



MCKENZIE
GROUP CONSULTING

TRANSMITTAL FORM

To:	Pittwater Council	Project No:	01028
Address:	DX 9018 Mona Vale		
Attention:	Customer Service	Date:	20 May 2003
Project:	Village Park Mona Vale		
From:	Robert Lee		
Method of Delivery:	<input type="checkbox"/> Mail <input type="checkbox"/> Courier <input type="checkbox"/> By Hand <input type="checkbox"/> Collected <input checked="" type="checkbox"/> DX		
Subject:	Construction Certificate		

Dear Sir or Madam:

Please find enclosed one (1) copy of the Construction Certificate No. 03/738-1 and it's attachment in accordance with Clause 151 (2) of the Environmental Planning & Assessment Regulation 2000, issued for the above project together with a cheque of \$26.00 being the lodgement fee.

Plans and specifications approved

- Architectural plans prepared by Brewster Hjorth Architects, drawing numbers: A01 - 30 / A, F01 & 02;
- Landscape plans prepared by Taylor Brammer, drawing numbers: LA001/03, LA002/03, LA00 to 05/D, 06/B & 07/C;
- Structural /Civil plans prepared by Connell Mott MacDonald, drawing numbers: DS00-002/3, 005-013/3, 015-21/3, CA001/3 & 002/3;
- Hydraulic plans prepared by Acor, drawing numbers: HD1-08/D, SP01/B;
- Hydraulic Specifications
- Mechanical plans prepared by Steensen Varming (Aust) Pty Ltd, drawing numbers: 01832-M1000-1002/B, 1002/B, 1003/C, 2001-2002/B, 3001/B, 4001/B, 5001/B, 6001-6002/B, 7001/B, 8001/B, 9001/B, 9002/C;
- Mechanical specifications;
- Electrical plans prepared by Steensen Varming (Aust) Pty Ltd, drawing numbers: 01832-E000, 01-08/B;
- Electrical specifications.

Attachments

- Fire safety schedule

BUILDING REGULATIONS CONSULTANTS

Level 6 / 189 Kent Street Sydney New South Wales 2000
 Telephone 02 8298 6800 Facsimile 02 8298 6899 email@mckenzie-group.com.au
 www.mckenzie-group.com.au

Transmittal Form - Council

Offices in Melbourne and Brisbane

Issued 13.2.03

- Application form for Construction Certificate
- Evidence of Long Service Levy payment;
- Structural design compliance certificate prepared by Connell Mott MacDonald, dated 14 March 2003;
- Drainage design report prepared by Connell Mott MacDonald, dated 13 March 2003;
- Fire & hydraulic design compliance certificate prepared by Acor, dated 17 March 2003;
- Electrical and mechanical compliance certificate prepared by Steesen Varming (Aust) Pty Ltd;
- Landscape design compliance certificate prepared by Grammer, dated 25 March 2003;
- Design certification for roadworks, Park St, Mona Vale prepared by Colin Mathison, dated 10 April 2003;
- Access design compliance certificate prepared by Morris-Goding Accessibility Consulting, dated 15 April 2003;
- Acoustic certificate prepared by Hyder Consulting (Aust) Pty Ltd, dated 22 April 2003; and
- Contamination assessment prepared by Douglas Partners Pty Ltd, dated 26 February 2003.
- General Construction Notes

Please provide a receipt upon completion of payment process and note our reference.

If you require further information please contact me on (02) 8298 6800.

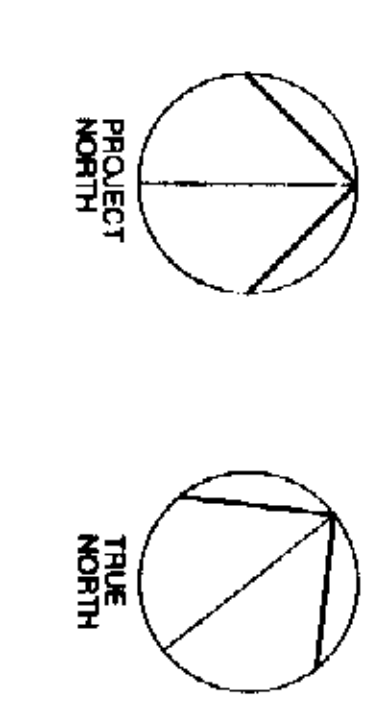
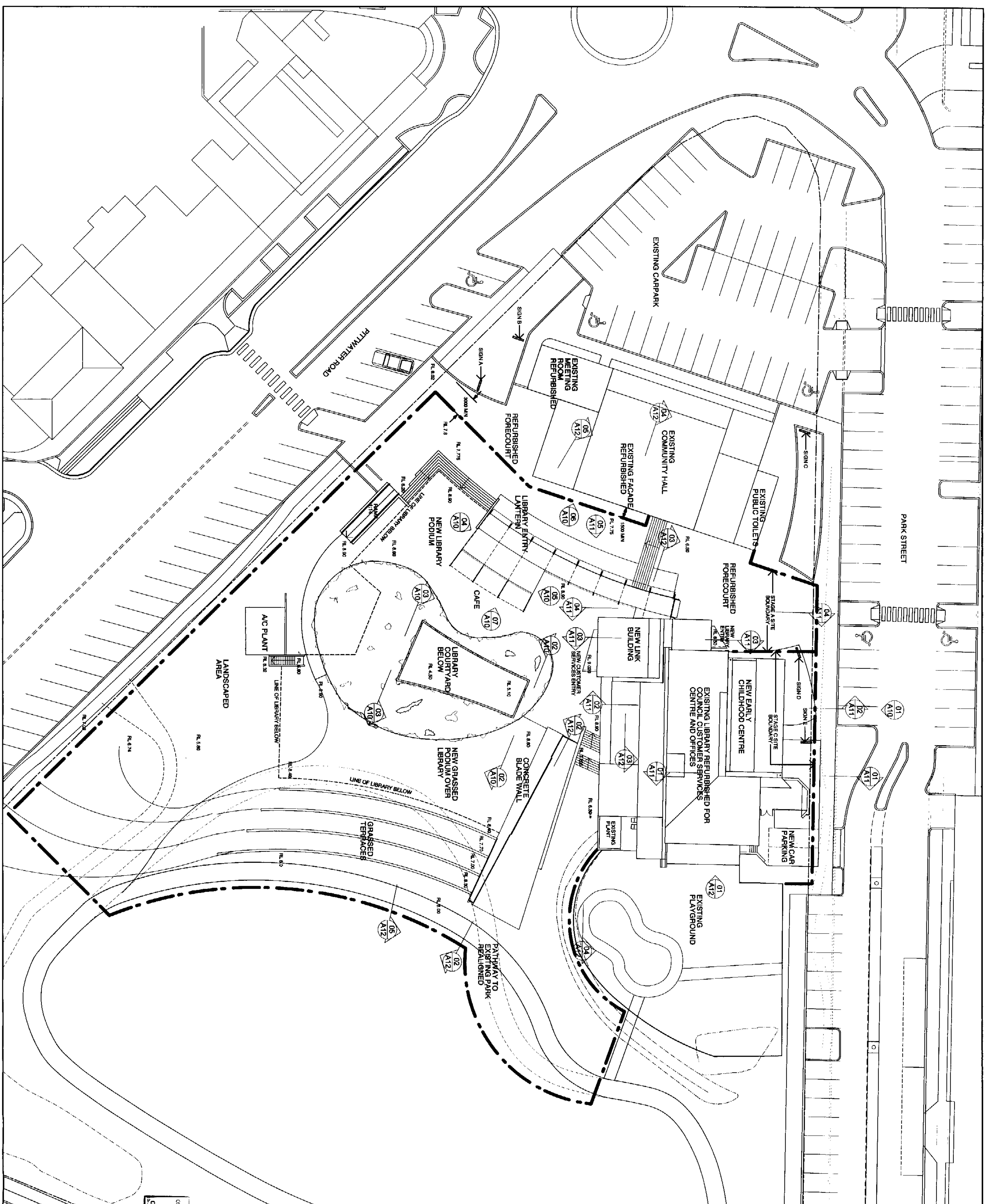
Regards,

per Robert Lee

Robert Lee
Senior Building Surveyor
McKenzie Group Consulting (NSW) Pty Ltd
ACN 093 211 995

Copy To:	Attention:	Address:
Brester Hjorth Architects	Andrew Hjorth	Level 2, 201 Kent Street, Sydney NSW 2000





PROJECT STAGING

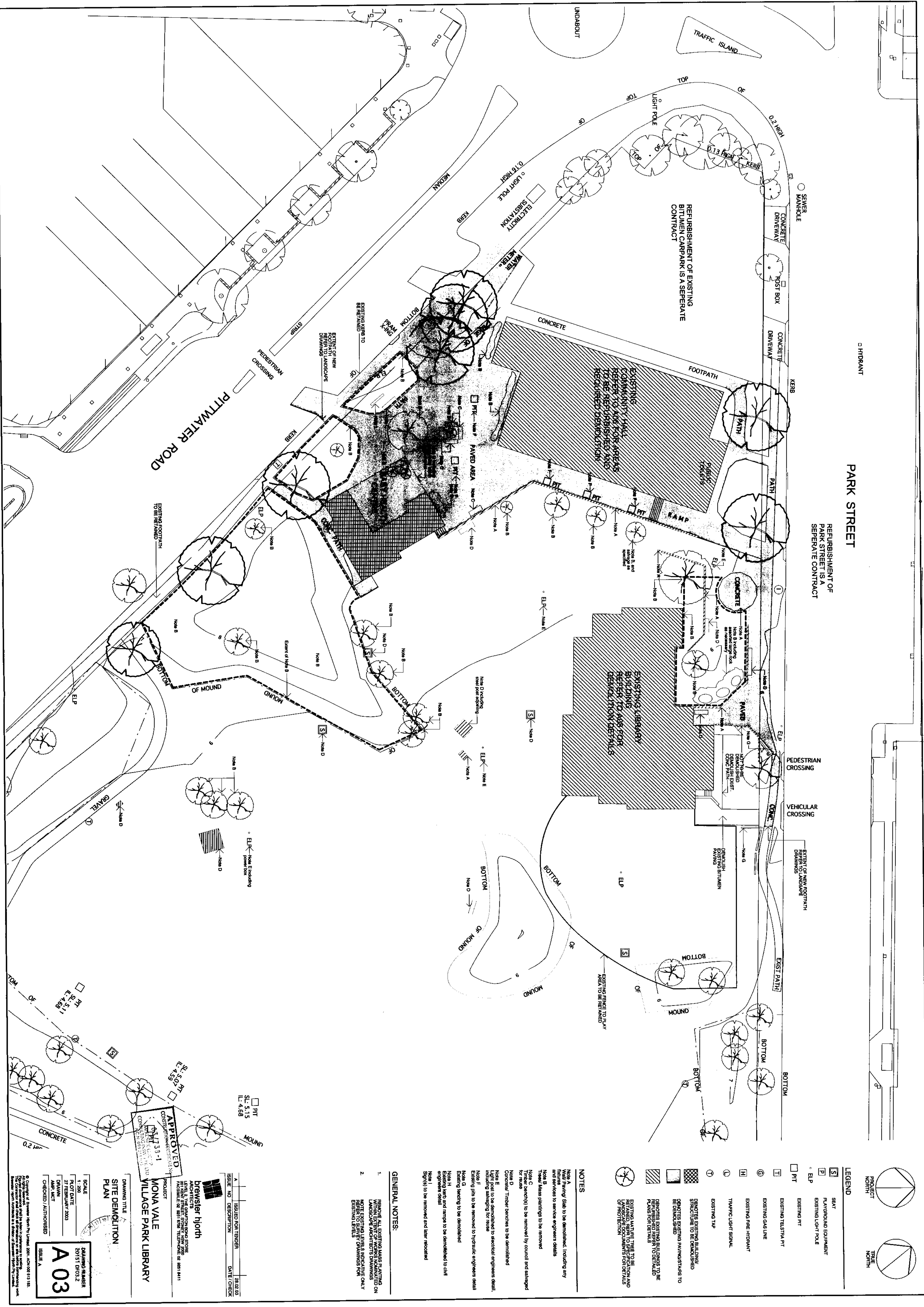
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NOTES:

1. REFER TO SPECIFICATION FOR DETAILS
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PROJECT: MONNA VALE VILLAGE PARK LIBRARY
 DRAWING NUMBER: A02
 DATE: 27 FEBRUARY 2008
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 AUTHORIZED BY: [Name]
 SCALE: 1:100
 SHEET NO.: 1 OF 1
 PROJECT NO.: 03/133-1
 CONSULTANT: [Name]
 PROJECT LOCATION: [Address]
 PROJECT OWNER: [Name]
 PROJECT MANAGER: [Name]
 PROJECT COORDINATOR: [Name]
 PROJECT ARCHITECT: [Name]
 PROJECT ENGINEER: [Name]
 PROJECT LANDSCAPE ARCHITECT: [Name]
 PROJECT STRUCTURAL ENGINEER: [Name]
 PROJECT MECHANICAL ENGINEER: [Name]
 PROJECT ELECTRICAL ENGINEER: [Name]
 PROJECT CIVIL ENGINEER: [Name]
 PROJECT ENVIRONMENTAL ENGINEER: [Name]
 PROJECT HISTORIC ARCHITECTURE CONSULTANT: [Name]
 PROJECT ARCHAEOLOGICAL CONSULTANT: [Name]
 PROJECT GEOTECHNICAL ENGINEER: [Name]
 PROJECT SOILWORK CONSULTANT: [Name]
 PROJECT SURVEYOR: [Name]
 PROJECT PHOTOGRAMMETRY CONSULTANT: [Name]
 PROJECT LANDSCAPE ARCHITECTURE CONSULTANT: [Name]
 PROJECT STRUCTURAL ENGINEER: [Name]
 PROJECT MECHANICAL ENGINEER: [Name]
 PROJECT ELECTRICAL ENGINEER: [Name]
 PROJECT CIVIL ENGINEER: [Name]
 PROJECT ENVIRONMENTAL ENGINEER: [Name]
 PROJECT HISTORIC ARCHITECTURE CONSULTANT: [Name]
 PROJECT ARCHAEOLOGICAL CONSULTANT: [Name]
 PROJECT GEOTECHNICAL ENGINEER: [Name]
 PROJECT SOILWORK CONSULTANT: [Name]
 PROJECT SURVEYOR: [Name]
 PROJECT PHOTOGRAMMETRY CONSULTANT: [Name]

A02
 SITE PLAN/ STAGING
 DRAWING NUMBER: A02
 DATE: 27 FEBRUARY 2008
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 AUTHORIZED BY: [Name]
 SCALE: 1:100
 SHEET NO.: 1 OF 1
 PROJECT NO.: 03/133-1
 CONSULTANT: [Name]
 PROJECT LOCATION: [Address]
 PROJECT OWNER: [Name]
 PROJECT MANAGER: [Name]
 PROJECT COORDINATOR: [Name]
 PROJECT ARCHITECT: [Name]
 PROJECT ENGINEER: [Name]
 PROJECT LANDSCAPE ARCHITECT: [Name]
 PROJECT STRUCTURAL ENGINEER: [Name]
 PROJECT MECHANICAL ENGINEER: [Name]
 PROJECT ELECTRICAL ENGINEER: [Name]
 PROJECT CIVIL ENGINEER: [Name]
 PROJECT ENVIRONMENTAL ENGINEER: [Name]
 PROJECT HISTORIC ARCHITECTURE CONSULTANT: [Name]
 PROJECT ARCHAEOLOGICAL CONSULTANT: [Name]
 PROJECT GEOTECHNICAL ENGINEER: [Name]
 PROJECT SOILWORK CONSULTANT: [Name]
 PROJECT SURVEYOR: [Name]
 PROJECT PHOTOGRAMMETRY CONSULTANT: [Name]



PARK STREET
 REFURBISHMENT OF
 PARK STREET IS A
 SEPARATE CONTRACT

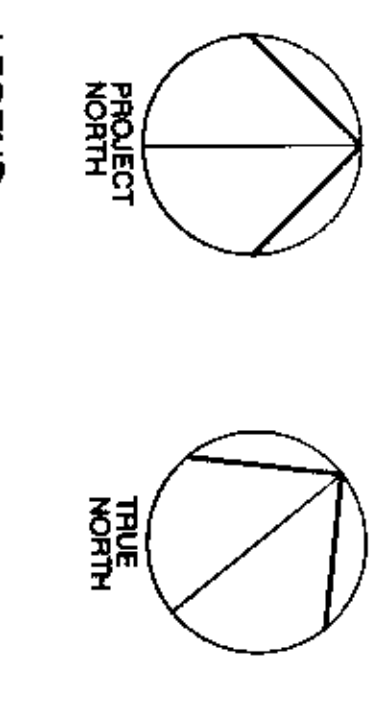
REFURBISHMENT OF EXISTING
 BITUMEN CARPARK IS A SEPARATE
 CONTRACT

EXISTING CONCRETE DRIVEWAY
 TO BE REFINISHED AND
 REPAIRED TO AS PER
 DEMOLITION DETAILS

EXISTING LIBRARY
 BUILDINGS
 TO BE DEMOLISHED
 TO AS PER
 DEMOLITION DETAILS

PITWATER ROAD

APPROVED
 2017/31-1
 MONA VALE
 VILLAGE PARK LIBRARY



- LEGEND**
- SEAL
 - PAVING AND EQUIPMENT
 - EXISTING LIGHT POLE
 - ELP
 - EXISTING PV
 - EXISTING PV
 - EXISTING TELSTRIP PV
 - EXISTING GAS LINE
 - EXISTING FIRE HYDRANT
 - TRAMPING LIGHT SIGNAL
 - EXISTING TAP
 - DEMOLISH EXISTING BUILDING STRUCTURE TO BE DEMOLISHED
 - DEMOLISH EXISTING MANGROVES TO BE DEMOLISHED
 - DEMOLISH EXISTING CONCRETE DRIVEWAY TO BE DEMOLISHED
 - DEMOLISH EXISTING BITUMEN CARPARK TO BE DEMOLISHED
 - DEMOLISH EXISTING FENCE TO BE DEMOLISHED
 - DEMOLISH EXISTING SIGNAGE TO BE DEMOLISHED
 - DEMOLISH EXISTING LIGHT POLES TO BE DEMOLISHED
 - DEMOLISH EXISTING PV TO BE DEMOLISHED
 - DEMOLISH EXISTING TELSTRIP TO BE DEMOLISHED
 - DEMOLISH EXISTING GAS LINE TO BE DEMOLISHED
 - DEMOLISH EXISTING FIRE HYDRANT TO BE DEMOLISHED
 - DEMOLISH EXISTING TRAMPING LIGHT SIGNAL TO BE DEMOLISHED
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 - DEMOLISH EXISTING GAS LINE TO BE DEMOLISHED
 - DEMOLISH EXISTING FIRE HYDRANT TO BE DEMOLISHED
 - DEMOLISH EXISTING TRAMPING LIGHT SIGNAL TO BE DEMOLISHED
 - DEMOLISH EXISTING TAP TO BE DEMOLISHED

- NOTES**
- Note A: Paving (Seal) to be demolished, including any manholes and services to services engineers details.
 - Note B: Paving (Seal) to be removed.
 - Note C: Three benches to be removed by council and salvaged for reuse.
 - Note D: Timber benches to be demolished.
 - Note E: Light poles to be demolished to electrical engineers detail, including salvaging for reuse.
 - Note F: Existing gas to be removed to hydraulic engineers detail.
 - Note G: Existing fire hydrant to be demolished.
 - Note H: Existing PV to be demolished to civil engineers detail.
 - Note I: Existing Telstrip to be demolished and later reconnected.
 - Note J: Existing gas line to be demolished and later reconnected.
 - Note K: Existing fire hydrant to be demolished and later reconnected.
 - Note L: Existing Tramping Light Signal to be demolished and later reconnected.
 - Note M: Existing Tap to be demolished and later reconnected.
 - Note N: Existing Building Structure to be demolished.
 - Note O: Existing Mangroves to be demolished.
 - Note P: Existing Concrete Driveway to be demolished.
 - Note Q: Existing Bitumen Carpark to be demolished.
 - Note R: Existing Fence to be demolished.
 - Note S: Existing Signage to be demolished.
 - Note T: Existing Light Poles to be demolished.
 - Note U: Existing PV to be demolished.
 - Note V: Existing Telstrip to be demolished.
 - Note W: Existing Gas Line to be demolished.
 - Note X: Existing Fire Hydrant to be demolished.
 - Note Y: Existing Tramping Light Signal to be demolished.
 - Note Z: Existing Tap to be demolished.

- GENERAL NOTES:**
1. REMOVE ALL EXISTING MANGROVES PLANTING ON LANDSCAPE ARCHITECT'S DRAWINGS.
 2. NOTE EXISTING LEVELS AS INDICATED ONLY EXISTING LEVELS.

APPROVED
 2017/31-1
 MONA VALE
 VILLAGE PARK LIBRARY

PROJECT
 DREWSTER NORTH
 ARCHITECTS
 201/511 DROGDA STREET
 MONA VALE NSW 1508
 TEL: 02 9438 1111 FAX: 02 9438 1112
 WWW.DREWSTER.COM.AU

DATE
 27 SEP 2017

SCALE
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DRAWING NUMBER
 2017/31-1 DROGDA 2

ISSUE
 A 03

DATE
 27 SEP 2017

DESIGNED BY
 DREWSTER NORTH

CHECKED BY
 DREWSTER NORTH

DATE
 27 SEP 2017

SCALE
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DRAWING NUMBER
 2017/31-1 DROGDA 2

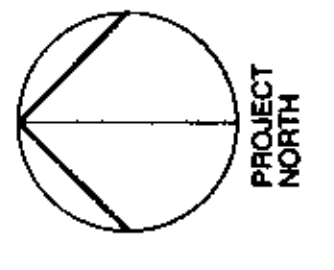
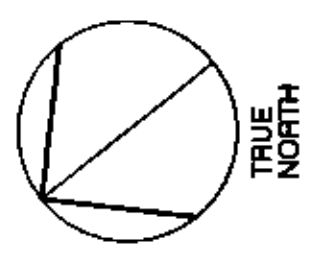
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DATE
 27 SEP 2017

DESIGNED BY
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 DREWSTER NORTH

DATE
 27 SEP 2017



- NOTES:**
1. REFER TO ARCHITECT'S DRAWINGS FOR FINISHED GROUND LEVELS, PAVING, AND DETAILS.
 2. DRAWINGS FOR DETAILS OF FOOTINGS AND SLAB.
 3. DRAWINGS FOR DETAILS OF MECHANICAL ENGINEERS.
 4. REFER TO ELECTRICAL ENGINEERS FOR DETAILS OF ELECTRICAL EQUIPMENT.
 5. WHERE COLUMN SETOUT NOT DIMENSIONED TO BE CENTERED ON GRID LINE UNLESS NOTED OTHERWISE ON A11.
 6. REMOVE SETOUT THRESHOLD TO BE AS TO OTHERWISE USE NEW TILES TO MATCH EXISTING AND TO MATCH THE EASTING PATTERNS.
 7. BE WEALED TO ALL CORNERS AND AROUND THE UP EDGE.
 8. AVOID CHANNELS IN THE WATERPROOF MEMBRANE.
 9. FOR ELECTRICAL AND DATA CABLES REFER TO TYPICAL INSERT DETAILS.

APPROVED
CONTRIBUTION NO. 03/73-1
CONTRACT NO. 10000000000000000000

ISSUED FOR TENDER 28 FEBRUARY 2008
DATE OF CONTRACT 28 FEBRUARY 2008

brewster horth
ARCHITECTS
100 RIVER STREET, SYDNEY, NSW 2000
PHONE: (61) 2 9211 1111
FAX: (61) 2 9211 1112
WWW.BREWSTERHORTH.COM.AU

MONA VALE VILLAGE PARK LIBRARY

PROJECT TITLE
LEVEL 1
LIBRARY PLAN

SCALE
1:100

DRAWN
28 FEBRUARY 2008

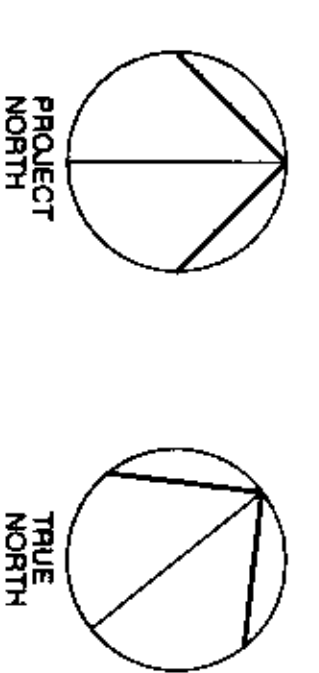
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AMP, MCT

DRAWING NUMBER
A 04
ISSUE A

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01 PART PLAN AT FLOOR LEVEL
SCALE 1:100



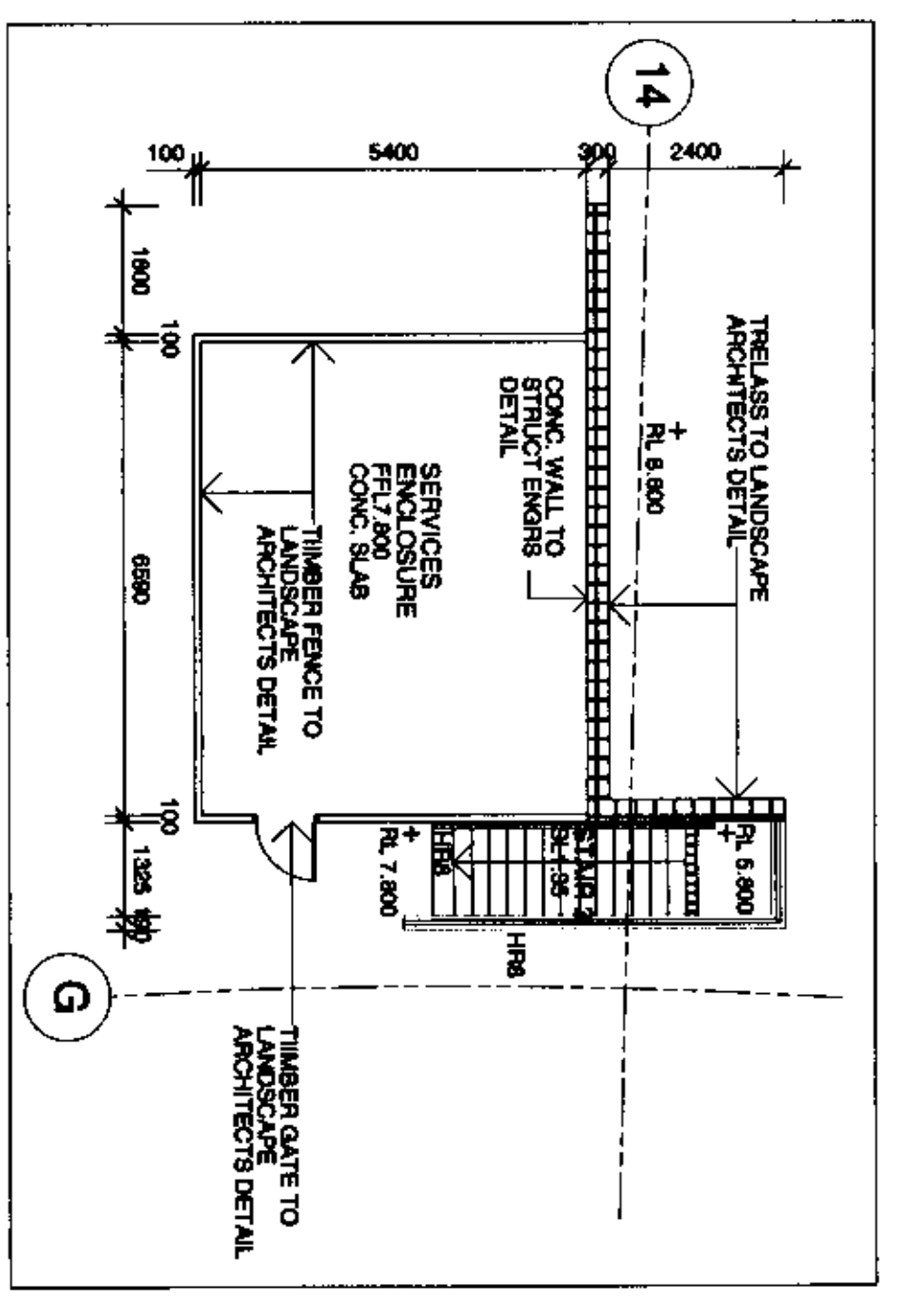
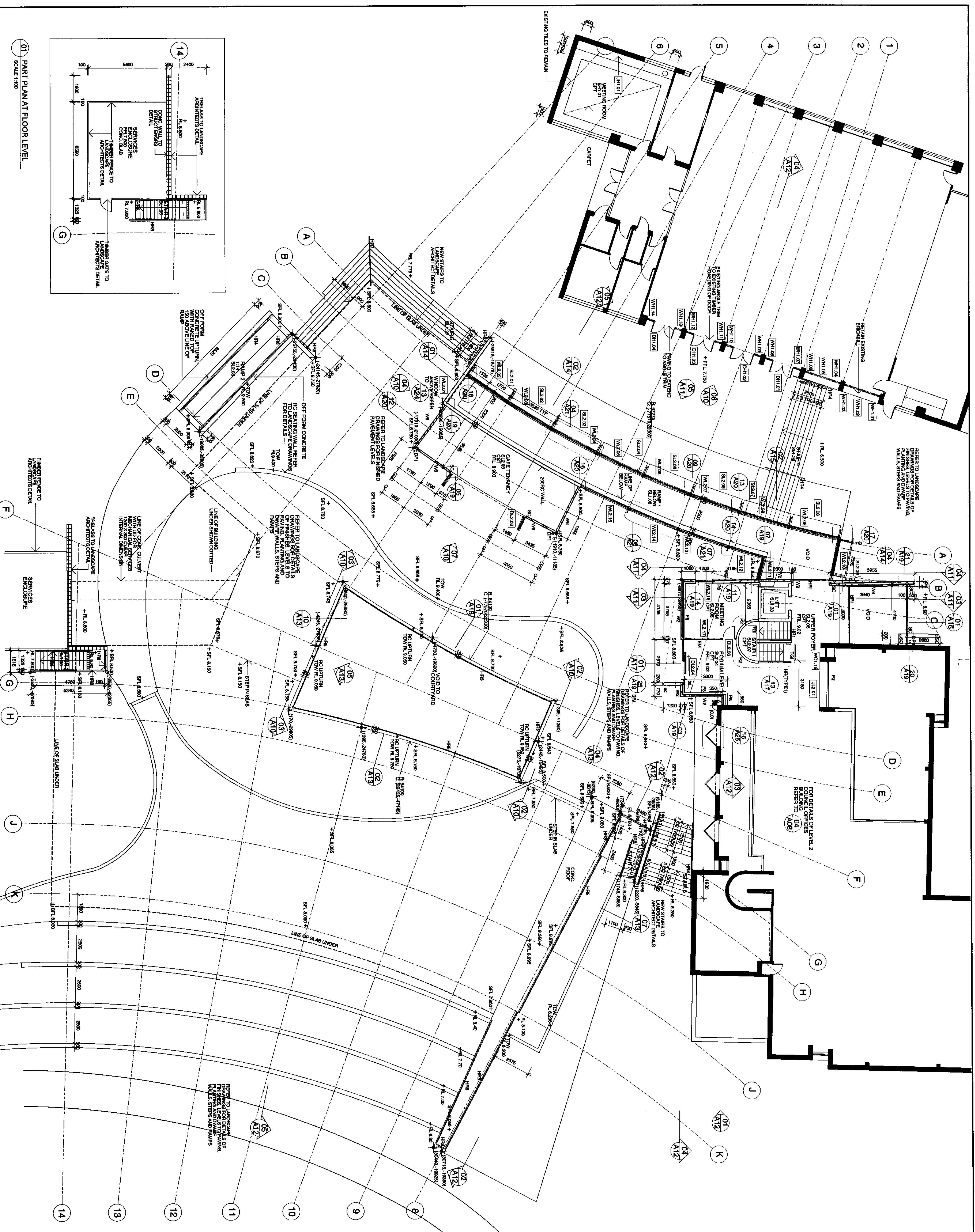
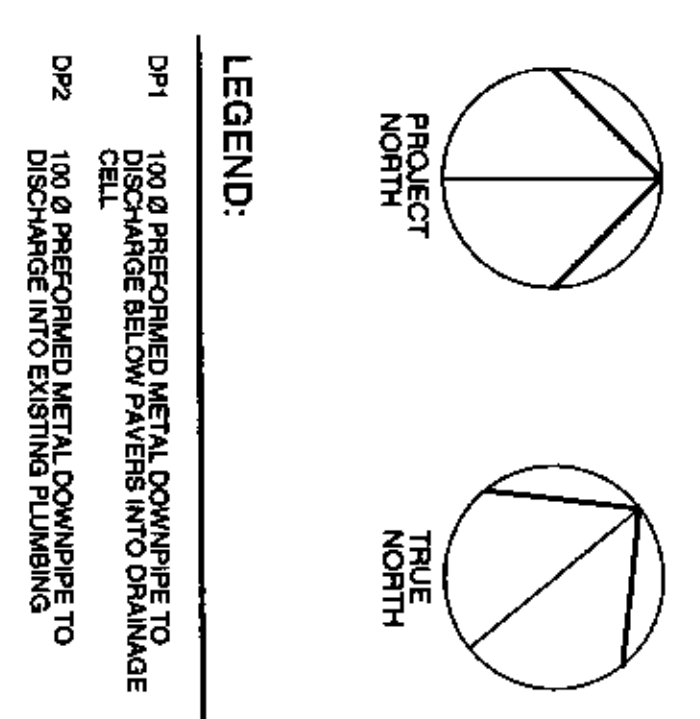
- NOTES:**
- REFER TO GENERAL DIMENSIONS DRAWING AND SECTION FOR REGISTER HEIGHTS AND RETURN AIR GRILLES
 - ENGINEERING DRAWINGS AND SPECIFICATION DEFINITIVE DRAWINGS, ETC.
 - THE LOCATION OF ALL LIGHT FITTINGS AND COMPONENTS ON SITE WITH THE ARCHITECT
 - REMOVE ALL REGISTER SET, PAINTED BACK SURFACE OF REGISTER TO BE PAINTED BLACK

- LEGEND:**
- 800 x 600 SUPPLY AIR REGISTER
 - RETURN AIR GRILLE
 - 800 x 600 ACCESS PANEL
 - TYPE A, RECESSED LIGHT FITTING, HEIGHT TO BE CORRELATED ON SITE
 - TYPE B, RECESSED FLUORO IN CEILING
 - TYPE D, RECESSED DOWNLIGHT IN CEILING
 - TYPE E, RECESSED LOW BROWDNITNESS IN CEILING
 - TYPE S, RECESSED BATTERY FLUORO LIGHT
 - TYPE L, 100 x 100mm RECESSED
 - TYPE M, RECESSED, THORN SURFACE FLUORO IN CEILING
 - TYPE N, RECESSED LOW VOLTAGE FITTING
 - EMERGENCY LIGHT
 - CEILING MOUNTED EXIT LIGHT
 - WALL MOUNTED EXIT LIGHT
 - REFER TO GENERAL DETAILS FOR ALL FITTINGS AND SIZES
 - SH BLINDHEAD

APPROVED
 CONTRACTOR: [Signature]
 03/1/31-1
 DATE: [Signature]

PROJECT:
 DREWSTER NORTH
 LIBRARY RCP
 MONA VALE VILLAGE PARK LIBRARY

DRAWING NUMBER:
 A 05
ISSUE:
 ISSUE A



PROJECT: MONA VALE VILLAGE PARK LIBRARY

CLIENT: BREWSSTER HIORTH

ARCHITECT: GARDNER WHARF ARCHITECTS

PROJECT ADDRESS: 501 BAY STREET, SUITE 2000, VICTORIA, BC V8W 2R4

PROJECT NO.: 2008-001

DATE: 03/17/11

CONTRACT NO.: 03/17/11

PROJECT TITLE: LEVEL 2 PODIUM PLAN

DRAWING NUMBER: A 06

SCALE: 1:100

DATE: 03/17/11

DESIGNED BY: [Name]

DRAWN BY: [Name]

CHECKED BY: [Name]

DATE: 03/17/11

SCALE: 1:100

DATE: 03/17/11

PROJECT NO.: 2008-001

PROJECT TITLE: LEVEL 2 PODIUM PLAN

DRAWING NUMBER: A 06

SCALE: 1:100

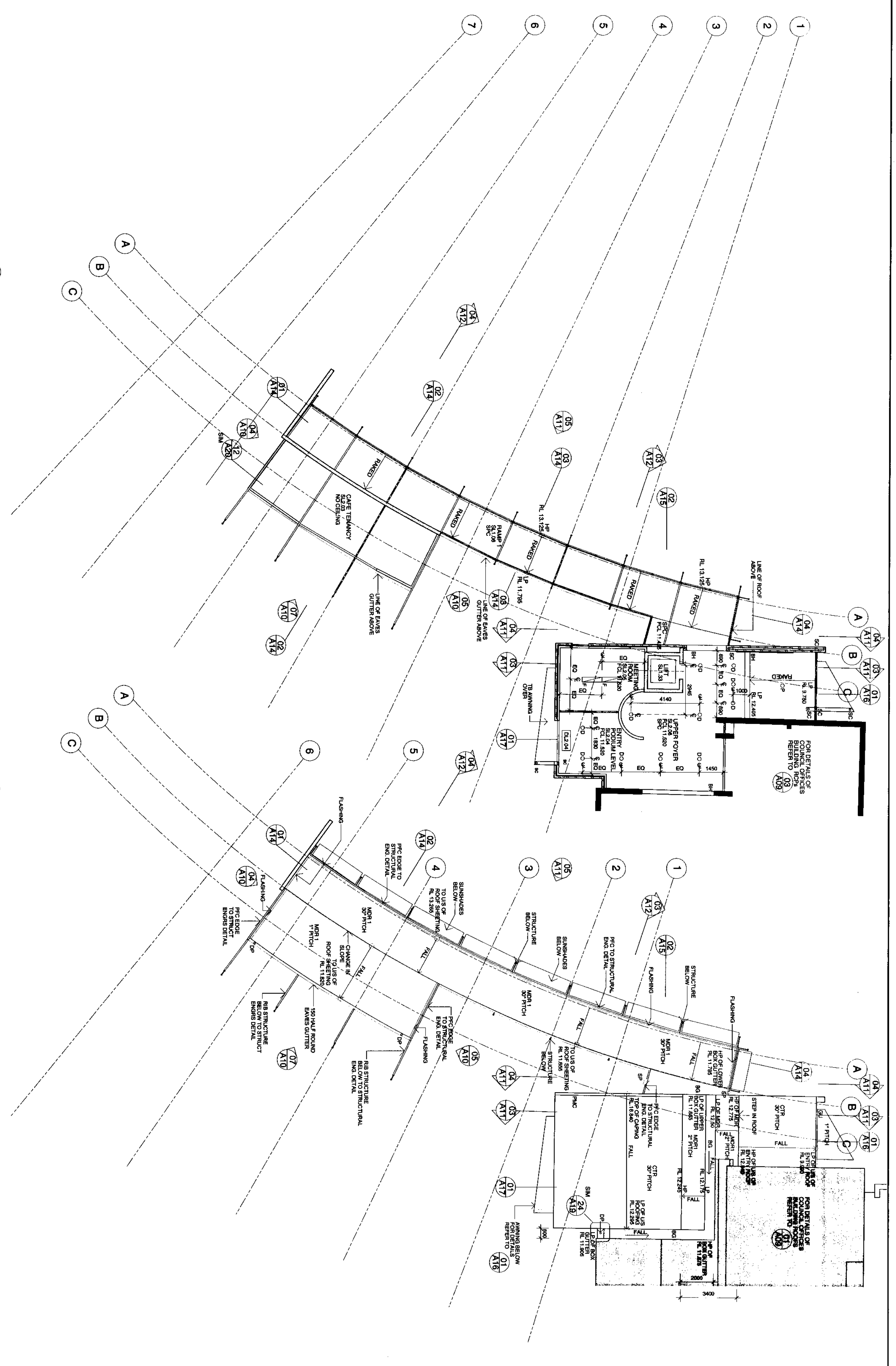
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DESIGNED BY: [Name]

DRAWN BY: [Name]

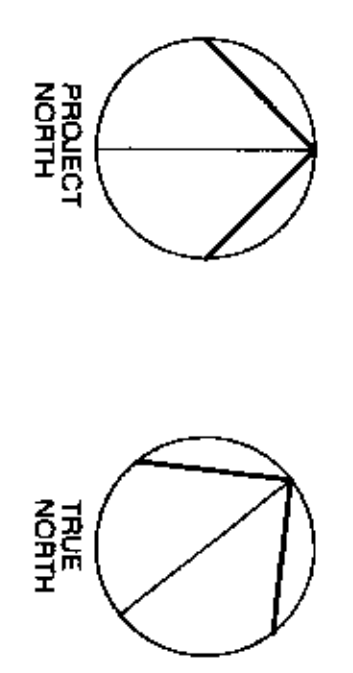
CHECKED BY: [Name]

DATE: 03/17/11



01 REFLECTED CEILING PLAN-LEVEL 2
SCALE: 1/8"=1'-0"

02 ROOF PLAN
SCALE: 1/8"=1'-0"

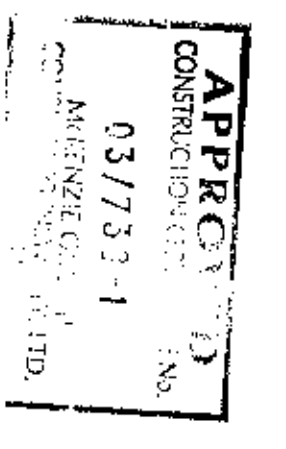


NOTES:

1. REFER TO STRUCTURAL ENGINEER'S DRAWINGS AND SPECIFICATION FOR DETAILS ON SUPPLY.
2. REFER TO STRUCTURAL CONSULTANT'S ENGINEER'S DRAWINGS AND SPECIFICATION, DETAILERS, SPEAKERS, ETC.
3. THE LOCATION OF ALL LIGHT FITTINGS AND COMPONENTS ON SITE WITH THE ARCHITECT.

LEGEND:

- TYPE D INCREASED SOUND/AC IN CEILING
- FLASHING IN CEILING
- REFER TO STRUCTURAL DETAILS FOR ALL FITTINGS AND SIZES
- BH BALANCE



A	ISSUED FOR TENDER	DATE / CHECK
1	ISSUED FOR TENDER	28/02/09
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3	ISSUED FOR TENDER	28/02/09
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6	ISSUED FOR TENDER	28/02/09
7	ISSUED FOR TENDER	28/02/09

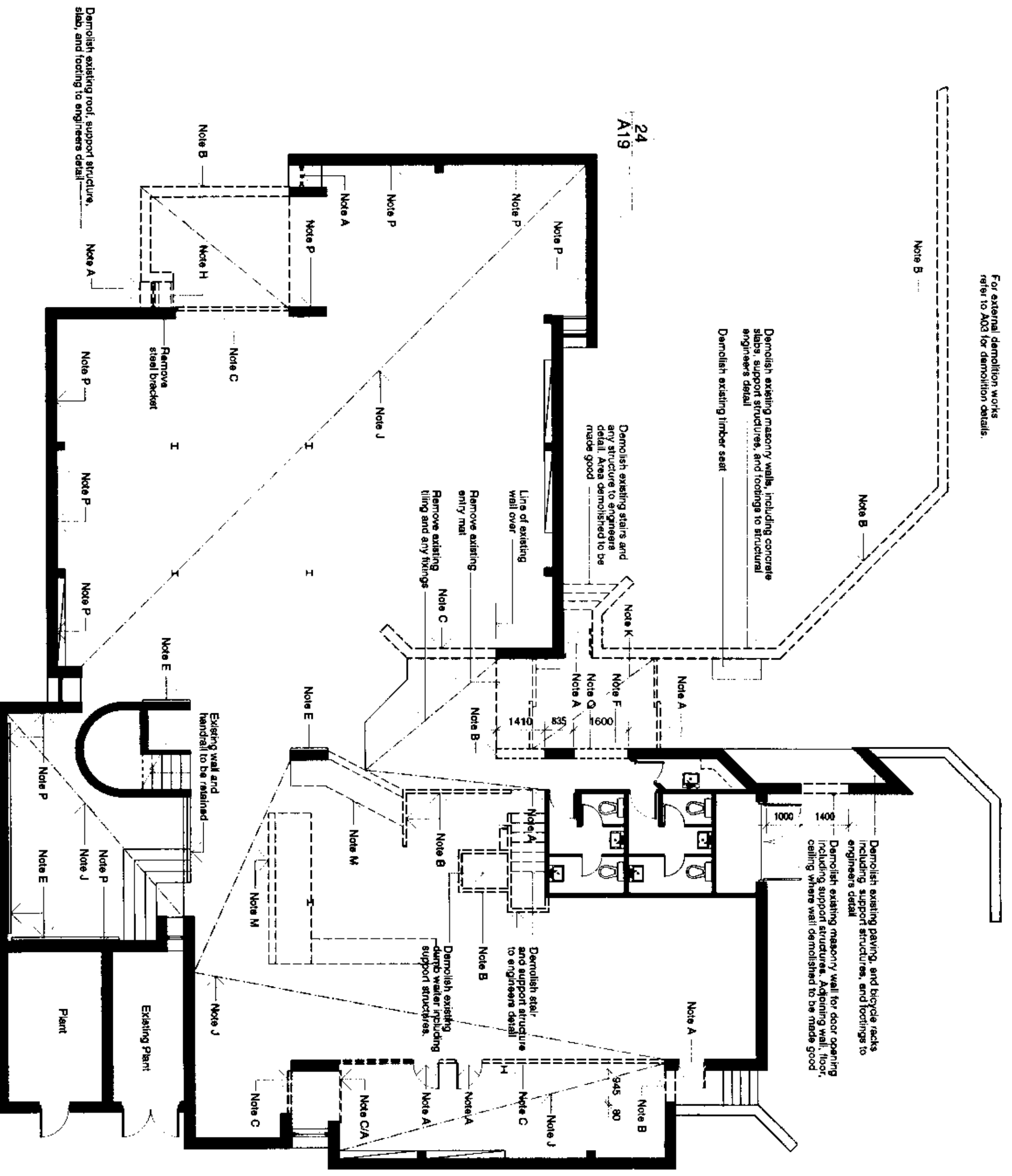
Drewster North
 ARCHITECTS
 LEVEL 2, THE GARDEN ROOM STORES
 100/102, 104/106, 108/110, 112/114
 PACIFIC DRIVE, MELBOURNE VIC 3004
 PHONE: 03 9241 9799 FAX: 03 9241 9411
 PROJECT: MONA VALE VILLAGE PARK LIBRARY

DRAWING TITLE:
 LEVEL 2 RL 8.5
 PODIUM RCP - ROOF PLAN
 NEW WORKS

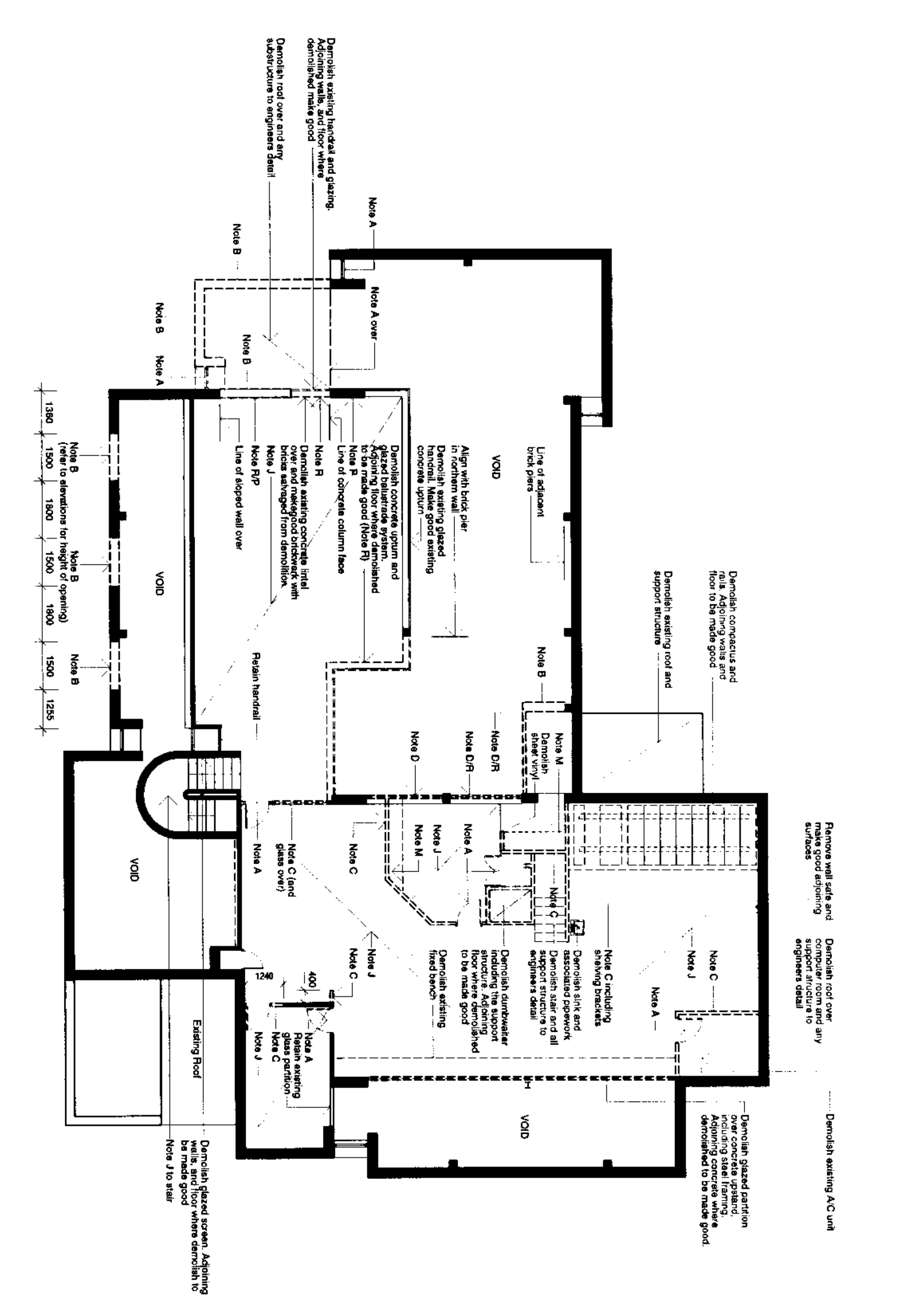
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 DRAWING NUMBER: A 07
 DATE: 28 FEBRUARY 2009
 DRAWN BY: [Name]
 CHECKED / APPROVED: [Name]

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 Project: Monna Vale Village Park Library, 100/102, 104/106, 108/110, 112/114 Pacific Drive, Melbourne VIC 3004.

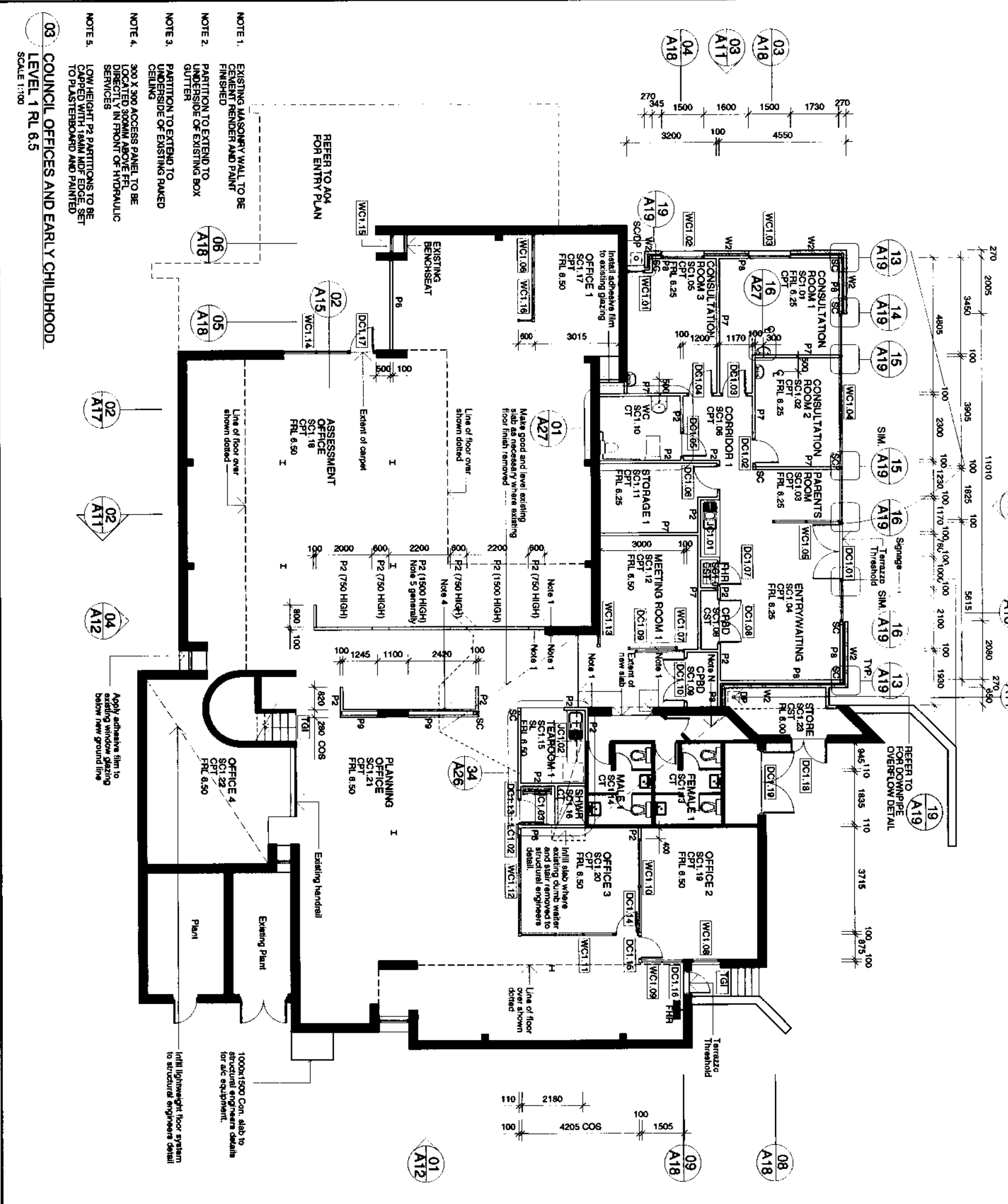
F-4 Existing demolition work
 refer to 2007 demolition work



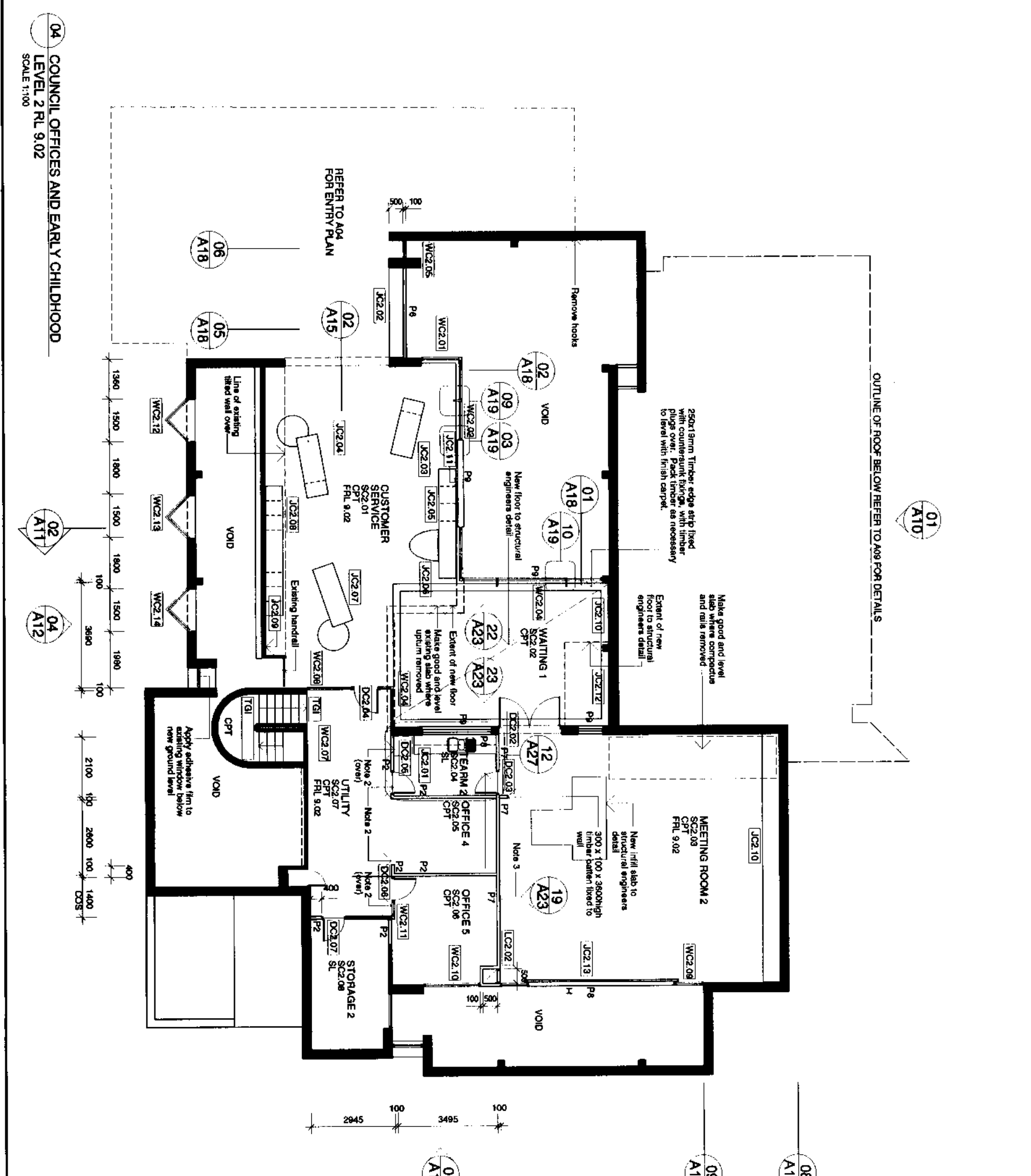
01. EXISTING PLAN AND DEMOLITION
 LEVEL 1 RL 6.5
 SCALE 1:100



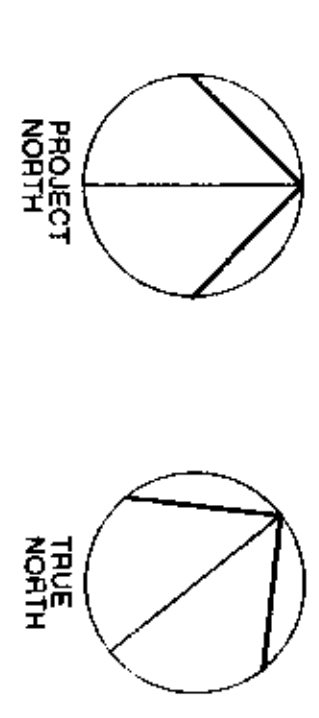
02. EXISTING PLAN AND DEMOLITION
 LEVEL 2 RL 9.02
 SCALE 1:100



08. COUNCIL OFFICES AND EARLY CHILDHOOD
 LEVEL 1 RL 6.5
 SCALE 1:100



04. COUNCIL OFFICES AND EARLY CHILDHOOD
 LEVEL 2 RL 9.02
 SCALE 1:100



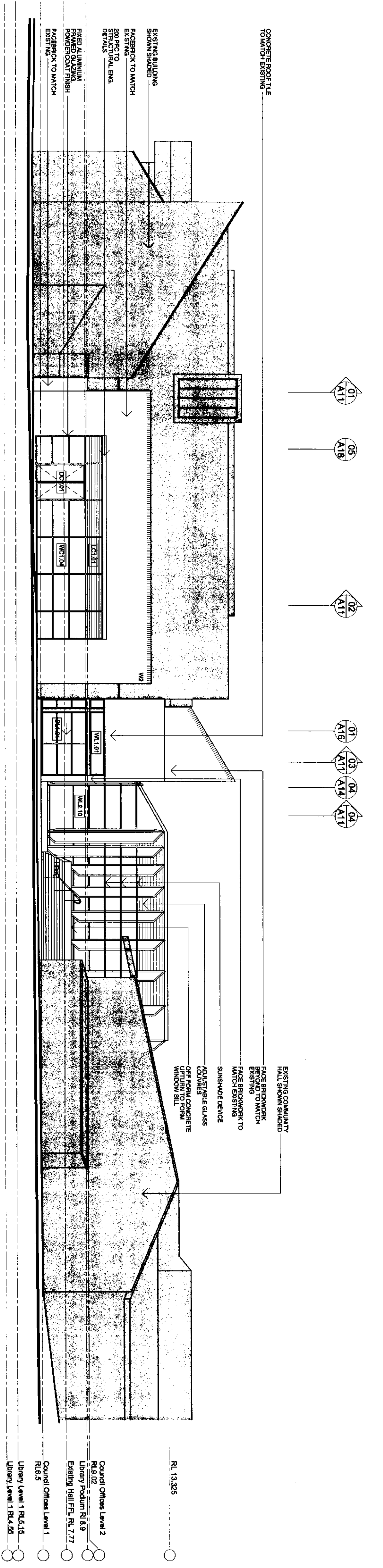
LEGEND:

- Demolish existing roof and support structure
- Demolish existing walls and interior partitions
- Demolish existing floor and ceiling
- Demolish existing AC unit

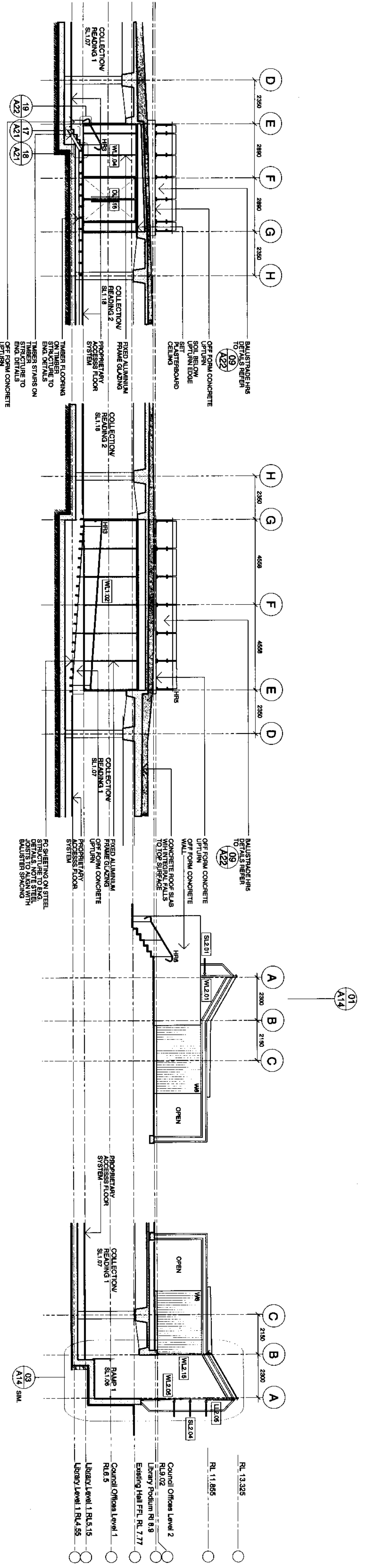
NOTES:

- Remove all existing light fittings, unless indicated otherwise.
- Remove all existing wall, ceiling and floor finishes, unless indicated otherwise.
- Remove all existing floor, ceiling and wall finishes, unless indicated otherwise.
- Unless noted otherwise, all new plasterboard partitions to be fixed to concrete or masonry.

DRAWING TITLE
LEVEL 1 AND 2 COUNCIL OFFICES DEMOLITION AND NEW WORKS
 PROJECT
MONA VALE VILLAGE PARK LIBRARY
 DRAWING NO.
A 08
 SCALE
AS SHOWN
 DATE
27 FEBRUARY 2008
 DRAWN BY
27 FEBRUARY 2008
 CHECKED BY
27 FEBRUARY 2008
 ISSUED BY
27 FEBRUARY 2008



01 PARK STREET ELEVATION
SCALE 1:100

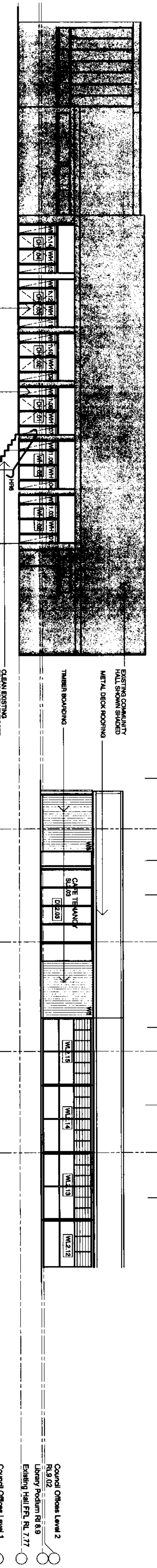


02 SECTION ELEVATION
SCALE 1:100

03 SECTION
SCALE 1:100

04 CAFE ELEVATION
SCALE 1:100

05 SECTION ELEVATION
SCALE 1:100



06 ELEVATION
SCALE 1:100

07 ELEVATION
SCALE 1:100

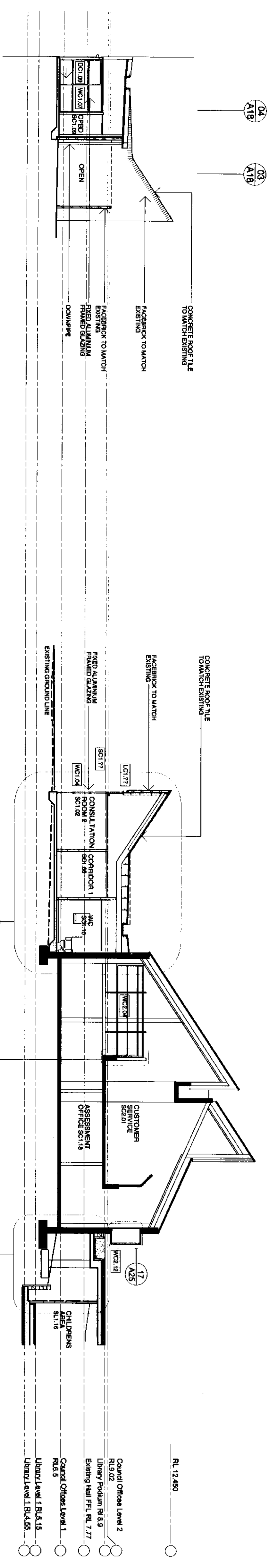
APPROVED
CONSTRUCTION CONTRACT
03/733-1
ARCHITECTS ASSOCIATES

Dyweston North
ARCHITECTS
201 BELMONT STREET, STONEY MOUNT, 2000
PH: 06 853 8798 FAX: 06 853 8799
MOBILE: 06 853 8799 TELEPHONE: 06 853 8411

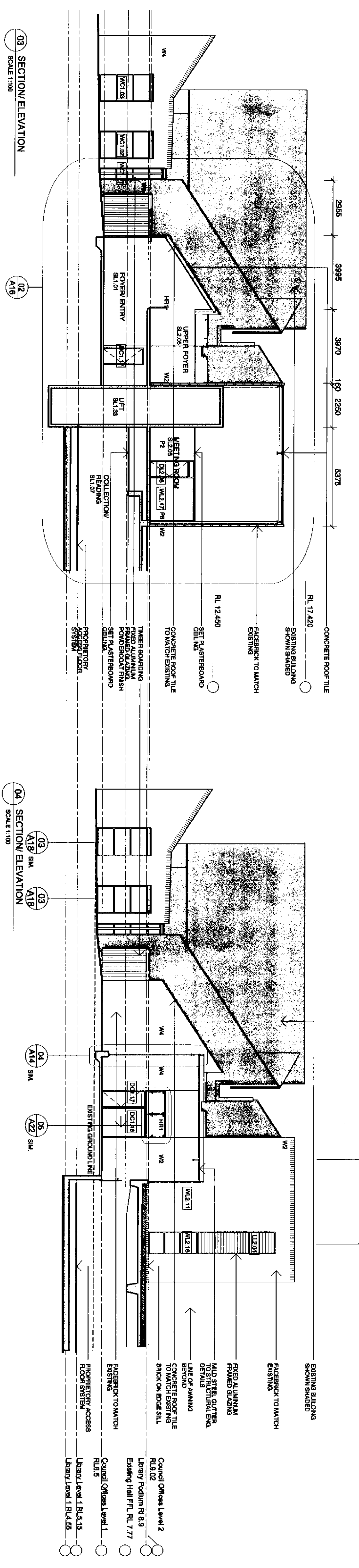
PROJECT
MONA VALE VILLAGE PARK LIBRARY

DRAWING NUMBER
A 10

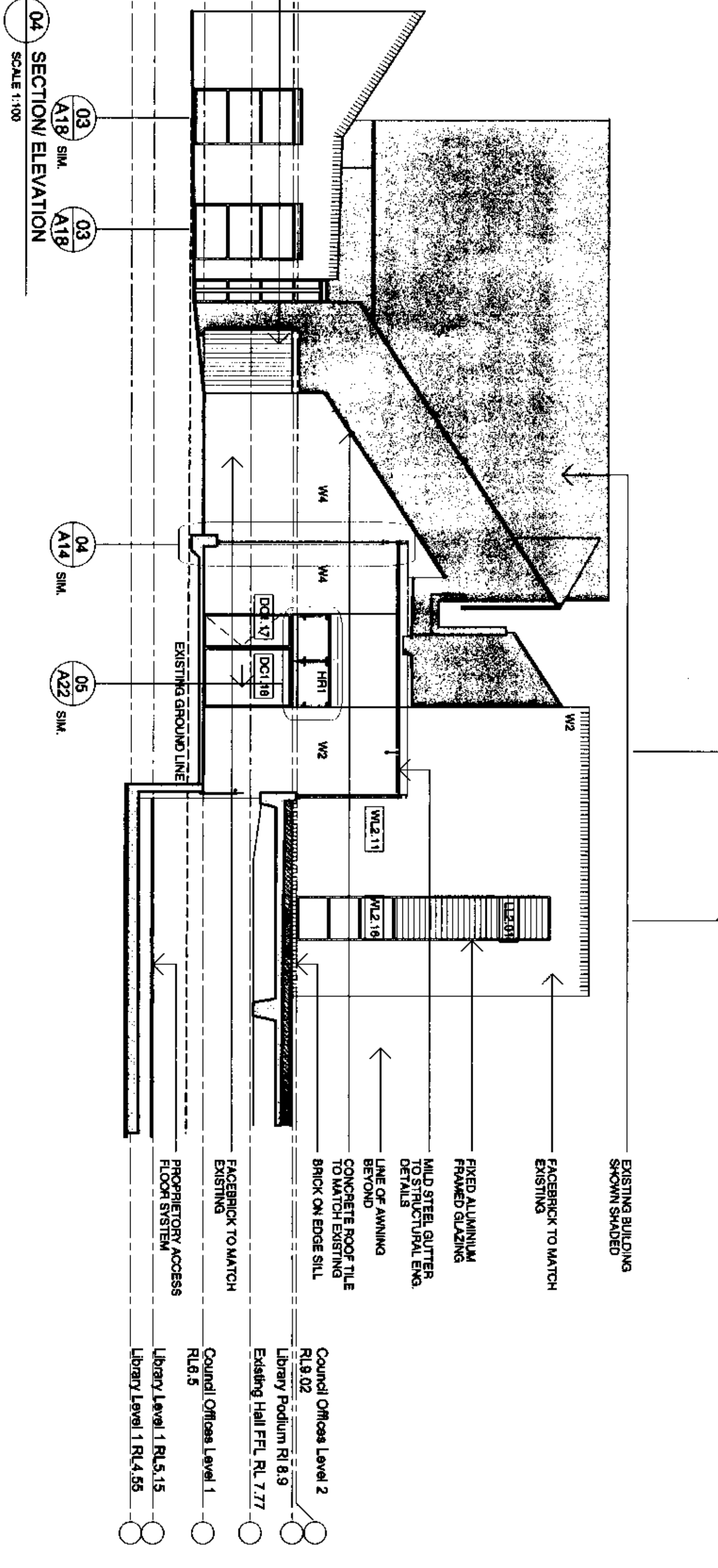
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DRAWN BY
CHECKED / APPROVED
DATE



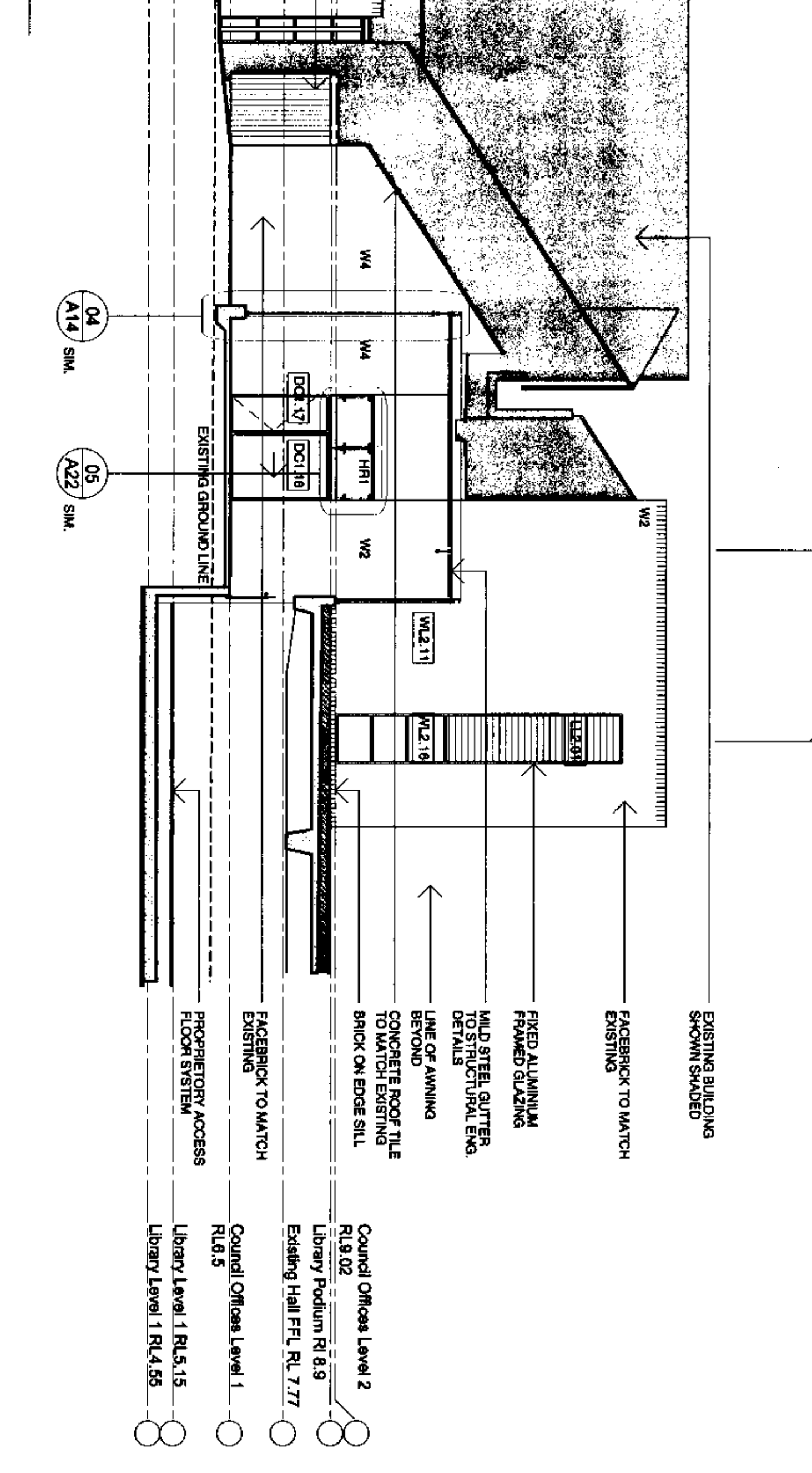
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SCALE 1:100



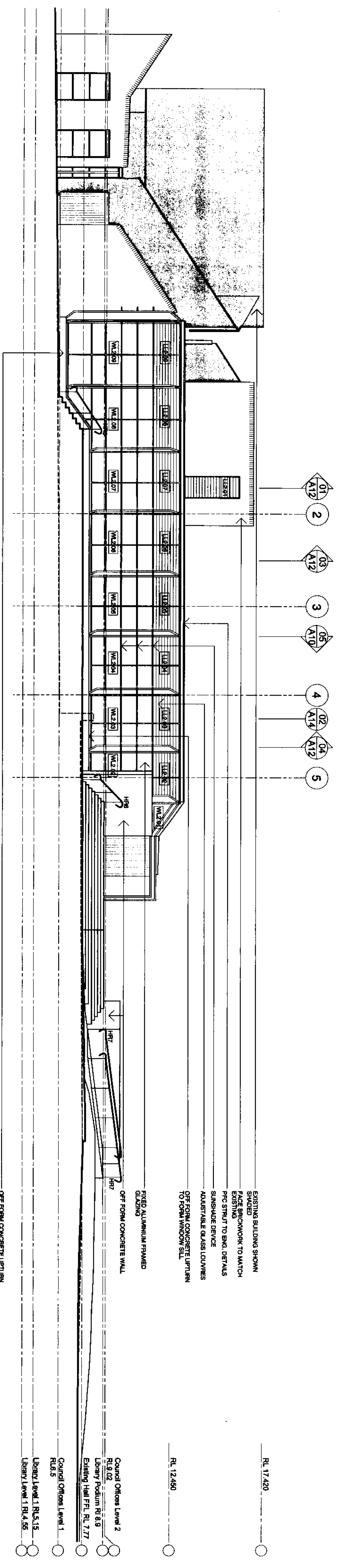
02 SECTION ELEVATION
SCALE 1:100



03 SECTION ELEVATION
SCALE 1:100



04 SECTION ELEVATION
SCALE 1:100



05 WEST ELEVATION
SCALE 1:100

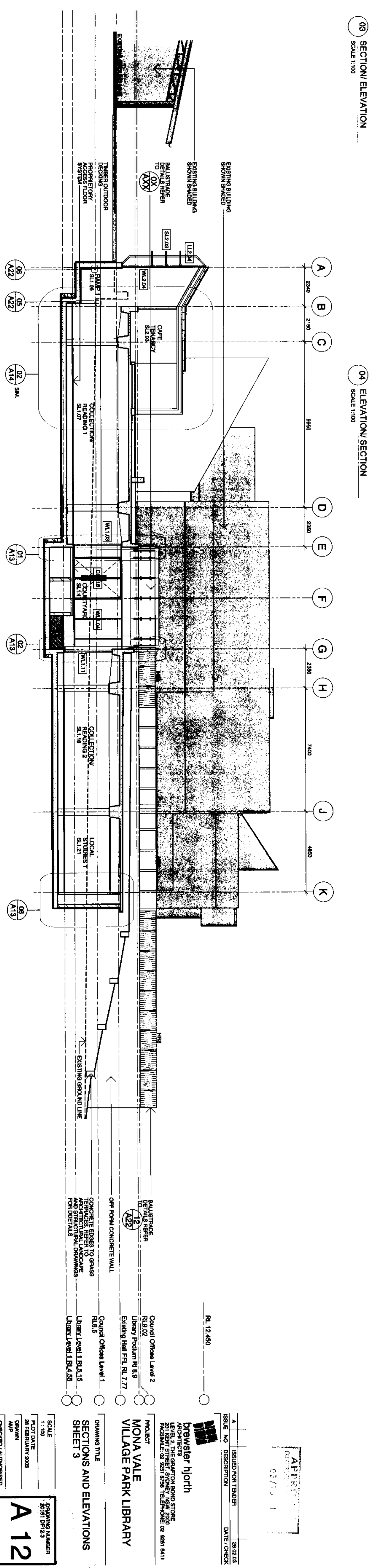
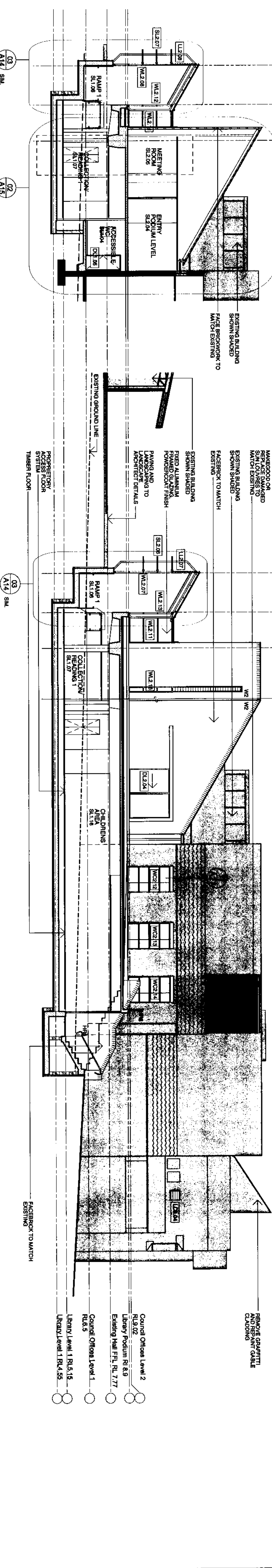
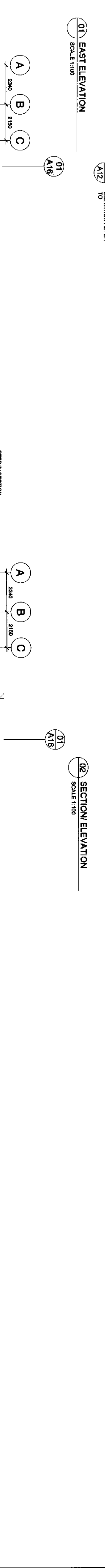
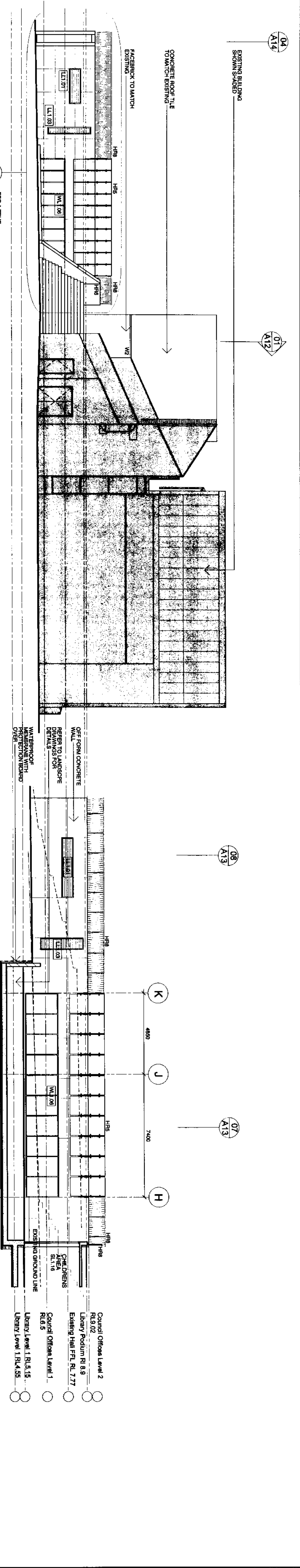
APPROVED
CONSTRUCTION CONTRACT
03/17/23-1
C. [Signature]

PROJECT
brewster biorth
ARCHITECTS CONSULTANTS GROUP
27 BENT STREET, TORONTO, ONTARIO M5H 1M1
PHONE: (416) 977-7000 FAX: (416) 977-7001
WEBSITE: WWW.BREWSTERBIORTH.COM TELEPHONE: (416) 977-7000

DRAWING TITLE
SECTIONS AND ELEVATIONS
SHEET 2
3 1/4" X 11"

SCALE
1:100
PLOT DATE
2/20/23
DRAWN
APP
CHECKED / AUTHORISED
ISSUE A

28/03/23
DATE CHECKED



APPROVED
03/15/11

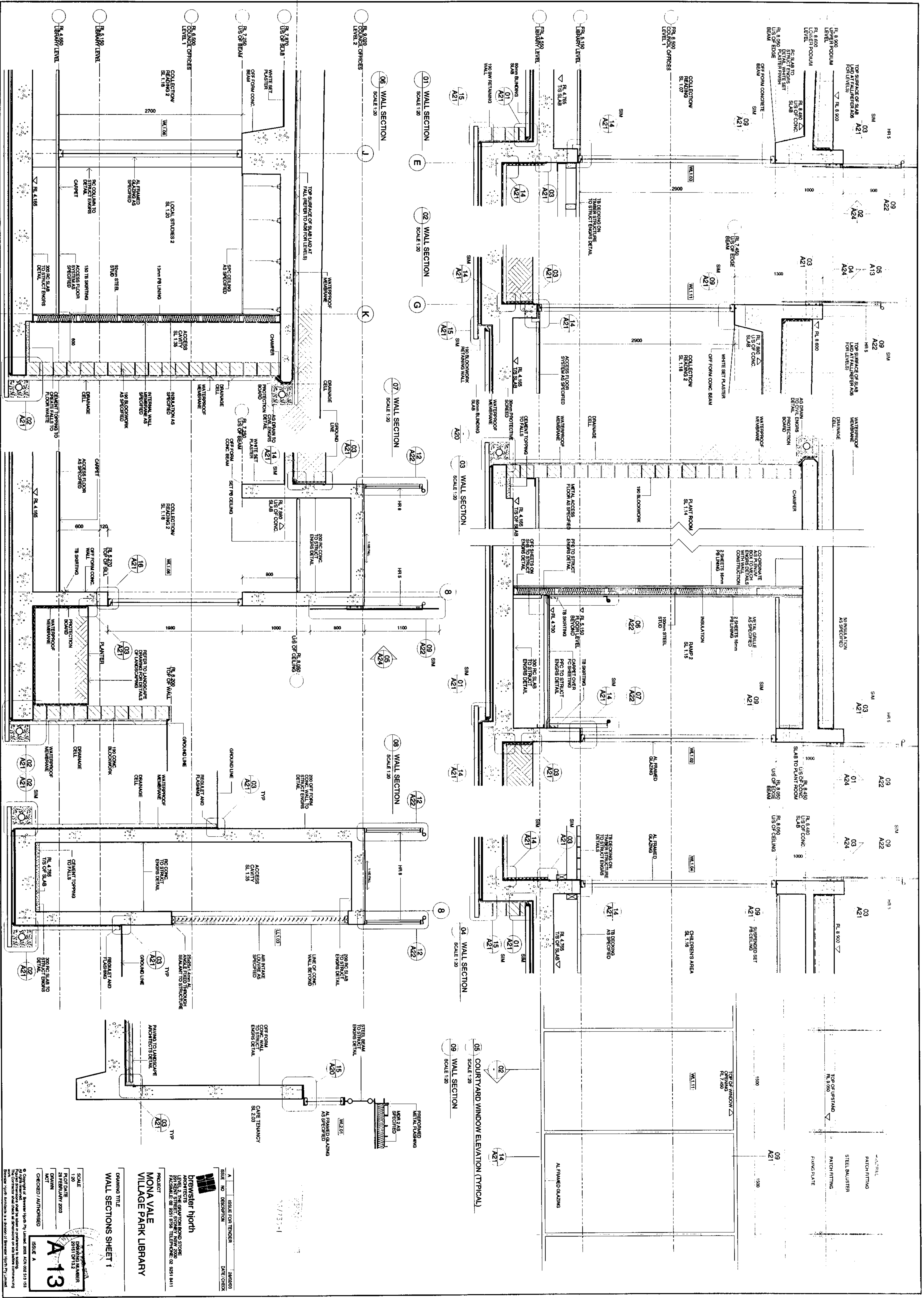
NO.	REVISION/DESCRIPTION	DATE	CHANGED BY
1	ISSUED FOR TENDER	03/22/11	

PROJECT
 Brewster North
 ALBERTA ARCHITECTURE BOARD STONE
 301 BERT STREET, S.W. CALGARY, ALBERTA T2P 1B9
 TEL: 403.243.1200 FAX: 403.243.1201

PRODUCT
 MONA VALE
 VILLAGE PARK LIBRARY

DRAWING NUMBER
 2011 DR-23
A 12

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PROJECT
MONA VALE VILLAGE PARK LIBRARY

CLIENT
Drewsen hyorth

DATE
 28 FEBRUARY 2003

SCALE
 SCALE 1:20

ISSUE FOR TENDER

NO.	DESCRIPTION	DATE	CREATED BY
1	ISSUE FOR TENDER	28 FEB 2003	...

DRAWING TITLE
WALL SECTIONS SHEET 1

SCALE
A13

DATE
 28 FEBRUARY 2003

CREATED BY
 ...

APPROVED BY
 ...

PROJECT
 MONA VALE VILLAGE PARK LIBRARY

CLIENT
 Drewsen hyorth

DATE
 28 FEBRUARY 2003

SCALE
 SCALE 1:20

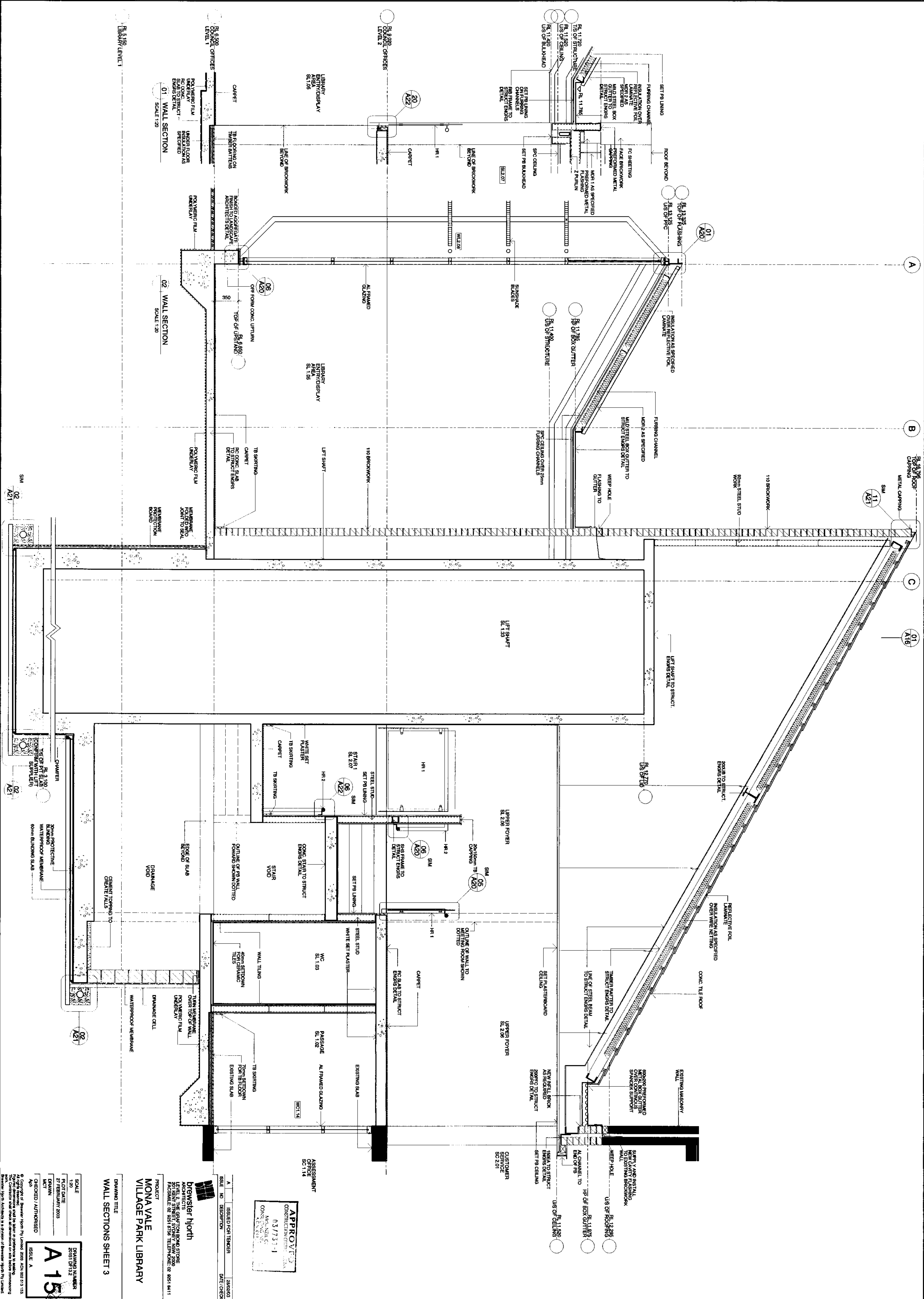
ISSUE FOR TENDER



APPROVED
 CONTRACT DOCUMENTS
 03/733-1
 CONTRACT NO. 19/0000000000
 CONTRACT VALUE \$1,191,191.00
 CONTRACT START DATE 15/01/2019

ISSUED FOR TENDERS
 DATE CHECK 28/03/20
 PROJECT MONA VALE VILLAGE PARK LIBRARY
 DRAWING TITLE WALL SECTIONS SHEET 2
 SCALE 1:20
 PLOT DATE 20/03/2020
 DRAWN MCT
 CHECKED/JAN/PH/MSD
 SHEET NO. 14
 SHEET TOTAL 14

CONTRACT NUMBER 2019/0122
A 14
 CONTRACT VALUE \$1,191,191.00
 CONTRACT START DATE 15/01/2019
 CONTRACT END DATE 31/03/2020
 CONTRACT VALUE \$1,191,191.00
 CONTRACT START DATE 15/01/2019
 CONTRACT END DATE 31/03/2020



01 WALL SECTION
SCALE 1:20

02 WALL SECTION
SCALE 1:20

DRAWING TITLE
WALL SECTIONS SHEET 3

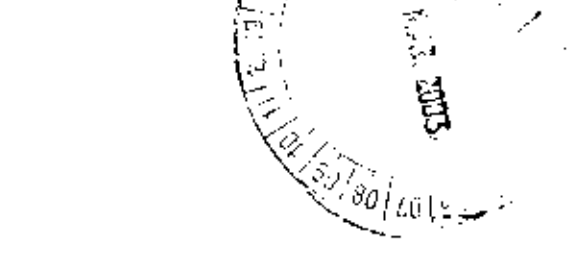
PROJECT
MONA VALE
VILLAGE PARK LIBRARY

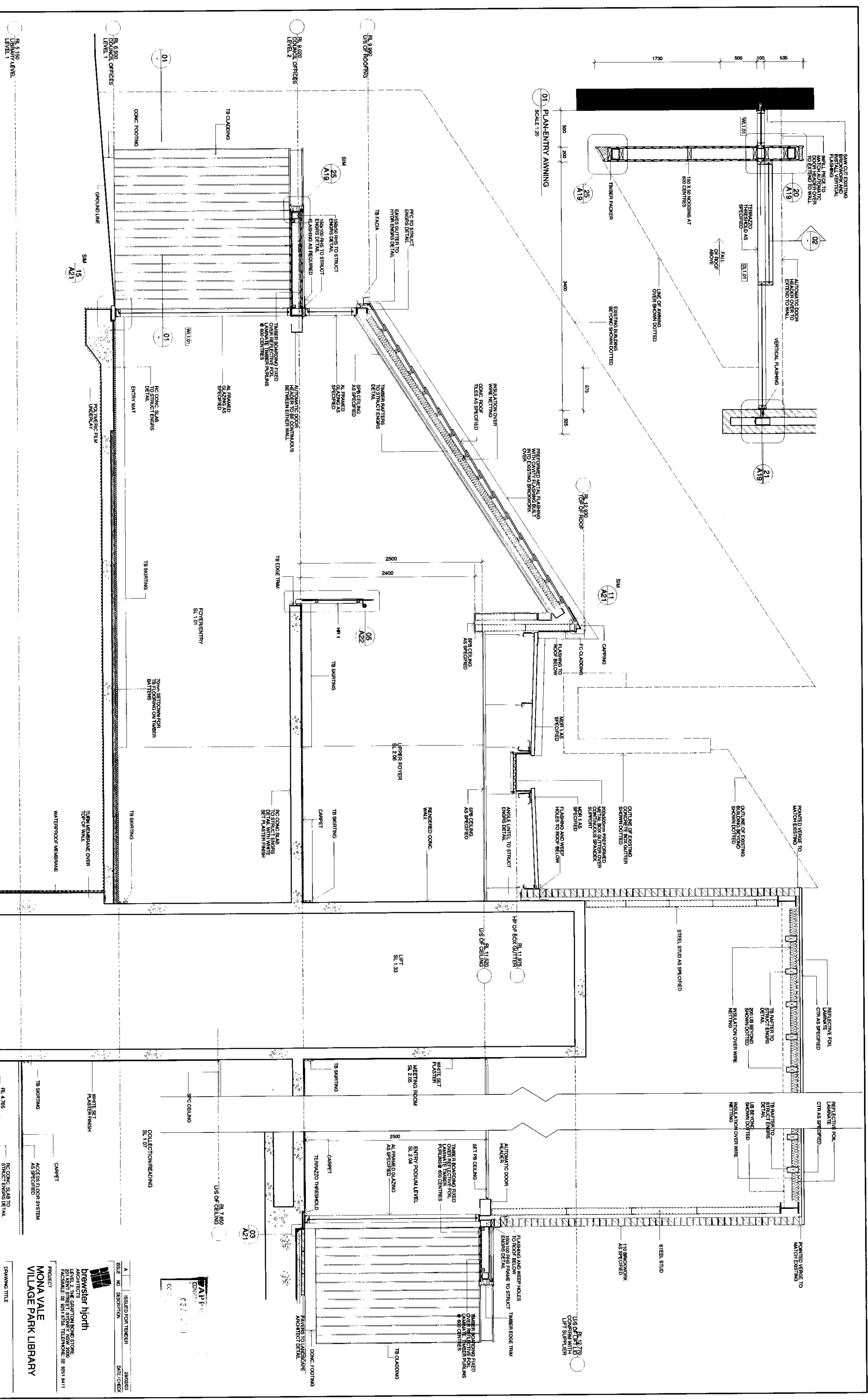
designer horth
ARCHITECTS
LEVEL 1 THE SPURTON BUILDING
100 SPURTON ROAD
PASCADALE NSW 2218
PHONE: 02 9281 8788 TELEPHONE: 02 9281 1411

ISSUE NO.	ISSUED FOR / REVISION	DATE / CHECK
1	ISSUED FOR TENDER	28/06/2023

APPROVED
DATE: 03/07/23
CONTRACT NO: 23/0000000000

SCALE
1:20
PLOT DATE
20/07/23
DESIGNED
MCT
CHECKED / AUTHORIZED
APN
DRAWING NUMBER
20/07/23
DATE
20/07/23
A 15





02 WALL SECTION
SCALE 1/8"

01 PLAN-ENTRY AWNING
SCALE 1/8"

PROJECT	MONA VALE VILLAGE PARK LIBRARY
CLIENT	drewevster hioth
ARCHITECT	drewevster hioth
DATE	27 FEBRUARY 2020
SCALE	1/8"
DRAWING NUMBER	A 16
ISSUED FOR TENDER	30/03/20
DATE CHECK	

WALL SECTIONS SHEET 4

PROJECT: MONA VALE VILLAGE PARK LIBRARY

CLIENT: drewevster hioth

ARCHITECT: drewevster hioth

DATE: 27 FEBRUARY 2020

SCALE: 1/8"

DRAWING NUMBER: A 16

ISSUED FOR TENDER: 30/03/20

DATE CHECK:

WALL SECTIONS SHEET 4

PROJECT: MONA VALE VILLAGE PARK LIBRARY

CLIENT: drewevster hioth

ARCHITECT: drewevster hioth

DATE: 27 FEBRUARY 2020

SCALE: 1/8"

DRAWING NUMBER: A 16

ISSUED FOR TENDER: 30/03/20

DATE CHECK:

WALL SECTIONS SHEET 4

PROJECT: MONA VALE VILLAGE PARK LIBRARY

CLIENT: drewevster hioth

ARCHITECT: drewevster hioth

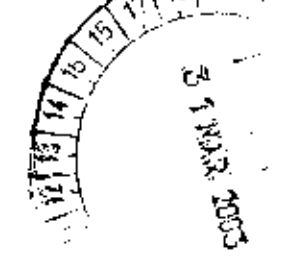
DATE: 27 FEBRUARY 2020

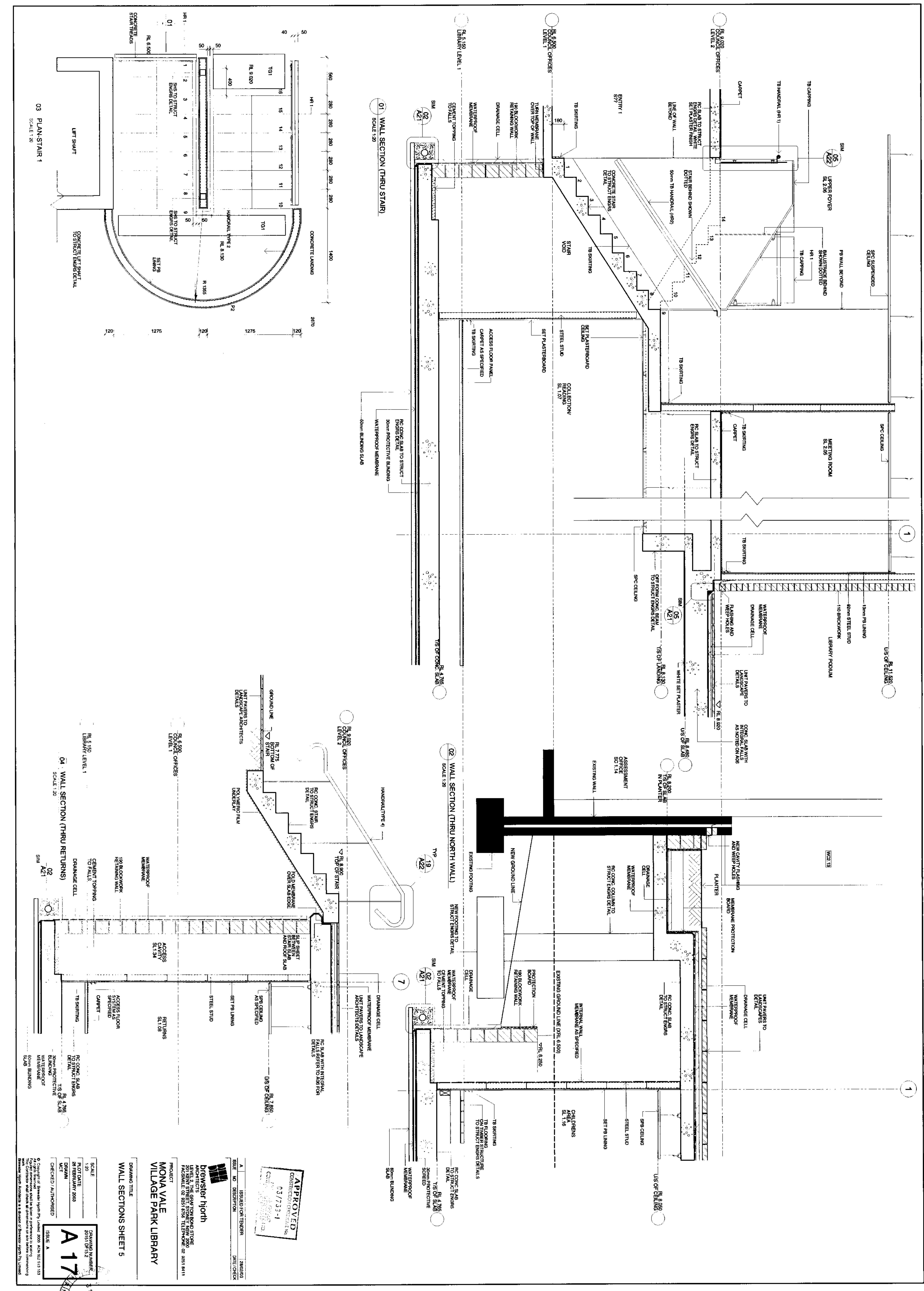
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DRAWING NUMBER: A 16

ISSUED FOR TENDER: 30/03/20

DATE CHECK:





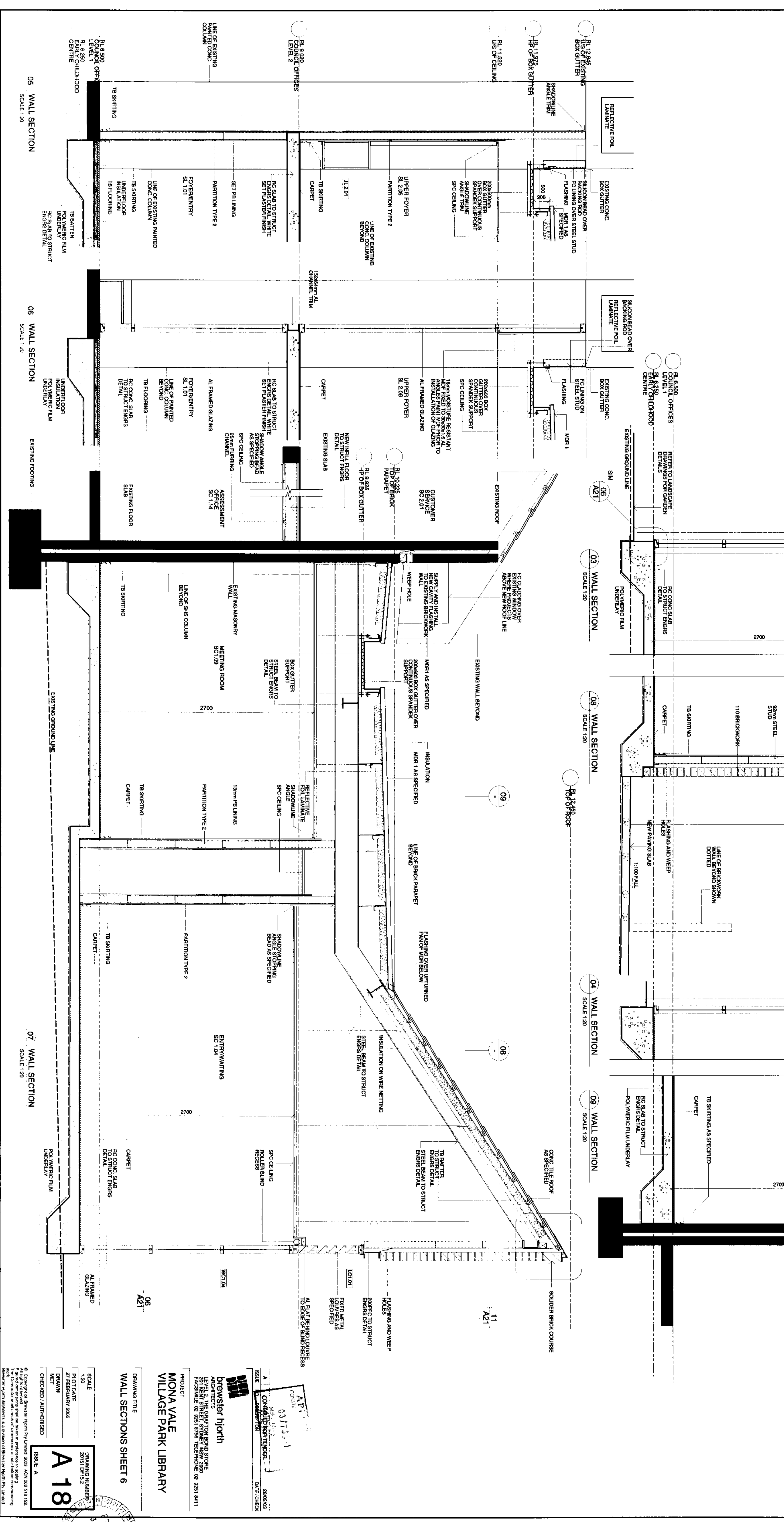
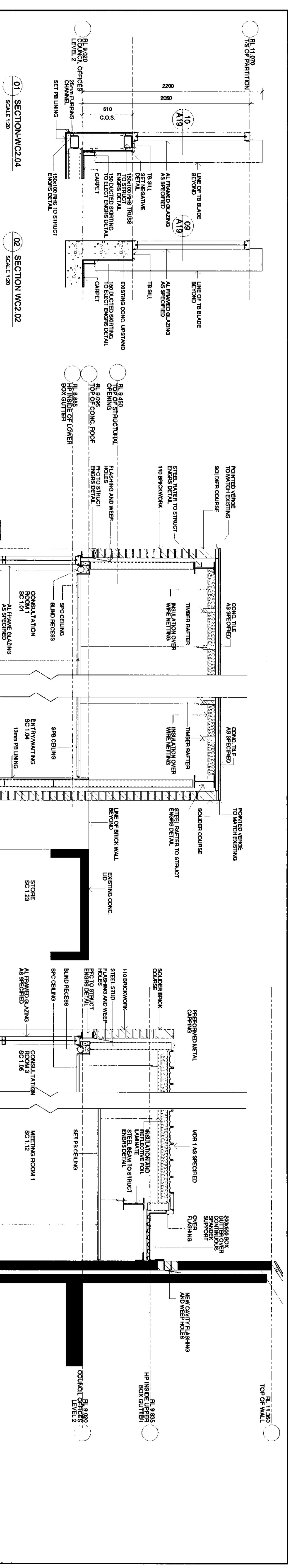
APPROVED
 CONTRACT NO. 03/733-1
 03/11/11

Brewster North
 ARCHITECTS
 201 BENTLEY STREET, BENTLEY NSW 2155
 PHONE: (02) 9339 9200 FAX: (02) 9339 9201
 PROJECT: MONA VALE VILLAGE PARK LIBRARY

DRAWING TITLE
WALL SECTIONS SHEET 5

SCALE
 1:50
 DATE
 2011 01 12
A17

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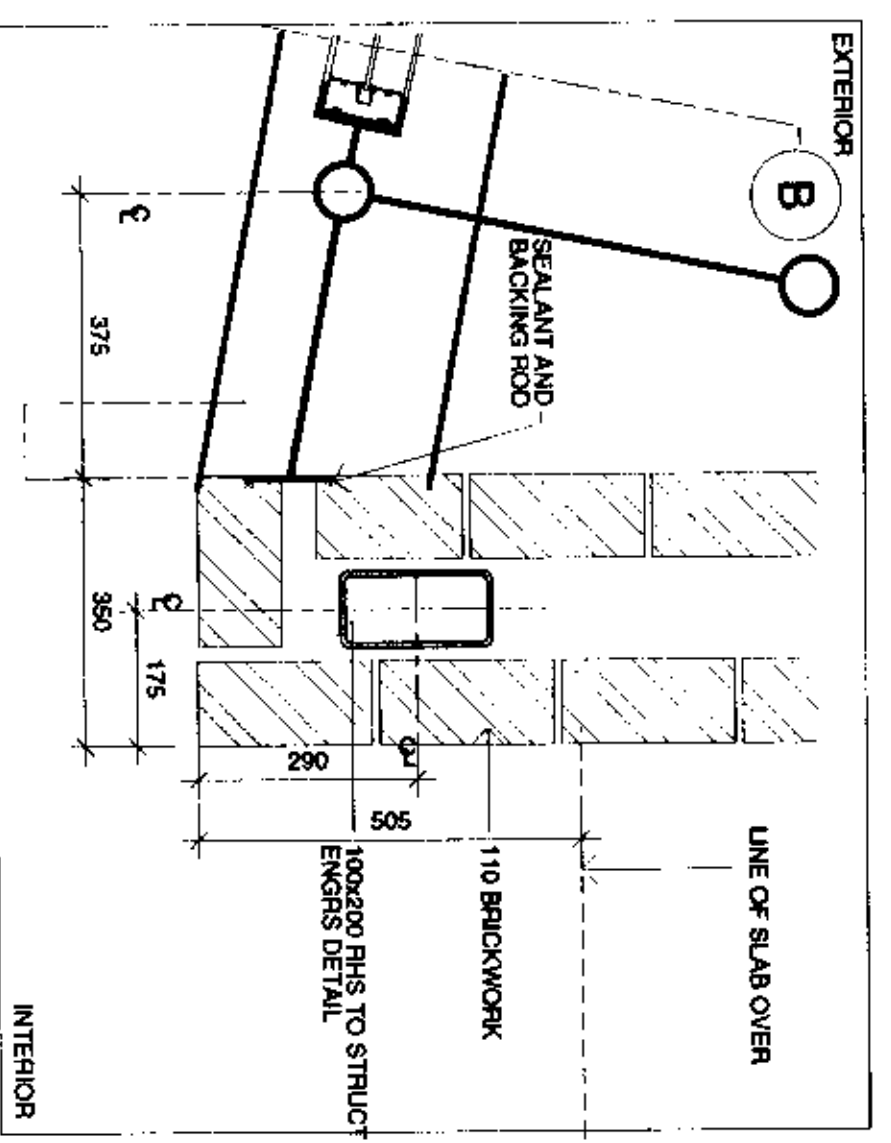
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WALL SECTIONS SHEET 6
 PROJECT
**MONA VALE
 VILLAGE PARK LIBRARY**
 DRAWING NUMBER
A 18
 DATE CHECKED
 DATE DRAWN
 27 FEBRUARY 2009
 DRAWN BY
 CHECKED BY
 ALPHONSE

DRAWING NUMBER
A 18
 DATE CHECKED
 DATE DRAWN
 27 FEBRUARY 2009
 DRAWN BY
 CHECKED BY
 ALPHONSE

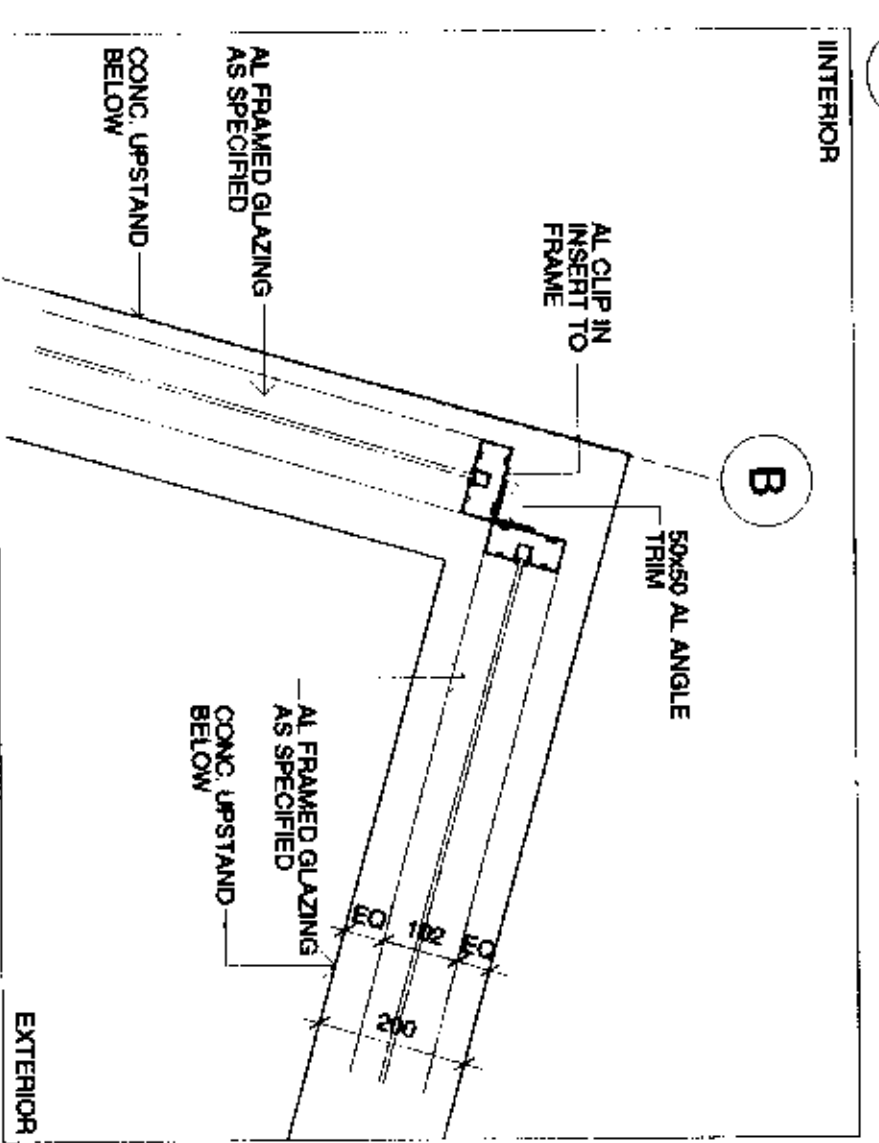
PROJECT
**MONA VALE
 VILLAGE PARK LIBRARY**
 DRAWING NUMBER
A 18
 DATE CHECKED
 DATE DRAWN
 27 FEBRUARY 2009
 DRAWN BY
 CHECKED BY
 ALPHONSE

DRAWING NUMBER
A 18
 DATE CHECKED
 DATE DRAWN
 27 FEBRUARY 2009
 DRAWN BY
 CHECKED BY
 ALPHONSE

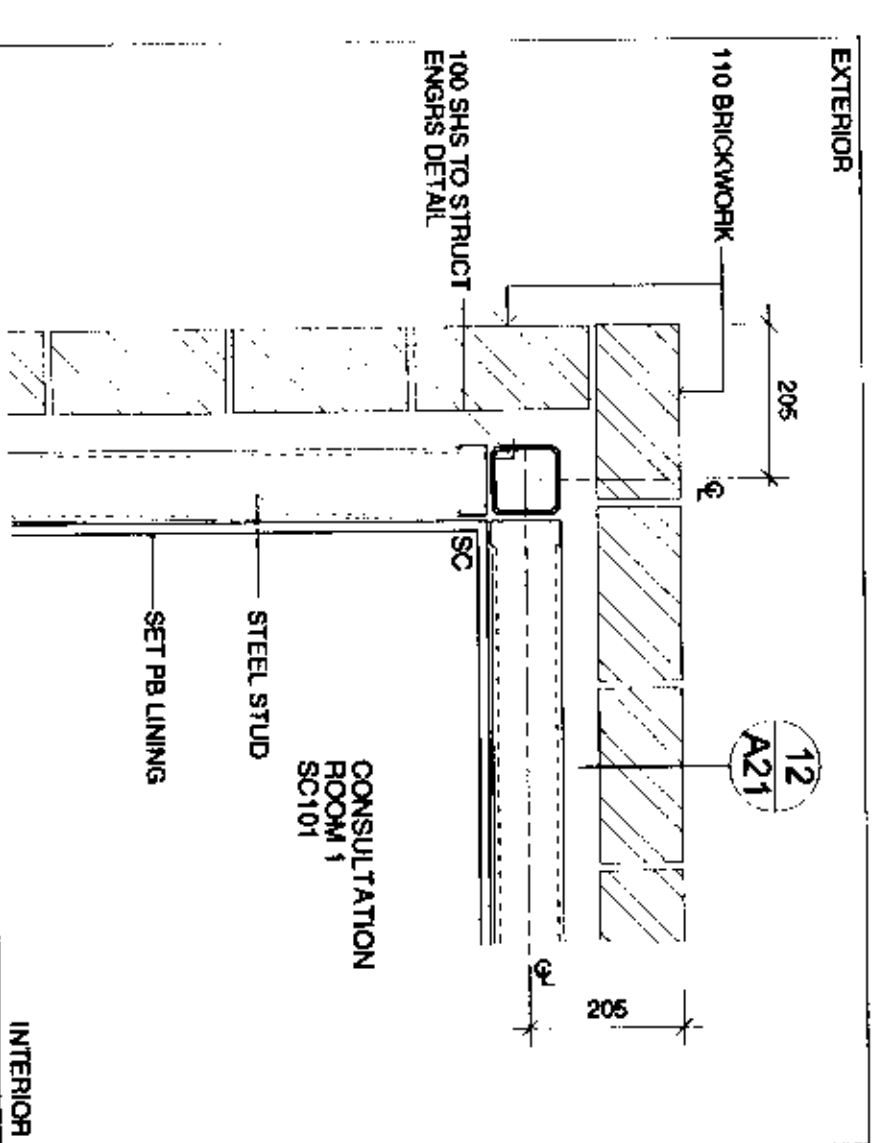




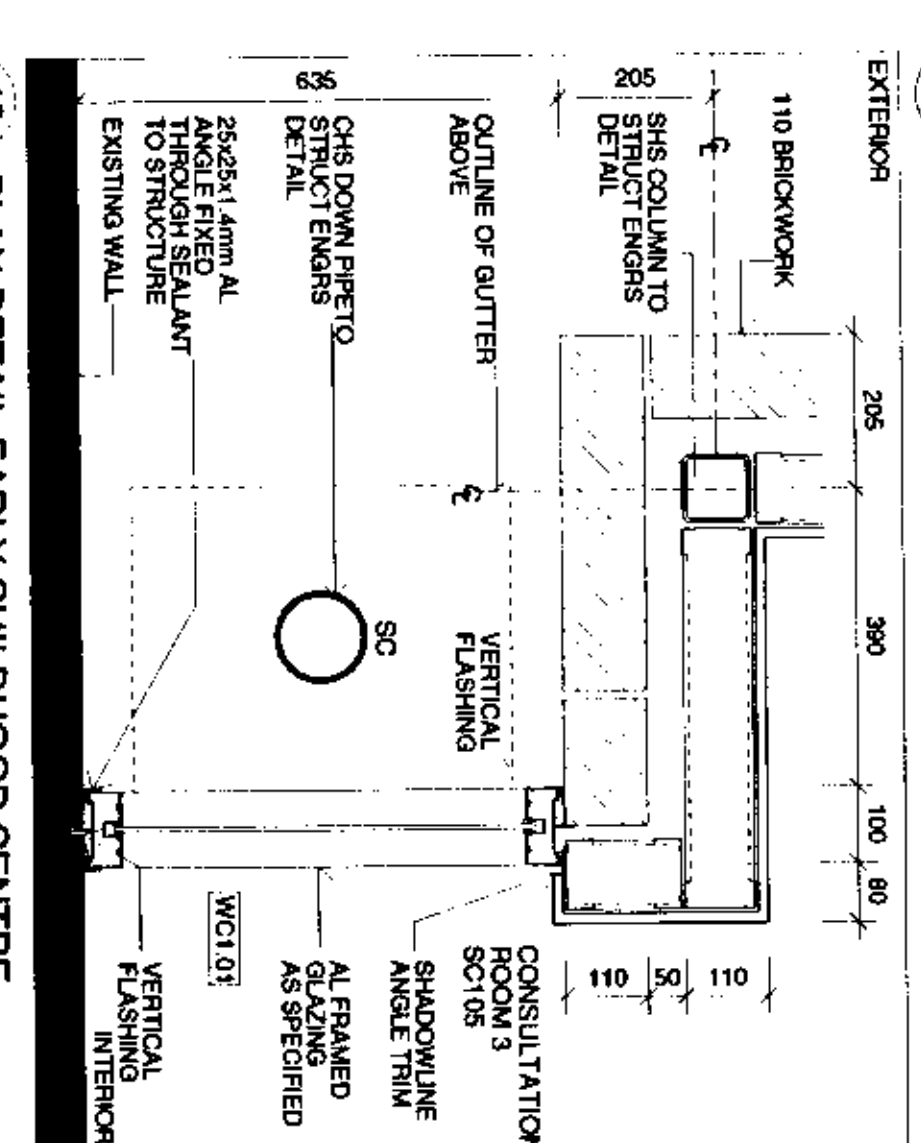
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SCALE 1:10



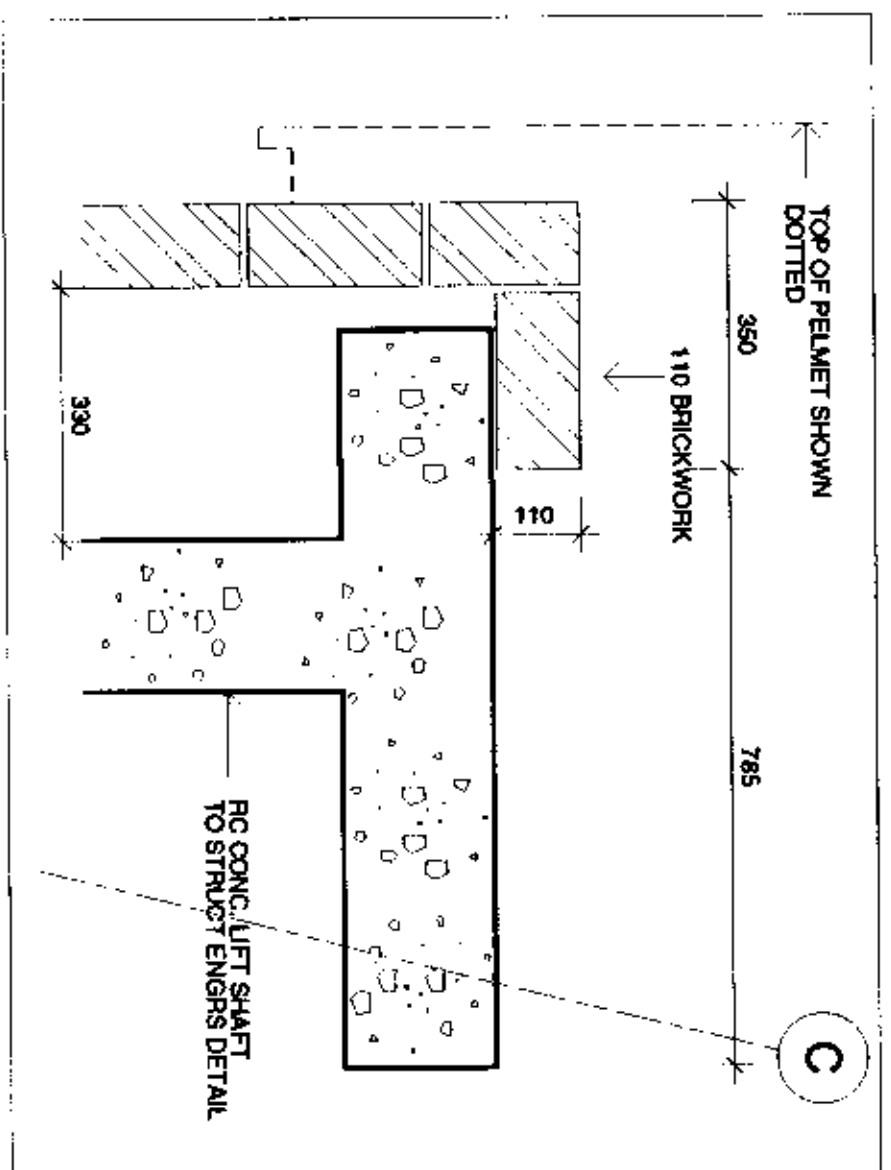
07 PLAN DETAIL
SCALE 1:10



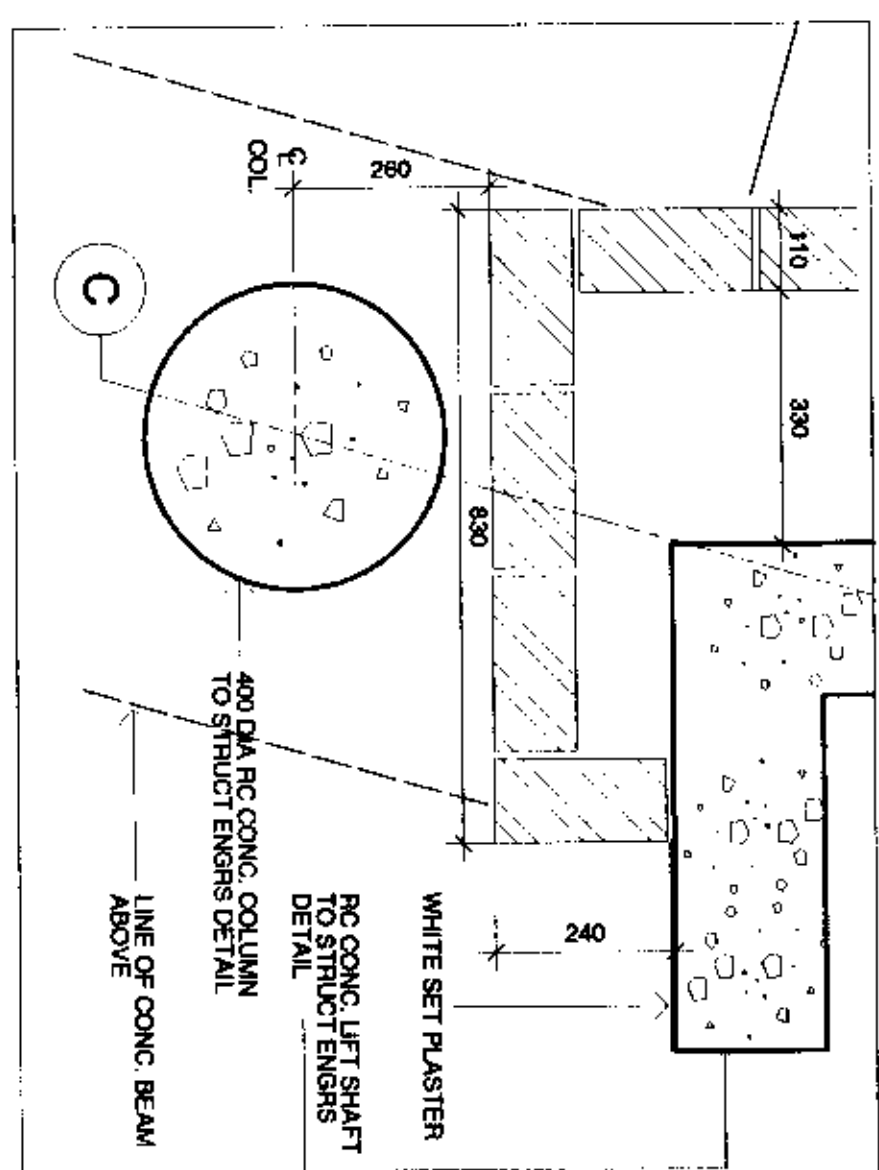
13 PLAN DETAIL - EARLY CHILDHOOD CENTRE
SCALE 1:10



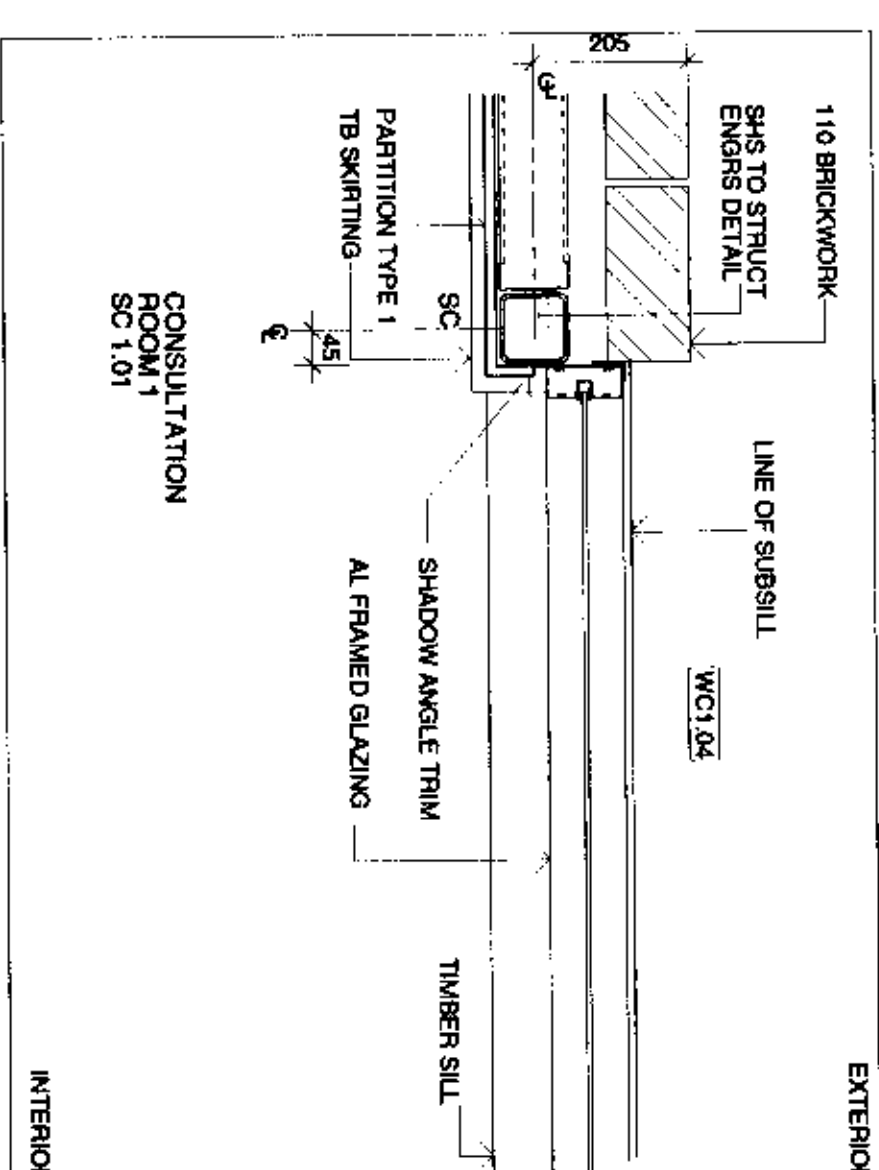
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SCALE 1:10



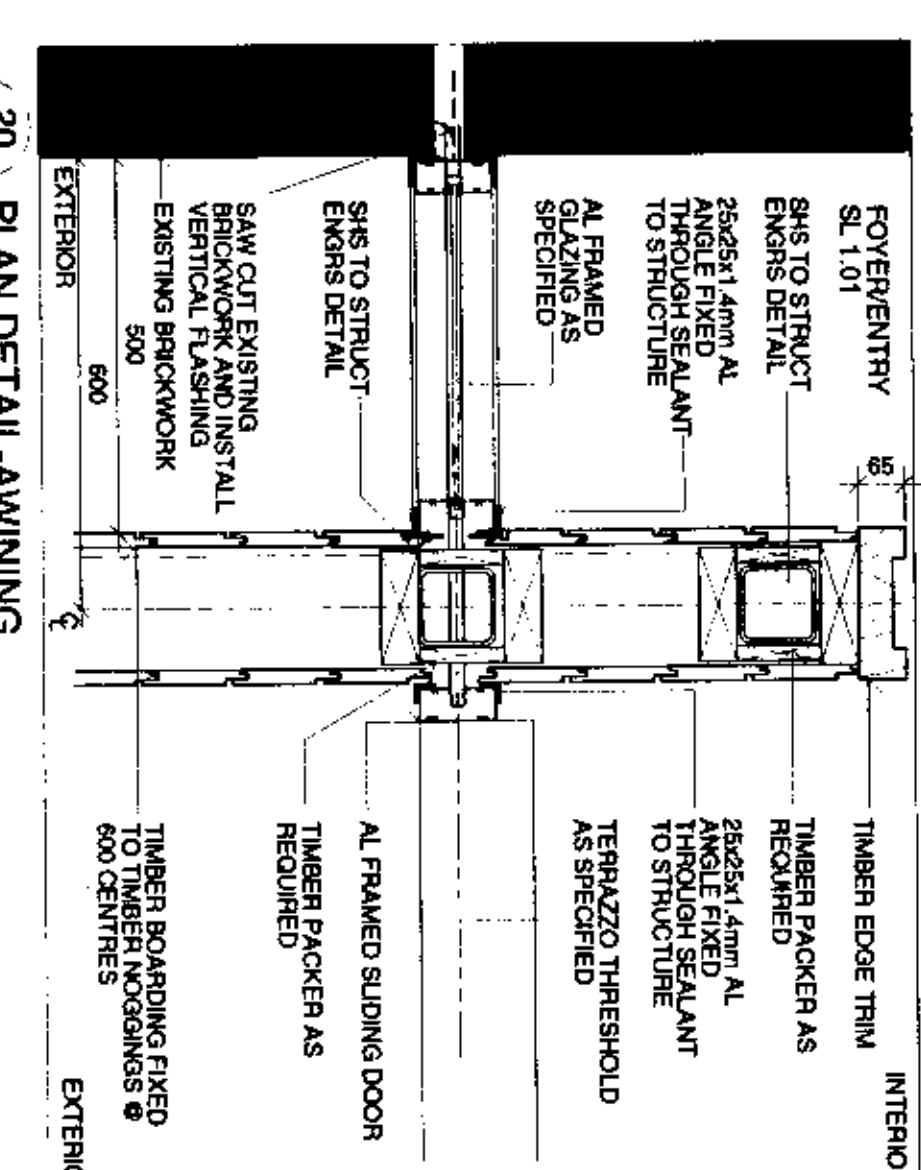
01 PLAN DETAIL - LEFT SHAFT
SCALE 1:10



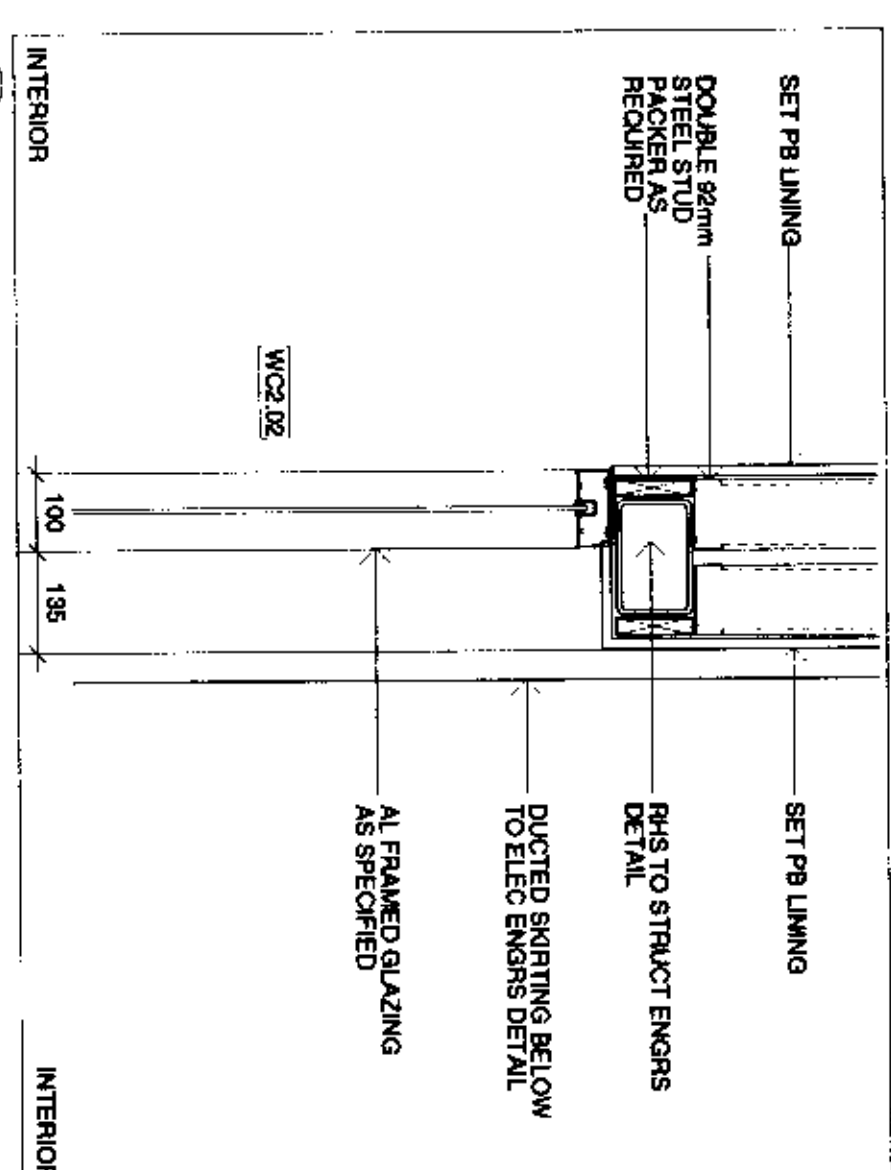
08 PLAN DETAIL - LEFT SHAFT
SCALE 1:10



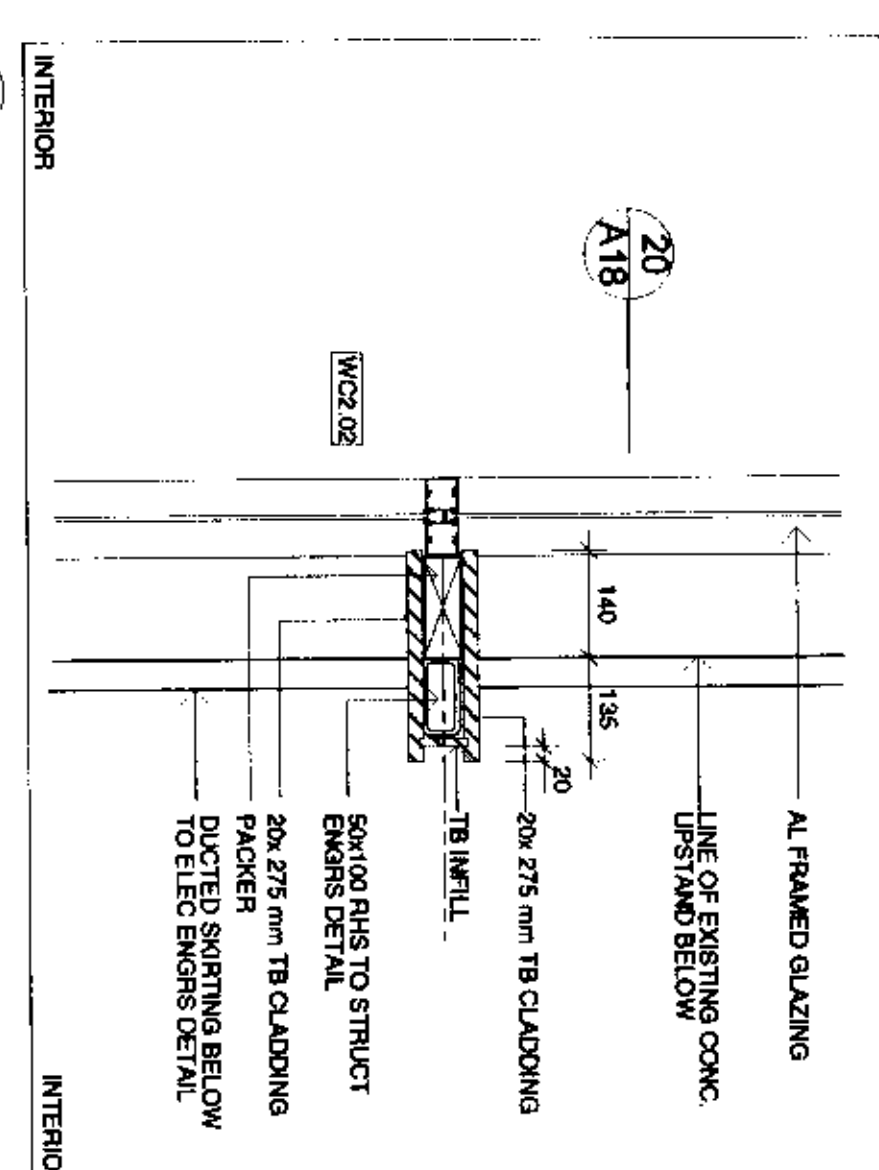
14 PLAN DETAIL - EARLY CHILDHOOD CENTRE
SCALE 1:10



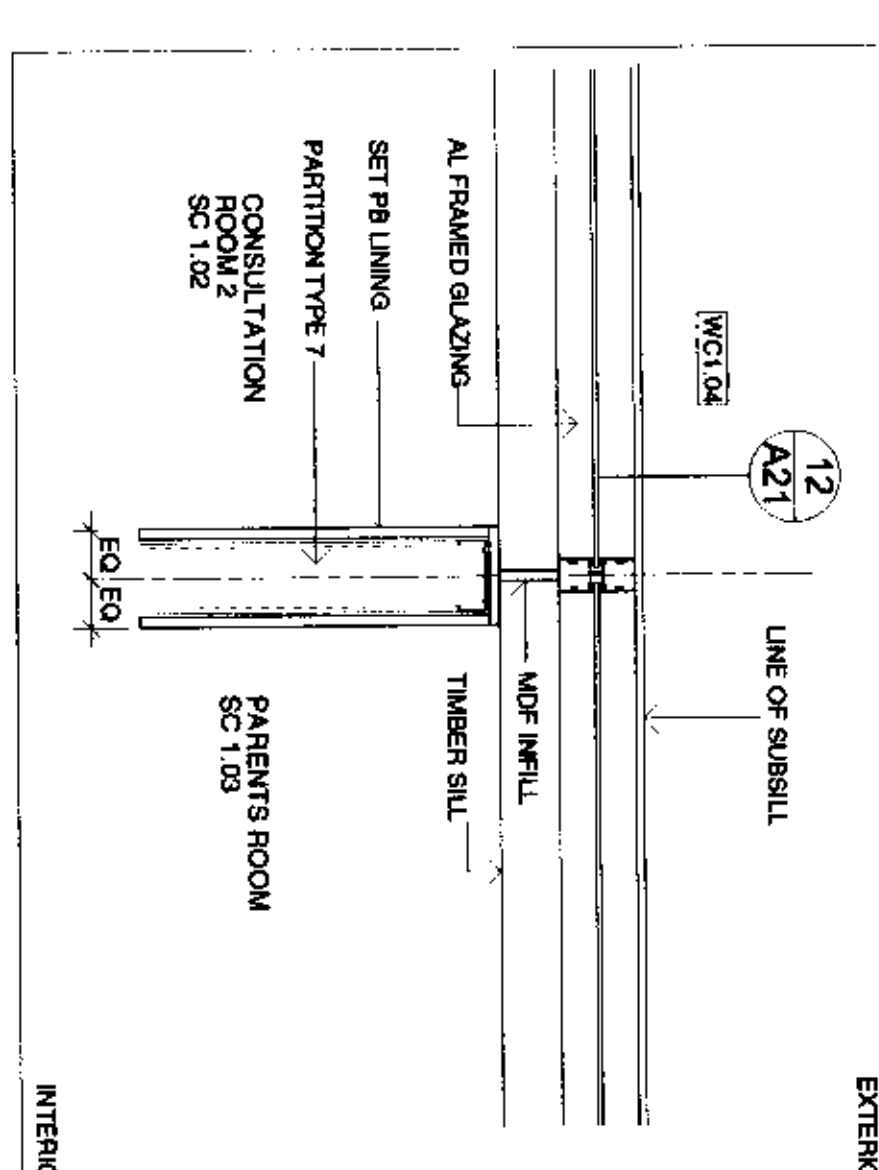
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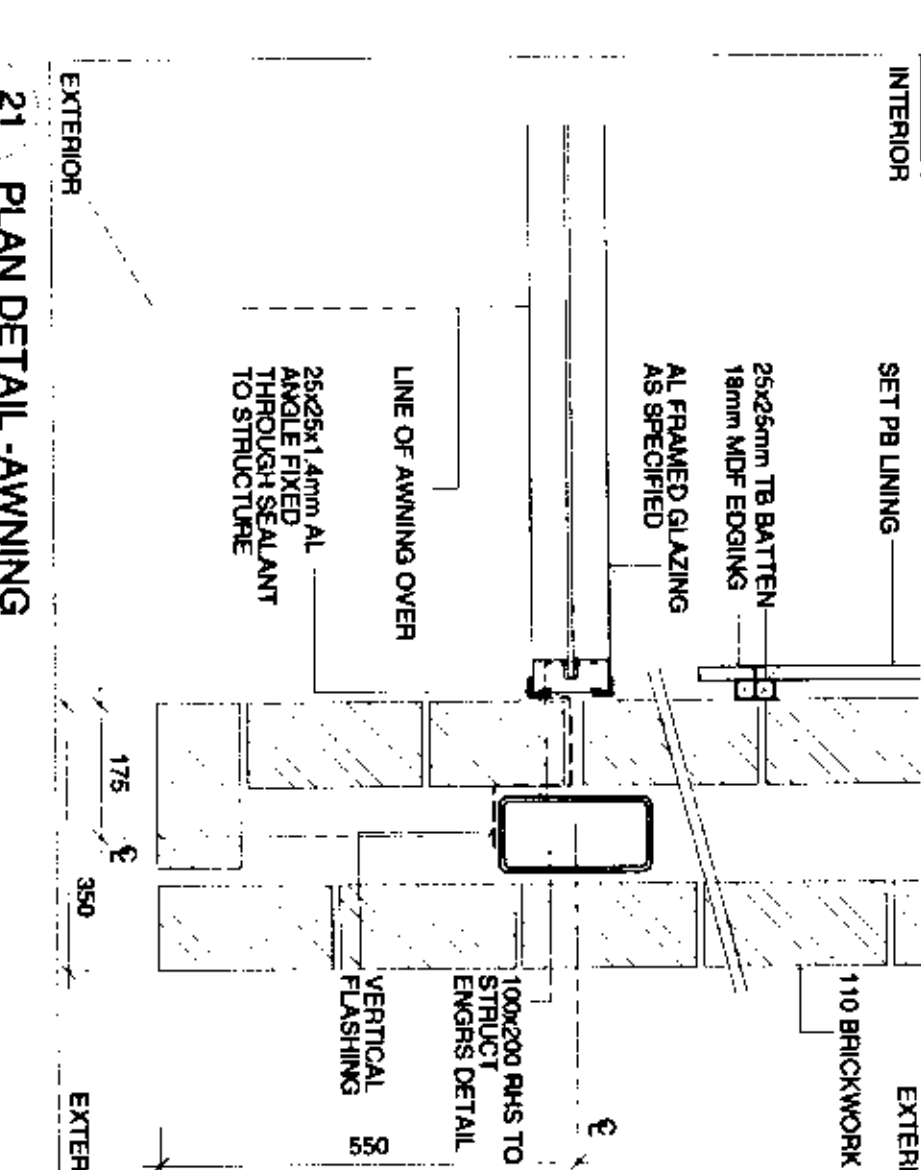
08 PLAN DETAIL - NEW UPSTAND (CUST. SERVICE)
SCALE 1:10



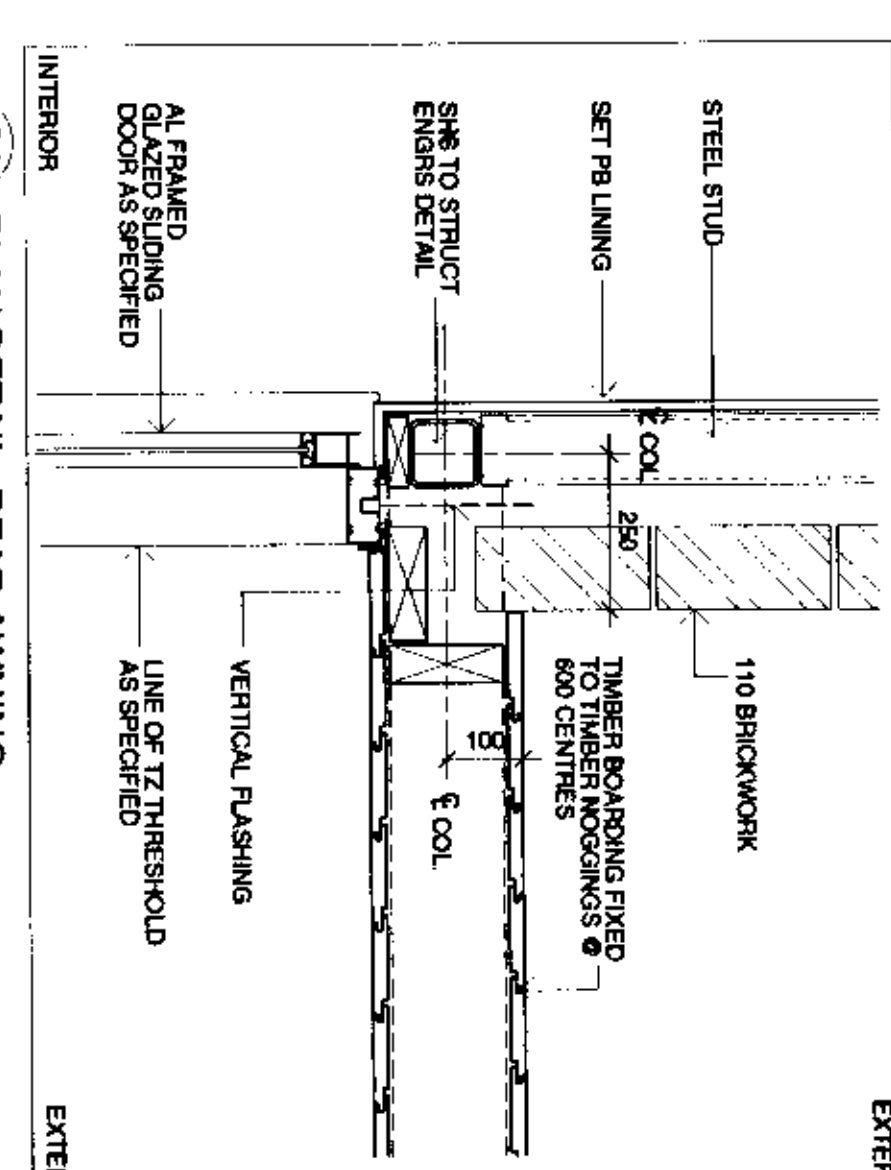
09 PLAN DETAIL - EXISTING UPSTAND (CUST. SERVICE)
SCALE 1:10



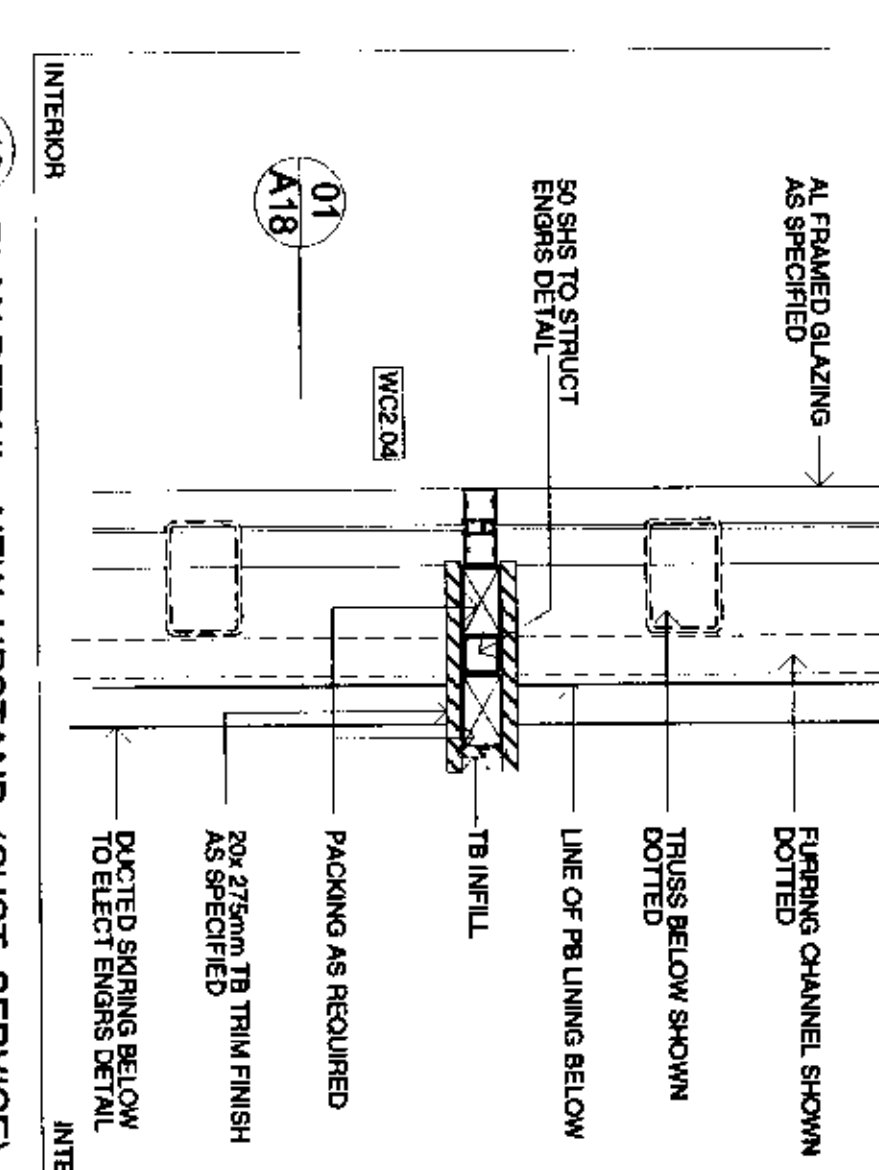
15 PLAN DETAIL - EARLY CHILDHOOD CENTRE
SCALE 1:10



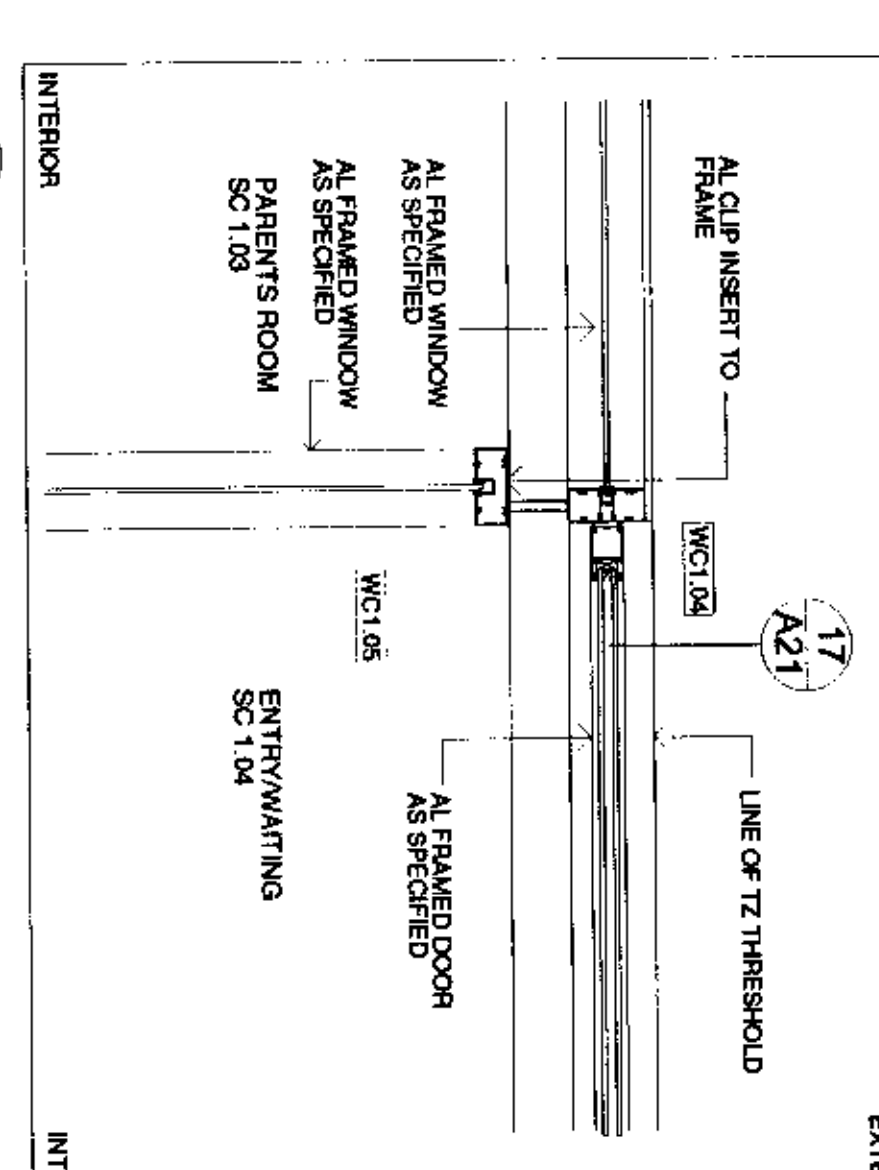
21 PLAN DETAIL - AWNING
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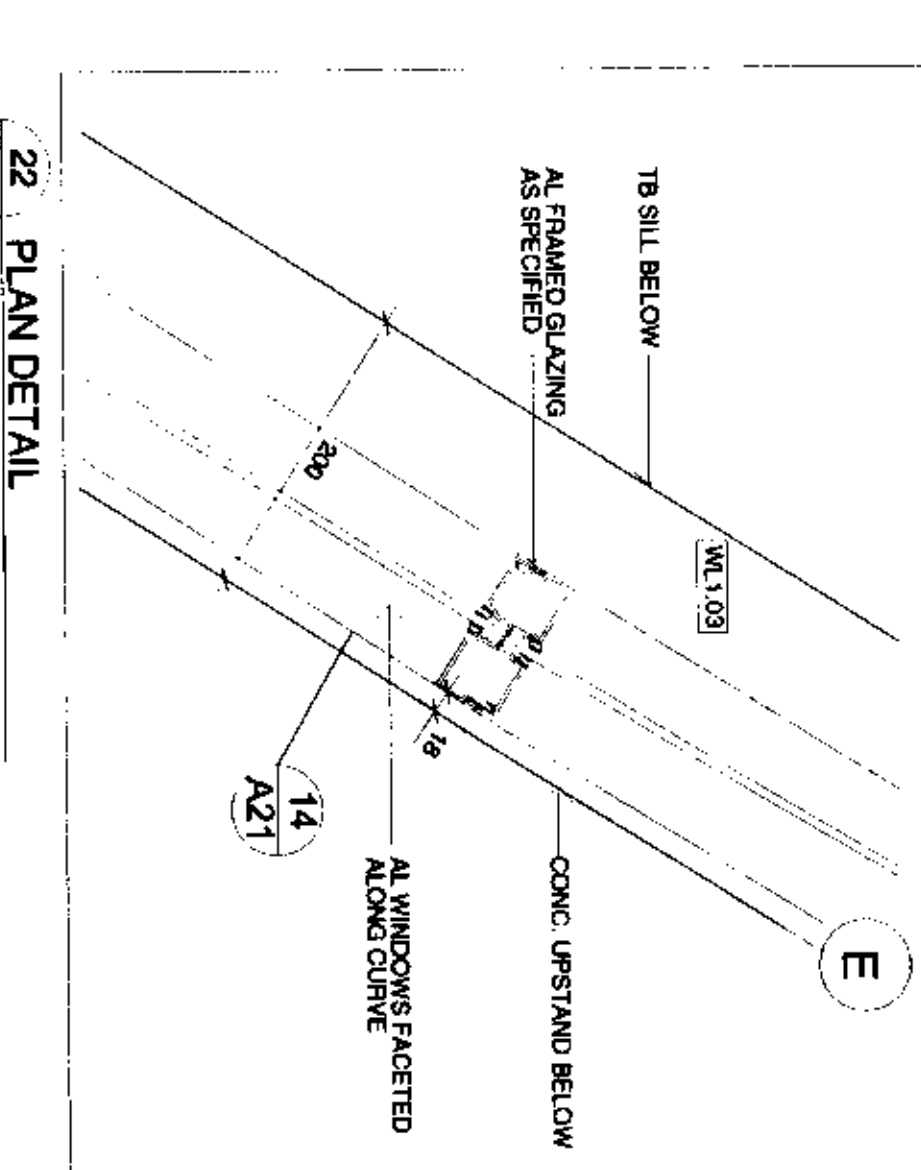
04 PLAN DETAIL - REAR AWNING
SCALE 1:10



