Waste Management Plan for

12-22 Willan Drive, Cartwright NSW

Development Application

Report Number 710.10278-R01

16 March 2018

Impact Group

Suite 15

Level 3, 924 Pacific Highway

Gordon NSW 2072

Version: v0.2

Waste Management Plan for

12-22 Willan Drive, Cartwright NSW

Development Application

PREPARED BY:

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
2 Lincoln Street
Lane Cove NSW 2066 Australia
(PO Box 176 Lane Cove NSW 1595 Australia)
T: +61 2 9427 8100 F: +61 2 9427 8200
sydney@slrconsulting.com www.slrconsulting.com

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
710.10278-R01-v0.2	16 March 2018	I-hui Waung	Lono Tyson	Lono Tyson
710.10278-R01-v0.1	6 July 2017	I-hui Waung	Lono Tyson	Lono Tyson

Table of Contents

Table of Contents

TABLES

FIGURES

ATTACHMENTS

1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) was engaged by Impact Group (the Client) to prepare a Waste Management Plan (WMP) in support of a Development Application (DA) to Liverpool City Council (Council) for the proposed development of two residential flat buildings located at 12 – 22 Willan Drive, Cartwright NSW 2168. Further details of the proposed redevelopment are provided in **Section 4**.

This report has been prepared based on architectural drawings and email correspondences provided to SLR by the Client.

1.1 Site Identification

The development site is located at 12 – 22 Willan Drive, Cartwright NSW 2168 and comprises Lots 344, 345, 346, 347, 348 and 349 on DP 227167. The site is located within the Liverpool City Council Local Government Area (LGA).

The location of the site is shown in **Figure 1**.

Adapted from image obtained from SIX Maps (https://maps.six.nsw.gov.au)

Figure 1 Location of 12 – 22 Willan Drive, Cartwright, NSW

1.2 Scope

This WMP applies to the proposed site preparation works, construction and operation of two residential flat buildings at the site.

The provisions contained in this WMP are to be implemented at all stages of the development and may be subject to review upon expansion or changes to the development.

Waste management for the site preparation and construction stages is described in **Section 5**. Waste management for the operational stage is described in **Section 6**.

1.3 Objectives

The principal objective of this WMP is to identify wastes likely to be generated at the site during site preparation, construction and operational stages of the proposed development, including a description of how waste would be handled, processed and disposed of (or re-used/recycled), in accordance with Council requirements.

2 BETTER PRACTICE FOR WASTE MANAGEMENT AND RECYCLING

2.1 Waste Management Hierarchy

This WMP has been prepared in line with the following approaches of the waste management hierarchy, as established under the *Waste Avoidance and Resource Recovery Act 2001*:

- Waste avoidance through prevention or reduction of waste generation. Waste avoidance is best achieved through better design and purchasing choices;
- Waste reuse, without substantially changing the form of waste;
- Waste recycling, through the treatment of waste that is no longer usable in its current form to produce new products;
- Energy recovery, through thermal treatment of residual waste materials and from green waste processing; and
- Waste disposal, in a manner that causes the least harm to the natural environment.

The order of preferences of approaches of the waste management hierarchy is shown in **Figure 2**.

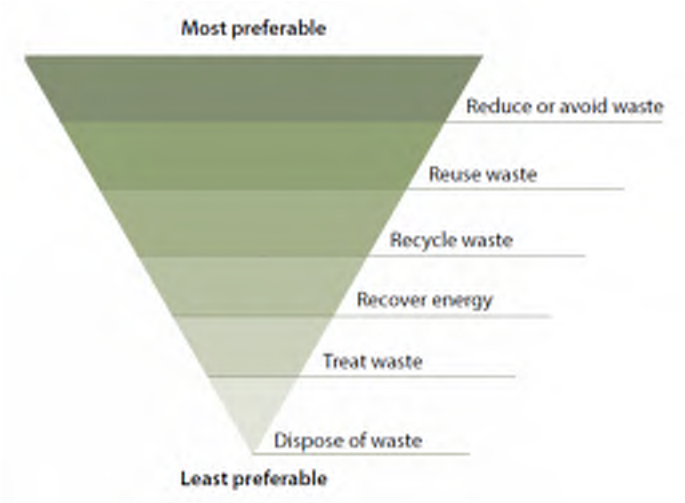


Image source: NSW EPA (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21.*

Figure 2 Waste management hierarchy

2.2 Benefits of Adopting Better Practice

Benefits of adopting better practice principles in waste management and recycling include:

- Enhanced social and environmental reputation of an organisation;
- Reduced costs associated with waste disposal;
- Benefits to all stakeholders and the wider community; and
- Improved environmental outcomes.

3 WASTE LEGISLATION AND GUIDANCE

The legislation and guidance outlined in **Table 1** should be referred to during all stages of the development.

Table 1 Waste Legislation and Guidance

Legislation / Guidance	Objectives
Waste Avoidance and Resource Recovery Act 2001	To promote extended producer responsibility in place of industry waste reduction plans. Specific objectives include: • To encourage efficient use of resources. • To minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste. • To ensure that industry shares with the community the responsibility for reducing and dealing with waste. • To ensure the efficient funding of waste and resource management planning, programs and service delivery.
Protection of the Environment Operations Act (POEO) 1997 & Amendment Act 2011	Administered by the Environmental Protection Authority (EPA) to enable the Government to establish instruments for setting environmental standards, goals, protocols and guidelines. The owner of a premises, the employer or any person carrying on the activity which causes a pollution incident is to *immediately* notify the relevant authorities when material harm to the environment is caused or threatened. A list of each relevant authority is provided in the POEO Amendment Act and will be noted in the site's incident register.
POEO (Waste) Regulation 2014	Contains provisions relating to the waste levy, waste tracking and management requirements for certain waste types, payment schemes for local councils, consumer packaging recycling and other miscellaneous provisions.
NSW EPA's Waste Classification Guidelines (Part 1) 2014	To assist waste generators to effectively manage, treat and dispose of waste to ensure the environmental and human health risks associated with waste are managed appropriately and in accordance with the POEO Act and is associated regulations.
Building Code of Australia (BCA) and relevant Australian Standards	The BCA has the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently.
Liverpool Development Control Plan (DCP) 2008 Part 1 – General Controls for all Developments	Chapter 25 of the DCP applies to all application within the Council LGA and stipulates controls intended to: • Minimise waste produced during demolition and construction of new developments and maximise resource recovery; • Ensure waste management for the end use of the development is designed to provide satisfactory amenity for occupants and provide appropriately designed collection systems; and • Minimise ongoing waste to landfill and maximise recycling of ongoing waste.
Liverpool Development Control Plan (DCP) 2008 Part 3.7 – Residential Flat Buildings	Part 3.7 of the DCP is to be read in conjunction with Part 1 of the DCP and contains additional waste management considerations for residential flat buildings.
Liverpool City Council's Waste Management Services For Residential Flat Buildings and Multi Dwelling Housing	Provides a summary of variety of bin sizes available, frequency of Council pick-ups, method of waste collection and storage requirements.
NSW EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21	A key component of the State Government's vision for the environmental and economic future of the state that will be supported financially by the *Waste Less, Recycle More* funding initiative providing long-term targets for 6 key result areas including reduced illegal dumping.

4 PROJECT DESCRIPTION

The site currently comprises six residential properties, each of which is occupied by a low density residential dwelling. The proposed work for the development comprises:

- Demolition of existing dwellings on all six properties; and
- Construction of two 4-storey residential flat buildings, with each building containing 32 units and at-grade carparking.

A copy of the architectural drawings of the proposed development is attached.

5 DEMOLITION AND CONSTRUCTION WASTE MANAGEMENT PLAN

Recent aerial images of 12 – 22 Willan Drive shows the individual properties are each occupied by a low density residential dwelling. Most properties contain secondary structures such as sheds and garages, as well as grassed yards, paved paths and driveways. These existing structures and features will be demolished and the existing ground surface shall be cleared to make way for construction of the residential flat buildings.

5.1 Key Activities

Key demolition and construction activities at the site are anticipated to include:

- Demolition of existing buildings and constructed or prepared surfaces; and
- Construction of two 5-storey residential flat buildings, including a new driveway and at-grade carpark spaces constructed on hardstand.

5.2 Waste Streams and Classifications

The demolition and construction stages of the proposed redevelopment are anticipated to generate the following broad waste streams:

- Demolition wastes, including bricks, timber, plasterboard, tiles, steel and concrete;
- Site clearance wastes, including green waste, excavated material (virgin excavated natural material and/or excavated natural material) and potentially contaminated soils;
- Construction waste;
- Plant maintenance waste;
- Packaging waste;
- Work compound (on-site employees) waste; and
- Wastewater (e.g. from wheel washes, plant maintenance and construction activities).

