



208-8487

APRIL 2009

LEIGHTON PROPERTIES PTY LIMITED

PRELIMINARY ACID SULFATE SOIL INVESTIGATION
REVISION 3

THE KINGSCLIFF RESORT
CASUARINA WAY
KINGSCLIFF



Soil Surveys Engineering Pty Limited
Specialists in Applied Geotechnics
A.B.N. 70 054 043 631
www.soilsurveys.com.au

Directors
PJ Dixon
PR Cosh
NT Perkins
MV Geale
GEJ Gray
P Elkington

Associates
AM Rutten

J Irons
CP Johnson

BE(Hons) RPEQ
BE(Civil) CPEng MIE Aust RPEQ
BAppSC(AppGeol) BEng(Hons1)
BEng(Civil) MBA CPEng MIE Aust RPEQ

BE(Civil) MIE Aust RPEQ

BE(Hons1) MEngSc LGE CPEng
MIE Aust RPEQ
BEng(Hons) FGS RPEQ
BEng(Civil) RPEQ

Gold Coast Office
Job No: 208-8487
Ref: 2-8487ARrev3
Author: Peter Elkington

21st April, 2009

Leighton Properties Pty Limited
Level 12, 259 Queen Street
BRISBANE QLD 4000

ATTENTION: MR ANDREW MABIN

Dear Sir,

**RE: PRELIMINARY ACID SULFATE SOIL INVESTIGATION - THE KINGSCLIFF
RESORT - CASUARINA WAY, KINGSCLIFF**

Enclosed is our acid sulfate soil investigation report for the above project dated April, 2009.
One bound, one unbound and an electronic copy of the report has been issued.

Should you have any queries regarding this report, please contact Peter Elkington at our
Gold Coast Office.

Yours faithfully,

P. ELKINGTON (RPEQ 7226)

for and on behalf of
SOIL SURVEYS ENGINEERING PTY LIMITED

Brisbane Level 2, 19 Finchley Street Milton Qld PO Box 317 Paddington Qld 4064 Australia Ph 617 3369 6000 Fax 617 3369 6660 brisbane@soilsurveys.com.au	Gold Coast Unit 8, 140 Millaroo Drive Helensvale Qld PO Box 3429 Helensvale T.C. Qld 4212 Australia Ph 617 5500 0465 Fax 617 5500 0462 goldcoast@soilsurveys.com.au	Sunshine Coast Unit 1, 25 Premier Circuit Warana Qld 4575 PO Box 1552 Buddina Qld 4575 Australia Ph 617 5493 1980 Fax 617 5493 2837 sunshinecoast@soilsurveys.com.au	Northern Rivers Unit 16, 39 Corporation Circuit Tweed Heads South NSW 2486 Australia Ph 617 5523 4214 Fax 617 5523 4577 northernrivers@soilsurveys.com.au
---	---	--	---

TABLE OF CONTENTS

<u>1.0 INTRODUCTION</u>	1
<u>2.0 PROPOSED DEVELOPMENT</u>	1
<u>3.0 SCOPE OF SERVICES</u>	1
<u>4.0 INVESTIGATION METHOD</u>	2
<u>4.1 Field Investigation</u>	2
<u>4.2 Laboratory Assessments</u>	3
<u>4.2.1 Soil</u>	3
<u>5.0 INVESTIGATION FINDINGS</u>	4
<u>5.1 Site Description</u>	4
<u>5.2 Regional Geology</u>	5
<u>5.3 Subsurface Conditions</u>	5
<u>5.4 Groundwater</u>	5
<u>5.5 Laboratory Testing - Soils</u>	6
<u>5.5.1 Preliminary Screening Tests</u>	6
<u>5.5.2 Quantitative Tests</u>	6
<u>6.0 DISCUSSION OF RESULTS</u>	7
<u>6.1 Soil Classification</u>	7
<u>6.2 Results of Laboratory Testing</u>	7
<u>6.2.1 Soil Tests</u>	7
<u>7.0 SUMMARY</u>	8
<u>9.0 LIMITATIONS</u>	9

APPENDICES

- A** **Notes Relating to this Report**
- B** **Borehole Records**
- C** **Laboratory Test Results**
- D** **Site Plan**

1.0 INTRODUCTION

This report presents the results of the preliminary acid sulfate soils investigation carried out by Soil Surveys Engineering Pty Limited on the 26th September, 2008 for the proposed 'Kingscliff Resort' development at Casuarina Way, Kingscliff.

The objectives of this investigation were to assess subsurface conditions at the site in accordance with the Scope of Services detailed in Section 2.0.

2.0 PROPOSED DEVELOPMENT

It is understood the proposed development is to consist of 180 resort style units and various community facilities as part of an environmentally sensitive resort.

The majority of the development is to consist of residential type structures with loads typical for residential developments of up to two storeys.

Earthworks are understood to consist of minor cut to fills across the site, of up to 1.5m.

3.0 SCOPE OF SERVICES

The scope of services provided by Soil Surveys Engineering Pty Limited for the acid sulfate soil investigation was directed towards assessment of the following:-

- The nature and type of upper level subsurface materials envisaged to be excavated as part of the proposed development.
- Delineation of Actual and Potential Acid Sulfate Soils, (AASS) and (PASS).
- Development of an Acid Sulfate Management Plan (ASMP) if required.

4.0 INVESTIGATION METHOD

4.1 Field Investigation

To provide the required evaluations the following field investigation was undertaken.

- Drilling of 5 boreholes each to a depth of 6m using a 4WD mounted Jacro 105 drilling rig. All boreholes were augmented by Dynamic Cone Penetrometer (DCP's) tests adjacent the boreholes where access was available for the drilling.
- Sampling of the boreholes to depths of up to 3.0m.

All work including the soil classification descriptions and field sampling was carried out in general accordance with the following procedures:-

AS1726 - 1993

Geotechnical Site Investigations

ASSMAC

New South Wales Acid Sulfate Soil Management
Advisory Committee, August 1998.

Notes relating to this report, borehole record sheets, laboratory test results and a site plan detailing borehole and sampling locations are included in the appendices.

Fieldwork was carried out on the 26th September, 2008. All soil samples were transferred to a chilled esky for transport to the laboratory.

