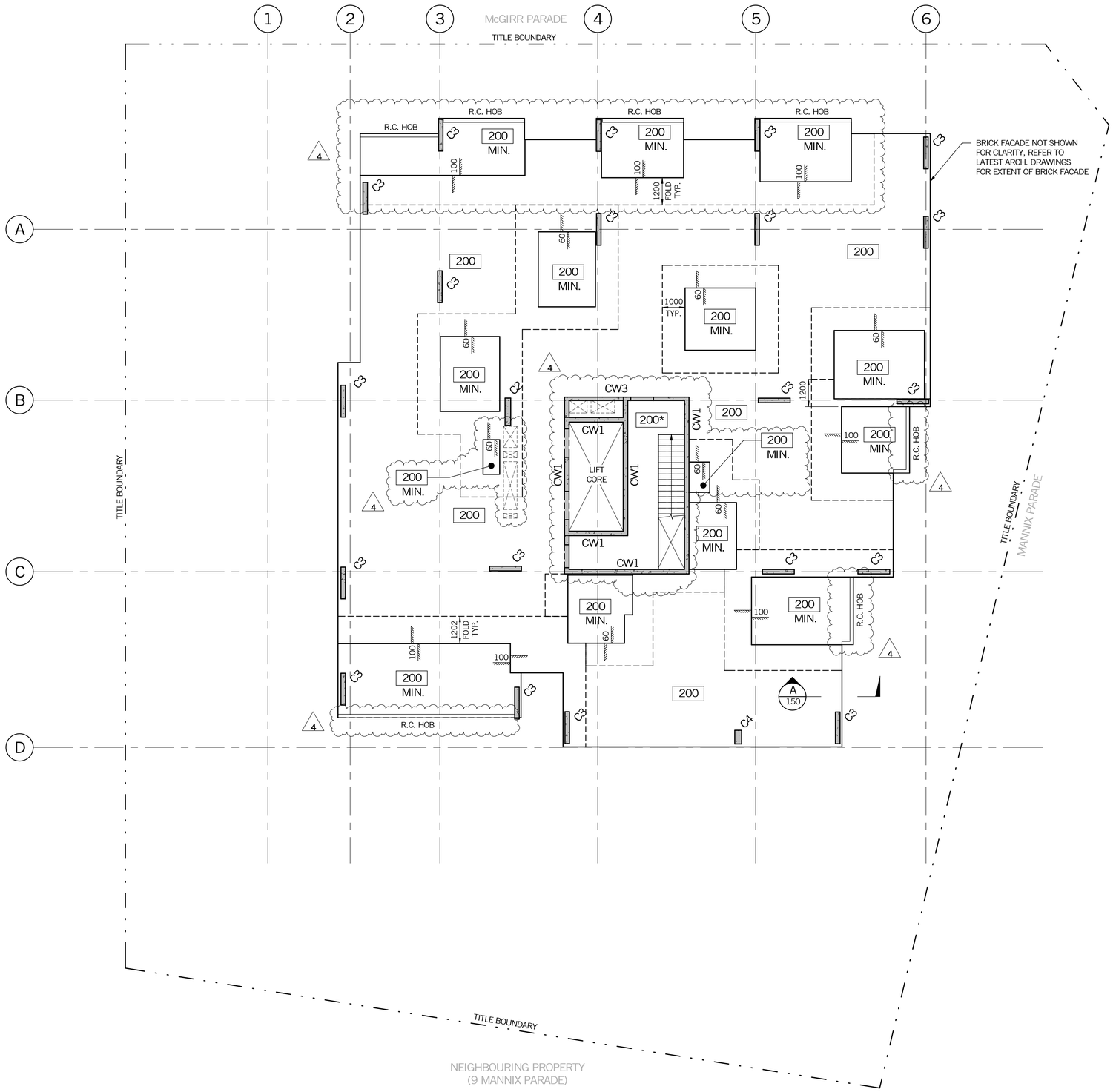

LEVEL 5 - GENERAL ARRANGEMENT PLAN

SCALE: 1 : 100

LEVEL 5 - SLAB SCHEDULE				
THICKNESS	f'c (MPa)	REINF. RATE (kg/m³)	P.T. RATE (kg/m²)	REMARKS
200	40	95	4.8	P.T. SLAB BY D&C CONTRACTOR
200*	40	130	N/A	R.C. CORE SLAB

LEVEL 5 - CONCRETE COLUMN SCHEDULE				
MARK	SIZE	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
C2	250 x 1200	40	160	INSITU CONCRETE COLUMN
C3	200 x 1400	40	180	INSITU CONCRETE COLUMN
C4	300 x 600	40	160	INSITU CONCRETE COLUMN

LEVEL 5 - WALL SCHEDULE				
MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
CW1	200	40	180	INSITU CONCRETE CORE WALL
CW3	150	40	180	INSITU CONCRETE CORE WALL
W1	200	50	180	INSITU CONCRETE WALL
W2	250	40	180	INSITU CONCRETE WALL

NOTES:

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2. ALL SERVICES PENETRATIONS TO BE CO-ORDINATED AND APPROVED BY WEBBER DESIGN.
3. REBATES AND CAST IN PLATES FOR STRUCTURAL STEEL WORK AND FACADE TO BE CO-ORDINATED WITH ARCHITECT.
4. CONTRACTOR SHALL ALLOW FOR CONSTRUCTION JOINTS AS REQUIRED.

POST TENSIONED SLAB NOTES:

THE SUSPENDED FLOOR SLABS ARE A DESIGN AND CONSTRUCT COMPONENT.
REFER TO DRAWING S-WEB-001 & S-WEB-002 FOR DESIGN AND CONSTRUCTION POST-TENSIONING FLOOR SLAB AND DESIGN BRIEF AND GENERAL DESIGN & LOADING CRITERIA

GENERAL NOTES:

- ALL CONCRETE SLABS AND BEAMS TO BE POST-TENSIONED U.N.O. PT AND REINFORCEMENT TO BE DESIGNED BY PT CONTRACTOR.
- SLABS TO BE MINIMUM 200mm THICK, f'c = 40MPa AND POST-TENSION BY OTHERS U.N.O.
- THE POST TENSIONING CONTRACTOR SHALL ENSURE POTENTIAL INTERNAL FORCES AND CRACKS INDUCED BY PRESTRESSING, SHRINKAGE, AND/OR TEMPERATURE ARE CONTROLLED IN THE VICINITY OF RESTRAINING ELEMENTS AND MAKE PROVISION FOR MOVEMENT AND SHRINKAGE AS REQUIRED THROUGHOUT, INCLUDING MOVEMENT JOINTS, POUR STRIPS, LOW SHRINKAGE CONCRETE MIX ETC.
- NO COLUMN STIFFNESS SHOULD BE USED IN THE SLAB AND BEAM DESIGN.
- SLABS TO BE CHECKED FOR PUNCHING SHEAR WITH MOMENT DERIVED WITH 100% COLUMN STIFFNESS. PT CONTRACTOR TO MAKE ALLOWANCE FOR SHEAR HEAD REINFORCEMENT (WHERE REQUIRED) TO SATISFY PUNCHING SHEAR REINFORCEMENTS
- Ieff TO Igross MAX RATIO TO BE DETERMINED BY THE DESIGNER BUT IN NO INSTANCE SHALL BE GREATER THAN 0.7 FOR THE SLAB AND BEAM CALCULATIONS.
- PT CONTRACTOR TO MAKE ALLOWANCE FOR STRUCTURAL INTEGRITY REINFORCEMENT IN ACCORDANCE WITH CL9.2.2 OF AS3600-2018 FOR ALL SLABS AND BEAMS.
- PT CONTRACTOR TO PROVIDE A MINIMUM P/A OF 1.4MPA (AFTER FINAL LOSSES) TO ALL INTERNAL CONCRETE SLABS AND BEAMS, AND 2.0MPa (AFTER FINAL LOSSES) TO ALL EXTERNAL AREAS (BALCONIES, TERRACES, EXPOSED ROOFS, ETC.) PLUS SL82 TOP MESH U.N.O.
- ALL EXPOSED SLABS/BEAMS CRACK WIDTH TO BE LIMITED TO 0.3mm MAX.

EXPOSURE CLASSIFICATION
- A2 INTERNAL
- B1 EXTERNAL
- B1 SURFACES IN CONTACT WITH THE GROUND

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- RESIDENTIAL -- 90 MINUTES FRL
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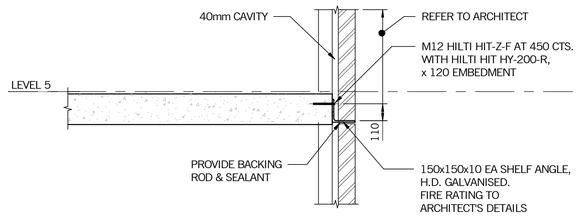

SECTION A/150

SCALE: 1 : 20

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GENERAL ARRANGEMENT LEGEND

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Status

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TITLE

LEVEL 5 - GENERAL ARRANGEMENT PLAN

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20023	S-WEB-150	4

PRINT TIME: 5/02/2021 3:59:26 PM C:\Users\pac\Documents\WI\20023 - LAHC Warwick Farm NSW - Central - STRUCTURAL_pac2UEEP.rvt

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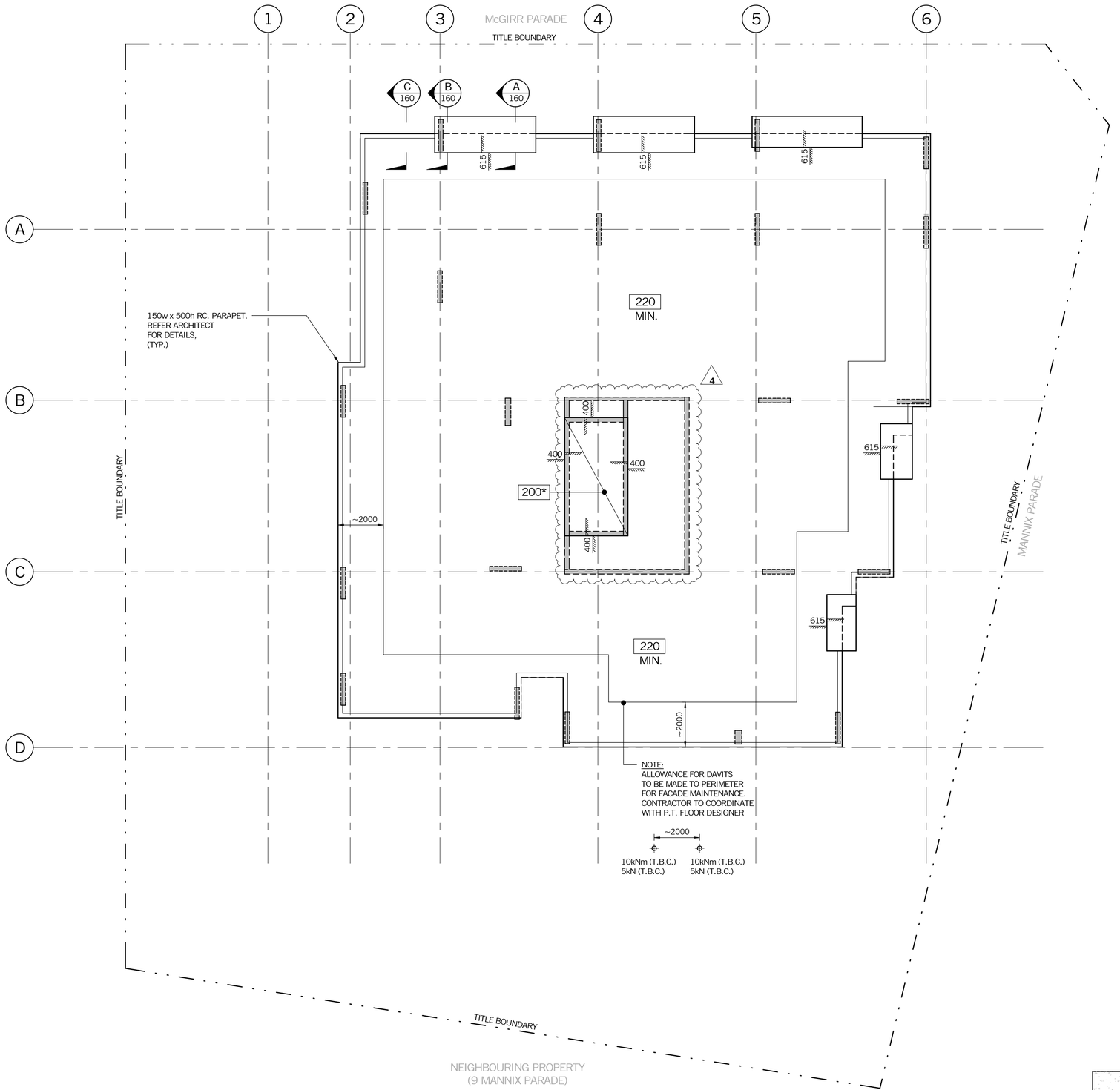

ROOF - GENERAL ARRANGEMENT PLAN
SCALE: 1 : 100

ROOF - SLAB SCHEDULE				
THICKNESS	f'c (MPa)	REINF. RATE (kg/m³)	P.T. RATE (kg/m²)	REMARKS
220	40	60 + SL82 MESH TOP THROUGHOUT	6.5	P.T. SLAB BY D&C CONTRACTOR
200*	40	120	N/A	R.C. LIFT LID

NOTES:
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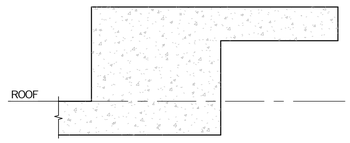
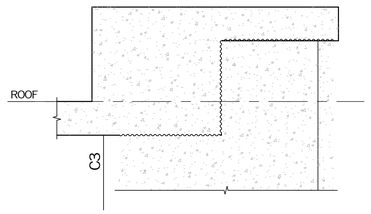


SECTION A
SCALE: 1 : 20



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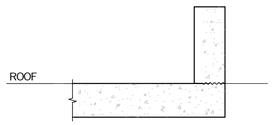

SECTION C
SCALE: 1 : 20

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CLIENT

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PROJECT

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TITLE

ROOF - GENERAL ARRANGEMENT PLAN

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20023	S-WEB-160	4

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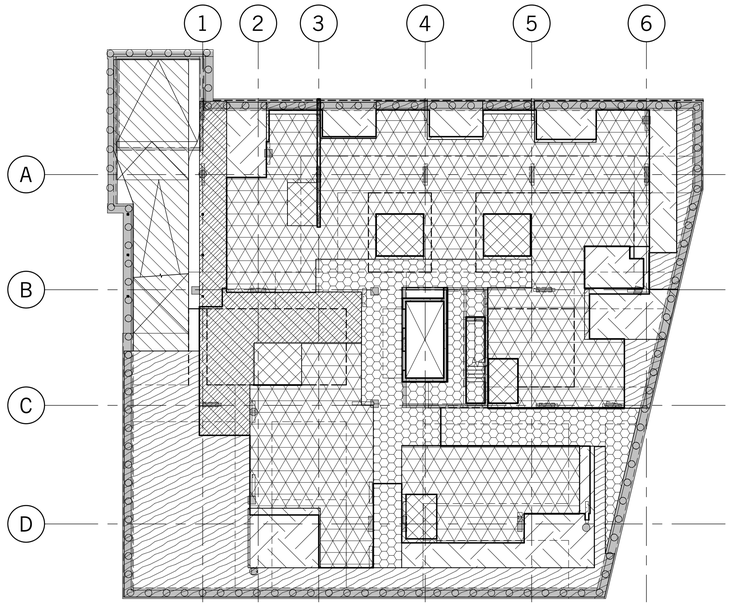
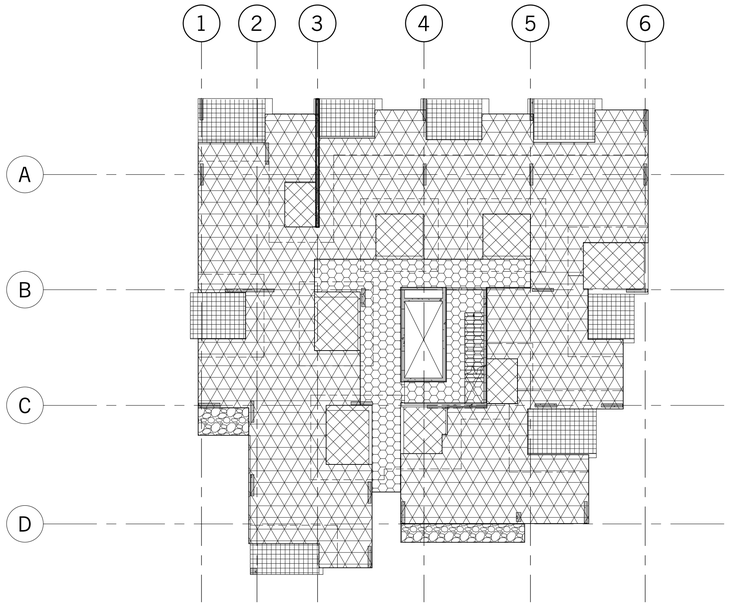


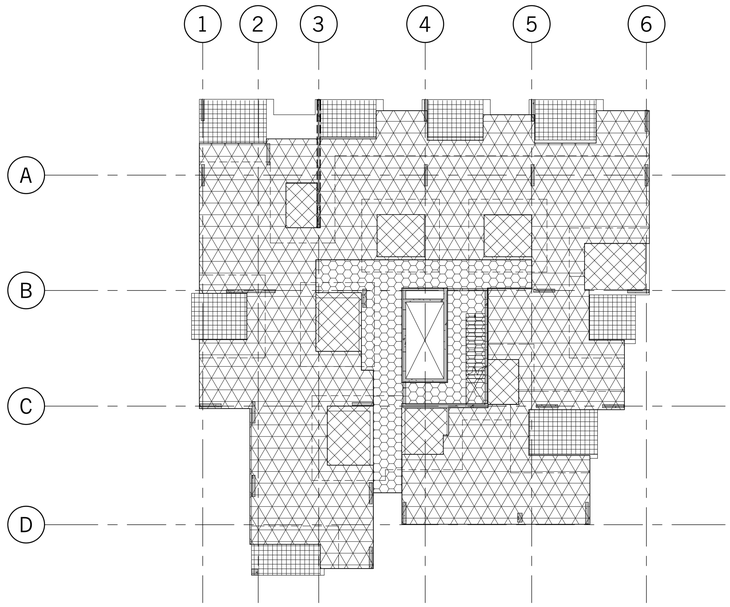
GROUND FLOOR - LOADING PLAN

SCALE: 1 : 200



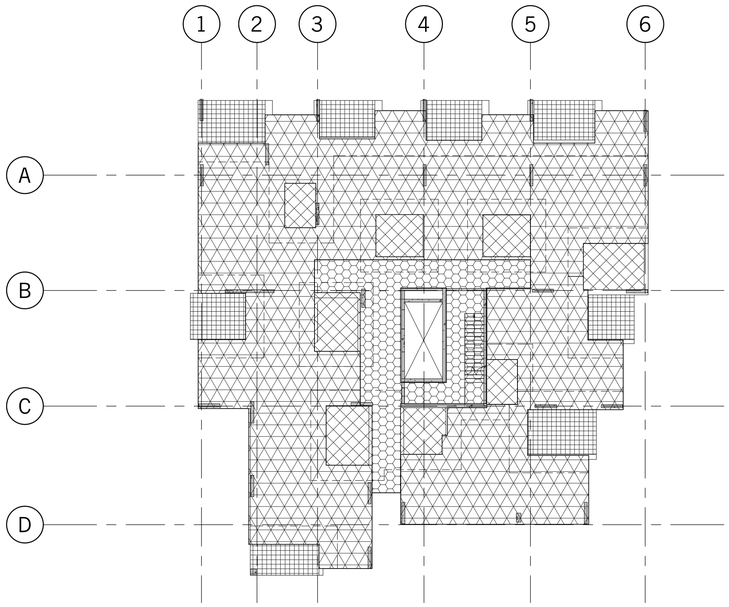
LEVEL 1 - LOADING PLAN

SCALE: 1 : 200



LEVEL 2 - LOADING PLAN

SCALE: 1 : 200



LEVEL 3 - LOADING PLAN

SCALE: 1 : 200

LOADING PLAN LEGEND

RESIDENTIAL
SIDL = 1.0 kPa
LL = 1.5 kPa

NON-ACCESSIBLE ROOF
SIDL = 2.0 kPa
LL = 1.5 kPa

TERRACES
SIDL = 2.0 kPa
LL = 4.0 kPa

BALCONIES
SIDL = 1.5 kPa
LL = 2.0 kPa

CARPARK
SIDL = 0.5 kPa
LL = 2.5 kPa

BATHROOM / WET AREAS
SIDL = 2.0 kPa
LL = 1.5 kPa

CORRIDOR / FIRE STAIR
SIDL = 1.5 kPa
LL = 4.0 kPa

COURTYARD / LANDSCAPE
SIDL = 2.0 kPa
LL = 4.0 kPa MIN. OR 18.0 kPa
(PER METRE OF SOIL DEPTH)

SUBSTATION
SIDL = TBC
LL = TBC

WASTE
SIDL = 0.5 kPa
LL = 3.0 kPa

LIGHT PLANT
SIDL = 2.0 kPa
LL = 5.0 kPa

NOTE
- FACADE LINE LOADS
  (ALLOW FOR 6.5kN/m FOR BRICK VENEER)
- LOADS FROM N.L.B. ELEMENTS ADDITIONAL,
  i.e. INTERNAL PARTITION WALLS /
  MASONRY WALLS / GLAZING .
  REFER LATEST ARCHITECTURAL GA's FOR DETAILS.
- ADDITIONAL LOADING RESULTING FROM
  TOWER BOOM / HOIST / CRANE SUBJECT
  TO FURTHER COORDINATION WITH BUILDER.
- REFER LIFT CONTRACTOR DETAILS FOR
  LIFT PIT / LID LOADING, AND LIFTING HOOK SET OUT.

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TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

LOADING PLANS - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:200	PAC	PW

JOB No.	DRAWING No.	REV.
20023	S-WEB-200	2

PRINT TIME: 18/12/2020 11:18:28 AM C:\Users\Peter\Documents\WD20\20023 - LAHC Warwick Farm NSW - Centre - STRUCTURAL_peter2UJEEP.rvt

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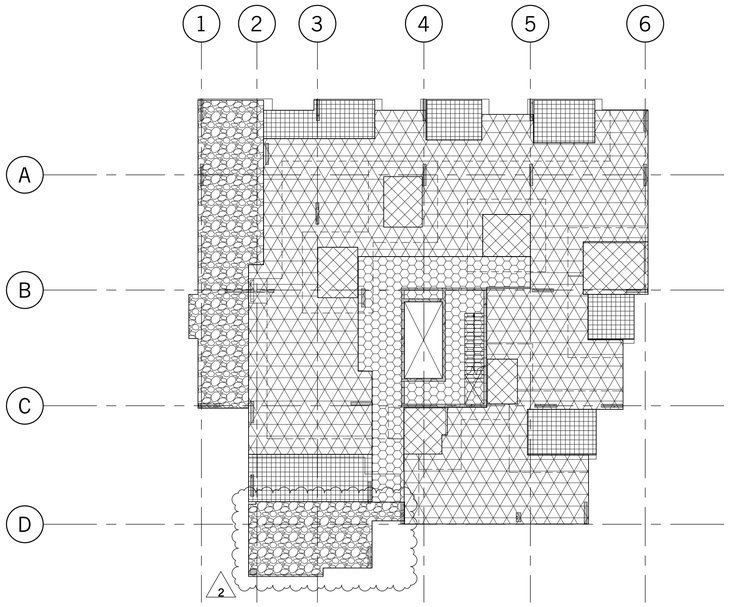
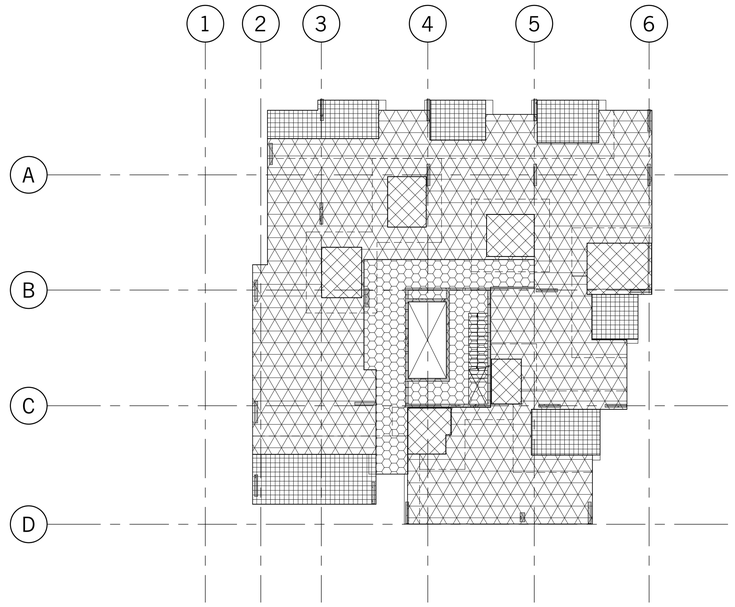


LEVEL 4 - LOADING PLAN
SCALE: 1 : 200



LEVEL 5 - LOADING PLAN
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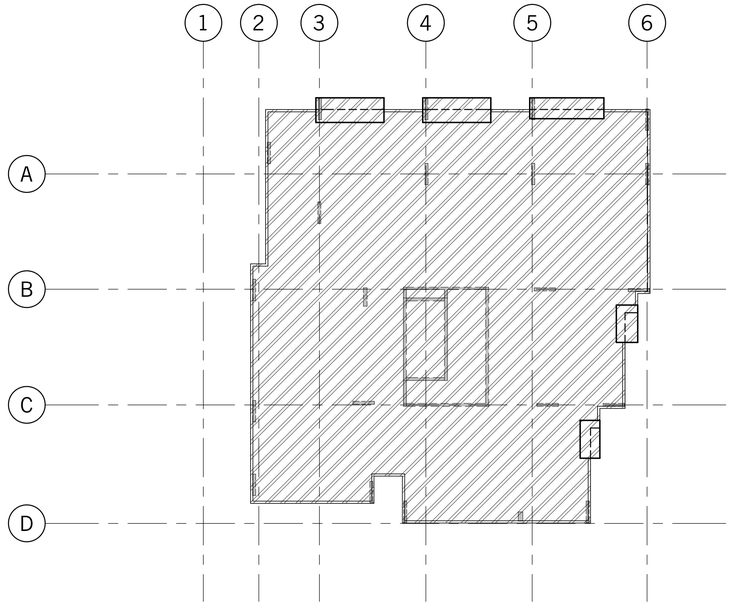

ROOF - LOADING PLAN
SCALE: 1 : 200

LOADING PLAN LEGEND

RESIDENTIAL
SIDL = 1.0 kPa
LL = 1.5 kPa

NON-ACCESSIBLE ROOF
SIDL = 2.0 kPa
LL = 1.5 kPa

TERRACES
SIDL = 2.0 kPa
LL = 4.0 kPa

BALCONIES
SIDL = 1.5 kPa
LL = 2.0 kPa

CARPARK
SIDL = 0.5 kPa
LL = 2.5 kPa

BATHROOM / WET AREAS
SIDL = 2.0 kPa
LL = 1.5 kPa

CORRIDOR / FIRE STAIR
SIDL = 1.5 kPa
LL = 4.0 kPa

COURTYARD / LANDSCAPE
SIDL = 2.0 kPa
LL = 4.0 kPa MIN. OR 18.0 kPa
(PER METRE OF SOIL DEPTH)

SUBSTATION
SIDL = TBC
LL = TBC

WASTE
SIDL = 0.5 kPa
LL = 3.0 kPa

LIGHT PLANT
SIDL = 2.0 kPa
LL = 5.0 kPa

NOTE
- FACADE LINE LOADS
  (ALLOW FOR 6.5kN/m FOR BRICK VENEER)
- LOADS FROM N.L.B. ELEMENTS ADDITIONAL,
  i.e. INTERNAL PARTITION WALLS /
  MASONRY WALLS / GLAZING .
  REFER LATEST ARCHITECTURAL GA's FOR DETAILS.
- ADDITIONAL LOADING RESULTING FROM
  TOWER BOOM / HOIST / CRANE SUBJECT
  TO FURTHER COORDINATION WITH BUILDER.
- REFER LIFT CONTRACTOR DETAILS FOR
  LIFT PIT / LID LOADING, AND LIFTING HOOK SET OUT.