A summary of likely waste types arising from demolition and construction activities, along with their waste classifications and proposed management methods, is provided in **Table 2.**

For further information on how to determine a waste's classification refer to the NSW EPA (2014) *Waste Classification Guidelines*[1]*.*

[1] Available online from http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm

Table 2 Potential waste types, classifications and management methods – demolition and construction

Waste Types	NSW EPA Classification	Proposed Reuse / Recycling / Disposal Method
Demolition and Site Preparation		
Bricks, timber, plasterboard, tiles, steel, concrete and sandstone	General solid waste (non-putrescible)	Off-site recycling
Asbestos waste	Asbestos special waste	Off-site disposal (landfilling)
Bulk electrical cabling	General solid waste (non-putrescible)	Off-site recycling
Glass	General solid waste (non-putrescible)	Off-site recycling
Light bulbs	Hazardous waste	Off-site recycling
Green waste	General solid waste (non-putrescible) (garden waste)	Off-site recycling
Fill material	Solid waste (non-putrescible) requiring classification	Off-site recycling or disposal to landfill if required
Excavated natural material	General solid waste (non-putrescible)	Reuse on site if possible or off-site beneficial re-use
Virgin excavated natural material	General solid waste (non-putrescible)	Reuse on site if possible or off-site beneficial re-use
Construction		
Concrete, bricks, sand/soil, metal, timber and plasterboard	General solid waste (non-putrescible)	Off-site recycling
Plant Maintenance		
Empty oil and other drums / tins (e.g. fuel, chemicals, paints, spill clean ups)	Hazardous waste if the containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and from which residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if the containers have been cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility. (Note: Discharge to sewer is likely to be subject to Trade Waste Agreement with Sydney Water)
Air filters and rags	General solid (non-putrescible) waste	Disposal at landfill
Oil filters	Hazardous waste	Off-site recycling
Batteries	Hazardous waste	Off-site recycling
Packaging		
Packaging materials, including wood, plastic (including stretch wrap or LLPE), cardboard and metals	General solid (non-putrescible) waste	Off-site recycling
Wooden crates	General solid (non-putrescible) waste	Reused for similar projects, returned to suppliers, or off-site recycling
Work Compound and Associated Offices		
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid (non-putrescible) waste	Commingled recycling at off-site licensed facility
Clean paper and cardboard	General solid (non-putrescible) waste	Paper and cardboard recycling at off-site licensed facility
General domestic waste generated by workers (soiled paper and cardboard, food stuffs, polystyrene)	General solid (non-putrescible) waste mixed with putrescible waste	Disposal at landfill
Pump-out waste and sewage	Liquid (trade) waste	Off-site disposal at licensed facility or disposal direct to sewer where arranged with Council

Source: http://www.epa.nsw.gov.au/wasteregulation/classify-waste.htm

5.3 Estimated Quantities of Demolition and Construction Waste

5.3.1 Demolition Waste

Demolition of existing buildings and infrastructure is anticipated to produce primarily residential building rubble and, from site surface preparation, green waste and excavation spoil. In the absence of Council published sources, the estimated quantities of demolition waste (**Table 3** and **Table 4**) are based on quantities presented for a three-bedroom brick house in Appendix A of *The Hills Development Control Plan (DCP) 2012*, area estimates obtained from NSW Government Spatial Services SIX Maps (https://maps.six.nsw.gov.au/), and an assumed average excavation depth of 500 mm across the extent of the site (upper 50 mm comprising grass cover/topsoil).

Table 3 Estimated quantities (tonnes) of waste from demolition of existing residential buildings

	Property ID and total area of residential buildings						
	12 Willan Dr	14 Willan Dr	16 Willan Dr	18 Willan Dr	20 Willan Dr	22 Willan Dr	**Total**
Waste	275 m^2	185 m^2	189 m^2	206 m^2	300 m^2	136 m^2	--
Sandstone	207	139	142	155	225	102	**970**
Concrete	10	7	7	7	10	5	**46**
Bricks	282	190	194	212	308	140	**1,326**
Timber	30	21	21	23	33	15	**143**
Plasterboard	30	21	21	23	33	15	**143**
Steel	2	2	2	2	2	1	**11**
Roof tiles	21	14	15	16	23	11	**100**
Total	**582**	**394**	**402**	**438**	**634**	**289**	**2,739**

Residential dwelling area for each property includes all buildings on the property.

Table 4 Estimated quantities (tonnes) of excavation spoil and green waste/topsoil from site preparation

	Property ID and total area of property						
	12 Willan Dr	14 Willan Dr	16 Willan Dr	18 Willan Dr	20 Willan Dr	22 Willan Dr	**Total**
Waste	563 m^2	563 m^2	563 m^2	563 m^2	563 m^2	563 m^2	--
Green waste / topsoil[1]	7	7	7	7	7	7	**42**
Excavation spoil[2]	482	482	482	482	482	482	**2,892**
Total	**489**	**489**	**489**	**489**	**489**	**489**	**2,934**

1. Medium density of 0.23 tonnes/m^3 for "Vegetation – Garden" (converted from EPA Victoria *Waste Materials – Density Data*: http://www.epa.vic.gov.au/business-and-industry/lower-your-impact/~/media/Files/bus/EREP/docs/wastematerials-densities-data.pdf)

2. Low range bulk density of 1.9 tonnes/m^3 for "medium-dense sands and gravels" (Table 6-1-1 from Tomlinson (1986)[2])

5.3.2 Construction Waste

Construction of the two residential flat buildings is anticipated to produce waste primarily from excess quantities of building materials (e.g. concrete, bricks, timber, plasterboard). In the absence of Council published sources, the estimated quantities of construction waste (**Table 5**) are based on quantities presented for a "block of flats" in Appendix A of *The Hills Development Control Plan (DCP) 2012* and gross floor areas (GFA) as shown on architectural drawings provided to SLR.

[2] Tomlinson M.J. (1986) *Foundation design and construction.* John Wiley & Sons.

Table 5 Estimated quantities (tonnes) of waste from construction of residential flat buildings

	Building 1 Levels and total GFAs				
	Ground Floor	Level 1	Level 2	Level 3	**Sub Total**
Waste	396.41 m^2	691.92 m^2	691.92 m^2	691.92 m^2	--
Timber	0.28	0.49	0.49	0.49	**1.75**
Concrete	2.66	4.64	4.64	4.64	**16.58**
Bricks	1.27	2.22	2.22	2.22	**7.93**
Plasterboard	0.52	0.9	0.9	0.9	**3.22**
Sand	11.38	19.86	19.86	19.86	**70.96**
Metal	0.52	0.9	0.9	0.9	**3.22**
Other	0.24	0.42	0.42	0.42	**1.5**
Sub Total	16.87	29.43	29.43	29.43	**105.16**
	Building 2 Levels and total GFAs				
	Ground Floor	Level 1	Level 2	Level 3	**Sub Total**
Waste	396.41 m^2	691.92 m^2	691.92 m^2	691.92 m^2	--
Timber	0.28	0.49	0.49	0.49	**1.75**
Concrete	2.66	4.64	4.64	4.64	**16.58**
Bricks	1.27	2.22	2.22	2.22	**7.93**
Plasterboard	0.52	0.9	0.9	0.9	**3.22**
Sand	11.38	19.86	19.86	19.86	**70.96**
Metal	0.52	0.9	0.9	0.9	**3.22**
Other	0.24	0.42	0.42	0.42	**1.5**
Sub Total	16.87	29.43	29.43	29.43	**105.16**
Total (Building 1 & 2)	**33.74**	**58.86**	**58.86**	**58.86**	**210.32**

Building 1: Constructed on former 12 – 16 Willan Drive. Building 2: Constructed on former 18 – 22 Willan Drive.

Total GFA obtained from GFAs provided on architectural drawings prepared by DKO Architecture (NSW) Pty Ltd, Project Name: SGCH Willan Drive, Project Number: 11534.

Waste from construction of roof level is assumed to be incorporated into waste shown in Table 5.

5.4 Waste Avoidance

The building designer should consider:

- Using recycled steel;
- Reducing the use of PVC;
- Preferentially using paints, floor coverings and adhesives with low VOC (volatile organic compound) content;
- Using low formaldehyde wood products, post-consumer reused timber and/or Forest Stewardship Council (FSC) certified timber;
- Using fittings and furnishings that have been recycled, are made from or incorporate recycled materials and have been certified as sustainable or environmentally friendly by a recognised third party certification scheme; and
- Preferentially using building materials, fittings and furnishings (including structural framing, roofing and façade cladding) that have longer life and better re-use and/or recycling potential.

The building contractor should:

- Apply practical building designs and construction techniques;
- Sort and segregate demolition and construction wastes to ensure efficient recycling of wastes (see also **Section 5.6.1**);
- Store wastes on site appropriately to prevent cross-contamination and/or mixing of different waste types (see also **Section 5.6.1**);
- Exercise a preference for long lifespan and/or high potential for re-use in selecting construction materials;
- Re-use formwork where appropriate;
- Reduce packaging waste by:
  - Returning packaging to suppliers where possible and practicable;
  - Purchasing in bulk;
  - Requesting cardboard or metal drums rather than plastics;
  - Requesting metal straps rather than shrink wrap;
  - Using returnable packaging such as pallets and reels; and
- Ensure subcontractors are informed of and implement site waste management procedures.

