RESPONSE

TO THE

DESIGN REVIEW PANEL REPORT

DATED FEBRUARY 2010

FOR THE

PROPOSED

COMMERCIAL DEVELOPMENT

KNOWN AS SY3

AT

NO 639 GARDENERS ROAD MASCOT

This Response has been prepared by James Nangle of Planning Strategies Pty Ltd

February 2nd 2010

1.0 INTRODUCTION

The revised application for the proposed development known as SY3 at No 639 Gardeners Road Mascot was referred by the Council to the Design Review Panel for further consideration and their additional report was received in January 2010

The matters raised therein are discussed below

2.1 CONTEXT

We strongly agree the architectural and pedestrian ambience is important in relation to the development and we have considered the relatively new existing residential development on the adjoining site and surrounding environment in the design of the Equinix data centre. See our response to one aspect of this issue in 2.3(b)

2.2 SCALE

Item: 'Satisfactory Except for south-east corner'

Resolution: The scale of the proposed development in the south east corner has been reduced as requested. The 3.0 metre high perimeter parapet wall to the south east corner has been moved back as far as possible to reduce the bulk and scale without compromising the acoustic requirements of the building. The acoustic treatments to the proposed building remain the highest standard. There has been no compromise in the noise attenuation measures as a result of the design change.

The setback of the parapet will reduce the visual bulk as requested and improves the amenity of the adjoining residential units. It is proposed to finish this baffle wall so that it blends more with other background structures (see revised detailed Architectural drawings)

Even though the current overshadowing complies with the DCP, the revised setback of the wall will also increase the amount of sunlight which will be provided toe the residential units.

Please refer to the attached sketches from the Drew Dickson Architects for further details.

2.3 BUILT FORM

Item: South east corner visual bulk and neighbour amenity

Resolution : a) As advised above in Scale the overall height of the screen wall along the south east corner of the proposed development is reduced at the boundary by 3.0 metres by setting back as far as possible. for –

- A length of 6.8 metres in a westerly direction and for
- A length of 14.5 metres in a northerly direction

Access to the roof is now via access hatch and ladder.

Item: Public Art or Streetscape Activation

Resolution b) The Proposed Data Centre has currently proposed a level of public Art in the way of Bollards which are shown on the Landscape documents running along Bourke Street and Gardeners

Road. Should this not be considered activation the Client is willing to reduce the quantity of bollards shown and proposes to create a public art feature as recommended in the May 2009 DRP (Ref:29A0529) at the Gardeners Road setback by way of a 'pictorial depiction of local history' and will allocate $ 50,000 for the design, fabrication and installation of such artwork. We suggest this $50,000 public art contribution be a conditional approval.

This will aid in providing variety and interest at footpath level for pedestrians

The applicant explored the option raised by the Design Review Panel of building a cafe or retail outlet on the corner. Unfortunately it was not commercially viable. Some reasons that work against the retail option are that there is no street parking, there are current retail vacancies in the vicinity and the passing trade was too small. Accordingly the public art option raised by the Design Review Panel was chosen as the preferred option.

2.4 DENSITY

Noted – No further comment required

2.5 RESOURCE, ENERGY AND WATER EFFICIENCY

Item: Information does not adequately indicate intentions

Resolution: The proposed development is proposing to capture and reuse over 70,000 litres of rainwater harvesting and an additional 70,000 of On Site Detention(OSD) The proposed development has other water saving design features such as waterless urinals, low flow fixtures and fittings to save water.

Many other environmental initiatives, including energy efficiency measures, are proposed to be implemented. These can be reviewed in the ARUP report which has been revised and attached to address all issues identified in the Botany Local Environmental Plan 1995-REG22.

2.6 LANDSCAPE

Item: Accepted, additional removal requested

Resolution; We acknowledge the DRPs acceptance of the proposed removal of the existing trees. We also accept the request to remove trees '25 and 26'. The request to extend the eucalypt planting closer to the corner will be implemented in the revised landscape plans submitted prior to the construction certificate.

we're still waiting amended info re: trees

2.7 AMENITY

Item: No provision of Amenity facilities within the building.

Resolution: The proposed data centre will have a very small number of staff working within the building. As this proposed facility is located adjacent to the existing two data centre stages the staff who are monitoring and operating within the existing facilities will be supplemented to assist with the SY3 proposed development operations. The existing facilities have a lounge and outdoor BBQ area which all staff will be able to access.

Within the proposed building is a lounge area which is to include kitchenette, vending machines, lounges and will be available for all staff. This is located on the Mezzanine Level and is approximately 40 metres square.

These existing and proposed facilities may not have been known to the Design Review Panel at the time. Accordingly, when the site is considered as a whole the issues of amenity and common open space are considered adequate.

Item: Location of the new building

Resolution: The overshadowing of some apartments within the adjoining mixed use development to the east must be considered against the proposed development's compliance with the Council's Energy Efficiency DCP in that the proposed commercial building does not materially increase overshadowing to adjoining properties and reduce solar access to these buildings

However it is proposed to reduce the overall height of the proposed building at the south east corner and this will further reduce overshadowing in the afternoon

In terms of separation of built forms it is noted that the proposed eastern and southern faces of SY3 are a minimum of between 19.65-31.77 metres from the adjoining mixed use buildings and this complies with the DCP requirement

The eastern and southern elevations of SY3 can be treated to provide some articulation and modulation within the overall façade. The proposal is attached and will be developed with the architect in terms of colours and textures prior.

The DRP accept the height and scale of the development, apart from the south east corner and therefore visual impacts is within reasonable parameters. Given the highly technical requirements and layout of the data centre it is not feasible to move the building.

Item: Treatment of the 8 parking spaces

Resolution: The applicant accepts the Design Review Panel's recommendation that there should be at least a 1 metre wide planting strip with the construction of a 3 metre masonry wall on the boundary. The plans will be amended accordingly.

2.8 SAFETY AND SECURITY

Item: Ensure good lighting and considered landscape

Resolution: Reasonable lighting will be provided to all paths and driveways of the proposed development which will also ensure no adverse 'spill over' effect to adjoining residential developments . The Landscape of Gardeners road will also address the request to keep native shrub planting to a metre in depth against the building.

2.9 SOCIAL DIMENSIONS

Noted – no further action required

2.10 AESTHETICS

Item: Eastern Elevation is bland

Resolution: The eastern and southern elevations of SY3 can be treated to provide some articulation and modulation within the overall façade. The proposal is attached and will be developed with the architect in terms of colours and textures prior.

The revised plans prior to Construction Certificate will address and resolve the issues raised by the DRP

3.0 CONCLUSION

The applicant has responded positively to the comments raised by the Design Review Panel. The revised plans and commitments directly addressed the vast majority of the Panel's issues. I believe the revisions have resolved all potential issues of concern particularly in terms of improved amenity.

