Sutherland Shire COUNCIL

SUTHERLAND SHIRE COUNCIL
ABN 52 018 204 808

and

AUSTRALAND KURNELL PTY LTD
ABN 79 097 928 839

and

BREEN HOLDINGS PTY LTD
ABN 57 000 039 225

Variation of Voluntary Planning Agreement: Hockey Fields
Fields 2 and 3:– Part Lot 111 DP 777967 and Part Lot 1123 DP 794114

Sutherland Shire Council
Administration Centre
4-20 Eton Street
Sutherland NSW 2232
DX 4511 Sutherland
Telephone: 9710 0333
Ref: EE:LS/01/255732

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HOCKEY FIELDS COMPACTION WORKS AGREEMENT

DATE 18 November 2014

PARTIES

SUTHERLAND SHIRE COUNCIL a body politic under section 220 of the *Local Government Act* 1993 ABN 52 018 204 808 of 4-20 Eton Street, Sutherland NSW 2232 **(Council)**

and

AUSTRALAND KURNELL PTY LTD ABN 79 097 928 839 of Level 3, 1C Homebush Bay Drive, Rhodes, NSW, 2138 **(Australand)**

and

BREEN HOLDINGS PTY LTD ABN 57 000 039 225 of 9, 92 Pitt Street, Sydney, NSW, 2000 **(Breen)**

Recitals:

A. Council, Australand and Breen entered into a Voluntary Planning Agreement dated 3 June 2010 (the **VPA**). Generally, the VPA requires Australand and Breen to provide a recreation area, including 10 playing fields and ancillary facilities on land on Captain Cook Drive Kurnell to be transferred to Council. The cost of the recreation area is being met by Australand and Breen, up to $25,000,000 excluding GST.

B. Peninsula Fields was created by Australand and Breen as a joint venture company to carry out certain works required by Australand and Breen under the VPA.

C. The 10 playing fields referred to in Recital A are known as fields 1-10. The VPA proposes 3 stages of works in relation to the 10 playing fields and ancillary facilities.

D. "Sub-Stage 1B of Developers Works" is outlined in Schedule 3 of the VPA and includes, amongst other things, the proposed construction of sporting Field 2 and Field 3 (**Sub-Stage 1B Works**) on the Australand Land and the Breen Land (collectively, the **Sub-Stage 1B Land**).

E. This Agreement amends the VPA in respect of the Sub-Stage 1B Land.

F. The property boundary between the Australand Land and the Breen Land on the Sub-Stage 1B Land diagonally dissects Field 2 and Field 3 (as depicted in Schedule C). The Australand Land has an underlying natural sand base. The Breen Land has been excavated and is proposed to be filled with different materials to that underlying the Australand Land.

G. In approximately May 2011, Council requested that Field 2 and Field 3 be used as hockey fields finished with a synthetic surface rather than the grassed turf surface contemplated by the VPA.

H. The parties agreed that it was necessary for the specification for the hockey field component of the Sub-Stage 1B Works on the Sub-Stage 1B Land to be upgraded to a higher compaction and geotechnical standard than that contemplated by the VPA to accommodate the proposed synthetic surface. These specifications are referred to as the **Hockey Compaction Works** and are attached to this Agreement at Schedule **D**. The proposed synthetic surfacing works for the hockey field component of the Stage 1B Works on the Stage 1B Land are referred to as the **Council Hockey Works**.

I. Attached at Schedule **A** is Breen's pricing for the Sub-Stage 1B Works dated 3 December 2013. Attached at Schedule **B** is Australand's pricing prepared by Burton Contractors dated 19 November 2013 for Field 3 of the Sub-Stage 1B Works.

J. On 3 March 2014, Council resolved to proceed with the Hockey Compaction Works and the Council Hockey Works on the Sub-Stage 1B Land.

K. There are three development consents that relate to the Sub-Stage 1B Works on the Sub-Stage 1B Land. These consents are as follows:

(i) the Concept Masterplan Consent;

(ii) the Stage 1B Bulk Earthworks Consent; and

(iii) the Stage 1B Civil Works Consent.

L. The Australand Hockey Compaction Works are to be undertaken by Australand. The Breen Hockey Compaction Works are to be undertaken by Breen. The Council Hockey Works are to be undertaken by Council.

M. GeoEnviro has prepared the GeoEnviro Report. The GeoEnviro Report presents an Earthwork Management Plan (**EMP**) for the Hockey Compaction Works and Council Hockey Works and provides the work methodology and controls for the earthworks in order to achieve the required compacted and stable platform for the proposed Hockey Fields.

N. GeoEnviro will supervise and monitor the Hockey Compaction Works. Council will appoint RPS Australia East as Project Superintendent and engineer for the Hockey Compaction Works and Council Hockey Works.

Operative Part:

1 Definitions and Interpretation

1.1 Definitions

In this Agreement:

All Definitions contained in the VPA are adopted for the purposes of this Agreement unless otherwise expressly stated.

Australand Hockey Compaction Works means the works outlined in the Specification which Australand will undertake on the Australand Land.

Australand Land means Part Lot 111 DP 777967.

Australand Payment means $528,348.19 excluding GST, as adjusted in accordance with this Agreement

Breen Hockey Compaction Works means the works outlined in the Specification which Breen will undertake on the Breen Land.

Breen Land means Part Lot 1123 DP 794114.

Breen Payment means $310,927.76 excluding GST, as adjusted in accordance with this Agreement.

Breen Property means Breen Property Pty Limited (ACN 000 188 492).

Burton Contractors means Burton Contractors Pty Ltd (ABN 29 109 960 652).

Concept Masterplan Consent means development consent to DA11/0665 issued by Council on 23 April 2012 for:

> Staged Development - Concept Masterplan for 10 Sporting Fields, Skate Park and Associated Parking, Lighting and Amenities Building, Green and Golden Bell Frog Habitat and Stormwater Treatment Facilities. First Stage: Sporting Field No. 1, Associated Development and Torrens Title Subdivision of Three (3) Lots into Eight (8) Lots.

Council Hockey Works means Sports Surface Consultants Ltd 'Base Construction, Synthetic Surfacing and Ancillary Works contract for Two Water Based Synthetic Turf Hockey Pitches' attached at Schedule **F**.

Field 2 and Field 3 means fields 2 and 3 located on the Sub-Stage 1B Land as shown marked on the VPA Site Plan attached at Schedule **C**.

GITA means Geotechnical Inspection and Testing Authority, being GeoEnviro or other suitably qualified professional as agreed by the parties.

GeoEnviro means GeoEnviro Consultancy Pty Limited ABN 62 084 294 762.

GeoEnviro Report means the report prepared by GeoEnviro entitled "Earthworks Management Plan, Stage 1B Green Hills Parkland, Part Lot 111 DP77967 and Part Lot 1123 DP794114, Captain Cook Drive, Kurnell," dated September 2013.

Hockey Compaction Works means the Australand Hockey Compaction Works and the Breen Hockey Compaction Works as set out in the Specification attached to this Agreement at Schedule **D** and the Hockey Compaction Works Site Plan attached to this Agreement at Schedule **E**.

Hockey Compaction Works Program means the program to complete (to the point of certification under this Agreement) the Hockey Compaction Works in accordance with the program issued by the Project Control Group as agreed between the parties, as updated from time-to-time in accordance with clause 6.1.

Hockey Fields means field 2 and field 3 located on the Sub-Stage 1B Land as shown marked on the Hockey Compaction Works Site Plan attached at Schedule **E**.

Peninsula Fields means Peninsula Fields Pty Ltd (ABN 85 147 060 928) registered in Victoria.

Project Superintendent means RPS Australia East or other suitably qualified professional agreed by the parties.

RPS Australia East means RPS Australia East Pty Ltd (ABN 44 140 292 762).

Specification means the Hockey Compaction Works specification attached to this Agreement at Schedule **D**.

Sub-Stage 1B Bulk Earthworks Consent means development consent to DA11/0941 issued by Council on 11 May 2012 for:

> Recreation Area Development - Stage 1B - Bulk Earthworks in Relation to Creation of Playing Fields.

Sub-Stage 1B Civil Works Consent means development to DA12/0083 issued by Council on 30 November 2012 for:

> Staged Development Under Section 83B for Sporting Field Development - Stages 1B and 2 - Sporting Fields 4, 5, 9 & 10 (Excluding Sporting Fields 2 &3), Associated Facilities, Car Parking and Landscaping.

Sub-Stage 1B Land means Australand Land and Breen Land which will together be developed into Fields 2 and 3.

WHS Act means the *Workplace Health and Safety Act* 2011 (NSW).

WHS Law means the WHS Act, the WHS Regulation and any other legislative requirement dealing with the health, safety or protection of workers on construction sites in New South Wales.

WHS Regulation means the *Workplace Health and Safety Regulation* 2011 (NSW).

Works Contribution Amount means the amount of $1,040,000 excluding GST, being the amount estimated and agreed by the parties, that it would have cost Australand and Breen to undertake the grassed turf surfacing works required to complete Field 2 and Field 3 pursuant to the VPA.

1.2 Interpretation

In the interpretation of this Agreement, the following provisions apply unless the context otherwise requires:

(a) Headings are inserted for convenience only and do not affect the interpretation of this Agreement.

(b) A reference in this Agreement to a business day means a day other than a Saturday or Sunday on which banks are open for business generally in Sydney.

(c) If the day on which any act, matter or thing is to be done under this Agreement is not a business day, the act, matter or thing must be done on the next business day.

(d) A reference in this Agreement to dollars or $ means Australian dollars and all amounts payable under this Agreement are payable in Australian dollars.

(e) A reference in this Agreement to any law, legislation or legislative provision includes any statutory modification, amendment or reenactment, and any subordinate legislation or regulations issued under that legislation or legislative provision.

(f) A reference in this Agreement to any agreement, deed or document is to that agreement, deed or document as amended, novated, supplemented or replaced.

(g) A reference to a clause, part, schedule or attachment is a reference to a clause, part, schedule or attachment of or to this Agreement.

(h) An expression importing a natural person includes any company, trust, partnership, joint venture, association, body corporate or governmental agency.

(i) Where a word or phrase is given a defined meaning, another part of speech or other grammatical form in respect of that word or phase has a corresponding meaning.

(j) A word which denotes the singular denotes the plural, a word which denotes the plural denotes the singular, and a reference to any gender denotes the other genders.

(k) References to the word 'include' or 'including' are to be construed without limitation.

(l) A reference to this Agreement includes the agreement recorded in this Agreement.

(m) A reference to a party to this Agreement includes a reference to the servants, agents and contractors of the party, and the party's successors and assigns.

(n) Any schedules and attachments form part of this Agreement.

2 Effect of this Agreement

2.1 As and from the date of this Agreement, the provisions of the VPA that apply to the Sub-Stage 1B land are amended in accordance with the provisions of this Agreement.

2.2 If there is any inconsistency between the terms and conditions of the VPA and the terms and conditions of this Agreement, this Agreement will, to the extent of any inconsistency, prevail.

2.3 This Agreement is supplemental to the VPA.

2.4 Except as otherwise provided in this Agreement, the terms and conditions of the VPA are expressly ratified and confirmed.

3 Hockey Compaction Works

3.1 Agreement

(a) The parties acknowledge and agree that:

(i) Council will undertake the Council Hockey Works;

(ii) Breen will undertake the Breen Hockey Compaction Works;

(iii) Australand will undertake the Australand Hockey Compaction Works;

(iv) any works or actions required of the parties pursuant to this Agreement, will not be a breach of the VPA or constitute an Event of Default under the VPA;

(v) provided that they have fully complied with the requirements set out in this Agreement, Australand and Breen will have satisfied their respective obligations under clause 8 of the VPA in respect of the Australand Compaction Works and Breen Compaction Works on Field 2 and Field 3;

(vi) the Concept Masterplan Consent, Sub-Stage 1B Bulk Earthworks Consent and Sub-Stage 1B Civil Works Consent do not need to be amended as a result of the Hockey Compaction Works or Council Hockey Works; and

(vii) the scope of works described under the heading 'SUBSTAGE 1B OF DEVELOPERS WORKS' in Schedule 3 of the VPA is amended by deleting the works located inside Field 2 and Field 3 which are identified as unshaded white areas in the plan at Schedule E in this Agreement are deleted and are not required to be performed by Australand or Breen.

3.2 Council Release

Council acknowledges and agrees that from the date of this Agreement, Council will not enforce clause 8 of the VPA in respect of completion of the Hockey Fields above 500mm against Australand and Breen and releases and forever discharges Australand and Breen from and in respect of its obligations in relation to the completion of the Hockey Fields above 500mm (being a level that is 500mm below the playing surface).

4 Payment

4.1 Council will pay Australand the Australand Payment in four equal portions (which together comprise the Australand Payment) on completion of the following nominated stages referred to in the Specification on the Australand Land:

(a) placement of the sandstone capping layer;

(b) certification of the compaction of the sandstone capping layer by the GITA;

(c) certification of Zone A (as identified in the Specification) by the GITA; and

(d) certification of Zone B (as identified in the Specification) by the GITA.

4.2 Council will pay Breen the Breen Payment in four equal portions (which together comprise the Breen Payment) on completion of the following nominated stages referred to in the Specification on the Breen Land:

(a) placement of the sandstone capping layer;

(b) certification of the compaction of the sandstone capping layer by the GITA;

(c) certification of Zone A (as identified in the Specification) by the GITA; and

(d) certification of Zone B (as identified in the Specification) by the GITA.

4.3 As a condition precedent for payment, Australand and Breen must attach to all progress claims or any claims for payment a Statutory Declaration executed by a person authorised to bind the respective company, and with actual knowledge of the things being declared, which states that all workers and subcontractors engaged by either Australand or Breen (as applicable) for the purposes of the Australand Hockey Compaction Works and the Breen Hockey Compaction Works, respectively, have been paid in full.

4.4 Subject to this clause 4, payment terms in relation to payments due and payable under this Agreement are 28 days from submission of a payment claim by Breen or Australand.

4.5 Australand and Breen must provide Council with a tax invoice compliant with the GST Law (as that term is defined in *The New Tax System (Goods and Services Tax) Act 1999 (Cth)*) when submitting a payment claim for the relevant amounts payable under clauses 4.1 and 4.2.

5 Works Contribution Amount

5.1 Breen and Australand, acting severally, will pay Council the Works Contribution Amount, by way of contribution to the construction of the Hockey Fields, in the following proportions:

(a) Australand: 60%; and

(b) Breen: 40%,

by way of two (2) equal progress payments on the date when the Project Superintendent certifies that:

(c) the Hockey Fields base course has been placed and compacted in accordance with Schedule F and the construction of the perimeter kerb and water harvesting system have been completed in accordance with Schedule F; and

(d) the Council Hockey Works, including the perimeter pavements, dug outs, walls, fencing, lighting, scoreboards, drainage and synthetic surface, have been completed in accordance with Schedule F,

provided that Council has provided to Australand and Breen a tax invoice that is compliant with the GST Law (as that term is defined in *The New Tax System (Goods*

and Services Tax) Act 1999 (Cth)), for the Works Contribution Amount, which tax invoice may, at Australand and Breen's election, be addressed to Peninsula Fields.

5.2 The parties acknowledge and agree that the payment of the Works Contribution Amount may be made by Peninsula Fields in satisfaction of this clause.

6 Variations, impact rolling and latent conditions

6.1 Variations

(a) If the Project Superintendent determines that a variation to the Hockey Compaction Works is required, the parties must meet and attempt to agree (acting reasonably) on the scope of that variation and any variation to the timing and cost of carrying out the Hockey Compaction Works Program.

(b) If the parties cannot agree on the adjustments to the Hockey Compaction Works, the related costs, and/or the Hocky Compaction Works Program arising from a variation requested by the Project Superintendent (or any other variation):

(i) the matter will be referred for dispute resolution in accordance with the process set out in clause 14 of the VPA;

(ii) Australand and Breen are not required to perform the variation works; and

(iii) Australand and Breen are not required to pay the Works Contribution Amount,

until the time and/or cost implications are agreed or determined under clause 14 of the VPA.

(c) If Australand or Breen (as the case may be) is delayed in completing the Hockey Compaction Works due to an event beyond its control, then Australand or Breen (as the case may be) will be entitled to an extension of time, determined by the Project Superintendent, acting reasonably, and the Hockey Compaction Works Program shall be adjusted accordingly.

6.2 Impact rolling

(a) The parties acknowledge that:

(i) due to the change in specification for Field 2 and Field 3 contemplated by this Agreement, the Hockey Compaction Works involves more sand compaction works than would have been required if the VPA had not been varied in accordance with this Agreement;

(ii) the additional sand compaction works will require additional impact rolling, which creates vibration;

(iii) a sewer line, managed by Sydney Water, runs adjacent to Field 2 and 3, and the sewer line may be adversely impacted by the vibration that is caused by the impact rolling;

(iv) Council will engage the GITA to undertake vibration monitoring to ensure that vibrations do not exceed the level recommended by Council's consultants and agreed to by Sydney Water on 24 July 2014, being 10mm/sec; and

(v) if vibration levels exceed 10mm/sec, the Project Superintendent will instruct Australand and Breen to suspend impact rolling.

(b) The parties agree that:

(i) any instruction or requirement to suspend all or part of the Hockey Compaction Works for any reason relating to the sewer line; and

(ii) any variation to the Hockey Compaction Works, including a variation to construction methodology, that is instructed or required in relation to or as a result of the sewer line,

shall be deemed to be a variation directed by the Project Superintendent under clause 6.1, and Australand and Breen shall be entitled to claim additional costs incurred and an extension of time to the date for completion in the Hockey Compaction Works Program.

6.3 Latent conditions

(a) In this clause 'latent conditions' are physical conditions on the site and its near surrounds, including artificial things but excluding weather conditions, which differ materially from the physical conditions which should reasonably have been anticipated by a competent contractor at the date of this Agreement if the contractor had inspected the site and its near surrounds.

(b) Australand and Breen, upon becoming aware of a latent condition while carrying out the Hockey Compaction Work, shall promptly, and where possible before the latent condition is disturbed, give the Project Superintendent written notice of the general nature of the latent condition.

(c) If required by the Project Superintendent promptly after receiving that notice, Australand and Breen shall, as soon as practicable, give the Project Superintendent a written statement of:

(i) the latent condition encountered and the respects in which it differs materially;

(ii) the additional work, resources, time and cost which Australand and Breen estimate to be necessary to deal with the latent condition; and

(iii) other details reasonably required by the Project Superintendent.

(d) The effect of the latent condition shall be deemed to be a variation directed by the Project Superintendent under clause 6.1, and Australand and Breen shall be entitled to claim additional costs incurred and an extension of time to the date for completion in the Hockey Compaction Works Program. The additional costs claimed for the latent condition shall not include costs which Australand and Breen would have incurred arising from the latent condition if the VPA had not been varied in accordance with this Agreement. The

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additional costs claimed shall not include costs incurred more than 28 days before the date on which Australand and Breen provided notice in accordance with clause 6.3(c) above.

7 Project Superintendent

7.1 Council must enter into a contract with the Project Superintendent appointing it as the Project Superintendent for the following purposes under this Agreement:

(a) certifying the Council Hockey Works in accordance with Schedule F pursuant to clause 5.1 of this Agreement;

(b) checking the progress of the Hockey Compaction Works;

(c) checking compliance with this Agreement;

(d) determining extensions of time;

(e) if required, requesting variations to the Hockey Compaction Works pursuant to clause 6.1 of this Agreement;

(f) allocating WHS Law site requirements and responsibilities for Australand, Breen and Council;

(g) supervising and coordinating the Australand Hockey Compaction Works, Breen Hockey Compaction Works and Council Hockey Works; and

(h) acting honestly, reasonably and fairly in the performance of these functions.

7.2 Subject to clause 6 of this Agreement, each party agrees to comply with the reasonable direction and instruction of the Project Superintendent.

8 Costs and Outlays

Council, Australand and Breen must pay their own costs in connection with the negotiation, preparation and execution of this Agreement.

9 Certification of the Hockey Compaction Works

9.1 Council will engage the GITA, at its cost, to certify the Hockey Compaction Works in accordance with this Agreement and the Specification.

9.2 The relevant stages of the Hockey Compaction Works, outlined in the Specification, will be deemed complete when the GITA issues a certificate that the relevant stage of work is compliant with the Specification.

9.3 Certification will be issued within 5 working days of notification by Australand, Breen and/or Council.

9.4 Any defect will deem that stage of the Hockey Compaction Works incomplete and will be subject to additional testing by the GITA following rectification by Australand and/or Breen prior to issuing a certificate of completion.

9.5 The parties agree that Australand and Breen will rely on the GITA's certification, given under clause 9.2, that a stage of the Hockey Compaction Works is complete. If

the GITA certifies that a stage of the Hockey Compaction Works is complete, and it is later found that this certification was in error or there is a defect in that stage of the Hockey Compaction Works, then Australand and Breen shall not be responsible for the cost and time consequences arising from:

(a) the error or defect; or

(b) any re-work required to address the error or defect.

10 Access

10.1 Australand and Breen must, subject to clause 14.1(e), each provide access to Field 2 and Field 3 to each other, to the GITA, to the Project Superintendent and to Council as required so as to enable them to:

(a) check the progress of the Hockey Compaction Works;

(b) check compliance with this Agreement; and

(c) certify the completion of the Hockey Compaction Works.

10.2 Access to the Australand Land and Breen Land is at all times subject to compliance with that owner's reasonable requirements regarding health and safety.

11 Subcontracting

11.1 Australand and Breen are able to subcontract work under this Agreement.

11.2 Australand intend to engage Burton Contractors to perform the Australand Hockey Compaction Works. Breen intend to engage BreenLand Pty Ltd (ABN: 71 167 426 717) to perform the Breen Hockey Compaction Works. Australand and Breen must obtain the consent of Council (not to be unreasonably withheld) if either wishes to subcontract to any other party.

11.3 Australand and Breen must provide to Council a copy of any proposed construction subcontract in relation to the Hockey Compaction Works and receive Council's consent to the form of subcontract (not to be unreasonably withheld or delayed) prior to it being executed by the parties.

11.4 Council agrees that Australand may appoint Burton Contractors as 'principal contractor' in accordance with WHS Regulation, for the Australand Hockey Compaction Works.

12 Indemnity

12.1 Australand indemnifies Council and Breen in respect of any claim, action, damage, loss, liability, cost or expense which Council or Breen may incur or is liable for, in connection with any damage, loss, injury or death, caused or contributed to by Australand or their respective servants and agents in connection with the carrying out of the Australand Hockey Compaction Works, except to the extent that Council or Breen has caused or contribution to such claim, action, damage, loss, liability, cost or expense by its wrongful act, negligence or default.

12.2 Breen indemnifies Council and Australand in respect of any claim, action, damage, loss, liability, cost or expense which Australand or Council may incur or is liable for,

in connection with any damage, loss, injury or death, caused or contributed to by Breen or their respective servants and agents in connection with the carrying out of the Breen Hockey Compaction Works, except to the extent that Australand or Council has caused or contribution to such claim, action, damage, loss, liability, cost or expense by its wrongful act, negligence or default.

12.3 Council indemnifies Australand and Breen in respect of any claim, action, damage, loss, liability, cost or expense which Australand or Breen may incur or is liable for, in connection with any damage, loss, injury or death, caused or contributed to by Council or their respective servants and agents in connection with the carrying out of the Council Hockey Works, except to the extent that Australand or Breen has caused or contribution to such claim, action, damage, loss, liability, cost or expense by its wrongful act, negligence or default.

13 Time and Programming

13.1 Australand must commence the Australand Hockey Compaction Works and Breen must commence the Breen Hockey Compaction Works, and use reasonable endeavours to progress that work to completion, in accordance with the Hockey Compaction Works Program so that the Australand Land and the Breen Land are ready for Council to carry out the Council Hockey Works.

14 Co-operation, Communication and Working Together

14.1 Australand and Breen must:

(a) deliver the Australand Hockey Compaction Works and the Breen Hockey Compaction Works, respectively, in accordance with the Specification, including the treatment of the boundary overlap; and

(b) undertake the Australand Hockey Compaction Works and the Breen Hockey Compaction Works, respectively, under the reasonable supervision and coordination of the Project Superintendent and the GITA;

(c) work collaboratively together to program their respective work concurrently or so as to maximise efficiencies, and ensure the work is being undertaken as expeditiously as possible;

(d) work cooperatively with the other to ensure that any potential issues, faults, defects or latent defects are minimised and eliminated;

(e) allow (and not unreasonably refuse access to) the other access across the boundary between Field 2 and Field 3 for the purposes of this Agreement, but only to the extent necessary to ensure that there is seamless 'stitching' across the two fields;

(f) ensure that any works required along the boundary between Field 2 and Field 3 do not prevent the adjoining property works being carried out in accordance with the Specification and the Hockey Compaction Works Program; and

(g) subject to clause 6 of this Agreement, take instruction, to the extent that such instruction is required to meet the requirements of this Agreement and the Specification, from the Project Superintendent and the GITA.

15 Security of Payment Indemnity

15.1 Breen and Australand continually indemnify Council against any claim, action, liability, cost, expense, loss or damage (including legal costs and disbursements on a full indemnity basis, but excluding consequential loss) which Council pays, suffers, incurs or is liable for in respect of:

(a) any suspension by Breen's subcontractors or Australand's subcontractors; and

(b) any other right or remedy exercised by Breen's subcontractors and Australand's subcontractors,

pursuant to the Building and Construction Industry Security of Payment Act 1999 (NSW), except to the extent that Council is directly responsible for such suspension or the exercise of such other right or remedy by Breen's subcontractors or Australand's subcontractors.

16 Personal Properties Securities Act (PPS Law)

16.1 If Council determines that a PPS Law applies, or will at a future date apply in respect of this Agreement, Council, in its discretion, may give notice to Breen and Australand requiring them to do anything that in Council's reasonable opinion is necessary to ensure that, to the maximum possible extent, Council's security position, and rights and obligations, are not adversely affected (or that any such adverse effect is overcome), or that Council 's security position is maintained or improved, including requiring Breen and Australand to ensure that any Security Interests held by them or subcontractor in the Hockey Compaction Works are removed or extinguished.

16.2 Breen and Australand shall comply with the requirements of a notice given by Council under Clause 16 within the time stipulated in the notice.

16.3 For the avoidance of doubt, Council's rights in relation to Clause 16 take precedence in the event of any conflict or inconsistency between Council's, Breen's and Australand's rights under the PPS Law for the extent allowed at law.

16.4 Breen and Australand acknowledge that nothing in Clause 16 affects the time at which title in any of the Hockey Compaction Works passes in accordance with this Agreement or the the VPA .

17 Dispute Resolution

17.1 If a party claims that a dispute exists under this Agreement:

(a) the matter will be referred for dispute resolution under clause 14 of the VPA; and

(b) Australand and Breen are not required to perform the Australand Hockey Compaction Works and the Breen Hockey Compaction Works, respectively, and Australand and Breen are not required to pay the Works Contribution Amount, until the dispute has been agreed or determined under clause 14 of the VPA.

18 General

18.1 Severability

If a clause or a part of a clause of this Agreement can be read in a way that makes it illegal, unenforceable or invalid, but can also be read in a way that makes it legal, enforceable and valid, it must be read in the latter way.

If any clause or a part of a clause is illegal, unenforceable or invalid, that clause or part is to be treated as removed from this Agreement, but the rest of this Agreement is not affected.

18.2 Variation to Agreement

This Agreement can only be varied by a further agreement executed by all parties.

18.3 Explanatory Note

The explanatory note to this Agreement, as required by clause 25E of the Environmental Planning and Assessment Regulation 2000, is not to be used in construing this Agreement.