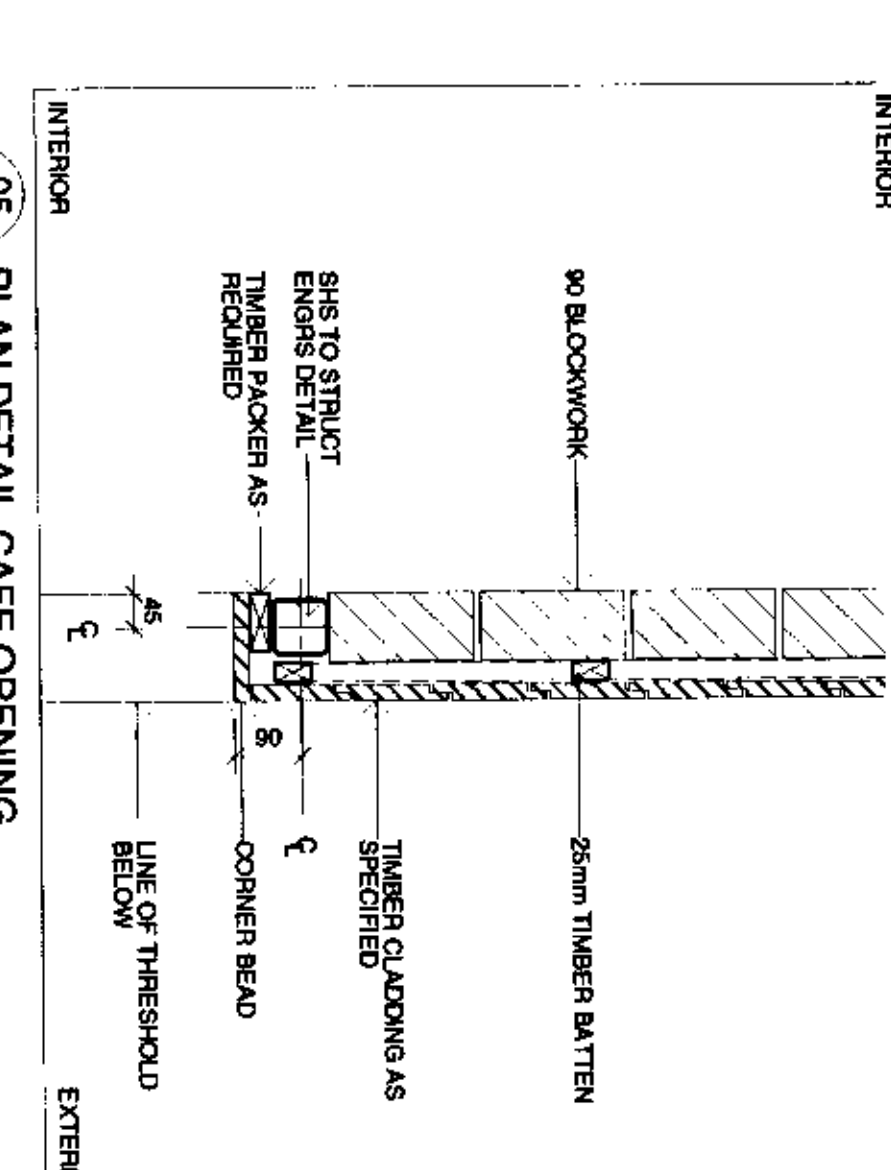
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SCALE 1:10



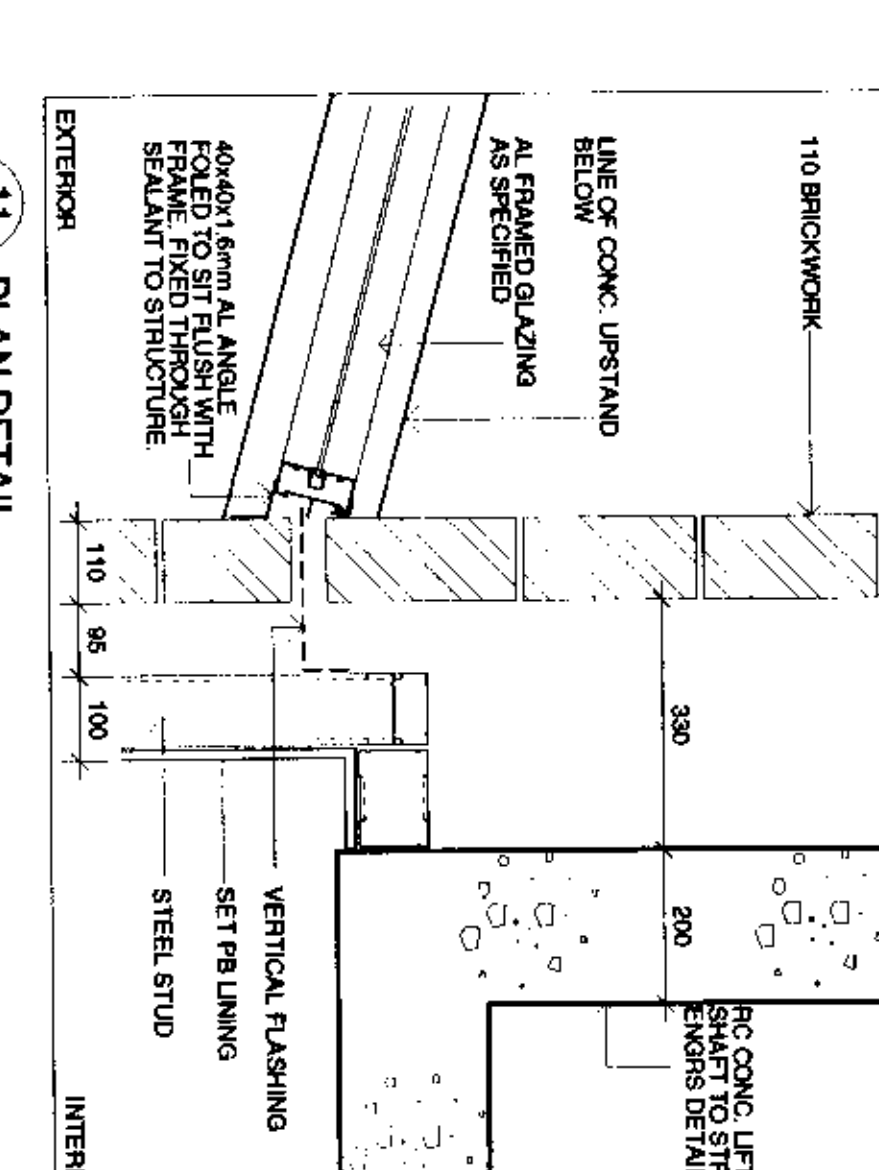
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SCALE 1:10



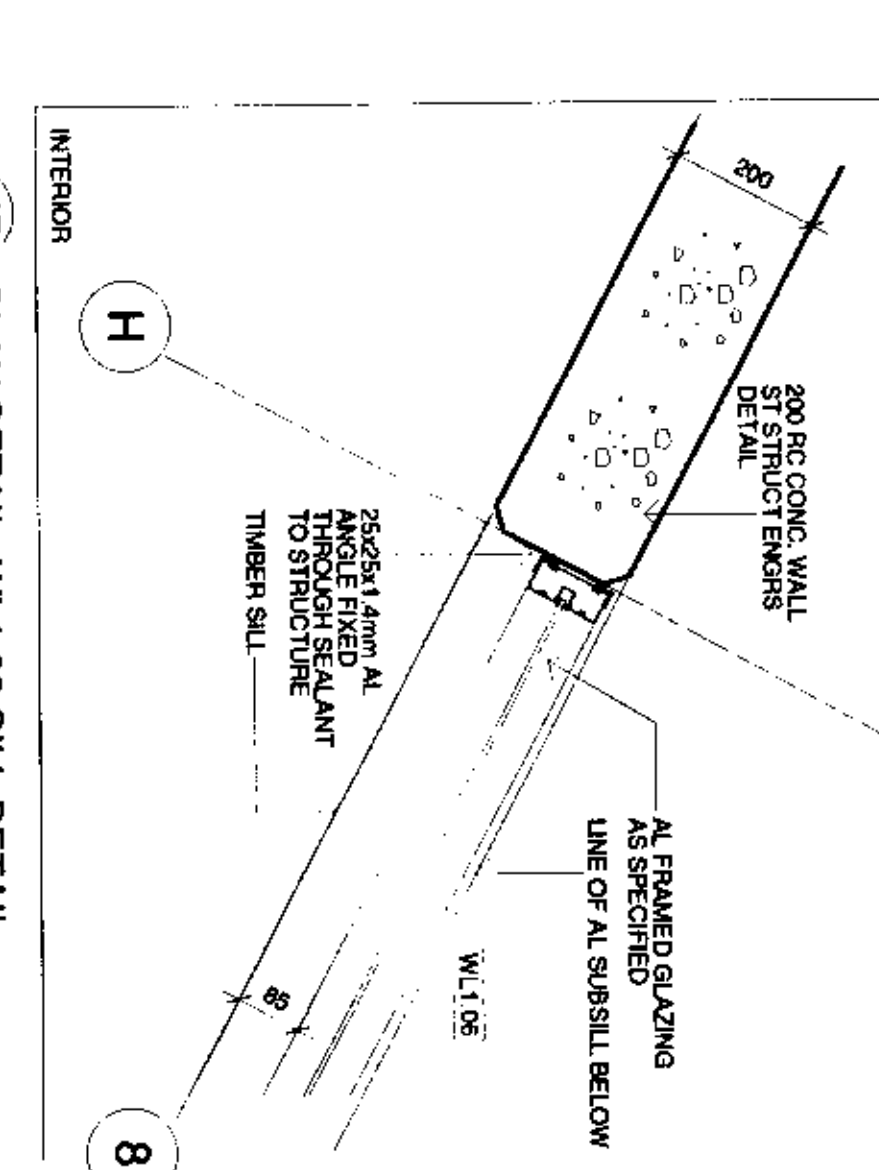
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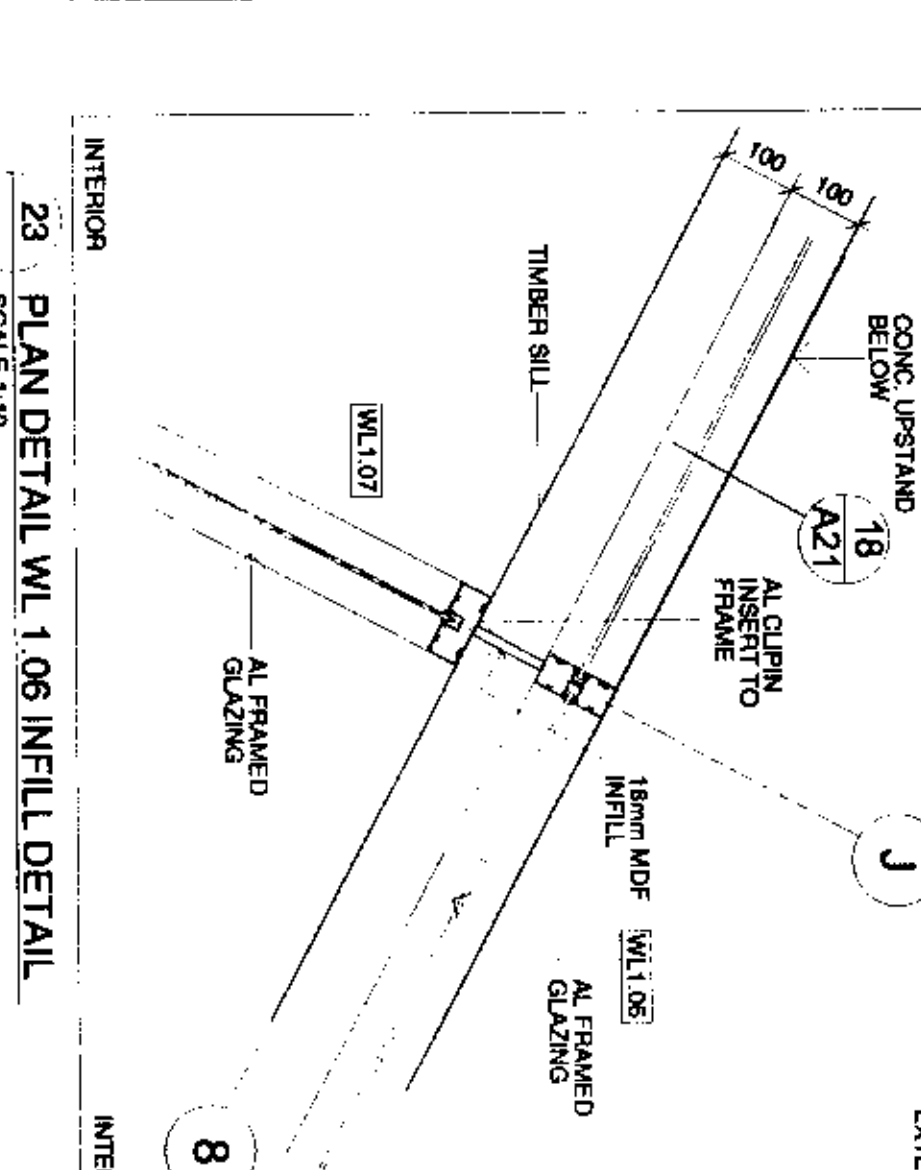
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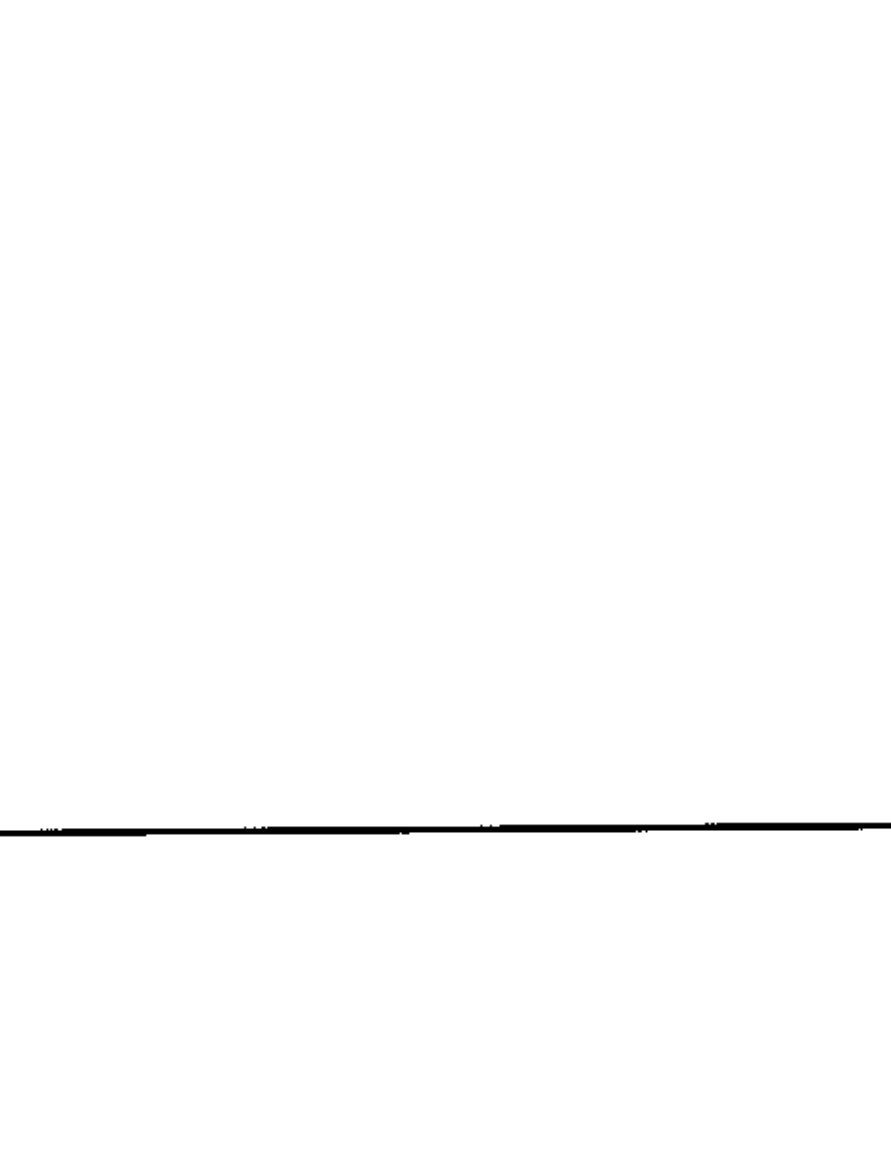
11 PLAN DETAIL
SCALE 1:10



17 PLAN DETAIL - WIL 06 SILL DETAIL
SCALE 1:10



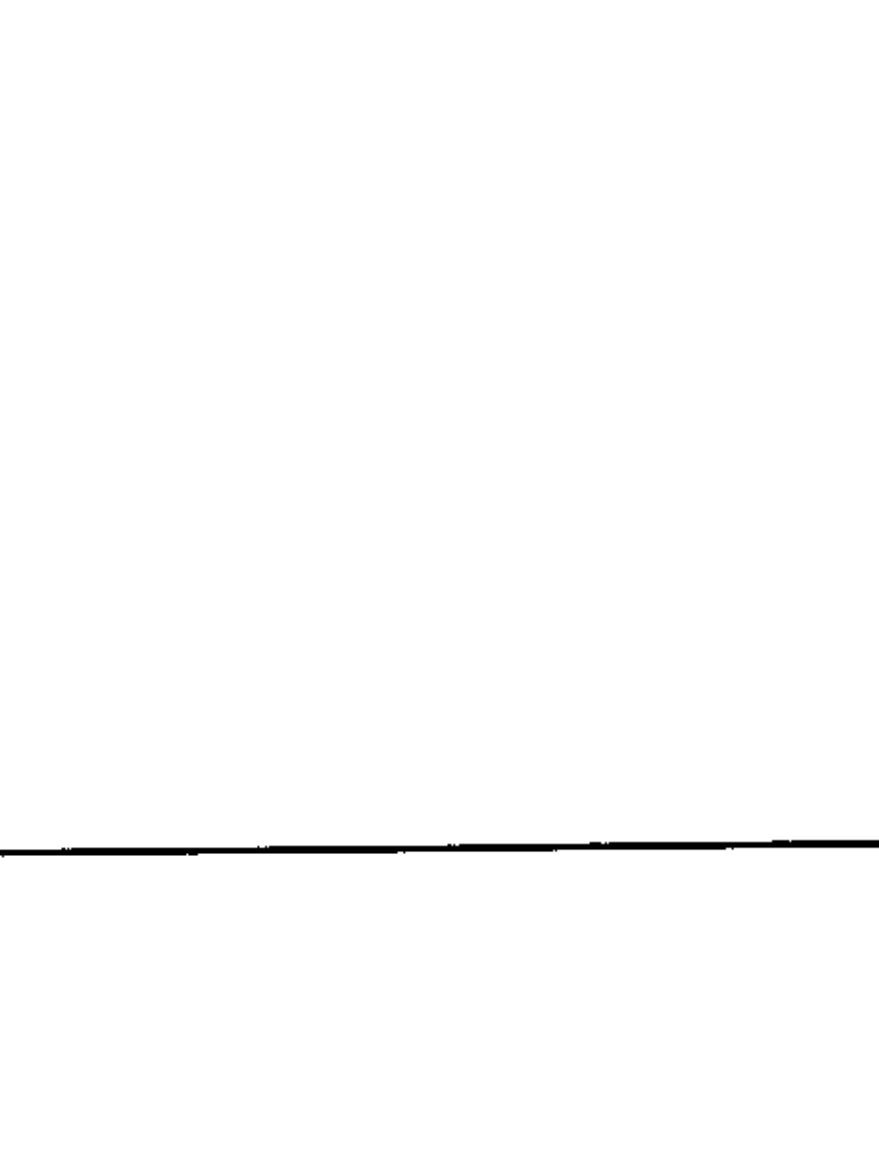
23 PLAN DETAIL WIL 1.06 INFILL DETAIL
SCALE 1:10



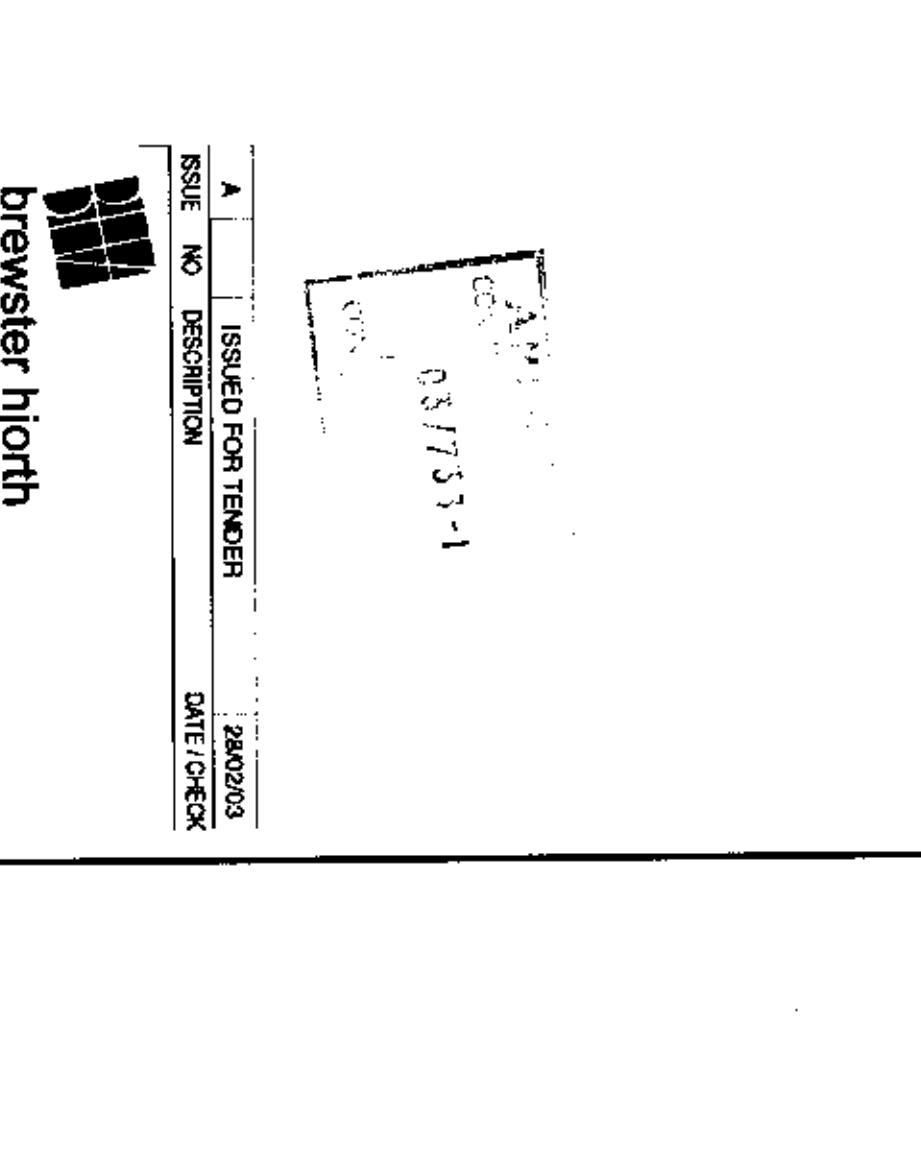
24 PLAN DETAIL - TYPICAL RAINWATER HEAD
SCALE 1:10



25 PLAN DETAIL - AWNING
SCALE 1:10



26 PLAN DETAIL - COURTYARD WINDOW
SCALE 1:10



27 PLAN DETAIL - COURTYARD WINDOW
SCALE 1:10



28 PLAN DETAIL - COURTYARD WINDOW
SCALE 1:10



29 PLAN DETAIL - COURTYARD WINDOW
SCALE 1:10

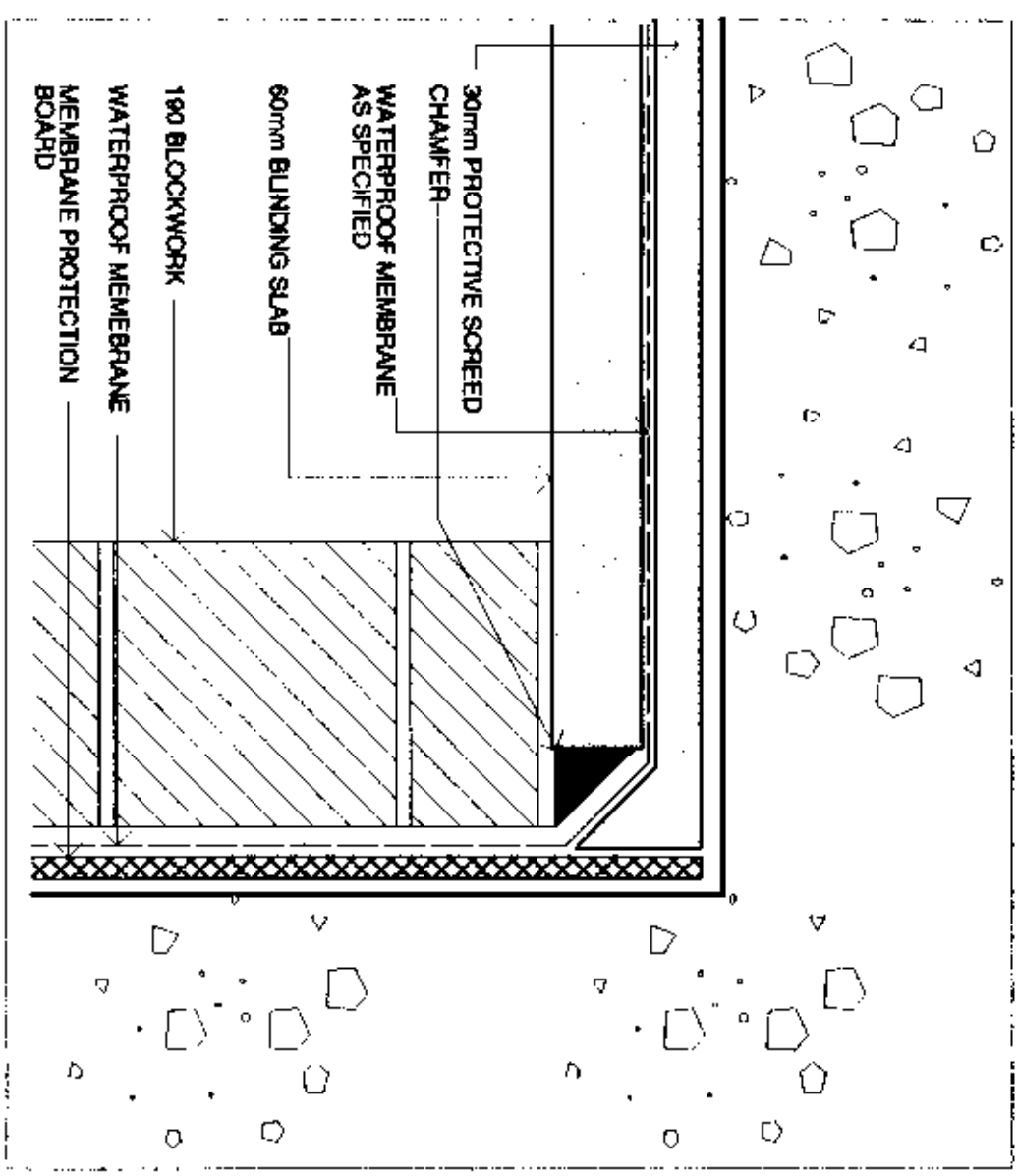


30 PLAN DETAIL - COURTYARD WINDOW
SCALE 1:10

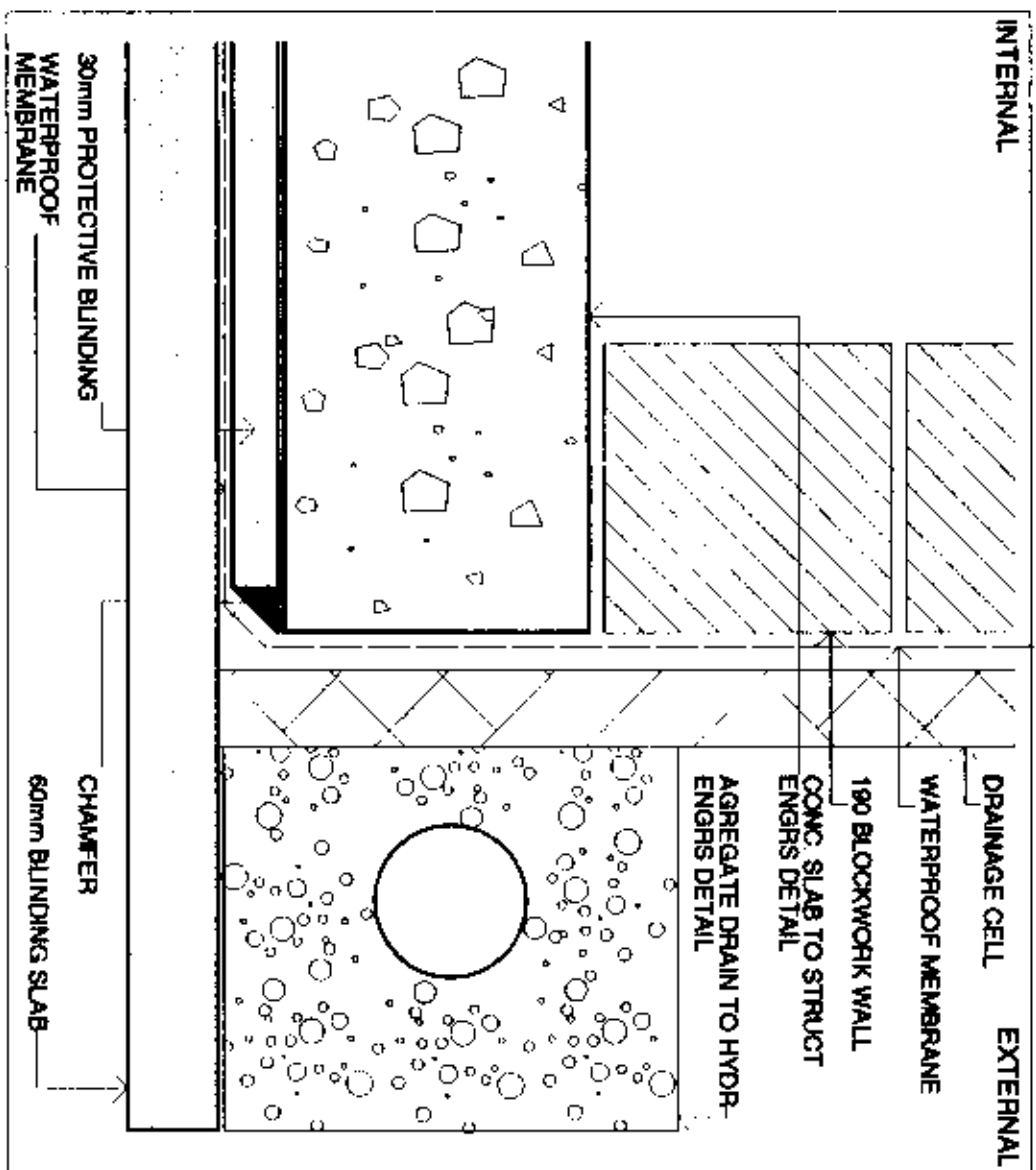


31 PLAN DETAIL - COURTYARD WINDOW
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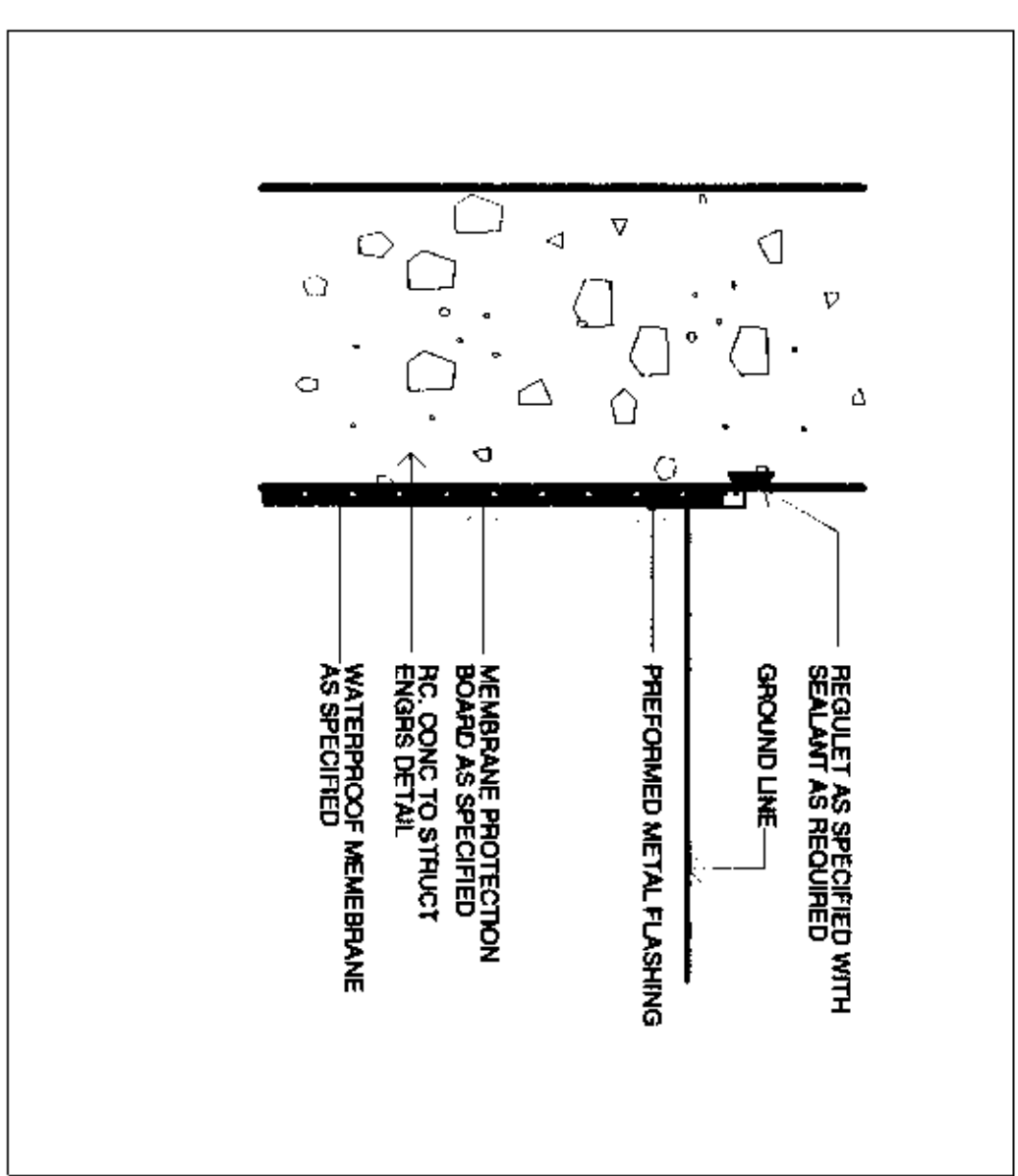
PROJECT: brewster hirth
MONA VALE VILLAGE PARK LIBRARY
DRAWING NUMBER: 31743-123
SCALE: 1:10
DATE: 27 FEBRUARY 2018
DRAWN: [Name]
CHECKED: [Name]
ISSUE: A



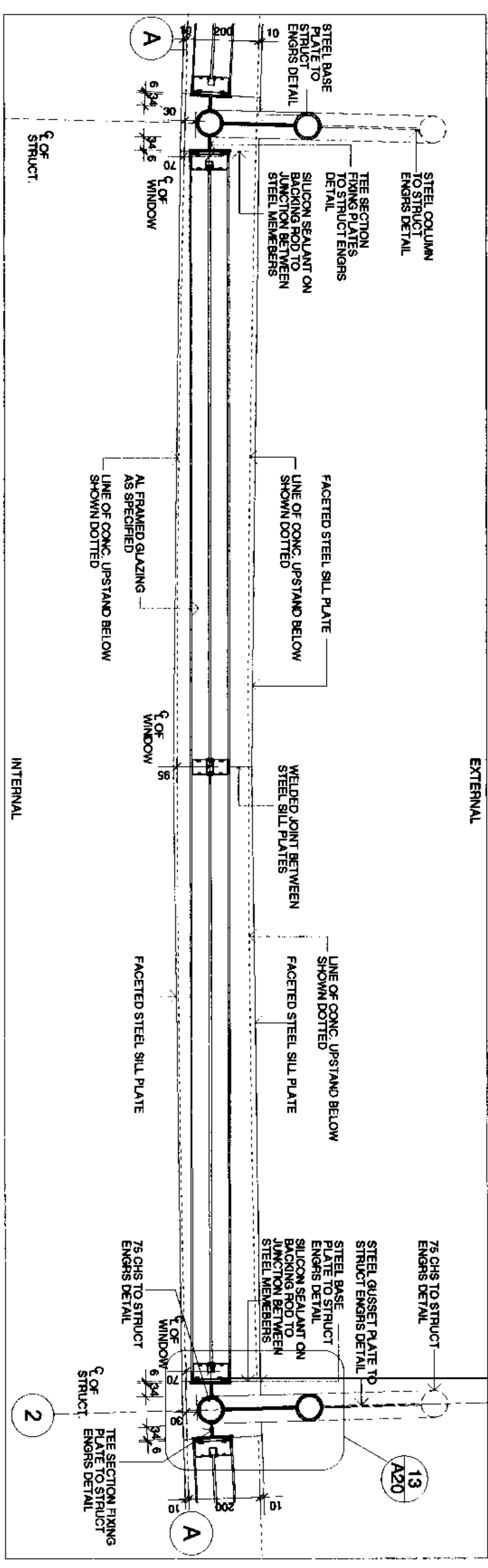
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SCALE 1:5



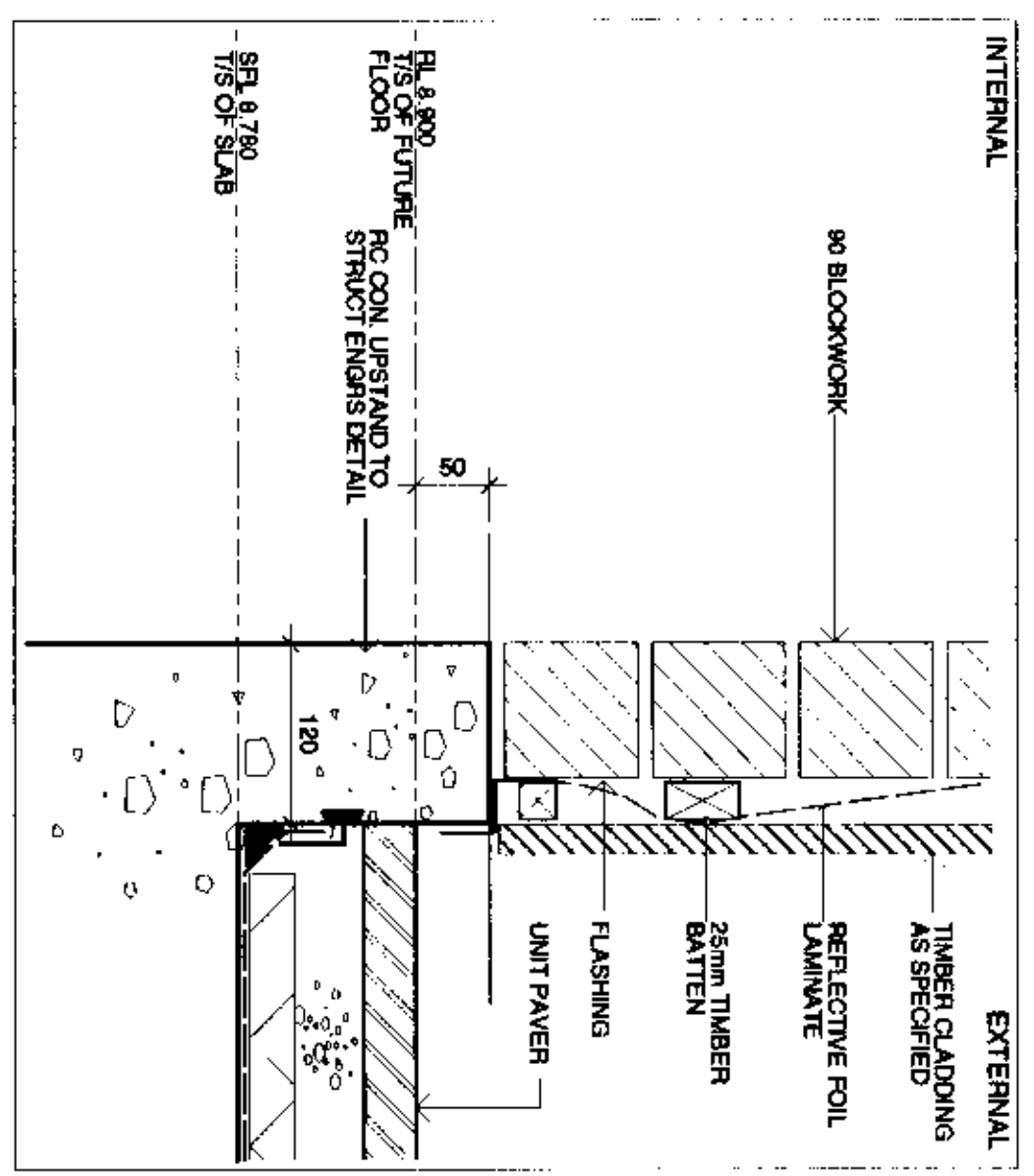
02 SECTION-BASE OF WALL
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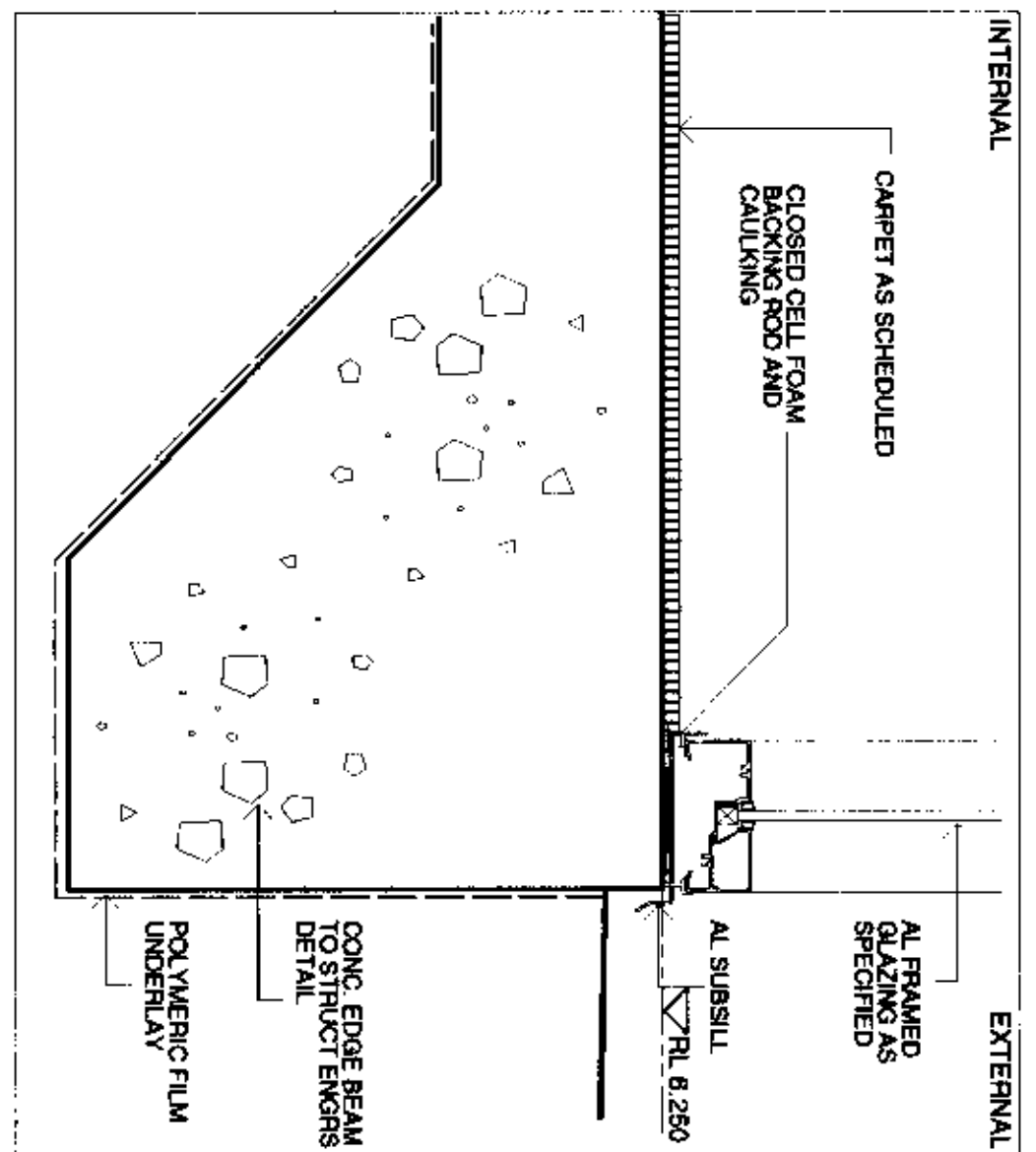
03 REGULATE FIXING DETAIL
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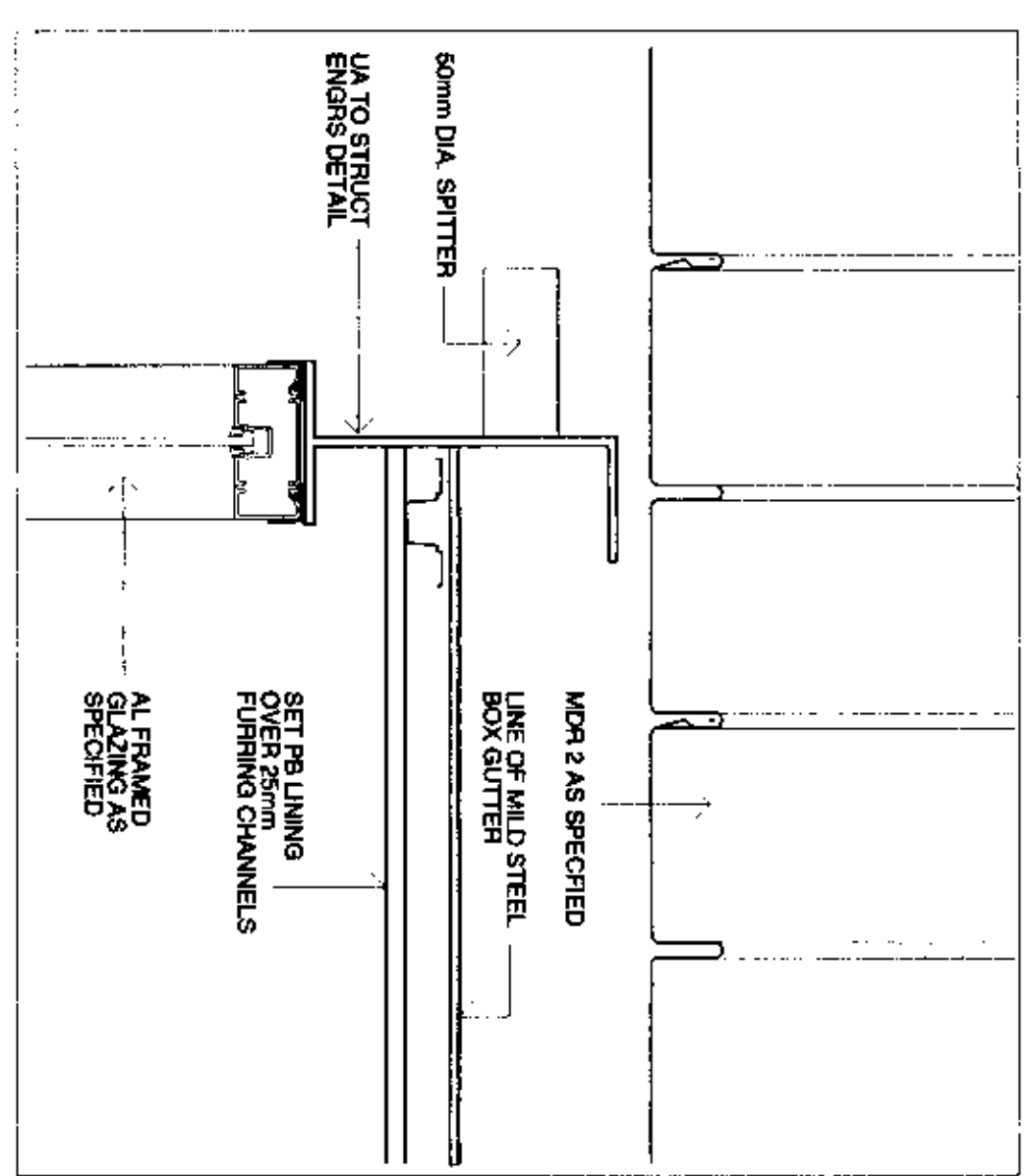
04 DETAIL-LATERAL COLUMN SETOUT
SCALE 1:10



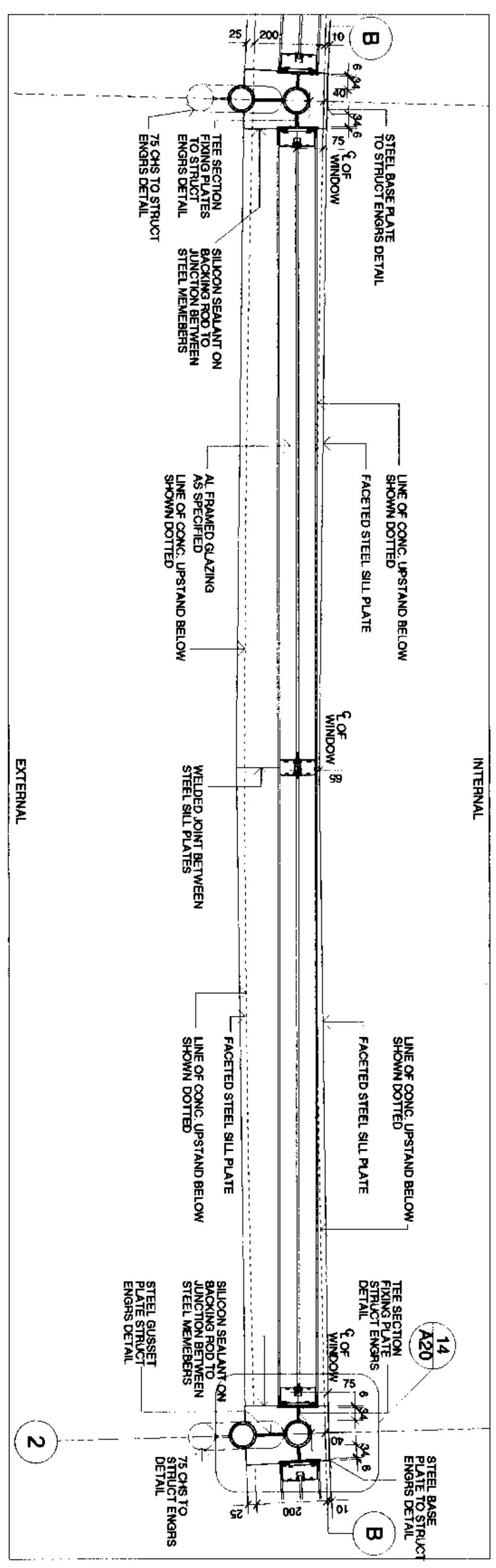
05 SECTION DETAIL-CAFE WALL (TYPICAL)
SCALE 1:5



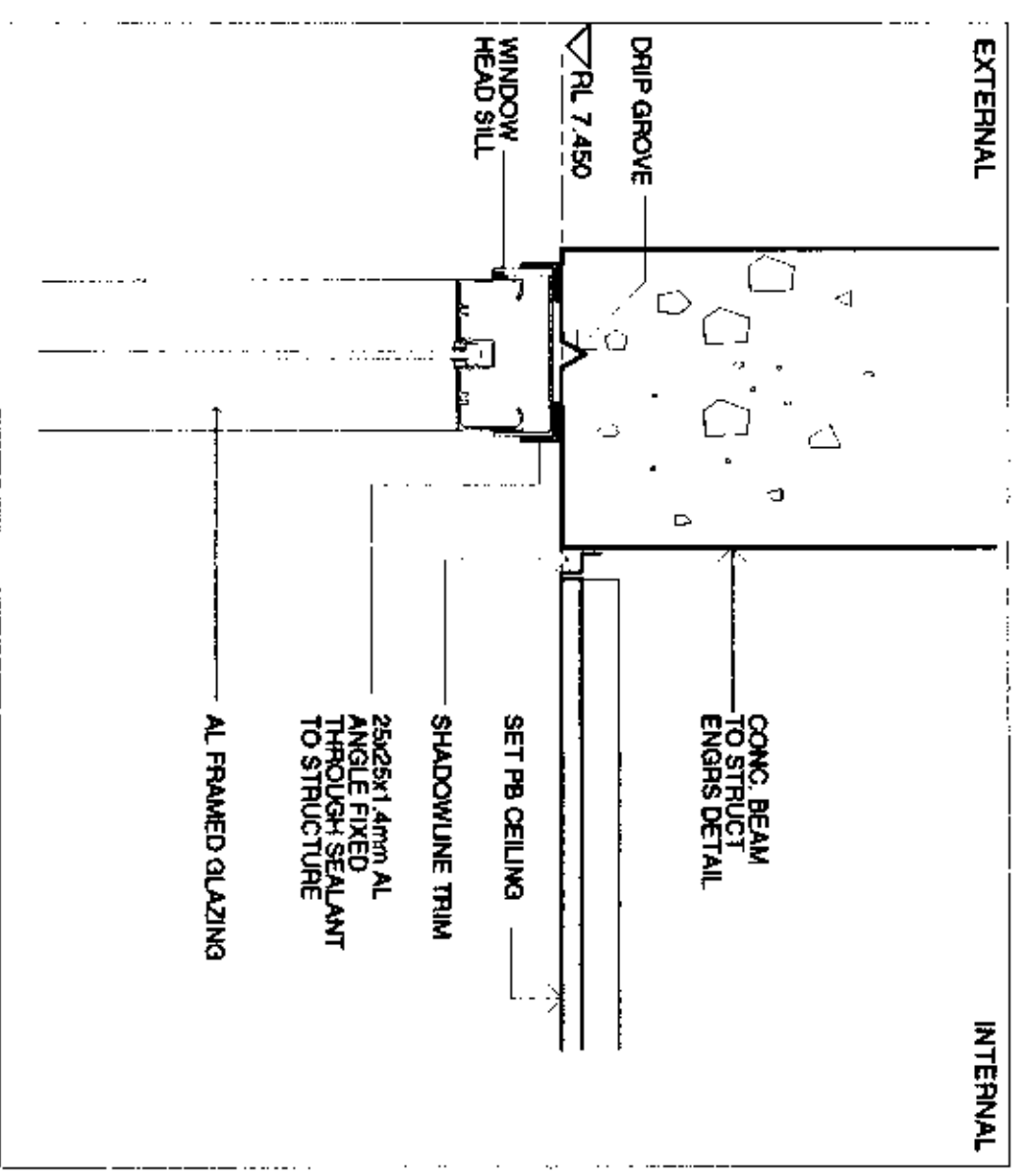
06 WINDOW SUBSILL DETAIL (EARLY CHILDHOOD CENTRE)
SCALE 1:5



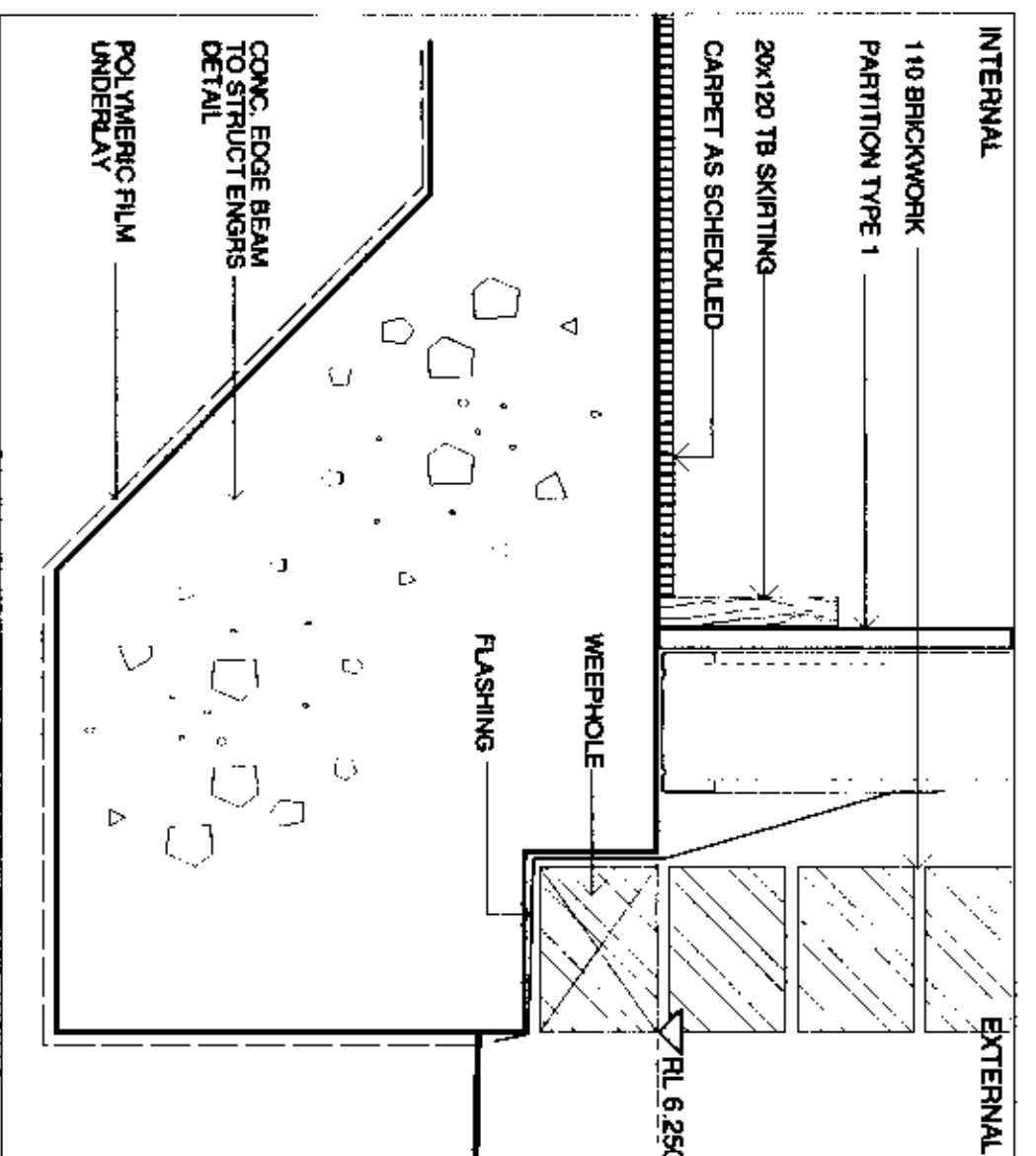
07 SECTION DETAIL-BOX GUTTER DETAIL
SCALE 1:5



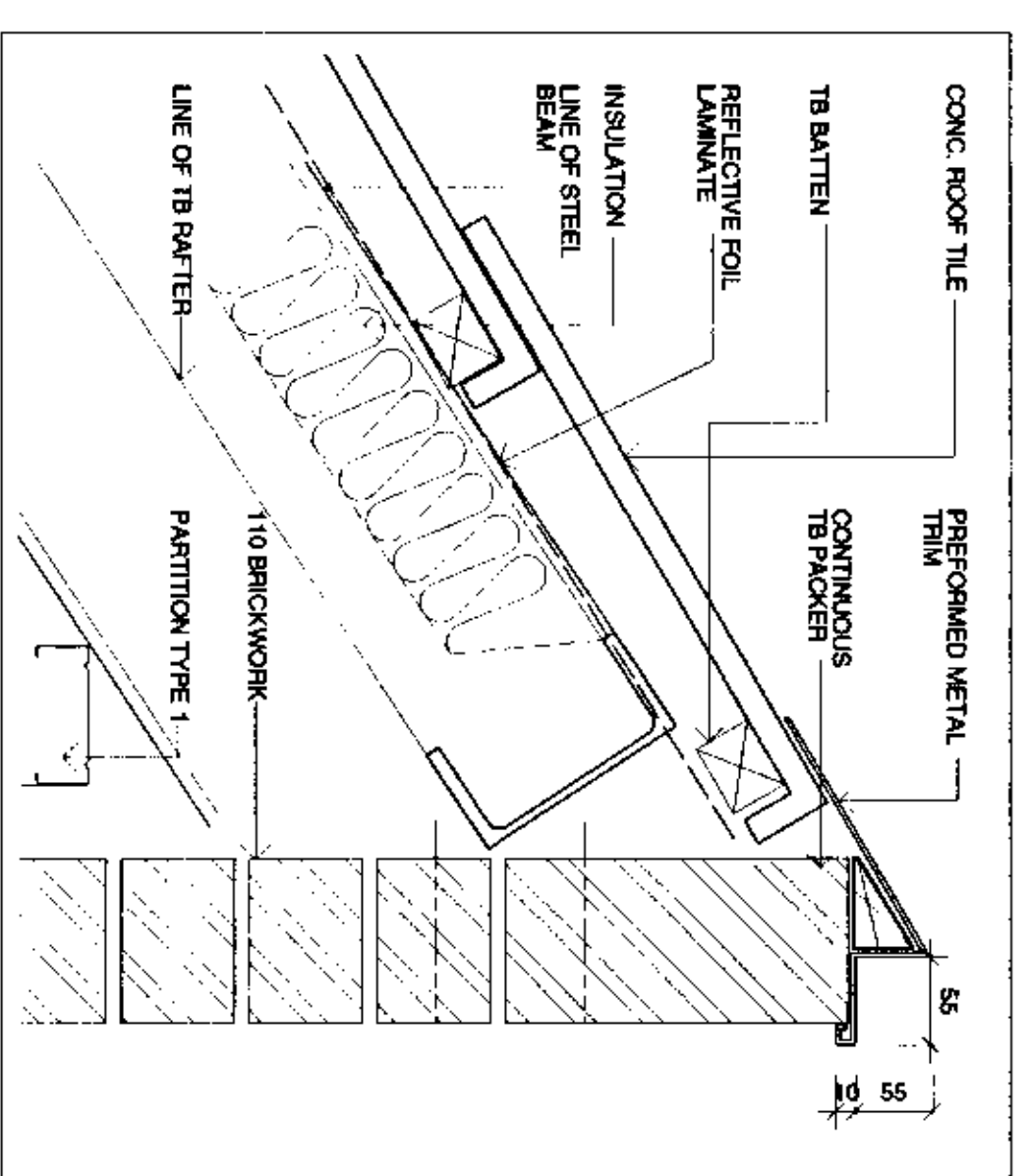
08 DETAIL-LATERAL COLUMN SETOUT
SCALE 1:10



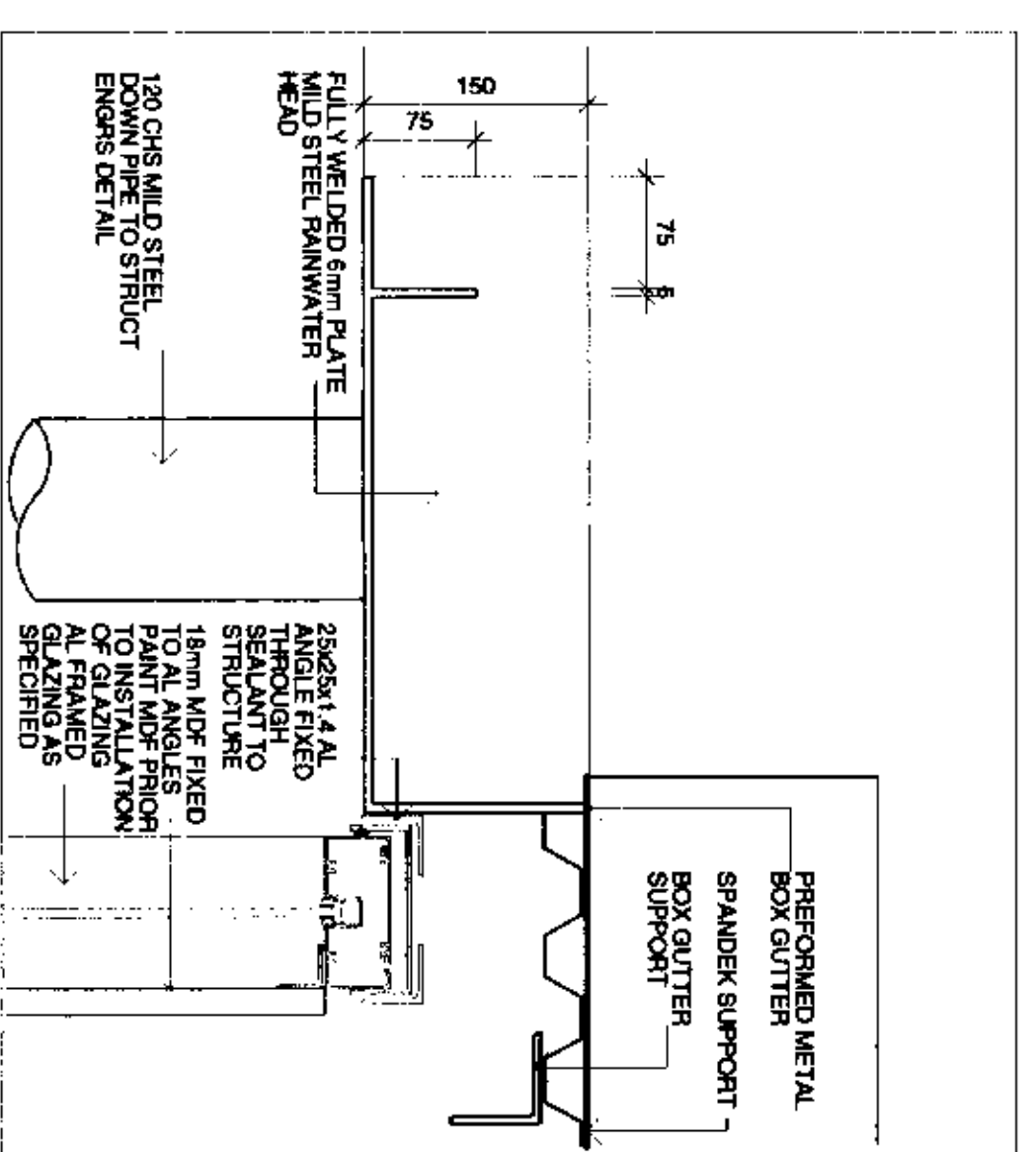
09 COURTYARD WINDOW HEAD DETAIL
SCALE 1:5



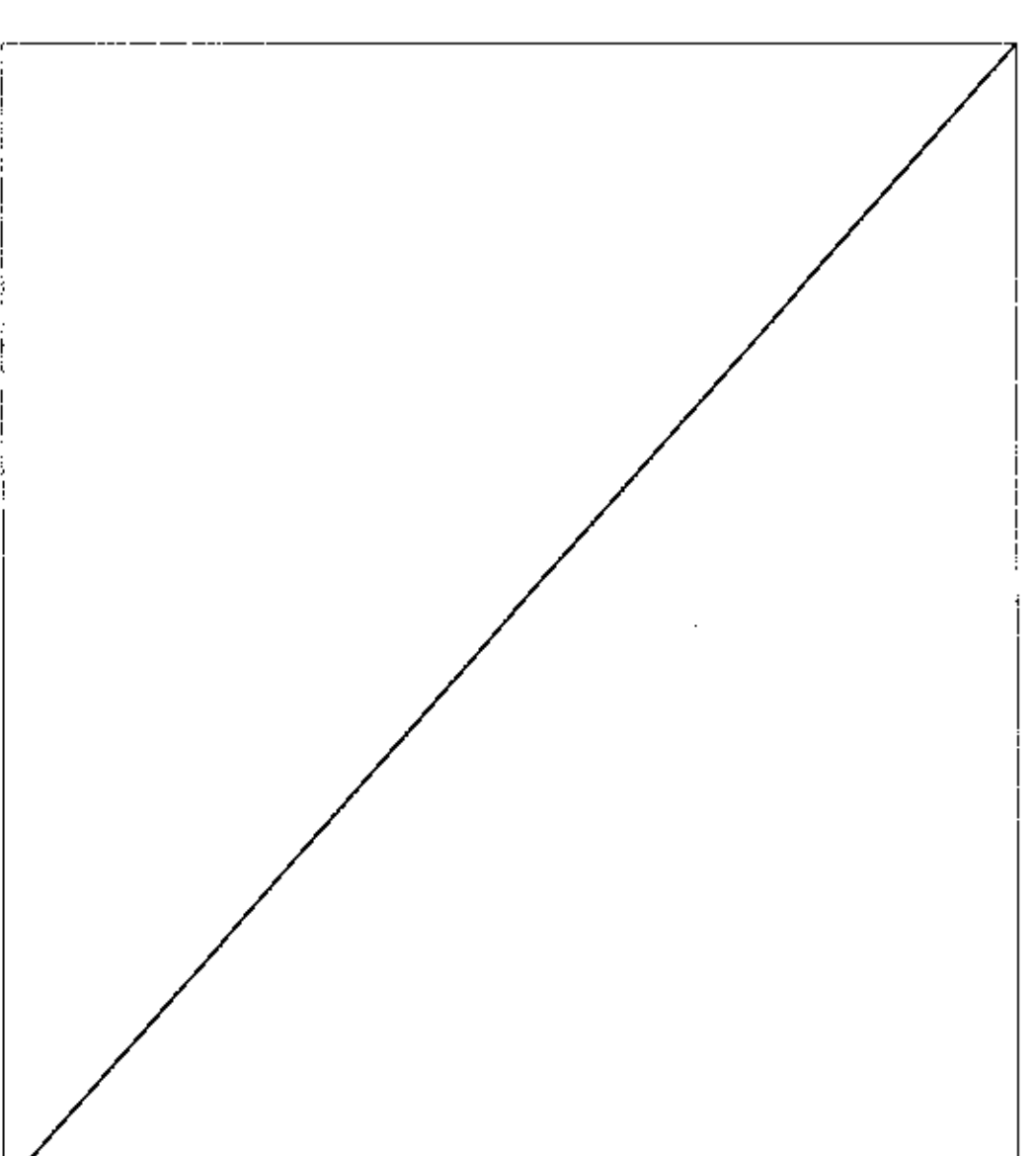
10 SLAB DETAIL (TYPICAL IN EARLY CHILDHOOD CENTRE)
SCALE 1:5



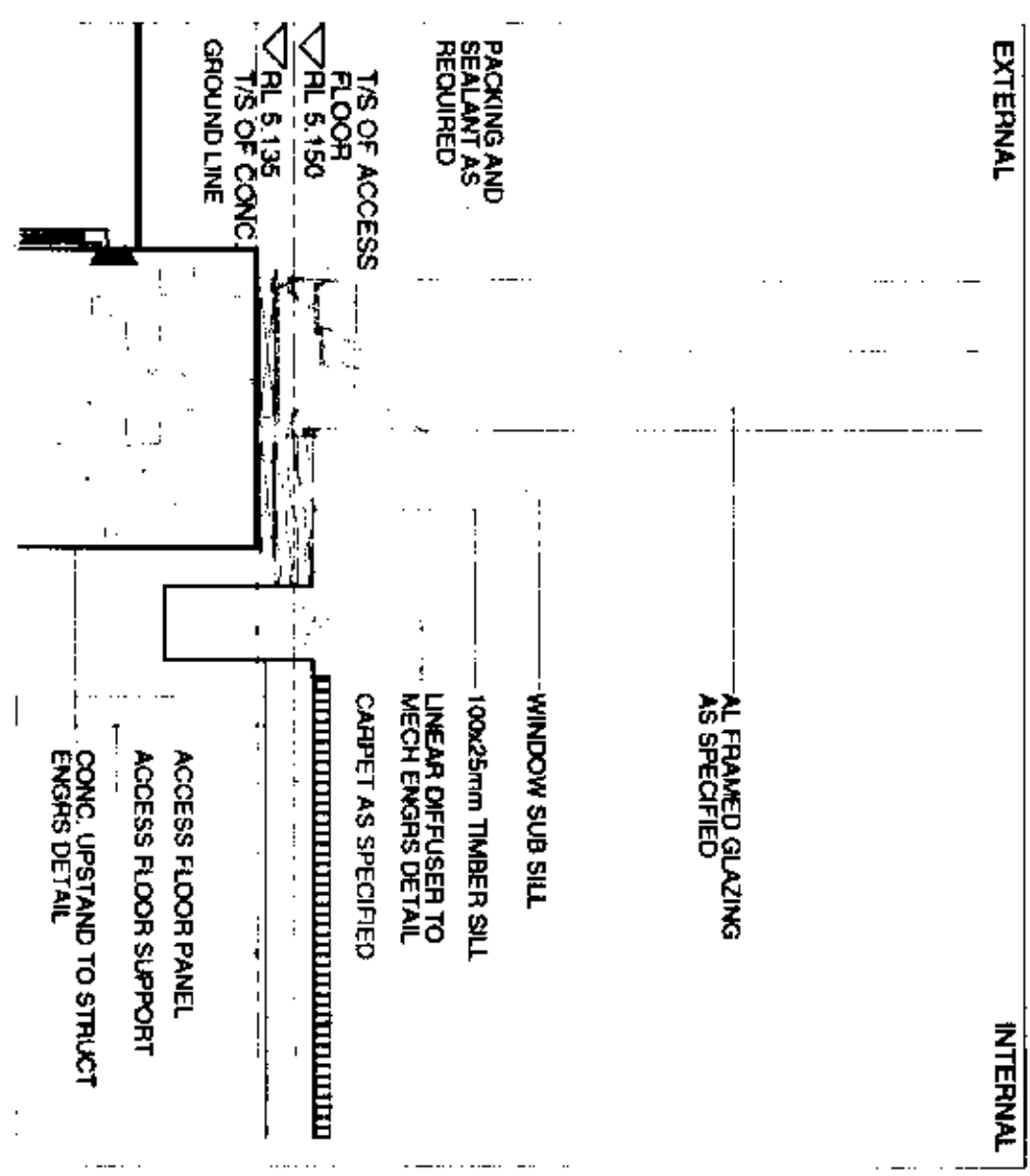
11 ROOF DETAIL
SCALE 1:5



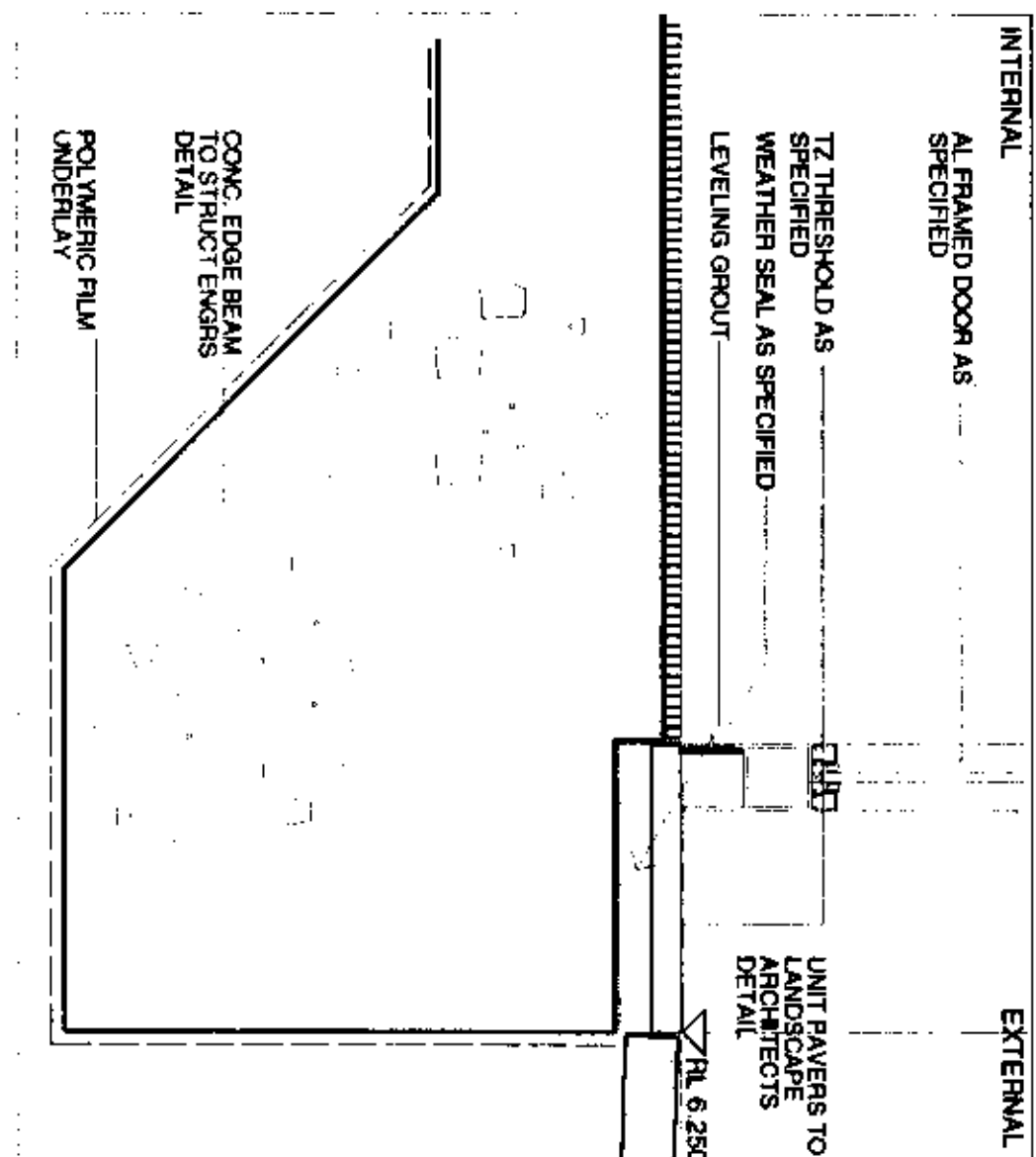
12 SECTION-RAINWATER HEAD
SCALE 1:5



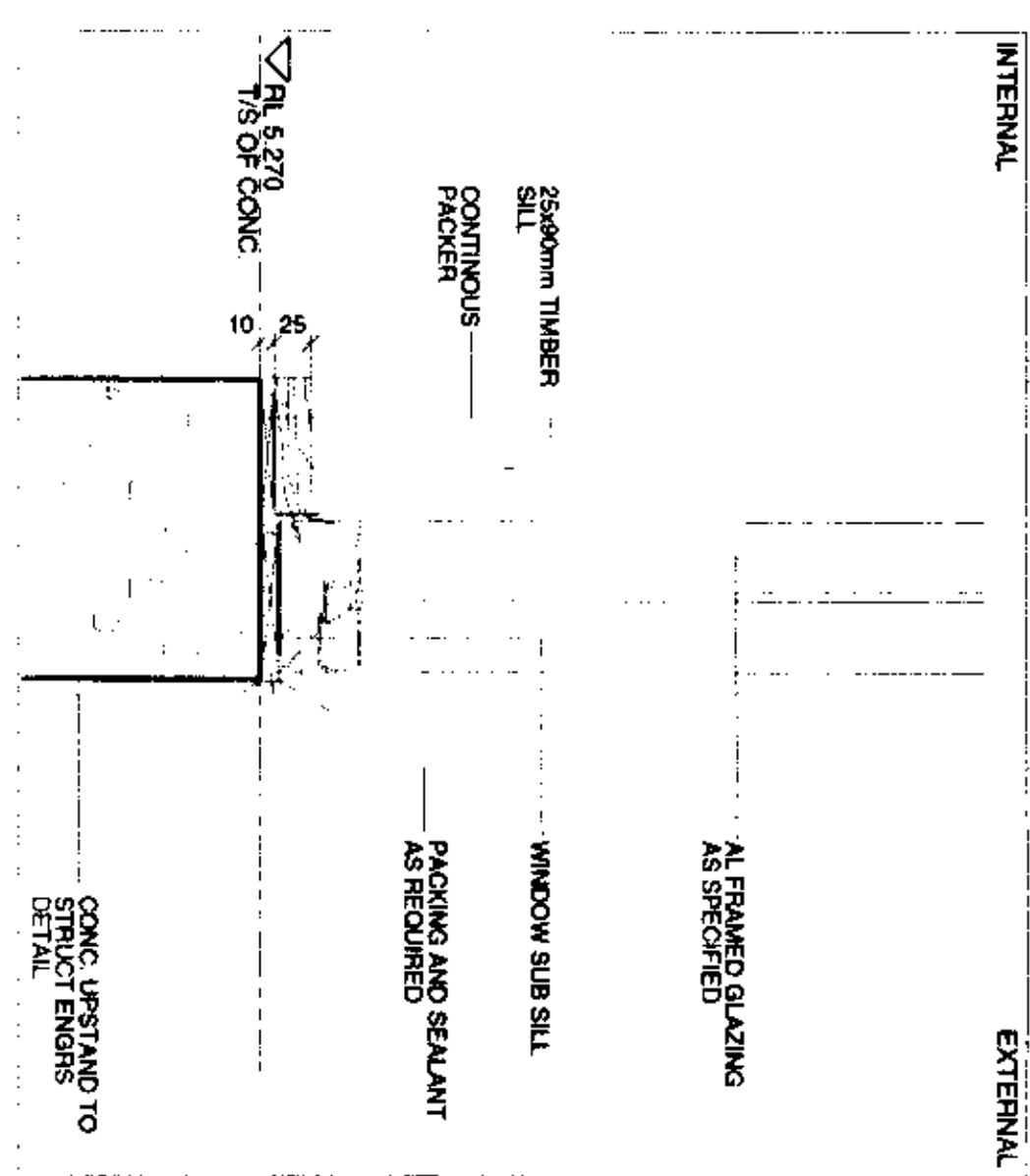
13 SECTION-DETAIL
SCALE 1:5



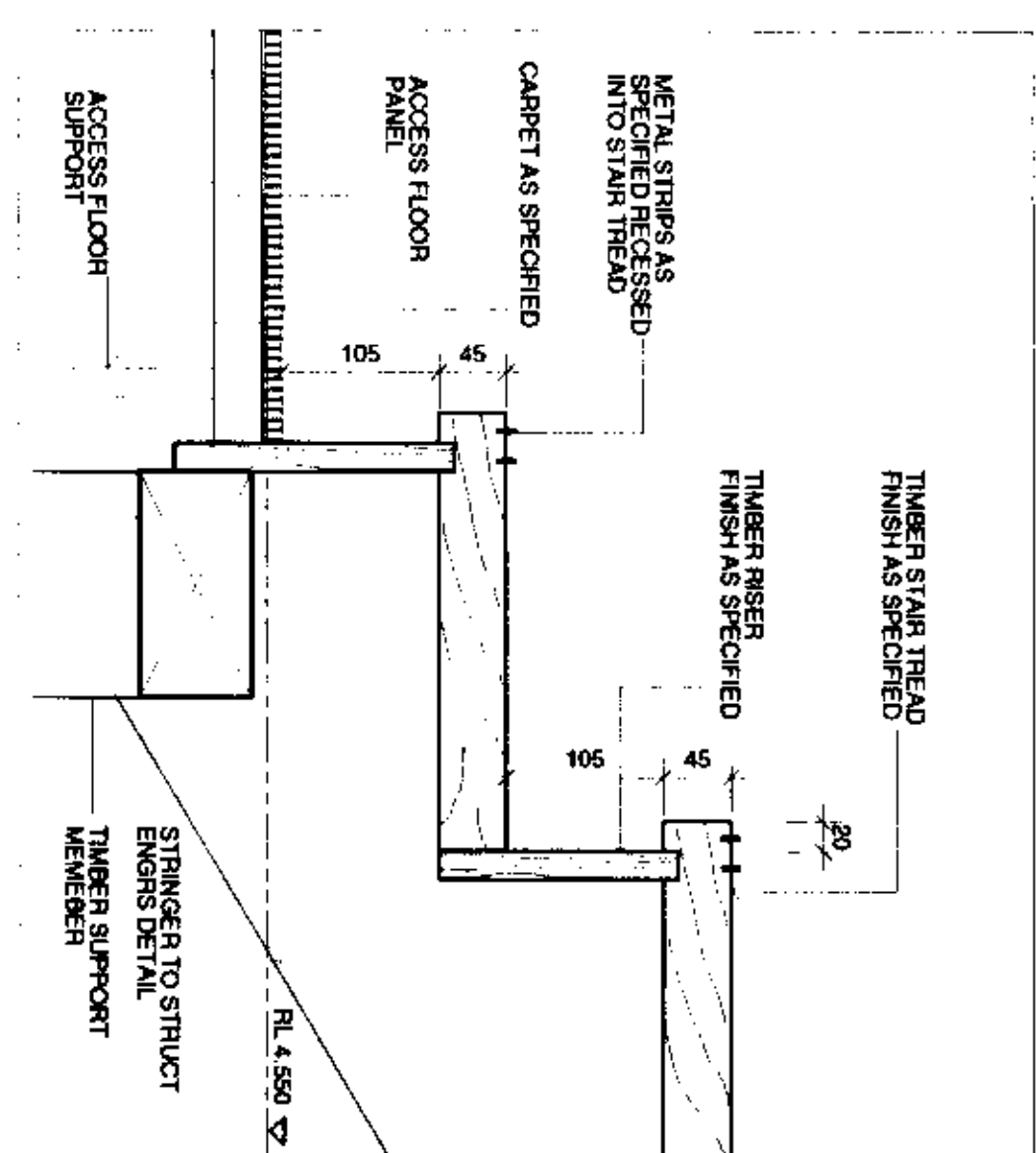
14 COURTYARD WINDOW SILL DETAIL
SCALE 1:5



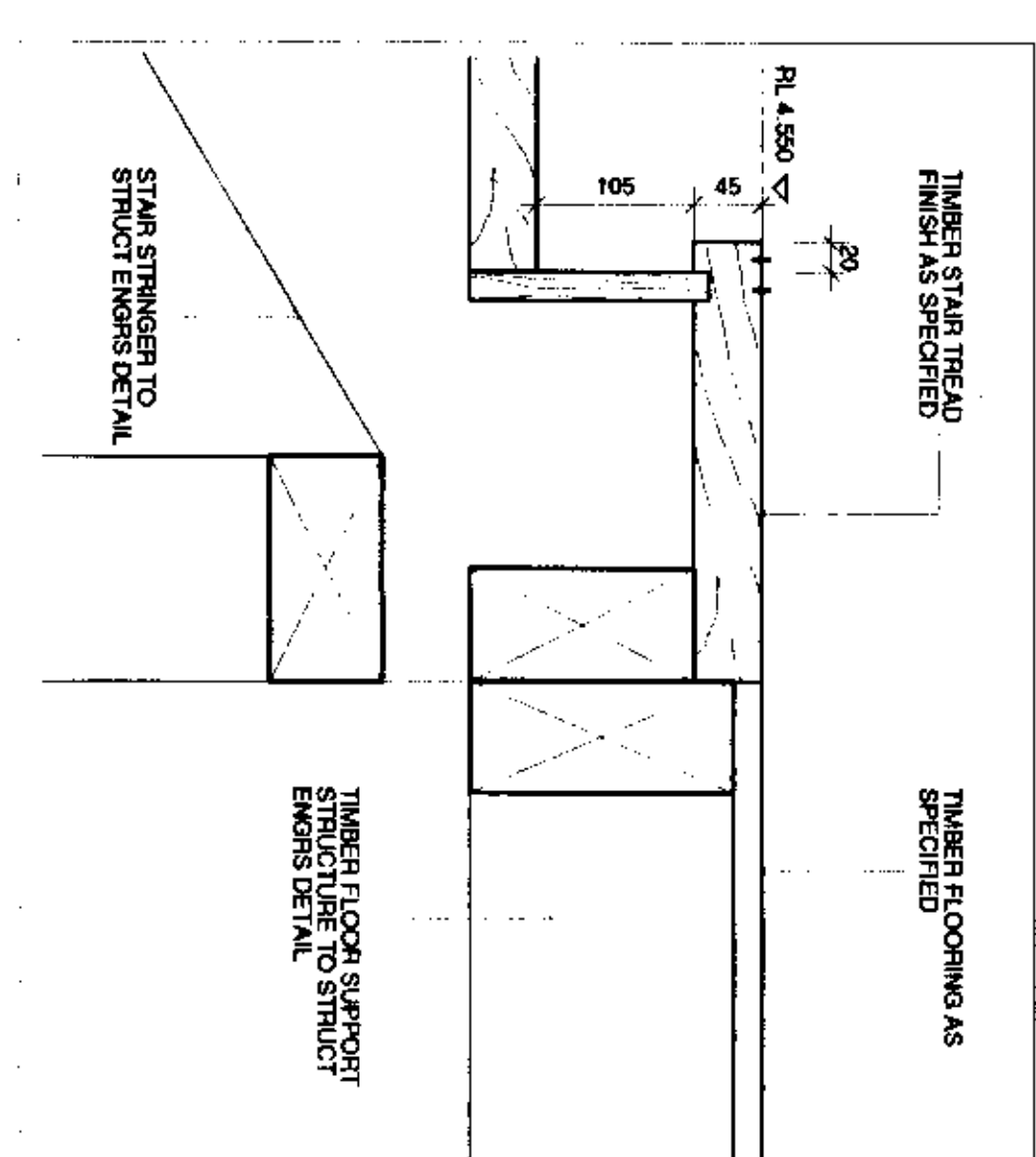
15 THRESHOLD DETAIL (EARLY CHILDHOOD CENTRE ENTRY)
SCALE 1:5



16 WINDOW SILL DETAIL
SCALE 1:10

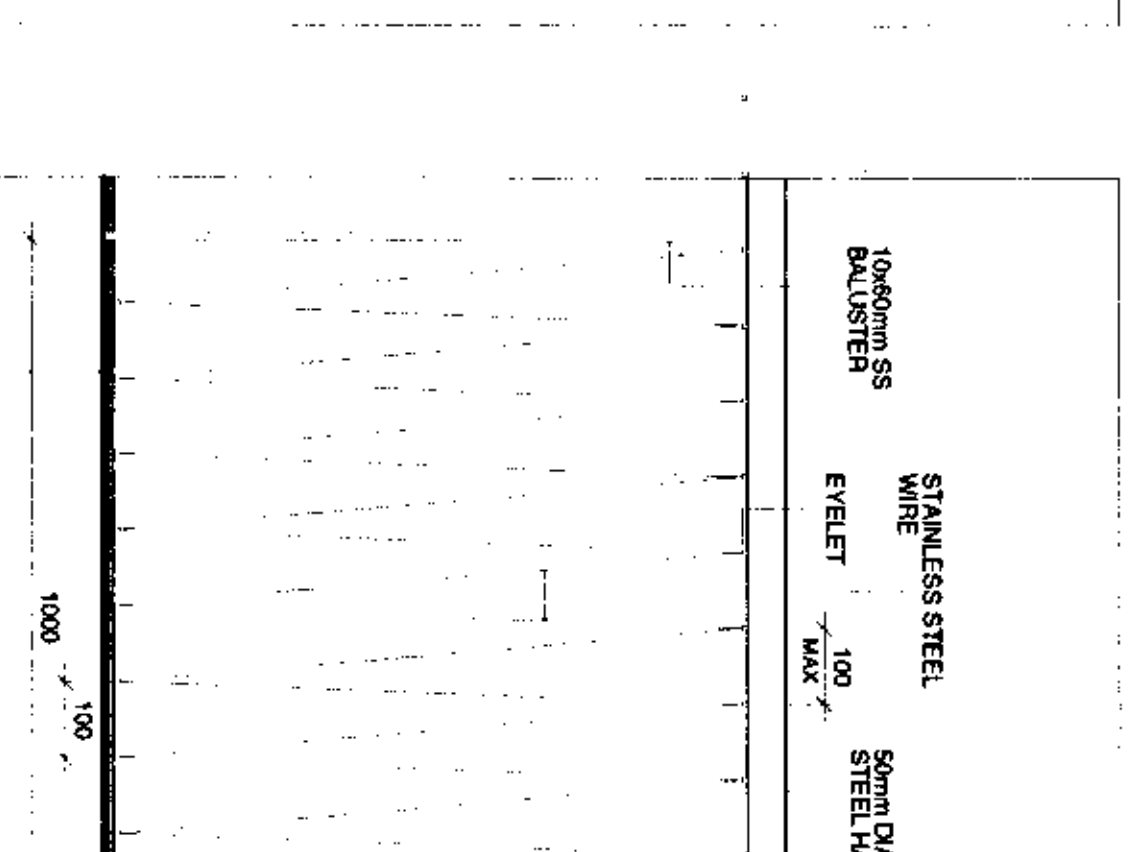
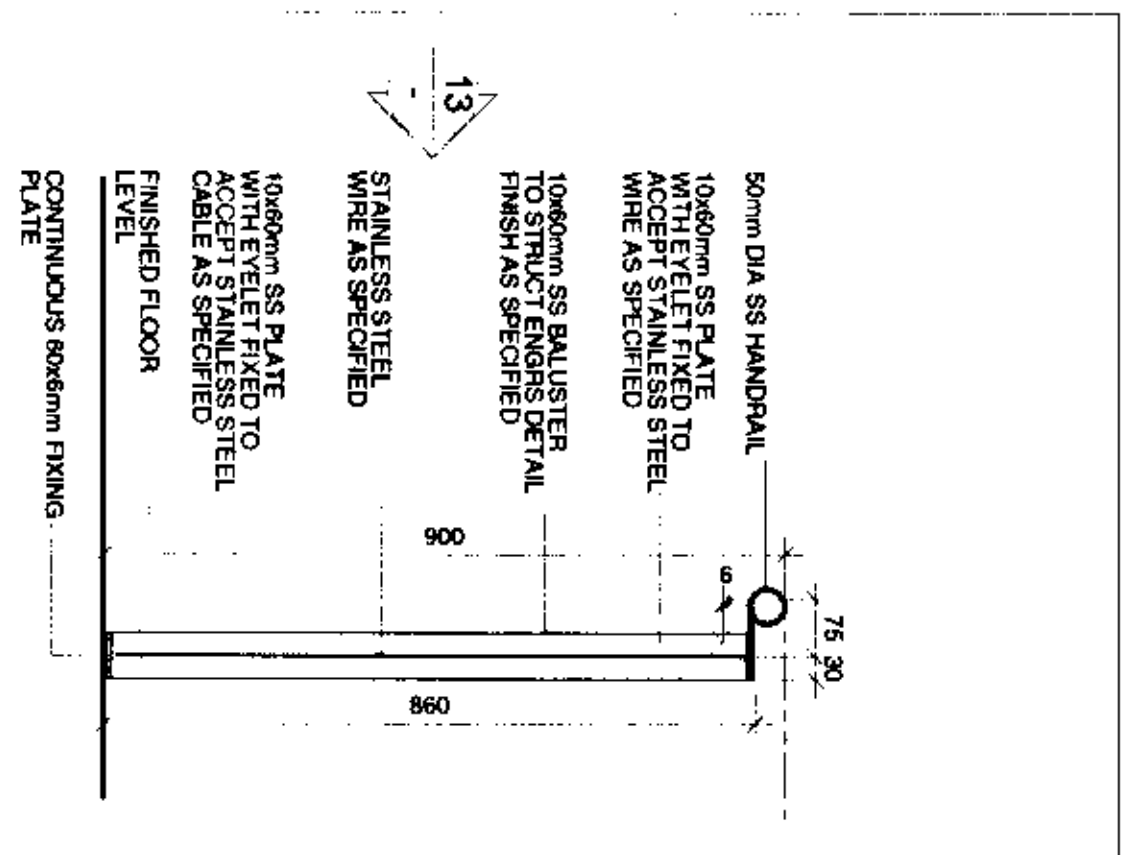
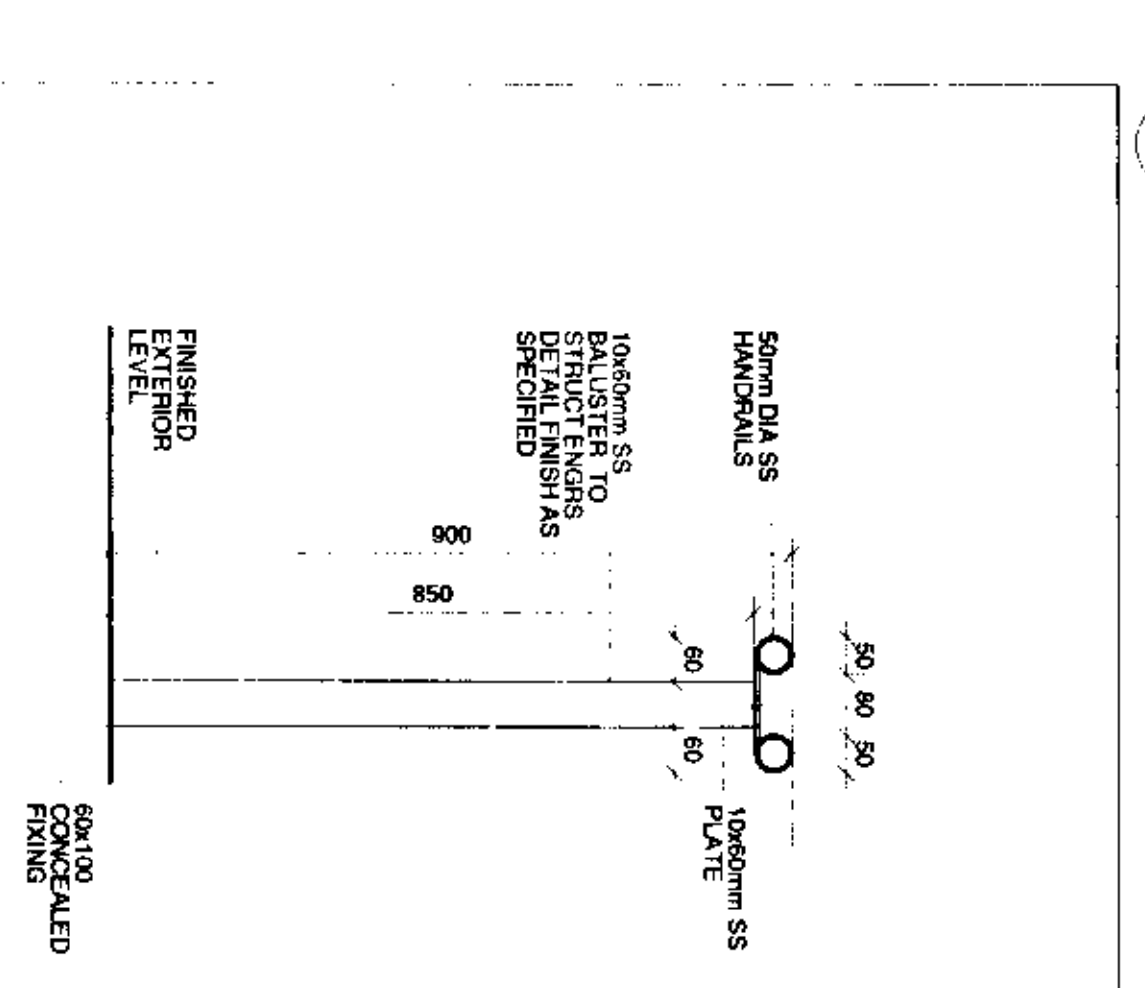
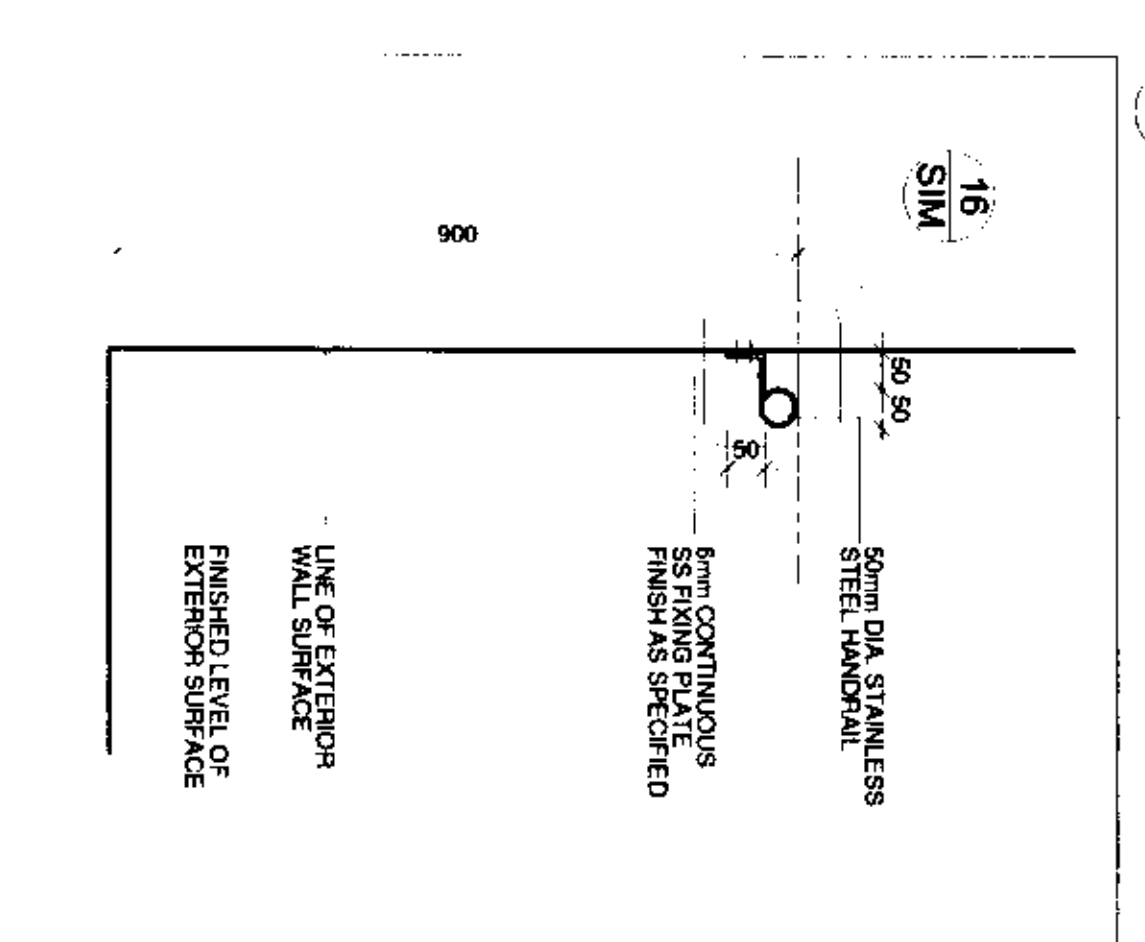
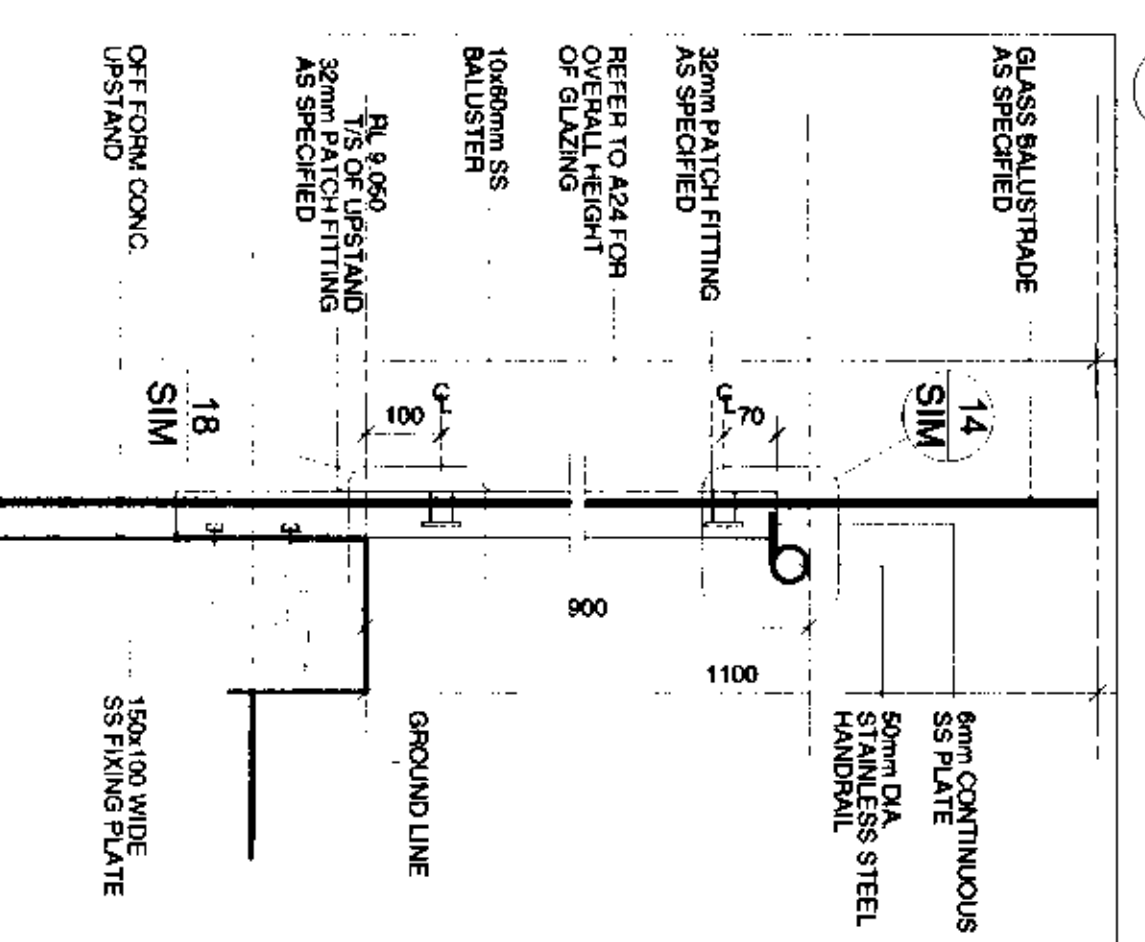
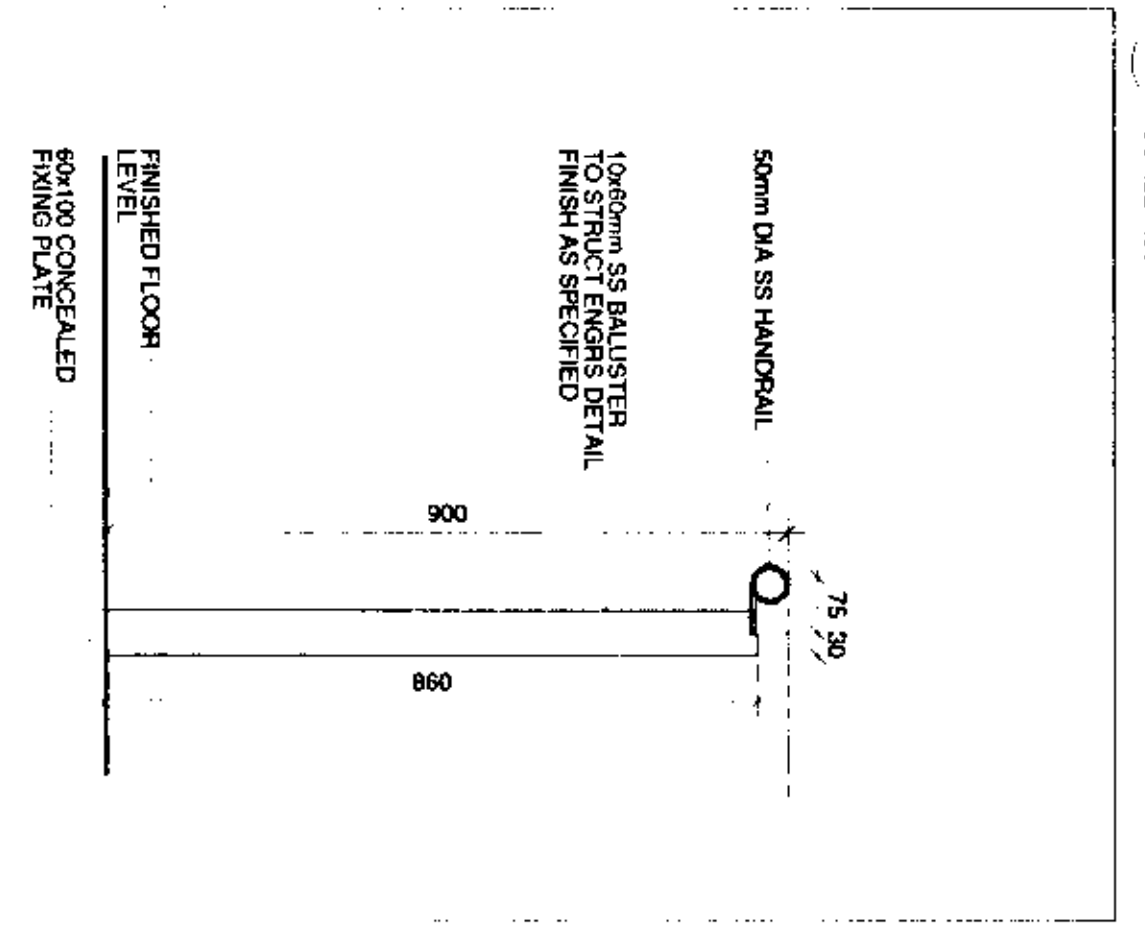
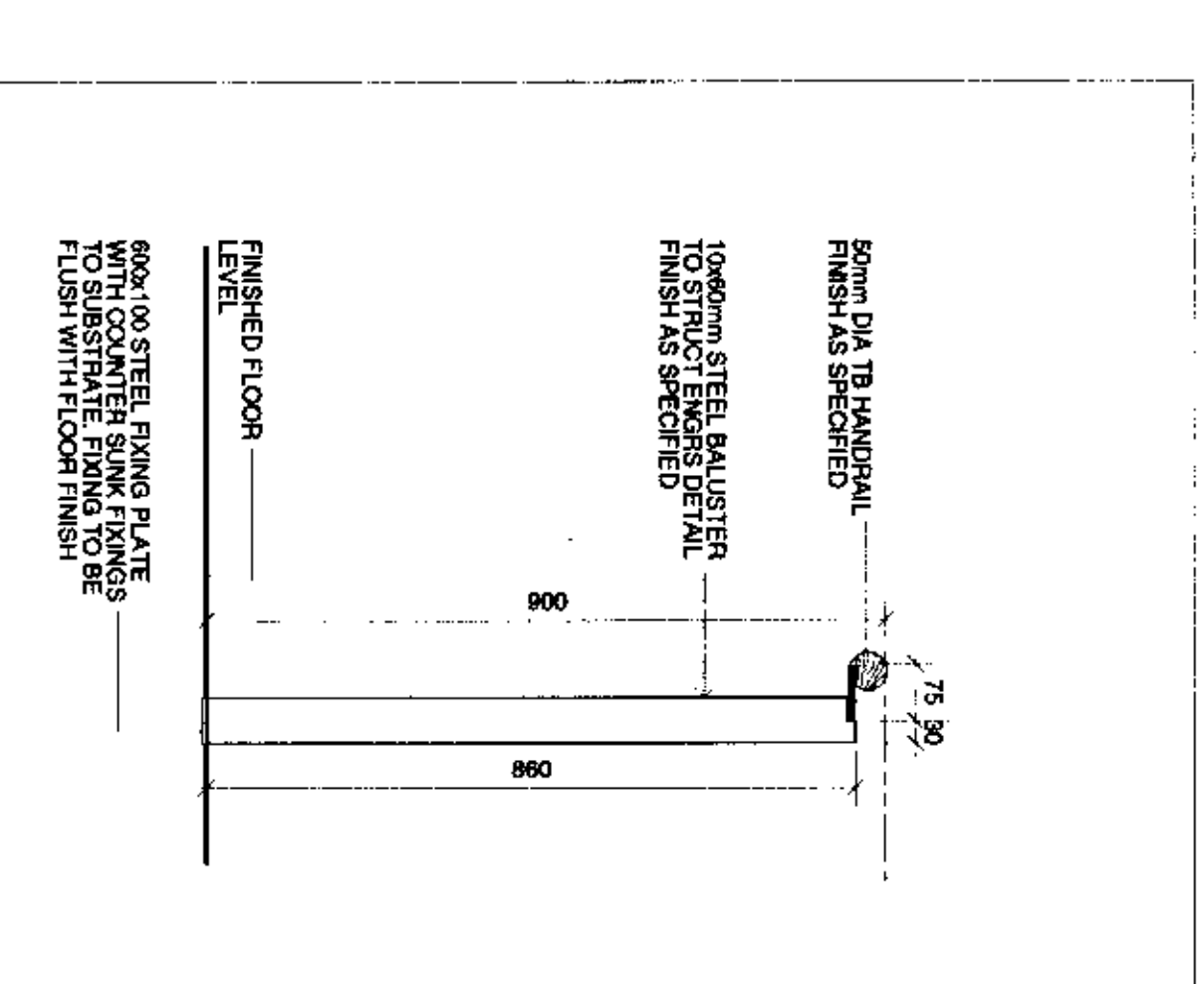
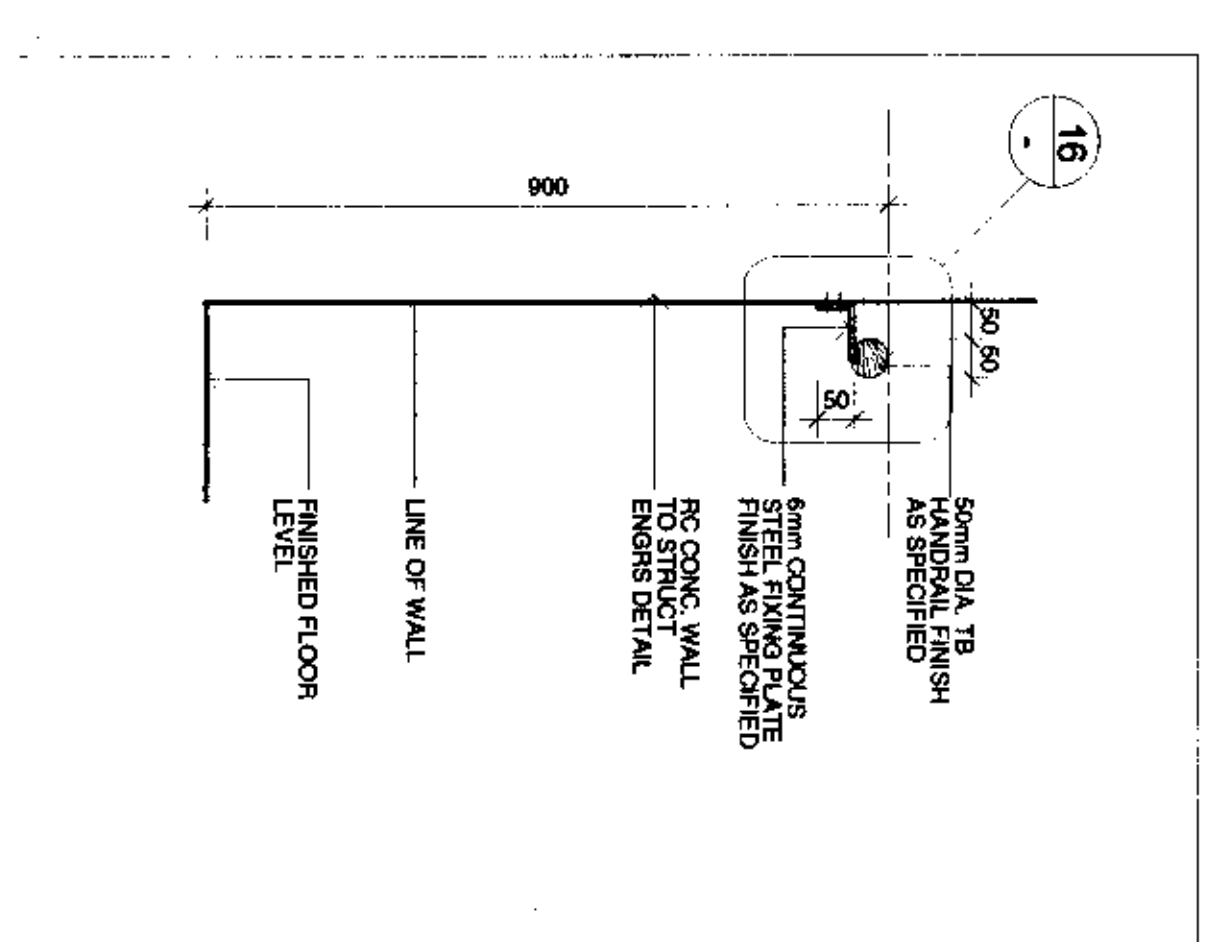
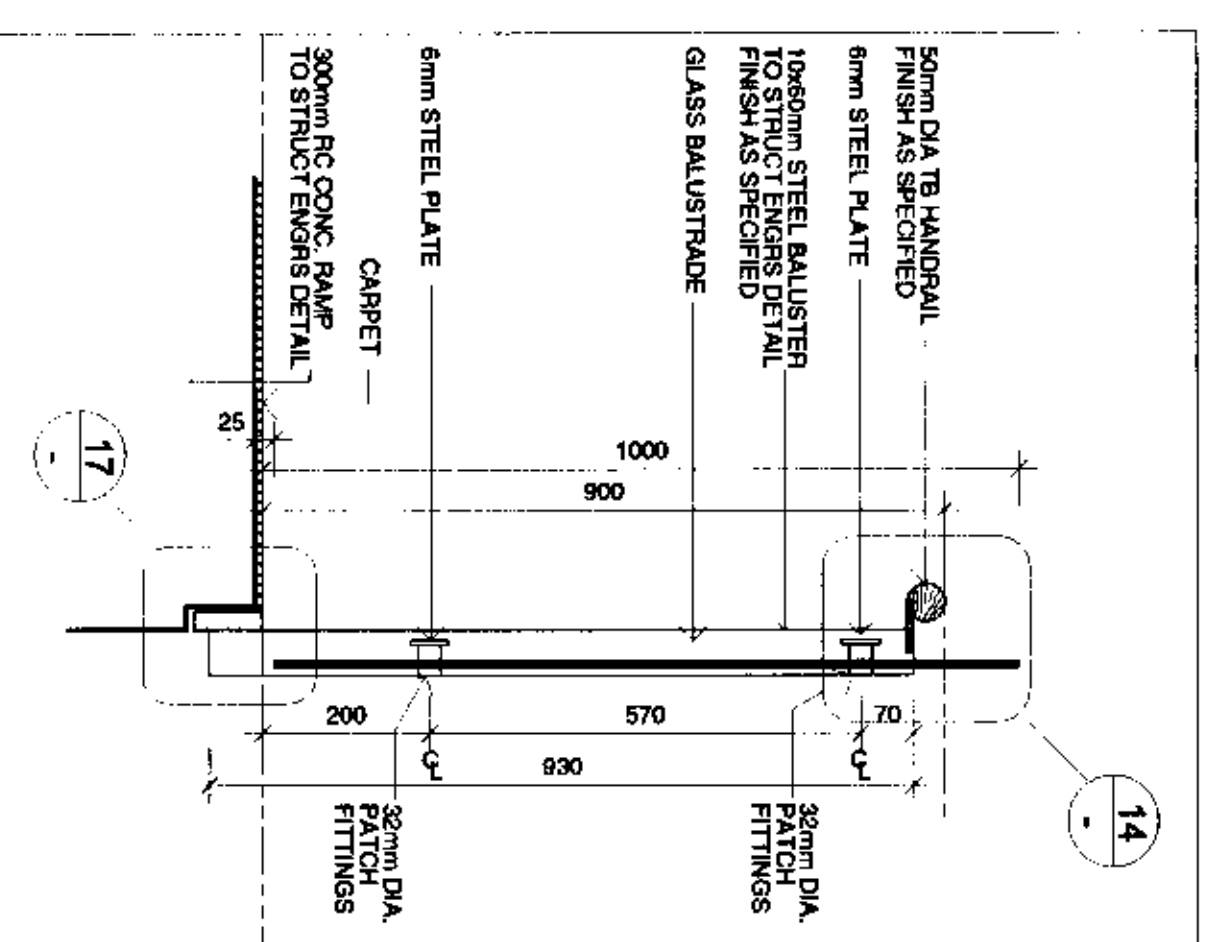
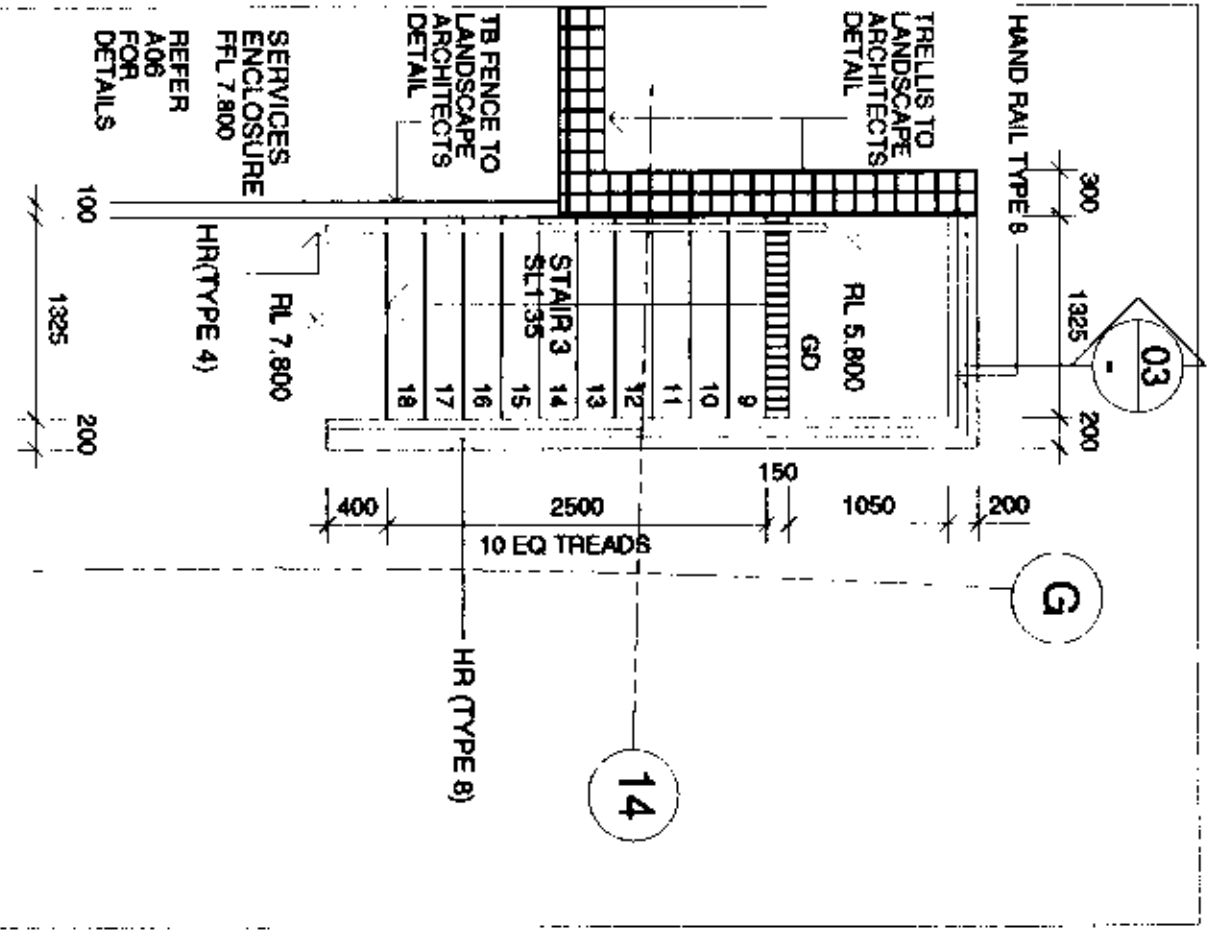
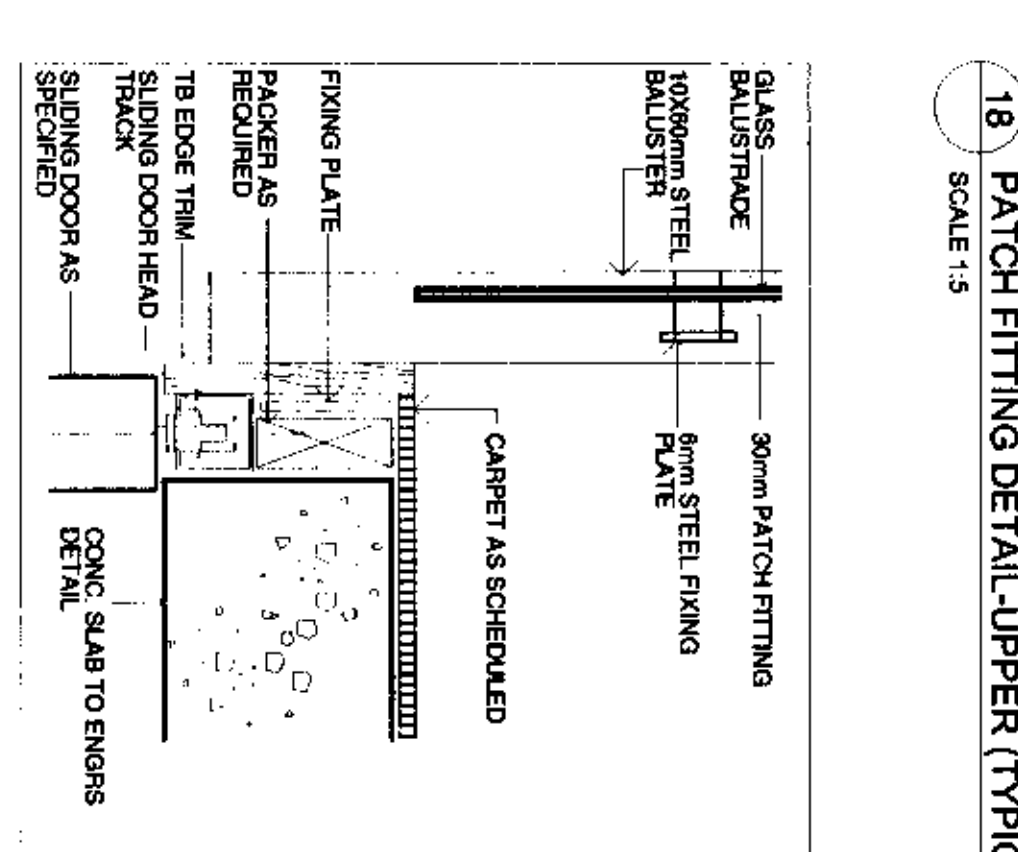
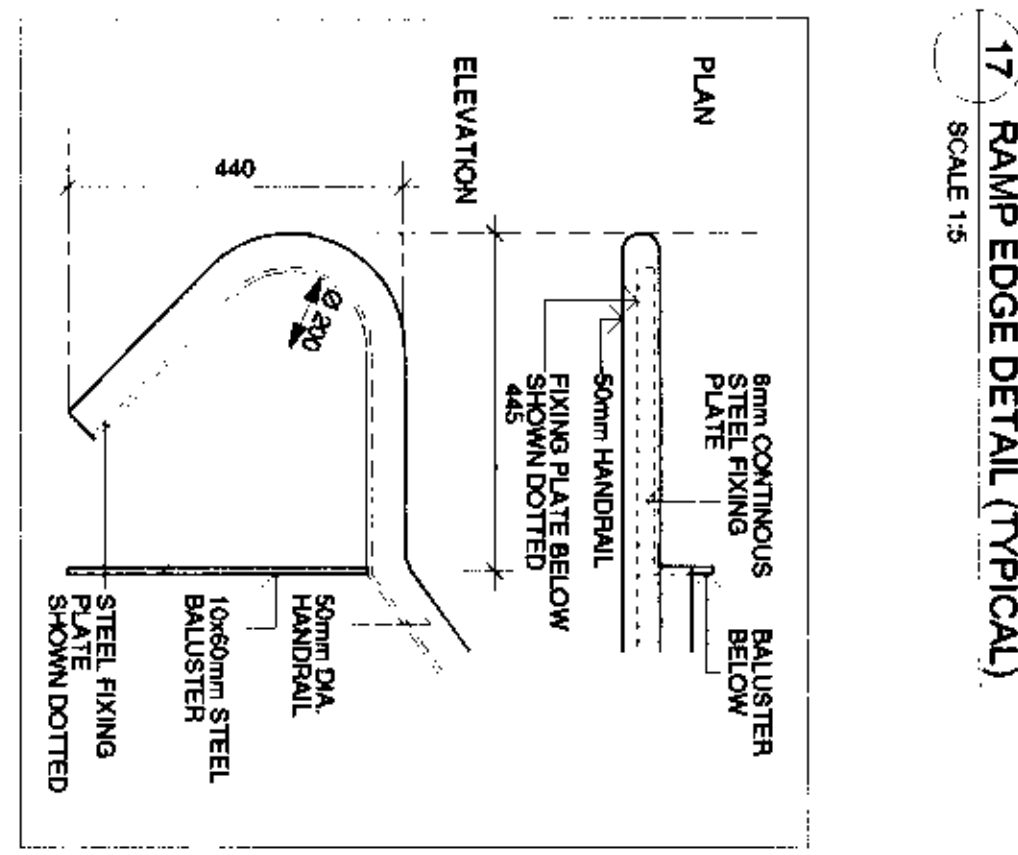
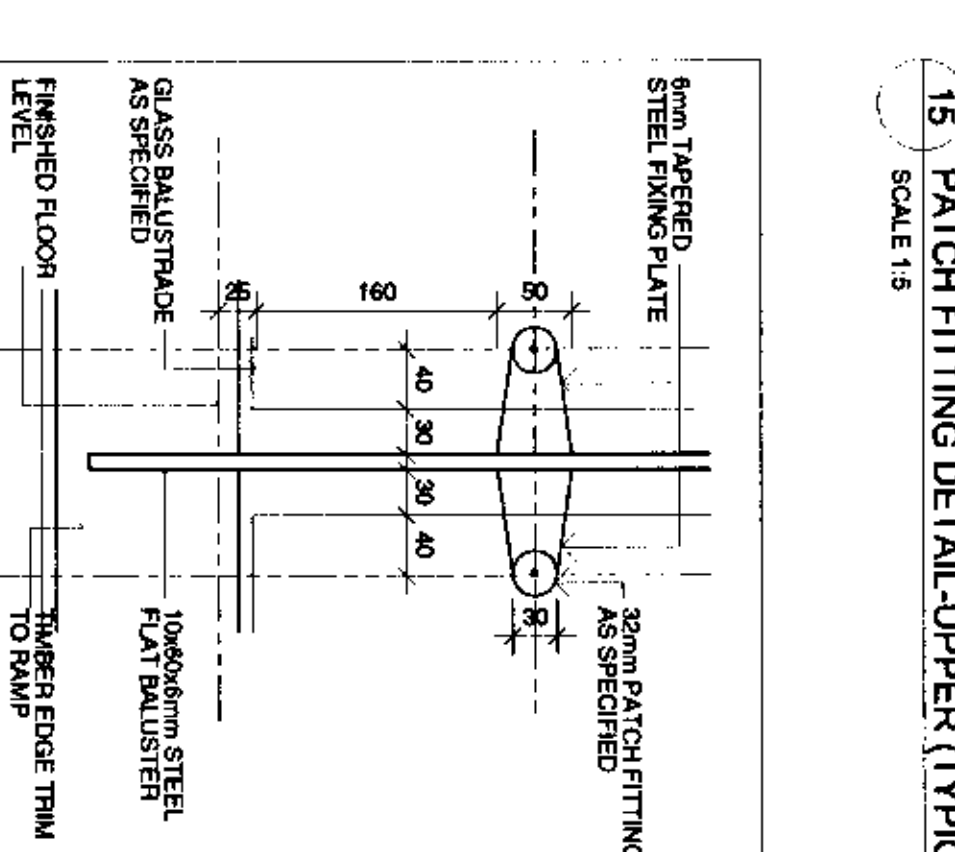
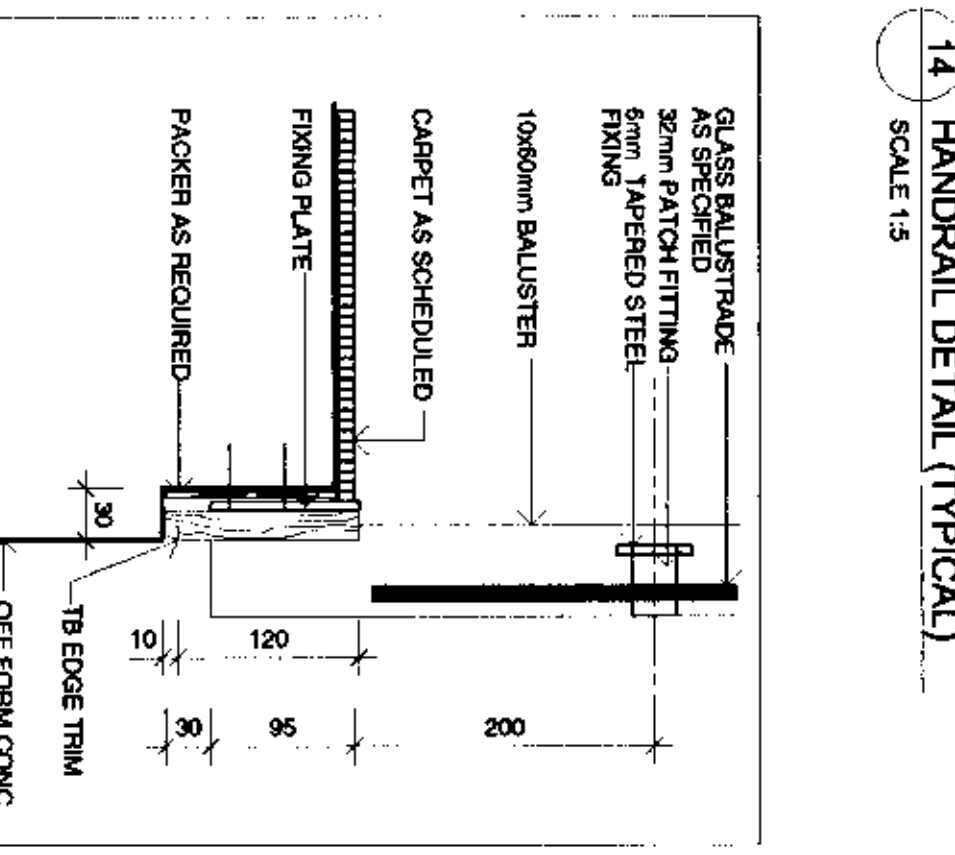
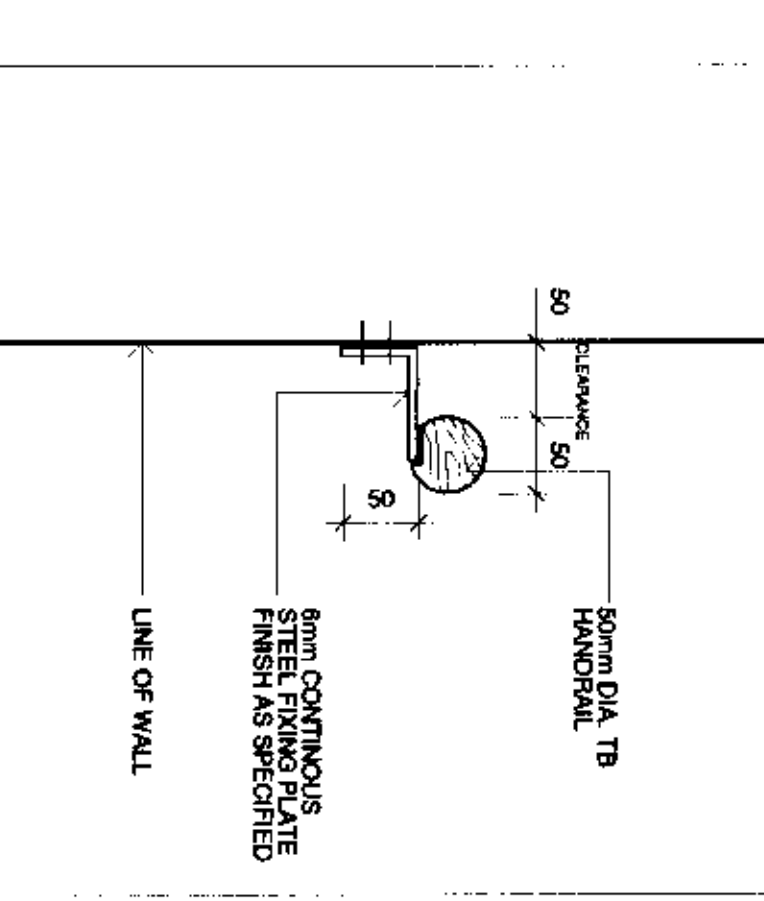
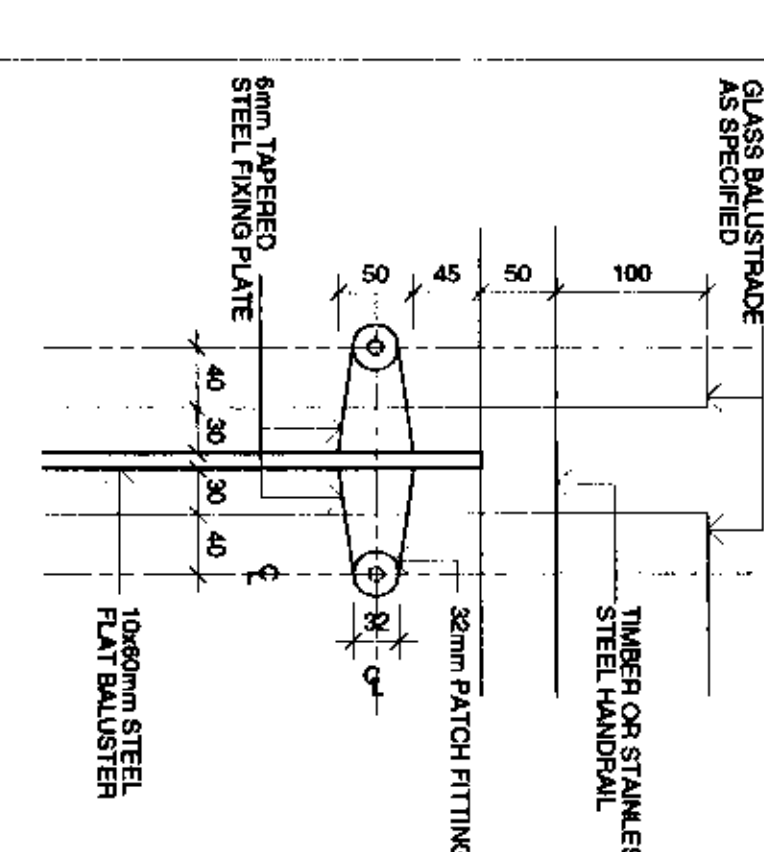
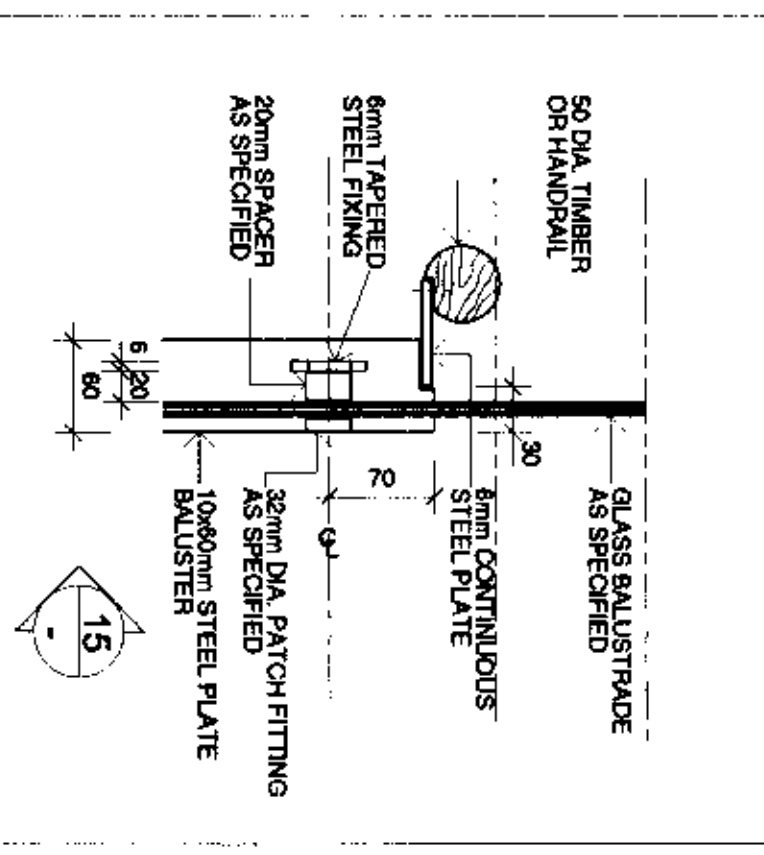
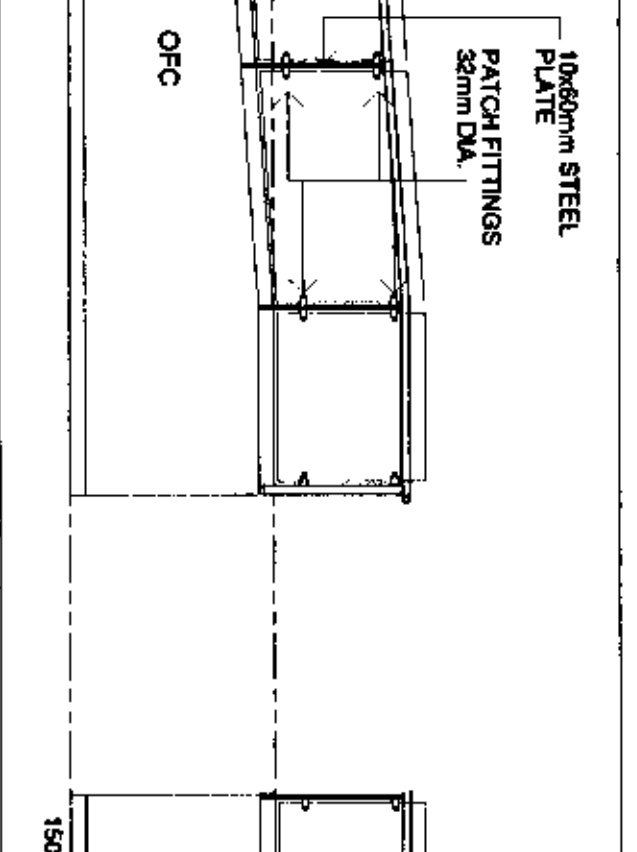
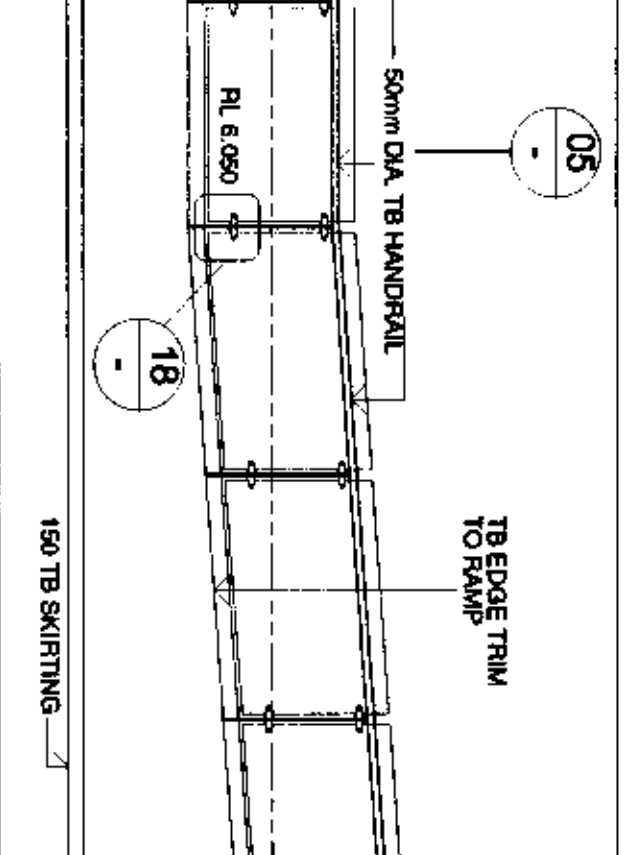
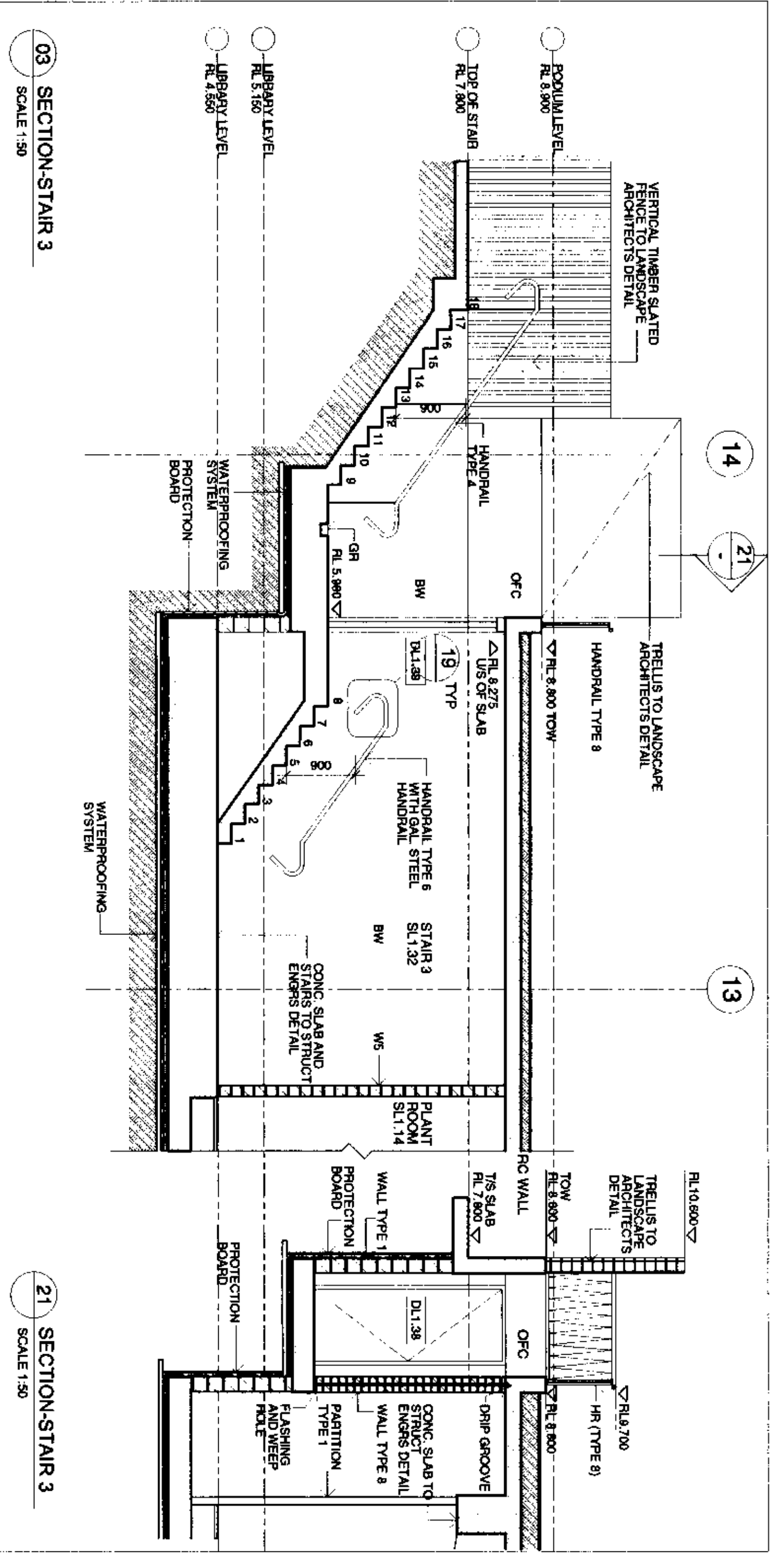
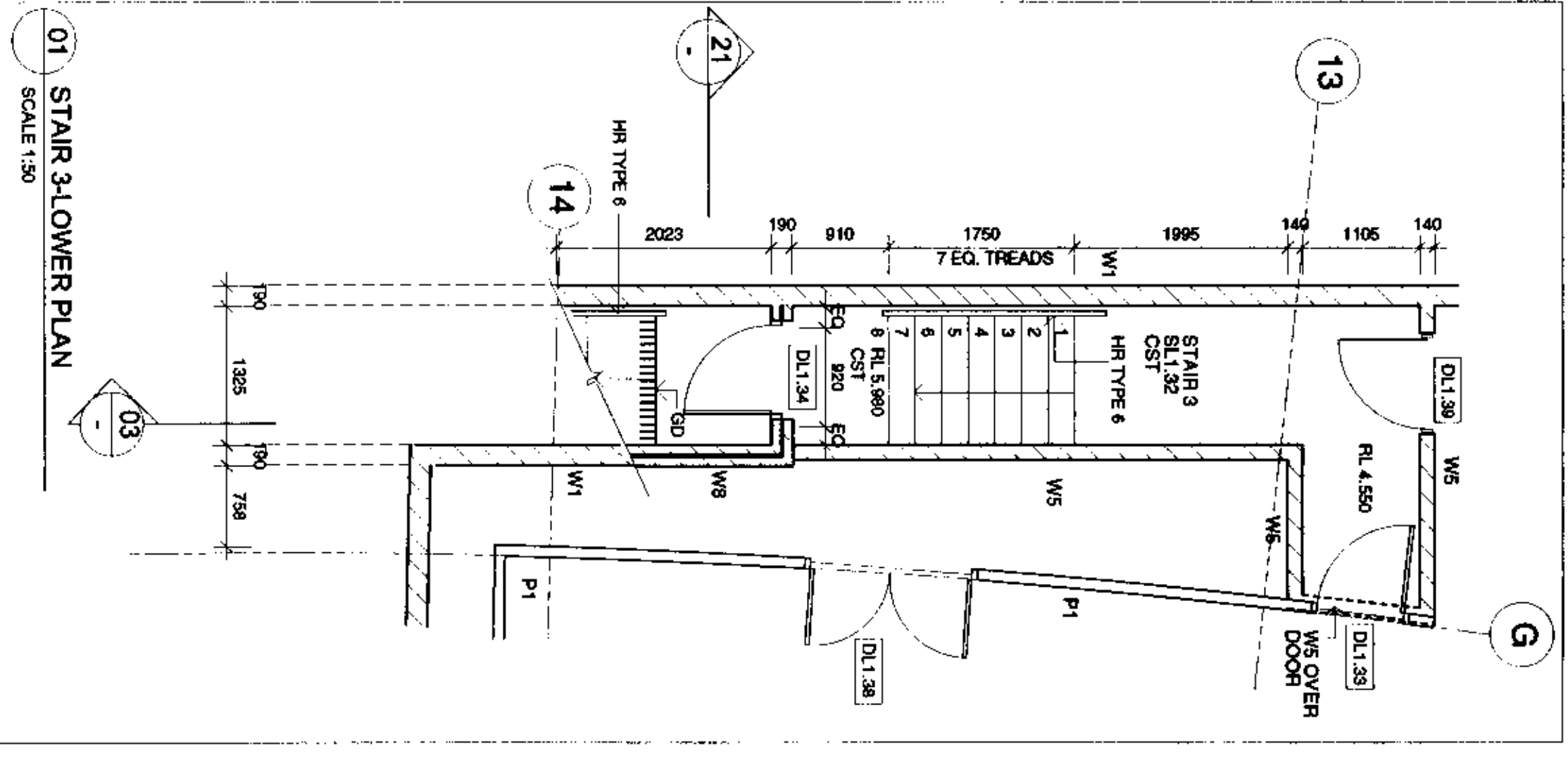
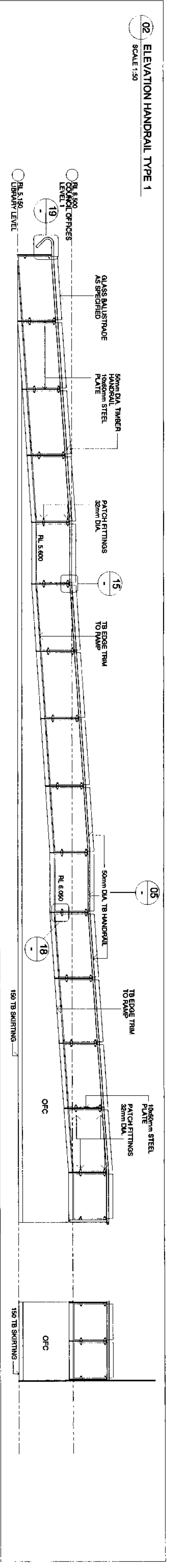


17 STAIR 1 DETAIL
SCALE 1:5



18 STAIR 2 DETAIL
SCALE 1:5

DRAWING TITLE
CONSTRUCTION DETAILS
SHEET 2
 PROJECT
MONA VALE VILLAGE PARK LIBRARY
 DRAWING NUMBER
A21
 SCALE
 1:5
 DATE
 27 FEBRUARY 2008
 CHECKED / AUTHORIZED
 DATE CHECKED
 28/02/08
 ISSUE 1
 5 Copyright of Designer North Pty Limited 2008. All Rights Reserved. No part of this drawing may be reproduced without the prior written consent of Designer North Pty Limited. Designer North Pty Limited is a division of Designer North Pty Limited.



PROJECT:
MONA VALE VILLAGE PARK LIBRARY

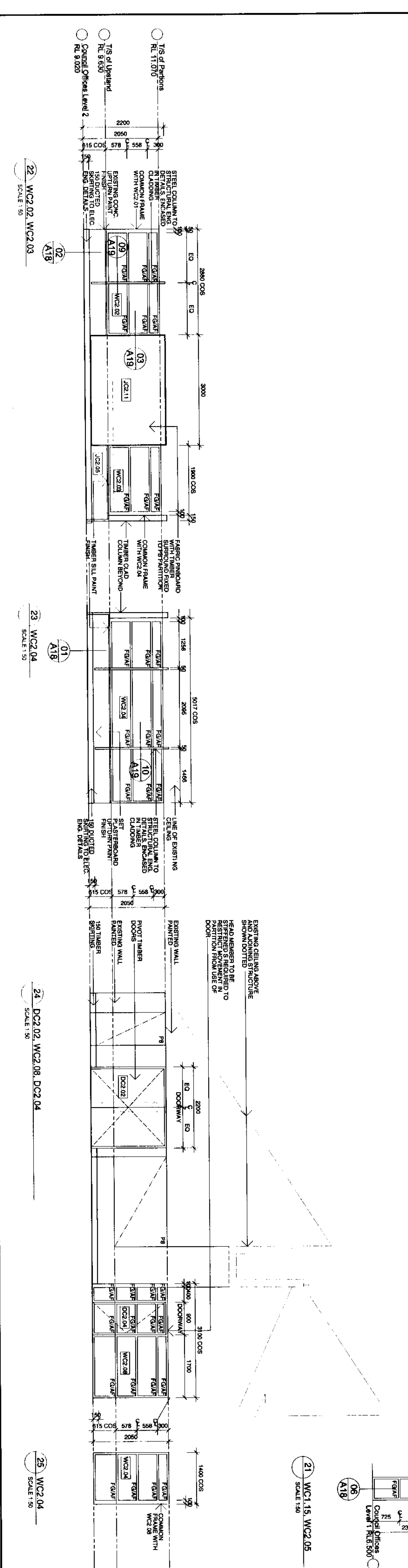
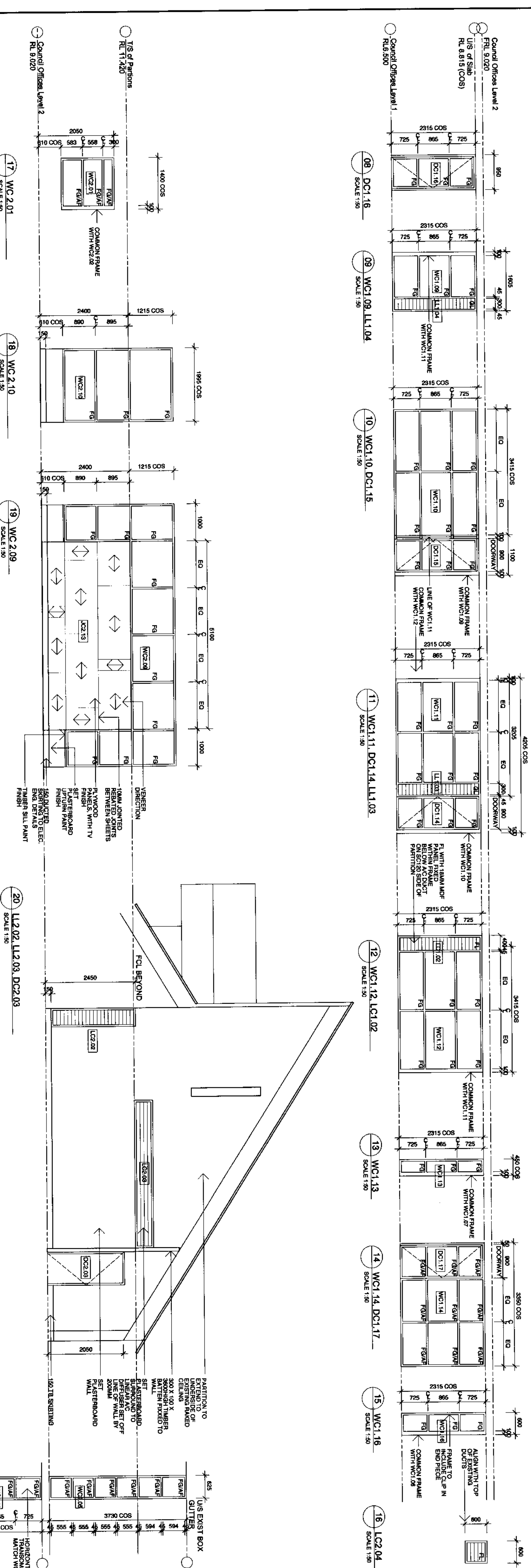
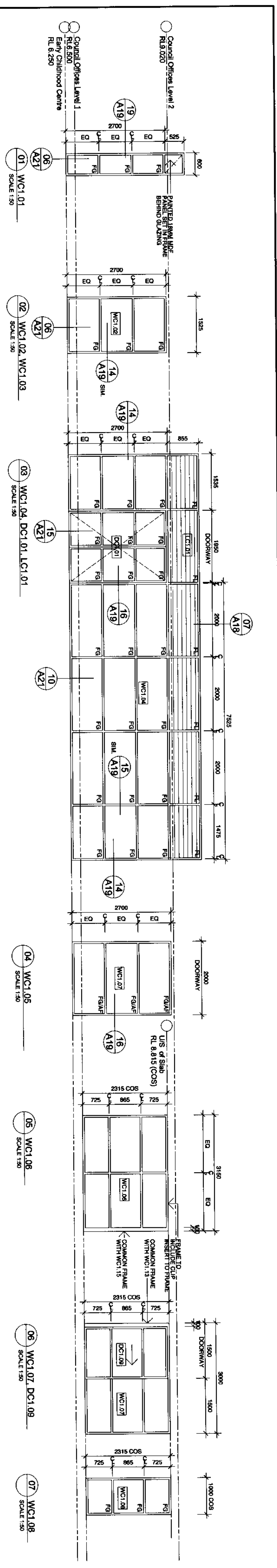
ARCHITECTS:
Brewster North
211 KENT STREET, STONE MOUNTAIN, VIC 3041
PH: 03 9330 7800 FAX: 03 9330 7801

DRAWING TITLE:
STAIR / RAMP / HANDRAIL

SCALE:
AS SHOWN
DRAWN BY: [Signature]
CHECKED BY: [Signature]
DATE: 27/10/2009

ISSUE A

22

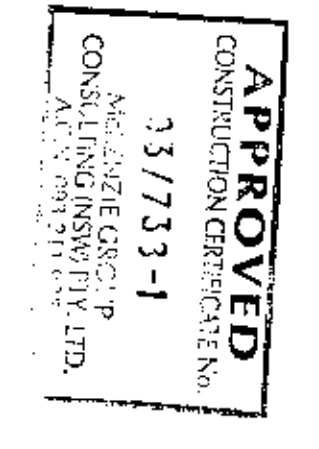


NOTES:

1. ALL DIMENSIONS ARE PER STRUCTURAL DRAWINGS UNLESS OTHERWISE SPECIFIED.
2. ALL OPENING SIZES ARE TO BE CONFIRMED ON SITE PRIOR TO MANUFACTURE.
3. REFER TO SPECIFICATION FOR FRAMING SYSTEM DETAILS.
4. ALL WINDOWS AND DOORS ARE VIEWED FROM INTERIOR UNLESS OTHERWISE SPECIFIED.

LEGEND:

FG	FIXED GLAZING
FL	FIXED ALUMINUM LOUVERS
COL	CONCRETE COLUMN
TB	TIMBER TRIM
FS	FIBROUS SHEET
ES	EXTERIOR FINISH
CC	CONCRETE CURB
CF	CONCRETE FINISH
AF	ADHESIVE FILM



APPROVED
13/7/21 - 1
CONSULTING ENGINEER
M. J. J. J. J.