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Rev.	Description	Eng.	Draft.	Date
1	ISSUED FOR TENDER (DRAFT)	MA/BT	PAC	27.11.20
2	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20

DRAWING REFERENCE	REFERENCE No.
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SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

2

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TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

LOADING PLANS - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:200	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-201	2

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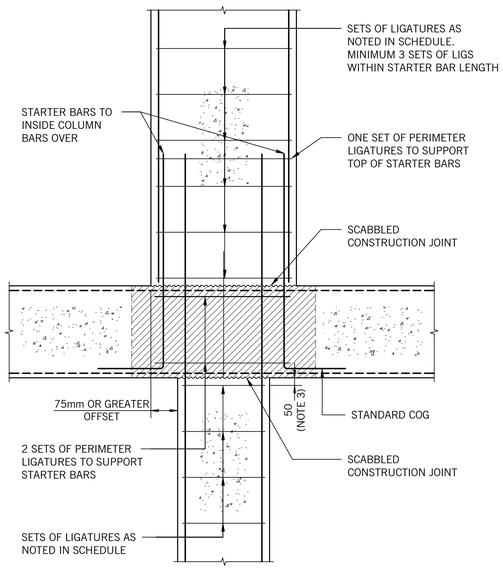
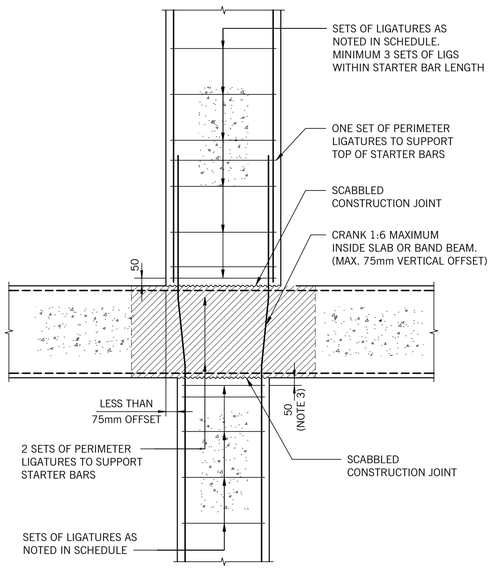
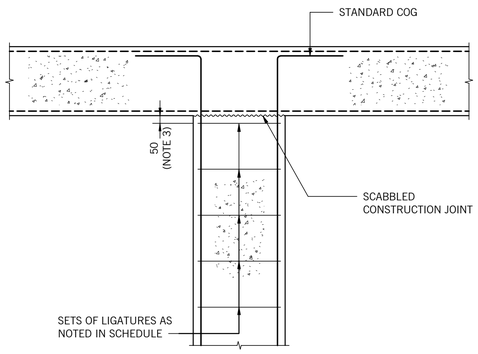


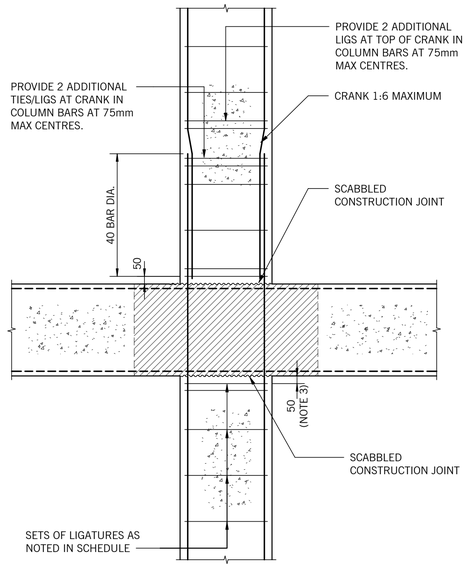
COLUMN TRANSITION TYPE 1

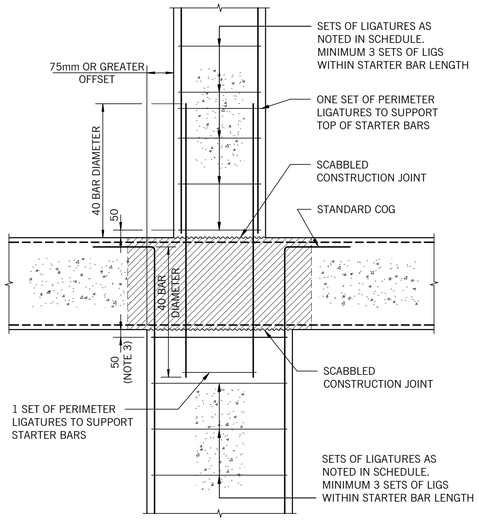


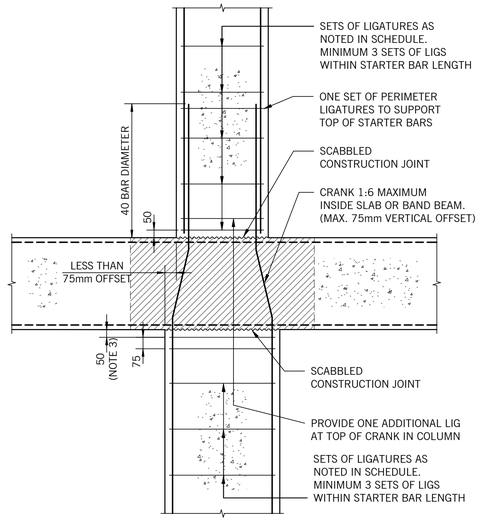


TYPICAL COLUMN TERMINATION DETAIL

SCALE 1:20

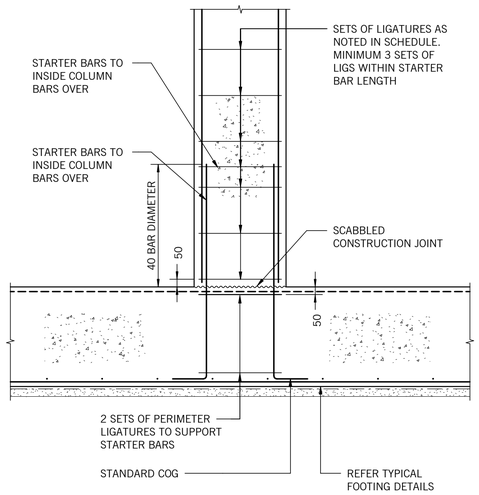






TYPICAL COLUMN SPLICE DETAILS

SCALE 1:20



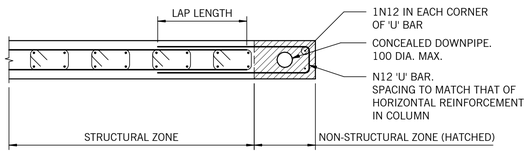
TYPICAL COLUMN TRANSITION DETAILS

SCALE 1:20

SLAB POUR CONCRETE STRENGTH f'c

DENOTES 1200 x 1200 LOCALLY INCREASED SLAB f'c ZONE.
LOCAL SLAB ZONE f'c SHALL BE ≥ 0.75 COLUMN f'c

eg. IF COLUMN f'c = 65MPa THEN THE DENOTED HATCHED SLAB ZONE SHALL BE 50MPa MIN.
IF COLUMN f'c = 80MPa THEN THE DENOTED HATCHED SLAB ZONE SHALL BE 65MPa MIN.



TYPICAL NON-STRUCTURAL COLUMN EXTENSION DETAIL

SCALE 1:20

NOTE:
1. REFER LATEST ARCHITECTURAL DRAWINGS AND HYDRAULIC SERVICES DRAWINGS FOR LOCATION OF CONCEALED PIPES.
2. NON-STRUCTURAL ZONE TO BE FORMED AND POURED MONOLITHICALLY WITH STRUCTURAL ZONE.

TYPICAL COLUMN DETAIL AT FOOTING

SCALE 1:20

NOTE:
1. STARTER BARS TO BE SAME NUMBER, DIAMETER AND ARRANGEMENT AS COLUMN OVER.
2. REFER TO COLUMN SCHEDULE FOR COLUMN SIZES AND REINFORCEMENT.
3. LIGATURES 50mm BELOW SLABS WHERE THREE OR LESS INTERSECTING BEAMS OR LIGATURES 50mM BELOW THE SHALLOWEST BEAM WHERE FOUR INTERSECTING BEAMS.

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R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

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TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

INSITU CONCRETE
COLUMN TYPICAL DETAILS
- SHEET 1

DATE	DESIGNED BY	CHECKED BY
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SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-800	2

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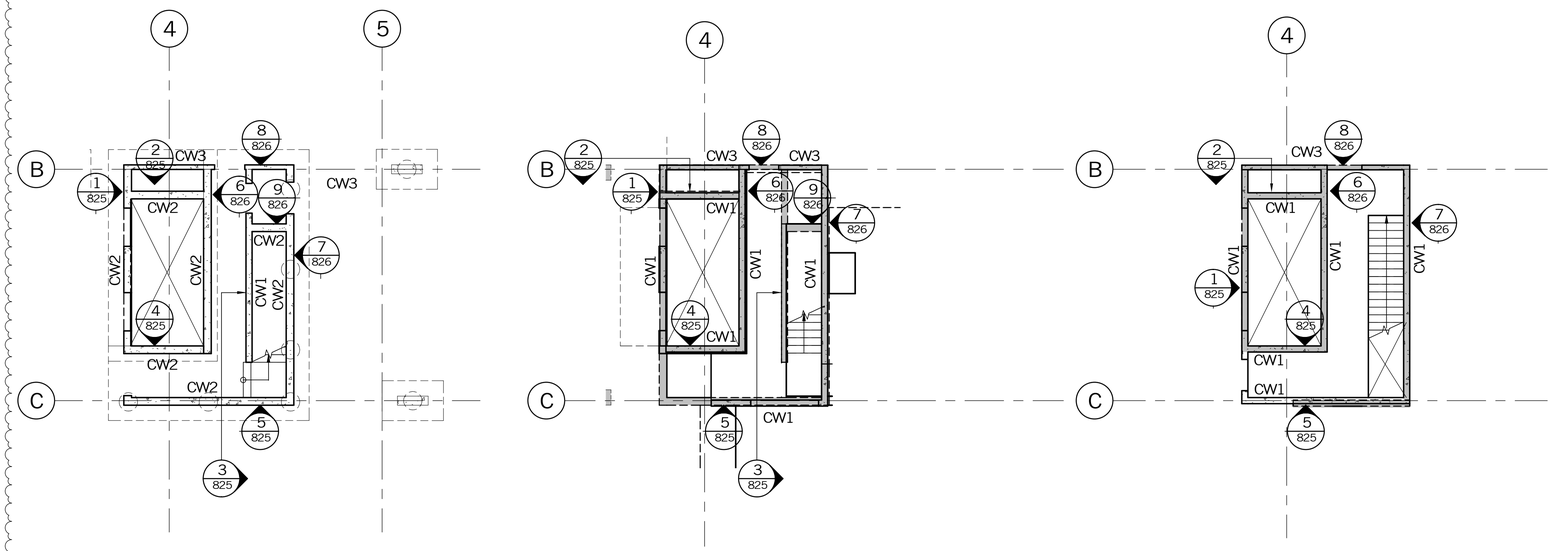
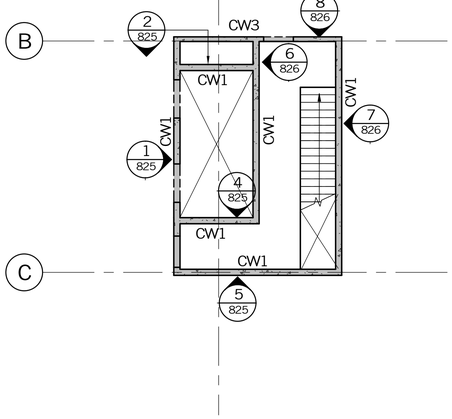


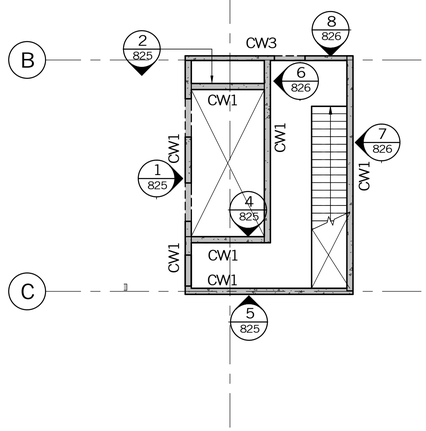
BASEMENT 1 - CORE WALL KEY PLAN
SCALE: 1 : 100

GROUND FLOOR - CORE WALL KEY PLAN
SCALE: 1 : 100

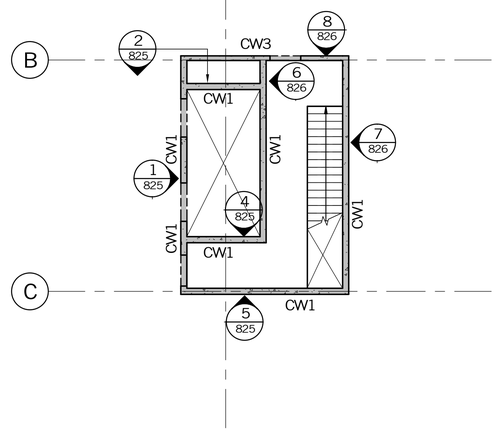
LEVEL 1 - CORE WALL KEY PLAN
SCALE: 1 : 100



LEVEL 2 - CORE WALL KEY PLAN
SCALE: 1 : 100



LEVEL 3 - CORE WALL KEY PLAN
SCALE: 1 : 100



LEVEL 4 - CORE WALL KEY PLAN (LEVEL 5 SIMILAR)
SCALE: 1 : 100

3

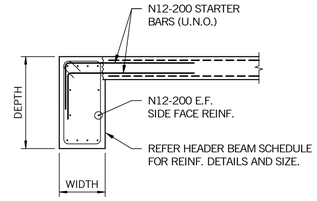
INSITU CORE WALL SCHEDULE				
MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
CW1	200	50	220	INSITU CONCRETE CORE WALL
CW2	250	50	180	INSITU CONCRETE CORE WALL
CW3	150	50	180	INSITU CONCRETE CORE WALL

IN-SITU WALL REINFORCEMENT & CONCRETE NOTES:

1. ALL SERVICES PENETRATION TO BE COORDINATED AND APPROVED BY WEBBER DESIGN.
2. CONTRACTOR SHALL ALLOW FOR CONSTRUCTION JOINT AS REQUIRED.
3. PROVIDE 25mm CLEAR COVER TO CORE WALL REINFORCEMENT (U.N.O.).
4. WHERE BARS OF DIFFERENT DIAMETERS ARE SPLICED,USE THE SPLICE OF THE LARGER BAR DIAMETER.
5. FOR WALLS WITH BARS ANCHORED OR SPLICED AT LESS THAN 150 CTS. MULTIPLY THE ABOVE LENGTHS BY 1.4
6. UNLESS SHOWN ON DRAWINGS, THE SPLICE LOCATIONS MUST BE APPROVED BY THE ENGINEER.
7. IF BARS HAVE STANDARD COGS AT THE ENDS, HALVE THE ABOVE LENGTHS.
8. N36 AND N40 BARS IN TENSION ARE NOT TO BE SPLICED.

NOTES:-
CO-ORDINATE ALL PENETRATION SIZES AND LOCATIONS WITH SERVICES CONSULTANTS. NO PENETRATION TO BE INCREASED IN SIZE OR MOVED WITHOUT THE WRITTEN AGREEMENT OF WEBBER DESIGN PTY. LTD.

ANCHORAGE AND SPLICE LENGTH FOR INSITU/PRECAST WALLS UNO.	
N12	600
N16	800
N20	1000
N24	1200
N28	1400
N32	1400
N36	1400 (COMPRESSION SPLICE)
GENERAL	45 BAR DIA.



HEADER BEAM DETAIL FOR IN-SITU WALLS

SCALE 1:20

1. REFER TO LIFT SHAFT MANUFACTURER SHOP DRAWINGS FOR LIFT DETAILS, REQUIREMENTS AND DIMENSIONS.
2. CO-ORDINATE ALL LIFT SHAFT PENETRATION SIZES AND LOCATIONS WITH SERVICES CONSULTANTS. NO PENETRATION TO BE INCREASED IN SIZE OR MOVED WITHOUT THE WRITTEN AGREEMENT OF THIS OFFICE.
3. REFER TO LIFT MANUFACTURER FOR ALL ADDITIONAL CAST IN ITEMS AND BLOCK OUTS.
4. REFER TO LIFT SUPPLIERS DRAWINGS FOR DETAILS AND LOCATIONS OF ALL CAST IN FERRULES, UNI-STRUTS ETC. FOR FIXING OF ALL LIFT EQUIPMENT.

IN-SITU CORE HEADER BEAM SCHEDULE				
MARK	WIDTH	DEPTH	LEVEL	REINF. (kg/m³)
CW1	200	800	BASEMENT 1 - LEVEL 3	220
CW2	250	800 MIN.	LEVEL 4 - LEVEL 5	200

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TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

CORE KEY PLANS

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-820	3

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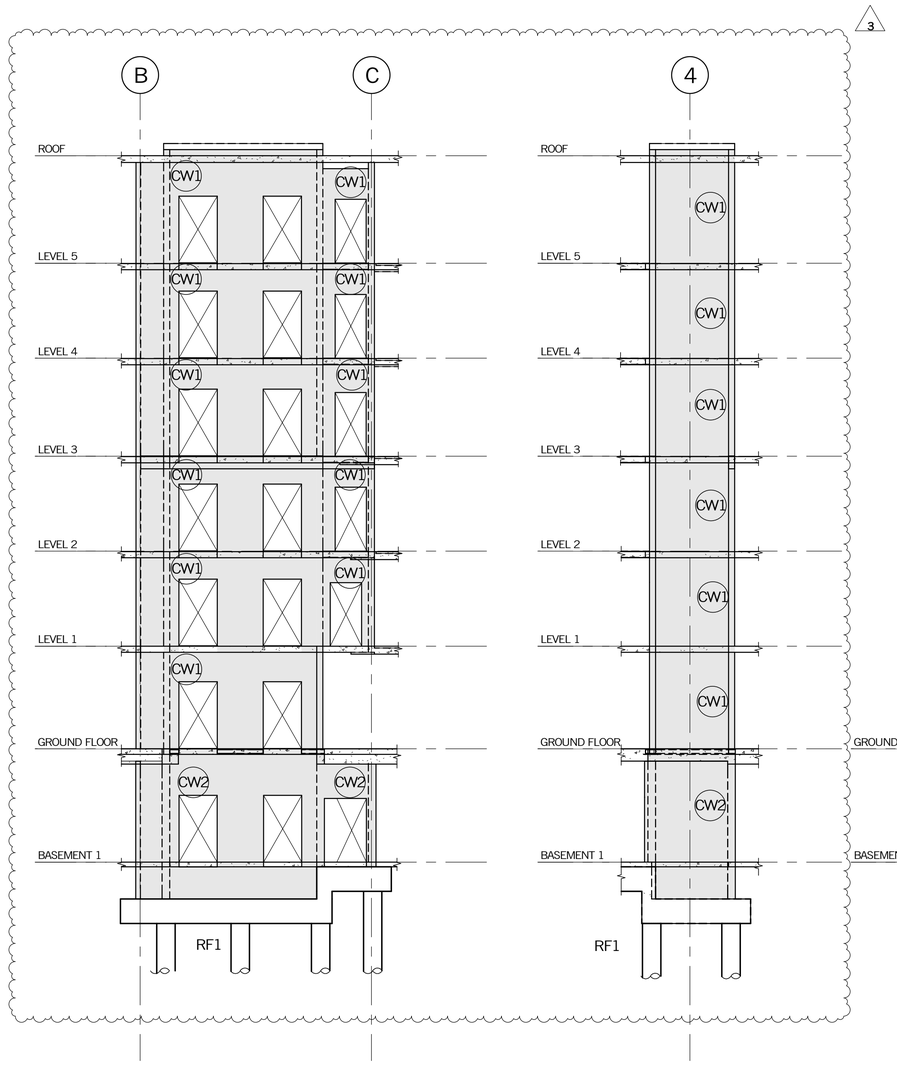

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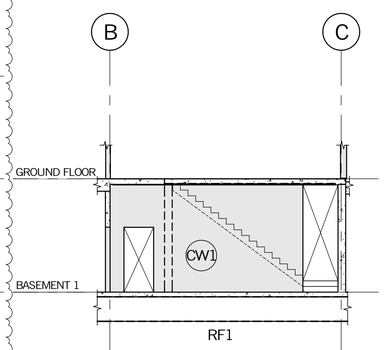

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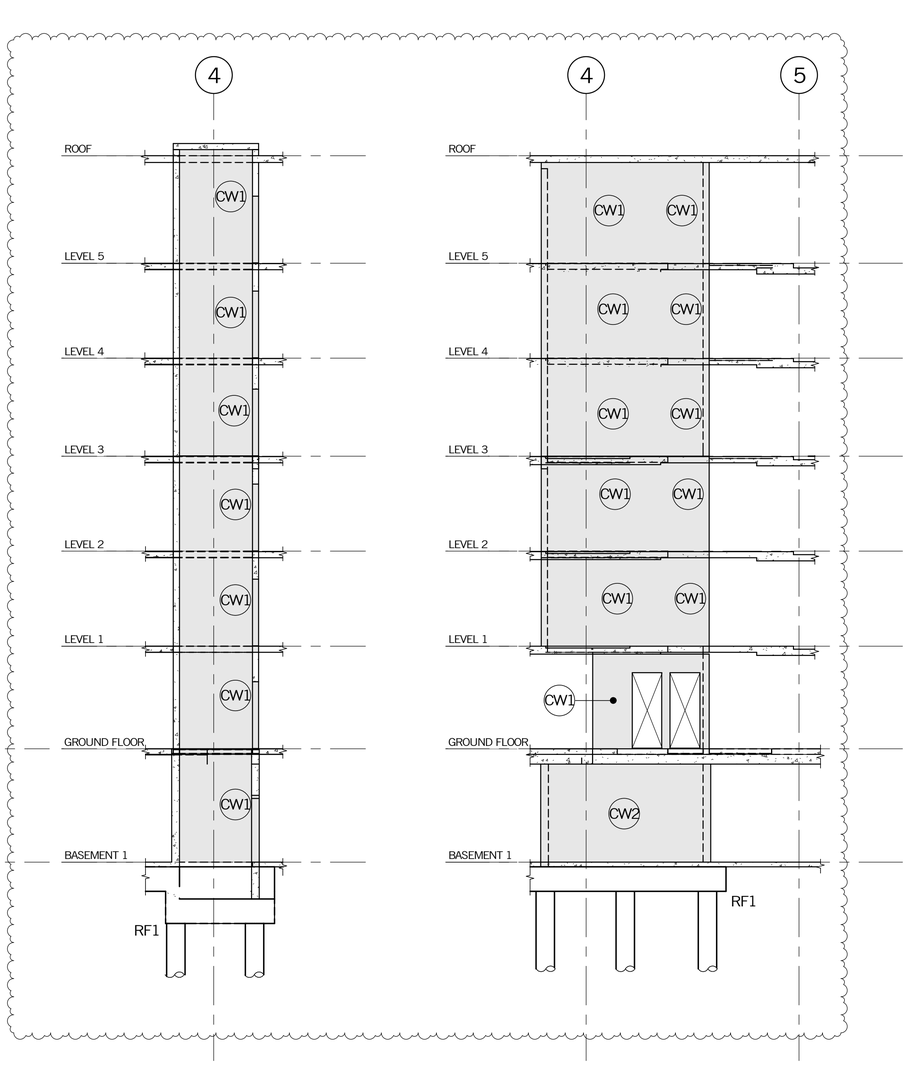

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11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

STAIR AND LIFT CORE
ELEVATIONS - SHEET 1

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JOB No.	DRAWING No.	REV.
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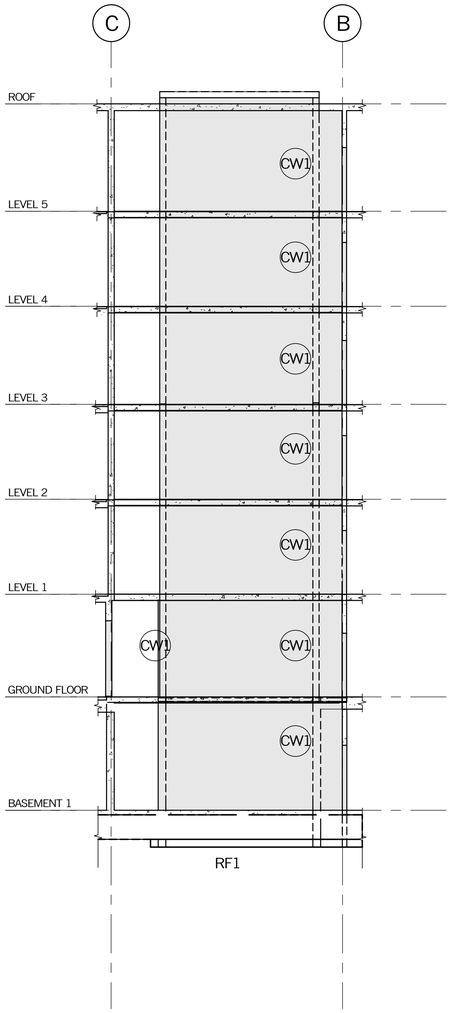
3	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	05.02.21



ELEVATION 6 / 820
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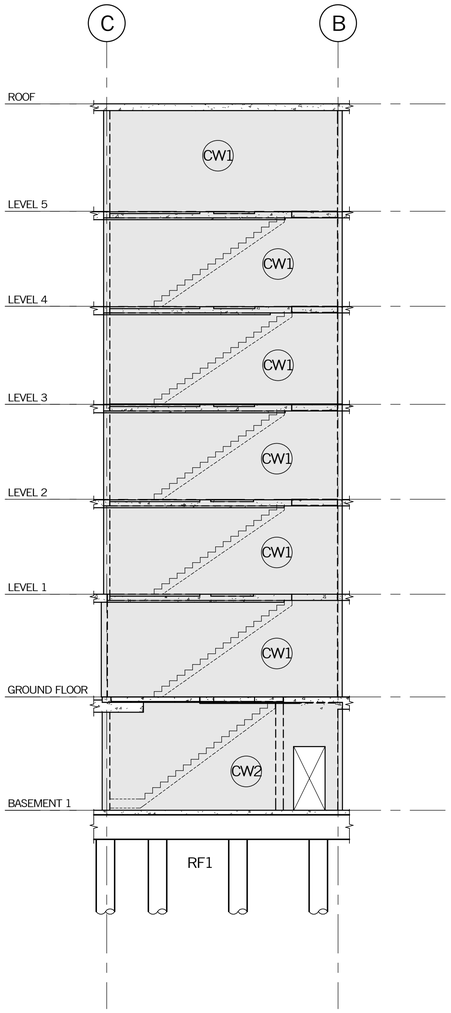

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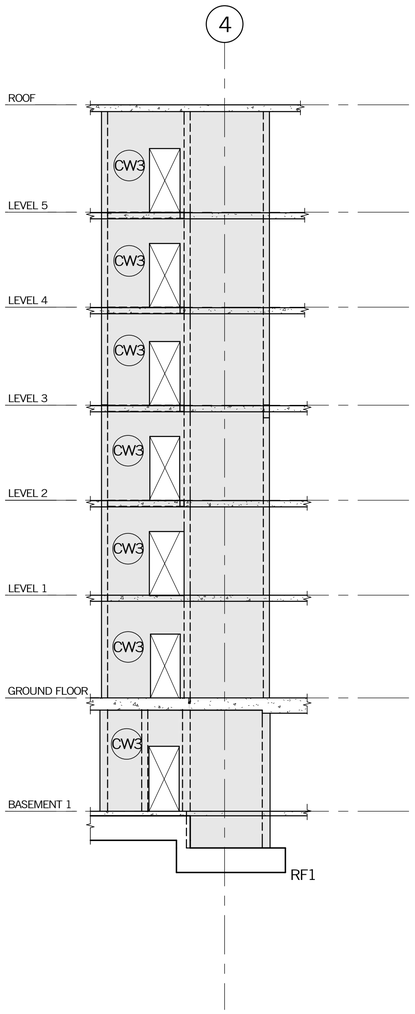

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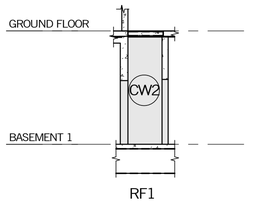
SCALE: 1 : 100



ELEVATION 9 / 820
SCALE: 1 : 100

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
CONCRETE COLUMNS	S-WEB-800-819
IN-SITU WALLS	S-WEB-820-879
PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

ISSUED FOR TENDER

Status

STRUCTURAL DRAWING

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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

STAIR AND LIFT CORE
ELEVATIONS - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-826	3

PRINT TIME: 5/02/2021 3:59:06 PM C:\Users\peter\Documents\WD20023 - LAHC Warwick Farm NSW - Central - STRUCTURAL_peter2UEEP.rvt

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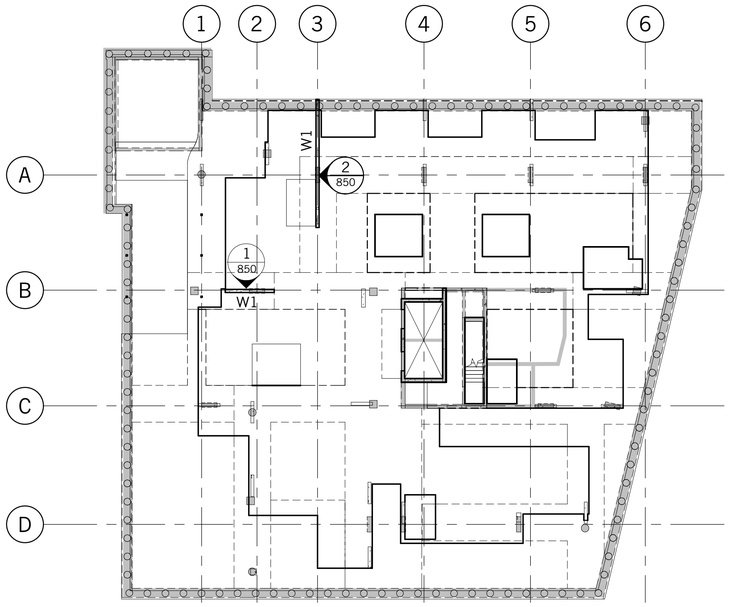
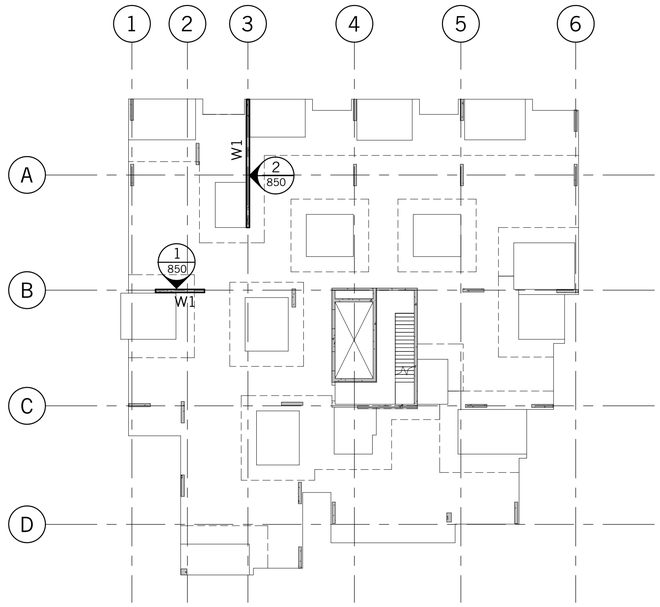


GROUND FLOOR - INSITU WALL KEY PLAN

SCALE: 1 : 200



LEVEL 1 - INSITU WALL KEY PLAN (LEVELS 2-5 SIMILAR)

SCALE: 1 : 200

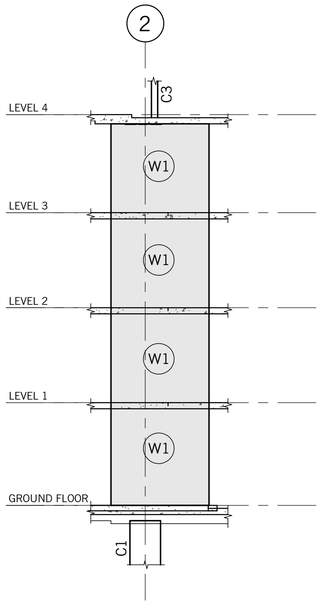
INSITU WALL SCHEDULE				
MARK	WIDTH	f'c (MPa)	REINF. RATE (kg/m³)	REMARKS
W1	200	50	220	INSITU CONCRETE WALL
W2	250	40	180	INSITU CONCRETE WALL

IN-SITU WALL REINFORCEMENT & CONCRETE NOTES:

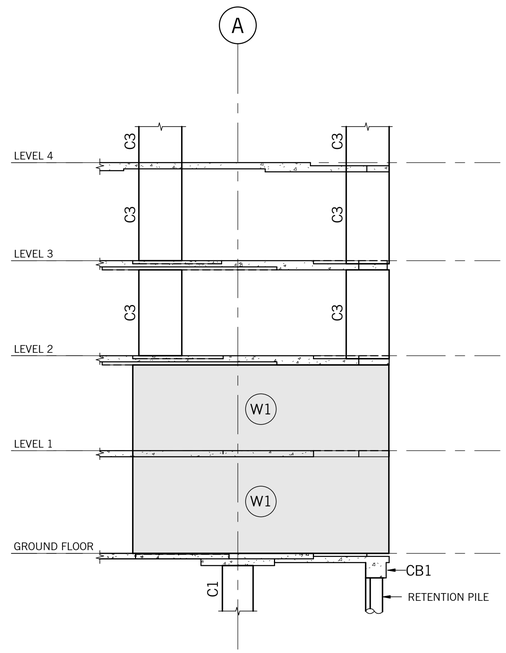
1. ALL SERVICES PENETRATION TO BE COORDINATED AND APPROVED BY WEBBER DESIGN.
2. CONTRACTOR SHALL ALLOW FOR CONSTRUCTION JOINT AS REQUIRED.
3. PROVIDE 25mm CLEAR COVER TO CORE WALL REINFORCEMENT (U.N.O.).
4. WHERE BARS OF DIFFERENT DIAMETERS ARE SPLICED,USE THE SPLICE OF THE LARGER BAR DIAMETER.
5. FOR WALLS WITH BARS ANCHORED OR SPLICED AT LESS THAN 150 CTS. MULTIPLY THE ABOVE LENGTHS BY 1.4
6. UNLESS SHOWN ON DRAWINGS, THE SPLICE LOCATIONS MUST BE APPROVED BY THE ENGINEER.
7. IF BARS HAVE STANDARD COGS AT THE ENDS, HALVE THE ABOVE LENGTHS.
8. N36 AND N40 BARS IN TENSION ARE NOT TO BE SPLICED.