4.2 Laboratory Assessments

4.2.1 Soil

A staged testing program was carried out on recovered soil samples as follows:-

Test Method	Test Objective
pH_F, pH_{FOX} and Reaction to HCl & H₂O₂	Qualitative screening
TAA (Total Actual Acidity)	Quantitative - acid trail
CRS (Chromium Reducible Sulfur)	Quantitative - sulfur trail
Retained Acidity	Quantitative - acid trail

pH_F, pH_{FOX}, TAA, RA and CRS testing was carried out in accordance with QASSIT 'Acid Sulfate Soils Laboratory Methods Guidelines 2004' test methods 2A2, 19A2, 20B, 20J, 22B, 23A, 23F and 23L.

Laboratory test results are summarised in Section 5.5 and certificates are included in Appendix 'C'.

Laboratory Assessments

Laboratory assessments were undertaken by the following laboratory:-

- Soil and Water Laboratories
Unit 16/39 Corporation Drive
SOUTH TWEED HEADS NSW 2485
Telephone: 07) 5523 4422

Project No: 208-8487

April, 2009

Ref: 2-8487ARrev3

Leighton Properties Pty Limited - Preliminary Acid Sulfate Investigation-The Kingscliff Resort- Casuarina Way, Kingscliff

5.0 INVESTIGATION FINDINGS

5.1 Site Description

The subject site of the proposed development is described as Lot 490 on DP1095234 and part of Lot 489 on DP47021 and part of Lot 500 on DP1095235 and is located between Cudgen Creek and the Pacific Ocean, to the north of the Salt Development.

The site is understood to have been previously mined.

Vegetation consisted of a dense covering of medium sized trees with a couple of tracks cross the site.

The site is indicated in the below site photo.



5.2 Regional Geology

The coastal landforms, of which this site forms part, are essentially dependent on the basement geology and the river erosion and deposition processes. Low rises in the flood plain in this area are commonly residual soils and shallow rock (mainly phyllite and metasandstone), while the relatively flat flood plains consist of alluvial soils.

The reason for two systems side by side is explained in terms of Pleistocene ice ages when, at times, the level of the sea was some 100 metres lower than the present level. Major rivers then entered the sea somewhere on the continental shelf. Progressive rising and falling sea levels resulted in depositional and erosional processes.

Prominent along the low lying areas of the eastern, northern and north-western coasts of Australia, particularly below RL 5.0 AHD, iron sulfide layers are found. These sulfide layers formed when the sea level rose and inundated the land. Seawater containing sulfate mixed with land sediments. These sulfide sediments, when exposed to air oxidise to produce sulfuric acid, thus the term Acid Sulfate Soils.

5.3 Subsurface Conditions

The subsurface profile encountered generally comprised sands together with some isolated silty sand layers.

Borehole records are presented in Appendix B.

5.4 Groundwater

Groundwater was noted in the boreholes at various levels across the site, ranging from 1.2m below the ground surface at Borehole 2 to 5m in Borehole 1.

Water levels can be expected to vary with seasonal and climatic conditions.

5.5 Laboratory Testing - Soils

A total of 30 soil samples were submitted to a staged acid sulfate testing program as follows:-

5.5.1 Preliminary Screening Tests

Testing was carried out on representative soil samples recovered from the boreholes to provide preliminary qualitative assessment of the presence of acid sulfate soils (ASS). This testing was in the form of assessing the pH of the sample before and following oxidation with 30% hydrogen peroxide (H_2O_2). This test involved measuring a known quantity of soil sample from a particular depth in the strata; the field pH (pH_F) of the sample was then measured and recorded. Following this, a uniform volume of hydrogen peroxide was then added to the sample. Each sample was left to react / oxidise for 1 hour and the pH following oxidation (pH_{FOX}) was recorded.

This is a quick, qualitative assessment of the potential acidity of the soil. Reactivity to hydrochloric acid (HCl) was also assessed as a qualitative determination of the neutralising carbonate content including calcium carbonate (shells) within the soil. The results of these screening tests were used as an additional tool in determining which soil samples should be further assessed by quantitative laboratory testing.

Laboratory test certificates containing screening (qualitative) test results of pH_F and pH_{FOX} are presented in Appendix 'C', where $pH_F < 4.0$ indicates actual A.S.S. and $pH_{FOX} < 3.0$ indicates potential A.S.S.

5.5.2 Quantitative Tests

A total of 15 CRS + TAA analyses (Chromium Reducible Sulfur and Total Actual Acidity) were carried out on recovered soil samples based on the results of the screening tests to quantify the potential and actual acid hazard within the soils.

TAA is a measure of the soils existing acidity prior to oxidation of sulfidic material. The CRS test quantifies the sulfur trail.

Laboratory test certificates are presented in Appendix 'C'.

6.0 DISCUSSION OF RESULTS

6.1 Soil Classification

Samples recovered from the field investigation program were generally classified sands and clayey sands, including locally derived fill materials.

An appraisal of the topography and soil classifications suggested that there is minimal potential for acid sulfate conditions to develop across the site.

6.2 Results of Laboratory Testing

6.2.1 Soil Tests

Results of screening tests (pH_F pH_{FOX}) generally confirmed the indications of the soil classifications.

The qualitative test results indicate that actual and potential acidity may be present in the soils. Actual acid sulfate soils are due to oxidation as the water table fluctuates and potential acid sulfate soils have limited previous oxidation.

Generally pH_F values ranged between 6.4 and 9.4 with pH_{FOX} values ranging between 5.2 and 7.0.

Scr values of less than 0.01% and TAA values of up to 5 mole H^+ /t resulted from the samples tested.

For comparison of test results, ASSMAC Action Criteria are presented in Table 3.

TABLE 3 ACTION CRITERIA - (ASSMAC OCT. 1998 TABLE 4.0)

Texture Range/Classification	Approximate Clay Content (%)	Action Criteria 1-1000 tonnes disturbed		Action Criteria >1000 tonnes disturbed	
		S _{pos} (%)	TPA (mol H ⁺ /t)	S _{pos} (%)	TPA (mol H ⁺ /t)
Coarse / Sands to Loamy Sands	≤5	0.03	18	0.03	18
Medium / Sandy Loams to Light Clays	5-40	0.06	36	0.03	18
Fine / Medium to Heavy Clays and Silty Clays	≥40	0.1	62	0.03	18

7.0 SUMMARY

On the basis of the testing and investigation undertaken, no acid sulfate soils were encountered on the site.

