



Lord Howe Island Critical Infrastructure Project

Airborne Noise Impact Assessment

PREPARED FOR

NSW National Parks and Wildlife Service (NPWS) (part of the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW)) on behalf of the Lord Howe Island Board

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
Proponent	NSW DCCEEW
CNVMP	Construction Noise and Vibration Management Plan
dB(A)	dB(A) denotes a single number sound pressure level that includes a frequency weighting ("A-weighting") to reflect the subjective loudness of the sound level. The frequency of a sound affects its perceived loudness. Human hearing is less sensitive at low and very high frequencies, and so the A-weighting is used to account for this effect. An A-weighted decibel level is written as dB(A).
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water

Acronym	Description
DECC	NSW Department of Environment and Climate Change (now DCCEEW)
DECCW	NSW Department of Environment, Climate Change and Water (now DCCEEW)
DPHI	NSW Department of Planning, Housing and Infrastructure
EPA	Environment Protection Authority
ICNG	Interim Construction Noise Guideline
L ₁₀	The noise level exceeded for 10 per cent of the time and is approximately the average of the maximum noise levels.
L ₉₀	The noise level exceeded for 90 per cent of the time and is approximately the average of the minimum noise levels. The L ₉₀ level is often referred to as the “background” noise level and is commonly used as a basis for determining noise criteria for assessment purposes.
L _{eq}	The ‘equivalent continuous sound level’, L _{eq} , is used to describe the level of a time-varying sound or vibration measurement. L _{eq} is often used as the “average” level for a measurement where the level is fluctuating over time. Mathematically, it is the energy-average level over a period (i.e., the constant sound level that contains the same sound energy as the measured level). When the dB(A) weighting is applied, the level is denoted dB L _{Aeq} . Often the measurement duration is quoted, thus L _{Aeq,15 min} represents the dB(A) weighted energy-average level of a 15-minute measurement.
L _{max}	The absolute maximum noise level in a noise sample.
NSR	Noise Sensitive Receiver
NPI	Noise Policy for Industry
NSW	New South Wales
PNTL	Project Noise Trigger Level
RBL	The Rating Background Level (RBL) is the overall single figure background level representing each assessment period (day, evening, and night) over a noise monitoring period. It is the median value of: <ul style="list-style-type: none"> • All day Assessment Background Levels (ABLs) over the monitoring period for the day; • All evening ABLs over the monitoring period for the evening; or • All night ABLs over the monitoring period for the night.
RMS	Roads and Maritime Services
RNP	Road Noise Policy
SPL	Sound Pressure Level
SWL	Sound Power Level

EXECUTIVE SUMMARY

The NSW National Parks and Wildlife Service ('NPWS') (part of the NSW Department of Climate Change, Energy, the Environment and Water ('NSW DCCEEW' or 'the Proponent')) on behalf of the Lord Howe Island Board ('LHIB') proposes to construct, operate and maintain new marine infrastructure, biosecurity infrastructure, and waste management facility (the Project) on Lord Howe Island.

Environmental Resources Management Australia Pty Ltd has prepared this Airborne Noise and Vibration Impact Assessment on behalf of the Proponent to assess the operational and construction airborne noise and vibration impacts of the Project.

The existing airborne noise environment at identified noise sensitive receivers was established, and construction and operational noise management levels and assessment criteria were developed in accordance with the relevant NSW standards and guidelines.

Applicable worst-case construction and operational assessment scenarios for the Project were developed based on project-specific information, as outlined in this report.

Construction and operational noise levels were predicted and compared to the established noise management levels and criteria to assess compliance.

For the residential noise sensitive receivers R1, R2, R3, R4 and R5, the construction noise level predictions at both the North and South Zones were assessed to be below the Interim Construction Noise Guidelines (ICNG) Highly Noise Affected Management Level. However, noise at these receivers is predicted to exceed the ICNG Noise Affected Management Level for both total predicted noise level and noise from individual equipment. For passive recreation area R8, the ICNG Management Level is predicted to be exceeded by the total predicted noise level and noise from individual equipment (e.g., jackhammer, concrete saw). For commercial receivers R3 and R4, construction noise levels from both the North Zone and South Zone were predicted to be below the ICNG Management Level.

The operational noise assessment concluded that all noise sensitive receivers would achieve compliance with the Noise Policy for Industry Project noise trigger levels.

Cumulative noise impacts at NSRs are not expected as no other relevant future projects were identified in the vicinity of the Project.

To minimise noise impacts from the construction and operation of the Project, final equipment selection and quantities are recommended to adhere to the Sound Power Levels specified in this assessment. If the Sound Power Level, location or quantity of the equipment changes significantly, this assessment would need to be updated.

Construction and operational road traffic noise impacts are not expected.

1. INTRODUCTION

The NSW National Parks and Wildlife Service ('NPWS') (part of the NSW Department of Climate Change, Energy, the Environment and Water ('NSW DCCEEW' or 'the Proponent') on behalf of the Lord Howe Island Board ('LHIB') proposes to construct, operate and maintain new marine infrastructure, biosecurity infrastructure, and waste management facility (the Project) on Lord Howe Island.

Environmental Resources Management Australia Pty Ltd (ERM) has prepared this Airborne Noise and Vibration Impact Assessment (ANVIA) on behalf of the Proponent to assess the operational and construction airborne noise and vibration impacts of the Project.

The ANVIA addresses the key issues relating to noise and vibration as follows:

- An assessment of the potential construction noise impacts of the development in accordance with NSW Department of Environment and Climate Change (DECC) (now NSW Department of Climate Change, Energy, the Environment and Water [DCCEEW])– *NSW Interim Construction Noise Guideline (ICNG)*, July 2009;
- An assessment of operational noise impacts in accordance with the NSW Environment Protection Authority (EPA) – *Noise Policy for Industry (NPI)*, October 2017; and
- An assessment of both operational and construction road traffic noise impacts in accordance with NSW Department of Environment, Climate Change and Water (DECCW) (now NSW DCCEEW) – *NSW Road Noise Policy (RNP)*, March 2011.

2. PROJECT OVERVIEW

The Project is on Lord Howe Island, which is a 1,455 hectare (ha) island located about 770 kilometres (km) to the northeast of Sydney, NSW, and about 570 km east from Port Macquarie, NSW. Port Macquarie is the nearest mainland port to Lord Howe Island and is the base for the current marine freight service. Lord Howe Island is part of the state of NSW and is regarded legally as an unincorporated area administered by the Lord Howe Island Board.

The Project is part of the broader Lord Howe Island Critical Infrastructure Program; however, the aspects being considered within the environmental impact statement (EIS) comprise the construction, operation and maintenance of the following:

- North Zone - Freight handling facility which includes new and upgraded marine infrastructure (new piled vessel ramp and upgraded jetty and existing boat ramp), boat wash down and maintenance area, cargo loading/offloading areas, biosecurity infrastructure, adaptive reuse of the 'Old Cargo Shed' and 'Ocean View' heritage buildings, viewing area, picnic area, landscaping, retaining walls, amenities and vehicle and boat trailer parking;
- South Zone - Waste management facility (WMF) upgrades which includes new storage sheds and materials processing facilities (including for organic material), wastewater treatment plan (WWTP) and waste receival area (including chemical and hazardous waste), hardstand and roads, staff office, and selective dune restoration at the existing WMF;
- Dedicated dog kennels to house detection dogs; and
- Self-service fuel bowser along Old Lagoon Road.

While the Project includes marine freight vessel operations as part of the marine infrastructure components, the procurement of the marine freight vessel and upgrades to mainland port/biosecurity infrastructure are not part of the Project.

3. EXISTING NOISE ENVIRONMENT

3.1 NOISE SENSITIVE RECEPTORS

Noise sensitive receivers (NSRs) in the vicinity of the North Zone and South Zone were identified (**Table 3-1**). The NSRs are also shown graphically in the operational noise contour maps provided in **Appendix A**.

3.2 BACKGROUND NOISE LEVELS

In the absence of background noise monitoring, typical rating background levels (RBLs) for suburban residential receivers were adopted from Table 2.3 of the NPI (EPA, 2017), as provided in **Table 3-2**.

The receiver category of 'suburban residential' is justified based on the description provided. Notwithstanding, the NSRs are currently exposed to noise from the existing WMF and freight handling facility/operations during daytime and, therefore, the adopted daytime RBL of 45 dB(A) is likely conservative. It should be noted that the Project is not expected to operate during the evening and night periods.

TABLE 3-1 NOISE SENSITIVE RECEIVERS

NSR ID	Name/ Address	NPI Noise Amenity Area	Coordinates (UTM Zone 57J)		Approximate Distance to Site Boundary (in metres)
			Easting	Northing	
R1	8 Ocean View Drive	Residential Suburban	505654	6512461	90
R2	25 Lagoon Road	Residential Suburban	505592	6512529	65
R3	34 Lagoon Road (The Cabin)	Residential Suburban	507324	6510510	105
R4	341 Lagoon Road	Residential Suburban	507256	6510834	270
R5	Ocean View Apartments	Residential Suburban	505666	6512548	135
R6	BOM Weather Station	Commercial premises	507512	6510385	290
R7	Qantas Freight Domestic Terminal	Commercial premises	507402	6510480	170
R8	Thompson Memorial Park	Area specifically reserved for passive recreation	505675	6512251	175

TABLE 3-2 TYPICAL BACKGROUND NOISE LEVELS – TABLE 2.3 OF THE NPI (EPA, 2017)

Receiver category	Typical planning zoning – standard instrument	Typical existing background noise levels	Description
Suburban Residential	RU5 – village RU6 – transition R2 – low density residential R3 – medium density residential E2 – environmental conservation E3 – environmental management	Daytime RBL<45 dB(A) Evening RBL<40 dB(A) Night RBL<35 dB(A)	Suburban – an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.

4. NOISE POLICIES, GUIDELINES AND STANDARDS

This assessment has been conducted in accordance with the following policies and guidelines:

- NSW DECC (now NSW DCCEEW) –ICNG (July 2009);
- NSW EPA –NPI (October 2017); and
- NSW DECCW (now NSW DCCEEW) –RNP (March 2011).

Further information regarding the application of the key policy and guidelines is provided below.

4.1 NSW INTERIM CONSTRUCTION NOISE GUIDELINE

The ICNG (DECC, 2009), presents an accepted method to assess construction noise impacts for a range of receiver types. It provides a set of recommended standard hours for construction, specifically:

- Monday to Friday: 7am to 6pm;
- Saturday: 8am to 1pm; and
- No work on Sundays or public holidays.

Construction outside these hours might be undertaken in accordance with the ICNG for the following categories of work:

- The delivery of oversized plant or structures that police or other authorities determine require special arrangements to transport along public roads;
- Emergency work to avoid the loss of life or damage to property, or to prevent environmental harm; and
- Works where an proponent demonstrates and justifies a need to operate outside the recommended standard hours.

The ICNG encourages works to occur within the recommended standard hours of construction unless justification is provided. It focuses on minimising noise by managing construction noise impacts, rather than only on achieving numeric noise levels, and recognises that some noise from construction sites is inevitable.

The ICNG encourages organisations involved with construction, maintenance or upgrading works (e.g., large scale contractors or Government agencies) to develop best-practice techniques for managing construction noise and vibration and implementing feasible and reasonable mitigation measures.

The ICNG is suitable to quantitatively assess potential noise emissions and impacts associated with the construction of the Project. The ICNG assessment methodology has been adopted to develop project-specific construction noise management levels (NMLs), assess potential impacts, and recommend mitigation and management measures.

Table 4-1 outlines the ICNG construction NMLs guidance for residential receivers. The NMLs for passive recreation areas and offices are $L_{Aeq(15 \text{ min})}$ 60 dB(A) and $L_{Aeq(15 \text{ min})}$ 70 dB(A) respectively.

TABLE 4-1 CONSTRUCTION NOISE MANAGEMENT LEVELS FOR RESIDENTIAL RECEIVERS

Time of day	Management Level, L_{eq} (15min), dB(A)	How to apply
Recommended standard hours (SH): <ul style="list-style-type: none"> Monday to Friday: 7am to 6pm Saturday: 8am to 1pm No work on Sundays or public holidays 	Noise affected RBL + 10 dB(A)	<p>The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{eq, 15 \text{ minute}}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level.</p> <p>The Proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</p>
	Highly noise affected 75 dB(A)	<p>The highly noise affected level represents the point above which there may be a strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, considering:</p> <ul style="list-style-type: none"> Times identified by the community when they are less sensitive to noise (e.g., before and after school for works near schools); Mid-morning or mid-afternoon for works near residences; and If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours (OOH): <ul style="list-style-type: none"> All other times including Public Holidays 	Noise affected RBL + 5 dB(A)	<p>A strong justification would typically be required for works outside the recommended standard hours.</p> <p>The Proponent should apply all feasible and reasonable work practices to meet the noise affected level.</p> <p>Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.</p> <p>For guidance on negotiating agreements see section 7.2.2 of the ICNG.</p>

4.2 NSW NOISE POLICY FOR INDUSTRY

Responsibility for the control of noise emissions in NSW is typically vested in Local Government and the NSW EPA. The NPI (EPA, 2017) provides a framework and methodology for deriving criteria for project consent and environment protection licence conditions.

The criteria, referred to as the project noise trigger levels (PNTLs), are defined in *Section 2.1* of the NPI, which considers the lowest of the intrusive or amenity residential receiver criterion so that the most stringent threshold is set for existing industrial noise in the area. PNTLs were established in accordance with the NPI for all identified residential receivers. PNTLs for all associated assessment periods (day/evening/night) are also provided as noise sources are expected to be present during all these periods.

4.2.1 PROJECT INTRUSIVENESS NOISE LEVEL

The NPI states:

"The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the background noise level by more than 5 dB when beyond a minimum threshold. This intrusiveness noise level seeks to limit the degree of change a new noise source introduces to an existing environment."

The intrusiveness noise level is determined as follows:

$$L_{Aeq, 15min} \leq \text{Rating Background Noise Level} + 5 \text{ dB}$$

The RBL is the single-figure background L_{90} level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24-hour period used for the assessment background level).

TABLE 4-2 ASSUMED RBLs AND PROJECT INTRUSIVENESS NOISE LEVELS (EPA, 2017)

Time of day ¹	Assumed RBL, in dB(A) ²	Project Intrusiveness Noise level, $L_{Aeq,15min}$ dB(A) ³
Day	45	50
Evening	40	45
Night	35	40

Notes:

1. Day – 7am to 6pm, Evening – 6pm to 10pm, Night – 10pm to 7am
2. The justification for the assumed RBL is provided in **Section** Error! Reference source not found.

3. Project Intrusiveness Noise Level is $L_{Aeq,15\text{ min}} \leq \text{RBL} + 5$

4.2.2 AMENITY NOISE LEVELS AND PROJECT AMENITY NOISE LEVELS

To limit continuing increases in noise levels from application of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels specified in Table 2.2 of the NPI, where feasible and reasonable. The recommended amenity noise levels will protect against noise impacts such as speech interference, community annoyance and sleep disturbance. The Project amenity noise levels are provided in **Table 4-3**.

