



PROPOSED MIXED USE DEVELOPMENT

61 Brookes Street, Bowen Hills

Brookes JV Pty Ltd

Site Based Stormwater Management Plan – Quality
Low Risk Development

PLANS AND DOCUMENTS
referred to in the PDA APPROVAL

14 OCT 2015

MEDQ



BG Group
ENGINEERS

LOCAL AUTHORITY: Brisbane City Council
REPORT NUMBER: C15-194 SBSMP Quality
DATE PREPARED: April 2015
APPLICATION No: -



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1.0 INTRODUCTION

BG Civil Pty. Ltd. has been engaged by our client Brookes JV Pty Ltd to prepare a site-based stormwater management report for a new mixed use development at 61 Brookes Street, Bowen Hills. This report will form part of the development application which will be submitted to Brisbane City Council (BCC) as supporting documentation for the proposed development.

1.1. AVAILABLE INFORMATION

- Architectural drawings prepared by Cottee Parker Architects Pty Ltd

Job no. 4981

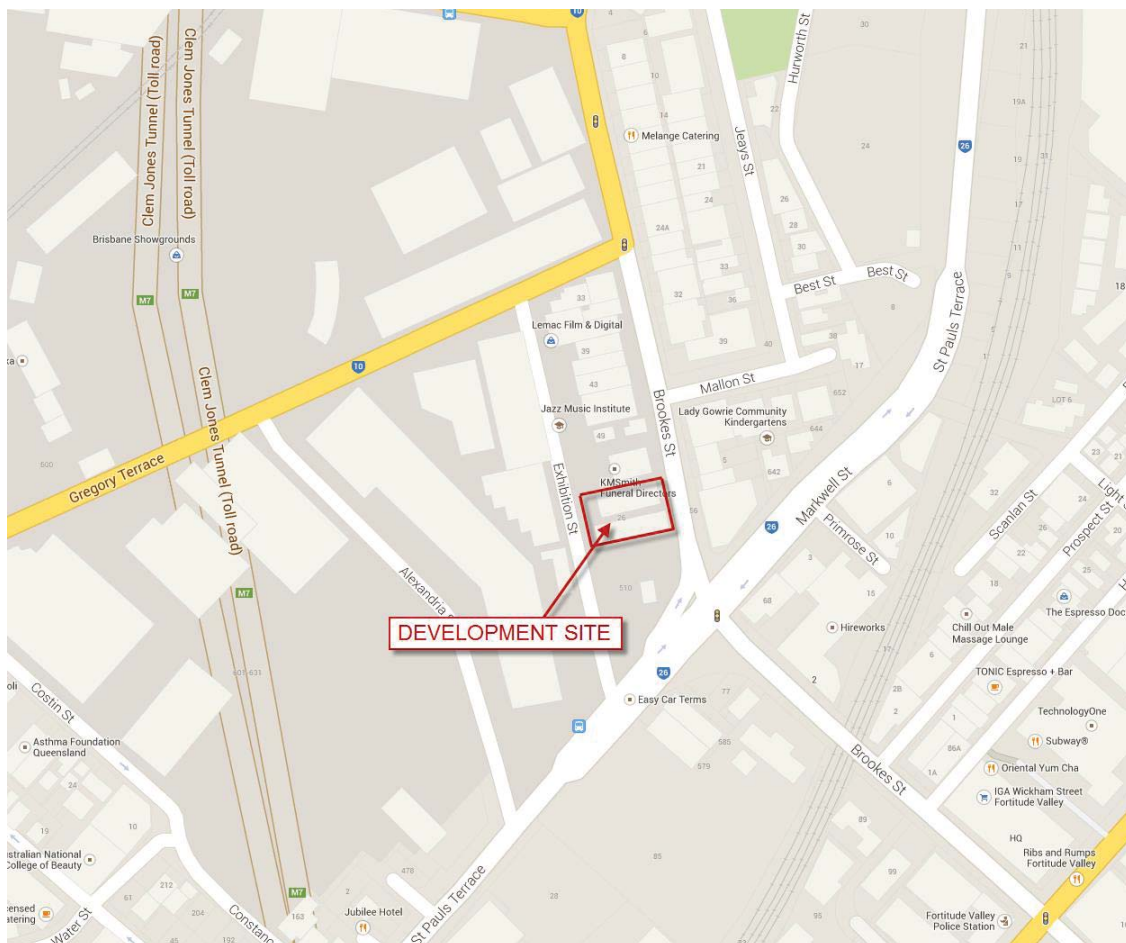
- Detailed Survey prepared by John Dawson Consulting Surveyor

Plan Ref: 1810DTL

- Council As Constructed Information (eBIMAP)

1.2. LOCALITY PLAN

Figure 1-1 SITE LOCATION



2.0 SCOPE OF REPORT

This report will address the following stormwater issues:

Legal Point of Discharge

- Identify the location of the legal point(s) of discharge for the development in compliance with the Local Authority guidelines.

Stormwater Quality

- Identify the development sites classification (high or low risk) and the relevant planning policies and guidelines that the development must comply with,
- If applicable, Identify Water Quality Objective Targets as determined by Local Authority Planning Schemes & Department of Environment & Resource Management,
- Identify a suitable “stormwater treatment train” aimed to comply with the set Water Quality Objectives and/or Stormwater Quality Best Management Practices,
- If applicable, demonstrate compliance to the determined Water Quality Objectives with the use of “Model for Urban Stormwater Improvement Conceptualisation” Software (MUSIC Version 5.1.13),
- Prepare a conceptual stormwater layout highlighting all stormwater quality treatment devices proposed for this development,
- Provide details on monitoring and maintenance requirements for all stormwater treatment devices incorporated within this development.

Erosion and Sediment Control

- Provide details of the Erosion and Sediment Control Devices recommended to be implemented.

3.0 SITE CHARACTERISTICS

3.1. LOCATION

The development site is located approximately 3km North East of Brisbane City CBD. The site address is 61 Brookes Street, Bowen Hills and is formally described as Lot 3 on RP910687.

3.2. SITE DESCRIPTION

The site in its current state is sloping with slopes up to 20% and has a total area of approximately 1450m². The subject site falls from the centre of the lot towards both frontages of the development site (Brookes Street and Exhibition Street).

Figure 3-2 AERIAL PHOTOGRAPH



3.3. SITE CLASSIFICATION

The implementation of a suitable stormwater management plan for the proposed development is determined from the following:

- Identify if compliance with the Department of Environment and Resource Management, State Planning Policy is required, or
- Implement Best Management Practice Guidelines for low risk sites

Either compliance objective will still be designed based on the following key principles:

- The use of Water Sensitive Urban Design (WSUD) principles are to be adopted throughout the site where possible,
- Water Quality controls are to be considered under two separate phases of the development, the construction phase and the operational phase,
- The construction phase requires the assessment of the site during the construction and maintenance period of the development.

3.4. STATE PLANNING POLICY ASSESSMENT

To determine whether compliance with DERM's State Planning Policy is required, it is important to undertake the State Planning Policies Checklist. If any of the trigger questions are answered Yes, then compliance is expected with the State Planning Policy, if all trigger questions are answered No, then stormwater quality best management practices will be adopted.

Table 3-1 STATE PLANNING POLICY CHECKLIST

MATERIAL CHANGE OF USE FOR URBAN PURPOSES THAT INVOLVES A LAND AREA GREATER THAN 2500m ² THAT:	NO
Will result in an impervious area greater than 25 per cent of the net developable area, or	NOT APPLICABLE
Will result in 6 or more dwellings;	NOT APPLICABLE
RECONFIGURATING A LOT FOR URBAN PURPOSES THAT INVOLVES A LAND AREA GREATER THAN 2500m ² , AND WILL RESULT IN SIX (6) OR MORE LOTS.	NO
OPERATIONAL WORK FOR URBAN PURPOSES THAT INVOLVE DISTURBING MORE THAN 2500m ² OF LAND.	NO

Highlighted in the above table are the items applicable to this development application. As none of the above items are applicable to this development, the State Planning Policy is not applicable and this development will adopt a stormwater quality best practice approach as per Brisbane City Councils City plan 2014.

4.0 EXISTING SITUATION

4.1. EXISTING LAND USE

The development site is currently occupied by an existing building on ground surrounded by a bitumen carpark with a majority of the carpark covered by another building suspended over. The site has a driveway access located on the Exhibition Street frontage and a pedestrian access on the Brookes Street frontage. The remainder of the site has minimal landscaping areas.

4.2. EXISTING STORMWATER DISCHARGE

Based on Council eBimap data and site inspection it appears that no minor internal stormwater drainage exists within the development site. It is reasonable to assume that collected roof water is discharge to the stormwater infrastructure in Exhibition Street and any uncaptured groundwater runoff is allowed to discharge overland and down Exhibition Street.

Refer to Appendix C for council eBiMAP data.

5.0 PROPOSED SITUATION

5.1. PROPOSED LAND USE

The proposal is for a new mixed use development with associated car parking and driveways. The proposed development will cover approximately 73% of the site with the remainder (27%) being landscaping and/or open space areas.

Refer to Appendix A for Architectural documentation which is current at the time in preparing this report.

5.2. DEVELOPED STORMWATER DISCHARGE

The proposed development roof areas cover approximately 64% of the site with the balance areas to be retained as driveway, landscaping and/or open space. As there are significant roof areas, the installation of rainwater harvesting devices are highly recommended however is not included within this report.

All roof areas of the proposed building shall be captured by a series of gutters and downpipes and be directed to the site legal point of discharge. Downpipes are to be fitted with a first flush devices to ensure pollutants from roof areas are discharged to the landscaped areas of the development. The First Flush device will need to be designed by a hydraulic consultant during the detailed design phase of the development. This will allow suitable treatment for the roof area and aid in removal of gross pollutants and total suspended solids.

All stormwater from unroofed impervious ground and driveway areas shall be directed to strategically placed field inlets fitted with Stormwater 360 Enviropods (or approved equivalent) prior to discharging to the sites legal point of discharge. The internal drainage to be designed and detailed by a suitably qualified hydraulic consultant at the operational works phase of the development.

All captured site stormwater will discharge to the existing stormwater infrastructure located along the frontage of the site within Exhibition Street.

As mentioned above, it is recommended that rainwater re-use tanks be utilised to harvest collected water by the roof areas. These tanks should be used as hose down and for landscaping as a minimum however this is not included within this report.

6.0 STORMWATER QUALITY

6.1. POLLUTANT CONCERNS

The pollutants of concern are summarised below. These pollutants can have adverse environmental impacts within the downstream catchment. It is proposed to adopt Site-Based Water Sensitive Urban Design to provide capture and treatment to the below mentioned pollutants.

Table 6-2 TYPICAL POLLUTANTS

POLLUTANT	SOURCE
Litter	Paper, Construction Packaging, Food Waste, Cement, Off - Cuts
Sediment	Unprotected Exposed Soils, Stockpiles, Erosion
Hydrocarbons	Fuel And Oil Spills, Leaks From Machinery
Toxic Materials	Cement Slurry, Asphalt Primer, Solvents, Cleaning Agents
Ph Altering Substances	Acid Sulphate Soils, Cement Slurry, Wash Water
Thermal Pollution	Vehicles And Machinery, Increased Impervious Areas

6.2. CONSTRUCTION PHASE

During the construction phase, the potential exists for significant increases in the amount of pollutants, particularly sediment, escaping from the site. During this period, an erosion and sediment control plan is required to be prepared as part of the overall Environmental Management Plan prepared for the construction phase.

An erosion and sediment control plan will be prepared during the detailed design phase of the development. This plan will be prepared in accordance with Local Authority Guidelines and with recognised industry standards. This plan will also be submitted to Brisbane City Council for operational works approval.

6.3. OPERATIONAL PHASE

The Department of Environment and Resource Management, State Planning Policy, outlines the criteria for which types of developments are deemed 'high risk' for which the State Planning policy applies. Developments that fall outside the 'high risk' category are deemed to be 'low risk' and shall comply with local council requirements.

As this development has been identified as 'low risk', selection of appropriate Stormwater Quality Best Management Practices (SQBMP's) are essential to improve stormwater quality through the prevention, minimisation and/or trapping of pollutants.

6.4. WATER QUALITY OBJECTIVES

Specific water quality objectives need not be identified for this development as this development has been identified as 'low risk' for water quality. Understanding the expected pollutants for this type of development will assist in selection of which types of practices will be appropriately implemented for the pollutants of concern.

7.0 STORMWATER QUALITY BEST MANAGEMENT PRACTICES

7.1. SELECTION OF SQBMP's

There exist a number of publications describing the different types, functions, applications, and performance of many SQBMP's. Water Sensitive Urban Design should be used to look at the integration of SQBMP's within any Stormwater Quality Management Plan. Some of the more typical SQBMP's are listed in the below table for consideration.

Table 7-3 TYPICAL SQBMP's

STORMWATER QUALITY BEST MANAGEMENT PRACTICES	
Treatment Device / Practice	Benefits
Site Maintenance	Reduce the amount of gross pollutants and sediment runoff generated by the development by maintaining vegetated areas and the removal of debris and litter.
Rubbish Bins	Reduce the amount of gross pollutants generated by the development by collecting and dumping litter and/or waste.
Filter Baskets (within inlet pits)	Reduction in gross pollutants and total suspended solids generated by the development by filtering water prior to entering the stormwater system which traps litter, debris and fine sediment.
Gross Pollutant Traps (GPT's)	Removal of gross pollutants generated by the development site. Some GPT's that are available on the market today can also remove hydrocarbons from runoff, thus reducing any oil and fuel pollutants generated by the development.
Rainwater Re-Use	Re-using generated site runoff for landscaping and irrigation purposes etc. will reduce pollutant loads generated by the development site.
Grass Swales	Directing site runoff to grass swales prior to discharging will have a reduction to the total pollutants generated by the development.
Sand Filters (Bio-Retention)	Directing site runoff to a bio-retention basin prior to discharging will have a reduction to the total pollutants generated by the development.

