

PREPARED FOR
Lend Lease Development
Level 4
30 Hickson Road
Millers Point NSW 2000

REVISION SCHEDULE

Date	Revision	Issue	Prepared By	Approved By
12/4/2013	1	DRAFT FOR REVIEW	JW	JS
19/4/2013	2	UPATED DRAFT	JW	JS
27/4/2013	3	FINAL	JW	JS
15/05/133	4	FINAL	JW	JS

Prepared By:

Jenna Wilkins

Revision:

4

Approved By:

Jamie Shelton

Revision:

4

PROJECT NAME: Student Accommodation, Haymarket

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This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning and Infrastructure pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

More specifically this subsequent DA seeks approval for a residential building (student accommodation) within the Western development plot (Darling Drive) of The Haymarket and associated public domain works. The DA has been prepared and structured to be consistent with the Concept Proposal DA.

The proposal relates to a detailed ('Stage 2') DA for a residential building (student accommodation) in the Darling Drive Plot of The Haymarket together with associated public domain works. The Haymarket Site is to be developed for a mix of residential and non-residential uses, including but not limited to residential buildings, commercial, retail, community and open space. The Darling Drive Plot is one of six development plots identified in the Concept Proposal DA.

- Demolition of existing site improvements;
- Associated tree removal and planting;
- Construction and use of one residential building within the Darling Drive Plot, to be used for student accommodation purposes;
- Public domain improvements, including:
 - o Realignment and upgrade of Darling Drive (part); and
 - o Provision of a new urban square (known as Macarthur Place) located at the termination of The Goods Line.
- Extension, realignment and augmentation of physical infrastructure / utilities as required.

On 21 March 2013 a critical step in realising the NSW Government's vision for the SICEEP Project was made, with the lodgement of the first two SSD DAs with the Department of Planning and Infrastructure. The key components of these proposals are outlined below.

- The Public-Private Partnership (PPP) SSD DA (SSDA 1) includes the core facilities of the SICEEP Project, comprising the new, integrated and world-class convention, exhibition and entertainment facilities along with ancillary commercial premises and public domain upgrades.

- The Haymarket Concept Proposal SSD DA (SSDA 2) establishes the vision and planning and development framework which will be the basis for the consent authority to assess detailed development proposals within the Haymarket Site.

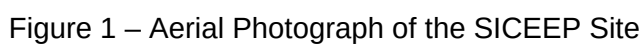
- Staged demolition of existing site improvements, including the existing Sydney Entertainment Centre (SEC), Entertainment Centre Car Park, and part of the pedestrian footbridge connected to the Entertainment car park and associated tree removal;
- A network of streets, lanes, open space areas and through-site links generally as shown on the Public Domain Concept Proposal, to facilitate reintegration of the site into the wider urban context and connection with the broader SICEEP Site;
- Street layouts;
- Development plot sizes, development plot separation, building envelopes (maximum height in RLs), building separation, building depths, building alignments and a benchmark for natural ventilation and solar provision for the precinct;
- Land uses across the site, including residential and non-residential uses;
- A maximum total gross floor area (GFA) across The Haymarket Site of 197,236m² for the mixed use development (excluding ancillary above ground car parking), comprising of:
 - o A maximum of 49,545m² non-residential GFA; and
 - o A maximum of 147,691m² residential GFA;
- Above ground parking including public car parking;
- Residential car parking rates to be utilised in the subsequent detailed (Stage 2) Development Applications, being:
 - o Zero (0) spaces per studio apartment;
 - o Maximum one (1) space per two (2) one bedroom apartments;
 - o Maximum one (1) space per one bedroom + study apartment, plus one (1) additional space per five (5) apartments;
 - o Maximum one (1) space per two bedroom apartment, plus one (1) additional space per five (5) apartments; and
 - o Maximum two (2) spaces per 3+ bedroom apartment.

- This report has been prepared to support a detailed Stage 2 SSD DA for a residential building (student accommodation) and associated public domain works within The Haymarket (SSDA 3), consistent with the Concept Proposal SSD DA.

The SICEEP Site is located within Darling Harbour. Darling Harbour is a 60 hectare waterfront precinct on the south-western edge of the Sydney Central Business District that provides a mix of functions including recreational, tourist, entertainment and business.

The Haymarket Site is:

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-
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1. North Plot;
2. North East Plot;
3. South East Plot;
4. South West Plot;
5. North West Plot; and
6. Western Plot (Darling Drive).



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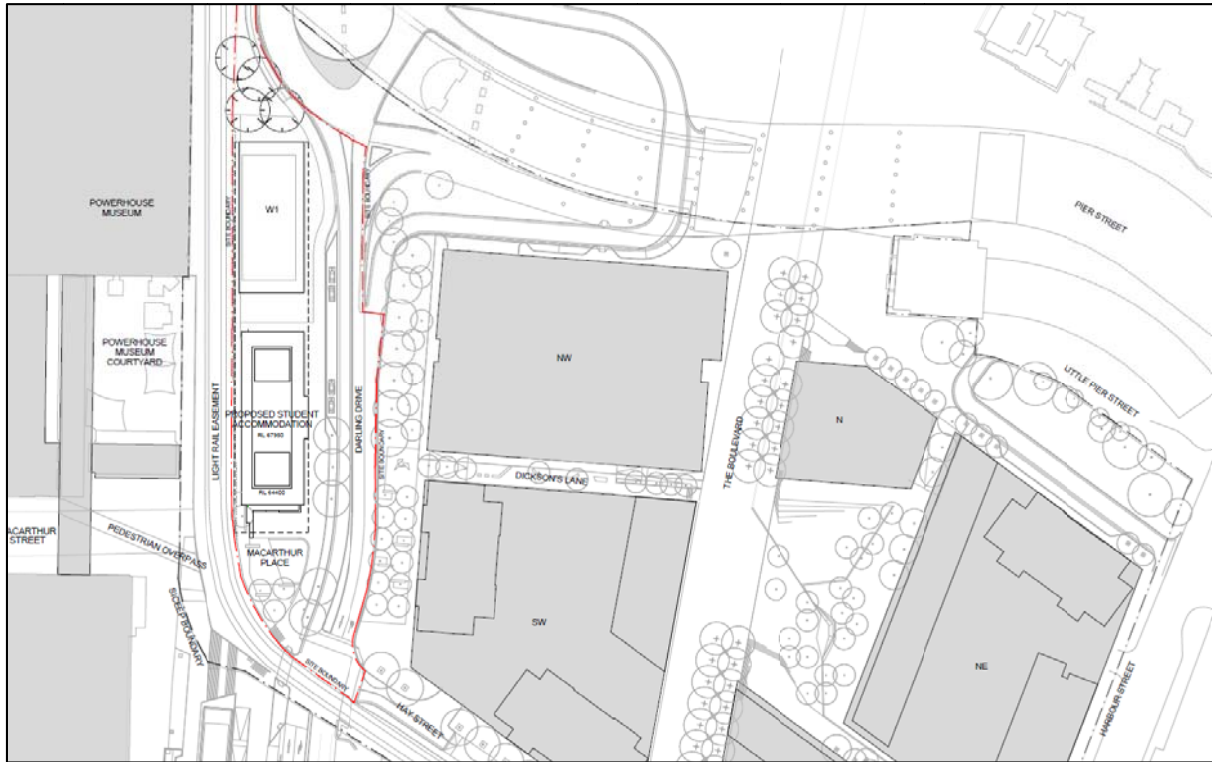


Figure 3 – Works Boundary for subject DA

Planning Approvals Strategy

The SICEEP Project will result in the lodgement of numerous SSD DAs for the various components of the redevelopment project. SSD DAs have already been lodged for the PPP component of the SICEEP Project (comprising the convention centre, exhibition centre, entertainment facility and ancillary commercial premises and associated public domain upgrades), and the Stage 1 Concept Proposal for The Haymarket. Separate 'Stage 2' SSD DAs for the development of the South West Plot and the North West Plot and associated public domain works will be lodged concurrently with this application. Future applications will be lodged for the Hotel complex, and the remaining development plots of The Haymarket Site.

STRUCTURE

Site Constraints

A bored Energy Australia cable tunnel (City West Cable Tunnel) crosses the Application Site, approximately from North to South at a depth of about 20m and overlain by approximately 13m of bedrock. The tunnel is of segmental precast concrete construction and is 3.45m in diameter and was constructed in 2008.

A Sydney Water sewer also crosses the Application Site. This is a diversion of the Hay Lackey sewer and was constructed by open cut in about 1988. The sewer comprises a 1.0m diameter glass reinforced plastic liner cast in to a 1.6mx1.6m reinforced concrete block with depth to crown of approximately 5.0m to 7.5m.

Geotechnical Conditions

A geotechnical assessment of the Haymarket Site within the SICEEP has been undertaken by Coffey Geotechnics (GEOTLCOV24303AG-AD, 6 March 2013).

The Application Site (south west portion of the western plot) is not within the zone that may be affected by the Great Sydney Dyke or the GPO fault zone joint that traverse the Haymarket precinct and so conventional piled foundations taken to bedrock may be used to support the building.

The ground conditions below the Application Site can be described as comprising a variable thickness of fill and alluvial/estuarine soils above sandstone bedrock. The water table is relatively shallow, but is not expected to be encountered by the excavations other than the piling works. The construction will not impact on the water table.

Structural Description

The building is a 20 storey tower, rectangular on plan. There is no basement.

Typical floors of accommodation repeat from level 3 to roof. Between level 1 (Ground) and level 3, raked columns support the buildings perimeter. Perimeter column lines are transferred at level 3 at the top of the raked columns.

Typical floors are to be of post-tensioned concrete, flat plate construction, supported vertically by blade columns and lift and stair cores.

Level 1 (Ground) will be suspended, constructed on-grade and supported by ground beams and core bases.