TABLE 4-3 PROJECT AMENITY NOISE LEVELS

Receiver/ Noise Amenity Area	Assessment Period	Recommended Amenity Noise Level, L_{eq} dB(A)	Project Amenity Noise Level $L_{Aeq,period}$ dB(A)	Project Amenity Noise Level $L_{Aeq,15min}$ dB(A) ^{c,d}
Residential Suburban	Day	55	50	53
	Evening	45	40	43
	Night	40	35	38
Area specifically reserved for passive recreation (e.g. national park)	When in use	50	45	48
Commercial Premises	When in use	65	60	63

Note:

Project Amenity Noise Level is Recommended Amenity Noise Level minus 5 dB(A) plus 3 dB(A) to convert from a period level to a 15-minute level.

Day - 7am to 6pm (Monday to Saturday) or 8am to 6pm (Sundays and Public Holidays), Evening - 6pm to 10pm, Night - Remaining periods

The recommended amenity noise levels represent the objective for total industrial noise at a receiver location, whereas the project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows:

Project amenity noise level for industrial developments = Recommended amenity noise level minus 5 dB(A)

4.2.3 MAXIMUM NOISE LEVEL EVENT ASSESSMENT – SLEEP DISTURBANCE

The potential for sleep disturbance from maximum noise level events associated with the Project during the night-time period must be considered. Sleep disturbance relates to both awakenings and disturbance to sleep stages.

A detailed maximum noise level event assessment should be undertaken where the Project night-time noise levels at a residential location exceed:

- $L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater; and/or
- L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

The night-time noise levels subject to a detailed maximum noise level event assessment are therefore $L_{Aeq,15min}$ 40 dB(A) and/or L_{AFmax} 52 dB(A).

The detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the RBL, and the number of times this happens during the night-time period.

Other factors that may be important in assessing the extent of impacts on sleep include:

- How often high noise events will occur;
- The distribution of likely events across the night-time period and the existing ambient maximum events in the absence of the subject development;
- Whether there are times of day when there is a clear change in the noise environment (such as during early-morning shoulder periods); and
- Current scientific literature available at the time of the assessment regarding the impact of maximum noise level events at night.

4.3 NSW ROAD NOISE POLICY

The RNP (DECCW, 2011) outlines the range of measures needed to minimise road traffic noise and its impacts. It is intended for use by acoustics specialists as well as:

- Road project proponents;
- Determining authorities and regulators involved in the approval and construction of road projects and land use developments that generate additional traffic on existing roads; and
- City and transport planners and policymakers dealing with issues such as route corridors, heavy vehicle transport and building codes.

The RNP aims to identify the strategies that address the issue of road traffic noise from existing roads, new road projects, road redevelopment projects and new traffic-generating developments.

The RNP provides guidance, criteria, and procedures for assessing noise impacts from existing, new, and redeveloped roads and traffic generating developments. The assessment of road traffic noise impacts on residences near public roads is assessed under the RNP. In this case, the RNP is considered the suitable document to qualitatively assess potential noise emissions and impacts associated with construction and operational road traffic. The RNP details noise assessment criteria for various road categories and land uses.

5. PROJECT-SPECIFIC NOISE MANAGEMENT LEVELS AND CRITERIA

5.1 CONSTRUCTION NOISE MANAGEMENT LEVELS

Construction works are expected to occur only during the recommended standard daytime hours as defined in **Section 2.1**. The project-specific construction NMLs, for works within the recommended standard hours for construction, are presented in **Table 5-1**.

These NMLs have been established with due regard to the requirements of the ICNG for all identified residential and other sensitive non-residential receivers.

For this assessment, noise monitoring was not conducted and instead the minimum RBLs as stated in the NPI summarised in **Table 5-2** were applied. This provides a conservative construction noise assessment for the Project.

TABLE 5-1 CONSTRUCTION NOISE MANAGEMENT LEVELS

Receiver Type and Time of Day	Daytime Rating Background Level (RBL), dB(A)	Noise Affected Management Level, $L_{eq}(15 \text{ min})$, dB(A)	Highly Noise Affected Management Level, $L_{eq}(15 \text{ min})$, dB(A)	Management Level, $L_{eq}(15 \text{ min})$, dB(A)
Residence - Recommended Standard Hours ¹	45	55	75	
Passive Recreation Area	-	-	-	60
Offices	-	-	-	70

Note:

Standard Hours - Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm

5.2 PROJECT NOISE TRIGGER LEVELS

NPI PTNLs have been determined in **Table 5-2** and are the more stringent level between the project intrusiveness noise level and the project amenity noise criteria for all assessment periods.

TABLE 5-2 NSW NPI CRITERIA – PNTLS

Receiver Category	Assessment Period	Project Intrusiveness Noise Level ^b LAeq,15min dB(A)	Project Amenity Noise Level LAeq,15min dB(A)	Project Noise Trigger Level (PNTL) LAeq,15min dB(A)	Sleep Disturbance L _{max}
Suburban Residential	Day	50	58	50	
	Evening	45	48	48	
	Night	40	38	38	52
Commercial Premises	-	-	63	63	
Area specifically reserved for passive recreation	When in Use	-	48	48	

Table 5-2 shows that the PNTLs are dictated by the project intrusiveness noise levels for all assessment periods and are applicable to the operational noise assessment.

By meeting the PNTLs at the identified sensitive receivers, the noise levels at all other receivers located further away from the Project are expected to comply with the noise criteria of the NPI.

If the night-time PNTL of $L_{Aeq,15min}$ 35 dB(A) at the identified receivers is met, a detailed maximum noise level event assessment is not required.

5.3 ROAD TRAFFIC NOISE CRITERIA

The RNP criteria applicable to the nearest residences affected by additional road traffic due to the Project are presented in **Table 5-3**.

TABLE 5-3 RNP RESIDENTIAL ROAD TRAFFIC NOISE CRITERIA

Road Category	Type of Project/Land Use	Assessment Criteria – dB(A)	
		Day 7am to 10pm	Night 10pm to 7am
Local road	Existing residences affected by additional traffic on existing local roads generated by land use developments.	$L_{Aeq,1hr}$ 55 (external)	$L_{Aeq,1hr}$ 50 (external)

Note: The assessment criteria for external noise levels apply at 1 metre from the façade of any affected residential receiver.

It should be noted that the that the RNP is applicable to a permanent road traffic scenario. The usage of the RNP noise criteria for construction, which is temporary, is considered conservative.

6. CONSTRUCTION NOISE ASSESSMENT

6.1 METHODOLOGY

Conservative predictions of construction noise have been established by calculating the geometrical dispersion of noise with the assumption of flat topography, no acoustic shielding and no ground absorption effects.

A worst-case noise scenario considers the total predicted noise level from all the construction noise sources at the NSRs. The noise predictions consider the sound power levels of all equipment operating continuously for a 15-minute period.

All the noise sources are assumed to be at the boundaries of the North Zone site area and the South Zone site area fronting the nearest sensitive receivers, representing the shortest separation distance between noise sources and receivers.

It should be noted that the construction noise levels at any receiver depend on the type and duration of construction activity being undertaken and are expected to be variable over the total construction program.

6.2 CONSTRUCTION NOISE SOURCES

The noise-generating construction activities to be carried out in the North Zone would include:

- A mobile concrete batching facility would be established (as there is no existing concrete batching plant on the island);
- Site clearing works including removal of vegetation;
- Earthworks to regrade the existing hardstand laydown area and install retaining walls;
- Civil construction and installations, structural and building installations; electrical, water, piping, lighting installation; and
- Delivery of materials, plant, and equipment, which would involve truck movements coordinated with vessel arrivals.

The noise-generating construction activities in the South Zone would include:

- Site clearing works include removal and disposal of any contaminated material and stockpiles of legacy material on the site (e.g., white goods, construction waste, old machinery). Any material that will remain on site for future processing, like organic waste, would be stockpiled in a segregated area that does not affect construction;
- Temporary relocation of existing equipment (e.g., materials recovery facility [MRF], horizontal baler, hot-rot unit etc.) to enable the existing equipment to remain operational during the construction of the new facilities;
- Civil construction and installations, structural and building installations; electrical, water, piping, lighting installation; and processing plant installation for new waste management facilities; and
- Final relocation of equipment such as the hot-rot unit and balers and installation, testing and commissioning of new equipment.

The final staging and construction approach will be determined by the contractor.

The following typical construction noise sources and their sound power levels have been adopted for this assessment (**Table 6-1**). Conservative assumptions for operational time during a worst-case 15-minute period were used.

TABLE 6-1 CONSTRUCTION NOISE SOURCES

Equipment	North Zone	South Zone	Sound Power Level per unit, dB(A)	Assumed Percentage of Operational Time in a Worst-case 15-minute Period, %
Crane-driven piling rig	1		111	50
Medium sized pick and carry crane		1	104	50
Medium sized crawler crane	1		104	50
Large cranes (25T-30T)	1	1	105	50
Medium sized excavators (20T-30T)	1	1	107	50
Excavator (additional / general use)	1	1	107	50
Forklift	1	1	106	50
Loader	1	1	105	50
Small excavator (5T)	1	1	107	50
Small watercart / sweeper	1	1	107	50
Medium sized roller	1	1	108	50
Concrete 'volumetric' mixer	1	1	98	50
Mobile concrete batching plant - Conveyor	1	1	75	100
Concrete pump	1	1	109	100
Trucks	1	1	107	50
Generator	1	1	99	100
Compressor (silenced)	1	1	101	100
Jackhammer	1	1	113	50
Concrete saw	1	1	117	50

Note - The sound power levels provided in the above table are based on AS 2436:2010 (Standards Australia, 2010) and Transport for New South Wales Construction Noise and Vibration Guideline (TfNSW, 2023).

6.3 CONSTRUCTION NOISE LEVEL PREDICTIONS

The predicted construction noise levels at the NSRs for the North Zone and the South Zone are presented in **Table 6-2** and **Table 6-3** respectively.

TABLE 6-2 PREDICTED CONSTRUCTION NOISE LEVELS – NORTH ZONE

NSR	Predicted Construction Noise Level, LAeq (15 min) dB(A) ^{1,2}																		
	Crane-driven piling rig	Medium sized crawler crane	Large cranes (25T-30T)	Medium sized excavators (20T-30T)	Excavator (additional / general use)	Forklift	Loader	Small excavator (5T)	Small watercart / sweeper	Medium sized roller	Concrete mixer	Mobile concrete batching plant - Conveyor	Concrete pump	Trucks	Generator	Compressor (silenced)	Jackhammer	Concrete saw	Total
R1 ¹	61	54	55	57	57	56	55	57	57	58	48	28	62	57	52	54	63	67	72
R2 ¹	64	57	58	60	60	59	58	60	60	61	51	31	65	60	55	57	66	70	74
R5 ¹	57	50	51	53	53	52	51	53	53	54	44	24	58	53	48	50	59	63	68
R8 ²	55	48	49	51	51	50	49	51	51	52	42	22	56	51	46	48	57	61	66

Notes:

1. Residential Receiver - The Noise Affected Management Level is LAeq(15 min) 55 dB(A), and the Highly Noise Affected Management Level is LAeq(15 min) 75 dB(A).
2. Passive Recreation Area - The Management Level is LAeq(15 min) 60 dB(A).
3. Residential Noise Affected Management Level exceedances are shown in bold font.



TABLE 6-3 PREDICTED CONSTRUCTION NOISE LEVELS – SOUTH ZONE

NSR	Predicted Construction Noise Level, $L_{Aeq}(15 \text{ min})$ dB(A) ^{1,2}																	
	Medium sized pick and carry crane	Large cranes (25T-30T)	Medium sized excavators (20T-30T)	Excavator (additional / general use)	Forklift	Loader	Small excavator (5T)	Small watercart / sweeper	Medium sized roller	Concrete mixer	Mobile concrete batching plant - Conveyor	Concrete pump	Trucks	Generator	Compressor (silenced)	Jackhammer	Concrete saw	Total
R3 ¹	56	57	59	59	58	57	59	59	60	50	27	61	59	51	53	65	69	70
R4 ¹	47	48	50	50	49	48	50	50	51	41	18	52	50	42	44	56	60	62
R6 ²	47	48	50	50	49	48	50	50	51	41	18	52	50	42	44	56	60	61
R7 ²	51	52	54	54	53	52	54	54	55	45	22	56	54	46	48	60	64	66

Notes:

1. Residential Receiver - The Noise Affected Management Level is $L_{Aeq}(15 \text{ min})$ 55 dB(A), and the Highly Noise Affected Management Level is $L_{Aeq}(15 \text{ min})$ 75 dB(A).
2. Commercial Receiver - The Management Level is $L_{Aeq}(15 \text{ min})$ 70 dB(A).
3. For Residential Receivers, Noise Affected Management Level exceedances are shown in bold font.

For residential receivers R1, R2, R3, R4 and R5, the construction noise levels for both the North and South Zones were predicted to be below the ICNG 'highly noise affected management level'. However, the ICNG 'noise affected management level' was predicted to be exceeded at these residential receivers by the total predicted noise level and by individual equipment.

For passive recreation area R8, the ICNG management level was predicted to be exceeded by the total predicted noise level and by individual equipment (e.g., jackhammer, concrete saw).

For commercial receivers R6 and R7, the construction noise levels were predicted to be below the ICNG management level at both the North Zone and South Zone.

Noise mitigation and management measures are required to reduce the construction noise impacts at the NSRs during the construction phase of the Project.

6.4 CONSTRUCTION VIBRATION – SAFE WORKING DISTANCES

Safe working distances for high vibration-generating plant, which may be used during the construction activities, have been taken from the Transport for New South Wales Construction Noise and Vibration Guideline (TfNSW, 2023) (**Table 6-4**).

TABLE 6-4 RECOMMENDED SAFE WORKING DISTANCES

Plant Item	Rating/Description	Safe Working Distance, in metres	
		Cosmetic Damage (BS 7385 ¹)	Human Response (AS 2670)
Vibratory Roller	<50 kN (1-2 t)	5	15 to 20
Vibratory Roller	<100 kN (2-4 t)	6	20
Piling rig -bored (nominal)	≤ 800 mm	2 m	N/A
Piling rig-hammer	12 t down force	15 m	50 m
Jackhammer	Handheld	1 m (nominal)	Avoid contact with structure

The safe working distances for a typical vibration causing plant in construction range from 1 m to 50 m to trigger a human response. There is no vibration sensitive receiver within this range and therefore, construction vibration impacts are not expected to result from the Project.

¹ BS 7385 -2: 1993 Guide to damage levels from ground borne vibration

7. OPERATIONAL NOISE ASSESSMENT

7.1 METHODOLOGY

Noise modelling has been undertaken using the CONCAWE algorithm (Manning, 1981), implemented by using SoundPLAN version 9.1. The noise modelling considers the sound power levels of the proposed site equipment, and applies adjustments for attenuation from geometrical dispersion, acoustic shielding from intervening ground topography, vegetation, ground effects, meteorological effects, and atmospheric absorption.

The noise modelling parameters are summarised in **Table 7-1**.

TABLE 7-1 NOISE MODELLING PARAMETERS

Modelling Aspect	Parameter
Software	SoundPLAN v9.1
Outdoor Noise Propagation Algorithm	CONCAWE incorporating ISO 171534-3 (improved method selected)
Ground Absorption Factor	0.5 (50% acoustically hard ground and 50% acoustically soft ground)
Topographical contours	10 m intervals
Vegetation	Foliage volume attenuation as per ISO 9613-2
Receiver height	1.5 m
CONCAWE Meteorological Inputs	<ul style="list-style-type: none"> Daytime/Evening: Stability category D with wind speed of 3m/s Night-time: Stability category F with wind speed of 2m/s

7.2 OPERATIONAL NOISE SOURCES

The operational noise sources for the Project comprise:

- External noise sources such as outdoor equipment; and
- Noise breakout through open roller doors, louvres, openings and perforated screens (considered to be acoustically transparent) from Project buildings.

