# VOLUME 2 ENVIRONMENTAL ASSESSMENT SANDSTONE RECYCLING FACILITY LOT 1, DP 88087 and LOT B, DP 376646 No.2 ALBERT STREET St PETERS

24 September 2012

Prepared by:
Nexus Environmental Planning Pty Ltd
Suite 29, 103 Majors Bay Road
PO Box 212
CONCORD NSW 2137
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# Appendix 1



OFFICIAL COMMUNICATIONS SHOULD BE ADDRESSED TO THE TOWN CLERK, SOUTH STONEY CITY COUNCIL P.O. 80x 103, BEACOMERIELA N.S.W. 2014

F6/281-11

# THE COUNCIL OF THE CITY OF SOUTH SYDNEY

ADMINISTRATIVE OFFICES: 140 JOYNTON AVENUE, ZETLAND 2017

TELEPHONE: (02) 313 0111 FACSBILE: (02) 662 6965

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

P/N 2410

NOTICE TO APPLICANT OF DETERMINATION OF A DEVELOPMENT APPLICATION

To: Road Transport Authority

of PO Box 198 Haymarket 2000

being the owner in respect of a development application for -

1 WOODLEY STREET, ALEXANDRIA

Pursuant to Section 92 of the Act notice is hereby given of the determination by the consent authority of the development application No. U90 00211.

The development application has been determined by granting of consent subject to the conditions specified in this notice.

The conditions of the consent are as set out in the resolution attached dated 12 December 1990

The reasons for the imposition of the conditions are as set out in the resolution attached dated 12 December 1990

Endorsement of date of consent:- 12 December 1990

#### NOTES:

- (1) To ascertain the date upon which the consent becomes effective refer to Section 93 of the Act.
- (2) To ascertain the extent to which the consent is liable to lapse refer to Section 99 of the Act.
- (3) Section 97 of the Act confers on an applicant who is dissatisfied with the determination of a consent authority a right of appeal to the Land and Environment Court exercisable within 12 months after receipt of this notice.

Date: 31 December 1990

Signature on behalf of consent authority



#### NOTES:

- 1. This development consent does not remove the need to obtain any other statutory consent necessary under the Environmental Planning and Assessment Act, 1979, or any other Act. In particular, your attention is drawn to the necessity to lodge-
  - (a) a Building Application where the 'erection or alteration of a building is proposed;
  - (b) an application under Ordinance No. 55 of the Local Government Act, 1919, for licence for any sign.
- 2. It is to be noted that, if necessary, any requirements of the Director of Health and Community Services must be observed in respect of the use of the premises, including the licensing of the premises and the possible need to provide mechanical ventilation.

#### COUNCIL

#### 12 DECEMBER 1990

11.

PREMISES NO. 1 WOODLEY STREET, ALEXANDRIA (ALSO KHOWN AS NO. 2 ALBERT STREET, ST. PETERS) - PROPOSED CHANGE OF USE - DEVELOPMENT APPLICATION - CONTRIBUTION INCLUDED IN CONSENT (U90-00211)

- (A) That the Council as the responsible authority grants its consent to the application submitted by J.A. Bradshaw Pty Ltd with the authority of the Roads and Traffic Authority for permission to use the subject site for the stockpiling and grading of sandstone and road base materials and to carry out associated site works including fencing and landscaping, all in accordance with "E15 5156" and accompanying, plans, subject to the following conditions, namely:-
  - (1) That the use shall cease after a period of five years from the date of consent;

(The applicant is advised that a further application may be lodged before the expiration of this consent for Council's consideration of the continuation of the proposed use)

- (2) That pursuant to Section 94 of the Environmental Planning and Assessment Act, 1979, and in accordance with Council's Development Contribution Policy, the development has been assessed as requiring the payment of a contribution of \$34,446 towards the construction and maintenance of roadworks in the locality, currently at the rate of \$200 per 100m<sup>2</sup> site area.
- (3) That a minimum of two off-street car parking spaces shall be provided and, except where elsewhere stipulated, each space shall be a minimum of 5.4m x 2.6m, located, prepared and marked to the satisfaction of the Director of Planning and Building;
- (4) That parking shall be also provided on-site for the grader and for any trucks left at the premises;
- (5) That the hours of operation shall be restricted to between 6.30 a.m. to 5.00 p.m. Mondays to Fridays, and 7.00 a.m. to 4.00 p.m. Saturdays;
- (6) That no operations or vehicle movements shall occur on Sundays or public holidays;

- (7) That landscaping strips five metres and three metres wide shall be provided to the Albert Lane and Woodley Street frontages of the site respectively and shall be landscaped with quick growing and tall trees and plants (such as, acacias, hakeas, eucalptys salignus and the like;
- (8) That a plan for the landscaping of the site, including details of any subsoil drainage where landscaping is provided on a slab and any proposed security fencing, shall be lodged with the Director of Planning and Building for approval and the site shall be landscaped in accordance with the plan as so approved and be maintained at all times to the satisfaction of the Director of Planning and Building and the Director of Parks and Properties;
- (9) That a solid type fence (brick, colorbond steel or the like) a minimum of three metres high shall be erected behind the landscaping strips;
- (10) That the height of the stockpile shall not exceed the existing height being RL 21 metres AHD;
- (11) That the surface of the stockpiles shall be kept damp with water sprays or stabilised so as to minimise wind blown dust:
- (12) That the non-vegetated sections of the static faces of the stockpile shall be treated with a holding agent and seeded so as to create a "green" cover to the static faces of the stockpile;
- (13) That No. 1 Woodley Street shall be drained into the adjacent St. Peters waste disposal pit and that such discharge shall be in accordance with conditions to be agreed upon by the Council of the City of Sydney, Marrickville Municipal Council and the Council of the City of South Sydney;
- (14) That all vehicles shall be driven in a forward manner into and out of the site;
- (15) That the bitumen surface sealing of the site shall be to the satisfaction of the City Engineer;
- (16) That the wheel wash shall be drained to the adjacent St. Peters Waste Disposal site;
- (17) That the queueing of trucks in the public way adjoining the site shall be prohibited, and vehicles entering the site shall have right of way:
- (18) That the sealed trafficable areas, sealed roads and the public street adjacent to the premises shall be kept as far as practicable free of dust and dirt;

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- (19) That unsealed trafficable areas and unsealed roads shall be kept damp in order to minimise wind blown dust;
- (20) That all trucks carrying material to or from the site shall have their loads covered with tarpaulines or similar covers;
- (21) That a truck wheel wash shall be provided to prevent mud and dirt being deposited on the street;
- (22) That no vehicle washing shall occur on-site other than wheel washing;
- (23) That any contaminated stormwater or water spray runoff from the site shall be directed to settling basins before discharge to the stormwater drainage system;
- (24) That noise emissions from the site shall not exceed 5dBA above the background noise level;
- (25) That the power screen shall be located a minimum of 55 metres from the entrance to the site and shall only be operated between 9.00 a.m. and 5.00 p.m. on Mondays and Fridays;
- (26) That trucks shall not arrive at the site outside of the approved hours of operation;
- (27) That all loading and unloading operations shall be carried out wholly within the confines of the site, at all times;
- (28) That at all times the car parking spaces and driveway thereto shall be kept clear of goods and shall not be used for storage purposes including garbage storage;
- (29) That no garbage or industrial waste shall be placed on the public way, eg. footpaths, roadways, plazas, reserves, at any time;
- (30) That a separate application shall be submitted at the appropriate time for any proposed signs;
- (31) That a Building Application and plans, in accordance with Part 8 of Ordinance No. 70 of the Local Government Act, 1919 and incorporating the requirements in the conditions contained in this consent, shall be submitted to Council and no building work shall be commenced until that application and plans have been approved;

- (32) That building/demolition work in connection with the proposed development shall only be carried out between the hours of 7.30 a.m. and 5.00 p.m. on Mondays to Fridays, inclusive, and 7.30 a.m. and 3.00 p.m. on Saturdays and no work shall be carried out on Sundays or public holidays where applicable, these restrictions do not apply to the maintenance of site cranes nor to the use of mobile cranes which stand and operate from a public road, provided that a permit has been obtained from the City Engineer's Department for the use of a mobile crane;
- (33) That the building/demolition work shall comply with the Council's Code for the Control and Regulation of Noise on Building Sites and Australian Standard 2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites";
- (34) That the street numbers shall be clearly displayed to the satisfaction of the Director of Planning and Building with such numbers being of a colour contrasting with the wall to which they are affixed;
- (35) That full compliance shall be given to any requirement of the Director of Health and Community Services;
- (36) That any intruder alarm shall be fitted with a timing device in accordance with the requirements of Regulation 12A of the Noise Control Act, 1975, and Australian Standard 2201, Parts 1 and 2 - 1978, Intruder Alarm Systems;
- (37) That the installation of any machinery other than the power screen, the water cart and the rubber tyred loader shall require the approval of Council;
- (38) That the volume of the material stored on-site shall not exceed 50,000 cubic metres;
- (39) That a sign shall be erected adjacent to the exit driveway directing drivers not to use Albert Street or Albert Lane for access to or from the site;
- (40) That the applicant shall provide Council with written acceptance of all the conditions contained herein prior to the approval of the Building Application or, where no Building Application is required, prior to the use commencing.

The reason for the Council's consent being granted subject to the abovementioned conditions, is as follows:-

That the granting of unrestricted consent would be likely to cause injury to the amenity of the neighbourhood, including injury due to the emission of noise and vibrations and the creation of a traffic hazard and traffic congestion and, further would not be in the public interest.

- (B) That the persons who made representations regarding the proposal be advised of Council's decision.
- (C) That Marrickville Council and the Department of Planning be advised of Council's decision.

Carried.

TEL: (02) 335 2000 FAX: (02) 335 2029

POSTAL ADDRESS BOX 14, PETERSHAM 2049 DX3910 - ANNANDALF

ALL COMMUNICATIONS TO BE ADDRESSED TO THE GENERAL MANAGER



Administrative Centre Fisher Street Pelorsham 2049

COUNCIL'S REFERENCE: DO

D80.110 BSM:tac

YOUR REFERENCE:

22 August, 1996

Peter Wotton

Keown & Drummond Pty Limited Consulting Surveyors & Town Planners 371A Pitt Street SYDNEY 2000

Dear Sirs

# 2 ALBERT STREET, ST PETERS

The Council has considered your application under Section 102 of the Environmental Planning and Assessment Act to modify Development Consent No. 13498, (DA 657/95).

The Council resolved to APPROVE the application and to issue an amended Development Consent with 2 and 15 modified in the following manner:

- 2. The approval being limited to a period of ten (10) years expiring on 8th January, 2001. Reason: In view of the County Road proposal affecting the property.
- 15. The hours of operation being restricted to between the hours of 6.30 am to 5.00 pm Mondays to Fridays, and 7.00 am to 4.00 pm Saturdays, with no work being carried out on Sundays or Public Holidays, with no trucks arriving at the site outside the approved hours.

Reason: To ensure that the operation of the premises does not interfere with the amenity of the locality.

Please find <u>attached</u> a copy of the Development Consent 13498 as modified. The modified consent is now the consent in force under the Environmental Planning and Assessment Act as from the above date.

# 127 1

Under Section 102(5) of the Environmental Planning and Assessment Act you may appeal to the Land and Environment Court if you are dissatisfied with the Council's determination.

Yours faithfully

- Summer

CRMILLS & GENERAL MANAGER

encl

Enquiries: Mr James Lidis on 9335.2156

Ref: P13 tac0820 S1

TEL: (02) 335 2000 FAX: (02) 335 2029 POSTAL ADDRESS BOX 14, PETERSHAM 2049 DX3910 - ANNANDALE

ALL COMMUNICATIONS TO BE ADDRESSED TO THE GENERAL MANAGER



Administrative Centre Fisher Street Petersham 2049

COUNCIL'S REFERENCE

YOUR REFERENCE:

D0080.0110 BSM:tac

**MODIFIED DETERMINATION NO 13498** 

22 August, 1996

Keown & Drummond Pty Limited Consulting Surveyors & Town Planners 371A Pitt Street SYDNEY 2000

Dear

# ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 ("THE ACT") NOTICE OF DETERMINATION OF A DEVELOPMENT APPLICATION

Pursuant to Section 92 of the Act, notice is hereby given of the determination by the Council of **Development Application No DA 657/95** for the continued use of the land at 2 Albert Street St Peters for the stockpiling and grading of sandstone and road base material relating to property situated at:

## 2 ALBERT STREET, ST PETERS

In determining this application, the Council considered all matters listed under Section 90 of the Act that were relevant to the Development Application.

The Development Application was determined on 8 January, 1991 by the granting of CONSENT subject to the following conditions:

- 1. The development being carried out substantially in accordance with Plan No. 5156 EIS and details submitted to Council on 5th April, 1990 with the application for development approval and as amended by the following conditions. Reason: To confirm the details of the application as submitted by the applicant.
- 2. The approval being limited to a period of ten (10) years expiring on 8th January, 2001.

  Reason: In view of the County Road proposal affecting the property.
- 3. The volume of the material stored on site not exceeding 50,000 cubic metres.

  Reason: To confirm the terms of Council's approval.

4. A minimum of two (2) off-street car parking spaces being provided, paved, linemarked and maintained at all times to Council's satisfaction and in accordance with Council's standards prior to commencement of the use. Reason: To ensure practical off-street car parking is available for the use of the premises. 5. All parking spaces and turning area thereto being provided in accordance with the design requirements set out in Council's Off-Street Parking Code and being used exclusively for parking and not for storage or any other purpose.

Reason: To ensure adequate manoeuvrability to all car parking spaces and that the spaces are used exclusively for parking.

- 5. All parking spaces and turning area thereto being provided in accordance with the design requirements set out in Council's Off-Street Parking Code and being used exclusively for parking and not for storage or any other purpose.
  - Reason: To ensure adequate manoeuvrability to all car parking spaces and that the spaces are used exclusively for parking.
- 6. A plan for the landscaping of the site being submitted to, and approved by, Council within one (1) month of the date of this consent. Such plan to include landscape strips a minimum of 3m in width of dense planting around the Albert Street frontage of quick growing advanced tall trees and plants.

Reason: To ensure that trees and shrubs are planted in sufficient numbers and scale to enhance the appearance of the development.

- 7. The landscaping of the site being carried out within two (2) months of the date of this consent in accordance with the approved plan and being maintained at all times to Council's satisfaction.
  - Reason: To ensure adequate landscaping is maintained.
- 8. A solid type fence a minimum of 3.4 metres high being erected behind the landscaping strips. Details of such fencing being submitted to and approved by Council within one (1) month of the date of this consent with the fencing being erected in accordance with the approved details within a period of two (2) months from the date of this consent. Reason: To help screen the activity from the surrounding neighbourhood.
- The height of the stockpile not exceeding the exceeding height of RL 21 metres AHD.

  Reason: To ensure that the height of the stockpile is not increased.
- 10. All surfaces of the stockpiles being regularly and efficiently sprayed with water to keep such surfaces damp or all surfaces of the stockpiles being stabilised so as to minimise wind blown dust.
  - Reason: A To minimise wind blown dust from the stockpiles.
- 11. The non-vegetated sections of the static faces of the stockpile being treated with a holding agent and seeded so as to create a "Green" cover to the static faces of the stockpile.
  - Reason: To protect the amenity of the surrounding neighbourhood.
- 12. All vehicles entering and leaving the property in a forward direction with no queuing of vehicles being permitted on street.

  Reason: To reduce traffic hazard and congestion on the site and adjacent streets.

- The sealed trafficable areas, sealed roads and the public roads adjacent to the property being kept as far as practicable free of dust and dirt and all unsealed trafficable areas and unsealed roads being kept damp in order to minimise wind blown dust.

  Reason: To minimise wind blown dust.
- 14. All trucks carrying material to or from the site having their loads covered with tarpaulins or similar covers.

Reason: To ensure dust and other particles are not blown from vehicles associated with the use.

15. The hours of operation being restricted to between the hours of 6.30 am to 5.00 pm Mondays to Fridays, and 7.00 am to 4.00 pm Saturdays, with no work being carried out on Sundays or Public Holidays, with no trucks arriving at the site outside the approved hours.

Reason: To ensure that the operation of the premises does not interfere with the amenity of the locality.

16. The machinery to be installed on the premises being restricted to a power screen with watercart and a rubber tyred loader with no additional machinery being installed without the prior approval of Council.

Reason: To confirm the details of machinery as submitted with the application.

- 17. The power screen being located a minimum of 55 metres from the entrance to the site and only being operated between 9.00 a.m. and 5.00 p.m. Mondays and Fridays Reason: To lessen the impact of the proposal on the surrounding neighbourhood.
- 18. A truck wheel wash being provided within two (2) months of the date of this consent to prevent mud and dirt being deposited on the street with no vehicle washing occurring on-site other than wheel washing. Details of the wheel wash installation shall be submitted for approval of the Municipal Engineer within one (1) month of the date of this consent.

Reason: To ensure soil particles are not deposited onto adjacent streets.

- 19. Any contaminated stormwater or water spray runoff from the site being directed to settling basins before discharge to the stormwater drainage system.

  Reason: To protect the proposed drainage system.
- 20. The applicant is advised that Albert Street, St. Peters is subject to a load limit of 3 tonnes and all vehicles entering or leaving the site shall observe the load restrictions applying to Albert Street.

Reason: Albert Street is a light traffic thoroughfare with a weight limit of 3 tonnes.

21. All roof and surface stormwater from the site of the proposed development and any catchment external to the site that presently drains thereto, shall be collected in a system of pits pipelines/channels and major storm event surface flow paths and shall be discharged to the adjacent Sydney City Council's tip in a manner acceptable to the Sydney City Council's Engineer.

Reason: To provide for adequate site drainage.

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- 22. The applicant shall confirm the completion of an agreement between the applicant and the Sydney City Council whereby the latter permits stormwater runoff from the development to be discharged to the adjacent Sydney City Council's tip and then pumped to an alternative stormwater drainage system. Confirmation of this agreement shall be submitted to the Municipal Engineer prior to the issue of development consent. Reason: To ensure the applicant has permission to discharge stormwater into Sydney City Council's land.
- 23. Plans detailing the existing and proposed site drainage network including plans and longitudinal sections of pipeline, the location of pits, pipe invert and pit surface levels, junction details, size and class of pipes, trench conditions and details of surface flow paths together with hydrologic and hydraulic calculations that detail the drainage network hydraulic grade line and the capacities of the various surface flow regimes shall be submitted for the approval of the Municipal Engineer prior to the commencement of the drainage works. The drainage works so approved shall be completed within two (2) months from the date of development consent.

Reason: To enable the Municipal Engineer to assess the adequacy of the proposed site drainage.

- 24. The applicant shall provide details and plans of methods to be used to prevent the transportation of sediments by stormwater runoff from the site in accordance with the requirements of the State Pollution Control Commission and the Municipal Engineer.

  Reason: To protect the proposed drainage system and prevent the sedimentation of any receiving waters.
- 25. The existing vehicular washdown area is unsatisfactory and shall be modified to ensure that a minimal amount of soil particles is deposited on to adjacent streets by vehicles leaving the site. Details and plans of the proposed modifications including drainage details of the washdown area shall be submitted for the approval of the Municipal Engineer and the works so approved shall be completed within two (2) months from the date of development consent.

Reason: To ensure soil particles are not deposited onto adjacent streets by vehicles leaving the site.

26. Details of methods proposed to retain stockpiles onsite and prevent dust and other materials from being blown from the site including details of type and extent of sealing of the site shall be submitted to the Municipal Engineer for approval and the works so approved shall be completed within two (2) months from the date of the development consent.

Reason: To ensure dust and other particles are not blown from the site.

27. Detailed landscaping plans shall be submitted for the approval of the Municipal Engineer and the landscaping works so approved shall be completed within two (2) months from the date of development consent.

Reason: To ensure the proposed landscaping is in accordance with the requirements of the Municipal Engineer.

28. The applicant shall obtain development consent issued by the City of South Sydney in regard to this development.

Reason: To comply with all the requirements of the City of South Sydney.

- 29. The applicant shall comply with all the requirements of the State Pollution Control Commission (S.P.C.C.) in regard to pollution control measures.
  Reason: To control pollution from the site of the development.
- 30. Compliance with the requirements included in paragraphs 1(0, 2(h), 3(a) (e) (k) of the Standard Engineering Conditions, annexed hereto, all of which paragraphs shall be deemed to be included in, and form part of the Conditions attached to this consent.

  Reason: As per reasons specified in the Annexure.

This consent is effective and operates from 21 August, 1996. This consent will lapse unless the proposed development is commenced in accordance with Section 99 of the Act.

Under Section 97 of the Act you may, within twelve (12) months of receipt of this notice, appeal to the Land and Environment Court if you are dissatisfied with the Council's determination.

All conditions imposed by the Council must be observed. Breach of a condition is a breach of the Act and may also constitute an offence.

Please address any enquiries concerning this Consent to the Development and Environmental Services Division of Council.

Yours faithfully,

*a* .

GENERAL MANAGER

Endorsed Date of Consent: 21 August, 1996

Enquiries: Mr James Lidis on 9335.2156

Ref: P13 tac0820 S2

31 July 1996

Keown & Drummond Pty Ltd 371A Pitt Street SYDNEY NSW 2000



Christine Edney 9 288 5271 Kem Hawlers

Merichville Peter Wollon 9 335 2260

Our Ref U90-00211 Plan. 14556 DD/jm

Premises 1 Woodley Street, Alexandria-

Dear Sir

I refer to the application to vary the conditions imposed by Council when granting development consent to use the subject site for the stockpiling and grading of sandstone and road base materials and to carry out associated works including fencing and landscaping.

Arising from consideration of the application, Council at its meeting held on 24 July 1996, decided pursuant to Section 102 of the Environmental Planning and Assessment Act 1979, as amended, to modify the consent granted on 12 December 1990 only in so far as for the deletion of the following condition:

(1) That the use shall cease after a period of five years from the date of consent:

(The applicant is advised that a further application may be lodged before the expiration of this consent for Council's consideration of the continuation of the proposed use.)

and the insertion in lieu thereof of the following new condition set out hereunder:

(1) That the use shall cease after a period of ten years from the date of consent;

(The applicant is advised that a further application may be lodged before the expiration of this consent for Council's consideration of the continuation of the proposed use.)

In addition, you are advised that the Section 94 contribution of \$19,178 as required on 28 August 1991 must be paid within 90 days from the date of this modification.

The reason for Council granting consent, subject to the above conditions, is:-

Granting unconditional consent would be likely to adversely affect the amenity of the neighbourhood, including the emission of noise and vibration, overshadowing, privacy loss, streetscape qualities, heritage issues, traffic and parking congestion, and would not be in the public interest.

Date of consent: 12 December 1990

Yours sincerely

Dennis Davis
Executive Assistant

SEE NOTES ATTACHED

# Appendix 2



# Record of Minister's opinion for the purposes of Clause 6(1) of the State Environmental Planning Policy (Major Development) 2005

I, the Director, Mining & Industry Projects of the Department of Planning, as delegate of the Minister for Planning under delegation executed on 25 January 2010, have formed the opinion that the development described in the Schedule below, is development of a kind that is described in Schedule 1 of the State *Environmental Planning Policy (Major Development) 2005* – namely clause 27 "development for the purposes of resource recovery or recycling facilities that handle more than 75,000 tonnes per year of waste" - and is thus declared to be a project to which Part 3A of the *Environmental Planning and Assessment Act 1979* applies for the purpose of section 75B of that Act.

## Schedule

The St Peters Materials Recycling Project at 2 Albert Street, St Peters, which involves the processing of up to 150,000 tonnes of building and construction waste a year.

obkitto.

David Kitto

Director

Mining & Industry Projects

Date: 27 APRIL 2010

# Appendix 3



Contact: Andrew Hartcher Phone: 02 9228 6503 Fax: 02 9228 6466

Email: andrew.hartcher@planning.nsw.gov.au

Our ref: 10/09214

Mr Neil Kennan Consultant Nexus Environmental Planning Pty Ltd PO Box 212 CONCORD NSW 2137

Dear Mr Kennan

# St Peters Materials Recycling Facility Project (MP 11\_0086) Director-General's Requirements

The Department has received your application for the St Peters Materials Recycling Facility Project.

I have attached a copy of the Director-General's requirements for the project. These requirements have been prepared in consultation with the relevant agencies, based on the information you have provided to date. I have also attached a copy of the agencies' comments for your information.

Please note that the Director-General may alter these requirements at any time.

If your proposal is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth Environment Protection Biodiversity Conservation Act 1999 (EPBC Act). This approval is in addition to any approvals required under NSW legislation. It is your responsibility to contact the Department of and the Arts Canberra (6274 1111 Environment, Water, Heritage in http://www.environment.gov.au) to determine if the proposal requires an approval under the EPBC Act. If it is subsequently determined that an approval is required under the EPBC Act. please contact the Department immediately as supplementary Director-General's requirements may need to be issued.

I would appreciate it if you would contact the Department at least two weeks before you propose to submit your Environmental Assessment for the project. This will enable the Department to determine the:

- applicable fee (see Division 1A, Part 15 of the Environmental Planning and Assessment Regulation 2000);
- consultation and public exhibition arrangements; and
- number of copies (hard-copy and CD-ROM) of the Environmental Assessment that will be required for exhibition purposes.

Once it receives the Environmental Assessment, the Department will review it in consultation with the relevant agencies to determine if it adequately addresses the Director-General's requirements, and may require you to revise it prior to public exhibition.

The Department is required to make all the relevant information associated with the project publicly available on its website. Consequently, I would appreciate it if you would ensure that all the documents you subsequently submit to the Department are in a suitable format for the web, and arrange for an electronic version of the Environmental Assessment to be hosted on a suitable website.

If you have any enquiries about these requirements, please contact Andrew Hartcher on the details listed above.

Yours sincerely

Richard Pearson

**Deputy Director-General** 

**Development Assessment & Systems Performance** 

22/7/11

# **Director-General's Requirements**

Section 75F of the Environmental Planning and Assessment Act 1979

Application Number	11_0086
Project	The St Peters Materials Recycling Facility Project, which involves the construction and operation of a materials recycling facility that would process up to 150,000 tonnes of waste per annum.
Location	2 Albert Street, St Peters (Lot 1 DP 88087 and Lot B DP 376645) in the City of Sydney and Marrickville local government areas.
Proponent	Concrete Recyclers (Group) Pty Ltd
Date of Issue	July 2011
General Requirements  Key Issues	The Environmental Assessment of the project must include:  an executive summary;  a detailed description of the following within the site and any associated areas:  historical operations/activities; and  existing and approved operations/facilities, including any statutory approvals that apply to these operations and facilities.  a detailed description of the project, including the:  need for the project;  proposed modifications or upgrades to activities or infrastructure;  alternatives considered;  various components and stages of the project;  likely interactions between existing and proposed operations as well as the project and other land uses in the vicinity of the site; and  plans of any proposed building works;  a risk assessment of the potential environmental impacts of the project, identifying the key issues for further assessment;  a detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment (see above), which includes:  a description of the existing environment, using sufficient baseline data;  an assessment of the potential impacts of the project, including any cumulative impacts, taking into consideration any relevant guidelines, policies, plans and statutory provisions (see below);  a description of the measures that would be implemented to avoid, minimise, mitigate, rehabilitate/remediate, monitor and/or offset the potential impacts of the project, including detailed contingency plans for managing any significant risks to the environment;  a statement of commitments, outlining all the proposed environmental management and monitoring measures;  a conclusion justifying the project on economic, social and environmental grounds, taking into consideration whether the project is consistent with the objects of the Environmental Planning & Assessment Act 1979; and  a signed statement from the author of the Environmental Assessment, certifying that the information contained within the document is neither false nor misleading.
ney issues	<ul> <li>Waste Management – including a clear description of the activities which would be undertaken at the premises; source, quantity input rates and</li> </ul>

References	<ul> <li>Air Quality – including a quantitative assessment of the potential air quality impacts (particularly odour and dust) of the project at full capacity, particularly on any nearby sensitive receivers during construction and operation;</li> <li>Noise – including construction, operational, and traffic noise and vibration. This assessment shall consider the potential impacts of the proposal on any nearby sensitive receivers;</li> <li>Traffic and Access – including details of all traffic types and volumes likely to be generated; assessment of predicted impacts on road safety and the capacity of the road network to accommodate the project, in particular, the intersection of Campbell Street/Campbell Road and Albert Street/Barwon Park Road; and assessment of where off-site infrastructure works are required as a result of traffic impacts;</li> <li>Greenhouse Gas Emissions &amp; Energy Efficiency – including a comprehensive assessment of the potential scope 1, 2 and 3 greenhouse gas emissions of the project, and the potential impacts of these emissions on the environment; and a detailed description of the measures that would be implemented on site to ensure that the project is energy efficient;</li> <li>Hazards and Risk – including an assessment of the potential hazards and risks associated with the proposed project and risks to adjacent industries. A preliminary risk screening must be completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) and Applying SEPP 33 (DoP, 2011); and</li> <li>Cumulative Impacts – including potential cumulative impacts (particularly on air quality, noise and traffic) that may arise from the combined operation of the project, together with the operations within the broader context of St Peters.</li> <li>The environmental assessment of the key issues listed above must take into account relevant guidelines, policies, and plans. While not exhaustive, the following attachment contains a list of some of the</li></ul>
Consultation	plans that may be relevant to the environmental assessment of this project.  During the preparation of the Environmental Assessment, you should consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups or affected landowners.  In particular you must consult with the:  Office of Environment and Heritage; Roads and Traffic Authority; NSW Office of Water; City of Sydney Council; and Marrickville Council.  The consultation process and the issues raised during this process must be
Deemed Refusal Period	described in the Environmental Assessment.  60 days

# Policies, Guidelines and Plans

Aspect	Policy /Methodology
Risk Assessment	
	AS/NZS 4360:2004 Risk Management (Standards Australia)
	HB 203: 203:2006 Environmental Risk Management – Principles & Process (Standards Australia)
Waste	
	Waste Avoidance and Resource Recovery Strategy 2007 (DECC)
	Waste Classification Guidelines (DECC)
	Environmental Guidelines: Solid Waste Landfills 1996 (DECC)
	Environmental Guidelines: Composting and Related Organics Processing Facilities (2004)
	Composts, soil conditioners and mulches (Standards Australia, AS 4454)
	State Environmental Planning Policy (Infrastructure) 2007
Soil and Water	
Soil	Acid Sulfate Soil Manual (ASSMAC)
	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC & NHMRC)
	National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC)
	State Environmental Planning Policy No. 55 - Remediation of Land
	Managing Land Contamination - Planning Guidelines SEPP 55 – Remediation of Land (DUAP and EPA)
	Rural Land Capability Mapping
	Agricultural Land Classification
Surface Water	National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Guidelines for Sewerage Systems - Effluent Management (ARMCANZ/ANZECC)
	National Water Quality Management Strategy: Guidelines for Sewerage Systems - Use of Reclaimed Water (ARMCANZ/ANZECC)
	National Water Quality Management Strategy - Guidelines For Water Recycling: Managing Health And Environmental Risks (Phase1) (EPHC, NRMMC & AHMC)
	Using the ANZECC Guideline and Water Quality Objectives in NSW (DEC)
	National Water Quality Management Strategy - Guidelines For Water Recycling: Managing Health And Environmental Risks (Phase1) (EPHC, NRMMC & AHMC)
	Managing Urban Stormwater: Treatment Techniques (EPA)
	Managing Urban Stormwater: Source Control. Draft (EPA)
	Managing Urban Stormwater: Soils & Construction (Landcom)
	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC)
	NSW State Wetlands Management Policy (DWE)
	NSW State Floodplain Management Manual (DWE)
	NSW State Farm Dams Policy (DIPNR)

	Floodplain Risk Management Guideline: Practical Consideration of Climate Change (DECC)
	Technical Guidelines: Bunding & Spill Management (DECC)
	Environmental Guidelines: Use of Effluent by Irrigation (DECC)
	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)
	NSW State Groundwater Policy Framework Document (DLWC)
	NSW State Groundwater Quality Protection Policy (DLWC)
One con alcorate a	NSW State Groundwater Quantity Management Policy (DLWC)
Groundwater	NSW State Groundwater Dependent Ecosystem Policy(DLWC)
	Murray-Darling Basin Commission. Groundwater Flow Modelling Guideline (Aquaterra Consulting Pty Ltd)
	Guidelines for the Assessment and Management of Groundwater Contamination (DECC) Draft
Air Quality	
	Protection of the Environment Operations (Clean Air) Regulation 2002
	Approved Methods for the Modelling and Assessment of Air Pollutants in
	NSW (DECC)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DECC)
	Guidance Note: Assessment of Non-Standard Fuels 2005 (DEC)
Odour	
	Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
	Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC)
Noise	
	NSW Industrial Noise Policy (DECC)
	NSW Road Noise Policy (OEH formerly DECCW)
	Environmental Noise Control Manual (DECC)
Traffic and Transport	Environmental Meloe Control Mandal (BEGG)
Tranio ana Tranoport	Multi-Level Risk Assessment (DUAP, 1997)
	Guide to Traffic Generating Development (RTA, 2002)
O	RTAs Road Design Guide (RTA, 1996)
Greenhouse Gas	National Consultation Assessment (NOA) Factors 2000
	National Greenhouse Accounts (NGA) Factors 2008
	Guidelines for Energy Savings Action Plans (DEUS)
Hazards and Risks	
	AS/NZS 4360:2004 Risk Management (Standards Australia)
	HB 203: 203:2006 Environmental Risk Management – Principles & Process
	(Standards Australia) State Environmental Planning Policy No 33– Hazardous and Offensive
	Development (SEPP 33)
	Applying SEPP 33: Hazardous And Offensive Development Application Guidelines (DP&I 2011)
	Planning Advisory Paper No. 6 – Guidelines for Hazardous Analysis (DUAP
	Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning (DUAP)
	Planning for Bush Fire Protection (NSW Rural Fire Service)
Local Planning	
	Draft Marrickville Local Environmental Plan 2011
	South Sydney Local Environmental Plan 1998
	Draft Sydney Local Environmental Plan 2011

# Appendix 4

#### City of Sydney

ABN 22 636 550 790 GPO Box 1591 Sydney NSW 2001 Australia Town Hall House 456 Kent Street Sydney NSW 2000 Australia

Phone +61 2 9265 9333 Fax +61 2 9265 9222 council@cityofsydney.nsw.gov.au www.cityofsydney.nsw.gov.au

11 July 2011

Our Ref: 2011/162858 Your Ref: 10/09214

Ms Felicity Greenway
Team Leader - Industry
NSW Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001





Department of Planning Received 1 5 JUL 2011 Scanning Room

Dear Ms Greenway,

# Key Issues & Assessment Requirements - St Peters Materials Recycling Facility Project

I refer to your correspondence, dated 16 June 2011, advising of a major project application for the Materials Recycling Facility at No. 2 Alfred Street, St Peters. It is understood that the proponent seeks to construct and operate a materials recycling facility that would process up to 150,000 tonnes of waste per annum.

This submission is based upon the information provided within the Preliminary Environmental Assessment (EA), prepared by Nexus Environmental Planning for the project. Council officers have identified the following key issues and assessment requirements for inclusion within the Director General's Requirements (DGRs):

Acoustic Amenity – Concern is raised regarding any operations on the site prior to 7.00am considering the proximity to residents on the opposite side of Campbell Lane. The documentation indicates a 6.00am commencement for truck arrival/loading on the site. The commencement of loading operations from 6.00am suggests that trucks would have arrived at the site prior to 6.00am. In the event that access is not available to the site prior to 6.00am trucks may be queued in local streets.

While potential noise and amenity impacts have been identified in the EA, the documentation is considered to insufficiently address the issue as it does not include any management plans and/or acoustic measures to mitigate these amenity impacts to neighbouring residents. It is recommended that the DGRs require the preparation and provision of more detailed acoustic assessment.

- Traffic The Traffic Impact Assessment Report provided within the EA is considered to be inadequate to the extent that it does not provide any detail on the matters listed below. As the proposal has the potential to impact upon both the amenity of nearby residents and the existing traffic movements on the local street network, it is recommended that the DGRs require that the proponent expand upon their traffic assessment to include the following:
  - the types of heavy vehicles likely to access the subject site;
  - how heavy vehicle deliveries would be managed to avoid vehicle queuing in Albert Street and surrounding laneways;

- how site ingress and egress would be managed and controlled;
- the maximum number of trucks that could be accommodated on-site at any one time.
- provision of a swept path analysis to indicate access to/from the site, as well as internally within the site to indicate adequate circulation area for the largest vehicle intended to visit the site; and
- provision of a operational management plan for vehicle circulation in site to minimise internal safety concerns.
- Infrastructure upgrade works It is requested that the Department require the proponent to liaise with Council's Traffic and Transport Unit regarding the upgrade of the existing vehicular crossover to the site from Albert Street. The current crossover/driveway from Albert Street is in poor condition and should be required to be redesigned and upgraded in accordance with Australian Standard 2890.2-2002 in order to accommodate the proposed level of vehicular traffic.
- Air Quality The DGRs should require that the "Preliminary Air Quality Assessment" submitted with the EA be expanded to outline the mitigation measures that will be required to ensure the dust emissions resulting from the use do not adversely impact upon surrounding residents. An operational management plan should be required to be submitted and detail on-going mechanisms/processes that are required to be undertaken by the operator. It is understood that the application will require referral to the NSW Office of Environment & Heritage, and a licence would be required to be obtained pursuant to the Protection of the Environment Operations Act.
- Option of time limitation on use It is considered that insufficient information
  has been submitted with the proposal to indicate whether any indicative time
  frame is proposed for the use of the site as a recycling facility.

While industrial uses are permissible with the current and draft planning controls pursuant to both the South Sydney LEP 1998 and the Draft Sydney LEP 2011, the inner city context, proximity to residential properties and potential amenity impacts should be considered in any assessment. It is considered that the Department should include a time limitation on any heavy industrial use to reflect the re-gentrification of the inner city.

Thank you for the opportunity to provide input at this stage of the proposal. I look forward to providing further comments when the EA and detailed design for the project are submitted. Should you require further information or wish to arrange a meeting, please contact Nicola Reeve by telephone on 9265 9333 or by email at nreeve@cityofsydney.nsw.gov.au.

Yours sincerely

Monica Barone Chief Executive Officer



OUR REF: YOUR REF:

1 July, 2011



Felicity Greenway Team Leader - Industry Mining and Industry Projects NSW Department of Planning & Infrastructure GPO Box 39 SYDNEY NSW 2001

Department of Planning Received 6 JUI 2011 Scanning Room

Dear Ms Greenway,

# DIRECTOR-GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS FOR PROPOSED MATERIALS RECYCLING FACILITY PROJECT AT 2 ALBERT STREET, ST PETERS

I refer to the Department's recent correspondence concerning the above application under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Council officers have reviewed the Preliminary Environmental Assessment Report prepared by the proponent and provide the following comments to assist the Department in its consideration of the proposal's suitability as a Part 3A Project and the contents of any associated DGR's.

#### Traffic and Access

A comprehensive traffic study should be submitted as part of any major projects application and should detail/address the following issues:

- The impact of the additional traffic on the surrounding intersections in particular at the intersection of Campbell Street/Campbell Road with Albert Street/Barwon Park Road;
- The study should assess the sight distance at the intersection of Campbell Street/Campbell Road with Albert Street/Barwon Park Road and propose improvements.
- The study should detail the size, type and frequency of trucks accessing the site and demonstrate (with the use of turning circles) the suitability or otherwise of the existing access.
- The study should also assess the adequacy of the existing location of the entry to the site adjacent to the existing entry to the St Peters Waste Transfer Station. Currently there is potential for vehicular conflict between vehicles entering the St Peters Waste Transfer Station and vehicles egressing 2 Albert Street.
- The traffic study counts in the Preliminary Environmental Assessment were taken in December 2009 (no exact date provided). December is not a typical month to take traffic counts due the Christmas and school holiday periods. New traffic counts are required to be undertaken outside of the school holiday period.

## **ENGLISH**

#### **IMPORTANT**

This letter contains important information. If you do not understand it, please ask a relative or friend to translate it or come to Council and discuss the letter with Council's staff using the Telephone Interpreter Service.

#### GREEK

## ΣΗΜΑΝΤΙΚΟ

Αυτή η επιστολή περιέχει σημαντικές πληροφορίες. Αν δεν τις καταλαβαίνετε, παρακαλείστε να ζητήσετε από ένα συγγενή ή φίλο να σας τις μεταφράσει ή να έλθετε στα γραφεία της Δημαρχίας και να συζητήσετε την επιστολή με προσωπικό της Δημαρχίας χρησιμοποιώντας την Τηλεφωνική Υπηρεσία Διερμηνέων.

#### PORTUGUESE

## **IMPORTANTE**

Este carta contém informação importante. Se não o compreender peça a uma pessoa de família ou a um/a amigo/a para o traduzir ou venha até à Câmara Municipal (Council) para discutir o assunto através do Serviço de Intérpretes pelo Telefone (Telephone Interpreter Service).

## ARABIC

مام

تحتوي هذه الرسالة معلومات هامة. فإذا لم تستوعبوها يرجى أن تطلبوا من أحد أقربائكم أو أصدقائكم شرحها لكم، أو تفضلوا إلى البلدية واجلبوا الرسالة معكم لكي تناقشوها مع أحد موظفي البلدية من خلال الاستعانة بخدمة الترجمة الهاتفية.

# **VIETNAMESE**

# THÔNG TIN QUAN TRONG

Nội dung thư này gồm có các thông tin quan trọng. Nếu đọc không hiểu, xin quý vị nhờ thân nhân hay bạn bè dịch giùm hoặc đem đến Hội đồng Thành phố để thảo luận với nhân viên qua trung gian Dịch vụ Thông dịch qua Điện thoại.

#### MANDARIN

## 重要资料

本信写有重要资料。如果不明白,请亲友为您翻译,或到市政府来,通过电话传译服务,与市政府工作人员讨论此信。

- Truck access to and from the site should be prohibited from Barwon Park Road and Albert Streets which are residential streets.
- The proposed truck routes should be amended as the proposed "truck route out" (Figure 5B) is incorrect as left turn out manoeuvres at Campbell Street are not permitted by vehicles greater than 8m (Assuming trucks are greater than 8m in length).

## Stormwater Management and Sediment Control

- The Preliminary Environmental Assessment notes that the maximum daily water usage in summer during the ongoing operation phase is estimated at 40,000 l/day. The proposed stormwater system should be configured so as to maximise the capture of stormwater for on site re-use for dust suppression and minimise the reliance on potable water
- The applicant should propose a water quality treatment system and testing regime to demonstrate how any stormwater discharges from the site will meet the target of 50 mg/L of total suspended solid (TSS).

## Air Quality Impact

Given the exposed nature of the site, coupled with the sensitive land uses that surround the site, it is essential that adequate measures are implemented to mitigate dust generation.

While it is noted that the applicant states that raw material stockpiles will be watered with mist sprays to ensure the material generates a crust on the outside of the stockpile, no details are provided as to the method of dust suppression. It is considered that the installed dust suppression system should be designed such that it will automatically operate to spray a sufficient amount of water to suppress dust and to prevent fugitive emissions at higher wind speeds.

The following measures should also be investigated and/or implemented to mitigate air quality impacts on the surrounding area:

- The operator must ensure that all stockpiles are wetted prior to material being removed for processing, and that during processing they are kept wet and high-pressure water sprays are utilized to prevent the migration of dust.
- Crushing, grinding and screening of the stockpiles must be subject to stringent dust
  mitigation measures utilising water sprays on the processing equipment at all times
  without a break during processing so that the materials being processed or moved are
  sufficiently wetted so as to prevent fugitive dust emissions.
- All vehicles carrying materials to or from the site must have their loads covered with tarpaulins or similar covers.
- All vehicles leaving the site must be first put through a wheel wash.
- The roadway between the wheel wash and the exit of the site is to be kept clean by satisfactory methods employed within the site addressing tracking of mud and sediments.
- Truck access to and from the site shall be prohibited from Barwon Park Road and Albert Streets which are residential streets.
- All haul roads and stockpile areas must be regularly watered to prevent dust emissions from the site migrating onto neighbouring land.
- The vehicle routes in use around the site are to be kept damp during operating hours.
- Dust emissions from the stockpiles and other areas of the site shall be suppressed at all times by a permanently installed irrigation system and by a water truck or similar machine.
- Dust sprays and/or dust collection systems must be installed and operating on all crushing, grinding and screening equipment at the site.
- An anemometer should be maintained on the site at all times.

- The anemometer shall be linked to a device that issues a warning and which activates mist sprays on stock piles and in areas where processing is carried out in the open air at moderate and higher wind speeds.
- A Plan of Management detailing treatment techniques to eliminate the tracking of sediment onto the egress road and onto public streets by vehicles exiting the site should be submitted as part of any major project application. The Plan of Management should also contain a complaints handling procedure.

## Noise and Amenity Impacts

It is noted that the subject site is located in relatively close proximity to the Barwon Park Triangle which is the area bounded by Barwon Park Road to the east, Campbell Street to the south, and the Princes Highway to the west. The Barwon Park Triangle used to form part of the Roads and Traffic Authorities Arterial Road Reservation and the area was rezoned to Residential 'C' with the gazettal of Marrickville Local Environmental Plan (Amendment No 14) on 5 September 2003. Marrickville Local Environmental Plan (Amendment No 14) and Marrickville Development Control Plan No. 41 – Barwon Park Triangle, St Peters contain objectives and controls which aim to guide the redevelopment of the area to contain both mixed use and residential development.

Any development of the site must ensure that noise and amenity impacts on this area are minimised. As pointed out above, truck access to and from the site should be prohibited from Barwon Park Road and Albert Streets as they are residential streets. Any major projects application submitted must demonstrate that the residential amenity of this area will not be unreasonably impacted by the proposed use.

## **Hours of Operation**

It is noted that in the Preliminary Environmental Assessment Report prepared by the applicant identifies that the site (including loading of trucks) will operate between the hours of 6.00am and 6.00pm Monday to Saturday and the operation of the crushers/screens would be restricted to between 7.00am and 6.00pm Monday to Saturday.

It is however noted that the Acoustics and Air Report prepared by Wilkinson Murray Pty Ltd and the Preliminary Environmental Assessment – Air Quality prepared by Nexus Environmental Planning identify that the site (including loading of trucks) will operate between the hours of 6.00am and 6.00pm Monday to Friday and 7.00am and 4.00pm on Saturdays, with truck loading/unloading only between 6.00am and 7.00am Monday to Friday.

Given the subject site is located in close proximity to sensitive land uses consideration must be given the ensuring the hours of operation adequately protect the residential amenity of the surrounding area. Furthermore, where extensive hours of operation are proposed they should only be supported on a trial basis to ensure that any impacts can be re-assessed particularly given the potential impacts this may have on the residential amenity of the area.

#### Draft Marrickville Local Environmental Plan 2011

Council has prepared a comprehensive draft Local Environmental Plan which contains new zoning and development standards for development located within the Marrickville Local Government Area. The new comprehensive LEP will replace the Marrickville Local Environmental Plan 2001.

Council at its meeting on 28 May 2011 resolved (in part) to adopt draft Marrickville Local Environmental Plan 2011 and resolved to forward the draft Plan to the Department of Planning and Infrastructure with a request for referral to the Minister for Planning and Infrastructure to make the Plan, and to seek the Governor's approval of the Plan.

The draft plan was forwarded to the Department of Planning and Infrastructure on 3 June 2011. Council officers have had discussions with officers from the Department and understand that the gazettal of the Plan is imminent. As such any major projects application must consider the objectives and controls contained in Draft MLEP 2011.

## Conclusion

The above issues and assessment requirements should be included in the Director-General's Environmental Assessment Requirements.

Should you have further enquiries please contact Jamie Erken on 9335 2251.

Yours sincerely

Judy Clark Acting Director, Development and Environmental Services

Trim No.: 40739.11

JClark



Your reference: Our reference: File: 10/09214 DOC11/31114



Felicity Greenway
Team Leader - Industry
Mining and Industry Projects
Department of Planning & Infrastructure
GPO Box 39
SYDNEY NSW 2001

BY EMAIL, AND STANDARD POST

Dear Ms Greenway

Re: Proposed St Peters Materials Recycling Facility – Recommended Environmental Assessment Requirements

Issued pursuant to Section 75F of the Environmental Planning and Assessment Act 1979

I refer to your request, dated 16 June 2011, for the Office of Environment and Heritage's ("OEH") environmental assessment requirements for the proposed St Peters Materials Recycling Facility at 2 Albert Street, St Peters ("the proposal"), lodged by Concrete Recyclers (Group) Pty Ltd ("the proponent"). The request was received by OEH on 21 June 2011.

Please note that, although the Environment Protection Authority ("EPA") is now a part OEH, certain statutory functions and powers continue to be exercised in the name of the EPA.

OEH has considered the details of the proposal as provided by the Department of Planning and Infrastructure, and has identified the information it requires to assess the project (see Attachment 1). The proponent should ensure that the Environmental Assessment ("EA") is sufficiently comprehensive to enable OEH to determine the extent of the impact(s) of the proposal.

The key issues requiring assessment for this proposal are summarised below::

- 1) Waste management, including classification and management of the waste stockpiled at the proposed facility;
- 2) Air quality issues (including dust management);
- 3) Noise impacts (including blasting and vibration); and
- 4) Stormwater and leachate management.

Department of Planning Received 1 2 JUL 2011 Scanning Room Please contact me on 9995 5795 if you have any questions about this letter.

Yours sincerely

ma 7/7/11

JACQUELINE INGHAM Unit Head Waste Operations Office of Environment and Heritage

## Attachment 1

# DECCW's Recommended Environmental Assessment Requirements (EARs)

## 1 Environmental impacts of the project

- Impacts related to the following environmental issues need to be assessed, quantified and reported on:
  - Waste
  - Air Issues
    - air quality
    - greenhouse gas
  - Noise and vibration
  - Water and Soils
    - Stormwater and leachate management
    - Acid sulfate soils
    - Contaminated sites

Environmental assessments (EAs) should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A full list of guidelines is at **Attachment 2**.

## 2 Licensing requirements

- 1. On the basis of the information submitted to date, it appears the proposal is a scheduled activity (waste storage and waste processing (non-thermal treatment) under the *Protection of the Environment Operations Act 1997* (POEO Act) and will therefore require an Environment Protection Licence (EPL) if approval is granted. The EA should address the requirements of Section 45 of the POEO Act determining the extent of each impact and providing sufficient information to enable DECCW to determine appropriate limits for the EPL.
- Should project approval be granted, the proponent will need to make a separate application to DECCW for an EPL for the proposed facility prior to undertaking any on site works. Additional information is available through the DECCW Guide to Licensing document

(www.environment.nsw.gov.au/licensing/licenceguide.htm).

## SPECIFIC ISSUES

## 3 Waste

#### The EA should:

- Include a detailed plan for the classification of all in-situ waste material, including
  the sampling locations and sampling regime that will be employed to classify the
  waste. Include a volumetric survey that identifies the amount of in-site waste
  material currently at the Premises.
- Identify, quantify, characterise and classify the in-situ waste that is proposed to be retained on-site for use in benching, permanent stockpiles and bunds. The EA must demonstrate that this material is appropriate to be retained on the site, based on its classification and/or it meeting a relevant Resource Recovery Exemption.

Note: All waste must be classified in accordance with DECCW's Waste Classification Guidelines.

- Identify, characterise and classify all in-situ waste that is proposed to be disposed
  of offsite, including proposed quantities of the waste to be removed from the
  Premises and potential disposal locations for the waste. This includes waste that
  is utilised for re-use or recycling.
  - **Note:** All waste must be classified in accordance with *DECCW's Classification Guidelines*. The EA should identify the Resource Recovery Exemptions that the materials that will be produced under and the proposed inputs into these exemptions.
- Identify and characterise all waste that is proposed to be imported to the Premises, including the proposed quantity of waste to be imported to the Premises within defined timeframes.
- Include a commitment to retaining all sampling and classification results for the life of the project to demonstrate compliance with DECCW's Waste Classification Guidelines.
- 6. Provide details of how waste will be handled and managed onsite to minimise pollution, including:
  - a) Processes and machinery to be utilised, including locations of the machinery;
  - b) Stockpile location and management including:
    - a) Labelling of stockpiles for identification, ensuring that all waste is clearly identified and stockpiled separately from other types of material (especially the separation of any contaminated and non-contaminated waste).
    - b) Proposed height limits for all waste to reduce the potential for dust and odour.
    - c) Procedures for minimising the movement of waste around the site.
    - d) Measures such as sediment fencing to minimise leaching from stockpiles into the surrounding environment.
- Provide details of how the waste will be handled and managed during transport to a lawful facility.

- 8. Include details of all procedures and protocols to be implemented to ensure that any waste leaving the site is transported and disposed of lawfully and does not pose a risk to human health or the environment.
- 9. Details of how the Proponent will ensure that any material transported from the Premises for reuse complies with the relevant resource recovery exemption. Include a statement demonstrating that the Proponent is aware of the relevant legislative requirements for disposal of the waste, including any relevant Resource Recovery Exemptions, as gazetted by OEH from time to time.
- 10. Outline contingency plans for any event that affects operations at the site and may result in environmental harm, including: excessive stockpiling of waste, volume of leachate generated exceeds the storage capacity available on-site etc.

## 4 Air issues

## 4.1 Air quality

The EA should include a detailed air quality impact assessment (AQIA). The AQIA should:

- Assess the risk associated with potential discharges of emissions for <u>all stages</u> of the proposal. Assessment of risk relates to environmental harm, risk to human heath and amenity.
- Justify the level of assessment undertaken on the basis of risk factors, including but not limited to:
  - a) proposal location:
  - b) characteristics of the receiving environment; and
  - c) type and quantity of pollutants emitted.
- 3. Describe the receiving environment in detail. The proposal must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but should not be limited to:
  - a) meteorology and climate;
  - b) topography;
  - c) surrounding land-uses and receptors; and
  - d) ambient air quality.
- 4. Include a quantitative assessment, conducted by a suitably qualified independent consultant, of the potential air impacts from the proposal. All processes that could result in air emissions must be identified and described. Sufficient detail must be provided to identify the characteristics and quantity of <u>all emissions from the</u> project.
- Detail emission control techniques/practices that will be employed by the proposal.
- Account for cumulative impacts associated with existing emission sources, including the neighbouring Alexandria Landfill, as well as any currently approved developments linked to the receiving environment.

