



Cowman Stoddart Pty Ltd

PO Box 738

NOWRA NSW 2541

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6 December 2021

Attention: Mr. S Richardson

Dear Steve,

**Re: Flood Compliance Report for Proposed Amendment to Planning Modification 17,
Shoalhaven Starches Expansion Project, Mod 24**

This letter has been prepared by R W Dewar BSc, MEngSci, MIEAust CPEng Member No 477618 who has over 37 years of experience of floodplain management in NSW.

1 Introduction

1.1 WMAwater's report of 1st May 2020

WMAwater's flood impact assessment report of 1st May 2020 for Shoalhaven Starches Pty Ltd included amendments to Planning Modification 17 as detailed below:

1. Amend the siting and footprint of the Product Dryer building (Gluten Dryer No. 8 or GD8) from that which was approved under Modification 16.
2. Extend Specialty Products Building (SPB) to the north and to provide Bulk Chemical Storage to the south of the Product Dryer Building.
3. Part of the existing stores and maintenance offices buildings will be demolished.
4. The existing Maintenance workshop that will be retained will be altered internally to provide staff amenities and plant operational control rooms.
5. Changed internal truck movements associated with SPB will necessitate the removal of 48 carparks which are currently located adjacent to the existing Maintenance Store and Workshop. It is proposed to include the proposed Area 3 car park, north side of Bolong Road to the east of the fire pump house, in Modification 17.
6. Sifter room extension.

1.2 Proposed Amendments to GD8 Building

Shoalhaven Starches have recently been undertaking more detailed design for the construction of the GD8 building referred to above in our flood impact assessment report of 1st May 2020. Shoalhaven Starches have identified that the following amendments are required to this building (refer to Appendix A for plans of the works).

- The GD8 building needs to be fire separated from the SPB. Under Mod 17 the GD8 building adjoined the SPB. It is now proposed to set the GD8 building 6 metres from the SPB to provide sufficient fire separation under the Building Code of Australia (BCA). This shifts the building to the west.

WMAwater Pty Ltd

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- The separation of these buildings will also provide the benefit of allowing operational access to remove / install equipment for maintenance purposes.
- In addition, internal dimensions of the building have also been required to be amended to accommodate paths of travel within the building that comply with the BCA, as well as improve operational manoeuvrability.
- In addition, it is also proposed to provide a stair tower adjacent to the western wall of the relocated GD8 building to provide compliant paths of travel under the BCA which has further added to the footprint of the proposal.
- To accommodate the shifting of the GD8 building footprint to the west as proposed it is now proposed to demolish the Maintenance Building which the GD8 building was to originally adjoin under Mod 17.
- The roof of the GD8 building has also been raised to provide a skillion roof form to improve stormwater design to better meet BCA requirements.
- The above amendments to the design and positioning of the GD8 building will require approval from the Department of Planning, Industry and Environment as a new Modification Application (Mod 24).

This current report relates to the above changes to the GD8 building that was originally approved under Mod 16 and then subsequently extended under Mod 17 of the Shoalhaven Starches Expansion Project. WMAwater's 1st May 2020 flood compliance assessment report detailed the flooding assessment relating to Mod 17.

As the GD8 building is on land inundated in the 1% Annual Exceedance Probability (AEP) flood event by floodwaters from the Shoalhaven River, this letter provides an assessment of the implications of these proposed amendments on flood levels.

Background to the flooding assessment has not been repeated herein but is documented in WMAwater's 1st May 2020 flood compliance assessment report.

2 Objectives of this Report

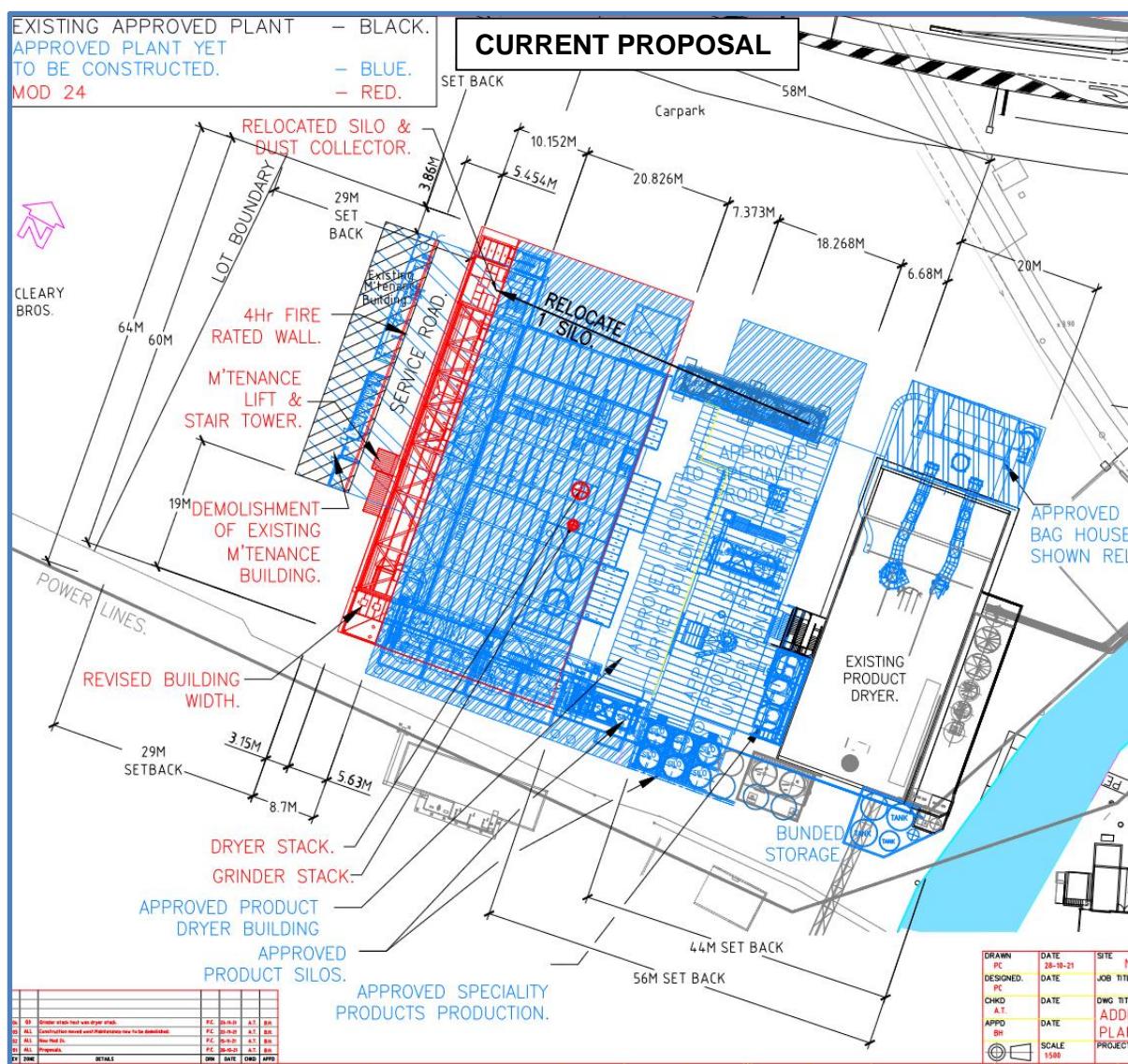
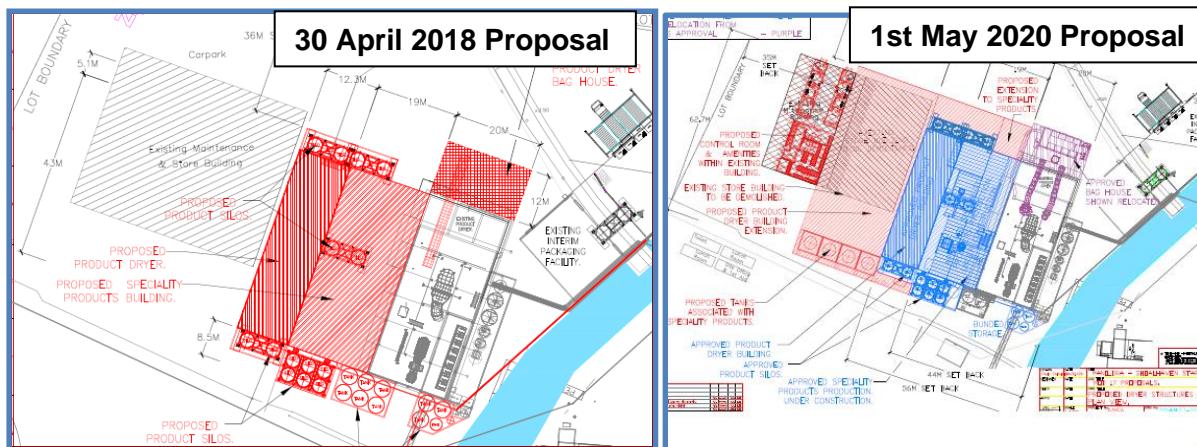
The objectives of this report are to provide a comparison of the changes in peak levels between the proposed works to the GD8 building (Section 1.2) and those provided in our 1st May 2020 flood compliance assessment report (Section 1.1).

