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Darling Square - The North Plot & Square Waste Management Plan November 2016

This report is based on information provided by Lend Lease coupled with Waste Audit and Consultancy Services (Aust) Pty Ltd's knowledge of waste generated within the retail sector. To that extent this report relies on the accuracy of the information provided to our consultant. It has been compiled by Waste Audit and Consultancy Services (Aust) Pty Ltd on behalf of Lend Lease.

This report is not a substitute for legal advice on the relevant environmental related legislation, which applies to businesses, contractors or other bodies. Accordingly, Waste Audit and Consultancy Services (Aust) Pty Ltd will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Waste Audit and Consultancy Services (Aust) Pty Ltd's negligence.

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1. Project Overview

This letter provides a response to submissions and assessment of the proposed amended development in relation to the State Significant Development (SSD) Development Application (DA) for the development of the North Plot and Square in Darling Square (SSD 7021).

The SSD DA was publicly exhibited for a period of 47 days from 17 March 2016 to 2 May 2016. During this time, ten (10) submissions were received from government agencies and the City of Sydney Council.

This letter should be read in conjunction with the original assessment prepared by Waste Audit and Consultancy Services (Aust) Pty Ltd dated May 2015 to support the development of the North Plot and Square (SSD 7021). This letter should also be read in conjunction with a concurrent s96 modification application to the North-East Plot (SSD 6626), with consequential amendments to this approval proposed in order to accommodate servicing and functions generated by the North Plot.

1.1 Proposed Amended Development

Since public exhibition of the proposal, generally minor amendments and improvements have been made to the proposed development. The final project design includes amendments made by Lend Lease pursuant to Clause 55 of the Environmental Planning & Assessment Regulation, including changes to address matters raised in the submissions.

The following key amendments have been made to the proposal:

- Minor increase in overall site area;
- Minor increase in Gross Floor Area;
- Changes to the external building design including a revision of the external stair, shifting of floor plates and resultant changes of revised internal planning;
- Slight adjustment to the site boundary, increasing to accommodate the revised Darling Exchange building and public domain interface enhancements;
- Revisions and enhancements to the proposed public domain treatments; and
- Revised loading and servicing strategy; and
- Inclusion of fitout and operation of the child care facility.

The final proposal seeks approval for the following key development:

- Construction and use of a six (6) storey building (known as The Darling Exchange) containing the following uses:
 - Retail tenancies/market hall (such as market stalls, food and beverage premises and bar/restaurant operations);
 - Community uses (such as a library including IQ Hub and child care); and
 - Fitout and operation of the ground level and mezzanine market hall, child care facility, and the food and beverage offering (bar/restaurant) within The Darling Exchange.
- Public domain improvements, including:
 - Creation of a new publically accessible square (The Square) with space for markets, outdoor events, passive and active recreation;
 - Provision of a timber canopy extending from The Darling Exchange along the western edge of The Square;
 - Provision of two kiosk-style retail pods below the canopy;

- Creation of Little Hay Street, a new pedestrian only laneway between the North-East Plot and South-East Plot; and
- Completion of general interface works to connect areas of new public domain with the existing public domain.
- Remediation as may be required; and
- Extension and augmentation of physical infrastructure/utilities as required.

2. Waste Generation

2.1 Waste Streams

Based on the estimated waste profile, the following waste streams are expected:

1. General Waste
2. Cardboard/Paper Recycling
3. Commingled (Container) Recycling
4. Food Organics Recycling
5. Used Cooking Oil
6. E-Waste Recycling
7. Battery Recycling
8. Mobile Phone Recycling
9. Toner Cartridge Recycling
10. Fluorescent Light Tube Recycling

2.2 Waste Generation Estimates

The following tables detail the estimated retail waste generation quantity and profile based on the indicative retail mix, using WACS' retail waste model derived from extensive current and historical data from Lend Lease's national retail portfolio. All tenancies listed below will operate 7 days per week, except for the Child Care centre, which will operate 5 days per week.

