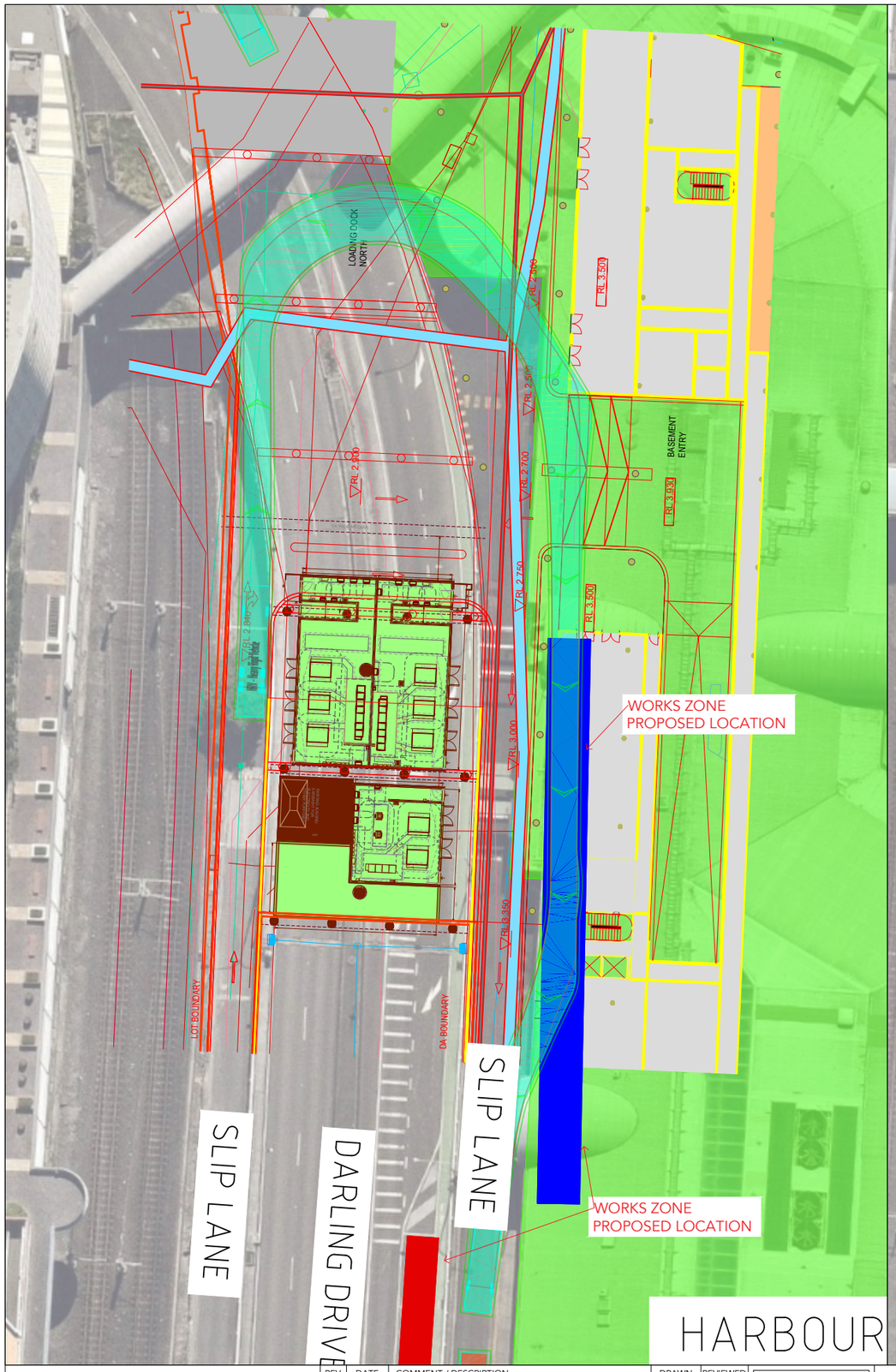

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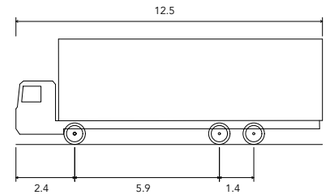
A3



HRV - Heavy Rigid Vehicle	
Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

ptc.

Suite 502, 1 James Place
North Sydney NSW 2060

t +61 2 8920 0800

ptcconsultants.co

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
P5	07.10.22	FOR INFORMATION	JAJ	DB/SW
P4	13/04/22	FOR INFORMATION	JAJ	SW
P3	15/03/22	FOR INFORMATION	JAJ	AM / DB
P2	07/03/22	FOR INFORMATION	JAJ	AM
P1	10/02/22	FOR INFORMATION	HL / JAJ	DB/AM

PROJECT

HARBOURSIDE SHOPPING

DRAWING TITLE

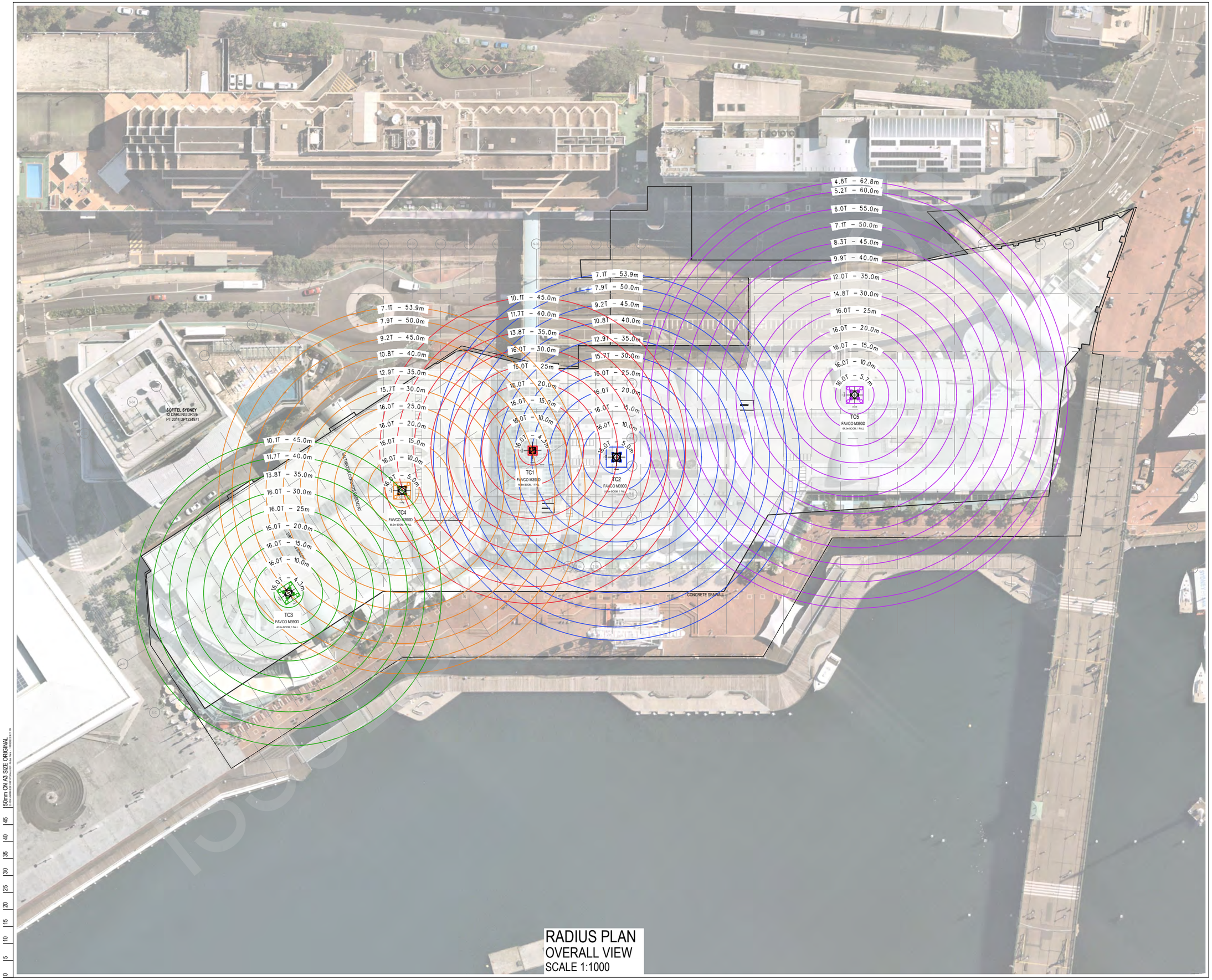
HEAVY RIGID VEHICLE ACCESS TO SITE FROM DARLING DRIVE - WORKS ZONE ACCESS

CLIENT	MIRVAC
DRAWING #	PTC-HRV001.1
PROJECT #	22-0036
SCALE	1 : 500 @ A3

PRELIMINARY

REV P5

Attachment 3 Tower Crane Setout (Mirvac)



RADIUS PLAN
OVERALL VIEW
SCALE 1:1000

DRAWING NOTES

1. THE LOCATION OF THE TOWER CRANES IS SHOWN FOR DISCUSSION. FINAL LOCATIONS TO BE AGREED BETWEEN MIRVAC & MARR.

2. TOWER CRANES INSTALL AND DISMANTLE METHODOLOGY PENDING FURTHER ASSESSMENTS.

3. REFERENCE FILES USED IN THE DRAWING:
   • ARCHITECTURAL DRAWINGS FROM SNØHETTA+HASSELL
   • NEARMAP IMAGE DATED 03.04.22 - FOR REFERENCE ONLY

REV	DESCRIPTION	BY	DATE
P2	ISSUED FOR INFORMATION	AM	11/08/2022
P1	ISSUED FOR INFORMATION	AM	04/07/2022

COMMERCIAL IN CONFIDENCE

THE MEN FROM MARR'S

MARR CONTRACTING PTY LTD
2 CHISHOLM ROAD, SEFTON NSW 2162 AUSTRALIA P +61 (2) 9738 5533 W MARR.COM.AU

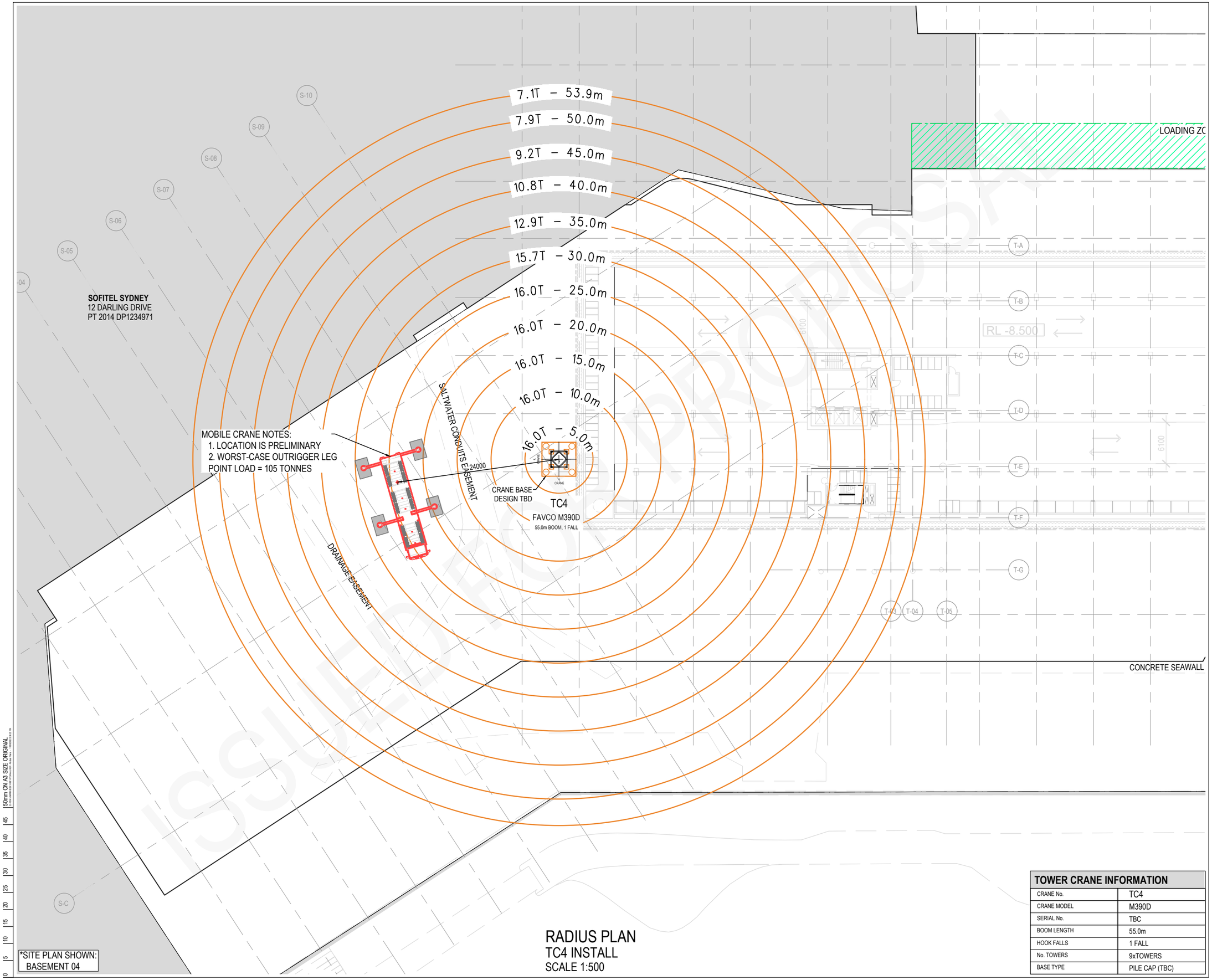
CLIENT: mirvac

PROJECT/SITE: HARBOURSIDE REDEV.

TITLE:
TOWER CRANES SETOUT
RADIUS PLAN - OVERALL VIEW
TC1-TC5

SCALE AT A3:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:1000	04/07/2022	AM	JY	-

PROJECT No.:	DRAWING No.:	REVISION:
22-P0045	MARR - 000 - 01 - 0010	P2



*SITE PLAN SHOWN:
BASEMENT 04

RADIUS PLAN
TC4 INSTALL
SCALE 1:500

TOWER CRANE INFORMATION	
CRANE No.	TC4
CRANE MODEL	M390D
SERIAL No.	TBC
BOOM LENGTH	55.0m
HOOK FALLS	1 FALL
No. TOWERS	9xTOWERS
BASE TYPE	PILE CAP (TBC)

DRAWING NOTES

1. THE LOCATION OF THE TOWER CRANES IS SHOWN FOR DISCUSSION. FINAL LOCATIONS TO BE AGREED BETWEEN MIRVAC & MARR.

2. TOWER CRANES INSTALL AND DISMANTLE METHODOLOGY PENDING FURTHER ASSESSMENTS.

3. REFERENCE FILES USED IN THE DRAWING:
   • ARCHITECTURAL DRAWINGS FROM SNØHETTA+HASSELL

REV	DESCRIPTION	BY	DATE
P2	ISSUED FOR INFORMATION	AM	08/08/2022
P1	ISSUED FOR INFORMATION	AM	04/07/2022

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MARR CONTRACTING PTY LTD
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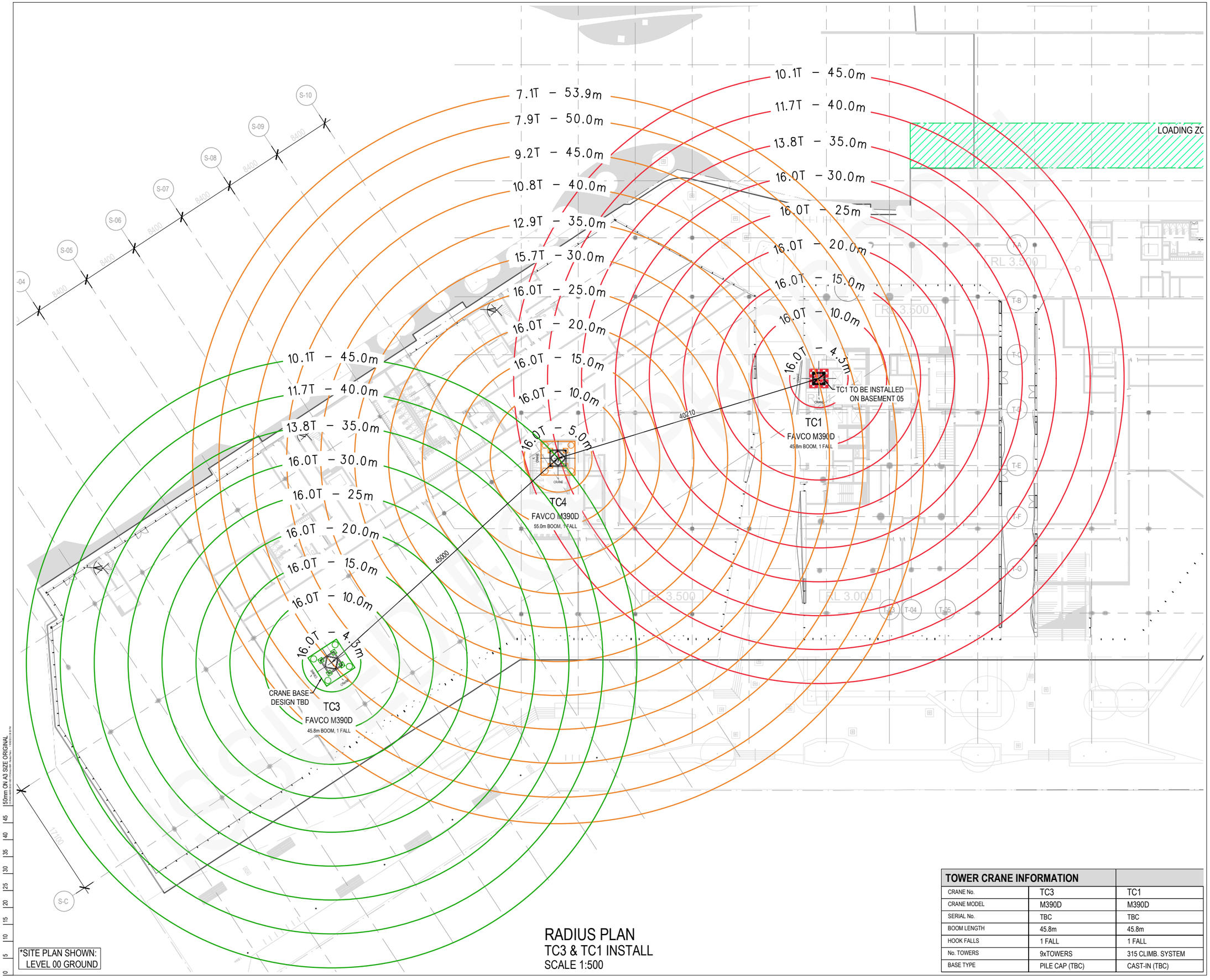
CLIENT: mirvac

PROJECT/SITE: HARBOURSIDE REDEV.

TITLE:
TOWER CRANES SETOUT
RADIUS PLAN
TC4 INSTALL

SCALE AT A3:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:500	04/07/2022	AM	JY	-

PROJECT No.: 22-P0045 DRAWING No.: MARR - 000 - 01 - 0011 REVISION: P2



*SITE PLAN SHOWN: LEVEL 00 GROUND

RADIUS PLAN
TC3 & TC1 INSTALL
SCALE 1:500

TOWER CRANE INFORMATION		
CRANE No.	TC3	TC1
CRANE MODEL	M390D	M390D
SERIAL No.	TBC	TBC
BOOM LENGTH	45.8m	45.8m
HOOK FALLS	1 FALL	1 FALL
No. TOWERS	9xTOWERS	315 CLIMB. SYSTEM
BASE TYPE	PILE CAP (TBC)	CAST-IN (TBC)

DRAWING NOTES

1. THE LOCATION OF THE TOWER CRANES IS SHOWN FOR DISCUSSION. FINAL LOCATIONS TO BE AGREED BETWEEN MIRVAC & MARR.

2. TOWER CRANES INSTALL AND DISMANTLE METHODOLOGY PENDING FURTHER ASSESSMENTS.

3. REFERENCE FILES USED IN THE DRAWING:
   • ARCHITECTURAL DRAWINGS FROM SNØHETTA+HASSELL

REV	DESCRIPTION	BY	DATE
P2	ISSUED FOR INFORMATION	AM	08/08/2022
P1	ISSUED FOR INFORMATION	AM	04/07/2022

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CLIENT: mirvac

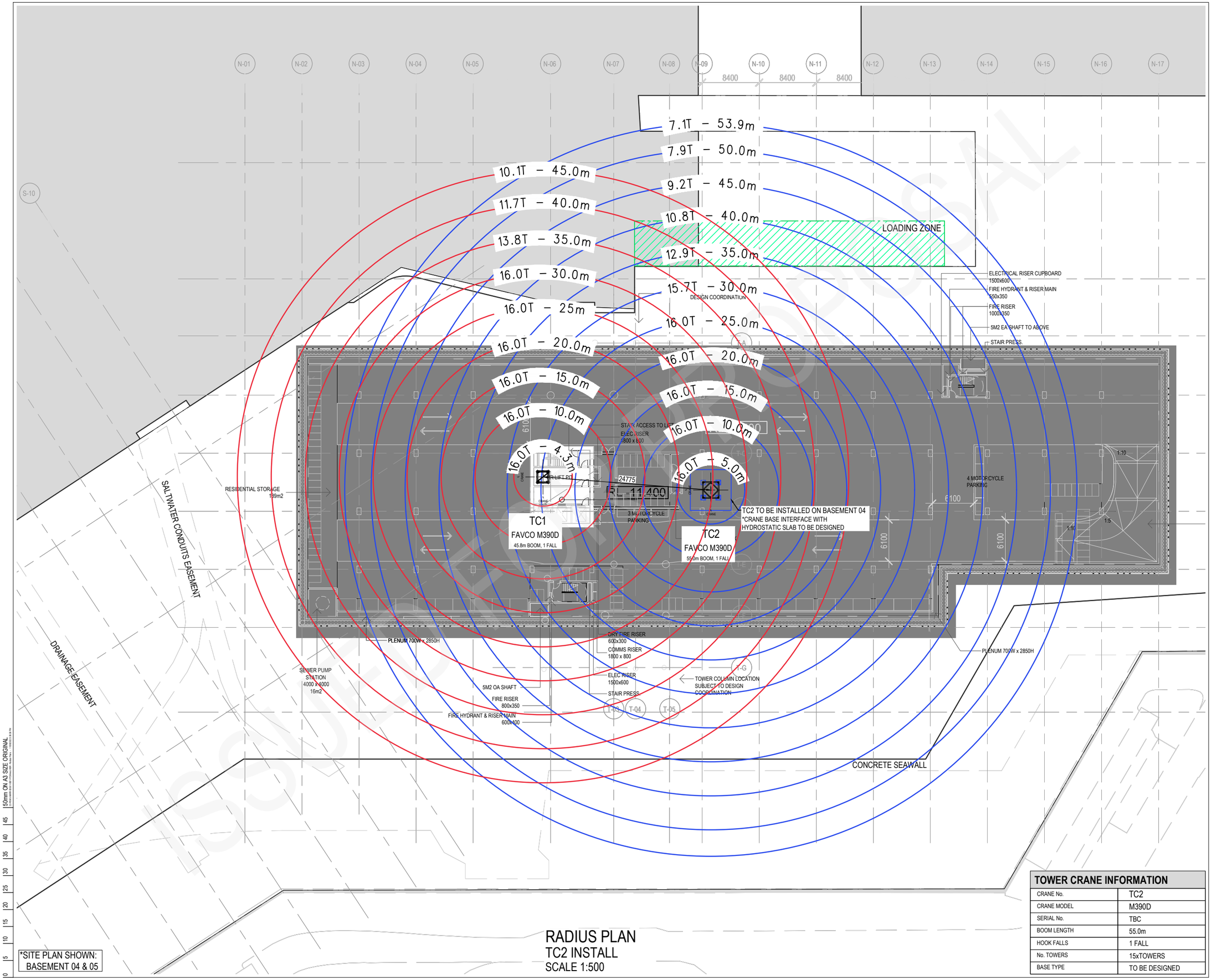
PROJECT/SITE: HARBOURSIDE REDEV.

