



Structural



Civil



Flood

Conceptual Stormwater Management Plan

Masterplan of Development

KING FISO 155 P/L & KOM INDUSTRIAL 5 P/L &
LINK BROSE NO.1 P/L

110 Links Avenue South, 155, 161 Fison Avenue West and 364 Curtin Avenue West

Eagle Farm

Job Reference Number – 9914

Date: 23 November 2021

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2021/1246

Date: 26-Oct-2022



Queensland
Government

Document Status

Rev No	Author	Reviewer	Approved for Issue			
			Name	Signature	Date	RPEQ #
0	J. Zhang	N. Green	E. Clements		14.10.21	8614
1	J. Zhang	N. Green	E. Clements		23/11/21	8614

Distribution

Rev No	Date	Issue	Issued To	Format
0	14.10.21	Draft	Mewing Planning Kingsmede Rothelowman RPS	PDF
1	23/11/21	For Approval	Mewing Planning Kingsmede Rothelowman RPS	PDF

TABLE OF CONTENTS

1	Introduction	5
1.1.	Purpose and Scope	5
1.2.	Report Limitations	6
2	Site Characteristics	7
2.1.	Location	7
2.2.	Topography	7
3	Development Layout	8
4	Flooding	9
5	Stormwater Management	10
5.1.	Objectives	10
5.2.	Existing Conditions	10
5.3.	Lawful Point of Discharge	10
5.4.	Stormwater Quantity Calculations	10
5.5.	Stormwater Detention Requirements	12
6	Operational Stormwater Quality Management	12
6.1.	Introduction	13
6.2.	Pollutants	13
6.3.	Water Quality Objectives	14
6.4.	Proposed Treatment Strategy	14
6.5.	Water Quality Modelling	19
6.6.	Water Quality Maintenance	23
7	Construction Phase Water Quality Management	24
7.1.	Pollutants	24
7.2.	Potential Impacts	24
7.3.	Erosion and Sediment Control Measures	24
7.4.	Performance Objectives and Indicators	25
7.5.	Monitoring and Maintenance	25
7.6.	Asset Handover	25
8	Conclusions and Recommendations	27
9	References	28

APPENDICES

APPENDIX A – ARCHITECTURAL PLANS

APPENDIX B – SURVEY PLAN

APPENDIX C – CIVIL WORKS DRAWINGS

APPENDIX D – BRISBANE CITY COUNCIL CODES

APPENDIX E – FLOODWISE PROPERTY REPORT

APPENDIX F – OCEAN PROTECT FILTERRA TYPICAL DESIGN

1 Introduction

1.1. Purpose and Scope

Inertia Engineering has been commissioned by KING FISO 155 P/L & KOM INDUSTRIAL 5 P/L & LINK BROSE NO.1 P/L to prepare a Conceptual Stormwater Management Plan (CSWMP) for Eagle Farm Precinct masterplan of development at 110 Links Avenue South, 155, 161 Fison Avenue West and 364 Curtin Avenue West, Eagle Farm (the subject site).

This report details the conceptual planning, layout, and design of the stormwater management infrastructure for both the construction and operational phases of the development. The requirements for stormwater quantity and quality management for the proposed development have also been addressed in this report.

This report has been prepared in accordance with the *Northshore Hamilton PDA Development Scheme, State Planning Policy* (SPP, 2017), *Queensland Urban Drainage Manual Fourth Edition 2016 - Provisional* (QUDM, 2016), Brisbane City Council's City Plan (BCC, 2014) and Economic Development Queensland Engineering standards PDA guideline no.13 (EDQ, 2017)

Throughout this report the developable area is referred to as the 'subject site'.

1.2. Report Limitations

This report has been prepared by Inertia Engineering Pty Ltd for KING FISO 155 P/L & KOM INDUSTRIAL 5 P/L & LINK BROSE NO.1 P/L and may only be used and relied on by KING FISO 155 P/L & KOM INDUSTRIAL 5 P/L & LINK BROSE NO.1 P/L for the purpose agreed between Inertia Engineering and KING FISO 155 P/L & KOM INDUSTRIAL 5 P/L & LINK BROSE NO.1 P/L as detailed within this report.

Inertia Engineering otherwise disclaims responsibility to any person other than KING FISO 155 P/L & KOM INDUSTRIAL 5 P/L & LINK BROSE NO.1 P/L arising in connection with this report. Inertia Engineering also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by Inertia Engineering in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. Inertia Engineering has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by Inertia Engineering described in this report. Inertia Engineering disclaims liability arising from any of the assumptions being incorrect.

Inertia Engineering has prepared this report on the basis of information provided by KING FISO 155 P/L & KOM INDUSTRIAL 5 P/L & LINK BROSE NO.1 P/L and others who provided information to Inertia Engineering (including Government authorities), which Inertia Engineering has not independently verified or checked beyond the agreed scope of work. Inertia Engineering does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2

The land contained within the site is described as follows:

Title Details:	Lot 94 on SP120026
Street Address:	110 Links Avenue South, 155, 161 Fison Avenue West and 364 Curtin Avenue West, Eagle Farm
Site Area:	49,000 m ²

Refer to Appendix B for Survey Plan / DBYD information.

2.1. Location

The subject site is located in Eagle Farm, approximately 7km north-east from Brisbane CBD. It occupies a total area of 49,000m² and lies within the Northshore Hamilton Urban Development Area under PDA Development Scheme. The site is bounded by Fison Avenue West to the north, Links Avenue South to the west, Curtin Avenue West to the south, an industrial lot to the south-west and industrial properties to the east.

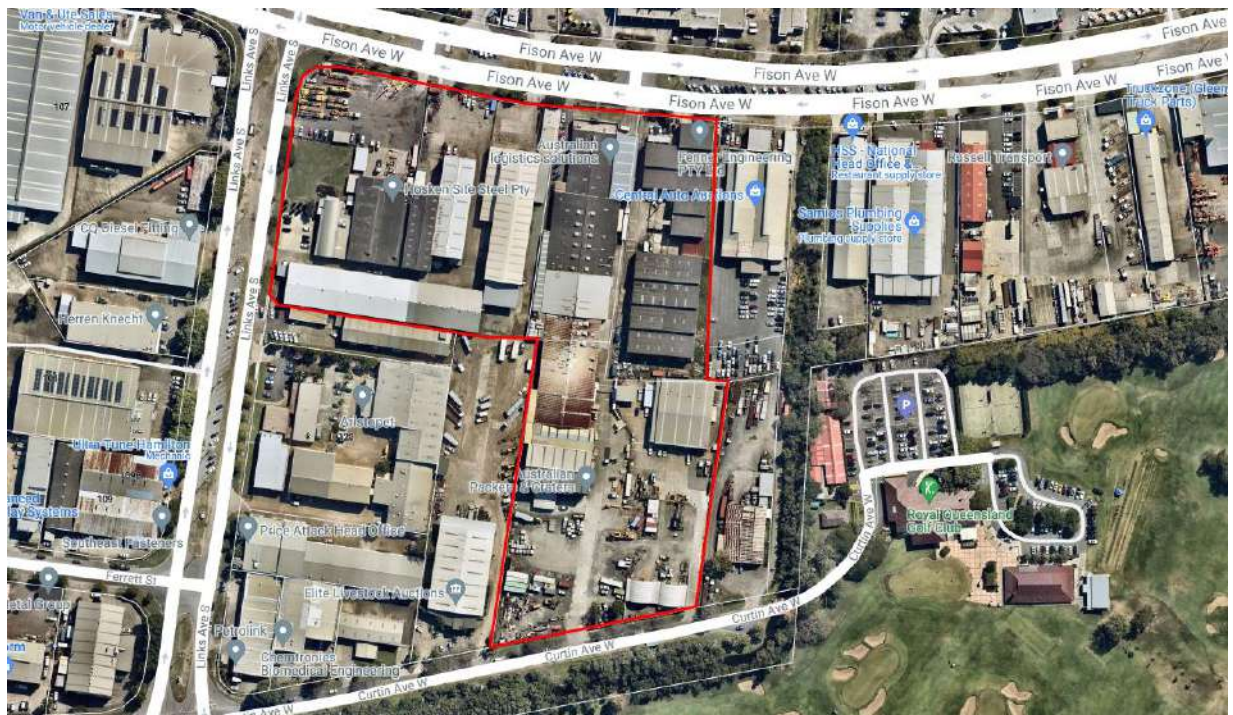


Figure 2-1 – Location Plan

2.2. Topography

The subject site is generally flat. It grades from high points in the eastern portion of approximately 3.5m AHD to low points of 2.7m AHD at north-east and south-east corners. The average grade across the site is less than 1%. For further details refer to Goodwin Midson's Survey (ref:14047-1) included in Appendix B.

3 Development Layout

Based on the information received from Rothelowman Architect, the development proposal consists of two stages:

- Stage 1 of the Eagle Farm masterplan of development consists of new commercial and industrial buildings with private driveway works access via Fison Avenue West and Curtin Avenue West.
- Stage 2 of the Eagle Farm masterplan consists of new industrial buildings and associated car parking facilities in the north-western portion of the site bound by Fison Avenue and Links Avenue South. Three additional site access are proposed from Fison Avenue and Links Avenue.

For further details refer to Rothlowman Eagle Farm Precinct, *Site Plan (Stage 1 and 2)* (ref: 221044) included as Appendix A.

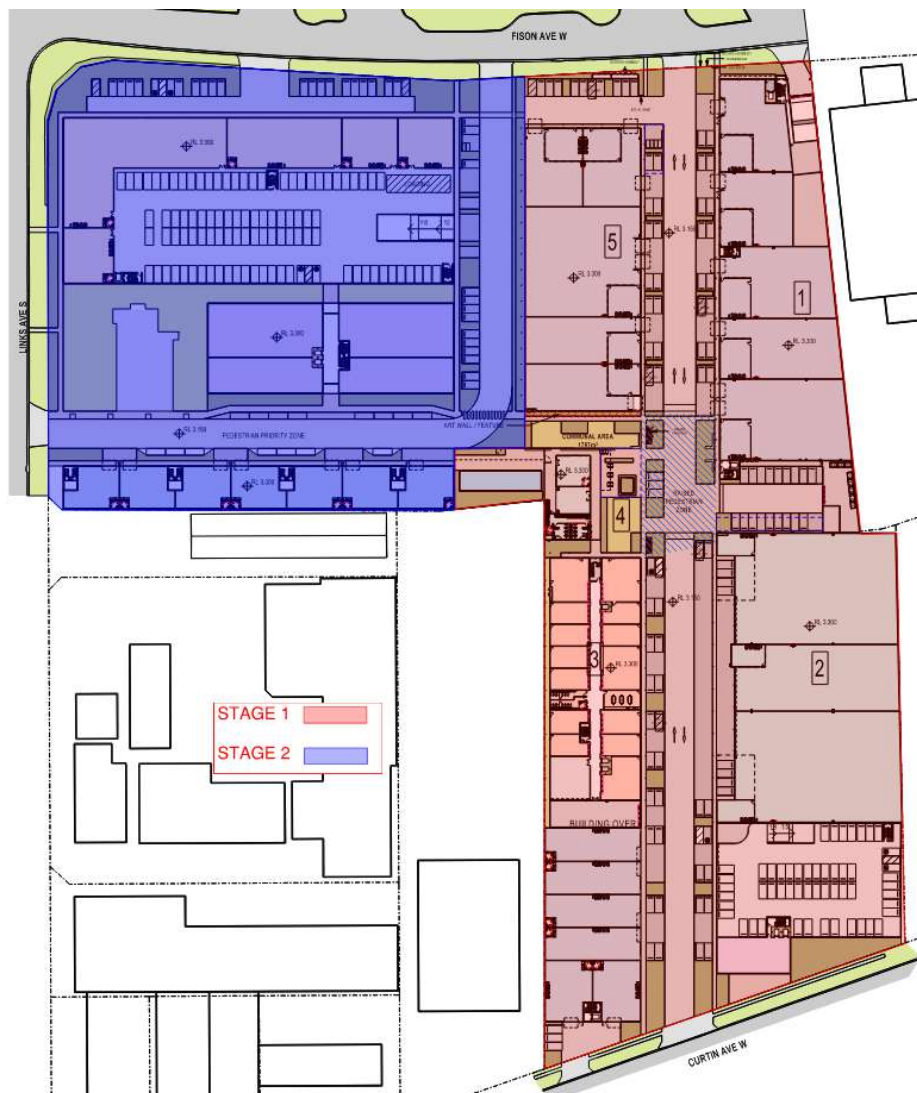


Figure 3-1 – Development Layout

4 Flooding

The site is triggered by BCC's Overlay Mapping as being susceptible to flooding from Brisbane River and Storm-Tide inundation refer to Figure 4-1 & 4-2. The governing flood source is the storm-tide inundation, which will set the design floor levels on site. According to EDQ's Protection from flood and storm inundation PDA guideline no.15 and BCC's City Plan Scheme, the minimum floor level of any new building is 3.1m AHD and minimum levels for access, car park and manoeuvring areas are 2.2m AHD.



Figure 4-1 – Brisbane River Flooding BCC Plan Mapping (2014)



Figure 4-2 – Coastal Hazard – Medium storm-tide BCC Plan Mapping (2014)

5 Stormwater Management

5.1. Objectives

The hydrologic objectives have been set in accordance with PDA Development Scheme, WSUD (2021), QUDM (2018) and BCC City Plan (2014), including but not limited to:

- The proposed development shall ensure that all stormwater drainage is directed to a lawful point of discharge in accordance with QUDM Section 3.4 (2018);
- No adverse impact on adjoining or downstream properties; and
- MUSIC modelling to determine a treatment strategy to achieve the SPP water quality objectives.

5.2. Existing Conditions

The existing site runoff is being collected by a series of field inlets and conveys to the existing stormwater infrastructure in Curtin and Links Avenue and Fison Avenue.

There are two existing stormwater manholes within Links Avenue. The northern manhole directs runoff into a 675mm dia PC pipe and the southern one directs runoff into a 750mm dia PC pipe, both pipes ultimately convey flow into the existing surface drain and further to Brisbane River.

There is also a gully pit within southern verge of Fison Ave that conveys runoff to a 675mm dia PC pipe and further drains to the existing surface drain. There is also a manhole within Curtin Ave West and discharge into the same surface drain through a 450mm PC pipe. The surface drain ultimately discharge to Brisbane River as well.

5.3. Lawful Point of Discharge

The nominated lawful points of discharge for the site are listed below:

- LPOD 1 - Southern portion of Stage1 : discharge to the drainage channel runs within the southern verge of Curtin Avenue West.
- LPOD 2-Northern portion of Stage 1: discharge to the existing stormwater system that runs within Fison Ave road reserves.
- LPOD 3- Northern portion of Stage 2: discharge to the existing stormwater system that runs within Fison Ave road reserves.
- LPOD 4 -Southern portion of Stage 2 : discharge to the drainage channel runs within the eastern verge of Links Ave.

Refer to Appendix C for the location of Lawful Points of Discharge.

5.4. Stormwater Quantity Calculations

The Rational Method was used to estimate the site flow for both the existing and developed site conditions.

5.4.1.Existing Conditions

The subject site consists of the following catchment:

- EX1 – 49,000m² (85% impervious)

The total fraction impervious for the existing catchment is 85%. Note that the existing catchment includes the site only and does not include any external areas

Table 5-1 – Existing Site Flows

Parameters	Units	Design Storm Event (yr ARI)						
		1	2	5	10	20	50	100
Catchment Area	ha	4.9						
Time of Concentration	min	7.0						
Runoff Coefficient (Cy)		0.68	0.72	0.81	0.85	0.89	0.98	1.00
Rainfall Intensity (Iy)	mm/hr	105.39	134.80	169.07	189.12	216.45	252.37	279.76
Peak Flow	L/s	975.4	1325.6	1858.2	2188.0	2629.4	3357.7	3807.9

5.4.2.Developed Conditions

Under developed conditions, four internal drainage networks are provided to convey stormwater runoff from the developed areas. The inertial drainage network will discharge runoff into the existing stormwater mains. Each discharge point is evaluated below:

- C1 (roof areas) – 22,060m² (100% impervious)
- C2 (green roof areas) – 2815m² (20% impervious)
- C3 (road areas) – 15,639m² (100% impervious)
- C4 (landscape areas) – 6,441m² (0% impervious)
- C5 (paved ground) – 2,045m² (100% impervious)

The total fraction impervious of the developed catchment is 82%. Note that the developed catchment includes the site only and does not include any external areas.

Table 5-2 – Developed Site Flows

Parameters	Units	Design Storm Event (yr ARI)						
		1	2	5	10	20	50	100
Catchment Area	ha	4.9						
Time of Concentration	min	7.0						
Runoff Coefficient (Cy)		0.68	0.72	0.81	0.85	0.89	0.98	1.00
Rainfall Intensity (Iy)	mm/hr	105.39	134.80	169.07	189.12	216.45	252.37	279.76
Peak Flow	L/s	975.4	1325.6	1858.2	2188.0	2629.4	3357.7	3807.9

5.5. Stormwater Detention Requirements

Stormwater detention is deemed to be unnecessary for the following reasons;

- The increased landscaping features (pervious area) on site, this has decreased the developments runoff rates across all storm events, so will not cause adverse impacts or nuisance to surrounding properties.
- The site discharges directly into the lower catchments of Brisbane River via open drains. Generally it is undesirable to have detention where it may allow peak flows from the site to coincide with the wider upstream catchment flood peaks.

6 Operational Stormwater Quality Management

6.1. Introduction

The operational phase of the management plan focuses on appropriate consideration of Stormwater Quality Improvement Devices, Section 3.9 of the PDA Development Scheme and Water Sensitive Urban Design (WSUD) principles to be incorporated into the total water cycle management of the developed site.

The State Planning Policy (2017) states for a proposed material change of use that involves a site area greater than 2500m² and will result in an impervious area greater than 25% a Site Based Stormwater Quality Management Plan is required.

6.2. Pollutants

Pollutants typically generated during the operational phase of the development are shown below (BCC, 2015).

Table 6-1 – Pollutants typically generated during the operational phase

Pollutant	Sources
Litter	Construction, construction, food waste materials
Sediment	Exposed soils and stockpiles
Oxygen demanding substances	Organic or chemical matter
Nutrients (N & P)	Nitrogen, phosphorus
Pathogens / Faecal coliforms	Sewerage
Hydrocarbons	Fuel and oil spills
Heavy metals (with fine sediment)	Sediment runoff
Surfactants	Detergents from car washing, cleansing agents
Organochlorines & organophosphates	Pesticides, herbicides
Thermal pollution	Heat (ie runoff from impervious areas)
pH altering substances	Washwaters

6.3. Water Quality Objectives

The State Planning Policy (2017) sets out the following water quality objectives for South East Queensland in order to protect downstream receiving waters:

- Total Suspended Solids (TSS) 80% reduction
- Total Phosphorus (TP) 60% reduction
- Total Nitrogen (TN) 45% reduction
- Gross Pollutant (>5mm) 90% reduction

The percent reductions listed above are the target reductions for comparing mitigated site annual pollutant loads with unmitigated site annual pollutant loads. The proposed treatment strategy selected for the development will ensure these objectives are met for all pollutants.

6.4. Proposed Treatment Strategy

The following treatment strategies were incorporated as part of the stormwater system to achieve the abovementioned water quality objective. Streetscape Biopods, permeable pavement and green roof are implemented in addition to the Filterra system used in MUSIC model to further improve the stormwater quality to achieve the superior outcome.

- Ecosol Bio Tree Pits to be fitted within the kerb of the internal roads to treat the runoff prior discharge to Filterra system
- Permeable pavement and green roof to be implemented where applicable
- A minimum of 57m² of Filterra (or approved equivalent) to treat the runoff prior discharge to Curtin Ave
- A minimum of 35m² of Filterra (or approved equivalent) to treat the runoff prior discharge to Fison Ave(North)
- A minimum of 33m² of Filterra (or approved equivalent) to treat the runoff prior discharge to Fison Ave (West)
- A minimum of 27m² of Filterra (or approved equivalent) to treat the runoff prior discharge to Links Ave

All stormwater quality treatment devices are to be installed offline with a diverted manhole to treat the Q3month runoff.

Please refer to Appendix C for the detailed design drawings.

6.4.1. Permeable Pavement

Unlike traditional pavements where water runoff is directed through falls in the pavement's impermeable surface towards a drainage outlet, a permeable pavement allows the movement of water through the surface into the substructure of the pavement. From here the water can be stored, harvested, re-used or discharged at a controlled rate.

The permeable membrane can be a range of different materials. The most common include interlocking permeable paving units, no fines concrete, and porous asphalt however other materials do exist. Whilst allowing infiltration of water through it, the surface still needs to remain durable and intact for the duration of the pavements intended design life.

There are many benefits in using a permeable pavement. It can dramatically reduce site run-off by storing water within the substructure of the pavement. By doing this it will attenuate flood peaks by acting as an intermediary between an intense storm event and the existing storm water infrastructure. Storing and holding water within this substructure and allowing it to slowly penetrate into the subgrade can assist an area in recharging groundwater and maintaining the natural water cycle.

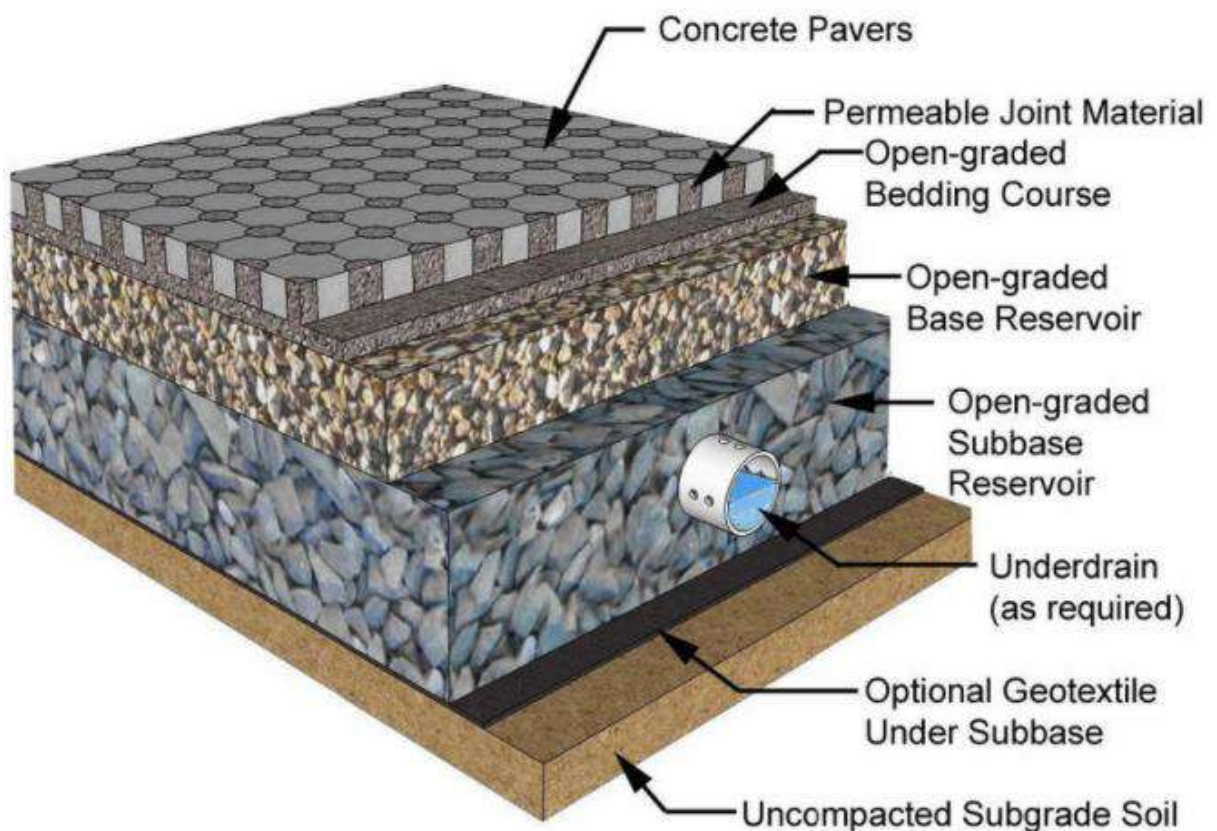


Figure 6-1 Profile of typical permeable pavement. (Source Smith, D., 2006.)

