PLAN 2

PLANNING APPLICATION PLN-19-0034

59 RAEBURN ROAD & ACCESS OVER 827,831 & 833 HOBART ROAD, BREADALBANE

ATTACHMENTS

A Application & plans, correspondence with applicant

B Responses from referral agencies

C Representations & applicant's response

1-93

WOOLCOTT SURVEYS

Our Ref: L190116

Date 11/02/2019

Planning Department
Northern Midlands Council

By Email: planning@nmc.tas.gov.au

RE: PLANNING APPLICATOIN – 59 RAEBURN ROAD, BREADALBANE

Dear Planning Department

Please find attached an application to develop a new concrete batch plant and landscaped bunding at the above mentioned address.

Please find included:

- Planning report
- Proposal plans
- EPA Correspondence
- Folio text and plan
- Schedule of Easements
- Planning application form.
- Land Owner Consent

Could you please issue invoices in the name off Crossroads, and send care of myself.

If you have any questions regarding this application, please don't hesitate to get in touch on the numbers or email address provided.

Kind regards
Woolcott Surveys

James Stewart
Town Planner

LAUNCESTON
10 Goodman Crt,
Invermay
PO Box 593, Mowbray

ST HELENS
48 Cecilia St, St Helens
PO Box 430, St Helens TAS 7216
P 03 6376 1972

HOBART
Rear Studio, 132 Davey St,
Hobart TAS 7000
P 03 6227 7968

DEVONPORT
2 Piping Lane,
East Devonport TAS 7310
P 0428 349 479

ABN 15 808 360 064

1-94

PLANNING APPLICATION

AMENDED 5/3

Proposal

Concrete Batch Plant

Description of proposal: .....

.....

.....

.....

.....

.....

(attach additional sheets if necessary)

Site address: 59 Raeburn Road, Breadalbane, access over 827, 831 & 833 Hobart Road, Breadalbane

.....

CT no: : 159125/2, 157107/1, 144549/1, 166270/1 & 166271/1.

Estimated cost of project $600,000 *(include cost of landscaping, car parks etc for commercial/industrial uses)*

Are there any existing buildings on this property? *Yes / No*

If yes – main building is used as Quarry

If variation to Planning Scheme provisions requested, justification to be provided:

See report

.....

.....

.....

.....

(attach additional sheets if necessary)

Is any signage required? No

(if yes, provide details)

EXHIBITED

PLANNING APPLICATION

Proposal

Description of proposal: CONCRETE BATCH PLANT.

(attach additional sheets if necessary)

Site address: 59 RAEBURN ROAD BREADALBANE.

CT no: 159125/2 + 157107/1 - (ASSOCIATED MINE LOT)

Estimated cost of project $..... *(include cost of landscaping, car parks etc for commercial/industrial uses)*

Are there any existing buildings on this property? Yes / No
If yes – main building is used as QUARRY.

If variation to Planning Scheme provisions requested, justification to be provided:

SEE REPORT

(attach additional sheets if necessary)

Is any signage required? NO.
(if yes, provide details)

FILE NUMBER Y20423

GRANTEE
PART OF 584 ACRES GTD
TO THOMAS SCOTT

CONVERSION PLAN

LOCATION

CORNWALL - BREADALBANE

CONVERTED FROM GL1863

NOT TO SCALE LENGTHS IN METRES

Registered Number

P.144549

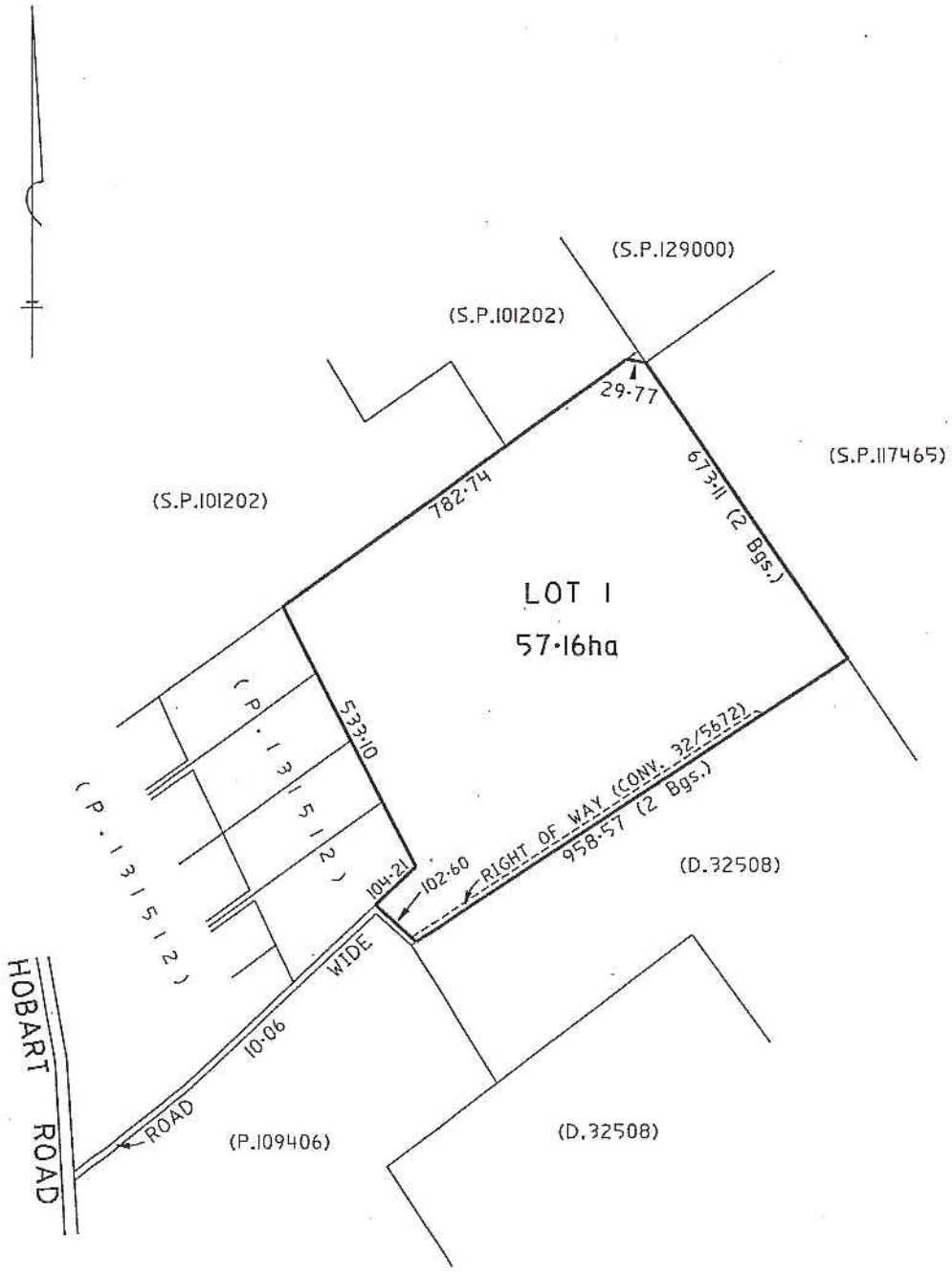
APPROVED 17 AUG 2005

Alice Kava
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 123 (5040) | LAST UPI No. 4700014 | ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN | DRAWN NJD

SKETCH BY WAY OF ILLUSTRATION ONLY

"EXCEPTED LANDS"



EXHIBITED

OWNER: TARA PROPERTY INVESTMENTS PTY LTD

FOLIO REFERENCE: C.T.109406/1

GRANTEE: PART OF 556 ACRES GRANTED TO THOMAS SCOTT.

PLAN OF SURVEY

4 5

WOOLCOTT SURVEYS

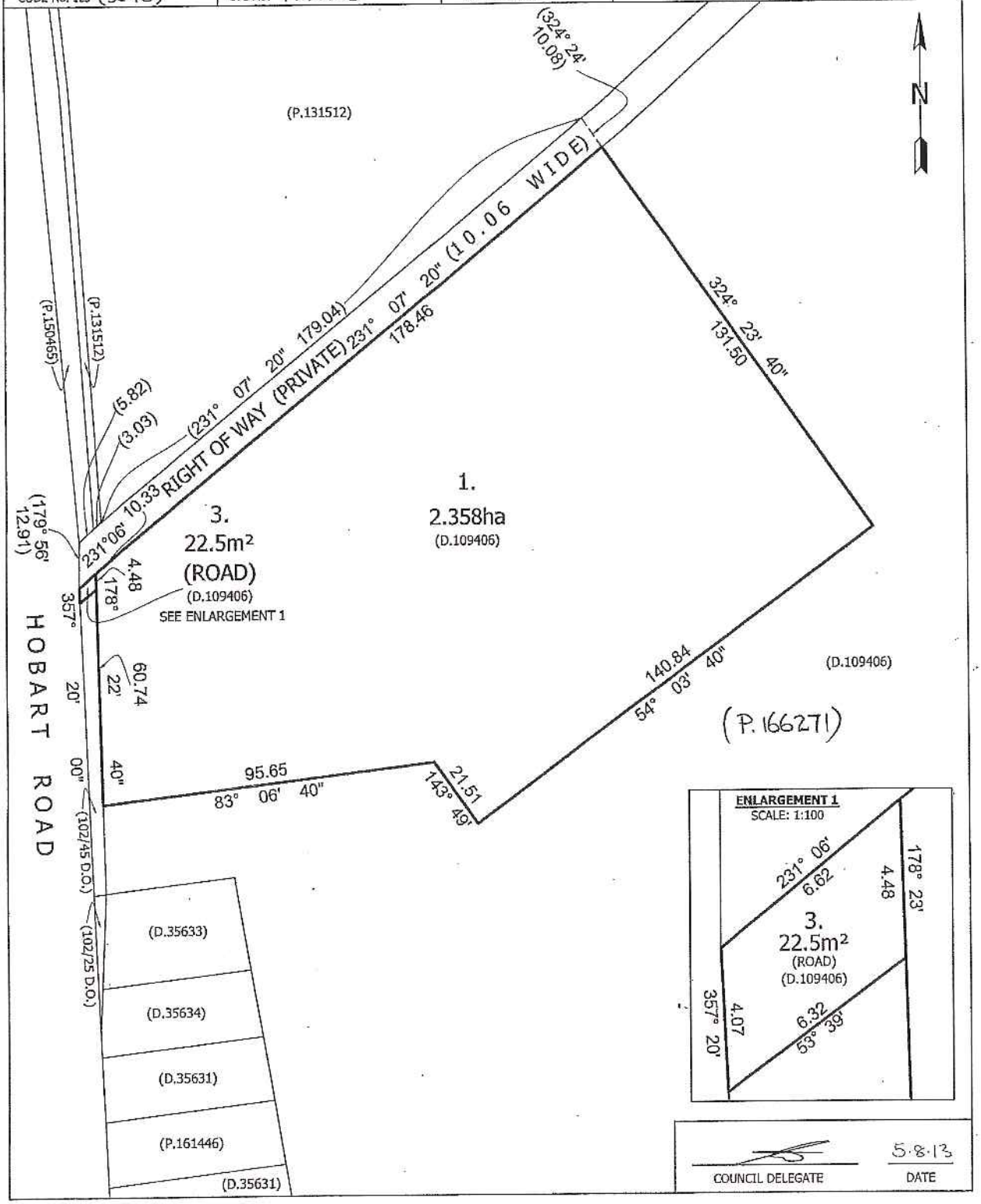
BY SURVEYOR: COLIN STERLING SMITH
LOCATION: PARISH OF BREADALBANE
LAND DISTRICT OF CORNWALL
SCALE 1:1000 LENGTHS IN METRES

REGISTERED NUMBER

SP166270

APPROVED 13 AUG 2013
EFFECTIVE FROM
Alice Kavia
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 123 (5040)	LAST UPI No. 4742213	LAST PLAN No. P.109406	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN



COUNCIL DELEGATE 5.8.13 DATE

EXHIBITED

OWNER: TARA PROPERTY INVESTMENTS PTY LTD

FOLIO REFERENCE: C.T.109406/1

GRANTEE: PART OF 556 ACRES GRANTED TO THOMAS SCOTT.

PLAN OF TITLE

WOOLCOTT SURVEYS

LOCATION: PARISH OF BREADALBANE
LAND DISTRICT OF CORNWALL
CONVERTED BY PLAN No. P.109406
COMPILED BY: WOOLCOTT SURVEYS
NOT TO SCALE LENGTHS IN METRES

Registered Number

P166271

APPROVED 13 AUG 2013

Alice Kawa
Recorder of Titles

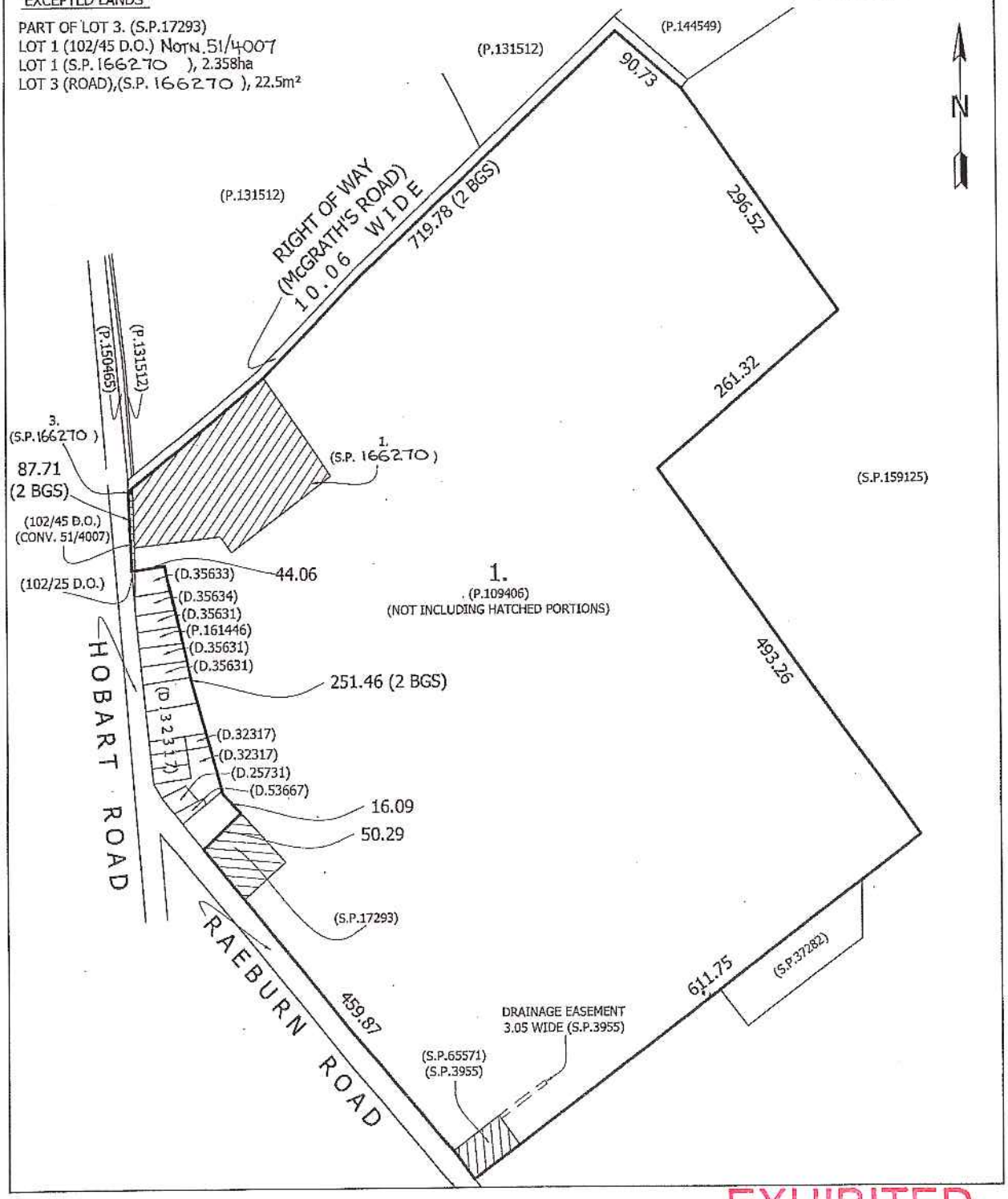
MAPSHEET MUNICIPAL Code No. 123 (5040)	LAST UPI No. 4742213	LAST PLAN No. P.109406	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

SKETCH BY WAY ILLUSTRATION ONLY

BALANCE PLAN

'EXCEPTED LANDS"

PART OF LOT 3. (S.P.17293)
LOT 1 (102/45 D.O.) NOTN.51/4007
LOT 1 (S.P.166270), 2.358ha
LOT 3 (ROAD),(S.P. 166270), 22.5m²



EXHIBITED

OWNER: A & J GARDNER PTY LTD

FOLIO REFERENCE: CT.32508/1, CT.32508/3

GRANTEE: PART OF 584 ACRES GRANTED TO THOMAS SCOTT, WHOLE OF 43A-0R-11PS. LOCATED TO H. MULLENS, WHOLE OF 43A-1R-29PS. LOCATED TO J. DAWSON AND PART OF 106A-1R-0PS. GTD. TO CHARLES FLETCHER HOWARD.

PLAN OF SURVEY

BY SURVEYOR PETER NOEL ANDERSON of CAMPBELL SMITH PHELPS PEDLEY 3/23 BRISBANE STREET, LAUNCESTON

LOCATION PARISH OF BREADALBANE DISTRICT OF CORNWALL

REGISTERED NUMBER **SP157107**

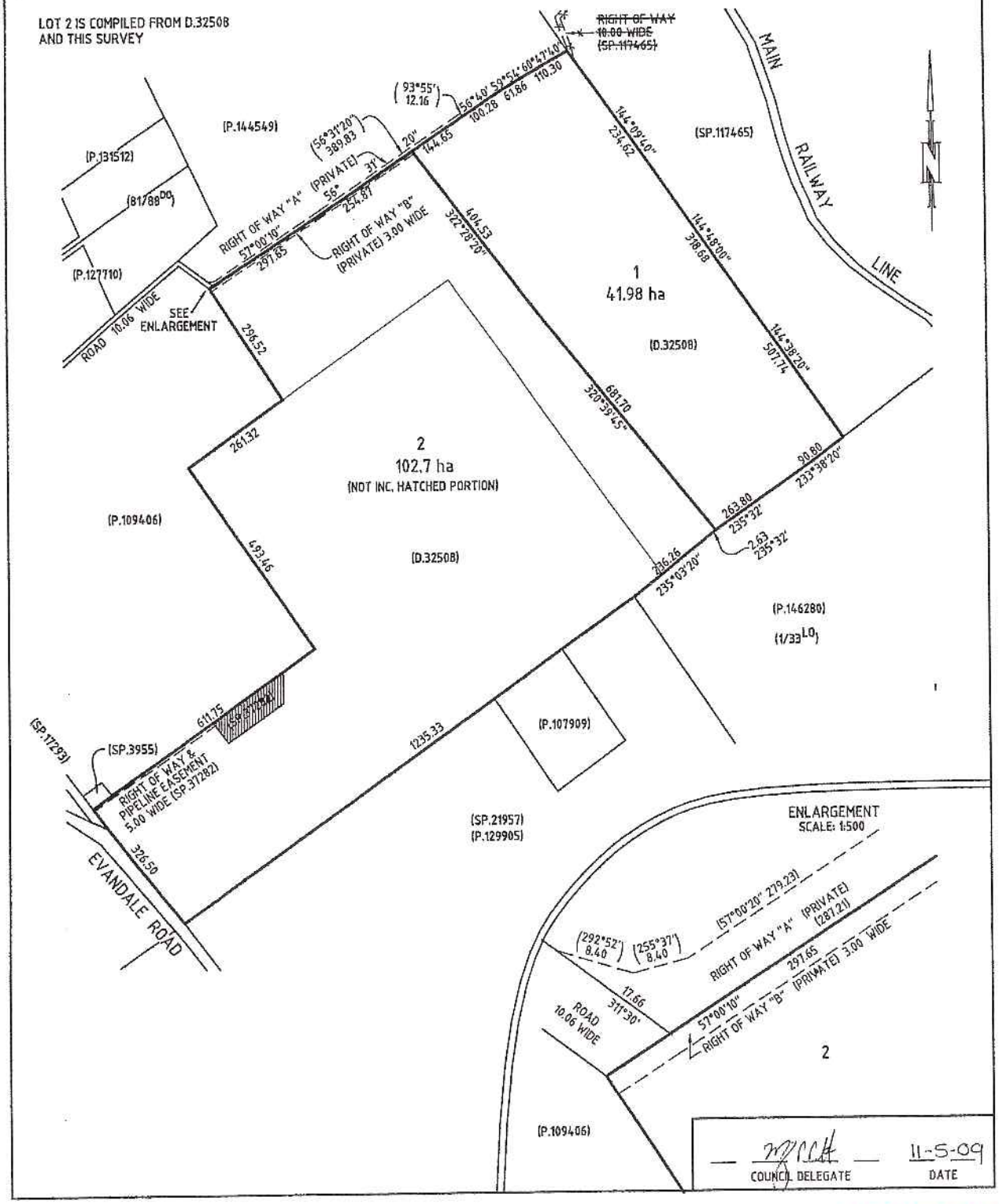
~~APPROVED~~ EFFECTIVE FROM 25 MAY 2009

Alice Kava
Recorder of Titles

SCALE: 1:8000	LENGTHS IN METRES	SURVEYORS REF: 304-08

MAPSHEET MUNICIPAL CODE No. 123 (5040 - 55)	LAST UPI No FET 03 , 4701190	LAST PLAN No. D32508	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

LOT 2 IS COMPILED FROM D.32508 AND THIS SURVEY



MCH — COUNCIL DELEGATE — 11-5-09 — DATE

EXHIBITED

OWNER: A & J GARDNER PTY LTD.

FOLIO REFERENCE: CT.157107/2

GRANTEE: PART OF 584 ACRES GRANTED TO THOMAS SCOTT, WHOLE OF 43A - 0R - 11P LOCATED TO H. MULLENS, WHOLE OF 43A - 1R - 29P PART LOCATED TO J. DAWSON, ~~WHOLE~~ OF 106A - 1R - 0P GRANTED TO CHARLES FLETCHER HOWARD

PLAN OF SURVEY

BY SURVEYOR: JOHN WILLIAM DENT of CAMPBELL SMITH PHELPS PEDLEY 3/23 BRISBANE STREET, LAUNCESTON

LOCATION: PARISH OF BREADALBANE DISTRICT OF CORNWALL

SCALE: 1:7500 | LENGTHS IN METRES | SURVEYORS REF: 304-08

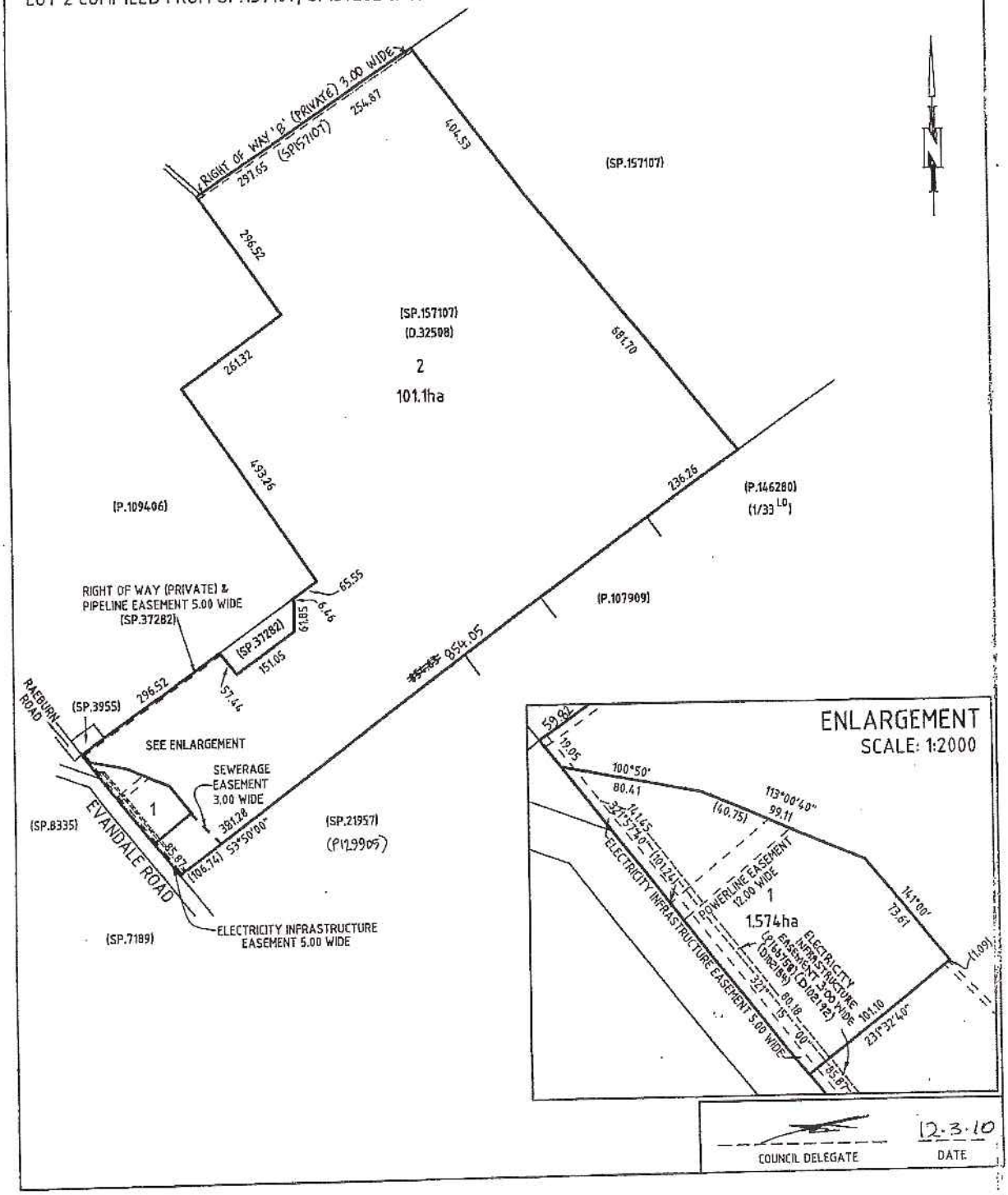
REGISTERED NUMBER: **SP159125**

APPROVED EFFECTIVE FROM - 8 APR 2010

Alice Kawa
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 123 (5040 - 55) | LAST UPI No FET03 | LAST PLAN No. SP157107 | ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

LOT 2 COMPILED FROM SP.157107, SP.37282 & THIS SURVEY.



COUNCIL DELEGATE

12.3.10
DATE

EXHIBITED

WOOLCOTT SURVEYS

PLANNING APPLICATION

Concrete Batch Plant and Landscaped Bunding

Owner:
A & J Gardner Pty Ltd

Property address:
59 Raeburn Road
Breadalbane

Northern Midlands Council
Rural Resource Zone

Yinghuan Liu
yinghuan@woolcottsurveys.com.au
Town planner

Contents

1. Proposal

Use: Extractive Industries

The application for the proposed concrete batch plant is occurring on the same site as the existing Level 2 Raeburn Quarry. The batch plant is heavily reliant on the quarry in order to provide its materials for processing. The batch plant will process rocks from the quarry, mix the product with cement powder, and produce the concrete which is distributed from the site.

As the proposed development is directly associated with the extractive industries use class, it is assessed that the concrete batch plant is classified into this use.

Clause **8.2.2** states:

A use or development that is directly associated with and a subservient part of another use on the same site must be categorised into the same use class as that other use.

The main components of the development are as follows:

Concrete Batch Plant
The concrete batch plant is located in the north western portion of the lot. The development consists of a main entrance which fronts onto a road reserve. The internal driveway will provide access to a car park, office buildings, laboratory and concrete works area.

The admin building (Plan A005) will contain a reception area, staff room and offices. The admin building is single story with a height of approximately 4m. The lab (A005) will be of similar style and height and allows required testings associated with the plant to be carried out onsite. The lab and admin building are both adjacent the batch plant and associated infrastructure.

The concrete batch plant will consist of a number of bays, each of which provides an element in the production of concrete. Conveyor belts will transfer the materials into two 51 tonne silos, before transporting the concrete into trucks. Each silo has a height of 9.6m from natural ground level.

A landscaped bund will be developed around the southern and eastern portion of the concrete plant. The landscaped bunding will provide both a visual barrier and noise buffer for nearby properties, including the Launceston airport and Hobart Road. The bund which has a maximum height of approximately 5m from natural ground level will be landscaped to further soften any visual elements which may be visible from outside the site.

Traffic associated with the development will be much the same as what is currently experienced. The proposal will allow trucks to collect the finished product onsite, before transporting it from the premises. The process is simplified, as trucks don't need to transport the rock to batch plants in other parts of Launceston. The only meaningful change will come as a result of staff coming to the site each day. This is not expected to be more than 20 movements per day. The proposed development is expected to employ approximately 18 people, with half of these located onsite.

Due to the nature of the business, there will be occasions that concrete is required during the night. While this is seen as an exception as opposed to the norm, the concrete plant will have the ability to operate 24/7 should such occasions arise.

2. Subject Land

2.1 Location

The subject site has an address of 59 Raeburn Road, Breadalbane.

2.2 Land Area

The irregular shaped lot currently has a size of 102.7ha. The entire site has a combined area of 144ha.

2.3 Existing Infrastructure

The land is currently serviced via reticulated water. There is no sewer on the lot with onsite wastewater being relied upon.

2.4 Access

The land currently has multiple accesses. There is an access road which runs from the proposed building area to Hobart Road. Access is also provided via Raeburn road in the southern portion of the site.

2.5 Special or Significant Features of the Subject Land

This portion of the site is currently subject to mining lease ML1874P17. The lease covers two lots which are adjoining, one of which being developed for the concrete batch plant. The application has been discussed with the EPA who have confirmed they do not have an interest in the proposed batch plant.

2.6 Existing Uses, Buildings and Structures

The site contains a number of buildings and uses. The primary use of the site is extractive industry, with the Raeburn Quarry operating from 1987. It is noted that the revised DPEMP undertaken 2010, mentions a concrete batch plant which had previous approval for the site. This batch plant was never constructed.

The area subject to the existing mining lease is currently vacant and covered with scrub/weed. Other parts of the site outside of the mining lease are used for grazing purposes. There are outbuildings located in the south eastern portion of the lot.

The site is classified as Class 4 capability, which is described as land well suited to grazing but which is limited to occasional cropping or a very restricted range of crops.

2.7 Adjoining Properties

The adjoining properties are zoned Rural Resource. There are no residential uses adjoining the subject site.

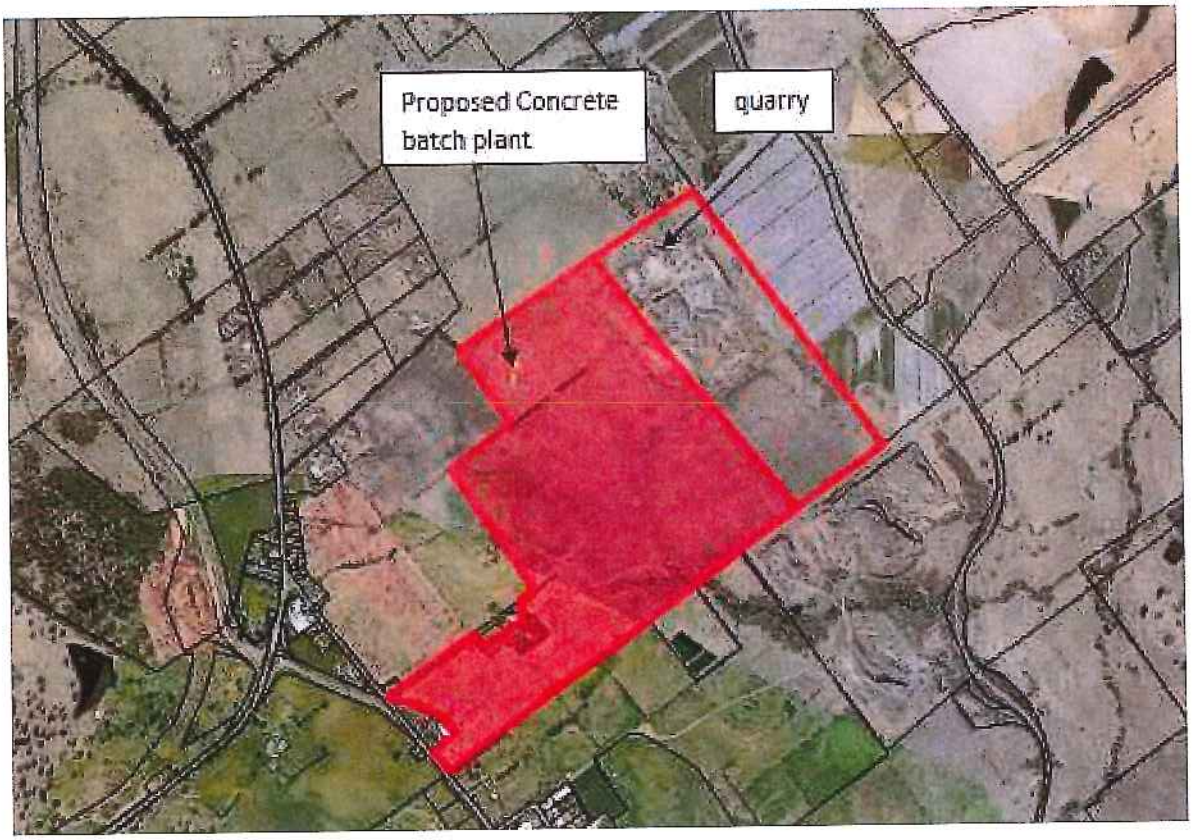


Figure 1 - Aerial photo of the subject site and its surrounding areas.

3. Planning Controls

3.1 Zoning of Subject Land and Surrounding Land

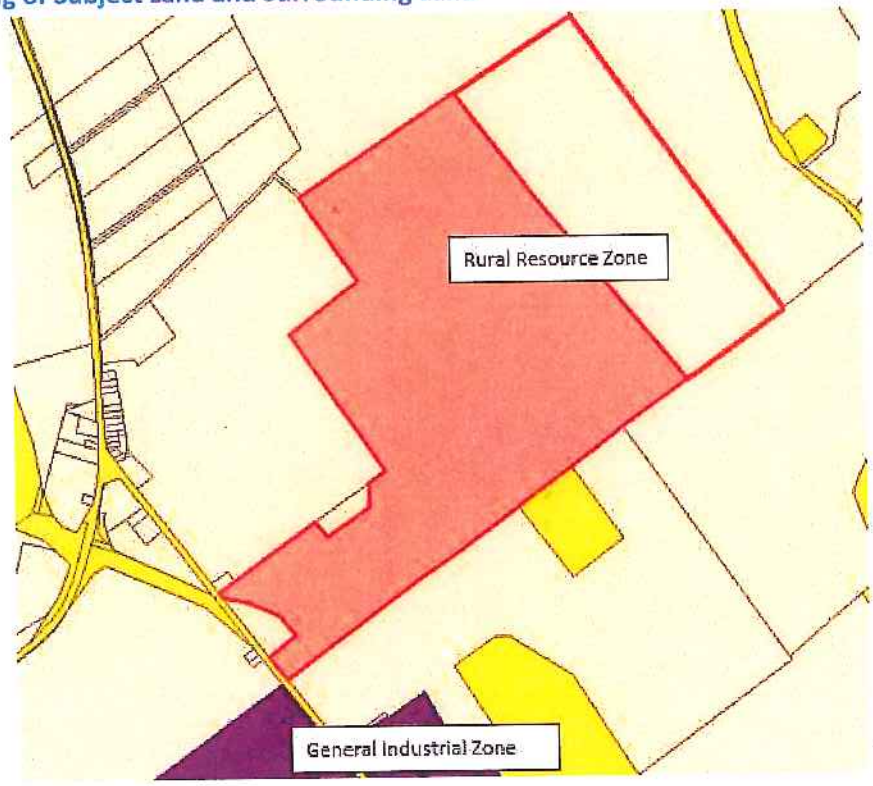


Figure 2 - The subject sites falls within Rural Resource Zone.