TITLE:
TOWER CRANES SETOUT
RADIUS PLAN
TC3 & TC1 INSTALL

SCALE AT A3:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:500	01/07/2022	AM	JY	-

PROJECT No.: 22-P0045 DRAWING No.: MARR - 000 - 01 - 0012 REVISION: P2

150mm ON A3 SIZE ORIGINAL



*SITE PLAN SHOWN:
BASEMENT 04 & 05

RADIUS PLAN
TC2 INSTALL
SCALE 1:500

TOWER CRANE INFORMATION	
CRANE No.	TC2
CRANE MODEL	M390D
SERIAL No.	TBC
BOOM LENGTH	55.0m
HOOK FALLS	1 FALL
No. TOWERS	15xTOWERS
BASE TYPE	TO BE DESIGNED

DRAWING NOTES

1. THE LOCATION OF THE TOWER CRANES IS SHOWN FOR DISCUSSION. FINAL LOCATIONS TO BE AGREED BETWEEN MIRVAC & MARR.

2. TOWER CRANES INSTALL AND DISMANTLE METHODOLOGY PENDING FURTHER ASSESSMENTS.

3. REFERENCE FILES USED IN THE DRAWING:
   • ARCHITECTURAL DRAWINGS FROM SNØHETTA+HASSELL

REV	DESCRIPTION	BY	DATE
P2	ISSUED FOR INFORMATION	AM	08/08/2022
P1	ISSUED FOR INFORMATION	AM	04/07/2022

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MARR CONTRACTING PTY LTD
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CLIENT: mirvac

PROJECT/SITE: HARBOURSIDE REDEV.

TITLE:
TOWER CRANES SETOUT
RADIUS PLAN
TC2 INSTALL

SCALE AT A3:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:500	01/07/2022	AM	JY	-

PROJECT No.: 22-P0045 DRAWING No.: MARR - 000 - 01 - 0013 REVISION: P2

150mm ON A3 SIZE ORIGINAL
0 5 10 15 20 25 30 35 40 45

4.8T – 62.8m
5.2T – 60.0m
6.0T – 55.0m
7.1T – 50.0m
8.3T – 45.0m
9.9T – 40.0m
12.0T – 35.0m
14.8T – 30.0m
16.0T – 25m
16.0T – 20.0m
16.0T – 15.0m
16.0T – 10.0m
16.0T – 5.7m

N-08 N-09 N-10 N-11 N-12 N-13 N-14 N-15 N-16 N-19 N-20 N-21 N-22 N-23 N-24 N-25

4800 8400 8400 8400 8400 8400 8400 8400 8400 8400 8400 8400 8400 8400 8400

LOADING ZONE

RL 3.500

T-A T-B T-C T-D T-E T-F T-G T-05

16897

CRANE

CRANE BASE DESIGN TBD

TC5
FAVCO M390D
64.2m BOOM, 1 FALL

MOBILE CRANE NOTES:
1. LOCATION IS PRELIMINARY
2. WORST-CASE OUTRIGGER LEG POINT LOAD = 105 TONNES

17100 8400 8700 8550 8550 8550 12450

50mm ON A3 SIZE ORIGINAL

*SITE PLAN SHOWN:
LEVEL 00

RADIUS PLAN
TC5 INSTALL
SCALE 1:500

TOWER CRANE INFORMATION	
CRANE No.	TC5
CRANE MODEL	M390D
SERIAL No.	TBC
BOOM LENGTH	64.2m
HOOK FALLS	1 FALL
No. TOWERS	7xTOWERS (TBC)
BASE TYPE	PILE CAP

DRAWING NOTES

1. THE LOCATION OF THE TOWER CRANES IS SHOWN FOR DISCUSSION. FINAL LOCATIONS TO BE AGREED BETWEEN MIRVAC & MARR.

2. TOWER CRANES INSTALL AND DISMANTLE METHODOLOGY PENDING FURTHER ASSESSMENTS.

3. REFERENCE FILES USED IN THE DRAWING:
   • ARCHITECTURAL DRAWINGS FROM SNØHETTA+HASSELL

REV	DESCRIPTION	BY	DATE
P2	ISSUED FOR INFORMATION	AM	08/08/2022
P1	ISSUED FOR INFORMATION	AM	04/07/2022

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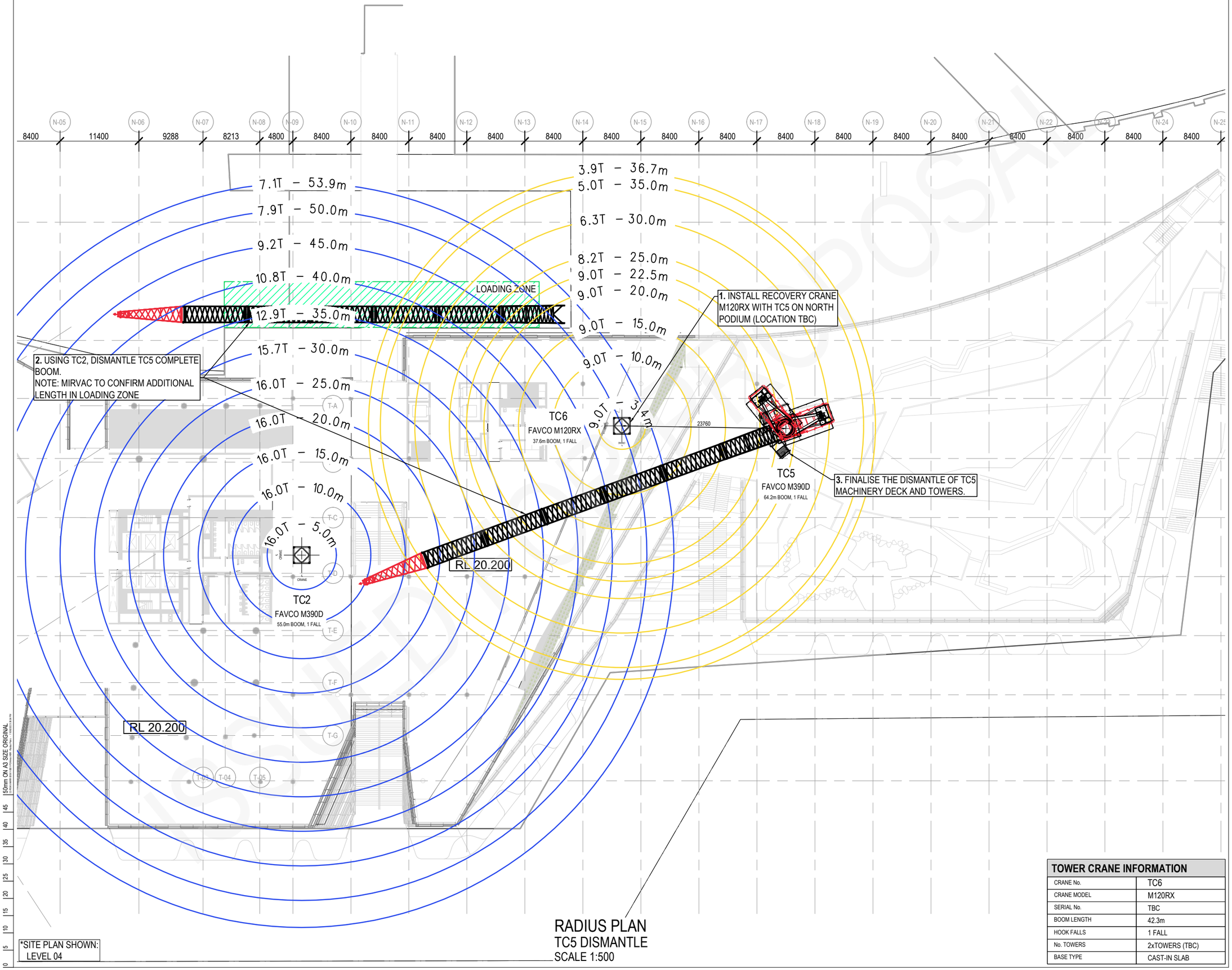
CLIENT: mirvac

PROJECT/SITE: HARBOURSIDE REDEV.

TITLE:
TOWER CRANES SETOUT
RADIUS PLAN
TC5 INSTALL

SCALE AT A3:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:500	11/08/2022	AM	JY	-

PROJECT No.:	DRAWING No.:	REVISION:
22-P0045	MARR - 000 - 01 - 0014	P2



*SITE PLAN SHOWN:
LEVEL 04

RADIUS PLAN
TC5 DISMANTLE
SCALE 1:500

TOWER CRANE INFORMATION	
CRANE No.	TC6
CRANE MODEL	M120RX
SERIAL No.	TBC
BOOM LENGTH	42.3m
HOOK FALLS	1 FALL
No. TOWERS	2xTOWERS (TBC)
BASE TYPE	CAST-IN SLAB

DRAWING NOTES

1. THE LOCATION OF THE TOWER CRANES IS SHOWN FOR DISCUSSION. FINAL LOCATIONS TO BE AGREED BETWEEN MIRVAC & MARR.

2. TOWER CRANES INSTALL AND DISMANTLE METHODOLOGY PENDING FURTHER ASSESSMENTS.

3. REFERENCE FILES USED IN THE DRAWING:
 • ARCHITECTURAL DRAWINGS FROM SNØHETTA+HASSELL

REV	DESCRIPTION	BY	DATE
P2	ISSUED FOR INFORMATION	AM	08/08/2022
P1	ISSUED FOR INFORMATION	AM	04/07/2022

COMMERCIAL IN CONFIDENCE

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CLIENT: mirvac

PROJECT/SITE: HARBOURSIDE REDEV.

TITLE:
TOWER CRANES SETOUT
RADIUS PLAN
TC6 INSTALL & TC5 DISMANTLE

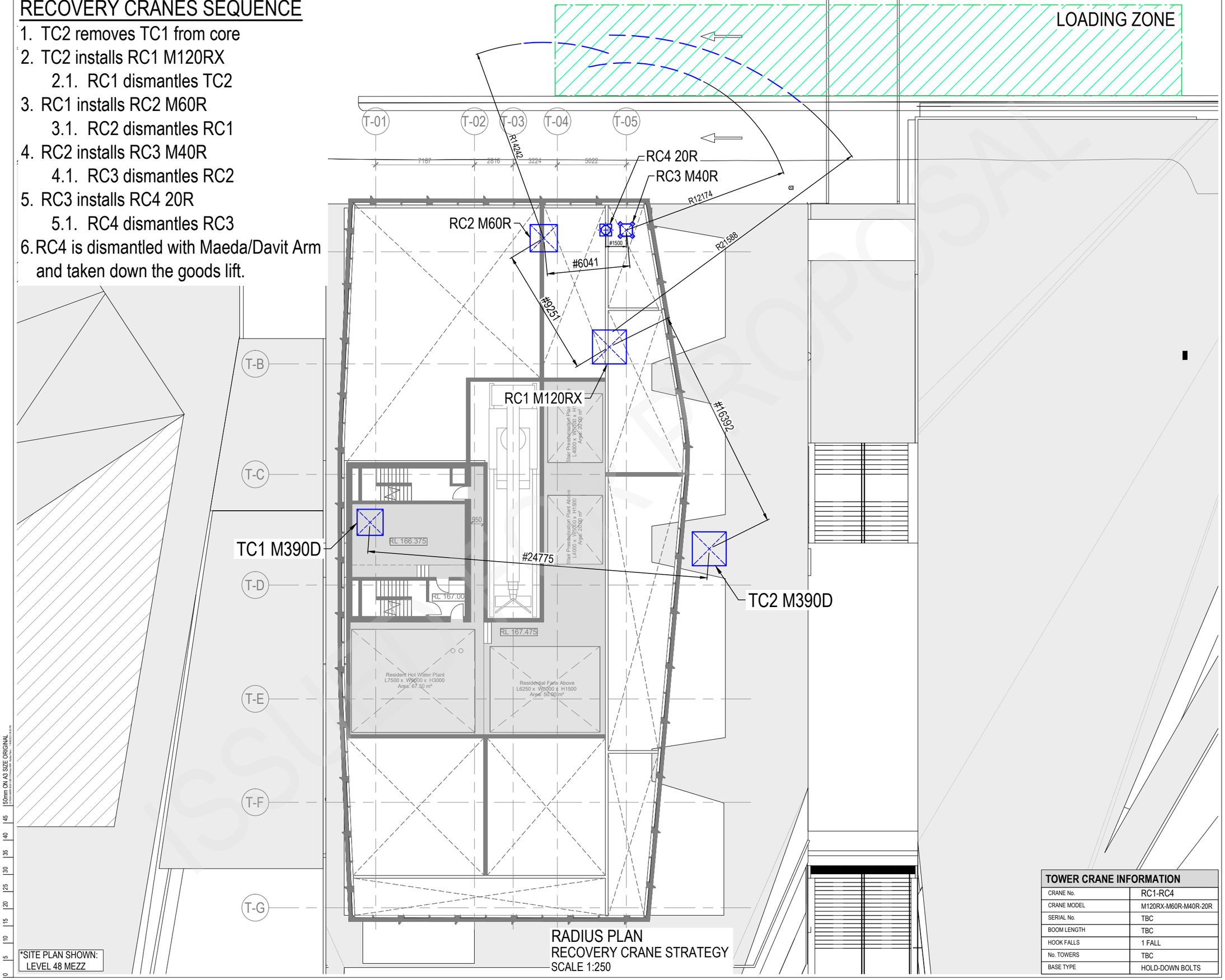
SCALE AT A3:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:500	01/07/2022	AM	JY	-

PROJECT No.: 22-P0045 DRAWING No.: MARR - 000 - 01 - 0015 REVISION: P2

50mm ON A3 SIZE ORIGINAL
0 5 10 15 20 25 30 35 40 45 50

RECOVERY CRANES SEQUENCE

1. TC2 removes TC1 from core
2. TC2 installs RC1 M120RX
   - 2.1. RC1 dismantles TC2
3. RC1 installs RC2 M60R
   - 3.1. RC2 dismantles RC1
4. RC2 installs RC3 M40R
   - 4.1. RC3 dismantles RC2
5. RC3 installs RC4 20R
   - 5.1. RC4 dismantles RC3
6. RC4 is dismantled with Maeda/Davit Arm and taken down the goods lift.



RADIUS PLAN
RECOVERY CRANE STRATEGY
SCALE 1:250

*SITE PLAN SHOWN:
LEVEL 48 MEZZ

TOWER CRANE INFORMATION	
CRANE No.	RC1-RC4
CRANE MODEL	M120RX-M60R-M40R-20R
SERIAL No.	TBC
BOOM LENGTH	TBC
HOOK FALLS	1 FALL
No. TOWERS	TBC
BASE TYPE	HOLD-DOWN BOLTS

DRAWING NOTES

1. THE LOCATION OF THE TOWER CRANES IS SHOWN FOR DISCUSSION. FINAL LOCATIONS TO BE AGREED BETWEEN MIRVAC & MARR.

2. TOWER CRANES INSTALL AND DISMANTLE METHODOLOGY PENDING FURTHER ASSESSMENTS.

3. REFERENCE FILES USED IN THE DRAWING:
   - ARCHITECTURAL DRAWINGS FROM SNØHETTA+HASSELL

REV	DESCRIPTION	BY	DATE
P2	ISSUED FOR INFORMATION	AM	08/08/2022
P1	ISSUED FOR INFORMATION	AM	04/07/2022

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CLIENT: mirvac

PROJECT/SITE: HARBOURSIDE REDEV.

TITLE:
TOWER CRANES SETOUT
RADIUS PLAN
RECOVERY CRANES

SCALE AT A3:	DATE:	DRAWN:	CHECKED:	APPROVED:
1:250	01/07/2022	AM	JY	-

PROJECT No.:	DRAWING No.:	REVISION:
22-P0045	MARR - 000 - 01 - 0017	P2

50mm ON A3 SIZE ORIGINAL

Attachment 4 Cyclist Temporary Overhead Protection (Mirvac)

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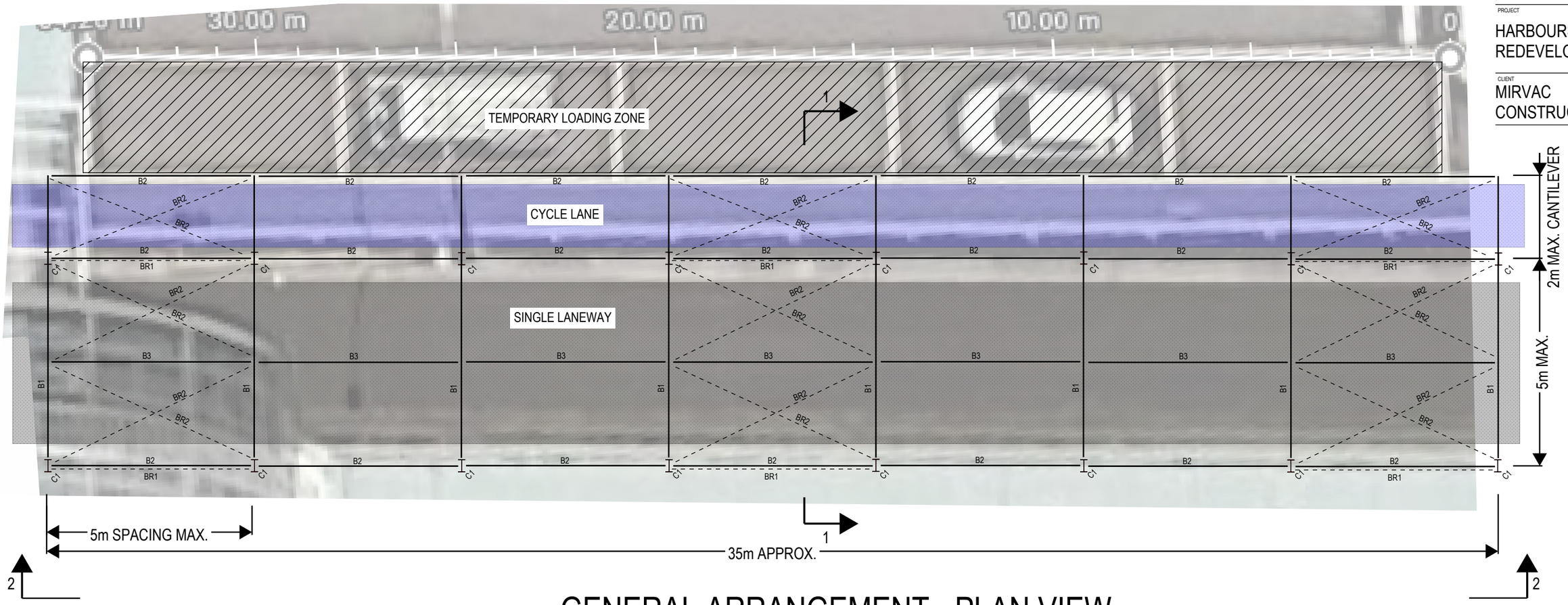
PROJECT
HARBOURSIDE REDEVELOPMENT

CLIENT
MIRVAC CONSTRUCTIONS



GENERAL ARRANGEMENT - PLAN VIEW

GENERAL NOTES:

1. SETOUT AND COORDINATION TO BE CONFIRMED PRIOR TO CONSTRUCTION
2. STEEL SHOP DRAWINGS (ACCOMPANIED WITH IFC MODEL) TO BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO COMMENCING FABRICATION
3. REFERENCE DOCUMENTATION:
   - 'HBR DRG0013 Hoardings Demolition Phase Rev B SW Culvert'
   - 'Harbourside_RfP_Temp Engineering - Hoardings'
4. DESIGN LOADING:
   - V100 WIND LOADING (41m/s)
   - 6.67kPa UDL OVERHEAD PROTECTION (10kPa ULTIMATE)
   - NO ALLOWANCE HAS BEEN MADE FOR MATERIAL STACKING
   - NO ALLOWANCE HAS BEEN MADE FOR IMPACT LOADS ON COLUMNS OR BRACES
5. UNLESS NOTED OTHERWISE:
   - ALL STEEL MEMBERS = 300 GRADE
   - ALL STEEL PLATES = 250 GRADE
   - ALL BOLTS = M20-8.8/S
   - ALL WELDS = 6mm CFW (SP CAT)
6. SURFACE FINISHED TO CONTRACTOR'S DETAILS

MEMBER SCHEDULE		
MARK	SIZE	COMMENTS
C1	310 UB 46.2	END PLATE (MOMENT) CONNECTION TO B1 MEMBER (SEE DETAIL 2 & 3)
B1	310 UB 46.2	END PLATE (MOMENT) CONNECTION TO C1 MEMBER (SEE DETAIL 2 & 3)
B2	310 UB 40.4	CONNECTION = 10PL + 3M20 (SEE DETAIL 1)
B3	310 UB 46.2	CONNECTION = 10PL + 3M20 NOTE: B3 MEMBER SIZE MAY BE REDUCED IF PROPRIETARY B-CLASS HOARDING MODULES ARE USED TO SPAN BETWEEN PORTAL FRAMES.
BR1	75x6 EA x 2	CONNECTION = 10PL/BEAM FLANGE + M20 (REFER DETAILS)
BR2	100x6 EA x 2	CONNECTION = 10PL + M20 (REFER DETAILS)

Rev	Date	Description	Drn	App
B	01/08/22	ISSUE FOR TENDER	JL	PM
A	12/05/22	CONCEPT ONLY	RS	PM

Drawing title
BIKE LANE TEMPORARY OVERHEAD PROTECTION

Drawn by	Design checker	Approved by	LD ref.
JL	PM	PM	XXX
Suitability status: FOR TENDER	Scale: 1:100	Sheet size: A3	
Drawing No.: 17278-HA-01-100-SK-S-0001			Revision: B

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

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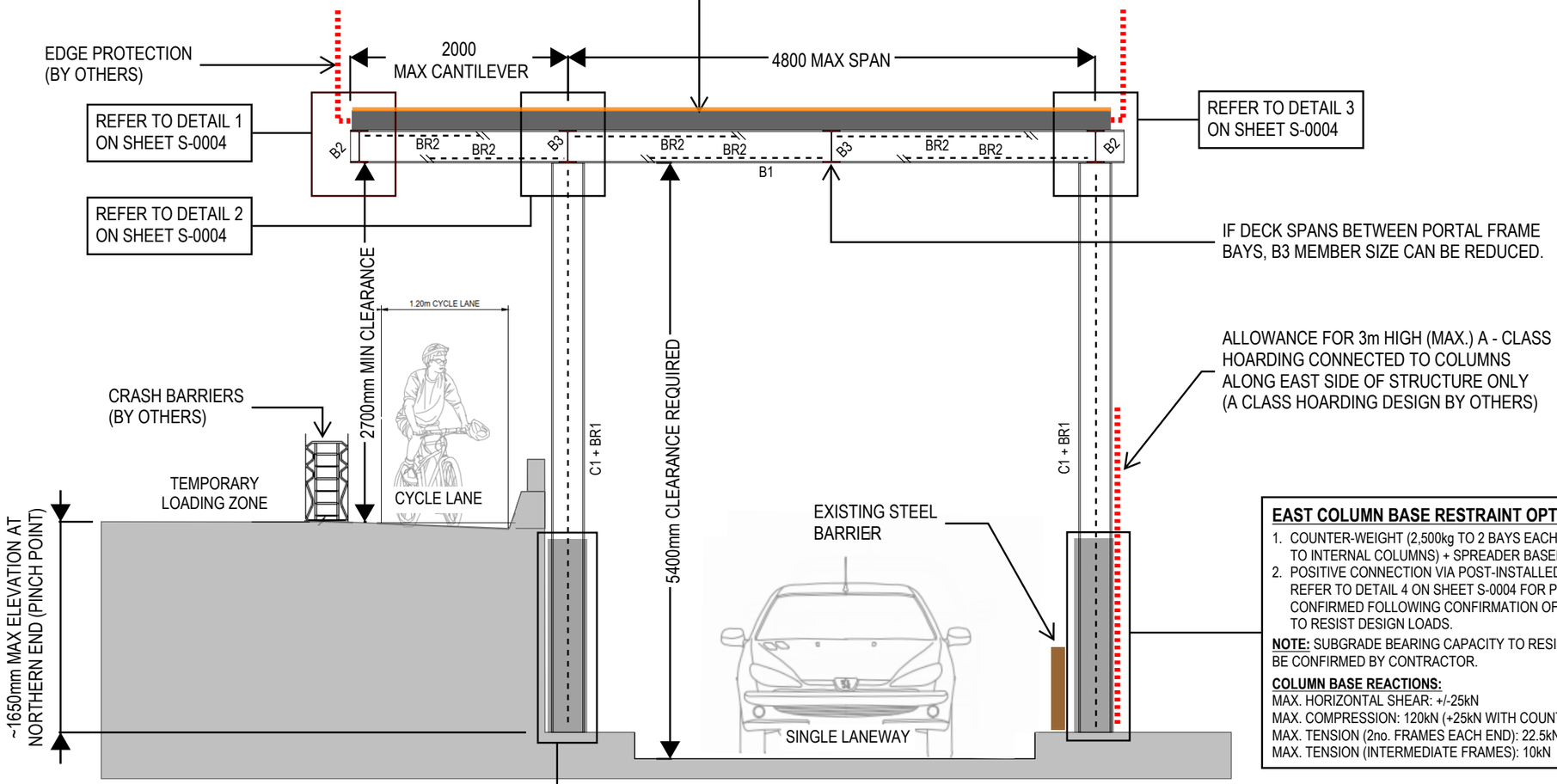
PROJECT
HARBOURSIDE REDEVELOPMENT

CLIENT
MIRVAC CONSTRUCTIONS

NOTES: REFER TO PAGE '17278-HA-01-100-SK-S-0001' FOR GENERAL NOTES AND MEMBER SCHEDULE.

