HEC
HAYES ENVIRONMENTAL CONSULTING

ABN 32 295 203 367

MANAGEMENT PLAN FOR POST-CONSTRUCTION PERMANENT BASEMENT PUMP OUT

RESIDENTIAL DEVELOPMENT AT 132-138 KILLEATON STREET, ST IVES NSW 2075

Hayes Environmental Consulting Pty Ltd
Report No. MP135 AF

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1.0 INTRODUCTION

Hayes Environmental Consulting Pty Ltd (HEC) was engaged by Meriton Apartments Pty Ltd (Meriton) to develop a management plan for water to be pumped from the basement of the residential development at 132-138 Killeaton Street, St Ives, in New South Wales (henceforth referred to as 'the site').

At the time of completing this plan, the site was in the early stages of a major development (MP 10_0057), approved by the NSW Department of Planning. This development included (*Ref.* Appendix A):

- demolition and excavation;
- construction of six residential buildings of four to six storeys in height, comprising a total of 298 apartments;
- adaptive reuse of an existing monastery building for communal facilities, including a pool and gymnasium;
- a common, stepped basement car parking facility underneath the apartment buildings (requiring bulk excavations to depths of 3-6m below ground level (BGL); and
- landscaping works.

This document provides a plan for the on-going (permanent) management of a basement pump out system, that would be in operation post-construction of the basement slabs. It addresses the request made by Ku-ring-gai Council (*Ref.* S08190; dated 11 August, 2011), for the "details of the proposed treatment system", so that due consideration can be given to the suitability of groundwater disposal into the local stormwater system. The aim is to ensure that all related discharge will not adversely affect Council's stormwater system and any receiving waterways, both in terms of quantity and quality of water.

This plan complements HEC's "*Management Plan for Temporary Dewatering During Excavation and Construction; Residential Development at 132-138 Killeaton Street, St Ives NSW 2075*" (*HEC Ref.* MP135 AE; dated 27 September, 2011). It would come into effect once the temporary dewatering had ceased.

2.0 SITE DESCRIPTION

The site is located on the southern side of Killeaton Street, approximately 150m east of its intersection with Mona Vale Road. The greater site is L-shaped, covering an area of about 22,000m^2, and is further identified as Lot 2 in Deposited Plan 748682, in the Parish of Gordon and County of Cumberland. The northern (Killeaton Street) frontage is approximately 175m in length and the land extends to the south by about 250m at the furthest point.

The property lies within an undulating landscape that generally slopes down to the east. Surface levels range from approximately RL158m in the southern section to RL160m in the northern section.

Prior to commencement of the current development, the majority of the site was vacant and grassed. Scattered trees and shrubs were located in the vicinities of the property boundaries. A two storey, brick building, understood to have been a former monastery, was situated in the central portion, while a circular, brick well was present in the southern portion.

The surrounding land was predominantly made up of residential and recreational properties, with a college located to the south.

3.0 PREVIOUS INVESTIGATIONS

Geotechnical and groundwater quality investigations of the site have been completed by Jeffery and Katauskas Pty Ltd (JK), as follows:

- "*Report to Karimbla Construction Services Pty Ltd on Hydrogeological Assessment for Proposed Residential Development at 132-138 Killeaton Street, St Ives, NSW*" (*Ref.* 23765Z2rpt; dated 5 August, 2011);

- "*Report to Karimbla Construction Services Pty Ltd on Groundwater Screening for Temporary Dewatering During Construction at 132-138 Killeaton Street, St Ives, NSW*" (*Ref.* E23765Krpt1.1; dated August, 2011); and

- "*Proposed Amendment to DOP Condition C35(a); Proposed Residential Development; 132-138 Killeaton Street, St Ives, NSW*" (*Ref.* E23765KPletV1; dated 16 August, 2011).

Sub-Surface Conditions

Based on the findings from the geotechnical investigations, the site was "underlain by a surficial topsoil/fill, over residual silty clays then shale bedrock at relatively shallow to moderate depth". Perched groundwater was found at "a relatively shallow level" (from 0.5-1.2m BGL) and the hydraulic gradient had "an overall slope down towards the south-east of about 1.5-2°", ultimately draining into Middle Harbour Creek, located about 1.4km to the (south) east in Garigal National Park.

Based on the data from their borehole pump-out tests, JK estimated "average permeability values of about $5x10^{-8}$ m/sec and 10^{-7} m/sec" for "the clays and underlying upper rock mass, respectively".

Groundwater Quality

The findings from the groundwater quality screening included the following:

- only "three registered groundwater bores lie within 1km of the site", all of which were up- or cross-gradient, indicating that groundwater is not a significant resource in the immediate area;

- marginally acidic pH conditions (4.1-5.4), outside the adopted stormwater assessment criteria (SWAC), were identified; and

- elevated concentrations of some heavy metals (cadmium, copper, nickel, zinc and iron), above the adopted SWAC, were identified; although

- "the heavy metal concentrations are likely to be consistent with regional/background levels and are not the result of an on-site contamination source".

JK were "of the opinion that the proposed intermittent pumping [of basement seepage water] is unlikely to impact on the groundwater conditions from a contamination viewpoint". It was also concluded, however, that "as a result of the acidic pH conditions and the concentrations of some heavy metals above the adopted SWAC, treatment of the groundwater would most likely be required prior to disposal into the stormwater system".

Estimate of Groundwater Inflow

The proposed basement will generally extend into bedrock and intersect the groundwater table (*Ref.* Appendix B). JK estimated "a groundwater inflow rate into the proposed basement excavation of between about 2500L/day to 4000L/day"; however, as "the site is located at the crest of a hill and as such, there is a very limited catchment over which surface water can feed the groundwater", while "shales are tight aquifers which generally comprise a complex of perched water tables", JK also suggested that "the rate of inflow will decrease once the excavation has initially drained the local area".

Groundwater inflow into the completed (i.e. paved) basement will therefore be derived from the bedrock exposed by the bulk excavation. Hence, most of the infiltration will be derived from the rock layer below the basement slab, forced upwards by via hydrostatic pressure. Assuming a mass rock permeability of 10^{-7} m/sec, the total inflow rate of groundwater is expected to be less than 2.5 m^3/day (i.e. <2500 L/day), which is relatively low.

Implications for Pump Out Management

JK identified that "temporary dewatering will be required during construction" and it was recommended that "the completed basement should be designed as drained with pump-out facilities". Features of the pump out system were to include, or take into account, the following:

- "the limited groundwater volumes must be collected in sumps and pumped to the stormwater system"; and

- "the groundwater would need to be tested and, depending on groundwater quality, treatment may be required prior to offsite disposal".

Water quality monitoring is required during the site excavation and construction phase (i.e. forms part of the management plan for temporary dewatering; *HEC Ref.* MP135 AE). The data will assist in determining the treatment requirements, if any, for the permanent basement pump out system.

4.0 MANAGEMENT PLAN

4.1 Overview

The primary aims of this management plan are to ensure that:

- all basement water is discharged to Council's stormwater drainage system in accordance with the requirements of the *Protection of the Environment Operations Act 1997*; and

- discharges derived from basement pump out do not cause adverse impacts on any receiving waterways, both in terms of quantity and quality of water.

This Management Plan (MP) describes the relevant procedures for proper containment and disposal of basement pump out waters to the stormwater pipe entry drain that is located in the north eastern site corner. Also presented are a water monitoring program and contingency measures that would be implemented should failures of the dewatering system be encountered.

4.2 Site Specific Compliance Issues

The Owners Corporation will ensure that basement pump out is undertaken with due regard for the environment and in accordance with all relevant statutory requirements. In particular, all pumped water will comply with the requirements of the following NSW Acts:

- *Environmental Planning and Assessment Act 1979;*
- *Contaminated Land Management Act 1997*;
- *Protection of the Environment Operations Act 1997;*
- *Environmental Protection & Biodiversity Conservation Act 1999;*
- *Environmental Offences and Penalties Act 1997*;
- *Water Management Act 2000*; and
- *Occupational Health and Safety Act 2000.*

The Owners Corporation will also be responsible to ensure that basement pump out complies with the following relevant conditions:

1. No water containing suspended matter, heavy metals, or any other contaminant, is to leave the site in a manner which could pollute (as defined by the *Protection of the Environment Operations Act 1997*) nearby water courses, such as the Council's stormwater drains and the nearby Middle Harbour Creek.

2. The pH of any discharge water is to be between 6.5 and 8.5, as per Condition 13(A) of the NSW Office of Water *Conditions Statement on Bore License 10BL604937.*

4.3 Methodology for Basement Pump Out

Summary

Plans for the proposed basement are presented in Appendix A. The basement pump out system shall involve an integrated pit and pipe network, the pit details being presented in Appendix A.

All water that accumulates in the basement will be collected and drained into a pit containing a functioning oil-water separator (general purpose 1000L model GPP-01000, manufactured by Beresford Concrete Products Pty Ltd, designed for silt settlement and oil capture). The treatment process will include alkali (lime) and/or acid (hydrochloric acid) dosing, to adjust the pH to the acceptable range (6.5-8.5), and addition of a flocculant and/or coagulant to promote precipitation of (in)organic compounds (e.g. metals and PAHs). Recommended alternative flocculants (i.e. in addition to lime) are aluminium sulfate and iron (II) sulfate.

Powdered lime will be added to the water by shovel (or similar), then mixed. Liquid HCl will be poured into the pit, then mixed. Additional flocculant / coagulant will be added to the water by shovel (or poured, as appropriate), then mixed. Field pH and turbidity testing on representative samples will be performed to ensure that sufficient neutralisation and/or sedimentation has occurred.

Hence, all pump out water will be subjected to treatment (purification), prior to release. The treatment will involve pH adjustment, flocculation, gravity sedimentation and oil-water separation. It is understood that the Owners Corporation shall be responsible for conducting the water treatment processes.

Treated water is then pumped into the local stormwater system. The discharge point shall be the 300mm stormwater pipe entry drain closest to Killeaton Street (i.e. Line A, in the north eastern site corner; *Ref.* Appendix D). This interallotment pipe runs in an easterly direction, parallel with Killeaton Street, ultimately draining water into the Council's stormwater system. Based on the design capacity of the receiving stormwater network, its peak discharge rate is 225 L/second. Note that Line A has an overflow facility, or overflow wall, which can redirect excess water directly to Killeaton Street if necessary (e.g. a 1 in 100 year storm).

Note that the local road network, both internal and external to the site, contributes substantial volumes (>>2.5 m^3/storm) of runoff into the local stormwater system. This water is largely untreated, and potentially more contaminated by oil, grease and metals etc., compared with the pump out water (most of which shall be natural, groundwater up-seepage).

Estimate of Daily Discharge

The pumping rate from the basement pit will be 10-20 L/minute, which will not change, regardless of weather conditions. This is significantly less than the peak discharge capacity of the receiving interallotment pipe (225 L/second).

The total volume of water that will be discharged from the basement is expected to be low, $\leq$2.5 m^3/day (i.e. $\leq$2500 litres). In terms of quantity, such volume will have no, or minimal, impact on any receiving waterway (e.g. Middle Harbour Creek).

The site is situated on a hill and is not near a natural water course. Hence, the main source of pump out water will be groundwater inflow (i.e. up-seepage), although there will also be contributions from vehicle and surface runoff. The actual inflow rate should be monitored and Meriton shall confirm the current estimate by assessing seepage rates at the base of the excavation during temporary dewatering.

Pump Out Pit

The concrete-lined pit (with general purpose oil-water separator) will be an industry standard device, designed to discharge groundwater that enters the basement via hydrostatic pressure within the building area (*Ref.* Appendix C). Once collected within the pit, the water will not be pumped directly, or immediately, to the interallotment pipe (i.e. Line A). Rather, the pump is activated automatically, by an integrated float mechanism (or switch), once the pit fills to the designated capacity (which is about 25%). This delay allows a secondary level of purification (via gravity sedimentation). The pumping rate will be 10-20 L/minute, which will not change, regardless of the weather and infiltration conditions.

The pump out pit on this site will have a holding capacity of approximately $24m^3$, or 24,000L, which greatly exceeds the expected daily inflow rate (*Ref.* Section 3). Note, however, that the pump would normally be activated well before the maximum ($24m^3$) is reached, to prevent an over-flow.

Visual inspections of the pump out pit are to be integrated into the sampling (monitoring) program, as part of the system maintenance, with repairs to be performed as required. The surface water (effluent) in the pit is to be colourless and clear (i.e. transparent), indicating that the supernatant is suitable for off-site discharge. If the water is discoloured, the automatic switch is to be turned off until the water is colourless and clear.

All estimates of volume and inspection notes (including colour and appearance) are to be logged on the monitoring checklist. A copy of each checklist is to be submitted as part of the on-going (monthly), monitoring reporting.

4.4 Water Quality Monitoring Program

It is critical that the performance of the dewatering system is routinely monitored. This sampling program provides a practical framework for the monitoring and reporting of basement water quality across the site. The following measures will be of particular relevance to the proposed system:

- completion of monthly inspections and monitoring checklists of the pump out pit (to confirm the inflow rate and check water clarity);
- monthly inspections of the release point (i.e. stormwater entry drain); and
- mechanisms for enacting remedial measures, should faults or non-compliance occur.

Monthly sampling and laboratory analysis of basement water are to be initiated immediately after the pump out system has been installed, well in advance of any building occupation. The results will complement the baseline data generated during the temporary dewatering phase (*HEC Ref.* MP135 AE; dated 27 September, 2011). Once a comprehensive data set has been collated (i.e. at least 6-12 rounds of sampling), a judgement on further monitoring and/or treatment requirements shall be made.

Recommended Sampling Locations and Analysis

For each (monthly) sampling event, at least one representative discharge water sample is to be collected from the release point (i.e. the north eastern stormwater entry drain). The relevant, or key, parameters that should be tested (as a minimum) are:

- total filtered metals (arsenic, cadmium, chromium, copper, iron, lead, mercury, nickel and zinc);
- C_6-C_{36} total petroleum hydrocarbobs (TPHs);
- polycyclic aromatic hydrocarbons (PAH)s;
- pH;
- electrical conductivity (EC; allowing calculation of total dissolved solids (TDS));
- total suspended solids (TSS);
- total Kjeldahl nitrogen (TKN);
- ammonia;
- oxides of nitrogen (i.e. dissolved nitrate and nitrate); and
- total phosphorus (TP).