7.2. ADOPTED SQBMP's

When choosing to adopt selected SQBMP's, it is important to identify the expected pollutants that the proposed development will generate during its operational phase. A summary of the expected pollutants can be found within Section 6.1 of this report.

Based on the expected pollutants and this developments expected residential activities, the following is a summary of the SQBMP's that are recommended to be adopted as a minimum.

- Site Maintenance
- Rubbish Bins
- First Flush Device
- Filter Baskets

Site Maintenance

As this development is a residential development which will have a body corporate; it is assumed that regular landscaping and general maintenance will occur including the removal of any rubbish or debris within the development, removing the gross pollutants on site.

Rubbish Bins

The development is required to have rubbish bins for general waste to remove gross pollutants generated by the development.

First Flush Device

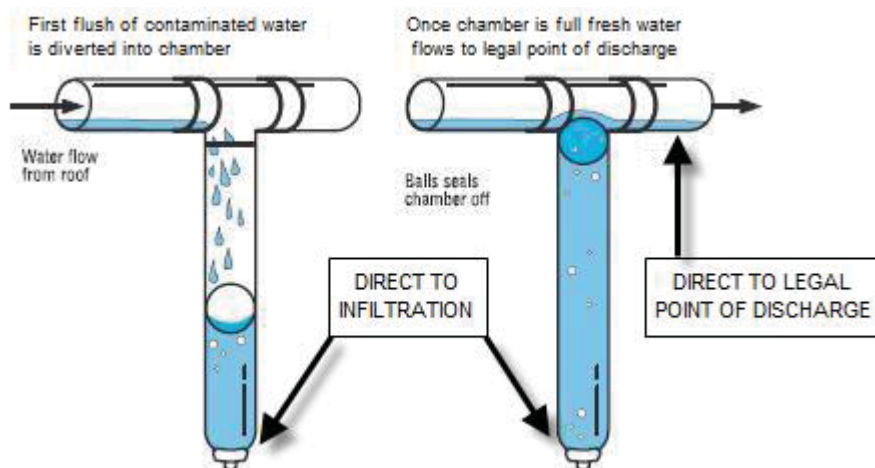
Downpipes are to be fitted with a first flush device to ensure pollutants from roof areas are discharged to areas within the development site that are suitable for infiltration.

The First Flush device will need to be designed by a hydraulic engineer during the detailed design phase of the development. Section 9.3 of Australian Standard Handbook HB230-2008 states that to improve rainwater quality, a minimum of 20 L per 100 m² is to be diverted and will be adopted as a minimum.

The diverted chamber of the first flush device is to be discharged through a slow release valve and is to be connected to an infiltration system.

Maintenance of the first flush device is to be conducted regularly (at least quarterly). Removal of leaves and debris within the system and unscrewing the slow release valve cap and flushing the system is essential to maintain optimum performance.

Figure 7-3 EXAMPLE FIRST FLUSH DEVICE



Filter Baskets

As part of the sites internal stormwater infrastructure, all inlet pits placed in hardstand and/or driveway areas are to be installed with Enviropods (or approved equivalent) to prevent debris and fine sediment entering the stormwater system. Enviropods are effective at removing gross pollutants and total suspended solids from stormwater runoff and are capable of operating under a high flow scenario (relative catchment).

Refer to Appendix E for product information.

Figure 7-4 EXAMPLE ENVIROPOD



Image is a worked example of an Enviropod installation to a gully inlet (without filter inlay) From: www.stormwater360.com.au

8.0 MONITORING AND MAINTENANCE

8.1. MAINTENANCE REQUIREMENTS

Routine maintenance of the proposed infrastructure is required to minimise the potential for untreated stormwater discharging from the site.

The stormwater treatment device(s) shall be maintained using the following documentation;

- Manufacturers specifications for proprietary stormwater management devices,
- Water by Design's "Maintaining Vegetated Stormwater Assets" Manual,

8.2. MAINTENANCE FREQUENCY

More detailed performance information with regard to maintenance frequency and scheduled maintenance tasks for the site can be obtained by actively developing a maintenance log (refer below); however, it does not supersede maintenance requirements outlined in the manufacturers' specifications for proprietary elements of the SBSMP.

8.3. MAINTENANCE RECORD

A record of all maintenance checks for all stormwater controls on-site should be kept to evolve an appropriate maintenance routine to reflect the particular characteristics of the adopted treatment devices. It will also allow management of the site to refine the maintenance frequencies listed in this report, which were based on generic devices located in typical urban environments.

The report is to be carried out to create a chain of responsibility for maintenance and should include details of the following:

- The date of maintenance,
- The name of the persons performing the maintenance,
- What types of maintenance actions were performed for each water quality device,
- The environmental state of the device including an estimate of the type and weight of litter removed and the amount of sediment captured where appropriate.

9.0 EROSION AND SEDIMENT MANAGEMENT

9.1. OBJECTIVES

The objective of Erosion and Sediment Management is to limit soil erosion and control sediment discharge from the proposed development by using suitable control devices during the four (4) primary phases; Existing, Earthworks, Construction and the Proposed Use.

Typical erosion and sediment control measures that will be incorporated into these development phases are highlighted in the following section.

9.2. EROSION & SEDIMENT MANAGEMENT DURING DEVELOPMENT PHASES

PHASE 1 - EXISTING

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

- Designation of transport routes to ensure minimal vegetation disturbance. Transport routes will have construction exits in accordance with IEAust Guidelines,
- Construction entry/exit to be installed and will comprise of a designed gravel pad or placement of hardwood logs in accordance with the IEAust Guidelines,
- Install sediment fences around the proposed site (along tow of batter alignment),
- Install check dams if required, and
- Install dust control fences adjacent to the proposed earthworks areas (along property boundary).

PHASE 2 - EARTHWORKS AND PHASE 3 - CONSTRUCTION

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

- Sediment fences to be erected at the base of all batters and stockpiles to prevent sediment transportation off site,
- Turf filter strips to be placed along all road verges,
- Diversion swales to divert sediment laden water,
- Rock check dams are to be placed intermittently along diversion swales,
- Incorporate a temporary sediment basin in the treatment of sediment laden water.
- Re-vegetation of all disturbed areas as soon as possible,
- All sediment control structures to be maintained in an effective manner and inspected after each stormwater event. No structure is to accumulate sediment above 40% of its capacity,

- Construction of water quality treatment devices are to be undertaken in the final stages of construction of the development to ensure that clogging of the filter media is avoided, and
- Regular monitoring of water quality to determine the effectiveness of the sediment and erosion control measures.

PHASE 4 - PROPOSED DEVELOPMENT

Once construction is completed, the following strategies will be implemented to limit soil erosion and control sediment discharge leaving the site:

A monitoring program will be established for the stormwater treatment devices.

9.3. EROSION CONTROL MEASURES

The time of disturbance on-site should be kept to a minimum by ensuring that construction works immediately follow the earthworks phase. Consideration to staging works should be given to minimise the area of exposed works at any given time.

Areas that may be subject to concentrated flow and that have been cleared may require turfing to ensure gully erosion does not start.

Any overburden that is not to be taken off-site should be stockpiled nearby and covered to prevent the mobilization of any particles into the drainage system.

The remaining exposed areas of the site are to be damped down as deemed necessary by the site supervisor to prevent dust. All batters are to have mulch or erosion control mats installed immediately after achieving final level.

Dust fencing is to be installed around the perimeter of earthworks to prevent wind velocities at ground level over the site.

The site is to be landscaped and revegetated in accordance with the approved Landscape Plans immediately after completion of construction activities to minimise the risk of erosion from exposed earthworks.

9.4. SEDIMENT CONTROL MEASURES

With reference to the IEAust Guidelines and Current Best Practice methods, there are four fundamental sediment control principles that have been identified for use during construction for this development site and are as follows:

- Construction Exit
- Sediment Fences
- Sediment Barriers
- Turfed Filter Strips

10.0 CONCLUSION

10.1. LEGAL POINT OF DISCHARGE

The legal point of discharge will be to the existing stormwater infrastructure located along the frontage of the site within Exhibition Street.

10.2. STORMWATER QUALITY

Stormwater quality improvement devices have been appropriately selected as to generally comply with Stormwater Quality Best Management Practices and incorporation of Water Sensitive Urban Design where possible.

The following is a summary of the minimum treatment devices and/or management practices required for the proposed development.

- Site Maintenance

Regular landscaping and general maintenance is to occur including the removal of any rubbish or debris within the development, removing the gross pollutants on site.

- Rubbish Bins

The development is required to have rubbish bins for general waste as to remove gross pollutants generated by the development.

- First Flush Device

Downpipes are to be fitted with a first flush device to provide quality treatment to captured runoff from roof areas.

- Filter Baskets

All inlet pits placed in hardstand and/or driveway areas are to be installed with Enviropods (or approved equivalent) to prevent debris and fine sediment entering the stormwater system.

Refer to Appendix E for product and maintenance information.

10.3. EROSION AND SEDIMENT CONTROL

An Erosion and Sediment Control (ESC) plan will be completed as part of the detailed design phase of this Development and shall incorporate the recommendations included within this Report. This Report and plan shall remain on site at all times, and it is the responsibility of the Contractor on-site to ensure the assembly and maintenance of all devices throughout the Development.

Appendix A - ARCHITECTURAL PLANS



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1 VIEW FROM EXHIBITION STREET
SCALE NTS @ A1

Schematic MULTI RESIDENTIAL

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100	ISSUED FOR PERMIT	25/01/15	JH

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL 61 BROOKES STREET, BOWEN HILLS
Drawing Title
VIEW FROM EXHIBITION STREET

Scale	Date	Job no.
As Shown	JAN 2015	4081
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 0202	01	

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1 VIEW OF ROOF TERRACE
SCALE NTS @ A1

Schematic

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Issue	Revision	Date	By
01	REVISED BY ISSUE	22/07/15	JH
02	ON ISSUE	07/08/15	JH
Issue	Revision	Date	By
Amendments			

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL, 61 BROOKES STREET, BOWEN HILLS
Drawing Title
VIEW OF ROOF TERRACE

Scale	Date	Job no.
As Shown	JAN 2015	4001
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 0203	01	

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Issue	Revision	Date	By
Amendments			

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 MULTI RESIDENTIAL, 61 BROOKES STREET, BOWEN HILLS
 Drawing Title
 VIEW FROM BROOKES STREET

Scale	Date	Job no.
As Shown	JAN 2015	4881
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 0204	00	

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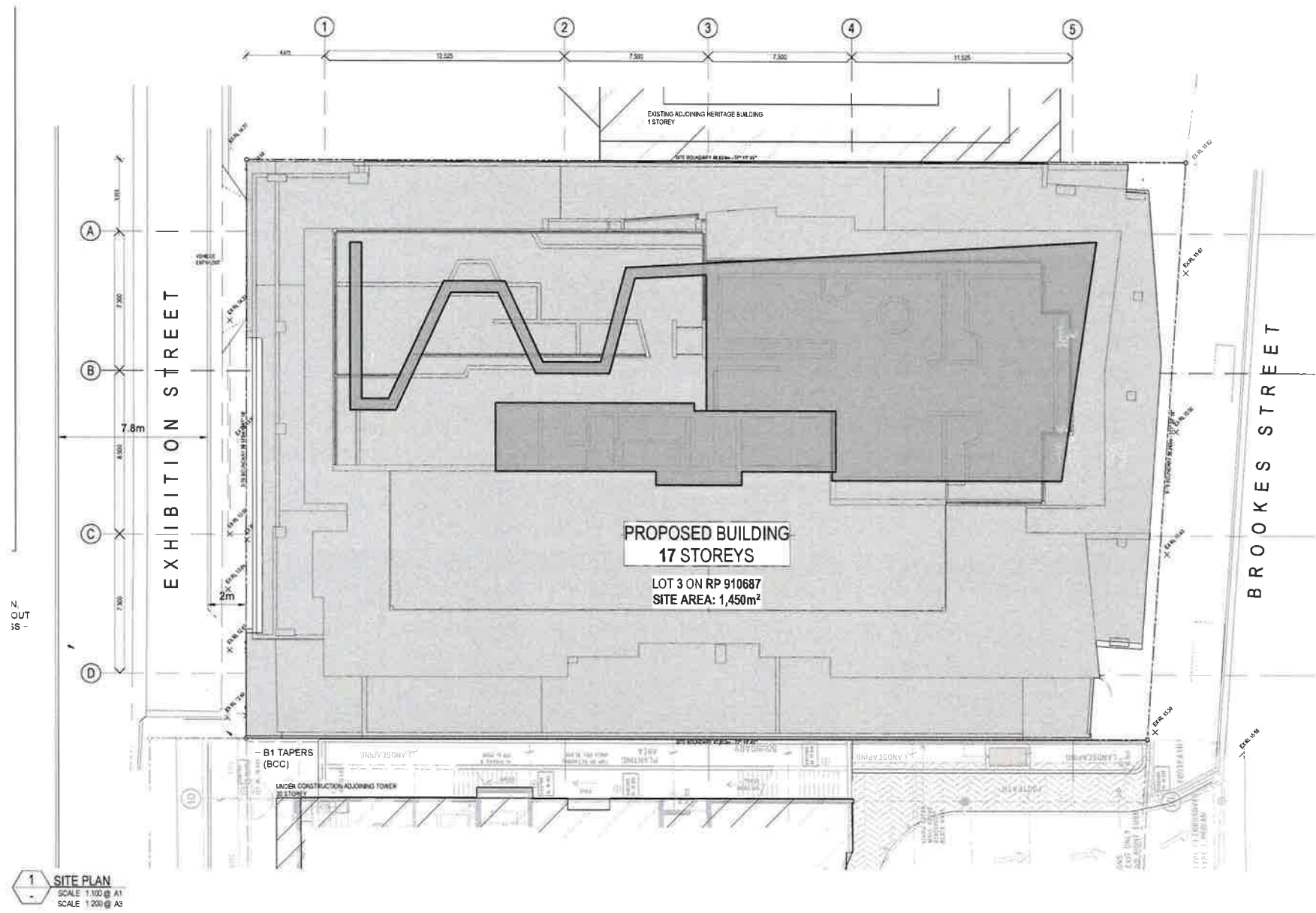
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Issue	Revision	Date	By
All measurements			