All Project operations are expected to occur only during the daytime period (7am to 6pm).

The following sections describe the noise sources and operational noise modelling assumptions. The locations of all modelled noise sources in North Zone and South Zone are shown in **Appendix A**.

Site plans for the North Zone and South Zones displaying the Project buildings are shown in **Appendix B**.

The dimensions of noise breakout areas are provided in the 'Master Plan Architectural Elevation Drawings' in **Appendix C**.

7.2.1 FREIGHT HANDLING FACILITY

7.2.1.1 LAND BASED INFRASTRUCTURE – NORTH ZONE

The laydown hardstand will be used for organizing and managing cargo and freight and would be designed to accommodate various freight types including containers, bulk goods, and bulk fuel. This area would also provide suitable space for boat maintenance including the application of anti-fouling paints. The laydown area would be accessed via Lagoon Road.

A new container unstuffing/stuffing shed is proposed to serve as a cargo and handling area for the freight vessel operators. The shed would be built on a reinforced concrete slab and would be constructed of compressed fibre cement cladding, with a profiled metal roof sheeting and high level operable glazed louvres. Roller doors would be provided to accommodate forklift access.

The external noise sources associated with the land-based infrastructure in the North Zone are presented in **Table 7-2**.

TABLE 7-2 EXTERNAL NOISE SOURCES

Area	Noise Source	Sound Power Level per unit	Quantity	Notes
Laydown Hardstand	Small forklift	82	4	9 t - 13.5 t
	Medium forklift	106	1	10 t
	Mobile crane	104	1	25 t - 30 t
	Truck	103	5	5 t
	Generator (1000 kVA)	96	1	1000 kVA

The buildings in the North Zone and the associated internal noise sources are shown in **Table 7-3**. These buildings contain noise breakout areas which behave as noise sources.

TABLE 7-3 BUILDING INTERNAL NOISE SOURCES

Building	Internal Noise Sources	Internal Sound Pressure Level, dB(A)	Noise Breakout Area	Notes
Unstuffing Shed	Cargo and handling activities for the freight vessel operators	85	Roller Door fully open	The NSW Occupational Health and Safety noise limit of 85 dB(A) is assumed to be met internally for staff members working within the shed. This internal noise level is considered conservative. The sound power level per m ² for the Noise Breakout Areas is 79 dB(A)/m ² .

7.2.2 WASTE MANAGEMENT FACILITY

The Project would include upgrades to the existing WMF to provide a fully functioning waste reception and processing facility to service the needs of the residents of Lord Howe Island.

The noise sources associated with the WMF would include:

- Waste-receival area comprising a dedicated, one-way, drive-through waste drop-off facility for commercial and residential waste with clearly demarcated areas to segregate waste types (e.g., mixed-recyclables, paper and cardboard, food and organics etc.);
- A MRF, which would include a new working platform to provide secure, safe operating conditions. The MRF equipment would consist of two balers, a wrapper, hoppers, conveyors, picking station, sorting conveyor/trommel, capture bins, glass crusher and sorter. The MRF will also house a baler for steel and aluminum cans and other waste; and
- A dedicated organics processing workshop with specialised equipment to mechanically and biologically break down organic materials and include dehydrators, curing and storage areas for final products.

The WWTP will include settling and aeration tanks, clarifiers, disinfection equipment and sludge treatment. It is fully containerised and is not expected to be a significant noise source.

The external noise sources associated with MRF are presented in **Table 7-4**.

TABLE 7-4 EXTERNAL NOISE SOURCES

Area	Noise Source	Sound Power Level per unit	Quantity	Notes
Staging Area and Internal WMF Roads	Generator	82	4	1000 kVA
	Light vehicle/ 4WD	103	3	Vehicles accessing the reception drop-offs
Area adjacent to the Storage Shed	Mobile Hammer Mill Wood Shredder	105	1	Sound Pressure Level of 80 dB(A) at 15m as referenced from Noise Pollution from Chippers and Chain Saws, Journal of Arboriculture, August 1975
	Mobile Concrete/Brick Crusher	102	1	Noise data sourced from Bison 120 Mobile Crusher Operations Manual

The buildings within the WMF and associated internal noise sources are shown in **Table 7-5**. These buildings contain noise breakout areas which behave as noise sources.

TABLE 7-5 BUILDING INTERNAL NOISE SOURCES

Building	Internal Noise Sources	Internal Sound Pressure Level, dB(A)	Noise Breakout Areas	Notes
Reception	<ul style="list-style-type: none"> Bin Tippers 	72	<ul style="list-style-type: none"> Drive-through and drop-off opening 	The internal noise level is based on 4 x Bin Tippers each at a Sound Power Level of 84 dB(A) operating 50% of the time in a 15 min period. The Sound Power Level was sourced from Smart Waste Solution Bin Tipper noise specifications. The sound power level per m2 for the Noise Breakout Area is 66 dB(A)/m ² .
Materials Recovery Facility (MRF)	<ul style="list-style-type: none"> 2 x Conveyors 2 x Feeding Hopper Horizontal baler 400 – 38T Over-band magnet separator Wrapping machine Screening separator Glass crusher Glass sorting machine (glass screen) Polystyrene compactor Medium capacity telehandlers 	85	<ul style="list-style-type: none"> Perforated Steel Screens (considered to be acoustically transparent and behave like an opening) Fully open high level operable louvres Fully open vertical sliding openings for waste, recycling and paper Fully open roller doors Glass feeder conveyor opening 	The NSW Occupational Health and Safety noise limit of 85 dB(A) is assumed to be met internally for staff members working within the MRF. The sound power level per m2 for the Noise Breakout Areas is 79 dB(A)/m ² .
Organics Shed	<ul style="list-style-type: none"> 2 x Dehydrators HotRot Composter 	85	<ul style="list-style-type: none"> Fully Open Roller Doors 	The NSW Occupational Health and Safety noise limit of 85 dB(A) is assumed to be met internally for staff members working within the shed. The sound power level per m2 for the Noise Breakout Areas is 79 dB(A)/m ² .

7.2.3 DOG KENNELS AND FUEL BOWSER

Kennels are proposed to house the biosecurity detection dogs. The kennels would be constructed on an existing grass area adjacent to the BoM weather station at 16 Old Lagoon Road (Lot 219 DP45732). The facility would include kennels for up to four dogs and an outdoor and indoor training area. The noise generated from the dog kennels is expected to be minimal given the number of dogs to be housed in the facility and the fact that the outdoor training will be shielded.

The fuel bowser would include a fully covered, concrete, bunded, hardstand area. The fuel bowser would be accessed via a driveway from Old Lagoon Road. The noise generated from the fuel bowser is expected to be minimal due to the low vehicular traffic and the fuel bowser being fully covered.

7.2.4 MODELLING RESULTS

Predicted operational noise levels at the nearest NSRs of the North Zone and the South Zone for standard noise enhancing meteorological conditions are shown in **Table 7-6**, including a comparison to the NPI PNTLs. Noise contours of predicted operational noise levels at NSRs are provided in **Appendix A**.

The predicted operational noise levels indicate compliance with the relevant NPI PNTLs at all NSRs.

TABLE 7-6 PREDICTED OPERATIONAL NOISE LEVELS

Sensitive Receiver ID	Name/ Address	NPI Noise Amenity Area	Assessment Criteria, PNTL, $L_{Aeq,15 \text{ min}}$, dB(A) Day	Predicted Operational Noise Level for Standard Meteorological Conditions, $L_{Aeq,15 \text{ min}}$, dB(A) ¹ Day	Predicted Operational Noise Level for Noise Enhancing Meteorological Conditions, $L_{Aeq,15 \text{ min}}$, dB(A) ² Day	Compliance?
R1	8 Ocean View Drive	Residential Suburban	50	41	41	✓
R2	25 Lagoon Road	Residential Suburban	50	42	43	✓
R3	34 Lagoon Road (The Cabin)	Residential Suburban	50	48	50	✓
R4	341 Lagoon Road	Residential Suburban	50	43	45	✓
R5	Ocean View Apartments	Residential Suburban	50	37	38	✓
R6	BOM Weather Station	Commercial premises	50	41	44	✓
R7	Qantas Freight Domestic Terminal	Commercial premises	50	43	45	✓
R8	Thompson Memorial Park	Passive Recreation Area	50	46	48	✓

Notes:

- Standard meteorological conditions - Day/evening/night: stability categories A–D with wind speed up to 0.5 m/s at 10 m AGL.
- Noise-enhancing meteorological conditions - Daytime/evening: stability categories A–D with light winds (up to 3 m/s at 10 m AGL). Night-time: stability categories A–D with light winds (up to 3 m/s at 10 m AGL) and/or stability category F with winds up to 2 m/s at 10 m AGL.

7.3 CUMULATIVE IMPACTS

The NPI project amenity noise level is specifically used for addressing cumulative noise impacts and has been considered in the development of the PNTLs for this Project. The predicted noise levels for the Project indicate compliance with the PNTLs and therefore, also demonstrates that cumulative impacts are unlikely.

It is assumed that the noise impacts from future developments will be assessed in accordance with and comply with the NPI (EPA, 2017). Future noise-generating projects are also expected to achieve the NPI project amenity noise levels to address cumulative noise impacts during the planning application stage.

8. TRAFFIC NOISE ASSESSMENT

This section discusses impacts from noise generated by traffic associated with the construction and operation of the Project.

8.1 CONSTRUCTION TRAFFIC NOISE

Up to 3, 14 t tandem axle tipper trucks (approx. 8.5 m³ volume) will operate on 30-minute return cycles. Therefore, conservatively, 4 heavy vehicle movements during construction have been assumed. The existing vehicular traffic on Old Lagoon Road is low. The addition of construction traffic is unlikely to exceed the RNP noise criteria.

8.2 OPERATIONAL TRAFFIC NOISE

Operational traffic is unlikely to differ from the existing traffic levels. Therefore, traffic noise impacts at NSRs during operational of the Project are expected to be negligible.

9. RECOMMENDATIONS

9.1 CONSTRUCTION

The construction noise levels for the North Zone and South Zone are predicted to be below the ICNG 'highly noise affected management level'; however, they will exceed the ICNG 'noise affected management level'. This is based on worst-case assumptions of construction activities at the Project boundary fronting NSRs.

Although construction noise may be audible and there may be some adverse impacts, this is typical for construction projects near residential receivers. By implementing noise control measures, the impacts to the NSRs surrounding the Project can be managed.

The highest construction noise impacts will be experienced for a short duration when construction activities are nearest to the NSRs. As the construction activities move further away from the receivers, the noise levels will be lower to the predicted noise levels. The noise level predictions are also based on the concurrent operation of all equipment. This scenario is likely to be rare.

The following construction noise control measures are recommended to manage noise impacts at NSRs:

- Noise generating work and activities should be limited to during the ICNG standard hours:
 - 7am to 6pm Monday to Friday;
 - 8am to 1pm Saturdays;
 - No work on Sundays or public holidays);
- Where construction activities that generate higher noise levels (>55 dB(A)) are undertaken close to the Project boundary, respite periods (e.g., three hours of work, followed by one hour of respite) should be applied, if possible. Note that respite may extend the duration of works and inadvertently increase noise impacts. Hence, due care should be taken when considering this management measure;
- When selecting equipment for use in construction, equipment noise specifications should be reviewed to select the quietest and most appropriate equipment for each task. Equipment should not be over-powered for the tasks being performed;
- Efficient work practices should be adopted to minimise the total construction period and the number of noise sources on the site;
- Unnecessary noise due to idling engines should be avoided. High engine speeds should be avoided when equipment can be powered down and lower engine speeds are feasible;
- All equipment used for the Project should be maintained to minimise noise, with consideration of exhaust silencers, covers on engines and inspection of squeaking or rattling components. Excessive noise-generating machines should be repaired or removed from the site;
- Reversal alarms shall be replaced with broadband "squash duck" motion alarms, where feasible;
- If noise complaints are received, operator attended noise validation and compliance monitoring should be undertaken to compare site noise levels to the NMLs. All site noise

levels should be measured and quantified in the absence of any influential noise sources not associated with the Project. If the measured site noise levels are above the NMLs, further mitigation and/or management measures should be considered;

- Unattended noise monitoring systems are recommended to be established at selected NSRs depending on the different activities and stages of construction when such details are finalised. The results may be used to improve the noise mitigation and management measures for the Project so that best practice noise control is continually implemented;
- Construction traffic noise management should include site awareness training and environmental inductions for construction staff, highlighting driving practices to minimise traffic noise impacts on the sensitive receivers; and
- As per standard practice for any construction activities in NSW, a Construction Noise Management and Vibration Plan (CNVMP) containing noise mitigation and management measures shall be created for the construction phase of this Project.

9.2 OPERATION

The roller doors at the MRF and the Organics Shed are recommended to be kept shut whenever possible to reduce noise breakout from these buildings; however, PNTL compliance is still achieved with the roller doors open.

10. CONCLUSION

This report has assessed potential construction and operational noise impacts associated with the Project.

The existing noise environment at identified NSRs was established, and construction and operational noise management levels and assessment criteria were developed in accordance with the relevant NSW standards and guidelines, namely the NPI, ICNG and the RNP.

Applicable worst-case construction and operational assessment scenarios for the North Zone and the South Zone were developed based on project information outlined in this report. Construction and operational noise levels were predicted and compared to the established NMLs and criteria to assess compliance.

For the noise sensitive receivers R1, R2, R3, R4 and R5, the construction noise levels for the North Zone and South Zone are predicted to be below the ICNG 'highly noise affected management level'; however, they will exceed the ICNG 'noise affected management level'. For passive recreation area R8, the ICNG 'management level' is predicted to be exceeded by the total noise level and by individual equipment (e.g., jackhammer, concrete saw). For commercial receivers R3 and R4, the construction noise from both the North Zone and South Zone were predicted to be below the ICNG 'management level'.

The operational noise assessment concluded that compliance with the NPI PNTLs is achieved at all NSRs.

Cumulative noise impacts are unlikely as no relevant future projects were identified.

The selection of equipment and quantities used should adhere to the sound power levels (per plant item and quantity) assessed. If the sound power level, location or quantity of equipment changes significantly, this assessment should be updated.

Construction and operational road traffic impacts are not expected at the identified NSRs.

11. REFERENCES

- DECC. (2009). *NSW Department of Environment & Climate Change (DECC) (now NSW Department of Climate Change, Energy, the Environment and Water [DCCEEW]), Interim Construction Noise Guideline (ICNG)*.
- DECCW. (2011). *NSW Department of Environment, Climate Change and Water (DECCW) (now NSW Department of Climate Change, Energy, the Environment and Water [DCCEEW]), Road Noise Policy (RNP)*.
- EPA. (2017). *NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI)*.
- Manning, C. J. (1981). *The Propagation of Noise from Petroleum and Petrochemical Complexes to Neighbouring Communities, CONCAWE Report No. 4/81*.
- Standards Australia. (2010). *AS 2436 Guide to noise and vibration control on construction, demolition and maintenance sites*.
- TfNSW. (2023). *Construction Noise and Vibration Guideline Public Transport Infrastructure*.