- 7. Include air dispersion modelling conducted in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2005).
- 8. Demonstrate the proposal's ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations (POEO) Act (1997)* and the *POEO (Clean Air) Regulation (2002)*.
- Provide an assessment of the project in terms of the priorities and targets adopted under the NSW State Plan 2010 and its implementation plan Action for Air.

## 4.2 Greenhouse gas

- The EA should include a comprehensive assessment of, and report on, the
  project's predicted greenhouse gas emissions (tCO2e). The following emissions
  during the construction and operational phase should be reported, including
  annual emissions:
  - a) direct emissions (scope 1 as defined by the Greenhouse Gas Protocol see reference below),
  - b) indirect emissions from electricity (scope 2), and
  - c) upstream and downstream emissions (scope 3)
- The EA should include an estimate of the greenhouse emissions intensity (per unit of production). Emissions intensity should be compared with best practice if possible.
- 3. The emissions should be estimated using an appropriate methodology, in accordance with NSW, Australian and international guidelines (see Attachment 2).
- 4. The proponent should also evaluate and report on the feasibility of measures to reduce greenhouse gas emissions associated with the project. This could include a consideration of energy efficiency opportunities or undertaking an energy use audit for the site.

## 5 Noise and vibration

- 1. In relation to noise, the following matters should be addressed:
  - Construction noise associated with the proposed development should be assessed using the *Interim Construction Noise Guideline (DECC*, 2009);
  - Vibration from all activities (including construction and operation) to be undertaken on the premises should be assessed using the guidelines contained in the Assessing Vibration: a technical guideline (DEC, 2006);
  - Operational noise from all activities to be undertaken on the premises should be assessed using the guidelines contained in the NSW Industrial Noise Policy (EPA, 2000) and Industrial Noise Policy Application Notes; and
  - d) Noise on public roads from increased road traffic generated by land use developments should be assessed using the guidelines contained in the Environmental Criteria for Road Traffic Noise (EPA, 1999).
- Outline noise mitigation measures that would be implemented to address noise impacts during construction and operation at the closest receivers along Albert Street and Campbell Road, St Peters.

## 6 Water and soils

## 6.1 Stormwater & Leachate management

- Proposed Erosion, sediment and leachate controls including measures to be implemented to minimise erosion, leachate and sediment mobilisation at the site during works. The EA should show the location of each measure to be implemented. The Proponent should consider measures such as sediment traps, diversion banks, sediment fences, bunds and geofabric liners.
- 2. Details of existing and proposed leachate management measures at the Premises, including:
  - a) how leachate from stockpiled waste material will be kept separate from stormwater runoff;
  - details of surface water management, including potential sediment-laden water, to ensure that it is captured onsite, treated or beneficially reused as practicable; and
  - c) treatment of leachate, prior to discharging from the Premises.
- 3. Details of the stormwater drainage system at the Premises, including:
  - a) a plan of the stormwater system;
  - b) the capacity of the stormwater system; and
  - c) details of any pollution control equipment.
- 4. Details of systems that will be installed to prevent the tracking of mud and dust from vehicle movements onto the street.

#### 6.2 Acid sulfate soils

- The potential impacts of the development on acid sulfate soils must be assessed in accordance with the relevant guidelines in the Acid Sulfate Soils Manual (Stone et al. 1998) and the Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004).
- 2. Describe mitigation and management options that will be used to prevent, control, abate or minimise potential impacts from the disturbance of acid sulfate soils associated with the project and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

## 6.3 Contaminated sites assessment and remediation

- 1. Outline the site history to identify potential soil contamination at the Premises.
- 2. Describe the existing situation in terms of soil types and properties and soil contamination.
- 3. Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of:
  - a) disturbing any existing contaminated soil; and
  - b) contamination of soil by operation of the activity.

- Describe and assess the effectiveness or adequacy of any soil management and mitigation measures during construction and operation of the proposal including:
  - a) erosion and sediment control measures; and
  - b) proposals for site remediation.

## Attachment 2 - Guidance Material

Title	Web address
	Relevant Legislation
Contaminated Land Management Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+140+1
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1
	Licensing
DECCW Guide to Licensing	www.environment.nsw.gov.au/licensing/licenceguide.htm
	Waste
Waste	
Waste Classification Guidelines (DECC, 2008)	http://www.environment.nsw.gov.au/waste/envguidIns/index.htm
DECCW Resource recovery exemption	http://www.environment.nsw.gov.au/waste/RRecoveryExemptions.htm
	Air Issues
Air Quality	
Approved methods for modelling and assessment of air pollutants in NSW (2005)	http://www.environment.nsw.gov.au/resources/air/ammodelling05361.pdf
POEO (Clean Air) Regulation 2002	http://www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+642+2002+cd+0+N
Greenhouse Gas	
The Greenhouse Gas Protocol: Corporate Standard, World Council for Sustainable Business Development & World Resources Institute	http://www.ghgprotocol.org/standards/corporate-standard
National Greenhouse Accounts (NGA) Factors, Australian Department of Climate Change (Latest release),	http://www.climatechange.gov.au/publications/greenhouse-acctg/national-greenhouse-factors.aspx
National Greenhouse and Energy Reporting System, Technical Guidelines (latest release)	http://www.climatechange.gov.au/en/government/initiatives/national-greenhouse-energy-reporting/tools-resources.aspx
National Carbon Accounting Toolbox	http://www.climatechange.gov.au/government/initiatives/ncat.aspx
Australian Greenhouse Emissions Information System (AGEIS)	http://ageis.climatechange.gov.au/
	Noise and Vibration
Interim Construction Noise Guideline	http://www.environment.nsw.gov.au/noise/constructnoise.htm

Title	Web address
(DECC, 2009)	30000
Industrial Noise Policy Application Notes	http://www.environment.nsw.gov.au/noise/traffic.htm
Environmental Criteria for Road Traffic Noise (EPA, 1999)	http://www.environment.nsw.gov.au/noise/traffic.htm
	Water and Soils
Stormwater and leachate management	
Managing urban stormwater: soils and construction, vol. 1 (Landcom 2006) and vol. 2 (A. Installation of services; B Waste landfills; C. Unsealed roads; D. Main Roads; E. Mines and quarries) (DECC 2008)	Vol 1 - Available for purchase at <a href="http://www.landcom.com.au/whats-new/publications-reports/the-blue-book.aspx">http://www.landcom.com.au/whats-new/publications-reports/the-blue-book.aspx</a> Vol 2 - <a href="http://www.environment.nsw.gov.au/stormwater/publications.htm">http://www.environment.nsw.gov.au/stormwater/publications.htm</a>
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approve dmethods-water.pdf
Acid sulphate soils	
Acid Sulfate Soils Planning Maps	http://canri.nsw.gov.au/download/
Acid Sulfate Soils Manual (Stone et al. 1998)	Manual available for purchase from: http://www.landcom.com.au/whats-new/the-blue-book.aspx Chapters 1 and 2 are on DoP's Guidelines Register at: Chapter 1 Acid Sulfate Soils Planning Guidelines: http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%20Acid%20Sulfate%20Soils%20Planning%20Guidelines.pdf Chapter 2 Acid Sulfate Soils Assessment Guidelines: http://www.planning.nsw.gov.au/rdaguidelines/documents/NSW%20Acid%20Sulfate%20Soils%20Assessment%20Guidelines.pdf
Acid Sulfate Soils Laboratory Methods Guidelines (Ahern et al. 2004)	http://www.derm.qld.gov.au/land/ass/pdfs/lmg.pdf This replaces Chapter 4 of the Acid Sulfate Soils Manual above.
Contaminated Sites Assessment and Remediation	
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	http://www.planning.nsw.gov.au/DevelopmentAssessments/RegisterofDevelopmentAssessmentGuidelines/tabid/207/language/en-US/Default.aspx
Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000)	http://www.environment.nsw.gov.au/resources/clm/97104consultantsglines.pdf
Guidelines for the NSW Site Auditor Scheme - 2nd edition (DEC, 2006)	http://www.environment.nsw.gov.au/resources/clm/auditorglines06 121.pdf
Sampling Design Guidelines (EPA, 1995)	Available by request from DECCW's Environment Line
National Environment Protection (Assessment of Site Contamination) Measure 1999 (or update)	http://www.ephc.gov.au/taxonomy/term/44

Our Ref; RDC 11M1778 SYD11/00544/0 Contact: Sevda Huseyin T 8849 2041 DoP Ref: 10/09214



The Manager Mining and Industry Projects Department of Planning and Infrastructure GPO Box 39 Sydney NSW 2001



Attention: Andrew Hartcher

# DIRECTOR GENERAL'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS FOR ST PETERS MATERIALS RECYCLING FACILITY PROJECT

Dear Sir / Madam,

Reference is made to the Department's correspondence dated 16 June 2011 requesting the Roads and Traffic Authority (RTA) to provide details of key issues and assessment requirements regarding the abovementioned development for inclusion in the Director General's Environmental Assessment (EA) requirements.

The RTA would like the following issues to be included in the transport and traffic impact assessment of the proposed development:

- I. Details of service vehicle movements (including vehicle type and likely arrival and departure times).
- 2. Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required).

The key intersections in close proximity to the subject site shall be examined / modelled.

3. Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle widths, etc).

Department of Planning Received

6 JUL 2011

Scanning Room

Is and Traffic Authority of New South Wales

4. The swept path of the longest vehicle entering and exiting the subject site, as well as manoeuvrability through the site.

Should you require any further clarification in relation to this matter, please call the contact officer named at the top of this letter.

Yours faithfully

James Hall Senior Land Use Planner

Transport Planning, Sydney Region

30 June 2011

# Appendix 5

## **Information Provided Through**

Rudov & Associates P/L Ph. 92678865 Fax. 92676617

## **Title Search**

**LEAP Searching** An Approved LPI NSW Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: AUTO CONSOL 6701-195

SEARCH DATE

TIME EDITION NO \_\_\_\_ \_\_\_\_\_

22/7/2010

2:51 PM

VOL 6701 FOL 195 IS THE CURRENT CERTIFICATE OF TITLE

LAND

LAND DESCRIBED IN SCHEDULE OF PARCELS LOCAL GOVERNMENT AREA SYDNEY PARISH OF ALEXANDRIA COUNTY OF CUMBERLAND PARISH OF PETERSHAM COUNTY OF CUMBERLAND TITLE DIAGRAM SEE SCHEDULE OF PARCELS

FIRST SCHEDULE

THE COMMISSIONER FOR MAIN ROADS

(T'L771531)

SECOND SCHEDULE (4 NOTIFICATIONS)

\_\_\_\_\_ RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S) 1

- LAND EXCLUDES MINERALS RESERVED IN THE GRANT OF 2 ROODS 13 78/100 PERCHES AND 2 ROODS 39 1/4 PERCHES - SEE CROWN GRANT
- EXCEPTING LAND BELOW A DEPTH FROM THE SURFACE OF 15.24 METRES IN 3 THE GRANT OF 2 ROODS 39 1/4 PERCHES - SEE CROWN GRANT
- 3081329 LEASE TO J A BRADSHAW PTY. LIMITED. EXPIRES 31.3.2002. OPTION OF RENEWAL 5 YEARS

NOTATIONS

UNREGISTERED DEALINGS: NIL

SCHEDULE OF PARCELS \_\_\_\_\_

TITLE DIAGRAM

LOT 1 IN DP88087

DP88087

LOT B IN DP376645

DP376645.

\*\*\* END OF SEARCH \*\*\*

PRINTED ON 22/7/2010

13438

\* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. Leap Searching hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 92B(2) of the Real Property Act.

# Appendix 6

# MATERIALS RECYCLING FACILITY 2 ALBERT STREET, ST PETERS

AIR QUALITY ASSESSMENT



# MATERIALS RECYCLING FACILITY 2 ALBERT STREET, ST PETERS

AIR QUALITY ASSESSMENT

REPORT NO. 09355-AQ VERSION B

**NOVEMBER 2011** 

## PREPARED FOR

CONCRETE RECYCLERS (GROUP) PTY LTD
PO BOX 238
RYDALMERE, NSW, 1701

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**APPENDIX A – Emission Inventory** 

## **GLOSSARY OF TERMS**

**Airshed:** A geographic area, usually containing some significant atmospheric emission sources. The boundary of the area is determined largely by characteristic trajectories followed by parcels of polluted air due to interaction of synoptic-scale winds and local winds (eg sea breezes, valley winds and winds steered by topographic features). Characteristic trajectories can include recirculation and oscillatory patterns of airflow. These lead to accumulation of air pollutants and also increase the time pollutants are resident in the airshed. The increased residence time is especially significant for secondary air pollutants such as ozone.

**Air toxics:** Gaseous, aerosol or particulate pollutants (other than the six criteria pollutants) which are present in the air in low concentrations with characteristics such as toxicity or persistence so as to be a hazard to human, plant or animal life. The terms 'air toxics' and 'hazardous air pollutants' (HAPS) are used interchangeably.

**Ambient air:** As defined in the Ambient Air Quality National Environment Protection Measure: 'ambient air means the external air environment, it does not include the air environment inside buildings or structures.'

**Criteria pollutants:** In Australia six criteria pollutants have been identified: carbon monoxide, lead, nitrogen dioxide, photochemical oxidants (measured as ozone), particles as  $PM_{10}$  (particles of 10 micrometres or less) and sulfur dioxide. The criteria air pollutants require special focus due to their abundance in the environment and their demonstrated adverse health effects.

**Emission factor:** For stationary sources, the relationship between the amount of pollution produced and the amount of raw material processed or burned. For mobile sources, the relationship between the amount of pollution produced and the number of vehicle miles travelled. Emissions for a given source can be calculated from the emission factor of a pollutant and specific data regarding quantities of materials used by the source. This approach is used in preparing an emissions inventory.

**Emissions:** Releases of contaminants from a facility, area or volume source (routine or accidental).

**Environmental impact assessment:** A systematic process to assess the actual or potential effects of policies, objectives, programs, plans or activities on the local or global environment. An assessment of risks to the environment either directly or indirectly as a result of human activities.

**Fugitive emission:** Atmospheric emissions due to leaks (eg from processing plants, storage facilities and their interconnections). Generally fugitive emissions occur near to the ground.

**Goal:** As used in national environment protection measures, a goal is the desired outcome, for example:

- protection of human health;
- preservation of ecosystems; or
- restoration of water quality to support aquaculture.

The term 'goal' carries the implication of the outcome to be achieved. It may be something desirable in the future and not immediately attainable. It should, however, represent the aspiration of the Australian people for environmental quality.

**Guideline:** As used in national environment protection measures, 'guidelines' provide guidance on how:

- standards or goals may be achieved (eq nutrient management strategies); or
- specified environmental problems can be addressed (eg site contamination)

**Hazard:** An intrinsic capacity to cause harm associated with an agent or process.

**Particulate matter (PM):** Any material, except pure water, that exists in the solid or liquid state in the atmosphere. The size of particulate matter can vary from coarse particle windblown dust to fine particle combustion products.

**Primary air pollutants:** Substances contained in an atmospheric emission that degrade air quality by their presence in the atmosphere.

**Respirable suspended particles:** The proportion of total suspended particles of a size smaller than 10 micrometres. They have the ability to penetrate deeply into the lungs. Depending on their source and the existing meteorological conditions, respirable

**Source:** Any place or object from which air pollutants are released. Sources may be either stationary (fixed in space) or mobile (move in space).

**Temperature inversion:** A layer of warm air in the atmosphere that prevents the rise of cooling air and traps pollutants beneath it.

**Topography:** The configuration of a surface, especially the Earth's surface, including its relief and the position of its natural and human-made anthropogenic features.

**Total suspended particles (TSPs):** Particles of solid or liquid matter – such as soot, dust, aerosols, fumes, and mist – up to approximately 30 micrometres in size.

## 1 INTRODUCTION

This report has been prepared by Wilkinson Murray with modelling assistance provided by Todoroski Air Sciences (TAS) and presents an air quality assessment for the proposed development of a material recycling facility located at No.2 Albert Street, St Peters (hereafter referred to as the Project.

This report is structured to allow the reader to understand predicted air quality impacts from the proposed development by:

- identifying the dust generating activities and quantifying the emissions from the development;
- describing how the dispersion modelling was conducted;
- presenting the predicted findings of the dispersion modelling; and
- providing an interpretation of the predicted level of impact at nearby residences.

The air quality issue of relevance for this development is dust, including suspended particulates and dust deposition.

## 2 BACKGROUND

The site previously has been used as a storage facility for approximately 600,000 tonnes of sandstone material which has been collected from excavations in the Sydney metropolitan area. The material was collected as part of two development consents issued by the then South Sydney Council and Marrickville Council for the processing of sandstone material, but both consents have since lapsed and the site abandoned by the tenants.

The proposed materials recycling facility would recycle the existing sandstone material by means of crushing and separating into different sizes to be sold to various construction industries in Sydney metropolitan area.

## 3 PROJECT SETTING

The Project site is located at No.2 Albert Street, St Peters in inner Sydney; approximately 2km north of Sydney Kingsford Smith Airport (see **Figure 3-1**).

The local topography is relatively flat with the surrounding land use being predominantly industrial. To the west, south and east of the site is Dial-a-dump industries recycling facility, the Alexandria Landfill and the Sydney Recycling Centre.

Eight residential properties have been identified surrounding the proposed site and each of these has been specified as discrete receptor in the dispersion model to allow specific model predictions to be made at each receptor. The residences located approximately 15m to the north of the site have frontage to Campbell Road and a vegetation buffer between the site and the residences.

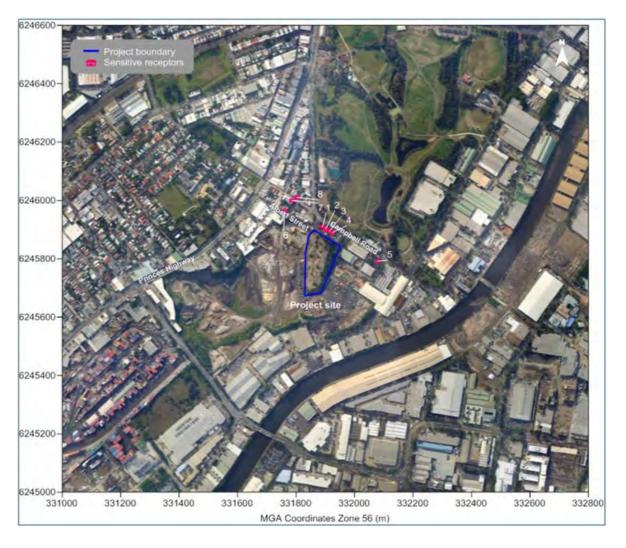


Figure 3-1 Site Location

## 4 PROJECT DESCRIPTION

The recycling of the existing stockpile will be undertaken in stages based on the relative level of stockpile material being removed. All activities occurring on-site are proposed to occur at the top of the existing stockpile, the height of which will gradually reduce as material is recycled. During the site preparation, an access way will be constructed for trucks and machinery to access the top of the stockpile. Also a five metre high stockpile barrier will be constructed at the northern end of the site to assist in the mitigation of environmental impacts on the residences to the north.

The stockpiled material would need to be crushed and blended with other material such as crushed concrete and or demolition rubble for use in major civil projects. This requires importing other source separated waste material to site in the form of construction and industry (C&I) waste consisting of bricks, concrete and sand which would be mixed with the sandstone material to make it saleable.

The recycling is generally undertaken by way of crushing the source material to generate a specific sized product depending on the requirements of the customer. Crushed material is transported by way of front end loader to a product stockpile. The processed material is loaded

into trucks for delivery to the end user. The product material would be used for such things as road base, drainage fill and landscaping fill.

## 5 AIR QUALITY ASSESSMENT CRITERIA

Air quality criteria are benchmarks set to protect the general community against adverse health and nuisance effects arising from air pollution. This section identifies the relevant air quality criteria that are applicable to the Project.

## 5.1 Particulates

**Table 5-1** summarises the air quality goals that are relevant to this study as sourced from the Office of Environment and Heritage (OEH) document "*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*" (**NSW DEC, 2005**).

The air quality goals for the relevant criteria pollutants relate to the total pollutant burden in the air and not just the pollutants from the project, as such consideration of background pollutant levels needs to be made when using these goals to assess potential impacts.

**Table 5-1 OEH Air Quality Impact Assessment Criteria** 

Relevant Criteria Pollutants										
Pollutant	<b>Averaging Period</b>	Criterion	Source							
Total suspended particulates (TSP)	Annual	90μg/m <sup>3</sup>	NHMRC (1996)							
Destinate Matter 10 mg (DM )	Annual	30µg/m <sup>3</sup>	EPA (1998)							
Particulate Matter $< 10 \mu m (PM_{10})$	24 hours	50μg/m <sup>3</sup>	NEPC (1998)							

Source: NSW DEC, 2005

## 5.2 Deposited Dust (insoluble solids)

In addition to an assessment for potential health impacts, airborne dust is also assessed due to the potential to cause nuisance by depositing on surfaces. **Table 5-2** shows the criteria for maximum acceptable increases in dust deposition over existing dust levels from an amenity perspective (**NSW DEC, 2005**).

**Table 5-2 OEH Criteria for Insoluble Solids** 

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Level	Maximum Total Deposited Dust Level	Source
Deposited dust	Annual	2g/m <sup>2</sup> /month	4g/m <sup>2</sup> /month	NERDDC (1988)

Source: NSW DEC, 2005

## **6 EXISTING ENVIRONMENT**

This section characterises the existing climate and ambient air quality in the area surrounding the Project site.

#### 6.1 Local climate

For this assessment site-specific meteorological data is not available, however representative meteorological data has been obtained from the Bureau of Meteorology weather station at Sydney Airport AMO (Site No. 066037). This data has been used to characterise the local climate in proximity to the Project.

The Sydney Airport station is located approximately 4km south-southwest of the Project site. Data have been collected over an approximate 71-year period, with January recorded as the hottest month with a mean maximum temperature of 26.4°C and July as the coldest month with a mean minimum temperature of 7.1°C. Rainfall data shows June to be the wettest month with an average rainfall of 119.8mm over 8.7 days.

**Table 6-1** presents a summary of long-term average values of climatic elements at the Sydney Airport station.

**Table 6-1** Monthly Climate Statistics Summary

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature												
Mean max. temperature (°C)	26.4	26.3	25.2	22.9	20.0	17.6	17.0	18.3	20.5	22.5	24.0	25.7
Mean min. temperature (°C)	18.8	19.0	17.5	14.1	10.9	8.6	7.1	8.1	10.3	13.1	15.3	17.5
Rainfall												
Rainfall (mm)	93.8	112.6	115.3	106.1	101.0	119.8	71.3	76.3	60.8	71.6	80.8	73.8
Mean No. of rain days (≥1mm)	8.1	8.6	9.1	8.4	8.7	8.7	6.7	6.8	6.9	7.9	8.4	7.7
9am conditions												
Mean temperature (°C)	22.4	22.3	21.1	18.2	14.6	11.9	10.8	12.5	15.7	18.4	19.9	21.6
Mean relative humidity (%)	70	73	73	71	73	74	71	65	62	61	64	66
Mean wind speed (km/h)	14.4	13.8	12.9	12.9	12.6	13.4	13.3	14.4	15.5	16.3	16.0	14.8
3pm conditions												
Mean temperature (°C)	24.8	24.8	23.9	21.7	19.0	16.6	16.1	17.2	19.0	20.7	22.1	23.9
Mean relative humidity (%)	60	63	61	59	58	57	52	49	51	54	56	58
Mean wind speed (km/h)	24.1	23.0	21.0	19.3	17.1	17.8	18.2	20.8	23.1	24.6	25.3	25.2

Source: Bureau of Meteorology, 2011

**Figure 6-1** presents the annual and seasonal windroses prepared from the 2008 calendar year dataset. The annual windrose indicates the predominant wind direction to be from the south and to a lesser extent from northwest. The seasonal windroses show that during summer the predominant wind direction is from the south. In winter the dominate wind direction is from the west with a spread of winds from the northwest quadrant. Autumn winds mainly originate from the northwest. The spring windrose shows dominant winds from the. On an annual basis calm winds occur approximately 0.3% of the time; the site recorded an annual average wind speed of 5.68m/s.

It is noted that the airport is likely to be windier than the Project site which is sheltered by terrain and buildings, and may be subject to more southerly sea breezes.

Stability class has been determined using Turner's 1964 method (**USEPA, 2000**), based on observed values for cloud cover, cloud ceiling height and wind speed data collected at Sydney Airport. **Table 6-2** presents the stability class distribution for 2008.

**Table 6-2 Stability Class for Sydney Airport (Station No. 066037)** 

Stability Class	Frequency of Stability Class Occurrence (%)
Α	0.8
В	7.2
С	16.1
D	48.3
Е	16.5
F	11.1

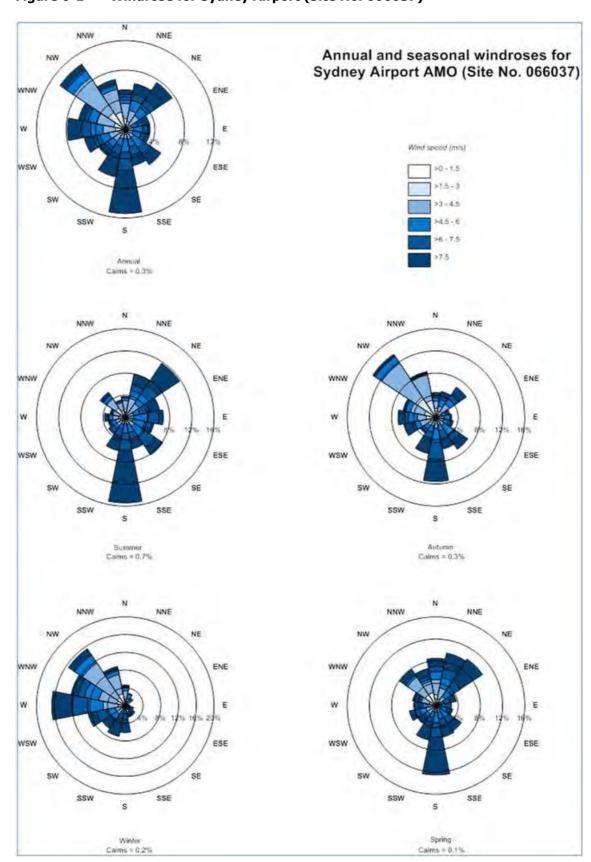


Figure 6-1 Windrose for Sydney Airport (Site No. 066037)

## 6.2 Local Air Quality

Suitable site specific air quality monitoring data is not available, as such background ambient monitoring data has been obtained from two OEH monitoring sites that measure  $PM_{10}$  concentration using a Tapered Element Oscillating Microbalance (TEOM)s. The sites are located at Earlwood, situated approximately 4km west of the Project and at Randwick, situated approximately 6km east-southeast of the Project.

A summary of the monthly  $PM_{10}$  monitoring data from 2005 to 2010 collected at the Earlwood and Randwick monitoring sites is presented in **Table 6-3** and **Table 6-4**, respectively. The monitoring data shows the annual average  $PM_{10}$  concentrations at both sites are below the  $30\mu g/m^3$  criterion for all years reviewed. The maximum monthly 24-hour average criterion of  $50\mu g/m^3$  is exceeded on a number of occasions at both monitoring sites. Investigation into the possible causes of these exceedances has found that bushfire actives near the Sydney area may have caused many of the elevated readings. Additionally in 2009 there were notable occasions of widespread dust storm events that contributed to high dust concentrations.

Table 6-3 Summary of  $PM_{10}$  Monitoring from Earlwood OEH Monitoring Site ( $\mu g/m^3$ )

Υe	ar	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2005	Max	46.8	39.1	ND	35.7	40.9	49.5	35.1	38.4	27.3	39.3	34.8	61.2	61.2
2003	Ave	22	23.9	ND	22	23	24.1	19.3	25.2	17	20.9	19.7	32.6	22.7
2006	Max	57.2	41.4	37.5	51.2	56.7	29.4	28.7	31.9	67.1	38.7	68.9	58.3	68.9
2000	Ave	22.3	26.9	22.8	28.7	23.6	16.9	17.1	20.7	22.6	27.8	28.4	23.2	23.4
2007	Max	42.9	26	35	43.9	68.6	32.4	27.6	29.4	34.1	50.3	30.4	29.2	68.6
2007	Ave	24.5	18.5	21	23.3	26.4	15	15.6	18	20.6	28.7	16.1	18.7	20.5
2008	Max	32.5	34.3	30.3	28.8	37.5	27.7	35.7	25.7	40.5	50.6	34.5	42.9	50.6
2008	Ave	21.5	15.6	18.9	16.3	23.2	15.1	17.7	14	23.3	21.9	20.4	23.3	19.3
2009	Max	44.8	39.2	50.5	191	28.4	34.6	32.8	42.7	1653.7	48.8	65.7	34	1653.7
2009	Ave	26.9	23.6	22.3	25.4	19.3	15.9	15.3	25.3	91.4	18.2	27.7	19.1	27.5
2010	Max	47.8	28.1	45	30.8	33.8	24.2	23.9	27.4	31.2	27	27.8	33.1	47.8
2010	Ave	24.8	19	21.5	16.9	16.4	14.5	14	15	18.2	16.7	18.1	19.3	17.9
ND – no	data	Soi	urce: <b>NS</b>	W OEH,	2011									

Table 6-4 Summary of  $PM_{10}$  Monitoring from Randwick OEH Monitoring Site  $(\mu g/m^3)$ 

Ye	ear	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	0ct	Nov	Dec	Annual
2005	Max	41.7	38.3	30.6	37.5	ND	34.1	26.5	27	26.8	38.6	37.9	46.3	46.3
2003	Ave	23	22.8	17.1	21.1	ND	18.4	14.4	16.7	14.8	19.5	18.7	25.9	19.3
2006	Max	43.5	36.4	41.4	31.9	26.7	20.4	25.9	25	38.2	31.4	55.7	45.5	55.7
2000	Ave	22.5	21.4	20.4	18.9	15.4	14.1	14.4	17.2	19.7	22	23.2	22.8	19.3
2007	Max	44.6	23.4	37.1	34.8	71.2	21.1	22.3	31	28.3	35.6	27.8	32.3	71.2
2007	Ave	23.9	17.5	20	19.9	19.3	13.5	12.7	14.8	17.5	23.8	15.5	19.7	18.2
2008	Max	32.3	33.8	28.2	23.6	31.5	18.9	31.9	23	36.3	32	27.3	33.7	36.3
2008	Ave	22	16.3	17.4	15.1	17.4	13.7	15.1	12.3	21	19.2	17.3	20.5	17.3
2009	Max	56.6	38.3	45.4	191.1	33.8	22.4	27.1	41.6	1735.6	39.3	148.9	31.4	1735.6
2009	Ave	24.6	22.8	22.1	27.8	20.8	13.6	12.2	20.2	84.5	17.2	29.5	19.1	26.2
2010	Max	35.5	33.7	42.7	24.7	28.7	20.4	18.9	21.1	27.8	28.2	28.6	27.8	42.7
2010	Ave	22.4	19.4	19.8	14.3	15	13.3	11.4	10.8	15	15.4	16.7	18.3	16.0
ND no	o doto	C-	NIC	W OFH	2011									

ND – no data Source: **NSW OEH, 2011** 

## 7 EMISSION ESTIMATION

Dust emissions from the proposed project have been estimated for all dust generating activities based on information provided by the Proponent, using emission factor equations published in AP-42 (US EPA, 1985 and updates), the State Pollution Control Commission document "Air Pollution from Coal Mining and Related Developments" (SPCC, 1983) and the OEH document, "NSW Coal Mining Benchmarking Study: International Best Practise Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining", prepared by Katestone Environmental (Katestone, 2010). The detailed calculations are presented in Appendix A, which provides information on the equations used, the basic assumptions about material properties (e.g. moisture content, silt content etc.), quantities of materials that would be handled during operations and control measures employed. Table 7-1 summarises the estimated TSP emissions based on the operations occurring at the Project site.

**Table 7-1** Estimated TSP Emissions

Activity	TSP Emissions (kg/year)
Hauling imported material on-site	594
Unloading imported material to stockpile	254
Excavator removing material	381
FEL loading to crusher	636
Crushing and/or scalping screen	405
FEL on stockpile	636
Loading to trucks	636
Hauling product off-site	1,342
Wind erosion	3,101
TOTAL	7,985

#### 8 DISPERSION MODEL

AUSPLUME Version 6.0 was used in predicting the air quality impacts for this study. AUSPLUME is a Gaussian dispersion model developed by the Victorian EPA (**VEPA, 1986**). AUSPLUME has been used extensively for assessing air impacts and is a recommended model in the NSW OEH "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" (**NSW DEC, 2005**).

## 8.1 Dispersion Modelling Results

This section presents the predicted impacts on air quality arising from dust emissions from the Project for each relevant dust metric. **Table 8-1** presents the dispersion modelling results at each of the discrete receptors shown in **Figure 3-1**.

Table 8-1	Dispersion Modelling Results for Discrete Receptors (	(Project Alone)	)
-----------	---	-----------------	---

Receptor ID	PM <sub>10</sub> (	ug/m³)	TSP (μg/m³)	DD (g/m²/month)		
	24-hour Average	Annual Average	Annual Average	Annual Average		
1	7.7	1.3	2.8	1.9		
2	7.8	1.3	2.8	1.9		
3	8.0	1.2	2.6	1.8		
4	7.9	1.1	2.4	1.7		
5	1.8	0.3	0.5	0.3		
6	2.3	0.3	0.6	0.3		
7	1.5	0.3	0.6	0.3		
8	1.5	0.3	0.6	0.3		

**Figure 8-1**, **Figure 8-2** and **Figure 8-3** present respective contour plots for the predicted maximum 24-hour average  $PM_{10}$ , annual average  $PM_{10}$  and TSP concentrations due to the Project alone showing the potential maximum extent of impact.

## 8.1.1 24-Hour Average PM<sub>10</sub>

It can be observed from **Figure 8-1** and **Table 8-1** that the predicted maximum incremental 24-hour average  $PM_{10}$  concentration is  $8\mu g/m^3$  at receptor 3. All other discrete receptor locations are below this value.

To assess cumulative maximum 24-hour average  $PM_{10}$  concentrations, a contemporaneous impact and background analysis was completed for receptor 3, the most impacted receptor.

To refine the assessment at receptor 3, each individual dispersion model prediction is added to the corresponding measured background concentration for selected days of high risk. The results of this analysis are summarised in **Table 8-2** and **Table 8-3** for the Earlwood Monitoring Site and the Randwick Monitoring Site, respectively. The left side of the table shows the total predicted concentration on days with the highest background, and the right side shows the total predicted concentration on days with the highest predicted incremental ground level concentration.

The analysis shows that potential impacts from the Project would not contribute to total levels over the OEH criterion of  $50\mu g/m^3$  on any day at the worst affected receptor.

Table 8-2 Contemporaneous Impact & Background — OEH Earlwood Monitoring Site

Date	PM <sub>10</sub> 24-hour Average (μg/m³)				PM <sub>10</sub> 24-hour Average (μg/m³)		
	Background	Predicted increment	Total	Date	Background	Highest predicted increment	Total
06/12/2008	42.9	1.5	44.4	15/06/2008	11.7	8.0	19.7
02/10/2008	42.3	0.1	42.4	22/10/2008	9.4	7.2	16.6
20/09/2008	40.5	0.1	40.6	23/08/2008	11.1	7.1	18.2
22/09/2008	38.2	0.0	38.2	06/09/2008	10.2	7.0	17.2
21/09/2008	37.8	0.6	38.4	23/10/2008	11.3	7.0	18.3
16/09/2008	37.6	1.6	39.2	21/01/2008	15.1	6.1	21.2
27/05/2008	37.5	0.1	37.6	06/06/2008	13.6	5.9	19.5
23/12/2008	37.2	1.7	38.9	21/03/2008	21.8	5.8	27.6
28/09/2008	36.1	0.8	36.9	05/06/2008	12	5.7	17.7
01/07/2008	35.7	0.9	36.6	01/02/2008	10.3	5.5	15.8

Table 8-3 Contemporaneous Impact & Background – OEH Randwick Monitoring Site

	PM <sub>10</sub> 24-hour average (μg/m³)				PM <sub>10</sub> 24-hour average (μg/m³)		
Date	Background	Predicted increment	Total	Date	Background	Highest predicted increment	Total
16/09/2008	36.3	1.6	37.9	15/06/2008	14.8	8.0	22.8
21/09/2008	34.1	0.6	34.7	22/10/2008	13.2	7.2	20.4
25/02/2008	33.8	0.0	33.8	23/08/2008	16	7.1	23.1
31/12/2008	33.7	0.2	33.9	06/09/2008	16	7.0	23.0
06/12/2008	33.3	1.5	34.8	23/10/2008	13.2	7.0	20.2
04/01/2008	32.3	0.0	32.3	21/01/2008	18.7	6.1	24.8
02/10/2008	32	0.1	32.1	06/06/2008	16.8	5.9	22.7
01/07/2008	31.9	0.9	32.8	21/03/2008	24.2	5.8	30.0
31/10/2008	31.9	0.6	32.5	05/06/2008	16.5	5.7	22.2
28/01/2008	31.8	3.0	34.8	01/02/2008	10.8	5.5	16.3

## 8.1.2 Annual Average PM<sub>10</sub>

The incremental annual average  $PM_{10}$  concentrations at the nearest residential receptors are less than  $1.4\mu g/m^3$  and, considering the background levels in **Table 6-3** and **Table 6-4** and the annual average criterion of  $30~\mu g/m^3$ , the impacts from the project are unlikely to have any significant effect on the cumulative annual average  $PM_{10}$  concentration in the surrounding residential areas.

## 8.1.3 Annual Average TSP

The incremental annual average TSP concentrations at nearest residential receptors are less than  $2.9\mu g/m^3$  and, considering the background levels in **Table 6-3** and **Table 6-4** and the annual average criterion of  $90~\mu g/m^3$ , the impacts from the project are unlikely to have any significant effect on the cumulative annual average TSP concentration in the surrounding residential areas.

#### 8.1.4 Dust Deposition

The predicted dust deposition impacts arising from the Project alone are shown in **Figure 8-4**. The incremental annual average dust deposition levels at nearest discrete receptors are below 2g/m²/month and would comply with the OEH criteria presented in **Table 5-2**. Considering a conservative background level of 2g/m²/month for the area surrounding the Project, the predicted cumulative annual average dust deposition level would also comply with the OEH criteria of 4g/m²/month in the surrounding residential areas.

Figure 8-1 Predicted Maximum 24-hour Average  $PM_{10}$  Concentrations ( $\mu g/m^3$ ) (Project Alone)



Figure 8-2 Predicted Annual Average  $PM_{10}$  Concentrations ( $\mu g/m^3$ ) (Project Alone)



Figure 8-3 Predicted Annual Average TSP Concentrations ( $\mu g/m^3$ ) (Project Alone)



Figure 8-4 Predicted Annual Average Deposited Dust Levels (g/m²/month) (Project Alone)



## 9 DUST MITIGATION MEASURES

The proposed activities will generate dust, therefore it is prudent to take reasonable and practicable measures to prevent or minimise dust impacts at the surrounding receptors.

The primary dust sources identified from the Project are:

- Wind-blown dust from stockpiles or exposed areas; and
- Dust generated by operational activities.

The Project will develop a dust emissions management plan and the measures presented in Table 9-1 would be considered for implementation:

**Table 9-1** Dust mitigation measures

Source	Control Procedure		
Exposed areas	<ul> <li>Disturb only the minimum area.</li> <li>Rehabilitate completed areas as soon as practicable.</li> </ul>		
	<ul> <li>Use water sprays to minimise dust lift off.</li> </ul>		
Stockpiles	<ul> <li>Watering of stockpiles to minimise dust lift off.</li> <li>Ensure material is sufficiently wetted prior to handling.</li> </ul>		
Hauling activities	<ul> <li>Establish a stabilised access point to the site.</li> <li>Watering of active haul areas to minimise dust.</li> <li>Limit vehicle speeds.</li> <li>Maintain active haul roads.</li> <li>Covering loads.</li> </ul>		
Processing material	<ul> <li>Water sprays installed on equipment.</li> <li>Ensure material is sufficiently wetted prior to handling.</li> </ul>		

## 10 CONCLUSIONS

This report has assessed the potential dust impacts associated with the proposed Materials Recycling Facility at 2 Albert Street, St Peters.

Dispersion modelling using the Ausplume model has been applied to predict off-site impacts from the Project on the surrounding area.

The results indicate that particulate emissions of TSP,  $PM_{10}$  and dust deposition would comply with the NSW OEH criteria and would therefore not lead to unacceptable levels of environmental harm or impact on the amenity of the area.

#### 11 REFERENCES

#### **Bureau of Meteorology (2011)**

Climatic Averages Australia, Bureau of Meteorology website

[http://www.bom.gov.au/climate/averages]

#### **Katestone Environmental Pty Ltd (2010)**

"NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining" Katestone Environmental Pty Ltd prepared for DECCW, 2010.

#### **NSW DEC (2005)**

"Approved Methods for the Modelling and Assessment of Air Pollutants in NSW", August 2005

#### **NSW OEH (2011)**

Air Quality, New South Wales Office of Environment and Heritage website

[http://www.environment.gov.au/]

#### PAEHolmes (2010)

Preliminary Environmental Assessment – Air Quality Proposed Materials Recycling Depot, 13 December 2010.

#### **SPCC (1983)**

"Air Pollution from Coal Mining and Related Developments", State Pollution Control Commission.

#### Todoroski air sciences (2011)

Air Quality Assessment for Materials Recycling Facility at no. 2 Albert Street, St Peters, September 2011.

#### **US EPA (1985 and Updates)**

"Compilation of Air Pollutant Emission Factors", AP-42, Fourth Edition United States Environmental Protection Agency, Office of Air and Radiation Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711.

Note this reference is now a web-based document.

#### **VEPA (1986)**

"The AUSPLUME Gaussian Plume Dispersion Model", Environment Protection Authority, Olderfleet Buildings, 477 Collins Street, Melbourne Victoria 3000, Publication Number 264.

#### Warren, J. L. (1973)

"Green Space for Air Pollution Control". Technical Report N.50. School of Forest Resources, North Carolina State University, Rayleigh. July 1973.

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We are committed to and have implemented AS/NZS ISO 9001:2008 "Quality Management Systems – Requirements". This management system has been externally certified and Licence No. QEC 13457 has been issued.

Version	Status	Date	Prepared by	Checked by	
٨	Draft	22 September 2011	Phil Henschke (TAS)/	Noil Cross	
Α	Diait		John Wassermann	Neil Gross	
D	Draft	20 November 2011	Phil Henschke (TAS)/	Barry Murray	
В	Diait		John Wassermann		
D	Final	23 November 2011	Phil Henschke (TAS)/	Dawn ( M. 1995) (	
В	Final		John Wassermann	Barry Murray	

# APPENDIX A EMISSION INVENTORY

# **Materials Recycling Facility**

The dust emissions from the Project have been estimated from the operational description of the proposed activities provided by the Proponent and have been combined with emissions factor equations that relate to the quantity of dust emitted from particular activities based on intensity, the prevailing meteorological conditions and composition of the material being handled. Emission factors and associated controls have been sourced from the US EPA AP42 Emission Factors (US EPA, 1985 and Updates), the State Pollution Control Commission document "Air Pollution from Coal Mining and Related Developments" (SPCC, 1983) and the OEH document, "NSW Coal Mining Benchmarking Study: International Best Practise Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining", prepared by Katestone Environmental (Katestone, 2010).

Report No. 09355-AQ Version B Appendix A-1

**Table A-1** Emission Factor Equations

Activity	Emission Factor Equation	Variables	Control	Source
Loading / emplacing material	$EF = k \times 0.0016 \times \left( \left( \frac{U}{2.2} \right)^{1.3} / \left( \frac{M}{2} \right)^{1.4} \right) \frac{kg}{tonne}$	$k_{TSP} = 0.74$ $U = wind speed (m/s)$ $M = moisture content (%)$	-	US EPA, 1985
Hauling on unsealed surfaces	$EF = k \left(\frac{s}{12}\right)^{a} \times \left(\frac{W}{3}\right)^{b} \frac{lb}{VMT}$	k = 4.9 (lb/VMT) s = surface material silt content (%) W = average weight of vehicle (tons)	75% watering trafficked areas	US EPA, 1985
Crushing	$EF = 0.0027 \frac{kg}{Mg}$	-	-	US EPA, 1985
Wind erosion	$\frac{EF = 0.4 \frac{kg}{ha}}{hour}$	-	25% watering of exposed areas	SPCC, 1983 Katestone, 2010

# **Table A-2** Emission Inventory

ACTIVITY	TSP emission (kg/year)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variabl e 4	Units	Variabl e 5	Units	Variable 6	Units
Hauling imported material on-site	594	60,000	tonnes/year	0.0396	kg/t	25	tonnes/load	25	Mean vehicle mass (tonnes)	0.3	km/return trip	3.30	kg/VKT	10	% silt content	75	% Control
Unloading imported material to stockpile	254	60,000	tonnes/year	0.0042	kg/t	3.58	average of (U/2.2)^1.3	2	moisture content (%)								
Excavator removing material	381	90,000	tonnes/year	0.0042	kg/t	3.58	average of (U/2.2)^1.3	2	moisture content (%)								
FEL loading to crusher	636	150,000	tonnes/year	0.0042	kg/t	3.58	average of (U/2.2)^1.3	2	moisture content (%)								
Crushing and/or scalping screen	405	150,000	tonnes/year	0.0027	kg/Mg												
FEL on stockpile	636	150,000	tonnes/year	0.0042	kg/t	3.58	average of (U/2.2)^1.3	2	moisture content (%)								
Loading to trucks	636	150,000	tonnes/year	0.0042	kg/t	3.58	average of (U/2.2)^1.3	2	moisture content (%)								
Hauling product off-site	1,342	150,000	tonnes/year	0.0358	kg/t	30	tonnes/load	30	Mean vehicle mass (tonnes)	0.3	km/return trip	3.58	kg/VKT	10	% silt content	75	% Control
Wind erosion	3,101	1.2	ha	0.4	kg/ha/hour	8760	hours									25	% Control
Total	7,985																

# Appendix 7

# 2 ALBERT STREET, ST PETERS - MATERIALS RECYCLING FACILITY

NOISE IMPACT ASSESSMENT

REPORT NO. 09355 VERSION C

DECEMBER 2011

# PREPARED FOR

CONCRETE RECYCLERS PTY LTD 14 THACKERAY STREET CAMELLIA NSW 2142

# DOCUMENT CONTROL

Version	Status	Date	Prepared by	Checked by
Α	Draft	5 April 2010	Glenn Homes	Neil Gross
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**APPENDIX A – Noise Measurement Results** 

# GLOSSARY OF ACOUSTIC TERMS

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Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

**Maximum Noise Level (L\_{Amax})** – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

 $L_{A1}$  – The  $L_{A1}$  level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the  $L_{A1}$  level for 99% of the time.

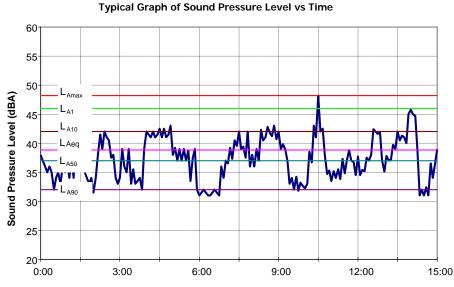
 $L_{A10}$  – The  $L_{A10}$  level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the  $L_{A10}$  level for 90% of the time. The  $L_{A10}$  is a common noise descriptor for environmental noise and road traffic noise.

 $L_{A90}$  – The  $L_{A90}$  level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the  $L_{A90}$  level for 10% of the time. This measure is commonly referred to as the background noise level.

 $L_{Aeq}$  – The equivalent continuous sound level ( $L_{Aeq}$ ) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

**ABL** – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the  $10^{th}$  percentile (lowest  $10^{th}$  percent) background level ( $L_{A90}$ ) for each period.

**RBL** – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.



Monitoring or Survey Period (5 sec samples)

#### 1 INTRODUCTION

Concrete Recyclers Pty Ltd is proposing to recycle material stockpiled at 2 Albert Street, in St Peters, Sydney as shown in Figure 1-1. The operation would entail removal of the stockpiled material with an excavator followed by crushing, screening, stockpiling and then loading onto trucks for transportation from the site. To ensure the material supplied can meet the demand of the market raw material will also be brought to site to mix with the stockpiled material on site.

The project would require an initial construction phase to establish the site for full operation. During this construction phase, plant would generally be limited to a crusher and an excavator.

The land is RTA property and will be leased from the RTA for the purpose of the project. The project area is located part within the Marrickville Council area and part within the City of Sydney. Land uses in the area are predominately industrial, although there are pockets of residential usage within the area. This land and part of the surrounding area, including nearby property used for residential purpose, is currently zoned as a road reservation by the respective councils for planned future arterial road usage.

Prior or as part of any future road construction, it would be necessary for the RTA or its contractors to remove the stockpiled material from this site. The proposed operation however seeks to recycle this material for various construction purposes.

Wilkinson Murray has been commissioned by Concrete Recyclers to undertake a noise impact assessment for the proposal. The results of this assessment and its recommendations are presented within this report.



Figure 1-1 Area Plan showing Site and Surrounding Residential & Industrial Uses

# 2 SITE DESCRIPTION

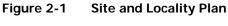
The site is located in St Peters in a pocket of land zoned "Arterial Road Reservation", within a greater industrial area. The nearest and potentially most affected receptors are a small group of dwellings located near the northern boundary of the site, in Campbell Road. Of these, the potentially most affected dwelling is at 13 Campbell Road (Location A), near the corner of Campbell Road and Albert Street. The remaining few dwellings located further to the east are at a lower surface level to the site, as the land progressively falls away. This provides increased acoustic shielding from the future activities on site.

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To the north-west of the site, there is another small pocket of dwellings, across the north western leg of Albert Street (Location B). It is important to note that both the abovementioned pockets of dwellings are located on land zoned by the relevant Councils for future arterial road purposes i.e. not on land zoned "Residential".

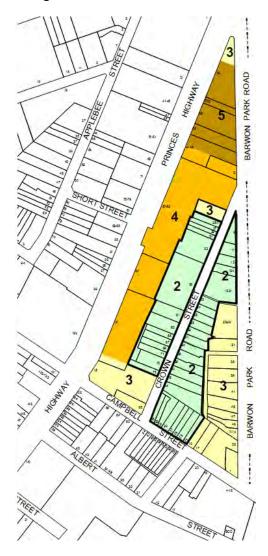
Figure 2-1 is a locality plan of the site and the adjacent area.





To the north-west is the proposed Barwon Triangle redevelopment for which a DCP exists. This allows for a mix of 3-4 storey residential with the existing residences. It is important to note that this area falls in the ANEF20 to ANEF 25 zone in the 2029 plan. This will require any of the new residential to require upgraded glazing and roofing to meet internal noise limits from aircraft noise in accordance with AS2021. This upgraded building construction would also provide noise reduction from other traffic and industrial noise in the area when windows are closed. It would be expected that new residents moving into this area would not be likely to be highly sensitive to noise given the existing environment.

Figure 2-2 Barwon Triangle



The nearest industrial facility to the west of the site is a recycling facility incorporating some landfill activity and truck movements to and from the adjoining site along Albert Street.

A short length of 3m Colorbond fence is located on the northern boundary of the site, near the entrance. A 2m Colorbond fence is located at the northern boundary of the neighbouring industrial site, to the west.

#### 3 PROPOSED OPERATIONS

#### 3.1 Recycling Methodology

Operation on site will require an initial construction phase. This will enable a driveway and ramp to be cleared and the establishment of the crusher and screening plant on top of the existing stockpile, towards the southern end, furthest from the residences. The general site operations are briefly described below and shown in Figure 3-1 overleaf. These may vary to some degree subject to site conditions and constraints:

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- Commence by clearing near the entrance of the site at first using an Excavator. A driveway / ramp would be cleared into the site to the initial location of the Crusher on top of the main stockpile set back a minimum of 20m from the northern edge. During these early works, material will be loaded onto trucks using the same excavator used in the clearing activity. Some of this material will be used to form a noise mound at the top of the existing stockpile, at its northern edge to the east of the ramp to RL25.
- Once a ramp onto the stockpile is formed, the northern noise mound complete and the top of the main stockpile prepared level at approximately RL20, the Crusher will be installed, towards the southern end of the main stockpile.
- Material will be crushed and stockpiled along the western edge of the main stockpile to
  provide shielding from the crusher towards the residences to the north west. The
  overall construction phase before commencement of "normal" operation may take
  approximately 3 months, subject to the conditions and constraints encountered on site.
- Normal Operations will also include a Screen unit located adjacent to the Crusher and a
  Front End Loader will be used to assist with stockpiling etc. Bricks and concrete will
  also be imported by truck to blend with the sandstone in order to improve the quality of
  the product and make it more marketable.
- Material from the crushed stockpile will then be loaded onto trucks by the Excavator in
  the area close to the crusher and removed from site by truck. This will require trucks
  to manoeuvre on top of the main stockpile, such that the size and height of the crushed
  stockpile may be limited. The excavator will also sit on a 2-3m mound adjacent to the
  crusher to assist with easy material handling.
- The site will then progressively work from south to north reducing the height of the main stockpile, whilst maintaining the northern noise mound at RL25 or at least 5m above the working area and the western stockpile 4m above the working area (and up to 5m once the RL of the working area reduces and more space and material is available). From time to time the crusher and screen would need to be temporarily relocated to reduce the height of the main stockpile. For short periods this equipment would operate without the full benefit of a crushed stockpile until enough material has been crushed to form a new one. This would occur for approximately a week each time the crusher was relocated.

