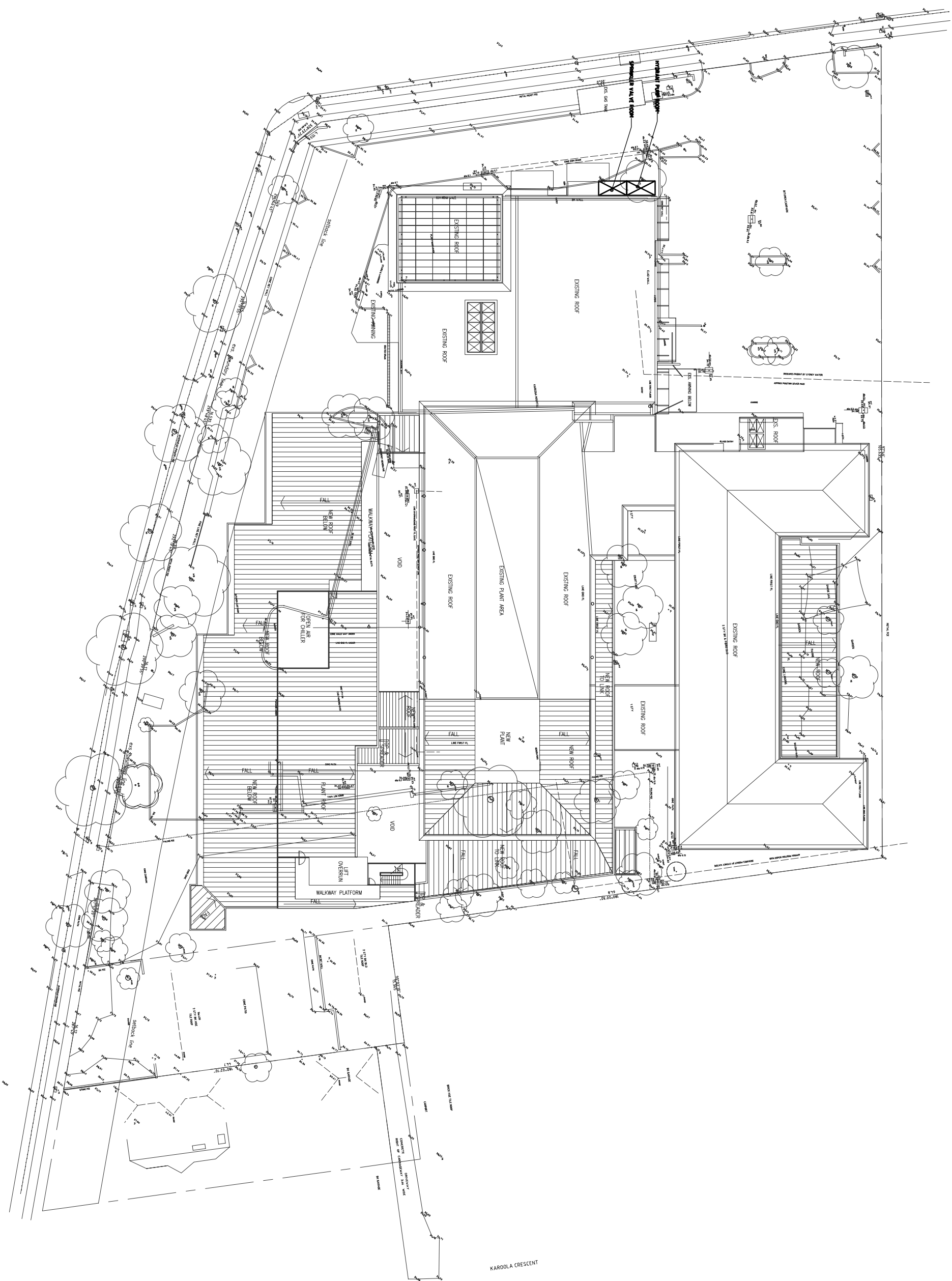


HYDRAULIC SERVICES DA DRAWINGS



SITE PLAN
SCALE 1:500

LEGEND

[illegible]

SYMBOLS

[illegible]

ABBREVIATIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | |
|------|----------------|
| TV | MADE WASTE |
| TV | TYPEAL |
| US | UNDISCOVERED |
| U6 | UNLESS NOTED |
| U6 | usual |
| US | UNDER SLAB |
| V | VEAT |
| VB | VANIT BASHN |
| VCP | VITRIFIED CLAY |
| W | WATER MARK ETC |
| WC | WATER CLOSET |
| WM | WATER PITCH |
| WMCH | WATERMARK |
| WS | WASTE SLACK |
| WST | WASTE SLACK |
| X | REDUCING 228 |

PRELIMINARY

| No. | Amendment | Date |
|-----|-------------------|----------|
| 1 | PRELIMINARY ISSUE | 08.03.07 |
| 2 | DA SUBMISSION | 12.03.07 |