In order to capture (isolate) any impacts posed by the proposed dewatering system, an additional location is the pump out pit. Sampling at the pit would be necessary if quality breaches are identified at the downstream release point.

Field Measurements

Parameters such as pH, EC and suspended solids can be readily measured by way of portable, field instruments. *In situ* monitoring will provide a more rapid analysis of the pit discharge, enabling better control of its quantity and quality. Note that turbidity (in nephelometric turbitity units (NTU)) is more readily analysed in-field than TSS, and provides a measure of this parameter. For this management plan, the acceptance level for turbidity monitoring shall be 6-50 NTU, which is equivalent to the ANZECC and ARMCANZ (2000) criterion for slightly disturbed lowland rivers in south-east Australia.

Recommended Sample Containers

Discharge 'grab' samples will be collected into laboratory-supplied, glass and plastic (HDPE) bottles.

Reporting

The results of the monthly water sampling and analysis must be included as part of the (site) reporting program.

4.5 Recommended Water Quality Criteria

In accordance with Condition 13(A) of the NSW Office of Water *Conditions Statement on Bore License 10BL604937*, the pH of any discharge water is to be between 6.5 and 8.5. As no further numerical standards are included in this statement, the corresponding ANZECC and ARMCANZ (2000) thresholds, or appropriate default criteria, should apply.

With respect to the ANZECC and ARMCANZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, criteria relating to the protection of 95% of species in freshwater aquatic ecosystems and slightly disturbed lowland rivers in south-east Australia are considered the most appropriate for this site. Note that the latter provide the trigger values for nitrite, total nitrogen, total phosphorus, EC, turbidity and TSS (presented under Tables 3.3.2-3.3.3 of the publication).

For the purposes of this management plan, these criteria will be referred to as the *Discharge Acceptance Levels* (DALs). A summary of the DALs is presented in Table 1.

4.6 Contingency Measures Triggered by Failures of the Pump Out System

During operation of the system, water discharge will be monitored, as part of the water sampling and maintenance program. Recommended check points include the stormwater entry drain and the pump out pit grates.

Only non-acidic / non-alkaline (i.e. pH 6.5-8.5), non-turbid (≤50 mg/L TSS) water will be discharged into the local drainage system. Should acidic (pH <6.5) or alkaline (pH >8.5) or turbid (>50 mg/L TSS) water be encountered, it will be retained within the pump out pit. It will then be (re-)treated with lime, hydrochloric acid (HCl) and/or additional flocculant (i.e. aluminium sulfate or iron (II) sulfate), as required, to display colourless and clear water with a pH level of 6.5-8.5, prior to release.

Field and laboratory analytical testing on representative samples will be performed to ensure that sufficient pH adjustment / contaminant (e.g. heavy metal) removal has occurred. If not, the water will be pumped into a licensed liquid waste transporter and disposed at the Lidcombe Liquid Waste Plant, Hill Road, Homebush Bay (or an equivalent liquid waste facility).

The information to be recorded shall include estimates of volume, colour, appearance and analytical test results. It is understood that the Owners Corporation shall be responsible for this monitoring and record keeping. This may involve the building manager / caretaker and the contracted environmental consultant.

Some 24m^3 of pit storage capacity will be available within the basement area (*Ref.* Appendix A). This will allow up to 10 days of storage, should a failure of the dewatering system occur, such that it requires temporary shut down until investigations and maintenance are completed.

In the event that the pit pump malfunctions, repairs would be conducted as soon as possible. The capacity of the pit (24m^3) is considered to be sufficient to enable repairs without overflow; however, a back-up pump would be engaged where necessary, which may only be used subject to adoption of the procedure in this plan. Flexible containment bunds will be employed to contain any pit overflows, should they arise.

In the event of an increase in sediment load (i.e. observed discoloration or >50 mg/L total suspended solids), discharge of water will cease for additional treatment to be implemented. Where contaminant removal is unsuccessful, the water will be pumped it into a licensed liquid waste transporter and disposed at the Lidcombe Liquid Waste Plant, Hill Road, Homebush Bay (or an equivalent liquid waste facility).

Table 1. Summary of the recommended Discharge Acceptance Levels.

ANALYTE	DALs
Total Filtered Metals (µg/L)	
arsenic	13
cadmium	0.2
chromium (as CrVI)	1.0
copper	1.4
iron	300 [1]
lead	3.4
mercury	0.6
nickel	11
zinc	8.0
TPHs (µg/L)	
C_{10}-C_{14}	total 600 [2]
C_{15}-C_{28}	
C_{29}-C_{36}	
PAHs (µg/L)	
total PAHs	3.0 [3]
benzo(a)pyrene	0.05 [4]
pH	6.5-8.5 [5]
EC (µS/cm)	125-2200
TDS (mg/L)	500 [1]
Total Suspended Solids (mg/L)	≤50 [6]
Oxides of Nitrogen (mg/L)	
nitrate	0.7
nitrite	0.04
Ammonia (mg/L)	0.9
Total Nitrogen (mg/L)	0.5
Total Phosphorus (mg/L)	0.05

Footnotes:

Filtered metals correspond to the dissolved fraction (0.45µm membrane filtered sample)

TDS may be determined by calculation (i.e. 0.65 x EC value (in µS/cm))

Discharge Acceptance Levels (DALs) are the ANZECC & ARMCANZ (2000) *Trigger Values* for protection of 95% of species in marine ecosystems, or slightly disturbed lowland rivers in south-east Australia, unless otherwise indicated

[1] NHMRC & ARMCANZ (1996) *Australian Drinking Water Guideline* (aesthetic based)

[2] Netherlands (1994) *Groundwater New C (Intervention)* value for mineral oil, which includes the C_{10}-C_{36} fraction

[3] NEPC (1999) *Groundwater Investigation Level for Aquatic Ecosystems (Fresh Waters)*

[4] Netherlands (1994) Groundwater New C (Intervention) value

[5] as per Condition 13(A) of the NSW Office of Water *Conditions Statement on Bore License 10BL604937*

[6] TSS is referred to as suspended particulate matter in Table 3.3.3 of the ANZECC & ARMCANZ (2000) *Guidelines*

Details of the system maintenance schedule are to be recorded, as part of the monitoring checklist. The pump out pit and oil-water separator should be emptied and cleaned at least once per month whilst in use. The resultant sediment is to be removed and dried as best as practicable, before off-site disposal as solid waste. Pit cleaning water will be retained on-site and treated in a similar manner to the groundwater seepage.

Incidents of Non-Compliance

Should there be non-compliance with a requirement of this Management Plan in relation to the discharge of water and its quality, corrective actions shall be immediately implemented:

- the discharge of basement water into the local drainage (stormwater) system shall immediately cease and not re-commence until water quality meets the DALs in Table 1 and the Environmental Health section of Ku-ring-gai Council has been notified by email or facsimile;
- an investigation will be undertaken by the relevant contractor/consultant, assisted by site management, to determine the cause of the problem;
- the work practices for the suspected activity shall be modified, as necessary, by recommendations made in writing to eliminate or reduce non-compliance, and those recommendations are to be adopted as if they form part of this plan;
- if water containment structures or sediment control devices are not operating effectively, they will be repaired or replaced at the direction of the consultant;
- additional water quality monitoring will be undertaken, where required by the consultant, to establish efficacy of the corrective action; and
- Ku-ring-gai Council and the NSW Office of Water will be notified within 24 hours of the incident occurring.

4.7 System Improvements

The integrity of the dewatering system will be maintained and improved by:

- the continuation of monthly system checks;
- recording the details of all system maintenance;
- retaining all contingency measures on-site;
- training site personnel, especially when new/additional methodology is to be implemented; and
- conducting water quality testing when instances of non-compliance are suspected, or confirmed.

4.8 Conclusions

In summary, the total volume of water that will be pumped from the basement on a daily basis is expected to be very low ($\leq$2.5 m^3, or $\leq$2500 litres). Prior to discharge into the local stormwater system, all such water will be subjected to treatment (purification), including a sedimentation pit with an oil-water separator. Prior to building occupation, sampling and testing shall be performed on a monthly

basis, to monitor the initial performance of the dewatering system and trigger remedial measures, should a breach in quantity and/or quality be identified.

It is therefore expected that the proposed basement pump out system will not adversely affect any receiving waterway, both in terms of quantity and quality of water.

5.0 STATEMENT OF LIMITATIONS

No warranties are made as to the information provided in this plan. All recommendations are the professional opinions of the HEC personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this plan or which are not made known to HEC personnel and which may impact on those opinions are not the responsibility of HEC.

Should you require additional information or clarification regarding any aspect of this plan, please call the undersigned on (02) 9529 3344 or 0413 356 802.

For and on behalf of,
HAYES ENVIRONMENTAL CONSULTING PTY LTD

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Environmental Chemist / Toxicologist

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MRACI C.Chem, MAIBiol, MAPESMA, MEIANZ

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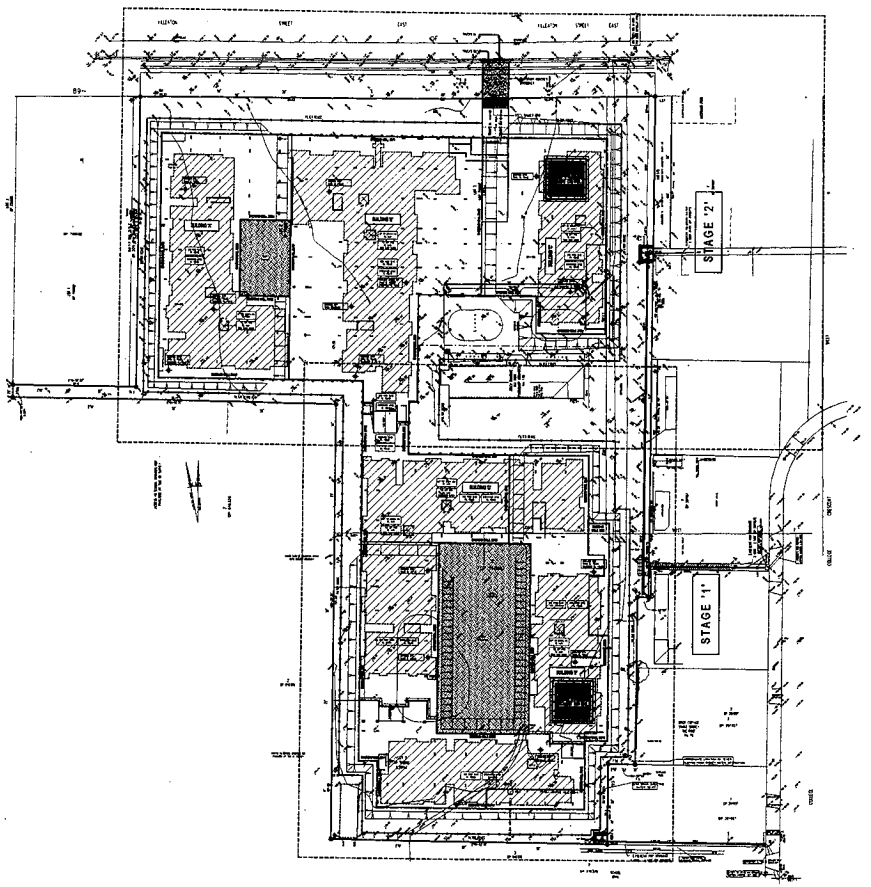
APPENDIX A

PLANS OF THE PROPOSED BASEMENT
(supplied courtesy of Meriton Apartments Pty Ltd)



EXC. PLAN (1-400) (DOUBLE)