Diemster North
ARCHITECTS
1/150 THE GREAT ROAD
MELBOURNE VIC 3000
TEL: 03 9594 1111
WWW.DIEMSTER.COM.AU

MONA VALE VILLAGE PARK LIBRARY

WINDOW SCHEDULE S1

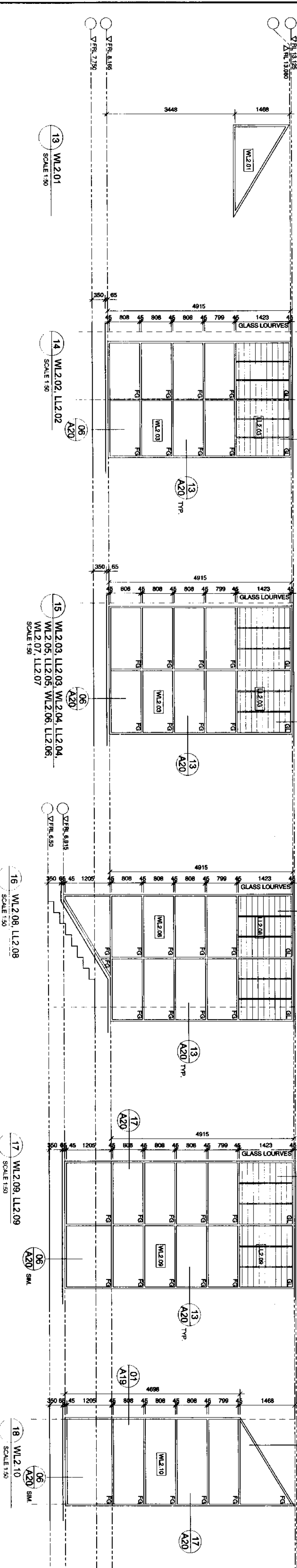
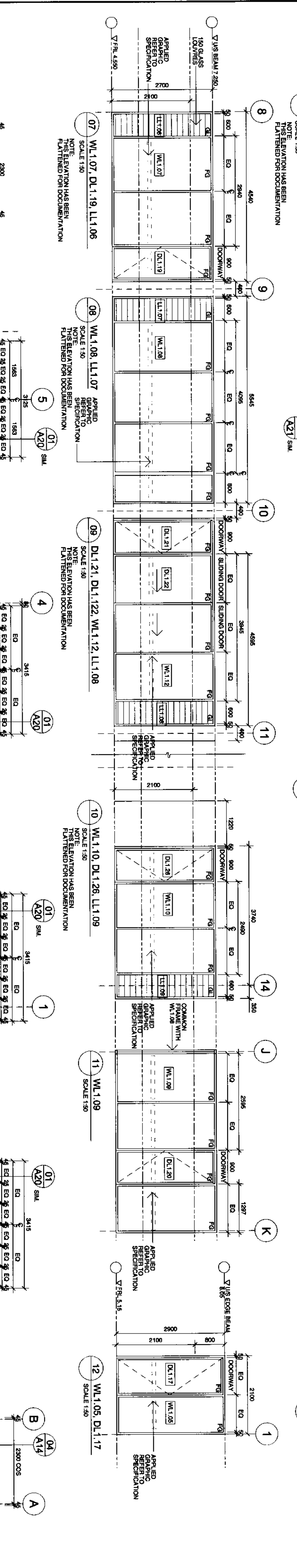
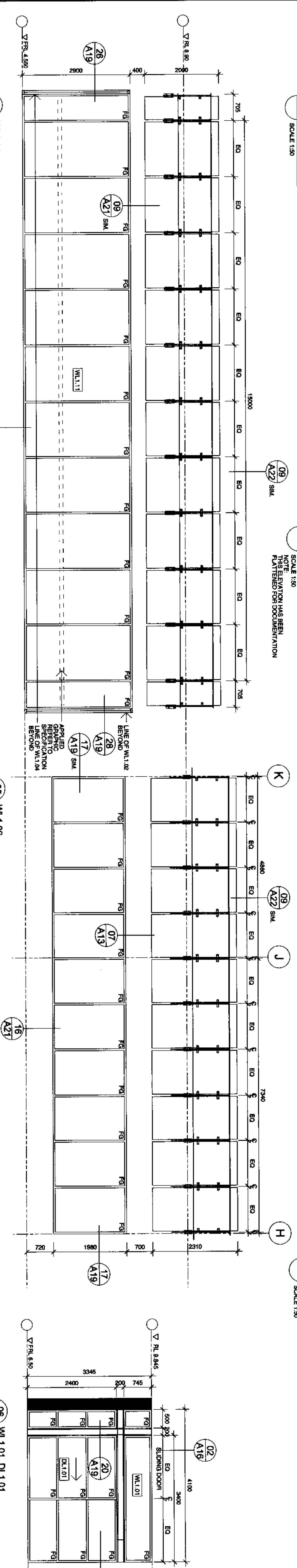
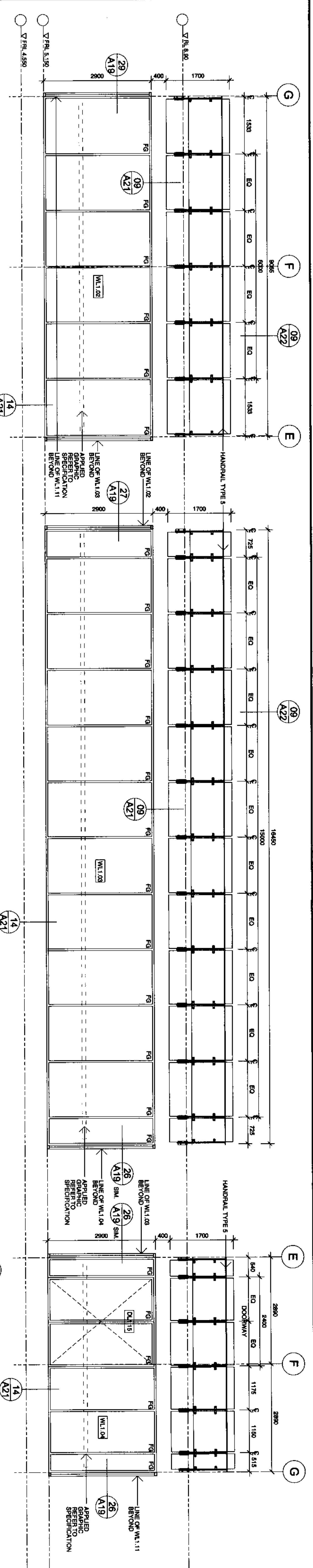
DRAWING NUMBER: A23

SCALE: 1:50

DATE: 27 FEBRUARY 2020

CHECKED: AUTOMATED

DATE CHECK: 28/02/20



NOTES:

1. ALL DIMENSIONS ARE FOR STRUCTURAL OPENING SIZES.
2. ALL OPENING SIZES ARE TO BE CONFIRMED ASSEMBLED BY MANUFACTURER.
3. REFER TO SPECIFICATION FOR FRAMING.
4. ALL WINDOWS AND DOORS ARE VENDED FROM OUTSIDE.

LEGEND:

- FG FIXED GLAZING
- FL FIXED ALUMINUM Louvers, AS SPECIFIED
- COL CONCRETE COLUMN
- GL GLASS LOUVER
- AL ADHESIVE FILM

APPROVED
DATE: 03/17/23
CONTRACT NO: 23-001-001

ISSUE NO. DESCRIPTION DATE CHECKED

ISSUED FOR TENDER 28.02.23

DATE CHECK

PROJECT:
MONA VALE VILLAGE PARK LIBRARY

DRAWING TITLE:
WINDOW SCHEDULE S8

SCALE:
1:50

DATE:
27 FEBRUARY 2023

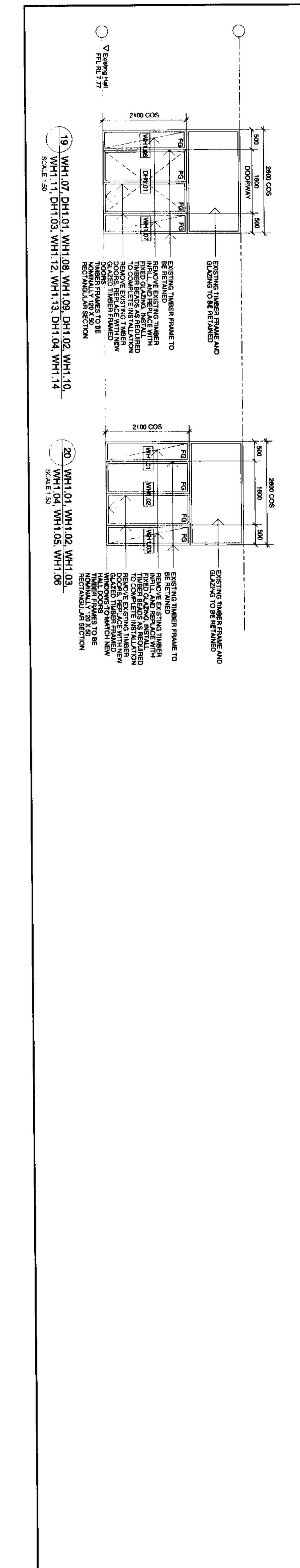
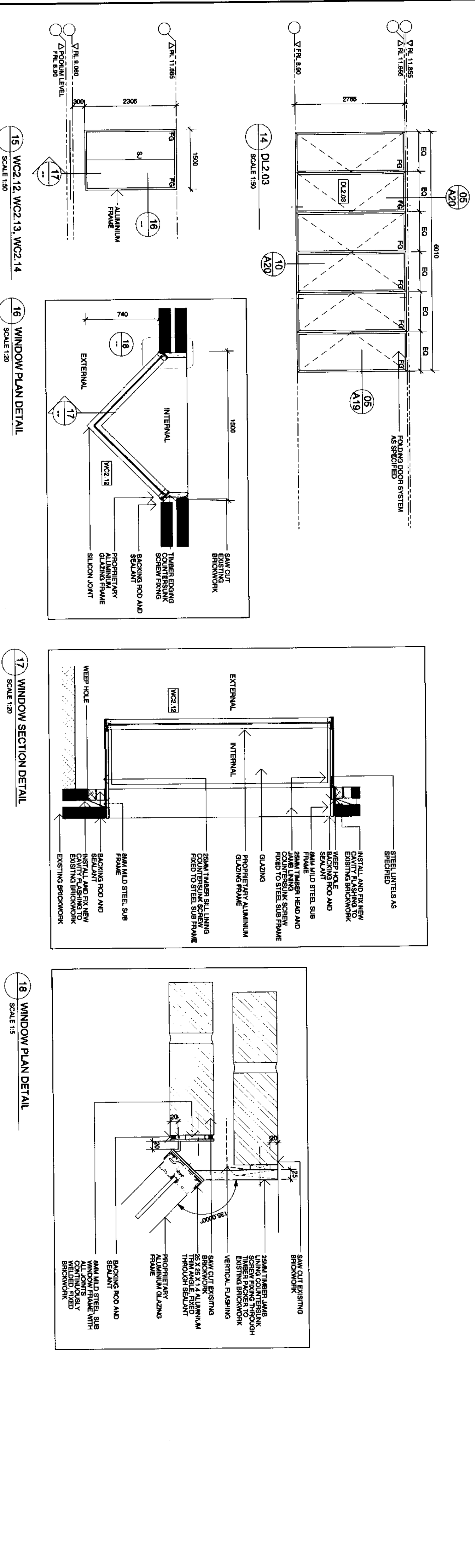
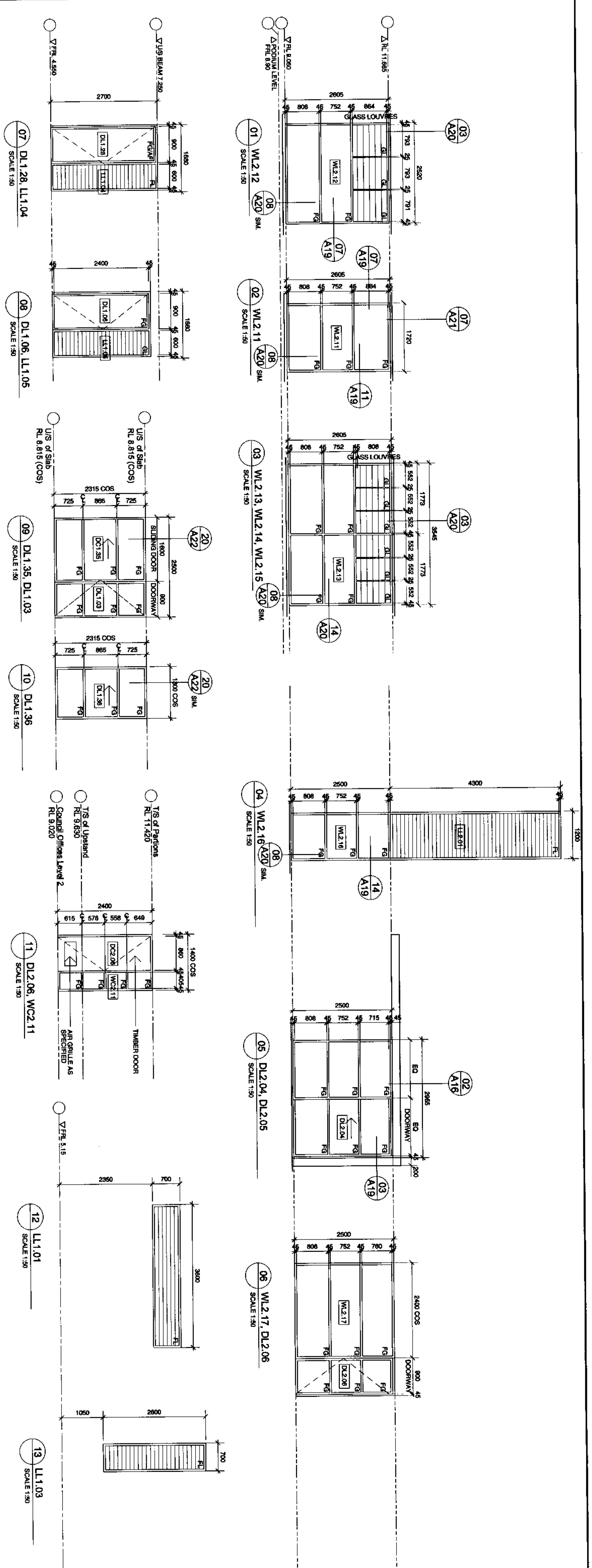
DRAWING NUMBER:
A24

ISSUE:
A

- NOTES:**
- ALL DIMENSIONS ARE FOR STRUCTURAL.
 - ALL OPENING SIZES ARE TO BE CONFIRMED ON SITE BEFORE MANUFACTURE.
 - REFER TO SPECIFICATION FOR FINISHES, MATERIALS & DETAILS.
 - ALL WINDOWS AND DOORS ARE VENEER FROM OUTSIDE.

LEGEND:

FG FIXED GLAZING
 FL FIXED Louvers
 COL. CONCRETE COLUMN



ISSUE NO.	DESCRIPTION	DATE CHECK
1	ISSUED FOR TENDERS	28/12/20

PROJECT:
MONA VALE VILLAGE PARK LIBRARY

ARCHITECT:
Drewsler hirth

DATE:
 20/01/2023

SCALE:
 1:50

PROJECT TITLE:
WINDOW SCHEDULE SET MISCELLANEOUS DETAILS

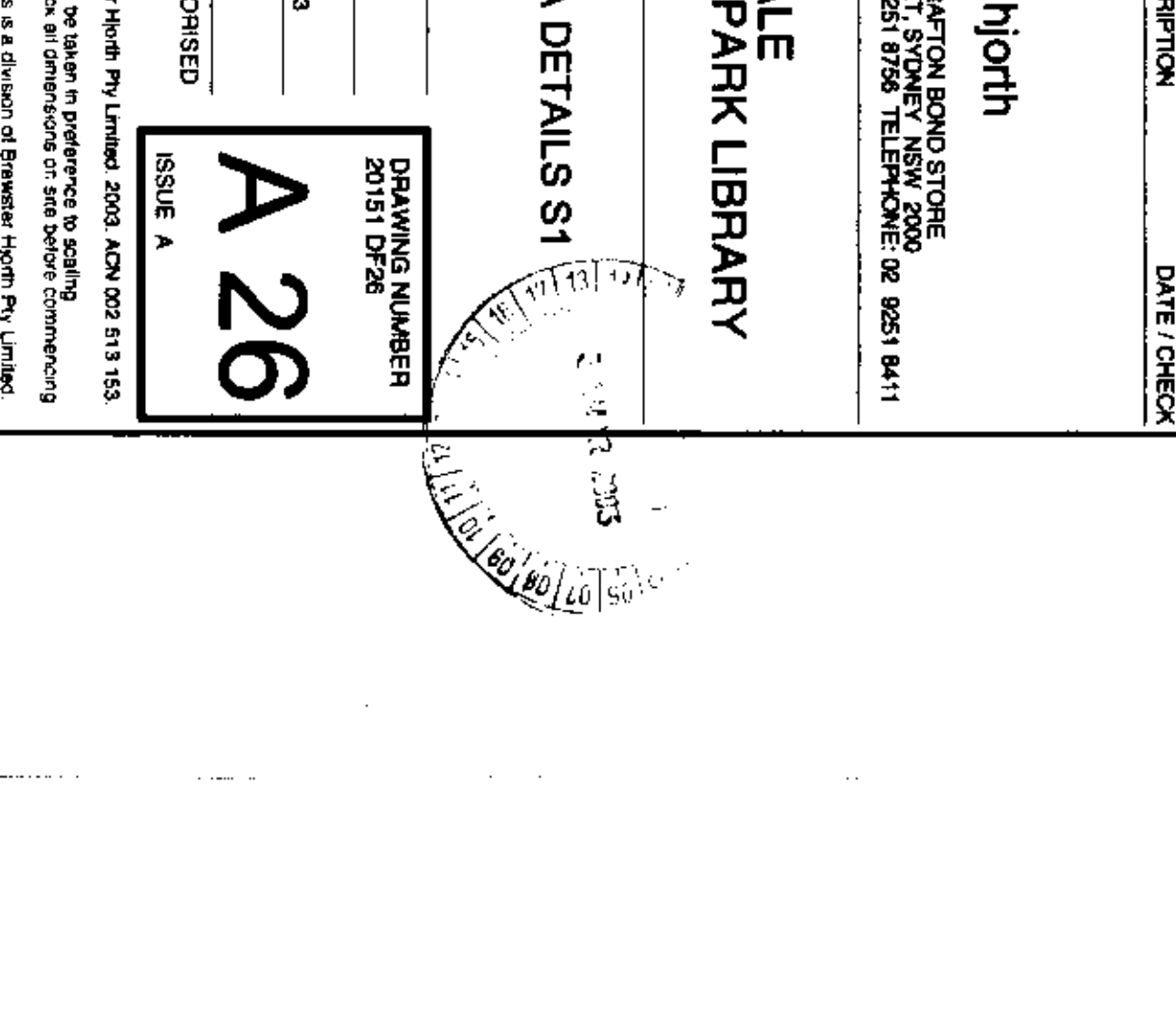
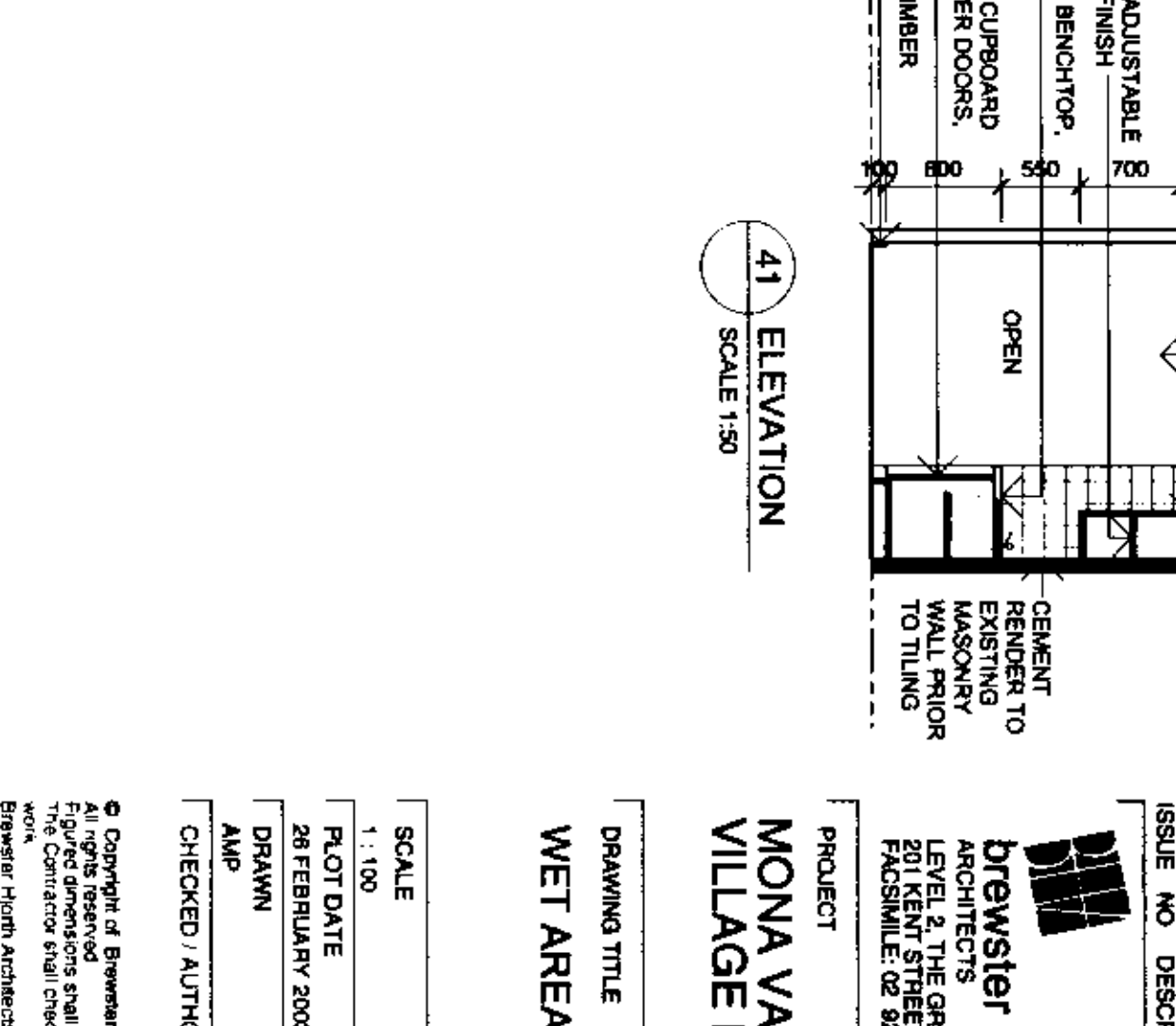
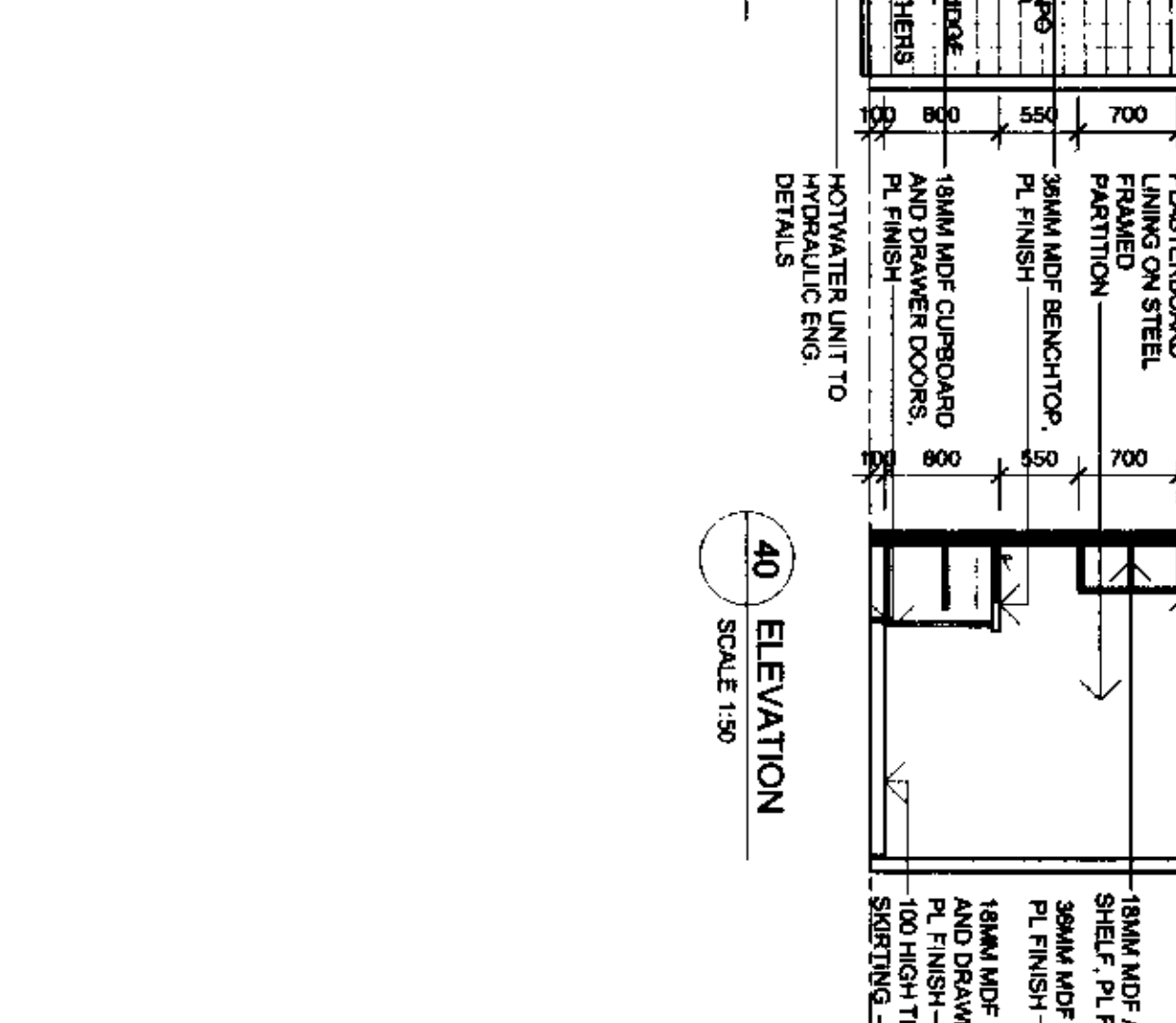
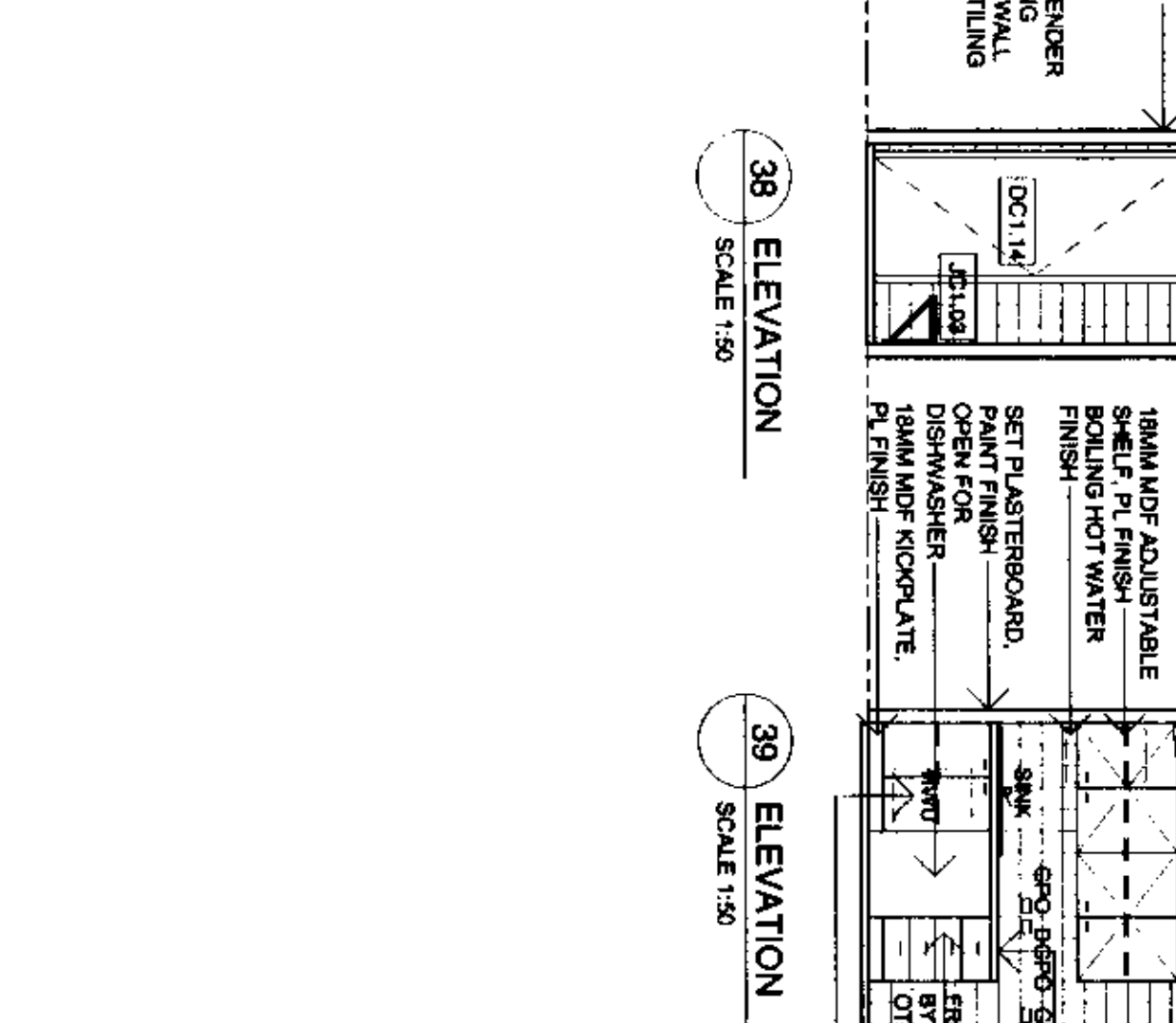
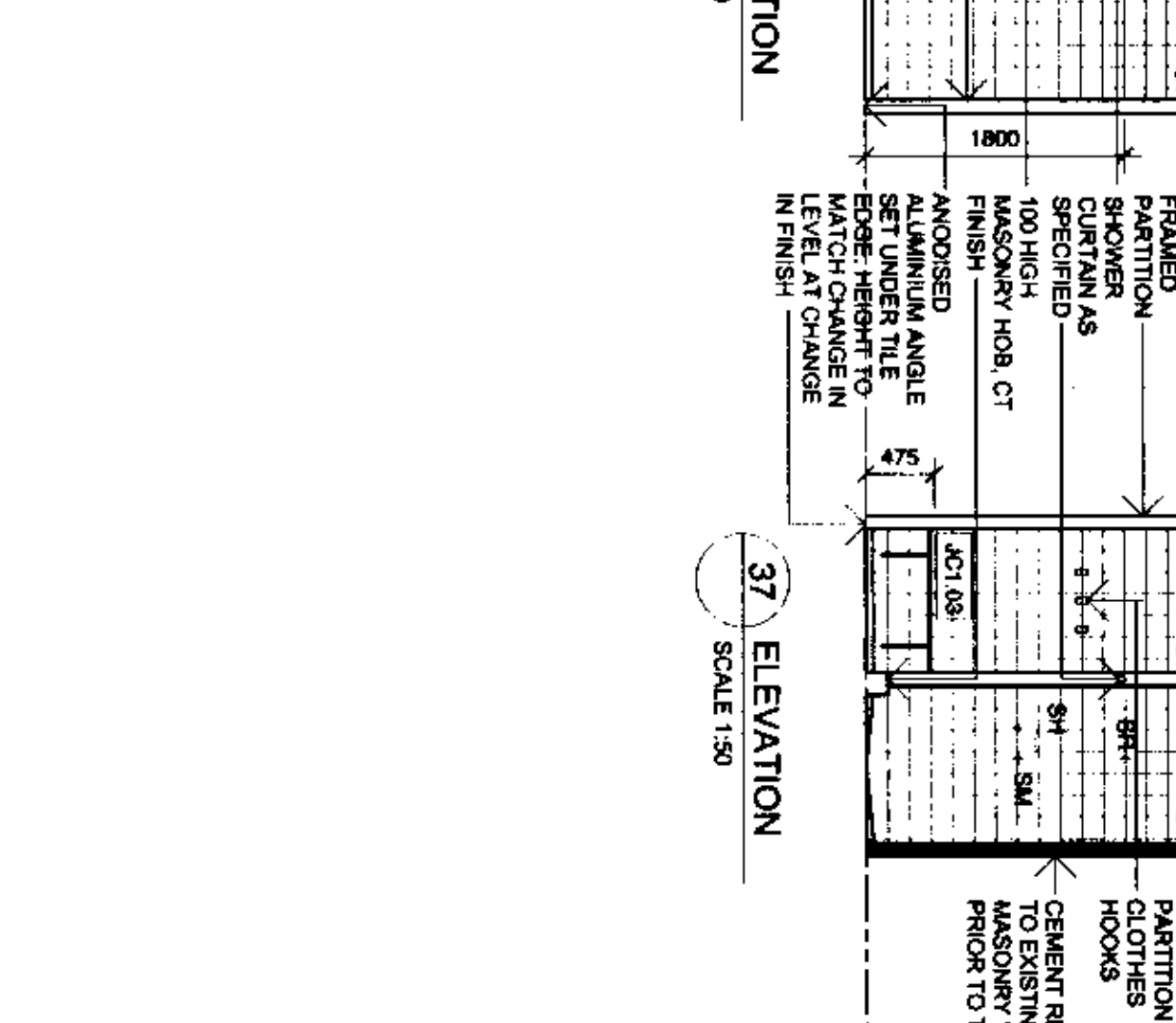
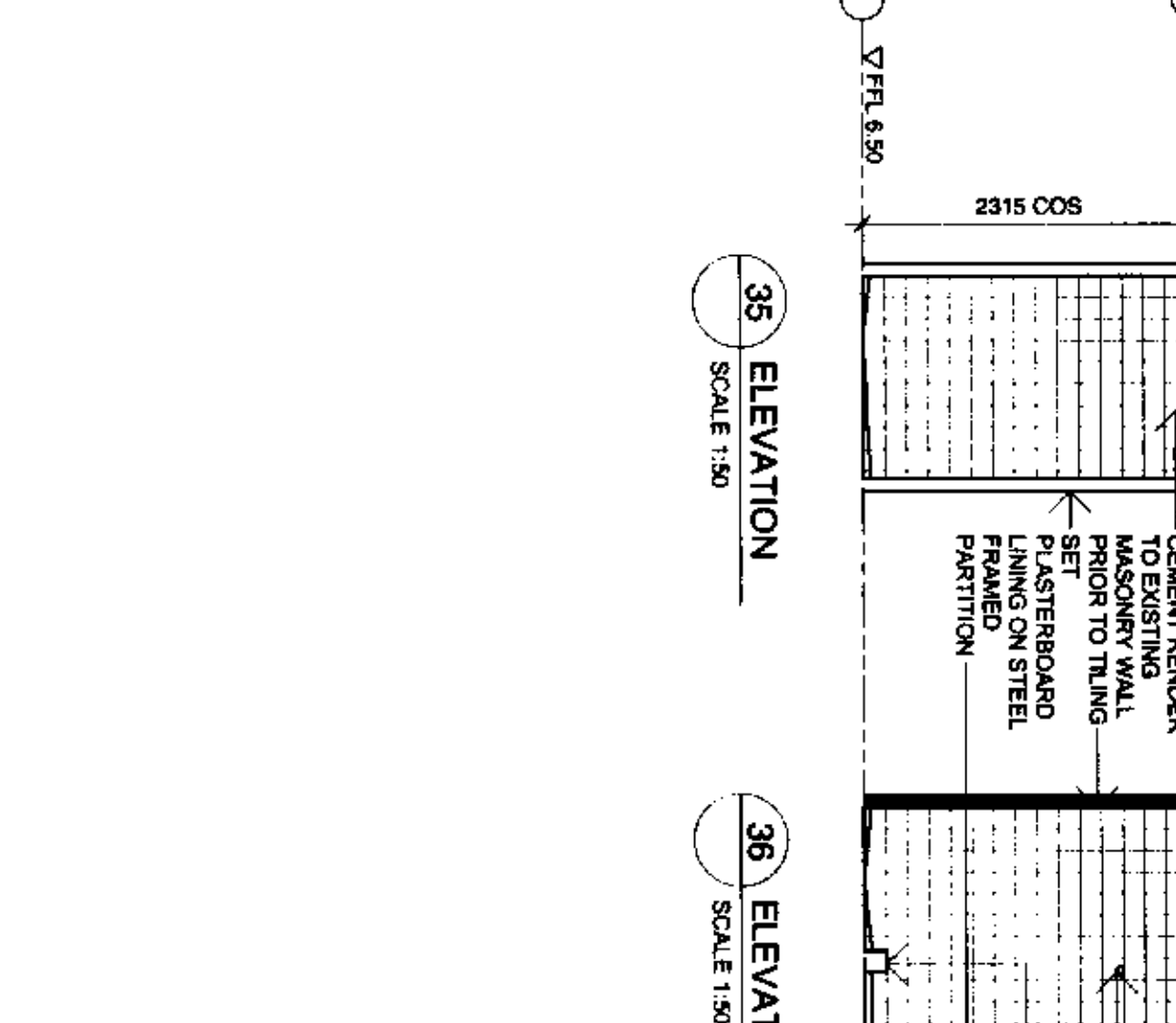
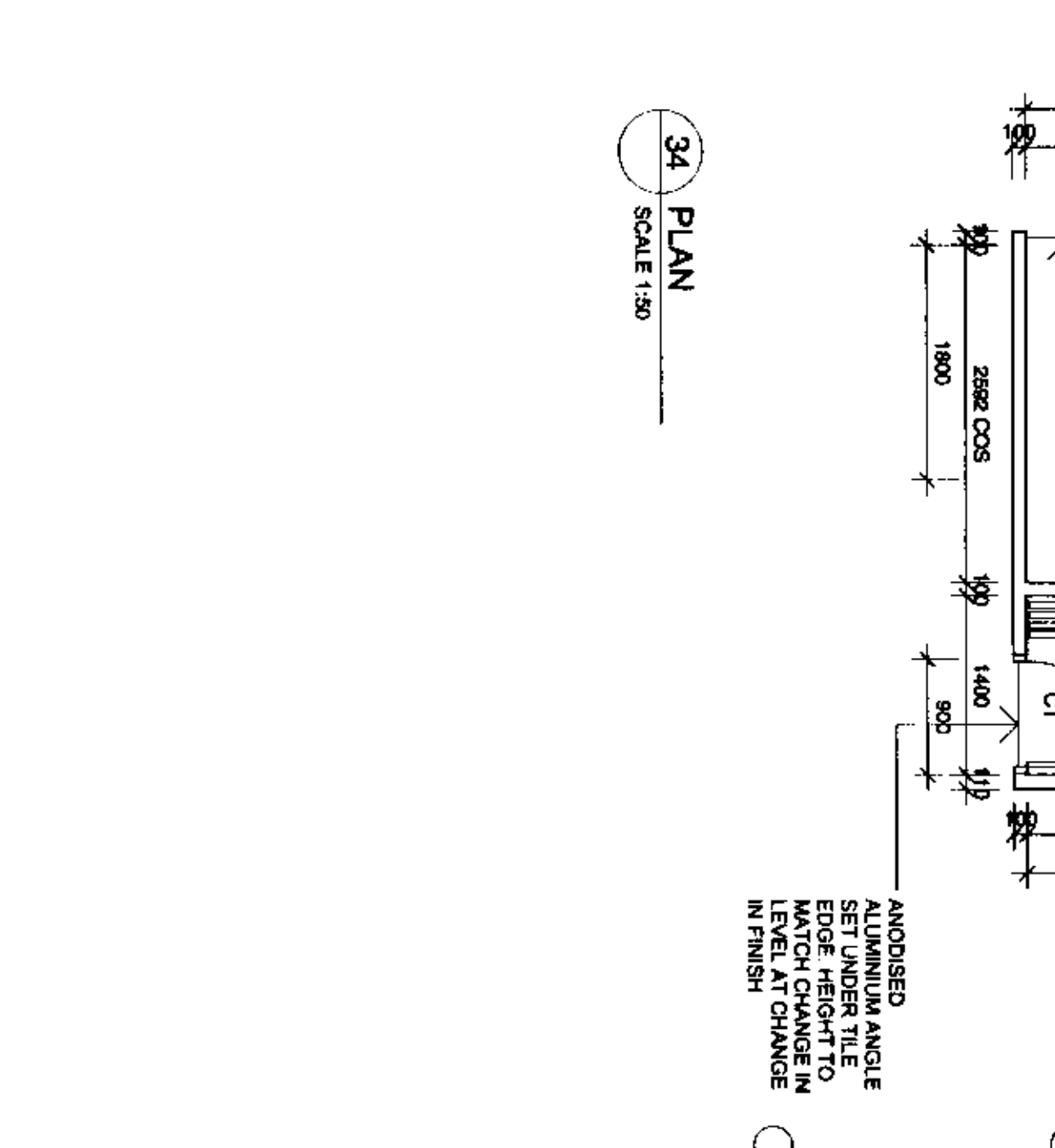
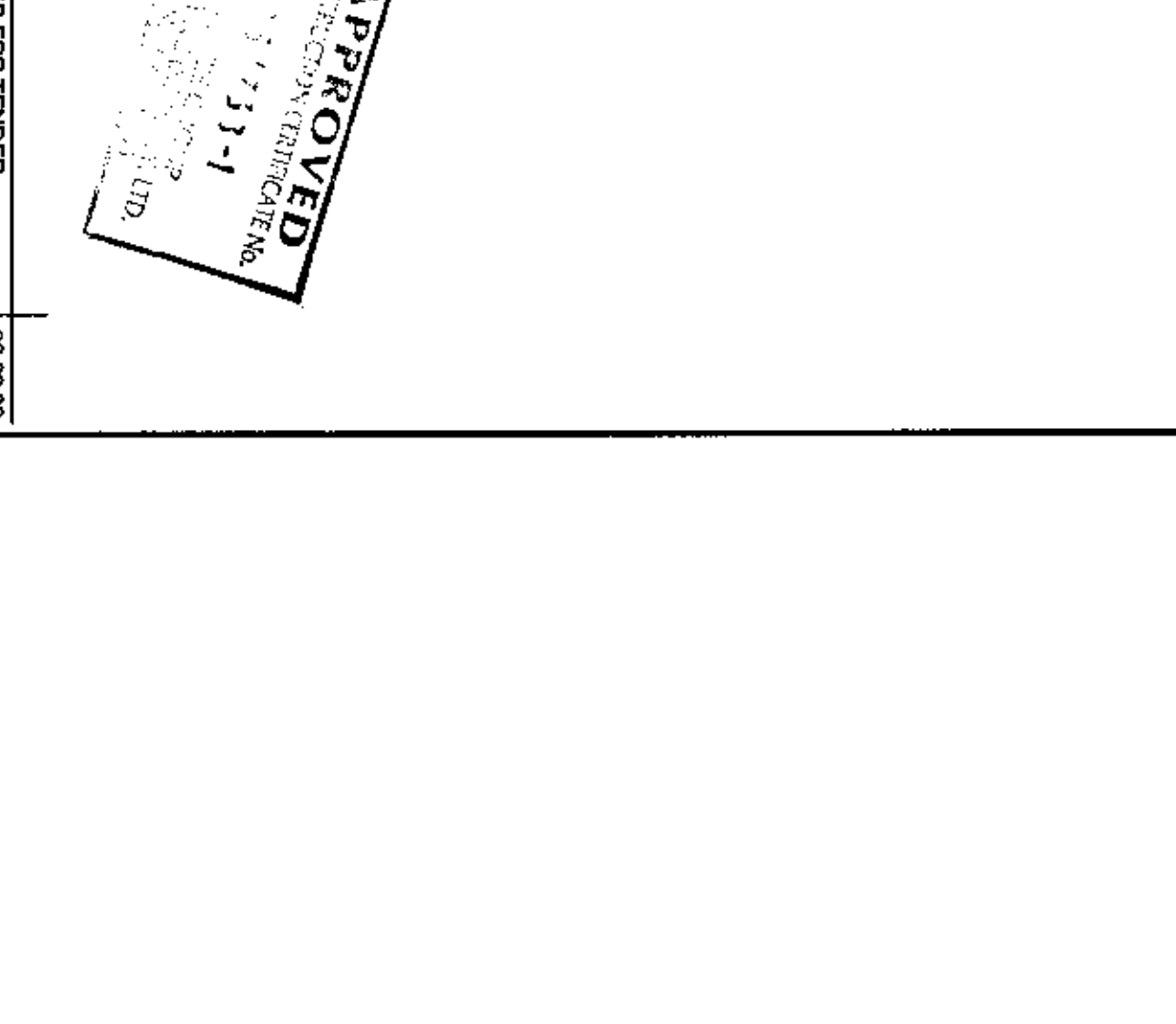
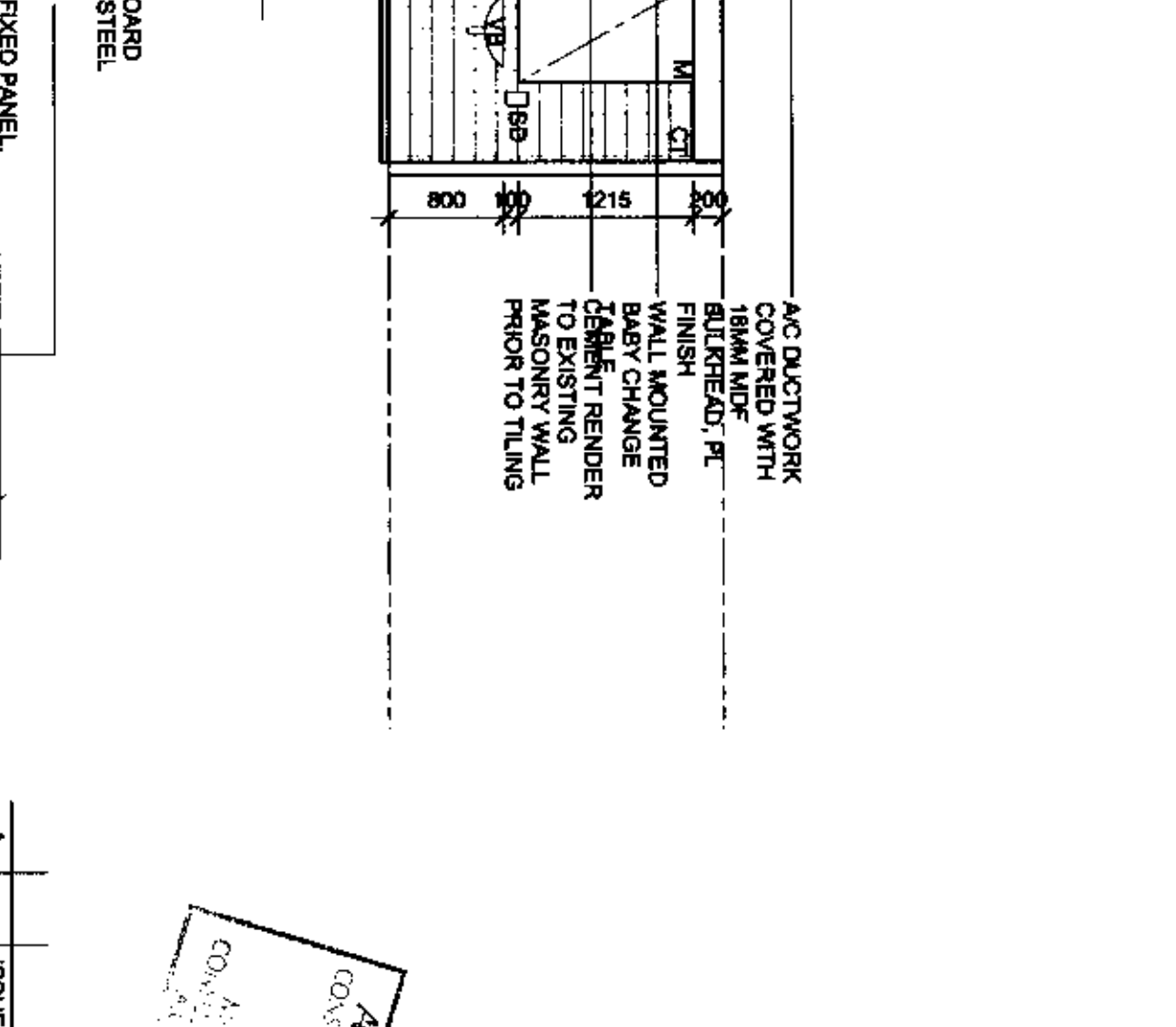
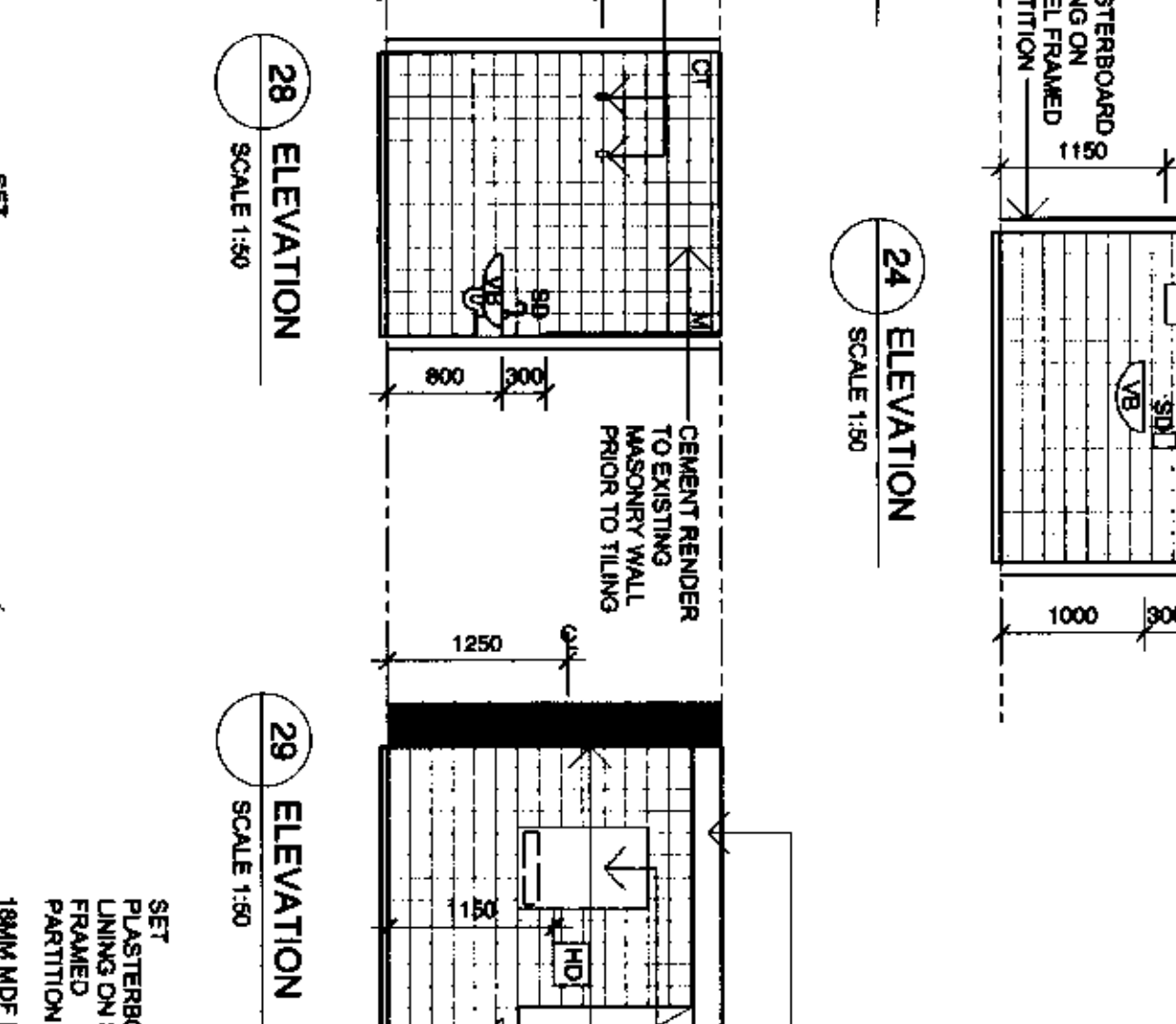
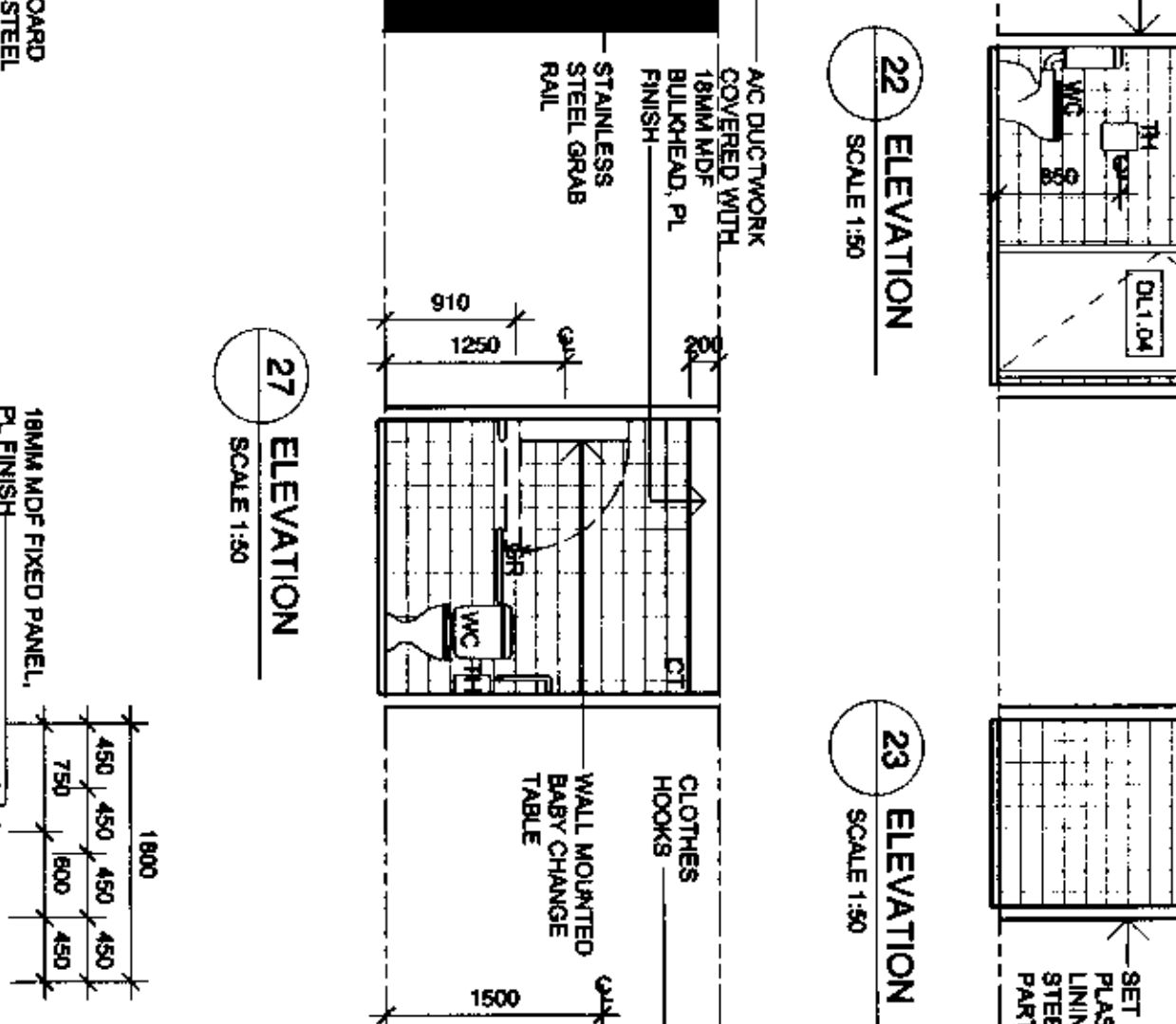
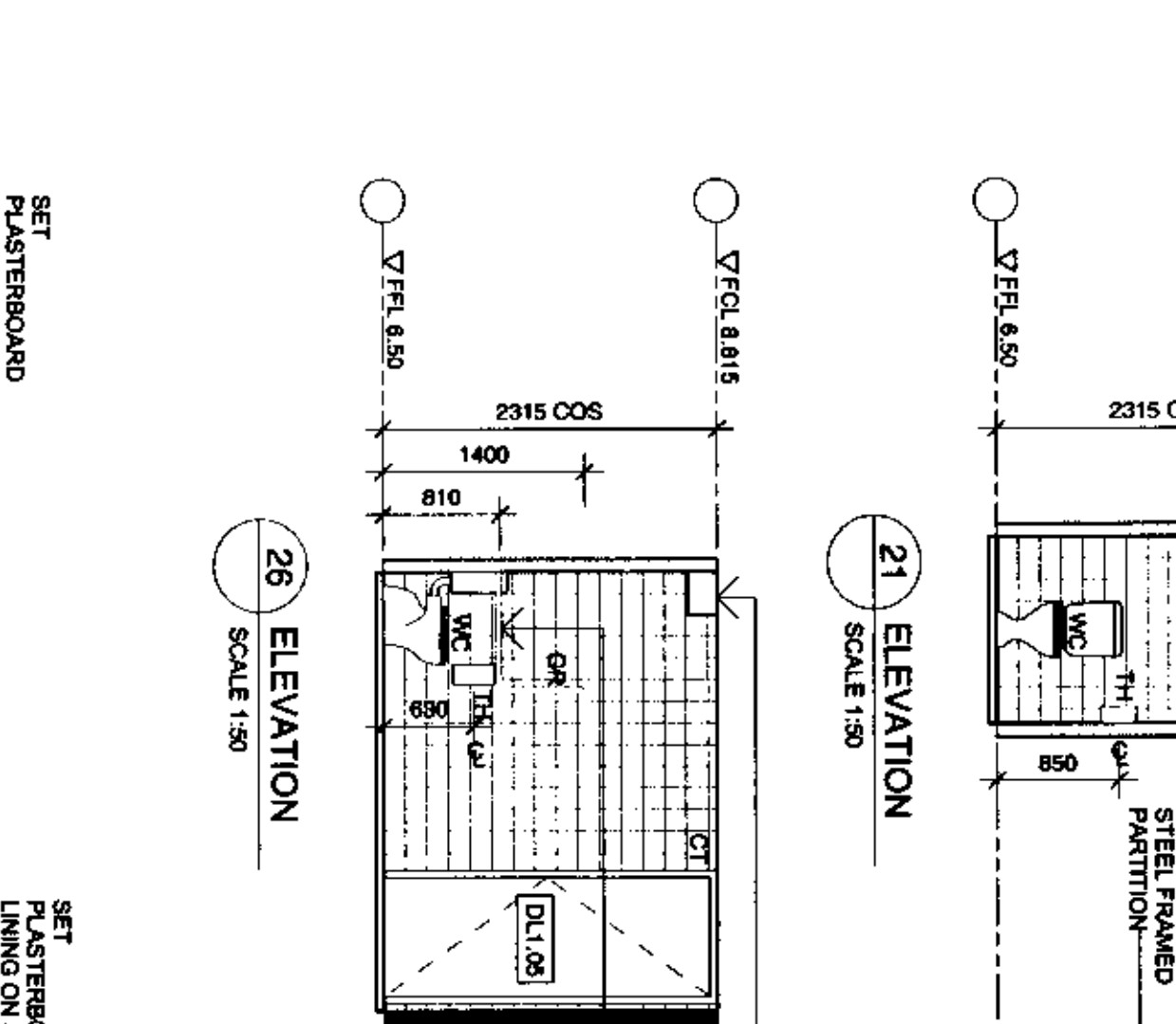
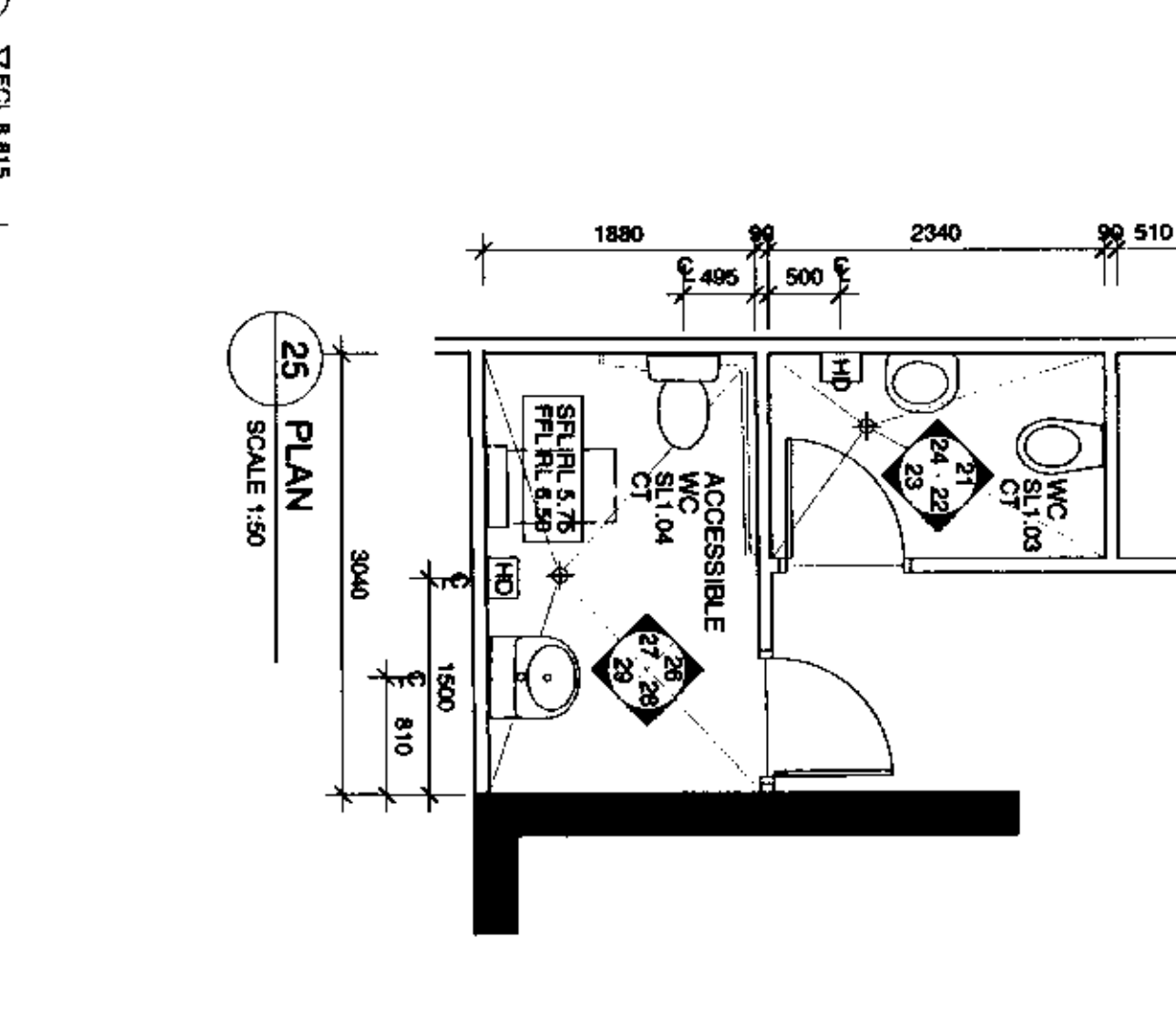
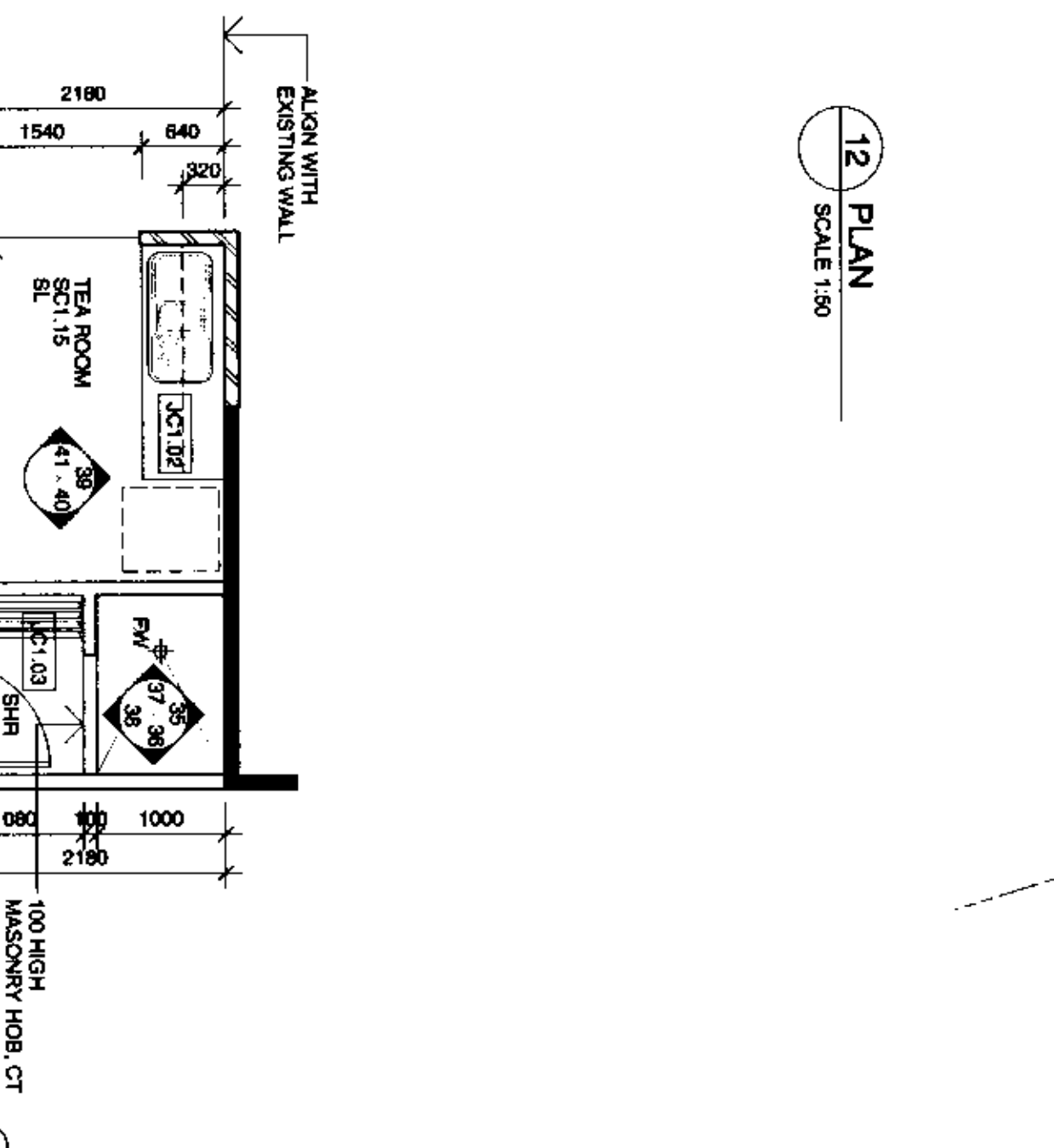
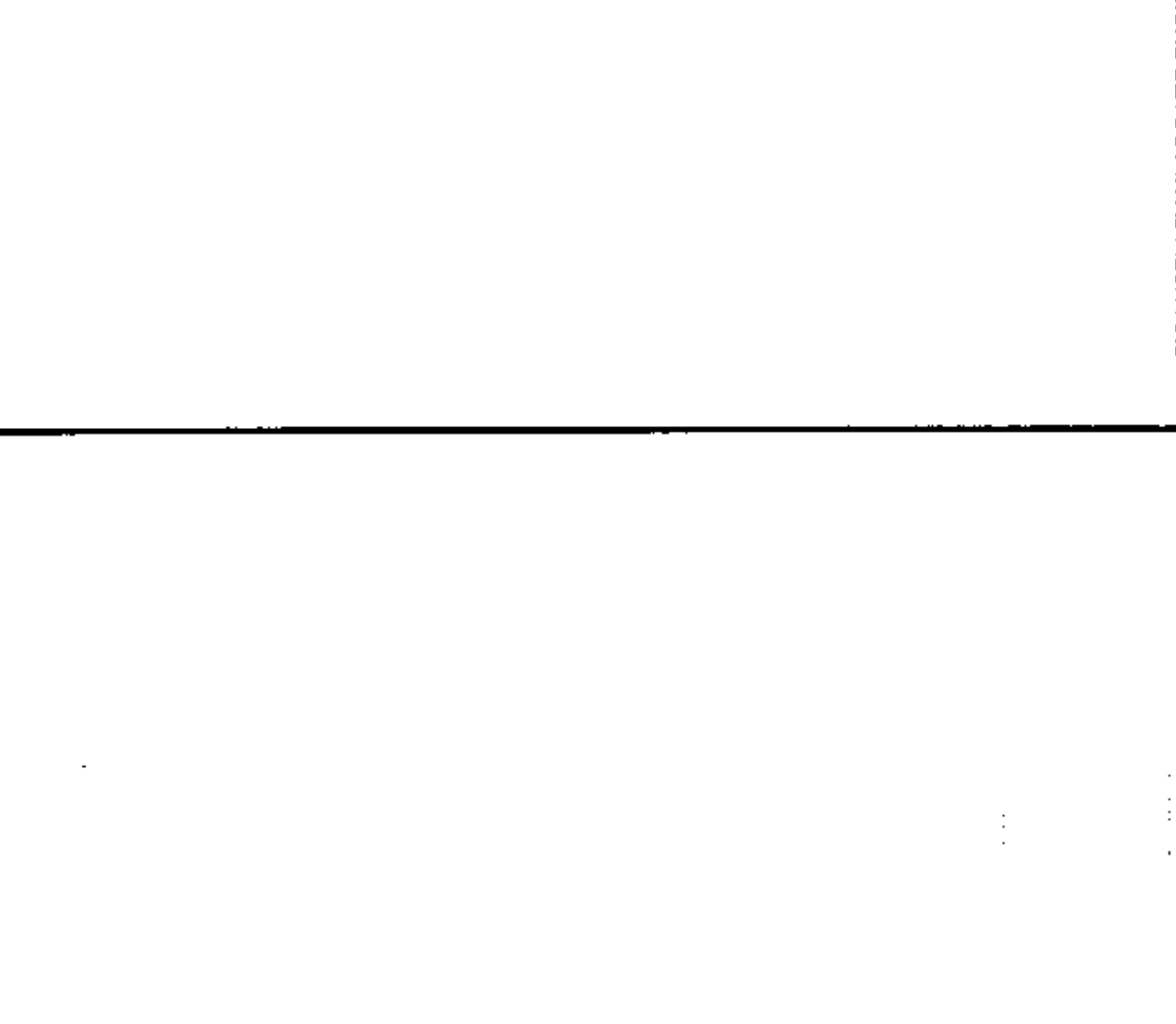
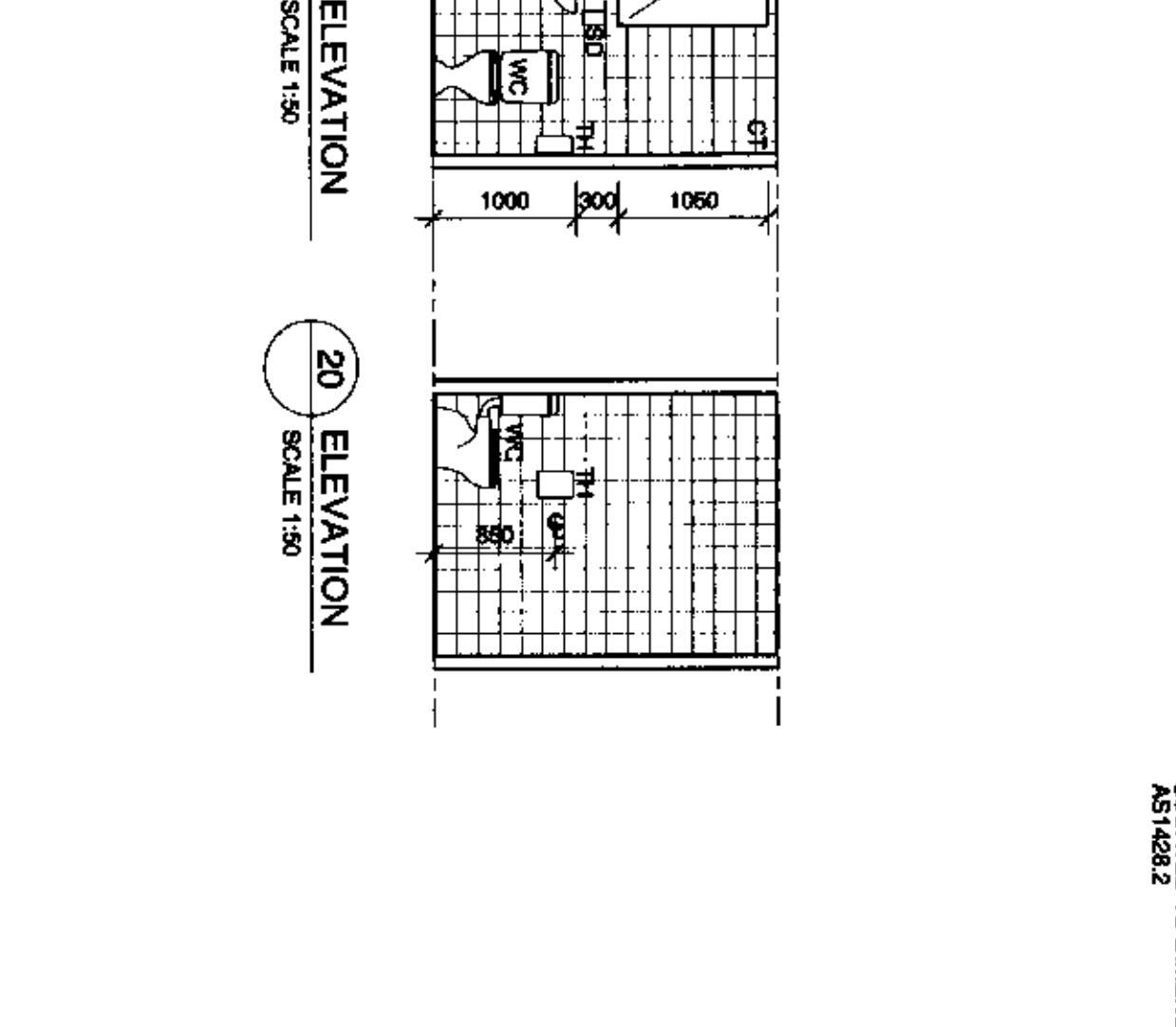
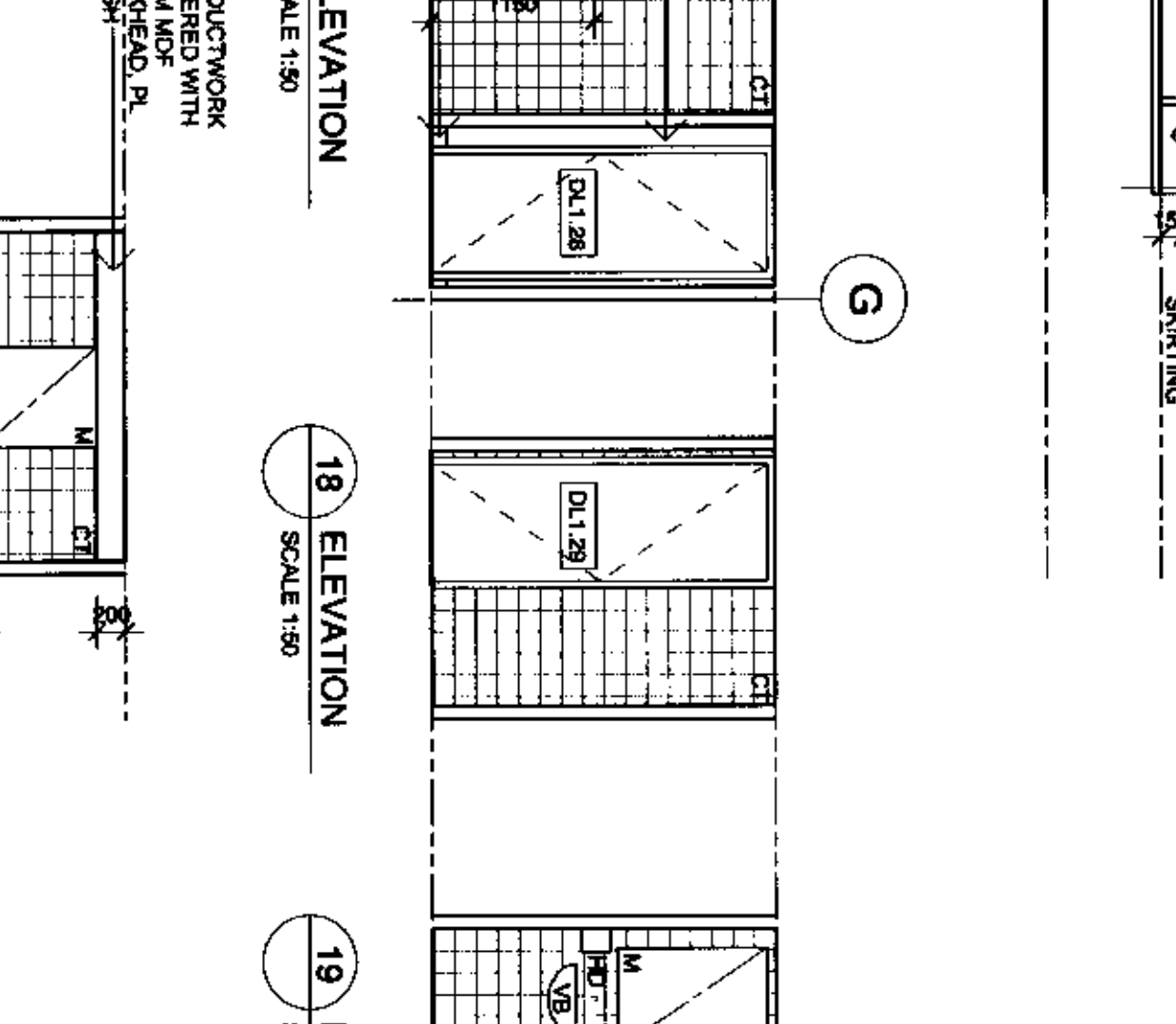
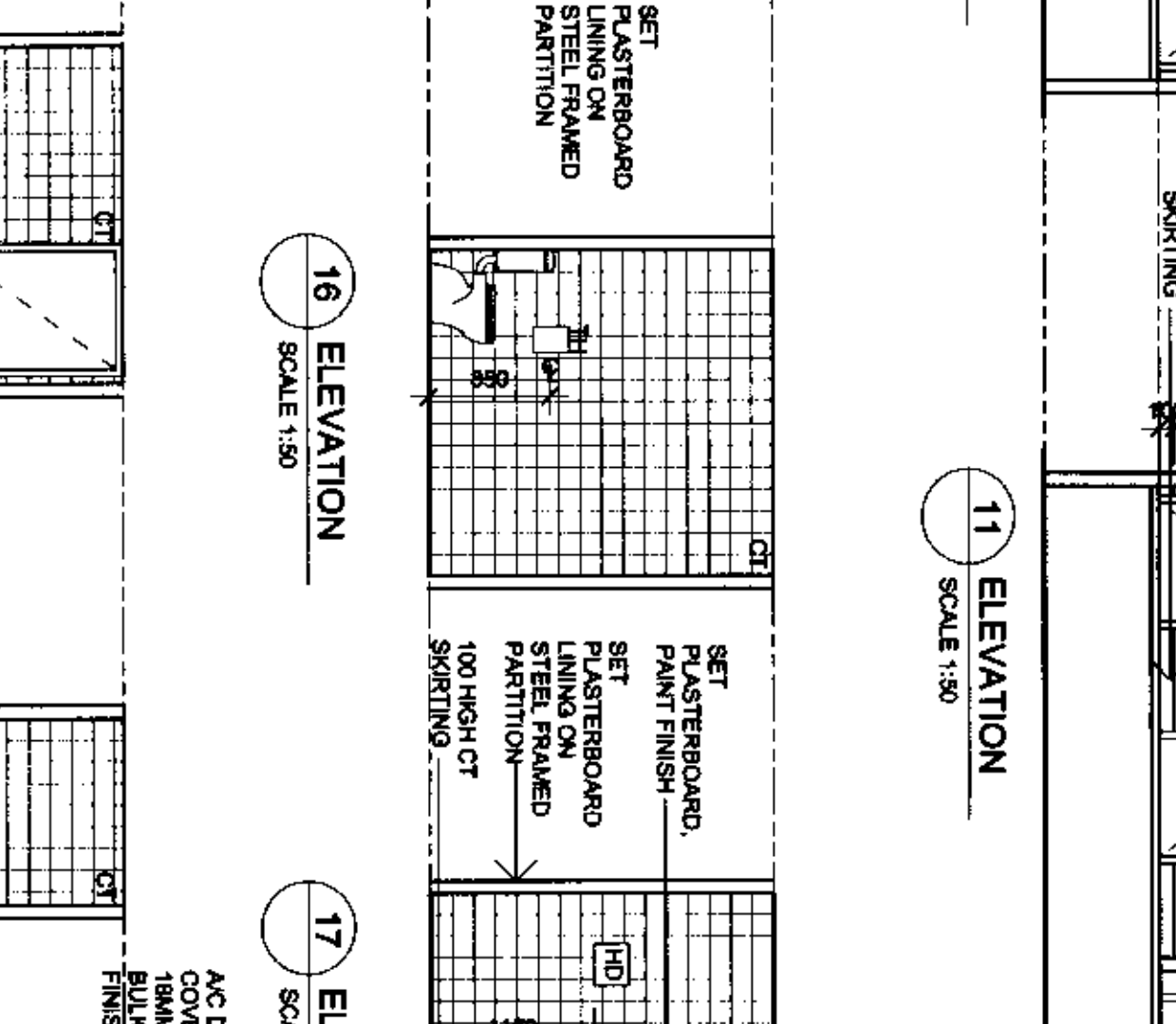
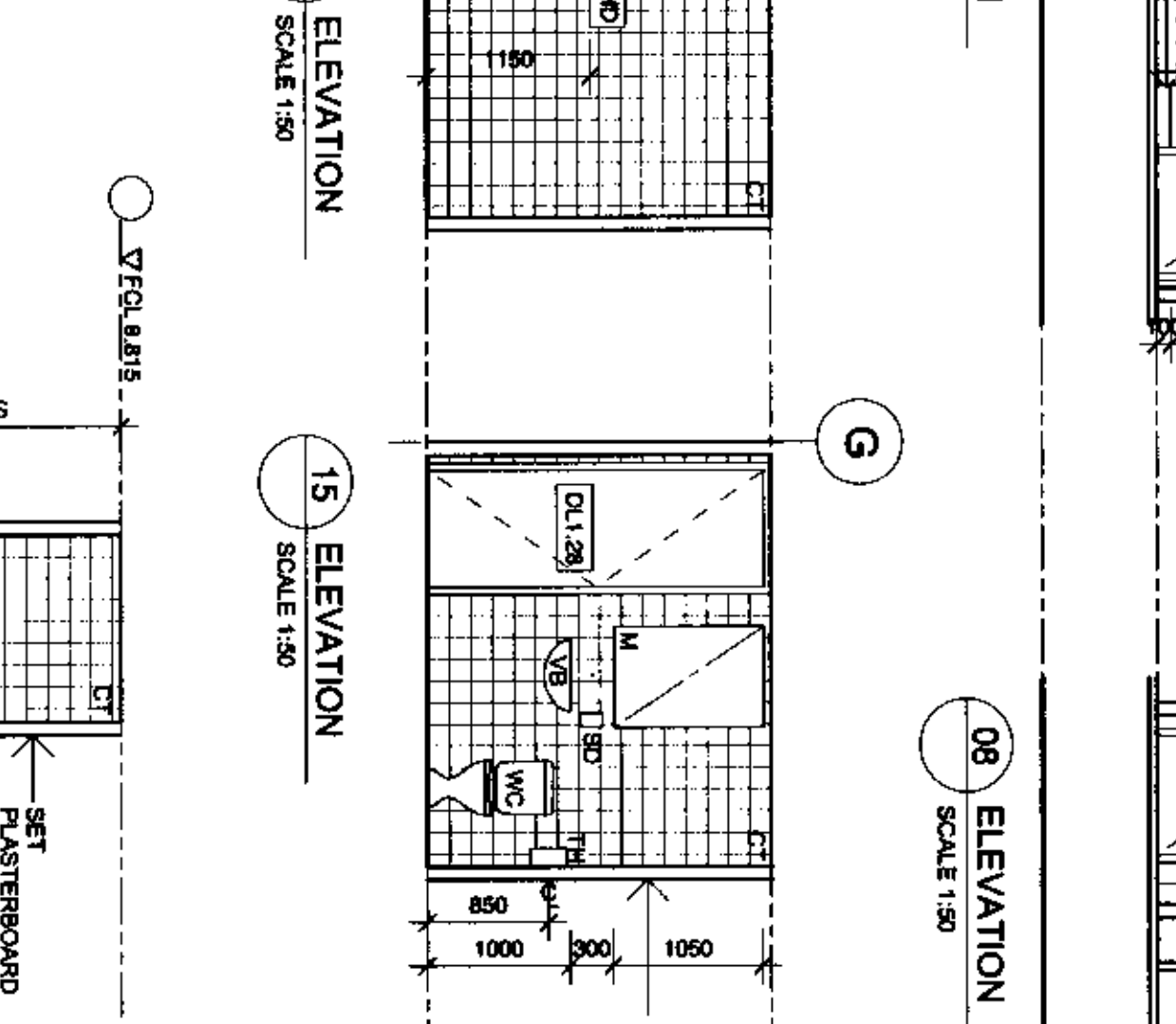
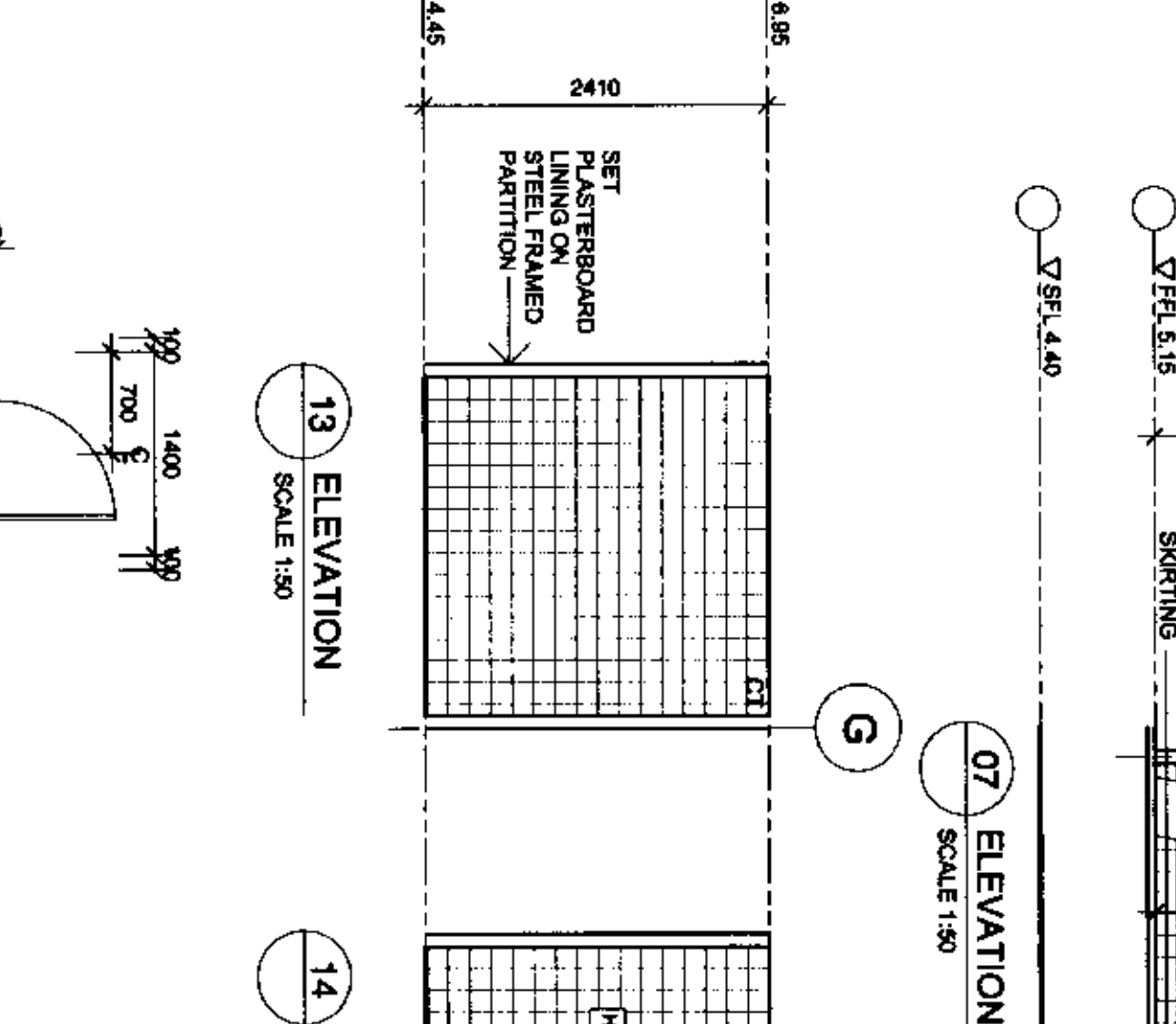
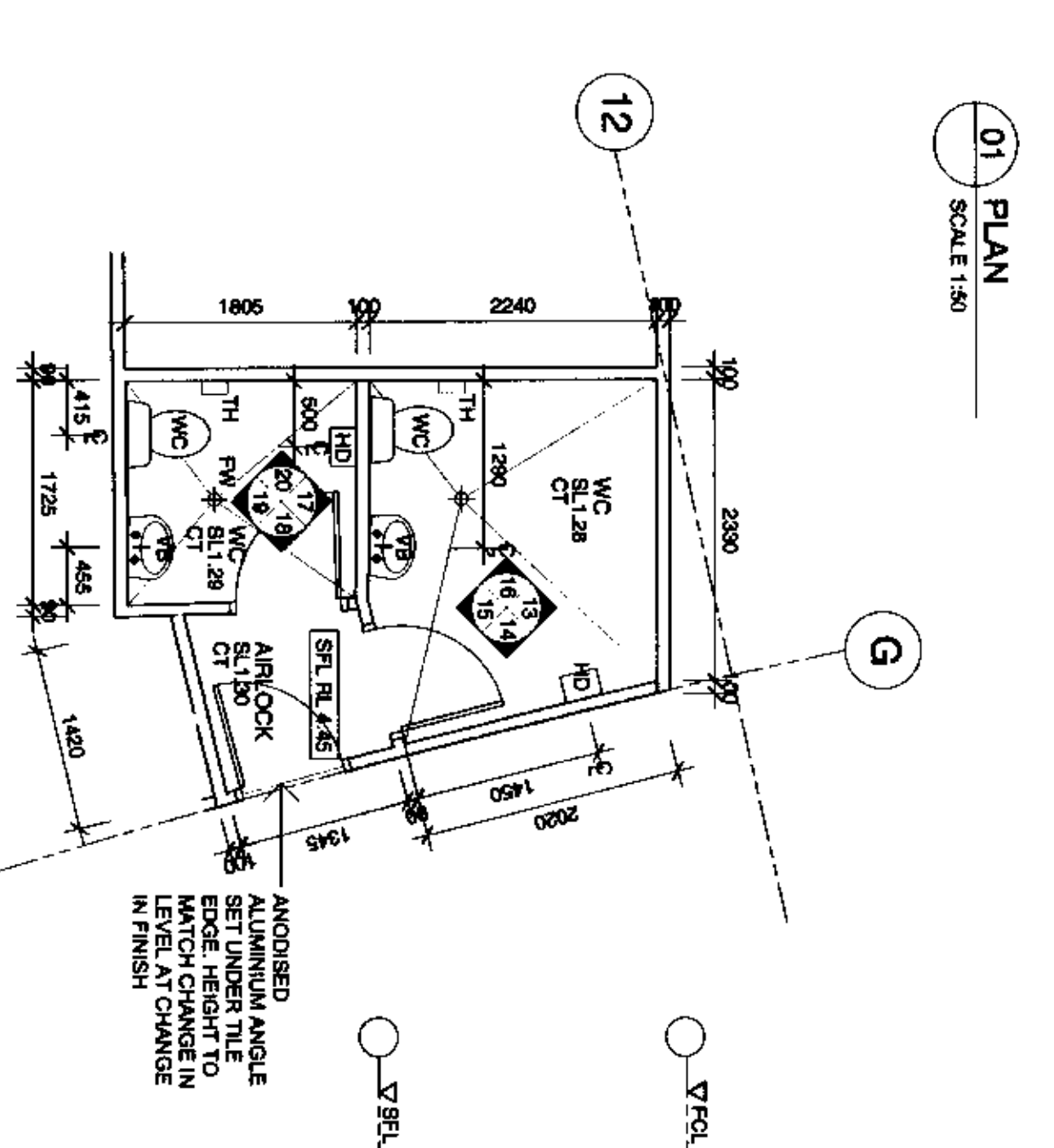
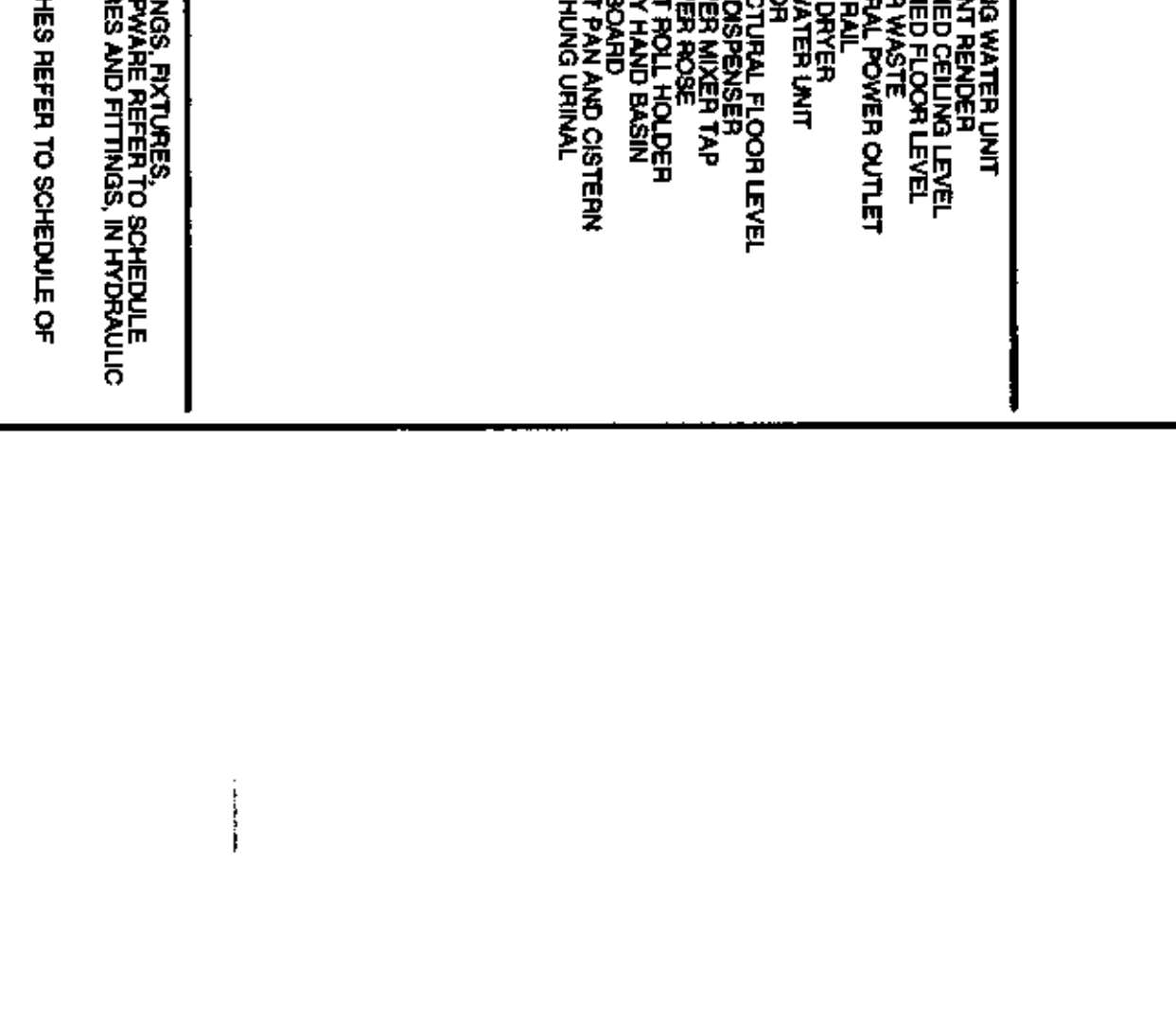
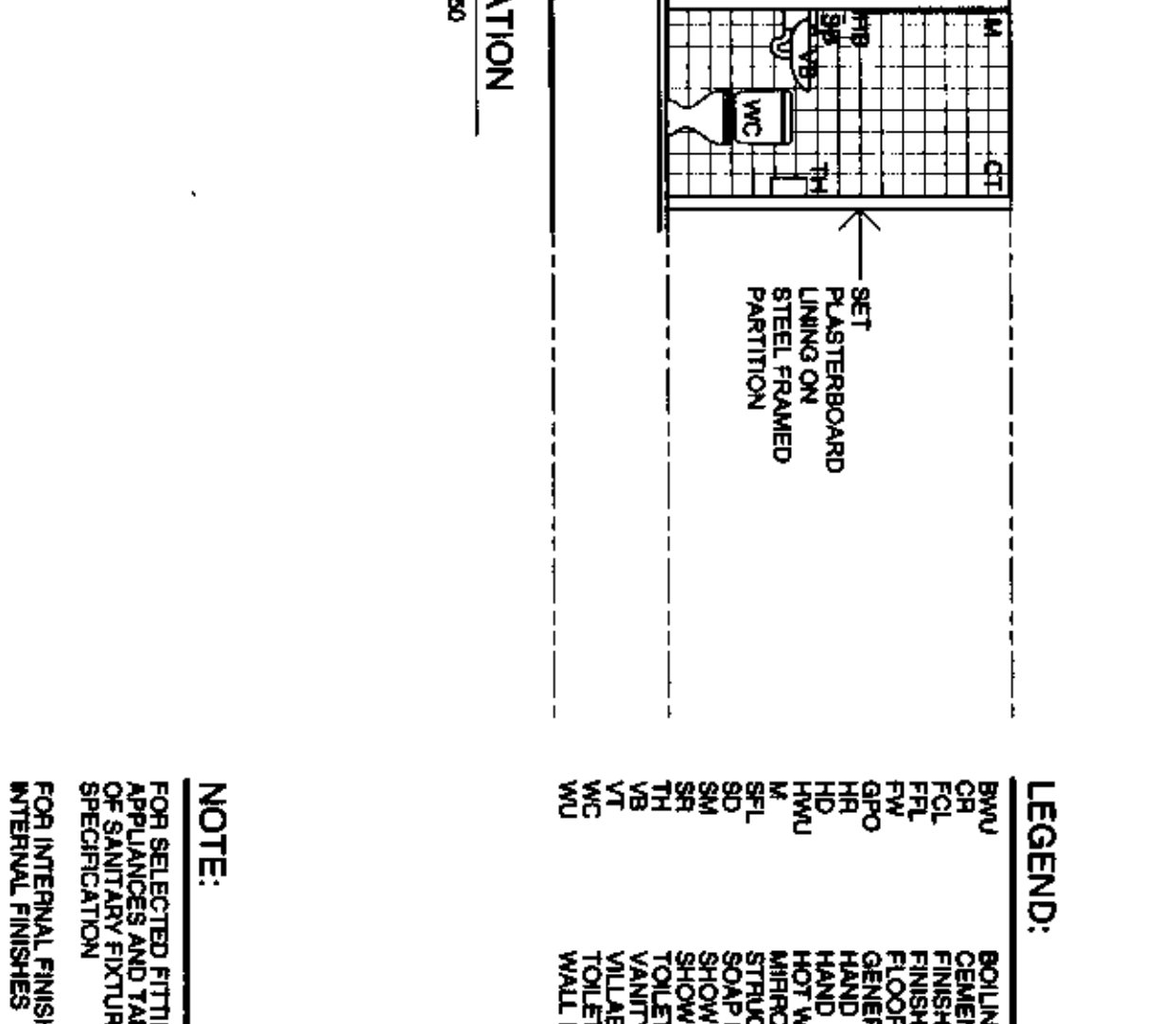
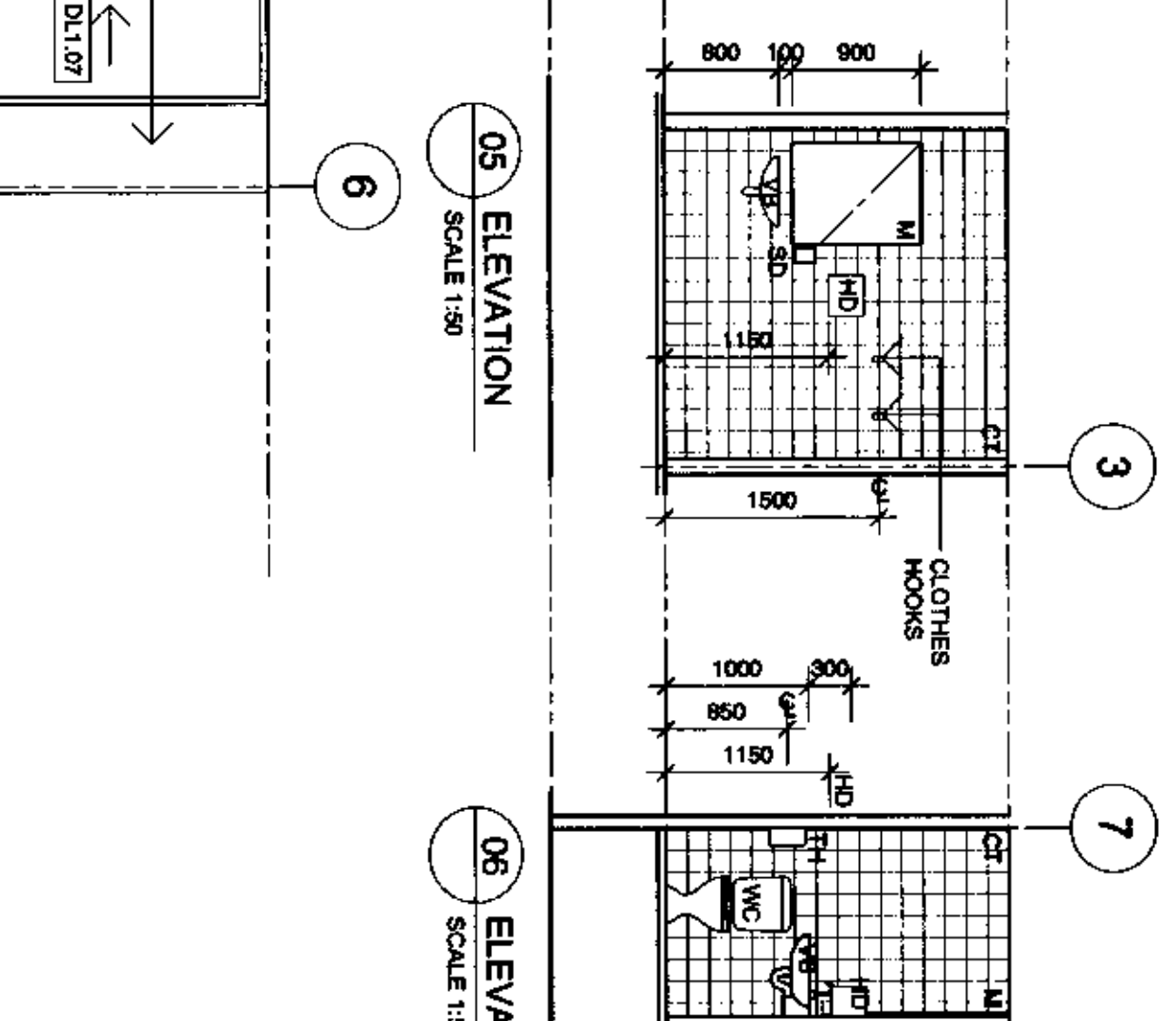
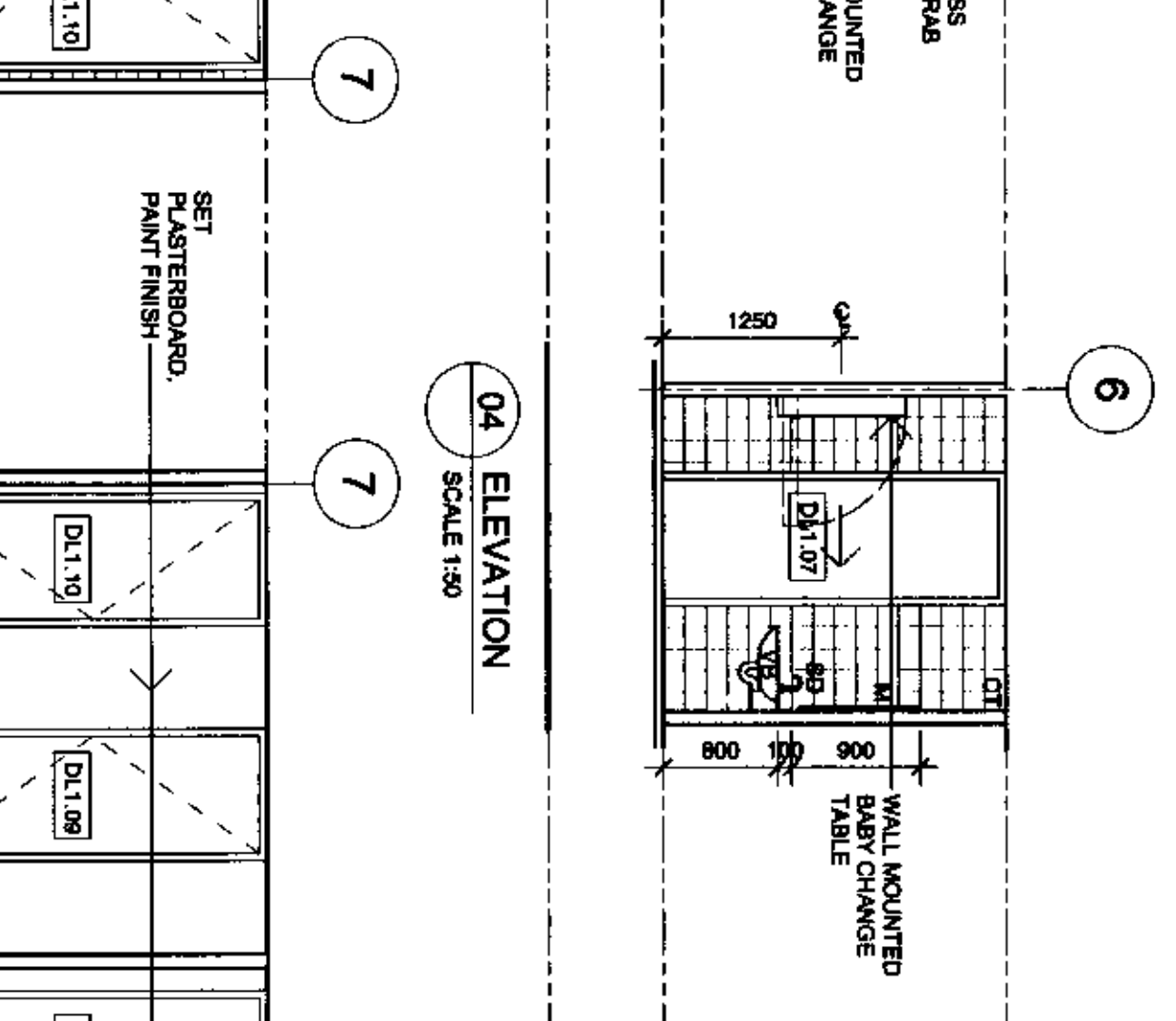
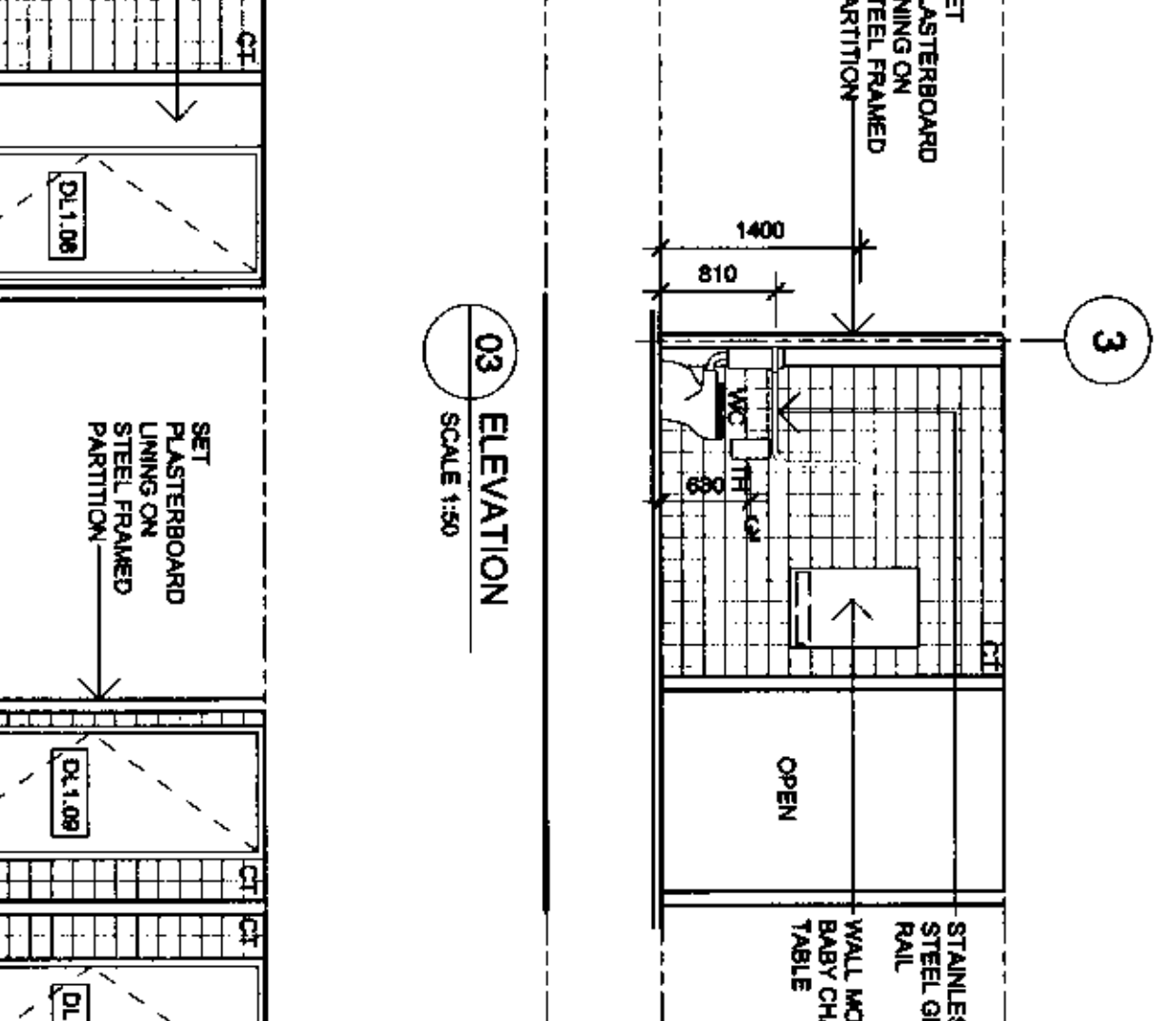
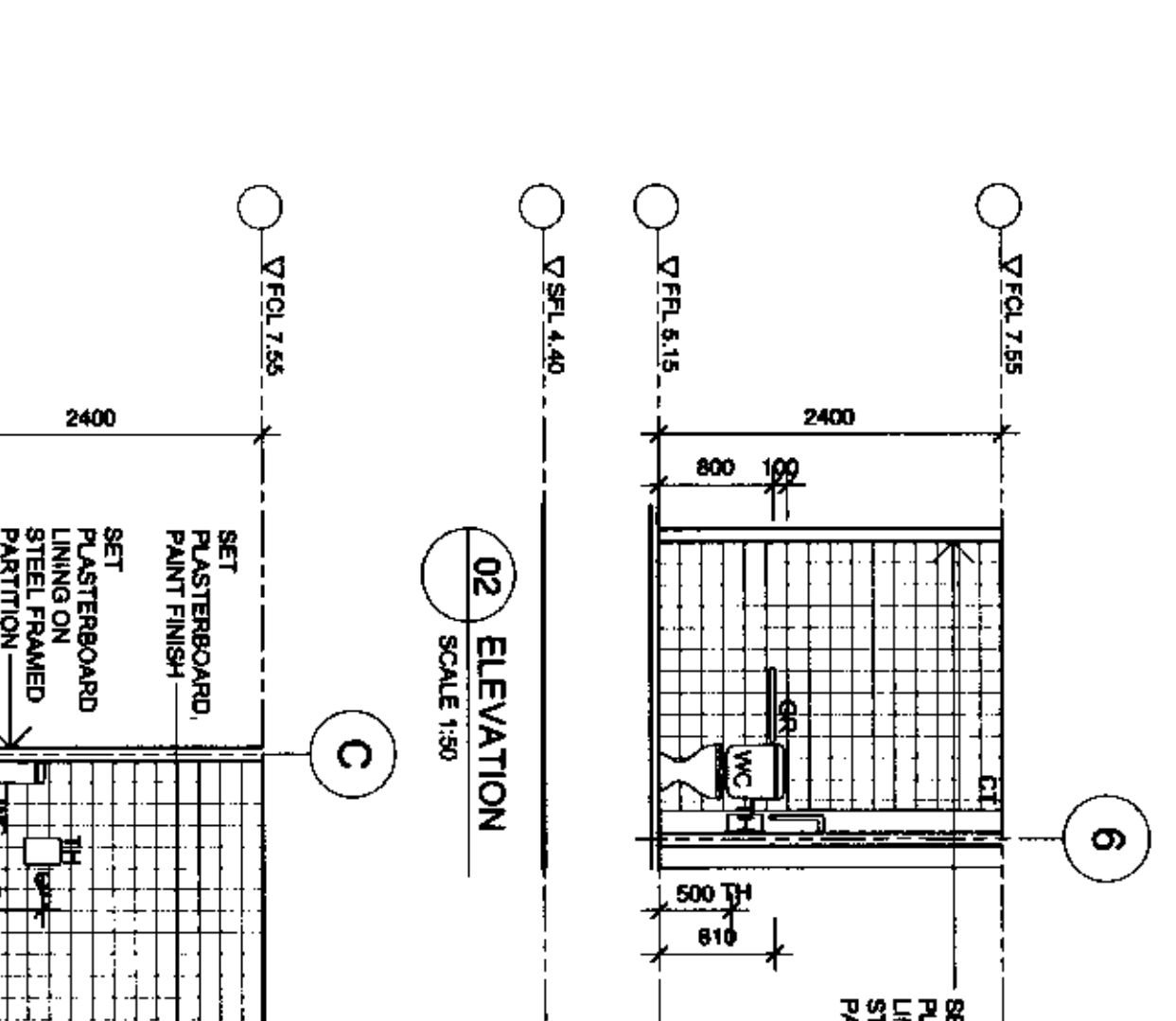
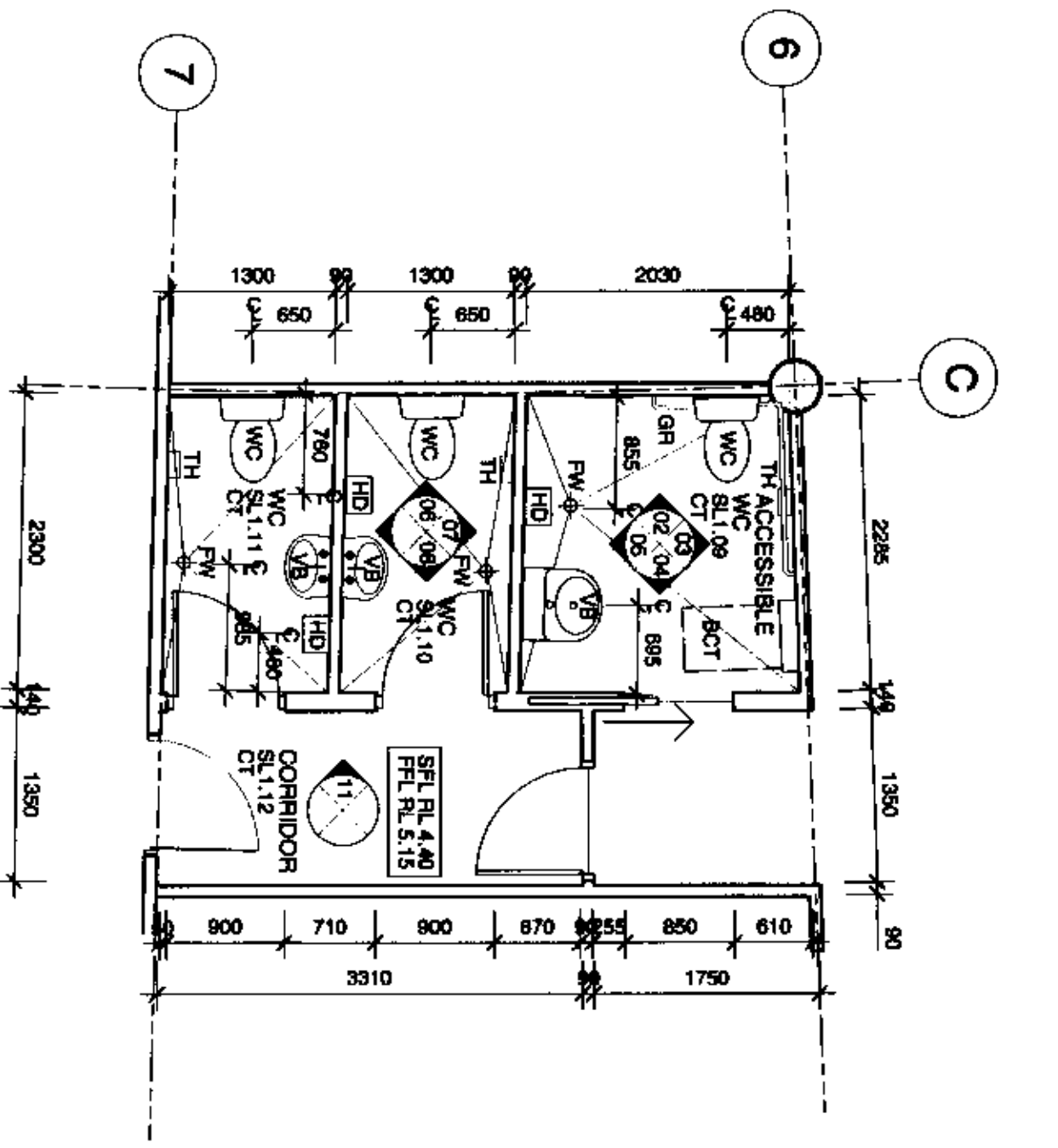
SCALE:
 1:50

DATE:
 27 FEBRUARY 2023

SCALE:
A 25

CONTRACTOR:
 [Name]

DATE:
 [Date]



LEGEND:

- BMV: BOUNDARY WATER JUMP
- CA: CEMENT RENDER
- CF: GENERAL FINISH
- FF: FINISHED FLOOR LEVEL
- GL: GENERAL LEVEL
- GP: GENERAL POWER OUTLET
- HD: HAND OVER
- HO: HOLLOW CORE
- HW: HOLLOW WALL
- IB: INTERIOR BRICK
- IS: INTERIOR STONE
- MA: MASONRY
- MC: MASONRY CEMENT
- MT: MASONRY TILE
- NS: NON-SLIP SURFACE
- PT: POLYURETHANE
- RF: RAIN WATER
- ST: STAINLESS STEEL
- TR: TRIM
- W: WALL FINISH
- WC: WALL COVERING
- WT: WALL TIE

NOTE:

1. ALL FINISHES REFER TO THE ARCHITECT'S SCHEDULE OF FINISHES AND FITTINGS IN PARTICULAR FOR INTERNAL FINISHES REFER TO SCHEDULE OF FINISHES AND FITTINGS IN PARTICULAR.

2. ALL FINISHES TO BE TO THE STANDARD SPECIFIED IN THE ARCHITECT'S SCHEDULE OF FINISHES AND FITTINGS.

APPROVED

DATE: 20/01/2028

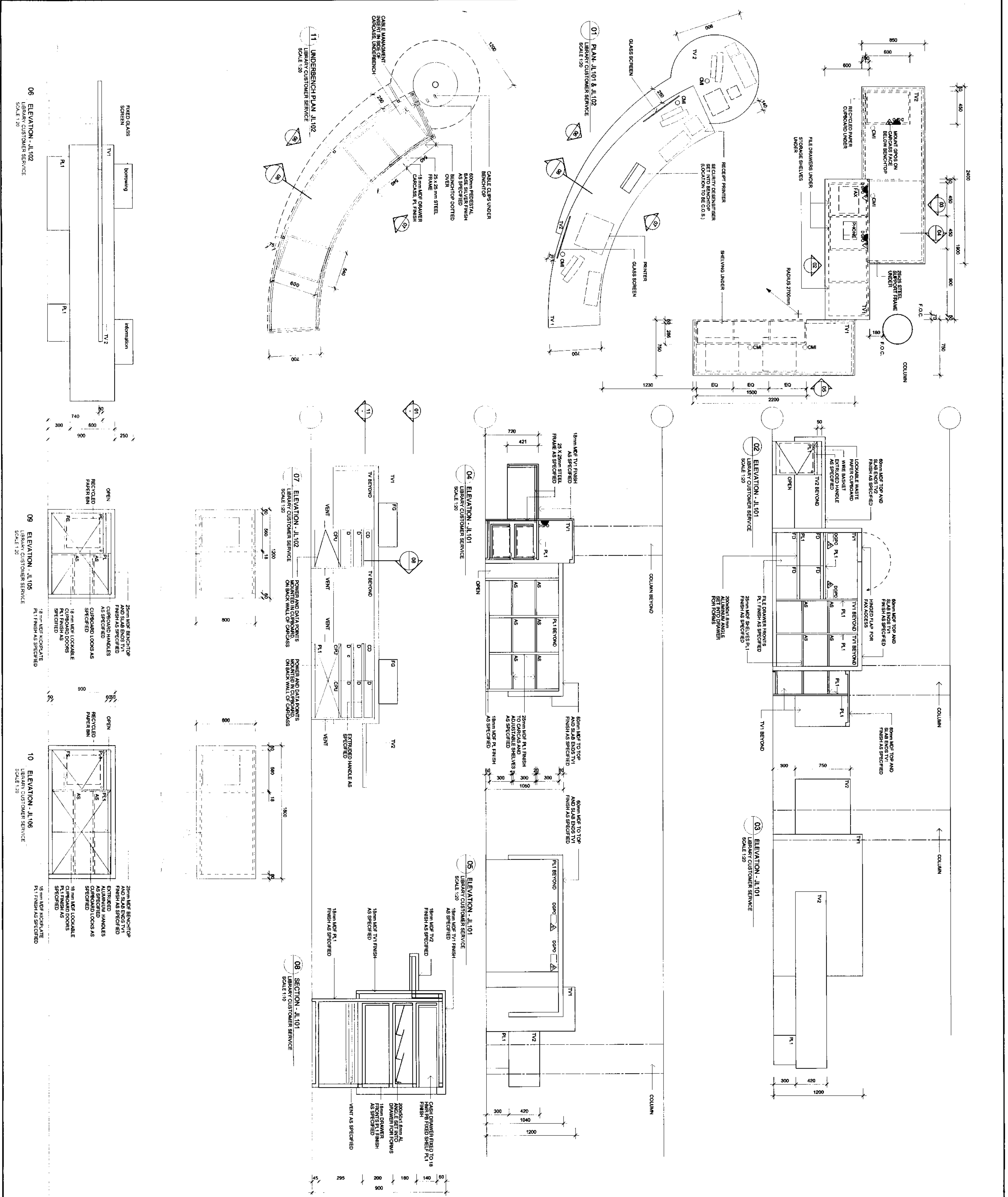
PROJECT:
brewster north
 8111 BREWSTER STREET, MONA VALE, NSW 2200
 PH: 02 9393 1978 TEL: 02 9393 1978

DRAWING TITLE:
WET AREA DETAILS S1

DRAWING NUMBER:
A 26

SCALE:
 1:100





- NOTES:**
- AS AIRTIGHT BREWING
 - CMU CONCRETE CONDUIT
 - CM CABLE MANAGEMENT TRAYS
 - FS FIXED SHELVING
 - D GLASS
 - HMR HIGH MOISTURE RESISTANT
 - TV THINER VENEER
 - PL PLASTIC LAMINATE
 - BT SOLID TIMBER
 - FD DRAWER UNIT
 - CP CASH DRAWER
 - VS VENTILATION SLOT

APR 11 2003
 CONTROLLED
 DATE: 03/13/03

PROJECT: **MONNA VALE VILLAGE PARK LIBRARY**

DESIGNER: **hyorth**

LEVEL: **LEVEL 1 THE GUANTON BOARD STORE**

DATE: **27 FEBRUARY 2003**

PROJECT NO: **03/13/03**

ISSUED FOR TENDER: **DATE CHECK**

DRAWING TITLE: **LEVEL 1 JOINERY DETAILS**

SCALE: **AS SHOWN**

DATE: **27 FEBRUARY 2003**

DRAWN: **AS**

CHECKED / APPROVED: **AS**

ISSUE: **A**

A 28

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- NOTES:
- AS ADJUSTABLE SHELVING
 - CU COMPUTER CURBOARD
 - CMH CABLE MANAGEMENT INSERTS
 - FS FIXED SHELVING
 - G GLASS
 - HMR HIGH MOISTURE RESISTANT
 - TV TIMBER VENEER
 - PL PLASTIC LAMINATE
 - ST SOLID TIMBER
 - D DRAWER UNIT
 - FD FILE DRAWER
 - CD CABINETS
 - VS VENTILATION SLOT

ISSUE NO. DESCRIPTION DATE / CHECK

1 2019/03/28

2 2019/04/11

3 2019/04/11

4 2019/04/11

5 2019/04/11

6 2019/04/11

7 2019/04/11

8 2019/04/11

9 2019/04/11

10 2019/04/11

PROJECT
MONA VALE VILLAGE PARK LIBRARY

DRAWING TITLE
LEVEL 1 JOINERY DETAILS 2

SCALE
 1:20, 1:10

DATE
 2019/04/11

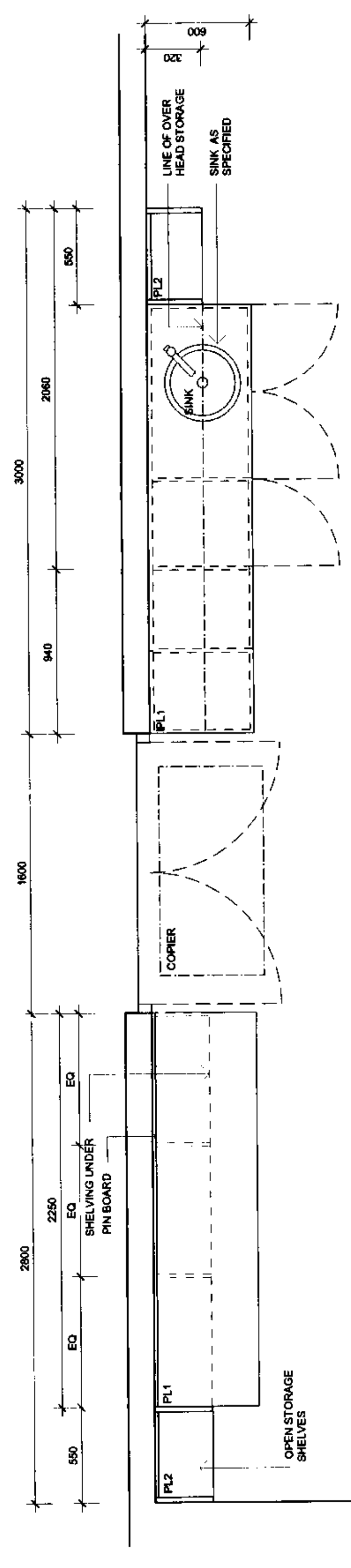
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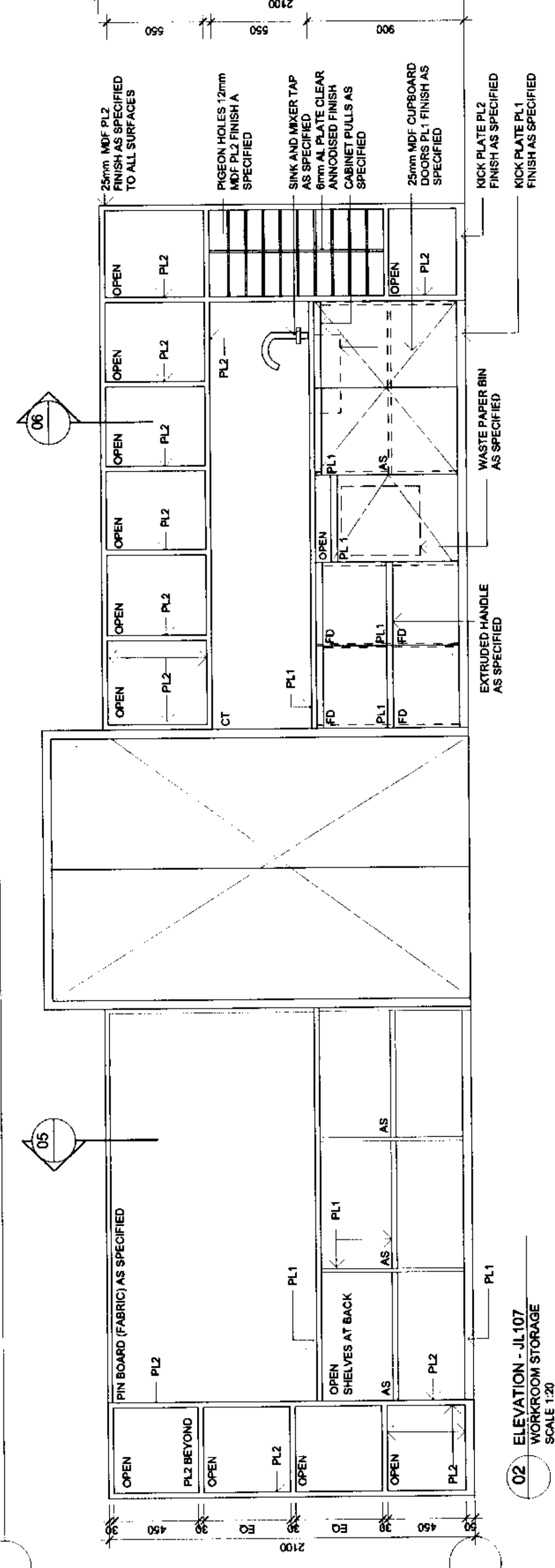
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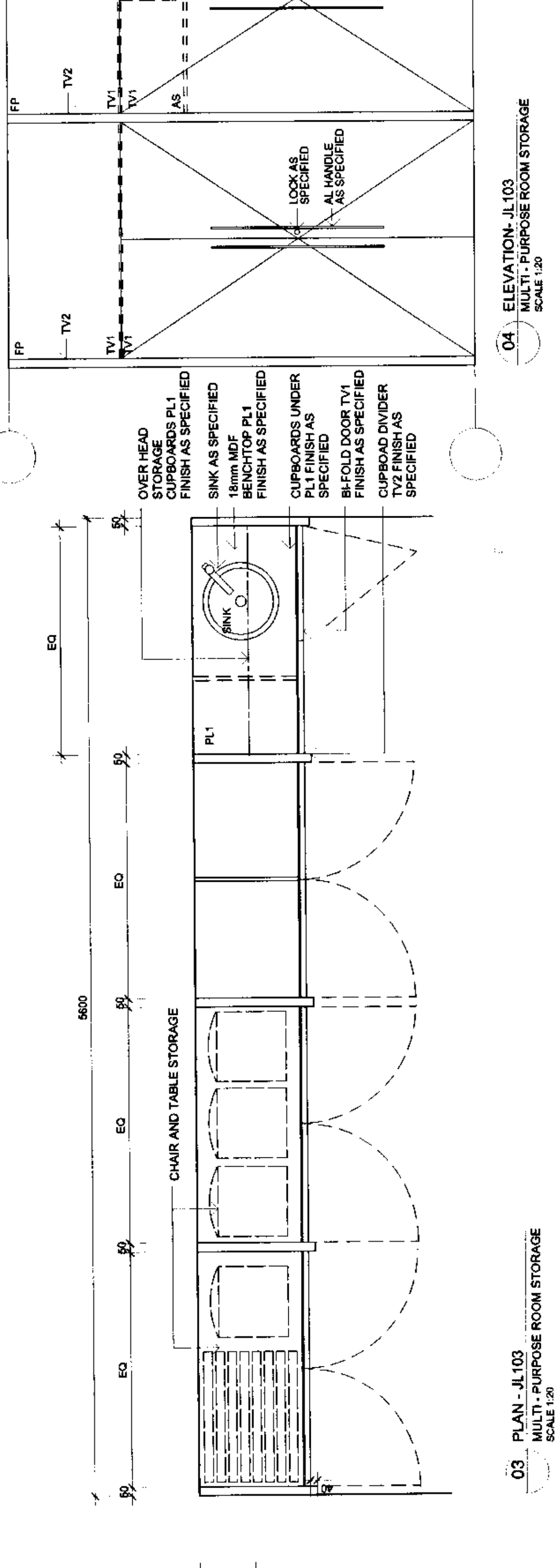
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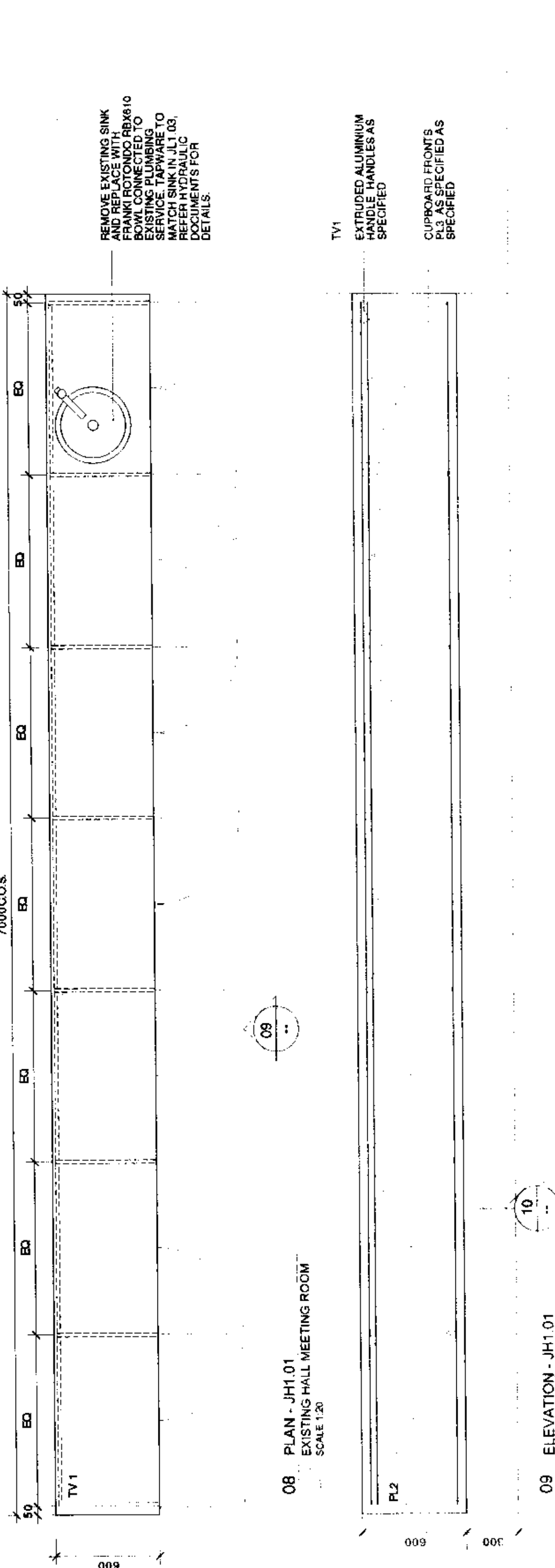
01 PLAN - JI.107 WORKROOM STORAGE SCALE 1:20



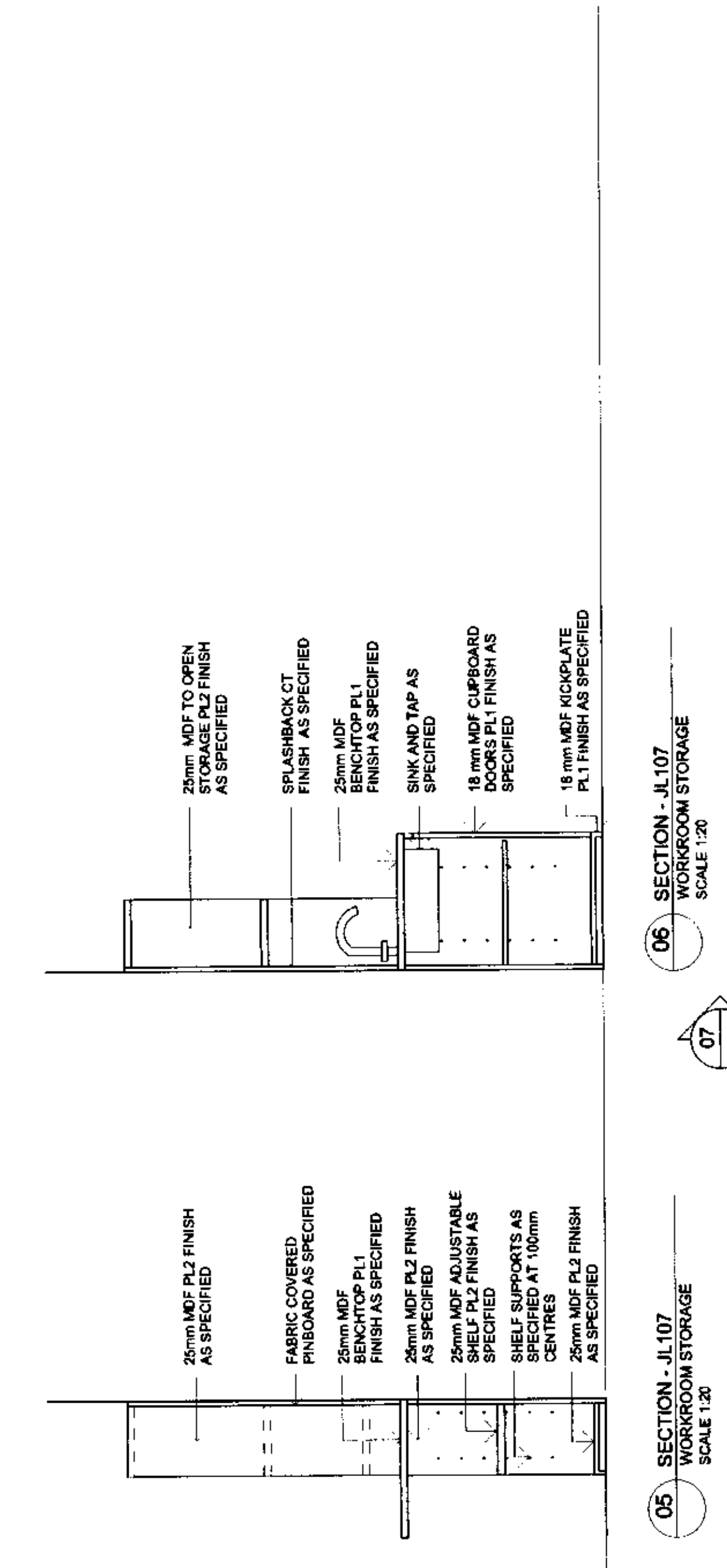
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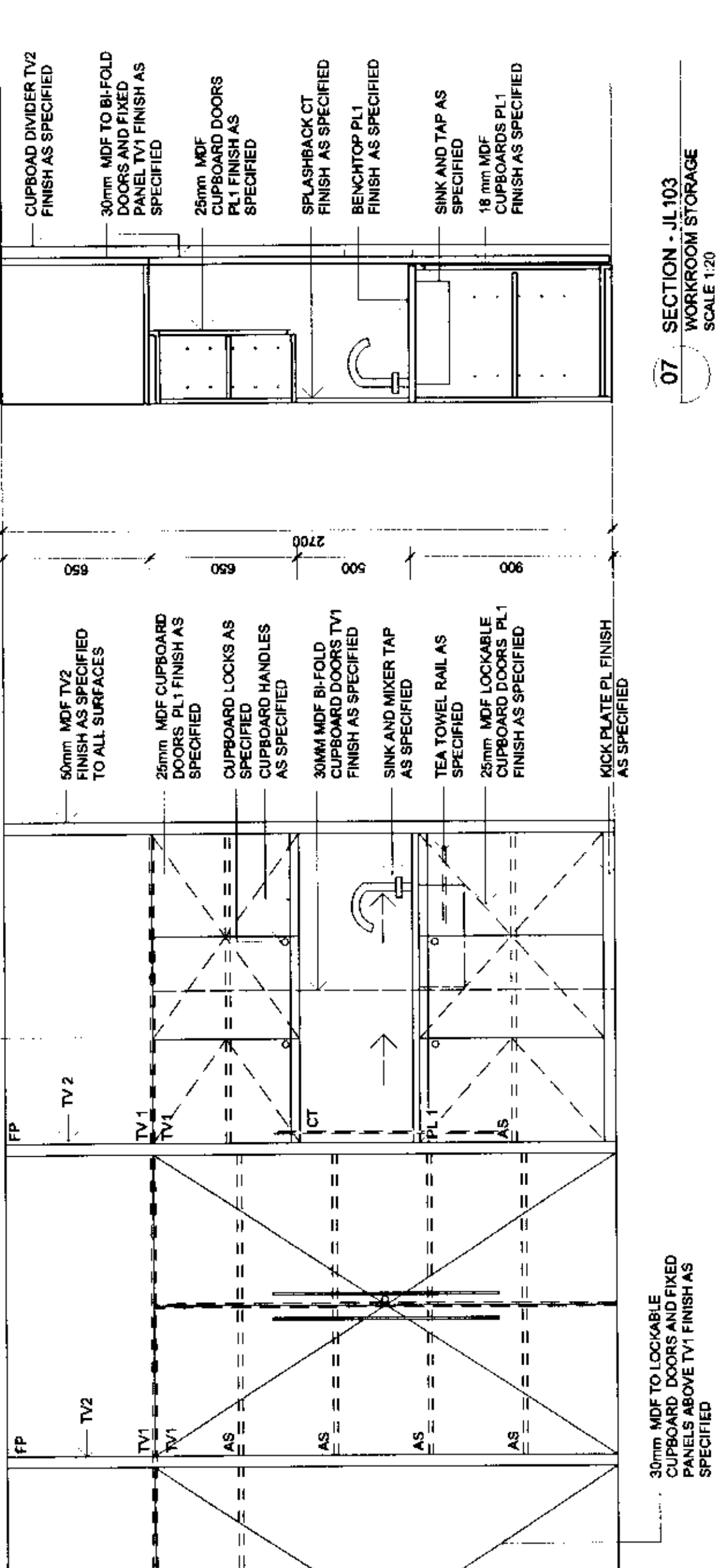
03 PLAN - JI.103 MULTI-PURPOSE ROOM STORAGE SCALE 1:20



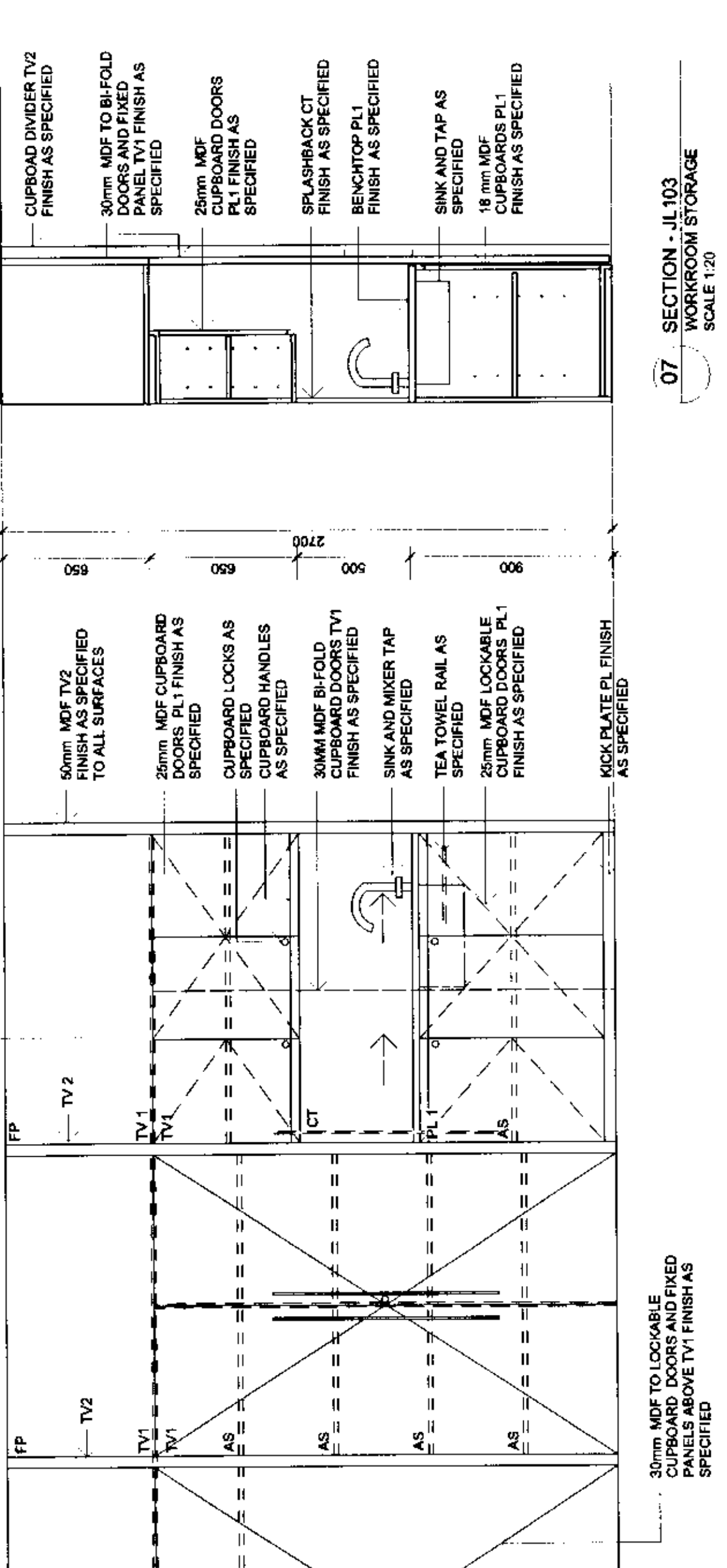
04 ELEVATION - JI.103 MULTI-PURPOSE ROOM STORAGE SCALE 1:20



05 SECTION - JI.107 WORKROOM STORAGE SCALE 1:20



06 SECTION - JI.107 WORKROOM STORAGE SCALE 1:20



07 SECTION - JI.103 WORKROOM STORAGE SCALE 1:20



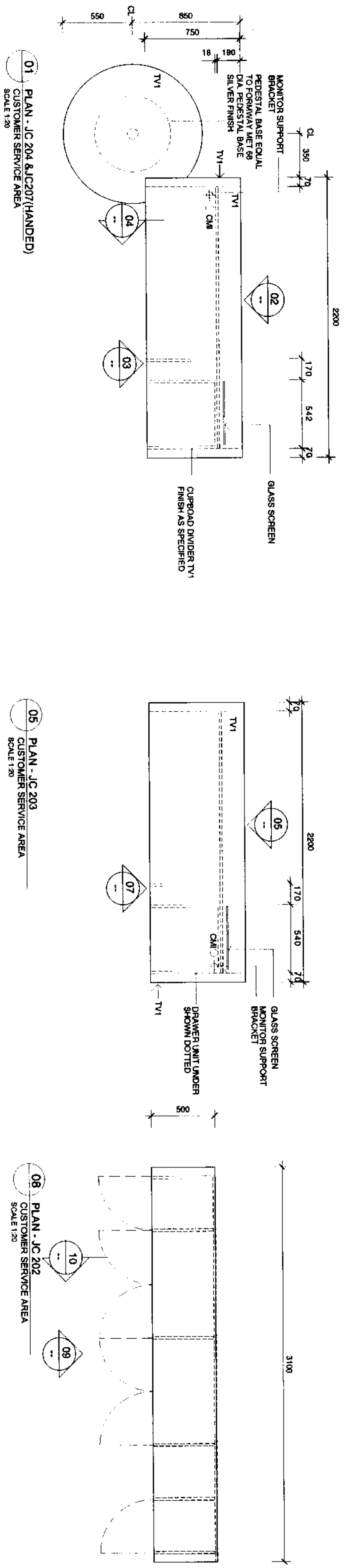
08 PLAN - JH.1.01 EXISTING HALL MEETING ROOM SCALE 1:20



09 ELEVATION - JH.1.01 EXISTING HALL MEETING ROOM SCALE 1:20

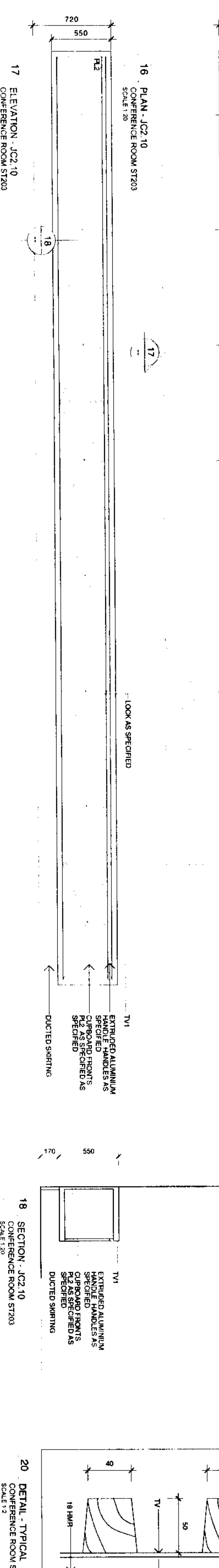
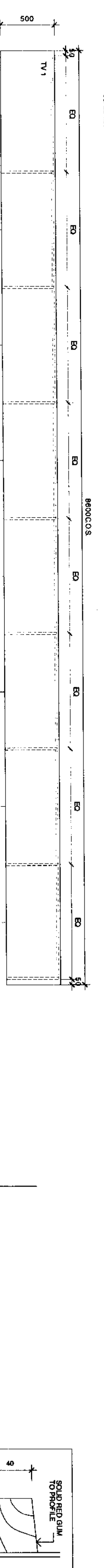
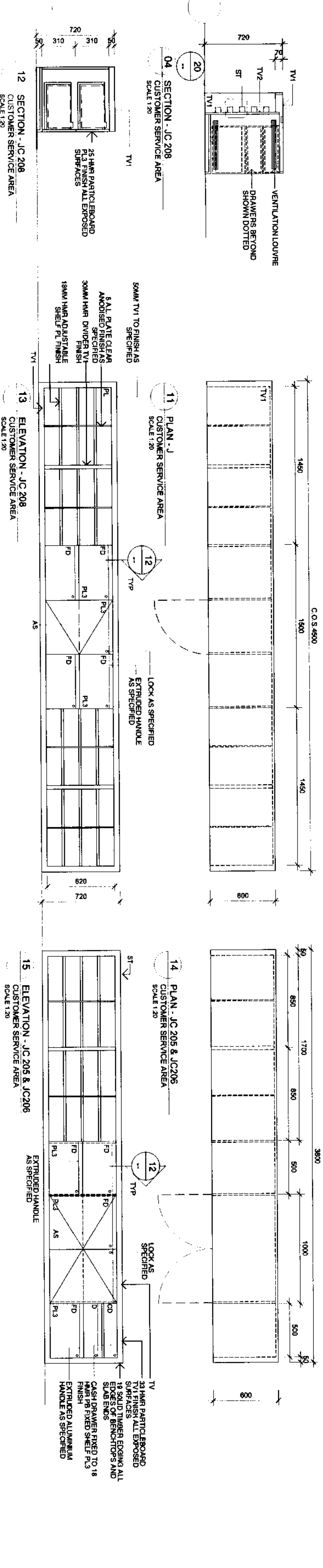
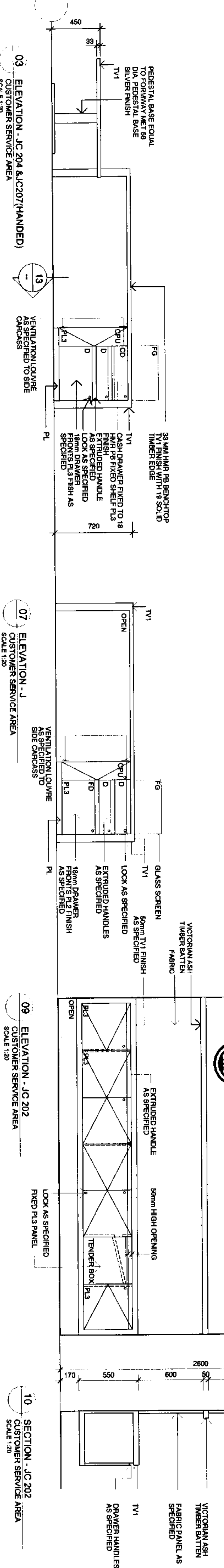
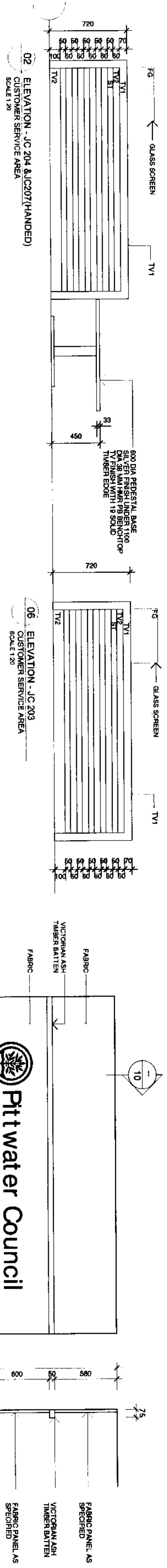


10 SECTION - JH.1.01 EXISTING HALL MEETING ROOM SCALE 1:20



NOTES

- AS ADJUSTABLE SHELVING
- CFU CONVENTOR OPERAND
- CM CABLE MANAGEMENT INSERTS
- FS FIXED SHELVING
- G GLASS
- HMI HIGH MOISTURE RESISTANT
- TV TIMBER VENEER
- PL PLASTIC LAMINATE
- ST SOLID TIMBER
- D DRAWER UNIT
- FD FILE DRAWER
- CD CASH DRAWER
- VS VENTILATION SLOT



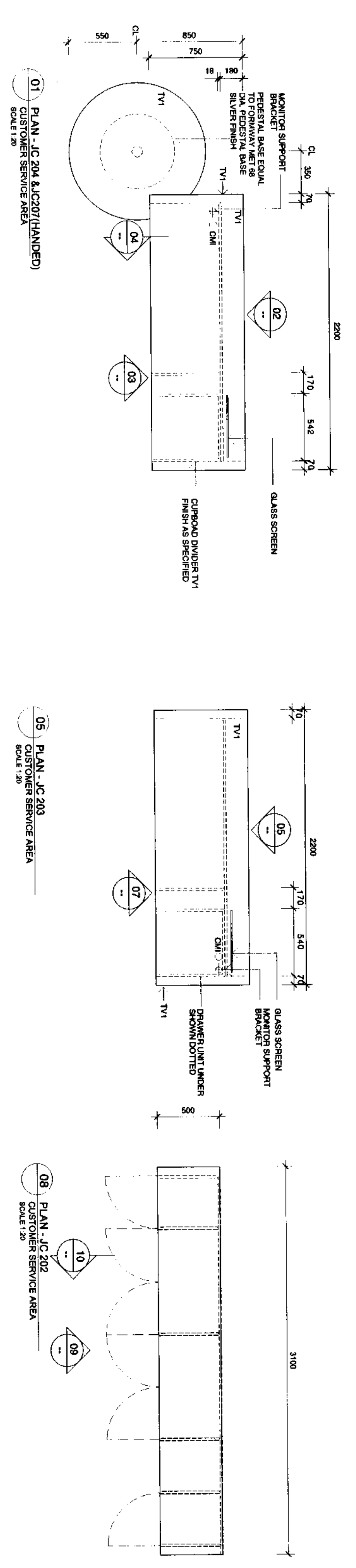
APPROVED
03/17/23

Issued For Tender 28/02/23
 ISSUE 1
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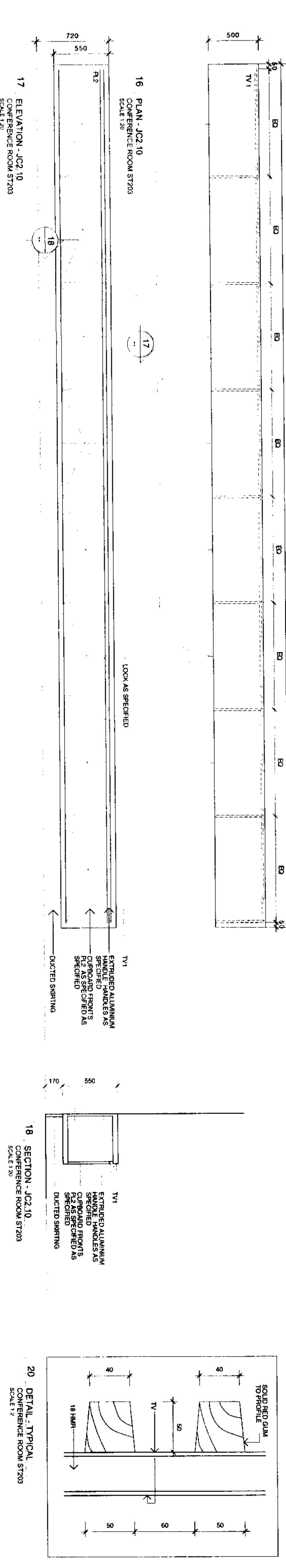
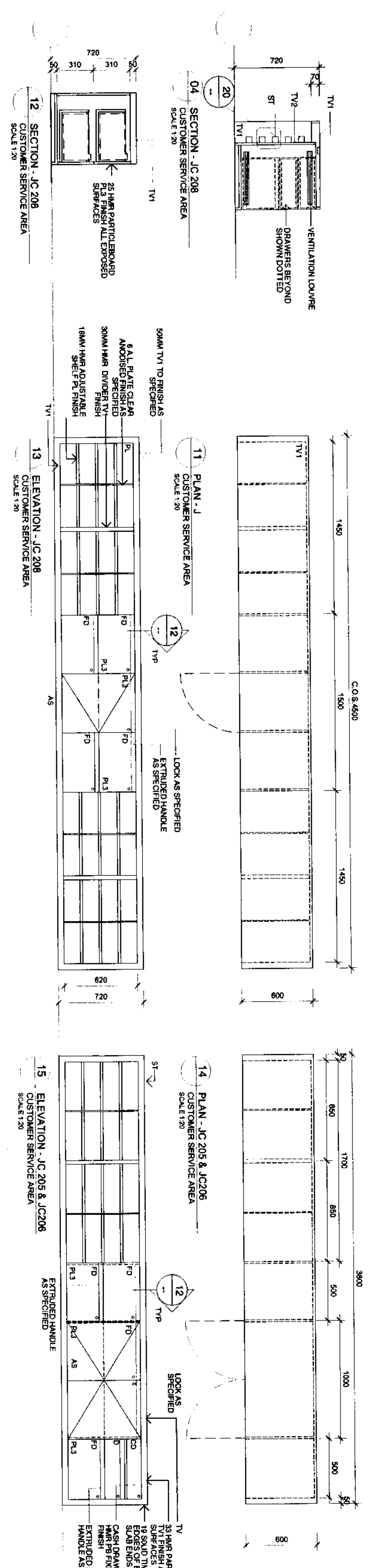
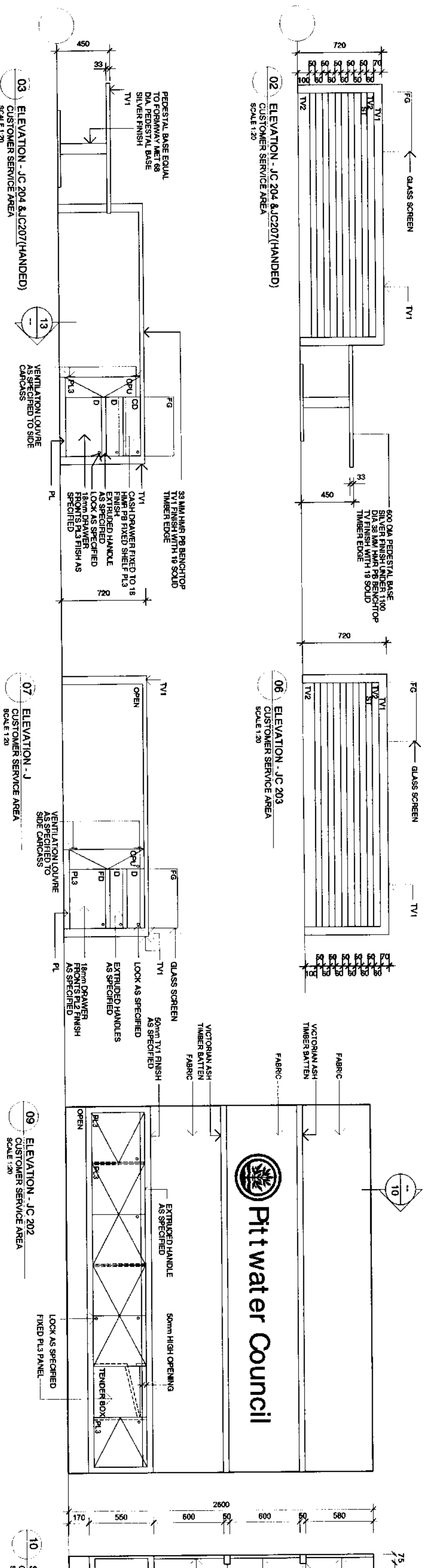
PROJECT
 MONA VALE
 VILLAGE PARK LIBRARY

DRAWING NUMBER
A 30

DATE CHECKED
 28/02/23



- NOTES:
- AS ADJUSTABLE BEHLING
 - CPU COMPUTER CUPBOARD
 - CM CABLE MANAGEMENT TRAYS
 - FS FIXED BELIND
 - G GLASS
 - HMR HIGH MOISTURE RESISTANT
 - TV TIMBER VENEER
 - PL PLASTIC LAMINATE
 - ST SOLID TIMBER
 - DM DRAWER UNIT
 - FD FILE DRAWER
 - CD CASH DRAWER
 - VS VENTILATION SLOT



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MONA VALE
 VILLAGE PARK LIBRARY

DRAWING TITLE: 3 11/2 1/3
 COUNCIL OFFICES JOINERY DETAILS

SCALE: 1:30, 1:10
 PLOT DATE: 27/04/2010
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]

ISSUE A

DATE: 27/04/2010

PROJECT: MONA VALE VILLAGE PARK LIBRARY

SCALE: 1:30, 1:10

PLOT DATE: 27/04/2010

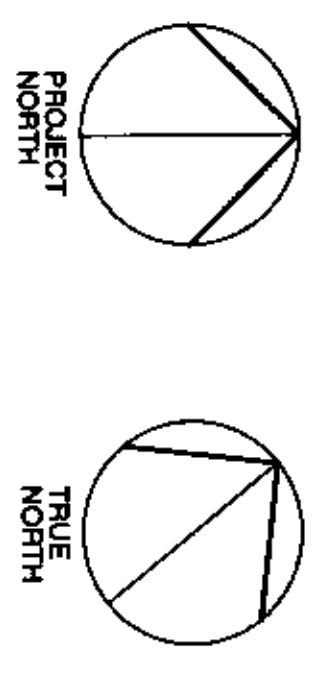
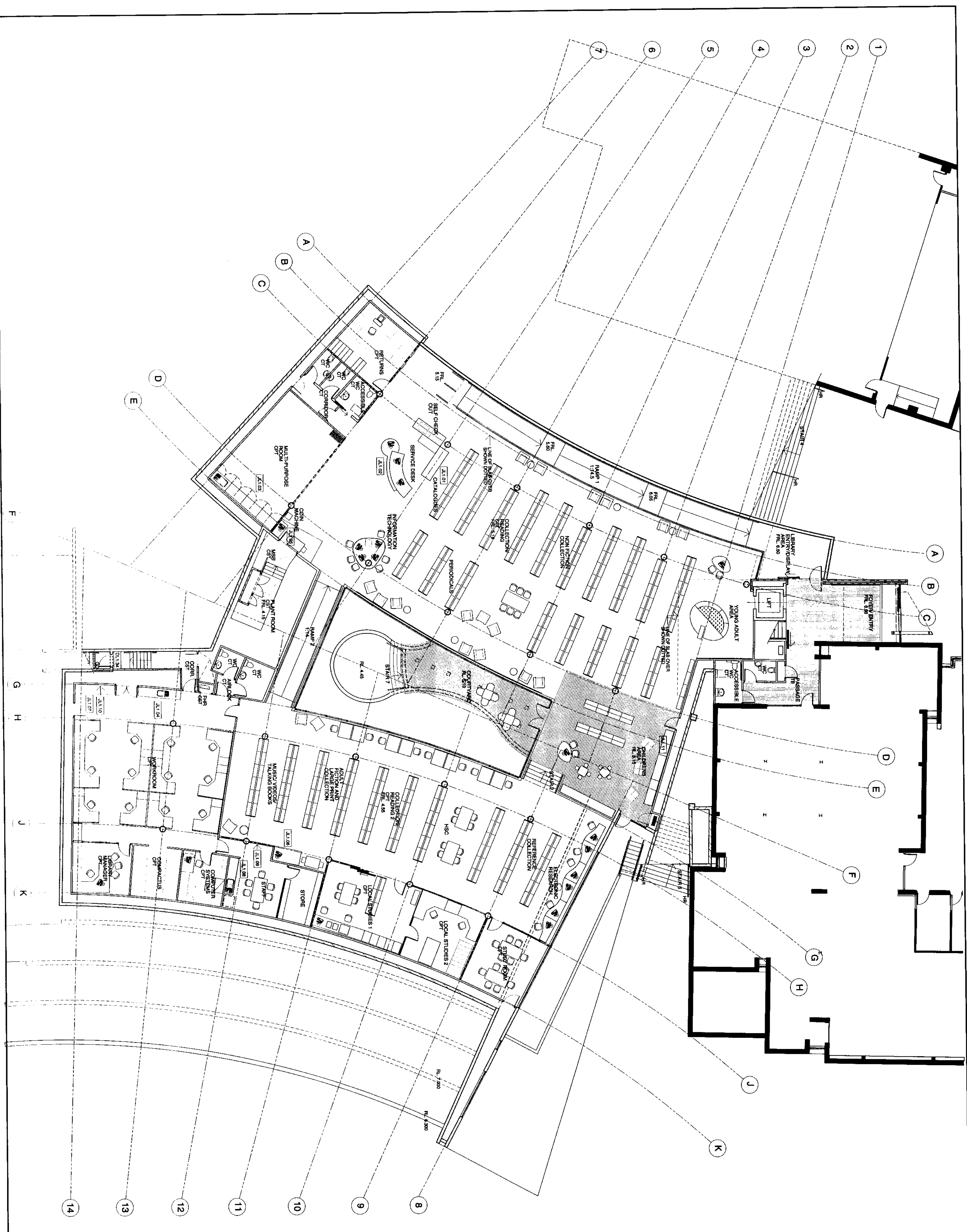
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ISSUE A

DATE: 27/04/2010

PROJECT: MONA VALE VILLAGE PARK LIBRARY



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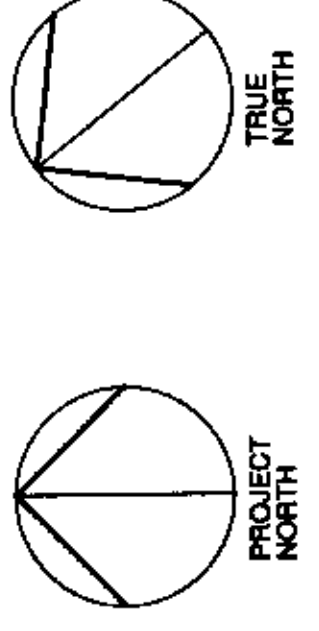
ISSUE NO	DESCRIPTION	DATE CHECK
1	SUBMITTED FOR TENDER	1 MAR 2023

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 PROJECT: MONNA VALE VILLAGE PARK LIBRARY

DRAWING TITLE:
LEVEL 1 LIBRARY FURNITURE PLAN

SCALE: 1:100
 PROJECT NO: 2023/010
 DRAWING NUMBER: 2023/010/F01
F 01

DATE: 03/07/23
 DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 APPROVED BY: [Signature]



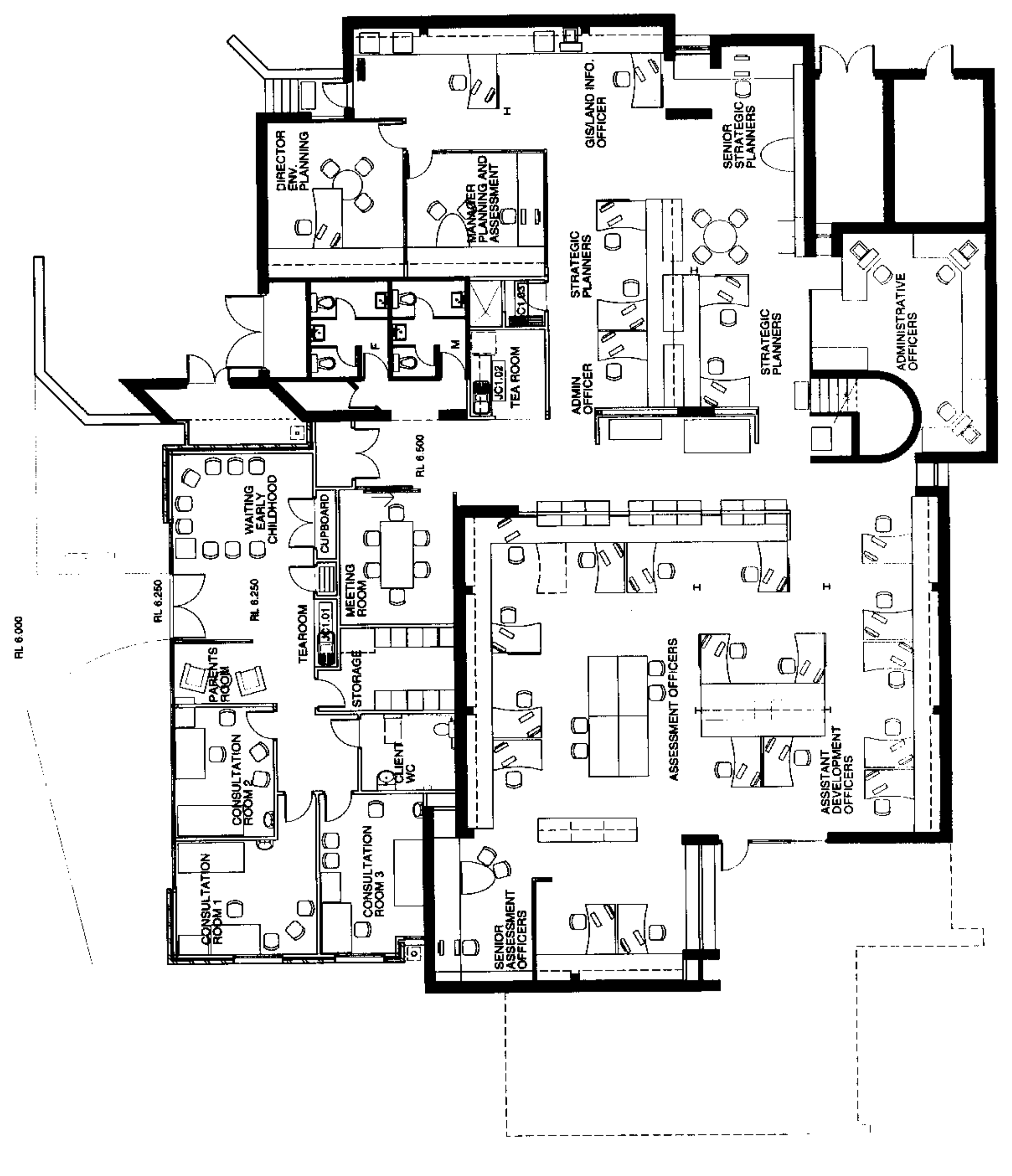
APPROVED
13/11/11

NO.	ISSUED FOR	DATE
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2	ISSUED FOR REVISION	DATE OF ISSUE

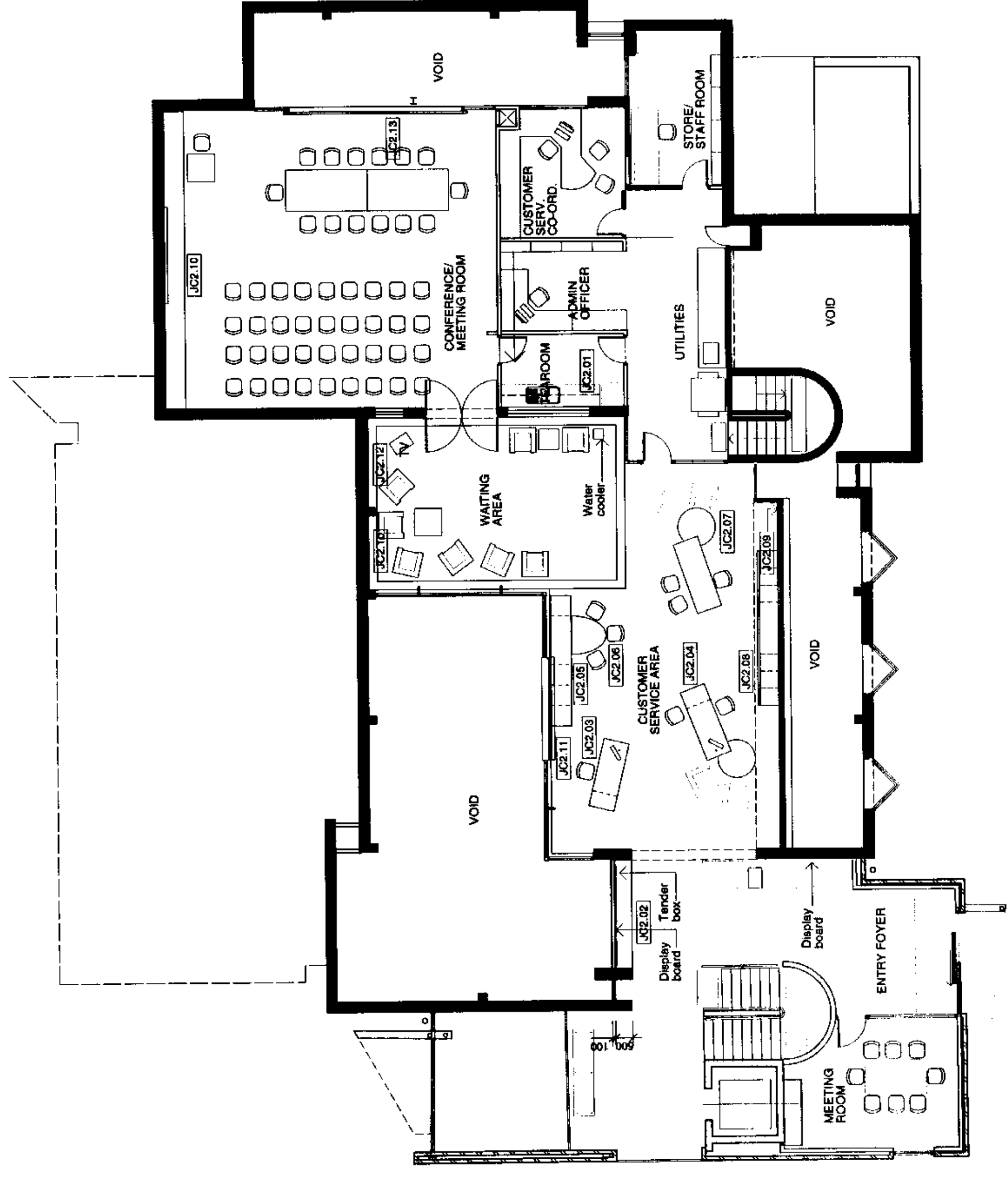
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MONA VALE VILLAGE PARK LIBRARY
DRAWING TITLE
LEVEL 1 AND 2 COUNCIL OFFICES FURNITURE PLANS
SCALE
1:100
DRAWN
28 FEBRUARY 2000
CHECKED / AUTHORISED
ISSUE A

DRAMA NUMBER
2015/00005
F 02
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01. COUNCIL OFFICES AND EARLY CHILDHOOD.
LEVEL 1 FURNITURE PLAN
SCALE 1:100



02. COUNCIL OFFICES AND EARLY CHILDHOOD.
LEVEL 2 FURNITURE PLAN
SCALE 1:100

Connell Mott MacDonald

...building the future

MONA VALE VILLAGE PARK LIBRARY



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<u>DRG NO</u>	<u>TITLE</u>
BS000	COVER SHEET
BS001	GENERAL NOTES - SHEET 1
BS002	GENERAL NOTES - SHEET 2
BS005	LIBRARY LEVEL 1 CONCRETE PROFILE PLAN
BS006	LIBRARY LEVEL 1 BOTTOM REINFORCEMENT PLAN
BS007	LIBRARY LEVEL 1 TOP REINFORCEMENT PLAN
BS008	LIBRARY LEVEL 1 DETAILS - SHEET 1
BS009	LIBRARY LEVEL 1 DETAILS - SHEET 2
BS010	LIBRARY LEVEL 2 CONCRETE PROFILE PLAN
BS011	LIBRARY LEVEL 2 BOTTOM REINFORCEMENT PLAN
BS012	LIBRARY LEVEL 2 TOP REINFORCEMENT PLAN
BS013	LIBRARY LEVEL 2 DETAILS
BS015	EARLY CHILDHOOD CENTRE & EXISTING BUILDING GROUND FLOOR MODIFICATION PLANS & DETAILS
BS016	EXISTING BUILDING LEVEL 2 MODIFICATION PLANS
BS017	EXISTING BUILDING LEVEL 2 MODIFICATION DETAILS
BS018	EARLY CHILDHOOD CENTRE & EXISTING BUILDING ROOF MODIFICATION PLAN & ELEVATIONS
BS019	EARLY CHILDHOOD CENTRE & EXISTING BUILDING ROOF DETAILS
BS020	LANTERN STEELWORK ROOF FRAMING PLAN & SECTIONS
BS021	LANTERN STEELWORK DETAILS



PRELIMINARY

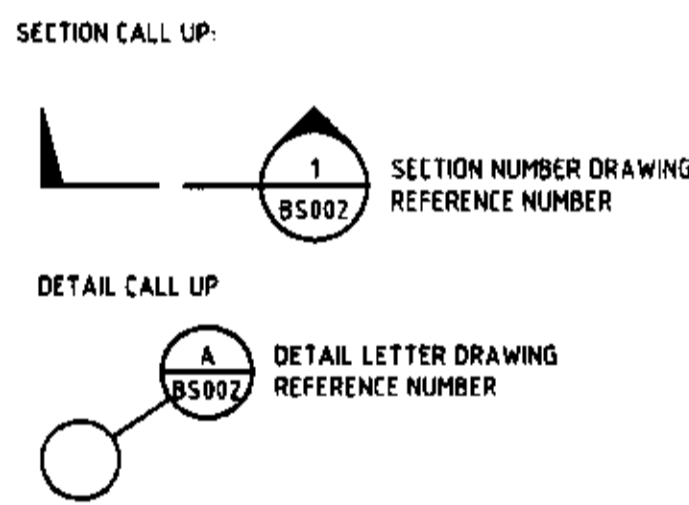
CW Project No.	Drawing No.	Revision
3785	BS000	03

GENERAL

- G1 THESE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT...