6.4.2. Off-Line Roadside Stormwater Treatment System

The Ecosol Bio Filter is a modern, modular fully self-contained, linear stormwater treatment system that provides effective primary, secondary and tertiary treatment of stormwater flows in one compact device.

The system has been designed to provide a robust and durable cost effective aesthetically attractive kerb-side treatment system. The system is filled with porous filter media and planted with vegetation to remove pollutants from stormwater runoff using natural and physical processes.



Figure 6-2 Typical Bio-pod landscape finishes (Source City of Melbourne & University of Melbourne)

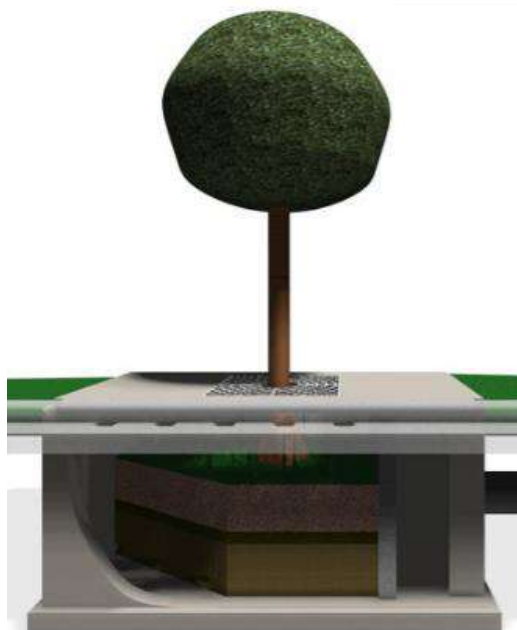


Figure 6-3 Off-Line Roadside Stormwater Treatment System (Source: Ecosol)

6.4.3. OceanProtect Filterra

Filterra is Ocean Protect's engineered high flow, high-performance biofiltration system. While it operates similarly to traditional bioretention, its high-flow media allows for a reduction in footprint (as low as 0.3% of catchment area). Filterra provides all the benefits of typical bioretention/filtration systems whilst being ideal for tight, highly developed sites, urban development projects, commercial parking lots, residential streets, and streetscapes.

Its small footprint reduces installation costs whilst still maintaining comparable life cycle costs compared with traditional bioretention. It can be configured in a variety of ways to integrate with other Water Sensitive Urban Design (WSUD) practices, whilst also enhancing site aesthetics.

During a storm, stormwater enters the Filterra system through a pipe, kerb inlet, or sheet flow and ponds over the pre-treatment mulch layer, capturing heavy sediment and debris. Organics and microorganisms within the mulch layer trap and degrade metals and hydrocarbons. The mulch also provides a water retention function for the system's vegetation.

Stormwater then flows through the engineered high flow media filtering fine pollutants and nutrients. Organic material in the media remove dissolved metals and act as a food source for root-zone microorganisms. Treated water exits through an underdrain pipe or infiltrates (if designed accordingly).

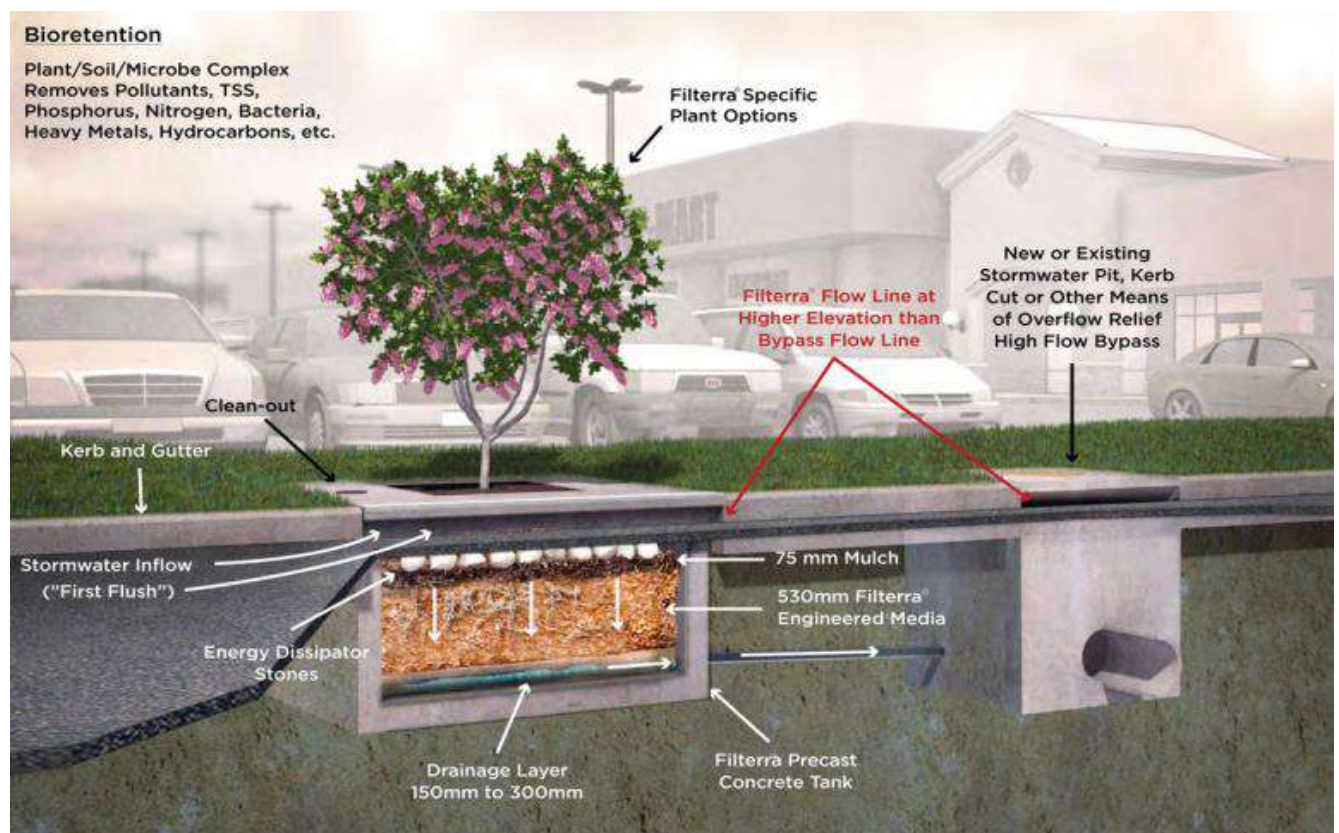


Figure 6-4 Typical Filterra System (Source: Ocean Protect)

6.4.4.Green Roof



A green roof is a roof that has media and vegetation planted above a roofing system. Living roofs have a wide variety of environmental and financial benefits. It has the potential to reduce energy demands in two ways: absorbing heat and acting as insulators for buildings. Adding a layer of soil and plants to a roof adds insulation to the building it covers. Since roofs are the site of the greatest heat loss in the winter and the hottest temperatures in the summer, the greater insulation offered by green roofs can decrease the amount of energy required to moderate the temperature of a building.

Furthermore, reducing the demand for energy consequently reduces air pollution. By lowering air conditioning demand, green roofs can decrease the production of associated air pollution and greenhouse gas emissions such as CO₂, coming from power plants. Additionally, because plants through photosynthesis convert atmospheric CO₂ into oxygen, the plants on green roofs can help filter harmful noxious gases in the air and reduce CO₂ emissions in the atmosphere.

Green Roofs have been implemented in the proposed development as a part of the stormwater quality improvement system. It has been modelled as “Roof” with 20% impervious. The area of Green Roof utilized in stage 1 is 284.2m² which contributes 0.6% of total site area.

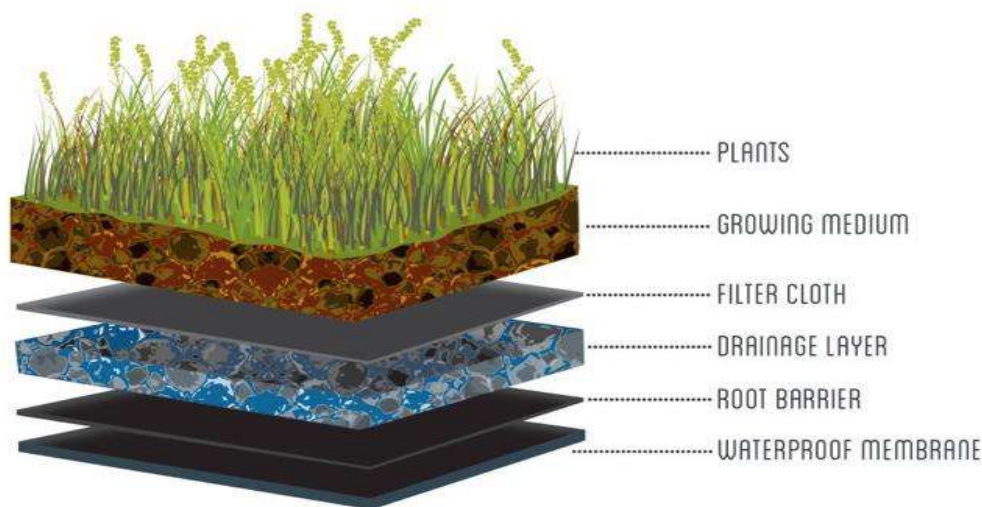


Figure 6-5 Green Roof System

6.5. Water Quality Modelling

The proposed treatment strategy has been modelled using MUSIC version 6.1. Rainfall, catchment properties and pollutant characteristics have been sourced from Water By Design's 'MUSIC Modelling Guidelines' (2010).

The rainfall data uses rainfall station 40842 (Brisbane Aero), 6-minute time step from 01/01/1980 to 31/12/1989 and all source and treatment nodes parameters have sourced from Water By Design's 'MUSIC Modelling Guidelines' (2010). The model source node parameter values and pollutant concentration parameters are shown in the tables below.

Table 6-2 - MUSIC Source Node Parameters (Industrial)

Rainfall Runoff Parameters	Values
Rainfall Threshold (mm/day)	1.00
Soil Storage Capacity (mm)	18
Initial Storage (% of capacity)	10
Field Capacity (mm)	80
Infiltration Capacity Coefficient – a	243
Infiltration Capacity Exponent – b	0.6
Initial Depth (mm)	50
Daily Recharge rate (%)	0
Daily Baseflow Rate (%)	31
Daily Deep Seepage (%)	0

Table 6-2 - MUSIC Pollutant Concentration Parameters (Industrial)

		TSS		TP		TN	
		Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow
Roof	Mean (Log mg/L)	0	1.30	0	-0.89	0	0.25
	Std Dev (Log mg/L)	0	0.44	0	0.36	0	0.32
Road	Mean (Log mg/L)	0.78	2.43	-1.11	-0.30	0.14	0.25
	Std Dev (Log mg/L)	0.45	0.44	0.48	0.36	0.20	0.32
Ground	Mean (Log mg/L)	0.78	1.92	-1.11	-0.59	0.14	0.25
	Std Dev (Log mg/L)	0.45	0.44	0.48	0.36	0.20	0.32

The table below shown the internal catchments for the purposes of the MUSIC modelling:

Table 6-4 - MUSIC Catchment Split

Stormwater Outlet/Manhole	Catchments	Area (m ²)	Fraction Impervious (FI)
Outlet-1 Curtin Ave	Roof	9,840	100%
	Green Roof	1,234	20%
	Road	4,800	100%
	Landscape	1,730	0%
	Paved Ground	1,290	100%
Outlet-2 Fison Ave	Roof	7,410	100%
	Road	2,820	100%
	Ground	1,080	0%
	Paved Ground	360	100%
Outlet-3 Fison Ave	Roof	2,130	100%
	Road	6,049	100%
	Landscape	1,645	0%
	Paved Ground	155	100%
Outlet-4 Links Ave	Roof	2,680	100%
	Green Roof	1,581	20%
	Road	1,970	100%
	Landscape	1,986	0%
	Paved Ground	240	100%
Total		49,000	

The catchment breakdown is shown in Figure 6-6 and the configuration of the model and results are shown in Figure 6-7 below. This demonstrates that the water quality objectives can be achieved by incorporating the proposed treatment strategy into the development.

- roof runoff will be discharged into the internal stormwater system by a series of downpipes
- ground runoff will be collected by a series of field inlets and convey to the LPOD

FISON AVE - LPOD 3

-  Roof : 2130m²
-  Road: 6049m²
-  Landscape: 1645m²
-  Paved Ground: 155m²

LINKS AVE - LPOD 4

-  Roof : 2680m²
-  Green Roof : 1581m²
-  Road: 1970m²
-  Landscape: 1986m²
-  Paved Ground: 240m²

MUSIC Model Site Area Breakup



Figure 6-6 MUSIC Catchment Breakup

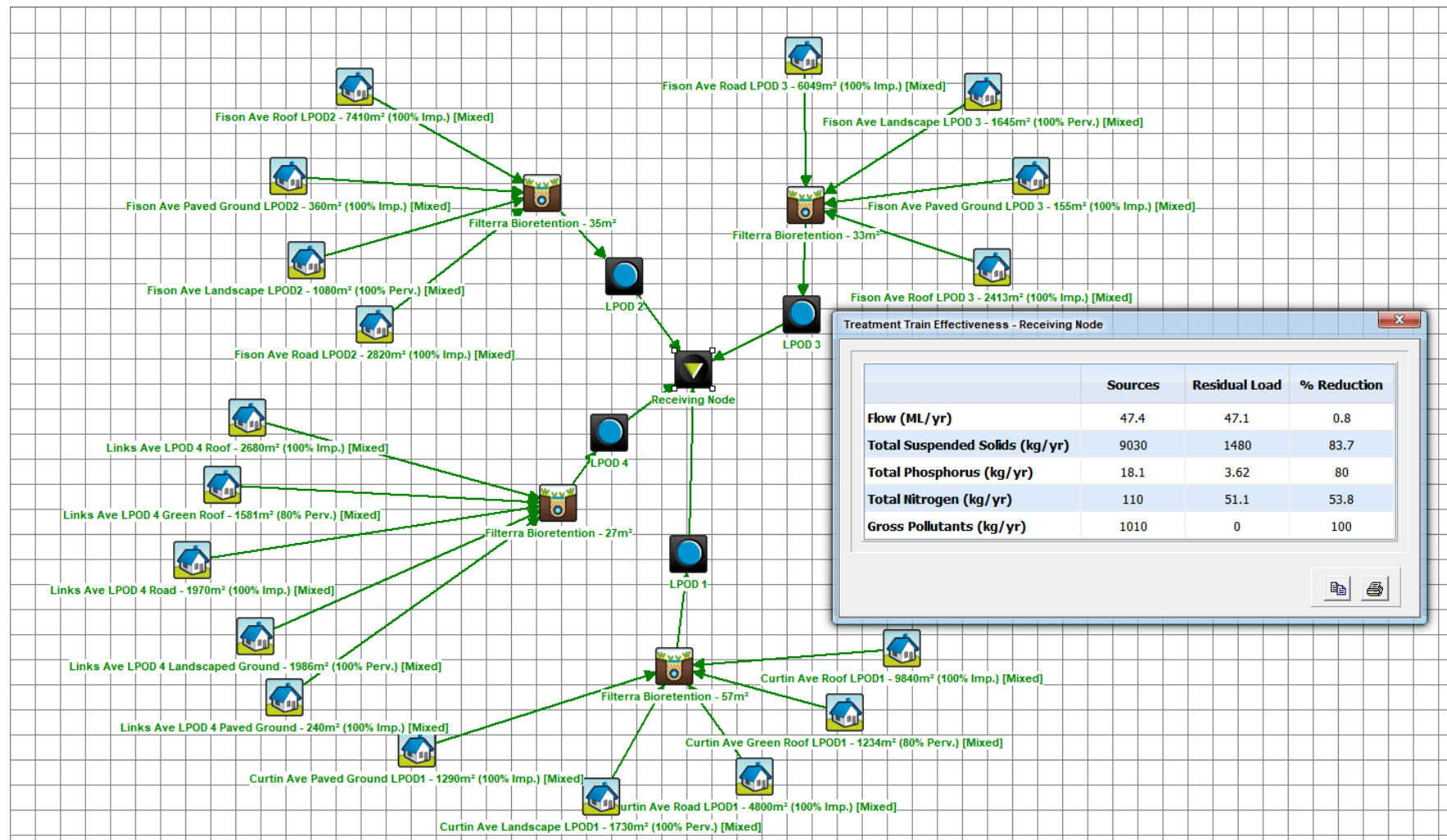


Figure 6-7 MUSIC Model Configuration

6.6. Water Quality Maintenance

6.6.1. Roadside Bio-Retention Street Tree Pods

It is necessary to perform regular inspections under a maintenance schedule to ensure the bio-retention Street Tree Pods operates at the desired efficiency.

The most intensive period of maintenance is during the plant establishment period (first two years) when weed removal and replanting may be required. It is also the time when large loads of sediments could impact on plant growth particularly in developing catchments with poor building controls.

Maintenance is primarily concerned with:

- Maintenance of flow to and through the bio-retention basin;
- Maintaining vegetation;
- Preventing undesired overgrowth vegetation from taking over the bio-retention basin;
- Removal of accumulated sediments; and
- Litter and debris removal.

Vegetation maintenance will include:

- Fertilising vegetation;
- Removal of noxious plants or weeds; and
- Re-establishment of vegetation that die.

Sediments accumulated at the inlets need to be monitored. Depending on the catchment activities the deposition of sediment can tend to smother plants and reduce the ponding volume available. Should excessive sediment build-up it will impact on the plant health and will require removal before it reduces the infiltration rate of the filter media. The proposed SQIDs will require regular maintenance and monitoring to ensure that they function as designed.

7 Construction Phase Water Quality Management

7.1. Pollutants

Pollutants typically generated during the construction phase are indicated in Table 7-1.

Table 7-1 - Pollutants Typically generated during the construction phase

Pollutant	Sources
Litter	Paper, construction packaging, food packaging, cement bags, off-cuts
Sediment	Unprotected exposed soils and stockpiles during earthworks and building works
Hydrocarbons	Fuel and oil spills, leaks from constructions equipment and temporary carpark areas
Toxic materials	Cement slurry, asphalt prime, solvents, cleaning agents, washwater (e.g. from tile works)
pH altering substances	Acid sulphate soils, cement slurry and wash waters

7.2. Potential Impacts

The construction phase of a development has the potential to release significant amounts of sediment and other pollutants into the receiving waterways. Potential impacts on the surrounding environment will be minimised during the construction phase with measures as outlined in this Conceptual Stormwater Management Plan and the Erosion and Sediment Control Plan, which will be provided at the Operational Works phase.

7.3. Erosion and Sediment Control Measures

7.3.1.Pre-Development

Prior to construction, the following sediment and erosion control measures will be implemented to minimise disturbance and ensure water quality is maintained;

- Set out transport routes to ensure minimal vegetation disturbance;
- Construct entry/exit areas that comprise of a designed gravel pad or placement of vibration grid in accordance with Best Practice;
- Install sediment fences around the proposed bulk earthworks site (along toe of batter alignment); and
- Install dust control fences adjacent to the proposed bulk earthworks site.

7.3.2.Bulk Earthworks

- Earthworks areas are to be protected against wind and water erosion;
- Silt fences are to be erected around the base of the earthworks and material stockpiles;
- Stockpiles and construction material are not permitted to be stored within the road reserve; and,
- Diversion drains to be provided at upstream catchments to reduce flows onto earthworks areas.

7.3.3.Construction

The following measures will be undertaken to mitigate water quality impacts during the construction phase:

- Sediment fences to be erected at the base of all batters and stockpiles to prevent sediment transportation off site;
- Grass filter strips to be placed along all road verges;

- Re-vegetation of all disturbed areas within two weeks of completion;
- All sediment control structures to be maintained in an effective manner and inspected after each storm event. No structure is to accumulate sediment above 40% of its capacity;
- Dust producing areas to be swept to remove silt/dust and wetting of roads is only permitted where sweeping has failed;
- At least one bin or littler trap is to be provided for waste material.

7.3.4. Post-Development – Maintenance Period

Silt fences are to remain in place during the maintenance period until the landscaping has been established and accepted ‘ON-Maintenance’.

7.4. Performance Objectives and Indicators

The BCC Guideline on Identifying and Applying Water Quality Objectives in Brisbane City (2000) states that stormwater runoff during the construction phase must be in accordance within the concentration ranges shown in Table 7-2 below.

Table 7-2 – Construction Phase Pollutant Objectives

Pollutant	Criteria
Total Suspended Solids	90th %tile < 100mg/L for wet weather periods 15mg/L for combined wet and dry periods
pH	6.5 – 8.5
Total Nitrogen (mg/L)	0.65
Total Phosphorous (mg/L)	0.07
Dissolved Oxygen	80 to 105 percent saturation
Oils and Grease	No visible films or odours
Litter	No anthropogenic material greater than 5mm

7.5. Monitoring and Maintenance

The following monitoring and maintenance procedures are to be undertaken by the site supervisor during all phases of the development:

- Restrict all work activities to designated construction areas;
- Earthworks and site cleaning are undertaken in accordance with the Erosion and Sediment Control plans;
- Inspections of Stormwater, Sediment and Erosion Controls are to be conducted at the end of each construction day and after each rainfall event (>25mm);
- Any failure to the stormwater system shall be immediately rectified to prevent uncontrolled discharge from the site

7.6. Asset Handover

The proposed stormwater quality treatment devices shall be dedicated to the owner/body corporate following practical completion of the proposed development. An Asset Handover Checklist is provided as a guideline for the necessary steps to be taken prior to the end of the on maintenance period.

Table 7-3 Asset Handover Checklist

Asset Location:		
Construction By:		
Maintenance Period:		
Treatment	Y	N
Actual treatment performance equivalent to design:		
Maintenance:		
Maintenance Plans Provided:		
Inspection and maintenance undertaken as per maintenance plan:		
Inspection and maintenance forms provided:		
Asset inspected for defects:		
Asset Information:		
Design assessment checklist provided:		
As constructed plans provided:		
Copies of all permits provided:		
Digital files provided		

8 Conclusions and Recommendations

This Conceptual Stormwater Management Report has assessed the stormwater management, for the masterplan of development at 110 Links Avenue South, 155, 161 Fison Avenue West and 364 Curtin Avenue West, Eagle Farm.

The stormwater management strategy has the following components:

- Provision of underground piped stormwater infrastructure to collect and convey development flows to the onsite treatment.
- Nomination of a lawful points of discharge
 - existing stormwater system that runs within Fison Ave road reserves
 - existing stormwater system that runs within Links Ave road reserves
 - drainage channel runs within the southern verge of Curtin Avenue West
- Stormwater quality treatment strategy consists of the following components to achieve pollutant reductions in line with SPP (2017) targets.:
 - Ecosol Bio Tree Pits
 - A minimum of 57m² of Filterra to treat the runoff prior discharge to Curtion Ave
 - A minimum of 67m² of Filterra to treat the runoff prior discharge to Fison Ave
 - A minimum of 27m² of Filterra to treat the runoff prior discharge to Links Ave
- Stormwater quantity assessment is deemed to be unnecessary as the proposed development does not increase the fraction of impervious

This report has demonstrated that the proposed development proposal provides an acceptable solution for all stormwater management and has been designed to comply with *State Planning Policy* (SPP, 2017), *Queensland Urban Drainage Manual Fourth Edition 2016 - Provisional* (QUDM, 2016), Brisbane City Council's City Plan (BCC, 2014) and Economic Development Queensland Engineering standards PDA guideline no.13 (EDQ, 2017).