5.5 Re-use, Recycling and Disposal

The building contractor is to implement the following with respect to re-use, recycling and disposal of demolition and construction waste:

- Provide separate waste bins for recyclable and non-recyclable general wastes;
- Hardstand rubble to be re-used on site or recycled off-site;
- Assess excavation spoil for contamination status and beneficial re-use;
- Waste oil to be recycled or disposed of in an appropriate manner;
- Retain used crates for storage purposes unless damaged;
- Recycle glass and steel;
- Recycle or dispose of solid waste timber, brick or concrete (where such waste cannot be re-used on site) to an appropriately licenced construction and demolition (C&D) waste recycling facility or an appropriately licenced landfill;
- Dispose of all asbestos, hazardous and/or intractable wastes in accordance with WorkCover NSW and NSW EPA requirements; and
- Batteries to be delivered to off-site recycling facilities/centres.

5.6 Waste Segregation, Storage and Servicing

5.6.1 Waste Segregation and Storage

Waste materials produced from demolition and construction activities are to be segregated and stored separately on site.

It is anticipated that the site will provide allowances for separate storage (e.g. separate skip bins and/or appropriately managed stockpiles) of the following waste types:

- Bricks, roof tiles, concrete and scrap metal;
- Metal/steel (if any, in a condition suitable for recycling at metal recycling facilities);

- Timber;
- Glass;
- Hardstand rubble;
- Green waste;
- Topsoil;
- Excavation spoil (uncontaminated);
- Contaminated excavation spoil (if present);
- Asbestos waste;
- Hazardous waste;
- Paper and cardboard;
- Recyclable general waste; and
- Non-recyclable general waste.

If there is insufficient space on site for full segregation of waste types, the building contractor should consult with recycling facilities to determine which waste types may be stored together and not cause difficulties in recycling the waste.

5.6.2 Waste Storage Areas

Areas designated for waste storage should:

- Allow unimpeded access by site personnel and waste disposal contractors;
- Have in place adequate environmental management controls to prevent off-site migration of waste materials and/or contamination from the waste; and
- Not present hazards to human health or the environment.

5.6.3 Waste Servicing and Transport Off-site

The building contractor is to:

- Arrange for suitable waste collection contractors to remove construction and demolition waste from site;
- Ensure waste bins are not filled beyond recommended filling levels;
- Ensure that all bins and loads of waste materials leaving site are covered;
- Maintain waste disposal documentation detailing, at a minimum:
    - Descriptions and estimated amounts of all waste materials removed from site;
    - Details of the waste/recycling collection contractor(s) and facilities receiving the waste/recyclables;
    - Records of waste/recycling collection vehicle movements (e.g. date and time of loads removed, licence plate of collection vehicles, tip dockets from receiving facility); and
    - Waste classification documentation for materials disposed to off-site recycling or landfill facilities.

Removal of waste is anticipated to be carried out during hours approved by Council.

5.7 Contaminated / Hazardous Waste

Contaminated materials, where identified, are to be removed by appropriately licenced contractors and transported to facilities licenced to accept such materials for treatment and/or disposal in accordance with NSW EPA regulations.

Where unexpected materials are encountered which are, or are suspected of being, contaminated or hazardous, at a minimum, the following shall be undertaken:

- Work in the vicinity of the suspect material is to stop immediately and the area isolated;
- Site manager is to contact a relevant hazardous materials assessor and/or appropriately qualified environmental consultant (as necessary) to arrange an assessment of the suspect material and advise on subsequent management procedures; and
- The building contractor's unexpected finds protocol, if available, shall be implemented.

It is anticipated that management of contaminated / hazardous waste will also be subject to relevant requirements as set out in the Construction Environmental Management Plan

5.8 Liquid Waste Management

Wastewater or liquid waste generated from site demolition or construction activities is not permitted to enter the stormwater system or migrate off-site.

Areas, if any, designated on site for wash-down of equipment plant or machinery are to be appropriately bunded and isolated from the local stormwater system and groundwater.

Liquid waste / wastewater are to be removed by a suitably qualified liquid waste contractor and transported to an appropriately licenced facility for treatment and/or disposal in accordance with NSW EPA regulations.

Refer also to the Soil and Erosion Management Plan and the Construction Environmental Management Plan for further site-specific details on wastewater and liquid waste management, treatment and/or disposal.

5.9 Spills Management

Spillages are to be immediately contained (if safe to do so) and the site manager notified immediately.

Spill containment kits and spill control equipment are to be provided and maintained in sufficient numbers and at appropriate locations to allow ready and rapid access by site personnel. Safety Data Sheets (SDSs) should also be available to provide advice on spill clean-up and disposal.

Refer also to the Construction Environmental Management Plan for further site-specific details on spills management.

5.10 Signage

Standard signage is to be posted in all storage/waste collection areas.

All waste containers are required to be labelled correctly and clearly to identify materials stored within.

Signs approved by the NSW EPA for labelling of waste materials are available online (http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm) and should be used where applicable. A selection of signs prepared by NSW EPA is provided in **Figure 3**.

Figure 3 Example NSW EPA signs for labelling of waste materials

5.11 Site Inductions

Waste management measures and procedures are to be included in the site induction for all personnel working at the site.

With respect to waste management, the site induction is to include, at a minimum:

- An outline of this WMP;
- Legal obligations;
- Emergency response procedures on site;
- Waste storage locations and separation of waste;
- Litter management in transit and on site;
- Implications of poor waste management practices;
- Correct use of spill kits; and
- Responsibility and reporting (including identification of personnel responsible for onsite waste management and individual responsibilities).

5.12 Monitoring and Reporting

Records of volumes or tonnages of waste re-used, recycled or disposed to landfill are to be maintained by the building contractor. Additionally, dockets/receipts verifying recycling and/or disposal in accordance with the WMP must be retained and presented to Council if requested.

Daily visual inspections of waste storage areas will be undertaken by site personnel to identify and rectify any issues concerning waste management at the site, as well as identifying opportunities to improve waste management at the site. A written record of these inspections, which will include observations made and the results of any remedial actions taken, is to be undertaken and retained by the building contractor as part of the construction environmental management documentation.

Refer also to the Construction Environmental Management Plan for further site-specific details on waste monitoring and reporting requirements.

5.13 Roles and Responsibilities

Suggested roles and responsibilities for waste management at the site are provided in **Table 6**.

Where possible, a construction environmental manager should be appointed for the demolition and construction work. Where a construction environmental manager is not appointed, responsibilities in **Table 6** for the construction environmental manager will become those of the site manager.

Table 6 Suggested roles and responsibilities for demolition and construction work

Site Manager	• Ensuring plant and equipment are well maintained. • Ordering only the required amount of materials. • Keeping materials segregated to maximise reuse and recycling. • Ensuring that waste sorting and storage areas are maintained in a tidy and functional state and do no present hazards to human health or the environment. • Ensure hazardous/contaminated materials are appropriately managed and disposed of. • Ensure site records and documentation is kept and is complete. • Ensure this WMP is implemented. • Liaise with Council as required.
Construction Environmental Manager or equivalent	• Ensuring staff and contractors are aware of site requirements for waste management. • Developing or identifying, and using, local commercial opportunities for re-use of materials where re-use on-site is impractical. • Facilitate waste collection by Council. • Engage suitable waste collection/disposal contractors. • Approval of off-site waste disposal locations and checking licensing requirements. • Arranging for the assessment of potentially hazardous and/or contaminated materials and liquid wastes. • Monitoring, inspection and reporting requirements.

6 OPERATIONAL WASTE MANAGEMENT PLAN

6.1 Targets for Resource Recovery

The waste management performance of each development should contribute to the overall NSW State target for recycling, which is expected to increase from 52% (2010 to 2011) to 70% (by 2021 to 2022) of the total waste generation per capita (NSW EPA (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*).

6.2 Waste Streams and Classifications

Operation of the residential flat buildings is anticipated to generate the following broad waste streams:

- General waste and commingled recycling;
- Bulk packaging wastes, including polystyrene and cardboard boxes; and
- Stores, plant and general maintenance wastes.

Potential waste types, their associated waste classifications, and management methods are provided in **Table 7**.

For further information on how to determine a waste's classification, refer to the NSW EPA (2014) *Waste Classification Guidelines.*

6.3 Waste Management Overview

Operational waste management is proposed to comprise:

- Residents will carry general waste and commingled recycling from their units to the bin storage room for their building, located on the ground floor (**Figure 4**). One ground-level bin storage room has been provided for each of the two residential flat buildings.
- MGBs in the bin rooms will be separated into those containing general waste and those containing commingled recycling. MGBs will be colour-coded and labelled to inform residents of the type of waste they can receive. Additionally, signs will be erected within the bin rooms to inform residents about bins for general waste and bins for commingled recycling.
- The interior sizes of ground-level bin rooms, estimated by SLR from Drawing DA200 Revision B ("Ground – Level 2 Plans") by DKO Architecture (NSW) Pty Ltd (Project Name: SGCH Willan Drive; Project Number 11534), are each approximately 23 m^2.
- MGBs will be moved by the building manager to the kerbside collection point for Council collection (**Figure 4**).