No management or treatment of the soils will be required.

No further investigation or testing for acid sulfate soils is recommended for the proposed development.

8.0 GROUNDWATER CONSIDERATIONS

Considering the proposed development, no disturbance of the existing groundwater can be expected due to the development.

No acid sulfate soils were encountered and any groundwater discharge will therefore not impact on the acid sulfate soils.

Project No: 208-8487

April, 2009

Ref: 2-8487ARrev3

Leighton Properties Pty Limited - Preliminary Acid Sulfate Investigation-The Kingscliff Resort- Casuarina Way, Kingscliff

9.0 LIMITATIONS

We have prepared this report for use by **LEIGHTON PROPERTIES PTY LIMITED** for acid sulfate management purposes in accordance with currently accepted environmental and geotechnical guidelines. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has not been prepared for use by parties other than by **LEIGHTON PROPERTIES PTY LIMITED** or their associated consultants. It may not contain sufficient information for the purposes of other parties or for other uses.

Soil Surveys Engineering Pty Limited offers a documentation review service to verify that the intent of recommendations is properly reflected in the A.S.M.P or D.M.P. It is recommended that clients avail themselves of this service; our standard rates will apply.



P. ELKINGTON (RPEQ 7226)

for and on behalf of

SOIL SURVEYS ENGINEERING PTY LIMITED

Project No: 208-8487

April, 2009

Ref: 2-8487ARrev3

Leighton Properties Pty Limited - Preliminary Acid Sulfate Investigation-The Kingscliff Resort- Casuarina Way, Kingscliff

APPENDICES

Project No: 208-8487

April, 2009

Ref: 2-8487ARrev3

Leighton Properties Pty Limited - Preliminary Acid Sulfate Investigation-The Kingscliff Resort- Casuarina Way, Kingscliff

APPENDIX A

NOTES RELATING TO THIS REPORT

INTRODUCTION

These notes are provided by Soil Surveys Engineering Pty Limited (the Company) to complement the geotechnical report in regard to classification methods and field procedures. Not all notes are necessarily relevant to all reports.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Geotechnical engineering involves gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and at the time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

Soils - The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726-1993 (Geotechnical Site Investigations), where appropriate. In general, descriptions cover the following properties - soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the dominant particle size and behaviour as set out in AS 1726-1993.

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, shear vane, laboratory testing or engineering examination. The strength terms are defined in AS1726-1993 Table A4.

Non-cohesive soils are classified on the basis of relative density usually based on insitu testing or engineering examination (see AS1726-1993 Table A5).

Rocks - Rock types are classified by their geological names (AS1726-1993 Table A6), together with

Table 1 Estimated strength descriptions given to rock based on engineering examination

Strength Term	Approximate Qu (MPa)
Extremely Weak	< 1.0
Very Weak	1.0 - 5.0
Weak	5.0 - 25
Medium Strong	25 - 50
Strong	50 - 100
Very Strong	100 - 250
Extremely Strong	> 250

Ref ISRM "Suggested Methods for the Quantitative Description of Discontinuities in Rock Masses"

descriptive terms regarding weathering (AS1726-1993 Table A9), strength (refer Table 1

below), defects (AS1726-1993 Table A10), etc. Where strength testing (ie Point Loads) is carried out, AS1726-1993 Table A8 is used. Where relevant, further information regarding rock classification is attached.

SAMPLING

Sampling is carried out during drilling or from other excavations to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on plasticity, grain size, colour, moisture content, minor constituents and, depending upon sample disturbance, (information on strength and structure).

Undisturbed samples are taken by pushing a thin walled sample tube, usually 50mm diameter (U50), into the soil and withdrawing it with a sample of the soil contained in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength, volume change potential and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling used are given on the attached logs.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application.

Test Pits - These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for an excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling - A borehole of 50 to 100mm diameter is advanced by manually operated equipment. Refusal of the augers can occur on a variety of materials such as hard clay, gravel or rock fragments and does not necessarily indicate rock level.

Continuous Spiral Flight Augers - The borehole is advanced using 75 to 300 mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling or insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the augers. Information from the drilling (as distinct from specific sampling) is of relatively lower reliability due to remoulding, inclusion of cuttings from above or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table has a lower reliability than augering above the water table. Various drill bits are attached to the base of the augers during the drilling. The depth of refusal of the different bit types can provide information as to the strength of the material encountered. Generally two different bit types are used. The 'V' bit is a V shaped steel bit and the 'TC' bit is a tungsten carbide tipped screw type bit.

Wash Boring - The borehole is usually advanced by a rotary bit with water or fluid pumped down the hollow drill rods and returned up in the space between the

rods and the soil or casing, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from "feel" and rate of penetration. More accurate information on soil strata is gained by regular testing and sampling using the Standard Penetration Test (SPT) and undisturbed thin walled tube samples (U50).

Mud Stabilized Drilling - Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilize the borehole. The term "mud" encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from regular intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling - A continuous core sample is obtained using a diamond or tungsten carbide tipped core barrel. Provided full core recovery is achieved (which is not always possible in very weak rocks and granular soils), this technique provides a very reliable method of investigation. In rocks, NMLC coring (nominal 52 mm diameter) is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS. The location of losses is determined on site by the supervisor. If the location of the loss is uncertain, it is placed at the top end of the run, when the core is placed in a storage tray and recorded on the log.

Standard Penetration Tests - Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" - Test 6.3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm, the upper 150 mm being neglected due to possible disturbance from the drilling method. In dense sands, very hard clays or weak rock, the full 450 mm

The DCP comprises a Cone of 20 mm diameter with 30 degree taper attached to steel rods of smaller section.

The cone end is driven with a 9 kg hammer falling 510 mm (AS. 1289 Test 6.3.2). The test was developed initially for pavement subgrade investigations, and empirical correlations of the test results with California Bearing Ratio have been published by various Road Authorities. The Company has developed their own correlations with Standard Penetration tests and Density Index tests in sands.

LOGS

The borehole or test pit logs presented herein are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The attached explanatory notes define the terms and symbols used in preparation of the logs.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line" variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems.

- Although groundwater may be present in lower permeability soils, it may enter the hole slowly or perhaps not at all during the time the hole is open.
- A localized perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.

- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be bailed out of the bore and mud must be washed out of the hole or "reverted" if water observations are to be made.

More reliable measurements can be made by use of standpipes which are read after stabilizing at periods ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc.) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse engineering characteristics or behaviour. If the volume and quality of fill is important to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing is normally carried out in accordance with Australian Standard 1289 "Methods of Testing Soil for Engineering Purposes". Details of the test procedure used are given on the individual report forms and the attached explanatory notes summarize important aspects of the Laboratory Test Procedures adopted.

ENGINEERING REPORTS

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal the information and interpretation may not be relevant if the design proposal is changed. If this happens, the Company will

be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical aspects and recommendations or suggestions for design and construction. Since the test sites in any exploration represent a very small proportion of the total site and since the exploration only identifies actual ground conditions at the test sites, even under the best circumstances actual conditions may vary from those inferred to exist. No responsibility is taken for:-

- Unexpected variations in ground and/or groundwater conditions.
- Changes in policy or interpretation of policy by statutory authorities.
- The actions of other persons.
- Any work where the company is not given the opportunity to supervise the construction using the Companies designs/recommendations.

If differences occur, the Company will be pleased to assist with investigation or advice to resolve any problems occurring.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are more readily resolved when conditions are exposed than at some later stage, well after the event.

REPRODUCTION OF INFORMATION FOR CONTRACTUAL PURPOSES

Attention is drawn to the document "Guidelines for the Provision of Geotechnical Information in Tender Documents", published by the Institution of Engineers, Australia. Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances, where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The Company would be pleased to assist

in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

REVIEW OF DESIGN

Where major civil or structural developments are proposed or where only a limited investigation has been completed or where the geotechnical conditions/ constraints are quite complex, it is prudent to have a joint design review which involves a senior geotechnical engineer. We would be happy to assist in this regard as an extension of our investigation commission.

SITE INSPECTION

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related.

- i) Site visits during construction to confirm reported ground conditions
- ii) Site visits to assist the contractor or other site personnel in identifying various soil/rock types such as appropriate footing or pier founding depths, the stability of a filled or excavated slope; or
- iii) Full-time engineering presence on site.

In the vast majority of cases it is advantageous to the principal for the geotechnical engineer who wrote the investigation report to be involved in the construction stage of the project.



Soil Surveys Engineering Pty. Limited

Consulting Geotechnical engineers RPECQ No. 195
A.C.N. 054 043 631
email brisbane@soilsurveys.com.au

Level 2 19 Finchley Street
Milton Q 4064
PO Box 317
Paddington Q 4064
Ph 61 7 3369 6000
Fax 61 7 3369 6660

Unit 9 39 Lawrence Dr
Nerang Q 4211
PO Box 2011
Nerang Q 4211
Ph 61 7 5536 1528
Fax 61 7 5578 3916

11 Production Ave
Kawana Waters Q 4578
PO Box 2
Buddina Q 4578
Ph 61 7 5493 1733
Fax 61 7 5493 2837

LEGEND SHEET

Information

DRILLING TYPES

V - open hole drilling using augers and a steel "V" bit
TC - open hole drilling using augers and a Tungsten Carbide bit
WB - wash boring using a drag or blade bit
RR - wash boring using a rock roller bit
NMLC - coring using a NMLC core barrel
Casing - steel casing in hole

DEPTH

Expressed in metres below the surface unless otherwise noted

ROCK DESCRIPTION

Rock name, grain size, colour, texture, fabric and any other relevant comments

WEATHERING GRADES

XW - Extremely Weathered
DW - Distinctly Weathered
SW - Slightly Weathered
FR - Fresh

STRENGTH

(estimate of UCS)

EW - extremely weak <1.0 MPa
VW - very weak 1.0 to 5.0 MPa
W - weak 5.0 to 25.0 MPa
MS - medium strong 25 to 50 MPa
S - strong 50 to 100 MPa
VS - very strong 100 to 250 MPa
ES - extremely strong >250 MPa

CORING DETAILS

Rec - core recovery in each run expressed as a %
RQD - Rock Quality Description expressed as a %

Defect Description

3.00m;J45;p,s,o,z

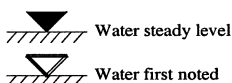
Depth in metres; Defect Type and angle with the core axis;planarity,roughness,aperture, infill

Defect Type	Planarity	Roughness	Aperture	Infill
J - Joint	p - Planar	s - Smooth	o - Open	z - Clean
F - Foliation	s - Sub-planar	r - Rough	c - Closed	c - Clay
B - Bedding	c - Curvi-linear	v - Very Rough		q - Quartz
V - Vein	u - Undulating	l - Slickensides		k - Calcite
S - Shear Zone				w - Weathered Rock
T - Fault				l - Limonite
C - Clay Seam				
Z - Contorted Zone				
RJ - Relict Joint				

Testing

SPT 10,15,15	SPT testing N value Blows/150mm or as noted
U50 (50) PP = 500 kPa	U50 Tube Samples (% Recovery) Pocket penetrometer reading
VS 1,30,5 : 25	Vane Shear Testing Seating, peak and residual : Corrected value
DIST	Disturbed Samples

Water Intersections



Testing Results

Corrected Point Load Test Result
Is50=4 (A) A - Axial, D - Diametral

Graphic Legend

	CH - CLAY of high plasticity
	CI - CLAY of intermediate plasticity
	CL - CLAY of low plasticity
	MH - SILT of high plasticity
	MI - SILT of intermediate plasticity
	ML - SILT of low plasticity
	Pt - PEAT
	OH - Organic SILTS and CLAYS of high plasticity
	OL - Organic SILTS and CLAYS of low plasticity
	SC - Clayey SAND
	SM - Silty SAND
	SP - poorly graded SAND
	SW - Well graded SAND
	GC - Clayey GRAVEL
	GM - Silty GRAVEL
	GP - poorly graded GRAVEL
	GW - well graded GRAVEL
	Fill
	Core loss
	Phyllite
	Meta-Siltstone
	Meta-Sandstone
	Greywacke
	Tuff
	Sandstone
	Siltstone
	Mudstone
	Conglomerate
	Breccia
	Granite
	Basalt
	VOLCANIC ASH
	VOLCANIC AGGOLMERATE
	MARINE DEPOSITS