This report does not describe compliance of the proposed amendments with Shoalhaven City Council's Chapter G9: Development on Flood Prone Land (DCP2014 Amended 1st July 2015) as the proposed changes do not alter the outcomes provided in our 1st May 2020 flood compliance assessment report.

3 Hydraulic Impact Assessment

3.1 Modifications to GD8 Building

The figures below indicate the changes in building outlines between those contained in our 30 April 2018 report, our 1st May 2020 report and those currently proposed in Section 1.2 and in Appendix A.



3.2 Modelling Approach

The hydraulic effects (change in flood levels) of the proposed works were analysed using the TUFLOW hydraulic model established for the Shoalhaven Starches 2013 *Shoalhaven River Flood Study* and used in our 30 April 2018 and 1st May 2020 assessments. This model was calibrated to

match the historical flood level data for the 1974, 1975, 1978 and 1988 floods and used to provide updated design flood levels for the Shoalhaven River downstream of Nowra.

The modelling process was to compare the *Current Proposed* scenario peak flood levels in each grid cell to the *Existing* scenario adopted in our 1st May 2020 report (results shown on Figures A to D). The *Existing* scenario represents the existing floodplain including all proposed but un-built approved Shoalhaven Starches structures at the time of our 1st May 2020 report.

In addition, the *Current Proposed* scenario was compared to the 1st May 2020 *Proposed* scenario (results shown on Figures 1 to 4). The 1st May 2020 *Proposed* scenario reflects the 1st May 2020 *Existing* scenario floodplain but including the works proposed in our 1st May 2020 report.

The comparison between the scenarios is termed a flood impact map with the different colours reflecting the change in peak water levels. In summary the purple tones reflect a decrease in flood level whilst the blue/green/brown tones reflect an increase in peak level.

More frequent events, smaller than the 1% AEP, have not been modelled as the northern riverbank of the Shoalhaven River is not overtopped to any significant extent until an event larger than the 5% AEP. Thus, in these small more frequent events there would be nil impact on peak flood levels of the proposed amendments. Larger events than the 1% AEP will occur but these events are obviously extremely rare and are not used for flood related planning determinations by Councils except when their failure has potential catastrophic consequences (such as dam failure).

3.3 Results

3.3.1 Compared to the 1st May 2020 *Proposed* scenario (Figures 1 to 4)

The results indicate the incremental change due to the works currently proposed in Section 1.2 and in Appendix A compared to the works as proposed in our 1st May 2020 Proposed scenario and are shown as follows.

Figure 1: Model Layouts for 1st May 2020 *Proposed* scenario and the *Current Proposed* scenario. Figure 2 to Figure 4 indicate the flood impact maps for the *Current Proposed* scenario versus the 1st May 2020 *Proposed* scenario for the 1% AEP, 0.5% AEP and Extreme events respectively

Figure 2 to Figure 3 indicate a minor reduction in peak flood level for the 1% and 0.5% AEP events upstream of the GD8 Building. This occurs as the proposed amendments create a larger flow path through the site than previously. This results in a minor increase in flood level downstream which is largely contained with the Shoalhaven Starches land. In the Extreme event (Figure 4) there is minimal change in peak level.

3.3.2 Compared to the 1st May 2020 *Existing* scenario (Figures A to D)

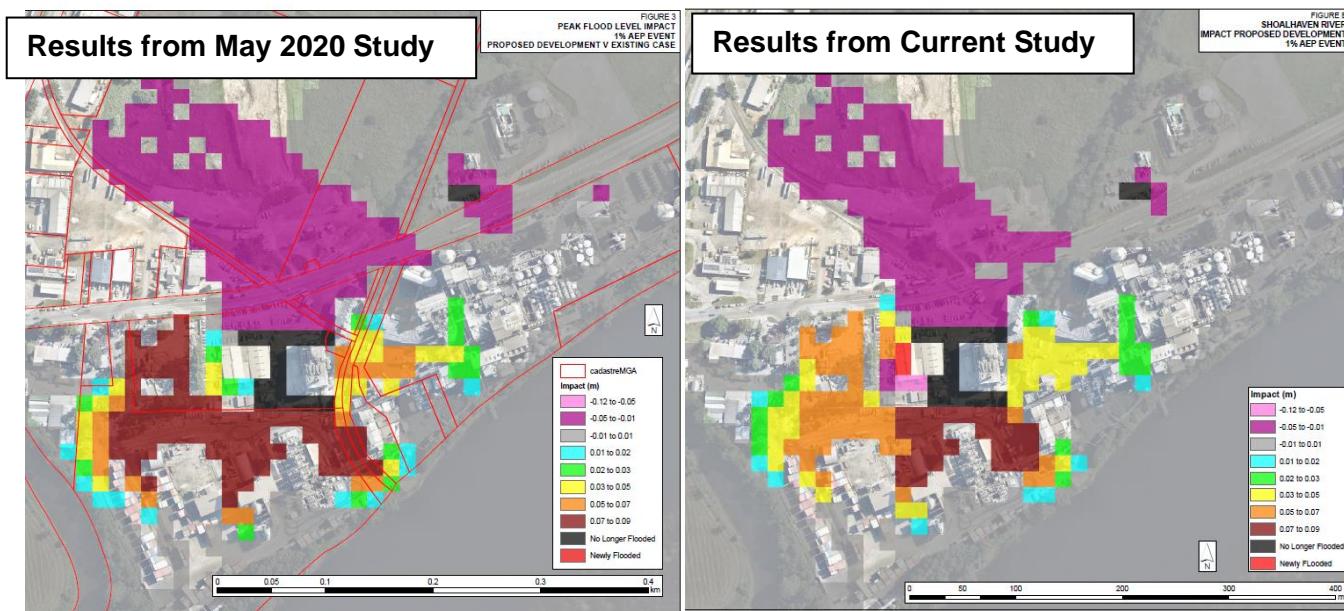
The results indicate the combined changes of all works (Mod 17 and as proposed herein) compared to the 1st May 2020 *Existing* scenario and are shown as follows.

Figure A: Model Layouts for 1st May 2020 *Existing* scenario and *Current Proposed* scenario.

Figure B to Figure D indicate the flood impact maps for the *Current Proposed* scenario versus the *Existing* scenario adopted in our 1st May 2020 report for the 1% AEP, 0.5% AEP and Extreme events

respectively (i.e the combined change in flood level of the *Proposed* works in our 1st May 2020 report and those currently proposed in Section 1.2 and in Appendix A).

Figure B (1% AEP event) shows similar results to our 1st May 2020 report (refer comparison below) with increases in peak level within Shoalhaven Starches property and minor decreases in peak level on land to the north. Figure C (0.5% AEP) shows similar impacts to Figure B and Figure D (Extreme) shows no significant change in peak level.



Should you have any questions or require further clarification regarding the above do not hesitate to contact the undersigned.