NOTES:-
CO-ORDINATE ALL PENETRATION SIZES AND LOCATIONS WITH SERVICES CONSULTANTS. NO PENETRATION TO BE INCREASED IN SIZE OR MOVED WITHOUT THE WRITTEN AGREEMENT OF WEBBER DESIGN PTY. LTD.

ANCHORAGE AND SPLICE LENGTH FOR INSITU/PRECAST WALLS UNO.	
N12	600
N16	800
N20	1000
N24	1200
N28	1400
N32	1400
N36	1400 (COMPRESSION SPLICE)
GENERAL	45 BAR DIA.



ELEVATION 1 — SCALE: 1 : 100 (850)



ELEVATION 2 — SCALE: 1 : 100 (850)

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Rev.	Description	Eng.	Draft.	Date
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R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

IN-SITU WALL KEY PLANS & ELEVATION

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:100, 1:200	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-850	2

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WEBBER DESIGN

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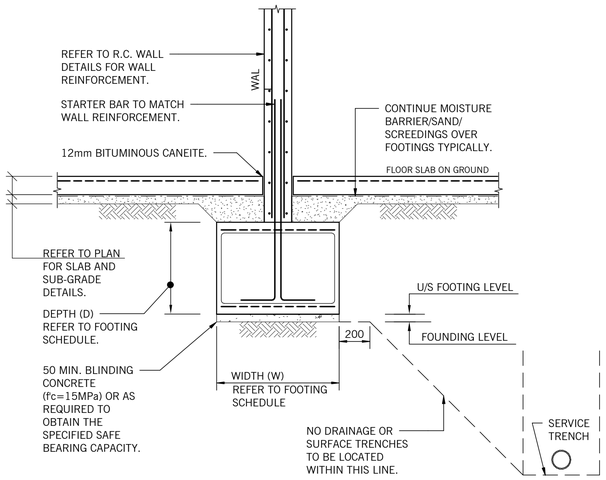
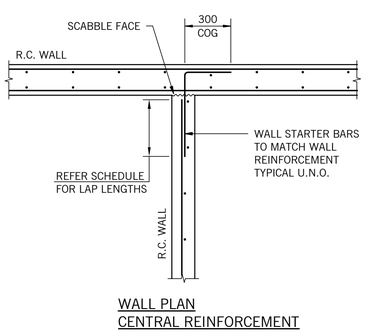
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991



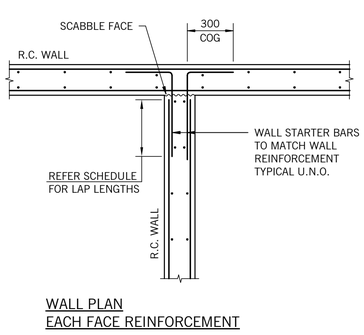
WALL SECTION

TYPICAL STRIP FOOTING TO R.C. WALL DETAIL

NOT TO SCALE



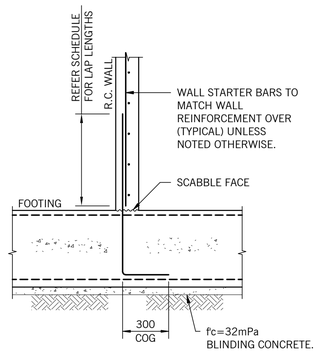
WALL PLAN
CENTRAL REINFORCEMENT



WALL PLAN
EACH FACE REINFORCEMENT

TYPICAL INTERNAL WALL UNDER DETAILS

SCALE 1:20



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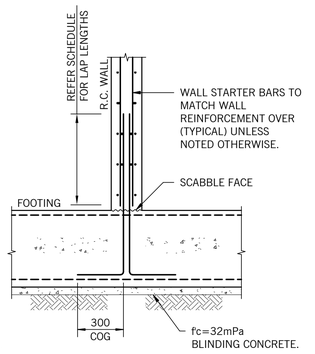
CENTRAL REINFORCEMENT

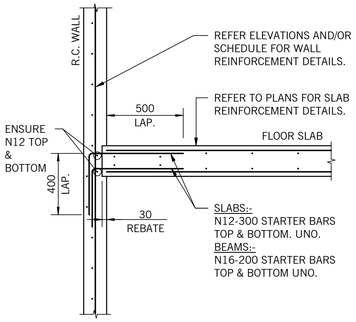


WALL SECTION
EACH FACE REINFORCEMENT

TYPICAL WALL BASE AT FOOTING DETAILS

SCALE 1:20

2



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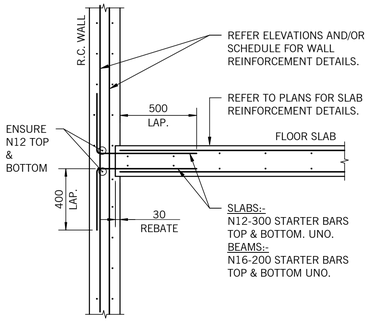
CENTRAL REINFORCEMENT



WALL SECTION
EACH FACE REINFORCEMENT

PERIMETER WALL TO SLAB / BEAM DETAILS - L STARTER BARS

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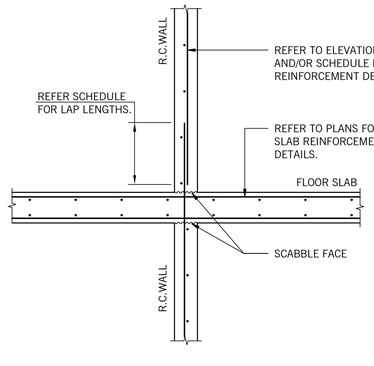

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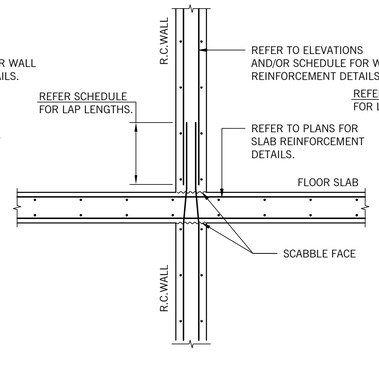

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EACH FACE REINFORCEMENT

TYPICAL CONTINUOUS INTERNAL WALL TO SLAB DETAILS

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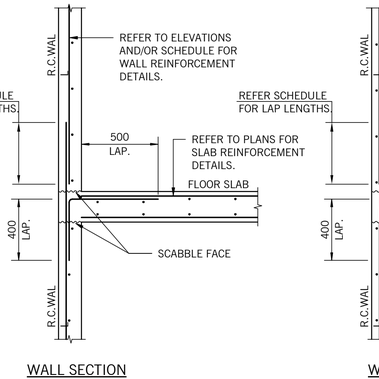

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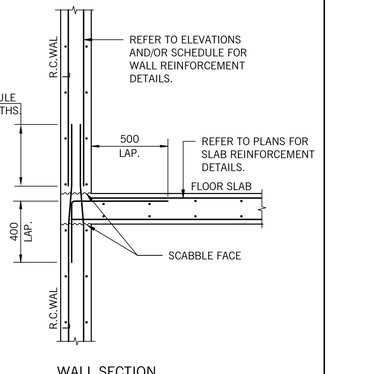
CENTRAL REINFORCEMENT



WALL SECTION
EACH FACE REINFORCEMENT

TYPICAL CONTINUOUS PERIMETER WALL TO SLAB DETAILS

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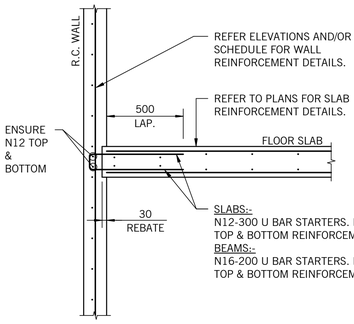

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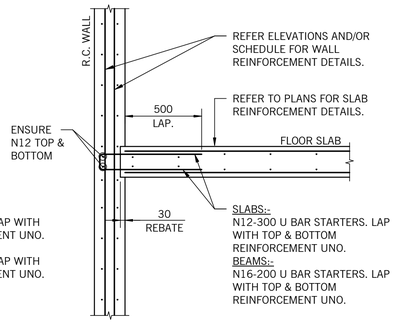
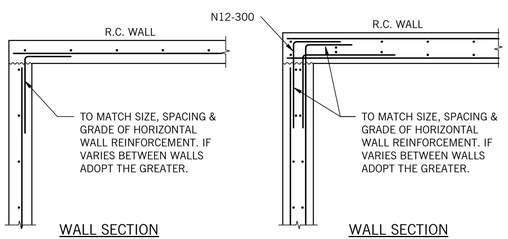


WALL SECTION
EACH FACE REINFORCEMENT

PERIMETER WALL TO SLAB / BEAM DETAILS - U BARS

SCALE 1:20

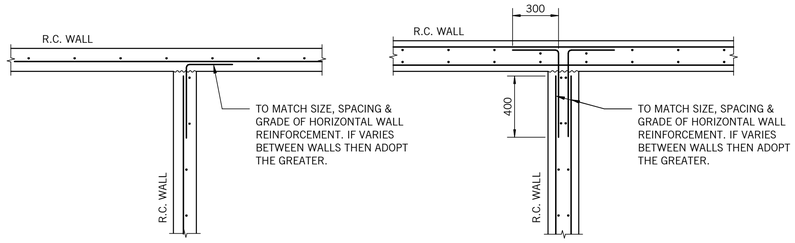


WALL SECTION
CENTRAL REINFORCEMENT

WALL SECTION
EACH FACE REINFORCEMENT

TYPICAL CORNER PLAN DETAILS

SCALE 1:20



WALL SECTION
CENTRAL REINFORCEMENT

WALL SECTION
EACH FACE REINFORCEMENT

TYPICAL 'T' INTERSECTION PLAN DETAILS

SCALE 1:20

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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

IN-SITU WALL DETAILS - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-877	2

PRINT TIME: 18/12/2020 11:18:43 AM C:\Users\Peter\Documents\W\2020\23 - LAHC Warwick Farm NSW - Central - STRUCTURAL_peterZ\1EEP.rvt

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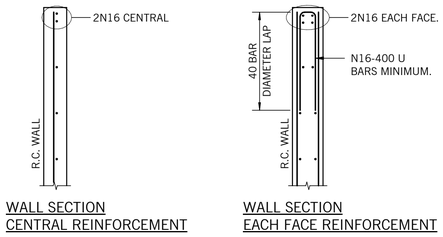
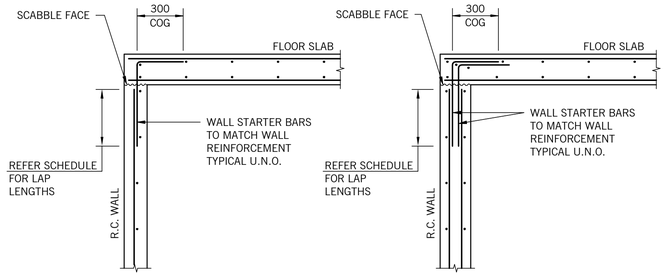


WALL SECTION
CENTRAL REINFORCEMENT

WALL SECTION
EACH FACE REINFORCEMENT

TYPICAL WALL TERMINATION DETAILS

SCALE 1:20

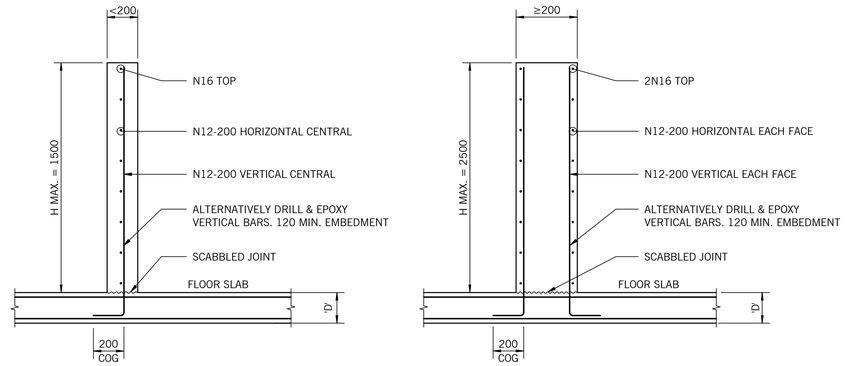


WALL SECTION
CENTRAL REINFORCEMENT

WALL SECTION
EACH FACE REINFORCEMENT

TYPICAL PERIMETER WALL UNDER DETAILS

SCALE 1:20

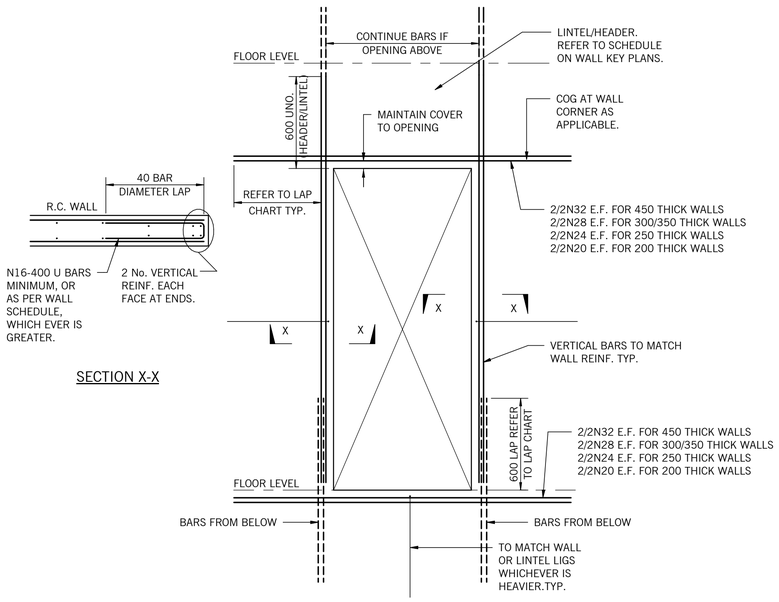


TYPICAL R.C. UPSTAND WALL DETAIL

SCALE 1:20

NOTES:

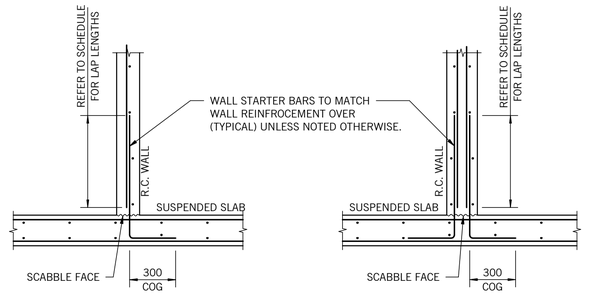
1: VERTICAL BARS 500 MIN. LAP U.N.O.
2: HORIZONTAL BARS 400 MIN. LAP U.N.O.
3: REFER TO ARCHITECTS DRAWINGS FOR DIMENSIONS AND LOCATIONS.
4: PROVIDE FORMED VERTICAL JOINTS & CUT HORIZONTAL REINFORCEMENT AT A SPACING OF NO GREATER THAN 4 TIMES THE WALL HEIGHT AND ALSO COINCIDE WITH CONTROL JOINTS.



SECTION X-X

TYPICAL DOOR OPENING DETAIL (OTHER WALL OPENINGS SIMILAR.)

NOT TO SCALE



WALL SECTION
CENTRAL REINFORCEMENT

WALL SECTION
EACH FACE REINFORCEMENT

TYPICAL INTERNAL WALL OVER SUSPENDED SLAB

SCALE 1:20

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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

IN-SITU WALL DETAILS - SHEET 2

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NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-878	2

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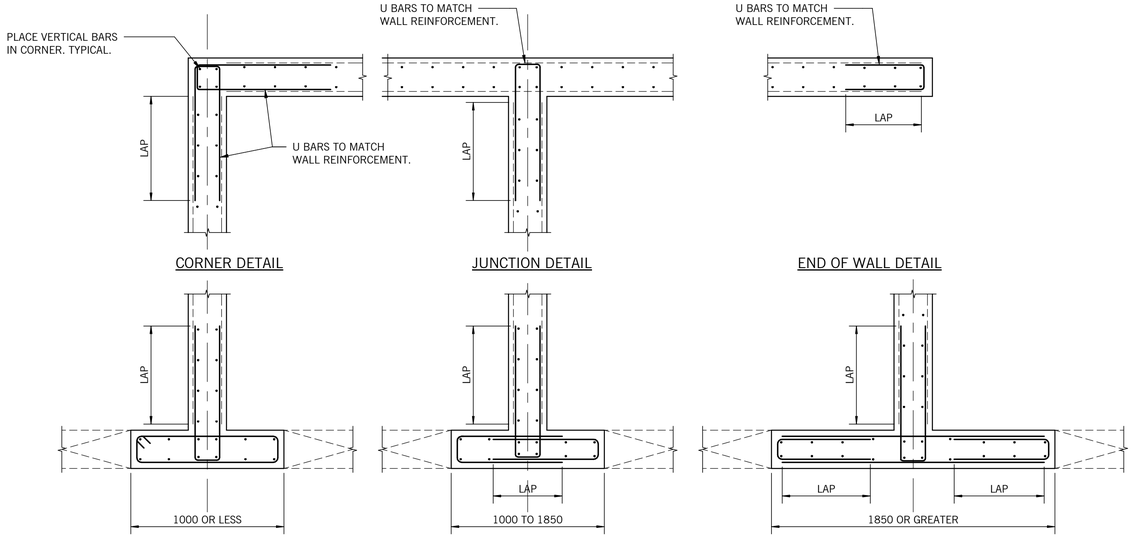

TYPICAL CORE WALL PLAN JUNCTION DETAILS (U.N.O.)

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2	ISSUED FOR TENDER (UPDATED)	MA/BT	PAC	18.12.20

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
CONCRETE COLUMNS	S-WEB-800-819
IN-SITU WALLS	S-WEB-820-879
PRECAST WALLS	S-WEB-880-909
SLAB ON GROUND DETAILS	S-WEB-950-951
SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

2

ISSUED FOR TENDER

Status

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RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

IN-SITU WALL DETAILS -
SHEET 3

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-879	2

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WEBBER DESIGN

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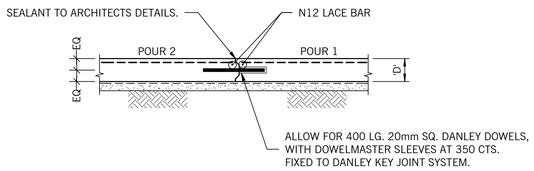
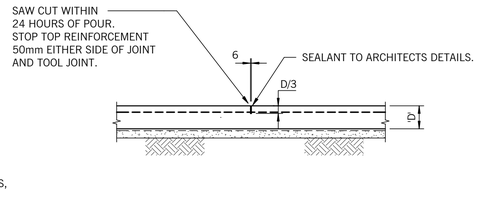
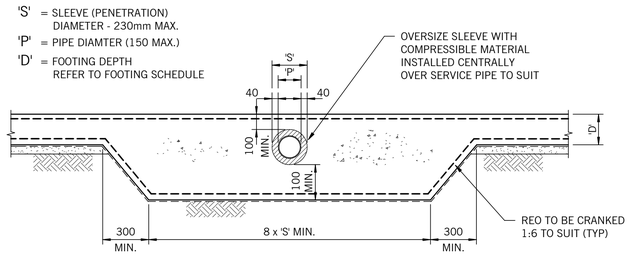


TYPICAL DOWELED CONSTRUCTION JOINT (D.C.J.)
SCALE 1:20



TYPICAL SAW CUT JOINT (S.C.J.)
SCALE 1:20



PIPE PENETRATION DETAIL
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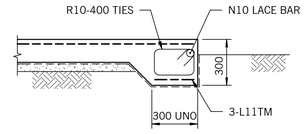
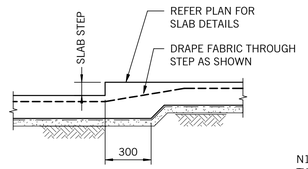
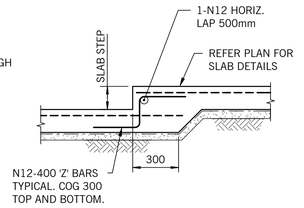


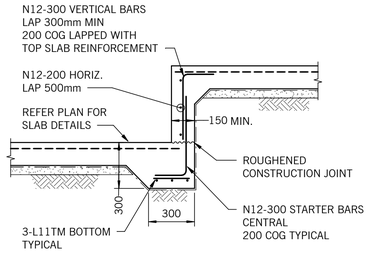
TYPICAL EDGE THICKENING
SCALE 1:20



TYPICAL SLAB STEP LESS THAN 95mm HIGH

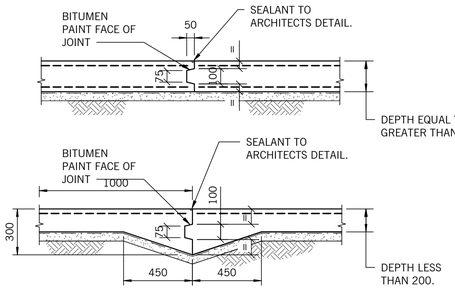


TYPICAL SLAB STEP GREATER THAN 100mm AND LESS THAN 300mm

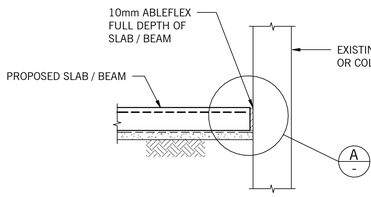


TYPICAL SLAB STEP GREATER THAN 300mm AND LESS THAN 1000mm

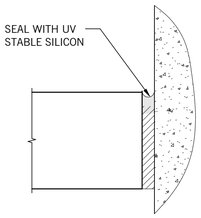
TYPICAL SLAB STEP DETAILS
NTS



KEYED CONSTRUCTION JOINT (K.C.J.)
SCALE 1:20



TYPICAL ISOLATION JOINT (I.J.)
SCALE 1:20



DETAIL A
SCALE: 1 : 5

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
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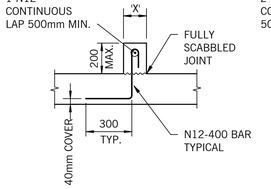
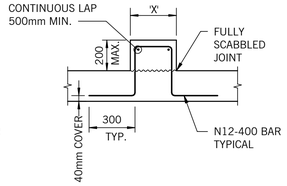
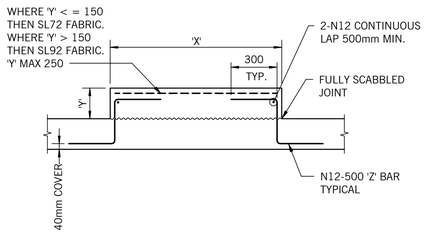
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991



WHERE 'X' = 70 TO 150
EXISTING SLAB DRILL INJECTION GROUT BAR AS SPECIFIED INTO EXISTING SLAB.



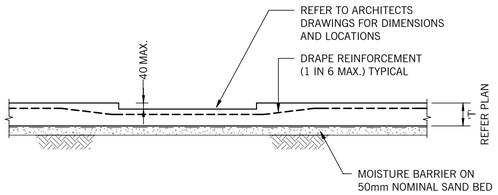
WHERE 'X' = 150 < 700
EXISTING SLAB DRILL INJECTION GROUT BAR AS SPECIFIED INTO EXISTING SLAB.



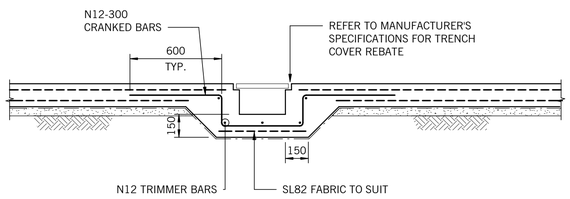
WHERE 'X' > 700

NOTE:
PROVIDE 12mm CHAMFER TO ALL TOP EDGES OF KERB/PLINTH

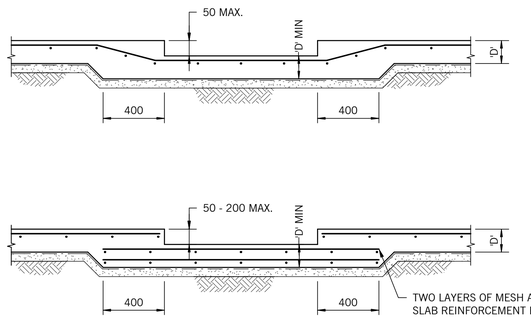
TYPICAL KERB/PLINTH DETAILS
NTS



SLAB MAT RECESS DETAIL
NTS

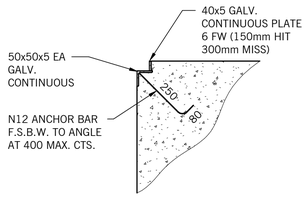


TYPICAL GRATED TRENCH DETAIL
SCALE 1:20

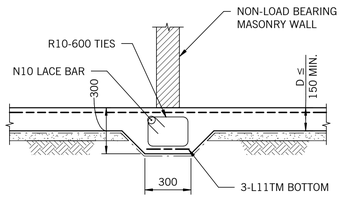


TYPICAL SETDOWNS IN SLAB
SCALE 1:20

NOTES:
REFER TO PLANS FOR EXTENTS OF SETDOWNS.
REFER TO ARCHITECTURAL DRAWINGS FOR DEPTH AND DIMENSIONAL SETOUT OF ALL SETDOWN REQUIREMENTS.