Equinix

Equinix SY3

BOTANY LOCAL ENVIRONMENTAL PLAN 1995 - REG 22

ISSUE 1

Equinix

Equinix SY3

BOTANY LOCAL ENVIRONMENTAL PLAN 1995 - REG 22

Greenhouse effect, global warming, air and water pollution and energy efficiency etc

January 2010

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Job number 206522

ARUP

Document Verification

Job title	Equinix SY3	Job number	206522
Document title	BOTANY LOCAL ENVIRONMENTAL PLAN 1995 - REG 22	File reference	

Document ref

Revision	Date				
Draft 1	05/11/09	Filename	0003Energy Efficiency Report.doc		
		Description	First draft		
			Prepared by	Checked by	Approved by
		Name	CB	THM	THM
		Signature			
Issue 1	27/01/10	Filename	0006Energy Efficiency Report.doc		
		Description			
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		Name	CB	THM	THM
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		Name			
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Issue Document Verification with Document ✓

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1 Executive Summary

The proposed internet exchange facility for Equinix Australia PTY LTD at Unit A, 639 Gardeners Road Mascot, NSW, incorporates a number of measures to increase energy efficiency and reduce waste production and are summarised below:-

- Airside economy cycle reduces the usage of the data centre's chilled water cooling system and significantly increases the overall energy efficiency of the system compared to traditional data centres.
- Fans and pumps will be installed with variable speed drives to increase energy efficiency and reduce electrical consumption.
- High efficiency water cooled centrifugal type chillers to increase energy efficiency and reduce electrical consumption..
- The air emissions and liquid discharges during the normal operation of the data centre are not considered pollutants as no chemicals or toxic gases are being emitted.
- Provision of 150,000 Litres of combined On Site Detention (OSD) and rainwater harvesting storage. 70,000 Litres will be dedicated to serve the data centre cooling towers and reduce the cooling tower water consumption by 8.9% per annum.
- Waterless urinals and dual flush W.C.s to further reduce water consumption.
- Intelligent lighting control systems to reduce electrical consumption of the lighting system.

Other low carbon and renewable technologies were considered for the project and are summarised below:-

- Combined Heat and Power (CHP) was considered, however is not viable due to the building's base electrical load being very low compared to its peak load due to the use of the airside economy cycle.
- Photovoltaic cells were considered, however due to the high energy density of the data centre, the amount of cells required would not be spatially feasible and the payback of such an investment would make the project unviable. However the building roof structure has been designed to accommodate the weight of photovoltaic cells if the building use was changed in the future.

2 Introduction

This report provides a summary of the measures taken to increase energy efficiency and reduce air and water pollution for the project Equinix Australia PTY LTD at Unit A, 639 Gardeners Road Mascot, NSW. The project involves the construction of a new facility on Equinix's current site to provide a third data centre housing up to 990 data cabinets, associated plant areas and supporting office accommodation.

3 Energy Consumption

Commercial data centres consume a large portion of electricity, however there are a number of measures that can be taken in order to reduce the energy consumption and provide a facility which runs at increased efficiency levels. Some of the common measures include the use of economy cycles, alteranative energy sources and Combined Cooling, Heat and power plants.

3.1 Economy Cycles

Economy cycles are an efficient means of using the outside conditions to reduce energy consumption. The two main types of economy cycles include airside economy cycles and waterside economy cycles.

3.1.1 Airside Economy Cycles

Airside economy cycles take advantage of outside air conditions to cool the data centre instead of running the chillers. When outside air temperatures are equal to or lower than the supply air temperatures, the amount of outside air is increased to suit. In turn, the amount of cooling necessary to achieve the desired room conditions is decreased.

An Airside economy cycle has been used for this project. The data centre is cooled with the use of Air Handling Units (AHUs). When outside air conditions are favourable, the outside air damper modulates to increase outside air quantities and thus allowing the return air system to operate as a heat exhaust system. This results in a decrease in the cooling requirements of the chiller and hence reduced energy consumption.

3.1.2 Waterside Economy Cycles

In a waterside economy cycle, the evaporative cooling capacity of the cooling towers is used as a means to produce chilled water. The condenser water circuits and chilled water circuits are arranged such that when the outdoor conditions mild enough, the chiller is by-passed and the condenser water is diverted to a heat exchanger which is linked to the chilled water circuit. This maintains the separation between the two circuits whilst taking advantage of the lower condenser water temperatures. The waterside economy cycle can be used for chilled water circuits which have flow temperatures of 10°C or higher.

Waterside economy cycles were not considered as climatic conditions do not favour this application and increase water consumption due to the requirement to operate the cooling towers for longer periods of the year.

3.2 Energy Sources

Renewable energy sources such as solar energy, wind power, tidal power energy, geothermal energy, hydroelectric power etc can be used in lieu of non-renewable energy sources. However the use of such alternative energy sources is highly dependant of the location of the data centre and the feasibility of using such sources.

Renewable energy sources were not considered as available space on site for such an application would not produce significant energy to meet the building's energy requirements and hence this was not a feasible option.

If the building use is changed in the future to a low energy density type i.e. office, light industrial, the north facing pitched roof could be converted into a photovoltaic collector array without significant structural changes as the roof has been designed to support high level services which would become redundant if the building use changes.

Another alternative is the use of Combined Cooling, Heating and Power plants (CCHP) where electricity, cooling and heat are produced from a single fuel source. CCHP plants can be used when there is sufficient waste heat. The waste heat is used to provide hot water and is used as the heat energy input required to serve absorption type chillers. CCHP plants are most efficient in data centres which use Computer Room Air Conditioning (CRAC) units to provide cooling for the data cabinets because in a CRAC unit system, the base load and peak load are similar as can be seen in Graph 2. With an AHU economy cycle system, the peak load and the base load vary considerably (Graph 1), therefore the use of CCHP plant in this scenario is not cost effective due to the amount of waste heat that is required to be rejected when the economy cycle is in operation.

3.3 Efficient Equipment

The second main consumer of energy in data centres is the cooling equipment which includes chillers, cooling towers, pumps, fans, etc. The use of high efficiency equipment reduces the energy consumption and hence the production of greenhouse gases.

High efficiency equipment have been specified for this project. This includes high efficiency pumps for the chilled water and condenser water circuits and fans.

Cooling towers generally run at condenser water flow/return temperatures of 29.5°C/35°C. In order to improve efficiency, the difference between the condenser water flow temperature and the wet bulb temperature of the outside air (24°C WB) is reduced. High efficiency cooling towers run at condenser water flow temperatures which are between 3°C to 4°C higher than the outside air wet bulb temperature. The condenser water flow/return temperatures for the new facility are designed at 28°C/35°C.

The Air Handling Units (AHUs) have been designed so that the pressure drop across the cooling coil is reduced compared to standard AHUs. This results in a lower external static pressure seen by the AHU fan and hence reducing the power consumption of the fans. Also the fans will be installed with variable speed drives to reduce energy consumption.

Similar approaches have been considered for the condenser water and chiller water circuits. A reduction in overall external static pressure has reduced the amount of energy consumed by the pumps.

The chillers used for this project are based on chilled water flow/return temperatures of 10°C/18°C. With higher chilled water temperatures, the chiller efficiency increases as the net refrigeration effect decreases resulting in a higher coefficient of performance.

The control of all lights within the facility will be managed by an intelligent lighting control system to minimise electrical consumption of the building's lighting system. The lighting control system will provide control via local switch, local passive infrared detection, time clock scheduling and / or central colour touch screens.

4 Potential Air and Water Pollution

4.1 Gaseous Emissions

During the normal operation of the data centre, the gaseous discharges will include general air exhaust, plant room air exhaust and cooling tower evaporation exhaust. The cooling tower will operate and be maintained according to AS/NZS 3666 eliminating the potential for

potential air pollution along with particulate growth. The plantroom and general exhaust systems do not contain any harmful pollutants.

In the event of a power outage, the diesel generators will run until power is restored from the Energy Australia (EA) supply grid. The expected quantity and quality of the gaseous discharge is dependant on the type of diesel engine and the duration of the power outage.

Table 1 below shows the measured emissions per second of running time for the selected diesel generator. The diesel generator was tested at 25°C ambient conditions in accordance with standard DIN ISO 3046 Reciprocating internal combustion engines - Performance.

Gas Emissions at 5% O_2	
Nitric Oxide NO_X	34800 mg/s
Carbon Monoxide CO	1740 mg/s
Unburned Hydrocarbons	870 mg/s
Particulate (Soot)	290 mg/s
Formaldehyde	348 mg/s

Table 1- Gas Emissions for Diesel Generator

4.2 Liquid Discharges

Liquid discharges include condensate drainage from the air conditioning equipment and cooling tower water flushing. These discharges are not deemed pollutants.