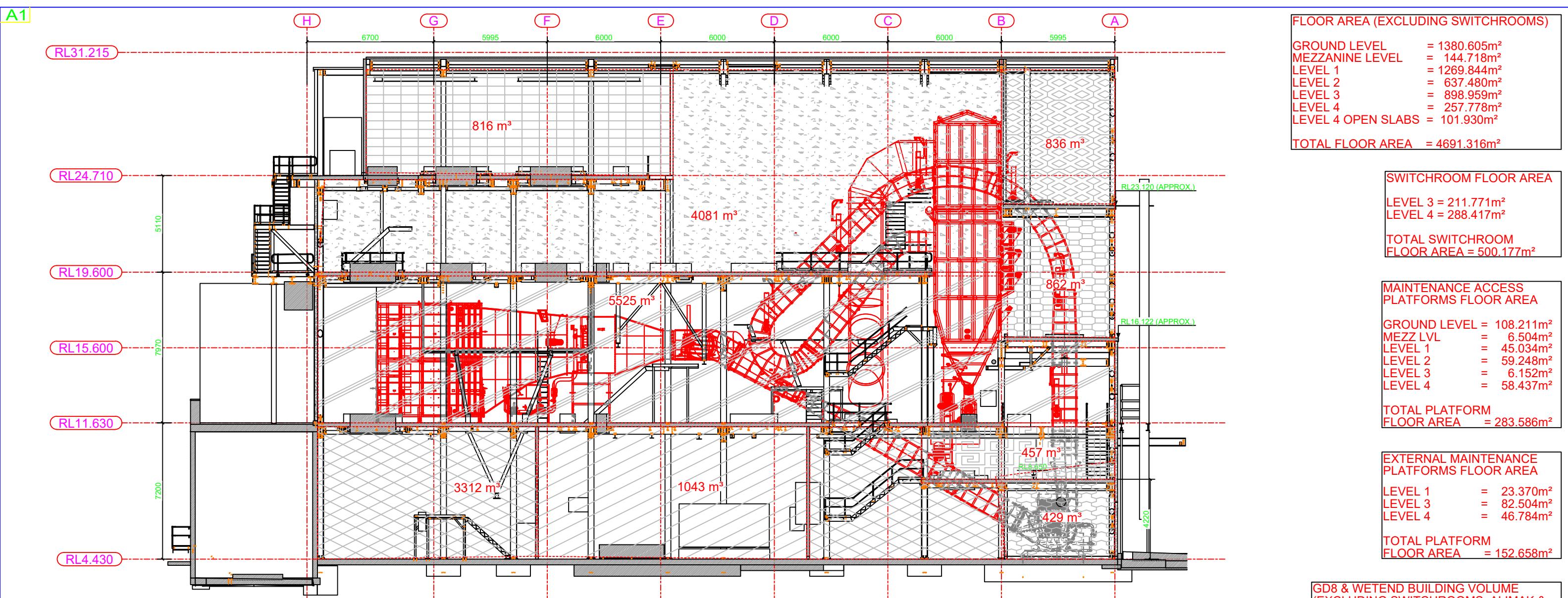
Yours Sincerely,
WMAwater



R W Dewar
Director



Appendix A



FLOOR AREA (EXCLUDING SWITCHROOMS)

GROUND LEVEL = 1380.605m²
 MEZZANINE LEVEL = 144.718m²
 LEVEL 1 = 1269.844m²
 LEVEL 2 = 637.480m²
 LEVEL 3 = 898.959m²
 LEVEL 4 = 257.778m²
 LEVEL 4 OPEN SLABS = 101.930m²
 TOTAL FLOOR AREA = 4691.316m²

SWITCHROOM FLOOR AREA
 LEVEL 3 = 211.771m²
 LEVEL 4 = 288.417m²
 TOTAL SWITCHROOM FLOOR AREA = 500.177m²

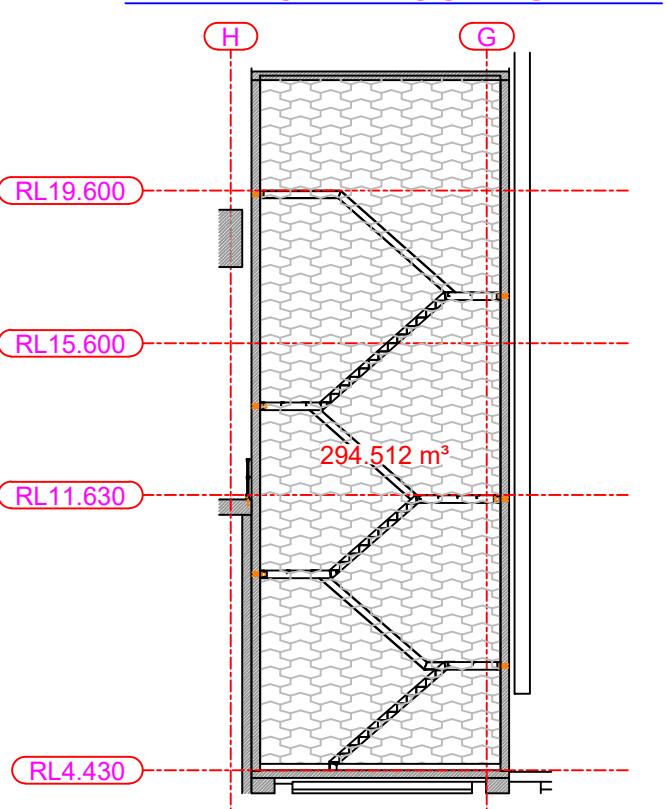
MAINTENANCE ACCESS PLATFORMS FLOOR AREA
 GROUND LEVEL = 108.211m²
 MEZZ LVL = 6.504m²
 LEVEL 1 = 45.034m²
 LEVEL 2 = 59.248m²
 LEVEL 3 = 6.152m²
 LEVEL 4 = 58.437m²
 TOTAL PLATFORM FLOOR AREA = 283.586m²

EXTERNAL MAINTENANCE PLATFORMS FLOOR AREA
 LEVEL 1 = 23.370m²
 LEVEL 3 = 82.504m²
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 TOTAL PLATFORM FLOOR AREA = 152.658m²

GD8 & WETEND BUILDING VOLUME (EXCLUDING SWITCHROOMS, ALIMAK & WESTERN & EASTERN STAIR TOWERS)
 TOTAL VOLUME = 32487m³

STAIR TOWERS & ALIMAK
 TOTAL VOLUME = 702m³

SWITCHROOM TOTAL VOLUME = 2138m³



ELEVATION 1A - LOOKING WEST

REV	REVISION DETAILS		DATE	DRG BY	DRG CHK	DESIGN CHK	DESIGN APPROVAL
1	WALLS & DOORS REVISED		07/10/21	S.H.	D.P.		
0	ISSUED FOR CONSTRUCTION		18/08/21	S.H.	D.P.		
D	ISSUED FOR CONSTRUCTION CERTIFICATE		08/06/21	S.H.	D.P.		
C	ISSUED FOR CONSTRUCTION CERTIFICATE		25/05/21	S.H.	D.P.		
B	ISSUED FOR CONSTRUCTION CERTIFICATE		28/04/21	S.H.	D.P.		
A	ISSUED FOR CONSTRUCTION CERTIFICATE		09/04/21	S.H.	D.P.		
P2	FOR INFORMATION ONLY		29/01/21	S.H.	D.P.		
P1	FOR INFORMATION ONLY		18/12/20	S.H.	D.P.		

multiCAD
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PROJECT: GLUTEN DRYER 8,
 WETEND &
 CHEMICAL STORE