APPENDIX A

OPERATIONAL NOISE CONTOURS

- No Design Elements (Indicative)**
- 1 UPGRADED PUBLIC BOAT RAMP
 - 2 UPGRADED WILSONS LANDING PICNIC AREA
 - 3 CONTAINER STUFFING/UNSTUFFING
 - 4 CARGO LOADING/UNLOADING AREA AND STORAGE
 - 5 BOAT PARKING FOR TFNSW/MARINE PARKS
 - 6 OCEAN VIEW BOATSHED ADAPTIVE REUSE
 - 7 MARINE RESCUE SHED RETAINED
 - 8 OLD CARGO SHED ADAPTIVE REUSE
 - 9 INFORMAL VIEWING AREA WITH SEATING
 - 10 UPGRADED MARINE INFRASTRUCTURE
 - 11 EXISTING CAR AND/OR TRAILER PARKING RETAINED
 - 12 BIOSECURITY/QUARANTINE SHED
 - 13 AUSTRALIA POST AND STORAGE ROOMS

- ID Receiver Location**
- R1 8 Ocean View Drive
 - R2 25 Lagoon Road
 - R5 Ocean View Apartments
 - R8 Thompson Memorial Park



- Legend**
- Receiver
 - Cadastre
 - Temporarily Secured Area During Vessel Loading/Unloading
 - Proposed Underground Water Tank
 - New Vessel
 - Proposed Hardstand
 - Proposed Berthing Dolphin
 - Proposed Timber Deck
 - Proposed Tree
 - Proposed Turf Area
 - Item to be removed
 - Project Area

- Operational Noise Contours, $L_{Aeq, 15(\text{min})}$**
- 30
 - 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65
 - 70
 - 75
- Noise Source**
- Generator
 - Mobile Crane
 - 1 X Medium Forklift, 4 X Small Forklift
 - 5 X Trucks
 - Industrial building, room 4

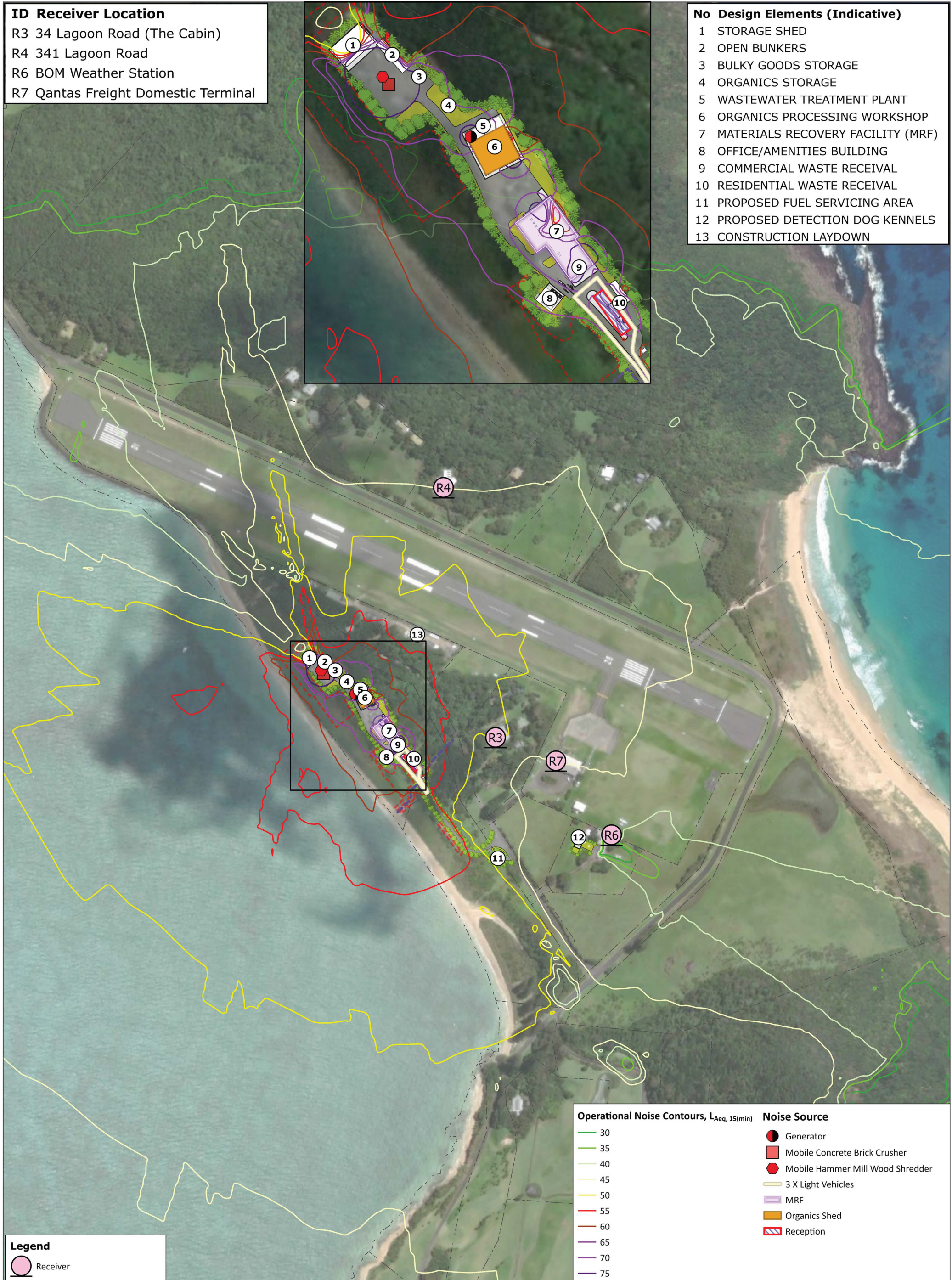
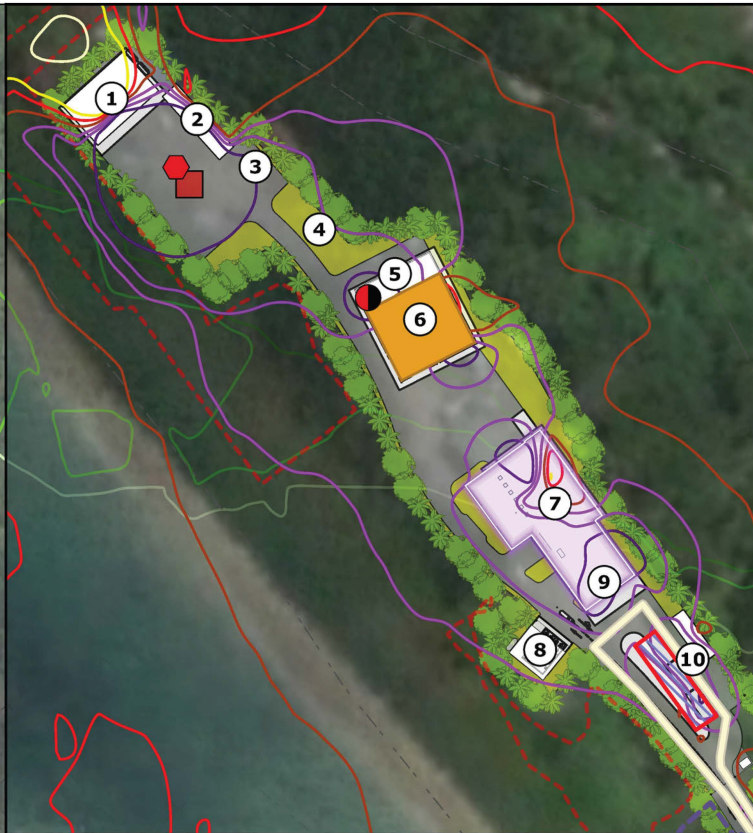
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Appendix A1 Operational Noise Contours – Noise-enhancing Meteorological Conditions – North Zone

LHI CIP
Environmental Impact Statement
Client: DCCEEW (NSW) on behalf of LHIB c/o APP Group

ID Receiver Location
 R3 34 Lagoon Road (The Cabin)
 R4 341 Lagoon Road
 R6 BOM Weather Station
 R7 Qantas Freight Domestic Terminal

- No Design Elements (Indicative)**
- 1 STORAGE SHED
 - 2 OPEN BUNKERS
 - 3 BULKY GOODS STORAGE
 - 4 ORGANICS STORAGE
 - 5 WASTEWATER TREATMENT PLANT
 - 6 ORGANICS PROCESSING WORKSHOP
 - 7 MATERIALS RECOVERY FACILITY (MRF)
 - 8 OFFICE/AMENITIES BUILDING
 - 9 COMMERCIAL WASTE RECEIVAL
 - 10 RESIDENTIAL WASTE RECEIVAL
 - 11 PROPOSED FUEL SERVICING AREA
 - 12 PROPOSED DETECTION DOG KENNELS
 - 13 CONSTRUCTION LAYDOWN



- Legend**
- Receiver
 - Existing Walking Track
 - Cadastre
 - Proposed New/Upgraded Road
 - Proposed Tree
 - Proposed Turf Area
 - Proposed Hardstand

- Operational Noise Contours, $L_{Aeq, 15min}$**
- 30
 - 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65
 - 70
 - 75
- Noise Source**
- Generator
 - Mobile Concrete Brick Crusher
 - Mobile Hammer Mill Wood Shredder
 - 3 X Light Vehicles
 - MRF
 - Organics Shed
 - Reception

Coordinate System:
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 Date: 30/09/2025
 Created By: MB/IS
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Appendix A2 Operational Noise Contours – Noise-enhancing Meteorological Conditions – South Zone

LHI CIP
Environmental Impact Statement
 Client: DCCEEW (NSW) on behalf of LHIB c/o APP Group



APPENDIX B MASTERPLAN SITE PLAN DRAWINGS

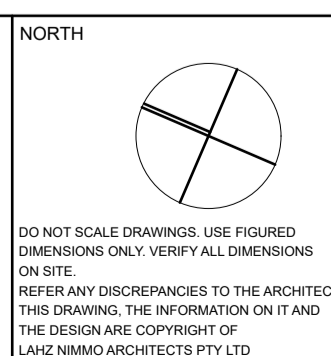


1 PROPOSED SITE PLAN - NORTH ZONE
1:500

REV	DESCRIPTION	DATE	AMENDMENTS IN CURRENT REVISION (SHOWN CLOUDED ON DRAWINGS)	TITLE
01	ISSUE FOR INFORMATION	23/5/2025	No.	AMENDMENT DESCRIPTION
02	DRAFT ISSUE	20/6/2025		
03	QS BRIEFING PACK	26/6/2025		
04	DRAFT 20% CONCEPT DESIGN ISSUE	6/8/2025		

TITLE	TITLE	TITLE	LEGEND

TITLE	TITLE	TITLE



CLIENT
Department of Climate Change,
Energy, the Environment and Water
(DCCEEW), NSW National Parks and
Wildlife (NPWS) Service with Lord
Howe Island Board (LHIB)

PROJECT TITLE
**CRITICAL INFRASTRUCTURE PROGRAM LORD
HOWE ISLAND**

SCALE CHECK

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LOCATION		TITLE	
NORTH ZONE		PROPOSED SITE PLAN	
REVIEW	DIRECTOR SIGNATURE	DATE	SCALE @A1
TENDER			BG 6/8/2025 1:500
CHECKED		PROJECT NO.	DRAWING NO.
BC		24-05	A - D A - 11.0.2
			REV. NO 04



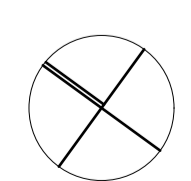
1 PROPOSED SITE PLAN - SOUTH ZONE
1:500

REV	DESCRIPTION	DATE	AMENDMENTS IN CURRENT REVISION (SHOWN CLOUDED ON DRAWINGS)	TITLE
01	ISSUE FOR INFORMATION	23/5/2025	No.	AMENDMENT DESCRIPTION
02	DRAFT ISSUE	20/6/2025		
03	QS BRIEFING PACK	26/6/2025		
04	DRAFT 20% CONCEPT DESIGN ISSUE	6/8/2025		

TITLE	TITLE	TITLE	LEGEND


TITLE	TITLE	TITLE

NORTH



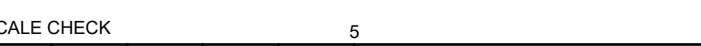
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Howe Island Board (LHIB)



PROJECT TITLE
CRITICAL INFRASTRUCTURE PROGRAM LORD HOWE ISLAND

SCALE CHECK



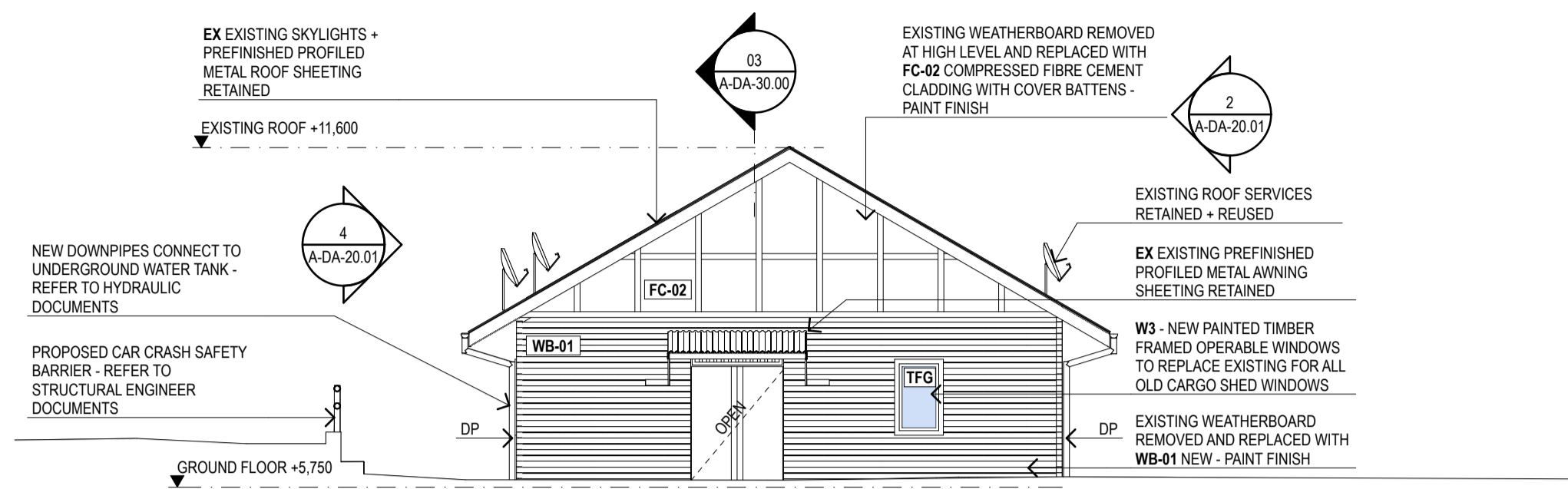
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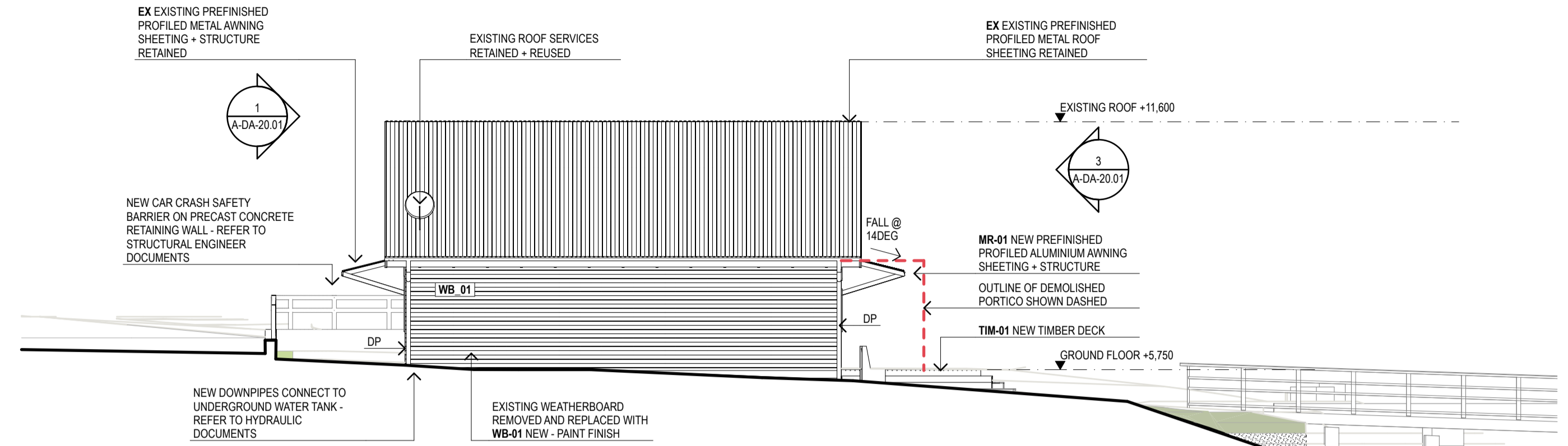
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REVIEW	DIRECTOR SIGNATURE	DATE	SCALE @A1
TENDER			BG 6/8/2025 1:500
CHECKED	PROJECT NO.	DRAWING NO.	REV. NO.
BC	24-05	A - D A - 11.14	04