• In the early morning shoulder period from 6.00am to 7.00am it is proposed to load trucks on site using the Front End Loader. At this time the crusher would not operate. This activity would occur on the top of the stockpile in an area where the northern and western noise mound and stockpile would provide shielding to the residences. It is critical to load product prior to the morning peak for delivery to sites in the metropolitan area.

Figure 3-1 shows the typical location of the Crusher and Screen and location of the noise mound and crushed stockpile between the main stockpile and the two areas of residential receivers at commencement. A more detailed plan is shown in Figure 3-2 with a 3D view in Figure 3-3. Figure 3-4 shows a 3D view once most of the stockpile has been processed.

The 3 receiver locations, (2 to the north A & C and one to the north-west B) are also shown.

Access to the site will be from Campbell Road, then onto Albert Street. Peak hourly movements in the order of 8 trucks per hour are anticipated. This would only tend to occur when there is a demand for the product. There will be days when the movements related to the site will be lower.

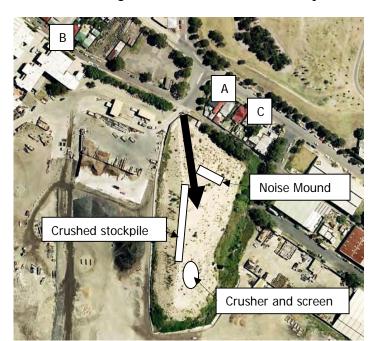


Figure 3-1 Site Plan Showing Residences and Indicative Layout

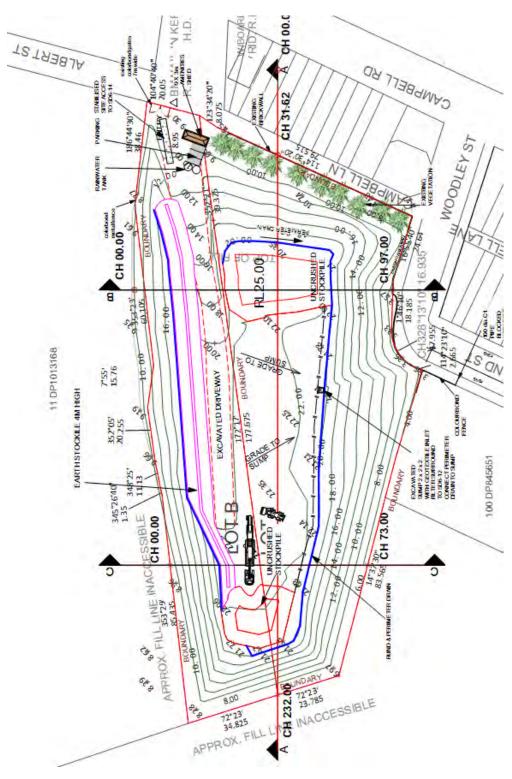


Figure 3-2 Site Plan showing Noise Mound RL20 and Crushed Stockpile

ENTRY

STABILISED
SITE ACCESS

AMENITIES SHED

UNCRUSHED
STOCKPILE

UNCRUSHED
STOCKPILE

STOCKPILE

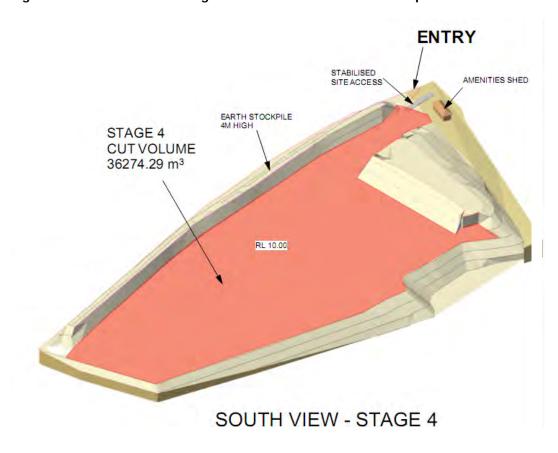
STOCKPILE

STOCKPILE

STOCKPILE

Figure 3-3 3D View showing Noise Mound and Crushed Stockpile – RL20

Figure 3-4 3D View showing Noise Mound and Crushed Stockpile – RL10



# 3.2 Hours of Operation

The OEH recommended standard construction hours that are applicable during the construction phase are:

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- Monday to Friday 7.00am to 6.00pm
- Saturday 8.00am to 1.00pm

Following the construction phase, the proposed operational hours are:

- Truck movements: 6.00am to 6.00pm Monday to Friday and 7.00am to 4.00pm Saturday.
- Full site operations: 7.00am to 6.00pm Monday to Friday and 7.00am to 4.00pm Saturday.
- Truck loading/unloading only: 6.00am to 7.00am Monday to Friday.

#### 4 AMBIENT NOISE ENVIRONMENT AND NOISE MONITORING

The ambient noise environment at the nearest dwellings is typical of an urban environment with some noise contribution from the existing recycling facility and road traffic noise from Campbell Road and Princes Highway. The current noise environment appears to be strongly controlled by road traffic noise, particularly at locations fronting the local roads.

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In order to quantify the existing acoustic environment, unattended noise monitoring using environmental noise loggers was carried out at the potentially most affected location, 13 Campbell Road (Location A), immediately to the north of the site.

The noise loggers were located on site on Tuesday, 12 January 2010 in order to capture at least one full week of ambient noise data. In order to provide data in relation to existing levels of road traffic noise, one unattended environmental noise logger was located at 13 Campbell Road fronting Campbell Road, and one noise logger was located at the side of the dwelling, fronting Albert Street. These two noise loggers were shielding from the environment at the rear of the house by way of the dwelling itself and fencing between the front portion and rear portion of the house.

In order to provide data to quantify the noise environment for the purpose of noise emission from the proposed site, another noise logger was located at the rear of the dwelling. The noise environment at this location (Location A) is considered to be reasonably similar to that at the dwellings further to the north-west of the site (Location B) and therefore representative of that location as well.

The weather during the first few days of the survey was somewhat unstable with some showers and thunderstorms. However, commencing from 16 January 2010, there was a full week of fine weather, with sunny conditions.

The noise logging was carried out using Acoustic Research Laboratory (ARL) Type 215 environmental noise loggers programmed to continuously monitor over the duration of the survey and record various relevant environmental statistical noise descriptors at the end of each 15 minute period. Calibration was checked before and after the noise survey to ensure no significant drift in calibration.

Appendix A presents a graphical representation of the ambient noise measurements at each monitoring location. The results show the strong contribution of road traffic noise, particularly at the locations adjacent to the nearby roads.

Table 4-1 summarises the background noise levels determined from noise logging at the rear of the house which will form the basis for the noise goals to assess site noise emissions.

Table 4-1 Background Noise Levels

Day	(dBA)	6.00am to 7.00am Morning Shoulder Period (dBA)
	48	46
Note:	U	nd noise levels above are the Rating Background Levels (refer to

Glossary) determined in accordance with the DECCW *Industrial Noise Policy* (as discussed in Section 5).

# 5 NOISE CRITERIA

Criteria for noise from the site are discussed for the construction noise phase as well as the ongoing operational noise.

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#### 5.1 Construction Noise

The NSW Interim Construction Noise Guideline (ICNG) presents the NSW Government's process to assess construction noise. The ICNG was developed by the Department of Environment Climate Change & Water (DECCW) taking into consideration that construction is temporary, noisy and difficult to ameliorate. As such the ICNG was developed to focus on applying a range of work practices most suited to minimising construction noise impacts, rather than focusing only on achieving a numeric noise level. The ICNG recommends that standard construction work hours should typically be as follows:

- Monday to Friday 7.00am to 6.00pm.
- Saturday 8.00am to 1.00pm.
- No work on Sundays or Public Holidays.

Additionally it recommends quantitative management noise goals at residences as presented in Table 5-1.

Table 5-1 Construction Noise at Dwellings

Time of Day	Management	How to Apply
	Level L <sub>Aeq (15 min)</sub>	
Recommended standard hours: Monday to Friday	Noise affected RBL + 10dBA	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{\text{Aeq}}$ (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
7am to 6pm Saturday 8am to 1pm No work on Sundays or Public Holidays	Highly noise affected 75dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level.  If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.
Outside recommended standard hours	Noise affected RBL + 5dBA	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community.

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Based on a full week of noise monitoring carried out at the rear of the dwelling near the corner of Albert Street, the RBL has been calculated to be 48dBA. Therefore, the project specific criterion at the dwellings for assessment purposes during recommended construction hours is:

Construction Noise Management Level (NML)

58dBA

At industrial receptors, the construction noise guideline recommends a  $L_{Aeq,15min}$  noise level of 75dBA which is applicable at the closest and potentially most affected industrial premises.

#### 5.2 Industrial Noise Policy

The NSW Government's policy and guidelines for the assessment of industrial noise is presented in the *Industrial Noise Policy (INP)*.

The INP's noise criteria at residences are:

**Intrusiveness Noise Criterion** – The  $L_{Aeq,15min}$  noise level within the day (7.00am to 6.00pm, 8.00am to 6.00pm Sundays and Public Holidays), evening (6.00pm to 10.00pm) or night time (10.00pm to 7.00am, 10.00pm to 8.00am Sundays and Public Holidays) assessment periods should not exceed the  $L_{A90}$  background noise level within that period by more than 5dBA. The purpose of this noise goal is to minimise the likelihood of disturbance.

In recognition that in many areas, the ambient noise environment often commences its night time to daytime increase during the early morning hours between for example 6.00am to 7.00am, the *INP* allows for the establishment of noise criteria for this "shoulder" period in these cases.

For this particular project, based on Rating Background Levels obtained for the daytime and the 6.00am to 7.00am early morning shoulder period as determined from the ambient noise monitoring carried out at the rear of the dwelling near the corner of Albert Street, the Intrusiveness Noise Criteria are:

• Daytime 53dBA

Morning (6.00am to 7.00am) Shoulder Period

**Amenity Noise Criterion** – The maximum ambient  $L_{Aeq}$  noise level within the day, evening and night assessment period should not exceed deemed acceptable noise levels, dependant on the relevant receiver type and Council zoning. The purpose of this noise goal is to provide an upper limit to industry related noise emission. Table 2.1 of the *INP* sets out Amenity Noise Criteria corresponding to various categories of residential receiver, typically including *Rural*, *Suburban* and *Urban* categories.

In the case of the dwellings closest to this particular development, the dwellings could be considered isolated residences within an industrial zone for which the Industrial Amenity criterion (70dBA) would apply.

Alternatively, if the residences are considered as Urban, for the daytime a criterion of 60dBA would apply and for the whole of the night time period a criterion of 45dBA would apply. However, as existing  $L_{Aeq}$  noise levels in the 1 hour early morning shoulder period are already 60dBA or higher on weekdays as a result of traffic and industrial noise and both are unlikely to reduce in the future, an amenity criterion of 50dBA would apply in strict accordance with the  $\it{INP}$  for this 1 hour..

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For the proposed truck loading activity during the 1 hour early morning period it is considered that  $L_{Aeq}$  noise levels over a busy 15 minute period is likely to be 2-3dBA noisier than a 1 hour period. On this basis the Intrusiveness Noise Criteria are considered the most stringent to assess the noise impact at the dwellings for both the daytime and early morning period.

In the case of industrial receptors, the *INP* recommends an Amenity Criterion, when in use, of 70dBA.

#### 5.3 Sleep Disturbance Criterion

Since the site will load trucks during the 6.00am to 7.00am period which forms part of the night time, short-term high noise level events have the potential to cause sleep disturbance if they emerge significantly above the background level. The *INP* does not specifically address sleep disturbance from these types of noise level events.

The OEH in the *Noise Guide For Local Government (NGLG)* recommends that the  $L_{A1,1min}$  noise level should not exceed the background  $L_{A90}$  level by more than 15dBA, which should be used as a screening test.

Based on a background noise level of 46dBA in this time period, this results in a criterion of 61dBA.

In addition, the *Environmental Criteria for Road Traffic Noise* (ECRTN) includes the following statements based on transportation type noise for internal noise levels.

'Maximum internal noise levels below 50-55dBA are unlikely to cause awakening reactions'

'One or two events per night, with maximum internal noise levels of 65-70dBA, are not likely to affect health and well being significantly.'

Given there will be more than one or two events per night, the 50-55dBA range inside should be adopted as a noise goal and allowing an industry accepted 10dBA difference from outside to inside with an open window, this equates to maximum external levels of 60-65dBA which is similar to the 61dBA discussed above.

# 6 SITE NOISE EMISSION, ASSESSMENT AND RECOMMENDATIONS

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#### 6.1 Noise Modelling

For this assessment, noise predictions were conducted using the "CadnaA" noise modelling software with ISO9613 noise prediction algorithms. This software considers the following noise attenuation factors;

- distance;
- barrier effects from earth mounds and/ or site fencing;
- ground attenuation; and
- air absorption.

No meteorological adjustments (due to wind or temperature inversions) have been incorporated as distances are less than 300m, and meteorological enhancements are minor and insignificant at these small distances.

Table 6-1 presents the A-Weighted sound power levels (SWLs) used in the noise modelling for the more significant plant that may be used on site. This is based on data contained within the Wilkinson Murray database and measurements specifically undertaken for the project.

Table 6-1 Sound Power Levels

Noise Source	L <sub>Aeq, 15min</sub> Sound Power Level, dBA
Truck manoeuvring on site	81 (Maximum pass by noise level at 7m)
Front End Loader (Post Construction Phase)	106 (115 L <sub>Amax</sub> from loading)
Excavator	105
Screen <sup>(1)</sup> (Post Construction Phase)	110
Crusher*	110

Note: 1 Based on noise measurements of units similar to those proposed for this project, currently stationed at Concrete Recycler's Kimbriki operation, in Terry Hills. Noise is as measured on noisier exhaust side of units. Noise levels on the opposite side of the units are 3dBA lower.

From the sound power levels in the table above, it is evident that the most significant sources of steady noise are the Crusher and Screen.

#### 6.2 Site Noise Emission and Assessment

The predicted  $L_{Aeq,15min}$  noise emissions from the site are presented in Table 6-2, based on information provided by Concrete Recyclers in relation to site operations (see Section 3.1 and Figure 3-1 to 3-3) and the equipment sound power levels used in the modelling and calculations.

Table 6-2 deals with the early construction phase as well as the ongoing operational phase where the stockpile is at its existing height and at a later stage where the stockpile has been reduced to existing ground level.

Table 6-2 Predicted Site Noise Emission L<sub>Aeq,15min</sub> dBA

Phase	Description	Noise Goals	Nort Resid	North-West Residences	
		dBA	Loc. A	Loc. C	Loc. B
Construction	Excavator clearing near northern boundary and during building of ramp	58	60	57	52
Phase (Initial Site Establishment)	Excavator at top of ramp with crusher at initial location near top of ramp 20m from northern edge of main stockpile during building of mound	58	55	55	52
Normal Operation (Post Relocated Crusher)	Crusher and screen at southern end. Excavator and Front End Loader working near the	<b>5</b> 0	47 High	43 High	48 High
	crusher. Trucks between site entry and crushed stockpile. RL20 High and RL8 Low	53	47 Low	44 Low	49 Low
	Possible temporary scenario without full height crushed stockpile.  Crusher and screen at southern end. Excavator	53	47 High	43 High	51 High
	and Front End Loader working near the crusher. Trucks between site entry and stockpile. RL20 High and RL8 Low	53	47 Low	44 Low	52 Low
	Excavator/FEL loading truck only near crushed stockpile between 6am and 7am. High and	51 L <sub>Aeq</sub>	47	43	46
	Low RL scenarios similar	61 L <sub>Amax</sub>	60	55	54

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During the early phase of the project, noise levels are expected to comply with the construction noise management level at the nearest dwellings, with the exception of the first few days where a marginal 2dBA exceedance is predicted for an excavator which would need to operate at the site boundary at the bottom of the ramp. The duration of these works is expected to be relatively short. For the most part, the noise levels are expected to fall within the construction objective at the nearest dwellings.

During the early construction phase of the works, noise levels near the western boundary extending into the nearby landfill site is expected to be in the order of 80dBA, with progressive reduction as the excavator moves up the ramp to the top of the main stockpile. This exceeds the 75dBA objective for industrial receptors within a localised area close to the boundary. We note however that this area appears to be used for temporary stockpiling and is not considered likely to interfere with the site operations.

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Following relocation of the crusher and commencement of "normal" operations, the crushed stockpile is to be maintained between the north western dwellings and the relocated crushing and screening plant to mitigate noise from the site. A minimum 3-4m high crushed stockpile is expected to minimise noise to below the noise objectives. Compliance with criteria is also predicted during temporary periods when the crusher is relocated and the stockpile is temporarily reduced in height.

As the main stockpile is reduced in height, there is more space for trucks to manoeuvre, such that it will be easier to maintain the crushed stockpile on the western edge of the top of stockpile working area. In addition, the northern bund will be maintained at RL25, or at least 5m above the working area. During the normal operational phase, noise levels within the most affected western industrial boundary are expected to comply with the  $L_{Aeq}$  70dBA limit recommended by the *INP*.

Noise emission from site during loading between 6.00am and 7.00am is also predicted to meet the shoulder period intrusive noise criteria and the sleep disturbance criterion of 61dBA. As trucks leave the site, the maximum noise level from this activity is discussed in the road traffic noise section (Section 7).

#### 6.3 Mitigation and Management Recommendations

In order to achieve compliance with the noise objectives and minimise potential noise disturbance to the potentially most affected receptors closest to the site, the following mitigation measures are recommended and where appropriate have been taken into consideration in the modelling. This considers the more sensitive 6.00am to 7.00am shoulder morning period.

- Consult with the industrial facility on the western boundary in relation to higher noise levels near the boundary during the construction phase of the project.
- Maintain the existing fencing on the northern boundary of the site to help contain noise within the site.
- Minimise works near the northern boundary of the site wherever feasible.
- During the construction phase, locate the crusher a minimum of 20m from the northern edge of the main stockpile.
- On relocating the Crusher, the Crusher and Screen units should be located to the southern boundary of the site and a crushed stockpile maintained whenever possible so as to maximise shielding to the dwellings to the north-west of the site.
- Following relocation of the Crusher and commencement of normal operations, maintain
  a mound to RL25 or at least 5m above the working area between the plant and
  equipment and the potentially most affected dwellings to the north and an uncrushed
  stockpile at least 4m above the working area to the west.
- Ensure mobile plant used on site is fitted with residential grade silencers.
- To minimise disturbance to the residents, advise truck drivers not to queue outside the gates before 6.00am.
- At all times, but particularly prior to 7.00am trucks should be loaded in a quiet manner by placing rather than dropping material into trucks.

# 7 ROAD TRAFFIC NOISE ASSESSMENT

#### 7.1 Road Traffic Noise Criteria

The NSW Government released a new *Road Noise Policy* on 1 July 2011 which replaces the *Environmental Criteria for Road Traffic Noise (ECRTN)*. These policies present recommended guidelines and criteria for the assessment of road traffic noise on public roads. However the requirements of the OEH in their letter of 7 July 2011 were still to use the previous *ECRTN*. The two policies' criteria considered relevant to this project are presented in Tables 7-1 and 7-2.

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Table 7-1 OEH Road Noise Policy Criteria

Road	Type of project/land use	Assessment criteria – dB(A)			
category		Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)		
Freeway/ arterial/ sub-arterial	Existing residences affected by noise from new freeway/arterial/sub-arterial road corridors	L <sub>Aeq, (15 hour)</sub> 55 (external)	L <sub>Aeq. (9 hour)</sub> 50 (external)		
roads	<ol> <li>Existing residences affected by noise from redevelopment of existing freeway/arterial/sub- arterial roads</li> </ol>	L <sub>Aeq, (15 hour)</sub> 60 (external)	L <sub>Aeq, (9 hour)</sub> 55 (external)		
	<ol> <li>Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments</li> </ol>				
Local roads	Existing residences affected by noise from new local road corridors     Existing residences affected by noise from redevelopment of existing local roads	L <sub>Aeq. (1 hour)</sub> 55 (external)	L <sub>Aeq, (1 hour)</sub> 50 (external)		
	Existing residences affected by additional traffic on existing local roads generated by land use developments				

Where existing traffic noise levels already exceed these assessment levels the Road Noise Policy states in Sections 3.4 and 3.4.1.

In assessing feasible and reasonable mitigation measures, an increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.

For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2dB above the corresponding 'no build' option

Table 7-2 OEH Environmental Criteria for Road Traffic Noise

		Criteria			
Type of Development	Day (7am-10pm)	Night (10pm-7am)	Where Criteria are Already Exceeded		
Land use developments with potential to create additional traffic on collector road. (Campbell)	L <sub>Aeq,1hr</sub> 60dBA	L <sub>Aeq,1hr</sub> 55dBA	Where feasible and reasonable, existing nois levels should be mitigated to meet the nois criteria. Examples of applicable strategie include appropriate location of private access roads; regulating times of use, using clustering		
Land use developments with potential to create additional traffic on local road.  (Albert)	L <sub>Aeq,1hr</sub> 55dBA	L <sub>Aeq, 1hr</sub> 50dBA	<ul> <li>using "quiet" vehicles; and using barriers an acoustic treatments</li> <li>In all cases, traffic arising from the developmer should not lead to an increase in existing nois levels by more than 2dB.</li> </ul>		

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In relation to this project, the *RNP* would be marginally less stringent as Campbell Street (collector road under the *ECRTN*) would now require fall under the Sub Arterial category and require assessment over 15 hours and 9 hours rather than the worst case 1 hour in either the day or night time.

Nevertheless, as a conservative approach we have adopted the previous *ECRTN* requirements.

Although not an explicit criterion, the *RNP* also recommends consideration of sleep disturbance that might result from road traffic noise. Based upon a review of a number of relevant studies, the *ECRTN* suggests that internal maximum noise levels below 50dBA to 55dBA are unlikely to result in awakening reactions. The *ECRTN* however recognises that awakening reactions are subject to many variables including background noise level, age, sleep state, number of maximum noise level events, etc. Research in this regard is not conclusive and no definitive correlation exists between awakening reactions and maximum noise level events.

For the purpose of acoustic assessment, based on definitions and guidelines provided within the *ECRTN*, Albert Street performs the function of a Local Road whereas Campbell Road performs the function of a Collector Road.

Based on the noise monitoring adjacent to facades fronting Albert Street and Campbell Road undertaken for the purpose of this assessment, the prevailing road traffic noise levels are summarised in Table 7-1.

Table 7-1 Existing Road Traffic Noise Level

Road	Day L <sub>Aeq,1hr</sub> Level (dBA)	Night L <sub>Aeq,1hr</sub> Level (dBA)
Campbell Road	66	60
Albert Street	67	63

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The prevailing road traffic noise levels in Table 7-1 are above the relevant noise criteria in Table 7-2 for the Albert Street and Campbell Road facades. For this project however, it is not considered reasonable for the proponent to implement measures to reduce overall road traffic noise to the noise criteria levels, therefore, as recommended by the *ECRTN* and consistent with its approach, any additional traffic noise generated by the project should not result in an increase of more than 2dBA, to minimise any noise impact to within acceptable levels.

Based on a peak number of hourly truck movements of 8 per hour, the  $L_{Aeq,1hr}$  traffic noise contribution is calculated at 56dBA on both the Campbell Road and Albert Street façades. This noise level is well below the current night-time road traffic noise levels, even in the early morning shoulder period between 6.00am and 7.00am and will result in a 1dBA increase in noise levels. This satisfies the *ECRTN* recommendation not to increase the existing noise level by more than 2dBA.

In relation to maximum noise levels, on the Campbell Road façade, the maximum noise level during truck pass bys, and trucks accelerating on the far lane, is estimated at approximately 73dBA outside, which translates to 63dBA (with windows open for ventilation purposes). This exceeds the 50dBA to 55dBA internal noise guideline considered unlikely to result in awakening reactions. However, a review of the monitored noise data indicates that the prevailing external  $L_{A1}$  noise levels (which are considered representative of the maximum noise levels) are typically in the order of 70dBA and higher between 6.00am and 7.00am, i.e. 60dBA internally.

In addition, traffic counting from 2009 indicates approximately 55 truck movements per hour during this time period, therefore an additional 8 movements per hour (assuming in the worst case that all traffic travels in the one direction) of similar maximum noise levels to those prevailing is considered unlikely to be perceived as a new source of sleep disturbance.

Updated counting in 2011 was only undertaken during the peak hours after 7.00am and not in the early morning period. Nevertheless it showed an increase in the number of trucks during the peak hours to in excess of 100 truck movements between 7.00am and 8.00am.

On Albert Street, the dwelling does not contain bedroom windows so sleep disturbance is not an issue on this façade of the dwelling.

The potential increase in noise levels from additional truck movements to and from the site, including the early morning shoulder period would meet the ECRTN  $L_{Aeq}$  criteria and result in negligible impact. The small percentage increase in truck movements is not expected to result in any change in sleep disturbance, given the high number of truck movements already using the local roads at this time.

#### 8 CONCLUSION

Concrete Recyclers Pty Ltd is proposing to operate a recycling facility at 2 Albert Street in St Peters. This area is on the boundary between two council areas, namely Marrickville and City of Sydney Council. The area is predominately industrial, although there are pockets of existing residences within the area as well as a DCP for the Barwon Triangle which includes more residential in the future. The proposed site and the land occupied by the nearby dwellings are zoned by the respective councils for arterial road widening and upgrade purposes.

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Establishment of operations on site will require an initial construction phase (approximately 3 months) and then normal operations following relocation of the Crusher unit within the site and introduction of additional plant required by the operation at this stage.

Based on Office of Environment and Heritage (OEH) recommendations, noise during the construction phase is expected to comply with the *Background + 10dBA* noise objective, with the exception of a marginal 2dBA exceedance during the first few days where plant operates at the northern boundary. Noise at the nearest industrial boundary to the west is expected to exceed the recommended 75dBA construction noise objective, however this will only occur for the localised area near the boundary which appears to be used for temporary stockpiling and not permanently occupied by personnel.

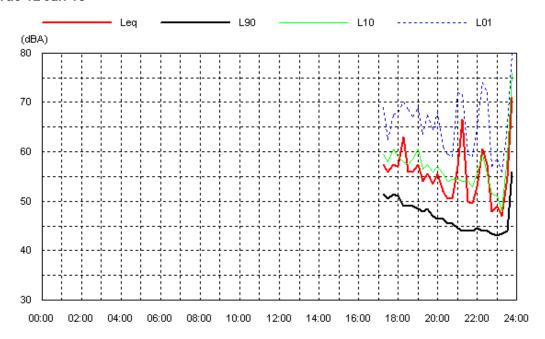
Following relocation of the Crusher towards the southern end of the main stockpile furthest from the residences and onset of normal operations, the criteria recommended by the OEH's *Industrial Noise Policy (INP)* will be complied with by maintaining a northern mound between the plant operations and the dwellings to the north and to minimise noise a crushed stockpile along part of the western edge of the main stockpile to shield residences to the north-west.

The proposed operations will also require careful management of the site as outlined in Section 6.3 of this report and in particular the loading of trucks in the morning shoulder 6.00am to 7.00am period.

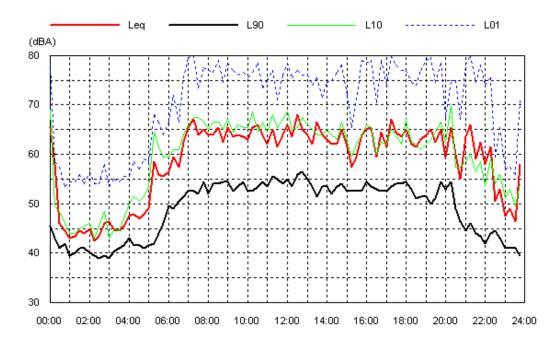
Road traffic noise associated with the development is expected to comply with the NSW Governments current and previous road traffic noise policy and the small increase in number of trucks at peak times should not adversely affect the acoustic amenity of the occupants of the nearby dwellings.



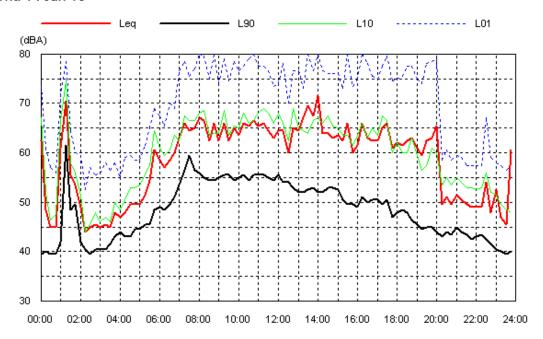
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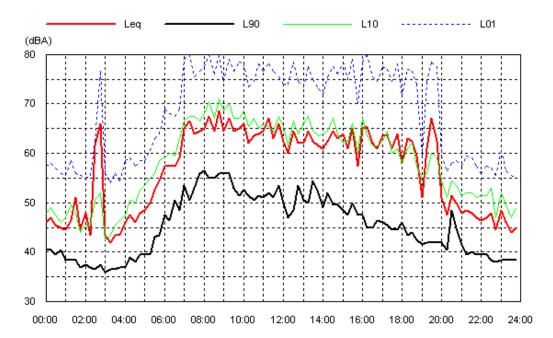
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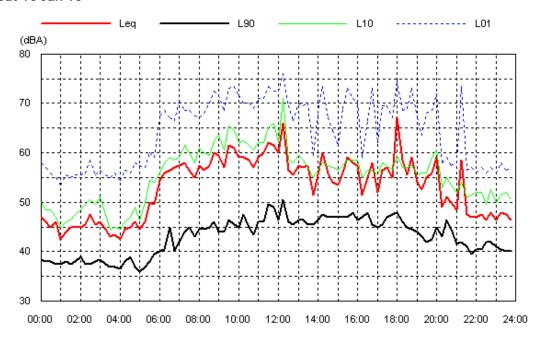
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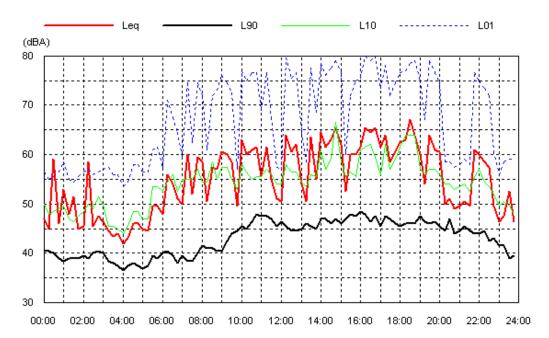
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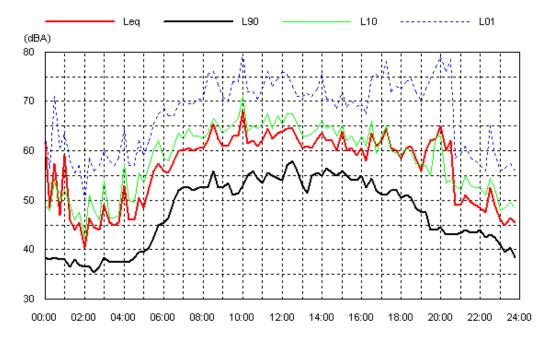
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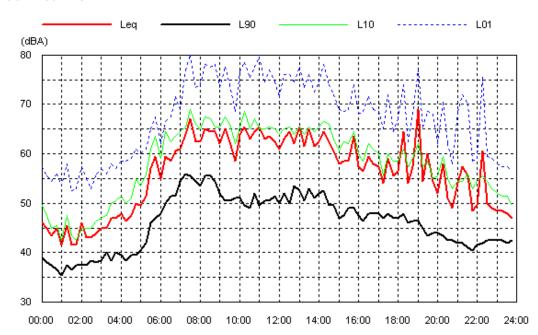
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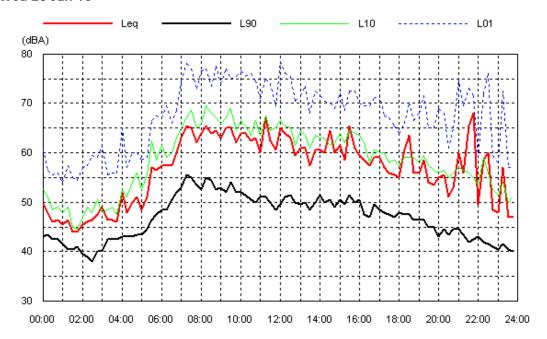
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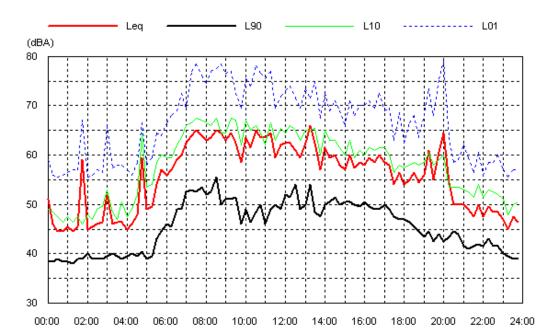
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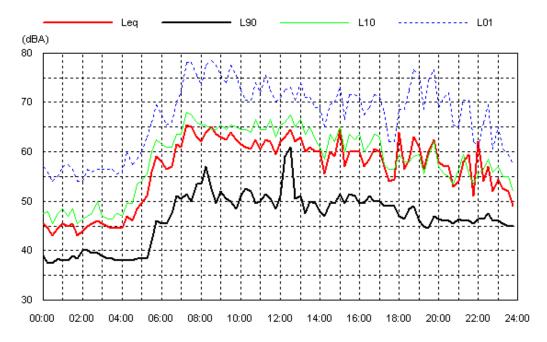
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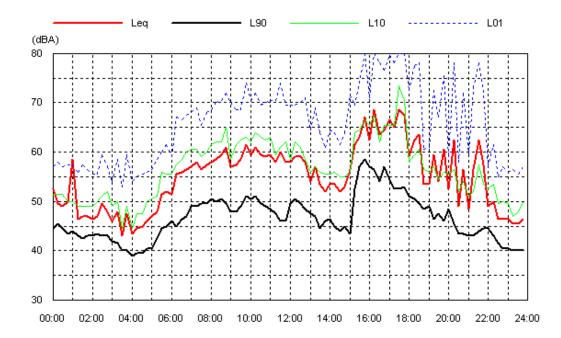
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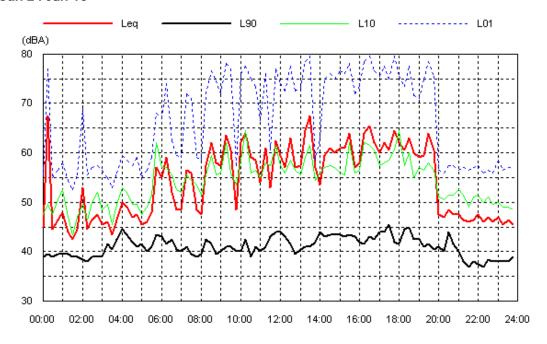
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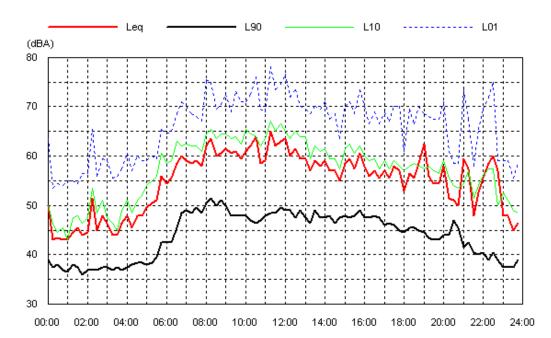
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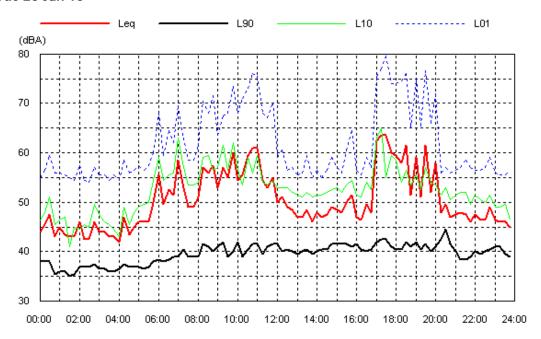


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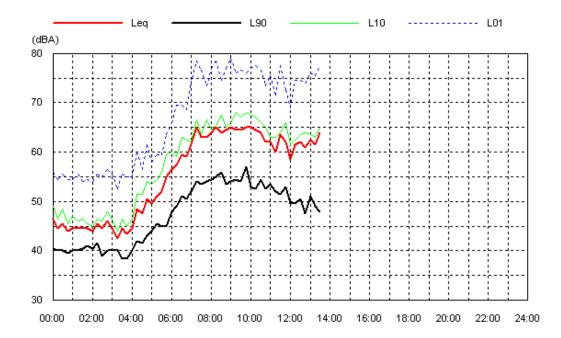


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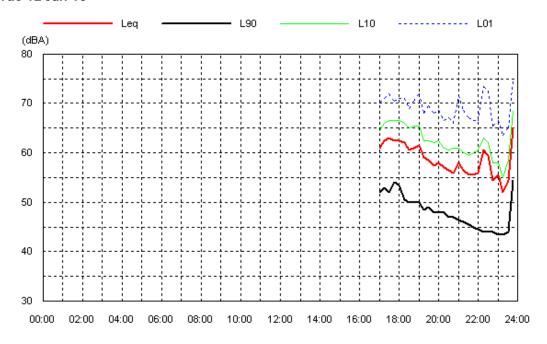
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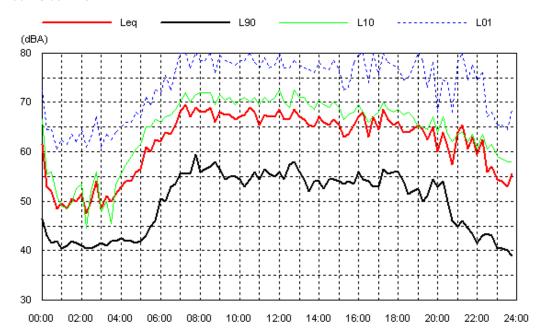
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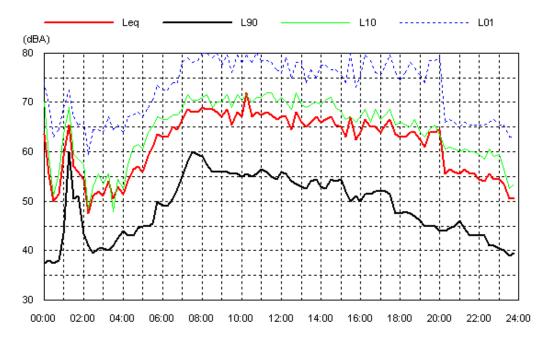
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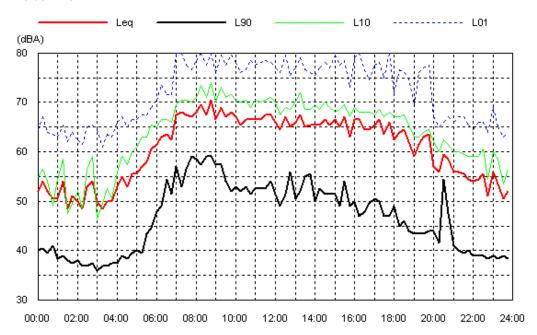
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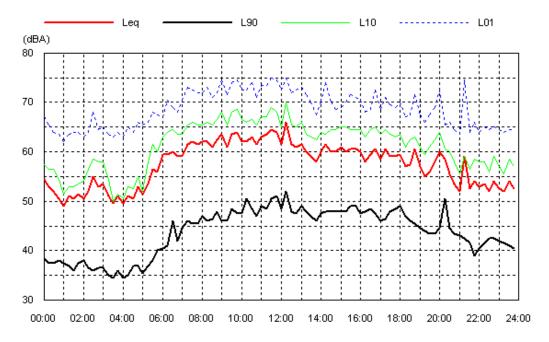
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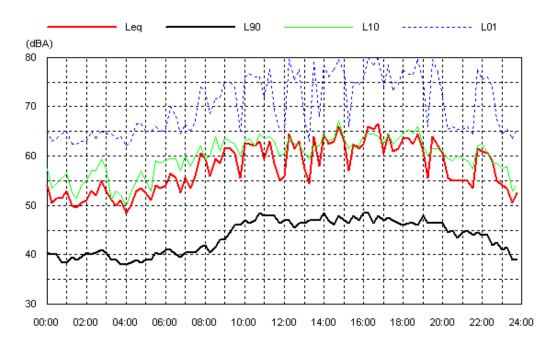
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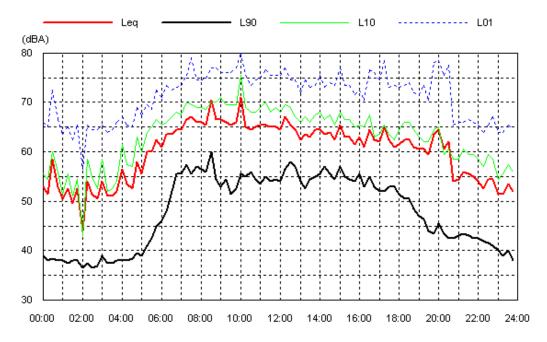
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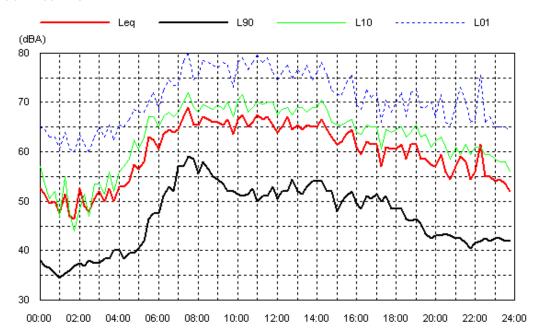
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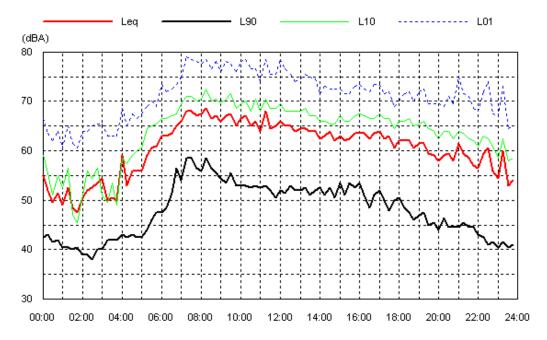
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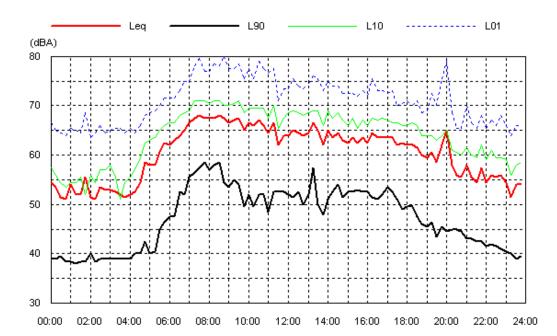
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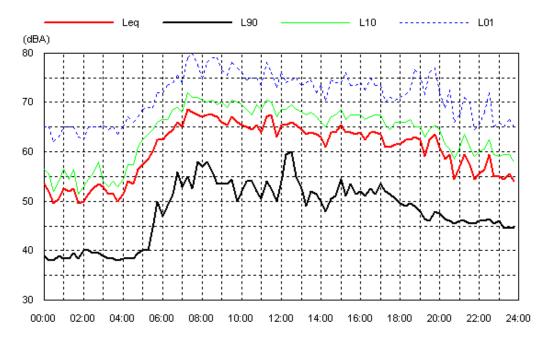
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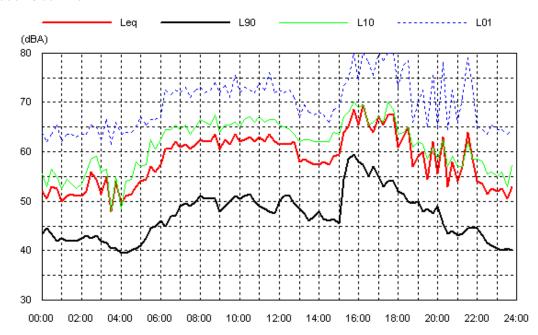
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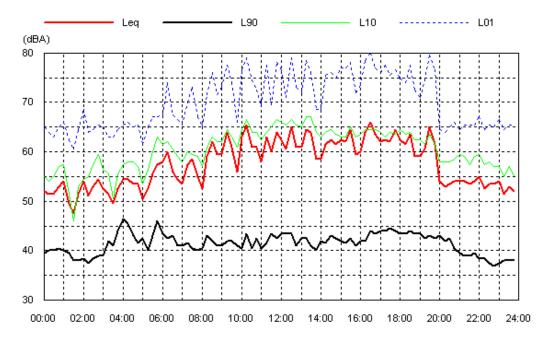
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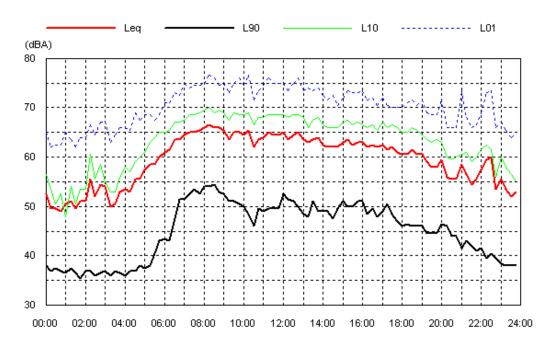
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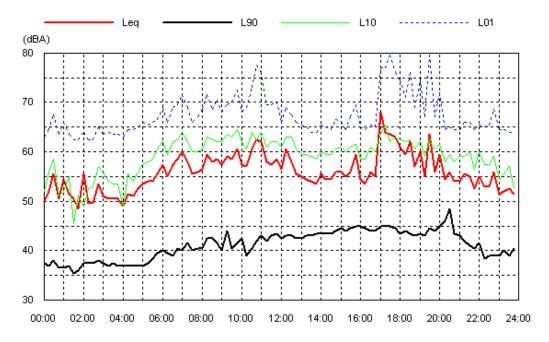
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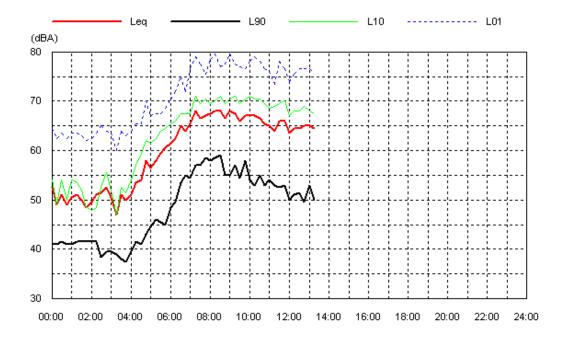
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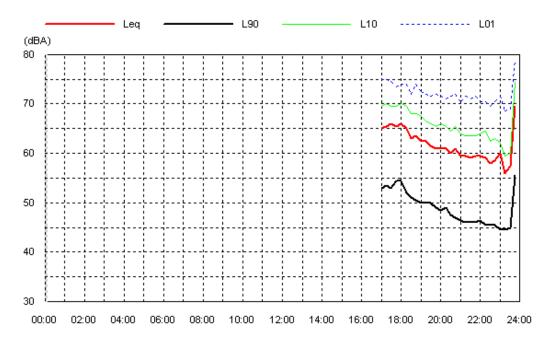


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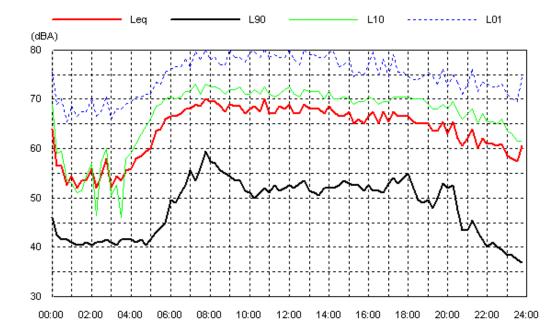


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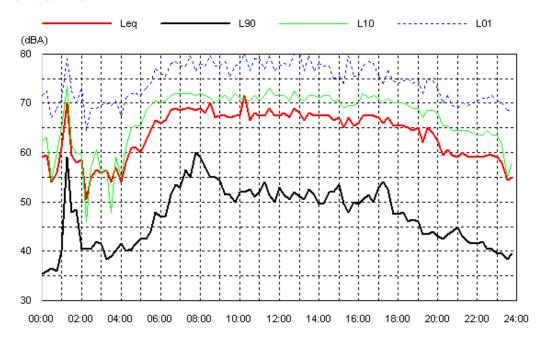


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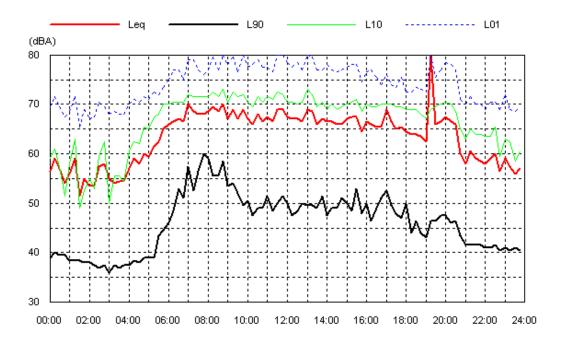


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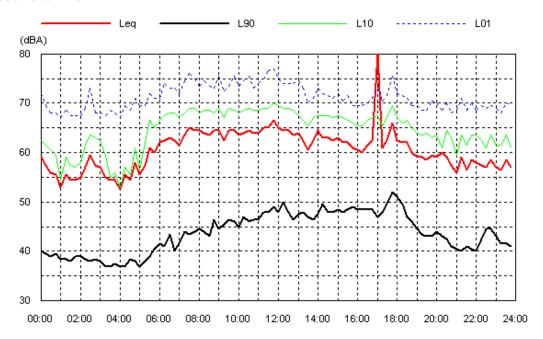


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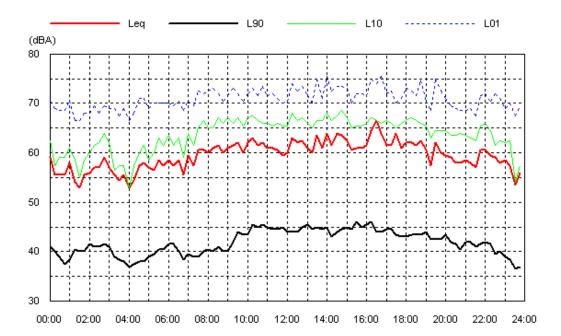


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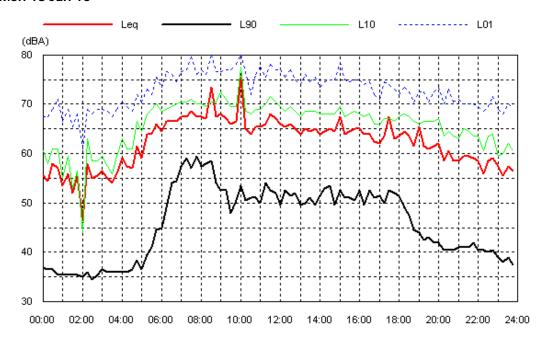


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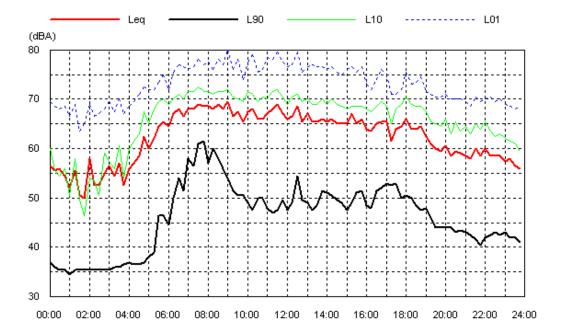


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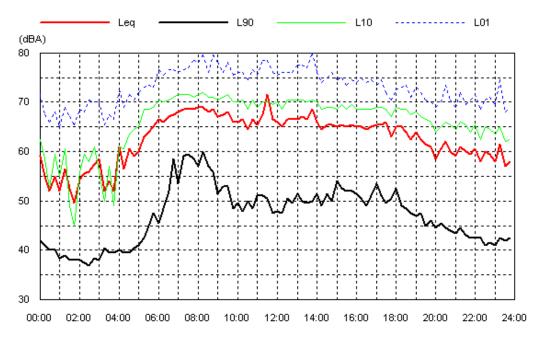


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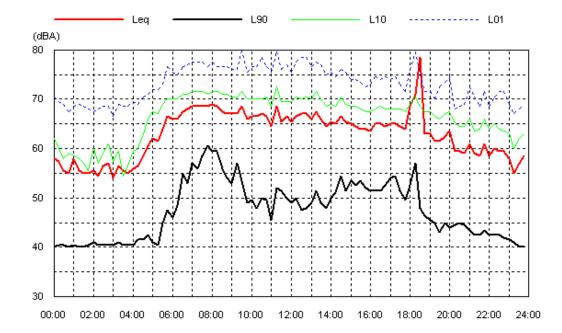


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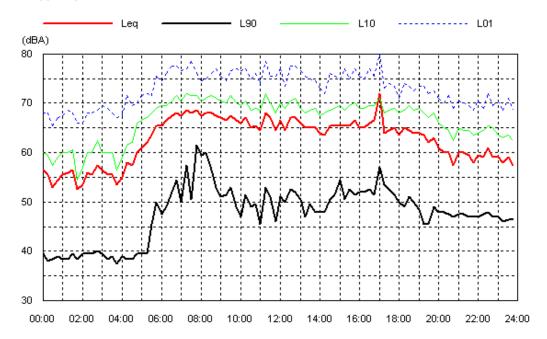


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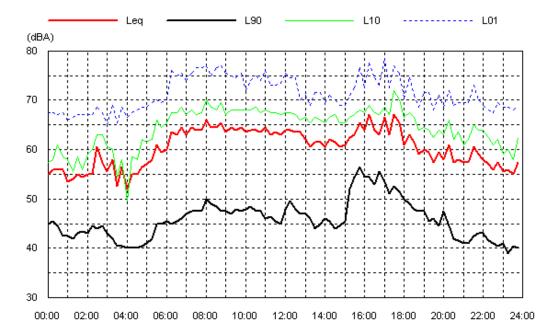


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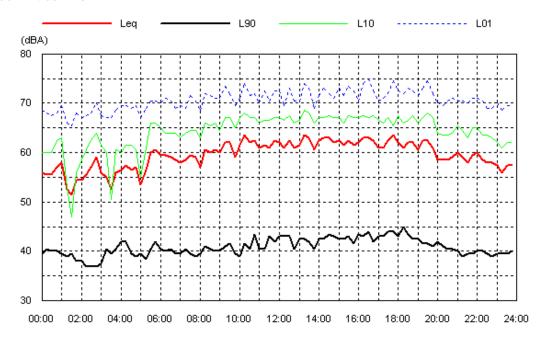


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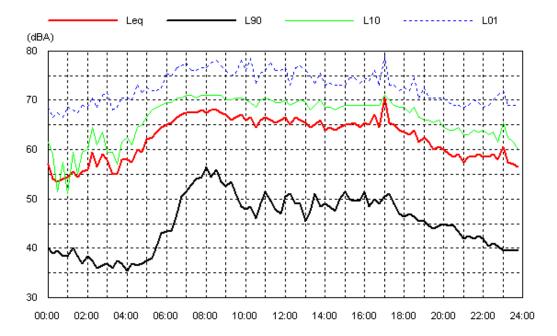


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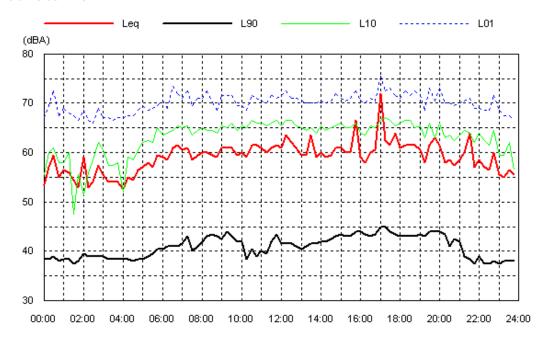


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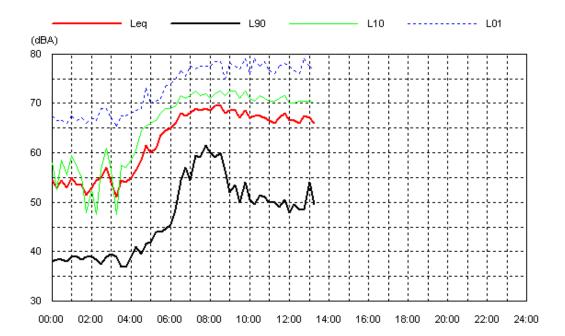


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# Appendix 8

# **CONCRETE RECYCLERS GROUP PTY LTD**

# TRAFFIC AND STORMWATER DRAINAGE REPORT

FOR ESTABISHMENT OF A

MATERIALS RECYCLING FACILITY

ON LOT 1, D.P. 88087 AND LOT B, D.P. 376646,

NO. 2 ALBERT STREET, ST. PETERS

# Prepared by:

Lyle Marshall & Associates Pty Ltd Consulting Engineers, Transportation and Environmental Planners

Suite 8, 871 Pacific Highway CHATSWOOD NSW 2067

Phone: (02) 9419-8191 Fax: (02) 9419-8107

Job No.: 9167/10 Report No.: 20/12

SEPTEMBER, 2012

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### **APPENDICES:**

Appendix A Survey Plan Drawing No. 13438 TS.