General waste will be collected daily, 7 days per week, and recyclables (cardboard, commingled recycling, and organics) will be collected 5 days per week. Streams 5-8 listed above would be collected on an as-needed basis.

It is estimated that the North Plot will generate a total of **7,005 litres = 881 kilograms** of waste and recyclables per day (see Table 1 below).

Table 1 – The Darling Exchange – Waste and Recycling Generation Rates per Tenancy

Tenancy	Level	GFA (m ²)	Litres/Day				
			General	Cardboard	Commingled	Organics	Total
Market Hall	G	450 m ²	540	360	135	135	1170
Food & Beverage	M	500 m ²	750	400	200	200	1550
Library	1-2	1790 m ²	358	143	36	0	537
Child Care	3-4	1264 m ²	632	253	126	126	1138
Bar/Restaurant	5	842 m ²	1263	674	337	337	2610
TOTAL		4,846 m²	3,543	1,830	834	798	7,005

Table 2 – The Darling Exchange: Waste and Recycling Generation Rates per Stream

Material Stream	Estimated Daily Generation	
	L	kg
General Waste	3,543	248
Recycling	3,462	633
TOTAL	7,005	881

The site will also have 15-20 market stalls operating 3 times per week, two kiosk-style retail pods operating 7 days per week that will generate food and beverage waste, and a number of public domain bins for general waste and recycling.

Daily waste and recycling generation rates for the retail pods are shown in Table 3. The retail pods will be self-contained and will be required to manage their own waste and recycling, and will form part of SHFA's ongoing daily waste management service.

Table 3 – The Retail Pods: Waste and Recycling Generation Rates per Stream

Material Stream	Estimated Daily Generation	
	L	kg
General Waste	48	3
Cardboard Recycling	32	3
Commingled Recycling	12	1
Organics Recycling	12	6
TOTAL	104	13

Daily waste and recycling generation rates for the 15-20 market stalls are shown in Table 4. Market Stall holders will be required to manage their own waste and recycling and will form part of SHFA's ongoing waste management service.

Table 4 – The Temporary Markets: Waste and Recycling Generation Rates per Stream

Material Stream	Estimated Daily Generation	
	L	kg
General Waste	96	7
Cardboard Recycling	64	6
Commingled Recycling	24	2
Organics Recycling	24	12
TOTAL	208	27

Public domain bins will be emptied daily as part of ongoing SHFA service. Estimated daily waste and recycling generation rates are shown in Table 5.

Table 5 – Public Domain Bins: Waste and Recycling Generation Rates per Stream

Material Stream	Estimated Daily Generation	
	L	kg
General Waste	200	19
Commingled Recycling	96	2
TOTAL	296	21

Table 6 on the following page summarises all general waste and recycling expected to be generated on a daily basis by North Plot tenancies and the public domain. The remaining waste and recycling streams listed in Section 2.1 (streams 5-10) will be generated occasionally and in relatively small volumes and will not require management and collection on a daily basis.

Table 6 – Summary: Waste and Recycling Generation Rates per Tenancy and Stream

Tenancy	Days Operation	Litres/Day				
		General Waste	Cardboard Recycling	Commingle Recycling	Organics Recycling	Total
Market Hall	7	540	360	135	135	1170
Food & Beverage	7	750	400	200	200	1550
Library	7	358	143	36	0	537
Child Care	5	632	253	126	126	1138
Bar/Restaurant	7	1263	674	337	337	2610
Retail Pods	7	48	32	12	12	104
Market Stalls	3	96	64	24	24	576
Public Bins	7	200	0	96	0	296
TOTAL		3,887	1,926	966	834	7,981

Table 7 shows the indicative floor space required for waste and recycling storage per tenancy and area. Collection bins will be spread across the floor plate for each tenancy (i.e. no central storage per floor/tenancy). Final selection of receptacles will be done in conjunction with Lend Lease.