While the Council DCP requires waste compartments to be provided on each level of a residential development which has more than 3 storeys and/or requires elevators to reach the upper level dwellings, SLR understands that the developer proposes to exclude waste compartments from each level of the proposed development due to:

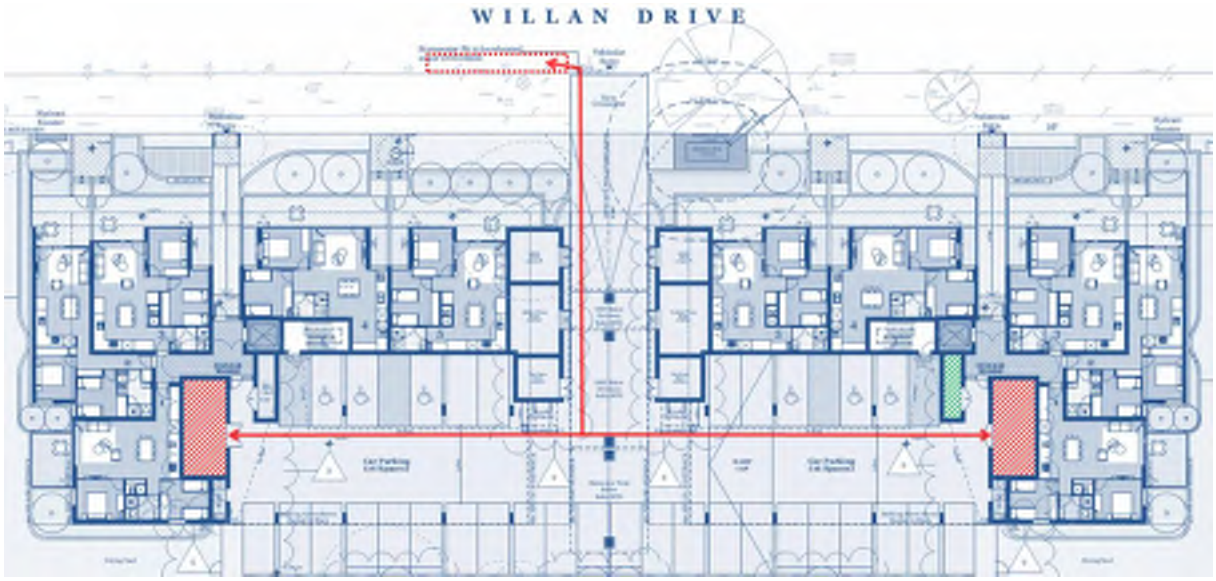
- Bin storage rooms to service the buildings are provided on the ground floor;
- The presence of waste compartments on each level of the development is likely to result in an increase in the potential for odour and vermin issues to occur; and
- The proposed development, comprising of four residential levels, is not considered substantially taller than three storeys and, as such, is considered by the building designers as not necessarily warranting the potential increase in odour and vermin issues that may result from the presence of waste compartments on each level of the development.

Table 7 Potential waste types, classifications and management methods – operation

Waste Types	NSW EPA Classification	Proposed Reuse / Recycling / Disposal Method
General		
General garbage (including non-recyclable plastics)	General solid (putrescible and non-putrescible) waste	Disposal at landfill
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid (non-putrescible) waste	Commingled recycling at off-site licensed facility
Food waste	General solid (putrescible) waste	Option to compost on site. Alternatively dispose to landfill with general garbage
Cardboard / bulky cardboard boxes	General solid (non-putrescible) waste	Cardboard recycling at off-site licensed facility (e.g. Council's Community Recycling Centre in Liverpool)
Bulky polystyrene	General solid (non-putrescible) waste	Disposal at landfill
Furniture	General solid (non-putrescible) waste	Off-site reuse (e.g. Council's Community Recycling Centre in Liverpool)
E-waste, batteries, printer toners and ink cartridges	Hazardous waste	Off-site recycling (e.g. Council's Community Recycling Centre in Liverpool)
Maintenance		
Spent smoke detectors[1]	General solid (non-putrescible) waste OR Hazardous waste (some commercial varieties)	Disposal to landfill, or off-site disposal at licensed facility
Glass (other than containers)	General solid (non-putrescible) waste	Off-site recycling
Light bulbs / fluorescent tubes	Hazardous waste	Off-site recycling
Cleaning chemicals, solvents, area wash downs, empty oil / paint drums / chemical containers	Hazardous waste if containers used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if containers cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility. Discharge to sewer likely to be subject to Trade Waste Agreement with Sydney Water.

1. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) require that when more than 10 smoke alarms (particularly americium-241 sources) are collected for bulk disposal they must be treated as radioactive waste and the requirements of the National Health and Medical Research Council's *Code of practice for the near-surface disposal of radioactive waste in Australia (1992)* must be met. Contact ARPANSA for more information. http://www.arpansa.gov.au/radiationprotection/factsheets/is_smokedetector.cfm

Source: http://www.epa.nsw.gov.au/wasteregulation/classify-waste.htm



Adapted from DKO Architecture (NSW) Pty Ltd "Ground – Level 2 Plans"

Figure 4 Indicative locations of ground-level bin rooms (red hatched areas), kerbside collection point (red dotted area), bulky waste storage (green hatched area) and anticipated movement of MGBs between bin rooms and the collection point.

6.4 Estimated Amounts of Operational Waste and Number of Bins

Council's *Waste Management Services for Residential Flat Buildings and Multi Dwelling Housing* "Fact Sheet" presents the following:

- Rates for garbage and recycling generation rates:
    - Garbage: 120 L per unit per week.
    - Recycling: 120 L per unit per week.
- Mobile garbage bin (MGB) allocation, for weekly service:
    - Garbage: 1 x 660 L MGB per 6 units;
    - Recycling: 1 x 660 L MGB per 6 units.

Based on the above, each of the two proposed buildings will require a total of **twelve 660 L MGBs to service garbage and recycling (six 660 L MGBs for garbage and six 600 L MGBs for recycling) based on a Council collection frequency of once per week**.

6.5 Bin Rooms

6.5.1 Room Floor Areas

Council's *Waste Management Services for Residential Flat Buildings and Multi Dwelling Housing* "Fact Sheet" indicates the following dimensions for each 660 L MGB:

- Height: 1,210 mm;
- Depth: 1,420 mm;
- Width: 780 mm; and
- Footprint: 1.16 m^2.

Based on the numbers of bins described in **Section 6.4**, the total bin footprint for each of the residential flat buildings are:

- Garbage: 6 x 660 L MGBs = 6.96 m^2 (say 7 m^2);
- Recycling: 6 x 660 L MGBs = 6.96 m^2 (say 7 m^2); and
- Total bin footprint per building = 14 m^2.

The interior floor areas of bin rooms, as estimated by SLR from Drawing DA200 Revision B (Ground – Level 2 Plans) by DKO Architecture (NSW) Pty Ltd (Project Name: SGCH Willan Drive; Project Number 11534), are each approximately 23 m^2 and are considered sufficient for storing the estimated number of MGBs required to hold operational waste.

6.5.2 Structural Requirements

Bin rooms should have the following features in accordance with Council and better practice waste management:

- Be constructed in accordance with the requirements of the Building Code of Australia and ensuring impervious floors and ceilings;
- The floors be constructed of concrete at least 75 mm thick or other approved material graded and drained to a Sydney Water Corporation approved drainage fitting. The drainage fitting is to be located within the storage area;
- Have a minimum height of 2 m;
- The floor must be finished to a smooth even surface coved at the intersection with walls and plinths and provided with a ramp if a change in floor elevation occurs between the bin storage area and the area for Council waste collection (i.e. kerbside);
- The ceiling over the bin storage area is to be finished with a rigid, smooth-faced, non-absorbent material capable of being easily cleaned;
- There must be an adequate, tap-based water supply to the bin storage area;
- Drainage point(s) should have a fine grade drain cover sufficient to prevent coarse pollutants from entering the sewer;
- Be located for convenient access by users and be well ventilated and well lit;
- Smoke detectors be installed in accordance with Australian Standards and connected to the fire prevention system of the building;
- The bin storage area is to have adequate signage as appropriate;
- Set-back at least 1 m from the front boundary to the street; and
- Not be located adjacent to an adjoining residential property.

6.5.3 Bulky Waste Storage

Sufficient space is to be provided within the development for the storage of large and/or bulky items (e.g. furniture and e-waste) that cannot be disposed of in the general or recyclable waste stream.

Based on the architectural drawings, a dedicated, separate storage space for bulky waste has been provided near the bin room of Building 2 (**Figure 4**).

Additional temporary storage of bulky waste, if required, can be provided by arranging a skip bin. The skip bin can be temporarily located within the car-parking area prior to removal by the licensed waste contractor.

A suitably licensed e-waste recycling contractor will be engaged to collect and recycle all e-waste items generated at the facility.

6.6 Communication Strategies

Waste management initiatives and management measures should be clearly communicated to building managers, owners, tenants and cleaners. Benefits of providing this communication include:

- improved satisfaction with services;
- increased ability and willingness to participate in recycling;
- improved amenity and safety;
- improved knowledge and awareness through standardisation of services;
- increased awareness or achievement of environmental goals and targets;
- reduced contamination of recyclables stream;
- increased recovery of recyclables and organics (where implemented) material; and
- greater contribution to state-wide targets for waste reduction and resource recovery.

To realise the above benefits, the following communication strategies should be considered by the building manager:

- use of consistent signage and colour coding throughout the development;
- ensure all tenants are informed of correct waste separation and management procedures;
- provide directional signage to show location of and routes to waste storage areas;
- general waste bins and commingled waste bins should be clearly labelled to ensure no cross contamination and to identify the types of waste that may be disposed of in each bin; and
- any employees / contractors conducting work on the property should adhere to this WMP.