All four elevations are to be of lightweight construction and supported by floor plates at each level.

Lateral stability is provided by three symmetrically located concrete cores, allowing columns to be designed as braced elements.

The building is supported by large diameter, piled foundations which will socket in to sandstone bedrock.

Managing Site Constraints

Of primary concern are the sewer and cable tunnel below ground structures crossing the site.

- Sydney Water Corporation (SWC) trunk sewer tunnel
- Energy Australia City West Cable Tunnel (CWCT)

An assessment has been undertaken by Pells Sullivan Meynink (PSM), consulting Geotechnical Engineers for Lend Lease Development to determine the impact of the development on these structures. Northrop have provided the pile layout and loads for the PSM assessment.

Through 3D finite element analysis, PSM have developed a foundation strategy to limit the loads, settlements and deflections generated in these structures to an acceptable level.

In summary, the foundation strategy is as follows.

Sydney Water Corporation (SWC) trunk sewer tunnel

Whilst not underlying the building footprint, the SWC does come close to the north-east corner of the building.

We propose to adopt the following PSM recommendations

- Piles are to extend below the sewer invert level
- A separation distance on 1.5m between the pile shaft and concrete sewer encasement is maintained

Energy Australia City West Cable Tunnel (CWCT)

The cable tunnel runs beneath the building, crossing the south-west corner.

We propose to adopt the following PSM recommendation

- Maintain 10m of rock cover to tunnel crown
- Limit foundation loads above the tunnel such that the impact on the tunnel structure is negligible (within agreed acceptance criteria).

We understand that further analysis will be undertaken by PSM during the detailed design stages to ensure compliance of the final solution. This will be undertaken in conjunction with the relevant utilities owners to obtain approval for the new works and acceptance criteria used in the final design.

MECHANICAL

Ventilation Systems

All habitable rooms are to be naturally ventilated in accordance with Section F4.6 of the NCC-2011. We note however, some habitable rooms will be provided with mechanical ventilation in order to address the requirements of the Acoustic Report.

Mechanical services ventilation have been designed to comply with Section F4.5 of NCC-2011, AS 1668.1-1991, and AS 1668.2-2012. This includes the following systems:

- Habitable rooms where closing of windows is required in the acoustic consultants report.
- Toilets and ensuites.
- Range hood ventilation
- Laundry ventilation.
- Garbage Rooms.

Smoke Hazard Management

We understand that the Ground Floor Level is classified as Class 5. Deemed-to-satisfy provisions require Class 5 spaces in buildings over 25 metres in height to incorporate zone smoke control. However, as the Class 5 component is at ground Floor level, we expect this deemed-to-satisfy provision to be addressed by a performed based solution.

On receipt of a fire trip, all air handling systems greater than 1000 L/s plant installed shall automatically shut down in accordance with AS 1668.1-1998.

Stairwell pressurisation, and the associated relief air system will be designed in accordance with AS 1668.1-1998.

Protection of Openings

All openings in fire rated walls and in the fire rated shaft will be designed in accordance with Sections C3.12, C3.13, C3.15 of the NCC-2011, AS 1668.1-1998, and AS 1682.1 – 1990.

Energy Efficiency

Mechanical services air conditioning and ventilation systems have been designed to comply with energy efficiency requirements of Section J5 of the BCA.

Refer to Section J5 of the BCA.

Access for Maintenance

The mechanical plant design shall conform to the requirements of section J8.2 in regards to access for maintenance.

Refer BCA Section J, Clause J8.2.

We, Northrop Consulting Engineers, being professional engineers, certify that the Mechanical Design will be designed in accordance with the above.

Proposed Air Conditioning Systems

The proposed air conditioning system will consist of a variable refrigerant volume air conditioning system. This system shall be designed in accordance with AS 1677.2-1998.

Pursuant to the provision of **Clause A2.2 Building Code of Australia**, I hereby certify that I am an appropriately qualified engineer and the above design has been carried out in accordance with normal engineering practice and will meet the relevant requirements of the Building Code of Australia, relevant Australian Standards and relevant conditions of Development Consent.

In making this certification, we also certify that the Conditions of the Development Consent and relevant conditions have been satisfied, which outline the requirements to fulfil Construction Certificate Approval, with regards to the mechanical services provisions.

We confirm that in preparing the mechanical services for this development, we have exercised due diligence and care, in accordance with Standard practice. This Certificate however, does not relieve other parties from their responsibilities.

Full Name of Designer: Sean Rapley CPEng NPER

Qualifications: Bachelor of Engineering (Mechanical)

Address of Designer: Level 1, Grafton Bond Store, 60 Hickson Road
Sydney NSW 2000

Business Telephone No: (02) 9241 4188 **Fax No:** (02) 9241 4324

Name of Employer: Northrop Consulting Engineers P/L

Signature:

A handwritten signature in black ink, appearing to be "S. Rapley", written over a light grey circular background.

ELECTRICAL SERVICES

Electrical Supply & Demand

Application for connection for the new proposed building has been lodged into Ausgrid for approval and advice. The preliminary maximum demand calculations have revealed loads in the order of 1287 Amps per phase for the student accommodation facility.

We anticipate a indoor mini chamber substation to be installed on site rate at 1000 kVA with a 1200 Amp Low voltage supply to the main switchboard.

Note the calculations have been based on data gathered on similar Urbanest student accommodation buildings coupled with standard industry unit rates for residential type of projects.

The calculation scan be found in the Appendices' at the rear of the documents.

Power Distribution System

The power distribution, including incoming supply, protection and cabling will be designed in accordance with AS/NZA 3000:2007, AS/NZS 3008.1.1:2009 and the NSW Service and Installation Rules.

Emergency and Exit Lighting

A system of self-contained, single point emergency and exit lighting will be designed in accordance with BCA Section E, Clauses E4.2, E4.4, E4.5, E4.6, and E4.8. and AS2293.1

Internal Lighting

Internal lighting will be designed in accordance with BCA Section F, Clause F4.4, and AS 1680.

External Lighting

External lighting will be designed in accordance AS 1158 and AS 4282.

Automatic Fire Detection

An automatic smoke detection system wil be designed in accordance with NCC (BCA) Section E, Table 2.2a, NSW Table E2.2b and BCA Specification E2.2a. and AS1670.

Occupant Warning Systems

A occupant warning system will be designed in accordance with NCC (BCA), Section E and AS1670.

Energy Efficiency

Energy efficiency measures will be included in the design in accordance with Section J, Clauses J6.2 and J6.3

The main IT room located at ground floor will feed the new building, there will be optical fibre/copper cabling installed to link the floor distribution cabinet. Cat 6 cabling is to be provided to all outlets.

The performance of the lift services will be specified in accordance with BCA Section E (E3.2, E3.3, E3.5) and AS1735 Parts 1,2 & 11.

We confirm that in preparing the electrical services documentation for this development, we have exercised due diligence and care, in accordance with Standard practice. This Certificate however, does not relieve other parties from their responsibilities.

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HYDRAULIC AND FIRE SPRINKLER

We understand that, in accordance with BCA 2012, the building has a rise in storeys of twenty storeys to be used for student accommodation and an effective height of over 50m and classifications as follows:

- Class 3 (accommodation)

This report has been prepared to describe:

- Brief overview of the required infrastructure (Sydney Water) services to service the building. It is noted that Northrop Engineers is not responsible for the infrastructure works. These works will be provided by others.
- Design objectives for the proposed development.
- Potential impact to existing services.
- Possible engineering strategies to enable development to occur at this site.
- Preliminary Spatial design for the major site works and servicing components required supporting the development.

Report Constraints

General site plans for the hydraulic services and partial set of building drawings have been provided for review. However, we note that the documents provided are at DA stage and are subject to change.

While every effort was made to accurately determine the existing hydraulic / fire services, Northrop recommends further site investigation to confirm certain elements including location, sizes, capacity and condition before a final design is adopted.

Existing Infrastructure

NOTE: All external infrastructure works and incoming services are being completed by others.

Northrop has allowed for connecting to the services provisions provided by others at the property boundary.

All works shall be subject to Sydney Water requirements under a section 73 Certificate Application.

Based on recent telephone discussions with Sydney Water, we understand these requirements to be as follows:

Building Plan Approval:

The development is in closed proximity to an existing 1000mm GRP Sydney Water sewer. Sydney Water will impose a number of requirements as part of a Section 73 Application. These requirements will include but are not limited to the following:

- Detail Service Protection Report "Peg out"
- CCTV investigation on the existing 1000mm main before and after the development
- Excavation procedure will need to ensure no impact on the existing 1000mm main

- The works will need to be bonded
- All new structural foundation to be taken below the Zone of Influence of existing sewer.

Sewer:

- A sewer extension from the existing 450mm GRP near the corner of Darling street & Pier Street will be nominated as the required sewer connection point to service this development.
- A new 225mm sewer extension will be required to the Northern of the site.

Please refer to Sketch SK-H-01 for general details. Note this sketch has been amended to reflect the requirements outlined by Hyder Consulting.

Water:

Sydney Water requested the following to be provided"

- Existing 500mm watermain traversing the site is to be diverted away from the buildings footprint.
- New 200mm watermain extension from the southern side of Hay Street is to be constructed to service the development.
- Please refer to Sketch SK-H-01 for general details. Note this sketch has been amended to reflect the requirements outlined by Hyder Consulting.

Hydraulic Description

The building is a 20 story tower, rectangular on plan. There are no basements proposed as part of the building.

Typical floors of accommodation repeat from level 3 to level 20.

Building over 50m high.

Individual Bathroom Pods will be used as part of the construction.