Appendix B

• ILSAX Inflow Hydrographs For 1 In 20, 50 and 100 Year Storms of 3 Hours Duration.

• ILSAX Inflow For Storms of 1 In 5, 10, 20, 50 and 100 Year ARI and 5 Minutes to 3 Hours Duration.

Appendix C Soil Loss Calculations

 Sydney City Council Stormwater Drainage System in Holland Street, Campbell Road and Burrows Road.

> Rainfall and Evaporation Data at Sydney Airport 1974 to 2012 (July). Highest Daily 24 Hour Rainfall in Months of Highest Rainfall 1974 to 2012.

Marrickville Council Intensity Frequency Duration (IFD) Rainfall Data.

Appendix E • Landcom Standard Drawings SD 6-8, SD 6-12

Appendix F
 SESL, PAH\_S and pH\_Sol Leachate Tests on Blended Materials.

• L2 Concentration Limits from ANZECC Publication

Appendix G Sydney Water Letter 01/04/11

Appendix H Stormwater Drainage Drawing Sheets 1, 2, 2A 3 and 4

### 1.0 INTRODUCTION

# 1.1 Background

This report has been commissioned by Concrete Recyclers Group Pty Ltd to assess the traffic and stormwater impacts arising from establishment of a materials recycling facility on the site comprising Lot 1, D.P. 88087 and Lot 2, D.P. 376646 at No. 2 Albert Street St. Peters.

Concrete Recyclers (Group) Pty Limited has recently negotiated a lease with the NSW Roads and Traffic Authority (RTA) the landowner of the subject site for the establishment of a "Materials Recycling Depot" on the site.

The site has previously been used as a storage area for approximately 400,000 tonnes of sandstone material which has been won in excavations in the Sydney metropolitan area. The material was collected as part of two development consents issued by the then South Sydney Council and Marrickville Council for the processing of sandstone material. Both Development Consents have now lapsed due to the expiration of leases and sunset clauses in both Development Consents. The sandstone material on the site was material to be processed as part of the abovementioned development consents before those consents lapsed.

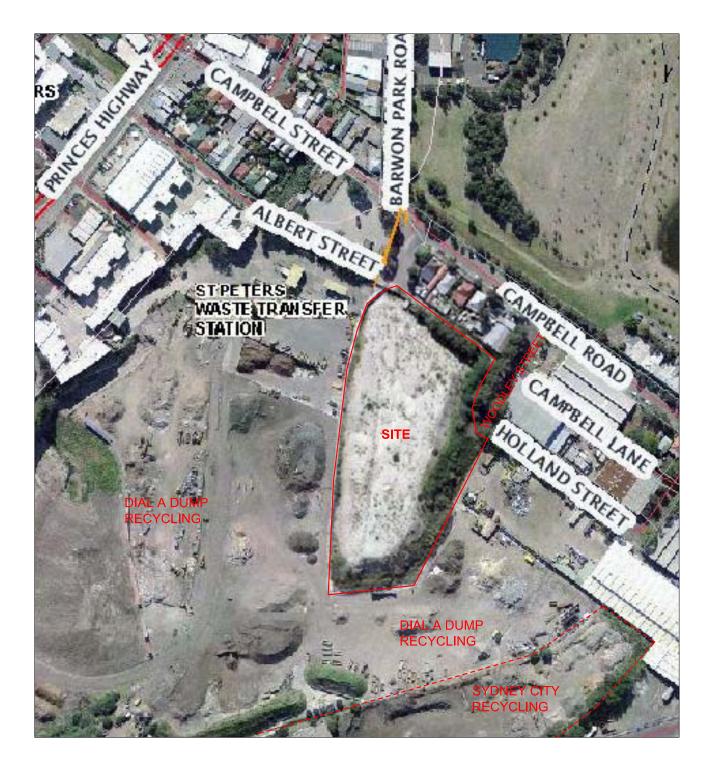
The local government boundary runs north/south through the site. The land west of this boundary is in Marrickville and the rest of the site to the east is in the City of Sydney.

This report is to be annexed to an Environmental Assessment (EA) prepared by Nexus Environmental Planning Pty Ltd in a Part 3A Application. The site is shown in **Figure 1**, **Locality Map.** 

# 1.2 Scope of Report

This report addresses the traffic and drainage issues arising from the construction phases and the on-going operation of the site of the proposed materials recycling facility.





### 2.0 EXISTING TRAFFIC CONDITIONS

# 2.1 Site Description

The site is located in land zoned "Arterial Road Reservation" within an industrial area and has the St. Peters Waste Transfer Station on its western boundary. Dial-a-Dump Recycling / Alexandria Landfill is located to the west, south and southeast of the property. Sydney City Recycling adjoins Dial-a-Dump Recycling to the south of the property. There is an industrial building on the eastern side of Woodley Street.

There is a small group of 6 residential dwellings to the north between Campbell Lane, which forms the northern site boundary and Campbell Road.

The site has a high brick wall along part of its northern and eastern boundaries and a screen of tall trees behind the wall and colour bond fencing 3 metres high along the remainder (**Photo P1**) of the northern boundary with entry gates to Albert Street. The colour bond fencing extends along the western boundary of the site. The site is occupied by a large stockpile of sandstone material. The stockpile rises to a height of **RL 22.5 AHD**, as shown on the Survey Plan Drawing No. **13438 TS** prepared by Asher Consulting Pty Ltd contained in **Appendix A** to this report.

# 2.2 Existing Road Network

Campbell Street and Campbell Road form part of **Regional Road 7017** that carries *heavy industrial traffic* between the Princes Highway **SH1** and Ricketty Street, **MR 183.** Albert Street runs east / west parallel to Campbell Street and then runs north to form an *offset four-way channelized intersection* with Campbell Street, Campbell Road and Barwon Park Road. At Campbell Road, Albert Street is controlled by *'Give Way Signs.'* The site entrance is adjacent to the entrance to *St. Peters Waste Transfer Station* in Albert Street. Albert Street is **15.8 metres** wide kerb to kerb and carries two-way traffic. There are no turning restrictions at Campbell Road.

Campbell Road is 12.9 metres wide kerb to kerb and has 2 traffic lanes and 2 kerbside parking lanes but these are sign posted "No Stopping" in the vicinity of Albert Street. Woodley Street and Holland Street to the east of the site are 12.9 metres and 12.8 metres wide kerb to kerb and have 2 traffic lanes and 2 kerbside parking lanes.

# 2.3 Existing Traffic Volumes

Automatic tube counters were installed in Albert Street and in Campbell Road opposite Car Shop No. 17 for 7 days in December 2009 by CFE Information Technologies to record hourly traffic volumes over 24 hours, vehicle classes and vehicle speeds. The St. Peters Waste Transfer Station was open and operating during the *tube counts*.



PHOTO P1 View north of site entrance gates and fence and Albert Street to north.

# 2.3 (Continued)

The commuter peak hours were 7:00 – 8:00am and 5:00 – 6:00pm. The weekday average peak hour traffic volumes and lunch hour volumes 12:00 – 1:00pm are shown in Figure 2. The average two-way am, pm peak hour volumes and lunch hour volumes in Albert Street were:-

7:00 – 8:00am 90 vph. 12:00 – 1:00pm 123 vph. 5:00 – 6:00pm 46 vph.

The weekday average percentages of heavy vehicles Classes 3 to 12 from 6:00am to 5:00pm are shown in Figure 3 and reflect the high percentage of trucks. The weekday average number of heavy vehicles in the am and pm peak hours and lunch hour in Campbell Road and Albert Street are listed in Table 2.3.

Table 2.3 Total Hourly Volumes all Vehicles and Hourly Volumes of Heavy Vehicles December 2009.

Road	Time	Eastb	ound	Westk	oound	TWO-WAY TOTAL		
		Total Vehicles	Heavy Vehicles	Total Vehicles	Heavy Vehicles	Total Vehicles	Heavy Vehicles	
Campbell Rd	7:00-8:00am	915	68	132	46	1047	114	
	12:00-1:00pm	407	63	228	54	635	117	
	5:00-6:00pm 351		20	474	22	825	42	
Albert St.		NORTHBOUND		SOUTH	BOUND			
	7:00-8:00am	53	11	37	11	90	22	
	12:00-1:00pm	59	13	64	21	123	34	
	5:00-6:00pm	30	2	16	2	46	4	

The weekly mean and weekly 85<sup>th</sup> percentile speeds by direction in Campbell Road and Albert Street were as follows:-

Road	Direction	Mean Speed	85 <sup>th</sup> Percentile				
Campbell Road	Eastbound	54	63				
	Westbound	53	64				
Albert Street	Northbound	18	25				
	Southbound	20 km/h	27 km/h				



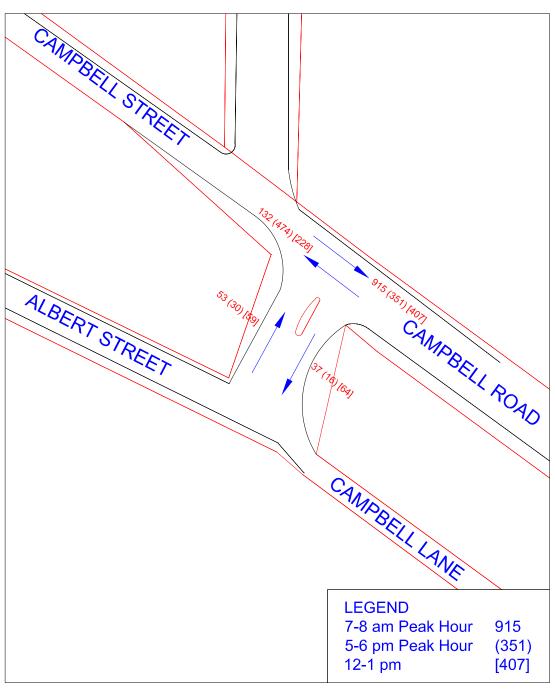


FIGURE 2: EXISTING WEEKDAY AVERAGE AM AND PM PEAK HOUR AND MIDDAY TRAFFIC VOLUMES DEC 2009



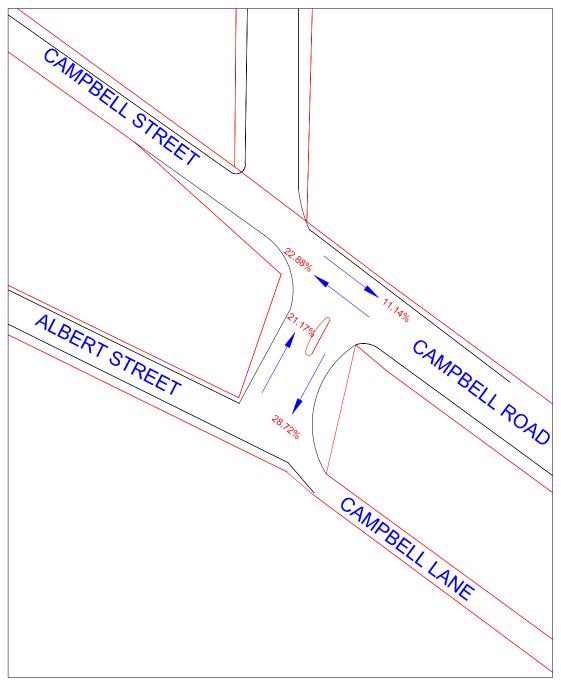


FIGURE 3: EXISTING AVERAGE WEEKDAY PERCENTAGES OF HEAVY VEHICLES CLASSES 3 TO 12 FROM 6am TO 5pm DEC 2009

# 2.4 Intersection Capacity

A count was made of all turning movements at the intersection of Albert Street and Campbell Road from 7:00am to 9:00am in March 2011. The turning movements in the 8:00 – 9:00am peak hour are shown in Figure 4. When the tube counts were made in December 2009 the morning peak hour was 7:00 – 8:00am.

At this unsignalised tee intersection there is *no cross traffic* and the turning volumes are relatively low. Based upon **Table 8.1** in *Austroads Part 2 Roadway Capacity*, capacity analysis is unnecessary.

An analysis has been made of the absorption capacity for the *right turn* from Albert Street into Campbell Road. The *right turn* from Albert Street is the 'critical movement' because these vehicles require an acceptance gap in both the eastbound and westbound direction in Campbell Road. The *right turn is highest* in the **am** peak hour.

Using the formula for 'practical absorption capacity' in Section 8.3.2 in Austroads Part 2 Roadway Capacity and assuming that trucks require a critical acceptance gap of 8 seconds and a follow up headway of 5 seconds to cross 2 lanes 2-way for a two-way flow of 1059 pcu's/hr in Campbell Road, the practical capacity is 104 vehicles/hour. The existing right turn volume is 41 pcu's/hr.

# 2.5 Traffic Growth in Campbell Road

The latest *RMS Publication Traffic Volume Data 2005* in the *Sydney Region* shows that annual average traffic volumes (**AADT**) at the Counting Station in Campbell Road east of Barwon Park Road in the nine year period **1996** to **2005** have fallen marginally:

AADT							
1996	9566						
2005	9511						

The annual compound change is - 0.06%.

### 2.6 Vehicle Access to Site

The existing vehicular crossing and entrance to the site in Albert Street and the adjacent vehicular crossing and separate entrance and exit crossings to St. Peters Waste Transfer Station are shown in **Photo P2**. A view north along Albert Street towards Campbell Road is shown in **Photo P3**.



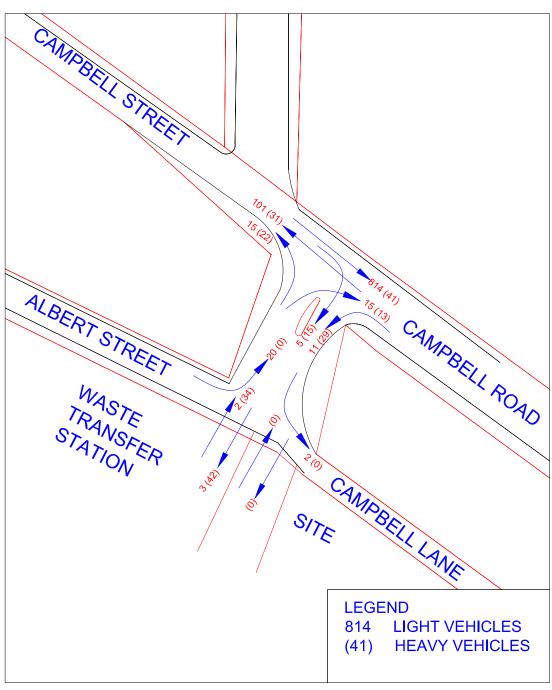


FIGURE 4: EXISTING 8-9AM PEAK HOUR TRAFFIC VOLUMES TUESDAY 15th MARCH 2011



PHOTO P2 Vehicle Crossing to Site in Albert Street



PHOTO P3 View North from Site Entrance to Campbell Road

### 3.0 TRANSPORT ISSUES TO BE ADDRESSED

The Director, Mining and Industry Projects of the Department of Planning has advised by letter dated 27/04/10 that the proposed Materials Recycling Facility is development of a kind that is described in *Schedule 1 of the SEPP (Major Development) 2005* and is declared to be a project to which **Part 3A** of the **EP** and **A Act** 1979 applies.

The key issues relating to traffic and transport had not been determined in April 2011 but comments have been made on Traffic and Transport by the Department in a letter dated 27/2/12 to Nexus Environmental Planning Pty Ltd following their review of the Environmental Assessment. These comments have been addressed in this report which has been undertaken in accordance with the RMS's Guide to Traffic Generating Development 2002 as per the Director-General's Requirements.

# 4.0 TRAFFIC MOVEMENTS GENERATED BY PROCESSING OPERATIONS OF PROPOSED MATERIALS RECYCLING FACILITY

# 4.1 Part 3A Application

An application under Part 3Aof the E P and A Act 1979 has been lodged with the Department of Planning for a *Materials Recycling Facility* on Lot 1, D.P. 88087 and Lot B, D.P. 376646 at No. 2 Albert Street St. Peters to process approximately 150,000 tonnes per annum of material made up of the sandstone material currently on site and the imported clean demolition rubble materials.

# 4.2 Excavation / Operational Phases and On Going Operational Stage

These matters are described in detail in the Preliminary Assessment prepared by Nexus Environmental Planning.

# 4.3 Estimated Daily and Hourly Truck Movements

Concrete Recyclers' has prepared a schedule of estimated truck loads during the construction phases in **Years 1** to **5** and the **on going operational phase** in **Year 6**. The estimated truck movements (loaded and empty) in each **2** hour period from 6:00am to 2:00pm and in the **3** hour period 2:00 to 5:00pm are shown in **Table 4.3**.

The majority of imported materials are expected to be demolition rubble from industrial sites in the Alexandria / Botany area, sandstone from Sydney CBD and virgin sand from the eastern suburbs. Average truck loads are expected to be 25 tonnes. Recycled materials will be delivered in 30 tonne loads. The proportions of imported materials for blending with sandstone materials on site in years 1 to 5 is estimated to be 40:60 in the recycled material exported from the site.

The site will operate 6 days per week subject to demand. Truck movements to and from the site will take place between 6:00am and 5:00pm. Crushing and screening will be carried out from 7:00am to 6:00pm. Monday to Friday and 7.00am to 4.00pm on Saturday.

Trucks bringing imported materials to the site will **arrive loaded** and **leave empty**. Trucks carrying recycled material from the site will **leave loaded** and **return empty**.

The site will be available to process materials **303** days per year subject to demand.

# 4.3 (Continued)

**TABLE 4.3 Estimated Truck Movements.** 

Year		Annual	Weekly Tonnage	Likely Max, Daily Tonnage	TRUCK MOVEMENTS									
		Tonnage			6.00-8.00AM		8.00-10.00AM		10.00-12.00PM		12.00-2.00PM		2.00-5.00PM	
					In	Out	In	Out	In	Out	In	Out	In	Out
1	IN*	20,000	400	320	4	4	3	3	3	3	2	2	1	1
	OUT*	50,000	1000	800	7	7	7	7	6	6	5	5	2	2
2	IN*	40,000	800	400	4	4	4	4	4	4	3	3	1	1
	OUT*	100,000	2000	1000	8	8	8	8	7	7	7	7	3	3
3	IN*	60,000	1200	400	4	4	4	4	4	4	3	3	1	1
	OUT*	150,000	3000	1000	8	8	8	8	7	7	7	7	3	3
4	IN*	60,000	1200	400	4	4	4	4	4	4	3	3	1	1
	OUT*	150,000	3000	1000	8	8	8	8	7	7	7	7	3	3
5	IN*	60,000	1200	400	4	4	4	4	4	4	3	3	1	1
	OUT*	150,000	3000	1000	8	8	8	8	7	7	7	7	3	3
6	IN*	150,000	3000	1000	7	7	11	11	10	10	8	8	4	4
	OUT*	150,000	3000	1000	9	9	9	9	8	8	4	4	3	3
Yr	Yr 7 – 10 as for Year 6													

NOTE:

IN \*

Raw Materials IN.

OUT\*

T \* Processed Materials OUT

# 4.4 Directional Distribution of Trucks to Main Road system

The directional distribution of trucks carrying demolition rubble/sand/sandstone to the site and recycled materials from the site is likely to vary day by day. An indicative estimate of truck routes to and from the site during the operational phase has been made based upon the likely sources of waste material and destinations for recycled materials estimated by Concrete Recyclers. The estimated truck routes with percentage of Concrete Recyclers trucks for raw materials in and processed materials out are as shown in Figures 5A and 5B respectively. Empty trucks leaving the site after delivering raw materials and empty trucks entering the site to be loaded with processed material will travel in the reverse direction to the loaded trucks.

# 4.5 Estimated Peak Hour Movements

The existing 8:00 – 9:00am peak hour volumes in Campbell Road are much higher than at midday 12:00 – 1:00pm and in the evening peak hour 5:00 – 6:00pm. The site is not expected to generate any traffic after 5:00pm.

The impacts of additional trucks on the road network will be small at any time but higher in the **am** peak hour.

The future **total** 8:00 - 9:00am peak hour volumes at the intersection of Albert Street / Campbell Street / Campbell Road during and after year 6 are shown in **Figure 6B**.

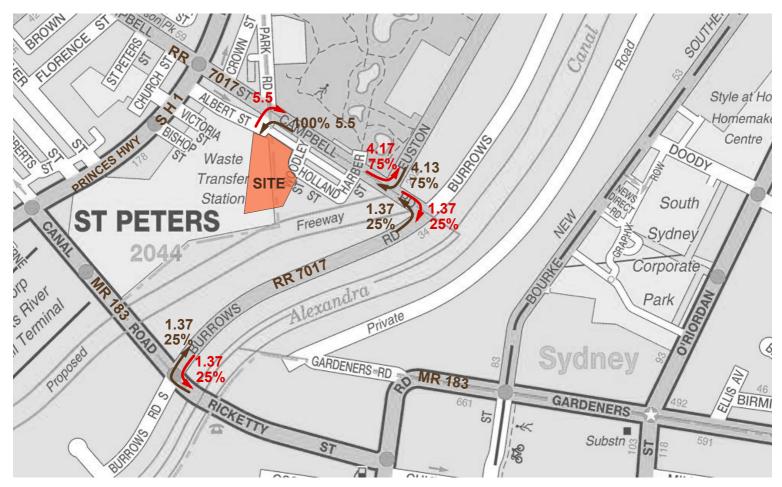


FIGURE 5A TRUCK ROUTES AND TRUCK NUMBERS RAW MATERIALS IN (BROWN), EMPTY TRUCKS OUT (RED)

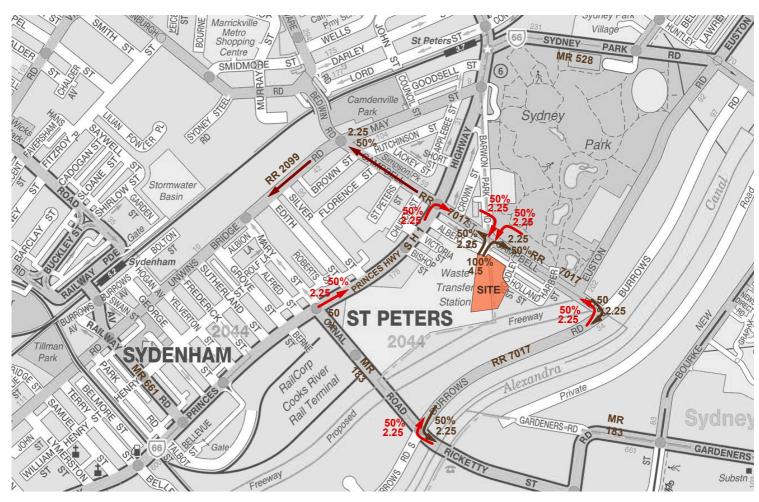


FIGURE 5B TRUCK ROUTES AND TRUCK NUMBERS PROCESSED MATERIALS OUT (BROWN), EMPTY TRUCKS IN (RED)

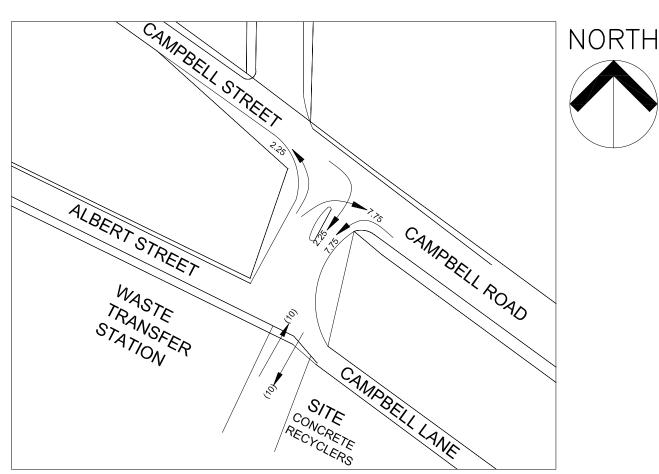


FIGURE 6A: FUTURE 8-9AM PEAK HOUR HEAVY VEHICLES AFTER YEAR 6 DUE TO CONCRETE RECYCLERS ONLY

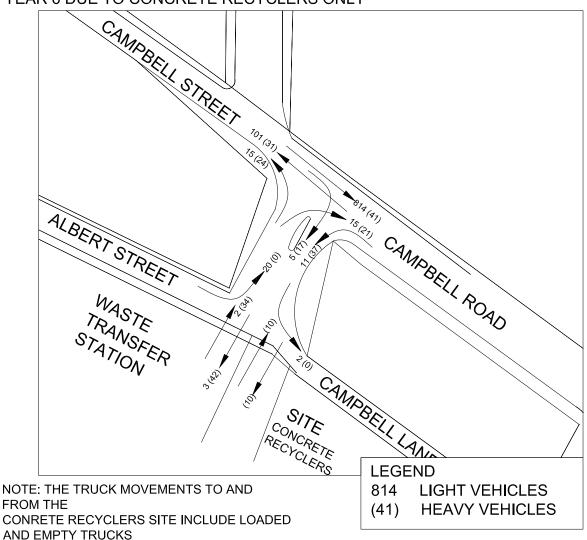


FIGURE 6B: FUTURE TOTAL 8-9AM PEAK HOUR TRAFFIC VOLUMES AFTER YEAR 6

The future **8:00 – 9:00am** peak hour heavy vehicles *after Year 6* generated by Concrete Recyclers **only** are shown in **Figure 6A**. There are *no light vehicles in the 8:00 – 9:00am peak hour.* 

# 4.6 Performance of Campbell Road / Albert Street Intersection

The Level of Service criteria for intersections in Table 4.2 of the RTA Guide to Traffic Generating Developments provides a useful guide to the performance under various Level of Service from A (best) to F (worst).

Table 4.2 Level of Service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
Α	< 14	Good operation	Good operation
В	15 to 28	Good with acceptable delays & space capacity	Acceptable delays & spare capacity
С	29 to 42	Satisfactory	Satisfactory, but accident study required.
D	43 to 56	Operating near capacity	Near capacity & accident study required.
Е	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode.	At capacity, requires other control mode.
F	Over 70	Extra capacity required.	Extreme delay, traffic signals or other major treatment required.

As discussed in **Section 2.4** a capacity analysis of the intersection performance is unnecessary because of the relatively low turning volumes. The future right turn volume into Campbell Road is well below the practical absorption capacity of **272 veh/hour**.

However, analysis of the intersection performance under Give Way sign control has been made using SIDRA of the existing 8:00-9:00am peak hour traffic and future 8:00-9:00am peak hour with Development Traffic. The Level of Service on each approach follows:-

Approach Intersection	Peak Hour	EXIS	STING TRAF	FIC	FUTURE TRAFFIC			
		Degree of Saturation DoS	Average Delay Secs/veh)	Level of Service LoS	Degree of Saturation DoS	Average Delay Secs/veh)	Level of Service LoS	
Campbell Street		.509	2.3	Α	.513	2.6	A	
Campbell Road		.127	2.4	Α	.136	2.8	А	
Albert St.	8:00 – 9:00am	.184	12.3	В	.246	13.4	В	

# 4.7 Mid-Block Capacity of Local Roads

The indicative peak hour capacity per lane of urban roads is shown in **Table 4.4** from the *RTA Guide to Traffic Engineering Developments 2002*.

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr	Two Lanes (veh/hr)
А	200	900
В	380	1400
С	600	1800
D	900	2200
Е	1400	2800

Campbell Road and Campbell Street are urban Regional 4 lane undivided roads with an inner lane and an outer parking lane that is parked out from 7:00am to 3:30pm on weekdays in each direction. Based upon *Table 4.3 in the RTA Guide to Traffic Generating Developments*, the mid-block capacity of a 4 lane undivided road with parked cars in the kerbside lanes is 1400 pcu's/hour in the inner lane at Level of Service **E**. One heavy vehicle equals 2 pcu's (Passenger Car Unit).

Albert Street is wide enough for 4 traffic lanes and has no kerb side parking. Because of the swept path manoeuvres of heavy trucks, Albert Street in practice carries one lane in each direction.

The existing and future traffic volumes on the local roads near the site vehicular access in the am, mid-day and afternoon peak hours and the estimated Levels of Service under existing and future traffic volumes are listed in **Table 4.7**.

Table 4.7 Existing and Future Traffic Volumes (After Year 6) on Local Roads.

ROAD	PEAK HOUR	LOCATION	DIRECTION	DIRECTION EXISTING PEAK HOUR VOLUME				FUT	JRE TRAI		UME	INCREASE IN TRAFFIC	
				Light	Heavy	Total	LoS	Light	Heavy	Total	LoS	No.	%
Campbell		East of	Eastbound	829	54	883	D	829	62	891	D	7.75	0.87
Road		Albert St	Westbound	112	60	172	В	112	68	180	В	7.75	4.31
Campbell	8-9am	West of	Eastbound	819	56	875	D	819	58	877	D	2.25	0.26
Street		Albert St	Westbound	116	53	169	В	116	55	171	В	2.25	1.32
Albert		South of	Northbound	30	35	65	Α	30	45	75	Α	10	13.33
Street		Campbell St	Southbound	16	44	60	Α	16	54	70	Α	10	14.29
Campbell		East of	Eastbound	344	63	407	С	344	68	412	С	5	1.21
Road		Albert	Westbound	174	54	228	В	174	59	233	В	5	2.15
Campbell	12.00	West of	Eastbound		Not Co	unted							
Street	to 1pm	Albert St	Westbound										
Albert		South of	Northbound	46	13	59	Α	46	19	65	Α	6	9.23
Street		Campbell St	Southbound	43	21	64	Α	43	27	70	Α	6	8.57
Campbell		East of	Eastbound	319	32	351	В	319	34.75	353.75	В	2.75	0.78
Road		Albert	Westbound	334	36	296	В	334	38.75	298.75	В	2.75	0.92
Campbell	4-5pm	West of	Eastbound		Not co	unted							
Street		Albert	Westbound		Not co	unted							
Albert		South of	Northbound	42	6	48	Α	42	9.5	51.5	Α	3.5	6.86
Street		Campbell	Southbound	22	5	27	Α	22	8.5	30.5	Α	3.5	11.48
Campbell		East of	Eastbound	331	20	351	В	331	20	351	В	0	0
Road		Albert St.	Westbound	452	22	474	С	452	22	474	С	0	0
Campbell	5.00 to	West of	Eastbound		Not Counte	d			No Increas	se		0	0
Street	6pm	Albert St.	Westbound									0	0
Albert		South of	Northbound	28	2	30	Α	31	2	3	Α		
Street		Campbell St	Southbound	14	2	16	Α	14	2	16	Α	0	0

# 4.8 Parking On Site

There will be **3** plant operators employed on site. The car park near the amenities building provides **3** spaces for the plant operators. These employees vehicles will arrive before **6:00am** and depart after **5:00pm** generally.

# 5.0 Barwon Park Triangle Residential Development

The only development approved by Marrickville Council in the vicinity of the site of the proposed materials recycling facility was **DA 2012/00026** for a part 3 storey and part 4 storey residential building containing **23** dwelling units and a basement car park with **24** spaces. The residential dwelling units were **2** studios, **8**/1Br, **10/**2Br and **3**/3Br.

Based upon traffic generation rates in Section 23.3.2 Medium Density Units in the RTA Guide to Traffic Generating Developments of **0.4** peak hour trips per **3**/Br unit and **0.3** trips per units up to **2**/Br, the total **AM** and **PM** peak hour traffic generation is **7.2** trips **in** and **out**.

The estimated directional split in the peak hours is:-.

PEAK HOUR	IN	OUT	TOTAL
7:00 – 9:00am	1.8	5.4	7.2
4:00 – 6:00pm	4.8	2.4	7.2

.

Hence, the traffic impact in Campbell Road is negligible.

#### 6.0 CUMULATIVE TRAFFIC IMPACTS

#### 6.1 Effects of Increased Traffic On Road Network

The only approved traffic generating development in the vicinity of the proposed materials recycling facility site is the Barwon Park residential building. The traffic impact in Campbell Road due to this development is negligible. There has been no traffic growth in Campbell Road in the period 1996 to 2005. Hence, the only increase will be due to the proposed materials recycling facility.

Trucks travelling to the site will travel on classified main roads, regional roads and industrial roads where there is a high percentage of heavy trucks.

Trucks travelling *from the site* will travel on regional roads, classified main roads and industrial roads in the Alexandria / Botany Bay region and on the Princes Highway and M5 Motorway to their destinations.

The number of trucks expected to be generated by this site in the excavation/operation and on going operations phases is very small in the 8:00 – 9:00am peak hour and much less in the 4:00 – 5:00pm afternoon peak hour, as shown in Table 4.7. In the am peak hour the increase in truck volumes in Campbell Road in the peak flow direction is expected to be about 1%. The increase in Campbell Street is expected to about 0.26%.

The *critical movement* at the intersection of Albert Street / Campbell Road and Campbell Street is the *right turn* from Albert Street into Campbell Road. The future right turning volume in the **8:00 – 9:00am** peak hour is **57 pcu's/hour** and *well below* the absorption capacity of **104 vehs/hour**. The SIDRA analysis of this intersection in the 8:00 – 9:00am peak hour shows that the Level of Service on each approach under existing and future traffic volumes is **unchanged**.

The increased traffic will have *minimal impact* on the capacity of the above intersection and the road network. The Level of Service (LoS) on the existing local roads will remain **unchanged** as shown in **Table 4.7** and there will be *spare capacity* based upon the indicative peak hour traffic volume capacity per lane in **Table 4.4**.

#### 7.0 STORMWATER REQUIREMENTS

# 7.1 Sydney City Council and Sydney Water Requirements

The Sydney City Council Drainage Connection Information states that "for all sites greater than 250m² OSD is required in accordance with the current Sydney Water guidelines that is the 100 year Average Recurrence Interval (ARI) post-development site run-off must be limited to the pre-development 5 year (ARI) site run-off. All run-off must pass through a silt trap located on site, before entering the City's drainage system".

In response to a facsimile with details of the site, proposed processing operations, aerial photo of site and survey plan, Sydney Water advised by letter dated 01/04/2011 that on site detention was not required for one year after which the requirements would be updated upon re application. A copy of the Sydney Water letter is in **Appendix G**.

The site is currently a stockpile of clean sandstone excavated from sites in the Sydney CBD and suburbs that was intended to be processed in Development Consents that have now lapsed. The steep batters to the west and level plateau at the top of the stockpile are stoney and are covered in sparse spiky vegetation. The surface is stabilised against wind erosion (Refer **Photos P1** and **P4**).

There are no Sydney Water stormwater assets in the vicinity of the site. Campbell Lane, Woodley Street and Holland Street drain to a double grated gully pit some 95 metres to the eastern boundary of the site in the City of Sydney LGA. These pipelines and pits are shown on the drawing in **Appendix D** and belong to the City of Sydney.

Sydney City Council allows a maximum number of three stormwater drainage outlets in a set at any one point along the kerb. The centre lines of each outlet are spaced at 300mm. These outlets can be 100 x 150 galvanised RHS or 100mm diameter UPVC Class 12. A second set of outlet pipes may be located not less than 6 metres from the first set. The discharge from each set of 3 outlets is restricted to 45 litres/sec.

Site preparation works will be required initially followed by a number of excavation / operational stages to lower the existing stockpile to its base level for the ongoing operational stage.

Because the site preparation and each excavation / operational stage are relatively short term and stormwater runoff is to be collected in retention basins for discharge to Holland Street and for use in site operations, the stormwater management facilities procedures will be mainly for erosion and sediment control and are described under these headings.



PHOTO P4 Plateau Vegetation.

# 7.2 Soil and Water Issues to be Addressed for Department of Planning

The Department of Planning has stated in the comments attached to the letter to Nexus Environmental Planning Pty Ltd dated 27/2/12 that the EA contains insufficient information on the proposed stormwater management system.

The stormwater management system has been amended to include a description of the existing pre-development drainage system surrounding the site and detailed contour plans and cross sections which include retention basins during the excavation / operational stages and the on going operational stage. The post development stormwater flows from the site do not exceed pre-development flows because the outflow is restricted. The total dissolved solids (T.S.S.) in the stormwater discharged from the site retention basins comply with ANZECC Guidelines.

#### 8.0 EXISTING STORMWATER DRAINAGE SYSTEM

Although the site is partly within the Marrickville LGA and partly within the City of Sydney LGA, the site falls from west to east and drains into the City of Sydney underground piped drainage system. Campbell Lane, Woodley Street and Holland Street drain to a double grated gully pit some **95** metres from the eastern site boundary in the City of Sydney LGA.

The level survey prepared by Aster Consulting Pty Ltd shows that the natural fall of the land across the site is from west to east. The *existing* stormwater management system is assumed to be adequate for the site area of 1.72 ha in its natural condition. The estimated peak discharge from a 1 in 5 year storm on the pre developed site is 424 l/sec.

The steep batters forming the north, east and south faces of the stockpile are covered with dense vegetation that filters stormwater run off from the site. Refer **Photos P5** and **P6**.

Stormwater runoff from the top of the stockpile currently flows down the steep vegetated batters to the concrete lined drain below. There is no evidence of any bank erosion.

The driveway from Holland Street to the Dial a Dump Recycling site which abuts the south eastern corner of the stockpile site (refer **Figure 1**) is flanked on the right by a low brick wall (**Photo P7**) and concrete block wall at the toe of the steep, dense vegetated bank leading to the reinforced concrete wall and entry gate (**Photo P 6**).

At the toe of the dense vegetated batter within the Dial-a-Dump site, there is a concrete lined stormwater channel that extends for 125 metres to the south and thence along the western side of the stockpile site and conveys filtered stormwater from the stockpile site and Dial-a-Dump site (Photo P8). The concrete lined trapezoidal shaped channel is approximately 1500 wide at the top, 350 wide at the base and 250mm deep. The channel slope is approximately 1.8% and varies (Photos P13 and P14). There is a gross pollutant trap fenced with open mesh fencing some 31 metre upstream of grated inlet pit (Photo P 15).

Some of this run off enters a grated inlet pit (**Photo P11**) and the balance is directed across the paved driveway by a low concrete diversion bank (**Photos P9** and **P10**) to a shallow concrete lined drain **4.3** metres wide that runs along the southern side of the dividing wall (**Photo P12**) between the Dial-a-Dump site and **Lot 100 D.P. 845651** that has a frontage to Holland Street.

The shallow concrete lined drain (**Photo P16**) extends along the concrete wall for **75** metres and discharges into a grated surface inlet pit (**Photo P 17**). A silt fence extends for the length of this drain and the channel that surrounds the Dial-a-Dump frontage to the stockpile site.

The existing stormwater management system as shown in the photographs complies with the comprehensive guidelines in *Managing Urban Stormwater Soils* and Construction published by the NSW Department of Housing.



PHOTO P5 Low concrete block wall 16m long and dense vegetation above.

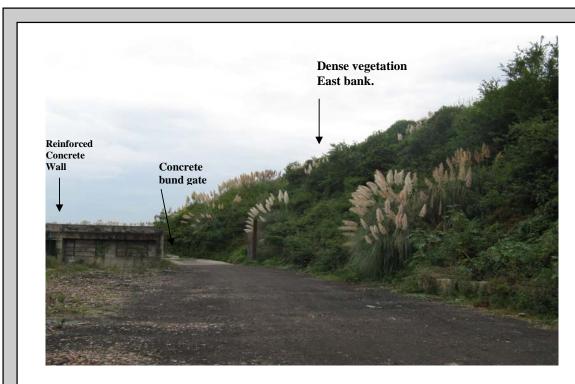


PHOTO P6 Dense vegetation east face of stockpile.



PHOTO P7 Remnants of brick wall 10.2m long.



PHOTO P8 View of concrete lined stormwater drain with filter vegetated bank.

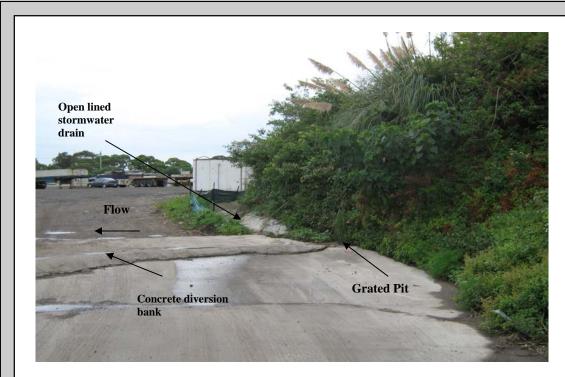


PHOTO P9 Stormwater drain, inlet pit and diversion bank.



PHOTO P10 Concrete bank inside entry gate to Dial-a-Dump site, south east of Lot 1, D.P. 88087



PHOTO P11 Grated Stormwater inlet pit.



PHOTO P12 Stormwater diversion along shallow concrete lined drain.



PHOTO P13 View upstream (south) of concrete channel.



PHOTO P14 View north of concrete lined channel with silt fencing on right.



PHOTO P15 Gross Pollutant Trap.



PHOTO P16 View west along shallow concrete drain from grated inlet at end.



PHOTO P17 View of grated inlet pit at end of shallow concrete drain.

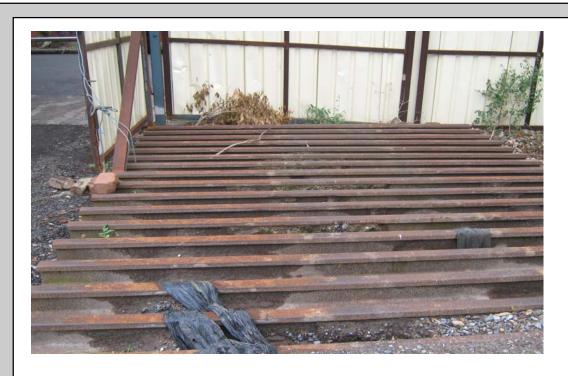


PHOTO P18 Steel Cattle Grid 3m wide.

# 9.0 ANALYSIS OF RAINFALL AND EVAPORATION AT SYDNEY AIRPORT AND STORMWATER MODELLING

# 9.1 ILSAX Modelling Of Stormwater Inflow

The ILSAX modelling including inflows from 1 in 5, 10, 20, 50 and 100 year ARI storms with durations from 5 minutes to 3 hours, are summarised in Appendix B together with the inflow hydrographs for 1 in 20, 50 and 100 year ARI Storms of 3 hours duration.

As the site preparation and excavation / operational stages 1 to 5 are short term, the basin storage and pump discharge characteristics have been designed to cater for a 1 in 20 Year Storm of 3 hour duration having a total rainfall of 103.5mm and inflow 346m<sup>3</sup>.

For the ongoing operational stage after **5** years the stormwater storage and gravity discharge system has been designed to cater for a **1** in **100** year storm of **3** hours duration and a total rainfall of **137.4mm**. All stormwater will be piped to Holland Street and there will be no overflow through the emerging spillway.

# 9.2 Daily and Monthly Rainfall and Monthly Evaporation at Sydney Airport 1974 to 2012

The Bureau of Meteorology has supplied monthly rainfall and evaporation in *mms* for the years **1974** to **2012** for the closest Meteorology Station at Sydney Airport. The months of heaviest rainfall and days of heaviest 24 hour falls are listed in **Appendix D**. There were 4 days during this 39 year period when the 24 hour rainfall equalled or exceeded 174mm.

# 10.0 PROPOSED STORMWATER DRAINAGE SYSTEM DURING SITE PREPARATION AND EXCAVATION/OPERATIONAL STAGES 1 TO 5 AND ON-GOING OPERATIONAL STAGE

# 10.1 Site Preparation

The top of the stockpile of material on site is at approximately **RL 22** and rises from a low point of **RL 8.95** near the Albert Street entrance, as shown on the Survey Plan in **Appendix A**.

The site is to be regraded and an access driveway constructed as shown on **Sheet 1** of **Drawing 9167-12** in **Appendix H.** Runoff from the site catchment area of **5170m**<sup>2</sup> will drain to retention basins **1** and **2** which have a *combined capacity* of **743m**<sup>3</sup>. The estimated runoff from a **1** in **20** year storm on the plateau area in a **3** hour storm is **346m**<sup>3</sup>.

The earthworks quantities in the site preparation amount to about **4650 cu.m**. and have been balanced in the site regrading so that material quantity required for building the acoustic mounds is equal to the excavated material.

Since the storage capacity of basins 1 and 2 to RL 20.5 at the emergency spillways is 743m³ and therefore able to store 200mm of rainfall it is very unlikely that the basins will overflow. An *overflow spillway* and *sediment fence* is provided from each basin for such an emergency.

Stormwater in the basins will be removed by pumping after heavy rain and the basins will be emptied so that recycling operations are not delayed or constrained by ponded water

A *cross section 4-4* through retention basin 1 is shown on **Sheet 2A** of Drawing **9167-12** together with details of the spillway, pumpwell and sediment fence. A *longitudinal section 6-6* through retention basins 1 and 2 is shown on **Sheet 2** of Drawing **9167-12**.

A perimeter drain as shown on **Sheet 1** encircles the work and stockpile areas and discharges to retention basins **1** and **2**.

Diesel pumps will be operated manually between the hours of **6:00am** to **6:00pm** as required to discharge stormwater from the site to Holland Street. Drainage **Line 1** is to be constructed from the *kerb to junction pit*  $\binom{1}{2}$  in the site preparation stage and is to include a *Humeceptor model STC 14 Hydrodynamic* device or equivalent that will capture **80%** of total Suspended Solids (**TSS**) and reduce the suspended solids in the discharge to **50mg / litre** and thus comply with the **ANZECC** water quality guidelines. The Humeceptor has been modelled by Humes Water Solutions for this Site.

Primary sediment treatment will be provided by a *sediment fence* with **Bidim A12 Geotextile** *erected around each pumpwell* to capture course sediment and other material as shown in **Detail B** on **Sheet 2A**.

# 10.2 Excavation/Operational Stages 1 to 5.

The stockpile of sandstone material will be excavated in a series of benches to base level commencing at the southern end and working progressively to the stockpile at the northern end. As work progresses detention basin **2** will be removed and any water stored in this basin will be pumped to *Holland Street* or into the *above ground storage tanks*.

Hence, the need to have **2** basins that alternate for storage of stormwater during **Stages 1** to **5**.

As work reaches basin 1, a new basin 2 will be formed at the lower level and any water remaining in basin 1 will be pumped to Holland Street or into the above ground tanks.

The pumpwell and sediment fence, perimeter drain, spillway and sediment fence will have to be progressively re-established during the benching operations to maintain the integrity of the system.

# 10.3 On Going Operational Stage

The site when excavated to base level will fall from west to east as shown in the site regrading on **Sheet 3** of Drawing No. **9167/12** and *cross section* on **Sheet 4** 

The site regrading for the retention storage allows the driveway to drain into the basin and the *diversion bank and sediment pond required in Stages 1 to 5 will be removed* 

The site in the on going / operational stage has been modelled using the ILSAX programme for 1 in 100 year storms having durations from 5 minutes to 6 hours. The total inflow from a 1 in 100 year storm of 3 hours duration is 1342m³ based upon a catchment area of 1.34ha. The ILSAX inflow hydrograph is contained in Appendix B.

A High Early Discharge Pit (**HED**) ( $^{1}/_{1}$ ) will be provided at the basin low point as shown in **Detail A** on **Sheet 4** with a **100mm UPVC** pipe outlet to pit ( $^{1}/_{2}$ ) in Drainage **Line 1**. All stormwater discharge to Holland Street will comply with **ANZECC** guidelines and the peak discharge will not exceed **24 litres / sec**.

The maximum storage volume with outflow from the **HED** pit will be **1162 cu.m** and the maximum water level in the retention basin has been calculated to be **RL 7.43**. The basin will empty under gravity control after each storm.

The basin will *empty after each storm* and *overflow will not occur*. However, an *emergency spillway* is to be provided as shown in **Detail A** and **Cross Section 5-5** on **Sheet 4**.

The above ground stormwater storage tanks are proposed to be **3.4 metres** diameter for transport by truck. The height will vary depending upon availability but is expected to be in the order of **8** to **9 metres**. The capacity of each tank will be **72.6** or **81.7 cu.metres**. The **5** tanks shown on **Sheet 3** would have a capacity of **363** or **408cu.metres**.

#### 11.0 EROSION AND SEDIMENT CONTROL

# 11.1 Site Preparation Stage (Short Term)

The site preparation works will involve excavation and site regrading to form the detention basins, regrading an access driveway from the Albert Street entrance to the top of the stockpile at a grade of about 14.2%, installation of a cattle grid at the exit, construction of stockpiles for noise control, construction of a diversion bank and a small sediment pond with an inlet filter to 5 D6-12, construction of pumpwells enclosed by a sediment fence with A12 Bidim geotextile to SD 6-8, construction of a perimeter drain and construction of a rock rubble lined spillway from each retention basin with a sediment fence to trap coarse sediment and litter. The sediment controls are shown on Sheet 1 of Drawing 9167-12.

Primary sediment treatment will be provided by a sediment fence with **Bidim A12 geotextile** erected mound each pump well to capture coarse sediment and litter as shown in **Detail B** on **Sheet 2**.

Drainage **Line 1** is to be constructed from junction pit ( $^{1}I_{2}$ ) to the kerb in Holland Street and will include a *Humeceptor Model STC 14 Hydrodynamic* device or equivalent that will capture 80% of Total Suspended Solids (**TSS**) and reduce the suspended solids in the discharge to **50mg / litre** to comply with the *ANZECC water quality guidelines*. Diesel pumps will be operated manually between **6:00am** and **6:00pm** as required to discharge stormwater from the retention basins to **Line 1**.

All erosion and sediment control works are to be carried out in accordance with the guidelines outlined in *Managing Urban Stormwater: Soils and Construction* (Landcom 2004).

Where practicable, the soil erosion hazard on the site will be kept as low as possible and as outlined in **Table 11.1**.

Table 11.1 Limitations to Access:

LAND USE	LIMITATION	COMMENTS
Construction Areas	Disturbance to be confined to the plateau at RL 20.0	A perimeter drain to be excavated within the plateau to form a 0.5metre high bank to prevent loose material from falling down the steep batter slopes.  The batters prevent movement outside the driveway.
Vehicular Access	Limited to a maximum width of 10 metres	The batters prevent movement outside the driveway.
Steep Batters	Entry Prohibited.	

# 11.2 Excavation / Operation Stages 1 to 5

The stockpile of sandstone material will be excavated in a series of **3 metre** benches to base level as shown conceptually on the architectural drawings. The erosion and sediment controls including the retention basins, perimeter drain, pumpwells with geotextile filter, overflow spillways with rock rubble lining and sediment fence will have to be replaced after each benching stage is completed.