Client
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 Project Name and Location
 MULTI RESIDENTIAL, 61 BROOKES STREET, BOWEN HILLS
 Drawing Title
 LOCALITY PLAN

Scale As Shown	Date JAN 2015	Job no. 4001
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Drawing no. SD 1001	Issue 00	

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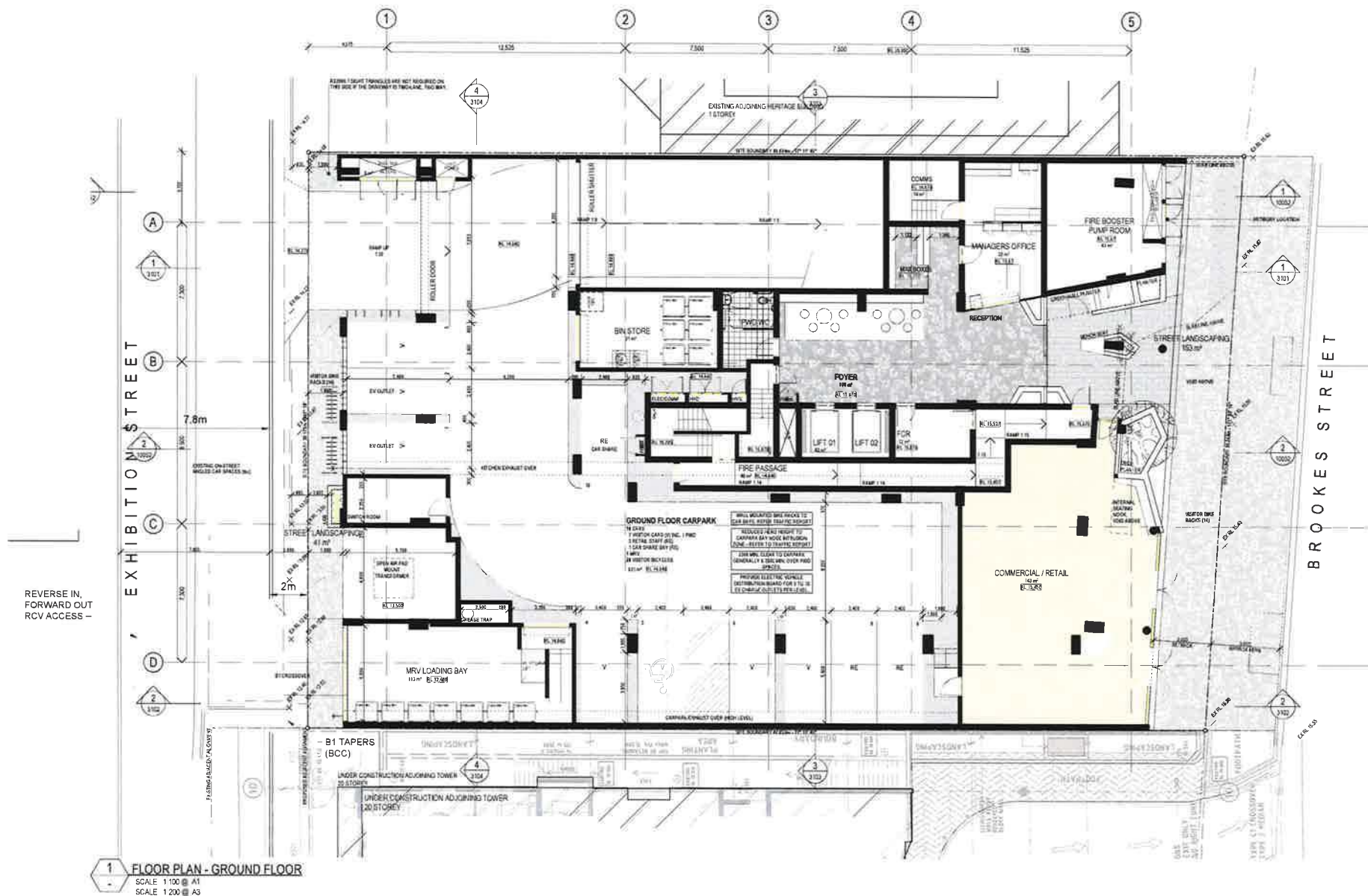
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Issue	Revision	Date	By
Amendments			

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL, 61 BROOKRES STREET, BOWEN HILLS
Drawing Title
SITE PLAN

Scale As Shown	Date JAN 2015	Job no. 4081
Drawn JH	Checked MT	Approved MT
Drawing no. SD 1003	Issue 00	

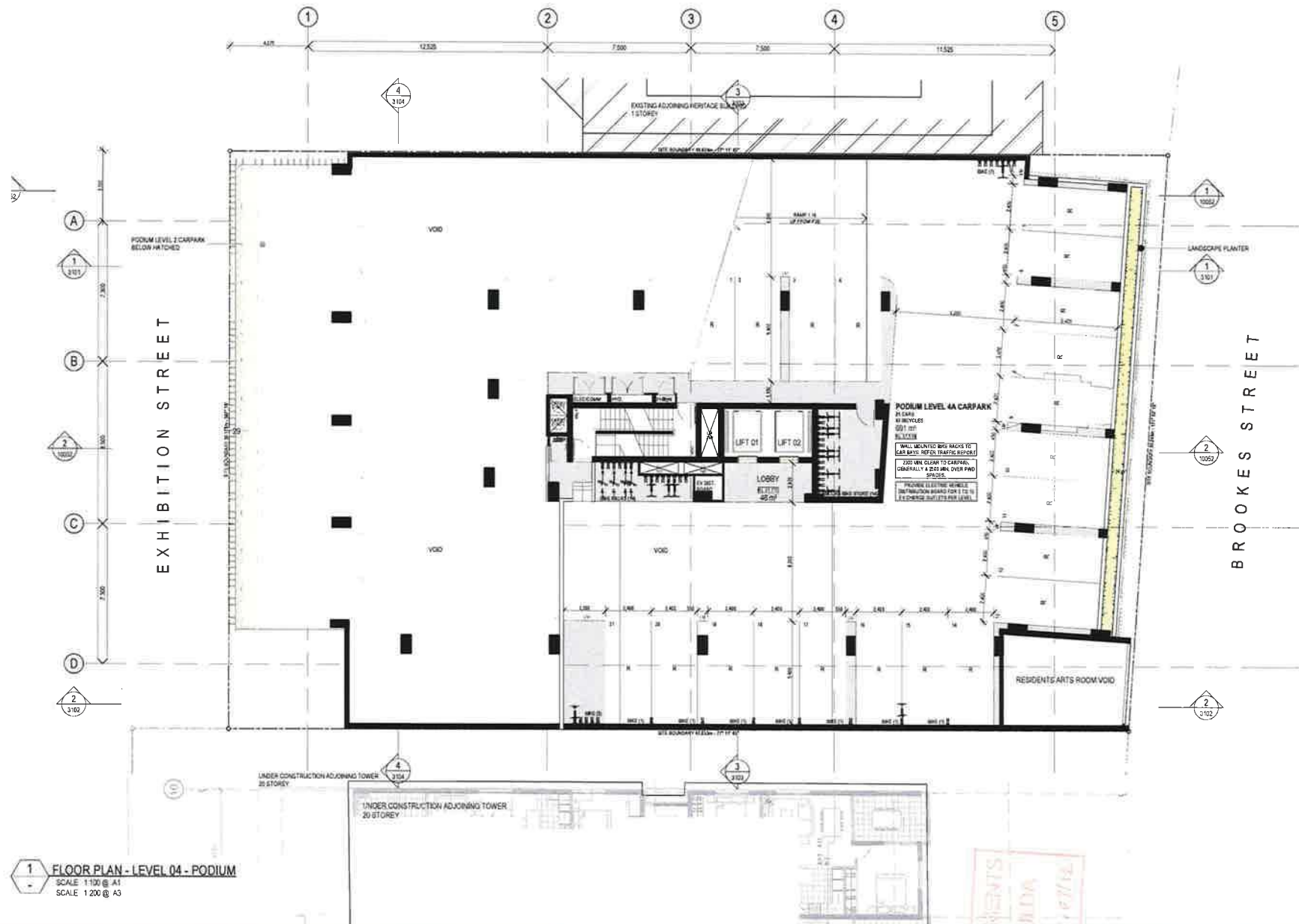
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1 FLOOR PLAN - LEVEL 04 - PODIUM
SCALE 1:100 @ A1
SCALE 1:200 @ A3

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

Rev	Description	Date	By
02	REVISED CARPARK	22/07/18	JH
01	REVISED CARPARK	22/09/18	JH
00	ISSUED FOR PERMIT	07/05/18	JH
Issue	Permitting	Date	By
Amendments			

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL 61 BROOKES STREET, BOWEN HILLS
Drawing Title
FLOOR PLAN - LEVEL 04 PODIUM CARPARKING

Scale As Shown	Date JAN 2015	Job no. 4081
Drawn JH	Checked MT	Approved MT
Drawing no. SD 2014	Issue 02	

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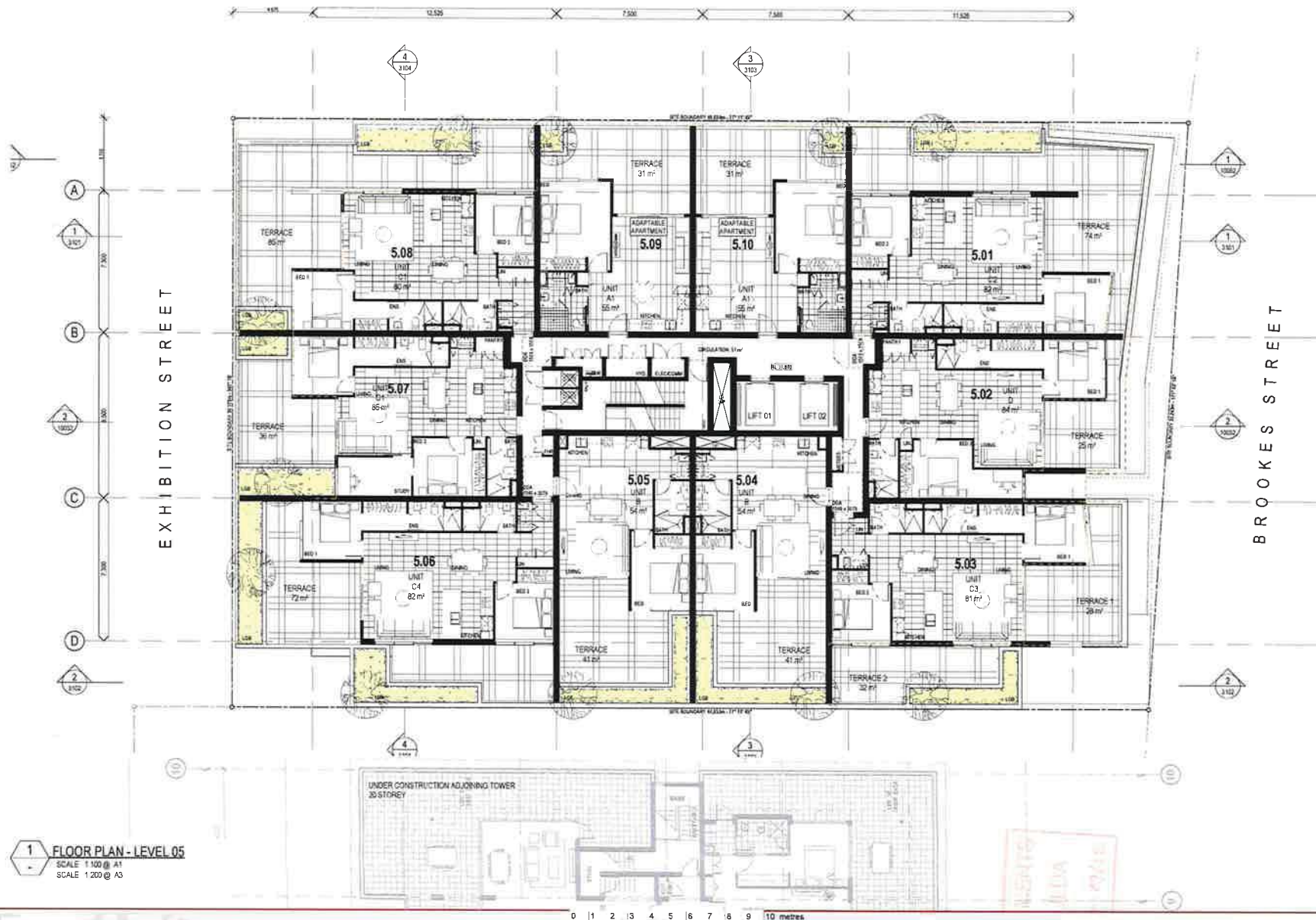


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1 FLOOR PLAN - LEVEL 05
SCALE 1:100 @ A1
SCALE 1:200 @ A3