ALL ROCK LEVELS ARE TO 'XXX' ROCK SURFACE LEVELS

SHORING WALL SETOUT IS TO THE INSIDE FACE OF TYPICAL

BULK EARTHWORK AND SHORING NOTES

GEOTECHNICAL REPORT
NOTE TO GEOTECHNICAL REPORT PREPARED BY JEFFERY AND KATAUSKAS PTY. LTD. AND CONTRACTOR IS TO ENSURE SECTION REPORT RECOMMENDATIONS ARE ADHERED TO
SITE SURVEY
THE SITE SURVEY BY [illegible] SURVEYORS PTY. LTD. DATED [illegible] FOR DETAILS
SITE CLASSIFICATION
THE SITE HAS BEEN CLASSIFIED AS CLASS 'E' SITE IN ACCORDANCE WITH AS 2870 - 1996
EXCAVATION
ALL EXCAVATION WORK SHALL COMPLY WITH THE RELEVANT REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT 1983 AND REGULATIONS MADE THEREUNDER
DESIGN AND CONSTRUCTION
ALL EXCAVATION WORK SHALL COMPLY WITH THE RELEVANT REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT 1983 AND REGULATIONS MADE THEREUNDER
DUST CONTROL
THE CONTRACTOR IS TO ENSURE THAT THE DUST PREVENTION METHODS HE ADOPTS ARE SUFFICIENT TO MEET THE REQUIREMENTS OF THE SYDNEY CITY COUNCIL. IT IS THE CONTRACTORS' RESPONSIBILITY TO ADJUST HIMSELF WITH THE REQUIREMENTS
SETOUT
REFER TO THE ARCHITECTS DRAWINGS FOR THE ACCURATE SETOUT OF ALL BUILDINGS, DRIVEWAYS DURING AREAS ETC. NOTE BULK EARTHWORKS PLAN IS INDICATIVE ONLY. CADASTRE AND CUT BATTERS FROM ARCHITECTS PLANS AND SURVEY CROSSSECTION PROFILES TO CLEARLY REQUIREMENTS
EXCESS
ALL EXCESS NEW BULK EARTHWORKS AND SHORING TO PROVIDE A STABLE SUBGRADE AND WORK SPACE FOR THE CONSTRUCTION OF THE PROPOSED DEVELOPMENT. STRIP AND DISPOSE OF TOPSOIL REDUCE SITE TO LEVELS INDICATED AND DISPOSE OF ALL UNWANTED MATERIAL CLEARLY
SUBGRADE
THE GEOTECHNICAL ENGINEER IS TO PROVIDE LEVEL 1 SUPERVISION (EXISTING FOR ALL EARTHWORKS DURING THE COURSE OF CONSTRUCTION AT THE COMPLETION OF THE BULK EXCAVATION CONTRACT THE GEOTECHNICAL ENGINEER IS TO PROVIDE CERTIFICATION THAT WORKS HAVE BEEN CARRIED OUT IN ACCORDANCE WITH BULK EARTHWORKS SPECIFICATION
SURFACE DRAINAGE / WATER CONTROL
PROVIDE SURFACE DRAINAGE DURING CONSTRUCTION TO ENSURE MINIMUM DISRUPTION FROM RAIN
SERVICES
DURING EXCAVATION CO-ORDINATE WITH ALL SERVICES INCLUDING SEWER, GAS AND POWER.
BULK EARTHWORKS & RETAINING WALL EXECUTION
1. ALL EXCAVATION WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED GEOTECHNICAL ENGINEERS REPORT
2. AT THE COMPLETION OF THE BULK EARTHWORKS, THE CONTRACTOR SHALL PROVIDE SUPERVISION OF PERMANENT DRAINAGE TO ENSURE NO SURFACE WATER IS PONDED ON THE SITE OR THAT SURFACE WATER FLOW DETRIMENTALLY OCCUPIES THE PREPARED BASE
EXCAVATION & SURFACE PROTECTION
1. ALL EXCAVATION WORK SHALL BE CARRIED UNDER GEOTECHNICAL ENGINEERS SUPERVISION.
2. GEOTECHNICAL ENGINEER SHALL BE CONSULTED ON SUITABILITY OF THE SUBCONTRACTOR'S METHOD OF EXCAVATION AT REMOVAL PROCESS.
HYDRAULIC DESIGN
DURING EXCAVATION CONTRACTOR SHALL BE RESPONSIBLE FOR ALL HYDRAULIC ENGINEERS REQUIREMENTS FOR [illegible] SYDNEY WATER CORPORATION
SLOPE BATTERING
1. PROVIDE AS-BUILT DRAWINGS PREPARED BY A REGISTERED SURVEYOR TO CONFIRM BULK EARTHWORKS IS COMPLETED TO REQUIRED DIMENSIONS AND LEVELS.
RETAINING WALLS
1. ALL RETAINING WALL SHORING SHALL CONTAIN OR SHALL INCLUDE A DILAPIDATION REPORT
2. ALL STRUCTURAL AND ROAD FEATURES PRIOR TO INSTALLATION OF SHORING WALL.
CONSTRUCTION JOINTS
1. CONSTRUCTION JOINTS IN RETAINING WALLS BY EXCAVATION CONTRACTOR TO BE LONG AND STEP PRIMARY TO ACHIEVE WATER TIGHT JOINTS.
2. CONTACT IN EXCESS OF 300mm WIDE EXPOSED AT OPTIMUM MOISTURE CONTENT OF 10%

SHORING WALL DESIGN SCOPE:

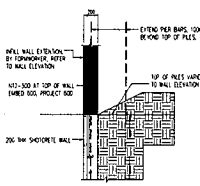
1. SCOPE OF WORKS
1.1 THE SCOPE OF SHORING SHALL CONSIST OF THE DESIGN, CONSTRUCTION AND CERTIFICATION OF THE PERMANENT BASEMENT SHORING WALLS.
1.2 THE PLAN EXTENT OF THE SHORING WALLS IS AS SHOWN. ELEVATIONS OF ALL SHORING WALLS, SECTIONS AND DETAILS ARE TO BE SHOWN. EACH WALL AND LINE WILL ONE AND SHALL EXTEND FROM THE TOP OF WALL R.L. TO 1000mm MINIMUM BELOW THE EXCAVATION LEVEL SHOWN.
1.3 THE SHORING WALL DESIGN SHALL BE SUBJECT TO ALL NECESSARY APPROVALS FOR THE CONSTRUCTION OF THE WALLS AND ANCHORS WITHIN ROAD RAIL TRUST THE NEW/EW CONSTRUCTION PROPOSE IS NOT INCLUDED.
1.4 SUBMIT DETAILS IN ADDITION TO THE STRUCTURAL DRAWINGS FOR REVIEW AND CO-ORDINATION WITH BUILDING WORKS AT ANY EARLY STAGE ALLOW FOR ATTACHMENT AT ANY DESIGN METHODS THAT MAY BE REQUIRED
2. CODES
2.1 THE GEOTECHNICAL INVESTIGATION HAS BEEN UNDERTAKEN BY JEFFERY AND KATAUSKAS PTY LTD AND THE RESULTS OF THAT INVESTIGATION ARE SHOWN IN THEIR REPORT No. 17766
2.2 THE WALL DESIGN SHALL BE CERTIFIED BY A CHIEF STRUCTURAL ENGINEER, WITH WIDE REGISTRATION, AS BEING STRUCTURALLY ADEQUATE TO RESIST THE DESIGN LOADS FOR THE TEMPORARY AND FINAL CONDITIONS IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS
2.3 THE WALLS SHALL BE DESIGNED FOR A DESIGN LIFE OF 50 YEARS.
2.4 [illegible] DESIGNED AND EXECUTED
2.5 ALL WORK SHALL COMPLY WITH THE GEOTECHNICAL REPORT AND ANY RELEVANT AUSTRALIAN STANDARDS
2.6 ALLOW 200Pa SURCHARGE TO CONSTRUCTION LINE LOAD AT EXISTING GROUND LEVEL
2.7 NO INTERIM PROPPING OF THE WALL SHALL BE PERMITTED UNLESS NOTED OTHERWISE
2.8 ANCHORS OR SOIL ANCHOR MUST NOT BE USED FOR THE TEMPORARY CONDITION DURING THE CONSTRUCTION OF THE BASEMENT SLABS.
2.9 ANY TEMPORARY PROPPING USED TO SUPPORT THE WALLS MUST BE SECURELY TIED AND CUT OFF, 7 DAYS MINIMUM AFTER THE CONSTRUCTION OF THE RELEVANT FLOORS
2.10 THE EXCAVATED CUTTING OF THE WATER TABLE MAY BE PERMITTED TO INSTALL THE WALL ONLY WHERE THE GROUNDWATER LEVEL IS LOWERED AND THE SITE TO BE DEWATERED DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL SUBMIT A DEWATERING METHOD STATEMENT FOR APPROVAL BY THE GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION
2.11 CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF FOOTINGS AND / OR BULK LEVEL CONTAINED IN THE FILL TO ALLOW FOR THE UNIMPEDED CONSTRUCTION OF THE SHORING WALL
2.12 TEMPORARY BACKSTOPS TO BE INSTALLED TO ANY PIONEER COLUMNS AND FLOOR SLAB
2.13 [illegible] DESIGNED
2.14 ALL WORK SHALL COMPLY WITH THE GEOTECHNICAL REPORT AND ANY RELEVANT AUSTRALIAN STANDARDS
2.15 THE SHORING WALLS MAY BE DESIGNED TO BE HORIZONTALLY SUPPORTED BY THE BASEMENT SLABS AS WELL AS THE ANCHORS. REFER TO THE ARCHITECTS DRAWINGS FOR THE LAYOUTS OF FLOORS AND RAMPS. EACH SECTION OF THE WALL MUST BE CAPABLE OF SPANNING THE VERTICAL SUPPORTS AROUND THE RAMPS AND THE FLOOR LEVEL
2.16 PROVISION SHALL BE MADE FOR THE SHORING WALLS TO BE EXTENDED ABOVE THE EXISTING GROUND LEVEL TO ENABLE PERMANENT LATERAL SUPPORT BY AN ABOVE GROUND "PODIUM" SLAB WHERE RELEVANT
2.17 ALLOW FOR FINAL LANDSCAPED EARTH LEVELS AROUND BUILDINGS WHICH MAY BE HIGHER THAN NATURAL GROUND
2.18 ALLOW 50Pa SURCHARGE LOAD AT FINAL GROUND LEVEL
2.19 EACH WALL SECTION MUST BE DESIGNED TO RESIST A MINIMUM "AT REST" EARTH PRESSURE FACTOR EQUIVALENT OF 0.5 SPECIFIED IN THE GEOTECHNICAL REPORT
3. CONSTRUCTION
3.1 THE WALLS MUST BE DESIGNED TO CARRY HYDROSTATIC FORCES FROM NEIGHBOURING GROUND WATER REFER TO GEOTECHNICAL REPORT
4. CONSTRUCTION TOLERANCE
VERTICAL DEVIATION + 0 75mm
HORIZONTAL DISPLACEMENT + 0 50mm

NOTE :
- PROOF ROLL SUB-GRADE UNDER RAFT FOUNDATIONS
- TEST SAND IN TOP 300mm LAYERS TO ACHIEVE 90% OF STANDARD DENSITY

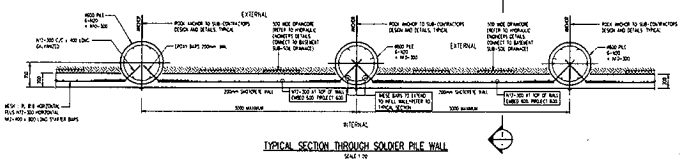
NOTE :
SHEETPILE WALL TO BE DESIGNED AND CONSTRUCTED BY CONTRACTOR. SHORING WALLS SHOULD BE DESIGNED TO WITHSTAND APPROPRIATE HYDROSTATIC WATER PRESSURES INCORPORATING RECOMMENDATIONS IN THE THE GEOTECHNICAL REPORT PREPARED BY JEFFERY AND KATAUSKAS PTY. LTD (REPORT No. 17766rpt)

NOTE :
THE CONTRACTOR SHALL SATISFY THEMSELVES TO THE CORRECTNESS OR OTHERWISE, OF THE ESTIMATED TOP OF ROCK LEVEL GIVEN IN THE GEOTECHNICAL REPORT. THE CONTRACTOR SHALL MAKE ALL ALLOWANCES NECESSARY TO COVER FOR VARIANCE BETWEEN ESTIMATED ROCK LEVEL AND ACTUAL ROCK LEVEL. NO TIME OR COST VARIATION WILL BE GIVEN SHOULD THERE EXIST A DIFFERENCE BETWEEN ACTUAL ROCK LEVEL AND ESTIMATED ROCK LEVEL.

LEGEND :
BH1 DENOTES LOCATION OF JEFFERY AND KATAUSKAS P/L BORE HOLE



SECTION 1 SCALE 1:20

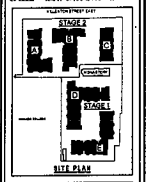


TYPICAL SECTION THROUGH SOLDIER PILE WALL
SCALE 1:20
(FINAL DESIGN TO SUB-CONTRACTORS DESIGN AND DETAILS)

GENERAL NOTES:

NOTES:
1. FOR DRAWING NOTES SEE GNO
2. CONCRETE STRENGTH AT 28 DAYS = f'c 32 MPa U.N.O
3. ALL HOLES TO BE f'c 100 f'c/MIX U.N.O
4. ALL DIMENSIONS IN MILLIMETRES TO BE VERIFIED 5mm TYPICAL
5. REFER TO THE ARCHITECTS DRAWINGS FOR LOCATIONS OF ALL PENETRATIONS AND DETAILS
6. PROVIDE N12 x 300 HOB AROUND ALL PIER / PODIUM EDGES
7. ALL DIMENSIONS SHOWN ON THE ARCHITECTS DRAWINGS FOR LOCATIONS TYPICAL

LEGEND:
(xx) SLAB LEVEL (+ SHOWN THUS + xx.x)
EL xx.xx SLAB SHOWCASTS SHOWN THUS EL xx.x
LP DENOTES LEAD BEARING PANEL
NLP DENOTES NON LEAD BEARING PANEL



NORTH POINT DIRECTION

TENDER NOTES :
1. THESE DRAWINGS ARE PRELIMINARY DRAWINGS ISSUED FOR TENDER PURPOSES ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS AND ANY OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS.
3. THESE DRAWINGS SHALL NOT BE SCALED FOR ANY DIMENSIONS.
4. ALL DIMENSIONS AND AMOUNTS (AREAS, VOLUMES, QUANTITIES) INCORPORATED OR SHOWN ON THESE DRAWINGS ARE APPROXIMATE ONLY AND ARE NOT GUARANTEED BY THE ENGINEER. THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF ALL SUCH DIMENSIONS AND AMOUNTS.
5. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL AND JOINT DRAWINGS. DO NOT SCALE DRAWINGS. IF IN DOUBT ASK.
6. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

ISSUED FOR TENDER ONLY

2	17.01.11	ISSUED FOR TENDER	SW
1	17.01.11	ISSUED FOR INFORMATION ONLY	SW
ISSUE	DATE	REVISION	BY

Meriton Apartments Pty. Ltd.
Builders & Developers

PROJECT:
PROPOSED RESIDENTIAL AND COMMERCIAL DEVELOPMENT
STAGE 2
131 - 139 KILLEATON STREET
ST IVES, NEW SOUTH WALES 2075

DRAWING TITLE:
EXC. PLAN (1-400) (DOUBLE)

