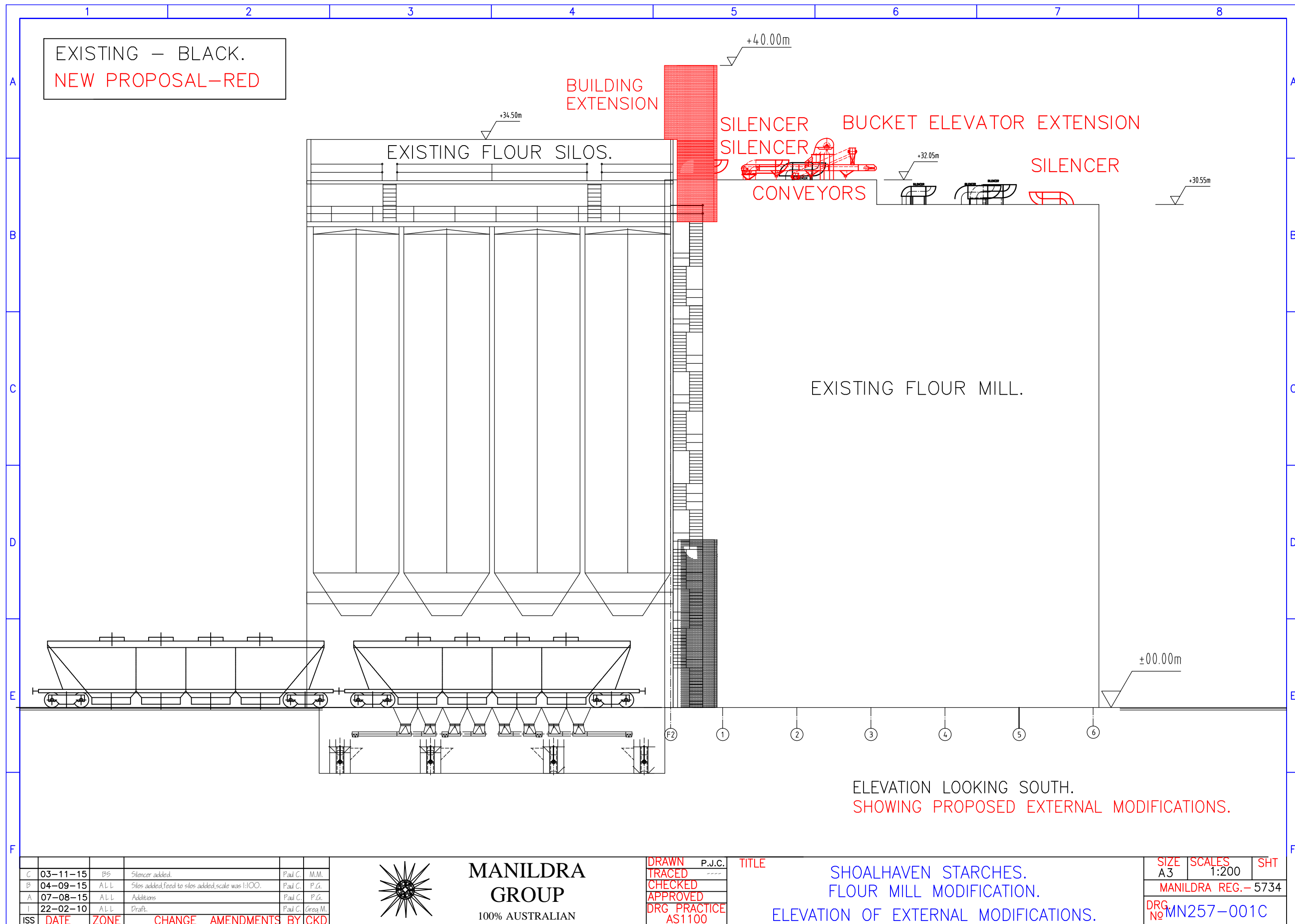
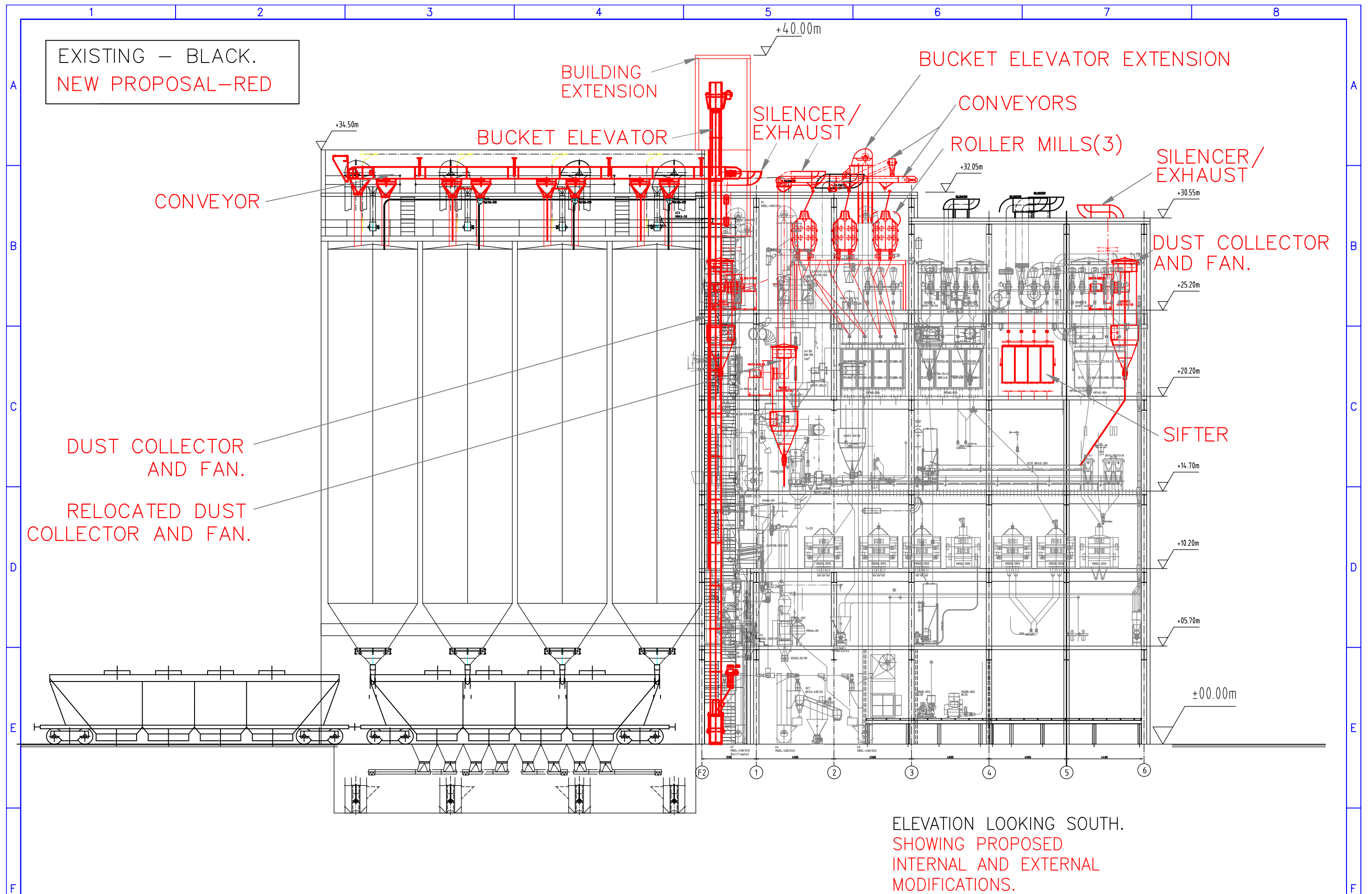


# ANNEXURE 1

## **ANNEXURE 1**

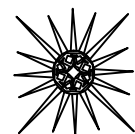
**Plans of Proposed Alterations  
to Existing Flour Mill**





ELEVATION LOOKING SOUTH.  
SHOWING PROPOSED  
INTERNAL AND EXTERNAL  
MODIFICATIONS.

ISS	DATE	ZONE	CHANGE	AMENDMENTS	BY	CHKD
C	03-11-15	CS	Relocated bag house filter.		Paul C.	M.M.
B	04-09-15	ALL	Silos added, feed to silos added, scale was 1:100.		Paul C.	P.G.
A	07-08-15	ALL	Additions		Paul C.	P.G.
I	22-02-10	ALL	Draft.		Paul C.	Graig M.



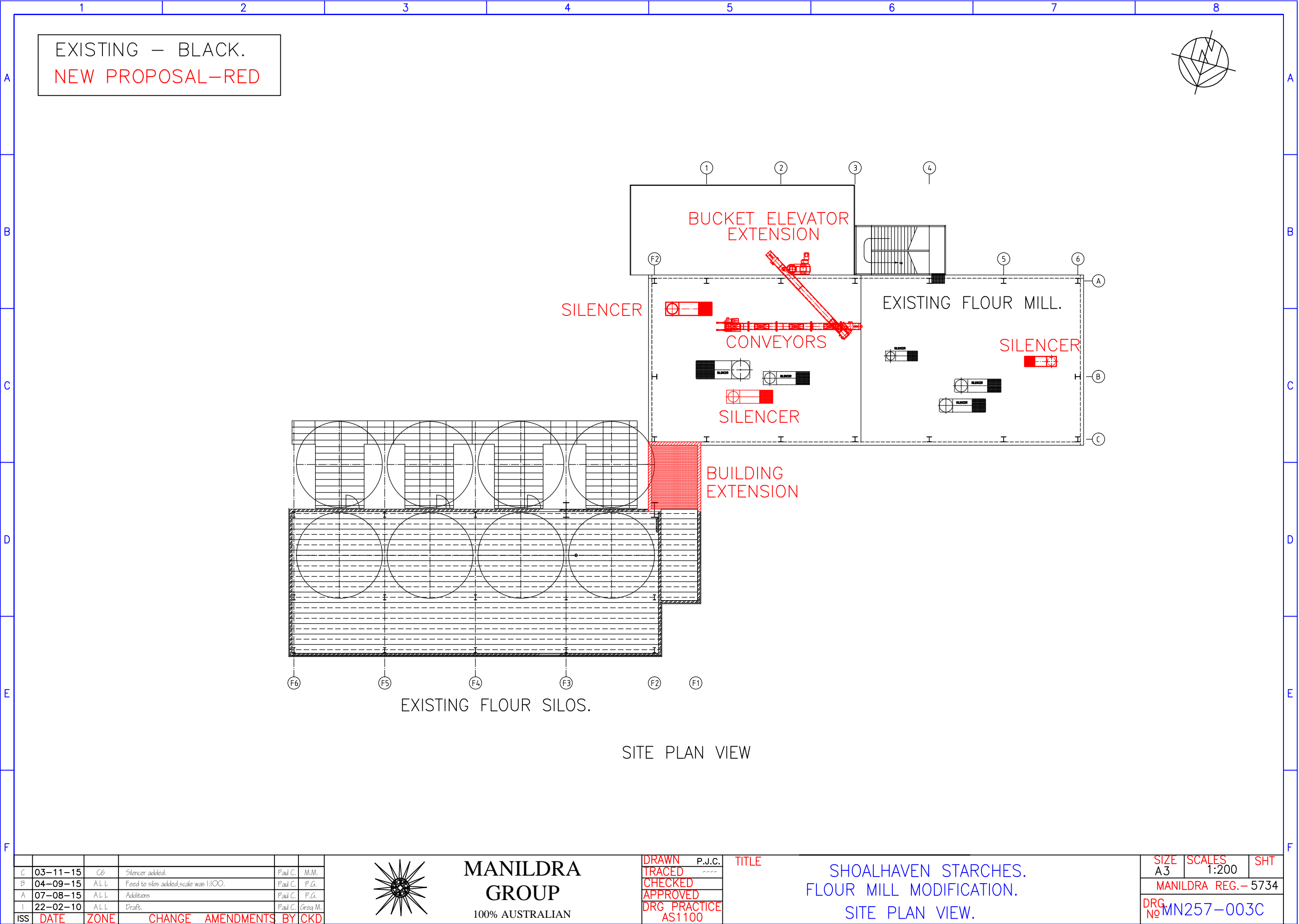
**MANILDRA  
GROUP**  
100% AUSTRALIAN

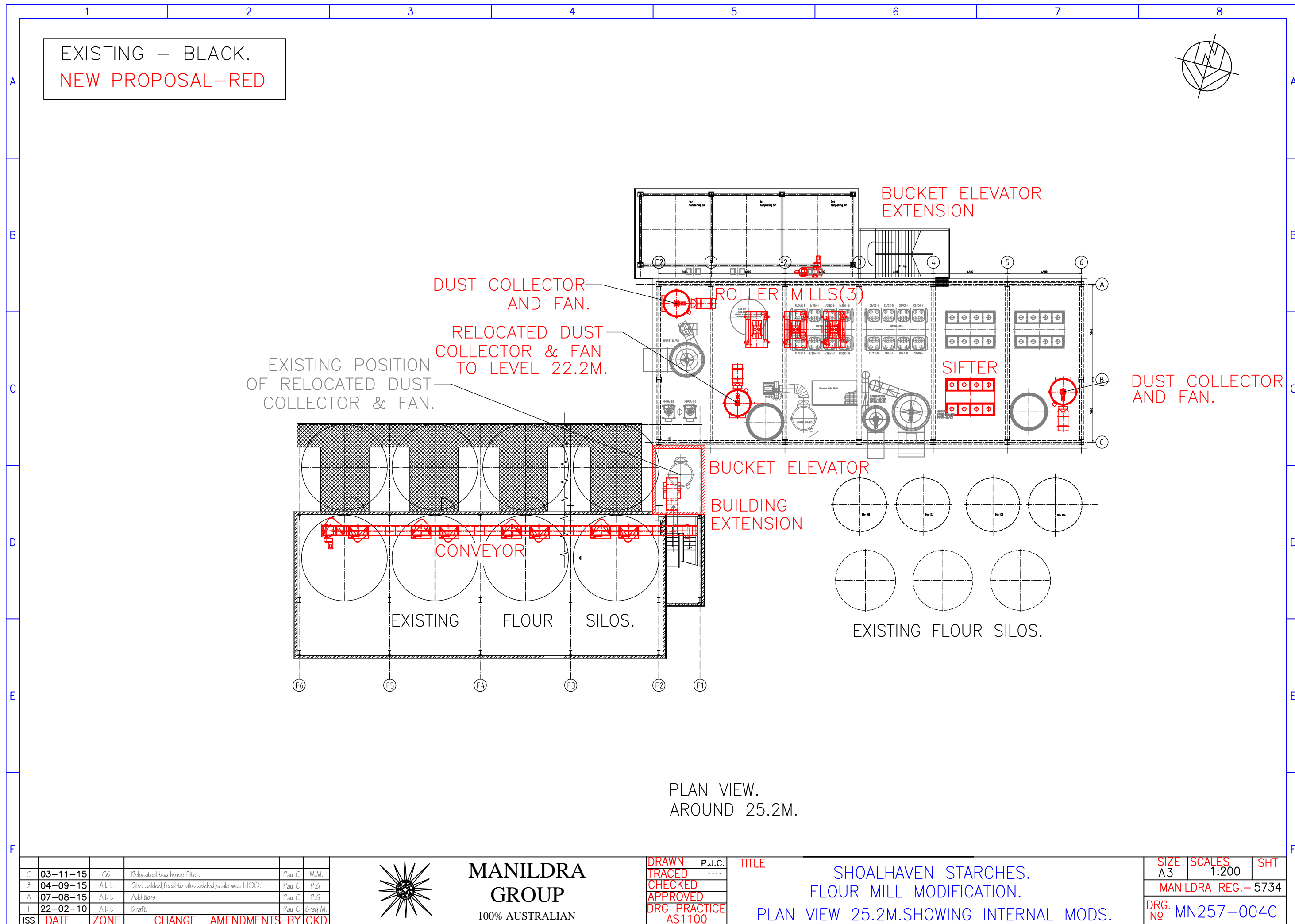
DRAWN P.J.C.  
TRACED  
CHECKED  
APPROVED  
DRG. PRACTICE  
AS1100

TITLE

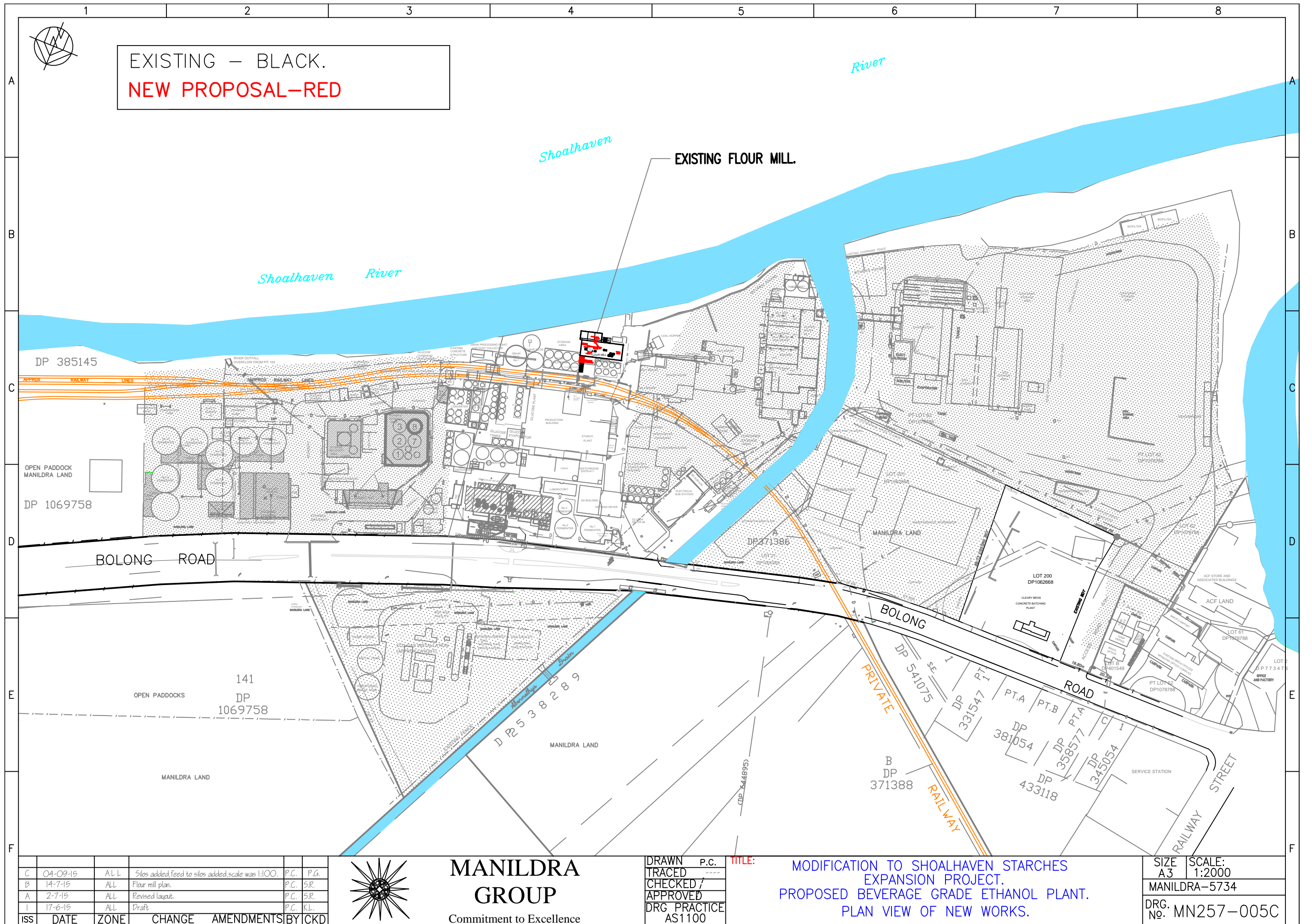
SHOALHAVEN STARCHES.  
FLOUR MILL MODIFICATION.  
ELEVATION OF INTERNAL MODIFICATIONS.

SIZE	SCALES	SHT
A3	1:200	
MANILDRA REG.- 5448		
DRG. NO. MN257-002C		

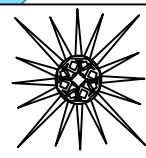








ISS	DATE	ZONE	CHANGE	AMENDMENTS	BY	CKD
C	04-09-15	ALL	Silos added, feed to silos added, scale was 1:100.	P.C.	P.G.	
B	14-7-15	ALL	Flour mill plan.	P.C.	S.R.	
A	2-7-15	ALL	Revised layout.	P.C.	S.R.	
I	17-6-15	ALL	Draft	P.C.	K.L.	

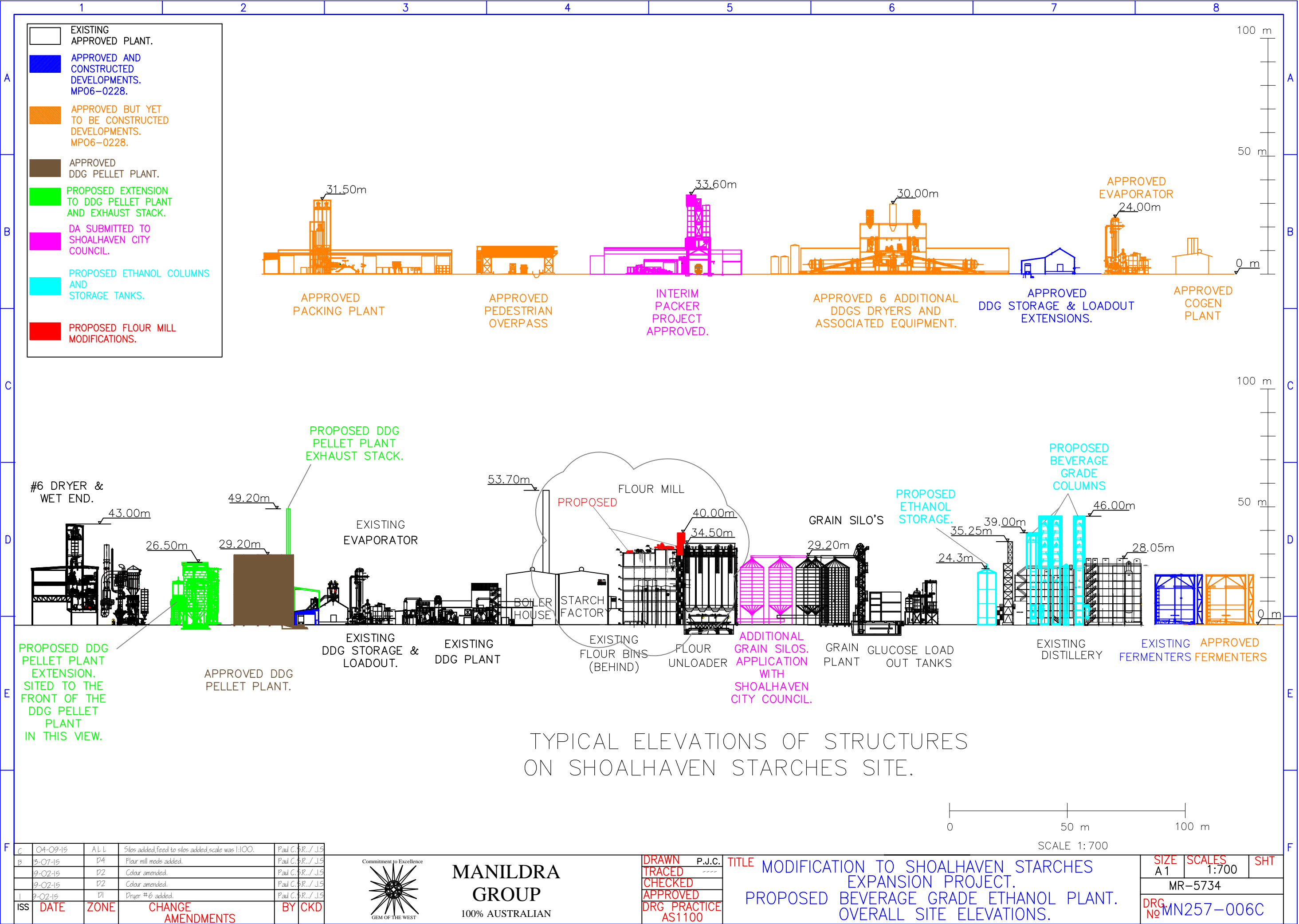


**MANILDRA  
GROUP**  
Commitment to Excellence

DRAWN P.C.  
TRACED  
CHECKED /  
APPROVED  
DRG PRACTICE  
AS1100

TITLE: MODIFICATION TO SHOALHAVEN STARCHES  
EXPANSION PROJECT.  
PROPOSED BEVERAGE GRADE ETHANOL PLANT.  
PLAN VIEW OF NEW WORKS.