The shaker cattle grid at the exit will be replaced by a *wheelwash*. The diversion bank and sediment pond with the geotextile inlet filter will require to be maintained.

Diesel pumps will continue to be operated manually from 6:00am to 6:00pm when required to empty the retention basins and discharge stormwater to pipeline 1 within the site, and thence to Holland Street as shown on Sheet 1. The fine sediments will be removed from the stormwater in the Humeceptor STC 14 prior to discharge to comply with the ANZECC quality guidelines of 50 mg / litre of T.S.S.

#### 11.3 On Going Operational Stage

The site will be excavated to base level and regraded to fall to a retention basin. Primary treatment of stormwater will be provided by a concrete lined sediment pond as shown in Detail A on Sheet 4 of Drawing 9167-12 to trap coarse sediment and litter.

The stormwater will then be filtered by a sediment fence before entering the **HED** pit for discharge by gravity to drainage **Line 1** and thence to Holland Street. As for all prior stages, the fine sediments will be captured in a *Humeceptor STC 14* hyrodynamic device prior to discharge.

The concrete lined sediment pond will be cleared out on a regular basis using a small front end loader. The geotextile sediment fence will also be cleaned of sediment and maintained in working order. The Humeceptor will require cleaning on an annual basis to remove stored sediment from the treatment chamber.

All erosion and sediment control devices are to be installed and maintained for the life of the project in accordance with the guidelines outlined in *Managing Urban Stormwater*, *Soils and Construction (Landcom 2004)*.

The stormwater modelling and the capacity of the stormwater drainage pipeline to Holland Street shows that proposed emergency spillway will never be overtopped. In such an emergency any overflow would filter through dense vegetation to the existing concrete lined channel.

#### 11.3.1 Analysis of Need for Sediment Basins

The site constraints and characteristics are deemed to be as shown in **Table 11.3.1.** for this preliminary assessment.

# 11.3.1 (Continued)

Table 11.3.1 Constraints and Characteristics.

CONSTRAINT	VALUE
Rainfall Erosivity	moderate (R = 3655)
Slope Gradients (Works Area)	Low, 1% to 5.5% maximum
Potential Erosion Hazard	Low (below A Line in Figure 4.6 Landcom.
Rainfall Zone	Zone 1, Figure 4.9 Landcom
Soil Erodibility	Moderate (K Factor 0.06 Table A3)
Calculated Soil Loss	56.14 Tonnes/ha/year.
Soil Loss Class	1 (Table 4.2 Landcom)
Soil Texture Group	Type C (< 20% > .02mm)
Percent Dispersible	Subsoil not exposed. Insignificant.
Runoff Coefficient	.686
Disturbed Site	1.0234 ha.

The calculations of **R** and **K** are contained in **Appendix C**.

The likely soil loss has been calculated to be **56.14** tonnes/ha/year using the Revised Universal Soil Loss Equation (RUSLE). The calculation is included in **Appendix C**. Based upon *Table 4.2* (Landcom 2004) the calculated soil loss is Soil Loss Class 1, the erosion hazard is very low and a sediment basin is not required. However, successful containment and control of coarse sediment will be carried out through the use of site treatment techniques such as those proposed in this report and fine sediment will be removed to comply with ANZECC guidelines using a Humeceptor hydrodynamic device

## 11.4 Erodibility Western Face of Existing Stockpile

This face is sparsely vegetated but has a firm hard crust that appears to be devoid of erosion and is quite stable. During the site preparation and excavation stages to base level this face will not be disturbed. The acoustic mound is insitu material created by excavation during the benching processes.

The western face will be inspected after heavy rain and if there is any erosion the surface will be stabilised with spray grass or a light grade woven polypropylene fabric pinned to the surface.

#### 12.0 LEACHATE MANAGEMENT MEASURES FOR WASTE MATERIALS

#### 12.1 SESL Leachate Tests

Samples of crushed blended materials typically produced by Concrete Recyclers and delivered to SESL Australia for PAH\_S and pH\_Sol leachate tests in their NATA registered laboratory were:

Sample Number	Material	Test Type	Total PAH_S mg/L	Final pH
1	20mm Hardroad (Crushed Asphalt)	PAH_S	.004	6.7
4	DG B20: Sandstone, 50:50 Composite (Sandstone/Concrete	pH_Sol	-	11.1
5	20mm Hardroad: Sandstone, 50:50 Composite Asphalt/Sandstone	PAH_S	.005	5.7

#### **SESL Conclusions:**

Based upon the analysis, **SESL** concluded that:

- (1) materials in Tests 1 and 5 showed very low leachability and will not pose any significant runoff contamination issues and;
- (2) results from Test No. 4 showed the material was highly alkaline.

Stormwater discharge will occur during the excavation / operational stages **1** to **5** and the ongoing operational stage after heavy rain. The stormwater will pass through the *secondary hydro dynamic device* and will be *diluted*.

# 12.2 Management Measures

The analysis of historical Bureau of Meteorology data shows that stormwater will pond in the retention basins during rainfall events and be discharged by pumping during the site preparation and excavation / operational **Stages 1** to **5 and by gravity** during the on going operational stage.

`The laboratory tests indicate concentrations of contaminants in the very low risk area except for pH. However, the dilution factor in any discharge after heavy rain is expected to reduce the pH value to within acceptable limits of **6.5** to **8.5** as shown in the Table from an *ANZECC Publication in Appendix F*.

The Management Measures are to include testing of stormwater discharge after completion of the Site preparation to confirm that the pH is within acceptable limits.

#### 13.0 EXECUTIVE SUMMARY

1. This report has been commissioned by Concrete Recyclers Group Pty Ltd to assess the traffic and stormwater impacts arising from establishment of a materials recycling facility on the site comprising Lot 1, D.P. 88087 and Lot 2, D.P. 376646 at No. 2 Albert Street St. Peters.

# **Site Description:**

- The site has previously been used as a storage area for approximately 400,000 tonnes of sandstone material which has been won in excavations in the Sydney metropolitan area. The material was collected as part of two development consents issued by the then South Sydney Council and Marrickville Council for the processing of sandstone material. Both Development Consents have now lapsed due to the expiration of leases and sunset clauses in both Development Consents.
- 3. The local government boundary runs north/south through the site. The land west of this boundary is in Marrickville and the rest of the site to the east is in the City of Sydney.
- 4. The site is located in land zoned "Arterial Road Reservation" within an industrial area and has the St. Peters Waste Transfer Station on its western boundary. Dial-a-Dump Recycling/Alexandria Landfill is located to the west, south and southeast of the property. Sydney City Recycling adjoins Dial-a-Dump Recycling to the south of the property. There is an industrial building on the eastern side of Woodley Street. There is a small group of 6 residential dwellings to the north between Campbell Lane, which forms the northern site boundary and Campbell Road.
- 5. The site has a high brick wall along part of its northern and eastern boundaries and a screen of tall trees behind the wall and colour bond fencing 3 metres high along the remainder of the northern boundary with entry gates to Albert Street. The colour bond fencing extends along the western boundary of the site. The site is occupied by a large stockpile of sandstone material. The stockpile rises to a height of RL 22.5 AHD.

#### Traffic:

- 6. Campbell Street and Campbell Road form part of **Regional Road 7017** that carries *heavy industrial traffic* between the Princes Highway **SH1** and Ricketty Street, **MR 183.** Albert Street forms an *offset four-way channelized intersection* with Campbell Street, Campbell Road and Barwon Park Road. At Campbell Road, Albert Street is controlled by *'Give Way Signs.'* The site entrance is adjacent to the entrance to *St. Peters Waste Transfer Station* in Albert Street.
- 7. Albert Street is **15.8** metres wide kerb to kerb and carries two-way traffic. There are *no turning restrictions* at Campbell Road. Campbell Road is **12.9 metres** wide kerb to kerb and has **2** traffic lanes and **2** kerbside parking lanes but these are sign posted "No Stopping" in the vicinity of Albert Street.
- 8. A Traffic Volume and Classification Count over 7 days in December 2009 showed that the peak hours were 7:00–8:00am and 5:00–6:00pm. Traffic volumes were highest in the am peak hour. The two-way traffic of 1047 vphr. included 114 heavy vehicles.

- 9. A count was made of all turning movements from **7:00am** to **9:00am** at the Albert Street / Campbell Road intersection in March 2011. For a *two-way total* of **1059 pcu's / hr**. in Campbell Road the practical capacity for the right turn from Albert Street is **104 pcu's / hr**. The existing volume is **41 pcu's/hr**.
- 10. Annual Average Daily Traffic volumes (**AADT**) published by the **RMS** at the counting station in Campbell Road east of Barwon Park Road have fallen marginally in the nine year period 1996 to 2005.
- 11. An application has been lodged with the Department of Planning for a *Materials Recycling Facility* on Lot 1, D.P. 88087 and Lot B, D.P. 376646 at No. 2 Albert Street St. Peters to process approximately 150,000 tonnes per annum of material made up of the sandstone material currently on site and the imported clean demolition rubble materials.
- 12. The estimated truck movements (*loaded and empty*) during the construction phases in years **1** to **5** and the on-going operational phase in year **6** during the busiest 2 hour period 8:00am 10:00am range from 4 loaded 7 empty in, and 4 empty 7 loaded out in year 1, to 11 loaded 9 empty in, and 11 empty and 9 loaded out in year 6.
- 13. The majority of imported materials are expected to be demolition rubble from industrial sites in the Alexandria / Botany area, sandstone from Sydney CBD and virgin sand from the eastern suburbs. Average truck loads are expected to be **25** tonnes. Recycled materials will be delivered in 30 tonne loads.
- 14. The site will operate 6 days per week subject to demand. Truck movements to and from the site will take place between 6:00am and 5:00pm. Crushing and screening will be carried out from 7:00am to 6:00pm Monday to Friday and 7.00am to 4.00pm on Saturday.
- 15. An *indicative estimate* of *truck routes* to and from the site during the operational phase has been made based upon the *likely sources of waste material and destinations for recycled materials estimated by Concrete Recyclers*.
- 16. The impacts of additional trucks on the road network will be small at any time but higher in the **am** peak hour.
- 17. Traffic volumes generated by the Barwon Park Triangle residential development are *very small* and the *traffic impact* in Campbell Road will be *negligible*.
- 18. Analysis of the Campbell Road / Albert Street intersection performance under Give Way sign control has been made using SIDRA of the existing and future 8:00am 9:00am peak hour traffic. The Level of Service in Campbell Road and Campbell Street is A under existing and future traffic and is B in Albert Street under existing and future traffic.

- 19. Campbell Road and Campbell Street are 4 lane undivided roads with an inner traffic lane and an outer kerbside parking lane that is parked out from 7:00am to 3:30pm on weekdays in each direction. The indicative mid block capacity of one lane is 900 pcu's per hour at Level of Service D. The future 8:00 -9:00am peak hour volumes in the peak direction of flow are approaching Level of Service D. In the off peak direction the Level of Service will be B.
- 20. **3** car parking spaces will be provided on site for the three plant operators.

#### Stormwater:

- 21. Stormwater runoff from the stockpile on site drains off the steep batters into a concrete lined channel that encompasses the site on the western, southern and eastern boundaries where it is collected in a number of grated inlet pits and piped underground. The underground stormwater system is deemed to have sufficient capacity to cater for the 1 in 5 year peak pre development discharge. The runoff is filtered by dense vegetation on the northern, eastern and southern slopes. There is no evidence of any bank erosion.
- 22. The site is partly within the Marrickville LGA and partly within the City of Sydney LGA and falls from west to east and drains into the City of Sydney underground piped drainage system. The level survey shows that the natural fall of the land across the site is from west to east.
- 23. The **ILSAX** modelling including inflows from 1 in 5, 10, 20, 50 and 100 year ARI storms with durations from 5 minutes to 3 hours are summarised in **Appendix B** together with the inflow hydrographs for 1 in 20, 50 and 100 year **ARI** Storms of 3 hours duration.
- 24. As the site preparation and excavation / operational stages 1 to 5 are short term, the basin storage and pump discharge characteristics have been designed to cater for a 1 in 20 Year Storm of 3 hour duration, having a total rainfall of 103.5mm and inflow 346m<sup>3</sup>.
- 25. For the ongoing operational stage after **5** years the stormwater storage and gravity discharge system has been designed to cater for a **1** in **100** year storm of **3** hours duration and a total rainfall of **137.4mm**. This is the *critical storm event*.
- 26. The Bureau of Meteorology has supplied monthly rainfall and evaporation in *mms* for the years **1974** to **2012** for the closest Meteorology Station at Sydney Airport. The months of heaviest rainfall and days of heaviest 24 hour falls are listed in **Appendix D**. There were 4 days during this 39 year period when the 24 hour rainfall equalled or exceeded 174mm.

# **Site Preparation and Excavation / Operational Stages 1 to 5:**

- 27. The site is to be regraded and retention basins are to be constructed in the site preparation, excavation/operational stages and on going operational stage. The capacity of the retention basins is 743m3 after the site preparation and will increase as the stockpile is lowered by benching in the excavation/operational Stages 1 to 5.
- 28. Primary sediment treatment will be provided by the geotextile sediment fence erected around each pumpwell to capture coarse sediment and litter.
- 29. The stormwater modelling and the pumping discharge procedure and capacity show that it is very unlikely that the basins will overflow. An overflow spillway and sediment fence is provided from each basin for such an emergency. The basins will be *emptied after each rain event*.
- 30. The diesel pumps will discharge to drainage **Line 1** which will be constructed from junction pit ( $^{1}I_{2}$ ) to the kerb in Holland Street and include the *Humeceptor Model STC 14* hydrodynamic device to reduce the **TSS** in the discharge to **50** mg/litre to comply with **ANZECC** water quality guidelines.
- 31. In the excavation / operation Stages 1 to 5, the stockpile of sandstone material will be excavated in a series of benches to base level commencing at the southern end and working progressively to the stockpile at the northern end. As work progresses detention basin 2 (southern) will be removed and any water stored in this basin will be pumped to Holland Street or into the above ground storage tanks. As work reaches basin 1 (northern), a new basin 2 will be formed at the lower level and any water remaining in basin 1 will be pumped to Holland Street or into the above ground tanks for use in the recycling operations and dust control.
- 32. The pumpwell and sediment fence, perimeter drain, spillway and sediment fence will have to be progressively re-established during the benching operations to maintain the integrity of the system. The steel shaker cattle grid will be removed and replaced with a wheel wash to prevent material being carried onto Albert Street.

# **On-Going Operational Stage:**

- 33. The site regrading for the retention storage allows the driveway to drain into the basin and the diversion bank and sediment pond required in Stages 1 to 5 will be removed
- 34. The site in the on going/operational stage has been modelled using the **ILSAX** programme for 1 in 100 year storms having durations from **5** minutes to **6** hours. The total inflow from a 1 in 100 year storm of **3** hours duration is **1342m**<sup>3</sup>.
- 35. A High Early Discharge Pit (**HED**) (¹/₁) will be provided at the basin low point as shown in **Detail A** on **Sheet 4** with a **100mm UPVC** pipe outlet to pit (¹/₂) in Drainage **Line 1**. All stormwater discharge to Holland Street will comply with **ANZECC** guidelines and the peak discharge will not exceed **24 litres / sec**.

- 36. The maximum storage volume with outflow from the **HED** pit will be **1162 cu.m** and the maximum water level in the retention basin has been calculated to be **RL 7.43**. The basin will empty under *gravity control* after *each storm* and *overflow over* the emergency *spillway* will *not occur*.
- 37. A tank farm comprising a number of **3.4 metre** diameter tanks is to be provided on site. These tanks are to be filled by pumping filtered water from the retention basins. The **5** tanks proposed have a total minimum capacity of **363cu.m**.

## **Erosion and Sediment Control:**

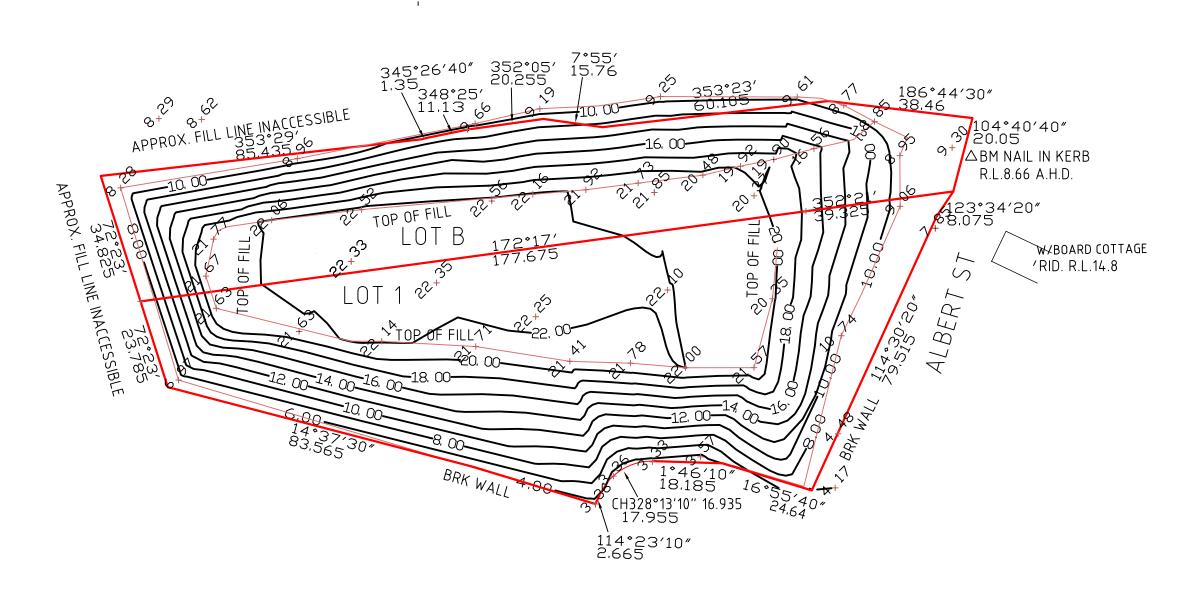
- 38. All erosion and sediment control works described in this report are to be installed and maintained for the life of the project in accordance with the guidelines outlined in Managing Urban Stormwater, Soils and Construction (Landcom 2004) during all stages of the recycling operations. The stormwater quality discharged to Holland Street will comply with ANZECC guidelines of 50mg/litre TSS.
- 39. Where practicable, the soil erosion hazard on the site will be kept as low as possible by limitations to access as outlined in **Table 11.1.**
- 40. During all Stages the geotextile sediment fence will also be cleaned of sediment and maintained in working order. The Humeceptor will require cleaning on an annual basis to remove stored sediment from the treatment chamber. During the on going operation state, the concrete lined sediment pond will be cleared out on a regular basis using a small 'front end loader'.
- 41. The western face of the acoustic stockpile will be inspected after heavy rain and if there is any erosion the surface will be stabilised with spray grass or a light grade woven polypropylene fabric pinned to the surface.

#### **Leachate Management Measures:**

- 42. Samples of crushed blended materials typically produced by Concrete Recyclers were tested by **SESL Australia**. SESL concluded that *leachate tests* on the crushed asphalt and composite asphalt/sandstone material showed *very low leachability* and will not pose any significant contamination issues. The results from the composite crushed sandstone/concrete material showed the material was highly alkaline.
- 43. Stormwater discharge will occur during the excavation / operational stages **1** to **5** and the ongoing operational stage after heavy rain. The stormwater will pass through the *secondary hydro dynamic device* and will be substantially *diluted*.
- 44. The laboratory tests indicate concentrations of contaminants in the very low risk area except for pH. However, the dilution factor in any discharge after heavy rain is expected to reduce the pH value to within acceptable limits of **6.5** to **8.5** as shown in the Table from an *ANZECC Publication in Appendix F*.
- 45. The Management Measures are to include testing of stormwater discharge after completion of the Site preparation to confirm that the pH is within acceptable limits.

**APPENDICES** 

APPENDIX A



#### WARNING:-

- Plan compiled from information at Land Titles Office as regards dimensions and these are subject to final survey.
- All details and features shown hereon have been plotted in relation to the occupations (fences and/or walls, etc.). These occupations have not yet been accurately located in relation to the boundaries.
- 3. The detail and features and contours are shown to scale plot accuracy only. Copying may distort the scale.
- 4. Service structures shown hereon are those that were visible at the time of survey and have been located by field survey. Further services may be present. Prior to any construction or excavation on site the relevant authorities should be contacted for possible location of further underground services and detailed locations of all services.

ORIGIN OF LEVELS BASED ON PM14327 R.L. A.H.D.9.834 SOURCE SCIMS 30.07.10

PLAN OF DETAIL AND LEVELS
LOTB D.P.376645 LOT1 DP88087
ALBERT ST
ST PETERS
PREPARED FOR BRENT LAWSON

ASHER CONSULTING PTY LTD

A.C.N. 112 285 239 13 Parkes Street, Parramatta, NSW 2150 P.O. BOX 1455, PARRAMATTA 2124 PHONE: (02) 9635 5474X: (02) 9635 5237 EMAIL: email@asherconsulting.com.au

SURVEYORS, ENGINEERS & PROJECT MANAGERS

REV.	AMENDMENT				DATE	CHEC.
REDUCTIO	N RATIO:		DAT	E:		
	1:1000			30/7/	10	
DRAWING	No.		JOB	No.		
	13438TS			1343	8	
DATUM:	.H.D.	DRAWN B	Y:	CHECKED BY:	APPROVE	D BY:
SHEET:	0F 1	DATE: 30/7/	10	DATE:	DATE:	

**APPENDIX B** 

M16A.020

ACCUMULATED RUNOFF =
INCLUDING BASEFLOW =
& USER HYDROGRAPHS =
VOLUME DIVERTED OUT =
OVERFLOWS IN TRANSIT =
RUNOFF COEFFICIENTS =

370 m3 0 m3 0 m3 0 m3

0 m3 (NET)

.306 (VOLUMETRIC) BASED ONLY ON RAINFALL INPUTS .034 (PEAK/AVERAGE) AND .008 (PEAK/PEAK) INCL. USER-PROVIDED HYDROGRAPHS, BUT NOT

BASEFLOWS

NO. OF PIPES = PEAK FLOWRATE = TOTAL BASEFLOW = GRASSED RUNOFF =

.006 m3/s 326.0 minutes AFTER START OF STORM .000 m3/s 215.9 %

RERUN WITH NEW RAINFALL PATTERN NO. 10

180 MIN, 20 YR ARI, MARRICKVILLE (ANTECEDENT MOISTURE CONDITION = 3.00)

# CATCHMENT PARAMETERS

INFILTRATIO		02.000 0 12.00.20				
	DEPRESSION STO	ORAGE (mm)	SOIL TYPE	AMC		
PARAMETERS	PAVED AREA	GRASSED	1234=ABCD		FI =	50.0
mm/h			5=NEW		FO =	125.0
					FC =	6.0
mm/h	1.0	5.0	3.00	3.00	К =	2.0
/h			3.00	3.00	00000000000	
mm					FID =	45.6
mm/h				INITIAL	RATE =	33.7

RAINFALL PARAMETERS AND DATA

DURATION (minutes)			INCREME minutes)		NUMBER INFALL IN	COF CREMENTS		RAINFALL (mm)
18	80.0		2.0		12		10	03.5
	D AUSTRAL ERAGE INT		FALL PAT 34.50 m		R ZONE	1	( MULTIPI	LIER =
21.9	21.9	21.9	21.9	21.9	21.9	21.9	47.4	72.9
72.9 72.9	72.9	72.9	72.9	72.9	103.9	103.9	103.9	103.9
103.9 103.9 36.0	103.9	70.0	36.0	36.0	36.0	36.0	36.0	36.0
50.1 31.5	50.1	50.1	50.1	50.1	50.1	50.1	40.8	31.5
31.5	31.5	31.5	31.5	31.5	22.8	22.8	22.8	22.8
22.8	22.8	24.6	26.5	26.5	26.5	26.5	26.5	26.5
17.8 14.5	17.8	17.8	17.8	17.8	17.8	17.8	16.1	14.5
14.5	14.5	14.5	14.5	14.5	9.9	9.9	9.9	9.9
9.9	9.9	8.1	6.2	6.2	6.2	6.2	6.2	6.2
7 - 6				0.000000				

# COMPUTATIONAL TIME STEP = 2.0 minutes

# PIPE SYSTEM DETAILS

MODE **				ACH I	- 1		** EVAL	UATION
TOTAL								
CONTRIBUT	ING		PAVED	SUP	PLEMENTAR	Y GRA	SSED	
SUB-CATO	HMENT AR	EA	.00 ha		.00 ha	1.3	4 ha	1.34
%			.0 %		.0 %	100.	0 %	100.0
ACCUMULA ha	TED AREA		.00 ha		.00 ha	1.3	4 ha	1.34
%			.0 %		.0 %	100.	0 %	100.0
GRASSED	AREA - T 0.0 m S		ULATED B		ATIC WAVE TE =	equatio 9.9 mi	A CONTRACTOR	Q = .332
GRASSED	AREA HYD	ROGRAPH	(m3/s)	- VOLUM	E = 89	5 m3	*	
.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.017	.057	.097	.137	.178	.224	.251	.277
.327	.330	.332	.308	.259	.210	.1.61	.113	.090
.093	.105	.116	.128	.139	.150	.151	.152	.146
.119	. 106	.093	.087	.087	.088	.082	.075	.069
.063	.058	.058	.060	.063	.066	.069	.072	.073
.073	.067	.061	.054	.048	.042	.042	.042	.041
.039	.034	.032	.030	.031	.031	.027	.024	.020
.017	.014	.014	.013	.010	.007	.004	.002	.000
SURFACE m3	HYDROGRA	PHS + AN	Y UPSTRE	AM REACI	I FLOWS (	m3/s) -	VOLUME	= 895
.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.017	.057	.097	.137	.178	.224	.251	.277
.327	.330	.332	.308	.259	.210	.161	.113	.090
.092 .093 .132	.105	.116	.128	.139	.150	.151	. 152	.146
	.106	-093	.087	.087	.088	.082	.075	.069
.063	.058	.058	.060	.063	.066	.069	.072	.073
.073	.067	.061	.054	.048	.042	.042	.042	.041
.039	.034	.032	.030	.031	.031	.027	.024	.020
.017	.014	.014	.013	.010 Page 6	-007 7	.004	.002	.000

TOTAL FI	OWS TO T	HIS POIN	T (SURFA	CE + PIP	ES) - VO	LUME =	895 m3	
.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.017	.057	.097	.137	.178	.224	.251	.277
.303	.330	.332	.308	.259	,210	.161	.113	.090
.092	.105	.116	.128	.139	.150	.151	.152	.146
.132	.106	.093	.087	.087	.088	.082	.075	.069
.063	.058	.058	.060	.063	.066	.069	.072	.073
.073	.067	.061	.054	.048	.042	.042	.042	.041
.039	.034	.032	.030	.031	.031	.027	.024	.020
.017	.014	.014	.013	.010	.007	.004	.002	.000

DETENTION BASIN ROUTING WITH DIVERSION OF OVERFLOWS

HE:	IGHT-STORAGE-OUTFL	OW RELATIONS	HIPS	
HEIGHT (m)	STORAGE (m3)		OUTFLOWS (m.	3/s)
N. Worte William Contact.	\$500 00005550 - 125050	LOW LEVEL	OVERFLOW	TOTAL
.000	.0	.000	.000	.000
.900	12027.0	.090	.000	.090
.910	12027.0	.090	10.000	10.090

WARNING - TIME STEP 120. SECONDS IS MORE THAN TWICE THE MINIMUM RATIO OF STORAGE DIFFERENCE VS OUTFLOW DIFFERENCE IN THE HEIGHT-STORAGE-OUTFLOW TABLE

0. seconds.

THIS MAY CAUSE INSTABILITIES IN BASIN CALCULATIONS.
YOU NEED TO CHECK RESULTS, AND POSSIBLY USE A SHORTER TIME STEP,
OR TO MODIFY THE TABLE.

STARTING STORAGE IS 0. m3

OUTFLOW HYDROGRAPH IS CURTAILED

VOLUMES OF INFLOW AND OUTFLOW HYDROGRAPHS ARE 895. AND 411. m3 AND RESPECTIVE PEAKS ARE .332 AND .006 m3/s PEAK HEIGHT IN BASIN IS .064 m, AND TIME OF PONDING IS 1440.0 minutes

INFLOW HYDROGRAPH (m3/s)

.000	.000	.000	.000	.000	.000	.000	.000	.000
.000	.017	.057	.097	.137	.178	.224	.251	.277
.303	.330	.332	.308	.259	.210	.161	.113	.090
.092	.105	.116	.128	.139	.150	.151	.152	.146
.132	.106	.093	.087	.087	.088	.082	.075	.069
.063	.058	.058	.060	.063	.066	.069	.072	.073
.073	.067	.061	.054	.048	.042	.042	.042	.041
.039	.034	.032	.030	.031	.031	.027	.024	.020
.017	.014	.014	.013	.010	.007	.004	.002	.000

OUTFLOW HYDROGRAPH (m3/s)

M16A.050

ACCUMULATED RUNOFF = INCLUDING BASEFLOW = & USER HYDROGRAPHS = VOLUME DIVERTED OUT = OVERFLOWS IN TRANSIT = RUNOFF COEFFICIENTS =

0 m3 0 m3 0 m3

475 m3

0 m3 (NET) .330 (VOLUMETRIC) BASED ONLY ON RAINFALL INPUTS .037 (PEAK/AVERAGE) AND .009 (PEAK/PEAK)

INCL. USER-PROVIDED HYDROGRAPHS, BUT NOT

BASEFLOWS NO. OF PIPES =

PEAK FLOWRATE = TOTAL BASEFLOW = .007 m3/s 126.0 minutes AFTER START OF STORM

.000 m3/s GRASSED RUNOFF = 216.1 %

RERUN WITH NEW RAINFALL PATTERN NO. 10

180 MIN, 50 YR ARI, MARRICKVILLE (ANTECEDENT MOISTURE CONDITION = 3.00)

# CATCHMENT PARAMETERS

DEPRESSION STORAGE (mm) SOIL TYPE AMC	50.0
	E0 0
PARAMETERS PAVED AREA GRASSED 1234=ABCD FI =	50.0
	125.0
mm/h	6.0
mm/h 1.0 5.0 3.00 3.00 K =	2.0
/h FID =	45.6
mm INITIAL RATE =	33.7

RAINFALL PARAMETERS AND DATA

	ATION		INCREME		NUMBER		100 X 100 X 100 X	RAINFALI
(minutes)		(	(minutes)		NFALL I	NCREMENTS	(mm)	
180.0			2.0		12		122.7	
	D AUSTRAL ERAGE INT				ZONE :		MULTIP	LIER =
28.0	28.0	28.0	28.0	28.0	28.0	28.0	55.2	82.5
82.5 82.5	82.5	82.5	82.5	82.5	114.8	114.8	114.8	114.8
114.8	114.8	78.8	42.7	42.7	42.7	42.7	42.7	42.7
42.7 57.9 38.3	57.9	57.9	57.9	57.9	57.9	57.9	48.1	38.3
38.3 28.5	38.3	38.3	38.3	38.3	28.5	28.5	28.5	28.5
28.5	28.5	30.7	32.9	32.9	32.9	32.9	32.9	32.9
23.6	23.6	23.6	23.6	23.6	23.6	23.6	21.1	18.7
18.7	18.7	18.7	18.7	18.7	13.7	13.7	13.7	13.7
13.7 13.7 9.3	13.7	11.5	9.3	9.3	9.3	9.3	9.3	9.3
9.3				20.000000000000000000000000000000000000				

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### M16A.050

### COMPUTATIONAL TIME STEP = 2.0 minutes

### PIPE SYSTEM DETAILS

HODE 44			RI	EACH 1	- 1		** EVA	LUATION
MODE **			**	****	***			
TOTAL								
CONTRIBU	ITTNG		PAVED	SUPF	LEMENTARY	GRAS	SED	
	CHMENT A	REA	.00 ha	a	.00 ha	1.34	ha	1.34
%			.0 9	6	.0 %	100.0	%	100.0
	ATED ARE	A	.00 ha	1	.00 ha	1.34	ha	1.34
%			.0 3	6	.0 %	100.0	%	100.0
GRASSED		TIME CALC SLOPE =	ULATED E		TE =	EQUATION 9.2 min	PEAK	Q = .376
GRASSED	AREA HY	DROGRAPH	(m3/s)	- VOLUME	= 1146	m3		
.000	.000	.000	.000	.000	.000	.000	.000	.000
.008	.059	.110	.161	.210	.238	.267	. 296	.325
.371	.374	.376	.348	.292	.236	.179	.134	.117
.118	.133	.146	.159	.172	.181	.182	.182	.175
.160	.129	.117	.113	.113	.114	.106	.099	.091
.084 .079	.079	.080	.082	.085	.089	.093	.096	.097
.098	.090	.083	.075	.068	.064	.064	.064	.062
.054	.050	.047	.046	.046	.046	.042	.038	.034
.028	.028	.028	026	.023	.019	.016	.013	.012
.012 .012	.005	.000						
SURFACE m3	HYDROGRA	APHS + AN	Y UPSTRE	AM REACH	FLOWS (m	3/s) - \	/OLUME	= 1146
.000	.000	.000	.000	.000	.000	.000	.000	.000
.000 .008	.059	.110	.161	.210	.238	.267	.296	
.371	.374	.376	.348	.292	.236	.179	.134	
.118	.133	.146	.159	.172	.181			
.160 .145 .084 .079	.129	.117			.114			
.084	.079	.080	.082	.085				
.097 .098 .058	.090	.083	.075	.068	.064	.064		
.058	.050	.047	.046	.046 Page 67	.046			.034

M164.050

				MIDA.US	0			
.031	.028	.028	.026	.023	.019	.016	.013	.012
.012	.005	.000						
TOTAL F	LOWS TO	THIS POINT	(SURFA	CE + PIP	ES) - VO	LUME =	1146 m3	
.000	.000	.000	.000	.000	.000	.000	.000	.000
.008	.059	.110	.161	.210	.238	.267	.296	. 325
.371	.374	.376	.348	.292	.236	.179	.134	.117
.120	.133	.146	.159	.172	.181	.182	.182	.175
.145	.129	.117	.113	.113	.114	.106	.099	.091
.079	.079	.080	.082	.085	.089	.093	.096	.097
.098	.090	.083	.075	.068	.064	.064	.064	.062
.054	.050	.047	.046	.046	.046	.042	.038	.034
.028	.028	.028	.026	.023	.019	.016	.013	.012
.012	.005	.000						

### DETENTION BASIN ROUTING WITH DIVERSION OF OVERFLOWS

HEIGHT (m)	GHT-STORAGE-OUTFL STORAGE (m3)		OUTFLOWS (m.	3/s)
		TOM LEVEL	OVERFLOW	TOTAL
.000	.0	.000	.000	.000
.900	12027.0	.090	.000	.090
.910	12027.0	.090	10.000	10.090

WARNING - TIME STEP 120. seconds is MORE THAN TWICE THE MINIMUM RATIO OF STORAGE DIFFERENCE VS OUTFLOW DIFFERENCE IN THE HEIGHT-STORAGE-OUTFLOW TABLE

 0. seconds.
 THIS MAY CAUSE INSTABILITIES IN BASIN CALCULATIONS. YOU NEED TO CHECK RESULTS, AND POSSIBLY USE A SHORTER TIME STEP, OR TO MODIFY THE TABLE.

STARTING STORAGE IS O. m3

OUTFLOW HYDROGRAPH IS CURTAILED

VOLUMES OF INFLOW AND OUTFLOW HYDROGRAPHS ARE 1146. AND 526. m3 AND RESPECTIVE PEAKS ARE .376 AND .008 m3/s
PEAK HEIGHT IN BASIN IS .082 m, AND TIME OF PONDING IS 1440.0 minutes

INFLOW HYDROGRAPH (m3/s)

.000	.000	.000	.000	.000	.000	.000	.000	.000
.008	.059	.110	.161	.210	.238	.267	.296	.325
.353 .371 .118	.374	.376	.348	.292	.236	.179	.134	.117
.120	.133	.146	.159	.172	.181	.182	.182	.175
.145	.129	.117	.113	.113	.114	.106	.099	.091
.079	.079	.080	.082	.085	.089	.093	.096	.097
.098	.090	.083	.075	.068	.064	.064	.064	.062

				M16A.05	0			
.054	.050	.047	.046	.046	.046	.042	.038	.034
.028	.028	.028	.026	.023	.019	.016	.013	.012
.012	.005	.000						
ONTFLOW	HYDROGRA	PH (m3/s	)					
960,000	.000	.000	.000	.000	.000	,000	.000	.000
.000	.000	.000	.000	.000	.001	.001	.001	.001
.002	002	.003	.003	.003	.003	.004	.004	.004
.004	. 004	.004	.004	.005	.005	.005	.005	.005
.005	.006	.006	.006	.006	.006	.006	.006	.006
.006	.007	.007	.007	.007	.007	.007	.007	.007
.007	.007	.007	.007	.007	.008	.008	.008	.008
.800. .800.	.008	.000	.008	.008	.008	.008	.008	.008
.008	.008	.008	800.	.008	.008	.008	.008	.008
.008	.008	.008	2008	.008	.008	.008	.008	.008
.008	.008	.008	.008	.008	.008	.008	.008	.008
.008	.008	.008	.008	800,	.008	.008	.008	.008
.008 .008	.008	.008	.008	.008	.008	.008	.008	.008
.008	.008	.008	.008	. 008	.008	.008	.008	.008
.008	.008	.008	.008	.008	.008	.008	.008	.008
.008	.008	.008	.008	.008	800.	.008	.008	.008
.008	.008	.008	.008	.008	. Q08	.008	.008	.008
.008	800.	.008	.008	.008	.008	.008	.008	.008
.008 .008 .007	.008	.008	.008	.008	.008	.007	.007	.007
.007	.007	.007	.007	.007	.007	.007	.007	.007
007	.007	.007	.007	.007	.007	.007	.007	.007
.007 .007 .007	.007	.007	.007	.007	.007	.007	.007	.007
.007 .007 .007	.007	.007	.007	.007	.007	.007	.007	.007
.007	.007	.007	.007	.007	.007	.007	.007	.007
.007	.007	.007	.007	.007	.007	.007	.007	.007
.007 .007 .007	.007	.007	.007	.007	.007	.007	.007	.007
.007 .007 .007	.007	.007	.007	.007	.007	.007	.007	.007
	.007	.007	.007	.007	.007	.007	.007	,00x
.007 .007 .007	.007	.007	.007	.007	.007	.007	.007	.007
.007 .007 .007	.007	.007	.007	.007	.007	.007	.007	.007
	.007	.007	.007	.007	.007	.007	.007	.007
.007				Page 60				

```
AREAS (ha) PAVED
BCH RCH
                                          GRASSED C VOL SURFACE PIT PIPE
     RCH AREAS (ha) PAVED GRASSED C VOL SURFAC
PAV SUP GRAS TOTAL TIME Q TIME Q Q
1 .00 .00 1.34 1.34 0 .000 0 -8 .744 .744 1199 .744
                                                                          .744
                                                                                  .000
OVERFLOW VOLUME IS 0 m3, AND THE PEAK FLOWRATE IS .000 m3/s
                                 REACH 1 -
                                                                  ** DESIGN MODE **
                                  交合存在交合存在交合存在企会
NO SUBCATCHMENT
                                                                             TOTAL
                                                                         CONTRIBUTING
                            PAVED
                                       SUPPLEMENTARY
                                                          GRASSED
                                                          1.34 ha
                                            .00 ha
ACCUMULATED AREA
                             .00 ha
                                                                            1.34 ha
                             .0 %
                                            .0 %
                                                         100.0 %
                                                                           100.0 %
TOTAL FLOWS TO THIS ROINT (SURFACE + PIPES) - VOLUME =
                                                                 0 m3
CIRCULAR PIPE.
                       UNRESTRICTED, NO-OVERFLOW INLET
                                           GRASSED C VOL SURFACE PIT PIPE
               AREAS (ha)
                                 PAVED
BCH RCH
          PAV SUP GRAS TOTAL TIME Q
                                         TIME Q
                                                                    Q
                                                                            Q
                                                                                 0
     2 .00 .00 .00 .00 0 .000 0 0 .000 0 .000 .000 .000
                     ORIGINAL DESIGNED CAP VEL VOLUMES OFLOW SS NO DIA nork NO DIA nork PAT Q BYP UPW OFL Q .00 0 .00 152 .15 1 .021 1.2 0 0 0 .000
                    ORIGINAL
LEN SLOPE
                B
  1 1.00 .00 .00 .00
                              OUTFALL HYDROGRAPH (m3/s)
                           O VALUES AT 2.0 minute INTERVALS )
                           1.34 ha ( .00 ha PAVED, .00 ha SUPPLEMENTARY 1.34 ha GRASSED AND .00 ha UNDRAINED )
TOTAL AREA =
                              0 m3
ACCUMULATED RUNOFF =
 INCLUDING BASEFLOW =
                              0 m3
 & USER HYDROGRAPHS =
                              0 m3
                              0 m3
VOLUME DIVERTED OUT =
OVERFLOWS IN TRANSIT =
                              0 m3 (NET)
                           .000 (VOLUMETRIC) BASED ONLY ON RAINFALL INPUTS
RUNOFF COEFFICIENTS =
                           .000 (PEAK/AVERAGE) AND .000 (PEAK/PEAK)
                            INCL. USER-PROVIDED HYDROGRAPHS, BUT NOT BASEFLOWS
NO. OF PIPES =
                             . 2
                           .000 m3/s
                                        .0 minutes AFTER START OF STORM
PEAK FLOWRATE =
                           .000 m3/s
TOTAL BASEFLOW =
                             .0 %
GRASSED RUNOFF =
RERUN WITH NEW RAINFALL PATTERN NO. 10
180 MIN, 100 YR ARI, MARRICKVILLE
(ANTECEDENT MOISTURE CONDITION = 3.00)
CATCHMENT PARAMETERS
                                                                     INFILTRATION
                                                                    PARAMETERS
FI = 50.0 mm
                                         SOIL TYPE
                                                          AMC
           DEPRESSION STORAGE (mm)
             PAVED AREA GRASSED
                                         1234=ABCD
                                                                          50.0 mm
                                                                    F0 = 125.0 \text{ mm/h}
                                            5=NEW
                                                                    FC = 6.0 \text{ mm/h}
```

м16 3.00 1.0 5.0

2.0 /h 3.00 K = FID =

45.6 mm 33.7 mm/h INITIAL RATE =

RAINFALL PARAMETERS AND DATA

DURATION (minutes)	TIME INCREMENT (minutes)	NUMBER OF RAINFALL INCREMENT	TOTAL RAINFALL S (mm)
180.0	2.0	12	137.4
STANDARD AUSTRALIAN WITH AVERAGE INTENS			( MULTIPLIER = 1.000 )
92.3 92.3 9 128.6 128.6 8 64.9 64.9 6 42.9 42.9 4 31.9 31.9 3 26.4 26.4 2 20.9 20.9 2	31.3 31.3 31. 92.3 92.3 92. 68.2 47.8 47. 64.9 64.9 64. 42.9 42.9 42. 34.3 36.8 36. 26.4 26.4 26. 20.9 20.9 20.9 20.	3 128.6 128.6 8 47.8 47.8 9 64.9 64.9 9 31.9 31.9 8 36.8 36.8 4 26.4 26.4 9 15.4 15.4	61.8 92.3 92.3 128.6 128.6 128.6 47.8 47.8 47.8 53.9 42.9 42.9 31.9 31.9 31.9 36.8 36.8 36.8 23.6 20.9 20.9 15.4 15.4 10.4 10.4

COMPUTATIONAL TIME STEP = 2.0 minutes

### PIPE SYSTEM DETAILS \*\*\*\*\*\*\*\*\*\*\*

	REACI	H 1- 1	** EVAL	UATION MODE **
	3.515.5153			TOTAL
	PAVED	SUPPLEMENTARY	' GRASSED	CONTRIBUTING
SUB-CATCHMENT AREA	.00 ha	.00 ha	1.34 ha	1.34 ha
	.0 %	.0 %	100.0 %	100.0 %
ACCUMULATED AREA	.00 ha	.00 ha	1.34 ha	1.34 ha
	.0 %	.0 %	100.0 %	100.0 %
GRASSED AREA - TIME CALC	ULATED BY I	KINEMATIC WAVE	EQUATION	
LEN = 90.0 m SLOPE =	.5 % n =	.015 TE =	8.8 min PEAK C	Q = .427  m3/5
		200 miles		
TOTAL FLOWS TO THIS POIN	T (SURFACE	+ PIPES) - VOL	.UME = 1342 m3	

### DETENTION BASIN ROUTING WITH DIVERSION OF OVERFLOWS

HEIGHT (m)	HT-STORAGE-OUTFL STORAGE (m3)	OW RELATIONS	HIPS OUTFLOWS (m	3/s)
	of Conference Carrier	LOW LEVEL	OVERFLOW	TOTAL
.000 .900 .910	.0 12027.0 12027.0	.000 .000	.000 .000 10.000	.000 .000 10.000

WARNING - TIME STEP 120. seconds IS MORE THAN TWICE THE MINIMUM RATIO OF STORAGE DIFFERENCE VS OUTFLOW DIFFERENCE IN THE HEIGHT-STORAGE-OUTFLOW TABLE 0. seconds.

THIS MAY CAUSE INSTABILITIES IN BASIN CALCULATIONS.
YOU NEED TO CHECK RESULTS, AND POSSIBLY USE A SHORTER TIME STEP, OR TO MODIFY THE TABLE.

STARTING STORAGE IS 0. m3

	COTFLOR	HIDROGRAFI	1 13 COK	TAILED						
ñ	VOLUMES	OF INFLOW	AND OUT	FLOW HYDR	OGRAPI	HS ARE	1342.	AND	0. m3	
ı	AND RES	OF INFLOW PECTIVE PEA IGHT IN BAS	AKS ARE	.427	AND	.000 n	13/s			
Ц	PEAK HE	IGHT IN BAS	SIN IS	.100 m,	AND	TIME OF PON	NDING	IS 1440.0	minutes	
	INFLOW	HYDROGRAPH	(m3/s)							
	000	000	000	000	000	000	000	2000	000	000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.423	.425	.427	.395	.329	.262	.196	.149	.137	.138
	.139	.154	.170	.185	.200	.207	.208	.208	.200	.182
	.164	.146	.133	.130	.130	.131	.122	.113	.104	.095
	.092	.092	.092	.095	.099	.103	.108	.111	.112	.112
	.112	.104	.095		.078	.074	.074	.074	.072 .041	.068
	.034	.034	.034	.032	.028	.024	.050	.017	.016	.036
	.016	.007	.000	.032	· OLO	1021	.020	.021	.010	.010
	OLUTION.	. UWDDOGDADI	. (-2/-2							
	OUTFLOW	HYDROGRAPH	1 (m3/5)							
	1									
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	,000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		000.	.000	.000	.000	.000	.000
	.000		.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	000	.000	.000	.000	.000
	.000	.000	.000		.000	000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	7000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	,000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	.000	.000	.000		.000	.000	.000	.000	.000	.000
	,000	.000	.000	.000	. 000	.000	.000	.000	.000	·

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APPENDIX C

### **CALCULATIONS**

### Soil Erodibility Factor K

Assumptions Per cent sand (0.1 to 2mm) - 30%. Organic Matter OM - 0% Silt and Fine Sand - 20% Soil Texture – Medium - Coarse granular. Permeability – 0.1mm/sec. Rapid From Figure A3 (Landcom 2004) the K Factor is 0.064*
Rainfall Erosivity Factor R
R = 164.74 (1.1177) <sup>S</sup> S 0.6444
Where S = 2 year ARI, 6 hour ARI rainfall event For Sydney LGA S = 13mm/hour. R = 3655*
Soil Loss
A = RKLS PC
Where A = Computed Soil Loss (tonnes/ha/year) R = Rainfall Erosivity factor. K = Soil erodibility factor LS = Slope/length/gradient factor. P = Erosion control practice factor. C = Ground cover and management factor.
<u>LS</u>
For Site L = 90m S < 1% From Table A1 (Landcom) LS = $0.20$ *
Surface Condition P Factor Table A2 (Landcom 2004) Assumed track walked along contour P = 1.2
Hence A = 3655 x .064 x 0.2 x 1.2 x 1 = 56.14 tonnes/ha/year < 150 (Table 4.2) Therefore, Sediment basin not required.

**APPENDIX D** 

> LANKS SMONANE QLSQZ The same of the sa AABAAH. BE STATE OF THE ST MOOBLEY SHOOT TO THE PART SH, 11
CITY OF SY D'NEY
STORMUN ATER NETWORKS

### DAYS OF HIGHEST RAINFALL from 1974 to 2012

	10 2012				
YEAR	MONTH	DAY OF MONTH	RAINFALL 24 HR TOTAL	TOTAL MM	EVAPORATION MM
1990	FEBRUARY	3	216.2		
1986	AUGUST	6	207	378.8	102.2
1990	FEBRUARY	4	177.8	581	155
1988	APRIL	30	174	476.2	101.8
1991	JUNE	11	151.2	372.2	79.1
1984	NOVEMBER	9	131.8	362.4	174.8
1992	FEBRUARY	10	123.8	314.4	146.3
1984	NOVEMBER	6	121		
1992	FEBRUARY	9	120.4		
1976	FEBRUARY	21	117.6	239.8	150.7
2002	FEBRUARY	5	116.8	329.2	147.5
1986	AUGUST	5	111		
1974	MARCH	12	108	299	143.3
2003	MAY	14	94.2	388.4	89
1983	MARCH	22	92	308.8	203.8
1988	APRIL	4	91.6		
2011	JULY	22	91	250.4	99.6
1975	JUNE	21	87.8	359.6	82.9
1998	AUGUST	8	86.6	396.6	108.2
2007	JUNE	9	72.4	319.4	71.8
1976	JANUARY	21	65.8	306	182.7
1978	JUNE	1	54.4	280.8	86.2
1985	APRIL	28	29.8	249.6	123

## TOTAL MONTHLY RAINFALL

	Year(S)	Cannat	February .	March	April	May	Same	Ary.	August	Saptember	October	Newspay	Decamber	Annual
-	191	4 150.8	107.4	288	133.1	186.3	2024	121	178.4	1	865	67.4	l.	. 1555
	1978		1,801	200	68.2	20	359.6	3	52		425	42.8	_	1254.8
	1978	_	239.6	260	27	33.4	165.2	161.4	25		268.3	122.4	_	1767.9
	187		150.8	225.4	198	101.2	100.6	17.8	18,4	62.8	88	21.5	24	979.4
	82.6)		2.5	2052	94.6	116.6	200.0	20.6	51.8		120.4	502	_	1525.8
-	197	_	38	154.8	16	112	173.5	34.2	7.4		42.2	73.5		7807
	1000	_	73.2	54.4	20.4	127.2	4.39	30.2	124		41.2	46		8
	1361		155	8	122.B	37.4	52.4	49.4	9	830	155.6	112.8		958.8
	1982	2.	24.5	153.4	4	13.4	106.6	1216	27.4	10	÷	25.4		173.1
	1983		7	300.8	119.4	142.8	75	61.0	56.2	92	128.6	35		1848
	1884		A.10	1634	52	107.4	74.6	140.8	Ξ		28	3624		180
	1895		332	N.	249.6	157	103	909	28.6		116.2	906		1000
	10%		82.4	2	ç	175	4	24.8	347.0		05.4	125.2		0458
	1991		35.8	132,8	888	72.8	63.6	1082	154.8		200.8	128.6		1155
	1988		121.4	H	4762	846	100.4	1344	83.2		0	1652		623.6
-	1858		62.6	134.6	979	133.4	212.0	14.4	41.2		15.4	47.6		1228
	1830	_	185	1282	311.6	1348	8	57.4	183.4		48.4	14.2		7192
	1931		41,8	24.6	8	92.6	372.2	107	4.6		80	12		56114
	3		314.4	90.6	89	48.2	124	13.6	44.6		35	1224		1000
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	1990		9'091	Ŧ	204.4	2	712	1702	93		131.0	392		251.6
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	2005		105.8	802	25.8	52.5	57.8	742	4.1		456	555		678.2
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	2002		105.4	702	101.8	10.5	316.4	38.8	200		13.6	1206		200
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Total monthly minfall in	2011		14.4	1534	211	97.2	40	250.4	40.8		47.6	151.6		251.4
(34) Total monthly califical in mm.	201		138	189.4	121	r R	1562	51.4						
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# TOTAL MONTHLY EVAPORATION

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### PPLEMENT 1

### Intensity Frequency Duration (IFD) Rainfall Data

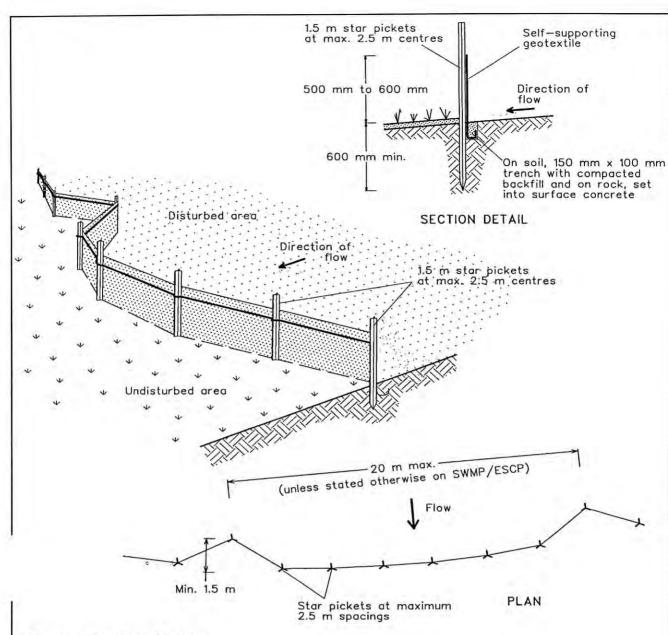
### Marrickville

2 year	50 year
1 <sub>1</sub> hr : 40.0	11 hr: 85.0
112 hr: 8.0	I <sub>12</sub> hr: 16.0
172 hr: 2.5	I <sub>72</sub> hr: 5.0

AVE	RAGE RE	CURREN	CE INTER	RVAL (AR	l) years	
TIME	2	5	10	20	50	100
5 mins	126.5	160.8	180.4	206.6	240.6	266.3
6 mins	118.7	151.3	170	194.8	227.1	251.6
7 mins	112.1-	~143.3	161.2	184.9	215.8	239.3
8 mins	106.6	136.4	153.6	176.4	206.1	228.7
9 mins	101.7	130.5	147.1	169	197.6	219.4
10 mins	97.5	125.2	141.3	162.5	190.1	211.2
12 mins	90.3	116.3	131.4	151.3	177.4	197.2
14 mins	84.3	109	123.3	142.1	166.8	185.6
15 mins	81.8	105.8	119.7	138.1	162.2	180.5
16 mins	79.4	102.8	116.5	134.4	157.9	175.8
18 mins	75.1	97.5	110.6	127.7	150.3	167.4
20 mins	71.4	92.9	105.5	121.9	143.6	160.1
25 mins	64	83.6	95.1	110.2	130	145.1
30 mins	58.3	76.4	87.1	101.1	119.5	133.5
40 mins	50.1	66	75.5	87.8	104.1	116.6
50 mins	44.3	58.7	67.3	78.4	93.2	104.6
1 hours	40	53.2	61.1	71.4	85	95.5
1.5 hrs	31	41	47.1	54.9	65.2	73.1
2 hours	25.7	34	38.9	45.3	53.8	60.3
3 hours	19.8	26	29.7	34.5	40.9	45.8
4.5 hrs	15.2	19.9	22.7	26.3	31.1	34.7
6 hours	12.6	16.4	18.7	21.7	25.6	28.5
9 hours	9.6	12.6	14.3	16.5	19.4	21.7
12 hours	8	10.4	11.8	13.6	16	17.8
15 hours	7	9.1	10.3	11.9	14	15.6
18 hours	6.2	8.1	9.2	10.6	12.5	13.9
24 hours	5.2	6.8	7.7	8.9	10.5	11.7
30 hours	4.5	5.9	6.7	7.7	9.1	10.1
36 hours	4	5.2	5.9	6.9	8.1	9
48 hours	3.3	4.3	4.9	5.7	6.7	7.4
72 hours	2.5	3.2	3.7	4.3	5	5.6

Co-efficient G: 0.00 F<sub>2</sub>: 4.29 F<sub>50</sub>: 15.80

**APPENDIX E** 

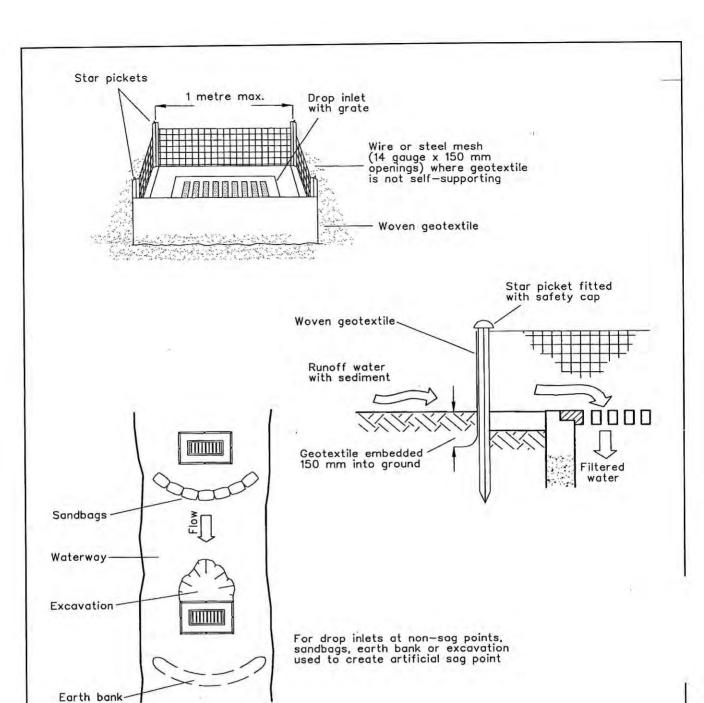


### **Construction Notes**

- Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
- Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
- Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
- 4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
- Join sections of fabric at a support post with a 150-mm overlap.
- 6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

### SEDIMENT FENCE

SD 6-8



### **Construction Notes**

- 1. Fabricate a sediment barrier made from geotextile or straw bales.
- 2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
- 3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
- 4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

### **GEOTEXTILE INLET FILTER**

SD 6-12

**APPENDIX F** 



AUSTRALIA'S MOST TRUSTED EARTH SCIENCE SERVICES

### **Multiple Analysis Profile**

Sample Drop Off: 16 Chilvers Road Tel: 02 9980 6554 Thornleigh NSW 2120 02 9484 2427 Fax:

Mailing Address: PO Box 357 Em: info@sesl.com.au

Pennant Hills NSW 1715 Web: www.sesl.com.au



Tests are performed under a quality system certified as complying with ISO 9001: 2008. Results and conclusions assume that sampling is representative. This document shall not be reproduced except in full.