9 References

Brisbane City Council - City Plan Policy – Land Development Guidelines

Queensland Urban Drainage Manual Fourth Edition 2016

Department of State Development, Infrastructure and Planning (2017), State Planning Policy

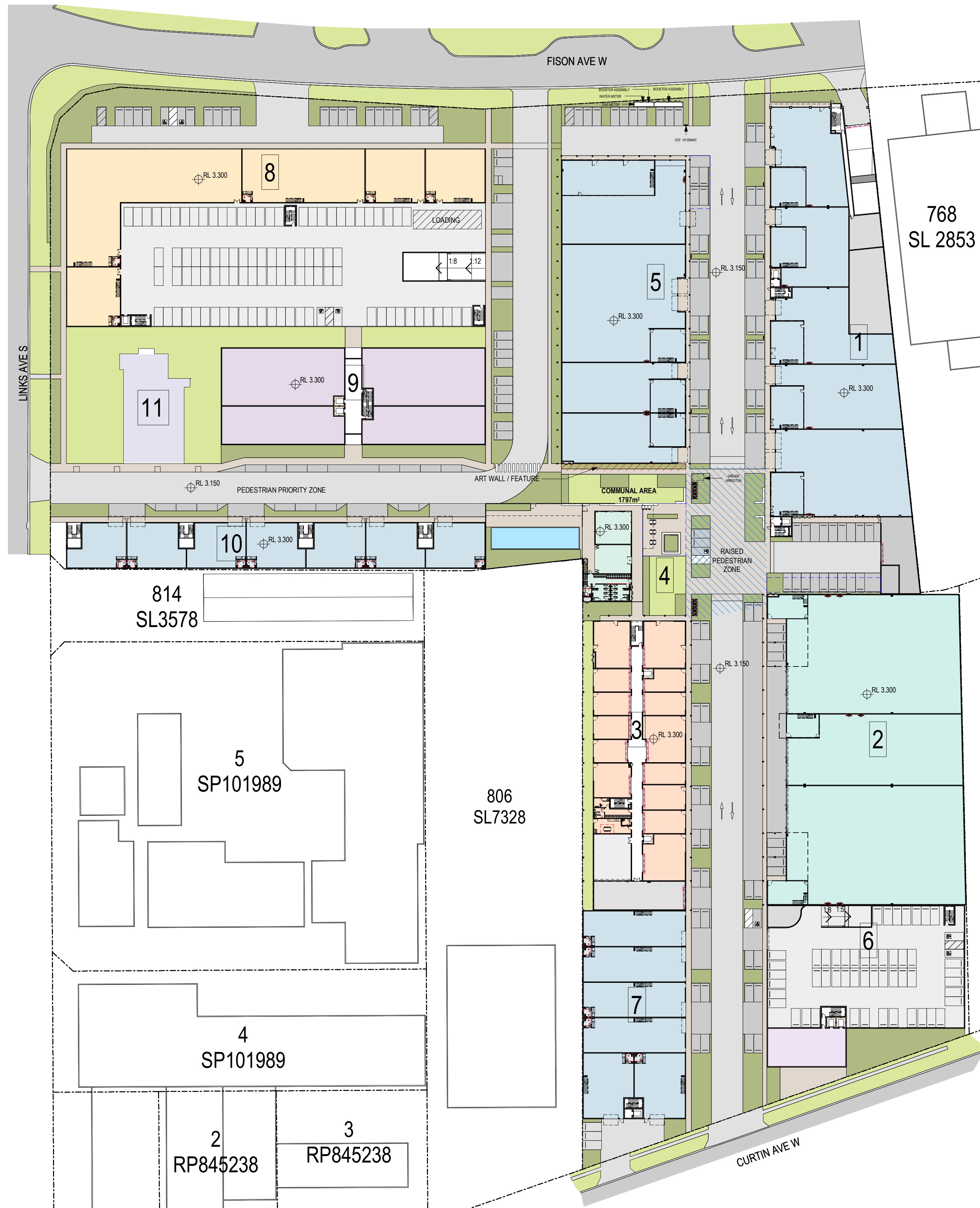
Water By Design, MUSIC Modelling Guidelines November 2018 – Consultation Draft



Appendices



Appendix A – Architecture Plans



PRELIMINARY

Revisions	
P1	20.10.21 For Coordination
P2	25.10.21 For Coordination
P3	28.10.21 Draft DA
P4	17.11.21 Final Coordination

JH
JH
GT
JH

Project / **Eagle Farm Precinct**

Drawing / **Site Plan - Ground Floor**

Project No / **221044** Date / **17.11.21**

Author / **JH**

Scale: @ A1 / **1 : 750**

Drawing No. / **TP00.50 P4**

110 Links Ave, 155 & 161 Fison Ave, Eagle Farm

Disclaimer: Rothe Lowman Property Pty. Ltd. retains all common law, statutory law and other rights including copyright and intellectual property rights in respect of this document. The recipient indemnifies Rothe Lowman Property Pty. Ltd. against all claims resulting from use of this document for any purpose other than its intended use, unauthorized changes or reuse of the document on other projects without the permission of Rothe Lowman Property Pty. Ltd. Under no circumstance shall transfer of this document be deemed a sale or constitute a transfer of the license to use this document. ABN 76 005 783 997

rothelowman

Brisbane, Melbourne, Sydney
www.rothelowman.com.au

PRELIMINARY

Revisions	P1	15.10.21	For Coordination
	P2	20.10.21	For Coordination
	P3	25.10.21	For Coordination
	P4	28.10.21	Draft DA
	P5	17.11.21	Final Coordination

JH
JH
JH
GT
JH

17/11/2021 9:26:32 AM



Project Eagle Farm Precinct

110 Links Ave, 155 & 161 Fison Ave, Eagle Farm

Disclaimer: Rothe Lowman Property Pty. Ltd. retains all common law, statutory law and other rights including copyright and intellectual property rights in respect of this document. The recipient indemnifies Rothe Lowman Property Pty. Ltd. against all claims resulting from use of this document for any purpose other than its intended use, unauthorized changes or reuse of the document on other projects without the permission of Rothe Lowman Property Pty. Ltd. Under no circumstance shall transfer of this document be deemed a sale or constitute a transfer of the license to use this document. ABN 76 005 783 997

Drawing Site Plan - Ground Floor Mezzanine

Project No 221044 Date 17.11.21

Author JH

Scale: @ A1 1 : 750

Drawing No. TP00.51 P5

rothelowman

Brisbane, Melbourne, Sydney
www.rothelowman.com.au

PRELIMINARY

Revisions	P1	15.10.21	For Coordination	JH
	P2	20.10.21	For Coordination	JH
	P3	25.10.21	For Coordination	JH
	P4	28.10.21	Draft DA	GT
	P5	17.11.21	Final Coordination	JH

17/11/2021 9:26:36 AM

Project Eagle Farm Precinct

110 Links Ave, 155 & 161 Fison Ave, Eagle Farm

Disclaimer: Rothe Lowman Property Pty. Ltd. retains all common law, statutory law and other rights including copyright and intellectual property rights in respect of this document. The recipient indemnifies Rothe Lowman Property Pty. Ltd. against all claims resulting from use of this document for any purpose other than its intended use, unauthorized changes or reuse of the document on other projects without the permission of Rothe Lowman Property Pty. Ltd. Under no circumstance shall transfer of this document be deemed a sale or constitute a transfer of the license to use this document. ABN 76 005 783 997

Drawing Site Plan - Level 1

Project No 221044 Date 17.11.21

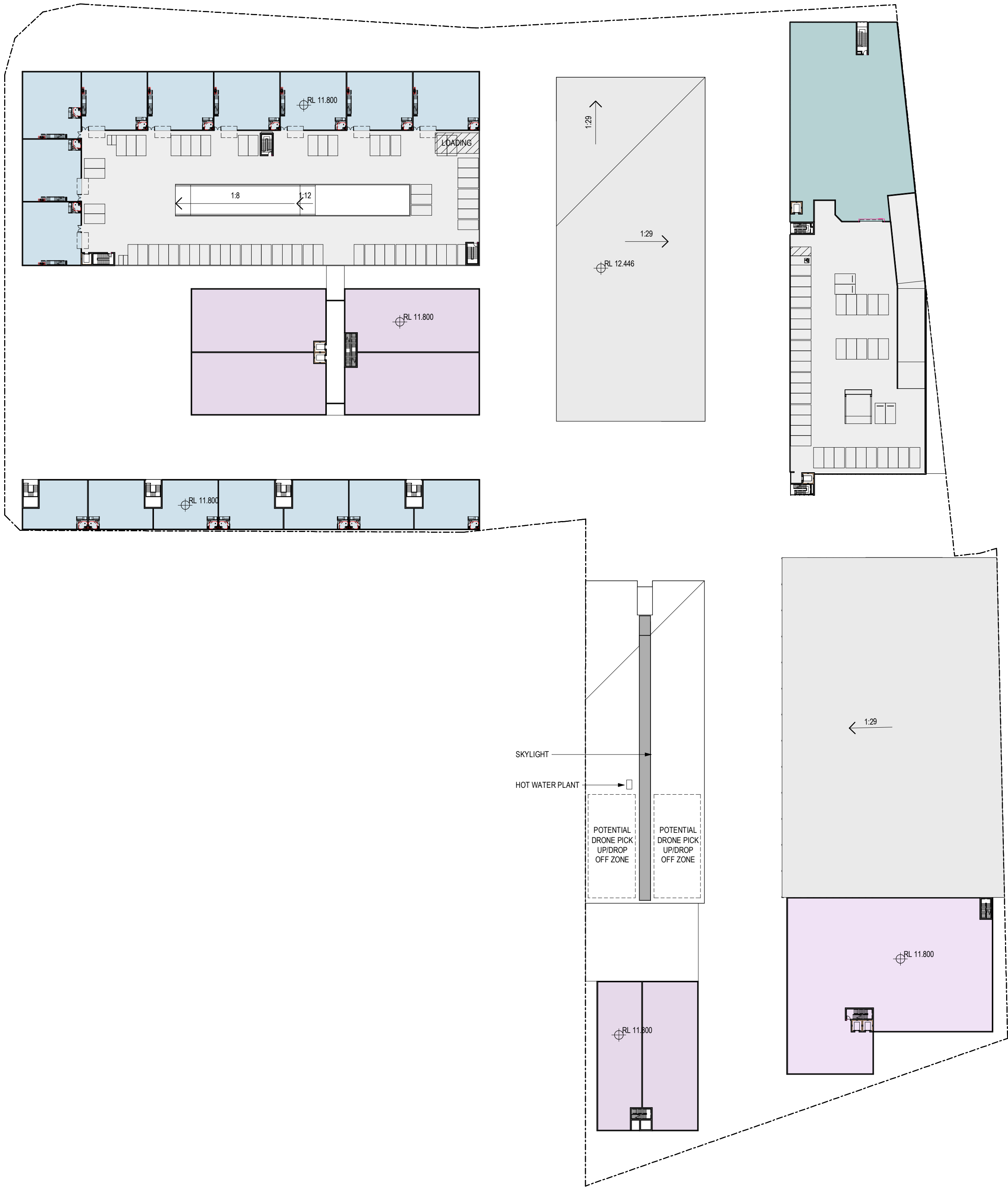
Author JH

Scale: @ A1 1 : 750

Drawing No. TP00.52 P5

rothelowman

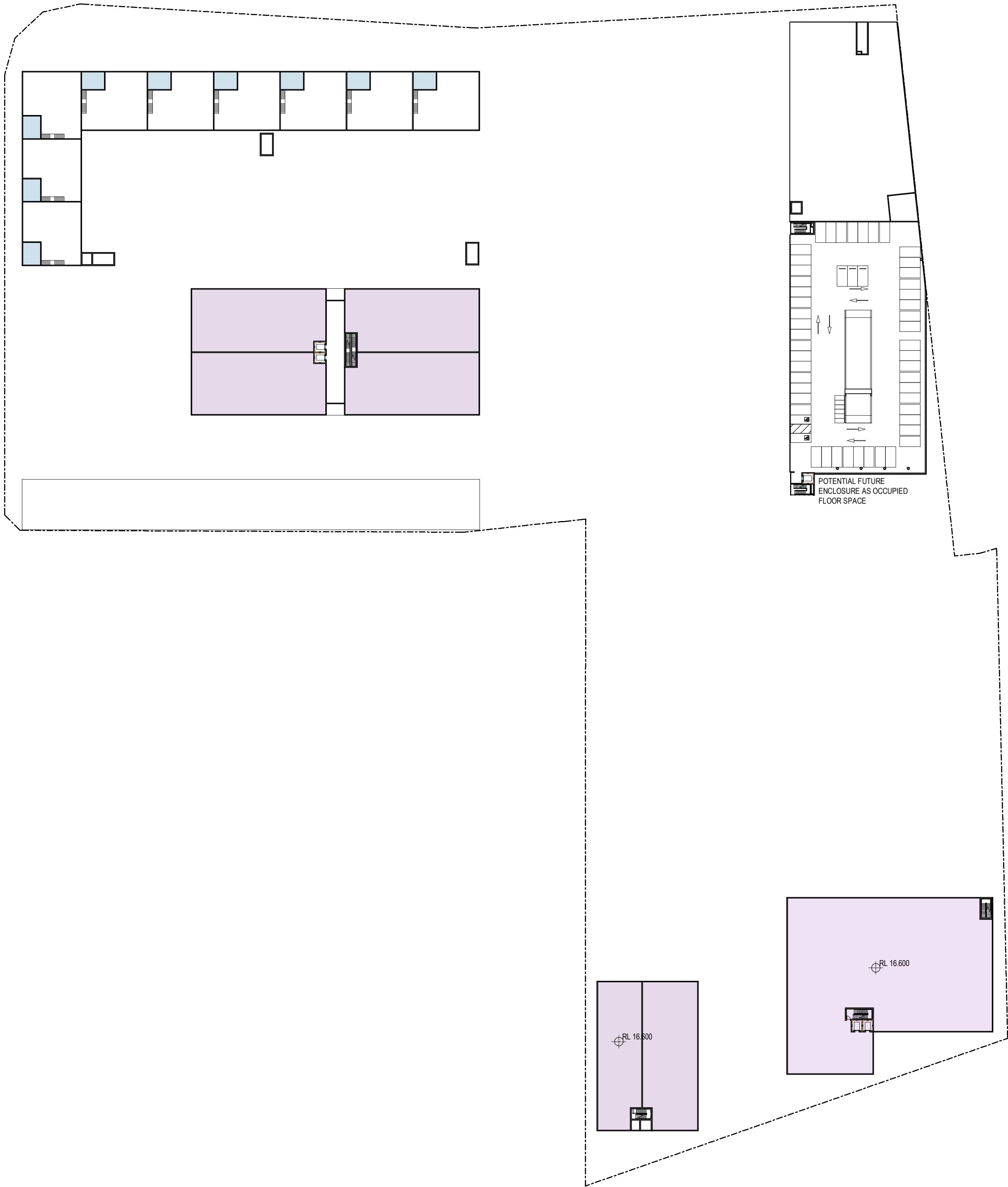
Brisbane, Melbourne, Sydney
www.rothelowman.com.au



PRELIMINARY

Revisions	P1	15.10.21	For Coordination	JH
	P2	20.10.21	For Coordination	JH
	P3	25.10.21	For Coordination	JH
	P4	28.10.21	Draft DA	GT
	P5	17.11.21	Final Coordination	JH

17/11/2021 10:16:06 AM



Project Eagle Farm Precinct

Drawing Site Plan - Level 2

Project No 221044 Date 17.11.21

Author JH

Scale: @ A1 1 : 750

Drawing No. TP00.53 P5

rothelowman

Brisbane, Melbourne, Sydney
www.rothelowman.com.au

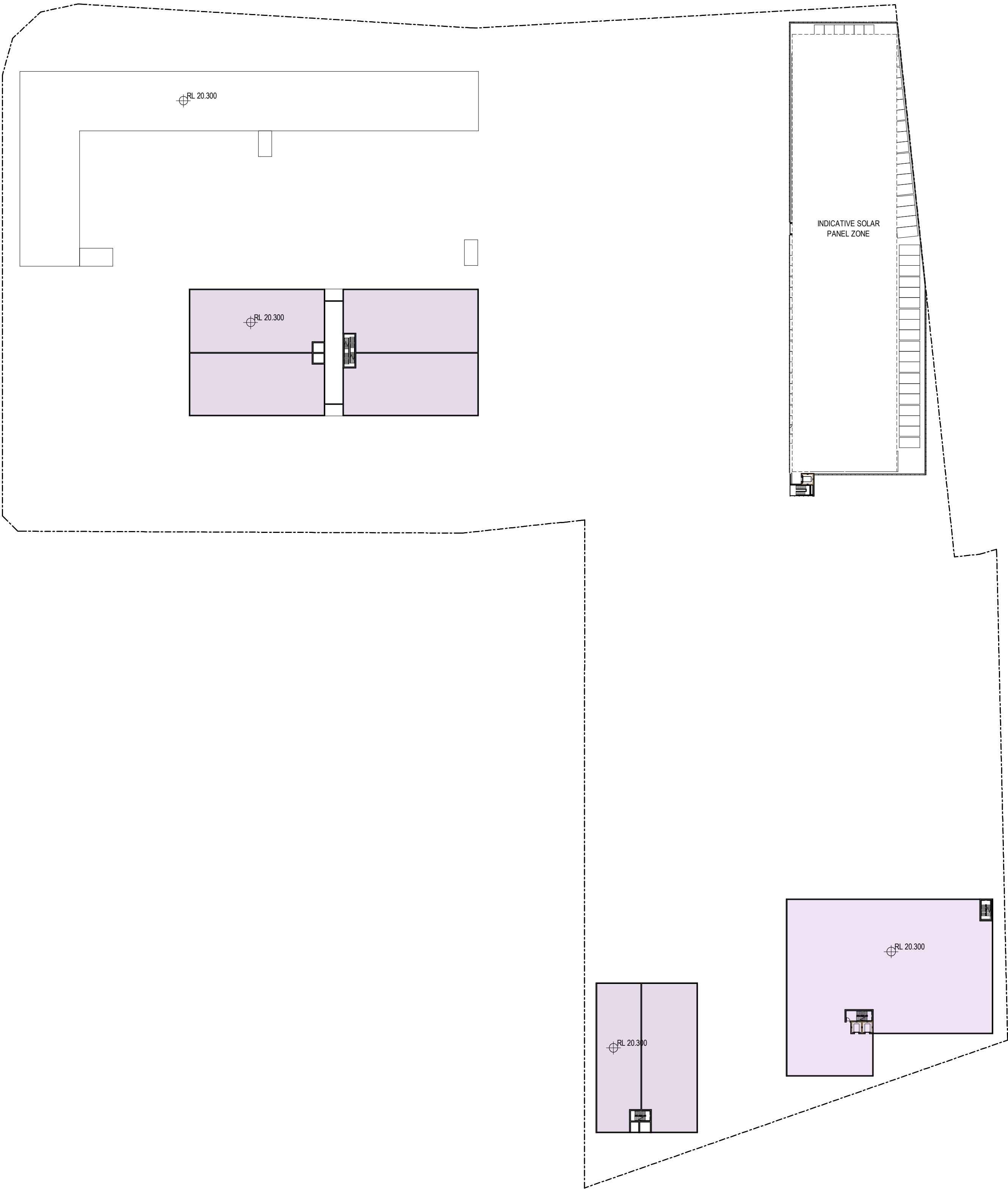
110 Links Ave, 155 & 161 Fison Ave, Eagle Farm
Disclaimer: Rothe Lowman Property Pty. Ltd. retains all common law, statutory law and other rights including copyright and intellectual property rights in respect of this document. The recipient indemnifies Rothe Lowman Property Pty. Ltd. against all claims resulting from use of this document for any purpose other than its intended use, unauthorized changes or reuse of the document on other projects without the permission of Rothe Lowman Property Pty. Ltd. Under no circumstance shall transfer of this document be deemed a sale or constitute a transfer of the license to use this document. ABN 76 005 783 997

PRELIMINARY

Revisions	P1	15.10.21	For Coordination
	P2	20.10.21	For Coordination
	P3	25.10.21	For Coordination
	P4	28.10.21	Draft DA
	P5	17.11.21	Final Coordination

JH
JH
JH
GT
JH

17/11/2021 9:26:43 AM



Project / **Eagle Farm Precinct**

Drawing / **Site Plan - Level 3**

Project No / **221044** Date / **17.11.21**

Author / **JH**

Scale: @ A1 / **1 : 750**

Drawing No. / **TP00.54 P5**

rothelowman

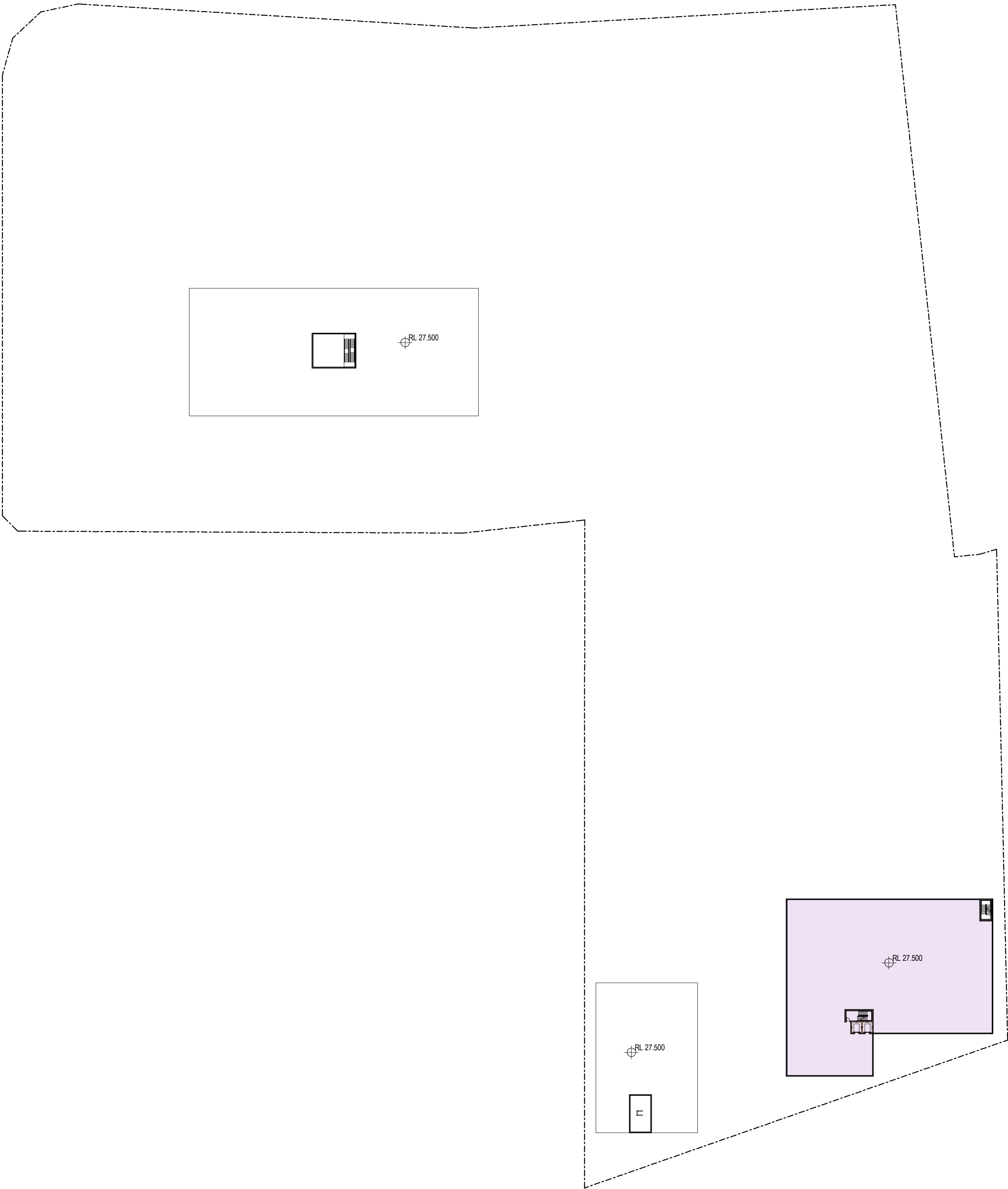
Brisbane, Melbourne, Sydney
www.rothelowman.com.au