Northrop will complete the following services:

- Sewer drainage
- Trade waste (Laundry)
- Water (Cold Water, hot water, Warm water)
- Rain water re-use
- Roofwater (downpipes, eaves/box gutter system)
- Fire hydrants
- Fire hose reels
- Fire Sprinklers
- Gas Service

Sanitary Plumbing and Drainage

The sanitary plumbing and drainage will be designed to AS 3500.2 and Sydney City Council requirements.

A Section 73 Application will be necessary to be lodged with Sydney Water to comply with the Development Consent.

The system will collect effluent from the sanitary plumbing stacks and Ground Floor fixtures and be conveyed by gravity to the proposed sewer connections, complete with manholes, piping, fittings, etc.

Northrop anticipates 1 x sewer connections within our site.

- **Connection 1:** The sewer connection will be at the southern end of the site to the external sewer to be provided by others.

An overflow gully will be provided as part of these services. The gully will be external to the building at ground level to prevent any surcharge of sewerage, within the building, in the event of blockage.

Inspections openings in pipes and fittings will be fitted in accessible positions to facilitate maintenance procedures for each individual section of pipework.

Trade Waste

On-Site provisions are to be constructed to AS3500 and Sydney City Council requirements. The following on-site trade waste provisions are anticipated:

- Our initial assessment would be 2000 litre inground Lint and cooling pit for the Laundry. **Note: Final Lint/ Cooling pit size & location shall be confirmed.**
- Bucket trap floor wastes will be required at the ground floor garbage room

Note. At this stage we understand that no commercial cooking will be undertaken within this facility.

Stormwater Drainage

Refer to the civil engineers report / documents for details relating to the stormwater drainage. Downpipes and overflow from the rainwater harvesting tank will be connected to the external stormwater system. The stormwater system is expected to be available for connection within 1.0M of the downpipes.

Domestic Cold Water

Domestic cold water for the new building will be supplied 2 x water connections (Fire Services & Coldwater) connection to the Ø200mm water supply Supplied by others.

A dedicated water meter complete with a zone protection back flow in accordance with AS 3500 requirements is to be provided.. The system will reticulate to all points of usage and be complete with connection to water main, pumps, piping, fittings, valves, etc. Non domestic user points

Domestic Hot Water

Note. As part of the design development, a Trigeneration hot water plant will be considered. If implemented, the trigeneration plant will need to be located at ground floor.

Warm water is to comply with the requirements of AS3500 requirements

The rainwater harvesting tank shall be provided with a first flush device and overflow pipe. The First Flush devices shall be equal to 'Rain Harvesting Systems Pty Ltd' The outlet pipe from the first flush-diverter system is then discharged into a downstream stormwater pit (refer to civil)

The rainwater harvesting system shall be provided with a potable cold water make-up supply complete with a three way valve, backflow prevention device and all other associated valves and equipment in accordance with Code and Australian Standards.

Natural gas for the new building will be supplied 1 x water connections to the gas supply supplied by others.

The internal system of pipework will supply 2.75kPa gas to all points of usage and be complete with piping, fittings, valves etc unless noted otherwise

Sanitary fixtures throughout the facility will form part of the services provided as part of the pods.

All other fixtures tapware shall be selected accordance with the Water Efficiency Labelling and Standards Scheme. Flow control will be considered and implemented as necessary.

The system will be designed to the requirements of AS 2419.1 – 2005 and the Building code of Australia.

Water supply will consist of a 25,000 litre water storage tank located at the top of the building and dual outlet Fire Brigade suction supply of the water main at ground level.

As the building is over 50 metres the system will contain 2 pressure zones, Upper pressure zone (level 8 to roof) and lower pressure zone (Ground to level 7). The maximum pressure zone height shall be 35metres.

The pressure and flow demand for the system is 20 litres/sec at 700 kPa at the highest hydrant (Level 20)

A separate electric and diesel booster pump located within a fire rated room with direct access to the fire stair is to be provided at roof level . The pump demand will be 10 liters/sec at 800 kPa in accordance with AS 2419.1

Fire hydrants will be located within both fire stairs on each level.

Pressure reducing valve sets are required to be installed to reduce operating pressures on the lower levels of the building as per AS 2419.1 Presently they have been located on Level 7.

A dual point Fire brigade Booster valve is required a ground level together with a fully flow fire brigade relay pump connected to the upper pressure zone as required by AS2419.1.

Pump run indications shall be connected to the Fire indicator Panel.

A fire hose reel system shall be designed in accordance with AS 2441 – 1988.

The water supply to fire hose reels will be connected to the potable metered water system on site.

Fire extinguishers

Fire sprinklers

The building shall be classified as light hazard throughout except for Ground level which will be classified as Ordinary Hazard Group 1.

Ordinary Hazard Group 1: 5mm/min over 72 m2

Light Hazard Group: 6 sprinklers at 48 L/min

An electric booster pump shall be located at ground level connected to the water main supply and diesel pump will be provided at roof level connected to the water storage tank adjacent to the hydrant pumps .

Two sprinkler control valve sets are required, one set controlling Ground floor to level 10 and the other Level 11 to roof. The maximum area a sprinkler alarm valve can control for light and ordinary hazard is 9,000 m².

Sprinkler Alarm valves shall be located at Ground level with direct access to the street.

Each level shall be provided with a flow switch connected to the Fire Indicator Panel and flow switch solenoid testing arrangement to enable routine testing of flow switches controlled from the Fire Indicator Panel.

Sprinkler heads shall be 10mm 68 deg fast response type sprinklers having a maximum coverage of 4.6m x 4.6m for light hazard and 4m x 3m for Ordinary Hazard.

A dual point fire brigade booster valve shall be located adjacent to the fire hydrant booster valve complete with block plan.

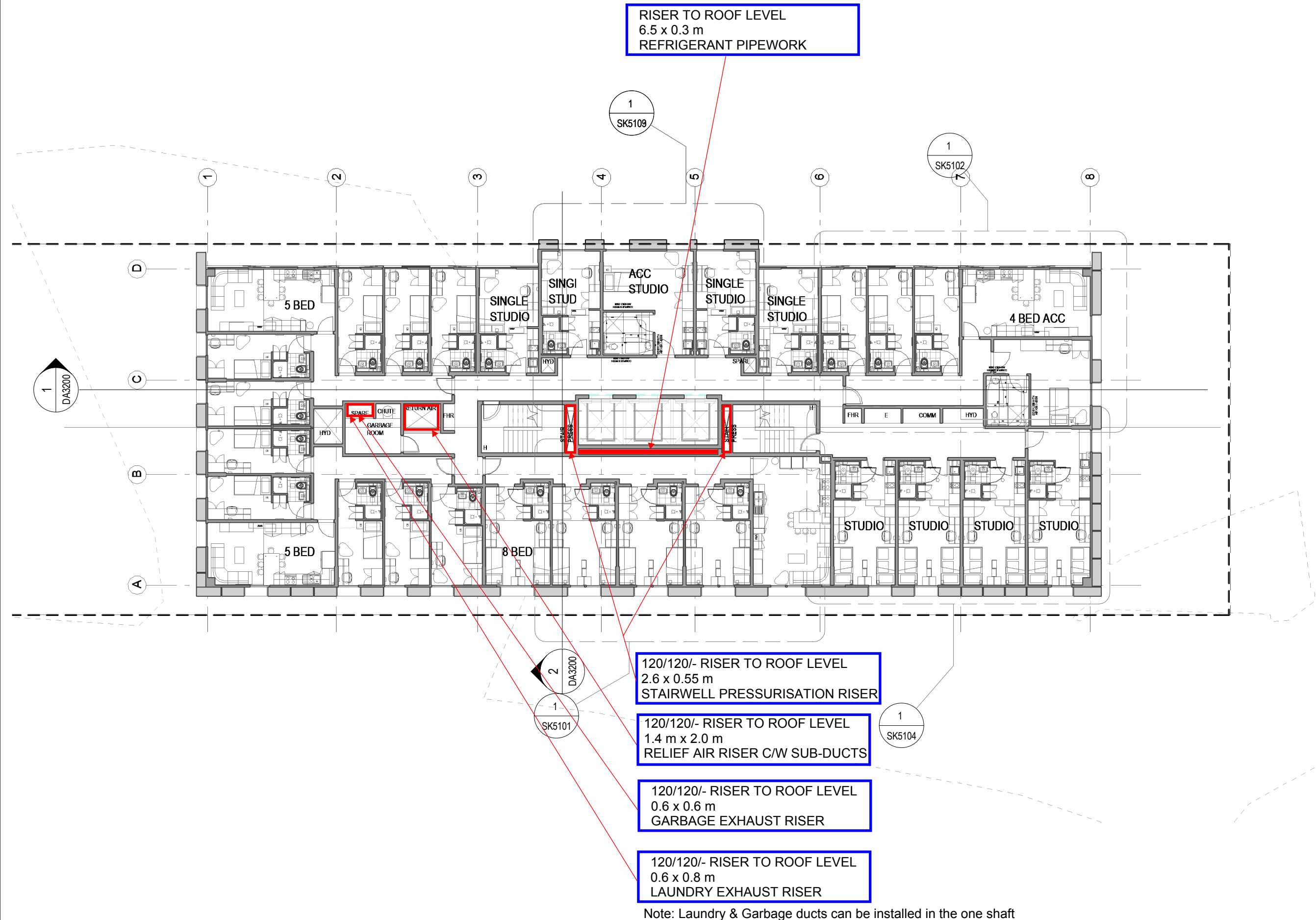
Window sprinklers maybe required to be provided to all windows on Darling Drive. If these sprinklers are required, an automatic self-closing system will need to be provided. All to AS2118 and BCA requirements.

BMS provisions will be provided to all major hydraulic plant including hot water plant, water, gas meters and pumps as required.