The cooling tower water discharge must be in accordance with the NSW Code of Practise for the Control of Legionnaires' Disease. Biocides used in the water treatment process must conform to the American Society for Testing and Materials standards ASTM E 645 Standard test method for efficacy of micro biocides used in cooling systems and ASTM E 1427 Standard guide for selecting test methods to determine the effectiveness of antimicrobial agents and other chemicals for the prevention, inactivation and removal of biofilm.

Approval for discharge of treated water into sewage reticulation systems must be obtained from the relevant water authority

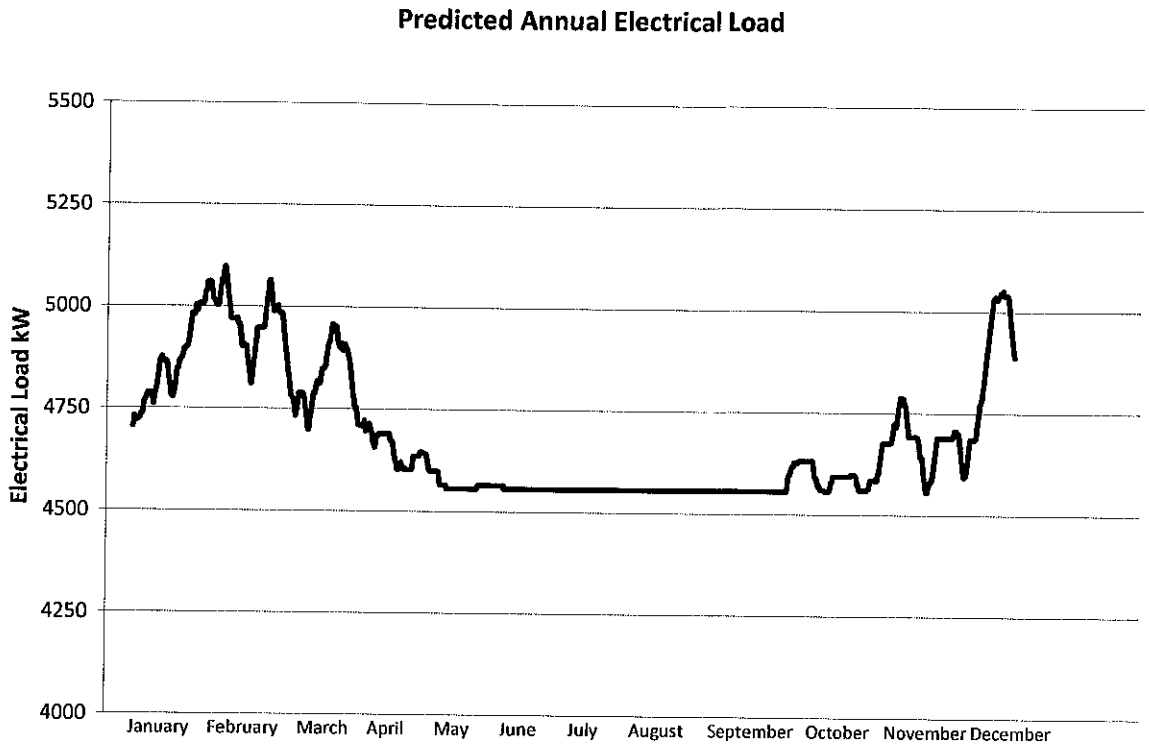
4.3 Future Emissions and Discharges

The air emissions and liquid discharges of the new facility will remain consistent throughout the operation of the data centre. It is not anticipated that this will change without a change in use of the development which would require council consent.

5 Energy Efficiency and Energy Conservation

5.1 Energy Consumption

The facility will consume a peak load of 5.3 megawatts (MW). This will only be seen in the warmer months as free cooling (due to the airside economy cycle) will not be viable. The base load seen by the facility will be 4.55MW. The electrical load is based on the summation of the absorbed power of the chiller, computer room air conditioning units (CRAC), air handling units, fans, pumps, cooling towers, equipment racks, lighting and uninterrupted power systems.



Graph 1- Predicted Energy Consumption of Data Centre

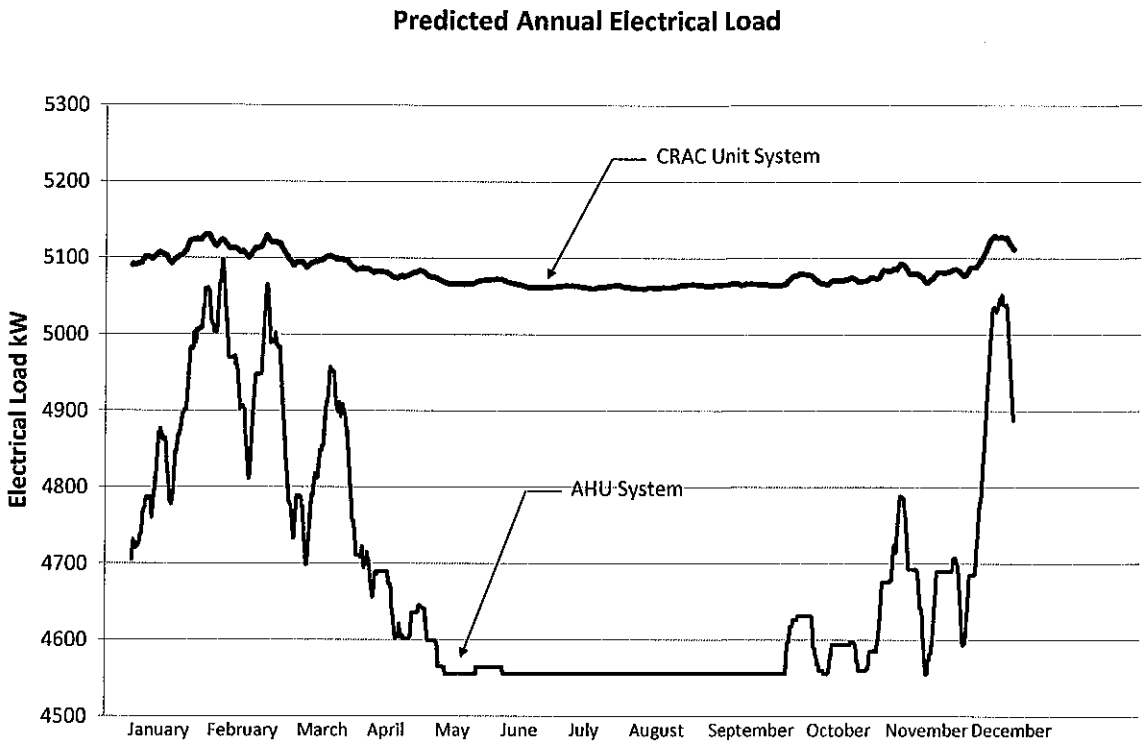
The above graph identifies the predicted energy consumption of the data centre on an annual basis.

5.2 Minimised Energy Requirements

The new data centre facility aims at reducing energy requirements with the use of a well insulated building envelope hence reducing the heat gains through the façade.

The level of insulation will achieve or exceed the requirements of the Building Code of Australia Part J.

The main reduction in energy requirements is the use of the AHU arrangement in lieu of multiple CRAC units. Graph 2 shows the predicted energy consumption of both systems. The CRAC unit electrical load is significantly higher throughout the winter months and does not fluctuate in comparison to the AHU system electrical load.



Graph 2- Energy Consumption Comparison

6 Soil and Groundwater Contamination

During regular operation, the data centre does not provide a potential risk for soil and groundwater contamination. Potential risks would be due to the very rare event of a failure of equipment used in the facility. This might include refrigerant leakages, battery cell leakages and overheating and failure of equipment racks.