DATE	SCALE	DRAWING No.	ISSUE
July 14, 2011	AS SHOWN	E-520-EXC	2
DESIGNED	DRAWN BY		
CA	DM		

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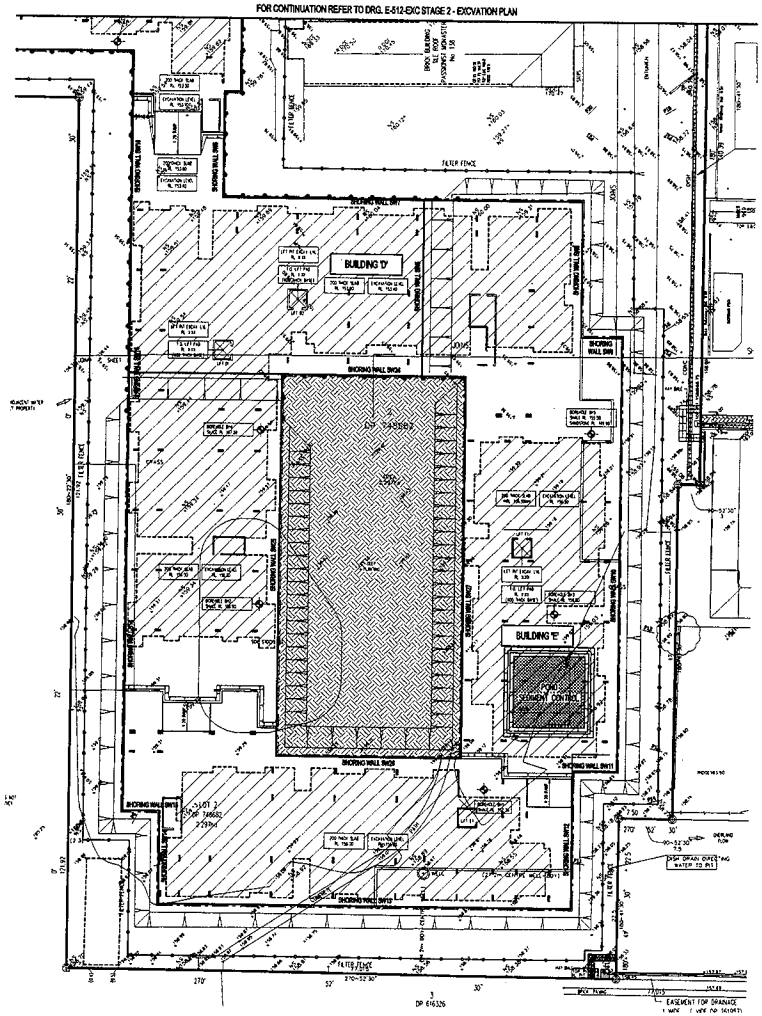
FOR CONTINUATION REFER TO DRG. E-512-EXC STAGE 2 - EXCVATION PLAN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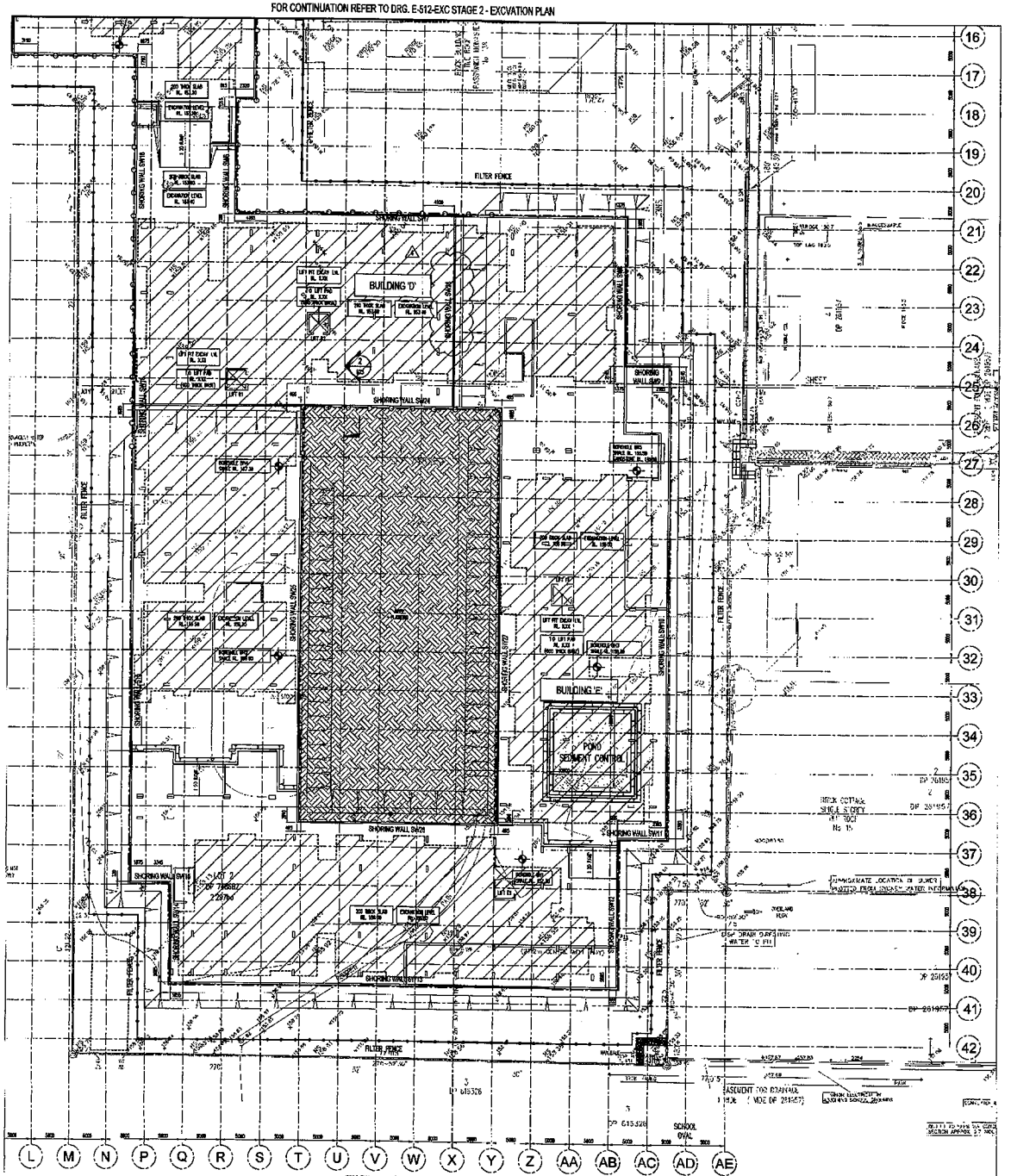
FOR CONTINUATION REFER TO DRG. E-512-EXC STAGE 2 - EXCVATION PLAN



STAGE 1 - EXC. PLAN (DOUBLE)

SCALE 1:100

...ALL ROCK LEVELS ARE TO 'YYY' ROCK SURFACE LEVELS

SHORING WALL SETOUT IS TO THE INSIDE FACE OF TYPICAL

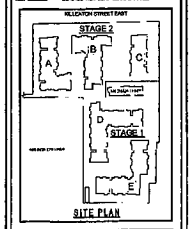
GENERAL NOTES

NOTES:

1. FOR GENERAL NOTES SEE E400
2. CONCRETE STRENGTHS AT 28 DAYS - f'c 32 MPa U.N.O
3. ALL WORK TO BE TO + TO WORK U.N.O
4. ALL DIMENSIONS AS INDICATED TO THE NEAREST 5mm TYPICAL REFER TO THE ARCHITECTS DRAWINGS FOR LOCATIONS OF ALL PENETRATIONS AND SETBACKS
5. PROVIDE 300 x 100 PADS AROUND ALL FIRE HYDRANT RECESSES AND POINDAMONS (REFER TO THE ARCHITECTS DRAWINGS FOR LOCATIONS) TYPICAL

LEGEND:

- (RL 100) SLAB LEVELS SHOWN THUS U.N.O
- 150 SLAB THICKNESS SHOWN THUS U.N.O
- SHW SHORING WALL SEALING PANEL
- MSHW SHORING WALL SEALING PANEL



SITE PLAN

NORTH POINT DIRECTION

TENDER NOTES

1. THESE DRAWINGS ARE PRELIMINARY DRAWINGS ISSUED FOR TENDER AS AN INDICATION OF THE EXTENT OF WORKS ONLY. REFER AND APPLY A COMPLETE CONSTRUCTION SET OF DRAWINGS
2. TO ESTIMATE THE FINAL EXTENT OF WORKS, THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS AND ANY OTHER RELEVANT DOCUMENTS
3. REFER TO ALL RELEVANT SERVICES AND THE HYDRAULIC, AND FIRED DRAWINGS AS NOT ALL ITEMS ARE SHOWN ON THE STRUCTURAL DRAWINGS
4. THESE ARE PRELIMINARY DRAWINGS ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. ALL DIMENSIONS AND LEVELS ARE TO BE CONFIRMED IMMEDIATELY PRIOR TO ORDERING OR FABRICATION OF ANY ITEMS
5. WORKSHOP DRAWINGS TO BE SUBMITTED FOR APPROVAL PRIOR TO ANY WORK BEING CARRIED OUT ON SITE. DRAWINGS ARE NOT TO BE USED ON SITE UNLESS THEY ARE MARKED 'APPROVED'

ISSUED FOR CONSTRUCTION

ISSUE	DATE	REVISION	BY
4	08.09.11	FINAL TENDER	SAH
3	19.08.11	ISSUED FOR SUBMISSION	SAH
2	07.07.11	ISSUED FOR TENDER	SAH
1	01.07.11	ISSUED FOR INFORMATION ONLY	SAH

Meriton Apartments Pty. Ltd.
Builders & Developers

PROJECT:
PROPOSED RESIDENTIAL AND COMMERCIAL DEVELOPMENT
STAGE 2
131 – 138 KILLEATON STREET
ST IVES, NEW SOUTH WALES 2075

DRAWING TITLE:
STAGE 1 – EXC. PLAN (DOUBLE)