SIZE A3  
SCALE: 1:2000  
MANILDRA-5734  
DRG. No. MN257-005C



## **ANNEXURE 2**

**Requirements  
of the  
Department of Planning & Environment**



## Stephen Richardson

---

**From:** Deana Burn <Deana.Burn@planning.nsw.gov.au>  
**Sent:** Thursday, 10 September 2015 4:12 PM  
**To:** Stephen Richardson; Christopher Ritchie  
**Cc:** Brian Hanley; John Studdert  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry  
**Attachments:** EPA requirements for modified flour mill.pdf

Hi Stephen

I have reviewed your letter of 12 August 2015 outlining the proposed alterations to the existing flour mill to increase its production capacity from 265,000 tonnes per annum (tpa) to 400,000tpa. The Department agrees with the key issues that you identify in your letter as requiring assessment. These include:

- **Noise** - a noise impact assessment in accordance with the Industrial Noise Policy (EPA 2000) that assesses the potential operational noise impacts of the proposal. The noise impact assessment should identify whether the proposal will comply with the existing noise limits in the EPL and if not, provide details of all reasonable and feasible mitigation measures that will be implemented to ensure compliance. Potential construction noise impacts should be assessed and determined in accordance with the provisions of the Interim Construction Noise Guideline (DECC 2009).
- **Air quality and odour** - an air quality impact assessment in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC 2005). This should include specific assessment of potential odour and total suspended particle impacts from the proposal and detail whether the existing pollution controls, such as the flour mill bag houses at the premises have sufficient capacity to deal with the proposed expansion. Where any exceedances of the relevant air quality assessment criteria are identified, the air quality impact assessment report should detail all reasonable and feasible mitigation measures that will be implemented to ensure compliance.
- **Hazards** – updated Preliminary Hazard Analysis for the flour mill prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011). The PHA should estimate the cumulative risks from the existing and proposed development.
- **Flooding and riverbank stability** – assessment of the impacts on riverbank stability, proposed mitigation measures and details of emergency bank stabilisation works in the vicinity of the modification.
- **Traffic** – assess the potential increase in rail and/or road traffic from the modification, including daily trip numbers, assess predicted impacts on the safety and capacity of the rail and road network including consideration of cumulative traffic impacts, detail any infrastructure upgrades required or any other measures to minimise traffic impacts.

I have attached the EPA's requirements (which have been incorporated into the above bullets), fyi.

If you have any questions in relation to the assessment requirements, please give me a call to discuss.

Regards,  
Deana.

---

**From:** Stephen Richardson [mailto:Steve@cowmanstoddart.com.au]  
**Sent:** Wednesday, 12 August 2015 12:09 PM  
**To:** Christopher Ritchie; Deana Burn  
**Cc:** Brian Hanley; John Studdert  
**Subject:** Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Dear Chris & Deana,

I understand that you have been in discussions with Brian Hanley in which the above modification proposal has been discussed.

Shoalhaven Starches intend to undertake modifications to the existing Flour Mill located at their Bomaderry plant to increase the amount of flour that will be able to be produced on the site. The proposal involves the installation of additional plant within the confines of the existing Flour Mill building only – no external additions to the existing building footprint are necessary.

Attached is a brief scoping submission that I have prepared on Shoalhaven Starches behalf, which outlines the proposed modification to the above approved project, and details issues that such a proposal will raise and which should be addressed in any Modification Application. It is envisaged that such will assist the Department in framing any requirements that it may have for this Modification Application submission.

The attached submission is therefore submitted seeking the Department's requirements for the Environmental Assessment for this project.

If you require any further clarification in connection with this matter please do not hesitate to contact me.

Regards

Stephen Richardson  
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F 02 4423 1569  
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-----

**From:** [Stefan Press](#)  
**To:** [Deana Burn](#)  
**Cc:** [Julian Thompson](#)  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry  
**Date:** Tuesday, 8 September 2015 4:42:11 PM

---

Hi Deana

Apologies again – not sure what happen to our email system as your original email unfortunately did not come through.

Based on the below info from Stephen Richardson of Cowman Stoddard, there are two key environment information/assessment requirements that the EPA has in relation to the proposed expansion of the existing flour mill, being:

Noise Impacts:

It is recommended that a noise impact assessment in accordance with the Industrial Noise Policy (EPA 2000) be prepared that assesses the potential operational noise impacts of the proposal. The noise impact assessment should identify whether the proposal will comply with the existing noise limits in the EPL and if not, provide details of all reasonable and feasible mitigation measures that will be implement to ensure compliance.

Potential construction noise impacts should be assessed and determined in accordance with the provisions of the Interim Construction Noise Guideline (DECC 2009).

Air Impacts:

It is recommended that an air quality impact assessment in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC 2005) be prepared. This should include specific assessment of potential odour and total suspended particle impacts from the proposal and detail whether the existing pollution controls, such as the flour mill bag houses at the premises have sufficient capacity to deal with the proposed expansion. Where any exceedances of the relevant air quality assessment criteria are identified, the air quality impact assessment report should detail all reasonable and feasible mitigation measures that will be implemented to ensure compliance.

Thank you for referring this one to us and if you need anything further please don't hesitate to let us know.

Regards  
Stefan

**Stefan Press**  
**Senior Operations Officer - South East | NSW Environment Protection Authority |**  
**☎: (02) 6229 7002 | Mobile ☎: 0408 029 607 | 📠: (02) 6229 7006 |**  
**✉: [Stefan.Press@epa.nsw.gov.au](mailto:Stefan.Press@epa.nsw.gov.au)**

**From:** Deana Burn [<mailto:Deana.Burn@planning.nsw.gov.au>]  
**Sent:** Tuesday, 8 September 2015 3:30 PM

**To:** Press Stefan

**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Thanks

---

**From:** Deana Burn

**Sent:** Thursday, 20 August 2015 2:41 PM

**To:** 'Stefan Press'

**Subject:** FW: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Hi Stefan

As discussed today, Starches propose to alter the existing flour mill to increase throughput on site. They have asked for assessment requirements for the modification. Can you please detail any specific requirements the EPA would like addressed.

Thanks

Deana.

---

**From:** Stephen Richardson [<mailto:Steve@cowmanstoddart.com.au>]

**Sent:** Wednesday, 12 August 2015 12:09 PM

**To:** Christopher Ritchie; Deana Burn

**Cc:** Brian Hanley; John Studdert

**Subject:** Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Dear Chris & Deana,

I understand that you have been in discussions with Brian Hanley in which the above modification proposal has been discussed.

Shoalhaven Starches intend to undertake modifications to the existing Flour Mill located at their Bomaderry plant to increase the amount of flour that will be able to be produced on the site. The proposal involves the installation of additional plant within the confines of the existing Flour Mill building only – no external additions to the existing building footprint are necessary.

Attached is a brief scoping submission that I have prepared on Shoalhaven Starches behalf, which outlines the proposed modification to the above approved project, and details issues that such a proposal will raise and which should be addressed in any Modification Application. It is envisaged that such will assist the Department in framing any requirements that it may have for this Modification Application submission.

The attached submission is therefore submitted seeking the Department's requirements for the Environmental Assessment for this project.

If you require any further clarification in connection with this matter please do not hesitate to contact me.

Regards

Stephen Richardson  
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F 02 4423 1569  
[www.cowmanstoddart.com.au](http://www.cowmanstoddart.com.au)  
[steve@cowmanstoddart.com.au](mailto:steve@cowmanstoddart.com.au)

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## Stephen Richardson

---

**From:** Deana Burn <Deana.Burn@planning.nsw.gov.au>  
**Sent:** Tuesday, 15 September 2015 4:02 PM  
**To:** Stephen Richardson; Christopher Ritchie  
**Cc:** Brian Hanley; John Studdert; Aaron Ticehurst; mark@meeng.com.au  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Hi Stephen

I have discussed with Chris and agree with his earlier email correspondence to you regarding the need to assess riverbank stability in your assessment of the modification to the flour mill. This has arisen out of questions from the Planning Assessment Commission on MOD 5, and a clause in the LEP that requires the assessment of riverbank stability.

I understand that Chris re-confirmed this in his meeting with Brian and Tom yesterday.

Regards,  
Deana.

---

**From:** Stephen Richardson [mailto:Steve@cowmanstoddart.com.au]  
**Sent:** Friday, 11 September 2015 9:41 AM  
**To:** Christopher Ritchie; Deana Burn  
**Cc:** Brian Hanley; John Studdert; Aaron Ticehurst; mark@meeng.com.au  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Thanks Chris

**From:** Christopher Ritchie [mailto:Chris.Ritchie@planning.nsw.gov.au]  
**Sent:** Friday, 11 September 2015 9:05 AM  
**To:** Stephen Richardson <Steve@cowmanstoddart.com.au>; Deana Burn <Deana.Burn@planning.nsw.gov.au>  
**Cc:** Brian Hanley <brian.hanley@manildra.com.au>; John Studdert <John.Studdert@manildra.com.au>; Aaron Ticehurst <aaron.ticehurst@manildra.com.au>; mark@meeng.com.au  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Stephen

Firstly, thank you for your email.

I will discuss with Deana and get back to you Monday.

However, I am not sure if you are aware of the line of questioning from the Independent Planning and Assessment Commission (the Commission) concerning Modification 5 which the Department has had to respond too. Brian would be aware of this questioning as we had to contact him regarding the Commission's questions around bank stability in light of a clause in the LEP.

Stephen – I believe the bank stability issue has been raised given the Commission's recent question and is a means of ensuring the issue is dealt with in the EA and therefore upfront. However, I will discuss with Deana and get back to you on Monday.

Chris

**From:** Stephen Richardson [<mailto:Steve@cowmanstoddart.com.au>]  
**Sent:** Friday, 11 September 2015 8:44 AM  
**To:** Deana Burn; Christopher Ritchie  
**Cc:** Brian Hanley; John Studdert; Aaron Ticehurst; [mark@meeng.com.au](mailto:mark@meeng.com.au)  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Dear Chris and Deana,

Thank you for Deana's email below with the requirements for the EA for the above project.

I would like to just confirm one aspect. The email below indicates that the Department agrees with the key issues outlined in our letter dated 12<sup>th</sup> August and then goes onto summarising the key issues to be addressed. One of the key issues outlined in the Departments' email is "riverbank stability".

Our submission dated 12<sup>th</sup> August however outlined that as the works associated with this proposal will be largely confined to within the existing flour mill building and no site works will be necessary it was considered there was no need for any further assessment in terms of riverbank stability in relation to this proposal. The Department's requirements are therefore inconsistent with this aspect of our submission.

Since the submission of our submission dated 12<sup>th</sup> August, Shoalhaven Starches have been undertaking further refinement of the plans for this proposal and it is now proposed to undertake a small extension to the building between the silo's and the mill building. This extension is however located away from the riverbank compared to the existing flour mill building.

I would appreciate it if you could confirm that an assessment of riverbank stability is required given these circumstances.

Regards

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[steve@cowmanstoddart.com.au](mailto:steve@cowmanstoddart.com.au)

**From:** Deana Burn [<mailto:Deana.Burn@planning.nsw.gov.au>]  
**Sent:** Thursday, 10 September 2015 4:12 PM  
**To:** Stephen Richardson <[Steve@cowmanstoddart.com.au](mailto:Steve@cowmanstoddart.com.au)>; Christopher Ritchie <[Chris.Ritchie@planning.nsw.gov.au](mailto:Chris.Ritchie@planning.nsw.gov.au)>  
**Cc:** Brian Hanley <[brian.hanley@manildra.com.au](mailto:brian.hanley@manildra.com.au)>; John Studdert <[John.Studdert@manildra.com.au](mailto:John.Studdert@manildra.com.au)>  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Hi Stephen

I have reviewed your letter of 12 August 2015 outlining the proposed alterations to the existing flour mill to increase its production capacity from 265,000 tonnes per annum (tpa) to 400,000tpa. The Department agrees with the key issues that you identify in your letter as requiring assessment. These include:

- **Noise** - a noise impact assessment in accordance with the Industrial Noise Policy (EPA 2000) that assesses the potential operational noise impacts of the proposal. The noise impact assessment should identify whether the proposal will comply with the existing noise limits in the EPL and if not, provide details of all reasonable and feasible mitigation measures that will be implemented to ensure compliance. Potential construction noise impacts should be assessed and determined in accordance with the provisions of the Interim Construction Noise Guideline (DECC 2009).
- **Air quality and odour** - an air quality impact assessment in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC 2005). This should include specific assessment of potential odour and total suspended particle impacts from the proposal and detail whether the existing pollution controls, such as the flour mill bag houses at the premises have sufficient capacity to deal with the proposed expansion. Where any exceedances of the relevant air quality assessment criteria are identified, the air quality impact assessment report should detail all reasonable and feasible mitigation measures that will be implemented to ensure compliance.
- **Hazards** – updated Preliminary Hazard Analysis for the flour mill prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011). The PHA should estimate the cumulative risks from the existing and proposed development.
- **Flooding and riverbank stability** – assessment of the impacts on riverbank stability, proposed mitigation measures and details of emergency bank stabilisation works in the vicinity of the modification.
- **Traffic** – assess the potential increase in rail and/or road traffic from the modification, including daily trip numbers, assess predicted impacts on the safety and capacity of the rail and road network including consideration of cumulative traffic impacts, detail any infrastructure upgrades required or any other measures to minimise traffic impacts.

I have attached the EPA's requirements (which have been incorporated into the above bullets), fyi.

If you have any questions in relation to the assessment requirements, please give me a call to discuss.

Regards,  
Deana.

---

**From:** Stephen Richardson [<mailto:Steve@cowmanstoddart.com.au>]

**Sent:** Wednesday, 12 August 2015 12:09 PM

**To:** Christopher Ritchie; Deana Burn

**Cc:** Brian Hanley; John Studdert

**Subject:** Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Dear Chris & Deana,

I understand that you have been in discussions with Brian Hanley in which the above modification proposal has been discussed.

Shoalhaven Starches intend to undertake modifications to the existing Flour Mill located at their Bomaderry plant to increase the amount of flour that will be able to be produced on the site. The proposal involves the installation of additional plant within the confines of the existing Flour Mill building only – no external additions to the existing building footprint are necessary.

Attached is a brief scoping submission that I have prepared on Shoalhaven Starches behalf, which outlines the proposed modification to the above approved project, and details issues that such a proposal will raise and which should be addressed in any Modification Application. It is envisaged that such will assist the Department in framing any requirements that it may have for this Modification Application submission.

The attached submission is therefore submitted seeking the Department's requirements for the Environmental Assessment for this project.

If you require any further clarification in connection with this matter please do not hesitate to contact me.

Regards

Stephen Richardson  
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F 02 4423 1569  
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[steve@cowmanstoddart.com.au](mailto:steve@cowmanstoddart.com.au)

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## Stephen Richardson

---

**From:** Deana Burn <Deana.Burn@planning.nsw.gov.au>  
**Sent:** Monday, 21 September 2015 11:05 AM  
**To:** Stephen Richardson; 'Brian Hanley'  
**Cc:** Christopher Ritchie  
**Subject:** Fw: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Hi Stephen, Brian

Please find response from the EPA below regarding the air quality assessment.

The Department has no further comments to add.

Regards,  
Deana.

---

**From:** Stefan Press <Stefan.Press@epa.nsw.gov.au>  
**Sent:** Monday, 21 September 2015 10:57  
**To:** Deana Burn  
**Cc:** Christopher Ritchie; Julian Thompson  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Hi Deana

The EPA notes the comments below from Mr Stephen Richardson in relation to the construction of new pollution control equipment (baghouses, silencers etc.) as part of the proposed flour mill expansion and that the air quality assessment is being undertaken on this basis. The EPA has no issues with this approach.

Regards  
Stefan

**Stefan Press**  
Senior Operations Officer - South East | NSW Environment Protection Authority |  
☎: (02) 6229 7002 | Mobile ☎: 0408 029 607 | 📠: (02) 6229 7006 |  
✉: [Stefan.Press@epa.nsw.gov.au](mailto:Stefan.Press@epa.nsw.gov.au)

**From:** Stephen Richardson [mailto:Steve@cowmanstoddart.com.au]  
**Sent:** Friday, 18 September 2015 11:16 AM  
**To:** Deana Burn; Christopher Ritchie; Press Stefan  
**Cc:** Brian Hanley; John Studdert; mark@meeng.com.au; Peter Stephenson  
**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Dear Deana, Chris, & Stefan,

We have been undertaking the preparation of the EA for the proposed alterations to the existing flour mill. We note however that in the requirements outlined in Deana's email below the following comment is made (in **bold**):

- ***Air quality and odour - an air quality impact assessment in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC 2005). This should include specific assessment of***



*potential odour and total suspended particle impacts from the proposal and detail whether the existing pollution controls, such as the flour mill bag houses at the premises have sufficient capacity to deal with the proposed expansion. Where any exceedances of the relevant air quality assessment criteria are identified, the air quality impact assessment report should detail all reasonable and feasible mitigation measures that will be implemented to ensure compliance.*

Please note however that this proposal does not rely upon the use of the existing pollution controls as suggested in the email above.

Additional exhausts will come from two new baghouses, through silencers, as shown in the attached process drawings mudm68412 and mudm68413. All new equipment is shown in colour.

The new baghouse shown on gridline A-3 of drawing mudm68412 will be connected to the new combi-cleaner in gridline E-3, but the connection spouting is not shown on the preliminary drawing.

The new baghouse servicing the Pneumatic Group "C" is shown on drawing mudm68413 on gridline D-8.

The air quality assessment that is currently being undertaken is being prepared on the above basis.

I trust that this clarifies this issue. If you require any further information or clarification in connection with this matter please do not hesitate to contact me.

Regards

Stephen Richardson  
Cowman Stoddart Pty Ltd  
PO BOX 738 NOWRA NSW 2541  
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F 02 4423 1569  
[www.cowmanstoddart.com.au](http://www.cowmanstoddart.com.au)  
[steve@cowmanstoddart.com.au](mailto:steve@cowmanstoddart.com.au)

**From:** Deana Burn [<mailto:Deana.Burn@planning.nsw.gov.au>]

**Sent:** Thursday, 10 September 2015 4:12 PM

**To:** Stephen Richardson <[Steve@cowmanstoddart.com.au](mailto:Steve@cowmanstoddart.com.au)>; Christopher Ritchie <[Chris.Ritchie@planning.nsw.gov.au](mailto:Chris.Ritchie@planning.nsw.gov.au)>

**Cc:** Brian Hanley <[brian.hanley@manildra.com.au](mailto:brian.hanley@manildra.com.au)>; John Studdert <[John.Studdert@manildra.com.au](mailto:John.Studdert@manildra.com.au)>

**Subject:** RE: Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Hi Stephen

I have reviewed your letter of 12 August 2015 outlining the proposed alterations to the existing flour mill to increase its production capacity from 265,000 tonnes per annum (tpa) to 400,000tpa. The Department agrees with the key issues that you identify in your letter as requiring assessment. These include:

- **Noise** - a noise impact assessment in accordance with the Industrial Noise Policy (EPA 2000) that assesses the potential operational noise impacts of the proposal. The noise impact assessment should identify whether the proposal will comply with the existing noise limits in the EPL and if not, provide details of all reasonable and feasible mitigation measures that will be implemented to ensure compliance. Potential construction noise impacts should be assessed and determined in accordance with the provisions of the Interim Construction Noise Guideline (DECC 2009).
- **Air quality and odour** - an air quality impact assessment in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC 2005). This should include specific assessment of potential odour and total suspended particle impacts from the proposal and detail whether the existing pollution controls, such as the flour mill bag houses at the premises have sufficient capacity to deal with the

proposed expansion. Where any exceedances of the relevant air quality assessment criteria are identified, the air quality impact assessment report should detail all reasonable and feasible mitigation measures that will be implemented to ensure compliance.

- **Hazards** – updated Preliminary Hazard Analysis for the flour mill prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011). The PHA should estimate the cumulative risks from the existing and proposed development.
- **Flooding and riverbank stability** – assessment of the impacts on riverbank stability, proposed mitigation measures and details of emergency bank stabilisation works in the vicinity of the modification.
- **Traffic** – assess the potential increase in rail and/or road traffic from the modification, including daily trip numbers, assess predicted impacts on the safety and capacity of the rail and road network including consideration of cumulative traffic impacts, detail any infrastructure upgrades required or any other measures to minimise traffic impacts.

I have attached the EPA's requirements (which have been incorporated into the above bullets), fyi.

If you have any questions in relation to the assessment requirements, please give me a call to discuss.

Regards,  
Deana.