DECK OPTIONS:
1 - TIMBER DECK OPTIONS - 150x77LVL'S @ 300CTS + 17mm F17 PLYWOOD LAYER
2 - PROPRIETARY B-CLASS HOARDING DECK MODULES
3 - STEEL DECK OPTIONS - 125 PFC'S @ 600CTS + 3PL
(MAX. ALLOWABLE SELF-WEIGHT OF DECK: 60kg/m²)



EAST COLUMN BASE RESTRAINT OPTIONS:
1. COUNTER-WEIGHT (2,500kg TO 2 BAYS EACH END - 4no. COLUMNS TOTAL. 1,200kg TO INTERNAL COLUMNS) + SPREADER BASEPLATE. TO CONTRACTOR'S DETAILS.
2. POSITIVE CONNECTION VIA POST-INSTALLED ANCHORS TO SUPPORT STRUCTURE. REFER TO DETAIL 4 ON SHEET S-0004 FOR PRELIMINARY DETAIL - TO BE CONFIRMED FOLLOWING CONFIRMATION OF SUPPORT STRUCTURE AND ABILITY TO RESIST DESIGN LOADS.

NOTE: SUBGRADE BEARING CAPACITY TO RESIST NOMINATED COLUMN LOADS TO BE CONFIRMED BY CONTRACTOR.

COLUMN BASE REACTIONS:
MAX. HORIZONTAL SHEAR: +/-25kN
MAX. COMPRESSION: 120kN (+25kN WITH COUNTERWEIGHT)
MAX. TENSION (2no. FRAMES EACH END): 22.5kN
MAX. TENSION (INTERMEDIATE FRAMES): 10kN

WEST COLUMN BASE RESTRAINT OPTIONS:
1. COUNTER-WEIGHT (2,500kg TO 2 BAYS EACH END - 4no. COLUMNS TOTAL. 1,200kg TO INTERNAL COLUMNS) + SPREADER BASEPLATE. TO CONTRACTOR'S DETAILS.
2. POSITIVE CONNECTION VIA POST-INSTALLED ANCHORS TO SUPPORT STRUCTURE. REFER TO DETAIL 4 ON SHEET S-0004 FOR PRELIMINARY DETAIL - TO BE CONFIRMED FOLLOWING CONFIRMATION OF SUPPORT STRUCTURE AND ABILITY TO RESIST DESIGN LOADS.

NOTE: SUBGRADE BEARING CAPACITY TO RESIST NOMINATED COLUMN LOADS TO BE CONFIRMED BY CONTRACTOR.

COLUMN BASE REACTIONS:
MAX. HORIZONTAL SHEAR: +/-15kN
MAX. COMPRESSION: 270kN (+25kN WITH COUNTERWEIGHT)
MAX. TENSION (2no. FRAMES EACH END): 20kN
MAX. TENSION (INTERMEDIATE FRAMES): 10kN

SECTION 1-1

Rev	Date	Description	Drn	App
B	01/08/22	ISSUE FOR TENDER	JL	PM
A	12/05/22	CONCEPT ONLY	RS	PM

Drawing title
BIKE LANE TEMPORARY OVERHEAD PROTECTION - SECTION 1

Drawn by	Design checker	Approved by	LD ref:
JL	PM	PM	XXX
Suitability status: FOR TENDER		Scale: 1:50	Sheet size: A3
Drawing No.: 17278-HA-01-100-SK-S-0002			Revision: B

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PROJECT

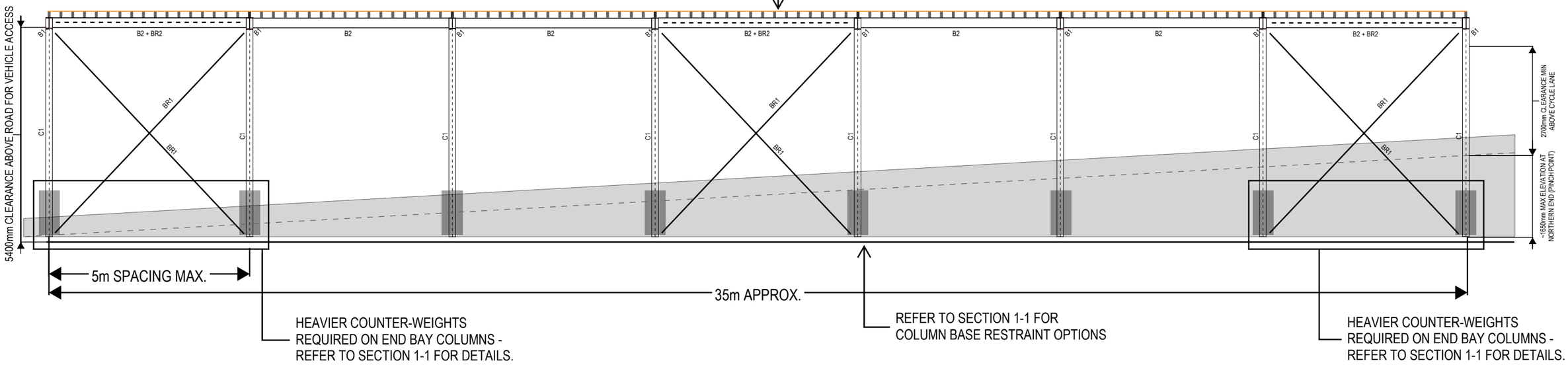
HARBOURSIDE REDEVELOPMENT

CLIENT

MIRVAC CONSTRUCTIONS

NOTES: REFER TO PAGE '17278-HA-01-100-SK-S-0001' FOR GENERAL NOTES AND MEMBER SCHEDULE.

DECK OPTIONS:
1 - TIMBER DECK OPTIONS - 150x77LVL'S @ 300CTS + 17mm F17 PLYWOOD LAYER
2 - PROPRIETARY B-CLASS HOARDING DECK MODULES
3 - STEEL DECK OPTIONS - 125 PFC'S @ 600CTS + 3PL
(MAX. ALLOWABLE SELF-WEIGHT OF DECK: 60kg/m^2)



SECTION 2-2

Rev	Date	Description	Dm	App
B	01/08/22	ISSUE FOR TENDER	JL	PM
A	12/05/22	CONCEPT ONLY	RS	PM

Drawing title

BIKE LANE TEMPORARY OVERHEAD PROTECTION - SECTION 2

Drawn by	Design checker	Approved by	LD ref:
JL	PM	PM	XXX
Suitability status: FOR TENDER	Scale: 1: 100		Sheet size: A3
Drawing No.: 17278-HA-01-100-SK-S-0003			Revision: B

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

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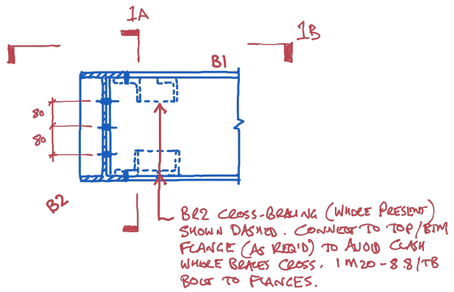
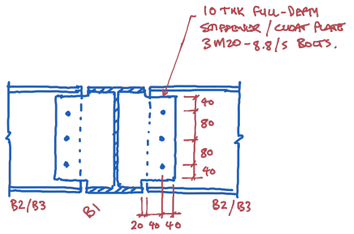


DETAIL 1

(NOTE: DECKING NOT SHOWN)



SECTION 1A

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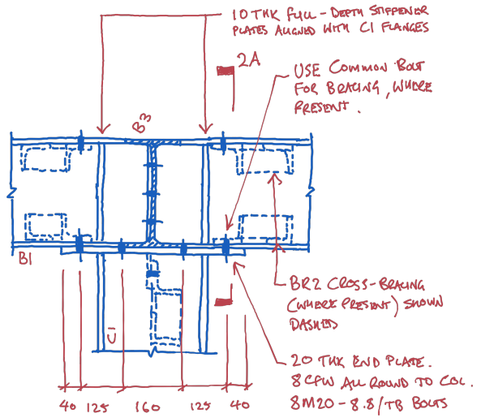

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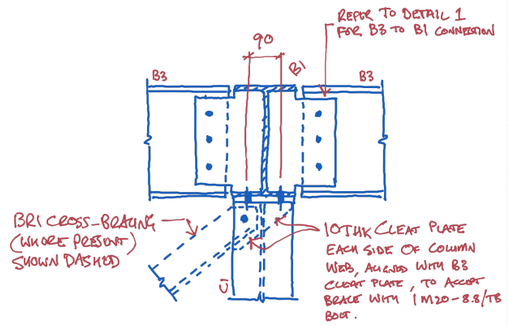

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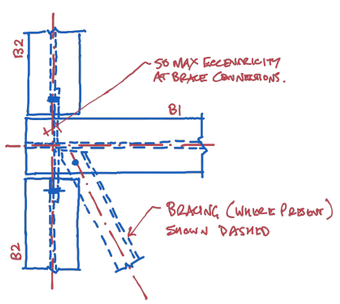

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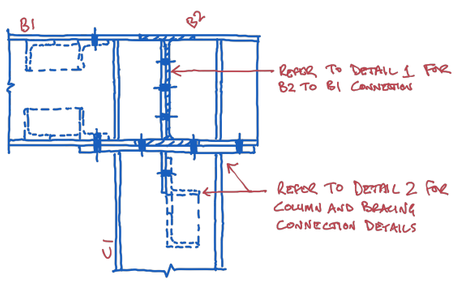

DETAIL 3

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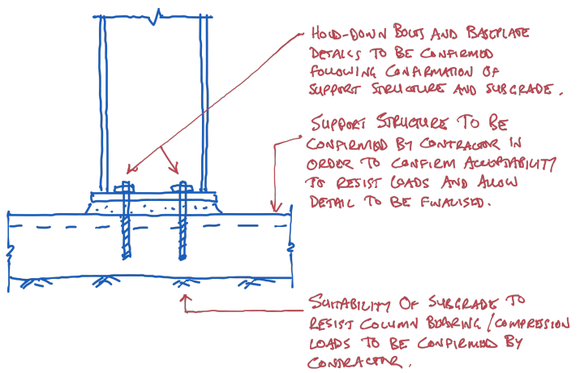


DETAIL 4

(POSITIVE CONNECTION OPTION - PRELIMINARY)

HATCH Lindsay Dynan

Sydney | Perth | Newcastle | Central Coast

www.lindsaydynan.com

PROJECT

HARBOURSIDE REDEVELOPMENT

CLIENT

MIRVAC CONSTRUCTIONS

NOTES: REFER TO PAGE '17278-HA-01-100-SK-S-0001' FOR GENERAL NOTES AND MEMBER SCHEDULE.

Rev	Date	Description	Drn	App
B	01/08/22	ISSUE FOR TENDER	JL	PM

Drawing title

BIKE LANE TEMPORARY OVERHEAD PROTECTION - SECTION 2

Drawn by	Design checker	Approved by	LD ref:
JL	PM	PM	XXX
Suitability status: FOR TENDER		Scale: -	Sheet size: A3
Drawing No.: 17278-HA-01-100-SK-S-0004			Revision: B

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

Attachment 5 Hoardings and Site Plan (Mirvac)

LEGEND

- Incoming Vehicles/Trucks
- Truck and Trailers removing material
- General Deliveries
- Alternate Load Path for Truck & Trailers

NOTES
Laybacks and temporary access will be established to allow vehicular access into the building footprint.

MGA 2020

LOADING ZONE - SUBJECT TO PLACE NSW APPROVAL

GATE 1

GATE 2

GATE 3

DARLING

DRIVE

EASEMENT FOR SALTWATER CONDUITS IN STRATUM (DP773353)

EASEMENT TO DRAIN WATER IN STRATUM (DP773353)

HARBOURSIDE

ABOUT 1m FROM END OF VISIBLE HERITAGE WALL TO BOUNDARY

EXTENT OF VISIBLE HERITAGE WALL

EXISTING BOUNDARY (APPROXIMATE ONLY)

0.5 sq m

SHOTCRETE AND CONCRETE COLUMNS

CONCRETE

EXISTING 0.750 STORMWATER OUTLET

OHP STRUCTURE FOR BIKELANE

TYPICAL B CLASS TYPE HOARDING

TYPICAL A CLASS TYPE HOARDING - REQUIRED BELOW PYRMONT BRIDGE

IMAGE: NEARMAPS, DATED 1 AUGUST 2020

OHP CUSTOM STRUCTURE IMAGES

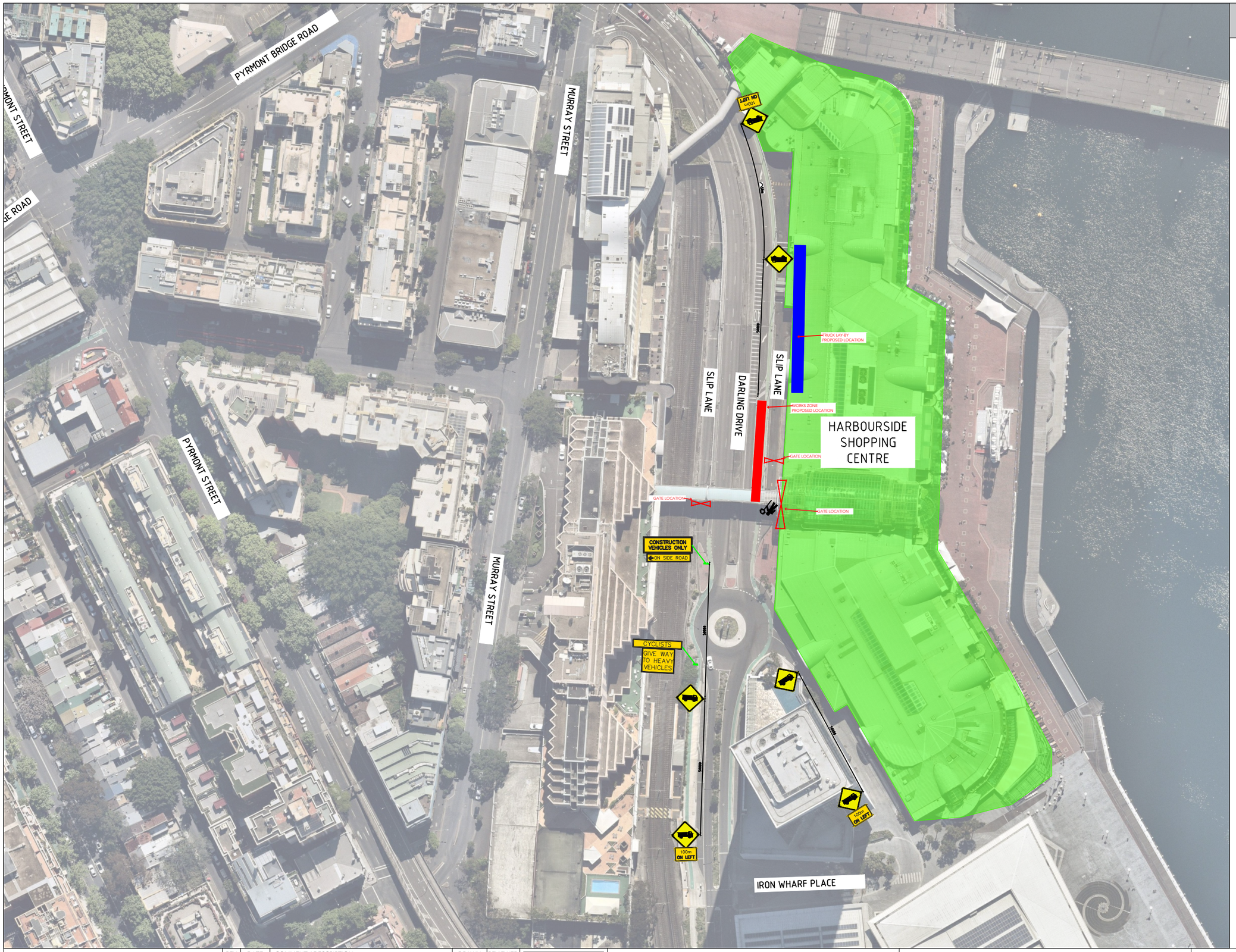
mirvac

LEGEND

- A Class Hoarding
- DA Boundary
- Existing Layback
- MCPL Crane

MIRVAC CONSTRUCTIONS PTY LTD	HARBOURSIDE REDEVELOPMENT
DRAWING TITLE:	SITE HOARDINGS- PHASE 2 -CONSTRUCTION
DRAWING NO:	HBR-SITE-MGR-CM-DRG-0014
DATE: 08/02/2022	REVISION: C

Attachment 6 Indicative Traffic Guidance Schemes (TGS)



comments

A3

GENERAL NOTES:

1. All information provided regarding traffic guidance schemes (TGS) is indicative
2. Detailed TGS are to be developed by the appointed traffic control company
3. All TGS revisions or adjustments must be made by a suitably accredited person with the appropriate safework NSW licence
4. This drawing is not to scale and is to be used for reference purposes only
5. All signage is to be in accordance with TCAWS v6.1 (2022) and set up in visible and appropriate locations
6. The role of traffic controllers is to hold construction vehicles within the site until it is safe for them to leave the site. They are not permitted to stop traffic to enable truck movements.

SITE SPECIFIC NOTES:

1. The Darling Drive slip lane is to be considered part of the active construction site. gate access as shown will control vehicular access to construction vehicles only.
2. Based on construction vehicle swept paths, cyclists approaching form the south require warning of turning trucks.

ptc.
Suite 502, 1 James Place
North Sydney NSW 2060
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ptcconsultants.co

REV	DATE	COMMENT / DESCRIPTION	DRAWN	REVIEWED
P1	19.09.22	INDICATIVE TRAFFIC GUIDANCE SCHEME	JAJ	DB

PROJECT
HARBOURSIDE SHOPPING

DRAWING TITLE
INDICATIVE TRAFFIC GUIDANCE SCHEME (TGS)
DRAWN BY: Jake A Jansen, TCT1027562 (PWZ)
REVIEWED BY: Dan Budai, TCT0016805 (PWZ)

CLIENT	MIRVAC
DRAWING #	PTC-TGS001
PROJECT #	22-0036
SCALE	NOT TO SCALE

PRELIMINARY

REV P5

15.3 APPENDIX C – CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN (CNVMP)

MATTHEW PALAVIDIS
VICTOR FATTORETTO
MATTHEW SHIELDS

Harbourside

SSDA 3 Acoustic Assessment

SYDNEY
9 Sarah St
MASCOT NSW 2020
(02) 8339 8000

ABN 98 145 324 714
www.acousticlogic.com.au

Project ID	20220030.2
Document Title	SSDA 3 Acoustic Assessment
Attention To	Mirvac Retail Sub SPV Pty Limited

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	20/03/2023	20220030.2/2003A/R0/LA	LA		TA
1	21/04/2023	20220030.2/2104A/R1/LA	LA		AW

TABLE OF CONTENTS

1 INTRODUCTION

This report supports a State Significant Development Application (SSD 49653211) submitted to the Minister for Planning and Public Spaces pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Following consent being granted for the Concept Proposal, Stage 1 demolition works, bulk excavation works and the lodgement of SSDA 2, Mirvac Retail Sub SPV Pty Ltd (Mirvac) is now pursuing the next stage of planning approvals for the public domain elements associated with the redevelopment of the Harbourside Shopping Centre at Darling Harbour. Mirvac has divided the stages of works into three related, but separate, SSDAs to ensure the efficient staged delivery of this large scale project.

This report forms part of the third SSDA application relating to the construction and use of the public domain and Waterfront Garden, including construction and use of the Bunn Street and North Bridge works associated with the Harbourside redevelopment. It more broadly forms part of the Harbourside redevelopment that will deliver a world class mixed use retail, commercial and lifestyle precinct and contribute to the ongoing renewal and revitalisation of Darling Harbour.

This document addresses noise impacts associated with the following:

- Noise intrusion to project site from public domain usage.
- Construction noise and vibration impacts.

AL have utilised the following documents and regulations in the noise assessment of SSDA 3:

- SSD 7375 – "*Secretary's Environmental Assessment Requirements (SEARs)*"
- SSD 7874 – "*Instrument of Consent.*"
- City of Sydney Council – "*Construction Hours/Noise within the Central Business District.*"
- AS2436:2010 - "*Guide to Noise Control on Construction, Maintenance and Demolition Sites.*"
- DIN 4150-3 (2016) – "*Vibration in Buildings – Part 3.*"
- BS 7385 Part 2-1993 – "*Evaluation and Measurement for Vibration in Buildings. Part 2. Guide to damage levels from groundborne vibration.*"
- NSW EPA document – "*Assessing Vibration: A technical Guideline.*"
- Sydney Water – "*Sydney Water Specialist Engineering Assessment*."
- Transport for NSW – "*Development near Rail Tunnels (T HR CI 12051 ST).*"

An assessment of noise impacts associated with the development has determined that the proposal can achieve the requirements of the aforementioned authorities and regulations for all time periods of the day, evening and night.

2 BACKGROUND

Mirvac is planning the redevelopment of the Harbourside Shopping Centre at Darling Harbour, transforming the previous tired and outdated asset and delivering a world-class mixed-use precinct.

The Harbourside redevelopment project is a timely urban intervention that has the potential to connect a series of developments that are revitalising the Western Harbour Corridor of Sydney, spanning from the Central Station Renewal and Tech Precinct, through Central Park, UTS, the Goods Line, Darling Square and the Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP), and Star Casino and along Darling Harbour.

Sitting at the junction of Pyrmont Bridge and Darling Harbour, the site will act as a key mixed use precinct, connector and destination. This role will only grow in importance as further renewal of the Pyrmont Peninsula occurs with the delivery of Sydney Metro West and the implementation of the Pyrmont Peninsula Place Strategy. The Harbourside site is identified as a catalyst and key site under the Pyrmont Peninsula Place Strategy.