Signs approved by the NSW EPA for labelling of bins and waste storage areas are available online (http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm).

6.7 Monitoring and Reporting

Auditing and visual monitoring of bin rooms should be undertaken by the building manager at the following frequencies:

- Weekly, within the first two (2) months of operation to ensure the waste management system is sufficient for the operation; and
- Every six (6) months, to ensure waste is being managed appropriately.

Any deficiencies identified in the waste management system should is to be rectified by the building manager as soon as practicable.

6.8 Roles and Responsibilities

It is the responsibility of the building manager to implement this WMP and a responsibility of all tenants and staff to follow the waste management procedures set out by the WMP.

A summary of recommended roles and responsibilities is provided in **Table 9**.

Table 8 Suggested roles and responsibilites

Responsible Person	General Tasks
Building Manager	Ensure the WMP is implemented throughout the life of the operation.
	Update the WMP as needed to ensure the plan remains applicable.
	Undertake liaison with and management of contractor collections.
	Conduct inspections of bins and bin rooms on a regular basis for condition and cleanliness.
	Organise cleaning and maintenance requirements for bin rooms and bins as required.
	Manage any complaints and non-compliances reported through waste audits etc.
	Ensure effective signage, communication and education is provided to alert new staff and visitors about the provisions of this WMP.
	Monitor and maintain signage to ensure it remains clean, clear and applicable.
	Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.
Cleaners / Caretaker	Monitor bins to ensure no overfilling occurs.
	Ensure bin rooms are kept tidy.
	Transfer of bins from the ground-level bin rooms to the kerbside collection point as required.
	Cleaning of all bins and waste and recycling area as required.
Residents	Adhere to all waste management directions as given by the Building Manager

Attachment

ARCHITECTURAL DRAWINGS

DEVELOPMENT APPLICATION
12-22 Willan Drive
Cartwright, 2168

B

DWG No.	Title	REV
DA000	Title Page	B
DA100	Site Analysis	A
DA101	Site Plan	B
DA102	Demolition Plan	A
DA200	Ground - Level 2 Plans	B
DA201	Level 03 - Roof Plans	B
DA300	Typical Units	A
DA301	Adaptable Units	A
DA400	Elevations	B
DA401	Elevations & Section	B
DA402	Perspectives	B
DA500	GFA Calculations	A
DA501	Solar Access Calculations	A
DA502	Cross Ventilation Calculations	A
DA503	Communal Open Space Calculations	A
DA504	Deep Soil Zone Calculations	A
DA505	Development Summary	A
DA701	Shadow Diagrams 1	A
DA702	Shadow Diagrams 2	A

Printed: Thursday, 15 March 2018

7.6
Average star rating
NATIONWIDE HOUSE ENERGY RATING SCHEME
www.nathers.gov.au

Certificate no.: 0001788060
Assessor Name: Amir Girgis
Accreditation no.: 20579
Certificate date: 10 August 2017
Dwelling Address: 12-16 Willan Drive Cartwright, NSW 2168

www.nathers.gov.au

ABSA Australian Building Sustainability Association
Class 2 Building Multi-Unit

Validation Number	1011315676
Validation Date	10/08/2017
Assessor Name	Amir Girgis
Assessor Number	20579
Assessor Signature	

Simulated under BASIX Thermal Comfort Protocol
BASIX® Building Sustainability Index

BASIX NOTES

Water efficiency:

•5,000L rainwater tank per building to collect water from a roof area of 500m2
•Rainwater to serve all common landscape irrigation on ground floor 399m per building.
• 4- Star WELS rated toilets
•5-Star WELS kitchen taps and bathroom taps
•3-Star WELS rated showers (>4.5 but <= 6 L/min)
• 5 Star WELS rated toilet for Carers Toilet on GF
• 5 Star WELS rated taps for Carers Toilet on GF

Thermal Comfort:

•R3.0 bulk insulation to all external exposed walls (total R-value for the wall system R3.24)
•R1.5 slab insulation for all suspended floors (total R-value for the suspended floor, R1.71)
• Total R-value for party walls R0.28
•R2.5 bulk insulation under all exposed ceiling area (total R-value for the ceiling/roof with air gap R2.66 (including exposed to balcony above)
•All windows to achieve a total U-value of 5.4 and SHGC of 0.49 (NFRC)
• Provision of NO downlights/spotlights in the apartments or provision of thermally sealed fittings
• Weather seals for all exhaust & ventilation vents

Energy Efficiency:

•Gearless traction lifts with Variable Voltage & Frequency (VVVF) motors
• No Mechanical ventilation in plant/service rooms
• Exhaust ventilation only in garbage rooms
•Natural Ventilation(no mechanical ventilation) in hallways
• LED lighting for all lifts and lighting connected to lift call button
• LED for garbage room/ plant room/ service room with motion sensor control
• LED lighting with daylight sensors and motion sensors for GF lobbies and all other hallways
•6 Star instantaneous gas hot water system for each individual dwelling
• Individual fans ducted to façade for kitchen, bathroom and laundry exhaust and interlocked to light
• Gas cooktops and electric ovens
• Dedicated Compact Fluorescent/LED fittings for all internal areas in apartments
•ceiling fans for living rooms and bedrooms
• Common area clothes line
• Indoor clothes drying line (including balconies)

Rev.	Date	By	Chk	Description
A	23/08/2017	JO	IL	Issue For Development Application
B	15/03/2018	JO	IL	Issue For Development Application

Client Details
SGCH St George Community Housing
T +61 2 9585 1499
E office@sgch.com.au

Consultants
idealgeotech
M G Child & Associates
NORTHROP
CHEUNG ACCESS
GAT & Associates Pty Ltd
in view
FloodMit
SLR
STANBURY TRAFFIC PLANNING
A.J Whipps Consulting Group

DKO

DKO Architecture (NSW) Pty Ltd
119 Redfern Street
Redfern, NSW 2016
T +61 2 8346 4500
info@dko.com.au
www.dko.com.au
ABN: 81 956 706 590

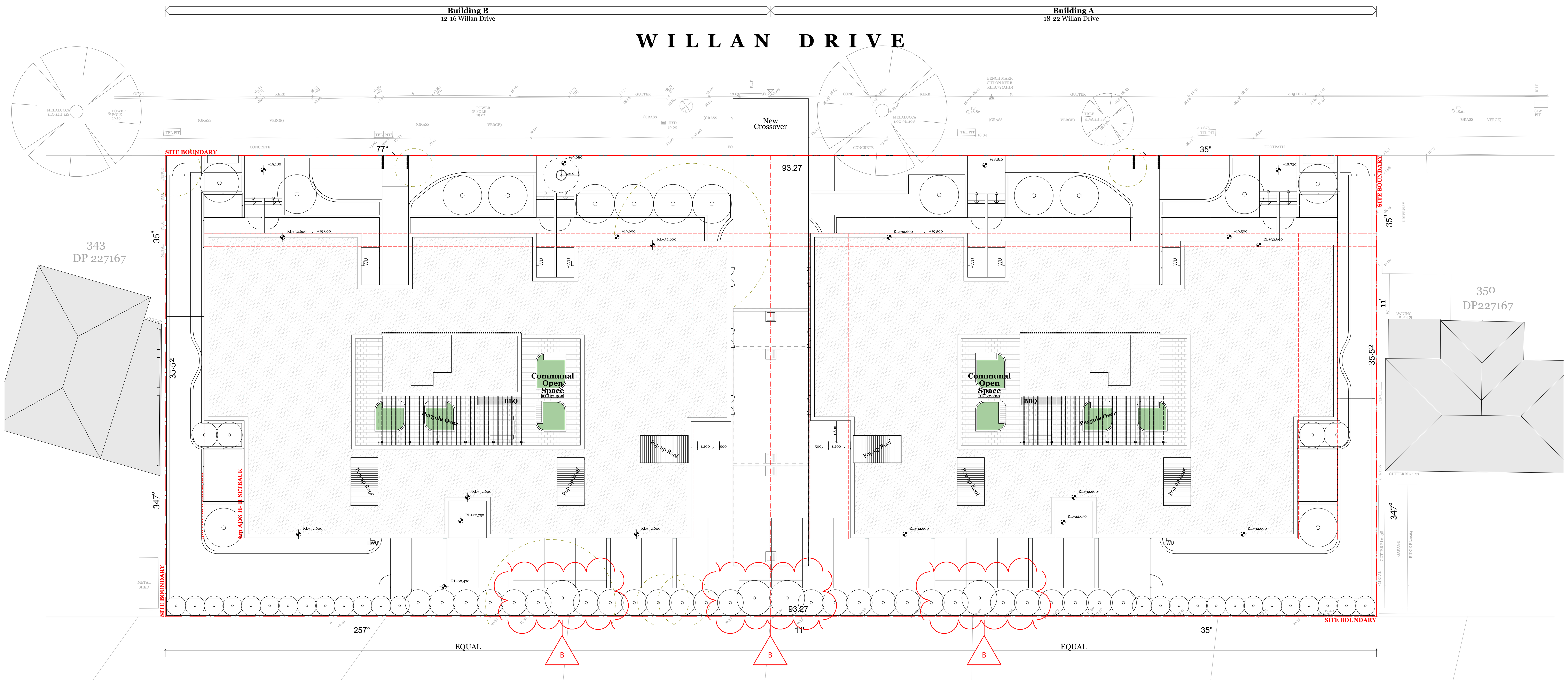
NSW Nominated Architects
Koos de Keijzer 5767 &
David Randerson 8542

Project Name	SGCH Willan Drive
Project Number	11534
Project Address	12-22 Willan Drive, Cartwright, NSW 2168
Drawn By	JO
Checked By	IL
Date	
Scale	1:200@A1
Drawing Series	Cover Pages
Drawing Name	Title Page
Drawing Number	DA000
Revision	B

N

Builder/Contractor shall verify job dimensions before any job commences Figured dimensions take precedence over drawings and job dimensions. All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

REFER TO SITE SURVEY FOR ALL INFORMATION RELATING TO EXISTING SITE DATA.