Schedule A – Breen Pricing

BREEN HOLDINGS PTY LIMITED

ABN 57 000 039 225

M

Level 4/32 The Street
SYDNEY NSW 2000
T (02) 9235 0400
F (02) 9235 0411

3 December 2013

The General Manager
Sutherland Shire Council
Locked Bag 17
SUTHERLAND NSW 1499

Attention: John Rayner - General Manager

Dear John,

Re: GreenHills Parkland - Stage 1B Bulk Earthworks Proposal

I refer to your request to provide a proposal to undertake Bulk Earthworks for the above project defined by Geotechnical report Ref JT13712A Cl. 5.1 dated July 2013 (the **"Works"**).

Breen Holdings Pty Ltd ("Breen") is pleased to provide a proposal to undertake these works for a Price of **$310,927.76** + GST (**"Proposal"**). This price is based on the General Contractual Terms that Breen and the Sutherland Shire Council entered into as part of the Voluntary Planning Agreement

Breen's Proposal is based on the following:

- Annexure A – Schedule of inclusions and exclusions
- Annexure B – General Conditions of this proposal
- Annexure C - Pricing

If you have any queries, please call to discuss.

Yours faithfully

Damien Vella
General Manager

BREEN

N

Annexure A - Schedule of inclusions and exclusions

The following items have been included in the Price:

1. Setting out of the area that is to be compacted
2. Full-time supervision of works under this variation.
3. Placement of native sands, to approx. RL 2.5.
4. Load, cart and place nominal 300mm un-compacted sandstone capping layer across Lot 1123.
5. Environmental controls
6. Loading and transport of sufficient volumes of material for lot 1123, that is currently stockpiled (Stockpiles 2, 4, and 5) and delivered to lot 1123 for blending with material supplied by others.
7. Blending, placement and compaction of Zone A layer under Level 1 supervision on Lot 1123 only
8. Final trim.

The following items have been excluded from the Price:

1. Carry out High Energy Impact Compaction within Lots 1123 and 111.
2. Compaction of native sands, to approx. RL 2.5 in accordance with the GeoEnviro specification
3. Removal of sandstone following impact compaction, as not required by GeoEnviros specification.
4. Compaction of sandstone layer prior to impact compaction by others.
5. Removal of organic matter or foreign items from native sand from lot 111.

Note: Any variations to volumes identified in this proposal will be considered a variation to this proposal.

Annexure B - General Conditions of this proposal

1. The submitted Price will remain valid for a period of 60 days from the date of submission.
2. This Proposal and any other documents or information concerning the work included in this Proposal is confidential and may only be used for the sole purpose of considering this Proposal.
3. Sutherland Shire Council must ensure that its employees do not, up until the time that Sutherland Shire Council announces that it has accepted a proposal, divulge to or discuss with any other person the terms of this proposal except to the extent required by law.
4. This price is based on the General Contractual Terms that Breen and the Sutherland Shire Council entered into as part of the Voluntary Planning Agreement dated 3 June 2010.

Annexure C - Pricing

Kurnell Playing Fields - Stage 1B - Bulk Earthworks	Date:	3-Dec-13		
Item/Description	Unit	Qty	Rate	Amount
IMPACT COMPACTION (INCL. PREPARATION OF AREA)				
Cut to Fill Sand from Lot 1123 to Lot 1123 (Zone B) including placement and compaction (Stockpile 1)	m3	26,723.00	$ 8.59	$ 229,550.57
Prepare Lot 1123 prior to placing capping layer	m2	11,393.50	$1.59	$ 18,115.67
Placing Capping Layer over lot 1123 (300mm layer)	m2	11,393.50	$ 4.25	$ 48,422.38
Impact Compaction to Lot 1123	m2	10,358.10		by others
Fill Zone A with Blended Materials from Stockpiles 2, 4 and 5	m3	22,787.00	$7.98	$ 181,840.26
Cartage of Stockpile 2 material to blending point	m3	4,796.50	$3.86	$ 18,514.49
Fill Zone B with Sand	m3	17,640.00	$4.71	$ 83,084.40
Final Trim Subgrade	m2	13,200.00	$0.77	$ 10,164.00
Final Trim Batters	m2	4,249.50	$4.30	$ 18,272.85
			Subtotal Costs	$ 607,964.61
CREDITS				
Fill (Zones A and B) to 95% standard, 500mm layers	m3	67,150.00	$4.00	$ 268,600.00
Final Trim Subgrade	m2	13,200.00	$0.77	$ 10,164.00
Final Trim Batters	m2	4,249.50	$4.30	$ 18,272.85
			Subtotal Credits	$ 297,036.85
NOTES:				
Any variations to volumes will be considered a variation to this proposal.				
If material that Breen currently has on site cannot be placed within Stage 1B, council will bear the cost of its disposal				
Extra Over Price for Bulk Filling Works			Grand Total	$ 310,927.76

BREEN

BB

Schedule B – Australand Pricing

Burton Contractors Pty Ltd
ABN 29 109 960 652
Homebush Business Village
Unit 3 - 11-21 Underwood Road,
Homebush NSW 2140
Tel: +61 2 9581 5550
Fax: +61 2 9581 5551
www.burtoncontractors.com.au

19th November 2013

Whelan Insites Pty Ltd
Suite 2, Level 1, 668 Princess Highway
Sutherland NSW 2232

Attention: Andrew Wallis
By Fax: 02 9542 4631

Dear Andrew,

Construction Contract – Greenhills Parklands Stage 1B – Bulk Earthworks between Australand Kurnell Pty Ltd and Burton Contractors Pty Ltd ("Contract")

VARIATION NOTICE VAR005
Bulk Filling of Stage 1B Revised Methodology

Further to our discussions regarding the revised methodology required for the bulk filling of Stage 1B, please find attached for your review our Lump Sum price to carry out these works.

As identified in previous correspondence (Variation Notice 001, dated 8th August 2013), due to a change in the use of these playing fields from soccer pitches to hockey pitches, Burton Contractors has now been asked to compact the subgrade to a depth of 5m through the use of High Energy Impact Compaction prior to placing the general fill. (Ref. Geotechnical Report Ref. JT13712A Cl. 5.1, Dated July '13)

Combined with the High Energy Impact Compaction works, pricing for additional preparatory works and filling works has been requested in order to bring the area for the hockey pitches to the required Reduced Level of 6.5.

The scope of these works covers the following general activities:

1. Site preparation of Lot 111.
2. Cutting natural sands from Lot 111 and tipping in Lot 1123 following cartage through Kurnell Landfill Weighbridge. Placement and compaction works will be carried out By Others to bring Lot 1123 to approx. RL 2.5.
3. Placing of sandstone capping layer across Lot 111, Lot 1123 By Others.
4. Carry out High Energy Impact Compaction within Lots 1123 and 111.
5. Full-time compaction monitoring and verification reporting.

10 8 BB

6. Blending of onsite stockpiled material with externally sourced material approved by geotechnical engineer under Level 1 supervision, and placed in two separate layers – Zone A and Zone B. Blending volumes will only be generated for the m3 required in Zone A and Zone B of Lot 111
7. Final trim of upper layer, Zone B in Lot 111 to required RL. Lot 1123 final trim By Others
8. The movement of material from Lot 111 to Lot 1123 has been allowed to go through the weighbridge, as directed by EPA requirements. In addition to this, any material coming in from outside of the landfill footprint will also require to go through the weighbridge.

The Lump Sum price for carrying out the works is $728,940 (seven hundred and twenty eight thousand, nine hundred and forty dollars only) +GST.

INCLUSIONS AND EXCLUSION

The cost of the variation works will include:

1. Setting out of the area that is to be compacted.
2. Float plant to site to carry out the works.
3. Full-time supervision of works under this variation by Burton's Supervisor.
4. Project Engineer has been allowed for 50% of the time on the project to ensure QA processes and material quantities are tracked.
5. Level Lot 111 to level at RL 2.5 approx. so that where, following the placement of the 300mm thick sandstone capping layer, Landpac can drive their plant between 10-14kph which is required for carrying out the impact compaction.
6. Load, cart and place nominal 300mm un-compacted sandstone capping layer across Lot 111.
7. Weighbridge administration fee for carting in sandstone (EPA requirement for fill material)
8. Smooth Drum roller to seal the sandstone as this work progresses in order to protect the sandstone from any inclement weather
9. Traffic Controller/Spotter (x1) at weighbridge site/landfill entrance to safely manage the various vehicle movements between the trucks carting the sandstone and public vehicles using the landfill.
10. Landpac costs to complete the works in accordance with their attached quote.
11. Landpac costs to provide Level 1 supervision along with verification testing & reporting and vibration monitoring in accordance with their attached quote
12. Provision of Burton Contractor's watercart and pump to work full-time with Landpac.
13. Maintaining a clean entrance/driveway at landfill during carting of sandstone
14. Environmental controls
15. Loading and transport of stockpiled material out of Stockpiles 2, 4, and 5 and delivered to Stage 1B area for blending with material supplied by others.

Quantity carted from these stockpiles will be in line with the blending guidelines outlined in the Geo Enviro report. "*Earthworks Management Plan, Stage 1B Green Hills Parkland, Part Lot 111 DP 77967 and Part Lot 1123 DP 794114*", dated September 2013

16. Blending, placement and compaction of Zone A layer under Level 1 supervision on Lot 111 only.
17. Loading and transport of material from Stockpile 1 through the weighbridge and delivery to Stage 1B area for placement and compaction in Zone B on Lot 111 only, under Level 1 supervision.
18. Final trim of the subgrade across Lot 111 once RL6.5 of the hockey pitches footprint is achieved.
19. Final trim of the batters surrounding Stage 1B on Lot 111 only.

Price based on:

20. Work can be carried out in a continuous and productive manner
21. Works can be carried out on Saturdays.
22. Enough sandstone is made available by Breen's to continuously cart from stockpile to site, the stockpile is within 300m of the site and there is adequate, safe access from the site to the stockpile area.
23. The sandstone capping layer remains in place for the general earthworks.
24. Any deficit of material for the works will be sourced and supplied by Breen's.

Not allowed for:

25. Dewatering of the site
26. Processing of sandstone
27. Removal of sandstone following impact compaction
28. Compaction of sandstone layer prior to HEIC other than 'tracking in'
29. Removal of organic matter or foreign items from native sand or sandstone.
30. Replacing any unsuitable subgrade material either before or after impact compaction or dealing with Latent Conditions.
31. Coordination with Council if inspections are required.
32. Impact Compaction to the area outside that shown on the attached plan. This remaining 3,200m^2 will be treated as per the original requirements of the contract.
33. Removal of any contaminated material including asbestos should it be encountered

Once written approval of this variation has been received, we can commence the works. Note that there could be a lead time of between 2-4 weeks for Landpac to mobilise on site to carry out the impact compaction.

If you require further information, please don't hesitate to contact me

Kind Regards

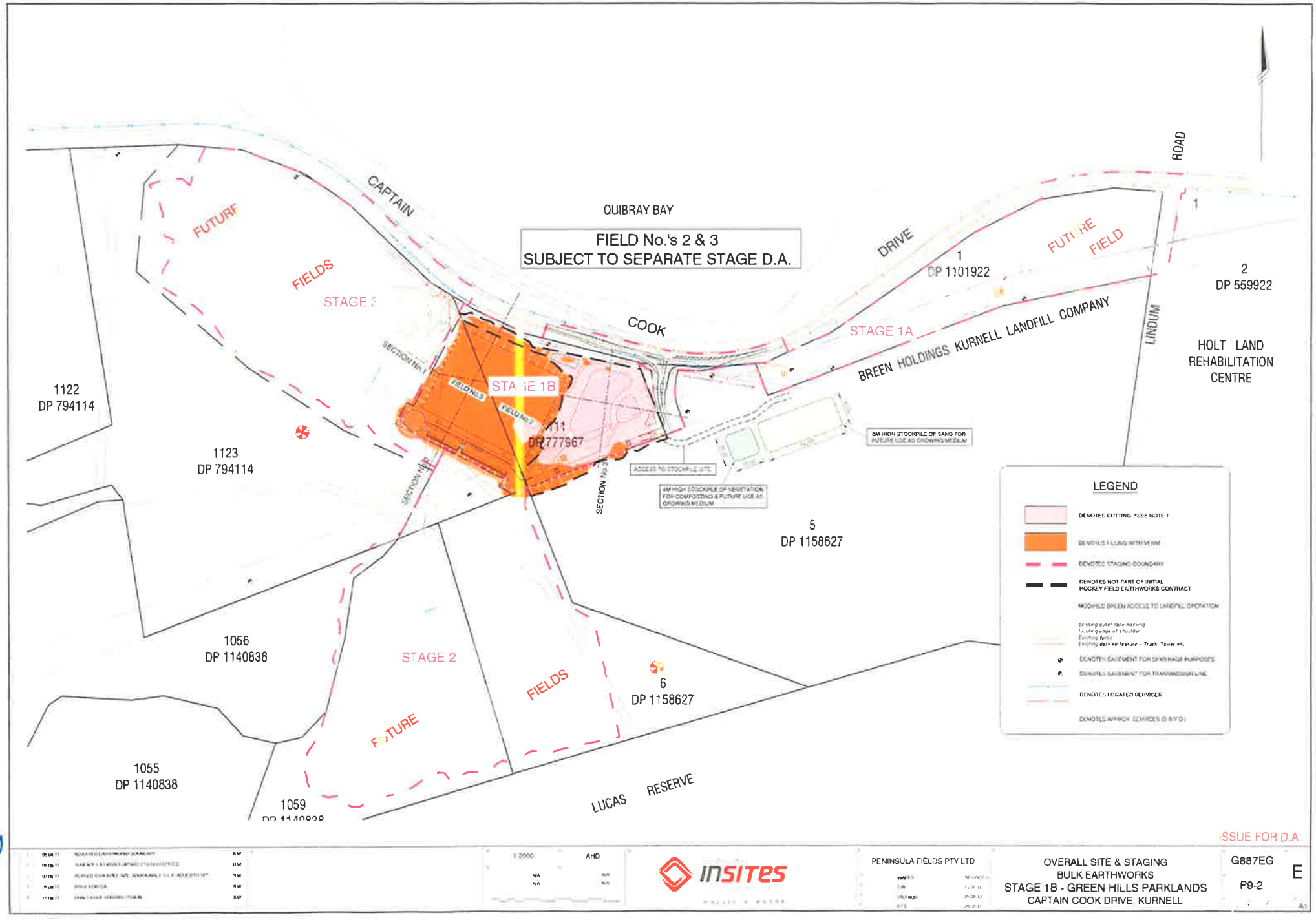
Burton Contractors Pty Limited

Dave Condon
Project Manager

Project:	Kurnell Playing Fields - Stage 1B - Bulk Earthworks	Date:	19-Nov-13
Variation # 005	Revised Filling Methodology	Job No:	329

BURTON
Civil Engineering Contractors

Schedule C - VPA Site Plan


QUIBRAY BAY
FIELD No.'s 2 & 3
SUBJECT TO SEPARATE STAGE D.A.
CAPTAIN COOK DRIVE
FUTURE FIELDS
STAGE 3
STAGE 1B
STAGE 1A
STAGE 2
FUTURE FIELDS
FUTURE FIELD
ROAD
LINDUM
1
DP 1101922
2
DP 559922
HOLT LAND REHABILITATION CENTRE
BREEN HOLDINGS KURNELL LANDFILL COMPANY
1122
DP 794114
1123
DP 794114
1056
DP 1140838
1055
DP 1140838
1059
5
DP 1158627
6
DP 1158627
LUCAS RESERVE
SECTION No.1
SECTION No.2
SECTION No.3
FIELD No.2
FIELD No.3
ACCESS TO STOCKPILE SITE
6M HIGH STOCKPILE OF SAND FOR FUTURE USE AS GROWING MEDIUM
4M HIGH STOCKPILE OF VEGETATION FOR COMPOSTING & FUTURE USE AS GROWING MEDIUM
LEGEND
DENOTES CUTTING *SEE NOTE 1
DENOTES FILLING WITH VENM
DENOTES STAGING BOUNDARY
DENOTES NOT PART OF INITIAL HOCKEY FIELD EARTHWORKS CONTRACT
MODIFIED BREEN ACCESS TO LANDFILL OPERATION
DENOTES EASEMENT FOR SEWERAGE PURPOSES
DENOTES EASEMENT FOR TRANSMISSION LINE
DENOTES LOCATED SERVICES
ISSUE FOR D.A.
1:2000
AHD
INSITES
PENINSULA FIELDS PTY LTD
OVERALL SITE & STAGING
BULK EARTHWORKS
STAGE 1B - GREEN HILLS PARKLANDS
CAPTAIN COOK DRIVE, KURNELL
G887EG
P9-2
E
A1

Schedule D – Specification

SEPCIFICATION FOR COMPACTION WORKS FIELDS 2 & 3
GREENHILLS PARKLAND SUB-STAGE 1B

Prior to the construction of the synthetic hockey fields the owners shall carry out compaction works as follows:

1. Supervision

1.1. All works shall be carried out under the supervision of the nominated Project Superintendent and Geotechnical Inspection & Testing Authority (GITA)

2. Preparation

2.1. Fields 2 & 3 shall be cleared and regraded and the subgrade near level at approx RL 2.5 AHD for the placement and compaction of fill in accordance with the following layers.

3. Stockpiles

The stockpiles to be used in the Sandstone Capping Layer, Zone A and Zone B are nominated in the specification are located as per Drawing 1 and consist of the material identified in Appendix A of this Schedule the "Stockpile Assessment".

4. Sandstone Capping Layer

4.1. The Sandstone Capping Layer is as identified in Appendix B of this Schedule

4.2. Placement of a layer of sandstone or crushed rock capping material from Stockpile 6 (refer to drawing 1) to form a stable platform for impact rolling. The appropriate thickness of the capping material shall be determined by the impact rolling contractor. Typical thickness of capping material may range from 300mm to 500mm.

4.3. Impact rolling of the prepared surface by a specialist contractor and this equipment shall be equipped with a Continuous Impact Response (CIR) unit to monitor the densification process.

4.4. The impact rolling contractor shall carry out compaction testing as witnessed by the GITA

4.5. All materials are to be placed and compacted to ensure that there is seamless 'stitching' across property boundary affected by the works.

5. Zone A

5.1. Zone A is as identified in Appendix B of this Schedule

5.2. Shall comprise of material from Stockpiles 2, 4, 5, 6 & 7 and shall be treated and improved by moisture conditioning by drying. Material selection and blending shall be under the supervision of the GITA.

5.3. The treated fill shall be used within Zone A up to approx. RL 5m AHD

5.4. The treated fill shall be placed in layers not exceeding 300mm loose thickness and compacting using a minimum 10 tonne vibrating roller

5.5. The fill within Zone A shall be compacted to a minimum density ratio of 98%

5.6. Density testing shall be carried out by the nominated GITA and NATA accredited laboratory to ensure the minimum specified compaction level is achieved.

5.7. All materials are to be placed and compacted to ensure that there is seamless 'stitching' across property boundary affected by the works.

6. Zone B

6.1. Zone B is as identified in Appendix B of this Schedule

6.2. Zone B material shall consist of cohesionless material including material from stockpile 1, surplus excavated sand from the Australand's platform and the sand won from the wetland excavation to form the upper 2.0m (min) of the hockey field platform.

6.3. The sand fill shall be placed in layers not exceeding 300mm loose thickness and compacting using a minimum 10 tonne vibrating roller.

6.4. The material within Zone B shall be compacted to a minimum 80% Density Index.

6.5. Density testing shall be carried out by the nominated GITA and NATA accredited laboratory to ensure the minimum specified compaction level is achieved.

6.6. All materials are to be placed and compacted to ensure that there is seamless 'stitching' across property boundary affected by the works.

7. Zone C

7.1. Zone C is as identified in Appendix B of this Schedule and does not form part of these works

8. Testing

8.1. The frequency of density testing complying with Table 8.1 AS 3798-2007 "Guidelines for Earthworks for Commercial and Residential Sites" shall be carried out by the GITA.

8.2. Testing shall be carried out to each zone and the certificate of compliance must be issued prior to proceeding with works to the following zone.

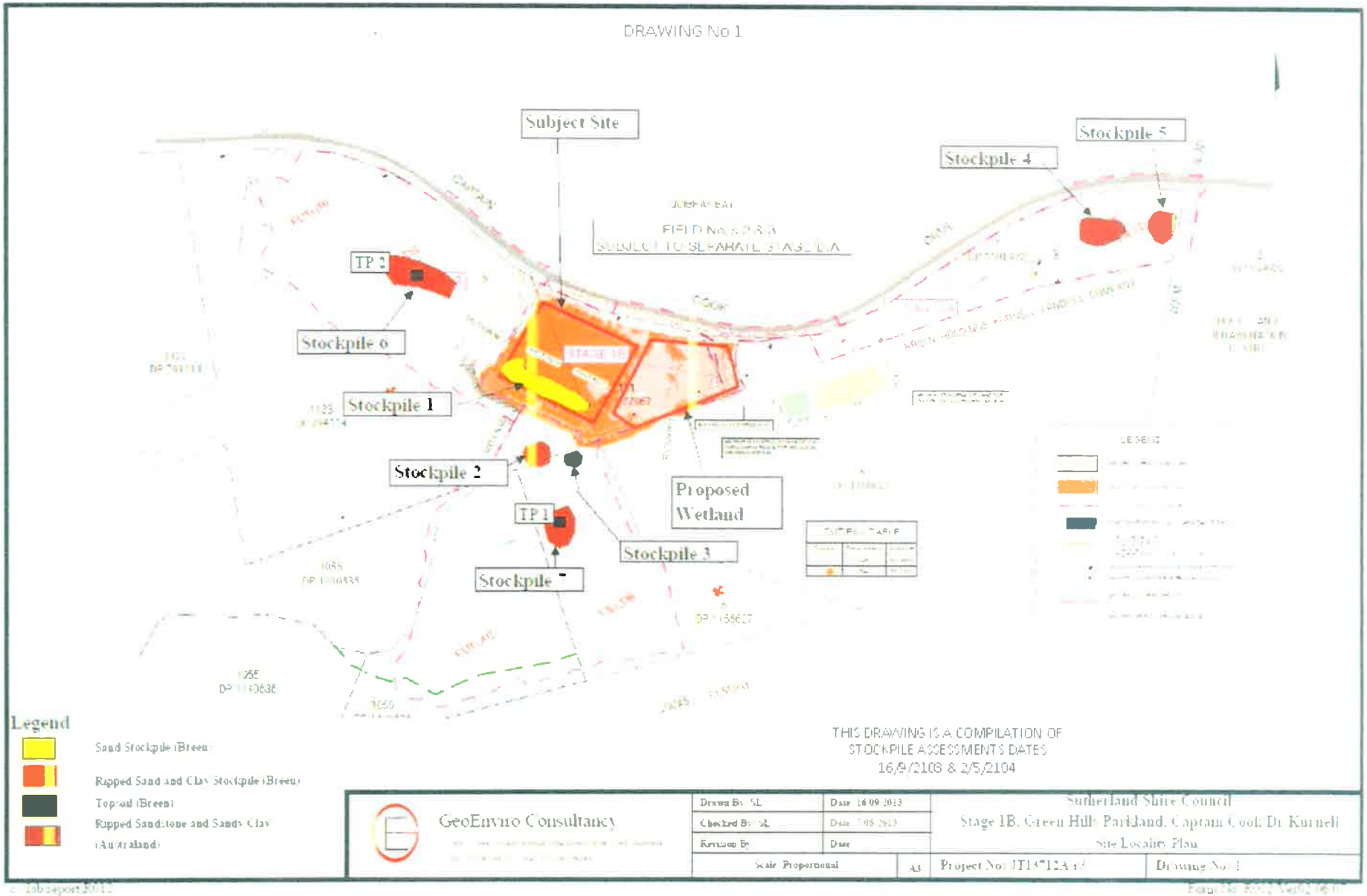
8.3. Works failing to comply with the required specification shall be rectified prior to proceeding with any further works.

9. Sydney Water Sewer Mains Protection

9.1. Site densification using impact rolling and conventional vibrating roller shall be carried out with care to avoid damage to Sydney Water's sewer mains referenced by AECOM letter dated 10 September 2013

10. Final Compliance Certification

10.1. A final compliance certificate shall be issued by the GITA upon completion of all densification and earthworks.


DRAWING No 1
Subject Site
Stockpile 5
Stockpile 4
TP 2
Stockpile 6
Stockpile 1
Stockpile 2
TP 1
Stockpile 3
Stockpile
Proposed Wetland
Legend
Sand Stockpile (Breen)
Ripped Sand and Clay Stockpile (Breen)
Topsoil (Breen)
Ripped Sandstone and Sandy Clay (Australand)
THIS DRAWING IS A COMPILATION OF STOCKPILE ASSESSMENTS DATES 16/9/2108 & 2/5/2104
GeoEnviro Consultancy
Sutherland Shire Council
Stage 1B, Green Hills Parkland, Captain Cook Dr Kurnell
Site Locality Plan
Drawn By: SL
Checked By: SL
Revision By:
Scale: Proportional
A3
Drawing No: 1


EXTENT OF
COMPACTION
NOTE
YOU DIG
INSITES

Appendix A

GeoEnviro Stockpile Reports

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown, NSW 2148, Australia
PO Box 1543, Macquarie Centre, North Ryde, NSW 2113

ABN 62 084 294 7[illegible]
Tel: (02) 9679 8733
Fax: (02) 9679 8744
Email: geoenviro@exemail.com.au

18th July 2014

Our Ref: JT13712A-r4(rev)

Sutherland Shire Council
Locked Bag 17
SUTHERLAND NSW 1499

Attention : Mr Mick Ryan

Dear Sir

RE: Stockpile Material Assessment – Stockpile No 6 and Stockpile No 7
Stage 1B Green Hills Parkland
Part 111 DP 77967 and Part Lot 1123 DP 794114 Captain Cook Drive Kurnell

As requested we have carried out a site visit on the 20th March 2014. The purpose of the site visit was to inspect the fill stockpiles (Stockpile No 6 and Stockpile 7) placed within the Breen site and to assess the suitability of the material for use in the construction of the proposed Hockey field.

1.0 Stockpile Description

Stockpile No 6 is located to the south west and Stockpile No 7 is located to the south of the proposed hockey field as shown on the attached Drawing No 1. Two test pits (TP 1 and 2) were excavated into the stockpiles to depths of 5.0m and 4.30m below existing ground surface. Four samples (Sample A to D) were taken from the stockpiles.

The test pits revealed the stockpiles to consist predominantly of ripped sandstone with some pockets of Silty Clay. The following is a summary of the stockpile material encountered:

Stockpile	Test Pit	Depth	Sample	Material Description
Stockpile 7	1	0.0-0.5		Ripped Sandstone and Ripped Shale with some broken concrete and brick fragments
		0.8-1.5	Sample B	Gravelly Silty Clay: medium to high plasticity, with small concrete fragments
		1.5-5.0	Sample A	Ripped Shale with some bricks and concrete and a trace of PVC fragments
Stockpile 6	2	0.0-0.5		Sand
		0.5-1.0		Ripped Sandstone and Silty Clay mixture. Some sandstone boulders and a trace of building rubble
		1.0-2.5	Sample C	Ripped sandstone : cobbles and boulders
		2.5-3.0		Silty Clay with ripped sandstone, red brown
		3.0-4.3	Sample D	Ripped sandstone with some boulders

2.0 Laboratory Testing

Four samples were taken from the stockpiles and the samples were tested for the following:

- Hydrometer
- Atterberg Limits
- Particle Size Distribution
- Natural Moisture Content
- Emerson Dispersion

Please find attached laboratory test reports. The following is a summary of the laboratory test results.