Table with columns: FLOOR USAGE, LIVE LOAD (kPa), SUPERIMPOSED DEAD LOAD (kPa), and values for LIBRARY, GENERAL, PLANTROOM, COURTYARD, TOILETS, LEVEL 2 PODIUM.

- G6 THE STRUCTURE HAS BEEN DESIGNED FOR WIND ACTIONS IN ACCORDANCE WITH AS/NZS1170.2:2002. THE DESIGN WIND SPEED Vdes IS 50m/s...



LEGEND

- 300 INDICATES SLAB THICKNESS.
INDICATES STEP IN SLAB.
INDICATES SETDOWN IN SLAB.
INDICATES PENETRATION IN SLAB.
INDICATES LOADBEARING CONCRETE WALL UNDER.
INDICATES LOADBEARING CONCRETE WALL OVER ONLY.
INDICATES LOADBEARING CONCRETE WALL UNDER & OVER.
INDICATES LOADBEARING BRICKWORK WALL UNDER.
INDICATES LOADBEARING BRICKWORK WALL OVER ONLY.
INDICATES LOADBEARING BRICKWORK WALL UNDER & OVER.

LEGEND CONT.

- INDICATES LOADBEARING BLOCKWORK WALL UNDER.
INDICATES LOADBEARING BLOCKWORK WALL OVER ONLY.
INDICATES LOADBEARING BLOCKWORK WALL UNDER & OVER.
INDICATES COLUMN UNDER.
INDICATES COLUMN OVER ONLY.
INDICATES COLUMN UNDER & OVER.
INDICATES EXISTING STRUCTURE.
INDICATES WALL TAG.
INDICATES WALL TAG WITH CONCRETE STRENGTH.

ABBREVIATIONS

Table with columns: GENERAL, AND, UNITS, and various abbreviations like ALT, APPROX, AS, etc.

FOOTINGS

- F1 FOOTINGS HAVE BEEN DESIGNED FOR AN ALLOWABLE BEARING CAPACITY OF 200kPa. THE FOUNDATION MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER...

MONITORING OF ADJACENT BUILDINGS

- MA1 SURVEY POINTS SHALL BE ESTABLISHED ON ADJACENT BUILDINGS WHERE SHOWN ON THE PLAN MARKED THIS - #1. IN EACH CASE A POINT SHALL BE ESTABLISHED AT GROUND LEVEL AND ONE AT THE TOP OF THE BUILDING...

NEW CONCRETE TO EXISTING

STRUCTURE NOTES

- N1 THESE NOTES APPLY TO CONCRETE WALLS CAST AGAINST EXISTING BRICK WALLS OF ADJACENT BUILDINGS.
N2 PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE BUILDER MUST CARRY OUT A SURVEY OF THE EXISTING WALL AS SPECIFIED IN THE CONTRACT DOCUMENTS AND OBTAIN ALL NECESSARY APPROVALS.
N3 WALLS SHALL BE CONSTRUCTED IN LIFTS NOT TO EXCEED SAFE CAPACITY OF SUPPORTING WALL (MAX 600mm)...

NON LOAD BEARING WALL STANDARD LINTELS

SCHEDULE OF SIZES

Table with columns: MAXIMUM SPAN (mm) and LINTEL DIMENSIONS (mm) with values for spans from 950 to 3000.

- S12 INSTALLATION GENERAL: PROVIDE 1 LINTEL TO EACH WALL LEAF. DO NOT CUT ON SITE. KEEP LINTELS 5mm CLEAR OF HEADS AND FRAMES. PACK MORTAR BETWEEN THE ANGLE UPSTAND AND SUPPORT MASONRY UNITS.
S13 STRUCTURAL LINTELS FOR ALL STRUCTURAL LOAD BEARING LINTELS REFER TO THE APPROPRIATE DRAWINGS FOR LOCATION AND DETAILS.
S14 ALL LINTELS TO BE HOT DIP GALVANISED.

RETAINING WALLS

- R1 DO NOT BACKFILL RETAINING WALLS (OTHER THAN CANTILEVER WALLS) UNTIL FLOOR CONSTRUCTION AT TOP AND BOTTOM IS COMPLETED.
R2 ENSURE FREE DRAINING BACKFILL AND DRAINAGE IS IN PLACE BEHIND ALL RETAINING WALLS.

FORMWORK

- FW1 THE DESIGN, CERTIFICATION, CONSTRUCTION, INSPECTION AND PERFORMANCE OF THE FORMWORK AND FALSE WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, EXCEPT TO THE EXTENT THAT FORMWORK DESIGN IS SHOWN ON THE STRUCTURAL DRAWINGS.
FW2 THE FORMWORK SHALL NOT BE DESIGNED TO RELY ON RESTRAINT OR SUPPORT FROM THE PERMANENT STRUCTURE.
FW3 DESIGN INFORMATION FOR THE FOUNDATIONS UNDER THE FORMWORK SHALL BE DETERMINED BY THE CONTRACTOR FROM THE CONDITIONS EXISTING ON SITE AT THE TIME OF CONSTRUCTION.
FW4 FORMWORK CONSTRUCTION TOLERANCES AND STRIPPING TIMES SHALL COMPLY WITH AS3610 AND AS3690.
FW5 DURING CONSTRUCTION, SUPPORT PROPPING WILL BE REQUIRED WHERE LOADS FROM STACKED MATERIALS, FORMWORK AND OTHER SUPPORTED SLABS INDUCE LOADS IN A SLAB OR BEAM WHICH EXCEED THE DESIGN CAPACITY FOR STRENGTH OR SERVICEABILITY LIMIT STATES AT THAT AGE.
FW6 IT IS TO BE EXPECTED IN MULTI-STORY CONSTRUCTION THAT PROPPING WILL BE REQUIRED TO EXTEND A NUMBER OF LEVELS BELOW THE FLOOR BEING CAST.
FW7 FORMED CONCRETE SURFACES SHALL HAVE FINISHES IN ACCORDANCE WITH AS3610, AS SPECIFIED IN THE BREWSTER NORTH CONCRETE FORMWORK SPECIFICATION.

FORMWORK CONT.

- FW8 DO NOT PLACE PERMANENT LOADS ON THE CONCRETE STRUCTURE UNTIL AFTER FORMWORK AND PROPPING IS REMOVED.
FW9 REFER TO THE SPECIFICATION FOR TEST PANEL REQUIREMENTS. REINFORCEMENT FOR TEST PANELS SHALL BE SIMILAR TO THAT IN THE PERMANENT STRUCTURE BEING REPRESENTED BY THE TEST PANEL.
FW10 BEFORE PLACING REINFORCEMENT IN THE FORMWORK, APPLY A RELEASE AGENT TO THE FACE OF THE FORMWORK COMPATIBLE WITH THE REQUIRED SURFACE FINISH.
FW11 DIMENSIONAL TOLERANCES SHALL COMPLY WITH AS3610 FOR THE APPROPRIATE FINISH CLASS.
FW12 CHAMFER RE-ENTRANT ANGLES AND FILLET AT CORNERS BY 25mm UNDO.
FW13 BEFORE PLACING CONCRETE, REMOVE ALL WATER, DUST, AND DEBRIS FROM THE FORMWORK.
FW14 FILL ALL HOLES LEFT BY FORM TIE BOLTS WITH MORTAR MATCHING THE SURFACE COLOUR OF THE FINISHED SURFACE.

TIMBER NOTES

- T1 ALL TIMBER DESIGN, MATERIALS AND CONSTRUCTION TO BE TO AS1720.1 AND AS1720.2.
T2 SOFTWOOD TO BE MINIMUM STRESS GRADE F7 U.N.O. HARDWOOD TO BE MINIMUM STRESS GRADE F9 U.N.O.
T3 EXTERNAL TIMBER TO BE EITHER HARDWOOD, NATURAL MINIMUM DURABILITY, CLASS 2 TO AS1720.2 OR PRESERVATIVE TREATED PINE OF EQUIVALENT DURABILITY.
T4 ALL TIMBER IS TO BE IDENTIFIED BY BRANDING OR CERTIFICATION BY AN APPROVED AUTHORITY. BRANDING IS TO INCLUDE:
- STRESS GRADE
- METHOD OF GRADING
- "SEASONED" OR "S"
- THE CERTIFICATION MARK OF THE PRODUCT CERTIFICATION PROGRAM
- THE APPLICABLE STANDARD.
T5 PROVIDE SUPPORTING DOCUMENTATION FOR PRESERVATION TREATMENT.
T6 ALL DIMENSIONS APPLY TO FINISHED SIZES.
T7 ALL SIZES ASSUME NO NOTCHING U.N.O.
T8 TOLERANCES ON FINISHED TIMBER ARE AS STATED IN AS2082, AS1748, AS2858, AS3519 AS APPROPRIATE.
T9 ALL JOINTS AND NOTCHES ARE TO BE A MINIMUM 100mm AWAY FROM LOOSE KNOTS, SEVERE SLOPING GRAIN, GUM VENS AND OTHER SIGNIFICANT DEFECTS.
T10 ALL BOLTS SHALL BE M16, GRADE 4.6 BOLTS WITH HEXAGONAL HEADS U.N.O. BOLT HEADS TO BE DRILLED TO EXACT BOLT SIZE. WASHERS UNDER BOLT HEADS AND NUTS TO BE A MINIMUM 1.5 TIMES BOLT DIAMETER. ALL BOLTS AND SCREWS ARE TO BE HOT DIP GALVANISED.
T11 PREFABRICATED TRUSS DESIGN SHALL SATISFY THE FOLLOWING CRITERIA:
DESIGN ACTIONS DETERMINED IN ACCORDANCE WITH AS/NZS1170.2:2002 FOR DESIGN WIND SPEED Vdes, 50m/sec.
MAXIMUM LONG TERM DEFLECTION UNDER DEAD LOAD: SPAN/600.
T12 PREFABRICATED TRUSSES ARE TO BE PRECAMBERED AN AMOUNT EQUAL TO THE DEAD LOAD DEFLECTION AND NOT LESS THAN 5mm.
T13 MINIMUM FINISHED WIDTH OF TRUSS CHORD MEMBERS: 45mm.
T14 THE TRUSS DESIGNER SHALL PROVIDE DETAILS OF ALL PLATES AND CLEATS FOR FIXING THE ROOF TRUSS TO THE SUPPORTING STRUCTURE.
T15 SHOP DRAWINGS FOR THE TRUSSES ARE TO BE SUBMITTED FOR APPROVAL IN ACCORDANCE WITH THE SPECIFICATION GIVING THE FOLLOWING INFORMATION:
DESIGN LOADS ON THE ROOF, CEILING AND SUPPORT POINTS.
PRECAMBER.
MEMBER SIZES AND LOCATIONS.
JOINT DETAILS.
TIMBER SPECIES, STRESS GRADE, STRENGTH GROUP.
SERVICES TO BE ACCOMMODATED WITHIN THE ROOF SPACE.
T16 CERTIFICATION SHALL BE PROVIDED COVERING THE DESIGN AND FABRICATION OF THE TRUSSES.
T17 TRUSS INSTALLATION SHALL COMPLY WITH AS4440.

Table with columns: Rev, Date, Revision Details, By, Ver, App. Includes entries for ISSUED FOR CONSTRUCTION, ISSUED FOR TENDER, ISSUED FOR INFORMATION.

Connell Mott MacDonald

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New South Wales 2089 Australia Email: cmo@connellmott.com

PITTWATER MUNICIPAL COUNCIL

MONA VALE VILLAGE PARK LIBRARY

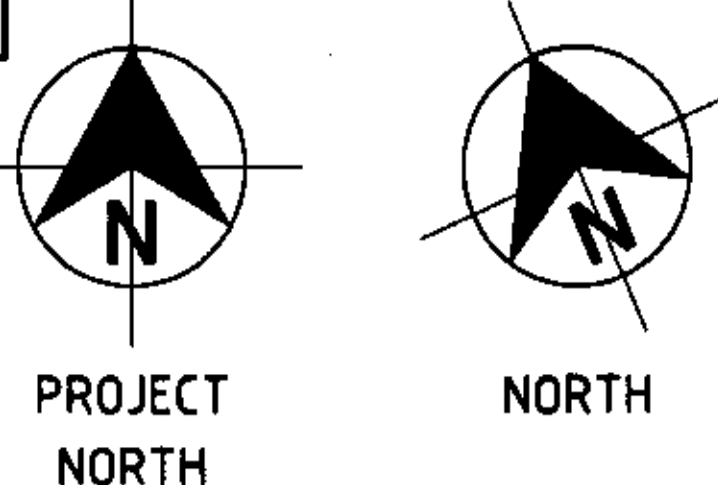
GENERAL NOTES SHEET 1

APPROVED CONSTRUCTION CERTIFICATE No. 03/733-1

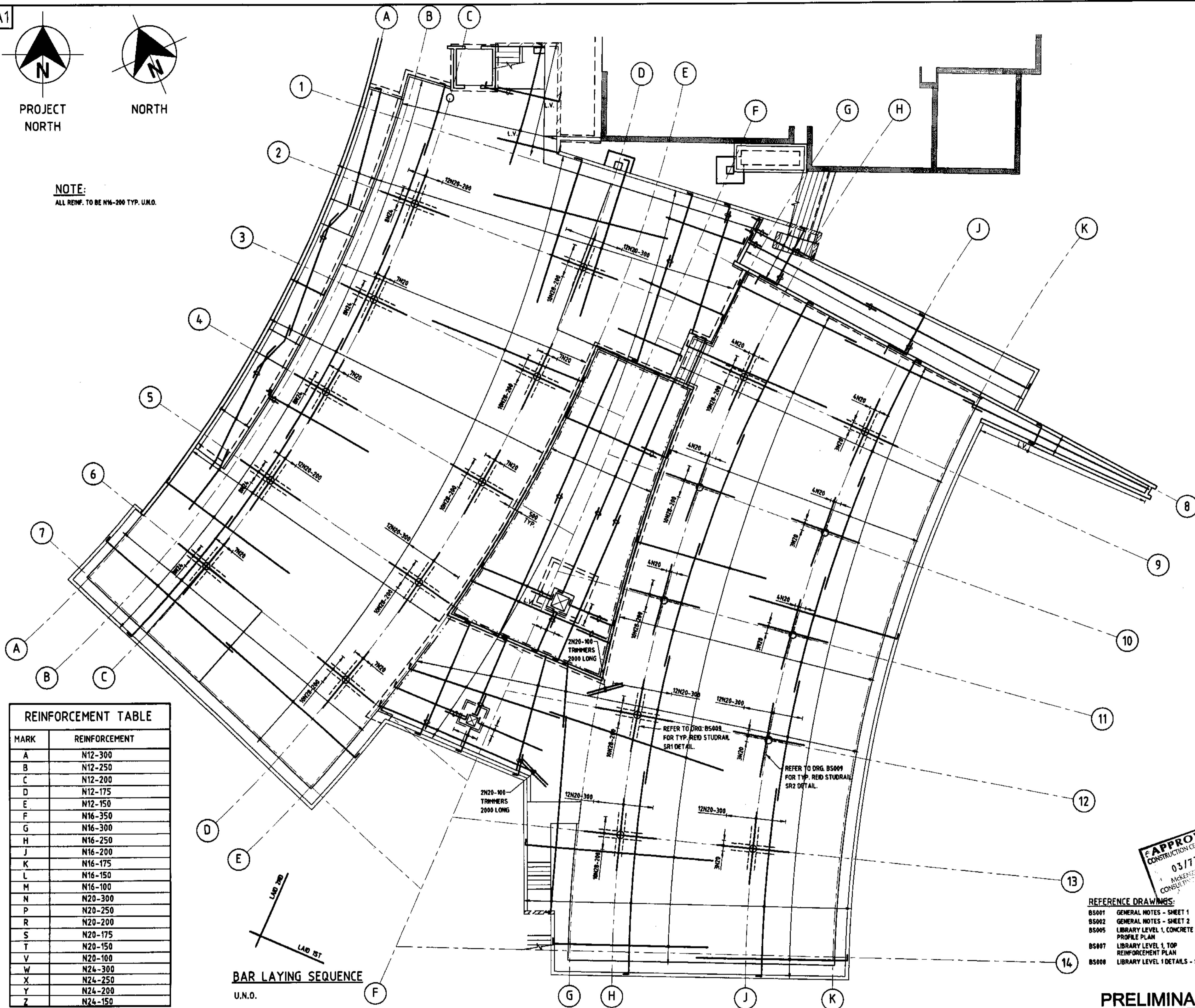
Table with columns: Drawn, Signed, Date, Verified, Signed, Date. Includes CW Project No. 3785 and Drawing No. BS001.

PRELIMINARY

A1



NOTE:
ALL REINF. TO BE N16-200 TYP. U.N.O.



MARK	REINFORCEMENT
A	N12-300
B	N12-250
C	N12-200
D	N12-175
E	N12-150
F	N16-350
G	N16-300
H	N16-250
J	N16-200
K	N16-175
L	N16-150
M	N16-100
N	N20-300
P	N20-250
R	N20-200
S	N20-175
T	N20-150
V	N20-100
W	N24-300
X	N24-250
Y	N24-200
Z	N24-150

BAR LAYING SEQUENCE
U.N.O.

Rev	Date	Revision Details	By	Ver.	App.
03	14.03.03	ISSUED FOR CONSTRUCTION	CD		
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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Client:
PITTWATER MUNICIPAL COUNCIL

Project:
MONA VALE VILLAGE PARK LIBRARY

Drawing Title:
LIBRARY LEVEL 1 BOTTOM REINFORCEMENT PLAN

Drawn	Signed	Date	Verified	Signed	Date
CD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
CW Project No.		3785		Scale: 1:100	
Drawing No.		BS006		Revision: 03	

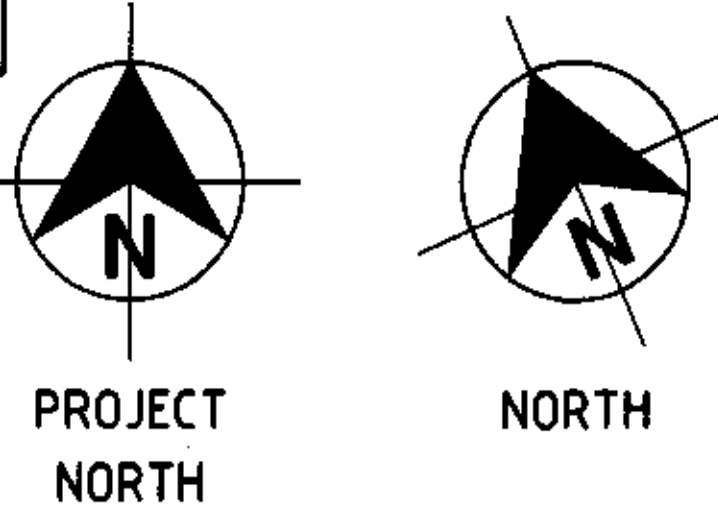


REFERENCE DRAWINGS:
BS001 GENERAL NOTES - SHEET 1
BS002 GENERAL NOTES - SHEET 2
BS005 LIBRARY LEVEL 1, CONCRETE PROFILE PLAN
BS007 LIBRARY LEVEL 1, TOP REINFORCEMENT PLAN
BS008 LIBRARY LEVEL 1 DETAILS - SHEET 1

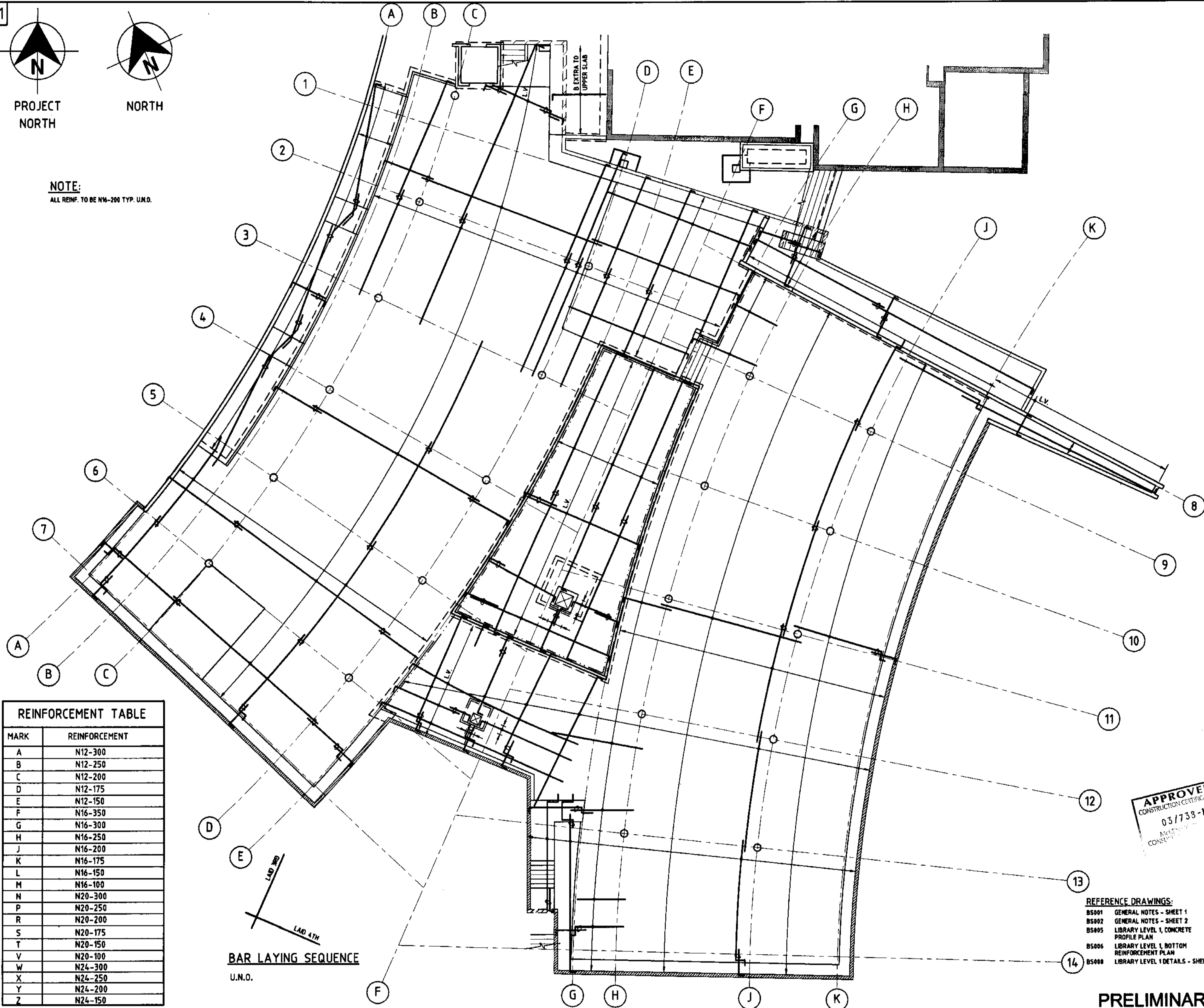
PRELIMINARY

Scale: 1:100

A1



NOTE:
ALL REINF. TO BE N16-200 TYP. UNL.



MARK	REINFORCEMENT
A	N12-300
B	N12-250
C	N12-200
D	N12-175
E	N12-150
F	N16-350
G	N16-300
H	N16-250
J	N16-200
K	N16-175
L	N16-150
M	N16-100
N	N20-300
P	N20-250
R	N20-200
S	N20-175
T	N20-150
V	N20-100
W	N24-300
X	N24-250
Y	N24-200
Z	N24-150

BAR LAYING SEQUENCE
U.N.O.

- REFERENCE DRAWINGS:**
- BS001 GENERAL NOTES - SHEET 1
 - BS002 GENERAL NOTES - SHEET 2
 - BS005 LIBRARY LEVEL 1, CONCRETE PROFILE PLAN
 - BS006 LIBRARY LEVEL 1, BOTTOM REINFORCEMENT PLAN
 - BS008 LIBRARY LEVEL 1 DETAILS - SHEET 1

Rev	Date	Revision Details	By	Ver	App.
03	14.03.03	ISSUED FOR CONSTRUCTION CERTIFICATE	CD		
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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PITTWATER MUNICIPAL COUNCIL

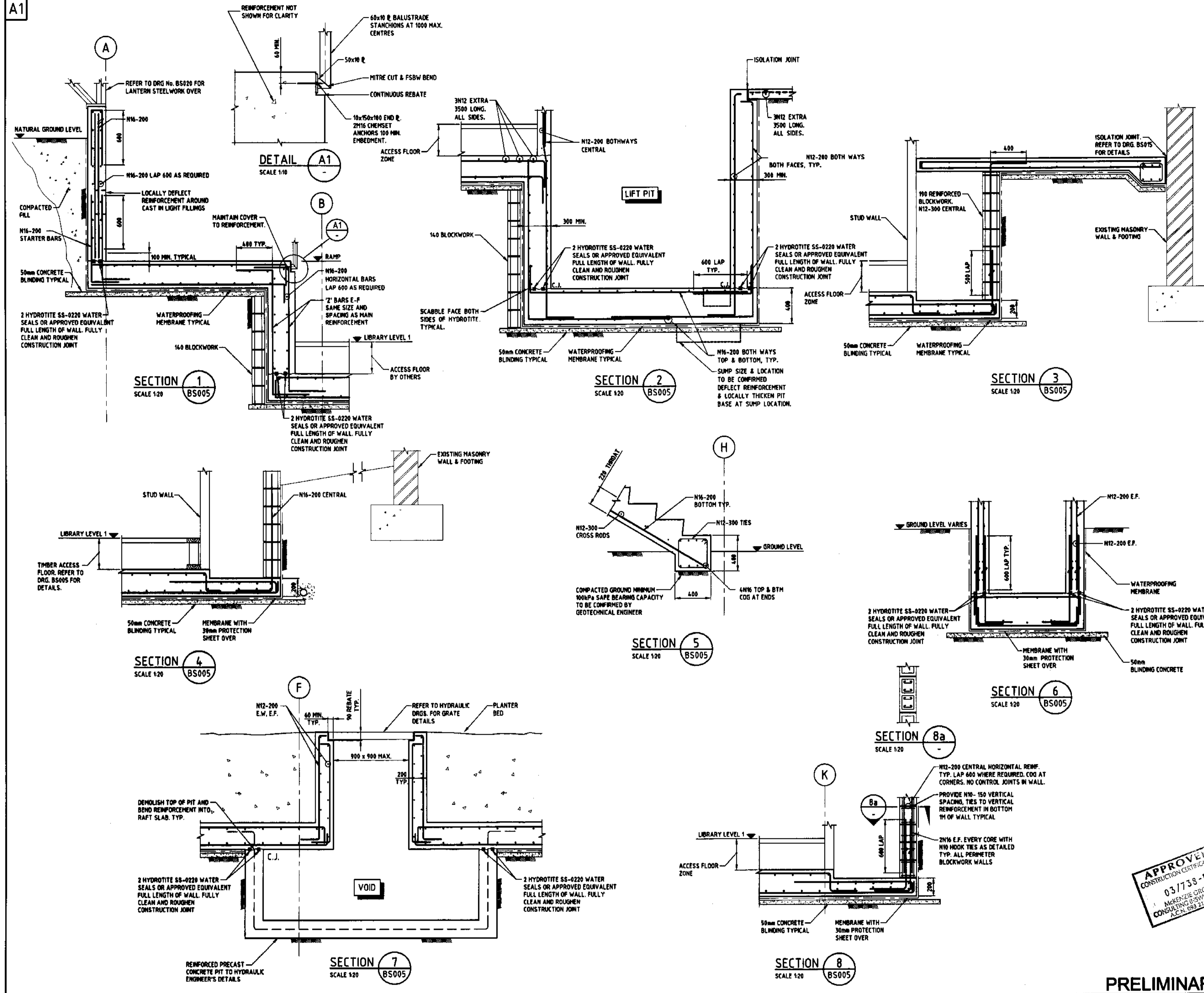
Project:
MORRIS VALLEY VILLAGE PARK LIBRARY

Drawing Title:
LIBRARY LEVEL 1 TOP REINFORCEMENT PLAN

Drawn	Signed	Date	Verified	Signed	
CD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
CW Project No.		Scale		Revision	
3785		1:100		03	
Drawing No.		BS007		03	

PRELIMINARY





Rev	Date	Revision Details	By	Ver.	App.
03	14.03.03	ISSUED FOR CONSTRUCTION	CD		
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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 New South Wales 2060 Australia Email: cmw@cornellmott.com

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Client:
PITTWATER MUNICIPAL COUNCIL

Project:
MONA VALE VILLAGE PARK LIBRARY

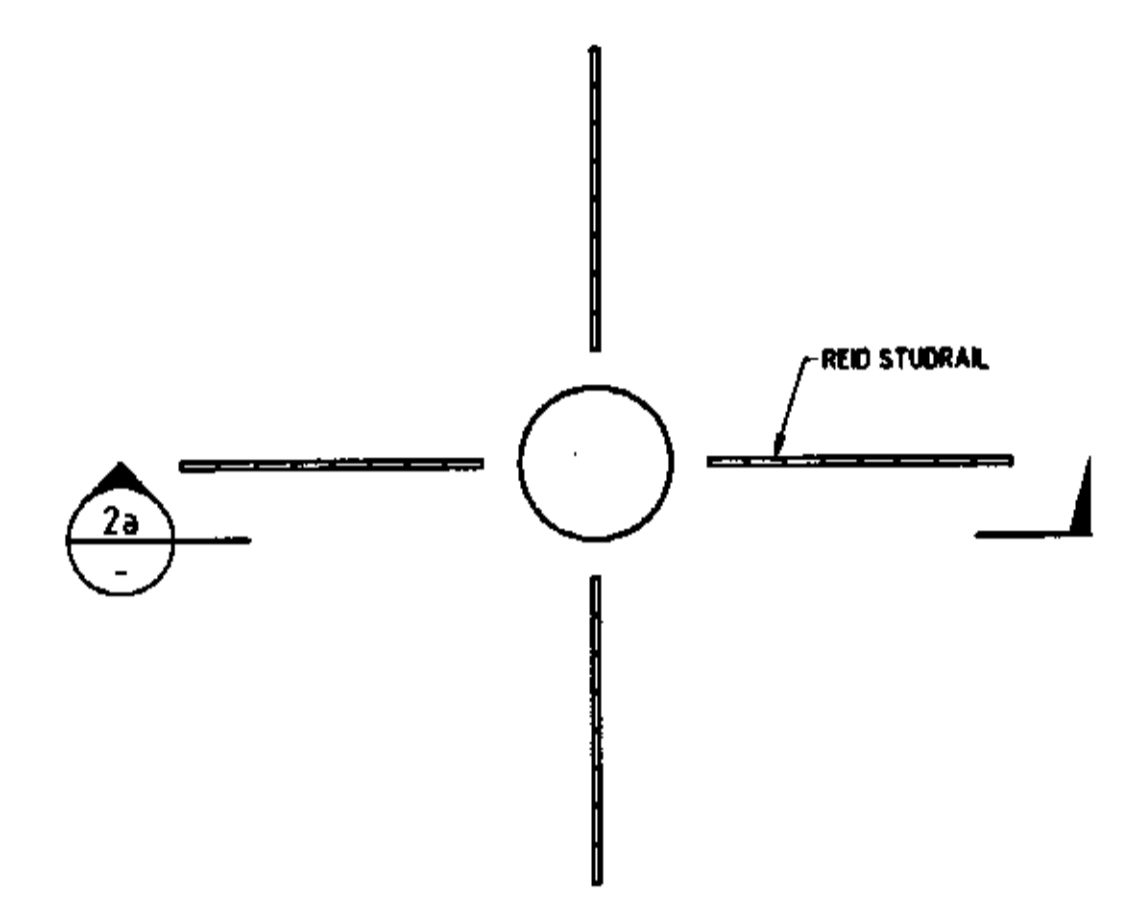
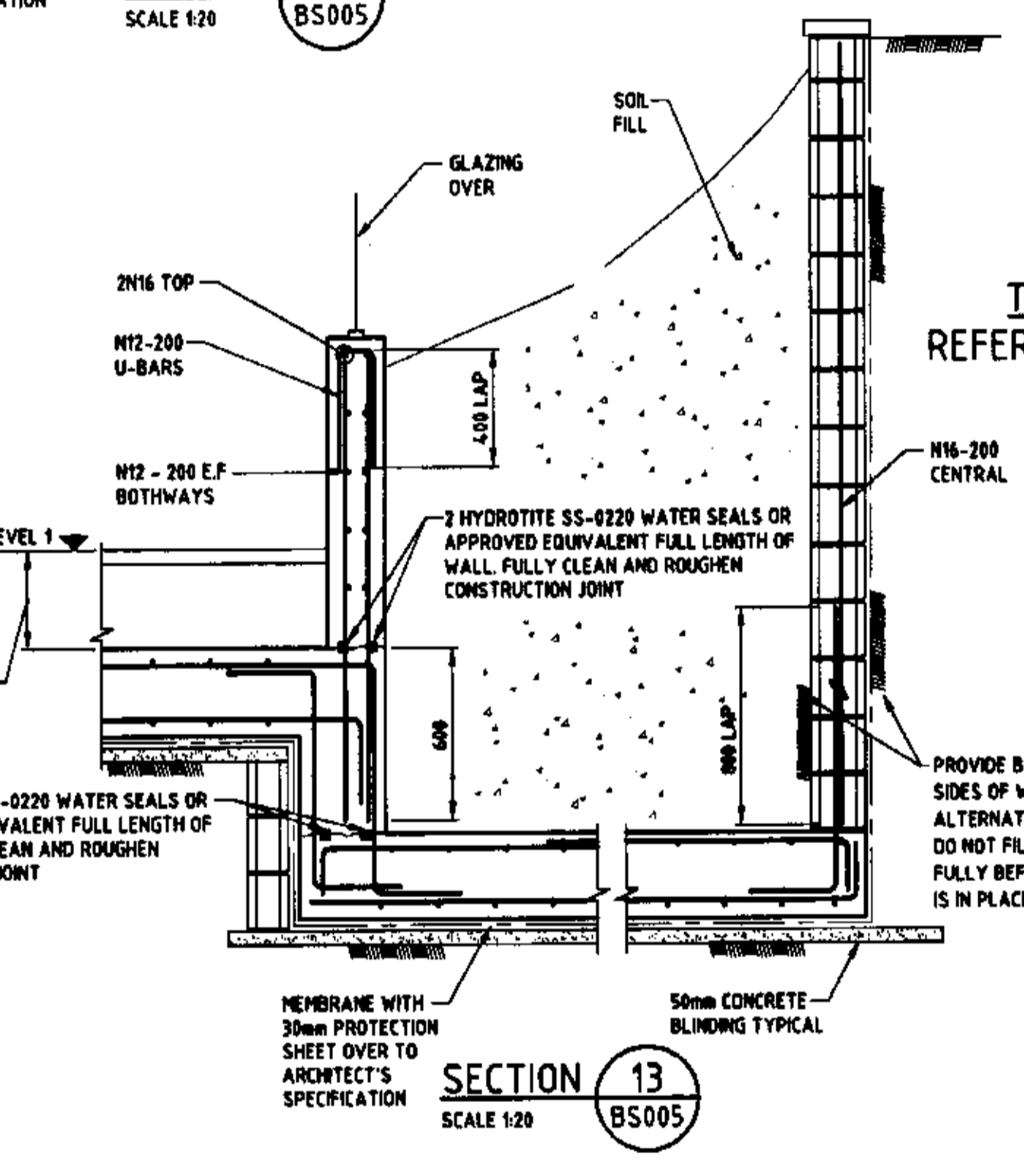
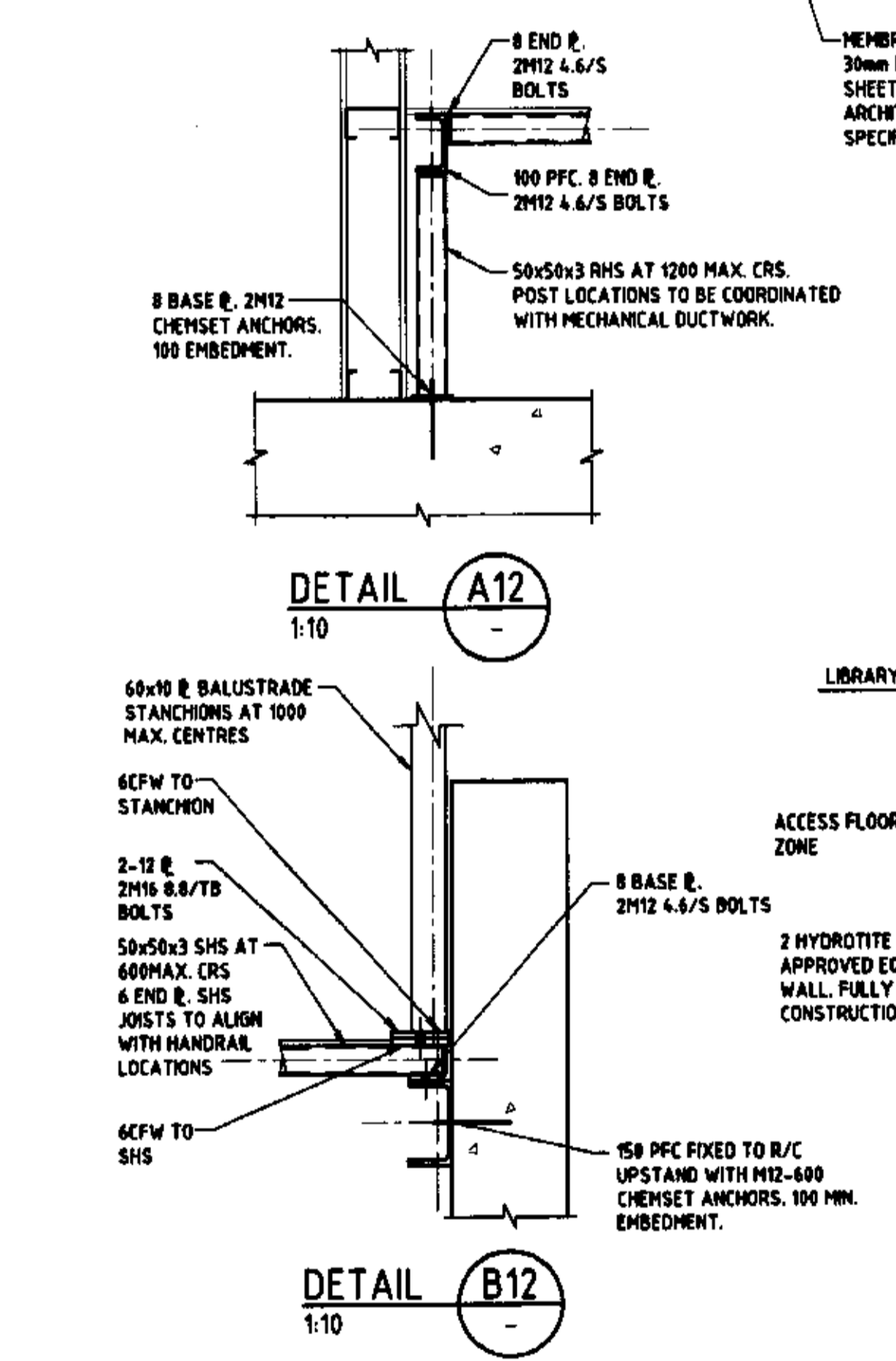
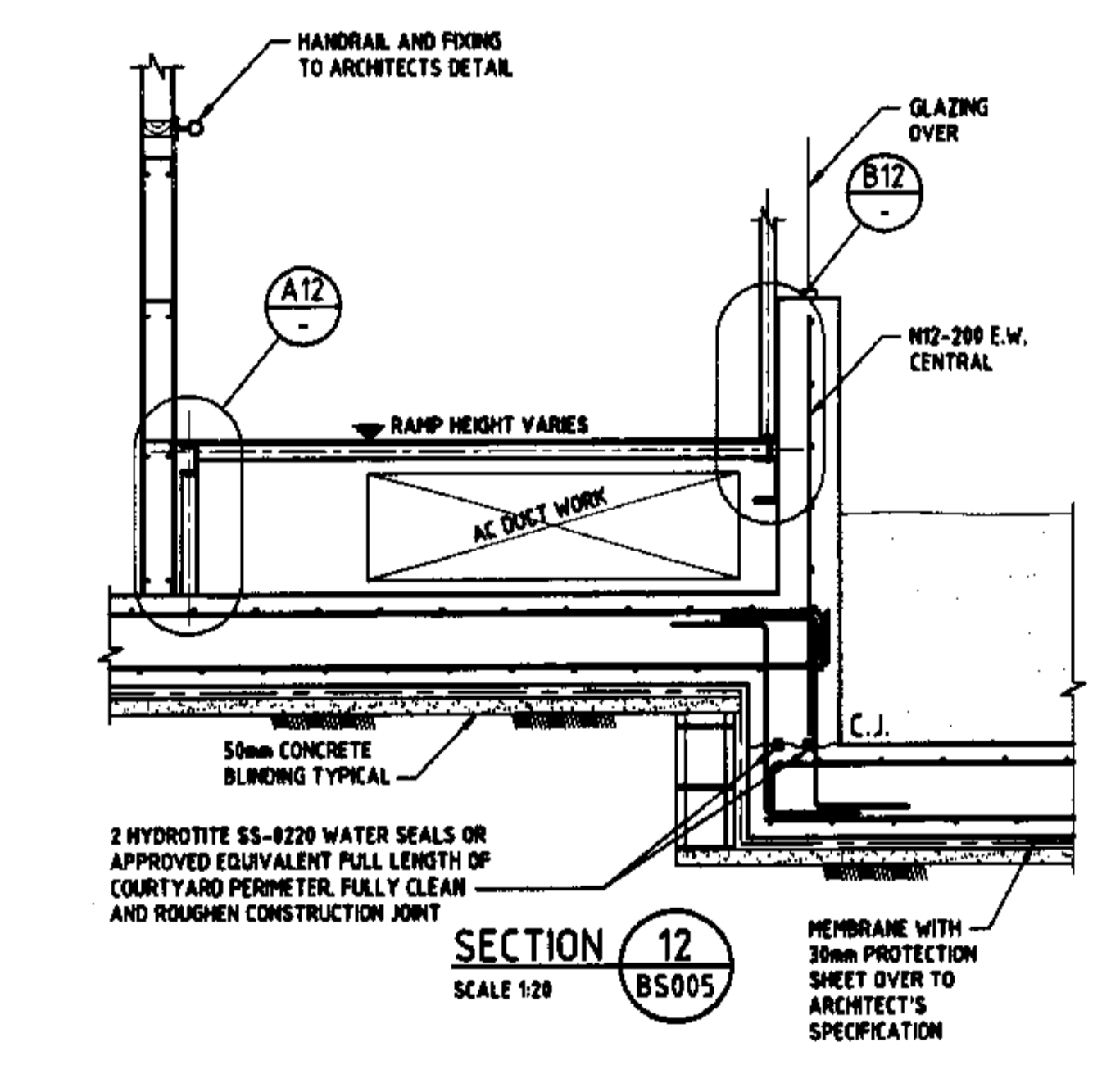
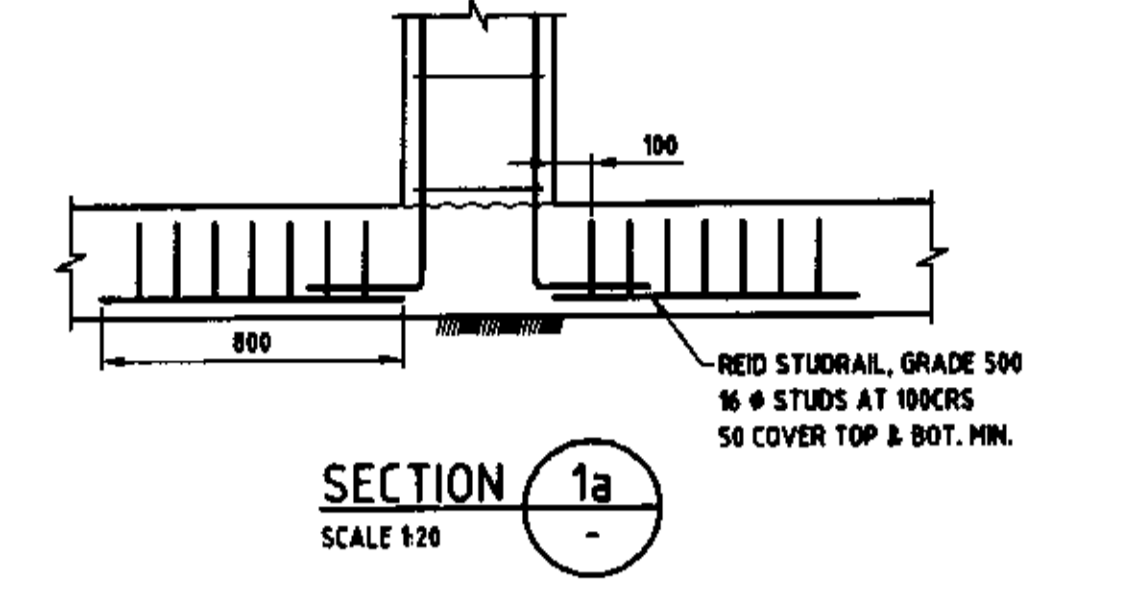
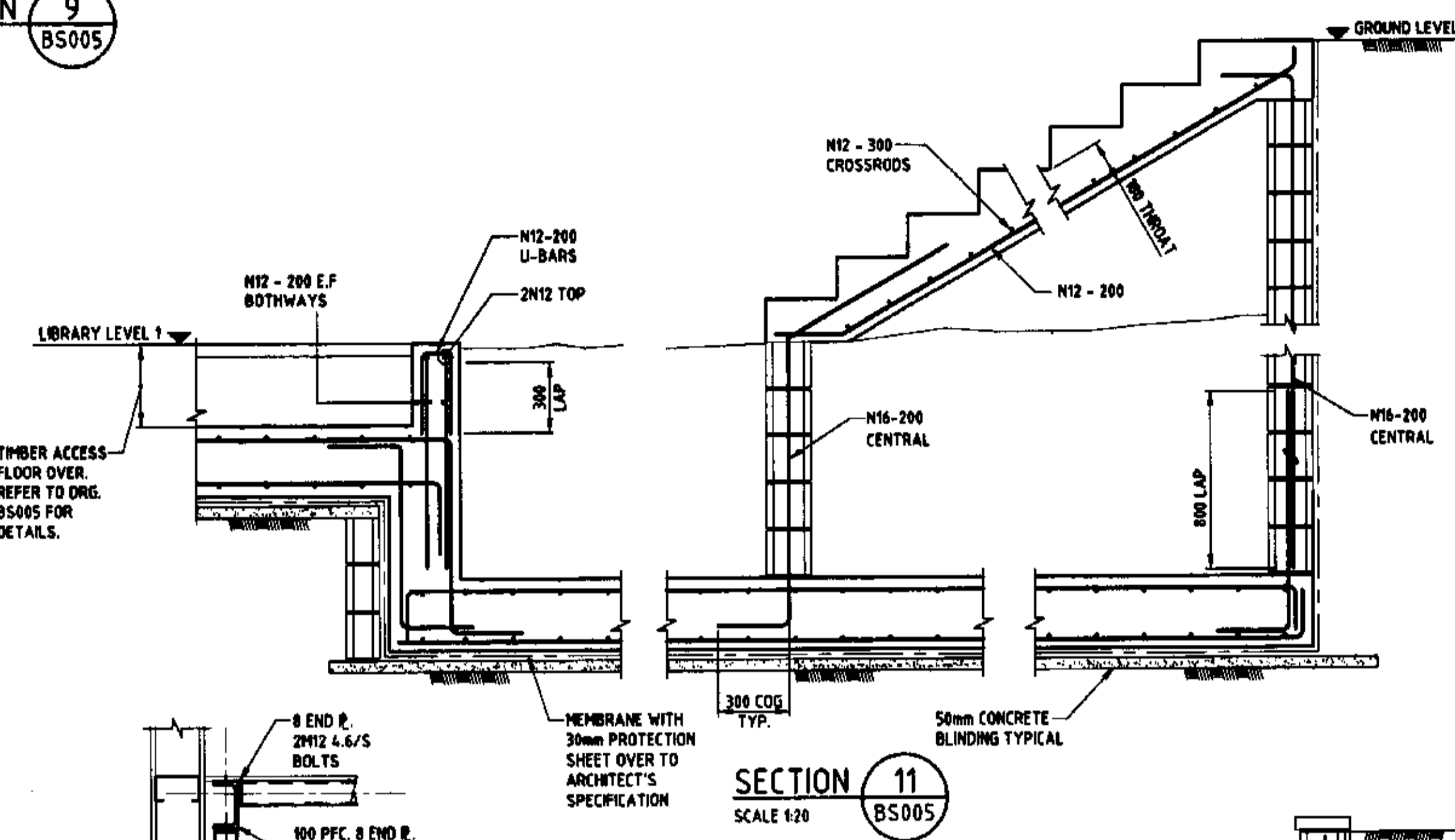
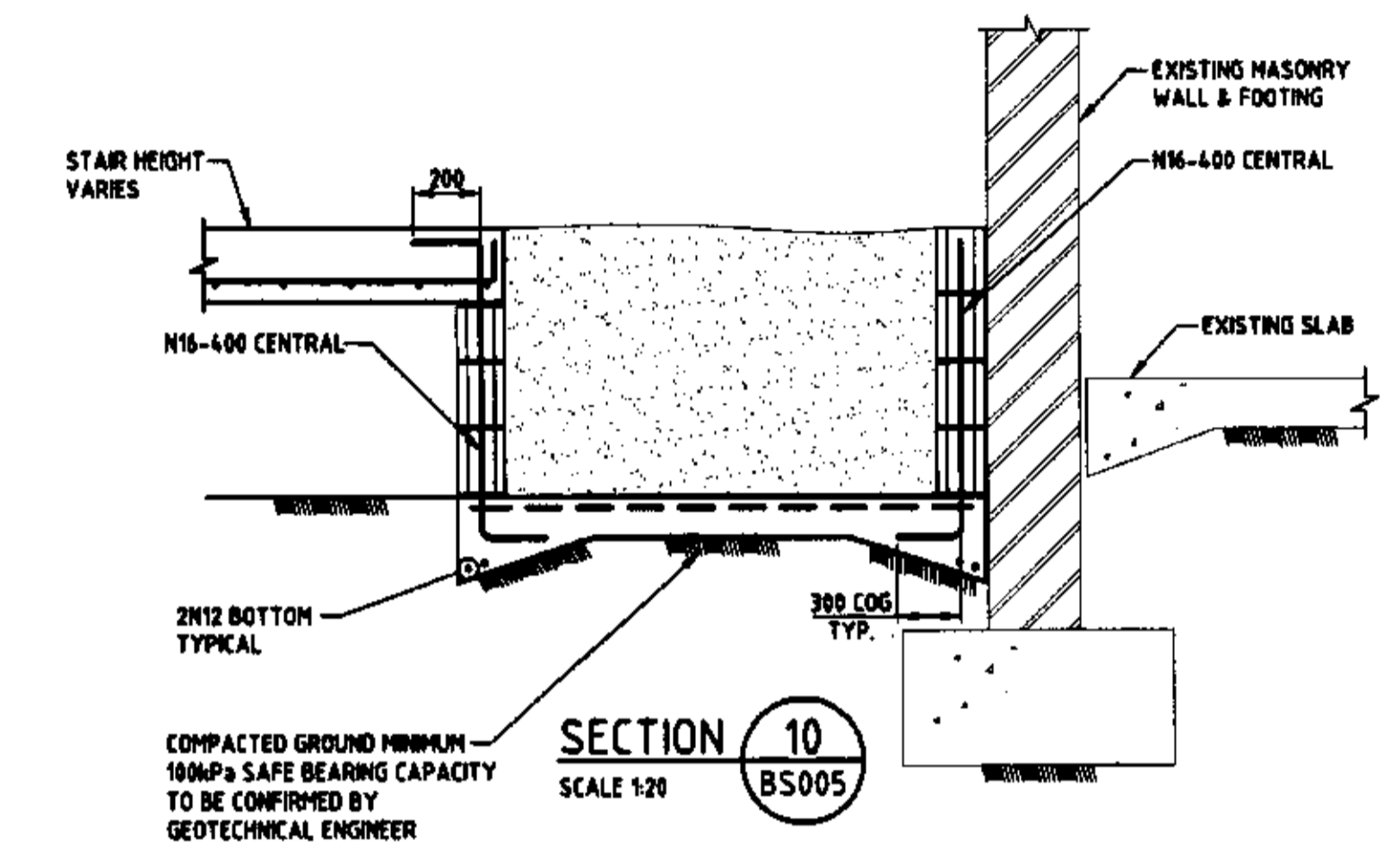
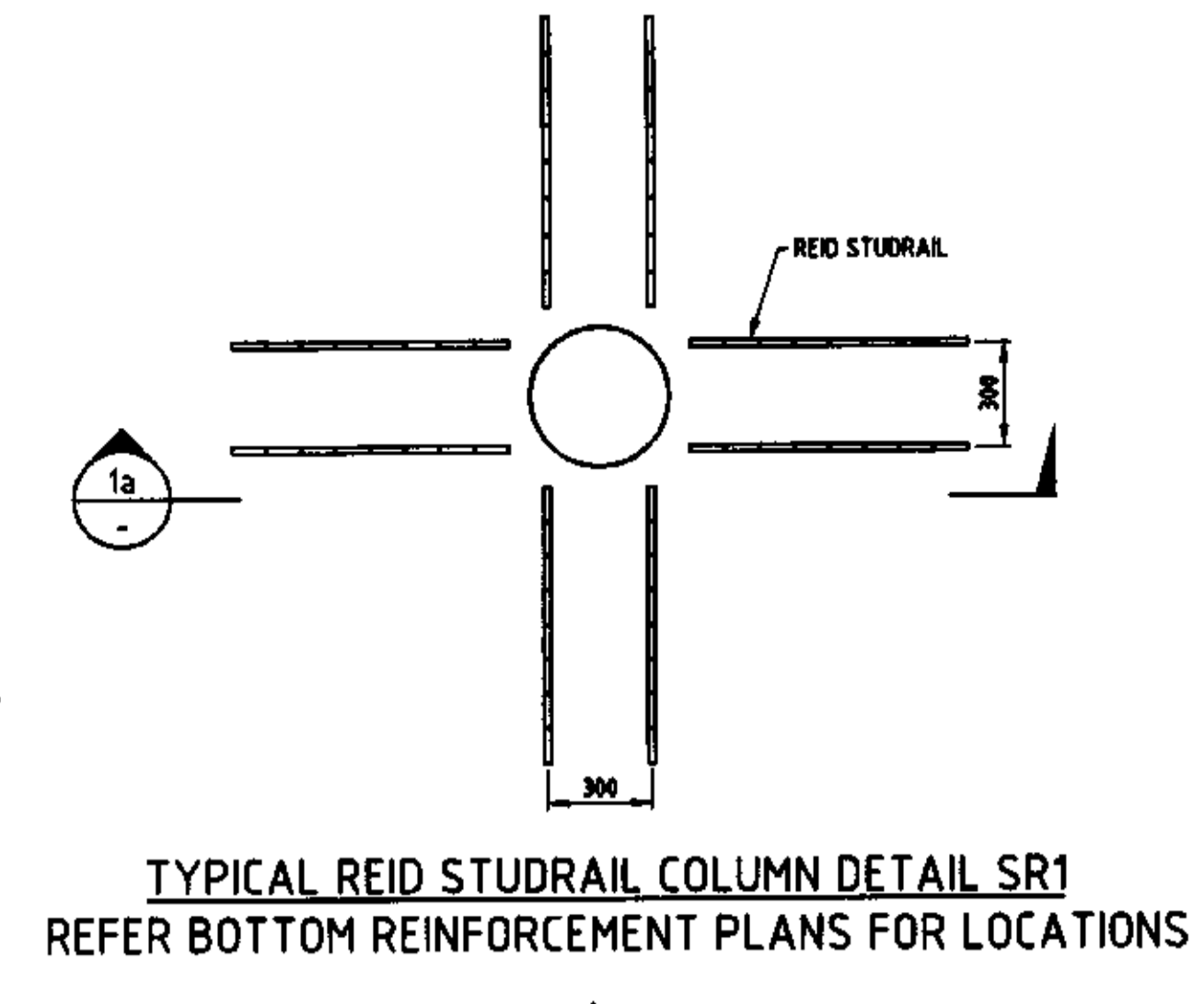
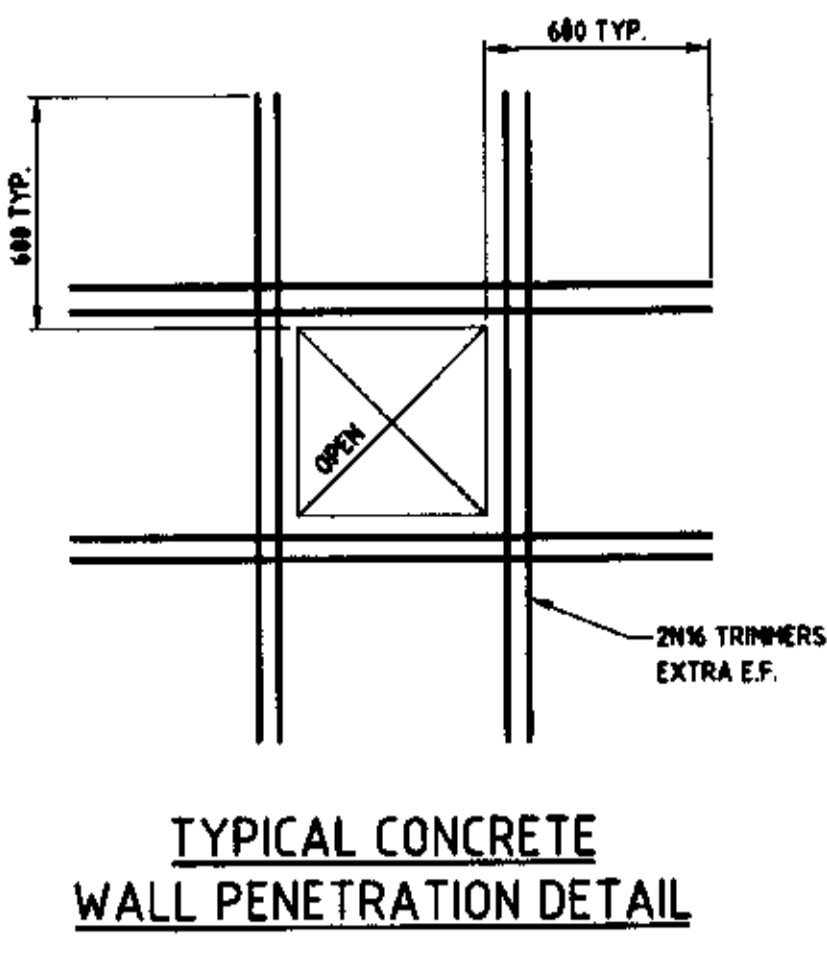
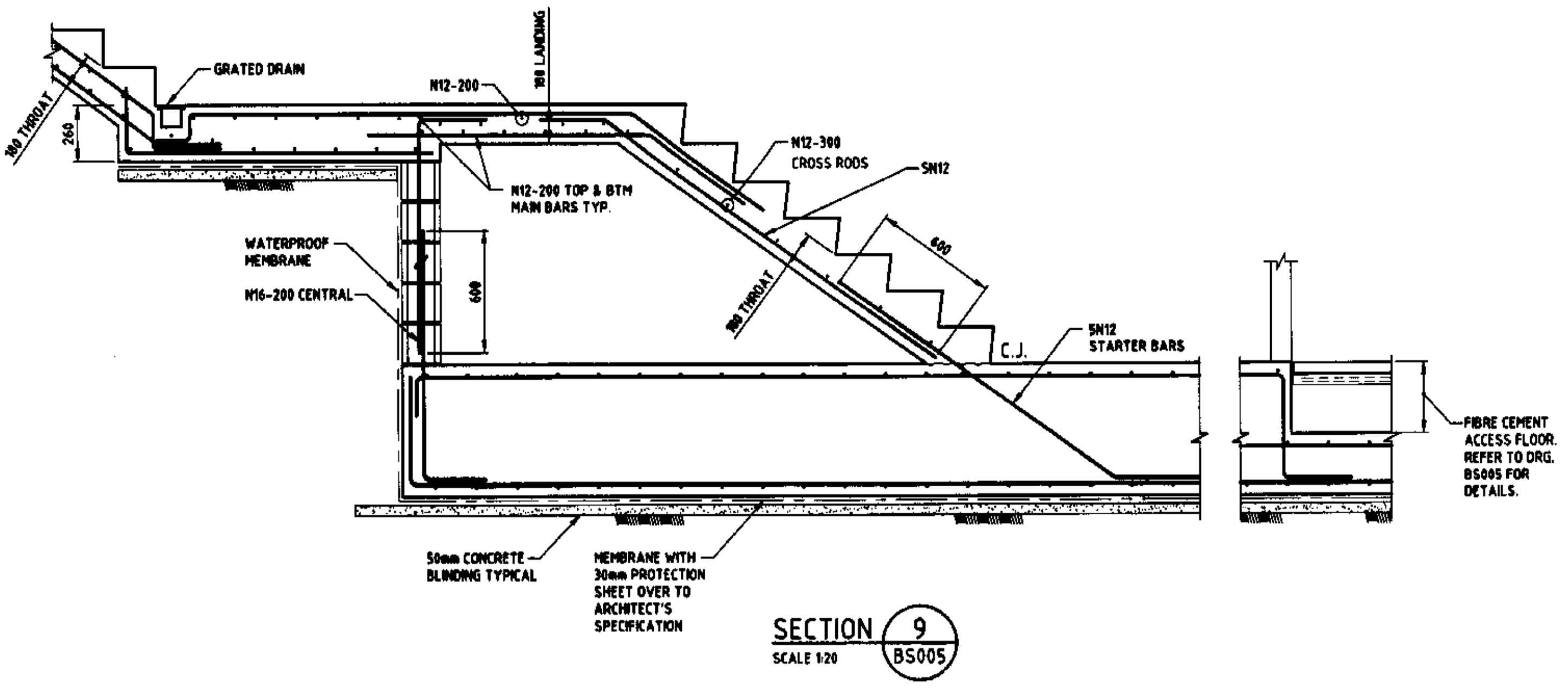
Drawing Title:
LIBRARY LEVEL 1 DETAILS SHEET 1

Drawn	Signed	Date	Verified	Signed	Date
CD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
CW Project No. 3785			Scale: 1:10, 1:20		
Drawing No. BS008			Revision: 03		

APPROVED
 CONSTRUCTION CERTIFICATE NO. 03/738-1
 MCKENZIE GROUP CONSULTING ENGINEERS LTD
 A.C.N. 088 221 992

PRELIMINARY

A1



TYPICAL REID STUDRAIL COLUMN DETAIL SR2
REFER BOTTOM REINFORCEMENT PLANS FOR LOCATIONS

03	14.03.03	ISSUED FOR CONSTRUCTION CERTIFICATE	CD
02	27.02.03	ISSUED FOR TENDER	CD
01	21.02.03	ISSUED FOR INFORMATION	CD
Rev	Date	Revision Details	By Ver App

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118 Military Road (PO Box 608) Healds Bay Parramatta +61 2 9480 2008
New South Wales 2008 Australia Email: connym@connm.com

Client:
PITWATER MUNICIPAL COUNCIL

Project:
MONA VALE VILLAGE PARK LIBRARY

Drawing Title:
LIBRARY LEVEL 1 DETAILS SHEET 2

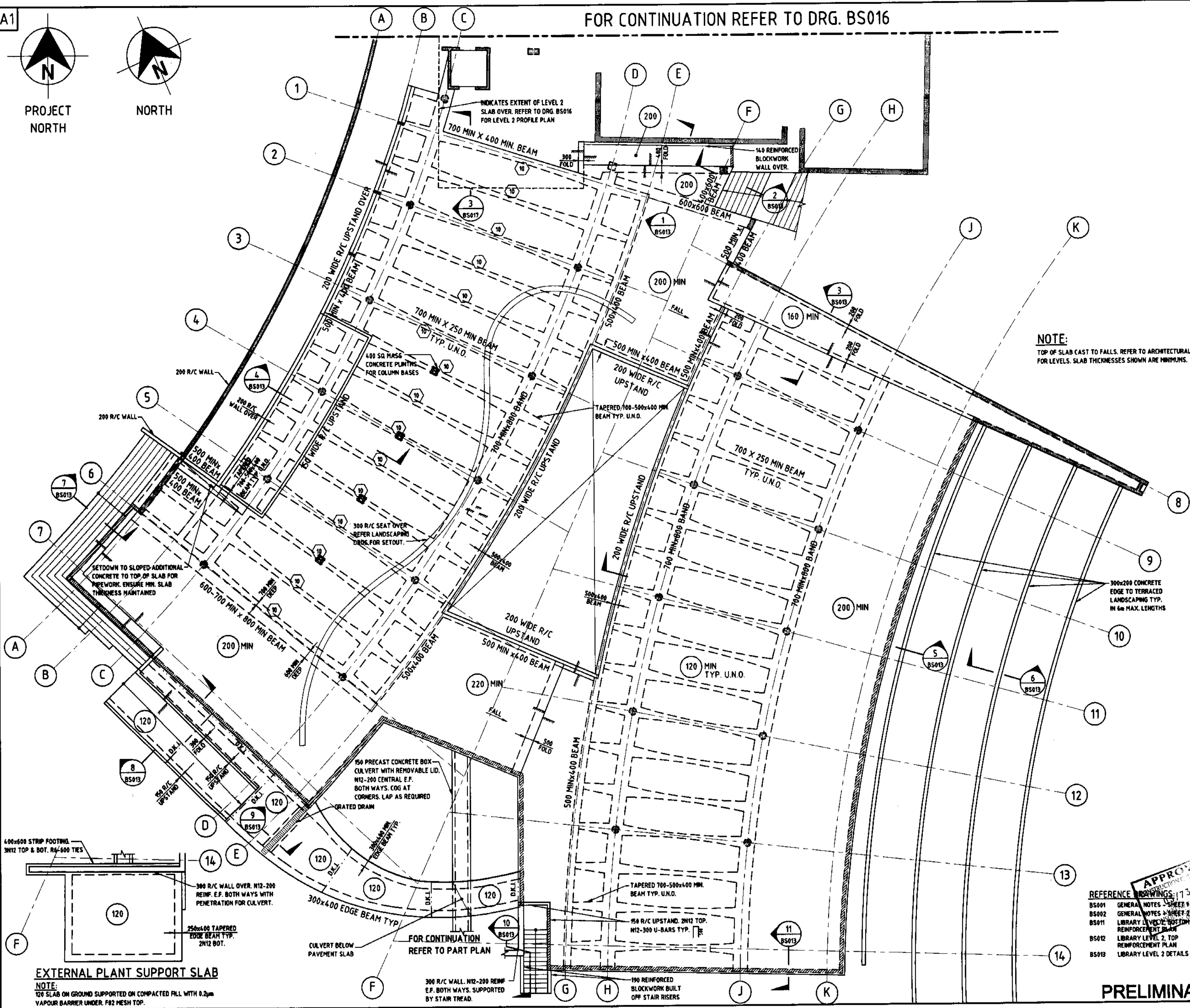
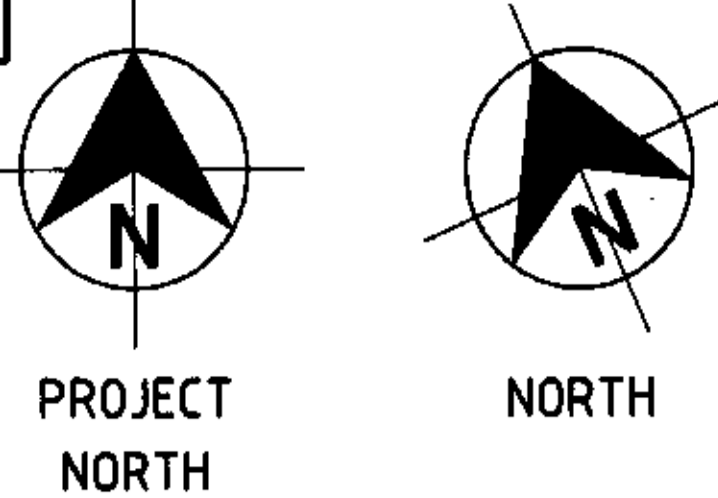
Drawn	Signed	Date	Verified	Signed	Date
CD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
CW Project No	3785		Scale:	1:10, 1:20	
Drawing No	BS009		Revision:	03	

APPROVED
CONSTRUCTION CERTIFICATE NO. 03/733-1
MARRAZZI GROUP PTY LTD
CONSULTING ENGINEERS
ALYAN 289 231 092

PRELIMINARY

A1

FOR CONTINUATION REFER TO DRG. BS016



NOTE: TOP OF SLAB CAST TO FALLS. REFER TO ARCHITECTURAL DRGS. FOR LEVELS. SLAB THICKNESSES SHOWN ARE MINIMUMS.

LEGEND

- 300 INDICATES SLAB THICKNESS.
INDICATES STEP IN SLAB.
INDICATES PENETRATION IN SLAB.
INDICATES SETDOWN IN TOP OF SLAB.
INDICATES LOADBEARING CONCRETE WALL UNDER.
INDICATES LOADBEARING CONCRETE WALL OVER ONLY.
INDICATES LOADBEARING CONCRETE WALL UNDER & OVER.
INDICATES LOADBEARING BRICKWORK WALL UNDER.
INDICATES LOADBEARING BRICKWORK WALL OVER ONLY.
INDICATES LOADBEARING BRICKWORK WALL UNDER & OVER.
INDICATES LOADBEARING BLOCKWORK WALL UNDER.
INDICATES LOADBEARING BLOCKWORK WALL OVER ONLY.
INDICATES LOADBEARING BLOCKWORK WALL UNDER & OVER.
INDICATES COLUMN UNDER.
INDICATES COLUMN OVER ONLY.
INDICATES COLUMN UNDER & OVER.
INDICATES PRE-CAMBER AMOUNT IN BEAM, AT MIDSPAN.

Revision table with columns: Rev, Date, Issued For, By, Ver, App. Includes entries for construction, tender, and information issues.

Connell Mott MacDonald logo and contact information including address, phone, and email.

Client: PITTWATER MUNICIPAL COUNCIL

Project: MONA VALE VILLAGE PARK LIBRARY

Drawing Title: LIBRARY LEVEL 2 CONCRETE PROFILE PLAN

Approval table with columns: Drawn, Signed, Date, Verified, Signed, Date. Includes signatures for CD and S.J.G.

Cw Project No: 3785, Drawing No: BS010, Scale: 1:100, Revision: 03

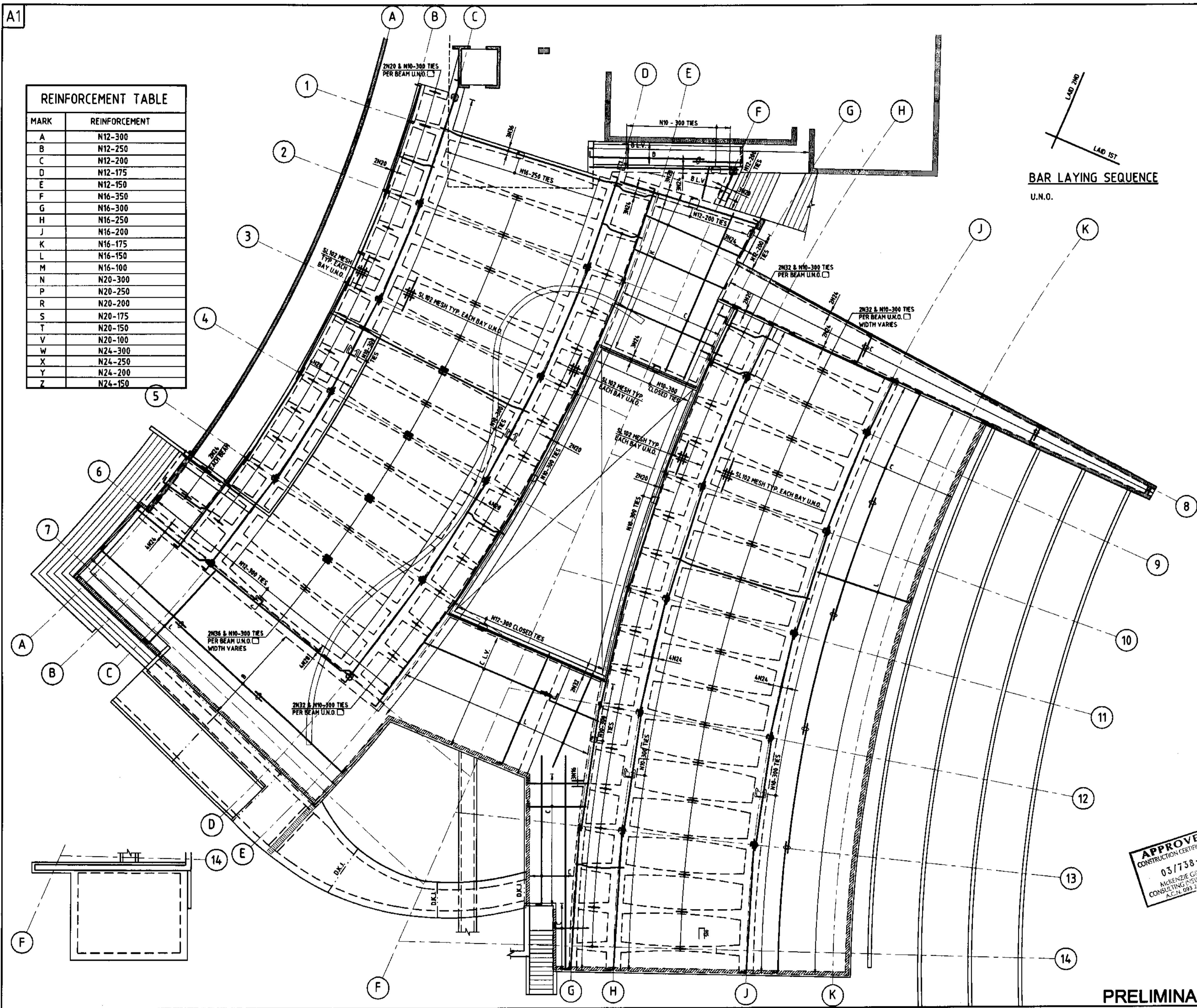
REFERENCE DRAWINGS: 1730-1
BS001 GENERAL NOTES - SHEET 1
BS002 GENERAL NOTES - SHEET 2
BS011 LIBRARY LEVEL 2 REINFORCEMENT PLAN
BS012 LIBRARY LEVEL 2 TOP REINFORCEMENT PLAN
BS013 LIBRARY LEVEL 2 DETAILS - SHEET 1

PRELIMINARY

EXTERNAL PLANT SUPPORT SLAB
NOTE: 120 SLAB ON GROUND SUPPORTED ON COMPACTED FILL WITH 0.2mm VAPOUR BARRIER UNDER. F82 MESH TOP.

A1

MARK	REINFORCEMENT
A	N12-300
B	N12-250
C	N12-200
D	N12-175
E	N12-150
F	N16-350
G	N16-300
H	N16-250
J	N16-200
K	N16-175
L	N16-150
M	N16-100
N	N20-300
P	N20-250
R	N20-200
S	N20-175
T	N20-150
V	N20-100
W	N24-300
X	N24-250
Y	N24-200
Z	N24-150



Rev	Date	Revision Details	By	Ver.	App.
03	14.03.03	ISSUED FOR CONSTRUCTION CERTIFICATE		CD	
02	27.02.03	ISSUED FOR TENDER		CD	
01	21.02.03	ISSUED FOR INFORMATION		CD	

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Client:
PITTWATER MUNICIPAL COUNCIL

Project:
WANA VALE VILLAGE PARK LIBRARY

Drawing Title:
LIBRARY LEVEL 2 BOTTOM REINFORCEMENT PLAN

Drawn	Signed	Date	Verified	Signed	Date
CD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
EW Project No.		Scale:			
3785		1:100			
Drawing No.		Revision:		03	
BS011					

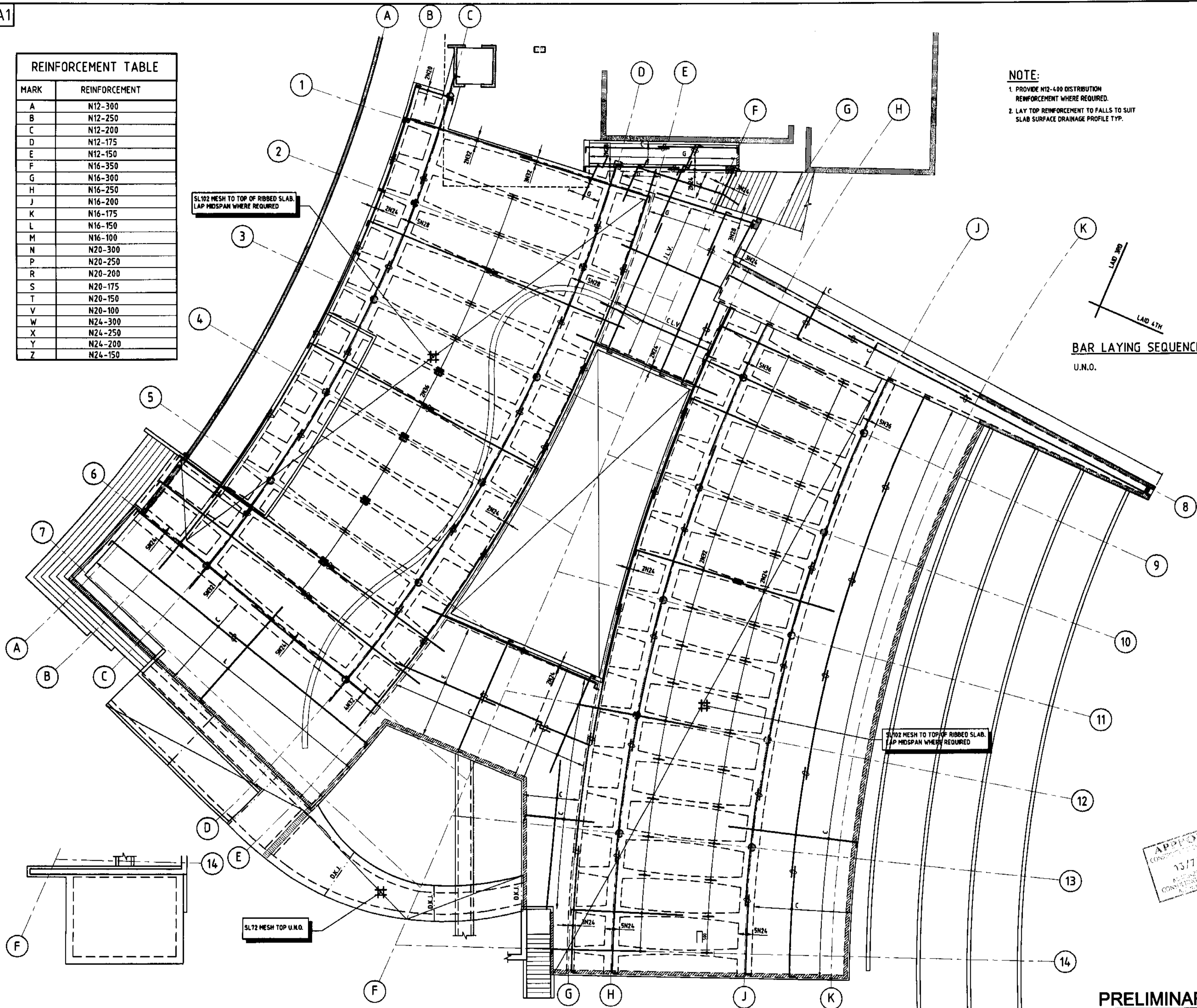
APPROVED
 CONSTRUCTION CERTIFICATE No.
03/738-1
 ARCHENDE GROUP
 CONSULTING ENGINEERS LTD
 ACN 099 211 111

PRELIMINARY

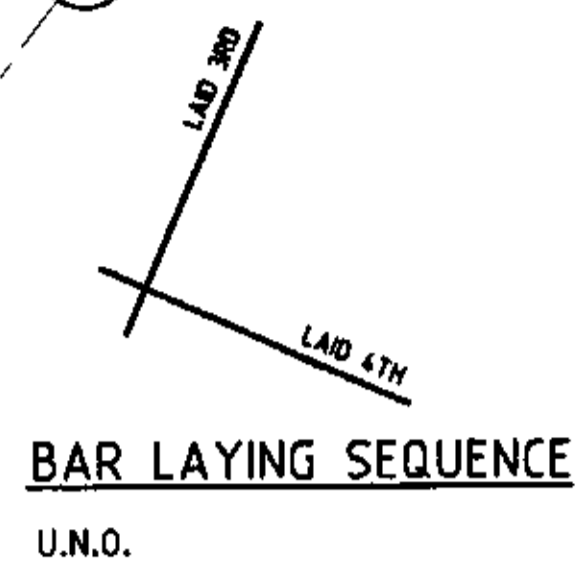
20 30 40 50 60 70 80 90 100

A1

MARK	REINFORCEMENT
A	N12-300
B	N12-250
C	N12-200
D	N12-175
E	N12-150
F	N16-350
G	N16-300
H	N16-250
J	N16-200
K	N16-175
L	N16-150
M	N16-100
N	N20-300
P	N20-250
R	N20-200
S	N20-175
T	N20-150
V	N20-100
W	N24-300
X	N24-250
Y	N24-200
Z	N24-150



NOTE:
 1. PROVIDE N12-400 DISTRIBUTION REINFORCEMENT WHERE REQUIRED.
 2. LAY TOP REINFORCEMENT TO FALLS TO SUIT SLAB SURFACE DRAINAGE PROFILE TYP.



Rev	Date	Revision Details	By	Ver	App
03	14.03.03	ISSUED FOR CONSTRUCTION	CD		
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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PITTWATER MUNICIPAL COUNCIL

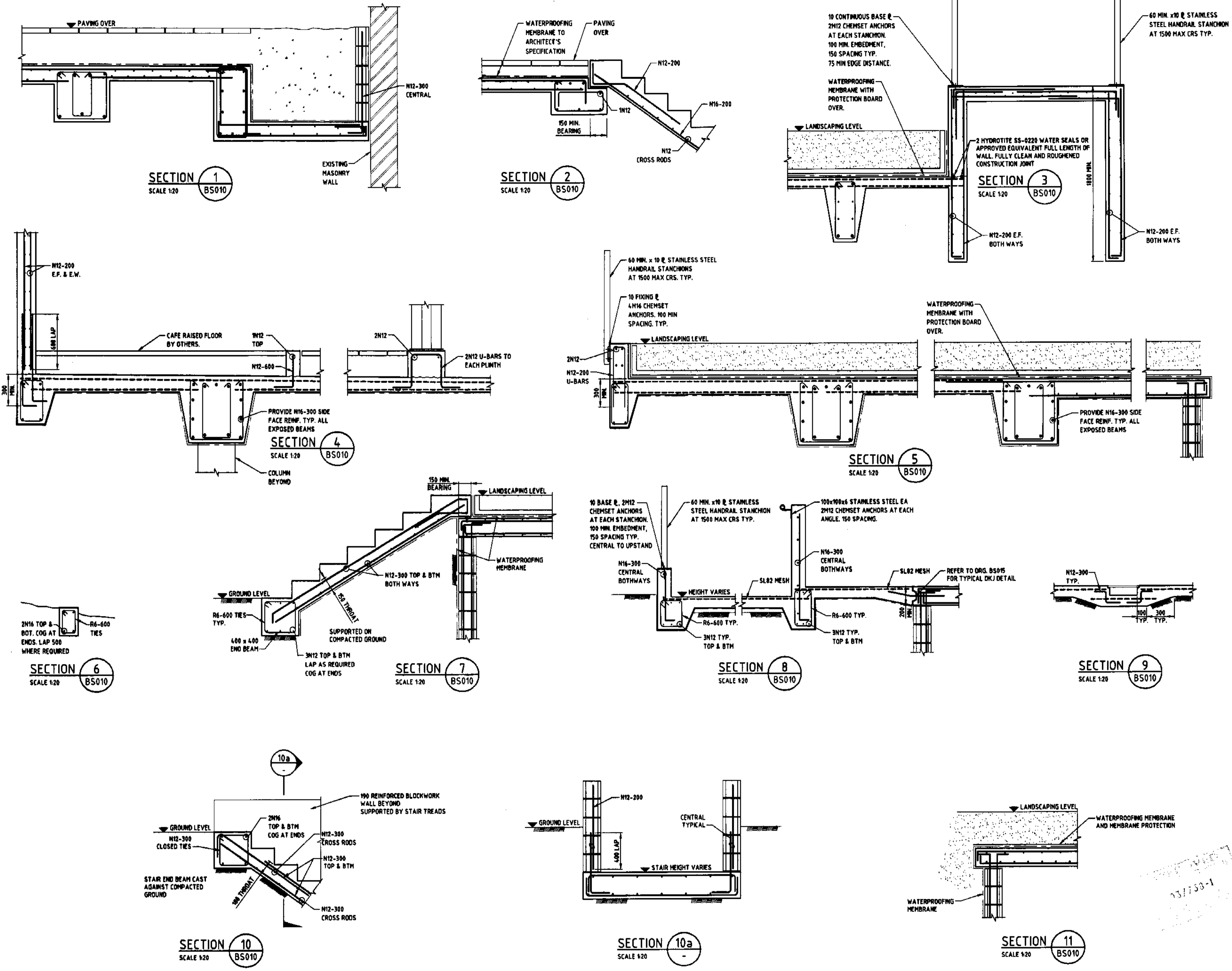
Project:
MONA VALE VILLAGE PARK LIBRARY

Drawing Title:
LIBRARY LEVEL 2 TOP REINFORCEMENT PLAN

Drawn	Signed	Date	Verified	Signed	Date
CD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
CW Project No.	3785		Scale:	1:100	
Drawing No.	BS012		Revision:	03	

PRELIMINARY

0 10 20 30 40 50 100mm



03	14.03.03	ISSUED FOR CONSTRUCTION	CD
CERTIFICATE			
02	27.02.03	ISSUED FOR TENDER	CD
01	21.02.03	ISSUED FOR INFORMATION	CD
Rev	Date	Revision Details	By Ver App

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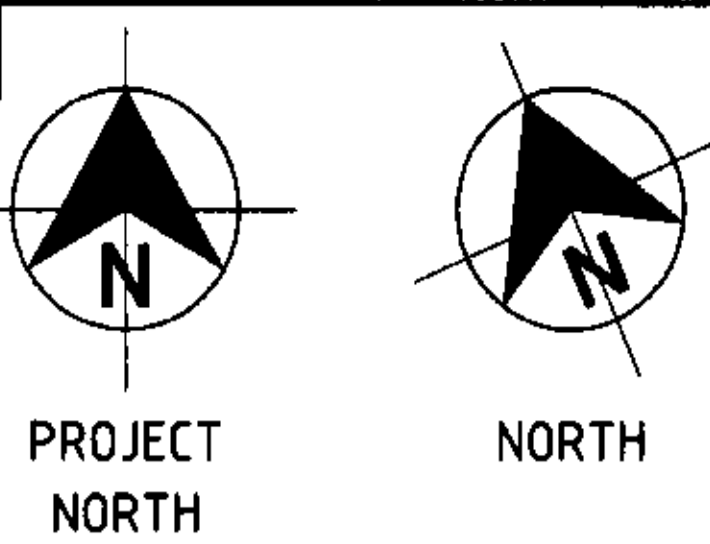
Project:
MONA VALE VILLAGE PARK LIBRARY

Drawing Title:
LIBRARY LEVEL 2 DETAILS

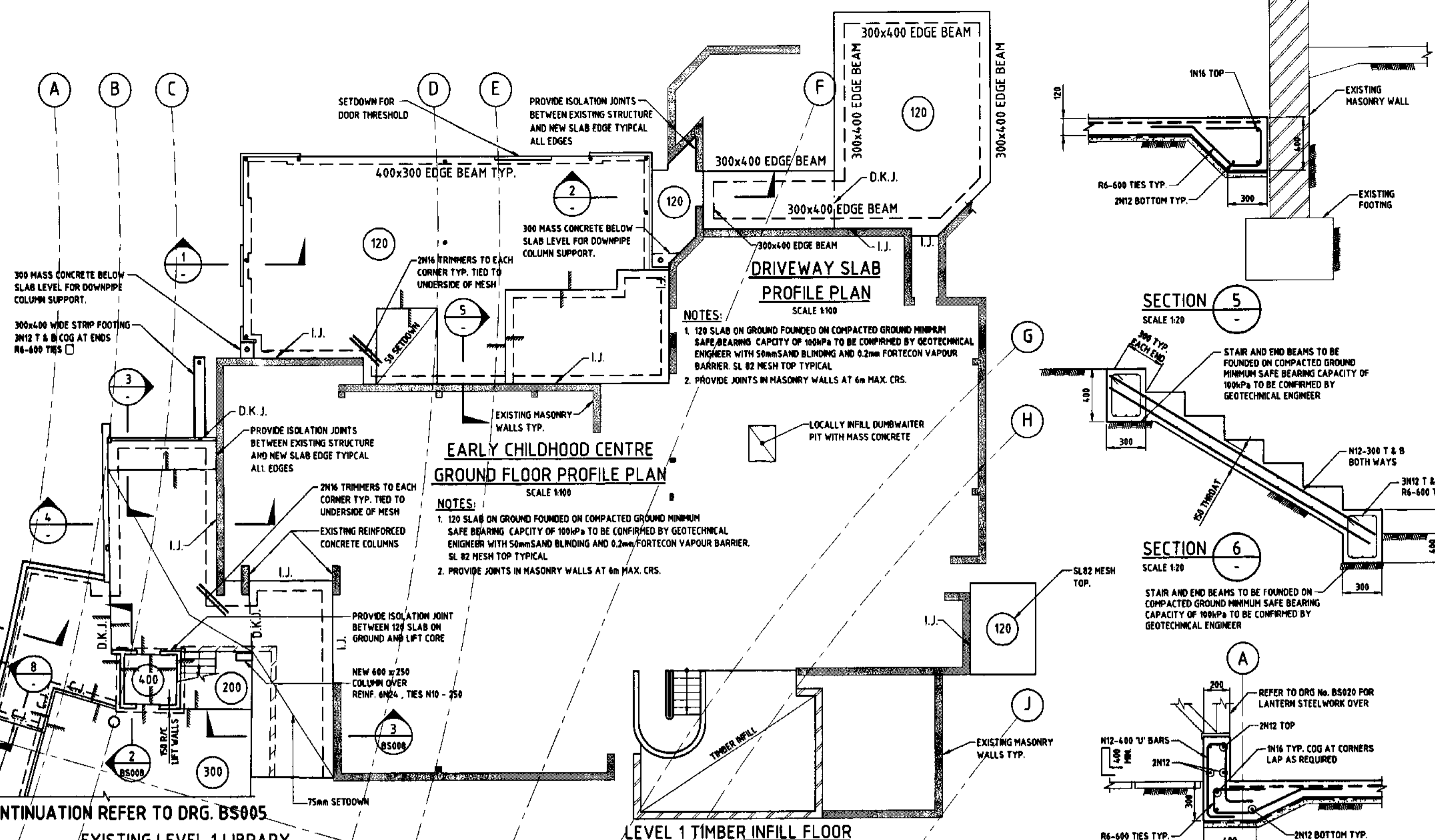
Drawn	Signed	Date	Verified	Signed	Date
CD					
Designed	Signed	Date	Approved	Signed	Date
S.J.G.					
CW Project No.	3785		Scale:	1:20	
Drawing No.	BS013		Revision:	03	

PRELIMINARY

A1



NOTE:
 PROVIDE CHASING TO EXISTING SLAB ON GROUND WHERE REQUIRED FOR NEW PIPE WORK & CABLING



LEGEND

- 300 INDICATES SLAB THICKNESS.
- INDICATES STEP IN SLAB.
- INDICATES PENETRATION IN SLAB.
- INDICATES SETDOWN IN TOP OF SLAB. REFER ARCHITECTS DRAWINGS FOR DEPTH OF SETDOWN.
- INDICATES LOADBEARING CONCRETE WALL UNDER.
- INDICATES LOADBEARING CONCRETE WALL OVER ONLY.
- INDICATES LOADBEARING CONCRETE WALL UNDER & OVER.
- INDICATES LOADBEARING BRICKWORK WALL UNDER.
- INDICATES LOADBEARING BRICKWORK WALL OVER ONLY.
- INDICATES LOADBEARING BRICKWORK WALL UNDER & OVER.
- INDICATES LOADBEARING BLOCKWORK WALL UNDER.
- INDICATES LOADBEARING BLOCKWORK WALL OVER ONLY.
- INDICATES LOADBEARING BLOCKWORK WALL UNDER & OVER.
- INDICATES COLUMN UNDER.
- INDICATES COLUMN OVER ONLY.
- INDICATES COLUMN UNDER & OVER.
- INDICATES PRE-CAMBER AMOUNT IN BEAM, AT MIDSPAN.

Rev	Date	Revision Details	By	Ver	App
03	14.03.03	ISSUED FOR CONSTRUCTION		CD	
CERTIFICATE					
02	27.02.03	ISSUED FOR TENDER		CD	
01	21.02.03	ISSUED FOR INFORMATION		CD	

Cornell Mott MacDonald
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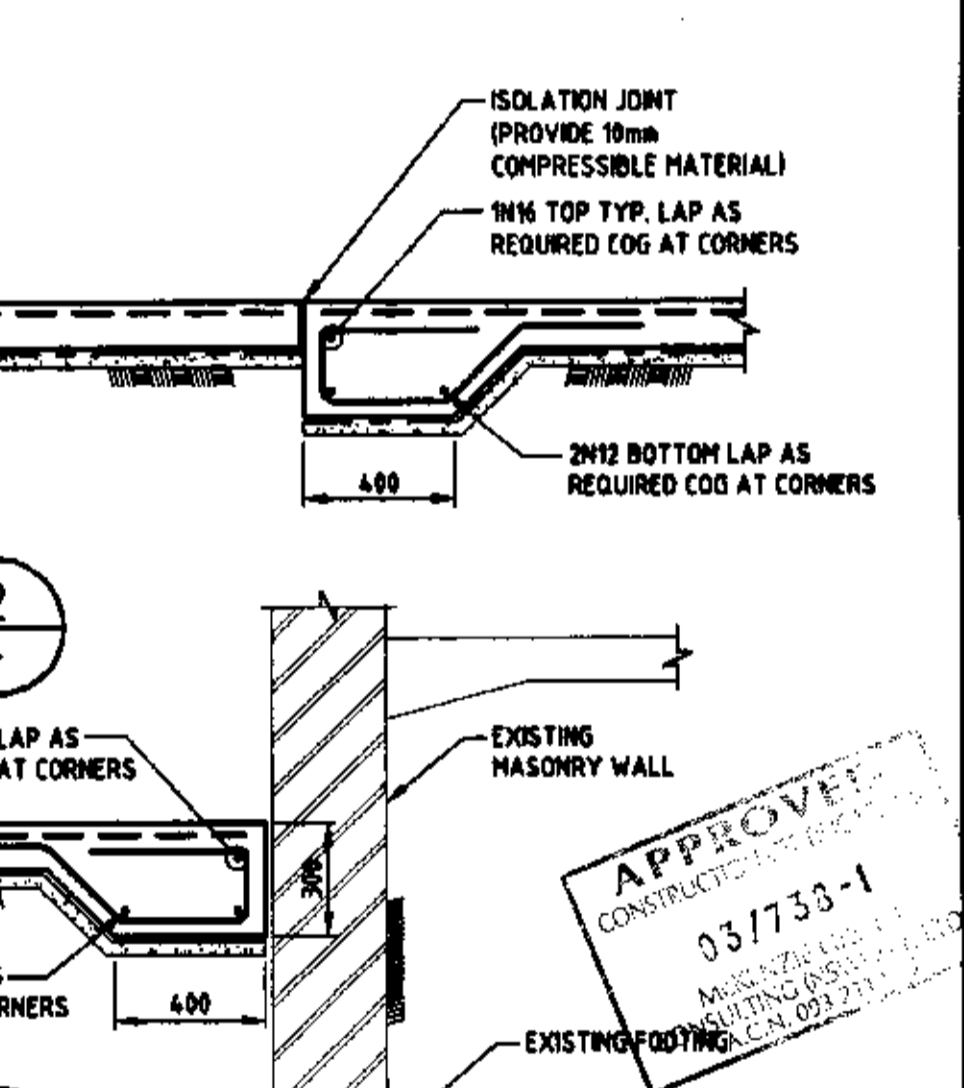
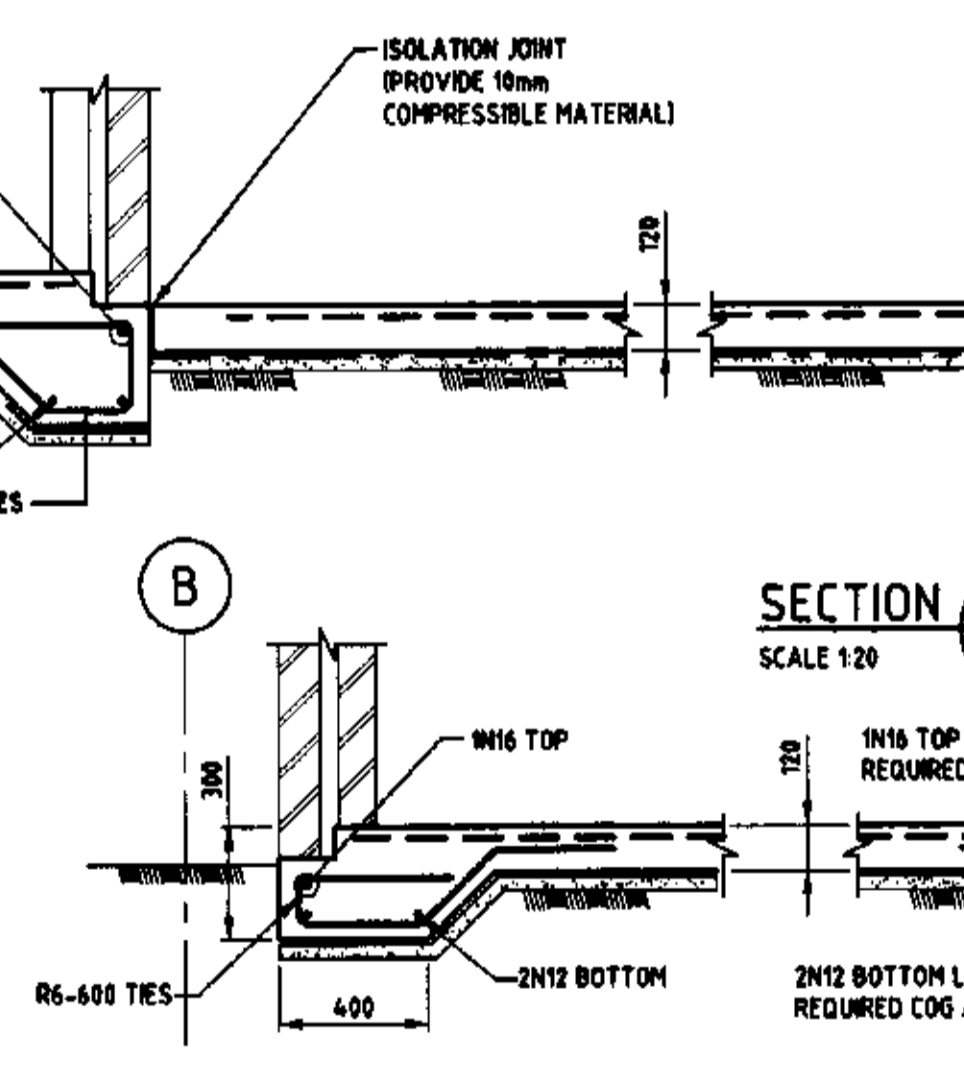
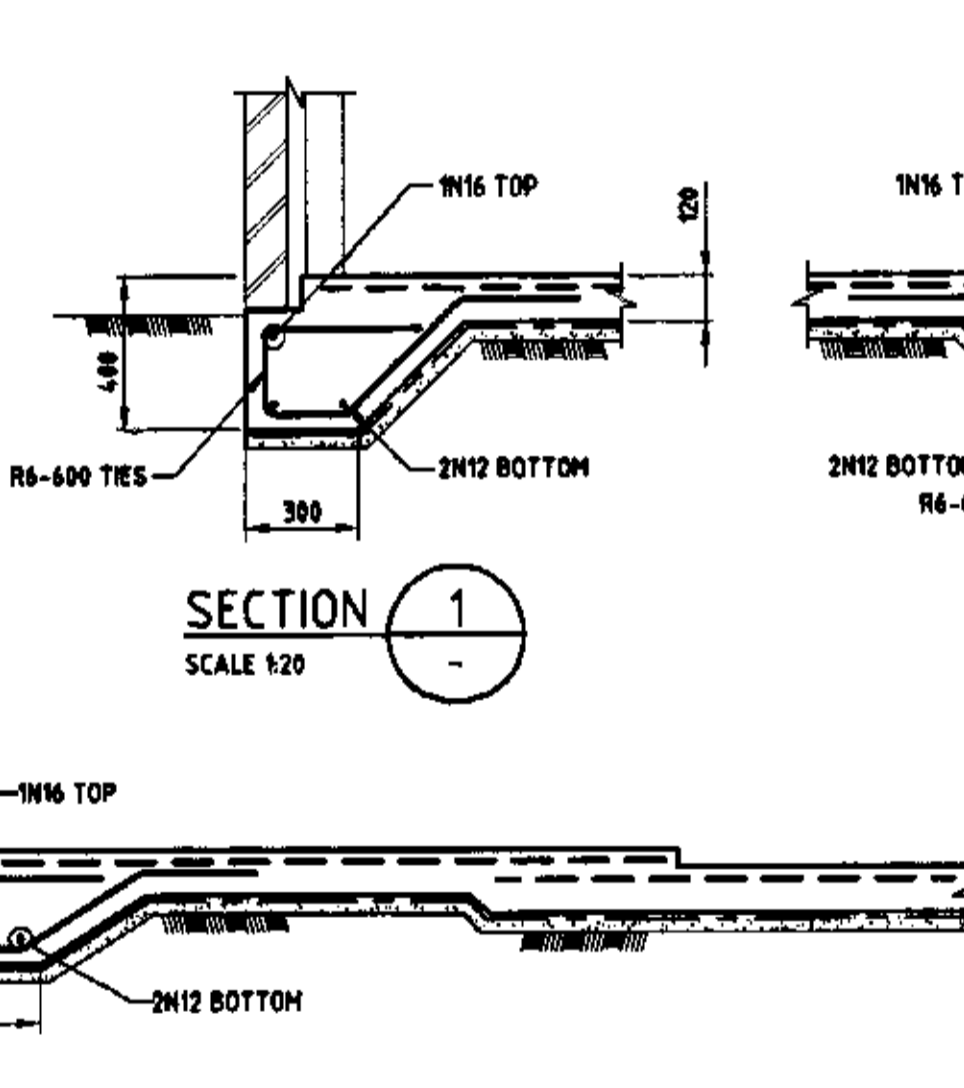
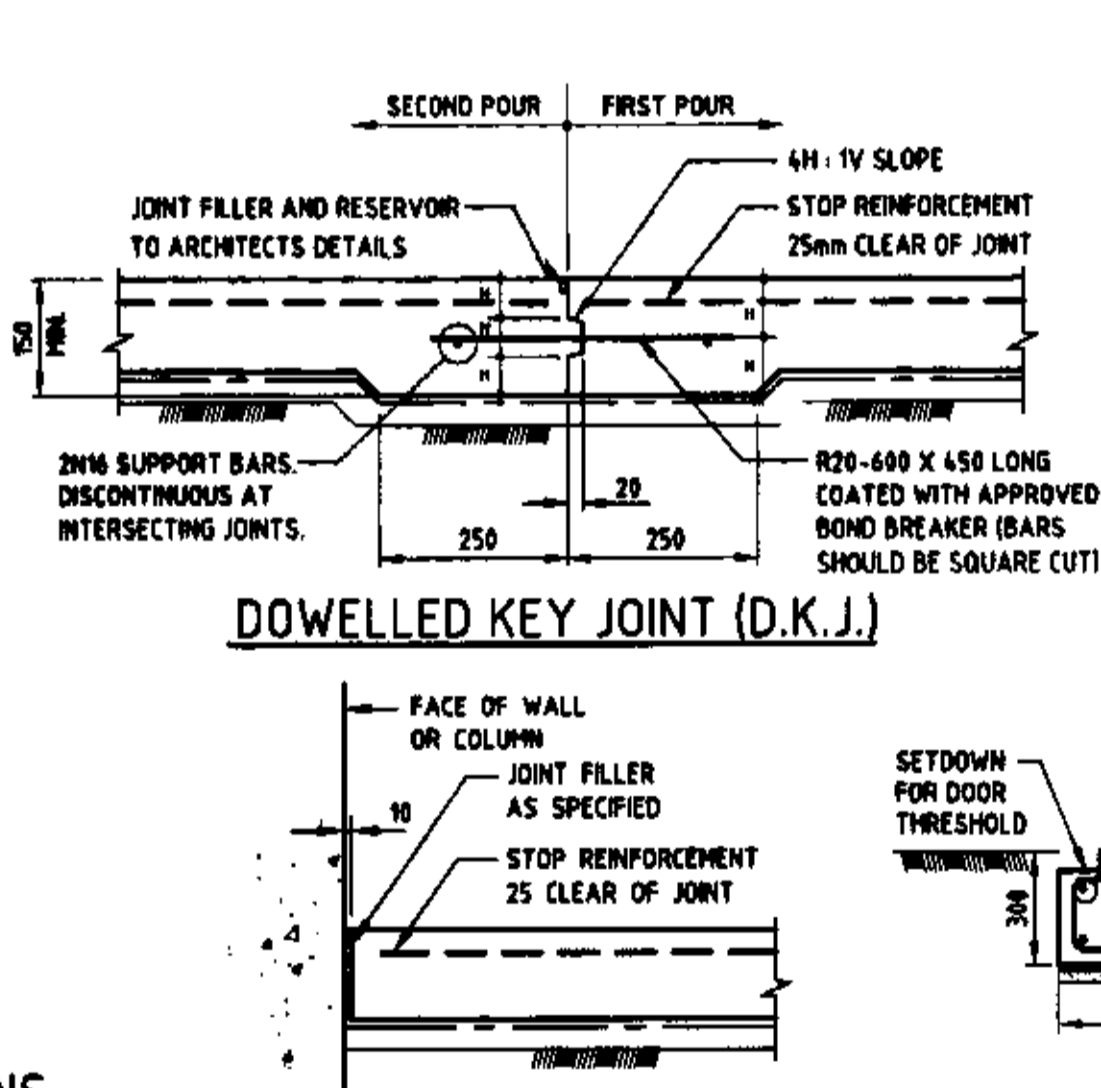
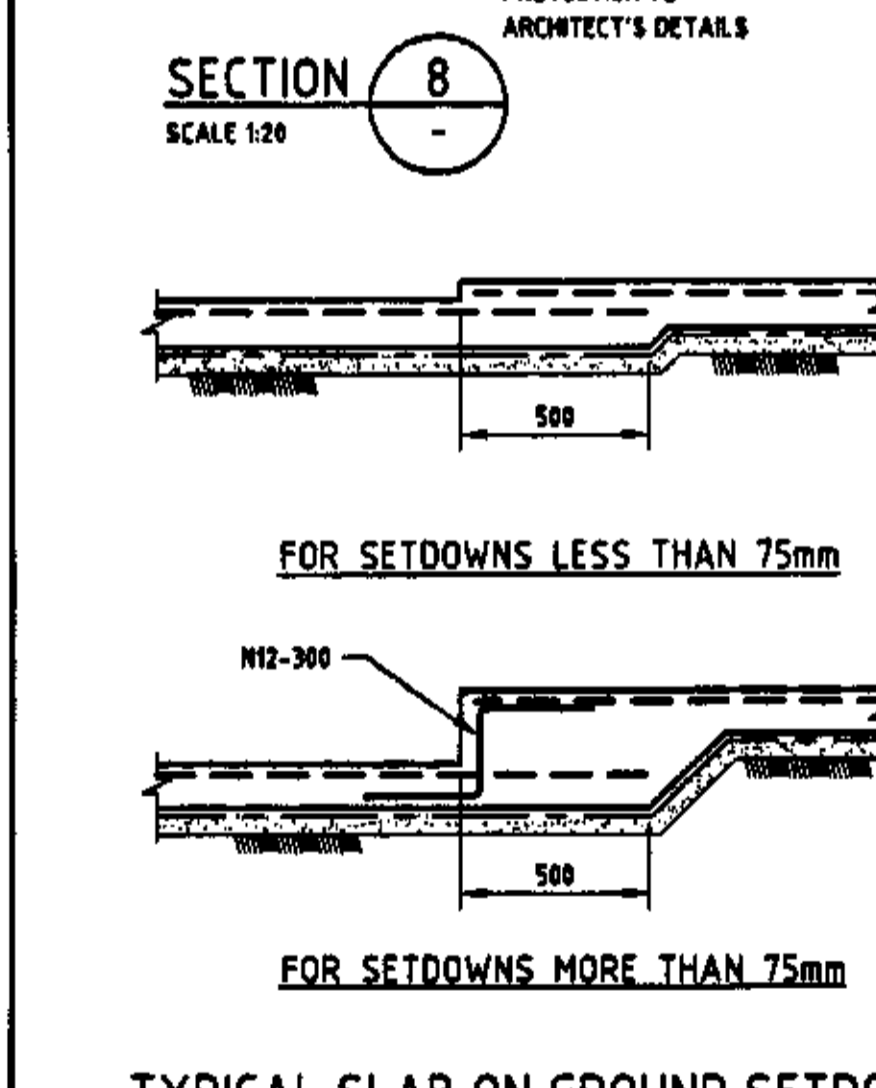
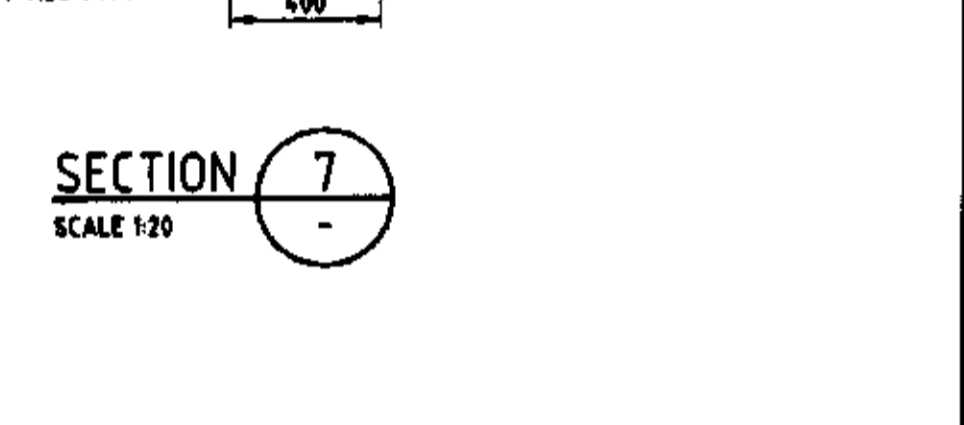
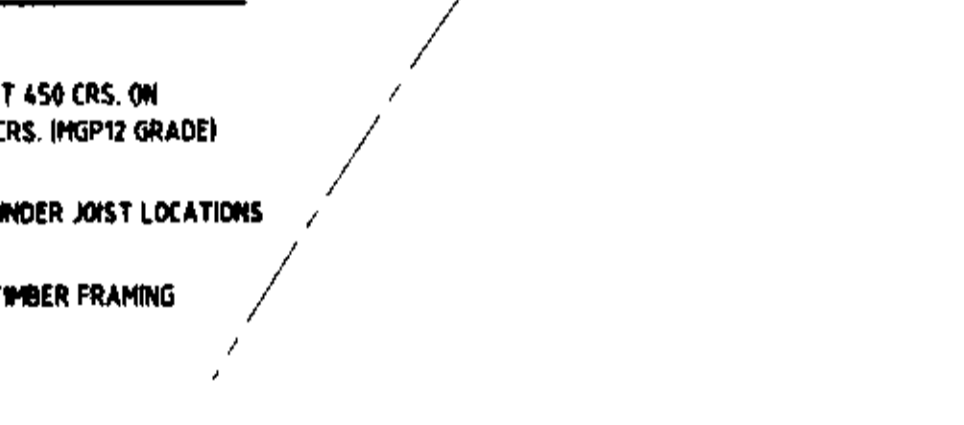
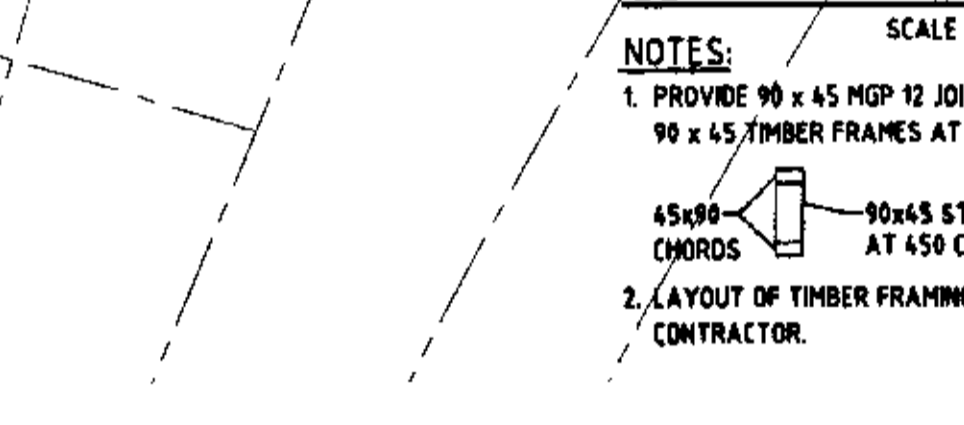
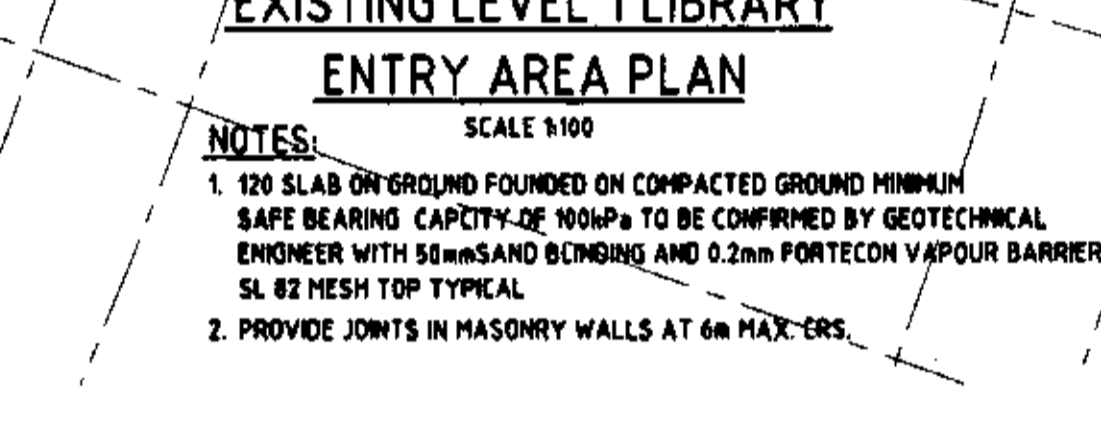
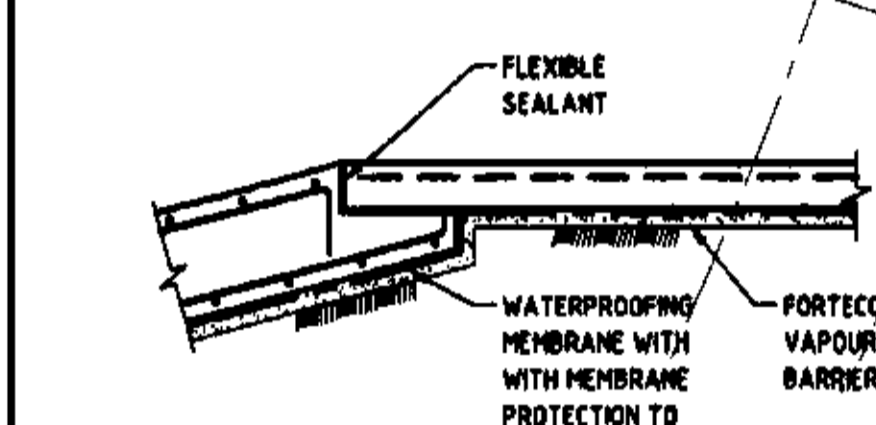
Client:
PITTWATER MUNICIPAL COUNCIL

Project:
MONA VALE VILLAGE PARK LIBRARY

Drawing Title:
EARLY CHILDHOOD CENTRE & EXISTING BUILDING LEVEL 1 MODIFICATION PLANS & DETAILS

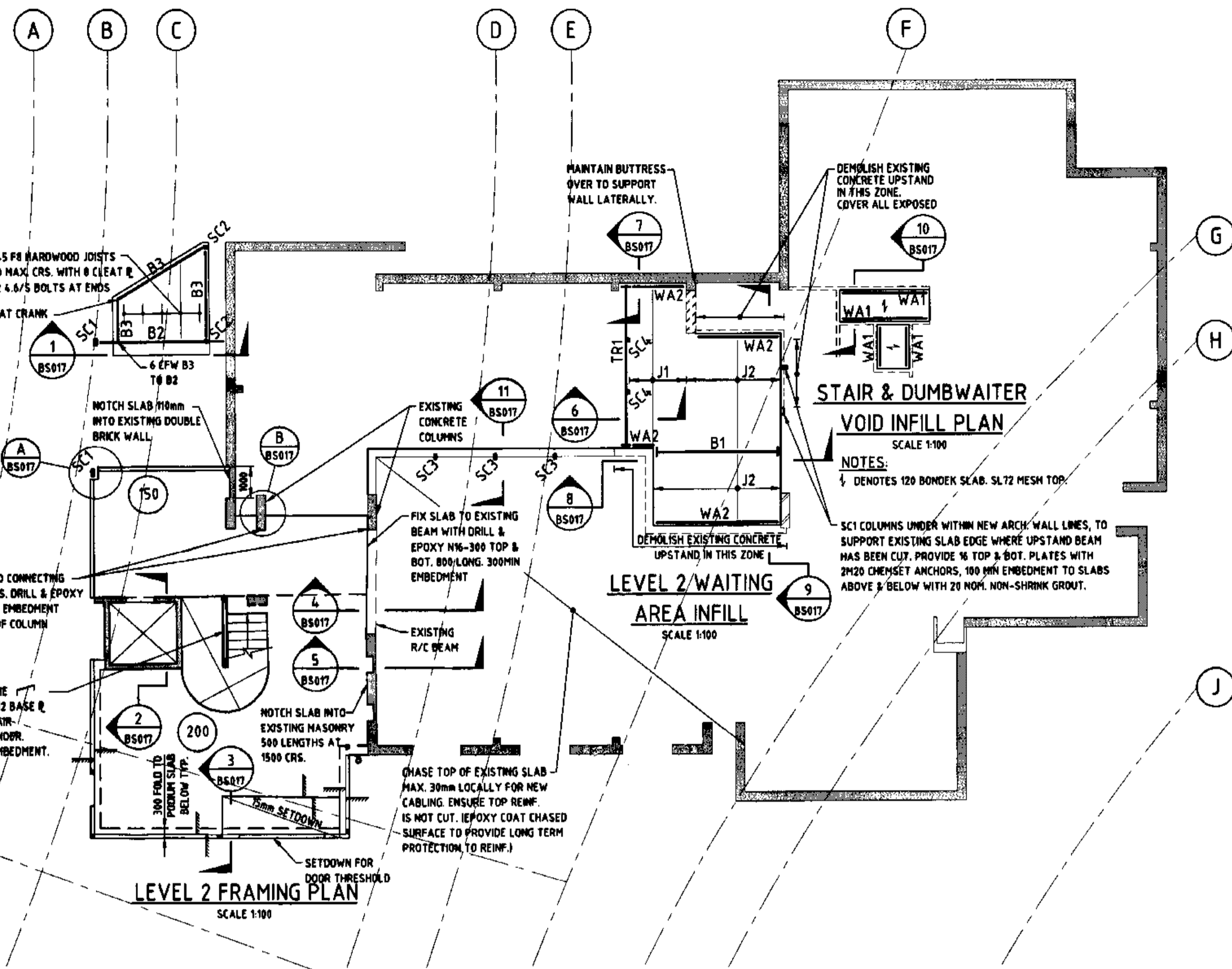
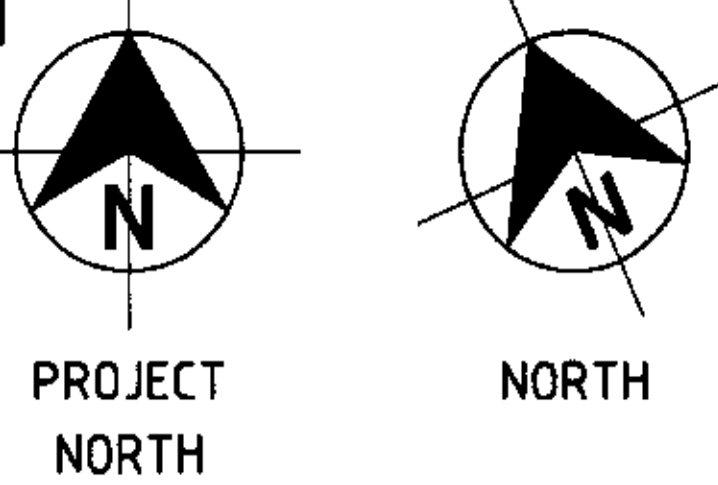
Drawn	Signed	Date	Verified	Signed	Date
CD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
CW Project No. 3785		Scale: 1:100, 1:20			
Drawing No. BS015		Revision: 03			

PRELIMINARY



APPROVED
 CONTRACT NO. 03/1733-1
 03/1733-1

A1



MEMBER SCHEDULE		
MARK	SIZE	REMARKS
B1	150 UC 30	
B2	150x100x6 SHS	
B3	150x50x4 RHS	FULLY WELD B3 FRAME
TR1	TRUSS	150x100x4 RHS TOP & BOT. CHORDS WITH 100x50x4 RHS DIAGONAL INFILLS AT 450 CRS. 800 MIN. DEEP
SC1	200x100x6 RHS	12 BASE R. 4M16 4.6/5 HD BOLTS
SC2	89x4.0 SHS	12 BASE R. 4M16 4.6/5 HD BOLTS
SC3	100x50x4 RHS	
SC4	50x50x4 SHS	
WA1	75 x 6 EA	FIXED TO CONCRETE SLAB EDGE
WA2	100 x 10 EA	
J1	C 150 19	300 CRS. PROVIDE DOUBLE JOIST AT END & HOOGING MIDSPAN.
J2	C 150 19	450 CRS. PROVIDE DOUBLE JOIST AT END & HOOGING MIDSPAN.

- LEGEND**
- INDICATES SLAB THICKNESS.
 - INDICATES STEP IN SLAB.
 - INDICATES PENETRATION IN SLAB.
 - INDICATES SETDOWN IN TOP OF SLAB. REFER ARCHITECTS DRAWINGS FOR DEPTH OF SETDOWN.
 - INDICATES LOADBEARING CONCRETE WALL UNDER.
 - INDICATES LOADBEARING CONCRETE WALL OVER ONLY.
 - INDICATES LOADBEARING CONCRETE WALL UNDER & OVER.
 - INDICATES LOADBEARING BRICKWORK WALL UNDER.
 - INDICATES LOADBEARING BRICKWORK WALL OVER ONLY.
 - INDICATES LOADBEARING BRICKWORK WALL UNDER & OVER.
 - INDICATES LOADBEARING BLOCKWORK WALL UNDER.
 - INDICATES LOADBEARING BLOCKWORK WALL OVER ONLY.
 - INDICATES LOADBEARING BLOCKWORK WALL UNDER & OVER.
 - INDICATES COLUMN UNDER.
 - INDICATES COLUMN OVER ONLY.
 - INDICATES COLUMN UNDER & OVER.
 - INDICATES PRE-CAMBER AMOUNT IN BEAM, AT MIDSPAN

Rev	Date	Revision Details	By	Ver.	App.
03	14.03.03	ISSUED FOR CONSTRUCTION	CD		
CERTIFICATE					
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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Client:

PITTWATER MUNICIPAL COUNCIL

Project:

MONA VALE VILLAGE PARK LIBRARY

Drawing Title:

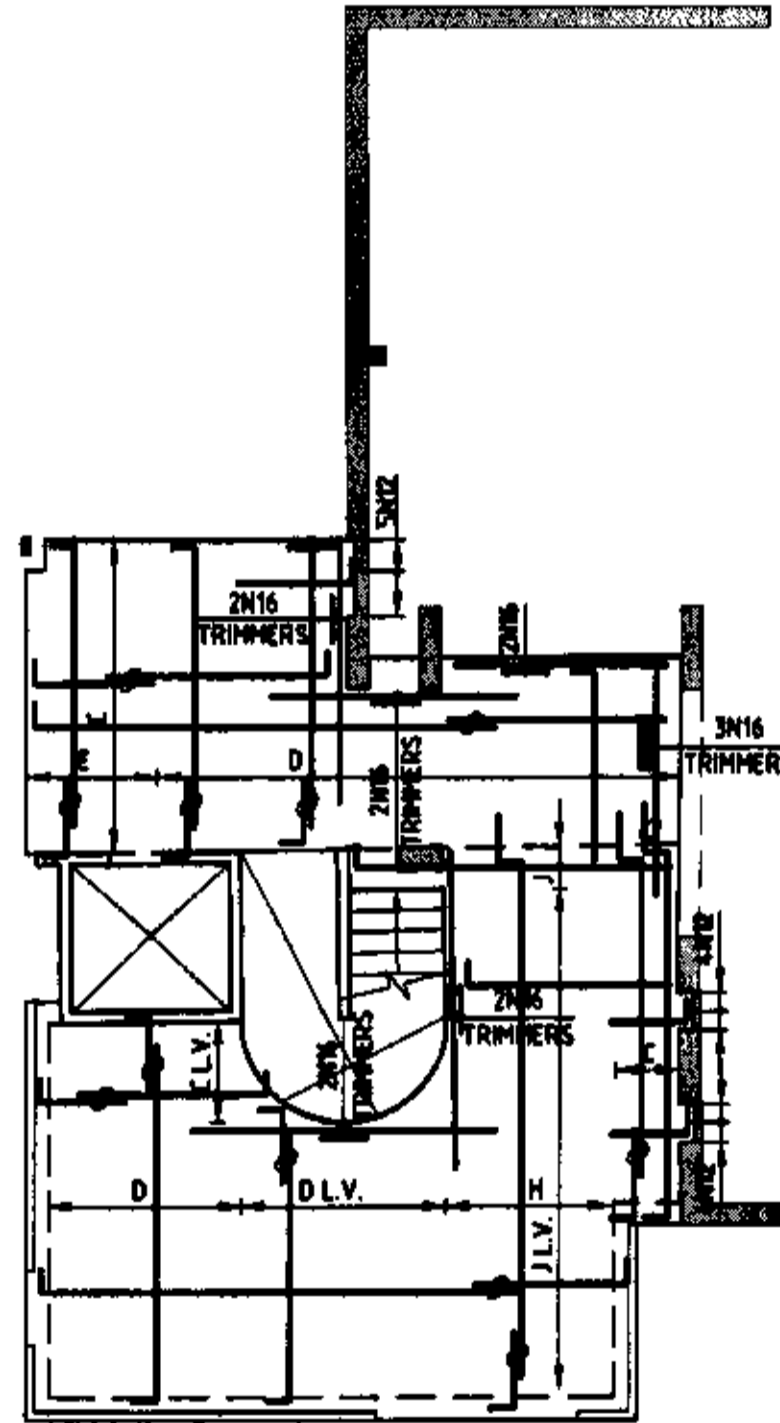
EXISTING BUILDING LEVEL 2 MODIFICATION PLANS

Drawn	Signed	Date	Verified	Signed	Date
CD					

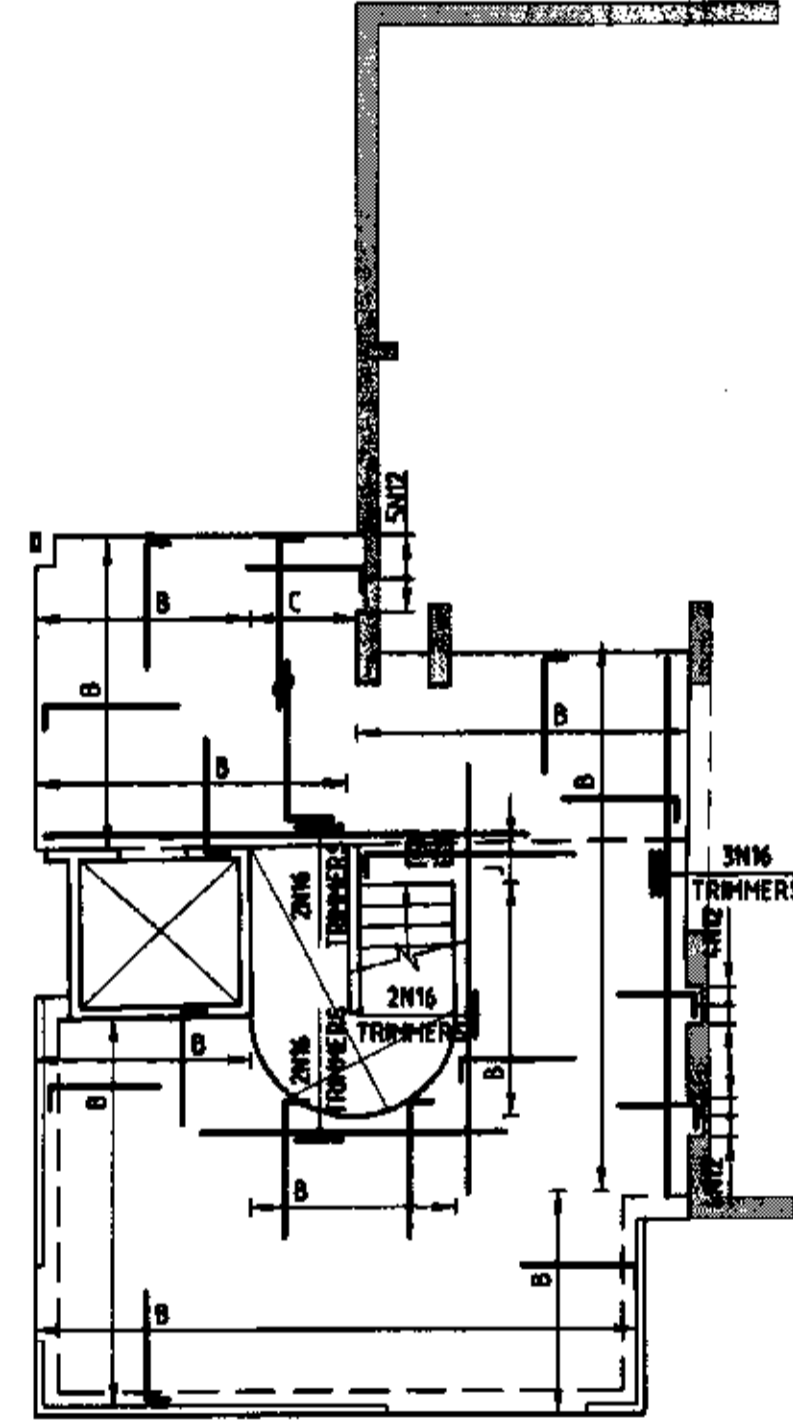
Designed	Signed	Date	Approved	Signed	Date
SJG					

CW Project No. **3785** Scale: **1:100**

Drawing No. **BS016** Revision: **03**



LEVEL 2 BOTTOM REINFORCEMENT PLAN
SCALE 1:100

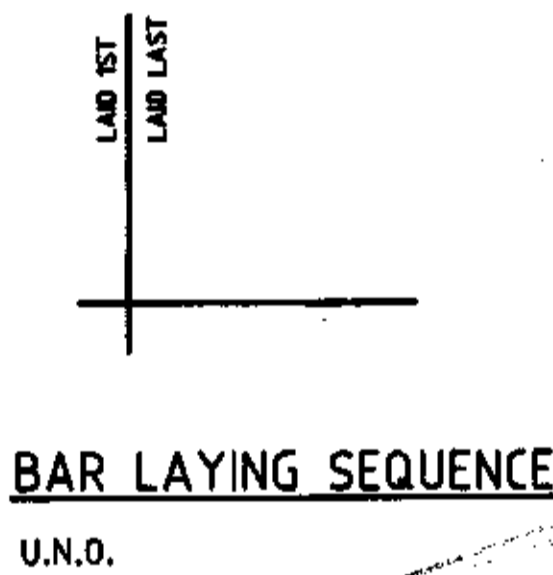


LEVEL 2 TOP REINFORCEMENT PLAN
SCALE 1:100

NOTE:
PROVIDE M12-300 DISTRIBUTION REINFORCEMENT WHERE REQUIRED

REINFORCEMENT TABLE

MARK	REINFORCEMENT
A	N12-300
B	N12-250
C	N12-200
D	N12-175
E	N12-150
F	N16-350
G	N16-300
H	N16-250
J	N16-200
K	N16-175
L	N16-150
M	N16-100
N	N20-300
P	N20-250
R	N20-200
S	N20-175
T	N20-150
V	N20-100
W	N24-300
X	N24-250
Y	N24-200
Z	N24-150



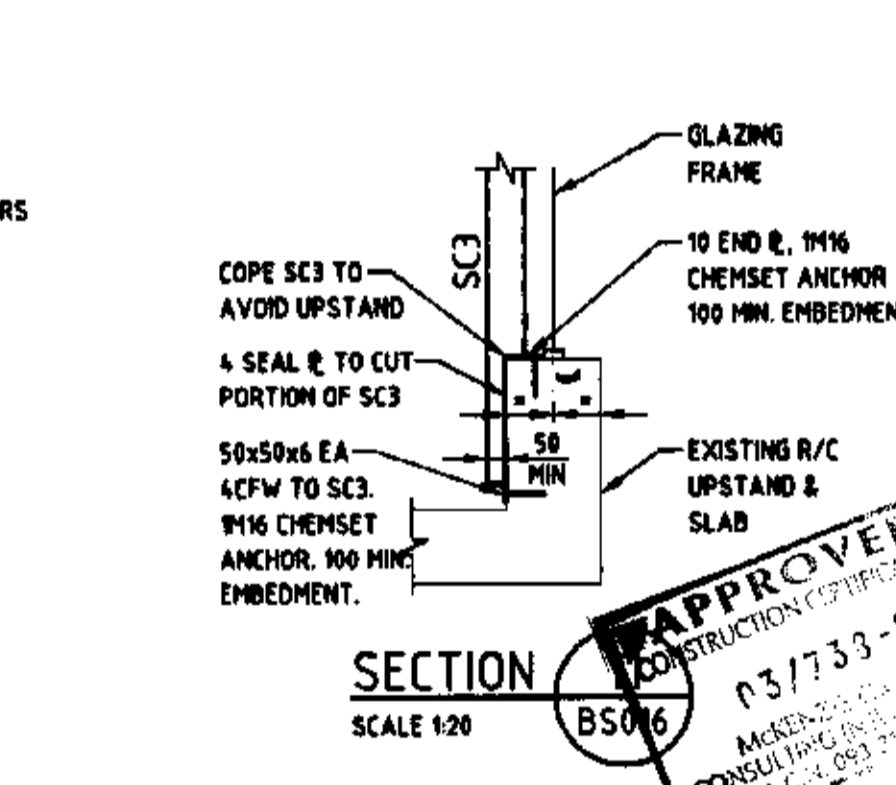
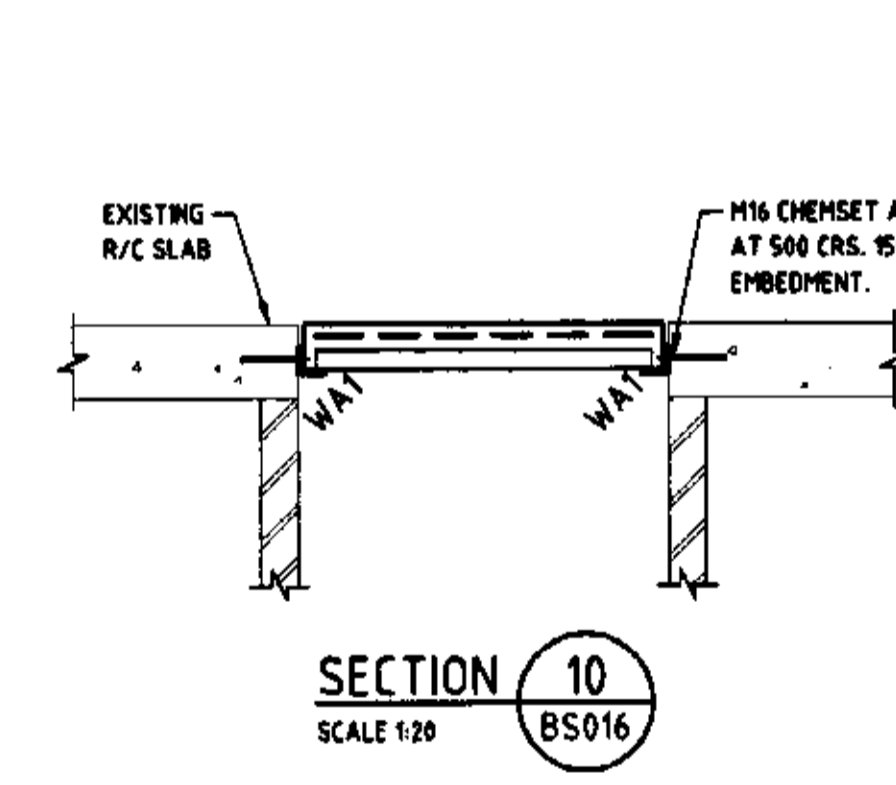
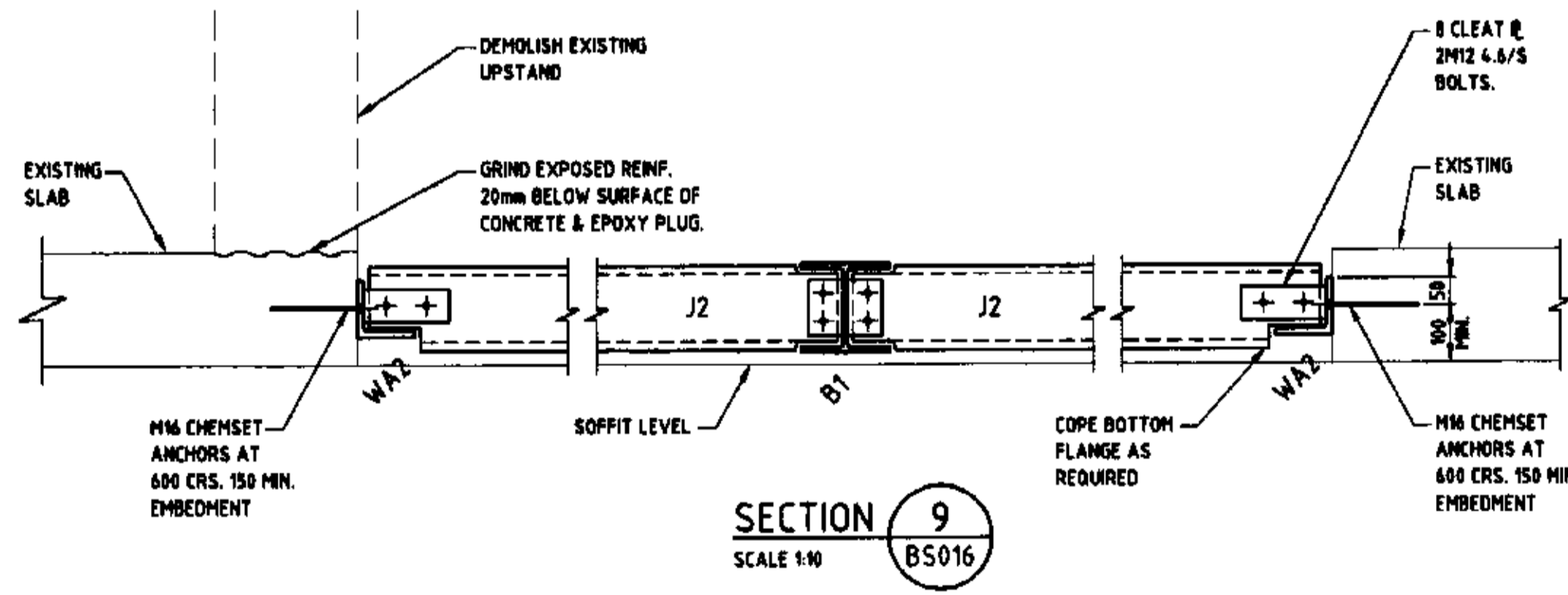
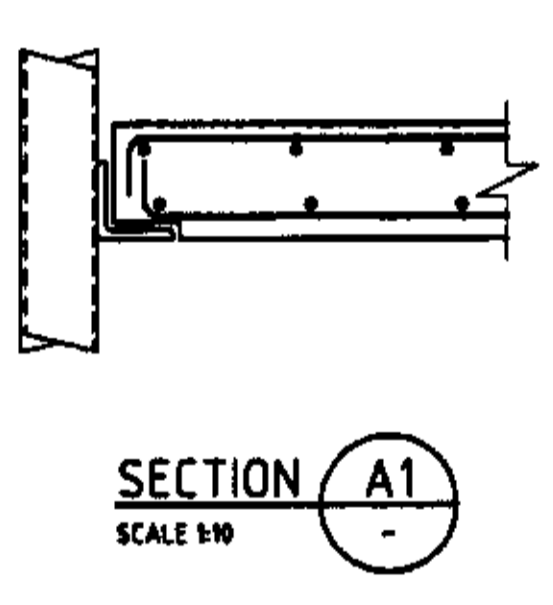
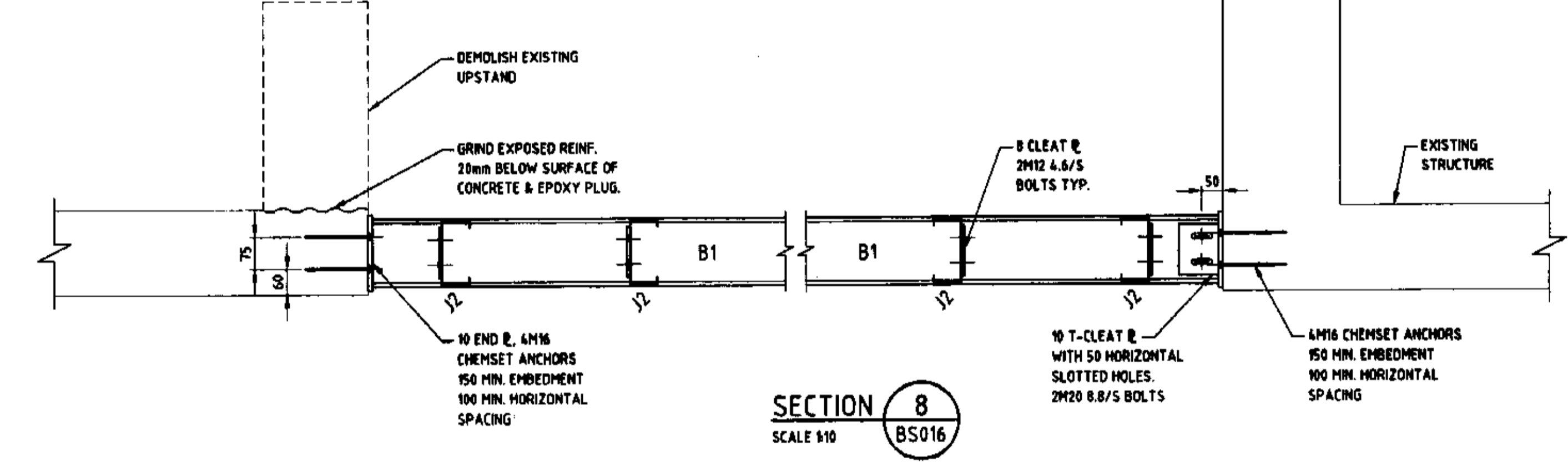
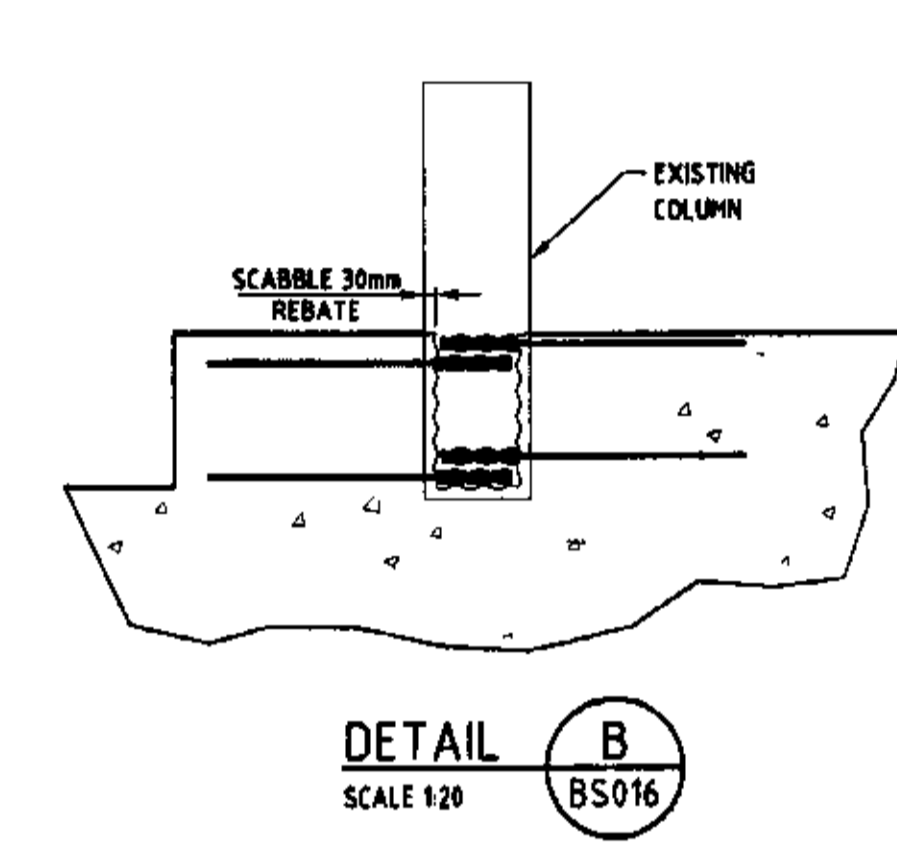
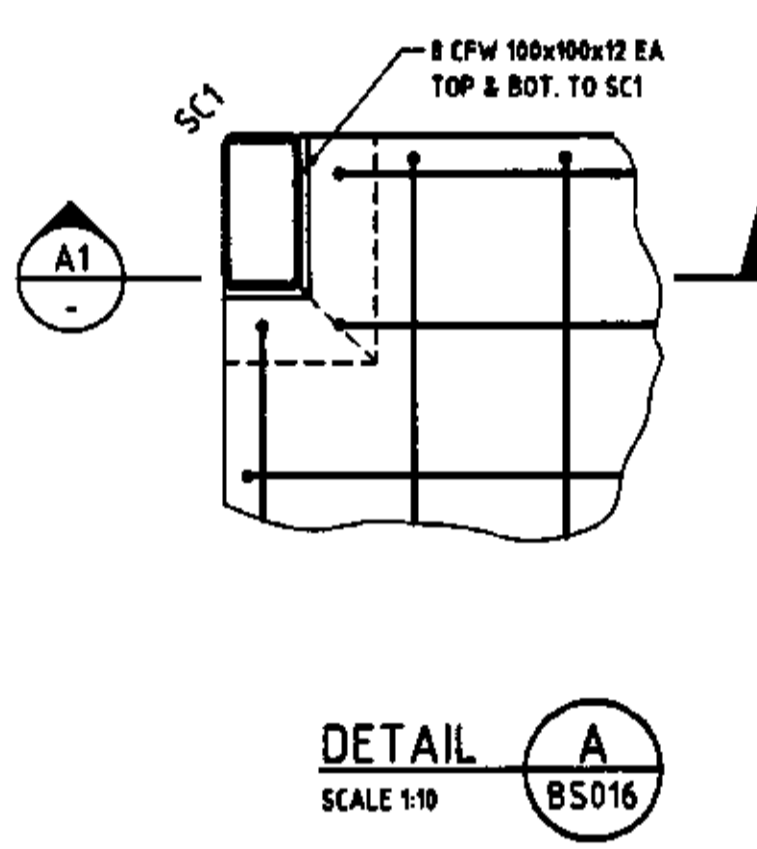
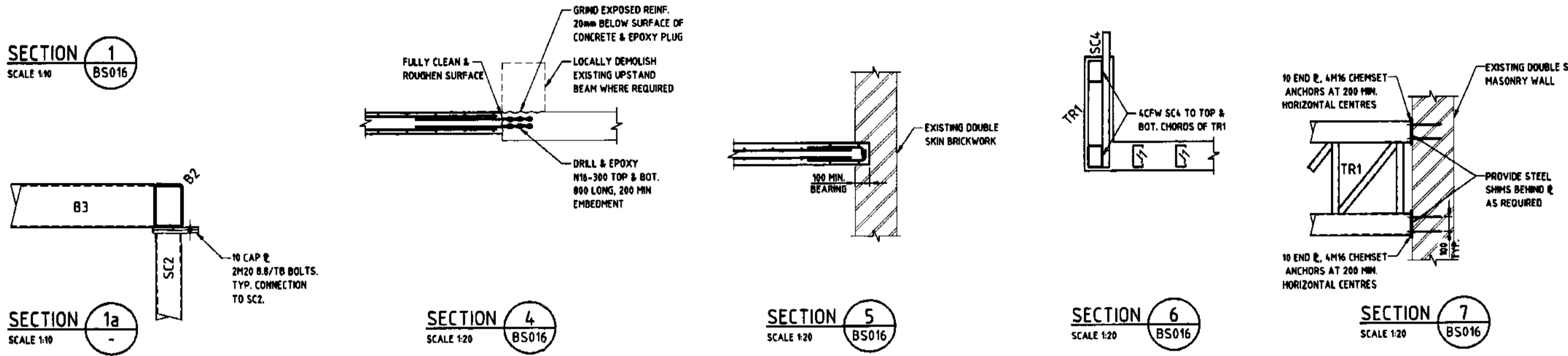
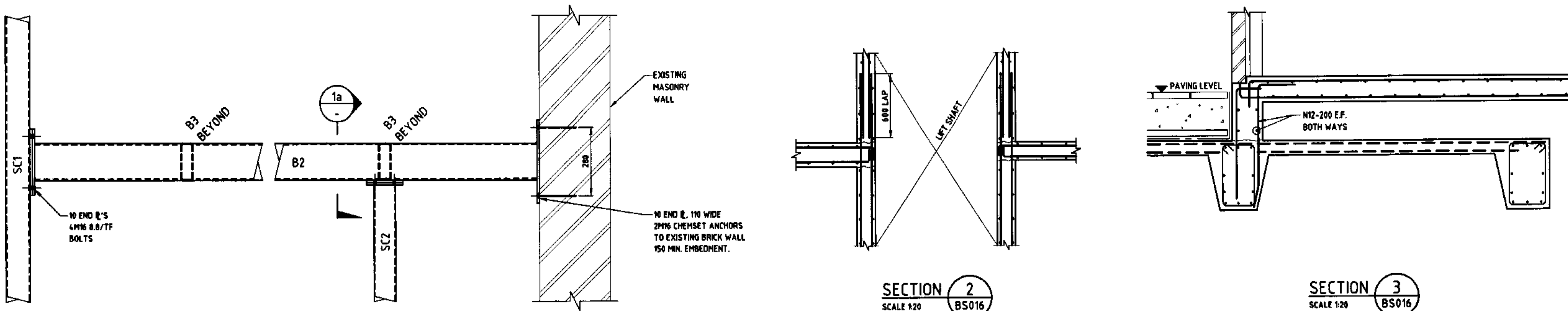
BAR LAYING SEQUENCE

U.N.O.