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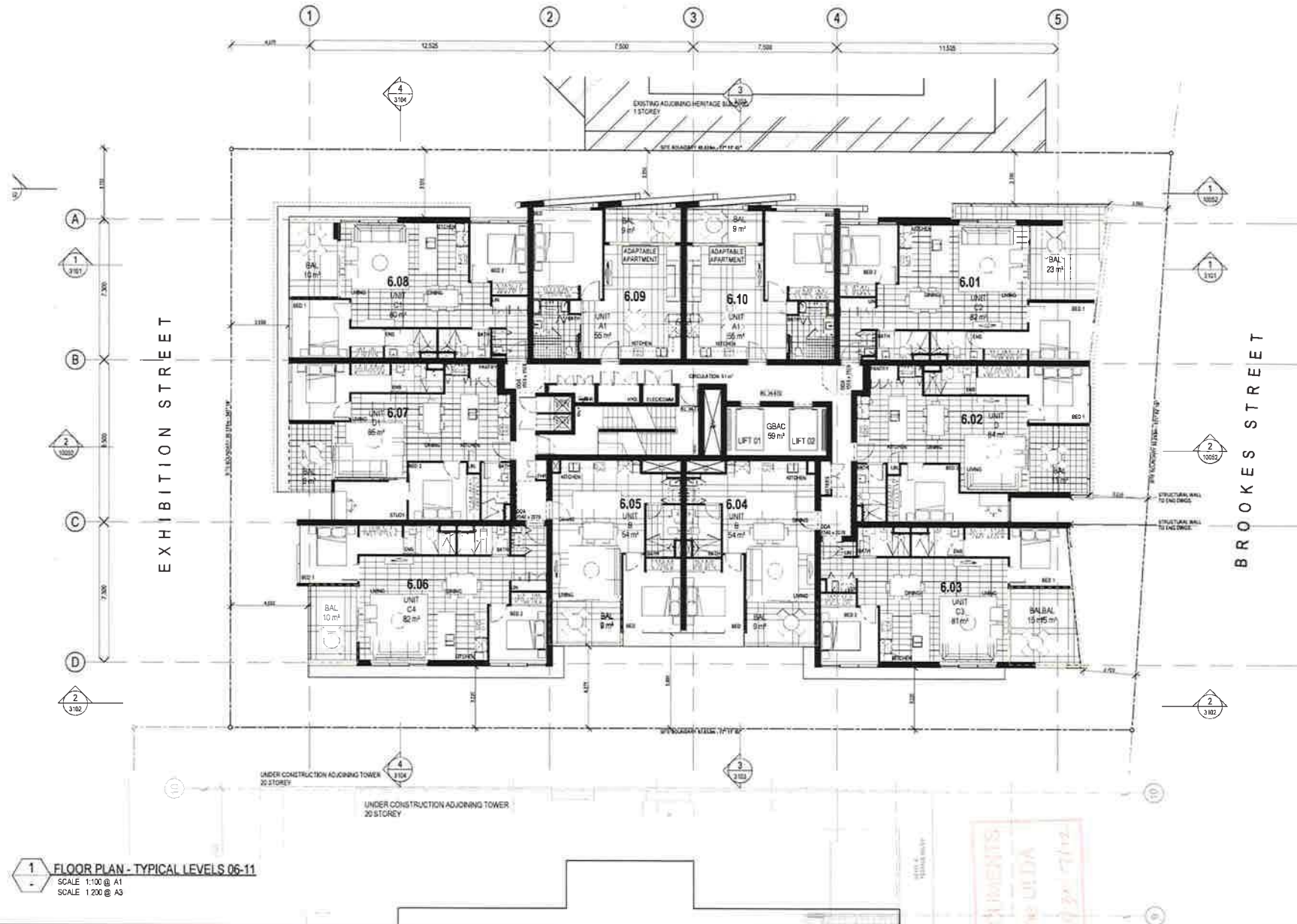
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04	REVISED ON BLUE	07/05/15	JH
05	REVISED ON BLUE	07/05/15	JH
06	REVISED ON BLUE	07/05/15	JH
07	REVISED ON BLUE	07/05/15	JH
08	REVISED ON BLUE	07/05/15	JH
09	REVISED ON BLUE	07/05/15	JH
10	REVISED ON BLUE	07/05/15	JH

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL 61 BROOKES STREET, BOWEN HILLS
Drawing Title
FLOOR PLAN - LEVEL 05

Scale	Date	Job no.
As Shown	JAN 2015	4051
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 2015	02	

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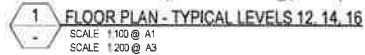
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02	REVISED DRAWING	21/06/15	JH
03	REVISED DRAWING	07/06/15	JH
Issue	Revision	Date	By
Amendments			

Client
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 Project Name and Location
 MULTI RESIDENTIAL 61 BROOKES STREET BOWEN HILLS
 Drawing Title
 FLOOR PLAN - TYPICAL LEVEL 06-11

Scale	Date	Job no.
As Shown	JAN 2015	4051
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 2016	02	

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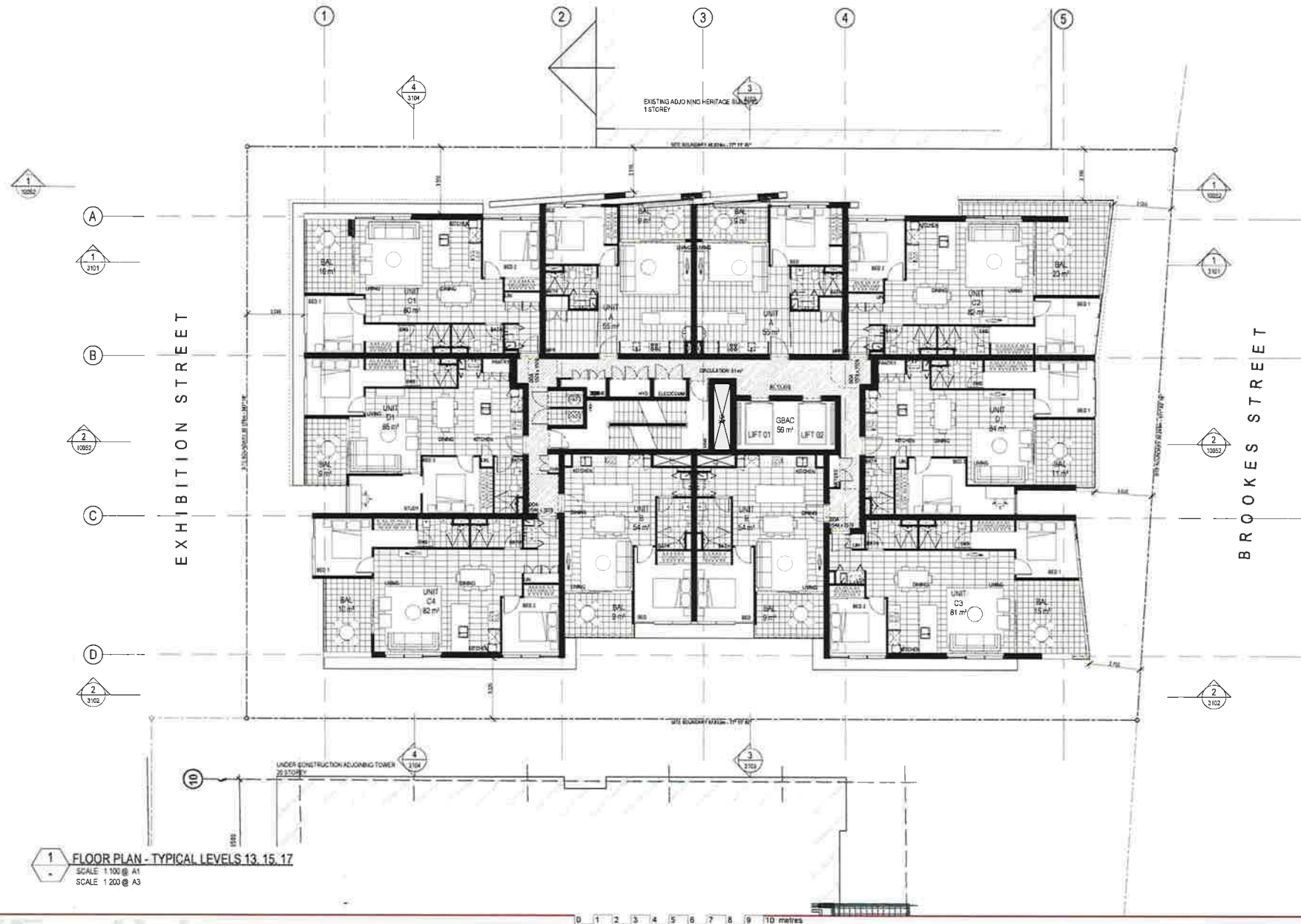


Client
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Project Name and Location
MULTI RESIDENTIAL, 61 BROOKES STREET, BOWEN HILLS

Drawing Title
FLOOR PLAN - TYPICAL LEVEL 12, 14, 16

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1 FLOOR PLAN - TYPICAL LEVELS 13, 15, 17
SCALE 1:100 @ A1
SCALE 1:200 @ A3

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01	REVISED DRAWING	20/07/18	JH
02	REVISED DRAWING	21/09/18	JH
03	CHANGES	01/09/18	JH
04	CHANGES	01/09/18	JH
05	CHANGES	01/09/18	JH
06	CHANGES	01/09/18	JH
07	CHANGES	01/09/18	JH
08	CHANGES	01/09/18	JH
09	CHANGES	01/09/18	JH
10	CHANGES	01/09/18	JH

Client
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Project Name and Location
MULTI RESIDENTIAL 61 BROOKES STREET, BOWEN HILLS
Drawing Title
FLOOR PLAN - TYPICAL LEVELS 13, 15, 17

Scale
As Shown
Date
JAN 2018
Drawn
JH
Checked
MT
Approved
MT
Drawing no.
SD 2018

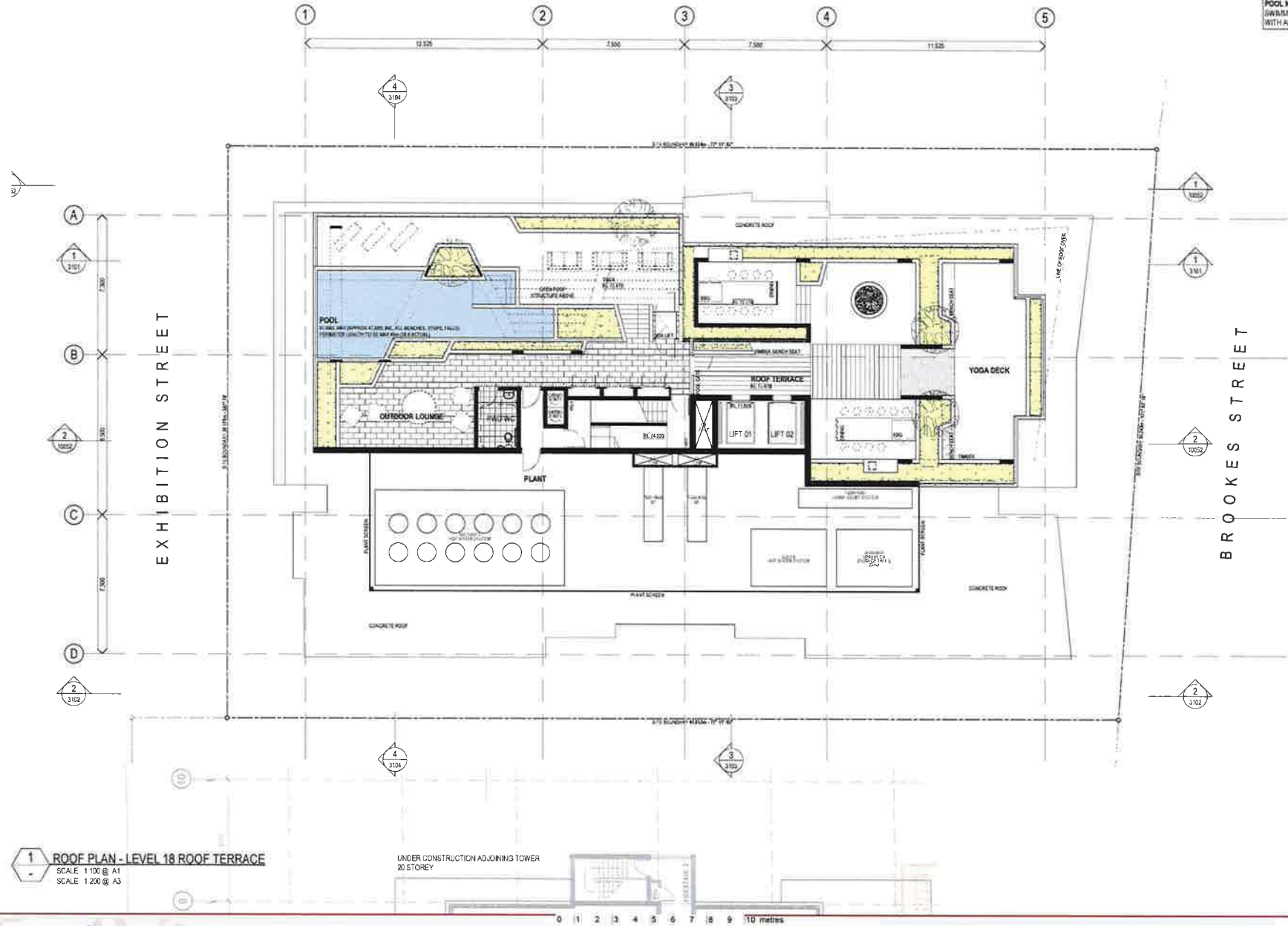
Job no.
4051
Revision
02

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POOL NOTE:
SWIMMING POOL FENCING IN ACCORDANCE
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1
-
ROOF PLAN - LEVEL 18 ROOF TERRACE
SCALE 1:100 @ A1
SCALE 1:200 @ A3