Atterberg and Natural Moisture Content

Sample No	Depth	LL (%)	PL (%)	PI (%)	LS (%)	MC (%)
Sample A	1.5-2.0m	32	18	14	4	14.5
Sample B	0.8-1.3m	31	17	14	4	11.5
Sample C	1.0-1.5m	NP	NP	NP	NP	11.5
Sample D	3.0-3.5m	NP	NP	NP	NP	10.7

Note: LL – Liquid Limit
PI – Plastic Limit
PI - Plasticity Index
LS – Linear Shrinkage
MC – Moisture Content
NP – Non Plastic

Particle Size Distribution

Sample No	Depth	Percentage			
		Clay	Silt	Sand	Gravel
Sample A	1.5-2.0m	15%	25%	15%	45%
Sample B	0.8-1.3m	20%	28%	20%	32%
Sample C	1.0-1.5m	17%	15%	53%	15%
Sample D	3.0-3.5m	6%	7%	60%	27%

Emerson

Sample No	Depth	Emerson Class	Description
Sample A	1.5-2.0m	2	High Dispersion
Sample B	0.8-1.3m	2	High Dispersion
Sample C	1.0-1.5m	4	Moderate Dispersion
Sample D	3.0-3.5m	3	Moderate to High Dispersion

3.0 Material Assessment

Based on the laboratory test results, the stockpile material comply with the material specification for Zone A in our Earthworks Management Plan (Report Ref JT13712A-r3 dated September 2013).

From our test pit investigation, the fill stockpiles were found to predominantly consist of ripped sandstone with some pockets of clay. Our comments and assessment on the reuseability of this stockpile material are as follows:

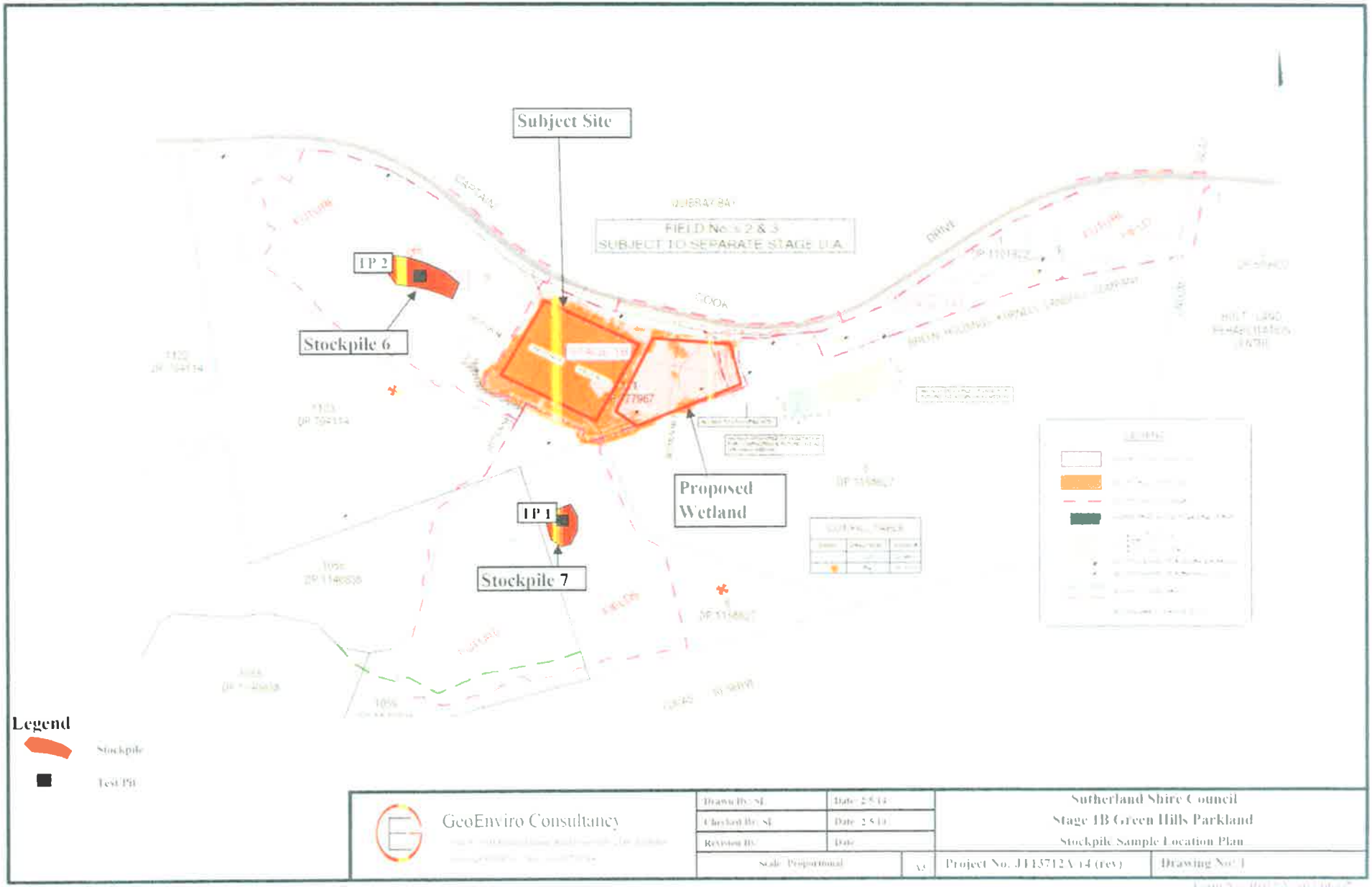
- This material may be reused as Zone A fill for the proposed hockey field.
- This material is not suitable for use as Zone B and C fill for the hockey field.
- This material may be generally considered suitable for use as the sandstone capping material for the impact rolling. We note that the fill stockpile has some pockets of clay and this material where encountered during excavation should be isolated or mixed with the ripped sandstone prior to use as capping material. As the impact rolling contractor will be responsible for ground improvement of material below the capping layer, we recommend further advice be sought with the impact rolling contractor to ensure suitability of this material for reuse.

If you have any queries regarding the above, please contact the undersigned.

Yours faithfully,
GeoEnviro Consultancy Pty Ltd

Solem Liew CPEng
Director

Attachment: Drawing No 1- Stockpile Sampling Location Plan
Laboratory Test Report


Subject Site
FIELD Nos 2 & 3
SUBJECT TO SEPARATE STAGE II A
TP 2
Stockpile 6
Proposed
Wetland
TP 1
Stockpile 7
Legend
Stockpile
Test Pit
GeoEnviro Consultancy
Sutherland Shire Council
Stage 1B Green Hills Parkland
Stockpile Sample Location Plan
Project No. J113712A 14 (rev)
Drawing No. 1

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148 Australia
Tel: (02) 96796733 Fax: (02) 96796744

Emerson Class Number

Client / Address: Sutherland Shire Council / Sutherland				Job No: JT13712A-r4	
Project: Stage 1B Green Hills Parkland				Date: 22/04/2014	
Location: Captain Cook Drive, Kurnell				Report No: R01A	
Sample Identification	= A (1.50-2.00m)	= B (0.80-1.30m)	= C (1.00-1.50m)	= D (3.00-3.50m)	
Sample Register No	SR 8611	SR 8612	SR 8613	SR 8614	
Sample Date	21-Mar-14	21-Mar-14	21-Mar-14	21-Mar-14	
Test Date	27-Mar-14	27-Mar-14	27-Mar-14	27-Mar-14	
Sample Procedure	AS 1289 1.1.1.2.1 (6.5.4)	AS 1289 1.1.1.2.1 (6.5.4)	AS 1289 1.1.1.2.1 (6.5.4)	AS 1289 1.1.1.2.1 (6.5.4)	
Test Procedure	AS 1289 1.1.1.2.1, 3.8.1				
Test Results					
Air Dried crumbs					
Time in water	10:56	10:54	10:54	10:54	
Time dispersion starts	10:56	10:54	-	-	
Remoulded Soil					
Time in water	-	-	11:05	11:05	
Time dispersion starts	-	-	-	11:10	
Type of water	Distilled	Distilled	Distilled	Distilled	
Temp. of water	23°C	23°C	23°C	23°C	
Emerson Class Number					
Class No	2	2	4	3	
Remarks					

NATA TECHNICAL COMPETENCE

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96798733 Fax: (02) 96798744

Atterberg Limits & Particle Size Distribution

Client / Address: Sutherland Shire Council / Sutherland	Job No: JT13712A-r4
Project: Stage 1B Green Hills Parkland	Date: 22/04/2014
Location: Captain Cook Drive, Kurnell	Report No: R02A
Lab Reference No: SR 6611	Sample Identification: = A (1.50-2.00m)
Laboratory Specimen Description: Ripped Shale and Ripped Sandstone	

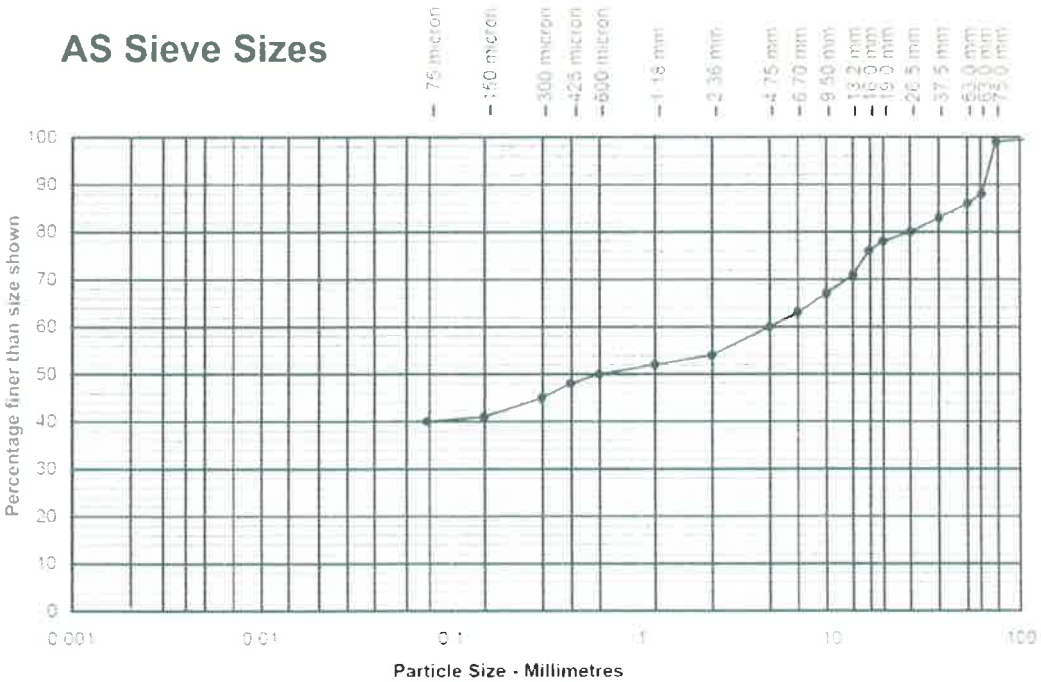
Test Method	Test Results	Test Procedure
Liquid Limit (%)	32	AS 1289.3.1.1
Plastic Limit (%)	18	AS 1289.3.2.1
Plasticity Index (%)	14	AS 1289.3.3.1
Linear Shrinkage (%)	4.0	AS 1289.3.4.1
Natural Moisture %	14.5	AS 1289.2.1.1
Sample History	Air dried	
Preparation Method	Dry sieved	
Condition of linear shrinkage	Curling linear shrinkage	
Linear shrinkage mould length	250mm	

NC = not determined NO = not obtainable *P = non plastic

Test Procedure: AS1289.3.1.1, 3.6.3

Sieve Size	% Passing	Specification
150 mm	100	
75 mm	99	
63 mm	88	
53 mm	86	
37.5 mm	83	
26.5 mm	80	
19 mm	78	
16 mm	76	
13.2 mm	71	
9.5 mm	67	
6.7 mm	63	
4.75 mm	60	
2.36 mm	54	
1.18 mm	52	
600 um	50	
425 um	48	
300 um	45	
150 um	41	
75 um	40	

AS Sieve Sizes



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks:

NATA TECHNICAL

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96798733 Fax: (02) 96798744

Atterberg Limits & Particle Size Distribution

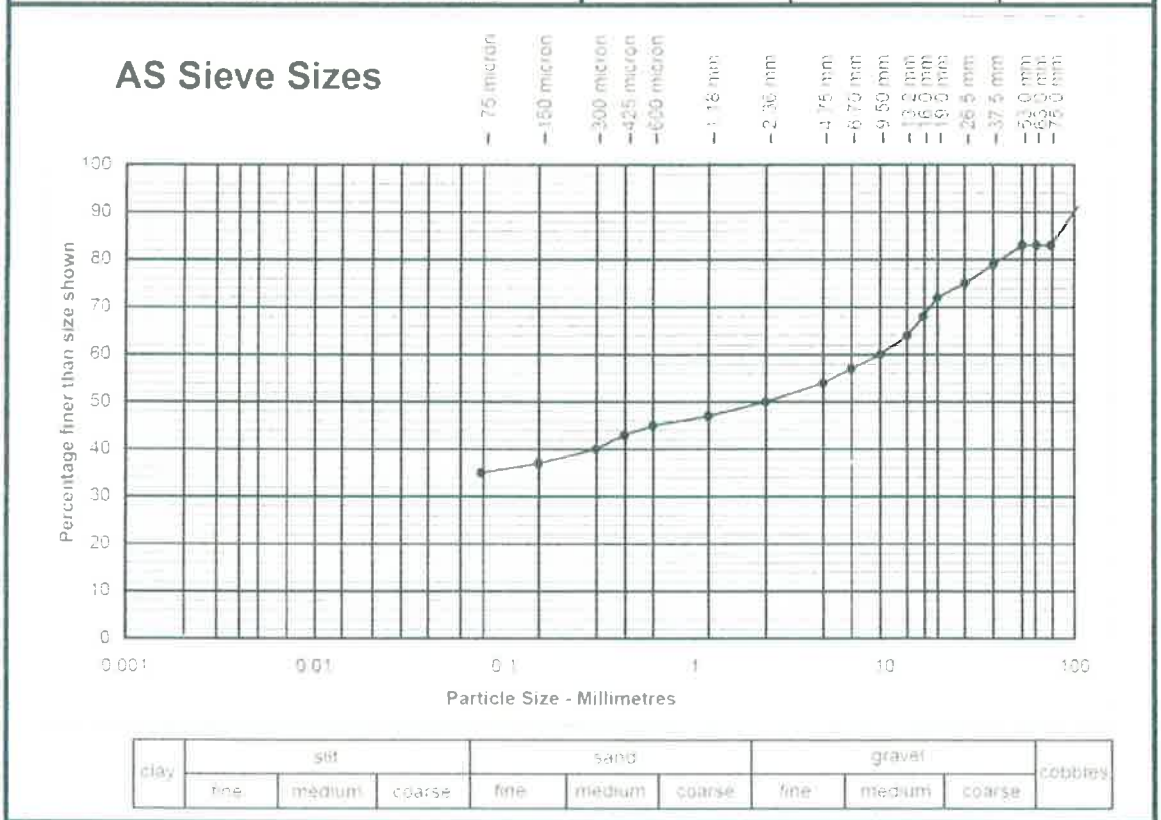
Client / Address: Sutherland Shire Council / Sutherland	Job No: JT13712A-r4
Project: Stage 1B Green Hills Parkland	Date: 22/04/2014
Location: Captain Cook Drive, Kurnell	Report No: R03A
Lab Reference No: SR 8612	Sample Identification: = B (0.80-1.30m)
Laboratory Specimen Description: Ripped Shale and Ripped Sandstone	

Test Method	Test Results	Test Procedure
Liquid Limit (%)	31	AS 1289.3.1.1
Plastic Limit (%)	17	AS 1289.3.2.1
Plasticity Index (%)	14	AS 1289.3.3.1
Linear Shrinkage (%)	4.0	AS 1289.3.4.1
Natural Moisture %	11.5	AS 1289.2.1.1
Sample History	Air dried	
Preparation Method	Dry sieved	
Condition of linear shrinkage	Curling linear shrinkage	
Linear shrinkage mould length	250mm	

ND = not determined, NC = not obtainable, NP = non plastic

Test Procedure: AS1289.2.1.1, 3.6.3

Sieve Size	% Passing	Specification
150 mm	100	
75 mm	83	
63 mm	83	
53 mm	83	
37.5 mm	79	
26.5 mm	75	
19 mm	72	
16 mm	68	
13.2 mm	64	
9.5 mm	60	
6.7 mm	57	
4.75 mm	54	
2.36 mm	50	
1.18 mm	47	
600 um	45	
425 um	43	
300 um	40	
150 um	37	
75 um	35	



Remarks

NATA TECHNICAL COMPETENCE

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Tel (02) 96798733 Fax (02) 96798744

Atterberg Limits & Particle Size Distribution

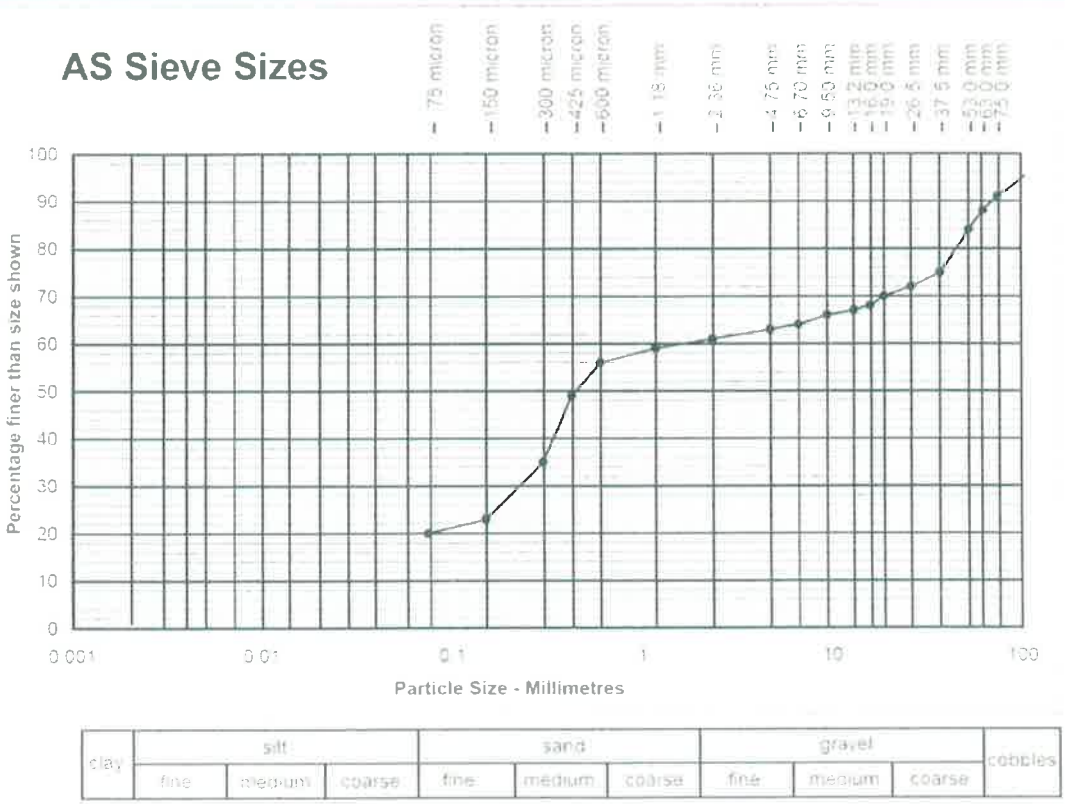
Client / Address Sutherland Shire Council / Sutherland	Job No JT13712A-r4
Project Stage 1B Green Hills Parkland	Date 22/04/2014
Location Captain Cook Drive Kurnell	Report No R04A
Lab Reference No SR 8613	Sample Identification = C (1.00-1.50m)
Laboratory Specimen Description Ripped Sandstone	

Test Method	Test Results	Test Procedure
Liquid Limit (%)	NP	AS 1289.3.1.1
Plastic Limit (%)	NP	AS 1289.3.2.1
Plasticity Index (%)	NP	AS 1289.3.3.1
Linear Shrinkage (%)	NP	AS 1289.3.4.1
Natural Moisture %	11.5	AS 1289.2.1.1
Sample History	Air dried	
Preparation Method	Dry sieved	
Condition of linear shrinkage		
Linear shrinkage mould length		

ND = not determined, NC = not obtainable, NP = non plastic

Test Procedure AS1289.2.1.1 3.6.3

Sieve Size	% Passing	Specification
150 mm	100	
75 mm	91	
63 mm	88	
53 mm	84	
37.5 mm	75	
26.5 mm	72	
19 mm	70	
16 mm	68	
13.2 mm	67	
9.5 mm	66	
6.7 mm	64	
4.75 mm	63	
2.36 mm	61	
1.18 mm	59	
600 um	56	
425 um	49	
300 um	35	
150 um	23	
75 um	20	



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks:

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APPENDIX A

Atterberg Limits & Particle Size Distribution

Client / Address: Sutherland Shire Council / Sutherland	Job No: JT13712A-r4
Project: Stage 1B Green Hills Parkland	Date: 22/04/2014
Location: Captain Cook Drive, Kurnell	Report No: R05A
Lab Reference No: SR 8614	Sample Identification: = D (3.00-3.50m)
Laboratory Specimen Description: Ripped Sandstone	

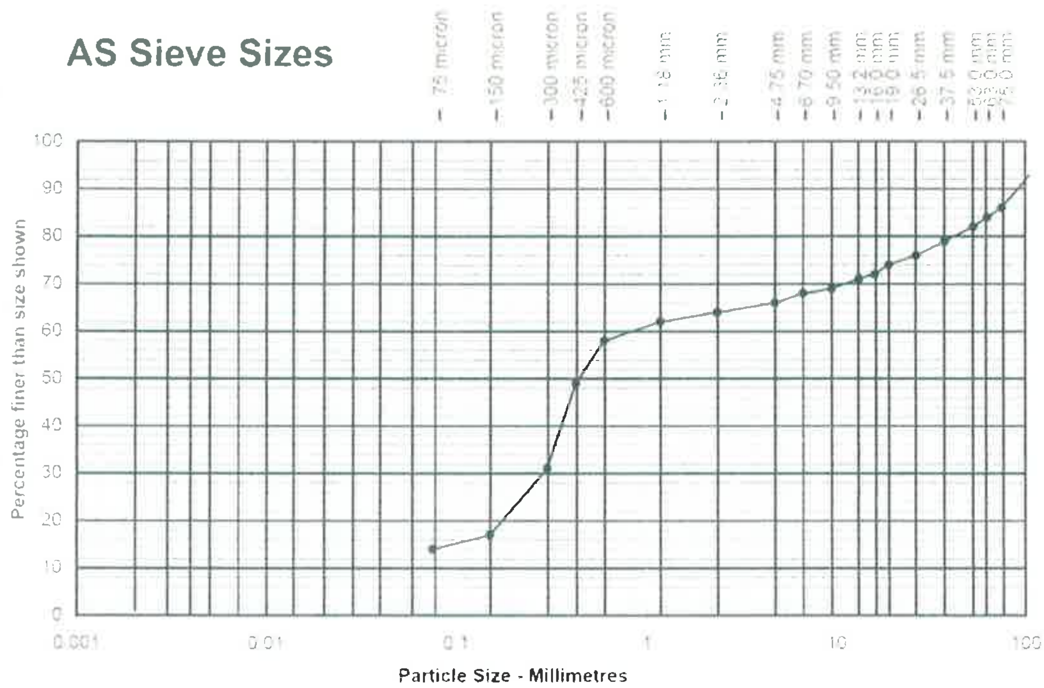
Test Method	Test Results	Test Procedure
Liquid Limit (%)	NP	AS 1289 3.1.1
Plasitc Limit (%)	NP	AS 1289 3.2.1
Plasticity Index (%)	NP	AS 1289 3.3.1
Linear Shrinkage (%)	NP	AS 1289 3.4.1
Natural Moisture %	10.7	AS 1289 2.1.1
Sample History	Air drier	
Preparation Method	Dry sieved	
Condition of linear shrinkage		
Linear shrinkage mould length		

ND = not determined NO = not obtainable NP = non plastic

Test Procedure: AS1289 2.1.1, 3.6.3

Sieve Size	% Passing	Specification
150 mm	100	
75 mm	86	
63 mm	84	
53 mm	82	
37.5 mm	79	
26.5 mm	76	
19 mm	74	
16 mm	72	
13.2 mm	71	
9.5 mm	69	
6.7 mm	68	
4.75 mm	66	
2.36 mm	64	
1.18 mm	62	
600 um	55	
425 um	49	
300 um	31	
150 um	17	
75 um	14	

AS Sieve Sizes



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks:

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NATA Accredited Laboratory Number: [illegible]

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Atterberg Limits & Particle Size Distribution (Hydrometer)

Client / Address: Sutherland Shire Council / Sutherland — Job No: JT13712A-r4

Project: Stage 1B Green Hills Parkland — Date: 22/04/2014

Location: Captain Cook Drive, Kurnell — Report No: R06A

Lab Reference No: SR 3611 — Sample Identification: = A (1.50-2.00m)

Laboratory Specimen Description: Ripped Shale and Ripped Sandstone

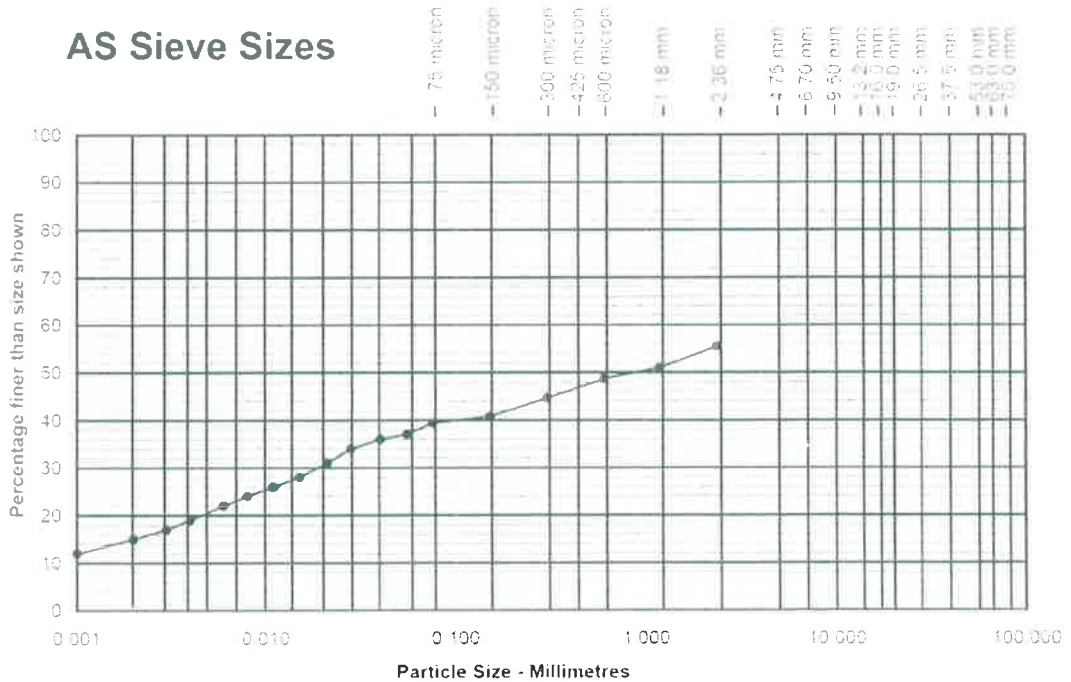
Test Method	Test Results	Test Procedure
Liquid Limit (%)	32	AS 1289.3.1.1
Plastic Limit (%)	18	AS 1289.3.2.1
Plasticity Index (%)	14	AS 1289.3.3.1
Linear Shrinkage (%)	4.0	AS 1289.3.4.1
Natural Moisture %	14.5	AS 1289.2.1.1
Sample History	Air dried	
Preparation Method	Dry sieved	
Condition of linear shrinkage	Curling linear shrinkage	
Linear shrinkage mould length	250mm	

ND = not determined, NO = not obtainable, NP = non plastic

Test Procedure: AS1289.2.1.1; 3.6.3

Sieve Size	% Passing	Specification
2.36 mm	56	
1.18 mm	51	
600 um	49	
300 um	45	
150 um	41	
75 um	39	
55 um	37	
40 um	36	
28 um	34	
21 um	31	
15 um	28	
11 um	26	
8 um	24	
6 um	22	
4 um	19	
3 um	17	
2 um	15	
1 um	12	