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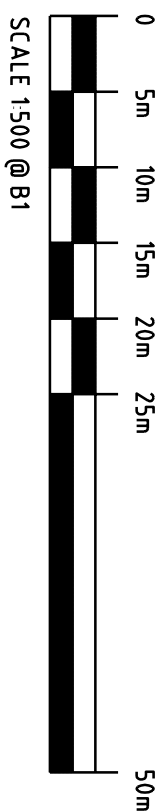
HASSELL LTD A/CN 007 711 435
88 CUMBERLAND STREET SYDNEY
AUSTRALIA
SYDNEY@HASSELL.COM.AU
T 61 2 9273 2300 F 61 2 9273 2345

Hydraulics & Flow Measurement Consultants

Project:

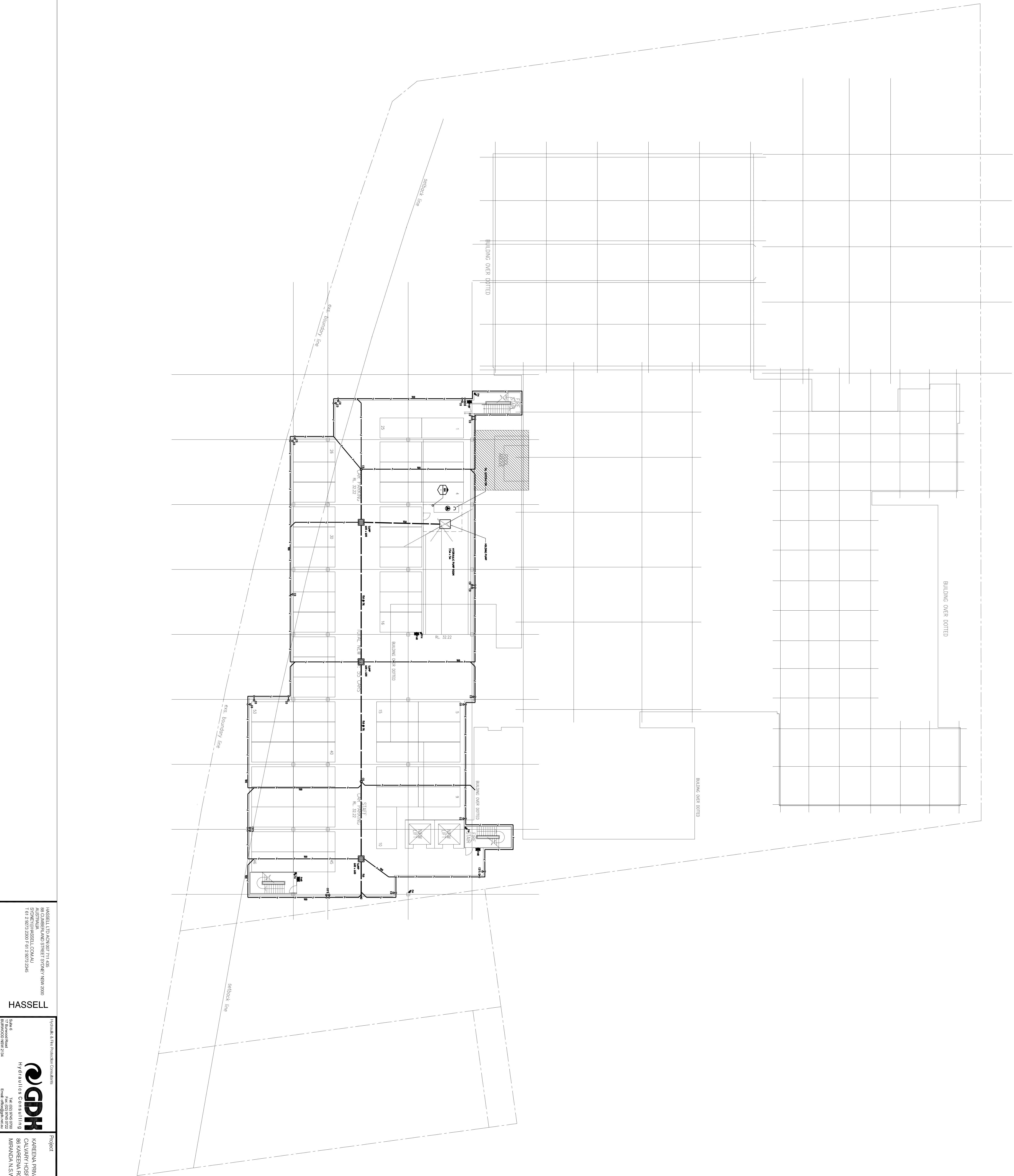
KAREENA PRIVATE HOSPITAL
CALVALRY HOSPITAL - SITE OFFICE
86 KAREENA ROAD
MIRAMBA N.S.W. 2228

| | | | |
|---|----------|----------|--------------------|
|  | Date | JAN 2007 | Job No. : Drawings |
| | Scale | 1:500 | |
| | Drawn | SP | 6047 |
| | Revision | P2 | SK-01 |