The ESD initiatives are proposed for coordination:

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Revisions		Key	Client	Architect	Project	Drawing Title	Date:	9/04/2013	Project No:	13.0157
No.	Date	Description					Project:	URBANEST DARLING HARBOUR		
0		Issue for	URBANEST	AJ+C ALLEN JACK + COTTIER 79 Myrtle Street Chippendale NSW 2008 AUSTRALIA ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250	URBANEST HAYMARKET THE HAYMARKET, SYDNEY, NSW 12023	TYPICAL F	Title:	TYPICAL MECHANICAL LAYOUT		
8		Consultant Issue					Drawing No:	SK-M-02	Revision:	1
0							Drawn:	SR	Scale:	NTS
							NORTHROP			

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DARLING DRIVE

EWIS & FIP PANELS
LOCATED WITHIN FIRE
CONTROL ROOM

MIMIC PANEL
RECESSED WITHIN
WALL

INDOOR MINI SURFACE
CHAMBER SUBSTATION.
2x1000kVA.
ROOM IS ADEQUATELY
SIZED AS SHOWN. NO
FURTHER COMMENTS

MAIN SWITCH ROOM. 2x
OUTWARD OPENING
DOORS, AT OPPOSITE ENDS
OF ROOM.
2 HOUR FIRE RATED WALLS.
ROOM SIZE IS ADEQUATE
AS SHOWN. NO FURTHER
COMMENTS.

MAIN COMMS ROOM. 1x
OUTWARD OPENING DOOR.
2 HOUR FIRE RATED WALLS.
FULL AIR CONDITIONING
REQUIRED.
ROOM SIZE IS ADEQUATE
AS SHOWN. NO FURTHER
COMMENTS.

COMMS RACKS

LIGHT RAIL ALIGNMENT

LIGHT

LIGHT

RAIL

RAIL

EDGE OF RAIL

PUMPS
0 m2

ARTICULATION ZONE
MASTERPLAN ENVELOPE

FORECOURT

DISPLAY SUITES
= 70 Sq. m

FIRE
CONTROL
9 m2

FIRE
PUMPS
9 m2

COMMON
= 270 Sq. m

OFFICE
= 16 m2

REC

COMMUNAL AREA
= 109 Sq. m

MAIL

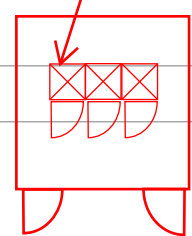
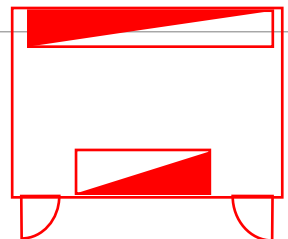
GARBAGE
= 23 m2

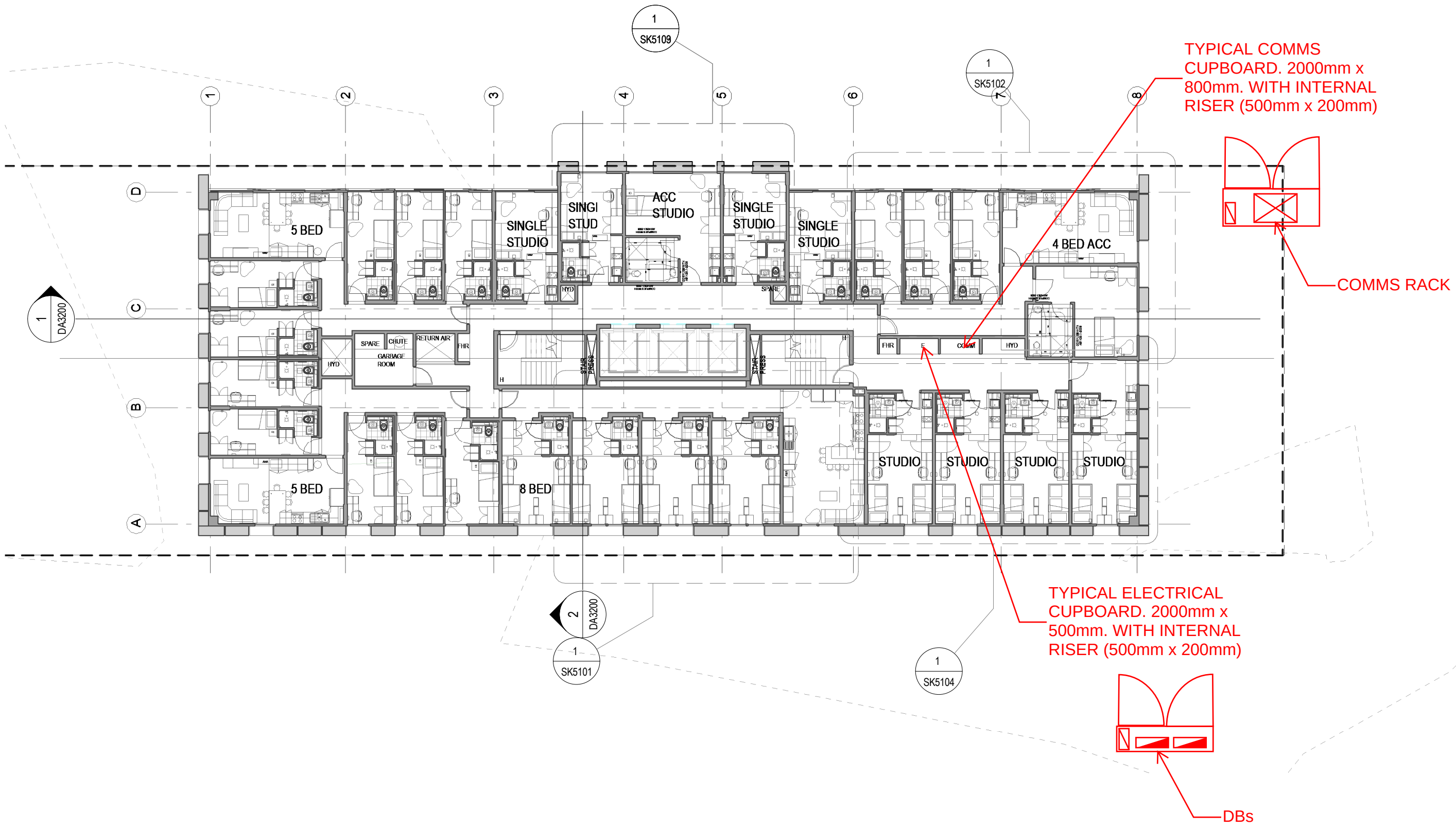
BIKE STORE
(44) 45 m2

MAIN
SWITCH
ROOM
24 Sq. m

COMMS
12 Sq. m
METERS
12 Sq. m

SERVICES
32 Sq. m





Revisions No. Date Description Ver App'd	Key	Client URBANEST	Architect AJ+C ALLEN JACK COTTIER 79 Myrtle Street Chippendale NSW 2008 AUSTRALIA ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250	Project URBANEST HAYMARKET THE HAYMARKET, SYDNEY, NSW COMMUNODATION 12023	Drawing Title TYPICAL PLAN - LEVEL 3	Scale	Drawing No.	Issue
						1 : 200	SK2103	1
						NOT FOR CONSTRUCTION		

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-  Existing Gas Main
-  Existing Water Main
-  Existing Sewer Main
-  Proposed Water Main Upgrade
-  Proposed Sewer Main Extension
-  Fire Hydrant Main
-  Fire Sprinkler Main
-  Gas Main
-  Water Main
-  Footpath Isolation Valve
-  Isolation Valve
-  Monitoring Valve
-  Water Meter
-  Gas Meter
-  Gas Regulator
-  FRNSW Booster
-  FRNSW Suction Point

AIR CONDITIONING CONDENSER COMPOUND
15 X 5 METRES - 2 PLACES
CONDENSER HEIGHT - 1700 mm
PROVIDE LOUVRED SCREENS AROUND CONDENSERS

25,000L EFFECTIVE CAPACITY
DOMESTIC TANK REQUIREMENT
TO BE CONFIRM

BRIDGE

A
3201

75,000L EFFECTIVE CAPACITY
COMBINE FIRE HYDRANT AND
FIRE SPRINKLER TANK

STAIRWELL PRESSURISATION
FANS - 2.3 X 5 METRES
2 PLACES

FIRE HYDRANT (UPPER SECTION)
AND SPRINKLER SYSTEM PUMP
ROOM. PROVIDE DIRECT ACCESS
FROM FIRE STAIRS

Date:	3/04/2013	Project No:	130157
Project:	URBANEST DARLING HARBOUR		
Title:	ROOF MECH. SPATIAL PLANNING		
Drawing No:	SK-M-03	Revision:	0
Drawn:	SR	Scale:	NTS
			