Schematic

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Rev	Description	Date	By	Check	Appr
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02	REVISED DA BLUE	22/06/15	JPH		
01	DA BLUE	20/06/15	JPH		
00	DA BLUE	07/05/15	JPH		
Issue	Revision	Date	By	Check	Appr
Attachments					

Client
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Project Name and Location
MULTI RESIDENTIAL, 61 BROOKES STREET, BOWEN HILLS

Drawing Title
ROOF PLAN - LEVEL 18 - ROOF TERRACE

Scale As Shown	Date JAN 2015	Job no. 4621
Drawn JPH	Checked MT	Approved MT
Drawing no. SD 2101	Issue 03	

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UNDER CONSTRUCTION ADJOINING TOWER
20 STOREY

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

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K1149914-000181 1/22 Drawings: 11.01.01.02 Bowen estate/Architectural/Urban/Conceptual/01 Houses/Architect/1/22 11.01.01.02 11.01.01.02 11.01.01.02



03	REVISED DA ISSUE	22/07/19	JH
01	REVISED DA ISSUE	22/06/19	JH
01	REVISED DA ISSUE	10/06/19	JH
00	DA ISSUE	07/05/19	JH
Issue	Revision	Date	Iss
Amendments			

Client	BROOKES JV PTY LTD
Project Name and Location	MULTI RESIDENTIAL, 61 BROOKES STREET, BOWEN HILLS
Drawing Title	ROOF PLAN

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Drawing no. SD 2102		Issue 03

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SITE COVER CALCULATION

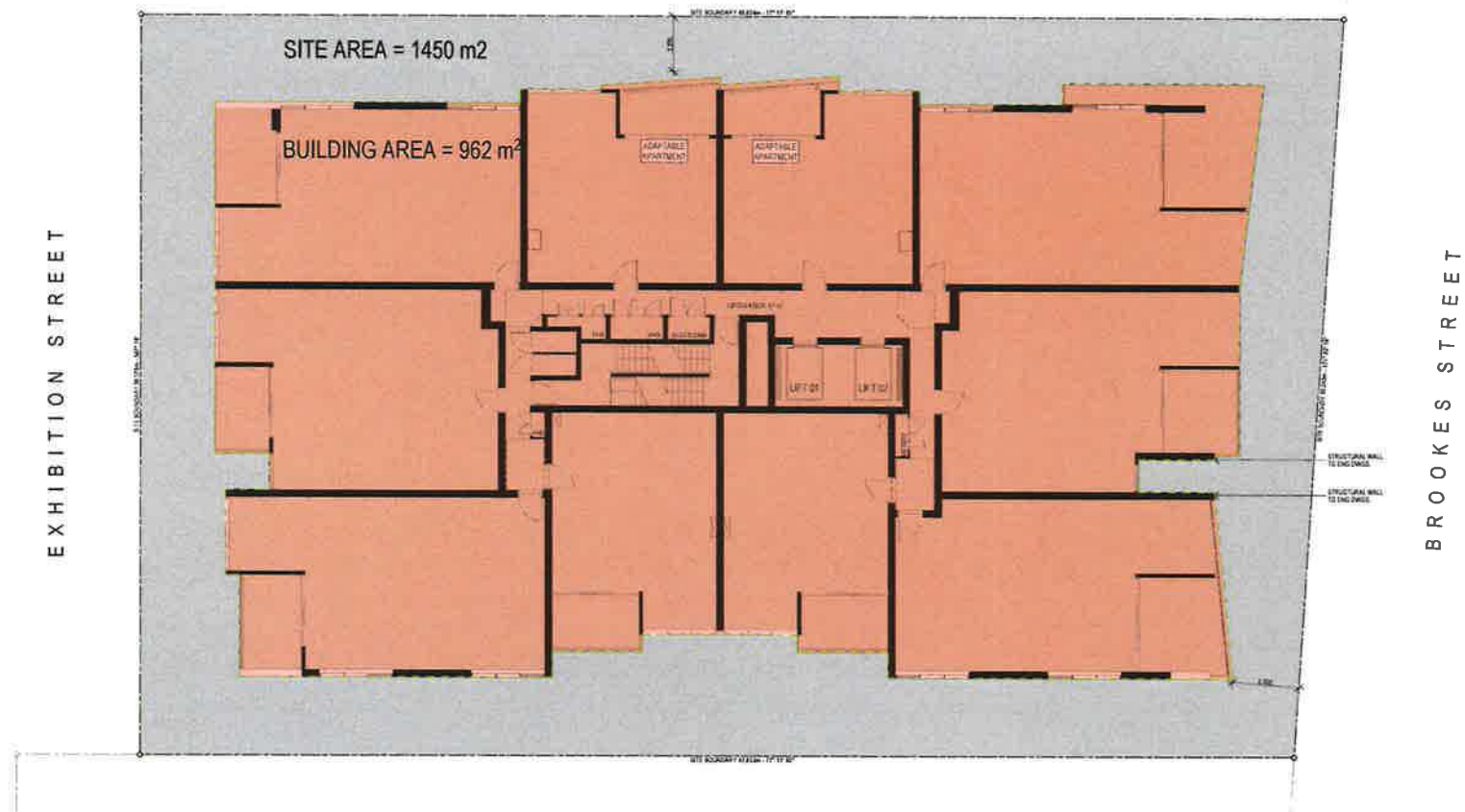
SITE AREA = 1450m²

BUILDING AREA = 962m²

$962\text{m}^2 / 1450\text{m}^2 * 100 = 66.3\%$

NOTE:

SITE COVER DOES NOT INCLUDE
CONCRETE SLAB PROJECTIONS,
ROOF OVERHANGS OR SUNHOODS.



1 SITE COVER - TYPICAL UPPER LEVEL PLAN
SCALE 1:100 @ A1
SCALE 1:200 @ A3

Schematic
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0 1 2 3 4 5 6 7 8 9 10 metres

DT	REVISED ON	DATE	BY
01	REVISED ON	2015/10/19	JH
02	REVISED ON	2015/10/19	JH
Issue	Revisions	Date	By
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Drawing Title
SITE COVER

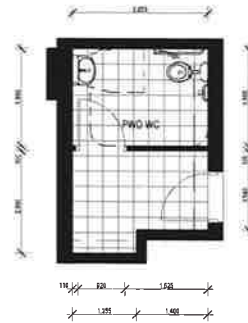
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As Shown	JAN 2015	4581
Drawn	Checked	Approved
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Drawing no.	Issue	
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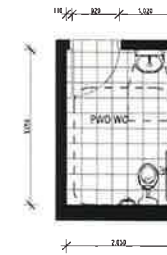




1 UNIT PLAN - TYPICAL ADAPTABLE UNIT
SCALE 1:50 @ A1
SCALE 1:100 @ A3



2 FLOOR PLAN - GROUND FLOOR PWD TOILET
SCALE 1:50 @ A1
SCALE 1:100 @ A3



3 FLOOR PLAN - LEVEL 18 PWD TOILET
SCALE 1:50 @ A1
SCALE 1:100 @ A3

Schematic

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A multi-residential development located at 61 Brookers Street, Bowen Hills, Brisbane, Queensland, Australia. The development consists of a multi-story residential building with a total of 10 units.



0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 metres

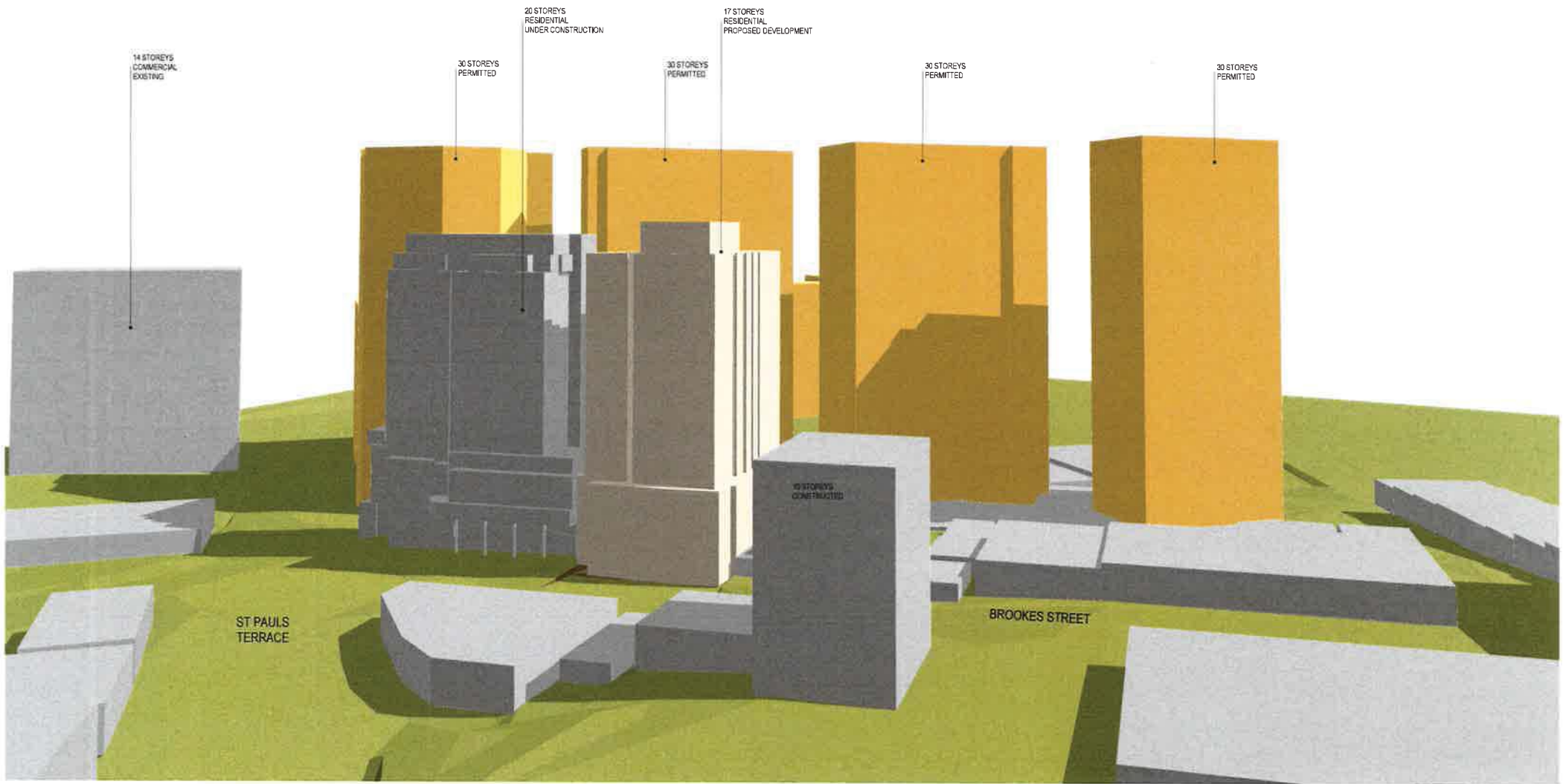
Issue	Revision	Date	By
01	PROVIDED BY CLIENT	23/05/15	JH
02	ON ISSUE	17/05/15	JH
Issue	Revision	Date	By
Amendments			

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL 61 BROOKES STREET, BOWEN HILLS
Drawing Title
PWD PLANS

Scale	Date	Job no.
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Drawing no.	Issue	
SD 2803	01	