Project No: 208-8487

April, 2009

Ref: 2-8487ARrev3

Leighton Properties Pty Limited - Preliminary Acid Sulfate Investigation-The Kingscliff Resort- Casuarina Way, Kingscliff

APPENDIX B

BOREHOLE RECORDS



Soil Surveys Engineering Pty. Limited

Consulting Geotechnical engineers RPECQ No. 195
A.C.N. 054 043 631
email brisbane@soilsurveys.com.au

Level 2 19 Finchley Street
Milton Q 4064
PO Box 317
Paddington Q 4064
Ph 61 7 3369 6000
Fax 61 7 3369 6660

Unit 9 39 Lawrence Dr
Nerang Q 4211
PO Box 2011
Nerang Q 4211
Ph 61 7 5596 1528
Fax 61 7 5578 3916

11 Production Ave
Kawana Waters Q 4578
PO Box 2
Buddina Q 4578
Ph 61 7 5493 1733
Fax 61 7 5493 2837

BOREHOLE RECORD SHEET

Borehole Number : **1**

Project Number : 208-8487

Project Name : The Kingscliff Resort

Location : Casurina Way, Kingscliff

Client : Leighton Propties

Date : 26/09/2008

Page : 1

Easting : 556977

Northing : 6872947

RL :

Logger : CW

Driller : CW

Drilling Rig : J105

Drilling Method						Depth	Graphic	Description	DCP Test (blows/100mm)					Samples and Remarks
V	TC	WB	RR	NMLC	Casing				5	10	15	20	25	
						0.40		Silty SAND (SM) Very loose, fine to medium grained, dark brown, fine size gravel, organics, moist.						D
						1.00		SAND (SP) Loose, fine to medium grained, light brown, moist.						D
						2.00		SAND (SP) Medium dense, fine to medium grained, light brown, trace of fine shells, moist.						D
						3.00								D
						4.00								D
						5.00								D
						6.00		SAND (SP) Loose to medium dense, fine to medium grained, light brown, trace of fine shells, wet.						D
						7.00		Borehole Terminated 6.00m						
						8.00								
						9.00								
						10.00								

COMMENTS

1) Groundwater was observed at 5m.

Approved : _____

Date : ____ / ____ / ____

ISSUE No. 1.1 08/10/97 RS007A

▼ Water First Noted ▽ Water Steady Level



Soil Surveys Engineering Pty. Limited

Consulting Geotechnical engineers RPECO No. 195
A.C.N. 054 043 631
email brisbane@soilsurveys.com.au

Level 2 19 Finchley Street
Milton Q 4064
PO Box 317
Paddington Q 4064
Ph 61 7 3369 6000
Fax 61 7 3369 6660

Unit 9 39 Lawrence Dr
Nerang Q 4211
PO Box 2011
Nerang Q 4211
Ph 61 7 5596 1528
Fax 61 7 5578 3916

11 Production Ave
Kawana Waters Q 4578
PO Box 2
Buddina Q 4578
Ph 61 7 5493 1733
Fax 61 7 5493 2837

BOREHOLE RECORD SHEET

Borehole Number : **2**

Project Number : 208-8487

Project Name : The Kingscliff Resort

Location : Casurina Way, Kingscliff

Client : Leighton Propties

Date : 26/09/2008

Page : 1

Easting : 556716

Northing : 6872849

RL :

Logger : CW

Driller : CW

Drilling Rig : J105

Drilling Method						Depth	Graphic	Description	DCP Test (blows/100mm)					Samples and Remarks
V	TC	WB	RR	NMLC	Casing				5	10	15	20	25	
						0.50		SAND (SP) Very loose, fine to medium grained, light brown, moist.						D
						1.0		Silty SAND (SM) Very loose, fine to medium grained, dark brown, fine size gravel, moist.						D
						1.20								D
						1.50		SAND (SP) Loose to medium dense, fine to medium grained, brown, wet.						D
						2.0		SAND (SP) Loose to medium dense, fine to medium grained, light grey brown, trace of fine shells, wet.						D
						3.0								D
						4.0								D
						5.0								D
						6.0								D
						6.00		Borehole Terminated 6.00m						
						7.0								
						8.0								
						9.0								
						10.0								

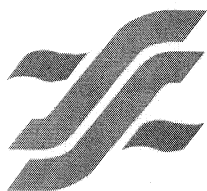
COMMENTS

1) Groundwater was observed at 1.2m.

Approved :

Date : / /

▼ Water First Noted ∇ Water Steady Level



Soil Surveys Engineering Pty. Limited

Consulting Geotechnical engineers
A.C.N. 054 043 531
email brisbane@soilsurveys.com.au
RPECCQ No. 195

Level 2 19 Finchley Street
Milton Q 4064
PO Box 317
Paddington Q 4064
Ph 61 7 3369 6000
Fax 61 7 3369 6660

Unit 9 39 Lawrence Dr
Nerang Q 4211
PO Box 2011
Nerang Q 4211
Ph 61 7 5596 1528
Fax 61 7 5578 3916

11 Production Ave
Kawana Waters Q 4578
PO Box 2
Buddina Q 4578
Ph 61 7 5493 1733
Fax 61 7 5493 2837

BOREHOLE RECORD SHEET

Borehole Number : **3**

Project Number : 208-8487

Project Name : The Kingscliff Resort

Location : Casurina Way, Kingscliff

Client : Leighton Propties

Date : 26/09/2008

Page : 1

Easting : 556777

Northing : 6872796

RL :

Logger : CW

Driller : CW

Drilling Rig : J105

Drilling Method						Depth	Graphic	Description	DCP Test (blows/100mm)					Samples and Remarks
V	TC	WB	RR	NMLC	Casing				5	10	15	20	25	
						1.0		SAND (SP) Very loose to loose, fine to medium grained, light brown, trace of fine shells, moist.						D
						2.0								D
						3.0								D
						3.60								D
						4.0		SAND (SP) Very loose to loose, fine to medium grained, light brown, trace of fine shells, wet.						D
						5.0								
						6.0								
						6.00								
								Borehole Terminated 6.00m						
						7.0								
						8.0								
						9.0								
						10.0								

COMMENTS

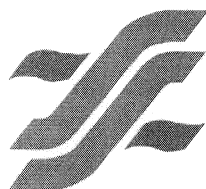
1) Groundwater was observed at 3.6m.