7 Waste Minimisation and Reuse

The new facility will provide capacity for 150,000 Litres of combined On Site Detention (OSD) and rainwater harvesting storage with 70,000 Litres allocated for rainwater harvesting. A series of 15,000 Litre tanks will be located on the northern façade of the building with screening to match the exterior of the building.

The rainwater harvesting will be dedicated to supply the data centre cooling towers which will be a significant consumer of water on the site.

Below shows a summary of the rainwater collected over a typical year and the water demand for the cooling towers.

Rainwater	Rainwater tank size	70000	Litres
	Roof area	3650	m2
	Annual rain fall	1213.3	mm
	Total Rainwater potential (95% Collection)	4207.1	m3/year
Cooling towers	Max peak cooling tower load	3	l/s
	Max 24 hour load (80% peak over 24 hours)	207.36	m3/day
	Average annual 24 hour load (50% peak over 24 hours)	129.6	m3/day
	Average Annual load	47304	m3/year

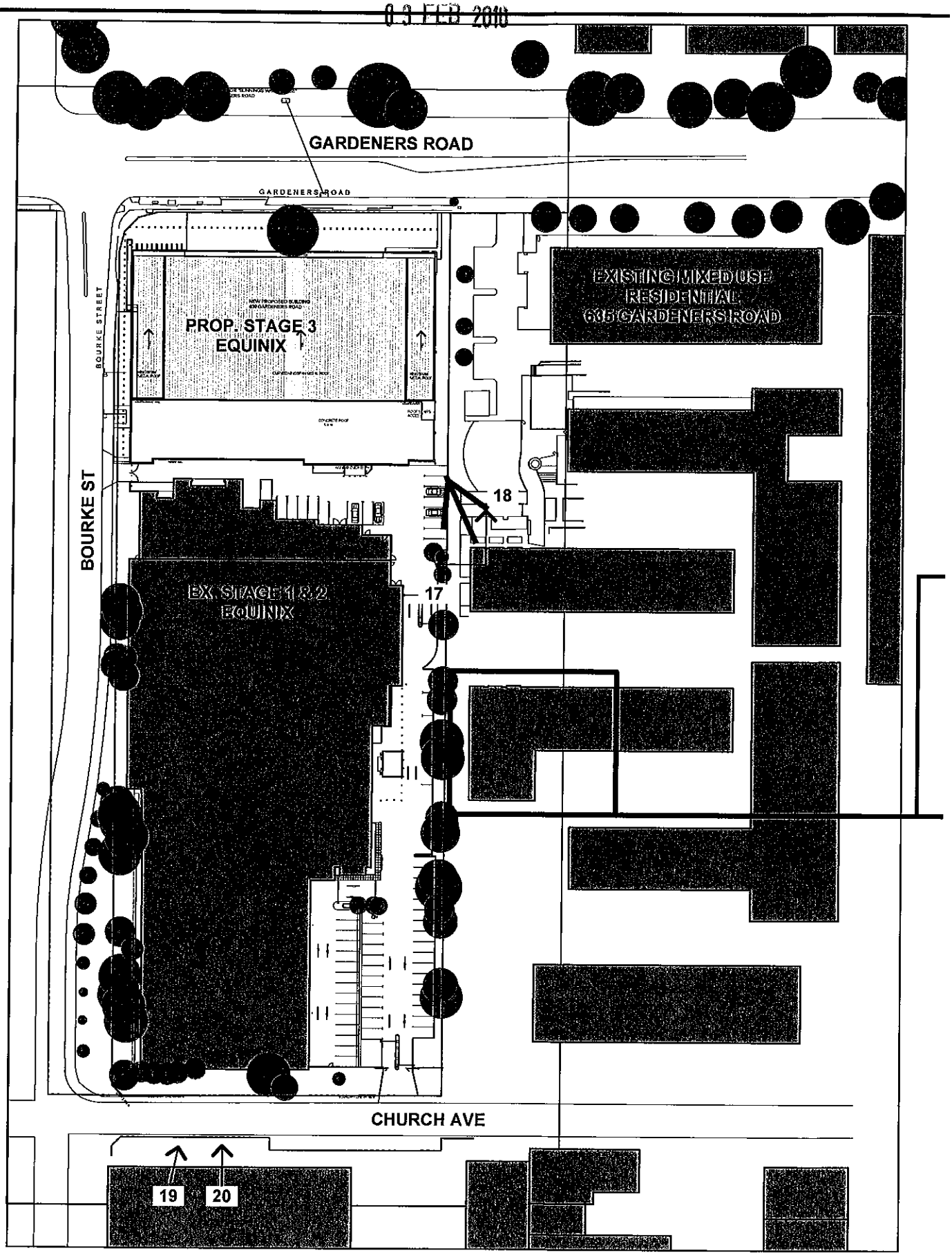
Month	Rainfall mm/month	
Jan	102.8	
Feb	116.9	
March	130.8	
April	125.7	
May	122.3	
June	128.1	
July	97.8	
Aug	81.5	
Sep	69.4	
Oct	77.3	
Nov	83	
Dec	77.7	
Total	1213.3	mm/year

The cooling tower load is drawing 24 hours a day and is greater then the peak rainfall event therefore it can be concluded that all rainfall can be used by the colling towers

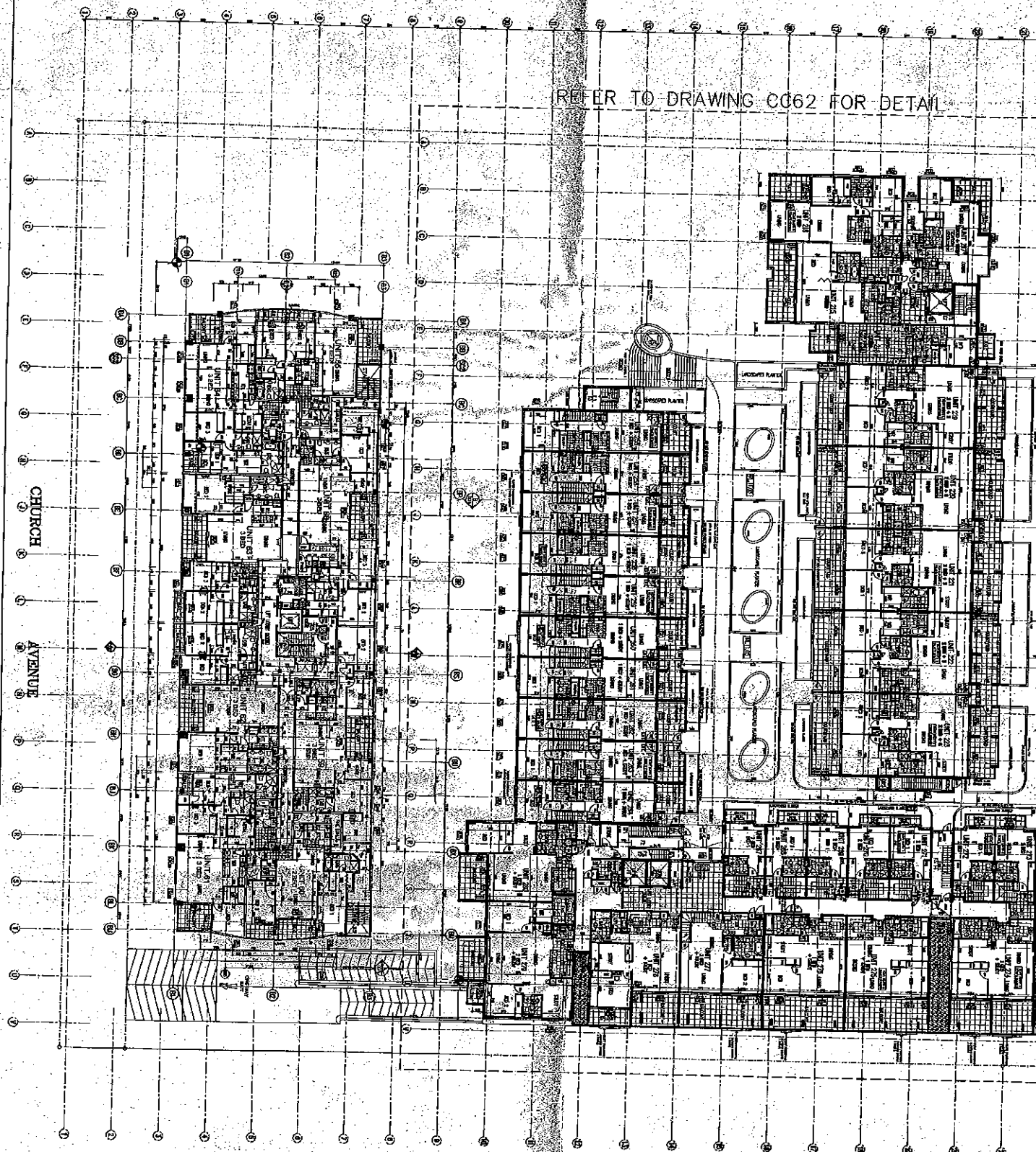
Utilisation	Rainwater can meet	8.9	% of the cooling tower load