APPROVED
13.7.03-1
CONNELL MOTT MACDONALD

PRELIMINARY

A1



Rev	Date	Revision Details	By	Ver.	App.
03	14.03.03	ISSUED FOR CONSTRUCTION	CD		
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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Client:
PITTWATER MUNICIPAL COUNCIL

Project:
MONA VALE VILLAGE PARK LIBRARY

Drawing Title:
EXISTING BUILDING LEVEL 2 MODIFICATION DETAILS

Drawn	Signed	Date	Verified	Signed	Date
CD					
SJG			Approved		

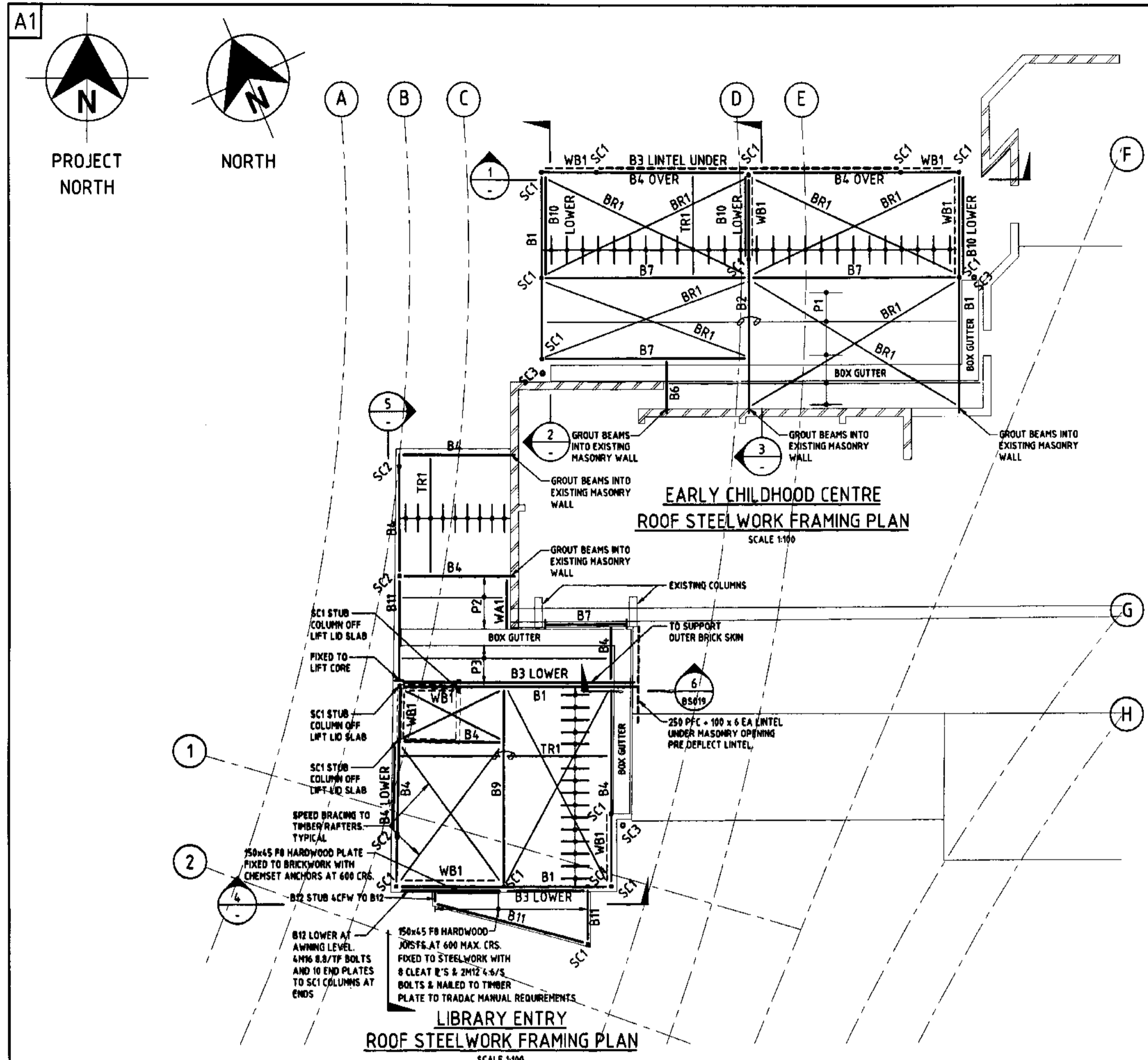
CW Project No. **3785** Scale: **1:10, 1:20**

Drawing No. **BS017** Revision: **03**

APPROVED
CONSTRUCTION CONTRACT NO. 03/733-1
MOTT MACDONALD CONSULTING ENGINEERS PTY LTD
A/C 110537876
110 MILITARY ROAD, NEUTRAL BAY, NSW 1585

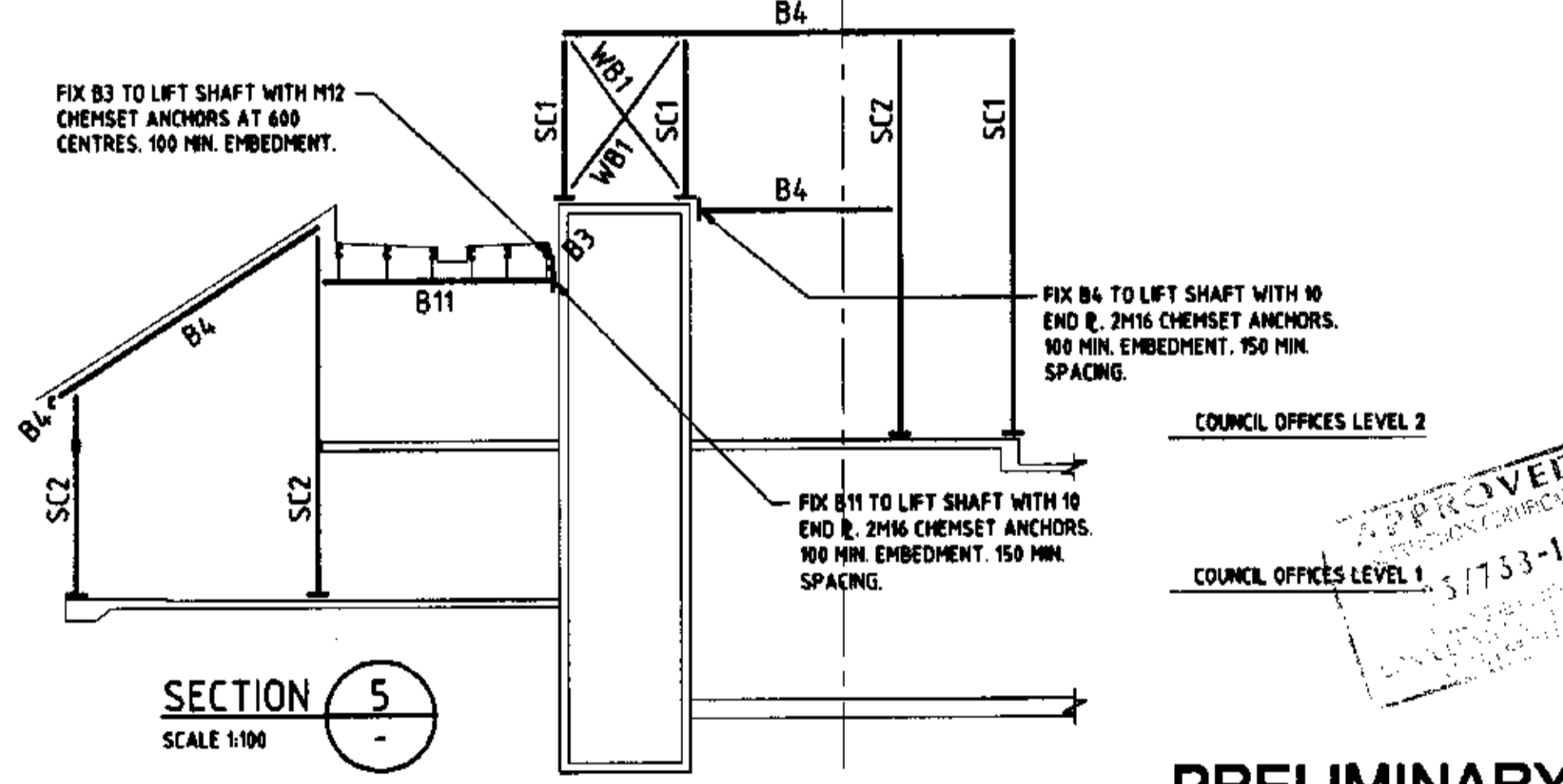
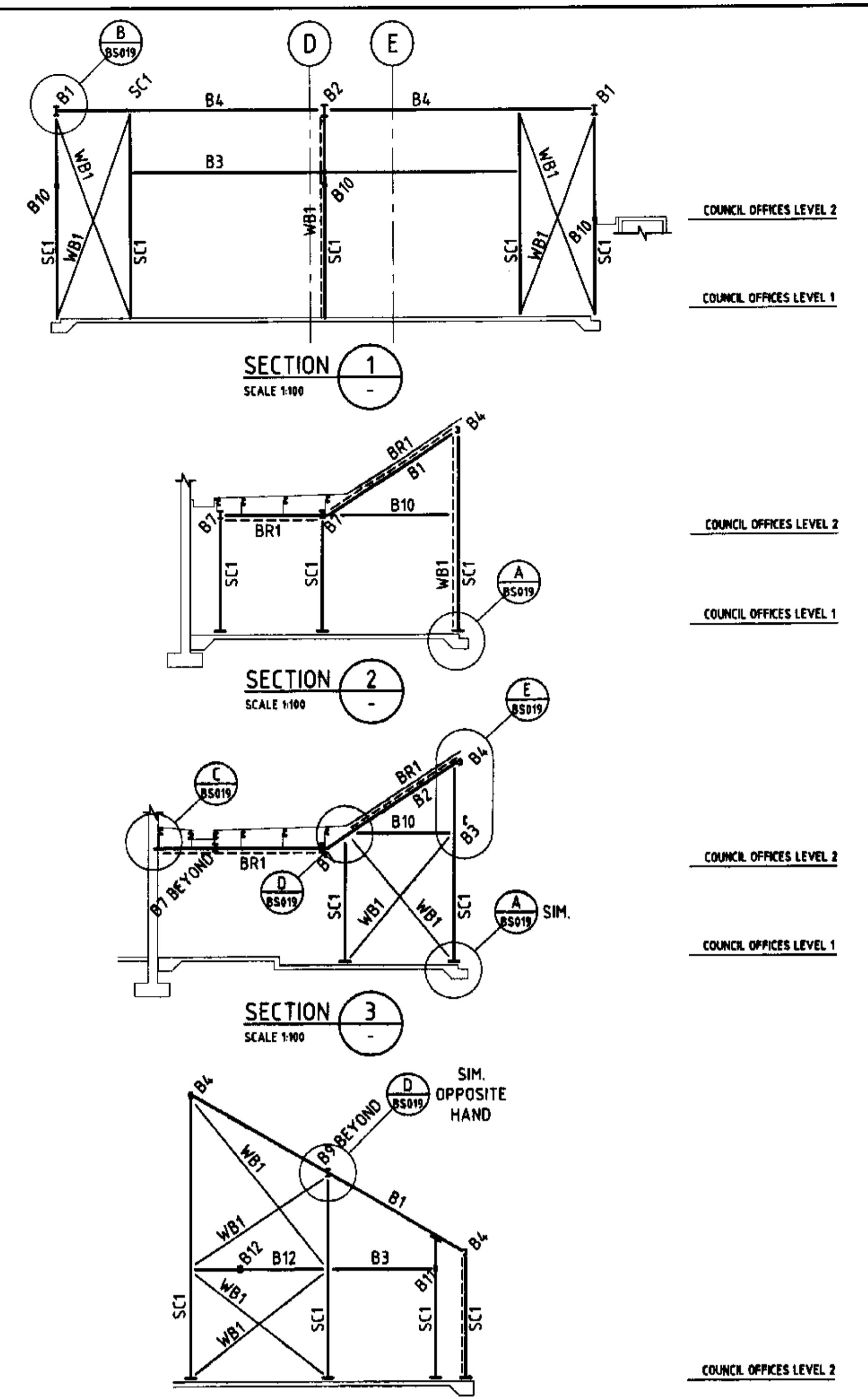
PRELIMINARY

Scale: 1:10, 1:20



ROOF MEMBER SCHEDULE		
MARK	SIZE	REMARKS
B1	250 UB 31	CRANKED WHERE REQUIRED. FSBW AT CRANK.
B2	310 UB 4.0	CRANKED WHERE REQUIRED. FSBW AT CRANK.
B3	200 PFC	LINTEL BEAM
B4	180 PFC	
B5	NOT USED	
B6	150 PFC	PURLIN SUPPORT FIXED TO MASONRY WITH MASONRY ANCHORS.
B7	200 UB 22	
B8	100x100x6 EA	MASONRY HEAD RESTRAINT
B9	200 UB 30	
B10	89 x 4 CHS	
B11	150 x 50 x 4 RHS	
B12	150 x 100 x 4 RHS	

ROOF MEMBER SCHEDULE		
MARK	SIZE	REMARKS
BR1	Ø 12 ROD	CLIP TO U/S OF ROOF AT 1/3 POINTS
P1	C 150 19	1200 CRS. 2 ROWS OF BRIDGING. 900 CRS. AT ENDS.
P2	C 150 12	1200 CRS. 1 ROW OF BRIDGING. 900 CRS. AT ENDS.
P3	C 150 19	900 MAX. CRS.
SC1	89 x 5.0 SHS	FIX TO NEW & EXISTING MASONRY WALLS WITH MASONRY TIES AT 600 CRS. POWER FIXED TO COLUMN TYP. WHERE ADJACENT TO MASONRY WALLS.
SC2	200 x 100 x 6 RHS	
SC3	150 x 4.0 CHS	DOWNPIPE COLUMN WITH 90° RAINWATER HEAD. & CPW TO COLUMN & Ø CLEAT @'S TO STEELWORK & MASONRY WALLS. AS REQUIRED. 10 BASE @ WITH 4M16 HD BOLTS.
TR1	150x50 MGP 12 TIMBER	TIMBER RAFTERS AT 150 CRS. SUPPORTING 50x40 HOP 10 BATTENS (N.S.G.P.) AT SPACING TO SUIT TILES.
WA1	100x100x6 EA	WALL ANGLE FIXED TO MASONRY AT 600 CRS. WITH M16 CHEMSET ANCHORS 150 MIN EMBEDMENT.
WB1	50x10 FLAT	CROSS BRACING



Rev	Date	Revision Details	By	Ver	App
03	14.03.03	ISSUED FOR CONSTRUCTION	CD		
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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Client:
PITTWATER MUNICIPAL COUNCIL

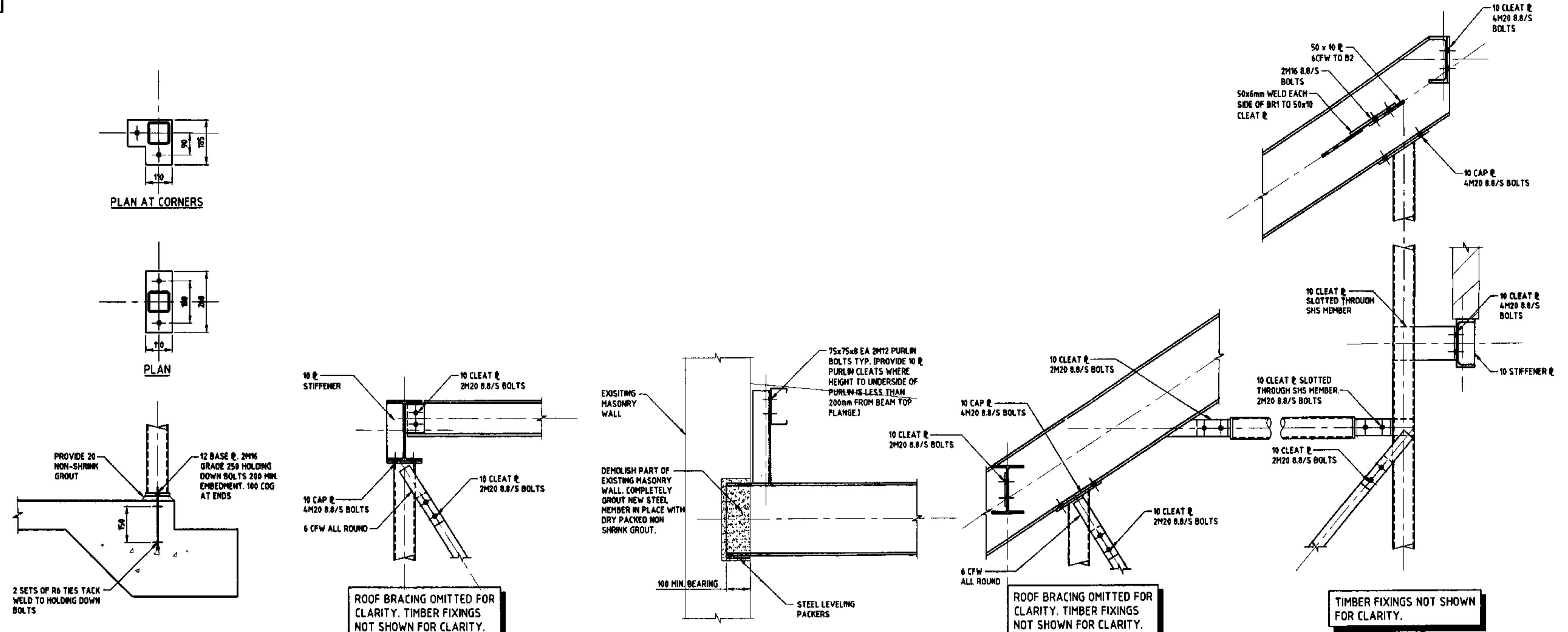
Project:
MONA VALE VILLAGE PARK LIBRARY

Drawing Title:
EARLY CHILDHOOD CENTRE & EXISTING BUILDING ROOF MODIFICATION PLAN & ELEVATIONS

Drawn	Signed	Date	Verified	Signed	Date
CD					
Design	Signed	Date	Approved	Signed	Date
SJG					
CW Project No. 3785		Scale: 1:100			
Drawing No. BS018		Revision: 03			

PRELIMINARY

Scale: 1:100



DETAIL A
SCALE 1:10
BS018

TYPICAL BASE PLATE DETAIL

DETAIL B
SCALE 1:10
BS018

TYPICAL WALL BRACING CONNECTION DETAIL

DETAIL C
SCALE 1:10
BS018

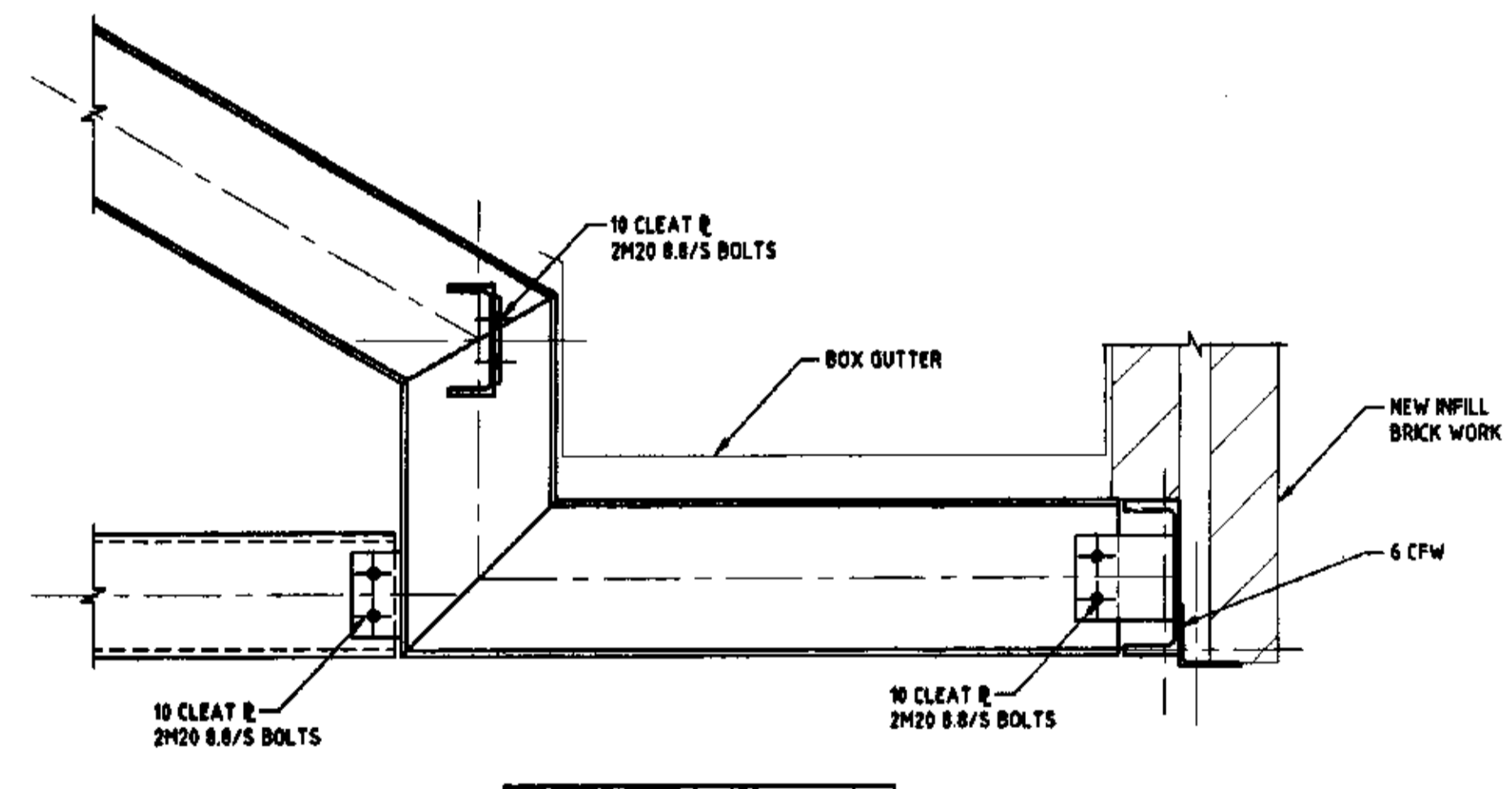
TYPICAL NEW BEAM TO EXISTING MASONRY WALL CONNECTION DETAIL AND TYPICAL PURLIN CONNECTION DETAIL

DETAIL D
SCALE 1:10
BS018

TYPICAL PURLIN CONNECTION DETAIL

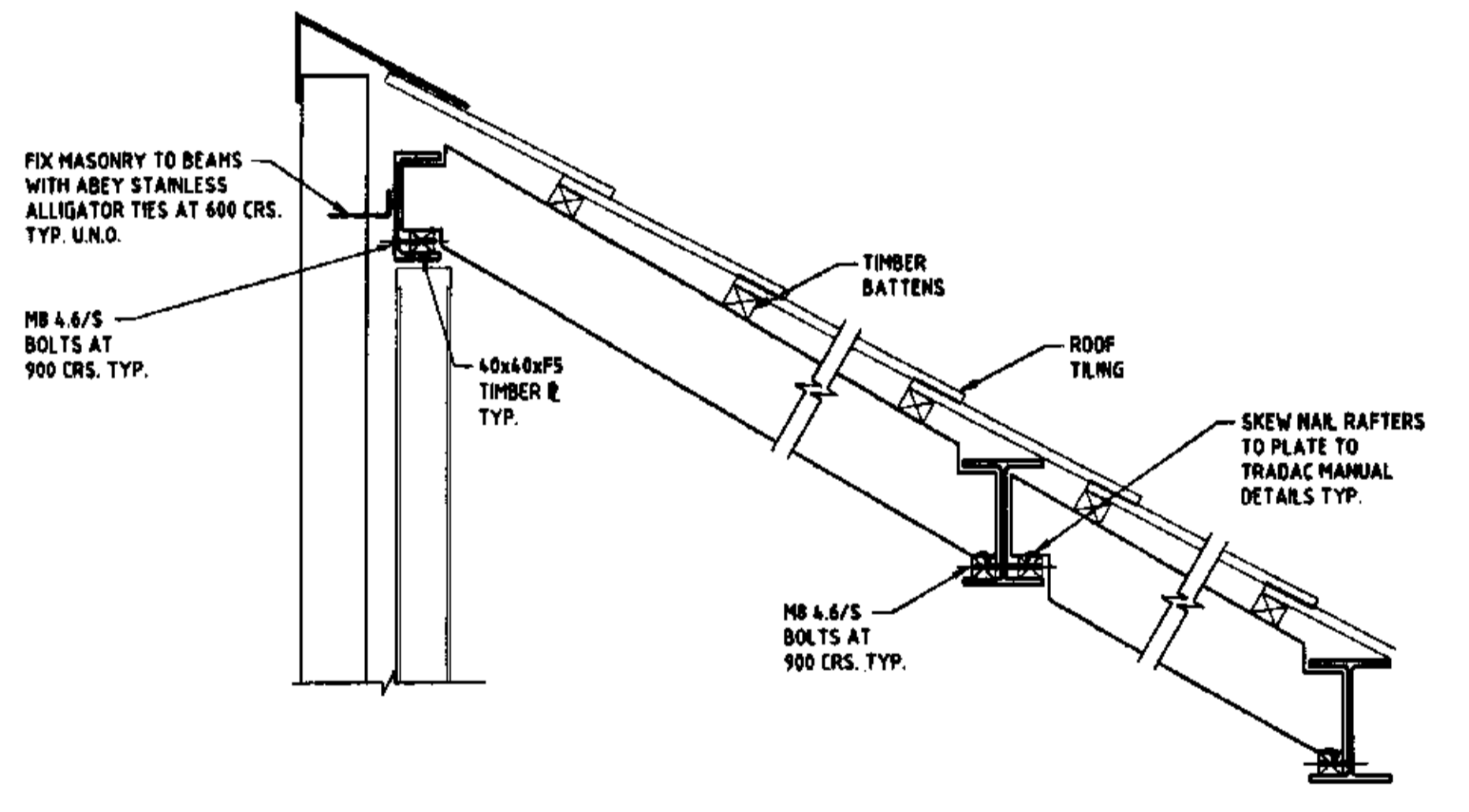
DETAIL E
SCALE 1:10
BS018

TYPICAL TIMBER FIXINGS TO STEEL BEAMS



TIMBER FIXINGS NOT SHOWN FOR CLARITY.

SECTION 6
SCALE 1:10
BS018



TYPICAL TIMBER FIXINGS TO STEEL BEAMS

Rev	Date	Revision Details	By	Ver.	App
03	14.03.03	ISSUED FOR CONSTRUCTION CERTIFICATE	CD		
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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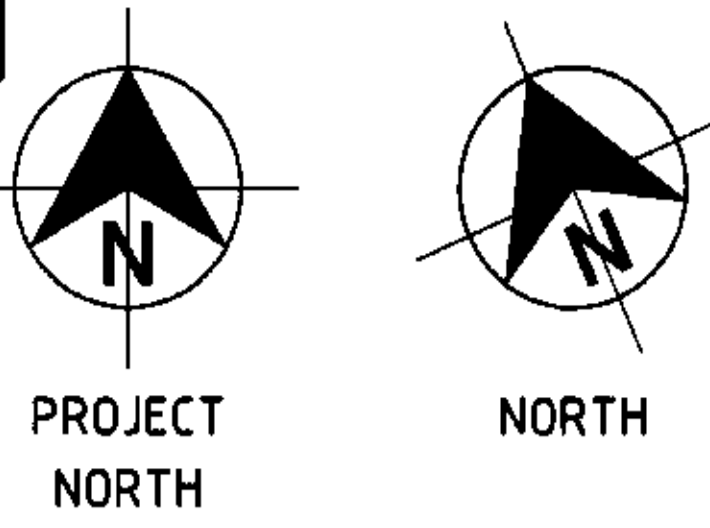
Project:
VILLAGE PARK LIBRARY

Drawing Title:
EARLY CHILDHOOD CENTRE & EXISTING BUILDING ROOF DETAILS

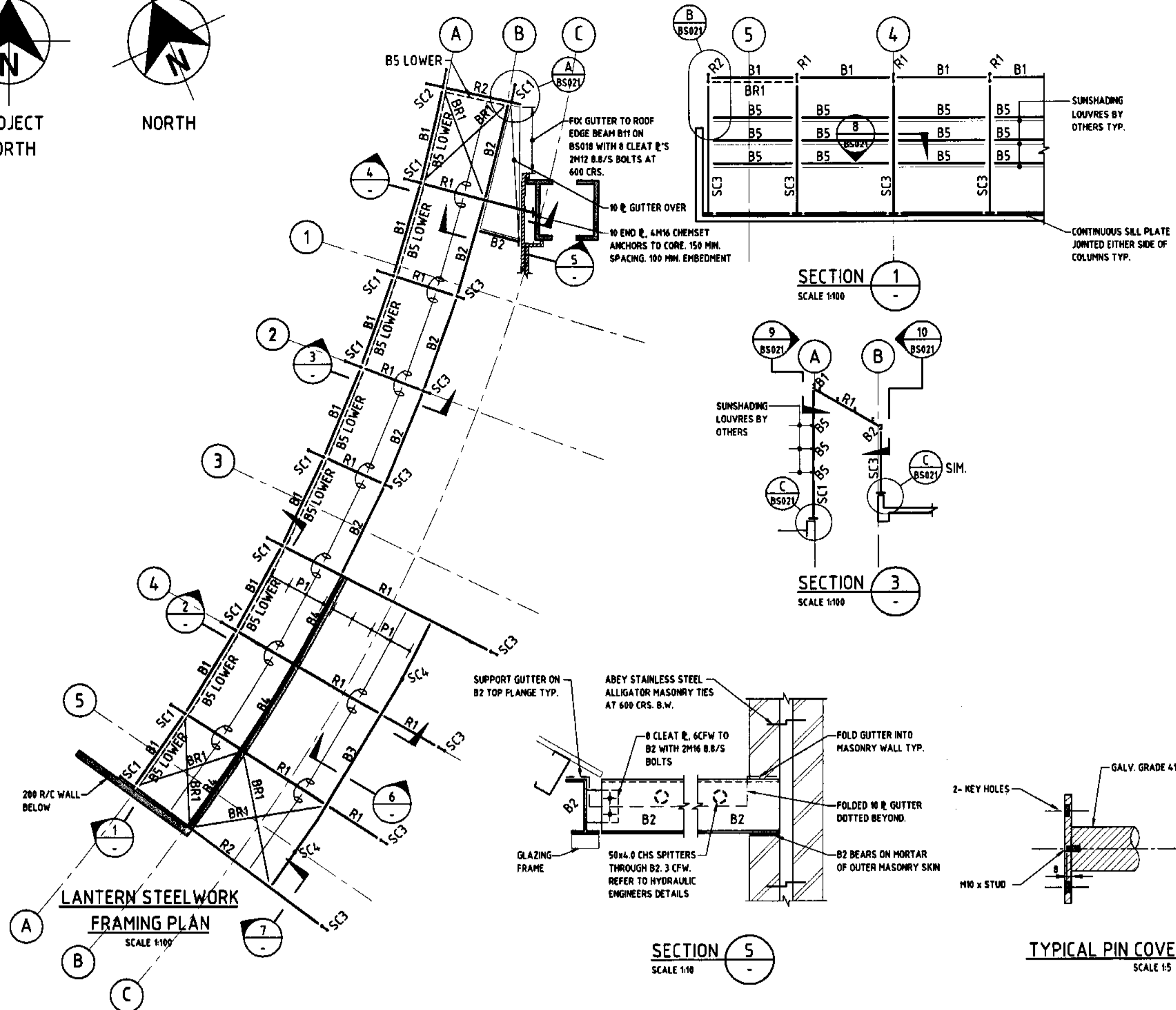
Drawn	Signed	Date	Verified	Signed	Date
CD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
Project No				Scale	
3785				1:10	
Drawing No				Revision	
BS019				03	

APPROVED
CONSTRUCTION CERTIFICATE No. 037733-1
ASSISTIVE GROUP
CONSTRUCTION GROUP
PRELIMINARY

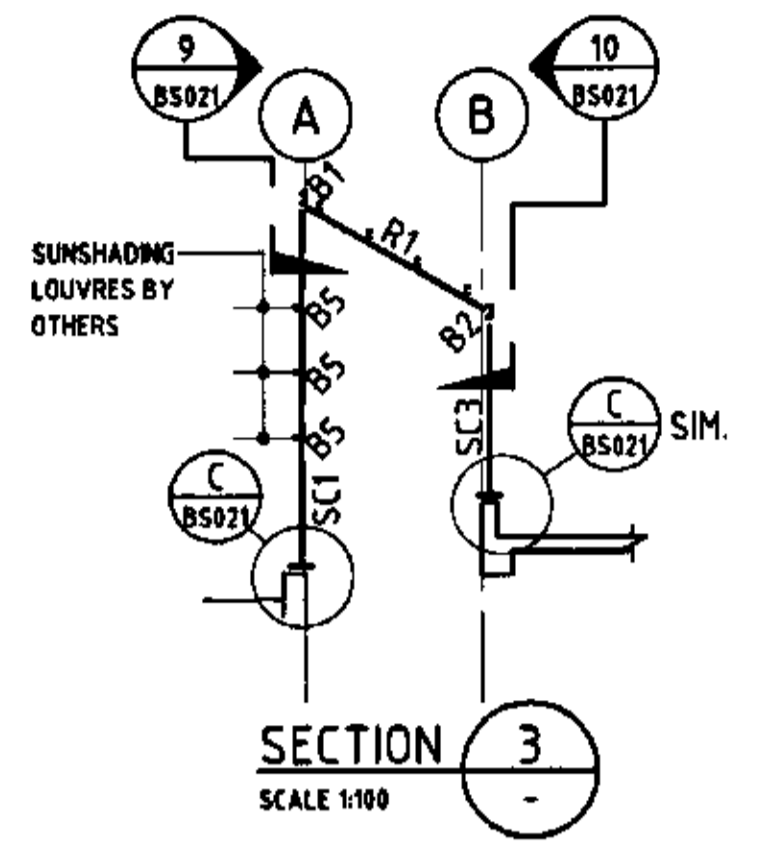
A1



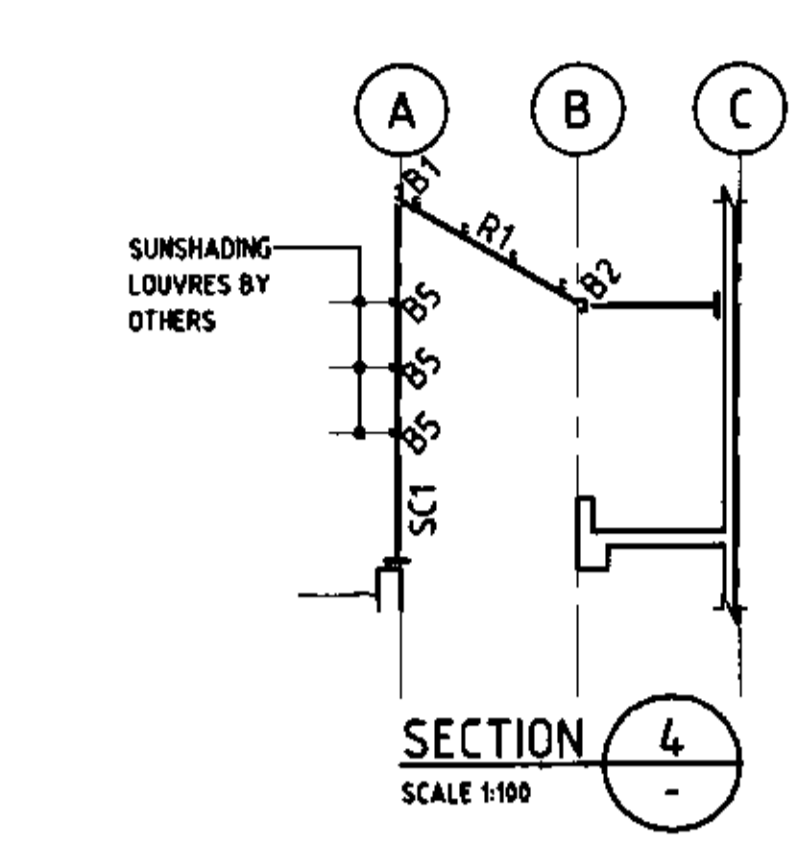
PROJECT NORTH
NORTH



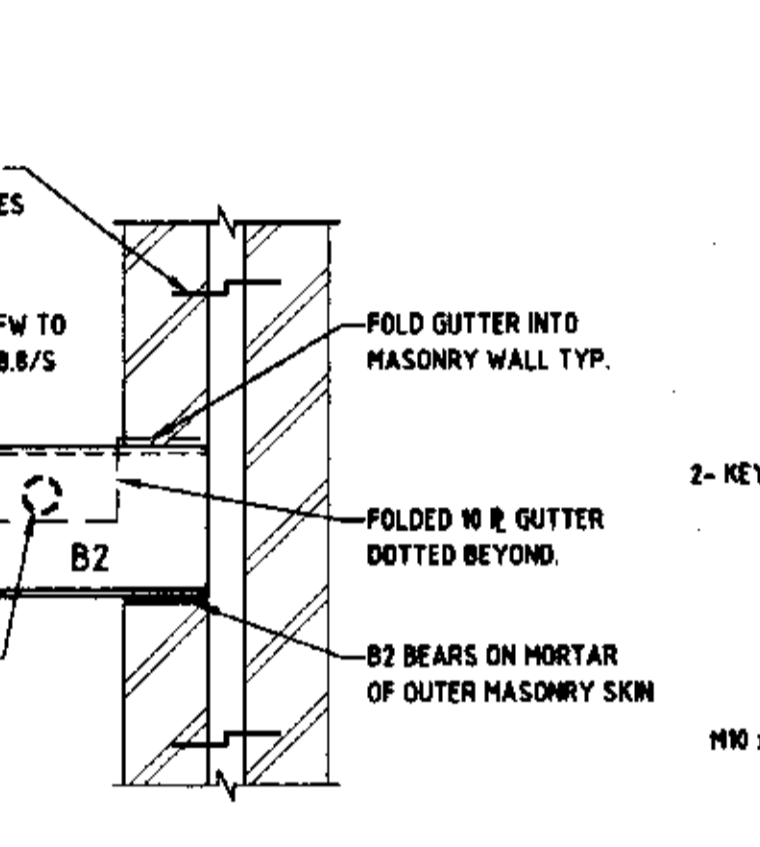
SECTION 1
SCALE 1:100



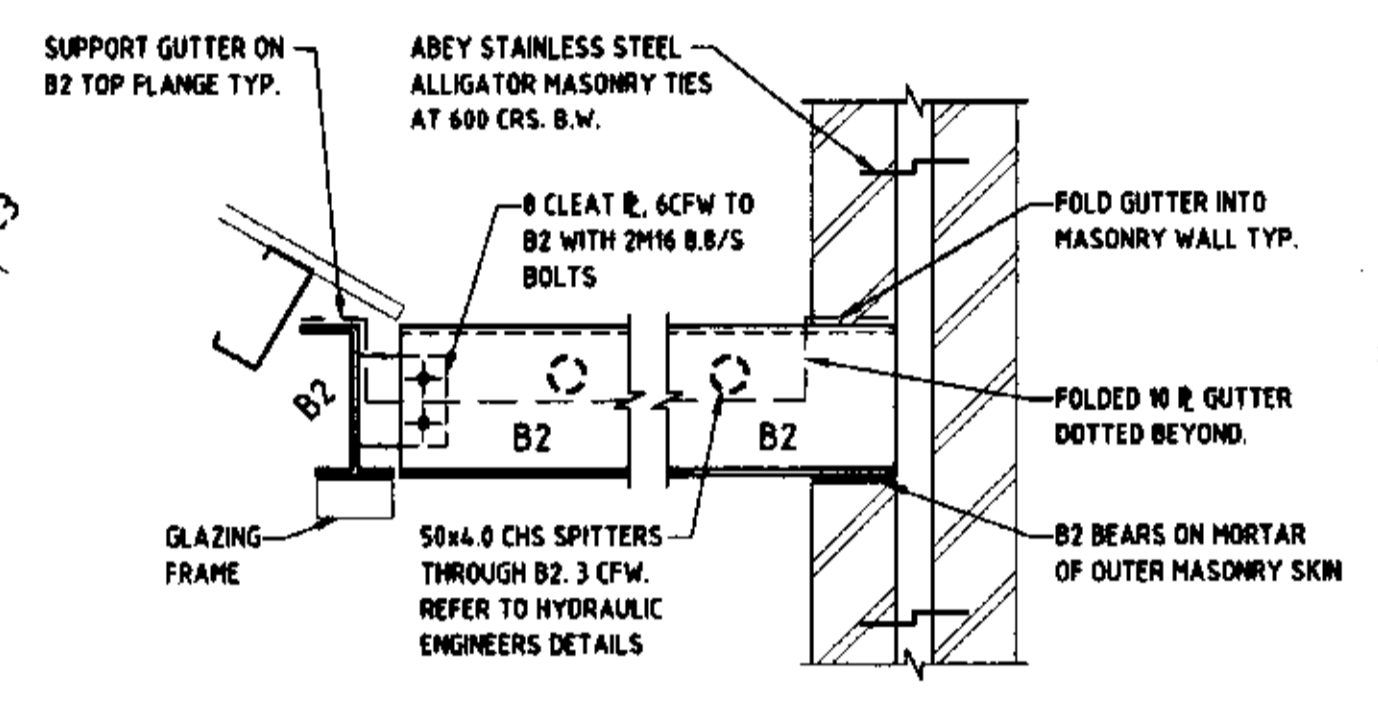
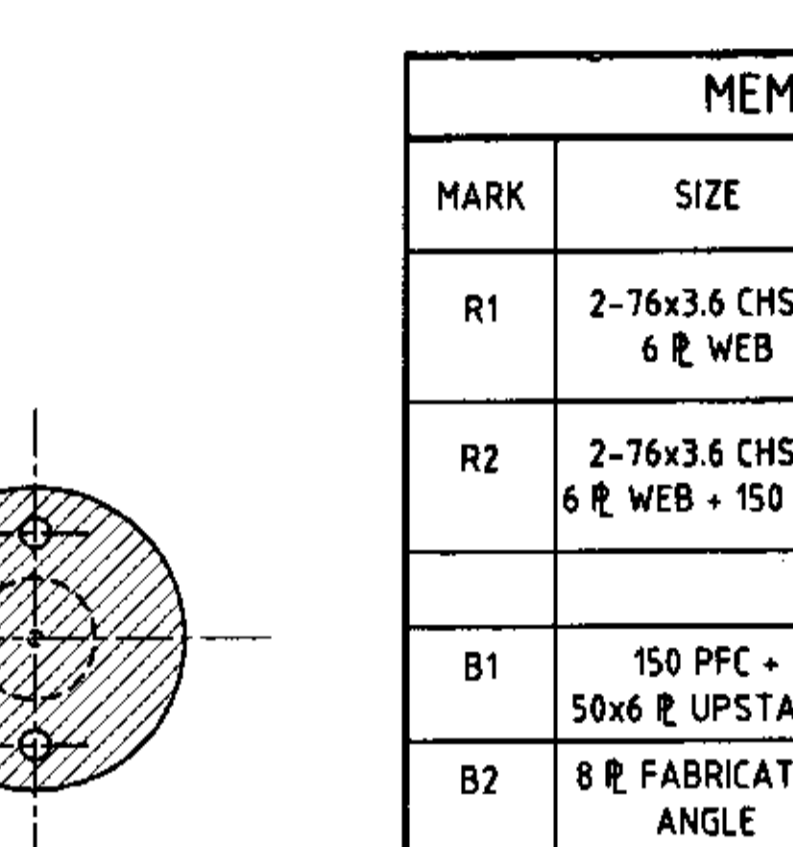
SECTION 2
SCALE 1:100



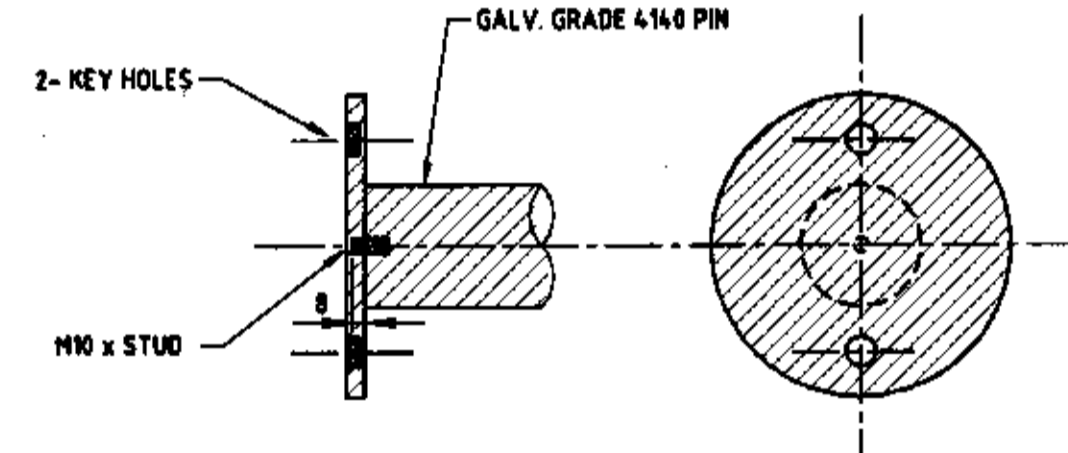
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SCALE 1:100



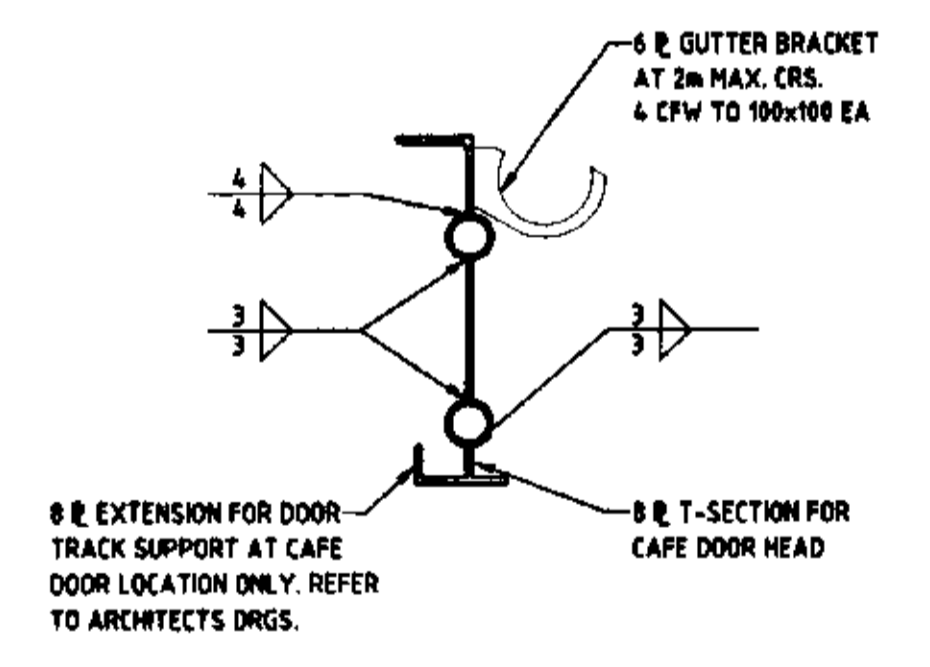
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SCALE 1:100



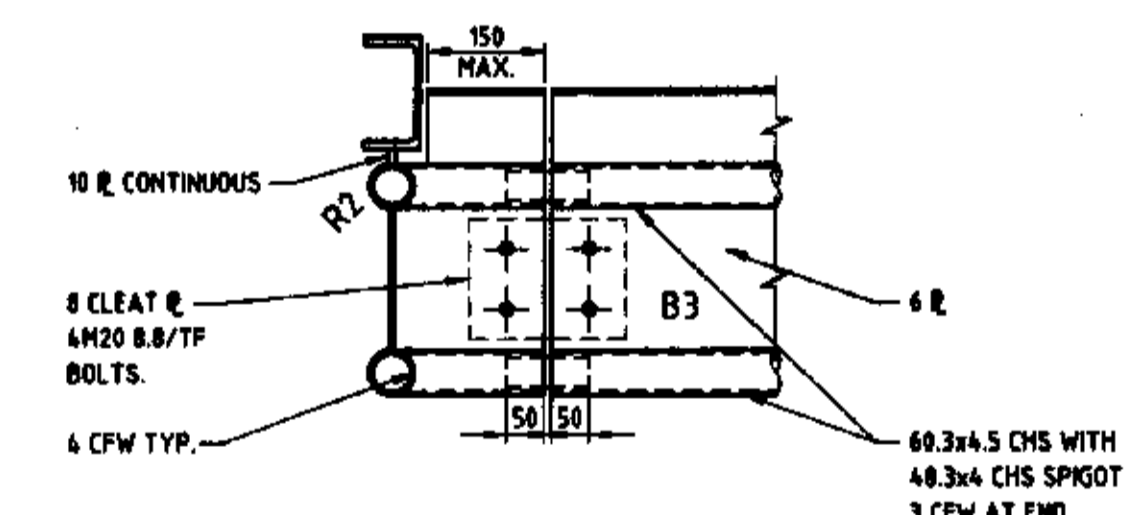
SECTION 5
SCALE 1:10



TYPICAL PIN COVER PLATE DETAIL
SCALE 1:5



SECTION 6
SCALE 1:10



SECTION 7
SCALE 1:10

MEMBER SCHEDULE		
MARK	SIZE	REMARKS
R1	2-76x3.6 CHS + 6 R WEB	
R2	2-76x3.6 CHS + 6 R WEB + 150 PFC	
B1	150 PFC + 50x6 R UPSTAND	
B2	8 R FABRICATED ANGLE	
B3	2-76x3.6 CHS + 6 R WEB + 100x100x6 EA	
B4	2-76x3.6 CHS + 6 R WEB + 100x6 R	
B5	3-50x4 CHS	MULLION SUPPORT BEAM. PROVIDE 75x25x4 R FIXING BETWEEN B5 & MIDSPAN MULLION.
SC1	2-76x3.6 CHS + 6 R WEB	
SC2	3-76x3.6 CHS + 6 R WEB	
SC3	2-76x3.6 CHS + 6 R WEB	
SC4	75x75x4 SHS	12 BASE R, 2M16 4.6/S HD BOLTS. 20 NOV. GROUT UNDER. 10 R & 2M20 8.8/S BOLT FIXING TO B3.
BR1	Ø12 ROD	SLOTTED THROUGH PURLING
P1	C 100 15	AT 900 MAX. CRS. 1 ROW BR BRIDGING FIXED TO EDGE OF B1 & B2.

APPROVED MONA VALE CONSTRUCTION CERTIFICATE NO. 03/733-1 VILLAGE PARK LIBRARY

Drawing Title: LANTERN STEELWORK ROOF FRAMING PLAN & SECTIONS

Drawn	Signed	Date	Verified	Signed	Date
Described	Signed	Date	Approved	Signed	Date
CW Project No. 3785			Scale: 1:100, 1:10, 1:5		
Drawing No. BS020			Revision: 03		

03	14.03.03	ISSUED FOR CONSTRUCTION CERTIFICATE	CD
02	27.02.03	ISSUED FOR TENDER	CD
01	21.02.03	ISSUED FOR INFORMATION	CD
Rev	Date	Revision Details	By Ver. App.

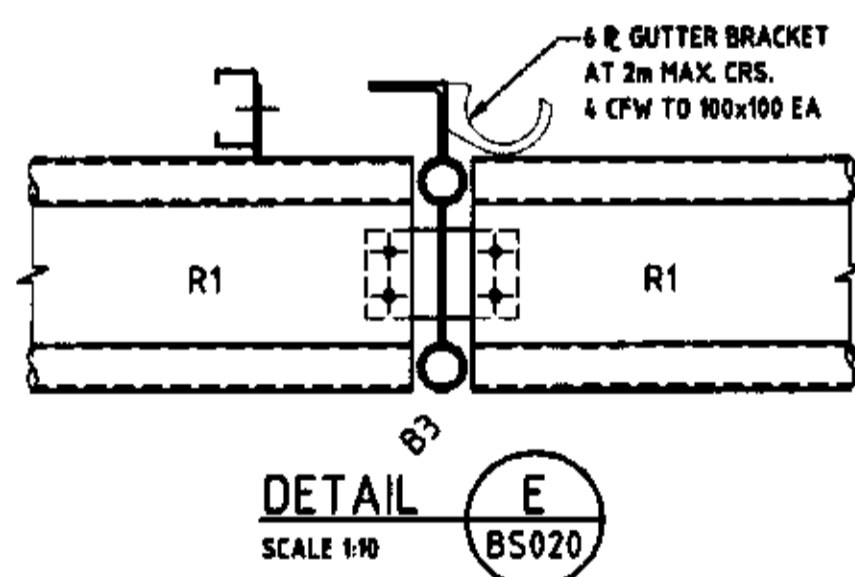
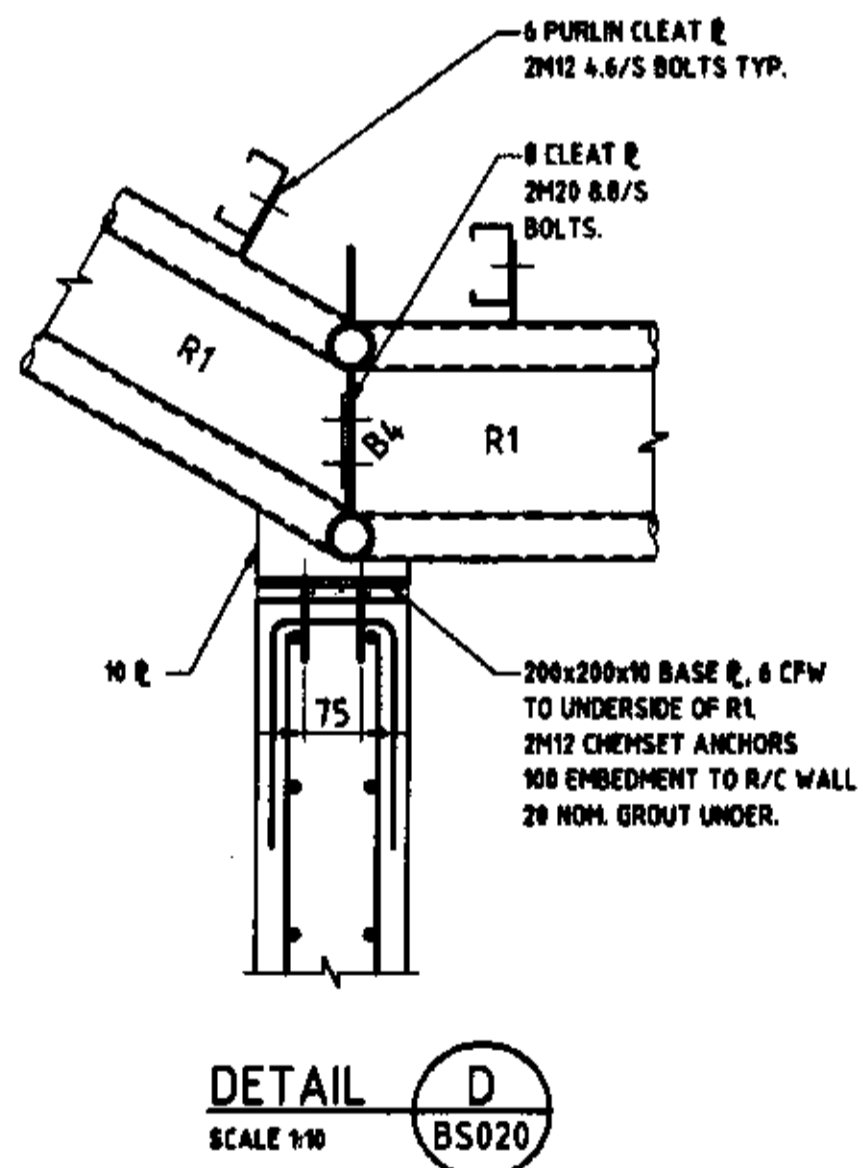
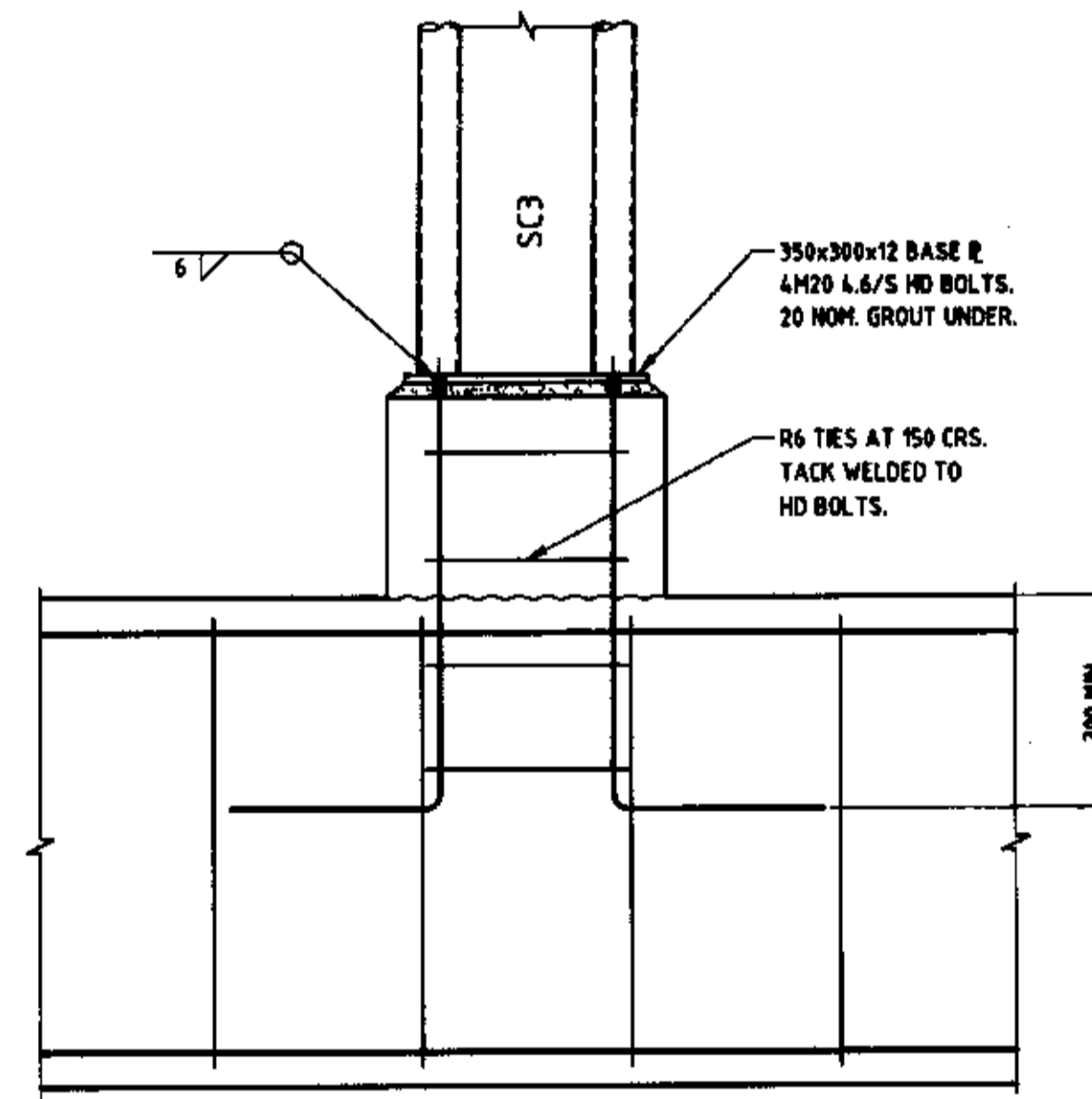
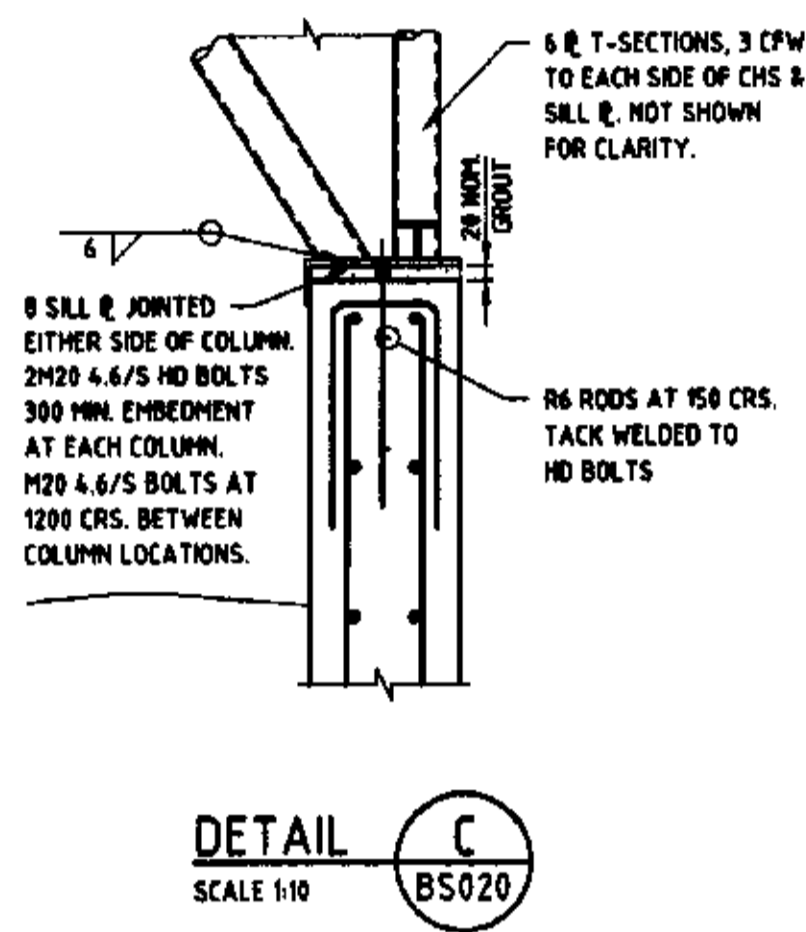
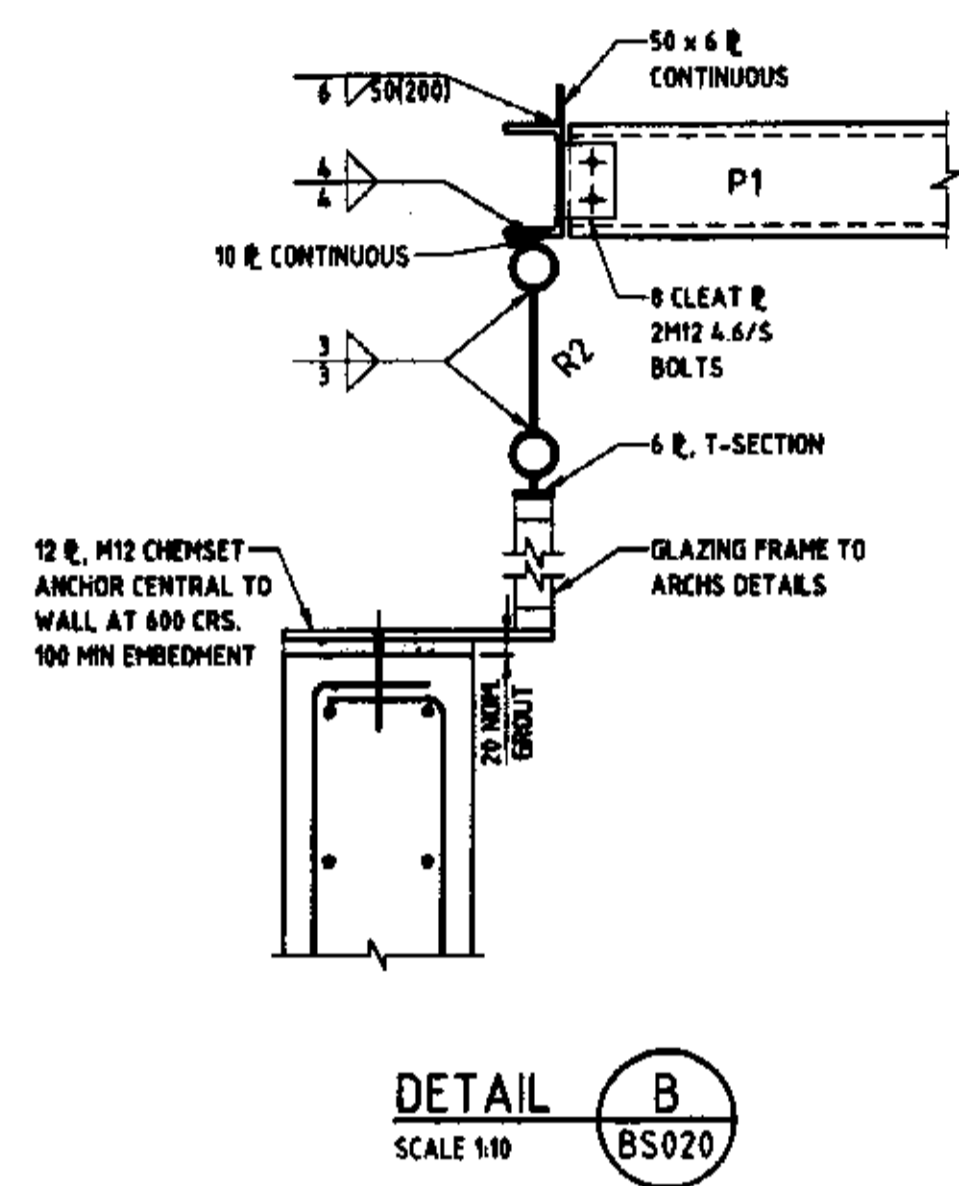
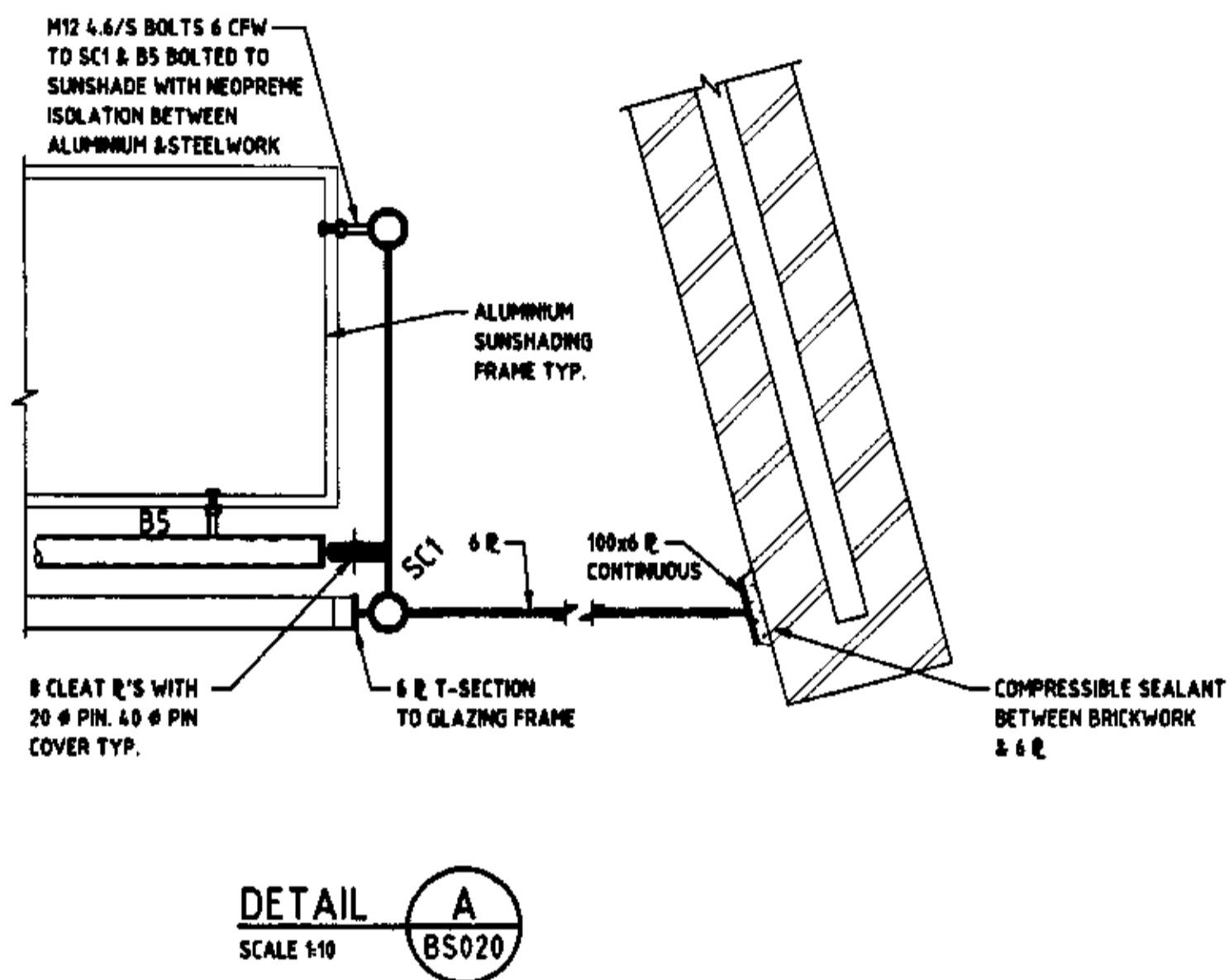
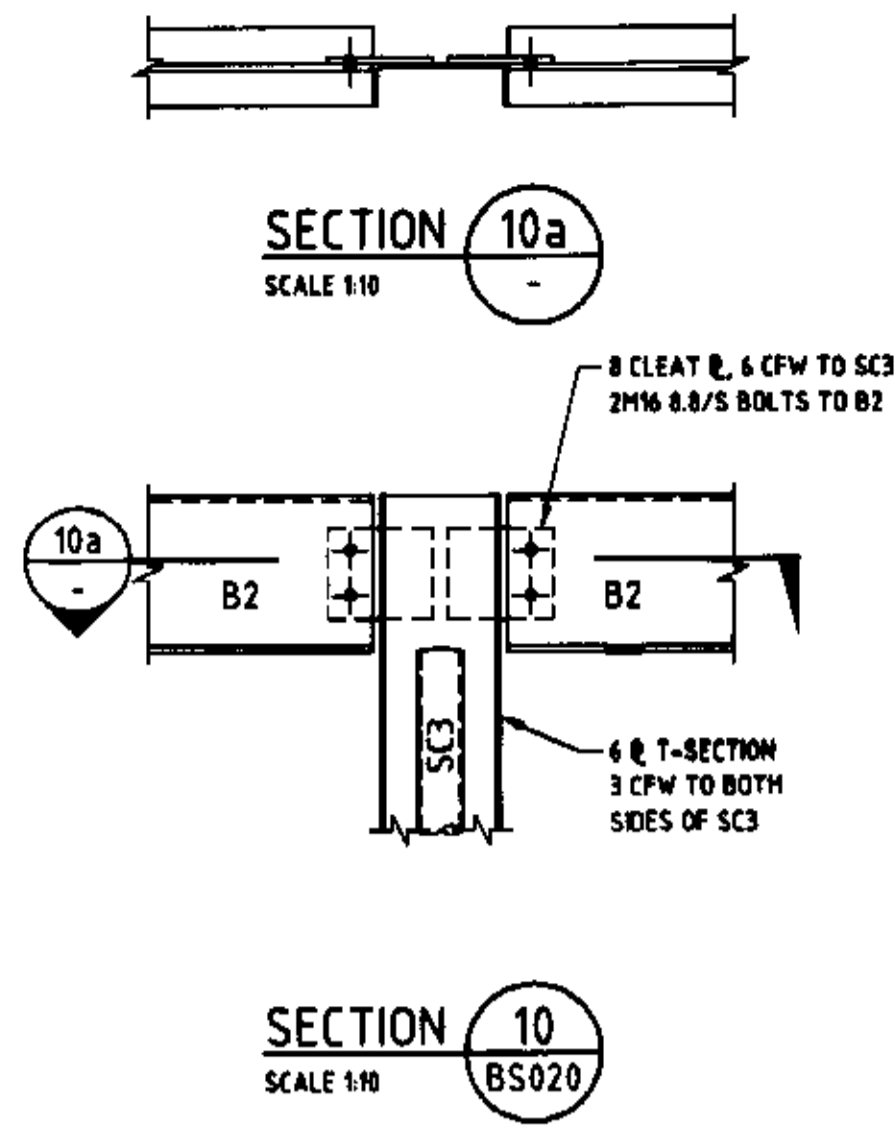
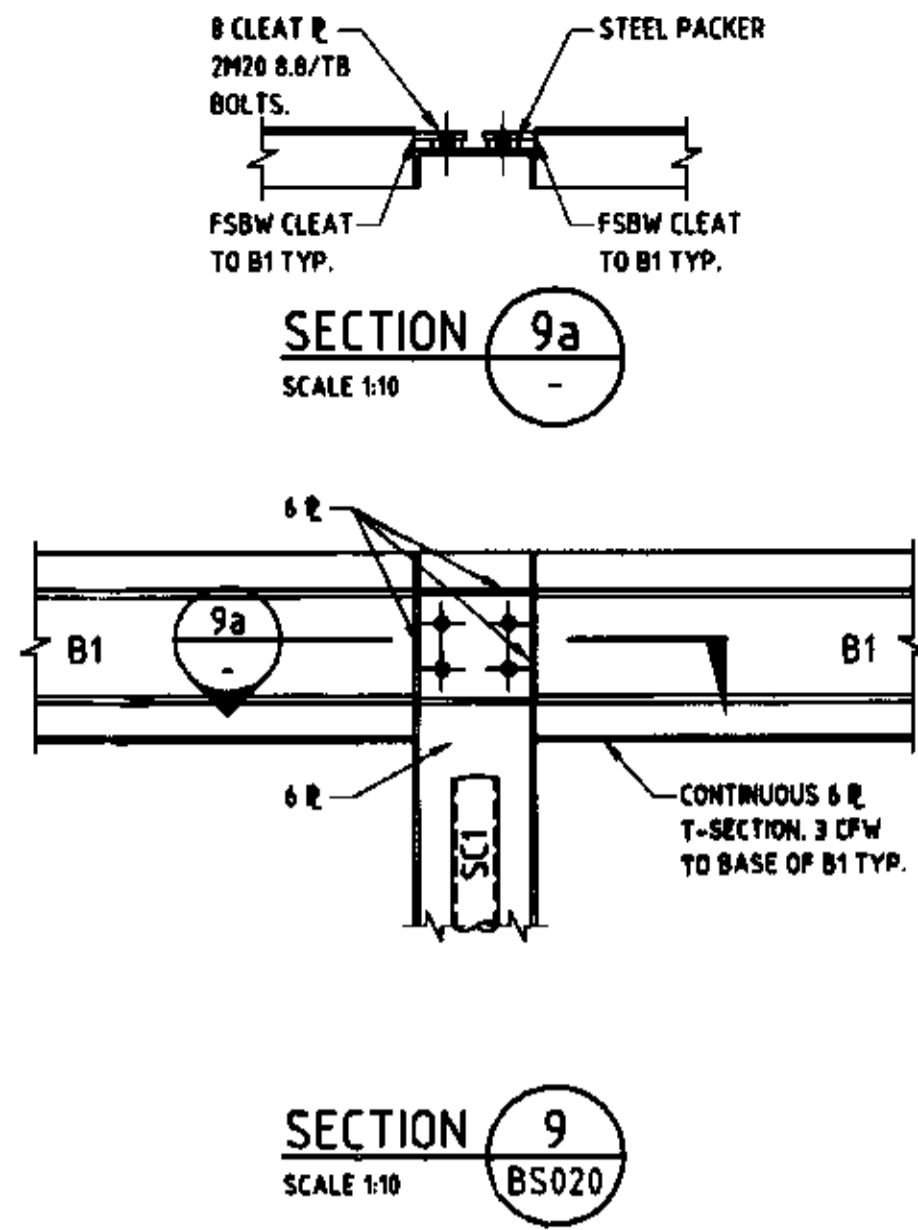
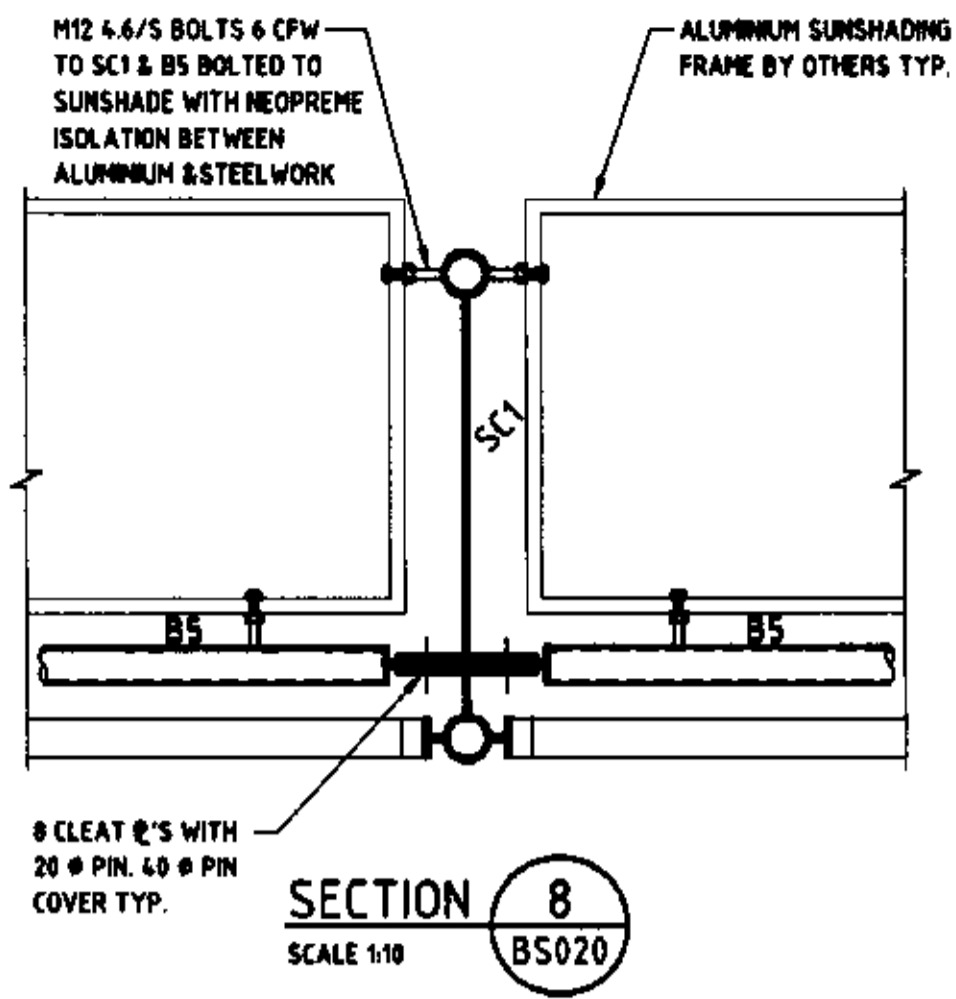
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Client: PITTWATER MUNICIPAL COUNCIL

Project:

PRELIMINARY



Rev	Date	Revision Details	By	Ver.	App.
03	16.03.03	ISSUED FOR CONSTRUCTION	CD		
02	27.02.03	ISSUED FOR TENDER	CD		
01	21.02.03	ISSUED FOR INFORMATION	CD		

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Client:
PITTWATER MUNICIPAL COUNCIL

Project:
MONA VALE VILLAGE PARK LIBRARY

Drawing Title:
LANTERN STEELWORK DETAILS

Drawn	Signed	Date	Verified	Signed	Date
LD					
Designed	Signed	Date	Approved	Signed	Date
SJG					
CW Project No.		Scale:		Revision:	
3785		1:10		03	
Drawing No.			Revision:		
BS021			03		

APPROVED
CONSTRUCTION CERTIFICATE No. 33/733-1
ANZLIZIE GROUP CONSULTING (NSW) PTY. LTD. 10/3 271 100

PRELIMINARY

MONA VALE VILLAGE PARK LIBRARY HYDRAULIC SERVICES

HYDRAULIC SERVICES LEGEND

PIPELINES	ABBREVIATIONS
RISER	RISER
SERVICE TYPE	SERVICE TYPE
PROPOSED	PROPOSED
EXISTING SERVICE	EXISTING SERVICE
FIRE HYDRANT	FIRE HYDRANT
DOMESTIC COLD WATER	DOMESTIC COLD WATER
DOMESTIC HOT WATER RETURN	DOMESTIC HOT WATER RETURN
WATER	WATER
NATURAL GAS SERVICES	NATURAL GAS SERVICES
SANITARY DRAINAGE/WIRING	SANITARY DRAINAGE/WIRING
VENT PIPE	VENT PIPE
GREASE WASTE	GREASE WASTE
NON-PORTABLE COLD WATER	NON-PORTABLE COLD WATER
NON-PORTABLE HOT WATER	NON-PORTABLE HOT WATER
DIRECTION OF FLOW	DIRECTION OF FLOW
SUCTION/DRAINAGE TYPE-A HOSE WITH 1/2 INCH 3000	SUCTION/DRAINAGE TYPE-A HOSE WITH 1/2 INCH 3000
SEWER RISER	SEWER RISER
IRRIGATION SUPPLY PIPE	IRRIGATION SUPPLY PIPE
STOP VALVE	STOP VALVE
OPEN VALVE	OPEN VALVE
PNEUMATIC THROUGH STRUCTURE	PNEUMATIC THROUGH STRUCTURE
PLANT DRAIN	PLANT DRAIN
FLOOR WASTE	FLOOR WASTE
BUCKET TRAP FLOOR WASTE	BUCKET TRAP FLOOR WASTE
RAIN WATER OUTLET	RAIN WATER OUTLET
THERMOSTATIC MIXING VALVE	THERMOSTATIC MIXING VALVE
BACKFLOW PREVENTION ASSEMBLY	BACKFLOW PREVENTION ASSEMBLY
SCUM GULLY	SCUM GULLY

DESIGN NOTES

- D1. HYDRAULIC SERVICE PLANS TO BE READ IN CONJUNCTION WITH LATEST ARCHITECTURAL, STRUCTURAL, CIVIL AND MECHANICAL ENGINEERING PLANS.
- D2. ALL WORK TO BE IN ACCORDANCE WITH SYDNEY WATER CORPORATION, N.S.W. FIRE BRIGADES, AS3598.
- D3. EXISTING SERVICES HAVE BEEN PLOTTED USING SUPPLIED DATA. THE SUBCONTRACTOR SHALL FULLY INQUIRE THEMSELVES OF ALL SITE SERVICES PRIOR TO CONSTRUCTION.
- D4. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PERMISSION TO ANY SERVICES ENCOUNTERED IN WORKING TOUHS.
- D5. CONTRACTOR TO PROVIDE AS BUILT DOCUMENTATION UPON PRACTICAL COMPLETION OF THE PROJECT AND SHALL BE RESPONSIBLE FOR OBTAINING APPROVALS.
- D6. CONTRACTOR TO MAKE ALL APPLICATIONS AND PAY ALL FEES TO AUTHORITIES FOR MAINS CONNECTIONS AND START WORK PERMITS.

DRAWING SCHEDULE

- H01 HYDRAULIC SERVICES - OVERS NOTES AND LEGEND
- H02 EXISTING HYDRAULIC SERVICES - SITE PLAN
- H03 SANITARY DRAINAGE - SITE PLAN
- H04 HYDRAULIC SERVICES - LEVEL 1 WATER AND GAS SUPPLY
- H05 HYDRAULIC SERVICES - LEVEL 2 SANITARY DRAINAGE
- H06 HYDRAULIC SERVICES - LEVEL 2 WATER AND GAS SUPPLY
- H07 HYDRAULIC SERVICES - LEVEL 3 SANITARY DRAINAGE
- H08 HYDRAULIC SERVICES - OFFICES WATER AND GAS SUPPLY

SANITARY DRAINAGE NOTES

- S01 CONTRACTOR TO PROVIDE LOCATION OF EXISTING FLOOR TRAPS AND TRAP MARKERS TO SUBCONTRACTOR PRIOR TO CONSTRUCTION.
- S02 CONTRACTOR TO PROVIDE ANY ADDITIONAL EXCAVATION REQUIREMENTS INCLUDING THOSE TO WATER BODIES INCLUDING THOSE TO BRANCH DRAINS.
- S03 ALL ROOF PENETRATIONS TO BE TYPICAL AND PAINTED TO MATCH EXISTING ROOF FINISH.
- S04 ALL MANHOLES GREATER THAN 1.5M DIA SHALL BE CONSTRUCTED WITH STEEL RINGS TO STONY WATER RESISTANT.
- S05 DRAINS TO BE SUPPORTED ON OR FROM SOLID GROUND. DRAINS UNDER BILBOARDS SHALL BE SET ON CONCRETE OR BE VERIFIED ON SITE PRIOR TO CONSTRUCTION.
- S06 DRAINS UNDER BILBOARDS SHALL BE DETECTED WHERE DIRECTED BY CONTRACT MANAGER.
- S07 INSPECTION OPENINGS SHALL BE PROVIDED AT:
 - THE PROPERTY BOUNDARY
 - AT MAX 30M INTERVALS SPREAD EQUIDISTANT
 - WHERE ACCESS TO STREAM AND DOWNSTREAM OF ALL JUNCTIONS BY THE AUTHORITY FOR INSPECTION AND MAINTENANCE
- S08 CONTRACTOR SHALL PROVIDE ALL TYPING, MARKING AND LABELLING OF ALL TRENCHES INCLUDING THE REMOVAL OF SAME UPON COMPLETION OF PREWORK.
- S09 PROVIDE 30mm COMPRESSIBLE MATERIAL OVER PREWORK TRENCH EXCAVATION TO UNDERSCORE OF FOOTING IS LESS THAN 150mm.
- S10 CONTRACTOR SHALL OBTAIN ALL AUTHORITY APPROVALS AND PAY ALL FEES.

SITING NOTES

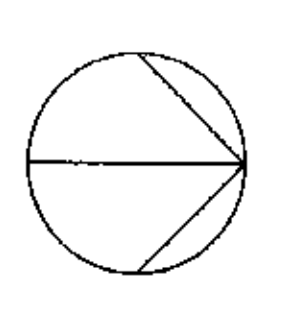
- S11 GROUND OF LEVEL - AUSTRALIAN HEIGHT DATUM
- S12 CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK.
- S13 ALL TRENCH BACKFILL MATERIAL SHALL BE ADJACENT MATERIAL.
- S14 ALL SERVICE TRENCHES UNDER VERTICAL OR AN APPROVED GRAVEL AS MATERIAL AND DENSITY IN ACCORDANCE WITH AS 1099 PART 1.
- S15 THE SUB CONTRACTOR SHALL APPOINT ALL SURVEY SETOUT BY A REGISTERED SURVEYOR.
- S16 ON COMPLETION OF PRE INSTALLATION, ALL DISTURBED AREAS INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AREAS, GASSED AREAS AND ROAD PAVEMENTS, TRINCHES TO BE REPAIRED TO ORIGINAL CONDITION AND A MINIMUM 50mm BITUMASTOLIC SURFACE TO BE APPLIED TO ALL WORK AREAS.
- S17 WHERE NEW WORK AREAS EXISTING THE SUB CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVALS FROM THE AUTHORITY.
- S18 CARB SHALL BE TAKEN WHERE EXISTING AREAS EXISTING OVER TRENCH OR ELECTRICAL SERVICES EXCAVATE BY HAND IN THESE AREAS.

SANITARY PLUMBING NOTES

- S17 ALL BRANCH LINES SHALL BE GRADED AND/OR LOWERED TO AVOID PENETRATING EXISTING STEEL BEAMS. THE SUB CONTRACTOR SHALL PROVIDE ANY ADDITIONAL EXCAVATION REQUIREMENTS INCLUDING THOSE TO WATER BODIES INCLUDING THOSE TO BRANCH DRAINS.
- S18 ALL SERVICE TRENCHES UNDER VERTICAL OR AN APPROVED GRAVEL AS MATERIAL AND DENSITY IN ACCORDANCE WITH AS 1099 PART 1.
- S19 EXPOSED PREWORK SHALL BE GROUND PLATED COPPER PIPE STACKS WITH TYPE C COPPER BRANCHES SHALL BE CAST FROM BRASS WITH TYPE C COPPER BRANCHES.
- S20 ALL SANITARY PLUMBING PREWORK SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S21 ALL PRE PENETRATIONS SHALL BE FITTED WITH A PROOF FLANGE AND MADE GOOD AND WATER TIGHT.
- S22 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S23 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S24 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S25 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S26 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S27 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S28 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S29 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.
- S30 ALL SUSPENDED SLAB PENETRATIONS SHALL BE REINFORCED WITH TYPE C COPPER BRANCHES AND APPROVED BY THE CONTRACT ADMINSTRATOR. THIS SHALL BE IN ACCORDANCE WITH THE LOCAL AUTHORITY.

HYDRAULIC SERVICES NOTES

- H01 SANITARY DRAINAGE LINES TO BE LOCATED MINIMUM 150mm FROM FOOTINGS UNO.
- H02 EXCAVATION INCLUDING ROAD BACKFILL OF PERS, AUTHORITY REQUIREMENTS INCLUDING THOSE TO BRANCH DRAINS.
- H03 ALL BRANCH LINES SHALL BE GRADED AND/OR LOWERED TO AVOID PENETRATING EXISTING STEEL BEAMS. THE SUB CONTRACTOR SHALL PROVIDE ANY ADDITIONAL EXCAVATION REQUIREMENTS INCLUDING THOSE TO WATER BODIES INCLUDING THOSE TO BRANCH DRAINS.



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PROJECT
MONA VALE
VILLAGE PARK LIBRARY

DRAWING TITLE
HYDRAULIC SERVICES
COVER, NOTES & LEGEND

SCALE
N.T.S.

DATE
15/01/2010

ISSUE NO
H01

ISSUE D

APPROVED BY
[Signature]

DATE
15/01/2010

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PROJECT
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DRAWING TITLE
HYDRAULIC SERVICES
COVER, NOTES & LEGEND

SCALE
N.T.S.

DATE
15/01/2010

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H01

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DATE
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PROJECT NO
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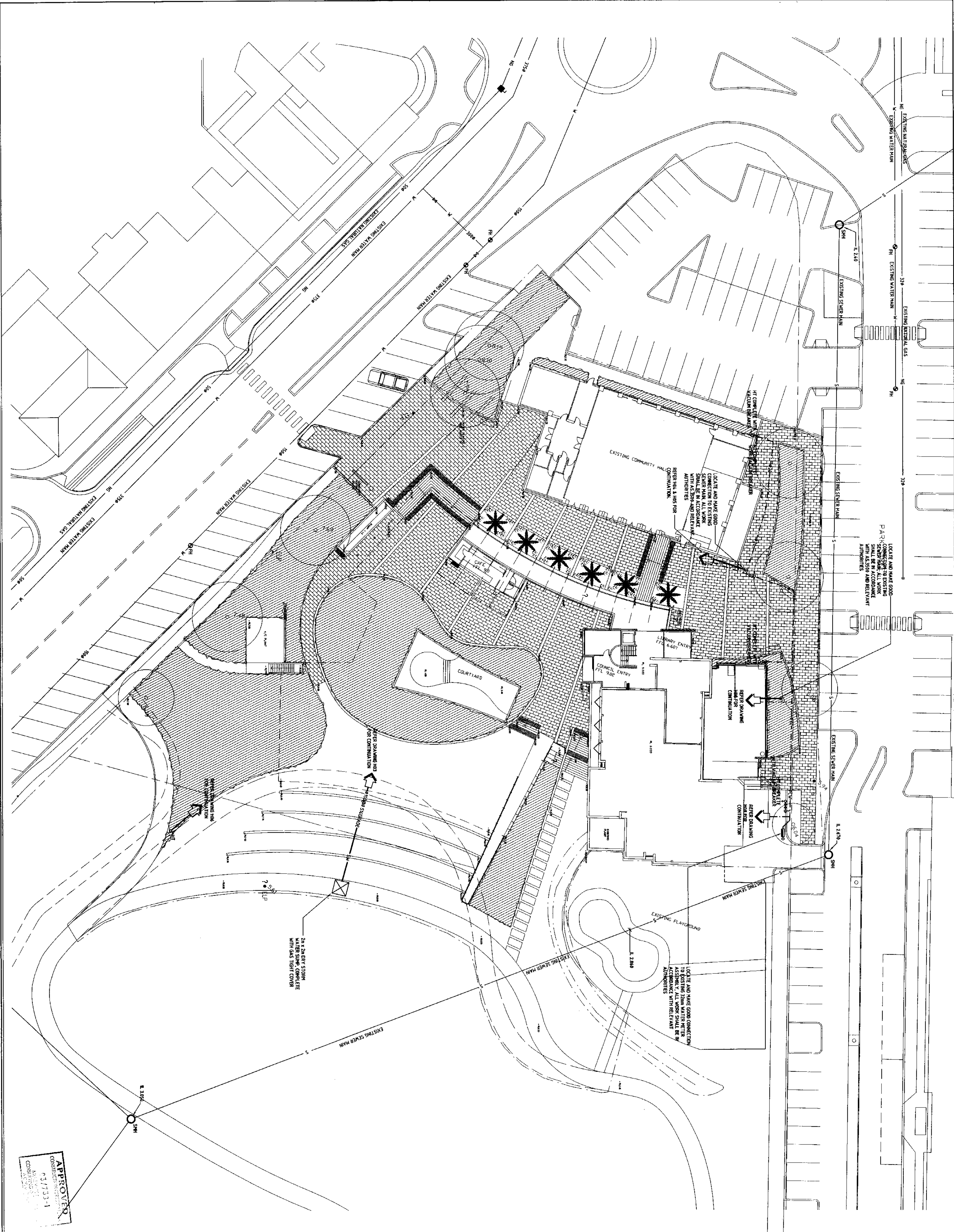
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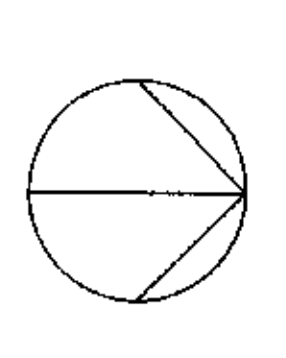
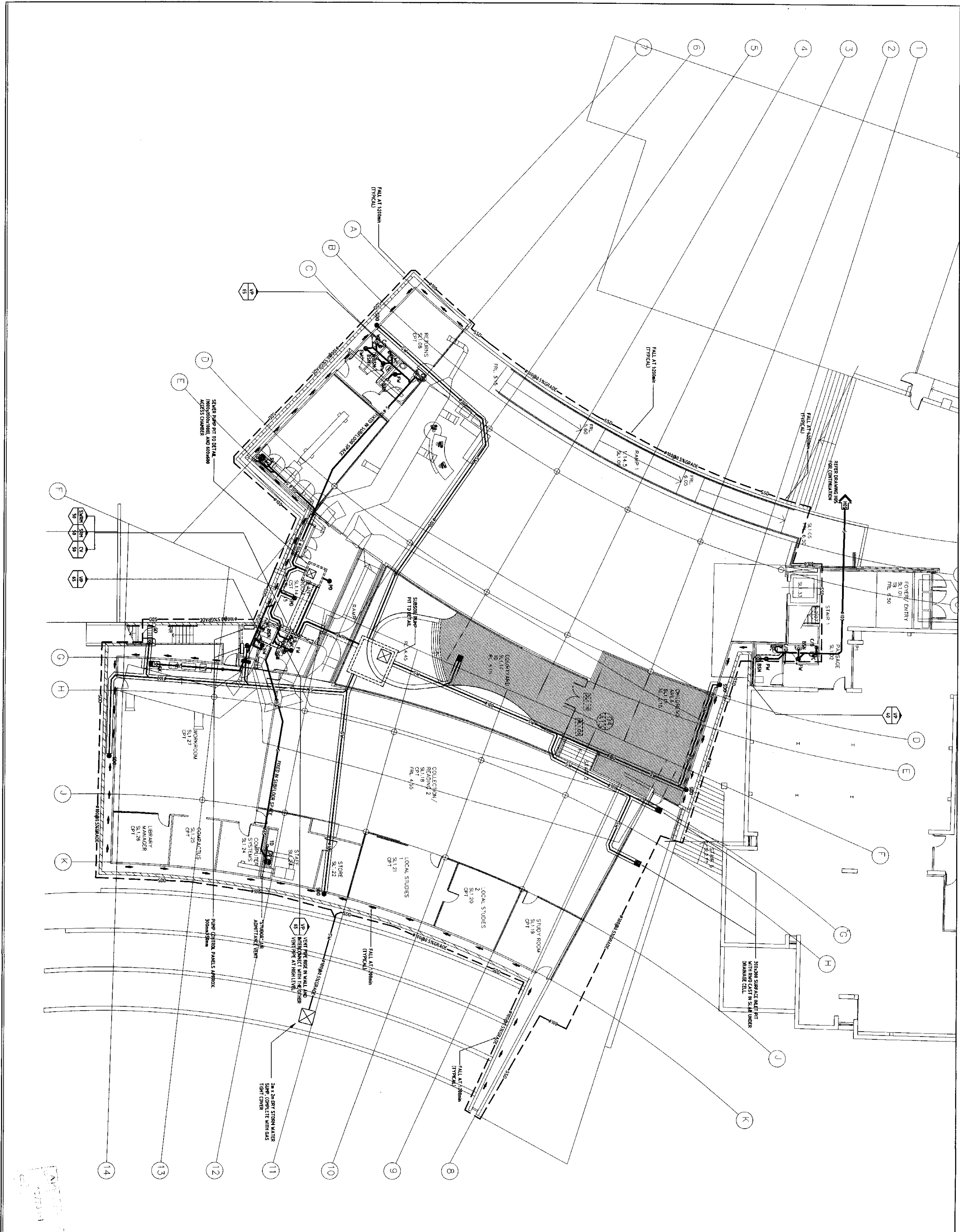
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<p>ACOR</p> <p>ALCON CONSULTANTS ENGINEERING HYDRAULIC SERVICES 1/11-13/15 1/11-13/15 1/11-13/15 1/11-13/15</p>	<p>Drewsister North ARCHITECTS 1/11-13/15 1/11-13/15 1/11-13/15 1/11-13/15</p>	<p>MONA VALE VILLAGE PARK LIBRARY HYDRAULIC SERVICES SITE PLAN</p>	<p>SCALE: 1:100 DATE: 20/01/2023 DRAWING NUMBER: H02 SHEET: 3</p>
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B	1	CLIENT REVIEW ISSUE	30.12.02
A	1	PRELIMINARY ISSUE	20.12.02

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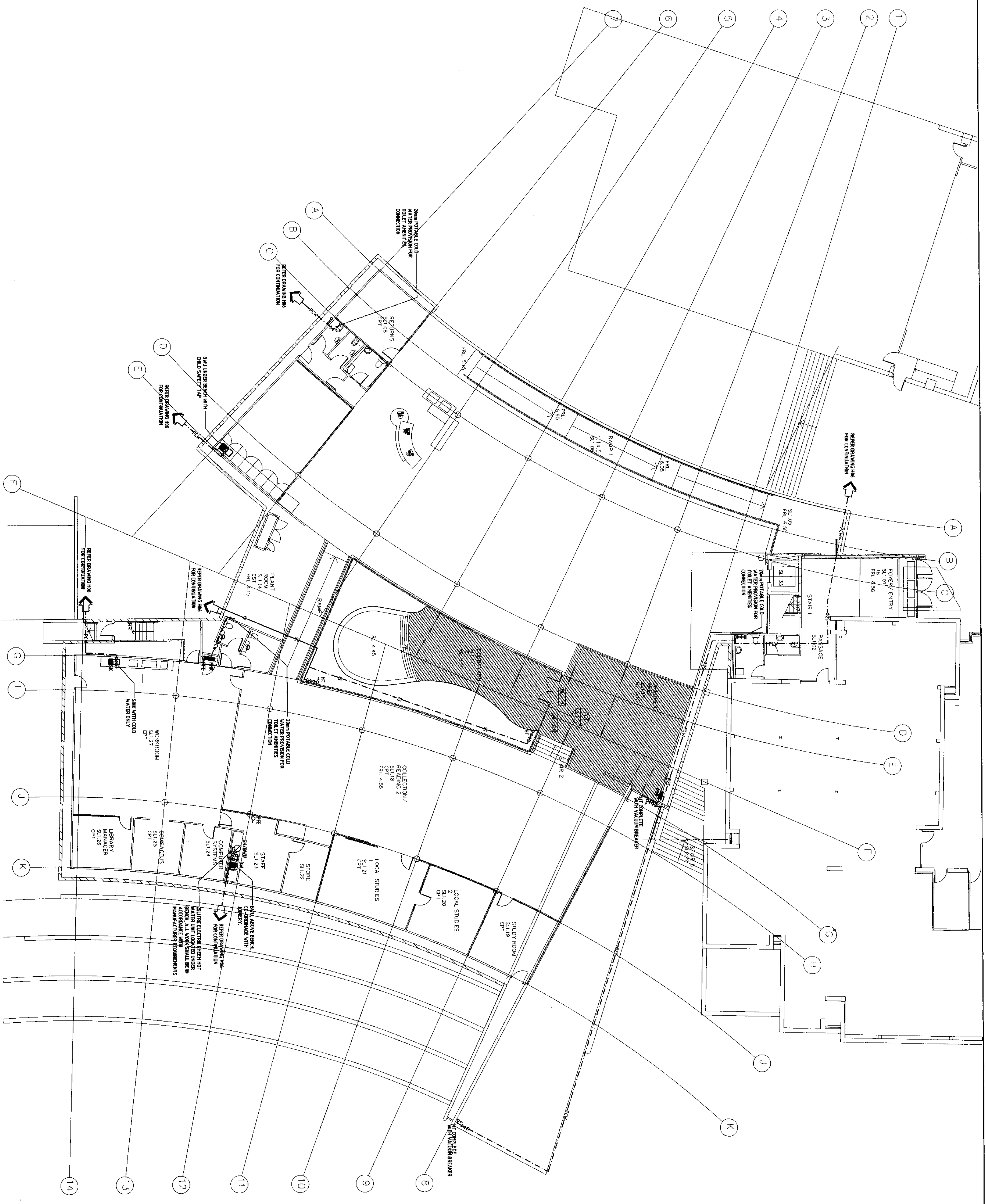
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HYDRAULIC SERVICES
LEVEL 1
DRAINAGE PLAN

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 CHECKED BY: [Name]

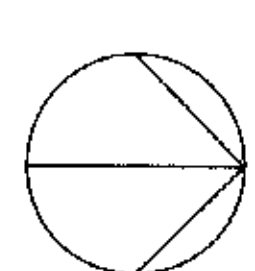
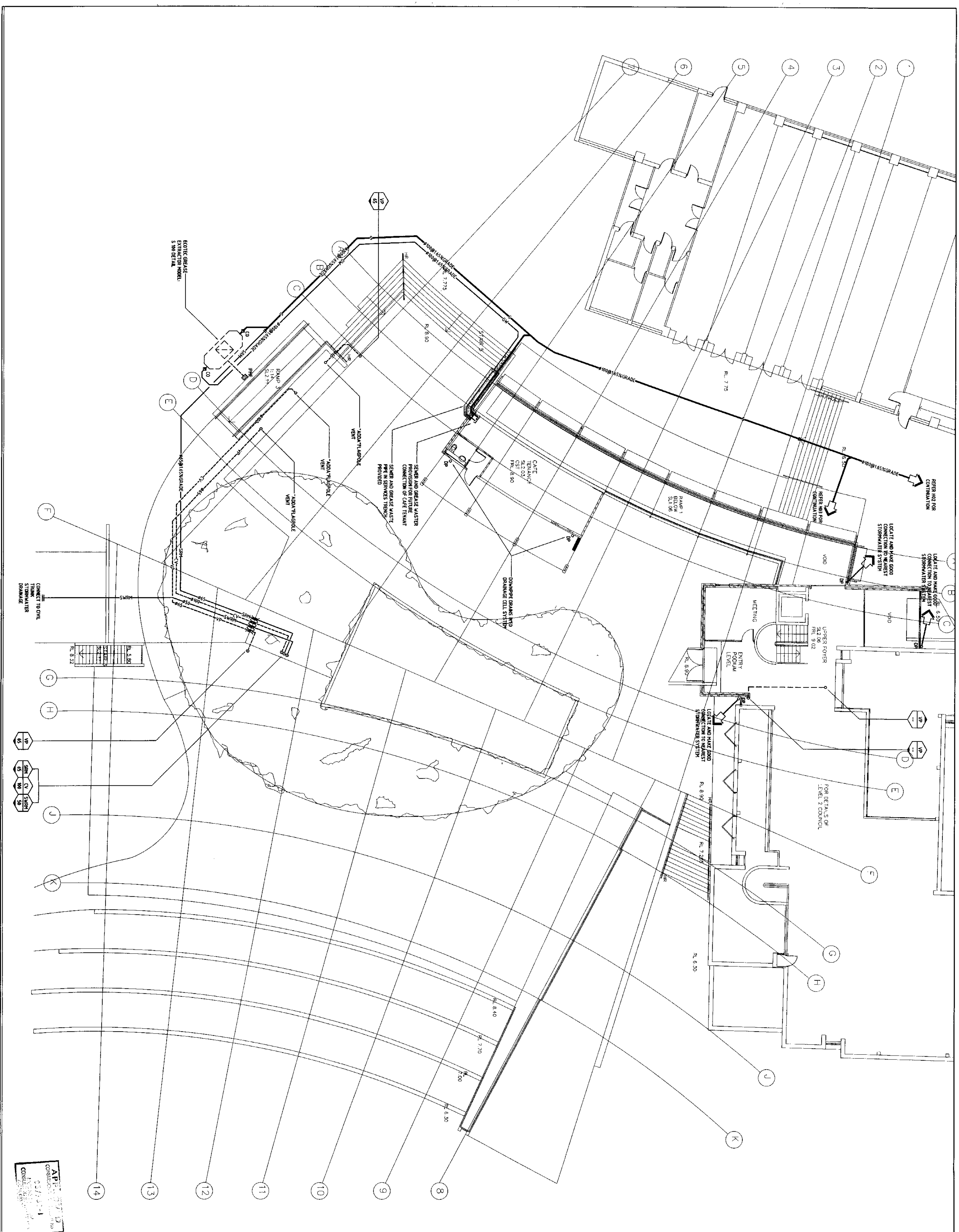
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MONNA VALE VILLAGE PARK LIBRARY LEVEL 1 WATER & GAS SUPPLY	
DRAWING TITLE HYDRAULIC SERVICES LEVEL 1 WATER & GAS SUPPLY	PROJECT NO. 2013-001
SCALE 1:100	DATE FEBRUARY 2013
DRAWN J. SMITH	CHECKED / AUTHORIZED J. SMITH
H04	

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	2013.02.01
2	REVISED PER COMMENTS	2013.02.05
3	REVISED PER COMMENTS	2013.02.15
4	REVISED PER COMMENTS	2013.02.20
5	REVISED PER COMMENTS	2013.02.25
6	REVISED PER COMMENTS	2013.03.01
7	REVISED PER COMMENTS	2013.03.05
8	REVISED PER COMMENTS	2013.03.10
9	REVISED PER COMMENTS	2013.03.15
10	REVISED PER COMMENTS	2013.03.20
11	REVISED PER COMMENTS	2013.03.25
12	REVISED PER COMMENTS	2013.04.01
13	REVISED PER COMMENTS	2013.04.05
14	REVISED PER COMMENTS	2013.04.10



NO	DESCRIPTION	DATE / CHECK
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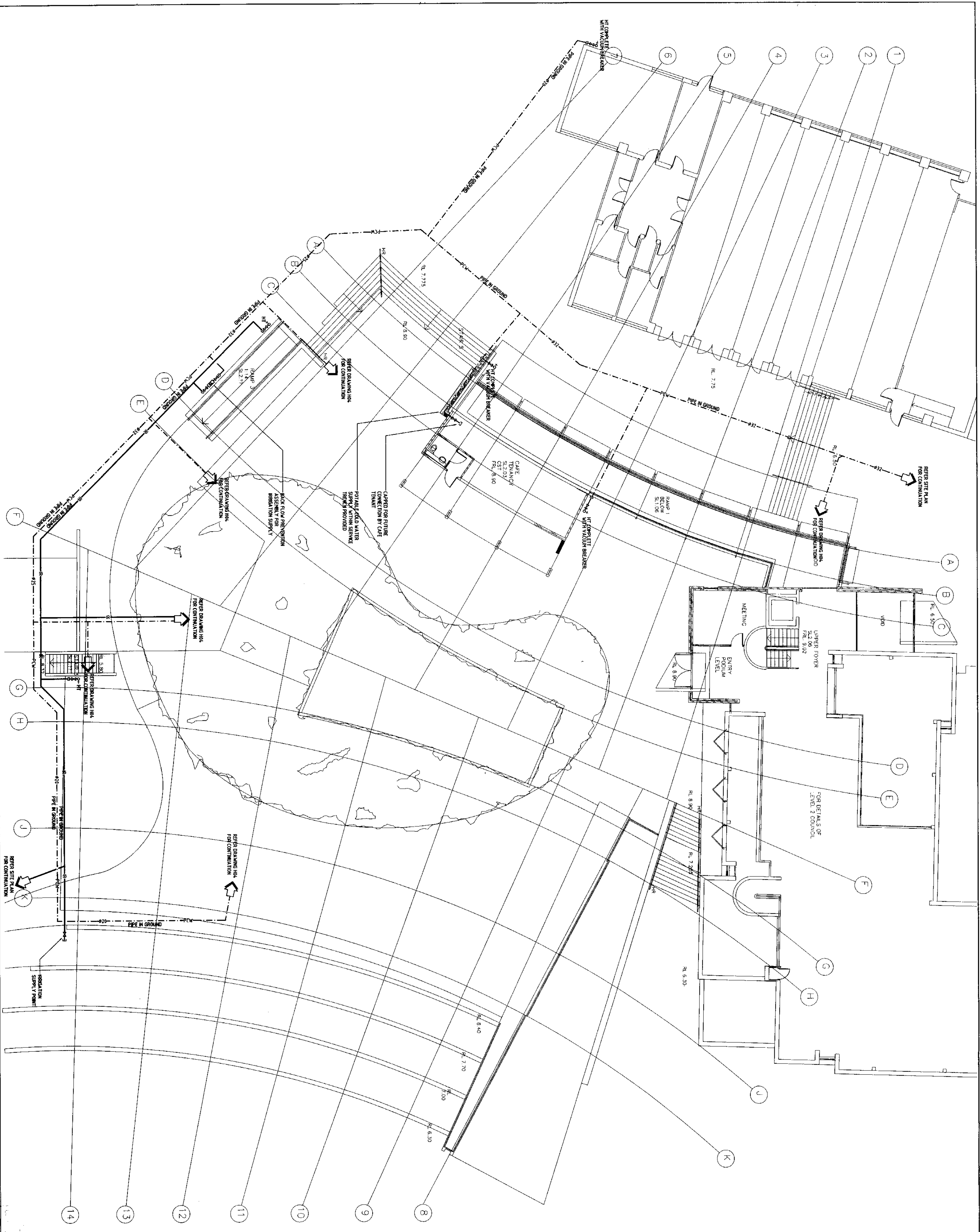
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Drawn by: [Name]
Checked by: [Name]

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Date: 18/02/23
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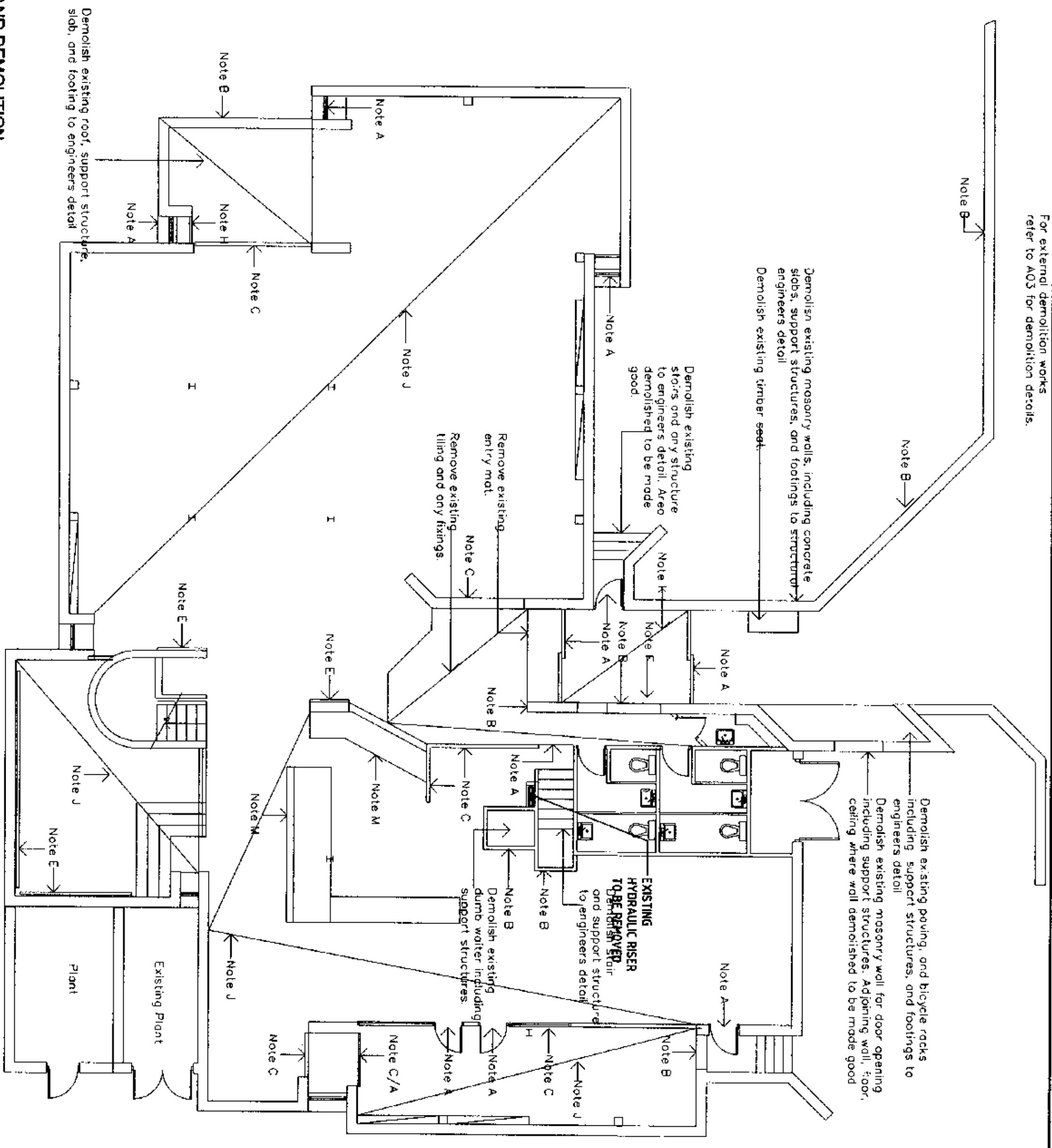


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13	ENVIRONMENTAL ENGINEERS	
14	MECHANICAL ENGINEERS	
15	ELECTRICAL ENGINEERS	
16	CIVIL ENGINEERS	
17	STRUCTURAL ENGINEERS	
18	VEGETATION CONSULTANTS	
19	HERITAGE CONSULTANTS	
20	ARTISTS	
21	PAINTERS	
22	SCULPTORS	
23	LANDSCAPE ARCHITECTS	
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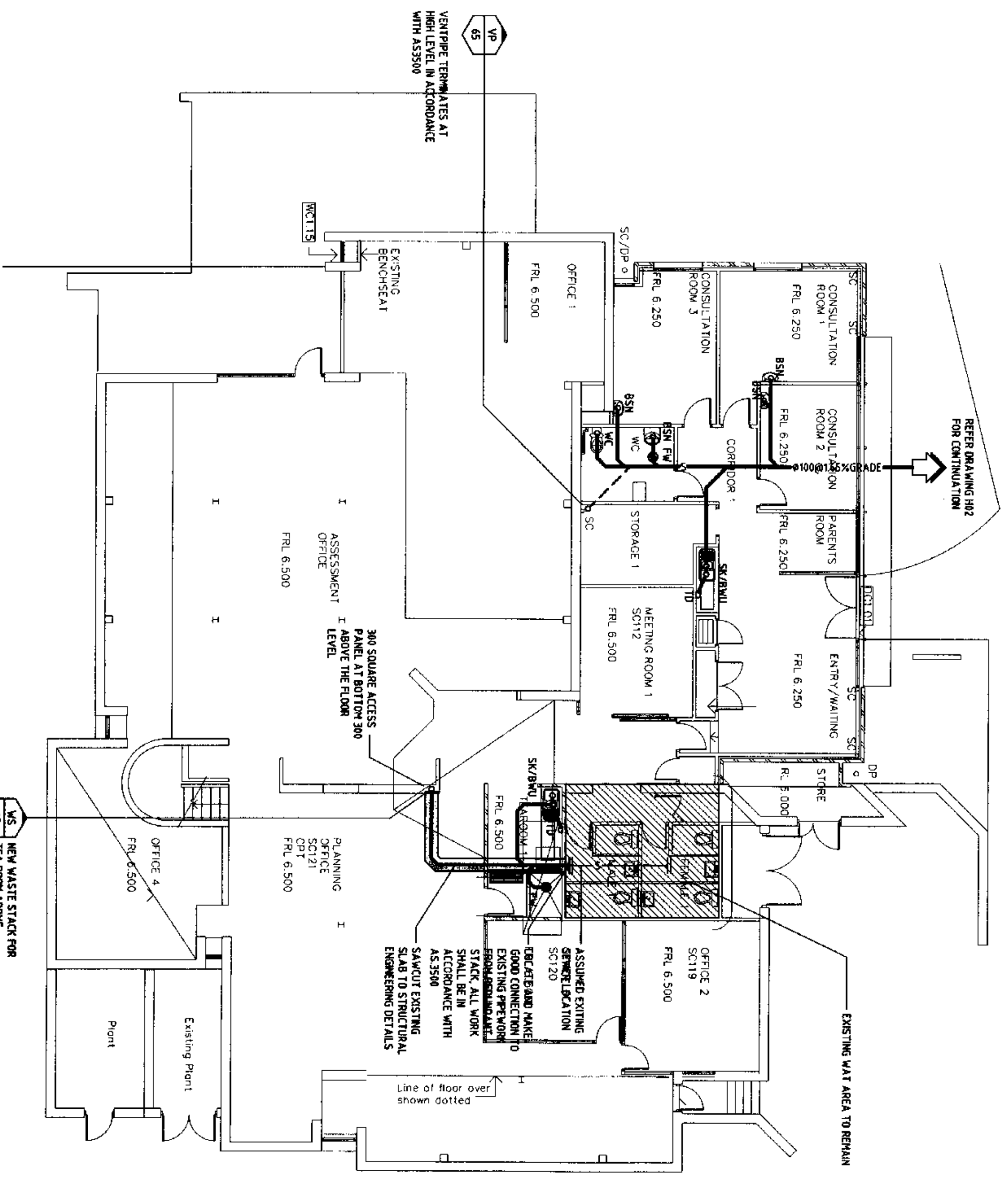
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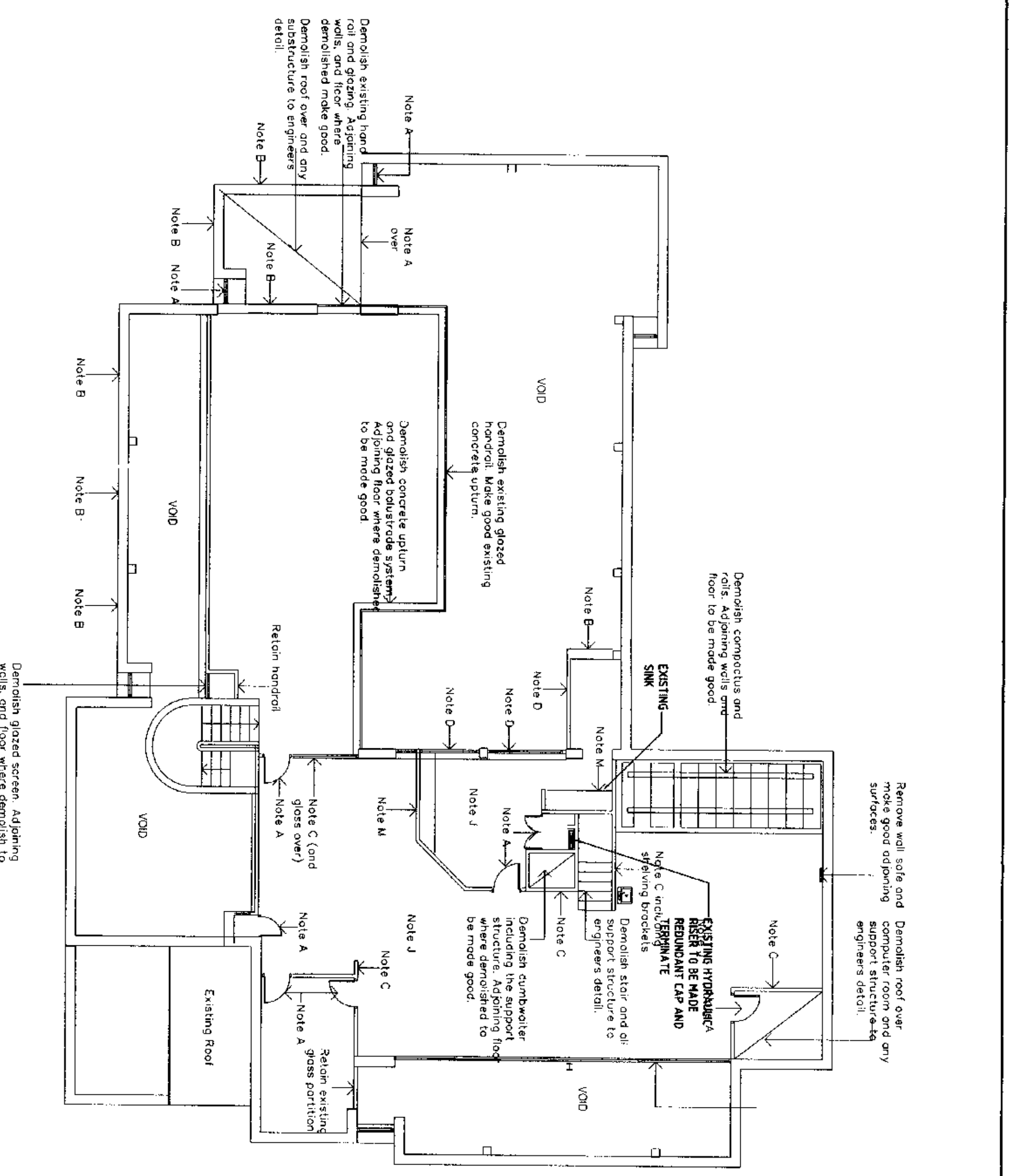
PROJECT: MONA VALE VILLAGE AGE PARK LIBRARY
 DRAWING TITLE: HYDRAULIC SERVICES LEVEL 2 WATER & GAS SUPPLY
 SCALE: 1:100
 DRAWING NUMBER: H06
 DATE: 28.02.23
 DRAWN: [Name]
 CHECKED / APPROVED: [Name]



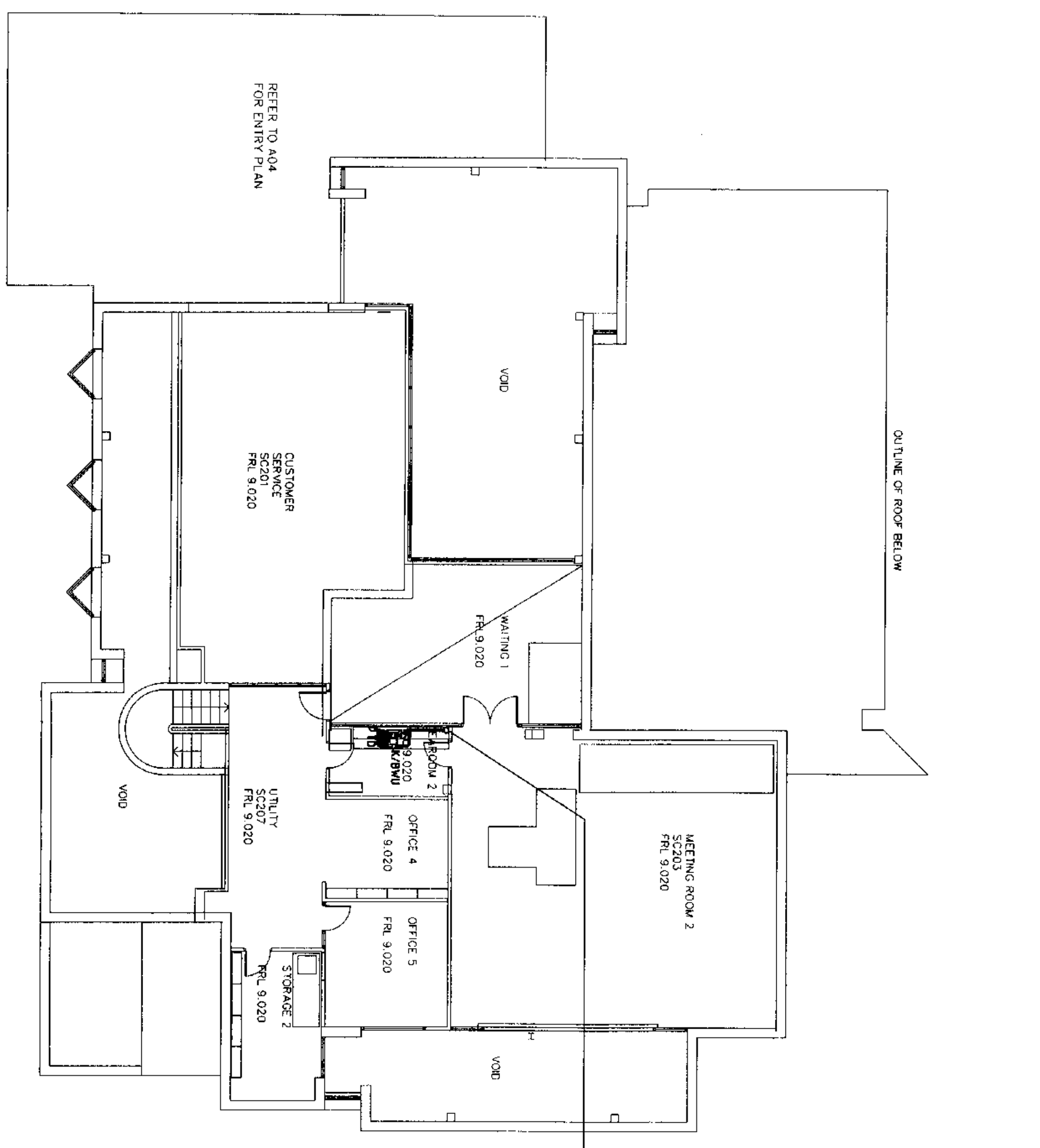
01 EXISTING PLAN AND DEMOLITION
LEVEL 1, RL 6.5
SCALE 1/8"



02 EXISTING PLAN AND DEMOLITION
LEVEL 2, RL 9.02
SCALE 1/8"



03 EXISTING PLAN AND DEMOLITION
LEVEL 3, RL 6.5
SCALE 1/8"



04 EXISTING PLAN AND DEMOLITION
LEVEL 4, RL 6.5
SCALE 1/8"

01 COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 1, RL 6.5
SCALE 1/8"

02 COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 2, RL 9.02
SCALE 1/8"

03 COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 3, RL 6.5
SCALE 1/8"

04 COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 4, RL 6.5
SCALE 1/8"

APOR
Architectural Practice
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PROJECT
MONA VALE
VILLAGE PARK LIBRARY

DRAWING TITLE
HYDRAULIC SERVICES
OFFICES
DRAINAGE PLAN

SCALE
AS SHOWN

DATE
2010

REVISIONS

NO.	DESCRIPTION	DATE / USER
1	ISSUE FOR PERMIT	2010 / [Name]
2	ISSUE FOR PERMIT	2010 / [Name]
3	ISSUE FOR PERMIT	2010 / [Name]
4	ISSUE FOR PERMIT	2010 / [Name]
5	ISSUE FOR PERMIT	2010 / [Name]

DRAWING NUMBER
H07

PROJECT NUMBER
2010

DATE
2010

SCALE
AS SHOWN

PROJECT
MONA VALE
VILLAGE PARK LIBRARY

DRAWING TITLE
HYDRAULIC SERVICES
OFFICES
DRAINAGE PLAN

SCALE
AS SHOWN

DATE
2010

REVISIONS

NO.	DESCRIPTION	DATE / USER
1	ISSUE FOR PERMIT	2010 / [Name]
2	ISSUE FOR PERMIT	2010 / [Name]
3	ISSUE FOR PERMIT	2010 / [Name]
4	ISSUE FOR PERMIT	2010 / [Name]
5	ISSUE FOR PERMIT	2010 / [Name]

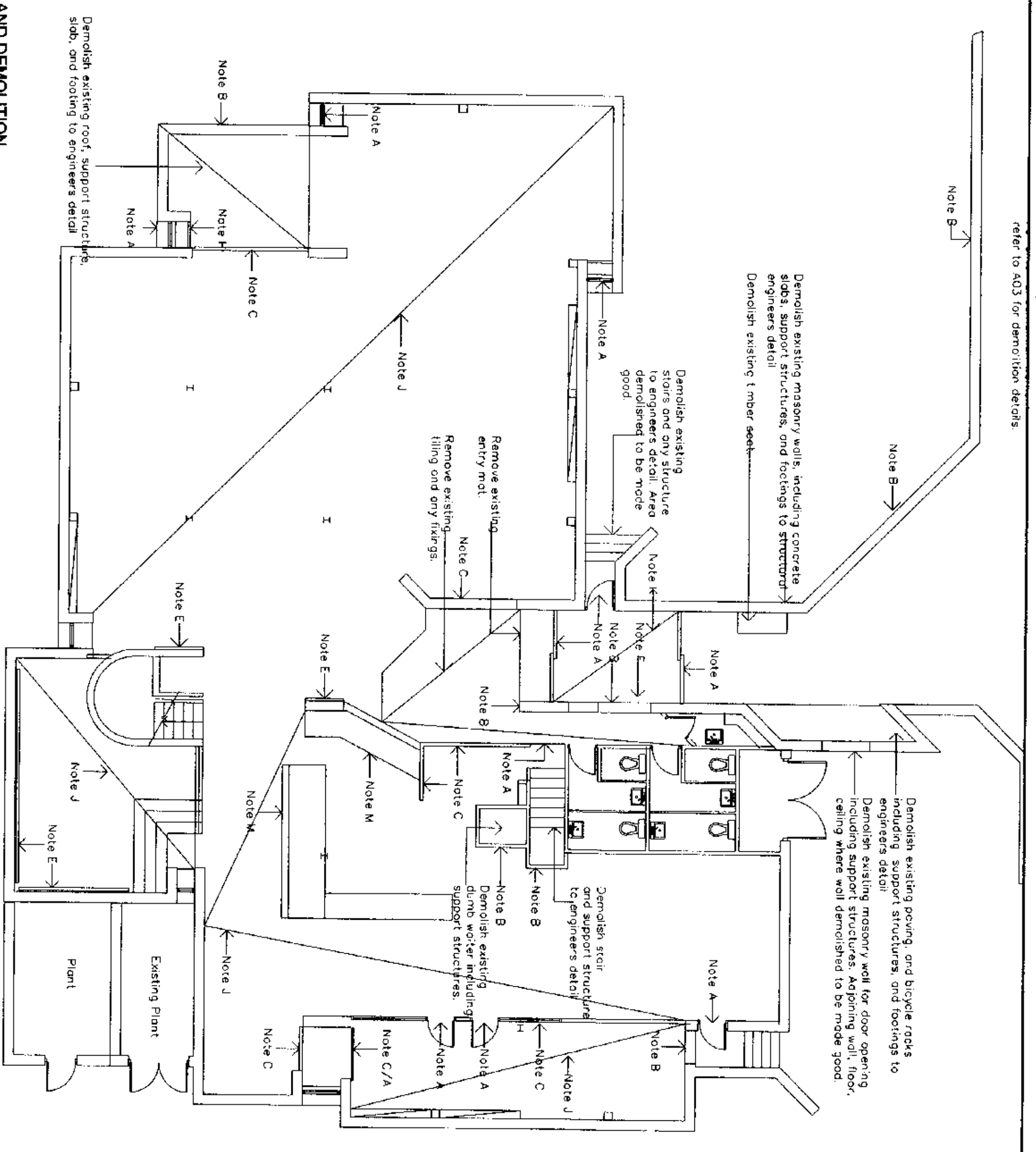
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PROJECT NUMBER
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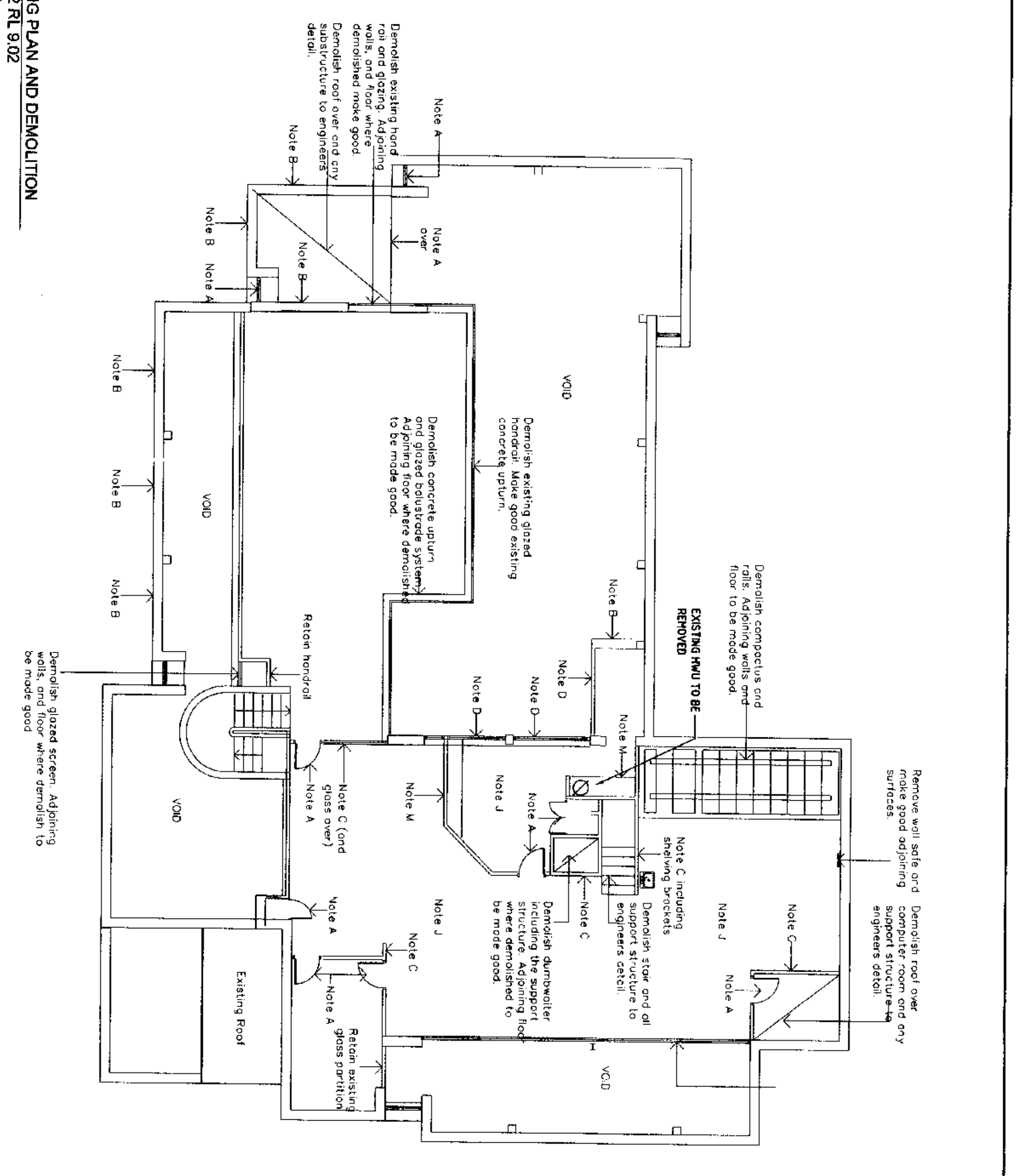
DATE
2010

SCALE
AS SHOWN

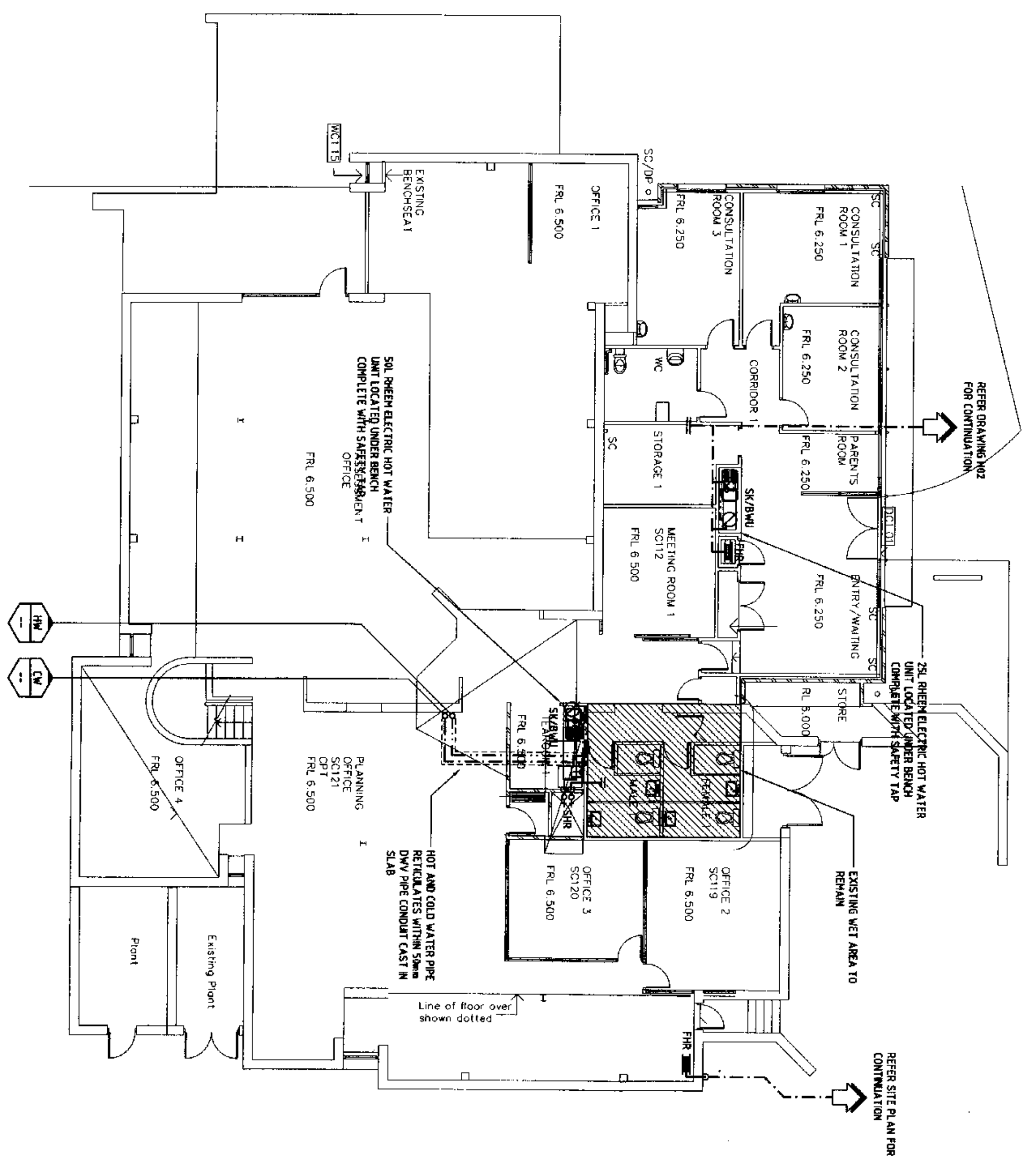
01 EXISTING PLAN AND DEMOLITION
LEVEL 1 RL 6.5
SCALE 1:100



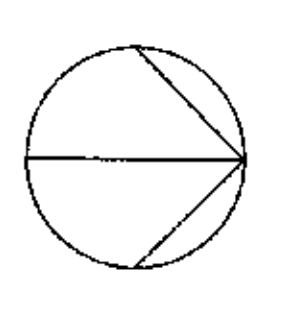
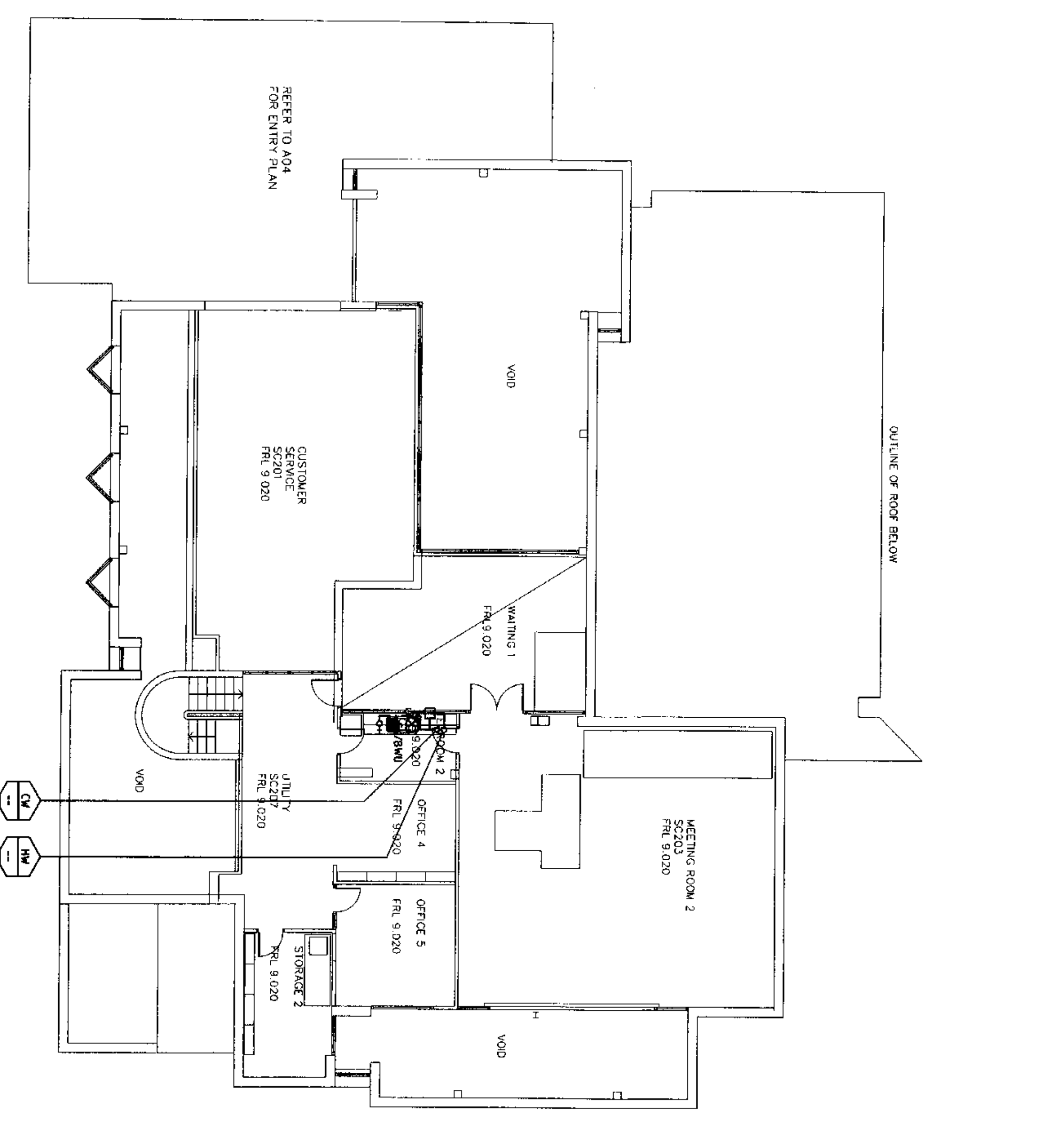
02 EXISTING PLAN AND DEMOLITION
LEVEL 2 RL 6.02
SCALE 1:100



03 COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 1 RL 6.5
SCALE 1:100



04 COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 2 RL 6.02
SCALE 1:100



NO	DESCRIPTION	DATE / CHECK
0	TENDER ISSUE	28.02.02
1	TENDER REVIEW ISSUE	27.02.02
2	PRELIMINARY ISSUE	20.02.02
3	PRELIMINARY ISSUE	20.02.02

ACOR
ARCHITECTS
100/101 STATION STREET, SYDNEY NSW 2008
TEL: (02) 9239 4000
WWW.ACOR.COM.AU

Drewster North
ARCHITECTS
100/101 STATION STREET, SYDNEY NSW 2008
TEL: (02) 9239 4000
WWW.DREWSTER.COM.AU

HYDRAULIC SERVICES
WATER & GAS SUPPLY 28 MAR 2002
SCALE 1:100

H08

03 COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 1 RL 6.5
SCALE 1:100

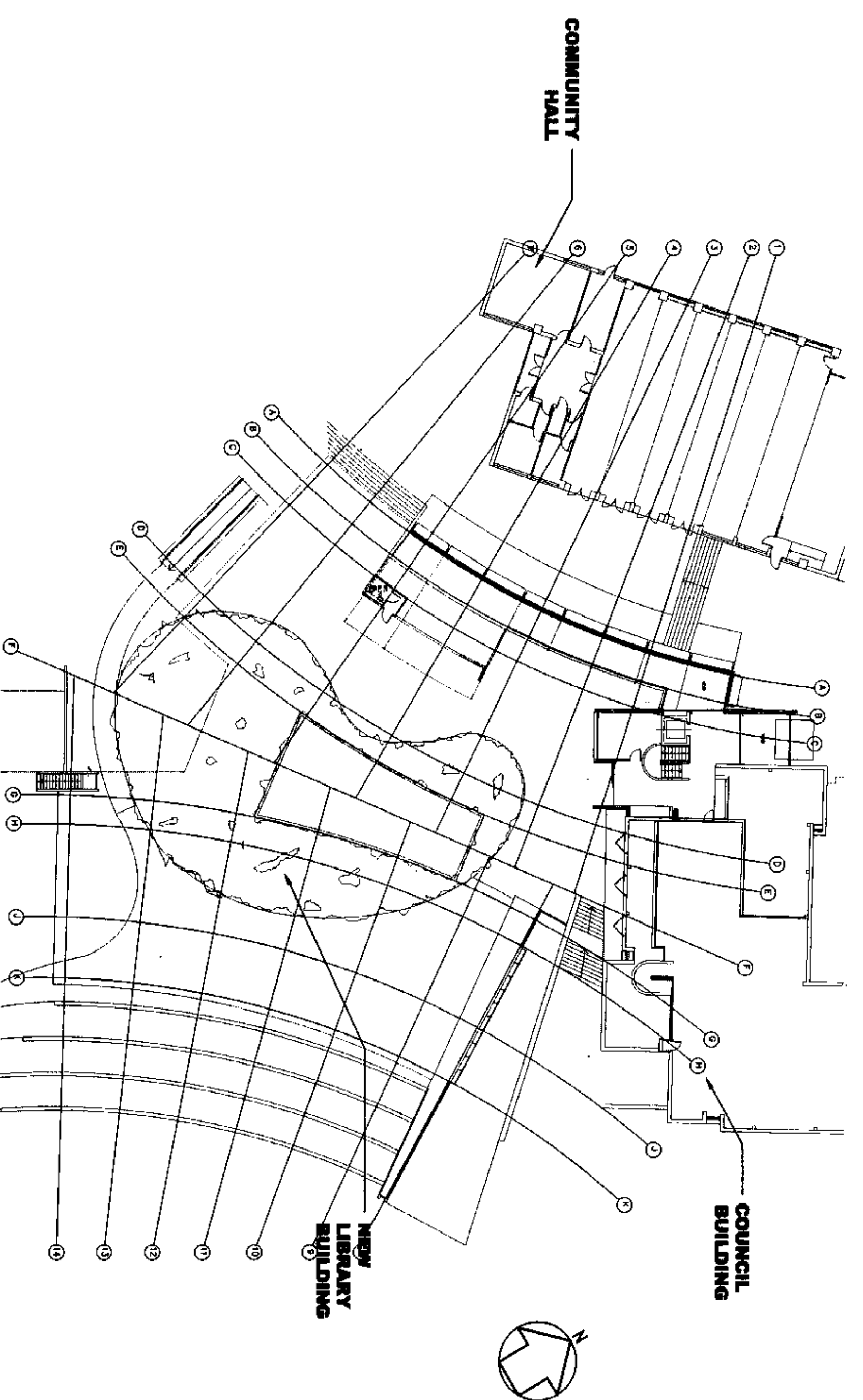
04 COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 2 RL 6.02
SCALE 1:100

MECHANICAL SERVICES

- 01832-M-1001
- 01832-M-1002/1
- 01832-M-1002/2
- 01832-M-1003
- 01832-M-2001
- 01832-M-2002
- 01832-M-3001
- 01832-M-4001
- 01832-M-5001
- 01832-M-6001
- 01832-M-7001
- 01832-M-8001
- 01832-M-9001

- 01832-M-9001
- 01832-M-9002

- LEGEND
- DUCT INSTALLATION DETAILS SHEET (1 OF 2)
- DUCT INSTALLATION DETAILS SHEET (2 OF 2)
- NEW LIBRARY AND EXISTING BUILDING EQUIPMENT SCHEDULES
- NEW LIBRARY GROUND FLOOR AC & VENTILATION LAYOUT
- NEW LIBRARY GROUND FLOOR AC & VENTILATION DETAILS
- NEW LIBRARY HEATING & CHILLED WATER LAYOUT
- NEW LIBRARY AIR HANDLING PLANTROOM LAYOUT
- NEW LIBRARY AIR HANDLING PLANTROOM SECTIONS
- NEW LIBRARY AIR SIDE CONTROL SCHEMATIC
- NEW LIBRARY HEATING & CHILLED WATER CONTROL SCHEMATIC
- NEW LIBRARY SINGLE LINE POWER DIAGRAM
- NEW LIBRARY HEATING & CHILLED WATER SCHEMATIC
- COUNCIL OFFICE EXISTING SERVICES LAYOUT
- COUNCIL OFFICE & COMMUNITY HALL AC & VENTILATION LAYOUT & CONTROLS



FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
IF IN THE CONTINUING RESPONSIBILITY TO PROVIDE CONSULTANT
SERVICES UNDER THE PROFESSIONAL
SERVICES ACT 2002

MONA VALE VILLAGE PARK LIBRARY 01832

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STEENSEN WARMING (AUST) PTY LTD



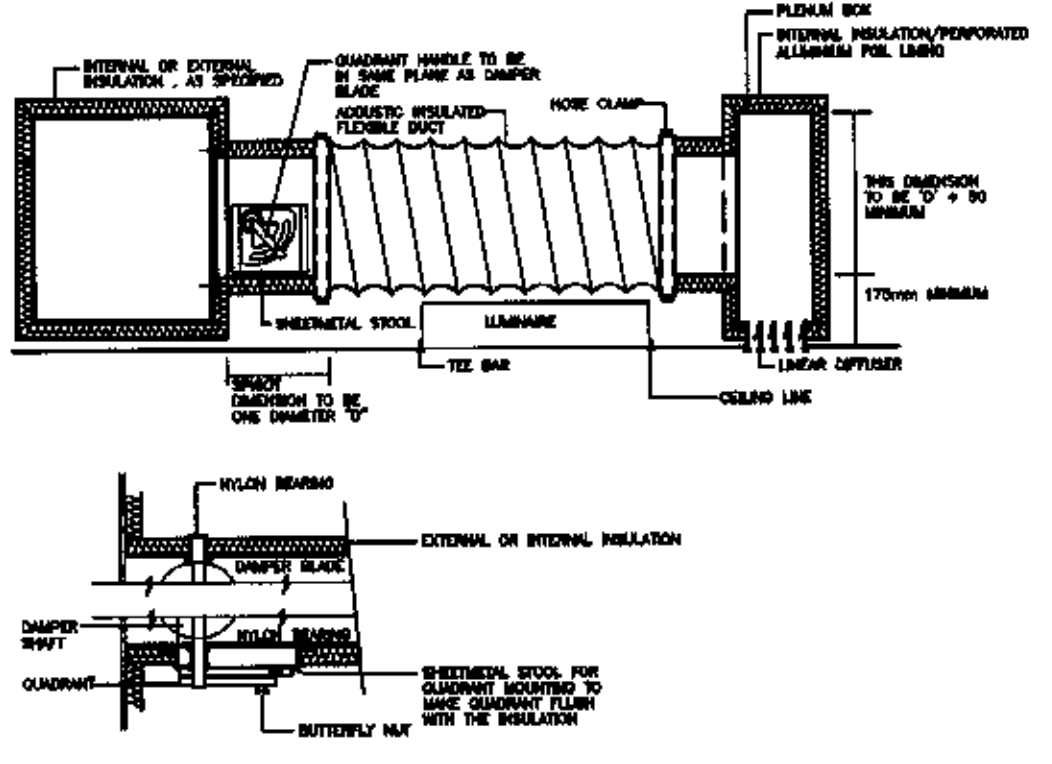
QUALITY ASSURANCE CHECKS - DOCUMENT CONTROL

NO	DATE	INITIALS	LOCATION
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30			FOR ISSUE
40	12/26/03	CA	FOR ISSUE
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100			CHECK NOT IN PROGRESS