Approved : _____

Date : ____ / ____ / ____

ISSUE No. 1.1 08/10/97 RS007A

▼ Water First Noted ▽ Water Steady Level



Soil Surveys Engineering Pty. Limited

Consulting Geotechnical engineers RPECQ No. 195
A.C.N. 054 043 631
email brisbane@soilsurveys.com.au

Level 2 19 Finchley Street
Milton Q 4064
PO Box 317
Paddington Q 4064
Ph 61 7 3369 6000
Fax 61 7 3369 6660

Unit 9 39 Lawrence Dr
Nerang Q 4211
PO Box 2011
Nerang Q 4211
Ph 61 7 5596 1528
Fax 61 7 5578 3916

11 Production Ave
Kawana Waters Q 4578
PO Box 2
Buddina Q 4578
Ph 61 7 5493 1733
Fax 61 7 5493 2837

BOREHOLE RECORD SHEET

Borehole Number : **4**

Project Number : 208-8487

Project Name : The Kingscliff Resort

Location : Casurina Way, Kingscliff

Client : Leighton Propties

Date : 26/09/2008

Page : 1

Easting : 556636

Northing : 6872749

RL :

Logger : CW

Driller : CW

Drilling Rig : J105

Drilling Method						Depth	Graphic	Description	DCP Test (blows/100mm)					Samples and Remarks
V	TC	WB	RR	NMLC	Casing				5	10	15	20	25	
						0.35		Silty SAND (SM) Very loose, fine to medium grained, dark brown, fine size gravel, organics, moist.						D
						0.80		SAND (SP) Loose, fine to medium grained, light brown, moist.						D
						1.0		SAND (SP) Loose to medium dense, fine to medium grained, light brown, trace of fine shells, moist.						D
						1.60		SAND (SP) Loose to medium dense, fine to medium grained, light grey brown, trace of fine shells, wet.						D
						2.0								D
						3.0								D
						4.0								D
						4.50		SAND (SP) Loose to medium dense, fine to medium grained, dark grey, trace of fine shells, wet.						D
						5.0								
						6.0								
						6.00								
								Borehole Terminated 6.00m						
						7.0								
						8.0								
						9.0								
						10.0								

COMMENTS

1) Groundwater was observed at 1.6m.

Approved : _____

Date : ____ / ____ / ____

ISSUE No. 1.1 08/10/97 RS007A

▼ Water First Noted ▽ Water Steady Level



Soil Surveys Engineering Pty. Limited

Consulting Geotechnical engineers RPECC No. 195
A.C.N. 054 043 631
email brisbane@soilsurveys.com.au

Level 2 19 Finchley Street
Milton Q 4064
PO Box 317
Paddington Q 4064
Ph 61 7 3369 6000
Fax 61 7 3369 6660

Unit 9 39 Lawrence Dr
Nerang Q 4211
PO Box 2011
Nerang Q 4211
Ph 61 7 5596 1528
Fax 61 7 5578 3916

11 Production Ave
Kawana Waters Q 4578
PO Box 2
Buddina Q 4578
Ph 61 7 5493 1733
Fax 61 7 5493 2837

BOREHOLE RECORD SHEET

Borehole Number : **5**

Project Number : 208-8487

Project Name : The Kingscliff Resort

Location : Casurina Way, Kingscliff

Client : Leighton Propties

Date : 26/09/2008

Page : 1

Easting : 556964

Northing : 6872683

RL :

Logger : CW

Driller : CW

Drilling Rig : J105

Drilling Method						Depth	Graphic	Description	DCP Test (blows/100mm)					Samples and Remarks
V	IC	WB	PR	NMLC	Casing				5	10	15	20	25	
						1.0		SAND (SP) Medium dense, fine to medium grained, mottled light brown and dark brown, organics, moist.						D
						1.30								D
						2.0		SAND (SP) Medium dense, fine to medium grained, light brown, trace of fine shells, moist.						D
						3.0								D
						4.0								D
						5.0								D
						6.0								
						6.00		Borehole Terminated 6.00m						
						7.0								
						8.0								
						9.0								
						10.0								

COMMENTS

1) Groundwater was not observed. 2) DCP refusal at 1.1m.

Approved : _____

Date : ____ / ____ / ____

ISSUE No. 1.1 08/10/97 RS007A

▼ Water First Noted ▽ Water Steady Level

Project No: 208-8487

April, 2009

Ref: 2-8487ARrev3

Leighton Properties Pty Limited - Preliminary Acid Sulfate Investigation-The Kingscliff Resort- Casuarina Way, Kingscliff

APPENDIX C

LABORATORY TEST RESULTS



Soil & Water Laboratories P/L
16/39 Corporation Circuit, Tweed Heads, NSW. 2486.
Phone: (02) 5523 4422; Fax: (07) 3503 9063

Screening Test

For Soil Surveys Engineering Pty Ltd, Unit 8, 140 Millaroo Drive, Helensvale, Qld 4212.