PRELIMINARY

| | | |
|-----|-------------------|----------|
| NO. | Revised | Date |
| E1 | PRELIMINARY ISSUE | 18.03.07 |
| E2 | DA SUBMISSION | 12.03.07 |
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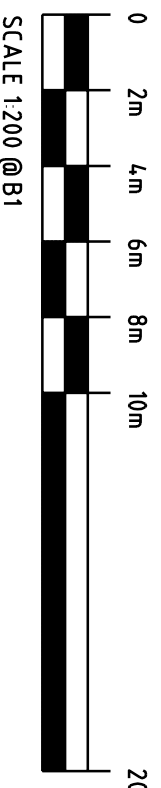
HASSELL LTD ACN 007 711 435
80 CLAREMOUNT STREET STONEY NSW 2000
STONEY@HASSELL.COM.AU
T 61 2 9673 2207 F 61 2 9673 2245

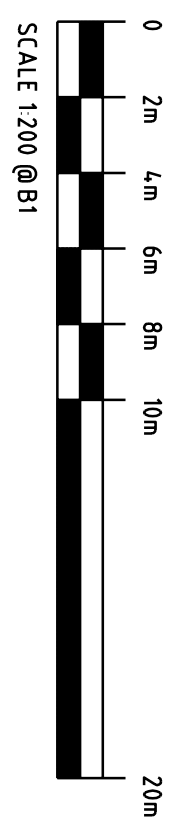
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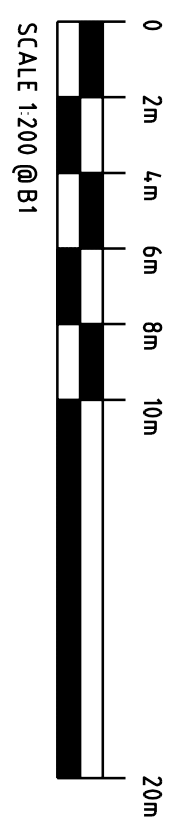
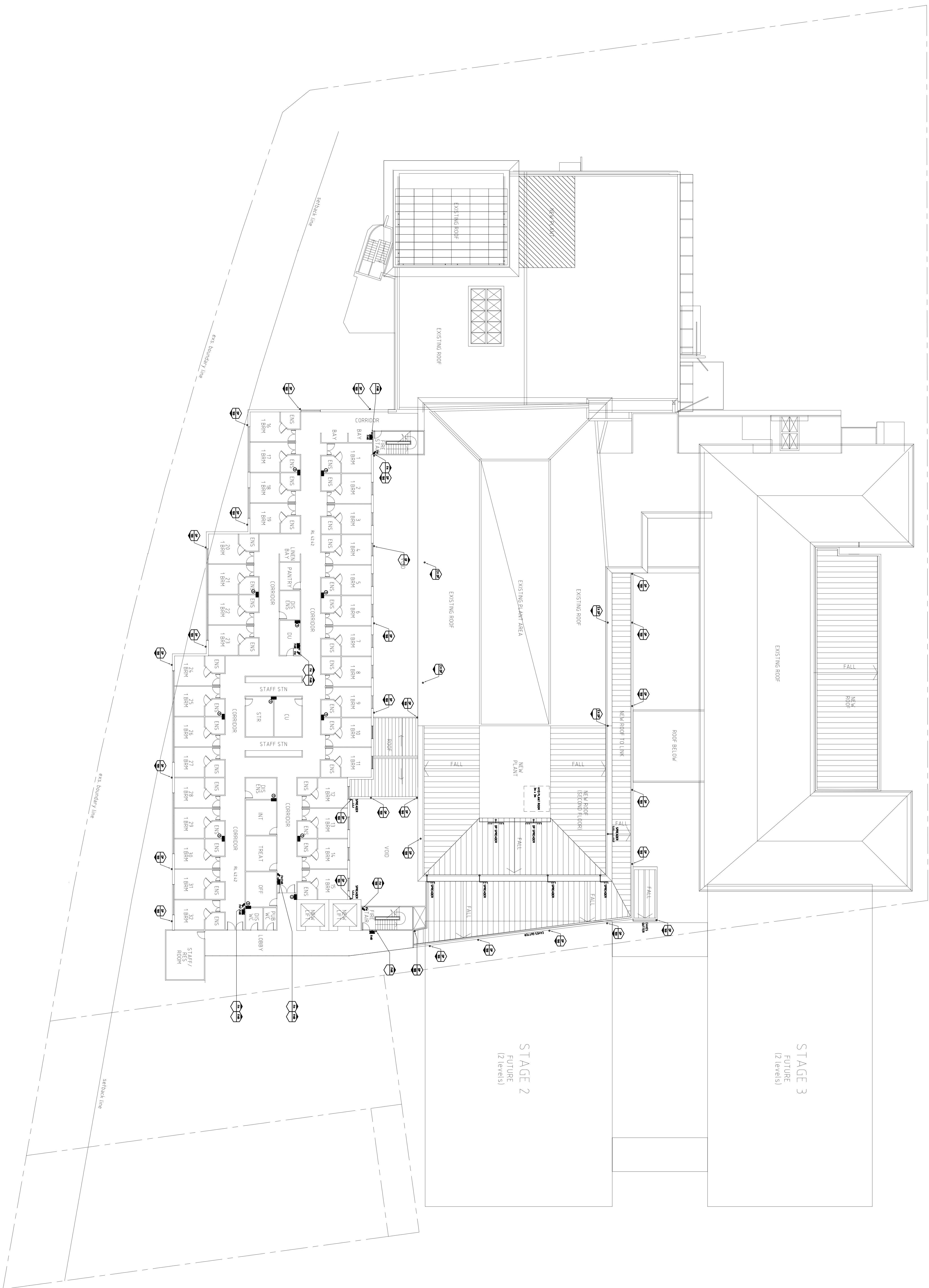
Hydraulic & Fire Protection Consultants
14/147 Sullivan Street, Cammeray NSW 1585
Tel: (02) 9445 0722
Fax: (02) 9445 0722
Email: info@hassell.com.au