AS Sieve Sizes



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks

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Atterberg Limits & Particle Size Distribution (Hydrometer)

Client / Address: Sutherland Shire Council / Sutherland — Job No: JT13712A-r4
Project: Stage 1B Green Hills Parkland — Date: 22/04/2014
Location: Captain Cook Drive, Kurnell — Report No: R07A

Lab Reference No: SR 8612 — Sample Identification: # B (0.80-1.30m)

Laboratory Specimen Description: Ripped Shale and Ripped Sandstone

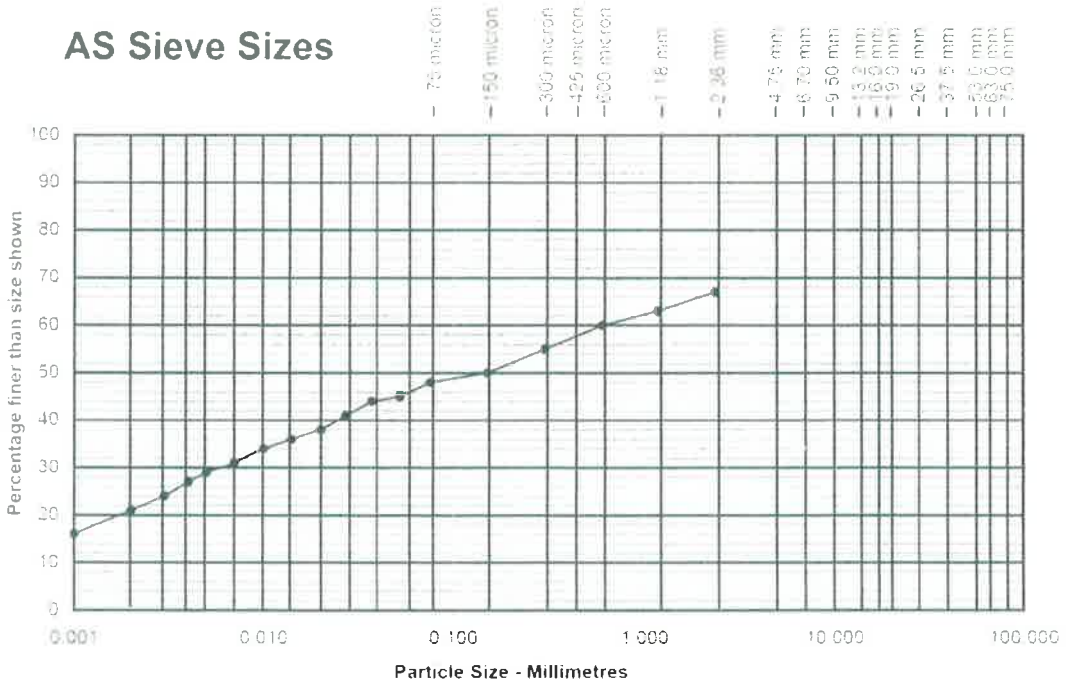
Test Method	Test Results	Test Procedure
Liquid Limit (%)	31	AS 1289 3.1.1
Plastic Limit (%)	17	AS 1289 3.2.1
Plasticity Index (%)	14	AS 1289 3.3.1
Linear Shrinkage (%)	4.0	AS 1289 3.4.1
Natural Moisture %	11.5	AS 1289 2.1.1
Sample History	Air dried	
Preparation Method	Dry sieved	
Condition of linear shrinkage	Curling linear shrinkage	
Linear shrinkage mould length	250mm	

ND = not determined, NO = not obtainable, NP = non plastic

Test Procedure: AS1289.2.1.1, 3.6.3

Sieve Size	% Passing	Specification
2.36 mm	67	
1.18 mm	63	
600 um	60	
300 um	55	
150 um	50	
75 um	48	
52 um	45	
37 um	44	
27 um	41	
20 um	38	
14 um	36	
10 um	34	
7 um	31	
5 um	29	
4 um	27	
3 um	24	
2 um	21	
1 um	16	

AS Sieve Sizes



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks

Authorised Signatory: _____ Date: 22/04/2014

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Atterberg Limits & Particle Size Distribution (Hydrometer)

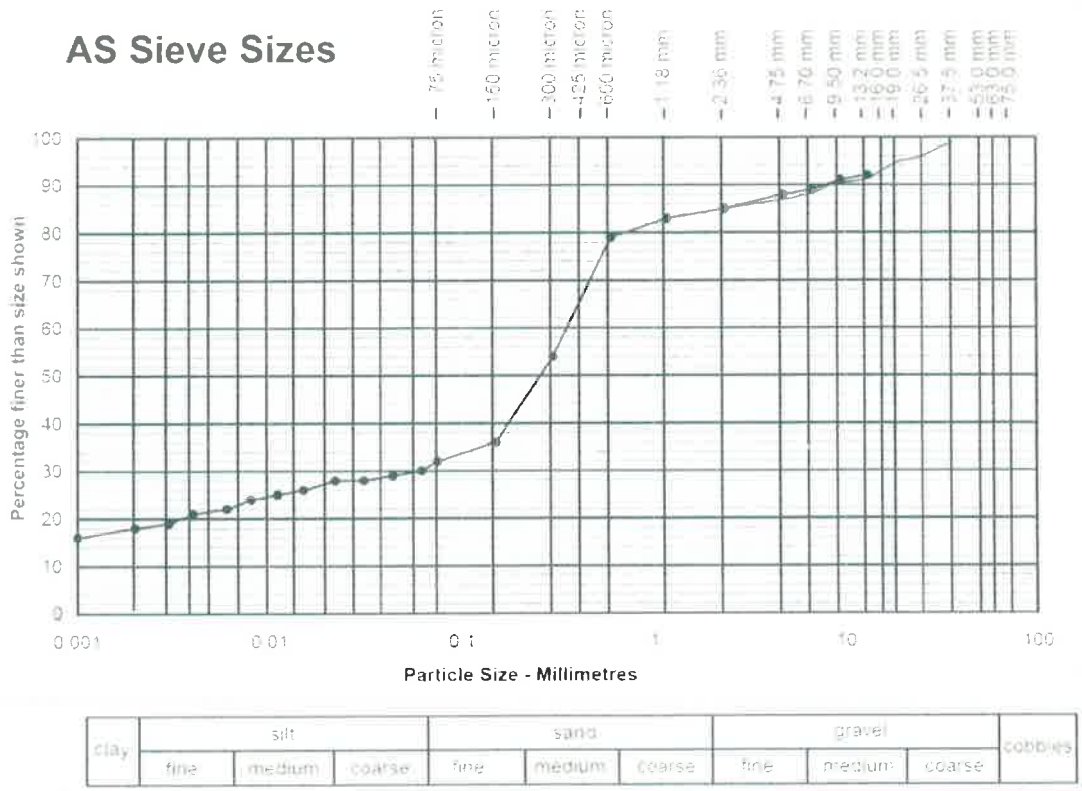
Client / Address: Sutherland Shire Council / Sutherland	Job No: JT13712A-r4
Project: Stage 1B Green Hills Parkland	Date: 22/04/2014
Location: Captain Cook Drive, Kurnell	Report No: R08A
Lab Reference No: SR 8613	Sample Identification: = C (1.00-1.50m)
Laboratory Specimen Description: Ripped Sandstone	

Test Method	Test Results	Test Procedure
Liquid Limit (%)	NP	AS 1289.3.1.1
Plastic Limit (%)	NP	AS 1289.3.2.1
Plasticity Index (%)	NP	AS 1289.3.3.1
Linear Shrinkage (%)	NP	AS 1289.3.4.1
Natural Moisture %	11.5	AS 1289.2.1.1
Sample History	Air dried	
Preparation Method	Dry sieved	
Condition of linear shrinkage		
Linear shrinkage mould length		

NS = not determined, NA = not obtainable, NP = non plastic

Test Procedure: AS1289.3.6.3

Sieve Size	% Passing	Specification
2.36 mm	85	
1.18 mm	83	
600 um	79	
300 um	54	
150 um	36	
75 um	32	
62 um	30	
44 um	29	
31 um	28	
22 um	28	
15 um	26	
11 um	25	
8 um	24	
6 um	22	
4 um	21	
3 um	19	
2 um	18	
1 um	16	



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Atterberg Limits & Particle Size Distribution (Hydrometer)

Client / Address: Sutherland Shire Council / Sutherland	Job No: JT13712A-r4
Project: Stage 1B Green Hills Parkland	Date: 22/04/2014
Location: Captain Cook Drive, Kurnell	Report No: R09A
Lab Reference No: SR 8614	Sample Identification: = D (3.00-3.50m)
Laboratory Specimen Description: Ripped Sandstone	

Test Method	Test Results	Test Procedure
Liquid Limit (%)	NP	AS 1289 3.1.1
Plastic Limit (%)	NP	AS 1289 3.2.1
Plasticity Index (%)	NP	AS 1289 3.3.1
Linear Shrinkage (%)	NP	AS 1289 3.4.1
Natural Moisture %	10.7	AS 1289 2.1.1
Sample History	Air dried	
Preparation Method	Dry sieved	
Condition of linear shrinkage		
Linear shrinkage mould length		

ND = not determined NC = not calculable NP = non plastic

Test Procedure: AS1289.2.1.1, 3.6.3

Sieve Size	% Passing	Specification
2.36 mm	74	
1.18 mm	72	
600 um	68	
300 um	39	
150 um	17	
75 um	13	
70 um	11	
50 um	11	
35 um	10	
25 um	10	
17 um	10	
13 um	9	
9 um	9	
6 um	8	
5 um	8	
3 um	7	
2 um	6	
1 um	6	

AS Sieve Sizes

clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks

2. PROJECT APPRECIATION

We understand that the hockey fields to be constructed on the western half of Stage 1B Green Hills Parkland will be surfaced with synthetic grass. Construction of the hockey field platform will require bulk earthworks by filling to about Reduced Level (RL) 7m Australian Height Datum (AHD). Based on current ground surface level, fill up 3.5m high will be required on the Australand Site (ie Lot 111) and up to 6m will be required on the Breen Site (ie Lot 1123).

Based on our discussion with Mr Claudio Savian of Sutherland Shire Council, we understand that a total of 80,000 m³ of fill will be required and it is intended for the fill to be sourced from within the site as follows (Refer to Drawing No 1).

Source	Stockpile Material Description	Quantity (Approx)	Ownership
Stockpile 1	Silty Sand	45000m³	Breen
Stockpile 2	Ripped Sandstone and Clay lumps		
Stockpile 3	Silty Sand Topsoil with organics		
Stockpile 4	Ripped sandstone with Clayey Sand	35000m³	Australand
Stockpile 5			
Proposed Wetland	Silty Sand		

The following is a summary of material properties based on our laboratory test results. Refer to Appendix A for details of the laboratory test reports..

Particle Size Distribution (Hydrometer)

Sample	Stockpile	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
No 1	Stockpile 5	12	9	63	16
No 2	Stockpile 4	14	12	58	16
No 3	Stockpile 2	16	11	58	15
No 4	Stockpile 3	12		86	2
No 5	Stockpile 1	10		82	8

Atterberg Limits

Sample	Stockpile	LL	PL	PI	LS	MC
No 1	Stockpile 5	25%	15%	10%	5%	10.5%
No 2	Stockpile 4	26%	15%	11%	4.5%	9.2%
No 3	Stockpile 2	29%	17%	13%	6.5%	13.3%
No 4	Stockpile 3	NP	NP	NP	NP	17.6%
No 5	Stockpile 1	NP	NP	NP	NP	7.4%

Note: LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; LS = Linear Shrinkage; MC = Moisture Content

The eastern portion of Stage 1B will be converted into a wetland and this will mainly involved excavation and reshaping of the landform.

3. BACKGROUND INFORMATION

3.1 Site Locality

The Green Hills Parkland is located on the southern side of Captain Cook Drive on the Kurnell Peninsula between the Cronulla Sewerage Treatment plant and Endurn Road. The entire parkland has an irregular shape with an approximate 1.6 km frontage to Captain Cook Drive and extends about 700m from the frontage road to Lucas Reserve as shown on Drawing No 1.

Stage 1B parkland is situated approximately in the middle of the Green Hills Parkland and is bound by the Kurnell Landfill to the west, Captain Cook Drive to the North and Breen Holdings property to the south. Stage 1B comprises of two lots, Lot 111 DP 77967 owned by Australand Holdings and Lot 1123 DP 794114 owned by Breen Holdings.

The proposed hockey fields which will extend over any area of about 160m square will occupy the major portion of Stage 1B with the remaining eastern portion proposed to be used as wetlands. The boundary of Lot 111 and Lot 1123 transects diagonally across the proposed hockey fields. Refer to Drawing No 2.

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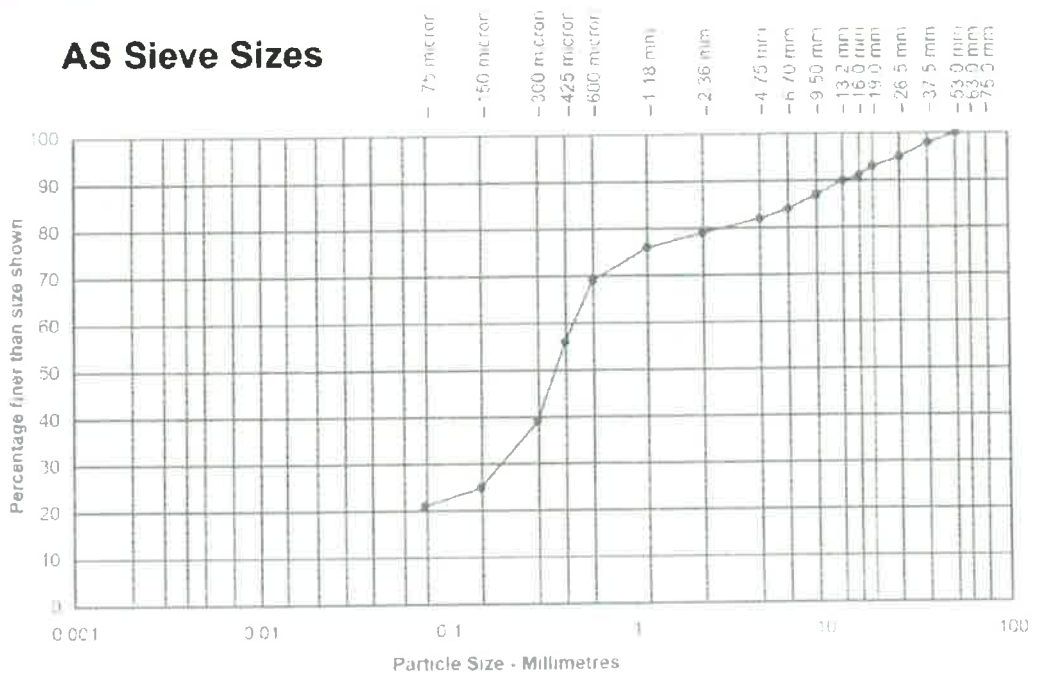
Particle Size Distribution

Client: - Address: Insites Pty Ltd (SYDNEY)	Job No: JT13712A-3
Project: Stage 1B Green Hills Parkland	Date: 17/09/2013
Location: Captain Cook Drive, Kurnell	Report No: R01A
Lab Reference No: SR 8171	Sample Identification: # 1 Australand Stockpile East (Stockpile 5)
Laboratory Specimen Description: Gravelly Clayey Sand, Fine to coarse grained, brown/yellow, with fine to coarse grave	
Test Procedure: AS1289.3.5.1, 3.6.1, 3.6.3	Sample Procedure: AS 1289.1.1, 1.2.1, 6.5.4

Sieve Size	% Passing	Specification	Sieve Size	% Passing	Specification
150 mm			425 um	56	
75 mm			300 um	39	
63 mm			150 um	25	
53 mm	100		75 um	21	
37.5 mm	98		59 um		
26.5 mm	95		39 um		
19 mm	93		28 um		
16 mm	91		20 um		
13.2 mm	90		14 um		
9.5 mm	87		10 um		
6.7 mm	84		7 um		
4.75 mm	82		5 um		
2.36 mm	79		4 um		
1.18 mm	76		3 um		
600 um	69		2 um		

AS Sieve Sizes



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks

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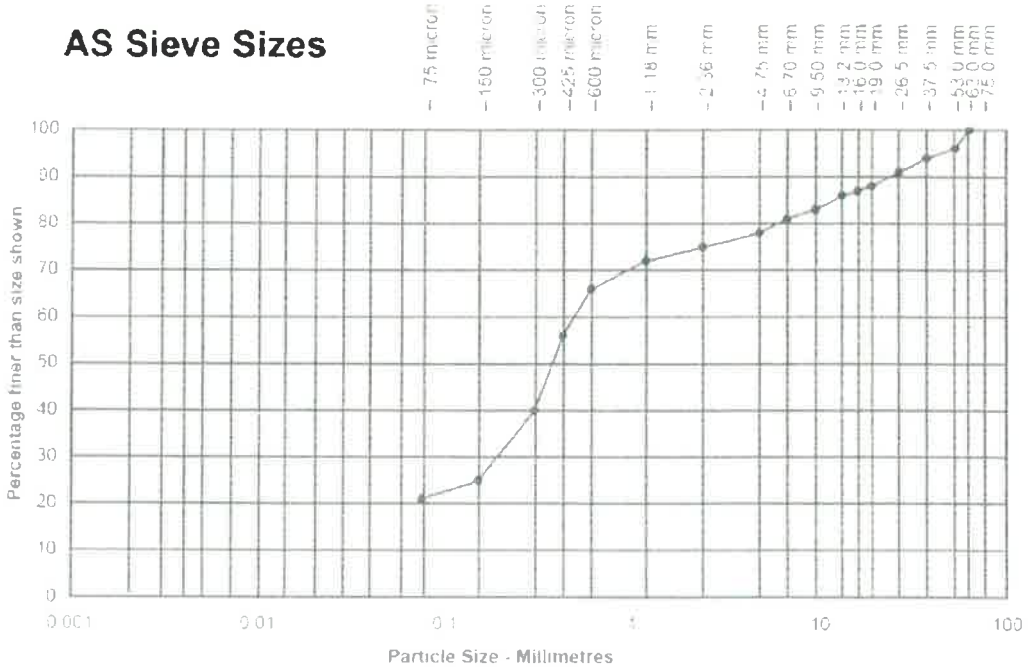
Particle Size Distribution

Client: Address: Insites Pty Ltd (SYDNEY)	Job No: JT13712A-r3
Project: Stage 1B Green Hills Parkland	Date: 17/09/2013
Location: Captain Cook Drive, Kurnell	Report No: R02A
Lab Reference No: SR 8172	Sample Identification: # 2 Australand Stockpile west (Stockpile 4)
Laboratory Specimen Description: Gravelly Clayey Sand: Fine to coarse grained, brown yellow, fine to coarse gravel	
Test Procedure: AS1289.3.5.1, 3.6.1, 3.6.3	Sample Procedure: AS 1289.1.1, 1.2.1 (6.5.4)

Sieve Size	% Passing	Specification	Sieve Size	% Passing	Specification
150 mm			425 um	56	
75 mm			300 um	40	
63 mm	100		150 um	25	
53 mm	96		75 um	21	
37.5 mm	94		59 um		
26.5 mm	91		39 um		
19 mm	88		28 um		
16 mm	87		20 um		
13.2 mm	86		14 um		
9.5 mm	83		10 um		
6.7 mm	81		7 um		
4.75 mm	78		5 um		
2.36 mm	75		4 um		
1.18 mm	72		3 um		
600 um	66		2 um		

AS Sieve Sizes



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks

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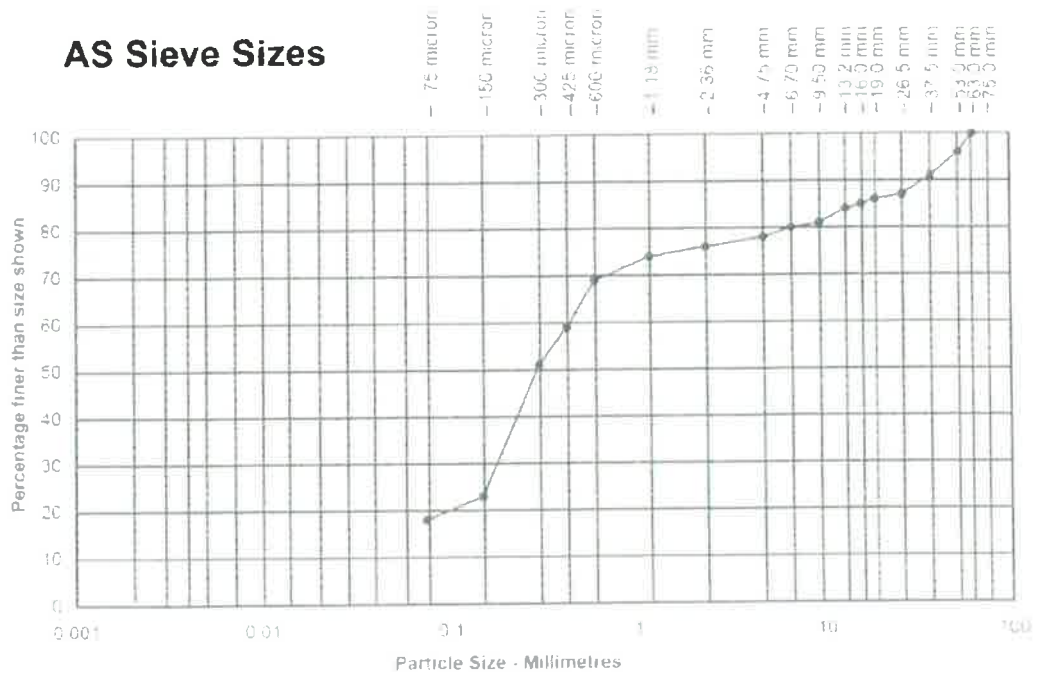
Particle Size Distribution

Client / Address: Insites Pty Ltd (SYDNEY)	Job No: J1137/12A-r3
Project: Stage 1B Green Hills Parkland	Date: 17/09/2013
Location: Captain Cook Drive, Kurnell	Report No: R03A
Lab Reference No: SR 3173	Sample Identification: # 3 Brown Large Stockpile (Stockpile 3)
Laboratory Specimen Description: Gravelly Clayey Sand: Fine to medium grained, brown yellow, with fine to coarse gravel	
Test Procedure: AS1289.3.5.1, 3.6.1, 3.6.3	Sample Procedure: AS 1289.1.1, 1.2.1 (6.5.4)

Sieve Size	% Passing	Specification	Sieve Size	% Passing	Specification
150 mm			425 um	59	
75 mm			300 um	51	
63 mm	100		150 um	23	
53 mm	96		75 um	18	
37.5 mm	91		59 um		
26.5 mm	87		39 um		
19 mm	86		28 um		
16 mm	85		20 um		
13.2 mm	84		14 um		
9.5 mm	81		10 um		
6.7 mm	80		7 um		
4.75 mm	78		5 um		
2.36 mm	76		4 um		
1.18 mm	74		3 um		
600 um	69		2 um		

AS Sieve Sizes



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

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BB

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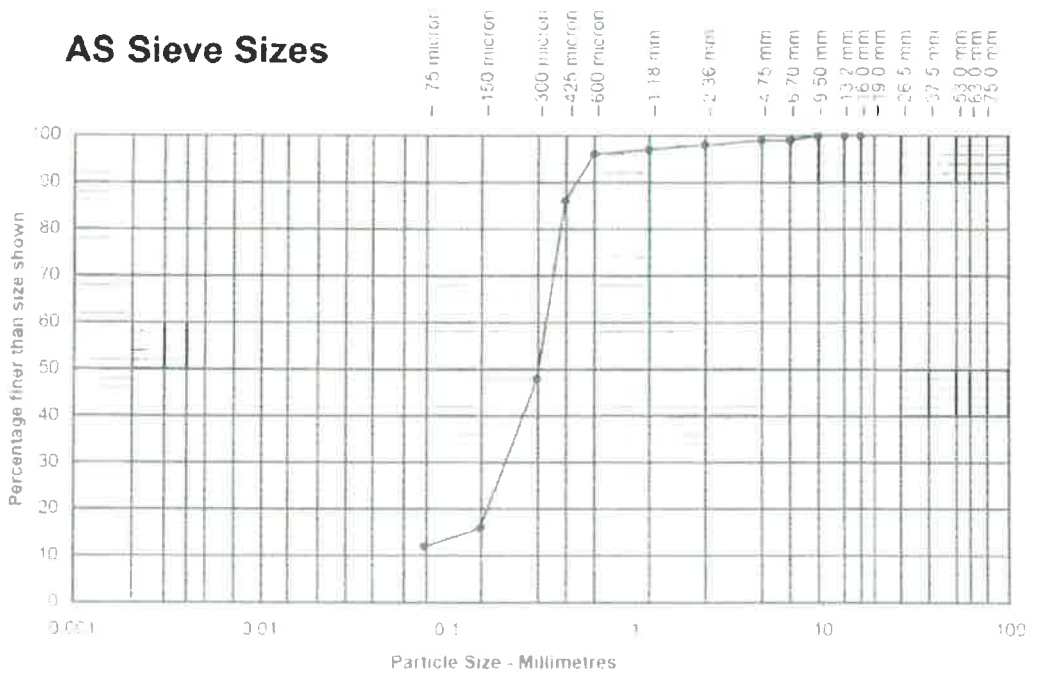
Particle Size Distribution

Client's Address Insites Pty Ltd (SYDNEY)	Job No JT13712A-r3
Project Stage 1B Green Hills Parkland	Date 17/09/2013
Location Captain Cook Drive, Kurnell	Report No R04A
Lab Reference No SR 8174	Sample Identification # 4 Green Large Stockpile (Stockpile 3)
Laboratory Specimen Description Silty Sand Fine to medium grained, brown	
Test Procedure AS1289.3.5.1, 3.6.1, 3.6.3	Sample Procedure AS 1289.1.1, 1.2.1 (6.5.4)

Sieve Size	% Passing	Specification	Sieve Size	% Passing	Specification
150 mm			425 um	86	
75 mm			300 um	48	
63 mm			150 um	16	
53 mm			75 um	12	
37.5 mm			59 um		
26.5 mm			39 um		
19 mm			28 um		
16 mm	100		20 um		
13.2 mm	100		14 um		
9.5 mm	100		10 um		
6.7 mm	99		7 um		
4.75 mm	99		5 um		
2.36 mm	98		4 um		
1.18 mm	97		3 um		
600 um	96		2 um		



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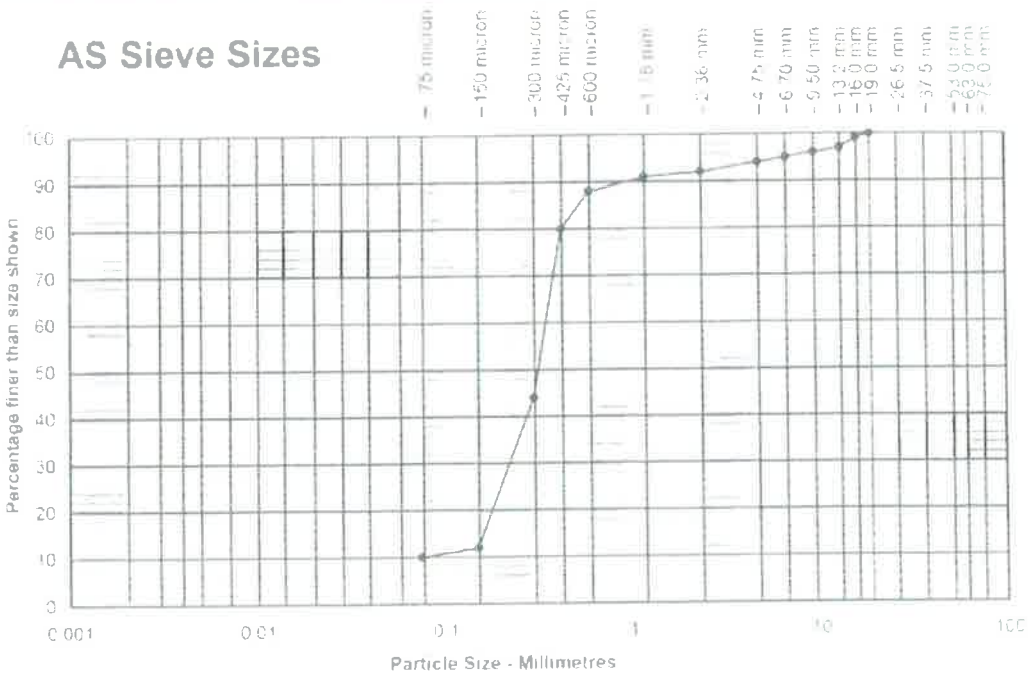
Particle Size Distribution