---

**From:** Stephen Richardson [mailto:[Steve@cowmanstoddart.com.au](mailto:Steve@cowmanstoddart.com.au)]

**Sent:** Wednesday, 12 August 2015 12:09 PM

**To:** Christopher Ritchie; Deana Burn

**Cc:** Brian Hanley; John Studdert

**Subject:** Proposed Modification Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to Existing Flour Mill, Bolong Road, Bomaderry

Dear Chris & Deana,

I understand that you have been in discussions with Brian Hanley in which the above modification proposal has been discussed.

Shoalhaven Starches intend to undertake modifications to the existing Flour Mill located at their Bomaderry plant to increase the amount of flour that will be able to be produced on the site. The proposal involves the installation of additional plant within the confines of the existing Flour Mill building only – no external additions to the existing building footprint are necessary.

Attached is a brief scoping submission that I have prepared on Shoalhaven Starches behalf, which outlines the proposed modification to the above approved project, and details issues that such a proposal will raise and which should be addressed in any Modification Application. It is envisaged that such will assist the Department in framing any requirements that it may have for this Modification Application submission.

The attached submission is therefore submitted seeking the Department's requirements for the Environmental Assessment for this project.

If you require any further clarification in connection with this matter please do not hesitate to contact me.

Regards

Stephen Richardson  
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## **ANNEXURE 3**

**Submission under Clause 4.6  
of Shoalhaven LEP 2014**

**prepared by**

**Cowman Stoddart Pty Ltd**

**PROPOSED ALTERATIONS  
TO EXISTING FLOUR MILL  
IN EXCESS OF ELEVEN METRE  
MAXIMUM BUILDING HEIGHT LIMIT  
(Clause 4.3(2A) Shoalhaven LEP 2014)**

**Lot 1 DP 838753  
160 Bolong Road  
Bomaderry**

Prepared for

**Shoalhaven Starches Pty Ltd**

November 2015



**Prepared by:**

*COWMAN STODDART PTY LTD*



SUBMISSION UNDER  
CLAUSE 4.6 OF SHOALHAVEN LEP 2014

PROPOSED MODIFICATION  
OF EXISTING FLOUR MILL  
IN EXCESS OF ELEVEN METRE  
MAXIMUM BUILDING HEIGHT LIMIT  
(Clause 4.3(2A) Shoalhaven LEP 2014)

LOT 1 DP 838753  
NO. 160 BOLONG ROAD  
BOMADERRY

Ref. 15/49

Town Planning, Agricultural & Environmental Consultants

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Stuart Dixon, B.Urb & Reg Plan, C.P.P., MPIA

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COWMAN STODDART PTY LTD

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## **1.0 INTRODUCTION**

This submission has been made in support of a modification application that seeks approval to undertake modifications to the existing Flour Mill to increase the amount of flour that will be able to be produced on the Shoalhaven Starches factory site at Bolong Road Bomaderry.

The site is zoned IN1 General Industrial under the provisions of the Shoalhaven LEP (SLEP) 2014. There are no specific maximum building height provisions specified for the subject site on mapping supporting the LEP. Clause 4.3(2A) of the Shoalhaven LEP stipulates that if no height limit is specified then a maximum height of any building is to be eleven (11) metres.

The proposal seeks Council's consent to undertake modifications to the existing Flour Mill which will have a maximum height of 40 metres. The proposed structures will therefore exceed the 11 m building height limit set by Clause 4.3(2A) of SLEP 2014.

Clause 4.6 of Shoalhaven LEP 2014 deals with exceptions to development standards and provides that Council may consent to a development even though it contravenes a development standard. The provisions of Clause 4.6 require that a written request accompany a proposal that justifies the contravention of a development standard.

This submission has therefore been prepared pursuant to Clause 4.6 and provides justification that the proposal is appropriate and that strict compliance with the provisions of Clauses 4.3(2A) are unreasonable and unnecessary under the specific circumstances associated with the application.

## **2.0 DESCRIPTION OF SITE AND SURROUNDS**

The Shoalhaven Starches Factory site is situated on various allotments of land on Bolong Road, Bomaderry within the City of Shoalhaven. The factory site is located on the south side of Bolong Road on the northern bank of the Shoalhaven River. The factory site (excluding the former Dairy Farmers site) has an area of approximately 12.5 hectares.

This development application concerns land located at 160 Bolong Road Bomaderry (Lot 1 DP 838753).

The town of Bomaderry is located 0.5 km (approx.) to the west of the factory site, and the Nowra urban area is situated 2.0 km to the south west of the site. The “Riverview Road” area of the Nowra Township is situated approximately 600 metres immediately opposite the factory site across the Shoalhaven River.

The village of Terara is situated approximately 1.5 kilometres to the south east of the site, across the Shoalhaven River. Burruga (Pig) Island is situated between the factory site and the village of Terara and is currently used for dairy cattle grazing.

There are a number of industrial land uses which have developed on the strip of land between Bolong Road and the Shoalhaven River. Industrial activities include a metal fabrication factory, the Shoalhaven Starches site and the former Shoalhaven Paper Mill (Australian Papers). The industrial area is serviced by a privately owned spur railway line that runs from just north of the Nowra-Bomaderry station to the starches plant.

The state railway terminates at Bomaderry with a separate, privately owned spur line to the factory site. Shoalhaven City Council sewerage treatment works is situated between the railway line and the factory.

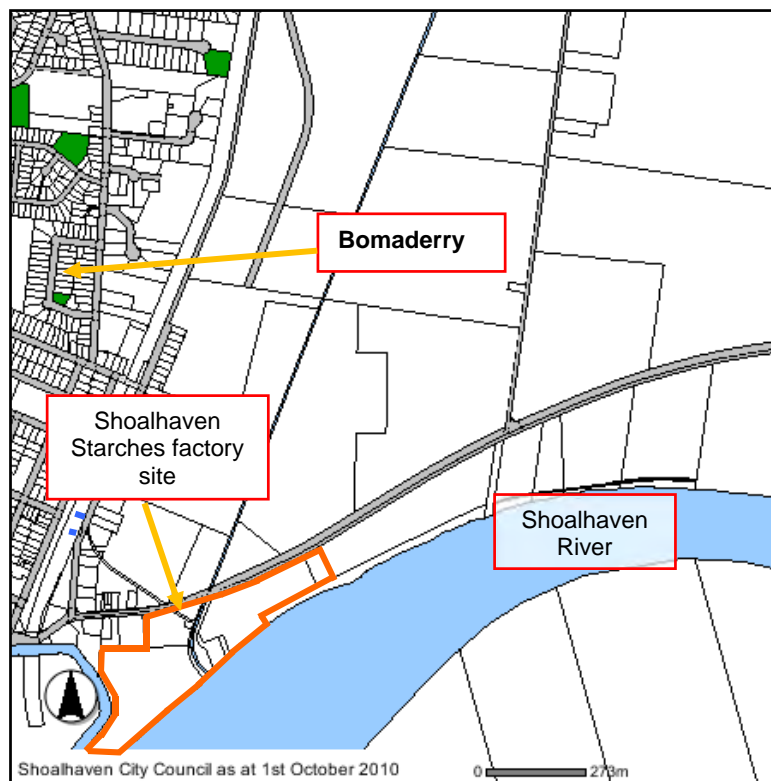
The Company also carries out irrigation activities on the Company’s Environmental Farm located over 1000 hectares on the northern side of Bolong Road. This area is cleared grazing land and also contains spray irrigation lines and wet weather storage ponds). These wet weather storage ponds on the farm form part of the irrigation management system for the factory.

The subject proposal is to be situated entirely within the factory site located on the southern side of Bolong Road and the west of Abernethy’s Creek on Lot 1 DP 838753, 160 Bolong Road, Bomaderry.

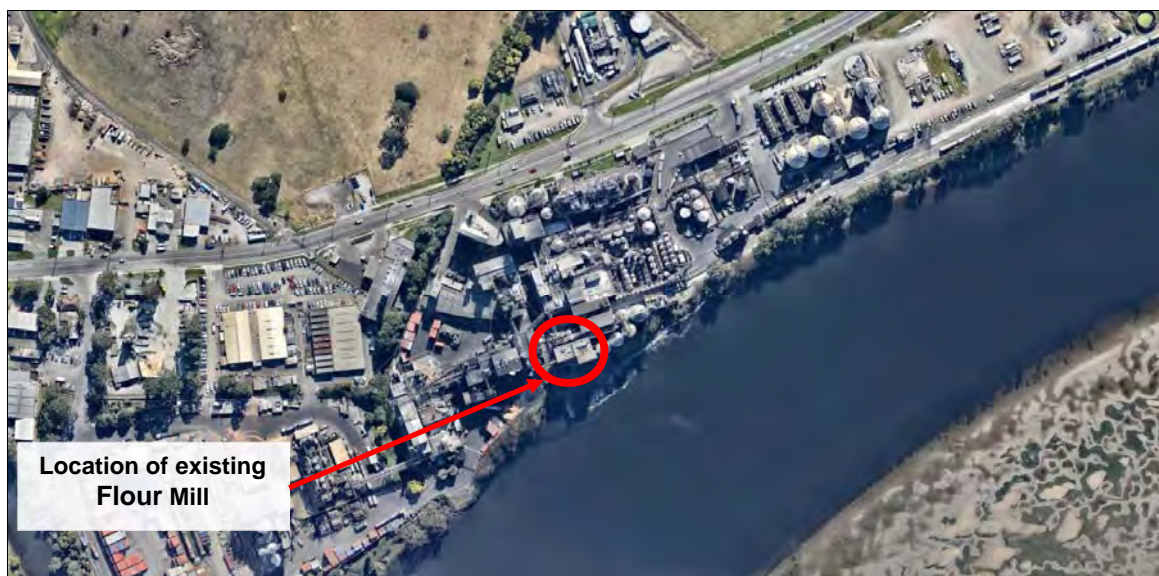
The land is zoned IN1 General Industrial pursuant to Shoalhaven Local Environmental Plan (SLEP) 2014. Mapping that supports the SLEP 2014 does not identify the subject site as having a specified building height limit. The provisions of Clause 4.3(2A) of the SLEP state

that if no height limit is specified for a parcel of land then a maximum building height of eleven (11) metres applies.

**Figure 1** is a site locality plan, whilst **Figure 2** is an aerial photo of the locality.



**Figure 1: Site locality plan.**



**Figure 2: Aerial photograph of Shoalhaven Starches factory site.**



### **3.0 THE PROPOSAL**

This submission made pursuant to Clause 4.6 of the SLEP 2014 supports a modification application that seeks approval from the NSW Department of Planning & Environment to undertake alterations to the existing Flour Mill at the Shoalhaven Starches factory site at Bolong Road Bomaderry. The modified Flour Mill will have a maximum height above ground level of 40 m.

#### **3.1 JUSTIFICATION FOR PROPOSAL**

15,000 tonnes per week of flour is approved to be transported to the site by rail for use in the production process at the site in conjunction with the flour (5,000 tonnes per week) that is presently milled by the existing Flour Mill located on the site and approved in 2007.

Shoalhaven Starches now propose to undertake modifications to the existing Flour Mill to increase industrial grade flour production at the Bomaderry Plant. The proposed modifications to the existing Flour Mill will enable the processing of 3,375 tonnes per week of grain producing 2,700 tonnes per week of flour. In conjunction with the flour already processed on the site, this will mean that 7,700 tonnes of flour will be able to be produced at the Bomaderry plant per week, reducing the amount of flour that is required to be transported to the site from Manildra to 12,300 tonnes.

The proposal will not alter the overall approved flour consumption of the plant of 20,000 tonnes per week.

The proposed alterations to the existing Flour Mill at the Bomaderry site will also enable subsequent spare capacity at the Company's flour mills at Manildra, Gunnedah and Narrandera to be devoted to the production of higher grade flour therefore increasing export opportunities for the Company.

## **4.0      CLAUSE 4.3 OF SHOALHAVEN LEP 2014**

Clause 4.3 of Shoalhaven LEP 2014 stipulates the following:

### **4.3 Height of buildings**

- (1) *The objectives of this clause are as follows:*
  - (a) *to ensure that buildings are compatible with the height, bulk and scale of the existing and desired future character of a locality,*
  - (b) *to minimise visual impact, disruption of views, loss of privacy and loss of solar access to existing development,*
  - (c) *to ensure that the height of buildings on or in the vicinity of a heritage item or within a heritage conservation area respect heritage significance.*
- (2) *The height of a building on any land is not to exceed the maximum height shown for the land on the Height of Buildings Map.*
- (2A) *If the Height of Buildings Map does not show a maximum height for any land, the height of a building on the land is not to exceed 11 metres.*

Mapping supporting the SLEP 2014 does not identify a maximum building height that applies to this land. Under these circumstances, and having regard to Clause 4.3(2A) a maximum building height of 11 metres applies to the subject site.

The heights of the works associated with this modification application will be above the eleven metre maximum building height limit. The development therefore does not comply with the provisions of Clause 4.3(2A) of Shoalhaven LEP 2014.

## 5.0      **CLAUSE 4.6 OF SHOALHAVEN LEP 2014**

Clause 4.6 of Shoalhaven LEP 2014 stipulates:

### **4.6 Exceptions to development standards**

- (1) *The objectives of this clause are as follows:*
  - (a) *to provide an appropriate degree of flexibility in applying certain development standards to particular development,*
  - (b) *to achieve better outcomes for and from development by allowing flexibility in particular circumstances.*
- (2) *Development consent may, subject to this clause, be granted for development even though the development would contravene a development standard imposed by this or any other environmental planning instrument. However, this clause does not apply to a development standard that is expressly excluded from the operation of this clause.*
- (3) *Development consent must not be granted for development that contravenes a development standard unless the consent authority has considered a written request from the applicant that seeks to justify the contravention of the development standard by demonstrating:*
  - (a) *that compliance with the development standard is unreasonable or unnecessary in the circumstances of the case, and*
  - (b) *that there are sufficient environmental planning grounds to justify contravening the development standard.*
- (4) *Development consent must not be granted for development that contravenes a development standard unless:*
  - (a) *the consent authority is satisfied that:*
    - (i) *the applicant's written request has adequately addressed the matters required to be demonstrated by subclause (3), and*
    - (ii) *the proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out, and*
  - (b) *the concurrence of the Director-General has been obtained.*
- (5) *In deciding whether to grant concurrence, the Director-General must consider:*
  - (a) *whether contravention of the development standard raises any matter of significance for State or regional environmental planning, and*
  - (b) *the public benefit of maintaining the development standard, and*
  - (c) *any other matters required to be taken into consideration by the Director-General before granting concurrence.*
- (6) *Development consent must not be granted under this clause for a subdivision of land in Zone RU1 Primary Production, Zone RU2 Rural*

*Landscape, Zone RU3 Forestry, Zone RU4 Primary Production Small Lots, Zone RU6 Transition, Zone R5 Large Lot Residential, Zone E2 Environmental Conservation, Zone E3 Environmental Management or Zone E4 Environmental Living if:*

- (a) the subdivision will result in 2 or more lots of less than the minimum area specified for such lots by a development standard, or*
- (b) the subdivision will result in at least one lot that is less than 90% of the minimum area specified for such a lot by a development standard.*

**Note.** *When this Plan was made it did not include all of these zones.*

- (7) After determining a development application made pursuant to this clause, the consent authority must keep a record of its assessment of the factors required to be addressed in the applicant's written request referred to in subclause (3).*
- (8) This clause does not allow development consent to be granted for development that would contravene any of the following:*
  - (a) a development standard for complying development,*
  - (b) a development standard that arises, under the regulations under the Act, in connection with a commitment set out in a BASIX certificate for a building to which State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 applies or for the land on which such a building is situated,*
  - (c) clause 5.4,*
  - (ca) clause 6.1 or 6.2*

## **5.1 CLAUSE 4.6 AND ITS USE**

Clause 4.6 of the SLEP 2014 sets out the general principle that a development standard may be varied where strict compliance can be shown to be unreasonable or unnecessary in the circumstances of the case; and that there are sufficient environmental planning grounds to justify contravening the development standard.

Before applying the discretionary power of Clause 4.6 the consent authority must be satisfied that the standard for which the departure is sought is a "development standard" and not a matter which would prohibit the proposal.

A development standard is defined within Section 4 of the EP&A Act.

*"Development standard" means provisions of an environmental planning instrument in relation to the carrying out of development, being provisions by or under which requirements are specified or standards are fixed in respect of any aspect of that development, including, but without limiting the generality of the forgoing, requirements or standards in respect of -*

- (a) the area, shape or frontage of any land, the dimensions of any land, buildings or works, or the distance of any land, building or works, or the distance of any land, building or work from any specified point;*

- (b) the proportion or percentage of the area of a site which a building or work may occupy;*
- (c) the character, location, siting, bulk, scale, shape, size, height, density, design or external appearance of a building or work;*
- (d) the cubic content or floor space of a building;*
- (e) the intensity or density of the use of any land, building or work;*
- (f) the provision of public access, open space, landscaped space, tree planting or other treatment for the conservation, protection or enhancement of the environment;*
- (g) the provision of facilities for the standing, movement, parking, servicing manoeuvring, loading or unloading of vehicles;*
- (h) the volume, nature and type of traffic generated by the development;*
- (i) road patterns;*
- (j) drainage;*
- (k) the carrying out of earthworks;*
- (l) the effects of the development on patterns of wind, sunlight, daylight or shadows;*
- (m) the provision of services, facilities and amenities demanded by the development;*
- (n) the emission of pollution and means for its prevention or control or mitigation; and*
- (o) such other matters as may be prescribed.*

Having regard to the definition of “*development standard*”, particularly paragraph (c), it is considered that Clause 4.3 contains a development standard limiting the height of a building. Furthermore, Clause 4.3 is contained in Part 4 of the Shoalhaven LEP, which contains the primary development standards outlined in the LEP. This reinforces the contention that the provisions of Clause 4.3 are a development standard. Such a development standard is therefore open to a written request made pursuant to Clause 4.6.

A consent authority must also be satisfied of three matters (pursuant to the provisions of Clause 4.6) before it may agree with the written request and grant development consent to a development application for development that could, but for a development standard, be carried out with development consent.

First, the request is to be in writing (Clause 4.6(3)), demonstrate that the compliance with that development standard is unreasonable or unnecessary in the circumstances of the case (Clause 4.6(3)(a)) and that there are sufficient environmental planning grounds to justify contravening the development standard (Clause 4.6(3)(b)).

Secondly, the consent authority must also be satisfied that the proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out (Clause 4.6(4)(a)(ii)).

Finally, the consent authority can only grant development consent for a development that contravenes a development standard if the concurrence of the Secretary (formerly Director General) of Planning and Infrastructure has been obtained (Clause 4.6(4)(b)).

The Secretary in deciding whether to grant concurrence must consider pursuant to Clause 4.6(5):

- (a) *whether contravention of the development standard raises any matter of significance for State or regional environmental planning, and*
- (b) *the public benefit of maintaining the development standard, and*
- (c) *any other matters required to be taken into consideration by the Director-General before granting concurrence.*

As this matter does not concern the subdivision of land zoned *RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU3 Forestry, Zone RU4 Primary Production Small Lots, Zone RU6 Transition, Zone R5 Large Lot Residential, Zone E2 Environmental Conservation, Zone E3 Environmental Management or Zone E4 Environmental Living* the provisions of Clause 4.6(6) are also not applicable to this proposal and are not further addressed in this written request.

This submission has been prepared having regard to the above relevant matters.

## **5.2 DEPARTMENT OF PLANNING AND INFRASTRUCTURE GUIDELINES**

The Department of Planning and Infrastructure has produced a document entitled "*Varying Development Standards – A Guide*" dated August 2011. This document updates the former Circular B1 which applied to *State Environmental Planning Policy No. 1 (SEPP No. 1) - Development Standards* to include the relevant matters applying under Clause 4.6 where the Standard Instrument LEP has been adopted.

The Guidelines build upon the matters outlined above and in Clause 4.6 itself, and also stipulates that the application should address the "five part test". In this regard, the Land and Environment Court (*Wehbe v Pittwater Council [2007] NSWLEC827 (21 December 2007)*) has set out a "five part test" for consent authorities to consider when assessing a proposal that seeks to vary a development standard. The "five part test" is as follows:

1. *the objectives of the standard are achieved notwithstanding non-compliance with the standard;*

2. *the underlying objective or purpose of the standard is not relevant to the development and therefore compliance is unnecessary;*
3. *the underlying object of purpose would be defeated or thwarted if compliance was required and therefore compliance is unreasonable;*
4. *the development standard has been virtually abandoned or destroyed by the council's own actions in granting consents departing from the standard and hence compliance with the standard is unnecessary and unreasonable;*
5. *the compliance with development standard is unreasonable or inappropriate due to existing use of land and current environmental character of the particular parcel of land. That is, the particular parcel of land should not have been included in the zone.*

Relevant matters are addressed in Section 7.0 below.

## **6.0        ASSUMED CONCURRENCE**

The Guidelines prepared by the Department deal with the concurrence requirements of proposals reliant upon an exception to development standards. Where a Standard Instrument LEP applies, as is the case with this proposal and the provisions of Shoalhaven LEP 2014, the Guidelines reference Planning Circular PS 08-003 issued in May 2008 and which advises that the concurrence can be assumed with respect to all environmental planning instruments that adopt Clause 4.6, or a similarly worded clause, providing for exception to development standards.

The concurrence of the Secretary of the Department of Planning and Infrastructure can therefore be assumed with respect to this proposal.



## **7.0 THE REQUEST**

### **7.1 WRITTEN REQUEST JUSTIFYING CONTRAVENTION OF CLAUSE 4.3 SLEP 2014**

This written request seeks to justify the departure to the provisions of Clause 4.3(2A) of the SLEP 2014 which imposes a maximum building height of eleven (11) metres. The proposal seeks to undertake alterations to the existing Flour Mill within the existing Shoalhaven Starches factory site.

This written request demonstrates that compliance with Clause 4.3(2A) of SLEP 2014 is unreasonable and unnecessary given the specific circumstances of this case; and that there are sufficient environmental planning grounds to justify contravention of the maximum height limit.

#### **7.1.1 Objectives Underpinning Clause 4.3 are Achieved**

Preston CJ in *Wehbe v Pittwater Council* [2007] NSWLEC827 (21 December 2007) provides commentary with respect to establishing whether compliance with a development standard is unreasonable or unnecessary under the specific circumstances of a particular matter. Whilst this case related to the use of SEPP 1, given the similarities between the objects of SEPP No.1 and Clause 4.6 the findings of Preston CJ does provide guidance with respect to the implementation of this clause.

According to Preston CJ one of the most commonly invoked ways to establish that compliance with the development standard is unreasonable or unnecessary is because the objectives of the development standard are achieved notwithstanding non-compliance with the standard.

The rationale is that development standards are not ends in themselves but means of achieving ends. The ends are environmental or planning objectives. Compliance with a development standard is fixed as the usual means by which the relevant environmental or planning objective is able to be achieved. However, if the proposed development proffers an alternative means of achieving the objective, strict compliance with the standard would be unnecessary (it is achieved anyway) and unreasonable (no purpose would be served).