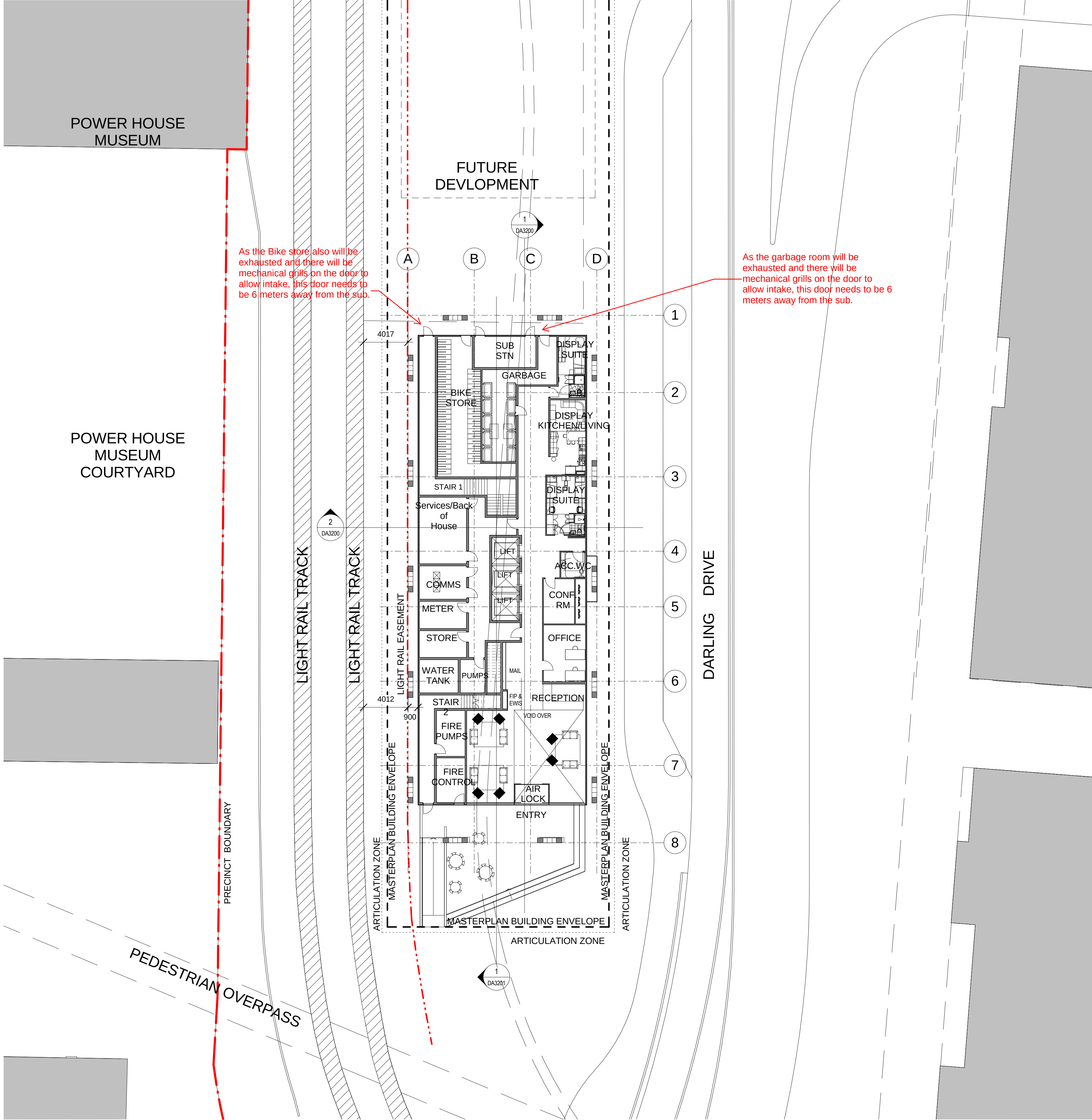
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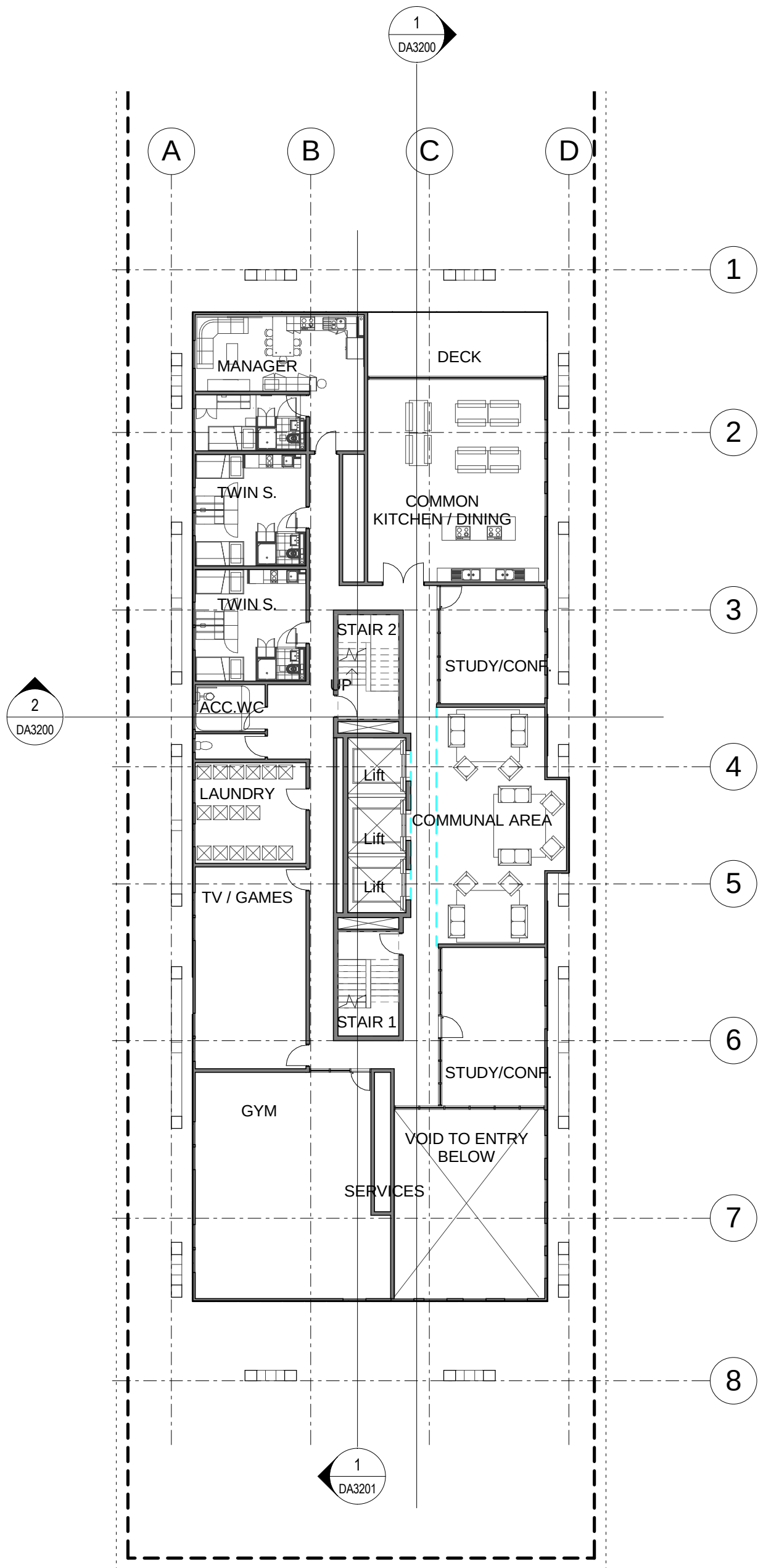
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Urbanest Haymarket ROOF PLAN (L19)

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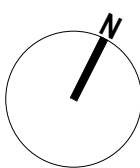


1 GROUND FLOOR PLAN
1 : 200



2 LEVEL 1 PLAN
1 : 200

Revisions	No.	Date	Description	Ver	App'd
1	09.04.13	85% Issue for review			
2	12.04.13	95% Issue			



Key

Client



Architect



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ABN 53 003 782 250

Project

URBANEST HAYMARKET NEW
STUDENT ACCOMMODATION
THE HAYMARKET, SYDNEY, NSW

Proj. No.

12023

Drawing Title

GROUND FLOOR AND LEVEL 1
PLAN

Scale

1 : 200

Drawing No.

DA2100

Issue

2

NOT FOR CONSTRUCTION



Level 1, Grafton Bond Store, 60 Hickson Road
Sydney NSW 2000

PO Box H171 Australia Square NSW 1215

T (02) 9241 4188 F (02) 9241 4324

E sydney@northrop.com.au

SICEEP

ELECTRICAL SERVICES

ELECTRICAL DEMAND REPORT

PREPARED BY

Northrop Consulting Engineers
ACN 064 775 088
Level 1 60 Hickson Road
SYDNEY NSW 2000

Tel: 02 9241 4188
Fax: 02 9241 4324

Ref: s130157

PREPARED FOR

Urbanest Pty Limited
Suite 102, Level 1
Australia Square, Plaza Building

Tel: (02) 8415 6400
Fax: (02) 8415 6401

Revision Schedule

[illegible]

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1. INTRODUCTION

This report analyses the maximum power demand requirements for the new SICEEP project which is to be a student accommodation building.

The site forms part of the overall Convention center upgrade works. The student accommodation building comprises of 488 room facility spread over several floors.

The purpose of this report is to identify the maximum demand calculation for the site with a focus on confirming if a 1 x 1000 kVA substation will be adequate to support the proposed electrical loads.

Traditional methods of utilising AS 3000 calculations, rating per Apartments/Room/Bed and actual measured results of similar facilities have been used in determining the loads.

1.1 Method 1 – AS3000

MULTIPLE LIVING UNITS PER PHASE

Based on the above calculations we will require a 1 x 1000 kVA substation and another smaller substation to top up the additional demand.

Ausgrid only provide a 1200 Amp fuse or circuit breaker for a 1000 kVA substation. With the notion of incorporating an indoor chamber type of substation, if we were to proceed with this option, we would be prematurely providing larger indoor chamber substations which would take up prime real estate and add to the building costs over all.

1.2 Method 2 – kVA per Apartment and Rooms

Actual Energy Authority Measurements from 2 Urbanest facilities were taken to prepare the below spread sheet to provide a benchmarking exercise to determine the maximum demand as the AS3000 calculations are generally very conservative.

The third site is under construction in Victoria and the calculations for this site is also provided below, note that there is greater number of studio apartments at this site.