Table 7 – Tenancy Storage Requirements

Tenancy	General Waste	Commingle Recycling	Organics Recycling	TOTAL Footprint (m ²)
Market Hall	1.02	1.02	0.33	2.37
Food & Beverage	0.51	1.02	1.86	1.86
Library	0.51	1.02	0.00	1.53
Child Care	0.51	1.02	1.86	1.86
Bar/Restaurant	1.02	1.02	0.33	2.37

2.3 Waste/Recycling Bin Requirements and Footprints

The number, type, and total footprint of bins required has been estimated based on collection of general waste 7 x weekly for and cardboard, commingle, and organics recycling 5 x weekly. Bin footprints include a 20% allowance for space between bins and circulation.

Table 8 – Bin Requirements per Stream

Material Stream	Bin Type	No.	Total Capacity Litres	Required Capacity Litres	Footprint per Bin (m ²)	Total Footprint (m ²)
General Waste	240 litre	9	2,160	3,887	0.51	8.7
General Waste	1100 litre	2	2,200		2.05	
Cardboard Recycling	1100 litre	4	4,400	3,851	2.05	8.2
Commingle Recycling	240 litre	8	1,920	1,932	0.51	4.1
Organics Recycling	120 litre	12	1,440	1,668	0.33	3.9
TOTAL		35				24.9 m²

A further 10-12 m² will be required for the following:

- Bin wash area
- Oil recycling unit (for waste cooking oil from restaurants)
- Storage of bulky waste/other recyclable materials (see Section 8)

Tenancy cleaning staff will bring all waste and recycling from the North Plot to the dedicated room shown on the North East Plot podium ground level plan (see Appendix C). This room is approximately **40 square metres** in area, which will be sufficient to house the equipment listed in Table 8 above.

2.4 Tenancy Waste Storage – North Plot

We do not recommend the use of any MGBs larger than 240 litres for transport of waste and recyclables from The Darling Exchange to the North East Plot storage room. For organics recycling we recommend 120 litre bins as larger bins may become too heavy (~100 kg) to move safely.

Tenancies will require their own internal bins for separation of materials – each tenancy will be responsible for managing their own waste and recycling and will have contract cleaners who will transport the materials to the North East Plot storage room via the access route shown on p.10.

3. Waste Systems

The following details the recommended waste and recycling systems to be implemented as well as the required collection frequency.

As detailed in Table 5, space will be provided within each tenancy for the temporary storage of recyclables and general waste. All general waste and recyclables will be transported to the main waste room located in the North East Plot by cleaning staff, at minimum on a daily basis, and more frequently if required.

3.1 Levels 2 & 5 Restaurants

Multi-sort bins will be installed throughout the fitout to allow the source segregation of all waste and recycling streams generated (general waste, mixed recycling, and food organics).

General waste, recyclables, and organics will then be transported to the main waste room located in the North East Plot by cleaning staff as required.

3.2 Child Care

Multi-sort bins will be installed throughout the fitout to allow the source segregation of all waste and recycling streams generated (general waste, mixed recycling, and food organics).

General waste, recyclables, and organics will then be transported to the main waste room located in the North East Plot by cleaning staff as required.

3.3 Library

Multi-sort bins will be installed throughout the fitout to allow the source segregation of all waste and recycling streams generated (general waste and mixed recycling only).

General waste and recyclables will then be transported to the main waste room located in the North East Plot by cleaning staff as required.

3.4 Market Hall

Multi-sort bins will be installed in the market stalls to allow the source segregation of all waste streams generated in the Market Hall. In addition, bins will be located within the market area for patrons to deposit general waste and recyclables.

Cleaning staff will empty bins from both the public and stall receptacles into 240 litre MGBs (for general waste and recyclables) and 120 litre MGBs (for organics) and wheel the bins to the North Plot storage room located on the podium ground level of the North East Plot.

Any used cooking oil generated by stallholders will be poured back into the original container for collection by the cleaners for transport to the main waste storage room in the North East Plot for decanting into a dedicated oil collection tank.

3.5 Temporary Outside Market Stalls

There will be approximately 15-20 market stores operating up to three days per week in Market Square. Discussions will be conducted with each stall operator as to expected waste/recyclables that will be generated and a management plan for this process will be developed.