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1 VIEW OF EXISTING & FUTURE BUILDING HEIGHTS
SCALE NTS @ A1

Schematic

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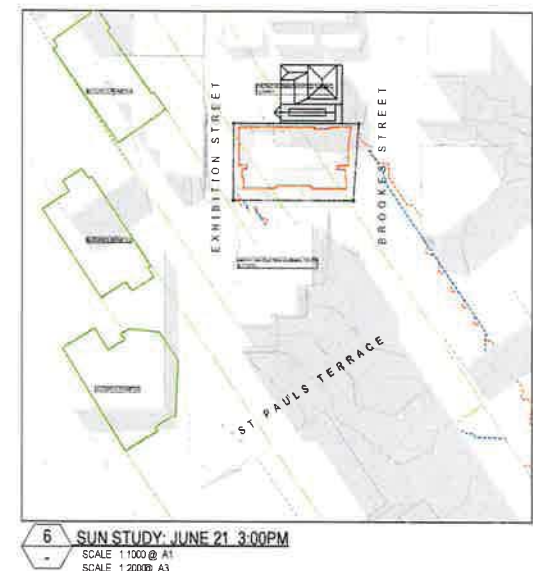
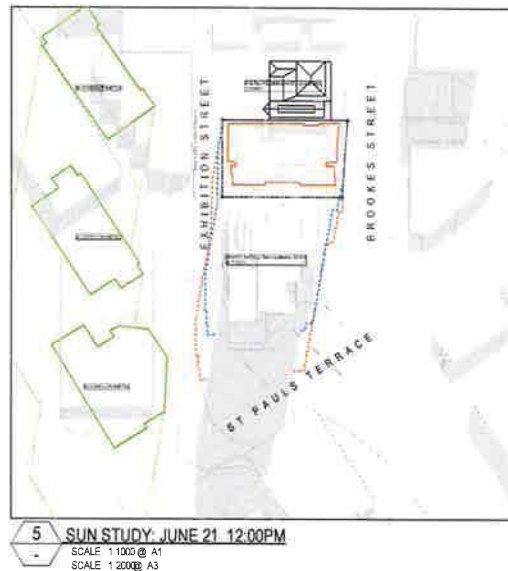
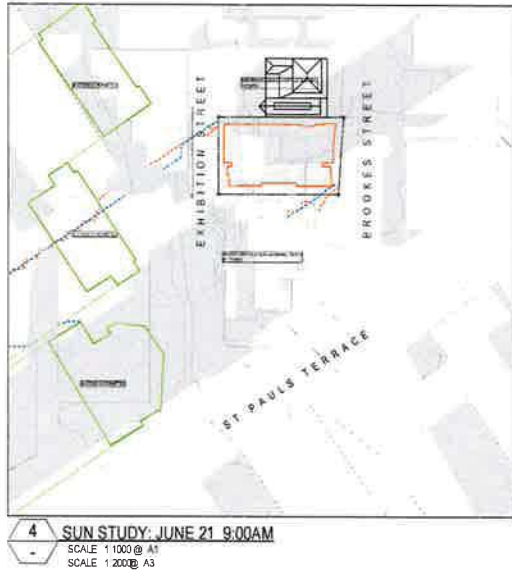
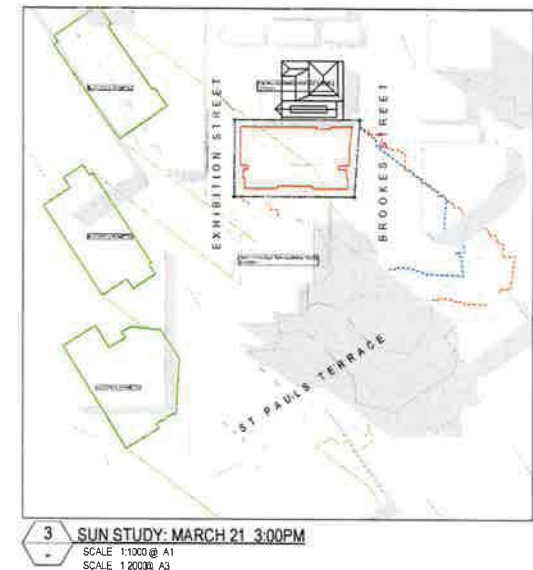
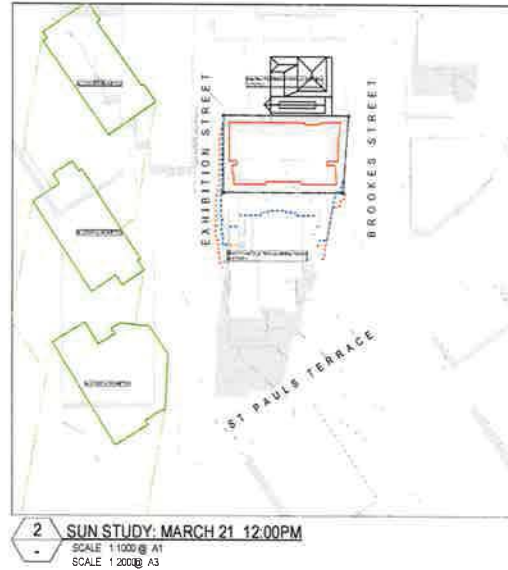
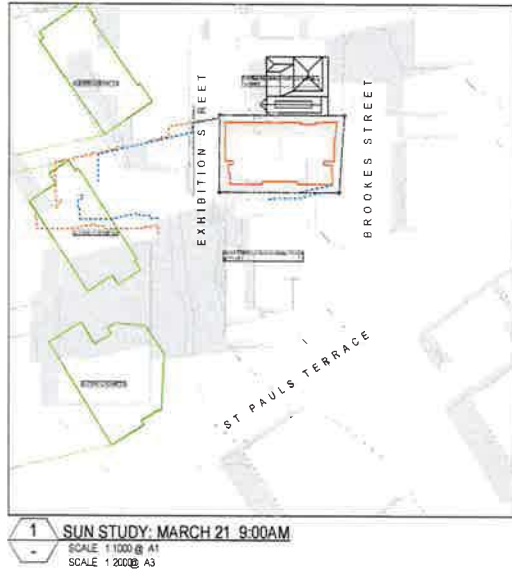
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Issue	Revision	Date	By
01			

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL 51 BROOKES STREET, BOWEN HILLS
Drawing Title
VIEW OF FUTURE BUILDING HEIGHTS

Scale	Date	Job no.
As Shown	JAN 2015	4981
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 2804	00	

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NO	DATE	REVISION	BY	DATE	BY
00	23/07/15	JH			
Issue	Revision	Date	By		
Amendments					

Client
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Project Name and Location
MULTI RESIDENTIAL, 61 BROOKES STREET, BOWEN HILLS
Drawing Title
SUN STUDIES MARCH AND JUNE

Scale	Date	Job no.
As Shown	JAN 2015	4581
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 2805	00	

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1 **PODIUM ELEVATION - EAST**
SCALE 1:100 @ A1
SCALE 1:200 @ A3

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

00	DA 0001	22/01/15	JH
Issue	Revision	Date	By
Amendments			

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL, 61 BROOKES STREET, BUWEN HILLS
Drawing Title
PODIUM ELEVATION - EAST

Scale	Date	Job no.
As Shown	JAN 2015	4861
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 2807	00	

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Schematic
MULTI RESIDENTIAL

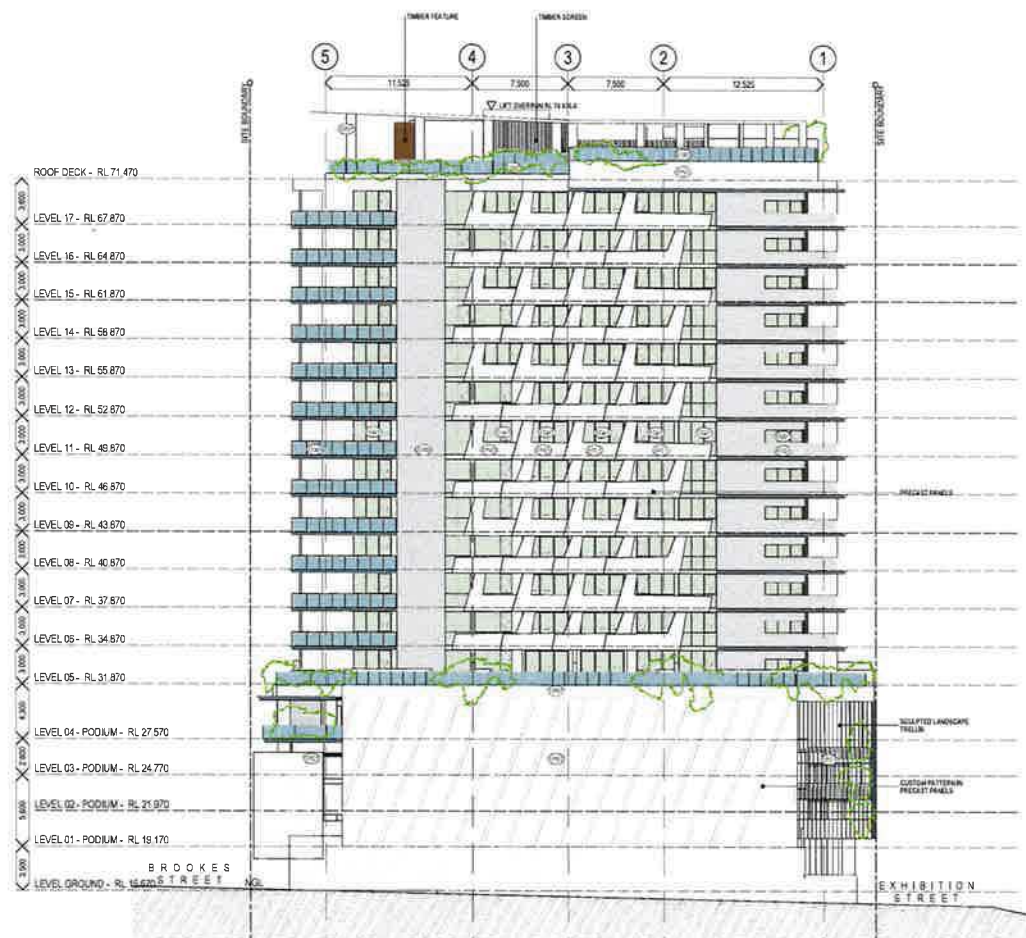
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FRESH LESSON

- EXTERNAL PAINT FINISH-1 WHITE
- EXTERNAL PAINT FINISH-2 ROSE GRAY
- EXTERNAL PAINT FINISH-3 BLACK
- POWER GLAZING-11 UNICOGLAZ
- EXTERNAL GLAZING-11 LIGHT GRAY (TO ISO SPEC)
- IN-CRISTAL ALUMINUM FRAME
- EXTERNAL GLAZING-12 TINTED LIGHT GRAY
- IN-CRISTAL ALUMINUM FRAME
- EXTERNAL GLAZING-13 TINTED LIGHT BLUE
- IN-CRISTAL ALUMINUM FRAME
- EXTERNAL GLAZING-14 UNPAVED GLAZING
- IN-CRISTAL ALUMINUM FRAME
- EXTERNAL BRACK



1 NORTH ELEVATION
SCALE 1/2" = 1'-0"
SCALE 1/4" = 1'-0"

Schematic

MULTI RESIDENTIAL

[illegible]

0 2 4 6 8 10 12 14 16 18 20 metres

01	SA ISSUE		23/07/15	J
00	SA ISSUE		07/05/15	J
Issue	Revision		Date	Initials

Client
BROOKES JV PTY LTD

Project Name and Location
MULTI RESIDENTIAL 61 BROOKES STREET, BOWEN HILLS

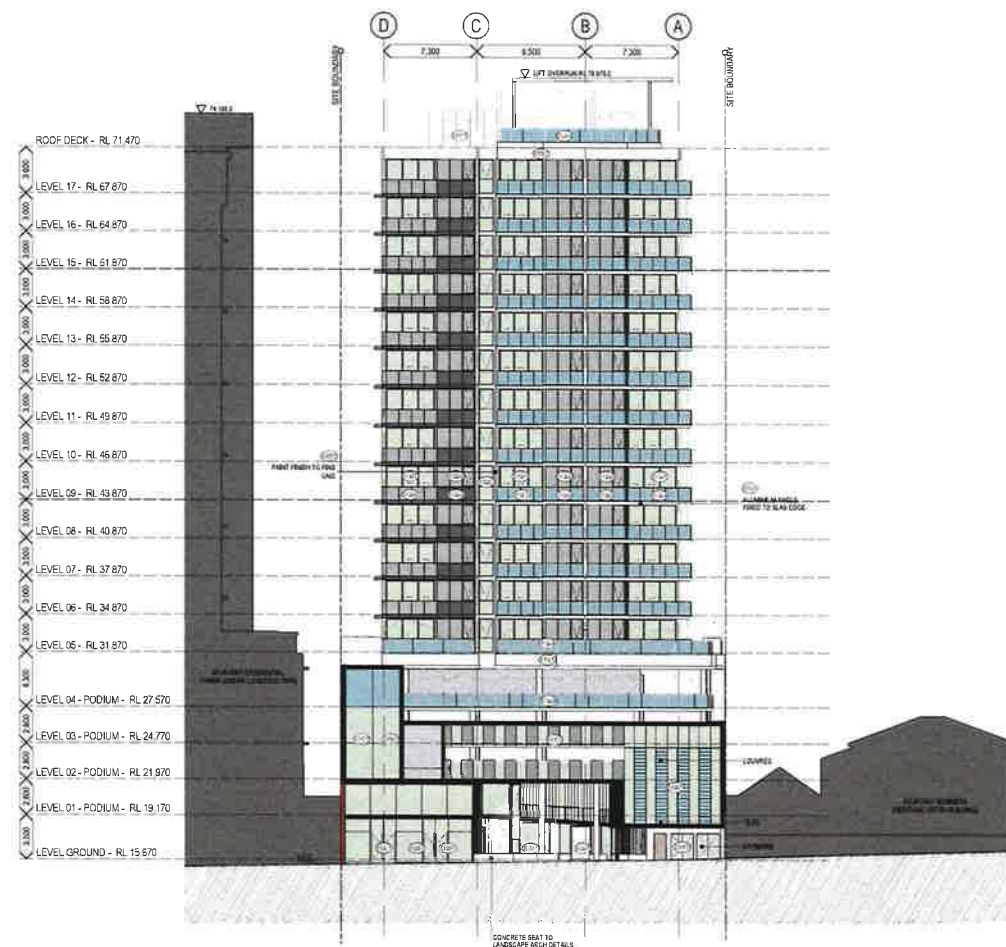
Drawing Title
ELEVATION - NORTH

Scale As Shown	Date JAN 2015	Job no. 4081
Drawn JH	Checked MT	Approved MT
Drawing no. SD 3001		Issue 01

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FINISH LEGEND	
(1) 101	EXTERNAL PAINT FINISH (1) WHITE
(1) 102	EXTERNAL PAINT FINISH (2) EDGE GREY
(1) 103	EXTERNAL PAINT FINISH (3) BLACK
(1) 104	POWDER COATING (1) CHARCOAL
(1) 105	EXTERNAL GLAZING (1) LIGHT GREY (2) RSD SPEC)
(1) 106	EXTERNAL GLAZING (3) TINTED LIGHT GREY
(1) 107	EXTERNAL GLAZING (4) TINTED LIGHT BLUE
(1) 108	EXTERNAL GLAZING (5) IMPROVED GLAZING
(1) 109	EXTERNAL GLAZING (6) IMPROVED GLAZING
(1) 110	EXTERNAL BRICK



1 EAST ELEVATION
SCALE 1:200 @ A1
SCALE 1:400 @ A3

Schematic

MULTI RESIDENTIAL

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0 2 4 6 8 10 12 14 16 18 20 metres