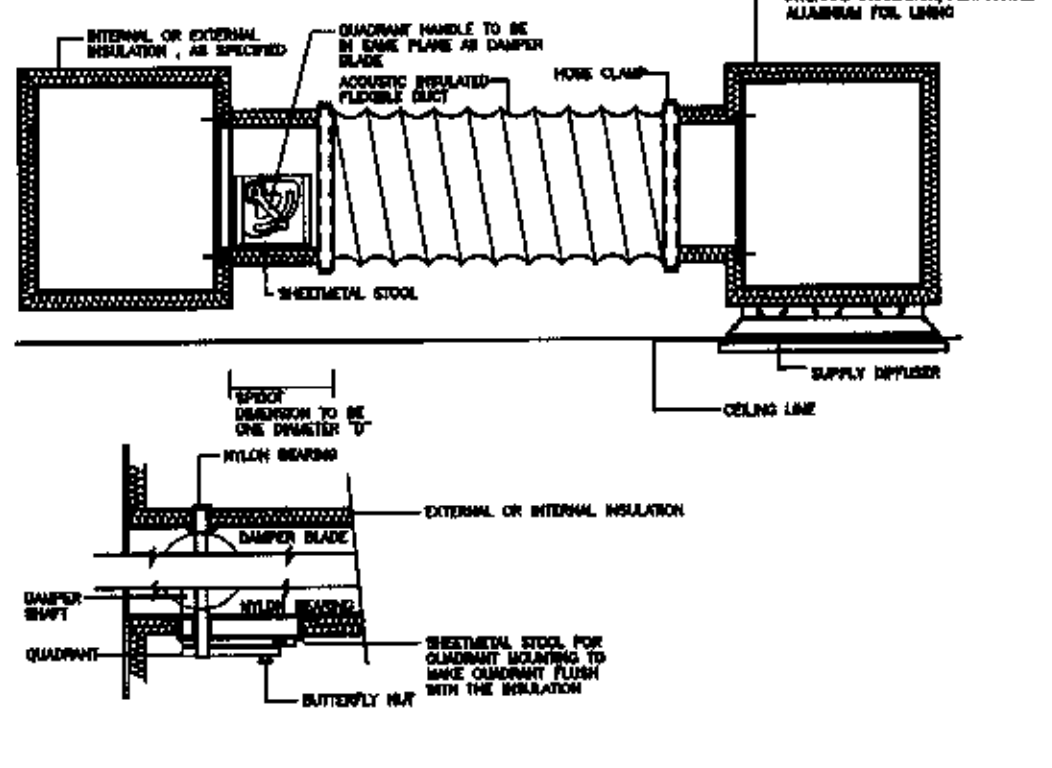
COMMENTS:

10/2/03

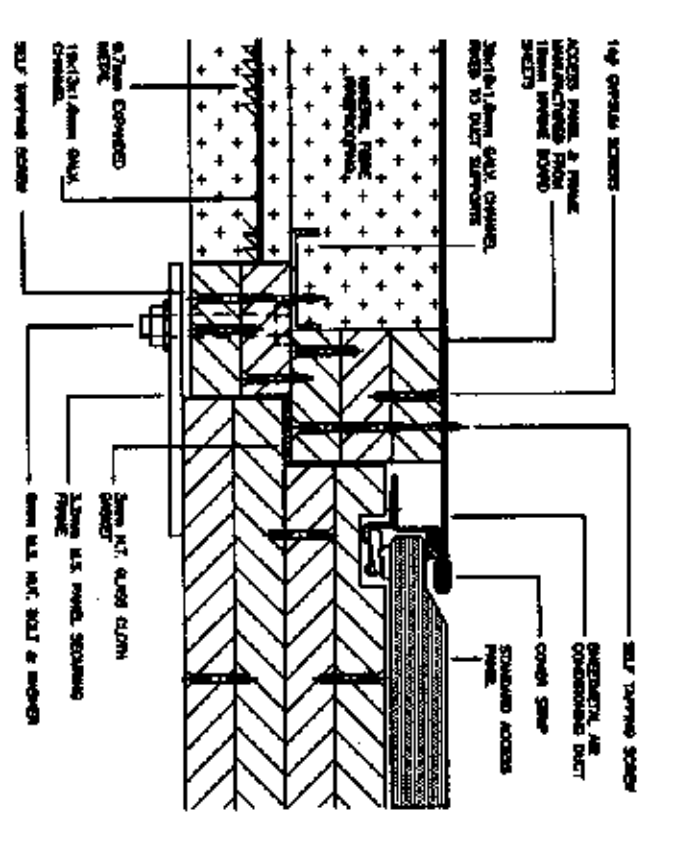
LOW PRESSURE TAKE-OFF AND CONNECTION TO AIR FILTERS



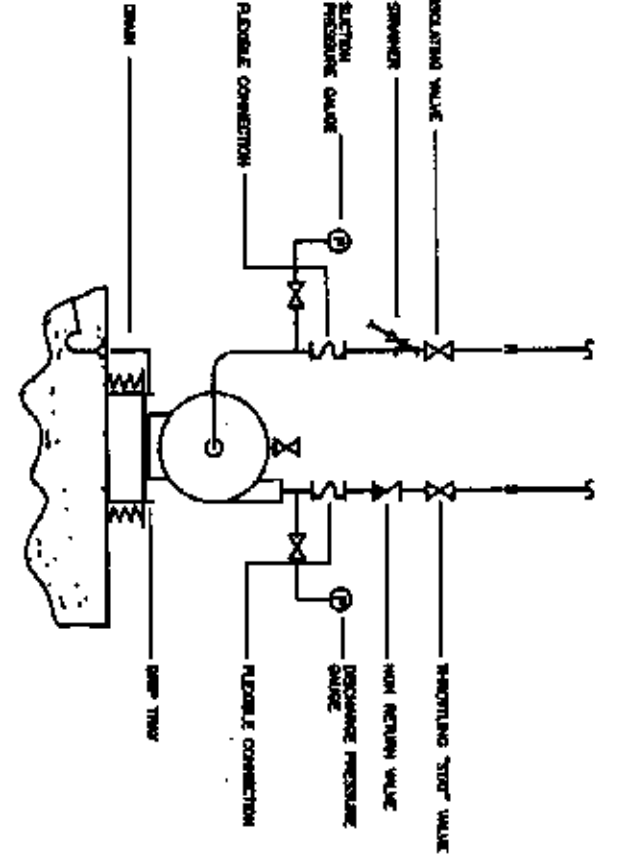
LOW PRESSURE TAKE-OFF AND CONNECTION TO AIR FILTERS



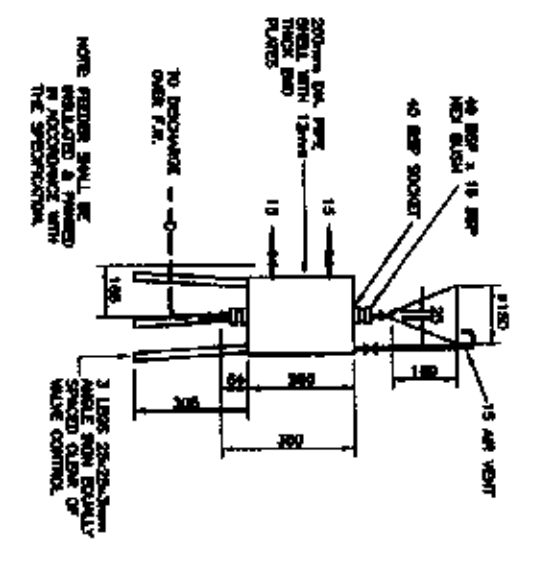
FIRE RATED AIR DUCT ACCESS PANEL (TYPE A - JANSI/ULATED PANEL)



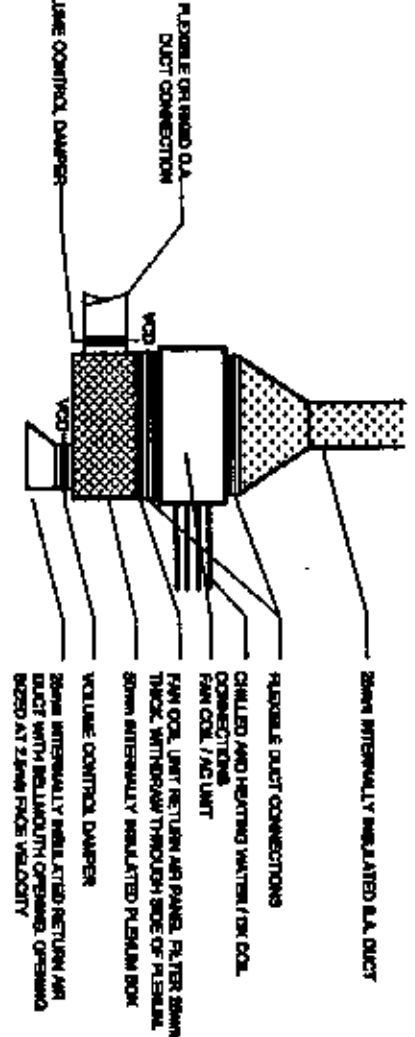
TYPICAL PIPE CONNECTION DETAIL



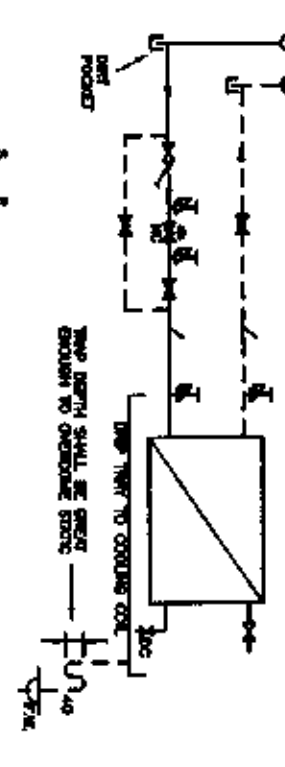
RECESS SYSTEM FOR FAN TERMINAL



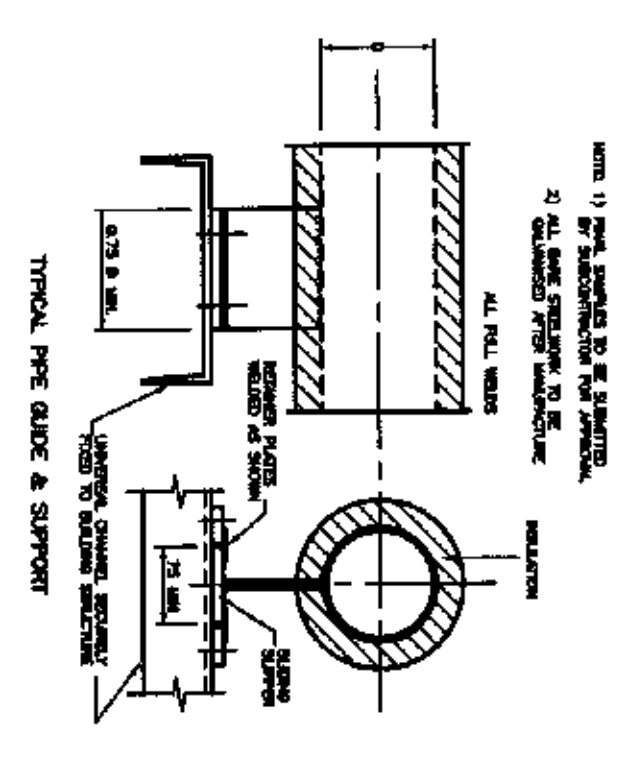
TYPICAL FAN COIL & AC UNIT CONNECTION DETAILS



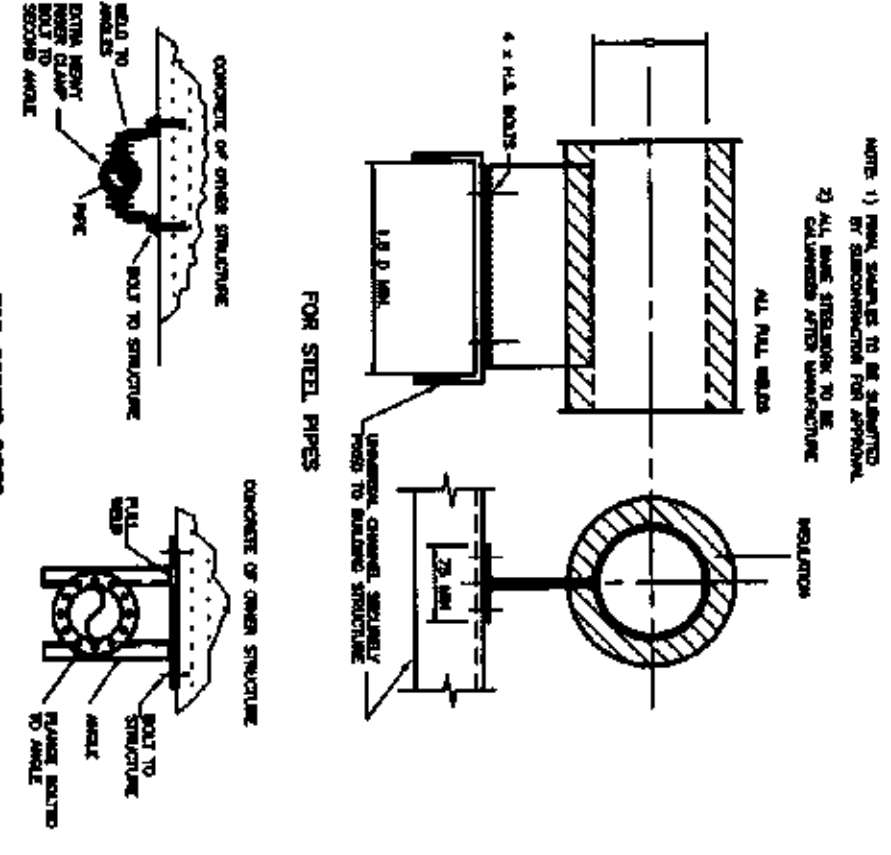
SINGLE COILING COILS



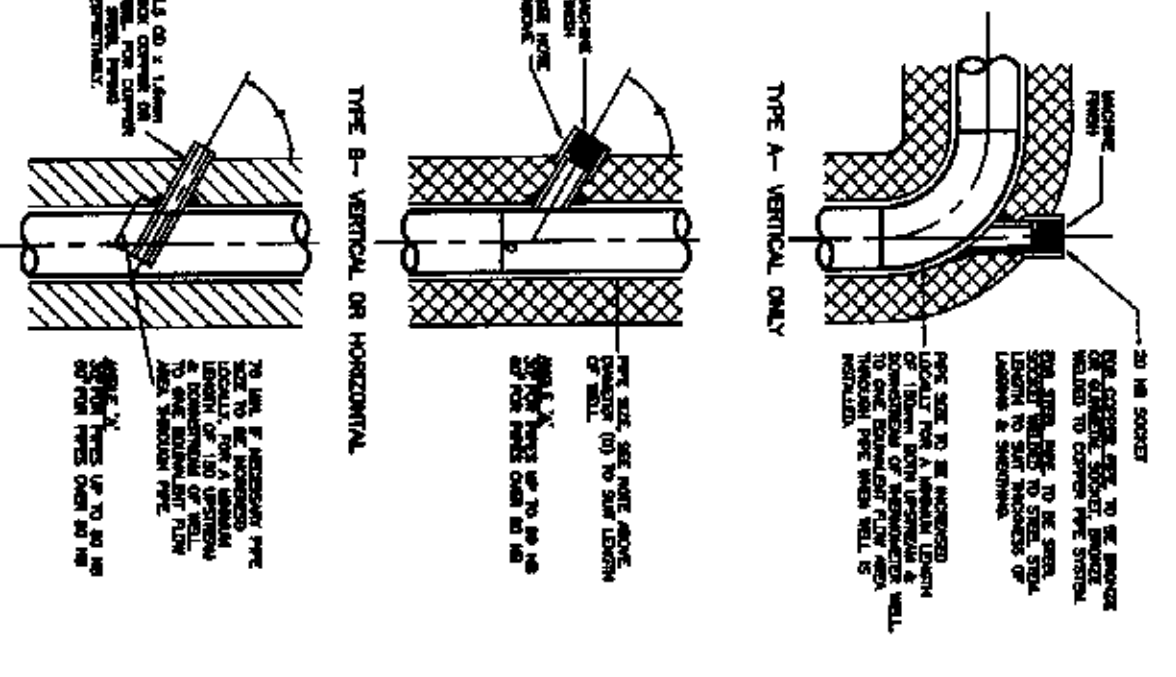
TYPICAL PIPE RISERS AND SPOCKETS



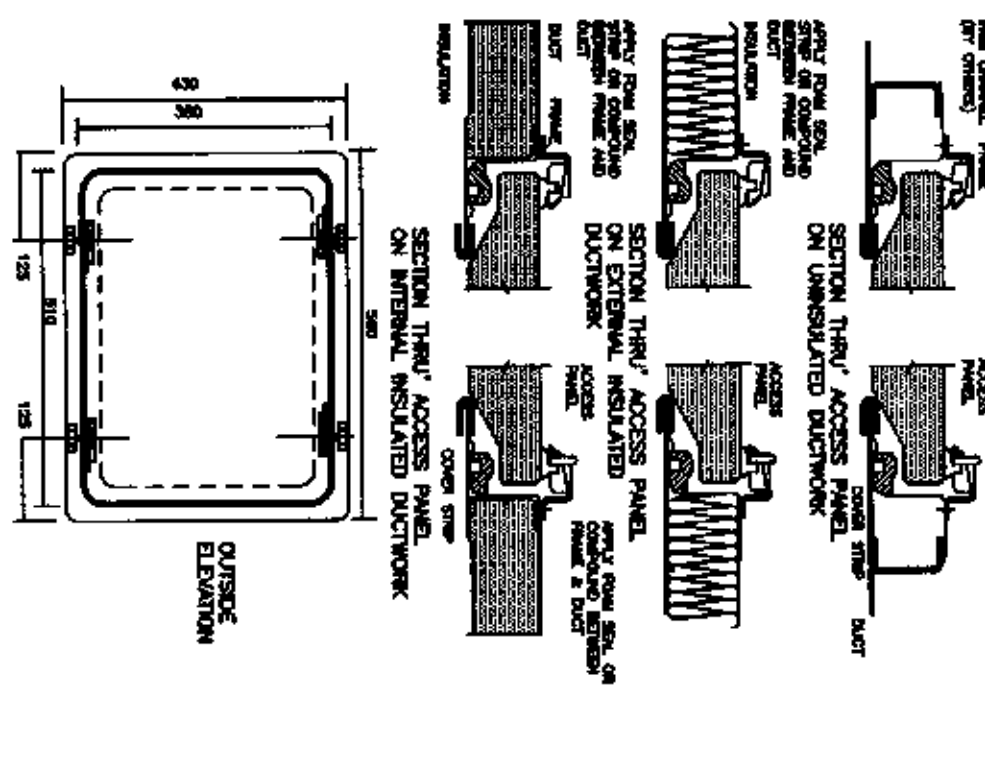
DETAILS OF PIPE ANCHOR BOLTS



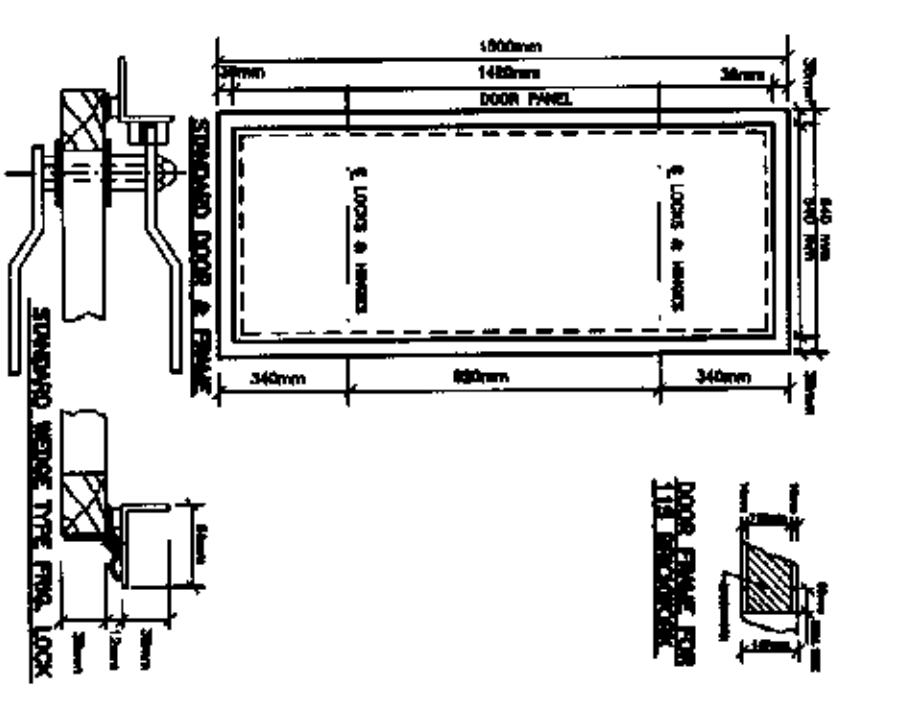
DIAPHRAGM WALLS



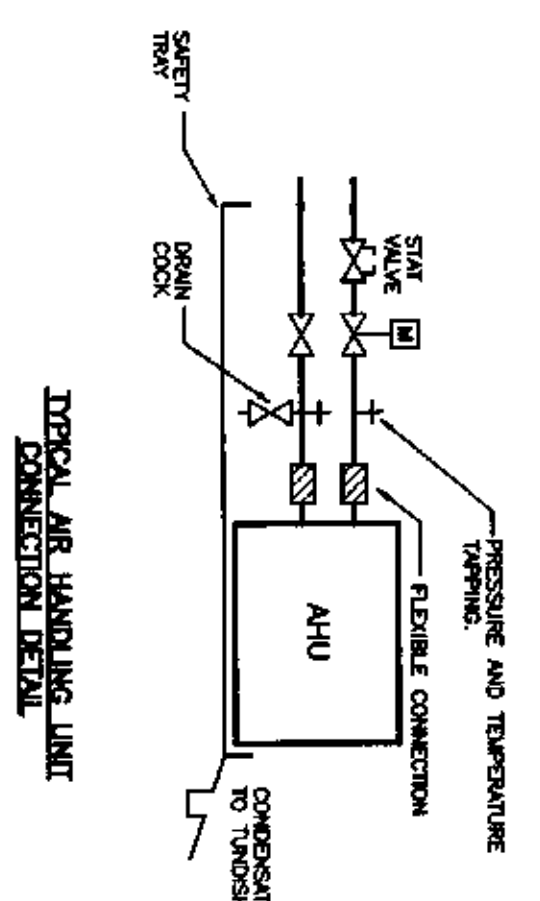
DUCTWORK ACCESS



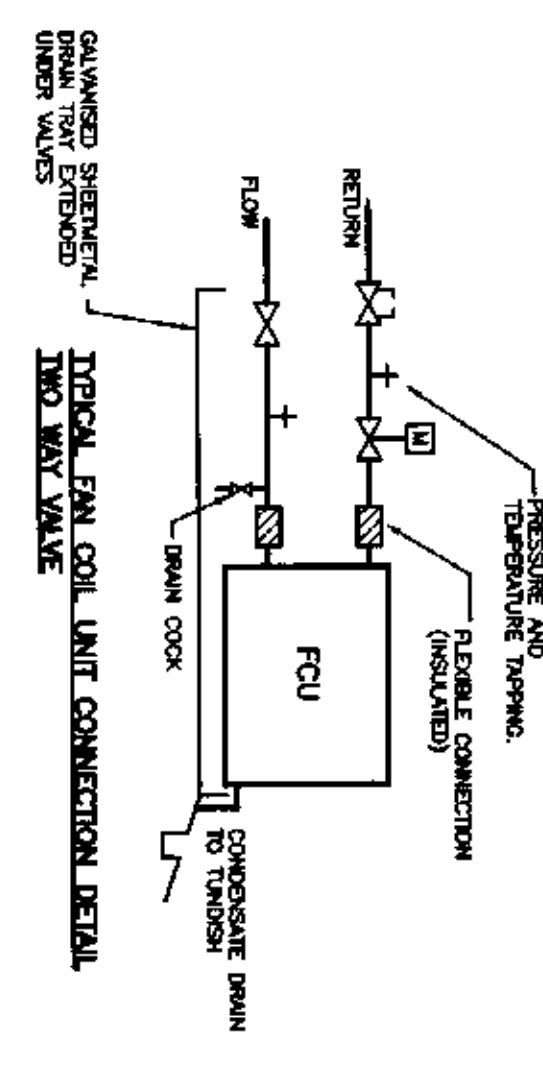
AIR CONDITIONING UNITS



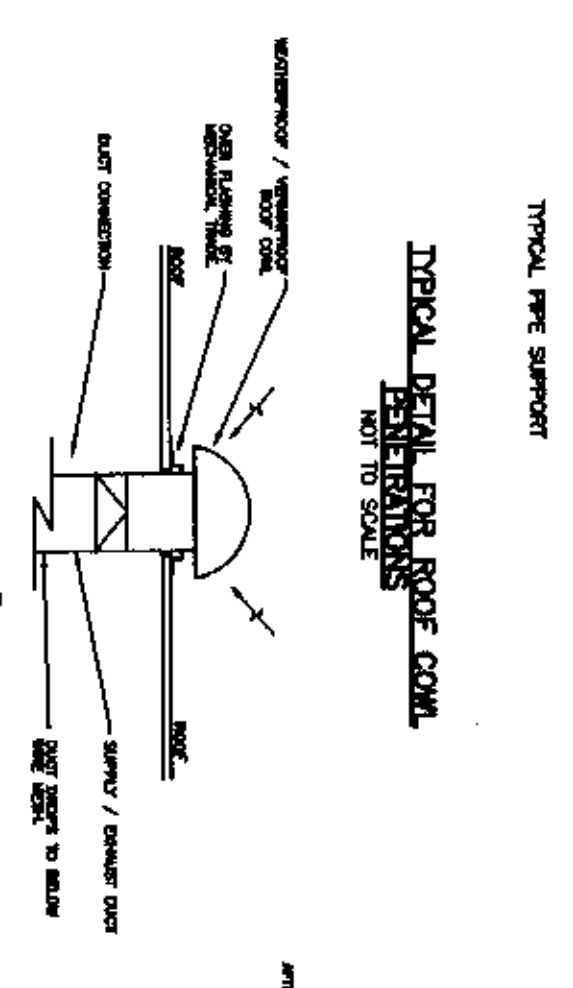
TYPICAL AIR HANDLING UNIT CONNECTION DETAIL



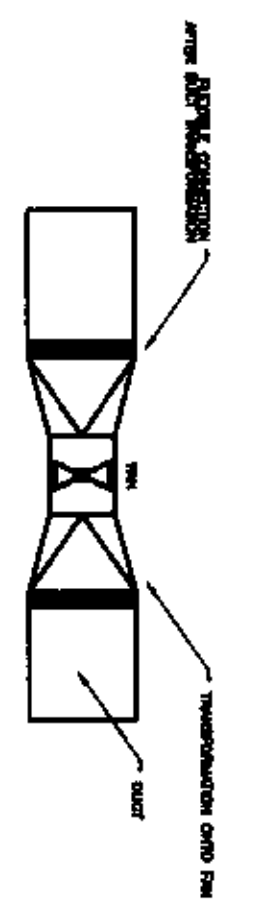
TYPICAL FAN COIL UNIT CONNECTION DETAIL



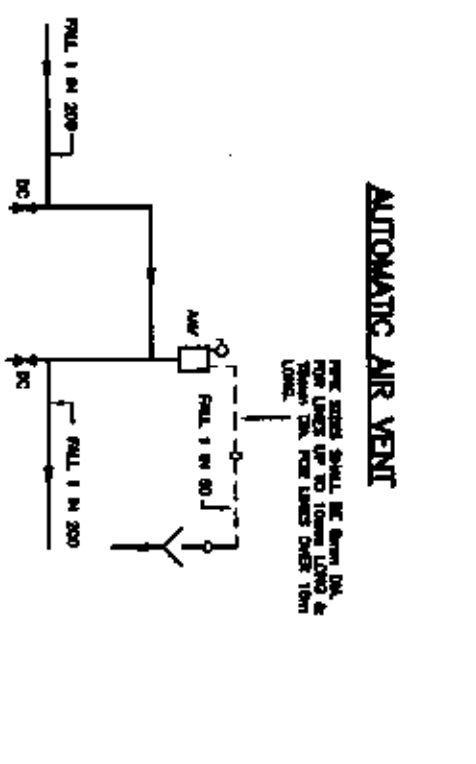
TYPICAL FAN ROOF COIL CONNECTION DETAIL



TYPICAL FAN CONNECTION



AUTOMATIC AIR VENT



FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
IF THE CONTRACTOR DISAGREES WITH THE CONTRACTOR'S INTERPRETATION OF ANY PART OF THIS DRAWING, HE SHALL REFER TO THE SPECIFICATION.

APPROVED
03/17/03-1
CONSULTING ENGINEER AND ARCHITECT

STEENSENSVARMING
CONSULTING ENGINEERS & MANAGERS

MONA VALE
VILLAGE PARK
LIBRARY

MECHANICAL SERVICES
INSTALLATION
DETAILS SHEET

01832 M1002/1 B

NO	REVISION	DATE	INITIALS	DESCRIPTION
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FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
FOR THE PURPOSES OF TENDERING, THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LEVELS ON THE DRAWING AND SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED IN THE BIDDING DOCUMENTS.

NO	REVISION	DATE	INITIALS	DESCRIPTION
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FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
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NO	REVISION	DATE	INITIALS	DESCRIPTION
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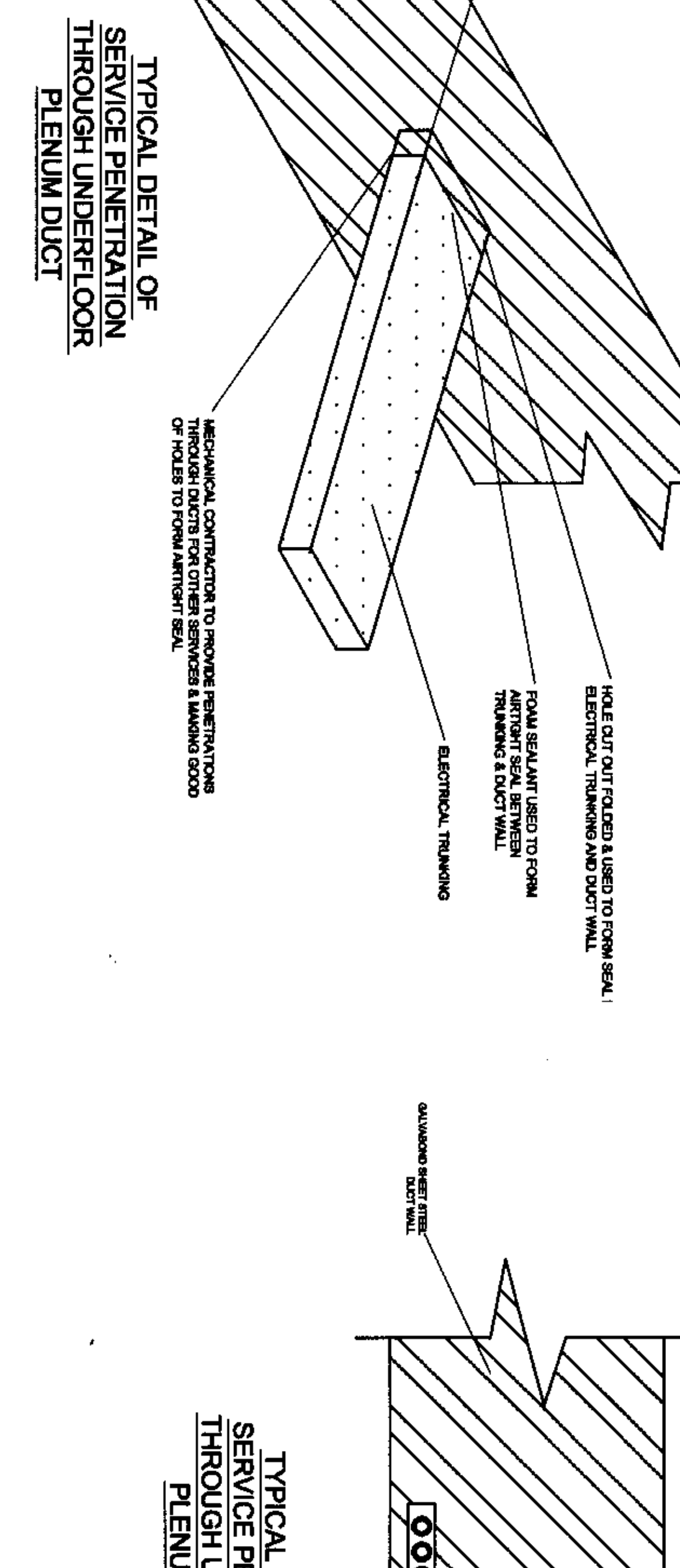
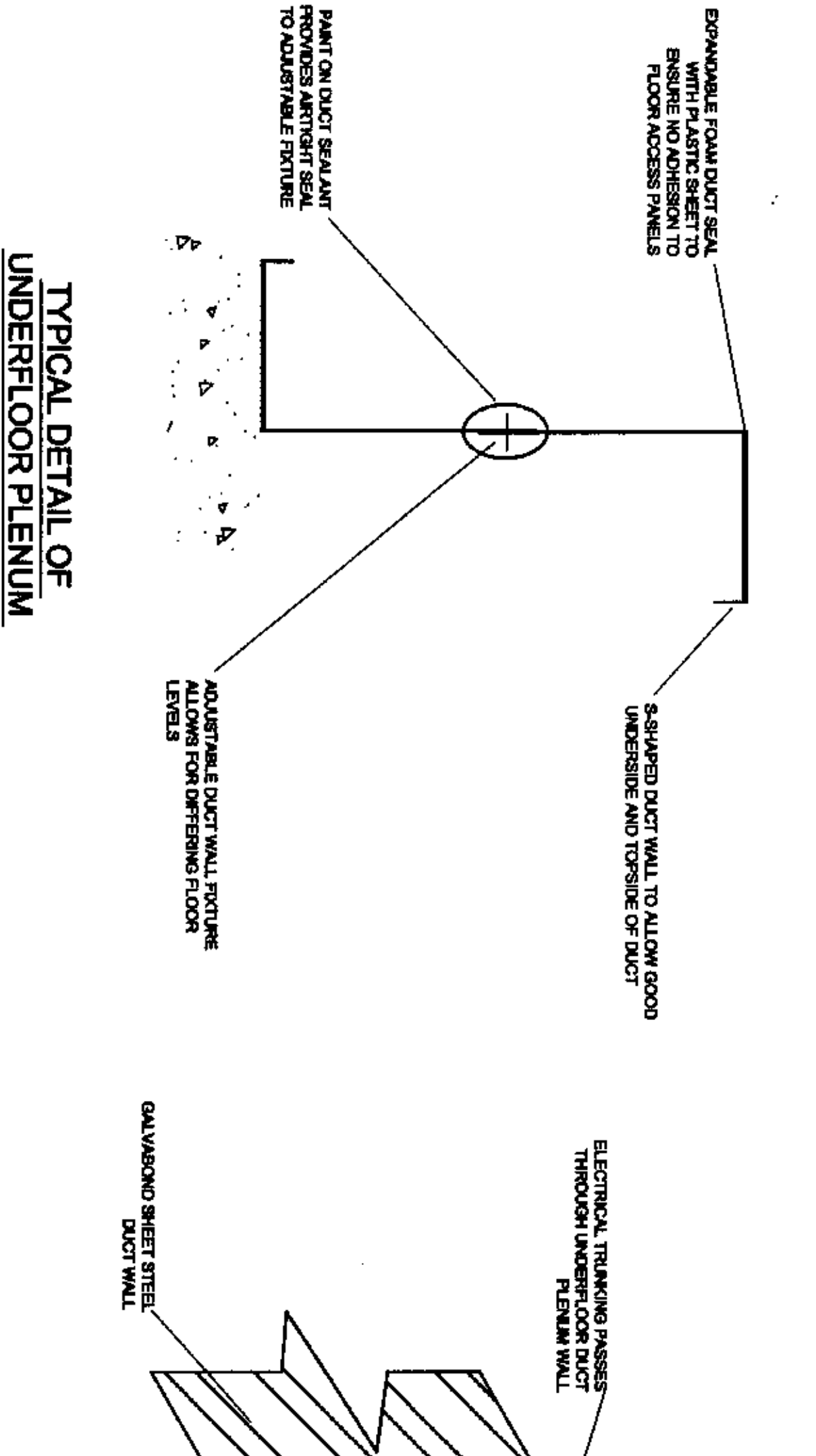
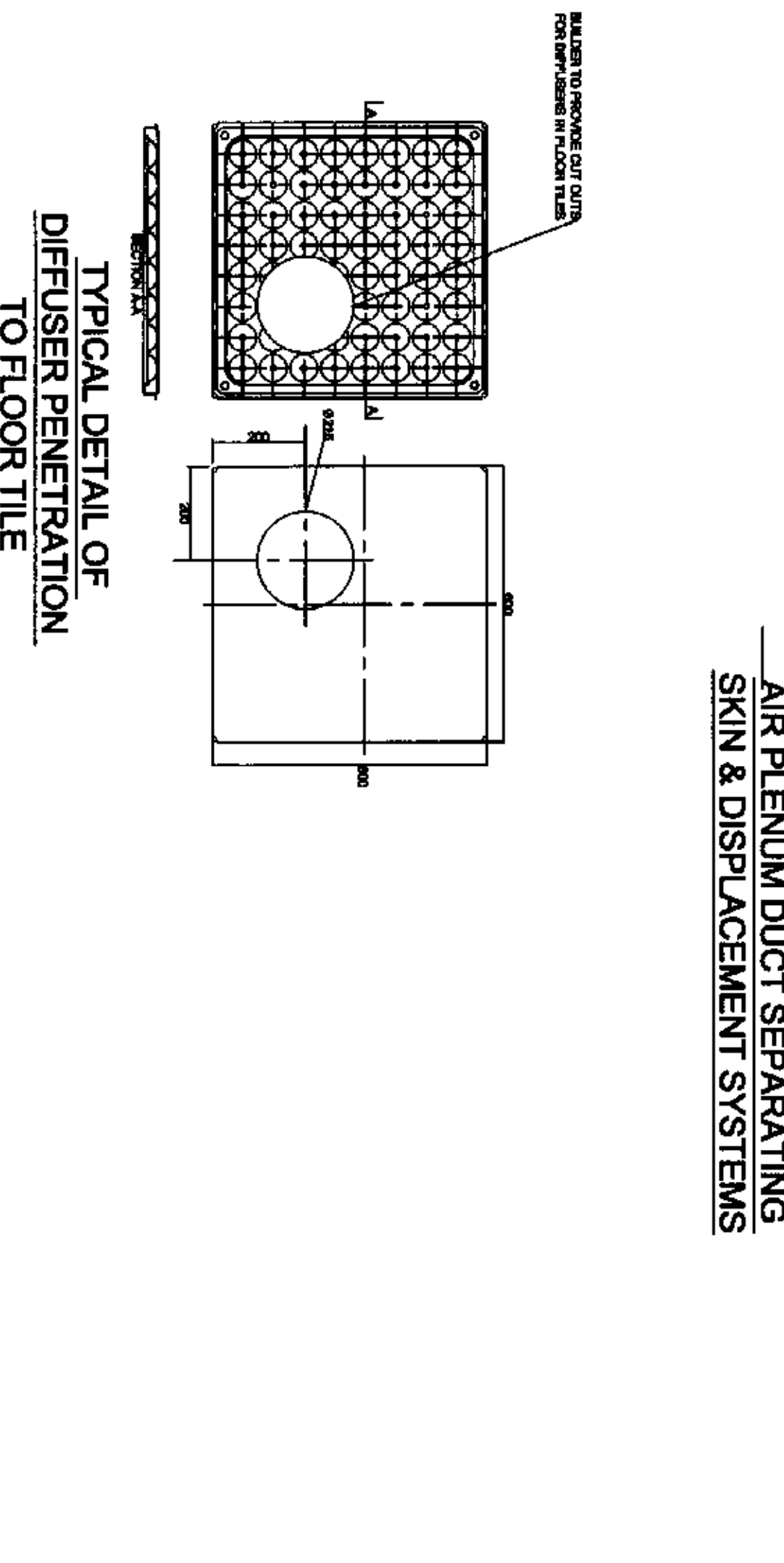
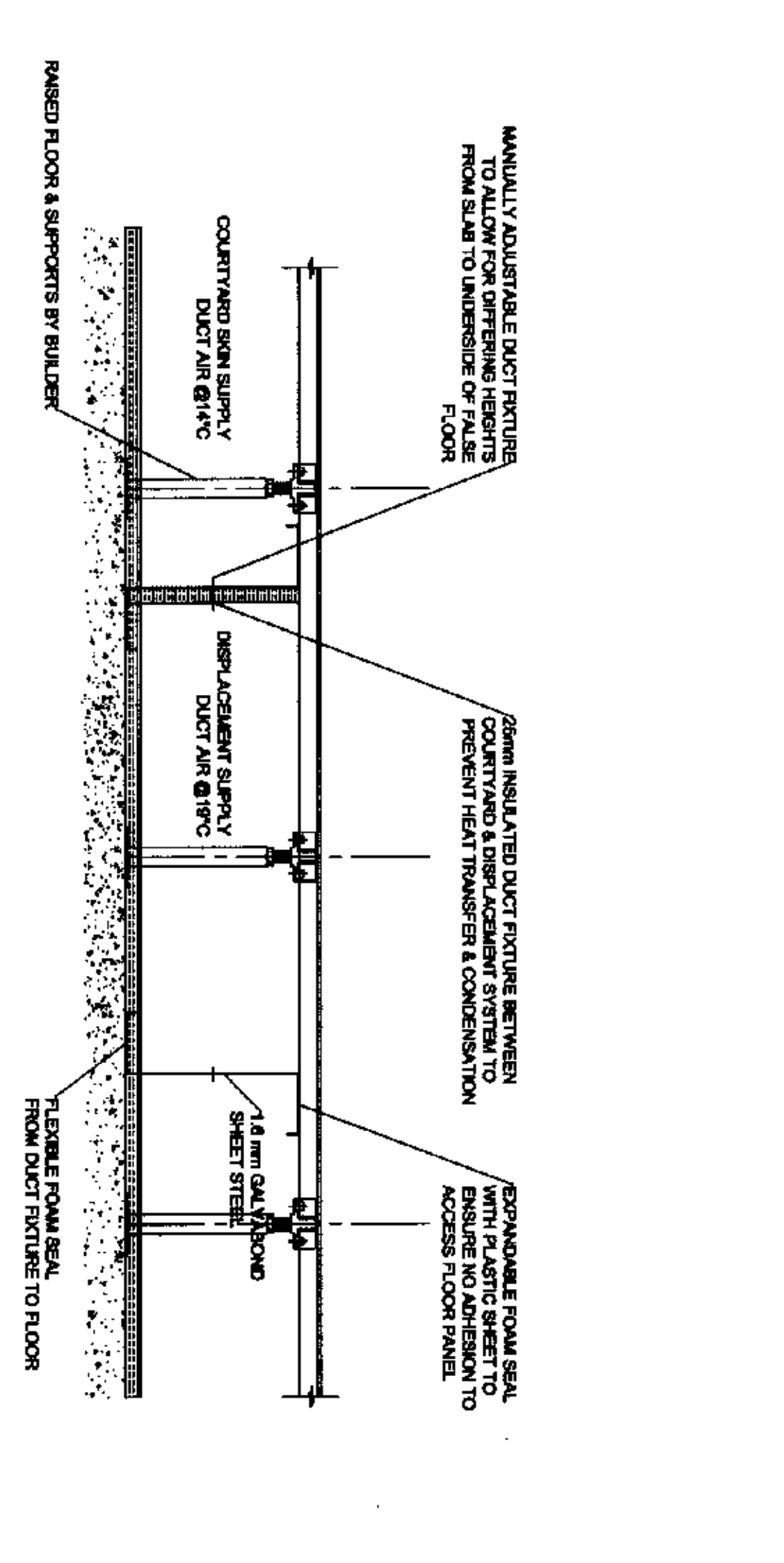
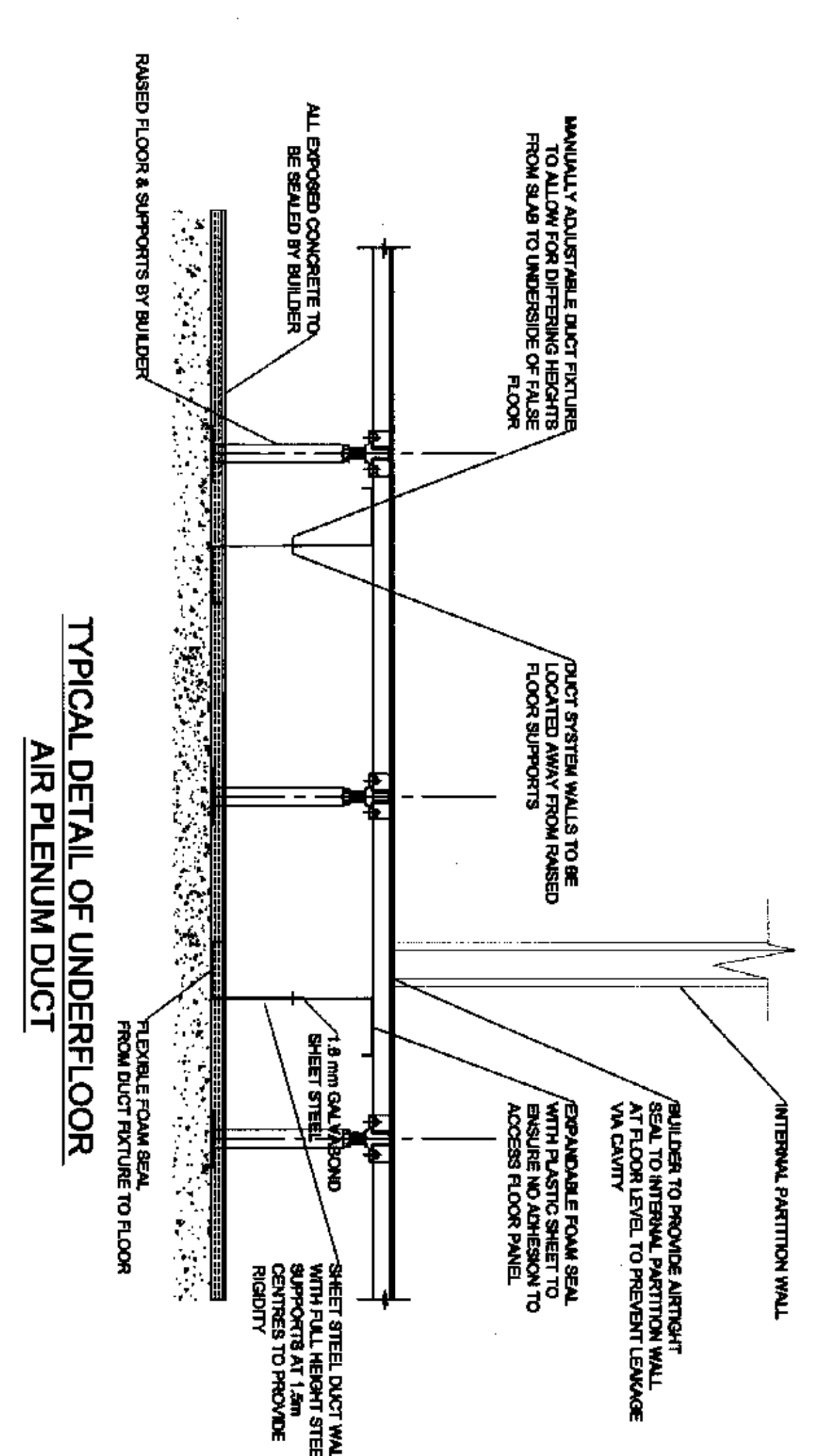
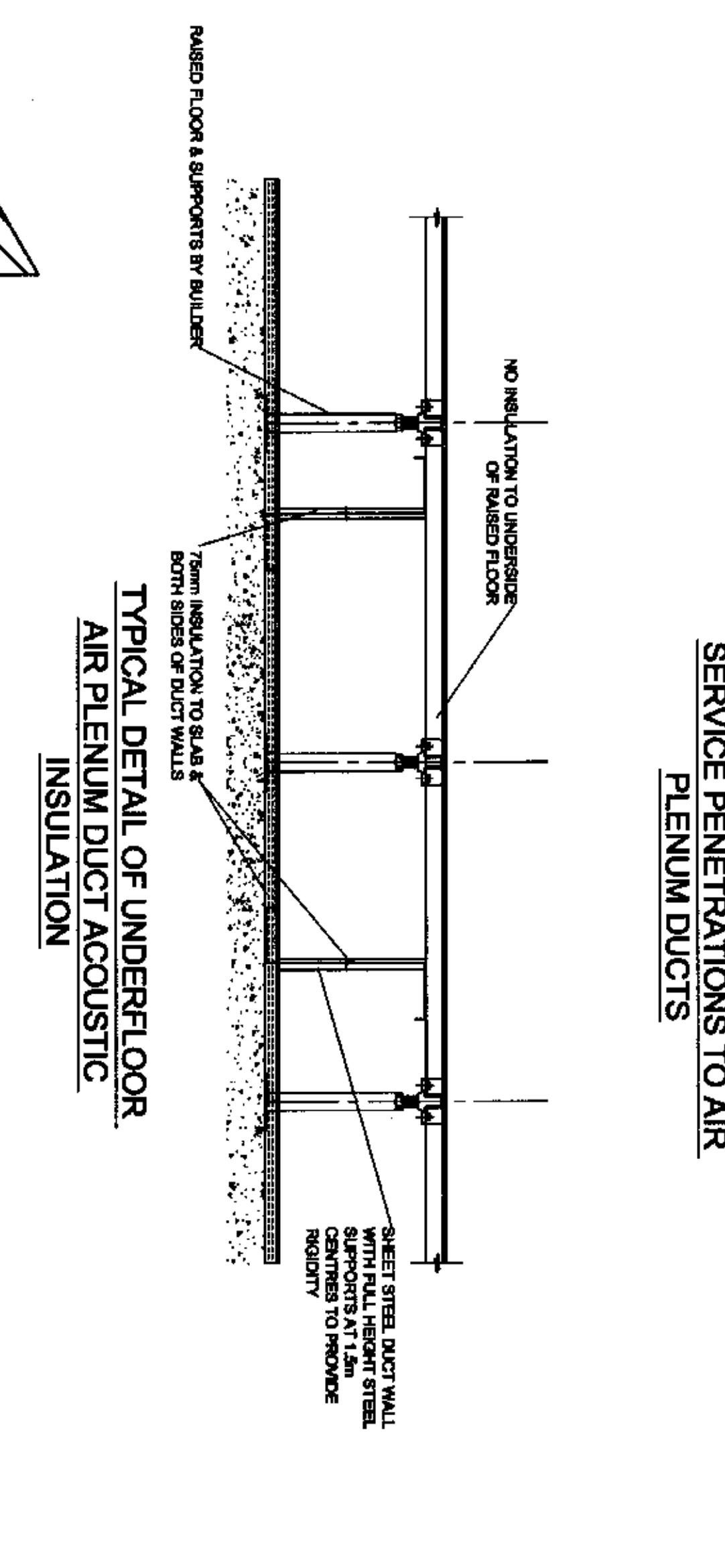
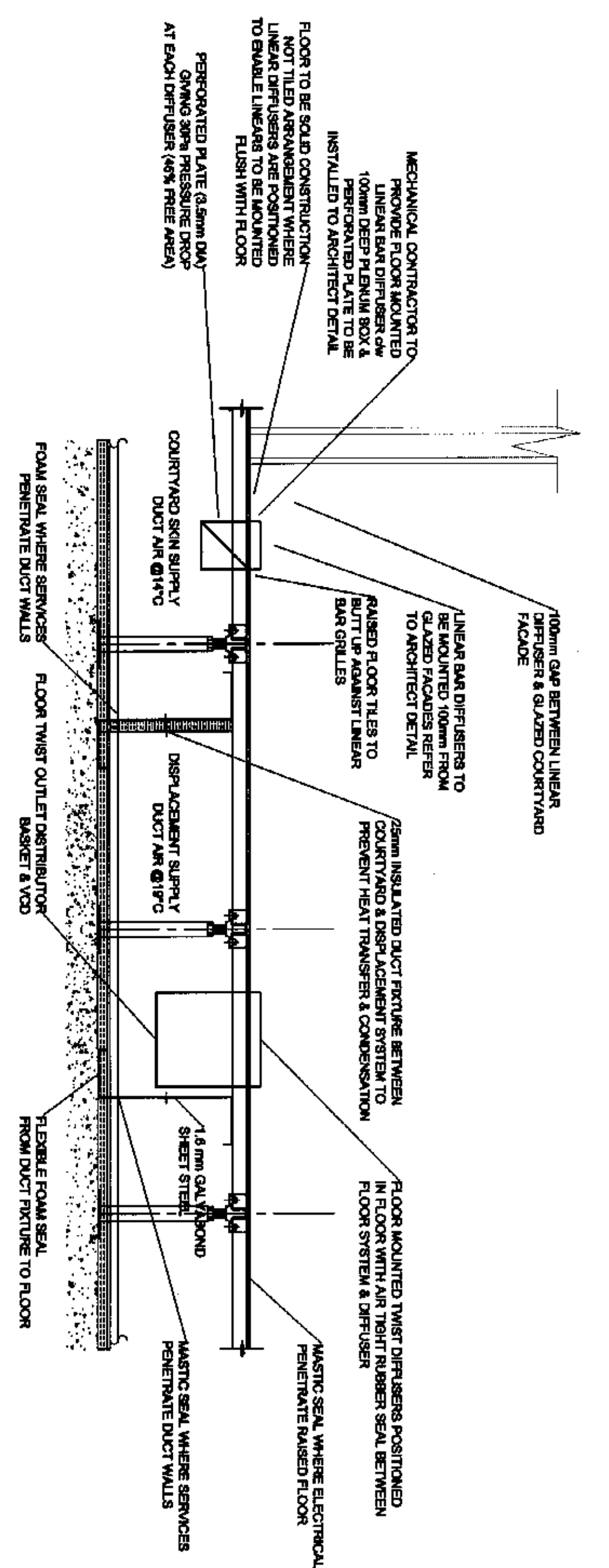
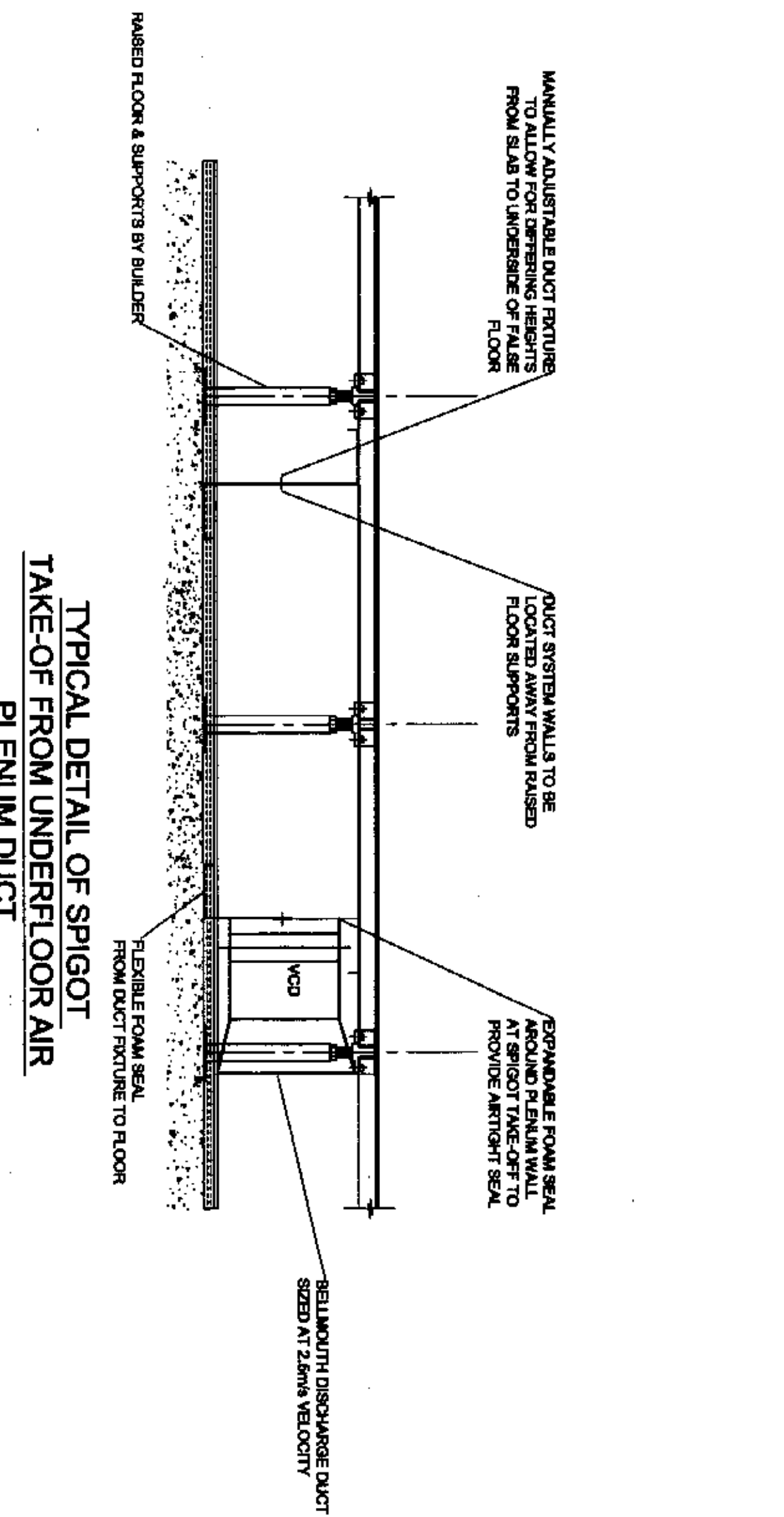
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FOR TENDER
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STEENSEN VARMING
CONSULTING ENGINEERS & MANAGERS
STEENSEN VARMING (AUSTRALIA) PTY. LIMITED
Level 2, 100, Roper Street, Rockdale, NSW 2216
Tel: (02) 9439 2200
Fax: (02) 9439 2201
Email: steensen@steensenvarming.com.au
STEENSEN VARMING (AUSTRALIA) PTY. LIMITED
ABN 62 150 208 220
REGISTERED OFFICE: 150, ROPER STREET, ROCKDALE, NSW 2216
REGISTERED OFFICE: 150, ROPER STREET, ROCKDALE, NSW 2216

MECHANICAL SERVICES
INSTALLATION
DETAILS SHEET (2 OF 2)
MONA VALE
VILLAGE PARK
LIBRARY
JAN 03 ND ND CA
01832 M1002/2 B



FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
FOR THE PURPOSES OF TENDERING, THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LEVELS ON THE DRAWING AND SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED IN THE BIDDING DOCUMENTS.

APPROVED
13/11/13-1
13/11/13-1

B1

TYPE	FLOW RATE (m³/s)	TYPE & SIZE	FLEX. DIA. (mm)	COMMENTS
A	400	ROOF-200	200	PLASTIC GRILLES TO BE ON AND TO THE VOA
B	400	ROOF-200	200	PLASTIC GRILLES TO BE ON AND TO THE VOA & MANUAL DIRECTION CONTROL
C	400	ROOF-200	200	PLASTIC GRILLES TO BE ON AND TO THE VOA & MANUAL DIRECTION CONTROL

TYPE	FLOW RATE (m³/s)	TYPE & SIZE	FLEX. DIA. (mm)	COMMENTS
D	411	1200x90	100	200
E	411	1200x90	100	200

TYPE	FLOW RATE (m³/s)	TYPE & SIZE	FLEX. DIA. (mm)	COMMENTS
F	411	1200x90	100	200
G	411	1200x90	100	200

TYPE	FLOW RATE (m³/s)	TYPE & SIZE	FLEX. DIA. (mm)	COMMENTS
H	411	1200x90	100	200
I	411	1200x90	100	200

TYPE	FLOW RATE (m³/s)	TYPE & SIZE	FLEX. DIA. (mm)	COMMENTS
J	411	1200x90	100	200
K	411	1200x90	100	200

TYPE	FLOW RATE (m³/s)	TYPE & SIZE	FLEX. DIA. (mm)	COMMENTS
L	411	1200x90	100	200
M	411	1200x90	100	200

TYPE	FLOW RATE (m³/s)	TYPE & SIZE	FLEX. DIA. (mm)	COMMENTS
N	411	1200x90	100	200
O	411	1200x90	100	200

NO.	TYPE	TEMP.	TYPE	TEMP.	TYPE	TEMP.	TYPE	TEMP.	TYPE	TEMP.
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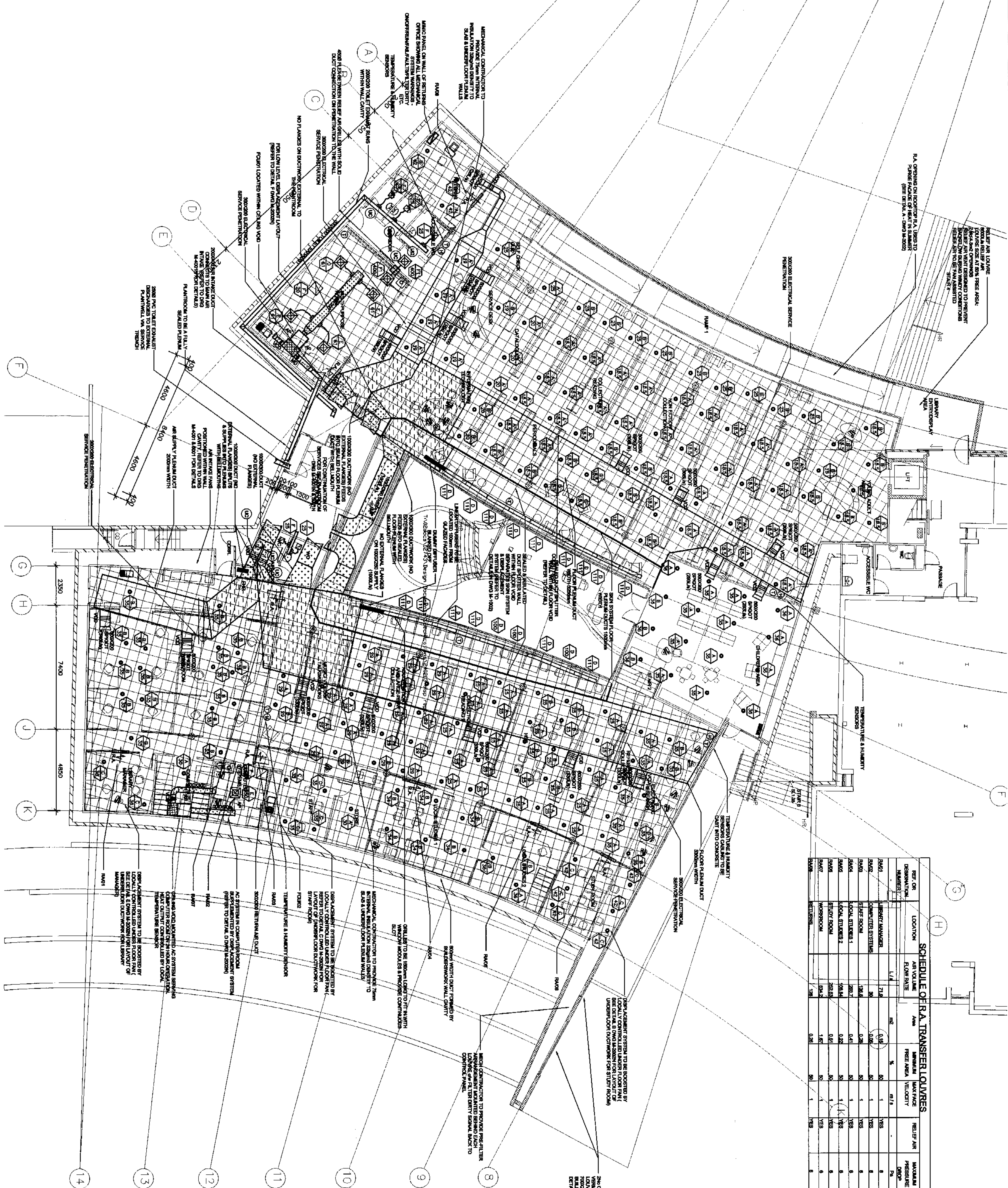
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7

NO.	DATE	INITIALS	LOCATION
1	12/12/12	CA	MECHANICAL
2	12/12/12	CA	MECHANICAL
3	12/12/12	CA	MECHANICAL

STEENSEN VARMING
CONSULTING ENGINEERS & MANAGERS
1000 10th Street, Suite 1000
San Francisco, CA 94103
Tel: 415.774.2200
Fax: 415.774.2201
www.steensenvarming.com

MECHANICAL SERVICES
NEW LIBRARY &
EXISTING BUILDING
EQUIPMENT SCHEDULES

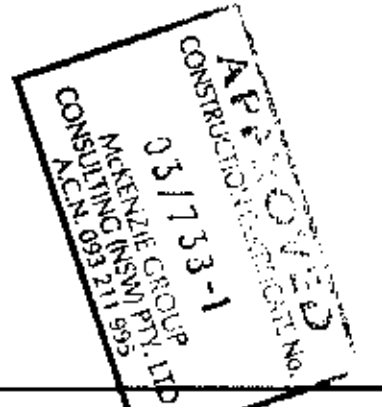
FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE COMPETITIVE
QUOTATIONS AND TO VERIFY ALL DIMENSIONS AND CONDITIONS
SHOWN ON THIS DRAWING.



SCHEDULE OF R.A. TRANSFER LOUVERS

REF. OR IDENTIFICATION	LOCATION	AIR VOLUME (L/S)	AREA (M ²)	PERCENTAGE	TYPE	REMARKS
1	LOBBY	1.0	1.0	100%	1	LOUVER IN THE LOBBY AREA TO SERVE THE LOBBY
2	RECEPTION	1.0	1.0	100%	1	LOUVER IN THE RECEPTION AREA TO SERVE THE RECEPTION
3	MEETING ROOMS	1.0	1.0	100%	1	LOUVER IN THE MEETING ROOMS AREA TO SERVE THE MEETING ROOMS
4	STAFF ROOMS	1.0	1.0	100%	1	LOUVER IN THE STAFF ROOMS AREA TO SERVE THE STAFF ROOMS
5	OFFICE	1.0	1.0	100%	1	LOUVER IN THE OFFICE AREA TO SERVE THE OFFICE
6	CONFERENCE ROOM	1.0	1.0	100%	1	LOUVER IN THE CONFERENCE ROOM AREA TO SERVE THE CONFERENCE ROOM
7	RECEPTION	1.0	1.0	100%	1	LOUVER IN THE RECEPTION AREA TO SERVE THE RECEPTION
8	MEETING ROOMS	1.0	1.0	100%	1	LOUVER IN THE MEETING ROOMS AREA TO SERVE THE MEETING ROOMS
9	STAFF ROOMS	1.0	1.0	100%	1	LOUVER IN THE STAFF ROOMS AREA TO SERVE THE STAFF ROOMS
10	OFFICE	1.0	1.0	100%	1	LOUVER IN THE OFFICE AREA TO SERVE THE OFFICE
11	CONFERENCE ROOM	1.0	1.0	100%	1	LOUVER IN THE CONFERENCE ROOM AREA TO SERVE THE CONFERENCE ROOM
12	RECEPTION	1.0	1.0	100%	1	LOUVER IN THE RECEPTION AREA TO SERVE THE RECEPTION
13	MEETING ROOMS	1.0	1.0	100%	1	LOUVER IN THE MEETING ROOMS AREA TO SERVE THE MEETING ROOMS
14	STAFF ROOMS	1.0	1.0	100%	1	LOUVER IN THE STAFF ROOMS AREA TO SERVE THE STAFF ROOMS

FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE COMPLETE AND ACCURATE INFORMATION TO THE ARCHITECT



QUALITY ASSURANCE CHECKS

NO.	DESCRIPTION	DATE	STATUS
1
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NOTES

- 1) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 2) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 3) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 4) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 5) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 6) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 7) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 8) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 9) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.
- 10) LOUVER ACQUISITION SHALL BE MADE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS.

REVISIONS

NO.	DESCRIPTION	DATE	BY
1
2
3
4
5
6
7
8
9
10

STEENSENVARMNING
CONSULTING ENGINEERS & MANAGERS
STEENSENVARMNING AUSTRALIAN PTY. LIMITED, A/CIA & FIDIC
100/100 MARKET STREET, SYDNEY, NSW, 2000
TELEPHONE: (02) 9231 1111
FAX: (02) 9231 1112
WWW.STEENSENVARMNING.COM.AU

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MECHANICAL SERVICES NEW LIBRARY GROUND FLOOR AC & VENTILATION LAYOUT

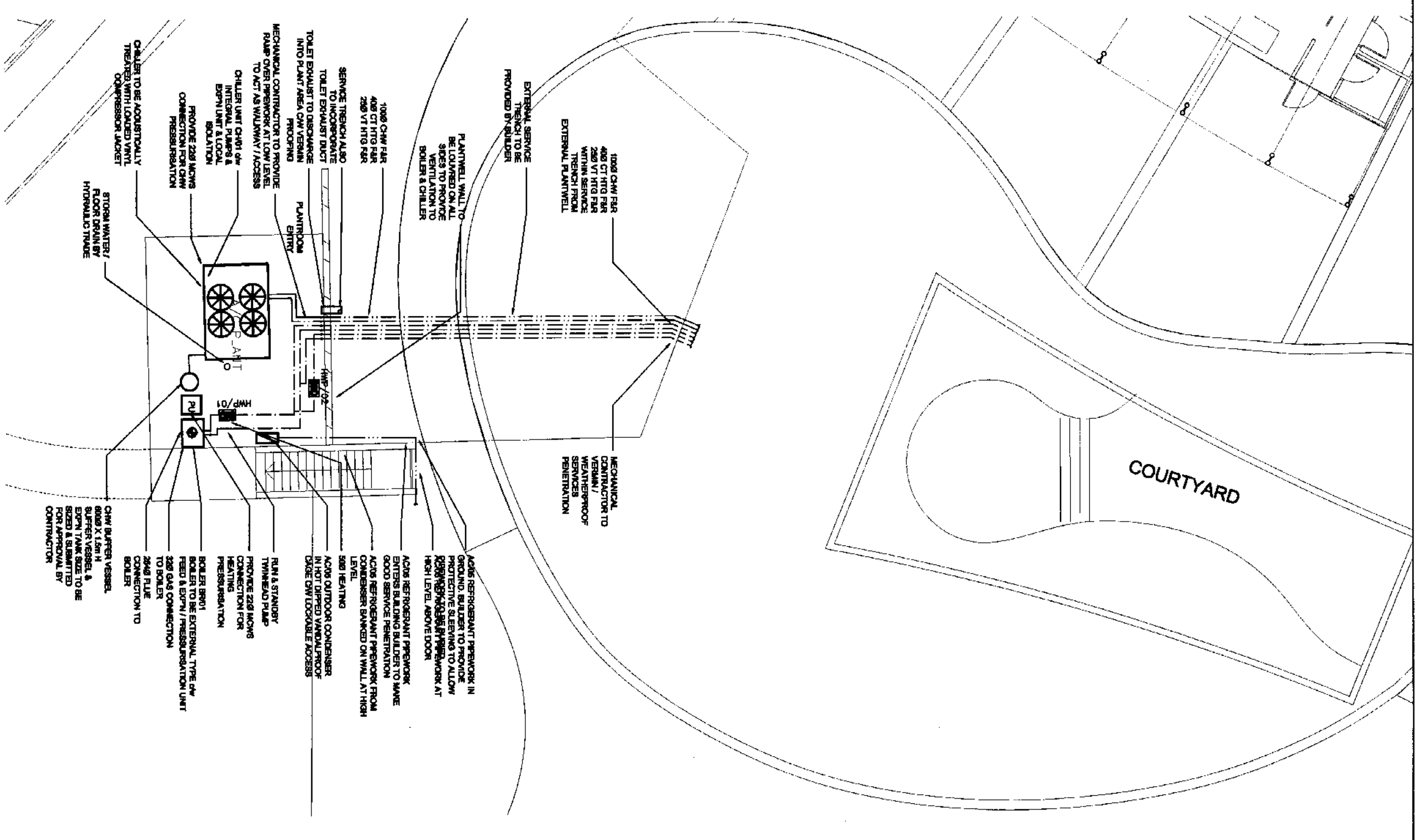
1:100 JAN 03 ND ND CA

01832 M2001 B



UNDERFLOOR HEATING CIRCUITS

REF	CIRCUIT LENGTH (m)	FLOW RATE (L/min)	PRESSURE DROP (Bar)	FLOW / RETURN (°C)
A1	95	2.8	0.3	55/47
A2	95	2.8	0.3	55/47
A3	95	2.6	0.2	55/47
A4	85	2.5	0.2	55/47
A5	85	2.5	0.2	55/47



FOR TENDER
 THIS IS NOT A WORKSHOP DRAWING
 IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE COMPLETIONAL
 DIMENSIONS AND TO CHECK ALL DIMENSIONS WITH THE RELEVANT
 CONTRACT DOCUMENTS.

QUALITY ASSURANCE CHECKS

NO	DESCRIPTION	DATE	STATUS
1	DESIGN CHECKS		
2	CONSTRUCTION		
3	COMPLETION		

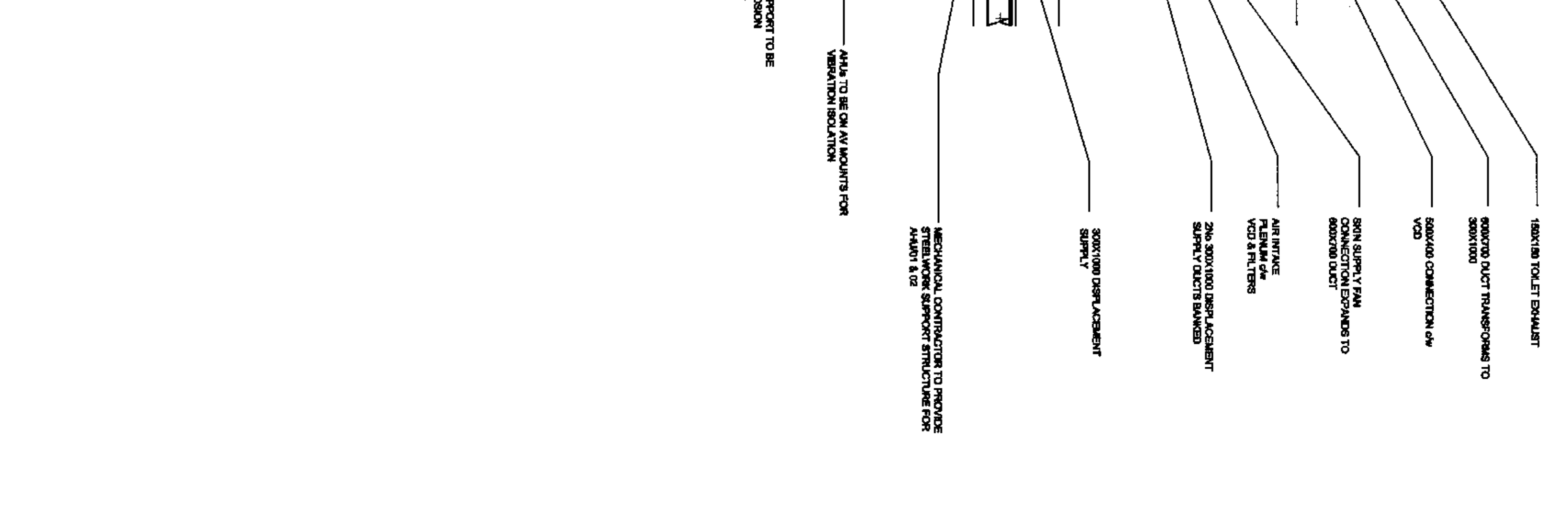
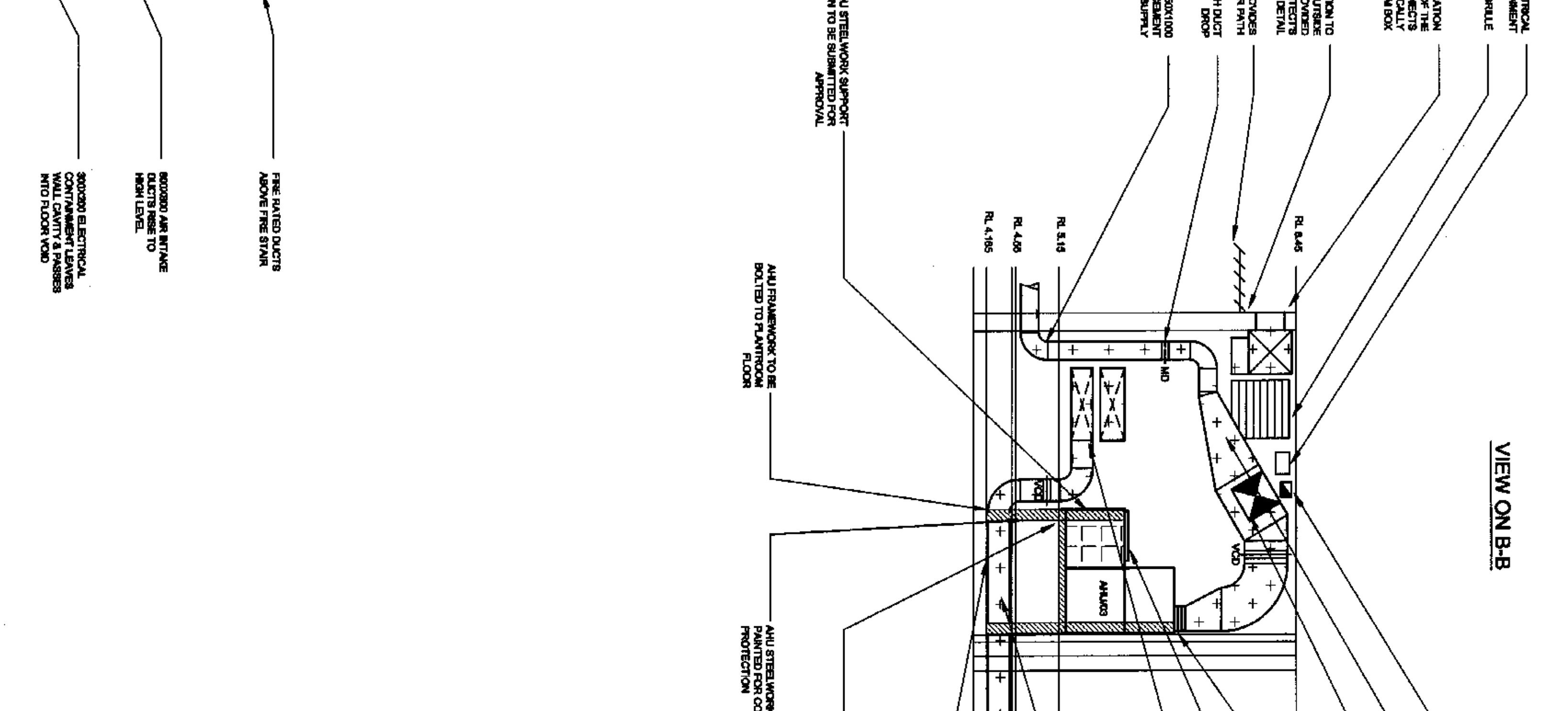
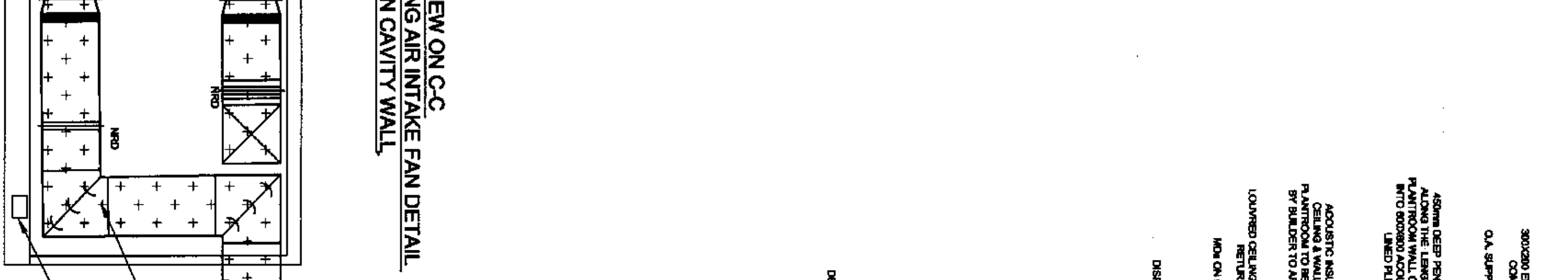
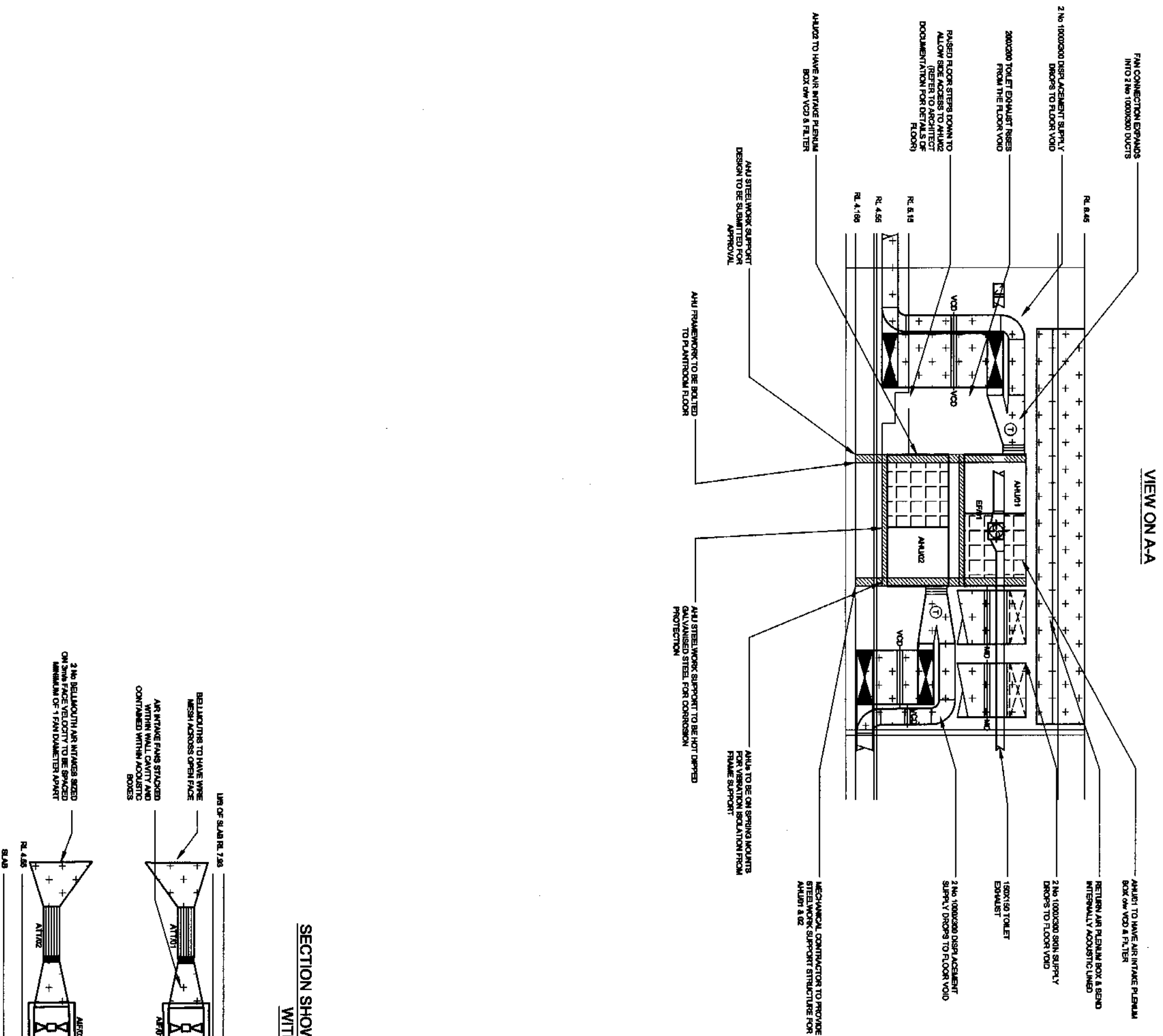
NOTES
 1. ALL WORK TO BE DONE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.
 3. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE ARCHITECT.
 4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL SERVICES AT ALL TIMES.
 5. ALL WORK SHALL BE COMPLETED WITHIN THE SPECIFIED TIME FRAME.

REVISIONS

NO	DESCRIPTION	DATE	BY
1	ISSUE	14/02/03	CA
2	TENDER ISSUE AMENDED IN LINE WITH ARCHITECT COMMENTS	25/02/03	CA

STEENSEN VARRING
 CONSULTING ENGINEERS & MANAGERS
 10000 VILLAGE PARK DRIVE, SUITE 100
 VILLAGE PARK, WEST YORKSHIRE, LE19 1BQ
 TEL: 01937 546123 FAX: 01937 546124
 EMAIL: SALES@STEENSENVARVING.CO.UK
 WEBSITE: WWW.STEENSENVARVING.CO.UK

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 & EXT PLANT SERVICES
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QUALITY ASSURANCE CHECKS

PROJECT	DATE	INITIALS	LOCATION
20			
50			
70	12/22/03	CA	OFF FIRM STORE
80	12/22/03	CA	OFF FIRM STORE
90			
100			

NOTES

- 1) QUALITY CHECKS SHOULD BE CONTROLLED UNDER THE SUPERVISION OF THE PROJECT MANAGER.
- 2) CHECKS SHOULD REFLECT THE SIZE BEFORE INSULATION IS ADDED.
- 3) CHECKS SHOULD REFLECT THE SIZE AFTER INSULATION IS ADDED.
- 4) ALL CONNECTIONS TO WALL SHALL BE FLEETABLE FOR MOUSE.
- 5) CHECKS SHOULD BE MADE THROUGH VENTS.
- 6) CHECKS SHOULD BE MADE THROUGH PLUMBING HOLE FLOOR FOR ACCESS.

REV	DESCRIPTION	DATE	BY
A	TENDER ISSUE	14.02.03	CA
B	REVISED IN LINE WITH ARCHITECT COMMENTS	28.02.03	CA

STEENSVARMING
CONSULTING ENGINEERS & MANAGERS
STEENSVARMING (AUSTRALIA) PTY LIMITED, AC/EA FIELD
1/110, RIVERVIEW ROAD, RIVERVIEW VIC 3081
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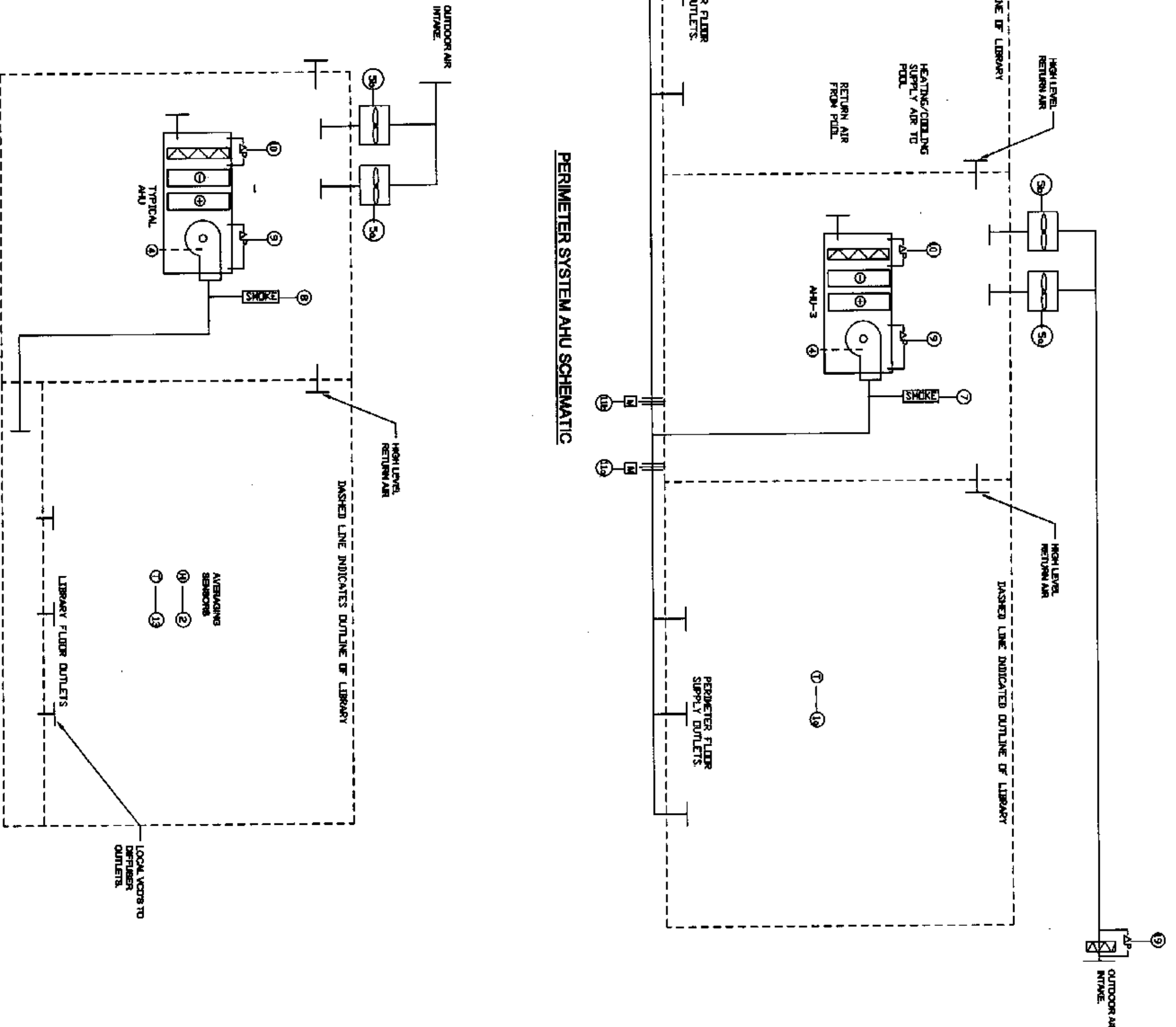
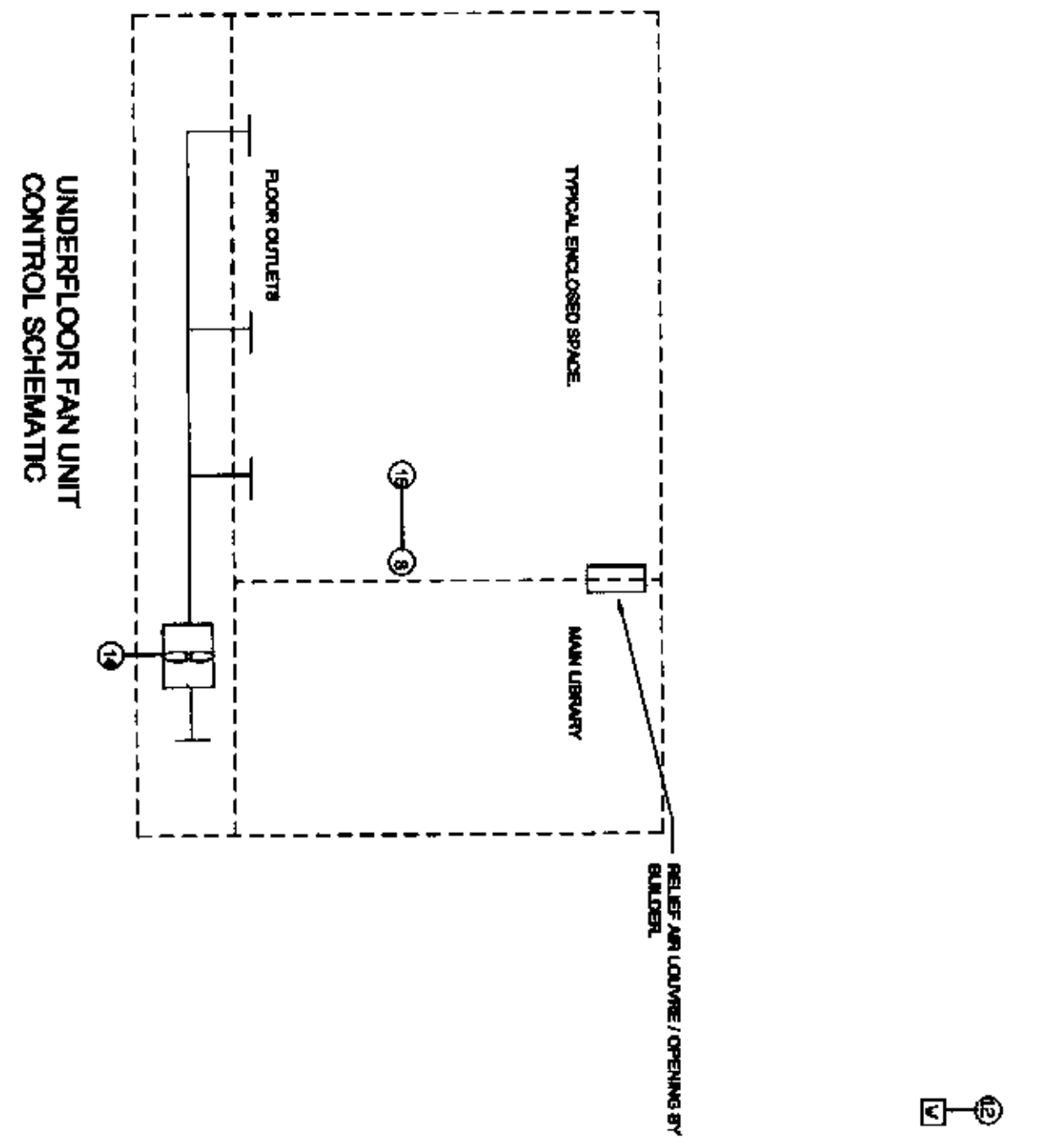
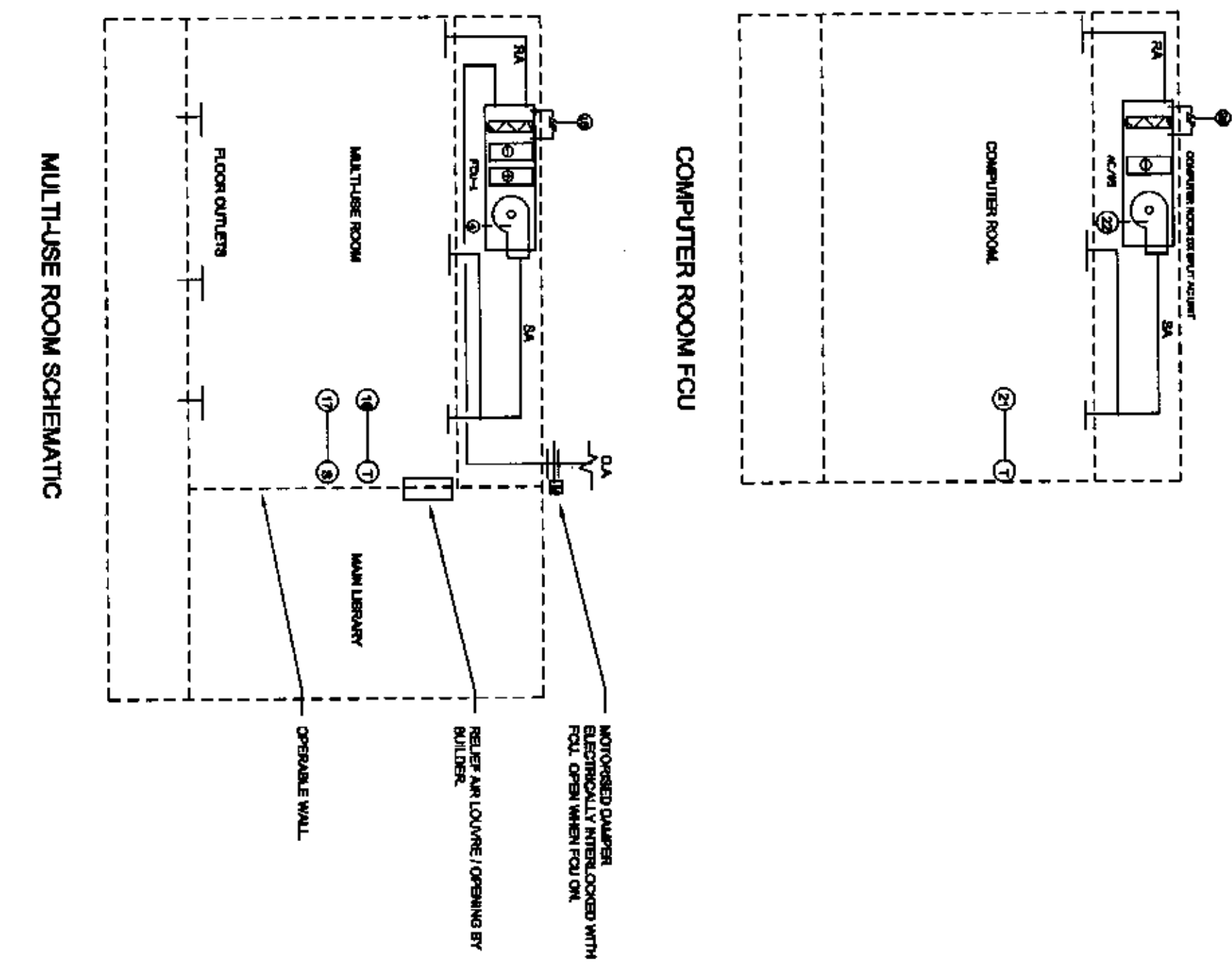
28 MAR 2003

FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE CONSTRUCTION DETAILS AND TO CHECK ALL DIMENSIONS WITH THE ARCHITECT

APPROVED
03/7/03-1

PERCENT	DATE	INITIAL	LOCATION
20			PROSULTANT
50			PRELIMINARY
70	12/20/03	CA	REVISED
75	12/23/03	CA	CHECK END
100			PRELIMINARY

COMMENTS: THE CONTRACTOR AND OWNER SHALL BE RESPONSIBLE FOR THE SUPPLY OF ALL MATERIALS AND LABORERS TO BE USED IN THE CONSTRUCTION OF THE SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES TO REMAIN ON THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES TO REMAIN ON THE SITE.



SIGNAL	REASON FOR CHANGE	DESCRIPTION	ISSUE NO
14	UNDERFLOOR FAN UNIT	REVISOR TO MANUAL SWITCHING, (IS)	A
15	PERIMETER SYSTEM AHU	MANUAL FAN COIL UNIT SHOULD BE SHOWN, (IS)	A
16	PERIMETER SYSTEM AHU	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
17	PERIMETER SYSTEM AHU	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
18	PERIMETER SYSTEM AHU	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
19	PERIMETER SYSTEM AHU	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
20	PERIMETER SYSTEM AHU	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
21	PERIMETER SYSTEM AHU	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
22	PERIMETER SYSTEM AHU	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A

SIGNAL	REASON FOR CHANGE	DESCRIPTION	ISSUE NO
1	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
2	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
3	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
4	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
5	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
6	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
7	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
8	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
9	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
10	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
11	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
12	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
13	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
14	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
15	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
16	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
17	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
18	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
19	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
20	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
21	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A
22	UNDERFLOOR FAN UNIT	REVISOR TO SHOW THE RETURN AIR FLOW TO LOCAL AHU TO MAINTAIN THE FLOW TO THE PERIMETER SYSTEM AHU.	A

FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE CONSTRUCTION DETAILS AND TO OBTAIN ALL NECESSARY PERMITS FROM THE RELEVANT AUTHORITIES.

MECHANICAL SERVICES
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STENSSEN VARMING AUSTRALIA PTY LIMITED A/CEA FIELD
LEVEL 13, 100 COLLEGE STREET, SYDNEY NSW 2000
TEL: (61) 02 9550 6600 FAX: (61) 02 9550 6601
WWW.STENSSEN.COM.AU

TENDER ISSUE 14/02/03 CA
TENDER ISSUE AMENDED IN LINE 25/02/03 CA
WITH REVISION COMMENTS

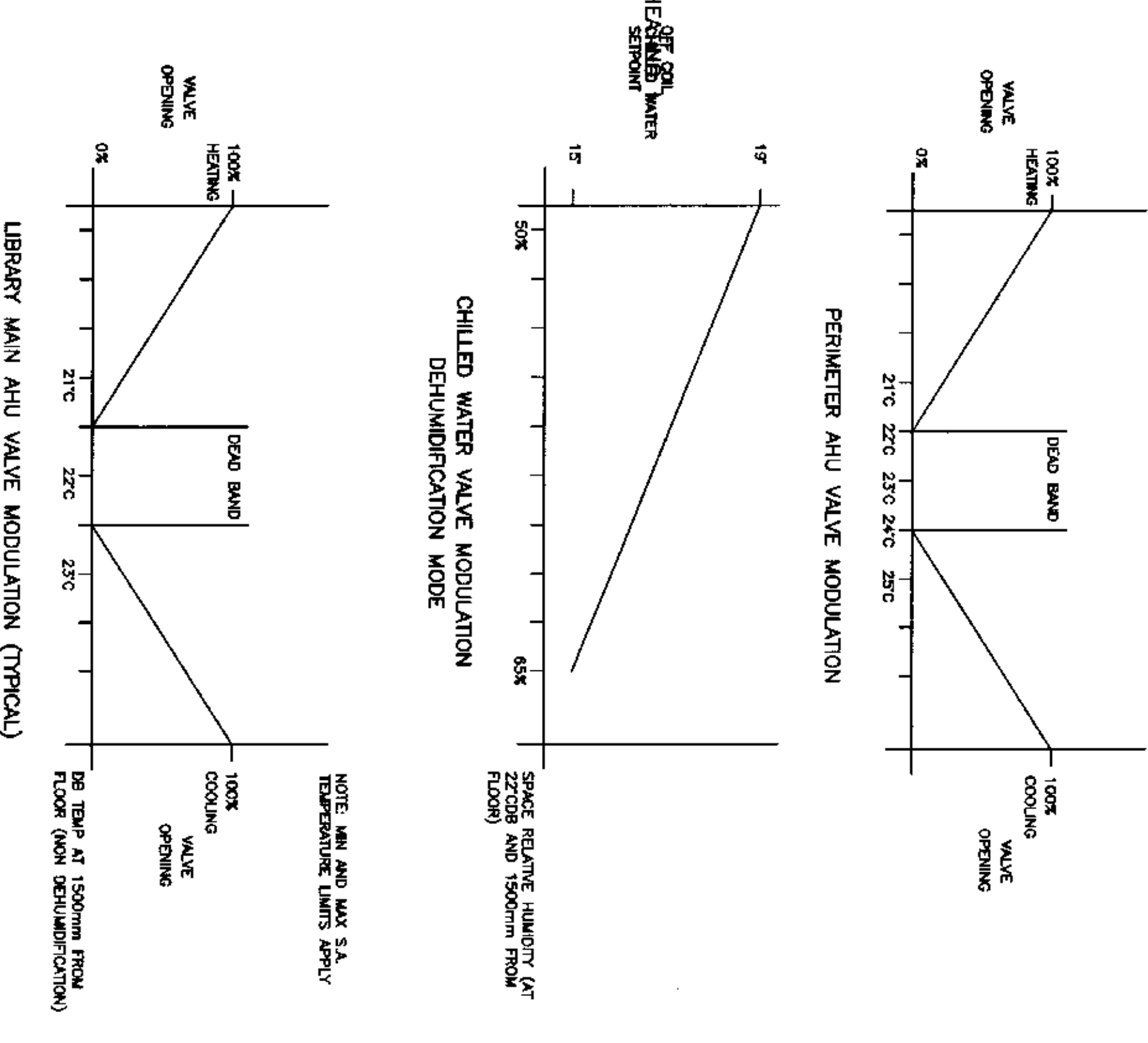
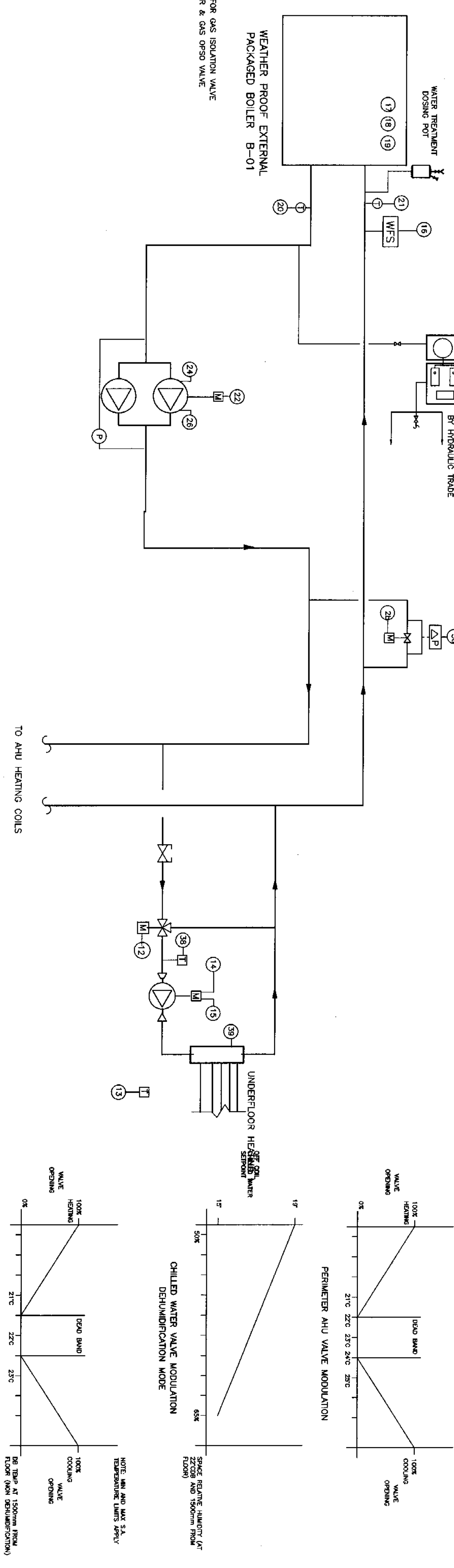
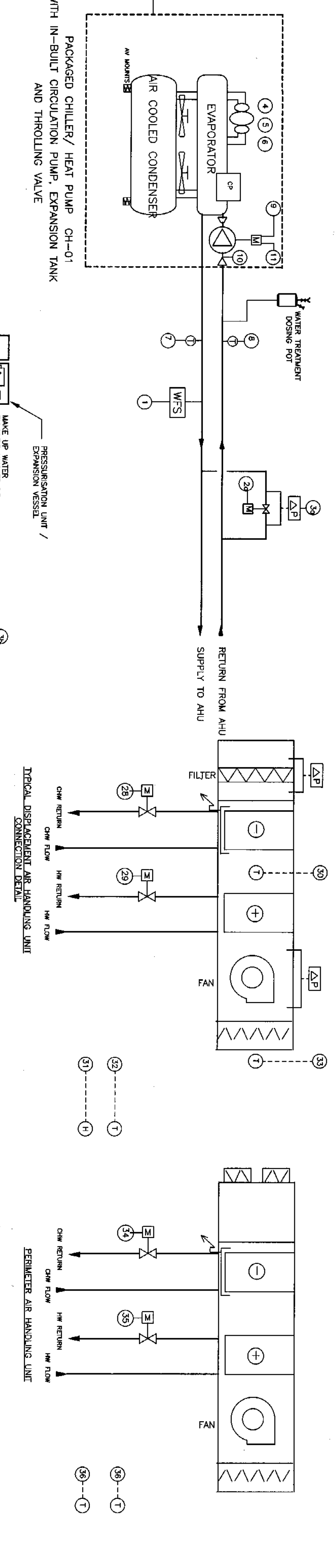
DATE: 14/02/03
LOCATION: CA

01832 M6001 B

PROJECT	DATE	INITIAL LOCATION
20		NEW ISSUE
21	12.02.03	NEW ISSUE
22	12.02.03	SUBMITTED
23		FOR ISSUE

QUALITY ASSURANCE CHECKS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL MATERIALS AND LABOUR REQUIRED FOR THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL MATERIALS AND LABOUR REQUIRED FOR THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL MATERIALS AND LABOUR REQUIRED FOR THE WORK.



DESCRIPTION OF COMPONENTS

SIGNAL NO.	EQUIPMENT	DESCRIPTION	ANALOG/ DIGITAL INPUT/ OUTPUT
1	CHILLED WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH CHILLER/HEATING PACKAGED CHILLER	DI
2	CHILLED WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH CHILLER/HEATING PACKAGED CHILLER	DI
3	CHILLED WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH CHILLER/HEATING PACKAGED CHILLER	DI
4	CHILLER	CHILLER START/STOP EQUIPMENT STATUS THROUGH CHILLER CONTROL MODULE	DO & DI
5	CHILLER	CHILLER ALARM SIGNAL FROM CHILLER FROM FAILURE IN OPERATION AND INITIATED ALARM AT HOS-1	DI
6	CHILLER	CHILLER ALARM SIGNAL FROM CHILLER FROM FAILURE IN OPERATION AND INITIATED ALARM AT HOS-1	DI
7	TEMPERATURE OF WATER RETURN	RECEIVE SIGNAL FROM SENSOR AND WIRELESS ON/OFF/VALVE CONTROL OF CHILLER SET POINT AT 6°C (ADJUSTABLE) WHEN COOLING	AI & AO
8	WATER RETURN	USE SIGNAL 7 & 8 TOGETHER TO CALCULATE THE ACTUAL COOLING/HEATING LOAD PROVIDED BY THE CHILLER WHEN IN OPERATION. WIRELESS ONLY	AI
9	WATER RETURN	USE SIGNAL 7 & 8 TOGETHER TO CALCULATE THE ACTUAL COOLING/HEATING LOAD PROVIDED BY THE CHILLER WHEN IN OPERATION. WIRELESS ONLY	AI
10	WATER RETURN	USE SIGNAL 7 & 8 TOGETHER TO CALCULATE THE ACTUAL COOLING/HEATING LOAD PROVIDED BY THE CHILLER WHEN IN OPERATION. WIRELESS ONLY	AI
11	WATER RETURN	USE SIGNAL 7 & 8 TOGETHER TO CALCULATE THE ACTUAL COOLING/HEATING LOAD PROVIDED BY THE CHILLER WHEN IN OPERATION. WIRELESS ONLY	AI
12	WATER RETURN	USE SIGNAL 7 & 8 TOGETHER TO CALCULATE THE ACTUAL COOLING/HEATING LOAD PROVIDED BY THE CHILLER WHEN IN OPERATION. WIRELESS ONLY	AI
13	WATER RETURN	USE SIGNAL 7 & 8 TOGETHER TO CALCULATE THE ACTUAL COOLING/HEATING LOAD PROVIDED BY THE CHILLER WHEN IN OPERATION. WIRELESS ONLY	AI
14	WATER RETURN	USE SIGNAL 7 & 8 TOGETHER TO CALCULATE THE ACTUAL COOLING/HEATING LOAD PROVIDED BY THE CHILLER WHEN IN OPERATION. WIRELESS ONLY	AI
15	WATER RETURN	USE SIGNAL 7 & 8 TOGETHER TO CALCULATE THE ACTUAL COOLING/HEATING LOAD PROVIDED BY THE CHILLER WHEN IN OPERATION. WIRELESS ONLY	AI

NOTE: INTERNAL, THESE SIGNALS ARE REQUIRED TO MONITOR THE OPERATION OF THE SYSTEM. INTERNAL, THESE SIGNALS ARE REQUIRED TO MONITOR THE OPERATION OF THE SYSTEM.

SIGNAL NO.	EQUIPMENT	DESCRIPTION	ANALOG/ DIGITAL INPUT/ OUTPUT
16	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
17	BOILER B-01	BOILER START/STOP EQUIPMENT STATUS THROUGH BOILER CONTROL MODULE	DO & DI
18	BOILER B-01	BOILER ALARM SIGNAL FROM BOILER FROM FAILURE IN OPERATION AND INITIATED ALARM AT HOS-1	DI
19	BOILER B-01	BOILER ALARM SIGNAL FROM BOILER FROM FAILURE IN OPERATION AND INITIATED ALARM AT HOS-1	DI
20	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
21	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
22	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
23	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
24	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
25	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
26	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
27	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
28	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
29	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
30	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI
31	HOT WATER FLOW SWITCH	WATER FLOW SWITCH TO DETERMINE WATER FLOW DUE TO ACTIVATION OF WATER FLOW SWITCH INTERLOCKED WITH BOILER TO PREVENT CHILLER	DI

NOTE: INTERNAL, THESE SIGNALS ARE REQUIRED TO MONITOR THE OPERATION OF THE SYSTEM. INTERNAL, THESE SIGNALS ARE REQUIRED TO MONITOR THE OPERATION OF THE SYSTEM.

SIGNAL NO.	EQUIPMENT	DESCRIPTION	ANALOG/ DIGITAL INPUT/ OUTPUT
32	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
33	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
34	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
35	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
36	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
37	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
38	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
39	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
40	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
41	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
42	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
43	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
44	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
45	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
46	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
47	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
48	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
49	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
50	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
51	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
52	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
53	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
54	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
55	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
56	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
57	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
58	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
59	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI
60	UNDER-FLOOR HEATING	UNDER-FLOOR HEATING VALVE MODULATION	AI

NOTE: INTERNAL, THESE SIGNALS ARE REQUIRED TO MONITOR THE OPERATION OF THE SYSTEM. INTERNAL, THESE SIGNALS ARE REQUIRED TO MONITOR THE OPERATION OF THE SYSTEM.

FOR TENDER
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THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL MATERIALS AND LABOUR REQUIRED FOR THE WORK.

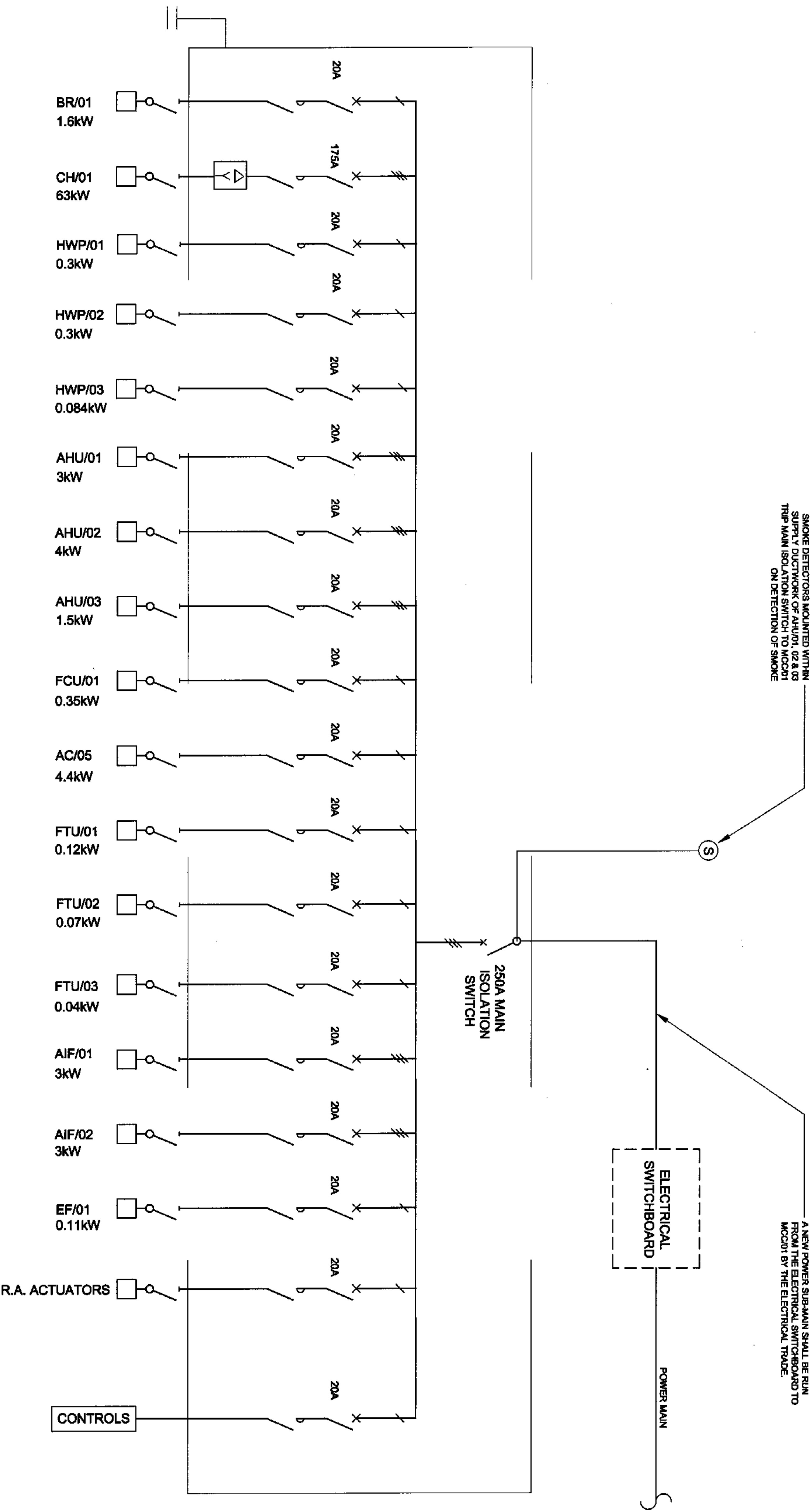
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CONSULTING ENGINEERS & MANAGERS
STEESENS VARMING (AUSTRALIA) PTY LIMITED
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MECHANICAL SERVICES
NEW LIBRARY HEATING & CHILLED WATER CONTROL SCHEMATIC

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JAN 03 JL ND CA

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MCC-1 NON-ESSENTIAL SUPPLY : SINGLE LINE POWER DIAGRAM

NOTE: FOR TENDERING PURPOSES ONLY. CONTRACTOR SHALL SUBMIT SELECTIONS FOR APPROVAL.

QUALITY ASSURANCE CHECKS

NO	DATE	STATUS	LOCATION
20		PRELIMINARY	
21	14/02/03	FOR ISSUE	
22	14/02/03	FOR PERMIT	
23	14/02/03	CHECK LIST	
24		CHECK LIST	
25		FOR CALCULATIONS	

COMMENTS:

DATE: 14/02/03

REVISIONS

NO	DESCRIPTION	DATE	BY
A	TENDER ISSUE	14/02/03	CA
B	WITH ARCHITECT COMMENTS	26/02/03	CA

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CONSULTING ENGINEERS & MANAGERS
STEENSEN VARMING (AUSTRALIA) PTY LIMITED
14/02/03 CA

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MECHANICAL SERVICE
COUNCIL OFFICE
SINGLE LINE
POWER DIAGRAM

RECEIVED
28 MAR 2003

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FOR TENDER
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IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK THE CONTRACTUAL REQUIREMENTS AND TO ACCORDANCE WITH THE RELEVANT STANDARDS AND TO CONSULT THE ARCHITECT.

APPROVED
03/1733-1
14/02/03

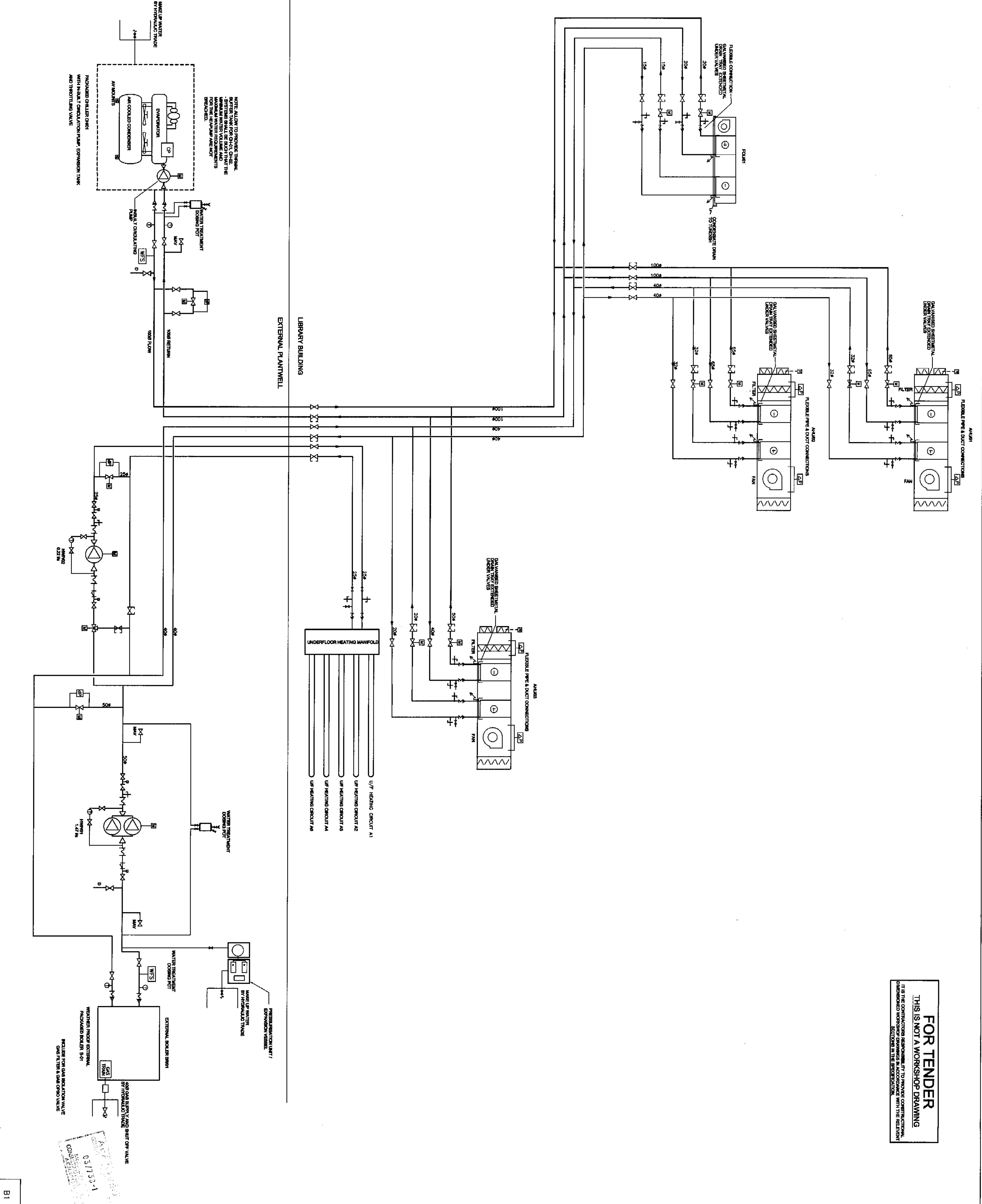
FOR TENDER
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 IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE COMPLETION
 DETAILED WORKSHOP DRAWINGS IN ACCORDANCE WITH THE RELEVANT
 SPECIFICATIONS AND STANDARDS.

QUALITY ASSURANCE CHECKS

NO	DATE	INITIALS	COMMENTS
20			PREPARED
30			FOR ISSUE
70	12.02.03	CA	FOR ISSUE
80	12.02.03	CA	FOR ISSUE
90			CHECK NOTED
100			FOR CLOSURE

COMMENTS:

NOTES:
 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL MATERIALS AND LABOUR REQUIRED FOR THE WORK.
 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY PERMITS AND APPROVALS.
 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY PROTECTIVE MEASURES.
 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY SAFETY MEASURES.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL NECESSARY SIGNAGE.



REVISIONS

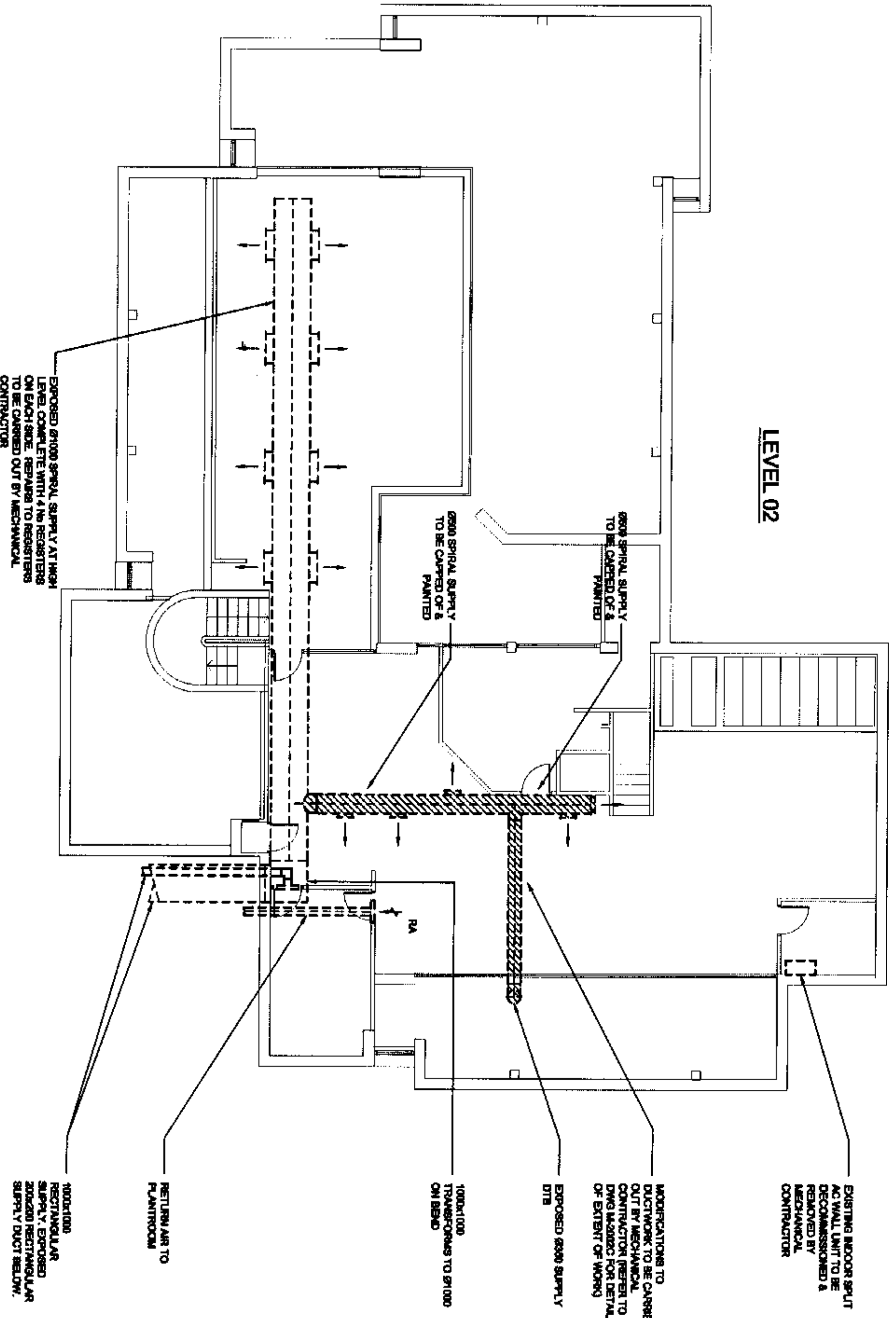
NO	DESCRIPTION	DATE	BY
A	TENDER ISSUE	14.02.03	CA
B	TENDER ISSUE AMENDED IN LINE WITH ARCHITECT COMMENTS	26.02.03	CA

STEENSEN VARRING
 CONSULTING ENGINEERS & MANAGERS
 STEENSEN VARRING AUSTRALIA PTY. LIMITED
 LEVEL 2, 100, NEW BRIDGE ROAD, THE CITY CENTRE
 SYDNEY, NEW SOUTH WALES 2000
 TEL: (02) 9232 2200
 FAX: (02) 9232 2201
 WWW: WWW.STEENSENVARRING.COM.AU

MECHANICAL SERVICES
 NEW LIBRARY
 AC & VENT. SCHEMATIC and
 HTG & CHW SCHEMATIC

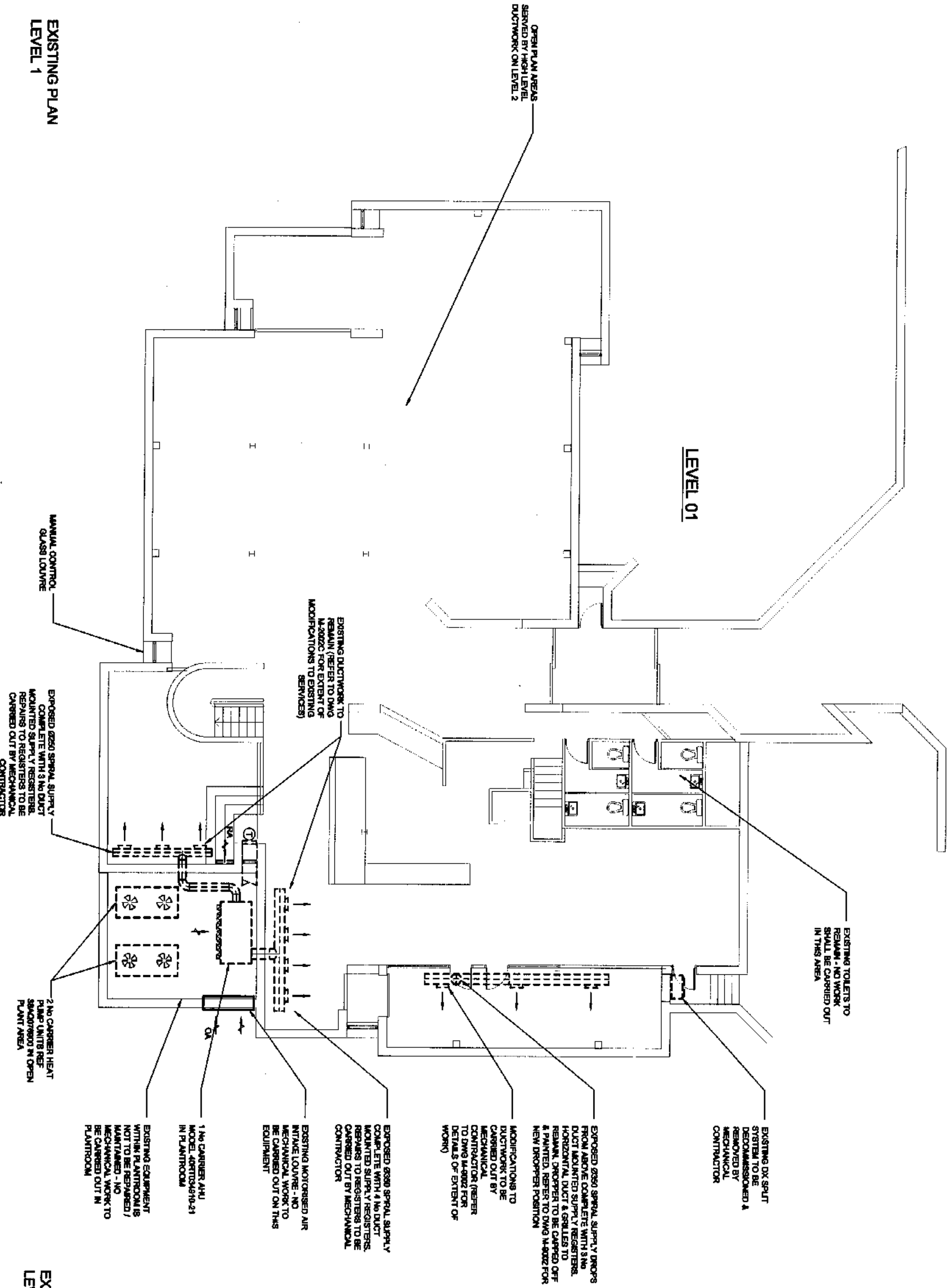
DATE: 03/11/03
 PROJECT NO: M8001
 DRAWING NO: B1
 SCALE: 1:100
 JAN 03 JL ND CA
 01832 M8001 B

EXISTING PLAN
LEVEL 2



LEVEL 02

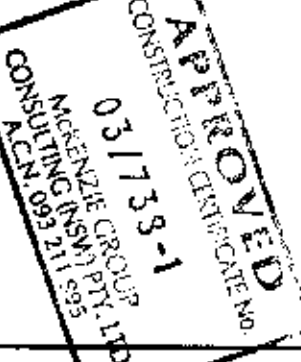
EXISTING PLAN
LEVEL 1



LEVEL 01

EXISTING PLAN
LEVEL 2

FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE CONSTRUCTION
DETAILS AND TO OBTAIN ALL NECESSARY PERMITS AND APPROVALS
BEFORE COMMENCING WORK.



B1

QUALITY ASSURANCE CHECKS - DOCUMENT CONTROL

PERCENT	DATE	INITIAL	LOCATION
20			PRELIMINARY
20	1/22/03	CA	FOR ISSUE
20	1/23/03	CA	CHECK SHEET
40			FOR CALCULATIONS

COMMENTS: THE CONSULTANT AND DESIGN TEAM, THE CONTRACTOR OR SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL STRUCTURAL ELEMENTS AND DETAILS ON THE DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL NON-STRUCTURAL ELEMENTS AND DETAILS ON THE DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL MECHANICAL AND ELECTRICAL ELEMENTS AND DETAILS ON THE DRAWING.

NOTES:
 1) DRAWING INDICATES EXISTING SERVICES WITHIN THE EXISTING LIBRARY.
 2) DRAWING INDICATES EXISTING SERVICES WITHIN THE EXISTING LIBRARY.
 3) DRAWING INDICATES EXISTING SERVICES WITHIN THE EXISTING LIBRARY.
 4) DRAWING INDICATES EXISTING SERVICES WITHIN THE EXISTING LIBRARY.
 5) DRAWING INDICATES EXISTING SERVICES WITHIN THE EXISTING LIBRARY.
 6) DRAWING INDICATES EXISTING SERVICES WITHIN THE EXISTING LIBRARY.

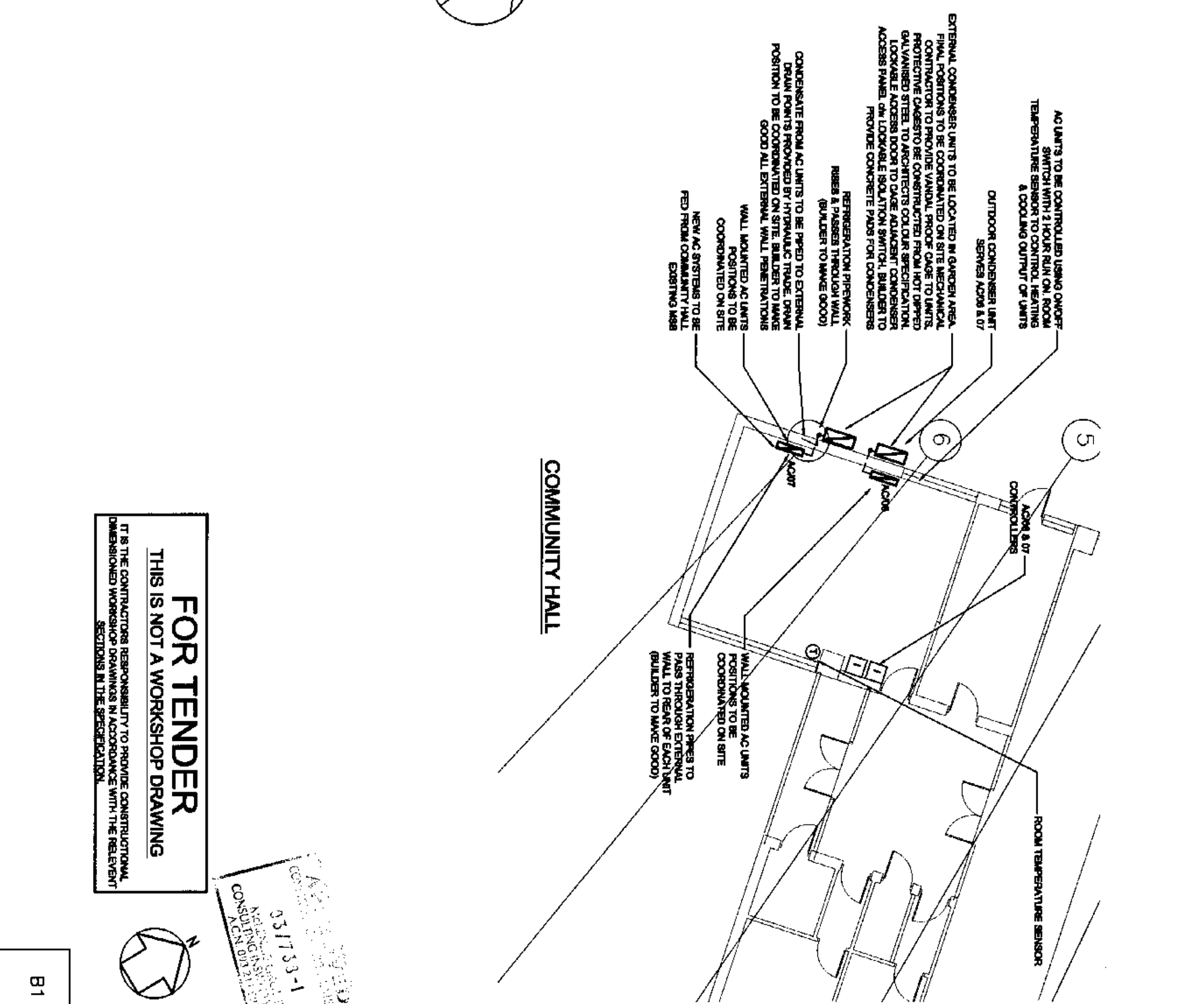
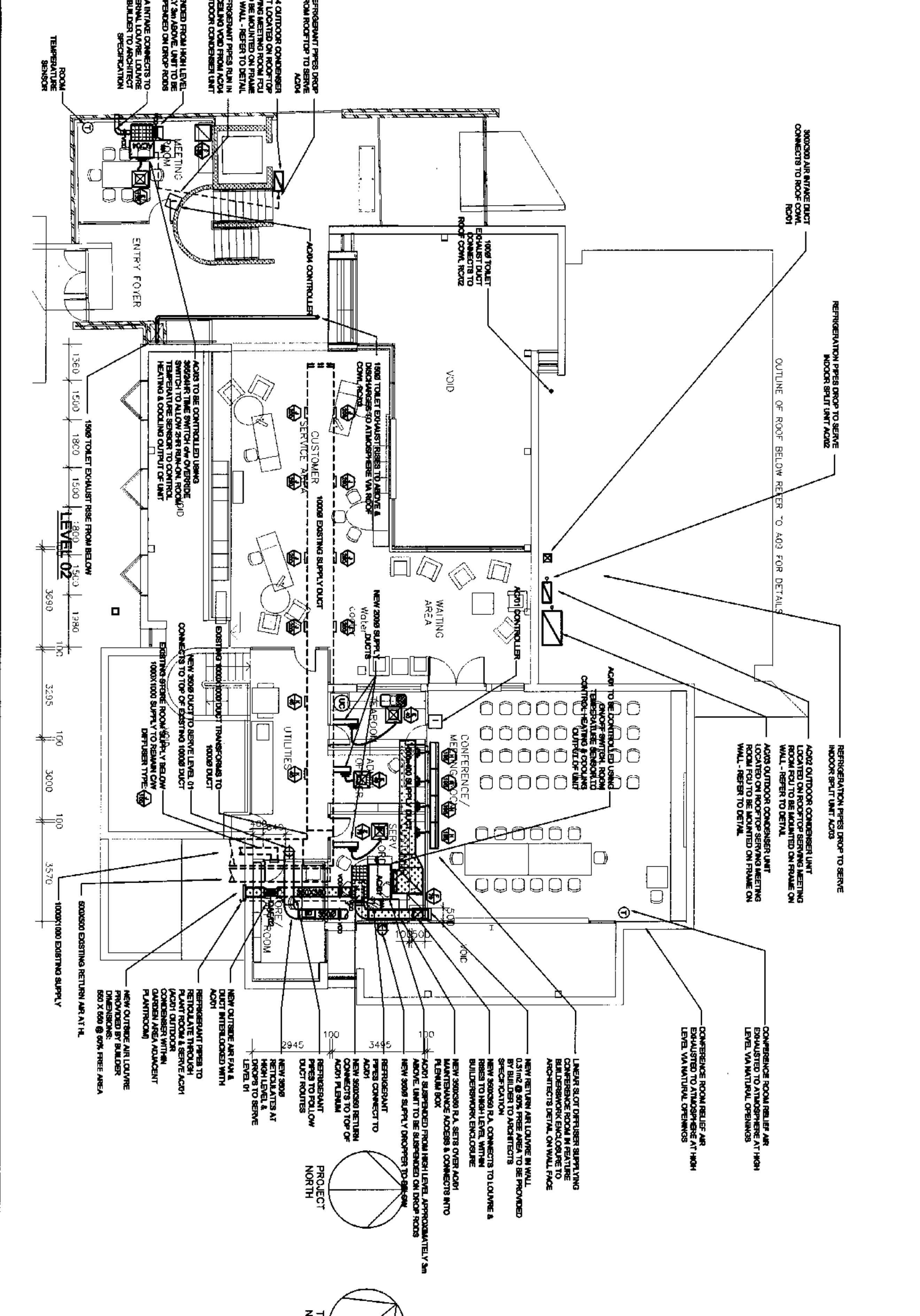
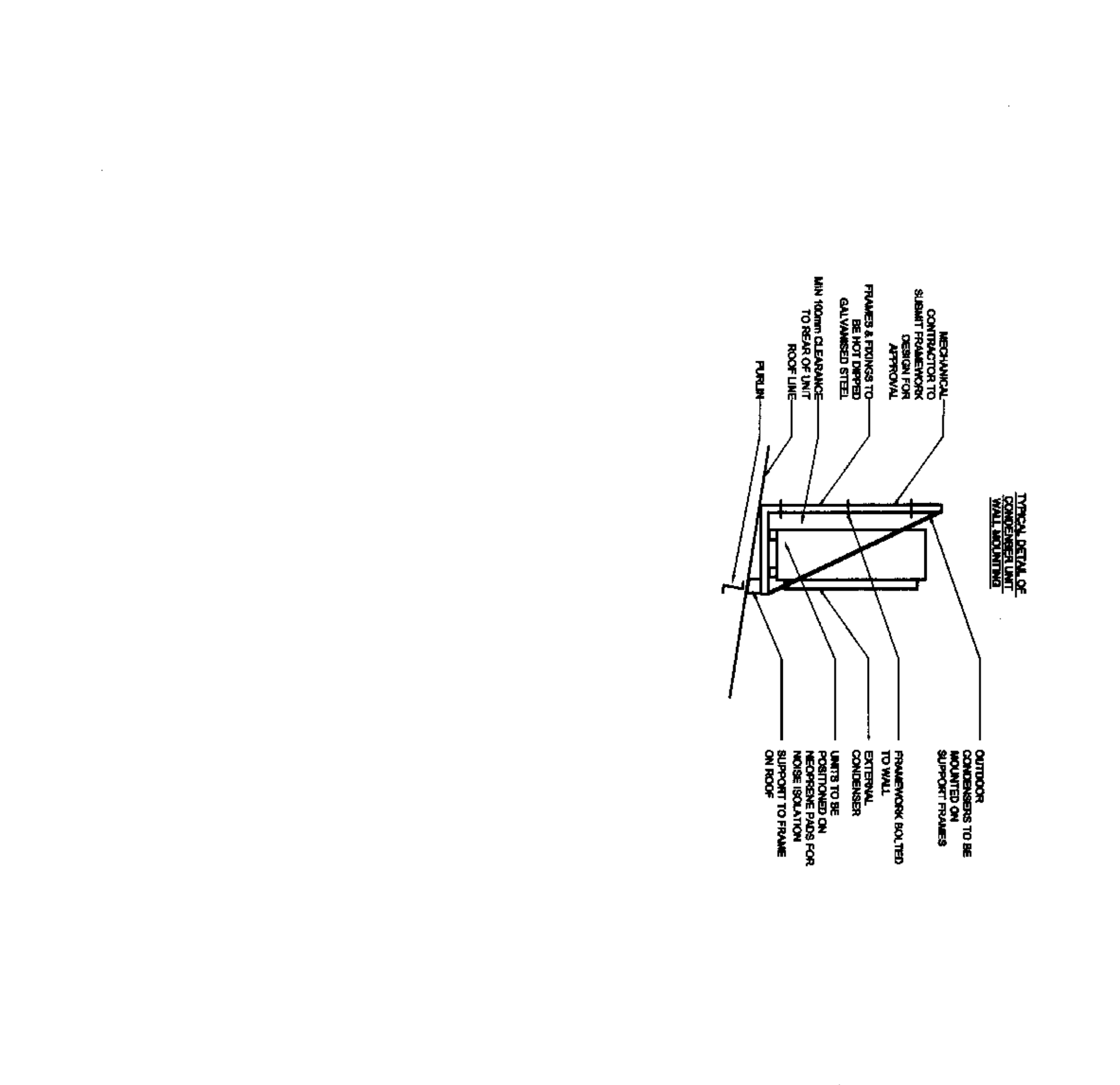
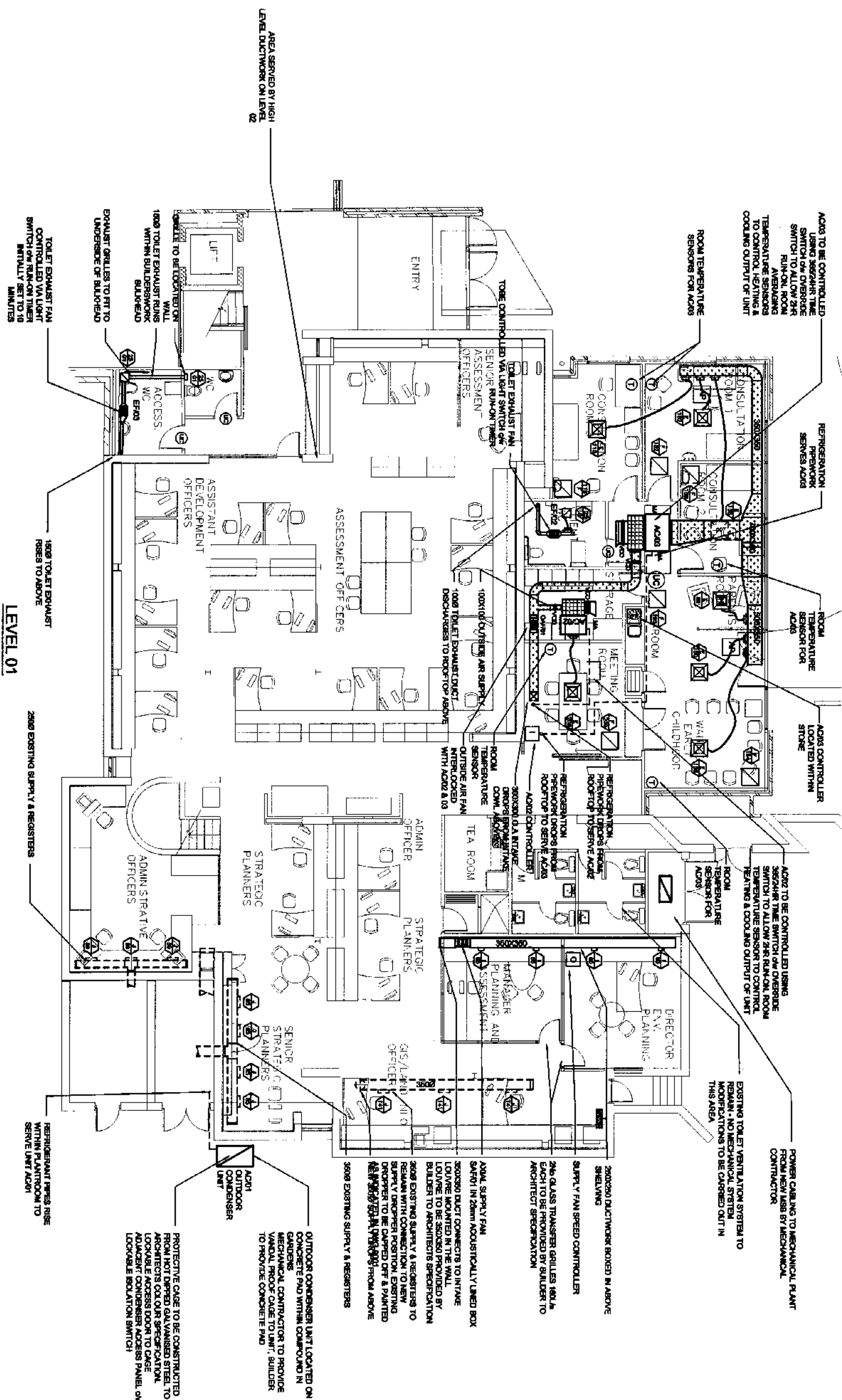
NO.	DESCRIPTION	DATE	STATUS
1	REVISION	1/22/03	CA
2	REVISION	1/23/03	CA
3	REVISION	1/23/03	CA
4	REVISION	1/23/03	CA
5	REVISION	1/23/03	CA
6	REVISION	1/23/03	CA

STEENSENVARRING
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 STEENSENVARRING AUSTRALIAN PTY LIMITED A/CLIA FIELD OFFICE
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 FAX: (02) 9550 5001
 EMAIL: SALES@STEENSENVARRING.COM.AU
 WEBSITE: WWW.STEENSENVARRING.COM.AU

MONA VALE
 VILLAGE PARK
 LIBRARY

MECHANICAL SERVICES
 EXISTING SERVICES LAYOUT

ISSUED DATE: 1/1/03
 ISSUE NO: 1
 1:100 JAN 03 ND ND CA
 DRAWING NO: 01832 M9001 B



QUALITY ASSURANCE CHECKS

NO.	DESCRIPTION	DATE	STATUS
1	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
2	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
3	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
4	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
5	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
6	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
7	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
8	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
9	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED
10	MECHANICAL SYSTEMS DETAIL	1/10/03	COMPLETED

- NOTES
- 1) ALL DUCT RUNS TO HAVE TYPICAL VIBES
 - 2) DAMAGED DUCTING SHOULD BE REPAIRED / REPLACED
 - 3) DUCT RUNS INDICATED SHOULD BE REPAIRED / REPLACED
 - 4) MECHANICAL CONTRACTOR TO CONDUCT AIR BALANCE TESTING PRIOR TO COMPLETION OF INSTALLATION WORK
 - 5) DUCT RUNS INDICATED SHOULD BE REPAIRED / REPLACED
 - 6) ALL EXTERNAL PLANT TO HAVE CORROSION LOCAL ELECTRICAL SOLUTION
 - 7) DUCTING TO HAVE LOCAL ELECTRICAL SOLUTION

REVISIONS

REV	DESCRIPTION	DATE	BY
A	TENDER ISSUE	14.02.03	CA
B	COMMUNITY HALL, AC	21.02.03	CA
C	TENDER ISSUE AMENDED IN LINE WITH ARCHITECT COMMENTS	25.02.03	CA

FOR TENDER
THIS IS NOT A WORKSHOP DRAWING
IF THE CONTRACTING RESPONSIBILITY TO PROVIDE COMPLETIONAL MECHANICAL SYSTEMS IS NOT SPECIFIED IN THE SPECIFICATION

STEENSEN VARRING
CONSULTING ENGINEERS & MANAGERS
11100 JAN 03 NID NID CA
01832 M9002 C

MECHANICAL SERVICES - AC & VENTILATION LAYOUT & CONTROLS

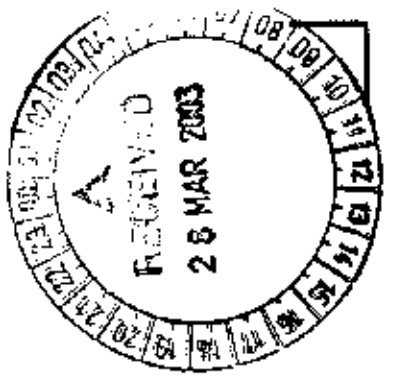
MONA VALE VILLAGE PARK LIBRARY

11100 JAN 03 NID NID CA
01832 M9002 C

MECHANICAL SERVICES - AC & VENTILATION LAYOUT & CONTROLS

MONA VALE VILLAGE PARK LIBRARY

STEENSEN VARRING CONSULTING ENGINEERS & MANAGERS
11100 JAN 03 NID NID CA
01832 M9002 C

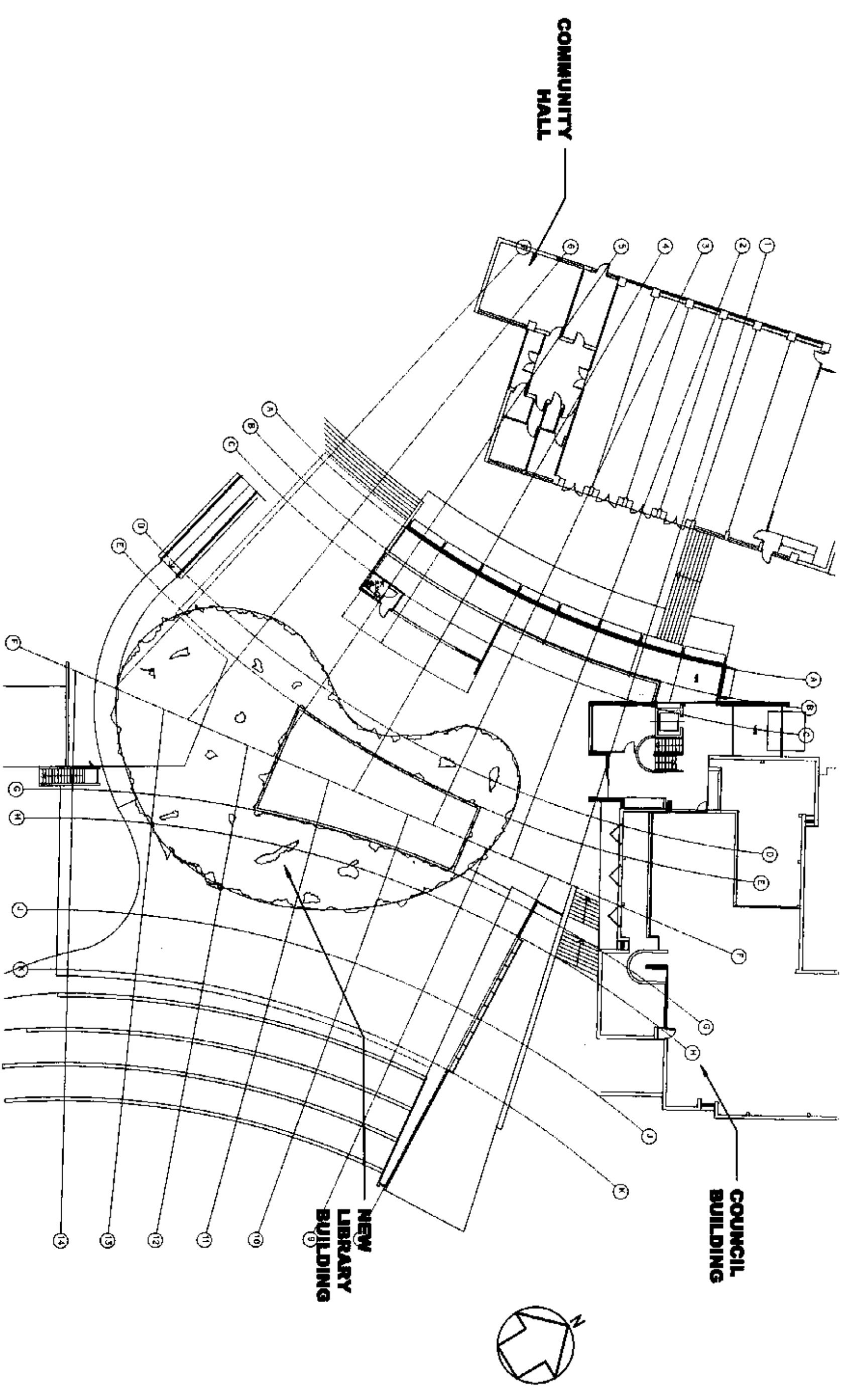


APPROVED
03/733-1

ELECTRICAL SERVICES

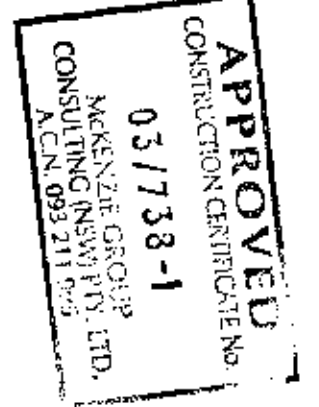
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- 01832-E-02
- 01832-E-03
- 01832-E-04
- 01832-E-05
- 01832-E-06
- 01832-E-07
- 01832-E-08

LEGEND
 ELECTRICAL SITE PLAN
 NEW LIBRARY LEVEL, 1 POWER, COMMUNICATIONS & SECURITY LAYOUT
 COUNCIL OFFICES POWER, COMMUNICATIONS & SECURITY LAYOUT
 NEW LIBRARY LEVEL, 1 LIGHTING, FIRE DETECTION & PA LAYOUT
 NEW LIBRARY PODIUM LEVEL, LIGHTING LAYOUT
 COUNCIL OFFICES LIGHTING, FIRE DETECTION LAYOUT
 ELECTRICAL SINGLE LINE DIAGRAM & COMMUNICATIONS DETAILS

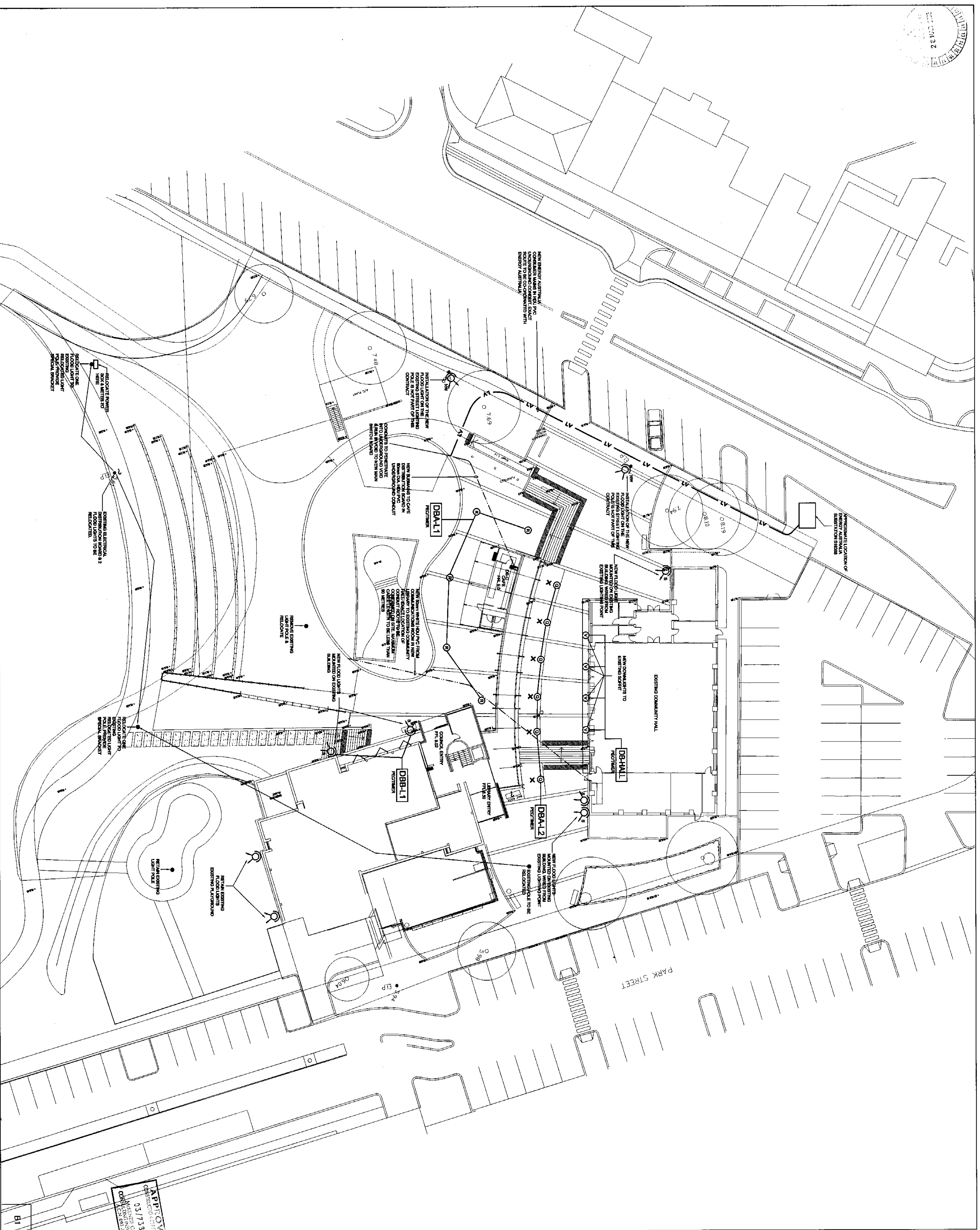
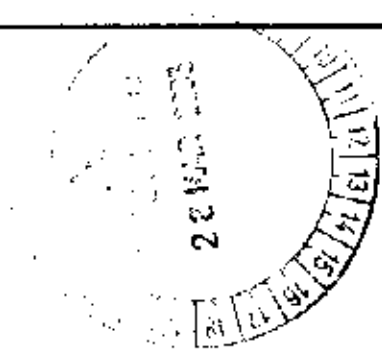


FOR TENDER
 THIS IS NOT A WORKSHOP DRAWING
 IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE CONSTRUCTIONAL
 DETAILS FROM THIS DRAWING AND TO CHECK THE INFORMATION
 SHOWN ON THE DRAWING.