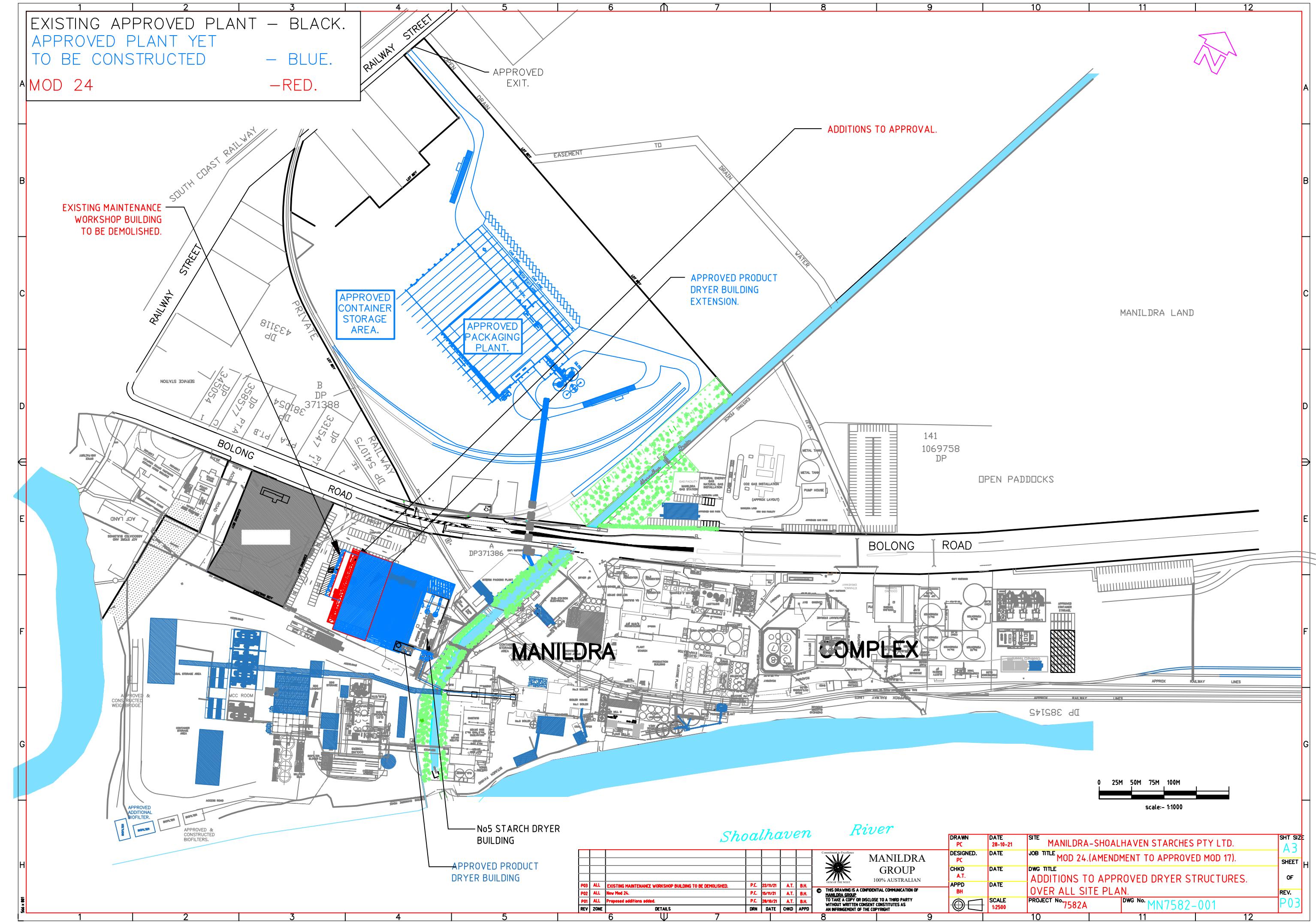
A.C.N. 101 867 207 CLIENT: MANILDRA

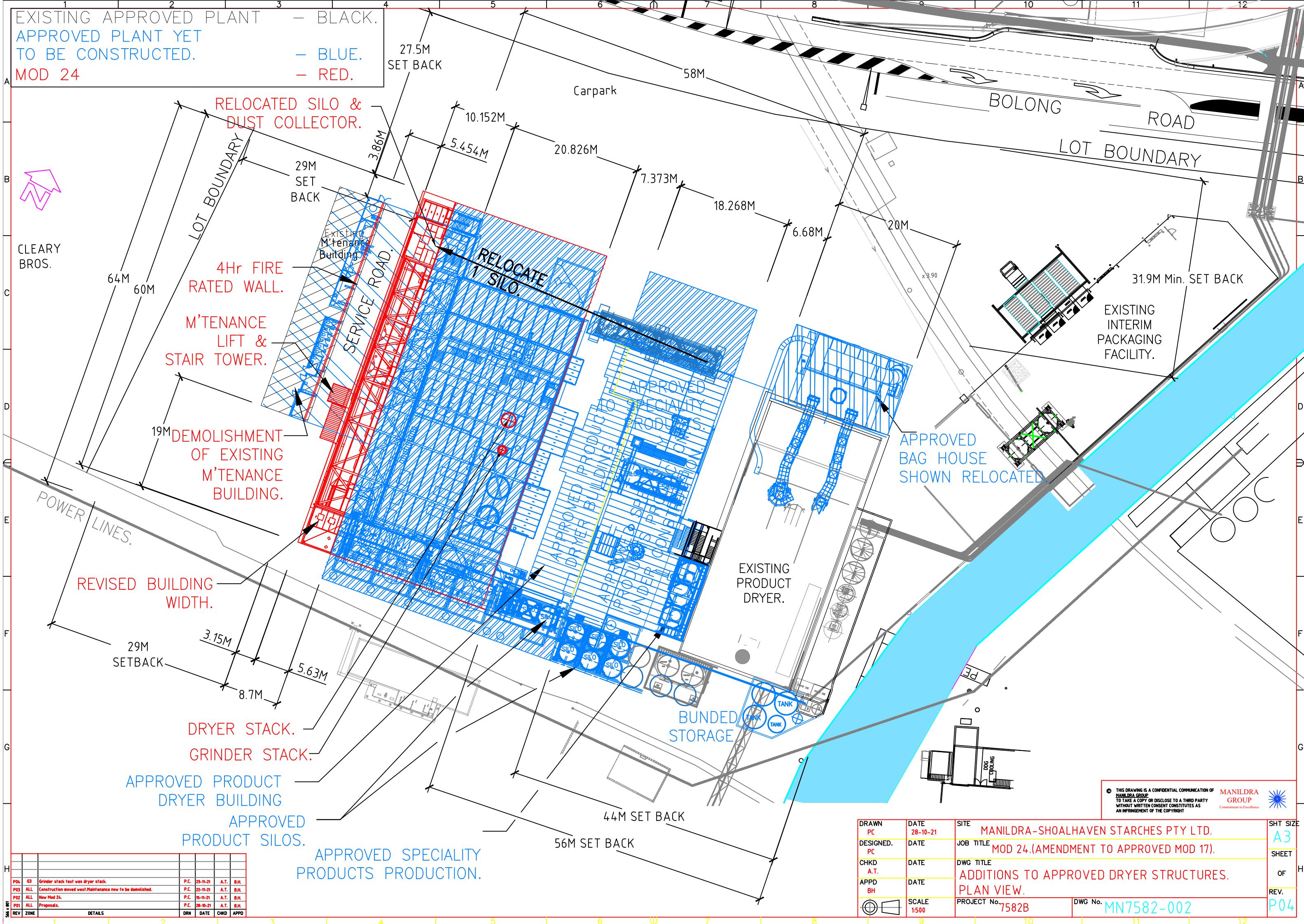
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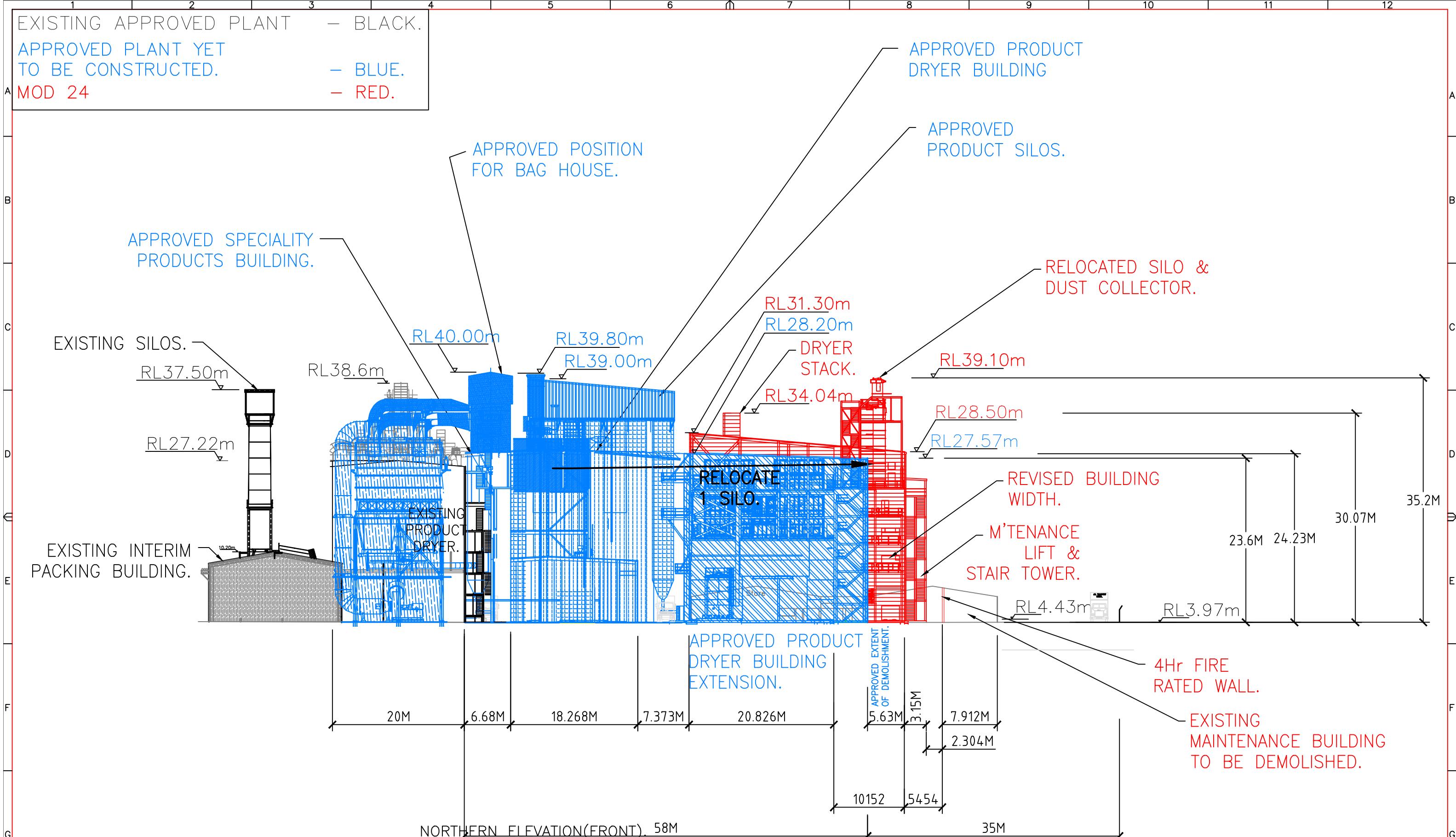
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SCALE 1:100	JOB No.	DRAWING No.	REV.
DRAWN S.H.	916	EL01	1

EXISTING APPROVED PLANT – BLACK.
APPROVED PLANT YET TO BE CONSTRUCTED – BLUE.
– RED.