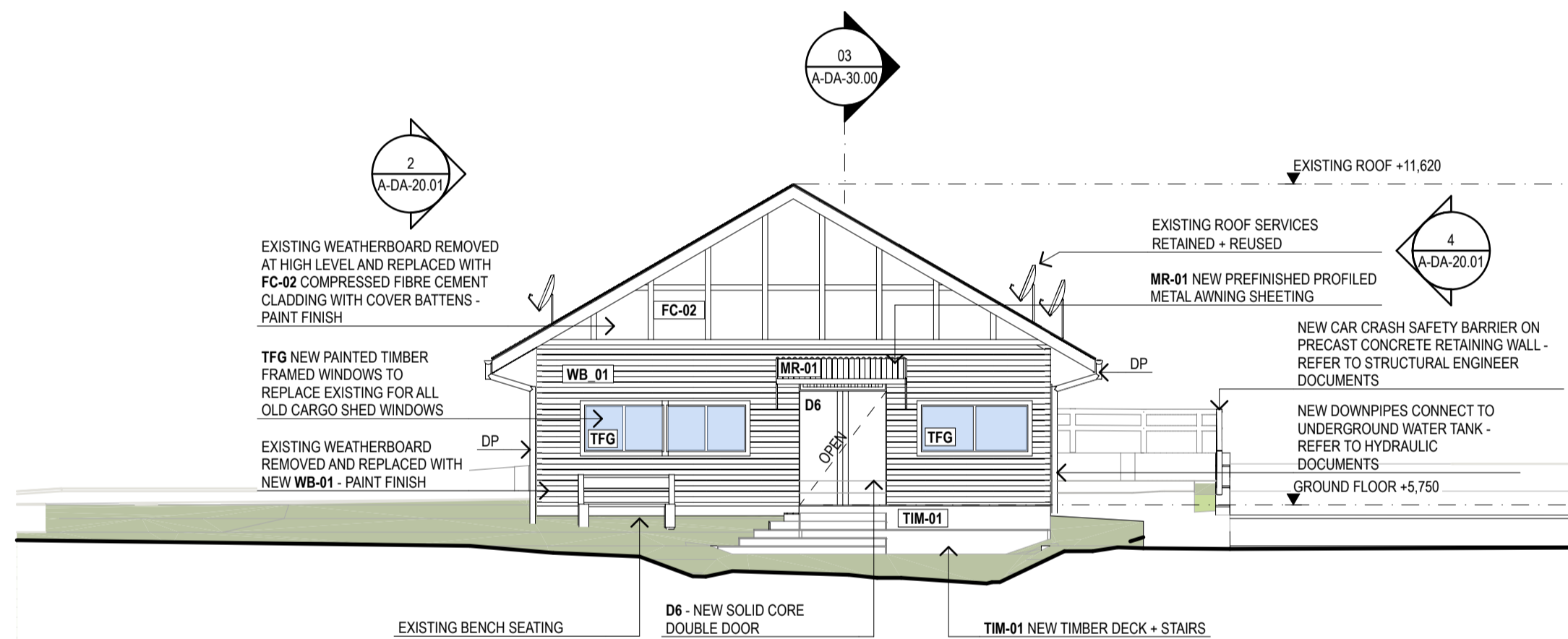
APPENDIX C MASTERPLAN ELEVATION DRAWINGS



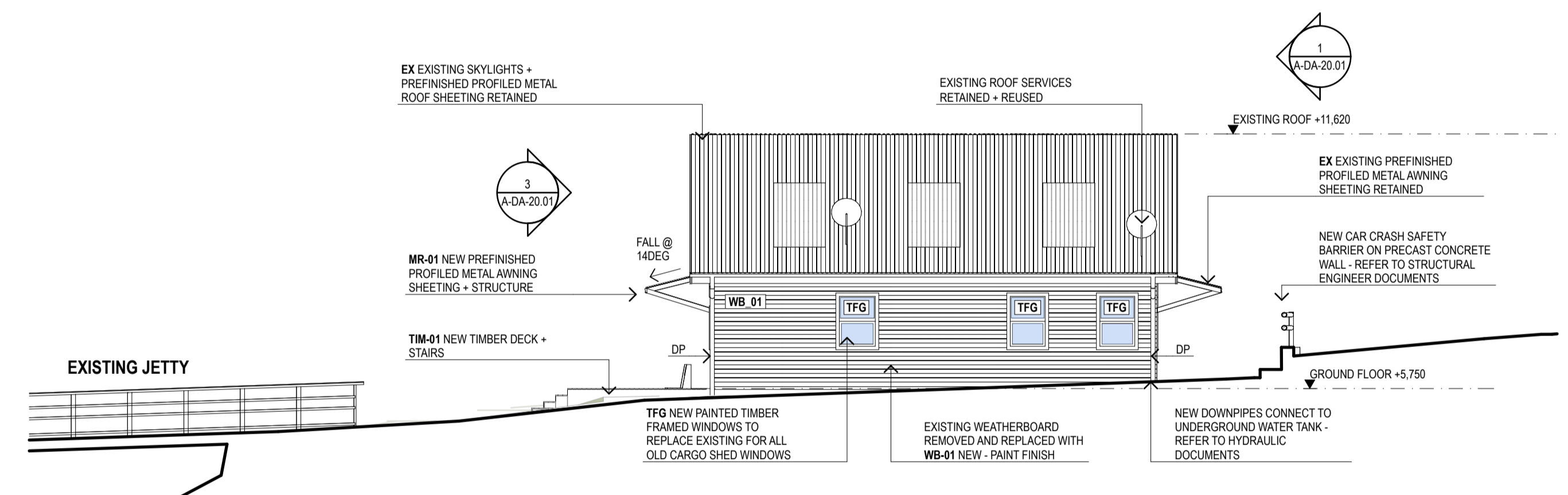
1 OLD CARGO SHED ELEVATION
1:100



2 OLD CARGO SHED ELEVATION
1:100



3 OLD CARGO SHED ELEVATION
1:100



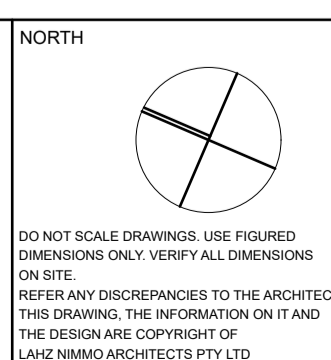
4 OLD CARGO SHED ELEVATION
1:100

FINISHES CODES			
AFG	ALUMINIUM FIXED GLASS	MC-01	METAL CLADDING
BV	BLACK VINYL SKIRTING	MR-01	METAL ROOF
CON	CONCRETE FLOOR	MR-02	METAL ROOF
CFC	COMPRESSED FIBRE CEMENT	PB	PLASTERBOARD
CT-01	CEILING TYPE	PC	PRECAST CONCRETE
CT-02	CEILING TYPE	PY	POLYCARBONATE
CT-03	CEILING TYPE	SCN-01	SCREEN
CV	COVED SKIRTING	SCN-02	SCREEN
EP	EPOXY	SH	SHADE COVER
EX	EXISTING	SF	SOFFIT
FC-01	FIBRE CEMENT	TFG	TIMBER FIXED GLASS
FC-02	FIBRE CEMENT	TIM-01	TIMBER
FC-03	FIBRE CEMENT	VIN-01	VINYL FLOOR
FC-04	FIBRE CEMENT	VIN-02	VINYL WALL
LIN-01	LINOLEUM FLOOR	WB-01	WEATHERBOARDS
LV	LOUVRES		

REV	DESCRIPTION	DATE	AMENDMENTS IN CURRENT REVISION (SHOWN CLOUDED ON DRAWINGS)	TITLE
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03	03 BRIEFING PACK	26/6/2025		
04	DRAFT 20% CONCEPT DESIGN ISSUE	6/8/2025		

TITLE	TITLE	TITLE	LEGEND

TITLE	TITLE	TITLE



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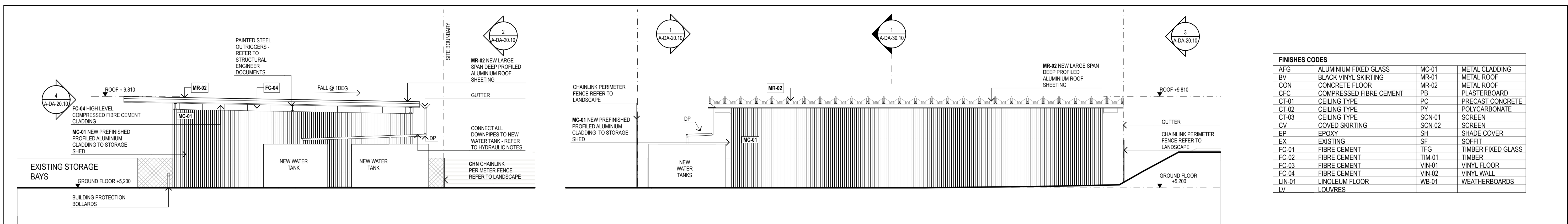
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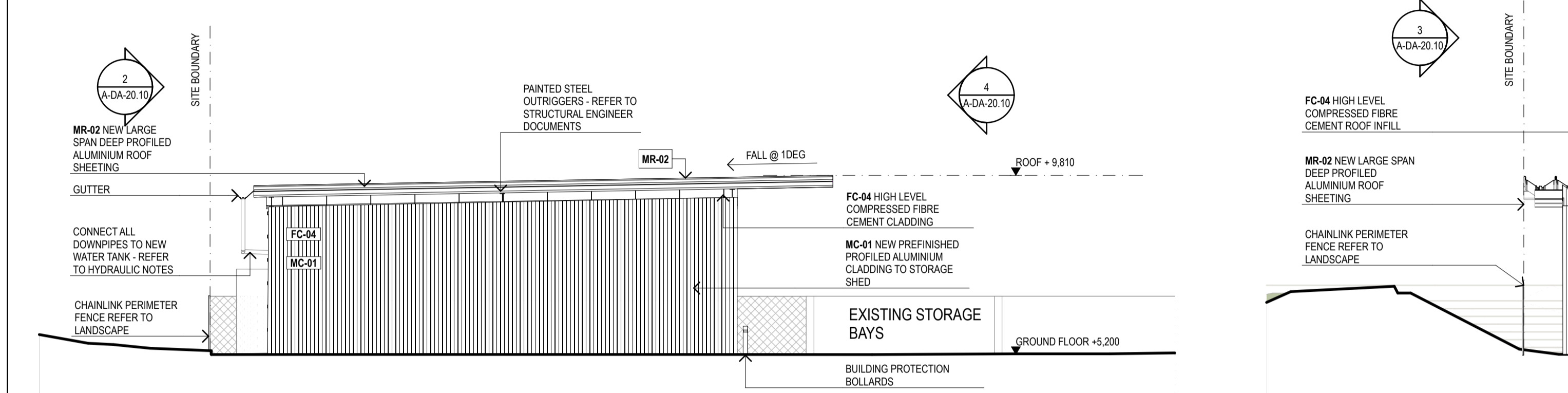
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ELEVATIONS	6/8/2025	1:100	
CHECKED	PROJECT NO.	DRAWING NO.	
BC	24-05	A - D A - 2 0 . 0 1	04



FINISHES CODES			
AFG	ALUMINIUM FIXED GLASS	MC-01	METAL CLADDING
BV	BLACK VINYL SKIRTING	MR-01	METAL ROOF
CON	CONCRETE FLOOR	MR-02	METAL ROOF
CFC	COMPRESSED FIBRE CEMENT	PB	PLASTERBOARD
CT-01	CEILING TYPE	PC	PRECAST CONCRETE
CT-02	CEILING TYPE	PY	POLYCARBONATE
CT-03	CEILING TYPE	SCN-01	SCREEN
CV	COVED SKIRTING	SCN-02	SCREEN
EP	EPOXY	SH	SHADE COVER
EX	EXISTING	SF	SOFFIT
FC-01	FIBRE CEMENT	TFG	TIMBER FIXED GLASS
FC-02	FIBRE CEMENT	TIM-01	TIMBER
FC-03	FIBRE CEMENT	VIN-01	VINYL FLOOR
FC-04	FIBRE CEMENT	VIN-02	VINYL WALL
LIN-01	LINOLEUM FLOOR	WB-01	WEATHERBOARDS
LV	LOUVRES		