Client Address: Insites Pty Ltd (SYDNEY)	Job No: J113712A-r3
Project: Stage 1B Green Hills Parkland	Date: 17/09/2013
Location: Captain Cook Drive, Kurnell	Report No: R05A
Lab Reference No: SR 8175	Sample Identification: # 5 Breen Long Stockpile (Stockpile 1)
Laboratory Specimen Description: Silty Sand, Fine to medium grained, brown/yellow, with fine to medium gravel	
Test Procedure: AS1289.3.5.1, 3.6.1, 3.6.3	Sample Procedure: AS 1289.1.1.1, 2.1.1, 6.5.4

Sieve Size	% Passing	Specification	Sieve Size	% Passing	Specification
150 mm			425 um	80	
75 mm			300 um	44	
63 mm			150 um	12	
53 mm			75 um	10	
37.5 mm			59 um		
26.5 mm			39 um		
19 mm	100		28 um		
16 mm	99		20 um		
13.2 mm	97		14 um		
9.5 mm	96		10 um		
6.7 mm	95		7 um		
4.75 mm	94		5 um		
2.36 mm	92		4 um		
1.18 mm	91		3 um		
600 um	88		2 um		

AS Sieve Sizes



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks

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Atterberg Limits & Particle Size Distribution (Hydrometer)

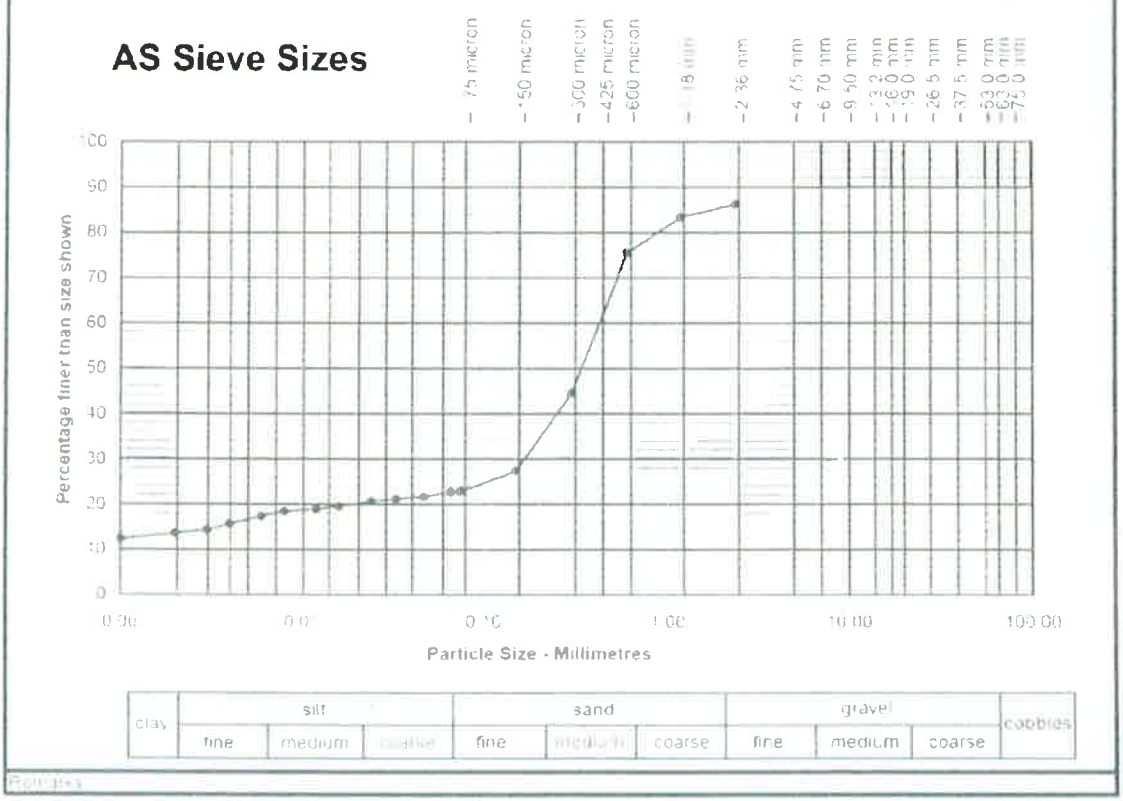
Client / Address Insites Pty Ltd (SYDNEY)	Job No JT13712A-r3
Project Stage 1B Green Hills Parkland	Date 17/09/2013
Location Captain Cook Drive, Kurnell	Report No R06A
Lab Reference No SR 8171	Sample Identification # 1 Australand Stockpile East (Stockpile 5)

Laboratory Specimen Description Gravelly Clayey Sand, Fine to coarse grained, brown yellow, with fine to coarse gravel

Test Method	Test Results	Test Procedure
Liquid Limit (%)		AS 1289 3 1 1
Plastic Limit (%)		AS 1289 3 2 1
Plasticity Index (%)		AS 1289 3 3 1
Linear Shrinkage (%)		AS 1289 3 4 1
Natural Moisture (%)		AS 1289 2 1 1
Sample History		
Preparation Method		
Condition of linear shrinkage		
Linear shrinkage mould length	250mm	

Test Procedure AS1289.3.6.3

Sieve Size	% Passing	Specification
2.36 mm	86	
1.18 mm	83	
600 um	76	
300 um	45	
150 um	27	
75 um	23	
66 um	23	
47 um	22	
33 um	21	
24 um	21	
16 um	20	
12 um	19	
8 um	18	
6 um	17	
4 um	16	
3 um	14	
2 um	14	
1 um	12	



Remarks

NATA TECHNICAL COMPETENCE

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-45 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96798733 Fax: (02) 96798744

Atterberg Limits & Particle Size Distribution (Hydrometer)

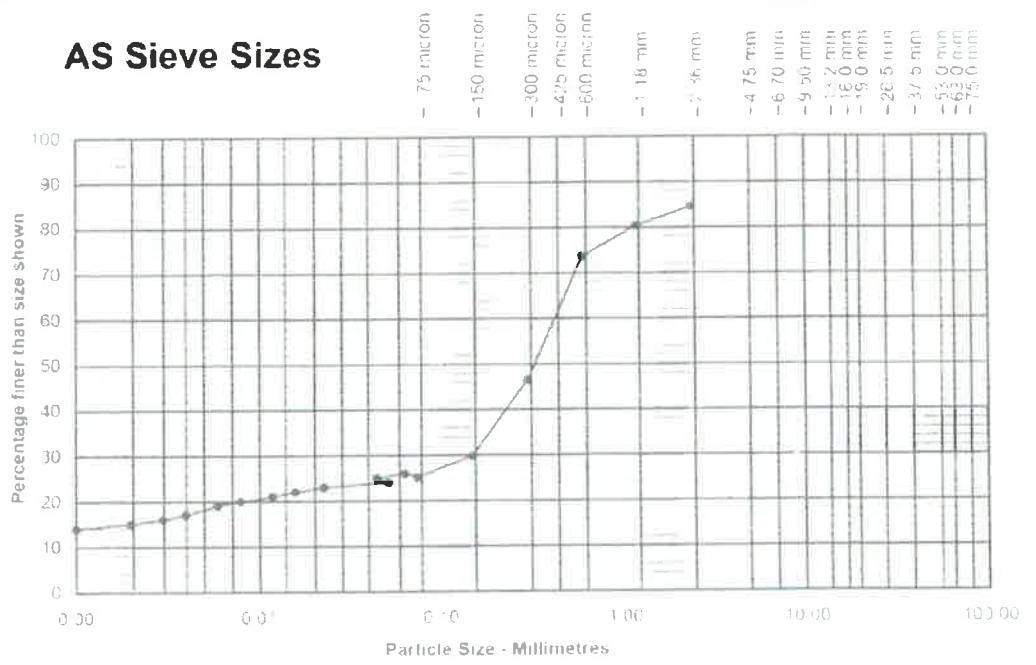
Client: Address: Insites Pty Ltd (SYDNEY)	Job No: JT13712A r3
Project: Stage 1B Greer Hills Park and	Date: 17/09/2013
Location: Captain Cook Drive, Kurnell	Report No: R07A
Lab Reference No: SR 8172	Sample Identification: # 2 Australand Stockpile West (Stockpile 4)
Laboratory Specimen Description: Gravelly Clayey Sand, Fine to coarse grained, brown yellow, fine to coarse gravel	

Test Method	Test Results	Test Procedure
Liquid Limit (%)		AS 1289.3.1.1
Plastic Limit (%)		AS 1289.3.2.1
Plasticity Index (%)		AS 1289.3.3.1
Linear Shrinkage (%)		AS 1289.3.4.1
Natural Moisture (%)		AS 1289.2.1.1
Sample History		
Preparation Method		
Condition of linear shrinkage		
Linear shrinkage mould length	250mm	

Test Procedure: AS1289.2.1.1, 3.6.3

Sieve Size	% Passing	Specification
2.36 mm	85	
1.18 mm	80	
600 um	74	
300 um	47	
150 um	30	
75 um	25	
64 um	26	
45 um	25	
32 um	24	
23 um	23	
16 um	22	
12 um	21	
8 um	20	
6 um	19	
4 um	17	
3 um	16	
2 um	15	
1 um	14	

ND = not determined, NC = not calculated, NP = non plastic



clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks:

NATA

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96793733 Fax: (02) 96798744

Atterberg Limits & Particle Size Distribution (Hydrometer)

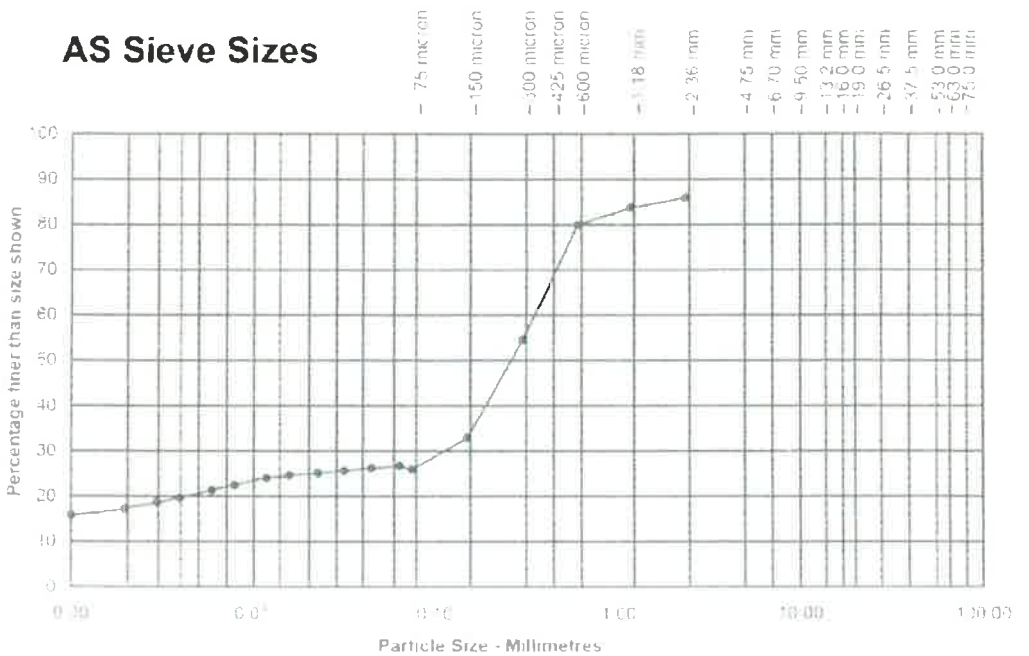
Client: Access Insites Pty Ltd (SYDNEY)	Job No: JT13712A-r3
Project: Stage 1B Green Hills Parkland	Date: 17/09/2013
Location: Captain Cook Drive, Kurnell	Report No: R08A
Lab Reference No: SR 8173	Sample Identification: # 3 Breen Large Stockpile (Stockpile 2)
Laboratory Specimen Description: Gravelly Clayey Sand, Fine to medium grained, brown yellow, with fine to coarse gravel	

Test Method	Test Results	Test Procedure
Liquid Limit (%)		AS 1289 3.1.1
Plastic Limit (%)		AS 1289 3.2.1
Plasticity Index (%)		AS 1289 3.3.1
Linear Shrinkage (%)		AS 1289 3.4.1
Natural Moisture %		AS 1289 2.1.1
Sample History		
Preparation Method		
Condition of linear shrinkage		
Linear shrinkage mould length	250mm	

Test Procedure: AS 1289.2.1.1, 3.6.3

Sieve Size	% Passing	Specification
2.36 mm	86	
1.18 mm	84	
600 um	80	
300 um	55	
150 um	33	
75 um	28	
64 um	27	
45 um	26	
32 um	26	
23 um	25	
16 um	25	
12 um	24	
8 um	22	
6 um	21	
4 um	20	
3 um	19	
2 um	17	
1 um	16	

AS Sieve Sizes



Clay	silt			sand			gravel			cobbles
	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	

Remarks

NATA TECHNICAL COMPETENCE

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148 Australia
Tel: (02) 96798733 Fax: (02) 96798744

Test Results - Atterberg Limits

Client / Address: Insites Pty Ltd (SYDNEY)			Job No: JT13712A-r3	
Project: Stage 1B Green Hills Parkland			Date: 17/09/2013	
Location: Captain Cook Drive, Kurnell			Report No: R09A	
Sample Identification	# 1 Australand Stockpile East (Stockpile 5)	# 2 Australand Stockpile West (Stockpile 4)	# 3 Green Large Stockpile (Stockpile 2)	# 4 Green Large Stockpile (Stockpile 3)
Sample Register No	SR 8171	SR 8172	SR 8173	SR 8174
Sample Date	3-Sep-13	3-Sep-13	3-Sep-13	3-Sep-13
Test Date	7-Sep-13	7-Sep-13	7-Sep-13	7-Sep-13
Sample Procedure	AS 1289.1.1.1 2.1 (6.5.4)	AS 1289.1.1.1 2.1 (6.5.4)	AS 1289.1.1.1 2.1 (6.5.4)	AS 1289.1.1.1 2.1 (6.5.4)
Test Results				
Test Procedure	AS 1289.3.1.2	AS 1289.3.1.2	AS 1289.3.1.2	AS 1289.3.1.2
Liquid Limit (%)	25	26	29	NON - PLASTIC
Test Procedure	AS 1289.3.2.1	AS 1289.3.2.1	AS 1289.3.2.1	AS 1289.3.2.1
Plastic Limit (%)	15	15	17	NON - PLASTIC
Test Procedure	AS 1289.3.3.1	AS 1289.3.3.1	AS 1289.3.3.1	AS 1289.3.3.1
Plasticity Index (%)	10	11	13	NON - PLASTIC
Test Procedure	AS 1289.3.4.1	AS 1289.3.4.1	AS 1289.3.4.1	AS 1289.3.4.1
Linear Shrinkage (%)	5.0	4.5	6.5	NON - PLASTIC
Test Procedure	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1	AS 1289.2.1.1
Natural Moisture Content %	10.5	9.2	13.3	17.6
Material Description	Gravelly Clayey Sand, Fine to coarse grained, brown yellow, with fine to coarse gravel	Gravelly Clayey Sand, Fine to coarse grained, brown yellow, fine to coarse gravel	Gravelly Clayey Sand, Fine to medium grained, brown yellow, with fine to coarse gravel	Silty Sand, Fine to medium grained, brown
Remarks				

NATA
TECHNICAL COMPETENCE

BB

GeoEnviro Consultancy Pty Ltd
Unit 5, 39-41 Fourth Avenue, Blacktown NSW 2148, Australia
Tel: (02) 96798733   Fax: (02) 96798744

Test Results - Atterberg Limits

Client / Address: Insites Pty Ltd (SYDNEY) — Job No: JT13712A-r3
Project: Stage 1B Green Hills Parkland — Date: 17/09/2013
Location: Captain Cook Drive, Kurnell — Report No: R10A

Sample Identification	# 5 Breen Long Stockpile (Stockpile 1)			
Sample Register No	SR 3175			
Sample Date	3-Sep-13			
Test Date	6-Sep-13			
Sample Procedure	AS 1289 1.1, 1.2.1 (6.5.4)			
Test Results				
Test Procedure	AS 1289 3.1.2			
Liquid Limit (%)	NON-PLASTIC			
Test Procedure	AS 1289 3.2.1			
Plasitc Limit (%)	NON-PLASTIC			
Test Procedure	AS 1289 3.3.1			
Plasticity Index (%)	NON-PLASTIC			
Test Procedure	AS 1289 3.4.1			
Linear Shrinkage (%)	NON-PLASTIC			
Test Procedure	AS 1289 2.1.1			
Natural Moisture Content %	7.4			
Material Description	Silty Sand: Fine to medium grained, brown yellow, with fine to medium gravel			

Remarks

Form No. R004 Ver 08/07/13

Accredited for compliance with ISO/IEC 17025
NATA Accredited Laboratory Number: 14209

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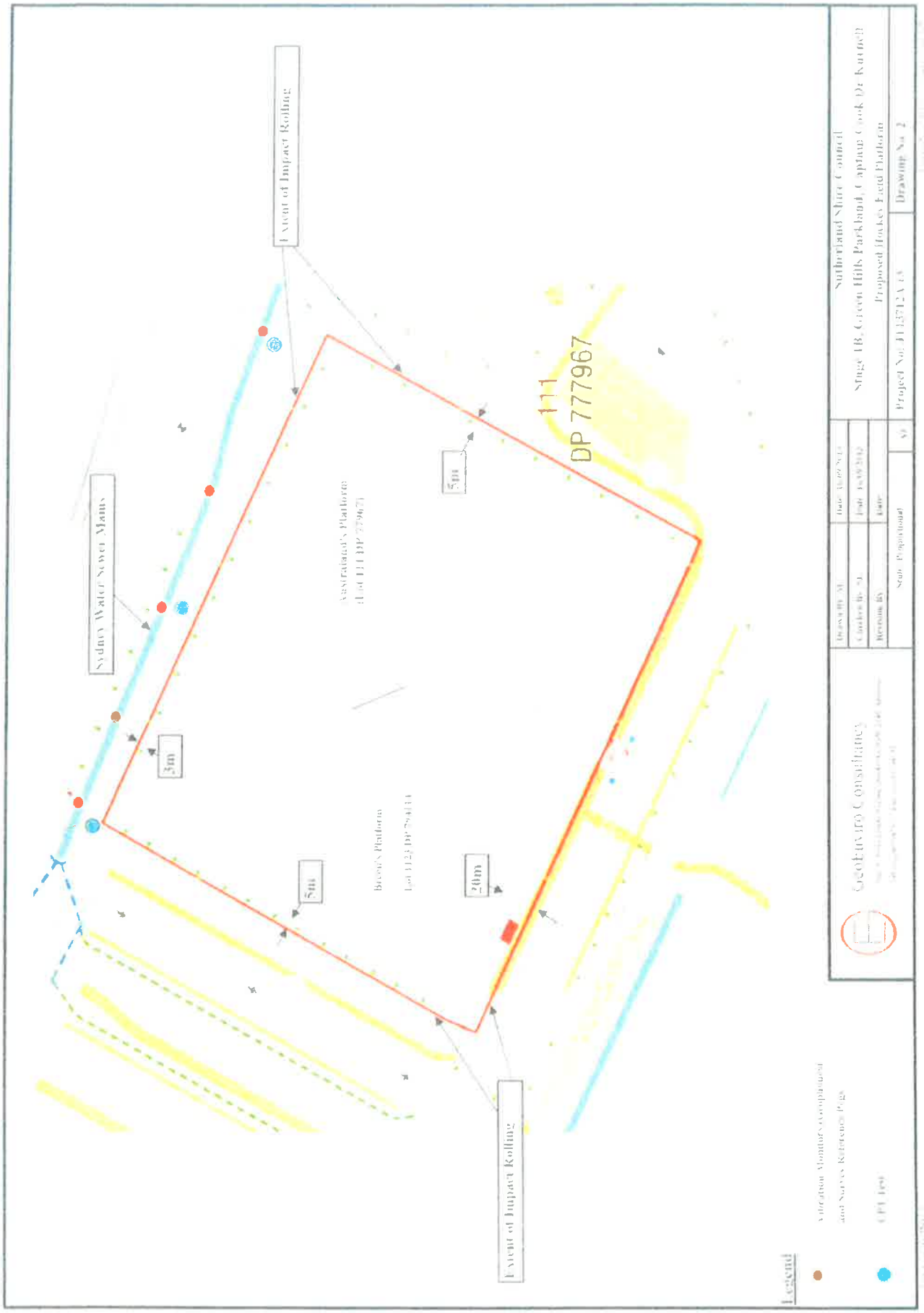
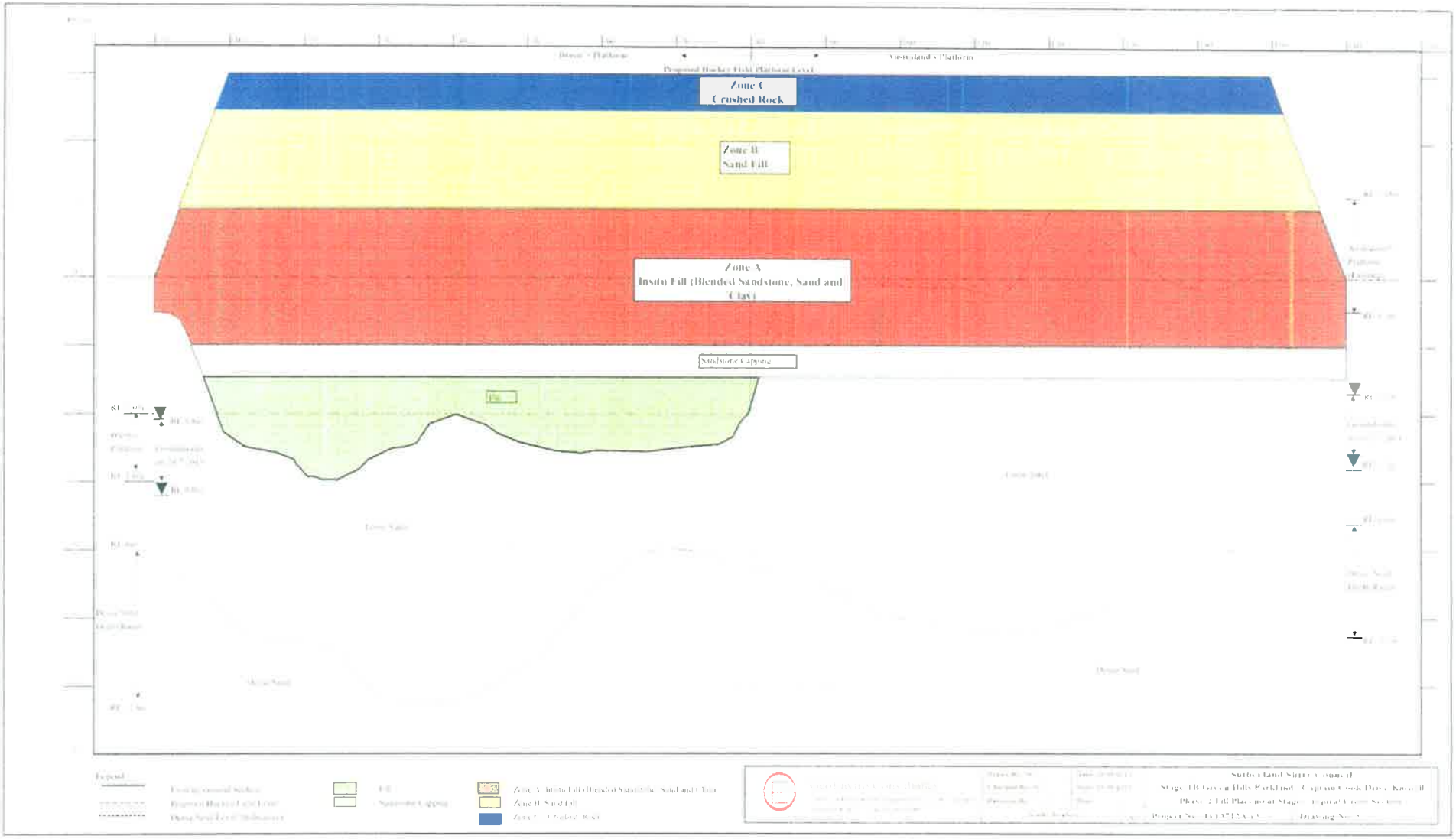
Approved Signatory: [signature]   Alan Poon   Date: 17/09/2013

Stockpile 5
Stockpile 4
Subject Site
Proposed Wetland
Stockpile 3
Stockpile 2
Stockpile 1
Legend
Sutherland Shire Council
GeoEnviro Consultancy

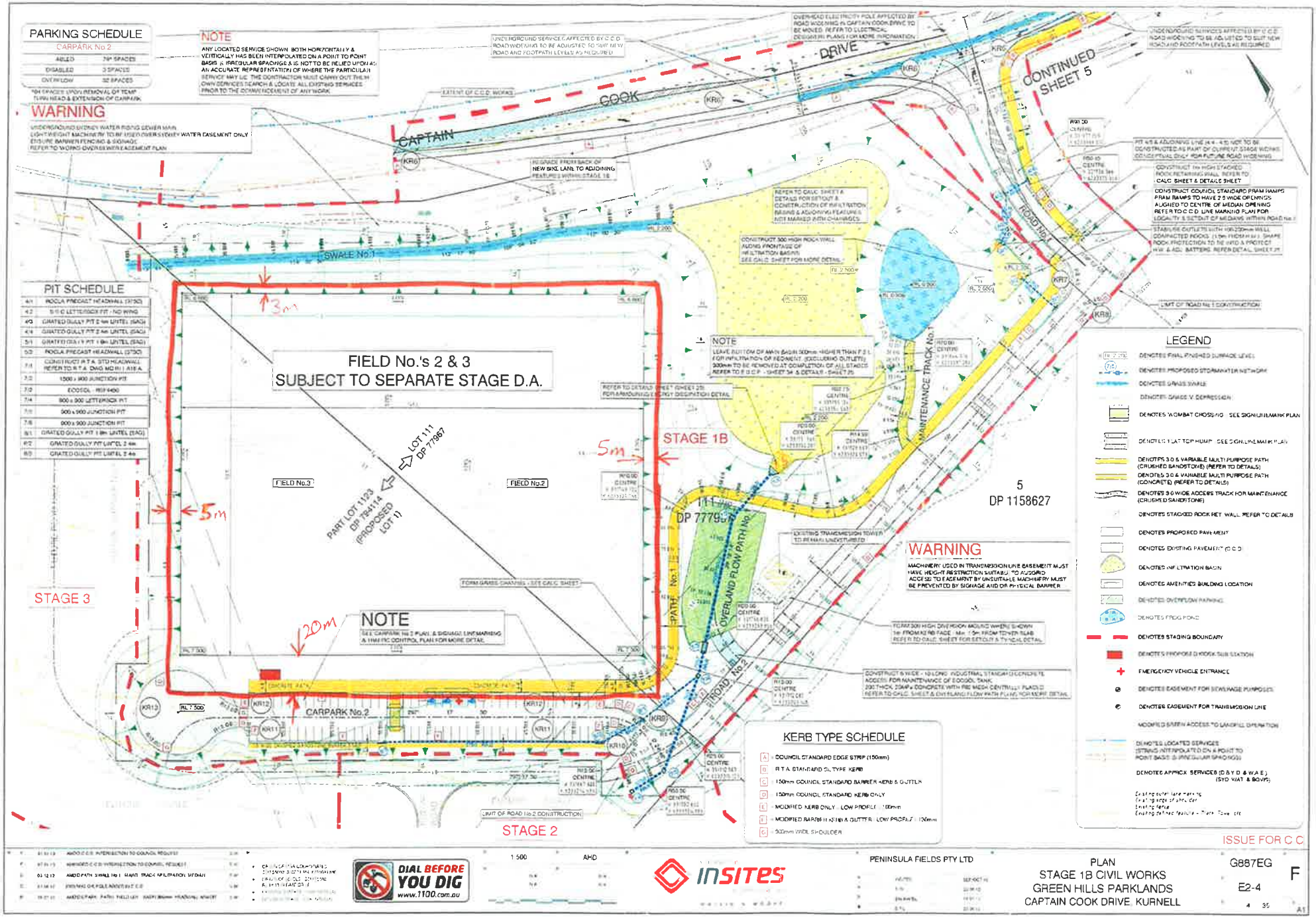

Extent of Impact Rolling
Sydney Water Sewer Mains
3m
5m
5m
20m
Extent of Impact Rolling
111
DP 777967
Legend