DATE	SCALE	DRAWING No.	ISSU.
SEP 14, 2011	1:100	E-521-EXC	4
DESIGNED BY	DRAWN BY		
GP	SDM		

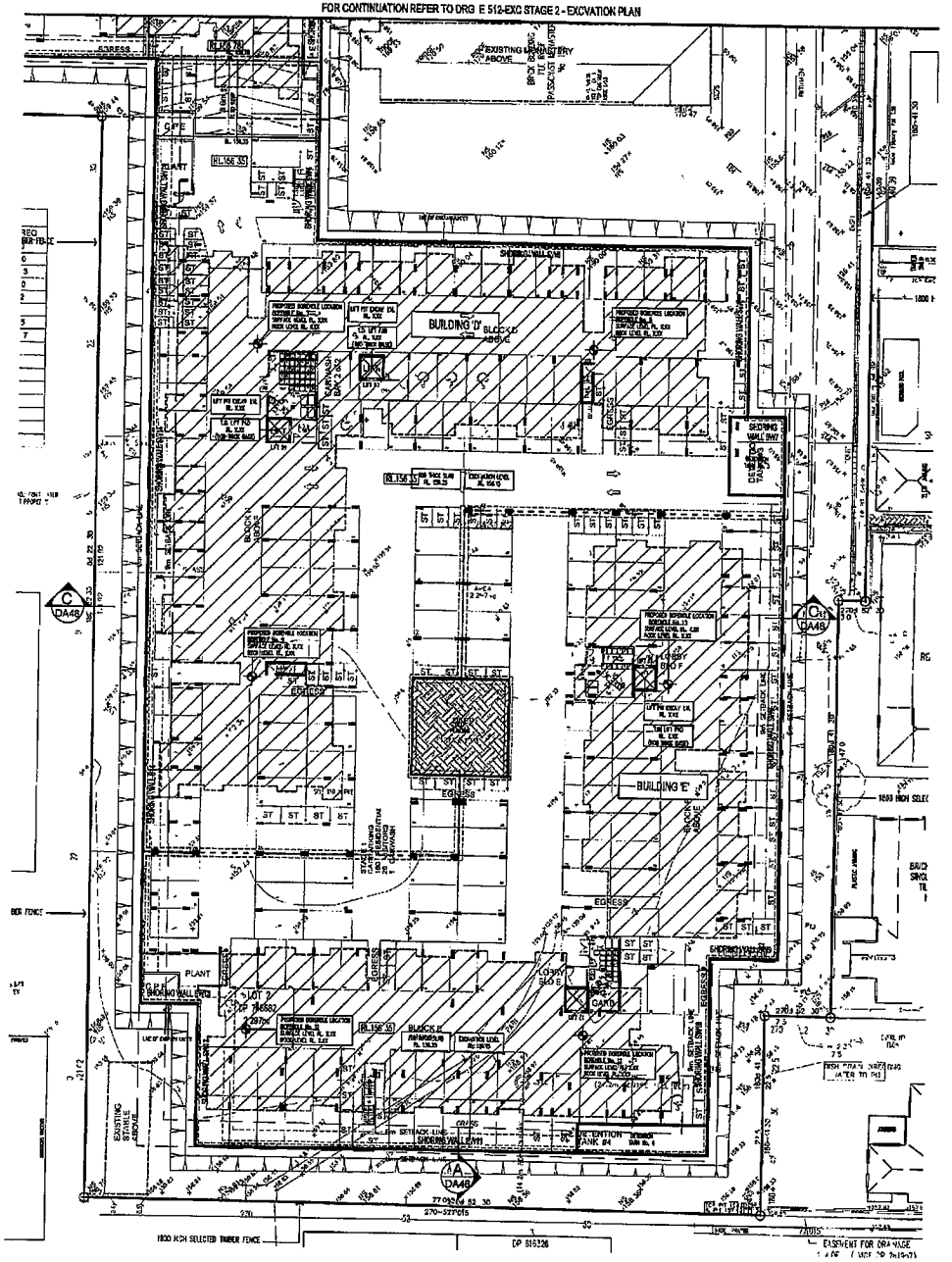
WARREN CENTRE PTY LTD
HEATHCOTE ARCHITECTS PTY LTD

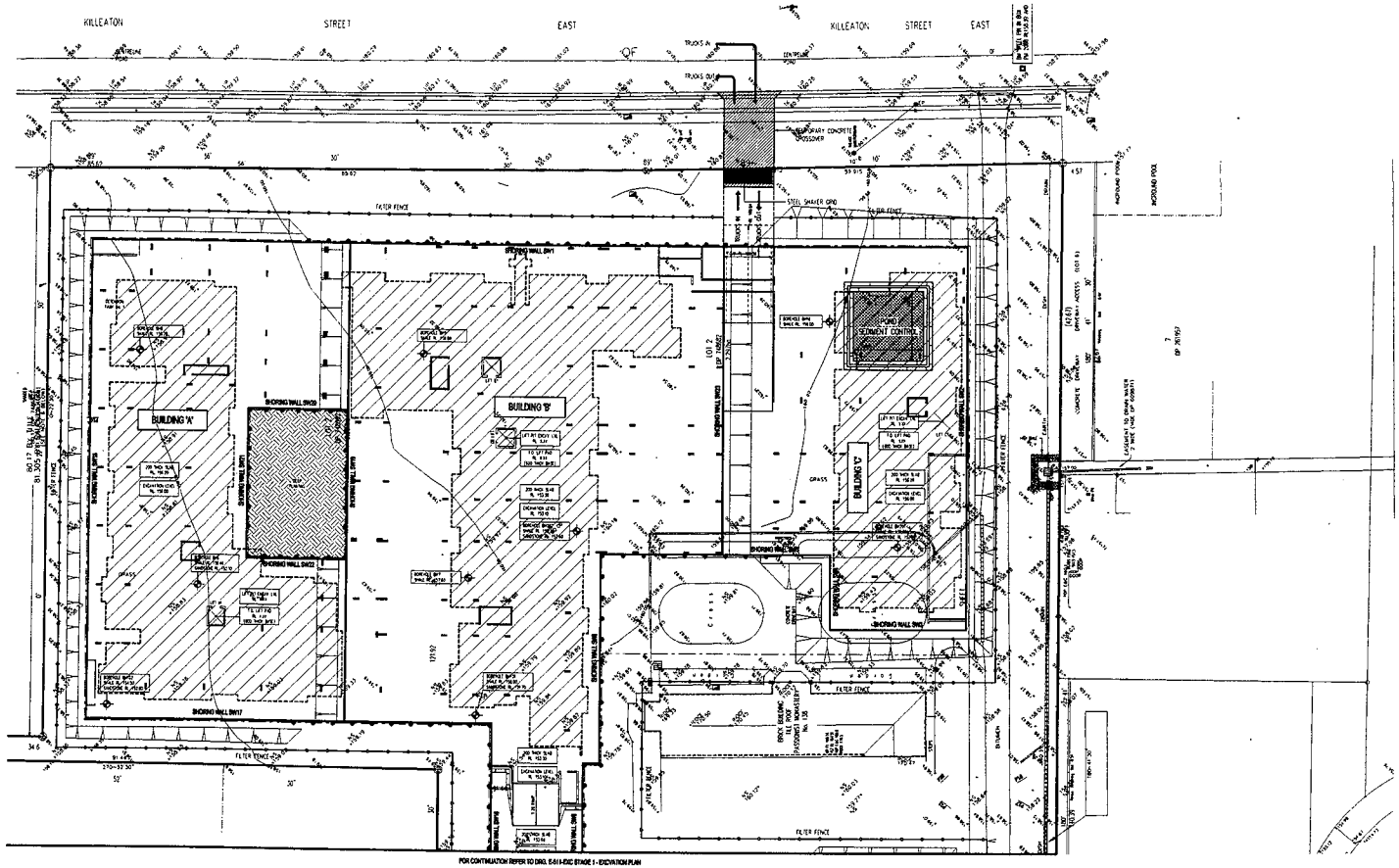
DO NOT SCALE

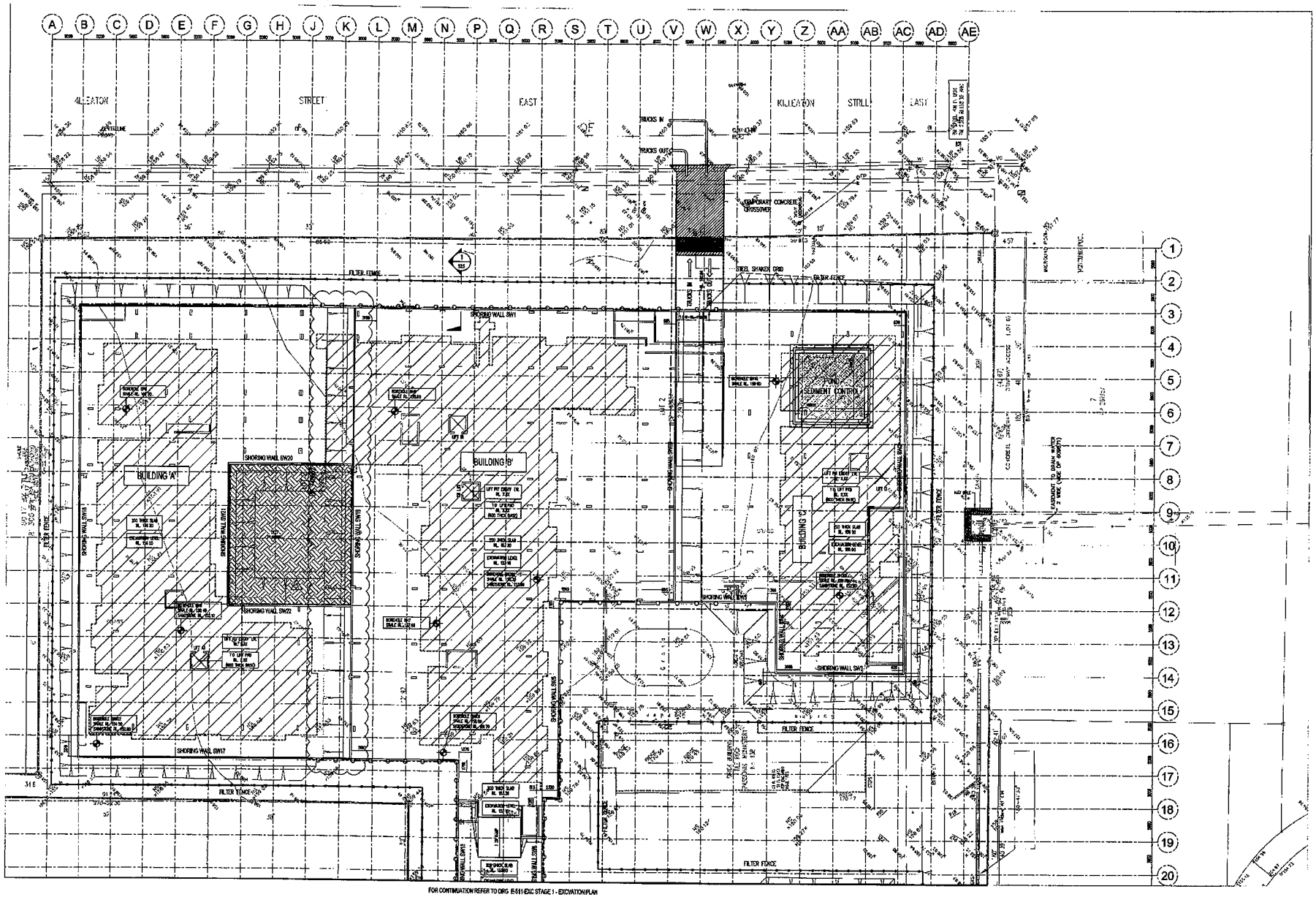
G:\P NOTEBOOKS\...\E-521-EXC - EXCAVATION (1 DUBBOARD).dwg

A0

FOR CONTINUATION REFER TO DRG E 512-EXC STAGE 2 - EXCVATION PLAN




KILLEATON STREET EAST
KILLEATON STREET EAST
TRUCKS IN
TRUCKS OUT
BUILDING 'A'
BUILDING 'B'
BUILDING 'C'
BUILDING 'D'
BUILDING 'E'
SHORING WALL SHT1
SHORING WALL SHT2
SHORING WALL SHT3
SHORING WALL SHT4
SHORING WALL SHT5
SHORING WALL SHT6
SHORING WALL SHT7
SHORING WALL SHT8
SHORING WALL SHT9
SHORING WALL SHT10
SHORING WALL SHT11
SHORING WALL SHT12
SHORING WALL SHT13
SHORING WALL



FOR CONTINUATION REFER TO DRG E-511-EXC STAGE 1 - EXCAVATION PLAN

STAGE 2 - EXC. PLAN (DOUBLE)

SCALE 1:100

ALL ROCK LEVELS ARE TO "XXX" ROCK SURFACE LEVELS

SHORING WALL SETOUT IS TO THE INSIDE FACE OF TYPICAL

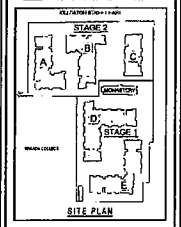
GENERAL NOTES

NOTES:

1. FOR GENERAL NOTES, SEE DWG
2. CONCRETE STRENGTH AT 28 DAYS = f'c 32 MPa U.N.O
3. ALL WORK TO BE N20 - 100 TYPICAL U.N.O
4. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK OR SHOP DRAWINGS ARE PREPARED
5. ALL SETOUT DIMENSIONS ARE TO THE FACE OF STRUCTURE U.N.O
6. REFER TO THE ARCHITECTS DRAWINGS FOR LOCATIONS OF ALL PENETRATIONS AND SETOUTS
7. PROVIDE 300 x 300 DEEP TRENCH DRAIN AT BASE OF ALL RAMPS U.N.O
8. PROVIDE 100 x 100 DEEP TRENCH DRAIN AT BASE OF ALL FIRE HYDRANT BOOSTER AND FIRE HYDRANTS. REFER TO ARCHITECTS DRAWINGS FOR LOCATIONS

LEGEND:

- (N36) SLAB LEVELS SHOWN THUS U.N.O
- RL 20.00 SLAB THICKNESS SHOWN THUS U.N.O
- LBW LOAD BEARING WALL
- NLBW NON LOAD BEARING WALL



NORTH POINT DIRECTION

TENDER NOTES

1. THESE DRAWINGS ARE PRELIMINARY DRAWINGS ISSUED FOR TENDER AS PER AGREEMENT BETWEEN THE CLIENT AND THE CONTRACTOR.
2. TO DETERMINE THE FINAL EXTENT OF WORK, THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS AND OTHER CONSULTANT DRAWINGS.
3. REFER TO ALL SERVICES DRAWINGS FOR SERVICES, AND OTHER DRAWINGS AS NOT ALL DETAILS ARE SHOWN ON THE STRUCTURAL DRAWINGS.
4. SHOULD ANY INCONSISTENCIES, ERRORS, OMISSIONS, DISCREPANCIES, INCONSISTENCIES OR OTHER FAULTY CASES OF CODE TO EXIST IN THE DOCUMENTS, IMMEDIATELY NOTIFY MERITON APARTMENTS PTY LTD IN WRITING.
5. DIMENSIONS SHOWN ON THE DRAWINGS ARE FOR THE CIVIL STRUCTURE ONLY. ANY DIMENSIONS FOR ARCHITECTURAL ELEMENTS SHALL BE CONFIRMED WITH ARCHITECTURAL DRAWINGS.

ISSUED FOR CONSTRUCTION

ISSUE	DATE	REVISION	BY
J	14.07.11	ISSUED FOR CONSTRUCTION	JM
I	27.01.11	ISSUED FOR TENDER	JM
H	07.01.11	ISSUED FOR INFORMATION ONLY	JM

Meriton Apartments Pty. Ltd.
Builders & Developers

PROJECT
PROPOSED RESIDENTIAL AND COMMERCIAL DEVELOPMENT
STAGE 2
131 – 139 KILLEATON STREET
ST IVES, NEW SOUTH WALES 2075

DRAWING TITLE
STAGE 2 – EXC. PLAN (DOUBLE)

DATE	SCALE	DRAWING No.	REV
July 14, 2011	AS SHOWN	E-522-EXC	3
DESIGNED BY: EH	DRAWN BY: SEM		

CAD FILE: E:\CIVIL\511-EXC\DWG\WORKING\511-EXC - DOUBLE.DWG

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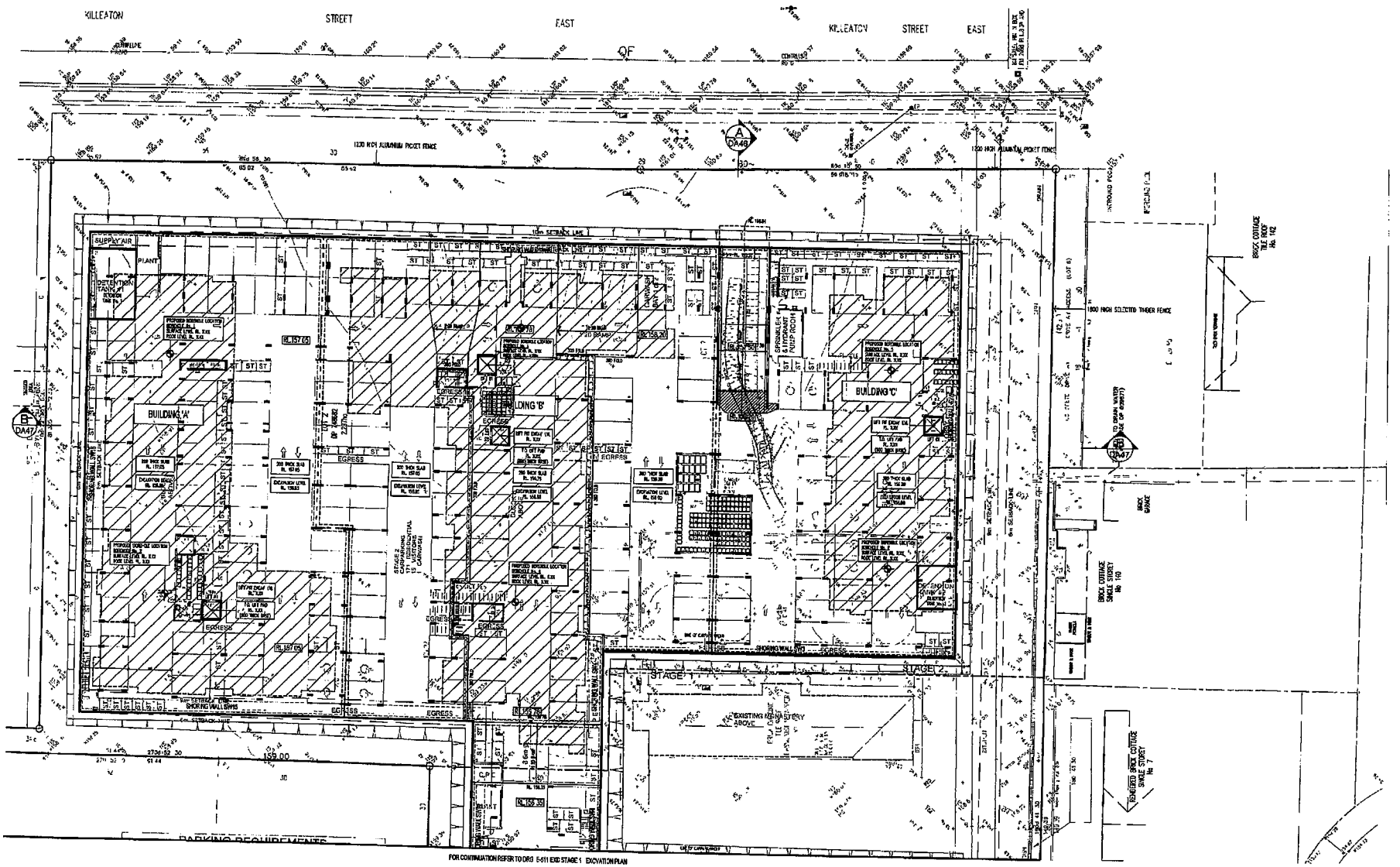