110 Links Ave, 155 & 161 Fison Ave, Eagle Farm
Disclaimer: Rothe Lowman Property Pty. Ltd. retains all common law, statutory law and other rights including copyright and intellectual property rights in respect of this document. The recipient indemnifies Rothe Lowman Property Pty. Ltd. against all claims resulting from use of this document for any purpose other than its intended use, unauthorized changes or reuse of the document on other projects without the permission of Rothe Lowman Property Pty. Ltd. Under no circumstance shall transfer of this document be deemed a sale or constitute a transfer of the license to use this document. ABN 76 005 783 997

PRELIMINARY

Revisions	P1	15.10.21	For Coordination	JH
	P2	20.10.21	For Coordination	JH
	P3	25.10.21	For Coordination	JH
	P4	28.10.21	Draft DA	GT
	P5	17.11.21	Final Coordination	JH

17/11/2021 9:18:10 AM



Project Eagle Farm Precinct

110 Links Ave, 155 & 161 Fison Ave, Eagle Farm

Disclaimer: Rothe Lowman Property Pty. Ltd. retains all common law, statutory law and other rights including copyright and intellectual property rights in respect of this document. The recipient indemnifies Rothe Lowman Property Pty. Ltd. against all claims resulting from use of this document for any purpose other than its intended use, unauthorized changes or reuse of the document on other projects without the permission of Rothe Lowman Property Pty. Ltd. Under no circumstance shall transfer of this document be deemed a sale or constitute a transfer of the license to use this document. ABN 76 005 783 997

Drawing Site Plan - Level 5

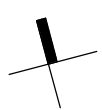
Project No 221044

Date 17.11.21

Author JH

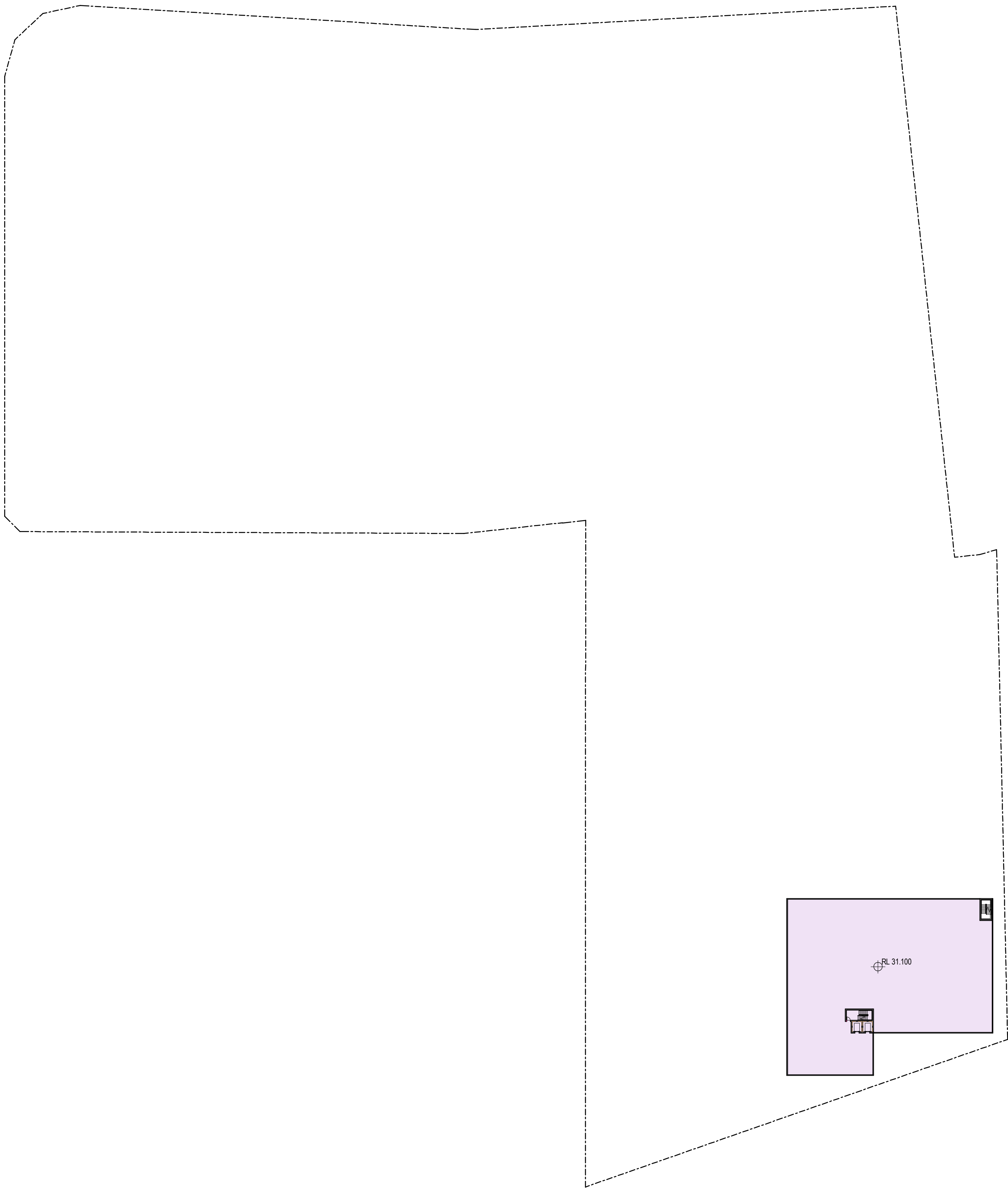
Scale: @ A1 1 : 750

Drawing No. TP00.56 P5



rothelowman

Brisbane, Melbourne, Sydney
www.rothelowman.com.au



PRELIMINARY

Revisions	P1	15.10.21	For Coordination
	P2	20.10.21	For Coordination
	P3	25.10.21	For Coordination
	P4	28.10.21	Draft DA
	P5	17.11.21	Final Coordination

JH
JH
JH
GT
JH

17/11/2021 9:18:13 AM

Project Eagle Farm Precinct

110 Links Ave, 155 & 161 Fison Ave, Eagle Farm

Disclaimer: Rothe Lowman Property Pty. Ltd. retains all common law, statutory law and other rights including copyright and intellectual property rights in respect of this document. The recipient indemnifies Rothe Lowman Property Pty. Ltd. against all claims resulting from use of this document for any purpose other than its intended use, unauthorized changes or reuse of the document on other projects without the permission of Rothe Lowman Property Pty. Ltd. Under no circumstance shall transfer of this document be deemed a sale or constitute a transfer of the license to use this document. ABN 76 005 783 997

Drawing Site Plan - Level 6

Project No 221044

Date 17.11.21

Author JH

Scale: @ A1 1 : 750

Drawing No. TP00.57 P5



rothelowman

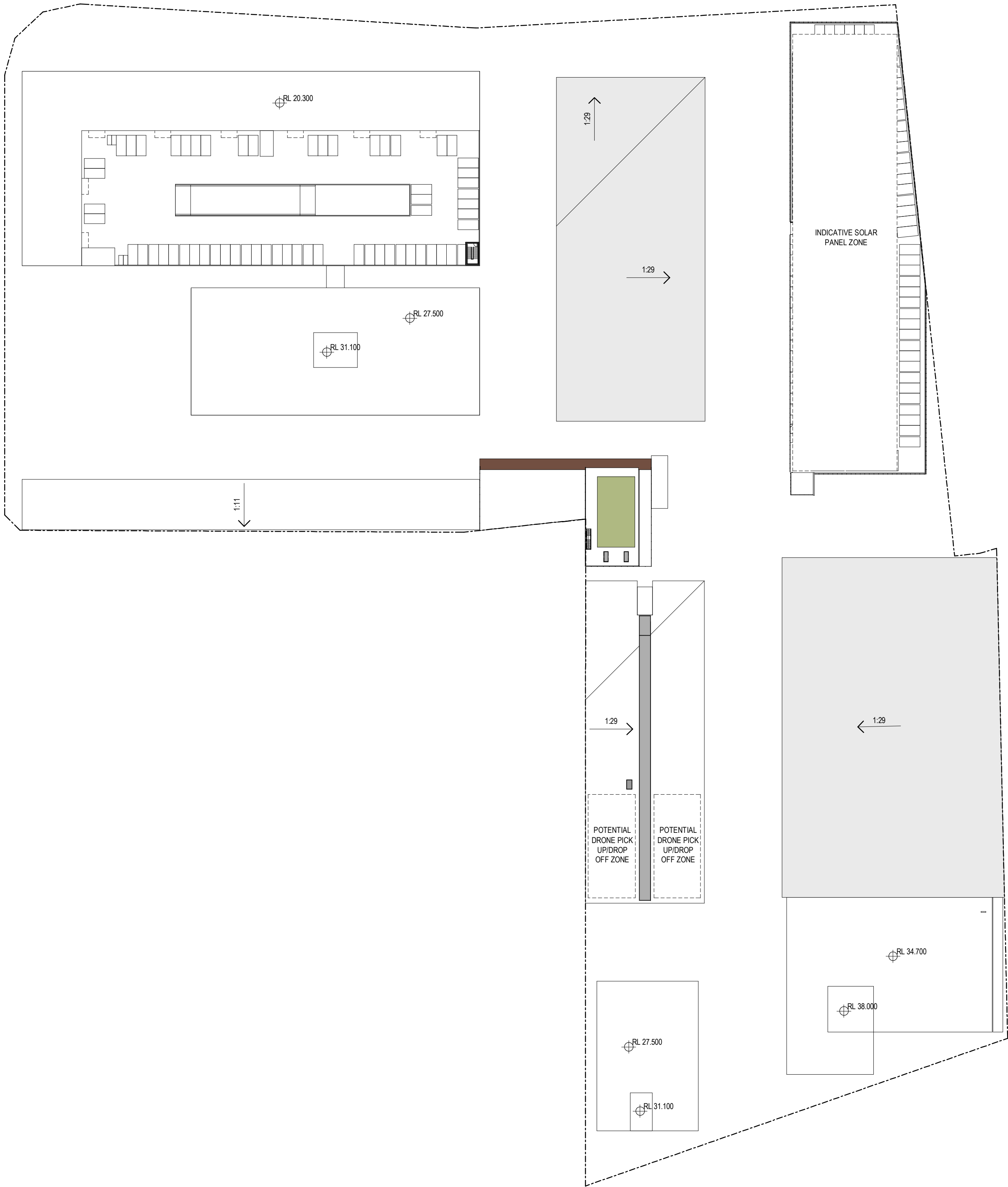
Brisbane, Melbourne, Sydney
www.rothelowman.com.au

PRELIMINARY

Revisions	P1	15.10.21	For Coordination
	P2	20.10.21	For Coordination
	P3	25.10.21	For Coordination
	P4	28.10.21	Draft DA
	P5	17.11.21	Final Coordination

JH
JH
JH
GT
JH

17/11/2021 9:18:17 AM



Project Eagle Farm Precinct

110 Links Ave, 155 & 161 Fison Ave, Eagle Farm

Disclaimer: Rothe Lowman Property Pty. Ltd. retains all common law, statutory law and other rights including copyright and intellectual property rights in respect of this document. The recipient indemnifies Rothe Lowman Property Pty. Ltd. against all claims resulting from use of this document for any purpose other than its intended use, unauthorized changes or reuse of the document on other projects without the permission of Rothe Lowman Property Pty. Ltd. Under no circumstance shall transfer of this document be deemed a sale or constitute a transfer of the license to use this document. ABN 76 005 783 997

Drawing Site Plan - Roof Plan

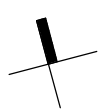
Project No 221044

Date 17.11.21

Author JH

Scale: @ A1 1 : 750

Drawing No. TP00.58 P5



rothelowman

Brisbane, Melbourne, Sydney
www.rothelowman.com.au



Appendix B – Survey Plans



**GOODWIN
MIDSON**

SURVEYING | TOWN PLANNING | MAPPING

Servicing Queensland with offices in:
BRISBANE (07) 3870 2161
BOONAH (07) 5463 1596
SUNSHINE COAST (07) 5493 1707
HERVEY BAY (07) 4125 1855
www.goodwinmidson.com.au



© Copyright protects this plan

client

EPOCA Constructions Pty Ltd

project

I55 Fison Avenue West EAGLE FARM

drawing title

Overall Plan of Level and Detail Survey
over Lot 655 on SL4010 and
Lot 724 on SL8236

PARISH: *TOOMBUL*

COUNTY: *Stanley*

horiz. datum Cadastral

vert. datum AHD
PM142475

drawn GHJ 30/6/10

surveyed GHJ 25/06/10

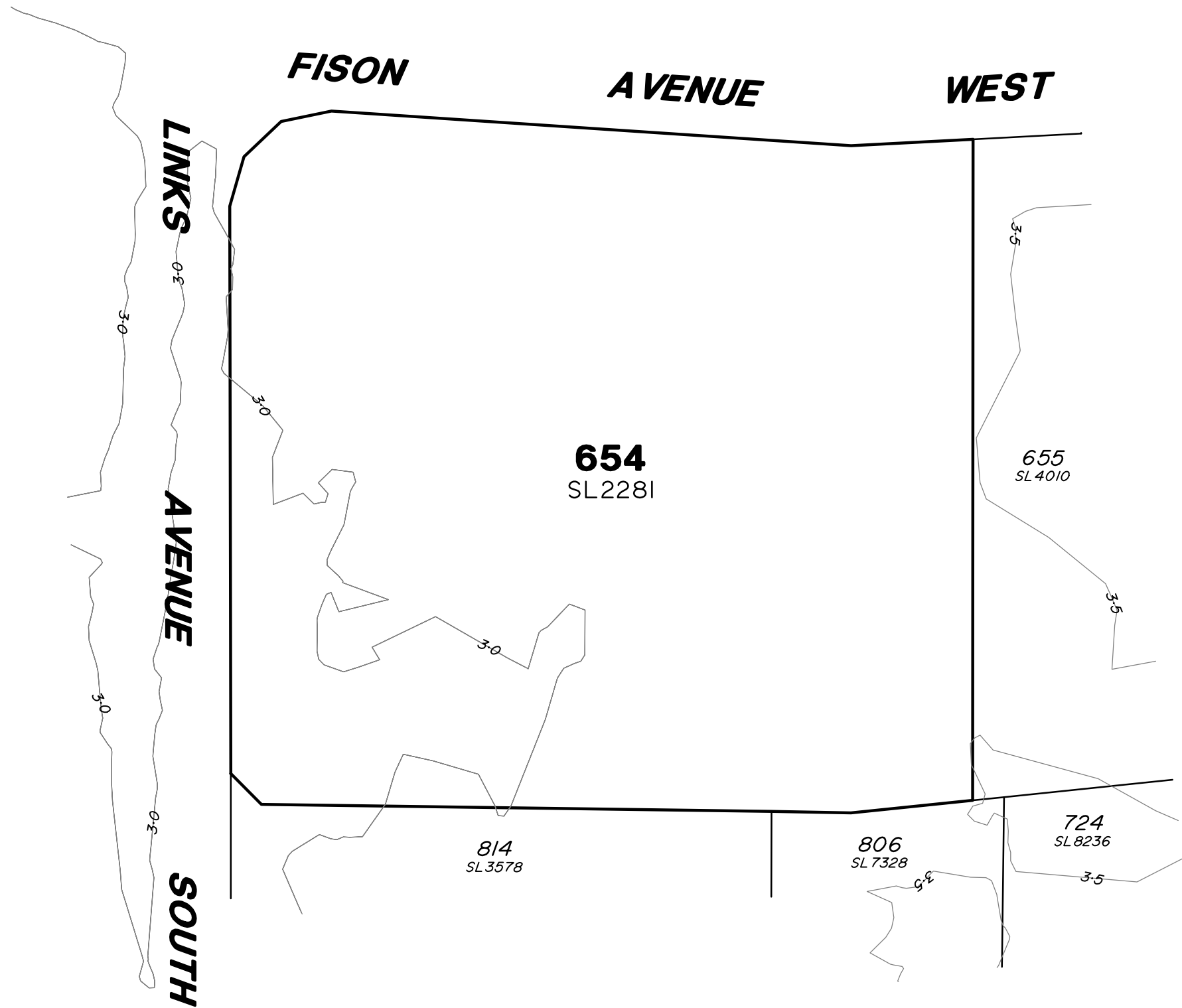
checked

scale 1:1000

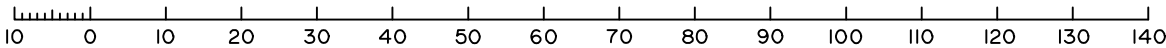
reference no
14047-1

A3

amdt



Scale 1:1000 Lengths are in Metres



110 Links Ave South
Eagle Farm

For

Epoca Group Pty Ltd

IMPORTANT NOTES:
(These notes are an integral part of this plan)
This plan has been prepared for Epoca Group Pty Ltd for the purposes of Determining Natural Ground Level
It is not to be used by any other person or corporation or for any other purposes.

Copyright © Queensland Surveying Pty Ltd, a Veris Company. 16/10/2017

THESE DESIGNS AND DRAWINGS ARE COPYRIGHT
AND ARE NOT TO BE USED OR REPRODUCED
WITHOUT THE WRITTEN PERMISSION OF VERIS

Data Sources	
Cadastral Boundaries	BCC City Plan 2000
Contours / Topographic	BCC City Plan 2000
Aerial Images	*
Flood Level	*
Engineering Design	*
Architectural Design	*
Landscape Design	*

A	Original	16.10.2017	ELH
Issue	Revisions	Date	Drawn

Locality: Eagle Farm
Local Authority: Brisbane City Council
Projection: *
Horizontal Meridian: BCC City Plan 2000
Vertical Level Datum: AHD
Level Origin: BCC City Plan 2000
Scale: 1:1000 @ A3
Surveyed: *
Designed: *
Drawn: RCS 6/10/17
Checked: ELH 16/10/17
Plot Date: 16 Oct, 2017
Computer File Ref:
32448-GP01-A Natural Ground Level.dwg

Plan of Natural Ground
Level over
Lot 654 on SL2281
110 Links Ave South
Eagle Farm



BRISBANE
(07) 3666 4700

WHITSUNDAYS
(07) 4945 1722

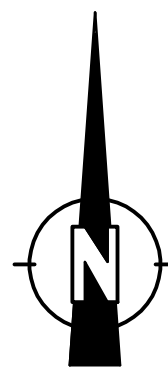
MACKAY
(07) 4951 2911

CAIRNS
(07) 4051 6722

veris.com.au

ACN 604 671 374
Queensland Surveying Pty Ltd, a Veris Company

Drawing No 32448-GP01 Issue A



Servicing Queensland with offices in:
BRISBANE (07) 3870 261
BOONAH (07) 5463 1596
SUNSHINE COAST (07) 5493 1707
HERVEY BAY (07) 4125 1855
www.goodwinmidson.com.au



© Copyright protects this plan

vertical datum		horizontal datum		field book:	
origin		origin		level book:	
				drawn	GJF 9/7/10
				surveyed	GHJ
				checked	
E					
D					
C					
B					
A	6/8/10	GHJ	Revised Structure Location		
revisions					

drawing title

Plan of Internal Layout of Offices
and Warehouse Areas

PARISH:

COUNTY:

client

EPOCA Construction Pty Ltd

project

155 Fison Avenue West
EAGLE FARM

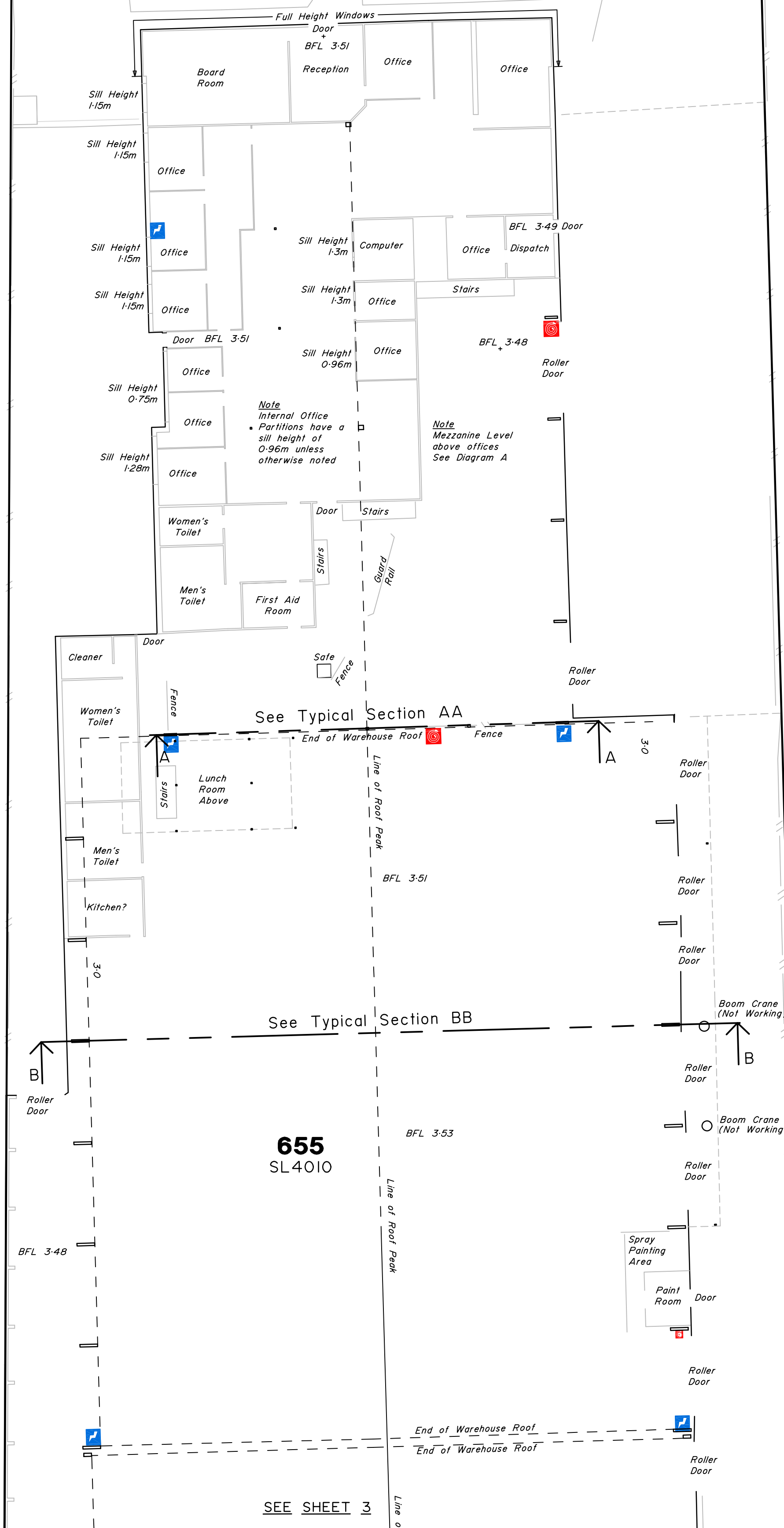
A1

scale
1:300

reference no
14047-2

amdt
A

FISON AVENUE WEST



E 940.000
N 5215.000

E 1002.000
N 5215.000

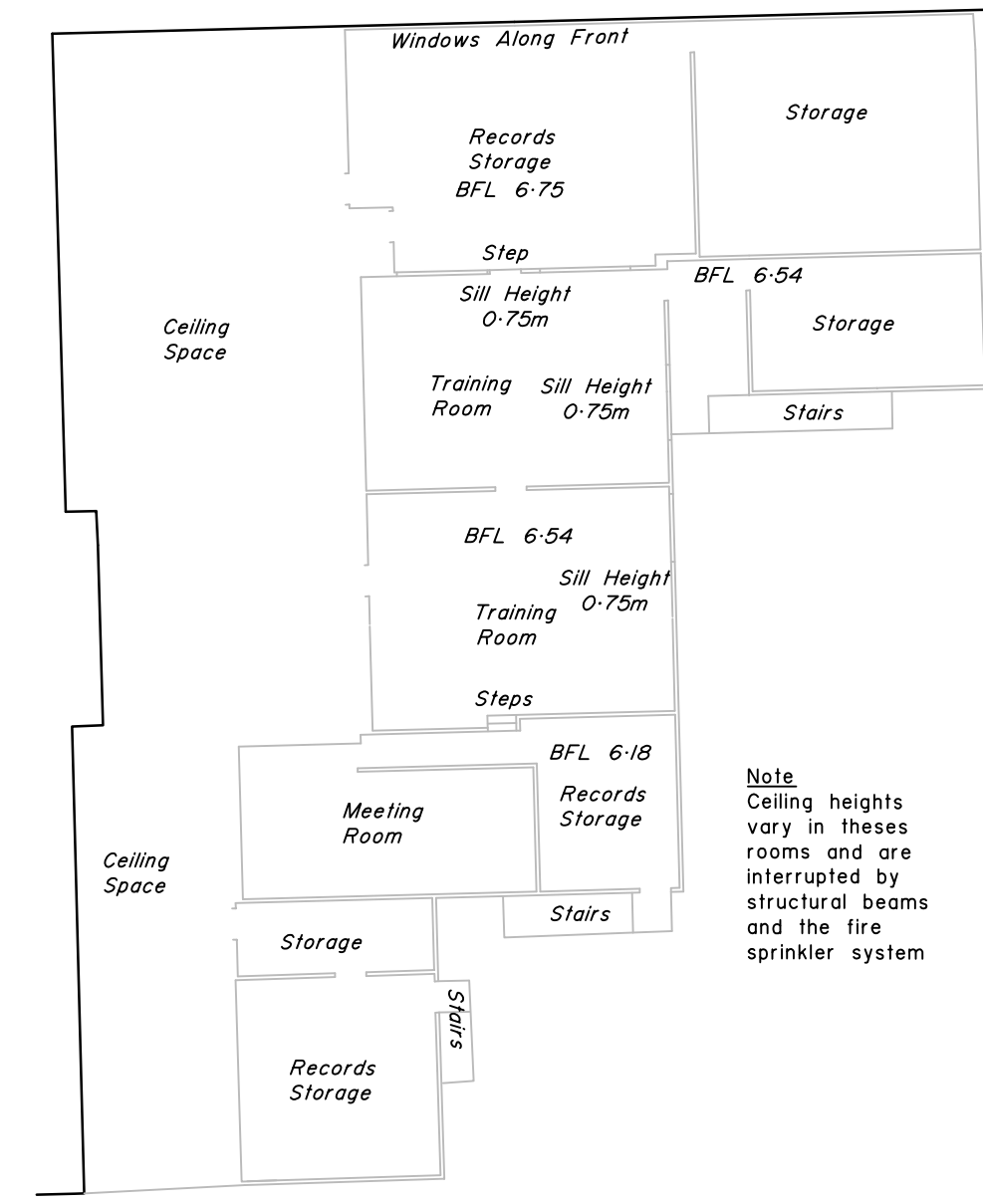
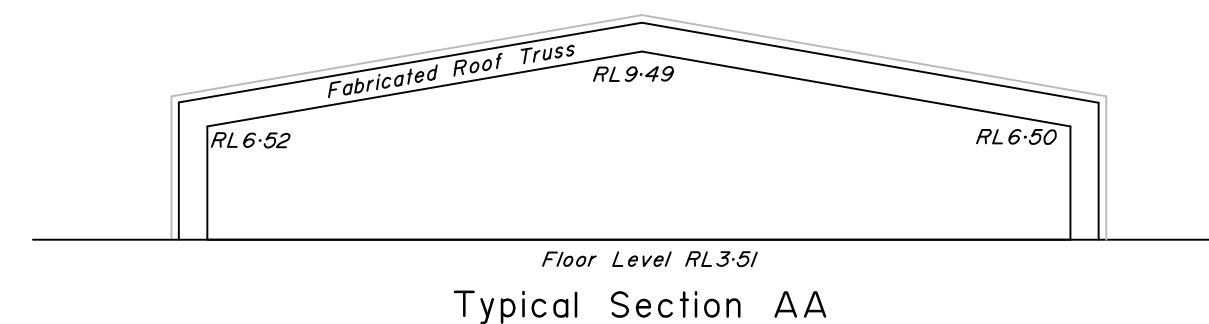
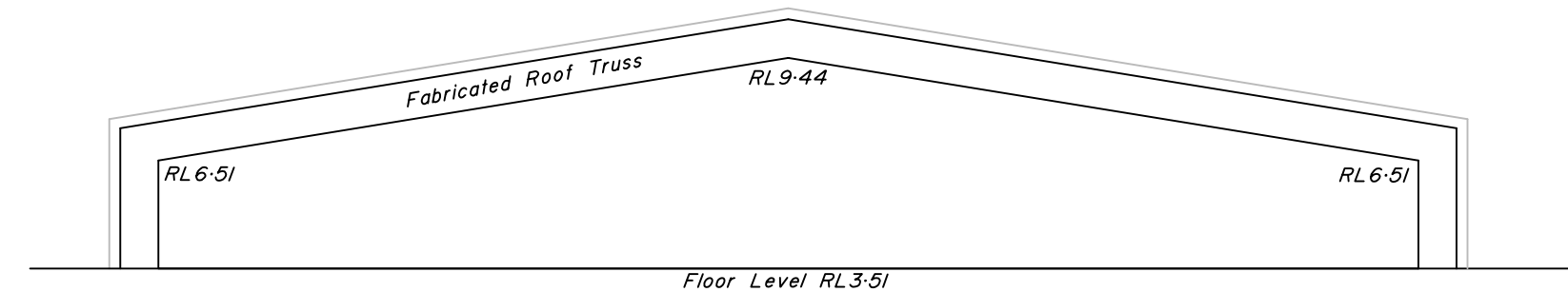


Diagram A
Mezzanine Level

TYPICAL WAREHOUSE SECTIONS



Typical Section AA



Typical Section BB

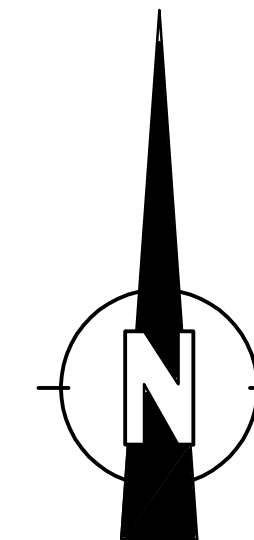
LEGEND

- Electrical Switchboard
- Fire Hydrant
- Fire Reel
- Building Floor Level

- Switchboard Cabinet
- Internal Walls

Symbols indicated on this plan are representative only and do not relate to the actual attributes of the physical object

Scale 1:200 Lengths are in Metres



GOODWIN MIDSON

SURVEYING | TOWN PLANNING | MAPPING

Servicing Queensland with offices in:
BRISBANE (07) 3870 2161
BOONAH (07) 5463 1596
SUNSHINE COAST (07) 5493 1707
HERVEY BAY (07) 4125 1855
www.goodwinmidson.com.au



Copyright protects this plan

client

EPOCA Construction Pty Ltd

project

**155 Fison Avenue West
EAGLE FARM**

drawing title

**Plan of Internal Layout
of Offices and
Warehouse Areas**

PARISH:

COUNTY:

Contour Interval:

field book:

level book:

drawn GHJ

surveyed GHJ

checked

vertical datum

AHD

horizontal datum

origin

PM142475

RL 3.267

associated consultants

H		
G		
F		
E		
D		
C		
B		
A	6/8/10	GHJ Revised Structure Location

revisions

scale 1:200

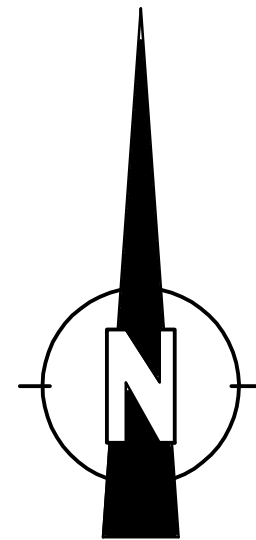
reference no

14047-2

A1

amdt

A



Servicing Queensland with offices in:

BRISBANE (07) 3670 261
BOONAH (07) 5463 1596
SUNSHINE COAST (07) 5493 1707
HERVEY BAY (07) 4125 1855
www.goodwinmidson.com.au



Copyright protects this plan

client

EPOCA Construction Pty Ltd

project

155 Fison Avenue West
EAGLE FARM

drawing title

Plan of Internal Layout
of Offices and
Warehouse Areas

PARISH:

COUNTY:

Contour Interval:

field book:

level book:

drawn

GHJ

surveyed

GHJ

checked

vertical datum

horizontal datum

AHD

origin

origin

PM142472

RL3.267

associated consultants

H		
G		
F		
E		
D		
C		
B		
A	6/8/10	GHJ Revised Structure Location

revisions

scale 1:200

A1

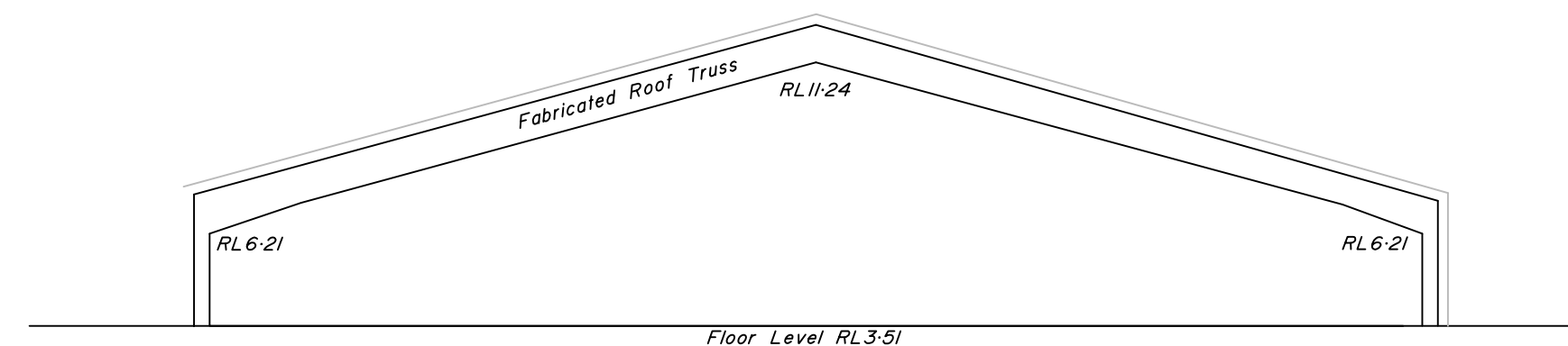
reference no

14047-2

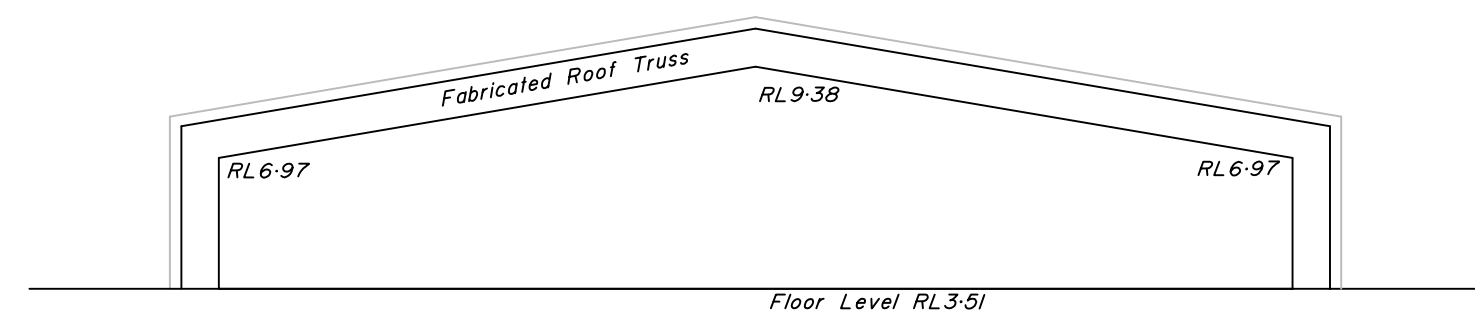
amdt

A

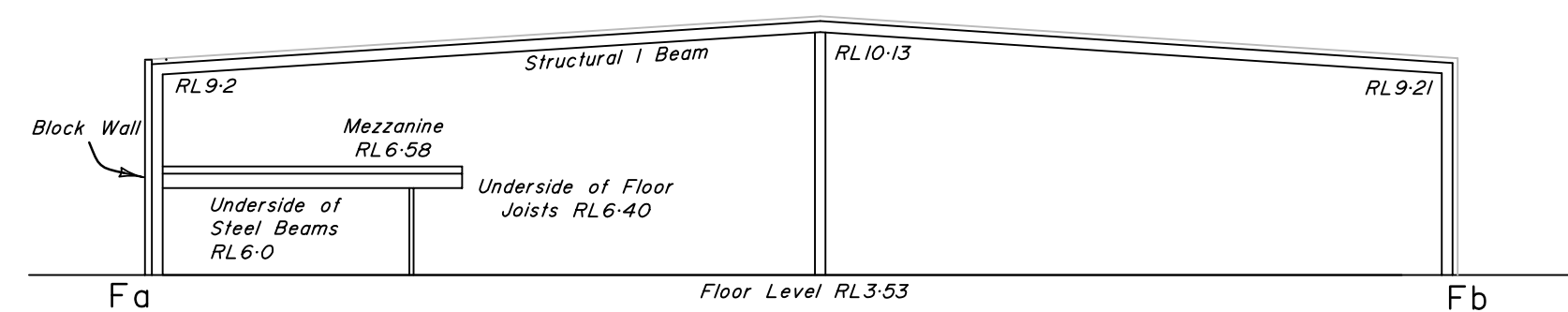
TYPICAL WAREHOUSE SECTIONS



Typical Section CC



Typical Section DD



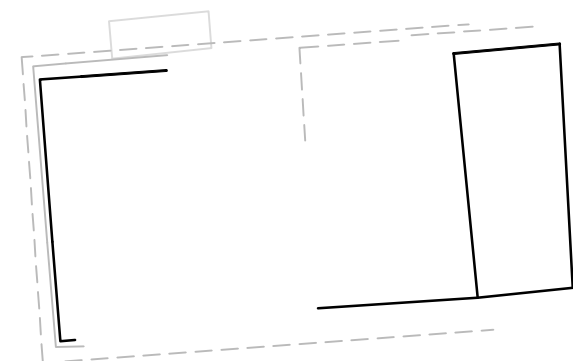
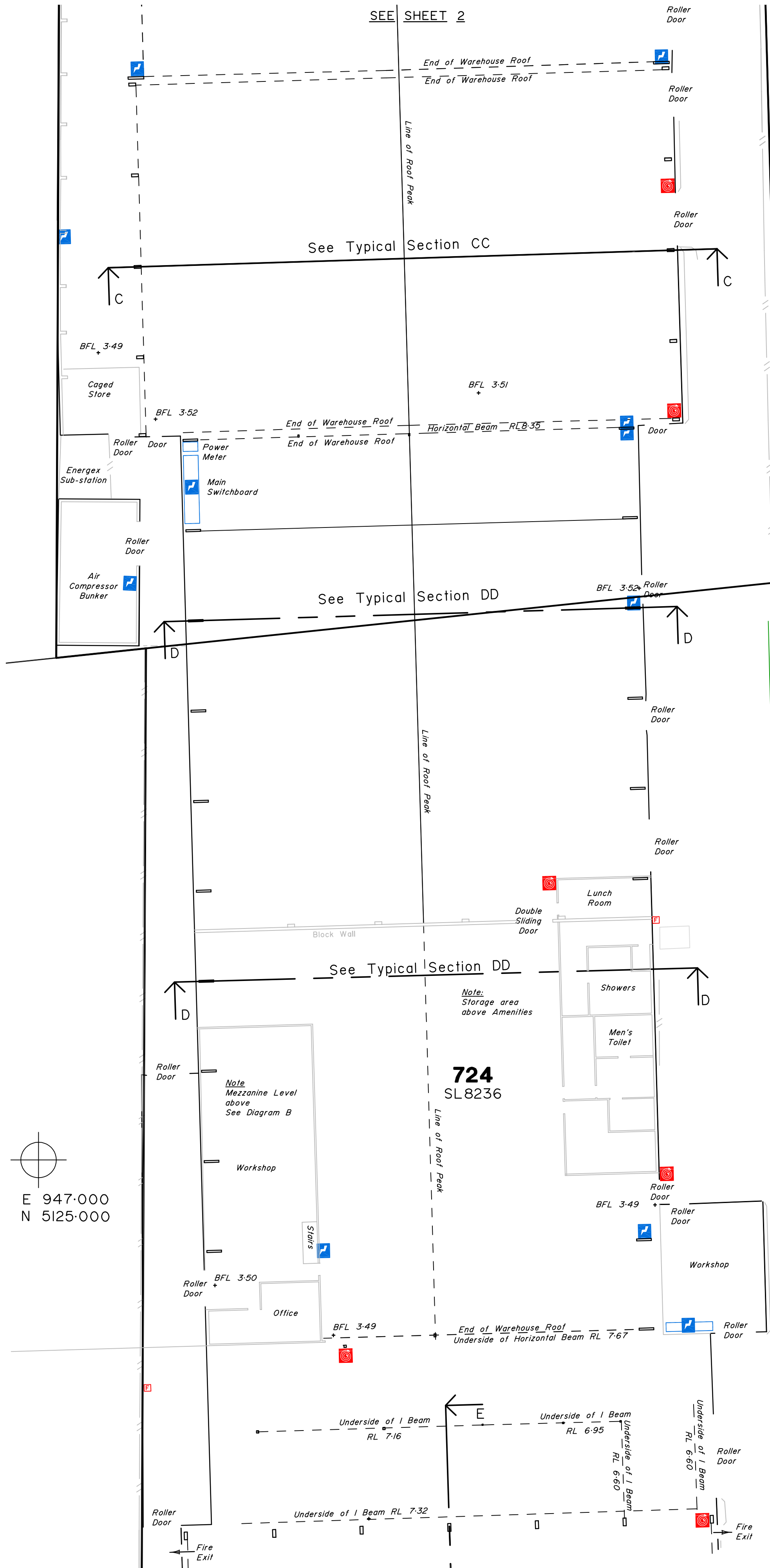
Section FaFb

Diagram B
Mezzanine Level

LEGEND

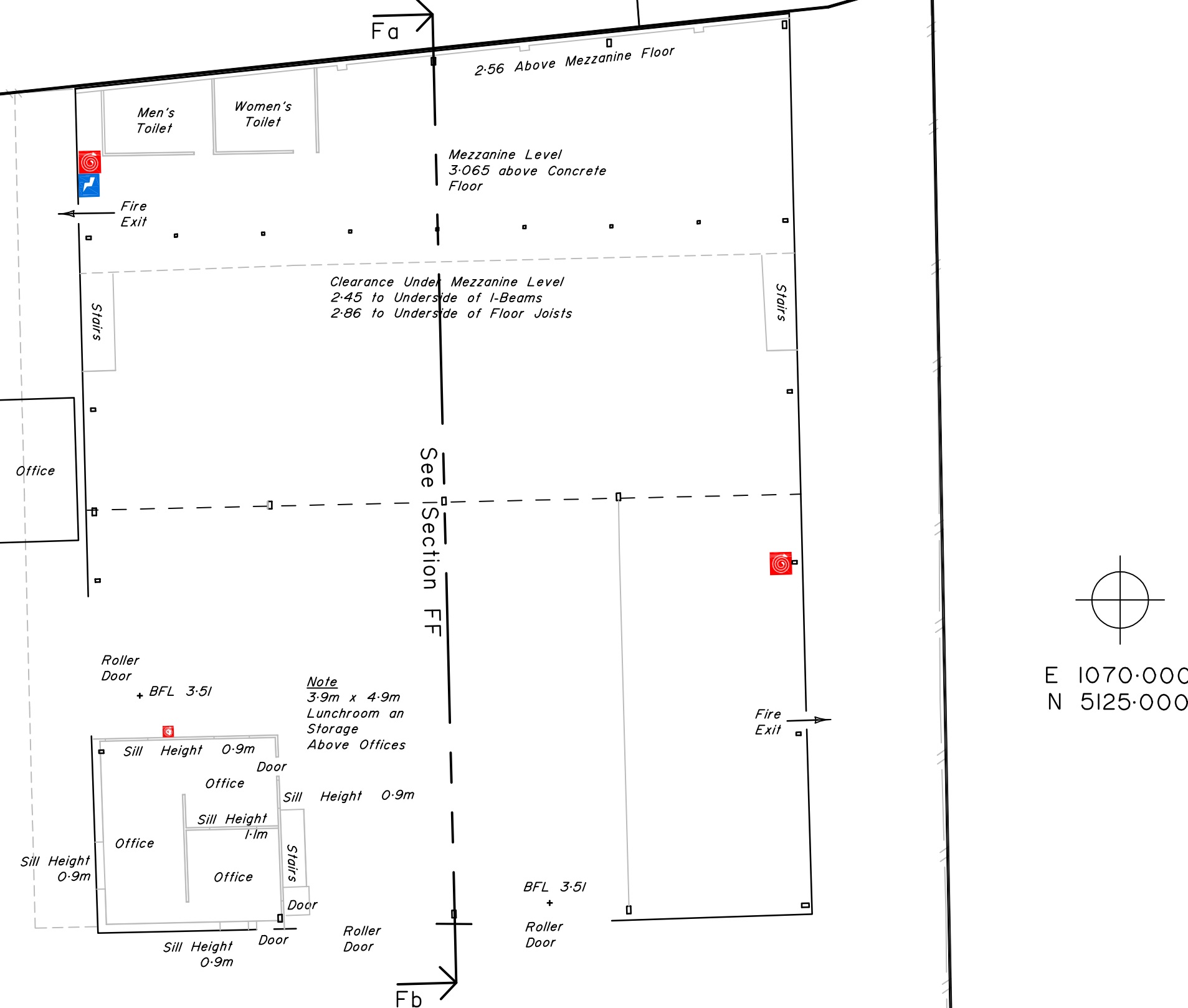
- Electrical Switchboard
- Fire Hydrant
- Fire Reel
- Building Floor Level
- Switchboard Cabinet
- Internal Walls

Symbols indicated on this plan are representative only and do not relate to the actual attributes of the physical object