TYPICAL CAST-IN TRENCH EDGE ANGLE DETAIL
NTS



SLAB THICKENING DETAIL

TYPICAL DETAIL AT MASONRY WALL
SCALE 1:20

NOTE: REFER TO ARCHITECTS DRAWINGS FOR DIMENSIONS AND LOCATIONS.

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RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

TYPICAL SLAB ON GROUND DETAILS - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:5, 1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-950	2

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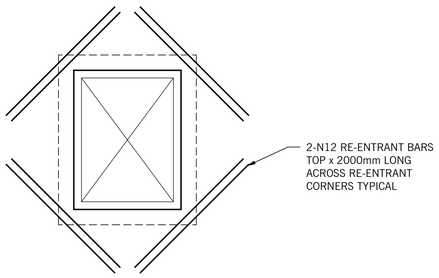
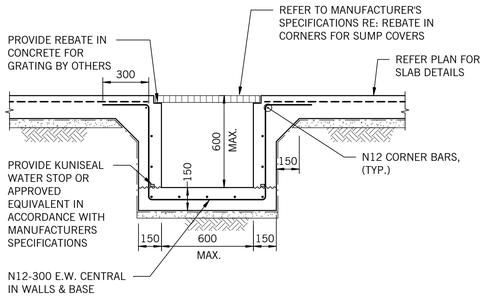
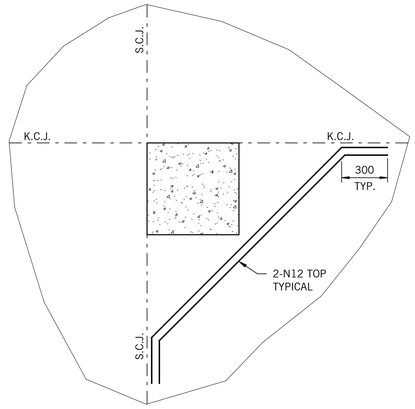


PLAN



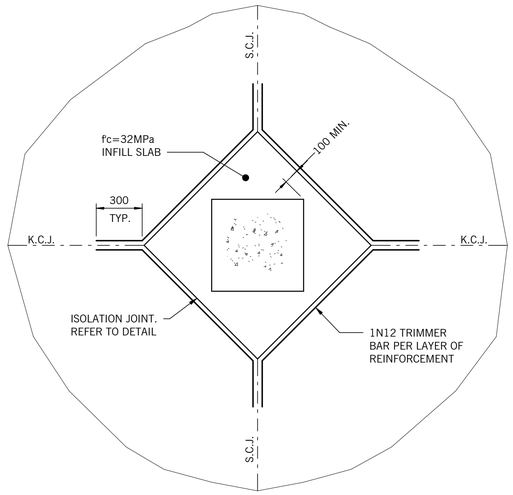
TYPICAL PIT/SUMP/GRATED TRENCH DETAIL

SCALE 1:20



TYPICAL RE-ENTRANT BAR DETAIL

SCALE 1:20



TYPICAL INFILL SLAB DETAIL AT STEEL OR R.C. COLUMN LOCATION

SCALE 1:20

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DRAWING REFERENCE	REFERENCE No.
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R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

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STRUCTURAL ENGINEERING
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SYDNEY OFFICE:
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RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

TYPICAL SLAB ON GROUND
DETAILS - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW

JOB No.	DRAWING No.	REV.
20023	S-WEB-951	2

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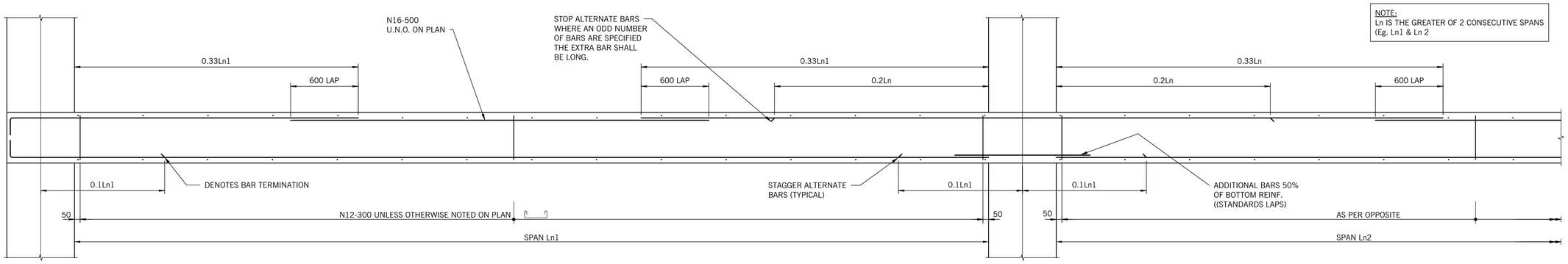
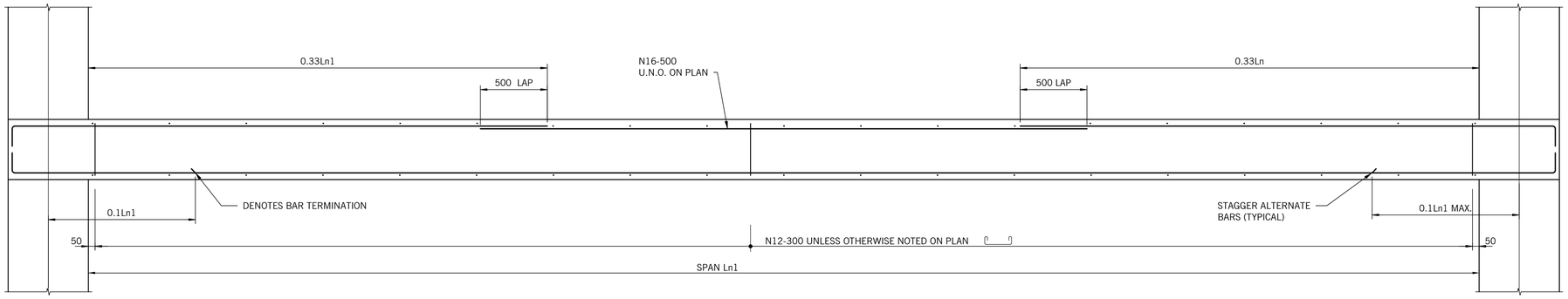


TYPICAL SECTION ALONG CONTINUOUS SPAN SLAB AND BEAM

SCALE 1:20



TYPICAL SECTION ALONG SINGLE SPAN SLAB AND BEAM

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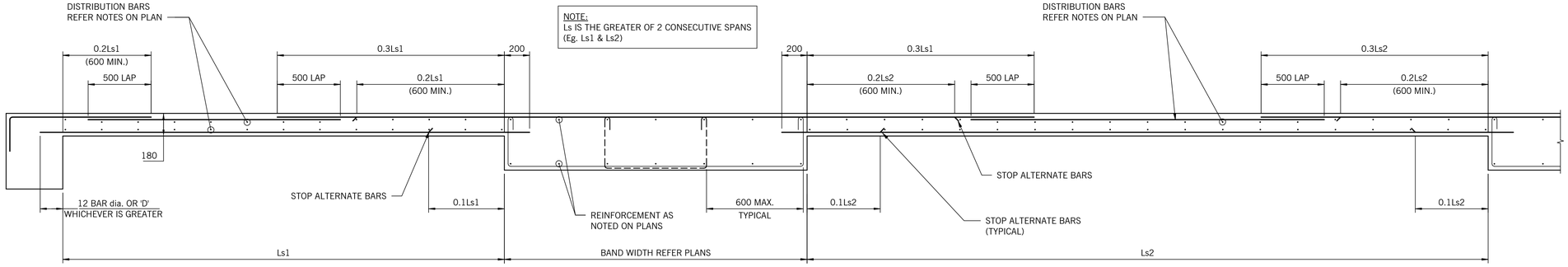
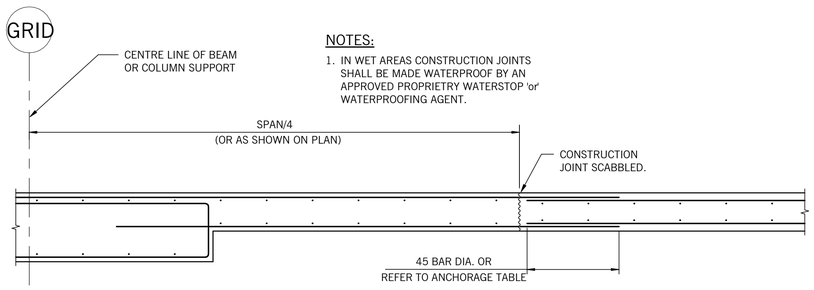


TYPICAL SECTION THROUGH R.C. SLAB AND BAND BEAM

SCALE 1:20



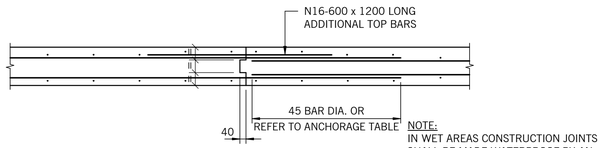
NOTES:

1. IN WET AREAS CONSTRUCTION JOINTS SHALL BE MADE WATERPROOF BY AN APPROVED PROPRIETRY WATERSTOP 'or' WATERPROOFING AGENT.

SLAB CONSTRUCTION JOINT

PERPENDICULAR TO BAND BEAMS

SCALE 1:20

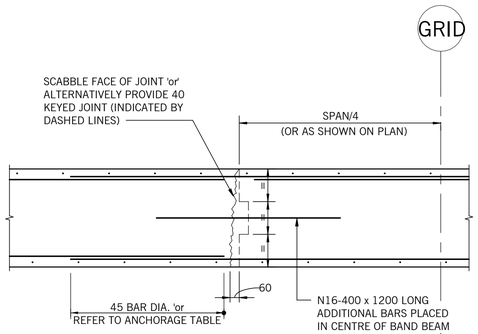


SLAB CONSTRUCTION JOINT

PARALLEL TO BAND BEAMS

SCALE 1:20

NOTE:
IN WET AREAS CONSTRUCTION JOINTS SHALL BE MADE WATERPROOF BY AN APPROVED PROPRIETRY WATERSTOP 'or' WATERPROOFING AGENT.



BAND BEAM CONSTRUCTION JOINT

SCALE 1:20

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STEEL DETAILS	S-WEB-990-991

ALL TYPICAL SUSPENDED SLAB DETAILS SHOWN ARE FOR INFORMATION, AND PRICING PURPOSES ONLY. SUB-CONTRACTOR TO PROVIDE THEIR OWN SUSPENDED SLAB TYPICAL DETAILS TO WEBBER DESIGN FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION ONSITE.

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STRUCTURAL DRAWING

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STRUCTURAL ENGINEERING
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MELBOURNE, VIC, AUSTRALIA 3000
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T: +61 2 9690 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

TYPICAL SUSPENDED SLAB DETAILS - SHEET 1

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-960	2

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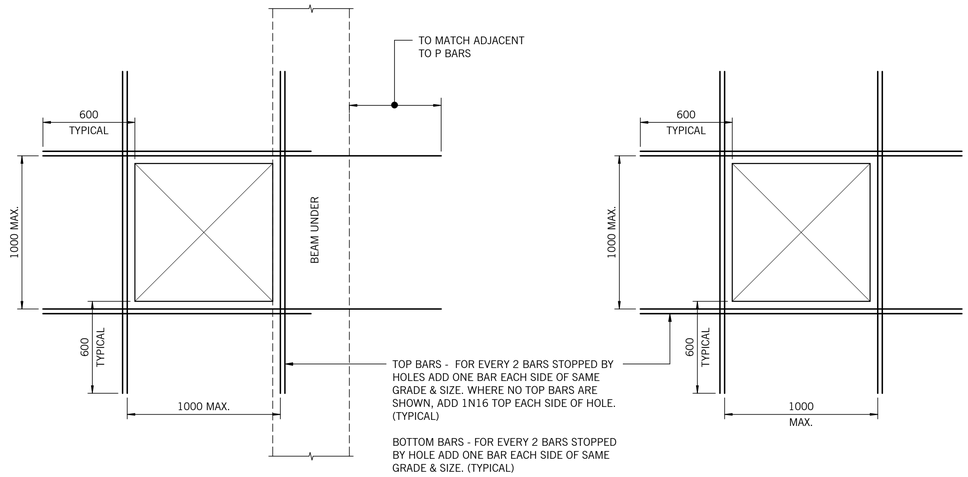


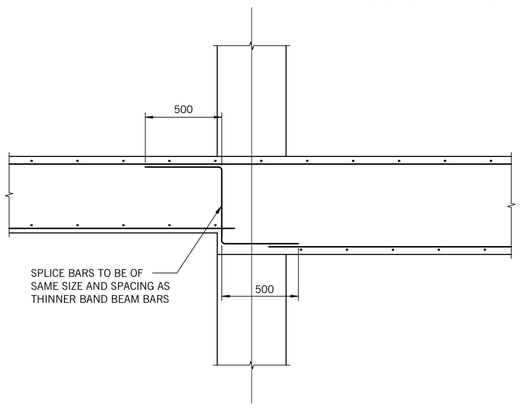
REINFORCEMENT TO SLAB PENETRATIONS

SCALE 1:20

NOTES:

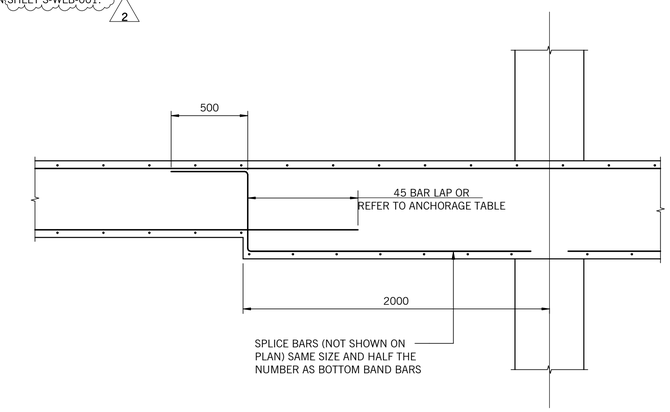
1. FOR HOLES LESS THAN 300 x 300, SLAB BARS TO BE RE-ARRANGED AROUND HOLE WITHOUT CUTTING.
2. FOR HOLES GREATER THAN 300 x 300 BUT LESS THAN 1000 x 1000, USE ABOVE DETAILS.
3. FOR HOLES GREATER THAN 1000 x 1000, REFER TO ENGINEERS PLANS.
4. LOCATIONS OF HOLES TO BE TO THE APPROVAL OF THE ENGINEER.
5. REFER ALSO TO STANDARD NOTES ON SHEET S-WEB-001.

2



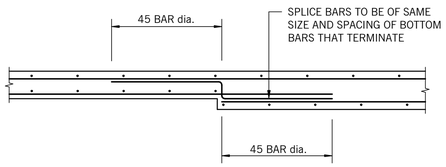
TYPICAL CHANGE IN SLAB THICKNESS AT SUPPORT

SCALE 1:20



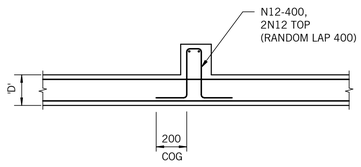
TYPICAL CHANGE IN BAND BEAM THICKNESS BETWEEN SUPPORT

SCALE 1:20



TYPICAL CHANGE IN SLAB THICKNESS

SCALE 1:20

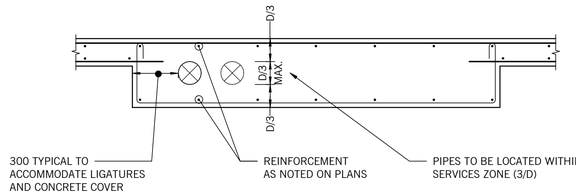


TYPICAL HOB DETAIL

SCALE 1:20

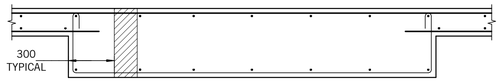
NOTES:

1: REFER TO ARCHITECTS DRAWINGS FOR DIMENSIONS AND LOCATIONS.



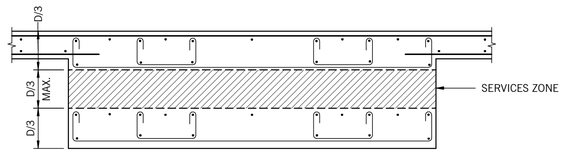
TYPICAL HORIZONTAL CAST-IN SERVICES PIPES ALONG BEAM

SCALE 1:20



TYPICAL VERTICAL CAST-IN PIPES

SCALE 1:20



TYPICAL HORIZONTAL SERVICES CAST-IN PIPES ACROSS BEAM

SCALE 1:20

MINIMUM D/3 ZONE REQUIRED TOP AND BOTTOM OF PIPE TO ACCOMMODATE ADDITIONAL LIGS DETAIL REQUIRED LIGS SHOWN ARE INDICATIVE ONLY AND ARE SUBJECT TO FINAL DETAIL DESIGN.

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POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
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STEEL DETAILS	S-WEB-990-991

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TITLE

TYPICAL SUSPENDED SLAB DETAILS - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
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JOB No.	DRAWING No.	REV.
20023	S-WEB-961	2

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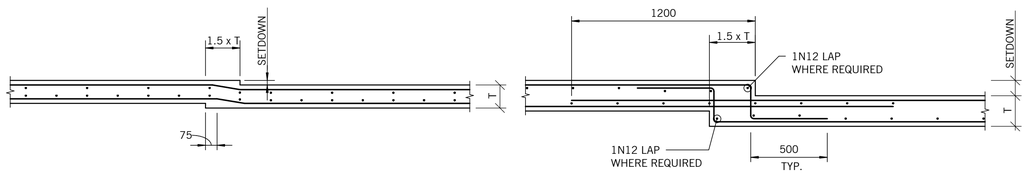


SETDOWN ≤ 0.2 x T

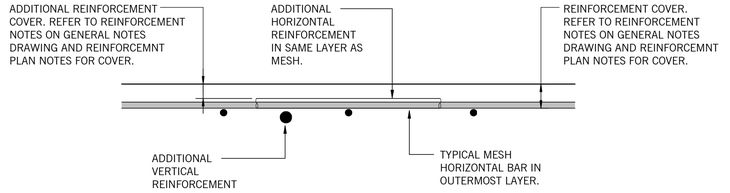
SETDOWN ≤ 0.8 x T

TYPICAL SUSPENDED FLOOR STEP DETAILS
SCALE 1:20

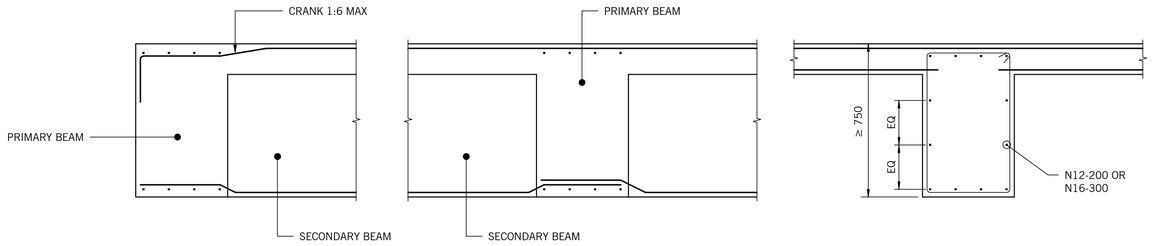
NOTES:
1. DETAILS APPLY UNLESS OTHERWISE SHOWN.
2. ALSO REFER TO STANDARD NOTES.

TYPICAL FABRIC DETAIL
SCALE 1:10

NOTE:
COMMON VERTICAL AND HORIZONTAL

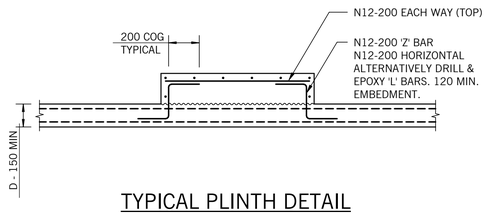


TYPICAL REINFORCEMENT COVER DETAILS
SCALE 1:5



TYPICAL PRIMARY TO SECONDARY BEAM DETAILS
SCALE 1:20

TYPICAL SIDE FACE REINFORCEMENT DETAIL FOR BEAMS ≥750 IN DEPTH
SCALE 1:20



TYPICAL PLINTH DETAIL
SCALE 1:20

NOTE:
1. REFER TO ARCHITECTS DRAWINGS FOR DIMENSIONS AND LOCATIONS.

ANCHORAGE AND SPLICE LENGTHS OF TENSION BARS IN BEAMS AND SLABS

BAR SIZE	LESS THAN 300mm OF CONCRETE BELOW HORIZONTAL BAR		MORE THAN 300mm OF CONCRETE BELOW HORIZONTAL BAR	
	CONCRETE GRADE		CONCRETE GRADE	
	25 MPa	>=32 MPa	25 MPa	>=32 MPa
N10	400	400	500	500
N12	500	450	650	600
N16	700	650	900	800
N20	900	800	1200	1100
N24	1100	1000	1550	1300
N28	1250	1100	1750	1600
N32	1600	1400	2100	1850
N36	2000	1700	2600	2200

NOTES:
1. THESE LENGTHS APPLY FOR ALL BARS IN BEAMS AND SLABS.
2. THE MINIMUM CONCRETE COVER TO ALL REINFORCEMENT BARS ARE TO BE IN ACCORDANCE WITH THE REINFORCEMENT NOTES ON THE GENERAL NOTES DRAWING (S-WEB-001).
3. THE MINIMUM CLEAR SPACING BETWEEN BARS MUST BE GREATER THAN TWICE THE COVER TO THE BAR.
4. FOR ALL SLABS WITH BARS AT LESS THAN 150mm CENTRES TO BE ANCHORED OR SPLICED, ANCHORAGE AND SPLICE LENGTHS NOTED ABOVE MUST BE MULTIPLIED BY 1.4.
5. UNLESS SHOWN ON THE DRAWINGS, THE SPLICE LOCATIONS MUST BE APPROVED BY WEBBER DESIGN.
6. IF BARS HAVE STANDARD COGS AT THE ENDS, ANCHORAGE LENGTHS NOTED ABOVE CAN BE HALVED.
7. N40 AND N50 BARS IN TENSION ARE NOT TO BE LAP SPLICED UNLESS APPROVED BY THE ENGINEER.
8. FOR PLAIN BARS USED AS LIGATURES OR TIES THE ANCHORAGE LENGTH SHALL BE 40 BAR DIAMETERS BUT NOT LESS THAN 300mm. OTHER PLAIN BARS MUST BE ANCHORED WITH A STANDARD HOOK OR COG.
9. THE ANCHORAGE LENGTH OF HARD DRAWN WIRE IS 50 BAR DIAMETERS.

2

DRAWING REFERENCE	REFERENCE No.
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TITLE

TYPICAL SUSPENDED SLAB DETAILS - SHEET 3

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
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JOB No.	DRAWING No.	REV.
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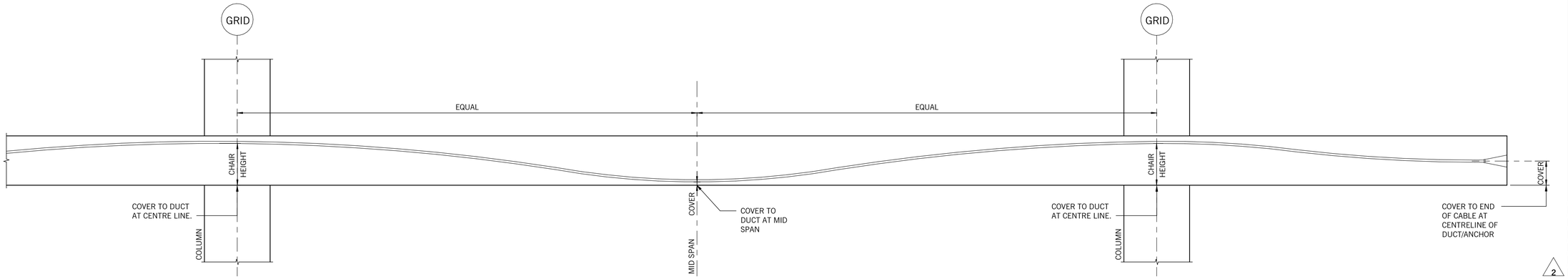
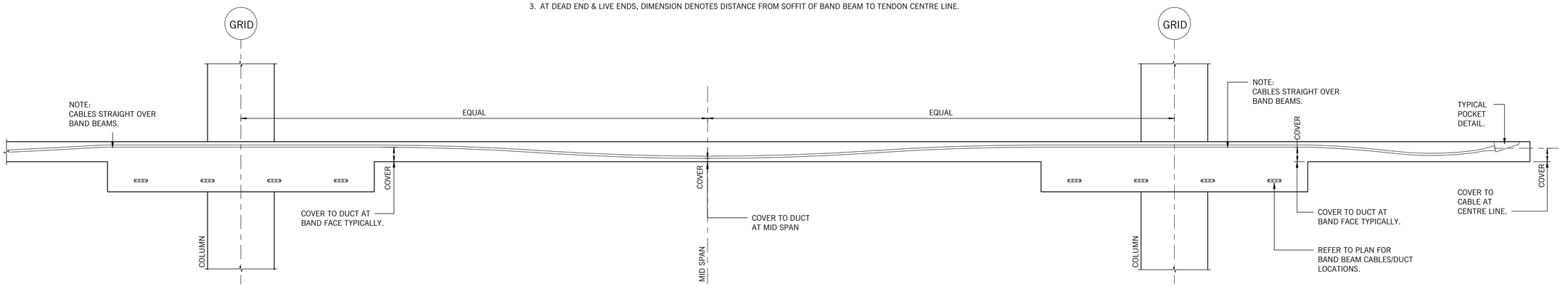


TYPICAL BAND BEAM - POST TENSIONED TENDON LAYOUT

SCALE 1:20

NOTE:

1. REFER TO POST TENSIONING PLAN FOR DIMENSIONS.
2. GENERALLY, DIMENSION DENOTES BOTTOM COVER TO DUCT (IN mm).
3. AT DEAD END & LIVE ENDS, DIMENSION DENOTES DISTANCE FROM SOFFIT OF BAND BEAM TO TENDON CENTRE LINE.

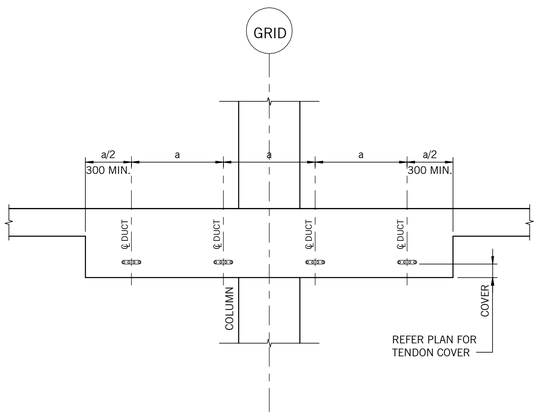


TYPICAL SLAB - POST TENSIONED TENDON LAYOUT

SCALE 1:20

NOTE:

1. REFER TO POST TENSIONING PLAN FOR DIMENSIONS.
2. GENERALLY, DIMENSION DENOTES BOTTOM COVER TO DUCT (IN mm)
3. AT DEAD AND LIVE ENDS, DIMENSION DENOTES DISTANCE FROM SOFFIT OF BAND BEAM TO TENDON CENTRE LINE.