2.1 STAGE 1 CONCEPT PROPOSAL (SSD 7874)

The first step in the planning process for the redevelopment of the site was completed in June 2021, with approval from the Independent Planning Commission (IPC) of the Stage 1 Concept Proposal (SSD 7874).

In accordance with clause 4.22 of the EP&A Act, SSD 7874 establishes the relevant planning parameters, including building envelopes, maximum Gross Floor Area (GFA) limits, Design Guidelines and a Design Excellence Strategy, and car parking rates to guide the future detailed design, construction, and operation of Harbourside under subsequent SSD applications. SSD 7874 also grants consent to the demolition of the existing shopping centre and associated structures down to ground slab level, also known as the *'Stage 1 demolition works'*.

2.2 DESIGN COMPETITION

A competitive Architectural Design Competition was held for the redevelopment of Harbourside in accordance with conditions A21, A22, and the endorsed Design Excellence Strategy of the SSD 7874 consent. Six local and international architectural practices were invited to participate, with the Hassell + Snøhetta scheme being confirmed as the winning entry in December 2021.

The winning scheme has undergone further design refinement in accordance with the endorsed Architectural Design Competition Report dated 9 December 2021. A Design Integrity Panel (DIP) has been established to ensure the achievement of design excellence.

2.3 PROJECT STAGING

To enable the efficient delivery of the project, Mirvac has divided the detailed design and construction works across separate SSDAs, comprising:

- SSDA 1: Bulk excavation works and construction of retaining structures approved 2 March 2023.
- SSDA 2: Detailed design, construction, and operation of the new podium and tower building – lodged 12 December 2022.
- SSDA 3: Construction, fitout and use of the public domain– the subject of this report.

This report forms part of the third application for the construction, fitout and use of the public domain areas surrounding the redeveloped Harbourside (SSDA 3).

3 SITE DESCRIPTION

The Harbourside redevelopment site is located within the Darling Harbour Precinct inside the City of Sydney Local Government Area (LGA). The Darling Harbour Precinct remains Sydney's premier tourist and entertainment destination and accommodates varied recreation, tourism, entertainment, retail, residential apartments, and business land uses.

Specifically, the Harbourside redevelopment site occupies an area of approximately 2.05 hectares within the north western portion of Darling Harbour, in between Cockle Bay and the Pyrmont Peninsula. It is irregularly shaped and existing site improvements include the 2-3 storey Harbourside Shopping Centre – noting approval has already been granted for Stage 1 demolition works.

The boundaries of the overall Harbourside redevelopment site are shown in Figure 1 below.

Figure 1: Harbourside Shopping Centre redevelopment site

4 OVERVIEW OF THE PROPOSED DEVELOPMENT

This report forms part of the detailed design SSDA for Harbourside (SSDA 49653211), and seeks consent for the following development:

- Fitout and use of the public domain surrounding the redeveloped Harbourside building, including:
    - Widening and upgrades to the Waterfront Promenade;
    - Embellishments to the building's interface with Darling Drive;
    - Opportunities for heritage interpretation, wayfinding and public art;
- Fitout and use of public domain elements of the building, including the Bunn Street Steps through-site link, Waterfront Steps, Pyrmont Bridge Steps, Waterfront Garden
- Embellishment of the North and South Walks; and
- Construction and operation of the new Bunn Street pedestrian bridge, and embellishments to the existing northern pedestrian bridge; and
- Associated ancillary works.

The subject SSDA will *not* involve excavation works (approved under SSDA 1).

The delineation between the scope of works of this SSDA, and that of SSDA 2, is shown in figures 2 – 3 below.

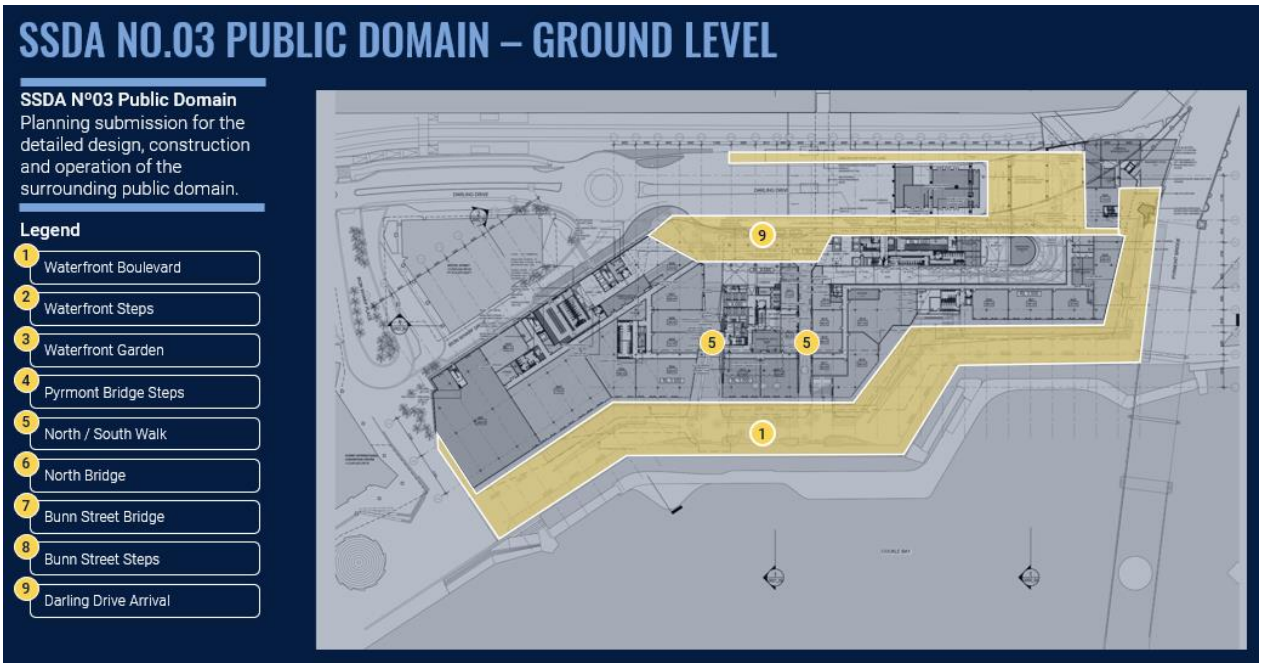


Figure 2: Scope of works of SSDA 3 (yellow) – Ground level

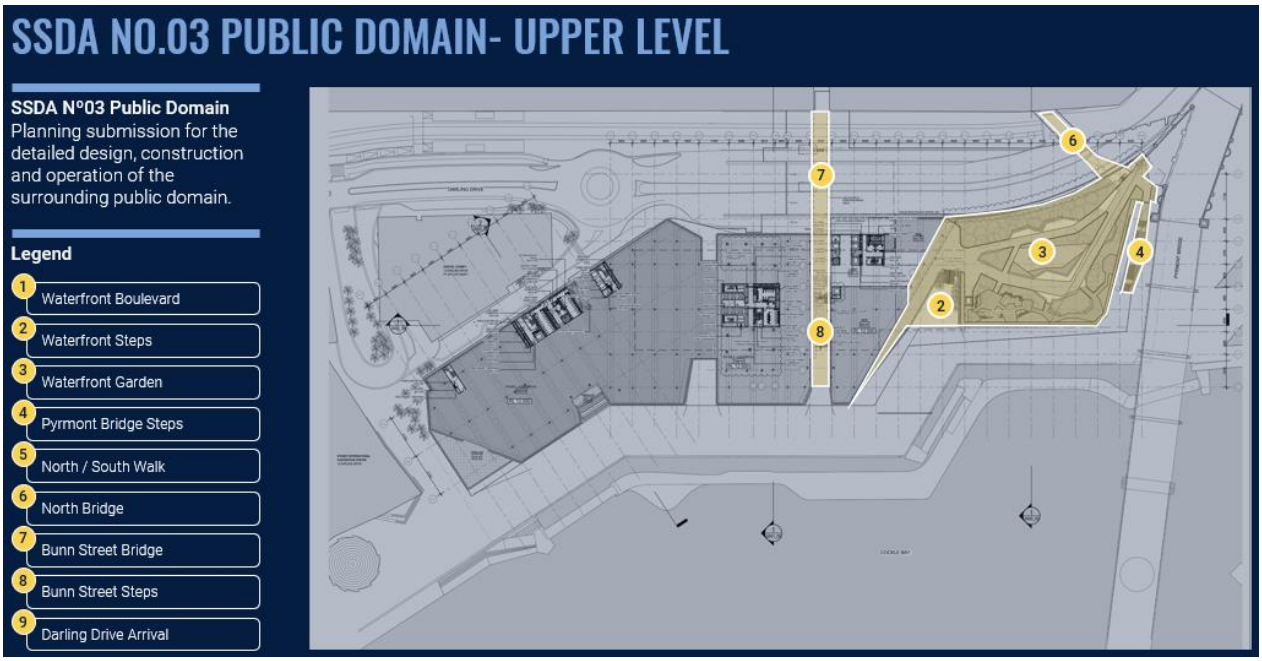


Figure 3: Scope of works of SSDA 3 (yellow) – Level 2

For more information, refer to the Environmental Impact Statement (EIS) prepared by Ethos Urban to which this report is attached.

4.1 CONSISTENCY WITH SSD 7874

The Harbourside Concept Approval (SSD 7874) sets out the relevant planning parameters to guide the detailed design and construction of the redeveloped Harbourside site. The proposed development is required to be consistent with SSD 7874 pursuant to section 4.24 of the EP&A Act, which states that "*while any consent granted on the determination of a concept development application for a site remains in force, the determination of any further development application in respect of the site cannot be inconsistent with the consent for the concept proposals for the development of the site*".

Part 3 of the SSD 7874 conditions of consent sets out conditions which must be met in all future detailed design applications at the site (the Future Environmental Assessment Requirements – FEARs). The proposal is consistent with all relevant SSD 7874 FEARs, with the relevant FEARs addressed in the table below.

Table 4-1 – SSD 7874 FEARs

FEARs	Response / Location in Report
C18. Future Development Application(s) must demonstrate that apartments within the proposal are adequately separated from lower floor active uses and events within the public domain to minimise the likelihood of noise disturbance.	C18 has been addressed through the incorporation within the design of four individual levels of commercial space between the Ground Floor Retail area and the residential tower, separating the residential tower from noise events within the public domain.
C19. Future Development Application(s) must be accompanied by a Noise and Vibration Impact Assessment (NVIA) that identifies and provides a quantitative assessment of the main noise generating sources and activities during operation. The NVIA must include: a) an alternative noise criterion for future apartments within the development utilising internal noise measurements with windows closed and designed to maximise the usage of the retail tenancies and events in the public domain without resulting in excessive impact on new and existing residents. b) details of any mitigation measures to ensure the amenity of sensitive land uses, and the function and 24-hour operation of noise generating uses are protected during the operation of the development. c) noise management and mitigation strategies for commercial uses which restricts hours of operation as a last resort	See Section 8
C20. Future Development Application(s) must demonstrate that the proposed apartments include sufficient acoustic attenuation to enable compliance with the alternative noise criteria.	
C53. All future development application(s) must provide an analysis and assessment of the impacts of Construction and include: … b) Construction Noise and Vibration Impact Assessment that identifies and provides a qualitative assessment of the main noise generating sources and activities during construction. Details are to be provided outlining any mitigation measures ensure the amenity of the adjoining sensitive land uses, including but not limited to the National Maritime Museum, is protected throughout the construction period(s)	See Section 9 to Section 15

4.2 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

In accordance with section 4.39 of the *Environmental Planning & Assessment Act 1979* (EP&A Act), Secretary's Environmental Assessment Requirements (SEARs) for SSD 49653211 have been issued. This report has been prepared to respond to the issued SEARs, as set out in the table below.

Table 4-2 – SSD-49653211 SEARs

SEARs	Response / Location in Report
14. Noise and Vibration Provide a noise and vibration assessment prepared in accordance with the relevant NSW Environment Protection Authority (EPA) guidelines. The assessment must detail construction and operational noise and vibration impacts on nearby sensitive receivers and structures and outline the proposed management and mitigation measures that would be implemented.	See Sections 8 to Section 15

5 NEAREST SENSITIVE RECEIVERS

The site is located at 2-10 Darling Drive, Darling Harbour. The site is bound to the north by Pyrmont Bridge, to the south by the Sofitel Sydney and the International Convention Centre (ICC), to the east by Darling Harbour and associated boardwalk/wharf and to the west by Darling Drive.

Figure 4 presents an aerial site map with Figure 5 illustrating an eastern elevation of the proposed Harbourside development.

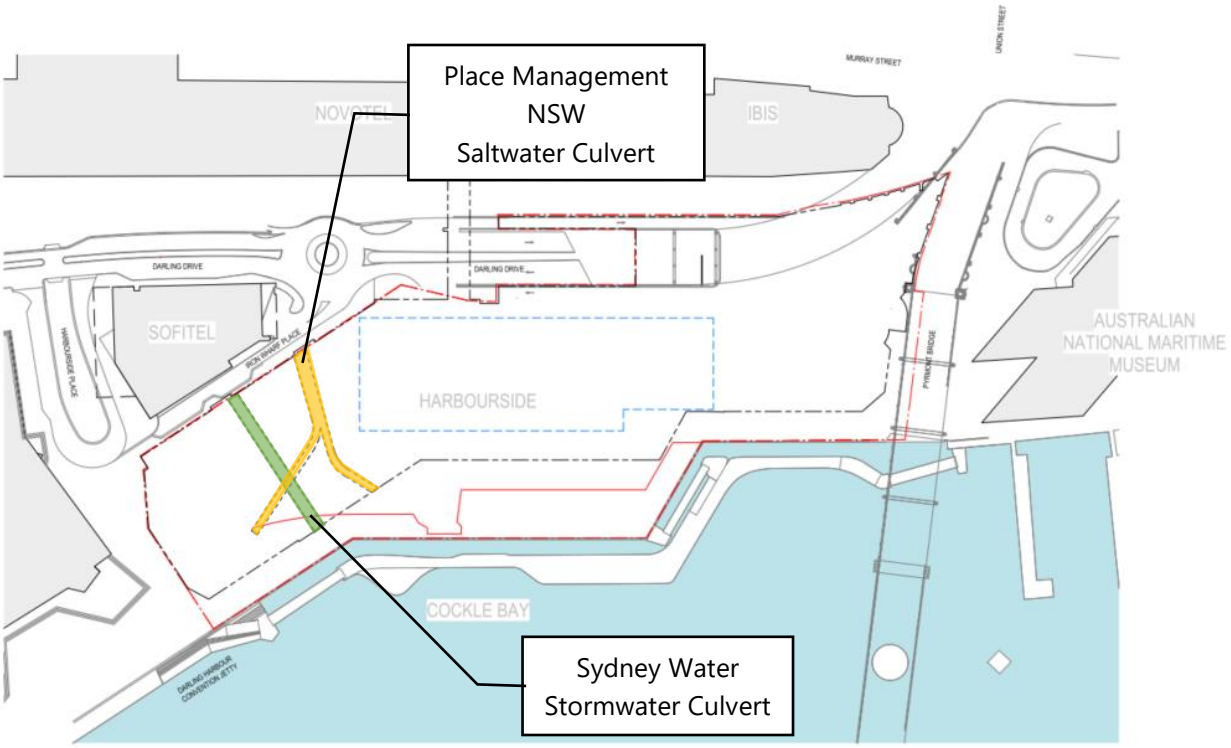


Figure 4: Aerial site map of the Harbourside project site

Figure 5: Eastern elevation of the proposed *'Harbourside'* project site

The nearest potentially affected noise and vibration sensitive receivers immediate to the Harbourside redevelopment project site are:

- **Receiver 1:** The Sofitel Sydney Darling Harbour located at 12 Darling Drive, Darling Harbour. The commercial receiver is located to the south of the project site.
- **Receiver 2:** The International Convention Centre (ICC) located at 14 Darling Drive, Darling Harbour. The commercial receiver is located to the south of the project site.
- **Receiver 3:** The Pyrmont Bridge heritage asset located to the north of the project site.
- **Receiver 4(a):** The Sydney Water stormwater culvert (Upstream) located directly beneath the project site at 2-10 Darling Drive, Darling Harbour.
- **Receiver 4(b):** The Sydney Water stormwater culvert (Downstream) located directly beneath the project site at 2-10 Darling Drive, Darling Harbour.
- **Receiver 4(c):** The Sydney Water stormwater culvert (centre) located directly beneath the project site at 2-10 Darling Drive, Darling Harbour
- **Receiver 5:** The Australian National Maritime Museum located at 2 Murray Street, Darling Harbour. The museum is located to the north of the project site.
- **Receiver 6:** The Novotel Sydney on Darling Harbour located at 100 Murray Street, Pyrmont. The commercial receiver is located to the west of the project site.
- **Receiver 7:** The Ibis Sydney Darling Harbour located at 70 Murray Street, Pyrmont. The commercial receiver is located to the west of the project site.
- **Receiver 8:** The One Darling Harbour located at 50 Murray Street, Sydney. The residential receiver is located to the west of the project site.
- **Receiver 9:** The Darling Harbour boardwalk and associated wharf/pier located to the east of the project site.
- **Receiver 10:** Sydney light rail network and associated light rail station 'Convention' located to the west of the project site.
- **Receiver 11:** Heritage item Water Cooling System and Manifold (saltwater intake and discharge culvert), Place Management NSW asset.
- **Receiver 12:** "W Sydney," a hotel development located at 31 Wheat Road, Sydney, to the south-east of the project site.
- **Receiver 13:** A collection of residential receivers maintained to the west of the project site, across Murray Street.
- **Receiver 14:** "Cockle Bay Park," a proposed commercial development, including a 42-storey commercial and retail tower, maintained east of the project site, across Darling Harbour.
- **Receiver 15:** "Darling Park," three multi-storey commercial buildings to the east of the project site, across Darling Harbour.
- **Receiver 16:** Sydney Water supply mains and sewer pipes located adjacent to the site on the west.

An aerial photo is presented in figure 6 detailing the sensitive receiver locations.

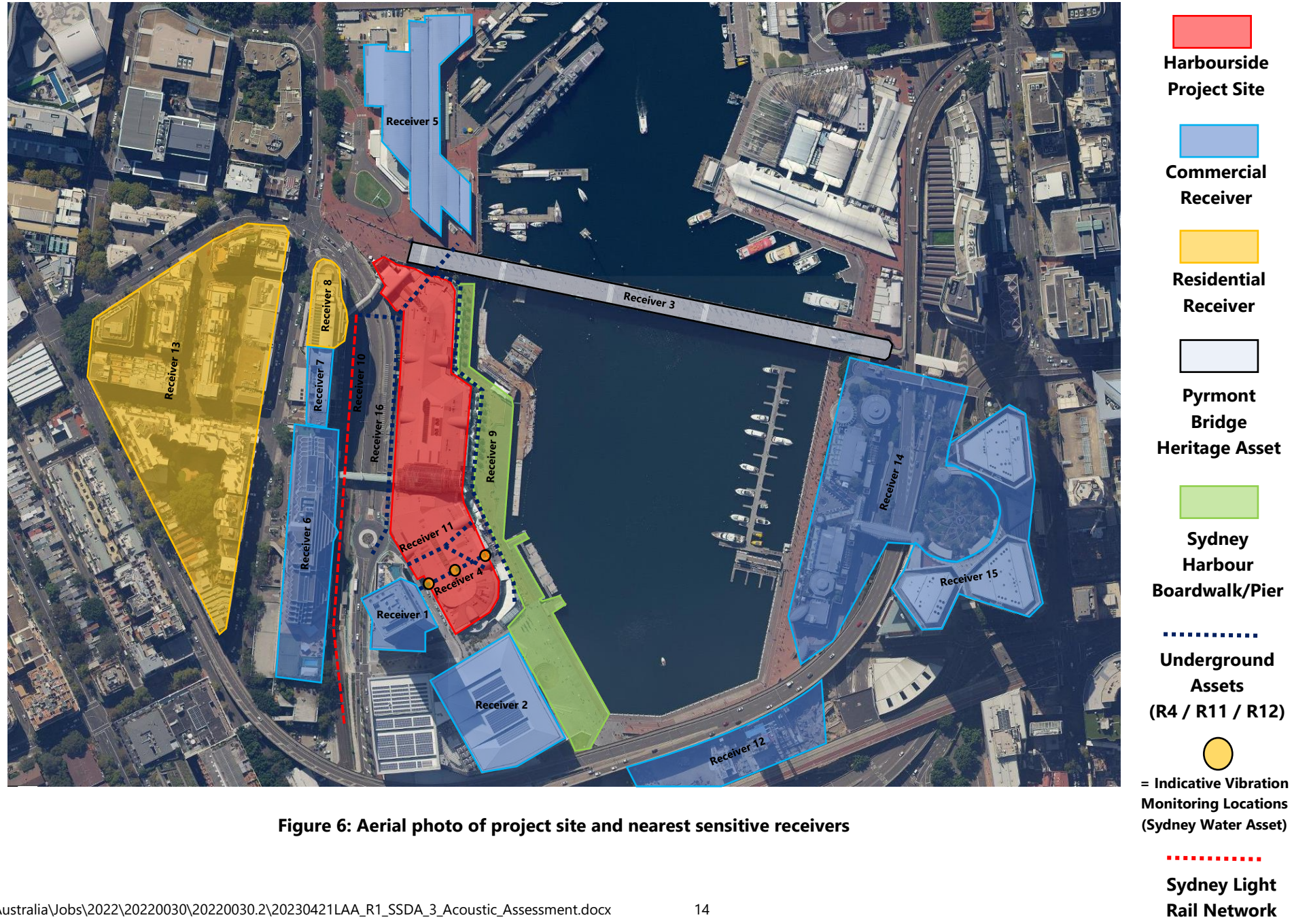


Figure 6: Aerial photo of project site and nearest sensitive receivers

6 SSDA 3 CONSTRUCTION ACTIVITIES

The information provided to this office of the primary noise producing activities associated during the SSDA 3 works phase of the project site are as follows below:

- Elevated Work Platforms and Hoists.
- Mini Cranes and mobile diesel cranes.
- Articulated truck movements for material handling and deliveries.
- Bobcats for material handling and landscaping.
- General hand tools.
- Angle grinders.
- Jackhammers.

Proposed hours of work for the SSDA 3 construction phase are from 7am to 7pm, Monday to Friday, and 7am-6pm on Saturdays, with no work to be conducted on Sundays and public holidays.

Trucks are proposed to enter the construction site by travelling north along Darling Drive, entering via Gate 1 where the vehicles will perform a U-turn manoeuvre under the Darling Drive ramp utilising the existing road and exit the site via Gate 2 or Gate 3 to the south. Vehicle movements are proposed to comprise of a collection of the following vehicle types; Concrete trucks, 19m Articulated, 12.5m Heavy Rigid, 8.8m Medium rigid and Utes / vans. There is to be an approximate maximum vehicle movements per day of 50 during the public domain stage.

Refer to figure 7 for the proposed vehicle travel path and figure 8 for the proposed crane location plan.