1.3 SITE 1

Supply Point: Apartments 1-61, Cnr Thomas Street & 81-91 Quay Street Haymarket, NMI: 410

Facility 61 Apartments															
Month	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	AVERAGE
Highest Metered Demand (kVA)							59.52	61.44	63.36	53.12	44.16	39.04	50.56	62.08	54.16
Average Load (kVA)							30.22	28.61	28.47	27.85	21.09	20.08	23.00	28.50	25.98
Month	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	
Highest Metered Demand (kVA)						121.304	136.62	130.66	110.51	136.55	159.38	183.60	142.42	158.67	142.19
Average Load (kVA)						89.109	80.24	69.45	60.65	67.62	64.83	74.49	75.68	84.91	74.11
TOTAL Highest Metered Demand (kVA)							196.14	192.10	173.87	189.67	203.54	222.64	192.98	220.75	198.96
TOTAL Highest Metered Demand (AMPS)							272.41	266.81	241.49	263.43	282.69	309.23	268.02	306.60	276.34
PER APARTMENT (kVA) 61							3.22	3.15	2.85	3.11	3.34	3.65	3.16	3.62	3.26
PER BED (kVA) 334							0.59	0.58	0.52	0.57	0.61	0.67	0.58	0.66	0.60
PER ROOM (kVA) 334							0.59	0.58	0.52	0.57	0.61	0.67	0.58	0.66	0.60
Per Meter Squared (8800M ²)							0.022	0.022	0.020	0.022	0.023	0.025	0.022	0.025	0.02

1.4 SITE 2

Supply Point: Level 1/140 North Terrace, Adelaide SA 5000, NMI: 2002226489

Facility 176 Apartments															
Month	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	AVERAGE
Highest Metered Demand (kVA)		243.860	207.400	269.870	266.310	286.860	312.54	230.40	248.62	264.04	265.97	278.12	304.84		264.90
Average Load (kVA)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
TOTAL Highest Metered Demand (AMPS)		338.69	288.06	374.82	369.88	398.42	434.08	320.00	345.31	366.72	369.40	386.28	423.39		367.92
PER APARTMENT (kVA) 176		1.386	1.178	1.533	1.513	1.630	1.78	1.31	1.41	1.50	1.51	1.58	1.73		1.51
PER BED (kVA) 503		0.485	0.412	0.537	0.529	0.570	0.62	0.46	0.49	0.52	0.53	0.55	0.61		0.527
PER ROOM (kVA) 461		0.529	0.450	0.585	0.578	0.622	0.678	0.500	0.539	0.573	0.577	0.603	0.661		0.57
Per Meter Squared (14975M ²)							0.021	0.015	0.017	0.018	0.018	0.019	0.020	0.000	0.02

1.5 SITE 3

[illegible]

Following this exercise, we determined the average power demands by using data for 8 months for site 1, 12 months of data for site 2 and design data on site 3.

Given that the mix of the sites were not exactly the same with regards to the apartment, room and bed configurations, a clear comparison could not be made.

The results that did provide uniformity across 2 sites were the per room and per bed rates, which both equated to approximately 0.6 per bed and room.

When looking at the results of site 3, per room and per bed results were double, hence the reflecting the mix of the type of rooms. Site 3 is predominantly made up of single studios hence having a higher number of oven, cooktop and AC per room.

We these rates are applied to the proposed SICEEP project and the following were the results.

1.6 SICEEP CALCULATIONS

	Quay Street	North Terrace	Berkeley Carlton	Darling Drive	30% mix based on Quay St	70% mix based on Berkeley St	Total Demand kVA
No. of Apartments	61	176	186	237	71	166	
No. of Rooms	334	461	188	488	146	342	
No. of Beds	334	503	275	635	191	445	
GFA	8800	14975	7200	14000	4200	9800	
Ave.Beds per Apartment	5.48	2.86	1.48	2.68			
Average KVA Demand	198.96	367.92	468.00		232	417	649
kVA/ Apartment	3.26	2.09	2.52		3.26	2.52	
kVA / Room	0.60	0.798	2.49		0.60	2.49	938
kVA/ per bed	0.60	0.73	1.70		0.60	1.70	870
kVA/GFA	0.02	0.02	0.07		0.02	0.07	732

1.7 Summary

- Per apartments rates vary due to the mix of each site.
- Per room rates are consistent with the exception of Berkeley Street, which are predominately studios, and reflect a higher rate.
- Per bed rates are consistent with the exception of Berkeley Street, which are predominately studios, and reflect a higher rate.
- On a typical floor of SICEEP, there are 13 apartments, with 9 single studios and 4 multiple room apartments. We have determined the make up as split to be 30% multiple apartment types and 70% studio apartments types.
- The above calculations for SICEEP are based on 30% to 70% split.
 - Quay Street 30%
 - Quay street results of 3.26 kVA per apartment
 - Quay Street results of 0.6 kVA per bed.
 - Quay Street results of 0.07 kVA per room.

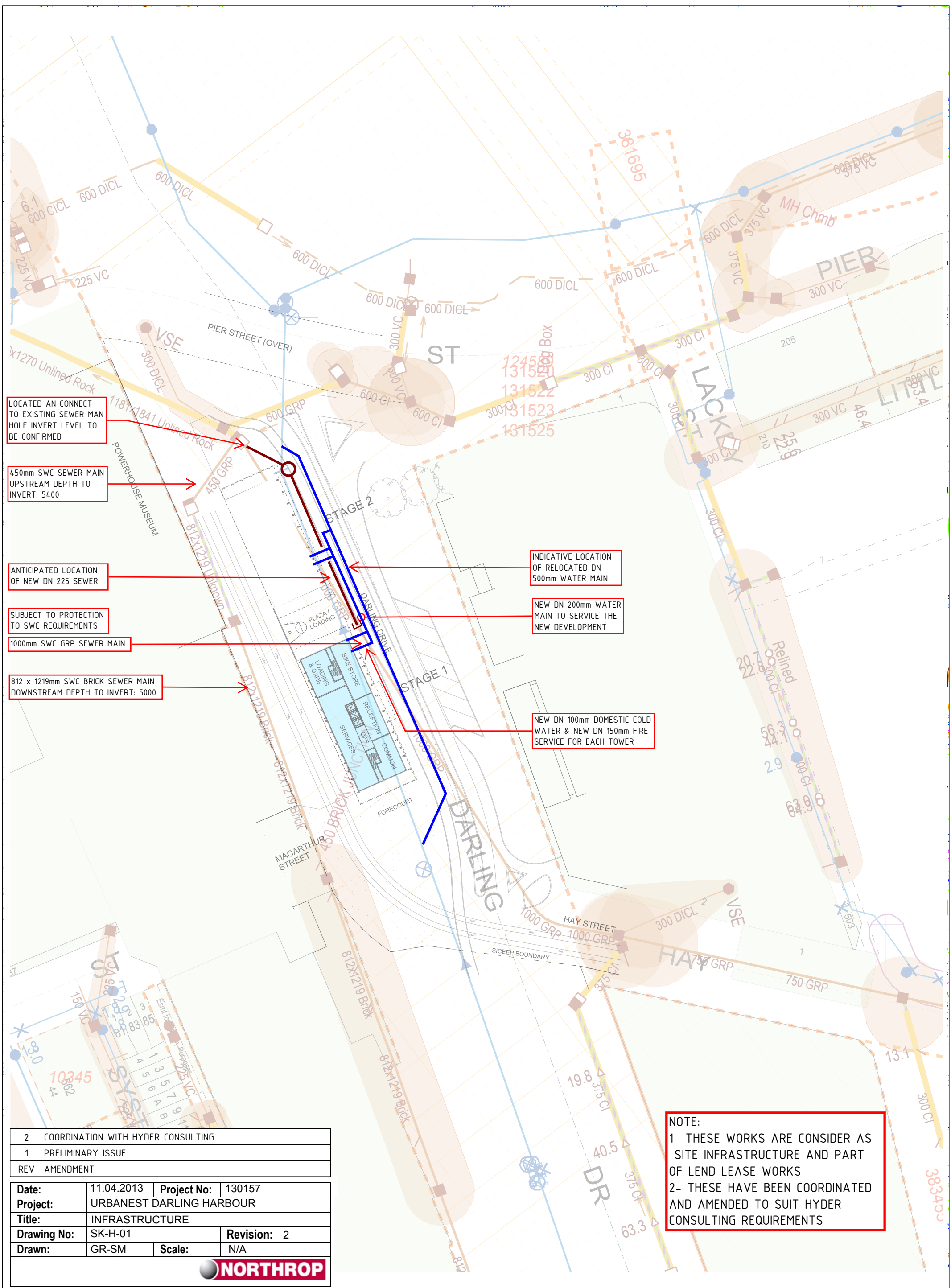
- Quay Street results of 0.02 kVA square meter.
 - Berkeley street 70%
 - Berkeley Street results of 2.52 kVA per apartment
 - Berkeley Street results of 2.49 kVA per bed.
 - Berkeley Street results of 1.7 kVA per room.
 - Berkeley Street results of 0.02 kVA square meter.
- Based on the items noted in the previous section we can confirm that we are confident that the proposed 1000 kVA substation will be adequate to support the new SICEEP facility.
- All ESD controls for Air conditioning, LED lighting, motion sensors and the like will be provided in the design development stages.
- Gas fired Dryers will be considered in the design development stages to assist in the reduction of electrical demand.

	Darling Drive	30% mix based on Quay St	70% mix based on Berkeley St	Total Demand kVA
No. of Apartments	237	71	166	
No. of Rooms	488	146	342	
No. of Beds	635	191	445	
GFA	14000	4200	9800	
Ave.Beds per Apartment	2.68			
Average KVA Demand		232	417	649
kVA/ Apartment		3.26	2.52	
kVA / Room		0.60	2.49	938
kVA/ per bed		0.60	1.70	870
kVA/GFA		0.02	0.07	732

1.8 Further Considerations

Following a site visit to the Urnbanest Quay street facility, the following items were noted coupled with discussions held with the Operations Manager.