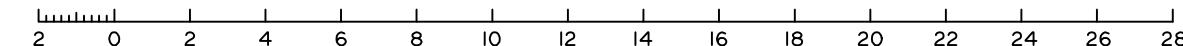


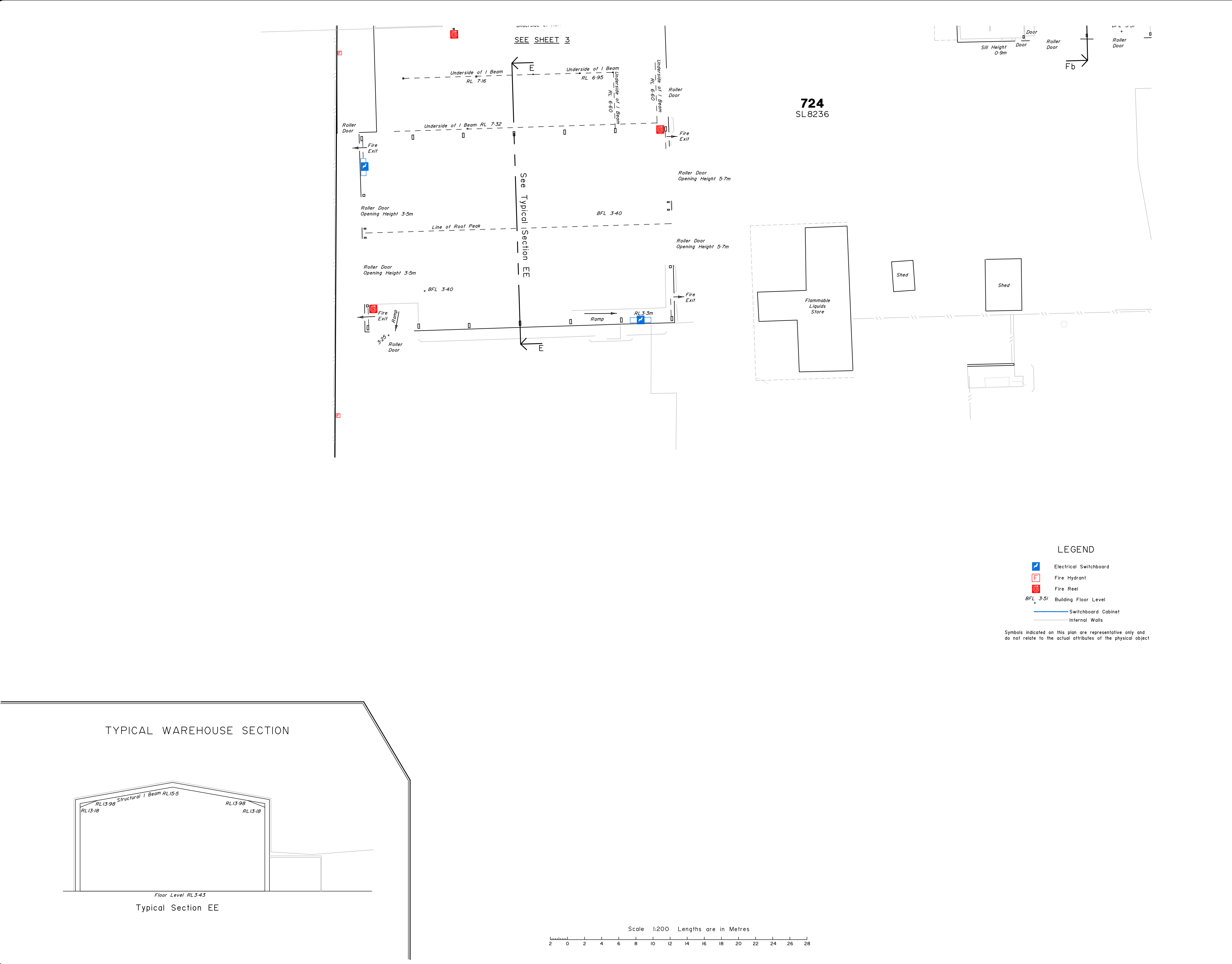
724 SL8236

SEE SHEET 4



Scale 1:200 Lengths are in Metres





**GOODWIN
MIDSON**
SURVEYING | TOWN PLANNING | MAPPING

Servicing Queensland with offices in:
BRISBANE (07) 3870 2161
BOONAH (07) 5463 1596
SUNSHINE COAST (07) 5493 1707
HERVEY BAY (07) 4125 1855
www.goodwinmidson.com.au

 Copyright protects this plan

client
EPOCA Construction Pty Ltd

project
155 Fison Avenue West EAGLE FARM

drawing title
Plan of Internal Layout of Offices and Warehouse Areas

PARISH:
COUNTY:

Contour Interval:

field book: level book:

drawn GHJ

surveyed GHJ

checked

vertical datum AHD	horizontal datum origin
origin PM142475 RL3.267	

associated consultants

H		
G		
F		
E		
D		
C		
B		
A	6/8/10	GHJ Revised Structure Location

revisions

scale	1:200	A1
reference no	14047-2	amdt A



The title boundaries as shown herein were not marked at the time of survey and have been determined by plan dimensions only and not by field survey. Services shown herein have been located where possible by field survey. If not able to be located, services have been plotted from relevant authority records and have been noted accordingly on this plan. Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

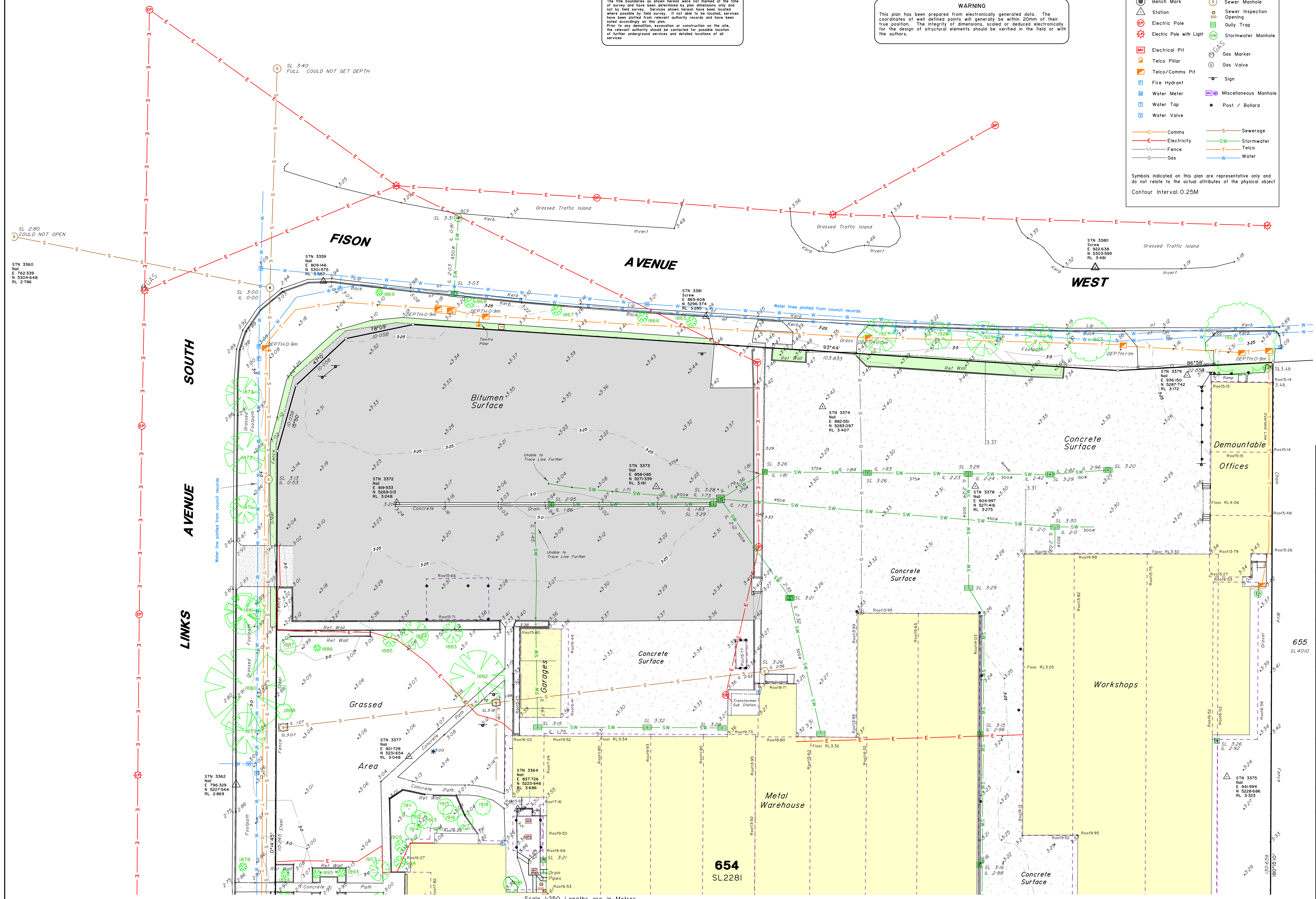
WARNING
This plan has been prepared from electronically generated data. The coordinates of well defined points will generally be within 20mm of their true position. The integrity of dimensions, scaled or deduced electronically for the design of structural elements should be verified in the field or with the authors.

LEGEND

Bench Mark	Sewer Manhole
Station	Sewer Inspection Opening
Electric Pole	Gully Trap
Electric Pole with Light	Stormwater Manhole
Electrical Pit	Gas Marker
Telco Pillar	Gas Valve
Telco/Comms Pit	Sign
Fire Hydrant	Miscellaneous Manhole
Water Meter	Post / Bollard
Water Tap	
Water Valve	

Comms	Sewerage
Electricity	Stormwater
Fence	Telco
Gas	Water

Symbols indicated on this plan are representative only and do not relate to the actual attributes of the physical object.
Contour Interval: 0.25M



110 Links Ave South Eagle Farm
For
Epoca Group Pty Ltd

IMPORTANT NOTES:
(These notes are an integral part of this plan)
This plan has been prepared for Epoca Group Pty Ltd for the purposes of Level and Detail survey.
It is not to be used by any other person or corporation or for any other purposes.
Copyright © Queensland Surveying Pty Ltd, a Veris Company. 16/10/2017

THESE DESIGNS AND DRAWINGS ARE COPYRIGHT AND ARE NOT TO BE USED OR REPRODUCED WITHOUT THE WRITTEN PERMISSION OF VERIS

Data Sources	
Cadastral Boundaries	Survey
Contours / Topographic	Survey
Aerial Images	
Flood Levels	
Engineering Design	
Architectural Design	
Landscape Design	

Revision	
A	Original
B	Revised

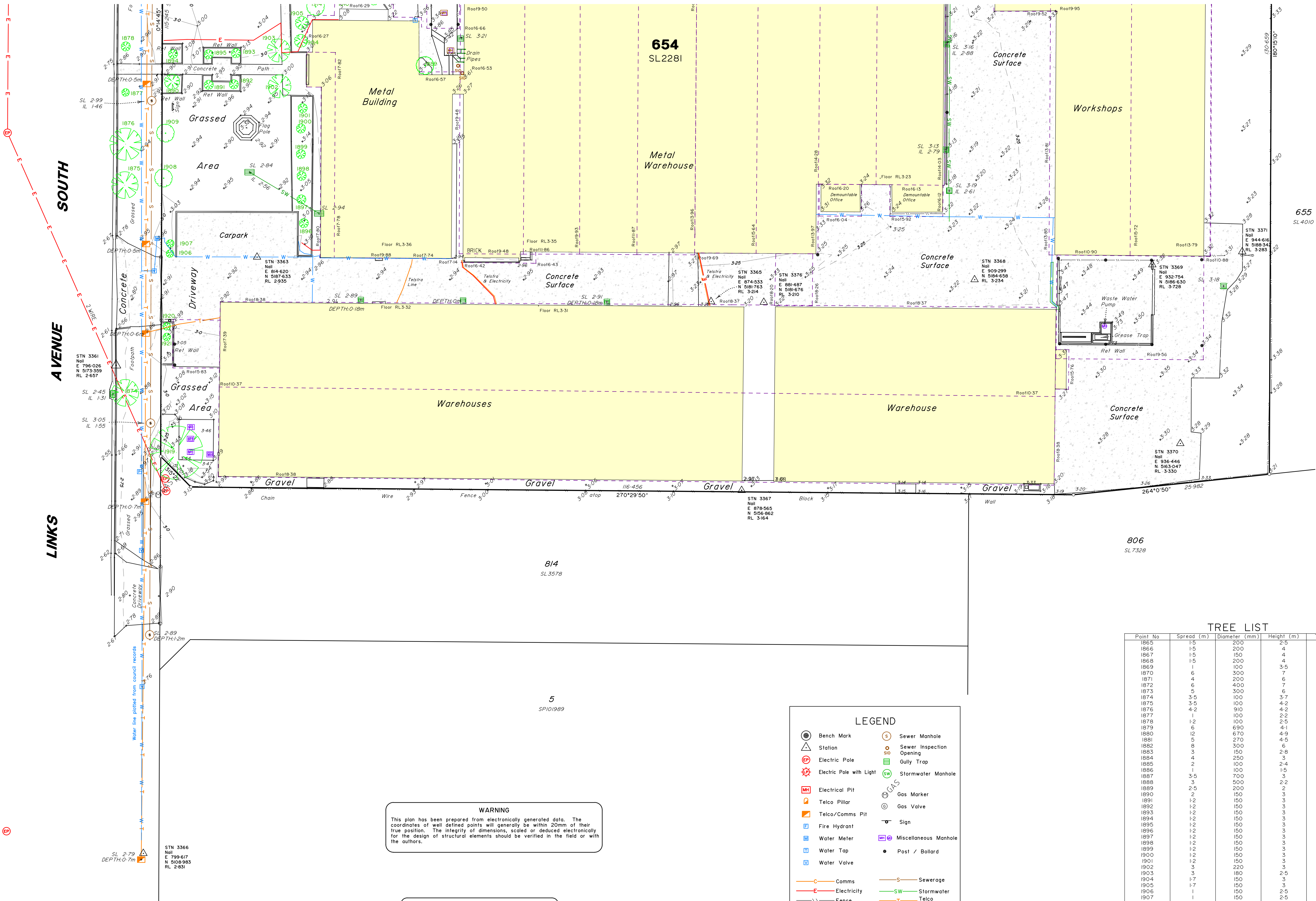
Locality: Eagle Farm
Local Authority: Brisbane City Council
Projection: SP201195
Horizontal Meridian: AHD
Vertical Level Datum: AHD
Scale: 1:250 @ A3
Surveyed: JM 25-08-2017
Designed: RCS 30-09-2017
Checked: ELH 18-10-2017
Plot Date: 27 Oct 2017
Computer File Ref: 32448-DS01-A.dwg

Plan of Level and Detail survey over Lot 654 on SL2281 110 Links Ave South Eagle Farm

BRISBANE 077 466 4700
MACKAY 077 461 2911
WHITSUNDAYS 077 466 1722
CAIRNS 077 461 6722
veris.com.au

ACN 604 671 374
Queensland Surveying Pty Ltd, a Veris Company

Drawing No 32448-DS01 Sht 1 Issue A



WARNING

This plan has been prepared from electronically generated data. The coordinates of well defined points will generally be within 20mm of their true position. The integrity of dimensions, scaled or deduced electronically for the design of structural elements should be verified in the field or with the authors.

The title boundaries as shown hereon were not marked at the time of survey and have been determined by plan dimensions only and not by field survey. Services shown hereon have been located where possible by field survey. If not able to be located, services have been plotted from relevant authority records and have been noted accordingly on this plan. Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

LEGEND

Bench Mark

Station

Electric Pole

Electric Pole with Light

Electrical Pit

Telco Pillar

Telco/Comms Pit

Fire Hydrant

Water Meter

Water Tap

Water Valve

Sewer Manhole

Sewer Inspection Opening

Gully Trap

Stormwater Manhole

Gas Marker

Gas Valve

Sign

Miscellaneous Manhole

Post / Bollard

Comms

Electricity

Fence

Gas

Sewerage

Stormwater

Telco

Water

Symbols indicated on this plan are representative only and do not relate to the actual attributes of the physical object

Contour Interval: 0.25M

TREE LIST

Point No	Spread (m)	Diameter (mm)	Height (m)	Tree Type
1865	1.5	200	2.5	General
1866	1.5	200	4	General
1867	1.5	150	4	General
1868	1.5	200	4	General
1869	1	100	3.5	General
1870	6	300	7	General
1871	4	200	6	General
1872	6	400	7	General
1873	5	300	6	General
1874	3.5	100	3.7	General
1875	3.5	100	4.2	General
1876	4.2	910	4.2	General
1877	1	100	2.2	General
1878	1.2	100	2.5	General
1879	6	690	4.1	General
1880	12	670	4.9	General
1881	5	270	4.5	General
1882	8	300	6	General
1883	3	150	2.8	General
1884	4	250	3	General
1885	2	100	2.4	General
1886	1	100	1.5	General
1887	3.5	700	3	Shrub
1888	3	500	2.2	Shrub
1889	2.5	200	2	Shrub
1890	2	150	3	General
1891	1.2	150	3	General
1892	1.2	150	3	General
1893	1.2	150	3	General
1894	1.2	150	3	General
1895	1.2	150	3	General
1896	1.2	150	3	General
1897	1.2	150	3	General
1898	1.2	150	3	General
1899	1.2	150	3	General
1900	1.2	150	3	General
1901	1.2	150	3	General
1902	3	220	3	General
1903	3	180	2.5	General
1904	1.7	150	3	General
1905	1.7	150	3	General
1906	1	150	2.5	General
1907	1	150	2.5	General
1908	2.2	200	2.7	Pine
1909	2.7	200	3	Pine
1910	6	900	3.5	Pine
1911	3.5	100	2	Shrub
1912	2	100	1.5	Shrub
1913	2.4	100	1.5	Shrub
1914	2	100	1.5	Shrub
1915	2	200	1.5	Shrub
1916	2	100	1.5	General
1917	2	100	1.5	Shrub
1918	3	300	3.2	General
1919	7	550	5	General
1920	1	120	2.2	General
1921	1	120	2.2	General
1922	11	650	5	Native
1923	6	400	5	Native
1924	4	250	4	General
1925	5	350	4.5	General
1926	4	250	4	General
1927	5	500	6	General

110 Links Ave South
Eagle Farm
For
Epoca Group Pty Ltd

IMPORTANT NOTES:
(These notes are an integral part of this plan)
This plan has been prepared for Epoca Group Pty Ltd for the purposes of Level and Detail survey.
It is not to be used by any other person or corporation or for any other purposes.
Copyright © Queensland Surveying Pty Ltd. a Veris Company. 30/8/2017

These designs and drawings are copyright and are not to be used or reproduced without the written permission of Veris.

Data Sources

Cadastral Boundaries	Survey
Contours / Topographic	Survey
Aerial Images	Survey
Flood Levels	Survey
Engineering Design	Survey
Architectural Design	Survey
Landscape Design	Survey

Local Authority: Eagle Farm
Brisbane City Council

Projection: SP245195

Horizontal Meridian: AHD

Vertical Level Datum: RL 3.267

Scale: 1:250 @ A4

Surveyed: JM 25-08-2017

Designed: RCS 30-08-2017

Drawn: ELH 16-10-2017

Checked: ELH 16-10-2017

Computer File Ref: 32448-DS01-A.dwg

Plan of Level and Detail
survey over
Lot 654 on SL2281
110 Links Ave South
Eagle Farm



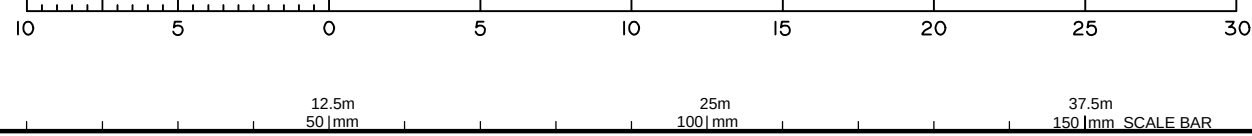
BRISBANE 071 366 4700
MACKAY 071 4951 2911
WHITSUNDAYS 071 466 1722
CAIRNS 071 466 1722

veris.com.au

ACN 604 671 374
Queensland Surveying Pty Ltd. a Veris Company

Drawing No Issue
32448-DS01 Sht 2 A

Scale 1:250 Lengths are in Metres

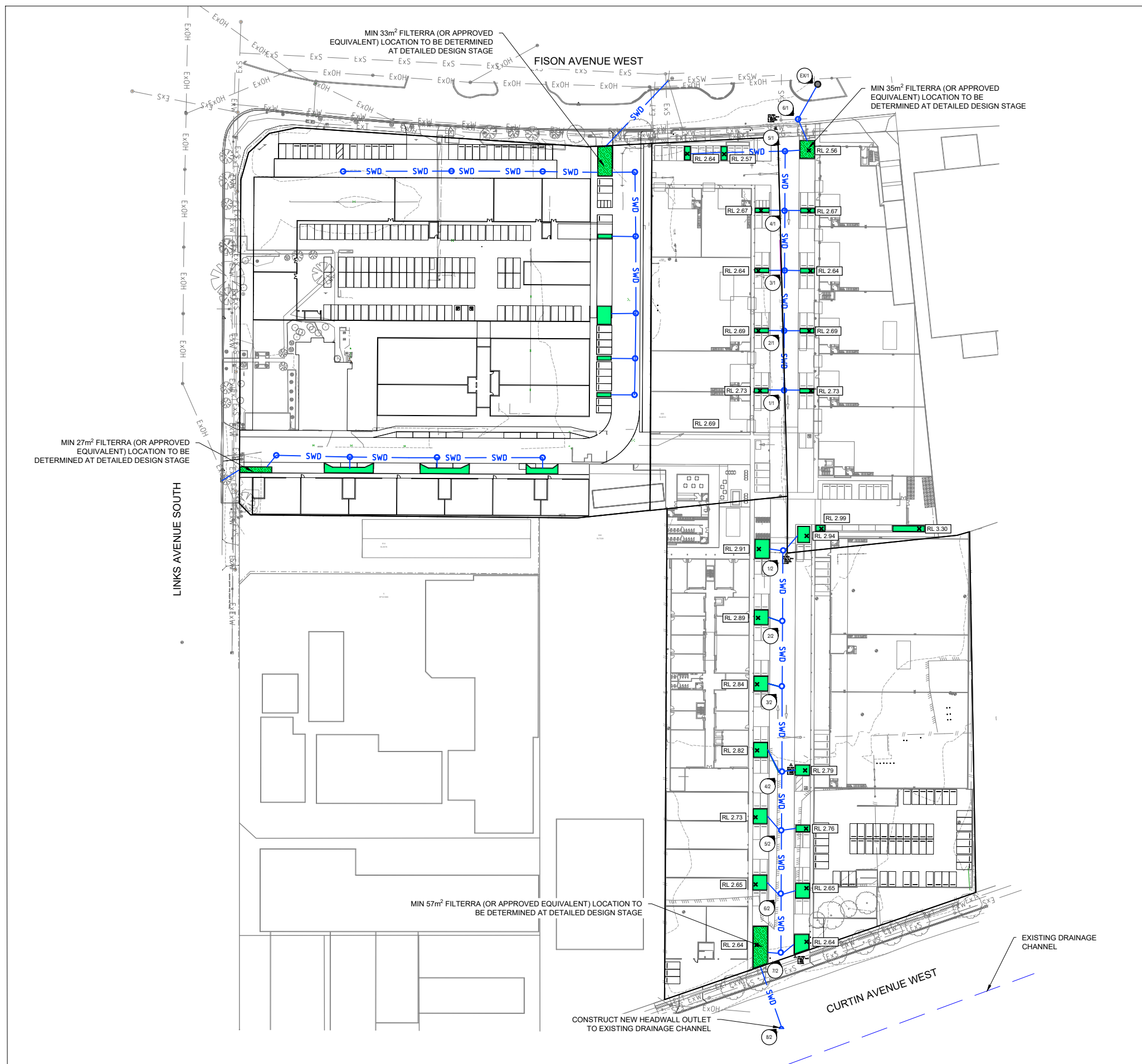




Appendix C – Civil Design Drawings

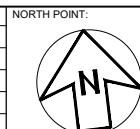
EXISTING PROPERTY BOUNDARY
EASEMENT BOUNDARY
EXISTING CONTOURS (AT 0.25m INTERVALS)
EXISTING KERB
EXISTING EDGE OF BITUMEN
EXISTING ROAD CENTRELINE
EXISTING TOP OF BATTER
EXISTING BOTTOM OF BATTER
EXISTING STORMWATER
EXISTING SEWERAGE
EXISTING WATER
EXISTING TELSTRA
EXISTING GAS
EXISTING OVERHEAD ELECTRICITY
EXISTING UNDERGROUND ELECTRICITY
PROPOSED STORMWATER DRAINAGE PIPE
PROPOSED DRAINAGE MH
PROPOSED BIOPOD
BIOPOD FILTER SURFACE LEVEL

1. ALL SURFACE DRAINAGE PIPES ARE uPVC SN8 UNLESS NOTED OTHERWISE.
2. ALL uPVC PIPE CONNECTIONS ARE BENDS AND ARE TO BE CONSTRUCTED USING PRODUCTS READILY AND CURRENTLY AVAILABLE ON THE MARKET.
3. REFER HYDRAULICS DESIGN DRAWINGS FOR DETAILS OF ROOFWATER PIPES.
4. ROOFWATER CONNECTIONS TO BE 1.2m FROM PROPERTY BOUNDARY UNLESS NOTED OTHERWISE.
5. ROOFWATER DRAINAGE LINES TO BE 0.6m OFFSET FROM REAR AND SIDE BOUNDARIES UNLESS SHOWN OTHERWISE
6. ALL ROOFWATER PIPES ARE Ø150mm uPVC UNLESS NOTED OTHERWISE.
7. ALL SETTING OUT IS THE RESPONSIBILITY OF THE CONTRACTOR. PRIOR TO WORKS COMMENCING ON SITE, THE SUPERINTENDENT'S SURVEYOR SHALL PEG ALL ALLOTMENT BOUNDARIES, PROVIDE COORDINATE INFORMATION TO THESE PEGS AND PLACE BENCH MARKS. THE CONTRACTOR SHALL SET OUT THE WORKS FROM AND MAINTAIN THESE PEGS.
8. THE CONTRACTOR IS TO CONFIRM THE LOCATION OF SERVICE CONDUITS WITH THE SUPERINTENDENT PRIOR TO LAYING STORMWATER DRAINAGE. ALL TRENCH EXCAVATION AND CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKS, HEALTH AND SAFETY ACT 2011.
9. REMOVE ANY REDUNDANT DRAINAGE OUTLETS FROM THE KERB AND CHANNEL INCLUDING ANY ASSOCIATED PIPE WORK ACROSS THE FOOTWAY AND REINSTATE THE KERB AND CHANNEL AND THE FOOTWAY AREA IN ACCORDANCE WITH THE COUNCIL GUIDELINES.