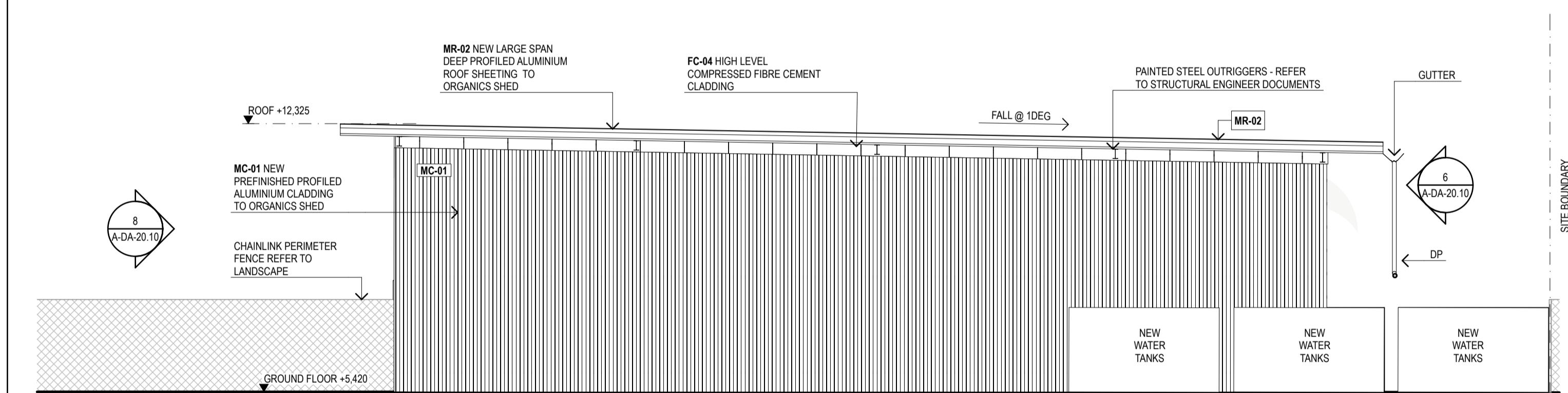
1 STORAGE SHED ELEVATION
1:100

2 STORAGE SHED ELEVATION
1:100

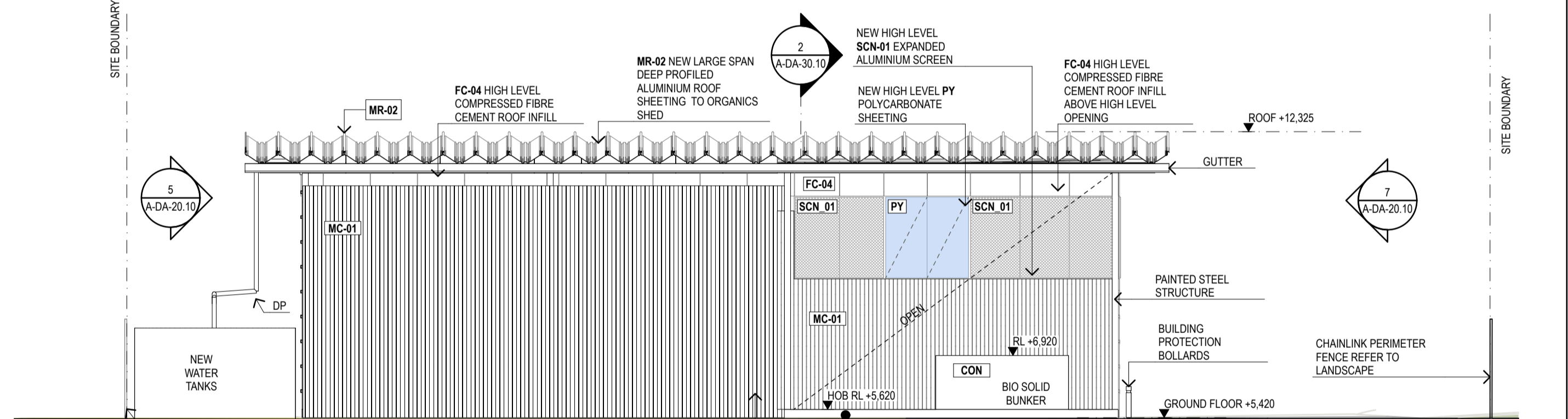


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1:100

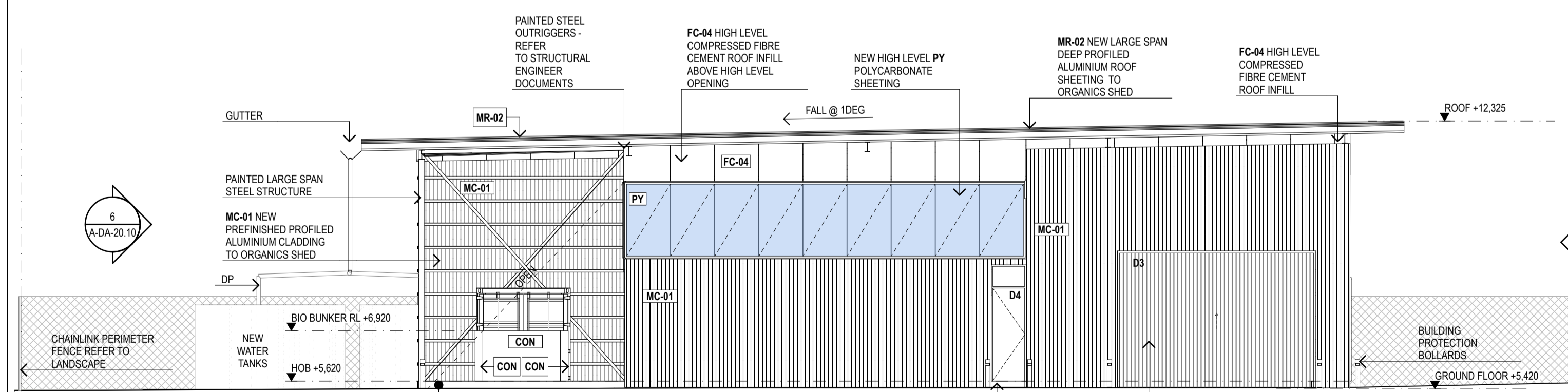
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1:100



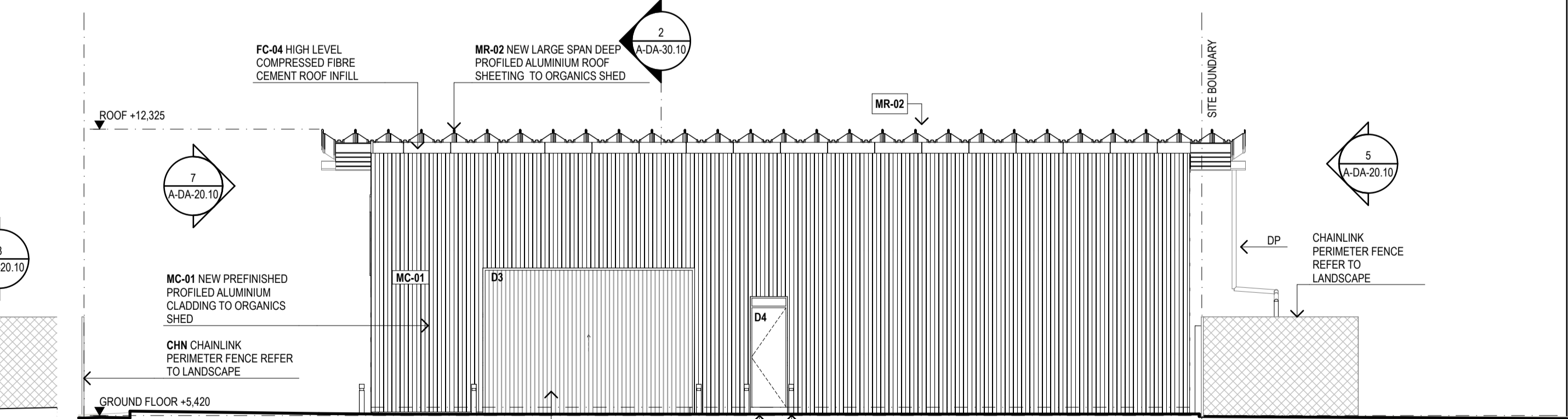
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1:100



6 ORGANICS SHED ELEVATION
1:100



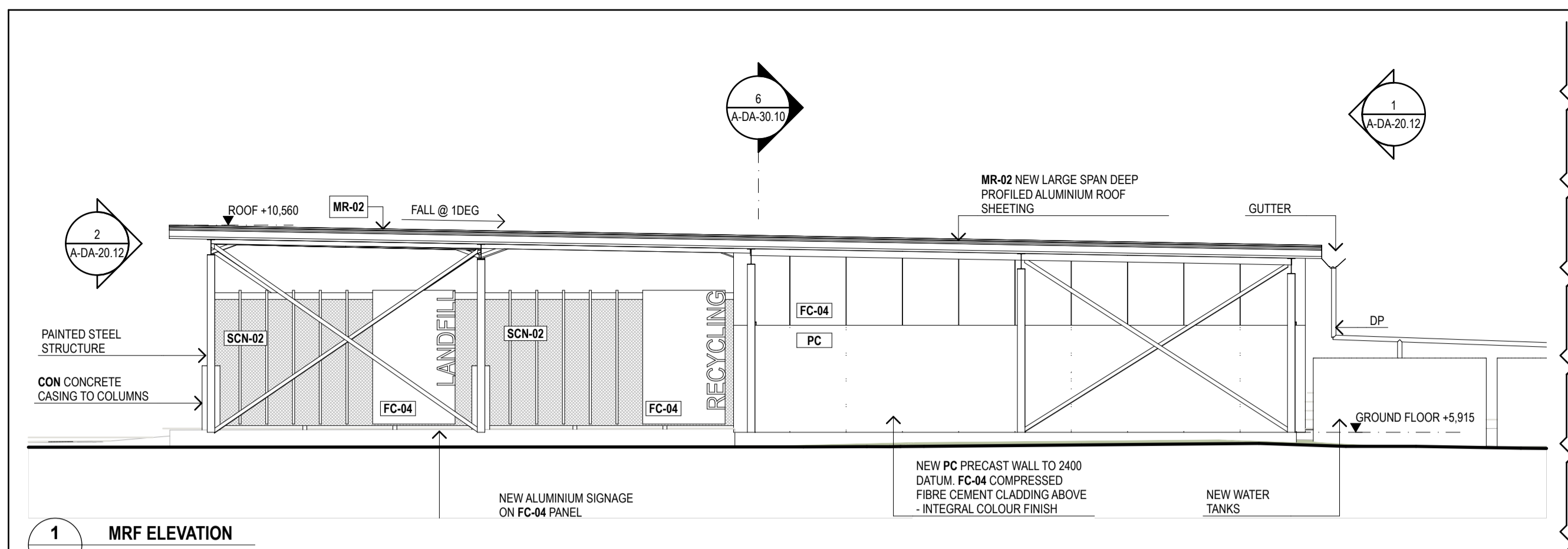
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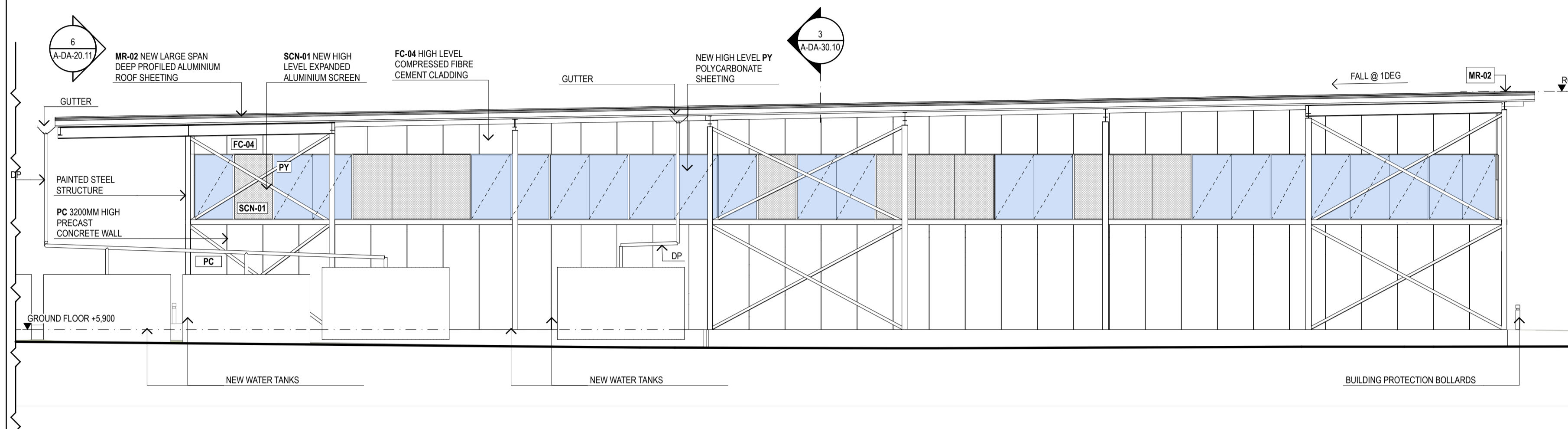
8 ORGANICS SHED ELEVATION
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REV	DESCRIPTION	DATE	AMENDMENTS IN CURRENT REVISION (SHOWN CLOUD ON DRAWINGS)	TITLE	TITLE	TITLE	LEGEND
01	ISSUE FOR INFORMATION	23/5/2025					
02	ISSUE FOR INFORMATION	17/6/2025					
03	DRAFT ISSUE	20/6/2025					
04	DS BRIEFING PACK	26/6/2025					
05	DRAFT 20% CONCEPT DESIGN ISSUE	6/8/2025					

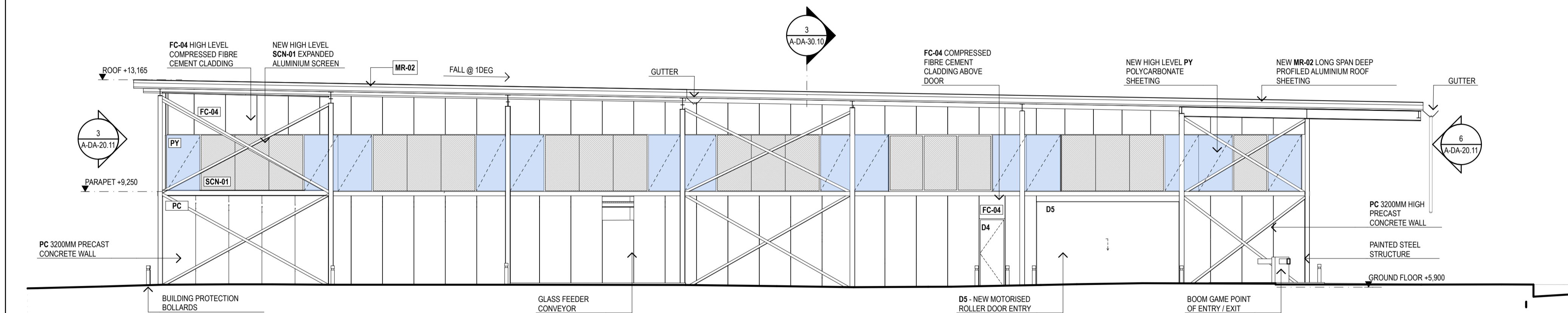
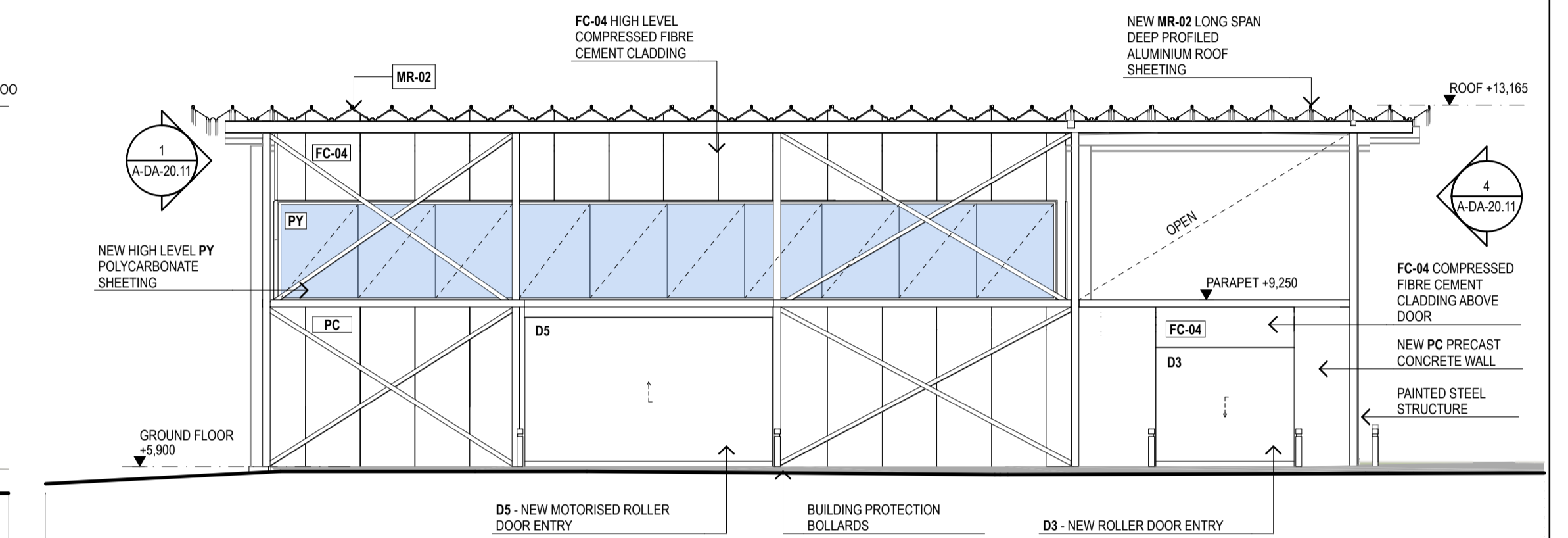
<p>NORTH</p> <p>DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS ON SITE. REFER ANY DISCREPANCIES TO THE ARCHITECT. THIS DRAWING, THE INFORMATION ON IT AND THE DESIGN ARE COPYRIGHT OF LAHZNIMMO ARCHITECTS PTY LTD.</p>	<p>CLIENT Department of Climate Change, Energy, the Environment and Water (DCCEEW), NSW National Parks and Wildlife (NPWS) Service with Lord Howe Island Board (LHIB)</p>	<p>PROJECT TITLE CRITICAL INFRASTRUCTURE PROGRAM LORD HOWE ISLAND</p> <p>SCALE CHECK</p>	<p>lahznimmo architects Suite 404, Flourmill Studios 3 Gladstone St Newtown NSW 2042 Australia www.lahznimmo.com</p> <p>T 62 9550 5200 F 62 9550 5233</p>	<p>LOCATION SOUTH ZONE</p>	
				<p>TITLE ELEVATIONS</p>	
<p>REVIEW</p>	<p>DIRECTOR SIGNATURE</p>	<p>DATE</p>	<p>DRAWN BG</p>	<p>PLOT DATE 6/8/2025</p>	<p>SCALE @A1 1:100</p>
<p>TENDER</p>	<p>CONST</p>	<p>CHECKED BC</p>	<p>PROJECT NO. 24-05</p>	<p>DRAWING NO. A - D A - 2 0 . 1 0</p>	<p>REV. NO 05</p>