- The air-conditioning system is shut down 4 times a day to ensure if someone has left the AC on accidentally; the unit will be switched off.
- All corridors were fitted with motion sensors to switch lights “off” when there was no one on the floors.
- The traffic movement of students during 8 am to 5 pm varied and with the type of studies, cultural backgrounds, age and gender.
- By 8.30 am the facility was less than 50% occupied.
- Most of the washing and drying was done between the hours of 10 pm and 4 am.
- The main entry foyer areas were fitted with halogen type of lamps which drew more power when compared with SICEEP, all fittings will be LED’s.
- All other rooms were fitted with fluorescent oyster fittings, when compared with SICEEP, all fittings will be LED’s.
- The majority of the students did not cook meals, and mainly dined out.
- Based on the above, there are huge diversity factors to be considered that would support the actual measured electrical demand of the Quay street facility.



LOCATED AN CONNECT
TO EXISTING SEWER MAN
HOLE INVERT LEVEL TO
BE CONFIRMED

450mm SWC SEWER MAIN
UPSTREAM DEPTH TO
INVERT: 5400

ANTICIPATED LOCATION
OF NEW DN 225 SEWER

SUBJECT TO PROTECTION
TO SWC REQUIREMENTS

1000mm SWC GRP SEWER MAIN

812 x 1219mm SWC BRICK SEWER MAIN
DOWNSTREAM DEPTH TO INVERT: 5000

INDICATIVE LOCATION
OF RELOCATED DN
500mm WATER MAIN

NEW DN 200mm WATER
MAIN TO SERVICE THE
NEW DEVELOPMENT

NEW DN 100mm DOMESTIC COLD
WATER & NEW DN 150mm FIRE
SERVICE FOR EACH TOWER

NOTE:
1- THESE WORKS ARE CONSIDER AS
SITE INFRASTRUCTURE AND PART
OF LEND LEASE WORKS
2- THESE HAVE BEEN COORDINATED
AND AMENDED TO SUIT HYDER
CONSULTING REQUIREMENTS

2	COORDINATION WITH HYDER CONSULTING		
1	PRELIMINARY ISSUE		
REV	AMENDMENT		
Date:	11.04.2013	Project No:	130157
Project:	URBANEST DARLING HARBOUR		
Title:	INFRASTRUCTURE		
Drawing No:	SK-H-01	Revision:	2
Drawn:	GR-SM	Scale:	N/A

LEGEND

- Existing Gas Main
- Existing Water Main
- Existing Sewer Main
- Proposed Water Main Upgrade
- Proposed Sewer Main Extension
- Fire Hydrant Main
- Fire Sprinkler Main
- Gas Main
- Water Main
- Footpath Isolation Valve
- Isolation Valve
- Monitoring Valve
- Water Meter
- Gas Meter
- Gas Regulator
- FRNSW Booster
- FRNSW Suction Point
- Anticipated definition line between site infrastructure and building works

DARLING DRIVE

FIRE BRIGADE AND SPRINKLER BOOSTER ARRANGEMENT TO COMPLY WITH AS2419.1 AND AS2118.1. CABINET MINIMUM DIMENSION 4000x1000mm DEEP. BOOSTER TO BE LOCATED 10m AWAY FROM ELECTRICAL SUBSTATION. LOCATION SUBJECT FRNSW APPROVAL

PROPOSED Ø150mm SEWER MAIN EXTENSION (BY OTHERS)

PROPOSED Ø200mm WATER MAIN EXTENSION (BY OTHERS)

PROPOSED GAS MAIN EXTENSION (BY OTHERS)

PROVIDE 1500(L)x650(D)x1500(H) RECESS FOR GAS REGULATOR TO AUTHORITIES APPROVAL

BOUNDARY TRAP LEVELS TO FUTURE DETAILS

UNDERGROUND LAUNDRY LINT TRAP AND COOLING PIT TO MANUFACTURES SPECIFICATION

LOWER SECTION OF BUILDING FIRE RELAY PUMP ROOM. PROVIDE ACCESS FROM FIRE STAIRS. NOTE LOCATE PUMPS AT REAR OF BOOSTER ASSEMBLY MIN AREA 24m²

Ø19mm x 36m LONG FIRE HOSE REEL TO COMPLY WITH AS2441 AND BCA

FIRE HYDRANT AND SPRINKLER MAIN WITHIN FIRE STAIRS

PROPOSED LOCATION OF FIRE CONTROL ROOM PROVIDE DIRECT ACCESS FROM STREET. 10m² MIN. AREA (STC)

OPTION 2 HOT WATER SYSTEM (TBC) TRIGEN/COGEN PLANT MIN. AREA 18m²

PROPOSED 30m³ ABOVE GROUND RAINWATER REUSE TANK TO BE CONFIRMED

DOMESTIC AND RAINWATER REUSED PUMP ROOM. RW PUMPS SUBJECT TO CONFIRMATION.

WATER/GAS METER AND REGULATOR ROOM. LOCATION SUBJECT TO AUTHORITIES APPROVAL. GAS REQUIREMENT TBC

LIGHT RAIL ALIGNMENT

LIGHT

RAIL

LIGHT

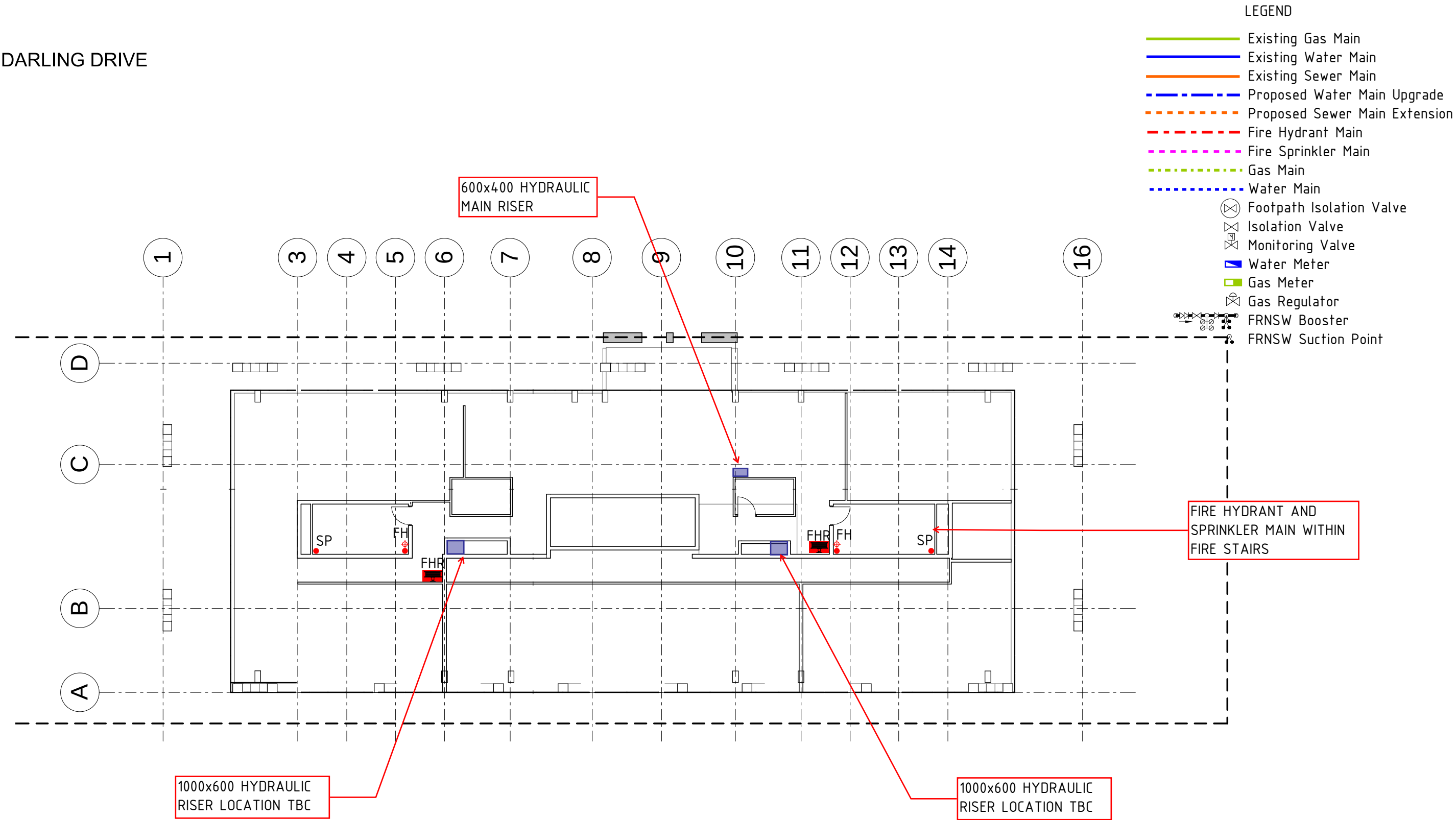
RAIL

EDGE OF RAIL

AWAITING NEW ARCHITECTURAL LAYOUTS

Date:	11.04.2013	Project No:	130157
Project:	URBANEST DARLING HARBOUR		
Title:	GROUND LEVEL		
Drawing No:	SK- H- 02	Revision:	2
Drawn:	GR- BL	Scale:	N/A
			

DARLING DRIVE



AWAITING NEW ARCHITECTURAL LAYOUTS

Date:	11.04.2013	Project No:	130157
Project:	URBANEST DARLING HARBOUR		
Title:	FIRST FLOOR		
Drawing No:	SK-H-03	Revision:	2
Drawn:	GR-BL	Scale:	N/A

Urbanest Haymarket
FIRST FLOOR (L2)

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DARLING DRIVE

LEGEND

- Existing Gas Main
- Existing Water Main
- Existing Sewer Main
- Proposed Water Main Upgrade
- Proposed Sewer Main Extension
- Fire Hydrant Main
- Fire Sprinkler Main
- Gas Main
- Water Main
- Footpath Isolation Valve
- Isolation Valve
- Monitoring Valve
- Water Meter
- Gas Meter
- Gas Regulator
- FRNSW Booster
- FRNSW Suction Point