BAND BEAM TENDON LOCATION

SCALE 1:20

NOTE:

1. REFER TO POST TENSIONING PLAN FOR DIMENSIONS.

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TITLE

TYPICAL POST TENSIONING DETAILS - SHEET 1

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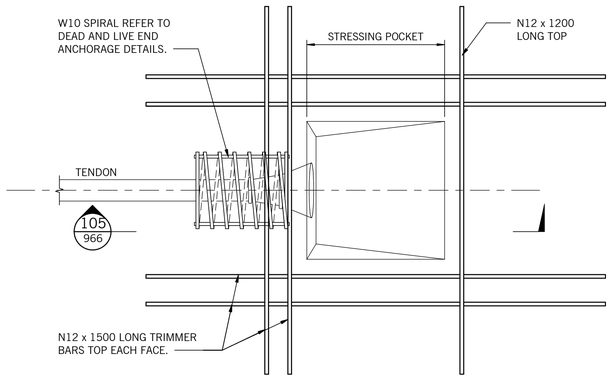
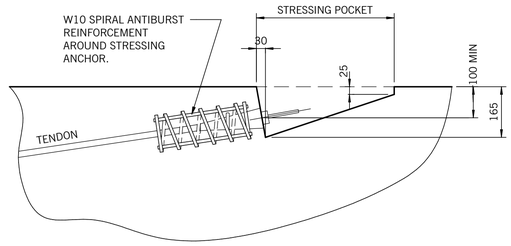


PLAN VIEW

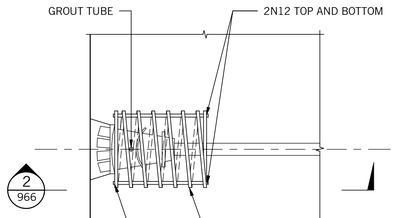


SECTION 1-1

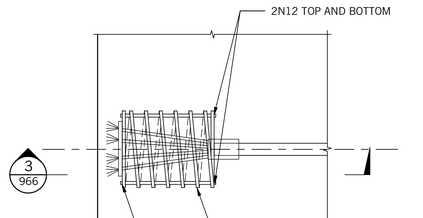
TYPICAL INTERNAL STRESSING POCKET

SCALE 1:10

1. REFER TO PLAN FOR ADDITIONAL REINFORCEMENT.

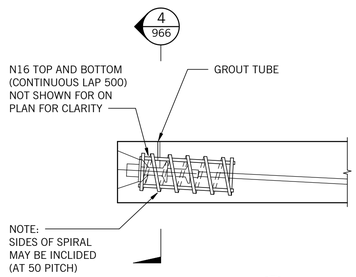


PLAN



PLAN

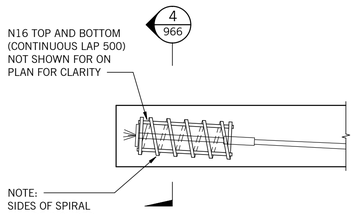
TYPICAL LIVE END BLOCK REINFORCEMENT



SECTION 2 / 966

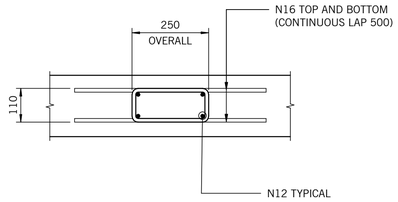
SCALE: 1 : 10

TYPICAL DEAD END BLOCK REINFORCEMENT



SECTION 3 / 966

SCALE: 1 : 10



SECTION 4 / 966

SCALE: 1 : 10

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TAYLOR

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WARWICK FARM, NSW 2170

TITLE

TYPICAL POST TENSIONING DETAILS - SHEET 2

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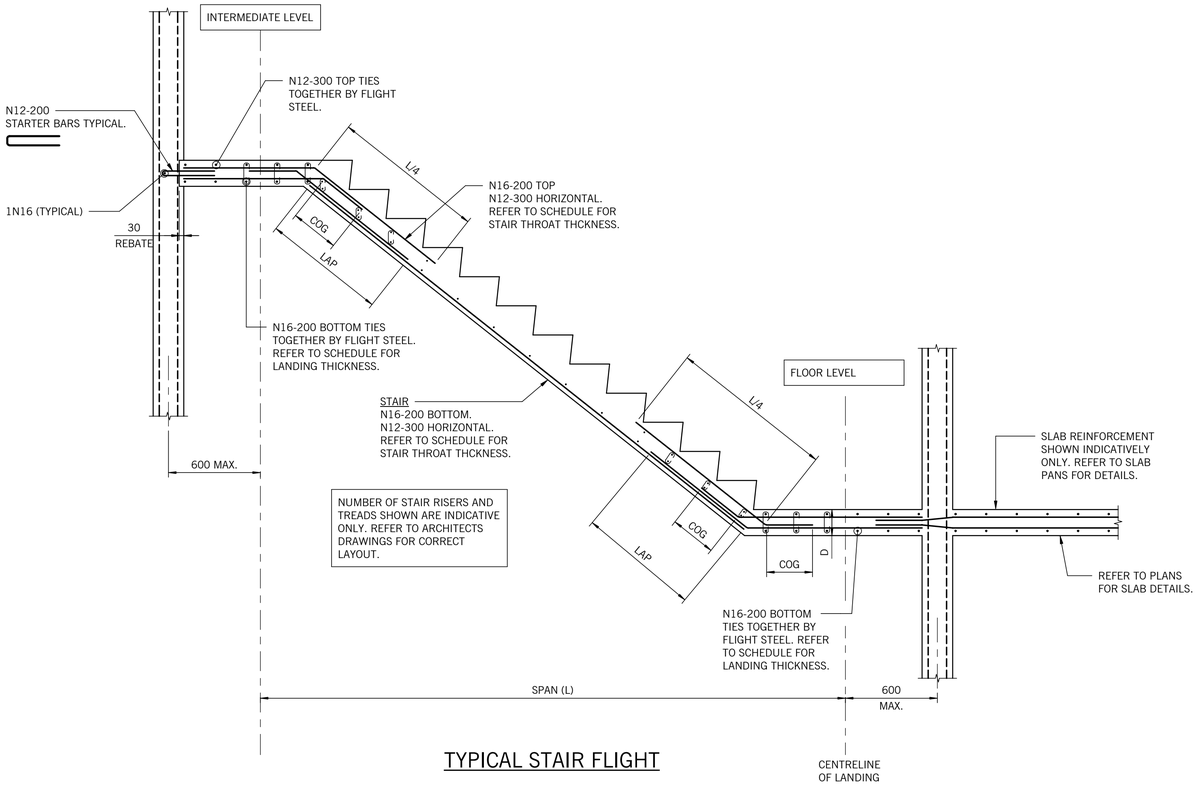


TYPICAL STAIR FLIGHT

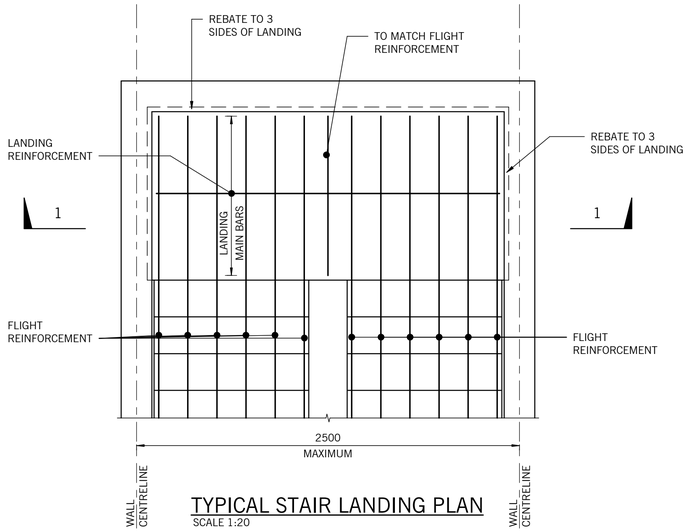
STAIR MASTER STAIRS

1. MAIN WIRES OF BOTTOM MESH TO BE CONTINUOUS (ie NO LAPS OR WELDS)
2. WELDING TO MESH IS NOT PERMITTED UNLESS PROCESS IS USED DO NOT ALTER MESH STRENGTH PROPERTIES OF AS. 1034 GRADE 450.
3. DO NOT WELD TO MAIN WIRES OF MESH.
4. MAIN WIRES TO BE LOWER MOST WITH 20mm COVER TO TRAY FORMWORK.
5. LANDING REINFORCEMENT MUST NOT BE INTERRUPTED BY SIDES OF FLIGHTS CONTINUOUS INTO LANDING.

STAIR THROAT THICKNESS (T) mm	STAIR LANDING THICKNESS (D) mm	MAXIMUM FLIGHT SPAN (L) mm	COMMENT
150	150	3200	-
160	160	3500	-
170	170	3800	-
180	180	4000	-
190	190	4300	-
200	200	4600	-
250	250	5600	-

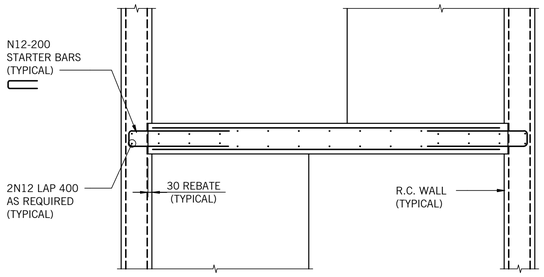
NOTES

1. MAXIMUM SPANS NOTED ABOVE FOR STAIR SLIGHTS ASSUME SPAN TO CENTRE LINES OF LANDINGS AND THAT LANDING SPANS ACROSS TO THE ADJACENT LOAD BEARING WALLS (ie WALLS THAT RUN PARALLEL TO STAIR FLIGHTS).
2. DESIGN LOADING FOR STAIRS = 4.0 kPa LIVE LOAD.
4. REFER TO PLANS FOR LOCATIONS.



TYPICAL STAIR LANDING PLAN

SCALE 1:20



SECTION 1-1

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SUSPENDED CONCRETE SLABS	S-WEB-960-962
POST TENSIONING DETAILS	S-WEB-965-966
R.C. STAIR DETAILS	S-WEB-970
MASONRY DETAILS	S-WEB-980-981
STEEL DETAILS	S-WEB-990-991

2

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RUSHCUTTERS BAY, NSW, AUSTRALIA 2011
T: +61 2 9680 2488

CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

R.C. STAIR DETAILS -
SHEET 1

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SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-970	2

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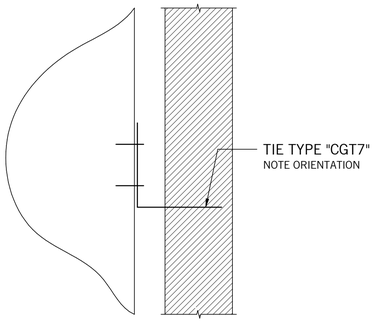
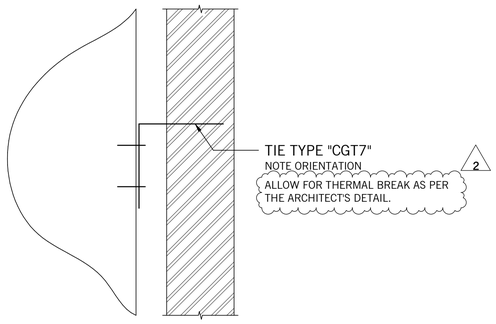


CONCRETE BLOCK



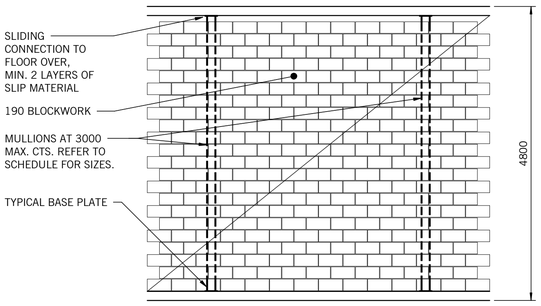
CLAY BRICKS

(CAVITY)

MASONRY WALL TO CONCRETE FACE

SCALE 1:10

SECTION DETAILS



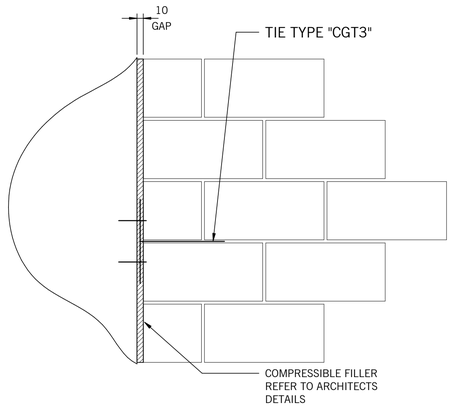
BLOCKWORK RESTRAINT DETAILS FOR HEIGHTS GREATER THAN 3.5m

SCALE 1:50

WALL HEIGHT:	MULLIONS (AT 3000 CTS.U.N.O.):
LESS THAN 4800	150 x 50 x 5.0 RHS (GRADE 350)

NOTE:

FIRST WALL PANEL WHERE WALL FREESTANDING TO HAVE 2 MULLIONS. THEREAFTER PROVIDE 1No. MULLION EVERY 3000.

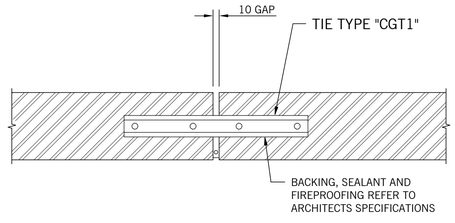


(CLAY BRICK OR CONCRETE BLOCKS)

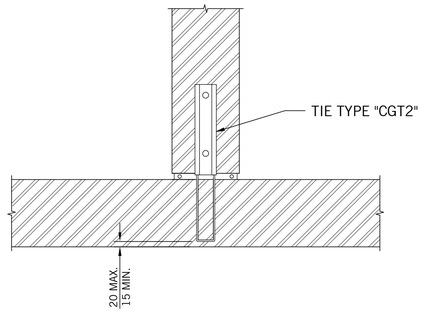
MASONRY WALL TO CONCRETE FACE

SCALE 1:10

ELEVATION DETAILS

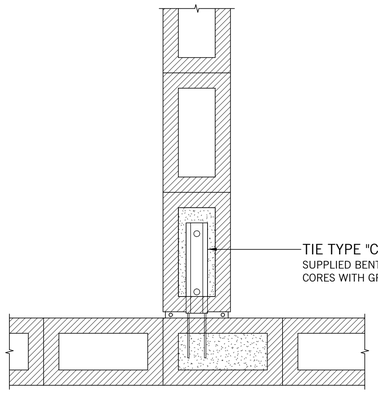


(SOLID CONCRETE BLOCKS OR CLAY BRICKS)

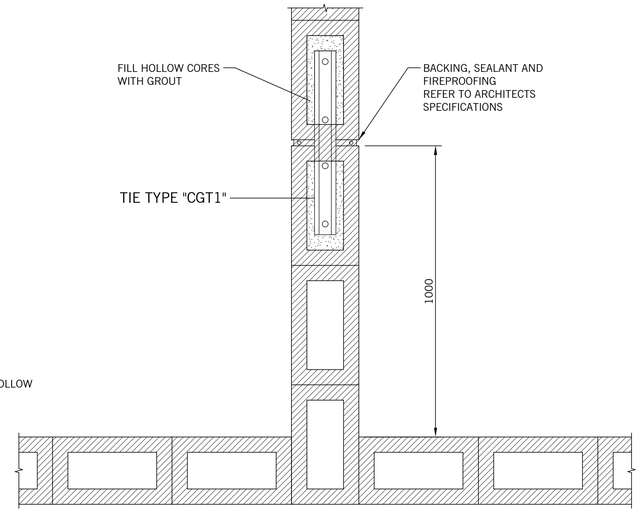


(INTERSECTING SOLID BLOCK WALLS)

2



(INTERSECTING HOLLOW BLOCK WALLS)



(CHANGES IN WALL DIRECTION)
(SIMILAR FOR SOLID BLOCKS)

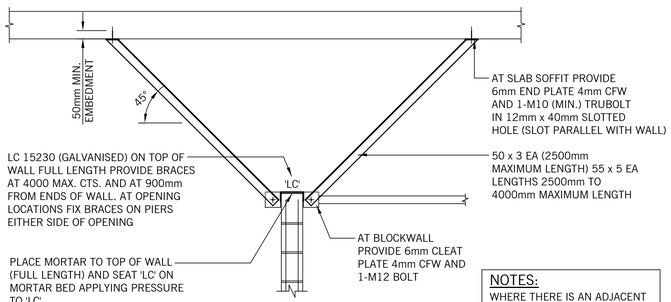
(NOTE: - BLOCKS TO BE TOOTHED UNLESS CONTROL JOINTS IS DENOTED ON PLANS)

VERTICAL CONTROL JOINTS

SCALE 1:10

PLAN DETAILS

REFER TO ARCHITECTS DRAWINGS FOR LOCATIONS OF VERTICAL CONTROL JOINTS.
REFER TO CATALOGUE FOR VARIATIONS OF "CERRA CGT" TIES FOR JOINTS AT INTERSECTIONS.
FOR FIRE RATED WALLS PROVIDE FIRE BLANKET TO ARCHITECTS DETAILS TO ALL WALL JOINTS.

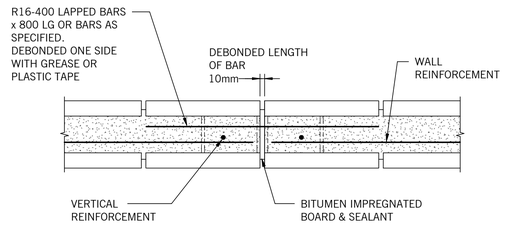


(APPLICABLE WHERE BLOCKWALL TERMINATES AT CEILING)

NOTES:

WHERE THERE IS AN ADJACENT CONCRETE WALL CONNECT BRACE HORIZONTALLY TO WALL (INDICATED BY DASHED LINES)

FOR CONCRETE FLOOR SLAB OVER



VERTICAL CONTROL JOINT THROUGH CORE FILLED REINFORCED BLOCK WALLS

SCALE 1:10

PLAN DETAILS

DRAWING REFERENCE	REFERENCE No.
DRAWING INDEX	S-WEB-000
GENERAL NOTES	S-WEB-001-002
RETENTION	S-WEB-010-029
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STEEL DETAILS	S-WEB-990-991

ALL BLOCKWALL DETAILS SHOWN ARE INTENDED TO BE INFORMATIVE AND IS FOR SUB-CONTRACTOR CONSIDERATION. SUB-CONTRACTOR IS TO CAREFULLY REVIEW WALL SPANNING WIDTH AND HEIGHT AND ITS CORRESPONDING FIRE RATING REQUIREMENT TO BUILDER SURVEYOR AND SUBMIT CONSTRUCTION DETAIL TO WEBBER DESIGN FOR APPROVAL PRIOR TO CONSTRUCTION ON SITE.

ISSUED FOR TENDER

Status

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PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

TYPICAL MASONRY DETAILS - SHEET 1

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1:10, 1:20, 1:50	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-980	2

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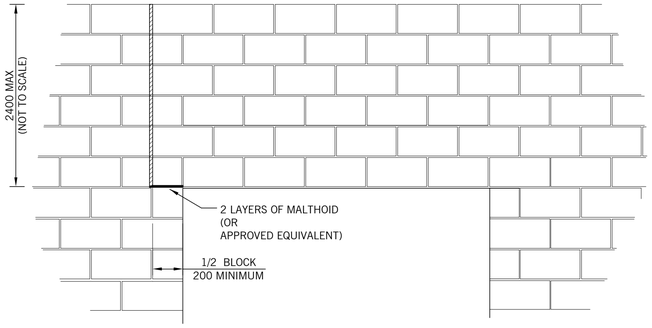


ELEVATION

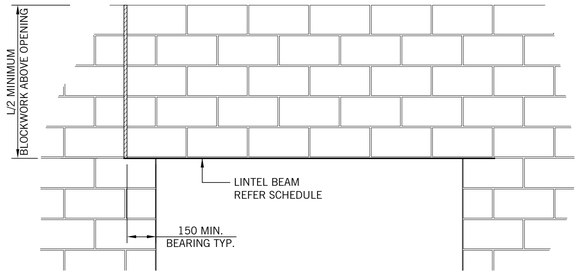
TYPICAL CONTROL JOINT AT DOOR / WINDOW HEADER

SCALE 1:20

NOTE

1: WHERE NO VERTICAL CONTROL JOINT HAS BEEN SPECIFIED AT DOOR OR WINDOW HEAD, THEN USE TWO LAYERS OF BED JOINT REINFORCEMENT. ONE IN EACH JOINT ABOVE THE LINTEL, EXTEND 1000 PAST EACH DOOR/WINDOW JAMB.

2: MAXIMUM CENTRES FOR VERTICAL CONTROL JOINTS SHALL BE 8000 UNLESS NOTED OTHERWISE ON PLANS.



TYPICAL INTERNAL LINTEL DETAILS ≤ 1350mm SPAN

SCALE 1:20

ELEVATION

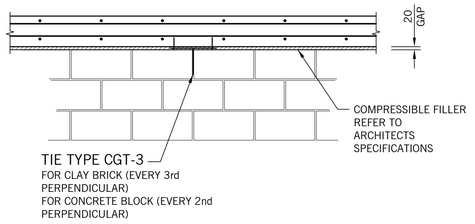
NOTE: REFER TO TYPICAL CONTROL JOINT AT DOOR/WINDOW HEADER FOR DETAIL NOT SHOWN.

FORMING NEW OPENING (≤ 1350mm)

1. SAWCUT BRICKWORK TO REQUIRED DOOR SIZE AND REMOVE BRICKWORK.
2. CHASE AND / OR CHISEL 30mm DEEP REBATE OUT FOR LINTELS.
3. SUPPORT LINTELS USING LOCAL PACKERS THEN RAMPACK GAPS WITH NON-SHRINK GROUT.

LINTEL SCHEDULE	
SPAN "L"	LINTEL REQUIRED
≤ 900	100 x 10 FLAT PLATE EACH FACE
≤ 1100	100 x 12 FLAT PLATE EACH FACE
≤ 1350	100 x 16 FLAT PLATE EACH FACE

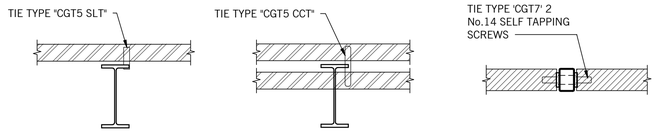
NOTE:- ALL STEELWORK TO BE HOT DIPPED GALVANISED



ELEVATION VIEW

NON LOAD-BEARING WALL TO SLAB OVER

SCALE 1:20

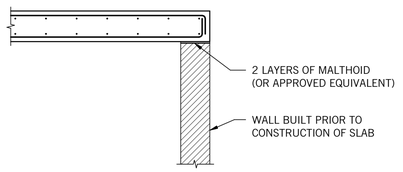


(SINGLE LEAF WALL) (CAVITY WALL) (RHS MULLION)

MASONRY WALL TO STEEL MULLION

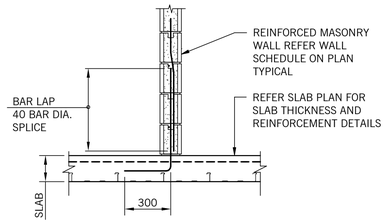
PLAN DETAILS

MULLION CENTRES TO BE ADVISED BY ENGINEER.



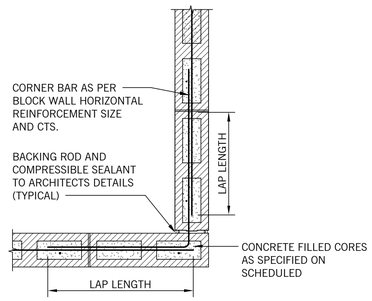
LOAD-BEARING WALL TO SLAB OVER

SCALE 1:20



REINFORCED BLOCKWALL TO SUSPENDED SLAB

SCALE 1:20

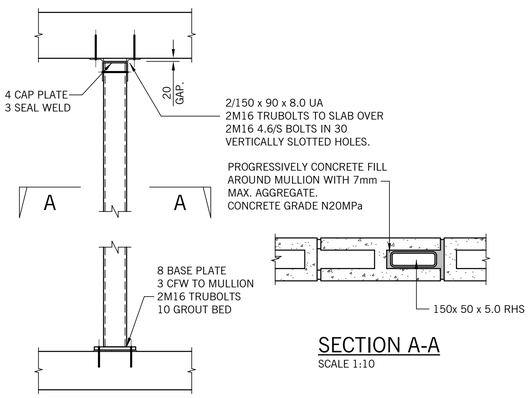


90° CORNER DETAIL

REINFORCED BLOCKWALL INTERSECTION

SCALE 1:20

CONTROL JOINT TO BE VERTICAL FOR FULL HEIGHT OF WALL. APPLY SEALANTS AS SPECIFIED TO EACH FACE OF THE BLOCKWALL.



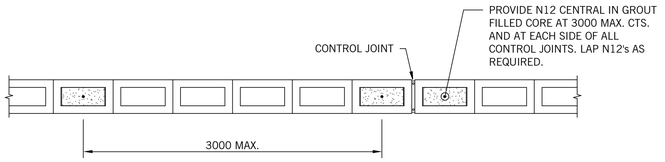
SECTION A-A

SCALE 1:10

TYPICAL MULLION CONNECTION

SCALE 1:20

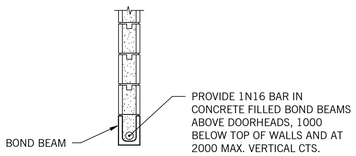
SUBJECT TO LATERAL LOAD AND FIRE RATING - REFER TO WEBBER DESIGN FOR CONFIRMATION



TYPICAL REINFORCED WALL - TYPE 1

SCALE 1:20

REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS



TYPICAL REINFORCED WALL - TYPE 2

SCALE 1:20

REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS

EXTERNAL LINTEL SCHEDULE

HEIGHT OVER LINTEL (mm)	BRICK WORK	CLEAR SPAN OF OPENING (mm)							
		1000	1200	1500	1800	2100	2400	2700	3000
	500	75x75x6.0 EA	75x75x6.0 EA	75x100x6.0 UA	75x100x6.0 UA	75x100x6.0 UA	100x100x6.0 EA	100x100x6.0 EA	100x100x6.0 EA
	1000	75x75x6.0 EA	75x100x6.0 UA	75x100x6.0 UA	75x100x6.0 UA	100x100x6.0 EA	100x100x6.0 EA	100x100x6.0 EA	150x90x8.0 UA
	1500	75x100x6.0 UA	75x100x6.0 UA	75x100x6.0 UA	100x100x6.0 EA	100x100x6.0 EA	100x100x6.0 EA	150x90x8.0 UA	150x90x8.0 UA
	2000	75x100x6.0 UA	75x100x6.0 UA	100x100x6.0 EA	100x100x6.0 EA	100x100x6.0 EA	150x90x8.0 UA	150x90x8.0 UA	150x90x8.0 UA
	2500	75x100x6.0 UA	75x100x6.0 UA	100x100x6.0 EA	100x100x6.0 EA	100x100x6.0 EA	150x90x8.0 UA	150x90x8.0 UA	150x100x10.0 UA
	3000	75x100x6.0 UA	75x100x6.0 UA	100x100x6.0 EA	100x100x6.0 EA	100x100x6.0 EA	150x90x8.0 UA	150x100x10.0 UA	

NOTES:
FIRST DIMENSION CORRESPONDS TO THE VERTICAL LINTEL LEG (eg. 75x100x6.0 UA LINTEL - 75 LEG VERTICAL).
PROVIDE 150 END BEARING EACH END ONTO BRICKWORK.
FOR HIGHER LOAD CONDITIONS (EG. POINT & ROOF LOADS) SEEK THE ADVICE OF AN ENGINEER.

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ISSUED FOR TENDER

Status

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CLIENT

TAYLOR

PROJECT

LAHC WARWICK FARM
11-13 MANNIX PARADE,
WARWICK FARM, NSW 2170

TITLE

TYPICAL MASONRY
DETAILS - SHEET 2

DATE	DESIGNED BY	CHECKED BY
NOV 2020	MA/BT	AC
SCALES AT A1	DRAWN BY	APPROVED BY
1:20	PAC	PW
JOB No.	DRAWING No.	REV.
20023	S-WEB-981	2

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WEBBER DESIGN

A1 0 1 2 3 4 5 6 7 8 9 10

LOCATION OF FENCES ARE APPROXIMATE ONLY

ONLY VISIBLE SERVICES HAVE BEEN LOCATED ACCURATELY

NO UNDERGROUND SERVICES SEARCH HAS BEEN CARRIED OUT

MGA

BOUNDARY DIMENSIONS AND AREAS ARE SUBJECT TO FINAL SURVEY

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DIAL1100 BEFORE YOU DIG

No.	DATE	NOTATION/AMENDMENT	No.	DATE	NOTATION/AMENDMENT

FILE	FILE SIZE (MB)	CHECKED BY

CONTOUR INTERVAL: 0.5m

DATUM: A.H.D.