STAGE 2 EXCAVATION PLAN

SCALE 1:200

ALL ROCK LEVELS ARE TO XXX ROCK SURFACE LEVELS

SHORING WALL SETOUT IS TO THE INSIDE FACE OF TYPICAL

GENERAL NOTES

NOTES

1. FOR GENERAL NOTES SEE DWG.
2. CONCRETE STRENGTH AT 28 DAYS = Fc 32 MPa U.N.O.
3. ALL HDG & TO BE MIN = 600 TYPICAL U.N.O.
4. ALL CHAMBERS RATIONALISED TO BE NEAREST 5mm TYPICAL
5. REFER TO THE ARCHITECTS DRAWINGS FOR LOCATIONS OF ALL ENCROACHMENTS AND DETAILS
6. PROVIDE 100 x 100 HDG AROUND ALL PIPE PENETRATIONS THROUGH CONCRETE WALLS AND FLOORS U.N.O.

LEGEND

(XX) SLAB LEVELS SHOWN THUS (XX)

SLAB THICKNESS SHOWN THUS XXX

RW RETAINING WALL (SEE SECTIONS)

RW RETAINING WALL (SEE SECTIONS)

SITE PLAN

NORTH POINT DIRECTION

TENDER NOTES

1. THESE DRAWINGS ARE PRELIMINARY DRAWINGS ISSUED FOR TENDER AS AN EXTENSION OF THE SCOPE OF WORKS ONLY AND ARE NOT TO BE CONSIDERED CONSTRUCTION TYPE OF DRAWINGS.
2. TO DETERMINE THE FULL EXTENT OF WORK, THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL, ENGINEERS AND SERVICE CONSULTANTS DOCUMENTS.
3. ALLOW FOR ALL WORK SHOWN ON THE ARCHITECTURAL AND OTHER DRAWINGS AS WELL ALL WORK NECESSARY FOR THE STRUCTURAL ELEMENTS.
4. SHOULD ANY INCONSISTENCY ERROR OR OMISSION BE DISCOVERED IN THE CONTRACT DOCUMENTS OR IF ANY DOUBT AS TO THE INTENTION OR MEANING OF ANY PART THEREOF, IMMEDIATELY REQUEST WRITTEN CLARIFICATION OR INSTRUCTIONS IN WRITING.
5. DO NOT SCALE DRAWINGS. FIGURED DIMENSIONS ONLY ARE TO BE USED. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ANY WORK IS COMMENCED. REPORT ANY DISCREPANCIES IN WRITING.

ISSUED FOR INFORMATION ONLY

ISSUE	DATE	REVISION	BY
3		RE ISSUED FOR INFORMATION ONLY	SJH
2	11/11/10	ISSUED FOR INFORMATION ONLY	SJH

Meriton Apartments Pty Ltd
Builders & Developers

PROJECT:
PROPOSED RESIDENTIAL AND COMMERCIAL DEVELOPMENT
STAGE 2
131 - 138 KILLEATON STREET
ST IVES NEW SOUTH WALES 2075

DRAWING TITLE:
STAGE 2 – EXCAVATION PLAN

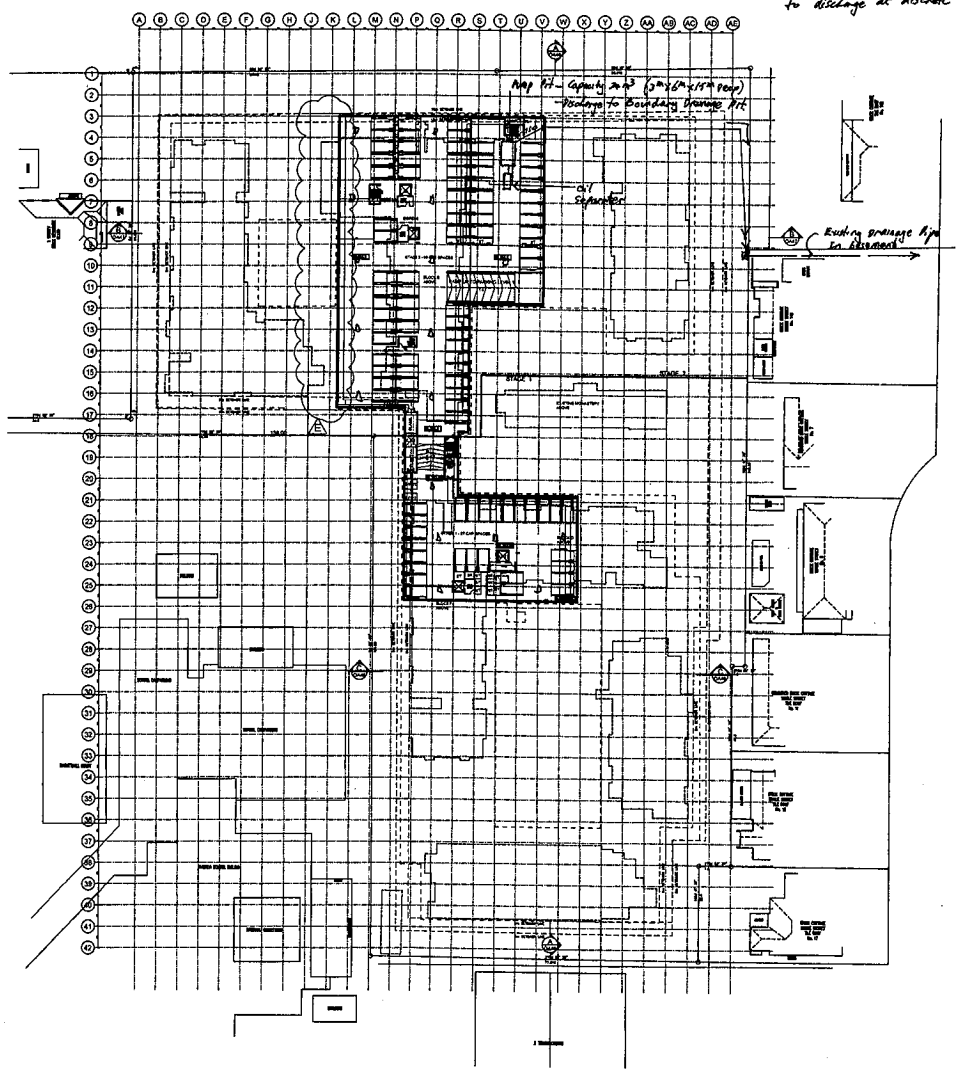
DATE	SCALE	DRAWING No.	ISSUE
JUL 11 2010	AS SHOWN	E-512 EXC	2
DESIGN BY	DRAWN BY		
G.R.	CDH		

MERITON APARTMENTS PTY LTD

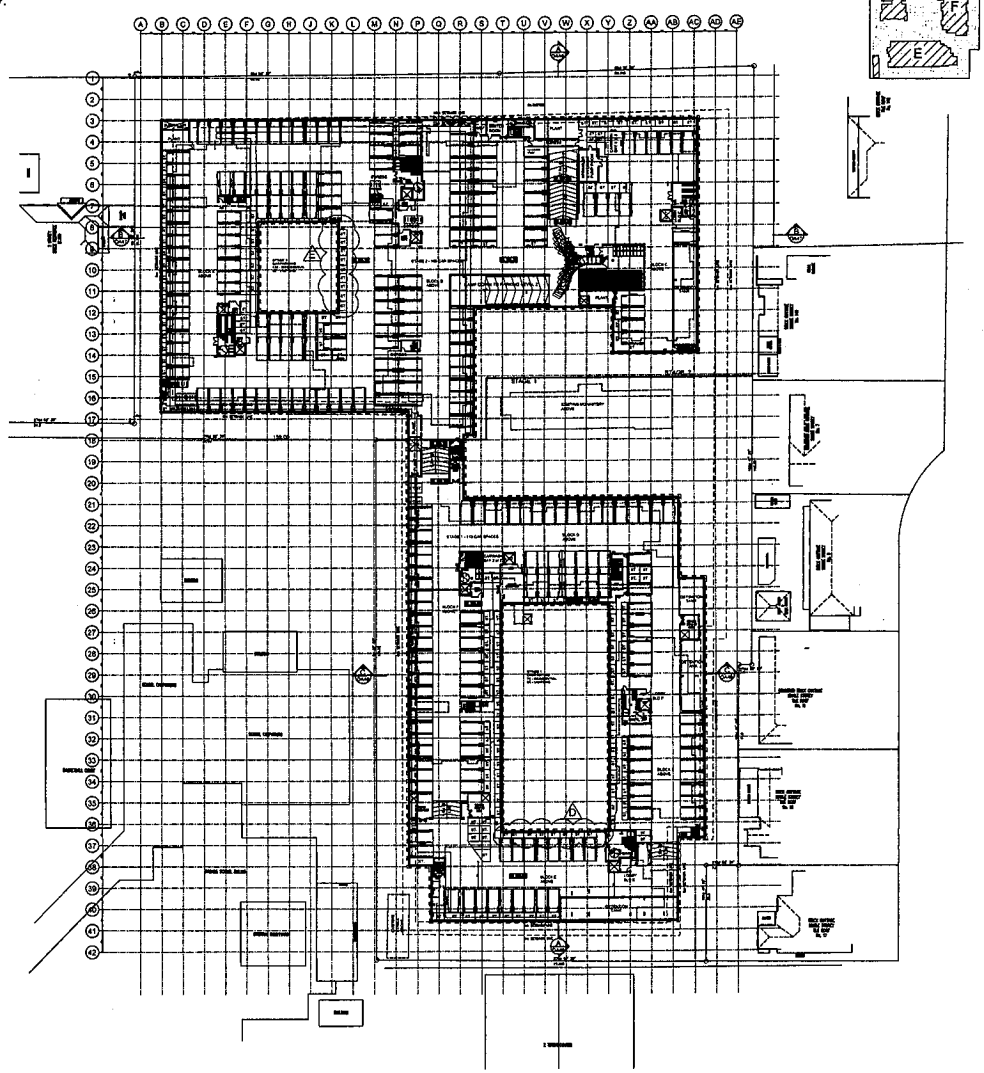
SURVEY DATUM

G.F. HOYLES 9811 OFFICE

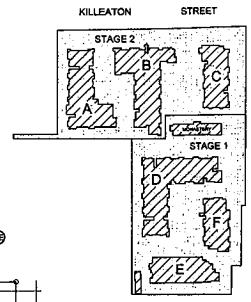
CADFILE:



PARKING LEVEL 2



PARKING LEVEL 1



CARPARK PLANS

SCALE 1:500

ISSUE	DATE	REVISION	BY
D	26.07.11	BASEMENT EXTENTS REVISED	JW
C	01.07.11	DRAWINGS REVISED FOR P.A.C. REQUIREMENTS	JRW
B	03.12.10	DRAWINGS REVISED FOR D.C.P. REQUIREMENTS	AJH
A	09.07.10	ISSUE FOR DEVELOPMENT APPLICATION	AJH
E	19.08.11	BASEMENT EXTENTS REVISED - 27 VISITOR SPACES DELETED	JW

DO NOT SCALE. USE FIGURED DIMENSIONS AT ALL TIMES. IF IN DOUBT CHECK WITH MERITON APARTMENTS PTY. LTD. CONTRACTORS TO CHECK AND VERIFY ALL LEVELS, DATUMS AND DIMENSIONS ON SITE AND SHALL REPORT ANY DISCREPANCIES OR OMISSIONS TO MERITON APARTMENTS PTY. LTD. PRIOR TO COMMENCEMENT OF WORK AND DURING THE CONSTRUCTION PHASE.