MONA VALE VILLAGE PARK LIBRARY 01832



STEENSEN WARMING (AUST) PTY LTD



QUALITY ASSURANCE CHECKS DOCUMENT CONTROL

PRECEDENT	DATE	INITIALS	LOCATION
20			PRELIMINARY
20			FOR ISSUE
20			FOR ISSUE
20			SUBMITTED
100	13.02.03	PH	CHECK MARK
			FOR CALCULATIONS

NOTES

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REVISIONS

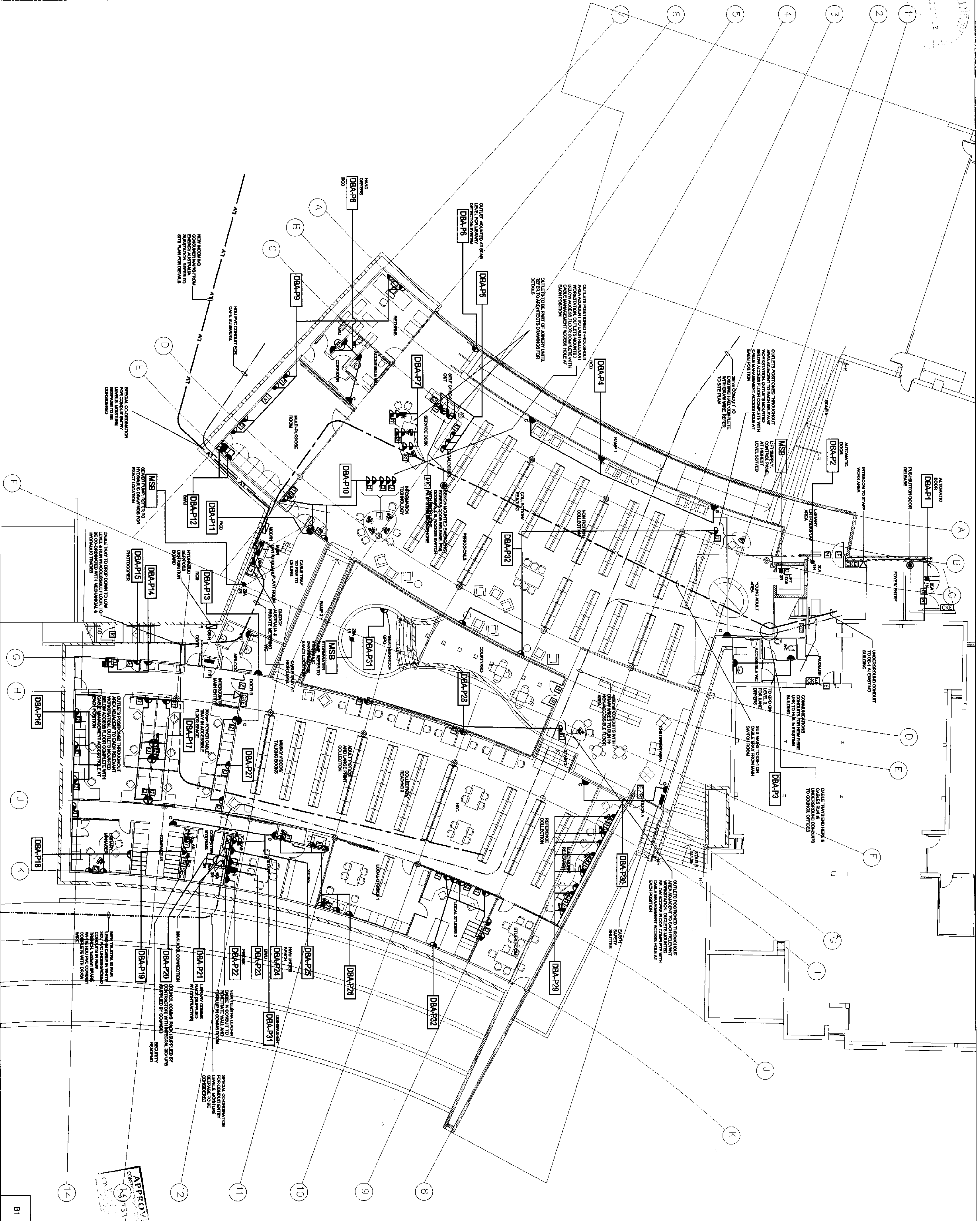
NO.	DESCRIPTION	DATE	BY
A <td>REVISION NUMBER</td> <td>13.02.03</td> <td>PH</td>	REVISION NUMBER	13.02.03	PH
B <td>REVISION NUMBER</td> <td>27.02.03</td> <td>PH</td>	REVISION NUMBER	27.02.03	PH

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 233-235 Sydney Avenue (Westfield) P.O. Box 1111, North Sydney, N.S.W. 1585
 Tel: (02) 9567 2200
 Fax: (02) 9567 2202
 Email: enquiries@steevensvarming.com.au
 STEESENS VARMING CONSULTING ENGINEERS & MANAGERS
 AUSTRALIA
 SYDNEY

MONA VALE LIBRARY
 ELECTRICAL SERVICES
 SITE PLAN

DATE: 13.02.03
 DRAWN BY: PH
 CHECKED BY: PH
 PROJECT NO.: 01832
 SHEET NO.: E02
 OF: B

1:200 03.02.03 PH PH MH
 01832 E02 B



QUALITY ASSURANCE CHECKS DOCUMENT CONTROL

NO	DATE	INITIALS	DESCRIPTION
1			PREPARED
2			FOR REVIEW
3			SUBMITTED
4			CHECKED
5			FOR CALCULATIONS

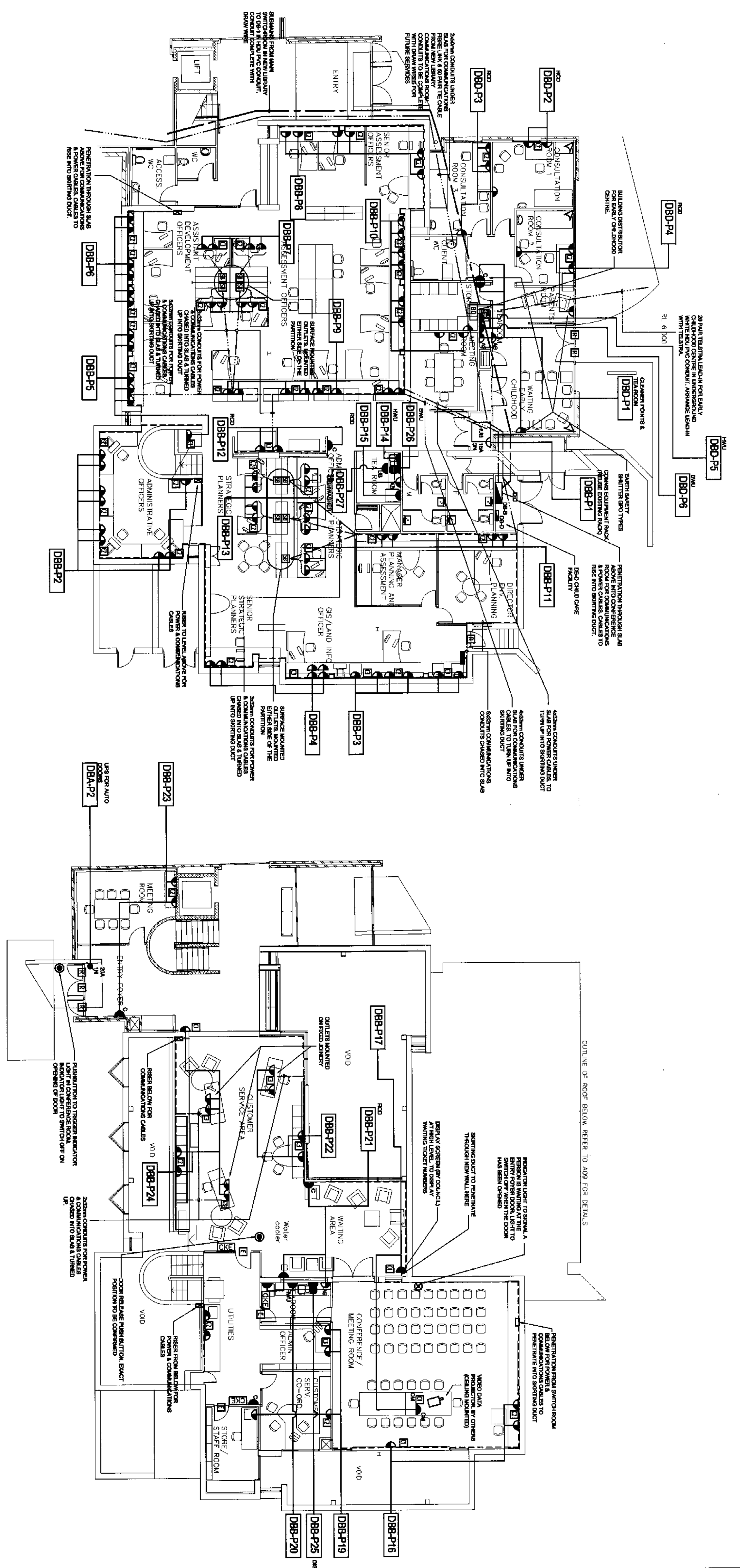
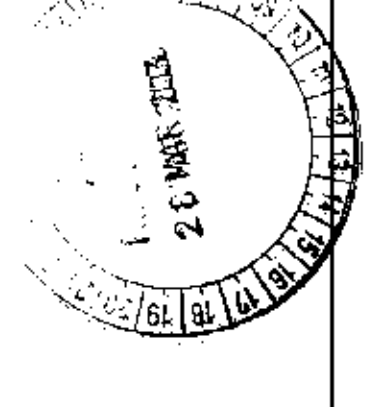
NOTES
 1. EXACT POSITION OF SERVICES & OUTLETS VARY ACCEPTABLE.
 2. EXACT POSITION OF SERVICES & OUTLETS VARY ACCEPTABLE.

REVISIONS

NO	DESCRIPTION	DATE	BY
1	ISSUED FOR TENDER	27/02/23	MM
2	REVISED TENDER ISSUE	27/02/23	MM

STEENSENS VARMING
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 TEL: (02) 9777 2222
 FAX: (02) 9777 2223
 EMAIL: info@steevensvarming.com.au
 WEBSITE: www.steevensvarming.com.au
 LICENSE NO. 12566
 LICENSED PROFESSIONAL ENGINEER (ELECTRICAL)
 LICENSED PROFESSIONAL ENGINEER (MECHANICAL)
 LICENSED PROFESSIONAL ENGINEER (PLUMBING)
 LICENSED PROFESSIONAL ENGINEER (CIVIL)
 LICENSED PROFESSIONAL ENGINEER (STRUCTURAL)
 LICENSED PROFESSIONAL ENGINEER (THERMAL, FLUIDS & ENERGY)
 LICENSED PROFESSIONAL ENGINEER (METALLURGY)
 LICENSED PROFESSIONAL ENGINEER (MINING)
 LICENSED PROFESSIONAL ENGINEER (PETROLEUM)
 LICENSED PROFESSIONAL ENGINEER (SURVEYING)
 LICENSED PROFESSIONAL ENGINEER (WATER SUPPLY)
 LICENSED PROFESSIONAL ENGINEER (WEAR & RISK)
 LICENSED PROFESSIONAL ENGINEER (WIND ENERGY)
 LICENSED PROFESSIONAL ENGINEER (WOOD PRESERVATION)
 LICENSED PROFESSIONAL ENGINEER (ZONING & PLANNING)

PROJECT TITLE: ELECTRICAL SERVICES NEW LIBRARY LEVEL 1 POWER, COMMUNICATIONS & SECURITY LAYOUT
 PROJECT NO: 01832 E03
 SHEET NO: B
 DATE: 12.12.02
 PH: MH
 APPROVED: [Signature] 13/11/11



COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 1
SCALE 1:100

COUNCIL OFFICES AND EARLY CHILDHOOD
LEVEL 2
SCALE 1:100

QUALITY ASSURANCE CHECKS - DOCUMENT CONTROL

PERCENT	DATE	INITIAL	LOCATION
20			PRELIMINARY
20			FOR ISSUE
20			FOR ISSUE
100	11.02.03	MH	CHECK, SIGN OFF FOR CALCULATIONS

COMMENTS: THE DOCUMENT HAS BEEN REVIEWED BY THE CONTRACTOR'S QUALITY ASSURANCE TEAM AND IS APPROVED FOR ISSUE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LEVELS ON THE DRAWING SHALL BE CORRECT AND ACCORDANCE TO THE DIMENSIONS SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL COUNCIL AND OTHER RELEVANT AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL COUNCIL AND OTHER RELEVANT AUTHORITIES.

NOTES: 1. CONSULT TO CONTRACT DRAWINGS FOR FURTHER DETAILS.

APPURTENANCES

NO.	DESCRIPTION	DATE	STATUS
1	TRANSFER TABLE	11.02.03	MH
2	REMOVED TRANSFER TABLE	21.02.03	MH

STEENSEN VARMING
CONSULTING ENGINEERS & MANAGERS
STEENSEN VARMING AUSTRALIA PTY. LIMITED, A CECA & ZLATOS COMPANY
10/110 WILSON ROAD, SYDNEY, NSW, 2050
TELEPHONE: (02) 9557 5500
FACSIMILE: (02) 9557 5502
EMAIL: steensen@steensenvarming.com.au
WEBSITE: www.steensevenvarming.com.au
REGISTERED OFFICE: AUSTRALIA - SYDNEY - NEW SOUTH WALES

APPROVED
CONSTRUCTION CONTRACT
03/17/18-1
MEASUREMENT CONTRACT
STEENSEN VARMING
CONSULTING ENGINEERS & MANAGERS
10/110 WILSON ROAD, SYDNEY, NSW, 2050

PROJECT TITLE
ELECTRICAL SERVICES
COUNCIL OFFICES
POWER, COMMUNICATIONS
& SECURITY LAYOUT

DATE: 12.12.02 PH
SCALE: 1:100
PROJECT NO.: 01832 E04
DRAWING NO.: B

DATE: 11/13/13
DRAWN BY: JH
CHECKED BY: JH
SCALE: AS SHOWN



QUALITY ASSURANCE CHECKS

PERCENT	DATE	INITIALS	LOCATION	DESCRIPTION
20				PRELIMINARY
20				REVISIONS
20				FINAL CHECK
40				CHECK PLAN
100	13/03/13	JH		FINAL CALCULATIONS

COMMENTS:

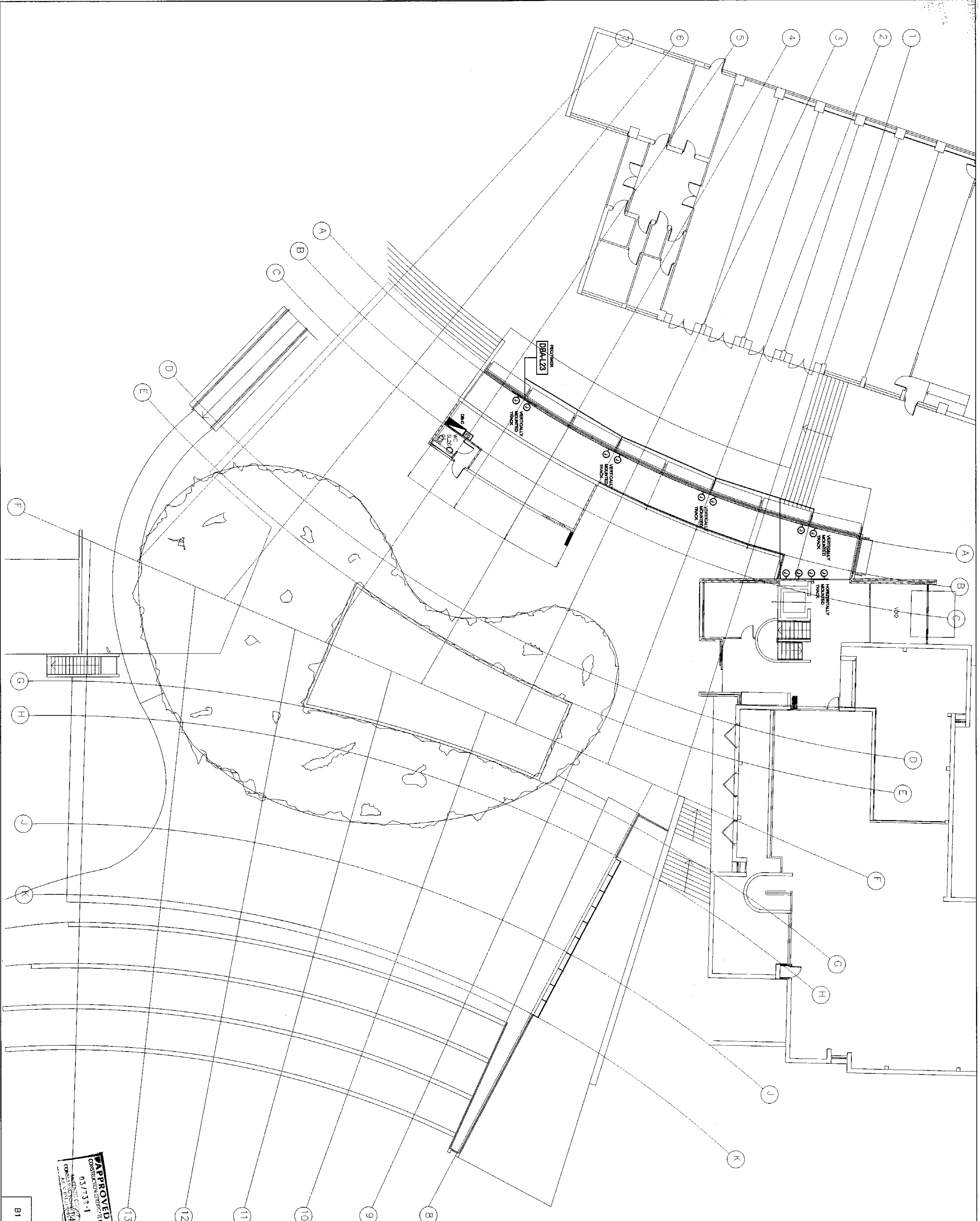
NOTES:

AMENDMENTS

REV	DESCRIPTION	DATE	BY	CHKD
1	ISSUED FOR PERMIT	18/03/13	JH	
2	REVISED DRAWING BOARD	27/03/13	JH	

STEENSEN VARMING
CONSULTING ENGINEERS & MANAGERS
15/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000

PROJECT TITLE: ELECTRICAL SERVICES
NEW LIBRARY
LEVEL 1 LIGHTING &
FIRE DETECTION LAYOUT
SCALE: AS SHOWN
DATE: 12.12.02 PH PH MH
PROJECT No: 01832 E05
SHEET No: B



QUALITY ASSURANCE CHECKS

PROJECT	DATE	INITIAL LOCATION	DOOR/KNOB CONTROL
20		PRELIMINARY	
30		FOR REVIEW	
40		FOR CHECK	
50		SUPERSEDED	
100		FOR CHECK	
		FOR CALCULATIONS	

NOTES

1. CONSULT THE CONSULTANT AND REVIEW AGAIN THE COMPATIBILITY OF THE LIGHTING FIXTURES WITH THE ARCHITECTURAL DESIGN AND THE ELECTRICAL SYSTEMS. THE LIGHTING FIXTURES SHOULD BE SELECTED TO BE COMPATIBLE WITH THE ARCHITECTURAL DESIGN AND THE ELECTRICAL SYSTEMS. THE LIGHTING FIXTURES SHOULD BE SELECTED TO BE COMPATIBLE WITH THE ARCHITECTURAL DESIGN AND THE ELECTRICAL SYSTEMS.

AMENDMENTS

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR PERMIT	18/02/20	PH
2	REVISED TRACK LIGHTS	27/02/20	PH

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 Melbourne VIC 3000
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 Email: info@steinsevarming.com.au
 Website: www.steinsevarming.com.au

PROJECT: UNITED TECHNOLOGIES AUSTRALIAN SERVICE HEADQUARTERS
 MONNA VALE LIBRARY

ISSUED FOR PERMIT
 APPROVED
 03/17/20
 03/17/20

DATE: 12.12.02
 PH
 MH

PROJECT No. 01832
 DRAWING No. E06
 SHEET No. B

QUALITY ASSURANCE CHECKS

NO.	DATE	INITIALS	DESCRIPTION	STATUS
1			DESIGN	
2			CONSTRUCTION	
3			OPERATION	
4			MAINTENANCE	
5			COMMISSIONING	
6			CLOSURE	
7			DECOMMISSIONING	
8			REMOVAL	
9			DEMOLITION	
10			RECONSTRUCTION	

NOTES

1. LIGHTING IN THE EXISTING BUILDING WAS NOT VERIFIED IN PLACE. ALL LIGHTING TO BE INSTALLED IN ACCORDANCE WITH THE CURRENT ASSESSMENT AND THE LATEST EDITION OF THE NEW ZEALAND ELECTRICAL CODE.

REVISIONS

REV.	DESCRIPTION	DATE	BY	CHK'D
1	ISSUE FOR PERMIT	18/12/20	PH	PH
2	REVISION TO ROOM MARK	22/12/20	PH	PH

STEENSEN VARMING CONSULTING ENGINEERS & MANAGERS

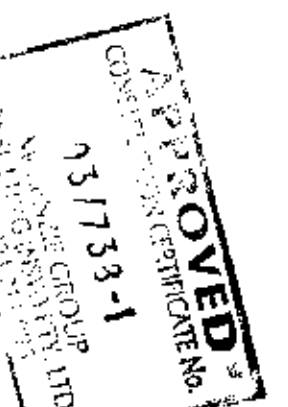
280 QUEEN STREET, 11TH FLOOR, AUCKLAND, NEW ZEALAND.

TEL: +64 (0)9 524 2100
 FAX: +64 (0)9 524 2101
 WWW.SVEENGINEERS.COM

PROJECT: MONA VALE LIBRARY

DESIGNED BY: PH
 CHECKED BY: PH
 DATE: 12.12.2020

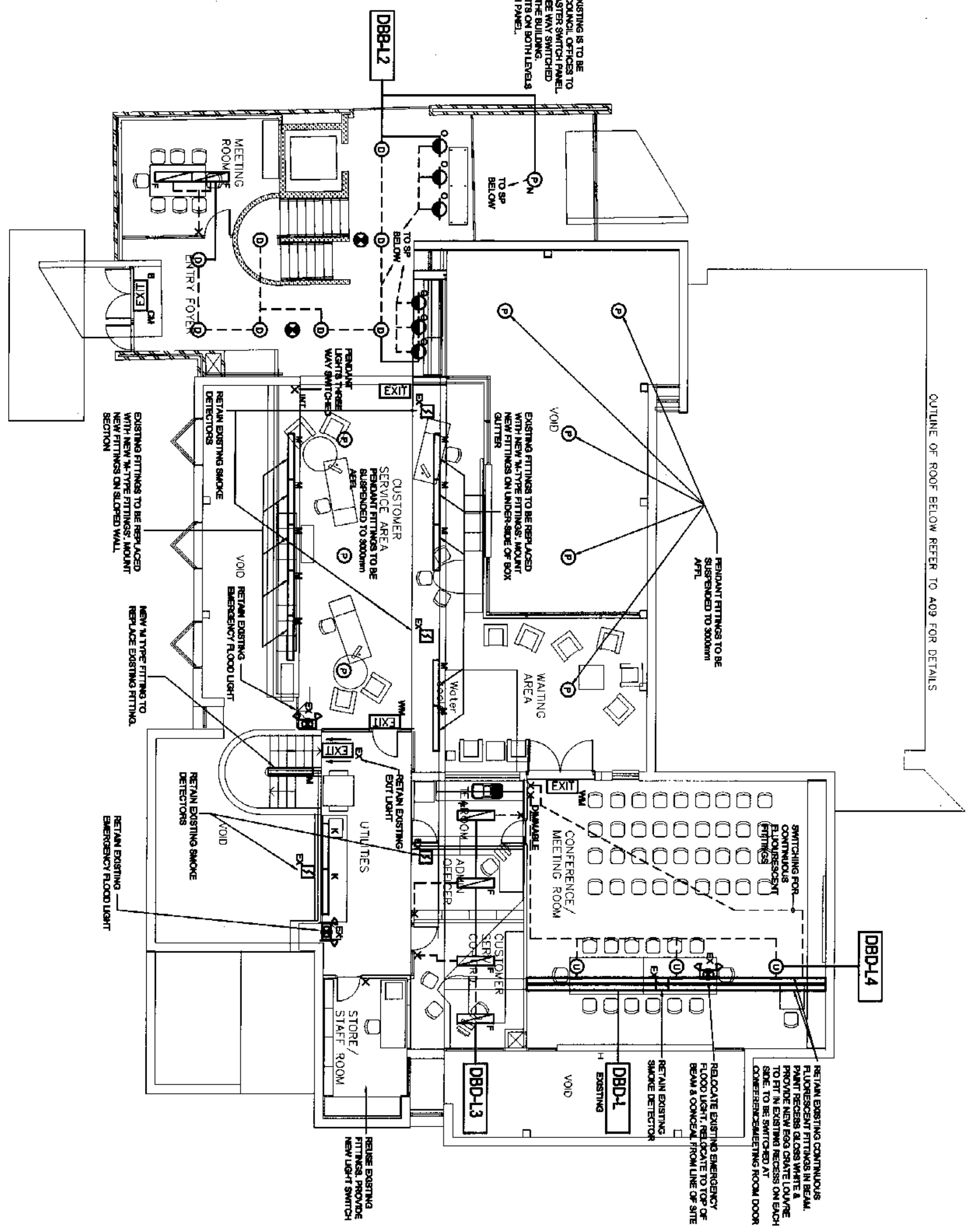
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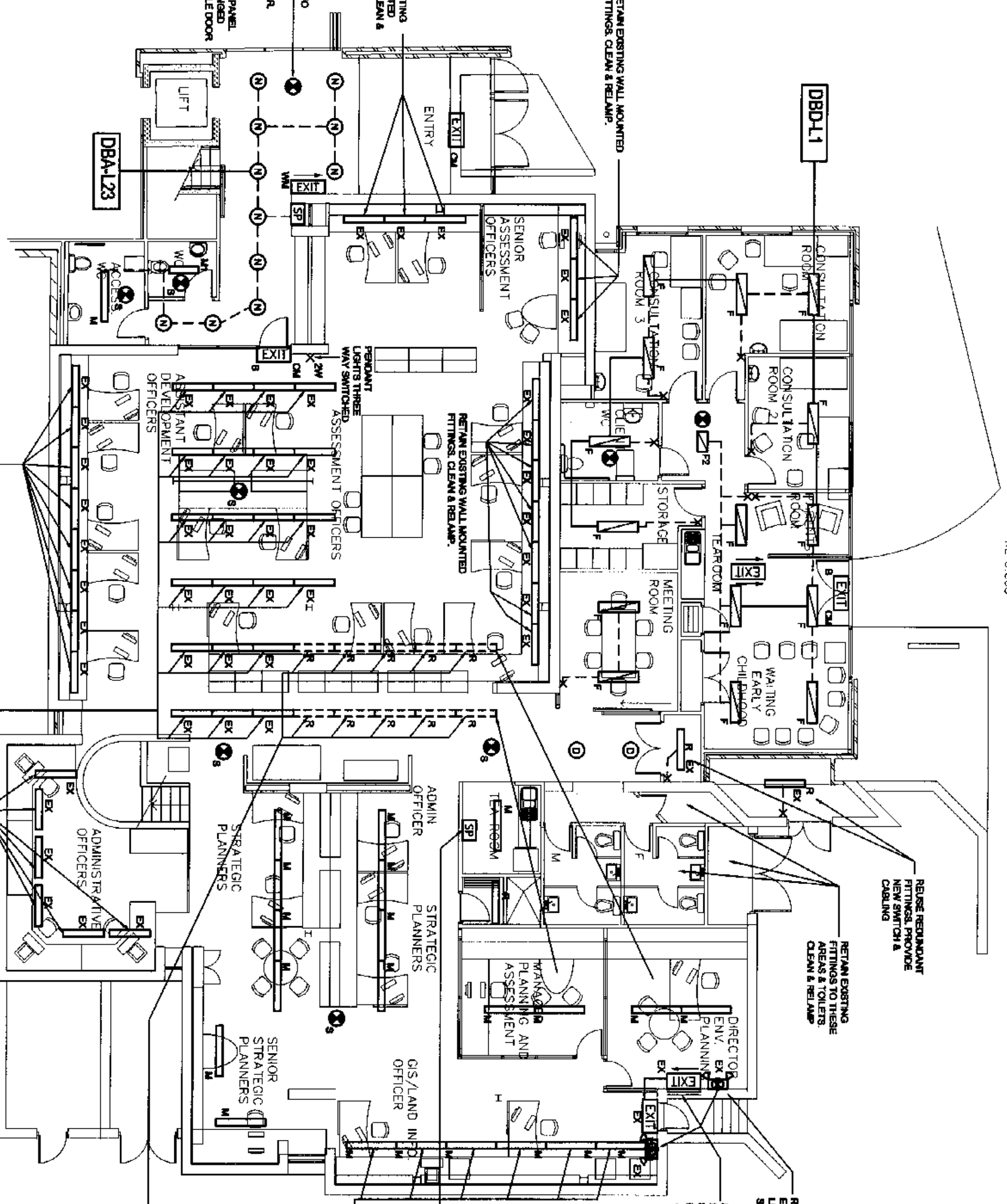
PROJECT No: 01832

DATE: 12.12.2020

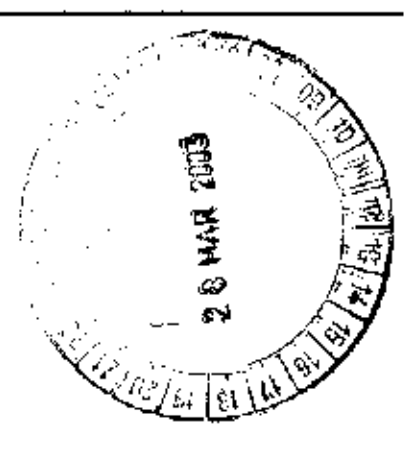
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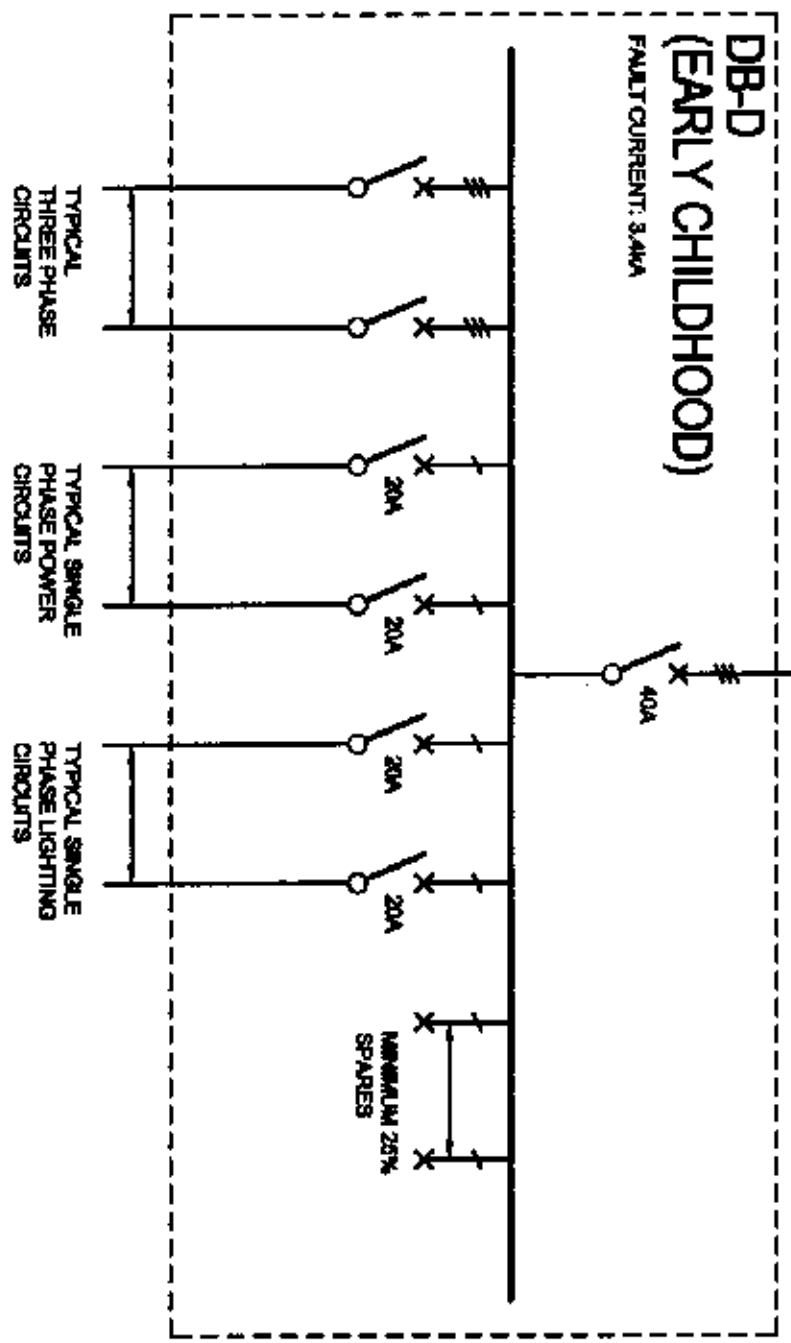
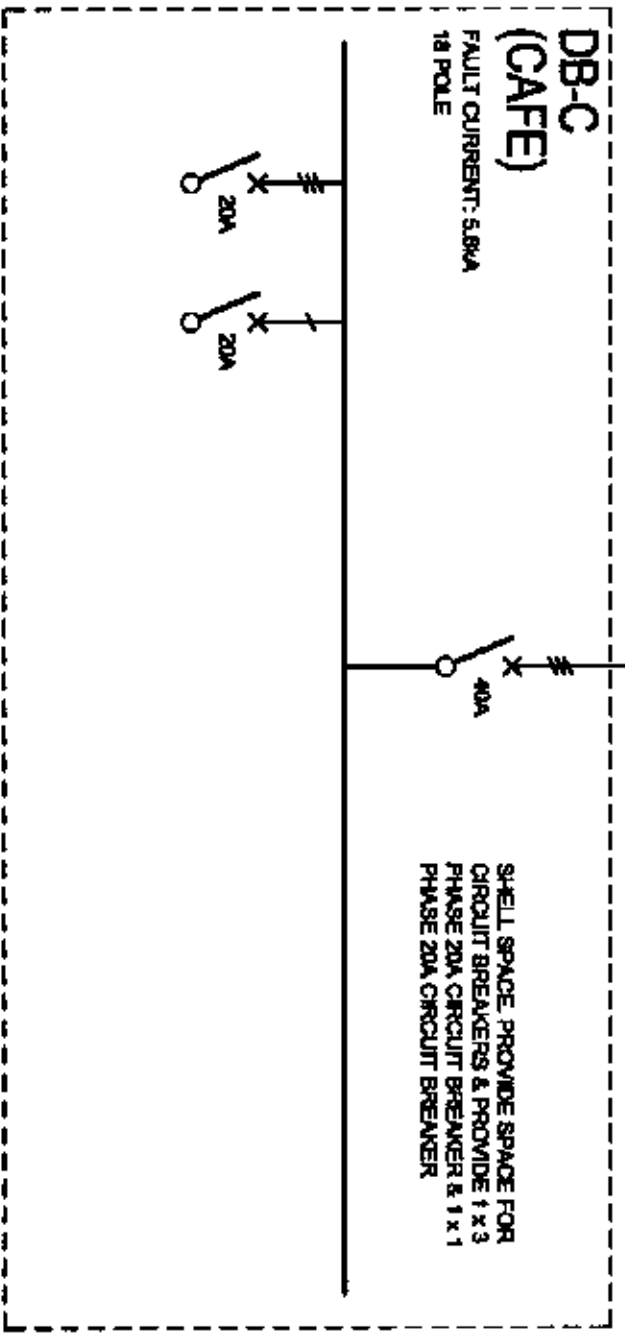
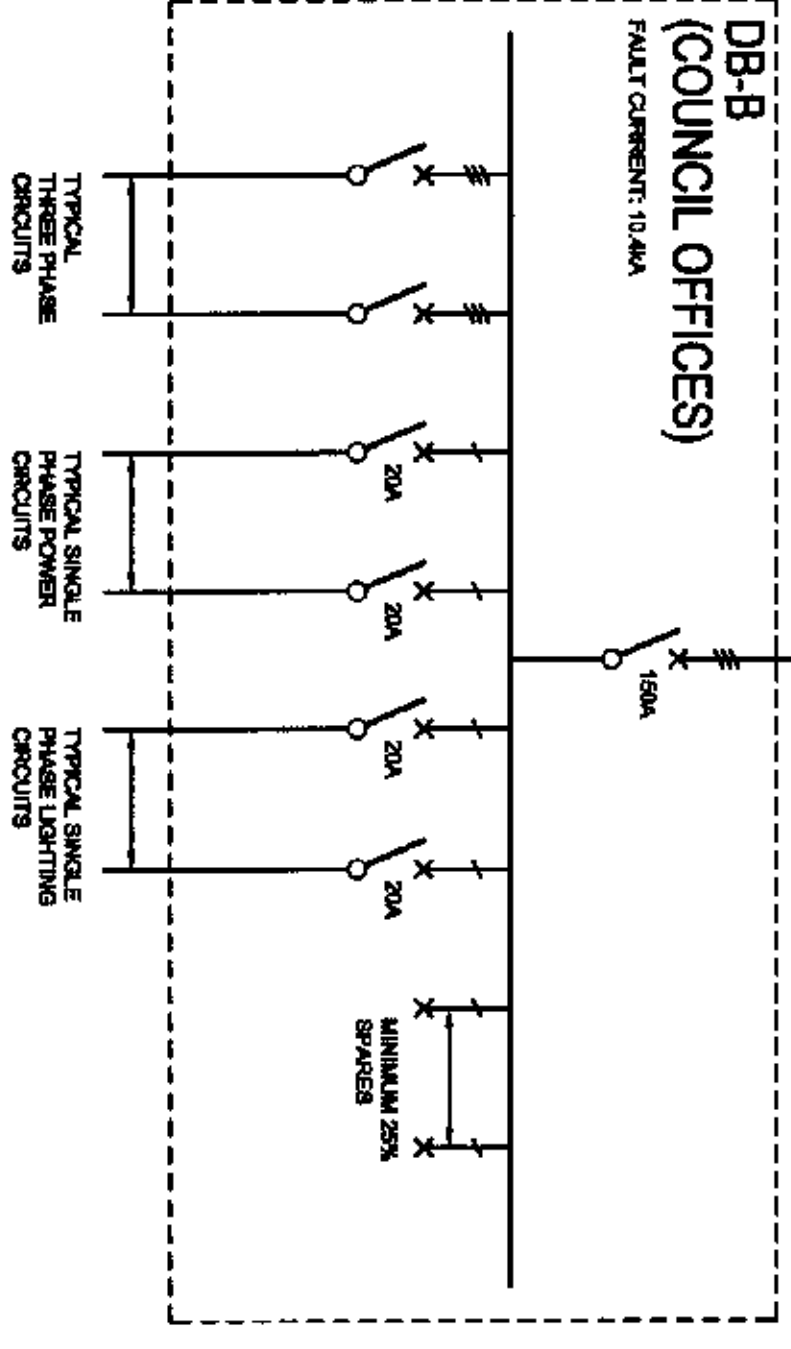
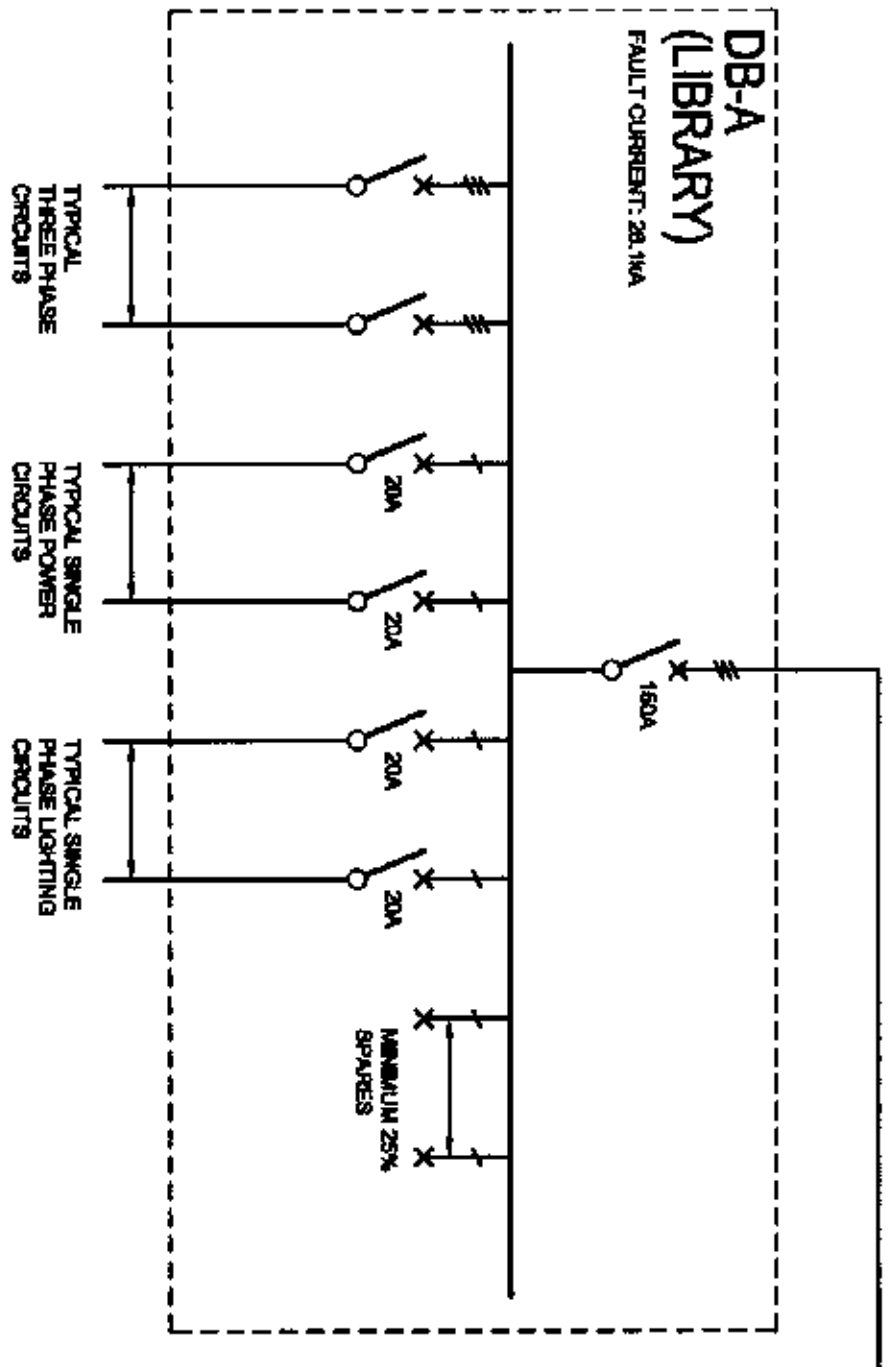
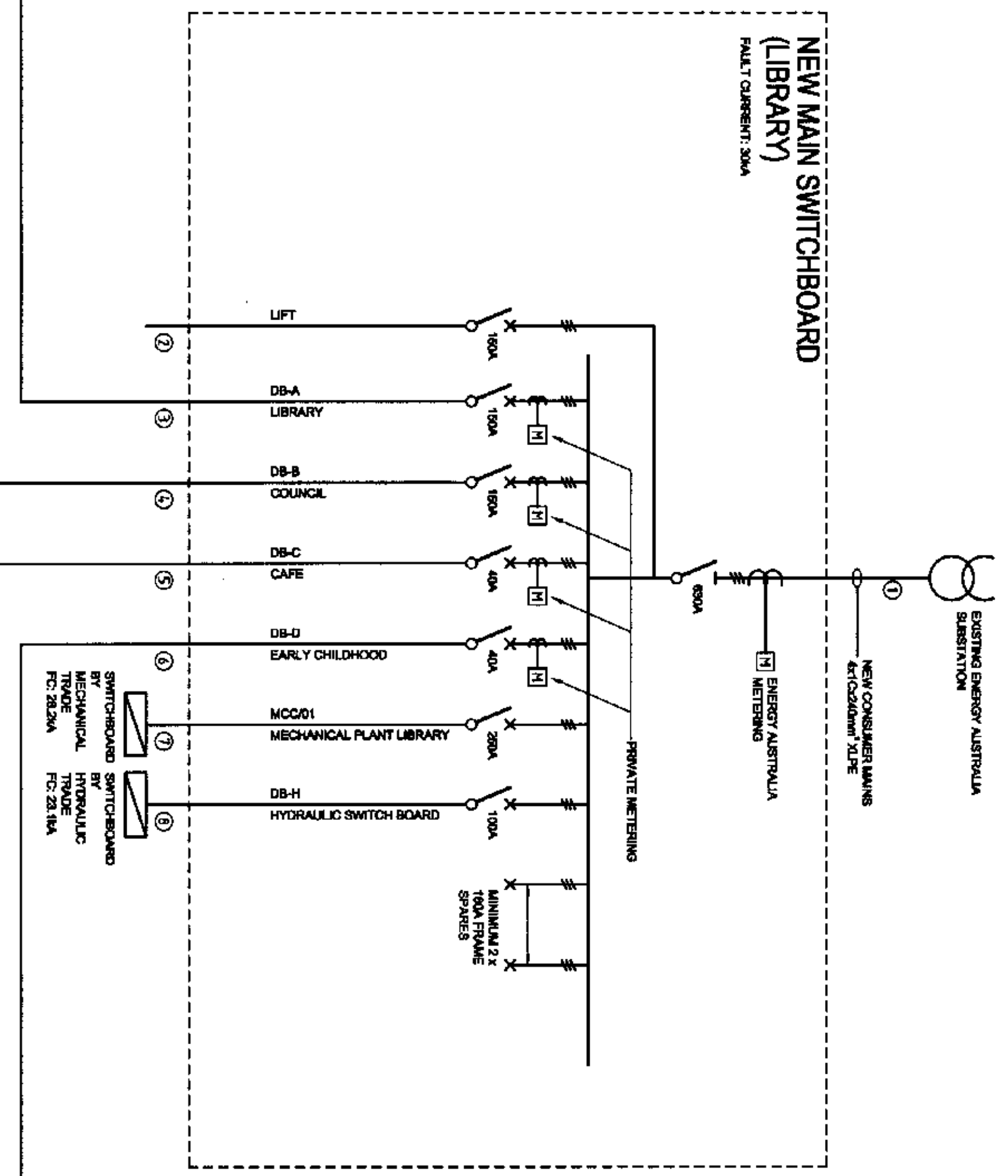
COUNCIL OFFICES AND EARLY CHILDHOOD LEVEL 2



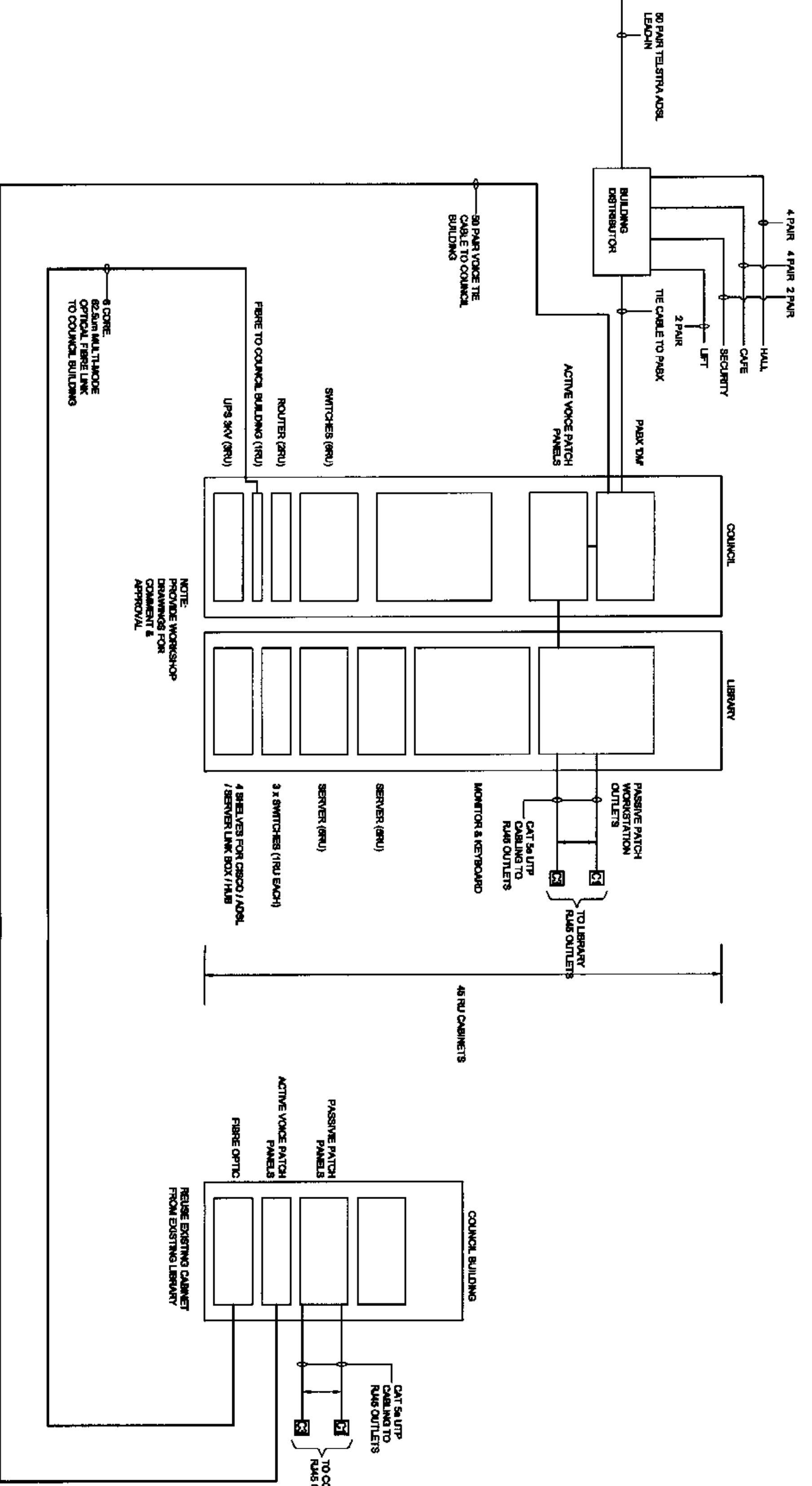
COUNCIL OFFICES AND EARLY CHILDHOOD LEVEL 1



CABLE NO.	SIZE
1	2 x 4 (L) 240sqmm Cu ALPFC & E
2	1 x 4C 240sqmm Cu ALPFC
3	1 x 4C 240sqmm Cu ALPFC & E
4	1 x 4C 240sqmm Cu ALPFC & E
5	1 x 4C 240sqmm Cu ALPFC & E
6	4 x 1C 150sqmm Cu ALPFC & E
7	4 x 1C 150sqmm Cu ALPFC & E
8	1 x 4C 240sqmm Cu ALPFC & E



2. ELECTRICAL SINGLE LINE DIAGRAM

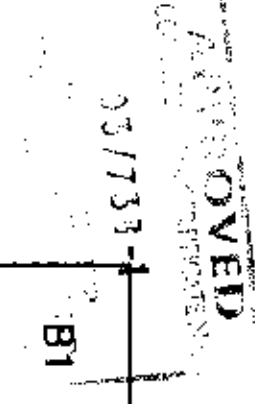


1. COMMUNICATIONS DETAIL

NO.	REV.	DATE	DESCRIPTION
1		12.02.03	SUBMITTED FOR CHECK PERIOD FOR APPROVAL
2			
3			

NOTES
 1. ALL WORK SHALL BE IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE RELEVANT AUSTRALIAN STANDARDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS FROM THE APPROPRIATE AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS FROM THE APPROPRIATE AUTHORITIES.

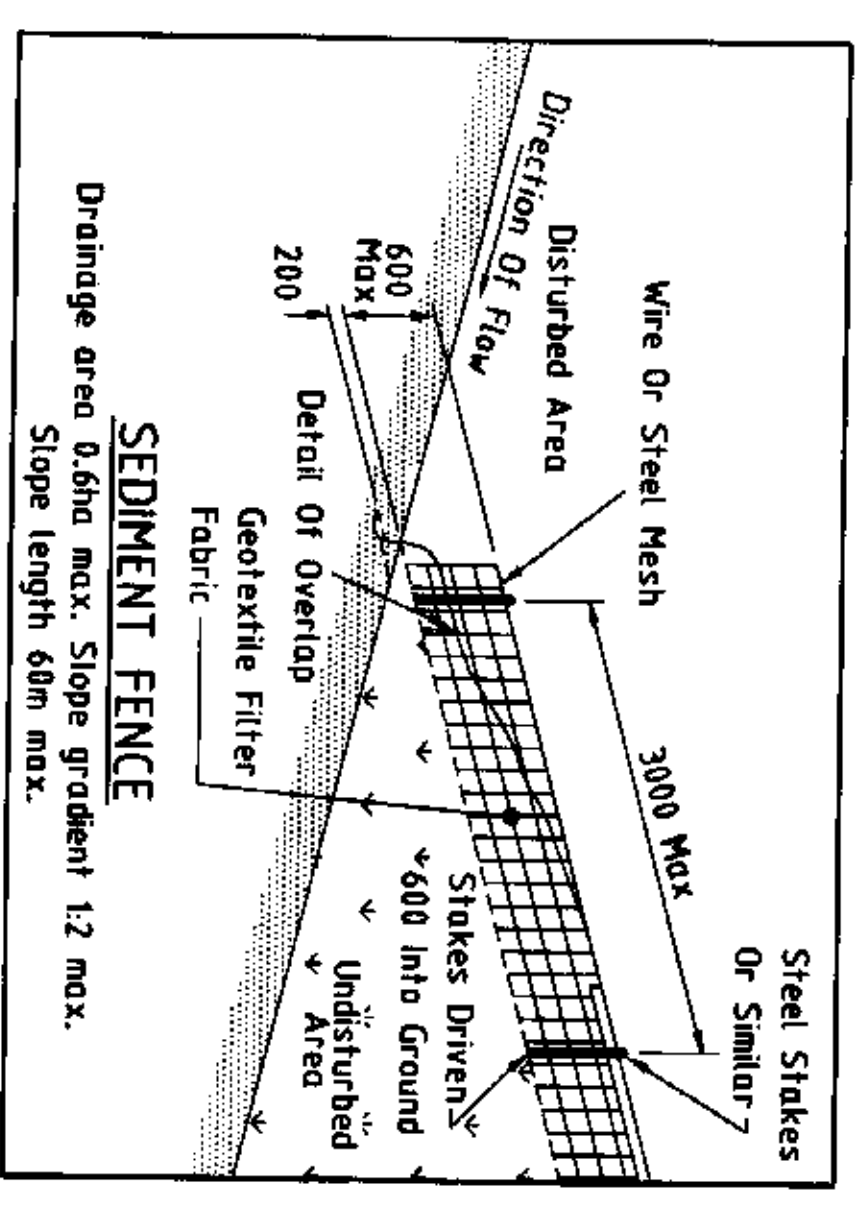
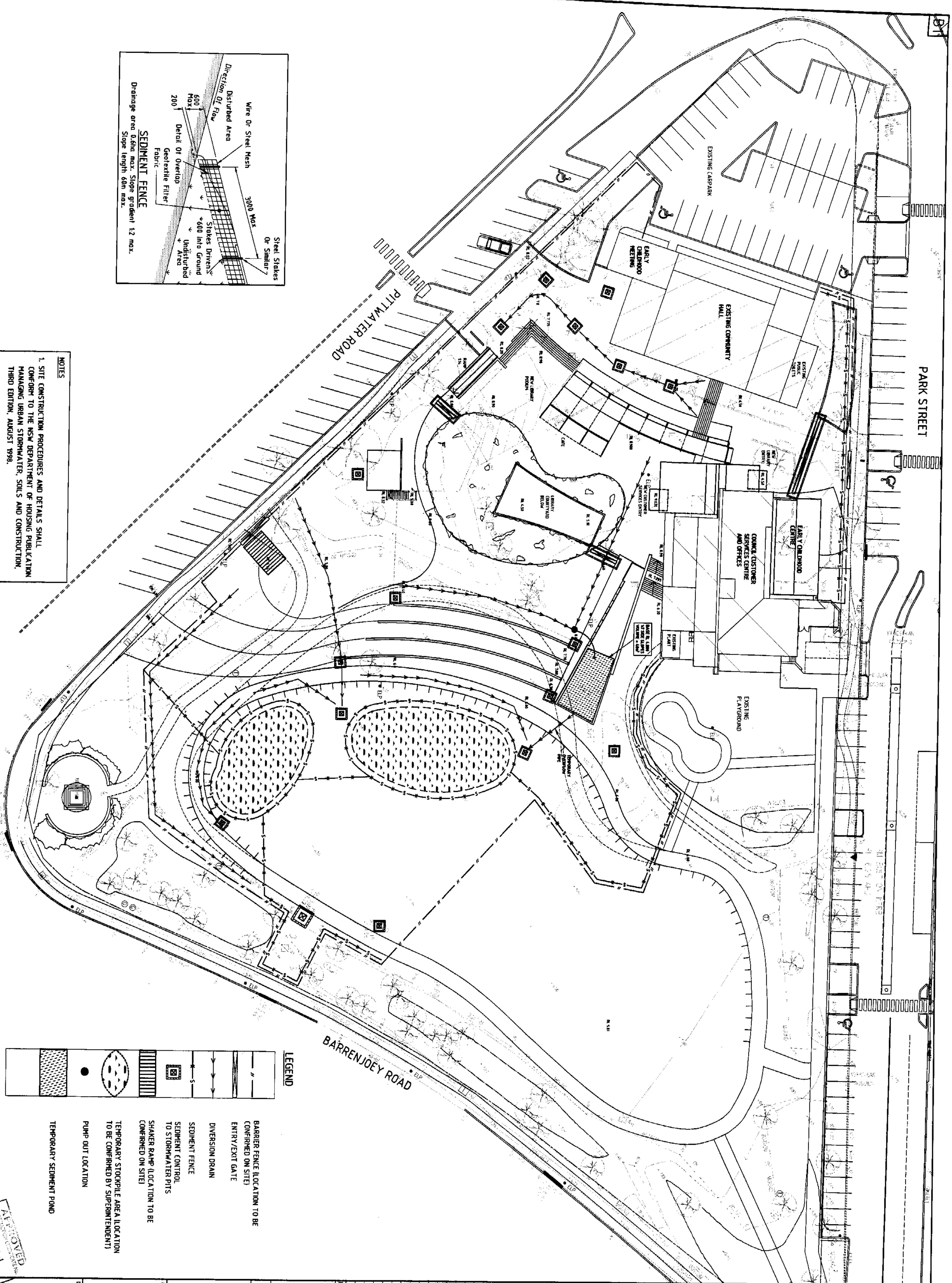
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2			
3			



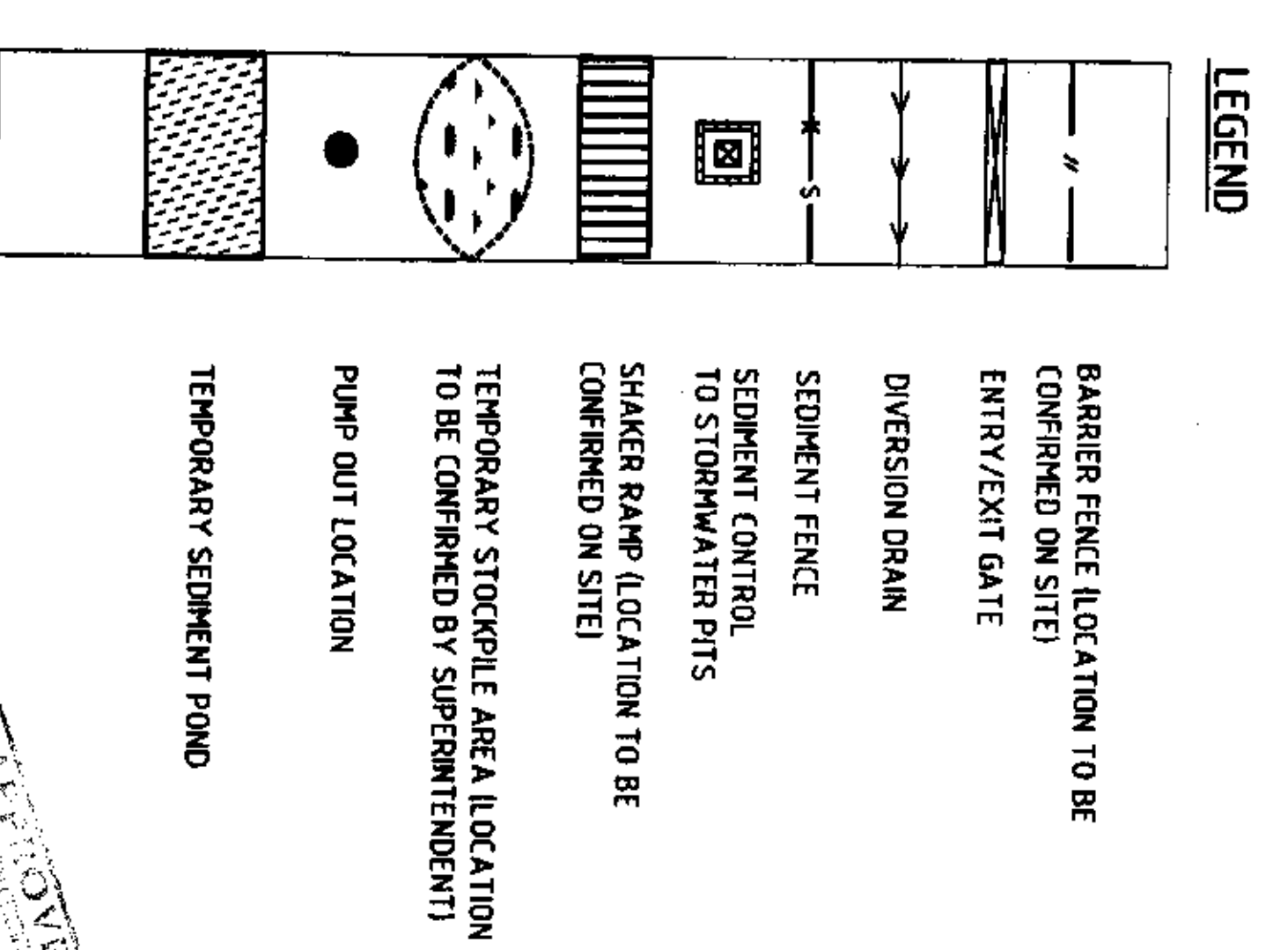
STEENSEN VARMING
 CONSULTING ENGINEERS & MANAGERS
 STEENSEN VARMING (AUSTRALIA) PTY LIMITED
 MONA VALE LIBRARY

DATE: 12.02.03 PH MH
 PROJECT NO: 01832 E08
 SHEET NO: B

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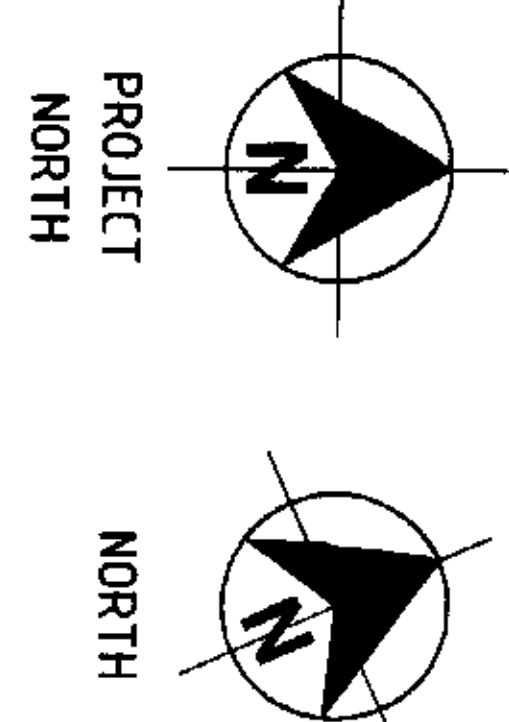


- NOTES**
1. SITE CONSTRUCTION PROCEDURES AND DETAILS SHALL CONFORM TO THE NEW DEPARTMENT OF HOUSING PUBLICATION HANDBOOK URBAN STORMWATER, SOILS AND CONSTRUCTION, THIRD EDITION, AUGUST 1998.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE STORMWATER LAYOUT PLAN.
 3. PAVED DRAINAGE TO BE CONSTRUCTED IN CONJUNCTION WITH THE SEDIMENT AND EROSION CONTROL PLAN.



SCALE 1:250

PRELIMINARY



Rev	Date	Revision Details	By	Ver	App
01	14-2-09	PRELIMINARY ISSUE	DNL		
02	27-2-09	ISSUED FOR TENDER	DNL		
03	14-03-09	FOR CONSTRUCTION ENTRY GATE	DNL		

Cornell Moti Macdonald
 Consulting Engineers
 118 Albany Road, PO Box 600, Macquarie NSW
 Phone: 02 9350 0000
 Fax: 02 9350 0000
 Email: cornell@macdonald.com.au

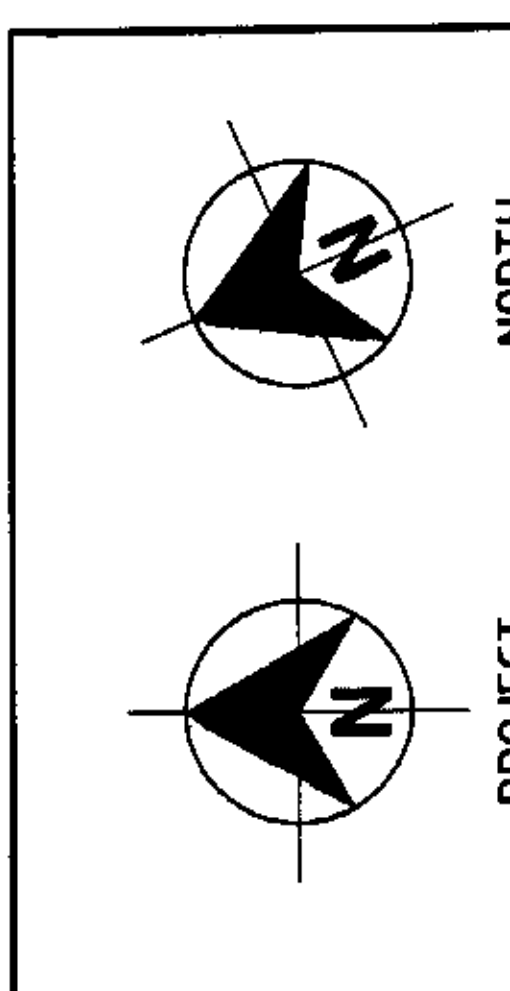
PITWATER MUNICIPAL COUNCIL

MONA VALE VILLAGE PARK LIBRARY

SEDIMENT AND EROSION CONTROL PLAN

Checked	Signat	Date	Verified	Signat	Date

Drawing No: CA001
 Revision: 03



NORTH
PROJECT NORTH

LEGEND

- IP INSPECTION POINT
- EXISTING PIT
- NEW PIT
- DOWNPIPE
- EXISTING PIT TO BE DEMOLISHED
- FLUSHING POINT
- ELECTRICITY POLE
- PIT NUMBER
- 150 SUBSOIL DRAIN
- NEW GRAVITY STORMWATER LINE
- EXISTING STORMWATER LINE
- PIPE INVERT LEVEL
- PROPOSED WATER MAIN
- PROPOSED SEWER MAIN
- PROPOSED SEWER RISING MAIN
- PROPOSED STORMWATER RISING MAIN
- CATCHMENT BOUNDARY
- 1 IN 100 YEAR DETENTION AREA
- EXISTING LEVEL
- PROPOSED LEVEL

REV	DATE	REVISION
01	14/03/03	FOR CONSTRUCTION CERTIFICATE
02	14/03/03	FOR CONSTRUCTION CERTIFICATE
03	14/03/03	FOR CONSTRUCTION CERTIFICATE
04	14/03/03	FOR CONSTRUCTION CERTIFICATE
05	14/03/03	FOR CONSTRUCTION CERTIFICATE
06	14/03/03	FOR CONSTRUCTION CERTIFICATE
07	14/03/03	FOR CONSTRUCTION CERTIFICATE
08	14/03/03	FOR CONSTRUCTION CERTIFICATE
09	14/03/03	FOR CONSTRUCTION CERTIFICATE
10	14/03/03	FOR CONSTRUCTION CERTIFICATE
11	14/03/03	FOR CONSTRUCTION CERTIFICATE
12	14/03/03	FOR CONSTRUCTION CERTIFICATE
13	14/03/03	FOR CONSTRUCTION CERTIFICATE
14	14/03/03	FOR CONSTRUCTION CERTIFICATE
15	14/03/03	FOR CONSTRUCTION CERTIFICATE
16	14/03/03	FOR CONSTRUCTION CERTIFICATE
17	14/03/03	FOR CONSTRUCTION CERTIFICATE
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19	14/03/03	FOR CONSTRUCTION CERTIFICATE
20	14/03/03	FOR CONSTRUCTION CERTIFICATE

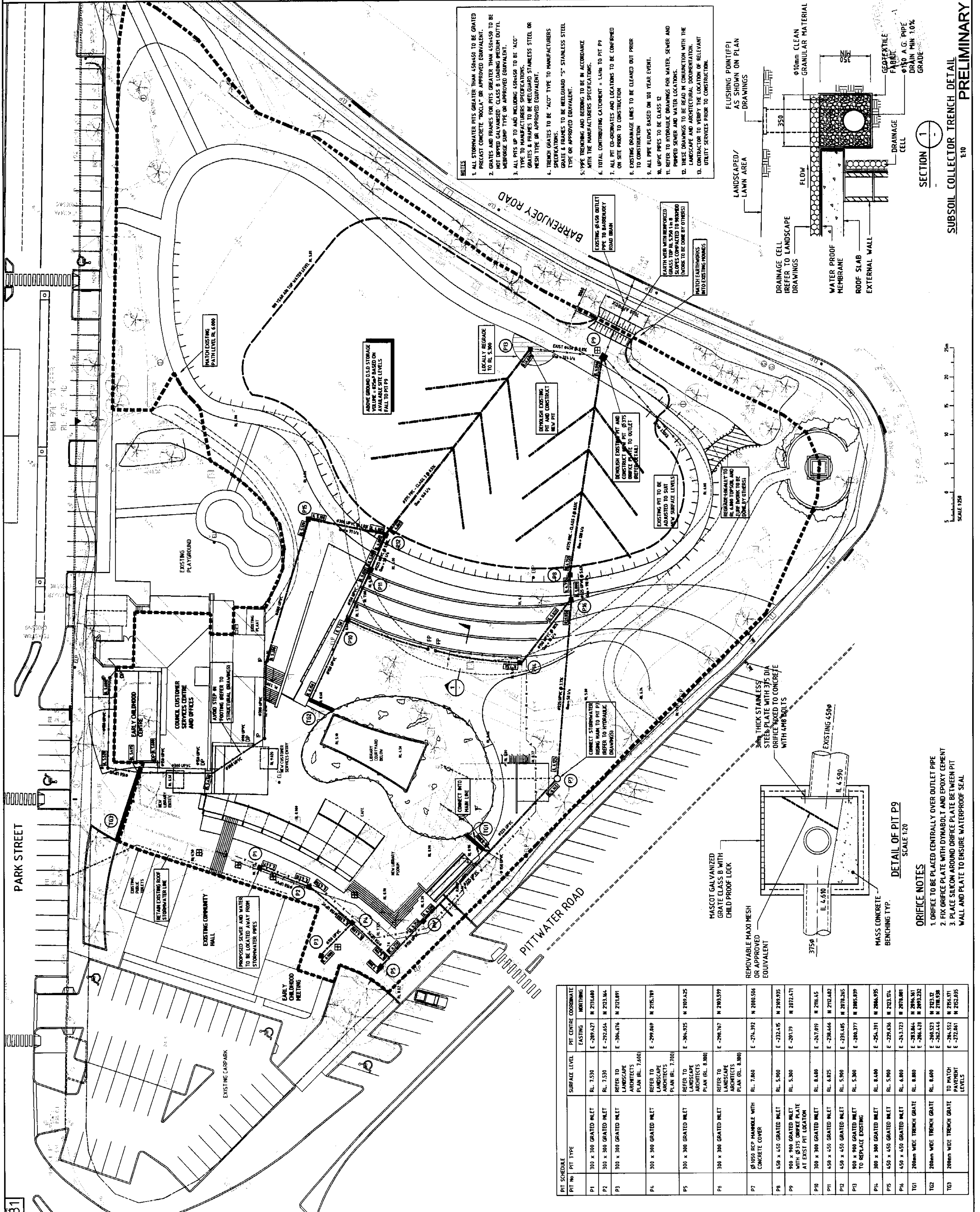
Connell Mott MacDonald
Building the Future
 Connell Mott MacDonald Pty Ltd
 ABN 64 008 138 873
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 Email: connell@connellmott.com.au
 Website: www.connellmott.com.au

PITWATER MUNICIPAL COUNCIL

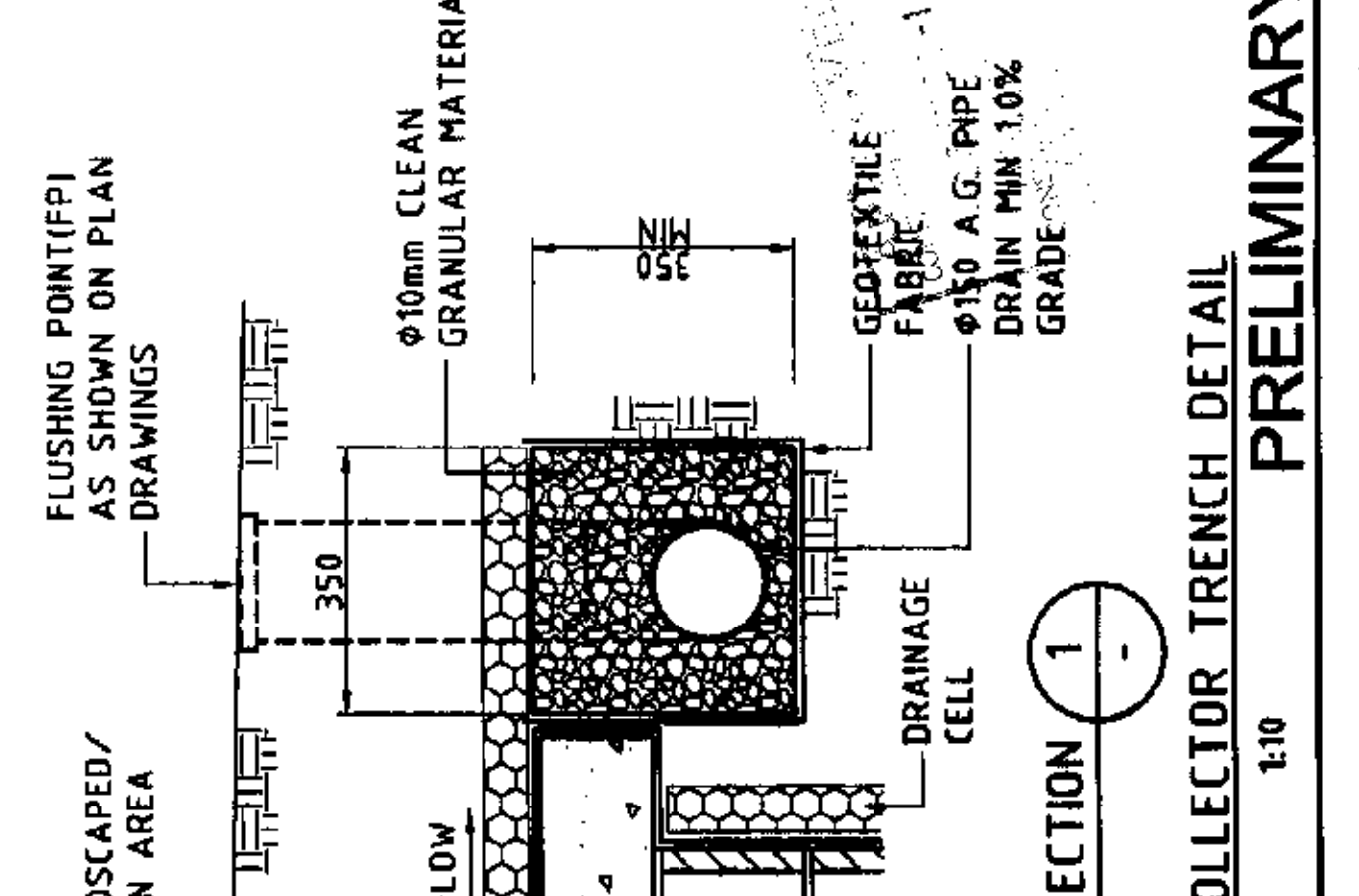
MONA VALE VILLAGE PARK LIBRARY

STORMWATER LAYOUT PLAN

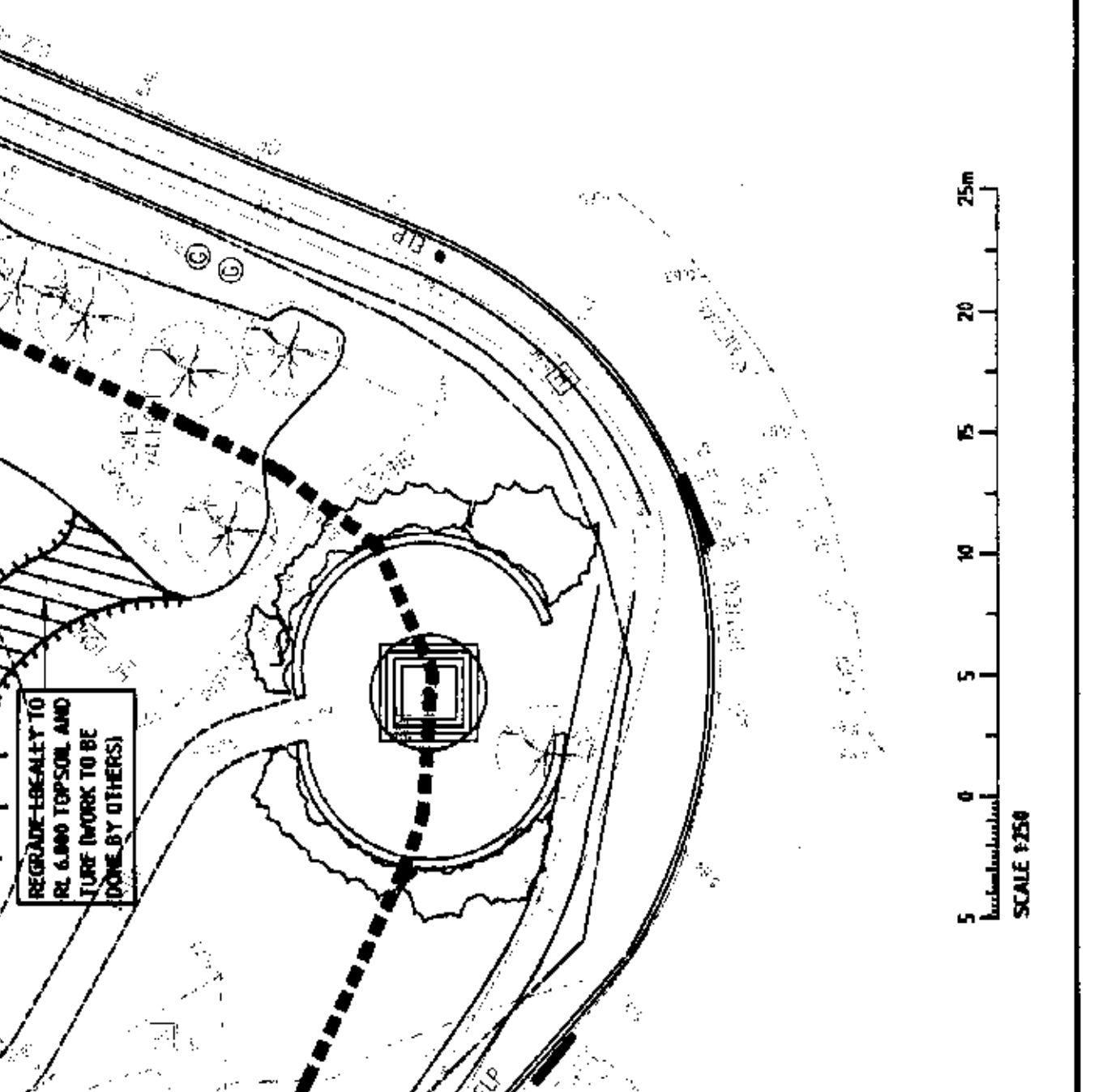
Drawn	Checked	Verified	Signed	Date
Designed	Checked	Verified	Signed	Date
LM Project No.	Scale	Sheet	Revision	
3785	1:250	3785	CA002	03



- NOTES**
1. ALL STORMWATER PITS GREATER THAN 450mm TO BE GRADED PRECAST CONCRETE "MOCKY" OR APPROVED EQUIVALENT.
 2. GRATES AND FRAMES FOR PITS GREATER THAN 450mm TO BE HOT DIPPED GALVANIZED CLASS 8 LOADING MEDIUM DUTY. WERBERG SUMP TYPE OR APPROVED EQUIVALENT.
 3. ALL PITS UP TO AND INCLUDING 450mm TO BE "A3" TYPE TO MANUFACTURERS SPECIFICATIONS.
 4. TRUCKY GRATES TO BE "A3" TYPE TO MANUFACTURERS SPECIFICATIONS. GRATE & FRAMES TO BE REINFORCED "S" STAINLESS STEEL TYPE OR APPROVED EQUIVALENT.
 5. TYPE TRENCHING AND BEDDING TO BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
 6. TOTAL CONTRIBUTING CATCHMENT = LINK TO PIT
 7. ALL PIT CO-ORDINATES AND LOCATIONS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION
 8. EXISTING DRAINAGE LINES TO BE CLEARED OUT PRIOR TO CONSTRUCTION
 9. ALL PIPE ELUDES BASED ON 100 YEAR EVENT.
 10. ALL PIPES TO BE CLASS 12
 11. REFER TO TYPICAL DRAWINGS FOR WATER, SEWER AND PUMPED SEWER AND WATER LOCATIONS.
 12. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH THE LANDSCAPE AND ARCHITECTURAL DOCUMENTATION.
 13. CONTRACTOR TO VERIFY THE LOCATION OF RELEVANT UTILITY SERVICES PRIOR TO CONSTRUCTION.



SECTION 1
 SUBSOIL COLLECTOR TRENCH DETAIL
 SCALE 1:10



DETAIL OF PIT P9
 SCALE 1:20

PIT SCHEDULE	PIT No	PIT TYPE	SURFACE LEVEL	PIT CENTRE COORDINATE
	P1	300 x 300 GRATED INLET	RL. 7.530	E -289.427 N 273.640
	P2	300 x 300 GRATED INLET	RL. 7.530	E -292.654 N 273.364
	P3	300 x 300 GRATED INLET	REFER TO LANDSCAPE ARCHITECTS PLAN (RL. 7.100)	E -304.674 N 272.891
	P4	300 x 300 GRATED INLET	REFER TO ARCHITECTS LANDSCAPE ARCHITECTS PLAN (RL. 7.100)	E -299.849 N 276.719
	P5	300 x 300 GRATED INLET	REFER TO LANDSCAPE ARCHITECTS PLAN (RL. 8.000)	E -304.295 N 289.625
	P6	300 x 300 GRATED INLET	REFER TO ARCHITECTS LANDSCAPE ARCHITECTS PLAN (RL. 8.000)	E -296.767 N 290.599
	P7	Ø1500 RCP MANHOLE WITH CONCRETE COVER	RL. 7.860	E -271.397 N 286.504
	P8	450 x 450 GRATED INLET	RL. 5.900	E -232.415 N 289.925
	P9	450 x 450 GRATED INLET WITH Ø375 ORIFICE PLATE AT EXIST PIT LOCATION	RL. 5.300	E -281.719 N 272.471
	P10	300 x 300 GRATED INLET	RL. 6.400	E -247.819 N 276.645
	P11	450 x 450 GRATED INLET	RL. 6.025	E -228.464 N 272.482
	P12	450 x 450 GRATED INLET	RL. 5.900	E -235.485 N 287.825
	P13	Ø600 RCP MANHOLE TO REPLACE EXISTING	RL. 5.300	E -284.377 N 286.829
	P14	300 x 300 GRATED INLET	RL. 6.400	E -254.311 N 286.975
	P15	450 x 450 GRATED INLET	RL. 5.900	E -229.434 N 273.074
	P16	450 x 450 GRATED INLET	RL. 6.400	E -243.273 N 287.801
	T01	200mm WIDE TRENCH GRATE	RL. 6.800	E -283.844 N 286.951
	T02	200mm WIDE TRENCH GRATE	RL. 6.400	E -268.573 N 283.187
	T03	200mm WIDE TRENCH GRATE	RL. 6.400	E -282.444 N 287.829
	T04	200mm WIDE TRENCH GRATE	RL. 6.400	E -291.552 N 285.871
	T05	200mm WIDE TRENCH GRATE	RL. 6.400	E -274.041 N 283.925

- ORIFICE NOTES**
1. ORIFICE TO BE PLACED CENTRALLY OVER OUTLET PIPE
 2. FIX ORIFICE PLATE WITH DYNAMBOLT AND EPOXY CEMENT
 3. PLACE SILICON AROUND ORIFICE PLATE BETWEEN PIT WALL AND PLATE TO ENSURE WATERPROOF SEAL

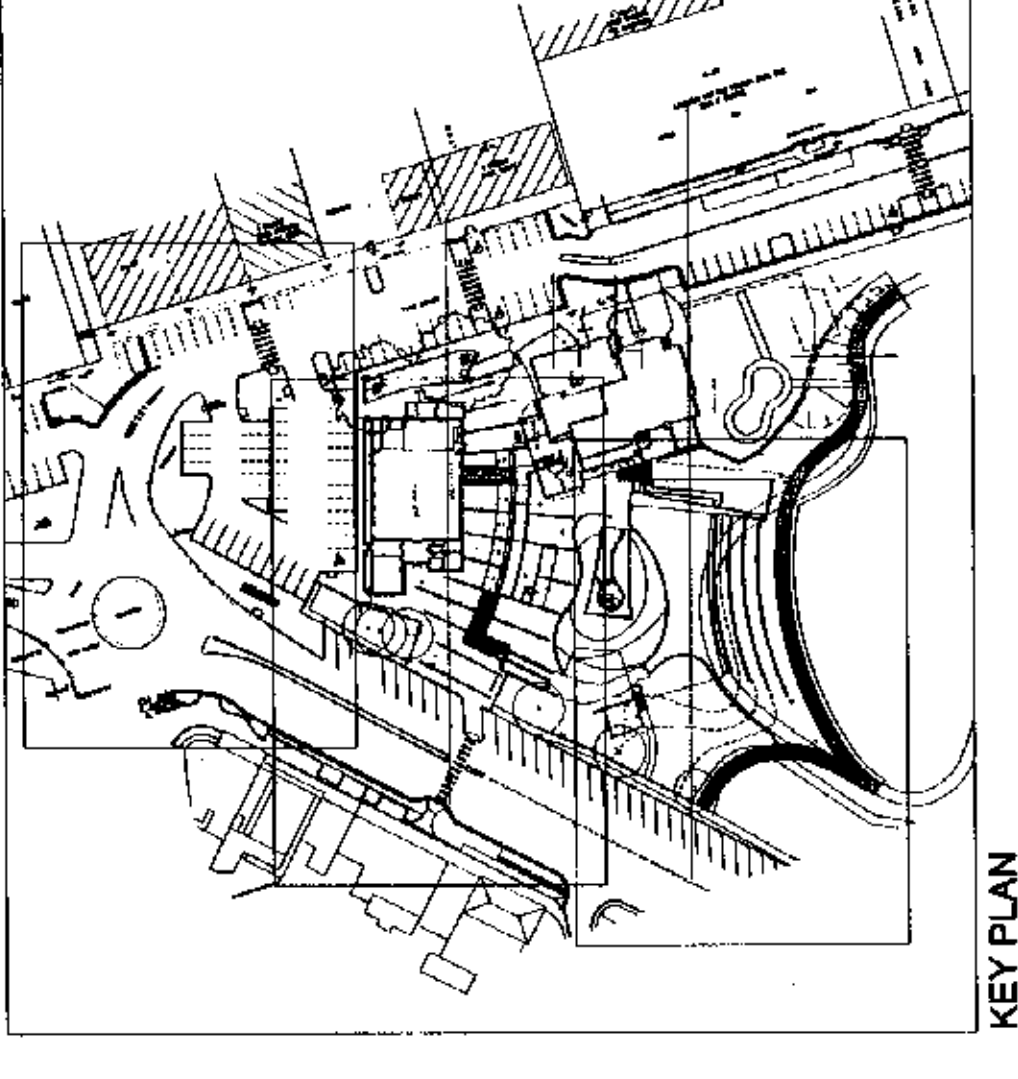
PRELIMINARY

LIBRARY & PUBLIC DOMAIN REDEVELOPMENT VILLAGE PARK MONA VALE

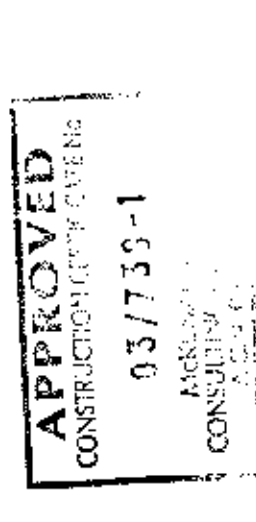
LANDSCAPE WORKS PACKAGE

prepared by:
Taylor Brammer Landscape Architects Pty Ltd

prepared for:
Pittwater Council



DWG NO.	DRAWING TITLE	SCALE
LA01	Community Hall	1:100 @ B1
LA02	Library Podium	1:100 @ B1
LA03	Library Podium	1:100 @ B1
LA04	Grass Terrace	1:100 @ B1
LA05	Landscape Sections	1:20 @ B1
LA06	Landscape Sections	1:20 @ B1
LA07	Landscape Details	various



11/02/11
12/02/11
13/02/11
14/02/11
15/02/11
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19/02/11
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taylor
brammer

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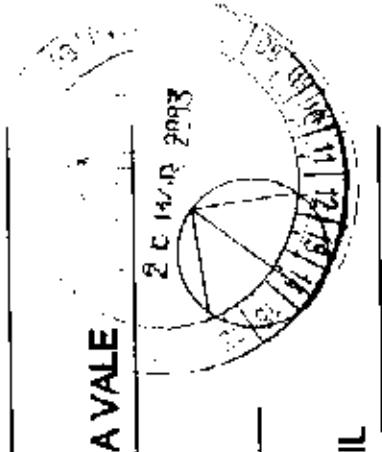
Project:
VILLAGE PARK MONA VALE

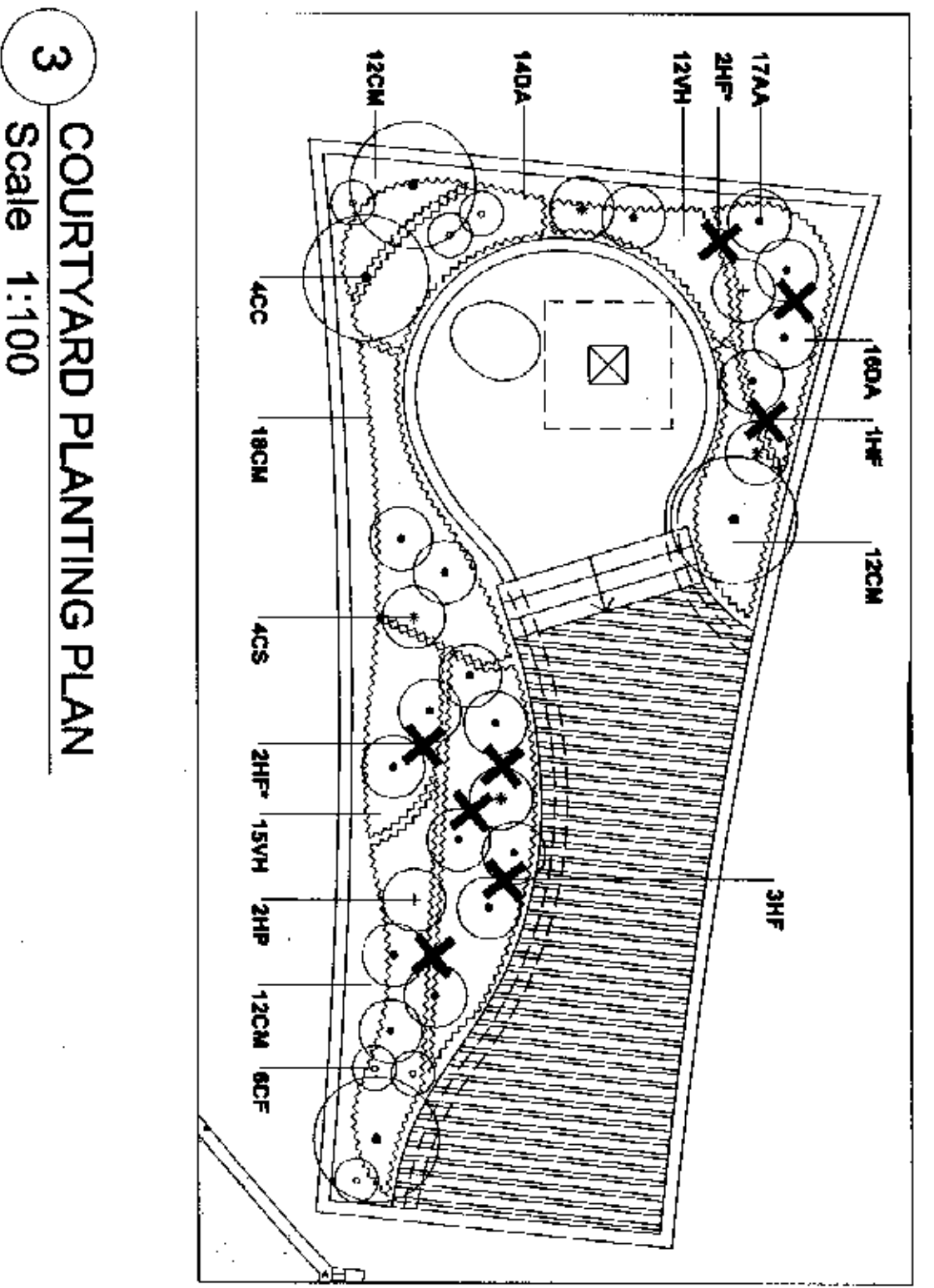
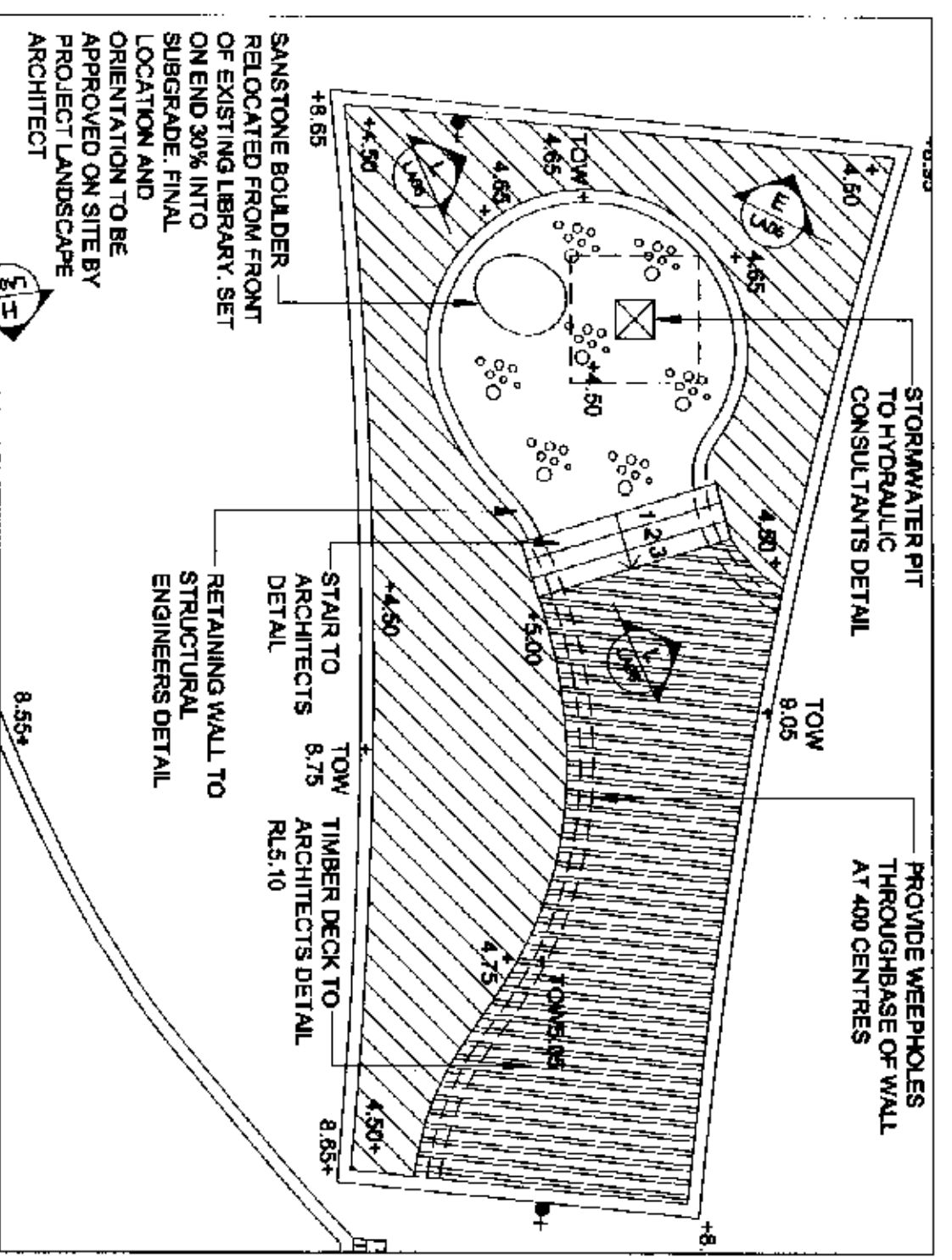
Drawing No:
2 E 14/01 2/05

Cover Sheet

Pittwater Council

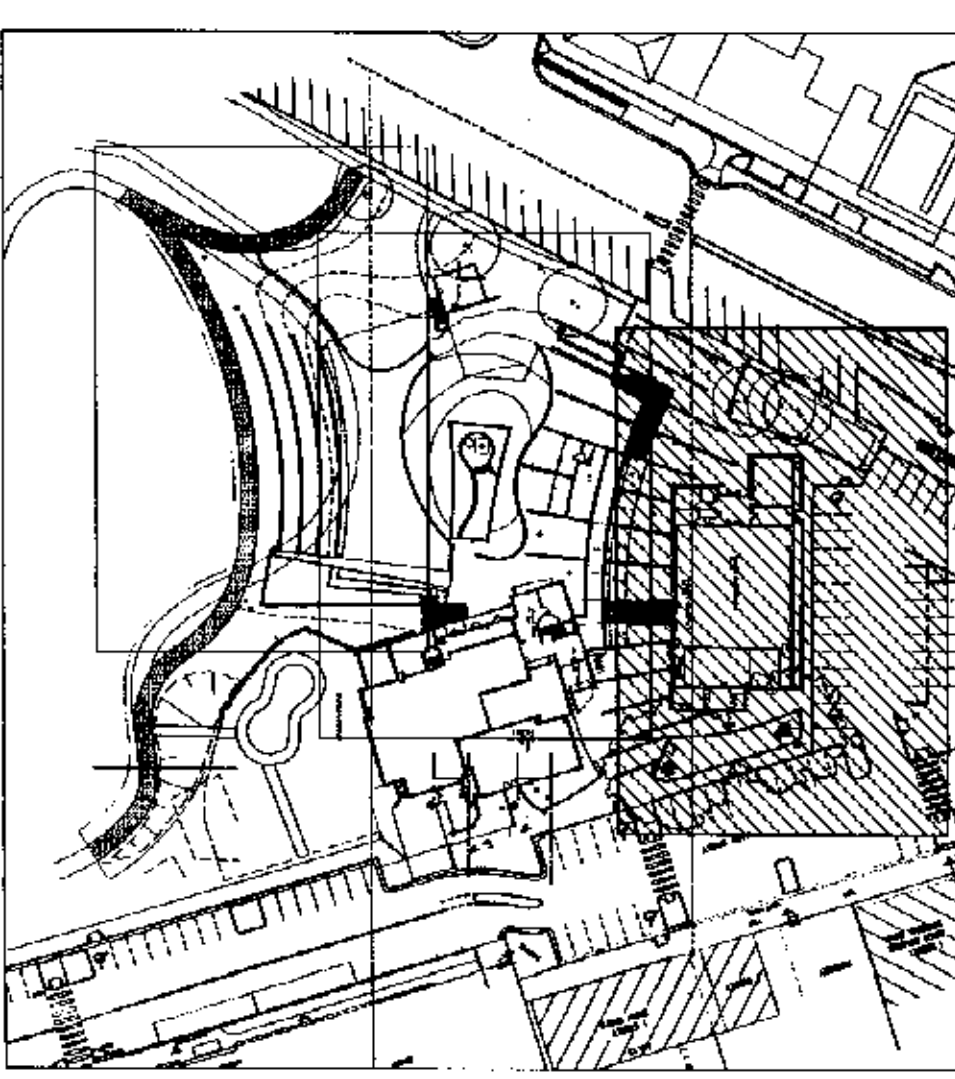
LA00 D





LEGEND

	EXTENT OF WORKS		TIMBER DECK REFER TO ARCHITECT'S DETAIL
	PROPOSED NEW CONTOUR		PERVIOUS PAVING REFER TO DETAIL
	EXISTING SPOT LEVEL		RECYCLED GRANITE PAVING REFER TO SPECIFICATION
	NEW FINISHED SPOT LEVEL		POST TOP LIGHT TO SPECIFICATION
	ELECTRICAL LIGHT POLE		RUBBER BARRIER TO SPECIFICATION
	EXISTING TREE TO BE RETAINED REFER TO ARCHITECT'S DETAIL		SEAL-HERFERTO TO SPECIFICATION
	PALM PLANTING LOCATION		MASS PLANTING BED REFER TO CROSS SECTION AND DETAIL
	STORMWATER PIT CONSULTANT'S DETAIL		TIRE-HERFERTO TO DETAIL
	HOSE TAP LOCATION REFER TO HYDRAULIC SPECIALIST'S DETAIL		EXISTING SERVICE PITS IN PAVING REFER TO DETAIL
	UPLIGHTER TO DETAIL		ASPHALT PATH REFER TO DETAIL
	CONCRETE EDGE REFER TO DETAIL		CONCRETE CROSS SECTION REFER TO DETAIL
	TIMBER EDGE REFER TO DETAIL		UNIT PAVING REFER TO CROSS SECTION
	HEADER PAVING REFER TO CROSS SECTION		PAVING AS SPECIFIED REFER TO CROSS SECTION
	PAVING LINE AS SPECIFIED REFER TO DETAIL		PAVING LINE AS SPECIFIED REFER TO DETAIL

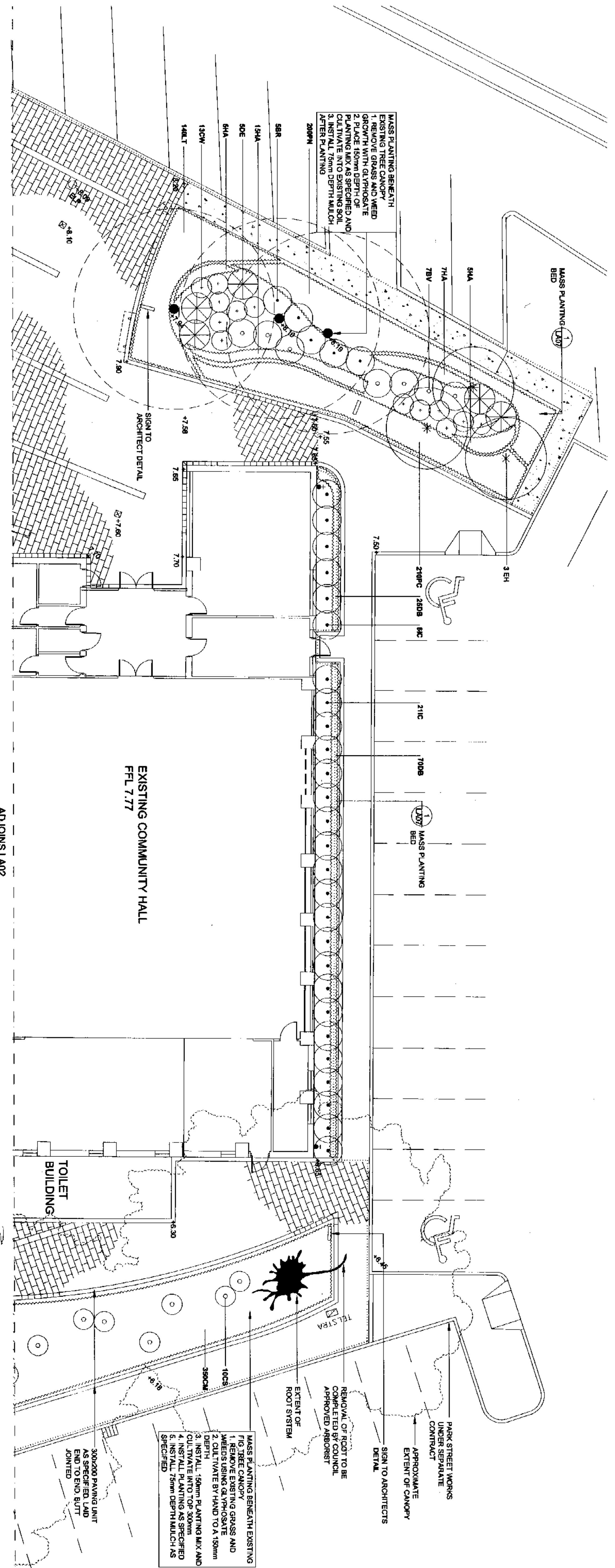


PLANT SCHEDULE - COURTYARD

Symbol	Botanical Name	No.	Size	Spacing	Notes
CM	Crataegus mollis	54	2000L	0.25m	
CH	Chamaecyparis stricta	27	1500L	0.25m	
WH	Wisteria floribunda	27	1500L	0.25m	
AC	Acacia saligna	4	1500L	as shown	
CP	Calliandra saligna	4	3000L	as shown	
HP	Halimolobos patersoniana	2	3000L	as shown	
PL	Platanus orientalis	17	3000L	as shown	
CC	Cassia occidentalis	4	3000L	as shown	
OC	Ocotea foenicea	4	3000L	as shown	
PF	Phoradendron australe	4	3000L	as shown	
MC	Macaranga daniellii	4	3000L	as shown	
CC	Cassia occidentalis	4	3000L	as shown	
PF	Phoradendron australe	4	3000L	as shown	
MC	Macaranga daniellii	4	3000L	as shown	

PLANT SCHEDULE

Symbol	Botanical Name	No.	Size	Spacing	Notes
SH	Shorea robusta	250	1500L	0.25m	
CM	Crataegus mollis	300	1500L	0.25m	
CH	Chamaecyparis stricta	180	1500L	0.25m	
WH	Wisteria floribunda	180	1500L	0.25m	
AC	Acacia saligna	146	1500L	0.25m	
HP	Halimolobos patersoniana	1150	7500L	0.25m	
PL	Platanus orientalis	1150	7500L	0.25m	
CC	Cassia occidentalis	410	7500L	0.25m	
OC	Ocotea foenicea	9	1500L	as shown	
PF	Phoradendron australe	17	3000L	as shown	
MC	Macaranga daniellii	28	3000L	as shown	
DE	Dryopteris erodonta	46	2000L	1.5m	
SHR	Shorea robusta	46	2000L	1.5m	
BY	Banksia integrifolia	35	2000L	1.5m	
CV	Calliandra saligna	127	2000L	1.5m	
WH	Wisteria floribunda	27	2000L	1.5m	
AC	Acacia saligna	27	2000L	1.5m	
HP	Halimolobos patersoniana	27	2000L	1.5m	
PL	Platanus orientalis	27	2000L	1.5m	
CC	Cassia occidentalis	27	2000L	1.5m	
OC	Ocotea foenicea	9	450L	as shown	
EH	Excelsiora leucostachya	13	450L	as shown	
LI	Ligustrum lucidum	3	750L	as shown	
UP	Ulmus parvifolius	3	750L	as shown	



1 COMMUNITY HALL LANDSCAPE PLAN
Scale 1:100

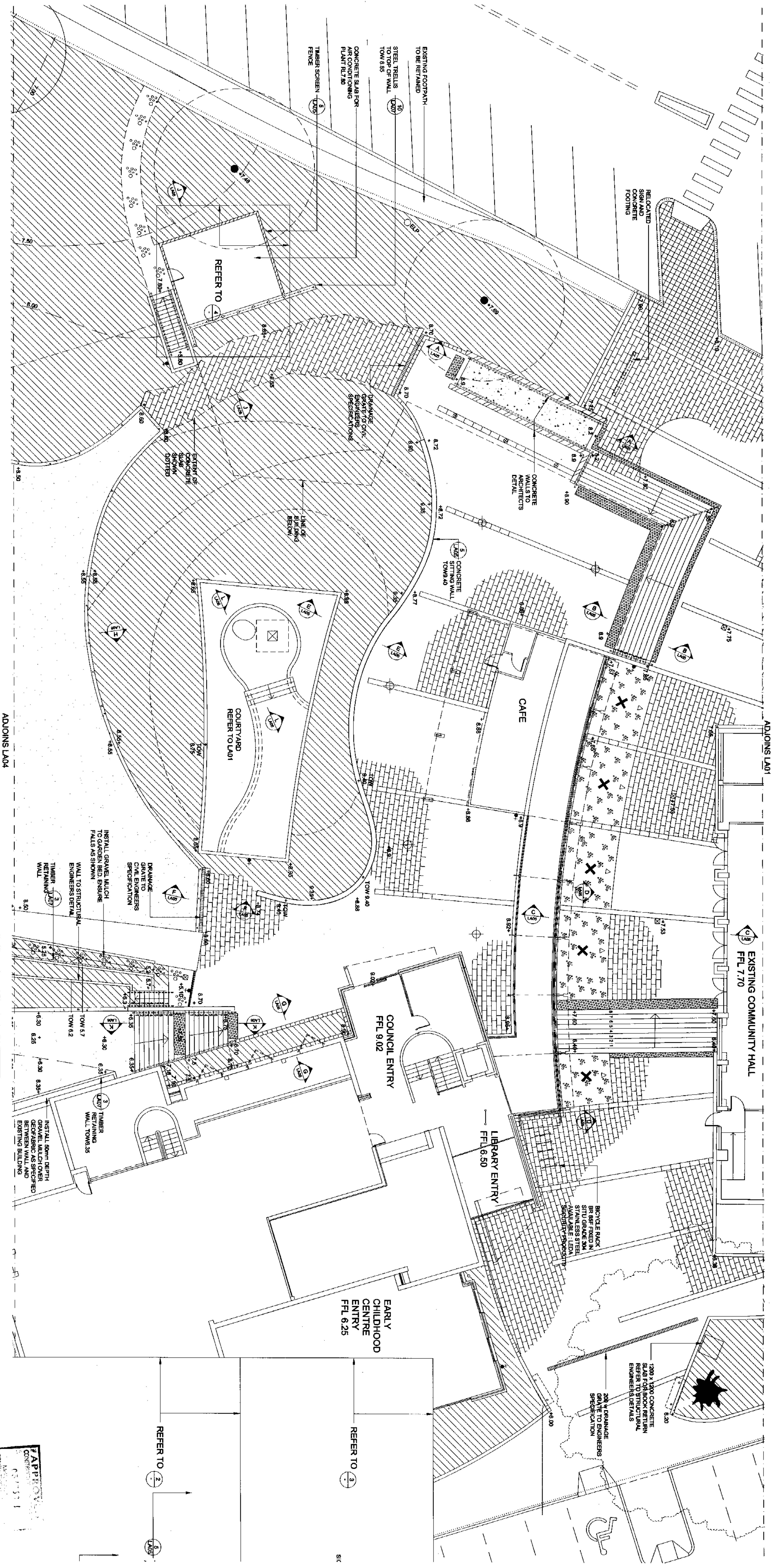
APPROVED
CONTRACT VALUE: \$3,733,341
DATE: 20/12/2024

taylor graham
LANDSCAPE ARCHITECTS
11/100 PARKVALE ROAD
PITWATER, 2013

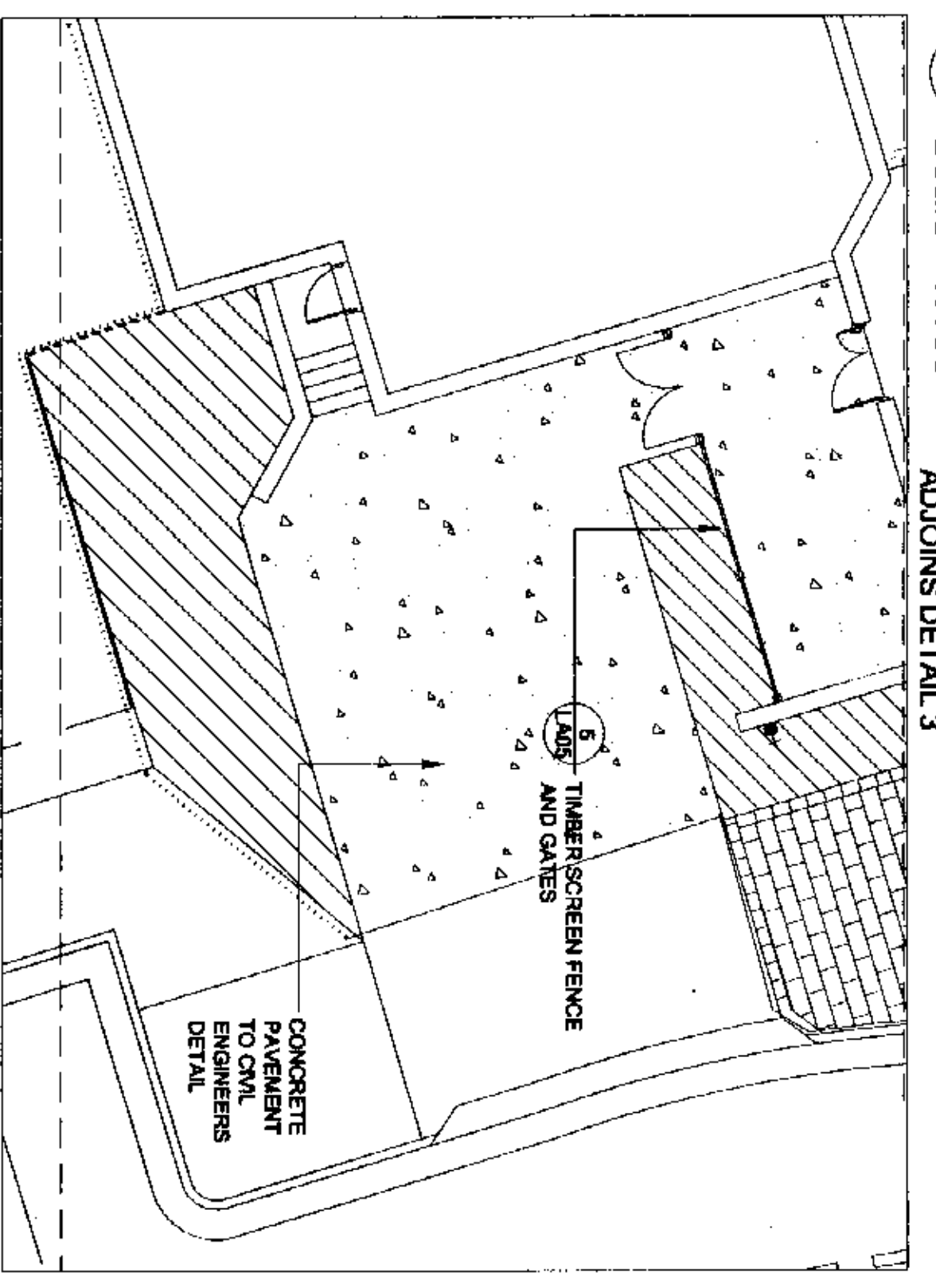
VILLAGE PARK MONA VALE
LANDSCAPE COURTYARD
AND COMMUNITY HALL
PITWATER COUNCIL

DATE: 20/12/2024
DRAWN BY: LA01 D
SCALE: 1:100

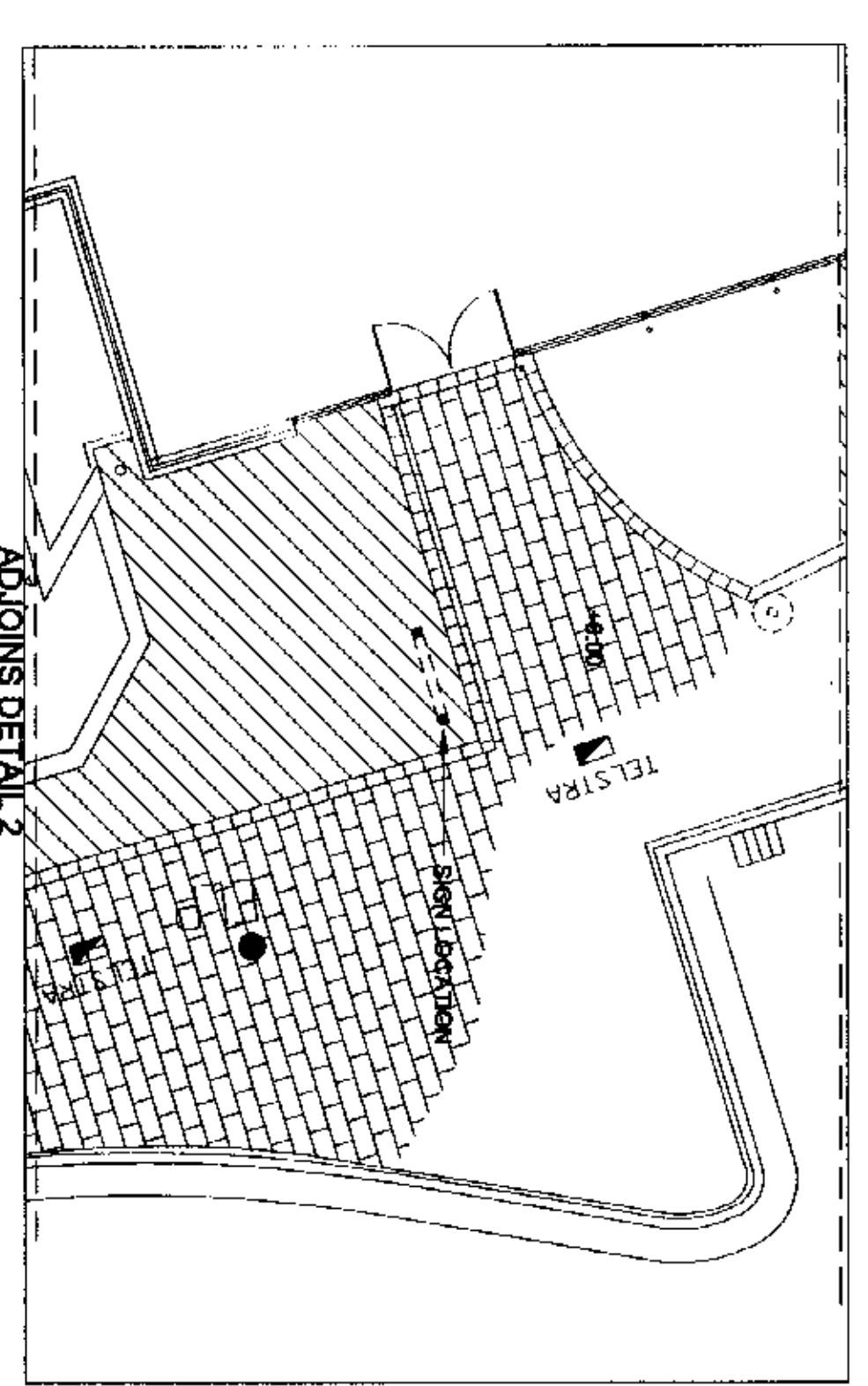
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1 LIBRARY PODIUM LAYOUT PLAN
Scale 1:100

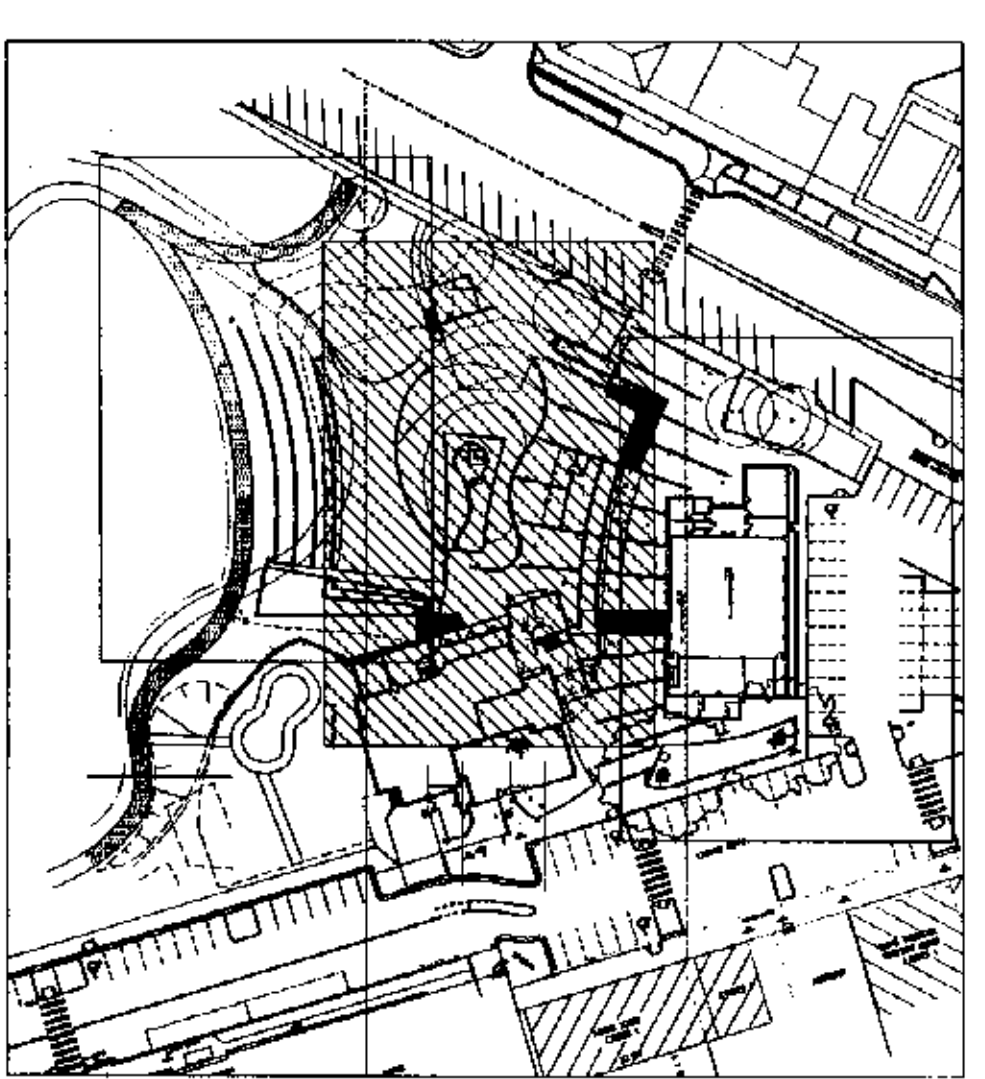
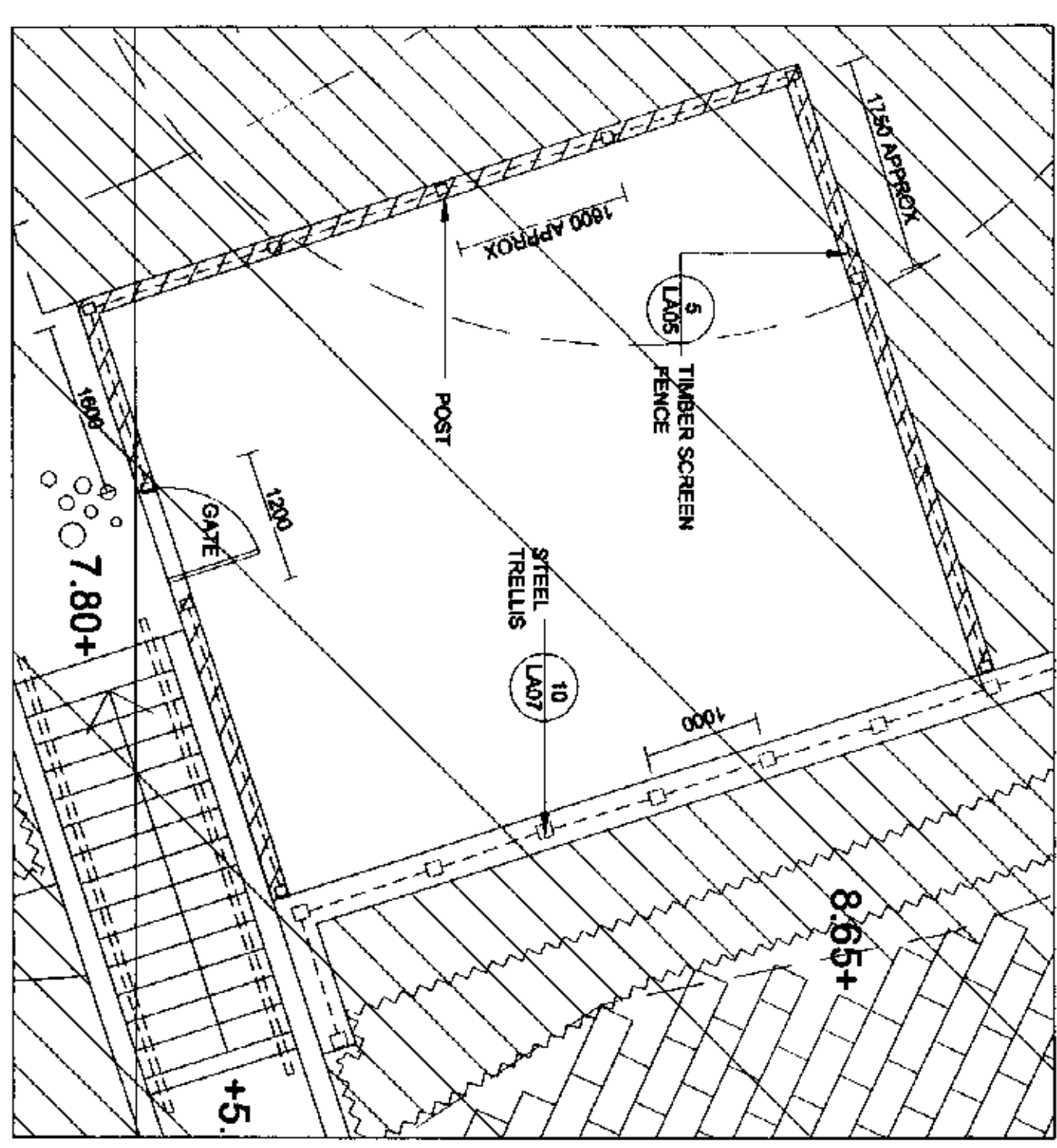


2 CARPARK LAYOUT PLAN
Scale 1:100



3 CHILDCARE ENTRY LAYOUT PLAN
Scale 1:100

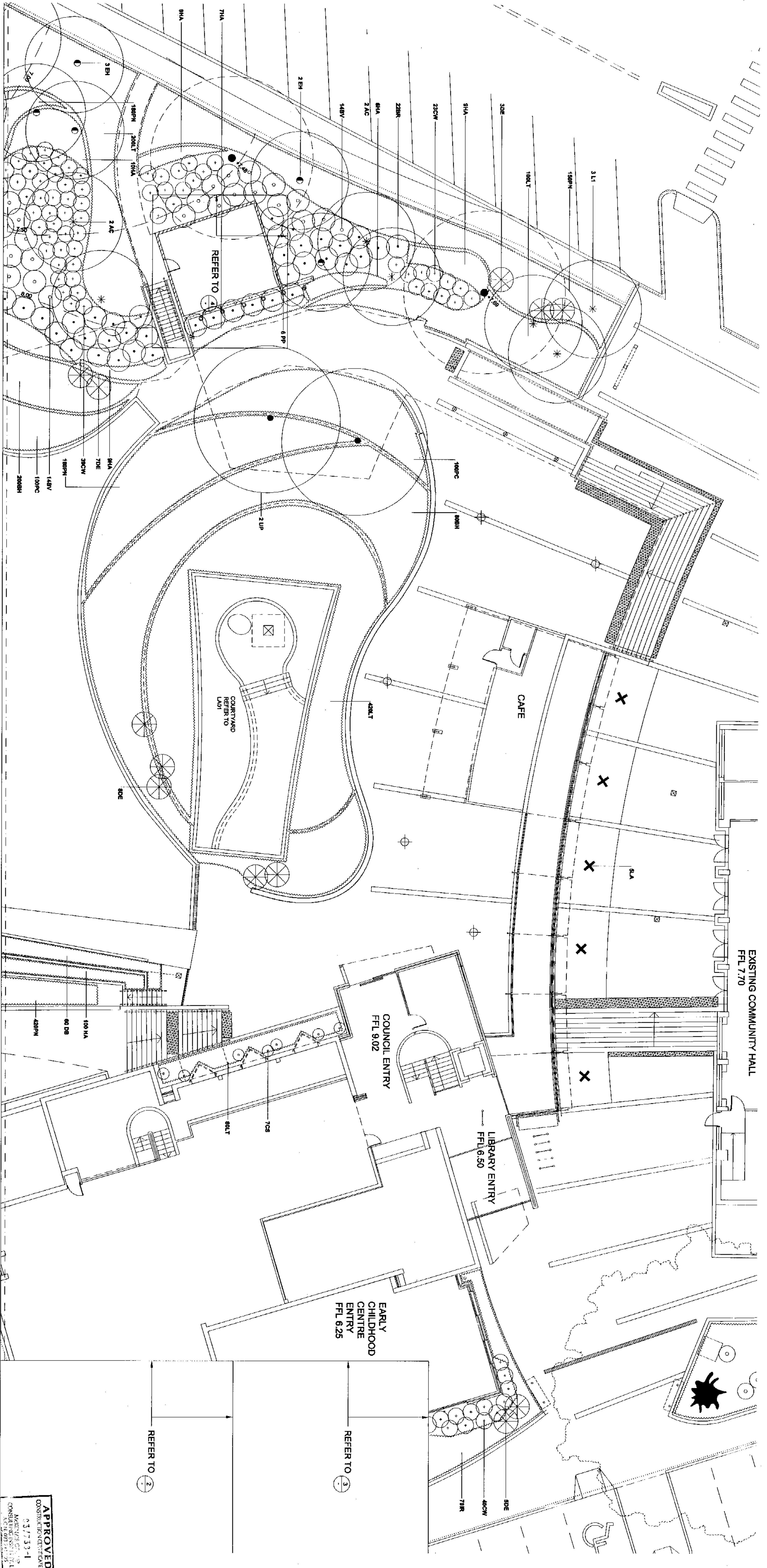
4 AIR CONDITIONING PLAN
Scale 1:50



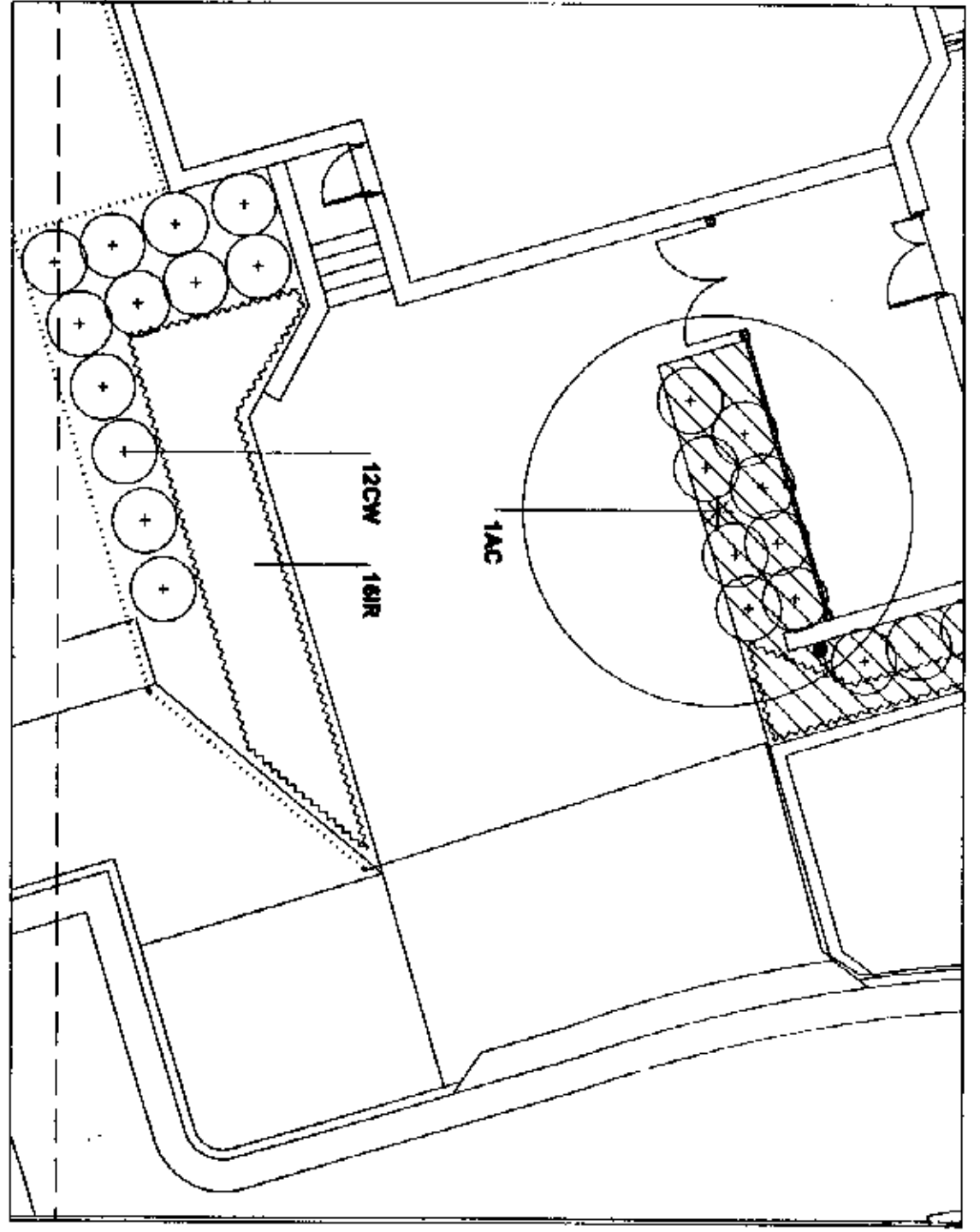
taylor glimmer
ARCHITECTS
1177 TOWN ROAD, WARRAH, VIC 3208
TEL: 03 9499 9999
WWW.TAYLORGLIMMER.COM.AU

VILLAGE PARK MONA VALE
DRAWING NO. VILLAGE PARK MONA VALE LIBRARY PODIUM LAYOUT PLAN
DATE: 28 NOV 2023
PROJECT: VILLAGE PARK MONA VALE LIBRARY PODIUM LAYOUT PLAN
DRAWING NO. VILLAGE PARK MONA VALE LIBRARY PODIUM LAYOUT PLAN
DATE: 28 NOV 2023
PROJECT: VILLAGE PARK MONA VALE LIBRARY PODIUM LAYOUT PLAN

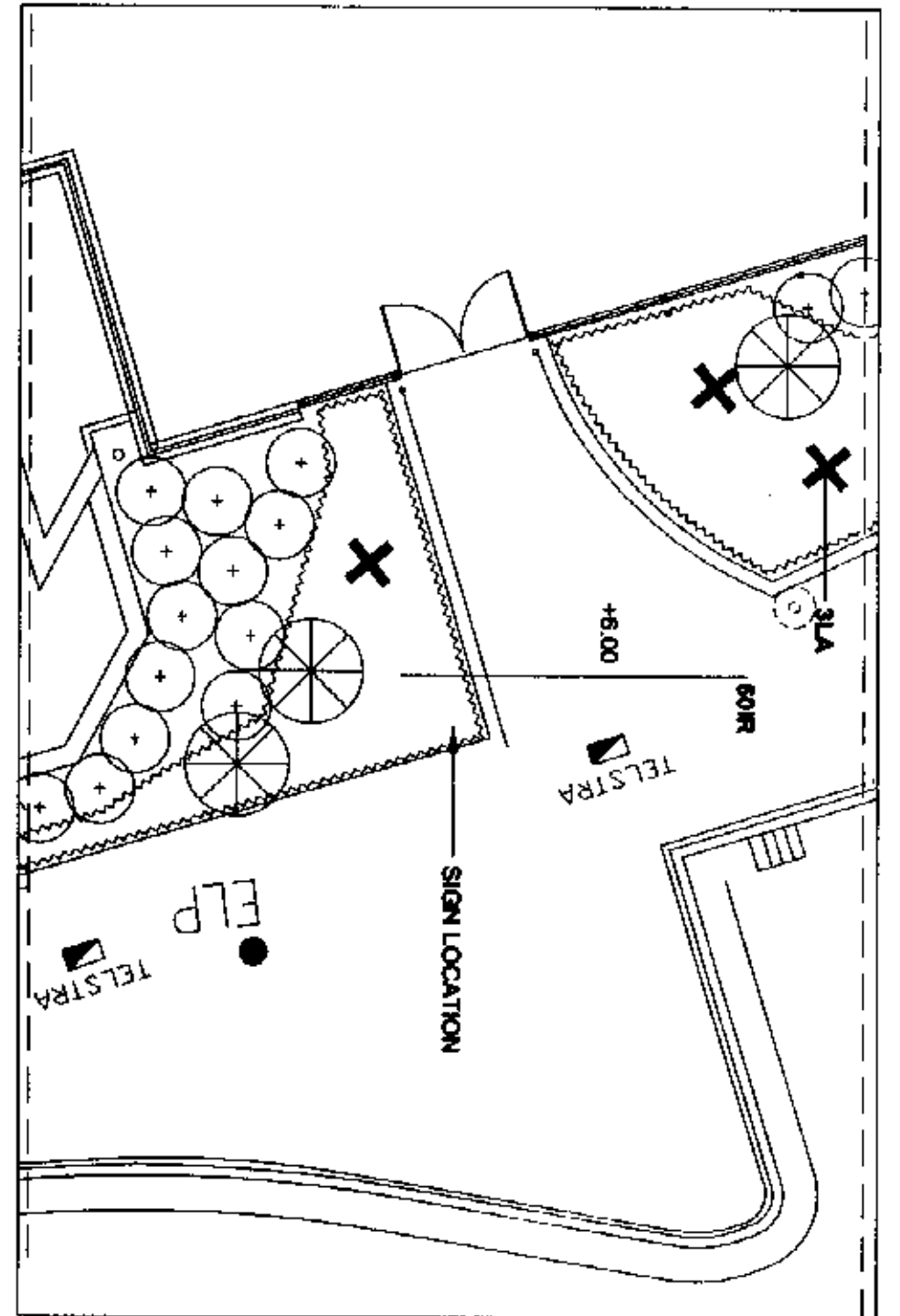
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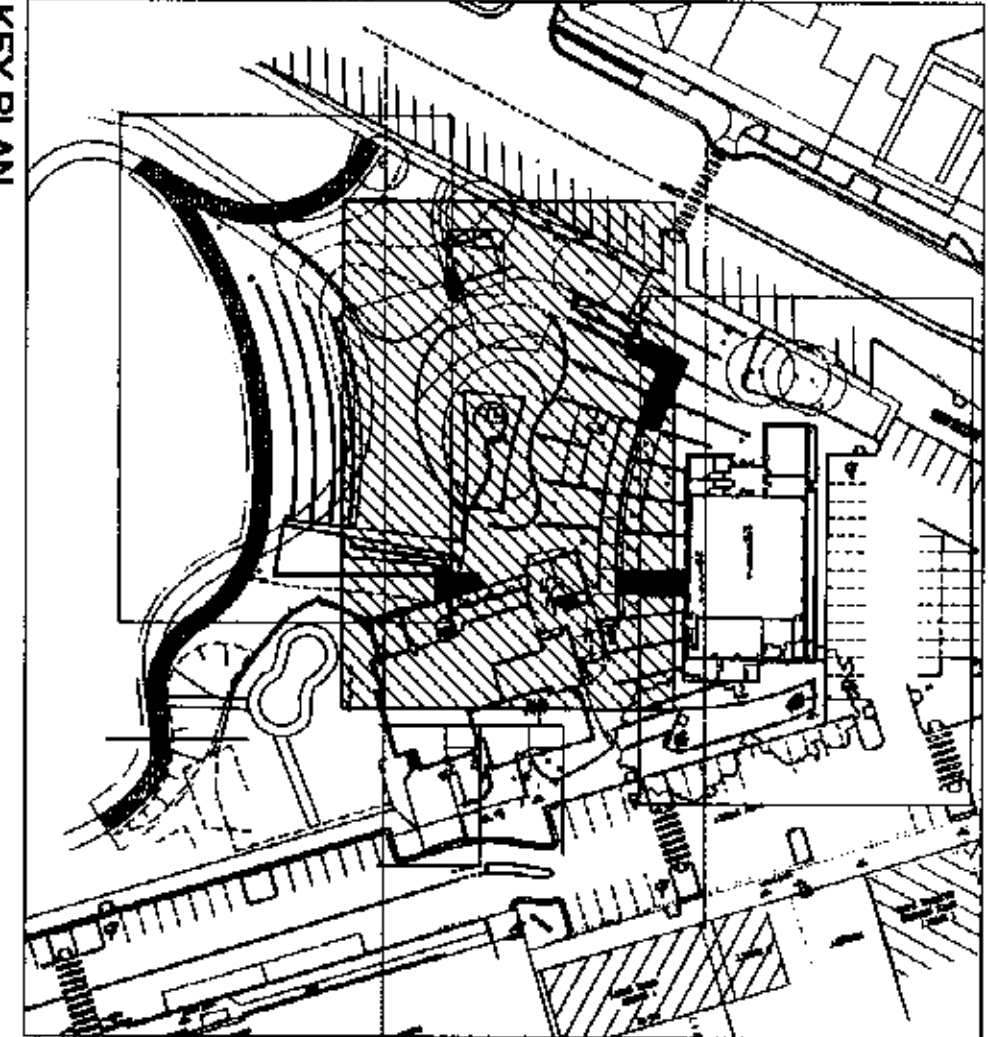
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2 CARPARK PLANTING PLAN
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3 CHILDCARE ENTRY PLANTING PLAN
Scale 1:100



KEY PLAN

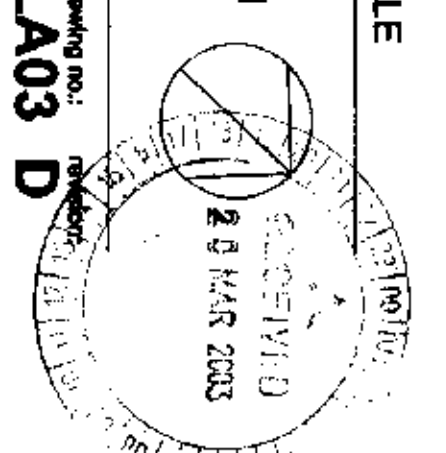
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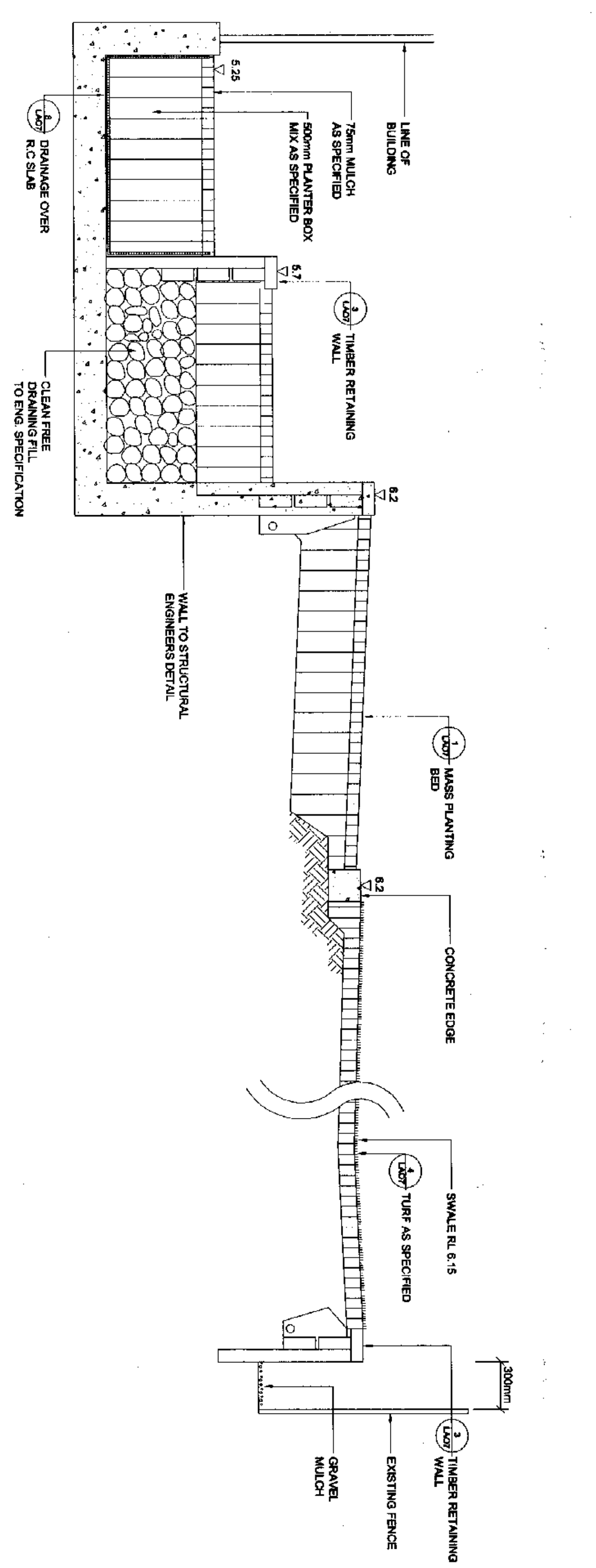
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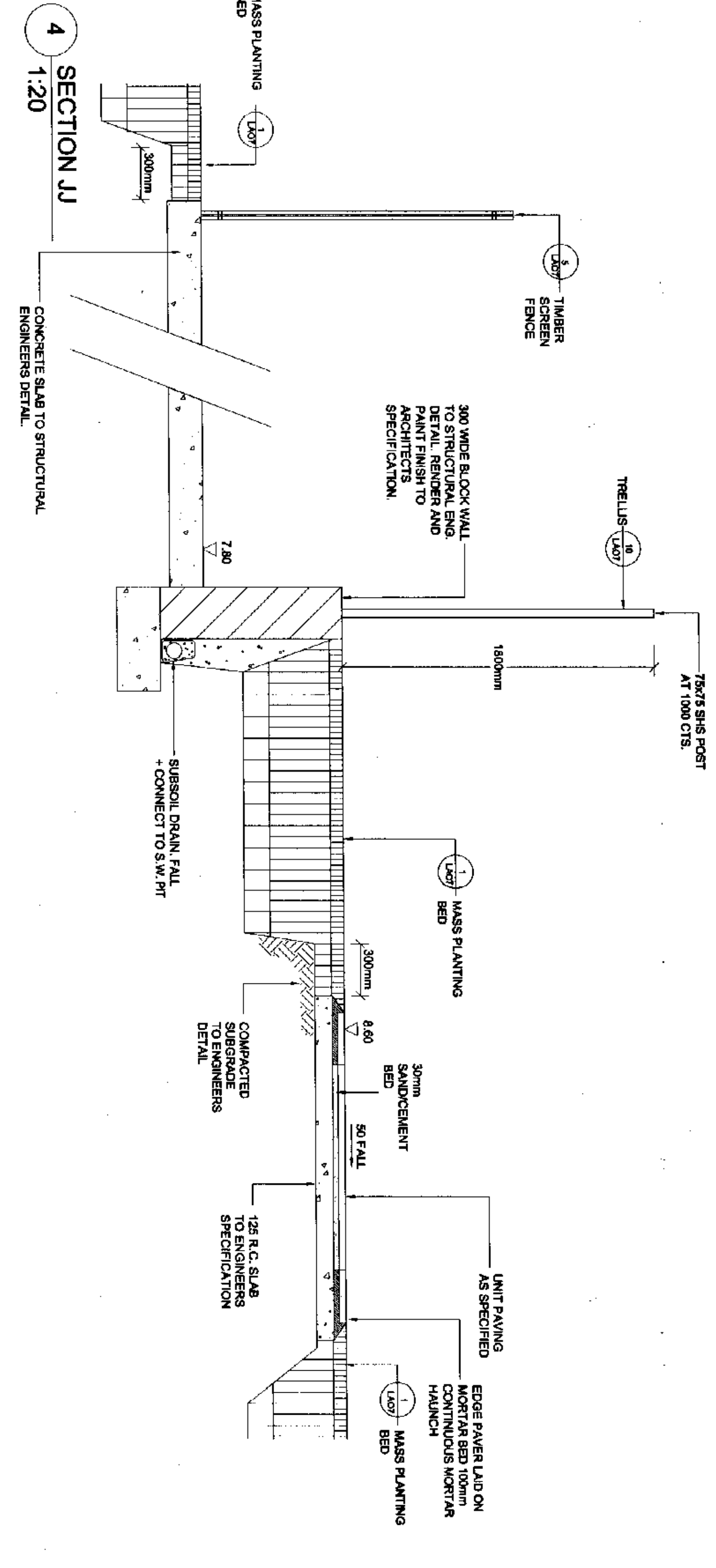
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DATE: 08/12/2023
DRAWN BY: J. DODD
CHECKED BY: J. DODD
SCALE: AS SHOWN

LANDSCAPE: LIBRARY
PODIUM PLANTING PLAN
CLIENT: PITTWATER COUNCIL
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DATE: 08/12/2023
DRAWN BY: J. DODD
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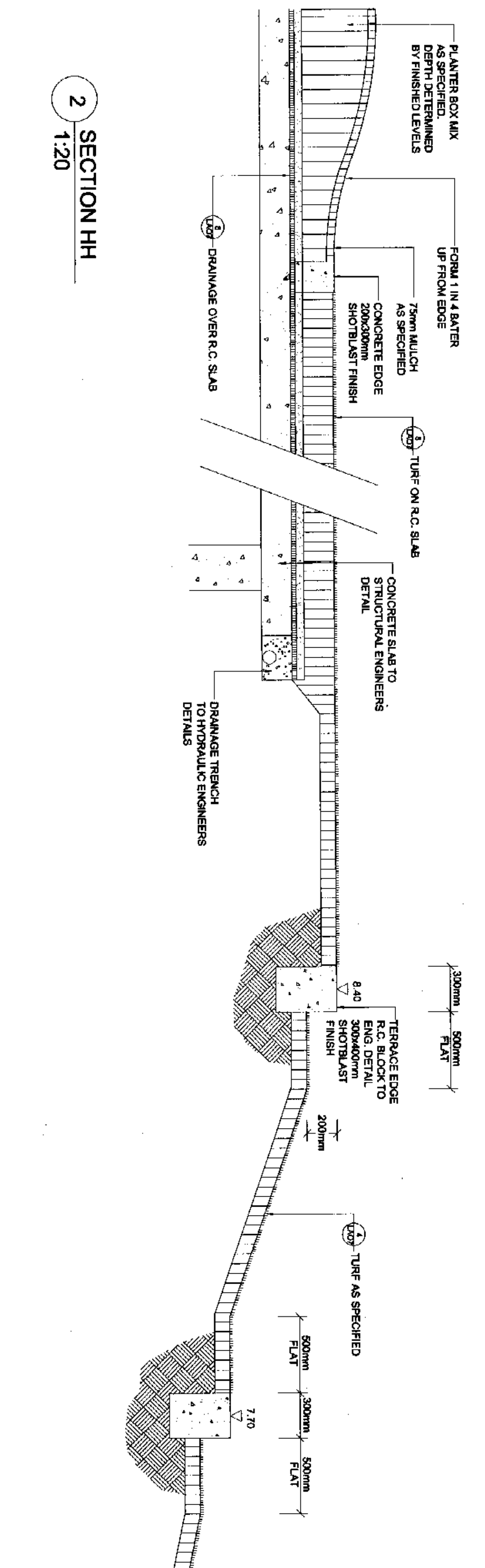




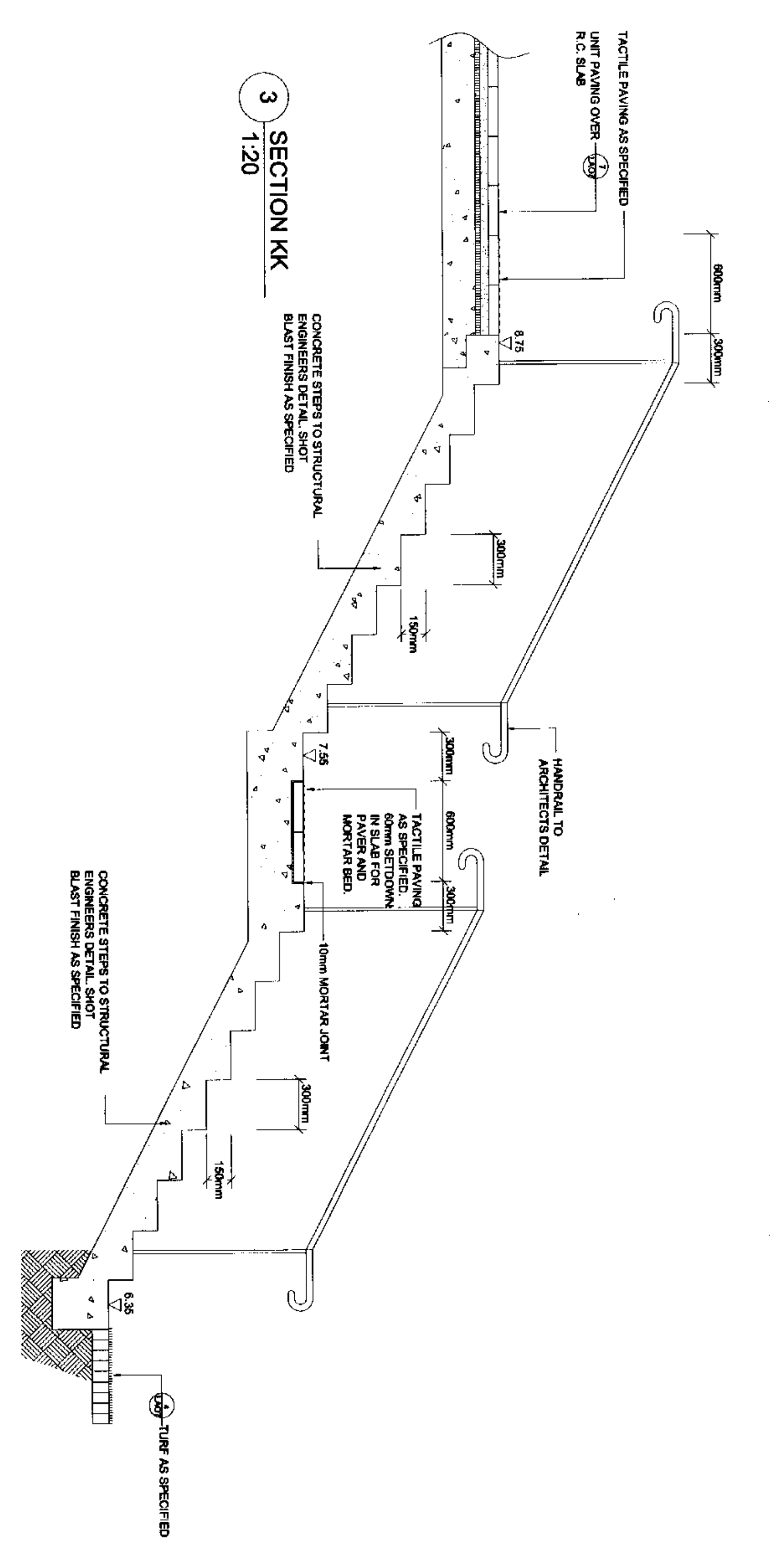
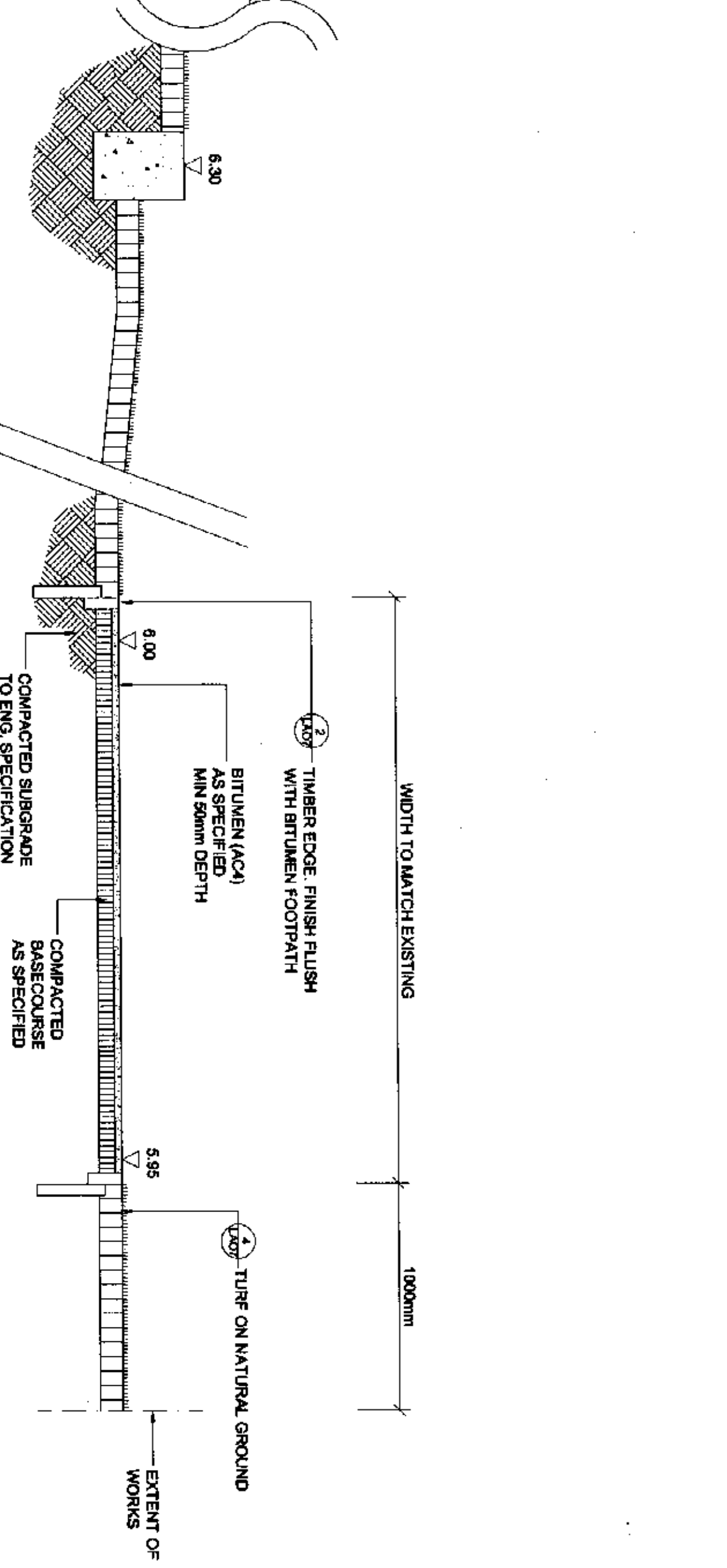
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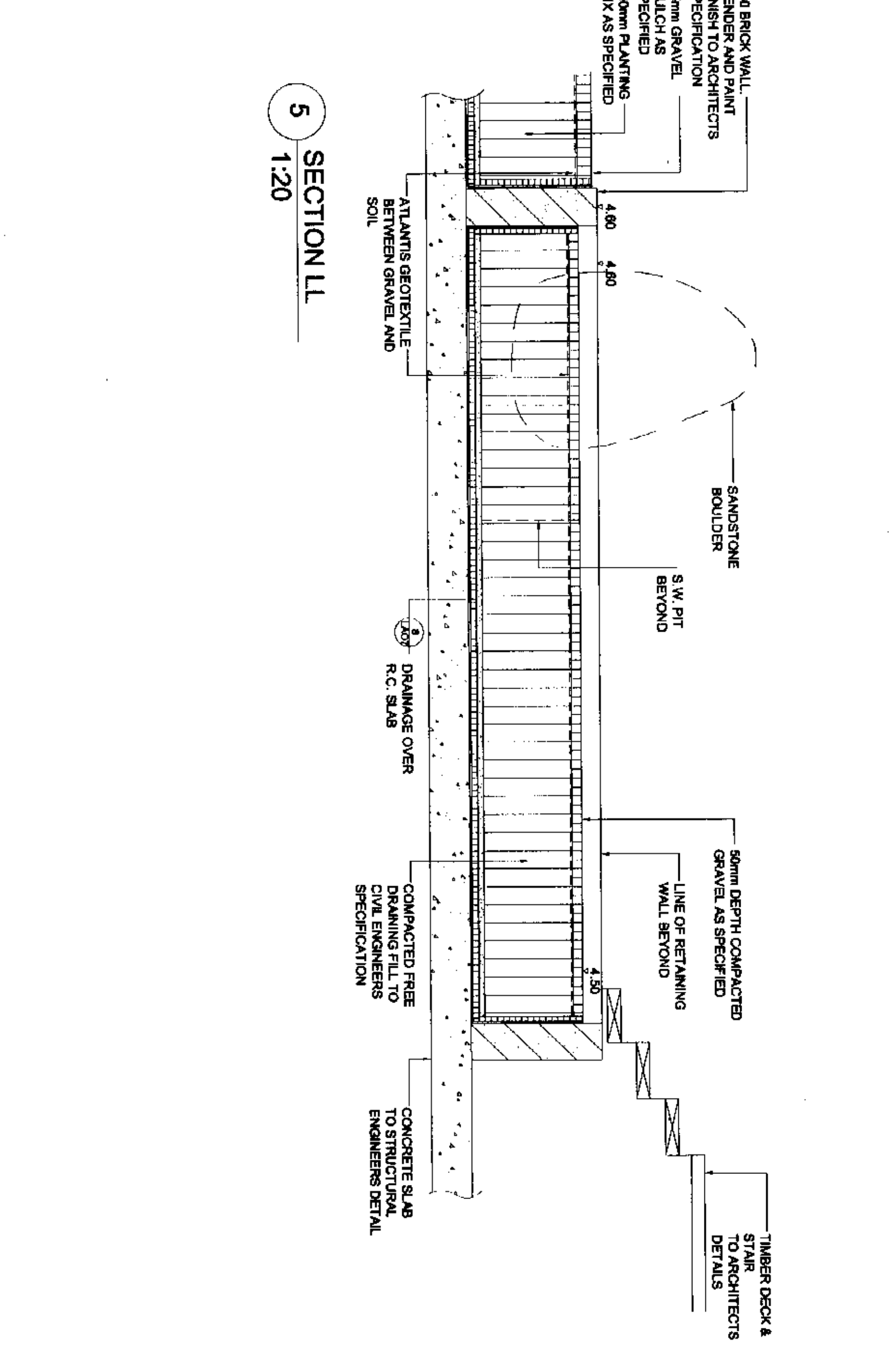
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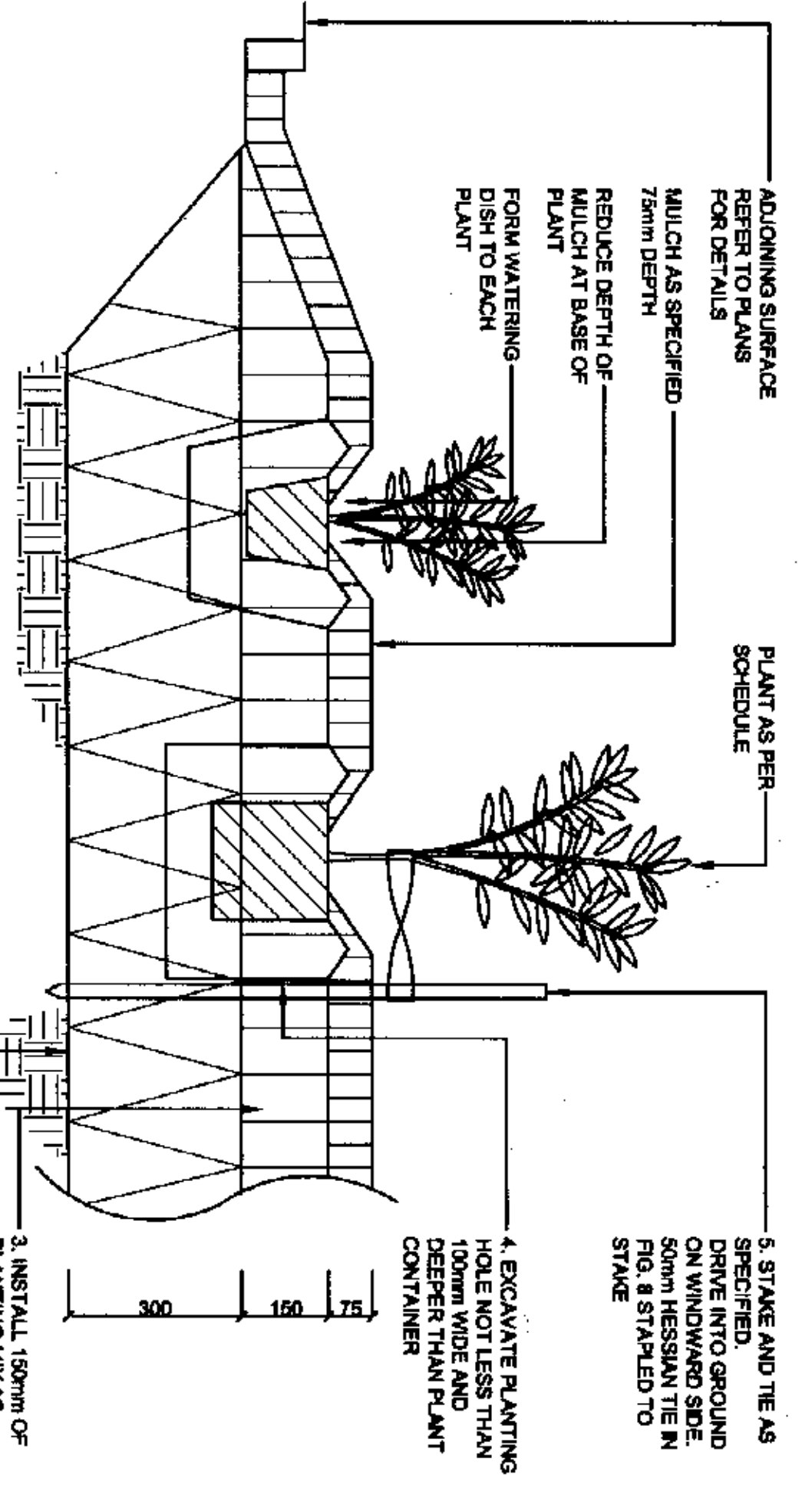