Batch N°: 23218 Sample N°: 1 Date Received: 27/7/12 Report Status: O Draft Final

Client Name: **Concrete Recyclers Pty Limited** 

Client Contact: Brent Lawson

Client Job N°:

Client Order N°:

Address: PO Box 238

**RYDALMERE NSW 1701** 

Project Name: Blending Analysis

Location:

SESL Quote N°:

Sample Name: 20mm Hardroad

Description:

Test Type: PAH\_S

Analysis	Unit	Result
Polyaromatic Hydrocarbons (PAH) in TCLP	mg/L	
Naphthalene in TCLP	mg/L	0.002
Phenanthrene in TCLP	mg/L	0.002
All other PAHs in TCLP	mg/L	<0.002
Total PAHs in TCLP	mg/L	0.004
Initial pH (Leachate Fluid)	pH units	6.2
Final pH (Leachate Fluid)	pH units	6.7

Analysed by MGT-Labmark, NATA # 1261, Report # 346451

This crushed asphalt sample provided by the Client was analysed to determine if the runoff of the material pose any potential contamination.

Based on this limited analysis, the TCLP results obtained from the analysis shows a fairly low levels of TCLP in PAHs with only two compounds detected in low quantities.

SESL concludes that the material shows very low leachability and will not pose any significant runoff contamination issues.

TCLP: Toxicity Characteristic Leaching Procedure

Consultant:

Authorised Signatory:

Ryan Jacka

Total No Pages: 1/1

Date of Report

08/08/2012

Kelly Lee

**END OF REPORT** 



AUSTRALIA'S MOST TRUSTED EARTH SCIENCE SERVICES

### **Multiple Analysis Profile**

Sample Drop Off: 16 Chilvers Road Tel: 02 9980 6554 Thornleigh NSW 2120 02 9484 2427 Fax:

Mailing Address: PO Box 357 Em: info@sesl.com.au

Pennant Hills NSW 1715 Web: www.sesl.com.au



Tests are performed under a quality system certified as complying with ISO 9001: 2008. Results and conclusions assume that sampling is representative. This document shall not be reproduced except in full.

Batch N°: 23218 Sample N°: 4 Date Received: 27/7/12 Report Status: O Draft Final

**Concrete Recyclers Pty Limited** Client Name: Project Name: Blending Analysis

Client Contact: Brent Lawson Location: Client Job N°: SESL Quote N°:

Client Order N°: Sample Name: DGB20:Sandstone, 50:50 Composite

Address: PO Box 238 Description:

**RYDALMERE NSW 1701** Test Type: pH\_Sol

Analysis	Unit	Result
рН	pH units	11.1

Analysed by SESL Australia, NATA #15633, Report #23218

This crushed concrete sample provided by the Client was analysed to determine pH of the composite material after blending with sandstone.

Based on this limited analysis, the results obtained from the analysis shows the material is highly alkaline.

Consultant:

Authorised Signatory:

Ryan Jacka

Total No Pages: 1/1

Date of Report 08/08/2012

Kelly Lee **END OF REPORT** 



AUSTRALIA'S MOST TRUSTED EARTH SCIENCE SERVICES

### **Multiple Analysis Profile**

 Sample Drop Off:
 16 Chilvers Road
 Tel:
 02 9980 6554

 Thornleigh NSW 2120
 Fax:
 02 9484 2427

Mailing Address: PO Box 357 Em: info@sesl.com.au

Pennant Hills NSW 1715 Web: www.sesl.com.au

Tests are performed under a quality system certified as complying with ISO 9001: 2008. Results and conclusions assume that sampling is representative. This document shall not be reproduced except in full.



Batch N°: 23218 Sample N°: 5 Date Received: 27/7/12 Report Status: ○ Draft ● Final

Client Name: Concrete Recyclers Pty Limited Project N

Client Contact: Brent Lawson

Client Job N°:

Client Order N°:

Address:

PO Box 238

RYDALMERE NSW 1701

Project Name: Blending Analysis

Location: SESL Quote N°:

OLOL QUOID IV .

Sample Name: 20mm Hardroad:Sandstone, 50:50 Composite

Description:

Test Type: PAH\_S

Analysis	Unit	Result
olyaromatic Hydrocarbons (PAH) in TCLP	mg/L	
Naphthalene in TCLP	mg/L	0.003
Phenanthrene in TCLP	mg/L	0.002
All other PAHs in TCLP	mg/L	<0.002
Total PAHs in TCLP	mg/L	0.005
Initial pH (Leachate Fluid)	pH units	7.6
Final pH (Leachate Fluid)	pH units	5.7

Analysed by MGT-Labmark, NATA # 1261, Report # 346451

This crushed alphalt sample provided by the Client was analysed to determine if the runoff of the material pose any potential contamination.

The sample is a composite of the crushed asphalt and sandstone material which were blended prior to analysis. Based on this limited analysis, the TCLP results obtained from the analysis shows a fairly low levels of TCLP in PAHs with only two compounds detected in low quantities.

SESL concludes that the material shows very low leachability and will not pose any significant runoff contamination issues.

TCLP: Toxicity Characteristic Leaching Procedure

Consultant:

Kelly Lee

图

Authorised Signatory:

Ryan Jacka

Total No Pages: 1/1

Date of Report 08/08/2012

**END OF REPORT** 

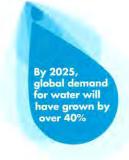
### .2 Concentration limits

- For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table. 12.1
- Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges. 12.2
- To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s. 12.3
- L2.4 Water and/or Land Concentration Limits

### POINT 2

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APPENDIX G







Telephone: 8849 4459 Fax: 8849 3063 Officer: John Hyde Our Ref.: 2011/02012F

1 April 2011

Lyle Marshall & Associates Pty Ltd Suite 8, 871 Pacific Highway Chatswood NSW 2067

Attention: Kane Chow

Dear Sir/Madam,

On Site Detention Requirements
2 Albert Street, St Peters (Lot 1 DP 88067, Lot B DP 376645)

With reference to your email dated 31 March 2011 and the attached drawing regarding the On Site Detention requirements at the above property.

The following requirements are to apply for a year from the date of this letter after which the requirements will be updated on reapplication.

On Site Detention is not required for the proposed work/development at the above location.

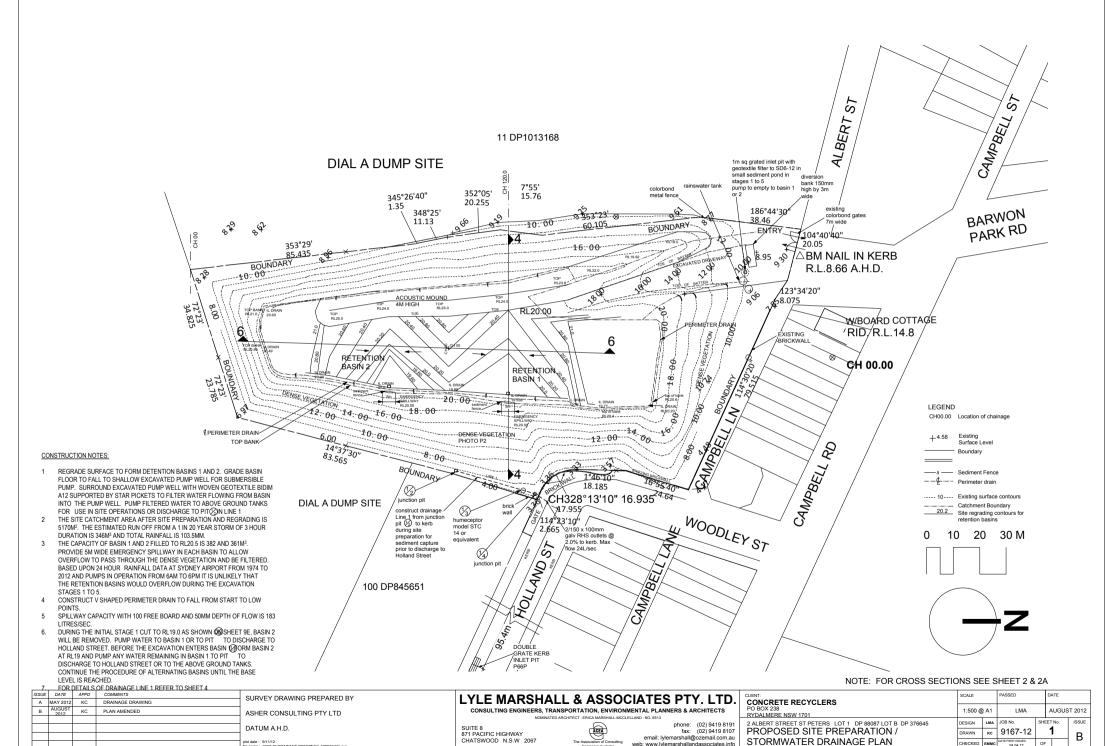
If you have any queries please do not hesitate to contact me on the above number.

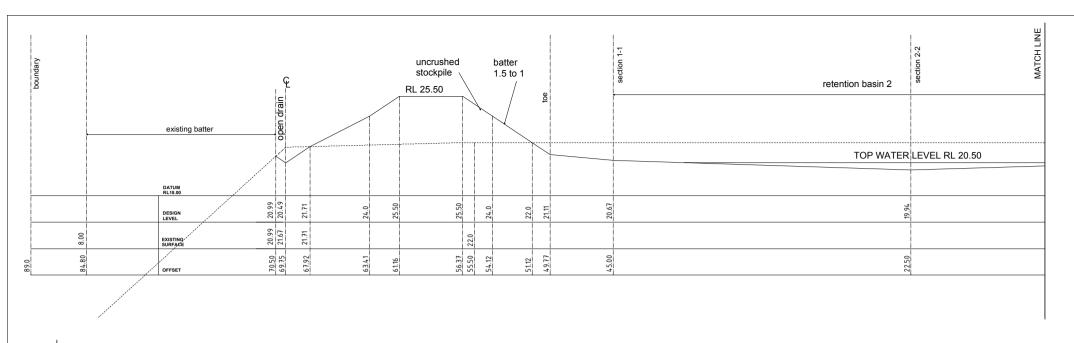
Yours sincerely

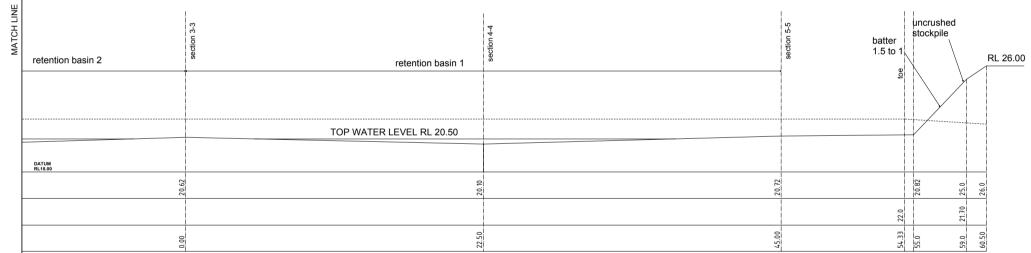
John Hyde

**Development Services Representative** 

**APPENDIX H** 







CROSS SECTION 6-6 SCALE 1:100 @ A1

ISSUE	DATE	APPD	COMMENTS	SURVEY DRAWING PREPARED BY
	MAY 2012		DRAINAGE DRAWING	30KVET DIGWING FREFARED BT
В	SEPTEMB FR 2012	KC	DRAWING AMENDED	ASHER CONSULTING PTY LTD
				DATUM A.H.D.
				plot date: 9/10/12 file name: 9167-12-DRAINAGE DRAWINGS 100912-KC very

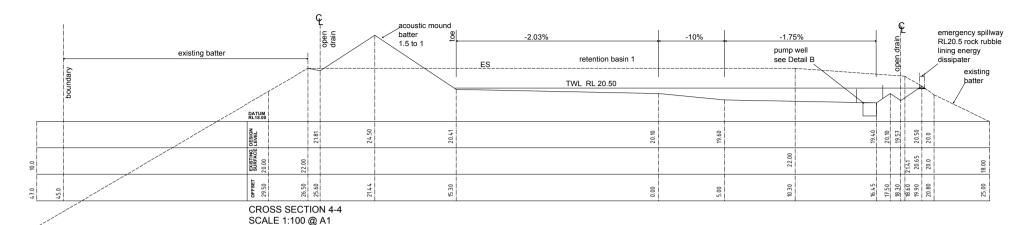
### LYLE MARSHALL & ASSOCIATES PTY. LTD. CONSULTING ENGINEERS, TRANSPORTATION, ENVIRONMENTAL PLANNERS & ARCHITECTS

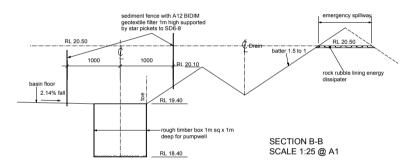
SUITE 8 871 PACIFIC HIGHWAY CHATSWOOD N.S.W 2067

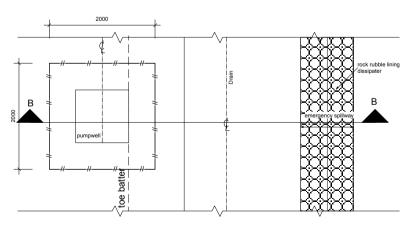
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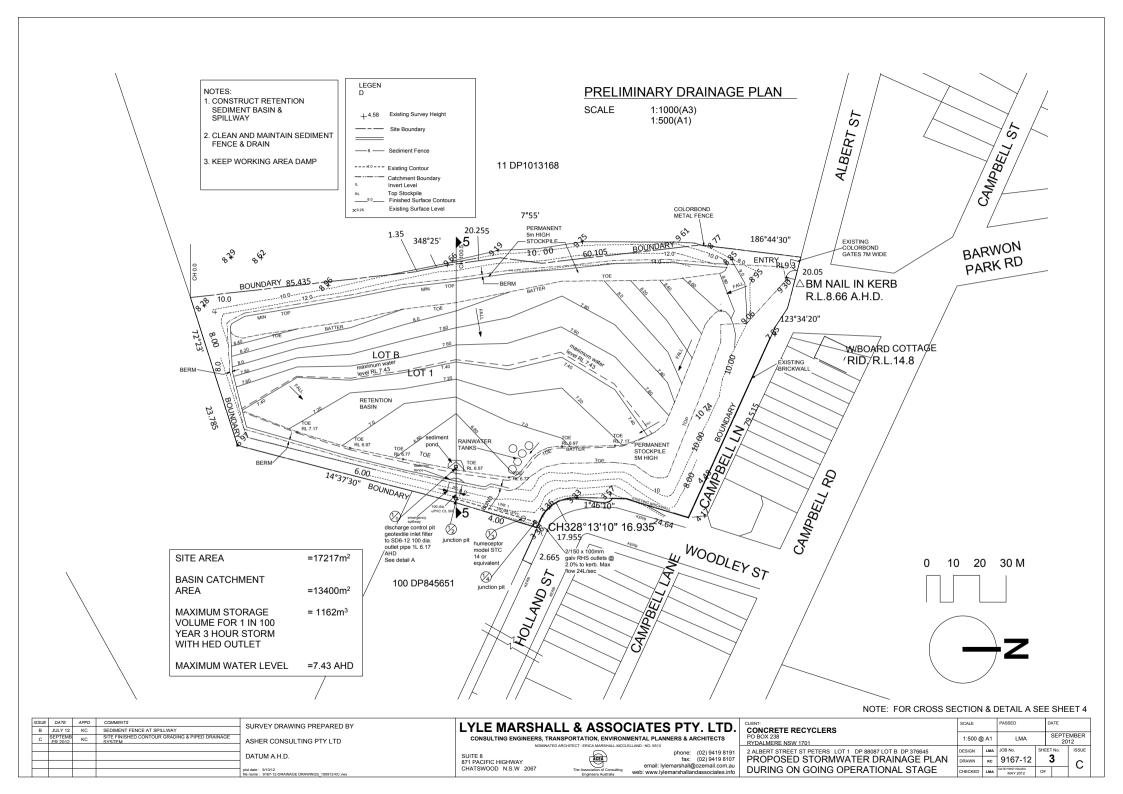
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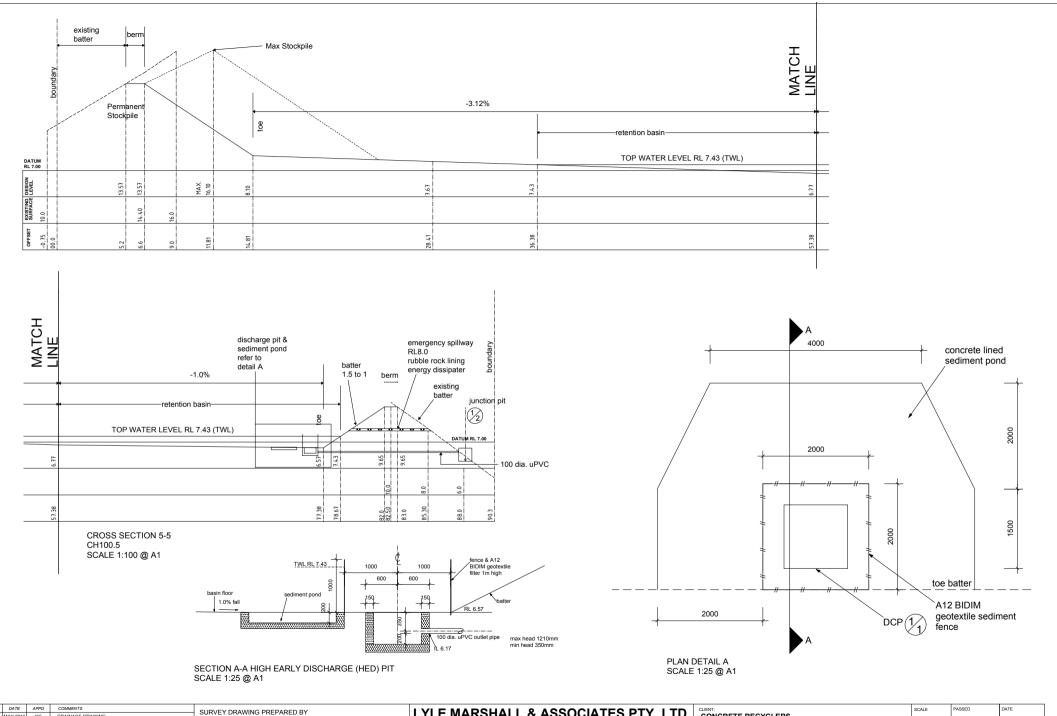
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### Appendix 9

### DRAWING SCHEDULE

### 2 ALBERT STREET ST PETERS

### LAND EXCAVATION STAGES DRAWING

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	1:1000	9167-10-20	D
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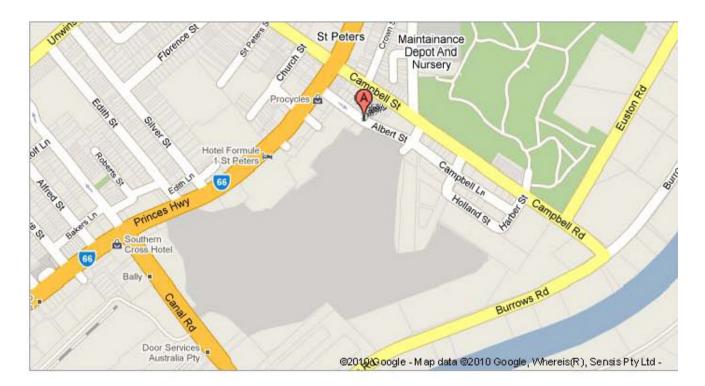
CONSULTING ENGINEERS, TRANSPORTATION, ENVIRONMENTAL PLANNERS & ARCHITECTS

NOMINATED ARCHITECT: ERICA MARSHALL-MCCLELLAND: NO. 6513

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### PROPOSED SITE

### STREET MAP



### **AERIAL LOCALITY MAP**

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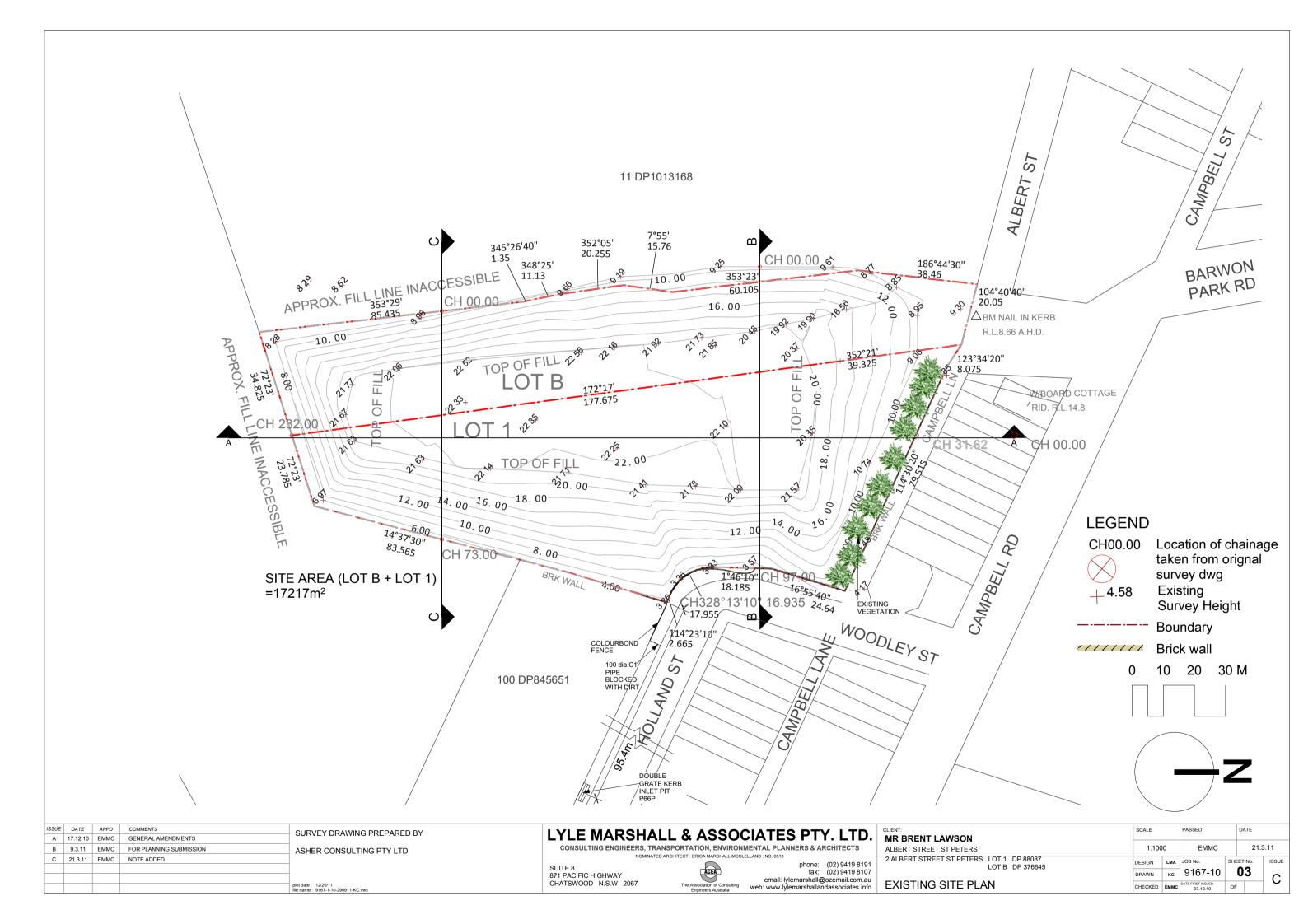
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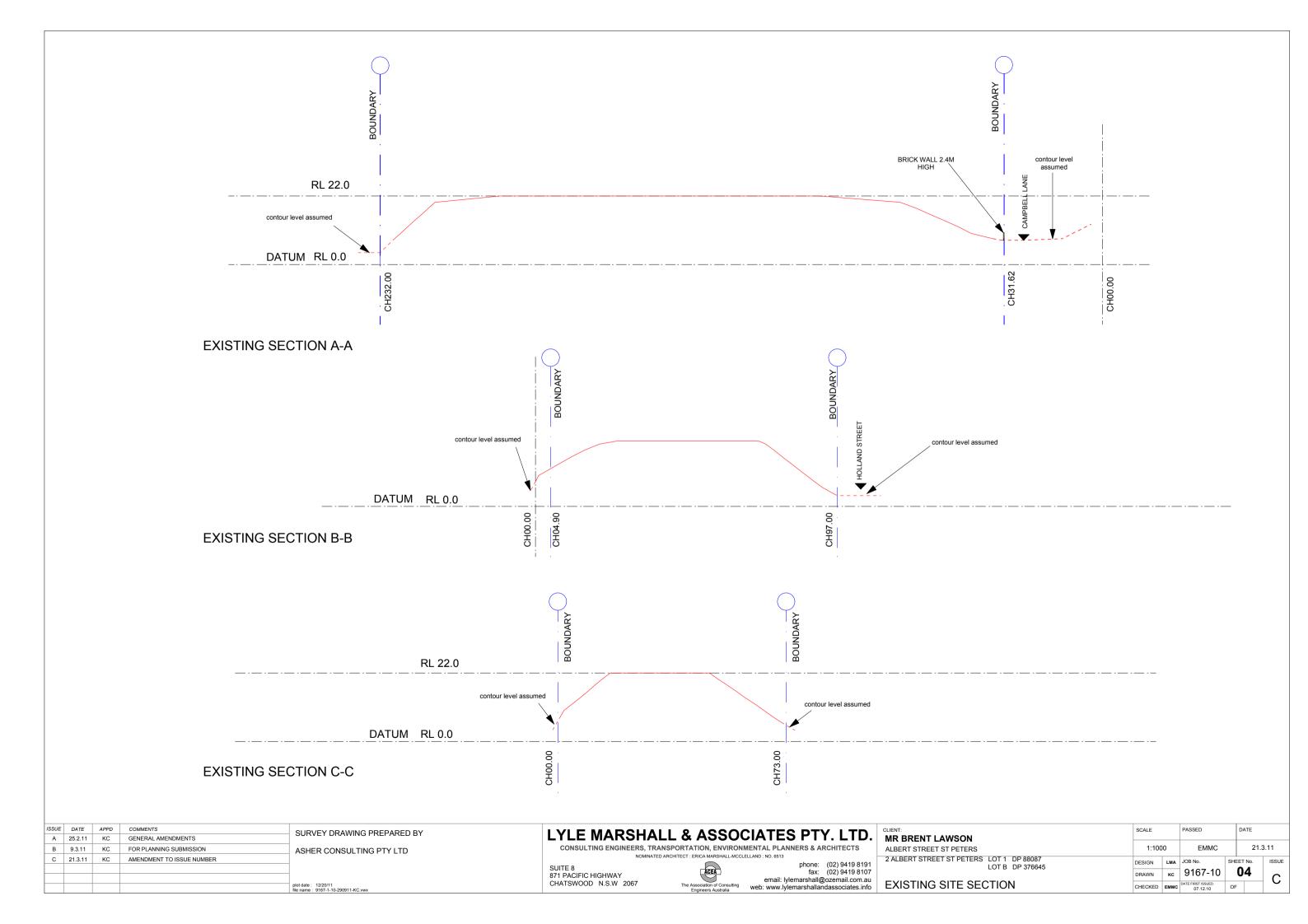


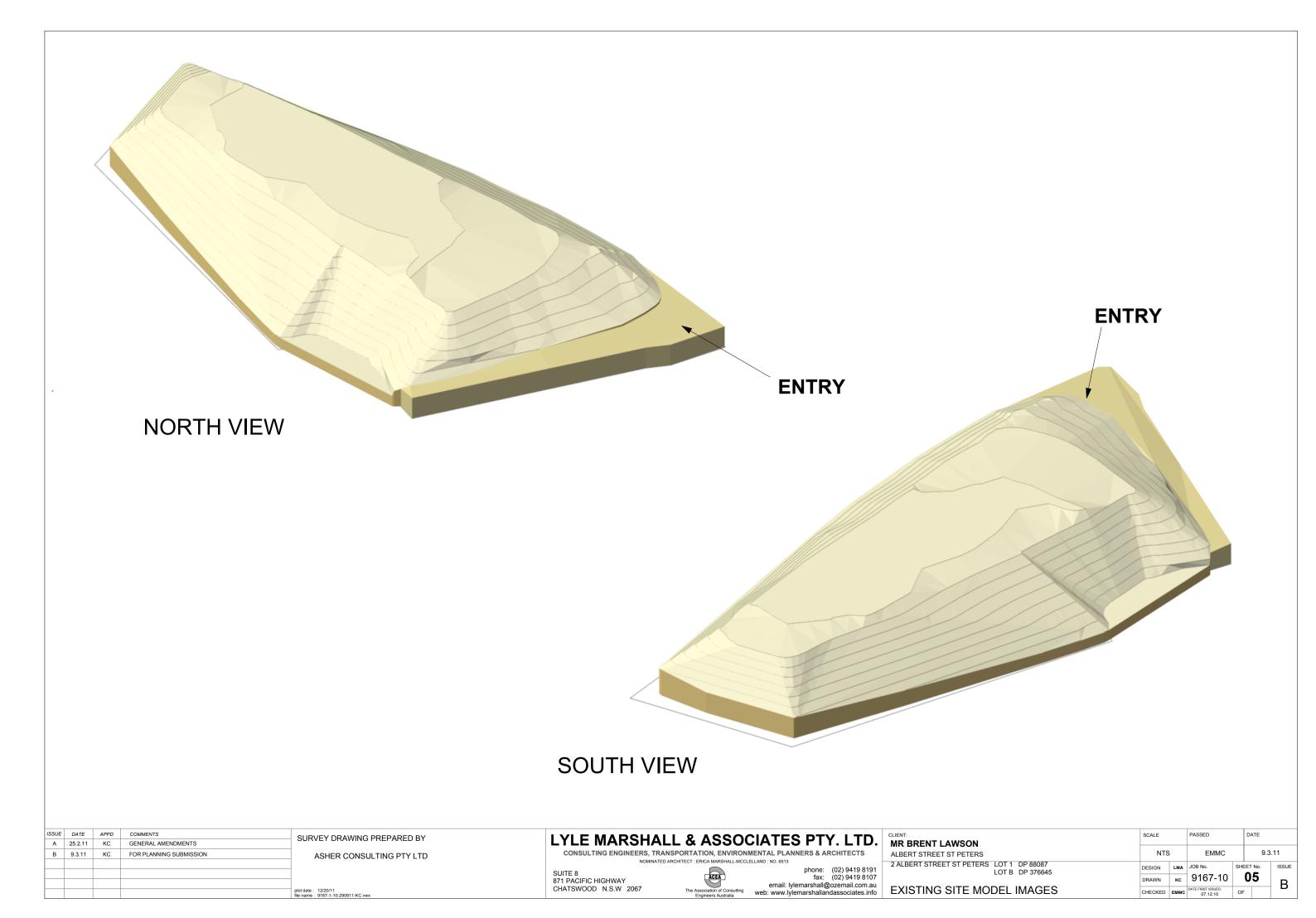
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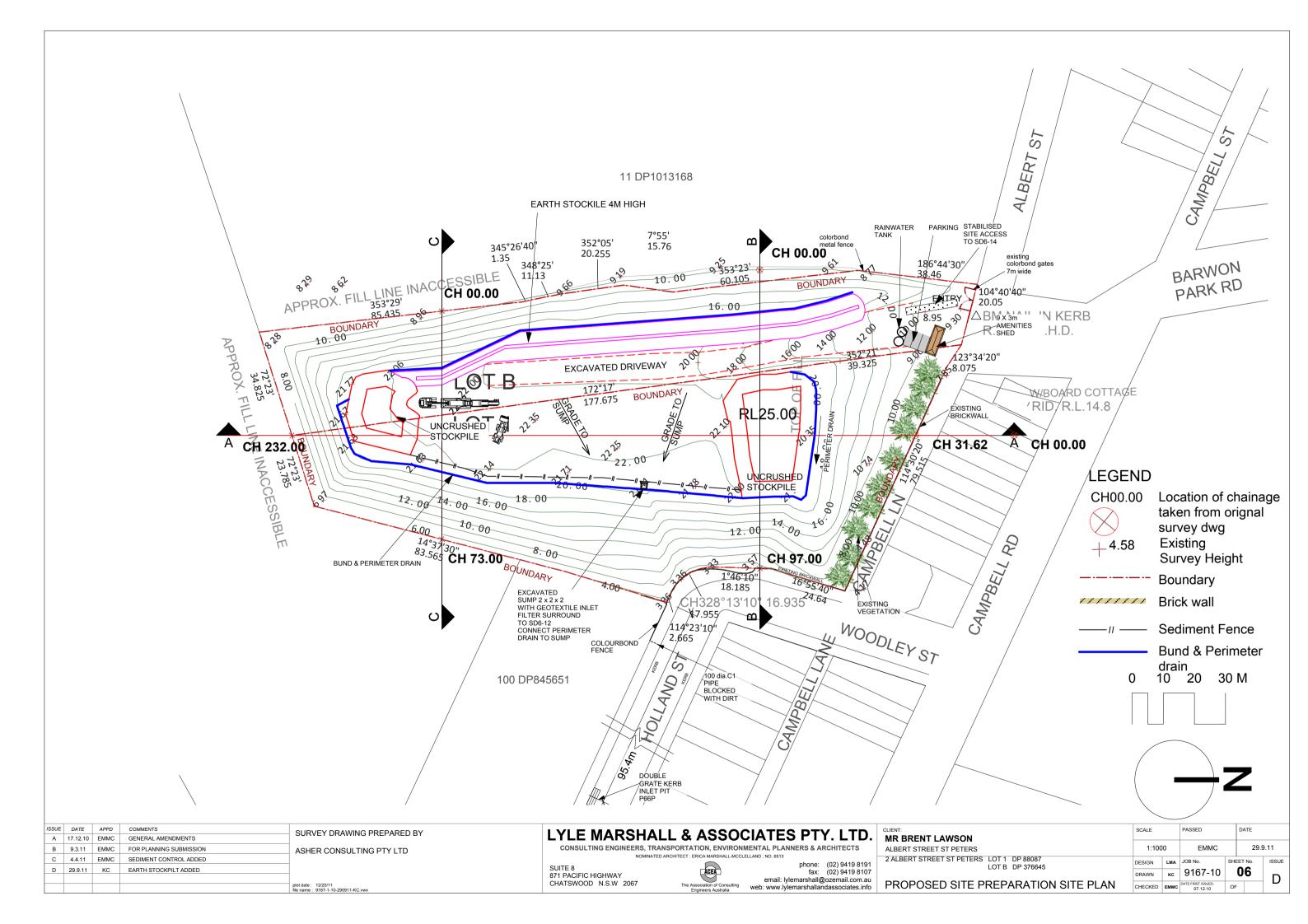
phone: (02) 9419 8191 fax: (02) 9419 8107 email: lylemarshall@ozemail.com.au web: www.lylemarshallandassociates.info

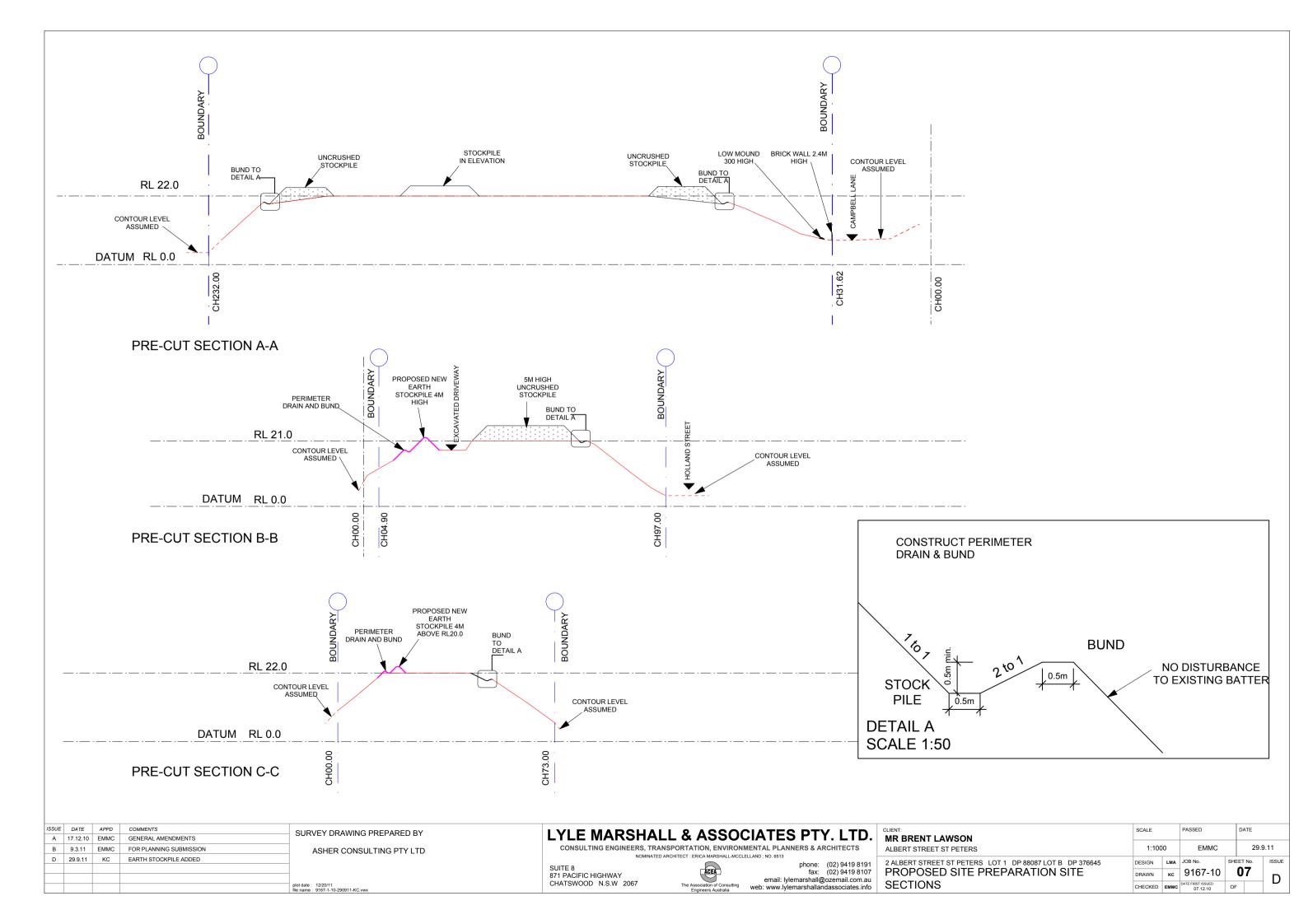
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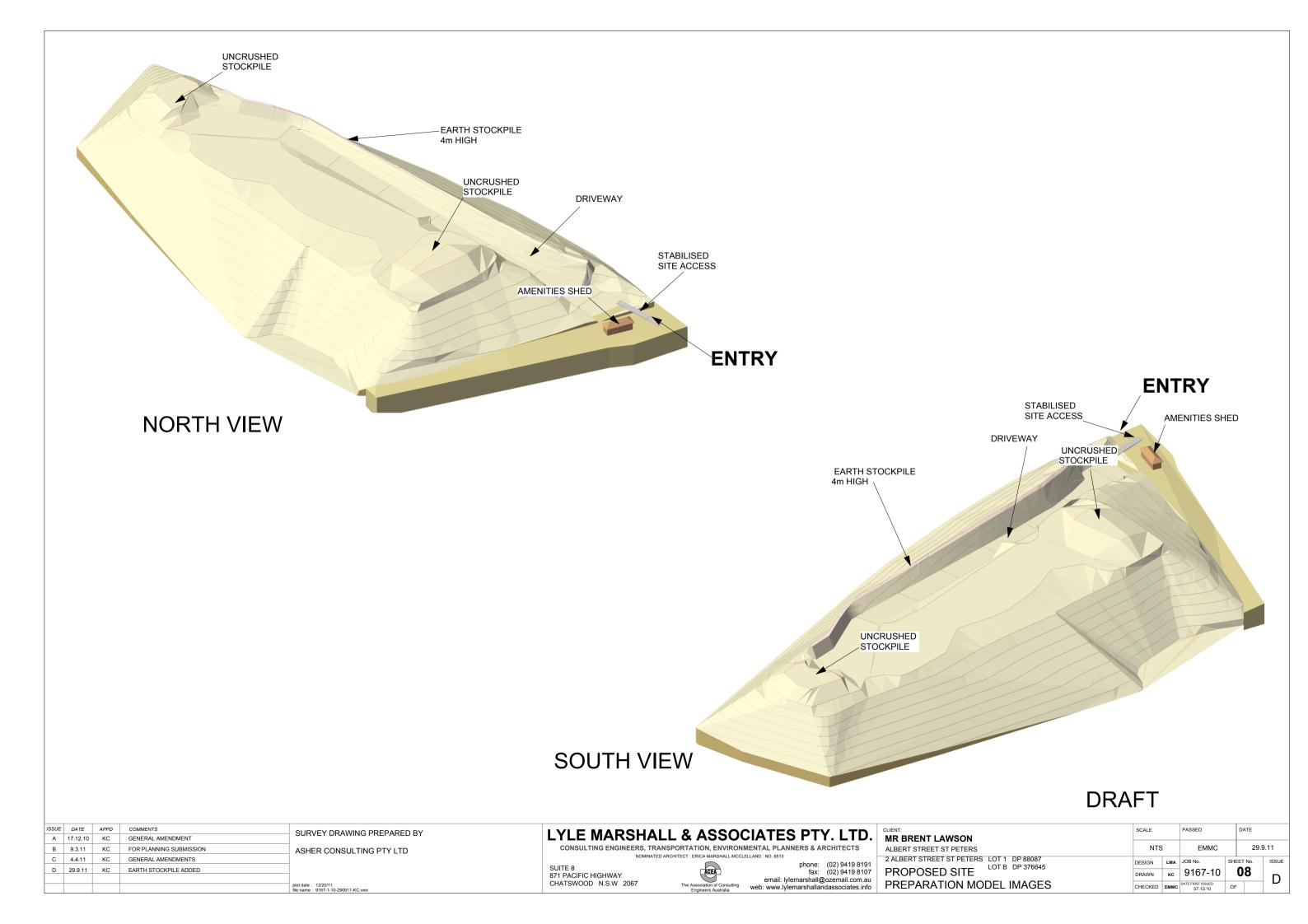