Casuarina Way, Kingscliff
208-8487

Reference Number: 13 - 8487

Certificate Number: 200886

Date Received: 26/09/2008

Date Tested: 29/09/2008

Date Issued: 29/09/2008

Sample Number	Identification			Reaction to		pH (1:5 susp.)	
	Borehole/Location	From	To	H2O2	HCl	H2O	
						pHf	pHfox
1	BH - 01	0.00	0.50	Nil	Moderate	6.8	5.5
2	BH - 01	0.50	1.00	Nil	Moderate	8.2	5.3
3	BH - 01	1.00	1.50	Nil	Moderate	7.6	5.2
4	BH - 01	1.50	2.00	Nil	Moderate	8.8	6.5
5	BH - 01	2.00	2.50	Nil	Moderate	7.7	5.4
6	BH - 01	2.50	3.00	Nil	Nil	8.5	6.0
7	BH - 02	0.00	0.50	Nil	Nil	7.1	4.8
8	BH - 02	0.50	1.00	Nil	Nil	6.5	4.2
9	BH - 02	1.00	1.50	Nil	Nil	6.4	4.5
10	BH - 02	1.50	2.00	Nil	Nil	8.2	6.3
11	BH - 02	2.00	2.50	Nil	Nil	8.7	6.6
12	BH - 02	2.50	3.00	Nil	Nil	8.9	7.0
13	BH - 03	0.00	0.50	Nil	Nil	6.9	4.9
14	BH - 03	0.50	1.00	Nil	Nil	7.5	5.5
15	BH - 03	1.00	1.50	Nil	Nil	9.1	7.0
16	BH - 03	1.50	2.00	Nil	Nil	9.3	6.9
17	BH - 03	2.00	2.50	Nil	Nil	9.3	6.9
18	BH - 03	2.50	3.00	Nil	Nil	9.2	7.0
19	BH - 04	0.00	0.50	Nil	Nil	8.1	6.0
20	BH - 04	0.50	1.00	Nil	Nil	9.0	6.6
21	BH - 04	1.00	1.50	Nil	Nil	9.3	6.9
22	BH - 04	1.50	2.00	Nil	Nil	9.2	6.7
23	BH - 04	2.00	2.50	Nil	Moderate	9.1	7.0
24	BH - 04	2.50	3.00	Nil	Moderate	8.9	6.7
25	BH - 05	0.00	0.50	Nil	Moderate	9.0	6.8
26	BH - 05	0.50	1.00	Nil	Moderate	9.0	6.3
27	BH - 05	1.00	1.50	Nil	Moderate	9.2	6.5
28	BH - 05	1.50	2.00	Nil	Nil	9.2	6.2
29	BH - 05	2.00	2.50	Nil	Nil	9.4	6.0
30	BH - 05	2.50	3.00	Nil	Nil	9.3	6.7

Signed:  for and on behalf of Soil and Water Laboratories P/L
Trevor Nelson - Laboratory Manager - Acid Sulphate Soils and Waters

Page:

1 of 1

1. Samples supplied by others
2. Samples tested in 'as received' condition



Soil & Water Laboratories P/L

16/39 Corporation Circuit, Tweed Heads South, NSW. 2486
Phone: (02) 5523 4422; Fax: (07) 3503 9063

Chromium Reducible Sulphur Suite Test Results

For Soil Surveys Engineering Pty Ltd, Unit 8, 140 Millaroo Drive, Helensvale, Qld 4212.
Kingscliff - Casuarina Way
208-8487



This Document is issued in accordance with NATA's accreditation requirements

Accredited for compliance with ISO/IEC 17025

Ref. Number: 13 - 8487

Certificate Number : 200891

Date : 02-Oct-08

Sample Number	Identification/...				Excluded Material		Moisture as Received (85°C)	Init. pH	ANC - bt	a - ANC - bt	s - TAA	TAA	S - HCl	S - KCl	S - NAS	s - S - NAS	SCr	
	Borehole/ Testpit	from	to	Date Sampled	Shell	Gravel	2B2	23A	19A2	A19A2	s - 23F	23F	20B	23C	20J	s - 20J	22B	a - 22B
		(m)			(%d.w.)			(1M KCl)	(%CaCO3 Eq.)	(eq. mol. H+/t)	(%S Eq.)	(mol. H+/t)		(% S)		(eq. mol. H+/t)	(% S)	(eq. mol. H+/t)
2	1	0.50	1.00	26-Sep-08	0.0	0.0	2.9	7.09	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	4
4	1	1.50	2.00	26-Sep-08	0.0	0.0	3.7	7.26	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	1
6	1	2.50	3.00	26-Sep-08	0.0	0.0	3.6	9.65	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	2
8	2	0.50	1.00	26-Sep-08	0.0	0.0	6.5	5.74	n/a	n/a	0.01	5	n/a	n/a	n/a	n/a	<0.01	2
10	2	1.50	2.00	26-Sep-08	0.0	0.0	16.5	8.24	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	2
12	2	2.50	3.00	26-Sep-08	0.0	0.0	22.9	9.89	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	5
14	3	0.50	1.00	26-Sep-08	0.0	0.0	3.6	8.44	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	1
16	3	1.50	2.00	26-Sep-08	0.0	0.0	4.2	9.83	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	1
18	3	2.50	3.00	26-Sep-08	0.0	0.0	4.5	9.98	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	2
20	4	0.50	1.00	26-Sep-08	0.0	0.0	3.8	9.55	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	3
22	4	1.50	2.00	26-Sep-08	0.0	0.0	5.9	9.79	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	0
24	4	2.50	3.00	26-Sep-08	0.0	0.0	23.5	9.86	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	1
26	5	0.50	1.00	26-Sep-08	0.0	0.0	3.1	9.81	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	2
28	5	1.50	2.00	26-Sep-08	0.0	0.0	3.4	9.80	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	1
30	5	2.50	3.00	26-Sep-08	0.0	0.0	4.2	9.90	n/a	n/a	0.00	0	n/a	n/a	n/a	n/a	<0.01	1

Samples Received: 26-Sep-08

Tests Completed: 01-Oct-08

Signed: _____
Trevor Nelson - Chemical Laboratory Manger

- 1 Determinations have been derived by the adoption of published test methods recommended by National Committee for Acid Sulphate Soils (NatCASS); Queensland Acid Sulphate Soils Management Advisory Committee (QASSMAC); Queensland Acid Sulphate Soils Investigation Team (QASSIT) & Queensland Department of Natural Resources, Mines and Energy; as described in the 'Acid Sulphate Soils Laboratory Methods Guidelines 2004'.
- 2 Samples supplied by others
- 3 Samples tested in 'as received' condition
- 4 The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards - AS17025-2005
- 5 NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.
- 6 Denotation: n/a - not applicable; n/r - not requested
- 7 Shell & gravel removed is not covered by the scope of accreditation

Project No: 208-8487

April, 2009

Ref: 2-8487ARrev3

Leighton Properties Pty Limited - Preliminary Acid Sulfate Investigation-The Kingscliff Resort- Casuarina Way, Kingscliff