Site Plan

Rev.	Date	By	Chk	Description
A	23/08/2017	JO	IL	Issue For Development Application
B	15/03/2018	JO	IL	Issue For Development Application

Client Details
T +61 2 9585 1499
E office@sgch.com.au
SGCH St George Community Housing

Consultants

DKO

DKO Architecture (NSW) Pty Ltd
119 Redfern Street
Redfern, NSW 2016
T +61 2 8346 4500
info@dko.com.au
www.dko.com.au
ABN: 81 956 706 590

NSW Nominated Architects
Koos de Keijzer 5767 &
David Randerson 8542

Project Name	SGCH Willan Drive
Project Number	11534
Project Address	12-22 Willan Drive, Cartwright, NSW 2168
Drawn By	JO
Checked By	IL
Date	
Scale	1:200@A1
Drawing Series	Site Series
Drawing Name	Site Plan
Drawing Number	DA101
Revision	B

N

Printed: Thursday, 15 March 2018

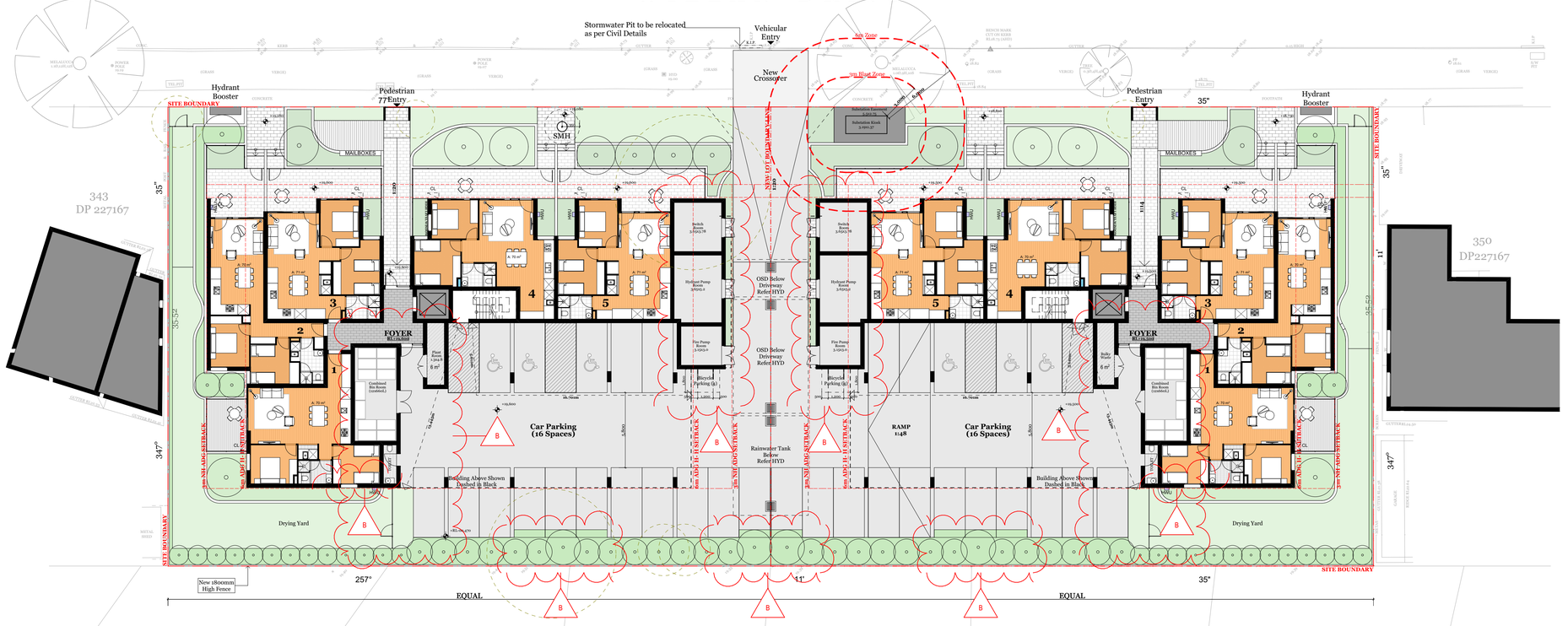
Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and Job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

REFER TO SITE SURVEY FOR ALL INFORMATION RELATING TO EXISTING SITE DATA.

Building B
12-16 Willan Drive

Building A
18-22 Willan Drive

WILLAN DRIVE



Ground Floor Plan

First & Second Floor Plans

Printed: Thursday, 15 March 2018

Rev.	Date	By	Chk	Description
A	23/08/2017	JO	IL	Issue For Development Application
B	15/03/2018	JO	IL	Issue For Development Application

Client Details
SGCH St George Community Housing

T +61 2 9585 1499
E office@sgch.com.au

Consultants
idealgeotech
NB Child & Associates
NORTHROP
CHEUNG ACCESS
GAT & Associates Pty Ltd
in view
FloodMit
SLR
STANBURY TOWN PLANNING
AJ Whipps Consulting Group

DKO

DKO Architecture (NSW) Pty Ltd
119 Redfern Street
Redfern, NSW 2016
T +61 2 8346 4500
info@dko.com.au
www.dko.com.au
ABN: 81 956 706 590

NSW Nominated Architects
Koos de Keijzer 5767 &
David Randerson 8542

Project Name	SGCH Willan Drive
Project Number	11534
Project Address	12-22 Willan Drive, Cartwright, NSW 2168
Drawn By	JO
Checked By	IL
Date	
Scale	1:200@A1
Drawing Series	Plans
Drawing Name	Ground - Level 2 Plans
Drawing Number	**DA200**
Revision	**B**

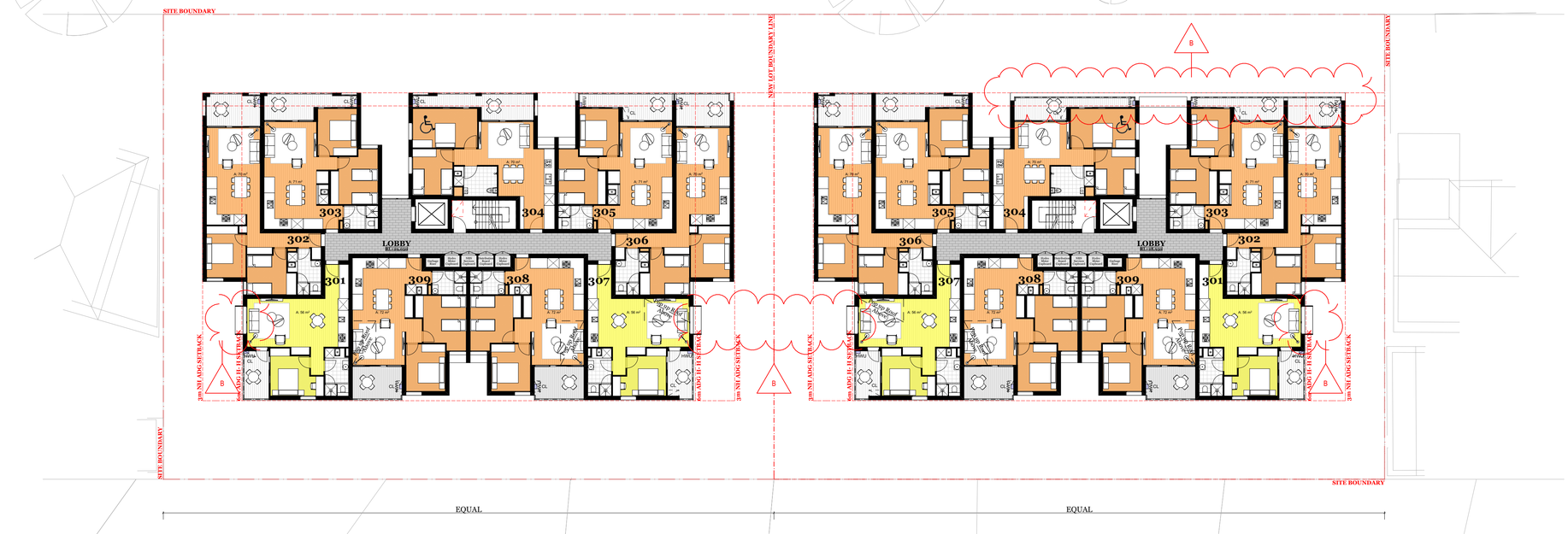
N

Builder/Contractor shall verify job dimensions before any job commences Figured dimensions take precedence over drawings and job dimensions. All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