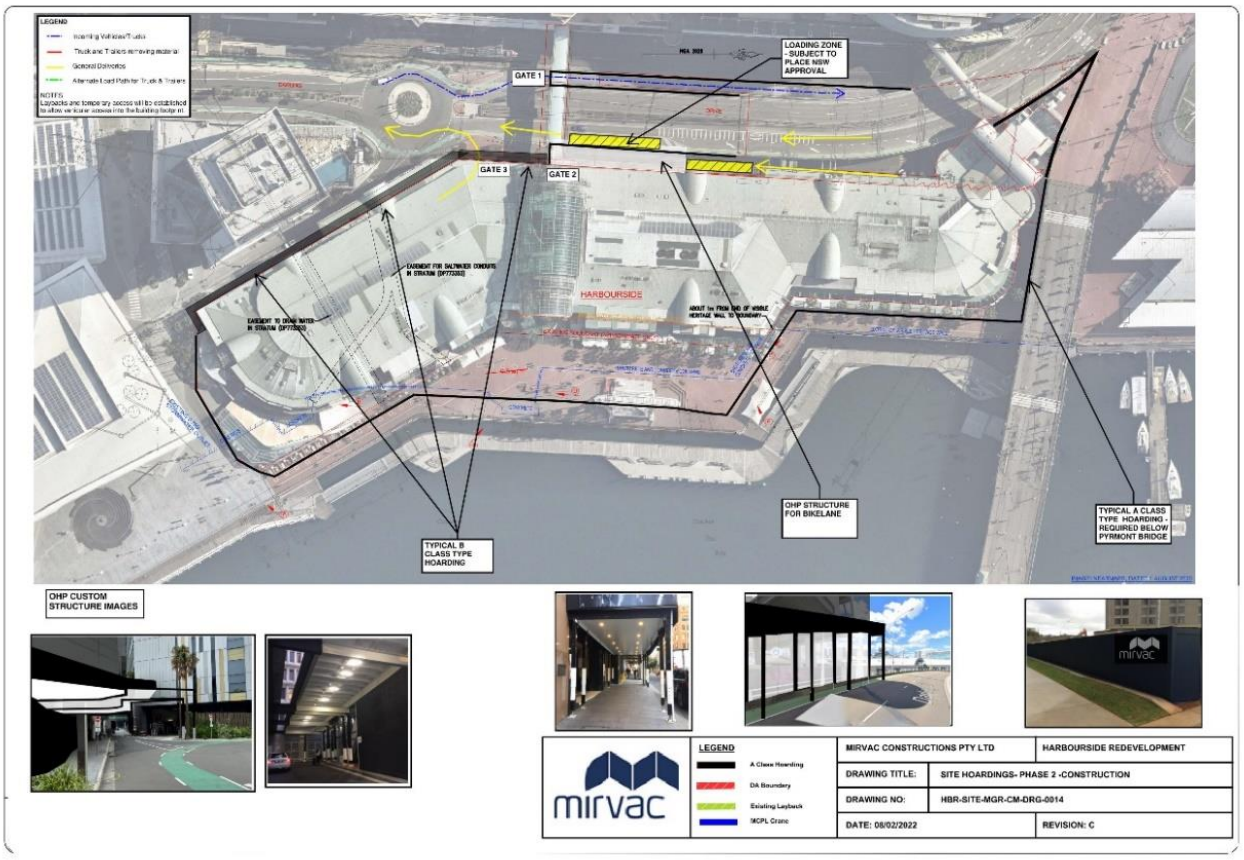


Figure 7: Proposed Vehicle Travel

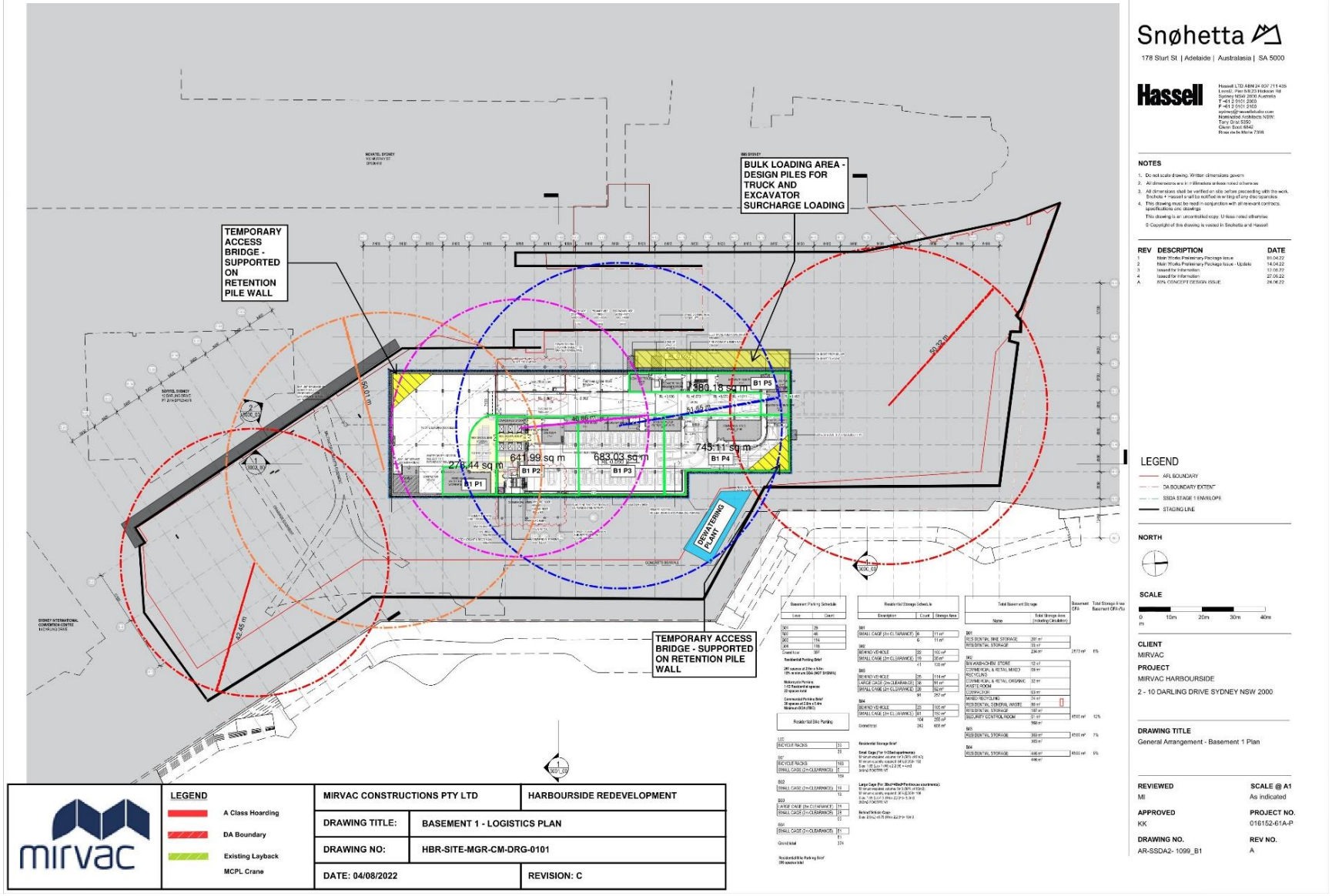


Figure 8: Proposed Tower Crane Layout

7 AMBIENT BACKGROUND NOISE SURVEY

The following section details the ambient noise survey undertaken by this office for the purposes of this development application. Note that ambient noise monitoring has only been conducted to investigate background noise levels at noise-sensitive receivers, i.e. excluding R4 R9 R10, R11 and R16, which are considered to be vibration sensitive receivers only.

7.1 AMBIENT BACKGROUND NOISE MEASUREMENTS

NSW EPA's Rating Background Noise Level (RBL) assessment procedure requires determination of background noise level for each day (the ABL) then the median of the individual days as set out for the entire monitoring period.

Appendices in this report present results of unattended noise monitoring conducted at the project site. Weather affected data was excluded from the assessment. The processed RBL (lowest 10th percentile noise levels during operation time period) are presented in Table 7-1.

Attended short term measurements of traffic noise were undertaken to supplement the unattended noise monitoring.

7.1.1 Measurement Position and Period

Multiple noise monitors have been set up for this site to investigate the existing acoustic profile of the locality.

The following locations were monitored to investigate existing ambient levels as part of this assessment:

- U204, 50 Murray Street, Pyrmont – 15th July to 05th August 2022.
- U1302, 50 Murray Street, Pyrmont – 28th July to 05th August 2022.
- Western façade of the Novotel, Level 3, 100 Murray Street, Pyrmont - 03rd June to 17th June 2022.
- Cockle Bay – North-Eastern Corner Level 2 - 27th July to 3rd August 2021.
- Cockle Bay – South-Eastern Corner Level 2 - 27th July to 3rd August 2021.

With regards to the monitoring conducted within 50 Murray Street Pyrmont, the following is noted:

- Two individual units, namely U204 and U1302 were selected to conduct background noise monitoring as part of this application.
- Noting that 50 Murray Street is a 15-storey residential building, the two individual units were selected for the purposes of background noise monitoring for the following reasons:
    - Having a monitor collate data close to the ground level and another monitor collate data close to the roof level allowed for a comparison and differentiation in criteria for individual levels within the development.
    - This is important due to the existing acoustic environment, noting that the background noise levels recorded at Level 13 of the development were considerably higher due to the environmental noise contributions of surrounding mechanical plant and having a wider field of view of the generalised hum associated with an urban environment, from which lower levels of development are shielded from.
    - By assessing background noise levels at varying levels of the development, one can deduce the required variance in acoustic design specific to the locality of the receiver, allowing for more detailed acoustic design and amenity control.

The following locations were monitored to investigate existing environmental noise levels as part of this assessment:

- Novotel roof (eastern side), 100 Murray Street, Pyrmont - 03rd June to 17th June 2022.
- Level 1 of Existing Harbourside Shopping Centre, 2-10 Darling Drive, Sydney - 03rd June to 17th June 2022.
- Existing Harbourside Roof, 2-10 Darling Drive, Sydney – 03rd June to 15th June 2022.
- Pedestrian walkway, 50 Murray Street, Pyrmont – 28th June to 12th July 2022.

Note that the monitoring conducted on the Novotel Roof and at the Existing Harbourside Shopping Centre was conducted at a time which correlated with Vivid 2022, with Vivid operating between 27th of May and 18th of June 2022. Hence, the monitoring data provided within this section, in essence, captures the impact of atypical public domain events, such as Vivid, at the monitoring locations and the general locality.

Attended noise measurements were taken around the project site on Friday 17th June 2022. Refer to figure 9 for detailed locations of monitor placements and attended noise measurement locations.

Noise levels for the receivers across Darling Harbour along the Western Distributor and Wheat Road have been adopted from noise monitoring conducted in 2018 during development application for the W Building (R11), as well as in 2021 during development application for Cockle Bay Park (R13). Refer to figure 9 for detailed locations of monitor placements and attended noise measurement locations.

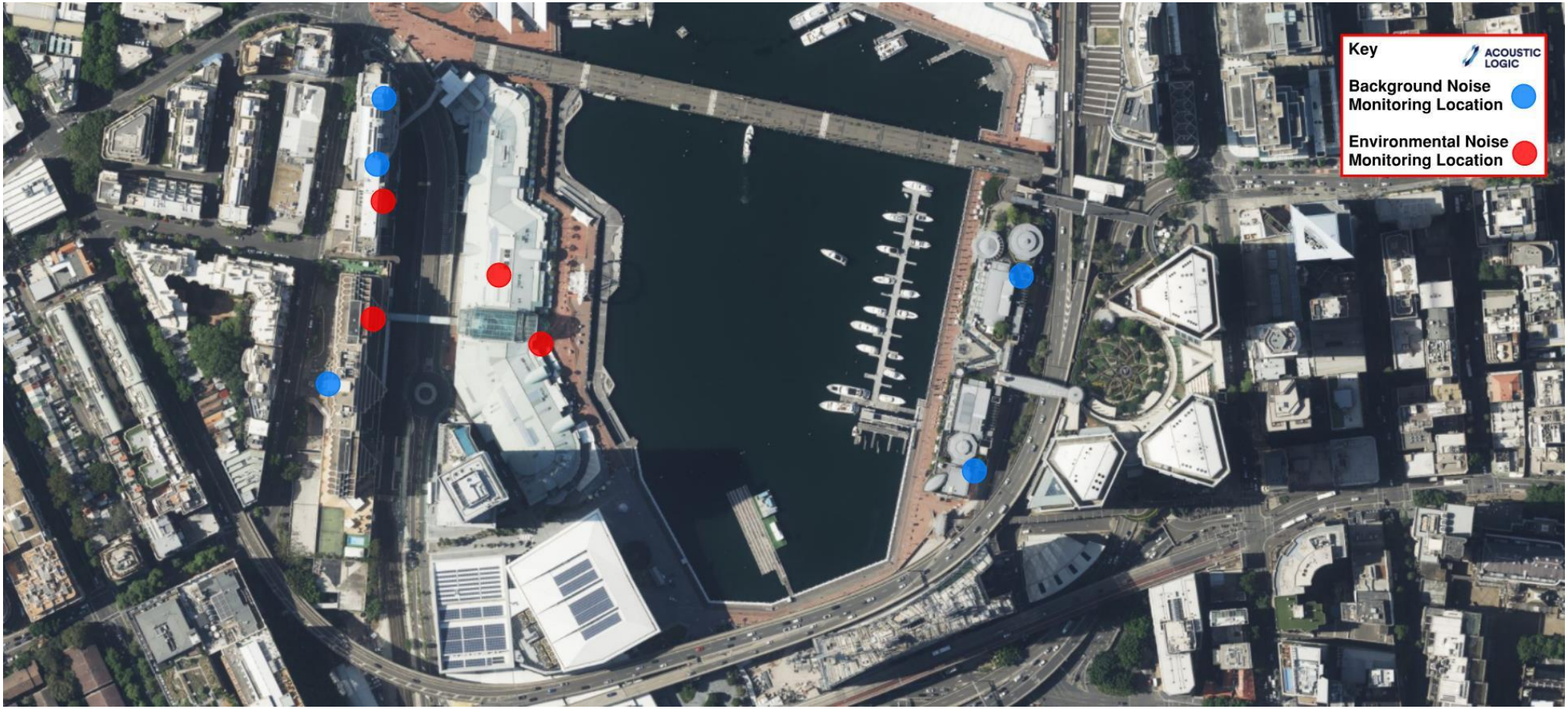


Figure 9: Aerial Site Map with Ambient Noise Monitoring Locations

7.1.2 Measurement Equipment

Equipment used consisted of an Acoustic Research Laboratories Pty Ltd noise logger. The logger was set to A-weighted fast response and was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted. Detailed noise monitoring data is detailed in the SSDA 2 Acoustic Assessment prepared by this office (Ref: 20220030.1/2610A/R2/LA).

Attended noise measurements were conducted using a Norsonic 140 Sound Analyser. The analyser was set to fast response and calibrated before and after the measurements using a Norsonic Sound Calibrator type 1251. No significant drift was noted.

7.2 SUMMARISED RATING BACKGROUND NOISE LEVELS

Summarised rating background noise levels for the project site and immediate surroundings are presented below.

Table 7-1 – Measured Rating Background Noise Levels

Monitor Location	Rating Background Noise Level $dB(A)_{L90(Period)}$		
	Day (7am – 6pm)	**Evening (6pm – 10pm)**	**Night (10pm – 7am)**
U204, 50 Murray Street, Pyrmont	53	54 (53)**	48
U1302, 50 Murray Street, Pyrmont	59	59	52
Western façade of the Novotel, Level 2, 100 Murray Street, Pyrmont	57	57	52
Novotel roof (eastern side), 100 Murray Street, Pyrmont	60	61 (60)**	55
Existing Harbourside Roof, 2-10 Darling Drive, Sydney	61	62 (61)**	51
Cockle Bay – North-Eastern Corner Level 2 (2021)*	68	60	52
Cockle Bay – South-Eastern Corner Level 2 (2021)*	63	57	48

**Monitoring conducted for previous development (Cockle Bay Park).*
***In line with the requirements of EPA document, "Noise Policy for Industry 2017," evening monitoring data has been corrected to be equal to the noise levels observed during the day at the monitoring location.*

On review of the monitoring data, the measured L_{90} noise levels during high wind speed days do not increase background noise levels significantly as periods with little to no wind. This demonstrates that even though wind speeds measured at Observatory Hill (the closest weather station) exceed EPA guidelines, either:

- The wind speed on site at this time was significantly lower than at Observatory Hill (which is likely given Observatory Hill is located in a very exposed area) and/or
- The wind on site was not sufficiently consistent to increase background noise levels compared to calm periods.

Therefore, only periods of adverse weather that were determined to have affected the noise data have been eliminated when determining the rating background noise level at the site, which is presented above.

7.3 SUMMARISED ENVIRONMENTAL NOISE LEVELS

The following noise levels for the site have been established based on short term attended measurements and long-term noise monitoring.

Table 7-2 – Measured Environmental Noise Levels

Monitor Location	Noise Level dB(A)$L_{eq(Period)}$	
	Day $L_{eq(15hr)}$ (7am – 10pm)	Night $L_{eq(9hr)}$ (10pm – 7am)
U204, 50 Murray Street, Pyrmont	58	54
U1302, 50 Murray Street, Pyrmont	62	58
Western façade of the Novotel, Level 2, 100 Murray Street, Pyrmont	62	59
Novotel roof (eastern side), 100 Murray Street, Pyrmont	63	60
Existing Harbourside Roof, 2-10 Darling Drive, Sydney	63	60
Existing Harbourside Level 01, 2-10 Darling Drive, Sydney	72	69
Pedestrian walkway, 50 Murray Street, Pyrmont	66	60
Cockle Bay – North-Eastern Corner Level 2 (2021)**	70	66
Cockle Bay – South-Eastern Corner Level 2 (2021)	69	64

The measured traffic noise levels above are based on measurements conducted at 1.5m above local ground level corrected to a façade noise level (presented noise level are without façade reflections, i.e., the noise level incident on the facade) All measurements were conducted at least 3m away from any façades.

8 NOISE EMISSIONS FROM PUBLIC DOMAIN

The noise emissions from use of the public domain have been assessed with reference to the requirements of the following documents:

- SSD 49295711 – "*Secretary's Environmental Assessment Requirements (SEARs)*"
- SSD 7874 – "*Instrument of Consent.*"

8.1 SEARS (REF: SSD 49295711)

"12. Noise and Vibration

Provide a noise and vibration assessment prepared in accordance with the relevant NSW Environment Protection Authority (EPA) guidelines. The assessment must detail construction and operational noise and vibration impacts on nearby sensitive receivers and structures and outline the proposed management and mitigation measures that would be implemented."

8.2 ENTERTAINMENT PRECINCT - INSTRUMENT OF CONSENT - FEARS (REF: SSD-7874)

"C18.

Future Development Application(s) must demonstrate that apartments within the proposal are adequately separated from lower floor active uses and events within the public domain to minimise the likelihood of noise disturbance.

C19.

Future Development Application(s) must be accompanied by a Noise and Vibration Impact Assessment (NVIA) that identifies and provides a quantitative assessment of the main noise generating sources and activities during operation. The NVIA must include:

a) an alternative noise criterion for future apartments within the development utilising internal noise measurements with windows closed and designed to maximise the usage of the retail tenancies and events in the public domain without resulting in excessive impact on new and existing residents.

b) details of any mitigation measures to ensure the amenity of sensitive land uses, and the function and 24-hour operation of noise generating uses are protected during the operation of the development.

c) noise management and mitigation strategies for commercial uses which restricts hours of operation as a last resort

C20.

Future Development Application(s) must demonstrate that the proposed apartments include sufficient acoustic attenuation to enable compliance with the alternative noise criteria."

8.3 NOISE EMISSION DISCUSSION

The public domain proposal of SSDA 3 as to which this document pertains relates to the following items:

- Waterfront Garden
- Alterations to the Waterfront Promenade.
- Inclusion of the Waterfront Steps.
- The construction of the Bunn Street Bridge and new through-site pedestrian link.

With regards to the acoustic impacts of the items maintained within the SSDA 3 proposal, we note the following:

- Use of public domain space is not governed by any statutory or local acoustic controls exclusive of that maintained within the Entertainment Precinct FEARs for the development, as provided above.
- With regards to the requirements of FEAR C19, the following is noted:
    - Acoustic Logic proposed alternative internal noise criteria for the use of retail and public domain within the SSDA 2 Acoustic Assessment (Ref: 20220030.1/3100A/R3/LA). The proposed internal noise criteria are as follows:
        - **Daytime and Evening (7am-10pm):**
            - 38dB(A) $L_{eq(15\ min)}$ in bedrooms (internally, with windows closed); and
            - 43dB(A) $L_{eq(15\ min)}$ in living rooms (internally, with windows closed).
        - **Late Evening (10pm-12am):**
            - 35dB(A) $L_{eq(15\ min)}$ in bedrooms (internally, with windows closed); and
            - 40dB(A) $L_{eq(15\ min)}$ in living rooms (internally, with windows closed).
        - **Overnight (12am-7am):**
            - 25dB(A) $L_{eq(15\ min)}$ in habitable spaces (internally, with windows closed).
    - The promenade of the existing Harbourside Shopping Centre is characterised by outdoor seating areas for various food and beverage tenancies. The impacts of the proposed changes to the promenade are generally consistent with that of the existing use of the space from an acoustic viewpoint.
    - Through a preliminary assessment conducted within the SSDA 2 Acoustic Assessment, it was concluded that upgraded glazing with perimeter acoustic seals for façade treatments would suffice for satisfying the alternative noise criteria presented above for the noise impacts associated with the Harbourside redevelopment ground floor retail tenancies and the outdoor seating areas within the promenade area, in conjunction with the surrounding entertainment precinct (W Sydney and Cockle Bay Park redevelopment). It was noted within this assessment that façade upgrades were to be determined during Detailed Design.
    - General use of Public Domain space is not expected to generate comparative noise levels to the operational uses assessed within the SSDA 2 Acoustic Assessment i.e. Patron activity within the entertainment precinct, vehicle movements along Darling Drive and use of the underground carpark and loading dock.

- All other items maintained within the proposed scope of the SSDA 3 application, such as the alterations to the waterfront area, the development of the new Bunn Street Bridge and the development of through-site links, are both generally consistent with existing site conditions, and also provide space which is not expected to generate significant external noise impacts, (Passive recreation and circulation areas) and hence will not provide any significant change to the ambient noise profile of the existing locality.

- With regards to surrounding noise sensitive receivers, the proposal is consistent with existing site conditions for surrounding noise sensitive receivers, noting that the boardwalk surrounding the existing Harbourside Shopping Centre currently provides passive recreation public domain space which is occasionally used for events such as Vivid and New Year's Celebrations. As such, the anticipated use and operation of the proposed passive recreation areas of the development does not significantly alter from the existing acoustic amenity of the area and should be considered acceptable from an acoustic viewpoint.
- Notwithstanding the above, modelling of general use of the Waterfront Garden area has been included within the following section to assess the impacts of this space on the residential tower, in conjunction with the use of the promenade indoor and outdoor seating space as included within the SSDA 2 Noise and Vibration Impact Assessment.

8.4 SOUNDPLAN MODELLING

Noise levels have been predicted at the receiver locations using SoundPLAN™ 8.0 modelling software implementing the ISO 9613-2:1996 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation" noise propagation standard.

Noise enhancing meteorological effects have been adopted as recommended by the NPfI, noting that the ISO 9613 modelling approach assumes that all receivers are 'downwind' (i.e., that noise enhancing wind conditions are in effect at all times).

Ground absorption was conservatively calculated with a ground factor of 0 for all areas except for localised lawns and greenery with a ground factor of 0.6 as recommended in *Engineering Noise Control* (Bies & Hanson).

In line with Factsheet C of the NPfI, penalties for annoying noise characteristics should be applied at the receiver, where applicable. Based on the predicted noise levels, no penalty should be applied (either for tonality, intermittency, or otherwise).

The following figures present the results of the SoundPLAN Noise modelling, and results are summarised in Table 12.