Each stall will be responsible for removal of their own waste and recycling and placing the materials into temporary 240 litre MGB bins for collection by SHFA.

These and all public domain bins will be emptied/collected by SHFA in accordance with the management plan referred to above.

3.6 Permanent Retail Pods – Market Square

The permanent retail pods will be required to implement suitable recycling programs within their tenancies. These will be serviced daily by SHFA in conjunction with the public bin service.

3.7 Public Realm

Appropriately designed bins for the collection of general waste and commingled recyclables will be located throughout the public realm. The design and location of these bins will be finalised through discussion with SHFA who will also manage the emptying and disposal of contents.

3.8 Waste Collection

For the North Plot, base building cleaning staff will bring all waste and recycling from the dedicated storage room to the waste collection point shown in the North East Plot ground level building plan on p.10. according to the site's designated collection schedules (7 x weekly for general waste, 5 x weekly for recyclables), and taken to appropriate facilities.

For the public domain, waste and recycling collection will be managed by a SHFA appointed contractor: no materials from the public areas will be stored onsite within the North East Plot.

4. Waste Storage

For the North Plot a centralised waste storage area has been provided within a back of house area on the podium ground level of the North East Plot. As described in the previous section, waste and recyclables will be collected by cleaning staff from the various levels and safely and neatly transported from the North Plot to the North East Plot, for consolidation in larger bins and collection by the site's waste contractor.

Bins and trolleys will be stored within the North East Plot and will only be taken into the North Plot by cleaners when the removal of waste from a tenancy is required. All waste will be transported in bins or trolleys and not carried in bags to avoid spills or leaks in the public domain.

The location of the waste storage area within the North East Plot is close to the goods lift egress within the North Plot and will allow for easy access by the Darling Exchange cleaning/stall staff to transport cleaning trolleys, and 1100 litre, 240 litre, and 120 litre MGB.

The double doors to this area should be at least 1500 mm wide to allow the egress of 1100 litre bins for wheeling to the collection area.

Storage locations and movement pathways for the entire site (North Plot and North East Plot) are shown in the podium ground level building plan on p.10.

Please note that the configuration of the podium ground level in the North East Plot is currently being amended via a Section 96 application to reflect the requirements of the North Plot with regard to waste management and storage.

5. Waste Stream Acceptance Criteria

General Waste (1100 and 240 litre MGBs):

Hazardous materials such as batteries, fluorescent light tubes, light bulbs and/or toner cartridges; recyclable materials such as cardboard, paper, or commingled recyclables; or electronic equipment such as computers, TVs and mobile phones, must not be placed in the general waste bins. Space has been allocated within the North East Plot storage room for collection of these materials.

Cardboard/Paper Recycling (1100 litre MGBs):

The cardboard and paper recycling stream can include all types of cardboard except waxed cardboard, and all office type paper. Common contaminants include non-office papers (e.g. food wrappers) and packaging materials from inside cardboard boxes (e.g. polystyrene).

Commingled Recycling (240 litre MGBs):

Commingled recycling systems generally accept all recyclable plastic containers; aluminium containers; steel cans; glass bottles; and liquid paperboard. Since acceptance criteria can vary slightly for different contractors, specific requirements should be confirmed with the site's waste contractor before implementing a program.

6. Bins and Signage

6.1 Bins

Containers located within the development for waste and recycling should be consistent. The following table outlines the colour coding that has been developed by Standards Australia.

Table 9 – Standards Australia Waste/Recycling Container Colour Coding

Material Stream	Bin Body Colour	Lid Colour
Paper Recycling	Blue	Blue
Cardboard Recycling	Green	Blue
Food Organics	Burgundy	Burgundy
Commingled Recycling	Green	Yellow
General Waste	Green	Red

6.2 Signage

All waste receptacles will be appropriately signed and additional room signage is usually provided from most waste contractors during implementation of the waste contract. Signage will be displayed on bin lids as well as at eye level on the wall of the storage area.