A MOD 24

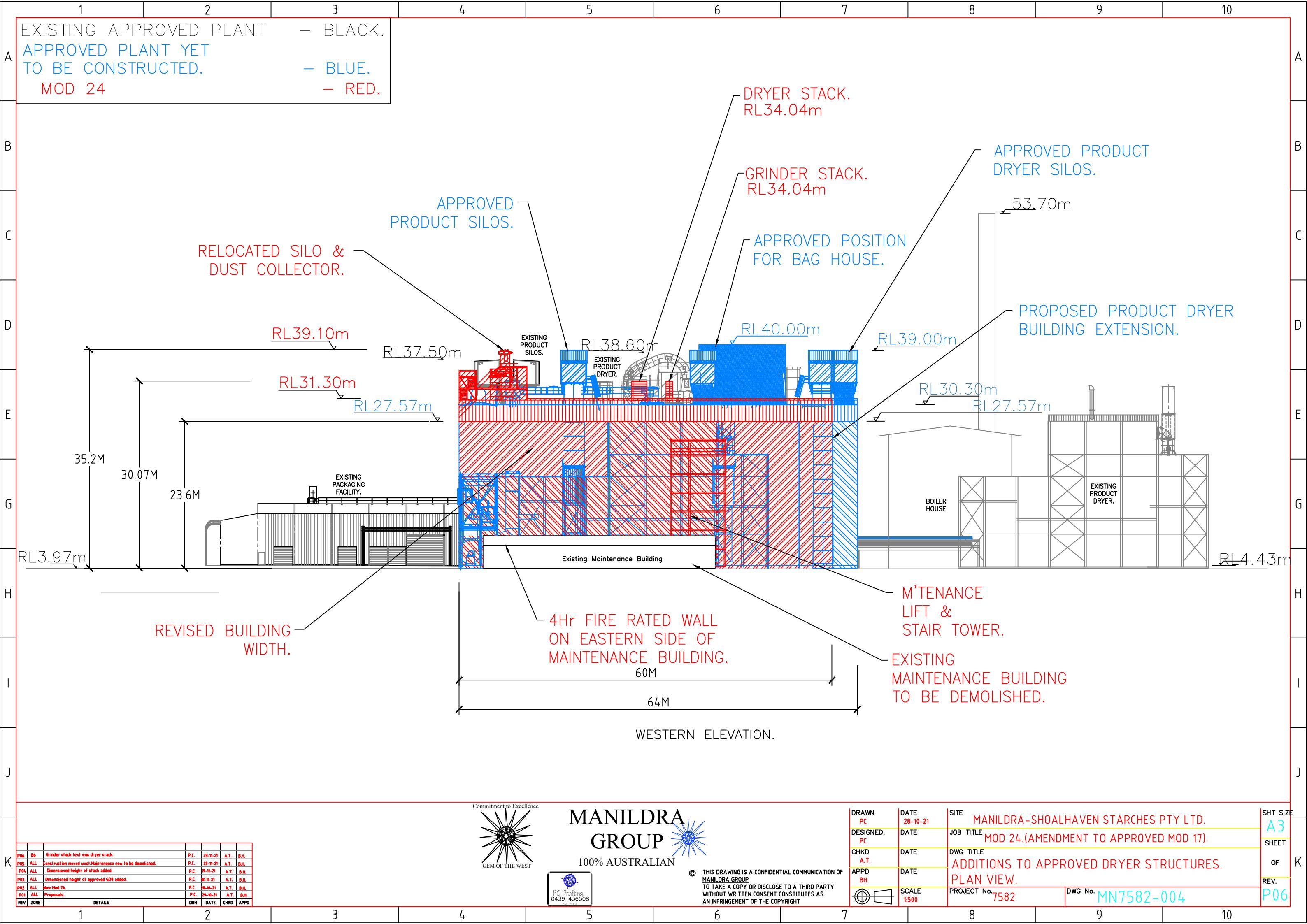


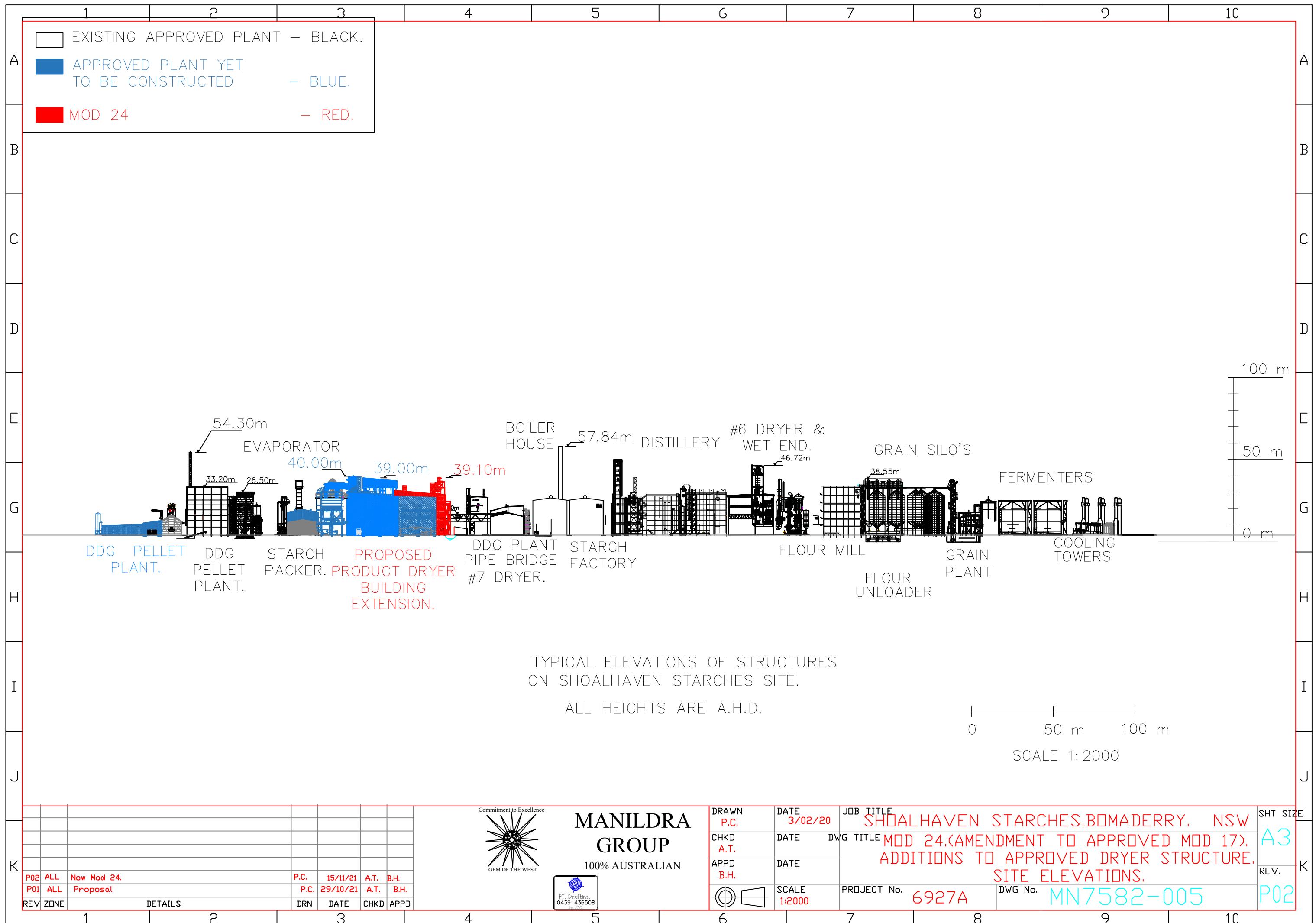




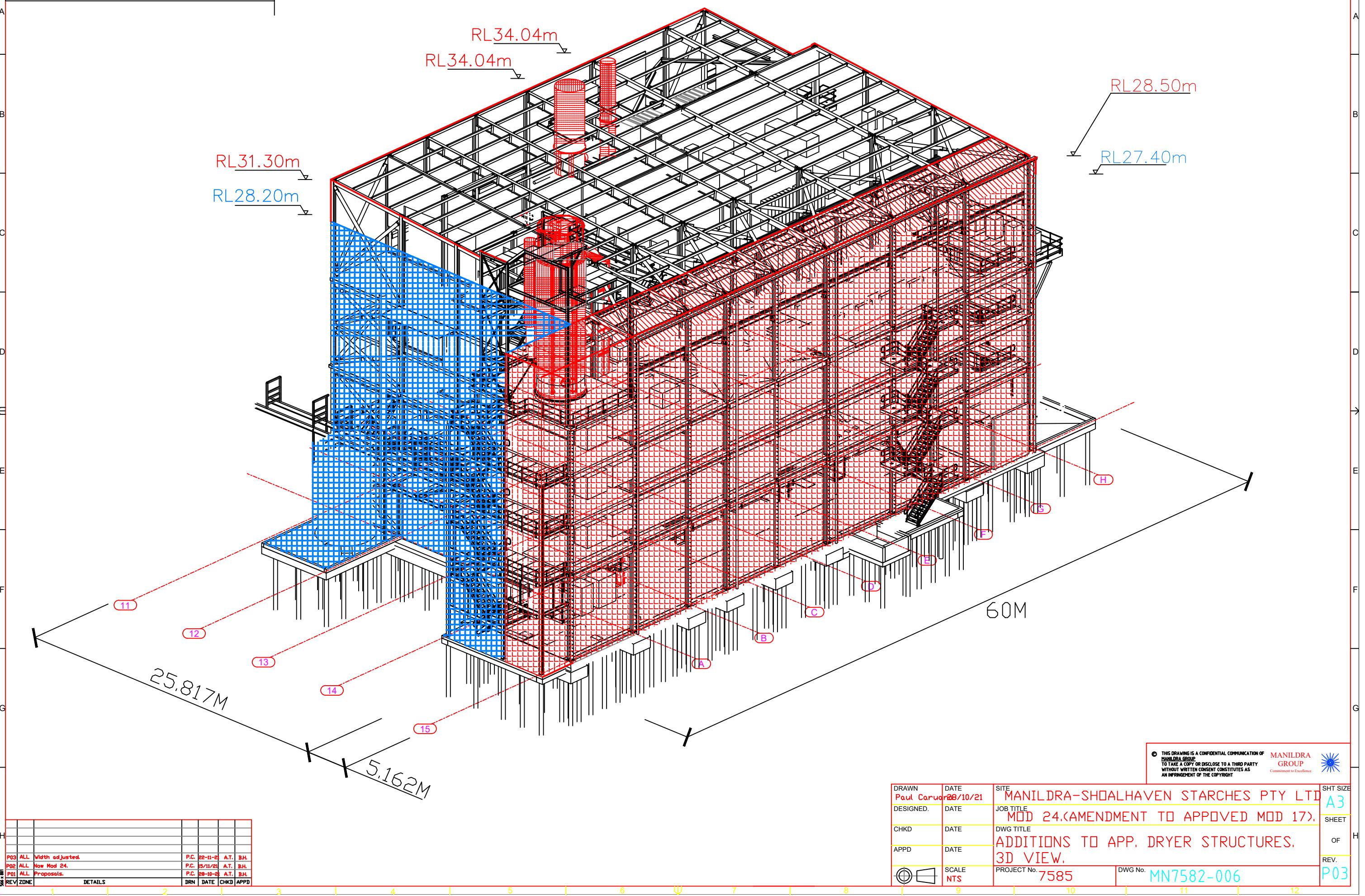
P01	C7	Dryer stack text was stacks.	P.C.	23-11-21	A.T.	B.H.
P06	ALL	Construction moved west Maintenance now to be demolished.	P.C.	23-11-21	A.T.	B.H.
P05	E12	Dimensioned height of stack added.	P.C.	23-11-21	A.T.	B.H.
P04	ALL	Dimensioned height of approved GD8 added.	P.C.	23-11-21	A.T.	B.H.
P03	ALL	New Mod 24.	P.C.	23-11-21	A.T.	B.H.
P02	F9	5.63 Dimension split.	P.C.	23-11-21	A.T.	B.H.
P01	ALL	Proposals.	P.C.	29-02-21	A.T.	B.H.
REV.			DRN	DATE	CHKD	APPO
36 x 60	ZONE		DETAILS			