1000x800 HYDRAULIC MAIN
RISER SERVICES (TBC)
CW/HW/HWR/NPCW(TBC) AND
DOWN PIPES

HOT WATER RING MAIN TO
BE CONFIRMED

SANITARY RISER 200x200
EXACT LOCATION TBC WITH
WET AREAS FUTURE DETAILS

SANITARY RISER 200x200 EXACT
LOCATION TO SUIT PRE- FABRICATED
PODS LOCATION

AWAITING NEW ARCHITECTURAL LAYOUTS

Date:	11.04.2013	Project No:	130157
Project:	URBANEST DARLING HARBOUR		
Title:	SECOND FLOOR (TYPICAL)		
Drawing No:	SK-H-04	Revision:	2
Drawn:	GR-BL	Scale:	N/A
NORTHROP			

Urbanest Haymarket
SECOND FLOOR (L3)

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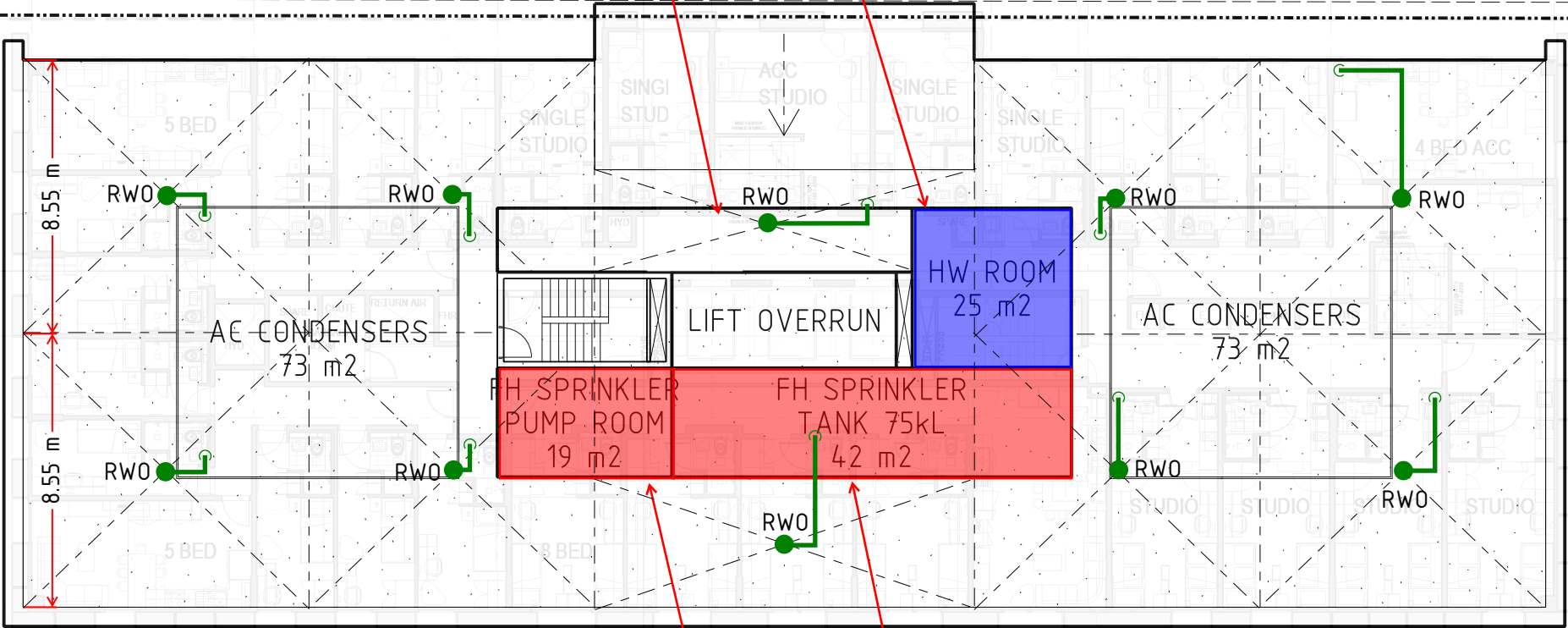
DARLING DRIVE

LEGEND

- Existing Gas Main
- Existing Water Main
- Existing Sewer Main
- Proposed Water Main Upgrade
- Proposed Sewer Main Extension
- Fire Hydrant Main
- Fire Sprinkler Main
- Gas Main
- Water Main
- Footpath Isolation Valve
- Isolation Valve
- Monitoring Valve
- Water Meter
- Gas Meter
- Gas Regulator
- FRNSW Booster
- FRNSW Suction Point

OPTION 1 HOT WATER
PLANT ROOM. MIN
AREA 18m²

DOMESTIC TANK NOT
REQUIRED.



LIGHT RAIL ALIGNMENT

AWAITING NEW ARCHITECTURAL LAYOUTS

50,000L EFFECTIVE CAPACITY
COMBINE FIRE HYDRANT AND
FIRE SPRINKLER TANK

FIRE HYDRANT (UPPER SECTION)
AND SPRINKLER SYSTEM PUMP
ROOM. PROVIDE DIRECT ACCESS
FROM FIRE STAIRS

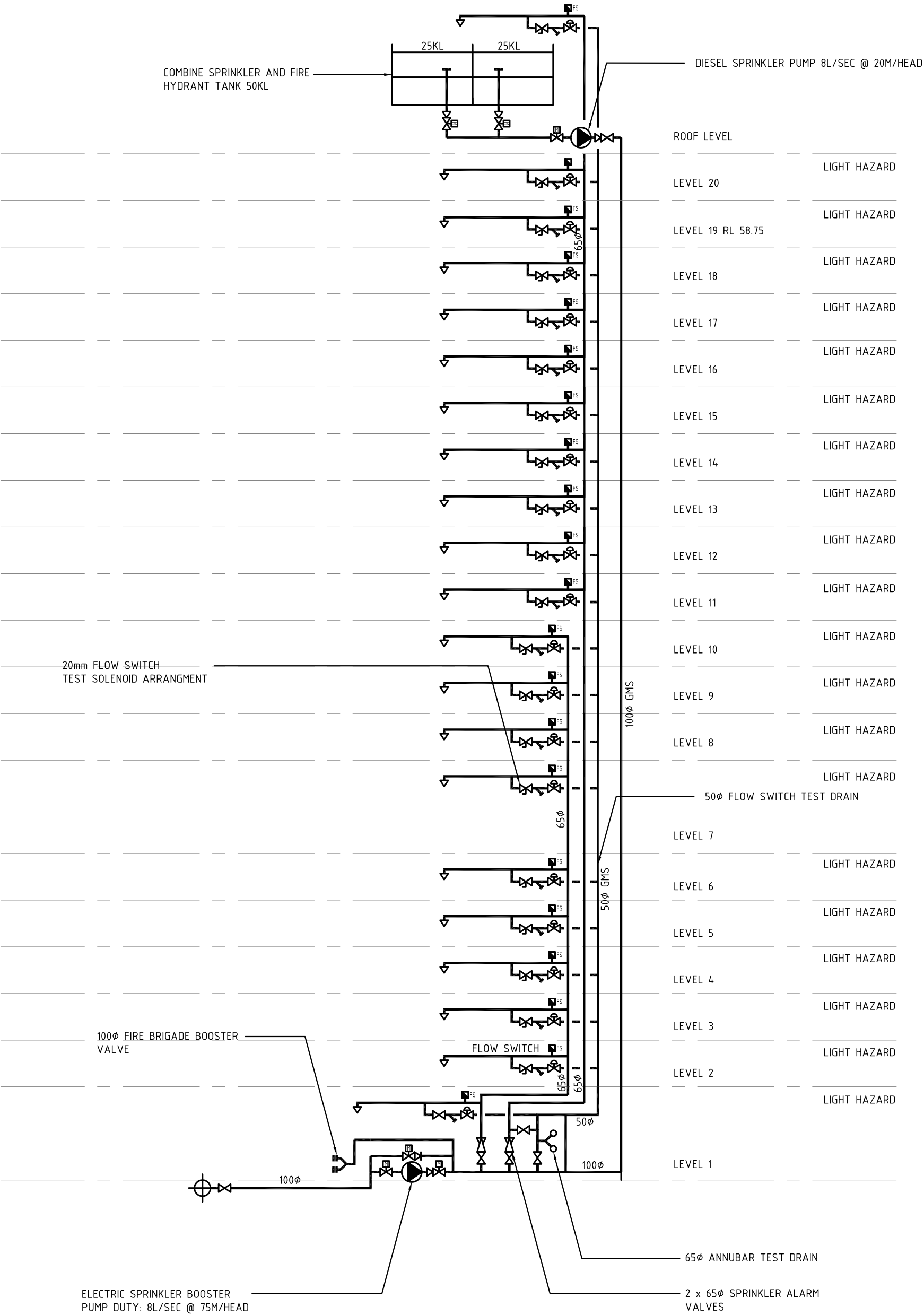
Urbanest Haymarket
ROOF PLAN (L19) - REV 04

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Date:	11.04.2013	Project No:	130157
Project:	URBANEST DARLING HARBOUR		
Title:	ROOF LEVEL		
Drawing No:	SK-H-05	Revision:	2
Drawn:	GR-BL	Scale:	N/A
NORTHROP			

12023 1:200 at A3 8/04/2013

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Date:	12.04.2013	Project No:	130157
Project:	URBANEST, DARLING HARBOUR		
Title:	FIRE SPRINKLER SCHEMATIC		
Drawing No:	SK-H-07	Revision:	2
Drawn:	SM	Scale:	NTS
 NORTHROP			