As outlined in Section 5.2 above, the objectives underpinning the development standard – in this instance the maximum Building Height of eleven metres is a relevant consideration in determining whether strict compliance with that standard under the specific circumstances of the case would be unreasonable or unnecessary.

The objectives of the height of buildings standard are expressly stated in Clause 4.3 as follows:

- (1) *The objectives of this clause are as follows:*
- (a) *to ensure that buildings are compatible with the height, bulk and scale of the existing and desired future character of a locality,*
  - (b) *to minimise visual impact, disruption of views, loss of privacy and loss of solar access to existing development,*
  - (c) *to ensure that the height of buildings on or in the vicinity of a heritage item or within a heritage conservation area respect heritage significance.*

The above objectives in my view provide a clear understanding of the purposes underpinning the building height standard outlined in Clause 4.3(2A) and which applies to the subject site.

This written submission will demonstrate that this proposal will not prevent the above objectives from being achieved notwithstanding non-compliance with the eleven metre height restriction development standard in the specific circumstances of this case.

Having regard to the objectives of Clause 4.3, it is my view that the proposal is not inconsistent with these for the following reasons:

- The proposal seeks consent to undertake alteration to the existing Flour Mill at the Shoalhaven Starches site. The proposal will involve the installation of additional plant largely within the confines of the existing Flour Mill building footprint. External alterations will comprise additional plant located on top of the existing Flour Mill building and a small building extension which will have an overall height of 40 metres. The additional roof top plant will include additional silencers in conjunction with existing silencers; as well as a bucket elevator and conveyors. The proposed rooftop additions will not be dissimilar to existing structures already located on the roof of the Flour Mill and elsewhere within the existing Shoalhaven Starches complex and will conform to the visual character of the site, ie. it is industrial development within an industrial setting. **Figure 3** is the elevation plan for the proposed alterations to the existing Flour Mill.
- The proposed building extension will have a footprint of 3 m x 4 m and an overall height of 40 m. The existing Flour Mill has a height of 32.05 m and the existing silos are 34.50 m high. As such, despite the increase in building height, the overall visual change will be minor given the small footprint of the proposed extension and that it will be viewed within the context of these existing buildings and also within the

context of the broader Shoalhaven Starches site. The broader site includes a range of different buildings and building heights including the new wet end dryer which has a height above ground level of 43 m and the boiler house which has a stack with a height of 53 m. Detailed plans of the proposed development are attached as **Annexure 1** to the EA.

The subject site is zoned IN1 general industrial and the proposed development meets the current and desired future character of the locality in which it is sited.

- The proposed development will have a limited visual impact. The main vantage points from where the development could potentially be visible would be from residences along Riverview Road directly south of the site (this view is from a distance of about 600 metres) and from Nowra Bridge to the South West of the site. The views from these sites are mainly dominated by the river, riparian vegetation and the floodplain. The existing Flour Mill is already visible from these vantage points. The existing Flour Mill will remain largely unchanged externally by the proposed modifications with the exception of additional plant that is proposed to be located on the roof of the building and a building extension that is to be located between the existing Flour Mill and silos (and away from these vantage points). The proposed external additions will not be dissimilar to existing structures already located within the existing Shoalhaven Starches complex and will conform to the visual character of the site. Under these circumstances, the proposed modifications will not be out of context in terms of the existing factory development when viewed from this vantage point. The visual impact of the modification proposal is discussed in Section 8.5 of the EA.
- The development will not lead to excessive overshadowing of foreshore areas given the scale and nature of the proposed alterations.
- The proposed development site is not subject to a heritage listing under the provisions of SLEP 2014 nor is it sited within the vicinity of a heritage item or within a heritage conservation area.
- The proposed development has been designed to comply with all relevant statutory planning provisions applying to this form of development.

Given these circumstances, it is our view that the proposed Flour Mill modifications will not be inconsistent with the prevailing character of this locality; or the envisaged character of the area given the planning provisions applying to the land, and will therefore not be inconsistent with the objectives outlined in Clause 4.3(1) of SLEP 2014.

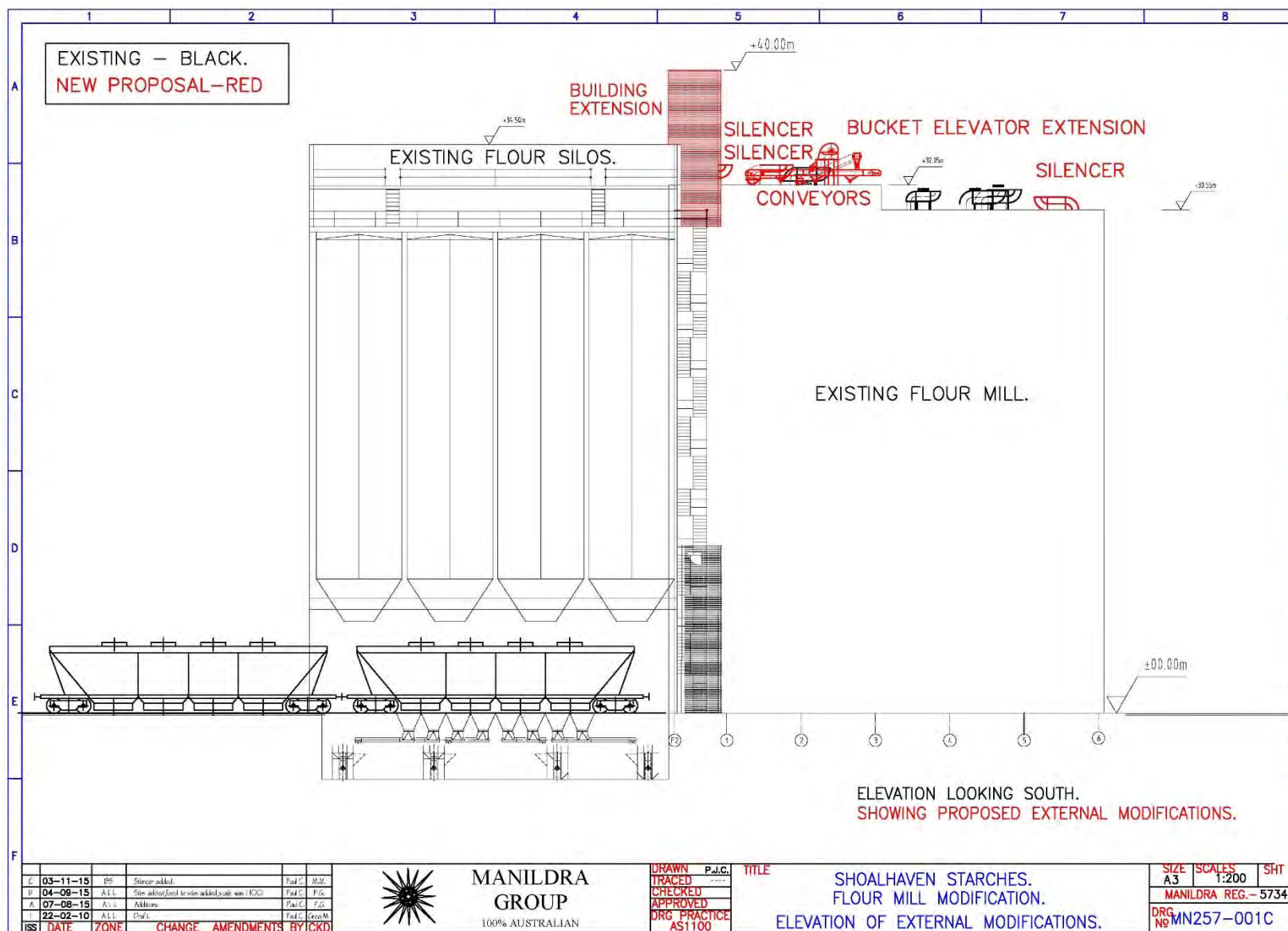


Figure 3: Elevation plan of proposed works.

### **7.1.2 Environmental Planning Grounds that Justify Contravening Development Standard**

The written request is also required to demonstrate that there are sufficient environmental planning grounds to justify contravening the eleven metre height restriction.

- The proposal is not inconsistent with state and regional planning provisions applying to this land.
- The proposal is consistent with the objectives and is permissible within the IN1 zone that applies to the land.
- Despite non-compliance with 11 metre height restriction, the proposal is consistent with the stated objectives of Clause 4.3 as they relate to the building height requirements as outlined above in Section 7.1.1 of this written request.
- The proposed development is representative of the prevailing character of the locality, ie. industrial development within an industrial zone and is of a height consistent with buildings already existent on the development.
- The subject site is eminently suitable for the proposal development.

### **7.1.3 Public Interest**

The written request is also required to demonstrate that the proposed development will be in the public interest because it is consistent with the objectives of the particular standard and the objectives for development within the zone in which the development is proposed to be carried out.

Section 7.1.1 of this submission demonstrates that the proposal will be able to satisfy the objectives of the development standard as enunciated within Clause 4.3 notwithstanding contravention of the eleven metre height restriction.

The subject site is zoned IN1 General Industrial under the provisions of the Shoalhaven Local Environmental Plan 2014.

The objectives of the IN1 zone are:

- *To provide a wide range of industrial and warehouse land uses.*
- *To encourage employment opportunities.*
- *To minimise any adverse effect of industry on other land uses.*
- *To support and protect industrial land for industrial uses.*

- *To allow a diversity of activities that do not significantly conflict with the operation of existing or proposed development.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.*

It is our view that the proposal is not inconsistent with the above objectives:

- The site is an existing factory complex and the development will ensure that land that is zoned for industrial purposes is fully utilised for that purpose.
- The proposed Flour Mill modifications will support and protect both the industrial use of the subject site and the employment opportunities provided by Shoalhaven Starches.
- Section 8.5 of the EA addresses the visual impact of the proposal and concludes that the proposal will not adversely impact the scenic amenity of this locality.

Given the proposal is consistent with the objectives that underpin Clause 4.3 and is consistent with the objectives of IN1 zone that apply to the land. It is our view that the proposal will be in the public interest having regard to clause 4.6(4)ii) of SLEP 2011.

#### **7.1.4 Clause 4.6(5) Matters for Consideration by Director-General**

As outlined the concurrence of the Director-General is to be assumed in this case.

- As identified in the original EA for the SSEP the overall proposal is consistent with state and regional planning provisions that apply to the site.
- As outlined in Section 7.1.3 of this submission it is our view that the proposal is in the public interest.

---

Under these circumstances it is my view that this objection made pursuant to Clause 4.6 is well founded and strict compliance with Clause 4.3(2A) of Shoalhaven LEP 2014 would be unreasonable under the specific circumstances of this case as:

- The objectives that underpin the development standard outlined in Clause 4.3 of Shoalhaven LEP are achieved notwithstanding non-compliance with the development standard.
- This proposal is consistent with state and regional planning provisions applying to this land.
- The proposal is consistent with the objectives of the IN1 zone that applies to the land.

- Despite non-compliance with the eleven metre height restriction, the proposal is consistent with the stated objectives of Clause 4.3 as they relate to the height of building requirements as outlined above in this written request.
- The proposed development is representative of the prevailing character of the locality, ie. industrial development within an industrial zone.
- The existing Flour Mill will remain largely unchanged externally by the proposed modifications with the exception of additional plant that is proposed to be located on the roof of the building and a building extension that is to be located between the existing Flour Mill and silos. The proposed external additions will not be dissimilar to existing structures already located within the existing Shoalhaven Starches complex and will conform to the visual character of the site.
- The underlying purpose of the proposed modifications would be defeated if compliance was required as restricted height would limit the ability to modify the existing Flour Mill and therefore compliance is unreasonable. Such would have an adverse impact on the ongoing operations on the site.
- The subject site is eminently suitable for the proposal development.

Although well considered, the eleven metre height restriction for the broader Shoalhaven encapsulated within Clause 4.3 should not be rigidly enforced as a development standard in all cases.

This submission demonstrates that the variation to the development standard sought by this proposal is consistent with the objectives of the state, regional and local planning provisions for this site. It is my opinion that strict compliance with this development standard under the specific circumstances of this case would be unreasonable and unnecessary.

For these reasons, this submission pursuant to Clause 4.6 requests that the Department exercise the discretionary power and support this proposal and the development application.



**Stephen Richardson**  
TOWN PLANNER CPP MPIA

## **ANNEXURE 4**

**Flood Impact Assessment**

**prepared by**

**WMAwater Pty Ltd**





**Cowman Stoddart Pty Ltd**  
PO Box 738  
NOWRA  
NSW 2541

J:\Jobs\114044\Admin\FlourMillAssessmentSept2015.docx

25 September 2015

**Attention: Mr. S Richardson**

Dear Steve,

**Re: DCP2014 Chapter G9:Flood Compliance Report for Proposed Modification  
Application to MP06-0228, Shoalhaven Starches Expansion Project, Alterations to  
Existing Flour Mill, Bolong Road, Bomaderry**

This letter has been prepared by R W Dewar BSc, MEngSci, MIEAust CPEng Member No 477618 who has over 30 years of experience in NSW in floodplain management.

## **1 Introduction**

Shoalhaven Starches intend to undertake modifications to the existing Flour Mill located at their Bomaderry plant to increase the amount of flour that will be able to be produced on the site. The proposal involves the installation of additional plant within the confines of the existing Flour Mill building. The only external addition to the existing building footprint is a small (3m by 4m) area located between the silos and the flour mill building. The proposal will involve additional plant being located on top of the existing building.

The alterations will result in an increase in flour that will be able to be produced by 2,700 tonnes per week to a total of 7,700 tonnes per week. New equipment will be housed entirely within the existing flour mill structure. No new storage silos will be required as part of this project.

Appendix A provides plans of the proposal as well as a site plan. The location of the proposed new flour mill on current GoogleMaps aerial photograph is shown below.

The site is inundated in the 1% Annual Exceedance Probability (AEP) flood event by floodwaters from the Shoalhaven River and this letter provides an assessment of the implications of this proposal on flood levels, flows and velocities.

### **WMAwater PTY LTD**

#### **DIRECTORS**

M K Babister	BE(Hons), MEngSc GradDipMgt, FIEAust
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E J Askew	BE(Hons), MIEAust
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Level 2, 160 Clarence St, SYDNEY NSW 2000  
Phone: 02 9299 2855 Fax: 02 9262 6208  
Email: enquiry@wmawater.com.au  
Website: wmawater.com.au



WMAwater (formerly known as Webb McKeown & Associates) undertook the 1990 Shoalhaven River Flood Study and subsequent 2008 Floodplain Risk Management Study and Plan. We have also undertaken many similar type flood assessments for Shoalhaven Starches in the past and are therefore very familiar with flooding in the Shoalhaven River floodplain and the implications for flooding of further development within the confines of the existing Shoalhaven Starches plant on Bolong Road.

## 2 Description of Proposal

The proposal is to construct plant as described in Appendix A. An indicative ground level at the site is 4.2 mAHD and the 1% AEP flood level is approximately 5.6 mAHD according to the Flood Certificate obtained on 23<sup>rd</sup> September 2015 (attached as Appendix B).

## 3 Council Flood Certificate

Council's flood certificate (Appendix B) advises that the site is inundated in the 1% AEP event and is described as part High Hazard and part Floodway. The projected sea level rise estimates due to climate change will not increase the 1% AEP flood level at this site as it is too far upstream from the ocean.

## 4 Compliance with Chapter G9: Development on Flood Prone Land (DCP2014)

The following sections describe compliance with Chapter G9: Development on Flood Prone Land (DCP2014 Amended 1<sup>st</sup> July 2015). As the works will not involve fill, excavation or subdivision of lands compliance with these performance criteria have not been addressed.

#### 4.1 Performance Criteria - General (Section 5.1 of DCP only)

PERFORMANCE CRITERIA	RESPONSE
<b>P1 Development or work on flood prone land will meet the following:</b>	
The development will not increase the risk to life or safety of persons during a flood event on the development site and adjoining land.	The works are such that their construction will not increase the number of workers on the site or additionally threaten their safety during a flood.
The development or work will not unduly restrict the flow behaviour of floodwaters.	Refer Hydraulic Impact Assessment below.
The development or work will not unduly increase the level or flow of floodwaters or stormwater runoff on land in the vicinity. The development or work will not exacerbate the adverse consequences of floodwaters flowing on the land with regard to erosion, siltation and destruction of vegetation.	The works are within industrial land clear of vegetation and due to their being no increase in footprint will have no impact on erosion or siltation.
The structural characteristics of any building or work that are the subject of the application are capable of withstanding flooding in accordance with the requirements of the Council.	<b>A separate structural report will be provided.</b>
The development will not become unsafe during floods or result in moving debris that potentially threatens the safety of people or the integrity of structures.	<b>A separate structural report will be provided.</b>
Potential damage due to inundation of proposed buildings and structures is minimised.	The works are largely sealed structures and/or above the PMF flood level which means there will be no damage due to inundation, even in a PMF, unless the structure itself fails. There will potentially be some damage to electrical and other components feeding the equipment and these are considered in Shoalhaven Starches Flood Plan.
The development will not obstruct escape routes for both people and stock in the event of a flood.	The works will not occupy escape routes or cause workers to become trapped.
The development will not unduly increase dependency on emergency services.	The works are such that their construction will not increase the number of workers on the site, additionally threaten their safety during a flood or increase the need for emergency services.
Interaction of flooding from all possible sources has been taken into account in assessing the proposed	Refer Hydraulic Impact Assessment below.

PERFORMANCE CRITERIA	RESPONSE
development against risks to life and property resulting from any adverse hydraulic impacts.	
The development will not adversely affect the integrity of floodplains and floodways, including riparian vegetation, fluvial geomorphologic environmental processes and water quality.	The works will be constructed on land designated as high hazard floodway in the 1% AEP event. The site is industrial land with nil existing vegetation and is beyond the influence of normal fluvial geomorphic processes. The works will have no impact on water quality.

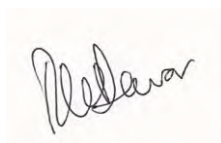
#### 4.2 Hydraulic Impact Assessment

The aerial image above from GoogleMaps indicates that the position of the proposed flour mill is surrounded by an extensive array of existing plant and buildings. Thus the flow path of floodwaters from the Shoalhaven River over the river bank and towards Bolong Road is already significantly impeded. In addition the majority of the proposed works are above the PMF (all except the 3m by 4m building extension) thus their construction will have nil impact on flood levels. Construction of the building extension will have an insignificant impact on flood levels due to the density of the surrounding existing plant and the small size of the extension.

In conclusion WMAwater consider that there would be no increase in the 1% AEP flood level as a result of the proposed works.