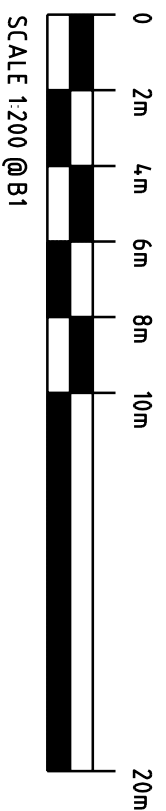
Project
KAREENA PRIVATE HOSPITAL
CALVERT HOSPITAL - SITE OFFICE
88 KAREENA ROAD
MIRANDA NSW 2228

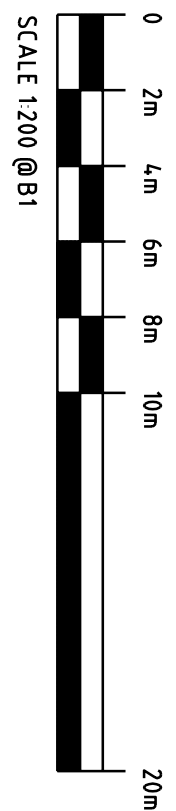
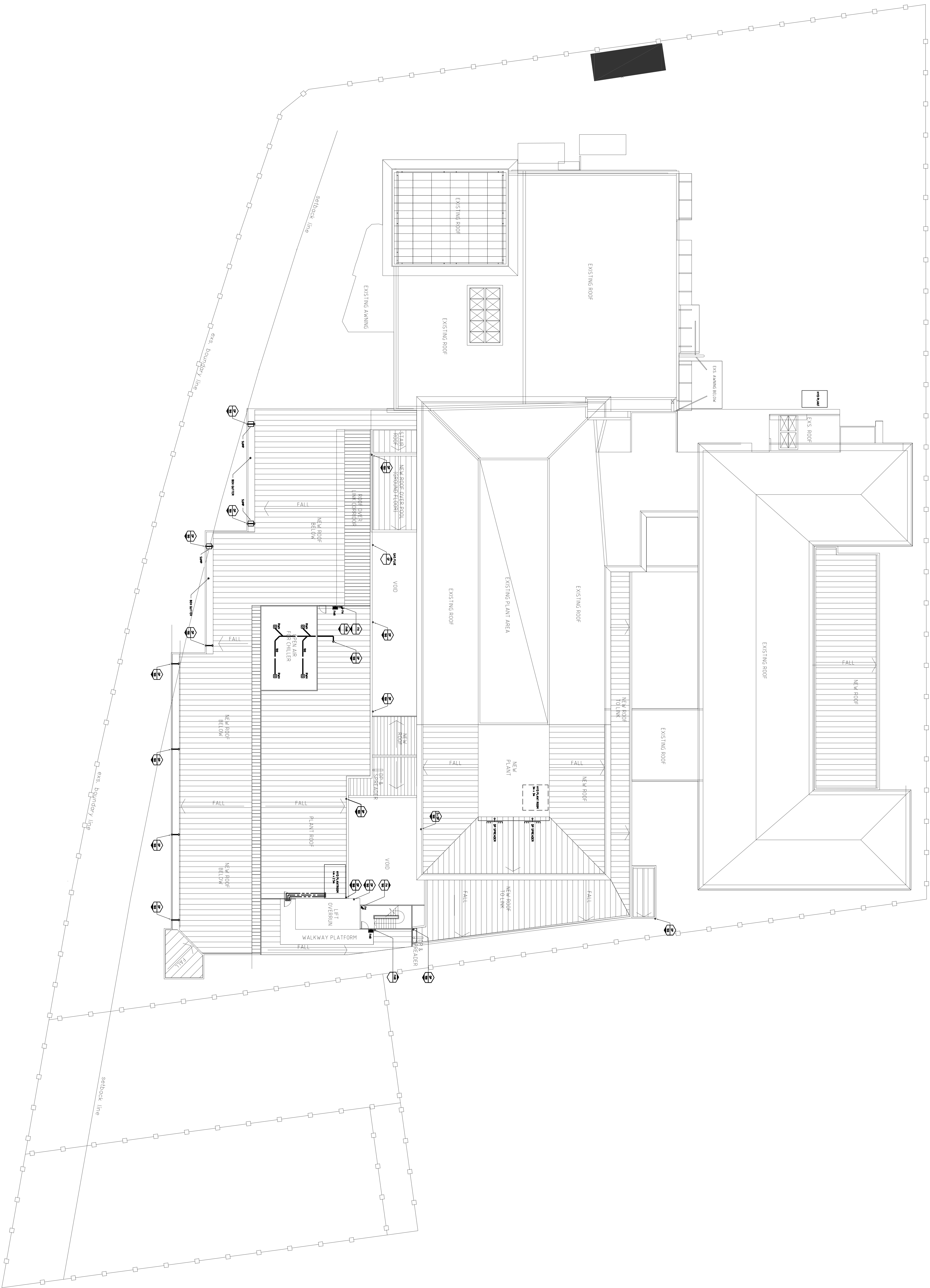
HYDRAULIC SERVICES
BASEMENT LEVEL PARKING PLAN
04/11/07
Scale: 1:200
Drawing No.: 6047 SK-02