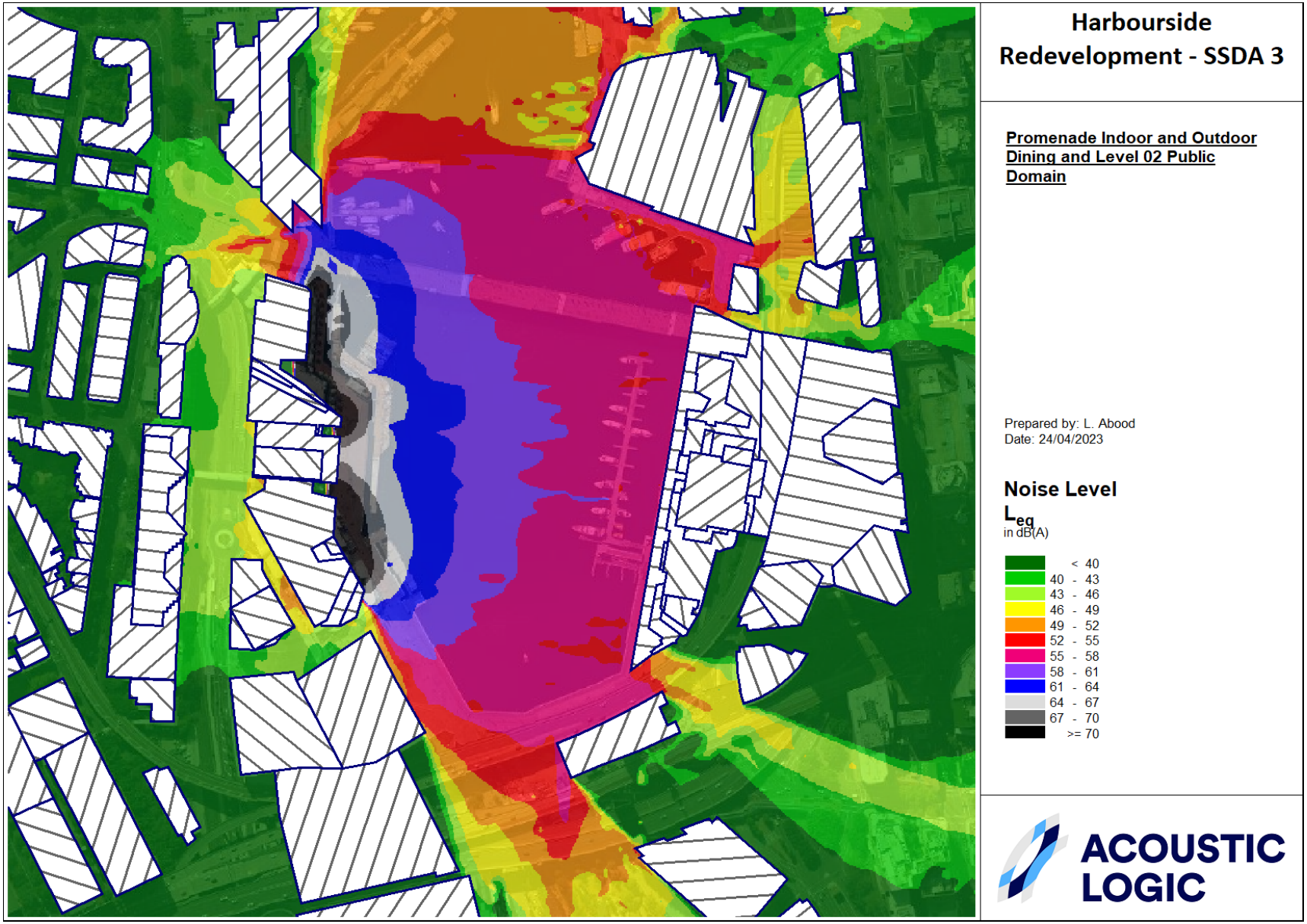


Figure 10: Harbourside Promenade and Public Domain Cumulative Noise

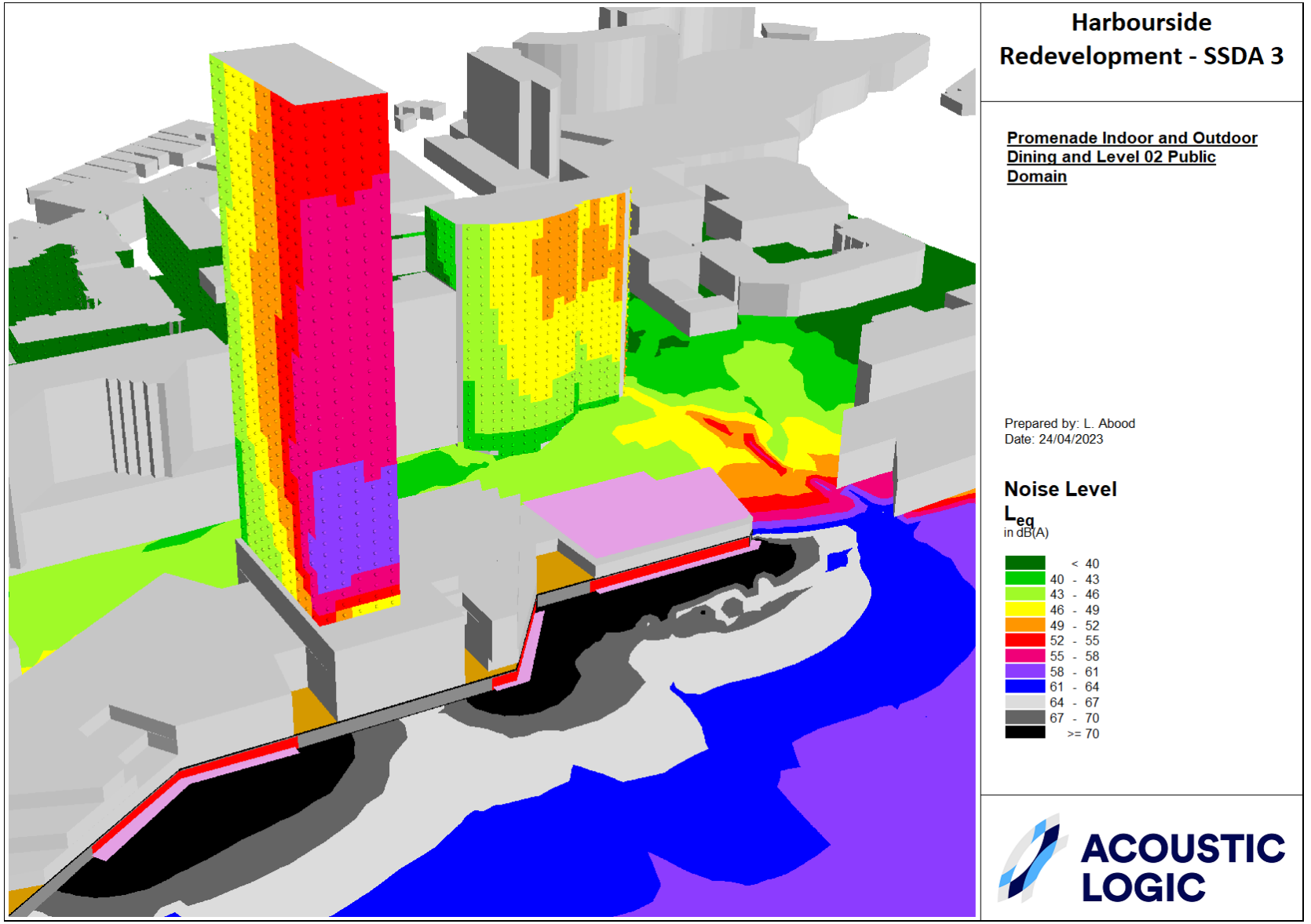


Figure 11: Harbourside Promenade and Public Domain Cumulative Noise – Residential Tower

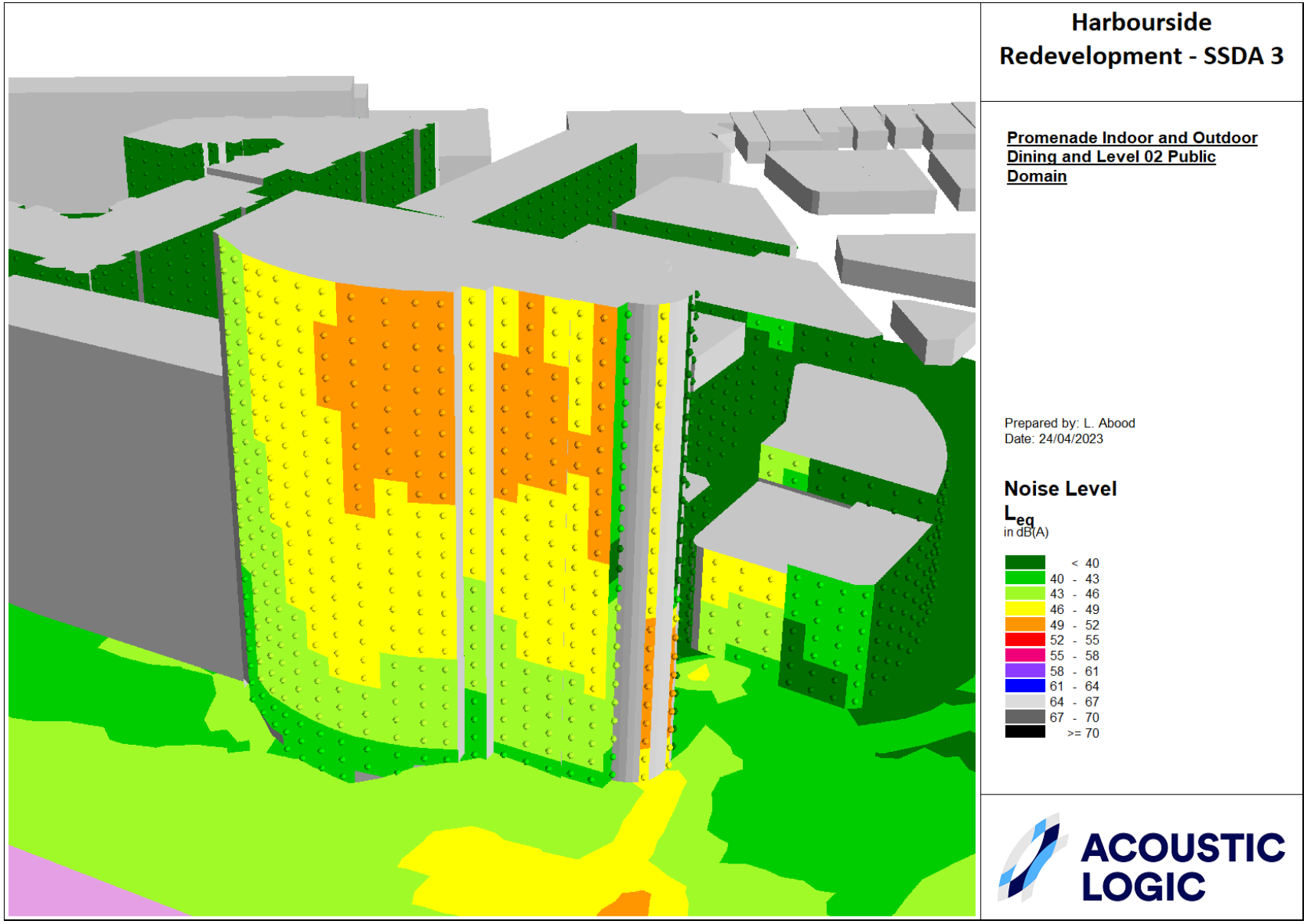


Figure 12: Harbourside Promenade and Public Domain Cumulative Noise – R8 and R12

The following table provides a comparison between the predicted noise levels at surrounding sensitive receivers for use of the promenade space only, and the use of the promenade space and the Level 02 Passive Recreation Public Domain space cumulatively.

Table 8-1 – Predicted Promenade and Public Domain Usage Noise Levels

Receiver	Maximum Predicted External Noise Level dB(A)L_{10}		Existing Background Noise Level at Receiver dB(A) L_{90}	Impact of Level 02 Passive Recreation Space?
	Promenade Indoor & Outdoor Dining only	Promenade Indoor & Outdoor Dining + Level 02 Passive Recreation Space		
R8	52	52	53 (Day and Evening) 48 (Night)	Negligible
R12	46	46		

8.5 SOUNDPLAN MODELLING RESULTS DISCUSSION

With regards to the above noise modelling results, Acoustic Logic note the following:

- The noise impact of the use of the Level 02 Passive Recreation Space on surrounding noise sensitive receivers is negligible when provided in comparison to the use of the promenade indoor and outdoor dining areas, in conjunction with the public domain area.
- The maximum predicted noise level from the uses of these spaces is below the background noise level measured at both locations at the 50 Murray Street (R8) receiver during the daytime and evening, and below the background noise level measured on the balcony of Apartment 1302 of 50 Murray Street during the night.
- Use of the promenade outdoor dining space has been shown to comply with the requirements of the NSW Office of Liquor and Gaming, as presented within the SSDA 2 Noise and Vibration Impact Assessment, prepared by this office, exclusive of the requirement for the noise impacts to be inaudible within habitable space after midnight (Ref: 20220030.1/3110A/R3/LA). The noise impacts of the promenade indoor and outdoor dining spaces are discussed within this document.
- Noise impacts from the use of public domain / passive recreation space are not generally governed by any statutory acoustic requirements, exclusive of that provided within the FEARs for the development.
- With regards to surrounding noise sensitive receivers, and with reference to the NSW EPA guideline, "*Noise Guide for Local Government,*" a predicted external noise level at surrounding sensitive receivers below a noise level of Background + 5dB(A) would be categorically considered to be a low level of impact.
- With regards to the noise impacts on the residential tower from use of the public domain space, similarly to the use of the promenade space, upgraded glazing with full perimeter acoustic seals would be sufficient to achieve the internal noise criteria provided within Section 8.3, and the extent of this upgraded façade is to be assessed during detailed design.
- In summation, the noise impacts associated with the use of Public Domain Space proposed as part of this assessment is consistent with the existing site conditions, and should be considered acoustically acceptable.

9 CONSTRUCTION NOISE CRITERIA

Construction noise criteria will be developed with reference to:

- City of Sydney Council – Code of Practice for Construction Hours/Noise within the Central Business District 1992, and
- Australian Standard AS2436:2010 Guide to Noise Control on Construction, Maintenance and Demolition Sites

The relevant requirements of the above documents are summarised in the following sections.

9.1 CITY OF SYDNEY COUNCIL – CODE OF PRACTICE FOR CONSTRUCTION HOURS/NOISE WITHIN THE CENTRAL BUSINESS DISTRICT 1992

The Council of The City of Sydney code of practice establishes various categories for construction works based on the time of day they are undertaken, as detailed and highlighted below.

Table 9-1 – Categories of Working Hours and Noise Levels

Day	Time Zone	Category	Noise Limit dB(A) $L_{Av, Max(15min)}$
Monday to Friday	00.00 – 07.00	4	Background + 0 dB(A)
	07.00 – 08.00	1	Background + 5dB(A)
	08.00 – 19.00	1	Background + 5dB(A) + 5 dB(A) (to be determined on a site basis)
	19.00 – 23.00	2	Background + 3 dB(A)
	23.00 – 24.00	4	Background + 0dB(A)
Saturday	00.00 – 07.00	4	Background + 0dB(A)
	07.00 – 08.00	1	Background + 5dB(A)
	08.00 – 17.00	1	Background + 5dB(A) + 5 dB(A) (to be determined on a site basis)
	17.00 – 23.00	2	Background + 3 dB(A)
	23.00 – 24.00	4	Background + 0dB(A)
Sundays and Public Holidays	00.00 – 07.00	4	Background + 0dB(A)
	07.00 – 17.00	3	Background + 3 dB(A)
	17.00 – 24.00	4	Background + 0dB(A)

9.1.1 Australian Standard AS2436:2010 "*Guide to Noise Control on Construction, Maintenance and Demolition Sites*"

Australian Standard AS2436 states that where all reasonable and available measures have been taken to reduce construction noise, mitigation strategies may be put in place to reduce levels noise levels to within a reasonable and acceptable level.

For the control and regulation of noise from construction sites, AS2436 nominates the following:

a. That reasonable suitable noise criterion is established,

b. That all practicable measures be taken on the building site to regulate noise emissions, including the siting of noisy static processes to locations of the site where they can be shielded, selecting less noisy processes, and if required regulating construction hours, and

c. The undertaking of noise monitoring where non-compliance occurs to assist in the management and control of noise emission from the construction site.

The guideline reflects on feasible and reasonable mitigation strategies, management controls and public liaising in the effort to reach realistic comprises between construction sites and potential noise affected receivers.

Based on these criteria the following procedure will be used to assess noise emissions:

- Predict noise levels produced by typical construction activities at the sensitive receivers.
- Adopt management conditions as per AS2436 in the event of a non-compliance.

9.2 SUMMARY OF RELEVANT CONSTRUCTION NOISE LEVELS

A summary is presented in table 9-2 to table 9-4 of the adopted construction noise management levels.

Table 9-2 – Summarised Construction Noise Requirements During Proposed Hours

Receiver	Period/Time	Background Noise Level	Construction Noise Levels
Receiver 1	Monday – Friday 7.00am – 8.00am	57 dB(A) L_{90}	62 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	57 dB(A) L_{90}	67 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	56 dB(A) L_{90}	61 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	56 dB(A) L_{90}	66 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	57 dB(A) L_{90}	60 dB(A) $L_{10(15min)}$
Receiver 2	Monday – Friday 7.00am – 8.00am	57 dB(A) L_{90}	62 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	57 dB(A) L_{90}	67 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	56 dB(A) L_{90}	61 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	56 dB(A) L_{90}	66 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	57 dB(A) L_{90}	60 dB(A) $L_{10(15min)}$
Receiver 5	Monday – Friday 7.00am – 8.00am	53 dB(A) L_{90}	58 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	53 dB(A) L_{90}	63 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	53 dB(A) L_{90}	58 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	56 dB(A) L_{90}	63 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	56 dB(A) L_{90}	59 dB(A) $L_{10(15min)}$

Table 9-3 – Summarised Construction Noise Requirements During Proposed Hours

Receiver	Period/Time	Background Noise Level	Construction Noise Levels
Receiver 6	Monday – Friday 7.00am – 8.00am	57 dB(A) L_{90}	62 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	57 dB(A) L_{90}	67 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	56 dB(A) L_{90}	61 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	56 dB(A) L_{90}	66 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	57 dB(A) L_{90}	60 dB(A) $L_{10(15min)}$
Receiver 7	Monday – Friday 7.00am – 8.00am	57 dB(A) L_{90}	62 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	57 dB(A) L_{90}	67 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	56 dB(A) L_{90}	61 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	56 dB(A) L_{90}	66 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	57 dB(A) L_{90}	60 dB(A) $L_{10(15min)}$
Receiver 8	Monday – Friday 7.00am – 8.00am	53 dB(A) L_{90}	58 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	53 dB(A) L_{90}	63 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	53 dB(A) L_{90}	58 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	56 dB(A) L_{90}	63 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	56 dB(A) L_{90}	59 dB(A) $L_{10(15min)}$

Table 9-4 – Summarised Construction Noise Requirements During Proposed Hours

Receiver	Period/Time	Background Noise Level	Construction Noise Levels
Receiver 12	Monday – Friday 7.00am – 8.00am	63 dB(A) L_{90}	68 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	63 dB(A) L_{90}	73 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	60 dB(A) L_{90}	65 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	62 dB(A) L_{90}	72 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	59 dB(A) L_{90}	62 dB(A) $L_{10(15min)}$
Receiver 13	Monday – Friday 7.00am – 8.00am	57 dB(A) L_{90}	62 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	57 dB(A) L_{90}	67 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	56 dB(A) L_{90}	61 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	56 dB(A) L_{90}	66 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	57 dB(A) L_{90}	60 dB(A) $L_{10(15min)}$
Receiver 14	Monday – Friday 7.00am – 8.00am	63 dB(A) L_{90}	68 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	63 dB(A) L_{90}	73 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	60 dB(A) L_{90}	65 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	62 dB(A) L_{90}	72 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	59 dB(A) L_{90}	62 dB(A) $L_{10(15min)}$
Receiver 15	Monday – Friday 7.00am – 8.00am	63 dB(A) L_{90}	68 dB(A) $L_{10(15min)}$
	Monday – Friday 8.00am – 7.00pm	63 dB(A) L_{90}	73 dB(A) $L_{10(15min)}$
	Saturday 7.00am – 8.00am	60 dB(A) L_{90}	65 dB(A) $L_{10(15min)}$
	Saturday 8.00am – 5.00pm	62 dB(A) L_{90}	72 dB(A) $L_{10(15min)}$
	Saturday 5.00pm – 6.00pm	59 dB(A) L_{90}	62 dB(A) $L_{10(15min)}$

9.3 VIBRATION

Vibrations caused by any proposed activities on site, at the façade or incident on the structure of any surrounding sensitive receivers including infrastructure and heritage items, will be assessed against the following provisions:

For buildings

- For structural damage to heritage buildings, German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*.
- For structural damage to buildings (excluding heritage buildings), British Standard BS 7385 Part 2-1993 *Evaluation and Measurement for Vibration in Buildings. Part 2. Guide to damage levels from groundborne vibration*

For Human Response to Vibration

- For human exposure to vibration, the evaluation criteria presented in NSW Environmental Protection Authority (EPA) "Assessing Vibration: A Technical Guideline".

For below Ground Assets (Culverts)

- For structural damage to heritage buildings, German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*.
- Requirements of Sydney Water 'Sydney Water Specialist Engineering Assessment

For the Light Rail Corridor

- British Standard BS 7385 Part 2-1993 *Evaluation and Measurement for Vibration in Buildings. Part 2. Guide to damage levels from groundborne vibration*
- Transport for NSW Standard "Development Near Rail Tunnels" (Ref: T HR CI 12051 ST); and

The criteria and the application of these guidelines are discussed in separate sections below. Note that this SSDA relates to the main works only, all excavation works to be undertaken via SSDA 1 where vibration has been addressed as part of the reports submitted in support of that application.

9.3.1 German Standard DIN 4150-3 (1990)

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 4.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 9-5 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration

	TYPE OF STRUCTURE	PEAK PARTICLE VELOCITY (mms^{-1})			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

= Receiver 8 & 13

= Receivers 3, 4a, 4b, 4c, 9 & 11

= Receivers 1, 2, 5, 6, 7, 12, 14 & 15

9.3.2 British Standard BS 7385 Part 2-1993

British Standard BS 7385 Part 2-1993 *Evaluation and Measurement for Vibration in Buildings. Part 2. Guide to damage levels from groundborne vibration* presents vibration guide values to determine the effect of ground movement on structures. The values in BS7385-2 are directly reproduced in Australian Standard AS2187.2.

The guidelines are presented in the table below:

Table 9-6 - BS 7385-2 - Guideline for Building Vibration

Line	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz – 15 Hz	15 Hz and above
1	Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structure. Residential or light commercial type buildings	15 mm/s at 4 Hz and above increasing to 20mm/s at 15 Hz	20 mm/s at 4 Hz and above increasing to 50mm/s at 40 Hz and above

Notes:
1. Values referred to are at the base of the building
2. For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm ZTP (zero to peak) should not be exceeded.

9.3.3 NSW EPA Assessing Vibration: A Technical Guideline

The NSW Environment Protection Authority's (EPA) publication "Assessing Vibration: A Technical Guideline" (Feb 2006), outlines vibration criteria to assess the effects on human exposure to vibration from industry, transportation and machinery. This will ensure the amenity of tenants within surrounding residential properties is not adversely impacted.

This document classifies vibrations in buildings into continuous (with magnitudes varying or remaining constant with time), impulsive (such as shocks) or intermittent (with the magnitude of each event being either constant or varying with time). Criteria stipulated in this publication is based on the type of vibrations generated by the source.

Criteria relevant to the proposed construction activities on site are detailed below.

Table 9-7 – EPA Recommended Human Comfort Vibration Criteria

		RMS acceleration (m/s^2)		RMS velocity (mm/s)		Peak velocity (mm/s)	
Place	**Time**	**Preferred**	**Maximum**	**Preferred**	**Maximum**	**Preferred**	**Maximum**
Continuous Vibration							
Residences	Daytime	0.01	0.02	0.2	0.4	0.28	0.56
Offices		0.02	0.04	0.4	0.8	0.56	1.1
Workshops		0.04	0.08	0.8	1.6	1.1	2.2
Impulsive Vibration							
Residences	Daytime	0.3	0.6	6.0	12.0	8.6	17.0
Offices		0.64	1.28	13.0	26.0	18.0	36.0
Workshops		0.64	1.28	13.0	26.0	18.0	36.0

9.3.4 Requirements of Sydney Water 'Sydney Water Specialist Engineering Assessment'

The vibration limits presented in table 9-8 are detailed within the '*Sydney Water Specialist Engineering Assessment*' document for threshold vibration limits of pipe assets. A number of Sydney Water assets are located close to or below the site, including:

- Sydney Water stormwater culvert and associated pipework located directly beneath the Harbourside project site.
- Sydney Water sewer & water supply pipework primarily adjacent the development to the west, with both running along Darling Drive. Supply pipework is adjacent to sewer mains, however also wraps around the building at the northern and southern extents.