NORTH

Meriton Apartments Pty. Ltd.
Builders & Developers
Level 11, 528 Kent Street Sydney NSW 2000
Tel (02) 9287 2686 Fax (02) 9287 2777

PROJECT: PROPOSED RESIDENTIAL DEVELOPMENT
KILLEATON
132-138 KILLEATON STREET
ST.IVES, NSW 2075

DRAWING TITLE: CARPARK PLANS - Groundwater drainage concept

PROJECT No.	748 & 750
DATE.	8/19/2011
DRAWN BY.	AH
SCALE	AS SHOWN
DRAWING No.	DA-02
ISS.	E

CAD FILE: s:\132-138-killeaton\ARCH\DA-02 CARPARK PLANS.dwg

JAMES WILTON - GEOFF - DA-02 CARPARK PLANS.DWF - 8/19/2011 - 15:06

B1

APPENDIX B

HYDROGEOLOGICAL PLAN

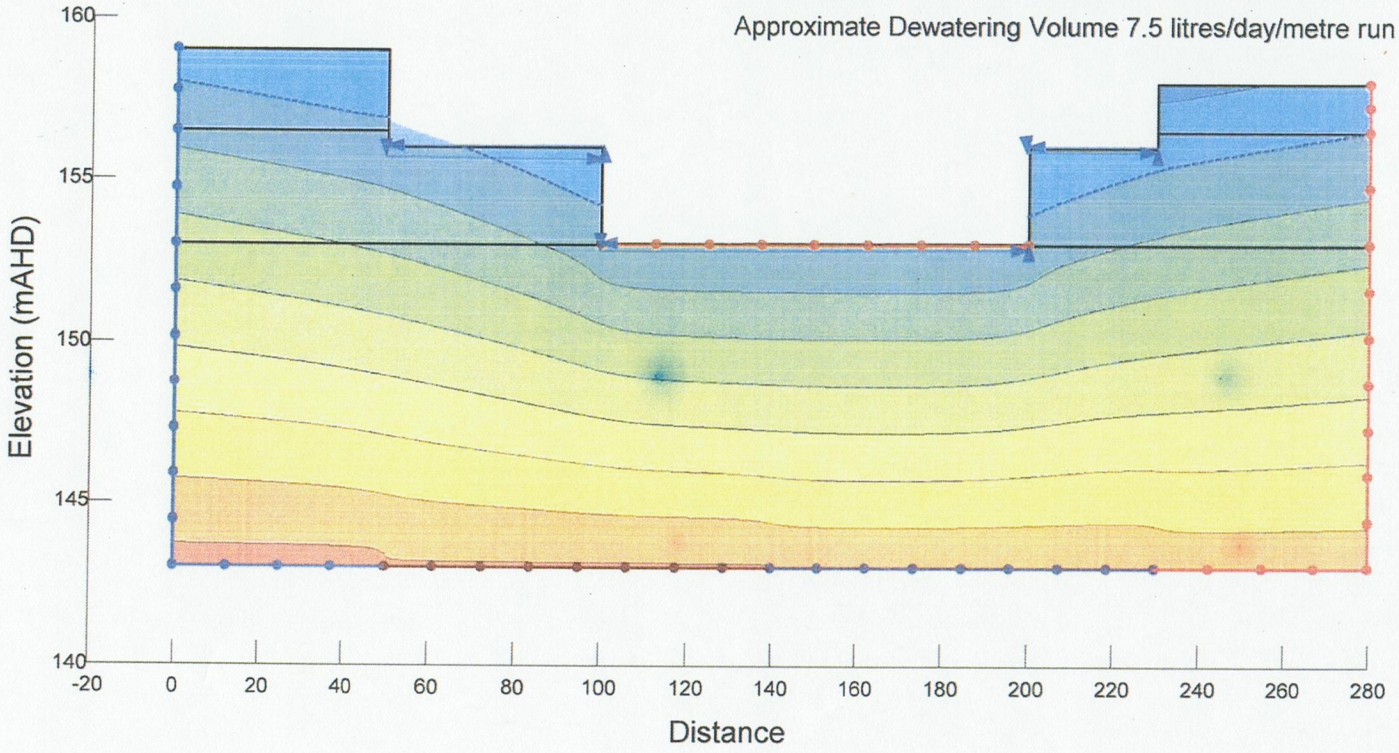
(supplied courtesy of Jeffery and Katauskas Pty Ltd)

Groundwater Seepage Analysis

132 - 138 Killeaton Street, St Ives, NSW

Seepage Flows into Basement Excavation

Approximate Dewatering Volume 7.5 litres/day/metre run

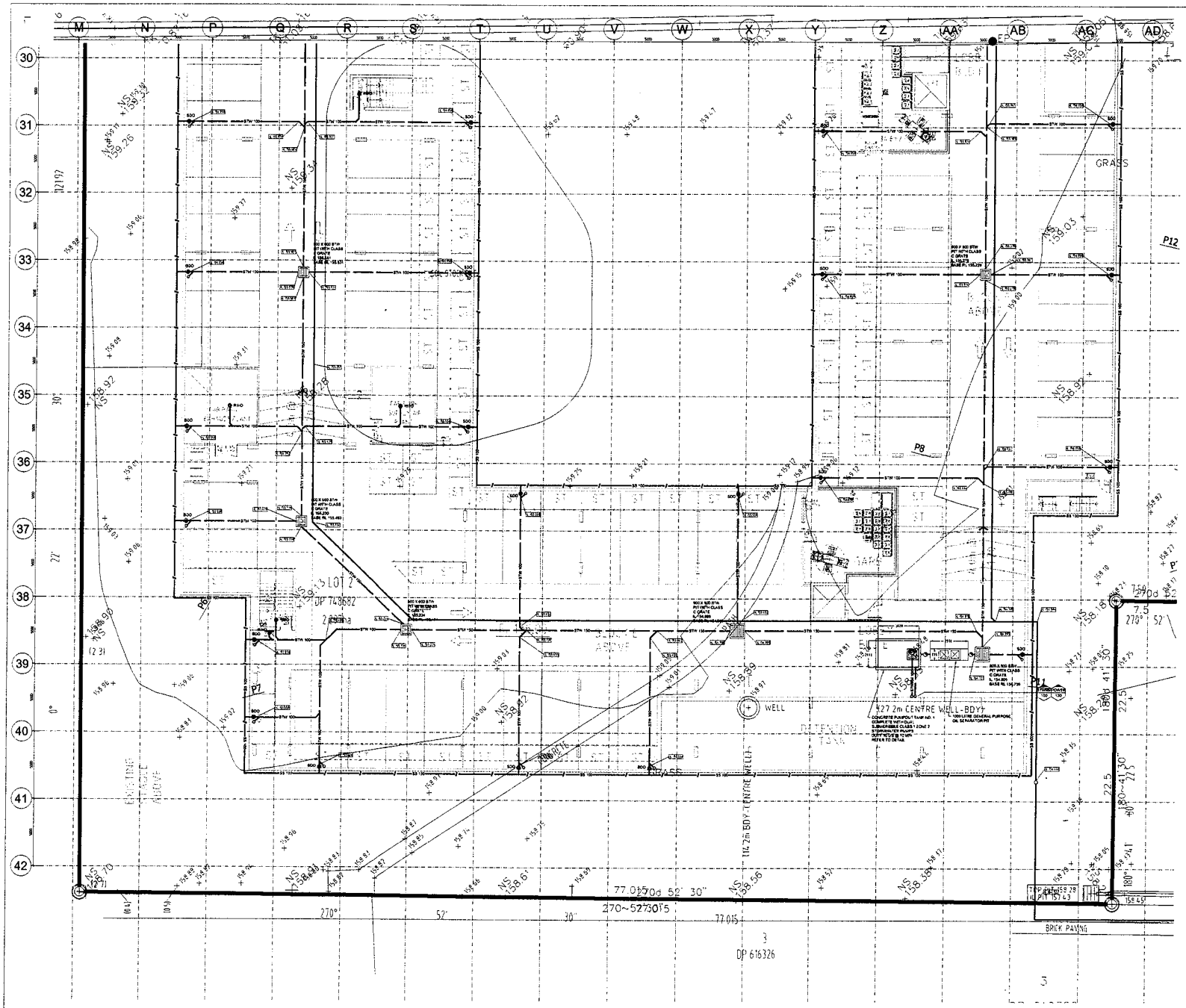


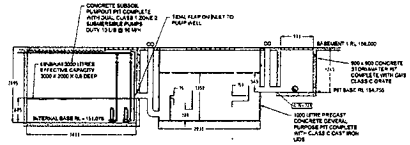
Jeffery and Katauskas Pty Ltd

Report No. 23765Z2 Figure No. 3

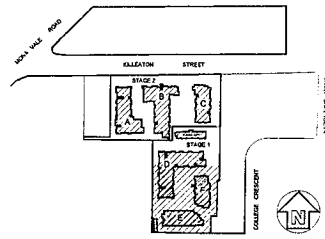
APPENDIX C

DETAILS OF THE PUMP OUT PIT
(supplied courtesy of Ilias Design Group Pty Ltd)





SUBSOIL PUMPOUT PIT CP-02
DIAGRAMMATIC
SCALE 1:50



SERVICES ON THIS DRAWING ARE SHOWN OUT OF THE ESTATE U.N.O.

QUALITY CONTROL

DISCIPLINE	DWG No	REV DATE
ARCHITECTURAL	N/A	N/A
STRUCTURAL	N/A	N/A
MECHANICAL	N/A	N/A
ELECTRICAL	N/A	N/A
HYDRAULIC	N/A	N/A
FIRE	N/A	N/A
NAME		
SIGNED		

revisions no	desc	date
P01	PRELIMINARY ISSUE	29-09-11
P02	PRELIMINARY ISSUE	29-09-11

PROPOSED RESIDENTIAL DEVELOPMENT
132-138 KILLEATON STREET
ST IVES NSW 2075

Meriton Apartments Pty. Ltd.
Builders & Developers

ELIAS DESIGN GROUP
HYDRAULIC AND FIRE PROTECTION CONSULTANTS
6-10 TOORONGA TERRACE, SEVEN HILLS NSW 2200
T 02 9838 4158 F 02 9838 4859 E info@eliasgroup.com.au
Web www.eliasgroup.com.au

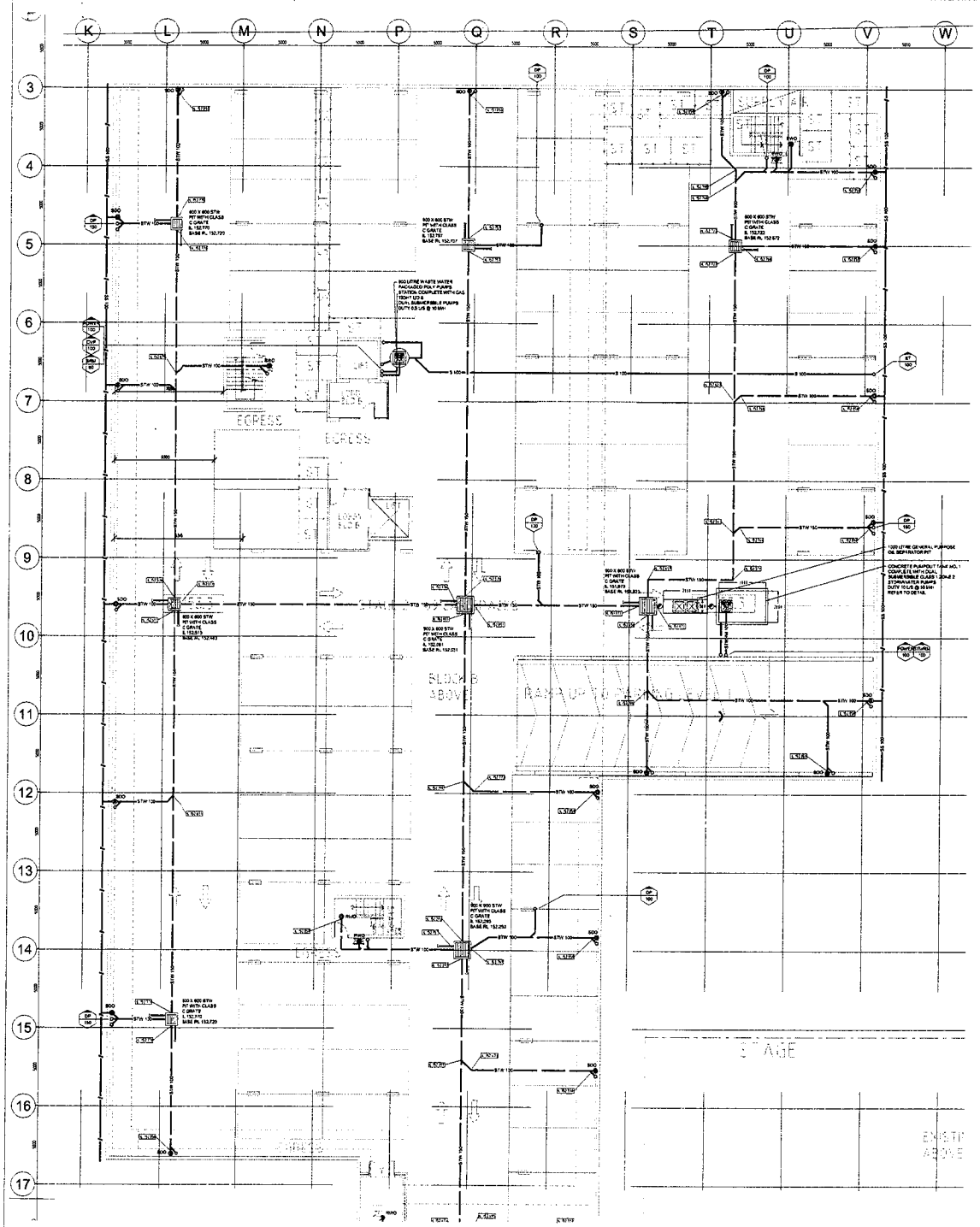
for & behalf of
K Mac Hydraulic Plumbing Service P/L
18 CARRINGTON RD
RANDWICK NSW 2031
Email - office@kmachydraulic-tuning.com.au
ph. 02 9399 9330 fax. 02 9399 9334

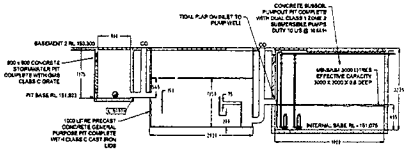
Drawing title
HYDRAULIC SERVICES
STAGE 1 CARPARK LEVEL 1
INGROUND SHEET 1 OF 2