3.2 Overlays of Subject Land

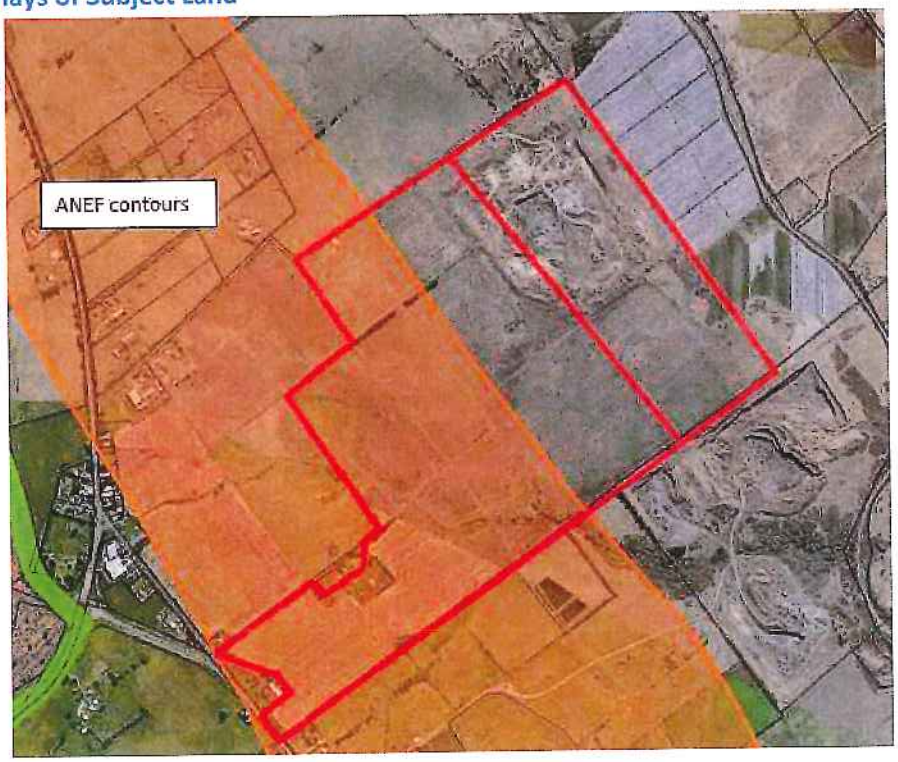


Figure 3 - The subject sites falls within ANEF contours

4. Northern Midlands Planning Scheme 2013

4.1 Planning Scheme Zone Assessment

26.0 Rural Resource Zone

26.1 Zone purpose

26.1.1 Zone Purpose statement:

> *26.1.1.1 To provide for the sustainable use or development of resources for agriculture, aquaculture, forestry, mining and other primary industries, including opportunities for resource processing.*

The proposed development is associated with the existing mining industry onsite. The co-location of related activities is considered appropriate for the rural area, away from residential uses and in harmony with any primary industry uses in the area.

> *26.1.1.3 To provide for economic development that is compatible with primary industry, environmental and landscape values.*

The proposed concrete batch plant and associated admin and lab buildings together work as a 'one-stop shop', which will significantly improve the productivity and efficiency of transforming raw material extracted from the quarry to a finished concrete product. The development will create more job opportunities to the local area and contribute to rural economy. The proposed landscaped bunding will ensure that the environmental and landscape values can be preserved.

26.2 Use table

Permitted	
Use Class	Qualification
Extractive industries	If not: a) located on prime agricultural land or; b) for a Level 2 Activity

The proposed concrete batch plant is not Level 2 Activity. Please refer to EPA correspondence attached. Therefore, it is classified as **permitted use** under the Scheme.

26.3.1 Discretionary Uses if not a single dwelling – Not applicable.

26.3.2 Dwellings – Not applicable

26.3.3 Irrigation Districts

P1 Performance Criteria relied upon. The site falls within North Esk Irrigation District. However, it has a current mining lease and the quarry has been operating for over 30 years.

a) The proposed concrete batch will be located on the northwest corner of the site, and only small portion of the site is occupied for mining. The majority of the site can still be used for grazing purpose, which will not reduce the current and future irrigation potential of the land.

b) The operational practicalities of irrigation systems relating to the site has no difference to other rural land in the surrounding areas. The site is under mining lease and has no irrigation need.

c) no management and conservation plan for the land. The site is under mining lease and has no irrigation need.

26.4.1 Building Location and Appearance

A1 Acceptable solution achieved. The height of the concrete batch plant is 9.6m and the associated admin and lab buildings are approx. 4m.

P2 Performance criteria relied upon. the proposed setback from the concrete batch plant the south boundary is approx. 37m. As this less than the required setback of 50, criteria has been addressed.

a) Not applicable. No sensitive use is proposed.

b) The existing landscaped mound will remain and be used as a buffer to the adjoining lot to the south.

c) Not applicable.

d) The nature of existing adjoining use is non-sensitive use. As it also falls within Rural Resource Zone, it is highly likely that the future use will remain the same. Therefore, the proposed setback satisfies.

e) Not applicable.

4.2 Planning Scheme Code Assessment

E4 Road and Railway Assets Code

E4.6 Use Standards

E4.6.1 Use and road or rail infrastructure

A1 Not applicable.

A2 Acceptable solution achieved as the expected number to be no more than 30 movements per day.

A3 Not applicable.

E4.7 Development Standards

E4.7.2 Management of Road Accesses and Junctions

A1 Acceptable solution achieved. Only one access has been proposed.

A2 Not applicable.

E4.7.4 Sight Distance at Accesses, Junctions and Level Crossings

A1a) Acceptable solution achieved. Site distances are adequate as per the Table E4.7.4.

E6 Car Parking and Sustainable Transport Code

E6.6.1 Car Parking Numbers

Table E6.1

Use	Parking Requirement	
	Vehicle	Bicycle
Extractive industry	1 space per 2 employees	1 space per 10 employees

A1a) Acceptable solution achieved. There are 12 car parking bays proposed on site, which can cater for 24 employees. There will normally be 8 employees, including 2 office staff, 2 lab staff, and 6 truck drivers. Therefore, the number of parking bays complies.

E6.6.2 Bicycle Parking Numbers

A1.1 Acceptable solution achieved. Given the size of the proposed development, the parking spaces for bicycle parking are sufficient.

E6.6.3 Taxi Drop-off and Pickup – Not applicable

E6.6.4 Motorbike Parking Provisions – Not applicable

E6.7.1 Construction of Car Parking Spaces and Access Strips

P1 Performance criteria relied upon. All car parking, access strips manoeuvring and circulation spaces are readily identifiable and constructed as can be seen from the site works plan (A002). The quarry has been operating for years and all the trucks and other vehicles can access to and from the site in all weather conditions. Run off will be no issue considering the size of the site and proposed setbacks from adjoining uses.

E6.7.2 Design and Layout of Car Parking

A1.1 Not applicable.

A1.2 Not applicable.

A2.1a) Acceptable solution achieved. The car park is flat.

A2.1b) Acceptable solution achieved. Vehicles to enter and exit the site in a forward direction.

A2.1c) Acceptable solution achieved. The width of vehicular access is sufficient.

A2.2 Acceptable solution achieved. The layout of car spaces and access ways are designed in accordance with relevant Standards.

E6.7.3 Car Parking Access, Safety and Security – Not applicable

E6.7.4 Parking for Persons with a Disability – Not applicable

E6.7.6 Loading and Unloading of Vehicles, Drop-off and Pickup

A1a) Acceptable solution achieved. Given the size of the proposal and the nature of business, there is sufficient space for truck loading.

A1b) Acceptable solution achieved. Loading and bus bays and access strips are designed in accordance with relevant Standards.

E6.8.2 Bicycle Parking Access, Safety and Security

A1a) Acceptable solution achieved. Given the size of the proposed development, bicycle parking spaces are accessible from a road, footpath or cycle track.

A1b) Acceptable solution achieved. bicycle parking spaces include a rail or hoop to lock a bicycle to that meets relevant Standard.

A1c) Acceptable solution achieved. Given the size of the proposal and the nature of business, bicycle parking spaces are to be located within 50m of and visible or signposted from the entrance to the activity they serve.

A1d) Acceptable solution achieved. Given the size of the proposal and the nature of business, bicycle parking spaces are available and adequately lit in accordance with Australian Standard AS/NZS 1158 2005 Lighting Category C2 during the times they will be used.

A1.2 Not applicable.

A2a) Acceptable solution achieved. The minimum dimensions of bicycle parking space are achieved.

A2b) Acceptable solution achieved. The bicycle parking spaces are flat.

E6.8.5 Pedestrian Walkways

P1 Performance criteria relied upon. The car park is design exclusively associating with the admin and lab building. Pedestrian access to and from the car park is safe.

E12 Airport Impacts Management Code

E12.5.1 Noise Impacts

P1 performance criteria relied upon. The use is not sensitive. The site will be used for industrial purposes. Noise issues associated with the airport are therefore not considered relevant.

A2 Not applicable as no sensitive use is proposed.

E12.6.1 Obstacles to Aircraft

A1 Acceptable solution achieved. The proposed location of concrete batch plant is situated at the low point of the land. The existing trees located along the northern and north western boundaries are approx. 20m in height, which is at least 10m taller than the concrete batch plant. Other buildings in the immediate vicinity are taller on the landscape then the proposed silos (i.e. cattery to the north west).The development must be approved pursuant to the Airports Act 1996 and the Airport (Protection of Airspace) Regulations 1996 and the Manual of Standards.

Figure 4 – Looking East. Aeroplane descent provides a sense of obstacle limitation requirements.

Figure 5 – trees apporx. 20-30m height located near the north western boundaries. Taller then proposed silos.

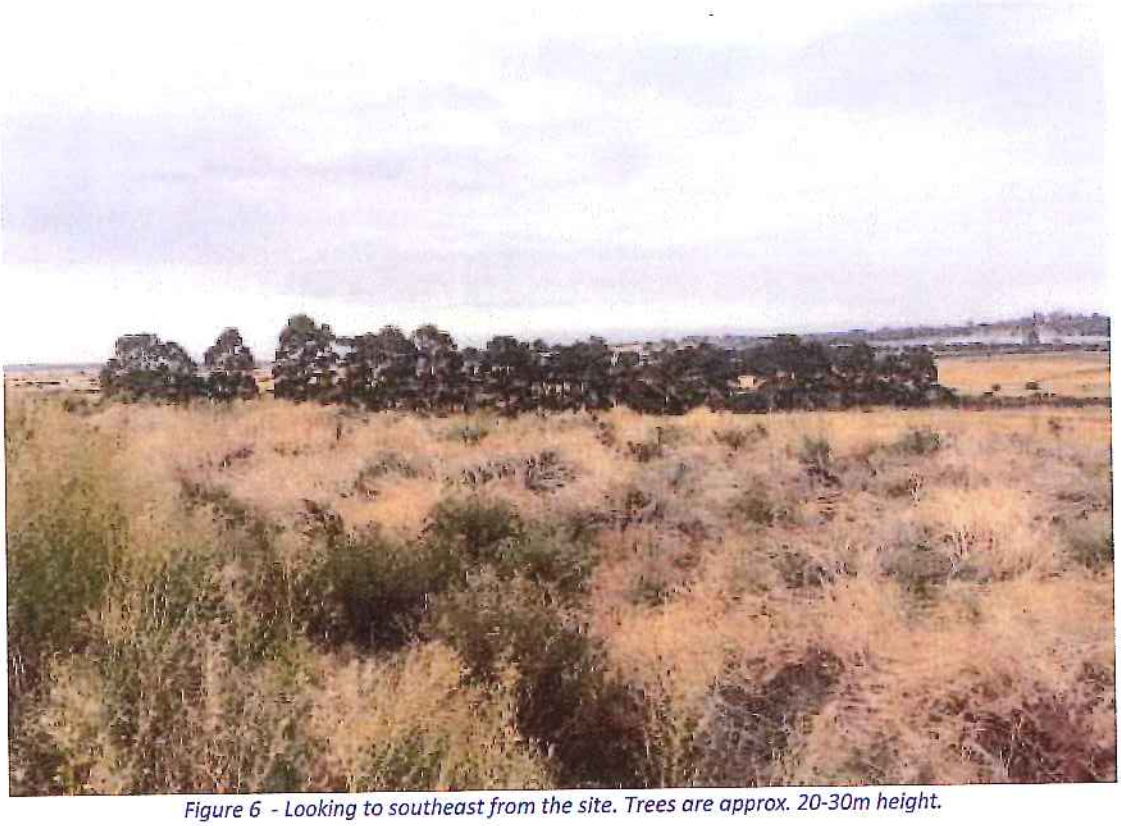


Figure 6 - Looking to southeast from the site. Trees are approx. 20-30m height.

Figure 7 - The indictive location of the proposed concrete batch plant. It fits in within the heights of surrounding trees and hills.

5. Strategic Planning

5.1 State Policies

The following State Policies are currently in force:

- Tasmanian State Coastal Policy 1986;
- State Policy on Water Quality and Management1997; and
- State Policy on the Protection of Agricultural Land 2000.
- National Environment Protection Council (Ambient Air Quality) Measure
- National Environment Protection Council (Assessment of Site Contamination) Measure 1999
- National Environment Protection Council (Movement of Controlled Wastes between States and Territories) Measure
- National Environment Protection Council (National Pollutant Inventory) Measure
- National Environment Protection Council (Used Packaging Materials) Measure

The proposed development is not known to conflict with or contravene any of the above State Policies.

6. Summary

The proposed Concrete Batch Plant is in keeping with the intent of the Rural Resource Zone and the relevant codes. It will provide economic benefit to the local economy while ensuring there will be no adverse impact on the environment. It is considered that the use of this land as a batch plant would have less of an impact on the adjoining properties then the existing mine developing the land as part of their lease

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
159125	2
EDITION	DATE OF ISSUE
2	08-Nov-2013

SEARCH DATE : 08-Feb-2019
SEARCH TIME : 09.05 AM

DESCRIPTION OF LAND

Parish of BREADALBANE Land District of CORNWALL
Lot 2 on Sealed Plan 159125
Derivation : Part of 584 Acres Gtd. to T. Scott, Whole of 43A-0R-11P Located to H. Mullens, Whole of 43A-1R-29P Located to J. Dawson and Part of 106A-1R-0P Gtd. to C.F. Howard
Prior CT 157107/2

SCHEDULE 1

C452322 TRANSFER to A & J GARDNER PTY LTD Registered 02-Jul-2003 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP159125 EASEMENTS in Schedule of Easements
SP159125 FENCING PROVISION in Schedule of Easements
D102192 BURDENING ELECTRICITY INFRASTRUCTURE EASEMENT with the benefit of a restriction as to user of land in favour of Aurora Energy Pty Ltd over the land marked Electricity Infrastructure Easement 3.00 wide shown on Sealed Plan 159125 (Subject to Provisions) Registered 08-Nov-2013 at 12.01 PM
C956846 AGREEMENT pursuant to Section 71 of the Land Use Planning and Approvals Act 1993 Registered 08-Apr-2010 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

EXHIBITED

OWNER: A & J GARDNER PTY LTD.

FOLIO REFERENCE: CT.157107/2

GRANTEE: PART OF 584 ACRES GRANTED TO THOMAS SCOTT, WHOLE OF 43A - 0R - 11P LOCATED TO H. MULLENS, WHOLE OF 43A - 1R - 29P PART OF LOCATED TO J. DAWSON, WHOLE OF 106A - 1R - 0P GRANTED TO CHARLES FLETCHER HOWARD

PLAN OF SURVEY

BY SURVEYOR: JOHN WILLIAM DENT of CAMPBELL SMITH PHELPS PEDLEY 3/23 BRISBANE STREET, LAUNCESTON

LOCATION: PARISH OF BREADALBANE DISTRICT OF CORNWALL

SCALE: 1:7500 | LENGTHS IN METRES | SURVEYORS REF: 304-08

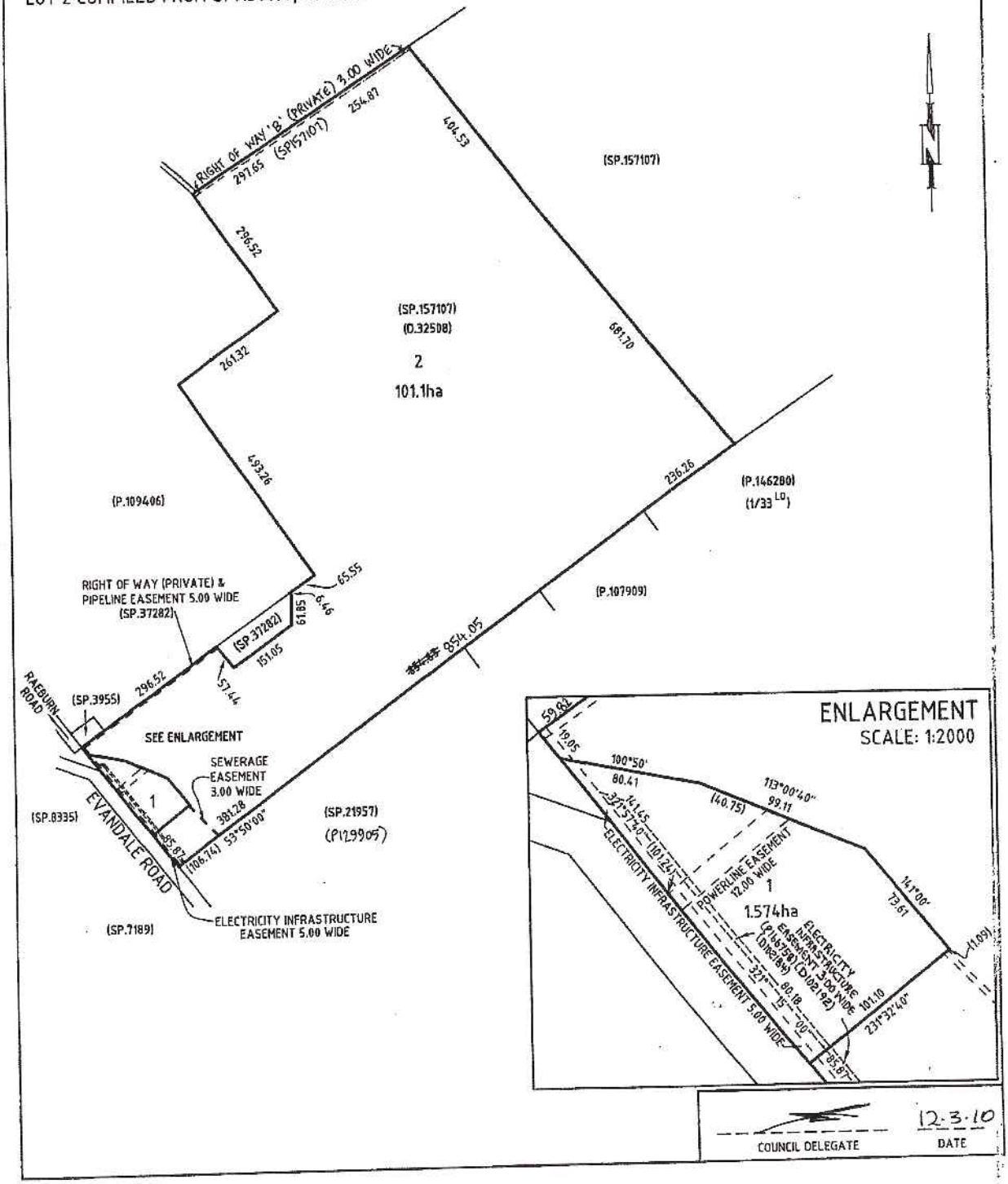
REGISTERED NUMBER: **SP159125**

APPROVED EFFECTIVE FROM - 8 APR 2010

Alice Kawa
Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 123 (5040-55) | LAST UPI No FET03 | LAST PLAN No. SP157107 | ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

LOT 2 COMPILED FROM SP.157107, SP.37282 & THIS SURVEY.



COUNCIL DELEGATE

12-3-10
DATE

EXHIBITED

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
157107	1
EDITION	DATE OF ISSUE
1	25-May-2009

SEARCH DATE : 08-Feb-2019
SEARCH TIME : 09.09 AM

DESCRIPTION OF LAND

Parish of BREADALBANE Land District of CORNWALL
Lot 1 on Sealed Plan 157107
Derivation : Part of 584 Acres Gtd. to T. Scott.
Prior CT 32508/3

SCHEDULE 1

C452322 TRANSFER to A & J GARDNER PTY LTD Registered 02-Jul-2003 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP157207 EASEMENTS in Schedule of Easements

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations

EXHIBITED

OWNER: A & J GARDNER PTY LTD

FOLIO REFERENCE: CT.32508/1, CT.32508/3

GRANTEE: PART OF 584 ACRES GRANTED TO THOMAS SCOTT, WHOLE OF 43A-0R-11PS. LOCATED TO H. MULLENS, WHOLE OF 43A-1R-29PS. LOCATED TO J. DAWSON AND PART OF 106A-1R-0PS. GTD. TO CHARLES FLETCHER HOWARD.

PLAN OF SURVEY

BY SURVEYOR PETER NOEL ANDERSON of CAMPBELL SMITH PHELPS PEDLEY 3/23 BRISBANE STREET, LAUNCESTON

LOCATION PARISH OF BREADALBANE DISTRICT OF CORNWALL

SCALE: 1:8000 | LENGTHS IN METRES | SURVEYORS REF: 304-08

MAPSHEET MUNICIPAL CODE No. 123 (5040-55) | LAST UPI No FET 03 , 4701190 | LAST PLAN No. D32508 | ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

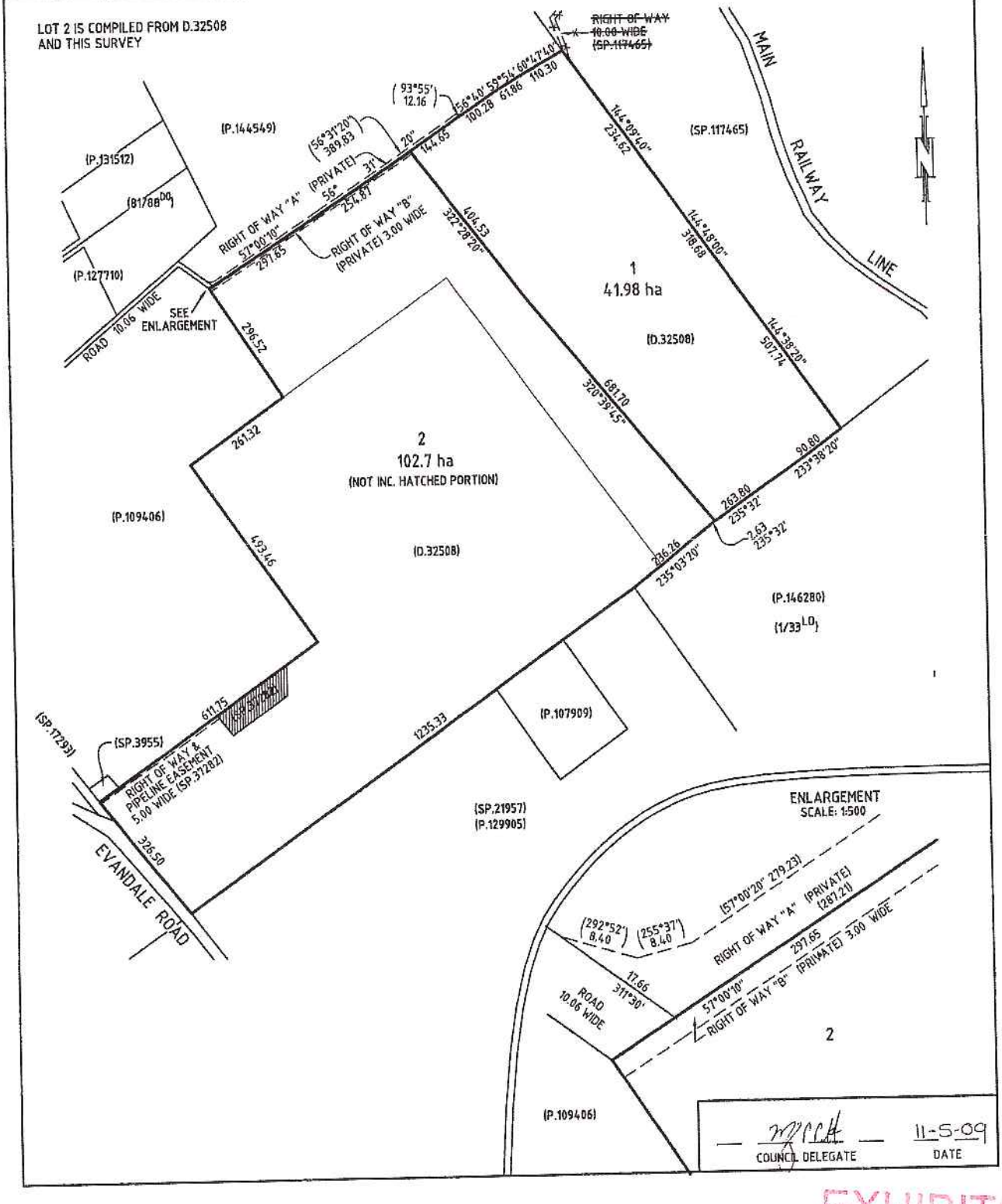
REGISTERED NUMBER

SP157107

~~APPROVED~~ EFFECTIVE FROM 25 MAY 2009

Alice Kowa

Recorder of Titles



EXHIBITE

Annexure 1 – Certificate of Title Plan and Folio Text

Annexure 2 – Proposal Plan

CLIENT:
CROSSROADS

PROJECT:
NEW CONCRETE BATCH PLANT

ADDRESS:
835 HOBART ROAD, BREADALBANE

PROJECT No:
19133

STATUS:
CONTROLLED DOCUMENT

ISSUED FOR / DESCRIPTION:
PLANNING

DRAWINGS:

COV - COVER SHEET
A001 - SITE PLAN
A002 - SITE WORKS PLAN
A003 - CONSTRUCTION AREA PLAN
A004 - SECTIONS - EARTH MOUND
A005 - ADMIN & LAB FLOOR PLAN
A006 - ADMIN & LAB ROOF PLAN
A007 - ADMIN & LAB ELEVATIONS
A008 - CONCRETE BATCH PLANT PLAN
A009 - BATCH PLANT ELEVATIONS
A010 - STORAGE BINS PLAN
A011 - PRECAST WALL - WP1
A012 - PRECAST WALL - WP2, WP3, WP5 & WP6
A013 - PRECAST WALL - WP4 & WP7-13
A014 - CONTROL ROOM & TOILET PLAN & ELEVATIONS

1 – 120

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

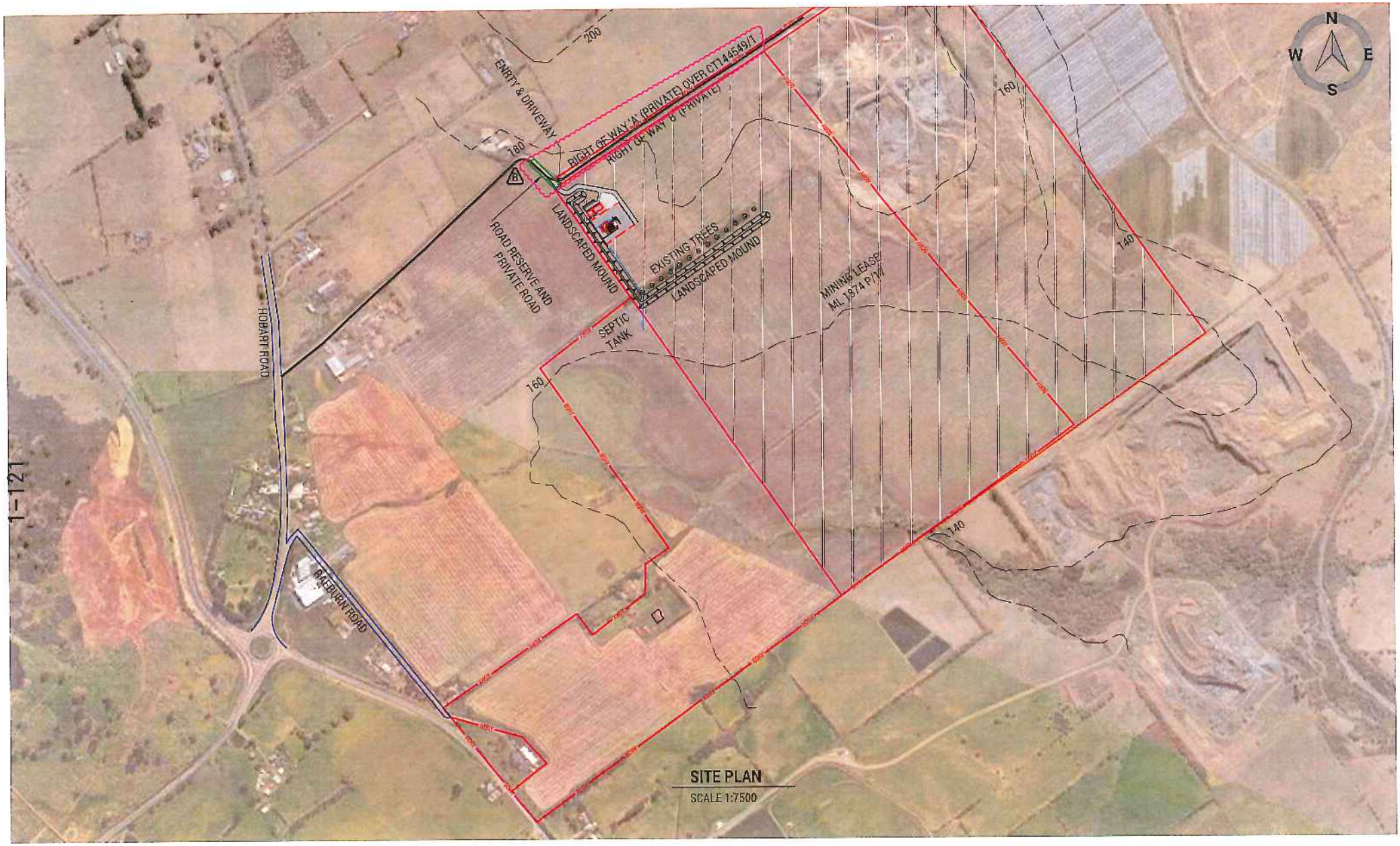
APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: COVER SHEET
SCALE: - SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: COV REV: A



SITE PLAN
SCALE 1:7500

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
B	ADDITIONAL PRIVATE ROAD NOTES	DRP	30-01-19
A	PLANNING APPROVAL	DRP	19-12-18

STATUS:
CONTROLLED DOCUMENT

DO NOT SCALE - IF IN DOUBT, ASK
THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS PREPARED. © RARE INNOVATION PTY LTD. ABN 51 619 598 257

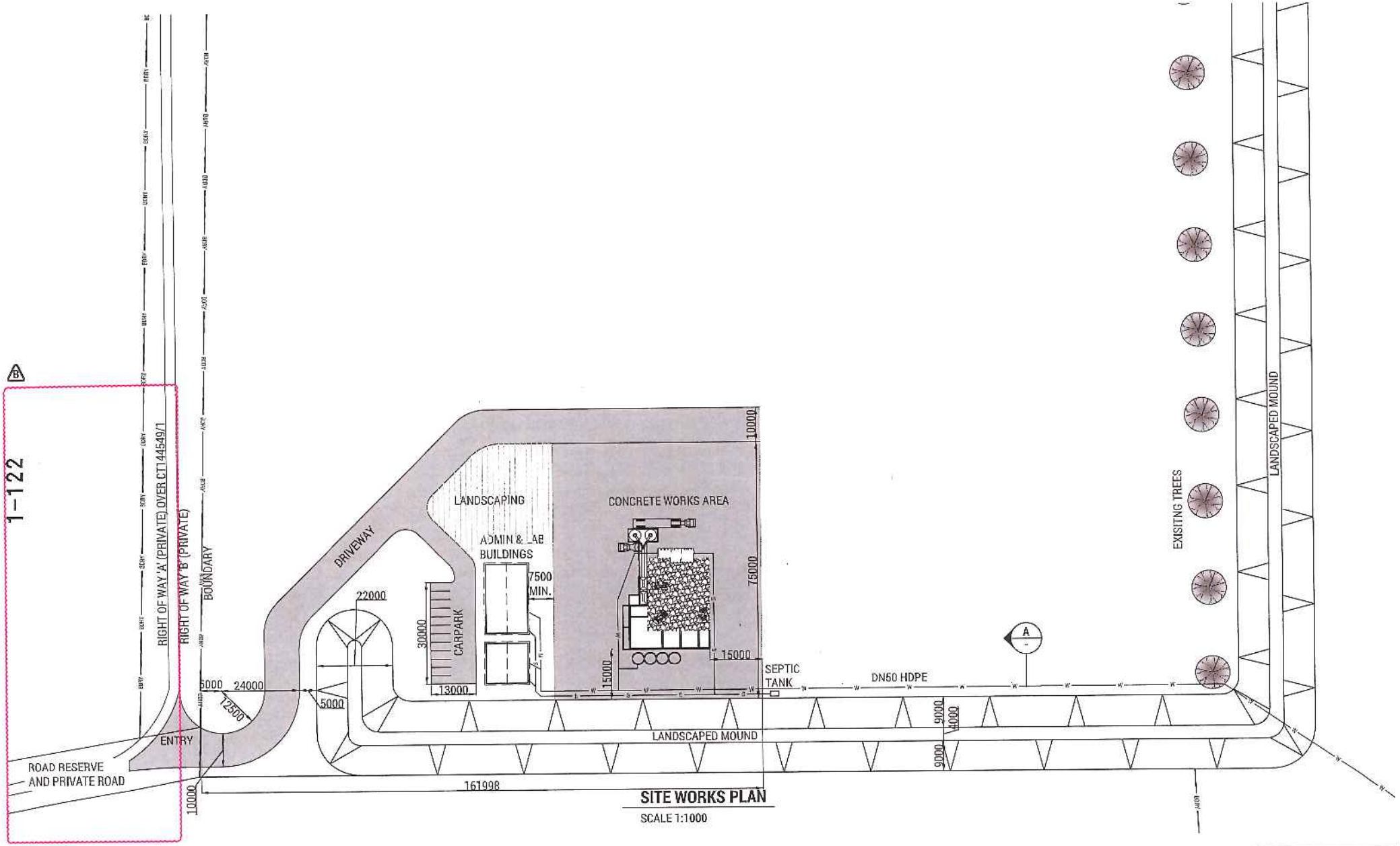
APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: SITE PLAN
SCALE: 1:7500 SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: A001 REV: B



SITE WORKS PLAN

SCALE 1:1000

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
B	ADDITIONAL PRIVATE ROAD NOTES	DRP	30-01-19
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK

THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS PREPARED. © RARE INNOVATION PTY LTD. ABN 51 619 698 257

APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS

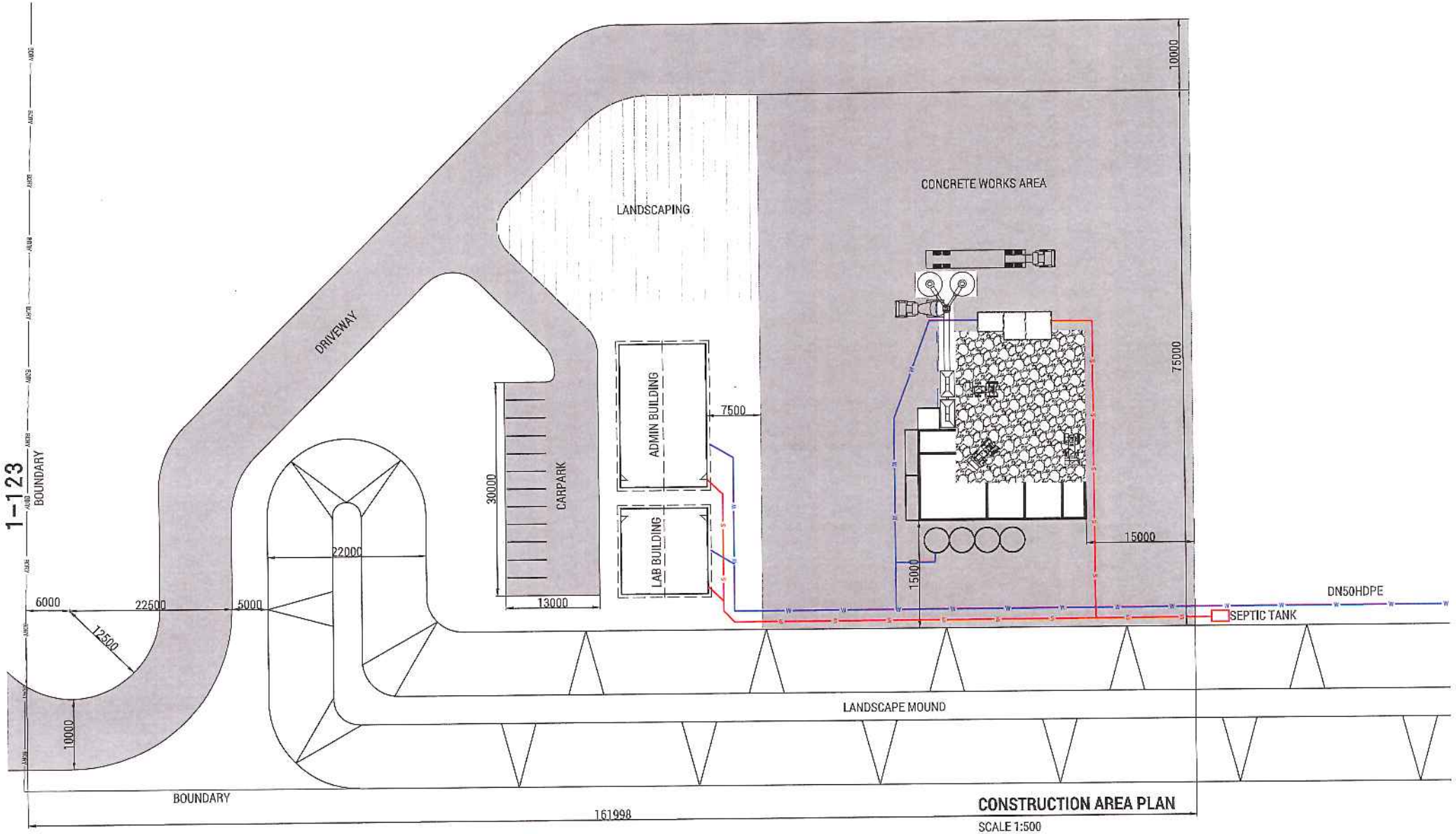
PROJECT: CONCRETE BATCH PLANT

ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: SITE WORKS PLAN

SCALE: 1:1000 SHEET SIZE: A3 DWGs IN SET: -

PROJECT No: 19133 DWG No: A002 REV: B



CONSTRUCTION AREA PLAN

SCALE 1:500

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK

APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS

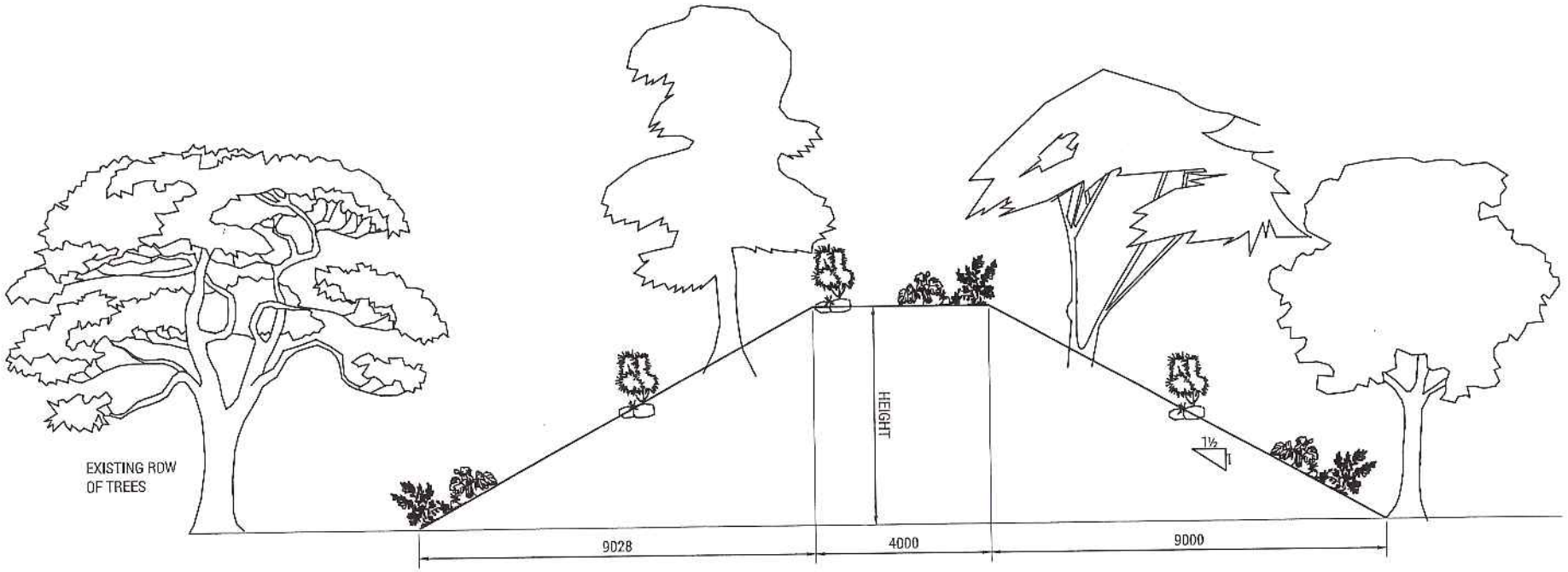
PROJECT: CONCRETE BATCH PLANT

ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: CONSTRUCTION AREA PLAN

SCALE: 1:500 SHEET SIZE: A3 DWGs IN SET: -

PROJECT No: 19133 DWG No: A003 REV: A



01 - **SECTION DETAIL**
SCALE 1:100

1–124

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

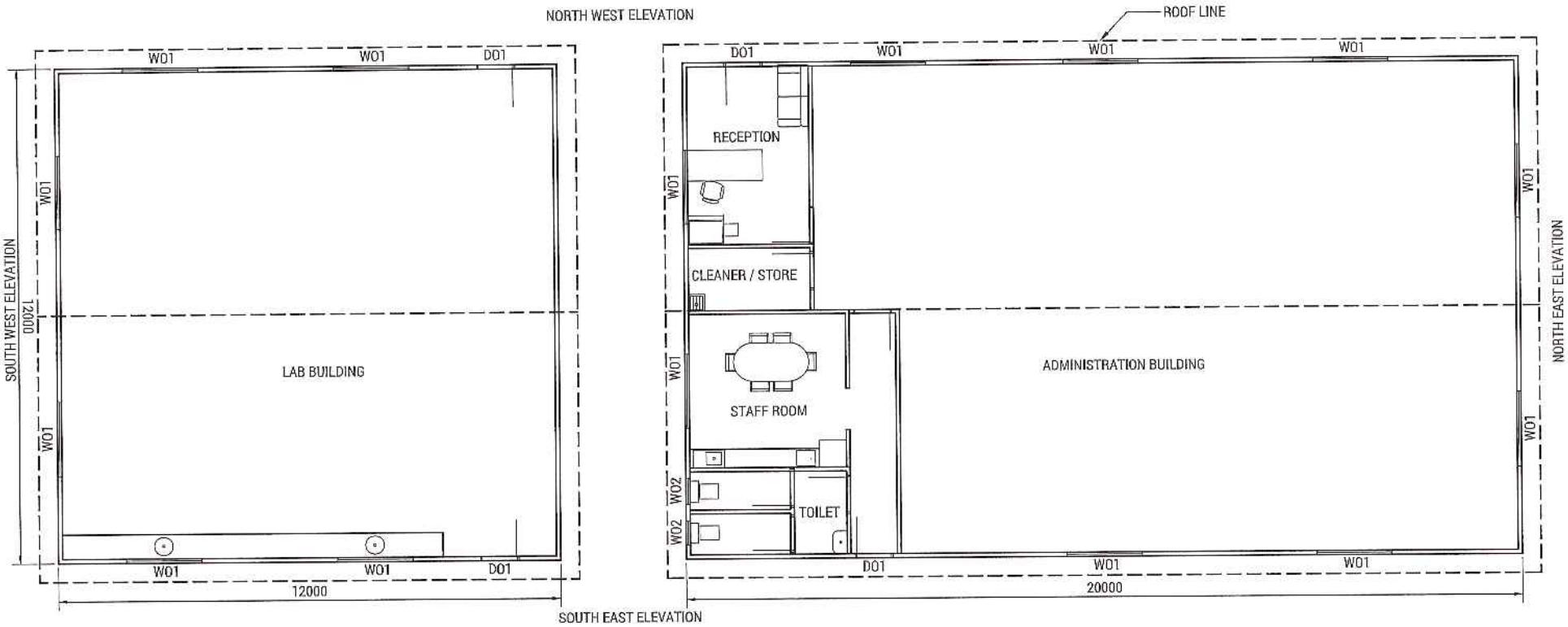
APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY: RJJ
DESIGN CHK: RJJ
DRAWN BY: DRP
DRAFT CHK: -
DATE: 18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: SECTIONS - EARTH MOUND
SCALE: 1:100 SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: A004 REV: A



1-125

ADMIN & LAB FLOOR PLAN

SCALE 1:100

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK
THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS PREPARED. © RARE INNOVATION PTY LTD. ABN 51 619 698 257

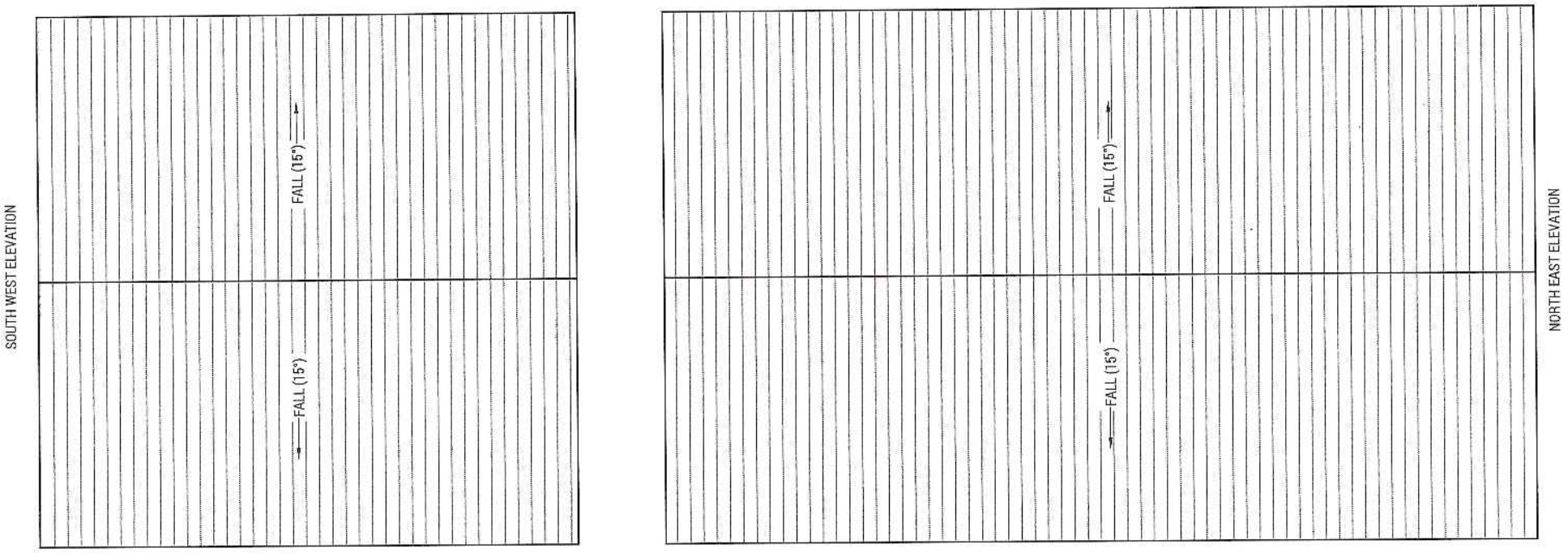
APPROVED: R. JESSON | ACRED. No: CC5848J

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: ADMIN & LAB FLOOR PLAN
SCALE: 1:100 SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: A005 REV: A



1–126

ADMIN & LAB ROOF PLAN

SCALE 1:100

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS

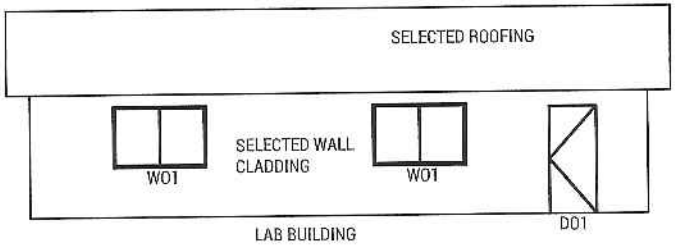
PROJECT: CONCRETE BATCH PLANT

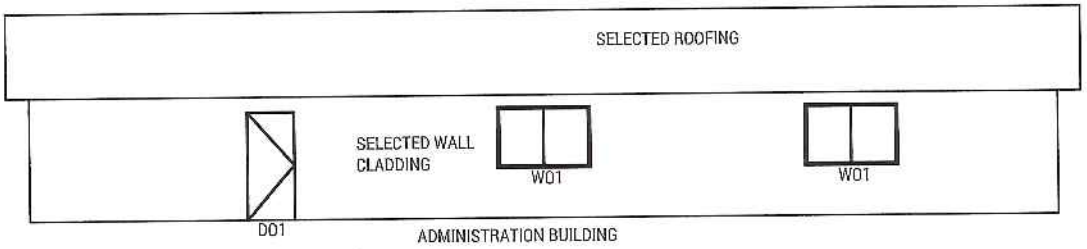
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: ADMIN & LAB ROOF PLAN

SCALE: 1:100 SHEET SIZE: A3 DWGs IN SET: -

PROJECT No: 19133 DWG No: A006 REV: A

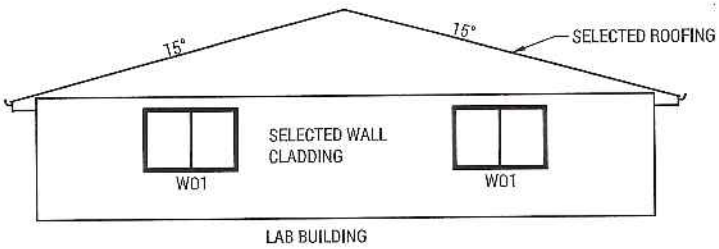




SOUTH EAST ELEVATION

SCALE 1:100

1-127



SOUTH WEST ELEVATION

SCALE 1:100

WINDOW & DOOR SCHEDULE

MARK	HEIGHT	WIDTH	STYLE
D01	2100	910	TBC
W01	1200	1810	TBC
W02	600	610	TBC

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

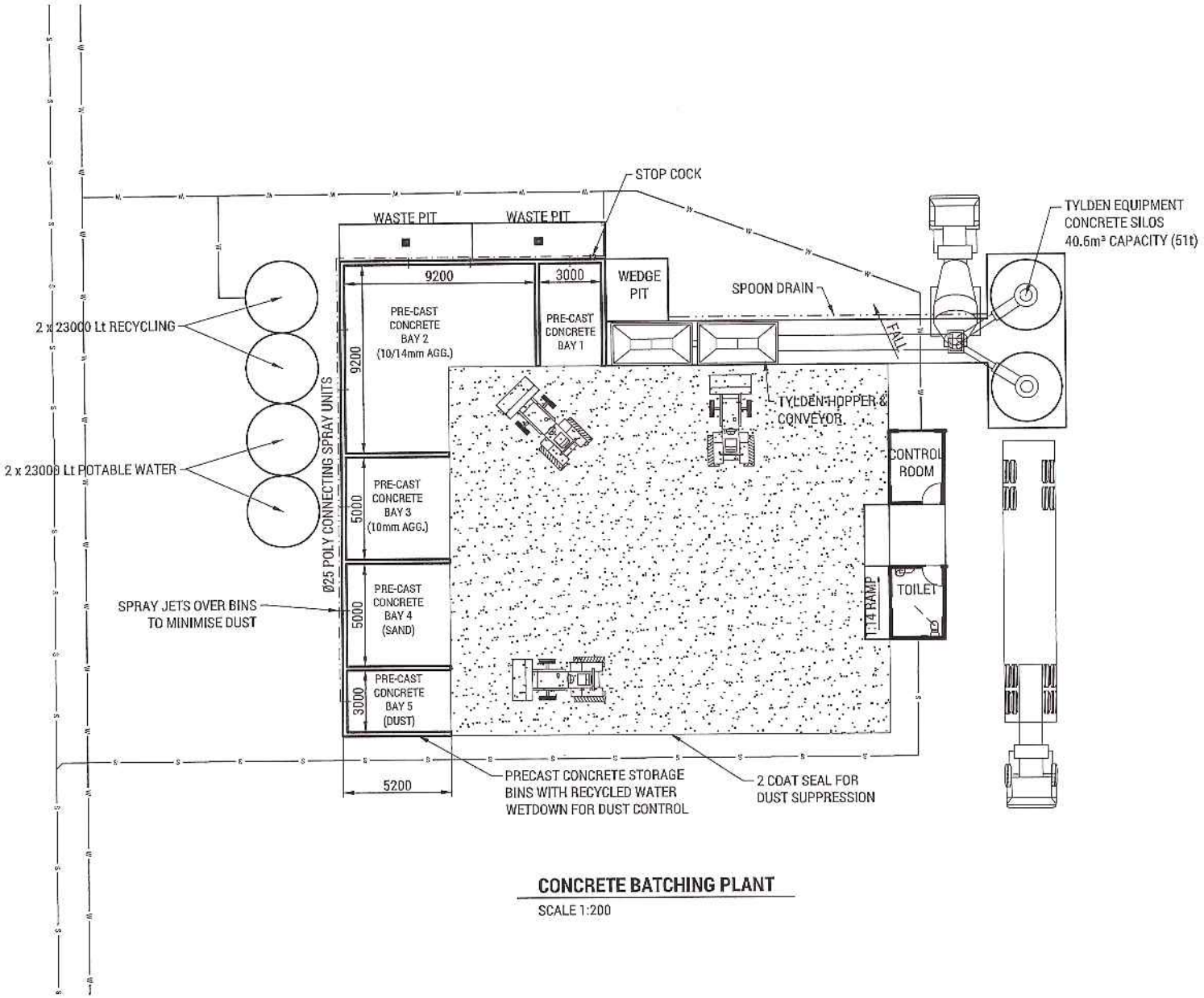
APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY: RJJ
DESIGN CHK: RJJ
DRAWN BY: DRP
DRAFT CHK: -
DATE: 18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: ELEVATIONS
SCALE: 1:100 SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: A007 REV: A



CONCRETE BATCHING PLANT

SCALE 1:200

REV:	DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK

APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS

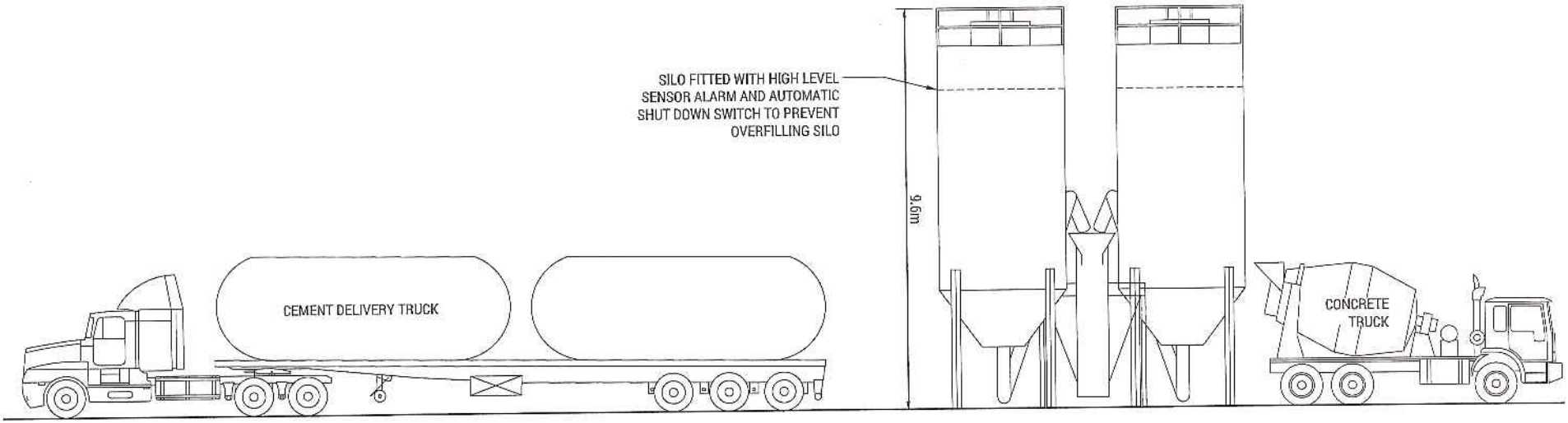
PROJECT: CONCRETE BATCH PLANT

ADDRESS: 835 HOBART ROAD, BREADALBANE

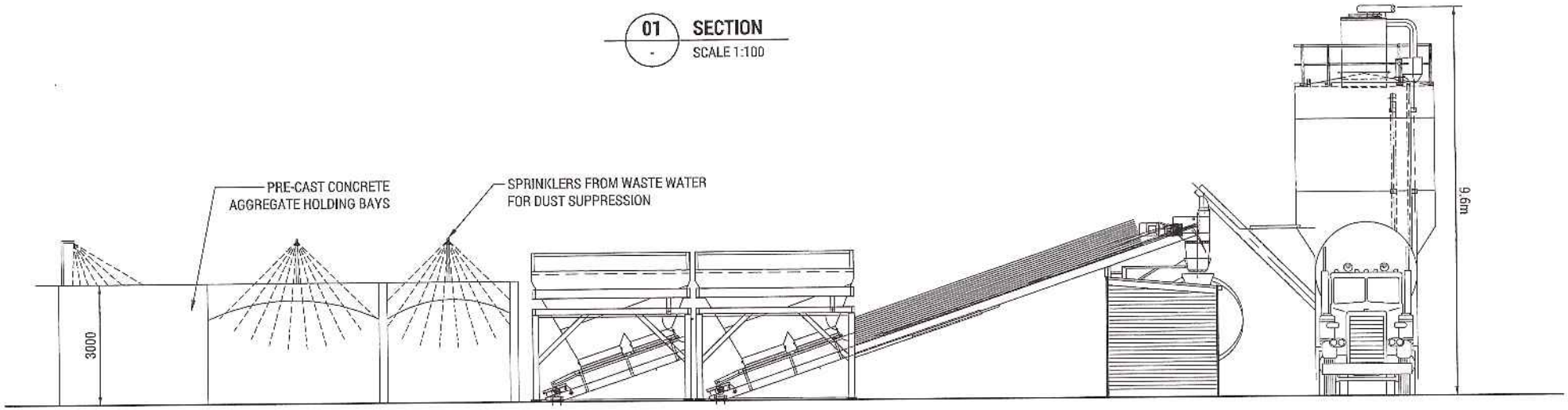
TITLE: CONCRETE BATCHING PLANT

SCALE: 1:200 SHEET SIZE: A3 DWGs IN SET: -

PROJECT No: 19133 DWG No: A008 REV: A



01 SECTION
SCALE 1:100



02 SECTION
SCALE 1:100

1-129

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

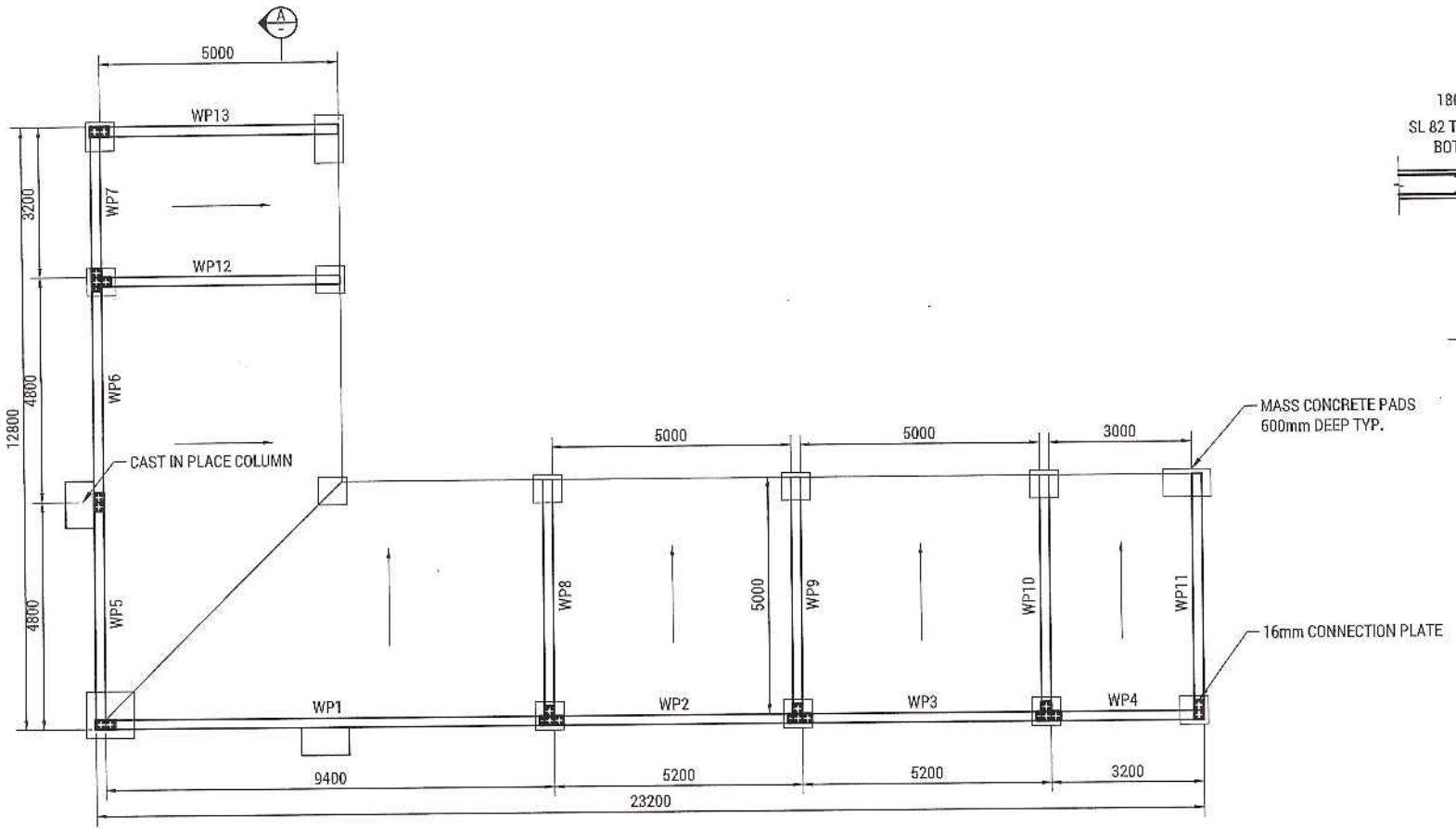
APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY: RJJ
DESIGN CHK: RJJ
DRAWN BY: DRP
DRAFT CHK: -
DATE: 18-12-18

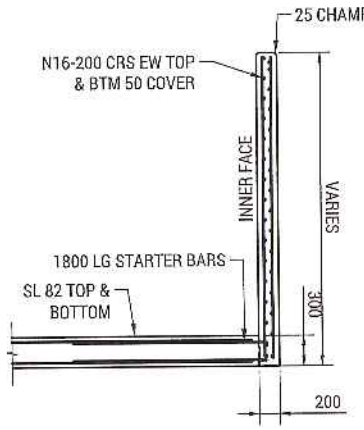
rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: BATCH PLANT - ELEVATIONS
SCALE: 1:100 SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: A009 REV: A



STORAGE BINS PLAN
SCALE 1:100



A SECTION
SCALE 1:50

1-130

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK

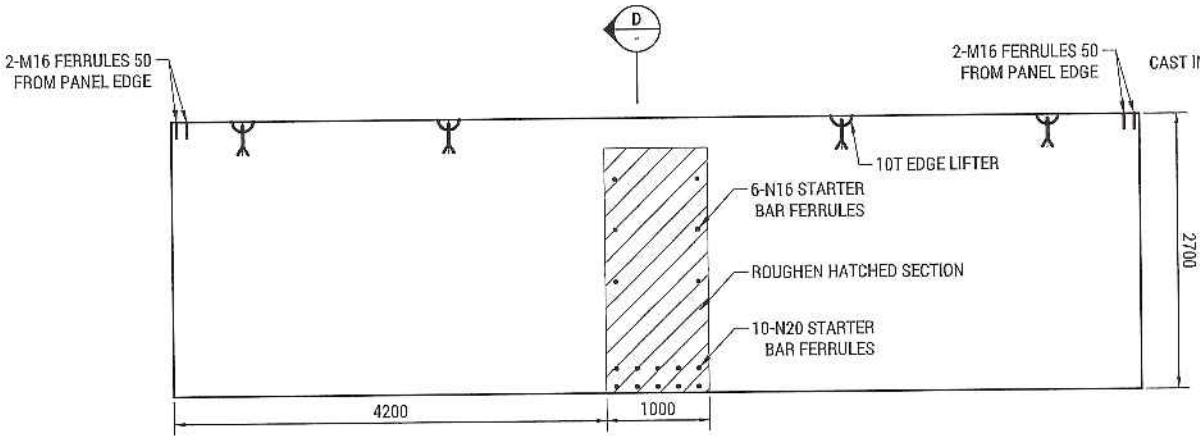
APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

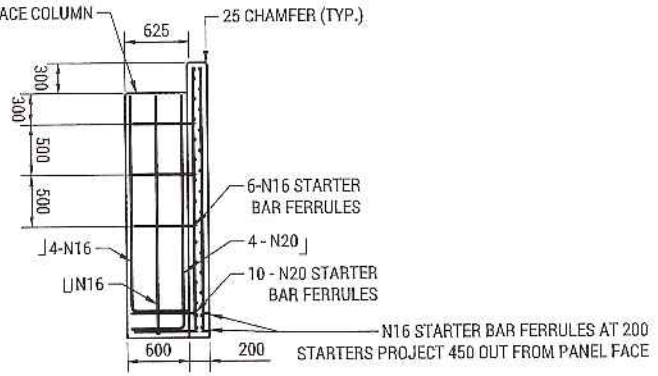
CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: STORAGE BINS PLAN
SCALE: 1:100 SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: A010 REV: A



WP1 - OUTER FACE ELEVATION

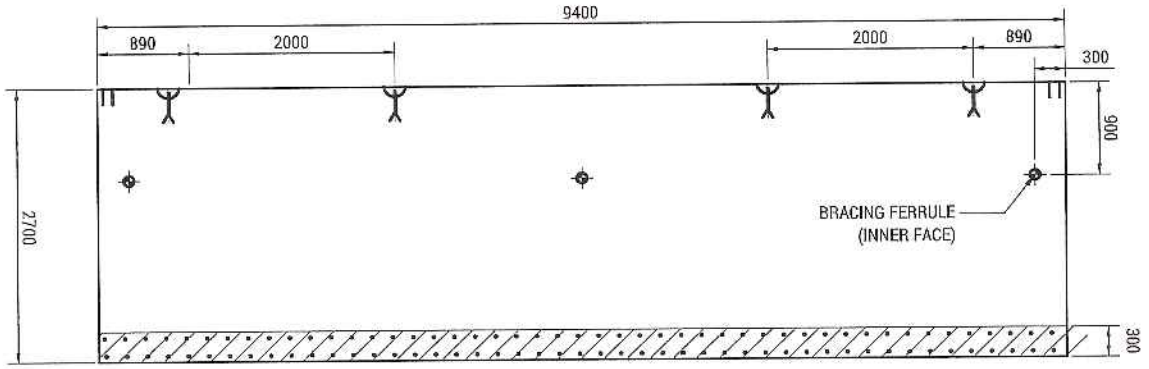
SCALE 1:50



D SECTION

SCALE 1:50

1-131



WP1 - INNER FACE ELEVATION

SCALE 1:50

THICKNESS	0.2m
AREA	25.38m²
VOLUME	5.08m³
MASS	12.7 TONNES
STRENGTH	N50

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK
THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS PREPARED. © RARE INNOVATION PTY LTD. ABN 51 619 598 257

APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: **CROSSROADS**

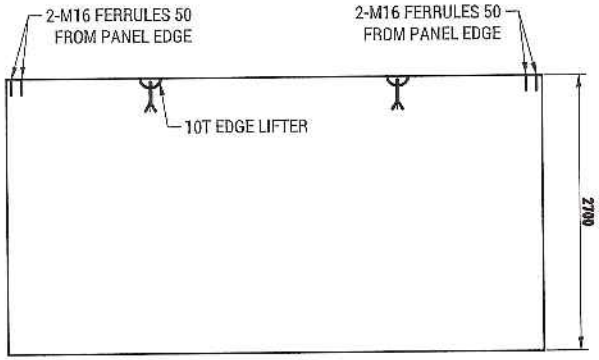
PROJECT: **CONCRETE BATCH PLANT**

ADDRESS: **835 HOBART ROAD, BREADALBANE**

TITLE: **PRECAST WALL - WP1**

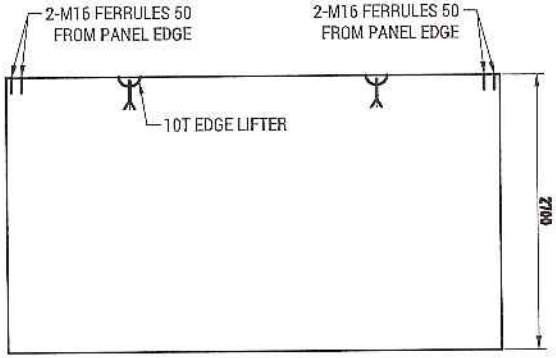
SCALE: 1:50 SHEET SIZE: A3 DWGs IN SET: -

PROJECT No: **19133** DWG No: **A011** REV: **A**



WP2 & WP3 - OUTER FACE ELEVATION

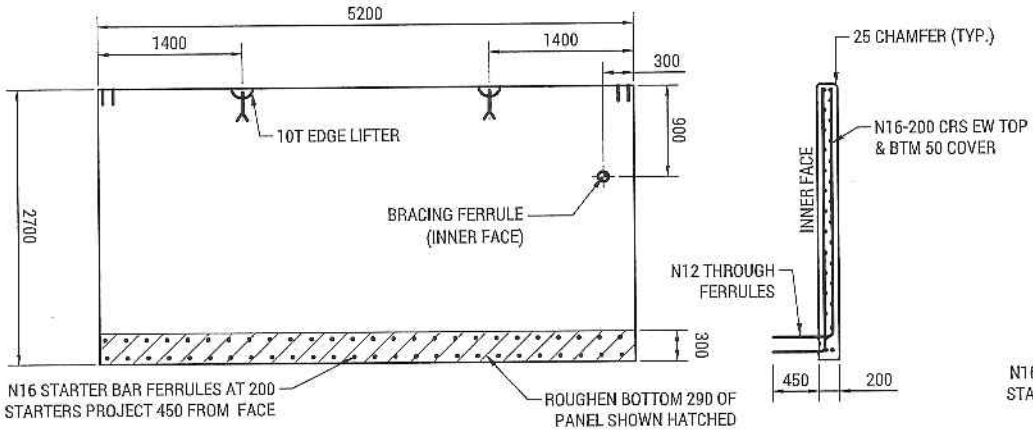
SCALE 1:50



WP5 & WP6 - OUTER FACE ELEVATION

SCALE 1:50

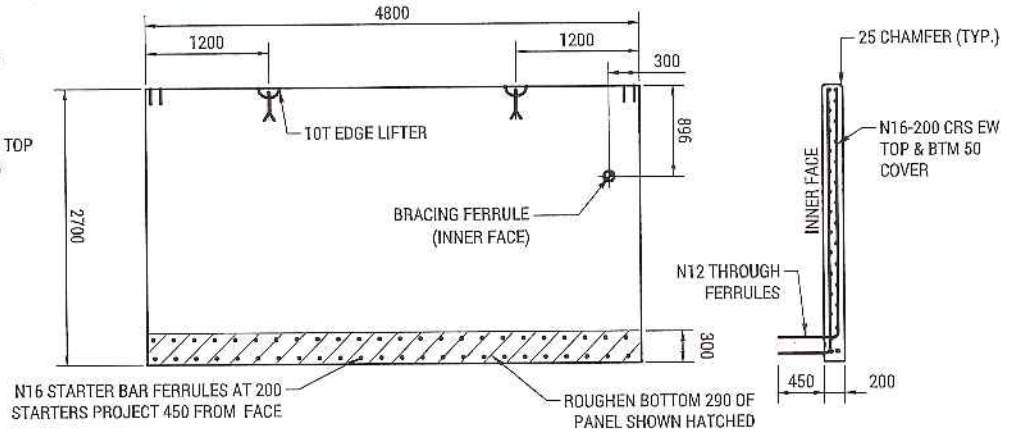
1-132



WP2 & WP3 - OUTER FACE ELEVATION

SCALE 1:50

THICKNESS	0.2m
AREA	14.04m²
VOLUME	2.81m³
MASS	7.02 TONNES
STRENGTH	N50



WP5 & WP6 - OUTER FACE ELEVATION

SCALE 1:50

THICKNESS	0.2m
AREA	12.96M²
VOLUME	2.59m³
MASS	6.48 TONNES
STRENGTH	N50

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK
THIS DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS PREPARED. © RARE INNOVATION PTY LTD. ABN 51 619 693 257

APPROVED: R. JESSON | ACRED. No: CC5848I

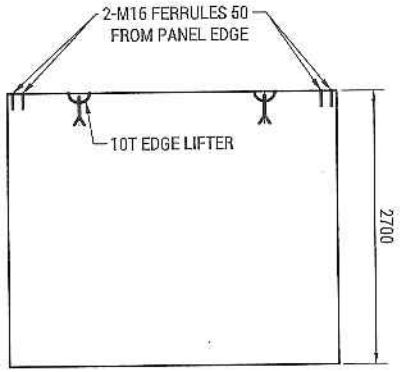
DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