Rev	Description	Date	By
01	Issue	22/07/18	JH
02	Issue	01/05/18	JH
03	Issue	01/05/18	JH
04	Issue	01/05/18	JH
05	Issue	01/05/18	JH
06	Issue	01/05/18	JH
07	Issue	01/05/18	JH
08	Issue	01/05/18	JH
09	Issue	01/05/18	JH
10	Issue	01/05/18	JH
11	Issue	01/05/18	JH
12	Issue	01/05/18	JH
13	Issue	01/05/18	JH
14	Issue	01/05/18	JH
15	Issue	01/05/18	JH
16	Issue	01/05/18	JH
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19	Issue	01/05/18	JH
20	Issue	01/05/18	JH

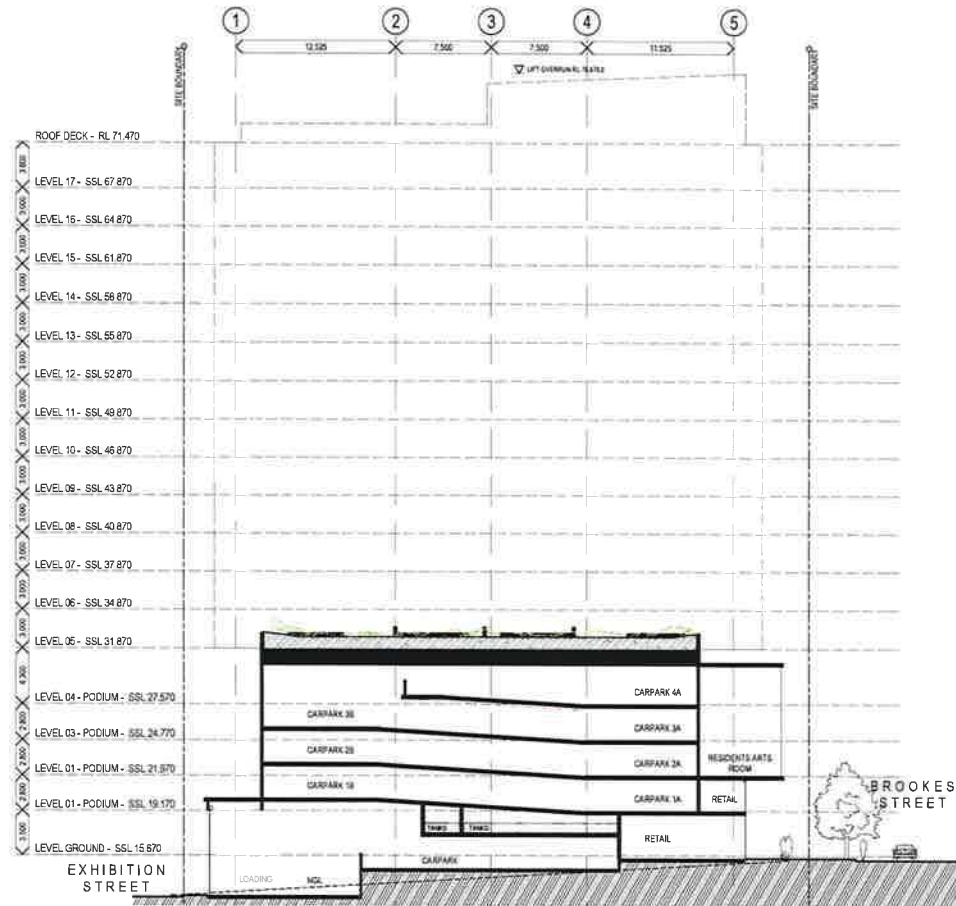
Client
BROCKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL 61 BROOKES STREET, BOWEN HILLS
Drawing Title
ELEVATION - EAST

Scale	Date	Job no.
As Shown	JAN 2015	4281
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 3002	01	

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[illegible]



2

SECTION B

SCALE 1:200 @ A1
SCALE 1:400 @ A3

Schematic

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0 2 4 6 8 10 12 14 16 18 20 metres

01	DR 1551/16	22/07/18	JH
02	DR 1551/16	07/08/18	JH
03	DR 1551/16	07/08/18	JH
04	DR 1551/16	07/08/18	JH
05	DR 1551/16	07/08/18	JH
06	DR 1551/16	07/08/18	JH
07	DR 1551/16	07/08/18	JH
08	DR 1551/16	07/08/18	JH
09	DR 1551/16	07/08/18	JH
10	DR 1551/16	07/08/18	JH
11	DR 1551/16	07/08/18	JH
12	DR 1551/16	07/08/18	JH
13	DR 1551/16	07/08/18	JH
14	DR 1551/16	07/08/18	JH
15	DR 1551/16	07/08/18	JH
16	DR 1551/16	07/08/18	JH
17	DR 1551/16	07/08/18	JH
18	DR 1551/16	07/08/18	JH
19	DR 1551/16	07/08/18	JH
20	DR 1551/16	07/08/18	JH

Client
BROOKES JV PTY LTD
Project Name and Location
MULTI RESIDENTIAL 61 BROOKES STREET, ROWEN HILLS
Drawing Title
SECTIONS

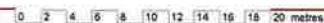
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As Shown	JAN 2015	4581
Drawn	Checked	Approved
JH	MT	MT
Drawing no.	Issue	
SD 3102	01	

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01	QA ISSUE	22/05/18	2
02	QA ISSUE	27/05/18	2
Issue	Revision	Date	In
Attachments			

Scale As Shown	Date JAN 2015	Job no. 4081
Drawn JH	Checked MT	Approved MT
Drawing no. SD 3103		Issue 01

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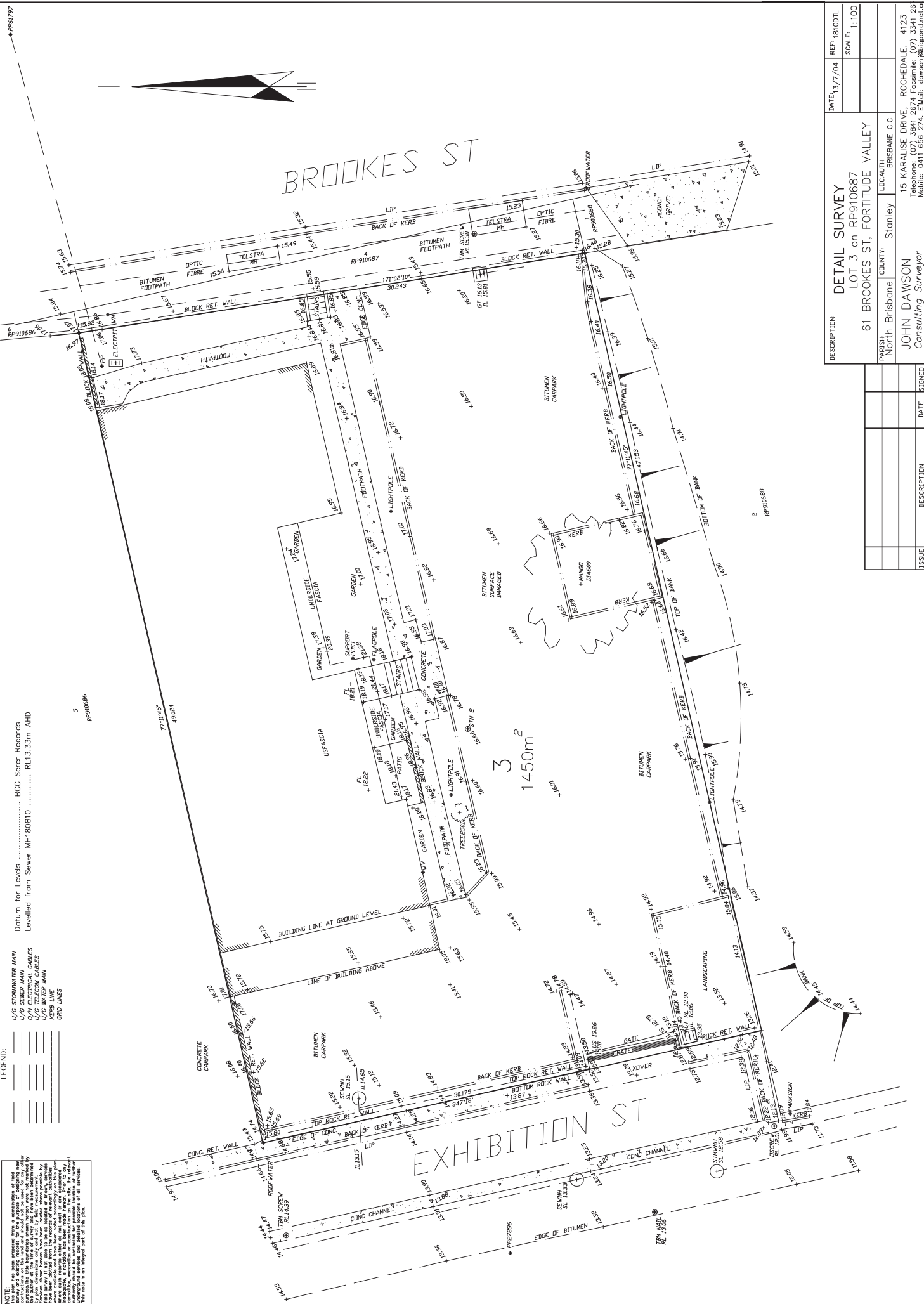
Appendix B - DETAILED SURVEY

LEGEND:

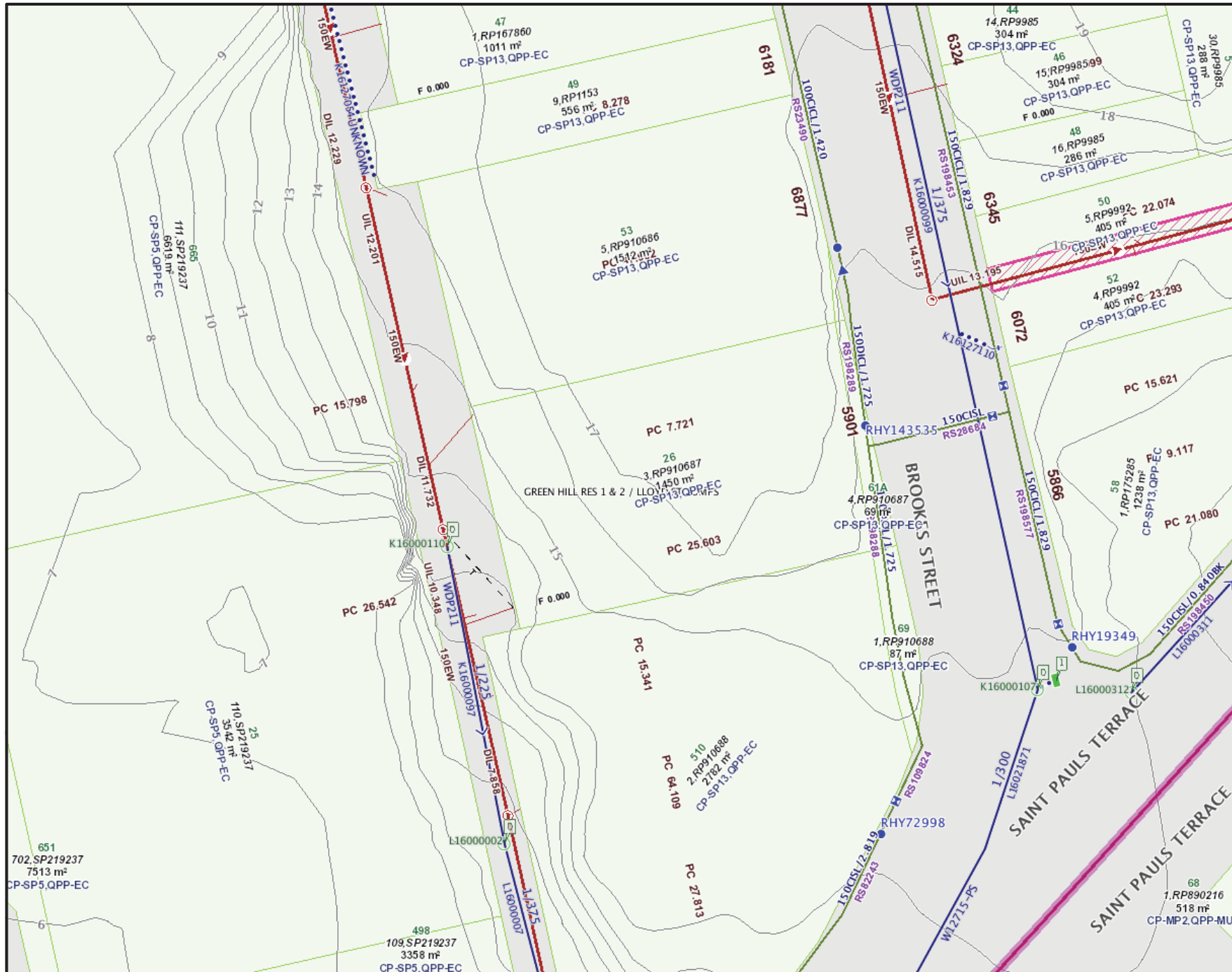
U/G STORMWATER MAIN
U/G SEWER MAIN
O/H ELECTRICAL CABLES
U/G TELECOM CABLES
U/G WATER MAIN
KERB LINE
GRID LINES

Datum for Levels BCC Serer Records
 Levelled from Sewer MH180810 RL13.33m AHD

5
RP910686

[illegible]