ORIGIN OF DATUM: S.S.M. 38840

14.738 SCIMS

100 YEAR FLOOD RL:

RECOMMENDED MINIMUM FLOOR RL:

SOURCE OF FLOOD INFO:

LEGEND OF COMMONLY USED SYMBOLS

WATER, SEWER, ELECTRICITY, TELECOM, GAS, DRAINAGE – Common, – Main

BENCH MARK SURVEY CONTROL MARK PM SSM

REDUCTION RATIO 1 : 250 @ A1, 500 @ A1

0 12.5 25

LAND TITLE INFORMATION

LOT: 6, 7, 8, 9, 10, 14, 15, 24, 25, 26 & 27

PLAN NO : D.P. 36641

OTHER:

AREA: TOTAL 6582.4m²

DATE OF SURVEY: 16 / 06 / 2016

SURVEY CONSULTANT:

Degotardi Smith & Partners
CONSULTING SURVEYORS ESTABLISHED 1957
t. (+61 2) 4964 1100 | f. (+61 2) 4964 1000
e. surveys@degotardi.com.au | w. www.degotardi.com.au

REGISTERED SURVEYOR
PAUL GARRETT

REF. 34441A01.DWG

NSW GOVERNMENT Family & Community Services
Land & Housing Corporation

DRAWING TITLE

PROPOSED SUBDIVISION

LOCATION

WARWICK FARM

STREET ADDRESS

MANNIX PARADE,
HINKLER AVENUE &
MCGIRR PARADE

TYPE

LUA

JOB NUMBER

BGMLG

SHT. 1

OF 1

L.G.A. OF LIVERPOOL

LEGEND :

+36.41	- DENOTES SPOT LEVEL
+36.41A	- DENOTES AWNING
+33.27TK	- DENOTES TOP OF KERB LEVEL
+30.12G	- DENOTES GUTTER FLOWLINE LEVEL
+30.11LIP	- DENOTES LIP OF KERB
+37.76FL	- DENOTES FLOOR LEVEL
+30.17VFL	- DENOTES VERANDAH FLOOR LEVEL
+37.76DFL	- DENOTES DECK FLOOR LEVEL
+33.15VC	- DENOTES VEHICLE CROSSING
+45.40GUT	- DENOTES TOP OF GUTTER
+41.92TW	- DENOTES TOP OF WALL
+40.19BW	- DENOTES BOTTOM OF WALL
+49.15RR	- DENOTES ROOF/RIDGE
VC	- DENOTES VEHICLE CROSSING
	- DENOTES GATE.
WM	- DENOTES WATER METER
HY	- DENOTES WATER HYDRANT
	- DENOTES WATER TAP
	- DENOTES SINGLE TELSTRA PIT
	- DENOTES TELSTRA TWIN CONC. PIT
	- DENOTES TELSTRA DISTRIB. PILLAR
DP	- DENOTES DOWN PIPE
	- DENOTES GRATED DRAIN.
	- DENOTES DRAIN
PP	- DENOTES POWER POLE
LP	- DENOTES LIGHT POLE
A	- DENOTES BOUNDARY CORNER
1	- DENOTES PHOTO LOCATION
	- DENOTES SIGN
SMH	- DENOTES SEWER MANHOLE
	- DENOTES MAILBOX
LH	- DENOTES LAMPHOLE
SIP	- DENOTES SEWER INSPECTION POINT
GAS	- DENOTES GAS METER
E	- DENOTES OVERHEAD ELEC. LINE
W	- DENOTES WATER MAIN (DBYD)
S	- DENOTES SEWER LINE (DBYD)
G	- DENOTES GAS LINE (DBYD)
T	- DENOTES TELSTRA LINE
EU	- DENOTES U/G ELEC. LINE (DBYD)
TEL	- DENOTES TELEPHONE LINE
D	- DENOTES DRAINAGE LINE
	- DENOTES COMMUNICATIONS

Notes:

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MGA

MANNIX LANE

MCGIRR

HINKLER AVENUE

PARADE

ADJOINS SHEET 2

ADJOINS SHEET 3

ADJOINS SHEET 3

LOTS 6, 7, 8, 9, 10, 14, 15, 24, 25, 26 & 27 BOUNDARY CORNERS		
M.G.A. COORDINATES		
CORNER	EASTING	NORTHING
A	308708.103	6245611.961
B	308776.985	6245617.303
C	308780.058	6245613.973
D	308766.486	6245527.875
E	308766.331	6245512.318
F	308768.031	6245506.464
G	308716.532	6245509.742
H	308725.630	6245535.944
I	308700.419	6245553.693
J	308699.077	6245559.062
K	308702.526	6245567.799
L	308705.445	6245581.200
M	308705.733	6245595.217
N	308704.739	6245608.031

10
D.P. 36641
499.5m²

9
D.P. 36641
575.4m²

36
D.P. 36641

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CONTOUR INTERVAL: 0.5m
DATUM: A.H.D.
ORIGIN OF DATUM: S.S.M. 38840
14.738 SCIMS
100 YEAR FLOOD RL:
RECOMMENDED MINIMUM FLOOR RL:
SOURCE OF FLOOD INFO:

LEGEND OF COMMONLY USED SYMBOLS

WATER, SEWER, ELECTRICITY, TELECOM, GAS, DRAINAGE

BENCH MARK SURVEY CONTROL MARK PM SSM

REDUCTION RATIO 1 : 100 @ A1

0 1 2 3 4 5 6 7 8 9 10

LAND TITLE INFORMATION

LOT: 6, 7, 8, 9, 10, 14, 15, 24, 25, 26 & 27

PLAN NO : D.P. 36641

OTHER:

AREA: TOTAL 6582.4m²

DATE OF SURVEY: 16 / 06 /2016

SURVEY CONSULTANT:

Degotardi Smith & Partners
CONSULTING SURVEYORS ESTABLISHED 1957
1/19-23 Bridge Street, Pymble, NSW 2073, Australia
t. (+61) 2 9440 1100 f. (+61) 2 9440 1055
e. surveys@degotardi.com.au w. www.degotardi.com.au
REGISTERED SURVEYOR PAUL GARRETT

REF. 34441A01.DWG

NSW GOVERNMENT Family & Community Services
Land & Housing Corporation

DRAWING TITLE

DETAIL & LEVEL SURVEY
-

LOCATION

WARWICK FARM

STREET ADDRESS

3-13 MANNIX PARADE,
2-6 HINKLER AVENUE &
2-4 MCGIRR PARADE

TYPE S

SITE LAYOUT JOB / /

SHT. 1 OF 6

L.G.A. OF LIVERPOOL

ADJOINS SHEET 1

PARADE

MCGIRR

MANNIX

OVERHEAD POWER LINE

GRASS

CONC.

KERB

GUTTER

FOOTPATH

PRAM RAMP

DRAIN

DISH

PP 11.47

PP 12.35

11.50

CONC. DRAIN PIT

Ø300 INV. 10.95

TEL PIT

B.M. S.S.M. 180675
R.L. 11.797 (A.H.D.)

DRILL HOLE IN CONC. AT BDY INTERSECTION

BUS STOP

85°33'55"

21.23

FENCE

Ø150 INV. 10.48

Ø150 INV. 10.50

SMH

137°17'40"

4.53

NAIL IN POST

METAL

WM

SIP

LH

DP

TREE SLO 5x40.10 W5

TREE SLO 55.0 40.20 H5

TREE SLO 40.10 NZ

9
D.P. 36641
575.4m²

27
D.P. 36641
676.6m²

GARDEN

VERANDAH

STEPS

DECK

CONCRETE

SHED

PATH

PALING

1.8m HIGH

1.1m HIGH

(20 YO)

GATE

DRIVEWAY

CARPORT OVER CONCRETE

FIBRO HOUSE TILE ROOF No.2 McGIRR

FIBRO HOUSE TILE ROOF No.13 MANNIX

85°33'55"

28.655

20°54'16"

33.53

27.335

265°23'10"

30.725

188°57'30"

21.84

ADJOINS SHEET 4

MGA

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LEGEND :

+36.41	- DENOTES SPOT LEVEL
+36.41A	- DENOTES AWNING
+33.277K	- DENOTES TOP OF KERB LEVEL
+30.12G	- DENOTES GUTTER FLOWLINE LEVEL
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PP	- DENOTES POWER POLE
LP	- DENOTES LIGHT POLE
A	- DENOTES BOUNDARY CORNER
1	- DENOTES PHOTO LOCATION
	- DENOTES SIGN
SMH	- DENOTES SEWER MANHOLE
	- DENOTES MAILBOX
LH	- DENOTES LAMPHOLE
SIP	- DENOTES SEWER INSPECTION POINT
GAS	- DENOTES GAS METER
E	- DENOTES OVERHEAD ELEC. LINE
W	- DENOTES WATER MAIN (DBYD)
S	- DENOTES SEWER LINE (DBYD)
G	- DENOTES GAS LINE (DBYD)
T	- DENOTES TELSTRA LINE
E U/G	- DENOTES U/G ELEC. LINE (DBYD)
TEL	- DENOTES TELEPHONE LINE
D	- DENOTES DRAINAGE LINE
	- DENOTES COMMUNICATIONS

LOTS 6, 7, 8, 9, 10, 14, 15, 24, 25, 26 & 27 BOUNDARY CORNERS

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A	308708.103	6245611.961
B	308776.985	6245617.303
C	308780.058	6245613.973
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N	308704.739	6245608.031

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REDUCTION RATIO 1 : 100 @ A1

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PLAN NO : D.P. 36641
OTHER:
AREA: TOTAL 6582.4m²

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REGISTERED SURVEYOR
PAUL GARRETT

REF. 34441A01.DWG

NSW GOVERNMENT Family & Community Services
Land & Housing Corporation

DRAWING TITLE

DETAIL & LEVEL SURVEY
-

LOCATION
WARWICK FARM

STREET ADDRESS
3-13 MANNIX PARADE,
2-6 HINKLER AVENUE &
2-4 MCGIRR PARADE

TYPE
S

SITE LAYOUT JOB
/ /

SHT. 2
OF 6

L.G.A. OF LIVERPOOL

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PP	- DENOTES POWER POLE
LP	- DENOTES LIGHT POLE
(A)	- DENOTES BOUNDARY CORNER
(1)	- DENOTES PHOTO LOCATION
	- DENOTES SIGN
SMH	- DENOTES SEWER MANHOLE
	- DENOTES MAILBOX
LH	- DENOTES LAMPHOLE
SIP	- DENOTES SEWER INSPECTION POINT
GAS	- DENOTES GAS METER
—E—	- DENOTES OVERHEAD ELEC. LINE
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TELECOM
GAS
DRAINAGE
BENCH MARK
SURVEY CONTROL MARK
PM SSM

REDUCTION RATIO 1 : 100 @ A1
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LAND TITLE INFORMATION
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PLAN NO: D.P. 36641
OTHER:
AREA: TOTAL 6582.4m²

DATE OF SURVEY: 16 / 06 / 2016
SURVEY CONSULTANT:
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NSW GOVERNMENT
Family & Community Services
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DRAWING TITLE
DETAIL & LEVEL SURVEY
-

LOCATION
WARWICK FARM

STREET ADDRESS
3-13 MANNIX PARADE,
2-6 HINKLER AVENUE &
2-4 MCGIRR PARADE

SITE / LAYOUT / JOB

TYPE
S

SHT. 3
OF 6

L.G.A. OF LIVERPOOL

ADJOINS SHEET 2

ADJOINS SHEET 3

ADJOINS SHEET 6

26
D.P. 36641
607.0m²

25
D.P. 36641
575.4m²

24
D.P. 36641
651.3m²

PARADE

MANNIX

M.G.A.

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M.G.A. COORDINATES

CORNER	EASTING	NORTHING
A	308708.103	6245611.961
B	308776.985	6245617.303
C	308780.058	6245613.973
D	308766.486	6245527.875
E	308766.331	6245512.318
F	308768.031	6245506.464
G	308716.532	6245509.742
H	308725.630	6245535.944
I	308700.419	6245553.693
J	308699.077	6245559.062
K	308702.526	6245567.799
L	308705.445	6245581.200
M	308705.733	6245595.217
N	308704.739	6245608.031

No.	DATE	NOTATION/AMENDMENT
1	DD/MM/YY	FINAL ISSUE

No.	DATE	NOTATION/AMENDMENT

FILE	FILE SIZE (MB)	CHECKED BY

CONTOUR INTERVAL: 0.5m
DATUM: A.H.D.
ORIGIN OF DATUM: S.S.M. 38840
14.738 SCIMS
100 YEAR FLOOD RL:
RECOMMENDED MINIMUM FLOOR RL:
SOURCE OF FLOOD INFO:

LEGEND OF COMMONLY USED SYMBOLS

WATER, SEWER, ELECTRICITY, TELECOM, GAS, DRAINAGE

BENCH MARK SURVEY CONTROL MARK PM SSM

REDUCTION RATIO 1 : 100 @ A1

0 1 2 3 4 5 6 7 8 9 10

LAND TITLE INFORMATION

LOT: 6, 7, 8, 9, 10, 14, 15, 24, 25, 26 & 27
PLAN NO : D.P. 36641
OTHER:
AREA: TOTAL 6582.4m²

DATE OF SURVEY: 16 / 06 /2016
SURVEY CONSULTANT:

Degotardi Smith & Partners
CONSULTING SURVEYORS ESTABLISHED 1957
1/19-23 Bridge Street | Pymble | NSW 2073 | Australia
t. (+61) 2 9440 1100 | f. (+61) 2 9440 1000
e. surveys@degotardi.com.au | w. www.degotardi.com.au
REGISTERED SURVEYOR PAUL GARRETT

REF. 3444\A01.DWG

NSW GOVERNMENT Family & Community Services
Land & Housing Corporation

DRAWING TITLE

DETAIL & LEVEL SURVEY
-

LOCATION
WARWICK FARM

STREET ADDRESS
3-13 MANNIX PARADE,
2-6 HINKLER AVENUE &
2-4 MCGIRR PARADE

TYPE
S

SITE LAYOUT JOB
/ /

SHT. 4
OF 6

L.G.A. OF LIVERPOOL

ADJOINS SHEET 3

MGA

63
D.P. 36711

LANE

CONC

FENCE

OVERHEAD POWER LINE

KERB

GUTTER

30.83
305°08'50"

1.8m HIGH

SHED

CONCRETE

19°08'50"
7.925

(20 YO)

NAIL IN FENCE

19°09'50"
18.29

PALING

GRASS

15
D.P. 36641
682.9m²

ADJOINS SHEET 6

CARPORT OVER CONCRETE

14
D.P. 36641
746.1m²

19°08'50"
17.375

HINKLER

CONC. DRIVEWAY

DRILL HOLE IN KERB

GATE

273°38'30"
51.605

11
D.P. 36641

12
D.P. 36641

3
D.P. 36641

Notes:

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THIS NOTICE MUST NOT BE ERASED.

LEGEND :

+36.41	- DENOTES SPOT LEVEL
+36.41A	- DENOTES AWNING
+33.27TK	- DENOTES TOP OF KERB LEVEL
+30.12G	- DENOTES GUTTER FLOWLINE LEVEL
+30.17LIP	- DENOTES LIP OF KERB
+37.76FL	- DENOTES FLOOR LEVEL
+30.17VFL	- DENOTES VERANDAH FLOOR LEVEL
+37.76DFL	- DENOTES DECK FLOOR LEVEL
+33.15VC	- DENOTES VEHICLE CROSSING
+45.40GUT.	- DENOTES TOP OF GUTTER
+41.92TW	- DENOTES TOP OF WALL
+40.198W	- DENOTES BOTTOM OF WALL
+49.15RR	- DENOTES ROOF/RIDGE
VC	- DENOTES VEHICLE CROSSING
	- DENOTES GATE.
WV	- DENOTES WATER STOP VALVE
WM	- DENOTES WATER METER
HY	- DENOTES WATER HYDRANT
	- DENOTES WATER TAP
	- DENOTES SINGLE TELSTRA PIT
	- DENOTES TELSTRA TWIN CONC. PIT
	- DENOTES TELSTRA DISTRIB. PILLAR
DP	- DENOTES DOWN PIPE
	- DENOTES GRATED DRAIN.
D	- DENOTES DRAIN
PP	- DENOTES POWER POLE
LP	- DENOTES LIGHT POLE
A	- DENOTES BOUNDARY CORNER
1	- DENOTES PHOTO LOCATION
	- DENOTES SIGN
SMH	- DENOTES SEWER MANHOLE
	- DENOTES MAILBOX
LHD	- DENOTES LAMPHOLE
SIP	- DENOTES SEWER INSPECTION POINT
GAS	- DENOTES GAS METER
E	- DENOTES OVERHEAD ELEC. LINE
W	- DENOTES WATER MAIN (DBYD)
S	- DENOTES SEWER LINE (DBYD)
G	- DENOTES GAS LINE (DBYD)
T	- DENOTES TELSTRA LINE
EU	- DENOTES U/G ELEC. LINE (DBYD)
TEL	- DENOTES TELEPHONE LINE
D	- DENOTES DRAINAGE LINE
	- DENOTES COMMUNICATIONS

LOTS 6, 7, 8, 9, 10, 14, 15, 24, 25, 26 & 27 BOUNDARY CORNERS

M.G.A. COORDINATES

CORNER	EASTING	NORTHING
A	308708.103	6245611.961
B	308776.985	6245617.303
C	308780.058	6245613.973
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RECOMMENDED MINIMUM FLOOR RL:
SOURCE OF FLOOD INFO:

LEGEND OF COMMONLY USED SYMBOLS

WATER, SEWER, ELECTRICITY, TELECOM, GAS, DRAINAGE – Common, – Main

BENCH MARK SURVEY CONTROL MARK PM SSM

REDUCTION RATIO 1 : 100 @ A1

0 1 2 3 4 5 6 7 8 9 10

LAND TITLE INFORMATION

LOT: 6, 7, 8, 9, 10, 14, 15, 24, 25, 26 & 27

PLAN NO : D.P. 36641

OTHER:

AREA: TOTAL 6582.4m²

DATE OF SURVEY: 16 / 06 /2016

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REGISTERED SURVEYOR
PAUL GARRETT

REF. 34441A01.DWG

NSW GOVERNMENT Family & Community Services Land & Housing Corporation

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DETAIL & LEVEL SURVEY
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TYPE

S

SITE LAYOUT JOB

SHT. 5

/ /

OF 6

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ORIGIN OF DATUM: S.S.M. 38840
14.738 SCIMS
100 YEAR FLOOD RL:
RECOMMENDED MINIMUM FLOOR RL:
SOURCE OF FLOOD INFO:

LEGEND OF COMMONLY USED SYMBOLS

WATER — H — SV
SEWER — MH — LH
ELECTRICITY O/H U/G — PP — Street Light — Consumer Connection Box
TELECOM O/H U/G — Joint Pit — Distribution Pillar
GAS — Valve — Identification Plate
DRAINAGE – Common — 150 dia — Pit — Junction
– Main — 525 dia

BENCH MARK — SURVEY CONTROL MARK — PM SSM

REDUCTION RATIO 1 : 100 @ A1

0 1 2 3 4 5 6 7 8 9 10

LAND TITLE INFORMATION

LOT: 6, 7, 8, 9, 10, 14, 15, 24, 25, 26 & 27
PLAN NO : D.P. 36641
OTHER:
AREA: TOTAL 6582.4m²

DATE OF SURVEY: 16 / 06 / 2016
SURVEY CONSULTANT:

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REGISTERED SURVEYOR
PAUL GARRETT

REF. 34441A01.DWG

NSW GOVERNMENT
Family & Community Services
Land & Housing Corporation

DRAWING TITLE
DETAIL & LEVEL SURVEY
-

LOCATION
WARWICK FARM

STREET ADDRESS
3-13 MANNIX PARADE,
2-6 HINKLER AVENUE &
2-4 MCGIRR PARADE

SITE LAYOUT JOB
/ /

TYPE
S

SHT. 6
OF 6

Appendix C – Borehole Logs

BOREHOLE: BH1M

eiaustralia
Practical Solutions for Built Environments

Project	Additional Site Investigation			Sheet	1 OF 1
Location	11-13 Mannix Parade, Warwick Farm NSW			Date Started	30/3/21
Position	Refer to Figure 2			Date Completed	30/3/21
Job No.	E25074.E03	Contractor	HartGeo Pty Ltd	Logged AS	Date:30/3/21
Client	Taylor Construction Group Pty Ltd	Drill Rig	Ute-Mounted Drill Rig	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS
AD/T	-	30/03/21	0	0.30				-	FILL: Silty CLAY; medium plasticity, dark brown, with trace organic roots, no odour.	M	-	
				0.80				CI	Silty CLAY; medium plasticity, dark orange, no odour.	M	-	
			1	1.60	BH1M_1.00-1.10 ES			CH	CLAY; high plasticity, grey-orange mottled red, no odour.	M	-	
			2	2.60	BH1M_2.00-2.10 ES			SM	Silty SAND; fine to coarse grained sand, light orange-grey, no odour.	D	-	
			3	3.40	BH1M_3.00-3.10 ES				From 2.6 m, with fine to medium ironstone gravels, no odour.			
			4	4.50	BH1M_4.00-4.10 ES			CI	Silty Sandy CLAY; medium plasticity, red-brown, with white-grey silt and sand, no odour.	D		
			5						From 4.5 m, red-orange, with orange silt and sand, no odour.	D - M	-	
			6	6.20					Borehole Terminated at 6.20 mBGL; Target Depth Reached.			
			7									
			8									
			9									
			10									

PIEZOMETER DETAILS
ID Static Water Level
BH1M

BH1M

Backfill
Bentonite
uPVC 50 mm Casing
Sand
uPVC 50 mm Screen

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

EIA LIB 1.03.GLB Log IS AU BOREHOLE 3 E25074.E03 BOREHOLE LOGS.GPJ <<DrawingFile>> 07/04/2021 14:26 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: EIA 1.03 2014-07-05 Prj: EIA 1.03 2014-07-05

BOREHOLE: BH3M

eiaustralia
Practical Solutions for Built Environments

Project	Additional Site Investigation			Sheet	1 OF 1
Location	11-13 Mannix Parade, Warwick Farm NSW			Date Started	30/3/21
Position	Refer to Figure 2			Date Completed	30/3/21
Job No.	E25074.E03	Contractor	-	Logged AS	Date:30/3/21
Client	Taylor Construction Group Pty Ltd	Drill Rig	2t Excavator	Checked	Date:
		Inclination	-90°		

Drilling					Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID / Static Water Level	
AD/T	-	30/03/21	0	0.30				-	FILL: Silty CLAY; medium plasticity, dark brown, with trace organic roots, no odour.	M	-	BH3M	Backfill
				0.70				CI	Silty CLAY; medium plasticity, dark orange, no odour.	M	-		
			1		BH3M_1.00-1.10 ES			S	Gravelly SAND; fine to coarse grained sand, orange, fine to medium gravels, sandstone, no odour.	D	-		
				1.60				SM	Silty SAND; fine to coarse grained sand, light grey, no odour.				Bentonite
			2		BH3M_2.00-2.10 ES								
				2.60					From 2.6 m, with ironstone banding, no odour.	D	-		uPVC 50 mm Casing
			3		BH3M_3.00-3.10 ES								
				3.80				S	Gravelly SAND; fine to coarse grained sand, dark brown-grey, fine to medium gravels, no odour.				Sand
			4		BH3M_4.00-4.10 ES					D	-		uPVC 50 mm Screen
				5.00				CI	Silty Sandy CLAY; medium plasticity, red-orange, with orange silt and sand, no odour.				
			5							D - M	-		
			6	6.10					Borehole Terminated at 6.10 mBGL; Target Depth Reached.				
			7										
			8										
			9										
			10										

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

EIA LIB 1.03.GLB Log IS AU BOREHOLE 3 E25074.E03 BOREHOLE LOGS.GPJ <<DrawingFile>> 07/04/2021 14:26 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: EIA 1.03 2014-07-05 Prj: EIA 1.03 2014-07-05

Appendix D – Laboratory Analytical Results

heet 1 of 2

ite: 1-13 Mannix Pde, Warick Farm

Project No: E25074

aboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	WATER	SOIL	OTHER	HM A /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM A /TRH/BTEX/PAHs	HM A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Sulphates	Chlorides		TCLP HM A/ / PAH
TP1_0.2-0.3	1	~~2×ZLB~~ ZLB	30/03/2021	am		X								X									
_0.6-0.7		ZLB				X																	
TP2_0.2-0.3	2	2×ZLB				X	X					16→X		X									
_0.5-0.6		ZLB				X																	
TP3_0.1-0.2	3	↓				↓								X									
_0.4-0.5																							
TP4_0.1-0.2	4													X									
_0.4-0.5																							
TP5_0.1-0.2	5													X									
_0.4-0.5		↓				↓																	
TP6_0.2-0.3	6	2×ZLB				X	X					17→X		X									
_0.4-0.5		ZLB	↓	↓		X																	

Sample Matrix: WATER, SOIL, OTHER

Analysis: HM A /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos; HM A /TRH/BTEX/PAHs; HM A /TRH/BTEX; BTEX; VOCs; Asbestos; Asbestos Quantification; pH / CEC (cation exchange); pH / EC (electrical conductivity); Dewatering Suite; sPOCAS; PFAS; Sulphates; Chlorides; TCLP HM A/ / PAH

Comments

HM A
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH

SGS EHS Sydney COC
SE218221

LABORATORY TURNAROUND
- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
= solvent washed, acid rinsed, Tefton sealed glass jar
= solvent washed, acid rinsed glass bottle
= natural HDPE plastic bottle
'C = glass vial, Tefton Septum
LB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: Andrew Schmidt	Print: Suba
Signature:	Signature:
Date: 30/03/2021	Date: 30/03/21 @ 2:55

Sampler's Comments:
Please cc: Linda.Xiao
~~Alejandra.beltran~~@eiaustralia.com.au and Andrew.Ibrahim@eiaustralia.com.au
Note: please test the additional ZIB with fragments for TP2 & TP6 for asbestos identification

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

source:SE_Admin.pdf page:1 SDG Ref: SE218221_COC

Sheet 2 of 2

Site: 1-13 Mannix Pde, Warick Farm

Project No: E25074

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHER	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Sulphates	Textural Classification	Soluble Cations & Soluble anions including chloride, carbonate, Sulphate	TCLP HM A/ / PAH
BH7-0.2-0.3	7	ZLB	30/03/2021	am		X								X									
-0.5-0.6		↓	↓	↓																			
BH1M-1.0-1.1	8	J													X	X					X	X	
-2.0-2.1	9														X	X					X	X	
-3.0-3.1	10														X	X					X	X	
-4.0-4.1	11			↓											X	X					X	X	
BH3M-1.0-1.1	12			pm											X	X					X	X	
-2.0-2.1	13														X	X					X	X	
-3.0-3.1	14														X	X					X	X	
-4.0-4.1	15	↓	↓	↓		↓									X	X					X	X	

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH

LABORATORY TURNAROUND
- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
- = solvent washed, acid rinsed, Tefton sealed glass jar
- = solvent washed, acid rinsed glass bottle
- = natural HDPE plastic bottle
- C = glass vial, Tefton Septum
- LB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: Andrew Schmidt	Print: Suba
Signature: A.Schmidt	Signature: S. Suba
Date: 30/03/2021	Date: 30/03/21 @ 2:55

Sampler's Comments:
Please cc: Linda.Xiao
~~Alejandra.beltran@eiaustralia.com~~.au and
Andrew.Ibrahim@eiaustralia.com.au

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

SAMPLE RECEIPT ADVICE

SE218221

CLIENT DETAILS

Contact	Andrew Schmidt
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	andrew.schmidt@eiaustralia.com.au
Project	**E25074 1-13 Mannix Pde, Warick Farm**
Order Number	**E25074**
Samples	17

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Tue 30/3/2021
Report Due	Thu 8/4/2021
SGS Reference	**SE218221**

SUBMISSION DETAILS

This is to confirm that 17 samples were received on Tuesday 30/3/2021. Results are expected to be ready by COB Thursday 8/4/2021. Please quote SGS reference SE218221 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	15 Soil, 2 Material
Date documentation received	30/3/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	12.7°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

7 samples have been placed on hold as no tests have been assigned for them by the client. These samples will not be processed.

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SAMPLE RECEIPT ADVICE

SE218221

CLIENT DETAILS

Client EI AUSTRALIA

Project E25074 1-13 Mannix Pde, Warick Farm

SUMMARY OF ANALYSIS

No.	Sample ID	Alkalinity in Soil	Conductivity and TDS by Calculation - Soil	Exchangeable Cations and Cation Exchange Capacity	Moisture Content	pH in soil (1:5)	Soil Texture (AS4419)	Soluble Anions (1:5) in Soil by Ion Chromatography	Total Recoverable Elements in Soil/Waste
008	BH1M_1.0-1.1	4	1	13	1	1	1	2	4
009	BH1M_2.0-2.1	4	1	13	1	1	1	2	4
010	BH1M_3.0-3.1	4	1	13	1	1	1	2	4
011	BH1M_4.0-4.1	4	1	13	1	1	1	2	4
012	BH3M_1.0-1.1	4	1	13	1	1	1	2	4
013	BH3M_2.0-2.1	4	1	13	1	1	1	2	4
014	BH3M_3.0-3.1	4	1	13	1	1	1	2	4
015	BH3M_4.0-4.1	4	1	13	1	1	1	2	4

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE218221

CLIENT DETAILS

Client EI AUSTRALIA

Project E25074 1-13 Mannix Pde, Warick Farm

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre ID in bulk materials	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil
001	TP1_0.2-0.3	-	2	9
002	TP2_0.2-0.3	-	2	9
003	TP3_0.1-0.2	-	2	9
004	TP4_0.1-0.2	-	2	9
005	TP5_0.1-0.2	-	2	9
006	TP6_0.2-0.3	-	2	9
007	TP7_0.2-0.3	-	2	9
016	TP2_0.2-0.3 FCP	1	-	-
017	TP6_0.2-0.3 FCP	1	-	-

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Testing as per this table shall commence immediately unless the client intervenes with a correction .

Sheet 1 of 1

Site: 11-13 Marnix Pde, Ulrich Farm

Project No: E25074

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHER	HM A /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM A /TRH/BTEX/PAHs	HM A /TRH/BTEX	BTEX	VOCs & Phenols	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	Sulphates	Chlorides	Soluble anions (including chloride & sulfate)	TCLP HM A / PAH
GW_BH1M-1	1	S, 2×P, 2×VC	1/4/21	pm	X				X			X				X						X	
GW_BH2M-1	2	↓	↓	↓	↓				↓			↓				↓						↓	
GW_BH3M-1	3	↓	↓	am	↓				↓			↓				↓						↓	
GW_QD1	4	S, P, 2×VC	↓	pm	↓					X													
GW_QR1	5	↓	↓	↓	↓					X													
GW_QRB1	~~6~~ 6	↓	↓	↓	↓																		
GW_QTB1	6	VC	Lab Prepared	↓	↓						X												
GW_QTS1	7	↓	↓	↓	↓						X												
GW_QT1	~~8~~ 8	S, P, 2×VC	1/4/21	pm	X																		

SGS EHS Sydney COC
SE218294

Comments

HM A
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH

LABORATORY TURNAROUND

- ☐ Standard
- ☐ 24 Hours
- ☐ 48 Hours
- ☑ 72 Hours
- ☐ Other_____

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass botlle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC March 2018 FORM v.4 - SGS

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Sampler's Name (EI):	Received by (SGS):
Print: Andrew Schmidt	Print: MICHAEL BASSETT
Signature: A. Schmidt	Signature:
Date: 1/4/21	Date: 1.4.21 4:30

Report with EI Waste Classification Table ☐

Sampler's Comments:
Please cc: Linda.Xiao and Andrew.Ibrahim
- Put GW_QRB1 on hold
- Please forward GW_QT1 to Enviolab (COC attached)

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

source:SE_Addressen.pdf page:1 SDG Ref:SE218294_COC

SAMPLE RECEIPT ADVICE

SE218294

CLIENT DETAILS

Contact	Andrew Schmidt
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	andrew.schmidt@eiaustralia.com.au
Project	**E25074 11-13 Manrix Pde, Warick Farm**
Order Number	**E25074**
Samples	7

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 1/4/2021
Report Due	Thu 8/4/2021
SGS Reference	**SE218294**

SUBMISSION DETAILS

This is to confirm that 7 samples were received on Thursday 1/4/2021. Results are expected to be ready by COB Thursday 8/4/2021. Please quote SGS reference SE218294 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	7 Water
Date documentation received	1/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	15.0°C	Sufficient sample for analysis	Yes
Turnaround time requested	Three Days		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

1 sample has been placed on hold as no tests have been assigned for it. This sample will not be processed.