HYDRAULIC SERVICES
SCHEME DESIGN REPORT

for

KAREENA HOSPITAL RE-DEVELOPMENT

JOB No.
6047

DATE:
Machy, 2007

ISSUE:
ISSUE A

HYDRAULIC & FIRE SERVICES CONSULTANTS



SUITE 6, 17 BURWOOD ROAD
BURWOOD NSW 2134
PHONE: (02) 9745 0700 FAX: (02) 9745 0722

DESCRIPTION OF WORK

SCOPE

The following will be provided as part of the Hydraulic Services Contract:

- . Sewer Drainage
- . Stormwater Drainage
- . Sub-Soil Drainage
- . Domestic Cold Water Service
- . Domestic Hot Water Service
- . Sanitary Fixtures and Taps and Valves
- . Sanitary Plumbing
- . Gutters, Roof Outlets and Downpipes
- . Fire Hydrant Service
- . Recycled Cold Water Service
- . Rainwater Harvesting

DESIGN PARAMETERS

The hydraulic services installation and design will conform with the requirements of the latest requirements of:

- . Local Building Regulations.
- . NSW Fire Brigade.
- . AS 3500 National Plumbing and Drainage Code - 1998
- . Natural Gas Company Rules and Regulations AG601 - 1995
- . Sutherland Shire Council.
- . NSW Health Department TS11, HBG

SEWER DRAINAGE

Description of Service

Sewer Drainage Service shall be a complete gravity system of drains laid in the ground connecting all sanitary fixtures throughout the building to the existing sewer connection. The sewer drainage system shall comply with the NSW Code of Practice, AS 3500.

The existing 150Ø Sydney Water sewer is to be disconnected at the Boundary in accordance with Council's requirements.

Pipework

Pipework shall be first quality UPVC (sewer grade) pipes and fittings with solvent fusion welded socketed joints.

Precast concrete pits and manholes shall be installed to provide adequate access for maintenance.

The sewer is to be supported on a crushed blue metal bedding in accordance with AS 3500 for pipework.

All pipework is to be backfilled under buildings with stabilised 20:1 sand cement to top of trench.

POOL WASTE DRAINAGE

The pool waste drainage services shall be a complete gravity system of drains laid in the ground providing a service for connection in Hydrotherapy pool.

The general purpose arrestor trap will be constructed in reinforced concrete to the Authority's standard design requirements for 3,000 litre capacity and located in the external area adjacent to the building.

Pipework

Pipework shall be first quality vitrified clay pipes and fittings with viton ring joints.

Concrete inspection pits shall be provided for access and maintenance.

STORMWATER DRAINAGE (BUILDING)

The stormwater drainage system shall be a complete gravity system from roof outlets, gutters, downpipes, sumps and pits connecting to the stormwater system. The roof drainage system is to be sized to cater for a 1:20 year storm for external eaves and gutters and 1:100 year storm for all internal areas and box gutters. The in-ground drainage system is to be sized for a 1:20 year storm recurrence.

A rainwater harvesting tank will be provided located with the detention tank with a volume of 10m³.

Pipework

Downpipes shall be PVC where concealed in the building.

Underground drainage lines shall be as follows:

Main Lines shall be FRC 300 mm dia and above.