Building B
12-16 Willan Drive

Building A
18-22 Willan Drive

WILLAN DRIVE

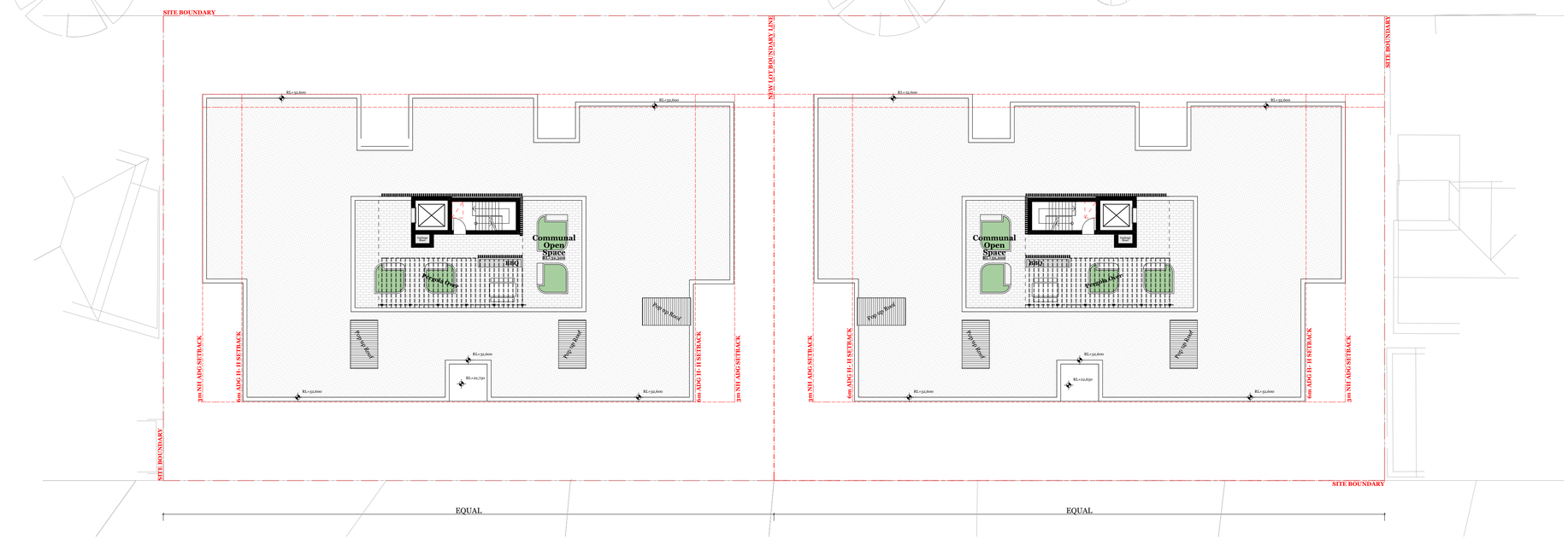


Level 3 Floor Plan

Building B
12-16 Willan Drive

Building A
18-22 Willan Drive

WILLAN DRIVE



Roof Level Plan

Rev.	Date	By	Chk	Description
A	23/08/2017	JO	IL	Issue For Development Application
B	15/03/2018	JO	IL	Issue For Development Application

Client Details
SGCH St George Community Housing

T +61 2 9585 1499
E office@sgch.com.au

Consultants
idealgeotech
NGH
NORTHROP
CHEUNG ACCESS
GAT & Associates Pty Ltd
in view
FloodMit
SLR
Stanbury Traffic Planning
AJ Whipps Consulting Group

DKO

DKO Architecture (NSW) Pty Ltd
119 Redfern Street
Redfern, NSW 2016
T +61 2 8346 4500
info@dko.com.au
www.dko.com.au
ABN: 81 956 706 590

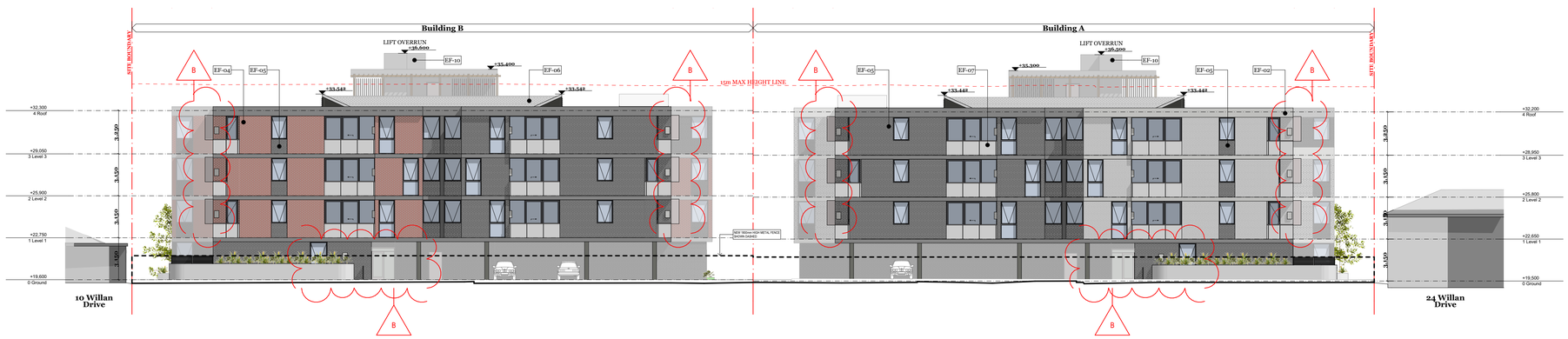
NSW Nominated Architects
Koos de Keijzer 5767 &
David Randerson 8542

Project Name	SGCH Willan Drive
Project Number	11534
Project Address	12-22 Willan Drive, Cartwright, NSW 2168
Drawn By	JO
Checked By	IL
Date	
Scale	1:200@A1
Drawing Series	Plans
Drawing Name	Level 03 - Roof Plans
Drawing Number	**DA201**
Revision	**B**

N

Printed: Thursday, 15 March 2018

North Elevation



South Elevation

External Finishes Legend

- **EF-01: Mid-Grey Paint**
- **EF-02: White Paint**
- **EF-03: Colorbond Grey**
- **EF-04: Brownish-Red Brick**
- **EF-05: Dark-Grey Brick**
- **EF-06: White Brick**
- **EF-07: Translucent Glass Balustrade**
- **EF-08: Powder Coated Metal Screens**
- **EF-09: Metal Fence**
- **EF-10: Light Grey Paint**

Rev.	Date	By	Chk	Description
A	23/08/2017	JO	IL	Issue For Development Application
B	15/03/2018	JO	IL	Issue For Development Application

Client Details
SGCH St George Community Housing

T +61 2 9585 1499
E office@sgch.com.au

Consultants
idealgeotech · M.G. Child & Associates · NORTHROP · CHEUNG ACCESS · GAT & Associates Pty Ltd · in view · FloodMit · SLR · Stanbury Traffic Planning · A.J. Whipps Consulting Group

DKO

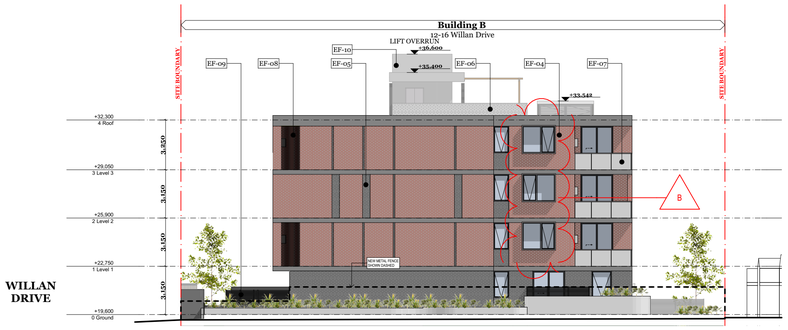
DKO Architecture (NSW) Pty Ltd
119 Redfern Street
Redfern, NSW 2016
T +61 2 8346 4500
info@dko.com.au
www.dko.com.au
ABN: 81 956 706 590

NSW Nominated Architects
Koos de Keijzer 5767 &
David Randerson 8542

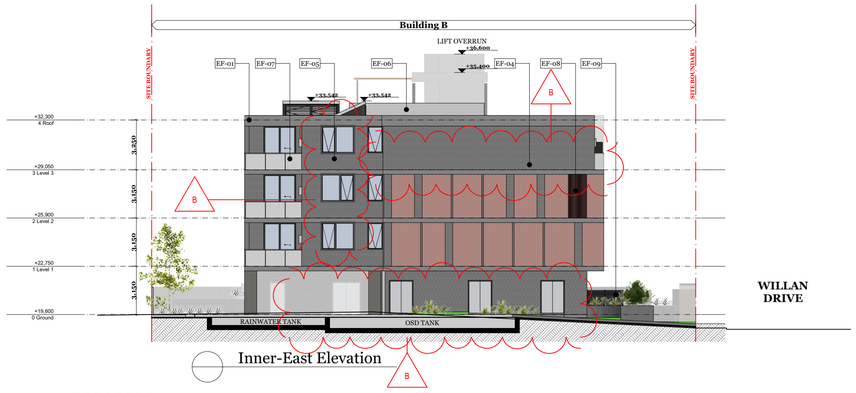
Project Name	SGCH Willan Drive
Project Number	11534
Project Address	12-22 Willan Drive, Cartwright, NSW 2168
Drawn By	JO
Checked By	IL
Date	
Scale	1:200@A1
Drawing Series	Elevations & Sections
Drawing Name	Elevations