Table 2- Water Demand Analysis

Also waterless urinals will be installed to further reduce the water consumption of the development.



SITE PLAN - PROPOSED DEVELOPMENT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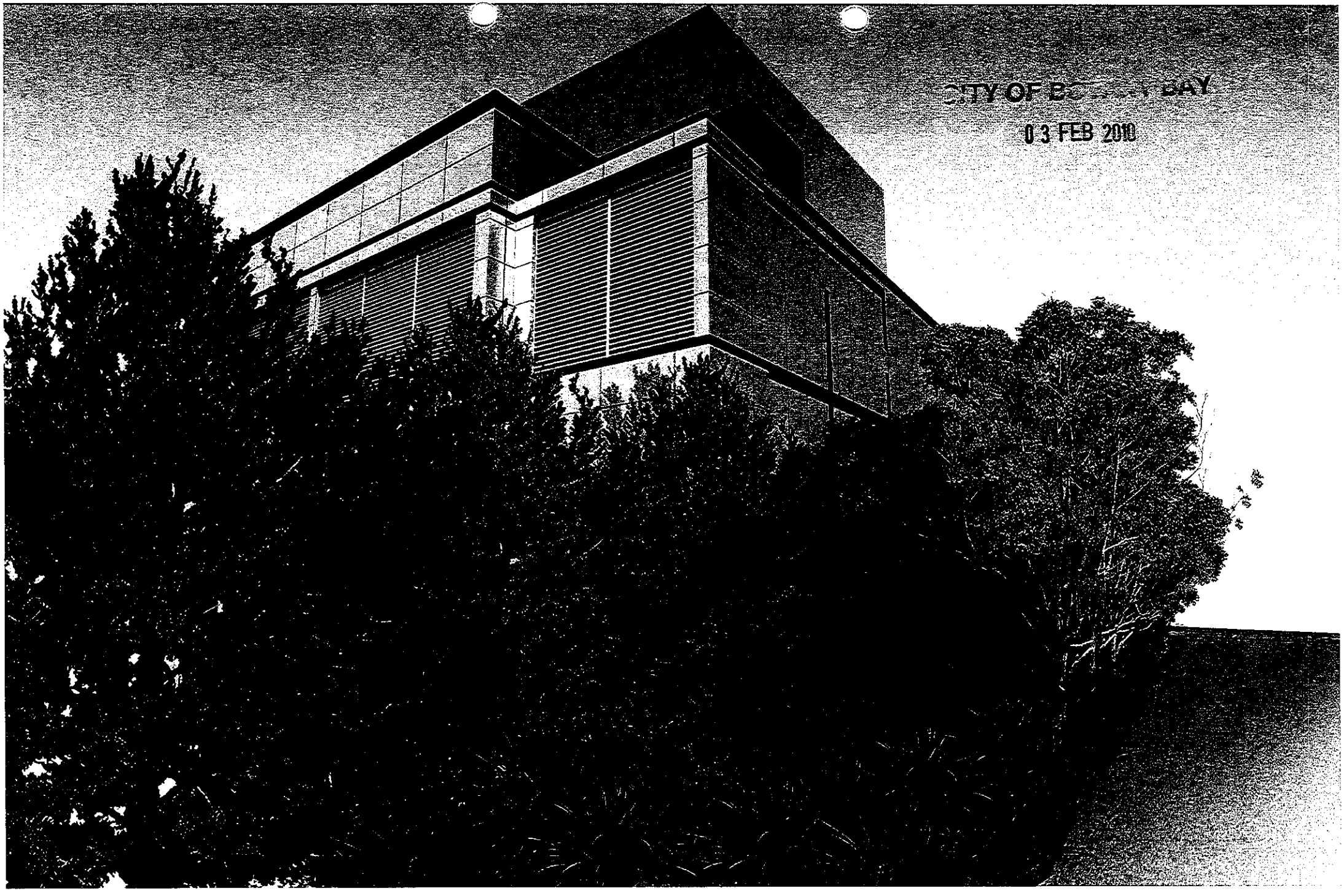
CHURCH
AVENUE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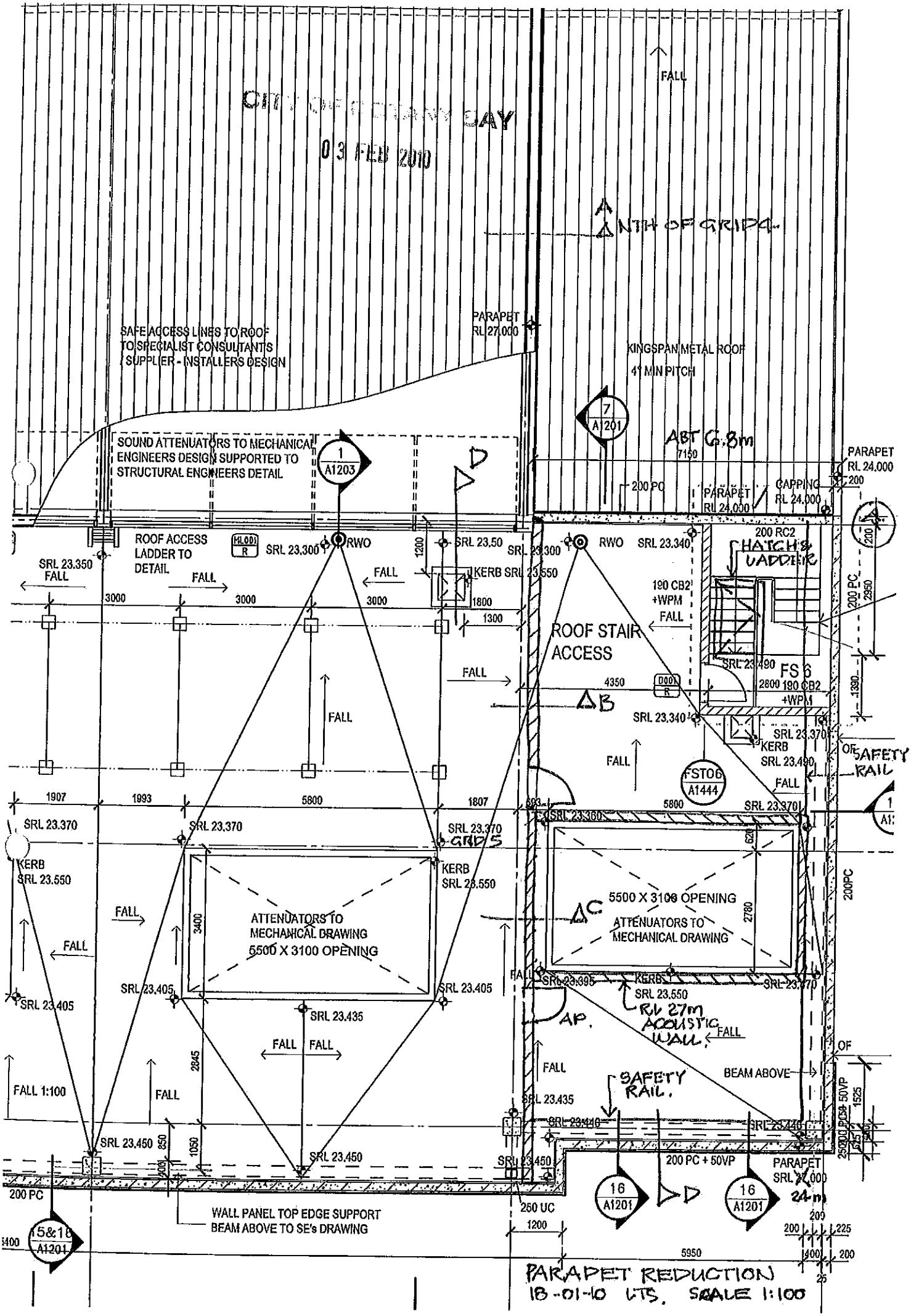
03 FEB 2010