A

A	ISSUED FOR APPROVAL	03.11.21	EG	NR
REV	DESCRIPTION	DATE	DRAWN	REVIEWED



ARCHITECT:
ROTHELOWEMAN

CLIENT:

KING FISO
& KOM INDUSTRIAL 5 P/L
& LINK BROSE NO.1 P/L



SCALE BARS:



0 9 18 24 36m

SCALE 1:750 @ A1

PROJECT:
PROPOSED DEVELOPMENT
EAGLE FARM PRECINCT
MASTER PLAN

DRAWING TITLE:
**STORMWATER
LAYOUT PLAN**

DESIGNED:



Appendix D – BCC City Plan Codes

Project Location: 110 Links Avenue South, 155, 161 Fison Avenue West and 364 Curtin Avenue West Job Reference: 9914

Flood Overlay Code Performance outcomes	Acceptable outcomes	Outcome	Comments	Council Use
Section B—If accepted development subject to compliance with identified requirements (acceptable outcomes only) or assessable development other than for a <u>dwelling house</u> or reconfiguring a lot Note—If development that is accepted development subject to compliance with identified requirements complies with the acceptable outcomes of this part, no further assessment against this code is required.				
PO3 Development: a) is compatible with flood hazard in a <u>defined flood event</u>; b) minimises the risk to people from flood hazard; c) does not reduce the ability of evacuation resources including <u>emergency services</u> to access and evacuate the site in a flood emergency, with consideration to the scale of the development; d) minimises impacts on property from flooding; e) minimises disruption to residents, business or site operations and recovery time due to flooding; f) minimises the need to rebuild structures after a flood event greater than the defined flood event.	AO3 Development for a material change of use is identified in <u>Table 8.2.11.3.C</u> as compatible with the flood hazard in the relevant flood planning area.	AO	The development is compatible with flood hazard in a defined flood event and minimises the risk to people from flood hazard. Emergency access and evacuation routes have been considered. The development does not cause impacts of flooding on surrounding properties.	

Flood Overlay Code Performance outcomes	Acceptable outcomes	Outcome	Comments	Council Use
Note—Where Table 8.2.11.3.C identifies that a flood risk assessment is required, compliance with this performance outcome can be achieved by submitting a flood risk assessment, which may be included within a flood study, addressing the criteria within this performance solution. Preparing flood risk assessments and flood studies is required to be in accordance with the Flood planning scheme policy. Note—An emergency management plan prepared in accordance with the Flood planning scheme policy, which sets out procedures for evacuation due to flooding may be used to demonstrate compliance with this performance outcome.				
PO4 Development for a <u>park</u> ensures that the design of a park and location of structures and facilities responds to the flood hazard and	AO4.1 Development involving a building or structure in a <u>park</u> complies with the flood planning levels specified in Table 8.2.11.3.D.	N/A	The development does not involve a park	

Flood Overlay Code	Acceptable outcomes	Outcome	Comments	Council Use
Performance outcomes				
balances the safety of intended users with: a) maintaining continuity of operations; b) impacts of flooding on asset life and ongoing maintenance costs; c) efficient recovery after flood events; d) recreational benefits to the city; e) availability of suitable land within the <u>park</u>.	AO4.2 Development involving a building or structure in a park where <u>Table 8.2.11.3.D</u> does not apply: a) is not located within the 20% <u>AEP</u> flood extent of any creek/waterway or overland flow path; or b) is located above the 20% AEP flood level of any creek/waterway or overland flow path.	N/A	The development does not involve a park	
Section C—If for assessable development other than for a <u>dwelling house</u>				
PO5 Development is located and designed to: a) minimise the risk to people from flood hazard on the site; b) minimise flood damage to the development and contents of buildings up to the <u>defined flood event</u>; c) provide suitable amenity; d) minimise disruption to residents, recovery time and the need to rebuild structures after a flood event up to and including the defined flood event.	AO5.1 Development complies with the flood planning levels specified in <u>Table 8.2.11.3.D</u>. Note—If located in an area with no Council-derived flood levels such as an overland flow path, a <u>Registered Professional Engineer Queensland</u> with expertise in undertaking flood studies is to derive the applicable flood level and certify that the development meets the required flood planning levels in <u>Table 8.2.11.3.D</u>. The study is to demonstrate that the development and engineering design methods conform to the principles within the <u>Flood planning scheme policy</u> and the <u>Infrastructure design planning scheme policy</u>. AO5.2 Development is:	AO	The proposed development complies with the flood planning levels specified in Table 8.2.11.3.D. The building finished floor levels have been set from 3.25m AHD up to 3.5m AHD, therefore exceed the minimum panning levels.	
		AO	The development will not be within any of the listed sub-categories.	

Flood Overlay Code Performance outcomes	Acceptable outcomes	Outcome	Comments	Council Use
	a) not located in the: (i) Brisbane River flood planning area 1, 2a, or 2b sub-categories; (ii) Creek/waterway flood planning area 1 or 2 sub-categories; (iii) Overland flow flood planning area sub-category; or b) only located in these sub-categories if a <u>Registered Professional Engineer Queensland</u> with expertise in undertaking flood studies certifies that: (i) the development design, siting and any mitigation measures will ensure the development is structurally adequate to resist hydrostatic, hydrodynamic and debris impact loads associated with flooding up to the defined flood event; and (ii) the risk to people is managed to an acceptable level.		The development will adhere to these conditions.	
PO6 Development involving essential electrical services or a <u>basement</u> storage area is suitably located and designed to ensure public safety and minimise flood recovery and economic consequences of damage during a flood.	AO6.1 Development ensures that: a) all areas containing essential electrical services comply with the flood planning levels in <u>Table 8.2.11.3.D</u> ; or b) if a <u>basement</u> contains essential electrical services or a private basement storage area, the basement is a waterproof structure with walls and floors impermeable to the passage of water with all entry points and	AO	Any essential electrical services are to be complied with the flood planning areas specified in the flood overlay code.	

Flood Overlay Code	Acceptable outcomes	Outcome	Comments	Council Use
Performance outcomes				
	services located at or above the relevant flood planning level in Table 8.2.11.3.D. Note—A <u>basement</u> storage area does not include a bike storage room, change room, building maintenance storage and non-critical electrical services.			
	AO6.2 Development involving a <u>basement</u> that relies on a pumping solution to manage floodwater ingress or for dewatering after a flood provides a secondary pump system with a backup power source for the pump.	N/A	The development does not involve a basement.	
PO7 Development does not directly or indirectly create a material adverse impact on flood behaviour or drainage on properties that are upstream, downstream or adjacent to the development.	AO7.1 Development: a) does not block, or divert floodwaters for any area affected by creek/waterway or overland flow flooding, excluding storm-tide flooding and Brisbane River flooding sources; or b) does not result in a material increase in flood level or hydraulic hazard on upstream, downstream or adjacent properties. Note—Compliance with this acceptable solution can be demonstrated by the submission of a flood study by a <u>Registered Professional Engineer of Queensland</u> with expertise in undertaking flood studies demonstrating that the development and engineering design methods conform to the	AO	The development does not directly or indirectly create a material adverse impact on flood behaviour or drainage on properties that are upstream, downstream or adjacent to the development.	

Flood Overlay Code	Acceptable outcomes	Outcome	Comments	Council Use
Performance outcomes				
	principles within the <u>Flood planning scheme policy</u> and the <u>Infrastructure design planning scheme policy</u> .			
	A07.2 Development retains existing overland flow paths and does not rely wholly on piped solutions to manage major flows.	N/A	The development does not contain any overland flow paths.	
	A07.3 Development which creates a new overland flow path or significantly modifies an existing overland flow path via earthworks does not materially worsen hydraulic hazard on the site from existing conditions. Note—Compliance with this acceptable solution can be demonstrated by the submission of a flood study by a <u>Registered Professional Engineer of Queensland</u> with expertise in undertaking flood studies demonstrating that the development and engineering design methods conform to the principles within the <u>Flood planning scheme policy</u> and the <u>Infrastructure design planning scheme policy</u> .	N/A		
PO8 Development for <u>filling or excavation</u> in an area affected by creek/waterway flooding does not directly, indirectly or cumulatively cause any material increase in	A08 Development ensures that no <u>filling or excavation</u> greater than 100mm is located in the Creek/waterway flood planning area 1, 2 or 3 sub-categories if contained in the 5% <u>AEP</u> flood extent of any Creek/waterway	N/A	The site is not affected by creek/waterway flooding.	

Flood Overlay Code	Acceptable outcomes	Outcome	Comments	Council Use
Performance outcomes flooding or hydraulic hazard or involve significant redistribution of flood storage from high to lower areas in the floodplain. Note—This can be demonstrated by undertaking earthworks in compliance with the <u>Compensatory earthworks planning scheme policy</u>. Note—This part of the code applies to all development other than a <u>dwelling house</u> and any <u>secondary dwelling</u> which involves <u>filling or excavation</u>, whether or not the development application comprises a separate development application for operational work involving filling or excavation.	flood planning area sub-category for which no waterway corridor has been mapped in the <u>Waterway corridors overlay</u>.			
PO9 Development ensures that the building and site design: a) maintains the conveyance capacity of existing overland flow paths and creek/waterways; b) ensures floodwaters and flood debris can pass predominantly unimpeded under a structure or building to minimise property or	AO9.1 Development involving a building undercroft in the Creek/waterway flood planning area sub-categories or the Overland flow flood planning area sub-category: a) complies with the minimum building undercroft clearance requirements in <u>Table 8.2.11.3.E</u>; b) not located directly above any part of a waterway corridor as mapped in the <u>Waterway corridors overlay</u>.	N/A	The development will not involve a building undercroft.	

Flood Overlay Code Performance outcomes	Acceptable outcomes	Outcome	Comments	Council Use
building damage, including for a flood larger than the <u>defined flood event</u>; c) mitigates flood impacts by ensuring that filling, excavation and location of services are designed to allow for the conveyance of floodwater across the site. Note—The <u>Flood planning scheme policy</u> provides guidance on relevant considerations in determining minimum undercroft clearances and treatment of ground level in undercroft areas where floodwater conveyance is required underneath development.	AO9.2 Development involving a building undercroft in the Creek/waterway flood planning area sub-categories or the Overland flow flood planning area sub category: (a) has a ground level within the undercroft area that is free draining; (b) does not involve excavation below ground level of more than 300mm within the undercroft area.	N/A	The development will not involve a building undercroft.	
PO10 Development for <u>vulnerable uses</u>, <u>difficult to evacuate uses</u> or <u>assembly uses</u> optimises vehicular access and efficient evacuation from the development to parts of the road network unaffected by flood hazard, in order to: a) protect safety of users and <u>emergency services</u> personnel;	AO10 Development for <u>vulnerable uses</u>, <u>difficult to evacuate uses</u> or <u>assembly uses</u>: a) is not isolated in any event up to the relevant flood planning level specified in <u>Table 8.2.11.3.L</u>; or b) has direct vehicle access to a critical route or interim critical route in the <u>Critical infrastructure and movement network overlay</u> for evacuation in a flood; or c) can achieve vehicular evacuation to a suitable flood-free location.	N/A	The development is not for vulnerable, difficult to evacuate or assembly uses.	

Flood Overlay Code	Acceptable outcomes	Outcome	Comments	Council Use
Performance outcomes				
b) support efficient emergency services access and site evacuation with consideration to the scale of development. Note—A flood risk assessment may be required to address the performance outcomes or acceptable solutions which deal with evacuation and isolation arrangements, and the ability to take refuge. The <u>Flood planning scheme policy</u> provides information for undertaking flood risk assessments.	Note—A suitable flood-free location is of a size and nature sufficient to provide for the size and characteristics of the population likely to need evacuation to that area.			
PO11 Development has access which, having regard to hydraulic hazard, provides for safe vehicular and pedestrian movement and emergency services access to adjoining roads.	AO11.1 Development provides an access or driveway into the site which is: a) trafficable during the defined flood event; b) not located in the Creek/waterway flood planning area 1 sub-category; c) not located in the Overland flow flood planning area sub-category if the hydraulic hazard is unsafe in the <u>defined flood event</u>; d) the access or driveway is not inundated by a 10% <u>AEP</u> flood.	AO	The existing access is trafficable during the defined flood event and complies with the acceptable outcomes listed.	
	AO11.2 Development located in the Creek/waterway flood planning area 1, 2, 3 or 4 sub-categories locates any disabled access in the highest part of the site.	N/A	The development is not located within these sub-categories.	

Flood Overlay Code	Acceptable outcomes	Outcome	Comments	Council Use
Performance outcomes				
	Note—explanation of hydraulic hazard provided in the Flood planning scheme policy .			
PO12 Development involving a new road, a bridge or culvert is designed to minimise impacts to flood behaviour, minimise disruption to traffic during a flood and allow for emergency access.	AO12 Development involving a new road complies with the flood planning levels in Table 8.2.11.3.F .	N/A	The development does not involve a new road.	
PO13 Development for pedestrian and cyclist paths: a) provides a suitable level of trafficability; b) manages the impacts of flooding on asset life and ongoing maintenance costs; c) balances route availability with recreational and transport connectivity benefits to the city.	AO13.1 Development for cyclist and pedestrian facilities other than on public roads, including those traversing through a park and adjacent to a watercourse and overland flow path, are located above the 39% AEP (2 year ARI) flood immunity from all flooding sources. Note—If the site is subject to more than one type of flooding, the requirement that affords the greatest level of protection will apply.	N/A	The development does not involve cyclist and pedestrian facilities.	
	AO13.2 All new on-road cyclist and pedestrian facilities comply with the flood planning levels and trafficability standards for the applicable category of road in Table 8.2.11.3.F or Table 8.2.11.3.K .	N/A	The development does not involve cyclist and pedestrian facilities.	

Flood Overlay Code Performance outcomes	Acceptable outcomes	Outcome	Comments	Council Use
PO14 Development which increases the residential population within the Brisbane River flood planning area sub-categories minimises the risk to people in all flood events with consideration to flood hazard, including warning time.	AO14 Development in the Brisbane River flood planning area sub-categories in areas where the <u>residential flood level</u> is greater than 12.8m <u>AHD</u> involving: a) an increase in the number of residential dwellings; or b) additional residential lots is not subject to an unsafe hydraulic hazard in the 0.2% <u>AEP</u> flood event. Note—Explanation of a hydraulic hazard is provided in the <u>Flood planning scheme policy</u> .	N/A	The development is not located within this sub-category.	
Additional performance outcomes and acceptable outcomes for <u>essential community infrastructure</u>				
PO15 Development involving <u>essential community infrastructure</u> : a) remains functional to serve community need during and immediately after a flood event, or is part of a network that is able to maintain the function of the essential community infrastructure when parts of the development are unable to function during or after a flood; b) is designed, sited and operated to avoid adverse impacts on the	AO15 Development involving <u>essential community infrastructure</u> : a) is ancillary to and not relied upon for the provision of the essential service during a flood; or b) is located above the flood planning levels in <u>Table 8.2.11.3.G</u> ; c) has access to or provides the necessary back-up emergency electricity and communications supply in times of flood; d) is designed and constructed to resist hydrostatic and hydrodynamic forces as a result of inundation by the flood event	N/A	The development does not involve essential community infrastructure.	

Flood Overlay Code Performance outcomes	Acceptable outcomes	Outcome	Comments	Council Use
community or the environment due to the impacts of flooding on infrastructure, facilities or access and egress routes; c) is able to remain functional or is part of a network which is able to remain functional even when other infrastructure or services (such as electricity supply) may be compromised in a flood event; d) contains mitigation measures which are not entirely dependent on human activation to respond to a flood event. Note—Protection of function is required up to and including the flood event in Table 8.2.11.3.G.	listed for the development type in Table 8.2.11.3.G; e) that services a local area: (i) is able to be accessed in times of flood to service local community needs up to the event listed for that development type in Table 8.2.11.3.G; or (ii) has a service continuity plan that demonstrates the continued provision of service during the relevant flood event.			
Additional performance outcomes and acceptable outcomes if development involves the processes in Table 8.2.11.3.H				
PO16 Development involving the storage and handling of <u>hazardous materials</u> avoids or minimises risks to public health and safety and the environment, by: a) protecting underground tanks for hazardous materials against the forces of buoyancy, velocity flow and debris impacts;	AO16 a) Development does not include the storage or handling of hazardous chemicals that exceed the hazardous chemicals flood hazard threshold quantities in Table 8.2.11.3.M. b) Development involving the processes listed in Table 8.2.11.3.H: (i) where located in the Flood overlay area, occurs only in the Creek/waterway flood planning area 5 sub-category or the	N/A	The development does not include the storage or handling of hazardous chemicals that are equivalent to or exceed the threshold quantities in Table 8.2.11.3.M. The development does not involve the processes in Table 8.2.11.3.H.	

Flood Overlay Code	Acceptable outcomes	Outcome	Comments	Council Use
b) securing above-ground tanks for hazardous materials against flotation and lateral movement; c) preventing damage to hazardous materials pipework or entry of floodwater into hazardous materials pipework; d) preventing damage to or off-site release of packages, drums or containers storing hazardous materials. Note—A chemical hazards flood risk report prepared in accordance with the <u>Management of hazardous chemicals in flood affected areas planning scheme policy</u> can assist in demonstrating achievement of this performance outcome. Note—A pump drainage system is not an acceptable measure to meet the performance outcome.	Brisbane River flood planning area 5 sub-category; or (ii) is consistent with the standards contained in the <u>Management of hazardous chemicals in flood affected areas planning scheme policy</u> and can operate without risk of environmental harm during a flood event. Note—The <u>Management of hazardous chemicals in flood prone areas planning scheme policy</u> sets out further information and processes including risk assessment for the management of hazardous chemicals in flood planning areas.			

* **SOLUTIONS:** A – Acceptable Solution; A/S – Alternate Solution; N/A – Not Applicable

Coastal Hazard Overlay Code Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
Section B— If for accepted development subject to compliance with identified requirements (acceptable outcomes only) or assessable development other than for a <u>dwelling house</u>				
PO2 Development other than for a park is located and designed to: (a) minimise the risk to all persons from coastal hazards; (b) minimise flood damages to the development and contents of buildings; (c) provide suitable amenity; (d) minimise disruption to residents, recovery time, and rebuilding or restoration costs after coastal hazard events.	AO2 Development achieves minimum flood planning levels consistent with Table 8.2.6.3.C . Editor's note—Information about flooding from storm tide is provided in Council's FloodWise Property Report .	AO	Development achieves minimum flood planning levels consistent with Table 8.2.6.3.C .	
PO3 Development for a park ensures that the design of the park and location of structures and facilities responds to coastal hazards and balances the safety of intended users with: (a) maintaining continuity of operations; (b) impacts of flooding on asset life and ongoing maintenance costs; (c) efficient recovery after flood events; (d) recreational benefits to the city; (e) availability of suitable land within the park. Note—The Infrastructure design planning scheme policy provides more detail on standards and specifications for public assets.	AO3 Development involving a building or structure in a park : (a) complies with the minimum flood planning levels in Table 8.2.6.3.C; or (b) is not located below the 20% AEP storm-tide level if Table 8.2.6.3.C does not apply to the type of structure.	N/A	Not applicable to this development	

Coastal Hazard Overlay Code		Acceptable outcomes	Solutions*	Comments	Council Use
Performance outcomes					
Section C—If assessable development other than for a dwelling house					
General					
P04 Development has access which provides for safe vehicular and pedestrian movement in the development, including emergency services access during and after a coastal hazard event.	A04 Development locates access points and driveways in the flood free area (or the area of the lowest flood risk) of the site.	AO	The access point for the site is located in the area of lowest flood risk.		
P05 Development for pedestrian and cyclist paths: (a) provides a suitable level of trafficability; (b) manages the impacts of flooding on asset life and ongoing maintenance costs; (c) balances route availability with recreational and transport connectivity benefits to the city.	A05.1 Development for off-road pedestrian and cyclist paths: (a) is not located in the Erosion prone area – coastal erosion subcategory; or (b) complies with the minimum flood planning levels in Table 8.2.6.3.H. Note—If the site is subject to more than 1 type of flooding, the requirement that affords the highest flood planning level will apply.	N/A	The development does not involve cyclist and pedestrian facilities.		
	A05.2 All new on-road cyclist and pedestrian facilities comply with the road flood immunity and trafficability standards for the applicable category of road in Table 8.2.6.3.H or Table 8.2.6.3.I				
P06 Development does not: (a) impact adversely on the safety or amenity of an adjoining site; (b) impact adversely on the ability of others to implement future coastal hazard adaptation actions.	A06 Development does not concentrate, intensify or divert floodwater, erosion impacts or cause nuisance ponding onto other premises.	AO	The proposed development does not concentrate, intensify or divert floodwater, erosion impacts or cause nuisance ponding onto other premises		

Coastal Hazard Overlay Code Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
P07 Development involving essential electrical services or a basement storage area is suitably located and designed to ensure public safety and minimise the need for flood recovery and economic consequences of damage during a flood.	A07.1 Development ensures that: (a) all essential electrical services comply with the flood planning levels in Table 8.2.6.3.C ; or (b) if a basement contains essential electrical services or a private basement storage area, the basement is a waterproof structure with walls and floors impermeable to the passage of water and all entry points and services are located at or above the relevant flood immunity level in Table 8.2.6.3.C . Note—A basement storage area is a basement-level area for private storage, other than a bike storage room, change room, building maintenance storage and non-critical electrical services.	N/A	No basements or essential electrical services are proposed as part of the development	
	A07.2 Development involving a basement that relies on a pumping solution to manage floodwater ingress or for dewatering after a flood, provides an appropriately flood protected backup power source for those pumps.			

Coastal Hazard Overlay Code Performance outcomes	Acceptable outcomes	Solutions*	Comments	Council Use
PO8 Development involving the storage and handling of hazardous materials avoids or minimises risks to public health and safety and the environment, by: (a) protecting underground tanks for hazardous materials against the forces of buoyancy, velocity flow and debris impacts; (b) securing above-ground tanks against flotation and lateral movement; (c) preventing damage to pipework or entry of floodwater into pipework; (d) preventing damage to or off-site release of packages, drums or containers. Note—A chemical hazards flood risk report prepared in accordance with the Management of hazardous chemicals in flood affected areas planning scheme policy can assist in demonstrating achievement of this performance outcome. Note—A pump drainage system is not an acceptable measure to meet the performance outcome.	AO8.1 Development does not include the storage or handling of hazardous chemicals that exceed the hazardous chemicals flood hazard threshold quantities in Table 8.2.6.3.J .	N/A	The development does not include the storage or handling of hazardous chemicals that are equivalent to or exceed the threshold quantities in Table 8.2.6.3.J. The development does not involve the processes in Table 8.2.6.3.F.	
	AO8.2 Development involving the processes listed in Table 8.2.6.3.F is consistent with the standards contained in the Management of hazardous chemicals in flood affected areas planning scheme policy and can operate without risk of environmental harm during a coastal hazard. Note—The Management of hazardous chemicals in flood affected areas planning scheme policy sets out further information and processes including risk assessment for the management of hazardous chemicals of hazardous chemicals in coastal hazard areas.			