Appendix B

Zone Identification


Zone C
Crushed Rock
Zone B
Sand Fill
Zone A
Insitu Fill (Blended Sandstone, Sand and Clay)
Sandstone Capping

Schedule E – Hockey Compaction Works Site Plan


PARKING SCHEDULE
CARPARK No.2
ABLED 74* SPACES
DISABLED 3 SPACES
OVERFLOW 32 SPACES
*104 SPACES UPON REMOVAL OF TEMP TURN HEAD & EXTENSION OF CARPARK
NOTE
ANY LOCATED SERVICE SHOWN BOTH HORIZONTALLY & VERTICALLY HAS BEEN INTERPOLATED ON A POINT TO POINT BASIS & IRREGULAR SPACINGS & IS NOT TO BE RELIED UPON AS AN ACCURATE REPRESENTATION OF WHERE THE PARTICULAR SERVICE MAY LIE. THE CONTRACTOR MUST CARRY OUT THEIR OWN SERVICES SEARCH & LOCATE ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK
WARNING
UNDERGROUND SYDNEY WATER RISING SEWER MAIN
LIGHTWEIGHT MACHINERY TO BE USED OVER SYDNEY WATER EASEMENT ONLY
ENSURE BARRIER FENCING & SIGNAGE
REFER TO WORKS OVER SW WTR EASEMENT PLAN
PIT SCHEDULE
4/1 ROCLA PRECAST HEADWALL (3T30)
4.2 S.H.C. LETTERBOX PIT - NO WING
4Q GRATED GULLY PIT 2.4m LINTEL (SAG)
4/4 GRATED GULLY PIT 2.4m LINTEL (SAG)
5/1 GRATED GULLY PIT 1.8m LINTEL (SAG)
5/2 ROCLA PRECAST HEADWALL (3T30)
7/1 CONSTRUCT R.T.A. STD HEADWALL REFER TO R.T.A. DWG NO R11 A1E A
7/2 1500 x 900 JUNCTION PIT
7/3 ECOSOL - RSP1400
7/4 900 x 900 LETTERBOX PIT
7/5 900 x 900 JUNCTION PIT
7/6 900 x 900 JUNCTION PIT
8/1 GRATED GULLY PIT 1.8m LINTEL (SAG)
8/2 GRATED GULLY PIT LINTEL 2.4m
8/3 GRATED GULLY PIT LINTEL 2.4m
WARNING
MACHINERY USED IN TRANSMISSION LINE EASEMENT MUST HAVE HEIGHT RESTRICTION SUITABLE TO ASSURED ACCESS TO EASEMENT BY UNSUITABLE MACHINERY MUST BE PREVENTED BY SIGNAGE AND OR PHYSICAL BARRIER
FIELD No.'s 2 & 3
SUBJECT TO SEPARATE STAGE D.A.
STAGE 1B
STAGE 2
STAGE 3
FIELD No.3
FIELD No.2
LOT 111 DP 77967
PART LOT 1123 DP 784114 (PROPOSED LOT 1)
LOT 111 DP 77795
5 DP 1158627
CARPARK No.2
SWALE No.1
PATH No.1
OVERLAND FLOW PATH No.2
ROAD No.2
MAINTENANCE TRACK No.1
CAPTAIN COOK DRIVE
CONTINUED SHEET 5
NOTE
SEE CARPARK No.2 PLAN & SIGNAGE LINEMARKING & TRAFFIC CONTROL PLAN FOR MORE DETAIL
NOTE
LEAVE BOTTOM OF MAIN BASIN 500mm HIGHER THAN P.S.L. FOR INFILTRATION OF RESIDENT (EXCLUDING OUTLETS) 300mm TO BE REMOVED AT COMPLETION OF ALL STAGES REFER TO R.G.C.P. - SHEET 34 & DETAILS - SHEET 35
KERB TYPE SCHEDULE
A - COUNCIL STANDARD EDGE STRIP (150mm)
B - R.T.A. STANDARD SL TYPE KERB
C - 150mm COUNCIL STANDARD BARRIER KERB & GUTTER
D - 150mm COUNCIL STANDARD KERB ONLY
E - MODIFIED KERB ONLY - LOW PROFILE - 100mm
F - MODIFIED BARRIER KERB & GUTTER - LOW PROFILE - 100mm
G - 500mm WIDE SHOULDER
LEGEND
DENOTES FINAL FINISHED SURFACE LEVEL
DENOTES PROPOSED STORMWATER NETWORK
DENOTES GRASS SWALE
DENOTES GRASS V DEPRESSION
DENOTES WOMBAT CROSSING - SEE SIGNLINEMARK PLAN
DENOTES FLAT TOP HUMP - SEE SIGNLINEMARK PLAN
DENOTES 3.0 & VARIABLE MULTI PURPOSE PATH (CRUSHED SANDSTONE) (REFER TO DETAILS)
DENOTES 3.0 & VARIABLE MULTI PURPOSE PATH (CONCRETE) (REFER TO DETAILS)
DENOTES 3.0 WIDE ACCESS TRACK FOR MAINTENANCE (CRUSHED SANDSTONE)
DENOTES STACKED ROCK RET. WALL REFER TO DETAILS
DENOTES PROPOSED PAVEMENT
DENOTES EXISTING PAVEMENT (C.C.C.)
DENOTES INFILTRATION BASIN
DENOTES AMENITIES BUILDING LOCATION
DENOTES OVERFLOW PARKING
DENOTES FROG POND
DENOTES STAGING BOUNDARY
DENOTES PROPOSED KIOSK SUB STATION
EMERGENCY VEHICLE ENTRANCE
DENOTES EASEMENT FOR SEWERAGE PURPOSES
DENOTES EASEMENT FOR TRANSMISSION LINE
MODIFIED SWIRN ACCESS TO LANDFILL OPERATION
DENOTES LOCATED SERVICES (STRAIGHT INTERPOLATED ON A POINT TO POINT BASIS & IRREGULAR SPACINGS)
DENOTES APPROX. SERVICES (D & Y D & W & E) (SYD WAT & BOWS)
ISSUE FOR C.C.
DIAL BEFORE YOU DIG www.1100.com.au
1:500
AHD
INSITES
PENINSULA FIELDS PTY LTD
PLAN
STAGE 1B CIVIL WORKS
GREEN HILLS PARKLANDS
CAPTAIN COOK DRIVE, KURNELL
G887EG
E2-4
F
A1

Schedule F – Civil Works Stage 1B

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SUTHERLAND SHIRE COUNCIL, NSW

BASE CONSTRUCTION, SYNTHETIC SURFACING

AND ANCILLARY WORKS CONTRACT FOR:

TWO WATER BASED SYNTHETIC TURF HOCKEY PITCHES

AT GREENHILLS HOCKEY FIELDS, CAPTAIN COOK DRIVE,

GREENHILLS, NSW

TECHNICAL SPECIFICATION

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N4 CABLING FOR PUBLIC ADDRESS SYSTEM
N5 PUMP SHED

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O1 GENERAL
O2 MATERIALS
O3 PAINTING

P SUNDRIES

******

A PRELIMINARY

A1 GENERAL

The Works described in this Technical Specification are for the supply and construction of two water-based, synthetic turf hockey pitches and surrounds at Greenhills Hockey Fields, Captain Cook Drive, Greenhills, in the Sutherland Shire, NSW 2230.

A2 EXTENT OF THE WORK

The extent of the work consists of: GREEN 543 Client Brief including (but not limited to) all specifications detailed in this document and associated documents.

The Extent of the Work comprises the supply of all materials, equipment, machinery and labour necessary to construct two water- based synthetic turf hockey pitches plus ancillaries but not necessarily limited to:

2.1 The inspection, checking and taking over of the subgrade construction as constructed by others.

2.2 The supply, spreading and compaction of granular sub-base and basecourse metal layers.

2.3 The supply, laying and compaction of an asphaltic concrete surface.

2.4 The supply and installation of storm water drainage collection piping and manholes, plus the connection to a storm water retention basin.

2.5 The construction of concrete edge kerbing and spoon drain complete with silt-trap pits.

2.6 The construction of a surround concrete path and kerbing.

2.7 The supply and installation of a rubber granule shock pad to the two pitches.

2.8 The supply and laying of two FIH approved water based synthetic turf hockey pitches, complete with all necessary playing and practice lines.

2.9 The supply and installation of a spectator fence to surrond both pitches.

2.10 The supply and installation of a security fence to surround the extremities of the two hockey pitches.

2.11 The supply, installation and commissioning of a pop up irrigation system complete with two water storage tanks

2.12 The supply, installation and commissioning of a 12 pole flood lighting system.

2.13 The training of the resident hockey club in the operation of both the irrigation and flood lighting systems.

2.14 The inspection, commissioning and handing over of the completed complex to the Principal.

2.15 The carrying out of follow up inspections and reports to satisfy the requirements of the guarantee.

A3 CONDITIONS OF CONTRACT

The works are to be carried out in accordance with the "General Conditions of Contract" (AS 2124-1992) and all its amendments, unless contradicted by this Specification, the Special Conditions of Contract, the Schedule of Works or the Contract Drawings. In the event of conflict between these documents the Specification shall take precedence.

A4 DEFINITIONS

For the purposes of this Specification,

"Principal" shall mean Sutherland Shire Council, NSW.

"Superintendent" shall mean Greg Smith, Manager Projects, Property Building Services for the Sutherland Shire Council, or his Deputy.

"Engineer" shall mean Robert J Jones of Sports Surface Consultants Ltd. Ph: +44 9 272 7145. Mob: +64 21 347 352, or his appointed representative.

"Site" shall mean the area designated for the proposed two synthetic hockey pitches, as designated on the plans by the surround security fencing.

"Contractor" shall mean the appointed contractor or his appointed sub-contractors.

A5 DRAWINGS

The drawings which are to be included with this Specifications are detailed in Section 4 of the Contract.

In addition, any farther plans which may be made available to the contractor as the work progresses.

A6 WORKING AREAS

Refer to Client Brief

A7 ACCESS TO WORKS AND INSPECTION BY THE ENGINEER

The works and all materials on site shall be open at all times to inspection by the Engineer or his duly appointed representative and in this connection the Contractor shall provide all facilities necessary.

A8 SAMPLING AND TESTING OF MATERIALS

The Contractor shall co-operate with the Engineer and his staff and make available to them facilities for taking samples and for making tests. The Engineer shall keep the Contractor informed of the results of all tests taken by him.

When test results show that the materials or work are not up to the required standard, the Contractor shall remove the faulty materials and/or complete the work to the required standard.

A9 DAMAGE TO PROPERTY OR STRUCTURES

Refer to the Special Conditions of Contract GREEN 543

A10 EXISTING SERVICES

Refer to Client Brief

A11 SITE AMENITIES

As the site has no amenities the Contractor shall therefore make his own arrangement for the provision of accommodation, storage and toilet facilities, plus temporary power.

A12 PROTECTION OF MATERIALS

The Contractor should note the following:

- The site is located in an extremely hostile environment where materials, both installed anstored will be subject to corrosion by salt.
- All materials shall be protected from the effects of wind blown salt while being stored on site awaiting installation. All surfaces are to be cleaned of salt and any other contaminants prior to being painted, covered or concealed.
- All external pipe work shall be, as a minimum, heavy galvanised (both above and below ground level).
- Externally located fixing brackets, fittings, etc. shall be either heavily galvanised or 316 grade stainless steel.

- Internally located fixing brackets, fittings, etc. shall have a protective coating applied to all surfaces prior to installation.
- All internal and external fixings and fastenings, (screws, bolts, dynabolts, etc), shall be 316 grade stainless steel
- All exposed pipes, conduits, brackets, fittings, etc, to be appropriately painted as specified in **Clause O3** below

A13 SETTING OUT

Refer to Client Brief

A14 TRAFFIC, LIGHTING, FENCING, AND GENERAL SAFETY

Not withstanding approvals by the Engineer, the Contractor shall remain responsible for the overall safety of all work, the safety of his employees and any other party throughout the duration of the work.

The Contractor shall arrange his work so as to cause the minimum inconvenience to the public. The Contractor shall remove from surrounding roads, paths and other areas surplus spoil, rubbish and surplus materials with all practicable dispatch.

Lights, barricades and other safety precautions shall be placed by the Contractor as required by the resident Local Authority. The name, address and telephone number of the person responsible for lighting, and all safety matters shall be notified in writing to both the Principal and the Engineer. The costs of complying with all these requirements are to be covered by the Contract Sum.

A15 ROAD CLEANING

The Contractor shall take all necessary precautions to keep the surrounding roads, footpaths, etc. in a clean and tidy condition.

The Contractor shall not store excavated or other material on areas adjacent to the Working Area without prior arrangements with the Engineer. The Contractor is to ensure that all reasonable measures are taken to clean trucks and their wheels of any material which may drop after they leave the Working Areas.

The Contractor will be responsible for any rubbish or dirt which may be dropped on streets or footpaths directly or indirectly as a result of his workings, and shall immediately clean streets of such rubbish or dirt.

Should the Contractor not do this satisfactorily or quickly enough to minimise inconvenience to others, the Principal reserves the right to arrange for the work to be done at the Contractors expense.

A16 SURPLUS MATERIAL, CLEANING AND MAKING GOOD

The Contractor shall be responsible for disposing off site as quickly as possible all surplus excavated material as well as all rubbish and materials as the Engineer shall direct. The Contract Sum is to cover this operation.

At the completion of the Works the Contractor shall, with all expediency, remove all plant, material and other items that may have been brought upon the site in connection with the works, and generally clear away all rubbish and leave the site in a similar condition to that which existed before the Contract was commenced.

The cost of diversion, protection, repair or reinstatement of any disturbance or damage done to any roadway, footpath, water pipe, sewers, drains, channelling, foundations or other services or structures or neighbouring property, shall be deemed to have been allowed for in the Tender price.

A17 DEFECTS LIABILITY PERIOD

Refer to General Conditions of Contract GC21

A18 SPECIFICATIONS

The Sutherland Shire Council's "Specifications for Civil Works", in conjunction with any nominated Specifications, shall apply to this work.

******

B EARTHWORKS SUBGRADE

B1 GENERAL

The Principal, under a separate contract will prepare the site up to design subgrade level.

The subgrade will be compacted to a 95% dry density and constructed to within a tolerance of + or – 20 mm.

B2 SUBGRADE APPROVAL

Prior to commencing on site the Contractor shall first inspect the subgrade and carry out any measurments or test they require to confirm that it is within the specified tolerance.

If, as the result of his inspection the Contractor considers there are any areas which fall outside of the specified tolerance then they shall arrange a site meeting with the Superintendent and the Engineer to inspect and resolve any issues.

In the event of any dispute the Engineer shall have the final say as to whether the surface is within the specified tolerance. The Contractor shall then advise the Principal in writing that they have

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inspected the subgrade and has accepted it as fully meeting his requirements for the construction and installation of his synthetic surface system.

B3 DUST CONTROL AND VIBRATION

The contractor shall maintain the works so that a nuisance is not caused to neighbouring residents from dust or vibration. This may involve wetting of disturbed surfaces outside normal working hours to lay wind blown dust.

B4 STORMWATER RUNOFF SILT CONTROL

Silt control will be in place when this contract commences. The Contractor shall take all necessary steps to protect and maintain the silt control until such time as the pitch bases and surrounds have been respectively asphalted and concreted.

C GRANULAR BASECOURSES

C1 GENERAL

A granular sub-base and a basecourse layer of total minimum 290 mm compacted depth shall be constructed on the prepared subgrade in accordance with this section of the Specification and to the lines, levels, grades and typical cross-sections shown on the drawings.

C2 SUB-BASE AND BASECOURSE MATERIALS

The first layer shall consist of a minimum compacted depth of 150 mm of DGS40 nominal size Densely Graded sub-base material

The top layer shall consist of a minimum compacted depth of 140 mm of DGB20 nominal size Densely Graded Basecourse material.

Both materials shall meet and comply with the requirements as setout in the NSW Government Transport Roads and Maritime Services QA Specification 3051, April 2011.

C3 SAMPLES AND TESTING

The Contractor shall, if instructed by the Engineer, supply a 10 KG sample, of the aggregate which they intend to use, for testing to determine that it complies with the Specification.

The Contractor shall send the sample to a Registered Soils Testing Laboratory and pay all charges for the necessary tests.

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C4 PLACEMENT OF SUB-BASE AND BASECOURSE AGGREGATES

The placement of the sub-base and basecourse aggregates shall be carried out in complete accordance with the requirements as specified in the latest edition of the NSW Government Transport Roads and Maritime Services QA Specification R71.

The Basecourse shall be placed on the prepared subgrade surface so that the final surface level requires a minimum of trimming.

C5 COMPACTION OF SUB-BASE AND BASECOURSE AGGREGATES

The compaction of the sub-base and basecourse aggregates shall be carried out in complete accordance with the requirements as specified in the latest edition of the NSW Government Transport Roads and Maritime Services QA Specification R71.

C6 CONSTRUCTION TOLERANCE

The finished surface of the basecourse shall fall within a maximum tolerance of + or - 6 mm in a three metre length, from correct level and grade, when measured in any direction on the surface.

C7 TESTING OF THE BASECOURSE CONSTRUCTION

A series of Benkelman Beam Tests will be required on the completed basecourse surface before the commencement of the laying of the asphalt layers.

The tests shall be carried out in accordance with the NSW Government Transport Roads and Maritime Services QA Specification RTA Test method T160, September 2008.

Before the basecourse surface construction will be approved for asphalting the Benkelman Beam readings must fall within the following limits:

Maximum deflection not to exceed 2.54mm.
90% of readings are to be less than 1.78mm.
Average reading to be less than 1.53mm.

C8 MAINTENANCE

Every precaution shall be taken to ensure that the surface of the basecourse does not pot hole, ravel, rut or become uneven prior to the installation of the asphalt layers. Should any of these conditions become apparent, the surfaces of the affected areas shall be repaired at the Contractors expense.

D ASPHALT SURFACING

D1 GENERAL

A single layer of dense graded asphalt, minimum 30 mm compacted depth, shall be constructed on the prepared basecourse surface in accordance with this section of the Specification and to the lines, levels, grades, typical cross-sections shown on the drawings.

The asphalt layer shall be applied to the smooth finished surface of the compacted basecourse after first applying a prime coat.

D2 SURFACE PREPARATION

Any loose caked material shall be removed from the surface without disturbing the compacted base, and the material so removed from the job. The surface shall then be swept clean of any dust, dirt, animal deposits or other deleterious matter. The surface of the basecourse, just prior to the application of the tack coat, shall be clean, dry, uniform, tightly compacted and shall present a stone mosaic appearance.

D3 PRIME COAT

When the basecourse surface has been cleaned, brought to the required standard and approved, a coat of bitumen emulsion shall be applied to the surface at a rate of 0.3 litres per square metre.

D4 ASPHALT MATERIAL

The asphalt material to be used shall comply in all respects with that specified in the NSW Government Transport Roads and Maritime Services QA Specification R116, Heavy Duty Dense Graded Asphalt.

The asphalt particle size grading shall be AC10.

D5 PLACEMENT AND COMPACTION OF THE ASPHALT LAYER

The placement and compaction of the asphalt layer shall be carried out in complete accordance with the requirements as specified in the NSW Government Transport Roads and Maritime Services QA Specification R116, Heavy Duty Dense Graded Asphalt.

D6 SURFACE FINISHED TOLERANCE

The finished surface of the surface asphalt concrete layer, shall fall within a maximum tolerance of + or - 5 mm in a three metre length, from correct level and grade, when measured at any point in any direction on the surface.

D7 SURFACE CORRECTION

On completion of the placement and compaction of the asphalt layer the entire surface shall be checked and all areas which do not fall within the maximum tolerance specified in **Clause D7** above shall be marked for further treatment as detailed below.

Any areas on the asphaltic concrete surface, which are found to be high, shall be removed by grinding, heating and scraping, or other method approved by the Engineer.

Any areas which are found to be low shall be either saw cut, removed and then the area re-asphalted to the correct level, or patched with the synthetic surface supplier's special patching mix.

The Contractor will **NOT** be permitted to patch low areas with thin layers of fine graded asphalt.

D8 FINAL APPROVAL OF ASPHALT SURFACE

When the Contractor has completed all the correction work on the asphalt surface they shall contact the Superintendent and the Engineer to arrange a joint inspection. A minimum of 48 hours shall be given for notification of the inspection.

After the joint inspection the Contractor shall correct any areas of the asphalt surface which, in the opinion of the Superintendent or Engineer still do not meet the tolerance limits specified in **Clause D6**, above. In the event of any dispute the Engineer shall have the final say.

E CONCRETE SPOON DRAIN

E1 GENERAL

A concrete spoon drain shall be constructed around three sides of each pitch area. The concrete spoon drain shall be laid in accordance with this section of the Specification and to the line and levels and grades as shown on the drawings.

E2 DIMENSIONAL & LEVEL ALIGNMENT

When setting out and installing the spoon drain the Contractor should take special notice of the following requirements

The finished height on the spoon drain fender shall fall within a maximum tolerance of + or - 5 mm from correct finished level and grade.

E3 MATERIALS

All concrete shall be ready mix Grade 25, with a minimum cement content of 280 m3, aggregate size range of 4.75 to 19 mm, and a slump between 25 to 100 mm.

The concrete employed shall meet a minimum crushing strength of 15 MPa after 7 days and 20 MPa after 28 days field curing.

E4 FOUNDATIONS

The spoon drain shall be built on a solid foundation of a minimum depth of 100 mm of AP20 graded crushed rock, compacted to a minimum 95% dry density. The subgrade must be trimmed to the correct line and level and provide a strong foundation for the concrete.

E5 BOXING

All form work shall be constructed so that the kerbing can be cast in one pour.
All forms shall be constructed of suitable material to the approval of the Superintendent.

E6 FINISHING

Concrete surface finishes, where exposed, shall be floated off with a steel trowel to produce a smooth finished surface.

F COMBINED KERBING/SURROUND FOOTPATH

F1 GENERAL

Around all four sides of the pitch area, as shown on the drawing, a combined kerbing and 100 mm depth cement concrete slab footpath shall be constructed. The concrete footpath slab shall be laid in accordance with this section of the Specification, and to the lines, levels, grades and cross-sections as shown on the drawings.

To avoid a longitudinal construction joint the combined kerbing and footpath shall be poured together in one single pour.

F2 MATERIALS

All concrete shall be ready mix Grade 25, with a minimum cement content of 280/m3, aggregate size range of 4.75 to 19 mm, and a slump between 25 to 100 mm. The concrete employed shall meet a minimum crushing strength of 15 MPa after 7 days and 20 MPa after 28 days field curing.

F3 FOUNDATIONS

The spoon drain shall be built on a solid foundation of a minimum depth of 100 mm of AP20 graded crushed rock, compacted to a minimum 95% dry density. The subgrade must be trimmed to the correct line and level and provide a strong foundation for the concrete.

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At the points where the spectator fence posts are set into the concrete kerbing, the rear face of the kerbing shall be thickened so that the minimum cover over the rear of the post is 100 mm.

F4 IRRIGATION STORAGE TANKS

Over the area of where the two irrigation storage tanks will be positioned the depth of the concrete path shall be increased to 150 mm and the slab continously reinforced with F62 MS mesh, placed centraf in the slab.

F5 BOXING

All form work shall be constructed so that the kerbing can be cast in one pour.
All forms shall be constructed of suitable material to the approval of the Superintendent.

F6 FINISHING

Concrete surface finishes, where exposed, shall be floated off with a steel trowel to produce a smooth finished surface.

F7 SPECTATOR FENCE POSTS

The Contractor shall allow to cast the galvanised pipe spectator fence posts into the kerbing as it is poured. The posts shall extend down to within 50 mm of the bottom of the kerbing.

The posts shall be suitably braced during the pouring to ensure that they are, and remain, vertical after the concrete has cured.

G DRAINAGE

G1 GENERAL

Drainage connection piping, to collect the storm water run-off from the two synthetic surfaces dish channels and pits and transport it to the adjacent storm water outfall piping, shall be laid in accordance with this section of the Specification and to the lines, levels, and grades shown on the drawings.

G2 WORK SPECIFICATION

The work shall be carried out in accordance with AS/NZS 3055.3:2003, "Part 3 Stormwater Drainage".

G3 EXCAVATION

Pipe trenches shall be excavated accurately to line and level and shall, where possible, have vertical sides. Should the Contractor excavate below the required levels they shall, at his own cost, fill the deficiency with crushed metal compacted in 150 mm layers.

G4 PIPES AND PIPE LAYING

All storm water pipes shall be UPVC Sewer Grade.

All pipes shall be laid in accordance with the manufacturers requirements and instructions, and must be laid with the greatest accuracy for both line and level.

At all points on the pipe lines, where there is a change of direction and not a collector pit, the pipe line shall be provided with inspection openings.

G5 PIPE BED AND HAUNCH

Pipe bedding and haunching shall be AP20 crushed rock.

G6 BACKFILLING

After pipes have been laid, bedding and haunching (or surrounding as the case may be) and testing have been completed to the approval of the Superintendent, the trench is to be backfilled. The operation of backfilling shall include the complete removal of all concrete formwork and all timbering unless directed otherwise.

Backfilling material shall be either selected and approved (and dried if necessary) spoil excavated from the trenches or approved imported backfill as the Contractor elects. No extra payment will be certified for imported fill.

G7 STORM WATER MANHOLE

The Contractor shall allow to construct a standard Council storm water manhole in the position as shown on the Sheet 3 of the drawings.

G8 SILT-TRAP PITS

Concrete silt-trap pits shall be constructed in the dish channels at the positions shown on the drawings. Walls shall be 150 mm thick, internal dimensions shall be 300 mm x 300 mm, and the sump bottom shall be 300 mm below the pipe invert. Sump grates shall be galvanised steel or cast aluminium with dimensions to fit the profile and width of the concrete dish channel.

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G9 GEOTEXTILE MEMBRANE

Any geotextile membrane which the Contractor chooses to use in the formation of a sub-surface drainage system shall be suitable for the combination of soil types surrounding it, the granular drainage medium which it protects and the volumes of water which must pass through it.

H SHOCKPAD

H1 GENERAL

The contractor shall supply and install a a cast-in-situ, machine laid rubber shockpad system.