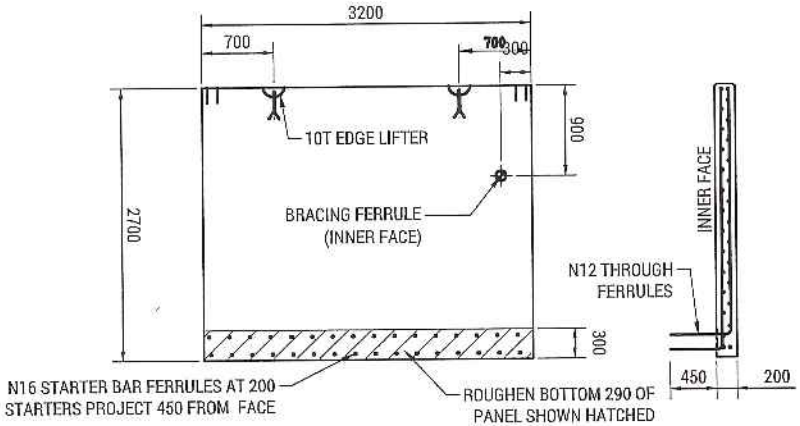
TITLE: PRECAST WALL - WP2, WP3, WP5 & WP6
SCALE: 1:100 SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: A012 REV: A

1-133



WP4 & WP7 - OUTER FACE ELEVATION

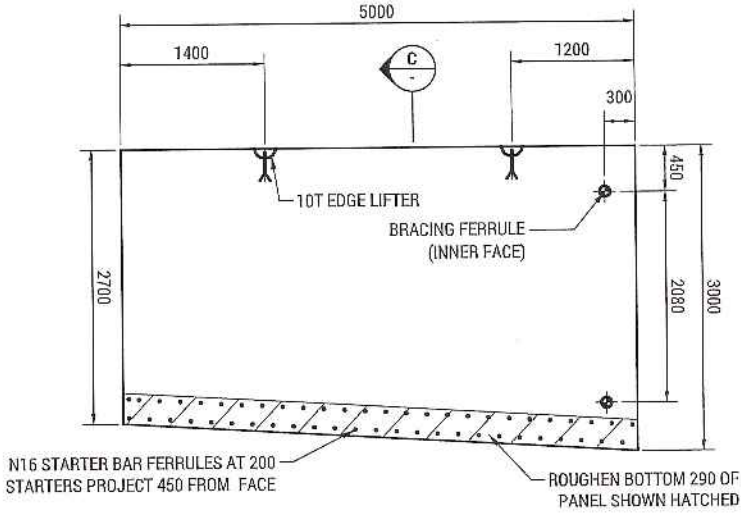
SCALE 1:50



WP4 & WP7 - OUTER FACE ELEVATION

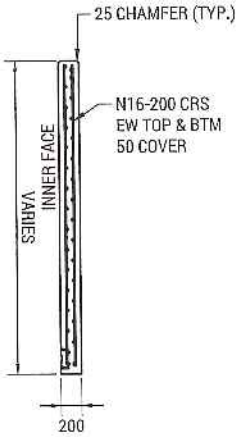
SCALE 1:50

THICKNESS	0.2m
AREA	8.64m²
VOLUME	1.73m³
MASS	4.32 TONNES
STRENGTH	N50



WP8, WP9, WP10. WP11, WP12 & WP13 INSIDE FACE ELEVATION

SCALE 1:50



C - SECTION

SCALE 1:50

THICKNESS	0.2m
AREA	14.25m²
VOLUME	2.85m³
MASS	7.13 TONNES
STRENGTH	N50

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

DO NOT SCALE - IF IN DOUBT, ASK

APPROVED: R. JESSON | ACRED. No: CC5848I

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-
DATE:	18-12-18

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: **CROSSROADS**

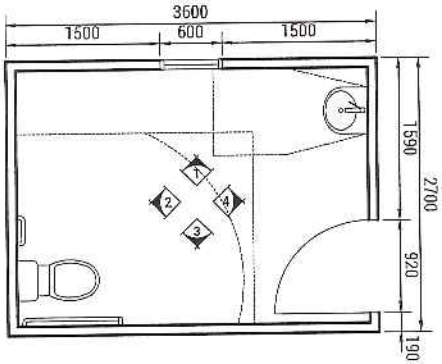
PROJECT: **CONCRETE BATCH PLANT**

ADDRESS: **835 HOBART ROAD, BREADALBANE**

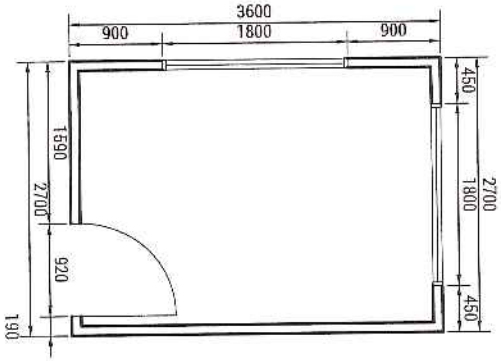
TITLE: **PRECAST WALL - WP4, WP7 - WP13**

SCALE: 1:100 SHEET SIZE: A3 DWGs IN SET: -

PROJECT No: **19133** DWG No: **A013** REV: **A**

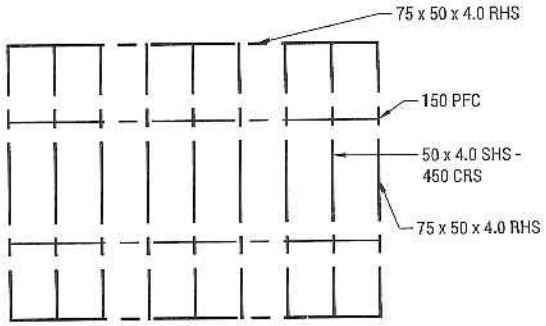


TOILET FLOOR PLAN
SCALE 1:50

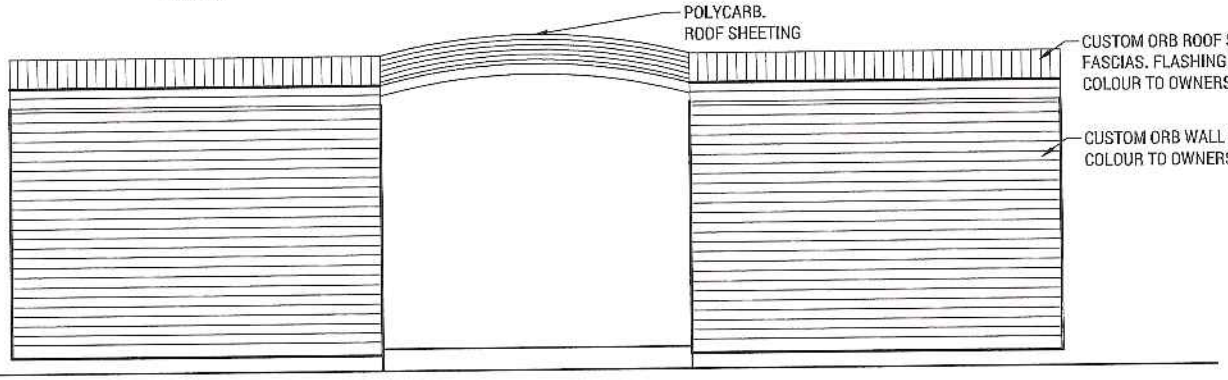


CONTROL ROOM FLOOR PLAN
SCALE 1:50

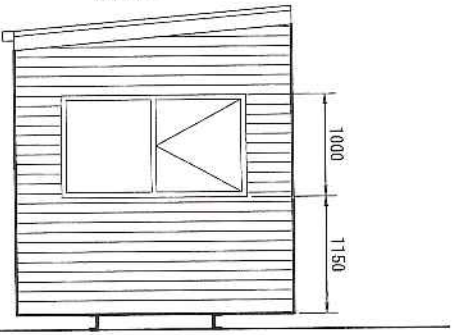
NOTE:
WALL BRACING TO AS1684
RESIDENTIAL TIMBER FRAMING



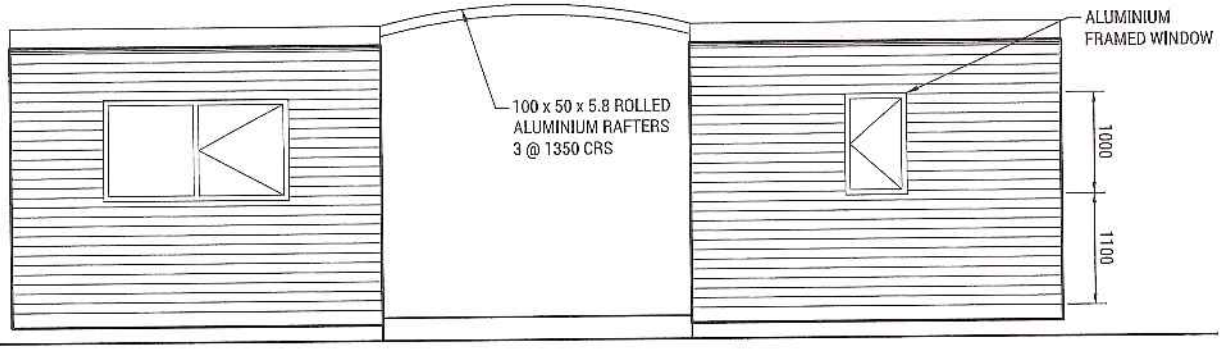
TOILET & CONTROL ROOM
FLOOR FRAMING PLAN
SCALE 1:50



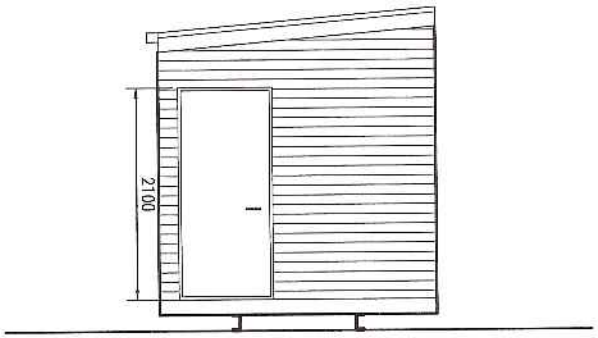
TOILET & CONTROL ROOM SW ELEVATION
SCALE 1:50



TOILET & CONTROL ROOM NW ELEVATION
SCALE 1:50



TOILET & CONTROL ROOM NE ELEVATION
SCALE 1:50



TOILET & CONTROL ROOM SE ELEVATION
SCALE 1:50

1-134

REV:	ISSUED FOR / DESCRIPTION:	BY:	DATE:
A	PLANNING APPROVAL	DRP	19-12-18

STATUS: **CONTROLLED DOCUMENT**

APPROVED: R. JESSON | ACRED. No: CC5848I | DATE: 18-12-18

DESIGN BY:	RJJ
DESIGN CHK:	RJJ
DRAWN BY:	DRP
DRAFT CHK:	-

rare.
Level 1a, 10-14 Paterson Street
Launceston TAS 7250
rarein.com.au
P. 03 6388 9200

CLIENT: CROSSROADS
PROJECT: CONCRETE BATCH PLANT
ADDRESS: 835 HOBART ROAD, BREADALBANE

TITLE: CONTROL ROOM & TOILET PLAN & ELEVATIONS
SCALE: 1:50 SHEET SIZE: A3 DWGs IN SET: -
PROJECT No: 19133 DWG No: A014 REV: A

Annexure 3 – EPA Correspondence

Hi James,

Helen has asked me to respond to your query. Section 25 (1A) of the EMPC Act provides a definition of 'not ancillary' for the purposes of determining whether or not Council referral is required. The wording is somewhat confusing but it is worth noting that in this context ancillary is not the same as not 'not ancillary'.

In applying Section 25 (1) and 25 (1A) to your query, assuming the concrete batching is not a level 2 activity in its own right, it would not meet the requirements of being 'not ancillary' and therefore would not require referral.

Happy to discuss further if needed.

Regards,

Annexure 4 – Land Owner Consent

EXHIBITE

1-138

3D MAPPING SOLUTIONS

WOOLCOTT SURVEYS

EAST COAST SURVEYING

Our Ref: L190116

Date 01/03/2019

Richard Charles Gardner
Emily Alison Gardner

Annandale 857 Tunbridge Tier Road
Interlaken TAS 7030

RE: NOTIFICATION OF PLANNING APPLICATOIN – 59 RAEBURN ROAD, BREADALBANE

Dear Sir/Madam,

I am writing on behalf of A & J Gardner, the land owner of the abovementioned site, and Crossroads Concrete Pty Ltd.

I hereby notify you that a Planning Application (Ref: PLN19-0034) has been lodged to the Northern Midland Council. This notification is made as you are the owner of 827 Hobart Road, Breadalbane TAS 7258, and access to this site is via a private road off Hobart Road which also accesses your land.

If you have any questions regarding this application, please do not hesitate to get in touch on the numbers or email address provided.

Kind Regards,
Woolcott Surveys

Yinghuan Liu
Town Planner

LAUNCESTON
10 Goodman Crt,
Invermay
PO Box 593, Mowbray

ST HELENS
48 Cecilia St, St Helens
PO Box 430, St Helens TAS 7216
P 03 6376 1972

HOBART
Rear Studio, 132 Davey St,
Hobart TAS 7000
P 03 6227 7968

DEVONPORT
2 Piping Lane,
East Devonport TAS 7310
P 0428 349 479

ABN 15 808 360 064

3D MAPPING SOLUTIONS

WOOLCOTT SURVEYS

EAST COAST SURVEYING

Our Ref: L190116

Date 01/03/2019

Mt. Oriel Breadalbane Pty Ltd
833 Hobart Road
Breadalbane TAS 7258

RE: NOTIFICATION OF PLANNING APPLICATOIN – 59 RAEBURN ROAD, BREADALBANE

Dear Sir/Madam,

I am writing on behalf of A & J Gardner, the land owner of the abovementioned site, and Crossroads Concrete Pty Ltd.

I hereby notify you that a Planning Application (Ref: PLN19-0034) has been lodged to the Northern Midland Council. This notification is made due to access to this site is via a private road off Hobart Road which also accesses your land.

If you have any questions regarding this application, please do not hesitate to get in touch on the numbers or email address provided.

Kind Regards,
Woolcott Surveys

Yinghuan Liu
Town Planner

1-140

Our Ref: L190116

Date 01/03/2019

Tara Property Investments Pty Ltd
Level 1 162 Macquarie Street
Hobart TAS 7000

RE: NOTIFICATION OF PLANNING APPLICATOIN – 59 RAEBURN ROAD, BREADALBANE

Dear Sir/Madam,

I am writing on behalf of A & J Gardner, the land owner of the abovementioned site, and Crossroads Concrete Pty Ltd.

I hereby notify you that a Planning Application (Ref: PLN19-0034) has been lodged to the Northern Midland Council. This notification is made as you are the owner of 831 Hobart Road, Breadalbane TAS 7258, and access to this site is via a private road off Hobart Road which also accesses your land.

If you have any questions regarding this application, please do not hesitate to get in touch on the numbers or email address provided.

Kind Regards,
Woolcott Surveys

Yinghuan Liu
Town Planner

LAUNCESTON
10 Goodman Crt,
Invermay
PO Box 593, Mowbray

ST HELENS
48 Cecilia St, St Helens
PO Box 430, St Helens TAS 7216
P 03 6376 1972

HOBART
Rear Studio, 132 Davey St,
Hobart TAS 7000
P 03 6227 7968

DEVONPORT
2 Piping Lane,
East Devonport TAS 7310
P 0428 349 479

ABN 15 808 360 064

1st February 2019

A & J Gardner Pty Ltd
162 Macquarie Street
Hobart TAS 7000

Northern Midlands Council
PO Box 156.
Longford Tas 7301.

Attn: Mr Paul Godier

Dear Sir/Madam

Re – **Development Application for Concrete Plant - Raeburn Quarry, Breadalbane**

The Proprietor of the Raeburn Property at Breadalbane is A&J Gardner P/L - ACN 092 171 045 as Trustee for the Stornoway Superannuation Fund. Within the Raeburn property there is the Raeburn Quarry. Hazell Bros Raeburn Quarry - ACN 630 027 075 is the mine operator of the Raeburn Quarry.

This quarry is covered by Mining Lease ML 1874P/M. and has planning approval from the Northern Midlands Council as per Planning Permit P10-147. The mine operations are covered by Environmental Permit No 8046.

There is an access agreement between the Proprietor and the Mine Operator that covers the working relationship between the two parties.

Hazell Bros (trading as Crossroads Concrete in Launceston) is in the process of submitting a Development Application to Northern Midlands Council to establish a concrete plant within the boundaries of the Mining Lease.

Hazell Bros have approval from the Proprietor to submit the Development Application for the Concrete Plant.

The purpose of this correspondence it to confirm that the Proprietor of the Raeburn property provides approval for Hazell Bros (trading as Crossroads) to proceed with the proposed concrete plant development on the property and within the boundaries of Mining Lease ML 1874P/M.

Yours truthfully

John N Williams
Signed for and on behalf of A&J Gardner Pty Ltd (as authorised)

Our ref: 201800.186;PLN-19-0034
Enquiries: Paul Godier

NORTHERN MIDLANDS COUNCIL

1/03/2019

Ying Huan
P.O. Box 593
MOWBRAY 7248
via email: yinghuan@woolcottsurveys.com.au

Dear Ying Huan

Additional Information Required for Planning Application PLN-19-0034- Concrete Batch Plant (Vary setbacks, Irrigation District, Car Parking & Sustainable Transport Code, Airport Impacts Management Code) at 59 Raeburn Road & access over 827,831 & 833 Hobart Road, Breadalbane

I refer to the abovementioned application. Prior to the application being reviewed by Council's Planners, the following information is required to compose a valid application under the *Northern Midlands Interim Planning Scheme 2013*:

- Revised application form to show access over 827, 831 & 833 Hobart Road – Sig required 05/3
- Certificates of title for additional access lots pf 1/3
- Confirmation that ALL owners have been notified as per the information above pf 1/3

This information is required under Section 51(1AC) of the *Land Use Planning and Approvals Act* 1993. If you have any queries, please contact Council's Planning Section on 6397 7301, or e-mail Planning@nmc.tas.gov.au

Yours sincerely

Rosemary Jones
Administration Officer

LAUNCESTON AIRPORT
In the heart of Tasmania

P.O. BOX 1220
LAUNCESTON, TASMANIA 7250
PHONE: (03) 6391 6222
FAX: (03) 6391 8580

18 Mar 2019

Erin Boer
Planning Officer
Northern Midlands Council
13 Smith Street
LONGFORD TAS 7301

Dear Erin

RE: Planning Application PLN-19-0034 - Concrete Batch Plant

I refer to the above development application and after review of the proposal and prescribed airspace regulations, provide the following comments:

- The site does lie within the ANEF contours mapped and laid out in the Launceston Airport Masterplan 2015, the development is not residential;
- The development does not infringe the Launceston Airport Obstacle Limitation Surfaces, and;
- It seems that the use of the proposal will not unduly attract wildlife that would have an effect on the safety of airport operations.

Therefore: Launceston Airport does not object to the development application at **59 Raeburn Road, Breadalbane TAS 7258.**

***N.B.** Due to the proximity to the prescribed airspace surfaces (OLS) for Launceston Airport, any plant or equipment that extends to a height greater than 10m from existing ground level including during construction may infringe the OLS and must be referred to Launceston Airport for written approval prior to use.*

If you or the applicant has any questions relating to the above comments, please don't hesitate in contacting me.

Yours sincerely,

Ilya Brucksch-Domanski
Manager Planning and Development
Australia Pacific Airports (Launceston) Pty. Ltd.

REFERRAL OF DEVELOPMENT APPLICATION PLN-19-0034 TO WORKS & INFRASTRUCTURE DEPARTMENT

Property/Subdivision No:
Date: 07.03.19
Applicant: Woolcotts
Proposal: 157107/1, 159125/2, 144549/1, 166270/1, 166271/1
Location: 59 Raeburn Road & access over 827,831 & 833 Hobart Road, Breadalbane

W&I referral PLN-19-0034, 59 Raeburn Road & access over 827,831 & 833 Hobart Road, Breadalbane

No W&I comment

Jonathan Galbraith (Engineering Officer)
Date: 26/3/18

Paul Godier

From: Chris Wicks
Sent: Monday, 8 April 2019 4:05 PM
To: Paul Godier
Subject: RE: Proposed concrete batch plant - 59 Raeburn Road

Hi Paul

Thank you for the request. I note that dust mitigation measures are detailed in the planning report drawings. This is welcome as it would be a standard condition that no nuisance be created off site.

Other than that, I have no other concerns.

Regards

Chris

Chris Wicks

NORTHERN MIDLANDS COUNCIL

Environmental Health Officer | Northern Midlands Council
Council Office, 13 Smith Street (PO Box 156), Longford Tasmania 7301
T: (03) 6397 7303 | F: (03) 6397 7331
E: chris.wicks@nmc.tas.gov.au | W: www.northernmidlands.tas.gov.au

Tasmania's Historic Heart

From: Paul Godier <paul.godier@nmc.tas.gov.au>
Sent: Thursday, 4 April 2019 10:41 AM
To: Chris Wicks <chris.wicks@nmc.tas.gov.au>
Subject: Proposed concrete batch plant - 59 Raeburn Road

Hello Chris, it has occurred to me it would be worthwhile getting your comments on this proposal from an EHO point of view.

Some of the representors are concerned with the health effects of cement dust.

Please let me know if you have any questions.

Regards,

Paul Godier

NORTHERN MIDLANDS COUNCIL

Senior Planner | Northern Midlands Council
Council Office, 13 Smith Street (PO Box 156), Longford Tasmania 7301
T: (03) 6397 7303 | F: (03) 6397 7331
E: paul.godier@nmc.tas.gov.au | W: www.northernmidlands.tas.gov.au

Tasmania's Historic Heart

COMMERCIAL PROJECT DELIVERY
Project + Development + Construction Management

PO Box 210
Newstead TAS 7250

March 24, 2019

Des Jennings
Northern Midlands Council
13 Smith Street
Longford, TAS, 7301

Dear Des

Representation – PLN-19-0034

I act on behalf of Anna Henry who owns the Pet Crematorium adjacent to the subject site at 805 Breadalbane Road and also a residential property at 803 Breadalbane Road in relation to this matter.

My client is not opposed to the proposed Concrete Batching Plant per se but would like to see some regulations put in place around operating hours and the sealing of the entrie length of the private road accessing the site from Hobart Road, both of which are reasonable requests in respect of how the DA should be considered under the relevant Planning Scheme standards as I will outline below.

Application Material

There are several deficiencies in the application material provided which do not allow adequate consideration of the proposal against relevant planning scheme standards. These are summarised below:

- **Definition and Classification of Batching Plant**
  The report accompanying the application has submitted that the proposal falls within the 'Extractive Industries' Use Class as in accordance with Clause 8.2.2 of the Planning Scheme it is ancillary to the quarry. It is noted that the definition of Extractive Industries in accordance with Table 8.2 is:

  > *'use of land for extracting or removing material from the ground, other than resource development, and includes the treatment or processing of those materials by crushing, grinding, milling or screening on, or adjoining the land from which it is extracted. Examples include mining, quarrying, and sand mining.'*

I submit that in the absence of meeting the qualification of being ancillary to Extractive Industry, the concrete batching plant in its own right would not fall under this use class.

The application goes on to state that the use is permitted as the use table at Clause 26.2 lists Extractive Industries as permitted if it is not for a Level 2 Activity. Extractive Industries is discretionary if it does not meet this qualification.

I submit that the application for a concrete batching plant cannot rely on being classified as Extractive Industries by virtue of being ancillary to a an existing Extractive Industry that is a Level 2 Activity ***but then also*** be considered as a permitted use by virtue of not being a Level 2 Activity. The Concrete Batching Plant itself may not constitute a Level 2 Activity but given it is ancillary to a Level 2 Activity, the cumulative impacts of both uses must be considered.

If the Concrete Batching Plant is not ancillary to the quarry, it would properly be classified under Table 8.2 as Manufacturing and Processing, which is defined as:

> *'Use or land for manufacturing, assembling, or processing products other than resource processing, Examples include boat building, brick making, cement works, furniture making, glass manufacturing, metal and wood fabrication, mineral processing and textile manufacturing.'*

Manufacturing and processing is a **prohibited** use within the Rural Resource Zone.

Thus, it follows that the only manner in which this application can be considered on this site is on the basis of being classified as ancillary to an Extractive Industry. Given that Extractive Industry is a Level 2 Activity, it is only reasonable that the use status afforded to the Extractive Industry is discretionary given the Quarry is a Level 2 Activity.

It is noted that Clause 25(1B) of EMPCA states:
If a planning authority determines that a use or development of land that is on the same land as an existing level 2 activity is ancillary to that activity, the planning authority must, if required by any person, give written reasons in support of its determination.

My client therefore requests that written reasons be provided as to why the concrete batching plant is ancillary to the extractive industry.

On the basis that the application should properly be assessed as a discretionary use, then it must be assessed against Clause 26.3.1 being the use standards for discretionary uses. The application material has not provided an assessment against these standards. Of particular interest is demonstration of compliance with P4 which requires:
'It must be demonstrated that:

a) *Emissions are not likely to cause an environmental nuisance; and*
b) *Primary industry uses will not be unreasonably confined or restrained from conducting normal operations; and*

c) *The capacity of the local road networks can accommodate the traffic generated by the use. '*

No detail has been provided around emissions and environmental nuisance nor the capacity of the local road network. Given dust emissions from the private road accessing the site are already an issue to neighbouring properties, the construction of the concrete batching plant is only going to exacerbate these issues. A condition requiring the sealing of the private access road would help to alleviate the problem.

Operation of the batching plant 24/7 will also likely cause environmental nuisance and in the absence of any material to demonstrate otherwise, it is submitted that the permit should be conditioned to limit the operating hours to be consistent with the quarry which the concrete batching plant is ancillary to (as per the application documentation). EPA permit No. 8046 issued on 3rd September 2010 limits the quarry operating hours under condition N2 as follows:

N2 Operating hours

1 Unless otherwise approved by the Director, activities associated with the extraction of rock, gravel, sand, clay or minerals, and loading of product, and screening/crushing must not be undertaken outside the hours of 0700 hours to 1900 hours on weekdays and 0800 hours to 1600 hours on Saturdays.

2 Notwithstanding the above paragraph, activities must not be carried out on Sundays and public holidays that are observed Statewide (Easter Tuesday excepted).

It is noted that earlier in 2010, the EPA issued a permit no. 7776 for expansion of the quarry on the site and construction of a concrete batching plant in the same location as the one proposed. Conditions on that permit required the operating hours of the concrete batching plant to be limited to the same as for the quarry. This was in part in response to concerns around environmental nuisance of the batching plant given the number of dwellings in the area. The application didn't ever proceed and a subsequent application was made for the quarry expansion only as noted above. It is submitted that if the EPA assessed as part of a Level 2 assessment with all the information around environmental impacts that are included in such an application, that the hours of operation of the concrete batching plant should be limited, then it follows that Council should also do the same.

Road and Rail Assets Code

- The application makes an assessment against the Road and Railway Code which states that it is expected that there will be no more than 30 vehicle movements per day and therefore complies with A2 of Clause E4.6.1 which requires the use not to generate more than a total of 40 entry and exit movements per day. The application material provided does not provide sufficient information to determine if this will actually be the case.

Section 1 of the application report states that the traffic will be much the same as currently occurs as trucks will leave the site with the processed material rather than taking rock to other batch plants in Launceston. It is submitted that a more detailed

breakdown of the current and proposed truck movements is required to make the assertion that there will be no new truck movements. It is understood that part of the process of concrete batching requires sand and cement powder to be mixed with the rock aggregate. What is unknown from the application material is whether these additional materials need to be brought into site and if so, surely that creates additional truck movements not accounted for in the assessment.

The application states in section 1 that there will not be more than an additional 20 traffic movements per day whilst in section 4.2 it states there will not be more than 30 movements per day. There is conflicting information contained within the application material.

The application states in section 1 that the batching plant will employ 18 people with half of these located on-site. It is unclear where the other half are located if employed by the batching plant and it is submitted that if there are 18 employees on site, that there is at a minimum 36 additional vehicle movements per day not accounting for additional truck movements which likely haven't been taken into consideration. On this basis, I query whether the application should have been assessed against P2 and accordingly a TIA provided to assist in that assessment.

Alternatively, I submit that the application should be assessed against A3 of Clause E4.6.1 as the access to the site is from Hobart Road which has a speed limit of more than 60km/hr. The access is from Hobart Road onto a private unsealed road. If it is accepted that E4.6.1 applies, then the number of movements at the junction must not increase by more than 10% per day. Given the lack of information provided in the DA about traffic movements at the junction, it is not possible to make a determination as to whether the movements will exceed this threshold or not. If they do, the application again must be considered against the performance criteria and a TIA prepared.

Car Parking and Sustainable Transport Code

- The assessment provided in the application material under the Car Parking and Sustainble Transport Code provides further confusion around employee numbers and therefore traffic movements on site. The report states that the car parking can cater for 24 employees and there will 'be 8 employees including 2 office staff, 2 lab staff and 6 truck drivers.' It is unclear whether there will be 24, 18, 8 or 10 employees on site as all these numbers have been mentioned throughout the application material.

From the material provided it is not possible to ascertain compliance with Clause E6.7.2 A2,1 as the dimensions of the car parking spaces are not annotated on the plans.

Conclusion

As stated, my client is not seeking for the batching plant to be refused, simply that some conditions be placed on the permit that ensure its operations does not impact any of the dwellings or businesses in the vicinity. The conditions are:

1. Require the private access road to be sealed to reduce dust emissions;
2. Limit the operating hours to be consistent with the quarry which the concrete batching plant is ancillary to (as per the application documentation). EPA permit No. 8046 issued on 3rd September 2010 limits the quarry operating hours under condition N2 as follows:

> **N2 Operating hours**
>
> 1 Unless otherwise approved by the Director, activities associated with the extraction of rock, gravel, sand, clay or minerals, and loading of product, and screening/crushing must not be undertaken outside the hours of 0700 hours to 1900 hours on weekdays and 0800 hours to 1600 hours on Saturdays.
>
> 2 Notwithstanding the above paragraph, activities must not be carried out on Sundays and public holidays that are observed Statewide (Easter Tuesday excepted).

It is noted that when the concrete batching plant was previously considered as part of a Level 2 Activity in conjunction with an expansion of the quarry approved by the EPA (Permit 7776) on January 13th 2010, that the same operating hours were proposed for the batching plant as the quarry and that these were reinforced by permit conditions N2 and N3 of that permit. It is understood that particular application was withdrawn from Council and a subsequent application made which did not include the concrete batching plant.

If these conditions are imposed on any permit issued, then my client's issues and concerns with the proposal would largely be alleviated. I request that given the concerns directly relate to provisions under the planning scheme that serious consideration be given by Council to applying these conditions.

Yours faithfully

Chloe Lyne
Planning and Development Consultant
Commercial Project Delivery
Mobile: [redacted]
www.cpdelivery.com.au

Rosemary Jones

From: Gillian Mau
Sent: Thursday, 21 March 2019 10:50 PM
To: NMC Planning
Subject: Concrete batch plant

Follow Up Flag: Follow up
Flag Status: Flagged

Dear General Manager ,

We are residents in Breadalbane and wish to object to the proposed location of the concrete batch plant. It will cause more trucks on Hobart Rd. We are upset about it as our five and seven year old will be catching the bus on Hobart Rd amongst all the unsafe extra trucks on the road . They catch it on the driveway of Marchinton west and her dropped off at the end of Marchington road on the edge of side of Hobart Road. Extra traffic caused by more trucks will delay our journeys to school and back . If a child happens to walk off the bus into the trucks on Hobart Rd it could be life threatening . A truck may hit our child while they are waiting for the bus . We live in Breadalbane and more trucks driving near our driveway from the concrete plant is not suitable for a quiet country residential area.
Thanks,
Gillian Mau

Rosemary Jones

From: Kaylene Challis <
Sent: Friday, 22 March 2019 7:05 PM
To: NMC Planning
Subject: PLN-19-0034 - 59 Raeburn Road & access over 827,831 & 833 Hobart Road, Breadalbane: (CT 157107/1, 159125/2, 144549/1, 166270/1, 166271/1) - Concrete Batch Plant (Vary setbacks, Irrigation District, Car Parking & Sustainable Transport Code, Airport Impacts

Follow Up Flag: Follow up
Flag Status: Flagged

To whom it may consern.

We would like to put forward our objections to the above planning submission.

This backs onto the back of our residence (via one paddock).

The zoning for this area is classes as Rural resource and not industrial as this business would be classed as.

We are also very concerned with the suggested movement of trucks in the area. We also have a quarry over the back (that do regular blastings), there are enough trucks going past on a very regular basis. We all have young children and no foot paths for them to catch the school buses.

We are also concerned about the amount of dust this will create in the area. With wind gusts the dust could end up any where. Given health issues this is going to make life somewhat harder. I don't believe the said sprinkler system will provide much relief.

Given that they are also applying for use of site to be used 24/7 this is just absolutely crazy.

We hopefully trust that you take into account our objections.

Kind regards
KAYLENE and Michael Challis
And family

20th March 2019. P. Clarke.

17153

To

The General Manager,

As a resident of Breadalbane for over 30 yrs. I have concerns with the construction of a concrete batch plant being proposed in our area. We live in a rural area, this concrete batch plant is not a rural operation. I objed to this operation, we already experience road noise from trucks as early as 5:30am to and from the Quarry, as well as road noise from the highway. It will be constructed practically at our back door, we dont know much dust and emissions will be created, dust from both Quarries is bad enough, when the wind blows in the wrong direction. So there for once again I objet to this desission to constuct this plant.

Yours Sincerely

P. Clarke
861 Hobart Rd.
Breadalbane
TAS 7258.

The General Manager
Northern Midlands Council
Reference Number PLN-19-0034

22 March 2019

Dear Sir / Madam

We live in the 21st century and I am all for progress, improvement, productivity, high employment and the benefiting of the economy.
So in the normal course of events I would not have a serious issue with this proposal.
BUT.
Having a concrete batch plant pollute the countryside is not a normal course of events.
Both I and my wife are not young anymore and currently suffer from various health issues.
For this reason we purchased in Hobart Road to live out of the city in the clean country air.
I regard the dust stirred up on the dust roads and the traffic and factory noise with annoyance, but not a high degree of animosity.
My more serious issue is that cement dust is impossible to control, and in our physical condition, it could be the straw that breaks the camel's back.
I am therefore dead against this proposed plant.
I further insist that if this project goes ahead irrespective of my concerns, I will hold Northern Midlands Council responsible for any out of pocket medical and health payments. You may in turn recoup these payments from the batch plant owners if you wish.
So although the noise, road dust, traffic, unsightliness, etc. are indeed an issue, my real concerns are health issues.