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

Yours Sincerely,  
**WMAwater**

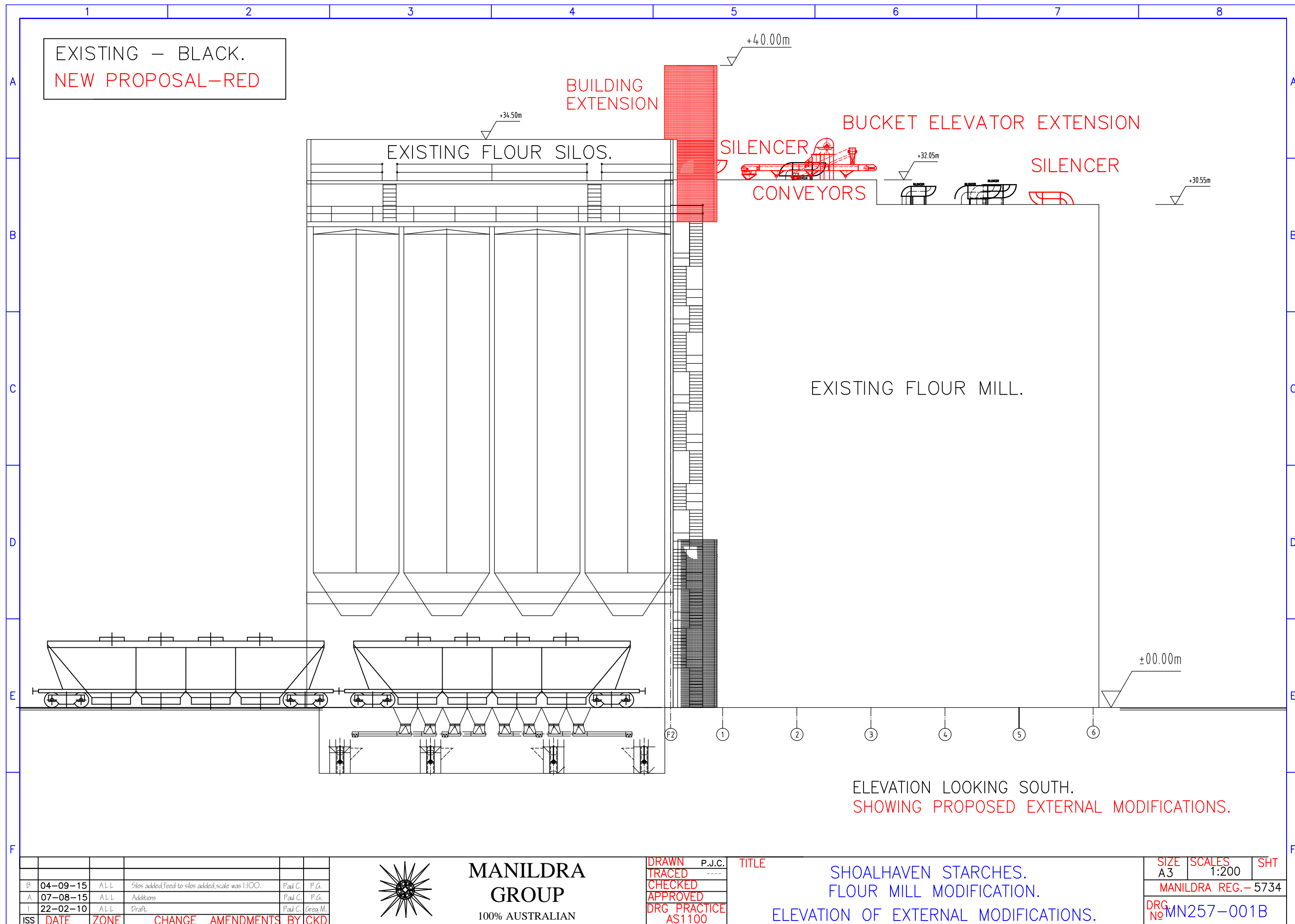


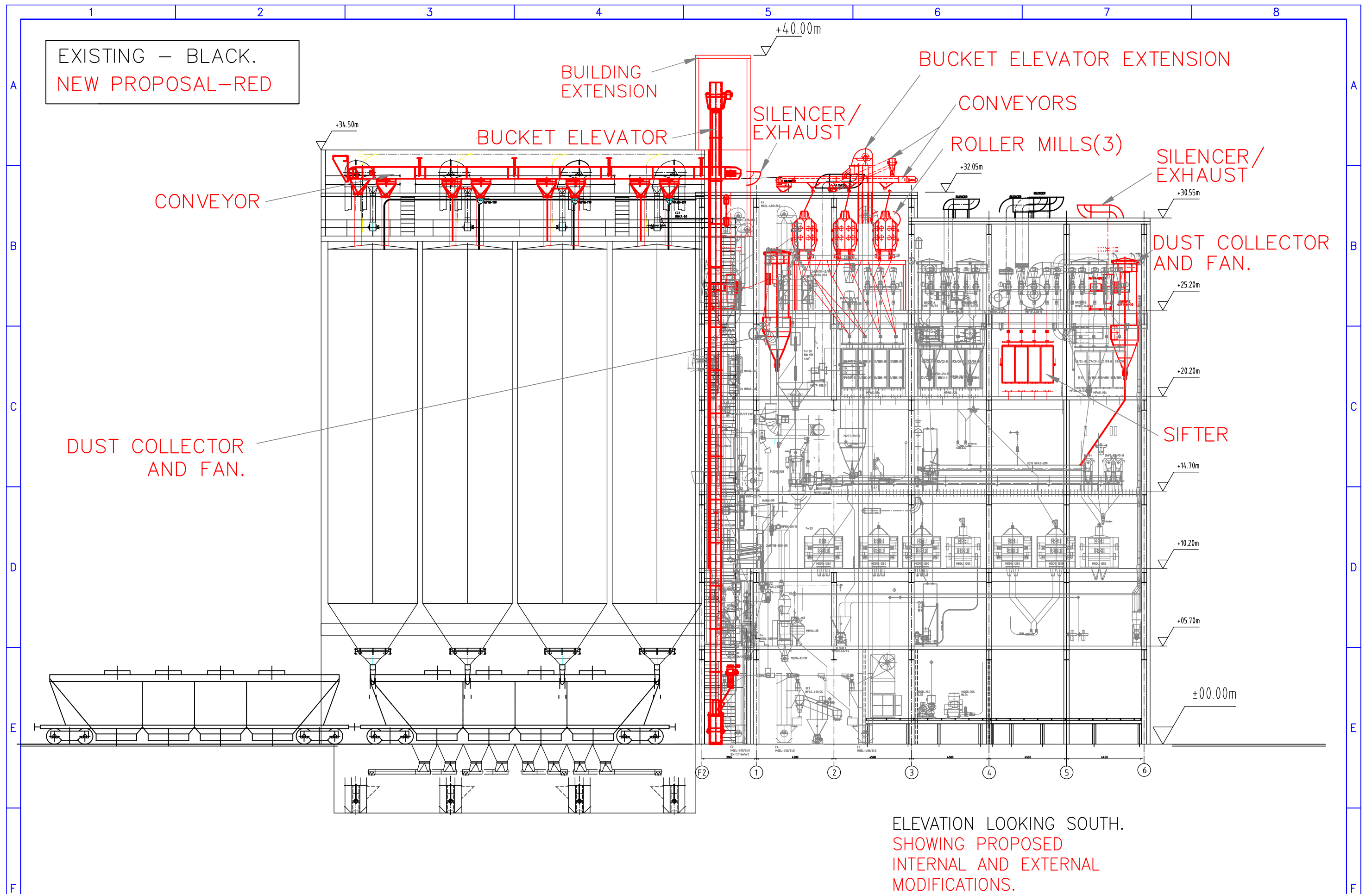
R W Dewar  
**Director**





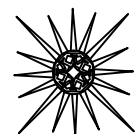






ELEVATION LOOKING SOUTH.  
SHOWING PROPOSED  
INTERNAL AND EXTERNAL  
MODIFICATIONS.

ISS	DATE	ZONE	CHANGE	AMENDMENTS	BY	CKD
B	04-09-15	ALL	Silos added, feed to silos added, scale was 1:100.	Paul C.	P.G.	
A	07-08-15	ALL	Additions	Paul C.	P.G.	
I	22-02-10	ALL	Draft.	Paul C.	Graig M.	



**MANILDRA  
GROUP**  
100% AUSTRALIAN

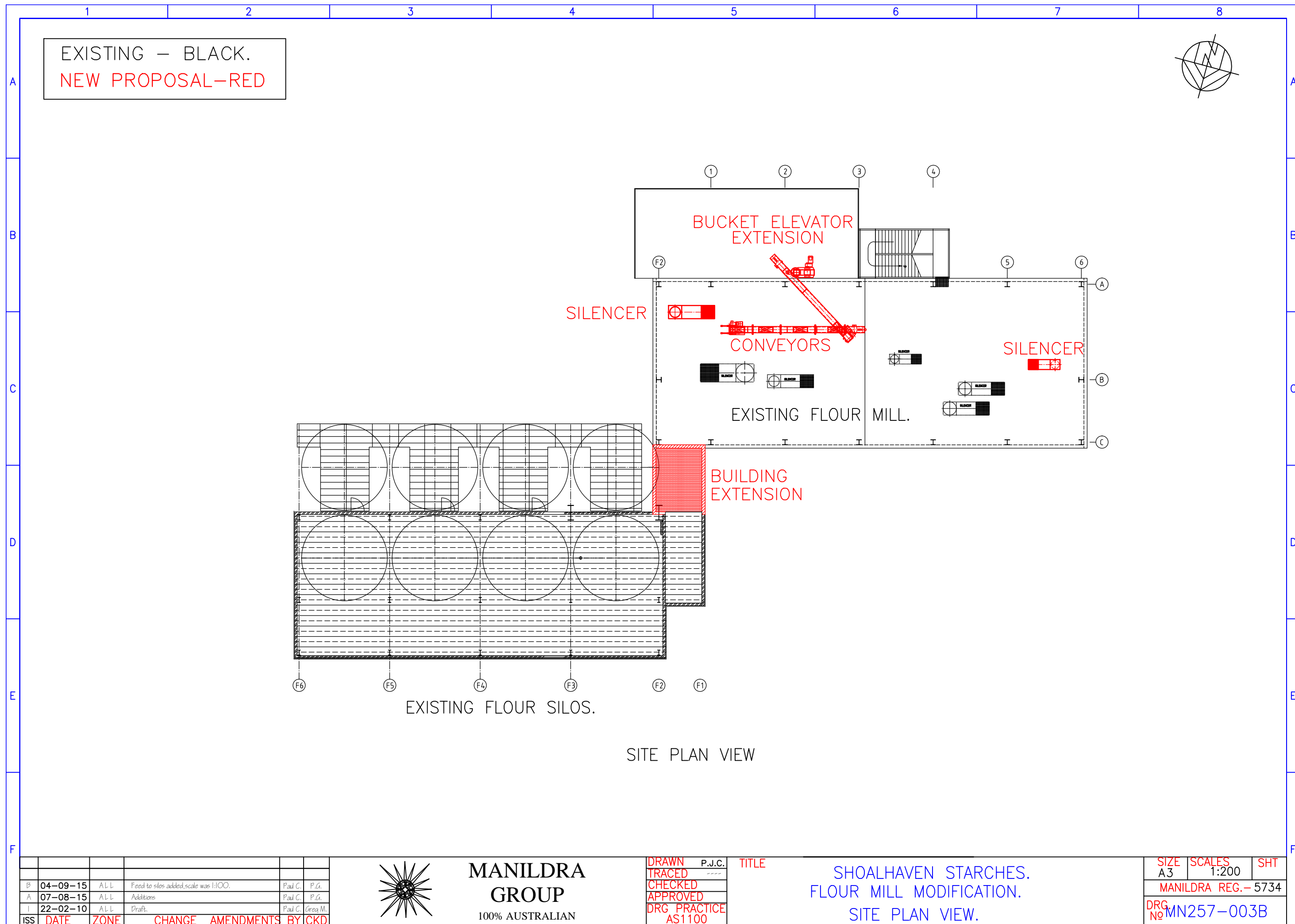
DRAWN P.J.C.  
TRACED  
CHECKED  
APPROVED  
DRG PRACTICE  
AS1100

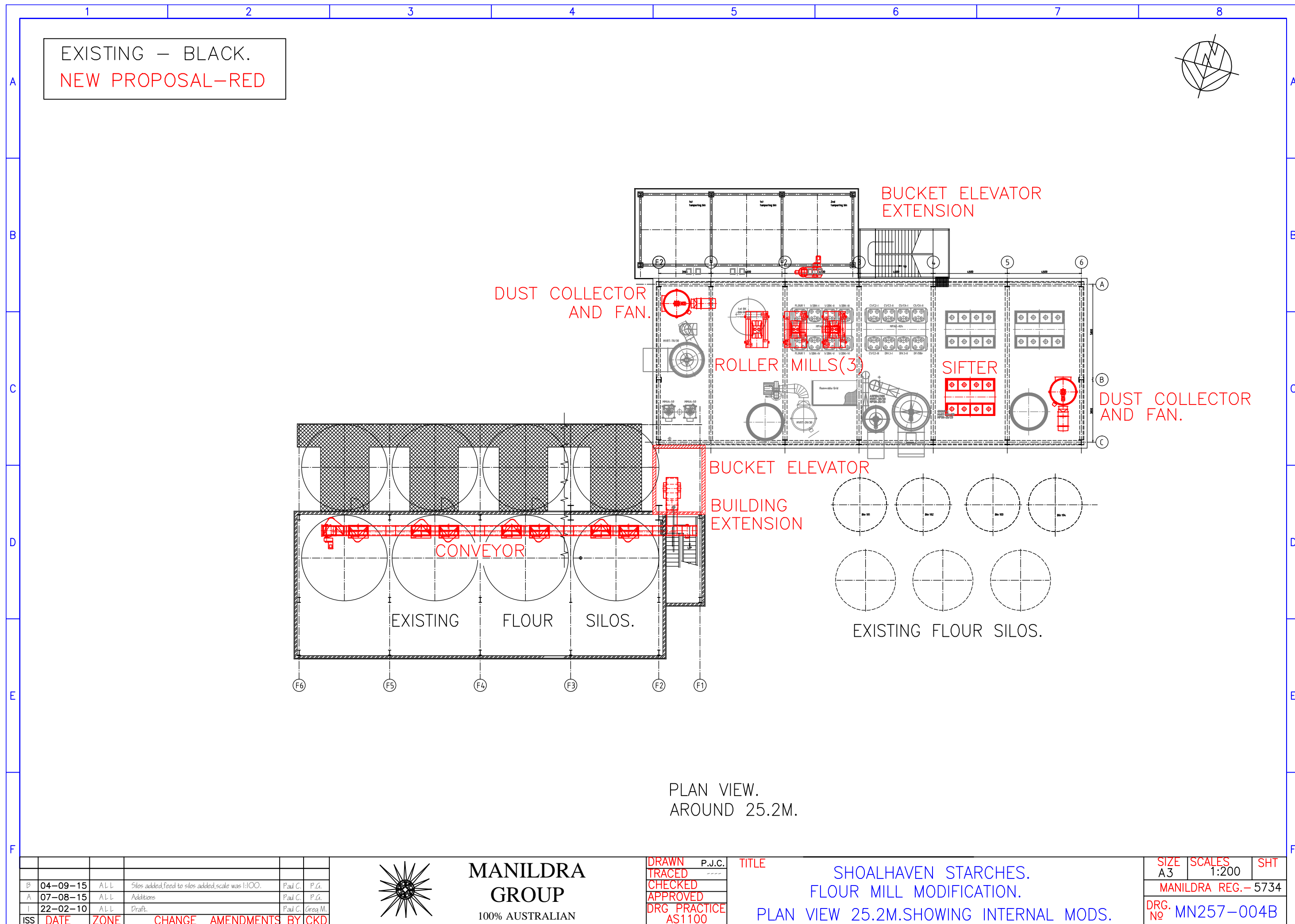
TITLE

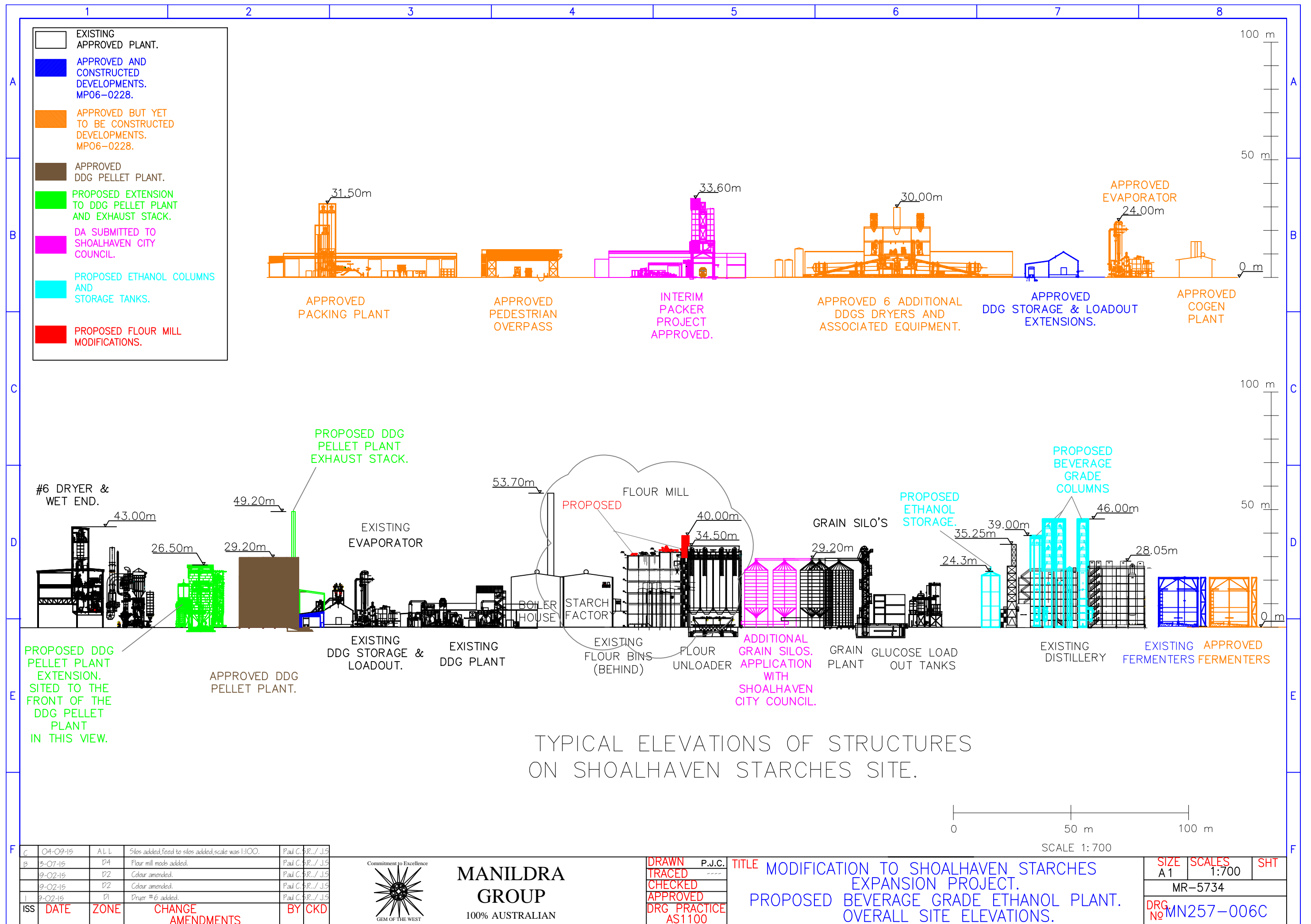
SHOALHAVEN STARCHES.  
FLOUR MILL MODIFICATION.  
ELEVATION OF INTERNAL MODIFICATIONS.

SIZE	SCALES	SHT
A3	1:200	
MANILDRA REG.- 5448		
DRG. No MN257-002B		











**City Administrative Centre**

Bridge Road, Nowra NSW Australia 2541

Phone: (02) 4429 3111 • Fax: (02) 4422 3168

**Address all correspondence to**

The General Manager, PO Box 42, Nowra NSW 2541 Australia

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COUNCIL REFERENCE: 28112E (D15/11422)

CONTACT PERSON: Kate Britton

DATE: 23 September 2015

Stephen Richardson  
PO BOX 738  
Nowra NSW 2541

Thank you for your recent inquiry in relation to flood data held by Shoalhaven City Council.

Please find below the original details of your inquiry, some general information on flooding as well as the requested property specific Flood Certificate.

Details of Inquiry:

<b>Name of Inquirer</b>	Stephen Richardson	<b>Date Requested:</b> 05 Jan 2015
<b>Reason for Enquiry</b>	New Construction	
<b>Contact Details</b>	Phone: 02 423 61998 Email: <a href="mailto:steve@cowmanstoddart.com.au">steve@cowmanstoddart.com.au</a> Postal: PO BOX 738 Nowra	
<b>Preferred Response</b>	Email	
<b>Notes</b>		
<b>Survey Detail</b>	Not Provided	
<b>Flood Safety Tip</b>	<b>Causeways can kill! Never drive through flood waters! Wait and be safe!</b>	
<b>General Flood Information</b>	Shoalhaven City Council in conjunction with SES has produced site specific flood brochures for Shoalhaven Heads, Nowra / Bomaderry / Terara, Greenwell Point/Orient Point and Sussex Inlet. General Flood Information booklets, such as "What to do before, during & after a flood" prepared by Emergency Management Australia are also available. You can pick up free copies of all brochures at the City Administration Building in Nowra.	

## FLOOD CERTIFICATE

According to the *Lower Shoalhaven River Floodplain Risk Management Plan – Climate Change Assessment (2011)* this property, 160 Bolong Rd, BOMADERRY - Lot 1 DP 838753, **is affected by the 1% AEP flood event.**

### FLOOD INFORMATION

Year	Existing	Projected 2050	Projected 2100
Flood Planning Level	Not applicable	6.1m AHD	6.1m AHD

Hazard Category	High	High	High
Hydraulic Category	Floodway	Floodway	Floodway

Probable Maximum Flood Level	7.8m AHD	7.8m AHD	7.8m AHD
1% AEP Flood Level	5.6m AHD	5.6m AHD	5.6m AHD
2% AEP Flood Level	5.1m AHD	5.1m AHD	5.1m AHD
5% AEP Flood Level	4.6m AHD	4.6m AHD	4.6m AHD
10% AEP Flood Level	4.5m AHD	4.5m AHD	4.5m AHD

Velocity (1% AEP flood event)	3.0m/s	3.0m/s	3.0m/s
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### SITE SPECIFIC CONSIDERATIONS

- Current NSW Government legislation requires climate change to be considered as part of this Floodplain Risk Management Study and Plan. Climate change related information evolves with time and it is expected that existing flood behaviour and levels may change in the future.  
All applications for buildings, and the like, must take into account the projected 2050 flood information. All subdivision and other long-term planning must take into account the projected 2100 flood information.  
On Tuesday 10th February 2015 Council's Policy & Resources Committee resolved to "Establish a sea level rise benchmarks for planning purposes based on a 2030 horizon 100 mm, a 2050 horizon of 230 mm and 360 mm horizon for 2100".  
These benchmarks vary from the benchmarks used in the flood information provided above (400mm and 900mm for the 2050 and 2100 horizon's respectively). The new benchmarks will be incorporated into the flood information in future. Until studies incorporating the new benchmarks are undertaken, however, Council will continue to use our best available information.
- Not all of the property is categorised high hazard floodway. Part of the property is categorised high hazard flood storage. For more specific information regarding the different hazard and hydraulic categorisations affecting this property please contact Council's Natural Resource and Floodplain Unit.

## STANDARD CONSIDERATIONS

### Properties below the Flood Planning Level:

Council considers the land in question to be below the flood planning level and therefore subject to flood related development controls. The conditions as set out below will reduce flood risk in flood events up to the Flood Planning Level, however the property may still be subject to flooding at higher levels during rare flood events.

### Development controls apply to flood affected properties.

**Development conditions will vary depending on flood hazard, hydraulic category as well as the type of development that is proposed.** Please refer to the following documents for information on Council's flood related development controls and the NSW State Government's Floodprone Land Policy.

- Shoalhaven Development Control Plan – Chapter 9: Development on Flood Prone Land <http://dcp2014.shoalhaven.nsw.gov.au/main-category/whole-document>
- NSW Floodplain Development Manual 2005: <http://www.environment.nsw.gov.au/floodplains/manual.htm>

### DISCLAIMER

Your enquiry relating to the likelihood of the land specified in the application being flooded has been referred to the Council's Floodplain Engineer.

In responding to your application the Council seeks to bring to your attention the fact that pursuant to s.733 of the Local Government Act a council does not incur liability in respect of the giving of any advice furnished in good faith by the Council relating to the likelihood of any land being flooded or the nature or extent of any such flooding.

The Council does not have a legal obligation to provide advice to you and to the extent that this reply is giving advice, the Council provides that advice in good faith with the intention of preserving, so far as is legally possible, the Council's immunity from liability pursuant to s.733 of the Local Government Act.

While all reasonable care has been taken to ensure the accuracy of the information given in this reply, its purpose is to provide a general indication of flood risk in the area. Flood lines shown on Council maps indicate the approximate extent of flooding only in relation to the abovementioned land.

The information provided may contain errors or omissions and the accuracy may not suit the purposes of all users. A site survey and further investigation are strongly recommended before commencement of any project based on this data.

The information given is the most current information at the time of the request. It is to be noted, however, that flood information is constantly reviewed and updated and as such, the information contained in this regard is current only on the day of issue.

Before acting upon the information provided in this reply, the Council urges you to obtain separate and independent advice as Council, in giving this information, does not intend it to be relied upon in such a fashion as to impose liability upon the Council.

Should you not be prepared to accept the information contained in this reply upon that basis then you should immediately notify Council.

### GLOSSARY

**AEP (Annual Exceedance Probability)** means the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage – for example a 1% AEP flood event has a 1% chance of occurring in any one calendar year.

**AHD (Australian Height Datum)** is a common national surface level datum corresponding approximately to mean sea level.

**Flood fringe** is the part of the floodplain remaining after the floodway and flood storage areas have been defined.

**Flood planning area** is any land identified as being flood affected in the 1% AEP flood event plus freeboard.

**Flood planning level (FPL)** is the 1% AEP flood level plus freeboard. The FPL is used for planning purposes, as determined in floodplain risk management studies and incorporated in floodplain risk management plans.

**Flood prone land** means any land susceptible to flooding up to the probable maximum flood event (that is, land within the floodplain) as identified in an adopted Council flood study or floodplain risk management study and plan.