Date: September 2011
Scale: 1:100 @ A0
Drawing no: H-102
Revision: P02

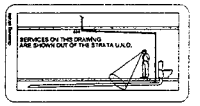
PRELIMINARY

A0





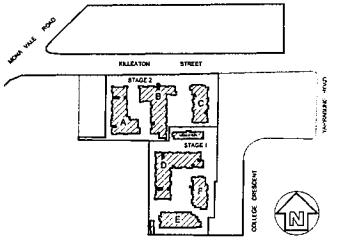
SUBSOIL PUMPOUT PIT CP-02
DIAGRAMMATIC
SCALE 1:50



QUALITY CONTROL

DISCIPLINE	DWG No	REV	DATE
ARCHITECTURAL	N/A	N/A	
STRUCTURAL	N/A	N/A	
MECHANICAL	N/A	N/A	
ELECTRICAL	N/A	N/A	
HYDRAULIC	N/A	N/A	
FIRE	N/A	N/A	
NAME			
SIGNED			

revision no	desc	date
P01	PRELIMINARY ISSUE	29-09-11



PROPOSED RESIDENTIAL DEVELOPMENT
132-138 KILLEATON STREET
ST IVES NSW 2075

Meriton Apartments Pty. Ltd.
Builders & Developers

ILIAS DESIGN GROUP™
HYDRAULIC AND FIRE PROTECTION CONSULTANTS
9-15 TORONGA TERRACE BEVERLY HILLS NSW 2209
T 02 8504 4100 F 02 9554 4688 E info@iliasdesign.com.au
Web www.iliasdesign.com.au

for & behalf of
K Mac Hydraulic Plumbing Service P/L
18 CARRINGTON RD
RANDWICK NSW 2031
Email - office@kmacplumbing.com.au
ph. 02 9399 9300 fax. 02 9399 9334

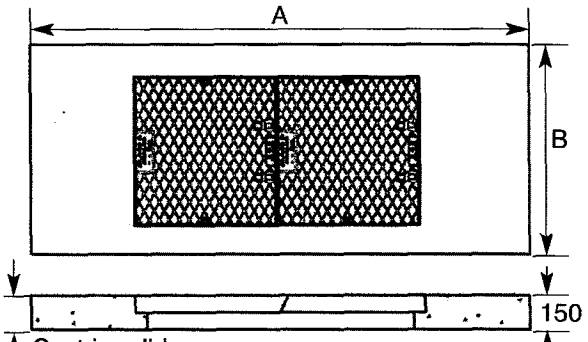
Drawing title
HYDRAULIC SERVICES
STAGE 2 CARPARK LEVEL 2
INGROUND

Job no.	1113
Drawn by	RM
Date	September 2011
Scale	1:100 @ A3
Drawing no.	H-200
Revision	P01

PRELIMINARY

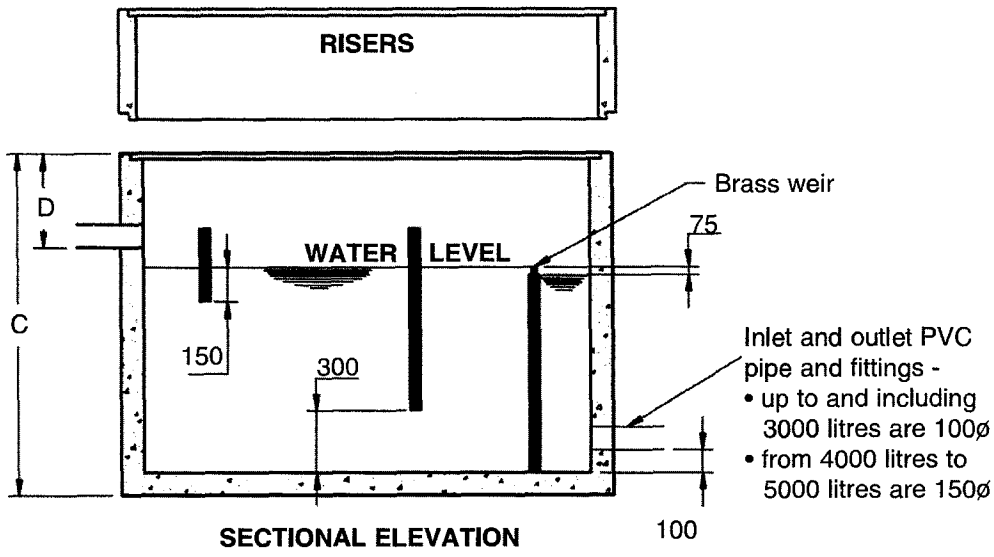
A0

GENERAL PURPOSE PITS



Cast iron lids
Class B 150
Class D 200
Light duty galvanised lids available

Cap. Litres	Gas tight Lids Order Codes & Mass				GMS Lid	Mass
	Class B	Kg	Class D	Kg	L/D	Kg
500	SAL-30500	560	SAL-40500	730	SAL-50500	100
750	SAL-30500	560	SAL-40500	730	SAL-50500	100
1000	SAL-31000S		SAL-41000S	1470	SAL-51000	
1500	SAL-31500S	1400	SAL-41500S	2170	SAL-51500	200
2000	SAL-31500S	1400	SAL-41500S	2170	SAL-51500	200
3000	GPL-33000		GPL-43000		GPL-53000	
4000	GPL-33000		GPL-43000		GPL-53000	
5000	SAL-35000		SAL-45000	5400	SAL-55000	



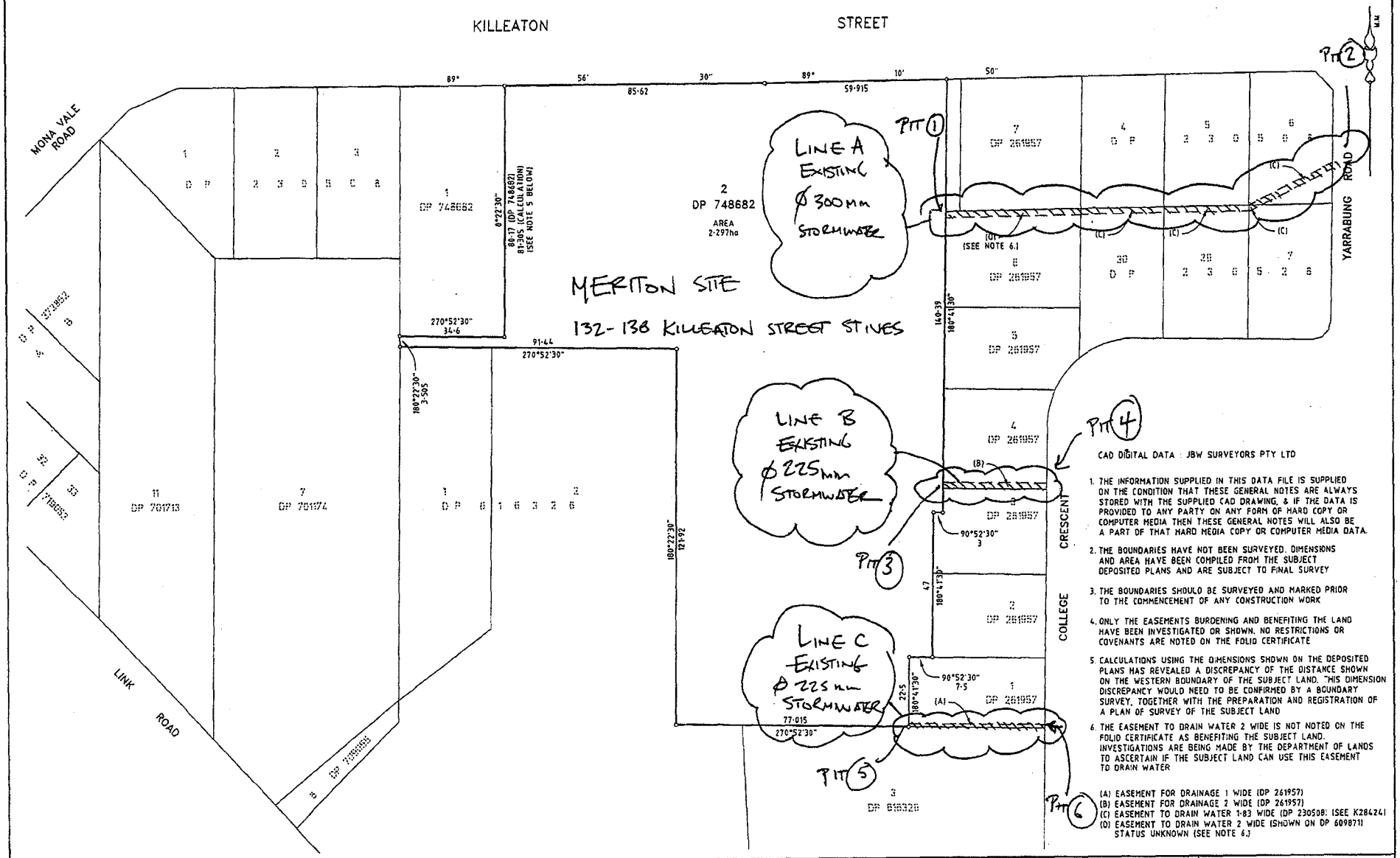
SECTIONAL ELEVATION

- 1000Ltr, 1500Ltr and 2000Ltr pits all Sydney Water approved.
- Step-irons and platforms are available for all size general purpose pits.
- Standard products suitable for in-ground applications only.
- Available with optional oil skimmer.

Cap. Litres	Pit Order Codes	Dimensions				Mass	Risers Order Codes & Mass					
		A	B	C	D	Kg	300mm	Kg	450mm	Kg	600mm	Kg
500	GPP-00500	2040	780	1430	505	2000	SAR-30500	340	SAR-40500		SAR-60500	
750	GPP-00750	2040	780	1430	195	2000	SAR-30500	340	SAR-40500		SAR-60500	
1000	GPP-01000	2830	880	1350	545	2600	SAR-31000	520	SAR-41000	580	SAR-61000	1040
1500	GPP-01500	3205	1230	1330	525	3500	SAR-32000	550	SAR-42000		SAR-62000	1260
2000	GPP-02000	3205	1230	1330	495	3500	SAR-32000	550	SAR-42000		SAR-62000	1260
3000	GPP-03000	4280	1550	1675	325	9000	GPR-33000	730	GPR-43000		GPR-63000	1460
4000	GPP-04000	4280	1550	1880	430	10000	GPR-33000	730	GPR-43000		GPR-63000	1460
5000	GPP-05000	4280	2150	1780	330	12000	SAR-36000	1400	SAR-46000	2100	SAR-66000	2700

APPENDIX D

SITE SURVEY PLAN WITH THE PUMP OUT DISCHARGE POINT
(supplied courtesy of Meriton Apartments Pty Ltd)



CAD DIGITAL DATA : JBW SURVEYORS PTY LTD

1. THE INFORMATION SUPPLIED IN THIS DATA FILE IS SUPPLIED ON THE CONDITION THAT THESE GENERAL NOTES ARE ALWAYS STORED WITH THE SUPPLIED CAD DRAWING, & IF THE DATA IS PROVIDED TO ANY PARTY ON ANY FORM OF HARD COPY OR COMPUTER MEDIA THEN THESE GENERAL NOTES WILL ALSO BE A PART OF THAT HARD MEDIA COPY OR COMPUTER MEDIA DATA.
2. THE BOUNDARIES HAVE NOT BEEN SURVEYED. DIMENSIONS AND AREA HAVE BEEN COMPILED FROM THE SUBJECT DEPOSITED PLANS AND ARE SUBJECT TO FINAL SURVEY
3. THE BOUNDARIES SHOULD BE SURVEYED AND MARKED PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORK
4. ONLY THE EASEMENTS BURDENING AND BENEFITING THE LAND HAVE BEEN INVESTIGATED OR SHOWN. NO RESTRICTIONS OR COVENANTS ARE NOTED ON THE FOLIO CERTIFICATE
5. CALCULATIONS USING THE DIMENSIONS SHOWN ON THE DEPOSITED PLANS HAS REVEALED A DISCREPANCY OF THE DISTANCE SHOWN ON THE WESTERN BOUNDARY OF THE SUBJECT LAND. THIS DIMENSION DISCREPANCY WOULD NEED TO BE CONFIRMED BY A BOUNDARY SURVEY, TOGETHER WITH THE PREPARATION AND REGISTRATION OF A PLAN OF SURVEY OF THE SUBJECT LAND
6. THE EASEMENT TO DRAIN WATER 2 WIDE IS NOT NOTED ON THE FOLIO CERTIFICATE AS BENEFITING THE SUBJECT LAND. INVESTIGATIONS ARE BEING MADE BY THE DEPARTMENT OF LANDS TO ASCERTAIN IF THE SUBJECT LAND CAN USE THIS EASEMENT TO DRAIN WATER

(A) EASEMENT FOR DRAINAGE 1 WIDE (DP 261957)
(B) EASEMENT FOR DRAINAGE 2 WIDE (DP 261957)
(C) EASEMENT TO DRAIN WATER 1-83 WIDE (DP 230508) (SEE K284241
(D) EASEMENT TO DRAIN WATER 2 WIDE (SHOWN ON DP 609871) STATUS UNKNOWN (SEE NOTE 6.)

REV.1-ADJOINING LOT AND EASEMENT INFORMATION ADDED (18/06/2010)

JBW Surveyors Pty Ltd.
ACN 001149373
Level 7, 376 Bay Street Brighton-Le-Sands NSW 2216
Phone. (02) 9335 9700 Fax: (02) 9556 3100
www.jbwsurveyors.com.au

CLIENT MERITON APARTMENTS PTY LTD

SHEET № 1 OF 1 SHEETS

TITLE
PLAN SHOWING COMPILED BOUNDARY DIMENSIONS OF LOT 2 IN DP 748682 BEING № 132-138 KILLEATON STREET, ST IVES

LGA KU-RING GAI

DRAFTED BS	SCALES 1:800
CHECKED AK	DATE 7/6/2010
AREA OF SITE -	PLAN REF.: 124622 BOUNDARIES REV. 1