These are some further comments I wish to make;

1. The landscaped 5.0M bund will not be sufficient a barrier to prevent noise travelling greater distances in the cooler Tasmanian air, and is in itself an admission that noise is a relevant problem – especially seeing as this is a 24/7 operation. I was out in the cool air one still morning last week and a truck approached from the quarry. It had terrible squealing brakes that could be clearly heard as it negotiated the bend in the dust road, again as it approached Hobart Road, and again as it neared the Breadalbane roundabout. This is a one-off incident that this proposal does not address, but is an eye opener to the kinds of unforeseen issues that are likely to increase should this batch plant go ahead.
2. The bund MAY only just hide the admin buildings but will not definitely not hide the two 9.6M silos
3. Although the truck traffic is expected to be the same as currently, there is now a huge difference. The trucks and batch plant will stir up and spread fine cement powder over a huge area, exacerbated in windy conditions for persons living nearby who will breath in the dust. Although the staff traffic of 20 movements per day may not seem huge, those extra vehicle movements will only continually stir up cement dust that may have spilled or settled on the road previously
4. A friend in Hobart has an office near a batching plant. I asked him to comment and he said that he had endless troubles with printers, computers and machinery from the pervasive

cement dust which was only reduced when he had to buy an air conditioning system at his own expense so that he could keep his windows closed. Added to my health bills then, I insist that I will hold Northern Midlands Council responsible for repairs to fridges, freezers, lawnmowers, air-con units, etc that may succumb as a result of pervasive cement dust

5. No studies have been done on the health hazards of cement dust, but I believe the effect of toxic cement dust to be similar to that of asbestos. Let me make it very clear again; if you allow this proposal to proceed, I will hold you responsible for the payment of my health bills
6. If the proposal goes ahead despite my opposition to it, I may insist at a later date that only certain accesses such as the Raeburn Road access be used, but at this point in time I am not yet sure of all the possibilities
7. The actual proposed site of the plant is foolishly situated at the top of the hill / contour which will allow dust and noise to travel further distances. I might even have suggested siting the plant over the hill nearer the quarry or elsewhere on the site were I not so extremely concerned about the health hazard it poses to ourselves
8. From time to time we have heavy rainfall. Any concrete or cement spills will be washed downhill from the proposed high point of the site – towards the houses on Hobart Road? - or will the bund prevent this? - or will this toxic water leach through the bund and prevent vegetation from growing and so cause an unsightly scar on the landscape? – and will animals eating the vegetation ingest the chemical dust as well?
9. E12.6.1 A1 This statement is patently false. The proposed location is NOT at the low point of the land – see figure 7. Also, the reference to trees does NOT apply because there are NO tall trees that will hide the proposed silos. This is a seriously childish attempt to hide the fact that silos are not trees. Trees, however tall, are expected and natural to the environment – silos are not!
10. The trees shown in figure 6 are nowhere near the proposed silos and will not hide them in any way.
11. The SUMMARY (No.6, page 12). I do not agree with the sentiment expressed that the land use as a batch plant would be less impactful. This statement makes no allowance for the hazardous nature of cement dust. The quarry is situated very low on the terrain. Rock dust does not have the health hazards that fine toxic cement dust does, and the rock dust from the quarry is very unlikely to <u>ascend</u> into the air to be transported by winds
12. Exposure to cement dust can lead to a disabling and often fatal lung disease called silicosis. At best, it can make you asthmatic, cough, wheeze, and breath with difficulty. It can burn or cause irritation to skin and eyes. It clogs air conditioners filters, hastens the demise of machinery, motors and lawnmowers engines, dirties hanging washing, and dirties houses, windows and cars.
13. A study in Denmark found that people working in concrete and cement manufacturing had an increased risk of laryngeal cancer. A Finnish case study indicated that cancer of the urinary bladder was more common in subjects that had been exposed to concrete and cement. Another study showed that concrete workers had significantly increased risks for malignancies of the lip, stomach, lung and prostate
14. This is the 21st century and millions of people work daily in dusty environments. They are exposed to different types of health hazards such as fumes, gases and dust, which are risk

factors in developing occupational diseases. The cement industry is involved in the development and structure of this advanced and modern world we live in, but it generates dust during its production. Cement dust causes lung function impairment, chronic obstructive lung disease, restrictive lung disease, pneumoconiosis and carcinoma of the lungs, stomach and colon. Other studies have shown that cement dust may enter into the systemic circulation and thereby reach essentially all the organs of the body and affect different tissues including heart, liver, spleen, bone, muscles and hair, and ultimately affects their micro-structure and physiological performance. Most studies have previously attempted to evaluate the effects of cement dust exposure on the basis of spirometry or radiology, or both. However, collective effort describing the general effects of cement dust on different organ and systems in humans or animals, or both, have not been published.

15. The harmful effect of cement dust upon living organisms consists in irritating, sensitizing and pneumoconiotic properties of its components. In animal studies it has been observed that cement dust induces atrophic and hypertrophic changes in nasal and pharyngeal mucosa and chronic exfoliative bronchitis. In the lungs of experimental animals slight tissue fibrosis and some emphysema foci were found. As discussed in point 8 above, has sufficient thought been given to wallabies / possums etc who graze on the fields as to the effect of them ingesting cement dust with their meals?

I have no wish to be difficult, but I also have no wish to end my days in suffering with coughs or cancers.

Your signed receipt of this letter is an acknowledgment of your liability to me in regard of my previously stated health expenses, and equipment maintenance or replacement costs.

I am therefore dead against this proposed batch plant.

Regards

Ian Vos

gave us a copy & asked us to Stamp & Signas received only.

no mention of Acknowledgment of liability.

Received by Northern Midlands Council Representative

Name . . . . . .

Signature . . . . . .

Date . . . . . .

Van Diemen CONSULTING

Van Diemen Consulting
PO Box 1
New Town TAS 7008
Mob: 0
Email:

Sunday 24 March, 2019

Attention:
General Manager
PO Box 156
Longford 7301
Email - Planning@nmc.tas.gov.au

PLN-19-0034 CONCRETE BATCH PLANT –

REPRESENTATION OBO MT ORIEL BREADALBANE PTY LTD

Dear Sir/Madam

I write on behalf of Mt Oriel Breadalbane Pty Ltd to lodge a representation in relation to PLN-19-0034 (Concrete Batch Plant - 57 Raeburn Road and Access Over 827, 831 and 833 Hobart Road).

I note the access from the CBP is to use land owned by Mt Oriel Breadalbane Pty Ltd, which is part of a Right of Way, and the private road to Hobart Road. Given this, my client has concerns about the suitability of the road system to cater for the traffic to be generated by the CBP use. Council is aware of the existing traffic use of the access and road, and that which is approved to occur for the 3 existing quarries that utilise the road. I trust that Council will consider these matters when determining the permit application and the setting of conditions.

regards.

Yours sincerely

Dr Richard Barnes B.Sc.(Hons). Ph.D. GDURP MESA MPIA
Director, Principal Regional/Urban Planner, Environmental Scientist and Ecologist

cc. Mr Martin O'Byrne, Director, Mt Oriel Breadalbane Pty Ltd

THE General Manager
Northern Midlands Council
PO Box 156,
Longford, TAS 7301

planning@nmc.tas.gov.au

19 March 2019

Dear Sirs,

RE: PLN-19-0034 CONCRETE BATCH PLANT, 59 RAEBURN ROAD. BREADLABANE

We write in objection to the above application. The township of Breadalbane is a small residential settlement near the airport. Whilst it is in a rural resource planning zone and is surrounded with rural farming there is a small pocket of residential properties that will be severely affected if the above proposal. We object to the proposal on the following grounds:

1. **NON-CONFIRMING USE**

The planning application use class is indicated as Extractive Industries. Extractive Industries is classified as

> *use of land for extracting or removing material from the ground, other than resource development, and includes the treatment or processing of those materials by crushing, grinding, milling or screening on, or adjoining the land from which it is extracted. Examples include mining, quarrying, and sand mining.*

The application states that it is not a level 2 Activity and as such is not required to be refereed to EPA for assessment. A concrete batch plant as defined in the *Environmental Management and Pollution Control Act 1994 in this situation is*

> *Manufacturing and Mineral Processing*
>
> *(a) Cement Works: the conduct of works for the use of argillaceous and calcareous materials in the production of cement clinker or the grinding of cement clinker.*

Therefore, the application is not a permitted use as indicated in the applicant, but at best a discretionary application (or prohibited) and should also be referred to the EPA for assessment.

Furthermore, the application relies on the concrete batch plant being reliant on the existing site as directly associated with and subservient part of the existing use. The existing use is a quarry and grazing. The planning scheme allows for resource development and resource processing when it is associated with the produce from the site. The produce from the site is rock, gravel and the like.

Resource Development as defined by the scheme as:

> *use of land for propagating, cultivating or harvesting plants or for keeping and breeding of livestock or fish stock. If the land is so used, the use may include the*

handling, packing or storing of produce for dispatch to processors. Examples include agricultural use, aquaculture, bee keeping, controlled environment agriculture, crop production, horse stud, intensive animal husbandry, plantation forestry and turf growing.

Resource processing as defined by the scheme as:

use of land for treating, processing or packing plant or animal resources. Examples include an abattoir, animal saleyard, cheese factory, fish processing, milk processing, winery and sawmilling.

Neither of these uses cover the processing of the produce from a quarry or mine.

Furthermore, The *Environmental Management and Pollution Control Act 1994 defines a concrete batch plant as:*

Manufacturing and Mineral Processing

(a) Cement Works: the conduct of works for the use of argillaceous and calcareous materials in the production of cement clinker or the grinding of cement clinker.

Likewise, the NMC Planning scheme definition for a concrete batch plant is Manufacturing and processing, which is defined as:

use of land for manufacturing, assembling or processing products other than resource processing. Examples include boat building, brick making, cement works, furniture making, glass manufacturing, metal and wood fabrication, mineral processing and textile manufacturing.

A cement mineral process or concrete batch plant is clearly a Manufacturing and Processing use as defined by both the Northern Midlands Council and the and *Environmental Management and Pollution Control Act 1994. Manufacturing and Processing is* not listed in the Rural Resource zone as a permitted use or discretionary use, therefore by its silence is a prohibited use. On this ground alone the application should not be considered further.

Further consideration should be given to the validity of the use as an extension to current operation. The application states it proposes to use the processed the rock, for the concrete batch plant. However the rock from the existing site is only a small component in the manufacturing and processing of concrete. The other components of the plant required, is sand and cement, both elements are required to be transported to site from other areas of Tasmania. One third of raw product required doesn't make the site directly associated or subservient, it is only convenient.

We therefore suggest the use of a concrete batch plant is prohibited.

2. TRUCK MOVEMENTS

The application is completely silent on traffic and truck movements. The applicant states *"traffic generated will be much the same".* This statement at best is lacking detail and at worst deliberately misleading.

The planning scheme requires

> *a Traffic Impact Assessment from a suitably qualified person to accompany a development application where it is assessed as having the potential to adversely impact on the traffic circulation, safety or network efficiency in the surrounding area.*

The application is for a concrete batch plant, currently no cement trucks enter or exit the site and as such there must be an increase in these movements. This alone should have justified the request for a Traffic Impact Assessment. Furthermore, as described above whilst some (less than 1/3rd) of the raw material is produced on site, namely the aggregate (rock). The other raw material namely, sand and cement will be required to be bought to site, again creating more truck movements. There is a considerable lack of detail on how much sand and cement will be required to service this proposal and as such no way to calculate the additional truck movements to and from the site. We suggest this is critical component of the proposal and further justification and rationalisation should be required to be provided by the applicant. Whilst the application states the proposal will allow trucks to collect the finish product on site to the use in new plant, it is only one third of the product. The application also does nothing to clarify what will occur with the existing truck movements, for example will the existing mining operation cease to transport material off site and all material be processed on site. It is fair to assume that only a portion of the operation will be carried out internally, the external operation will continue and as such there will be a considerable increase in truck traffic on Hobart Road. It is highly likely and an almost a certainty that there will be a significant increase in truck movements to and from the site which should be justified and explained by the applicant.

Hobart Road is already serviced by a large number of trucks, the small residential community of Breadalbane is subjected to truck braking and truck noise from approx. 5.30am to 5.30pm 5 days a week and occasionally on weekends. However, the proposal is for these large truck movements to be able to operate 24/7. This is not acceptable and is unreasonable as it severely effects the amenity of the local residents.

Given the ambiguity of the proposal on truck movements and the apparent misinformation or lack of information submitted. We would suggest that there will be a considerable and unreasonable increase in truck movements, that will be further exuberated by 24 hours a day, 7 days a week operation and believe the application should be rejected until evidence or justification is provided that clearly shows there is no increase in truck movements too and from the site

As residents of Breadalbane we believe there is already large amount of truck movements and would oppose any increase in the increase in truck movements to the site.

3. HOURS OF OPERATION

The current operation has an approx. hour of operations of 5.30am to 5.30pm Monday to Friday. There is already a large number of trucks and other vehicles that access this site via Raeburn Road from Hobart Road. Whilst the operation of a concrete batch plant is proposed to have visual screening and acoustic buffers. There has been no explanation or justification to the increased traffic movements of trucks and vehicles not only during the current operating hours but under the proposed changes to the hours of operations.

Residents to the area are already exposed to noisy trucks very early in the morning and under this proposal, will be subjected to trucks entering and exiting the site at anytime of the day or night. Whilst the area of Breadalbane is a rural resource zone, the residential homes on Hobart Road still rely on a basic residential amenity and if this operation were to occur or at worse become a 24 / 7 operation the residential amenity of the area would be destroyed.

4. WATER USE

The application does nothing to describe how water will be used on the site, whilst potable water and recycled water tanks are shown, the batch plant will use large amount of water for the processing and manufacture of the concrete but also for dust suppression, and there is no mention of fire fighting. Whilst not strictly a planning issue, TasWater are aware of the water flow / pressure issues at Breadalbane and any increase on the demand especial with a 24/7 operation will severely affect all neighbouring properties.

5. CONCLUSION

The small residential community of Breadalbane is in the rural resource zone. The location as such is one of rural living which we appreciate and acknowledge the rural industry and embrace this rural life style. We strongly oppose any industrial manufacturing and processing development in this area. This proposal is for a concrete batch plant, this is light industrial or a general industrial use. It is not a suitable or compatible development in this area and strongly oppose this on the grounds above. There are many more suitable locations in light industrial or general industrial zones nearby that this proposed development could happily collocate with.

We believe the above information justifies our position and trust that you will act in the best interest of your residents in refusing this application

Yours Sincerely

T Clayton. T J Clayton

Heath and Trish Clayton
832 Hobart Road
Breadalbane. TAS. 7258

From: Paul Westgarth <np[illegible]m>
Sent: Wednesday, 20 March 2019 9:13 PM
To: NMC Planning
Subject: RE PLN-19-0034 concrete batch plant 59 Raeburn Rd Breadalbane

Follow Up Flag: Follow up
Flag Status: Flagged

Dear Sir
We wish to lodge an objection to the above application as we believe it will unfairly impact on our lives due to the extra vehicular traffic - heavy transport past our home on Hobart Rd Breadalbane we believe that the application to construct a concrete batch plant is of a poor standard as this application has little or no information that relates to any vehicle assessment report or local community impact information . We request that a suitably qualified company complete a traffic assessment report & that this assessment/ report be made available to the public in the form of a upgraded application prior to any consideration made by Council on this manufacturing and processing plant that is to be considered in this rural resource zone, I question if this manufacturing and processing plant is an industrial plant if so is this planning application correctly zoned ?
thank you for your consideration
yours sincerely
P & L Westgarth
852 Hobart Rd Breadalbane

Name: Mary-Jane Wright
Address: 851 Hobart Road, Breadalbane, TAS., 7258

RE: REPRESENTATION AGAINST PLANNING APPLICATION PLN-19-0034 – CONCRETE BATCH PLANT AND LANDSCAPED BUNDING

My objections to and requests for further information in relation to the proposed development are tabled below.
I do not consider the said application has provided enough information for Council to validate consent being granted. Council also owes a duty of care to the residents of Breadalbane to not endorse the application until all relevant environmental, health, eco-systems, potential damage to eco-systems, visual amenity, compliances with legislation, confirmation of toxic material use and management and disclosure of same. That duty of care also applies to unnecessary burden on rate payers to provide funds for the monitoring and fixing the damage after the fact. There is also no way to calculate the potential damage to our health and the environment.

My personal drawcard to choose to live in Breadalbane is my premier view, night star filled sky, no light to the East of my property, mountain landscape and unobstructed view. Can the applicant please provide lighting plan, security lighting plan and explanation on how their extraneous light will not affect birdlife of a night flying above the lights in the flight path and light spill out of the site.

1-163

Please provide engineering report on slab design to withstand vibration from blasting at the Stornoway Quarry as the proposed buildings and structures are within the blasting attenuation zone and raises Work, Health and Safety risks.

I make particular representation to the potential truck traffic volumes increasing to 24/7 as the restrictions on the Quarry significantly reduce the noise in the weekday evenings and weekends (with measurements of "normal" truck acceleration ranging from 69dBA to 85dBA) ceasing. Tasmanian EPP (Noise) indicator level of 30dBA for avoidance of sleep disturbances. Residents look forward to evenings and weekends and wish to continue doing so.

Can the applicant also provide a full list of admixtures used and safety containment during processing and storing of highly toxic chemicals including Formaldehyde used in admixers and referred to in Schedule 1 of the National Environment Protection (Air Toxics) Measure. A full list of admixers used in concrete processing can be viewed by accessing The Environment Protection Policy (Air Quality) 2004 Information Bulletin – Community.

APPLICATION REFERENCE #	REPRESENTATION / REQUEST FOR FURTHER INFORMATION
1.	The development is NOT directly associated with the extractive use class and the Concrete Batch Plant should not be assessed in the same class as it is an Industrial Production Processing Plant. It is not a rural operation and should be located in an industrial area.
1. 8.2.2.	A component in the production of cement is the aggregate being sourced from the Quarry. There are many components needing to be outsourced and delivered to site for the production. Major construction of 4m administration office buildings, 9.6m silos and laboratory is in stark contrast to developments currently on the leased Rural Resource land. The Quarry has a small site office.
1.	Southern and Eastern bund visual barrier and noise buffer. Needs correction as the Hobart Road residential properties requiring the visual barriers are to the West of the site, the mountains are to the East.
1.	Soften visual elements which "MAYBE" visible from outside the site. This statement is too open and as no quarry operations are visible on the landscape I request there are no visible signs of the major development if it were to inappropriately be approved by Council.
1.	Not expected to be more than 20 movements per day. This is a false statement. 18 employees entering and leaving the site is 36. Outsourced materials delivered and leaving the site is not mentioned. Trucks entering and leaving to supply cement offsite then returning to refill is not mentioned.
1.	**ABILITY TO OPERATE 24/7**
2.3	Serviced by reticulated water.
2.4	Multiple access including Raeburn Road to South of Site. Are trucks and vehicles to be seen travelling across the landscape? Ref 1. States access is from Hobart Road. Please clarify.
2.6	Class 4 Capability. Land is suited to grazing but limited to occasional cropping or a very restricted range of crops. Environmental concerns are raised below for future sustainability of the land.
26.1.1.1.	To provide for the sustainable use or development of resources for agriculture, aquaculture, forestry, mining and other primary industries, including opportunities for resource processing. Processing the resource from the quarry may include crushing or separating the rock i.e. the raw material. I question the validity of this point being present in the application. The concrete batch plant is a manufacturing plant belonging to the goods-producing industries group. It is not a rural resource processing plant.
26.1.1.1.	To provide for economic development that is compatible with primary industry, environmental and landscape values.
26.3.3. P1.	The site falls within the North Esk irrigation district. Can information please be provided showing the environmental impacts of

	highly alkaline water produced from the plant please?
26.3.3. P1 a)	The majority of the site can still be used for grazing purposes, which will mpt redice the current and future irrigation potential of the land. Please explain how this statement is relevant when considering the attached environmental impact statements.
E4.6.1. A2	Acceptable solution achieved as the expected number to be no more than 30 movements per day. Please confirm total number of movements per day. Ref #1 stated 20 movements per day. No reference has been made to include outsourcing, and other concerns noted in my representation to same in Ref #1 and under the same reference is the 24/7 operation capability statement meaning more movements.
E4.7.2. A1	Acceptable solution achieved. Only one access has been proposed?
E6.6.1. A1a)	6 truck drivers. How many movements do these drivers add to the total movements?
E12.6.1	Obstacles to aircraft (refer to Figure 4 of the application looking East) The figure does not allow for 24/7 operation lighting impacts attracting birds and lights potentially causing a hazard to landing approach and take-off of aircraft.
5.1	The proposed development is not known to conflict with or contravene any of the above state policies. This insubstantial statement is concerning, as it does not provide any reference to how the applicant complies with State or National legislation. Therefore, can the applicant please provide the necessary authorised documentation substantiating their compliance. Please note the attached *EPA Environmental Guidelines for the Concrete Batching Industry* (ATTACHEMENT A) which includes key criteria relevant to best practice environmental management. I would have expected this detail to have been submitted with this application and contained within.

1-165

HOME PAGE

CHAPTER 6

Admixtures for Concrete

Admixtures are those ingredients in concrete other than portland cement, water, and aggregates that are added to the mixture immediately before or during mixing (Fig. 6-1). Admixtures can be classified by function as follows:

1. Air-entraining admixtures
2. Water-reducing admixtures
3. Plasticizers
4. Accelerating admixtures
5. Retarding admixtures
6. Hydration-control admixtures
7. Corrosion inhibitors
8. Shrinkage reducers
9. Alkali-silica reactivity inhibitors
10. Coloring admixtures
11. Miscellaneous admixtures such as workability, bonding, dampproofing, permeability reducing, grouting, gas-forming, antiwashout, foaming, and pumping admixtures

Fig. 6-1. Liquid admixtures, from left to right: antiwashout admixture, shrinkage reducer, water reducer, foaming agent, corrosion inhibitor, and air-entraining admixture. (69795)

Table 6-1 provides a much more extensive classification of admixtures.

Concrete should be workable, finishable, strong, durable, watertight, and wear resistant. These qualities can often be obtained easily and economically by the selection of suitable materials rather than by resorting to admixtures (except air-entraining admixtures when needed).

The major reasons for using admixtures are:

1. To reduce the cost of concrete construction
2. To achieve certain properties in concrete more effectively than by other means
3. To maintain the quality of concrete during the stages of mixing, transporting, placing, and curing in adverse weather conditions
4. To overcome certain emergencies during concreting operations

Despite these considerations, it should be borne in mind that no admixture of any type or amount can be considered a substitute for good concreting practice.

The effectiveness of an admixture depends upon factors such as type, brand, and amount of cementing materials; water content; aggregate shape, gradation, and proportions; mixing time; slump; and temperature of the concrete.

Admixtures being considered for use in concrete should meet applicable specifications as presented in Table 6-1. Trial mixtures should be made with the admixture and the job materials at temperatures and humidities anticipated on the job. In this way the compatibility of the admixture with other admixtures and job materials, as well as the effects of the admixture on the properties of the fresh and hardened concrete, can be observed. The amount of admixture recommended by the manufacturer or the optimum amount determined by laboratory tests should be used.

Table 6-1. Concrete Admixtures by Classification

Type of admixture	Desired effect	Material
Accelerators (ASTM C 494 and AASHTO M 194, Type C)	Accelerate setting and early-strength development	Calcium chloride (ASTM D 98 and AASHTO M 144) Triethanolamine, sodium thiocyanate, calcium formate, calcium nitrite, calcium nitrate
Air detrainers	Decrease air content	Tributyl phosphate, dibutyl phthalate, octyl alcohol, water-insoluble esters of carbonic and boric acid, silicones
Air-entraining admixtures (ASTM C 260 and AASHTO M 154)	Improve durability in freeze-thaw, deicer, sulfate, and alkali-reactive environments Improve workability	Salts of wood resins (Vinsol resin), some synthetic detergents, salts of sulfonated lignin, salts of petroleum acids, salts of proteinaceous material, fatty and resinous acids and their salts, alkylbenzene sulfonates, salts of sulfonated hydrocarbons
Alkali-aggregate reactivity inhibitors	Reduce alkali-aggregate reactivity expansion	Barium salts, lithium nitrate, lithium carbonate, lithium hydroxide
Antiwashout admixtures	Cohesive concrete for underwater placements	Cellulose, acrylic polymer
Bonding admixtures	Increase bond strength	Polyvinyl chloride, polyvinyl acetate, acrylics, butadiene-styrene copolymers
Coloring admixtures (ASTM C 979)	Colored concrete	Modified carbon black, iron oxide, phthalocyanine, umber, chromium oxide, titanium oxide, cobalt blue
Corrosion inhibitors	Reduce steel corrosion activity in a chloride-laden environment	Calcium nitrite, sodium nitrite, sodium benzoate, certain phosphates or fluosilicates, fluoaluminates, ester amines
Dampproofing admixtures	Retard moisture penetration into dry concrete	Soaps of calcium or ammonium stearate or oleate Butyl stearate Petroleum products
Foaming agents	Produce lightweight, foamed concrete with low density	Cationic and anionic surfactants Hydrolized protein
Fungicides, germicides, and insecticides	Inhibit or control bacterial and fungal growth	Polyhalogenated phenols Dieldrin emulsions Copper compounds
Gas formers	Cause expansion before setting	Aluminum powder
Grouting admixtures	Adjust grout properties for specific applications	See Air-entraining admixtures, Accelerators, Retarders, and Water reducers
Hydration control admixtures	Suspend and reactivate cement hydration with stabilizer and activator	Carboxylic acids Phosphorus-containing organic acid salts
Permeability reducers	Decrease permeability	Latex Calcium stearate
Pumping aids	Improve pumpability	Organic and synthetic polymers Organic flocculents Organic emulsions of paraffin, coal tar, asphalt, acrylics Bentonite and pyrogenic silicas Hydrated lime (ASTM C 141)
Retarders (ASTM C 494 and AASHTO M 194, Type B)	Retard setting time	Lignin Borax Sugars Tartaric acid and salts
Shrinkage reducers	Reduce drying shrinkage	Polyoxyalkylene alkyl ether Propylene glycol
Superplasticizers* (ASTM C 1017, Type 1)	Increase flowability of concrete Reduce water-cement ratio	Sulfonated melamine formaldehyde condensates Sulfonated naphthalene formaldehyde condensates Lignosulfonates Polycarboxylates

Table 6-1. Concrete Admixtures by Classification (Continued)

Type of admixture	Desired effect	Material
Superplasticizer* and retarder (ASTM C 1017, Type 2)	Increase flowability with retarded set Reduce water–cement ratio	See superplasticizers and also water reducers
Water reducer (ASTM C 494 and AASHTO M 194, Type A)	Reduce water content at least 5%	Lignosulfonates Hydroxylated carboxylic acids Carbohydrates (Also tend to retard set so accelerator is often added)
Water reducer and accelerator (ASTM C 494 and AASHTO M 194, Type E)	Reduce water content (minimum 5%) and accelerate set	See water reducer, Type A (accelerator is added)
Water reducer and retarder (ASTM C 494 and AASHTO M 194, Type D)	Reduce water content (minimum 5%) and retard set	See water reducer, Type A (retarder is added)
Water reducer—high range (ASTM C 494 and AASHTO M 194, Type F)	Reduce water content (minimum 12%)	See superplasticizers
Water reducer—high range—and retarder (ASTM C 494 and AASHTO M 194, Type G)	Reduce water content (minimum 12%) and retard set	See superplasticizers and also water reducers
Water reducer—mid range	Reduce water content (between 6 and 12%) without retarding	Lignosulfonates Polycarboxylates

* Superplasticizers are also referred to as high-range water reducers or plasticizers. These admixtures often meet both ASTM C 494 (AASHTO M 194) and ASTM C 1017 specifications.

AIR-ENTRAINING ADMIXTURES

Air-entraining admixtures are used to purposely introduce and stabilize microscopic air bubbles in concrete. Air-entrainment will dramatically improve the durability of concrete exposed to cycles of freezing and thawing (Fig. 6-2). Entrained air greatly improves concrete's resistance to surface scaling caused by chemical deicers (Fig. 6-3). Furthermore, the workability of fresh concrete is improved significantly, and segregation and bleeding are reduced or eliminated.

Air-entrained concrete contains minute air bubbles that are distributed uniformly throughout the cement paste. Entrained air can be produced in concrete by use of an air-entraining cement, by introduction of an air-entraining admixture, or by a combination of both methods. An air-entraining cement is a portland cement with an air-entraining addition interground with the clinker during manufacture. An air-entraining admixture, on the other hand, is added directly to the concrete materials either before or during mixing.

The primary ingredients used in air-entraining admixtures are listed in Table 6-1. Specifications and methods of testing air-entraining admixtures are given in ASTM C 260 and C 233 (AASHTO M 154 and T 157). Air-entraining additions for use in the manufacture of air-entraining cements must meet requirements of ASTM C 226. Applicable requirements for air-entraining cements are given in ASTM C 150 and AASHTO M 85. See Chapter 8, Air-Entrained Concrete, Klieger (1966), and Whiting and Nagi (1998) for more information.

WATER-REDUCING ADMIXTURES

Water-reducing admixtures are used to reduce the quantity of mixing water required to produce concrete of a certain slump, reduce water-cement ratio, reduce cement content, or increase slump. Typical water reducers reduce the water content by approximately 5% to 10%. Adding a water-reducing admixture to concrete without reducing the water content can produce a mixture with a higher slump. The rate of slump loss, however, is not reduced and in most cases is increased (Fig. 6-4). Rapid slump loss results in reduced workability and less time to place concrete.

An increase in strength is generally obtained with water-reducing admixtures as the water-cement ratio is

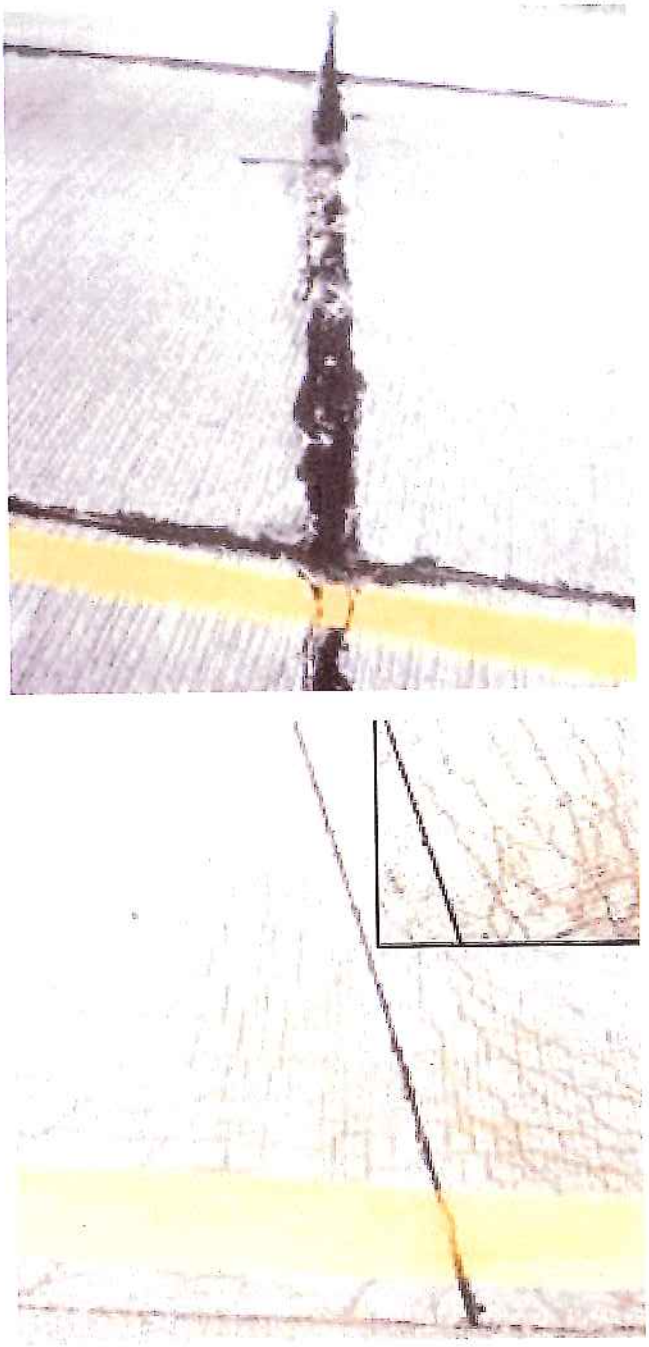


Fig. 6-2. Frost damage (crumbling) at joints of a pavement (top), frost induced cracking near joints (bottom), and enlarged view of cracks (inset). (61621, 67834, 67835)

Fig. 6-3. Scaled concrete surface resulting from lack of air entrainment, use of deicers, and poor finishing and curing practices. (52742)

reduced. For concretes of equal cement content, air content, and slump, the 28-day strength of a water-reduced concrete containing a water reducer can be 10% to 25% greater than concrete without the admixture. Despite reduction in water content, water-reducing admixtures may cause increases in drying shrinkage. Usually the effect of the water reducer on drying shrinkage is small compared to other more significant factors that cause shrinkage cracks in concrete. Using a water reducer to reduce the cement and water content of a concrete mixture—while maintaining a constant water-cement ratio—can result in equal or reduced compressive strength, and can increase slump loss by a factor of two or more (Whiting and Dziedzic 1992).

Water reducers decrease, increase, or have no effect on bleeding, depending on the chemical composition of the admixture. A reduction of bleeding can result in finishing difficulties on flat surfaces when rapid drying conditions are present. Water reducers can be modified to give varying degrees of retardation while others do not signifi-

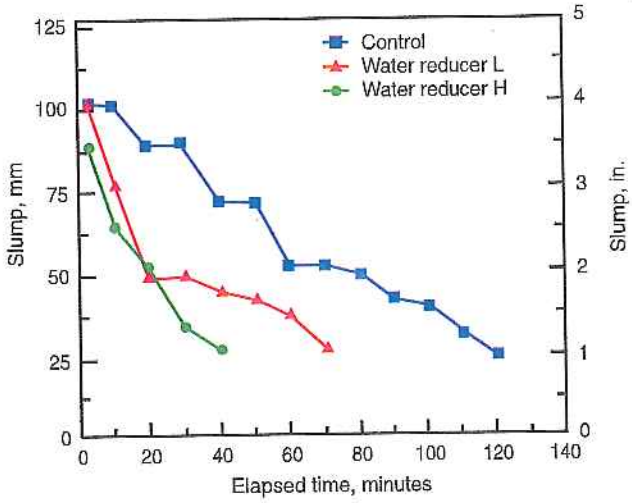


Fig. 6-4. Slump loss at 23°C (73°F) in concretes containing conventional water reducers (ASTM C 494 and AASHTO M 194 Type D) compared with a control mixture (Whiting and Dziedzic 1992).

cantly affect the setting time. ASTM C 494 (AASHTO M 194) Type A water reducers can have little effect on setting, while Type D admixtures provide water reduction with retardation, and Type E admixtures provide water reduction with accelerated setting. Type D water-reducing admixtures usually retard the setting time of concrete by one to three hours (Fig. 6-5). Some water-reducing admixtures may also entrain some air in concrete. Lignin-based admixtures can increase air contents by 1 to 2 percentage points. Concretes with water reducers generally have good air retention (Table 6-2).

The effectiveness of water reducers on concrete is a function of their chemical composition, concrete temperature, cement composition and fineness, cement content, and the presence of other admixtures. The classifications and components of water reducers are listed in Table 6-1. See Whiting and Dziedzic (1992) for more information on the effects of water reducers on concrete properties.

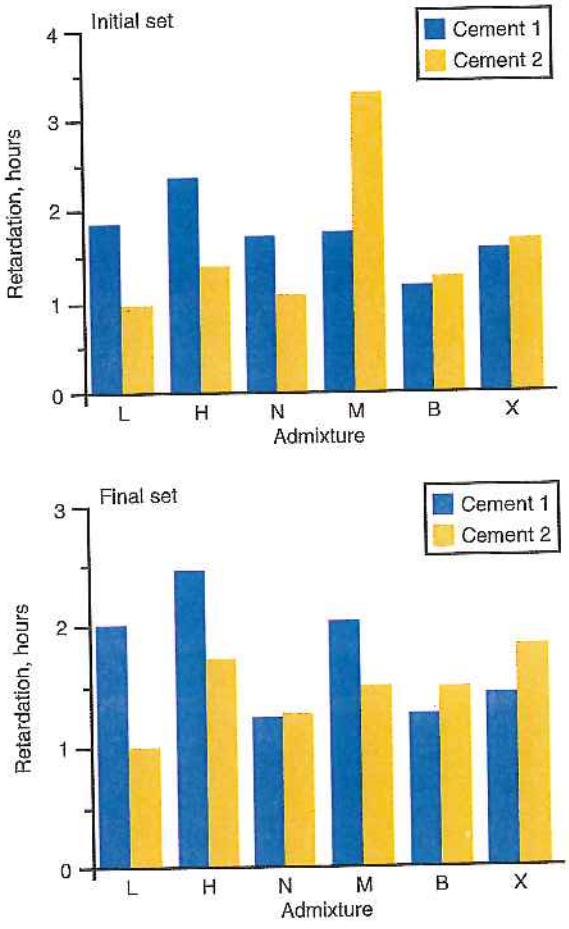


Fig. 6-5. Retardation of set in cement-reduced mixtures relative to control mixture. Concretes L and H contain conventional water reducer, concretes N, M, B, and X contain high-range water reducer (Whiting and Dziedzic 1992).

MID-RANGE WATER REDUCING ADMIXTURES

Mid-range water reducers were first introduced in 1984. These admixtures provide significant water reduction (between 6 and 12%) for concretes with slumps of 125 to 200 mm (5 to 8 in.) without the retardation associated with high dosages of conventional (normal) water reducers. Normal water reducers are intended for concretes with slumps of 100 to 125 mm (4 to 5 in.). Mid-range water reducers can be used to reduce stickiness and improve finishability, pumpability, and placeability of concretes containing silica fume and other supplementary cementing materials. Some can also entrain air and be used in low slump concretes (Nmai, Schlagbaum, and Violetta 1998).

HIGH-RANGE WATER REDUCING ADMIXTURES

High-range water reducers, ASTM C 494 (AASHTO M 194) Types F (water reducing) and G (water reducing and retarding), can be used to impart properties induced by regular water reducers, only much more efficiently. They can greatly reduce water demand and cement contents and make low water-cement ratio, high-strength concrete with normal or enhanced workability. A water reduction of 12% to 30% can be obtained through the use of these admixtures. The reduced water content and water-cement ratio can produce concretes with (1) ultimate compressive strengths in excess of 70 MPa (10,000 psi), (2) increased early strength gain, (3) reduced chloride-ion penetration, and (4) other beneficial properties associated with low water-cement ratio concrete (Fig. 6-6).