**Flood storage** areas are those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of a flood.

**Flood study** is a technical investigation of flood behaviour. It defines the nature of flood risk by establishing the extent, level and velocity of floodwaters. The study also provides information on the distribution of flood flows across various sections of the flood plain for the full range of flood events up to and including the PMF.

**Floodplain risk management plan** is a plan developed in accordance with the principles and guidelines contained in the NSW Government Floodplain Management Manual. Usually includes both written and diagrammatic information describing how particular areas of flood prone land are to be used and managed to achieve defined objectives.

**Floodplain risk management study** is a study that identifies and compares various risk management options. This includes an assessment of their social, economic, ecological and cultural impacts, together with opportunities to maintain and enhance river and floodplain environments.

**Floodway** means those parts of the floodplain where a significant discharge of water occurs during floods. They are often aligned with natural defined channels. Floodways are areas that, even if only partially blocked, would cause a significant redistribution of flood flow, or a significant increase in flood levels.

**Freeboard** is currently 0.5m for all catchments in the Shoalhaven. Freeboard is a factor of safety used to set the FPL (i.e.  $FPL = 1\% \text{ AEP flood level} + \text{freeboard (0.5m)}$ ). Freeboard takes into account uncertainties in flood modelling and climate change predictions, local factors that cannot be included in the flood model or wave action caused by wind, boats or vehicles driving through flood waters.

**Hazard category** represents the risk or danger to personal safety, evacuation movements and buildings and structures within the Flood Planning Area during the 1% AEP flood. There are only two possible hazard categories – high or low.

**Hydraulic category** describes the function of a specific part of the Flood Planning Area in conveying flood waters during a 1% AEP flood. There are three possible hydraulic categories – floodway, flood storage or flood fringe.

**Probable maximum flood (PMF)** is the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation. Generally, it is not physically or economically possible to provide complete protection against this event. The PMF defines the extent of flood prone land, that is, the floodplain.

**Provisional** is used for hazard categories that have been determined in a flood study. Hazard categories are provisional until the floodplain risk management study and plan has been completed and adopted by Council, as this document considers additional risks, not considered during the flood study.



## **ANNEXURE 5**

**Air Quality Impact Assessment**

**prepared by**

**Stephenson Environmental  
Management Australia**



**Stephenson**

Environmental Management Australia

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**AIR QUALITY IMPACT ASSESSMENT V2**

**PROPOSED MODIFICATIONS TO EXISTING FLOUR MILL**

**SHOALHAVEN STARCHES**

**BOLONG ROAD, BOMADERRY**

**PROJECT NO.: 5563/S23918/15**

**DATE OF ISSUE: 12 OCTOBER 2014**

**DATE OF V2 ISSUE 30 OCTOBER 2015**

**PREPARED FOR COWMAN STODDART ON BEHALF OF THE MANILDRA GROUP**

---



**Stephenson**

**Environmental Management Australia**

Peter W Stephenson & Associates Pty Ltd  
ACN 002 600 526 (Incorporated in NSW)  
ABN 75 002 600 526

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Newington NSW 2127 Australia  
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**AIR QUALITY IMPACT ASSESSMENT V2**

**PROPOSED MODIFICATIONS TO EXISTING FLOUR MILL**

**SHOALHAVEN STARCHES**

**BOLONG ROAD, BOMADERRY**

**PROJECT NO.: 5563/S23918/15**

**DATE OF ISSUE: 12 OCTOBER 2014**

**DATE OF V2 ISSUE 30 OCTOBER 2015**

**PREPARED FOR COWMAN STODDART ON BEHALF OF THE MANILDRA GROUP**

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**P W STEPHENSON**

**A NAGHIZADEH**

**A PRADHAN**

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## 1 INTRODUCTION

Stephenson Environmental Management Australia (SEMA) was engaged by Cowman Stoddart Pty Ltd on behalf of the Manildra Group to undertake an Air Quality Impact Assessment (AQIA) for modifications to be made to the existing flour mill at Bolong Road, Bomaderry, New South Wales (NSW).

This assessment has been prepared in response to the requirements issued by the NSW Department of Planning and Environment (DoPE), which included:

*“...Air Quality and Odour*

*...an air quality impact assessment in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DECC 2005). This should include specific assessment of potential odour and total suspended particle impacts from the proposal and detail whether the existing pollution controls, such as flour mill baghouses at the premises have sufficient capability to deal with the proposed expansion. Where any exceedances of the relevant air quality assessment criteria are identified, the air quality impact assessment report should detail all reasonable and feasible mitigation measures that will be implemented to ensure compliance.*

Following subsequent consultation between the Applicant, the DoPE and the NSW Environmental Protection Authority (EPA), it was outlined that this proposal does not rely upon the use of the existing pollution controls as suggested in the DoPE's requirements above. This air quality impact assessment has therefore been prepared on this basis, which has been subsequently agreed to by both the EPA and DoPE.

The AERMOD computer based dispersion model was used to determine the ground level impacts of odour and TSP. Modelling has been undertaken in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (AMMAAP)*.

Odour and TSP emission measurements conducted by Stephenson Environmental Management Australia at the existing flour mill on September 26<sup>th</sup> 2011 have been used as emission input data for the predictive dispersion modelling.

The Manildra Group provided proposed operational data, discharge stack and equipment design information.

## 2 THE SITE

The Manildra Group Shoalhaven Starches site is approximately 13 hectares, located between Bolong Road and the Shoalhaven River, approximately 0.6 km south east of the Bomaderry Post Office and 80 kilometres (km) south of Wollongong.

Figure 2-1 displays the location of the modelling domain and Figures 2-2 and 2-3 show plans of the proposed flour mill modifications on the Shoalhaven Starches site. Figure 2-4 illustrates elevations of the proposed modifications.

**FIGURE 2-1 SHOALHAVEN STARCHES LOCATION**

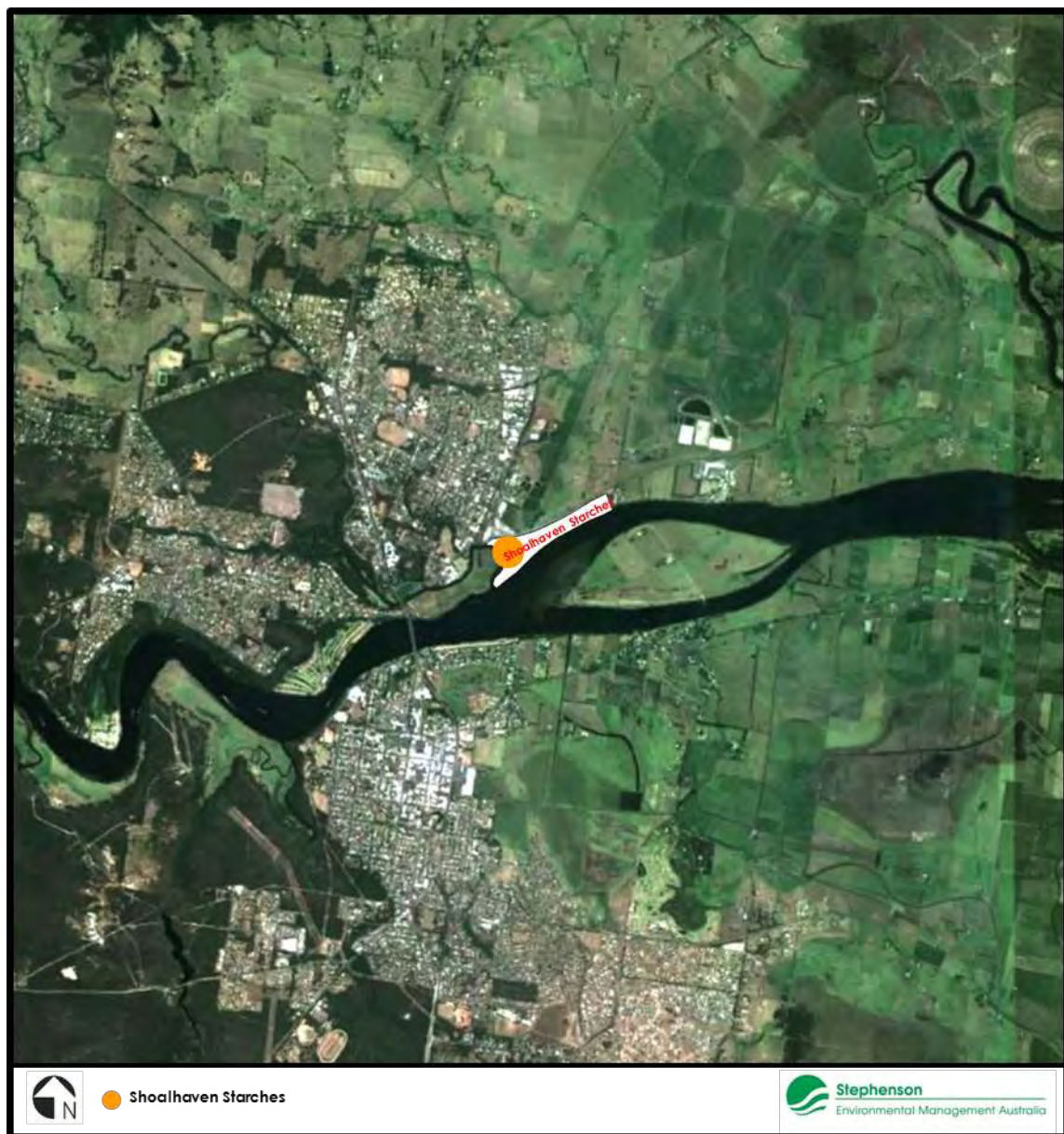


FIGURE 2-2 FLOUR MILL SITE





FIGURE 2-3 PROPOSED MODIFIED FLOUR MILL

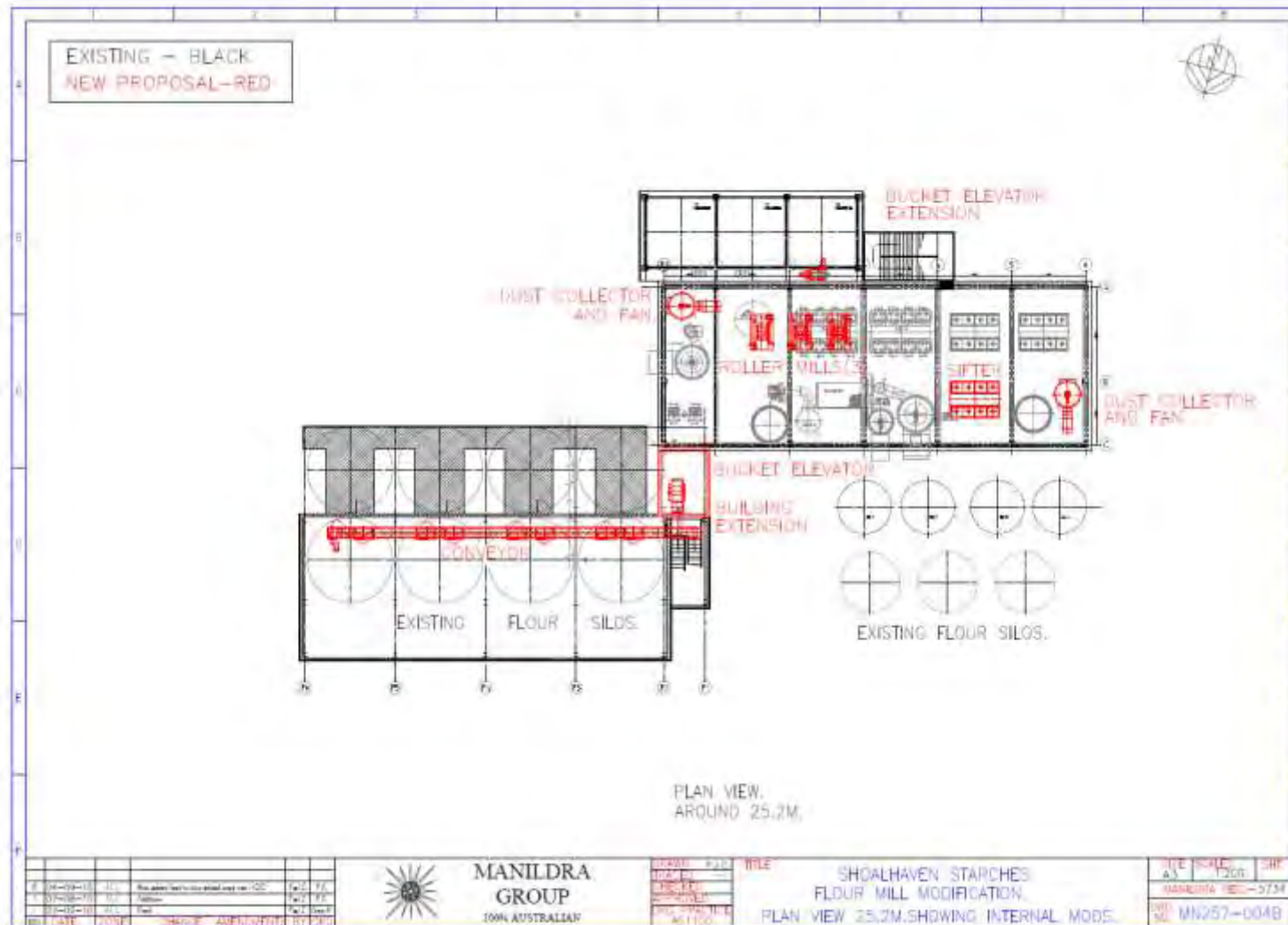
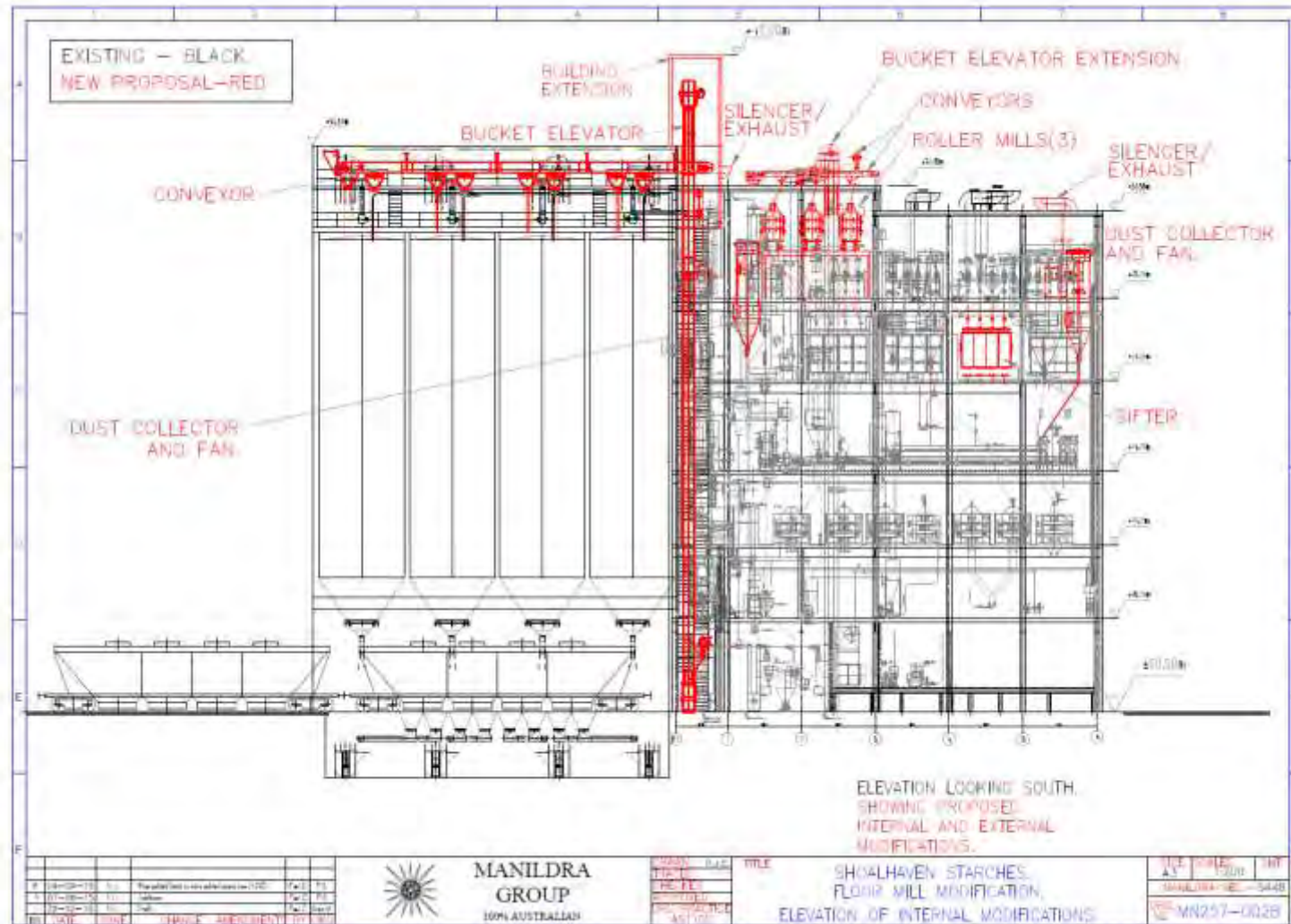




FIGURE 2-4 PROPOSED MODIFIED FLOUR MILL AND SILOS- ELEVATION PROFILE

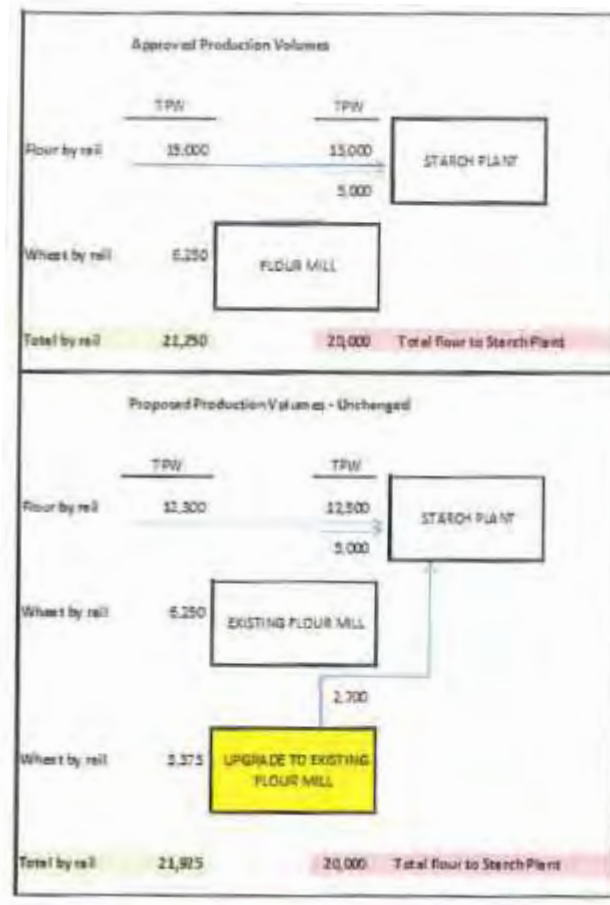


### 3 PROPOSED FLOUR MILL UPGRADE OPERATIONS

At present, industrial grade flour is supplied to the Starches Plant at Shoalhaven Starches at Bomaderry by rail from the flour mill at Manildra (owned by the Manildra Group of Companies). Further flour is milled on the Bomaderry site from wheat grain delivered by rail in the existing flour mill. Currently, 15,000 tonnes per week of industrial grade flour is delivered to the site by rail and an additional 5,000 tonnes of industrial grade flour is produced on-site in the existing flour mill.

The flour mill at Manildra also has the capacity to produce premium grade flour, in addition to the industrial grade flour used by the Shoalhaven Starches site. The Manildra Group propose to optimise the production capacity of the mill at Manildra for the production of the premium grade flour. The upgrade of the existing industrial grade flour mill on the Shoalhaven site will achieve this. These proposed modifications to the existing flour mill would produce the flour that was no longer being milled in Manildra mill. However, Shoalhaven Starches would still receive 12,300 tonnes per week of flour from the Manildra mill by rail. The remaining 7,700 tonnes per week of industrial grade flour would be produced by the upgraded flour mill on the Shoalhaven Starches site. Refer Figure 3-1 for production flow diagram.

FIGURE 3-1 PROPOSED MODIFICATIONS TO EXISTING FLOUR MILL - PRODUCTION FLOW DIAGRAM



## 4 IMPACT ASSESSMENT CRITERIA

### 4.1 ODOUR IMPACT ASSESSMENT CRITERIA

The *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (AMMAAP) provides a GLC impact assessment criterion for a number of potential air emissions. This method states that dispersion modelling undertaken should assess the modelling predictions against the GLCs to determine if the predicted impact from the emissions exceeds the criteria.

The Impact Assessment Criteria (IAC) for complex mixtures of odours have been designed to take into account the range of sensitivity to odours within the community and to provide additional protection for individuals with a heightened response to odours. This is achieved by using a statistical approach dependent upon population size. As the population density increases, the proportion of sensitive individuals is also likely to increase, indicating that more stringent criteria are necessary in these situations.

The GLC assessment criteria for the complex odour compound emissions considered in the modelling are shown in Table 4.1. The predicted odour impact due to the pollutant source must be reported in units consistent with the IAC as peak concentrations (i.e. approximately 1 second average).

The odour criterion that has been selected for use in this assessment, to determine the maximum odour GLC concentration from the proposed modifications to the flour mill, is the 2.0 odour units (ou) criterion for the 100th percentile of predicted odour concentrations, which indicates that 100 percent of all odour predictions would fall below this concentration. This criterion has been chosen because there are residential areas in the vicinity of the Shoalhaven Starches facility, such that the population density of the area surrounding the facility as a whole is expected to be in excess of 2000 people.

**TABLE 4-1 IMPACT ASSESSMENT CRITERIA FOR COMPLEX ODOROUS AIR POLLUTANTS**

Population of affected community	Impact Assessment Criteria (ou)
Urban (>2000) and/or schools and hospitals	2.0
~ 500	3.0
~ 125	4.0
~ 30	5.0
~ 10	6.0
~ single rural residence (<= 2)	7.0

Key:

ou = odour unit  
> = greater than  
< = less than

#### 4.1.1 ADJUSTMENT FOR PEAK-TO-MEAN RATIOS

AMMAAP notes that the evaluation of odour impacts requires the estimation of short or peak concentrations on the time scale of less than one second. The dispersion modelling predictions are valid for one-hour ground level concentrations or longer. Therefore the dispersion model, such as AERMOD, needs to be supplemented to accurately simulate atmospheric dispersion of odours and the instantaneous perception of odours by the human nose.