MANILDRA GROUP		DRAWN BY	DATE	SITE
Commitment to Excellence		P.C.	28-10-21	MANILDRA-SHOALHAVEN STARCHES PTY LTD.
		DESIGNED BY	DATE	JOB TITLE
		CHKD BY	DATE	DWG TITLE
		A.T.		ADDITIONS TO APPROVED DRYER STRUCTURES.
		APPD BY	DATE	NORTHERN ELEVATION.
		B.H.		
THIS DRAWING IS A CONFIDENTIAL COMMUNICATION OF MANILDRA GROUP TO TAKE A COPY OR DISCLOSE TO A THIRD PARTY WITHOUT WRITTEN CONSENT CONSTITUTES AS AN INFRINGEMENT OF THE COPYRIGHT		SCALE	1:500	PROJECT No. 7582C DWG No. MN7582-003
		(Signature)		





APPROVED PLANT YET
TO BE CONSTRUCTED -BLUE.
MOD 24
- RED



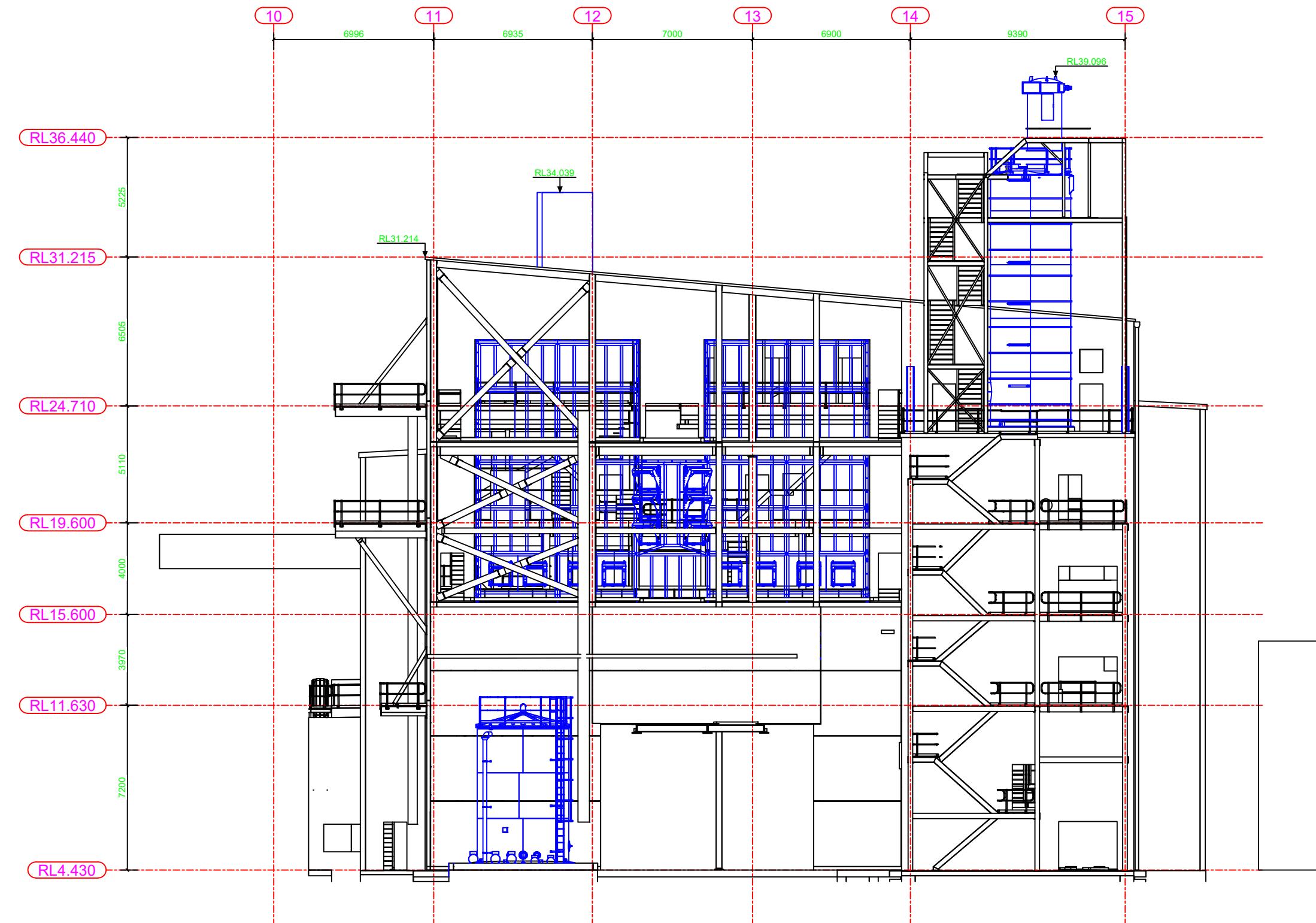
MOD 24.