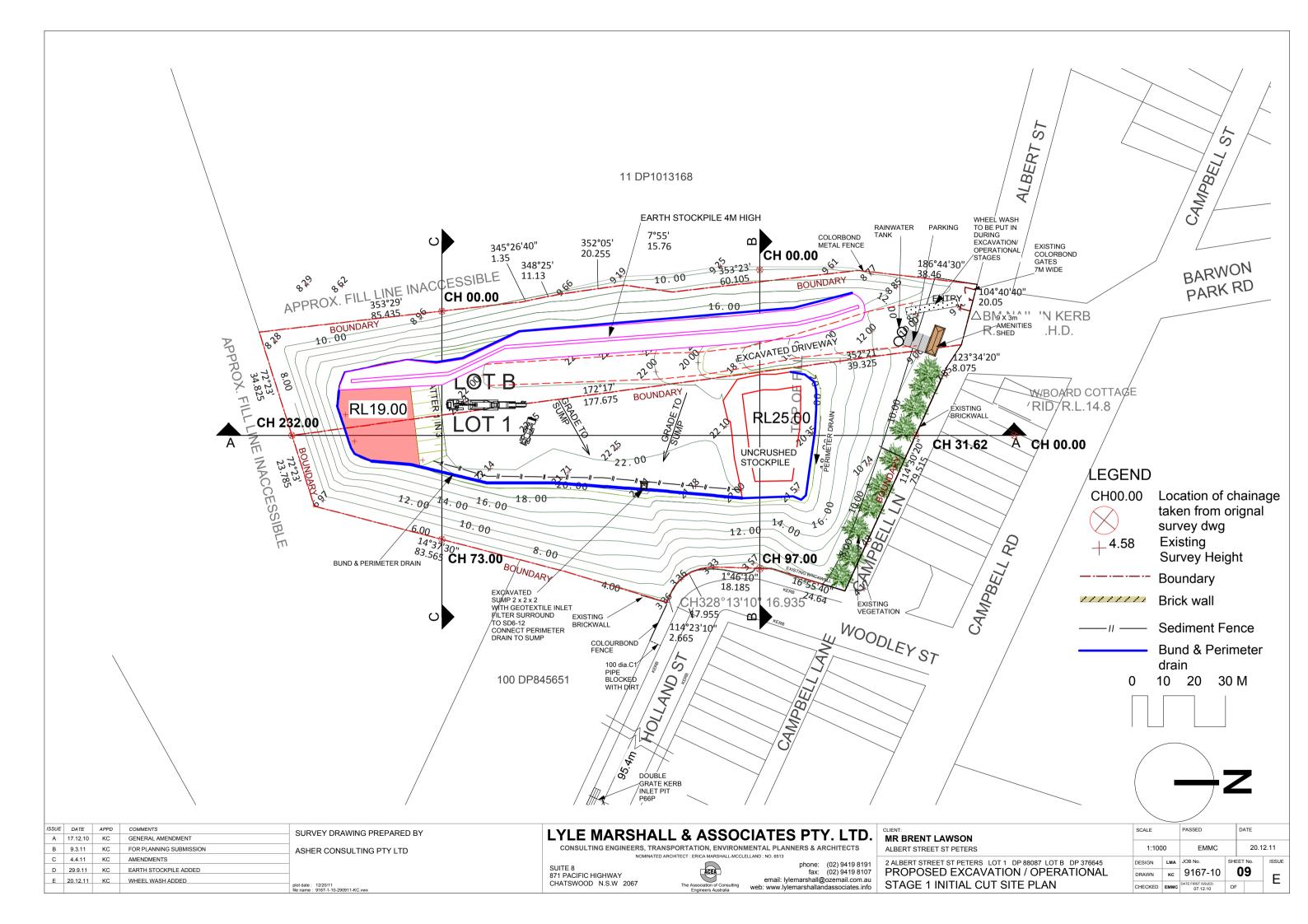


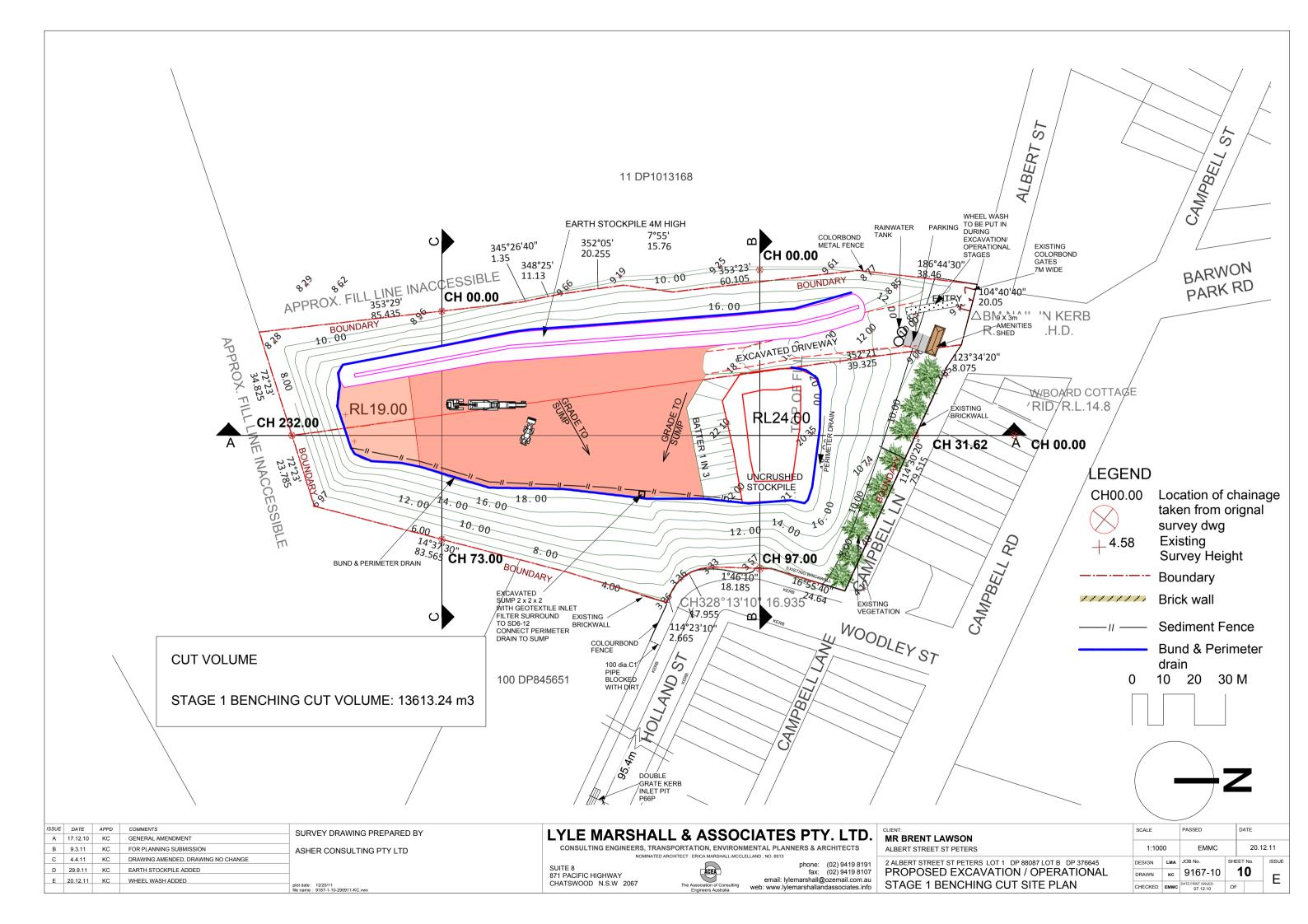


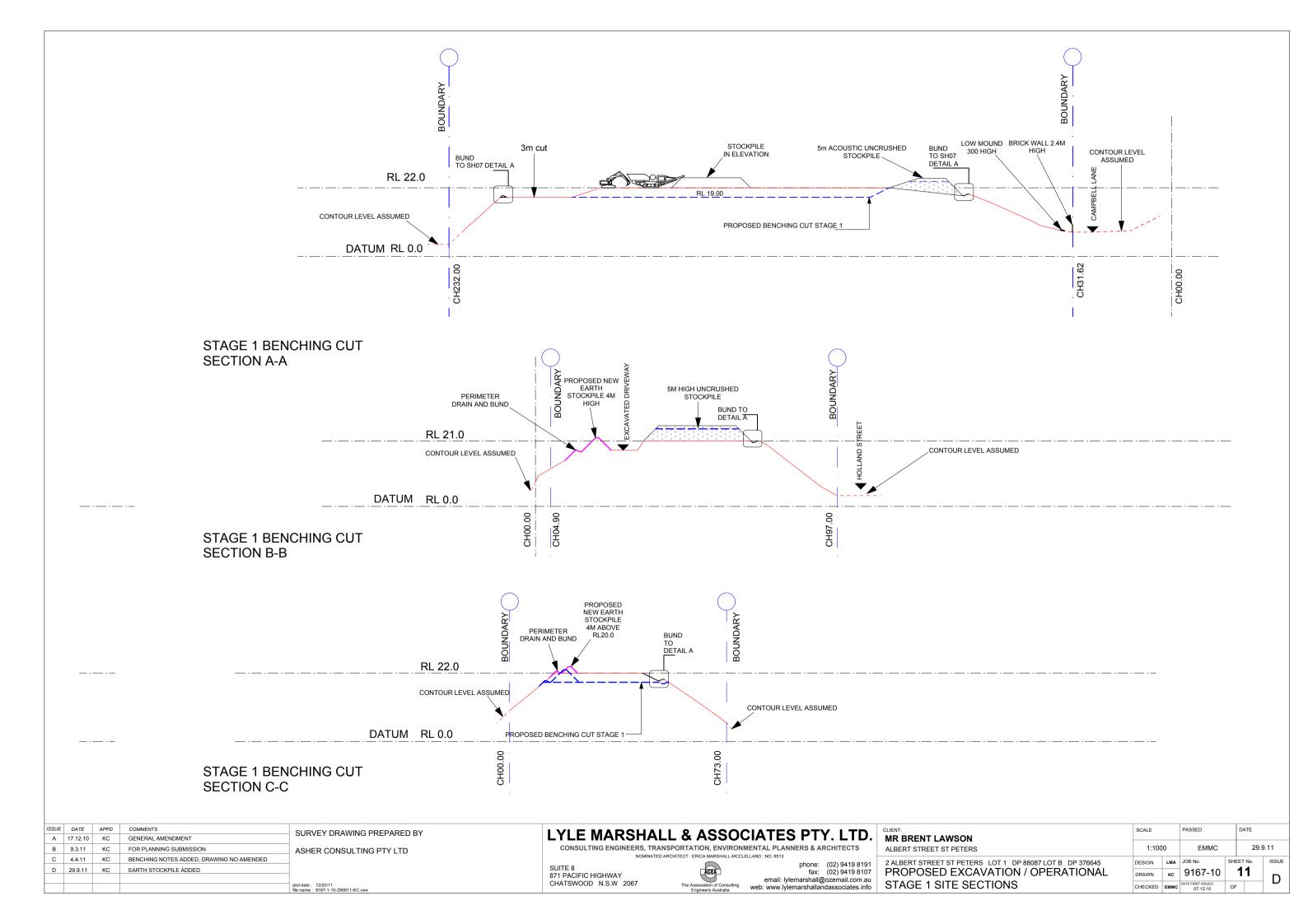


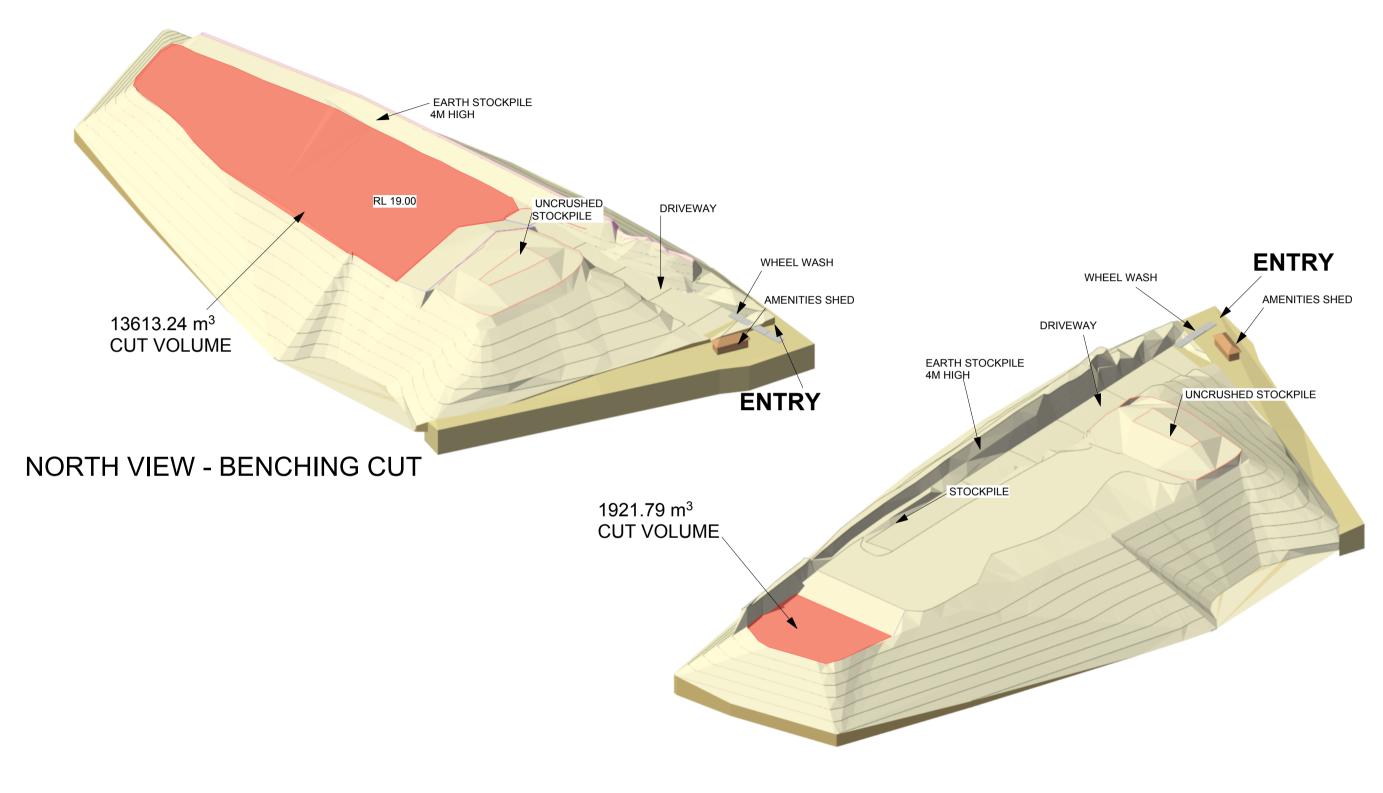












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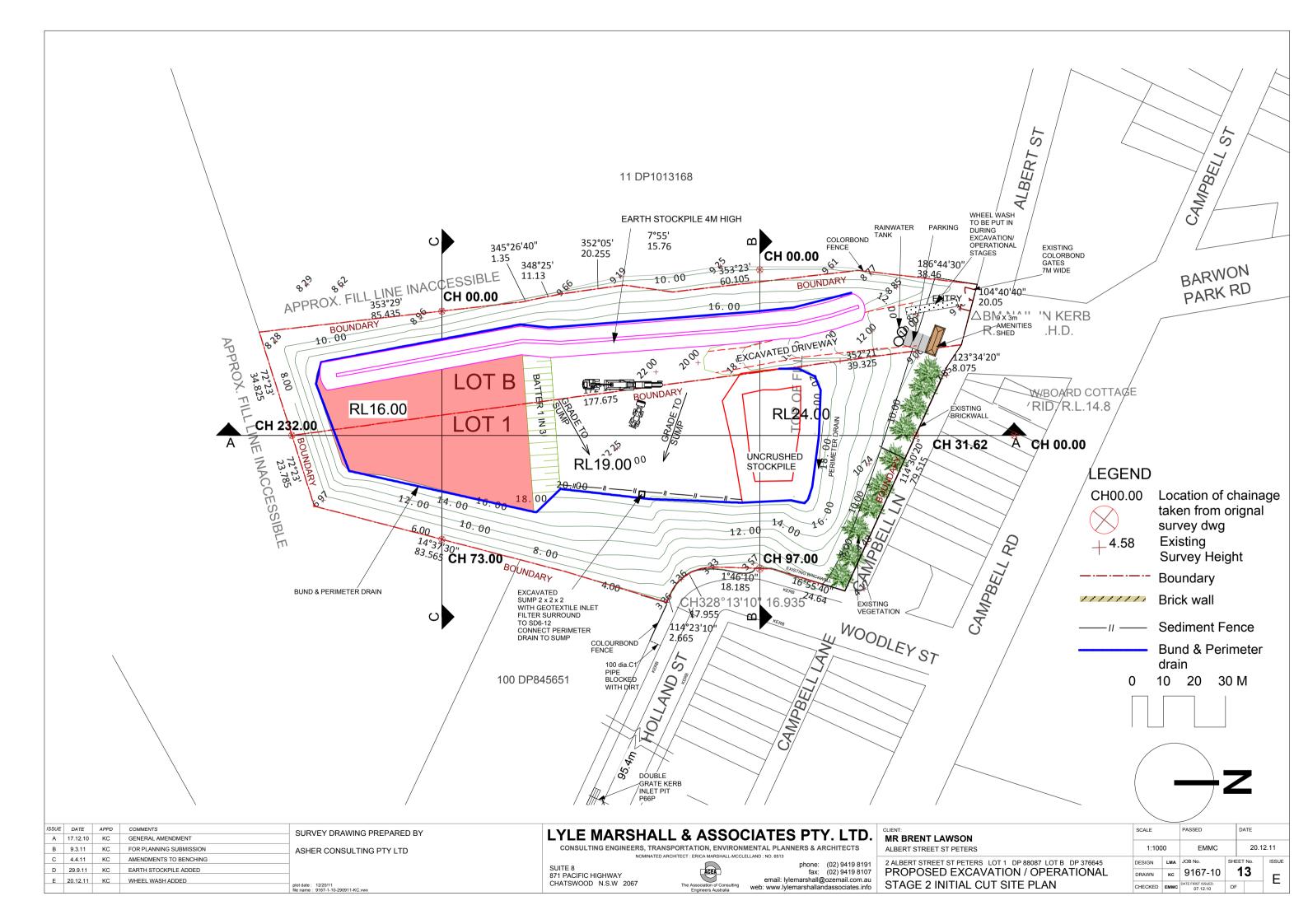
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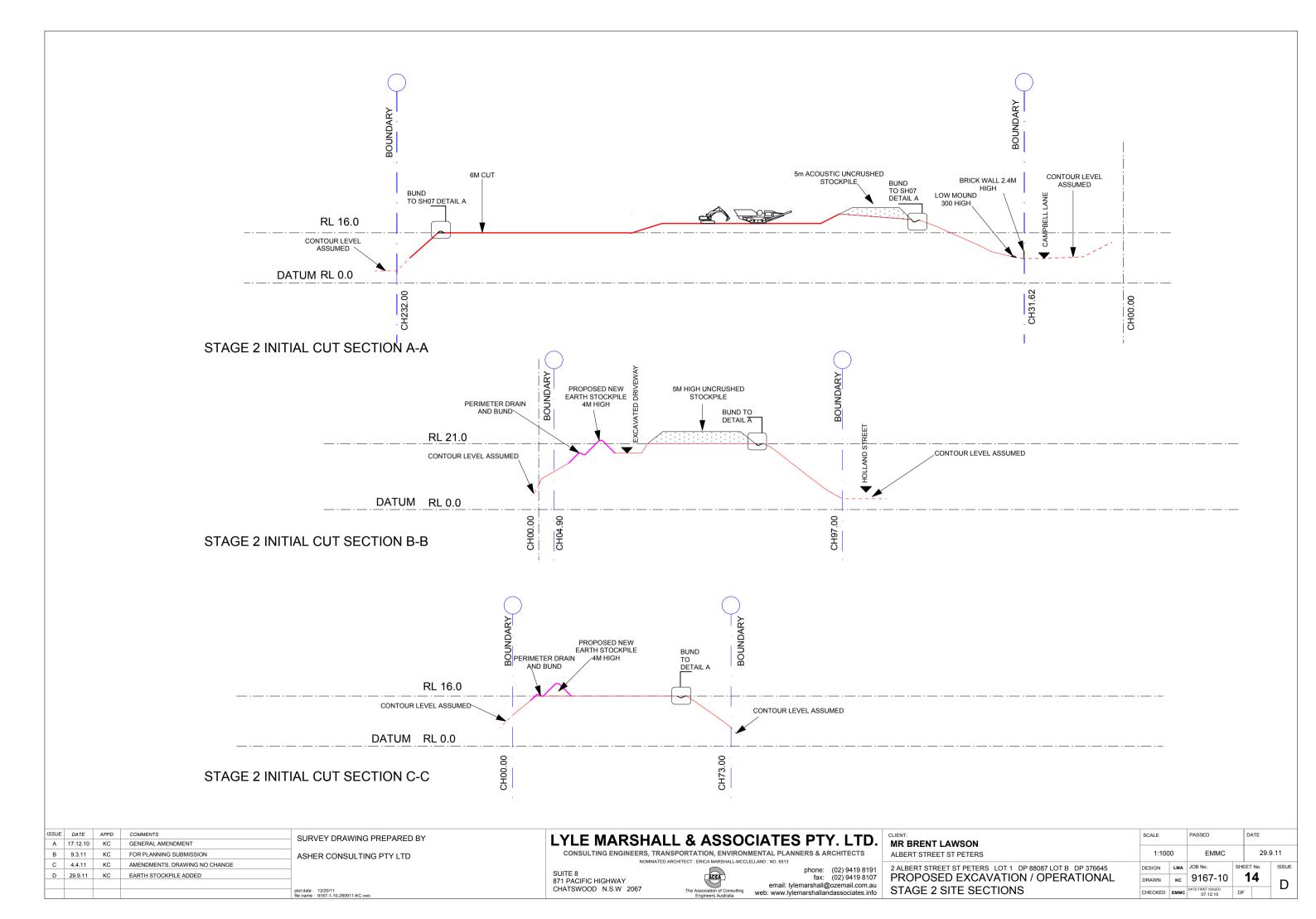
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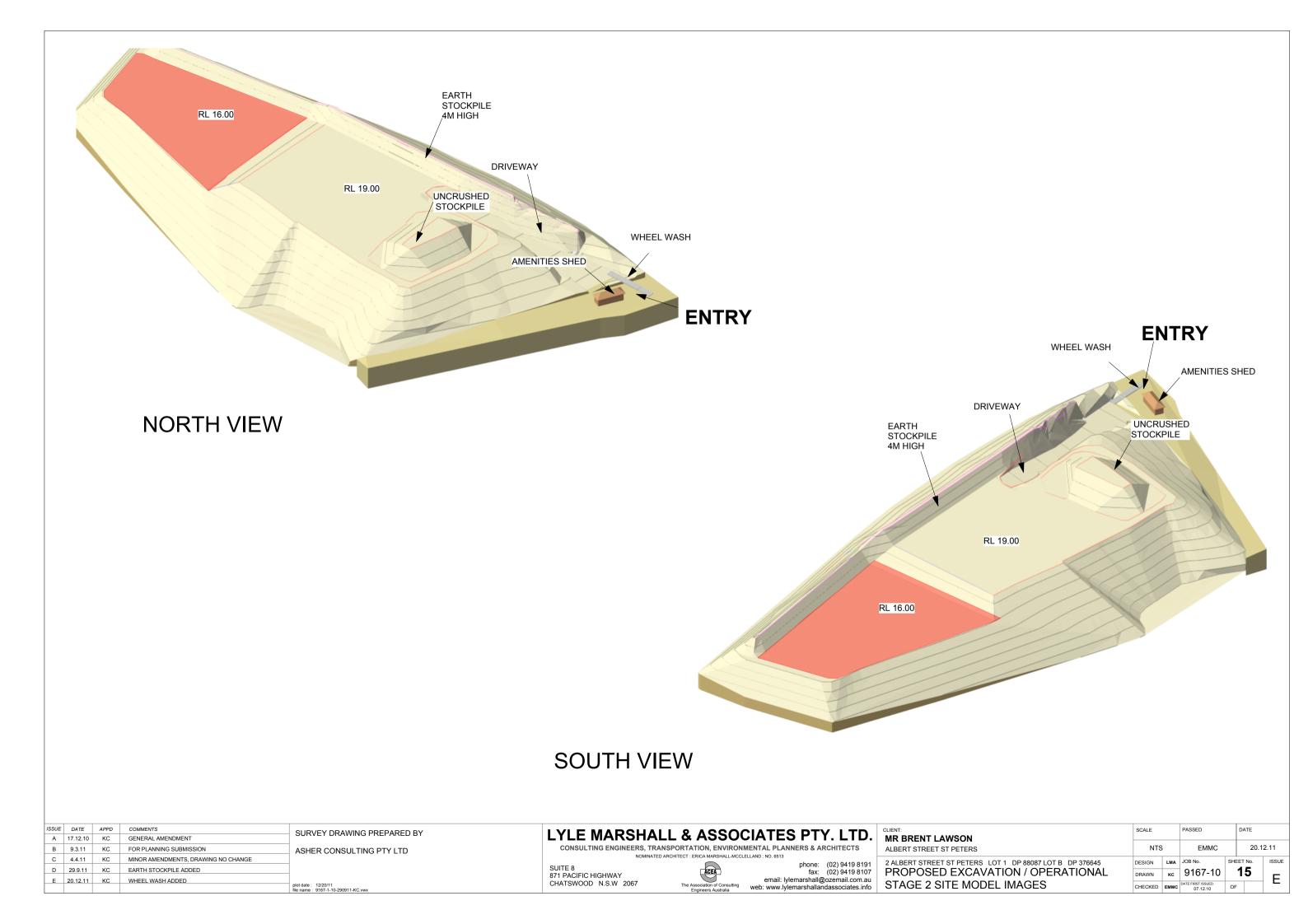
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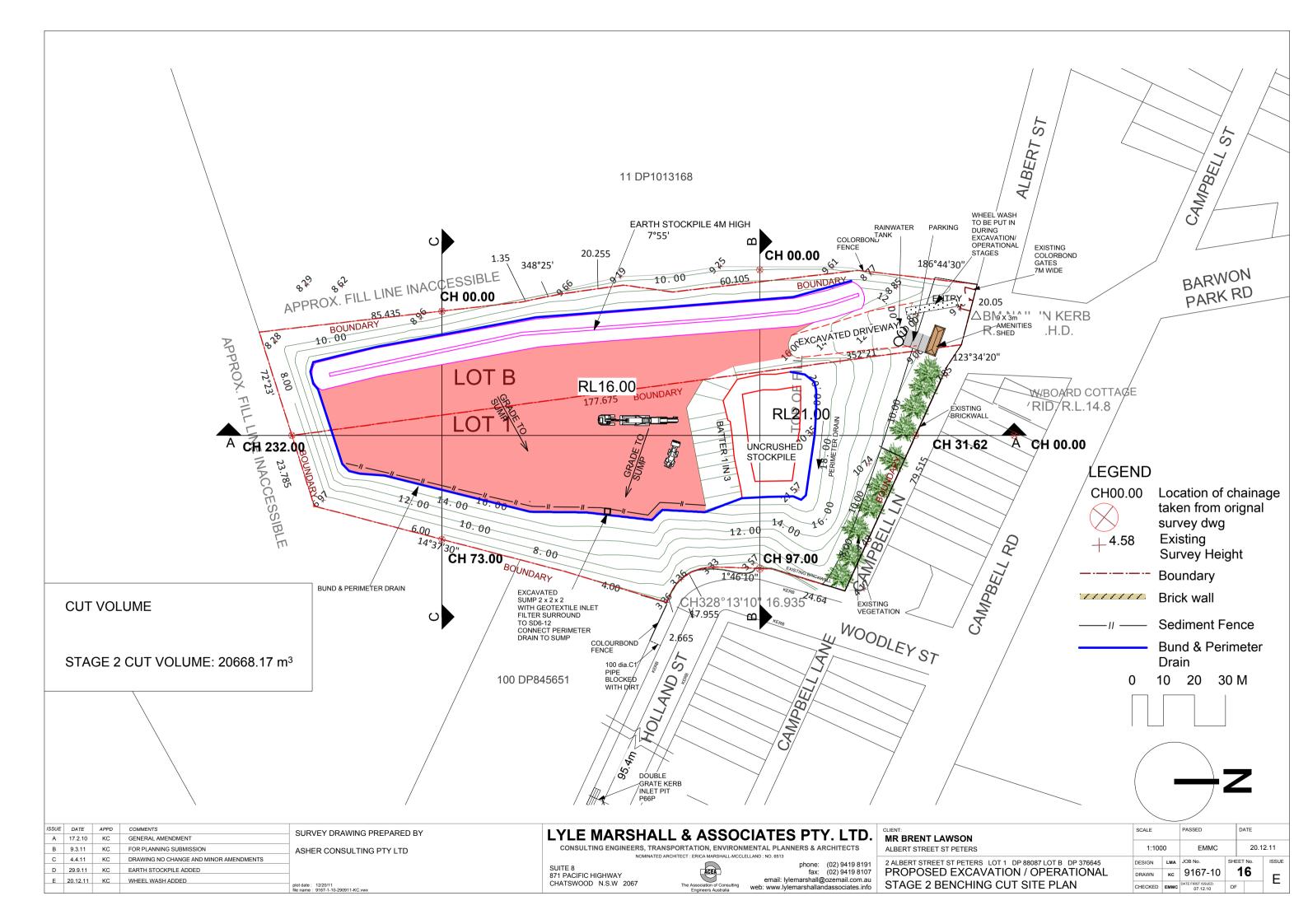
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		(02) 9419
ACEA	fax:	(02) 9419
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Association of Consulting	web: www.lylemarshallar	ndassociate

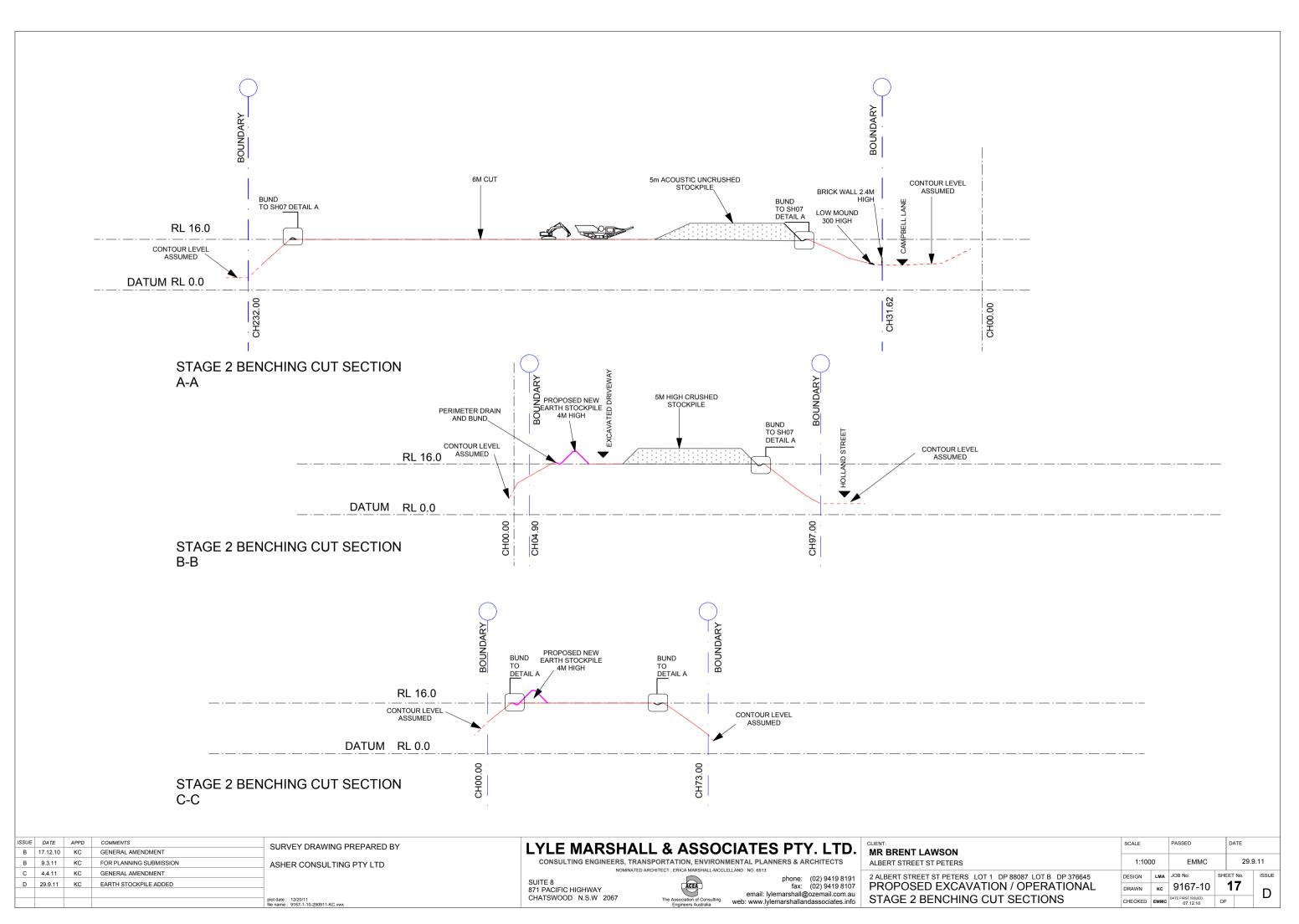
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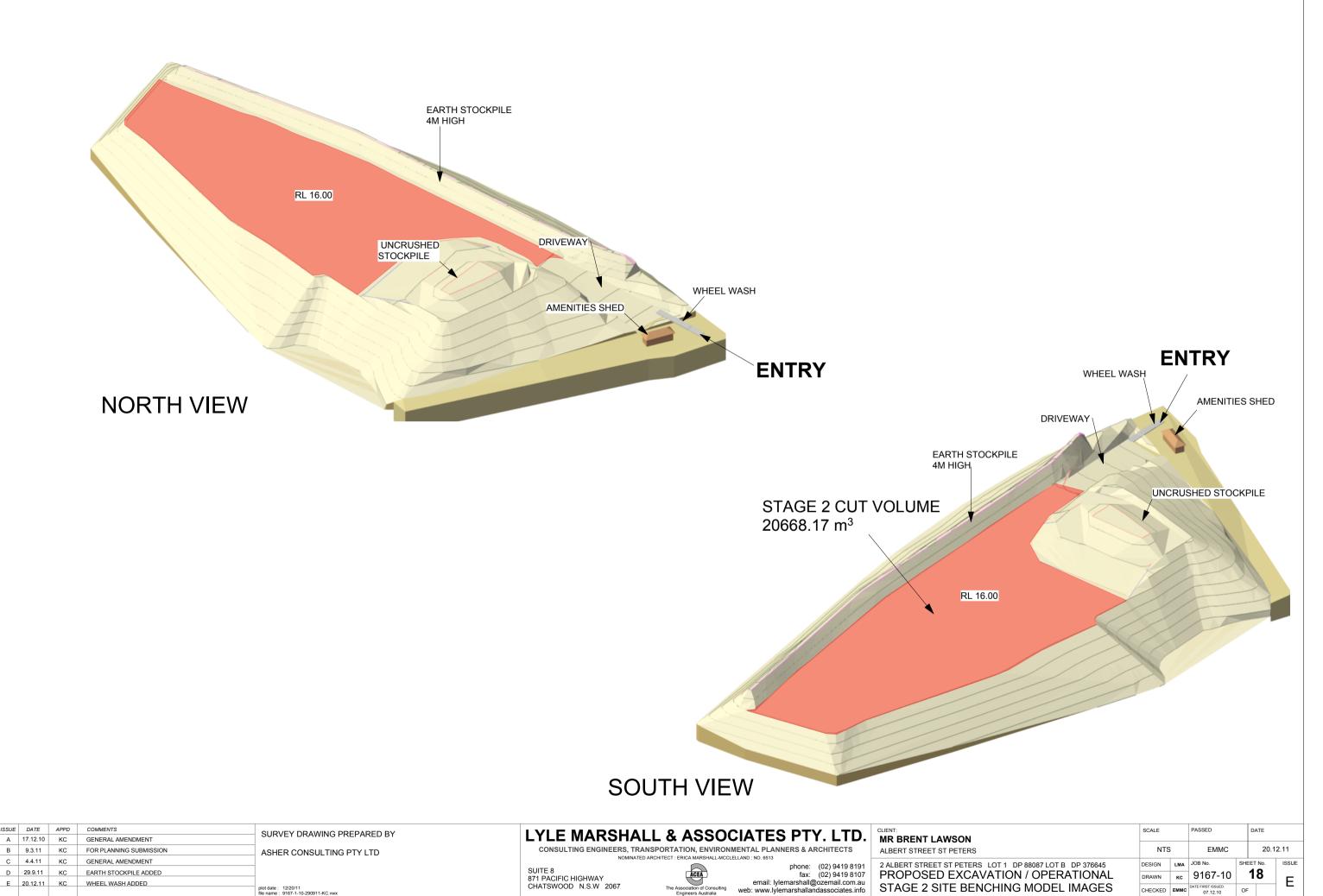










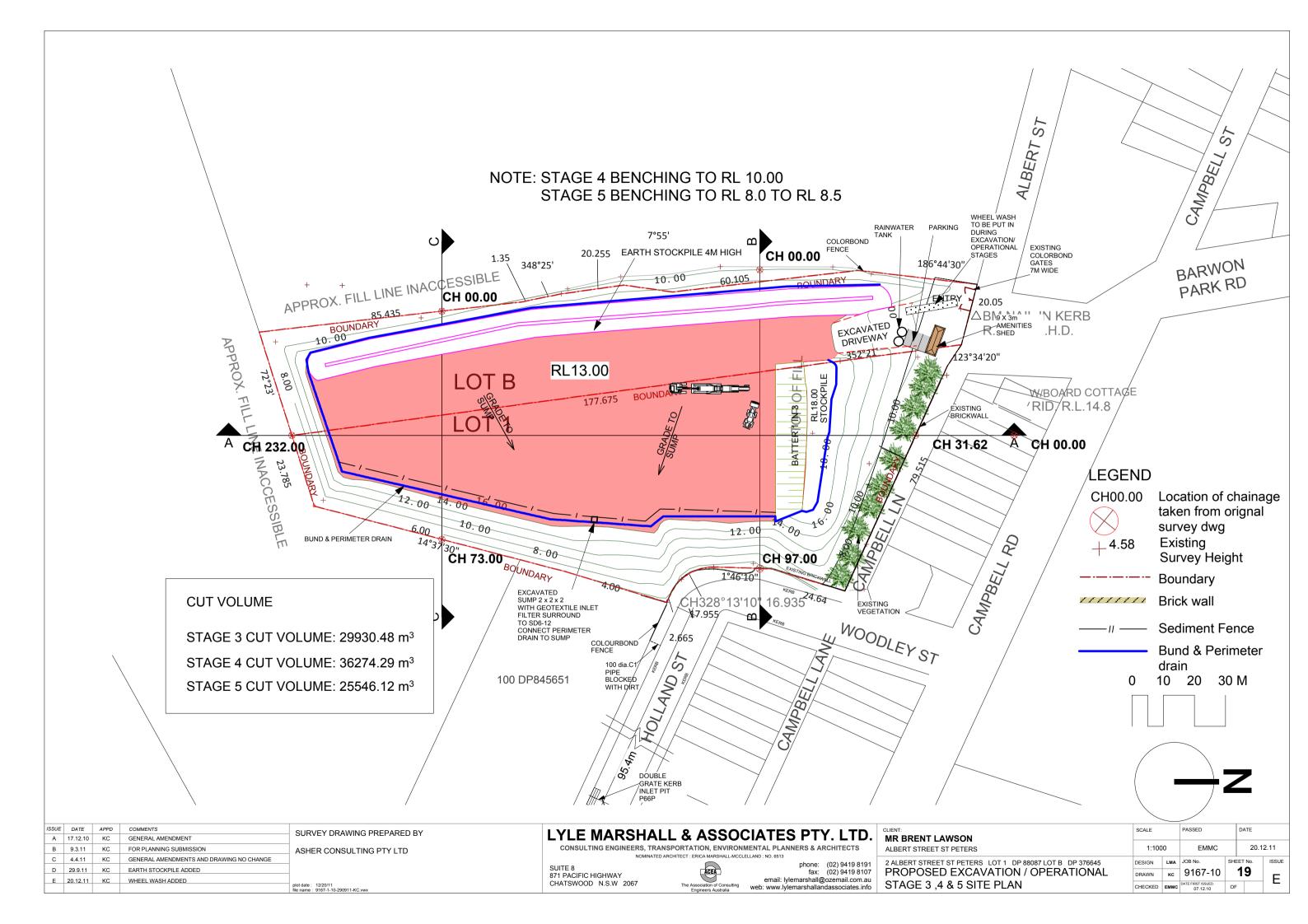


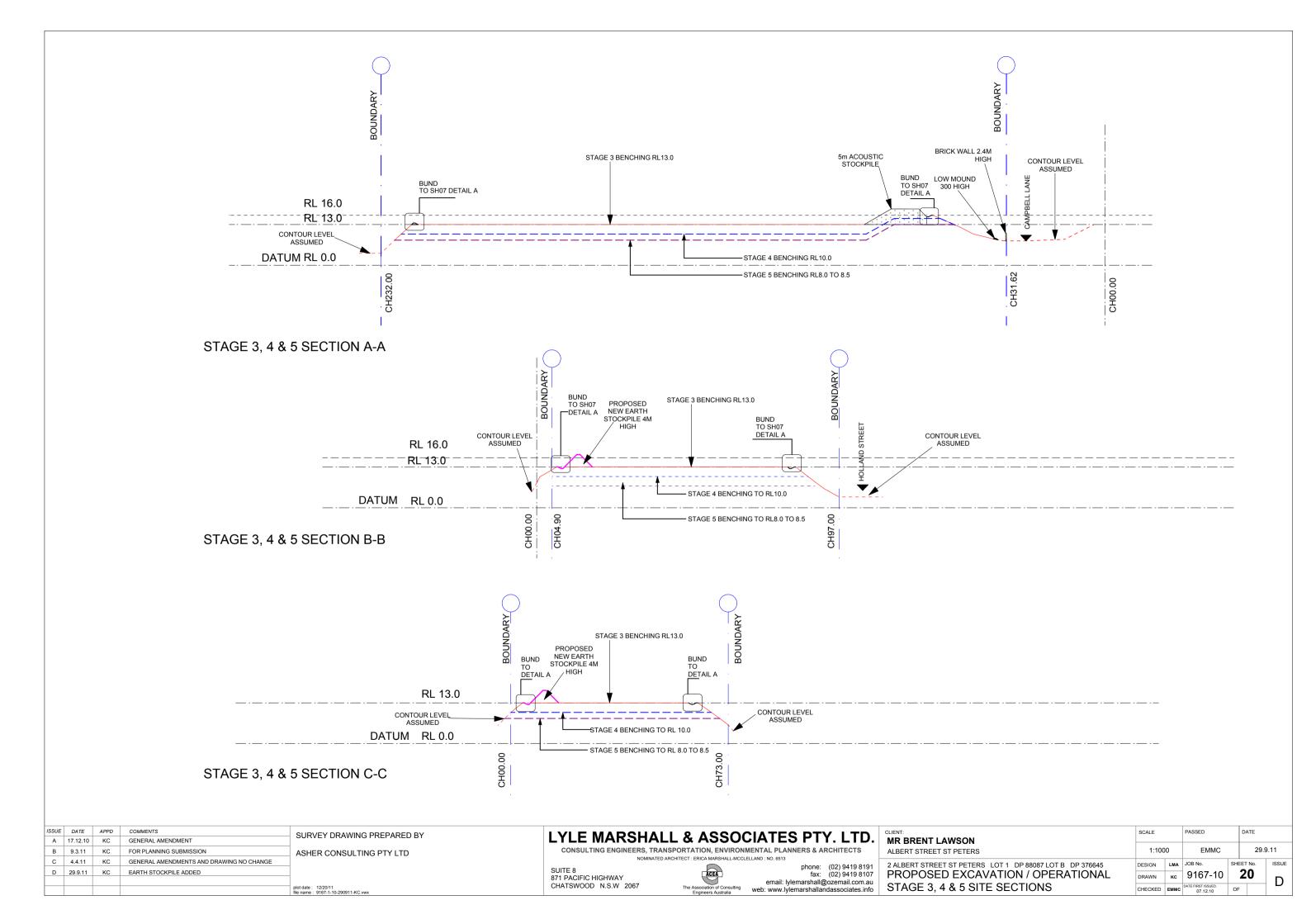
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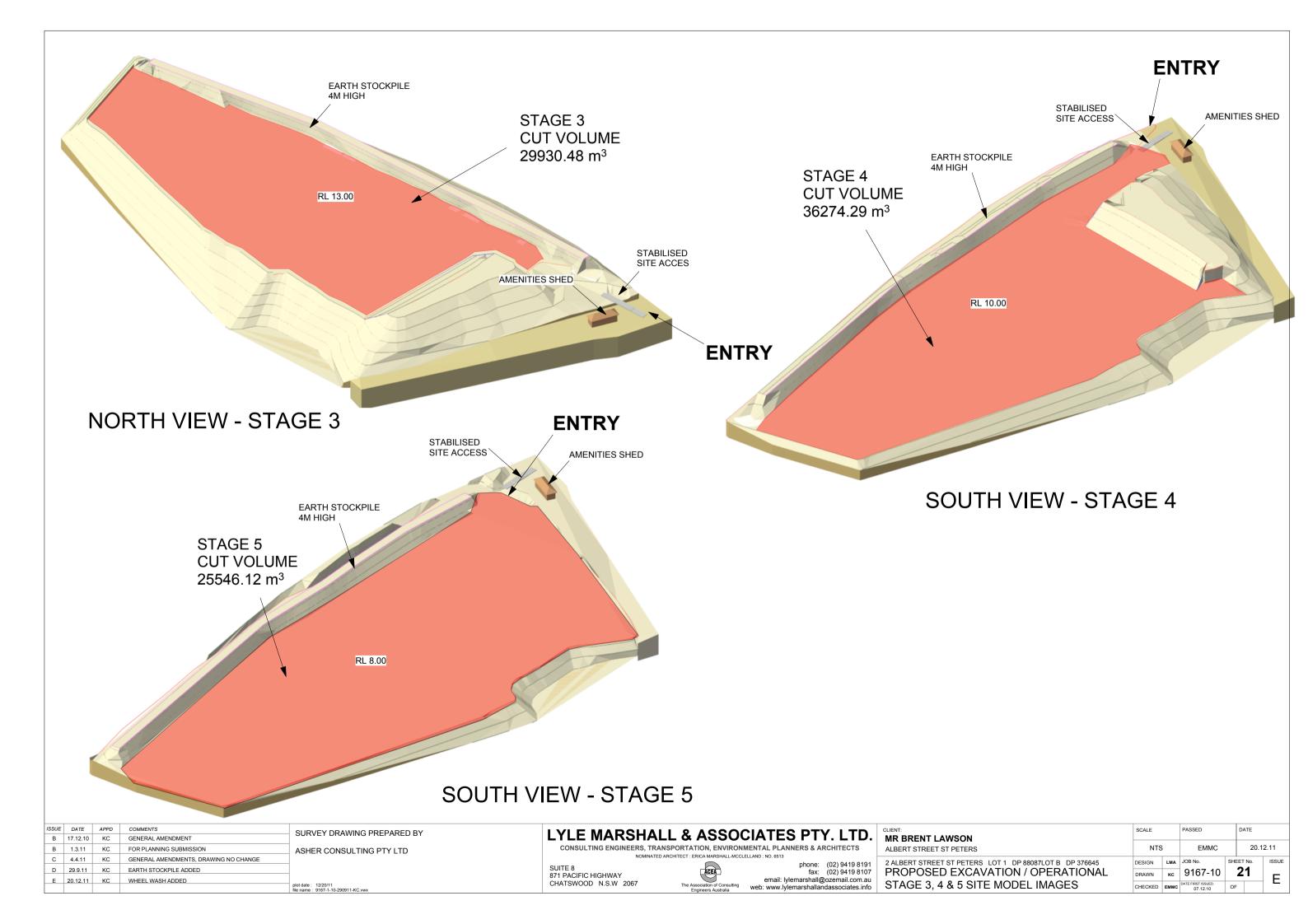
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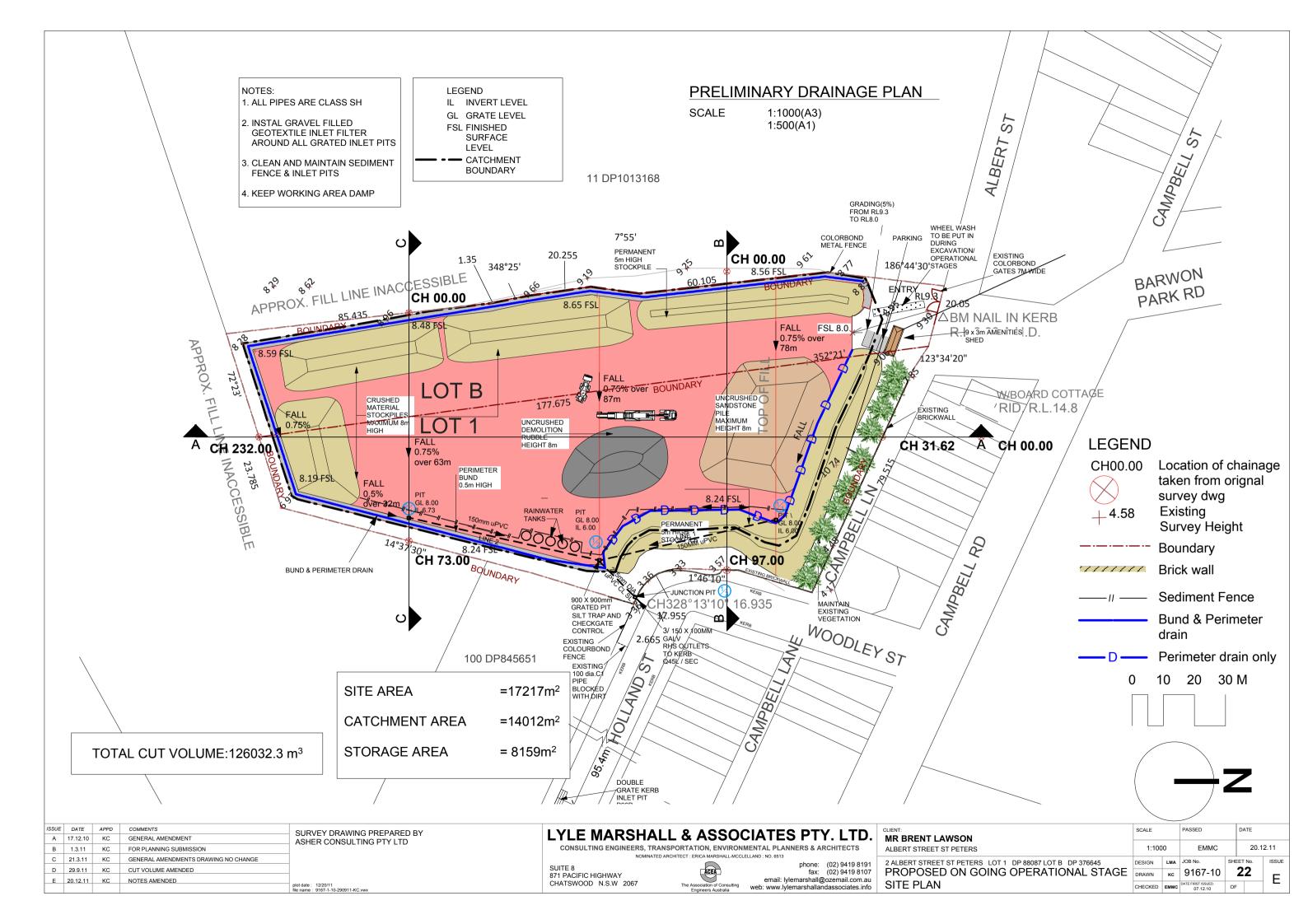
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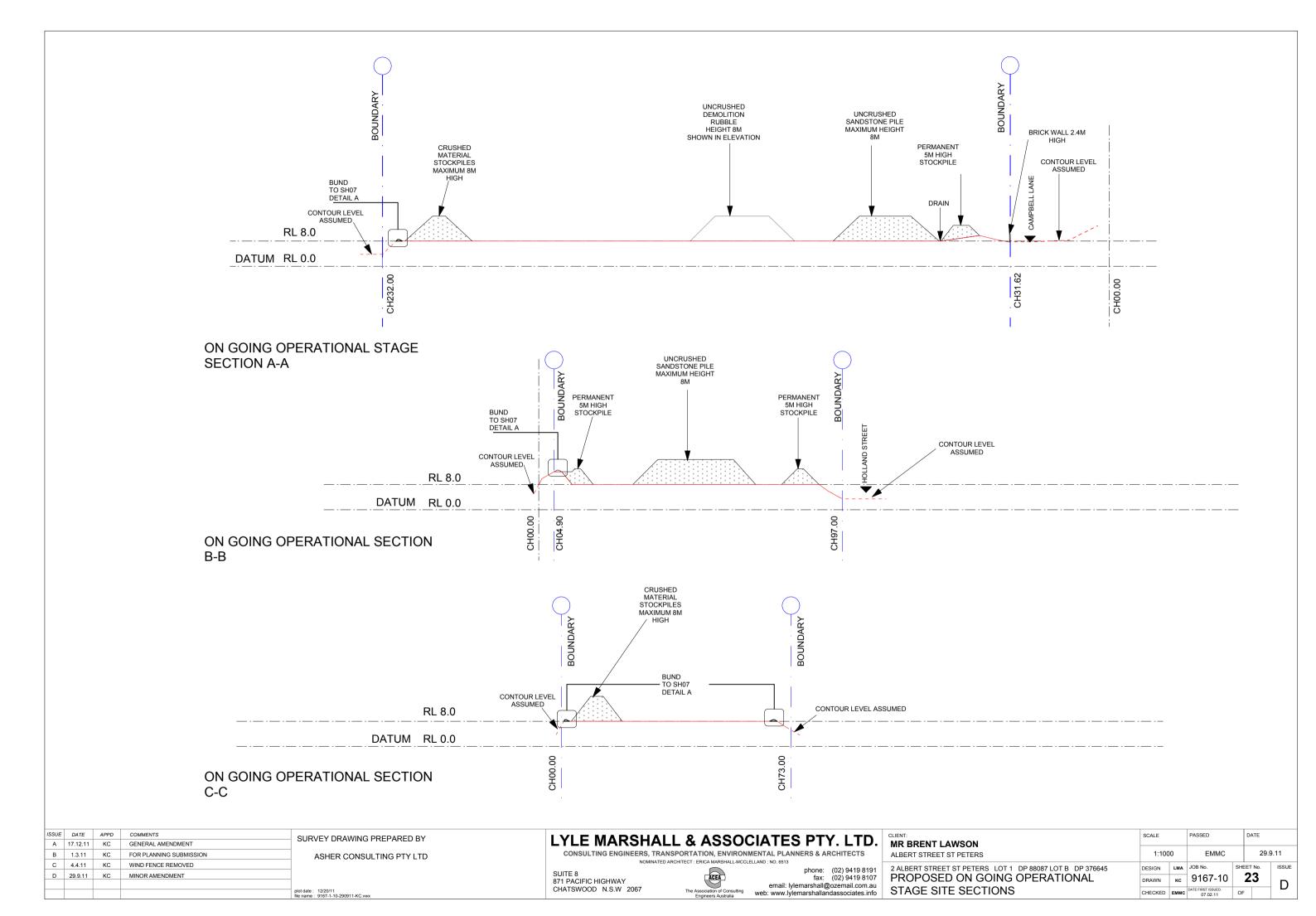
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# Appendix 10

# MATERIALS RECYCLING FACILITY 2 ALBERT STREET, ST PETERS

GREENHOUSE GAS EMISSIONS AND ENERGY EFFICIENCY
ASSESSMENT



# MATERIALS RECYCLING FACILITY 2 ALBERT STREET, ST PETERS

GREENHOUSE GAS EMISSIONS AND ENERGY EFFICIENCY
ASSESSMENT

REPORT NO. 09355-GE VERSION A

**NOVEMBER 2011** 

PREPARED FOR

CONCRETE RECYCLERS (GROUP) PTY LTD
PO BOX 238
RYDALMERE, NSW, 1701

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# 1 INTRODUCTION

Wilkinson Murray Pty Ltd has been commissioned by Concrete Recyclers to undertake a Greenhouse Gas and Energy Efficiency assessment in relation to the proposed development of a material recycling facility located at No.2 Albert Street, St Peters (hereafter referred to as the Project).

The purpose of this study is to identify and quantify sources of Greenhouse Gas (GHG) emissions during both site preparation and operation of the material recycling facility. All emissions have been calculated in accordance with the Department of Planning's Draft "Guidelines: Energy and Greenhouse in EIA (2002) and the Department of Climate Change and Energy Efficiency Account (July 2011).

The assessment of GHG emissions directly relates to the energy consumption and the associated impact on the environment. In addition a review of other Energy Efficiency issues have been identified which details measures that can be taken into account in the project. These include:

- Siting
- Construction Materials;
- Transportation

Therefore a review of the current proposal has been conducted to identify opportunities that can be adopted in the design.

# 2 SITE LOCATION

The site is located in St Peters in a pocket of land zoned "Arterial Road Reservation", within a greater industrial area. The nearest industrial facility to the west of the site is a recycling facility incorporating some landfill activity and truck movements to and from the adjoining site along Albert Street.

Figure 2-1 is a locality plan of the site and the adjacent area.

Figure 2-1 Site Location



#### 3 PROPOSED OPERATIONS

#### 3.1 Recycling Methodology

Operation on site will require an initial site establishment phase. This will enable a driveway and ramp to be cleared and the establishment of the crusher and screening plant on top of the existing stockpile, towards the southern end, furthest from the residences. The general site operations are briefly described below. These may vary to some degree subject to site conditions and constraints:

# Site Establishment

- Commence by clearing near the entrance of the site at first using an Excavator. A driveway / ramp would be cleared into the site to the initial location of the Crusher on top of the main stockpile set back a minimum of 20m from the northern edge. During these early works, material will be loaded into trucks using the same excavator used in the clearing activity and/or a front end loader. Some of this material will be used to form a noise mound at the top of the existing stockpile, at its northern edge to the east of the ramp to RL25.
- Once a ramp onto the stockpile is formed, the northern noise mound complete and the top of the main stockpile prepared level at approximately RL20, the Crusher will be installed, towards the southern end of the main stockpile.
- Material will be crushed and stockpiled along the western edge of the main stockpile to
  provide shielding from the crusher towards the residences to the north west. The
  overall site establishment phase before commencement of "normal" operation may take
  approximately 3 months, subject to the conditions and constraints encountered on site.

#### Normal Operations

- Normal Operations will also include a Screen unit located adjacent to the Crusher and a
  Front End Loader will be used to assist with stockpiling etc. Bricks and concrete will
  also be imported by truck to blend with the sandstone in order to improve the quality of
  the product and make it more marketable.
- Material from the crushed stockpile will then be loaded onto trucks by the Excavator
  and/or front end loader in the area close to the crusher and removed from site. This
  will require trucks to manoeuvre on top of the main stockpile, such that the size and
  height of the crushed stockpile may be limited. The excavator will also sit on a 2-3m
  mound adjacent to the crusher to assist with easy material handling.
- The site will then progressively work from south to north reducing the height of the main stockpile, whilst maintaining the northern noise mound at RL25 or at least 5m above the working area and the western stockpile 4m above the working area (and up to 5m once the RL of the working area reduces and more space and material is available). From time to time the crusher and screen would need to be temporarily relocated to reduce the height of the main stockpile. For short periods this equipment would operate without the full benefit of a crushed stockpile until enough material has been crushed to form a new one. This would occur for approximately a week each time the crusher was relocated.