* **SOLUTIONS:** A – Acceptable Solution; A/S – Alternate Solution; N/A – Not Applicable



Appendix E – FloodWise Property Report



Brisbane City Council FloodWise Property Report

Report Reference

1637635801868

23/11/2021 12:50:01

Dedicated to a better Brisbane

THIS REPORT IS FOR BUILDING AND DEVELOPMENT PURPOSES ONLY

The FloodWise Property Report provides property or lot-based flood information for building and development requirements. This report provides information on estimated flood levels, habitable floor level requirements and more technical information on the four sources of flooding: river, creek / waterway, storm tide and overland flow. Refer to the Useful Definitions section for a glossary of terms.

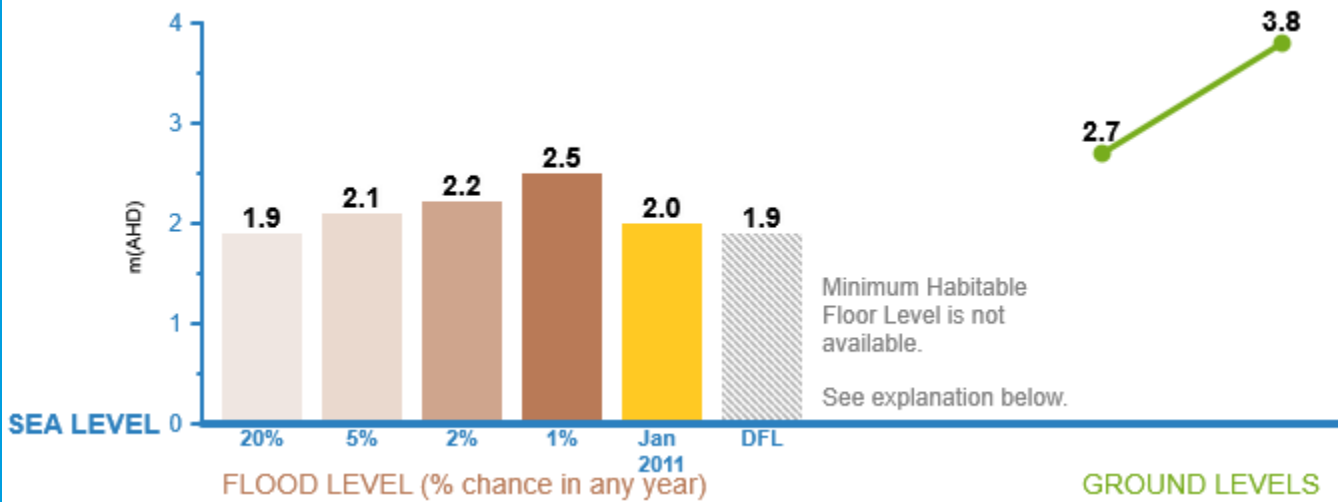
To find out more about how the contents of this report may affect building or development on this property, please visit www.brisbane.qld.gov.au/planning-building. For more general information about understanding your flood risk and how to prepare your property, family or business for potential flooding visit www.brisbane.qld.gov.au/beprepared

THIS IS A REPORT FOR:

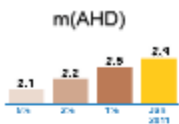
Rateable Address: 161 FISON AVE, EAGLE FARM QLD 4009

Lot Details: L.836 SL.8236

FLOOD LEVEL INFORMATION



EXPLANATION



m(AHD) - Metres Australia Height Datum. The level of 0.0m AHD is approximately mean sea level.

Flood Levels - The Flood level bar chart above shows the possible flooding level and percentage chance of that level being reached or exceeded in any year. If an orange bar shows, it is the calculated January 2011 flood level at this address or lot. Refer to 'Useful Definitions' for further information.

Minimum Habitable Floor Level - Applies to residential development only. Please refer to Council's planning scheme to learn how this may affect you. If a property is in an overland flow path, or a large allotment, a minimum habitable floor level cannot be provided. Refer flood and planning development flags below.

Ground Levels - The green line above shows this property's approximate lowest and highest ground levels based on latest available information (2019 airborne laser survey) to Council. If you are building, please confirm with a surveyor.

For further information and definitions please refer to the Useful Definitions page

FLOOD AND PLANNING DEVELOPMENT FLAGS

DEVELOPMENT FLAG(S)

This property may also be affected by one or more flood or property development overlays or flags. These include: LARGE ALLOTMENT

Please review the technical summary over page and refer to Council's planning scheme for further information.



Brisbane City Council FloodWise Property Report

Report Reference

1637635801868

23/11/2021 12:50:01

Dedicated to a better Brisbane

TECHNICAL SUMMARY

This section of the FloodWise Property Report contains more detailed flood information for this property so surveyors, builders, certifiers, architects and engineers can plan and build in accordance with Council's planning scheme. For more information about building and development in Brisbane please visit www.brisbane.qld.gov.au/planning-building or talk to a Development Assessment Planning Information Officer via Council's Contact Centre on (07) 3403 8888.

THIS IS A REPORT FOR:

Rateable Address: 161 FISON AVE, EAGLE FARM QLD 4009

Lot Details: L.836 SL.8236

PROPERTY INFORMATION (Summary)

The following table provides a summary of flood information for this property. More detailed flood level information is provided in the following sections of this report.

PROPERTY SUMMARY	LEVEL (mAHD)
Minimum Ground Level	2.7
Maximum Ground Level	3.8
Min Habitable Floor Level	Contact Council
Defined Flood Event Level	2.5
Defined Flood Event Level Source	STORMTIDE
Source of Highest Flooding	STORMTIDE
Flooding may also occur from	STORMTIDE,RIVER

ESTIMATED PEAK FLOODING LEVELS

The table below displays the peak estimated flood levels by probability for this property. Estimated flood level data should be used in conjunction with applicable planning scheme requirements - Refer to Flood Planning Development Information.

Note that the overland flow flooding level maybe higher than the levels below from other sources.

DESCRIPTION	LEVEL (mAHD)	SOURCE
20% AEP	1.9	STORMTIDE
5% AEP	2.1	STORMTIDE
2% AEP	2.2	STORMTIDE
1% AEP	2.5	STORMTIDE
1% AEP	2.2	RIVER
January 2011	2.0	RIVER
DFL	1.9	RIVER
RFL	2.2	RIVER

FLOOD PLANNING DEVELOPMENT INFORMATION

This section of the FloodWise Property Report contains information about Council's planning scheme overlays. Overlays identify areas within the planning scheme that reflect distinct themes that may include constrained land and/or areas sensitive to the effects of development.

FLOOD OVERLAY CODE

The Flood overlay code of Council's planning scheme uses the following information to provide guidelines when developing properties. The table below summarises the Flood Planning Areas (FPAs) that apply to this property. Development guidelines for the FPAs are explained in Council's planning scheme, which is available from www.brisbane.qld.gov.au/planning-building.

FLOOD PLANNING AREAS (FPA)		
RIVER	CREEK/WATERWAY	OVERLAND FLOW
FPA5		Not Applicable

COASTAL HAZARD OVERLAY CODE

The coastal hazard overlay code of Council's planning scheme uses the following information to provide guidelines when conducting new development. The table below summarises the coastal hazard categories that apply to this property. Development guidelines for the following coastal hazard overlay sub-categories are explained in the planning scheme, which is available from www.brisbane.qld.gov.au/planning-building.

COASTAL HAZARD OVERLAY SUB-CATEGORIES
Medium Storm Tide Inundation Area

NOTE: Where land is identified within one or more flood planning area on the Flood Overlay, or is identified within a Storm Tide Inundation area on the Coastal Hazard Overlay, the assessment criteria that provide the highest level of protection from any source of flooding applies.

PROPERTY DEVELOPMENT FLAGS

Large Allotment - This property is either a Large Allotment of over 1000 square metres or is located within a Large Allotment. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across the site. For more information or advice, it is recommended you engage a Registered Professional Engineer of Queensland.



Brisbane City Council FloodWise Property Report

Report Reference

1637635801868

23/11/2021 12:50:01

Dedicated to a better Brisbane

Useful Definitions

Australian Height Datum (AHD) - The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

Annual Exceedance Probability (AEP) - The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.

Defined Flood Level (DFL) - The DFL for Brisbane River flooding is a level of 3.7m AHD at the Brisbane City Gauge based on a flow of 6,800 m³/s.

Maximum and Minimum Ground Level - Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

Minimum Habitable Floor Level - The minimum level in metres AHD at which habitable areas of development (generally including bedrooms, living rooms, kitchen, study, family and rumpus rooms) must be constructed.

Council's Planning Scheme - The City Plan (planning scheme) has been prepared in accordance with the Sustainable Planning Act as a framework for managing development in a way that advances the purpose of the Act. In seeking to achieve this purpose, the planning scheme sets out the Council's intention for future development in the planning scheme area, over the next 20 years.

Residential Flood Level (RFL) - Residential flood level (RFL) for the Brisbane River flooding equates to the 1% Annual Exceedance Probability flood level.

Rateable Address - A Lot or Property may have more than one street address. The address shown on this report is the address used by Council for the Lot or property selected.

Property - A property will contain 1 or more lots. The *Multiple Lot Warning* is shown if you have selected a property that contains multiple lots.

Brisbane City Council's Online Flood Tools

Council provides a number of online flood tools:

- to guide planning and development
- to help residents and businesses understand their flood risk and prepare for flooding.

Planning and Development Online Flood Tools

Council's online flood tools for planning and development purposes include:

- FloodWise Property Report
- Flood Overlay Code

For more information on Council's planning scheme and online flood tools for planning and development:

- phone 07 3403 8888 to talk to a Development Assessment Customer Liaison Officer
- visit www.brisbane.qld.gov.au/planning-building
- visit a Regional Business Centre.

Helping residents and businesses be prepared for flooding

Council has a range of free tools and information to help residents and businesses understand potential flood risks and how to be prepared. This includes:

- Flood Awareness Map
- Flooding in Brisbane – A Guide for Residents
- Flooding in Brisbane – A Guide for Businesses
- Early Warning Alert Service. Visit www.brisbane.qld.gov.au/earlywarning to register for email, home phone or SMS severe weather alert updates.

Note: The Flood Awareness Map shows four levels of flood likelihood from high likelihood (flooding is very likely to occur) through to very low likelihood (very rare and extreme flood events).

For more information on Council's online flood tools for residents and business:

- Visit www.brisbane.qld.gov.au/beprepared
- Phone (07) 3403 8888.



Brisbane City Council FloodWise Property Report

Report Reference

1637635801868

23/11/2021 12:50:01

Dedicated to a better Brisbane

Disclaimer

1. Defined Flood Levels and Residential Flood Levels, and the Minimum Habitable Floor Levels are determined from the best available information to Council at the date of issue. These flood levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating flood levels.
2. Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property report. Council disclaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.



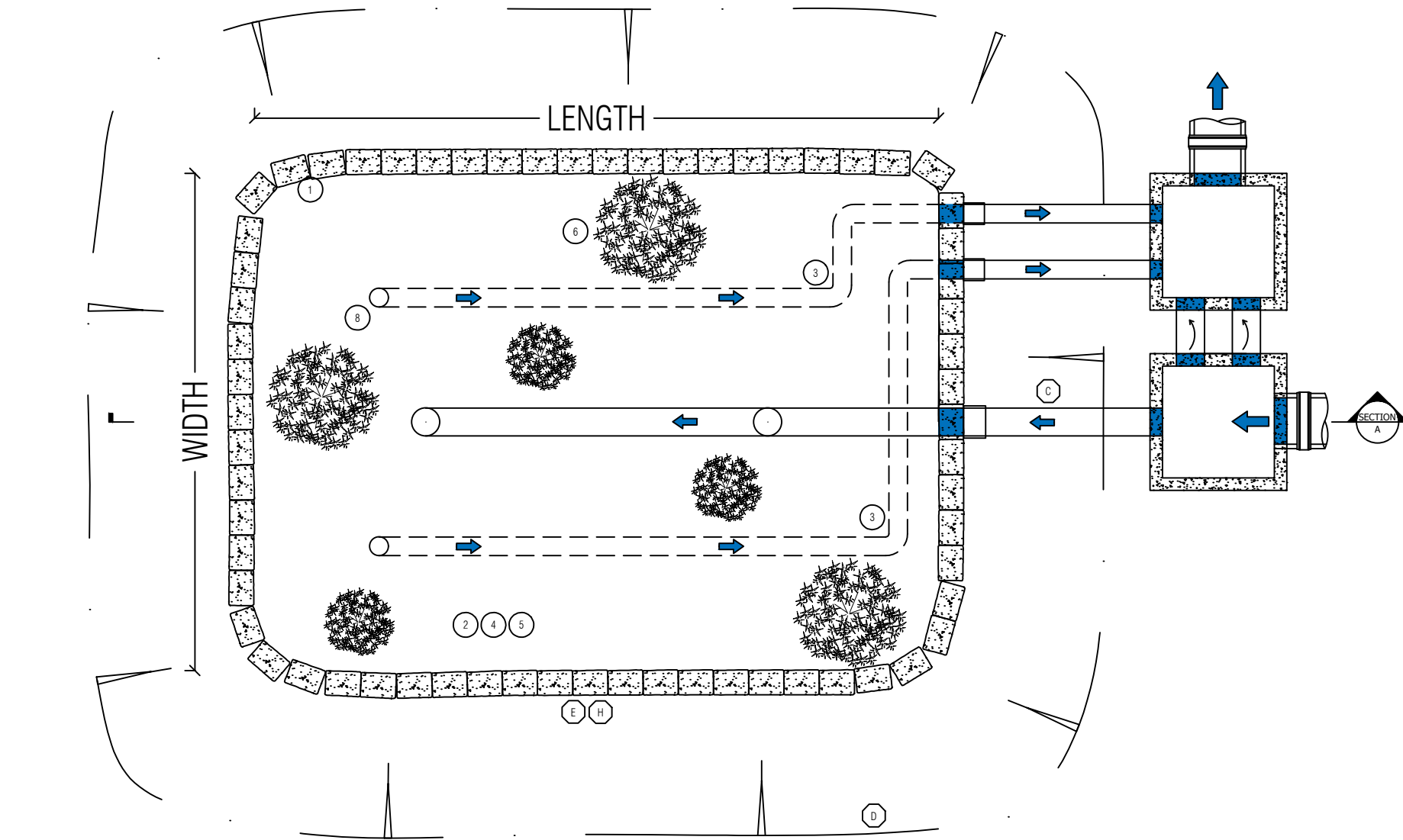
Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit www.brisbane.qld.gov.au/planning-building

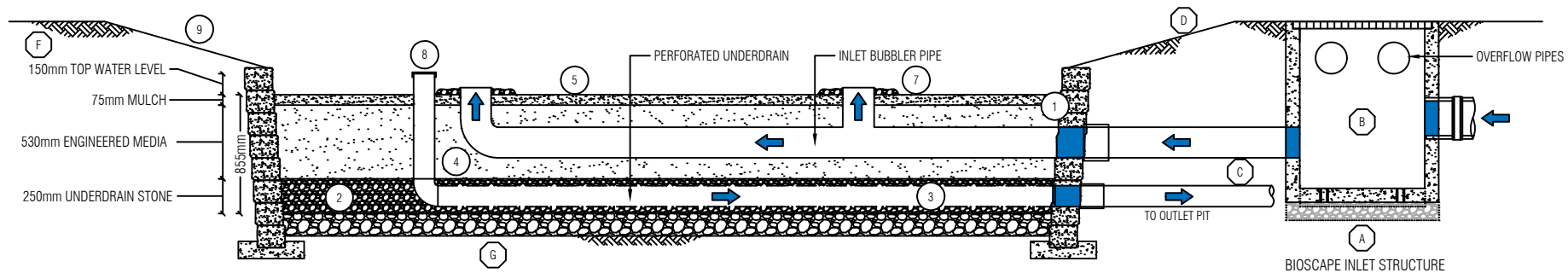
You can also find the Brisbane City Plan 2014 and Neighbourhood Plans as well as other information and training videos to help with your building and development plans.



Appendix F – OCEAN PROTECT FILTERRA TYPICAL DESIGN



PLAN



SECTION A-A

(PLANTING NOT SHOWN FOR CLARITY)

SITE SPECIFIC REQUIREMENTS		
COUNT	DESCRIPTION	INSTALLED BY
	FILTERRA SURFACE AREA (m ²)	OCEAN PROTECT
	MULCH VOLUME (m ³)	OCEAN PROTECT
	FILTERRA MEDIA DEPTH (mm)	OCEAN PROTECT
	VOLUME OF UNDERDRAIN STONE (m ³)	OCEAN PROTECT
	FILTERRA LINER (m)	OCEAN PROTECT

PLANTING SCHEDULE	
COUNT	FILTERRA BIOSCAPE SYSTEM PLANT PALETTE

- GENERAL NOTES
- CONTRACTOR SHALL CONTACT OCEAN PROTECT TO COORDINATE DELIVERY AND INSTALLATION OF FILTERRA BIOSCAPE SYSTEM. OCEAN PROTECT ACTIVATION CAN ONLY OCCUR ONCE CONTRACTOR RESPONSILTIES ARE COMPLETE.
 - PERFORM FILTERRA BIOSCAPE SYSTEM EXCAVATION ONLY AFTER ALL THE CONTRIBUTING DRAINAGE AREAS ARE PERMANENTLY STABILISED. DO NOT CONSTRUCT FILTERRA BIOSCAPE SYSTEM IN AN AREA PREVIOUSLY USED AS EROSION AND SEDIMENT CONTROL FACILITIES. DO NOT STOCKPILE MATERIALS OR STORE EQUIPMENT IN THIS AREA. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PREVENT CONSTRUCTION-RELATED EROSION RUNOFF FROM ENTERING THE FILTERRA MEDIA BAY.
 - FILTERRA SHALL BE INSTALLED OFFLINE AS EARLY AS POSSIBLE AFTER SITE STABILISATION TO ALLOW FOR SOIL MATURITY AND SYSTEM ESTABLISHMENT.
 - CONTRACTOR SHALL COORDINATE WITH OCEAN PROTECT BEFORE THE FILTERRA BIOSCAPE SYSTEM IS EXCAVATED TO MINIMISE THE TIME BETWEEN EXCAVATION AND COMPLETION OF THE FILTERRA BIOSCAPE SYSTEM. ONCE EXCAVATED, ANY STANDING WATER THAT ACCUMULATES IN THE EXCAVATED AREA MUST BE REMOVED BY THE CONTRACTOR BEFORE OCEAN PROTECT CAN COMMENCE THE FILTERRA BIOSCAPE SYSTEM. ANY ADDITIONAL EXCAVATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
 - CONTRACTOR SHALL PROVIDE ACCESS TO THE EXCAVATED AREA(S) FOR OCEAN PROTECT TO USE DURING THE CONSTRUCTION OF THE FILTERRA BIOSCAPE SYSTEM(S). ACCESS SHALL NOT PROHIBIT LIGHT DUTY EQUIPMENT THAT MAY BE USED TO INSTALL THE COMPONENTS (STONE, MEDIA, ETC). THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RE-STABILIZATION THAT MAY BE REQUIRED AFTER THE FILTERRA BIOSCAPE SYSTEM INSTALLATION/ACTIVATION.
 - OCEAN PROTECT AND/OR ITS REPRESENTATIVES SHALL BE RESPONSIBLE FOR THE LIST ENTITLED 'OCEAN PROTECT INSTALLATION RESPONSIBILITIES'.
 - NO FLOW SHALL ENTER THE FILTERRA SYSTEM UNLESS OCEAN PROTECT HAS ACTIVATED THE SYSTEM AND CONFIRMED ESTABLISHMENT

- CONTRACTOR WORKS AND INSTALLATION RESPONSIBILITIES
- A. CONTRACTOR TO PLACE FILTERRA INLET STRUCTURE ON BEDDING AS SPECIFIED BY THE ENGINEER. OCEAN PROTECT SUGGESTS AS A MINIMUM TO USE 150MM BEDDING STONE ON COMPACTED SUB-GRADE TO 90% DENSITY. UNSUTABLE MATERIAL SHALL BE REPLACED AS ADVISED BY THE ENGINEER.
 - B. CONTRACTOR SHALL PROVIDE AND INSTALL DRAINAGE ITEMS TO, FROM AND INCLUDING THE INLET AND OUTLET STUCTURES AS PER THE APPROVED SITE PLANS.
 - C. OCEAN PROTECT CAN PROVIDE COUPLERS AT THE FILTERRA INTERFACE FOR CONNECTION TO THE INLET DIVERSION PIPES. ALL DRAINAGE TO AND FROM THE FILTERRA MUST ALLOW FOR POSITIVE FLOW.
 - D. CONTRACTOR TO PROVIDE BATTER ACCORDING TO DIMENSION AND SLOPE SHOWN ON PLANS. SLOPE FROM SHOULDER TO FILTERRA BIOSCAPE SYSTEM SURFACE PERIMETER SHALL NOT EXCEED 3:1. TURF IS REQUIRED TO STABILISE SIDE SLOPES SHOWN ON DETAIL AND ON PLAN SHEETS.
 - E. CONTRACTOR TO EXCAVATE MEDIA AREA CORRESPONDING TO THE SIZE OF THE FILTERRA BIOSCAPE SYSTEM SURFACE AREA AS SHOWN ON DETAIL AND ON PLAN SHEETS.
 - F. CONTRACTOR SHALL EXCAVATE VERTICALLY FROM BOTTOM OF UNDERDRAIN STONE OR DRAINAGE STONE IF REQUIRED, TO ELEVATION OF MULCH AS SHOWN ON THIS DETAIL.
 - G. CONTRACTOR TO CONFIRM DEPTH OF EXCAVATION. IF THE EXCAVATION HAS BEEN MADE TOO DEEP AND ADDITIONAL UNDERDRAIN STONE NEEDS TO BE USED TO RAISE THE BASE OF THE FILTERRA, THIS COST SHALL BE TAKEN ON BY THE CONTRACTOR.
 - H. RETAINING WALLS AND ADDITIONAL EROSION CONTROL AROUND THE FILTERRA BIOSCAPE SYSTEM. RETAINED OFFLINE FROM FILTERRA

- OCEAN PROTECT SUPPLY AND INSTALLATION RESPONSIBILITIES
- 1. GEOTEXTILE FABRIC ALONG THE PERIMETER OF THE FILTERRA BIOSCAPE SYSTEM EXCAVATION.
 - 2. UNDERDRAIN STONE. TYPICALLY 250mm THICK (50mm UNDER THE PIPING 150mm AROUND THE PIPING AND 50mm ABOVE THE PIPING)
 - 3. 150mm UNDERDRAIN PIPING UNLESS OTHERWISE APPROVED BY OCEAN PROTECT, ASSOCIATED PIPING AND FITTINGS/ELBOWS TO CONNECT TO THE PIPING/FITTING(S) THAT IS PROVIDED BY CONTRACTOR (SEE CONTRACTOR INSTALLATION RESPONSIBILITIES THIS DETAIL).
 - 4. 530mm FILTERRA MEDIA.
 - 5. 75mm DOUBLE SHREDDED HARDWOOD MULCH OVER ENTIRE FILTERRA BIOSCAPE SYSTEM SURFACE AREA.
 - 6. PLANTINGS OF PLANTS SELECTED BY ENGINEER THAT MATCH OCEAN PROTECTS APPROVED PLANTING LIST.
 - 7. RIPRAP APRON AROUND ALL FLOW ENTRY POINTS AS DESIGNED AND INDICATED ON THIS DETAIL
 - 8. CLEAN-OUT ADAPTER,PLUG AND PIPING.
 - 9. COMMISSIONING THE SYSTEM



PHONE: 1300 354 722

www.oceanprotect.com.au

OCEAN PROTECT
FILTERRA BIOSCAPE SYSTEM
WITH BIOSCAPE INLET STRUCTURE
SPECIFICATION DRAWING



INERTIA ENGINEERING PTY LTD

Level 2, 139 Coronation Drive Milton 4064

P | 07 3857 7868 F | 07 3262 7359 E | info@inertiaeng.com.au

© Inertia Engineering 2021

This report is and shall remain the property of Inertia Engineering Pty Ltd. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.