(AMENDMENT TO APPROVED MOD 17).

ADDITIONS TO APPROVED DRYER STRUCTURES.

PROJECT No.7582

23/11/21



ERCTION NOTES:
 1) INDICATES MARKED END OF MEMBER TO BE ERECTED AT THIS LOCATION.
 2) COLUMNS HAVE ASSEMBLY MARK STAMPED ON NORTH OR WEST FACING FLANGE NEAR BASE OF SHAFT U.N.O.

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PROJECT: GLUTEN DRYER 8,
 WETEND &
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TITLE:
NORTHERN ELEVATION
GD8 & WETEND

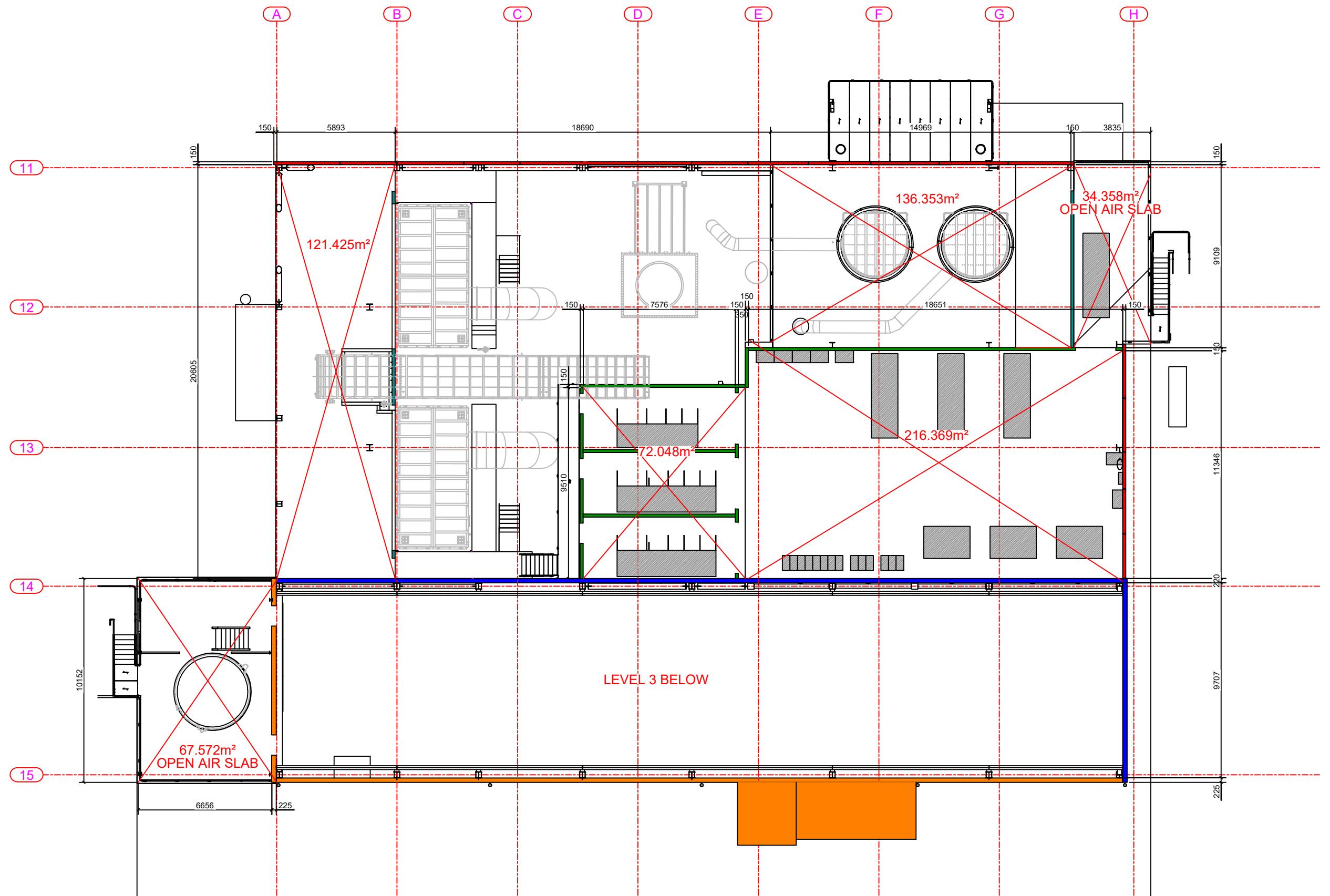
SCALE 1:100	JOB No.	DRAWING No.	REV.
DRAWN S.H.	916	EL14	0

0	ISSUED FOR CONSTRUCTION	28/10/21	S.H.	D.P.	DRG CHK	DESIGN CHK	DESIGN APPROVAL
REV	REVISION DETAILS	DATE	DRG BY	DRG CHK	DESIGN CHK	DESIGN APPROVAL	

A1



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P1	FOR INFORMATION ONLY	21/01/21	S.H.	D.P.	
	REVISION DETAILS	DATE	DRG BY	DRG CHK	DESIGN CHK DESIGN APPROVAL