Branch Lines shall be PVC up to 225 mm dia.

Pre cast sumps and grates shall be installed in accordance with AS 3500.

SUB-SOIL DRAINAGE

The sub-soil drainage system shall comprise a series of perforated pipes, spoon drains and collection pits installed behind retaining walls and in landscape areas, etc. as appropriate and shall convey by gravity all sub-soil water to the main stormwater drainage system via an oil coalescing plate separator and pump out located in the lower basement area.

Pipework and Drains

Pipework shall be slotted PVC pipes.

Spoon drains shall be formed in concrete and shall discharge through cast in rainwater outlets.

MAIN WATER SUPPLY

The main water supply shall be via one (1) connection located adjacent to the main entry road and shall extend to the proposed plantrooms.

The main shall be extended throughout the complex to all fixtures.

The main water supply will have a new upgraded water meter and RPZD assembly installed at the boundary.

Pipework

Pipework shall be either copper pipes (Cu) or polypropylene Aquatherm, and fittings as appropriate for their respective sizes.

DOMESTIC COLD WATER SUPPLY

The domestic cold water system shall be complete mains pressure system supplying potable water to all domestic type sanitary fixtures and points, hose cocks and as well as the domestic hot water service.

Droppers and branch lines will extend from the main reticulation system to supply all sanitary fixtures and equipment.

A separate rainwater harvesting system will be provided to all landscape areas for landscape watering.

Pipework

Pipe materials for mains connections shall be as follows:

| | |
|----------------------------------|-------------------|
| Domestic Cold Water: | Copper |
| Fire Hydrant Service Connection: | Copper – Inground |

Pipe materials for internal domestic cold water reticulation shall be either of the following:

Domestic Cold Water:

- | | | |
|-----|--|---|
| i) | For main pipelines 25mm diameter and larger | PN16 Aquatherm or equal polypropylene (PPR) pipe with electro-fusion or socket fusion joining system. |
| ii) | For branch pipelines 20mm diameter and smaller | Rehau Cross linked Polyethylene or James Hardie Profit. |

Or

- iii) Type B copper tube with silver soldered joints.

Recessed control valves shall be brass type valves.

Isolation valves are to be provided to localised area to facilitate shutdown and maintenance.

Additional isolation valves shall be provided to main reticulation system to facilitate additional shutdown access.

Design Parameters

Water velocities in inhabitable areas will not exceed 1.8m/sec

Minimum water pressure will not be less than 150 kpa

Maximum water pressure will not exceed 500 kpa

NOTE: Separation of water services by service, zone and individual requirements to the Code and Authority requirements is to be achieved utilising approved RPZD's (Reduced Pressure Zone Devices).

DOMESTIC HOT WATER SERVICE

The hot water service shall be a mains pressure system comprising three (3) independent systems equal to Rheem storage heaters, with pipework supplying hot water at 65° C.

Enware 2000 Series thermostatic mixing valves with pipework supplying warm water at 42.5°C to all patient and staff areas all type sanitary fittings. All TMV's to be installed in stainless steel wall boxes.

The potable cold and hot water services shall be designed and installed in accordance with AS 3500 and be extended from the new system to the various fittings and points as required.

The hot water service to be designed as a flow and return system connected from a new storage system within the new facility.

Pipework

Pipe materials for domestic hot and warm water reticulation shall be either of the following:

Domestic Hot Water:

- | | | |
|------|--|--|
| i) | For main pipelines 20mm diameter and larger | PN20 Aquatherm "Stabi" or equal polypropylene (PPR) aluminium stabilized pipe with electro-fusion or socket fusion joining system. |
| iii) | For branch pipelines 20mm diameter and smaller | Rehau Cross linked Polyethylene or James Hardie Profit. |

Or

- iii) Type B copper tube with silver soldered joints.

Circulating Pump

Circulating pump will be Kelair or similar centrifugal type close coupled inline circulator, with bronze casing, bronze impeller, stainless steel shaft, drip proof enclosure.

Valves Etc.

Isolating valves will be ball valves.

Balancing cocks will be Tour & Andersson or similar stat valves or equivalent.

Design Parameters

- . Water velocities in habitable areas will not exceed 1.8m/sec.
- . Minimum water pressure will not be less than 150 kpa.
- . Maximum water pressures will not exceed 500 kpa.
- . Minimum fixture flow scales set out in AS3500 will be used.
- . A temperature drop of not more than 10°C will be achieved between the flow and return system.
- . Usage factor based on 30 litres per bed per peak period.
- . Recovery is over 2 hours.

Insulation

All pipework chased in wall or exposed shall be insulated with Polylag or Crane Nu-Lag or similar.

All main pipework shall be thermotec (zero –4) as specified.

SANITARY FIXTURES AND TAPS AND VALVES**Sanitary Fixtures**

All sanitary fixtures shall be of first quality in all respects of and similar to the brands and type as scheduled.