H2 MATERIALS

The materials used in the manufacture of the shockpad shall be graded, cubical, SBR or EPDM black rubber, and a polyurethane synthetic binder which has been specifically formulated for use in synthetic sports surfacing where moisture might be present.

H3 INSTALLATION

The materials to be employed in the manufacture of the shockpad shall be mixed on site in the correct proportions, using a paddle blade drum mixer of sufficient capacity to allow a continuous pour process to be carried out. The shockpad shall be laid, cast-in-situ, using a specialist paving machine which has a heated vibrating screed for spreading, constantly adjustable height control, and a minimum paving width of 2.5 metres.

When measured, the compacted shockpad depth shall be, at the thinnest point, not less than 15 mm, when measured anywhere on the surface.

The shockpad shall be installed using a continuous pour process, such that the joints on adjacent runs are "joint matched" while the material on both sides of the joint is still wet to ensure a seamless surface is produced.

Every effort shall be made by the Contractor to ensure that the installation of the shockpad is as continuous as possible.

Any joints, either longitudinal or transverse, which are not joint matched while both edges are still "wet" shall be cut vertical and the face primed before the adjacent pour is commenced.

H4 CONSTRUCTION TOLERANCE

The finished surface of the shockpad shall fall within a maximum tolerance of + or - 5 mm in a three metre length, from correct line and grade, when measured in any direction on the surface.

I SYNTHETIC TURF SURFACING

I1 GENERAL

The Contractor shall allow to supply and install a water filled synthetic turf surfacing system to the entire pitch area. The surface selected shall be laid in accordance with this section of the Specification and to the requirements of the particular surface system supplier

The artificial synthetic turf must fully comply with the requirements of the F.I.H. (Federation International Hockey) - "Handbook of Requirements for Synthetic Hockey Pitches - Outdoor: Revised March 1999", particularly all those Clauses which refer to pitches requiring watering.

I2 MATERIALS

The synthetic turf to be supplied and installed shall be a water filled system which has full and current F.I.H. accreditation and must be able to maintain minimum compliance over its life. The Contractor shall allow to supply and install only their highest quality turf material.

The Contractor will be required to submit, with his tender, written documentation of the F.I.H. approval **(Refer to Clause I10.3).**

The surface is to be manufactured using a polyethylene or polypropylene yarn.

The turf shall exhibit a sufficient degree of stability so that it can be permanently line marked at the time of installation.

The synthetic turf shall be supplied in rolls of sufficient length to span the full width of the field without any transverse jointing.

The colours for the pitch and surrounds are to be: pitch - green, surrounds – rust red.

I3 INSTALLATION OF ARTIFICIAL TURF

The installation shall only be carried out by experienced, specialist tradesman strictly in accordance with the artificial turf manufacturer's instructions

Each panel of material when laid, shall be free of any creases and/or bubbles. Adjacent panels shall be tape and glue joined in accordance with the requirements of the turf manufacturer and supplier.

At the edges of the field, where the synthetic turf meets the fender of the concrete drainage channel, the edge of the turf must be permanently fixed by re-installing the existing aluminium angle strip.

14 CONSTRUCTION TOLERANCES

The finished surface of the synthetic turf shall fall within a maximum tolerance of + or - 5 mm in a three metre length, from correct level and grade, when measured in any direction on the surface.

15 QUALIFICATIONS OF CONTRACTORS

The Contractor must use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary skills, and who are completely familiar with the specified requirements and the methods needed for the proper performance of the work to be carried out.

In particular the Contractor shall have a qualified technician, experienced in the installation of the specified synthetic turf system to be employed, present on site for the bulk of the work.

In acceptance or rejection of the installed work, the Engineer will make no allowance for the lack of skill or experience on the part of the workmen.

16 PITCH MARKING

The surface shall be installed with permanent white pitch markings which shall conform with the standards laid down by the F.I.H. All straight lines shall be stitched in at the time of manufacture. All curved lines can be cut into the surface after installation.

On completion all playing lines, except for the circles, shall be straight to the eye without deviation. The circles shall follow even curves and shall not deviate from the circle radius by more than 5 mm at any point on the circle's circumference.

In addition the Contractor shall allow for the marking on each pitch of a half pitch in yellow and a quarter pitch in black. These markings shall be dashed with 200 mm line lengths and 200 mm gaps between adjacent lines.

The dimensions and markings of the completed installation shall meet the dimensional requirements for International Hockey Fields as set down by the F.I.H. No other markings are required on the pitch.

17 F.I.H. COMPLIANCE TESTING

On the completion of the shockpad and synthetic turf installation the Contractor shall engage an independent FIH acredited testing laboratory to carry out field tests on both pitches so that they can be awarded FIH Certification. The full cost of all testing will be born by the Contractor.
Should the tests show that FIH Certification could not be issued then the Contractor shall take all necessary steps to correct any defects and then meet the costs to have the pitches re-tested.

18 ARTIFICIAL PLAYING SURFACE MAINTENANCE AND TRAINING OF PRINCIPALS STAFF

The Contractor shall be responsible for **all aspects** of maintenance of the playing surface, (other than manufacturers recommended regular maintenance), for the first twelve months after the Completion Date. In particular the Contractor shall comply with the manufacturer's recommendations relating to the initial work period.

At the start of the maintenance period the Contractor shall conduct a training session for the hockey club's representatives on the correct method and procedure for the carrying out of regular maintenance procedures. This however, will not resolve the Contractor of any of his responsibilities under the Contract.

19 SUPPLEMENTARY INFORMATION TO BE PROVIDED WITH TENDER

The following information shall be provided by the Contractor at the time of tendering. **Failure to provide the required information could invalidate a tender.**

19.1 Warranty: The materials used to form the artificial playing surface, (both the shockpad and the synthetic turf), plus its installation, shall carry a written Warranty, for both materials and workmanship, for a minimum period **FIVE** (5) years.

The Warranty shall protect the shockpad and the turf surface for the Principal against:
(a) Degradation by Ultraviolet radiation.
(b) Wear greater than 25% of its capacity.
(c) Faulty materials.
(d) Faulty installation.

Should any problem arise under the Warranty during the Warranty Period, the Contractor shall rectify or replace, within 60 days of notification, any affected areas to the complete satisfaction of the Principal. This Warranty shall not however, limit the Principal's remedies under law.

The Contractor shall nominate in his tender submission if the Warranty Period for his turf product would exceed the nominated five years and confirm the total period of the Warranty.

19.2 *Life:* An approximate expected life of the synthetic surface under normal usage conditions before any major maintenance would be required.

19.3 Test Data: The Contractor, with his tender, shall include the following:

Product Approval: Written proof from the International Hockey Federation (F.I.H.) that the particular grade and type of water filled synthetic turf surface, on which the Contractor's tender has been based, has been tested and found to comply with all the performance requirements established by the F.I.H. for international hockey competition. In addition, the time for which the approval remains valid.

Certificate of Registration: Written proof from the International Hockey Federation (F.I.H.) that the Contractor's Factory is registered with the F.I.H., by licensing agreement, for the manufacture of synthetic turf surfaces which are approved by the F.I.H. for international hockey competition.

In addition, the time until which such approval remains valid.

19.4 Profiles: The Contractor shall supply with his tender, details of the turf installation experience of the technician who will be in charge of the installation.

19.5 Product Details: A full description of the materials used in the synthetic systems offered, together with the method to be employed to adhere (fix) the turf to the underlying shockpad.

19.6 Joint Approval: Not withstanding anything specified or required in any of the above Clauses, the combined system of shockpad and synthetic turf, when installed, shall be fully and currently approved by the F.I.H.

19.7 Surface Samples: One synthetic turf sample, in each of the two colours to be installed on the pitch and surrounds, shall be supplied as part of the tender submission.

19.8Installations: A list of hockey turf installations with reference particularly to Australia and New Zealand.

J INNER SPECTATOR FENCE

J1 GENERAL

The inner spectator fence shall be constructed in accordance with the dimensions, details, and to the line and levels as shown on the drawings. The spectator fence design shall be as detailed on the drawings.

J2 MATERIALS

The galvanised pipe materials to be employed shall be first grade quality as used for exterior fencing construction. The chain wire mesh shall be 50 mm x 3.15 mm heavy galvanised with 1.57 mm balck PVC double looped tiewires.

J3 WORKMANSHIP

The fencing shall be constructed in accordance with good trade practice.

J4 PEDESTRIAN GATES

A total of 5 single gates, each 1.0 metre in width, shall be provided in the positions in the spectator fence as shown on the drawings.

The gates shall be constructed from the same materials as the fence and open into the field. Each gate shall be hung with two galvanised hinges and provided with a top bolt.

Single gates for player and official access to the pitches shall be provided in the spectator fences in the positions as shown on the plans.

J5 VEHICLE ACCESS

Two, twin, 2.0 metre long gates, shall be constructed in the spectator fence in the positions as shown on the drawings.

The gates shall be constructed from the same materials as the fence and open into the field. The gate shall be hung with two galvanised hinges and provided with a top and bottom bolt. The bottom bolt shall fix down into a pipe sleeve set permanently into the concrete kerb.

J6 INFILL PANELS

The infill panels between the fence posts shall be black PVC coated chain wire mesh. Each panel shall be securely laced to the top and bottom rails and posts with PVC coated lacing wire.

J7 END WALLS

A reinforced Bessa block wall, 6 courses high, shall be contructed across the full width of the two ends of the two pitches in accordance with the detail as shown on the drawings.

J8 SAFETY FENCING

A section of safety fencing shall be installed directly behind the block wall and across the full width of the two ends of the two pitches, all in the positions as shown on the drawings.

Each fence section shall be constructed to the dimensions and heights and in accordance with the details as shown on the drawings. The fence shall be of similar galvanised pipe as the spectator fence but with a mesh covering for the full height and width of the safety portions.

The mesh shall be Gabba Products AFL Netting or equivalent. It shall be fixed to the outrigger at the top of each post and fixed, under slight tension, to the top of the Bessa block wall at the bottom.

It will be the fencing sub-contractor's responsibility to examine the Producers Statement which will be provided by the Engineer and confirm that the post and rail sizes and the foundation details are adequate for their purpose.

K SECURITY FENCE

K1 GENERAL

The Contractor shall price the following options: either a 1.8 metre high black palasade fence, or a 1.8 metre high PVC coated chain wire mesh fence, or a 2.4 metre high chain wire mesh fence. The fence shall be installed around all four sides of the boundaries of the facility, and in the position as shown on the drawings.

K2 FENCE MATERIALS AND CONSTRUCTION

The Contractor shall supply materilas and construct the fence in accordance with the following:

Intermediate posts shall be - 50mm NB capped, galvanized, light grade black powder coated tube set into 750mm deep and 250mm diameter concrete footing with post centre evenly spaced (accounting for openings).

Corner posts shall be - 80mm NB capped, galvanised, black powder coated tube set into 1100mm deep and 300mm diameter concrete footings. (If fence higher than 3.6m, use medium grade pipe and footing diameter should increase by 50mm x every half metre in height as a guide, any footing should not be needed any larger than 600mm in diameter)

Rails shall be — 32mm NB galvanised, light grade black powder coated tube located top and bottom (Additional rails as required for high impact areas)

Chainwire mesh - 50mm x 2.5mm gauge black PVC, or 50mm x 3.15 heavy galvanised (mesh requirement pending site specifics).

Cablewire: 3.15mm Black PVC or 3.15mm Heavy Galv, Helicoiled (1800mm high fence x 1 row, if used on high impact area x 2 rows)

Tiewire: 1.57mm Black PVC or Heavy Galv (double looped)

K3 GATES

One set of double opening vehicle access gates, (2 x 2 metres), shall be provided in the position as shown on the drawings for each field. The gates shall be designed to open and close on hinges, and supplied complete with bottom bolts and a central chain for padlocking.

Pedestrian access gates, three sets per pitch, and each 1.2 metres in width, shall be located in the positions to be nominated. These gates shall also be designed to open and close on hinges, and supplied complete with a central bolt which is suitable for padlocking.

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L IRRIGATION

L1 STANDARDS

Where a Standard or Code of Practice exists the works must adhere to the relevant Standard or code of Practice.

Where no Standard or Code of Practice exists the works are to be completed using best practices.

In general but not limited the Standards as listed in Appendix A are to be complied with:

Where the specification and /or accompanying drawings indicate works which exceed the Standard Code of Practice the speciation and or drawing is to be adopted unless it contravenes the Standard or Code of Practice.

L2 GENERAL

A flush ground, pop up sprinkler type irrigation system, complete with all the necessary underground pipe work, electrical controls and connections, shall be supplied and installed in accordance with this section of the Specification, **which is performance based**.

The Contractor shall design.and supply an irrigation system capable of providing the required:

- Amount of water required to the playing surface as per manufacturers specification and FIH
- Water quality to meet all relevant standards for player safety as well as product longevity
- Precipitation and uniformaty as required by the synthetic turf manufacturer and to be able to apply the specified amount of water in a set period.
- Irrigation system to meet thea minimum standard required by FIH
  If the tendered playing surface life expectancy or any other requirement affected by the water quality then the EC, Ph and any other required sensing and monitoring should be incorporated. Sutherland Council has incorported Royce Water equipment on other sites and either this or equivalent product should be utilised for example;

  CONTROLLER (SURFACE MOUNTING VERSION)
  Part No: RW T75-S-H-P-
  P-N-4A/2R Enclosure:
  IP66 Surface Mounting
  Power Supply: Universal 80-265V AC or
  DC. 15W max. Input 1:pH Sensor Input
  Input 2:pH Sensor Input
  Input 3:None - *Can add other input at later date*
  Compatable Royce PH and EC sensors
- Irrigation system to meet all best practice requirements for design and installation practices
- Control and monitoring of systems by Motorola IRRinet System as utilised by Sutherland Shire and connected to the existing IRRinet system. Centratech Systems are to be engaged for the intergartaion of the IRRinet system to the existing Central Control System. Contact Craig Simpson 0401 321 219.

Irrigation water will be primarly supplied from water harvesting both, stormwater and irrigation run off from the pitch.
The harvested water quality shall meet all relevant standards for unrestricted use as it may come incontact with both players and spectators from drift.
The concept designs for both the irrigation and water harvesting, including filtration and expected water quality, are to be outlined with in the tender application.
All pumps are to be either Grundfos or Lowara with supported pumping control. Pump components are to be suitable for re-use water with a minimum of 24 months manufacturers warranty for parts and labour.

L3 WATER STORAGE TANKS

The Contractor shall allow to supply and install two (2) by 25,000 litres capacity each. Water storage tanks are to be positioned as shown on the drawings. The tanks shall be installed above ground on a reinforced concrete slab foundation. The tanks shall comply in all respects with Australian standard AS/NZS 4766:2006 and shall be Brumby Wtaer tanks or equivalent.
The tanks must be fit for purpose and of commercial grade, details of the tanks construction make annd model must be included in the submission.
If the contractor wishes to offer an alternate form of storage that exceeds the minimum capacity offered it will be considered but meet all DA requirements for the site.
The tanks will be fitted with suitable level transducers (range matched to tank hieghts) for the monitoring of the tank levels and the operation of water transfer and potable water when required.
A backup low and high level 3 wire float will also be supplied to give backup protection for both pump sets, storm water harvest and field irrigation.
All level monitoring equipmenty shall have a connection point for the IRRinet.
The harvested water inlet to the tank will be operated by an electric solenoid valve rated to the required pressure and flow.
A suitable water meter will be fitted to the re-use inlet pipe work to the tank with the capability of a pulse output. This meter may need to meet requirements of liceneing or permission to utilise re-use water. The meter will also be utilised to assist in the management of the re-use pumps. The pulse output will be connected to the IRRinet.
The backup potable water supply to the tank will meet all required Sydney Water rules and regulations with all permits and specified backlow devices or requirements meet.
The contractor shall supply and pay for any applications testing or inspections to Sydney Water or any other required departments.
The potable supply will be fitted with a compliant meter with pulse output.
The discharge to the fields after the pumping system shall be meterd with a pulse capable meter and connected to the IRRinet.
Each tank shall be fitted with suitable slueth valve and locking mechanism so that only authorised use of the valve is capable. The slueth valves are to be piped back to the harvest pump pit prior to screening to allow cleaning of the storage tanks.
The balance pipe between the 2 tanks shall be set at hieght above the floor level to allow for settelment with in the tanks and not draw the sediment to the pumps. The balance pipe shall be sized adequatly so that the tanks will evenly reduce their level during pumping to the field irrigation.
The balance pipe shall have the ability to isolate the tanks from each other for maintenace purposes.
All inlet pipe work and sensing equipment required shall be fitted at manhole entrances for ease of maintenace.
Manhole entrances are to be secured so that no foreign material or animals can enter the tanks.

Tanks shall have required signage attached

L4 WATER QUALITY

The harvested water shall be treated to the specific requirements as set out by the NSW Office of Enviroment and Heritage for the use of harvested stormwater for sporting fields. http://www.environment.nsw.gov.au/stormwater/publications.htm and the NSW Health Department.
Details of the;

- Design and process of the water purification
- Water quality levels that will be meet
- On going maintenace requirements and costs
- Estimated maintenace costs and life span of materials and equipment used
- Relevant standards and authority licencing that will be meet and if there is any testing regime to be meet to maitain or renew the licences or ability to irrigate with reuse water
  All of the above information shall be presented in the tender submission.

The equipment recommended shall have the ability to be moinitored for faults, general alarms running, differential pressure where required.If media or screened filtration is utilised the IRRinet will control backflushing.

L5 WATER HARVEST PUMPING CHAMBER

The Contractor shall allow to construct an in ground concrete chamber in which to collect water from the pitch area and pump it back to the holding tanks.
This chamber shall have the ability to pre-screen the captured water prior to being pumped out to final filtration and storage. The use of a prefabricated chamber specifiely built for storm water harvest would be preferred. (products manufactured by Humes and Rocla are an example, but must be sized correctly to maximum flows)
The design and installation of the chamber shall also take into account the maintenace and cleaning of the chamber including;

- Suitable vehicle access
- Suitable pump out and collection equipment for cleaning the chamber
- Access for pump removal and maintenace

The chamber shall be located under the concrete surround path in the north west corner of the pitch, and have dimensions sufficent to allow a minimum water storage of 3.000 litres excluding the space required for;

- Minimum water levels for pump operation
- Required overflow levels..

A two pump system is to be installed to maximise pump and power efficincies in periods when there is no sporting event and it acts as stormwater collection only.
If one pump fails the system is still operational.
Process for storm water harvest.

- Single pump to operate of high level to pump to storm water tank if storage capacity is available.
- If a high high level is reached the option to utilise the second pump can be operated to optimise collection (in dry periods with limited rainfall) or overflow will be utilised to remove excess water.

Process for retrieval after irrigating

- This will need to be determined once the system is run and the physical return to the pump well is documented.
- A level transducer is to be fitted to the pumping chamber to monitor and record chamber levels to assist with management of the system to ensure efficiencies, reliability and utilise maximum reuse water

The pumping chamber is to be fitted with a low, high and high float arrangement. Floats are to have neoprene rubber sheath with 3 wires. Kelco or equivilant.

Two, 225mm dia overflow pipes shall be installed between the top of the tank and the stormwater infriltration basin.

The top of the tank shall finish flush with the footpath and fitted with a galvanised frame and lockable lid to allow easy access to the tank and pumps.

- Each pump shall have a minimum performance of 70% of the required refill rate to the storage tanks from the harvest chamber during sports field operation.
- Each pump shall be mounted on rails with an autocoupling arrangement for quick release and ease of maintenace
- Best practice and manufacturers specification will be followed for support and extraction cables.
- Motor cables will be installed to manufacturers size and specification
- Each pump shall be able to be removed from the auto coupler and not affect the use of the other pump.
- Individual isolation and check valves shall be fitted for each pump and accessable with out having to enter the tank.
- Test points must be fitted to each discharge prior to the isolation point so that closed head tests can be carried out as well as the correct operating presures so that the pumps operate at optimum performance.
- Pump tests to be carried out in the presence of the superientendant to manufacturesr and Australian Standards.

L6 DESIGN REQUIREMENTS

The irrigation system shall be designed to cover the entire turf surface area of 11,940 m2 with the ability to evenly distribute 2 to 3 mm depth of water , and in a maximum time span of 30 minutes.
Minimum standards to be meet:

- Designer is to be a certified irrigation designer to australian standards and accreditations.
- Pumping is to meet maximum demands with a minimum 5% extra capacity.
- Irrigation pumping is to be operated by variable speed drives.
- Water quality
- Precipitation and uniformaty as required by the synthetic turf manufacturer and to be able to apply the specified amount of water in a set period.
- Irrigation system to meet thea minimum standard required by FIH

- Irrigation system to meet all best practice requirements for design and installation practices

The twin water tanks will have a total capacity of 50,000 litres.

L7 SPRINKLERS

Three pop up sprinklers shall be installed along each of the east and west edges of the playing surface of each pitch, and flush with the installed synthetic surface. (6 sprinklers in total per pitch) One sprinkler shall be installed in each corner and one on the half way line.

The sprinklers shall be "Perrot" brand or equivalent. Synthetic turf shall be glued to the top of each head.

Each individual sprinkler head, after the synthetic surface has been attached, shall be set flush with the surrounding finished synthetic surface, and the feeder pipe fitted with a swing joint for head adjustment. The Contractor shall allow in his tender, for the adjustment of the sprinkler heights if necessary, once the synthetic surface is installed.
The sprinklers must be installed in such away that the playing surface will not be disturbed if maintenace is required on the sprinkler.
Each sprinkler shall be operated automaticly and independantly of other sprinklers. The sprinklers will be operated by a standard 24 VAC solenoid coil with all cabling conduited and returned to the pump shed.
There shall be 2 spare wires run to each pitch and follow the length of the pipe work.
All wiring shall have expansion loops of no less than 1 meter at each valve.
All infield wiring joints shall be carried out with 3DBY/R wire connectors
The system must be designed to FIH standards and follow best practice for irrigation design.
The design must be carried out by a Certified Irrigation designer
The water distribution must meet the FIH standards and the system must be tested and proven to these standards with the appropriate supervisors present.

L8 PIPE WORK

All piping is to be installed in accordance with the manufactures specification.
When installing the pipe in hot weather the Contractor is to allow for expansion and contraction within the work.
Only MDPE PE100 pn 12.5 pipe is to be used. Pipe is to be supplied in the longest possible lengths to minimise joints.
Only the correct purple colour coded pipe is to be used.

Fittings

All fittings must be rated to a minimum of pn 16.

Either electrofusion or butt welded fittings are to be used for all tees, elbows, bends, couplings and flanges

Where fittings are flanged (excluding fittings associated with the pump discharge lines) all backing rings are to be fabricated from mild steel, drilled to "Table E" and have a hot dipped galvanised finish.

Threaded take offs may be either electrofusion transition couplings of mechanical type male or female adaptors.

Tapping saddles
For 90mm diameter pipe and larger only electrofusion branching or tapping saddles are to be used.

For 75mm diameter pipe and small mechanical type fittings may be used. Saddles must be supplied with a tight fitting stainless steel retain ring on the branch and all nuts and bolts to be 304 stainless steel.

Thread Sealing

All threads are to be cleaned prior to the wrapping with PTFE Teflon thread tape.
Contractor's are to ensure threads remain clean while installing.

Nuts, Bolts and Washers

All nut and bolt sets, are to be 304 Stainless Steel. Bolt sets are to have a minimum of three (3) full threads and no more than ten 10) full threads once tightened. Washers are to used under both nut and bolt head.

Thread lubricant must be used on all threads.

Flange Size Table E	Bolt Diameter
<40mm	M12
50mm-200mm	M16
225mm>300mm	M20

Low Voltage Conduits

Within the same trench as the irrigation transfer main a 40mm low voltage conduit is to be installed. At the same time a nylon pull string is also to be installed. The string is to have a minimum of 2 m of length left at each end. The conduit ends are to be sealed using "duct tape".

Testing

Pipe work shall be pressure tested to the manufactures specifications and Australian Standards with the tests carried out with the superintendant present.
All test results shall be recorded and verified.
All testing is to be carried out prior to any hard surface being laid over the pipe network if this is not carried out the contractor is liable to any hard surface and its repair in the ese of a pipe failure.

L9 PUMPS

The contractor shall design a dual vertical multistage pumping system with each pump capable of running one (1) individual field without assistance.

The delivery pipe work to the fields should be sized so that both pumps are able to run at the same time and deliver enough flow and pressure to operate both fields at the same time applying the desired application rate in the desired time.

The pumps will be operated by individual VFD control and maintain a minimum pressure in the pipeline suitable to operate either 1 or 2 of the manual hose connections at the field.

Whilst operating the irrigation the pumps will be capable of operating 2 sprinklers at a time.

The pump set assembly shall be installed with an isolation panel. The panel shall be fitted with:

- Isolation (mains) switch;
- Suitable surge arrester to protect downstream electrical equipment for mains surges/spikes;
- Suitable circuit breakers;
- Ammeter; with output to IRRinet per pump
- Voltmeter; with output to IRRinet per pump
- Dedicated variable speed drive per pump that is recommended by the pump manufacturer (either Grundfos or Lowara)
- Open/Closed contacts input to be connected to IRRinet irrigation controller to remotely isolate pumping system;
- Open/Closed contacts output linked to pump system fault for connection to IRRinet irrigation controller (remote alarm) and external fault warning lamp per pump
- Open/Closed contacts output linked to pump running status for connection to IRRinet irrigation controller for run monitoring of each pump

- External pump running lamp on cabinet
- Connection to irrinet to monitor any filtration or UV disinfection equipment.

Provide easily accessible and suitably labelled terminals for the above.

Note: The Contractor shall oversize the pump power supply cables between the pump control panel variable speed drive outputs to the pumps as recommended by the manufacturer to prevent overheating. All pump power supply cables between the pump control panel variable speed drive outputs to the pumps shall be 'screened' as recommended by the manufacturer to eliminate and RFI noise being transmitted and installed within heavy duty electrical conduit. When sizing cables, the total length between the motor and the Power Supply Authority meter shall be taken into consideration.

The indicating range for electrical meters shall be chosen so that all currents and volts for the full start-up condition for the motors are accommodated on the full scale of the meter. Instruments shall conform to AS 1042.

Warning lights and reset push buttons shall conform to AS 1431, with bulb replacement from the front of the panel and lamp testing by pushing.

In addition to the fault warning, ammeter and voltmeter (with outputs to the IRRinet system for each pump), the pump shall be provided with at least the following equipment:

- Pump Run Hour Meter; and
- On-Off-Auto Switch

In the 'ON' position the pump shall start and run, irrespective of the pressure or flow condition of the sensors. In the 'OFF' position the pump shall be isolated and shall not start under any condition. In the 'AUTO' position the pump shall be controlled by the PID and or the PLC and shall start or stop depending upon the status of the pressure transducer.

The Contractor shall provide a 'Shop' Drawing for the cabinet layout for approval by the Superintendent prior to fabrication of panel sections.

Labels shall be fixed to the cabinet surfaces to indicate functionality and warnings. Labels shall be engraved "Trefolyte" or similar permanent material. Labels shall be mechanically secured to panel surfaces. Glue fixing of labels will not be acceptable.

Suitable ventilation shall be provided to ensure adequate cooling of switchgear and control equipment. If required, the Contractor shall provide fan cooling to guarantee a suitable operating temperature within the cabinet. Temperature rises shall be limited to ensure the absolute temperature within the cabinets, under the severe conditions of continuous full load on a day of extreme temperature (highest on record: 44.4°C), does not exceed the safe working temperature for the enclosed equipment or cause malfunctions in thermal trip mechanisms or thermally sensitive equipment.

Removable gland plates shall be used to execute cable and conduit entries to cabinets. Individual cables may enter the cabinets through separate cable glands if necessary. No cable shall penetrate cabinet walls without protection from chaffing.

Doors providing access to exposed live equipment shall be secured with fasteners requiring a tool for removal or shall be fitted with a power isolator that must be disengaged before the door can be opened.