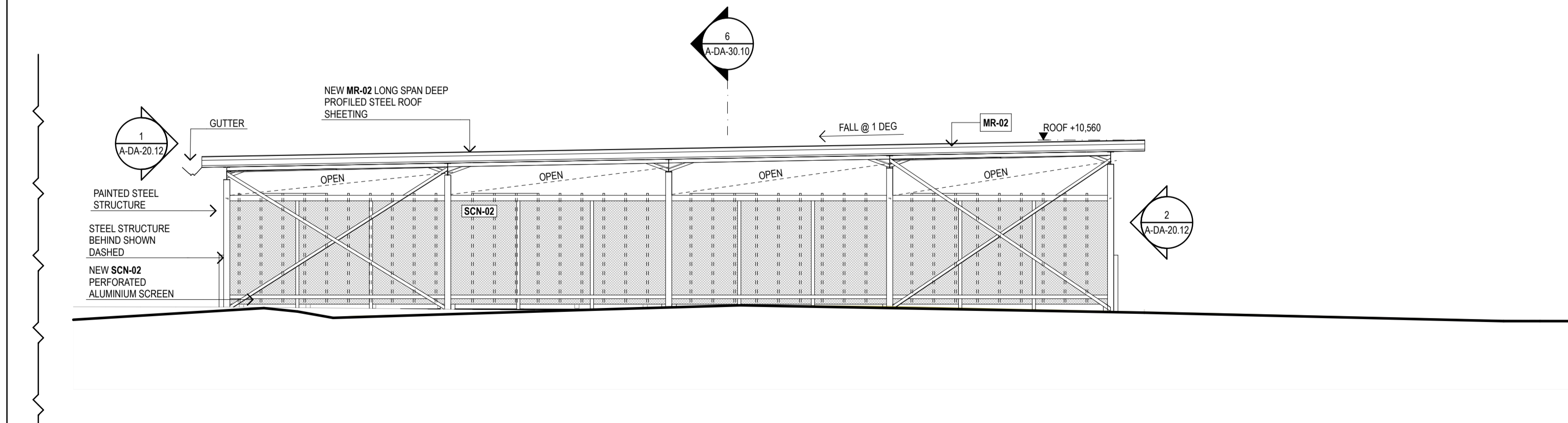
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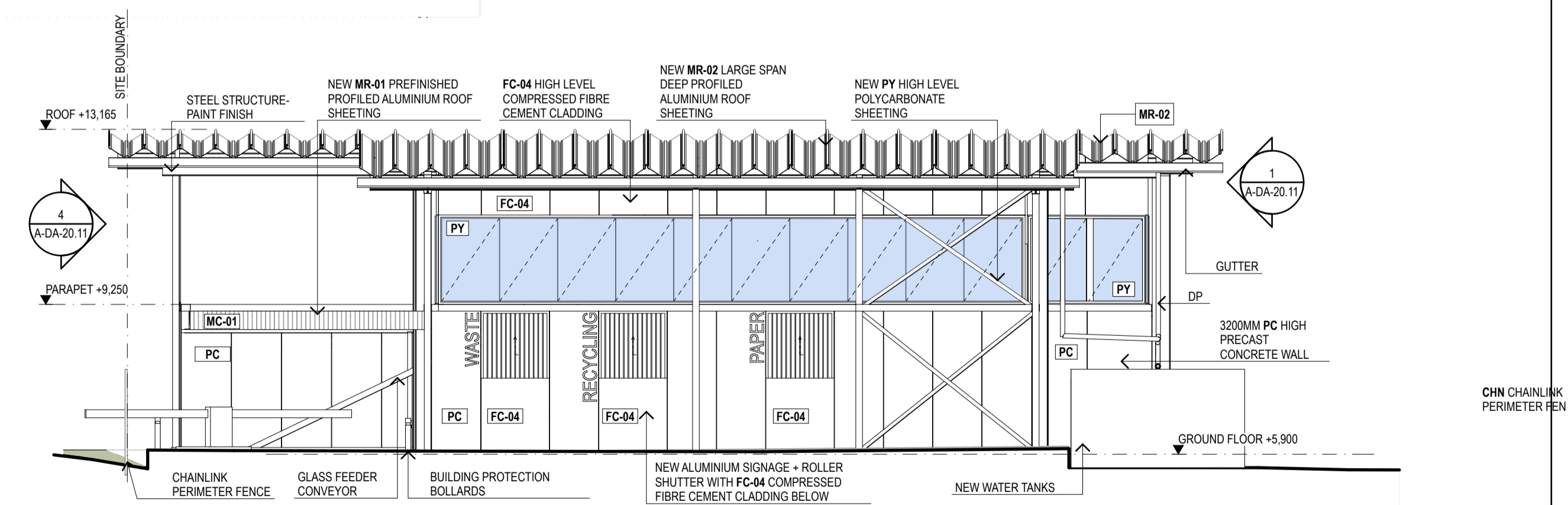
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1:100



4 MRF ELEVATION
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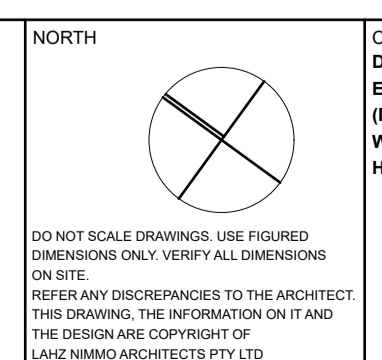
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FINISHES CODES			
AFG	ALUMINIUM FIXED GLASS	MC-01	METAL CLADDING
BV	BLACK VINYL SKIRTING	MR-01	METAL ROOF
CON	CONCRETE FLOOR	MR-02	METAL ROOF
CFC	COMPRESSED FIBRE CEMENT	PB	PLASTERBOARD
CT-01	CEILING TYPE	PC	PRECAST CONCRETE
CT-02	CEILING TYPE	PY	POLYCARBONATE
CT-03	CEILING TYPE	SCN	SCREEN
CV	COVED SKIRTING	SCN-01	SCREEN
EP	EPOXY	SCN-02	SCREEN
EX	EXISTING	SH	SHADE COVER
FC-01	FIBRE CEMENT	SF	SOFFIT
FC-02	FIBRE CEMENT	TFG	TIMBER FIXED GLASS
FC-03	FIBRE CEMENT	TIM-01	TIMBER
FC-04	FIBRE CEMENT	VIN-01	VINYL FLOOR
LIN-01	LINOLEUM FLOOR	VIN-02	VINYL WALL
LV	LOUVRES	WB-01	WEATHERBOARDS

REV	DESCRIPTION	DATE	AMENDMENTS IN CURRENT REVISION (SHOWN CLOUDED ON DRAWINGS)	TITLE
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04	DS BRIEFING PACK	26/6/2025		
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TITLE	TITLE	TITLE	LEGEND



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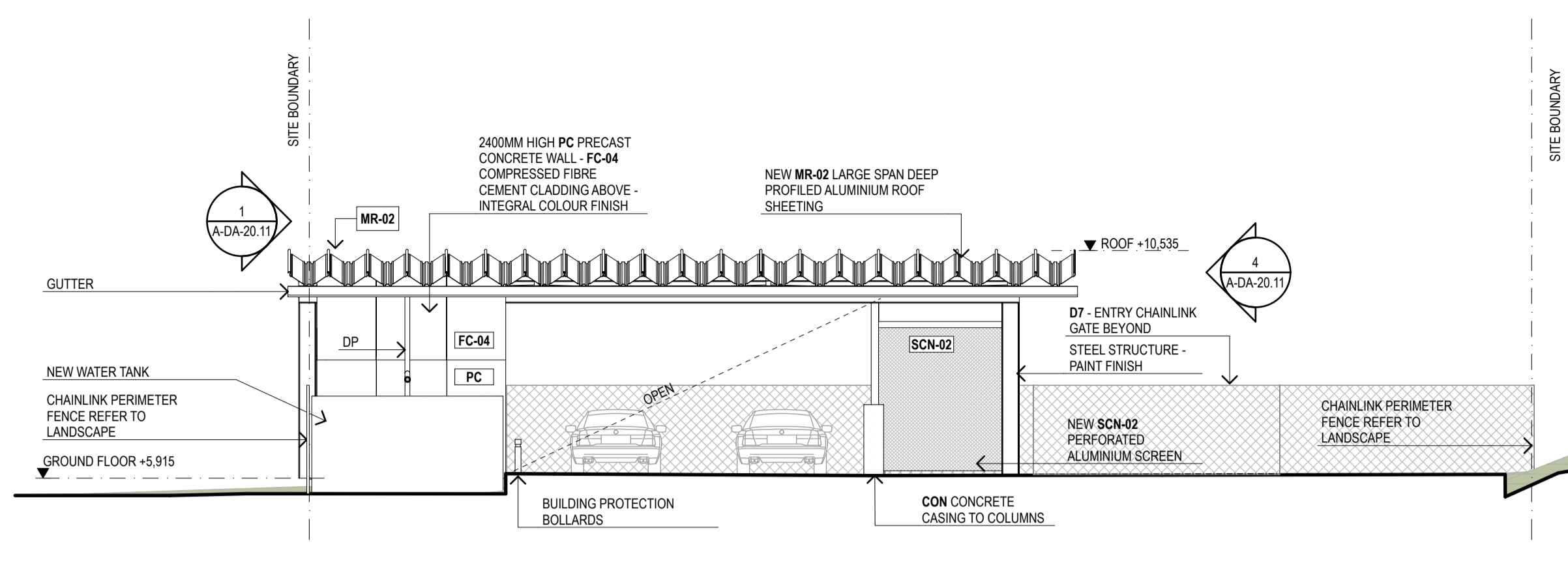
PROJECT TITLE
**CRITICAL INFRASTRUCTURE PROGRAM LORD
HOWE ISLAND**