All fixtures shall be installed plumb and level and neatly finished in a tradesmanlike manner and without damage all in accordance with the manufacturer's requirements and to the Local Authorities' as specified in the technical brief.

Sanitary fixtures and fittings schedule:

| Fixture Type | Fixtures | Fittings | Total |
|--------------------------------------|--|---|-------|
| | Fixtures unless noted otherwise are to be Caroma, vitreous china. Basins to be sealed to wall or vanity top with approved sealant. | Fittings unless noted otherwise are to be Enware Expo Series, chrome plated, ceramic disc, ¾ turn, Contra Rotating, vandal proof, all spouts to be aerated. Taps to be provided with blue-cold, red-hot, yellow-warm indicator buttons. Provide JEM flow or equal control valves to all fittings throughout the project. | |
| FE-3050 Basin: handwash, disabled | Caroma Integra 500. Nominal size 500mm x 430mm complete with 40mm chrome plated plug end waste, 1 tap hole, fixed to wall with D200 fixing kit. | Enware basin disabled single lever mixer. | |
| FE-2800 Basin: handwash, Type B | Caroma Caravelle 550 wall basin 550mm x 435mm complete with 40mm chrome plated plug and waste, three tap holes fixed to wall with D200 fixing kit. | Hospital 150mm lever adjustable basin set, with SP 010 swivel aerated spout with adjustable spray rose and jet No. 6. | |
| FE-2850 Basin: handwash, Type C | Caroma Caravelle 550 wall basin with shroud, 550mm x 435mm complete with 40mm chrome plated plug and waste, three tap holes fixed to wall with D200 fixing kit. | Expo adjustable basin set with SP 001 fixed aerated spout. | |
| FE-2850B Basin: handwash, Type C | SMC powder coated white, 316 stainless steel wall basin Model No SWB-1. | Enware push button basin assembly (DET 603R) complete with mini regulator DET 617 spout. | |
| FE-3100 Basin: scrub, Type A | Caroma Hospital wall basin nominal size 600mm x 515mm complete with 40mm chrome plated plug and waste, no tap holes, fixed to wall with D1511 bolt on pin bracket white enamel. | Enware Hospital Type 51 wall mounted 150mm lever wall set with SP 020 swivel spout with adjustable spray rose and Jet No 6. | |
| FE-3120 Basin: vanity | Caroma Concorde 500 semi recessed white vanity basin nominal size 500mm x 430mm with 40mm chrome plated plug and waste, 3 tap holes and sealed to counter with a silicone sealant and tie hooks. | Expo adjustable basin set with SP 001 fixed aerated spout. | |

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| FE-3410 Bath: adjustable height, hydraulic | Arjo Rhapsody mobile lift bath, 1970mm x 970mm, complete. | Expo washing machine taps one warm, one cold | |
| FE-5000 Boiling Water Unit: 5 litre | Zip Hydroboil Model HB 005. | Right angle cistern cock chrome plated. | |
| FE-26801 Dispenser: ice | Hoshizaki Ice Dispenser Model DCM110F. 50mm tundish connected to waste. | CSQ right angle cistern cock. | |
| FE-47500 Shower: fixed rose | | Expo shower set with SP 261 80mm BSJ shower. | |
| FE-47400 Shower: hand held | | Expo shower set with Conserv 'Hosfab' Model HS 018 Kit 6 hand shower kit with glide slide, 1.5m premium hose and solid brass wall outlet elbow, dual check with 9 litres per minute flow regulation and sediment filter. | |
| FE-48350 Sink & drainer: 1 ½ bowls | Clark Advance bowl and three quarter, nominal size 1230mm x 480mm complete with 50mm stainless steel plug and waste. | Sink single lever mixer, swivel with aerated spout. | |
| FE-47890 Sink & drainer: single 930mmL | Clark stainless steel 1000 series flushline sink nominal size 930mm x 471 mm complete with 50mm stainless steel plug and waste three tap holes. | Expo sink set with SP 010 swivel aerated spout. | |
| FE-48400 Sink & drainer: L bowl, mini | Clark stainless steel 1000 series flushline sink nominal size 930mm x 471 mm complete with 50mm stainless steel plug and waste three tap holes. | Expo sink set with SP 010 swivel aerated spout. | |
| FE-49111 Sink: 450x350x250D | Stainless Metal Craft flushing rim sink in 950mm x 600mm bench, 316 grade stainless steel, 300mm high splashback with stainless steel support frame and shelf (bowl size 450mm x 350mm x 250mm deep), on adjustable legs. 50mm stainless steel S trap. | Enware Hospital Type 51 wall mounted 200mm lever wall set with SP 020 swivel spout with adjustable spray rose and Jet No 6. | |