Drawing Number **DA400**
Revision **B**

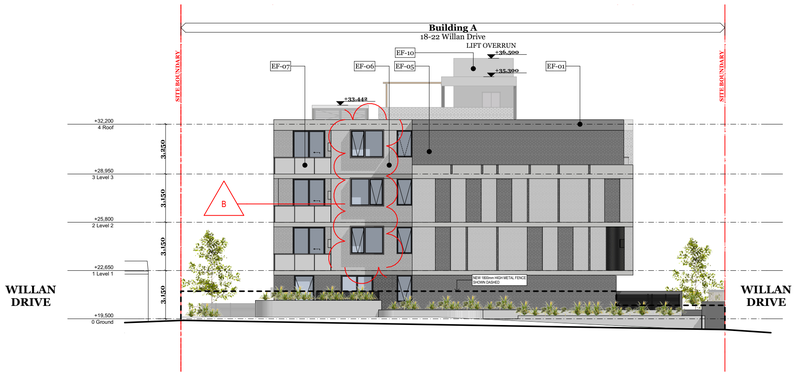
Printed: Thursday, 15 March 2018



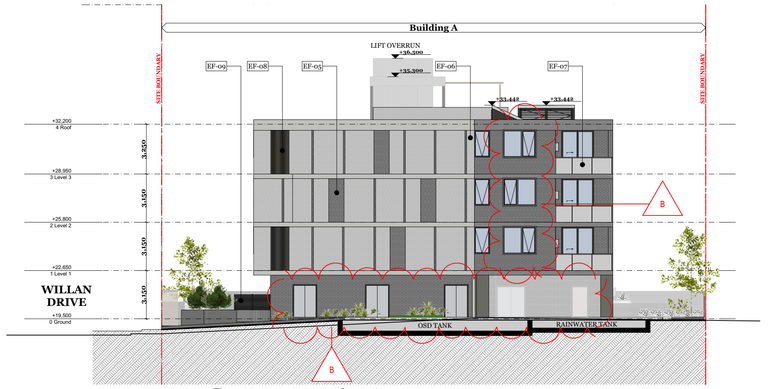
West Elevation



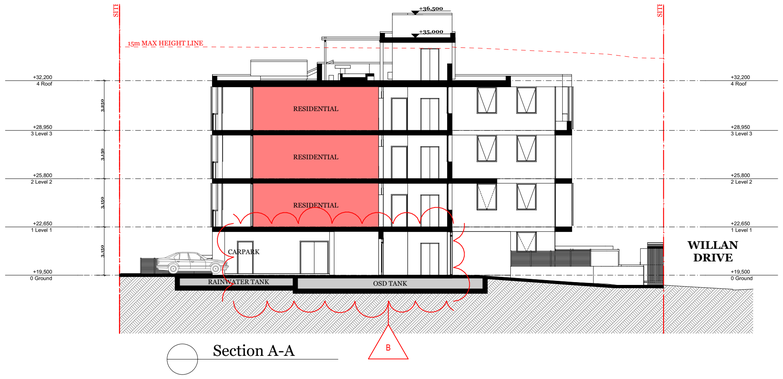
Inner-East Elevation



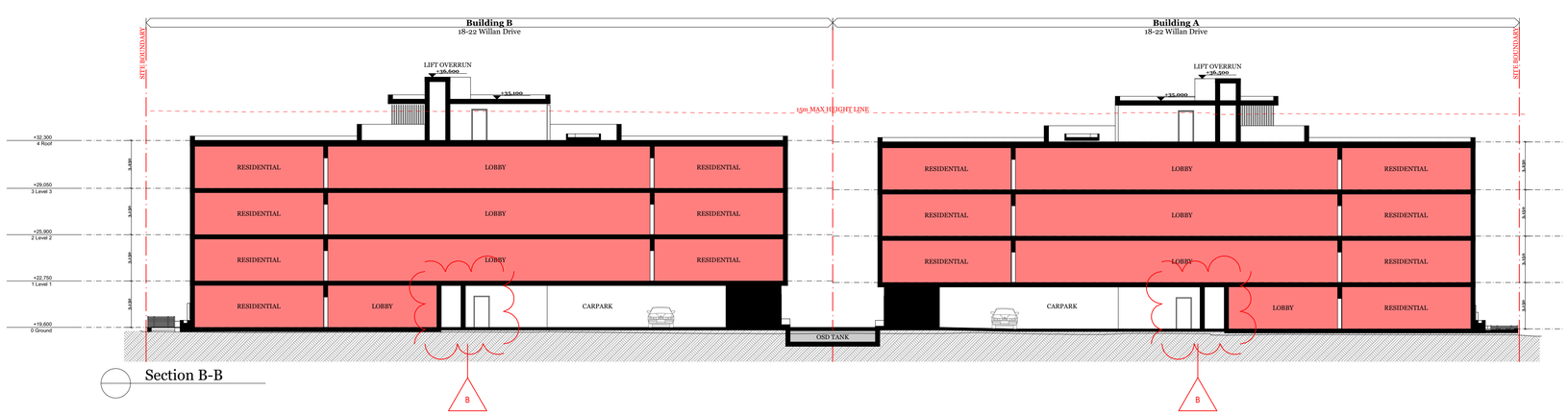
East Elevation



Inner-West Elevation



Section A-A



Section B-B

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and Job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

External Finishes Legend

- **EF-01: Mid-Grey Paint**
- **EF-02: White Paint**
- **EF-03: Colorbond Grey**
- **EF-04: Brownish-Red Brick**
- **EF-05: Dark-Grey Brick**
- **EF-06: White Brick**
- **EF-07: Translucent Glass Balustrade**
- **EF-08: Powder Coated Metal Screens**
- **EF-09: Metal Fence**
- **EF-10: Light Grey Paint**

Rev.	Date	By	Chk	Description
A	23/08/2017	JO	IL	Issue For Development Application
B	15/03/2018	JO	IL	Issue For Development Application

Client Details
SGCH St George Community Housing

T +61 2 9585 1499
E office@sgch.com.au

Consultants
idealgeotech
M.J. Child & Associates
NORTHROP
CHEUNG ACCESS
GAT & Associates Pty Ltd
in view
FloodMit
SLR
STANBURY TRAFFIC PLANNING
A.J. Whipps Consulting Group

DKO Architecture (NSW) Pty Ltd
119 Redfern Street
Redfern, NSW 2016
T +61 2 8346 4500
info@dko.com.au
www.dko.com.au
ABN: 81 956 706 590

NSW Nominated Architects
Koos de Keijzer 5767 &
David Randerson 8542

Project Name	SGCH Willan Drive
Project Number	11534
Project Address	12-22 Willan Drive, Cartwright, NSW 2168
Drawn By	JO
Checked By	IL
Date	
Scale	1:200@A1
Drawing Series	Elevations & Sections
Drawing Name	Elevations & Section
Drawing Number	**DA401**
Revision	**B**

Printed: Thursday, 15 March 2018

B

Builder/Contractor shall verify job dimensions before any job commences
Figured dimensions take precedence over drawings and job dimensions.
All shop drawings shall be submitted to the Architect/Consultant, and manufacture shall not commence prior to return of inspected shop drawings by the Architect/Consultant

External Finishes Legend

- **EF-01: Mid-Grey Paint**
- **EF-02: White Paint**
- **EF-03: Colorbond Grey**
- **EF-04: Brownish-Red Brick**
- **EF-05: Dark-Grey Brick**
- **EF-06: White Brick**
- **EF-07: Translucent Glass Balustrade**
- **EF-08: Powder Coated Metal Screens**
- **EF-09: Metal Fence**
- **EF-10: Light Grey Paint**

Rev.	Date	By	Chk	Description
A	23/08/2017	JO	IL	Issue For Development Application
B	15/03/2018	JO	IL	Issue For Development Application

Client Details
SGCH St George Community Housing

T +61 2 9585 1499
E office@sgch.com.au

Consultants
idealgeotech · D&E Child & Associates · NORTHROP · CHEUNG ACCESS · GAT & Associates Pty Ltd · in view · FloodMit · SLR · Stanbury Traffic Planning · A.J Whipps Consulting Group

DKO

DKO Architecture (NSW) Pty Ltd
119 Redfern Street
Redfern, NSW 2016
T +61 2 8346 4500
info@dko.com.au
www.dko.com.au
ABN: 81 956 706 590

NSW Nominated Architects
Koos de Keijzer 5767 &
David Randerson 8542

Project Name	SGCH Willan Drive
Project Number	11534
Project Address	12-22 Willan Drive, Cartwright, NSW 2168
Drawn By	JO
Checked By	IL
Date	
Scale	1:200@A1
Drawing Series	Elevations & Sections
Drawing Name	Perspectives

Drawing Number **DA402**
Revision **B**

Printed: Thursday, 15 March 2018