AMMAAP Table 6.1, reproduced in Table 4.2 below, provides EPA recommended one-second to one-hour (P/M60) peak-to-mean ratios for estimating concentrations for different source types, stabilities and distances. It is important to note that these emission factors are for idealised situations for one source in flat terrain where the receptor is located along the centreline of the single plume and do not consider fluctuations away from the plume centre line, terrain influences or plume interactions from multiple sources.

AMMAAP further requires that the P/M60 ratio for wake-affected point sources be applied to the proposed additional flour mill stacks to determine the maximum permissible stack concentration. Therefore, maximum permissible stack source emission rate will need to be multiplied by 2.3 when checking for compliance with the ambient odour GLC criterion.

TABLE 4-2 PEAK-TO-MEAN FACTORS

<b>Table 6.1: Factors for estimating peak concentrations in flat terrain (Katestone Scientific 1995 and 1998)</b>			
<b>Source type</b>	<b>Pasquill–Gifford stability class</b>	<b>Near-field P/M60*</b>	<b>Far-field P/M60*</b>
Area	A, B, C, D	2.5	2.3
	E, F	2.3	1.9
Line	A–F	6	6
Surface wake-free point	A, B, C	12	4
	D, E, F	25	7
Tall wake-free point	A, B, C	17	3
	D, E, F	35	6
Wake-affected point	A–F	2.3	2.3
Volume	A–F	2.3	2.3

\* Ratio of peak 1-second average concentrations to mean 1-hour average concentrations

Source: *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*

## 4.2 TSP IMPACT ASSESSMENT CRITERIA

The AMMAAP criterion for Total Suspended Particulate Matter is outlined in Table 4-3.

**TABLE 4-3 IMPACT ASSESSMENT CRITERIA FOR TOTAL SUSPENDED PARTICULATE MATTER**

Pollutant	Averaging Period	Impact Assessment Criteria ( $\mu\text{g}/\text{m}^3$ )	Source
TSP	Annual	90	NHMRC (1996)

Key:

TSP = Total suspended particulate matter

$\mu\text{g}/\text{m}^3$  = micrograms per cubic metre

NHMRC = National Health and Medical Research Council

## **5 DISPERSION MODELLING INPUT DATA**

AERMOD is a recommended Gaussian dispersion modelling system as it accurately estimates Ground Level Concentrations (GLC's) of source emissions. AERMOD requires the following input data – meteorological, buildings and structures on site, surrounding terrain data, discrete receptors and emissions and source information. These are all detailed in this section.

### **5.1 TERRAIN INPUT DATA**

The terrain surrounding the Shoalhaven Starches site ranges from flat terrain in the immediate vicinity to mountains between 100 and 200 metres above sea level in approximately 5km north-west of the plant. The township of Bomaderry, west of Shoalhaven Starches exists in moderately hilly terrain with slopes ranging from approximately 20 to 50 metres above sea level. The Shoalhaven River extends eastward from the south-east of the area under consideration, with a resultant river valley between Bomaderry and Nowra. The terrain is relatively flat around the river for the area east of Bomaderry.

### **5.2 METEOROLOGICAL INPUT DATA**

The area considered in AQIA dispersion modelling experiences typical coastal weather in addition to locally influenced patterns. A mountain range to the north of the site means northerly winds are much less common than the east-west wind patterns occurring as a result of the coastal sea breeze cycle. The meteorological (MET) file was provided by Lakes Environmental Met Data Services and included hourly data for temperatures, wind speed, wind direction, and mixing heights from January 1<sup>st</sup> to December 31<sup>st</sup> 2013.

Figure 5-1 presents this wind data. The arms in the figure represent the direction from which the wind is blowing and shows that westerlies and north westerlies were the most predominant for the 12 month period, which was considered typical meteorological data.

### **5.3 BUILDING INPUT DATA**

Buildings greater than 0.4 times the height of stack and within a distance of 5L must be incorporated into modelling, where L is the lesser of the height or width of the building. The Flour Mill has two tiers at heights of 30.9 and 32 metres above ground, and a total width of 32 metres. The proposed stacks have heights of 31.8 and 33.4 metres above the ground. The buildings incorporated into the modelling assessment were the existing Flour Mill buildings and silos, Flour Unloader, Starch buildings, DDG building, packaging building and the Boiler House. Figure 5-2 presents the building profile incorporated into the modelling assessment

**FIGURE 5-1 WIND ROSE- JANUARY 1<sup>ST</sup> –DECEMBER 31<sup>ST</sup> 2013**

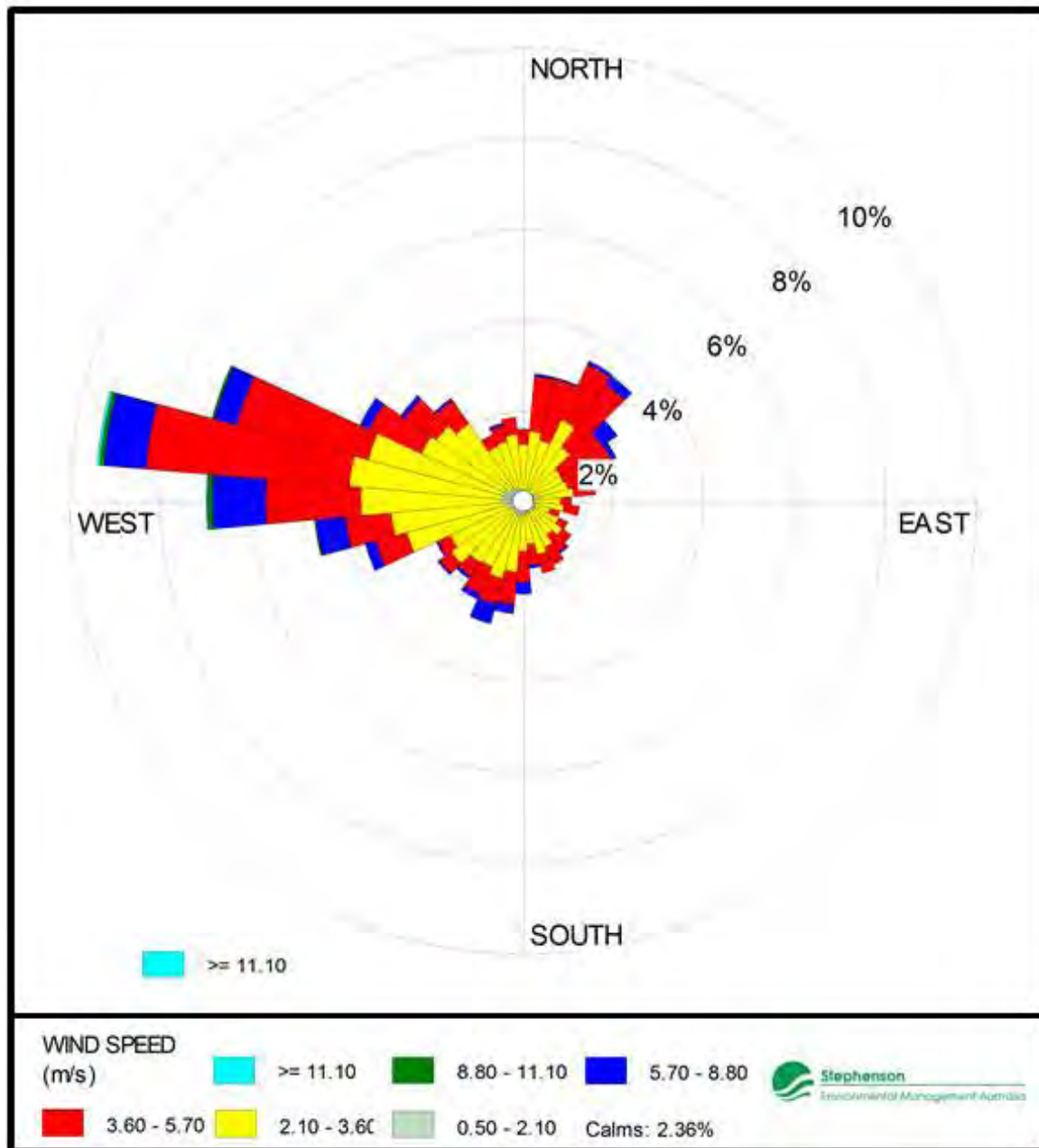


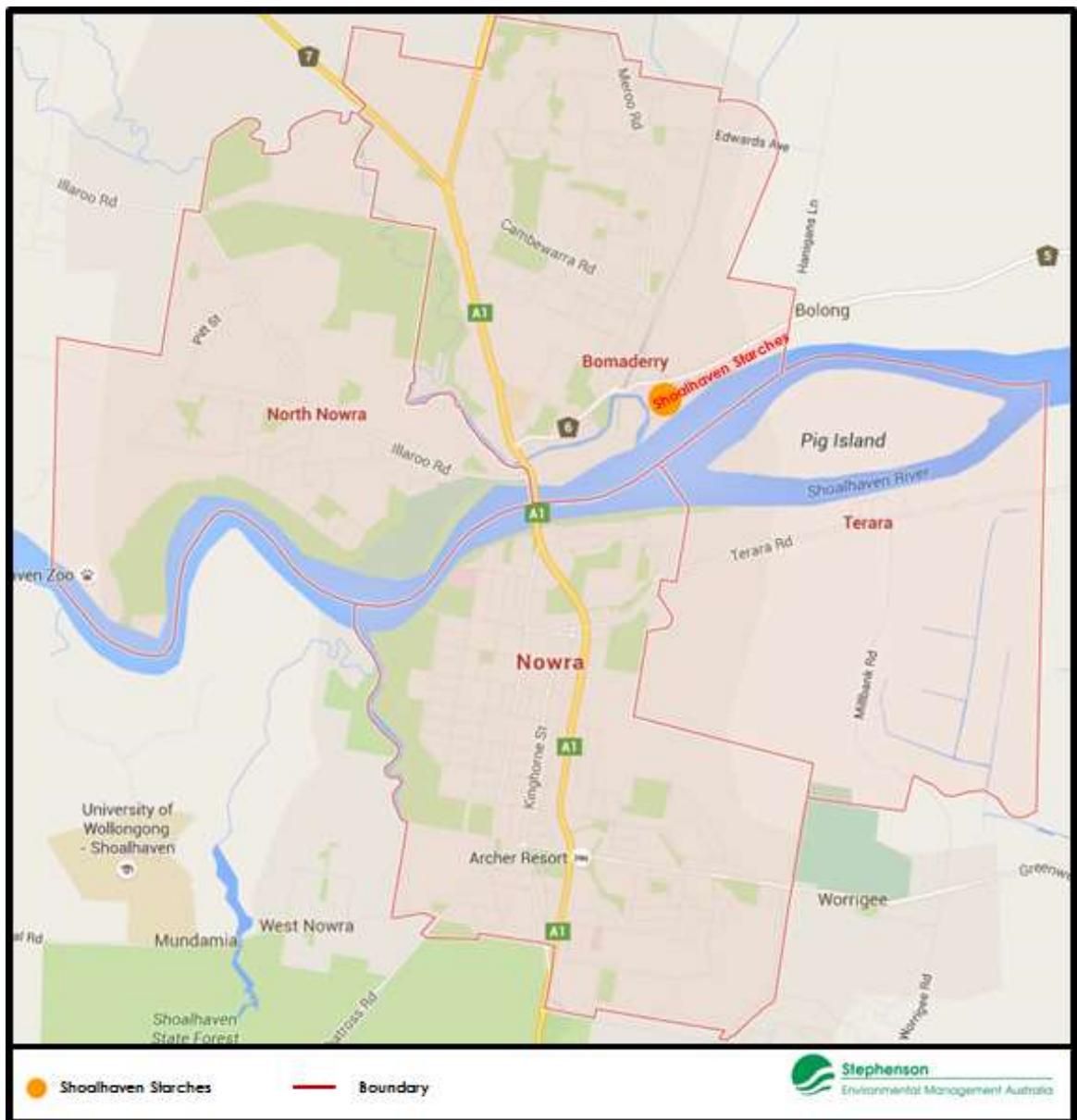


FIGURE 5-2 BUILDING INPUT DATA





FIGURE 5-3 RECEPTORS OF INTEREST LOCATIONS



#### 5.4 RECEPTORS OF INTEREST

The receptors of interest chosen for this assessment were reflective of those chosen in the 2008 GHD Air Quality Impact Assessment. The receptors selected included four (4) residential areas, which are Bomaderry, North Nowra, Nowra and Terara. These areas are highlighted in Figure 5-3. For this assessment, the highest odour and TSP GLCs in each of these areas was observed and included in this report, to compare with the 2008 GHD assessment.

## 5.5 EMISSION INPUT DATA

Stack emission input data was derived from two sources. The Manildra Group provided proposed stacks information including function, stack locations, dimensions and expected flow rate. SEMA conducted emissions monitoring tests, including odour and TSP on the existing flour mill exhaust stacks, and used the resulting concentrations and exhaust temperatures as input data. TSP and odour concentrations were derived from emission results from tests conducted in September 2011 on four stack exhaust points servicing the existing Flour Mill. The correlation between stacks on the existing and modified Flour Mill is shown in Table 5-1. Table 5-2 presents dimensions and flow rates for the two proposed stacks. Mass emission rates for TSP and odour were calculated based on data presented in Tables 5-3 and 5-4. The key to Tables 5.1 to 5.4 is presented overleaf.

**TABLE 5-1 EMISSION CONCENTRATIONS AND TEMPERATURES – PROPOSED MODIFIED FLOUR MILL**

Existing Stack ID	Proposed Stack ID	TSP Emission Concentration	Odour Emission Concentration	Exhaust Temperature
1	6	0.113 mg/m <sup>3</sup>	77 ou	27.1 °C
3	7	0.106* mg/m <sup>3</sup>	168* ou	49.0 °C

**TABLE 5-2 PHYSICAL EMISSION DATA – PROPOSED MODIFIED FLOUR MILL**

Proposed Stack ID	Stack Height	Stack Exit Diameter	Normal Flow Rate	Exit Velocity
6	33.4 m	0.90 m	2.7 Nm <sup>3</sup> /s	4.17 m/s
7	31.8 m	0.68 m	1.6 Nm <sup>3</sup> /s	4.4 m/s

**TABLE 5-3 TSP EMISSION RATE INPUT DATA**

Proposed Stack ID	Parameter	Averaging Time	Concentration	TSP Mass Emission Rate
6	TSP	Annual	0.113 mg/m <sup>3</sup>	0.0003 g/s
7	TSP	Annual	0.106 mg/m <sup>3</sup>	0.0002 g/s

**TABLE 5-4 ODOUR EMISSION RATE INPUT DATA**

Proposed Stack ID	Parameter	Concentration	Total Odour MER	Peak to Mean Ratio	Corrected Total Odour MER
6	Odour	77 ou	205 ou.m <sup>3</sup> /s	2.3	472 ou.m <sup>3</sup> /s
7	Odour	168 ou	266 ou.m <sup>3</sup> /s	2.3	612 ou.m <sup>3</sup> /s

Key to Tables 5.1 to 5.4

mg/m <sup>3</sup>	=	milligrams per cubic metre @ 0 C and one atmosphere pressure
ou	=	odour units
°C	=	Degrees Celsius
*	=	Not tested 09/2011. Manildra expect emissions to be same as existing stack 5.
m	=	metres
Nm <sup>3</sup> /s	=	cubic metres per second corrected to 1 atmospheric pressure and 273 Kelvin
m/s	=	metres per second
g/s	=	grams per second
ou/m <sup>3</sup> /s	=	odour units per cubic metre per second
TSP	=	total suspended particulates

## 5.6 CUMULATIVE ODOUR EMISSIONS

With the existing level of odour control, the proposed modification to the existing flour mill is not considered to make a significant contribution to the factory's total cumulative odour impact.

The 2008 air quality assessment carried out by GHD (Shoalhaven Starches – Report on Ethanol Upgrade Air Quality Assessment), estimated that the total odour emissions from the Shoalhaven Starches factory before implementation of odour controls is 604,811 ou.m<sup>3</sup>/s. Based on available data and measurement results, SEMA has estimated that the proposed modifications to the existing flour mill will emit a combined 1,084 ou.m<sup>3</sup>/s of odour into the atmosphere. This is an additional 0.2% of total odour emissions from the Shoalhaven Starches factory complex at Bomaderry.

After the implementation of additional odour controls (AOC), the proposed modified flour mill will appear to have an apparent larger contribution to the factory's cumulative odour impact. This is an artefact caused by the significant decrease in overall odour emissions from the factory complex after the implementation of these additional odour controls nominated in the 2008 GHD assessment report.

The GHD study has estimated that the total odour emissions for the factory complex will be reduced to 155,393 ou.m<sup>3</sup>/s after the completion of Stage 2 odour controls and 148,807 ou.m<sup>3</sup>/s after the completion of Stage 3 odour controls.

However, the total odour emissions from the additional stacks serving the proposed modified flour mill were not included in the original GHD study. These additional emissions from the modified flour mill have been assumed by SEMA modelling to be worst case; that is, to remain at 1,084 ou.m<sup>3</sup>/s which is an additional 0.7% of total odour emissions from the factory after the completion of AOC). Hence, the apparent relative increase in odour contribution over the aforementioned 0.2%.

Refer to Appendix A for breakdown of odour sources and odour emissions as reported by GHD.

## **5.7 CUMULATIVE TSP EMISSIONS**

Similar to cumulative odour impacts detailed in Section 5.6, the proposed modified flour mill is not considered to make a significant contribution to the factory's total cumulative impact for TSP.

The GHD study estimated that the total TSP emissions from the Shoalhaven Starches factory complex is 13.3 g/s. Based on available data and measurement results, SEMA has estimated that the proposed modified flour mill will emit a combined 0.0005 g/s of TSP into the atmosphere. This is an additional 0.004% of total TSP emissions from the Shoalhaven Starches factory complex in Bomaderry.

Refer to Appendix B for breakdown of particulate matter sources and emissions as reported by GHD.

## **6 IMPACT ASSESSMENT PREDICTIONS AND CUMULATIVE IMPACTS**

The air quality impact assessment predictions, from the dispersion modelling, for TSP and odour respectively are presented in Tables 6-1 and 6-2. GHD predicted impact ground level concentrations have been drawn from Tables 8-2 (odour) and 8-3 (TSP) of their Ethanol Upgrade Air Quality Assessment report.

Figures 6-1 and 6-2 present the aerial view of the predicted TSP and odour concentrations respectively.

The potential cumulative impact associated with the operation of the proposed modified flour mill is potentially higher than the existing concentrations. However TSP emissions are still predicted to be below the relevant criteria. The maximum TSP ground level concentration is predicted to be  $0.17 \mu\text{g}/\text{m}^3$ .

Odour ground level impacts from the stacks of the proposed modified flour mill alone are not predicted to exceed regulatory impact assessment criteria of 2 ou. The maximum odour concentration at ground level is predicted to be 0.3 ou from the additional stacks of the modified flour mill only. From the GHD assessment, the total odour GLC from the Shoalhaven Starches factory was predicted to be 100 ou on the northwest boundary. The highest impact from the proposed modified flour mill stacks at this same location would have a GLC of 0.26 ou.

TSP ground level impacts from the stacks of the proposed modified flour mill alone are not predicted to exceed regulatory impact assessment criteria of an annual average  $90 \mu\text{g}/\text{m}^3$ .

The maximum predicted worst case TSP concentration at ground level is  $0.17 \mu\text{g}/\text{m}^3$  on the boundary of the factory complex.

From the 2008 GHD assessment, the reported GLC at Bomaderry based on factory emission sources was predicted to be of the order of  $2 \mu\text{g}/\text{m}^3$  in the Bomaderry area. The highest impact on air quality in the Bomaderry area from the stacks serving the proposed modified flour mill is predicted to be  $0.1 \mu\text{g}/\text{m}^3$ . The cumulative impact would still be significantly lower than the impact assessment criteria of  $90 \mu\text{g}/\text{m}^3$ .

The results from the odour assessment by SEMA on the existing flour mill indicated a neutral hedonic tone. That is, the odour was not considered unpleasant or offensive. The odour from the proposed modified flour mill can also be expected to be of a similar, neutral hedonic tone.