03 FEB 2010
NTH OF GRID A
FALL
SAFE ACCESS LINES TO ROOF
TO SPECIALIST CONSULTANTS
/ SUPPLIER - INSTALLERS DESIGN
PARAPET
RL 27.000
KINGSPAN METAL ROOF
4° MIN PITCH
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A1201
ABT 6.8m
7150
SOUND ATTENUATORS TO MECHANICAL
ENGINEERS DESIGN SUPPORTED TO
STRUCTURAL ENGINEERS DETAIL
1
A1203
D
200 PC
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RL 24.000
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3000
1800
1300
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SRL 23.370
KERB
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GRID 5
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KERB
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RL 27m
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2845
SAFETY
RAIL.
BEAM ABOVE
OF
SRL 23.435
SRL 23.440
SRL 23.440
SRL 23.450
SRL 23.450
SRL 23.450
850
1050
200 PC + 50VP
PARAPET
SRL 24.000
200 PC
250 UC
1200
WALL PANEL TOP EDGE SUPPORT
BEAM ABOVE TO SE's DRAWING
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A1201
16
A1201
15&16
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24m
200
200
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400
200
5950
25
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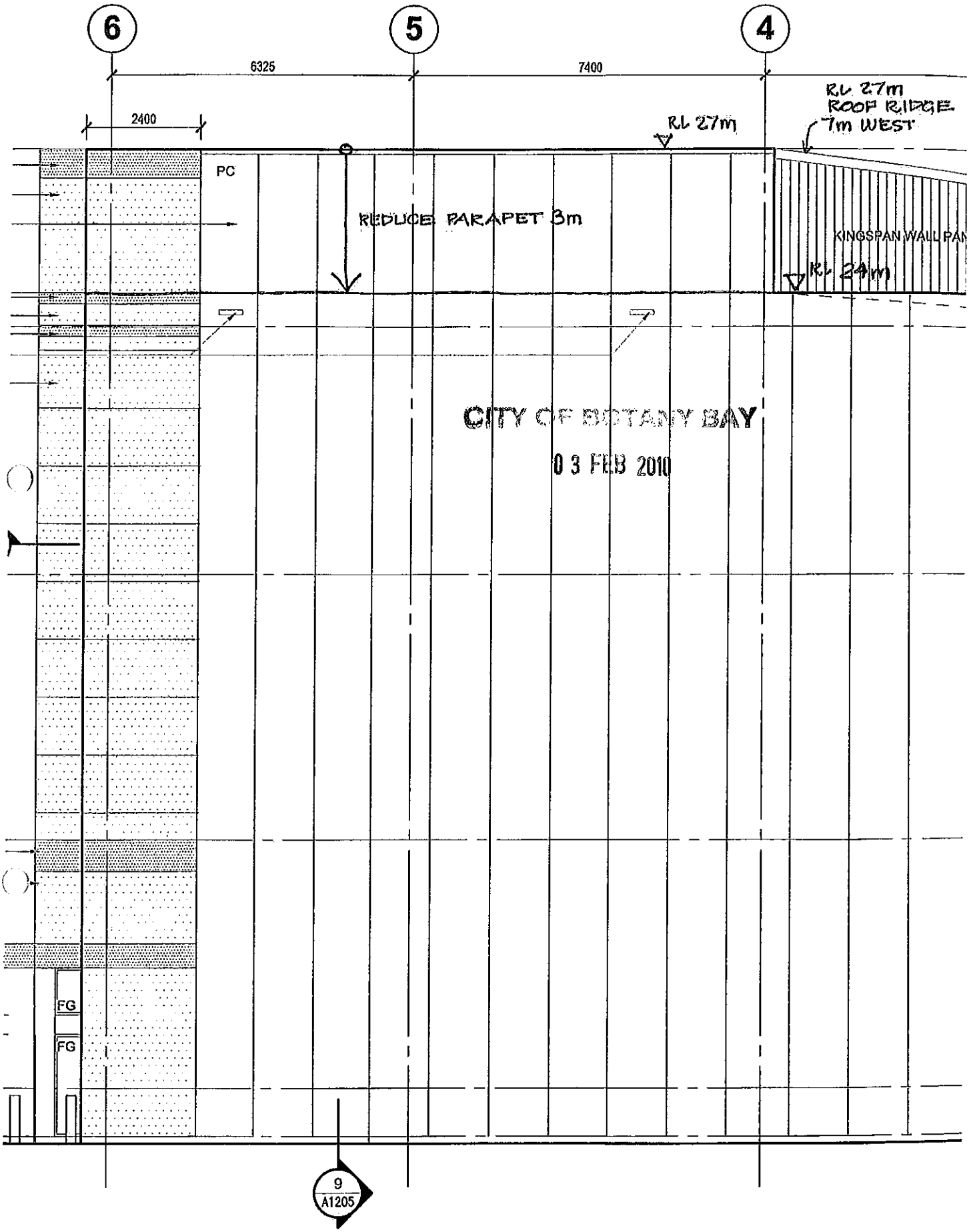
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7400
2400
RL 27m
RL 27m
ROOF RIDGE
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CITY OF BOTANY BAY
03 FEB 2010
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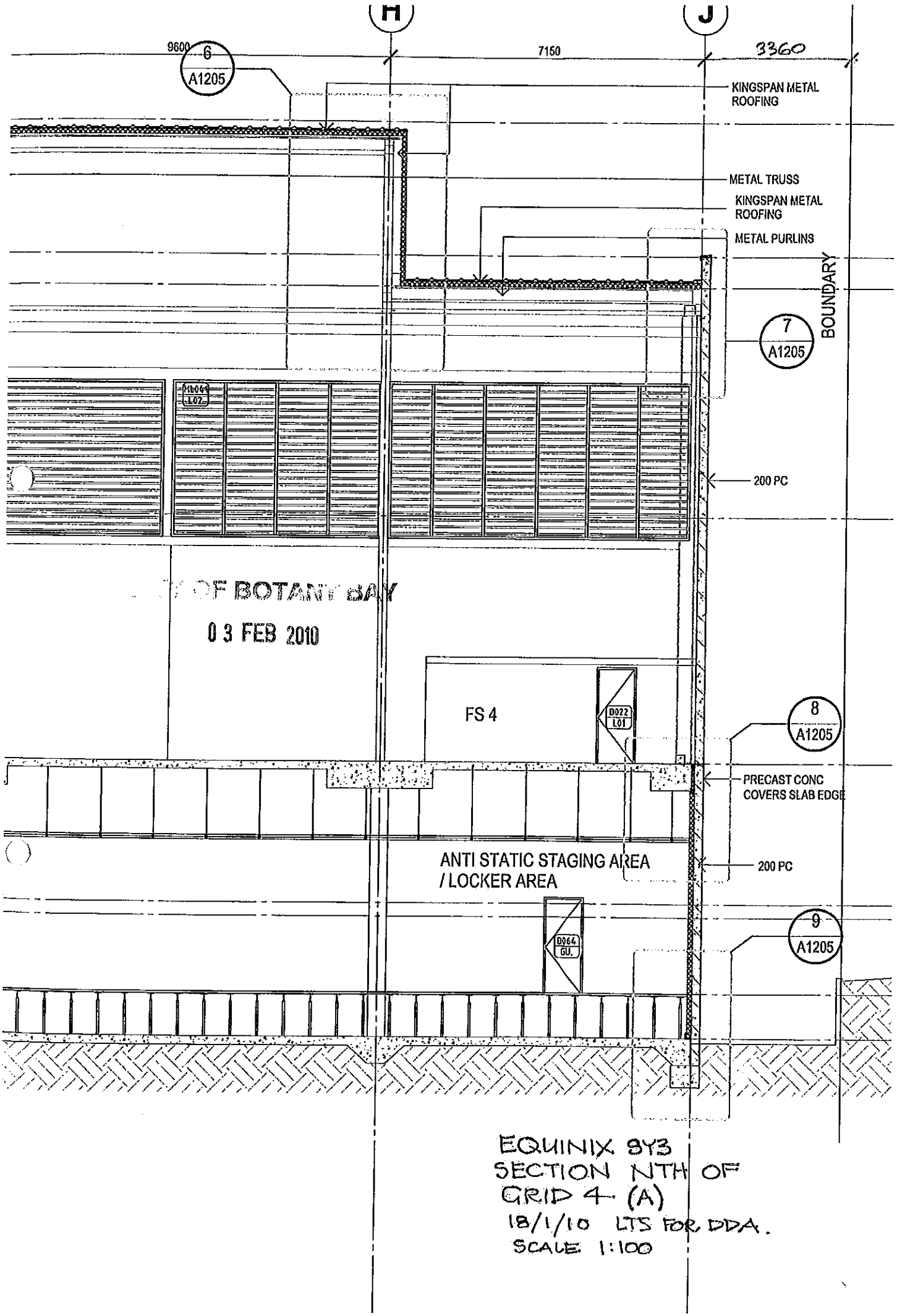
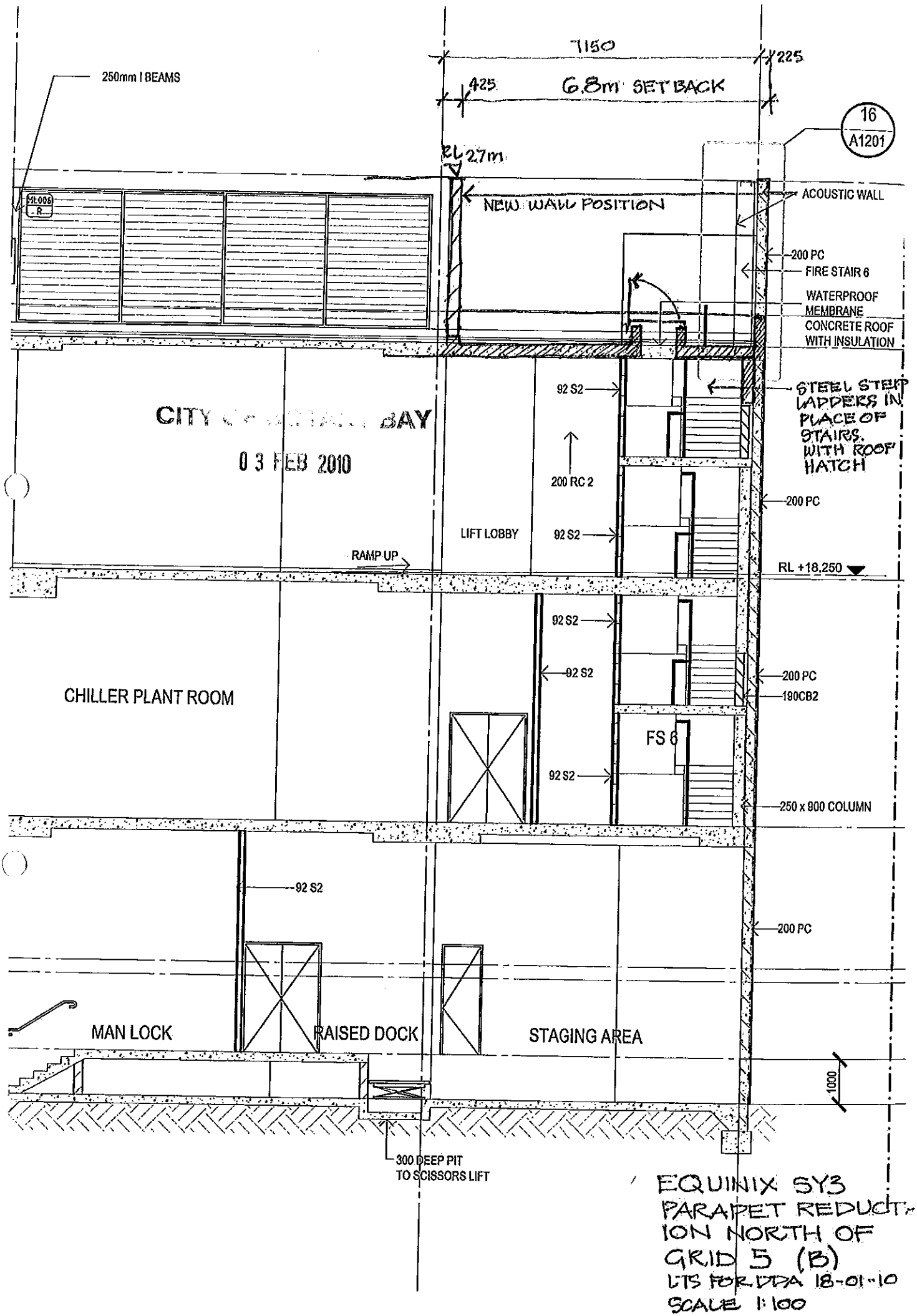
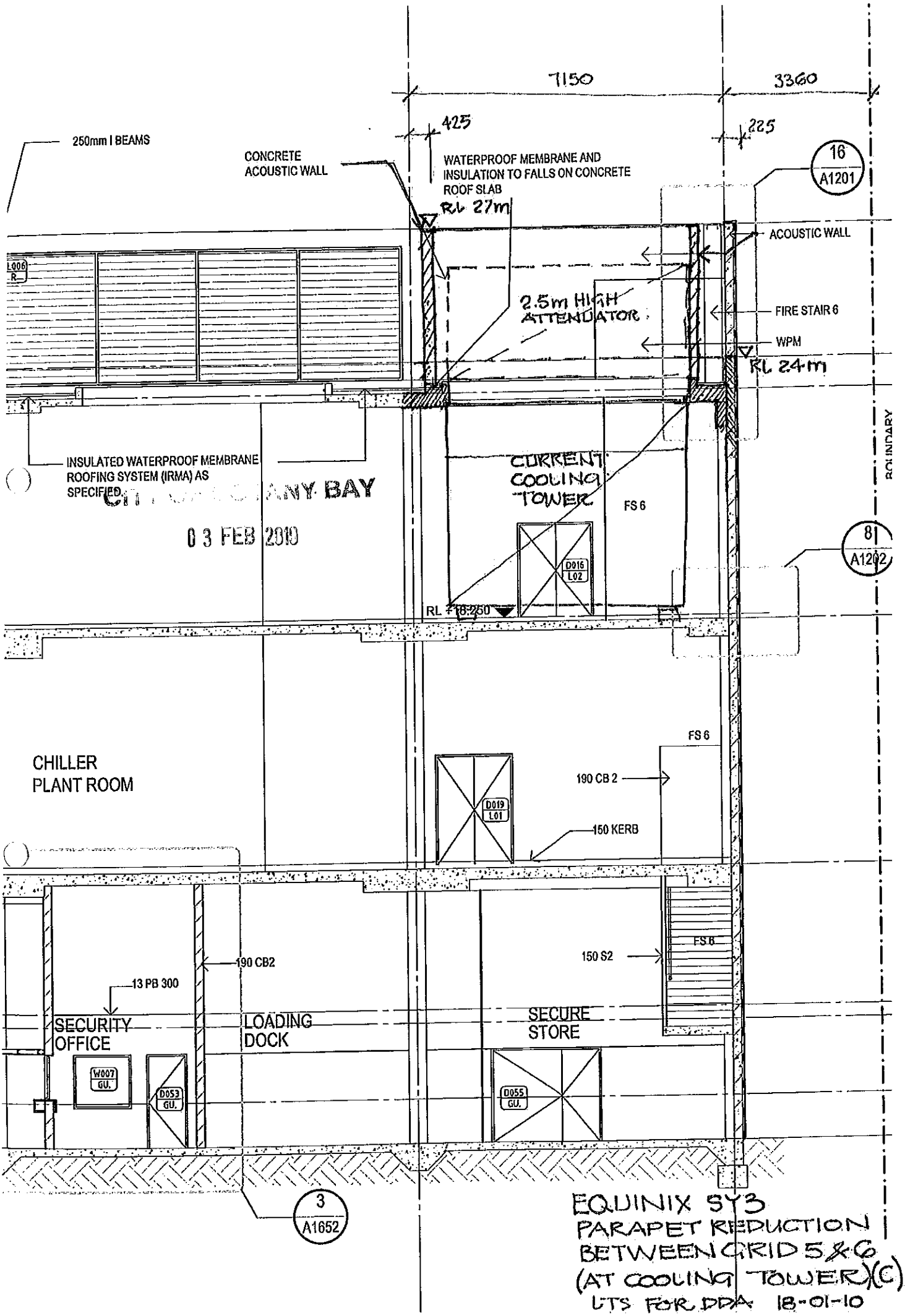
A1205