Appendix C - COUNCIL EBIMAP RECORDS



Date : Apr 28, 2015
User : bggroup05#967774

Scale = 1:500
Metres 10 20

Location :
6,963,656
503,319
N
503,647
6,963,490

CIVIL DIVISION

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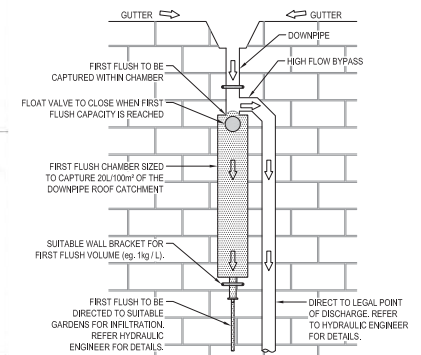
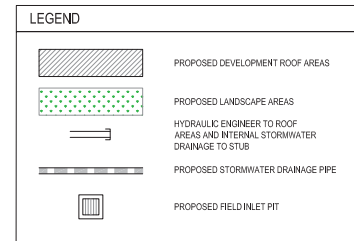
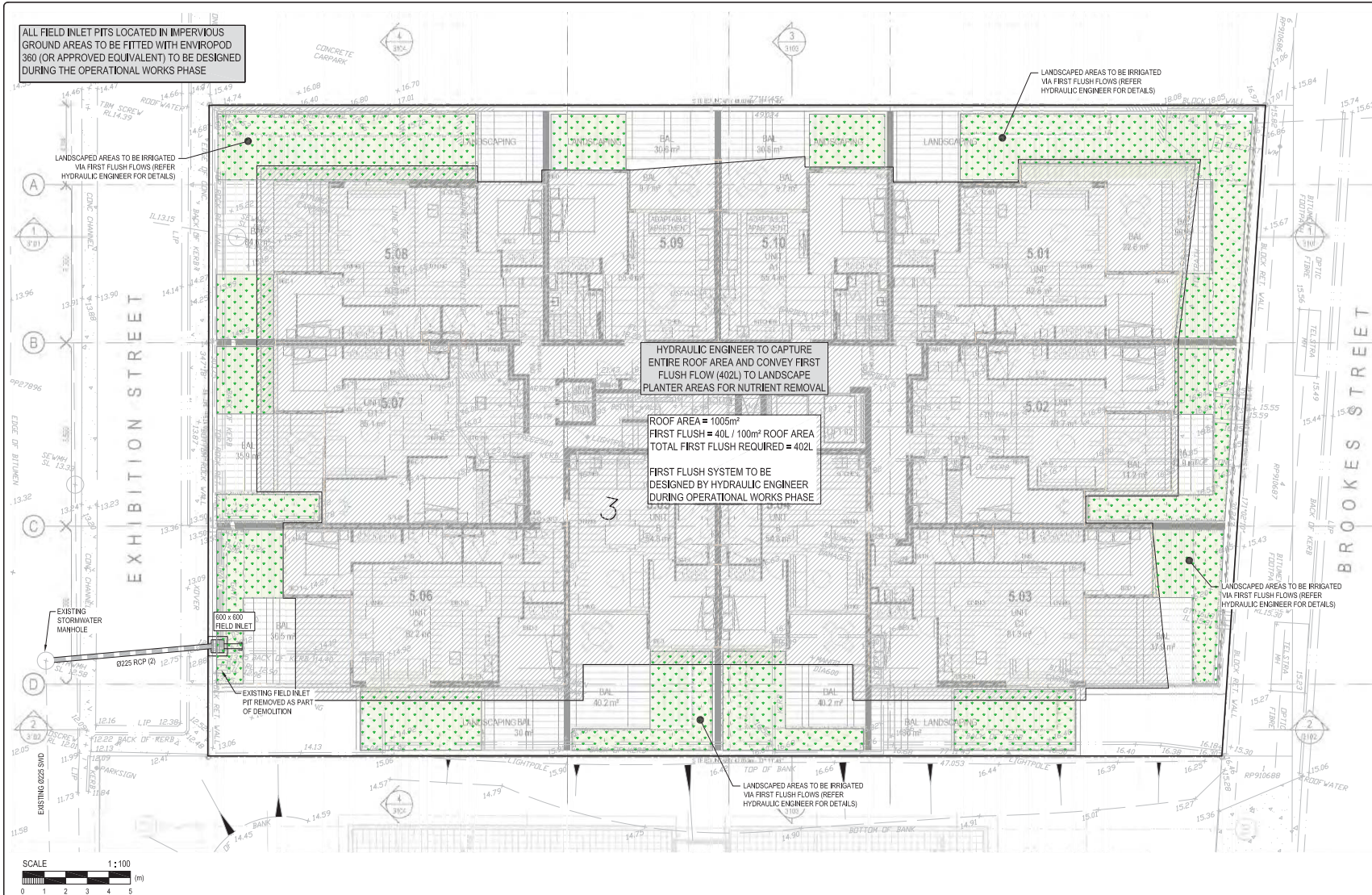
Caution: This map may contain the locations of abandoned underground asbestos pipes. Council gives no warranty to the completeness or accuracy of these records. Appropriate care needs to be taken in all cases.



Copyright BCC, 2006

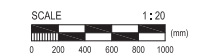
Appendix D – CONCEPT STORMWATER DRAINAGE PLANS

ALL FIELD INLET PITS LOCATED IN IMPERVIOUS GROUND AREAS TO BE FITTED WITH ENVIROPOD 360 (OR APPROVED EQUIVALENT) TO BE DESIGNED DURING THE OPERATIONAL WORKS PHASE



FIRST FLUSH DEVICE DETAIL

SCALE 1:20 @ A1



WATER QUALITY REQUIREMENT
ALL DOWNPIPES TO BE FITTED WITH A FIRST FLUSH DEVICE.
DESIGN REQUIREMENT: 40 L / 100 m² ROOF (MINIMUM)

CONTRACTOR TO DEPTH AND LOCATE ALL EXISTING SERVICES WITHIN FOOTPATH AND BG CIVIL ARE TO BE MADE AWARE OF ANY CLASHES PRIOR TO COMMENCEMENT OF WORKS ON SITE.



CONSULTANT: BG GROUP ENGINEERS
DISCIPLINE: CIVIL DIVISION
CONTACT: CHRIS PETROFF
TELEPHONE: (07) 3839 3366
EMAIL: CHRIS@BGCIVIL.COM.AU



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Drawn	Design	Checked	Supervisor	Orig. Size	Approved:
CP	CP	GF	GF	A1	

REVISIONS					
No.	Description	Date	By	Client	
A	ISSUE FOR APPROVAL	28.04.2015	CP		
B	UPDATED TO SUIT NEW ARCH	30.04.2015	CP		
Project: BROOKES JV PTY LTD					

CONCEPT STORMWATER DRAINAGE PLAN					
Size of Land:	Job No.	No.	Description	Date	By
0.145 HA	C15-194	A	ISSUE FOR APPROVAL	28.04.2015	CP
Scale: AS SHOWN	Drawing No.	B	UPDATED TO SUIT NEW ARCH	30.04.2015	CP
	SK01				
Project: BROOKES JV PTY LTD					
MIXED USE DEVELOPMENT AT 61 BROOKES STREET, FORTITUDE VALLEY					
Revision: B					

Appendix E - BEST PRACTICE TREATMENT DEVICE DATA

- Stormwater 360 – EnviroPod

Data extracted from 'Stormwater 360 Australia – Gross pollutant removal brochure'

EnviroPod®



Cost-effective, easily maintained gullypit insert

The EnviroPod is a proven gullypit insert that's been designed for easy retrofitting into new and existing stormwater gullypits, requiring no construction or land take. It removes a significant portion of sediment, litter, debris and other pollutants from water entering the stormwater system, and can be installed in either kerb inlet, standard pre-cast gullypits or manhole gullypits. Using low-cost passive screening and optional oil-adsorbent media, the EnviroPod can be customised to meet site-specific requirements with interchangeable polyester mesh screens ranging from 200 to 1600 micron pore size. Unless specified otherwise, 1600 micron filter mesh screening bags are supplied as standard.

The EnviroPod is also effective as a pre-treatment device for use in a treatment train with hydrodynamic separators, filtration devices, ponds and wetlands. In many cases, it is often the most practical solution for retrofits.

Independently trialled and tested by city councils throughout Australia and New Zealand, and with installation of over 15,000 units including North America, the EnviroPod filter is the premier gully pit insert.

How does it work?

As stormwater enters a storm grate or gullypit, it passes over the oil adsorbent pillows (optional) and into the screening bag. Litter, debris, and other pollutants larger than the screening bag aperture are captured and retained, while the oil adsorbent pillows reduce oil and grease. If the screening bag is full, or during high flows, overflow is released through the overflow apertures in the frame assembly.

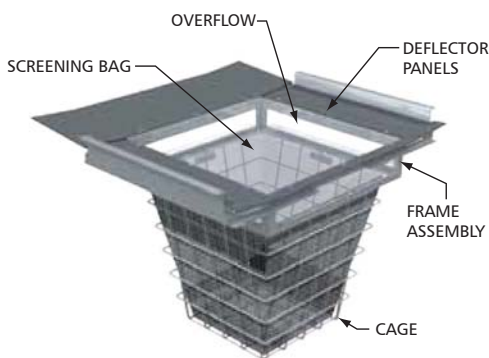
“

Designed for easy fit into new or existing gully pits, the EnviroPod® is a simple and effective solution for preventing gross pollutants from entering the stormwater system.



Design and operation

The EnviroPod consists of a screening bag supported by a filter box and structural cage. Modular plastic deflector panels attach to the filter box and guide the flow of water to the screening bag. The screening bag captures pollutants and allows the water to pass through to the outlet pipe. Optional absorbent material inside the screening bag captures oil and grease. Openings in the filter box allow water to bypass the screening bag during high flow conditions to prevent surface flooding.



Capabilities

- Captures sediment, litter, debris and other pollutants before they enter the drainage system
- Fits a range of gullypit sizes – ideal for retrofits
- Easy access – maintenance friendly design, generally no confined space entry required
- Bypasses high flows with no moveable parts
- Adjustable panels allow fine-tuning during installation for a perfect fit

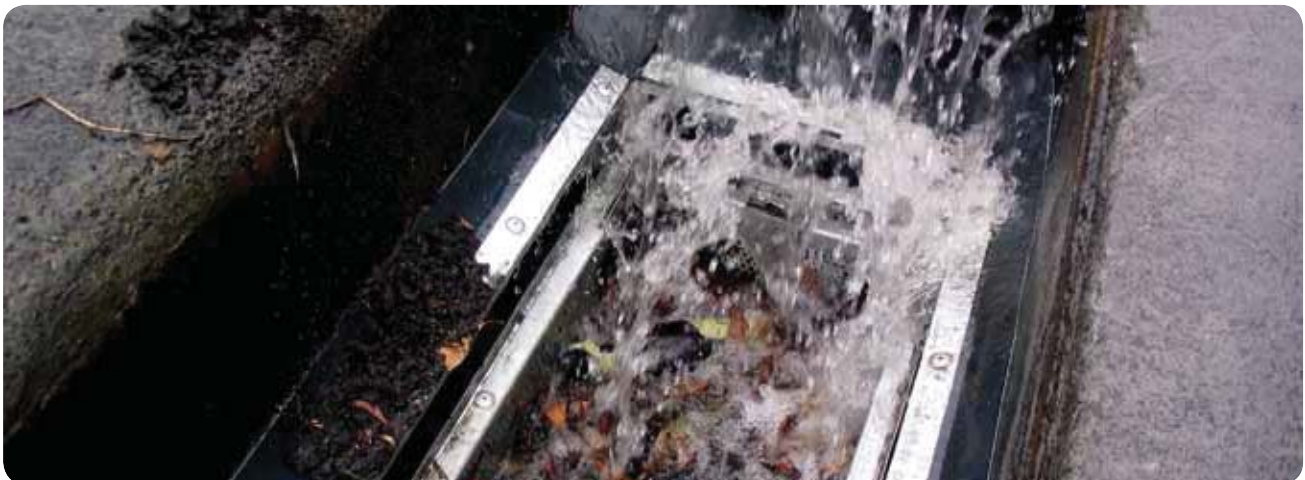
Configurations

The kerb entry EnviroPod is inserted through the pit access cover and is supported by aluminium arms fixed to the kerb channel/pit wall.

The Drop-In EnviroPod is designed to simply insert into the gullypit below the grate, again supported by aluminium arms fixed to the kerb channel/wall pit. Plastic deflector panels seal against the pit walls and direct flow into the filter box and through the mesh screens. There are two standard sizes to fit most pre-cast regular and kerb entry gullypits. Custom designs can be fabricated for non-standard pits.

Installation, inspection and maintenance

Traffic control must be well planned when installing, inspecting or maintaining EnviroPod Filters. All standard rules and regulations governing traffic control and safety while working on the road must be rigidly followed at all times. All potential hazards must be identified and control methods put in place prior to installing, inspecting or maintaining filters.



Appendix F - MAINTENANCE DOCUMENTATION

ENVIROPOD INSPECTION CHECKLIST

ASSET TYPE	Enviropod	ASSET ID
Location		
Date		
Date of last rainfall		Weather
Officer's name		

Additional Information	
Time taken to complete inspection or maintenance	
Photos of site (explanatory notes)	1. 2. 3. 4. 5. 6.
General comments and sketches	
Officer's signature	

MAINTENANCE REQUIREMENTS

Performance Required	Frequency of Inspection (<12 months after construction)	Frequency of Inspection (>12 months after construction)	Identification of Failure	Rectification Works
Maintenance	Every 3 to 4 Months	Every 3 or 4 Months	Bag full of litter / Debris	Remove Litter / Debris
General Task		Annually	Tears / Destruction of Material	Repair / Replace Bag