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SAMPLE RECEIPT ADVICE

SE218294

CLIENT DETAILS

Client EI AUSTRALIA

Project E25074 11-13 Manrix Pde, Warick Farm

SUMMARY OF ANALYSIS

No.	Sample ID	Anions by Ion Chromatography in Water	Conductivity and TDS by Calculation - Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	pH in water	Total Phenolics in Water	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	GW_BH1M-1	2	1	22	1	1	9	78	7
002	GW_BH2M-1	2	1	22	1	1	9	78	7
003	GW_BH3M-1	2	1	22	1	1	9	78	7
004	GW_QD1	-	-	-	-	-	9	11	7
005	GW_QR1	-	-	-	-	-	9	11	7
006	GW_QTB1	-	-	-	-	-	-	11	-
007	GW_QTS1	-	-	-	-	-	-	11	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE218294

CLIENT DETAILS

Client EI AUSTRALIA

Project E25074 11-13 Manrix Pde, Warick Farm

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Trace Metals (Dissolved) in Water by ICPMS
001	GW_BH1M-1	1	7
002	GW_BH2M-1	1	7
003	GW_BH3M-1	1	7
004	GW_QD1	1	7
005	GW_QR1	1	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Andrew Schmidt
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	andrew.schmidt@eiaustralia.com.au
Project	**E25074 1-13 Mannix Pde, Warick Farm**
Order Number	**E25074**
Samples	17

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE218221 R0**
Date Received	30/3/2021
Date Reported	8/4/2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Sample #4: Asbestos found in approx 5x3x2mm cement sheet fragment in >2mm portion.
Sample #6: Asbestos found in approx 6x4x2mm cement sheet fragments in >2mm portion.

Asbestos analysed by Approved Identifiers Ravee Sivasubramaniam and Yusuf Kuthpudin .

SIGNATORIES

Dong LIANG
Metals/Inorganics Team Leader

Huong CRAWFORD
Production Manager

Kamrul AHSAN
Senior Chemist

Ravee SIVASUBRAMANIAM
Hygiene Team Leader

Shane MCDERMOTT
Inorganic/Metals Chemist

Soluble Anions (1:5) in Soil by Ion Chromatography [AN245] Tested: 1/4/2021

PARAMETER	UOM	LOR	BH1M_1.0-1.1 SOIL - 30/3/2021 SE218221.008	BH1M_2.0-2.1 SOIL - 30/3/2021 SE218221.009	BH1M_3.0-3.1 SOIL - 30/3/2021 SE218221.010	BH1M_4.0-4.1 SOIL - 30/3/2021 SE218221.011	BH3M_1.0-1.1 SOIL - 30/3/2021 SE218221.012
Chloride	mg/kg	0.25	49	150	330	840	8.7
Sulfate	mg/kg	5	220	140	70	150	91

PARAMETER	UOM	LOR	BH3M_2.0-2.1 SOIL - 30/3/2021 SE218221.013	BH3M_3.0-3.1 SOIL - 30/3/2021 SE218221.014	BH3M_4.0-4.1 SOIL - 30/3/2021 SE218221.015
Chloride	mg/kg	0.25	25	54	210
Sulfate	mg/kg	5	56	61	110

pH in soil (1:5) [AN101] Tested: 1/4/2021

PARAMETER	UOM	LOR	BH1M_1.0-1.1 SOIL - 30/3/2021 SE218221.008	BH1M_2.0-2.1 SOIL - 30/3/2021 SE218221.009	BH1M_3.0-3.1 SOIL - 30/3/2021 SE218221.010	BH1M_4.0-4.1 SOIL - 30/3/2021 SE218221.011	BH3M_1.0-1.1 SOIL - 30/3/2021 SE218221.012
pH	pH Units	0.1	4.7	5.4	5.3	5.2	5.3

PARAMETER	UOM	LOR	BH3M_2.0-2.1 SOIL - 30/3/2021 SE218221.013	BH3M_3.0-3.1 SOIL - 30/3/2021 SE218221.014	BH3M_4.0-4.1 SOIL - 30/3/2021 SE218221.015
pH	pH Units	0.1	5.5	5.5	5.2

Conductivity and TDS by Calculation - Soil [AN106] Tested: 1/4/2021

PARAMETER	UOM	LOR	BH1M_1.0-1.1 SOIL - 30/3/2021 SE218221.008	BH1M_2.0-2.1 SOIL - 30/3/2021 SE218221.009	BH1M_3.0-3.1 SOIL - 30/3/2021 SE218221.010	BH1M_4.0-4.1 SOIL - 30/3/2021 SE218221.011	BH3M_1.0-1.1 SOIL - 30/3/2021 SE218221.012
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	170	200	290	630	60

PARAMETER	UOM	LOR	BH3M_2.0-2.1 SOIL - 30/3/2021 SE218221.013	BH3M_3.0-3.1 SOIL - 30/3/2021 SE218221.014	BH3M_4.0-4.1 SOIL - 30/3/2021 SE218221.015
Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	57	88	220

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122] Tested: 6/4/2021

PARAMETER	UOM	LOR	BH1M_1.0-1.1 SOIL - 30/3/2021 SE218221.008	BH1M_2.0-2.1 SOIL - 30/3/2021 SE218221.009	BH1M_3.0-3.1 SOIL - 30/3/2021 SE218221.010	BH1M_4.0-4.1 SOIL - 30/3/2021 SE218221.011	BH3M_1.0-1.1 SOIL - 30/3/2021 SE218221.012
Exchangeable Sodium, Na	mg/kg	2	690	990	1200	1100	230
Exchangeable Sodium, Na	meq/100g	0.01	3.0	4.3	5.2	4.9	1.0
Exchangeable Sodium Percentage*	%	0.1	23.3	35.9	37.0	46.1	25.0
Exchangeable Potassium, K	mg/kg	2	120	190	220	170	150
Exchangeable Potassium, K	meq/100g	0.01	0.30	0.48	0.55	0.43	0.39
Exchangeable Potassium Percentage*	%	0.1	2.3	4.0	3.9	4.0	9.9
Exchangeable Calcium, Ca	mg/kg	2	190	87	160	17	49
Exchangeable Calcium, Ca	meq/100g	0.01	0.95	0.43	0.82	0.08	0.24
Exchangeable Calcium Percentage*	%	0.1	7.3	3.6	5.8	0.8	6.1
Exchangeable Magnesium, Mg	mg/kg	2	1100	830	920	640	290
Exchangeable Magnesium, Mg	meq/100g	0.02	8.7	6.8	7.5	5.2	2.4
Exchangeable Magnesium Percentage*	%	0.1	67.1	56.5	53.3	49.1	59.1
Cation Exchange Capacity	meq/100g	0.02	13	12	14	11	4.0

PARAMETER	UOM	LOR	BH3M_2.0-2.1 SOIL - 30/3/2021 SE218221.013	BH3M_3.0-3.1 SOIL - 30/3/2021 SE218221.014	BH3M_4.0-4.1 SOIL - 30/3/2021 SE218221.015
Exchangeable Sodium, Na	mg/kg	2	770	790	780
Exchangeable Sodium, Na	meq/100g	0.01	3.3	3.5	3.4
Exchangeable Sodium Percentage*	%	0.1	37.4	39.2	43.4
Exchangeable Potassium, K	mg/kg	2	190	200	180
Exchangeable Potassium, K	meq/100g	0.01	0.48	0.51	0.47
Exchangeable Potassium Percentage*	%	0.1	5.4	5.7	6.0
Exchangeable Calcium, Ca	mg/kg	2	18	6	21
Exchangeable Calcium, Ca	meq/100g	0.01	0.09	0.03	0.11
Exchangeable Calcium Percentage*	%	0.1	1.0	0.3	1.4
Exchangeable Magnesium, Mg	mg/kg	2	610	590	470
Exchangeable Magnesium, Mg	meq/100g	0.02	5.0	4.8	3.8
Exchangeable Magnesium Percentage*	%	0.1	56.2	54.8	49.3
Cation Exchange Capacity	meq/100g	0.02	8.9	8.8	7.8

Alkalinity in Soil [AN002/AN135] Tested: 1/4/2021

PARAMETER	UOM	LOR	BH1M_1.0-1.1 SOIL - 30/3/2021 SE218221.008	BH1M_2.0-2.1 SOIL - 30/3/2021 SE218221.009	BH1M_3.0-3.1 SOIL - 30/3/2021 SE218221.010	BH1M_4.0-4.1 SOIL - 30/3/2021 SE218221.011	BH3M_1.0-1.1 SOIL - 30/3/2021 SE218221.012
Bicarbonate Alkalinity as HCO3 in Soil*	mg/kg	25	130	260	86	83	67
Carbonate Alkalinity as CO3 in Soil*	mg/kg	25	<25	<25	<25	<25	<25
Hydroxide Alkalinity as OH in Soil*	mg/kg	25	<25	<25	<25	<25	<25
Total Alkalinity as CaCO3 in Soil*	mg/kg	25	100	210	70	68	55

PARAMETER	UOM	LOR	BH3M_2.0-2.1 SOIL - 30/3/2021 SE218221.013	BH3M_3.0-3.1 SOIL - 30/3/2021 SE218221.014	BH3M_4.0-4.1 SOIL - 30/3/2021 SE218221.015
Bicarbonate Alkalinity as HCO3 in Soil*	mg/kg	25	76	210	72
Carbonate Alkalinity as CO3 in Soil*	mg/kg	25	<25	<25	<25
Hydroxide Alkalinity as OH in Soil*	mg/kg	25	<25	<25	<25
Total Alkalinity as CaCO3 in Soil*	mg/kg	25	62	170	59

Soil Texture (AS4419) [AN051] Tested: 1/4/2021

PARAMETER	UOM	LOR	BH1M_1.0-1.1 SOIL - 30/3/2021 SE218221.008	BH1M_2.0-2.1 SOIL - 30/3/2021 SE218221.009	BH1M_3.0-3.1 SOIL - 30/3/2021 SE218221.010	BH1M_4.0-4.1 SOIL - 30/3/2021 SE218221.011	BH3M_1.0-1.1 SOIL - 30/3/2021 SE218221.012
Texture Classification*	No unit	1	Medium Clay	Sandy Clay	Sandy Clay	Sandy Clay	Clay Loam

PARAMETER	UOM	LOR	BH3M_2.0-2.1 SOIL - 30/3/2021 SE218221.013	BH3M_3.0-3.1 SOIL - 30/3/2021 SE218221.014	BH3M_4.0-4.1 SOIL - 30/3/2021 SE218221.015
Texture Classification*	No unit	1	Clay Loam	Clay Loam	Clay Loam

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 31/3/2021

PARAMETER	UOM	LOR	BH1M_1.0-1.1 SOIL - 30/3/2021 SE218221.008	BH1M_2.0-2.1 SOIL - 30/3/2021 SE218221.009	BH1M_3.0-3.1 SOIL - 30/3/2021 SE218221.010	BH1M_4.0-4.1 SOIL - 30/3/2021 SE218221.011	BH3M_1.0-1.1 SOIL - 30/3/2021 SE218221.012
Calcium, Ca	mg/kg	5	190	270	9	16	55
Magnesium, Mg	mg/kg	10	1100	900	1100	730	420
Potassium, K	mg/kg	10	120	240	320	290	430
Sodium, Na	mg/kg	10	700	1000	1500	1200	300

PARAMETER	UOM	LOR	BH3M_2.0-2.1 SOIL - 30/3/2021 SE218221.013	BH3M_3.0-3.1 SOIL - 30/3/2021 SE218221.014	BH3M_4.0-4.1 SOIL - 30/3/2021 SE218221.015
Calcium, Ca	mg/kg	5	8	8	30
Magnesium, Mg	mg/kg	10	690	580	580
Potassium, K	mg/kg	10	330	380	530
Sodium, Na	mg/kg	10	790	770	860

Moisture Content [AN002] Tested: 31/3/2021

PARAMETER	UOM	LOR	BH1M_1.0-1.1 SOIL - 30/3/2021 SE218221.008	BH1M_2.0-2.1 SOIL - 30/3/2021 SE218221.009	BH1M_3.0-3.1 SOIL - 30/3/2021 SE218221.010	BH1M_4.0-4.1 SOIL - 30/3/2021 SE218221.011	BH3M_1.0-1.1 SOIL - 30/3/2021 SE218221.012
% Moisture	%w/w	1	19.4	12.3	12.7	12.0	6.6

PARAMETER	UOM	LOR	BH3M_2.0-2.1 SOIL - 30/3/2021 SE218221.013	BH3M_3.0-3.1 SOIL - 30/3/2021 SE218221.014	BH3M_4.0-4.1 SOIL - 30/3/2021 SE218221.015
% Moisture	%w/w	1	12.7	12.2	11.6

Fibre Identification in soil [AN602] Tested: 7/4/2021

PARAMETER	UOM	LOR	TP1_0.2-0.3 SOIL - 30/3/2021 SE218221.001	TP2_0.2-0.3 SOIL - 30/3/2021 SE218221.002	TP3_0.1-0.2 SOIL - 30/3/2021 SE218221.003	TP4_0.1-0.2 SOIL - 30/3/2021 SE218221.004	TP5_0.1-0.2 SOIL - 30/3/2021 SE218221.005
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	TP6_0.2-0.3 SOIL - 30/3/2021 SE218221.006	TP7_0.2-0.3 SOIL - 30/3/2021 SE218221.007
Asbestos Detected	No unit	-	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 7/4/2021

PARAMETER	UOM	LOR	TP1_0.2-0.3 SOIL - 30/3/2021 SE218221.001	TP2_0.2-0.3 SOIL - 30/3/2021 SE218221.002	TP3_0.1-0.2 SOIL - 30/3/2021 SE218221.003	TP4_0.1-0.2 SOIL - 30/3/2021 SE218221.004	TP5_0.1-0.2 SOIL - 30/3/2021 SE218221.005
Total Sample Weight*	g	1	**852**	**954**	**805**	**677**	**879**
Bonded ACM in >7mm Sample*	g	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AF/FA in >2mm to <7mm Sample*	g	0.00001	<0.00001	<0.00001	<0.00001	**0.0488**	<0.00001
AF/FA in <2mm Sample*	g	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	**0.007**	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	**0.007**	<0.001
Fibre Type*	No unit	-	NAD	NAD	NAD	Chrysotile, Amosite	NAD

PARAMETER	UOM	LOR	TP6_0.2-0.3 SOIL - 30/3/2021 SE218221.006	TP7_0.2-0.3 SOIL - 30/3/2021 SE218221.007
Total Sample Weight*	g	1	**774**	**831**
Bonded ACM in >7mm Sample*	g	0.001	<0.001	<0.001
AF/FA in >2mm to <7mm Sample*	g	0.00001	**0.0324**	<0.00001
AF/FA in <2mm Sample*	g	0.00001	<0.00001	<0.00001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	**0.004**	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	**0.004**	<0.001
Fibre Type*	No unit	-	Chrysotile	NAD

Fibre ID in bulk materials [AN602] Tested: 7/4/2021

PARAMETER	UOM	LOR	TP2_0.2-0.3 FCP MATERIAL - 30/3/2021 SE218221.016	TP6_0.2-0.3 FCP MATERIAL - 30/3/2021 SE218221.017
Asbestos Detected	No unit	-	Yes	Yes

METHOD	METHODOLOGY SUMMARY
AN002/AN135	Alkalinity (and forms of) by Titration: The sample is extracted 1to 5 in deionised water and the extract titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide . Reference APHA 2320. Internal Reference AN135
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN051	A small sample of soil is kneaded with water and then pressed out into a ribbon. The behaviour of this ribbon is used to classify the soil into one of the texture classes in AS 4419.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract of as received sample with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Salinity can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. Reference APHA 2510 B.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pre-treated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is referenced to Rayment and Lyons, 2011, sections 15D3 and 15N1.-
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

AN605	This technique gravimetrically determines the mass of Bonded Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight. Any fibrous asbestos (FA) found in this fraction will be added to the 2-7mm fraction and its mass recorded there.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free/respirable fibres which are only observed by standard trace analysis as per AN602.
AN605	Bonded asbestos containing material (Bonded ACM) comprises asbestos-containing-material which is sound in condition. Fibrous asbestos (FA) comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. Asbestos fines (AF) includes free fibres, small fibre bundles and also small fragments of bonded ACM that passes through a 7mm sieve - which implies that the bonded ACM fragments have a substantial degree of damage which increases the potential for fibre release.
AN-605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009 and NEPM 1999 (2013) schedule B1 section 4..

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE218221 R0

CLIENT DETAILS

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Facsimile	(Not specified)
Email	andrew.schmidt@eiaustralia.com.au
Project	**E25074 1-13 Mannix Pde, Warick Farm**
Order Number	**E25074**
Samples	17

LABORATORY DETAILS

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Email	au.environmental.sydney@sgs.com
SGS Reference	**SE218221 R0**
Date Received	30 Mar 2021
Date Reported	08 Apr 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Analysis Date	Moisture Content	8 items
Duplicate	Alkalinity in Soil	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	15 Soil, 2 Material
Date documentation received	30/3/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	12.7°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE218221 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Alkalinity in Soil

Method: ME-(AU)-[ENV]AN002/AN135

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.0-1.1	SE218221.008	LB221879	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	15 Apr 2021	06 Apr 2021
BH1M_2.0-2.1	SE218221.009	LB221879	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	15 Apr 2021	06 Apr 2021
BH1M_3.0-3.1	SE218221.010	LB221879	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	15 Apr 2021	06 Apr 2021
BH1M_4.0-4.1	SE218221.011	LB221879	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	15 Apr 2021	06 Apr 2021
BH3M_1.0-1.1	SE218221.012	LB221879	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	15 Apr 2021	06 Apr 2021
BH3M_2.0-2.1	SE218221.013	LB221879	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	15 Apr 2021	06 Apr 2021
BH3M_3.0-3.1	SE218221.014	LB221879	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	15 Apr 2021	06 Apr 2021
BH3M_4.0-4.1	SE218221.015	LB221879	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	15 Apr 2021	06 Apr 2021

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.0-1.1	SE218221.008	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	06 Apr 2021	06 Apr 2021
BH1M_2.0-2.1	SE218221.009	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	06 Apr 2021	06 Apr 2021
BH1M_3.0-3.1	SE218221.010	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	06 Apr 2021	06 Apr 2021
BH1M_4.0-4.1	SE218221.011	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	06 Apr 2021	06 Apr 2021
BH3M_1.0-1.1	SE218221.012	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	06 Apr 2021	06 Apr 2021
BH3M_2.0-2.1	SE218221.013	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	06 Apr 2021	06 Apr 2021
BH3M_3.0-3.1	SE218221.014	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	06 Apr 2021	06 Apr 2021
BH3M_4.0-4.1	SE218221.015	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	06 Apr 2021	06 Apr 2021

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.0-1.1	SE218221.008	LB221928	30 Mar 2021	30 Mar 2021	27 Apr 2021	06 Apr 2021	27 Apr 2021	07 Apr 2021
BH1M_2.0-2.1	SE218221.009	LB221928	30 Mar 2021	30 Mar 2021	27 Apr 2021	06 Apr 2021	27 Apr 2021	07 Apr 2021
BH1M_3.0-3.1	SE218221.010	LB221928	30 Mar 2021	30 Mar 2021	27 Apr 2021	06 Apr 2021	27 Apr 2021	07 Apr 2021
BH1M_4.0-4.1	SE218221.011	LB221928	30 Mar 2021	30 Mar 2021	27 Apr 2021	06 Apr 2021	27 Apr 2021	07 Apr 2021
BH3M_1.0-1.1	SE218221.012	LB221928	30 Mar 2021	30 Mar 2021	27 Apr 2021	06 Apr 2021	27 Apr 2021	07 Apr 2021
BH3M_2.0-2.1	SE218221.013	LB221928	30 Mar 2021	30 Mar 2021	27 Apr 2021	06 Apr 2021	27 Apr 2021	07 Apr 2021
BH3M_3.0-3.1	SE218221.014	LB221928	30 Mar 2021	30 Mar 2021	27 Apr 2021	06 Apr 2021	27 Apr 2021	07 Apr 2021
BH3M_4.0-4.1	SE218221.015	LB221928	30 Mar 2021	30 Mar 2021	27 Apr 2021	06 Apr 2021	27 Apr 2021	07 Apr 2021

Fibre ID in bulk materials

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP2_0.2-0.3 FCP	SE218221.016	LB222056	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021
TP6_0.2-0.3 FCP	SE218221.017	LB222056	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1_0.2-0.3	SE218221.001	LB222057	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021
TP2_0.2-0.3	SE218221.002	LB222057	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021
TP3_0.1-0.2	SE218221.003	LB222057	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021
TP4_0.1-0.2	SE218221.004	LB222057	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021
TP5_0.1-0.2	SE218221.005	LB222057	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021
TP6_0.2-0.3	SE218221.006	LB222057	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021
TP7_0.2-0.3	SE218221.007	LB222057	30 Mar 2021	30 Mar 2021	30 Mar 2022	07 Apr 2021	30 Mar 2022	08 Apr 2021

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1_0.2-0.3	SE218221.001	LB222057	30 Mar 2021	30 Mar 2021	26 Sep 2021	07 Apr 2021	26 Sep 2021	08 Apr 2021
TP2_0.2-0.3	SE218221.002	LB222057	30 Mar 2021	30 Mar 2021	26 Sep 2021	07 Apr 2021	26 Sep 2021	08 Apr 2021
TP3_0.1-0.2	SE218221.003	LB222057	30 Mar 2021	30 Mar 2021	26 Sep 2021	07 Apr 2021	26 Sep 2021	08 Apr 2021
TP4_0.1-0.2	SE218221.004	LB222057	30 Mar 2021	30 Mar 2021	26 Sep 2021	07 Apr 2021	26 Sep 2021	08 Apr 2021
TP5_0.1-0.2	SE218221.005	LB222057	30 Mar 2021	30 Mar 2021	26 Sep 2021	07 Apr 2021	26 Sep 2021	08 Apr 2021
TP6_0.2-0.3	SE218221.006	LB222057	30 Mar 2021	30 Mar 2021	26 Sep 2021	07 Apr 2021	26 Sep 2021	08 Apr 2021
TP7_0.2-0.3	SE218221.007	LB222057	30 Mar 2021	30 Mar 2021	26 Sep 2021	07 Apr 2021	26 Sep 2021	08 Apr 2021

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.0-1.1	SE218221.008	LB221844	30 Mar 2021	30 Mar 2021	13 Apr 2021	31 Mar 2021	05 Apr 2021	06 Apr 2021†
BH1M_2.0-2.1	SE218221.009	LB221844	30 Mar 2021	30 Mar 2021	13 Apr 2021	31 Mar 2021	05 Apr 2021	06 Apr 2021†
BH1M_3.0-3.1	SE218221.010	LB221844	30 Mar 2021	30 Mar 2021	13 Apr 2021	31 Mar 2021	05 Apr 2021	06 Apr 2021†
BH1M_4.0-4.1	SE218221.011	LB221844	30 Mar 2021	30 Mar 2021	13 Apr 2021	31 Mar 2021	05 Apr 2021	06 Apr 2021†
BH3M_1.0-1.1	SE218221.012	LB221844	30 Mar 2021	30 Mar 2021	13 Apr 2021	31 Mar 2021	05 Apr 2021	06 Apr 2021†

HOLDING TIME SUMMARY

SE218221 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Moisture Content (continued)

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M_2.0-2.1	SE218221.013	LB221844	30 Mar 2021	30 Mar 2021	13 Apr 2021	31 Mar 2021	05 Apr 2021	06 Apr 2021†
BH3M_3.0-3.1	SE218221.014	LB221844	30 Mar 2021	30 Mar 2021	13 Apr 2021	31 Mar 2021	05 Apr 2021	06 Apr 2021†
BH3M_4.0-4.1	SE218221.015	LB221844	30 Mar 2021	30 Mar 2021	13 Apr 2021	31 Mar 2021	05 Apr 2021	06 Apr 2021†

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.0-1.1	SE218221.008	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
BH1M_2.0-2.1	SE218221.009	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
BH1M_3.0-3.1	SE218221.010	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
BH1M_4.0-4.1	SE218221.011	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
BH3M_1.0-1.1	SE218221.012	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
BH3M_2.0-2.1	SE218221.013	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
BH3M_3.0-3.1	SE218221.014	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
BH3M_4.0-4.1	SE218221.015	LB221872	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021

Soil Texture (AS4419)

Method: ME-(AU)-[ENV]AN051

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.0-1.1	SE218221.008	LB221864	30 Mar 2021	30 Mar 2021	26 Sep 2021	01 Apr 2021	26 Sep 2021	01 Apr 2021
BH1M_2.0-2.1	SE218221.009	LB221864	30 Mar 2021	30 Mar 2021	26 Sep 2021	01 Apr 2021	26 Sep 2021	01 Apr 2021
BH1M_3.0-3.1	SE218221.010	LB221864	30 Mar 2021	30 Mar 2021	26 Sep 2021	01 Apr 2021	26 Sep 2021	01 Apr 2021
BH1M_4.0-4.1	SE218221.011	LB221864	30 Mar 2021	30 Mar 2021	26 Sep 2021	01 Apr 2021	26 Sep 2021	01 Apr 2021
BH3M_1.0-1.1	SE218221.012	LB221864	30 Mar 2021	30 Mar 2021	26 Sep 2021	01 Apr 2021	26 Sep 2021	01 Apr 2021
BH3M_2.0-2.1	SE218221.013	LB221864	30 Mar 2021	30 Mar 2021	26 Sep 2021	01 Apr 2021	26 Sep 2021	01 Apr 2021
BH3M_3.0-3.1	SE218221.014	LB221864	30 Mar 2021	30 Mar 2021	26 Sep 2021	01 Apr 2021	26 Sep 2021	01 Apr 2021
BH3M_4.0-4.1	SE218221.015	LB221864	30 Mar 2021	30 Mar 2021	26 Sep 2021	01 Apr 2021	26 Sep 2021	01 Apr 2021

Soluble Anions (1:5) in Soil by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.0-1.1	SE218221.008	LB221873	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021
BH1M_2.0-2.1	SE218221.009	LB221873	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021
BH1M_3.0-3.1	SE218221.010	LB221873	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021
BH1M_4.0-4.1	SE218221.011	LB221873	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021
BH3M_1.0-1.1	SE218221.012	LB221873	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021
BH3M_2.0-2.1	SE218221.013	LB221873	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021
BH3M_3.0-3.1	SE218221.014	LB221873	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021
BH3M_4.0-4.1	SE218221.015	LB221873	30 Mar 2021	30 Mar 2021	06 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.0-1.1	SE218221.008	LB221822	30 Mar 2021	30 Mar 2021	26 Sep 2021	31 Mar 2021	26 Sep 2021	06 Apr 2021
BH1M_2.0-2.1	SE218221.009	LB221822	30 Mar 2021	30 Mar 2021	26 Sep 2021	31 Mar 2021	26 Sep 2021	06 Apr 2021
BH1M_3.0-3.1	SE218221.010	LB221822	30 Mar 2021	30 Mar 2021	26 Sep 2021	31 Mar 2021	26 Sep 2021	06 Apr 2021
BH1M_4.0-4.1	SE218221.011	LB221822	30 Mar 2021	30 Mar 2021	26 Sep 2021	31 Mar 2021	26 Sep 2021	06 Apr 2021
BH3M_1.0-1.1	SE218221.012	LB221822	30 Mar 2021	30 Mar 2021	26 Sep 2021	31 Mar 2021	26 Sep 2021	06 Apr 2021
BH3M_2.0-2.1	SE218221.013	LB221822	30 Mar 2021	30 Mar 2021	26 Sep 2021	31 Mar 2021	26 Sep 2021	06 Apr 2021
BH3M_3.0-3.1	SE218221.014	LB221822	30 Mar 2021	30 Mar 2021	26 Sep 2021	31 Mar 2021	26 Sep 2021	06 Apr 2021
BH3M_4.0-4.1	SE218221.015	LB221822	30 Mar 2021	30 Mar 2021	26 Sep 2021	31 Mar 2021	26 Sep 2021	06 Apr 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Alkalinity in Soil

Method: ME-(AU)-[ENV]AN002/AN135

Sample Number	Parameter	Units	LOR	Result
LB221879.001	Total Alkalinity as CaCO3 in Soil*	mg/kg	25	<25

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB221872.001	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	0.17

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result
LB221928.001	Exchangeable Sodium, Na	mg/kg	2	0
	Exchangeable Potassium, K	mg/kg	2	0
	Exchangeable Calcium, Ca	mg/kg	2	0
	Exchangeable Magnesium, Mg	mg/kg	2	0

Soluble Anions (1:5) in Soil by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB221873.001	Chloride	mg/kg	0.25	<0.25
	Sulfate	mg/kg	5	<5.0

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB221822.001	Calcium, Ca	mg/kg	5	<5
	Potassium, K	mg/kg	10	<10
	Magnesium, Mg	mg/kg	10	<10
	Sodium, Na	mg/kg	10	<10

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may give a different calculated RPD.