**TABLE 6-1 CUMULATIVE WORST CASE PREDICTED TSP GLC**

Location	Parameter	Averaging Time	Modified Flour Mill* GLC ( $\mu\text{g}/\text{m}^3$ )	Whole Factory ** GLC ( $\mu\text{g}/\text{m}^3$ )	Impact Assessment Criteria ( $\mu\text{g}/\text{m}^3$ )
Worst case	TSP	Annual	0.17	-	90
Bomaderry	TSP	Annual	0.10	2	90
N Nowra	TSP	Annual	0.05	1	90
Nowra	TSP	Annual	0.05	1	90
Terara	TSP	Annual	0.05	1.5	90

Key to Tables 6-1 and 6-2

ou	=	odour units
$\mu\text{g}/\text{m}^3$	=	micrograms per cubic metre
TSP	=	Total Suspended Particulate Matter
GLC	=	Ground Level Concentration
sec	=	second
*	=	SEMA prediction (2015)
**	=	GHD 2008 Ethanol Upgrade predictions (2008)

**TABLE 6-2 CUMULATIVE WORST CASE PREDICTED ODOUR GLC**

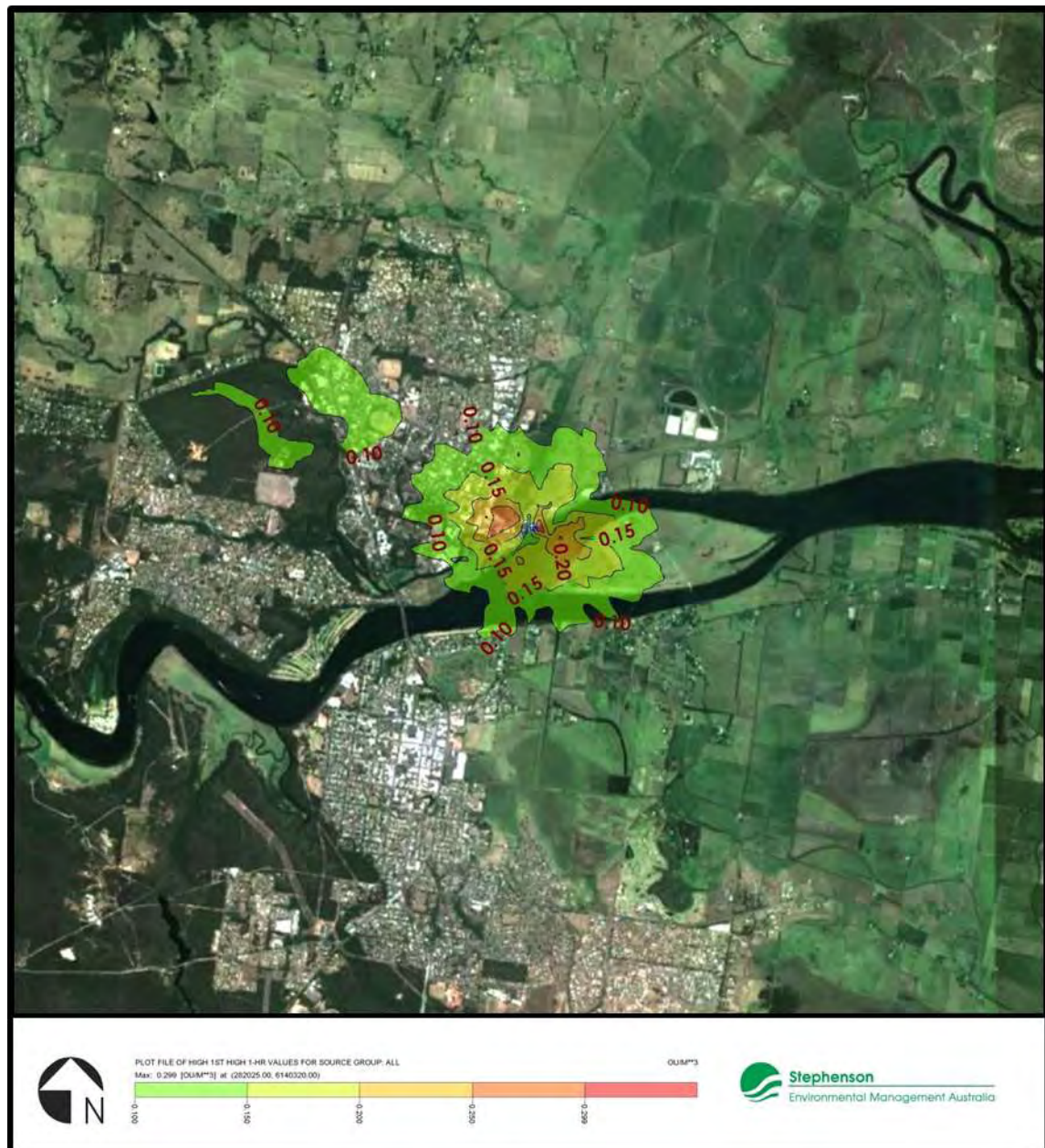
Location	Parameter	Averaging Time	Modified Flour Mill Contribution* to GLC (ou)	Whole Factory Predicted Impacts on GLC** (ou)	Impact Assessment Criteria (ou)
Factory north-west boundary	Odour	1 sec. (using peak-to-mean ratio)	0.26	~25 (MOC) ~10 (AOC) ~5 (AOC)	2.0
Bomaderry-Residential	Odour	1 sec. (using peak-to-mean ratio)	0.21	6 (MOC) 3 (AOC) 2 (AOC)	2.0
North Nowra	Odour	1 sec. (using peak-to-mean ratio)	0.13	3 (MOC) 2 (AOC) 1 (AOC)	2.0
Nowra	Odour	1 sec. (using peak-to-mean ratio)	0.11	5 (MOC) 3 (AOC) <2 (AOC)	2.0
Terara	Odour	1 sec. (using peak-to-mean ratio)	0.11	5 (MOC) 3 (AOC) <2 (AOC)	2.0

FIGURE 6-1 PREDICTED TSP CONCENTRATION, PROPOSED MODIFIED FLOUR MILL, SHOALHAVEN STARCHES





**FIGURE 6-2 PREDICTED ODOUR CONCENTRATION, PROPOSED MODIFIED FLOUR MILL, SHOALHAVEN STARCHES**





## 7 CONCLUSIONS

This Air Quality Impact Assessment predicts that the emissions of odour and particulate matter from the proposed modified flour mill complex will have the following impacts:

- Predicted **odour** GLCs from the proposed modified flour mill will be below the IAC of 2 odour units.
- Predicted worst case **TSP** GLC (annual average) from the proposed modified flour mill is  $0.17 \mu\text{g}/\text{m}^3$  which is on the site.
- The cumulative **TSP** impact of the ethanol upgrade and the modification of the existing flour mill would comply with the annual IAC of  $90 \mu\text{g}/\text{m}^3$ .
- The SEMA **odour** emissions assessment on the existing flour mill indicates a neutral hedonic tone, that is, odour was considered neither unpleasant nor offensive. The odour from the proposed additional stacks of the flour mill can also be expected to be of a similar, neutral hedonic tone.

Using the cumulative modelling results from the GHD 2008 Ethanol Upgrade Assessment, and assuming the odour emissions from the modified flour mill will remain constant through all mandatory and additional odour control stages; the following conclusions can be made:

- On the **north western boundary** of the factory complex site, the proposed modified flour mill is predicted to have an additional impact on **odour** GLC of;
  - 0.26 ou which equates to 1.04% of the cumulative plant odour emissions after mandatory odour controls (MOC) and 2.6% after additional odour controls (AOC).
- In the **Bomaderry residential area**:-
  - worst case GLC **odour** impact prediction from the modified flour mill stacks is 0.21 ou; which equates to 2.2% of the cumulative plant odour emissions after MOC and 3.6% after AOC.
- GHD (2008) **odour** impact predictions for the cumulative sources are:
  - 25 ou at the northwest site boundary and;
  - 6 ou at the **Bomaderry residential area with MOC**;
  - 10 ou at the northwest site boundary and;
  - 3 ou at the **Bomaderry residential area with AOC**;

---

## **APPENDIX A – ODOUR EMISSION INVENTORY (GHD REPORT)**



The OER inventory presented in the following sub-sections is limited to the principal factory and environmental farm odour sources identified in the Audit Report plus the potential odour sources associated with the ethanol upgrade. The odour reduction at each stage of odour control implementation is also included for each source or source group.

NB: The existing scenario includes emission sources that have been granted Development Approval (flour mill, starch dryer No. 5 and fermentation tanks No. 10 – 13). These odour sources have been included in the group of principal (existing) factory odour sources. The OERs for these sources have been derived from the OERs for similar equipment examined in the Audit Report.

In all cases, the adopted and projected odour emission rates for each odour source should be verified by odour emission testing following installation and commission of odour control measures to confirm performance against projected odour emission rates.

### 5.1.1 Factory

A breakdown of the principal odour sources from the existing factory OER and proposed ethanol upgrade at the different stages of odour control implementation is given in Table 5-1.

OERs in the following tables are expressed in odour units (OU) volumes per second (OU m<sup>3</sup>/s). OERs are taken directly from Table 23 in the Audit Report except where footnoted. Definitions of the abbreviations used to denote odour control actions are also given in the footnotes (refer to previous sections for detail on the odour control actions and their anticipated odour reduction efficiencies).

**Table 5-1 Odour Emission Inventory – Existing Factory and Ethanol Upgrade**

Plant	Odour Source	ID	OER Before Control OU m <sup>3</sup> /s	Stage 1 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 2 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 3 Odour Control <sup>1</sup> OU m <sup>3</sup> /s	
				Control	DER	Control	DER	Control	DER
				Existing Factory					
DDG (liquids)	Feed dump tank	DDG 20	8,900	BIO	1,338	BIO	1,338	BIO	1,338
DDG (liquids)	Condensate tank <sup>1L</sup>	DDG 23	25,711	BIO	3,857	BIO	3,857	BIO	3,857
DDG (liquids)	Vent condensor	DDG 24	3,500	BIO	525	BIO	525	BIO	525
DDG (liquids)	Condensor drain	DDG 25	3,167	Nil	3,167	BIO	475	BIO	475
DDG (liquids)	Finish Feed tank	DDG 26	18,333	BIO	2,750	BIO	2,750	BIO	2,750
DDG (liquids)	Finisher pump tank	DDG 28	1,433	BIO	215	BIO	215	BIO	215



Plant	Odour Source	ID	OER Before Control OU m <sup>3</sup> /s	Stage 1 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 2 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 3 Odour Control <sup>1</sup> OU m <sup>3</sup> /s	
				Control	OER	Control	OER	Control <sup>1</sup>	OER
DDG (liquids)	Dryer feed tank	DDG 30	1,433	BIO	215	BIO	215	BIO	215
DDG (liquids)	Feed holding tank	DDG 31	1,317	BIO	198	BIO	198	BIO	198
DDG (liquids)	CIP tank	DDG 32	417	BIO	63	BIO	63	BIO	63
DDG (solids)	DDG tent storage area	DDG 36	12,862	PP	1,929	PP	1,929	PP	1,929
DDG (solids)	DDG product storage sheds	DDG 34	6,820	PP	1,023	PP	1,023	PP	1,023
DDG (solids)	Grounds	DDG 37	203	HK	0	HK	0	HK	0
DDG (solids)	DDG - palmer cooler	DDG 16	17,886	BIO	2,650	BIO	2,650	BIO	2,650
DDG (solids)	DDG heat exchanger <sup>6</sup>	DDG 45	2,333	Repair	0	-	0	-	0
DDG (solids)	Decanter 3&4	DDG 5	1,700	Nil	1,700	BIO	255	BIO	255
DDG (solids)	Decanter 1&2	DDG 2	260	Nil	260	BIO	39	BIO	39
DDG (solids)	Decanter feed tank	DDG 1	217	WL	108	BIO	33	BIO	33
DDG (solids)	Feed dryer baghouses	DDG 18	867	BIO	130	BIO	130	BIO	130
DDG (liquid)	Light phase tank	DDG 19	450	Nil	450	Nil	450	BIO	68
DDG (solids)	DDG Dryer building	DDG 39	70,504	IV	7,050	IV / BIO <sup>10</sup>	7,050	IV / BIO <sup>11</sup>	7,050
DDG	Cooling towers	DDG 46	68,333	HK	6,833	HK	6,833	HK	6,833
Distillery	Incondensable gases vent	D6	400	Nil	400	Nil	400	Nil	400
Distillery	Molecular Sieve - Vacuum drum	D2	1,350	Nil	1,350	Nil	1,350	BIO	203
Distillery	DME vent	D12	107	Nil	107	Nil	107	Nil	107



Plant	Odour Source	ID	OER Before Control OU m <sup>3</sup> /s	Stage 1 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 2 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 3 Odour Control <sup>1</sup> OU m <sup>3</sup> /s	
				Control	OER	Control	OER	Control	OER
Ethanol	Grain silo - baghouse	E1	183	Nil	183	Nil	183	Nil	183
Ethanol	Cooling towers	E23	65,833	D	0	D	0	D	0
Ethanol	Propagator tanks 4 & 5	E15	28,333	Nil	28,333	BIO	4,250	BIO	4,250
Ethanol	Grain retention - tank 2	E8	6,500	WL	3,250	BIO	975	BIO	975
Ethanol	Propagator - tanks 1,2&3	E14	5,500	Nil	5,500	BIO	825	BIO	825
Ethanol	Jet cooker 2&4	E7	1,133	Nil	1,133	Nil	1,133	BIO	170
Ethanol	Jet cooker 1 - retention tank	E13	1,067	Nil	1,067	Nil	1,067	BIO	160
Ethanol	Rejects tank	E10	183	Nil	183	Nil	183	Nil	183
Ethanol	Feed to distillery	E22	167	WL	83	WL	25	WL	25
Ethanol	Fermentation vent <sup>2</sup>	FER. M10	518	Nil	518	Nil	518	Nil	518
Ethanol	Fermentation vent <sup>3</sup>	FER. M11	719	Nil	719	Nil	719	Nil	719
Ethanol	Farm tank	F18	7,867	WL	3,834	BIO	1,150	BIO	1,150
Flour	Cyclone and fabric filter <sup>3</sup>	4	1,854	ID	1,854	ID	1,854	ID	1,854
Flour	Cyclone and fabric filter <sup>3</sup>	5	617	ID	617	ID	617	ID	617
Flour	Cyclone and fabric filter <sup>3</sup>	6	1,477	ID	1,477	ID	1,477	ID	1,477
Flour	Cyclone and fabric filter <sup>3</sup>	7	551	ID	551	ID	551	ID	551
Glucose	Drum vacuum receiver	C4	3,500	Nil	3,500	Nil	3,500	BIO	525
Glucose	Ion exchange effluent tank	C18	250	Nil	250	Nil	250	BIO	38
Glucose	Enzyme Tanks (7 of)	B7	4,083	WL	2,042	BIO	613	BIO	613
Glucose	Cooker A & B Flash Tanks	B3	950	Nil	950	Nil	950	BIO	143
Starch	Dry gluten bin	S7	4,500	Nil	4,500	Nil	4,500	CTS	4,500



Plant	Odour Source	ID	OER Before Control OU m <sup>3</sup> /s	Stage 1 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 2 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 3 Odour Control <sup>1</sup> OU m <sup>3</sup> /s	
				Control	OER	Control	OER	Control <sup>1</sup>	OER
Starch	High protein dust collector	S8	600	Nil	600	Nil	600	Nil	600
Starch	Flour bin	S6	283	Nil	283	Nil	283	Nil	283
Starch	Flour bin aspirator	S13	1,000	Nil	1,000	Nil	1,000	Nil	1,000
Starch	Pellet silo	S12	350	Nil	350	Nil	350	Nil	350
Starch	No. 4 Gluten Dryer <sup>a</sup>	S5	13,331	HK	9,998	HK	9,998	CTS	9,998
Starch	No. 3 Gluten Dryer <sup>a</sup>	S3	19,501	HK	14,625	HK	14,625	CTS	14,625
Starch	No. 1 Gluten Dryer <sup>a</sup>	S2	13,182	HK	9,886	HK	9,886	CTS	9,886
Starch	No. 2 Gluten Dryer <sup>a</sup>	S4	5,511	HK	4,133	HK	4,133	CTS	4,133
Starch	No. 4 Starch Dryer <sup>a</sup>	S19	7,151	HK	5,363	HK	5,363	CTS	5,363
Starch	No. 3 Starch Dryer <sup>a</sup>	S18	6,436	HK	4,827	HK	4,827	CTS	4,827
Starch	No. 1 Starch Dryer <sup>a</sup>	S1	6,315	HK	4,736	HK	4,736	CTS	4,736
Starch	No. 5 Starch Dryer <sup>a</sup>	8	6,794	HK	5,095	HK	5,095	HK	5,095
Starch	Spray dryer	S20	983	HK	738	HK	738	HK	738
Starch	Kestner dryer	DDG 40	3,000	D	0	D	0	D	0
<b>Factory</b>	<b>TOTAL</b>		<b>468,105</b>		<b>158,290</b>		<b>110,659</b>		<b>111,266</b>
<b>ETHANOL UPGRADE</b>									
DDG	DDG tank vents	-	36,000	BIO	5,400	IV	5,400	IV	5,400
DDG	DDG transfer cyclones (6 units) <sup>b</sup>	-	9,083	BIO	1,362	BIO	1,362	BIO	1,362
DDG	DDG dryers (6 units) <sup>c</sup>	-	6,321	BIO	948	BIO	948	BIO	948
DDG	Decanters (10 units) <sup>d</sup>	-	8,417	BIO	1,263	BIO	1,263	BIO	1,263
DDG	Pelletiser baghouses (2 units) <sup>10</sup>	-	34,378	BIO	5,157	BIO	5,157	BIO	5,157





Plant	Odour Source	ID	OER Before Control OU m <sup>3</sup> /s	Stage 1 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 2 Odour Control <sup>1</sup> OU m <sup>3</sup> /s		Stage 3 Odour Control <sup>1</sup> OU m <sup>3</sup> /s	
				Control	OER	Control	OER	Control	OER
DDG	General ventilation <sup>1a</sup>	-	722	B/O	108	B/O	108	B/O	108
Ethanol	Propagation tank <sup>1b</sup>	2	14,167	Nil	14,167	B/O	2,125	B/O	2,125
Ethanol	Fermenters (3 tanks) <sup>1c</sup>	3	1,856	ID	1,856	ID	1,856	ID	1,856
Starch	No. 5 Gluten dryer <sup>1d</sup>	9	12,881	HK	9,661	HK	9,661	HK	9,661
Starch	Gluten grinder <sup>1d</sup>	10	12,881	HK	9,661	HK	9,661	HK	9,661
<b>SUB-TOTAL</b>	<b>Upgrade</b>		<b>136,706</b>		<b>49,583</b>		<b>37,541</b>		<b>37,541</b>
<b>SUB-TOTAL</b>	<b>Factory</b>		<b>468,105</b>		<b>158,296</b>		<b>117,852</b>		<b>111,266</b>
<b>TOTAL</b>	<b>Factory + upgrade</b>		<b>604,811</b>		<b>207,879</b>		<b>155,393</b>		<b>148,807</b>

Footnotes to table above:

1. Odour control abbreviations used are as follows: B/O – bioscrubber, WL – wet-leg (installed on tanks to condense vapour emissions); D – decommissioned plant item; HK – housekeeping actions such as ductwork cleaning and maintenance; IV – industrial ventilation improvements; ID – improve dispersion from discharge points; PP – DDG pelletiser plant installation; CTS – common tail stack; Nil – no odour control at this stage.
2. Plant item was not commissioned at the time of the odour audit. OER taken from SEMA odour testing report (March 2008).
3. The flourmill was not commissioned at the time of this assessment. OER adopted from the Short Mill Flour Environmental Assessment report (GHD, March 2007).
4. A limited quantity of OER data for the gluten and starch dryers was available from the Audit Report (singleton samples were collected using pre-dilution). Extensive emission testing has been conducted by SEMA on these sources as a result of routine emission testing, as set out in Shoalhaven Starch's licence conditions (samples were collected without pre-dilution) and data was also available also from tests conducted by SEMA to determine the potential for odour emission reduction from ductwork cleaning in March 2008 (samples here were collected with and without static pre-dilution). Consideration was given to all available data with respect to data quality and quantity. Odour concentrations reported in the Audit Report were an order of magnitude higher than the odour emissions that were reported on a consistent basis during routine testing. The Audit report the gluten and starch dryers were treated as outliers by GHD. For the purpose of this assessment, OER data was adopted from the SEMA emission survey report (March 2008), which was conducted as part of the ductwork cleaning trials.

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## **APPENDIX B – TSP EMISSION INVENTORY (GHD REPORT)**





The emission rate data used for TSP and PM10 in this air quality assessment were primarily based on emission testing conducted by SEMA, which was either reported in the SEMA emission survey report (March, 2008) or in the quarterly discharge license monitoring reports (in the case of Boiler No. 5/6).

Fugitive emissions of TSP and PM10 have not been included in this assessment. It is assumed that the application of standard dust mitigation measures around the site (e.g. housekeeping) would provide adequate control to minimise air quality impacts.

Table 5-3 shows the factory emission inventory for particulate matter as TSP and PM10.

**Table 5-3 Emission Inventory – Particulate Matter**

Discharge Point	Emission Control	In-stack TSP (mg/m <sup>3</sup> ) at Stack Gas Condition	In-stack TSP (mg/m <sup>3</sup> ) at Reference Condition	In-stack TSP Concentration Standard (mg/m <sup>3</sup> )	TSP g/s	PM10 g/s
Boiler No. 1 <sup>1,2</sup>	Gas-fired	ND	ND	-	0.07	0.07
Boiler No. 2 <sup>1</sup>	Cyclone	543	881 <sup>7</sup>	250 <sup>8</sup>	3.2	0.62
Boiler No. 3 <sup>1,2</sup>	Gas-fired	ND	ND	-	0.04	0.04
Boiler No. 4 <sup>1</sup>	Cyclone	741	723 <sup>7</sup>	250 <sup>8</sup>	6.1	1.2
Boiler No. 5/6 <sup>2</sup>	Cyclone & Fabric filter	32	32	50 <sup>8</sup>	1.0	0.75
Gluten dryer No. 1 <sup>8</sup>	Fabric filter	0.83	0.83	250 <sup>8</sup>	0.015	0.0003
Gluten dryer No. 2 <sup>1</sup>	Fabric filter	1.3	1.3	250 <sup>8</sup>	0.015	0.001
Gluten dryer No. 3 <sup>1</sup>	Fabric filter	0.56	0.56	250 <sup>8</sup>	0.02	0.02
Gluten dryer No. 4 <sup>1,3</sup>	Fabric filter	0.56	0.56	250 <sup>8</sup>	0.02	0.02
Starch dryer No. 1 <sup>1,4</sup>	Wet-scrubber	60	60	250 <sup>8</sup>	0.59	0.18
Starch dryer No. 3 <sup>1</sup>	Wet-scrubber	2	2	250 <sup>8</sup>	0.04	0.013
Starch dryer No. 4 <sup>1</sup>	Wet-scrubber	63	63	250 <sup>8</sup>	1.2	0.31
Starch dryer No. 5 (approved) <sup>10</sup>	Wet-scrubber	25	25	100 <sup>8</sup>	0.39	0.12



Discharge Point	Emission Control	In-stack TSP (mg/m <sup>3</sup> ) at Stack Gas Condition	In-stack TSP (mg/m <sup>3</sup> ) at Reference Condition	In-stack TSP Concentration Standard (mg/m <sup>3</sup> )	TSP g/s	PM10 g/s
Spray dryer <sup>5</sup>	Fabric filter	60	60	250 <sup>8</sup>	0.48	0.14
Flour Mill (approved)	Fabric filter	<10	<10	20 <sup>6</sup>	0.03	0.009
Other (aggregate) <sup>11</sup>	Fabric filter	<10	<10	250 <sup>6</sup>	0.1	0.1
<b>Total existing</b>					<b>13</b>	<b>3.6</b>
Gluten dryer No. 5 (proposed) <sup>8</sup>	Fabric filter	<10	<10	20 <sup>6</sup>	0.02	0.02
Gluten grinder (proposed) <sup>5</sup>	Fabric filter	<10	<10	20 <sup>6</sup>	0.02	0.02
Boiler No. 7 (proposed) <sup>12</sup>	Gas-fired	ND	ND	–	0.07	0.07
Co-generator turbine No. 1 (proposed) <sup>13</sup>	Gas-fired	ND	ND	–	0.1	0.1
Co-generator turbine No. 2 (proposed) <sup>13</sup>	Gas-fired	ND	ND	–	0.1	0.1
<b>Total – increment for proposed upgrade</b>					<b>0.31</b>	<b>0.31</b>
<b>Total – existing + upgrade</b>					<b>13.3</b>	<b>3.9</b>

Footnotes to table above:

ND: No data

1. TSP and PM10 mass emission rate adopted from SEMA report "Stack Emission Survey – Particles, Odour, Metals & Gases" (April 2008)
2. Highest PM10 emission rate selected from recent discharge licence test results reported by SEMA "Emission survey – Boilers No. 5 and 6" (April 2007).
3. TSP concentration reported was 35 mg/m<sup>3</sup>. GHD was advised by Shoalhaven Starches that this test result indicated a failure in the fabric filter control system, which would be fixed. Therefore, the emission rate measured for gluten dryer No. 3 was adopted.