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| FE-49200 Sink: cleaner | Stainless Metal Craft 555mm x 450mm x 205mm satin finish, stainless steel, cleaners sink, heavy duty, back hinged grate, 50mm plug and waste, supported on electro plated mild steel cantilever wall brackets. | Expo hose taps, one hot, one cold. | |
| FE-9300 Dispenser: detergent/chemical mixer | | Connections for Ecolab Laundry Chemical Dispensers: Hot and Cold ½" connections downstream from the RPZ valves. | |
| FE-49800 Sink: flushing rim | Stainless Metal Craft flushing rim conical sink in 950mm x 600mm bench, 316 grade stainless steel, 300mm high splashback with stainless steel support frame and shelf, on adjustable legs. 100mm stainless steel S trap with 50mm back inlet for concealed cistern flush pipe. Water wafer MK3 inwall 6 litre flush with large access panel and push button. | Right angle mini cistern cock. Hospital 150 lever sink set with SP 010 swivel spout with adjustable spray rose and jet No. 6. | |
| FE-49400 Sink: laundry, single | Clark single flushline tub, nominal size 634mm x 560mm with 50mm stainless steel plug and waste. | Expo wall set with SP 110 aerated swivel spout. | |
| FE-55650 Toilet suite: disabled use | Caroma Care concealed trap pan with Sovereign 2000 cistern and Pedigree toilet seat single flap. | Enware chrome plated mini right angle cistern tap. | |
| FE-55605 Toilet suite: patient | Leda 2000 white 6/3 dual flush, close coupled toilet pan, cistern to be Caroma in duct water wafer MK3 with remote button vandal resistant stainless steel panel and conversion kit, closed front Pedigree II toilet seat and single flap. | Enware chrome plated mini right angle cistern tap (in duct). | |
| FE-55600 Toilet suite: standard | Caravelle 2000 with Smartflush technology 4.5/3 litre close coupled toilet suite with Pedigree closed front white double flap seat. | Enware chrome plated mini right angle cistern tap. | |

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| FE-38700 Washer sanitiser: pan | <p>Pan Sanitiser – Atherton 005, freestanding electrically heated model complete. 100 mm stainless steel "S" trap outlet and 50 diameter copper vent pipe. (vent pipe shall be chrome plated where exposed).</p> <p>Provide 100mm stainless steel S-trap outlet and 50 diameter copper vent pipe (vent pipe shall be chrome plated where exposed).</p> | Expo right angle stop cocks and non return valves, hot and cold. | |
| FE-58200 Washer sanitiser: utensil | <p>Miele G7862 UT Utensil Washer complete with control valves, waste hose to connect to spigot on sink waste pipe</p> <p>Provide connection from utensil washer tundish to floor waste.</p> | Expo washing machine taps, hot and cold. | |
| FE-60650 Washing machine: domestic | Waste to connect. | CSQ washing machine taps, hot and cold. | |
| In wall tundish | Mod Tech in wall tundish 316 grade stainless steel, complete with removable stainless steel cover with window and 50mm top inlet. | | |

SANITARY PLUMBING

Description of Service

The sanitary plumbing service will comprise complete gravity stack systems, for soil and waste and discharge to the sewer drainage system.

All main vents will terminate above the roof levels as low as possible and in a symmetrical arrangement where practicable. P-trapped tundishes will be provided to receive plant room floor and equipment drains.

Pipework

Soil stacks, suspended drainage and main branch lines, main back vents, grease and chamber vents will be UPVC with appropriate fittings and jointing.

Waste branch lines will be UPVC with appropriate fittings and jointing.

All visual traps and pipework will be chrome plated.

Design Parameters

- . System to be designed to AS3500
- . Pool wastes to comply with AS 3500 requirements

HYDRANT AND HOSE REEL SYSTEM

Design

The new building system will be designed in accordance with the provision of BCA Amendment No 10, AS2419-1995 and the requirements of NSW Fire Brigade.

Water Supply

The water supply will be taken from the Sydney Water main in Kareena Avenue and extended through the site as required via a new diesel hydrant pump.

The fire hose reels shall be connected to the main cold water supply.

Pipework

Pipework shall be galvanized mild steel with appropriate fittings and jointing.

Pipework below ground shall be Table "B" copper tube.

HYDRANTS AND HOSE REELS

Hose Reels

Hose reels shall be Quell or equal fixed 36m hose with automatic turn on release valve nozzle coupling, complete with fixed plate noting operating instructions as required by the BCA.

Valves Etc.

Isolating valves and the like shall be in accordance with AS3500.

Internal

Hose reels will be provided adjacent to each stair and fire compartment exit to achieve coverage in accordance with the BCA. Hydrants and hose reels will be located such that the nozzle end of a thirty-six metre hose will reach all parts of the particular floor area within each compartment. Hydrants shall be located within each fire stair at each level.

FIRE EXTINGUISHERS

Fire extinguishers will be provided throughout. The number and type of extinguishers will be determined by the particular hazard in accordance with BCA requirements.

GAS SERVICE

The gas service will extend from the gas main in Kareena Avenue to all fittings as required. An upgraded gas meter is to be installed within the existing plant area.