All signs will:

- Clearly identify the waste/recycling stream and identify what is and is not be accepted
- Use correct waste/recycling stream colour coding
- Include highly visual elements for individuals for whom English is not a native language
- (Optionally) include text in other languages likely to be spoken by retailer staff/site users

Examples of typical signage styles are provided in Appendix B.

7. Education

On commencing operations, all tenancies will receive information, including training in the waste collection systems, including: how to use the systems; which items are acceptable for each stream; and collection times. This could also include a short video to support tenants in educating staff.

There should also be a focus on ongoing waste minimisation and initiatives that seek to increase the use of recyclable materials in supplier packaging and also minimise the amount of packaging used by suppliers and in retailers' products.

Guidelines to tenants regarding packaging could include the following information regarding:

- Reusability
- Recyclability
- Recycled material content
- Utilisation of renewable resources
- Supplier take-back programs

Following implementation of these programs, an ongoing monitoring program will be established. On a monthly basis, waste and recycling performance reports will be reported back to tenants so that they are aware of their performance and potential areas for improvement.

Waste and cleaning contracts will also include requirements for contractors to actively participate in the site's waste reduction program and contribute to the site's efforts to improve performance.

8. Other Materials Streams

The following materials will be also produced in variable quantities by tenants and base building:

- Used Cooking Oil
- Fluorescent Light Tubes
- Electrical and Electronic Recycling (E-Waste)
- Batteries, Mobile Phones
- Printer and Toner Cartridges

Used Cooking Oil

This will be decanted into the original container and transported by retailer staff to the North Plot storage room, where a dedicated oil recycling unit will be located.

Fluorescent Light Tubes

A recycling receptacle will be located in the North Plot storage room for use by in-house maintenance staff and/or electrical contractors.

E-Waste

A small area will be set aside for this material (obsolete/broken computers, keyboards, screens, copiers, fax machines, etc.) in the N North Plot storage room.

Batteries, Mobile Phones

Mobile phones can be collected in secure receptacles at centralised collection points, with co-located battery recycling boxes. The Library foyer would be a good location for these receptacles.

Toner Cartridges

A toner cartridge recycling bin/box would be located next to any photocopiers, such as in the Library or Child Care centre. These would be collected directly from the tenancy as needed by the company servicing the equipment, or by a dedicated recycler such as Cartridges for Planet Ark.

9. Ongoing Management

Prior to acceptance of the cleaning contract, the contractor will be required to demonstrate how the management of waste and recycling will be carried out so as to ensure that segregated materials are placed in the correct systems. This process will be agreed and a training program implemented by the cleaning contractor to ensure uptake by all staff, with monitoring and reporting carried out by the cleaning supervisor throughout the term of the contract.

In addition, cleaners will be required to feed back to site management any non-compliance issues they observe during their cleaning activities. This may include contamination of recycling; non-participation in the recycling system; or missing or damaged bins.

Waste and recycling contractors will be required to report actual volumes collected by stream so that site management can monitor performance and feed this back to stakeholders.

It is highly recommended that a reporting program be set up at the site which would include bin tally sheets that detail the number of bins collected and how full they are at the time of collection, in addition to procedures for waste contractors to provide feedback on contamination and leakage.

10. Public Place Recycling

With public open spaces, consideration needs to be given to public place recycling (PPR). General waste and recycling facilities will be provided in public realm areas throughout the precinct. The final number of bins will be determined in consultation with SHFA.

Simple, colour-coded and consistent representation of common recycling and waste streams makes it easier for people to know how and what to recycle. Introducing a public recycling system also has environmental, social and financial benefits including:

- Responding to community expectations
- Reducing the amount of waste sent to landfill and recovering valuable resources
- Financial benefits as materials are diverted from landfill and into recycling
- Contributing to triple bottom line reporting

It is important that general waste and recycling bins are always located together in order to make recycling as accessible as general waste disposal. Recycling bins should never be located in isolation as patrons are likely to contaminate the bin if there is no other option to dispose of general waste.

The implementation of organics recycling is not recommended in public places due to the high levels of contamination commonly observed in such systems.