Table 9-8 – Threshold Vibration Limits

Asset Type	Threshold values for velocity (PPV) measured on the asset in mm/s
Brittle Pipe assets – RC, VC/EW, CICL	Maximum PPV for intermittent vibrations 10mm/s Maximum PPV for continuous vibrations 5mm/s
Ductile Pipe assets – SCL, DI, PVC, PE, PP, GRP	Maximum PPV for intermittent vibrations 20mm/s Maximum PPV for continuous vibrations 10mm/s
Masonry	3mm/s
Unreinforced Concrete	3mm/s

Note: The table above is applicable for buried assets, in sound condition, and laid in a typical soil trench in stable ground. Alternative criteria shall be development for other asset types, above ground assets, concrete encased pipes, pipes on piled/special supports and pipes in tunnels or of other unusual construction or ground conditions.

Given the above vibration limits as outlined in the '*Sydney Water Specialist Engineering Assessment*' and the information provided in the '*Stormwater Culvert beneath Harbourside Pre-Construction Dilapidation and Condition Assessment Report*' (Ref: 8824.20.01 Pre-Construction Dilapidation and Condition Assessment Report) dated 25/02/2022.

The following vibration limits are applicable to submerged Sydney Water assets:

- Stormwater Culvert (Receiver 4):
  - Maximum PPV for intermittent vibrations: 10mm/s PPV.
  - Maximum PPV for continuous vibrations: 5mm/s PPV.
- Associated pipework:
  - Assumed to be unreinforced concrete: Maximum PPV for continuous vibrations: 3mm/s PPV.
- Supply main and sewer asset, as identified on Beveridge Williams detailed survey plans (DET-002 & DET-003)
  - Supply main – 250mm diameter ductile iron cement mortar lined pipe (DICL)
    - Maximum PPV for intermittent vibrations: 20mm/s PPV.
    - Maximum PPV for continuous vibrations: 10mm/s PPV.
  - Sewer – 300mm diameter vitrified clay (VC)
    - Maximum PPV for intermittent vibrations: 10mm/s PPV.
    - Maximum PPV for continuous vibrations: 5mm/s PPV.

The heritage item saltwater culvert on the southern end of the Harbourside development (Receiver 11) is addressed in the *Heritage Impact Statement and Archaeological Impact Statement* prepared by Curio Projects (April 2022). The item is noted as having structural integrity, and when last used (c1990) was noted to be in good condition and substantially intact. Notwithstanding, and given the heritage significance of the culvert, the lowest vibration level identified in the Sydney Water assessment will be adopted. We also note that this is in line with the lower range of the DIN 4150-3 recommended levels for heritage structures.

- Water Cooling System and Manifold
  - Maximum PPV for continuous vibrations: 3mm/s PPV.

9.3.5 Vibration Impacts to Light Rail Assets

9.3.5.1 Transport for NSW Development Near Rail Tunnels (T HR CI 12051 ST)

NSW Government Transport Asset Standards Authority Standard *Development Near Rail Tunnels* dated 15 November 2018 states:

> *Any development that occurs within a distance of 25 m horizontally from first reserve shall assess the vibration on the rail tunnels. The assessment criteria shall be a maximum peak particle velocity (PPV) of 15 mm/s at the tunnel lining for brick or mass concrete in good condition or a maximum PPV of 20 mm/s at the tunnel lining for cast iron, steel or concrete segment lining*

9.3.5.2 Summary of Light Rail Vibration Criteria

Considering the relevant guidelines for impact to light rail, we note:

- BS7385-2 provides reference for the point at which vibration is likely to cause structural damage. Considering the disruption structural damage to the light rail infrastructure would provide, vibration should be below this level at all times.
- The TfNSW guideline relating to train tunnels provides further guidance on an appropriate maximum level of vibration that is acceptable to buried rail assets (as opposed to on grade lines). This level is nominated as a maximum of 20mm/s PPV, which is consistent with the upper limits of BS7385-2.
- Based on the above, a maximum/stop work PPV vibration level of 15mm/s is considered acceptable to protect the light rail infrastructure.

9.3.6 Summary of Recommended Vibration Limits

The recommended vibration limit at the nearest vibration sensitive receivers are summarised in table 9-9.

Table 9-9 – Recommended Vibration Limit Criteria

Receiver Location	Vibration Limit Criteria (mm/s PPV)
Receiver 1	≤20
Receiver 2	≤20
Receiver 3	≤3
Receiver 4	≤3
Receiver 5	≤20
Receiver 6	≤20
Receiver 7	≤20
Receiver 8	≤5
Receiver 9	≤3
Receiver 10	≤15
Receiver 11	≤3
Receiver 12	≤20
Receiver 13	≤5
Receiver 14	≤20
Receiver 15	≤20
Receiver 16	≤10 (Supply Main) ≤5 (Sewer)

10 ACTIVITIES TO BE CONDUCTED AND THE ASSOCIATED NOISE SOURCES

Noise impacts will be determined from primary processes and equipment. The sound power levels of these activities are presented below.

Table 10-1 - Sound Power Levels of the Proposed Equipment

Stage	Equipment/Process	Sound Power Level dB(A)
Public Domain Works	Articulated Truck Movements	105
	Articulated Truck Idle	95
	Elevated Work Platform	95
	Mini Crane	95
	Diesel Mobile Crane	105
	Bobcat	105
	General Hand Tools	95
	Angle Grinder	105
	Jackhammer	105

The noise levels presented in the above table are derived from the following sources, namely:

- Table A1 of Australian Standard 2436-2010.
- Data held by this office from other similar studies.

11 NOISE EMISSION ASSESSMENT

11.1 PREDICTED NOISE EMISSIONS

An assessment of the principal sources of noise emissions has been undertaken to identify the activities that may produce noise and/or vibration impacts so that appropriate ameliorative measures can be formulated. In addition, SoundPLAN noise modelling has been conducted based on information provided to this office of construction methodology and activities likely to be undertaken and presents the cumulative predicted external noise levels to the nearest surrounding receivers.

Noise levels from construction works have been predicted at the nearby development and assessed with reference to the City of Sydney - Code of Practice for Construction Hours/Noise Within the Central Business District 1992.

With regard to the noise level generated at the nearest receivers, noise levels will vary depending where on the construction site the work in undertaken. To address this, a range of predicted noise levels is provided. Predicted noise levels are presented below.

The predicted noise levels are based on the assumption that the recommendations in section 9 have implemented/observed.

11.2 SOUNDPLAN MODELLING

Noise levels have been predicted at the receiver locations using SoundPLAN™ 8.0 modelling software implementing the ISO 9613-2:1996 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation" noise propagation standard.

Noise enhancing meteorological effects have been adopted as recommended by the NPfI, noting that the ISO 9613 modelling approach assumes that all receivers are 'downwind' (i.e., that noise enhancing wind conditions are in effect at all times).

Ground absorption was conservatively calculated with a ground factor of 0 for all areas except for localised lawns and greenery with a ground factor of 0.6 as recommended in *Engineering Noise Control* (Bies & Hanson).

In line with Factsheet C of the NPfI, penalties for annoying noise characteristics should be applied at the receiver, where applicable. Based on the predicted noise levels, no penalty should be applied (either for tonality, intermittency, or otherwise).

The following figures present the results of the SoundPLAN Noise modelling, and results are summarised in Table 12.

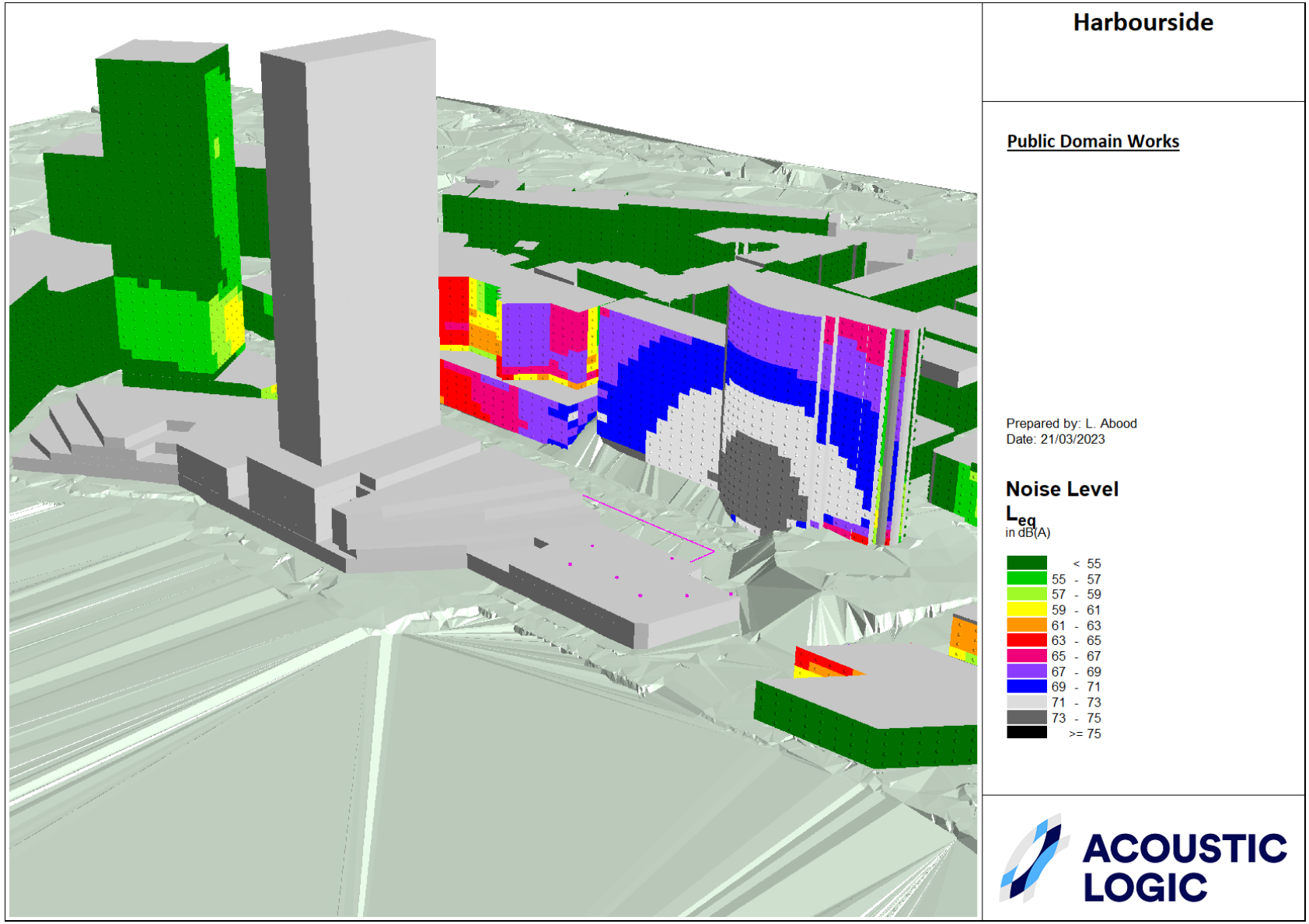


Figure 13: Harbourside Public Domain Construction Noise - R1, R2, R6, R7, R8 and R13

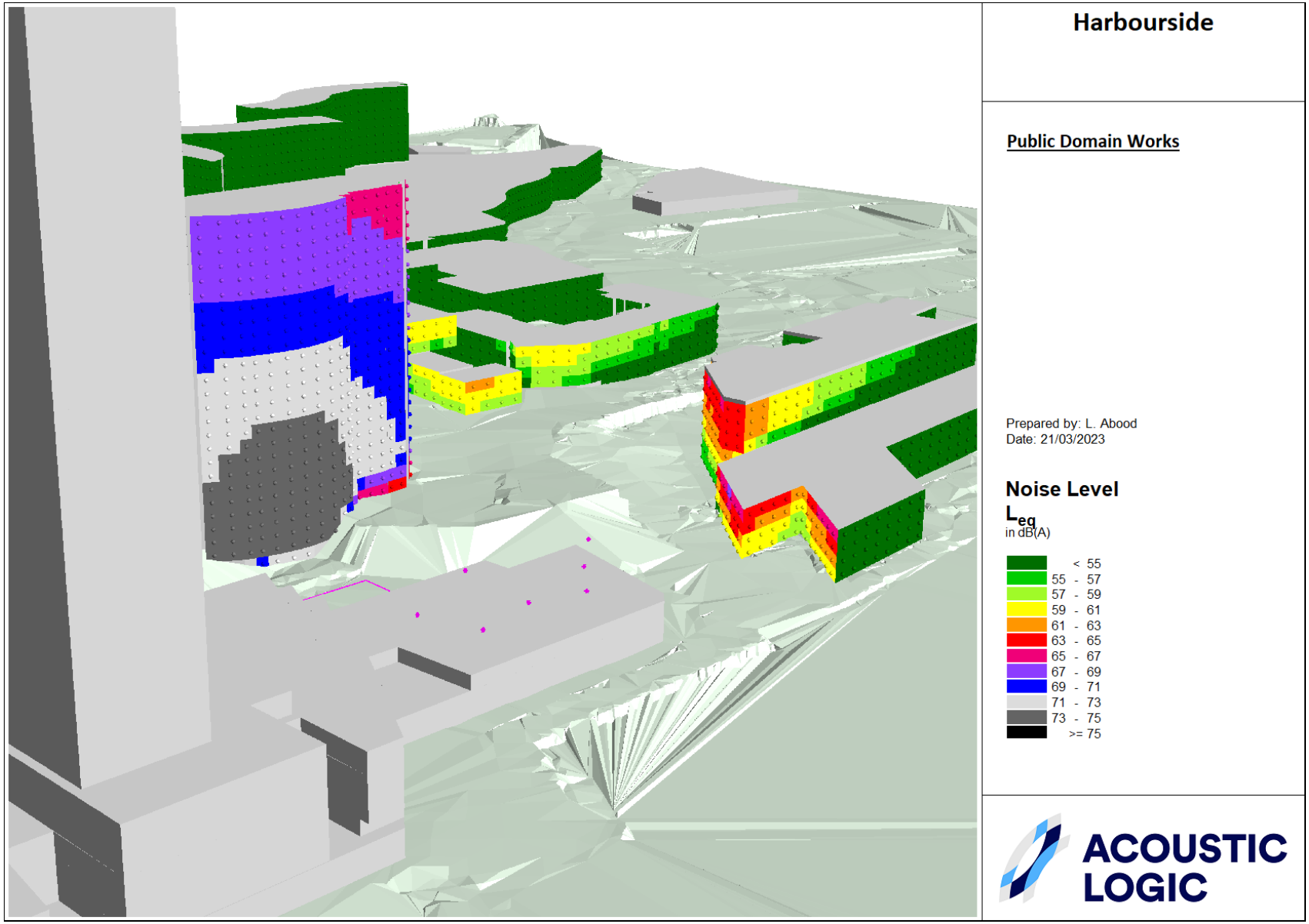


Figure 14: Harbourside Public Domain Construction Noise - R5, R6, R7, R8 and R13

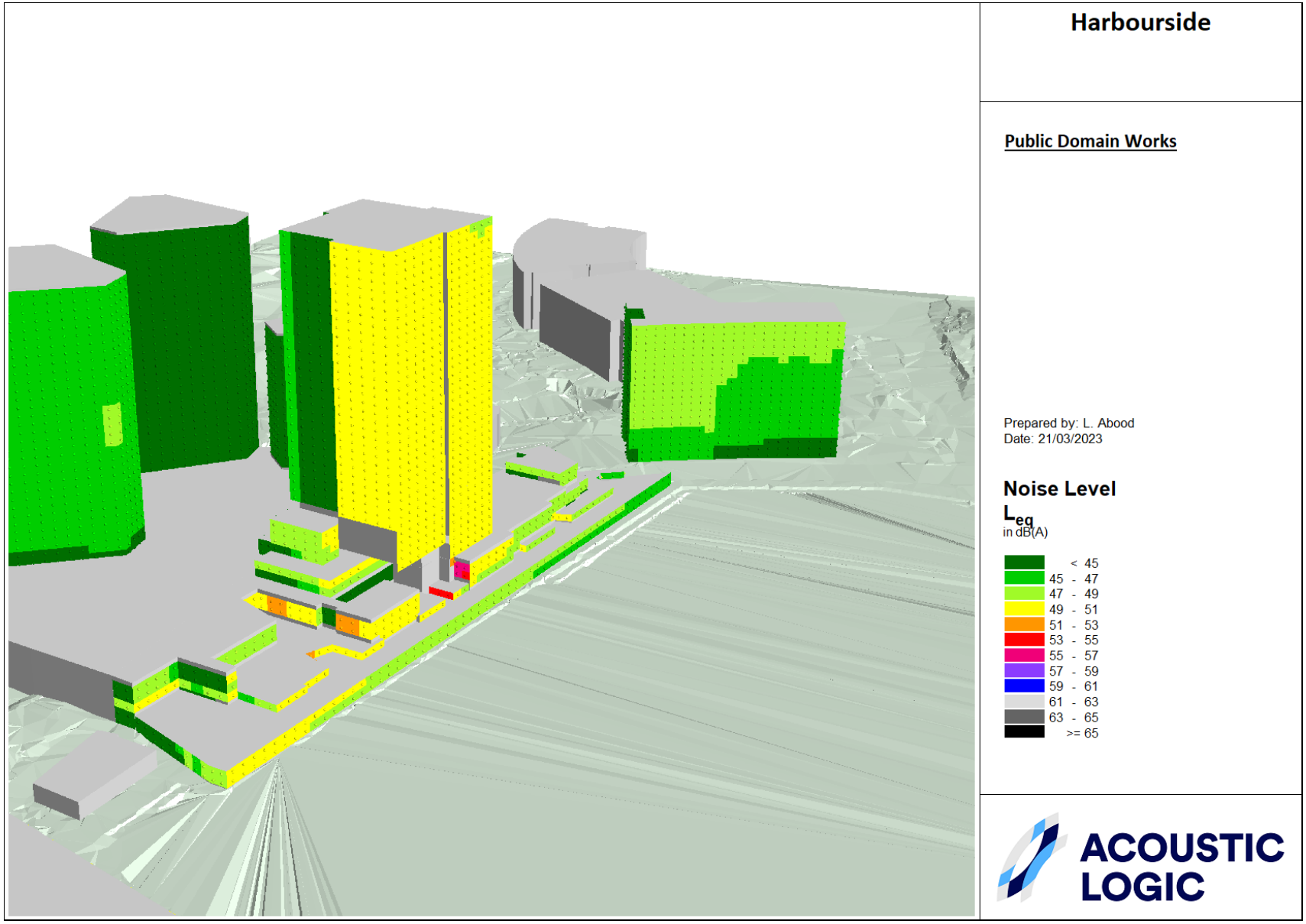


Figure 15: Harbourside Public Domain Construction Noise - R12, R14 and R15

11.3 PREDICTED NOISE LEVELS AT SENSITIVE RECEIVERS

The predicted external noise levels at nearest sensitive receivers are presented in the table below.

Table 11-1 –Predicted External Noise Levels at Nearest Sensitive Receivers – Construction Stage

Receiver Location	Construction Stage Predicted External Noise Level dB(A) $L_{10(15\ min)}$	City of Sydney Construction Noise Level Limit dB(A)$L_{10\ (15min)}$	Recommendations
R1	31-62	Monday to Friday (7.00am – 8.00am) = 62	Predicted to exceed the COS construction noise level limit on Saturdays. See Section 12 'Ameliorative Measures' for recommendations
		Monday to Friday (8.00am – 7.00pm) = 67	
		Saturday (7.00am – 8.00am) = 61	
		Saturday (8.00am – 5.00pm) = 66	
		Saturday (5.00pm – 6.00pm) = 60	
R2	29-45	Monday to Friday (7.00am – 8.00am) = 62	Predicted to adhere to the COS construction noise level limit.
		Monday to Friday (8.00am – 7.00pm) = 67	
		Saturday (7.00am – 8.00am) = 61	
		Saturday (8.00am – 5.00pm) = 66	
		Saturday (5.00pm – 6.00pm) = 60	
R5	33-67	Monday to Friday (7.00am – 8.00am) = 58	Predicted to exceed the COS construction noise level limit. See Section 12 'Ameliorative Measures' for recommendations
		Monday to Friday (8.00am – 7.00pm) = 63	
		Saturday (7.00am – 8.00am) = 58	
		Saturday (8.00am – 5.00pm) = 63	
		Saturday (5.00pm – 6.00pm) = 59	
R6	35-71	Monday to Friday (7.00am – 8.00am) = 62	Predicted to exceed the COS construction noise level limit. See Section 12 'Ameliorative Measures' for recommendations
		Monday to Friday (8.00am – 7.00pm) = 67	
		Saturday (7.00am – 8.00am) = 61	
		Saturday (8.00am – 5.00pm) = 66	
		Saturday (5.00pm – 6.00pm) = 60	
R7	42-73	Monday to Friday (7.00am – 8.00am) = 62	Predicted to exceed the COS construction noise level limit. See Section 12 'Ameliorative Measures' for recommendations
		Monday to Friday (8.00am – 7.00pm) = 67	
		Saturday (7.00am – 8.00am) = 61	
		Saturday (8.00am – 5.00pm) = 66	
		Saturday (5.00pm – 6.00pm) = 60	

Note: Receivers 3, 4, 9, 10, 11 and 16 as presented in Figure 4 have not been included in the above table given that these receiving locations are vibration sensitive structures only.

Table 11-2 –Predicted External Noise Levels at Nearest Sensitive Receivers – Construction Stage – cont.

Receiver Location	Excavation/Piling Stage Predicted External Noise Level dB(A) $L_{10(15\ min)}$	City of Sydney Construction Noise Level Limit dB(A)$L_{10\ (15min)}$	Recommendations
R8	41-74	Monday to Friday (7.00am – 8.00am) = 58	Predicted to exceed the COS construction noise level limit. See Section 12 'Ameliorative Measures' for recommendations
		Monday to Friday (8.00am – 7.00pm) = 63	
		Saturday (7.00am – 8.00am) = 58	
		Saturday (8.00am – 5.00pm) = 63	
		Saturday (5.00pm – 6.00pm) = 59	
R12	27-47	Monday to Friday (7.00am – 8.00am) = 68	Predicted to adhere to the COS construction noise level limit.
		Monday to Friday (8.00am – 7.00pm) = 73	
		Saturday (7.00am – 8.00am) = 65	
		Saturday (8.00am – 5.00pm) = 72	
		Saturday (5.00pm – 6.00pm) = 62	
R13	32-58	Monday to Friday (7.00am – 8.00am) = 62	Predicted to adhere to the COS construction noise level limit.
		Monday to Friday (8.00am – 7.00pm) = 67	
		Saturday (7.00am – 8.00am) = 61	
		Saturday (8.00am – 5.00pm) = 66	
		Saturday (5.00pm – 6.00pm) = 60	
R14	27-51	Monday to Friday (7.00am – 8.00am) = 68	Predicted to adhere to the COS construction noise level limit.
		Monday to Friday (8.00am – 7.00pm) = 73	
		Saturday (7.00am – 8.00am) = 65	
		Saturday (8.00am – 5.00pm) = 72	
		Saturday (5.00pm – 6.00pm) = 62	
R15	25-46	Monday to Friday (7.00am – 8.00am) = 68	Predicted to adhere to the COS construction noise level limit.
		Monday to Friday (8.00am – 7.00pm) = 73	
		Saturday (7.00am – 8.00am) = 65	
		Saturday (8.00am – 5.00pm) = 72	
		Saturday (5.00pm – 6.00pm) = 62	

Note: Receivers 3, 4, 9, 10, 11 and 16 as presented in Figure 4 have not been included in the above table given that these receiving locations are vibration sensitive structures only.