• In the early morning shoulder period from 6.00am to 7.00am it is proposed to load trucks on site using the Front End Loader. At this time the crusher would not operate. This activity would occur on the top of the stockpile in an area where the northern and western noise mound and stockpile would provide shielding to the residences. It is critical to load product prior to the morning peak for delivery to sites in the metropolitan area.

Figure 3-1 shows the typical location of the Crusher and Screen and location of the noise mound and crushed stockpile between the main stockpile.

Access to the site will be from Campbell Road, then onto Albert Street. Peak hourly movements in the order of 8 trucks per hour are anticipated. This would only tend to occur when there is a demand for the product. There will be days when the movements related to the site will be lower.

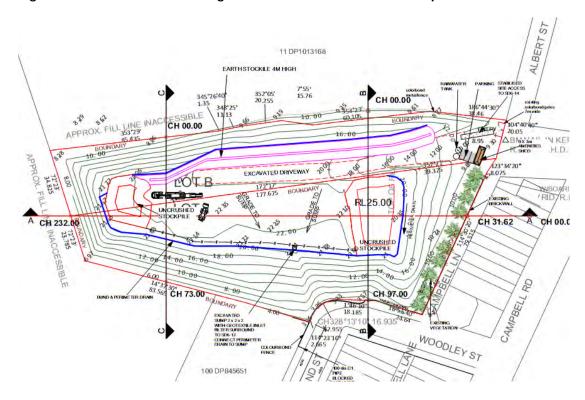


Figure 3-1 Site Plan Showing Noise Mound and Crushed Stockpile

### 3.2 Hours of Operation

The OEH recommended standard construction hours that are applicable during the construction phase are:

- Monday to Friday 7.00am to 6.00pm
- Saturday 8.00am to 1.00pm

Following the construction phase, the proposed operational hours are:

Truck movements: 6.00am to 6.00pm Monday to Friday and 7.00am to 4.00pm

Saturday.

- Full site operations: 7.00am to 6.00pm Monday to Friday and 7.00am to 4.00pm Saturday.
- Truck loading/unloading only: 6.00am to 7.00am Monday to Friday.

# 3.3 Site Equipment

A small amenities building is to be located at the northern entrance of the site. All operational plant to be located on the site will be mobile and will consist of:

- An Excavator,
- A Front End Loader,
- · Water Cart,
- Crusher and Screens.

# 4 GREENHOUSE GAS METHODOLOGY

The following greenhouse gases have been identified as significant contributors to global warming:

- carbon dioxide(CO2)
- methane(CH4)
- nitrous dioxide(N2O)
- synthetic gases
- Hydrofluorocarbons HFCs, SF6, CF4, C2F6

HFCs and synthetic gases are not relevant to the proposed development. The Department of Climate Change and Energy Efficiency Account (July 2011) has been used to provide a consistent set of emissions factors, which are suitable for reporting Greenhouse Gas Emissions.

Under the Department of Climate Change and Energy Efficiency protocol GHG emissions are categorized as Scope 1, Scope 2 and Scope 3 emissions, being.

#### Scope 1: Direct Greenhouse Gas Emissions

Direct greenhouse gas emissions are defined as those emissions that occur from sources that are owned or controlled by the reporting entity. Direct greenhouse gas emissions are those emissions that are principally the result of the following types of activities undertaken by an entity:

Generation of electricity, heat or steam. These emissions result from combustion of fuels in stationary sources;

Physical or chemical processing. Most of these emissions result from manufacture or processing of chemicals and materials, e.g., the manufacture of cement, aluminum, etc;

Transportation of materials, products, waste and employees. These emissions result from the combustion of fuels in entity owned/controlled mobile combustion sources, e.g., trucks, machinery, trains, ships, aeroplanes, buses and cars;

Fugitive emissions. These emissions result from intentional or unintentional releases, e.g., equipment leaks from joints, seals, packing, and gaskets; methane emissions from coal mines and venting; and methane leakages from gas transport.

#### Scope 2: Energy Product Use Indirect Greenhouse Gas Emissions

Scope 2 emissions are a category of indirect emissions that accounts for greenhouse gas emissions from the generation of purchased energy products (principally, electricity, steam/heat and reduction materials used for smelting) by the entity.

Scope 2 in relation to the Project covers purchased electricity defined as electricity that is purchased or otherwise brought into the organisations boundary of the entity.

### Scope 3: Other Indirect Greenhouse Gas Emissions

Scope 3 emissions are defined as those emissions that are a consequence of the activities of an entity, but which arise from sources not owned or controlled by that entity. Some examples of

scope 3 activities provided in the Greenhouse Gas Protocol are extraction and production of purchased materials, transportation of purchased fuels, and use of sold products and services.

The Greenhouse Gas Protocol provides that reporting scope 3 emissions is optional. If an organisation believes that scope 3 emissions are a significant component of the total emissions inventory, these can be reported along with scope 1 and scope 2. However, the Greenhouse Gas Protocol notes that reporting scope 3 emissions can result in double counting of emissions and can also make comparisons between organisations and/or products difficult because reporting is voluntary.

This GHG assessment considers the following GHG emissions and energy consumption activities associated with the project:

#### Scope 1 - Direct Emissions:

- On-site generation of GHG emissions from mobile plant and equipment;
- Transport of source materials to and from site.
- Employees of the recycling plant commuting to work.

#### Scope 2. - Indirect Emissions:

Electricity generated off-site of that is consumed on the site.

#### Scope 3 - Emissions generated by external operators:

The following Scope 3 emissions sources have not been considered in this assessment:

- Offsite Material handling activities;
- End use of product;

Greenhouse gases are formed and released during the combustion of fuels. The gas is liberated when fuels are burnt in diesel powered equipment and in the generation of the electrical energy that will be used by stationary plant and ancillary buildings.

Inventories of greenhouse gas emissions can be calculated using published emission factors. Different gases have different greenhouse warming effects and emission factors take into account the global warming potentials of the gases created during combustion.

The estimated emissions are referred to in terms of CO<sub>2</sub>-equivalent emission by applying a global warming potential of one for CO<sub>2</sub>.

#### 4.1 Emission Factors

The relevant emission factors applicable to the material recycling facility have been derived from the *National Greenhouse Accounts Factors July 2011*. Table 3-1 present the emission factors used in the estimates;

Table 3-1 Scope 1 - Emission Factors

Source	Energy content factor (GJ/kL unless otherwise indicated)	Emission factor $kg\ CO_2$ -e/GJ (relevant oxidation factors incorporated)		
		CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O
Diesel	38.6	69.2	0.2	0.5
Gasoline	34.2	66.7	0.6	2.3

Emission Factors for Scope 2 source is;

Electricity 0.89 kg CO2-e/kWh

# 5 ESTIMATION OF GREENHOUSE GAS EMISSIONS

The following section details the estimated emissions associated with the establishment and operation of the material recycling facility.

#### 5.1 Site Establishment

For the purposes of an initial assessment an estimate of emissions has been based on a three month site establishment period. Accordingly the assessment of site establishment associated with the material recycling facility is limited to site to the following activities:

- Vehicles, machinery and plant used on site; (Average of one diesel item of machinery operating 8 hrs a day)
- Electricity consumption associated with the site establishment office and other amenities; (based on small fridge, 1 x computers, printer, hot water, fluorescent lighting and air conditioning).
- Nominal site usage for power tools.
- Initial start up electricity requirements for the amenities building during commissioning (One Week) (Based on pro rata operational consumption).
- Construction staff travel to site (Average workforce of 3).

Equivalent CO<sub>2</sub>-e emissions have been estimated and are presented in Table 5-1

Table 5-1: Summary of estimated Site Establishment CO<sub>2</sub> emissions

	Tonnes of CO <sub>2</sub> -e				
Source	Stage 1	Stage 2	Stage 3	Annual (t/y)	
Electricity		5.3	-	5.3	
Diesel	130.0		-	130.0	
Petrol	2.3		-	2.3	
Total	132.3	5.3	-	137.6	

#### 5.2 Operation

Carbon Dioxide emissions from the project during operation would result from the following sources and yearly consumption:

• The operation of on site mobile plant 68,565 Litres of Diesel

• Transport of final product 122,850 Litres of Diesel.

• The electricity usage at the site. 6,000 kWh.

• Transport associated with Staff 4068 Litres of Petrol

Based in a production rate of 150,000 tonnes per year, equivalent  $CO_2$ -e emissions have been estimated. These are presented in Table 5-2.

Table 5-2: Summary of estimated yearly CO<sub>2</sub> emissions

	Tonnes of CO <sub>2</sub> -e				
Source	Stage 1	Stage 2	Stage 3	Annual (t/y)	
Electricity		5.3	-	5.3	
Diesel	4207.1		-	4207.1	
Petrol	17.2		-	17.2	
Total	4224.3	5.3	-	4229.6	

The majority of emissions are associated with crushing and onsite operations of mobile plant.

Therefore each tonne of product has been estimated to produce 25.2 kg  $CO_2$ -e/ tonne of product.

#### 5.3 Overall Emissions

Proposed production rates for the project are envisaged to start at a rate of 70,000 tonnes per annum in the first year and increase to a capacity of 150,000 tonnes per annum in year 3. For the purposes of estimating total emissions during the life of the project a 20 year period has been used for assessment purposes. Table 5-3 details the emissions from year 1 to 3.

Table 5-3 Years 1-3 Emissions

Year	Production- Rate - tpa	CO <sub>2</sub> e Tonnes Per Annum
Yr 1	70,000	1973.8
Yr 2	100,000	2819.7
Yrs 3 onwards	150000	4229.6

Australia's total greenhouse gas emissions in 2009 amounted to 564.5 million tonnes of carbon dioxide equivalent (Mt  $CO_2$ -e) whilst New South Wales accounted for 160.6 Mt of this total. Therefore the materials recycling facility when at full production accounts for less than 0.00003% of current NSW emissions.

Further, based on a nominal 20 year life span of the project, it is estimated that the total emissions associated with the project will be in the order of 76,903 tonnes. This is based on site establishment, operation and decommissioning stages of the project. In the case of decommissioning an assumption of 50% of site establishment emissions has been assumed.

# **6 GREENHOUSE GAS EMISSIONS CONCLUSION**

A review of greenhouse gas and energy considerations and management measures for the proposed new material recycling facility located at No.2 Albert Street, St Peters has been conducted.

The study has identified sources of greenhouse gas (GHG) emissions during both site establishment and operation of the material recycling facility. Contribution emissions are highly dependant on the construction methodology and program and as such are a rough estimate of possible emissions has been provided. In the case of operational an emission rate of 25.2 kg  $CO_2$ -e/ tonne of product have been established.

# 7 ENERGY IMPLICATIONS OF THE CURRENT DESIGN

The major components of the recycling facility consist of mobile plant which is powered by diesel fuel. Therefore there is minimal additional load on the Sydney Electrical Grid.

Measures that can be considered in the project with respect to energy efficiency of the project are detailed in the following sections.

#### 7.1 Siting and Overall Concept

While the development is modest in terms of its overall energy impact on the Sydney Region as a whole, the siting of the proposed facility offers the distinct advantage that it will be situated in an existing industrial area close to road routes and will have immediate access to existing civil and services infrastructure all at very little additional cost to the region.

# 7.2 Facilitation of Pedestrian and Non-Motorised Transport

The site parking allocation has been designed to provide 3 car parking spaces adjacent to the amenities building. Consideration should be given to providing bike racks adjacent to the site office so as to encourage alternative modes of transport.

#### 7.3 Solar Access

The form dictated by the site can be used to advantage by the designers to maximise the solar access of office and staff amenities building by:

- Maximising solar exposure of buildings.
- Incorporating horizontal shading to shield against high altitude summer sun.
- Minimising exposure to the west which is subject to cold winds in winter and sun in summer.

#### 7.4 Natural Ventilation

Natural ventilation is the most efficient mechanism in summer for replacing hot air inside a building with cooler outside air. The office and amenities design should accommodate good cross-flow ventilation potential.

#### 7.5 Thermal Mass and Insulation

Thermal mass is typically used to even out daily temperature variations. However the nature of the development will mean a lightweight construction. Therefore the use of thermal insulation and improved roofing (such as tropical roofs) should be considered.

Such measures will increase the thermal comfort of occupants and reduce heating and cooling loads on ancillary equipment.

# 7.6 Measures to ensure minimal energy use for lighting and ventilation

Solar access availability to the buildings should be considered primarily because of the influence of solar access on lighting and heating. Work areas should be located away from the western side of the development where utility areas such as toilets and showers should be located.

In addition utility areas should be naturally ventilated. The following will also be incorporated:

- Light switches will be located at room exits to encourage switching lights off when leaving a room. Separate switches will be installed for special purpose lighting.
- Motion detectors will be used for externally lit non critical areas.
- The option to use compact fluorescent bulbs is proposed. They use about one fifth of the energy of standard incandescent bulbs and last many times longer.

# 7.7 Use of energy efficient equipment, appliances and processes

#### **Hot Water**

Hot water is likely to be required for tea making and showering facilities. Electric storage hot water systems are the least efficient hot water systems. However as no natural gas is available on the site options are limited. The following options are proposed:

Instantaneous hot water in the kitchen area.

#### Kitchen Appliances

Provision will be made for a microwave oven in the kitchen. These offer enormous energy savings in terms of time needed for cooking and associated energy costs and will reduce the overall operation costs of the development once constructed.

Minimum 4 star energy performance rating will be applied for all appliances installed.

Any dishwashers will be energy efficient model providing savings in terms of both electricity and water consumption. Models being considered are manufactured by Bosch, Asko, Dishlex and Miele, all at the top of the Energy labelling list provided by the Australian Greenhouse Office (AGO) (www.energyrating.com.au).

# 7.8 Maximisation of use of Renewable and Low-Impact Energy Sources

#### **Photovoltaics**

Given the size of the development, a small array of solar collectors can provide adequate power to the amenities building.

#### Greenpower

Greenpower electricity supply will be considered as an ESD initiative. Greenpower works by the consumer paying a premium for their commercial electricity. The retailer then agrees to buy this same amount of electricity from an accredited "green" generator (eg biomass, wind, solar, hydro, etc). One of the major advantages of this scheme over installing on-site generation is

that the additional cost of green electricity is spread over many years, not in one large up-front cost.

## 8 ENERGY EFFICIENCY CONCLUSION

A review of the measures adopted for the project indicate that there a number of measures that have been implemented in the project to minimise energy usage.

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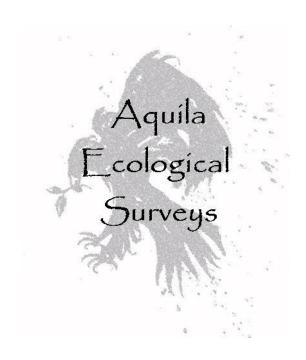
We are committed to and have implemented AS/NZS ISO 9001:2008 "Quality Management Systems – Requirements". This management system has been externally certified and Licence No. QEC 13457 has been issued.

Version	Status	Date	Prepared by	Checked by
A	Final	17 November 2011	Brian Clarke	Neil Gross

# **Appendix 11**

# Flora and Fauna Assessment, Proposed Sandstone Recycling Facility, 4 Albert Street, St Peters.

**March 2012** 



# Report prepared for:

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Draft Report Issued 9/04/2012

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#### 1. Introduction and Recommendations

AES was contracted by Concrete Recyclers (the applicant) to undertake a fauna and flora assessment of their proposal to use 4 Albert Street St Peters as a sandstone recycling facility. The extent of the proposed development is illustrated on the site plan (attached at rear) and detailed in the Statement of Environmental Effects, which this report accompanies. The aims of this assessment are to determine:

- whether the proposal is likely to have a "significant effect on threatened species, populations or ecological communities or their habitats", based on the seven factors listed in Section 5A of the Environmental Planning and Assessment Act 1979 as amended by the Threatened Species Conservation Act 1995 (TSC Act) and the Fisheries Management Act 1994 (FM Act); and
- impacts on threatened species and ecological communities under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

The main findings of the assessment are as follows:

- Vegetation at the site is composed of wattles, grasses and shrubs that have colonised the underlying sandstone material that was deposited by the Roads and Traffic Authority some years ago. The vegetation does not conform to any Endangered Ecological Community listed on the *TSC Act* or the *EPBC Act* and has no conservation significance.
- No flora species listed as threatened on either the TSC Act or the EPBC Act were detected on the
  site and it is considered unlikely that any would be present. Numerous flora species on site are
  listed as noxious weeds in the Sydney LGA.
- No threatened fauna species were detected on site. It is considered that no threatened fauna species
  are likely to occur.
- It is considered that the proposed action is unlikely to have a significant effect on threatened species, populations or communities, or their habitats. Therefore, a Species Impact Statement is not required to accompany the development application.
- There is unlikely to be a significant effect on threatened species, migratory species or ecological communities listed on the *Environment Protection and Biodiversity Conservation Act*. Therefore, referral to Federal Minister for the Environment is not required.

# 2. Environmental Setting

The site is illustrated on Figure 1 below. It covers approximately 2.1ha and is located south of Albert Street approximately 100m south west of its intersection with Campbell Street. Surrounding land use consists of industrial blocks of similar size and character.

The site is characterised by a large mound of some 600,000 tonnes of sandstone material that rises to some 13 metres above the ground level of Albert Street. This was deposited on the site by the Roads and Traffic Authority (now Roads & Maritime Services) some years ago and is the object of the applicant's proposal for material recycling.



Figure 1. Aerial Photo of the Site (outlined in red) © nearmap.

## 3. Methods

#### 3.1 Literature Review

Prior to undertaking the field survey a review of literature relevant to the subject site and wider local area and region was undertaken. Documents and databases reviewed included:

Vegetation mapping of the Sydney 1:100,000 map sheet (Benson & Howell 1994);

Vegetation mapping and vegetation community descriptions for south-east NSW (Tozer 2010);

and

• Point records of the Atlas of NSW Wildlife (OEH 2012a).

3.2 Field Survey

Fieldwork was undertaken on 17/03/2012 and 31/03/12 using the following methods.

3.2.1 Vegetation

The vegetation survey involved random meanders through the site and recording plant species present.

The vegetation of the site is described based on the dominant tree species and the height and cover of

the tree layer (following Specht, 1981). Plants not readily identified in the field were collected for

identification using standard texts. Checks were made against the Schedules 1 and 2 of the TSC Act

and the *EPBC Act* for species, populations and communities of conservation significance.

**3.2.2 Fauna** 

The vegetation community descriptions were used to describe the different fauna habitats that occur on

the site. The habitat surrounding the site was also investigated to gain an appreciation of the relative

importance of the habitat that occurs on the site.

Notes were made of specific sources of native fauna food and shelter, such as dense shrubs, flowering

trees, tree hollows and rock outcrops. The presence, or lack, of particular fauna habitat requirements

was noted to enable predictions of species that would be likely to utilise the site.

A search was made for indirect evidence of mammal presence such as droppings, burrows, tracks,

diggings and bones. Habitat types and the degree of disturbance were assessed to enable predictions of

mammal species presence.

A reptile search was undertaken throughout the site. This involved looking under rocks, bark, fallen

timber and leaf litter, with particular attention given to rock outcrop areas. Debris found near moist

habitats was checked for the presence of frogs and the type of moist habitats present was noted to allow

predictions of frog species likely to occur.

The Inner Western Sydney population of the Long-nosed Bandicoot is listed as an endangered

population on the TSC Act. As there were recent records of the species within five kilometres on the

Atlas of NSW Wildlife (OEH 2012a), a targeted survey for this species was undertaken. This involved

setting four hair tubes (Faunatech<sup>TM</sup>) baited with peanut butter, rolled oats and truffle oil across the site

for a period of 14 day  $(17^{th} - 31stMarch\ 2012)$ . The tubes are designed to attract the animal towards an

enclosed bait station at one end and as the animal enters and leaves, hair samples become attached to an

adhesive substance (FaunaGoo<sup>TM</sup>) smeared on a plastic lining attached to the inside of the tube. Any

hairs collected are then sent to an expert in mammalian hair for analysis.

4. Results

4.1 Literature Review

**4.1.1 Flora** 

**Vegetation Mapping** 

Vegetation mapping by Benson & Howell (1994) and Tozer et al (2010) indicates there is no remnant

native vegetation on or adjacent to the site. Nor does mapping held by Sydney Metropolitan Catchment

Management Authority indicate the presence of any Endangered Ecological Communities on the site

Threatened Flora Species

One threatened flora species have been detected within a five-kilometre radius of the subject site in the

past 30 years (Source: OEH 2012a). These were the Magenta Lilly Pilly (Syzygium paniculatum), a

record of which was made at Macdonaldtown rail yard in 2005; and Narrow-leaved Black Peppermint,

which was recorded at Summer Hill in 2008. Both species are commonly used in landscape plantings

well outside their natural ranges and habitats. The site does not represent natural habitat for either

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species.

4.1.2 Threatened Fauna

The following threatened fauna species have been detected within five kilometres of the subject site in the past 30 years (OEH 2012a).

**Table 3 Locally Occurring Threatened Fauna Species** 

Key

E- endangered; EP- endangered population; V- Vulnerable; M- Migratory.

Common Name Scientific name	Legislation		Habitat (OEH 2011b; pers obs)	
Č	EPBC Act	TSC Act		
Grey-headed Flying-fox Pteropus poliocephalus	V	V	Roosts in large camps in gullies, the nearest of which is at the Botanic Gardens. Forages widely on flowering and fruiting trees.	
Eastern Bentwing Bat Miniopterus (schreibersii) orianae oceanensis		V	Roost in caves, mines, tunnels etc. Forages over open forest and a range of other habitats.	
Long-nosed Bandicoot Perameles nasuta		EP <sup>1</sup>	Shelters mostly under older houses and buildings, and forages in parkland, remnant vegetation and back-yards	
Australasian Bittern Botaurus poiciloptilus	Е	V	Freshwater wetlands and occasionally estuarine reedbeds.	
Greater Sand-plover Charadrius leschenaultii	M	V	Beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats; occasionally occurs on sandy beaches, coral reefs and rock platforms	
Lesser Sand-plover Charadrius mongolus	M	V	Beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats; occasionally occurs on sandy beaches, coral reefs and rock platforms	
Great Knot Calidris tenuirostris		V	Sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons.	
Sanderling Calidris alba		V	Coastal areas on low beaches of firm sand, near reefs and inlets, along tidal mudflats and bare open coastal lagoons	
Pied Oystercatcher  Haematopus longirostris		Е	Shallow waters of beaches and estuaries.	
Sooty Oystercatcher Haematopus fuliginosus		V	Exposed rocky shores, wave cut platforms, reefs and stony beaches.	
Broad-billed Sandpiper Limicola falcinellus	М	V	Sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs.	
Black-tailed Godwit  Limosa limosa	M	V	Sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats.	
Terek Sandpiper Xenus cinereus		V	Mudbanks and sandbanks located near mangroves, but may also be observed on rocky pools and reefs, and occasionally up to 10 km inland around brackish pools.	
Little Tern Sterna albifrons		V	Sheltered coastal habitat and occasionally several kilometres from the sea in harbours, inlets and rivers	
Superb Fruit-dove Ptilinopus superbus		V	Rainforest species that occasionally is found in suburban Sydney during migration.	

<sup>&</sup>lt;sup>1</sup> population in inner western Sydney.

Common Name Scientific name	Legislation		Habitat (OEH 2011b; pers obs)
	<b>EPBC</b>	TSC Act	
	Act		
Regent Honeyeater	E,M	E	Woodland and open forest. Occasionally detected feeding
Xanthomyza phrygia			on planted eucalypts.
Green and Golden Bell Frog <i>Litoria aurea</i>	V	Е	Wide range of unpolluted waterbodies including both natural and man-made structures. Surrounding these are extensive grassy areas and an abundance of shelter sites such as rocks, logs, tussock forming vegetation and other cover.
Wallum Froglet		V	Only found in acid paperbark swamps and sedge swamps
Crinia tinnula			of the coastal 'wallum' country.

# **4.2 Survey Results**

#### **4.2.1 Flora**

## 4.2.1 (a) Vegetation Description

The site is vegetated with a range of plants that have colonised the fill that has been deposited on the site. The most common species is Pampas Grass (*Cortaderia selloana*) which has stems to four metres tall. The most common shrubs are Golden Wreath Wattle (*Acacia saligna*) and Sydney Golden Wattle (*A.longifolia*) which grow from two to four metres. It is likely that the seeds of these species came to the site in the fill and have germinated on deposition. Golden Wreath Wattle is a West Australian species that grows on roadsides around Sydney along with the native Sydney Golden Wattle. Other common shrub species are Crofton weed (*Ageratina* adenophora), Lantana (*Lantana camara*), Privet (*Ligustrum spp*) and Inkweed (*Phytolacca octandra*) whilst the groundcover includes a number of Asteraceous (Daisy family) weeds such as Fleabane (*Conyza Canadensis*), Cobbler's Pegs (*Bides pilosa*) and Catsear (*Hypochaeris radicata*).

# 4.2.1 (b) Conservation Significance of the Vegetation

The site's vegetation is highly modified and has no conservation significance.

## 4.2.1 (c) Flora Species

A list of flora species detected at the site is provided in Appendix A. No threatened flora species

were found at the subject site. Due to the unsuitability of the site's habitat, none of those

threatened species listed in Table 1 are considered likely to be present in the soil seedbank and not

apparent above ground.

The following species are listed as noxious weed in the Sydney LGA under the Noxious Weeds

Act 1993:

• Bitou Bush [*Chrysanthemoides monilifera subspecies rotundata*];

• Castor Oil Plant [Ricinus communis];

• Green Cestrum [Cestrum parqui];

• Lantana;

• Pampas Grass;

• Broad-leaf Privet [Ligustrum lucidum]; and

• Narrow-leaf Privet [Ligustrum sinense].

Under the Act, the control class for Bitou Bush and Green Cestrum is 3 requiring that the plant

must be fully and continuously suppressed and destroyed. For the other plants the control class is

4. This requires that the growth of the plant be managed in a manner that reduces its numbers,

spread and incidence and continuously inhibits its reproduction and the plant must not be sold

propagated or knowingly distributed.

4.2.2. Fauna

4.2.2(a) Fauna Habitat Features

The vegetation description broadly outlines fauna habitat. Other features that influence the range and

abundance of fauna are:

• The site is within an industrialised and urbanised area limiting the range of abundance of habitat

features that may favour the presence of native fauna species. The adjacent refuse centre affords

habitat for some bird species which were observed moving between the refuse centre and the top of

the mound.

• There are no tree hollows or stags (standing dead trees) suitable for habitation by vertebrate fauna.

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• A small pond with dimensions of approximately two metres by two metres and 15 centimetres depth

occurs on top of the mound. Although this may harbour common frog species such as the Eastern

Common Froglet (Crinia signifera), no frogs, tadpoles or egg congregations were observed in the

pond.

4.2.2(b) Threatened Fauna

A narrow range of fauna species was detected during the site survey. Species detected were

Australian White Ibis (Threskiornis moluccana), Peregrine Falcon (Falco peregrinus), Willie

Wagtail (Rhipidura leucophrys), Australian Raven (Corvus coronoides), Common Myna (Sturnus

tristis), House Mouse (Mus domesticus), Dog (Canis familiaris) and Garden Skink (Lamprophilus

delicata). The House Mouse was detected through the placement of the hair tubes. Long-nosed

Bandicoots were not detected in this manner, nor were any other signs of the species' habitation

(e.g. scats, conical feeding holes in the ground) observed.

Whilst the lack of fauna is to some degree a reflection of the brevity of the field survey, it is also a

function of the limited habitat value of the site and its environs. No fauna species listed as

threatened on the TSC Act or the EPBC Act were detected during the survey.

5. Impacts of the Proposed Development

5.1 Environmental Planning and Assessment Act

The Environmental Planning and Assessment Act as amended by the TSC Act, requires that the "seven-

part test" set out in S5A of the EP&A Act be considered to determine whether the proposed

development would have a significant effect on threatened species, populations or communities, or their

habitats. If it is found that there is likely to be a significant effect, a Species Impact Statement must

accompany the development application.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect

on the life cycle of the species such that a viable local population of the species is likely to be placed at

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risk of extinction,

No threatened species are known or likely to use the site. There would be no impact upon local

populations of threatened species.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse

effect on the life cycle of the species that constitutes the endangered population such that a viable local

population of the species is likely to be placed at risk of extinction, in the case of an endangered

ecological community or critically endangered ecological community, whether the action proposed:

No endangered populations are known or likely to use the site.

(c) in the case of an endangered ecological community or critically endangered ecological community,

whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local

occurrence is likely to be placed at risk of extinction,

(ii) or is likely to substantially and adversely modify the composition of the ecological community

such that its local occurrence is likely to be placed at risk of extinction,

Vegetation at the subject site is not a component of any Endangered Ecological Community.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action

proposed,

(ii) and whether an area of habitat is likely to become fragmented or isolated from other areas of

habitat as a result of the proposed action,

(iii) and the importance of the habitat to be removed, modified, fragmented or isolated to the long-

term survival of the species, population or ecological community in the locality,

The site does not represent habitat for any threatened species, population or community.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or

indirectly),

The site is not listed on the critical habitat register.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat

abatement plan,

No recovery plans or threat abatement plans are relevant to the site.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result

in the operation of, or increase the impact of, a key threatening process.

No key threatening processes are relevant to the proposed action.

Conclusion

It is considered that the proposed development would not have a significant effect threatened species,

populations, communities, or their habitats. A species impact statement need not accompany the

development application.

5.2 Environmental Protection & Biodiversity Conservation Act.

Under the EPBC Act an action will require approval from the Minister if the action has, will have,

or is likely to have, a significant impact on a matter of national environmental significance (NES).

Amongst other things, NES matters include those threatened species, migratory species,

communities and World Heritage areas listed on the Act.

No NES matters occur on or adjacent to the site. Therefore, referral to the Federal Minister for the

Environment to determine whether the proposed action is a controlled action is not required.

6. Environmental Management Measures and Safeguards

The only specific environmental management measure that is recommended in relation to ecological

issues is the removal and or control of noxious weeds on the site. This should be done as per the

requirements of the Noxious Weeds Act and any control plan that has been prepared for the relevant

species.

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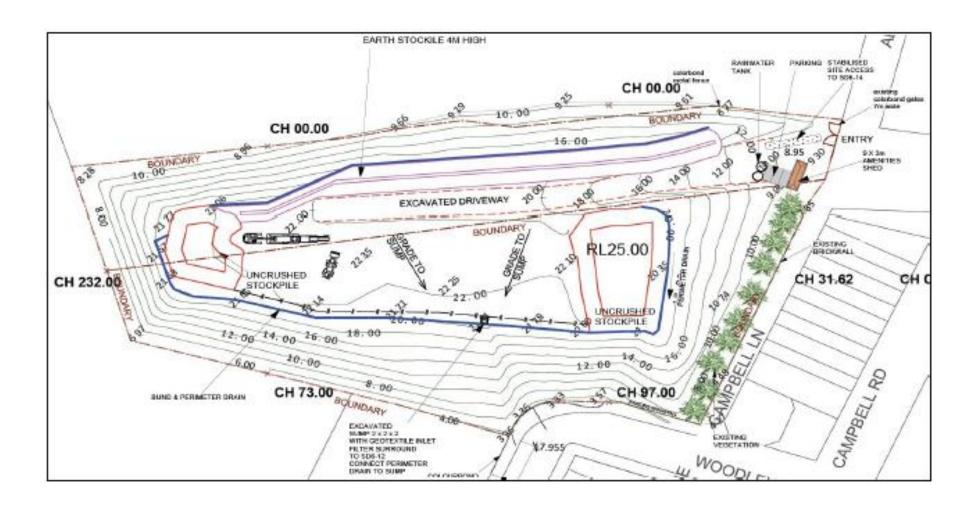
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# Appendix A – Plant Species List

* denotes introduced species					
Scientific Name	Common Name				
MAGNOLIOPSIDA	FLOWERING PLANTS				
MAGNOLIIDAE	DICOTYLEDONS				
AMYGDALACEAE					
Prunus persica*	Peach				
APIACEAE					
Foeniculum vulgare*	Fennell				
APOCYNACEAE					
Araujia sericifera *	Moth Vine				
ARALIACEAE					
Polyscias sambucifolius	Elderberry Panax				
ASTERACEAE					
Aster subulatus*	Bushy Starwort				
Ageratina adenophora*	Crofton Weed				
Bidens pilosa*	Cobbler's Pegs				
Chrysanthemoides monilifera subsp.	Bitou Bush				
rotundata*					
Cirsium vulgare*	Spear Thistle				
Conyza canadensis*	Fleabane				
Hypochaeris radicata*	Catsear				
Senecio madagascariensis*	Fireweed				
Taraxacum officinale*	Dandelion				
CASUARINACEAE					
Casuarina glauca	Swamp Oak				
EUPHORBIACEAE	C + O'I PI				
Ricinus communis*	Castor Oil Plant				
FABACEAE					
Sub-Family Faboideae	Haresfoot Clover				
Trifolium arvense* Trifolium dubium*					
Sub-family Mimosoidea	Yellow Suckling Clover				
Acacia baileyana*	Cootamundra Wattle				
Acacia binervia	Coast Myall				
Acacia longifolia	Sydney Golden Wattle				
Acacia saligna*	Golden Wreath Wattle				
Paraserianthes lophantha*	Crested Wattle				
GENTIANACEAE	Crested Wattle				
Centaurium erythraea*	Common Centaury				
LAURACEAE	Common Centaury				
Cinnamomum camphora*	Camphor Laurel				
MYRTACEAE	Campior Laurer				
Corymbia cladocalyx*	Sugar Gum				
OLEACEAE	Jugui Juni				
Ligustrum lucidum*	Large-leaf Privet				
Ligustrum sinense*	Small-leaf Privet				
PHYTOLACCACEAE					
Phytolacca octandra*	Ink Weed				
PLANTAGINACEAE					
Plantago lanceolata*	Lamb's Tongue				
POLYGONACEAE	J				
L	1				

Scientific Name	Common Name	
Acetosa sagittata*	Turkey Rhubarb	
RANUNCULACEAE	Turkey Kiiubarb	
Ipomoea indica*	Morning Glory	
SALICACEAE	Worling Glory	
	Cottonwood	
Populus deltoides* SOLANACEAE	Cottonwood	
	Lady of the Night	
Cestrum parqui*	Lady-of-the-Night	
Solanum nigrum*	Nightshade	
VERBENACEAE	T and an a	
Lantana camara*	Lantana	
Verbena litoralis*	Purple-top	
LILIDAE	MONOCOTYLEDONS	
ASPARAGACEAE	_	
Asparagus aethiopicus*	Asparagus Fern	
CYPERACEAE		
Cyerpus eragrostis*	Umbrella Sedge	
JUNCACEAE		
Juncus cognatus*		
Juncus usitatus	Common Rush	
POACEAE		
Arundo donax*	Giant Reed	
Chloris gayana*	Rhodes Grass	
Cortaderia selloana*	Pampas Grass	
Cynodon dactylon*	Couch	
Echinochloa crus-galli*	Barnyard Gass	
Eragrostis curvula*	African Lovegrass	
Melinus repens	Red Natal Grass	
Microlaena stipoides	Meadow Grass	
Paspalum dilatatum*	Paspalum	
Pennisetum clandestinum*	Kikuyu	
Setaria pumila*	Pigeon Grass	



Attachment: Extract from the Site Preparation plan for the initial stage of the proposed development.

# **Appendix 12**



#### ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS

**SYDNEY** 349 Annandale St, Annandale, NSW 2038 P: (02) 9555 4000 F: (02) 9555 7005 **MELBOURNE** 2/35 Hope St, Brunswick, VIC 3056 P: (03) 9388 0622

PERTH 13/336 Churchill Ave Subiaco, WA 6008 P: (08) 6262 2025

W: www.ahms.com.au

E: info@ahms.com.au

ABN: 45 088 058 388

ACN: 088 058 388

Our ref: 120716-1

2 August 2012

Neil Kennan, Nexus Environmental Planning, PO Box 212, Concord, NSW 2137.

Re: Aboriginal Heritage Advice - Proposed Materials Recycling Facility, 2 Albert Street, St Peters

Dear Mr Kennan,

This document outlines Aboriginal heritage advice in relation to the Materials Recycling Facility currently proposed at No. 2 Albert Street, St Peters. An application for consent to proceed with the project is being assessed in accordance with Part 4.1 of the *Environmental Planning and Assessment Act 1979*. Nexus Environmental Planning (Nexus) is currently preparing a revised Environmental Assessment for the project, in response to a request for further information from the Department of Planning and Infrastructure (DoPI).

The DoPI has requested further information to support the conclusion made in the initial Environmental Assessment, that there are no items of Aboriginal cultural heritage in the subject area. As a result, Archaeological and Heritage Management Solutions Pty Ltd (AHMS) was commissioned by Nexus to provide advice concerning the potential Aboriginal cultural heritage values of the subject area.

Please note that the advice in this letter is **not** a comprehensive Aboriginal heritage assessment in accordance with OEH Guidelines. Instead, it provides a **guide** to Aboriginal cultural heritage and archaeological issues that may be encountered during the proposed development, in addition to providing our opinion regarding whether or not further and more detailed heritage assessment is warranted to inform a proposal and/or to assess its impacts. If you have any further questions or enquiries, please contact Fenella Atkinson on 02 9555 4000.

Yours sincerely,

Peter Douglas

Director





# **Aboriginal Heritage Advice**

## Site Location

The subject area is known as 2 Albert Street, St Peters (**Figure 1**), and consists of Lot 1 in Deposited Plan 88087 and Lot B in DP 376645 (**Figure 2**). Part of the property is within the City of Sydney Local Government Area, and part within the Marrickville Local Government Areas. The subject area is in the Parish of Alexandria, County of Cumberland.

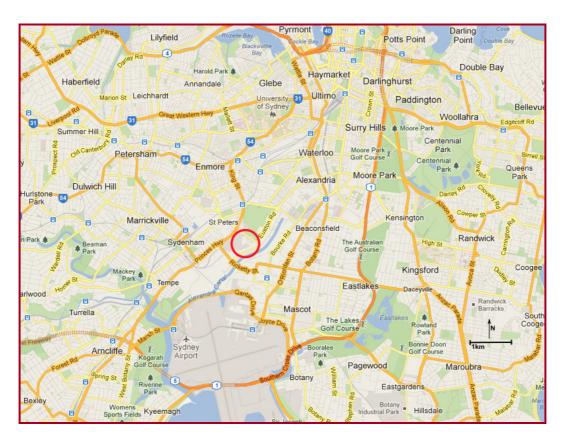


Figure 1. The general location of the subject area, circled in red (source of map: Google Maps).





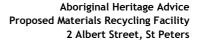
Figure 2. The subject area, marked in red (source of photograph: LPI, SIX Viewer).

#### **Proposed Development**

Concrete Recyclers (Group) Pty Limited proposes to construct and operate a materials recycling facility on the subject area. The facility would recycle the existing sandstone stockpile on the subject area, and further material brought in from excavations, by crushing, separating and blending the material.

The proposed development would be staged over several years (see **Figure 3**), following the processing and removal of the existing stockpile, and would consist of the following components:

- Grading along the western boundary to create access to the top of the existing stockpile.
- Establishment of mobile crushing machinery at the top of the existing stockpile.





- Progressive cutting, processing and removal of the existing stockpile.
- Installation of a portable office and amenities building at the entrance, with three adjacent car-parking spaces and two rain water tanks.
- Installation of a wheel wash facility at the entrance.
- Establishment of perimeter bund and bund drain.
- Establishment of stabilised site access.
- Creation of perimeter bund along the eastern, southern and western boundaries.
- Establishment of permanent stockpiles along the north-eastern, northern and north-western boundaries; crushed materials stockpiles along the western and southern boundaries; and uncrushed sandstone and demolition rubble stockpiles.
- Establishment of a stormwater management system linked to the existing stormwater system.

The proposed development involves significant excavation across most of the subject area. However, this bulk excavation will affect only the current stockpile, that is, material that has been brought into the property. There will also be some minor earthworks for the installation of site facilities and drainage.



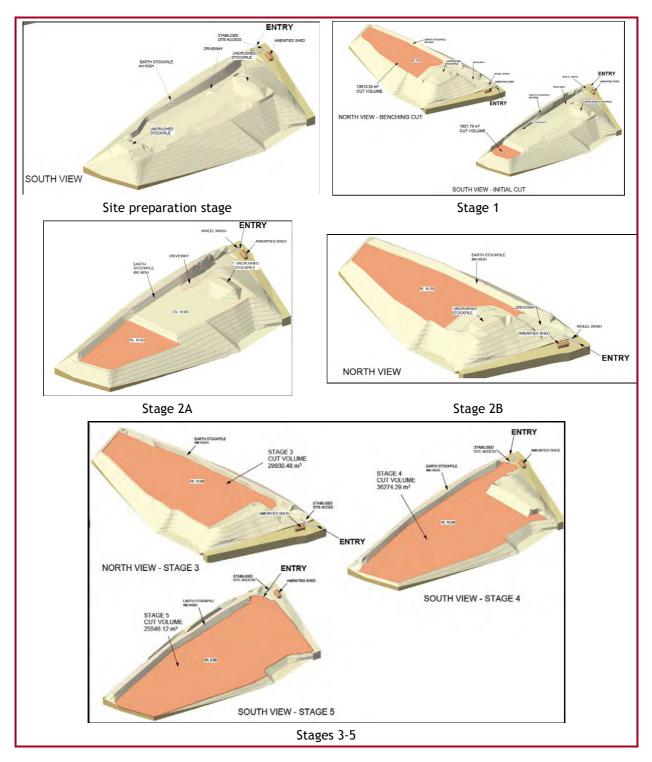


Figure 3. Models of the proposed stages of the proposed development (source: Nexus Environmental Planning).





#### **Approvals Context**

The proposed development was determined to be consistent with Schedule 1 Clause 23 of the State Environmental Planning Policy (Major Development) 2005, that is 'development for the purposes of resource recovery or recycling facilities that handle more than 75,000 tonnes per year of waste'. It was therefore declared to be a project to which Part 3A (now repealed) of the Environmental Planning and Assessment Act 1979 (EPA Act) applies, and is being assessed by the Minister for Planning and Infrastructure.

The Director-General's Requirements for the environmental assessment of the project (MP 11\_0086) were issued in July 2011 and did not identify Aboriginal cultural heritage as a key issue. The Environmental Assessment for the proposed development concluded:

The Site is one which contains a stockpile of sandstone which has been won in excavation sites across the Sydney CBD and nearby areas. As such, it is unlikely that any items of Aboriginal Cultural Heritage are present in the sandstone stockpile which is proposed to be removed as part of the proposed development.

DoPI requested further information to be included in a revised EA (4.7.12), as follows:

Information to support the conclusion that there are no items of Aboriginal cultural heritage on site, including a search of registers and databases and reference to any previous surveys or studies of the area.

The current letter report addresses the above request, and is intended to identify potential Aboriginal heritage constraints in relation to the proposed project. The report is not a detailed Aboriginal archaeological or a cultural heritage assessment

#### Landforms and Environment

The subject area falls on or near the boundary of an area of the Blacktown Soil Landscape, to the west, and an area mapped as disturbed terrain, to the east (Chapman & Murphy, 1989, pp.30-33, 94-97). The soil of the Blacktown Soil Landscape consists of an A1 horizon which is a friable loam, overlying an A2 horizon of brown clay loam, a B horizon of mottled brown light clay, and a B3 or C horizon of light grey mottled clay. The soils overlie Wianamatta Group shales and Hawkesbury shale, in turn overlying Hawkesbury sandstone, but rock outcrop is generally absent. The topography of the Blacktown Soil Landscape consists of gently undulating rises. The native vegetation would have consisted of tall open-forest (wet sclerophyll forest) and open-woodland (dry sclerophyll forest).

The area now mapped as disturbed terrain is likely to have originally been part of the Tuggerah Soil Landscape. This consists of deep Quaternary (Pleistocene and Holocene)



aeolian sand, with a topography of gently undulating plains and rolling rises of broad swales and dunes. The native vegetation has been almost entirely cleared, but consisted of dry sclerophyll eucalypt and apple woodland.

In the dunes of the Tuggerah Soil Landscape, rainfall tends to drain directly into the sand; when run-off occurs, this collects in depressions, lagoons and swamps. However, the drainage of the area has been significantly altered by development. Shea's Creek, a tributary of Cooks River, ran through swampy ground to the south of the subject area, but has been heavily modified for the creation of Alexandra Canal.

#### **Known Archaeological Sites**

A search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken on 19 July 2012 (Ref. No. 120712-1 St Peters). The search found five registered sites within a 5km square centred on the subject area (**Table 1** and **Figure 4**). There were no registered sites within the subject area itself. Two of the five listings relate to the same site, giving a total of four. Of these, one is recorded as a potential archaeological deposit; and the other three as artefact(s), two of these with shell as well.

Table 1.	Sites registere	d in AHIMS within	a 5km square	centred on t	the subject area.

Site ID	Site name	Site features
45-6-2597	Wynyard St Midden	Shell, Artefact
45-6-2358	K1 (same as 45-6-2198)	Shell, Artefact
45-6-2198	View Street	Shell, Artefact
45-6-0751	Shea's Creek	Artefact
45-6-2654	Fraser Park PAD	Potential Archaeological Deposit

Excavation at Shea's Creek, now Alexandra Canal, in the 1890s, revealed the presence of two shell horizons. Archaeological evidence in these horizons included stone axes and butchered bone. The finds were made in two locations, 232 and 824 m to the north of Ricketty Street (Attenbrow, 1984, p. 3); that is, along the stretch of the Canal to the south of the subject area. A sample of the bone was later dated, and yielded an age of  $5,520 \pm 70$  BP (conventional age) (JMCHM, March 2005, p. 9).

In the 1980s, a layer of shell was observed in sand deposits in the section of the brick pit, which at that time existed in the current Waste Transfer property, adjacent to the subject area. The shell was initially interpreted as the remains of an Aboriginal midden (Moran & Conyers, 1983), but further investigation indicated it was not midden material, but rather a natural shell bed (Attenbrow, 1984, p. 5).



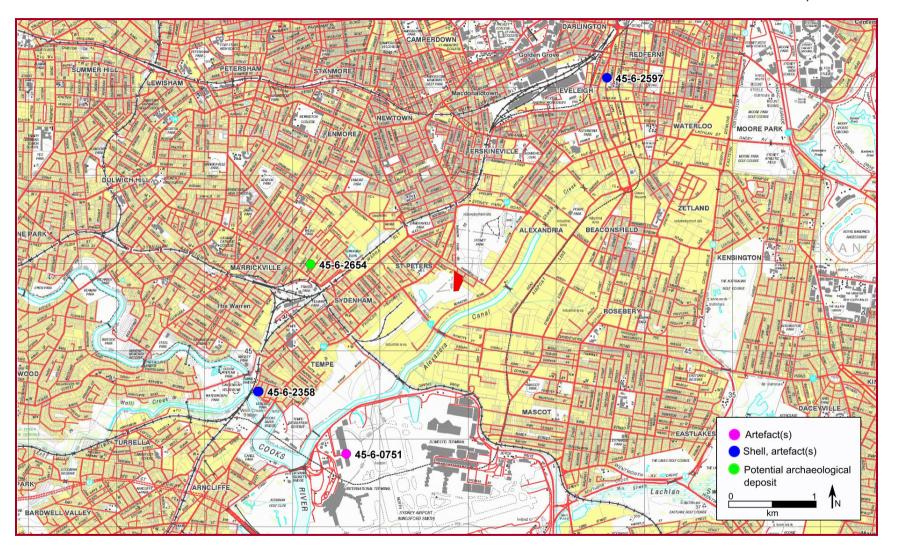


Figure 4. AHIMS sites within a 5km square centred on the subject area, coloured red (source of base map: LPI, TopoView).



# Historical Development and Disturbance

The 1943 historical aerial photograph shows that the subject area was occupied by a brickworks at this time (Figure 5). This was the Central Brick and Tile Company, which had been established on the site in 1913. The property had previously been part of Barwon Park Estate. Barwon Park House was still standing in the 1940s, and is visible in the 1943 aerial, to the west of the subject area (Ringer, 2008, p. 125). In 1951 the brickworks was largely destroyed by fire (Ringer, 2008, p. 252). The date of demolition of the brickworks is not known. Newspaper advertisements suggest that it continued to operate, at least in a limited capacity, through to about 1954. By 1983, the buildings had been removed, and the subject area was occupied by a large spoil heap (Figure 6).

Construction and operation of the brickworks would have involved significant ground disturbance. There would have been underground flues running under the kilns, and linking the kilns to the chimneys. However, the 1943 aerial indicates that disturbance may have been relatively minor along the southern and eastern boundaries of the subject area. Demolition of the brickworks is also likely to have involved some ground disturbance. However, the partial survival of boundary walls from the brickworks (see below) indicates that demolition was not comprehensive. It may therefore not have included removal of the below-ground elements of the brickworks.

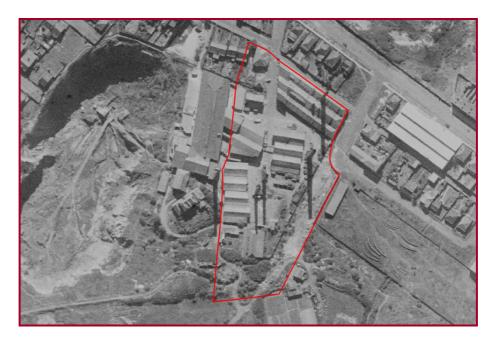


Figure 5. The subject area in 1943 (source of photograph: LPI, SIX Viewer).





Figure 6. A 1983 aerial photograph, looking north-west over St Peters. The subject area is visible in the right mid-ground, occupied by a large spoil heap (source: City of Sydney, ArchivePix, SRC2367).

## **Site Inspection**

The subject area was inspected by Fenella Atkinson (AHMS), on 31 July 2012.

The subject area is currently almost entirely occupied by a spoil heap, with the exception of a small area on the northern boundary (**Figure 7**). The spoil heap appears to be composed almost entirely of sandstone (**Figure 8**), and is a stockpile of stone from excavations in the Sydney CBD and nearby areas (Nexus Environmental Planning, p.3-12). The stockpile has a maximum height of approximately 22.52 m AHD, approximately 13.22 m above the level at the entrance to the subject area (9.3 m AHD).

There are areas of thick vegetation; consisting largely of pampas grass and wattle on the stockpile, and a row of eucalypts and lantana along the northern boundary. Ground visibility is otherwise good, although only introduced material is visible on the stock pile (Figure 9). The northern part of the subject area, between the stockpile and the boundary, is heavily grassed, and there is a carport with concrete slab surface (Figure 10). Where the ground is



visible in this area, the natural soil is not evident; the soil present is likely to have been deposited by run-off from the stockpile (Figure 11).

There are brick walls along the Campbell Lane and Woodley Street boundaries of the subject area (**Figure 12** and **Figure 13**). These are remnants of the brickworks structures and boundary wall. Within the subject area, the stockpile has been built up right against these walls. However, judging from a bricked-up entrance in one of the walls, the ground level at the time the brickworks were in operation appears to have been similar to the present street levels (Campbell Lane and Woodley Street).

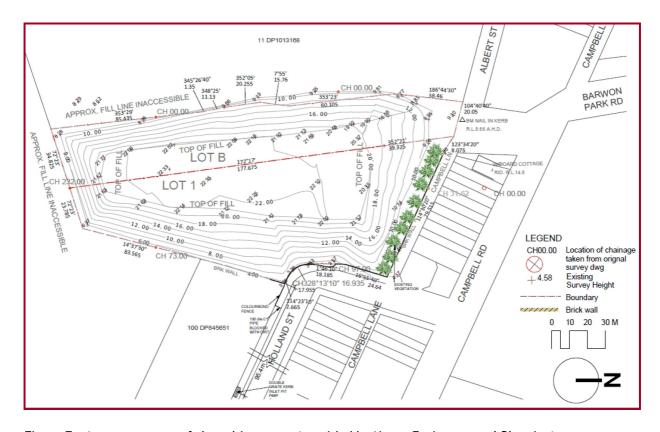


Figure 7. A recent survey of the subject area (provided by Nexus Environmental Planning).





Figure 8. Looking south to the stockpile, from the entrance to the subject area.



Figure 9. Detail of the ground surface visible on top of the stockpile.



Figure 10. Looking east along the northern boundary of the subject area.



Figure 11. Detail of the ground surface visible in the northern section of the subject area.



Figure 12. Looking east down Campbell Lane, with Figure 13. Looking west to the subject area,





Preliminary Aboriginal Heritage Assessment
Proposed Materials Recycling Facility
2 Albert Street, St Peters

the subject area on the right.

across Woodley Street, showing the stockpile behind the remnant brickworks wall

#### Conclusion

No registered Aboriginal objects or places are present within the subject area, and none were observed during the site inspection. The subject area is likely to be located on the edge of a soil landscape consisting of aeolian sand dunes bordering Botany Bay. Natural shell beds were present within this sand to the south of the subject area. Shell beds were also present along the line of Alexandra Canal, to the south and south east of the subject area; and archaeological material was found within these deposits.

However, the subject area itself has been significantly disturbed by the construction and operation of a brickworks in the twentieth century. Excavation required for the proposed development is likely to affect only introduced material (the sandstone stockpile), and the disturbed soils below this. It is therefore considered that the proposed development is unlikely to involve any impact to Aboriginal heritage.

It should be noted that deep sand deposits may survive below this disturbance, and that these deposits may include archaeological material. Should there be any modification to the development proposal, or any future development proposal, that requires deep excavation, further investigation of the potential for Aboriginal heritage impact is recommended.

It should further be noted that all Aboriginal sites, objects and places are protected under the *National Parks and Wildlife Act 1974*. Should any such items be uncovered in the course of the work, work should cease in the vicinity, and advice should be sought from the Office of Environment and Heritage.



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