Fig. 6-6. Low water to cement ratio concrete with low chloride permeability—easily made with high-range water reducers—is ideal for bridge decks. (69924)

High-range water reducers are generally more effective than regular water-reducing admixtures in producing workable concrete. A significant reduction of bleeding can result with large reductions of water content; this can result in finishing difficulties on flat surfaces when rapid drying conditions are present. Some of these admixtures can cause significant slump loss (Fig. 6-7). Significant retardation is also possible, but can aggravate plastic shrinkage cracking without proper protection and curing (Fig. 6-5). Drying shrinkage, chloride permeability, air retention (Table 6-2), and strength development of concretes with high-range water reducers are comparable to concretes without them when compared at constant water-cement ratios (reduced cement and water contents) (Fig. 6-8).

Concretes with high-range water reducers can have larger entrained air voids and higher void-spacing factors than normal air-entrained concrete. This would generally indicate a reduced resistance to freezing and thawing; however, laboratory tests have shown that concretes with a moderate slump using high-range water reducers have good freeze-thaw durability, even with slightly higher void-spacing factors. This may be the result of lower water-cement ratios often associated with these concretes.

When the same chemicals used for high-range water reducers are used to make flowing concrete, they are often called plasticizers or superplasticizers (see discussion below).

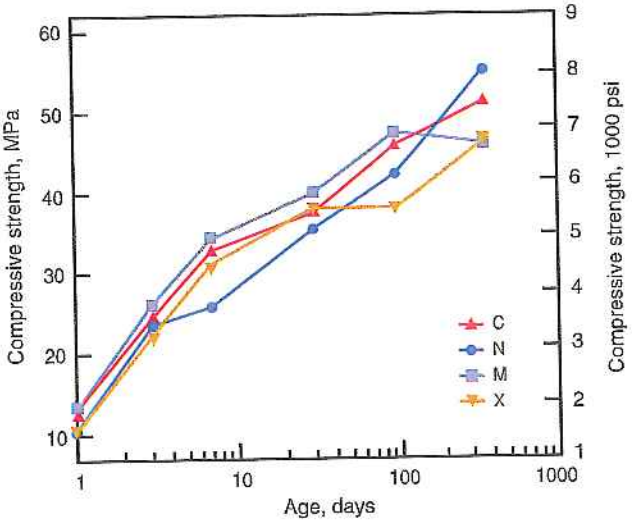


Fig. 6-8. Compressive strength development in cement-reduced concretes: control mixture (C) and concretes containing high-range water reducers (N, M, and X) (Whiting and Dziedzic 1992).

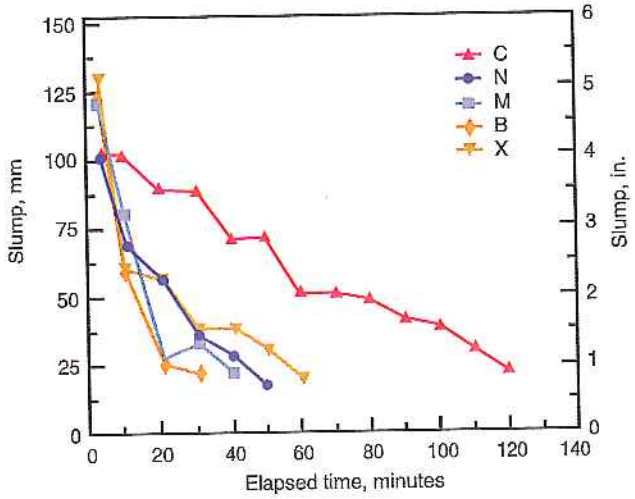


Fig. 6-7. Slump loss at 23°C (73°F) in mixtures containing high-range water reducers (N, M, B, and X) compared with control mixture (C) (Whiting and Dziedzic 1992).

PLASTICIZERS FOR FLOWING CONCRETE

Plasticizers, often called superplasticizers, are essentially high-range water reducers meeting ASTM C 1017; these admixtures are added to concrete with a low-to-normal slump and water-cement ratio to make high-slump flowing concrete (Fig. 6-9). Flowing concrete is a highly fluid but workable concrete that can be placed with little or no vibration or compaction while still remaining essentially

Table 6-2. Loss of Air from Cement Reduced Concrete Mixtures

Mixture		Initial air content, %*	Final air content, %†	Percent air retained	Rate of air loss, %/minute
C	Control	5.4	3.0	56	0.020
L	Water reducer	7.0	4.7	67	0.038
H	Water reducer	6.2	4.6	74	0.040
N	High-range water reducer	6.8	4.8	71	0.040
M	High-range water reducer	6.4	3.8	59	0.065
B	High-range water reducer	6.8	5.6	82	0.048
X	High-range water reducer	6.6	5.0	76	0.027

* Represents air content measured after addition of admixture.
† Represents air content taken at point where slump falls below 25 mm (1 in.).
Whiting and Dziedzic 1992.

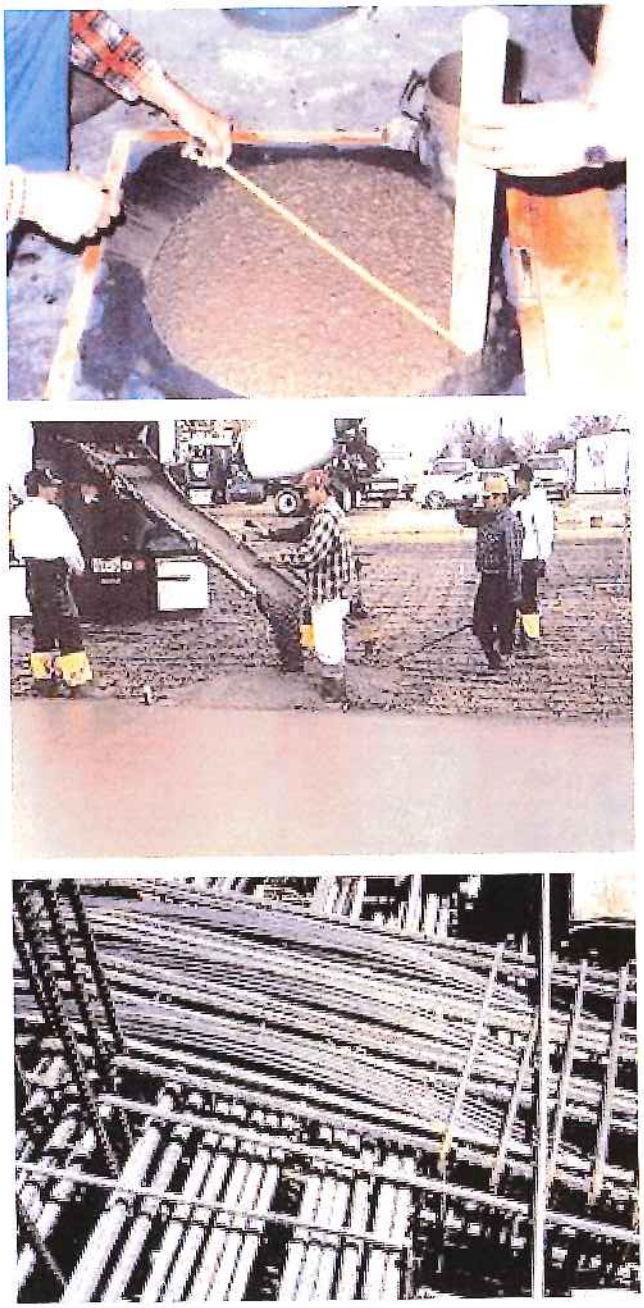


Fig. 6-9. Flowable concrete with a high slump (top) is easily placed (middle), even in areas of heavy reinforcing steel congestion (bottom). (47343, 69900, 47344)

free of excessive bleeding or segregation. Following are a few of the applications where flowing concrete is used: (1) thin-section placements (Fig. 6-10), (2) areas of closely spaced and congested reinforcing steel, (3) tremie pipe (underwater) placements, (4) pumped concrete to reduce pump pressure, thereby increasing lift and distance capacity, (5) areas where conventional consolidation methods are impractical or can not be used, and (6) for reducing handling costs. The addition of a plasticizer to a 75-mm

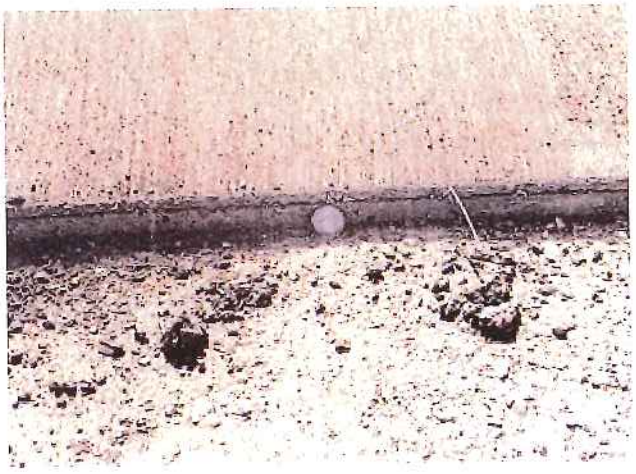


Fig. 6-10. Plasticized, flowing concrete is easily placed in thin sections such as this bonded overlay that is not much thicker than 1½ diameters of a quarter. (69874)

(3-in.) slump concrete can easily produce a concrete with a 230-mm (9-in.) slump. Flowing concrete is defined by ASTM C 1017 as a concrete having a slump greater than 190 mm (7½ in.), yet maintaining cohesive properties.

ASTM C 1017 has provisions for two types of admixtures: Type 1—plasticizing, and Type 2—plasticizing and retarding. Plasticizers are generally more effective than regular or mid-range water-reducing admixtures in producing flowing concrete. The effect of certain plasticizers in increasing workability or making flowing concrete is short-lived, 30 to 60 minutes; this period is followed by a rapid loss in workability or slump loss (Fig. 6-11). High temperatures can also aggravate slump loss. Due to their propensity for slump loss, these admixtures are some-

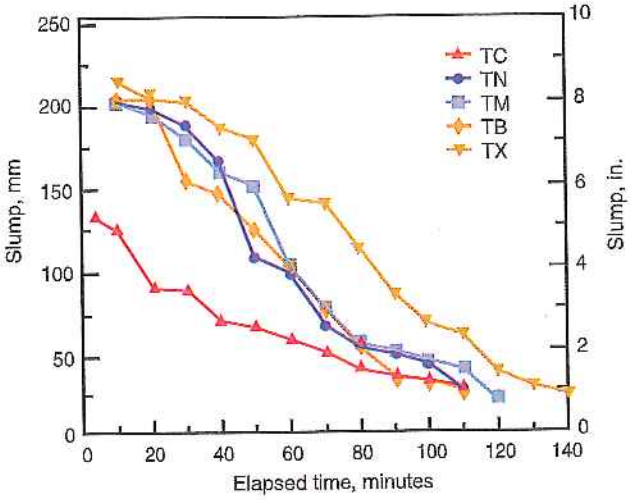


Fig. 6-11. Slump loss at 32°C (90°F) in flowing concretes (TN, TM, TB, and TX) compared with control mixture (TC) (Whiting and Dziedzic 1992).

times added to the concrete mixer at the jobsite. They are available in liquid and powder form. Extended-slump-life plasticizers added at the batch plant help reduce slump-loss problems. Setting time may be accelerated or retarded based on the admixture's chemistry, dosage rate, and interaction with other admixtures and cementing materials in the concrete mixture. Some plasticizers can retard final set by one to almost four hours (Fig. 6-12). Strength development of flowing concrete is comparable to normal concrete (Fig. 6-13).

While it was previously noted that flowing concretes are essentially free of excessive bleeding, tests have shown that some plasticized concretes bleed more than control concretes of equal water-cement ratio (Fig. 6-14); but plasticized concretes bleed significantly less than control concretes of equally high slump and higher water content. High-slump, low-water-content, plasticized concrete has less drying shrinkage than a high-slump, high-water-content conventional concrete; however this concrete has similar or higher drying shrinkage than conventional low-slump, low-water-content concrete (Whiting 1979, Gebler 1982, and Whiting and Dziedzic 1992).

The effectiveness of the plasticizer is increased with an increasing amount of cement and fines in the concrete. It is also affected by the initial slump of the concrete.

Plasticized flowing concrete can have larger entrained air voids and greater void-spacing factors than conventional concrete. Air loss can also be significant. Some research has indicated poor frost- and deicer-scaling resistance for some flowing concretes when exposed to a continuously moist environment without the benefit of a drying period (Whiting and Dziedzic 1992). However, field performance of flowing concretes with low water to portland cement ratios has been good in most frost environments.

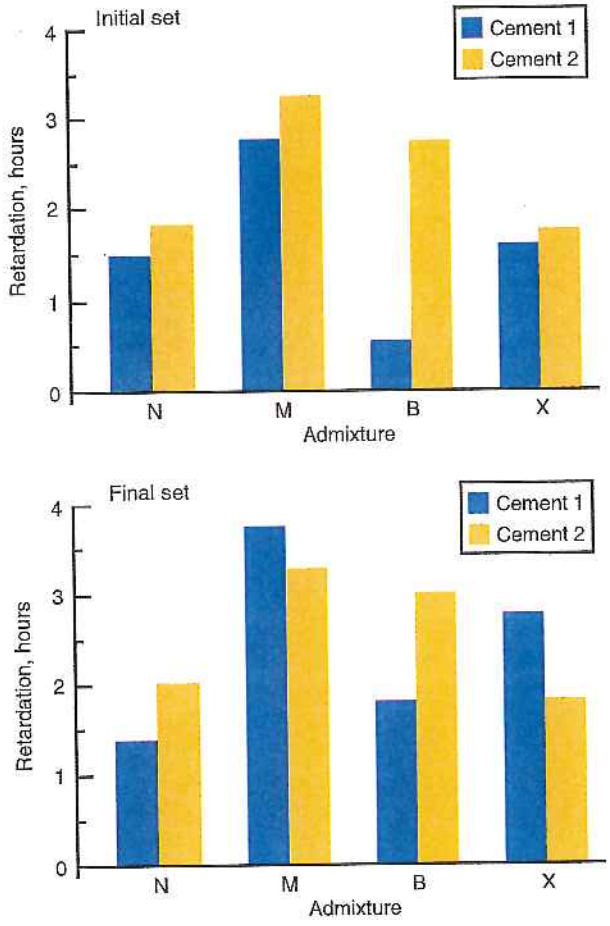


Fig. 6-12. Retardation of set in flowing concrete with plasticizers (N, M, B, and X) relative to control mixture (Whiting and Dziedzic 1992).

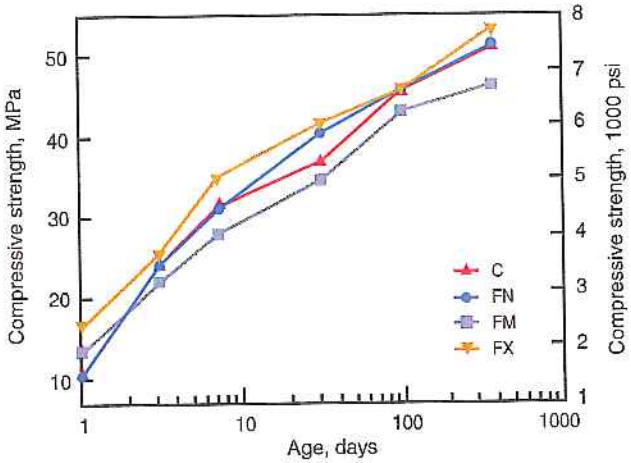


Fig. 6-13. Compressive strength development in flowing concretes. C is the control mixture. Mixtures FN, FM, and FX contain plasticizers (Whiting and Dziedzic 1992).

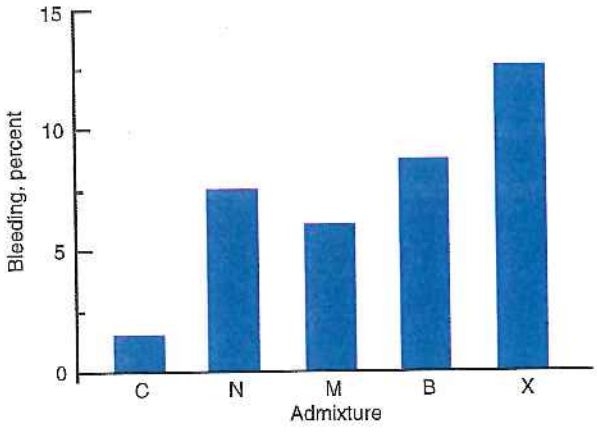


Fig. 6-14. Bleeding of flowing concretes with plasticizers (N, M, B, and X) compared to control (C) (Whiting and Dziedzic 1992).

Table 6-1 lists the primary components and specifications for plasticizing (superplasticizer) admixtures.

Video

RETARDING ADMIXTURES

Retarding admixtures are used to delay the rate of setting of concrete. High temperatures of fresh concrete (30°C [86°F]) are often the cause of an increased rate of hardening that makes placing and finishing difficult. One of the most practical methods of counteracting this effect is to reduce the temperature of the concrete by cooling the mixing water and/or the aggregates. Retarders do not decrease the initial temperature of concrete. The bleeding rate and bleeding capacity of concrete is increased with retarders.

Retarding admixtures are useful in extending the setting time of concrete, but they are often also used in attempts to decrease slump loss and extend workability, especially prior to placement at elevated temperatures. The fallacy of this approach is shown in Fig. 6-15, where the addition of a retarder resulted in an increased rate of slump loss compared to the control mixtures (Whiting and Dziedzic 1992).

Retarders are sometimes used to: (1) offset the accelerating effect of hot weather on the setting of concrete; (2) delay the initial set of concrete or grout when difficult or unusual conditions of placement occur, such as placing concrete in large piers and foundations, cementing oil wells, or pumping grout or concrete over considerable distances; or (3) delay the set for special finishing techniques, such as an exposed aggregate surface.

The amount of water reduction for an ASTM C 494 (AASHTO M 194) Type B retarding admixture is normally less than that obtained with a Type A water reducer. Type D admixtures are designated to provide both water reduction and retardation.

In general, some reduction in strength at early ages (one to three days) accompanies the use of retarders. The effects of these materials on the other properties of concrete, such as shrinkage, may not be predictable. Therefore, acceptance tests of retarders should be made with actual job materials under anticipated job conditions. The classifications and components of retarders are listed in Table 6-1.

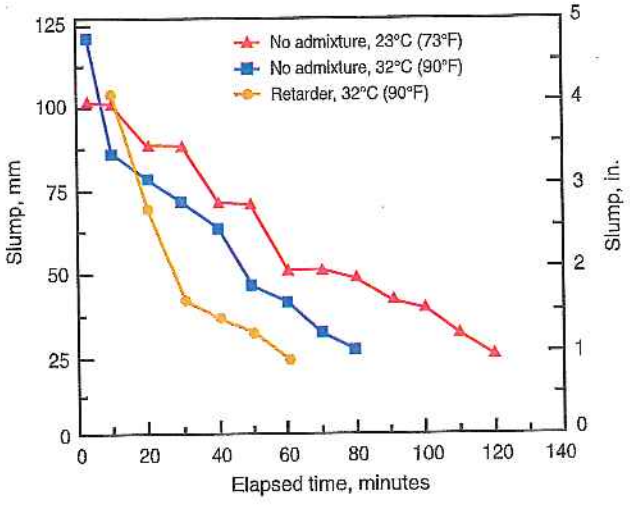


Fig. 6-15. Slump loss at various temperatures for conventional concretes prepared with and without set-retarding admixture (Whiting and Dziedzic 1992).

HYDRATION-CONTROL ADMIXTURES

Hydration controlling admixtures became available in the late 1980s. They consist of a two-part chemical system: (1) a stabilizer or retarder that essentially stops the hydration of cementing materials, and (2) an activator that reestablishes normal hydration and setting when added to the stabilized concrete. The stabilizer can suspend hydration for 72 hours and the activator is added to the mixture just before the concrete is used. These admixtures make it possible to reuse concrete returned in a ready-mix truck by suspending setting overnight. The admixture is also useful in maintaining concrete in a stabilized non-hardened state during long hauls. The concrete is reactivated when it arrives at the project. This admixture presently does not have a standard specification (Kinney 1989).

ACCELERATING ADMIXTURES

An accelerating admixture is used to accelerate the rate of hydration (setting) and strength development of concrete at an early age. The strength development of concrete can also be accelerated by other methods: (1) using Type III or Type HE high-early-strength cement, (2) lowering the water-cement ratio by adding 60 to 120 kg/m^3 (100 to 200 lb/yd^3) of additional cement to the concrete, (3) using a water reducer, or (4) curing at higher temperatures. Accelerators are designated as Type C admixtures under ASTM C 494 (AASHTO M 194).

Calcium chloride ($CaCl_2$) is the chemical most commonly used in accelerating admixtures, especially for non-reinforced concrete. It should conform to the requirements of ASTM D 98 (AASHTO M 144) and should be sampled and tested in accordance with ASTM D 345.

The widespread use of calcium chloride as an accelerating admixtures has provided much data and experience on the effect of this chemical on the properties of concrete. Besides accelerating strength gain, calcium chloride causes an increase in drying shrinkage, potential reinforcement corrosion, discoloration (a darkening of concrete), and an increase in the potential for scaling.

Calcium chloride is not an antifreeze agent. When used in allowable amounts, it will not reduce the freezing point of concrete by more than a few degrees. Attempts to protect

concrete from freezing by this method are foolhardy. Instead, proven reliable precautions should be taken during cold weather (see Chapter 14, Cold-Weather Concreting).

When used, calcium chloride should be added to the concrete mixture in solution form as part of the mixing water. If added to the concrete in dry flake form, all of the dry particles may not be completely dissolved during mixing. Undissolved lumps in the mix can cause popouts or dark spots in hardened concrete.

The amount of calcium chloride added to concrete should be no more than is necessary to produce the desired results and in no case exceed 2% by mass of cementing material. When calculating the chloride content of commercially available calcium chloride, it can be assumed that:

1. Regular flake contains a minimum of 77% $CaCl_2$
2. Concentrated flake, pellet, or granular forms contain a minimum of 94% $CaCl_2$

An overdose can result in placement problems and can be detrimental to concrete. It may cause: rapid stiffening, a large increase in drying shrinkage, corrosion of reinforcement, and loss of strength at later ages (Abrams 1924 and Lackey 1992).

Applications where calcium chloride should be used with caution:

1. Concrete subjected to steam curing
2. Concrete containing embedded dissimilar metals, especially if electrically connected to steel reinforcement
3. Concrete slabs supported on permanent galvanized-steel forms
4. Colored concrete

Calcium chloride or admixtures containing soluble chlorides *should not be used* in the following:

1. Construction of parking garages
2. Prestressed concrete because of possible steel corrosion hazards
3. Concrete containing embedded aluminum (for example, conduit) since serious corrosion of the aluminum can result, especially if the aluminum is in contact with embedded steel and the concrete is in a humid environment
4. Concrete containing aggregates that, under standard test conditions, have been shown to be potentially deleteriously reactive
5. Concrete exposed to soil or water containing sulfates
6. Floor slabs intended to receive dry-shake metallic finishes
7. Hot weather generally
8. Massive concrete placements

The maximum chloride-ion content for corrosion protection of prestressed and reinforced concrete as recommended by the ACI 318 building code is presented in Table 6-3. Resistance to the corrosion of embedded steel is further improved with an increase in the depth of concrete cover over reinforcing steel, and a lower water-cement ratio. Stark (1989) demonstrated that concretes made with 1% $CaCl_2 \cdot 2H_2O$ by mass of cement developed active steel corrosion when stored continuously in fog. When 2% $CaCl_2 \cdot 2H_2O$ was used, active corrosion was detected in concrete stored in a fog room at 100% relative humidity. Risk of corrosion was greatly reduced at lower relative humidities (50%). Gaynor (1998) demonstrates how to calculate the chloride content of fresh concrete and compare it with recommended limits.

Table 6-3. Maximum Chloride-Ion Content for Corrosion Protection of Reinforcement*

Type of member	Maximum water soluble chloride-ion (Cl^-) in concrete, percent by mass of cement
Prestressed concrete	0.06
Reinforced concrete exposed to chloride in service	0.15
Reinforced concrete that will be dry or protected from moisture in service	1.00
Other reinforced concrete construction	0.30

* Requirements from ACI 318 tested per ASTM C 1218.

Several nonchloride, noncorrosive accelerators are available for use in concrete where chlorides are not recommended (Table 6-1). However, some nonchloride accelerators are not as effective as calcium chloride. Certain nonchloride accelerators are specially formulated for use in cold weather applications with ambient temperatures down to -7°C (20°F).

CORROSION INHIBITORS

Corrosion inhibitors are used in concrete for parking structures, marine structures, and bridges where chloride salts are present. The chlorides can cause corrosion of steel reinforcement in concrete (Fig. 6-16). Ferrous oxide and ferric oxide form on the surface of reinforcing steel in concrete. Ferrous oxide, though stable in concrete's alkaline environment, reacts with chlorides to form complexes that move away from the steel to form rust. The chloride ions continue to attack the steel until the passivating oxide layer is destroyed. Corrosion-inhibiting admixtures chemically arrest the corrosion reaction.

Commercially available corrosion inhibitors include: calcium nitrite, sodium nitrite, dimethyl ethanolamine, amines, phosphates, and ester amines. Anodic inhibitors, such as nitrites, block the corrosion reaction of the chloride-ions by chemically reinforcing and stabilizing the passive protective film on the steel; this ferric oxide film is created by the high pH environment in concrete. The

Fig. 6-16. The damage to this concrete parking structure resulted from chloride-induced corrosion of steel reinforcement. (50051)

nitrite-ions cause the ferric oxide to become more stable. In effect, the chloride-ions are prevented from penetrating the passive film and making contact with the steel.

A certain amount of nitrite can stop corrosion up to some level of chloride-ion. Therefore, increased chloride levels require increased levels of nitrite to stop corrosion.

Cathodic inhibitors react with the steel surface to interfere with the reduction of oxygen. The reduction of oxygen is the principal cathodic reaction in alkaline environments (Berke and Weil 1994).

SHRINKAGE-REDUCING ADMIXTURES

Shrinkage-reducing admixtures, introduced in the 1980s, have potential uses in bridge decks, critical floor slabs, and buildings where cracks and curling must be minimized for durability or aesthetic reasons (Fig. 6-17). Propylene glycol and polyoxyalkylene alkyl ether have been used as shrinkage reducers. Drying shrinkage reductions of between 25% and 50% have been demonstrated in laboratory tests. These admixtures have negligible effects on slump and air loss, but can delay setting. They are generally compatible with other admixtures (Nmai, Tomita, Hondo and Buffenbarger 1998 and Shah, Weiss and Yang 1998).

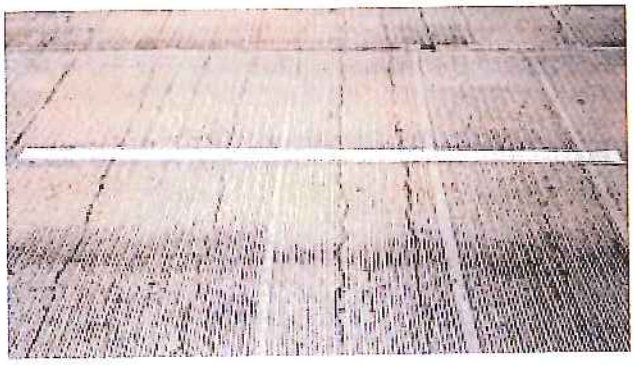


Fig. 6-17. Shrinkage cracks, such as shown on this bridge deck, can be reduced with the use of good concreting practices and shrinkage reducing admixtures. (69883)

CHEMICAL ADMIXTURES TO REDUCE ALKALI-AGGREGATE REACTIVITY (ASR INHIBITORS)

Chemical admixtures to control alkali-silica reactivity (alkali-aggregate expansion) were introduced in the 1990s (Fig. 6-18). Lithium nitrate, lithium carbonate, lithium hydroxide, lithium aluminum silicate (decrepitated spodumene), and barium salts have shown reductions of alkali-silica reaction (ASR) in laboratory tests (Thomas and Stokes 1999 and AASHTO 2001). Some of these materials have potential for use as an additive to cement (Gajda 1996). There is little long-term field experience available on the effectiveness of these materials.

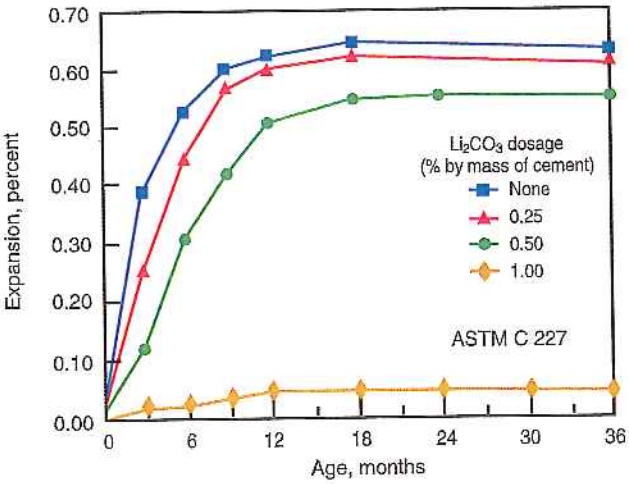


Fig. 6-18. Expansion of specimens made with lithium carbonate admixture (Stark 1992).

COLORING ADMIXTURES (PIGMENTS)

Natural and synthetic materials are used to color concrete for aesthetic and safety reasons (Fig. 6-19). Red concrete is used around buried electrical or gas lines as a warning to anyone near these facilities. Yellow concrete safety curbs are used in paving applications. Generally, the amount of pigments used in concrete should not exceed 10% by weight of the cement. Pigments used in amounts less than 6% generally do not affect concrete properties.

Fig. 6-19. Red and blue pigments were used to color this terrazzo floor. (69873)

Unmodified carbon black substantially reduces air content. Most carbon black for coloring concrete contains an admixture to offset this effect on air. Before a coloring admixture is used on a project, it should be tested for color fastness in sunlight and autoclaving, chemical stability in cement, and effects on concrete properties. Calcium chloride should not be used with pigments to avoid color distortions. Pigments should conform to ASTM C 979.

DAMPPROOFING ADMIXTURES

The passage of water through concrete can usually be traced to the existence of cracks or areas of incomplete consolidation. Sound, dense concrete made with a water-cement ratio of less than 0.50 by mass will be watertight if it is properly placed and cured.

Admixtures known as dampproofing agents include certain soaps, stearates, and petroleum products. They may, but generally do not, reduce the permeability of concretes that have low cement contents, high water-cement ratios, or a deficiency of fines in the aggregate. Their use in well-proportioned mixes, may increase the mixing water required and actually result in increased rather than reduced permeability.

Dampproofing admixtures are sometimes used to reduce the transmission of moisture through concrete that is in contact with water or damp earth. Many so-called dampproofers are not effective, especially when used in concretes that are in contact with water under pressure.

PERMEABILITY-REDUCING ADMIXTURES

Permeability-reducing admixtures reduce the rate at which water under pressure is transmitted through concrete. One of the best methods of decreasing permeability in concrete is to increase the moist-curing period and reduce the water-cement ratio to less than 0.5. Most admixtures that reduce water-cement ratio consequently reduce permeability.

Some supplementary cementing materials, especially silica fume, reduce permeability through the hydration and pozzolanic-reaction process. Other admixtures that act to block the capillaries in concrete have been shown to be effective in reducing concrete corrosion in chemically aggressive environments. Such admixtures, designed for use in high-cement content/low-water-cement ratio concretes, contain aliphatic fatty acid and an aqueous emulsion of polymeric and aromatic globules (Aldred 1988).

PUMPING AIDS

Pumping aids are added to concrete mixtures to improve pumpability. Pumping aids cannot cure all unpumpable concrete problems; they are best used to make marginally pumpable concrete more pumpable. These admixtures increase viscosity or cohesion in concrete to reduce dewatering of the paste while under pressure from the pump.

Some pumping aids may increase water demand, reduce compressive strength, cause air entrainment, or retard setting time. These side effects can be corrected by adjusting the mix proportions or adding another admixture to offset the side effect.

A partial list of materials used in pumping aids is given in Table 6-1. Some admixtures that serve other primary purposes but also improve pumpability are air-entraining agents, and some water-reducing and retarding admixtures.

BONDING ADMIXTURES AND BONDING AGENTS

Bonding admixtures are usually water emulsions of organic materials including rubber, polyvinyl chloride, polyvinyl acetate, acrylics, styrene butadiene copolymers, and other polymers. They are added to portland cement mixtures to increase the bond strength between old and new concrete. Flexural strength and resistance to chloride-ion ingress are also improved. They are added in proportions equivalent to 5% to 20% by mass of the cementing materials; the actual quantity depending on job conditions and type of admixture used. Some bonding admixtures may increase the air content of mixtures. Nonreemulsifiable types are resistant to water, better suited to exterior application, and used in places where moisture is present.

The ultimate result obtained with a bonding admixture will be only as good as the surface to which the concrete is applied. The surface must be dry, clean, sound, free of dirt, dust, paint, and grease, and at the proper temperature. Organic or polymer modified concretes are

acceptable for patching and thin-bonded overlayment, particularly where feather-edged patches are desired.

Bonding agents should not be confused with bonding admixtures. Admixtures are an ingredient in the concrete; bonding agents are applied to existing concrete surfaces immediately before the new concrete is placed. Bonding agents help "glue" the existing and the new materials together. Bonding agents are often used in restoration and repair work; they consist of portland cement or latex-modified portland cement grout or polymers such as epoxy resins (ASTM C 881 or AASHTO M 235) or latex (ASTM C 1059).

GROUTING ADMIXTURES

Portland cement grouts are used for a variety of purposes: to stabilize foundations, set machine bases, fill cracks and joints in concrete work, cement oil wells, fill cores of masonry walls, grout prestressing tendons and anchor bolts, and fill the voids in preplaced aggregate concrete. To alter the properties of grout for specific applications, various air-entraining admixtures, accelerators, retarders, and nonshrink admixtures are often used.

GAS-FORMING ADMIXTURES

Aluminum powder and other gas-forming materials are sometimes added to concrete and grout in very small quantities to cause a slight expansion of the mixture prior to hardening. This may be of benefit where the complete grouting of a confined space is essential, such as under machine bases or in post-tensioning ducts of prestressed concrete. These materials are also used in larger quantities to produce autoclaved cellular concretes. The amount of expansion that occurs is dependent upon the amount of gas-forming material used, the temperature of the fresh mixture, the alkali content of the cement, and other variables. Where the amount of expansion is critical, careful control of mixtures and temperatures must be exercised. Gas-forming agents will not overcome shrinkage after hardening caused by drying or carbonation.

AIR DETRAINERS

Air-detraining admixtures reduce the air content in concrete. They are used when the air content cannot be reduced by adjusting the mix proportions or by changing the dosage of the air-entraining agent and other admixtures. However, air-detrainers are rarely used and their effectiveness and dosage rate should be established on trial mixes prior to use on actual job mixes. Materials used in air-detraining agents are listed in Table 6-1.

FUNGICIDAL, GERMICIDAL, AND INSECTICIDAL ADMIXTURES

Bacteria and fungal growth on or in hardened concrete may be partially controlled through the use of fungicidal, germicidal, and insecticidal admixtures. The most effective materials are polyhalogenated phenols, dieldrin emulsions, and copper compounds. The effectiveness of these materials is generally temporary, and in high dosages they may reduce the compressive strength of concrete.

ANTIWASHOUT ADMIXTURES

Antiwashout admixtures increase the cohesiveness of concrete to a level that allows limited exposure to water with little loss of cement. This allows placement of concrete in water and under water without the use of tremies. The admixtures increase the viscosity of water in the mixture resulting in a mix with increased thixotropy and resistance to segregation. They usually consist of water soluble cellulose ether or acrylic polymers.

COMPATIBILITY OF ADMIXTURES AND CEMENTITIOUS MATERIALS

Fresh concrete problems of varying severity are encountered due to cement-admixture incompatibility and incompatibility between admixtures. Incompatibility between supplementary cementing materials and admixtures or cements can also occur. Slump loss, air loss, early stiffening, and other factors affecting fresh concrete properties can result from incompatibilities. While these problems primarily affect the plastic-state performance of concrete, long-term hardened concrete performance may also be adversely affected. For example, early stiffening can cause difficulties with consolidation of concrete, therefore compromising strength.

Reliable test methods are not available to adequately address incompatibility issues due to variations in materials, mixing equipment, mixing time, and environmental factors. Tests run in a laboratory do not reflect the conditions experienced by concrete in the field. When incompatibility is discovered in the field, a common solution is to simply change admixtures or cementing materials (Helmuth, Hills, Whiting, and Bhattacharja 1995, Tagni-Hamou and Aïtcin 1993, and Tang and Bhattacharja 1997).

STORING AND DISPENSING CHEMICAL ADMIXTURES

Liquid admixtures can be stored in barrels or bulk tankers. Powdered admixtures can be placed in special storage bins and some are available in premeasured plastic bags. Admixtures added to a truck mixer at the jobsite are often

in plastic jugs or bags. Powdered admixtures, such as certain plasticizers, or a barrel of admixture may be stored at the project site.