All bins should be clearly signed and appropriately colour-coded to ensure the streams are readily identifiable. Signage for PPR should be:

- Colour-coded: red for general waste and yellow for recycling
- Large and easily viewed from all angles: this may mean that signs are placed on all sides of the bin or above the bin
- Simple and jargon-free (acronyms such as PET, HDPE and even the recycling triangle can be confusing as this symbol can appear on items that are not necessarily recyclable)
- Unambiguous and uses visual imagery

All public domain waste and recycling will be managed and collected by SHFA.

The *Public Place Recycling Toolkit* produced by Sustainability Victoria in August 2013 is a comprehensive resource that can be used to guide the development of PPR for The Square.

11. City of Sydney Guidelines

The development utilises the “*Policy for Waste Minimisation in New Developments*” (Council of the City of Sydney, 2005) as a guide for waste management systems.

Table 10 - Consistency With City of Sydney Guidelines

Reference	City of Sydney Requirement	Consistency Status
A-6	Waste and recycling storage containers must be stored at all times within the boundary of the subject site unless formally approved by Council under a Local Approvals Policy (LAP) for the storage of waste in a public place.	Consistent
A-10	Sufficient space must be provided for equipment to handle or manage all waste and recycling likely to be generated on the premises between collections	Consistent
A-12	The room/s for storing waste and recycling must be located in a position that is convenient for both users and waste collection staff.	Consistent
A-24	The walls, floors and ceilings of the waste room(s), recycling room(s) and service compartment(s) must be finished with a light colour.	Consistent - Waste storage area will be painted in a light colour.
A-28	Waste rooms and recycling room(s) must be constructed in such a manner as to prevent the entry of vermin.	Consistent – The construction is designed to prevent vermin access and in addition no waste/recyclables will be stored on the floor or outside a bin.
A-29	Waste and recycling rooms must be ventilated by either: • Permanent, unobstructed natural ventilation openings direct to the external air, not less than one-twentieth i.e. 5% of the floor area. • A mechanical exhaust ventilation system exhausting at a rate of 5L/s.m2 floor area, with a minimum rate of 100L/s min; or (A-30).	Consistent – Natural ventilation is provided.
A-30	Waste and recycling rooms must be provided with artificial light controlled by switches located both outside and inside the room.	Consistent – Light switches are provided outside and inside the waste storage area.
A-37	Clear and easy to read “NO STANDING” signs and “DANGER” warning signs for children must be fixed to the external face of each waste and recycling room where appropriate.	Consistent – Will be provided.
A-38	Clear and easy to read sign(s) designating the storage of RECYCLABLES must be fixed to the internal wall(s) or on any racks provided.	Consistent - Will be provided and the signs will be developed from those provided for on the Sustainability Victoria website.

Reference	City of Sydney Requirement	Consistency Status
A-40	Vermin must be prevented from entering waste areas and containers.	Consistent - Refer to Section A-28.
A-41	Equipment must be protected from theft and vandalism.	Consistent - The waste storage area will be locked whenever not being accessed for depositing or collection of materials.
C-12	Waste and recyclables from the waste service compartment or waste and recycling holding area on each floor must be transferred to the centralised waste and recycling room or holding area daily or more frequently as required.	Consistent
C-16	For premises, • Whose waste generated contains 20% by weight or volume of fish, poultry or meat, OR • Which generates 50 litres of seafood, poultry or meat waste per day, Waste must be collected daily or refrigerated whilst awaiting collection.	Consistent - The percentages for organic materials will not be exceeded.
C-17	Storage of paper and cardboard must be in a dry, vermin-proof area. Paper and cardboard must not be stored for more than 2 weeks to prevent breeding of pests in the stored material.	Collections will be Mon-Fri and under no circumstances for more than 2 weeks.

Appendix A: Tenancy Bins/Equipment

Multi-Sort Waste/Recycling Hub for Tenancy Kitchen/BoH Areas



Cleaner's Trolley with Separate Bags for Different Streams



Appendix B: Signage Examples