Figures

FIGURE 1
SHOALHAVEN RIVER
MODEL LAYOUT

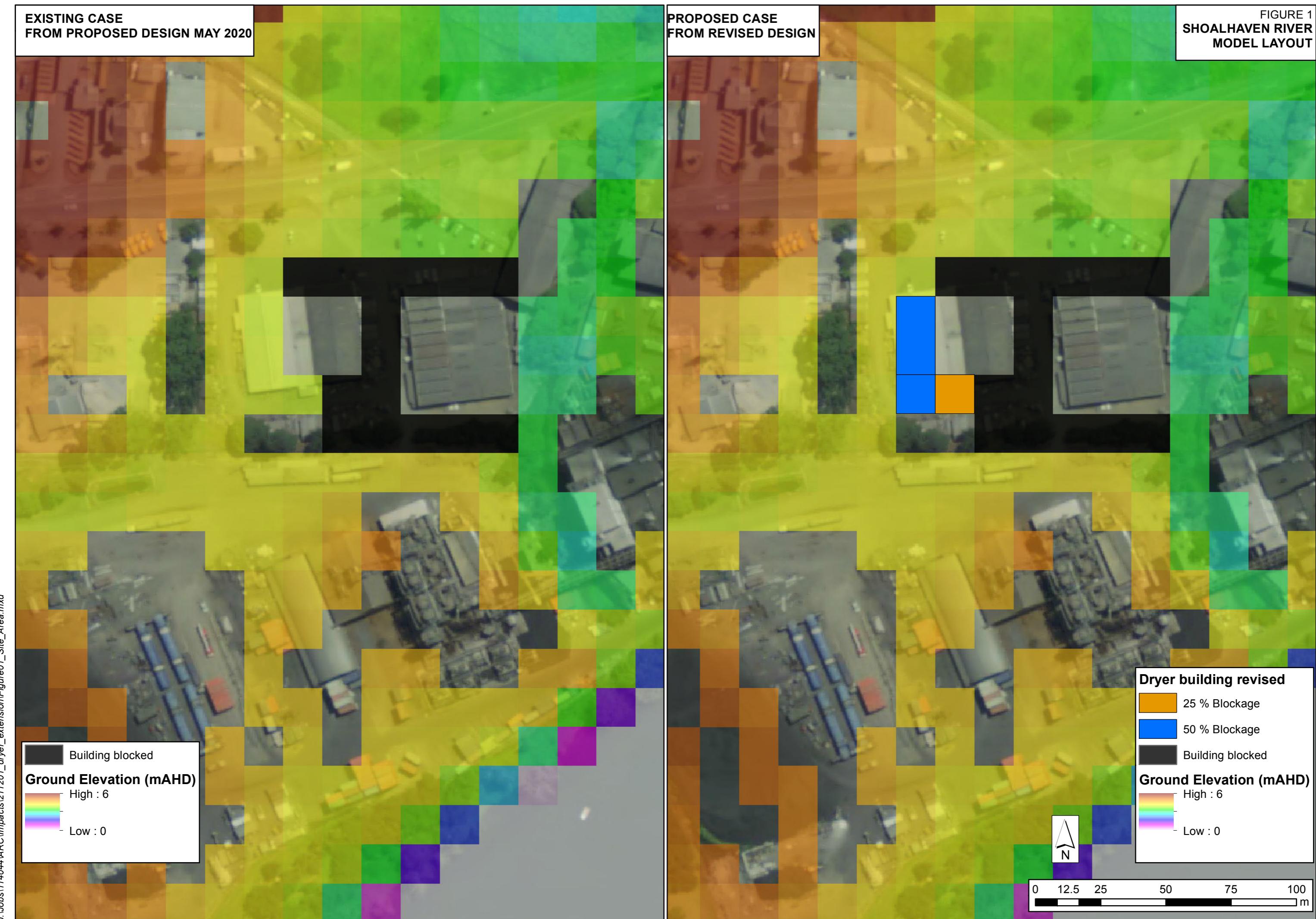


FIGURE 2
SHOALHAVEN RIVER
IMPACT PROPOSED DEVELOPMENT
1% AEP EVENT



FIGURE 3
SHOALHAVEN RIVER
IMPACT PROPOSED DEVELOPMENT
0.5% AEP EVENT



FIGURE 4
SHOALHAVEN RIVER
IMPACT PROPOSED DEVELOPMENT
EXTREME EVENT



FIGURE A
SHOALHAVEN RIVER
MODEL LAYOUT

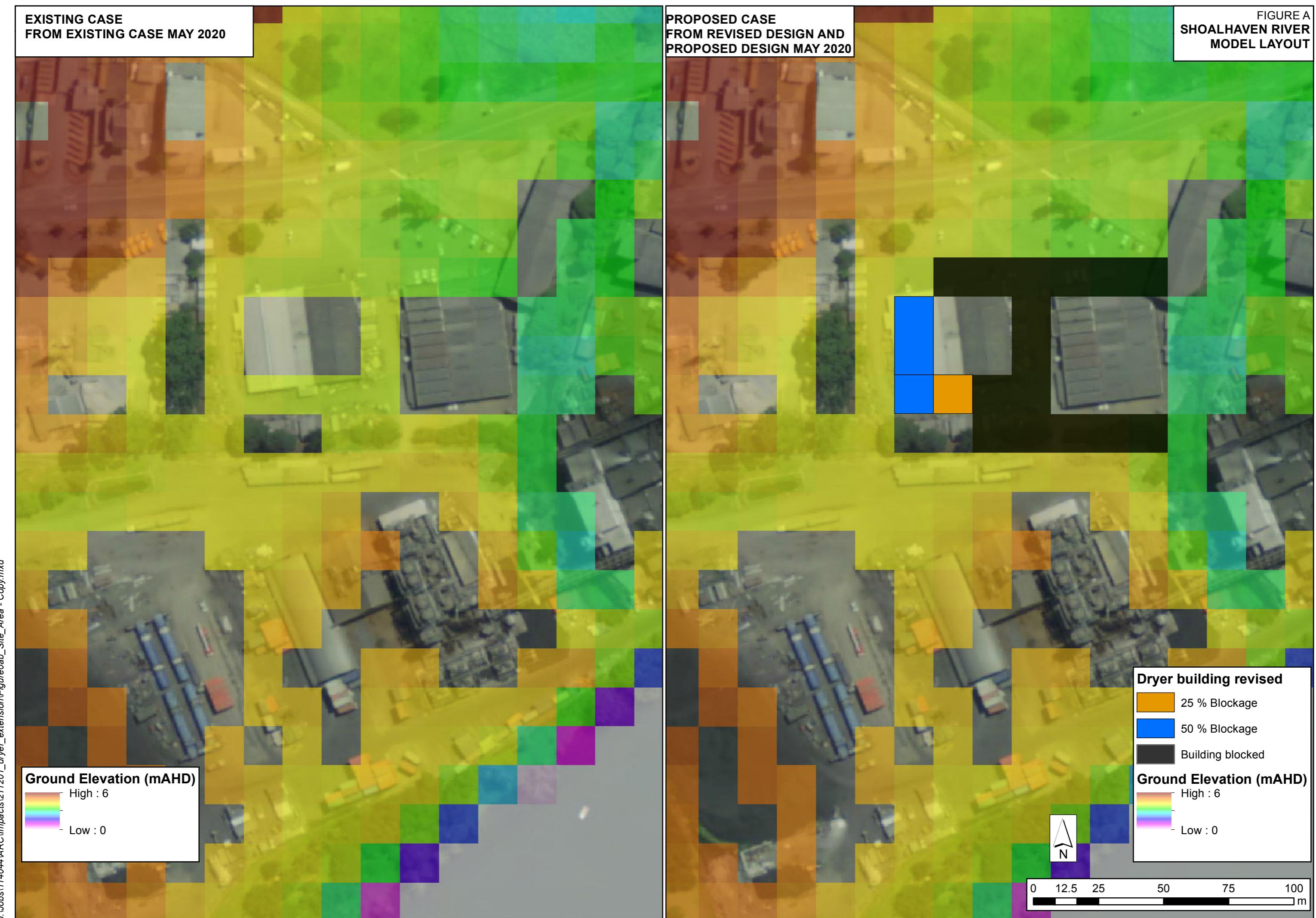


FIGURE B
SHOALHAVEN RIVER
IMPACT PROPOSED DEVELOPMENT
1% AEP EVENT



FIGURE C
SHOALHAVEN RIVER
IMPACT PROPOSED DEVELOPMENT
0.5% AEP EVENT

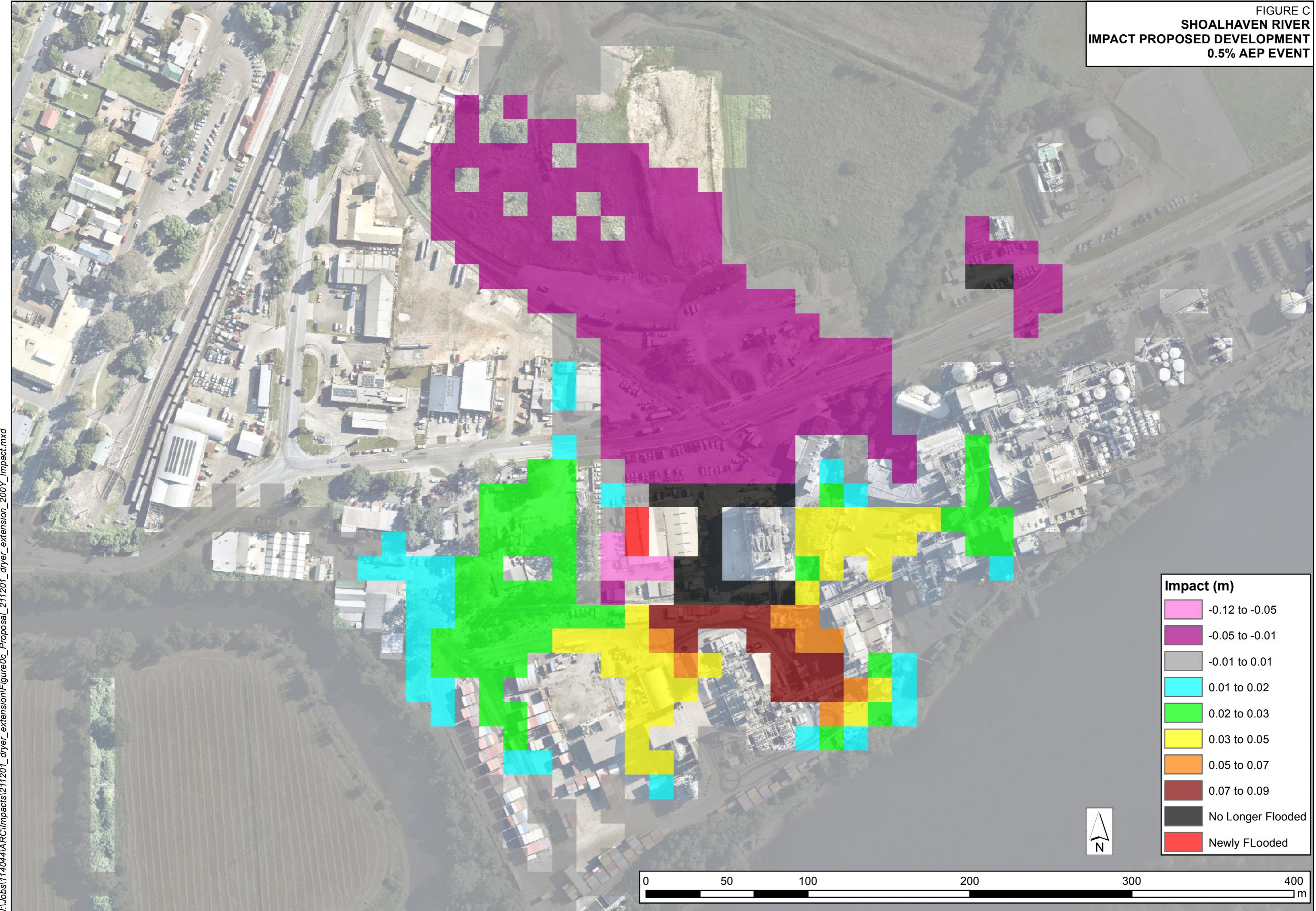


FIGURE D
SHOALHAVEN RIVER
IMPACT PROPOSED DEVELOPMENT
EXTREME EVENT