All wiring shall be terminated with tunnel type rail mounted terminal strips appropriate to the cable size and type. All terminal strips shall be located for ease of testing and fault finding. Sufficient slack shall be provided in wiring looms that cross door hinges so that no undue loads are transferred to the wires when doors are fully opened.

All control wiring shall be clearly labelled with Critchley Type Z (or equivalent) numbered sleeves fitted to both ends. Numbers on cables shall be recorded on the As-Built circuit diagrams.

The pump shall start on frequency drive (variable speed drive) by responding to a pressure drop (ie hydraulic demand). As the hydraulic demand varies, the pump shall be "ramped" up or down as required to maintain the set pressure.

The shut down procedure shall be the reversal of the start up procedure as water demand decreases.

The pump shall start via dedicated variable frequency converter (VSD) complete with RFI filter and harmonic dampers.

Suitable "starter" complete with deceleration option shall be incorporated into the control logic to ensure the available power load is not exceeded.

The pump control logic shall feature suitable No-Flow protection. The pump motor shall feature thermal protection.

The Contractor shall provide 'Shop' Drawings showing all electrical components and wiring configurations for the (proposed) control panel prior to the commencement of any purchasing, fabrication or installation.

Note: Should heat be problematic to the satisfactory operation of the pump control system, the Contractor shall allow for the installation of heat extraction fans or cooling systems as required

Cables

Pump Motor Cables
All cables are to be supplied of sufficient length so no joints occur below ground or within the pit or bore.

A minimum length of 300mm is to remain within the turrets and control cabinets.
Special care is to be taken to ensure cables are not damaged when installing the pumps
Prior to installation cables are to have the insulation tested and then retested:
Immediately after submergence of the pumps.
Then again 1 month after installation.

In both test results should be 200 megaohms or greater.

The results are to be recorded and included within the operation manual.

If it is found that a short to earth exists the cables are to be replaced.
Cables are not to be repaired.

Cable Terminals

All cables are to be connected using din mounted terminals of any colour excluding green/yellow.
Terminal sizes are to a minimum of:
One size larger than the nominal cable size entering the connector.

Pump motor lead	6.0mm²
Level transducer	2.5mm²
Others	2.5mm²

All earth cables are to be connected with din mounted terminals green/yellow in colour.

Within turret all terminals are to be clearly identified using trafellite labels with 10mm black letters on white backing.

Filtration and Water Qaulity
The filtration and water quality system shall be submitted with the pumping control

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The pumping control flow rates and operation pressure are tobe taken into account when sizing the irrigation pumps so that any friction loses or operating requirements from the filtration system will not affect the irrigation operation.

L10 AUTOMATIC CONTROL

The irrigation and lighting shall be controlled by the IRRinet system with a remote control panel mounted on the South end of the proposed ammenities block.
The remote panel will communicate with the IRRinet and operate a minimum of 4 preditined programs
Manual switching shall be capable to allow for individual operation of either sprinkler in a pair as well as two simultaneously. The automatic and manual control must be in minutes and seconds and capable of scaling through a water budget feature.

L11 CONTROL EQUIPMENT HOUSING

The control panel shall be located at the south end of the pitches in the proposed club house building.
If the proposed club house is not constructed conduits will be laid between the pump shed and the amenitties block with pulling pits at each bend. An allowance of 3 x 50mm HD electrical conduits with pulling cables must be allowed for.
The remote panel must be housed in an approved enclosure with an approved locking system.

L12 WATER SUPPLY CONNECTION

The Contractor shall allow to install a top-up potable supply pipe to the water storage tanks
The outlet to the tanks shall be provided with an electrically controlled solenoid valve which will control the flow of top-up water to the tanks. The logic for the opening and closing of the valve shall be controlled by the IRRinet system.

The backup supply will be from a potable metered supply with the size to be determined by the refill requirement of the storage tanks to operate both pitches if there is no storm water harvested. It is the contractors responsibility to ensure that the potable water supply to the site is capable of

An allowance for a secondary Lilac Polyethelen MDPE 110mm pN12 pipe line from the tank location to a designated point on the facilities boundary will be laid for future use.

L13 WORKMANSHIP

All the work shall be carried out by suitably qualified and registered trade persons.

L14 WATER TAPS

The Contractor shall allow to provide a piped drinking water supply to the vacinity of the dugouts for each pitch. For each pitch, two taps on stand pipes shall be positioned at the spectators fence, each one approximately 10 metres each side of the half way line. (4 taps in total).

One. 40 mm diameter supply point with isolation valve, locking mechanism for authorised use only and quick connection for a suitable hose hose for top up pitch water. These points shall be taken from the pressurised mainline. Taps shall be located in the spectaor fence line.

L15 TESTING AND COMMISSIONING

On completion of the installation it shall be thoroughly tested to the satisfaction of the Superintendent. After commissioning and before handing over, the Contractor shall instruct a nominated representative of the Hockey Club on the correct operation of the irrigation system and its controls.

The Contractor shall provide the Principal with two copies of all the relative instruction manuals, which shall include a fully detailed as built drawing showing the positions of all pipe work, sprinklers, control valves, control box and other components. Schematic drawings of the control panels shall be submitted.

Details of manufacture of all components shall be clearly shown within the manual, together with any extended warranty which is to be handed on to the Principal after the 12 month maintenance and warranty period.
Spare parts shall be supplied at the completion of the project.

L16 MAINTENANCE

The maintenance period is to be 12 months and it is to cover all parts and labour that are of manufacture or workmanship defects. During the maintenance period the Contractor is to be responsible for maintaining the installed equipment in a correct operating condition.

The Contractor shall replace any equipment or parts found to be faulty or not achieving the specified operation. No extra payment will be made for maintenance, replacement of faulty equipment, replacement parts or labour to the system during the maintenance period.

L17 INFORMATION TO BE PROVIDED WITH TENDER

The following information shall be provided by the Irrigation Contractor at the time of tendering. Failure to provide the required information could invalidate a tender.

* Full details of all the equipment to be installed, particularly the type, size, operating pressure, design flow and wetted radius of the sprinklers.

* Any further information which will assist the Engineer and the Principal in evaluating the irrigation design proposal.

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35.

M FLOOD LIGHTING

M1 GENERAL

The Flood Lighting section of the Specification shall cover the complete design, supply and delivery of floodlighting components plus all necessary ancillary equipment, electrical supply, testing, commissioning and aiming of lights.

The lighting installation shall consist of a total of 12 lighting poles to cover the two pitches. Four down each of the west side and east side of the pitch block and four in the middle between the two pitches to light both.

M2 LIGHTING DESIGN

The flood lighting shall be designed in accordance with drawing number: SLA Concord Sylvania N3751, as prepared by Sylvania Lighting Australia Pty Ltd.

The flood lighting is to be designed so that it can be maintained from outside of the playing surface as no heavy vehicles will be permitted on the synthetic surface.

M3 STANDARDS AND CODES

The lighting shall comply with the conditions and requirements as set down and specified within the appropriate codes and specifications including:

* The F.I.H.'s "Guide to the Artificial Lighting of Hockey Pitches"
* C.I.E. Publication No. 67-1986: "Guide for the Photometric Specification and Measurement of Sports Lighting Installations".

Although particular reference is made to the above, it does not exclude other relevant standards, codes or any other internationally recognised standard or code relating to this contract.

Not withstanding anything written in the following Specification, Section M, covering the lighting clauses the Contractor shall ensure that the system as installed fully meets all the requirements of acceptable lighting levels for both official matches and training.

M4 ILLUMINANCE

For the purpose of illumination design, the playing area shall have a 5 metre by 5 metre grid imposed on the surface parallel to the side lines and with the origin at the centre point of the halfway line.

The illuminance measuring points shall be the intersection of the grid lines.

The lighting shall be designed to give a 2000 hours maintained average horizontal illuminance of 500 Lux over the full playing field area.

In addition the Contractor shall allow for switching options for 250 Lux and 100 Lux, plus the option for only one half of the field to be illuminated at any required time.

M5 UNIFORMITY

Under the required full illuminance levels of 500 and 250 Lux the minimum uniformity ratio measured on a horizontal plane shall be 0.6.

M6 GLARE

The floodlights shall be correctly aimed and in particular shall be away from important directions of view. Mounting angles measured from the centre of the pitch shall be greater than 20° above the horizontal.

The average illuminance, on the vertical, at the eye level of any spectator at the inner fence, shall be not more than half the average value on the vertical over the pitch, and shall preferably be not more than one-third. In no case shall the Glare Rating exceed 50 as calculated in accordance with CIE publication No. 83.

M7 LIGHTING CONTRACTOR QUALIFICATIONS

The Lighting Subcontractor shall submit with his tender the following information:

i. Details of the qualifications, experience and capabilities of the technician who will be responsible for supervising the lighting installation.

ii. Details of the technical availability and support of a local representative, should this be required.

iii. Details of recent Australian hockey field installations which employed the proposed lighting system.

M8 LUMINAIRES

The luminaires shall comply with all appropriate and current standards relating to luminaires, transformers and control equipment, etc, including: NZS/AS 3137:1992, NZS/AS 3140:1988.

The luminaires proposed shall have a minimum International protection rating as follows: Optical System - IP55, and where integral control gear is fitted, the gear enclosure - IP34.
The luminaires and all mounting components shall be manufactured from a non-corrosive material adequately engineered for the purpose.
The luminaires shall be so designed as to allow sufficient cooling for the lamp to operate within its designed range temperature.
The luminaire shall provide for the identification of aiming angle, adjustment and locking in both the horizontal and vertical planes.
The glass front cover shall be of heat resistant toughened glass or approved equivalent.

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All wiring shall be of adequate conductor size, temperature rated, voltage rated to match the igniter's peak voltage and be of the correct colour coding and workmanship to comply with the appropriate Australian Standards.

M9 LAMPS

The lamps shall be Metal Halide.
The lamps supplied shall be readily available within Australia from normal stock.
The lamps must have consistent colour when used with the supplied control gear.

The tenderer shall submit in writing with his tender the following information.

* The lamp manufacturer's written guarantee for the lamp life.
* Details of the lamps initial run up time and the restrike time following a momentary fluctuation in the power supply.
* Depreciation and maintenance graphs.

M10 CONTROL GEAR

The control of the floodlighting shall be from the south end of the pitches in the proposed club house building. The lights shall be switched on and off by the IRRinet system either by the use of a secure text system or secure operation from the control panel. CTS Pty Ltd is to be contacted for the intergration with the IRRinet control system.
Monitoring of power usage on each circuit is to be incorporated in the system and monitored by the IRRinet system.

The control gear shall be approved by the lamp manufacturer so that the optimum performance of the lamp is guaranteed.

The control gear shall be designed to operate from a 400V or 230V, 50 hertz, power supply.
All components shall comply with the Australian recognised standards, and shall result in a power factor of not less than 0.95 lag per fitting.

Each fitting shall have the protection of an appropriately sized HRC fuse to protect the control gear and lamp, which in the case of remote control gear shall be mounted on the gear tray, and with integral control gear, shall be supplied for installation at the base of the pole.

If the control gear is separate from the luminaire then it shall be supplied fully wired on a gear tray per luminaire in a standard configuration and suitable for installation in a weatherproof outdoor enclosure.

M11 COMMISSIONING AND ACCEPTANCE TESTS

The Contractor shall be responsible for all adjustments and aiming of the luminaires to ensure that the design criteria is met.

The Contractor shall undertake such illuminance and uniformity tests as may be necessary to demonstrate to the satisfaction of the Principal, that the installation complies with the specification and the design proposed in the tender submission.

The final measurements shall be taken over a grid of not greater than 3 metres by 3 metres. Results of the tests shall be recorded and forwarded to the Principal. All defects shall be rectified by the Contractor at his expense.

The Contractor shall submit with his tender a full description of the proposed tests along with a programme for their implementation.

M12 MOUNTING, LIGHTING POLES AND FOUNDATIONS.

The Contractor shall fabricate, supply and install twelve, 18 metre (nominal height), flanged base, metal lighting poles complete with floodlight mounting brackets.

The total pole height is to be such as to allow the lowest flood lamps to be mounted at 18 metres above ground level and the highest at a maximum of 18.9 metres AGL. The poles shall be located in the positions as shown on the drawings.

The Contractor shall construct reinforced concrete foundations on to which the poles shall be fixed.

Lamp mountings, lighting poles, associated fittings and the concrete foundations shall be designed to fully comply with the relevent Code of Practice for General Structural Design and Design Loadings for Buildings. In particular the Lighting Subcontractor is required to ensure, by carrying out site test bores if necessary, that the concrete foundations for the poles as designed and proposed are adequate to meet the loadings stipulated.

The Contractor shall make the necessary application and pay all charges to the Sutherland Shire Council for the issue of a building permit for the lighting poles and their proposed reinforced concrete foundations.

The Contractor shall forward to the Superintendent and the Engineer, at least one month prior to pole the installation, foundation details, together with written assurance that all aspects of the lighting, pole and foundation design conforms to the requirements of the Code of Practice plus evidence of the building permit.

Any approval of the foundation or other design by the Superintendent and Engineer shall not in any way absolve the Contractor of his obligations under this clause.

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39.

N ELECTRICAL WORK

N1 GENERAL

The electrical shall cover the supply and installation of all necessary materials labour and equipment to provide a power supply for the flood lighting together with the irrigation sprinkler system.

All electrical work shall be carried out by experienced tradesmen in accordance with good trade practice and in conformity with all current and relevant Statutory Regulations and Codes of Practice which apply under law in Australia including the AS/NZS 3000:2007 Standard, "Wiring Rules".

The Contractor shall notify the Local Power Authority when carrying out electrical work under this contract and shall comply with all their requirements. All requisite Wiring Permits are the responsibility of the Electrical Contractor. The Tender Sum shall include the costs, if any, of all attendances by the Authority for inspectorial purposes, for any connection fees and for any other costs incurred in complying with the requirements of the Local Authority.

The Contractor shall co-operate with both the installer's of the flood lighting and the irrigation system to ensure that the electrical work is completed in accordance with the requirements of these trades.

N2 POWER SUPPLY

A power supply will be available at the site to allow connection and commissioning of services prior to completion. Should the Contractor require power prior to this time then they will need to allow to supply a temporary transformer.

N3 EXTENT OF WORK

The electrical work shall include: the arrangement with the Local Power Authority, and payment of all charges, for the provision of a sufficient voltage and capacity power supply to the site, the supply of all materials, laying of cables, the installation of all switching, control and fuse gear into the club room building plus the pump shed, connection of the cables to the floodlights and main power supply.

The supply of one three phase outlet, and one single phase light, in the pump shed, connection of the irrigation water supply pump and sprinkler system power supplies, plus all other work necessary to complete the installation to the satisfaction of both the Local Power Authority, the Superintendent and the Engineer

The switch socket for the three phase outlet shall be PDL type 56-CV-320 LE mounted in a PDL weatherproof box type 56-E2 or approved equivalent. The pump shed light and switch shall be domestic quality.

All cabling shall be underground.

Provision shall be made in the lighting switching programme, to allow for: 500, 250 and 100 Lux illuminance levels to be switched, plus for only half the field area to be illuminated.

The Contractor shall allow to provide a sufficient power supply to the irrigation system and to connect to the pumps with the required control switches, fuses, etc.

The Contractor shall, at the time of tendering, ascertain the electrical requirements of the irrigation installers in order to make their systems operational

N4 CABLING FOR PUBLIC ADDRESS SYSTEM

Suitable, two core, screened, audio pair cable is to be run underground to the central lighting pole situated between the two pitches. Sufficient cable shall be left coiled inside the lighting pole to allow for speakers to be mounted at least half the height of the pole.

The cable is to be run in a 100 mm diameter PVC cable duct which is to be laid from the club room site to the pole under the concrete footpath. The duct shall be laid complete with a draw-wire for possible future cable installation purposes.

N5 PUMP SHED

The Contractor will supply and ereet a suitably sized pump shed, adjacent to the irrigation tanks to house the pumping and filtration The shed must be suitably constructed to meet council codes and be fit to purpose with access, safety and quality.

- It must have suitable ventalation
- Suitable access for maintenace and repair
- Suitable wall space and support for the mounting of control cabinets
- 2 x Double Power points installed for use other than the control equipment
- Sufficient electric lighting to enable safe working conditions

The exterior wall and roof cladding shall be Colorbond sheathing to match the dugouts. The shed shall be installed and fixed onto the concrete footpath slab. The shed will be provided with key lockable doors and roller doors Doors shall have proximity switches fitted and connected to the IRRinet to monitor acces to the building.

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O PLAYERS AND OFFICIALS DUGOUTS

O1 GENERAL

Three separate dugouts, two for players and one for officials shall be constructed and erected for eah pitch in accordance with this section of the Specification, and in the position as shown on the drawings.

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O2 MATERIALS

Each dugout shall consist of two end walls, a rear wall, a roof, and an open front to the playing field.

The main framing shall be constructed from 60 NB galvanised pipe, and the sub-frame and bracing from 50 NB galvanised pipe.

The external walls, internal partitions and roof shall be clad in ColorBond. The fixing of the cladding shall be in accordance with the requirements of the manufacturer. The colour is to be as determined by the Principal.

Both the end walls, plus the internal partitions, from a point one metre up from the ground to the roof, shall be fitted with transparent sheets, of similar profile to the ColorBond.

The dugout shall be permanently fixed to the ground in accordance with the details as shown on the drawings. A slatted, dressed, treated timber seat shall be supplied and fixed along the length of the rear wall. It shall be supported on galvanised steel brackets securely fixed to the rear wall.

O3 PAINTING

The galvanised pipe framework shall be treated and painted as follows:
One coat of primer, one coat of undercoat and two coats of finished colour.
The Contractor shall ensure that on the completion of each coat that it is inspected by the Superintendent before the next coat is applied.

The timber slatted seats shall be painted with one coat of undercoat and two coats of exterior enamel of the same colour as the dugout framework.

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P SUNDRIES

Hockey Goals: The Contractor shall supply and deliver to the site four hockey goals to fully meet F.I.H. specifications. They shall be mouted on large rubber wheels so that they are fully portable.

The back and side boards of each goal shall be fitted with suitable rubber sheeting to act as a noise deadening surface.

Score Boards: The Contractor shall supply, deliver to the site and commission two electronic scoreboards to meet FIH specifications. Each board must be remotely control by wireless and wired into the power supply.

The boards shall be installed at the north end of each pitch, the exact location to be advised by the Hockey Association to the Contractor.

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APPENDIX A

Irrigation Standards

AS 1023.1	Low Voltage Switchgear and Controlgear – Protection of Electric Motors: Built-in Thermal Detectors and Associated Control Units
AS 1023.2	Current Sensing Protective Devices for AC Motors
AS 1023.3	Inherent Overheat Protectors
AS 1029.1	Low Voltage Contactors: Electromechanical – Up to and Including 1000 V AC and 1200 V DC
AS 1029.2	Low Voltage Contactors: Semiconductor (Solid State) – Up to and Including 1000 V AC and 1500 V DC
AS 1042	Direct-acting Indicating Electrical Measuring Instruments and their Accessories
AS 1023.1	Low Voltage Switchgear and Control gear– Protection of Electric Motors: Built-in Thermal Detectors and Associated Control Units
AS 1023.2	Current Sensing Protective Devices for AC Motors
AS 1023.3	Inherent Overheat Protectors
AS 1029.1	Low Voltage Contactors: Electromechanical–Up to and including 1000 V AC and 1200 V DC
AS 1029.2	Low Voltage Contactors: Semiconductor (Solid State) –Up to and Including 1000 V AC and 1500 V DC
AS 1042	Direct-acting Indicating Electrical Measuring Instruments and their Accessories
AS 1074	Steel Tubes and Tubulars Threaded for Ordinary Service
AS 1125	Conductors in Insulated and Control Gear Assemblies.
AS 1159	Polyethylene Pipe for Pressure Applications
As 1167	Welding and Brazing - Filler Metals
AS 1202	Parts 1&5 - AC Motor Starters - D.O.L & Semi-Conductor
AS 1214	Hot Dipped Galvanised Coatings on Threaded Fasteners (ISO Metric Coarse Thread Series)
AS 1281	Cement Mortar Lining of Steel Pipes and Fittings
AS 1289	Methods of Testing Soils for Engineering Purposes
AS 1302	Steel Reinforcing Bars for Concrete
AS 1303	Hard Drawn Steel Reinforcing Wire for Concrete
AS 1304	Welded Wire Reinforcing Fabric for Concrete
AS 1315	Portland Cement.
AS 1326	Polyethylene Film for Packaging and Allied Purposes

AS 1345	Identification of the Contents of Piping, Conduits and Ducts
AS 1348	Road & Traffic Engineering - Glossary of Terms
AS 1431.1	Low Voltage Switchgear and Controlgear - Control Circuit Devices and Switching Elements: General Requirements
AS 1432	Copper Tubes for Plumbing, Gasfitting and Drainage Applications
AS 1449	Stainless Steel Plate Sheets
AS 1460.1	Fittings for Use with Polyethylene Pipes: Mechanical Jointing Fittings
AS 1460.2	Fittings for Use with Polyethylene Pipes: Electrofusion Fittings
AS 1462	Methods for Test for Unplasticized PVC (uPVC) Pipe and Fittings
AS 1477.1	Unplasticized PVC (uPVC) Pipes and Fittings for Pressure Applications: Pipes
AS 1553	Covered Electrodes for Welding
AS 1554	Structural Steel Welding (SAA Structural Steel Welding g Code)
AS 1579	Arc Welded Steel Pipes and Fittings for Water and Waste Water
AS 1585	Capillary and Brazing Fittings of Copper and Copper Alloy
AS 1597	Precast Reinforced Concrete Box Culverts
AS 1608	Preservative Treated Farm Fencing Timber
AS 1628	Water Supply - Copper Alloy Gate, Globe and Non-Return Valves
AS 1645	Copper and Copper Alloy Compression Fittings for Use in Water Supply and Hot Water Services
AS 1646	Elastomeric Seals for Waterworks Purposes
AS 1650	Hot Dipped Galvanised Coating on Ferrous Articles
AS 1675	Current Transformers: Measurement and Protection
AS 1718	Water Supply - Copper Alloy Screw-down Pattern Taps Specified by Dimensions
AS 1722	Pipe Threads of Whitworth Form
AS 1741	Vitrified Clay Pipes and Fittings with Flexible Joints Sewer Quality
AS 1763	Lightning protection
AS 1769	Welded Stainless Steel Tubes for Plumbing Applications
AS 1882	Earth and bonding clamps
AS 1930	Circuit breakers for distribution circuits
AS 1939	Degrees of Protection Provided by Enclosures for Electrical Equipment (IP Code)
AS 2005	Low voltage fuses - fuses with enclosed fuse links
AS 2032	Code of Practice: Installation of uPVC Pipe Systems
AS 2033	Code of Practice: Installation of Polyethylene Pipe Systems
AS 2043	Coal-tar and Synthetic (fast dry) Primers for Steel Pipe
AS 2044	Coal-tar Enamel for Steel Pipe
AS 2045	Materials Associated with the Coating and Lining of Steel Pipes with Coal-tar/Primers Systems
AS 2046	Code of Practice for the Coating and Lining of Steel Pipes with Coal-tar/Primers Systems
AS 2053	Non Metallic Conduits and Fittings
AS 2129	Flanges for Pipes, Valves and Fittings
AS 2184	Low Voltage Switchgear and Controlgear Moulded-case Circuit-breakers (Up to and Including 600 V AC and 250 V DC)
AS 2280	Ductile Iron Pressure Pipes and Fittings
AS 2419.1	Fire hydrant installations - System design, installation and commissioning
AS 2423	Galvanised Wire Fencing Products
AS 2439	Perforated Plastics Drainage and Effluent Pipe and Fittings

AS 2518	Fusion-bonded Low-density Polyethylene Coating for Pipes and Fittings
AS 2544	Grey Iron Pressure Pipes and Fittings
AS 2566	Plastics Pipe laying Design
AS 2638	Cast Iron Sluice Valves for Waterworks Purposes
AS 2648	Underground marking tape
AS 2648.1	Underground Marking Tape - Non Detectable Tape
AS 2698.1	Polyethylene Micro Irrigation Pipe
AS 2701	Methods of Sampling and Testing Mortar for Masonry Constructions
AS 2717	Welding - Electrodes - Gas Metal Arc
AS 2845.1	Water Supply - Mechanical Backflow Prevention Devices
AS 2870	Residential Slabs and Footings Code
AS 2926	Standard voltages
AS 3000	Electrical Installations– Buildings, Structures and Premises (SAA Wiring Rules) and amendments
AS 3000	SAA Wiring Rules
AS 3008	Electrical Installations - Selection of cables
AS 3008.1	Part 1 Cables for Alternating voltages up to and including 0.6/1 kV
AS 3012	Electrical Installations - Demolition and Construction sites
AS 3111	Miniature Circuit Breakers
AS 3112	Plugs and Socket outlets
AS 3147	Electric Cables. Thermoplastic insulated and flexible cables for working voltages up to and including 0,6/1 kV
AS 3158	Fibrous insulated electric cables and flexible cables for working voltages of 0.6/1 kV
AS 3190	Residual current devices
AS 3439.1	Low Voltage Switchgear and Control Gear Assemblies: Type Tested and Partially Type Tested Assemblies
AS 3500.1	National Plumbing & Drainage Code: - Water Supply
AS 3600	Concrete Structures
AS 3680	Polyethylene Sleeving for Ductile Iron Pipelines
AS 3681	Guidelines for the Application of Polyethylene Sleeving for Ductile Iron Pipelines and Fittings
AS 3688	Water Supply - Copper and Copper Alloy Body Compression and Capillary Fittings and Threaded End Connectors
AS 3725	Loads on Buried Concrete Pipes
AS 3798	Guidelines on earthworks for commercial and residential developments
AS 3858	Low voltage switch gear and control gear - circuit breakers
AS 3879	Solvent Cements and Priming Fluids for use with Unplasticized uPVC Pipes and Fittings
AS 3947.3	Low Voltage Switchgear and Controlgear - Switches, Disconnectors, Switch-disconnectors and Fuse Combination Units
AS 4041	Pressure Piping
AS 4058	Precast Concrete Pipes (pressure and non-pressure)
AS 4060	Loads on Buried Vitrified Clay Pipes
AS 4087	Metallic Flanges for Waterworks Purposes
AS 4130	Polyethylene Pipes, Pressure Applications (Interim Standard)
AS 4131	Polyethylene Pipe Compounds (Interim Standard)
AS A123	Mortar for Masonry Construction
AS CB15	Welding of Steel Pressure Piping (SAA Pipe Welding Code)
ASTM A269	Seamless and Welded Austenitic Stainless Steel Tubing for General Service

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ASTM A312/A312M	Austenitic General Service
ASTM A450M	General Requirements for Carbon, Ferritic Alloy and Austenitic Alloy Steel Tubes
Code	NSW Water Supply and Sewerage Plumbing Regulations 1986 and amendments
Code	Local Supply Authority Electrical Specifications, Regulations and Codes
Code	Code of Practice - Plumbing & Drainage (Current Issue)
STD-010	Instrument and Equipment Tag Nominations

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EXECUTED as an Agreement

The Common Seal of
SUTHERLAND SHIRE COUNCIL was
hereunto affixed
on the 18 day of November 2014
pursuant to a resolution of the Council passed
on the 17 November 2014

Mayor

General Manager

Executed by
AUSTRALAND KURNELL PTY LTD
on the day of
in accordance with Section 127 of the
Corporations Act 2001

Signature of ~~secretary~~/director

MICHAEL BOWDEN NEWSOM

Print Name

Signature of secretary/~~director~~

ABHILASHA VANKINA

Print Name

Executed by
BREEN HOLDINGS PTY LIMITED
on the 10th day of November 2014
in accordance with Section 127 of the
Corporations Act 2001

Signature of secretary/director

Tom A.E. BREEN

Print Name

Signature of secretary/director

BENJAMIN BREEN

Print Name

BB