Dispenser tanks at concrete plants should be properly labeled for specific admixtures to avoid contamination and avoid dosing the wrong admixture. Most liquid chemical admixtures should not be allowed to freeze; therefore, they should be stored in heated environments. Consult the admixture manufacturer for proper storage temperatures. Powdered admixtures are usually less sensitive to temperature restrictions, but may be sensitive to moisture.

Liquid chemical admixtures are usually dispensed individually in the batch water by volumetric means (Fig. 6-20). Liquid and powdered admixtures can be measured by mass, but powdered admixtures should not be measured by volume. Care should be taken to not combine certain admixtures prior to their dispensing into the batch as some combinations may neutralize the desired effect of the admixtures. Consult the admixture manufacturer concerning compatible admixture combinations or perform laboratory tests to document performance.

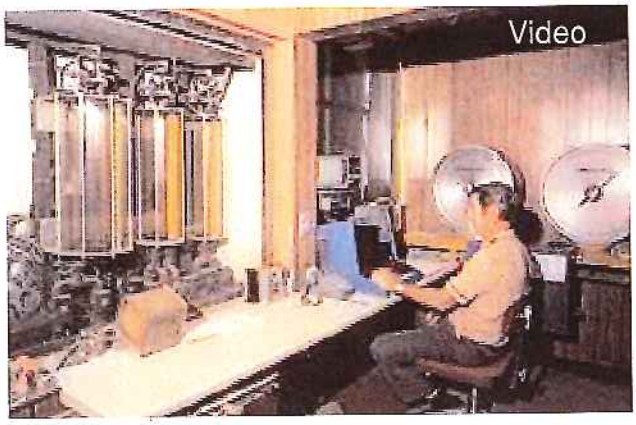


Fig. 6-20. Liquid admixture dispenser at a ready mix plant provides accurate volumetric measurement of admixtures. (44220)

REFERENCES

AASHTO, "Portland Cement Concrete Resistant to Excessive Expansion Caused by Alkali-Silica Reaction," Section 56X, *Guide Specification For Highway Construction*, http://leadstates.tamu.edu/ASR/library/gspec.stm, American Association of State Highway and Transportation Officials, Washington, D.C., 2001.

Abrams, Duff A., *Calcium Chloride as an Admixture in Concrete*, Bulletin 13 (PCA LS013), Structural Materials Research Laboratory, Lewis Institute, Chicago, http://www.portcement.org/pdf_files/LS013.pdf, 1924.

ACI Committee 212, *Chemical Admixtures for Concrete*, ACI 212.3R-91, American Concrete Institute, Farmington Hills, Michigan, 1991.

ACI Committee 212, *Guide for the Use of High-Range Water-Reducing Admixtures (Superplasticizers) in Concrete*, ACI 212.4R-93 (Reapproved 1998), American Concrete Institute, Farmington Hills, Michigan, 1998.

ACI Committee 222, *Corrosion of Metals in Concrete*, ACI 222R-96, American Concrete Institute, Farmington Hills, Michigan, 1996.

ACI Committee 318, *Building Code Requirements for Structural Concrete and Commentary*, ACI 318-02, American Concrete Institute, Farmington Hills, Michigan, 2002.

ACI E4, *Chemical and Air-Entraining Admixtures for Concrete*, ACI Education Bulletin No. E4-96, American Concrete Institute, Farmington Hills, Michigan, 1999, 16 pages.

Aldred, James M., "HPI Concrete," *Concrete International*, American Concrete Institute, Farmington Hills, Michigan, November 1988.

Berke, N. S., and Weil, T. G., "World Wide Review of Corrosion Inhibitors in Concrete," *Advances in Concrete Technology*, CANMET, Ottawa, 1994, pages 891 to 914.

Chou, Gee Kin, "Cathodic Protection: An Emerging Solution to the Rebar Corrosion Problem," *Concrete Construction*, Addison, Illinois, June 1984.

Gajda, John, *Development of a Cement to Inhibit Alkali-Silica Reactivity*, Research and Development Bulletin RD115, Portland Cement Association, 1996, 58 pages.

Gaynor, Richard D., "Calculating Chloride Percentages," *Concrete Technology Today*, PL983, Portland Cement Association, http://www.portcement.org/pdf_files/PL983.pdf, 1998, pages 4 to 5.

Gebler, S. H., *The Effects of High-Range Water Reducers on the Properties of Freshly Mixed and Hardened Flowing Concrete*, Research and Development Bulletin RD081, Portland Cement Association, http://www.portcement.org/pdf_files/RD081.pdf, 1982.

Helmuth, Richard; Hills, Linda M.; Whiting, David A.; and Bhattacharja, Sankar, *Abnormal Concrete Performance in the Presence of Admixtures*, RP333, Portland Cement Association, http://www.portcement.org/pdf_files/RP333.pdf, 1995.

Hester, Weston T., *Superplasticizers in Ready Mixed Concrete (A Practical Treatment for Everyday Operations)*, National Ready Mixed Concrete Association, Publication No. 158, Silver Spring, Maryland, 1979.

Kinney, F. D., "Reuse of Returned Concrete by Hydration Control: Characterization of a New Concept," *Superplasticizers and Other Chemical Admixtures in Concrete*, SP119, American Concrete Institute, Farmington Hills, Michigan, 1989, pages 19 to 40.

Klieger, Paul, *Air-Entraining Admixtures*, Research Department Bulletin RX199, Portland Cement Association, http://www.portcement.org/pdf_files/RX199.pdf, 1966, 12 pages.

Kosmatka, Steven H., "Discoloration of Concrete—Causes and Remedies," *Concrete Technology Today*, PL861, Portland Cement Association, http://www.portcement.org/pdf_files/PL861.pdf, 1986.

Lackey, Homer B., "Factors Affecting Use of Calcium Chloride in Concrete," *Cement, Concrete, and Aggregates*, American Society for Testing and Materials, West Conshohocken, Pennsylvania, Winter 1992, pages 97 to 100.

Nmai, Charles K.; Schlagbaum, Tony; and Violetta, Brad, "A History of Mid-Range Water-Reducing Admixtures," *Concrete International*, American Concrete Institute, Farmington Hills, Michigan, April 1998, pages 45 to 50.

Nmai, Charles K.; Tomita, Rokuro; Hondo, Fumiaki; and Buffenbarger, Julie, "Shrinkage-Reducing Admixtures," *Concrete International*, American Concrete Institute, Farmington Hills, Michigan, April 1998, pages 31 to 37.

Ramachandran, V. S., *Concrete Admixtures Handbook*, Noyes Publications, Park Ridge, New Jersey, 1995.

Rixom, M. R., and Mailvaganam, N. P., *Chemical Admixtures for Concrete*, E. & F. N. Spon, New York, 1986.

Shah, Surendra P.; Weiss, W. Jason; and Yang, Wei, "Shrinkage Cracking—Can it be Prevented?," *Concrete International*, American Concrete Institute, Farmington Hills, Michigan, April 1998, pages 51 to 55.

Stark, David, *Influence of Design and Materials on Corrosion Resistance of Steel in Concrete*, Research and Development Bulletin RD098, Portland Cement Association, http://www.portcement.org/pdf_files/RD098.pdf, 1989, 44 pages.

Stark, David C., *Lithium Salt Admixtures—An Alternative Method to Prevent Expansive Alkali-Silica Reactivity*, RP307, Portland Cement Association, 1992, 10 pages.

Tagnit-Hamou, Arezki, and Aïtcin, Pierre-Claude, "Cement and Superplasticizer Compatibility," *World Cement*, Palladian Publications Limited, Farnham, Surrey, England, August 1993, pages 38 to 42.

Tang, Fulvio J., and Bhattacharja, Sankar, *Development of an Early Stiffening Test*, RP346, Portland Cement Association, 1997, 36 pages.

Thomas, Michael D. A., and Stokes, David B., "Use of a Lithium-Bearing Admixture to Suppress Expansion in Concrete Due to Alkali-Silica Reaction," *Transportation Research Record No. 1668*, Transportation Research Board, Washington, D.C., 1999, pages 54 to 59.

Whiting, David, *Effects of High-Range Water Reducers on Some Properties of Fresh and Hardened Concretes*, Research and Development Bulletin RD061, Portland Cement Association, http://www.portcement.org/pdf_files/RD061.pdf, 1979.

Whiting, David A., *Evaluation of Super-Water Reducers for Highway Applications*, Research and Development Bulletin RD078, Portland Cement Association, http://www.portcement.org/pdf_files/RD078.pdf, 1981, 169 pages.

Whiting, D., and Dziedzic, W., *Effects of Conventional and High-Range Water Reducers on Concrete Properties*, Research and Development Bulletin RD107, Portland Cement Association, 1992, 25 pages.

Whiting, David A., and Nagi, Mohamad A., *Manual on the Control of Air Content in Concrete*, EB116, National Ready Mixed Concrete Association and Portland Cement Association, 1998, 42 pages.

ENVIRONMENTAL GUIDELINES FOR THE CONCRETE BATCHING INDUSTRY

Environment Protection Authority
State Government of Victoria

June 1998

ENVIRONMENTAL GUIDELINES FOR THE CONCRETE BATCHING INDUSTRY

Environment Protection Authority
Olderfleet Buildings
477 Collins Street
Melbourne Victoria 3000
Australia

Printed on recycled paper

Publication 628

ISBN 0 7306 7548 3

FOREWORD

This Best Practice Environmental Management (BPEM) Guideline was developed in consultation with the concrete batching industry and describes a forward looking approach to waste management issues for this industry. It builds on steps already taken by the industry to improve its environmental performance and seeks to integrate economic and environmental objectives. EPA acknowledges the contribution of the Australian Pre-Mixed Concrete Association to these Guidelines.

The philosophy behind BPEM is that of continual improvement. As industry looks for better ways to operate, it should also seek better ways to protect the environment.

Industry is encouraged to adopt the BPEM practices outlined in this BPEM Guideline so that both the industry and the environment can improve.

EPA will be pleased to receive comments on these guidelines from the concrete batching industry. Comments will, where appropriate, be incorporated in future editions.

BRIAN ROBINSON
CHAIRMAN

FRED MOSCHINI
CHAIRMAN, AUSTRALIAN-PRE-MIXED CONCRETE ASSOCIATION VICTORIAN BRANCH

Acknowledgment

These guidelines were drafted by Gregory M Haywood (Deakin University)

Contents

TABLES

1 INTRODUCTION

This publication is intended to help the concrete batching industry operate without causing adverse environmental impacts.

Poorly controlled concrete batching plants may discharge highly alkaline wastewater, dust and excess noise, but plants operated in accordance with these guidelines should operate in harmony with the environment and neighbouring communities.

Best practice environmental management (BPEM) is synonymous with best practice business management. Both aim to maximise the efficiency of raw material usage, while minimising waste generation and the consumption of energy, water and auxiliary chemicals.

BPEM is not driven by regulatory compliance, but by the recognition that efficient resource usage results in increased productivity as well as reduced environmental impact.

1.1 OBJECTIVE

These guidelines will assist the concrete batching industry to achieve the best practical environmental outcome, while allowing flexibility as to how this will be achieved. Thus, the guidelines provide the industry and regulators with:

- a statement of the potential impacts of concrete batching operations on each element of the environment
- a clear environmental performance objective for each element of the environment
- suggested measures to avoid adverse environmental impacts and thus meet the performance objective
- the flexibility to meet the environmental objectives by other measures, as long as they achieve equivalent or better outcomes.

1.2 SCOPE OF THE GUIDELINES

These guidelines will assist concrete batching plant managers and operators to:

- comply with the legislative requirements of the Victorian Government
- use and maintain appropriate technology to minimise the impact of their operations on the environment and the amenity of the local community
- identify potential environmental problems and the tools to monitor and solve these problems
- understand their plant management responsibilities.

These guidelines apply to concrete batching plants of all scale – regardless of whether they are subject to EPA works approval.

The guidelines permit and encourage innovative, effective and improved solutions for the environmental management of concrete batching.

A checklist is provided in Appendix 1 to enable the manager of the facility to check that all relevant environmental issues have been addressed in accordance with these guidelines. This checklist is derived from one developed by the Environmental Sub-Committee (Victoria) of the peak body – the Australian Pre-Mixed Concrete Association – to determine the winner of the industry's annual Environmental Performance Award.

1.3 BEST PRACTICE ENVIRONMENTAL MANAGEMENT

BPEM means managing an organisation or activity to achieve a high level of environmental performance which is sustainable, continuously improves and is consistent with business or economic objectives. BPEM needs to be integrated with overall management philosophy and practice.

The BPEM publication series comprises guidelines and codes of practice for industry sectors or activities, which outline what is needed to achieve optimum environmental outcomes, consistent with the industry's economic viability.

BPEM may encompass:

- site selection
- process design
- technology choice
- key operating parameters and procedures
- contingency arrangements
- monitoring and auditing aspects.

BPEM publications outline key environmental objectives relevant to the industry or activity, and provide suggested measures to achieve these objectives. Satisfactory implementation of the suggested measures will be deemed to achieve compliance with the objectives. However, operators are encouraged to consider alternative ways to meet the objectives and to apply the best site-specific solution equivalent to, or better than, the suggested measure. Thus, innovation is not stifled and flexibility is provided, while those seeking greater direction or certainty can simply apply the suggested measures.

The underlying philosophy of BPEM guidelines and codes is to provide a forward looking approach, rather than simply reflect what is presently the norm. Where problems or issues occur within the industry, a direction or solution to these will be included.

A comprehensive environmental management system – preferably in accordance with the principles outlined in the International Organisation for Standardisation (ISO) 14000 series – is an integral part of BPEM. These principles include the determination of all environmental aspects associated with the company's activities, and a process of continual improvement in environmental performance.

BPEM provides the opportunity to harness the following benefits:

- reduction in unit costs
- opportunities for eco-marketing
- possible preferred supplier status
- potential reduction in resource consumption
- sustainable improvements in environmental performance
- improved community perceptions and relations
- increased compliance with regulatory requirements
- reduced exposure to risk (occupational safety and health as well as environmental).

A BPEM guideline or code is not of itself mandatory, but the potential exists to call up such a document in approvals, licences or permits. Regulatory authorities generally expect forward-looking manufacturers, committed to continuous improvement through a total quality management approach, to voluntarily adopt BPEM guidelines and codes.

2 CONCRETE BATCHING INDUSTRY

2.1 DEFINITION

A mixture of cement, water, sand and aggregate is called concrete. The product is named 'Portland Cement' because after hardening the product resembles a natural limestone quarried at Portland, England.

Components of concrete

The process for making Portland Cement is relatively simple, but the chemistry of cement manufacture is complex.

The components of concrete include calcium, silica, alumina, magnesia, iron oxide and sulfur dioxide compounds along with:

- fly ash – a glass-like substance used in good quality cement products
- aggregates consisting of gravel and sand, which comprise the major raw material of concrete (aggregates are graded according to their size and character)
- admixtures – compounds added to the concrete in small quantities to modify its properties.

The amount of water required to chemically combine the cement is about 16% by weight, but for more efficient mixing a greater amount is used. Adding more water weakens the concrete, but makes it easier to work with.

In a concrete batching plant, the raw materials are mixed in one of the ways discussed below.

2.2 FRONT END LOADER CONCRETE BATCHING

In front end loader plants, a front end loader is used to transport coarse and fine aggregates from a ground level storage bin to an aggregate weigh hopper. The aggregate is then added to an agitator. Cement and fly ash are weighed in a separate hopper and transferred to the agitator. The correct proportion of water is added to the agitator. The concrete is mixed, ready for final slumping, inspection and transportation to the customer.

2.3 OVERHEAD BIN CONCRETE BATCHING

In overhead bin batching plants, coarse and fine aggregates are stored in separate bins. Aggregates are transported from the bins to a compartmentalised overhead storage hopper by conveyor belts. A weigh hopper is situated directly beneath the overhead storage hopper, where aggregate is weighed and transferred to the agitator.

Cement and fly ash are stored in separate overhead silos. They are weighed in a separate hopper and dropped into the agitator. The correct proportion of water is added, along with any required admixtures and the concrete is mixed, ready for final slumping, inspection and transportation to the building site.

3 STATUTORY REQUIREMENTS

Legislation

The *Environment Protection Act 1970* provides for the control of water, air and land pollution, industrial waste and noise. The Act is administered by EPA.

Under the Act, discharges of wastes into the environment must accord with State environment protection policies (SEPPs), which identify beneficial uses for particular segments of the environment, and establish ambient objectives and discharge limits.

Policies

The *Industrial Waste Management Policy (Waste Minimisation) 1990*, specifies objectives for minimising industrial waste generation through avoidance and reduction in preference to recycling and reclamation. Best available technology can be required for priority wastes. EPA can require industry to conduct waste audits and prepare waste management plans.

The *State Environment Protection Policy (The Air Environment)*, which applies to Victoria's air environment, sets out:

- beneficial uses
- air quality objectives
- design ground level concentrations
- plume calculation (dispersion modelling) procedures
- control requirements for specific industry groups.

Schedules in the SEPP set out the control requirements for specific industries. Schedule F-2 describes minimum requirements to control discharges of waste to air from concrete batching plants.

EPA has discretion to exempt operations from compliance with Schedule F in certain circumstances. These include situations where compliance would preclude innovative control or energy saving technologies. This is discussed further in section 5.3.

The *State Environment Protection Policy (Waters of Victoria)* applies to all surface waters within Victoria. The policy defines:

- segments of the environment
- beneficial uses
- water quality indicators and objectives
- emission limits for waste discharges to surface waters – including a requirement that the pH of discharges be in the range 6.0 to 9.0.

The *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*, specifies noise limits in noise sensitive areas (for example, dwellings, hospitals, hotels, motels), based on land use, planning zones, background noise levels, plant operating periods and the nature of the noise source. The policy applies in the Melbourne metropolitan area, but is used as a guide elsewhere.

Regulations

The *Environment Protection (Scheduled Premises and Exemptions) Regulations 1996* describe premises which are scheduled, and are thus required to comply with the licensing and works approval provisions of the *Environment Protection Act 1970*. Specific discharges which are exempt from the licensing provisions are also listed.

Concrete batching plants with a design throughput of at least 100 tonnes per week are scheduled and require a works approval from the EPA before they are constructed or undergo major modification. Licences are not required to operate concrete batching plants, but plants must accord with Policy requirements.

The *Environment Protection (Prescribed Waste) Regulations 1998* classify certain industrial and domestic wastes as prescribed waste. Prescribed waste can only be removed from a site by an approved waste transporter. Concrete batching plants may generate prescribed waste (for example, waste oil and alkaline sludges). Operators should confirm the status of specific waste streams and their responsibilities with EPA.

4 WASTE MINIMISATION

Waste minimisation is an integral part of BPEM. By focussing on waste avoidance and reduction through the use of better processes and practices, pollution control and waste disposal costs can be lowered.

4.1 WASTE MINIMISATION

The *Waste Minimisation Policy* sets out the following hierarchy for industrial waste management options:

- waste avoidance/reduction
- reuse, recycling and reclamation
- waste treatment
- waste disposal.

Preference should be given to waste avoidance or reduction, ahead of recycling and reuse. Treatment and the least preferred alternative of waste disposal should only be considered if these actions are not possible.

Waste minimisation includes good housekeeping practices and staff attitudes, as well as technical factors. Actions as simple as reducing the volume of water used during washouts may significantly reduce waste generation. The potential impact of such straightforward measures should not be underestimated.

Some of the smaller incremental improvements are easy to gain, but difficult to maintain. Teamwork and commitment from production staff, supported by strong management and effective management systems, should enable sustainable and continuous performance improvement.

Another essential part of waste minimisation is understanding what wastes are being produced and the processes which generate them. As well as establishing a baseline against which improvements can be assessed, this data will allow waste reduction options to be evaluated.

4.2 IMPLEMENTING WASTE MINIMISATION

In the concrete batching industry, waste minimisation principles can be applied to water, cement, aggregate and all other inputs. Significant cost savings have been achieved by plants using this approach.

A useful starting point for a waste minimisation program is to prepare a waste management plan (WMP). The first step to preparing a WMP is a waste audit, which involves identifying the sources, types and quantities of wastes generated by a concrete batching plant. The waste audit should:

- identify all waste streams
- quantify and characterise them
- establish how each waste stream is generated.

After the waste audit is completed, a waste assessment is conducted. This involves identifying the options available to minimise each of the waste streams.

A technical and economic feasibility analysis is then conducted to determine which of the identified waste minimisation opportunities should be adopted.

The WMP contains an implementation timetable and description of the method of implementation, and the anticipated costs and environmental benefits.

The waste minimisation program should not be a one-off activity. It should be periodically reviewed to ensure the WMP is being adhered to, and to identify any new waste minimisation opportunities.

The waste minimisation program should be an integral part of the company's approach to environmental management: it should be a key element when an environmental management system is established.

Further guidance on specific waste minimisation measures can be found in sections 5.2, 5.3 and 5.5.

More information can be found in:

- *Guidelines for Preparing Waste Assessments – A Practical Guide Towards Cleaner Production* (EPA Publication 277)
- *Guidelines for Preparation of Waste Management Plans* (EPA Publication 383)
- *Waste Minimisation, Assessments and Opportunities for Industry* (EPA Publication 351).

WASTE MINIMISATION

Objective

To minimise waste generation and maximise economic benefits.

Suggested measures

- Establish a management policy supporting waste minimisation.
- Establish a waste management team.
- Conduct a waste audit.
- Assess viable waste minimisation projects.
- Prepare and implement a WMP.
- Monitor and evaluate the effectiveness of the WMP.

5 ENVIRONMENTAL ELEMENTS

Environmental issues relating to the concrete batching industry – such as plant location, water quality, air quality, noise and solid waste – are set out in the following sections.

5.1 SITE CONSIDERATIONS

Concrete batching plants must be located in an area where they will not pose a hazard to the environment or the amenity of the local community.

Highly alkaline wastewater, dust emissions and noise are the key potential impacts associated with concrete batching plants. These problems need to be considered when planning new operations and major upgrades of existing sites. Plants should be located so that contaminated stormwater and process wastewater can be retained on-site. The land should not be flood-prone (it should have a flood average recurrence interval less than 100 years). These measures will help to ensure that wastewater is not discharged to waterways.

Dust problems can be minimised by siting the concrete batching plant out of prevailing high winds. The prevailing wind direction should be considered during the planning proposal, to ensure that bunkers and conveyors are sited in the leeward direction to minimise the effects of the wind. The provision of natural or artificial wind barriers – such as trees, fences and landforms – to help control the emission of dust from the plant should be considered during the planning process.

To protect amenity, buffers should be provided between batching plants and sensitive land uses. Buffers are designed to minimise any potential impacts due to accidental or fugitive air emissions. They assume that good control practices will be followed and do not eliminate the need for effective point source emission control.

A minimum buffer distance of 100 metres between batching plants and sensitive land uses is included in *Recommended Buffer Distances for Industrial Residual Air Emissions* (EPA Publication AQ 2/86 – as revised in July 1990). Sensitive land uses include residential areas and zones, hospitals, schools, caravan parks or other similar uses.

Access and exit routes for heavy transport vehicles should be planned to minimise impacts on the environment and amenity of the locality.

Thoughtful site selection and planning will mean fewer problems for future environmental management.

SITING

Objective

To minimise environmental impacts by appropriate site selection.

Suggested measures

- Batching plants should be sited on land that is not flood prone.
- Consider the current and future proximity of sensitive land uses.
- Establish and maintain buffer distances >100 metres.
- Provide vehicle access routes which minimise impacts.

5.2 WATER QUALITY

Potential pollutants in batching plant wastewater include cement, sand, aggregates and petroleum products. These substances can adversely affect the environment by:

- increasing soil and water pH
- increasing the turbidity of waterways (turbidity is a measure of the cloudiness of a suspension).

Increased turbidity results in less light entering an aquatic environment. This in turn affects the rate of photosynthesis by plants, and reduces the visibility of aquatic organisms. Turbidity can also clog fish gills, smother bottom feeding flora and fauna and generally decrease the amenity of an area.

Wastewater management – principles

Using the waste minimisation approach, the keys to avoiding adverse impacts on water quality are to minimise wastewater generation and to recycle the wastewater which is generated. These steps require that:

- the area of the site which generates contaminated stormwater is minimised
- separate dedicated drainage systems are provided for contaminated and clean stormwater
- all contaminated stormwater and process wastewater is collected and recycled.

Wastewater generation

The main sources of wastewater at batching plants are:

- contaminated stormwater runoff
- dust control sprinklers
- the agitator washout station
- the agitator charging station
- the slumping station
- cleaning and washing.

The site should be designed to minimise the areas which are contaminated with cement dust and thus have the potential to generate contaminated stormwater runoff.

Clean stormwater runoff – such as that from office buildings and staff car parks – should be separated from contaminated stormwater, or it will add to the volume of wastewater needing management. Separate drains should be provided for clean stormwater runoff.

All contaminated stormwater and process wastewater should be collected and retained on site. All sources of wastewater should be paved and bunded. (A bund is a small wall of concrete or another impervious material, similar to the curb beside a bitumen road. Bunds serve the dual purpose of ensuring all wastewater is captured and excluding clean stormwater runoff.)

The specific areas that should be paved and bunded include:

- the agitator washout area
- the truck washing area
- the concrete batching area
- any other area that may generate stormwater contaminated with cement dust or residues.

Wastewater capture and reuse

Contaminated stormwater and process wastewater should be captured and recycled by a system with the following specifications.

- The system's storage capacity must be sufficient to store the runoff from the bunded areas generated by 20 mm of rain.
- Water captured by the bunds should be diverted to a collection pit and then pumped to a storage tank for recycling.
- An outlet (overflow drain) in the bund, one metre upstream of the collection pit, should divert excess rainwater from the bunded area when the pit fills due to heavy rain (more than 20 mm of rain over 24 hours).
- Collection pits should contain a sloping sludge interceptor, to separate water and sediments. The sloping surface enables easy removal of sludge and sediments.
- Wastewater should be pumped from the collection pit to a recycling tank. The pit should have an primary pump triggered by a float switch and a backup pump which automatically activates if the primary fails.
- Collection pits should be provided with two visual alarms. The first should activate when the primary pump fails. The second should activate when water reaches the high level mark in the pit. Both alarms should activate warning devices on the operator's console.

Wastewater stored in the recycling tank needs to be reused at the ***earliest possible*** opportunity. This will restore the system's storage capacity, ready to deal with wastewater generated by the next rainfall event.

Many of the problems with wastewater management at batching plants have been caused by failure to recycle stored wastewater as quickly as possible. Uses for recycling tank water include concrete batching, spraying over stockpiles for dust control and washing out agitators.

If the water level exceeds the capacity of the recycling tank, the wastewater must be taken to a waste treater licensed by EPA for this type of waste.

As the wastewater system captures and recycles process water, wastewater must not be discharged from concrete batching plants in dry weather.

Runoff after heavy rainfall (more than 20 mm over 24 hours) contains very small quantities of wastes and is unlikely to pose a significant threat to the environment.

As specified in the *State Environment Protection Policy (Waters of Victoria)*, the pH of wet weather discharges must be in the range 6.0 to 9.0, and suspended solids must be less than 80 milligrams per litre.

Whenever wet weather discharges occur, they should be monitored for pH and suspended solids, and records retained. If unacceptable levels are found:

- an investigation should be carried out to determine the causes
- remedial actions should be identified and implemented.

Equipment and training should be provided, so that staff can carry out pH testing and take suspended solids samples for laboratory analysis (turbidity monitoring may also be used to provide an immediate indicator of discharge quality).

WATER QUALITY

Objective

To ensure contaminated wastewater is not discharged from the concrete batching plant to surface waters, groundwater or land.

Suggested measures

- Minimise the area of the site which generates contaminated stormwater runoff.
- Provide a separate dedicated drainage system to discharge clean stormwater from the site.
- Drain all contaminated stormwater and process wastewater to a collection pit for recycling.
- Regularly clean out solids that accumulate in the pit.
- The wastewater recycling system must be able to store the contaminated runoff generated by 20 mm of rain in 24 hours.
- Use wastewater stored in the recycling system at the earliest possible opportunity.
- There must be no dry weather wastewater discharges from the site.
- Monitor wet weather discharges for pH and suspended solids. Retain the records.

5.3 AIR QUALITY

Dust from cement, sand and aggregates is a pollutant. Fine dust particles can enter neighbouring premises and adversely affect amenity. Dust must be controlled so there are no significant emissions from the plant.

The following controls are consistent with those in Schedule F2 of the *State Environment Protection Policy (The Air Environment)*, but they include additional requirements which represent best practice.

Dust emission sources

Potential sources of dust pollution include:

- delivery of raw materials in trucks, trailers and tankers
- storage of raw materials in bunkers and stockpiles
- transfer of raw materials by front end loaders, conveyors, hoppers and agitators
- leakage or spillage of raw materials from silos, inspection covers and duct work.

The best way to avoid offsite dust problems is to prevent the release of the dust through good design and management techniques.

Ground pavement

The entire plant compound traversed by vehicles – including driveways leading into and out of the plant – should be paved with a hard, impervious material.

Unsealed surfaces should be protected with barriers to exclude vehicles. The pavement should be kept clean and dust-free. Spills and leaks must be contained and cleaned up immediately, before dust is generated.

Sand and aggregate stockpiles

Sand and aggregates should be delivered in a dampened state, using covered trucks. If the materials have dried out during transit they should be re-wetted before being dumped into the storage bunker.

Sand and aggregates should be stored in a hopper or bunker which shields the materials from winds. The bunker should enclose the stockpile on three sides. The walls should extend one metre above the height of the maximum quantity of raw material kept on site, and extend two metres beyond the front of the stockpile.

The hopper or bunker should be fitted with water sprays which keep the stored material damp at all times. Monitor the water content of the stockpile to ensure it is maintained in a damp condition.

If a combination of wall height and length coupled with water sprinklers is unable to contain the material, roofing and/or rubber entry curtains should be installed.

In-ground storage bunkers minimise dust emissions from stockpiles. Where these are filled by drive-over deliveries, the bunker should be shielded on two sides by shrouds or walls that are at least 0.5 metres high and extend the entire length of the bunker.

It is still essential to ensure the raw ingredients are damp on receipt and before they are delivered to the in-ground bunkers.

Overhead bins

Overhead storage bins should be totally enclosed. The swivel chute area and transfer point from the conveyor should also be enclosed.

Rubber curtain seals may be needed to protect the opening of the overhead bin from winds.

Conveyor belts and raw material transfer

Conveyor belts which are exposed to the wind and used for raw material transfer should be effectively enclosed, to ensure dust is not blown off the conveyor during transit.

Conveyor transfer points and hopper discharge areas should be fully enclosed. Double rubber curtain seals are recommended for transfer point outlets to prevent dust from raw materials escaping into the atmosphere.

Conveyor belts should be fitted with belt cleaners on the return side of the belt. It is important that any raw material collected by the belt cleaners is contained, so that dust is not discharged.

Aggregate weigh bins

Weigh hoppers at front end loader plants should be roofed and have weigh hoppers shrouded on three sides, to protect the contents from the wind. The raw materials transferred by the front end loader should be damp, as they are taken from a dampened stockpile.

Cement transfer and storage

Store cement in sealed, dust-tight storage silos. All hatches, inspection points and duct work should be dust-tight.

Cement should be delivered in sealed vehicles equipped for pneumatic transfer from the vehicle to the cement storage silo.

Any cement spills should be cleaned up as soon as they are detected.

Cement delivery

The silo feed pipe must be made of material able to withstand the effects of cement. The delivery pipes should be clearly labelled with the silo identification and material stored inside the silo. The silo delivery pipe should be kept locked at all times except when a delivery is in progress.

The infill pipe should be fitted with a fail-safe valve, which is 'tight shut-off', made of wear resistant materials, able to withstand high velocity product delivery. The valve should be located less than one metre above the fill point.

Silo over-fill protection

Silos should be equipped with a high level sensor alarm and an automatic delivery shut-down switch to prevent overfilling.

The high level alarm set point should be at a level which ensures the silo is not overfilled. The following points should be considered when setting the high level alarm:

- silo profile
- maximum fill rate
- the response time of the shut-down system
- volume of delivery vehicles.

An automatic shut-down switch should stop the flow of cement to the silo within 60 seconds of the high level alarm's activation.

Twin radio frequency probes are recommended for high level alarms. The silo over-fill protection system should incorporate a 30 minute reset time delay.

The high level alarm should be audible (or visual only, in areas sensitive to excess noise). There should be a test circuit to test the operation of the high level alarm sensor, which is tested before every delivery of cement to the silo.

Silo dust control

Cement dust emissions from the silo during filling operations must be minimised. The minimum acceptable performance is obtained using a fabric filter dust collector (FFDC). Equivalent or better performance using alternative dust control technology is acceptable.

Whichever technology is employed, it needs to be maintained properly, in accordance with the manufacture's instructions, to ensure adequate performance. A description of an adequate FFDC system follows.

Fabric filter dust collector (FFDC)

- The FFDC should be sized so that the dust collector bags are not subject to clogging. Install an appropriately sized multibag pulse jet filter in the silo, which is fitted and used in accordance with the manufacturer's recommendations. The cloth area of the filter must be adequate for the displaced air volume.
- The FFDC should be completely protected from the weather.
- The FFDC needs to be made of a material which can withstand continuous exposure to cement – such as polyester and polypropylene.
- The filter elements should be cleaned automatically at the end of the silo filling cycle. A source of high pressure, moisture- and oil-free air is required to operate the filters effectively.
- The FFDC should be able to withstand the maximum pressure differential which may be encountered. A differential pressure indicator should be fitted to an alarm to indicate bag filter pressure in excess of 1.0 kPa.
- Silos should be protected against internal pressures exceeding the design pressure. Positive type relief valves set at appropriate pressures should be installed. The relief valve should be ducted to a container on the ground, able to collect dust particles.
- The exhaust air from the silo filters should be ducted to a dust collection container on the ground. Confirm the exhaust discharge points are visible and monitored by the driver during silo filling operations. If dust is discharged from the duct work, the driver must immediately stop filling the silo.
- Burst bag detectors should be installed in all batching plants. The burst bag detector should be connected to the automatic silo overfill protection circuit to stop the flow of cement if a filter bag bursts.
- The FFDC should be inspected at least once a week and any necessary repairs carried out immediately.

Silo discharge

Silo discharge is controlled by an on/off valve. The valve is generally fitted above the weigh hopper. The control valve should be open air sprung, to close on failure of air pressure or electric power. The control valve should be fitted before (upstream of) any flexible joints in the pipe line and as close as possible to the silo outlet point at the base of the silo cone. This ensures that product can be stopped if a flexible joint fails. All flexible connections between the silo and the weigh hoppers must be sleeved in metal.

Silo discharge emergency shut-down

A back-up discharge emergency shut-down valve should be installed to ensure the flow of cement can be stopped if an emergency – such as failure of a flexible joint or failure of the discharge valve – occurs. The emergency shut-down valve should be similar in location and design to the silo discharge valve.

The plant operator should be able to shut-down product discharge by using an override button located at the silo operation area and from inside the control room. The emergency shut-down valve should operate with the silo discharge control valve. The two systems working in tandem provide extra security from accidental product discharge.

Cement weigh hoppers

Dust control

- Totally enclose the cement weigh hopper, to ensure that dust cannot escape to the atmosphere.
- The weigh hopper should be fitted with a dedicated FFDC, or equivalent dust control device, of similar design and specification to the dust control device installed to the silo.

Overfill protection

- Protect the weigh hopper against overfill by installing a radio frequency type high level alarm probe at the top of the hopper.
- The alarm should automatically shut-down the product delivery system to the weigh hopper.

Agitator loading bay

The load point must be fitted with either a:

- telescopic chute (preferred) or
- flexible sleeve.

The chute or sleeve needs to be long enough to enter agitator hatches. A flexible sleeve should be made of material capable of withstanding continuous exposure to concrete ingredients such as cement slurries and abrasive aggregates.

There must be no significant emission of dust particles from the load point. This can be achieved by installing water sprays in the perimeter of the load point, set to start automatically whenever a batch is discharged. Alternatively, an effective dust extraction system can be fitted to the load point.

Ensure the loading bay is roofed and enclosed on at least two sides. Flexible doors should be fitted to the open sides of the loading bay. A drive-through type bay with flexible doors at the entrance and exit is recommended.

It is important to ensure there is no leakage or spillage of cement during either the filling or dispensing of cement from the silo. Any cement product that escapes during the filling process must be cleaned up immediately.

Inspection program

An inspection of all dust control components should be performed routinely – for example, at least weekly. This will help identify any potential problems before a leak or spill occurs. The use of a checklist including the suggested requirements of this guide may be useful. Appendix 1 shows a checklist that can be used as the basis for the inspection.

Alternative technology

As previously noted, Schedule F2 of the *State Environment Protection Policy (The Air Environment)* sets out emission controls for concrete batching plants. However, the Policy allows EPA to exempt sites from compliance with Schedule F, subject to ambient objectives being met.

The Policy identifies the following matters as being relevant when considering exemptions:

- compliance with Schedule F would increase or create waste disposal problems
- compliance would preclude the use of energy saving technology or innovative controls
- compliance cannot be achieved by reasonably available technology
- maximum ground level concentrations will not be exceeded and the discharge will not adversely affect any beneficial use of the environment.