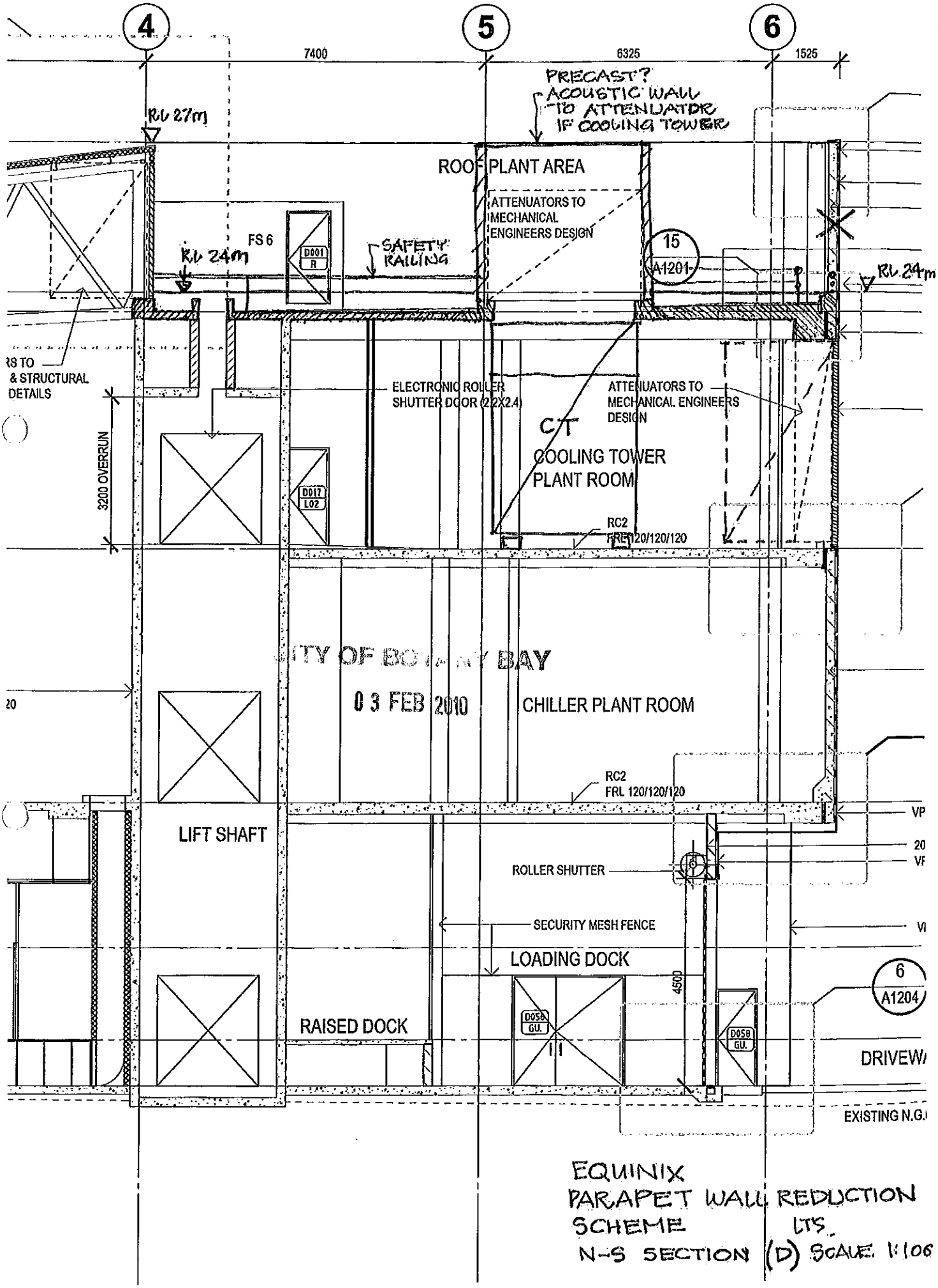


EQUINIX SY3
SECTION NTH OF
GRID 4 (A)
18/1/10 LTS FOR DDA.
SCALE 1:100


7150
225
425
6.8m SETBACK
16
A1201
250mm I BEAMS
RL 27m
NEW WALL POSITION
ACOUSTIC WALL
200 PC
FIRE STAIR 6
WATERPROOF MEMBRANE
CONCRETE ROOF WITH INSULATION
92 S2
STEEL STEP LADDERS IN PLACE OF STAIRS. WITH ROOF HATCH
CITY
BAY
0 3 FEB 2010
200 RC 2
LIFT LOBBY
RAMP UP
RL +18,250
CHILLER PLANT ROOM
190CB2
FS 6
250 x 900 COLUMN
MAN LOCK
RAISED DOCK
STAGING AREA
1000
300 DEEP PIT TO SCISSORS LIFT
EQUINIX SY3
PARAPET REDUCTION NORTH OF GRID 5 (B)
LTS FOR DDA 18-01-10
SCALE 1:100



EQUINIX SY3
PARAPET REDUCTION
BETWEEN GRID 5 & 6
(AT COOLING TOWER)(C)
LTS FOR DDA 18-01-10



EQUINIX
PARAPET WALL REDUCTION
SCHEME LTS.
N-S SECTION (D) SCALE 1:100