Alkalinity in Soil

Method: ME-(AU)-[ENV]AN002/AN135

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218221.015	LB221879.012	Total Alkalinity as CaCO3 in Soil*	mg/kg	25	59	130	41	78 ②

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218217.002	LB221844.011	% Moisture	%w/w	1	7.8	7.8	43	0
SE218217.012	LB221844.022	% Moisture	%w/w	1	7.5	6.7	44	10
SE218218.006	LB221844.032	% Moisture	%w/w	1	6.9	6.4	45	7

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218221.012	LB221872.014	pH	pH Units	0.1	5.3	5.3	32	1

Soluble Anions (1:5) in Soil by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218221.012	LB221873.013	Chloride	mg/kg	0.25	8.7	8.9	33	3
		Sulfate	mg/kg	5	91	84	36	7

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218221.015	LB221822.024	Calcium, Ca	mg/kg	5	30	35	45	17
		Potassium, K	mg/kg	10	530	540	32	2
		Magnesium, Mg	mg/kg	10	580	590	32	0
		Sodium, Na	mg/kg	10	860	850	31	1

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Alkalinity in Soil

Method: ME-(AU)-[ENV]AN002/AN135

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221879.002	Total Alkalinity as CaCO3 in Soil*	mg/kg	25	320	297.5	80 - 120	107

Conductivity and TDS by Calculation - Soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221872.002	Conductivity of Extract (1:5 dry sample basis)	µS/cm	1	NA	303	85 - 115	100

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221928.002	Exchangeable Sodium, Na	meq/100g	0.01	0.21	0.194	80 - 120	108
	Exchangeable Potassium, K	meq/100g	0.01	0.62	0.63	80 - 120	98
	Exchangeable Calcium, Ca	meq/100g	0.01	6.5	6.3	80 - 120	103
	Exchangeable Magnesium, Mg	meq/100g	0.02	1.1	1.11	80 - 120	98

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221872.003	pH	pH Units	0.1	7.4	7.415	98 - 102	99

Soluble Anions (1:5) in Soil by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221873.002	Chloride	mg/kg	0.25	96	100	70 - 130	96
	Sulfate	mg/kg	5	96	100	70 - 130	96

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221822.002	Calcium, Ca	mg/kg	5	9800	10367	80 - 120	94
	Potassium, K	mg/kg	10	1400	1348	80 - 120	106
	Magnesium, Mg	mg/kg	10	10000	10422	80 - 120	97
	Sodium, Na	mg/kg	10	890	756	80 - 120	118

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

QC Sample	Sample Number	Parameter	Units	LOR

MATRIX SPIKE DUPLICATES

SE218221 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

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ANALYTICAL REPORT

Accreditation No. 2562

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Order Number	**E25074**
Samples	7

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SGS Reference	**SE218294 R0**
Date Received	1/4/2021
Date Reported	8/4/2021

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

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Metals/Inorganics Team Leader

Ly Kim HA
Organic Section Head

VOCs in Water [AN433] Tested: 7/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003	GW_QD1 WATER - 1/4/2021 SE218294.004	GW_QR1 WATER - 1/4/2021 SE218294.005
Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1	<1	<1	<1
o-xylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX	µg/L	3	<3	<3	<3	<3	<3
Naphthalene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	<5	-	-
Chloromethane	µg/L	5	<5	<5	<5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	<0.3	-	-
Bromomethane	µg/L	10	<10	<10	<10	-	-
Chloroethane	µg/L	5	<5	<5	<5	-	-
Trichlorofluoromethane	µg/L	1	<1	<1	<1	-	-
Acetone (2-propanone)	µg/L	10	<10	<10	<10	-	-
Iodomethane	µg/L	5	<5	<5	<5	-	-
1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Acrylonitrile	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	<5	-	-
Allyl chloride	µg/L	2	<2	<2	<2	-	-
Carbon disulfide	µg/L	2	<2	<2	<2	-	-
trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	<2	<2	-	-
1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Vinyl acetate	µg/L	10	<10	<10	<10	-	-
MEK (2-butanone)	µg/L	10	<10	<10	<10	-	-
cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromochloromethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Chloroform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dibromomethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-nitropropane	µg/L	100	<100	<100	<100	-	-
Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	<5	-	-
cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-hexanone (MBK)	µg/L	5	<5	<5	<5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromoform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	-	-
Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	-	-

VOCs in Water [AN433] Tested: 7/4/2021 (continued)

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003	GW_QD1 WATER - 1/4/2021 SE218294.004	GW_QR1 WATER - 1/4/2021 SE218294.005
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
n-propylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
4-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
tert-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
sec-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	<0.3	-	-
p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	**1.8**	-	-
1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
n-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Total VOC	µg/L	10	<10	<10	<10	-	-

VOCs in Water [AN433] Tested: 7/4/2021 (continued)

PARAMETER	UOM	LOR	GW_QTB1 WATER - 1/4/2021 SE218294.006	GW_QTS1 WATER - 1/4/2021 SE218294.007
Benzene	µg/L	0.5	<0.5	[101%]
Toluene	µg/L	0.5	<0.5	[102%]
Ethylbenzene	µg/L	0.5	<0.5	[101%]
m/p-xylene	µg/L	1	<1	[100%]
o-xylene	µg/L	0.5	<0.5	[101%]
Total Xylenes	µg/L	1.5	<1.5	-
Total BTEX	µg/L	3	<3	-
Naphthalene	µg/L	0.5	<0.5	-
Dichlorodifluoromethane (CFC-12)	µg/L	5	-	-
Chloromethane	µg/L	5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	-	-
Bromomethane	µg/L	10	-	-
Chloroethane	µg/L	5	-	-
Trichlorofluoromethane	µg/L	1	-	-
Acetone (2-propanone)	µg/L	10	-	-
Iodomethane	µg/L	5	-	-
1,1-dichloroethene	µg/L	0.5	-	-
Acrylonitrile	µg/L	0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	-	-
Allyl chloride	µg/L	2	-	-
Carbon disulfide	µg/L	2	-	-
trans-1,2-dichloroethene	µg/L	0.5	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	-	-
1,1-dichloroethane	µg/L	0.5	-	-
Vinyl acetate	µg/L	10	-	-
MEK (2-butanone)	µg/L	10	-	-
cis-1,2-dichloroethene	µg/L	0.5	-	-
Bromochloromethane	µg/L	0.5	-	-
Chloroform (THM)	µg/L	0.5	-	-
2,2-dichloropropane	µg/L	0.5	-	-
1,2-dichloroethane	µg/L	0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	-	-
1,1-dichloropropene	µg/L	0.5	-	-
Carbon tetrachloride	µg/L	0.5	-	-
Dibromomethane	µg/L	0.5	-	-
1,2-dichloropropane	µg/L	0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	-	-
2-nitropropane	µg/L	100	-	-
Bromodichloromethane (THM)	µg/L	0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	-	-
cis-1,3-dichloropropene	µg/L	0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	-	-
1,3-dichloropropane	µg/L	0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	-	-
2-hexanone (MBK)	µg/L	5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	-	-
Chlorobenzene	µg/L	0.5	-	-
Bromoform (THM)	µg/L	0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	-	-
Styrene (Vinyl benzene)	µg/L	0.5	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	-	-

VOCs in Water [AN433] Tested: 7/4/2021 (continued)

PARAMETER	UOM	LOR	GW_QTB1 WATER - 1/4/2021 SE218294.006	GW_QTS1 WATER - 1/4/2021 SE218294.007
Isopropylbenzene (Cumene)	µg/L	0.5	-	-
Bromobenzene	µg/L	0.5	-	-
n-propylbenzene	µg/L	0.5	-	-
2-chlorotoluene	µg/L	0.5	-	-
4-chlorotoluene	µg/L	0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	-	-
tert-butylbenzene	µg/L	0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	-	-
sec-butylbenzene	µg/L	0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	-	-
p-isopropyltoluene	µg/L	0.5	-	-
1,2-dichlorobenzene	µg/L	0.5	-	-
n-butylbenzene	µg/L	0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	-	-
Hexachlorobutadiene	µg/L	0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	-	-
Total VOC	µg/L	10	-	-

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 7/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003	GW_QD1 WATER - 1/4/2021 SE218294.004	GW_QR1 WATER - 1/4/2021 SE218294.005
TRH C6-C9	µg/L	40	<40	<40	<40	<40	<40
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10	µg/L	50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 6/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003	GW_QD1 WATER - 1/4/2021 SE218294.004	GW_QR1 WATER - 1/4/2021 SE218294.005
TRH C10-C14	µg/L	50	<50	<50	**770**	<50	<50
TRH C15-C28	µg/L	200	<200	<200	**400**	<200	<200
TRH C29-C36	µg/L	200	<200	<200	<200	<200	<200
TRH C37-C40	µg/L	200	<200	<200	<200	<200	<200
TRH >C10-C16	µg/L	60	<60	<60	**800**	<60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	**800**	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500	<500	<500
TRH C10-C40	µg/L	320	<320	<320	**1200**	<320	<320

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 6/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	<1

Total Phenolics in Water [AN289] Tested: 6/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003
Total Phenols	mg/L	0.01	**0.03**	<0.01	**0.01**

Anions by Ion Chromatography in Water [AN245] Tested: 6/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003
Chloride	mg/L	0.05	**13000**	**8000**	**6800**
Sulfate, SO4	mg/L	1	**820**	**540**	**850**

pH in water [AN101] Tested: 1/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003
pH**	No unit	-	**4.9**	**5.7**	**5.2**

Conductivity and TDS by Calculation - Water [AN106] Tested: 1/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003
Conductivity @ 25 C	µS/cm	2	**41000**	**20000**	**18000**

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 6/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003	GW_QD1 WATER - 1/4/2021 SE218294.004	GW_QR1 WATER - 1/4/2021 SE218294.005
Arsenic, As	µg/L	1	3	<1	7	<1	<1
Cadmium, Cd	µg/L	0.1	0.5	0.5	0.6	0.5	<0.1
Chromium, Cr	µg/L	1	2	<1	1	<1	<1
Copper, Cu	µg/L	1	24	12	18	3	<1
Lead, Pb	µg/L	1	3	<1	1	<1	<1
Nickel, Ni	µg/L	1	170	81	360	78	<1
Zinc, Zn	µg/L	5	2700	4800	2100	4900	<5

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 6/4/2021

PARAMETER	UOM	LOR	GW_BH1M-1 WATER - 1/4/2021 SE218294.001	GW_BH2M-1 WATER - 1/4/2021 SE218294.002	GW_BH3M-1 WATER - 1/4/2021 SE218294.003	GW_QD1 WATER - 1/4/2021 SE218294.004	GW_QR1 WATER - 1/4/2021 SE218294.005
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN106	Salinity may be calculated in terms of NaCl from the sample conductivity. This assumes all soluble salts present , measured by the conductivity, are present as NaCl.
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN289	Analysis of Total Phenols in Soil Sediment and Water: Steam distillable phenols react with 4-aminoantipyrine at pH 7.9±0.1 in the presence of potassium ferricyanide to form a coloured antipyrine dye analysed by Discrete Analyser. Reference APHA 5530 B/D.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). Where F2 is corrected for Naphthalene, the VOC data for Naphthalene is used.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoveerable Hydrocarbons - Silica (TRH-Silica) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		
***	Indicates that both * and ** apply.				

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE218294 R0

CLIENT DETAILS

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Project	**E25074 11-13 Manrix Pde, Warick Farm**
Order Number	**E25074**
Samples	7

LABORATORY DETAILS

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SGS Reference	**SE218294 R0**
Date Received	01 Apr 2021
Date Reported	08 Apr 2021

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	7 Water
Date documentation received	1/4/2021	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	15.0°C	Sufficient sample for analysis	Yes
Turnaround time requested	Three Days		

HOLDING TIME SUMMARY

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SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB221923	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021
GW_BH2M-1	SE218294.002	LB221923	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021
GW_BH3M-1	SE218294.003	LB221923	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB221904	01 Apr 2021	01 Apr 2021	29 Apr 2021	01 Apr 2021	29 Apr 2021	01 Apr 2021
GW_BH2M-1	SE218294.002	LB221904	01 Apr 2021	01 Apr 2021	29 Apr 2021	01 Apr 2021	29 Apr 2021	01 Apr 2021
GW_BH3M-1	SE218294.003	LB221904	01 Apr 2021	01 Apr 2021	29 Apr 2021	01 Apr 2021	29 Apr 2021	01 Apr 2021

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB221924	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021
GW_BH2M-1	SE218294.002	LB221924	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021
GW_BH3M-1	SE218294.003	LB221924	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021
GW_QD1	SE218294.004	LB221924	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021
GW_QR1	SE218294.005	LB221924	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021
GW_BH2M-1	SE218294.002	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021
GW_BH3M-1	SE218294.003	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021
GW_QD1	SE218294.004	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021
GW_QR1	SE218294.005	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB221904	01 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
GW_BH2M-1	SE218294.002	LB221904	01 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021
GW_BH3M-1	SE218294.003	LB221904	01 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021	02 Apr 2021	01 Apr 2021

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB221922	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021
GW_BH2M-1	SE218294.002	LB221922	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021
GW_BH3M-1	SE218294.003	LB221922	01 Apr 2021	01 Apr 2021	29 Apr 2021	06 Apr 2021	29 Apr 2021	06 Apr 2021

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB221959	01 Apr 2021	01 Apr 2021	28 Sep 2021	06 Apr 2021	28 Sep 2021	07 Apr 2021
GW_BH2M-1	SE218294.002	LB221959	01 Apr 2021	01 Apr 2021	28 Sep 2021	06 Apr 2021	28 Sep 2021	07 Apr 2021
GW_BH3M-1	SE218294.003	LB221959	01 Apr 2021	01 Apr 2021	28 Sep 2021	06 Apr 2021	28 Sep 2021	07 Apr 2021
GW_QD1	SE218294.004	LB221959	01 Apr 2021	01 Apr 2021	28 Sep 2021	06 Apr 2021	28 Sep 2021	07 Apr 2021
GW_QR1	SE218294.005	LB221959	01 Apr 2021	01 Apr 2021	28 Sep 2021	06 Apr 2021	28 Sep 2021	07 Apr 2021

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021
GW_BH2M-1	SE218294.002	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021
GW_BH3M-1	SE218294.003	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021
GW_QD1	SE218294.004	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021
GW_QR1	SE218294.005	LB221921	01 Apr 2021	01 Apr 2021	08 Apr 2021	06 Apr 2021	16 May 2021	08 Apr 2021

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_BH2M-1	SE218294.002	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_BH3M-1	SE218294.003	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_QD1	SE218294.004	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_QR1	SE218294.005	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_QTB1	SE218294.006	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_QTS1	SE218294.007	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021

HOLDING TIME SUMMARY

SE218294 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
GW_BH1M-1	SE218294.001	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_BH2M-1	SE218294.002	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_BH3M-1	SE218294.003	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_QD1	SE218294.004	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_QR1	SE218294.005	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_QTB1	SE218294.006	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021
GW_QTS1	SE218294.007	LB222070	01 Apr 2021	01 Apr 2021	08 Apr 2021	07 Apr 2021	17 May 2021	08 Apr 2021

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA/QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	GW_BH1M-1	SE218294.001	%	40 - 130%	50
	GW_BH2M-1	SE218294.002	%	40 - 130%	44
	GW_BH3M-1	SE218294.003	%	40 - 130%	51
d14-p-terphenyl (Surrogate)	GW_BH1M-1	SE218294.001	%	40 - 130%	92
	GW_BH2M-1	SE218294.002	%	40 - 130%	84
	GW_BH3M-1	SE218294.003	%	40 - 130%	89
d5-nitrobenzene (Surrogate)	GW_BH1M-1	SE218294.001	%	40 - 130%	40
	GW_BH2M-1	SE218294.002	%	40 - 130%	42
	GW_BH3M-1	SE218294.003	%	40 - 130%	42

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	GW_BH1M-1	SE218294.001	%	40 - 130%	103
	GW_BH2M-1	SE218294.002	%	40 - 130%	101
	GW_BH3M-1	SE218294.003	%	40 - 130%	102
	GW_QD1	SE218294.004	%	40 - 130%	101
	GW_QR1	SE218294.005	%	40 - 130%	100
	GW_QTB1	SE218294.006	%	40 - 130%	99
	GW_QTS1	SE218294.007	%	40 - 130%	101
d4-1,2-dichloroethane (Surrogate)	GW_BH1M-1	SE218294.001	%	40 - 130%	102
	GW_BH2M-1	SE218294.002	%	40 - 130%	103
	GW_BH3M-1	SE218294.003	%	40 - 130%	103
	GW_QD1	SE218294.004	%	40 - 130%	103
	GW_QR1	SE218294.005	%	40 - 130%	100
	GW_QTB1	SE218294.006	%	40 - 130%	99
	GW_QTS1	SE218294.007	%	40 - 130%	102
d8-toluene (Surrogate)	GW_BH1M-1	SE218294.001	%	40 - 130%	98
	GW_BH2M-1	SE218294.002	%	40 - 130%	97
	GW_BH3M-1	SE218294.003	%	40 - 130%	97
	GW_QD1	SE218294.004	%	40 - 130%	97
	GW_QR1	SE218294.005	%	40 - 130%	98
	GW_QTB1	SE218294.006	%	40 - 130%	97
	GW_QTS1	SE218294.007	%	40 - 130%	100

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	GW_BH1M-1	SE218294.001	%	40 - 130%	103
	GW_BH2M-1	SE218294.002	%	40 - 130%	101
	GW_BH3M-1	SE218294.003	%	40 - 130%	102
	GW_QD1	SE218294.004	%	40 - 130%	101
	GW_QR1	SE218294.005	%	40 - 130%	100
d4-1,2-dichloroethane (Surrogate)	GW_BH1M-1	SE218294.001	%	60 - 130%	102
	GW_BH2M-1	SE218294.002	%	60 - 130%	103
	GW_BH3M-1	SE218294.003	%	60 - 130%	103
	GW_QD1	SE218294.004	%	60 - 130%	103
	GW_QR1	SE218294.005	%	60 - 130%	100
d8-toluene (Surrogate)	GW_BH1M-1	SE218294.001	%	40 - 130%	98
	GW_BH2M-1	SE218294.002	%	40 - 130%	97
	GW_BH3M-1	SE218294.003	%	40 - 130%	97
	GW_QD1	SE218294.004	%	40 - 130%	97
	GW_QR1	SE218294.005	%	40 - 130%	98

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB221923.001	Chloride	mg/L	0.05	<0.05
	Sulfate, SO4	mg/L	1	<1.0

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB221904.001	Conductivity @ 25 C	µS/cm	2	<2

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB221924.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB221921.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	52
		2-fluorobiphenyl (Surrogate)	%	-	68
		d14-p-terphenyl (Surrogate)	%	-	86

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Number	Parameter	Units	LOR	Result
LB221922.001	Total Phenols	mg/L	0.01	<0.01

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB221959.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB221921.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB222070.001	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5
		1,2-dichloropropane	µg/L	0.5	<0.5
		cis-1,3-dichloropropene	µg/L	0.5	<0.5
		trans-1,3-dichloropropene	µg/L	0.5	<0.5
		1,2-dibromoethane (EDB)	µg/L	0.5	<0.5
	Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5
		Chloromethane	µg/L	5	<5
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3
		Bromomethane	µg/L	10	<10
		Chloroethane	µg/L	5	<5
		Trichlorofluoromethane	µg/L	1	<1
		Iodomethane	µg/L	5	<5
		1,1-dichloroethene	µg/L	0.5	<0.5
		Dichloromethane (Methylene chloride)	µg/L	5	<5
		Allyl chloride	µg/L	2	<2
		trans-1,2-dichloroethene	µg/L	0.5	<0.5
		1,1-dichloroethane	µg/L	0.5	<0.5
		cis-1,2-dichloroethene	µg/L	0.5	<0.5
		Bromochloromethane	µg/L	0.5	<0.5
		1,2-dichloroethane	µg/L	0.5	<0.5
		1,1,1-trichloroethane	µg/L	0.5	<0.5
		1,1-dichloropropene	µg/L	0.5	<0.5
		Carbon tetrachloride	µg/L	0.5	<0.5
		Dibromomethane	µg/L	0.5	<0.5
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5
		1,1,2-trichloroethane	µg/L	0.5	<0.5
		1,3-dichloropropane	µg/L	0.5	<0.5
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5
		cis-1,4-dichloro-2-butene	µg/L	1	<1
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5
		1,2,3-trichloropropane	µg/L	0.5	<0.5
		trans-1,4-dichloro-2-butene	µg/L	1	<1
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5
		Hexachlorobutadiene	µg/L	0.5	<0.5
	Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5
		Bromobenzene	µg/L	0.5	<0.5
		2-chlorotoluene	µg/L	0.5	<0.5
		4-chlorotoluene	µg/L	0.5	<0.5
		1,3-dichlorobenzene	µg/L	0.5	<0.5
		1,4-dichlorobenzene	µg/L	0.3	<0.3
		1,2-dichlorobenzene	µg/L	0.5	<0.5
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5
		1,2,3-trichlorobenzene	µg/L	0.5	<0.5
	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5
		n-propylbenzene	µg/L	0.5	<0.5
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5
		tert-butylbenzene	µg/L	0.5	<0.5
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5
		sec-butylbenzene	µg/L	0.5	<0.5
		p-isopropyltoluene	µg/L	0.5	<0.5
		n-butylbenzene	µg/L	0.5	<0.5
	Nitrogenous Compounds	Acrylonitrile	µg/L	0.5	<0.5
	Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10
		MtBE (Methyl-tert-butyl ether)	µg/L	2	<1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB222070.001	Oxygenated Compounds	Vinyl acetate	µg/L	10	<10
		MEK (2-butanone)	µg/L	10	<10
		MIBK (4-methyl-2-pentanone)	µg/L	5	<5
		2-hexanone (MBK)	µg/L	5	<5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Sulphonated	Carbon disulfide	µg/L	2	<2
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	97
		d8-toluene (Surrogate)	%	-	96
		Bromofluorobenzene (Surrogate)	%	-	95
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5
		Bromodichloromethane (THM)	µg/L	0.5	<0.5
		Dibromochloromethane (THM)	µg/L	0.5	<0.5
		Bromoform (THM)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB222070.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	97
		d8-toluene (Surrogate)	%	-	96
		Bromofluorobenzene (Surrogate)	%	-	95

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may give a different calculated RPD.

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218294.003	LB221904.009	Conductivity @ 25 C	µS/cm	2	18000	18000	15	1

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218294.005	LB221924.013	Mercury	µg/L	0.0001	<0.0001	<0.0001	83	5

pH in water

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218294.003	LB221904.009	pH**	pH Units	-	5.2	5.2	17	0

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218278.001	LB221922.008	Total Phenols	mg/L	0.01	<0.01	<0.01	200	0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218310.002	LB221959.014	Arsenic, As	µg/L	1	3	3	45	1
		Cadmium, Cd	µg/L	0.1	0.4	0.4	40	1
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	2	2	74	3
		Lead, Pb	µg/L	1	<1	<1	184	0
		Nickel, Ni	µg/L	1	33	34	18	2
		Zinc, Zn	µg/L	5	440	440	16	2
SE218310.006	LB221959.019	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218294.005	LB221921.022		TRH C10-C14	µg/L	50	<50	<50	200	0
			TRH C15-C28	µg/L	200	<200	<200	200	0
			TRH C29-C36	µg/L	200	<200	<200	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C40	µg/L	320	<320	<320	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	<60	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218316.023	LB222070.025	Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.4	9.9	30	4
			d8-toluene (Surrogate)	µg/L	-	9.8	9.6	30	3
			Bromofluorobenzene (Surrogate)	µg/L	-	9.7	10.2	30	5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may give a different calculated RPD.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218316.024	LB222070.026	Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.6	10.2	30	4
			d8-toluene (Surrogate)	µg/L	-	10.2	9.6	30	6
			Bromofluorobenzene (Surrogate)	µg/L	-	9.9	10.1	30	1

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE218316.023	LB222070.025		TRH C6-C10	µg/L	50	<50	<50	200	0
			TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.4	9.9	30	4
			d8-toluene (Surrogate)	µg/L	-	9.8	9.6	30	3
			Bromofluorobenzene (Surrogate)	µg/L	-	9.7	10.2	30	5
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0
SE218316.024	LB222070.026		TRH C6-C10	µg/L	50	<50	<50	200	0
			TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.6	10.2	30	4
			d8-toluene (Surrogate)	µg/L	-	10.2	9.6	30	6
			Bromofluorobenzene (Surrogate)	µg/L	-	9.9	10.1	30	1
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221923.002	Chloride	mg/L	0.05	19	20	80 - 120	97
	Sulfate, SO4	mg/L	1	19	20	80 - 120	96

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221904.002	Conductivity @ 25 C	µS/cm	2	300	303	90 - 110	100

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221921.002		Naphthalene	µg/L	0.1	26	40	60 - 140	64
		Acenaphthylene	µg/L	0.1	33	40	60 - 140	83
		Acenaphthene	µg/L	0.1	30	40	60 - 140	76
		Phenanthrene	µg/L	0.1	32	40	60 - 140	81
		Anthracene	µg/L	0.1	31	40	60 - 140	77
		Fluoranthene	µg/L	0.1	32	40	60 - 140	81
		Pyrene	µg/L	0.1	34	40	60 - 140	86
		Benzo(a)pyrene	µg/L	0.1	33	40	60 - 140	82
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.3	0.5	40 - 130	54
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.3	0.5	40 - 130	62
		d14-p-terphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	78

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221904.003	pH**	No unit	-	7.4	7.415	98 - 102	99

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221922.002	Total Phenols	mg/L	0.01	0.22	0.25	80 - 120	88

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221959.002	Arsenic, As	µg/L	1	19	20	80 - 120	97
	Cadmium, Cd	µg/L	0.1	22	20	80 - 120	111
	Chromium, Cr	µg/L	1	22	20	80 - 120	110
	Copper, Cu	µg/L	1	23	20	80 - 120	114
	Lead, Pb	µg/L	1	23	20	80 - 120	114
	Nickel, Ni	µg/L	1	21	20	80 - 120	105
	Zinc, Zn	µg/L	5	22	20	80 - 120	108

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB221921.002		TRH C10-C14	µg/L	50	1300	1200	60 - 140	106
		TRH C15-C28	µg/L	200	1500	1200	60 - 140	126
		TRH C29-C36	µg/L	200	1500	1200	60 - 140	122
	TRH F Bands	TRH >C10-C16	µg/L	60	1500	1200	60 - 140	121
		TRH >C16-C34 (F3)	µg/L	500	1500	1200	60 - 140	123
		TRH >C34-C40 (F4)	µg/L	500	710	600	60 - 140	119

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222070.002	Halogenated	1,1-dichloroethene	µg/L	0.5	46	45.45	60 - 140	101
	Aliphatics	1,2-dichloroethane	µg/L	0.5	52	45.45	60 - 140	114
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	50	45.45	60 - 140	110
	Halogenated	Chlorobenzene	µg/L	0.5	51	45.45	60 - 140	112
	Monocyclic	Benzene	µg/L	0.5	46	45.45	60 - 140	101
	Aromatic	Toluene	µg/L	0.5	48	45.45	60 - 140	106
		Ethylbenzene	µg/L	0.5	49	45.45	60 - 140	108

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222070.002	Monocyclic	m/p-xylene	µg/L	1	99	90.9	60 - 140	108
	Aromatic	o-xylene	µg/L	0.5	50	45.45	60 - 140	109
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.0	10	60 - 140	100
		d8-toluene (Surrogate)	µg/L	-	10.0	10	70 - 130	100
		Bromofluorobenzene (Surrogate)	µg/L	-	9.8	10	70 - 130	98
	Trihalomethan	Chloroform (THM)	µg/L	0.5	54	45.45	60 - 140	119

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB222070.002		TRH C6-C10	µg/L	50	930	946.63	60 - 140	98
		TRH C6-C9	µg/L	40	800	818.71	60 - 140	98
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.0	10	60 - 140	100
		d8-toluene (Surrogate)	µg/L	-	10.0	10	70 - 130	100
		Bromofluorobenzene (Surrogate)	µg/L	-	9.8	10	70 - 130	98
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	640	639.67	60 - 140	99

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218284.017	LB221924.004	Mercury	mg/L	0.0001	0.0021	0.098	0.008	102

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE218294.001	LB221922.004	Total Phenols	mg/L	0.01	0.24	0.03	0.25	86

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE218287.001	LB222070.023	Monocyclic	Benzene	µg/L	0.5	0	45.45	103
		Aromatic	Toluene	µg/L	0.5	0.07574729113	45.45	103
			Ethylbenzene	µg/L	0.5	0.00886582398	45.45	103
			m/p-xylene	µg/L	1	0.02166972893	90.9	103
			o-xylene	µg/L	0.5	0.00664357187	45.45	103
		Polycyclic	Naphthalene	µg/L	0.5	0.13139874194	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.1875045353	-	104
			d8-toluene (Surrogate)	µg/L	-	9.71775583984	-	101
			Bromofluorobenzene (Surrogate)	µg/L	-	9.92066741402	-	101

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE218287.001	LB222070.023		TRH C6-C10	µg/L	50	0	946.63	82
			TRH C6-C9	µg/L	40	0	818.71	86
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10.1875045353	-	104
			d8-toluene (Surrogate)	µg/L	-	9.71775583984	-	101
			Bromofluorobenzene (Surrogate)	µg/L	-	9.92066741402	-	101
		VPH F	Benzene (F0)	µg/L	0.5	0	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	0	639.67	78

MATRIX SPIKE DUPLICATES

SE218294 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

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