When considering an exemption, EPA will look at how effectively the proposed alternative technology will control emissions compared with the controls set out in Schedule F2.

AIR QUALITY

Objective

To avoid or substantially reduce dust emissions so there is no loss of amenity.

Suggested measures

- Keep sand and aggregates damp.
- Cover or enclose conveyor belts and hoppers.
- Keep pavements and surfaces clean.
- Fit cement silos with high level alarms, multibag pulse jet filters, airtight inspection hatches and automatic cutoff switches on the filler lines.
- Keep duct work airtight.
- Enclose the loading bay.
- Develop and implement an inspection regime for all dust control components.
- Clean up spills immediately.

5.4 NOISE EMISSIONS

Noise is a form of pollution and a potential source of conflict between the operators of a concrete batching plant and the local community. Noise emitted from a concrete batching plant must be managed as carefully as other discharges from the site. Batching plants in the Melbourne metropolitan area must comply with the *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*.

Because of the potential for noise to affect residential amenity, management should give high priority to liaising with the local community so that it can be aware of, and resolve, noise issues.

Definition of noise

Noise is unwanted sound. The disturbing effects of noise depend on the level of the noise and its character – such as tones, intermittency, and so on. Higher frequency tones are more disturbing than lower frequency tones, but lower frequency tones are not easily controlled and can penetrate buildings, such as houses. Noise can cause stress in both employees and neighbours of the plant.

Sound levels are measured in units of decibels, dB(A). The 'A' weighting of a measured sound level approximates how the human ear perceives sound. If a sound is intensified by 10 dB(A), human ears would perceive the sound to have doubled in loudness.

Noise sources at concrete batching plants

Major noise sources at batching plants include:

- truck and front end loader engine noise
- hydraulic pumps
- aggregate delivery to bunkers and hoppers
- conveyor belts
- air valves
- truck air brakes
- filters
- alarms
- amplified telephones
- public address system
- compressors
- swinging, scraping, loading devices
- opening and closing gates
- radios
- reverse warning devices.

Noise mitigation measures

Noise abatement can often be achieved by relatively simple measures such as:

- locating noisy equipment away from potential sources of conflict
- locating noisy equipment behind sound barriers or sound absorbers – for example, gravel stockpiles or constructed barriers
- using self cleaning weigh hoppers
- enclosing compressors and pumps
- fitting silencing devices to all pressure operated equipment
- lining hoppers with a sound absorbing material such as rubber
- sealing roads and plant site with concrete or bitumen
- positioning access and exit points away from noise sensitive areas
- fitting efficient muffling devices to all engines
- using visual alarms in preference to audible alarms
- using a personal paging service instead of hooters to gain attention of staff
- relocating sirens to face away from residences
- weighing fine aggregates before coarse aggregates
- ensuring that maintenance is conducted in enclosed sheds, away from sources of conflict
- ensuring an adequate buffer is kept between the plant and neighbours
- erecting screens and barriers to reduce noise transmission
- storing aggregates below ground level where possible
- limiting operations to between 7.00am and 6.00pm Monday to Friday, and 7.00am and 1.00pm on Saturday if other noise mitigation measures are inadequate.

Where noise abatement requires more detailed analysis and control, an acoustic consultant should be used.

Table 1: Typical noise limits for various types of land uses

Land use	Noise limits dB(A)		
	M-F 7am-6pm* Sat 7am-1pm*	**All nights 10pm-7am**	**All other times**
Quiet rural areas	45	32	37
Mainly residential	50-54	39-43	44-48
Residential, commercial and industrial	54-59	39-43	48-52
Commercial and industrial	56-59	47-52	58-52
Industrial	63-68	52-56	57-61

* Excludes public holidays.

NOISE

Objective

To ensure no noise nuisance results from the facility.

Suggested measures

- Liaise with the local community to identify noise issues.
- Select quieter equipment.
- Alter or enclose equipment to reduce noise at the source.
- Use sound absorbing materials to prevent the spread of noise by isolating the source.
- Ensure hooters are used for emergencies only.
- Avoid public address systems for paging staff.

5.5 SOLID WASTES

The main solid waste generated by batching plants is waste concrete. Waste minimisation is the preferred approach to dealing with this problem. Careful matching of orders with production could minimise the need to return unused concrete to the batching plant.

It may be possible to use waste concrete for construction purposes at the batching plant. If this is not possible, direct the waste concrete to a fully enclosed pit where it can be dried and collected. It should then be reused, or taken to a recycling facility or licensed landfill site. Producers should satisfy themselves the reuse of such wastes avoids adverse environmental impacts – for example, any reuse as a road base or other beneficial use must avoid situations where there can be significant runoff.

Concrete agitator mixers and chutes must not be rinsed out to the stormwater system or roadways. It may be possible to add water and agitate the mixer during the return trip to the plant – making cleaning easier and enabling excess material to be reused.

It is recommended the driver of the agitator mixer obtain a signature from the purchaser declaring the amount of concrete received. This can be compared with the batch amount originally delivered. All concrete should be accounted for, to ensure proper disposal of the waste product.

Aluminium cans, glass bottles, paper, other office waste and packaging materials such as plastic and cardboard should be considered in the waste minimisation program. Recycling of these materials is part of best practice.

SOLID WASTE REDUCTION

Objective

To minimise solid waste generation and to reuse/recycle wherever possible.

Suggested measures

- Investigate ways to minimise the generation of waste concrete.
- Investigate ways to recycle excess material from agitators.
- Include solid waste streams in the WMP.
- Establish recycling programs for aluminium cans, glass bottles, packaging materials, cardboard and office paper.

6 ENVIRONMENTAL MANAGEMENT

A concrete batching plant must be well managed if it is to achieve consistently sound environmental performance. This is best done by an environmental management system (EMS), which is part of best practice.

6.1 ELEMENTS OF AN EMS

An EMS can be part of a wider quality management system. The EMS and (if applicable) the quality management system may use the International Standards ISO 14001 and ISO 9001 respectively, as guides to good management systems.

Key elements of an EMS are outlined below.

Management commitment

It is essential that senior management demonstrates its commitment to an environmental policy and that the policy is communicated to all staff. The policy should contain clear objectives detailing what the policy aims to achieve. The policy must be evaluated and reviewed regularly.

Environmental review and improvement plan

A thorough review of the plant's environmental impacts should be carried out. A plan – which includes specific objectives and targets – to reduce impacts can then be prepared.

Use *Section 5* as a guide to the range of environmental impacts associated with batching plants and ways to reduce them. *Appendix 1* sets out a checklist which can be used during the review.

Mechanisms to implement improvements

The management system should address responsibilities, communication processes, document control and operational procedures.

A manager at the plant should have the skills, authority and accountability to deal with environmental issues.

Maintenance and monitoring

Systems should be established to regularly maintain operations, and to monitor and review environmental performance. This should include the following.

Water quality

- Bund integrity
- Efficiency of the pumps in the collection pit
- Operation of the warning devices and alarms in the collection pit
- Confirm the collection pit is maintained to ensure adequate capacity is available when rain falls
- Check there is no dry weather flow to storm water
- pH and suspended solids are monitored and recorded during offsite discharges

Air quality

- Aggregates and sand are kept damp
- Pavements and other surfaces are not dust sources
- Warning devices and alarms systems are operating correctly
- Dust control devices are properly maintained and working correctly
- Duct work is airtight

Noise emissions

- Monitor noise impact on the neighbourhood.
- Maintain equipment.

System reviews

The EMS should be regularly reviewed to verify performance and identify areas for improvement.

Commitment to continuous improvement

The principle of continuous improvement is an integral part of good environmental management.

The development and implementation of an EMS is an essential part of best practice. Larger companies which operate a number of sites can develop a company-wide EMS which applies to all sites.

6.2 COMMUNITY LIAISON

A well managed facility should have an open attitude to the community. Industry should establish mechanisms and procedures to liaise with the community on a continuing basis. The scale of this liaison should reflect the impact of the site, the proximity of sensitive land uses and the level of community interest.

A key part of sound community liaison is an effective system to respond to complaints. It is important to document each complaint. The proforma in *Appendix 2* can be used.

The document should include the name and address of the complainant, time and date of the incident. The document must clearly state the problem or complaint, the outcome of the resulting investigation, solutions to the problem and the name of the person dealing with the complaint.

ENVIRONMENTAL MANAGEMENT

Objective

To achieve a consistently high level of environmental performance by good management of the operation.

Suggested measures

- Obtain a commitment to sound environmental management from senior company staff.
- Have an EMS.
- Carry out regular environmental audits which extend to all activities at the site.
- Establish mechanisms for continuing liaison with the community.

APPENDIX 1: ENVIRONMENTAL PERFORMANCE CHECKLIST FOR CONCRETE BATCHING PLANTS

SITING OF THE PLANT

Issue	Requirement
Buffer zone	At least 100 metre buffer between plant and residential zone.
Groundwater	No shallow groundwater in the plant's vicinity.
Winds	Bunkers located out of prevailing winds.
Access	Plant access minimises potential impacts on amenity.
Amenity	Batching plant does not detract from local amenity.

WATER QUALITY

Issue	Requirement
Paving	All working areas are paved in hard non-porous surface.
Bunding	Bunding is able to contain runoff.
Collection pit and recycle tank	Primary and secondary pumps fitted to collection pit.
	Excess water pumped to recycle tank.
	Collection pit empty of water, sand and gravel.
	Level controls working properly.
	Recycle tank large enough to store runoff from 20 mm rainfall event.
Monitoring offsite discharges	Visual alarms on console – to indicate when water is discharged from site – are installed and operable
	pH of offsite wastewater discharges between 6.0 and 9.0.
	Suspended solids levels of wastewater discharges less than 80 mg/L.
Fuel and chemical storage	Chemicals and fuels are stored in a dedicated and adequately protected store.
	Bund around the storage facility is adequate.
	Material Safety Data Sheet available for all chemicals.
	Underground storage tanks tested in accordance with applicable Regulations.

AIR QUALITY

Issue	Requirement
Aggregates	Aggregates are damp at all times.
	Wind shields are in place and offer adequate protection from the wind.
Silos	Filler caps are clearly identified and capped.
	Filler cut-off valve is installed and operating.
	High level alarms are installed and operating.
	Adequate test circuit.
	Hatches are air-tight.
	Dipping points are air-tight.
	Filter vents and silo protection valves are ducted to a ground level collection point.
	Cement discharge valves have fail-safe actuators.
	Flexible joints downstream of valves.
Conveyors	Conveyors covered and protected from winds.
	Transfer points fully enclosed.
	Conveyor spillage control provided.
	Conveyors fitted with belt cleaners.
Filters	Filter system in correct operating condition (service and maintenance records complete).
Weigh hoppers	Separate filters on cement silo and weigh hoppers.
	Overfill protection installed and operational.
Emergency shut-down	Emergency shut-down system operates from console and silo delivery point.
Loading bay	Loading bay is enclosed.

NOISE EMISSIONS

Issue	Requirement
Process equipment	Noisy equipment fitted with suitable enclosures.
	No excess noise emissions apparent.
Warning devices	No excess noise emissions apparent.

SOLID WASTE MANAGEMENT

Issue	Requirement
Waste concrete	All concrete wastes should be returned to the plant.
	Concrete waste return and disposal are monitored and documented.
	Waste concrete is reclaimed or recycled.
	Wastes disposed in storage pit, dried, then removed for recycling or to a licensed landfill.

ENVIRONMENTAL MANAGEMENT

Issue	Requirement
Waste minimisation	WMP developed and implemented.
EMS	Environmental policy developed and widely disseminated to staff.
	EMS developed, implemented and continuously reviewed.
Community liaison	Complaints are recorded, investigated and the complainant is advised of the outcome.
	Mechanisms are in place for community liaison.

APPENDIX 2: ENVIRONMENTAL COMPLAINT OR INCIDENT REPORT

COMPANY NAME: .....

ENVIRONMENTAL INCIDENT OR COMPLAINT REPORT	**Report Nos:** .....
Location: ..... Date:	
Incident/Complaint Details:	
Reported by (PRINT): ..... Signed:	
Complainant Name:	
Telephone Nos:	
Address:	

Incident Ranking (indicate which applies (x))

(EPA notification required for Level 2 to 4; company to nominate officer)

Level 1	**Level 2**	**Level 3**	**Level 4**
• Minor incident. • No external activity required. • Instigate clean up as appropriate. • Complete report.	• External contact made (regulator or neighbour) – for example, dust, noise, water, pollution. • Verbally report details to a more senior officer of the company. • Complete report within two days.	• Clean up or potential costs to exceed $5,000. • Immediately report details verbally to a more senior officer of the company. • Complete this report within stipulated timeframe.	• Clean-up or potential costs to exceed $50,000. • Immediately report details verbally to a more senior officer of the company and CEO. • Await directions from those advised.

CORRECTIVE ACTION/S

Short Term: .....

.....

.....

Long Term: .....

.....

.....

VERIFICATION OF EFFECTIVENESS OF CORRECTIVE ACTION

Reporting Officer: ..... Date:

Senior Officer: ..... Date:

Environmental Officer: ..... Date:

REFERENCES

AS 3901/ISO 9001, *Quality Systems for Design, Development, Production, Installation and Servicing*

Guidelines for Preparation of Waste Management Plans, EPA Publication 383, August 1993

Guidelines for Preparing Waste Assessments – A Practical Guide Towards Cleaner Production, EPA Publication 277, October 1994

ISO 14001, *Environmental Management Systems – Specification with Guidance for Use*

Recommended Buffer Distances for Industrial Residual Air Emissions, EPA Publication AQ 2/86, July 1990

Technical Guidelines: Concrete Batching Plants, EPA Publication TG 204/91, September 1991

Waste Minimisation, Assessments and Opportunities for Industry, EPA Publication 351, July 1993

Industrial waste management policy

Industrial Waste Management Policy (Waste Minimisation) 1990.

State environment protection policies

State Environment Protection Policy (The Air Environment) (particularly Schedule F2).

State Environment Protection Policy (Groundwaters of Victoria)

State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade).

State Environment Protection Policy (The Waters of Victoria).

EPA Publication 628

Concrete in Practice

What, why & how?

NRMCA

CIP 15 - Chemical Admixtures for Concrete

WHAT are Admixtures?

Admixtures are natural or manufactured chemicals added to the concrete before or during mixing. The most often used chemical admixtures are air-entraining agents, water reducers, water-reducing retarders, and accelerators.

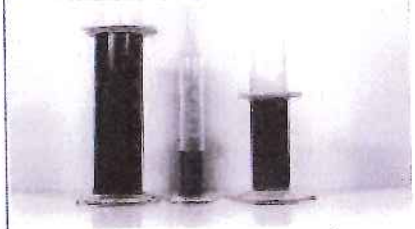
WHY Use Admixtures?

Admixtures are used to give special properties to fresh or hardened concrete. Admixtures may enhance the workability of fresh concrete and the durability strength of hardened concrete. Admixtures are used to overcome difficult construction situations, such as hot or cold weather placements, pumping requirements, early-age strength requirements, or specifications that require low water-cementitious materials ratio. Admixtures can be used to optimize the cementitious composition of concrete mixtures for performance and sustainability.

HOW to Use Admixtures?

Consult your ready mixed concrete supplier about admixture(s) appropriate for your application. Admixtures are evaluated for compatibility with cementitious materials, construction practices, job specifications and economic benefits before being used. Purchasers of ready mixed concrete should avoid requiring the use of specific brands or using products of their own accord.

Chemical Admixtures for Concrete



L to R: HRWR, Air-Entraining, Retarder
Relative quantities for one cu. yd.

Follow This Guide to Use Admixtures

1. **AIR-ENTRAINING ADMIXTURES** are liquid chemicals added when batching concrete to produce microscopic air bubbles, called entrained air, produced by the mixing action. These air bubbles improve the concrete's resistance to damage caused by exposure to cycles of freezing and thawing and deicing salt application. In fresh concrete entrained air improves workability and reduces bleeding and segregation. For exterior flatwork (parking lots, driveways, sidewalks, pool decks, patios) subject to freezing and thawing cycles, or in areas where deicer salts are used, an air content of 4% to 7% of the concrete volume is used depending on the size of coarse aggregate (see Table on next page). Air entrainment is not necessary for interior structural concrete since it is not subject to freezing and thawing. Entrained air should be avoided for concrete flatwork that will have a smooth troweled finish. In concretes with higher cementitious materials content, entrained air will reduce strength by about 5% for each 1% of air added; but in low cement content concretes, adding air has less effect and can reduce segregation and result in a modest increased strength due to the reduced water needed for required slump. Air entraining admixtures for use in concrete should meet the requirements of ASTM C260, *Specification for Air-Entraining Admixtures for Concrete*.

2. **WATER REDUCERS** are used for two different purposes: (1) to lower the water content in fresh concrete and so increase its strength, (2) to obtain higher slump without adding additional water. Water-reducers reduce the required water content of a concrete mixture for a target slump. These admixtures disperse the cement particles in concrete and make more efficient use of cement. This increases strength or allows the use of less cement to achieve a similar strength. Water-reducers are useful for pumping concrete and in hot weather, to offset the increased water demand. Some water-reducers may cause an increased rate of slump loss with time. Water-reducers should meet the requirements for Type A in ASTM C 494 *Specification for Chemical Admixtures for Concrete*.

   Mid-range water reducers are now commonly used and are used for a greater water reduction than typical water reducers. These admixtures are popular

as they improve the finishability of concrete flatwork. Mid-range water reducers must at least meet the requirements for Type A in ASTM C494. There is separate classification for these products in ASTM C494.

3. **HIGH RANGE WATER REDUCERS (HRWR)** is a special class of water reducer. Often referred to as superplasticizers, HRWRs reduce the water content of a given concrete mixture between 12 and 40% to maintain the same slump. HRWRs are therefore used to increase strength and reduce permeability of concrete by reducing the water content in the mixture; greatly increase the slump to produce "flowing" concrete or self-consolidating concrete (CIP 39) by using less water. These admixtures are essential for producing high strength and high performance concretes that contain higher contents of cementitious materials and mixtures containing silica fume. Some HRWRs may cause a higher rate of slump loss with time. In some cases, HRWRs may be added at the jobsite in a controlled manner to provide the required slump for placement. HRWRs are covered by ASTM Specification C494, Types F and G, and Types 1 and 2 in ASTM C1017 *Specification for Chemical Admixtures for Use in Producing Flowing Concrete*.
4. **RETARDERS** are chemicals that delay the initial setting of concrete by an hour or more. Retarders are often used in hot weather to counter the rapid setting caused by high temperatures. For large jobs, or in hot weather, concrete with retarder allows more time for placing and finishing. Retarders are typically a component of water reducers. Retarders should meet the requirements for Type B or D in ASTM C494.
5. **ACCELERATORS** reduce the initial setting time of concrete and produces higher strength at early ages. Accelerators do not prevent concrete from freezing; rather, they speed up the setting to permit finishing concrete earlier; and increase the rate of strength gain, thereby making the concrete stronger to resist damage from freezing in cold weather. Accelerators are also used in fast track construction requiring early form removal, opening to traffic, or load application on structures. Liquid accelerators should conform to ASTM C494 Types C and E. There are two kinds of accelerating admixtures: chloride based and non-chloride based. Calcium chloride is a commonly used effective and economical accelerators, which is available in liquid or flake form. Calcium chloride must meet the requirements of ASTM D98. For non-reinforced concrete, calcium chloride can be used to a limit of 2% by the weight of the cement. Because of concerns with corrosion of reinforcing steel induced by chloride, lower limits on chlorides apply to reinforced concrete. Prestressed concrete and concrete with embedded aluminum or galvanized metal should not contain any chloride based materials because of the increased potential for corrosion of the embedded metal. Non-chloride based accelerators are used where there is concern of corrosion of embedded metals or reinforcement in concrete.

Besides these standard types of admixtures, there are products available for enhancing concrete properties for a wide variety of applications. Some of these products include: corrosion inhibitors, shrinkage reducing admixtures, anti-washout admixtures, hydration stabilizing or extended set retarding admixtures, admixtures to reduce potential for alkali aggregate reactivity, pumping aids, permeability reducing admixtures, workability retaining admixtures, rheology and viscosity modifying admixtures and a variety of colors and products that enhance the aesthetics of concrete. Consult with your local ready mixed concrete producer on admixture products that add value to your project.

Recommended Air Content in Concrete

Nominal max. aggregate size, (Min)		Air Content, percent	
		Moderate Exposure	Severe Exposure
9.5	(¾)	7.5	6
12.5	(½)	7	5.5
19.0	(¾)	6	5
25.0	(1)	6	4.5
37.5	(1½)	5.5	4.5

Moderate exposure - concrete in a cold climate will be only occasionally exposed to moisture prior to freezing and not exposed to deicing salt application

Severe exposure - concrete in cold climate will be continuously in contact with water prior to freezing or where deicing salts are used.

References

1. *ASTM C 260, C 494, C 1017, D 98*. ASTM International, West Conshohocken, PA, www.astm.org
2. *Chemical and Air-Entraining Admixtures for Concrete*. ACI Educational Bulletin, E4, American Concrete Institute, Farmington Hills, MI, www.concrete.org
3. *Chemical Admixtures for Concrete*. ACI 212.3R. American Concrete Institute, Farmington Hills, MI
4. *Building Code Requirements for Structural Concrete*. ACI 318, American Concrete Institute, Farmington Hills, MI
5. *Understanding Chloride Permanganate*. NRMCA Publication No. 173, NRMCA, Silver Spring, MD, www.nrmca.org
6. *Self Consolidating Concrete*. CIP 39, NRMCA Concrete in Practice Series, Silver Spring, MD, www.nrmca.org

1987, 1993, 2001, 2014

3D MAPPING SOLUTIONS

WOOLCOTT SURVEYS

EAST COAST SURVEYING

Date: 03/04/2019
Reference: P18-020

Paul Godier

Northern Midlands Council

By email: planning@nmc.tas.gov.au

Dear Paul

I write in response to representations received on application PLN-19-0034, development of a Concrete Batch Plant at 59 Raeburn Road, Breadalbane. We have read through the redacted submissions and want to provide a letter to both Council and representors clarifying a number of matters. After digesting concerns raised, we feel that aspects of the original application were not clearly emphasised. We therefore seek to provide further information which may assist both representors and the Northern Midlands Council in understanding the proposal.

Issues raised in representations could generally be broken down into a number of categories. We have examined each of these categories and provided further information on the application.

General Issue	Specific Concerns Raised	Response
Traffic	*The application states in section 1 that there will not be more than an additional 20 traffic movements per day whilst in section 4.2 it states there will not be more than 30 movements per day.*	Further clarification has been provided from the batch plant operators regarding traffic movements. The key points relating to traffic are as follows: • The Raeburn Road access onto Hobart road currently has in excess of 110 movements per day. This is made up of 23,000 movements per year from Raeburn Quarry, 20,000 movements per year from Gradco Quarry, and staff movements from both (approx. 5000 movements). • The batch plant operator has confirmed that 10 staff will be employed at the concrete batch plant. The original figure provided in the DA was misleading and confusing in that it included staff currently working at the quarry. The 10 new staff includes 6 concrete truck drivers, 2 lab technicians, and 2 batch plant workers.

LAUNCESTON
10 Goodman Crt,
Invermay
PO Box 593, Mowbray

ST HELENS
48 Cecilia St, St Helens
PO Box 430, St Helens TAS 7216
P 03 6376 1972

HOBART
Rear Studio, 132 Davey St,
Hobart TAS 7000
P 03 6227 7968

DEVONPORT
2 Piping Lane,
East Devonport TAS 7310
P 0428 349 479

ABN 15 808 360 064

<table>
<tr>
<td></td>
<td></td>
<td>

The establishment of the batch plant in this location ensures that truck and dog trailer combinations which would normally be carting material off site, will instead be carting it to the batch plant. The operator has provided the following figures, taking into consideration staff movements, sand/cement deliveries, as well as quarry truck movements which would be reduced:

<table>
<tr><td>Concrete Trucks</td><td>+2,166 per year</td></tr>
<tr><td>Cement Trucks</td><td>+108 per year</td></tr>
<tr><td>Less reduction in quarry trucks</td><td>-800 per year</td></tr>
<tr><td>Nett effect</td><td>+ 1,474 per year (av 6 per day)</td></tr>
</table>
The total impact from traffic, given the existing movements will be minimal. A nett increase in 6 vehicles per day on average is less then a 10% increase on what is existing, and therefore ensured the application did not require a traffic impact assessment. It is also noted that large quarry trucks will be replaced by smaller concrete trucks, which produce less noise and dust then the dog and trailer quarry trucks.
</td>
</tr>
<tr>
<td></td>
<td>Raeburn Road should be sealed</td>
<td>A key point which was missed in the original development application related to the sealing of Raeburn Road. The concrete batch plant operator is <u>committed to sealing Raeburn Road</u> from the proposed batch plant down to the Hobart road intersection. This will provide a significant benefit to adjoining owners in the near vicinity. This section is approximately 800+m and will ensure dust and noise are reduced from what is currently occurring along the road. Amenity of adjoining properties will be improved as a result sealing Raeburn Road.</td>
</tr>
</table>

		 *Figure 1 - Raeburn Road to be sealed.*
	Concerns regarding safety of School children waiting for bus	We understand that the children currently catch the bus on Hobart road which is a major arterial road. We assure the representor that the additional 6 movements a day as a result of the concrete plant would have a negligible impact compared to normal traffic flow along Hobart Road. If anything, the reduction in 800 quarry trucks per year as a result of the plant would improve safety by removing larger trucks from the road network.
Hours of Operation	*Concerns regarding references to 24/7 operation.*	Further clarification is provided in relation to this reference. The application notes that the batch plant will be 24/7 operation. What should be have been emphasised more in the original DA, is that the batch plant will generally only operate between 5:00am and 5:00pm. The batch plant will service the concrete industry and not the quarry industry. Concrete is generally sought after in the morning for concreting jobs. It is within these timeframes that concrete is generally required. The **ONLY** reason for including the reference to 24/7 was so that emergency scenarios could be permitted without further approval. There are times when TasWater, The Launceston Airport etc require a delivery of concrete through the night to rectify an emergency situation. It is in this instance that the Concrete would need to be collected. It is expected that the batch plant would have similar operating hours to other plants around the greater Launceston area.

		The batch plant at Rocherlea is currently required to give all nearby residents (which are directly across the road) 24-hour notice when a late-night concrete delivery is needed. The operators find this difficult, as it is completely unknown as to when such a scenario would arise. Most batch plants around the country currently do not require permissions to ensure a late night pick up could occur. The operators are keen to be able to do such pickups without the consent of Council. If Council saw fit, a condition could be placed on the permit which reflected that regular hours (5:00am – 5:00pm) be adhered to, however that one off pick ups be allowed for exceptional scenarios. The operators want to emphasise that the plant **will not** be operating through the night, and will only have pickups occurring on site should an emergency situation arise.
Classification of Use	*A concrete Batch Plant as defined in the Environmental Management and Pollution Control Act 1994 is:* *Cement Works: the conduct of works for the use of argillaceous and calcareous materials in the production of cement clinker or the grinding of cement clinker.*	The proposed development is for a concrete batch plant, which includes the mixing of ingredients prior to distribution. It is not a cement works. The process does not include the production of cement clinker or the grinding of cement clinker. The operator also noted some inaccuracy in a representors understanding of concrete ingredients. For clarification please refer to below Concrete is produced by combining 1) Crushed stone - nominal 1000kg's per m3 2) Quarry sand - nominal 400kg's per m3 3) Fine sand (imported) – nominal 450kg's per m3 4) Cement (imported) – nominal 250kg per m3 5) Water – nominal 200litres per m3 6) Admixtures – nominal 1.5litres per m3. Therefore, the quarry ingredients represents 78% of the aggregates used in the mix The imported fine sand (22% of aggregate) has not been included in the count for truck movements because the trucks delivering sand will almost certainly leave the site with a load of quarry product to be delivered (already included in truck count for quarry).

		Cement is delivered to the site in sealed tankers. The cement is blown into sealed silos. Air vented from the silo passes through a filter to eliminate any cement dust escaping. The silos feed cement into a sealed weigh hopper which discharges into the back of the concrete trucks via a tube. Cement dust release to the atmosphere is eliminated due to the engineering and process controls. Admixtures are delivered to site in tank tainers and decanted into site storage tanks. The admixture is then pumped via a meter direct into the concrete trucks. All onsite storage is contained within a bunded area to avoid spillage. Sound engineering and processes prevent any uncontrolled spillage of these materials. The EPA was contacted prior to submission and asked to confirm whether EPA involvement was needed. They confirmed that it was not. Correspondence confirming this fact was provided to the Council.
	Concrete batch plant should be classified as Manufacturing and Processing under the Scheme, which is a prohibited use within the Rural Resource Zone.	• The proposed concrete batch plant will be directly associated with the quarry, aiming at increasing the productivity of the finished product produced by quarry. As noted above, material from the quarry represents 78% of the concrete mix. The placement of the concrete batch plant next to the existing quarry is a logical step in reducing costs and impacts of carting material (i.e. Lesly Vale Quarry/Batch Plant). The batch plant relies on the crushed rock being produced by the quarry in order to operate. In accordance with clause 8.2.2 of the Northern Midlands Planning Scheme, the operation is seen as being directly associated with and subservient to the extractive industries use onsite and can therefore be classified into the same use. This aspect was discussed with Council prior to the lodging of the development application. • Clause 26.1.2 - Local Area Objectives states that: *Processing and services can augment the productivity of primary industries in a locality*

		and are supported where they are related to primary industry uses and the long-term sustainability of the resource is not unduly compromised. It is clear that the proposal will not only increase the productivity but also reduce the transport cost of the finished product. Therefore, it meets the Local Area Objectives as outlined above.
	Given the concrete batch plant is ancillary to the quarry, which is a Level 2 Activity, it is only reasonable that the use status afforded to the Extractive Industry is discretionary.	A Concrete batch plant is specifically excluded from the Level 2 Activity by definition as set out in the *Environmental Management and Pollution Control Act 1994*. Therefore, the proposed use is classified as Extractive Industries AND is not A Level 2 Activity. Such use class is a Permitted use under the Clause 26.2 of the Scheme.
	Concrete batch plant is not suitable for quiet country residential area of Breadalbane.	The site is zoned as Rural Resource, with Extractive Industries (when not for a level 2 activity) listed as a permitted use under the Scheme. The existing quarry currently has a lease which allows for expansion into the area proposed for the batch plant. Should the concrete batch plant not go ahead, expansion of the quarry into this area would likely occur, arguably having more of an impact on nearby properties then the proposed concrete batch plant.
Impact on nearby properties amenity	*The operation of concrete batch will generate dust.*	The establishment of a concrete batch plant will arguably improve amenity to nearby properties. The subject site will be completely sealed, ensuring there is no dust as a result of vehicle movements. This is on top of the developer's commitment to seal Raeburn road down to Hobart Road. As stated previously, cement is delivered to the site in sealed tankers. The cement is blown into sealed silos. Air vented from the silo passes through a filter to eliminate any cement dust escaping. The silos feed cement into a sealed weigh hopper which discharges into the back of the concrete trucks via a tube. Cement

		dust release to the atmosphere is eliminated due to the engineering and process controls. The only dust generation would come from trucks travelling on the gravel road, which would be removed as a result of sealing the road. Council will monitor the site, and has the ability under the Environmental Management and Pollution Control Act to respond should any issue arise. Attention is drawn to the existing Rocherlea Concrete Batching Plant which currently operates directly opposite a residential area. The Rocherlea plant is far closer to sensitive uses then the proposed Breadalbane Plant and has operated for many years without dust issues. Given the majority of this land is considered to be Rural Land with a nearby quarry, any additional dust impact as a result of the batch plant will be negligible. Attention is further drawn to the Boral Plant in Invermay. The site is nearby to Bunnings Warehouse, as well as a number of residents across the Tamar in Trevallyn. There is no history of noise or dust issues from the site.
	Visual Amenity	The application has not sought to imply that that the silos will be hidden from adjoining properties. References to vegetation being of a similar height related more to impacts on aircraft associated with the airports code. The 9.6m silos will be partially screened as a result of 5.5m landscaped bund which surrounds the site. The bund will also contain plantings along the top, which will further soften the visual impact. The intent was never to fully screen the development, but rather to reduce any visual impact which nearby properties may experience. The operators would be open to discuss the landscaping in more detail if required.
	Noise Impact	Impacts associated with noise have been considered. The key points of this submission are to confirm that: • There will be approximately 800 less truck and trailer movements from the quarry each year on Raeburn road.

		• Concrete trucks will be significantly smaller then the existing truck/trailers using the road. As such, they will be quieter and will produce less dust as they are completely contained. • Raeburn road will be sealed should the batch plant go ahead. This would reduce noise of both existing trucks and concrete trucks using the road. • The concrete batch plant would not be operating through the night. It would simply have the ability to provide concrete should such demands arise out of normal hours. Normal hours would generally be 5am to 5pm.
Water	*The application does nothing to describe how water will be used on the site.*	A water line will be provided to the subject site as shown on the plans. The application has been referred to TasWater who have undertaken an assessment. TasWater conditions would likely be imposed on any planning permit issued.
Light impact	*The proposal obstacles to aircraft potentially causing a hazard to landing approach and take-off of aircraft.*	The application has been referred to the Launceston Airport who did not make objections known to the applicant or request any further information. The Airport was consulted with prior to the submission of the application and raised no concerns at that time.
North Esk irrigation district	*Provide information showing the environmental impacts of highly alkaline water produced from the plant, given the site falls within North Esk irrigation district.*	The operation will comply with relevant Regulations and Standards. The proposal, together with the existing quarry only occupy a small portion of the site. The majority of the site can still be used for grazing purposes, which will not reduce the current and future irrigation potential of the land. It should be noted that the site has a current mining lease, with the quarry operating for over 30 years. The quarry DA was approved and remains current. A Concrete batch plant was proposed on site many years ago but was never constructed. It therefore complies with the objectives and requirements of the scheme, and is consistent with the original intent for the site.

In conclusion, we feel that this letter provides greater clarification and surety to both Council and nearby property owners that the proposed concrete batch plant will not detrimentally impact on their existing lifestyle. The key points this submission have sought to elaborate on include:

- Raeburn Road will be sealed. Reducing dust and noise for all vehicles using it.
- There will be 800 less quarry truck and trailer movements on both Hobart and Raeburn road. The concrete trucks will be smaller and result in less emissions, including noise.
- The concrete batch plant will not operate throughout the night. The intent of mentioning 24/7 operations was to ensure that should an emergency situation arise, concrete could be collected outside of normal hours.
- Should the batch plant not proceed, the quarry will likely extend into this part of the land as has been previously approved. This would involve 5 x 15m benches under existing mining lease 1874PM (see below image). The impact of the quarry expansion would be expected to have a far greater impact through blasting and excavation then the proposed concrete batch plant.

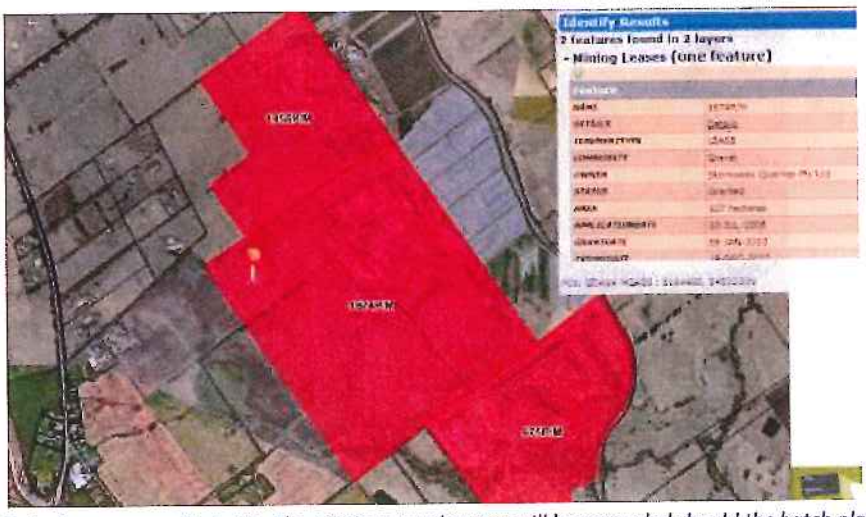


Figure 2 - Mining lease over subject site. The existing gravel quarry will be expanded should the batch plant not proceed.

We trust this information addresses many of the issues raised throughout the public exhibition process and welcome any further questions Council may have.

Kind regards
Woolcott Surveys

James Stewart
Town Planner

LAUNCESTON
10 Goodman Crt,
Invermay
PO Box 593, Mowbray

ST HELENS
48 Cecilia St, St Helens
PO Box 430, St Helens TAS 7216
P 03 6376 1972

HOBART
Rear Studio, 132 Davey St,
Hobart TAS 7000
P 03 6227 7968

DEVONPORT
2 Piping Lane,
East Devonport TAS 7310
P 0428 349 479

ABN 15 808 360 064