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10

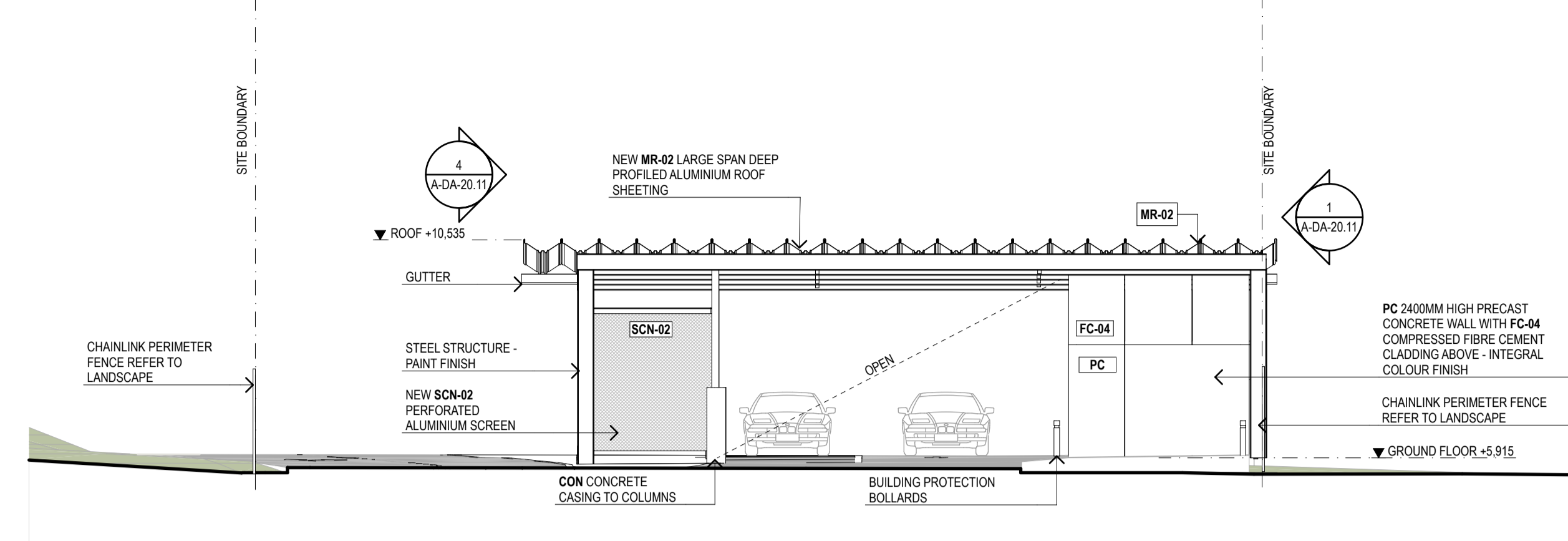
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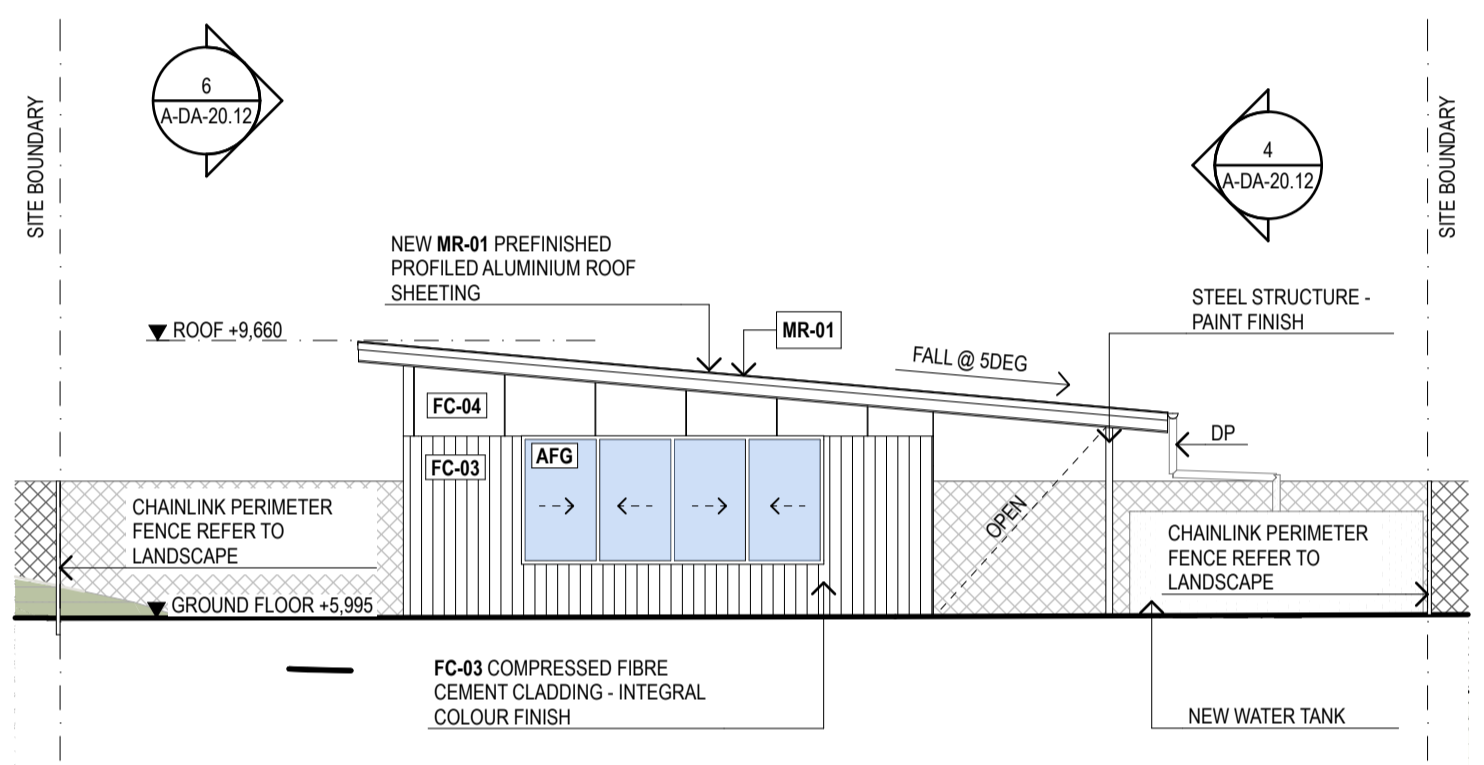
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SOUTH ZONE		ELEVATIONS	
REVIEW	DIRECTOR SIGNATURE	DATE	SCALE @A1
TENDER		6/8/2025	1:100
CHECKED	BC	PROJECT NO.	DRAWING NO.
		24-05	A - D A - 2 0 . 1 1
			REV. NO
			05



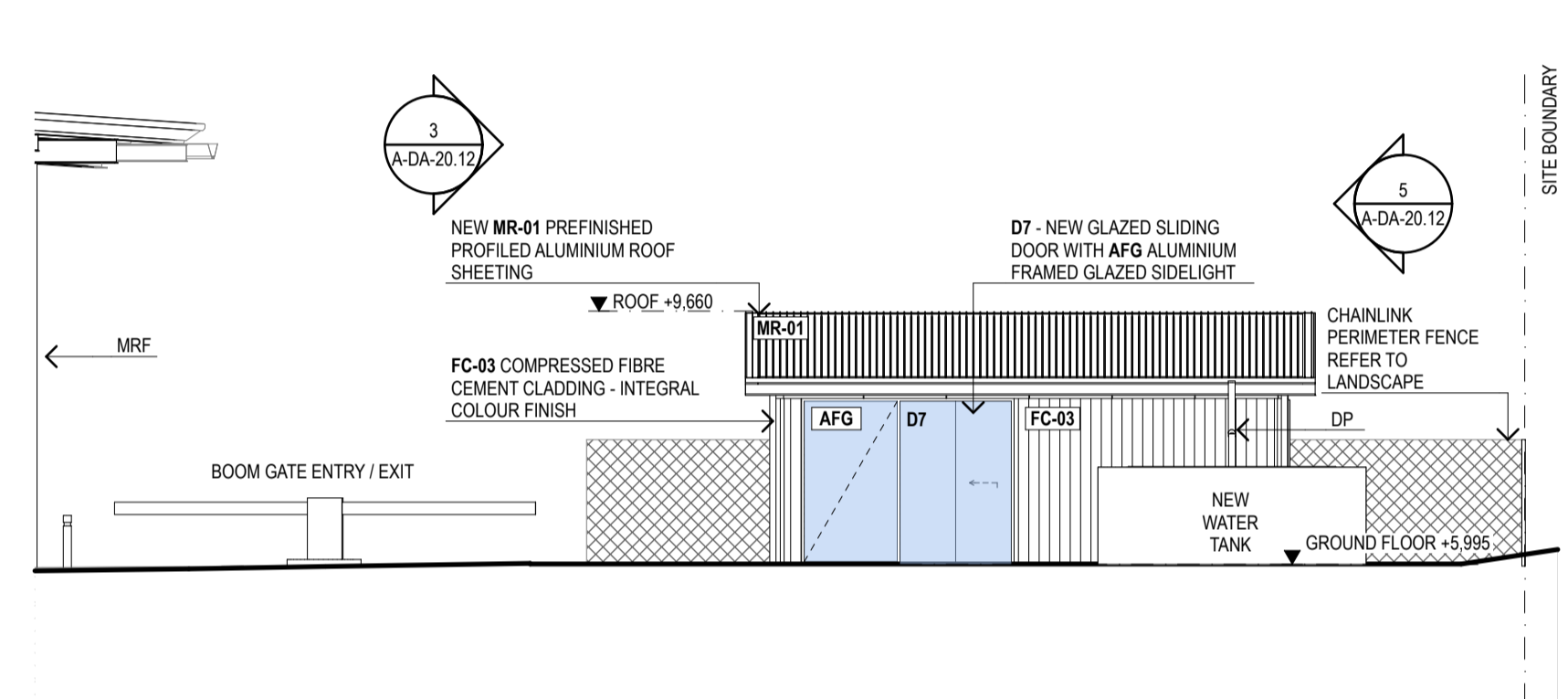
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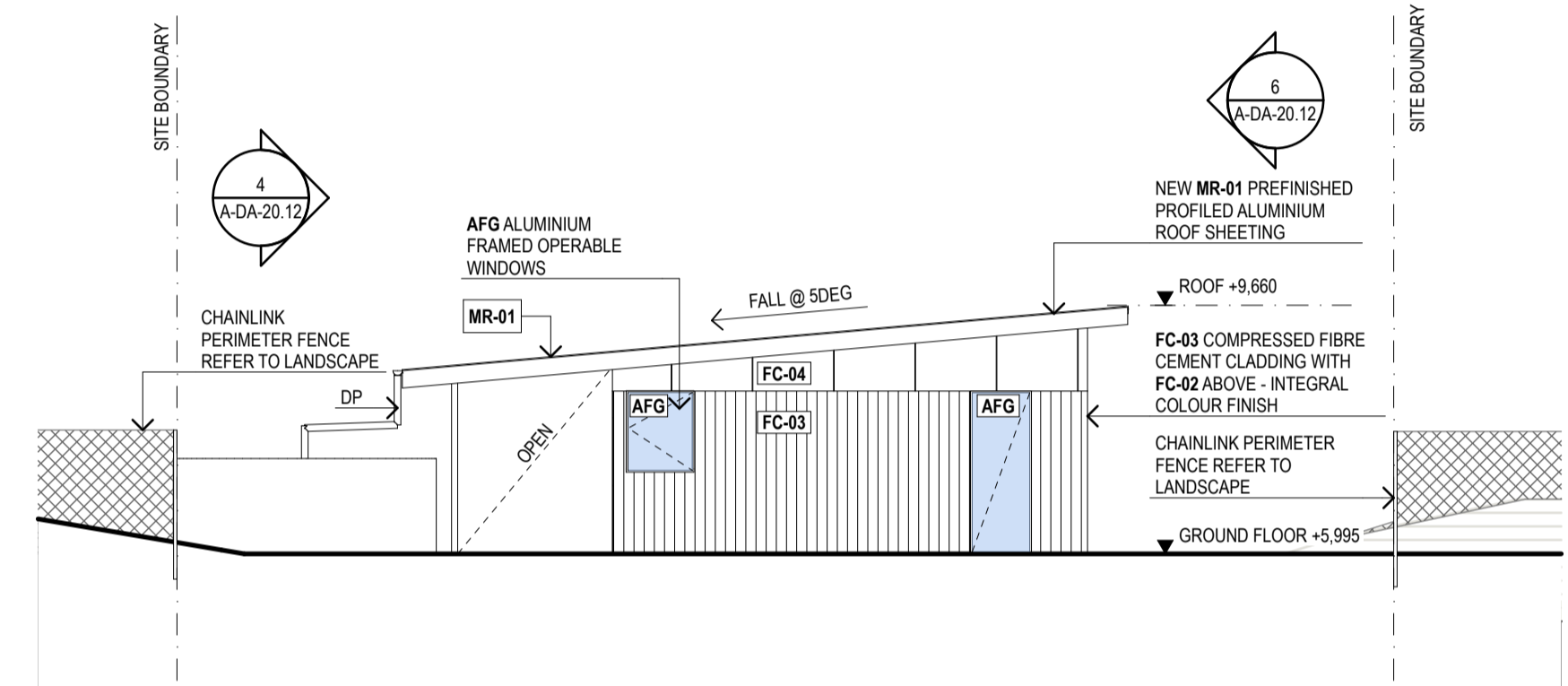
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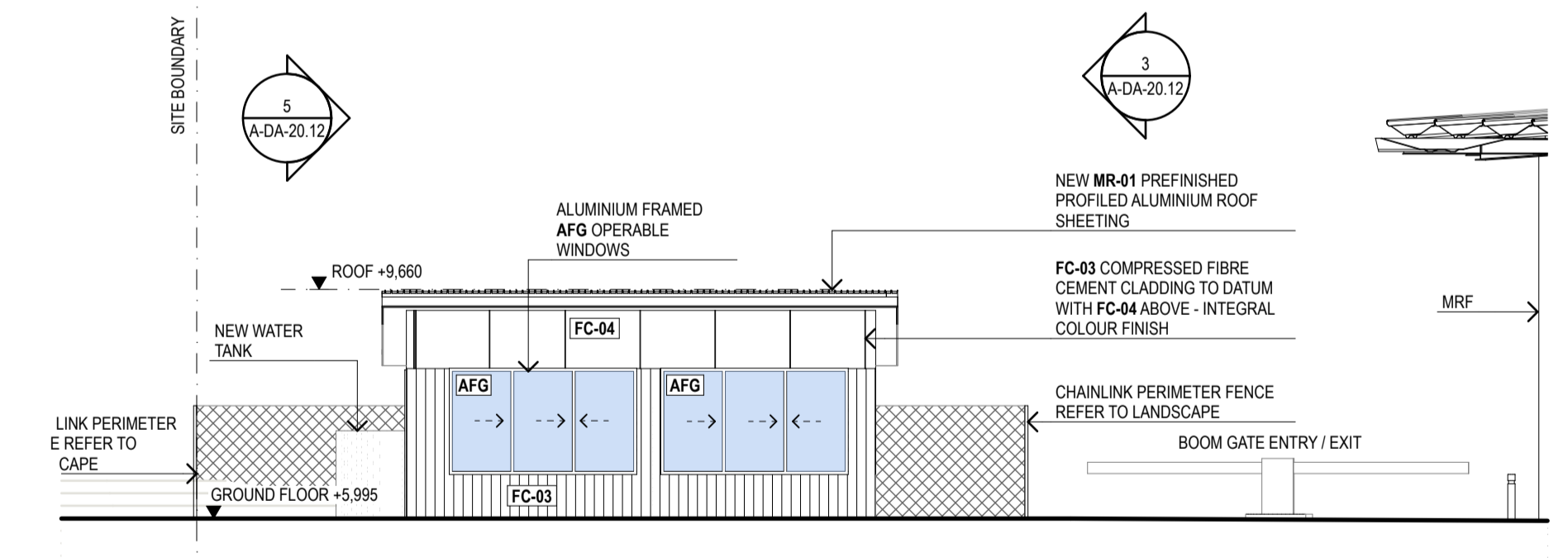
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4 OFFICE ELEVATION
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5 OFFICE ELEVATION
1:100



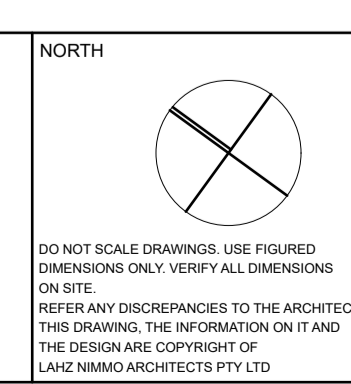
6 OFFICE ELEVATION
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FINISHES CODES			
AFG	ALUMINIUM FIXED GLASS	MC-01	METAL CLADDING
BV	BLACK VINYL SKIRTING	MR-01	METAL ROOF
CON	CONCRETE FLOOR	MR-02	METAL ROOF
CFC	COMPRESSED FIBRE CEMENT	PB	PLASTERBOARD
CT-01	CEILING TYPE	PC	PRECAST CONCRETE
CT-02	CEILING TYPE	PY	POLYCARBONATE
CT-03	CEILING TYPE	SCN-01	SCREEN
CV	COVERED SKIRTING	SCN-02	SCREEN
EP	EPOXY	SH	SHADE COVER
EX	EXISTING	SF	SOFFIT
FC-01	FIBRE CEMENT	TFG	TIMBER FIXED GLASS
FC-02	FIBRE CEMENT	TIM-01	TIMBER
FC-03	FIBRE CEMENT	VIN-01	VINYL FLOOR
FC-04	FIBRE CEMENT	VIN-02	VINYL WALL
LIN-01	LINOLEUM FLOOR	WB-01	WEATHERBOARDS
LV	LOUVRES		

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TITLE	TITLE	TITLE	LEGEND

TITLE	TITLE	TITLE



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LOCATION SOUTH ZONE			
TITLE			
ELEVATIONS			
REVIEW	DIRECTOR SIGNATURE	DATE	SCALE @A1
TENDER			BG 6/8/2025 1:100
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