12 AMELIORATIVE MEASURES

The following section presents specific and generalised ameliorative treatments that may be incorporated to control the amenity impacts of construction activity on surrounding noise-sensitive receivers.

12.1 SITE SPECIFIC RECOMMENDATIONS

- Notification - Prior to commencement of each month, neighbouring receivers should be notified of the anticipated works for that month and the potential noise and vibration generation from the anticipated construction activity.
- High Noise Generating Works:
    - Where high noise generating works exceeding the HNAML are undertaken, respite hours should be implemented to reduce the impact on surrounding receivers. For high noise generating works, respite periods should be provided between the hours of 7am – 8am and 1pm – 2pm.
- Vehicle Noise – Where feasible, trucks should turn off their engines rather than idling to reduce impacts on nearby receivers (unless truck ignition needs to remain on during concrete pumping). Minimise truck reversing. Plant and equipment should be off when not in use.
- Vehicles for construction activity must arrive and depart site within the approved hours of work (7am-7pm Monday to Saturday)
- Where feasible, selection of construction equipment should consider the noise levels of plant and equipment, with the aim of selecting equipment with lower sound power levels.
- Where feasible and safe to do so, handheld tools should be operated within the building shell during fit-out and services construction in order to allow the use of the existing building shell as noise shielding to nearby sensitive receivers.
- A conscientious effort should be made to avoid works near the nearest sensitive receivers wherever feasible. Compounding high generating activities simultaneously near receivers should be avoided where possible.
- All employees, contractors and sub-contractors are to undergo an environmental induction which outlines noise management techniques.
- Unnecessary shouting should be avoided on site, and appropriate signage should be installed to remind workers of their responsibility to reduce noise impacts where feasible. Loud music from radios and stereos is not permitted.
- Material handling procedures should be implemented to avoid careless dropping of construction waste or deliveries.
- Where allowable by site safety requirements, non-tonal reversing beepers can be implemented on construction equipment and mobile plant used regularly on site.

In the event of a complaint, noise management procedure identified in Section 13 of this report are to be followed. Notwithstanding above, general management techniques and acoustic treatments are included below which may be implemented on a case-by-case basis to reduce noise emissions to surrounding receivers.

12.2 GENERAL RECOMMENDATIONS

Other noise management practices which may be adopted are discussed below. In addition, notification, reporting and complaints handling procedures should be adopted as recommended in section in this report.

12.2.1 Silencing Devices

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

12.2.2 Material Handling

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

12.2.3 Treatment of Specific Equipment

In certain cases, it may be possible to specially treat a piece of equipment to reduce the sound levels emitted. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

12.2.4 Establishment of Site Practices

This involves the formulation of work practices to reduce noise generation. This includes locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers.

Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.

12.3 NOISE MONITORING

Noise monitors are recommended to be installed at the property boundaries of 50 Murray Street (R8), the nearest residential receiver to the area of public domain works to monitor construction noise levels.

12.3.1 Downloading of Noise Monitor Data

Downloading of the noise monitor data will be conducted on a regular basis. In the event of consistent high noise level periods, downloading of the noise monitor data will be conducted more frequently. Results obtained from the noise monitor will be presented in a graph format and will be forwarded to the client for review. It is proposed that reports are provided fortnightly, presenting the measured noise levels in reference to the noise management levels detailed in this report.

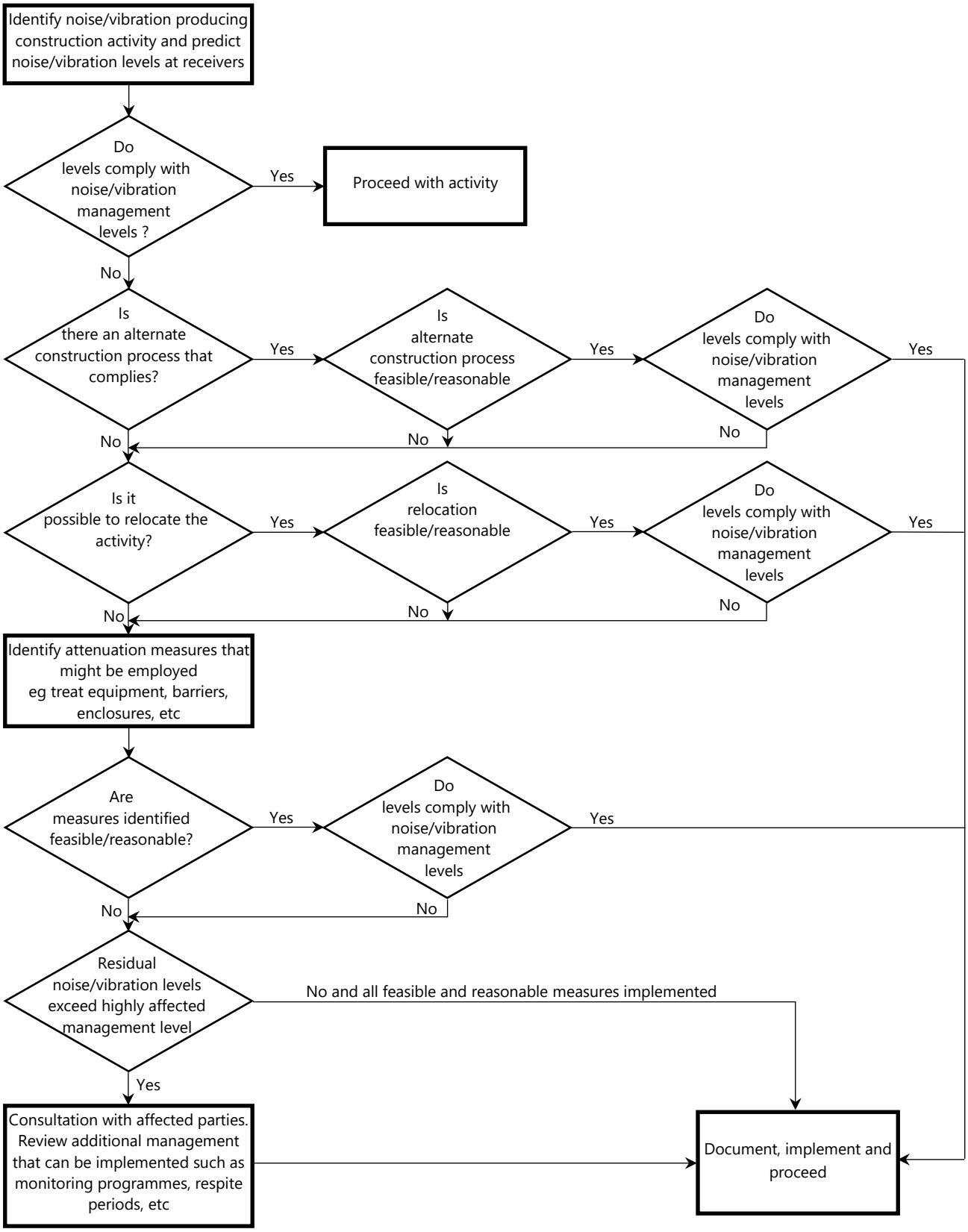
12.3.2 Presentation of Noise Monitor Results

A fortnightly report will be submitted to the client via email summarising the measured noise level events. Complete results of the continuous noise logging will be presented in fortnightly reports including graphs of the collected data.

13 ASSESSMENT METHODOLOGY AND MITIGATION METHODS

The flow chart that follows illustrates the process to be followed to minimise the impact associated with these activities.

Noise sources with the potential to exceed the criteria set out in section 6 have been identified and discussed in section 8.



14 ASSESSMENT OF VIBRATION

14.1 VIBRATION PRODUCING ACTIVITIES

We note that the purpose of this management plan is to assess the potential for noise and vibration impacts associated with the public domain works for the development, and that, of the proposed construction activities to occur during this phase, it is unlikely that the activities proposed would generate levels which exceed the nominated thresholds at surrounding receivers.

All construction activity is to comply with the requirements outlined within Section 9 of this SSDA Assessment.

14.2 VIBRATION MONITORING

Whilst not part of this specific assessment, vibration monitoring is proposed at sensitive receivers throughout the demolition, excavation and piling phases of the project in line with the Demolition NVMP and Excavation NVMPs prepared for previous development applications (Ref: 20220030.1/1909A/R3/SN and 20220030.1/0505A/R4/SN.) Additionally, it is recommended that monitoring be continued for a 2-week period during the construction phase of the project to review ongoing levels at vibration sensitive locations, as maintained within the Main Works CNVMP (Ref: 20220030.1/3110A/R1/LA).

As the works proposed to be conducted during the scope of SSDA 3 are not proposed to be high vibration generating works, and that the nearest sensitive receiver to the area of works is, at minimum, 30m away from any hammering activity, ambient vibration monitoring during the construction of the public domain space at surrounding sensitive receivers is not currently proposed to be conducted, nor recommended as part of this report.

Notwithstanding, if complaints surrounding vibration levels at nearby sensitive receivers during the public domain phase of construction, AL recommend vibration monitoring occur identify the cause of exceedance and to assist with developing ameliorative measures.

15 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

15.1 ESTABLISHMENT OF DIRECT COMMUNICATION WITH AFFECTED PARTIES

In order for any construction noise and vibration management programme to work effectively, continuous communication is required between; all parties which may be potentially impacted upon, the builder and the regulatory authority. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

The objective in undertaking a consultation process is to:

- Inform and educate the groups about the project and the noise controls being implemented.
- Increase understanding of all acoustic issues related to the project and options available.
- Identify group concerns generated by the project, so that they can be addressed.
- Ensure that concerned individuals or groups are aware of and have access to the Site Complaints Register which will be used to address any construction noise related problems should they arise.

To ensure that this process is effective, regular scheduled meetings may be required for a finite period, until all issues have been addressed and the evidence of successful implementation is embraced by all parties.

An additional step in this process is to produce a newsletter informing nearby residents of upcoming activities that are likely to generate higher noise/vibration levels.

15.2 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise or vibration occur, immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration limits, all work potentially producing vibration shall cease until the exceedance is investigated. The effectiveness of any changes shall be verified before continuing. Documentation and training of site staff shall occur to ensure the practices that produced the exceedances are not repeated.

If a noise complaint is received the complaint should be recorded on a Noise Complaint Form. The complaint form should list:

- The name and address of the complainant (if provided).
- The time and date the complaint was received.
- The nature of the complaint and the time and date the noise was heard.
- The name of the employee who received the complaint.
- Actions taken to investigate the complaint, and a summary of the results of the investigation.
- Required remedial action, if required.
- Validation of the remedial action.
- If necessary, setup vibration monitoring at the location representing the nearest affected vibration receiver, with alarm device which can inform the project manager on site if the vibration exceedance happened.
- Summary of feedback to the complainant.

A permanent register of complaints should be held.

All complaints received should be fully investigated and reported to management. The complainant should also be notified of the results and actions arising from the investigation.

The investigation of a complaint shall involve where applicable.

- noise measurements at the affected receiver.

- an investigation of the activities occurring at the time of the incident.
- inspection of the activity to determine whether any undue noise is being emitted by equipment; and
- Whether work practices were being carried out either within established guidelines or outside these guidelines.

Where an item of plant is found to be emitting excessive noise, the cause is to be rectified as soon as possible. Where work practices within established guidelines are found to result in excessive noise being generated then the guidelines should be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees should be carried out.

Measurement or other methods shall validate the results of any corrective actions arising from a complaint where applicable.

16 CONTINGENCY PLANS

Where non-compliances or noise complaints are raised the following methodology will be implemented.

1. Determine the offending plant/equipment/process.
2. Locate the plant/equipment/process further away from the affected receiver(s) if possible.
3. Implement additional acoustic treatment in the form of localised barriers, silencers etc where practical.
4. Selecting alternative equipment/processes where practical.
5. If necessary, setup noise and vibration monitoring devices at locations representing the nearest noise/vibration and dust affected receivers and provide data for each complain time period. Analysis is required to determine suitable mitigation measures.

Complaints associated with noise and vibration generated by site activities shall be recorded on a Complaint Form. The person(s) responsible for complaint handling and contact details for receiving of complaints shall be established on site prior to construction works commencing. A sign shall be displayed at the site indicating the Site Manager to the general public and their contact telephone number.

17 CONCLUSION

This report reviews the noise and vibration impacts associated with the works maintained within SSDA 3 of the Harbourside redevelopment, located at 2-10 Darling Drive, Darling Harbour.

Noise impacts assessed within this document include:

- Noise intrusion to project site from public domain usage.
- Construction noise and vibration impacts.

Provided that the practices and recommendations in this report are implemented, the noise and vibration impacts during the public domain phase of construction works will be minimised. The controls and safeguards implemented as a result of the analysis recommended in the plan would be reviewed at a number of stages as required to respond to local conditions and revised methods and equipment. Further reviews would be undertaken throughout the public domain phase of works, as required, in response to revised methods and equipment, as well as in response to the monitoring or measurements and evaluation of actual impacts.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

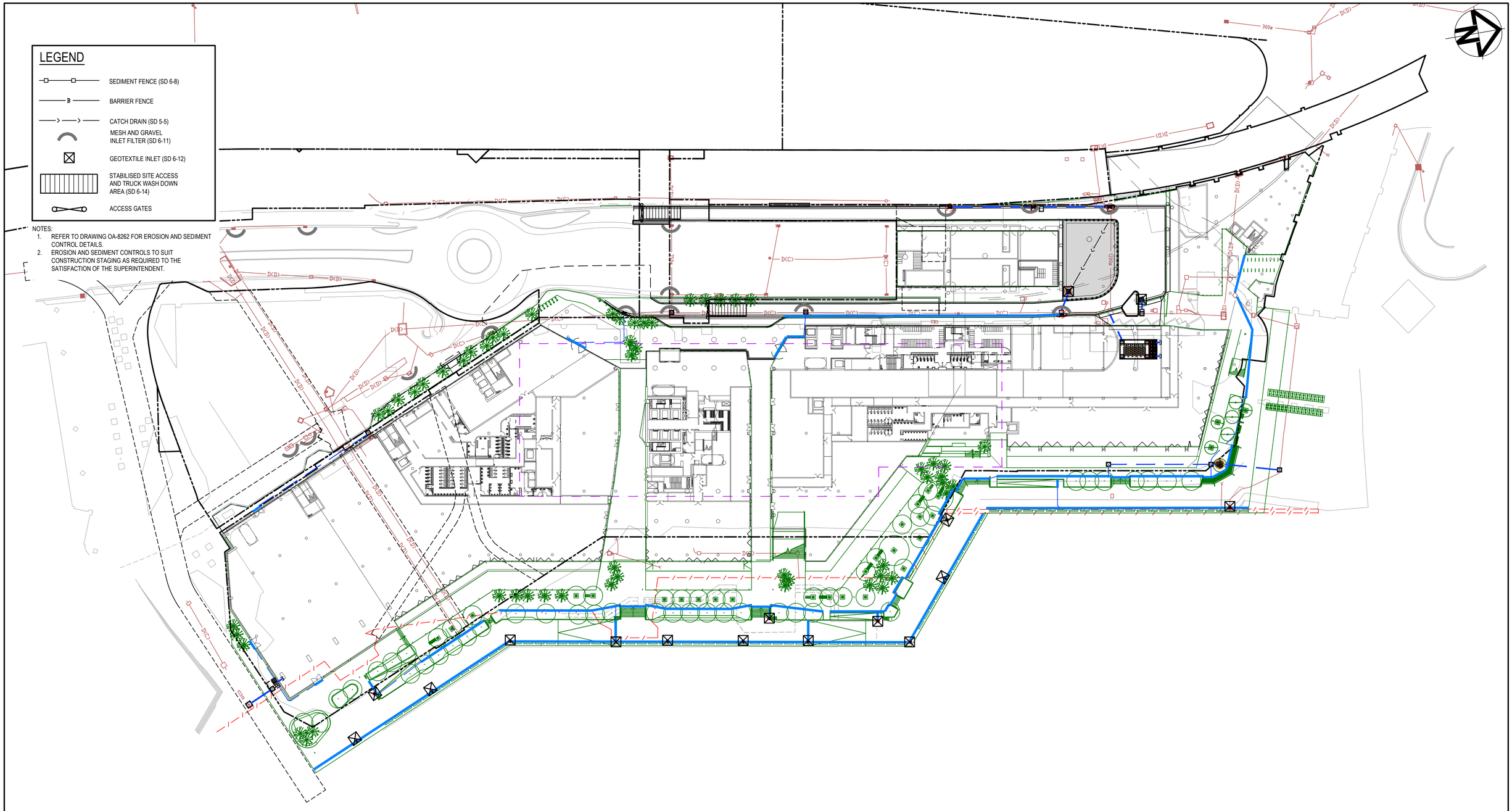
Acoustic Logic Pty Ltd
Lachlan Abood

15.4 APPENDIX D – SEDIMENT & EROSION CONTROL AND STORMWATER MANAGEMENT PLAN (AT&L)

LEGEND

- SEDIMENT FENCE (SD 6-8)
- BARRIER FENCE
- CATCH DRAIN (SD 5-5)
- MESH AND GRAVEL INLET FILTER (SD 6-11)
- GEOTEXTILE INLET (SD 6-12)
- STABILISED SITE ACCESS AND TRUCK WASH DOWN AREA (SD 6-14)
- ACCESS GATES

NOTES:
1. REFER TO DRAWING OA-8262 FOR EROSION AND SEDIMENT CONTROL DETAILS.
2. EROSION AND SEDIMENT CONTROLS TO SUIT CONSTRUCTION STAGING AS REQUIRED TO THE SATISFACTION OF THE SUPERINTENDENT.



Issue	Description	Date
P2	ISSUE FOR INFORMATION	30-03-23
P1	ISSUE FOR INFORMATION	08-03-23

Bar Scales

0 10 20 30 40 50m

1 : 500 @ A1 1 : 1000 @ A3

Client: mirvac

Scales	1:500	Drawn	CK
		Designed	CK
Grid	GDA20 MGA56	Checked	GJ
Height Datum	AHD	Approved	AT

SSD 7874
SSD 49259711

Project: MIRVAC HARBOURSIDE 2-10 DARLING DRIVE SYDNEY

Title: EROSION AND SEDIMENT CONTROL PLAN

Civil Engineers and Project Managers
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Level 7, 153 Walker Street
North Sydney NSW 2060
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9923 1055
www.atl.net.au
info@atl.net.au

Status: FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION

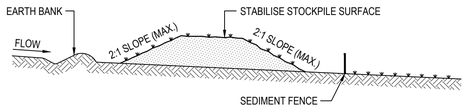
A1

Project - Drawing No.: CIV-DWG-OA-8261

Issue: P2

100mm on Original

F:\21-926 Harbourside Mirvac\6.0 Drgs\Civil\Final\3000 Series - Public Domain\CIV-DWG-OA-8261.dwg

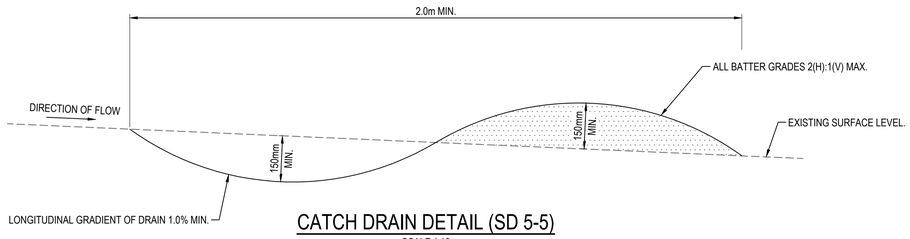


STOCKPILE CONSTRUCTION NOTES:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

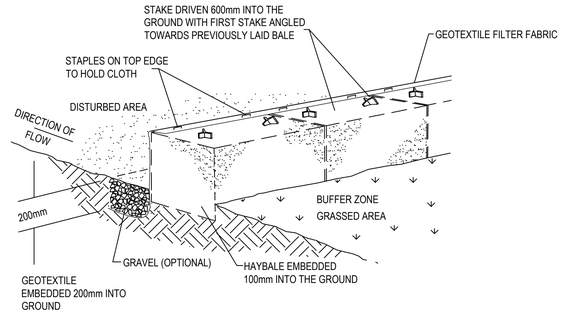
STOCKPILE SECTION (SD 4-1)

SCALE N.T.S.



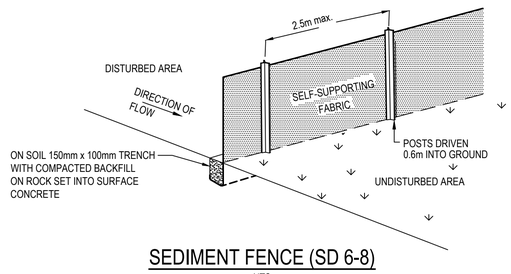
CATCH DRAIN DETAIL (SD 5-5)

SCALE 1:10



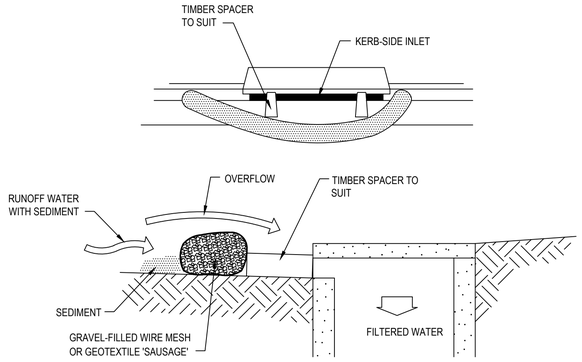
HAYBALE AND GEOTEXTILE SEDIMENT FILTER (SD 6-7)

NTS



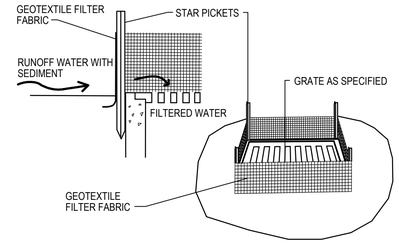
SEDIMENT FENCE (SD 6-8)

NTS



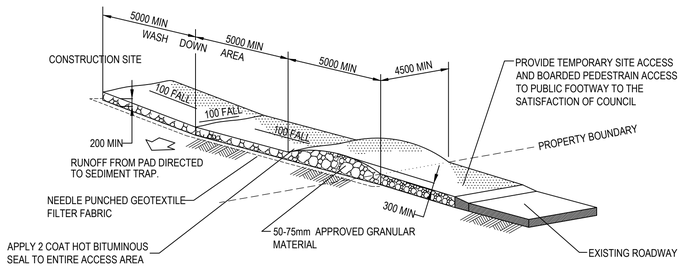
MESH AND GRAVEL INLET FILTER (SD 6-11)

NTS



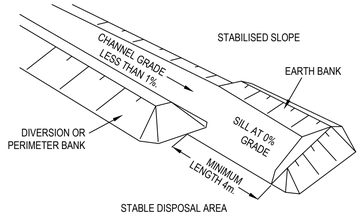
GEOTEXTILE FILTER PIT SURROUND (SD 6-12)

NTS



STABILISED SITE ACCESS AND TRUCK WASH DOWN AREA (SD 6-14)

NTS



LEVEL SPREADER (OR SILL)

NTS

Issue	Description	Date
P2	ISSUE FOR INFORMATION	30-03-23
P1	ISSUE FOR INFORMATION	08-03-23

Bar Scales

100mm on Original

Client: mirvac

Scales	NTS
Grid	GDA20 MGA56
Height Datum	AHD
Drawn	CK
Designed	CK
Checked	GJ
Approved	AT

SSD 7874
SSD 49259711

Project: MIRVAC HARBOURSIDE 2-10 DARLING DRIVE SYDNEY

Title: EROSION AND SEDIMENT CONTROL DETAILS

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Status: FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION

A1

Project - Drawing No.: CIV-DWG-OA-8262

Issue: P2

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