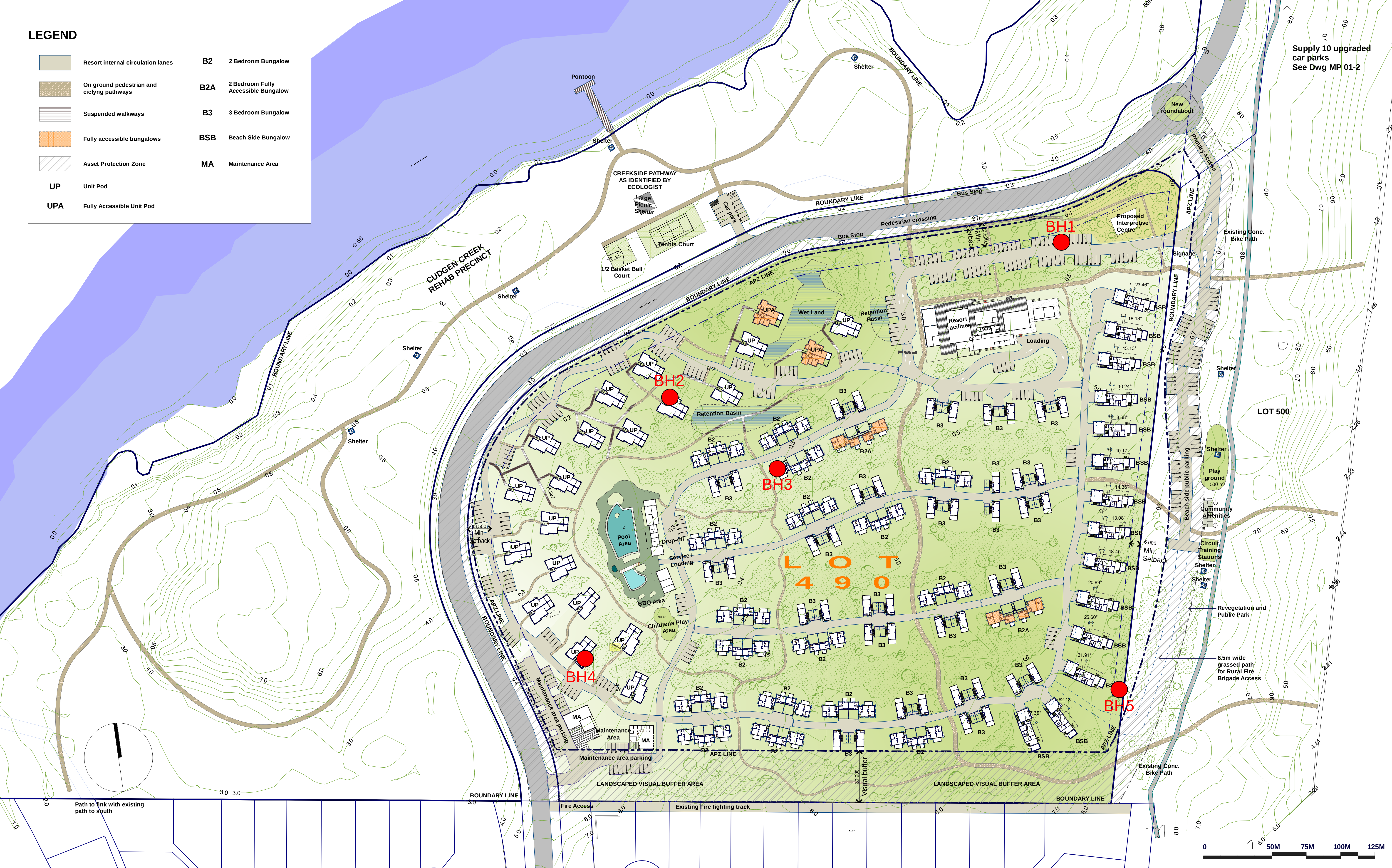
APPENDIX D

SITE PLAN

LEGEND

- Resort internal circulation lanes
- On ground pedestrian and cycling pathways
- Suspended walkways
- Fully accessible bungalows
- Asset Protection Zone
- UP Unit Pod
- UPA Fully Accessible Unit Pod

- B2 2 Bedroom Bungalow
- B2A 2 Bedroom Fully Accessible Bungalow
- B3 3 Bedroom Bungalow
- BSB Beach Side Bungalow
- MA Maintenance Area



Supply 10 upgraded car parks
See Dwg MP 01-2

AMENDMENTS

REV.	DATE:	DESCRIPTION:	ISSUED BY:
A	02.04.09	NSW DEPT OF PLANNING - DA	NK
B	25.08.09	RE LOCATE PONTOON	TK
C	07.10.09	ADJ. MAIN ROAD TO TRAFFIC ENG. REQ	TK
D	16.10.09	ADJ. ROAD TO MAINTENANCE AREA	TK
E	15.03.10	MP - UPDATE	PL

C COPYRIGHT

THESE DESIGNS, PLANS AND SPECIFICATIONS AND COPYRIGHT THEREIN ARE THE PROPERTY OF JMA ARCHITECTS QLD PTY LTD LEIGHTON PROPERTIES PTY LTD AND MUST NOT BE USED, COPIED OR REPRODUCED WHOLLY OR IN PART WITHOUT WRITTEN PERMISSION OF JMA ARCHITECTS QLD PTY LTD LEIGHTON PROPERTIES PTY LTD

NOTES:

Verify all dimensions on site before the commencement of any new construction work, alterations or shop drawings - take measured dimensions in preference to any scaled dimensions

Comply to the following or any other relevant codes:
- Building Code of Australia
- Local Authorities Rules and Guidelines
- covenants manual
- Apply all applicable AUSTRALIAN STANDARDS where relevant, including:
- Termite Barrier AS 3660.1
- Access and Mobility Codes AS 1428.1 & 1428.2
Larger Scale Drawings Take Precedence to smaller scale

Kingscliff Resort
DEVELOPMENT



LEIGHTON PROPERTIES

J M A

ARCHITECTS
QUEENSLAND PTY LTD

Level 1 36 Wyandra St, Newcastle, Qld 4006
P.O. Box 2716 Fortitude Valley BC, 4006 QLD
Email: jma@jma-arch.com
ACN: 101 165 271 ABN: 48 101 165 271
TEL: 07 3252 4400 FAX: 07 3252 2911

CLIENT. LEIGHTON PROPERTIES
JOB THE KINGSCLIFF RESORT
LOCATION CASUARINA WAY
KINGSCLIFF 2487
PROPERTY DESCRIPTION

JOB No. 1040
DATE. OCT 09
SCALE. 1:1000@A1
50%@A3
DRAWN. NK
CHECKED JMA Architects

DRAWING SET MASTER PLAN
DRAWING TITLE SITE PLAN
DRAWING No: 1040 MP-01-3
ISSUE E
PRINT DATE 16/03/2010

FOR SUBMISSION