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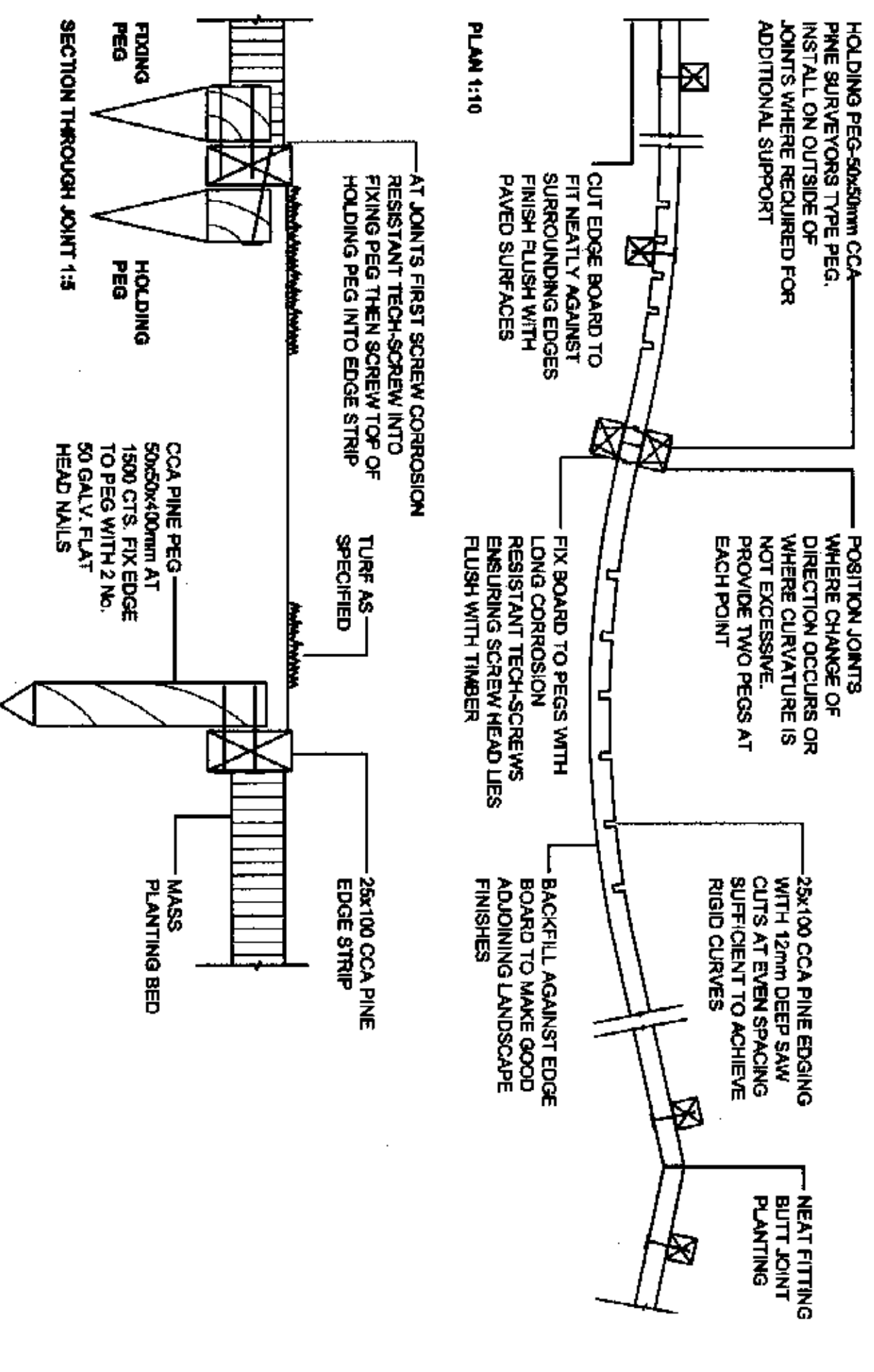
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Project:
Village Park Monna Vale
Drawing No: LA08 C
Client:
Pittwater Council

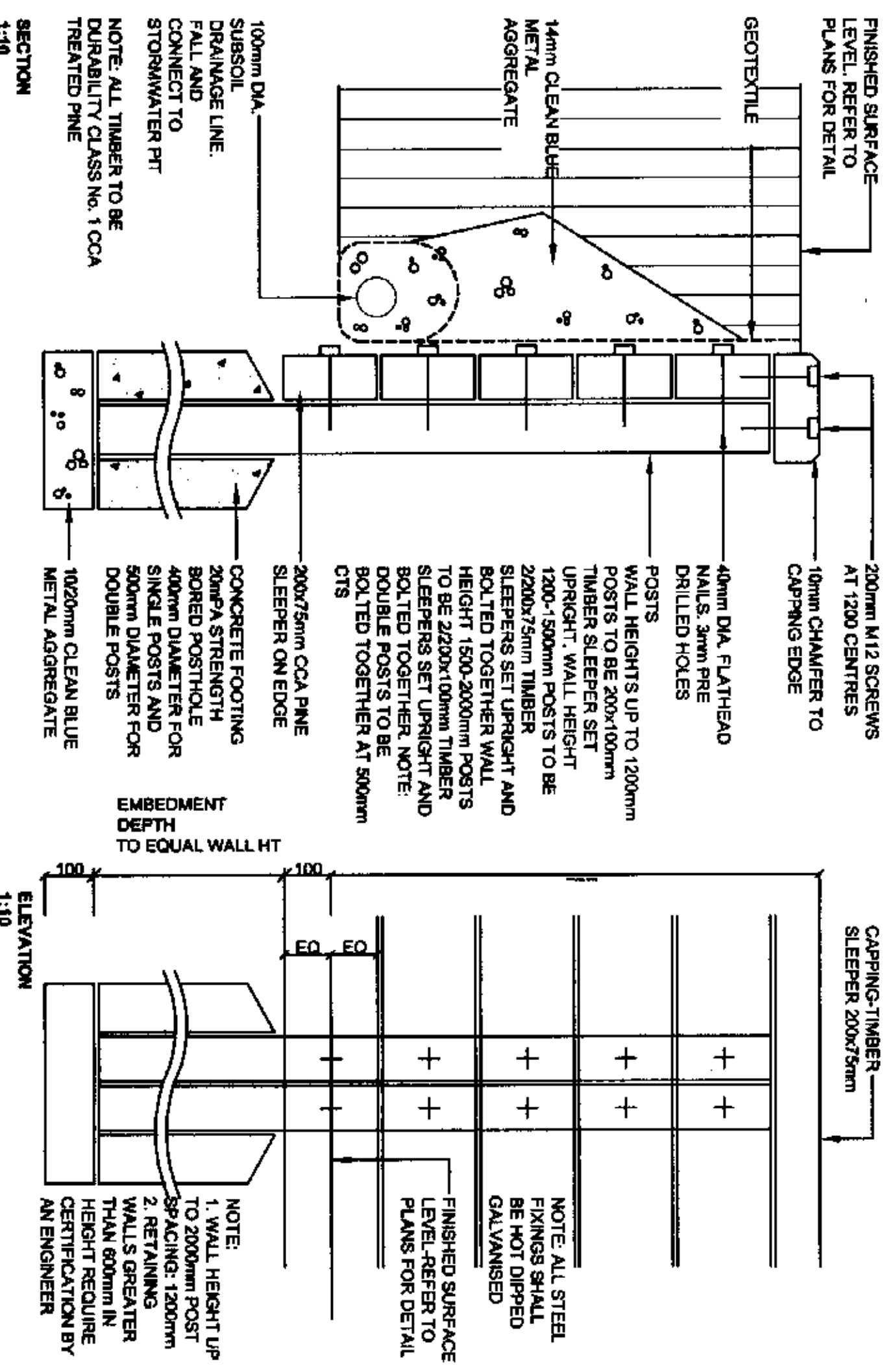
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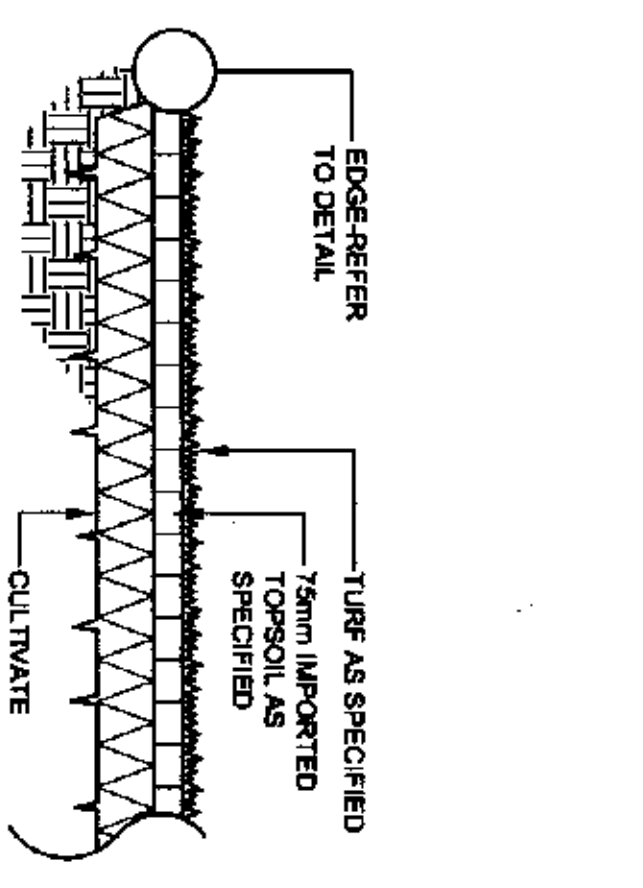
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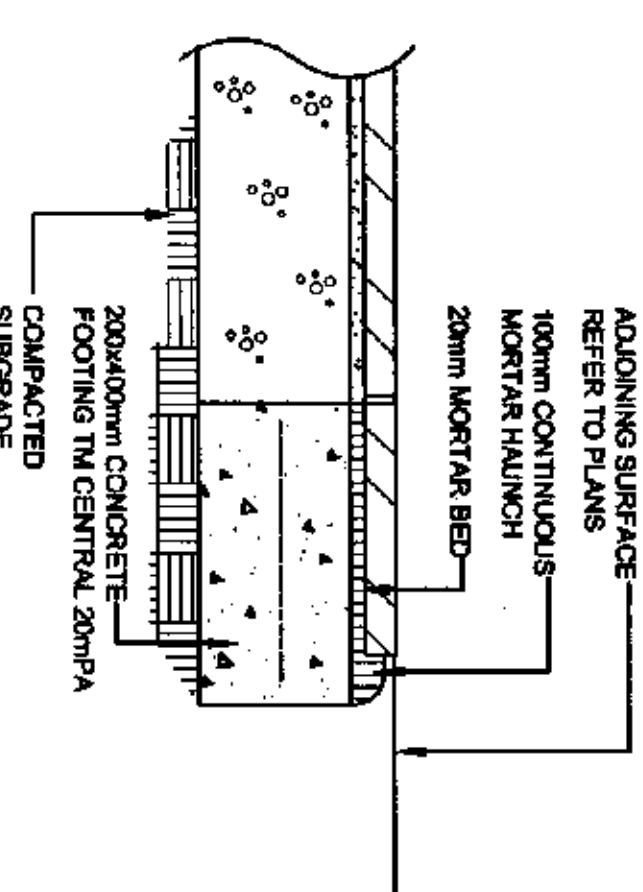
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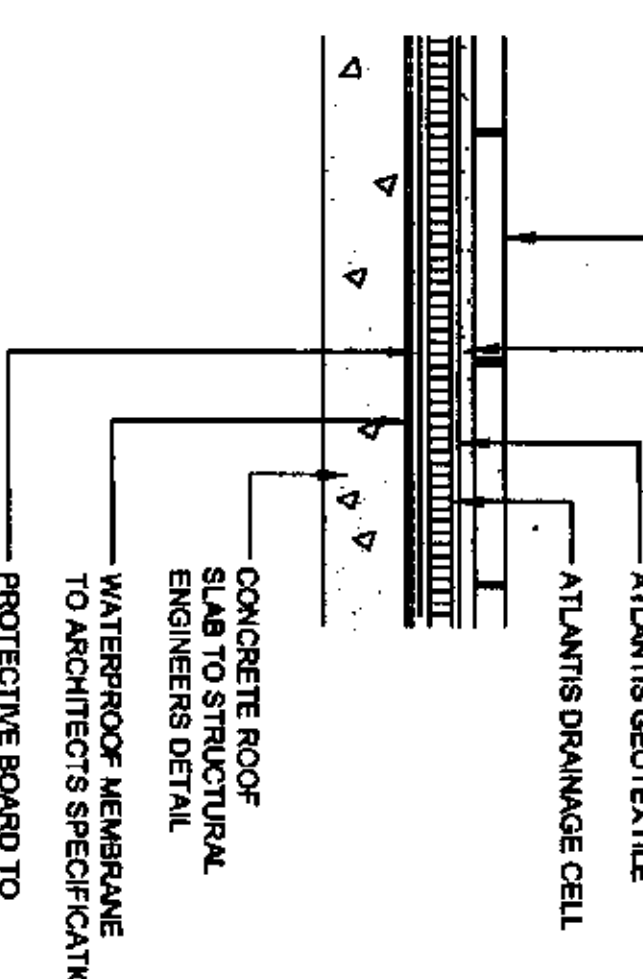
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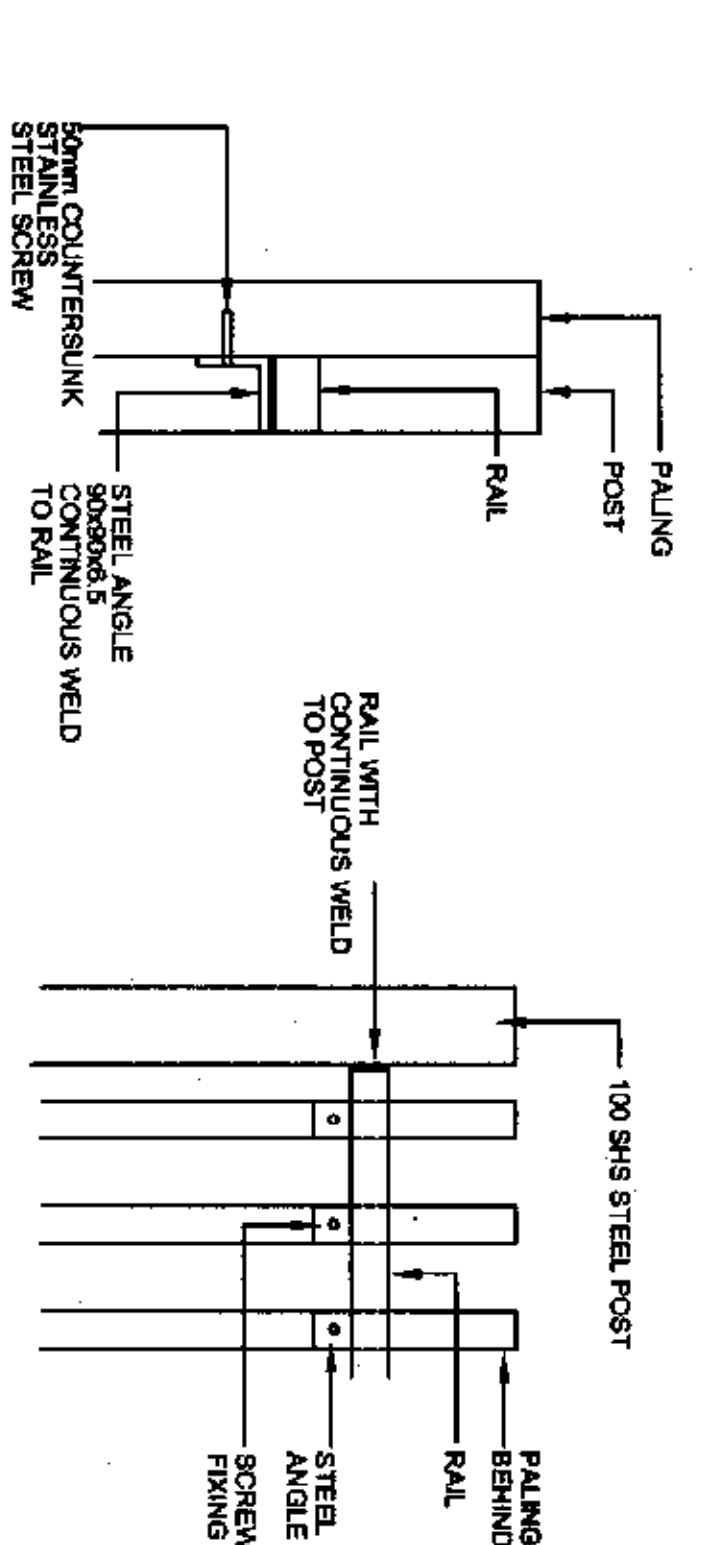
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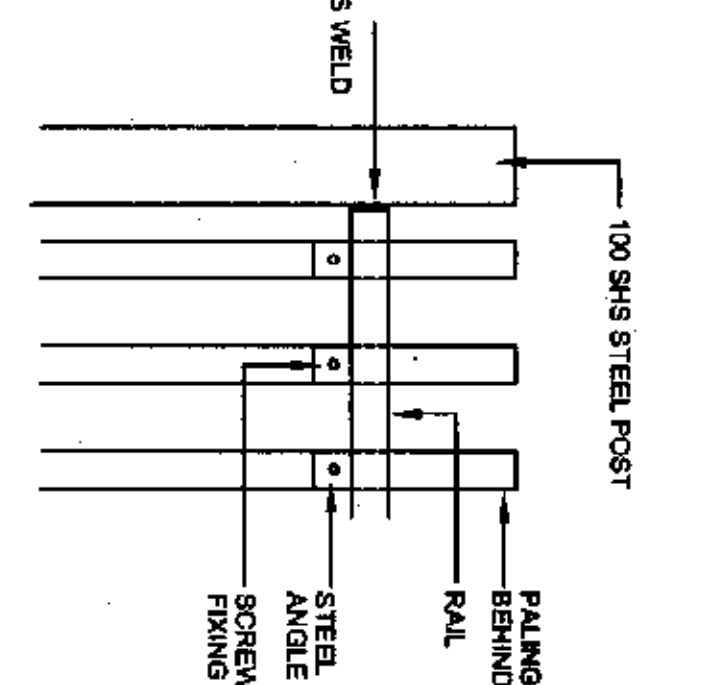
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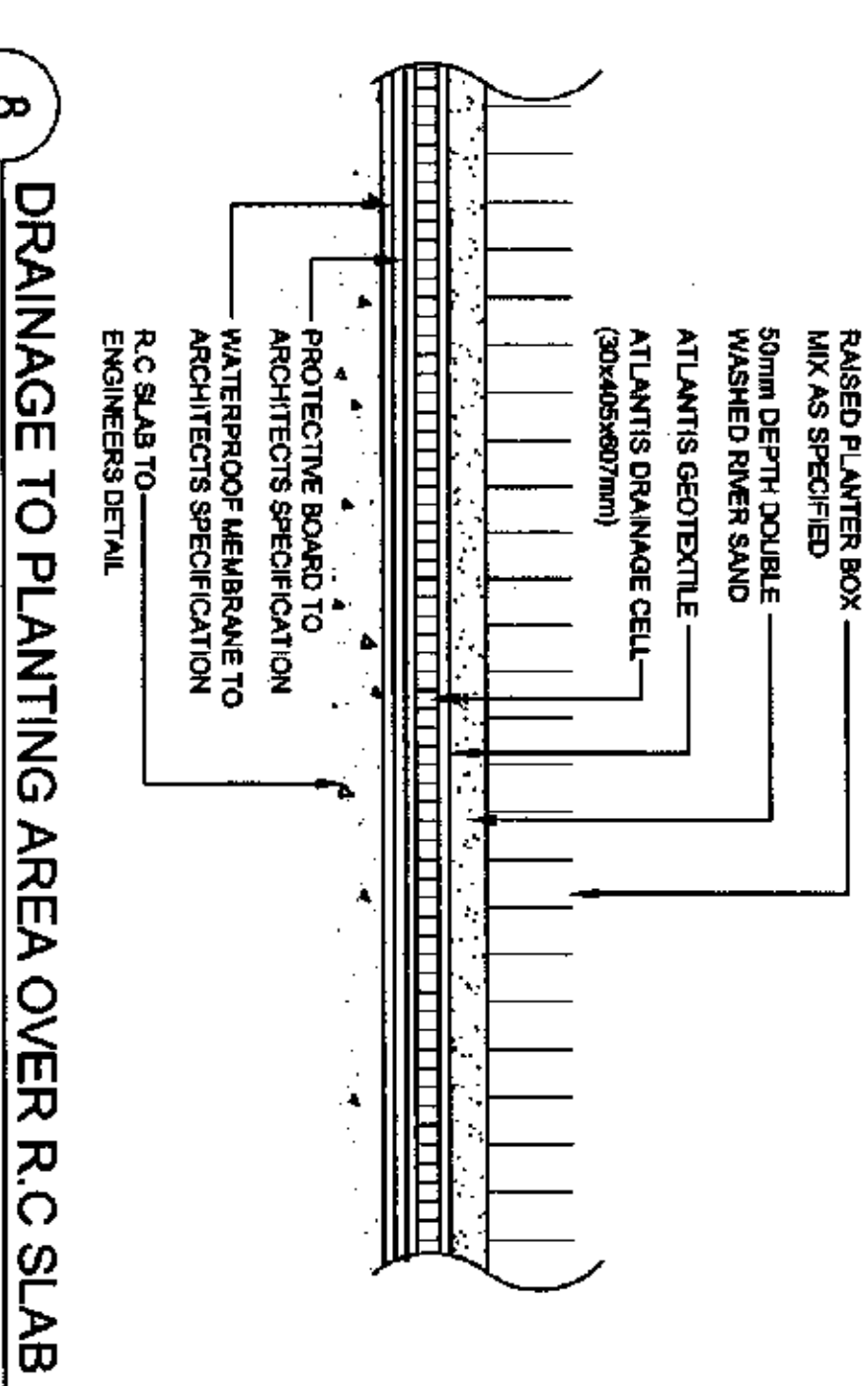
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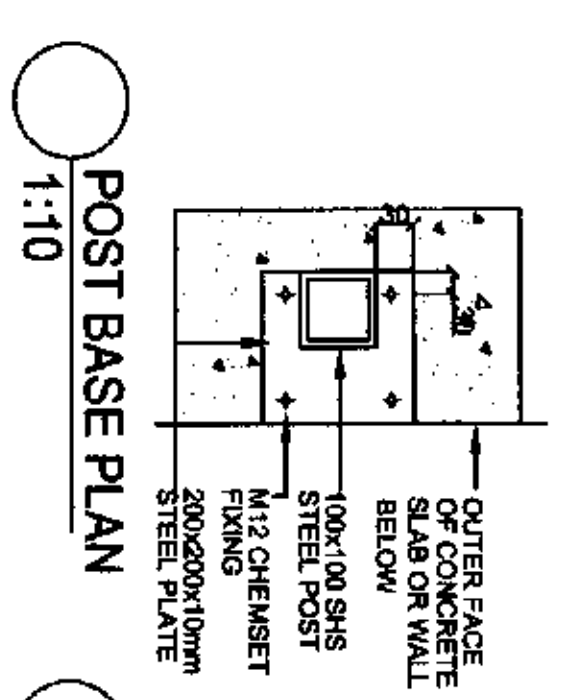
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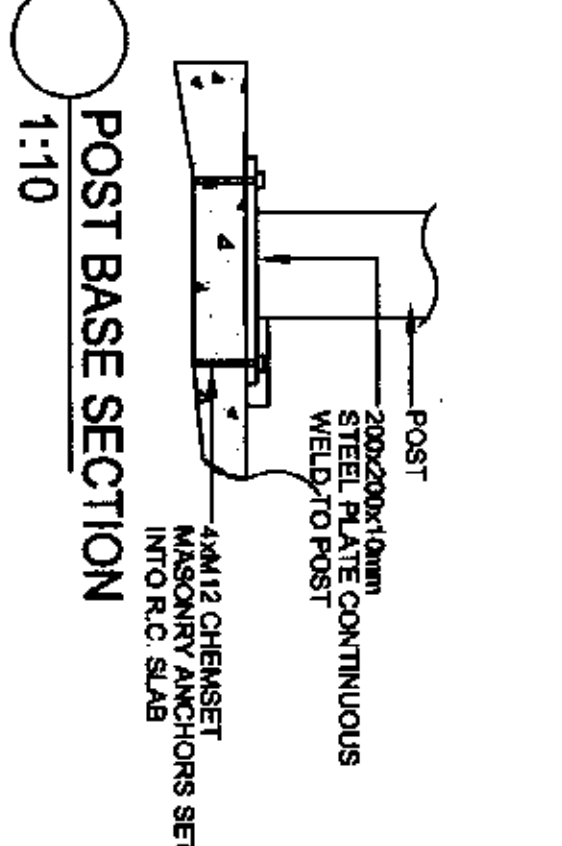
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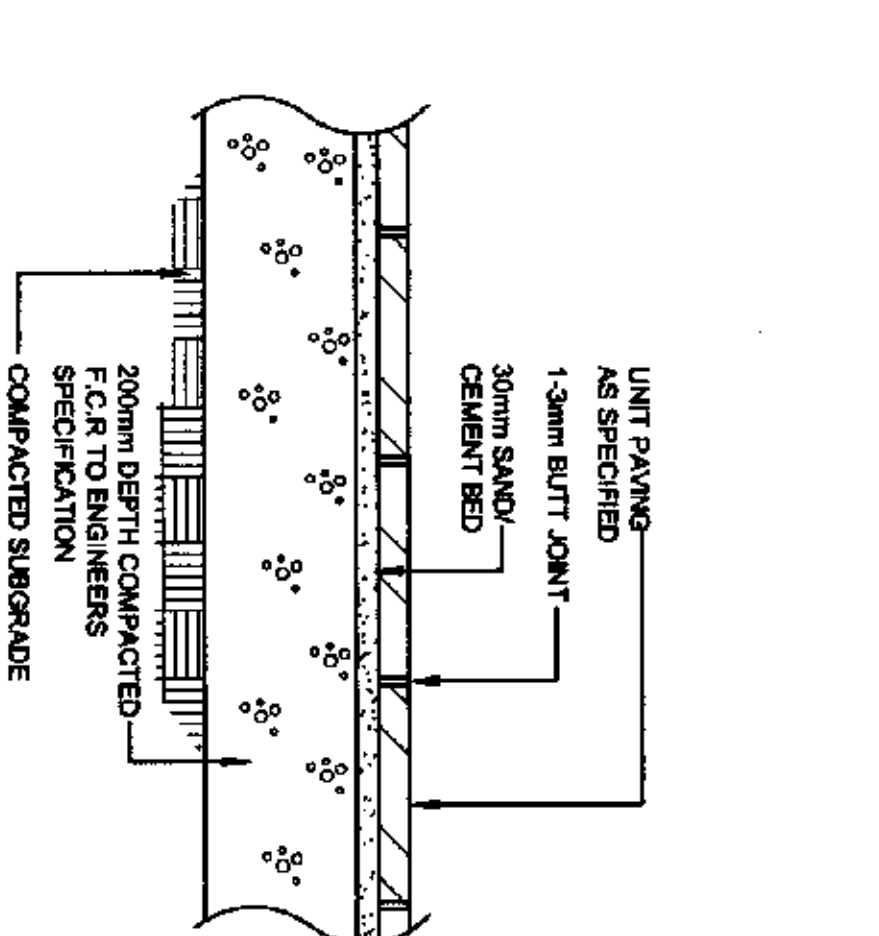
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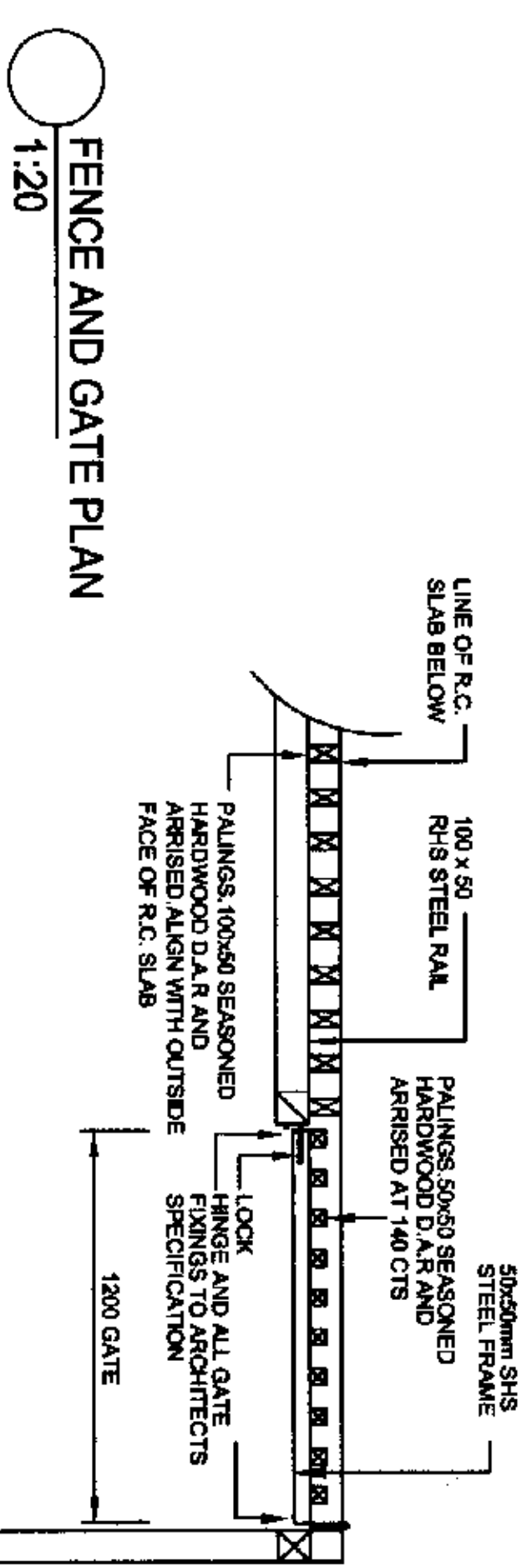
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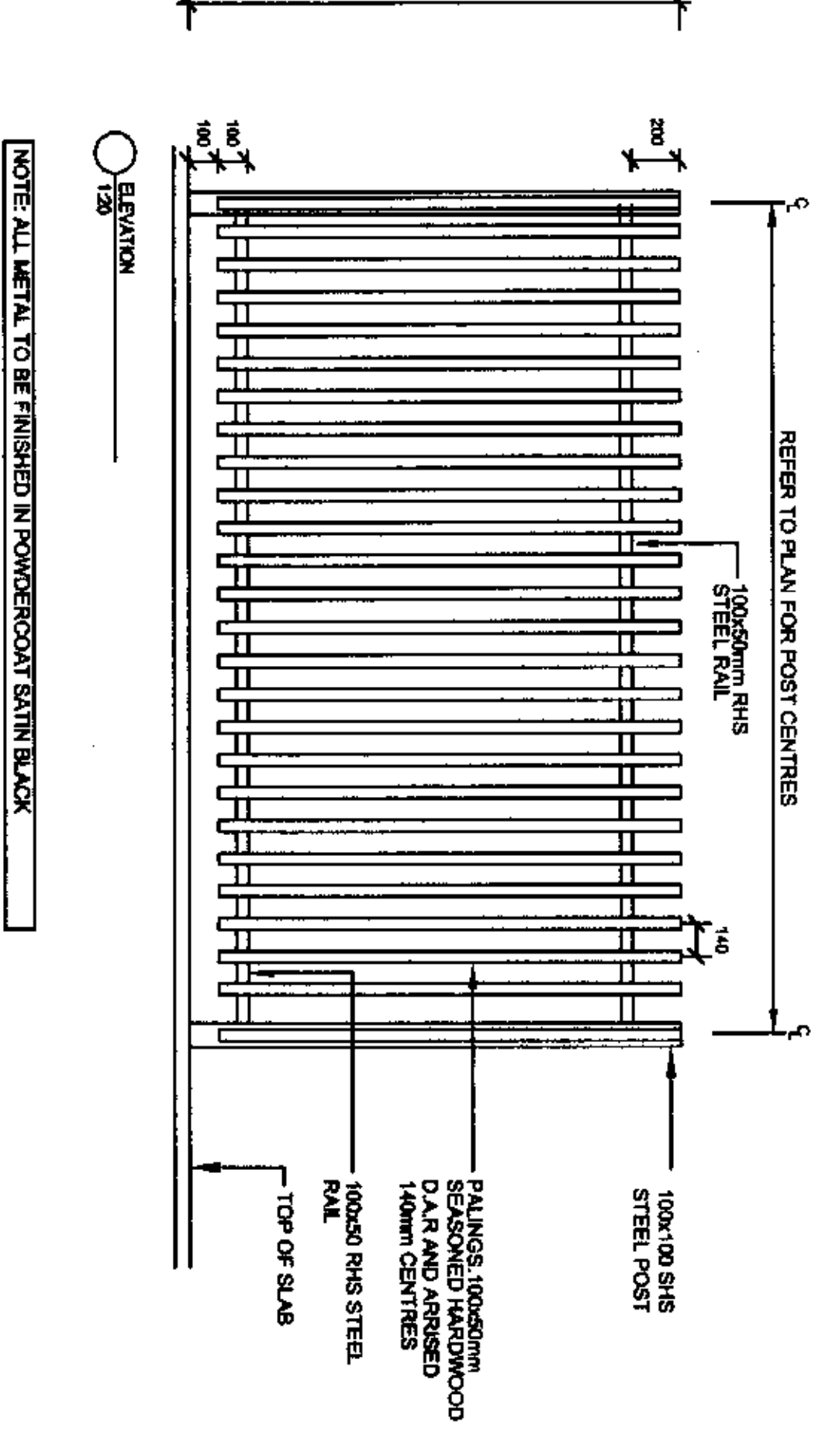
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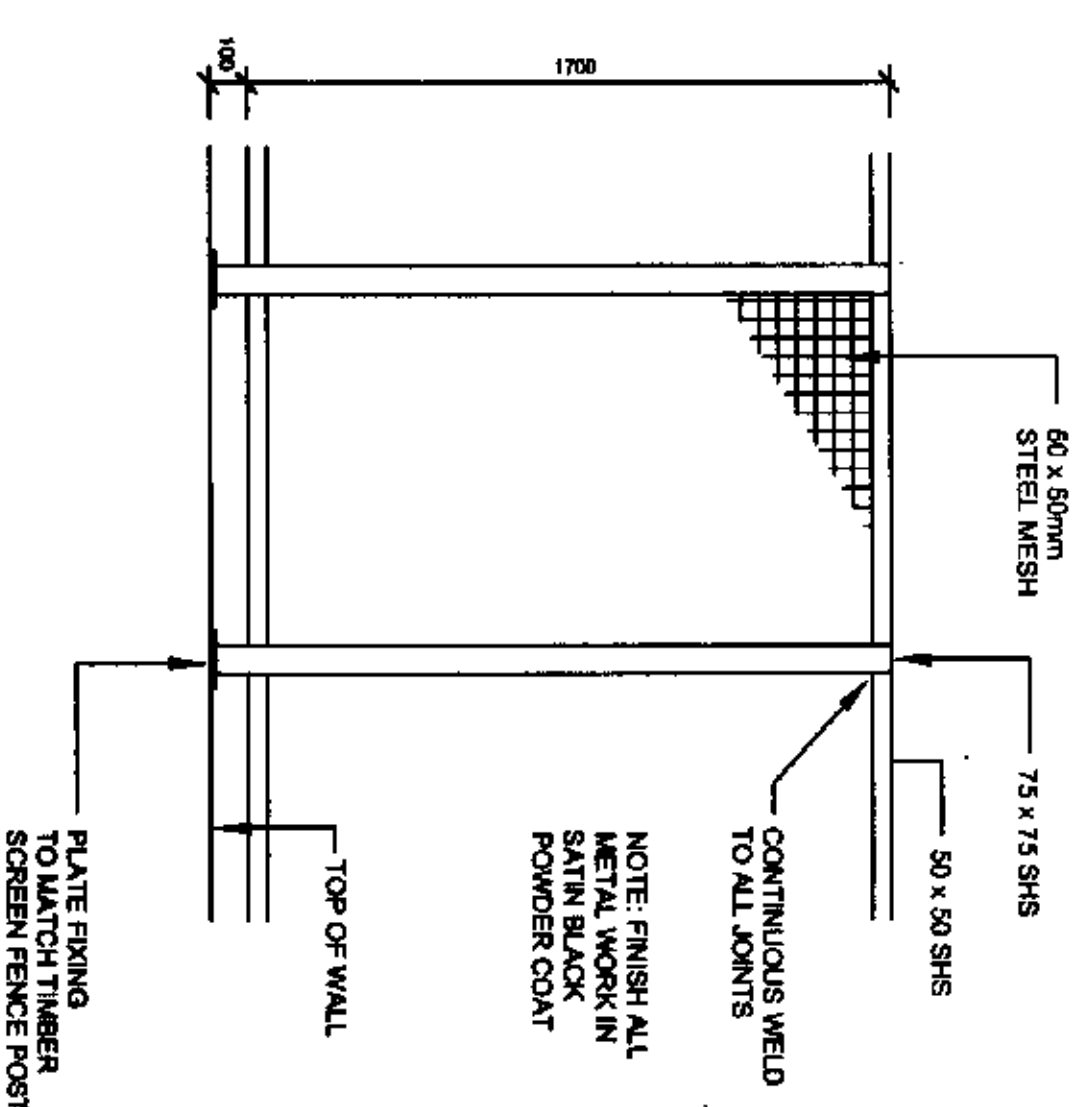
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5 TIMBER SCREEN DETAIL
SECTION 1:10



10 STEEL TRELLIS
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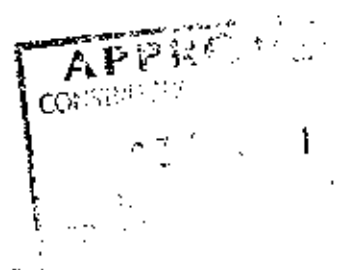
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PROJECT:
VILLAGE PARK MONA VALE
 LANDSCAPE CONSTRUCTION
 DETAILS

CLIENT:
PITWATER COUNCIL

DATE: 08/12/16
 DRAWING NO: LA07 B

DRAWN BY: [Signature]
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 APPROVED BY: [Signature]



**MONA VALE
VILLAGE PARK LIBRARY
HYDRAULIC SERVICES SPECIFICATION**

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BA	RRG		RRG	28.02.03

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A		Issued for review	20.02.03
B		Issued for tender review	28.02.03

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SECTION-2 SANITARYWARE

SECTION-3 FRESH WATER

SECTION-4 FIRE PROTECTION

SECTION-1 WASTEWATER

1 GENERAL

1.1 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections

- *Service Trenching*
- *Stormwater / Civil works*

1.2 STANDARD

Sanitary plumbing and sanitary drainage

General:

- To AS/NZS 3500.2.2.
- To Sydney Water requirements.

2 QUALITY

2.1 INSPECTION

Witness points

Give sufficient notice so that inspection may be made at the following stages:

- Excavated surfaces.
- Concealed or underground services.

Hold points

- Hydrostatic testing of sanitary drainage.
- Inspection required by Sydney Water inspector

2.2 SUBMISSIONS

Shop drawings and work as executed

Submit design drawings prior to construction for approval by superintendent in Autocad format (or equal translatable format) and schedules showing the layout and details of the system, with schedules showing the layout and details of the system, including

- location, type, grade and finish of piping, fittings, access points and pipe supports; and
- location, type and other relevant details of sanitary ware

Submit work as executed drawings prior to practical completion for approval by superintendent in Autocad format (or equal translatable format) and schedules showing the layout and details of the system, with schedules showing the layout and details of the system, including

- location, type, grade and finish of piping, fittings and pipe supports;;
- details of control panels including control and power diagrams;
- insulation of piping, fittings and tanks; and
- inspection openings, cover plates, valve boxes and access pits.

3 MATERIALS AND COMPONENTS

3.1 AUTHORISED PRODUCTS

Standard

To SAA MP52, unless otherwise required by the statutory authority.

3.2 SANITARY FIXTURES

General

Provide the accessories necessary for correct installation and perfect operation of the system.

4 EXECUTION

4.1 SANITARY PLUMBING

Scope Of Work

Plumbing works above ground shall include all those works generally considered by authorities and trade practice to be soil, waste, vent above ground as distinct from drainer's work.

Plumbing as defined in this Section shall comprise the following:-

Plumbing waste, condensate and vent pipes above ground.

Description Of Work

Plumbing shall be the connection of new sanitary fixtures and vents.

The contractor shall provide for protection of all fittings and pipework after installation and secure them against damage and shall be completely responsible for the replacement of any damaged or disfigured fitting, pipe or fixture at his own cost.

Material Schedule

<u>Description</u>	<u>Size</u>	<u>Material</u>
Sanitary systems	40 - 100	UPVC- DWV
Rising Mains	40 - 65	UPVC class 18 pressure pipe.
Roof vents	50 - 100	UPVC- DWV
External Vents	100	"Adda Flag Pole" Pty Ltd vent
Air Admittance vents	50	Studor mini vent

Supporting And Fixing Pipes

All pipes shall be adequately supported and securely fixed in accordance with the drawings and to the satisfaction of the Superintendent. Such supporting and fixing to be carried out without causing any distortion, damage or stress on the pipes or pipe joints. Pipes shall be supported at each collar and at spacing of no more than 900mm horizontally and no more than 1500mm vertically.

Fixture Traps

75mm water seal traps shall be provided for the following fixtures:

Sinks 50 mm two part universal pattern (NOTE: CP copper traps shall be used where exposed)

Basin 40 mm CP copper two part S or P-trap with 40 mm CP extension riser.

Vent pipes

Terminate all vents as required by the local authority or and as indicated on the drawings.

Supply and install "Adda flag poles Pty. Ltd" flag pole vents as indicated on drawings strictly to manufacturers instructions.

Supply and install "Studor" mini vents where nominated on drawings, all installation shall be strictly in accordance with manufacturer and Sydney Water requirements.

Flashing of vents which penetrate the roof shall be carried out within the hydraulics scope of works.

Flashing type: DEKTITE or equal

Staying to roof: If fixings for stays penetrate the roof covering, seal the penetrations and make watertight.

Terminations: Provide vent cowls of the same material as the vent pipe and paint all roof vents to architects specification.

4.2 SANITARY DRAINAGE

Scope Of Work

Drainage for the project shall include the following:-

Sanitary Drainage

Stormwater Drainage

The provision and construction of all manholes, inspection pits, sumps, pumps, gratings, covers etc.,

Description Of Drainage Systems

Drainage shall include the supply and installation of complete sanitary systems as shown on drawings connecting all fixtures and fittings as required.

<u>Material Schedule Description</u>	<u>Size</u>	<u>Material</u>
Sewer (General)	100	UPVC-DWV
Sewer (Cast in slab)	50-100	HDPE with compressible external lagging
Sewer rising main	40-65	UPVC-class 1B
Stormwater	100-150	UPVC DWV
Subsoil water	100	HDPE draincoil with filter sock

Pipelaying Generally

Drainage pipes shall be laid, lined and boned in to an even grade to levels shown on the Drawings or supplied by the Superintendent.

Pipes shall be laid in such a manner that their barrels bear firmly and evenly on the bedding material, the sockets being entirely free from bearing. The spigots shall be pushed home in the sockets so that an even line will occur at the invert, any lip due to eccentricity being at the soffit.

Minimum Drainage Gradients

The minimum recommended drainage gradients are:-

Sewer	1.25% Grade
Stormwater	0.5% Grade
Subsoil	0.5%

Any drainage laid at less than the recommended minimum gradients will require special permission from the Superintendent or the Authority unless otherwise noted on the drawings.

Testing Of Drainage

Carry out all tests as set out in the Company specification or as required by the Authorities and or the Superintendent. At least 48 hours notice shall be given for inspection of works under test. Supply all plugs and other materials necessary for the tests.

Underground or enclosed work shall not be covered or concealed from view until it has been inspected and approved by the Superintendent, and the governing authorities. Sewer lines

shall be subject to a hydrostatic test of 3 metres head for a minimum of 15 minutes. The line must be free of air pockets whilst under test.

Trade wastes

Dispose of trade waste through UPVC pipelines laid, bedded and jointed as necessary. Provide necessary sumps or interceptors.

Pipeline identification

Lay detectable plastic warning tape, 300 mm above buried piping, for the full length of the piping.

4.3 PIPING

Finishes

General: Finish exposed piping, including fittings and supports, as follows:

- Internal locations such as toilet areas: Chrome plate copper piping to AS 1192 service condition 2, bright.
- Externally, and steel piping and iron fittings internally: Paint.
- In concealed but accessible spaces (including cupboards and non-habitable enclosed spaces): Leave copper and plastic unpainted except for identification marking. Prime steel piping and iron fittings.

Valves: Finish valves to match connected piping.

4.4 DISCHARGE FROM AIR HANDLING SYSTEMS

Trays, sumps and drainage

Standard: To AS/NZS 3666.1.

4.5 PUMPING STATIONS

Sewage Pumping Station

Supply and install "Nossiter" package pump station as noted on drawings.

Holding well and associated equipment to include:

- 1000 litre (effective capacity) holding well to be constructed within concrete rebate.
- 2 x sewage cutter pumps (standby / duty) @ 1 litre per second and 10m head.
- Float level switches.
- Remote control panel with audible and visual high level alarm (located in staff area), relay switch for pump fault and high level alarm for linkage to security system.

Stormwater Pumping Station

Supply and install stormwater pumping station as noted on drawings.

Holding well and associated equipment to include:

- 5000 litre (effective capacity) holding well to be constructed within concrete rebate complete with access grate and internal step irons .
- 2 x waste pumps (standby / duty) @ 3.5 litres per second and 10m head.
- Float level switches.
- Remote control panel with audible and visual high level alarm (located in staff area), relay switch for pump fault and high level alarm for linkage to security system.

SECTION-2 SANITARYWARE

ITEM CODE	FIXTURE / LOCATION	MAKE/MODEL	ITEM CODE	FIXTURE
SHR	Shower Standard shower room		SWR3	Enware expo shower set (loose jumper valve).
BWU (1)	Boiling Water Unit Public accessible	Zip ABA30 Hydrotap (underbench) with anti scald safety mechanism.	-	-
BWU (1)	Boiling Water Unit Staff rooms	Zip Autoboil 1.5 litre (above bench).	-	-
FW(V)	Floor Wastes (Vinyl Floors)	SPS low grime vinyl floor drain with nickel bronze grate.	-	-
FW(T)	Floor Wastes (Tiled Floors)	Chrome plated brass with circular pattern grate.	-	-
SV	Isolation Valves	Enware ¾ fullway key operated top assembly with cover dome.		VP 356 wall tap assembly with key 20mm fullway
WC(D)	WC Disabled person toilet.	Caroma care trident disabled with viceroy cistern and Pedigree seat.		-
BSN(D)	Basin Disabled person toilet. Consultant rooms	Caroma Integra 500.	TP1	Enware SLM306D
BSN	Wall basin General handwash	Fowler Hamilton 500 3 tap hole Chrome plated brass plug. Caroma Concorde 500 3 tap hole with chrome plate "S" trap assembly.	TP 5	Enware Expo 306 basin set (chrome).
BSN(S)	Basin Small wc/bsn rooms	Caroma elfin one tap hole.	TP4	Lever basin mixer. Enware SLM306.

ITEM CODE	FIXTURE	MAKE/MODEL	TEM CODE	FIXTURE
TMV	Thermostatic mixing valve	Enware Aquablend 2000		
WC	Water closet General	Caroma / Fowler close coupled toilet (adjustable setout) suite 6 /3 litre flush with silent fill valve (rear entry cistern valve). Caroma / Fowler seat (double flap closed front) with concealed mini cistern cock		
TD2	Tundish (large)	Larger purpose made tundishes or tray shall be installed where required to drain RPZD valves.		
SK	Tea sinks	Clark stainless steel model 1003 (left) 1004 (right)	TP8	Enware single lever fivkmixer model SLM 307.
SK	Sinks in the multipurpose room and workroom	Franke Rotondo model no. rbx 610		Enware single lever fivkmixer model SLM 307.
CS	Cleaners Sink	Caroma model with wooden rest and hinged grate	TP7	Enware recess set (Expo handles), SP321 fixed spout and hose adaptor.

EXTENT OF WORK

The work specified in this section comprises the purchase storage and installation on site of sanitary ware, faucets and outlet fittings as scheduled, shown on drawings and/or specified, and necessary for complete installation.

All items shall be new and of first quality, free of chips, cracks and crazing and defects and shall be subject to inspection prior to installation.

Prior to placing orders, obtain guarantees from the manufacture that any items which craze or show any other defects within twelve months of issue of certificate of practical completion will be replaced providing that such crazing or other defects are not caused by abuse

Fix and support fixtures and tapware strictly to manufacturer's recommendations.

Store all faucets, taps and outlet fittings and be responsible for fixing of the same to the fixtures and appliances nominated and connect to the water service.

Tapware Indication Colours

Cold water taps	-	Blue
Hot water taps	-	Red
Warm water taps	-	Yellow

All Non potable water taps shall be installed with a sign reading "Non Potable Water Do Not Drink". White lettering on green background

All basins, showers and beverage sinks shall incorporate provision for future water flow control valves within the tapware.

SECTION-3 FRESHWATER

1 GENERAL

1.1 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Service Trenching*

1.2 STANDARDS

Water supply

General: To AS/NZS 3500.1.2.

Hot water supply

General: To AS/NZS 3500.4.2.

1.3 SCOPE OF WORK

General

Hydraulic service shall include all those services which convey water under pressure for use within the building.

Included within the hydraulic scope of work are the following:

- Domestic Cold Water for reticulation to sanitary fixtures and equipment, ie. basins, sinks, WC, showers, hose taps etc.
- Domestic hot and warm water services to sanitary fixtures as shown on drawings.
- Non potable hot and cold water to potential cross contamination areas.
- As constructed plans (in cad format) and maintenance manuals

2 QUALITY

2.1 INSPECTION

Witness points

The contractor shall engage and pay all fees to an independent certifier approved by ACOR Consultants P/L to witness, report and provide certification that the work meets the design intent and complies with the specifications and relevant standards.

Give sufficient notice so that inspection may be made at the following stages:

- Excavated surfaces.
- Concealed or underground services.

2.2 PRE-COMPLETION TESTS

Site tests

Test system for leaks, including pipe joints, valve seats, tap washers and strainers. Repair as necessary, replace if damaged, and retest.

2.3 SAMPLES

General

Submit samples of accessories not specified as proprietary items, including the following:

- Piping material and Valves.

- Instruments, including gauges and thermostats.
- Means of identification, including adhesive labels and engraved disks or plates.
- Fittings such as cover plates, purpose made sealing covers, valve boxes and couplings.

2.4 SUBMISSIONS

Shop drawings and works as executed

Submit design drawings prior to construction for approval by superintendent in Autocad format (or equal translatable format) and schedules showing the layout and details of the system, with schedules showing the layout and details of the system, including

- location, type, grade and finish of piping, fittings and pipe supports;
- location, type, grade and finish of piping, fittings, valves, meters and pipe supports;
- location, capacity, type and other relevant details of water heaters, water treatment systems including supports and safe trays;
- details of control panels including control and power diagrams;
- insulation of piping, fittings and tanks; and
- access openings, cover plates, valve boxes and access pits.

3 MATERIALS AND COMPONENTS

3.1 AUTHORISED PRODUCTS

Standard

To SAA MP52, unless otherwise required by the statutory authority.

3.2 THERMOSTATIC MIXING VALVES

Type

General: Water temperature regulated by a single hand control, and capable of delivering water at the temperature of either of the supply systems and at any temperature in between, and suitable for controlling single or multiple outlets, as appropriate.

Controls: Incorporate the following:

- A temperature sensitive automatic control which maintains temperature at the pre-selected setting and rapidly shuts down the flow if either supply system fails, or if the normal discharge water temperature is exceeded.
- Hot water flush facility.

Housing: Provide vandal resistant stainless steel housing.

Requirement: Valves shall be complete with isolation valves, strainers and provisions for temperature and pressure gauges.

Proprietary item: as indicated on sanitaryware schedule

3.3 BACKFLOW PREVENTORS

Type

Backflow prevention devices shall be installed in locations as by AS3500 and local authority and shall be RMC watts manufacture or equal. All backflow preventors shall be installed in accordance with manufacturers recommendations and AS 3500 Part 1.

Contractor shall submit all documentation and pay all fees to regulatory authorities and commission all backflow devices prior to practical completion.

3.4 PRESSURE CONTROL VALVES

Type

Provide reduction valves, pressure limiting valves, or ratio valves, which produce the necessary reduction in pressure.

3.5 LINE STRAINERS

Description

Type: Low resistance, Y-form bronze bodied type, with screen of dezincification resistant brass, corrosion-resistant stainless steel.

Screen perforations: 0.8 mm maximum.

3.6 PRESSURE GAUGES

General

Provide gauges with full scale reading in kPa, a minimum nominal diameter of 63 mm and capable of reading pressures at least 25% higher than the maximum static pressure of the system.

Standard

Bourdon tube gauges: To AS 1349.

Accuracy grade: Industrial.

Installation

Comply with the recommendations of AS 1349 Appendix B. Locate at inlet and outlet sides of cold water pumps. Isolate from pump vibration and provide complete with gauge cock on inlet.

4 EXECUTION

4.1 RETICULATION

Cold water system

Provide the cold water supply system, installed from the supply point to the draw-off points or connections to other services. Systems shall be installed to manufacturers recommendations and shall specifically include all necessary fittings and support systems, and necessary additional pipe work to account for thermal movement including expansion/contraction loops as required.

Cold water piping system schedule

Pipeline location	Material	Size (inside diameter)
Domestic cold water	Copper type-b	15-50
Fire hose reel supply	Copper type B	25-50

Hot water system

Provide the hot water system, installed from the cold water connection points to the draw-off points or connections to other services.

Hot water piping system schedule

Pipeline location	Material	Size (inside diameter)
Domestic hot water	Copper type-b with "Kemlag" or equal thermal insulation.	15-40 (lagged)

4.2 FITTINGS AND ACCESSORIES

General

Provide the fittings necessary for the proper functioning of the water supply system, including taps, valves, backflow prevention devices, pressure and temperature control devices, strainers, gauges and automatic controls and alarms.

Tap and valve heads

Vandalproof heads: If available, provide vandalproof or anti-tampering devices for the designated types.

Plastic heads and handles: Provide break-resistant fittings of a compact nature, to prevent fracture and exposure of jagged or rough edges.

Metal heads and handles: Provide brass fittings or suitably bush to prevent electrolysis and growth.

Tap positions

Locate hot tap to the left of, or above, the cold tap.

Valve spindles

If practicable, install in a vertical position.

Hose Taps

Provide and install external hose taps in all landscape areas as shown on drawings to provide full coverage with maximum 18 metre hose length. Final hose tap positions to be confirmed by landscape architect. Each external tap shall have separate isolation valve and hose tap vacuum breaker.

4.3 PIPING

Material identification marking

Pipes with grade or class identification markings: Install so that the markings are visible for inspection.

Finishes

General: Finish exposed piping, including fittings and supports, as follows:

- Internal locations such as toilet and kitchen areas: Chrome plate copper piping to AS 1192 service condition 2, bright.
- Externally, and steel piping and iron fittings internally: Paint.
- In concealed but accessible spaces (including cupboards and non-habitable enclosed spaces): Leave copper and plastic unpainted except for identification marking. Prime steel piping and iron fittings.

Valves: Finish valves to match connected piping.

4.4 PIPEWORK EXPANSION AND MOVEMENT

General

Take care in planning hot water pipe routes to ensure that sufficient offsetting is achieved to compensate for length increases from pipe expansion. Pipe brackets on the hot water pipework systems are to be guide type and are not to restrain the pipe from longitudinal movement. Ensure that branch pipes are of maximum lengths from main pipe circuits before being restrained by entering vertical built in positions. Ensure pipe systems exiting the ground can cope with reactive soil movements (up to +/- 100 mm) Install flexible couplings where required to the approval of the superintendents representative.

4.5 PIPING INSULATION

General

General: For insulated piping, completely cover the pipe with insulation fitted tightly to the pipe surface and secured with wires, straps, adhesive, adhesive tape or other appropriate means. If insulation is installed in sections, butt the joints closely together without gaps. Over connection unions and couplers, install the insulation so that it is readily removable.

Fittings: Provide insulation of thermal resistance equivalent to the piping insulation.

Testing

Do not install insulation until the piping has been tested.

Insulation schedule

Type of Service	Type of Insulation
Hot/Warm Water	
a) 15 - 25 diameter	Prelagged pipe (Kerlag or equal)
Cold Water	
a) Chased in walls	Kerlag or equal

4.6 PIPE SUPPORTS

Insulated pipe

General: Provide supports formed to fit around the insulation.

Protection: For pipes DN 25 either

- protect the insulation at the support point with metal sheathing; or
- replace the insulation at the support point with a shaped wooden spacer block. Butt the insulation up to the wooden block and seal with silicone compound. Clad the block and insulation in 0.5 mm zinc-coated steel sheet extending 100 mm each side of the support.

4.7 VALVE BOXES

General

Provide cast-iron valve boxes with removable covers for access to underground gate valves. Provide cast-iron sluice valve covers for access to sluice valves. Provide recessed stainless steel wall boxes with hinged lid for access to stop valves.

Installation

Set beneath each box a shaft formed of UPVC pipe to give clear access to the valve wheel or spindle. Set top flush with pavement surface, or 15 mm above unpaved surfaces, and encase in formed concrete box 150 mm thick, with top surface trowelled smooth.

Notice plate

Provide a notice plate at recessed wall boxes to read as follows "Water isolation valve".

Valves

All valves to be JOHN or equal and shall bear the Australian Standard or water mark as appropriate.

Gate valves: John Figure 59

Ball valves: John

Check valves: John Fig 4B

Stop valves: John

Landing valves: Quell

Unions: John No. 10

4.8 PITS

General

Install below-ground, stop valves and control valves, in concrete access pits with removable pit covers.

Construction

Internal dimensions: To give 300 mm clear space all around the fittings in the pit.

Concrete: Grade N20 to AS 1379, 100 mm thick, reinforced with F82 fabric.

Pit covers: To AS 3996.

Installation

Grade floor to a point on one side and drain to the stormwater drainage system. Carry the pit walls up to 50 mm above finished ground level. Cast in the pit cover frame flush with the top. Trowel the top smooth.

4.10 MARKING

Notice plate

Provide a notice plate containing condensed emergency instructions, legibly printed or engraved on durable material resistant to defacement, at least 3 mm thick or mounted on board at least 3 mm thick, permanently fixed in a convenient position at the control valves.

5 WATER HEATING SYSTEMS

5.1 PROPRIETARY WATER HEATERS

General

Supply and install mains pressure hot water units complete with all stop, check, drain and pressure relief valves necessary for a complete installation in accordance with AS 3500.4.2.

Unitary hot water storage heater

Location:	As shown on drawings
Water heater manufacturer:	RHEEM or equal
Heat storage volume:	As shown on drawings
Rated hot water delivery:	65°C
Container construction:	Enamel lined mild steel
Maximum water supply pressure (kPa):	600 kPa
Minimum working water pressure (kPa):	200 kPa

5.2 SAFE TRAY

All hot water units shall be mounted on supports on copper safe tray. The safe tray shall be installed in accordance with AS 3500.4.2. Safe tray shall be constructed of 1.2mm thick

6 COMPLETION

6.1 GENERAL

Pressure Test

Test the system on completion to 1.4mPa and hold test for 20 minutes.

Charging

On completion of installation, commissioning, testing and disinfection, fill the system with water, turn on control and isolating valves and the energy supply and leave the water supply system in full operational condition.

SECTION-4 FIRE PROTECTION

1 GENERAL

1.1 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Fresh water*

2 QUALITY

2.1 INSPECTION

Witness points

The builder shall engage and pay all fees to an independent certifier approved by ACOR Consultants P/L to witness, report and provide certification that the work meets the design intent and complies with the specifications and relevant standards.

Give sufficient notice so that inspection may be made of the mains supply connections.

2.2 SUBMISSIONS

Shop drawings and works as executed

Submit design drawings prior to construction for approval by superintendent in Autocad format (or equal translatable format) and schedules showing the layout and details of the system, with schedules showing the layout and details of the system, including

- location, type, grade and finish of piping, fittings and pipe supports;
- Available water supply and pressure.
- details of control panels including control and power diagrams;
- insulation of piping, fittings and tanks; and
- access openings, cover plates, valve boxes and access pits.

3 MATERIALS AND COMPONENTS

3.1 AUTHORISED PRODUCTS

General

Provide equipment listed in the SSL Register of Accredited Products - Fire Protection Equipment.

3.2 FIRE PROTECTION

General

Standards: Fire Hose reels	AS 1221 and AS2441.
Fire Hydrant protection	AS2941
Portable Fire extinguishers and fire blankets	AS2444

Supply and install 1 x 5kg Co2 extinguisher adjacent to each new or relocated fire hose reel and electrical distribution board.

Standards Mark: required

4 EXECUTION

4.1 INSTALLATION

Standards: refer clause 3.2

5 COMPLETION

5.1 MAINTENANCE

General: To AS 1851

MONA VALE LIBRARY
PITTWATER COUNCIL



03 03 01
CONS...

MECHANICAL SERVICES
SPECIFICATION

Steensen Varming (Australia) Pty Ltd

Sydney

Level 2, 160 Sailors Bay Road
Northbridge NSW 2063

Melbourne

Level 4, 150 Albert Road
South Melbourne VIC 3205

Brisbane

Level 4, 26 Wharf Street
Brisbane QLD 4000

Coffs Harbour

Unit 1, 30 Greenlinks Avenue
Coffs Harbour NSW 2450

AUSTRALIA

30
70

INTERNATIONAL

MONA VALE LIBRARY

MECHANICAL SERVICES SPECIFICATION

Prepared for:

Browster Hjorth Architects

Prepared by:

Steensen Varming (Australia) Pty Limited
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Northbridge NSW 2063
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QUALITY ASSURANCE			
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1 MECHANICAL GENERAL

1.1 DESCRIPTIONS

1.1.1 Building Description

Mona Vale library is a new single storey building composed of two wings. An external courtyard lies in the centre of the new building and separates the two wings. The building is partially submerged under the ground. The new building is mainly open plan library shelving areas with some enclosed work rooms and study areas. Air conditioning is to be provided through an underfloor supply system with floor level outlets. Raised floor void is to be used as a supply plenum. Underfloor fan units shall allow increased flows to the enclosed spaces as required. A supplementary fan coil unit is provided for the multi-use room and the computer room.

Variable temperature underfloor hot water heating is to be provided to offset façade losses through the western façade. Perimeter low level supply heating and cooling is provided for the perimeter to the courtyard.

Air cooled chiller plant shall provide cooling. Gas fired external boiler shall provide heating requirements. The plant is located externally. Main air handling equipment is located within a dedicated plant room at the Southern end of the new building.

Outdoor air is drawn through a plenum with maximum exposure to the sub-ground to maximise natural pre cooling/ heating of the incoming air.

Toilet exhaust systems are to be provided for the new toilet areas.

The existing library building is being fitted out as office spaces and conference room. A new extension to the existing library is being provided also. New air cooled split type air conditioning is to be provided for the extension and the conference room. Minor duct modifications are provided for the remainder of the existing building.

Automatic shut down of the mechanical equipment as appropriate shall be provided.

1.1.2 Air Systems Description

Main library shelving:

Underfloor low level supply air through floor level outlets. Return air at high level. Relief air through high level louvres in western façade.

Supply air through false floor plenum air supply channels installed by mechanical contractor. Non ducted to grilles.

Main air handling plant located in dedicated plant room in southern end.

Work rooms, study rooms:

Local underfloor fan unit with ducted connection to floor supply outlets. Relief air through relief air opening back to main library area by builder.
Manual control of air flow rate to control conditions.

Multi-use room:

Underfloor supply air supplemented with ceiling mounted Fan Coil Unit. Fan coil unit to be provided with manual on/off control.

Computer room:

Underfloor supply air supplemented with ceiling mounted DX type AC unit. AC unit to run 24 hours per day.

Toilets and ensuites:

Toilet areas are to be mechanically exhausted.

1.1.3 Smoke Control System Description

All non-essential systems shall shut down in the event of fire. Signal from smoke detectors mounted within supply air ducts to trip of main mechanical boards.

1.2 DESIGN PARAMETERS

i) Outdoor Design Conditions:

Summer: 32°C Dry bulb temperature
23°C Wet bulb temperature

Winter: 7°C Dry bulb temperature

ii) Indoor Design Conditions:

Summer

Temperature : 24°C ±1.5°C

Humidity: < 65% r.h at occupied zone. Lower limit not controlled.

Winter

Temperature : 21°C ±1.5°C

iii) Noise Levels: Recommended maximum dB(A) (in accordance with AS2107:2000)

- Library reading areas	45
- Library stack areas	50
- Library workshop areas	55
- Waiting & reception areas	50
- Corridors and Lobby	50
- Office areas	45
- Toilets and tea rooms	55

1.3 EXTENT OF WORK

Supply, install, test, commission and paint, the following mechanical services which includes, but is not limited to, the following:

1. Electric driven Air cooled chillers / heat pumps including all integral chilled water pumps, expansion tanks, throttling valves etc.
2. Heating water pumps.
3. Chilled water type fan-coil units inclusive of mixing plenum boxes, filters, cooling and heating coils, condensate trays etc.
4. Underfloor fan units
5. Motorised dampers
6. Fans.
7. Air Filters
8. Controls
9. Acoustic insulation including lined sheet metal boxes, silencers and lead loaded vinyl.
10. All pipework, valves and fittings for chilled water, hot water, condensate and drains including associated expansion pressurisation vessels & chilled water buffer tanks. Provision of buffer tanks and expansion / pressurisation units.
11. Sheetmetal work including ductwork, underfloor air channels within floor plenum, dampers, hangers, flexible ducting, flexible connections, access panels, clean-out panels in ducts, duct attenuators (silencers) fire dampers, smoke dampers.
12. Insulation to all supply air ductwork, Fan coil units, return air ductwork both internal and external including perforated zincanneal lining for fan coil units and ductwork and perforated aluminium foil lining to air diffuser plenums.
13. Insulation to all chilled water, hot water and condensate piping including metal sheathing in plantrooms and exposed locations.
14. Internal acoustic insulation to duct and air channels.

15. Underfloor heating including all controls, pipework, pipe supports etc.
16. Ductwork modifications to existing building including cleaning and repair of existing supply air grilles. Allow to rebalance airflows to existing building.
17. Air handling units including all cooling and heating water coils, fans, mixing boxes, etc. Cooling and heating coils shall be treated with Kirby Kote or approved equivalent.
18. Electric motors, variable speed drives and motor starters (soft start, star-delta, DOL).
19. All floor supply outlets (complete with volume control dampers), return air grilles, acoustic transfer grilles, exhaust grilles, etc.
20. Motor control centres and motor control panels complete with isolators, circuit breaker, starters, relays, contactors, indicating lights, selectors switches, etc.
21. All power and control wiring from motor control centre (MCC) to mechanical equipment.

NOTE: Wiring for general fire alarm signals from FIP to MCC by Fire Trade.
22. DDC control system including all control equipment and control wiring.
23. Water treatment for all water systems.
24. Protective painting and identification of all plantroom equipment and exposed pipework etc. Internal ductwork to be painted matt black where visible through grilles. Full testing, commissioning and demonstration of performance of all systems to the satisfaction of the Superintendent. Provision of all test figures and test information derived from acceptance test. Qualified technicians to be included for the testing and commissioning period.
25. Submission of all documentation to relevant authorities, obtaining approvals and paying of all required fees.
26. Provision of all type of insurance required under this contract.
27. A maintenance contract to maintain the plant for twelve (12) months. Rectification of all defects arising during the 12 months period.
28. Mechanical trade's Documents, and 'as installed' drawings. Full operating and maintenance instructions manuals prior to Completion.
29. Instruction of the Library personnel who will be in charge of operation of the plant after commissioning in regard to preventative maintenance procedures (User Training and Acceptance).
30. Balancing and commissioning of all mechanical systems.
31. Provision of smoke detection in supply ducts to trip MCC/ mechanical air handling plant in fire situation.
32. Provision of power & controls signal to motorised louvres and dampers.

All systems shall be in accordance with AS1668.1 & AS1668.2

1.4 WORK ASSOCIATED WITH MECHANICAL SERVICES

These lists are for assisting the Contractor and his trades at interface points.

1. Contractor

- a. Penetration through floors, ceiling, walls and roof for pipework conduits, sleeves, etc. and make good around all penetrations after installation.
- b. All permanent access openings and removable access panels in ceilings, walls, shafts etc. Panels to be fire rated where part of a fire wall:
- c. Making good after chasing, drilling and placing of sleeves etc.
- d. Supply and installation of roof insulation (50mm) and vapour barrier and all acoustic linings or treatment to walls and roofs.
- e. Outdoor air plenum cavity including all vapour barriers and insulation.
- f. Concrete culvert trench for chilled and heating water pipework from outdoor chiller plant to main airhandling plant.
- g. Supply and installation of plant area slabs, walls, all access stairs, handrails etc. provision of roof plant area to existing building also including handrails, access stairs etc.
- h. Provisions for rubbish collection and dumping from all working floors and for regular rubbish removal from site.
- i. Scaffolding.
- j. Provision of 415/240 volts, 4 wire power for mechanical trade for his use in operation of hand tools, welding equipment lighting.
- k. Provision of 415/240 volts, 4 wire power for balancing and testing of the plant, also outlets for temporary lighting.
- l. All plinths for equipment in plant areas to details set out by mechanical trade.
- m. All underflashing of ductwork at roof penetrations. Overflashing by mechanical trade.
- n. All door undercutting (19mm) where nominated.
- o. Supply and installation of external louvres to mechanical services requirements.
- p. Provision of external glazed louvers including all motorised actuators and control bars, rods etc. Control wiring and controller function to be by mechanical trade.
- q. Provision of internal relief air transfer louvres to mech services requirements

r. Airtight sealing to all walls/ partitions adjoining false floor to maintain false floor plenum integrity.

s. Sealant to raised floor cavity and wall air intake cavities.

2. Electrical trade

a. Provisions of incoming power cables to all motor centres.

b. All lighting for external plant areas.

3. Fire Services Trade

a. Fire trip signal and wiring from FIP to mechanical board (MCC). Termination onto mechanical board by mechanical trade.

4. Hydraulic Trade

a. Cold water supply to washdown areas in each plantroom and the main external plant area complete with local isolation.

b. All tundishes to local chilled water fan-coil units for condensate drainage as necessary.

c. All floor wastes to plantroom areas.

1.5 CO-OPERATION/CO-ORDINATION

Works on the site executed by the Contractor and sub-trades may be proceeding concurrently with the works included in this specification. The Mechanical trade shall co-operate as necessary with all other trades and with each firm to whom part or parts of the contract works are sub-let.

The Contractor shall be responsible for co-ordination with all trades to ensure that all services are accommodated satisfactorily, particularly in ducts, voids and cavities. The contract drawings do not indicate the presence of other services not included in this contract. Details of other services, supports for suspended ceilings, etc should be obtained from the Contractor and the relevant trade.

1.6 MATERIALS, WORKMANSHIP, DESIGN AND SAMPLES

All materials, fittings, accessories and apparatus are to be new (unless the reuse of existing materials, etc is specified) and of first grade design and manufacture and are to comply with relevant Australian Standard Specifications or where none are available then relevant British Standard Specifications.

The design and construction shall be such that ample factors of safety are provided and that all parts of the equipment are rated for continuous service i.e. 24 hours per day, 7 days per week throughout the year except for the minimum necessary maintenance. This requirement must not preclude the plant being equally suitable for intermittent usage requiring frequent stopping and starting to suit the application or to rating requirements expressed as starts per hour or similar.

The Mechanical trade may be required to submit for the approval of the Superintendent prior to commencing installation samples of all accessories, fitting and apparatus proposed to be used in the work and only such items as are approved may be installed.

Failure to comply with this provision may result in the unconditional rejection of such items when inspected on site.

Any rejected materials, fittings, accessories or apparatus shall be removed from the site within twenty four (24) hours of such rejection.

The workmanship shall be of a high standard throughout and only first-class tradesmen are to be employed on the work in their respective trades.

1.7 TYPE AND MANUFACTURE OF EQUIPMENT

Specific manufacturers or trade names or figure numbers mentioned in the specification are for the purpose of defining the required class of materials, quality, design or workmanship. For parity of tendering each tenderer shall include for such specified plant, equipment and materials.

Where specific manufacturers or trade names or figure numbers are included in the specification the Contractor and mechanical trade shall be responsible for the specified performance of the plant, equipment and materials and of the installations of which they form part. The mechanical trade should therefore obtain from such manufacturers or suppliers adequate guarantees in respect of such plant, equipment and materials.

Details of plant, equipment and materials of equal quality, workmanship, design and performance but of alternative manufacture may be submitted for the Superintendent's approval. Each such submission shall be entered in the appropriate schedule at the time of tendering and shall indicate:

- a) Alternative manufacturer.
- b) Type and/or figure number of alternative submitted.
- c) Other relevant details as to type, design and performance.
- d) The adjustments, if any, that would be effected to the tender price if the alternative were approved.

The Mechanical trade shall not order or install alternative plant, equipment and materials prior to the Superintendent's written authority.

Contractor to coordinate all Trades for the Selection of Electrical Panels, Panel Locks keyed alike, Moulded Case Circuit Breakers, contactors, relays, timers, control devices, terminals

and the like, such that all trades utilise goods manufactured by one supplier, as agreed between Trades. Devices not complying shall be replaced with compliant product at the Contractors expense.

1.8 LOCATION OF EQUIPMENT

All equipment and services shown on the drawings are diagrammatic. The drawings shall not be scaled and actual locations shall be determined on site. The Tender drawings and construction drawings shall be consulted for actual spaces available and for building details before installing all equipment and services. The Mechanical trade and Contractor shall be responsible for site measurements.

Any modifications and deviations to equipment and services from those shown on the drawings shall be made where necessary to accommodate the services within the actual space conditions.

All equipment which must be serviced, operated or maintained shall be located in fully accessible positions. Access doors shall be furnished as required for this purpose. If any equipment cannot be so located the same shall be brought to the attention of the Superintendent.

The Contractor and associated trade will at all times be fully responsible for the correct positioning and installation of all work and equipment installed by him in accordance with the specification and in consultation and co-operation with all other trades. No extras of any kind will be allowed if work and equipment has to be removed and replaced.

1.9 CONFORMITY WITH CODES, REGULATIONS, ETC

Except where the specification required a higher standard, the work is to be carried out in strict conformity with the provisions of all relevant Acts, Ordinances, Regulations, Codes, etc of:

- a) The Insurance Council of Australia;
- b) The Standards Association of Australia;
- c) Workcover Authority;
- d) The Local Electricity Supply Authority;
- e) Any other Authority having jurisdiction over the installation;

to ensure that the machinery and installation will comply with the Rules and Regulations.

The Following codes are highlighted for reference:

- AS 3666
- AS 1677
- AS 3000
- AS 1939
- AS 3304
- AS 2381

- AS 4254
- AS 1668 part 1 & 2
- Building Code of Australia
- Requirements of Local Council and Department of Local Government
- Environmental Responsibilities Laws (including all Noise Control Acts)
- Workcover Authority Requirement
- Energy Australia Requirements
- NSW Fire Brigade Requirements

Obtain all necessary design/authority approvals and pay all required fees.

In cases where the Standards Association of Australia has not yet issued specifications or codes, the relevant publications of the British Standards Institution will be held to apply.

On completion of the installation and prior to final payment being made the Contractor is to arrange for each Authority having jurisdiction to inspect and check the contract works and where required by the Superintendent to obtain certificates from such Authority to the effect that the equipment, machinery and installation complies with that Authority's requirements. These certificates are to be forwarded to the Superintendent.

Wherever possible the Mechanical trade, through the Contractor, is to advise the Superintendent of the date that the inspection is to take place to enable the Superintendent to be present. In particular all moving and/or dangerous and/or hazardous parts of machinery are to be guarded, fenced or enclosed to the complete satisfaction of the Department of Industrial Relations and the Superintendent as part of this contract.

1.10 CO-ORDINATION

The Mechanical trade shall co-ordinate his work with the Contractor and shall, in the preparation of shop and workshop drawings, ensure that these are co-ordinated with all other relevant trades and latest drawings. The Mechanical trade will be responsible at all times for ensuring that items of equipment and materials supplied and installed by him will not interfere with work supplied and installed by other trades.

1.11 SERVICE AISLES, WALKWAYS AND ACCESS SPACE

In locating equipment and piping in plantrooms, pay particular attention to furnishing easy access to it. On the design drawings, aisles, walkways and service areas around all items of equipment are generally indicated.

In the construction all such aisles must be preserved; piping, ductwork and cable trays must be left above head level or along the wall or to the side where they will not interfere with passage.

The Mechanical trade will be required to disassemble and reinstall any piping, supports or assemblies which interfere with the freedom of passage, at no extra cost. Where any doubt exists as to the adequacy and width of the passage way, verify the condition with the Superintendent before proceeding.

1.12 CONTRACTOR'S and MECHANICAL TRADE DOCUMENTS

REQUIREMENT: Provide complete manufacturing and installation Documents and all necessary technical data covering the Work under the Contract. Drawings are to be prepared on a CAD system.

PENETRATION DRAWINGS: Provide penetration drawings as a separate set of drawings to the actual cable and equipment layouts. Drawings shall include the set out dimensions from columns and the architectural boundaries. Penetration sizes shall be actual and include correct clearances and the allowance for insulation, flanges cable trays and the like.

Prepare on CAD base from architectural layouts of the latest agreed Revision number. Nominate the building element and material being penetrated. Submit to the Superintendent.

Overlay penetrations with electrical cabling, fire services and water piping drawings for full coordination of ceiling services before submitting drawing for review.

TIME: Supply documents such as Contractor's Documents, technical schedules, or other written information, to the Superintendent for examination at such times to make allowance for amendment and resubmission to be made and ordering, fabrication or manufacture to commence in accordance with the Contract Program.

NUMBER OF COPIES: All Contractor's Documents shall be submitted by the Contractor in reproducible form (CAD disk) together with five (5) prints - to the Superintendent.

Five (5) copies of the revised Contractor's Documents shall be submitted by the Contractor to the Superintendent for distribution to the Consultants and further copies shall be submitted to the appropriate authorities as necessary.

The Documents to be prepared and submitted by the Mechanical trade shall be 1:50 scale for floor plans and 1:20 scale for plantrooms and equipment details.

Additional drawings are required for:

- Penetration drawings as previously described.
- Drawings showing extent of Associated Work requirements.
- Control panel detail drawings.
- Piping layouts and diagrams.
- Control circuit diagrams and DDC diagrams.
- Manufacturer's drawings of purpose made equipment.
- Labelling: Details of labelling and engraving.

1.13 WORK AS EXECUTED DRAWINGS

SUBMISSION OF DRAWINGS: Submit two (2) copies of each drawing showing the work as completed. Drawings required may be updated Contractor's Drawings or updated tender Drawings. In addition to 'Work As Executed' drawings, the Contractor shall obtain and provide three (3) sets of manufacturer's detailed drawings of all items of plant and equipment suitably titled and with all drawing reference numbers noted.

FORMAT: Submit drawings on sheets the same size and format as the Contract Drawings.

DELIVERABLES: Provide two (2) sets of CAD disks based upon the working drawings showing the sizes and positions of all pipework, plant and equipment 'As Installed'.

The drawings shall be to the same scales as approved for Contractor's Documents and shall record details of the work actually installed and entitled 'WORK AS EXECUTED'.

Symbols shall be shown on all 'Work As Executed' drawings.

In order to achieve accurate drawings, all relevant information relating to the contract work shall be entered on to Working Drawings prints immediately the Work has been carried out. The Drawings shall appear 'as new'. No previous examined stamps, hand written notes or erase markings shall be evident. New Drawings shall be provided if necessary.

Evidence of progressive completion of 'Work As Executed' Drawings, Documents, Manuals and the like will be required at site meetings.

Drawings are to be prepared on a CAD system using drawing standards and symbols compatible with each of the trades being drawn and to the approval of the Superintendent. The CAD system proposed must be readily able to transfer the other systems without loss of drawing content or other difficulties.

Drawings submitted for approval may be hard copies in the first instance. When returned by the Superintendent, the Contractor shall carry out a full coordination of all trades drawings by overlaying the 1:50 returned plots. As evidence of this action, each plot shall be initialed by the Contractor and resubmitted to the Superintendent who shall examine the plot, initial it and take a record copy. The plot shall then be returned to the Contractor who shall then arrange for a final corrected ink plot for approval.

Supply 'Shop' and 'As executed' Drawings in digital format according to the following requirements:

- MEDIA - CD-R
- AutoCAD DXF format
- If compression of files used, supply decompression software with files.

APPROVED DRAWINGS: When Drawings have been approved, submit one (1) bound set on heavy weight paper together with the final CAD disks.

COMPLETION: The works or relevant separable portion will not be practically complete until the above requirements have been satisfactorily complied with.

1.14 OPERATING AND MAINTENANCE INSTRUCTIONS

The Contractor shall submit to the Superintendent prior to completion Operating and Maintenance Instruction Manuals which shall comprise a description of each installation, its operation and the regular operating and maintenance routines to be adopted.

Three (3) sets of Operating Instruction Manuals shall be provided, printed on A4 size paper adequately bound into volumes with rigid covers of plastic finish to withstand continual usage.

Prototype copy: Provide a prototype copy for approval before proceeding.

Manuals shall include:

1. General Description of Systems and Equipment

Include brief overall description of systems, design references and description of each individual system and equipment involved.

2. Operating of Systems and Equipment

Include general operation of plant, operation of each system and the equipment involved, starting up and shutting down of all systems, location of starting gear, etc. and normal operation of system, including all control settings and tolerances.

3. Maintenance of Systems and Equipment

Include maintenance duties in general, daily and all other periodic maintenance, lubrication chart and spare parts list.

4. Schedules

Include schedules of equipment showing quantity, location, type, supplier, etc., a valve schedule and a schedule of all suppliers with addresses and telephone numbers.

5. Manufacturer's Literature

Include manufacturer's data on maintenance and operation of all equipment installed. Do not include irrelevant data that does not pertain to the model of equipment actually installed. Such irrelevant information shall be erased from data sheets, etc.

6. Miscellaneous

Include any miscellaneous charts, graphs, descriptions, data, etc. needed for complete maintenance and operating instruction of all systems and equipment installed.

7. Spare Parts

Prior to Completion, the Contractor will be required to submit a schedule of the spare parts that he recommends and should be supplied together with their individual current prices.

These parts may or may not be ordered.

1.15 PREVENTATIVE MAINTENANCE

The contract works shall be maintained in a complete and satisfactory working order during the twelve (12) months following Contractual Completion Date. The Contractor shall be responsible for the supply and cost of all parts and expendable items during this period.

The Contractor shall maintain the plant in accordance with the duties listed in the Operating and Maintenance Instruction Manual.

2 EQUIPMENT

2.1 GENERAL

Each item of equipment shall be of approved make, design and construction, complete with all accessories and fittings as indicated in drawings and specification or as required for satisfactory performance of equipment.

All equipment shall be constructed and installed to comply with this specification and/or any other governing authority and/or specification, and the Principal's requirements.

2.2 PACKAGED AIR-TO-WATER CHILLERS

Provide as specified in "Natspec Services" and all current amendments and in accordance with performance requirements scheduled.

Chiller shall be a microprocessor controlled, air-cooled liquid chiller utilising R407C, dual refrigeration circuit, scroll compressors and electronic expansion valves. It shall be hydronic unit containing integral pumps and feed & expansion / pressurisation unit.

2.2.1 Equipment

Factory assembled, single piece, air-cooled liquid chiller. Units shall be of Carrier manufacture or approved equal and shall be designed for outdoor installation. Microprocessor-controlled unit factory charged with HFC-407C refrigerant and compatible lubricant (polyester synthetic oil). Factory-assembled, single-piece unit galvanised steel casing with oven-baked polyester-paint finish. Contained within the unit shall be all factory wiring, piping, controls, refrigerant charge, required prior to field start up.

Vertical discharge fan serving the air heat exchanger shall be direct-driven axial type, statically & dynamically balanced with inherent corrosion resistance complete with profiled airfoil blades for quiet operation. Fan shall be protected by steel wire safety guard coated with polyethylene. The fan motor shall be two-speed standard induction motor with IP55 degree of protection and insulation class F.

The refrigerant circuit shall include liquid line valve, suction line valve, two-way expansion device, receiver/heat exchanger device protecting the compressor against refrigerant migration, moisture indicating sight-glass, removable suction line screen filter, high pressure safety valve, pressure & temperature sensors and manually re-set high pressure switches.

Unit shall incorporate hermetic scroll compressors directly driven by two-pole electric motors and complete with oil level sight glass. Motors shall be suction gas cooled complete with thermal overload protection. Compressors shall be mounted on vibration isolation mountings inside the unit.

The water heat exchanger shall be a copper-welded stainless steel plate heat exchanger complete with freeze-up protection and single hydraulic circuit only. The air heat exchanger

shall be a vertical coil constructed of aluminium fins mechanically bonded to internally finned copper tubes complete with freeze-up protection.

Additional safety features shall include a main disconnect switch, thermal relays, fuses and circuit breakers.

The packaged air-to-water chiller unit shall incorporate an independent auto-adaptive microprocessor control system complete with user-friendly operator interface and BMCS interface capability. Refer to the "Automatic Controls" section for details on the control systems to be employed.

The unit shall be capable of the following functions:

- automatic changeover between compressors.
- Capacity control based on leaving chilled fluid temperature with return fluid temperature sensing
- Limit the chilled water temperature pull-down rate at start up to an adjustable range of 0.1°C to 1.1°C per minute to prevent excessive demand spikes at start up.
- Enable adjustment of leaving water temperature according to return temperature or by means of 0-10v signal to the outdoor temperature.
- Provide provision for dual set point for chilled water supply.

Refer to NATSPEC CHILLERS clause 3.5. Controls shall be menu driven, microprocessor based module.

Each chiller control module shall be able to communicate with a BMCS.

Safeties

Chiller shall be equipped with all necessary components, and in conjunction with the control system shall provide the unit with protection against the following:

- loss of refrigerant charge.
- Reverse rotation
- Low chilled water temperature
- Low oil pressure
- Current imbalance
- Thermal overload
- High pressure
- electrical overload
- loss of phase

Provide factory applied anti-corrosion treatment equivalent to Kirby Kote to condenser fins of the heat pump and chiller sets.

Chiller shall be capable of starting up with 13 °C entering water temperature on the condenser. Unit shall be capable of starting up with 25°C entering water temperature to the evaporator.

Motors shall be provided with soft starters. Include equipment for EMR suppression.

2.2.2 Testing

The chillers shall be tested in Australia, witnessed by the Superintendent, and at the manufacturers expense, to demonstrate performance to ARI standard 550-92 at full load and part load. Part load testing shall be carried out at 20%, 40%, 60%, 80% and 100%. Seven (7) days notice shall be given prior to testing. Data to be recorded shall include temperature, pressures, volts, and amps.

2.2.3 Noise

Provide with the tender schedules a noise spectrum for the chiller type proposed.

2.3 SPLIT REVERSE CYCLE AIR COOLED AIR CONDITIONING UNITS

1. General

The air cooled split type air-conditioning systems shall have net cooling & heating capacities as indicated in the schedules. The systems shall all be capable of reverse cycle operation. All equipment shall be of Temperzone or Daikin manufacture or approved equal. All equipment shall be installed as per the manufacturer's recommendations.

Fan coil units shall be ceiling mounted ducted type with capacities as indicated in the schedules. Each indoor unit shall have independent operation capability to satisfy the zone cooling & heating requirements.

Each indoor & outdoor unit shall be factory assembled complete with all the necessary safety devices, tested & pre-charged with R22 refrigerant. The air conditioning system shall be capable of continuous cooling operation at the ambient temperature of 35°C and continuous heating operation at the ambient temperature of -5°C.

All refrigerant pipework shall be thermally insulated. All exposed (including roof pipework) insulation shall be metal sheathed and painted. Pipework shall be run in ceiling voids and risers.

All necessary safety devices shall be provided to ensure the safe operation of each system.

2. Air Cooled Condensing Units

The air cooled condensing units shall be factory assembled complete with all the necessary safety devices, tested & pre-charged with R22 refrigerant. Each unit shall be housed in a sturdy weatherproof, free-standing, vibration-free cabinet constructed from rust-proofed mild steel panels coated with a baked enamel finish. The unit shall be of modular design and shall allow for side by side installation.

The condenser coil shall be constructed of refrigeration quality copper tubes mechanically bonded to aluminium fins. The aluminium fins shall be coated with an anti-corrosion resin film.

Discharge condenser fan shall be direct-driven propeller type, statically & dynamically balanced with inherent corrosion resistance. Fan shall be protected by steel wire safety guard

coated with polyethylene. The fan motor shall be two speed standard induction motor with IP55 degree of protection and insulation class F (minimum).

The compressors shall be of the hermetically sealed scroll type, shall be spring mounted, pressure lubricated and complete with internal motor winding protection. The compressor shall be sound isolated with internal gas mufflers. All necessary operating and safety controls shall be provided, including high and low pressure cut-outs, motor temperature & over current protection for all motors, condenser fan motor timed relay and cycling guard timer.

3. Fan Coil Units

The fan coil units shall be factory assembled complete with all the necessary safety devices, tested & pre-charged with R22 refrigerant. The units shall be of galvanised steel construction lined internally with 25mm fibreglass insulation complete with removable insulated & powder coated drain tray. The cabinet shall be treated with zinc chromate for corrosion protection.

Each fan coil unit shall incorporate an electronic expansion valve which shall modulate in response to zone load variations. Forward curved double inlet double width (DIDW) centrifugal fans in involute scrolls of aluminium construction shall be direct driven (3 speed) or belt driven by thermally protected standard electric induction motors. The fans shall be statically & dynamically balanced to ensure low noise & vibration free operation. The evaporator coil shall be constructed of refrigeration quality copper tubes mechanically bonded to aluminium fins.

Fan coil units shall be provided with insulated safety drip tray. Tray to be corrosion treated and hung below unit. Tray shall extend to encompass all valves and entire dimension of fan coil unit. Fan coil unit shall not be supported off safety tray. Condensate pipework shall be PVC and insulated for the first 3 metres of pipe. Pipework from unit safety tray to tundish shall be installed by mechanical contractor.

2.4 FANS

Provide as specified in 'NATSPEC SERVICES' including current amendments and to performance requirements scheduled.

Additionally fans shall comply with the following:

1. General

All fans shall be capable of handling the duties as shown on the Performance Schedules in this Specification. All fans shall be especially selected for quiet operation under their individual operating conditions.

All fan impellers shall be statically and dynamically balanced at the manufacturer's works at design speeds and with final pulleys on. Fans assembled on site shall be site balanced to the approval of the Superintendent.

The static pressures given in the Schedules are for tendering purposes only and the mechanical trade shall be responsible for selecting the final operating static pressure which shall be the minimum pressure necessary to ensure the required air quantity with dampers generally in the open position. Motors shall be selected with sufficient power to deliver 10%

additional air in each system at the resulting increased system resistance and also with sufficient kilowatts to enable the fan to be run up to speed in time before overloads drop out. Maximum run up time for any fan shall be 20 seconds.

2. In-line Axial Fans

In-line axial fans shall be adjustable pitch non-overload direct driven type as supplied by Fantech or approved equal. The fan casing shall be of hot-dip galvanised mild steel construction. Impellers shall be aluminium and shall be fitted with bushes for easy removal and fitting. Built in electric motor shall be squirrel cage induction motor with IP54 minimum enclosure standard. The complete assembly shall be designed for heavy duty application.

3. Roof-mounted Exhaust Fans

Roof-mounted exhaust fans shall be of the centrifugal vertical discharge type as supplied by Fantech or approved equal. The cowl shall be of the vertical discharge design & formed from UV-stabilised plastic and/or fibreglass. Steel components shall be corrosion-protected. Impellers shall be backward-curved centrifugal design and direct driven by speed-controllable external rotor electric motor with integral thermal protection.

4. Roof-mounted outside air fans

Roof-mounted outdoor air intake fans shall be of the centrifugal type as supplied by Fantech or approved equal. The cowl shall be of the downward intake design & formed from UV-stabilised plastic and/or fibreglass. Steel components shall be corrosion-protected. Impellers shall be backward-curved centrifugal design and direct driven by speed-controllable external rotor electric motor with integral thermal protection.

Provide prefilters at all outdoor air intakes. Suitable access shall be provided. Provide vermin meshes and fan guards. Main outdoor air intake pre-filter shall be provided with pressure drop indication with status indicator at the MCC.

2.5 AIR HANDLING UNITS

2.5.1 General

Each unit shall comprise a backward curved centrifugal belt driven fan, air filters, insulated drain pan, return/fresh air plenum mixing box, cooling coil, heating coil. The components are encased in a sheet metal insulated enclosure. Nominal static pressure have been included in equipment schedules for tender purposes. The mechanical trade shall be responsible for final calculation of static pressure required and selection of unit accordingly. The mechanical trade shall also allow for his cost such as calculations, selections and supply of fans to suit. Motorised fire dampers for return air and outdoor air shall be included.

2.5.2 Fans

Comply with 'NATSPEC' and details of Clause B.03

2.6 FILTERS

1. General

Allow for all holding frames, access panels and blanking panels required to suit the filters offered.

All filters serving air handling units and pre-filters to air cavity shall be supplied with magnahelic differential pressure sensors and indicator displays.

All filters shall be of size easily removable from plant rooms and ceilings. Filters may be provided in smaller discrete units to achieve this requirement. Filters will lock together in an air tight fashion upon insertion into air handling units.

Filter arrangements shall be to manufacturer's standard arrangement and recommendations. Air Filters shall be manufactured by Email Westinghouse or approved equal.

2. Panel Filter-Air Handling Units (As a Pre-Filter only)

Filtration shall be provided by disposable V-form type filter capable of filtering the air to 80% average arrestance efficiency for test dust No. 4 of AS 1132 Method No. 5 (or as scheduled).

Panel filter shall be capable of handling the nominate air quantity at a gross face velocity not exceeding 2.3 metres per second (unless otherwise stated).

Filters shall be easily serviceable while the equipment is still operational. Minimum filter thickness shall be 100mm (unless otherwise stated).

3. Final/Deep Bed Filters – Air Handling Units

Peak efficiency by AS 1132 No. 1 dust 27%, average efficiency by AS 1132 No. 2 dust 97%, No. 3 dust 92% and No. dust 85%.

4. Pre-Filter-Fresh Air Intakes (only)

Provide pre-filter panels in aluminium channel frames behind roof plantroom louvers, outdoor air intakes or in locations as indicated on drawings. The frames shall have an approved means of making air tight seal to louvre. Pre-filter shall be of panel washable type 70% efficiency to AS 1132 Method No. 4.

Not less than 10mm thick.

3. Return Air Filters

Provide panel type washable air filters to all return air intakes fitted with synthetic fibre filtering material requiring no adhesives and readily rinsed with cold or warm water. The mounting frame shall be of aluminium construction to resist corrosion. At rated capacity, the average arrestance efficiency by AS1132 testing procedure No. 4 (using test dust No. 4) shall be not less than 80%. The panel filters shall be capable of handling the nominated air quantities at a gross face velocity not exceeding 1.8 metres per second. Filters shall be easily serviceable while the equipment is still operational. Minimum filter thickness shall be 25 mm.

2.7 PUMPS

Provide as specified in 'NATSPEC SERVICES' including current amendments and to performance requirements scheduled.

Provide inertia base under all pumps complying with the following:

Inertia bases

General: Provide inertia bases with mass appropriate to the required level of vibration isolation.

Construction: Steel, or steel-framed reinforced concrete. Position foundation bolts for equipment before pouring concrete.

Supports: Support on vibration isolation mountings using height saving support brackets.

2.8 AIR COILS

Provide as specified in 'NATSPEC SERVICES' including current amendments and to performance requirements scheduled.

Coil connections to fan coil units shall be coordinated with fan coil unit installation such that access to the coil connections and valves can be achieved. Fan coil units are to be manufactured / selected in appropriate right and left hand configurations such as to facilitate the installation and allow sufficient access.

2.9 TANKS & VESSELS

Provide chilled water and heating water expansion vessels and tanks as specified in 'NATSPEC SERVICES', Clause 3.1 and 4.1 including current amendments.

In addition the following applies.

Chiller shall be equipped with integrated internal closed loop feed and expansion tank.

Makeup water including backflow prevention valves to chiller units shall be by hydraulic trade. Final connection to unit shall be by mechanical trade.

Chilled water buffer tank

Codes: AS/NZS 3500.1.2.

Construction:

Cathodic protection: Provide a cathodic protection system.

Mounting: Mount tanks on galvanized steel cradles or base rings.

Accessories:

Provide thermometer, pressure gauge with gauge cocks, valved supply, 25 mm drain, lifting lugs, and inspection personnel access with cover, gasketed and bolted in position.

Insulation:

Chilled water storage tanks: Polystyrene with vapour barrier.

Sheathing: Metal sheath over insulation.

Chilled water buffer tank shall have provision for complete drain down through valves at discharge of tank and relief vents at the top. Tank shall be sized according the actual system water volume including chiller equipment water capacity. Tank size shall be coordinated with chiller selection such that water loop volume does not exceed maximum and minimum requirements for the chiller expansion tank. Submit calculations and selections for approval.

Tank shall be pressure tested to 800 Kpa.

All water systems shall be designed and installed in accordance with AS3666.

2.10 CHILLED WATER & HEATING WATER FAN COIL UNITS

Fan coil units (FCUs) complete with independent chilled water (CHW) & low temperature hot water (LTHW) coils shall be of Temperzone or Fan Coil Industries manufacture or approved equal.

Die formed plate type heat exchanger coils consisting of aluminium fins mechanically bonded to refrigeration quality copper tubes. Forward curved double inlet double width (DIDW) centrifugal fans in involute scrolls of aluminium construction shall be direct driven (3 speed) or belt driven by standard electric induction motors. Fans shall be selected for high external static pressure to achieve the airflows required.

Ceiling concealed ducted horizontal supply air type FCU shall be of galvanised steel construction lined internally with 25mm fibreglass insulation complete with removable insulated & powder coated drain tray.

Fan coil units shall be selected to meet the acoustic performance specified. Alternative units submitted must meet performance requirements together with comparable physical dimensions of specified equipment prior to consideration being given. All units must fit with ceiling spaces.

Locations of all temperature sensors shall be coordinated with the furniture plans and submitted to the superintendent for approval. Exact locations shall be verified on site and coordinated. No claims shall be accepted for the relocation of temperature sensors to coordinate with the function and use of the space. Locations indicated on tender drawings are for information only and are not final locations.

2.11 UNDERFLOOR HEATING

All underfloor heating pipework and systems shall be installed by experienced and certified underfloor heating installer.

Installation shall be with pipework fixed to reinforcing and buried within concrete slab. Minimum depth of pipes under the concrete, from top of the concrete to the top of the pipe, is 30mm. Maximum depth of pipes to the top of the concrete is 50mm. Pipes shall be suitably tied to reinforcement mesh. Use either cable ties or PVC covered copper wire ties to

tie pipes to the reinforcement mesh at the chosen distance necessary to maintain pipes in required position (recommended spacing is every 600 mm).

When passing through expansion joint, pipes should be sleeved at least 20 cm each side of the expansion joint.

Heating pipe shall be constructed of cross-linked, high-density polyethylene (PE-Xa), co-extruded with a layer of oxygen barrier coating consisting of ethylene vinyl alcohol (EVAL). Pipework shall be RAUPINK or equivalent.

Pipework shall be fully pressure and leak tested prior to pouring of concrete slab. Insulation in the form of 22/20 mm polystyrene shall be laid under the concrete slab. Insulation shall be laid underneath the vapour barrier. This shall be coordinated with the builder.

The system is designed to provide the following conditions:

Temperature range of water entering the slab	- 40 °C – 55 °C.
Surface temperature of slab	- 25 °C – 30 °C.
Room temperature	- 18 °C – 20 °C.

Pipework to be installed at 150mm centres. Pipework to be manufactured to AS2492 and DIN 16892 and shall be oxygen tight to DIN 4726. Rating of the pipework shall be 50 years at 70C and 1000 kPa. Pipework shall be laid in serpentine fashion. Pipes to be laid not closer than 150mm from any wall.

Provide manifold with 5 ports to serve the 5 separate circuits. Refer to drawings for circuit zoning.

Manifold material: Brass MS63

Control system shall include individual thermal actuators for each circuit at the manifold, single room temperature sensor and associated controls to regulate the water flow through each circuit. Controls shall be provided as an integral part of the underfloor heating system.

Provide automatic time clock thermostat with night set-back with the thermostat set on a lower temperature for overnight running.

Coordination information :

1. Full co-operation between the builder and the underfloor heating trade is required whilst floor coils are being installed and pressure tested prior and after the concrete pour.
2. To take care not to damage the pipes during the concrete pour and during the construction of the building.

The following points in particular should be noted:

- All formwork to be finished and mesh installed on all parts of circuit prior laying pipes.

- Ensure that the concrete vibrator probe does not come into contact with pipes.
 - To avoid damaging pipes, tradesmen should be instructed not to light any fires or apply any heat to the concrete floor, also not to lay pipes under any open fireplace or slow combustion heater.
 - To minimize the possibility of accidental puncturing of pipes during the construction of the building, the pipes should be marked on the concrete in areas where this could happen.
3. To use water based adhesive under all floor tiles.
 4. To ensure that all parquetry floors or other timber floor coverings are thoroughly kiln dried to eliminate shrinkage. It is recommended that timber floor surfaces be laid whilst the heating system is operating.

Commissioning:

1. Ensure that all air is bled from the system.
2. Open all circuit header valves fully and allow the system to warm up for 24 hours. The complete system should then be rechecked and the circuits balanced.
3. After approximately 7 days the final balancing is performed. All floor coverings and furnishings should be completed before final balancing is carried out.

3 SHEETMETAL WORK / DUCTWORK

Sheetmetal work shall include ducts, drain pans, sumps, supports, flashings, and all items to complete the installation whether actually indicated or not in the specification or drawings.

The complete installation shall be to the Superintendent's approval. If any work does not comply with the requirements of the Superintendent the mechanical trade shall remove, alter, amend and re-instate the sheet metal work as determined by the Superintendent.

Sheetmetal work shall be constructed with new Lysaght "Galvabond" galvanised steel sheet or other metals if approved.

All ductwork construction shall be in accordance with the requirements and recommendations of the latest editions of the appropriate Duct Construction Standards of the ASHRAE Guide and Sheet Metal Construction Manuals issued by the Sheet Metal and Air Conditioning Contractors National Association Inc., USA, except where specified otherwise. All ductwork shall be constructed and installed as per the requirements of AS4254-2002.

All ductwork including casings, housing, plenums and chambers for low or medium pressure systems with greater dimensions in any direction between 1000mm and 1500mm shall be not less than 1.6mm thick.

3.1 DUCTWORK

Provide as specified in 'NATSPEC SERVICES' including current amendments and the relevant performance requirements scheduled for VAV Boxes, Duct Heaters (electric), and Sound Attenuators.

Add - 1. Clause 3.4 - Fire Protection

For fire protection of the ductwork, special supports and fixings shall be allowed in accordance with the fire rating system manufacturer's requirements and in accordance with the design complying with AS1668 Part 1 1998 and AS1530.4

2. Clause 3.3 - Kitchen Exhaust

Ductwork where installed horizontally shall rise in the direction of airflow at a slope of not less than 0.5%.

3. Clause 6.1 - Duct Heaters

Provide an unheated tail of at least 50mm between the terminal box mounting plate and the start of the heating element section.

4. Clause 7.2 - Slot Diffusers

Maximum length shall be 2000mm where continuous sections are shown. Slot widths shall be 25mm.

5. Clause 7.2 - Types of Diffusers

Door Grilles

Door Grilles shall be supplied by mechanical trade and installed by the Contractor. The door grilles shall have a correct free area for the designed air quantity and based on a velocity of 1.0 to 1.5m/s. Door grilles installed in fire doors shall include an integral intumescent fire damper. The damper and door leaf shall be certified as a whole unit. Door grilles and door leaves shall be coordinated with mechanical trade and builder.

Undercut door

Door to be undercut 19mm by Contractor. Fire doors shall not be undercut. In this instance fire rated door grilles shall be provided. Refer to above.

6. Clause 9.1 - Casing - Sheet Metal Construction

Plenums forming part of air handling, fan coil, packaged air conditioning unit or similar shall be of the same construction as the unit and bolted securely to the unit to form an integral assembly. Screws are not permitted. Plenums are to be lined with 50mm acoustic insulation with perforated metal facing.

7. Clause 4.5 - Variable Air Volume (VAV) Boxes

Include suitable mounting for hot water heating coils and supply and fit coils as per schedules. Provide drain trays under all hot water coil headers and valves. Trays shall be removable using brackets from the VAV Box and coil assembly.

9. Flexible Ductwork

Low pressure flexible ductwork shall be used where indicated on the drawings which are diagrammatic only and indicate the intent of the design. The ducts shall be as straight and smooth as possible with long radius bends. Supports shall be at a maximum of 2m centres and be of 1.2mm x 25mm galvanised steel.

Flexible ductwork shall not be located closer than 2000mm from any fire damper.

All flexible ductwork for supply air shall be acoustically insulated and shall be a minimum of 1200mm in length and shall not exceed 4200mm in length.

Flexible ductwork shall be circular, either of corrugated, semi-rigid lock-formed design, made of aluminium or alternatively, constructed of a zinc plated spring steel helix, encapsulated in a reinforced aluminium or foil laminate liner. The duct shall be cut to the required length; joining of two lengths of duct will not be permitted.

Joints between flexible ductwork and sheet metal ducts and/or registers shall be carried out in an approved manner using hose clips around the duct and two layers of duct tape covering the joint. Flexible ductwork shall be installed in compliance with the manufacturers recommendations.

10. Balancing Points

Balancing points (pressure tapping points for system balancing) shall be located downstream of any main branch from the main duct where flow balancing is required. For duct pressure up to 0.6kPa, 25mm diameter holes sealed with rubber gaskets shall be provided. For duct pressures over 0.6kPa, 25mm screwed sockets shall be provided.

All balancing points shall be provided in readily accessible position upstream of any volume control damper but not less than seven (7) duct widths down-stream of a volume control damper or bend.

Balancing points shall be distributed evenly across the duct side as follows:

Largest side of duct	230mm	-	1 opening
	231mm - 380mm	-	2 openings
	381mm - 600mm	-	3 openings
	601mm - 1200mm	-	4 openings
	Above - 1200 mm	-	5 openings

Where balancing points are provided in fire rated duct an access panel shall be provided.

3.2 DUCTWORK JOINTS, FITTINGS ETC.

All round elbows in rectangular ducts shall be full radius. Throat radius shall be equal to 3/4 of the duct dimensions in the direction of the turn.

All square elbows shall have short chord turning vanes. The vanes shall be 40mm maximum radius and be spaced at a distance equal to half the radius. Turning vanes shall be Barber Colman 'Airturns' or approved equal.

All damper quadrants, control instruments or any other device mounted on insulated ducts, plenums or casing shall be provided with sheet metal stools so that the device is flush with outer surface.

All transverse joints shall be sealed with 'Isoclad' duct sealer as per manufacturer's recommendation. Prior to application of sealer, clean all joints with 'Emer Clean' as manufactured by Emery Chemical Pty Ltd or approved equal.

Flanged joints shall be made with mastic sealer strip. A sample shall be submitted for approval.

All ducts over 450mm in either direction shall be cross-broken excepting those to which rigid board insulation is applied.

3.3 INSTALLATION

Ductwork runs shown on the drawings are diagrammatic only and the complete installation shall be neatly erected and spaced. All work shall be laid out at the building, taking all measurements the construct the work to meet the actual building conditioning.

Crossovers, transitions, offsets and changes in duct shapes shall be installed to avoid interference with other services and obstructions. In all cases equal air flow resistance of all ducts shall be maintained.

A minimum clearance of 150 mm between duct joints, flange or duct insulation and the underside of all hung false ceilings shall be maintained to provide access for installation and relocation and servicing of light fittings unless shown otherwise on the drawings.

All ends of ductwork shall be covered during construction and ductwork shall be inspected internally prior to erection to remove all dirt, dust and any foreign matter.

Ductwork shall not be penetrated by any other service unless deemed absolutely necessary. In such cases 'tear drop' sheet metalwork fairings shall be installed carefully shaped around the service and the ductwork sealed at the penetrations.

Floor of roof slabs of waterproof construction shall not be penetrated by retaining bolts or inserts. The approved method of securing will be checked by the Superintendent.

Sheetmetal work with spot welds shall be wire brushed and treated with cold galvanised paint.

Drain points shall be provided in any duct where water from outside may accumulate.

Ducts connecting to external louvres shall be fully sealed to rear of louvre.

3.4 DUCTWORK SUPPORTS

Sheetmetal work shall be adequately supported using hanger, brackets etc. and fixings suitable for the building structure. All ductwork shall be supported off structural beams.

Supports shall be straight, true and aligned and located where possible away from fittings.

Types of supports and fixings shall be approved before installation.

All ductwork under 750mm in width shall be supported by 25mm x 1.5mm flat iron brackets extending underneath the full width of the duct.

Ducts passing through walls, partitions and floors, except those with spring hangers, shall be secured to angle iron frames by rivets or screws.

For fixing of supports and spacings, refer to Sheetmetal Constructions Manual.

3.5 VOLUME DAMPERS

Manually operated volume dampers shall be of the opposed blade type for rectangular ducts and butterfly type for circular ductwork. All dampers shall be complete with an approved locking device for infinite adjustment with adjustment positions of open-half-shut clearly marked on the quadrant.

Damper size shall not be less than the duct size. Where external insulation occurs, the dampers shall have extended shafts and mounting lugs on the quadrant and sheet metal stools to make the damper control flush with the insulation.

On completion of the air balance, the damper control position shall be marked with red paint and locked at such position.

Dampers shall be installed in all branch take-offs from the main duct, all branch ducts to registers without integral opposed blade dampers and all locations necessary to achieve the correct air balance.

All outside air dampers shall be anodised aluminium throughout to afford best protection from salt laden air.

3.6 ACCESS DOORS

Access doors shall be installed at every air filter, volume damper, control equipment, turning vanes, to permit inspection, operation and maintenance.

Access doors shall be exactly located with respect to their respective equipment.

The Mechanical trade shall submit locations, size and design of all access doors in finished surfaces and exposed areas to the Contractor for approval based on approved workshop drawings in good time to enable them to be incorporated into the construction.

The Contractor shall ensure that all necessary access doors are provided and whilst it is anticipated that sufficient access doors have been detailed, the Contractor is to install any and all doors which will be required for the efficient installation and maintenance of the work.

3.7 SPLITTER DAMPERS

The blade shall be controlled by a rod or rods firmly fastened with a hinged or ball type joint near the leading edge of the blade.

The rods shall be adjusted through guiding bosses, riveted to the duct and sealed with 3 mm felt pad gaskets. After adjustment, the rods shall be securely clamped to the bosses with set screws. All rods shall be clearly marked with a shallow filed groove to indicated the final set position after balancing.

Rod hinges shall be zinc or cadmium plated.

Blades shall be constructed from galvanised sheet steel of the following minimum thickness:

- a. Double thickness - 1.0mm.
- b. Single thickness - 1.6mm.

Manually operated volume dampers shall be of the opposed blade type for rectangular ducts and butterfly type for circular ductwork. All dampers shall be complete with an approved locking device and adjustment positions of open-half-shut on the quadrant.

Damper size shall not be less than the duct size.

Where external insulation occurs the dampers shall have extended shafts and mounting lugs on the quadrant and sheet metal stools to make the damper control flush with the insulation. On completion of the air balance, the damper control positions shall be marked with red paint.

Dampers shall be installed in all branch take-offs from the main duct and all branch ducts to registers without integral opposed blade dampers and all locations necessary to achieve the correct air balance.

3.8 BACK DRAUGHT DAMPERS

Back draught or non return dampers shall be constructed with 1.0 mm thick aluminium flaps with felt or foam plastic lined closing edges, freely hung on 13 mm diameter bright steel spindles at centres not greater than 100 mm and secured in rigid self-supporting aluminium alloy frames.

The flaps shall be provided with adjustable counter weights or light springs to ensure satisfactory working operation.

3.9 FIRE DAMPERS

All fire dampers shall comply with the requirements of AS 1682 and AS 1668 Part 1. The fire dampers shall have a 4 hour fire rating determined in accordance with AS 1530, Part IV.

Fire dampers shall be of the black steel, gravity operated, approved type with fusible links (except dampers within fire doors which may be of intumescent type). All fire dampers shall have certified fire ratings as certified by the Commonwealth Building Research and Testing Station, Ryde, NSW to meet the application. The dampers shall have a smoke leakage rating of not more than 2.5% of the air handled by the damper.

Fire dampers shall be installed where ducts pass through any fire rated masonry or concrete walls and floors and fire partitions and wherever required by the Authorities having jurisdiction.

Fire dampers shall be set in openings so arranged that there is provision for expansion of the damper when heated; clearance being at the rate of 3mm for each 450mm length of damper blade with a maximum clearance of 15mm. Expansion space so formed shall be filled with 'Kaowool' or approved equal material so that the passage of fire and smoke through it is prevented.

Damper frames shall be not less than 2.5mm thick galvanised steel and damper blades shall have a maximum width of 300mm. On ducts deeper than 300mm, multi-blade dampers shall be used.

Fire dampers shall be sized to prevent any increase in static pressure or velocity to prevent any noise generation in the duct. Transformation duct pieces shall be provided to connect to the fire damper.

Motors for smoke dampers, fire dampers and volume control dampers shall be provided where required and as shown on the drawings.

FIRE DAMPERS ON THE EXTERNAL WALL AND/OR FOR OUTSIDE AIR APPLICATION SHALL BE STAINLESS STEEL.

3.10 UNDER-FLASHING AND OVER-FLASHING

Under-flashing for roof will be carried out by the building trade. Mechanical trade shall furnish and install over-flashing consisting of 0.8mm thick zinc which shall be brazed all around and lap over the flashing a minimum distance of 100mm.

4 AIR REGISTERS, DIFFUSERS AND GRILLES

4.1 GENERAL

All air registers, grilles and diffusers shall be provided as indicated for supply, return air, exhaust air and transfer air systems and shall be suitable for the air distribution application.

All registers, grilles and diffusers shall have concealed fixings of the spring clip type; exposed screw heads shall not be used.

Removable cores shall be provided except for linear fittings, swirl diffusers and frame styles and sizes shall be approved by the Superintendent to suit the ceiling and floor construction.

The Mechanical trade shall submit samples of each type of diffuser, grille, register and damper including plenum box, if applicable for approval by the Superintendent before ordering this equipment.

The exterior finish shall be baked enamel and the interior surfaces shall be matt black. Final colours to be selected by the Superintendent.

Each air register, grille or diffuser shall be provided with a means of adjusting the air quantity, either by means of an integral opposed blade volume damper, or remote opposed blade damper or splitter damper. In all cases dampers shall be readily accessible.

The exact position of all registers, grilles and diffusers shall be co-ordinated with the ceiling structure, the lighting layout and the floor plan layout and to the approval of the Superintendent, before fixing in position. The mechanical trade and Contractor shall be fully responsible for ensuring that the registers etc will fit in with the ceiling, lighting layout, and floor plenum without additional cost.

Where flexible connections are indicated, they shall be a minimum of 4000 mm long and shall be adequately supported.

Face and neck sizes, length and number of slots, etc. shall be as indicated on the tender drawings. Tenderers shall state the total numbers or lengths in their tender submission as taken from the drawings.

4.2 SIDEWALL SUPPLY AIR REGISTER

Sidewall supply air registers shall be double deflection type complete with acoustic insulated plenum boxes and volume control dampers (opposed blade type) adjustable through the core. The registers shall be constructed of extruded aluminium and shall incorporate both horizontal and vertical aerofoil blades. The registers shall be finished in baked enamel to a colour to be approved by the Superintendent. The blades shall be pitched at 25mm centres with the front blades horizontal and rear blades vertical. The core shall be removable.

4.3 CEILING MOUNTED SUPPLY AIR DIFFUSERS

Diffusers shall be manufactured from extruded aluminium and finished in baked enamel to a colour to be approved by the Superintendent. All diffusers shall have a removable core.

Each diffuser located in a plasterboard ceiling shall be fixed using a concealed method with mounting frame in accordance with manufacturer's recommendation. Diffuser in tiled ceiling shall have face dimensions and frame style to lay in the standard tile width where possible.

Each diffuser shall be complete with an acoustic insulated plenum box, mounting frame for concealed fixing and all accessories to complete the installation.

Each diffuser shall be provided with a volume control damper (opposed blade type) adjustable at duct spigot. The core of the diffuser shall be four way blow and blanked off where shown on drawings. All diffusers shall be 4-way louvred face type with nominal face and neck sizes as shown on the drawings.

4.4 FLOOR DIFFUSERS

Diffusers shall be Krantz floor twist outlet model DBE or approved equivalent. Diffusers shall be equipped with VSD type volume control damper consisting of two slotted baskets. Rotation of the inner basket allows volume control adjustment. Damper shall be fixed in position via securing tab or nut. Bottom of basket shall be non slotted to allow the prevention of dust and dirt entering the floor plenum. Grilles shall be removable to allow cleaning of the internal basket.

Three variants of the floor grille are to be provided:

- 1) Directional control. Grille face designed with non symmetrical pattern to allow rotation of grille to change air distribution direction
- 2) Directional control with duct connection type. Suitable for underfloor duct connection;
- 3) Non-directional control. Symmetrical air flow grille pattern.

Refer to drawings for numbers and locations of each type.

Diffusers shall be constructed of plastic with colour to architect specification.

4.5 CEILING MOUNTED EXHAUST / RETURN AIR GRILLES

Lattice or eggcrate type return air grilles shall be constructed from extruded aluminium and shall have fixed lattice fins spaced at 13mm centres. The grilles shall be finished in baked enamel to a colour to be approved by the Superintendent. All grilles shall be provided with acoustic insulated plenum boxes.

4.6 WALL MOUNTED RETURN AIR LOUVRES / DOOR GRILLES

All wall mounted return/relief/make-up air louvres and all door grilles shall be supplied by the mechanical trade and shall be installed by the Contractor. All such louvres and grilles shall have a correct free area for the designed air quantities.

Internal wall mounted return air grilles shall be half chevron type of aluminium construction and finished in baked enamel to a colour to be approved by the Superintendent. The grilles shall incorporate fixed louvres set at 45° angle and pitched at 25mm blade spacing. The grilles shall incorporate removable cores. All grilles shall be provided with acoustic insulated plenum boxes.

Door grilles used for make-up and relief air purposes shall be full chevron no sight type manufactured from aluminium extrusion with a natural or colour anodised aluminium finish - colour to be approved by the Superintendent. The grilles shall be supplied complete with a telescopic back frame for double sided appearance.

Outside air intake louvres shall be of aluminium construction with a weatherproof natural or colour anodised aluminium finish - colour to be approved by the Superintendent.

4.7 LINEAR CEILING DIFFUSERS

Linear ceiling diffusers shall be manufactured from high quality extruded aluminium sections and finished in baked enamel. Slot widths shall be as scheduled. Maximum length shall be 2000mm where continuous sections are shown, aligning strips be provided. Each slot shall be with adjusting device for flow and direction.

Plenum boxes shall be constructed from galvanised sheet metal and shall be acoustically installed.

4.8 LINEAR BAR DIFFUSERS

Linear floor diffusers shall be manufactured from high quality extruded aluminium sections and finished in powder coating. Slot widths shall be as scheduled. Maximum length shall be 2000mm where continuous sections are shown, aligning strips be provided. Each slot shall be with adjusting device for flow and direction.

Plenum boxes shall be constructed from galvanised sheet metal and shall be acoustically installed. Perforated plate shall be provided where necessary for balancing.

5 SECTION 5 PIPEWORK, FITTINGS AND VALVES

5.1 GENERAL

Furnish and install pipework, fittings, valves etc which shall include all items to complete the installation, whether actually indicated or not in the specification or drawings.

The complete installation shall be to the Superintendent's approval. If any work does not comply with the requirements of the Superintendent, the mechanical trade shall remove, alter, amend or re-instate the pipework and fittings as determined by the Superintendent

Refrigerant pipework shall be copper to AS4041-1992.

Chilled water and low temperature hot water pipework shall be copper to AS1432-1996 type B (hard drawn).

Condensate pipework shall be PVC to AS/NZS1477-1996 class 12.

Indoor and outdoor air conditioning split units shall be interconnected by means of refrigerant quality tubing. All required branches, tees and points necessary for the satisfactory completion of the works shall be provided.

The refrigerant and condensate pipework shall be supported from medium gauge galvanised steel cable tray using 17mm EVA coated galvanised steel cable band fixed to proprietary screw fixings.

Ensure that supports pass over the pipework insulation and that there is no direct contact between the copper pipework and galvanised tray. The insulation thickness shall not be reduced due to fixings and the like.

A condensate drain shall be provided for all air handling equipment including split ducted fan coil units, chilled water fan coil units and chilled water air handling units to a drain connection. Tundishes and floor wastes to be provided by hydraulic trade.

5.2 DESIGN PRESSURES & TEMPERATURES

The design pressures and temperatures of refrigerant piping, chilled water piping and low temperature hot water piping shall be as tabulated below :

System	Material	Design Pressure	Test Pressure	Temperature Range
Chilled Water	Copper	1400 kPa	2100 kPa	4 °C to 40 °C
Heating Water	Copper	1400 kPa	2100 kPa	10 °C to 100 °C
Refrigerant	Copper	2000 kPa	3000 kPa	-20 °C to 80 °C

5.3 PIPE SIZES

Pipe sizes mentioned throughout this specification are nominal sizes and those pipe sizes shown on the related drawings or indicated in the tender documents are the minimum acceptable sizes.

Sizes for copper piping indicate Nominal Outside Diameter (OD).

5.4 INSTALLATION

Pipe runs shown on the drawings are diagrammatic only and the complete installation shall be neatly erected and spaced.

Pipework shall follow lines of walls and shall be graded to ensure venting, draining and oil recovery. The clearance between pipework including insulation and building structure, other services or other pipework (including insulation) shall be a minimum of 40 mm.

Pipework in ducts and false ceiling shall be erected and spaced to allow access for future maintenance of all services.

Pipework shall be free from burrs, rust and other defects and shall be thoroughly cleaned before erection. All cut pipe ends shall be reamed out and left smooth before being joined together.

All ends of pipes shall be capped with metal screwed caps or plugs for screwed pipework, and wooden plugs where not screwed.

Pipework shall be installed to avoid any noise generation under normal operations.

5.5 PIPEWORK JOINTS AND FITTINGS

Unions or flanges, whichever is applicable, shall be fitted in sufficient numbers to allow easy dismantling of any section of pipework if desired and shall be fitted on all major items of equipment to allow removal of equipment without dismantling the pipework and fittings.

Reducing and expanders in horizontal pipework shall be of the eccentric pattern so arranged with top level and bottom offset for obviating air pockets in waterlines. For airlines they shall be so arranged with bottom level and top offset.

All bends/elbows shall be of the long radius type and pulled bends and sets shall be used where possible.

Joints or fittings shall not occur in the thickness of or be embedded in any part of the building structure.

Where pipework of dissimilar metal are jointed together, they shall be separated at each junction by an approved coupling.

Allow for all necessary expansion joints to manufacturer's recommendation.

5.6 PIPEWORK SUPPORTS

Pipework shall be adequately supported to prevent sagging, allow venting and draining and free movement due to expansion and contraction. All pipework within the building shall be supported off structural beams.

Supports shall be straight, true and aligned, and located where possible away from fittings. Where lines of pipework run as a common bank, they shall be supported on a common hanger bar of suitable type to minimise the number of fixings to the building structure.

Types of supports and fittings shall be approved before installation.

Supports for vertical pipework shall be of the clamp type.

Supports for pipework running along walls shall be suitable wall type or gang type hangers.

Supports for copper pipework shall have PVC tape or lead inserts between pipework and split ring.

Supports for chilled water pipework or any other pipework with vapour barrier insulation shall have hardwood inserts of full diameter of insulation between pipework and split ring.

Vapour barriers shall be continuous over hardwood inserts.

Hanger rods shall be of hot rolled steel and threaded and shall be of the following minimum diameter:

Nominal Pipe
size in mm

15 20 25 32 40 50 65 80 100 125 150 200

Rod diameter
size in mm

6 6 10 10 10 10 16 16 16 20 20 22

Maximum spacing between supports for copper pipework shall be as follows:

Nominal pipe
size in mm

13 19 25 32 38 51 63 76 102 127 152

Span in m

2 2 2 2.5 2.5 2.5 3 3 3 4 4

Fixings generally shall be of the "Rawl" manufacture. Power fixings will not be accepted.

5.7 SLEEVES

Sleeves shall be installed on pipework at all penetrations of the building structure and shall be the full thickness of the complete construction. The sleeves shall be of the same material as the pipe and be large enough to accommodate insulation.

5.8 STRAINERS

Furnish and install strainers where shown on the drawings for all systems and equipment susceptible to damage from dirt, grit or foreign matter.

Strainers shall be of the Y-type having bronze or monel removable mesh basket and shall be of such design as to allow blowing out of accumulated dirt and removal of the basket without discontinuity of service.

Strainers shall be of suitable pressure rating for the duty intended.

5.9 VALVES

Furnish and install all gate, vent, check, pressure relief, pressure reducing valves, and all other valves required for the complete and proper valving of all systems.

In all cases not specifically mentioned, approved types of valves only shall be used. All materials and packing shall suit the type of service in which the valve is to operate.

All valves shall be placed in accessible positions for maintenance and repair. Any valve located more than 2.5 m above the floor shall be chain operated with a suitable length of chain.

Drain valves shall be as the section "Draining" under "Pipework and Fittings".

Refrigerant valves shall be of approved type to suit the application.

Valves used in the chilled water and low temperature hot water circuits shall be as per the valve schedule on the following page.

PIPING MATERIALS, PRESSURES, TEMPERATURES – SCHEDULE

System	Material	Design Pressure kPa	Test Pressure kPa	Temperature Range
Chilled Water	Copper or Stainless Steel	1400	2100	4°C to 40°C
Condenser Water	Copper or Stainless Steel (Above ground) Stainless Steel or PVC Class 12 (Below ground)	800	1200	10°C to 50°C
Vents, Drains, Overflows, Make-up, cold-feed, expansion	Copper	To suit relevant system		0°C to 100°C
Condensate Return	Steel	500	1000	10°C to 100°C
Heating Water	Steel or Copper	1400	2100	10°C to 100°C
Refrigerant	Copper	2000	3000	-20°C to 350°C

5.10 VALVE SCHEDULE
 CHILLED WATER/CONDENSER WATER/HOT WATER 700 kPa to 2,100 kPa

Size (mm)	"Johns" Valve Figure Number	Body Material	Disc and Seat Material	Stem Material	Ends	Bonnet and Stem Design	Remarks
15-40	<u>THROTTLING</u> Fig. 501 Fig. 502 Fig. 201	B.R.	S.S.	S.S.	Screwed	Screwed I.S.	Globe Valves
50-80		B.R.	S.S.	S.S.	Table H	Screwed I.S.	Globe Valves
100-450		C.I.	Gummetal	D.R. Brass	Table F	Bolted OS & Y	Globe Valves
15-50	<u>ISOLATION</u> Fig. J360 Fig. 59 Fig. 60M Fig. 600F	B.R.	D.R. Brass	D.R. Brass	Screwed	Screwed I.S.	Ball Valves
15-50		B.R.	B.R.	S.S.	Screwed	Screwed I.S.	Gate Valves
50-80		B.R.	B.R.	S.S.	Table F	Screwed I.S.	Gate Valves
100-450		C.I.	B.R.	S.S.	Table F	Bolted I.S.	Gate Valves
50 & over	<u>NON-RETURN</u> Fig. 430	C.I.	S.S.	S.S.	Wafer	-	Dual Check Valve
50 & over	<u>BALANCING</u> To be equivalent to 'TA' STAT or 'John' balancing valves Flow Rate Valves (FCV) To be equivalent at Griswold automatic flow control valves. Accuracy $\pm 5\%$ for flow>	C.I.	P.T.F.E.	S.S.	Table H	Refer manuf.	Flap

Abbreviations:
 B.R. Bronze
 N.K.L. Nickel

S.S. Stainless Steel
 F.S. Forged Steel

C.I. Cast Iron
 S.G.C.I. Spheroidal Grey Cast Steel

C.S. Cast Steel

6 MECHANICAL INSULATION

Provide as specified in 'NATSPEC SERVICES' including current amendments.

Add - *Item 1.3 Application

Except where internal insulation is specified supply and install 25mm thermal insulation

- To all supply air ductwork
- To return air ductwork if located in the roof space and/or unconditioned space.

Where internal acoustic insulation is shown on the drawings, it may act as thermal insulation for these sections of ductwork or plenums only.

Provide internal lining to all fan coil return air/fresh air plenum and other ductwork where shown on drawings, and/or at least 6 metres from each air conditioning unit and fan if no lining is shown. Internal lining shall be 25mm, 50mm or 100mm where indicated. Internal lining for fire rated ducts shall have perforated metal facing.

Insulation thickness for hot water piping shall be as follows:-

Up to 80mm diameter pipes	25mm thick
Over 80mm diameter pipes	40mm thick

Insulation thickness for chilled water pipes shall be as follows:-

Up to 50mm diameter pipes	25mm thick
65mm to 250mm diameter pipes	40mm thick

Insulation thickness for condensate pipework (if copper) shall be 25mm. The first five meters of PVC condensate pipework shall be insulated 10mm thick if installed in an unconditioned space or under roof space.

All insulated piping inside plantroom and/or exposed to view/weather shall be metal sheathed with 0.6 mm thick zincanneal or equivalent spring over the insulation in one piece with at least 30 mm laps; the whole tightly clamped in position with 12 mm x 0.05 mm thick galvanised mild steel straps spaced at not more than 450 mm centre. Raw metal edges shall be rolled where exposed to view.

Metal sheathing on bends shall be lobster backed.

"Lobster backs" may be fastened with galvanised steel straps.

All insulated ductwork inside plantroom and/or exposed to view/weather shall also be metal sheathed to same requirements as above.

Supply and install thermal insulation to all refrigeration suction piping and fittings.

Fire resistance indices shall meet the requirements of AS 1668 Part 1.

Insulation shall not be applied until acceptance of all tests for leaks, etc.

Samples of manufacture and type of insulation shall be submitted for approval, together with the method of application.

Insulation shall be installed to permit the proper installation of the material specified with minimum space between adjacent construction and insulation of 40 mm for pipework. Make shift patching or filling with loose or blown insulation because of lack of space will not be permitted. Adjacent and parallel pipes will not be carried together within insulation material.

Insulation shall not be applied to wet, sweating or frosted surfaces until the surface is thoroughly dried and allowed to come to ambient conditions.

Insulation to surfaces normally below ambient conditions shall incorporate a vapour barrier which shall be continuous for the complete application.

The contractor shall make good any damage to installed and existing insulation during the execution of works.

6.1 Refrigeration suction pipework

The completed system shall be effectively evacuated and dried before charging.

Insulation material shall be closed cell polyethylene foam, having a density of not less than 50kg/m³ or pre-formed moulded section Class SL polystyrene foam. Both to be in accordance with AS 1366 Part 3.

Insulation thickness shall be 25 mm, up to 80 mm O.D. pipework and 40 mm thickness above. Insulation, facing and vapour seal shall be factory applied sisalation 450 glued to the insulation using an approved adhesive.

The Sisalation 450 facing shall be vapour sealed by making a 50 mm wide lap on longitudinal joints and gluing. Circumferential joints shall be sealed by means of 75 mm wide Sisalation 450 tape lapped 38 mm over each adjoining facing and glued with an approved adhesive.

Pipe runouts 20 mm O.D. and smaller from main pipework shall be insulated using fire resistant closed cell foamed plastic insulation equal to F.R. Armaflex of 15mm wall thickness in which case no facing or sheathing is required.

7 NOISE SUPPRESSION AND VIBRATION ISOLATION

7.1 GENERAL

Provide vibration isolation of all rotating or vibration emitting equipment including chillers, pumps, fans and fan coil units which shall be mounted and isolated from the building structure.

All isolation devices shall be selected for uniform static deflections according to distribution of weight. Mountings used externally shall be painted with cold galvanising paint or hot dipped galvanised.

7.2 RUBBER AND NEOPRENE MOUNTINGS

Rubber-in-shear isolators shall be properly housed and provided with adequate facilities for bolting. Rubber shall be hardness of 35 durometer with an area ratio of 0.5 and shall be selected to deflect by a maximum of 20% of its thickness.

Neoprene mountings shall be double deflection and shall have a minimum static deflection of 9mm. All metal surfaces shall be neoprene covered to avoid corrosion and shall have friction pads both top and bottom so that they need not be bolted to the floor. Bolt holes shall however be provided. Where necessary, steel rails shall be used above the mountings to compensate for overhang.

Rubber-in-steel isolating pads where indicated shall consist of 6.5mm thick steel plates cold bonded between 13mm thick rubber pads.

7.3 SPRING ISOLATORS

Spring isolators shall be laterally stable and shall be free standing without housing for deflection over 25mm. They shall be complete with 6.5mm thick neoprene acoustical friction pads between baseplate and support. All mounting shall have levelling bolts that must be rigidly bolted to the equipment. The outside diameter of each spring shall be as follows when floor mounted.

<u>Load - kg</u>	<u>Deflection</u>			
	<u>25</u>	<u>40</u>	<u>50</u>	<u>90mm</u>
up to 500	63	115	140	180
500 to 1000		100	140	180 200
1000 to 1500	140	180	200	200

In any event the ratio of spring diameter to compressed spring length shall not be less than 0.08.

All springs including those in spring hangers shall be designed to have equal constants in horizontal and vertical planes to withstand solid compression without being overstressed and to operate at not greater than 2/3 of solid deflection.

Equipment with operating weight different from installed weight shall include a housing with vertical resilient limit stops to prevent spring extension when weight is removed. The housing shall serve as blocking during erection and the installed and operating clearances shall be the same. A minimum clearance of 6.5mm shall be maintained round restraining bolts and between the housing and spring. Limit stops shall be out of contact during normal operations.

7.4 CHILLER ACOUSTIC MEASURES

Chiller shall be installed with loaded vinyl jacket around compressor.

7.5 FLEXIBLE CONNECTIONS FOR PIPEWORK

Flexible connections shall be installed parallel with and horizontal to the shaft of operating equipment wherever possible and of full bore.

The length of flexible connections shall be 300mm for 40mm diameter pipework and under, and 450mm for 50mm diameter pipework and above.

Piping within 10 metres of the pumps should have a medium soft neoprene rubber sleeve fitted between the pipe clamps and the pipe, as a vibration isolator. Neoprene should be a minimum 10mm thick soft enough to compress noticeably when compressed by hand, but not collapse totally.

Allow flexible connections for pipework where there are building movement joints.

7.6 FLEXIBLE CONNECTIONS FOR DUCTWORK

Flexible connections shall be fitted to isolate fans and/or conditioner casings from ductwork.

Materials and application of flexible connections shall be in accordance with AS 1668, Part 1. Flexible connections shall be air-tight and arranged to permit the renewal of the fabric without disturbing the ductwork or plant. All fabric at the seam shall be folded back to conceal raw edges.

The sewn joints shall be able to withstand all stresses imposed during service. The flexible connections shall have adequate slack to absorb relative movement and vibration of the connected items.

The metal parts of connected equipment shall be separated by not less than 100mm.

Allow flexible connections for ductwork where there are building movement joints. Flexible connection within ceiling spaces shall be wrapped with 1 (one) layer of 'Wavebar' or equal.

7.7 SOUND ATTENUATORS

Provide sound attenuators in ductwork for supply air fans, return air fans, and exhaust fans as shown on the drawings or scheduled.

7.8 APPLICATION OF VIBRATION ISOLATION

<u>Equipment Name</u>	<u>Minimum Type of Isolation</u>
AHU's, Packaged Units and Exhaust Fans over 1000L/s	25mm static deflection spring/neoprene vibration isolation mountings similar to EMBELTON XL or AL
Exhaust Fans under 1000L/s EMBELTON SH.	Double deflection neoprene hangers similar to
Chillers	Spring isolators
Pumps	Spring isolators
Condensing Units	25 mm static deflection spring/neoprene

8 WATER TREATMENT

Design

Provide water treatment systems for the control of the following:

- Open systems: Scale formation, corrosion, sludge accumulation and microbiological growth including *Legionella* species.
- Closed systems: Scale formation, corrosion, sludge accumulation and microbial growth.
- Allow for bleed-off and trimming chemicals to suit systems offered.

Compatibility

Provide water treatment which suits the fluid being treated and the as-installed system construction.

Corrosion rates

Provide water treatment to limit corrosion rates to the following:

- Mild steel and iron: 150 $\mu\text{m}/\text{year}$.
- Stainless steel: 5 $\mu\text{m}/\text{year}$, with no pitting.
- Copper: 12 $\mu\text{m}/\text{year}$.

Chemicals

Supply sufficient quantities of chemicals to treat the water from the time of initial filling to beyond the end of the maintenance period.

Test Loops

General: Provide loops in water circulating systems containing corrosion coupons representing the respective metals in the system.

Standard: To ASTM D 2688.

Coupons: Suitable for changing every 3 months.

Marking- Hazard identification

Identify piping and storage vessels containing hazardous materials.

Marking - Safety signs

If hazardous chemicals are to be stored, provide safety signs to AS 1319.

8.1 WATER TREATMENT SYSTEMS

CHEMICAL DOSING - OPEN SYSTEMS

General

For each independent system to be treated, provide a separate chemical dosing system consisting of a storage tank supplying chemicals to a dosing pump automatically activated by a control unit.

Storage tanks

Low density polyethylene construction with lid, sized to provide sufficient capacity between service visits.

Dosing pumps

Electrically direct driven, manually adjustable type.

Automatic bleed

General: Provide for automatic control of total dissolved solids in each system, using conductivity control units activating solenoid bleed valves in water bleed lines.

Solenoid valves: Diaphragm type, sized to suit the expected bleed off rate. Provide upstream Y-type strainers with 1.6 - 3.2 mm aperture size and isolation and throttling valves.

Stand-by bleed: Provide additional bleed lines for manual bleeding, with throttling valves.

Biocide dosing

System: Provide automatically controlled biocide treatment direct into each system.

Materials: Rotate the type of biocide regularly according to schedules prepared by a suitably qualified person.

CHEMICAL DOSING - CLOSED SYSTEMS

General

For each independent system to be treated, provide a separate chemical dosing system consisting of a by-pass slug-dose feeder vessel employing discharge flow to flush chemicals into the system.

Feeder vessels

Provide a storage tank capable of withstanding the maximum pump pressure. Provide a funnel, DN 15 piping and valve for adding chemicals, a vent line with valve, a DN 15 drain line with valve discharging to drain, and a DN 15 outlet line with valve.

FILTERS

Construction

General: Provide proprietary filter systems consisting of storage tanks, piping, valves, instruments timers and controls to provide automatic backwashing.

Backwash system: Complete with piping, valves, pressure gauges and ancillary devices to show the need for backwash.

Backwash cycle: Initiated by automatic timer with provision for manual override.

8.2 COMPLETION

COMPLETION TESTS

Acceptance tests

For bacteria including *Legionella* species: Sample and test using a NATA-accredited testing authority.

Legionella analysis: To AS/NZS 3896.

Bacteria analysis: Total plate count to AS 4276.3.1.

Test report: Required.

PRE-TREATMENT

General

Supply chemicals for pre-cleaning, cleaning and flushing of mechanical piping systems. Ensure correct use of the chemicals by providing instructions and supervision.

INITIAL TREATMENT

Chemical cleaning and flushing

Detergent flushing: After hydrostatic testing has been completed, release the testing water and flush piping systems using non foaming alkali detergent solution.

Cleaning and flushing: Introduce cleaning chemicals to piping systems and circulate continuously for at least 24 hours, with control and manual valves open. Drain the systems and clean strainers. Flush with clean water until cleaning chemicals are removed.

Initial treatment

Drain piping systems and charge with chemically treated water

9 AUTOMATIC CONTROL SYSTEM INCLUDING DDC

9.1 GENERAL

Furnish and install all labour, materials, equipment, commissioning, tests and services required for the complete automatic controls installation. All control equipment and software shall be BACnet compatible.

All automatic controls shall be so located as to be readily accessible for maintenance. Furnish and install access doors for this purpose.

All control wiring shall be run in conduit as specified in Section "Electrical" of this specification.

Under all schemes of control, starting the pumps/fans shall activate all automatic controls for any one system. When pump or fan is not operating, all controls shall be de-energised except where shown otherwise.

All controls shall have identification numbers. Numbers shall be in the same order as shown on the drawings and in this specification. Refer to Section "Painting and Identification" of this specification.

At the time of practical completion all controls shall be sealed in the presence of the Superintendent.

9.2 CONTROL DRAWINGS

Before commencing any installation work in connection with the control system, the Contractor shall submit for approval to the Superintendent, fully detailed, comprehensive diagrams, identifying all items of control equipment and showing the following :

1. Diagrammatic representation of all controls and control wiring indicating cubicle mounted and field mounted items.
2. Control schedule showing the relationship between measured variables and position of controlled devices.
3. Equipment schedule.
4. Description of sequence of operation.
5. Set points, operating ranges and zero positions of all instruments.

One copy of the approved drawings shall be placed inside the control panel door of the control switchboard inside a protective plastic cover.

One copy of the "as installed" drawings shall be provided with each operating and maintenance service manual.

All circuit breaker and fuse ratings, cable sizes, thermal overload range of motors, time delay settings, etc., shall be clearly indicated on the drawings.

The diagram and the symbols used shall conform to the S.A.A. Standards.

9.3 OPERATING SEQUENCE OF MECHANICAL SYSTEMS

The mechanical trade shall supply, install, test and put into operation the automatic electronic control systems to the functionality as shown on drawings. The following is a summary of the control interfaces and room controller provisions.

DDC controller panels:

DDC controller panels shall be provided to perform control functions for the main chiller plant. These panels shall be located within the mechanical switch boards. DDC controllers shall receive start/stop, temperature signals and after hours requests from local controllers as highlighted below. DDC controllers shall incorporate provision for outputs to a BMS system where specified on the drawings. Connection to BMS shall be a future provision.

Main plant shall run to a time schedule.

Summary of main control scenarios

Library internal air handling plant:

- Operates to a pre determined time schedule
- Constant volume underfloor system
- After hours call shall start main plant and run for an adjustable time period. Automatic switch off. Exact location of after hours switch to be determined on site.
- Operates in dehumidifying mode, cooling only, and heating only modes. Responds to room humidistat and dry bulb sensors to achieve set point conditions.
- Local manually adjustable VCD's at floor outlets to adjust air flow quantities.

Library courtyard façade air handling plant:

- Operates to a pre determined time schedule
- Air flow to each branch modulated through motorised dampers in response to space temperature.
- Interlocked with main library unit (including after hours).
- Responds to room dry bulb sensors to achieve set point conditions.

Outdoor air intake fans:

- Interlocked with library air handling plant (including after hours)
- Lead fan on variable speed drive
- In economy mode lead fan increases to full capacity and secondary fan activates

Room under floor fan units:

- On/off operates to predetermined time schedule
- interlocked with main library unit (including after hours)

- Manual control of fan speed (low & High speed) at local wall mounted switchpanel.

Multi use room air conditioning:

- Normal operation: Served off main library underfloor air conditioning.
- Manual on/off control of supplementary ceiling mounted Fan coil unit. Provide 2 hour (adjustable) run on timer. Temperature control to local wall mounted temperature sensor.

Computer room air conditioning:

- 24 hour conditioning to computer room space

Early Childhood centre:

- On/off control to predetermined time schedule (adjustable)
- Temperature control to local temperature sensors.
- Provide after hours push button complete with indicator LED. After hours duration adjustable.

Meeting & link meeting room (existing building):

- On/ off control (2 hour run before auto switch off)
- Temperature control to local temperature sensors.

Conference room

- On/ off control (2 hour run before auto switch off)
- Temperature control to local temperature sensors.

Community Hall

- On/off control to predetermined time schedule (adjustable)
- Temperature control to local temperature sensors.
- Provide after hours push button complete with indicator LED. After hours duration adjustable.

Relief louvres:

- Automatic open/closed control based on wind direction as sensed by wind sensor.
- Interlocked with main air conditioning equipment.
- Louvre actuator control grouped into sections to facilitate fine tuning of number of louvres open at any given time.

Outdoor air economy cycle:

- Initiated by external enthalpy sensor located within outdoor air plenum behind intake louvre.
- Initiates operation of two outdoor air fans at maximum capacity.

Night purge operation:

- Ventilation fans run to pre determined schedule and to outdoor air temp sensor overnight to pre-cool the building.

Underfloor heating

- Runs 24 hours during winter. Interlocked with boiler operation.
- Night set back of temperature set point during unoccupied times.

Refer to control drawings for details of all control sequences.

1. Fire Alarm Control

Mechanical Motor Control Centre shall be provided with a fire control relay and connecting terminals from in duct smoke detectors signal in air systems via fire rated control wiring.

On receipt of a fire mode signal from the smoke detectors all mechanical exhaust and air conditioning systems shall be shut down at the MCC.

9.4 AUTOMATIC CONTROL FIELD HARDWARE

Monitoring devices and sensors, controlled devices and electric/electronic controllers shall be BAC-net compatible.

1. Monitoring Devices

Analogue Input Devices:

Analogue devices shall be of types which provide long term accuracy without need for regular calibration. Devices requiring special scaling or compensation for lead length are not acceptable. All devices shall have a range, accuracy, and speed of response suitable for the application and shall be suitable for the environment in which they are installed. Device types and wiring systems shall be selected and installed to ensure that they will not be adversely affected by induced voltages from other wiring systems in the building. Specified device accuracies shall be achieved in the software point value, i.e. after inclusion of all transducer and signal transmission errors etc.

Analogue Input Transducers:

Transducers shall be designed to operate in environmental conditions of 0-50°C and 10-90% R.H. (non condensing). They shall have integral, accessible zero and span adjustments, open and short circuit protection and reverse polarity protection.

Transducer Accuracy:

In accordance with AS 1384 Accuracy Class 0.2 shall be maintained for a fluctuation in instrument supply voltage of -20% to +40%. Transducers shall have 3 times continuous overload capability at 25°C and 4KV isolation between all inputs and outputs for 1 minute. The

output of transducers shall be 4-20 mA directly proportional to input over the entire rated span of the transducer.

Current Transformers:

Current transformers shall comply with AS 1675 and shall be class 1.0. They shall be of the resin encapsulated type with 5A secondary windings and shall be suitable to withstand the maximum fault current applicable to the switchboard in which they are installed. They shall be selected so as to produce a 5A output when the measured current is approximately 150% of the full load current. Current transformers shall be protected against open circuits caused by removal of the measuring transducer. A suitably selected varistor is preferred.

Temperature Transducers:

Temperature transducers shall have an accuracy of $\pm 0.25\%$ of span and a span not exceeding 100°C. Within the working range the accuracy shall be $\pm 0.3^\circ\text{C}$.

Temperature transducer :	Working Range :
Chilled Water	5 to 15°C
Heating Water	30 to 80°C

Temperature transducer (Immersion type): Sensing elements for pipe or tank insertion shall be of sufficient length to ensure accurate measurement and shall be installed in wells designed to permit easy removal for inspection or repair. Wells shall be designed to suit the sensor so that the response time remains suitable for the application. The sensor shall be in thermal contact with the immersed surface of the well. Wells for insulated pipework shall have sufficient length to ensure that sensor removal is not hindered by the insulation and wells shall be mounted such that condensation does not run into the sensor head. The transmitter section of the transducer shall be mounted adjacent to the well in which the sensor is mounted. It shall be possible to remove the transmitter and/or the sensor without removing the well from the pipe.

Duct Temperature Sensors:

Duct temperature sensors shall be of the Balco 500 ohm type with insertion probe minimum length 460mm. Discharge temperature sensors shall be of the averaging type with maximum element length of 5000mm.

Space Temperature Sensors:

Space room temperature sensors shall be solid state controllers utilizing an integral solid state element to produce a 2-10 volt or 4-20mA output signal. Setpoint shall be adjustable from 15-30°C and throttling range from 1 to 10°C. Wall mounted space temperature sensors for chilled water fan coil units shall be described above except they shall be of the concealed wall mounted or return air type.

Relative Humidity Sensors:

Relative humidity sensors shall be of the capacitance type for durability and accuracy and shall be self contained and solid state in operation with a linear output signal over the control range 20- 90% R.H of 2-10 volt or 4-20 mA.

Differential Air Pressure Switches:

Differential air pressure switches shall have suitable differential, adjustable setpoint and fixed differential not exceeding 10kPa air handling units. Switches shall be single pole double throw rated for 240V AC, 10 amp power supply. Select differential according to service.

Air Static Pressure Sensors:

Static pressure sensors shall be 2 part with solid state electronic circuitry producing a 4-20mA signal from strain gauge diaphragm deflection. Span and zero shall be adjustable at the sensor for calibration purposes. The static pressure sensors, complete with fastenings, covers and wiring shall be suitable for ductwork mounting.

Water Differential Pressure Sensors:

The differential pressure shall be of the strain gauge diaphragm type with solid state circuitry to produce a 4-20mA output. Zero and span adjustable at the sensor for calibration purposes. The differential pressure sensor shall withstand the system static pressure without affecting differential pressure readings.

Air Flow Pressure Switches:

Provide air flow pressure switches suitable for ductwork mounting. The air flow switch to incorporate a spring loaded diaphragm to move with pressure variation and actuate the switch when the air pressure difference reaches the set point. The set point shall be adjustable. The output shall be a single pole double throw switch.

Water Flow Switches:

Provide water flow switches suitable for pipework mounting. Adjust the vane section to suit the diameter of the pipe into which it is inserted. The set point shall be adjustable. The output shall be a single pole double throw switch rated.

2. Control Devices

Electronic Damper Actuators:

Provide modulating type electric damper actuators with spring return to ensure either tight shut off or wide open dampers when power is not applied as required by AS 1668. The actuator shall incorporate a waterproof housing and a manual operating device. The actuators shall be loaded to not more than 50% of the manufacturer's published force and torque data to ensure ample power to drive the respective dampers. The actuator linkages shall be of the heavy type and shall be free from slack and/or spring in the mechanism. Adjust linkages and dampers for smooth operation. Pin linkages to the damper actuator drive shaft to ensure a positive drive connection. Provide an indicator on the damper actuator, together with permanently labelled "open" and "closed" position markers to show the operating range.

Modulating Motors Valves:

Shall have sufficient torque to close valve 100% against system pressure to which valve shall be subject. To have indicators to show travel position over full range and shall be of linear output and suitable for positioning by 0-10V signal from the DDC.

Motors:

Motors shall be suitable for 24V operation and shall be spring return to valve normally closed position.

Manual Operation:

Valve motors shall be fitted with a manual operator such that should a power failure occur the valve can be operated manually.

9.5 DDC SOFTWARE & BMCS INTERFACE

DDC software shall be an integral part of each DDC controller and not dependant on any higher level computer. Software shall be modular in design and be implemented in any combination of modules.

BMCS INTERFACE : Independently of whether DDC is supplied as part of a BMCS, existing plant or in packaged plant, the following information shall be able to be transferred across the DDC to future BMCS interfaces :

1. ability to display and manipulate all DDC system input and output values, alarm messages, hardware fault messages and control parameters at a BMCS.
2. ability to override all DDC system outputs, to alter control parameters and enter new or alter existing programs in the DDC controllers from a BMCS.

CONTROL PROGRAMS: Software modules that shall be able to be run on the DDC equipment shall include the following in addition to custom control programs :

1. Optimum start/ stop control;
2. Automatic time sequenced operations;
3. Even initiated sequencing;
4. Demand monitoring and load shedding;
5. Enthalpy control;
6. Night purge;
7. Proportional, integral, differential control (PID) of miscellaneous plant;
8. Duty cycle control;
9. Space load reset;
10. Reduced occupancy.

All interfaces shall be BAC-net compatible to allow for future connection to a BMS.

10 ELECTRICAL

10.1 EXTENT OF INSTALLATION

- a) All new Motor Control Centres (MCC's)
- b) Termination of fire trip (provided by Mechanical trade) to mechanical MCC's.
- c) All motors, starters, variable frequency drives, switchgear and safety protection equipment.
- d) Power wiring including fire rated cabling to meet statutory requirements.
- e) Control wiring in MCC and between equipment and the MCC including fire rated cabling to meet statutory requirements.
- f) Connection of all zone smoke control elements (Smoke detectors supplied and installed by Fire Trade).
- g) Mechanical trade to advise final electrical loads to the Superintendent on signing of contract.

10.2 MOTOR CONTROL CENTRES

General

The motor control centre shall be of the totally enclosed, front connected, floor or wall mounted type and shall consist of two separate compartments: one shall incorporate isolation, protection and starting for each motor circuit as specified below, and the other shall incorporate control relays, time switch, alarm functions, etc. The MCC shall be designed for operation with a 415/240 volts, 3 phase and neutral, 50 Hertz AC supply and with motor control circuits operating at a maximum of 240 volts. Motor Control Centres shall be to Form 1 requirements.

MCC shall comprise:

- Auto/Off Manual Switches.
- Pilot lights.
- Moulded Case Circuit Breakers.
- Contactor(s) and overload relays with single phase protection.
- Any other additional equipment as specified.

Pilot lights, instrumentation etc, as specified shall be installed on the front door of the MCC or on a separate instrument panel specifically for this purpose.

Construction of Motor Control Centres

Cabinets shall be rigidly constructed from minimum 1.6mm thick fire quality sheet steel and all joints shall be welded with continuous seam welds. All welds shall be ground flush after construction and the finished surface shall show no weld marks or other imperfections.

The mechanical trade shall allow for the respraying or touching up as necessary of the motor control centre paintwork prior to handover to correct scratches or chips in the paintwork.

Front access doors shall be gasketed for dustproofing, shall have chromed lift-off hinges and chromed lockable common key type latches. Latching bars shall not distort when latching or unlatching doors. All hinges and latches shall be to the complete approval of the Superintendent.

Cabinets shall be factory painted; exterior surfaces shall be painted in Orange X15 and interior surfaces in gloss white. All painted surfaces shall be baked stove enamel finish.

Refer to further sections in this specification for detailed specification of painting and finishing.

External Cable Connections

With the exception of the main incoming supply which shall terminate at the main switch, all incoming and outgoing wiring shall terminate at suitably rated terminal strips installed in the motor control centre.

Internal Busbars

Busbars shall comprise hard drawn high conductivity PVC sheathed copper bars installed in fully accessible busbars chambers.

Joints in busbars shall be of an approved type to ensure adequate conductivity and rigidity throughout the life of the equipment.

Internal Wiring

The mechanical trade shall provide all necessary internal wiring which shall be adequately identified with numbers corresponding to the terminal strip numbers. Phasing continuity shall be standardised by using red/yellow/blue in left to right, top to bottom and clockwise around equipment when viewed from the front of the MCC.

All internal wiring shall be loomed and laced with approved type plastic clips and brackets.

10.3 CABLING METHODS

10.3.1 Thermoplastic Insulated Cables

General

All Cables unless otherwise specified shall be 250 volt grade PVC insulated type V75 with stranded copper conductors complying with AS3147 and AS3191 and shall be rated in accordance with the SAA Wiring Rules.

Installation

Conduit pipes or ducts shall be completely installed and cleaned out prior to the drawing in of cables. The number of cables in any conduit, pipe or duct shall not exceed the maximum laid down in the SAA Wiring Rules, inclusive of a minimum of 25% spare capacity. General 'building wires' shall be installed on the loop-in system in continuous lengths and no joints will be permitted except at equipment terminals.

Conduit

Polyvinylchloride conduit shall be high impact heavy gauge coloured orange unless otherwise specified Class B to AS C173 Ap.

The minimum diameter of any conduit shall be 20mm. All conduit fittings and accessories shall be of approved type and manufacture. Accessories shall comply in all respects with AS C175 Ap.

Inspection bends, solid bends, elbow, tees or normal bends shall not be installed except with the approval in writing of the Superintendent.

Where for reason of construction PVC box faces are not flush with the wall or ceiling, purpose made extension pieces shall be employed of the same construction and dimension as the conduit box.

Conduits shall be run in square and symmetrical lines and efficient means shall be adopted to provide for the drainage of condensation and the runs shall be adequately ventilated.

All surface conduit runs shall be planned by the mechanical trade before installation is commenced and shall be indicated or marked out on site for approval by the Superintendent.

All bends shall be made on site, utilising an approved type of bending machine. Where wide radius bends are required, these shall be made with an approved type of bending block, always provided that the conduit is not deformed.

All conduits shall be cut square and all joints shall butt together tightly in order to ensure maximum electrical continuity. Where a number of conduits converge, large malleable cast iron or approved heavy gauge sheet steel adaptor boxes shall be employed in order to avoid crossing.

In no case shall wires or cables be drawn into conduits until all such conduits and conduit fittings have been permanently fixed in position and approved by the Superintendent.

'Draw in' boxes shall be provided at 8m intervals on all straight runs and after not more than two right angle bends.

In no case shall conduits from different switchboards be connected to the same junction box, nor shall cables from different switchboards be enclosed in the same conduit.

Flexible couplings shall be installed wherever expansion or contraction joints occur in a building and shall be installed wherever movements of the structure in excess of 4mm will occur.

Expansion fittings shall be installed in all straight runs of rigid PVC conduit except those embedded in concrete or in wall chases. The spacing of expansion fittings shall not be greater than 4m.

Where flexible conduits are specified they shall be of approved manufacture and shall comply in all respects with AS C90 or AS C154 as applicable.

The connection between the flexible conduit and fixed conduit or terminal boxes shall be made using purpose made glands of approved manufacture.

10.3.2 Duct Type Enclosures

Metal Ducts

Shall be galvanised sheet steel with removable covers fixed to the ducting by galvanised bolts and captive nuts (self tapping screws are prohibited) or by an approved type sliding fit. The ducting shall be electrically continuous throughout its complete length.

Plastic Ducts

Shall be of the rigid PVC plastic moulded type with removable covers of the clip on type. The duct shall be adequately constructed and supported to prevent sagging and warping between supports.

All separation barriers shall be continuous and securely fixed and all ducting shall be provided with cable retainers at 600mm intervals.

Bends, junction boxes, and duct accessories shall be purpose made of approved design and shall be of type and finish to match the duct to which they attach. Three and four way junctions in the duct system shall have their compartments fully isolated and the effective cross-sectional area of the branches shall not be reduced.

Where ductwork passes through holes in the building structure, a flush cover plate shall be fixed to the ductwork before installation and shall be arranged to project at least 50mm beyond the finished surface of the wall.

10.4 MOTORS AND ASSOCIATED EQUIPMENT

Generally

Motors shall be of a type suited to drive the equipment covered in this specification in a manner recommended by the manufacturers.

Motors shall be strictly in accordance with AS 1359, AS 1360 and BS 5000.

Motor Types

Motors supplied and installed under this contract shall be alternating current induction motors of the drip-proof type unless otherwise specified.

Motors exposed to weather shall be of IP 56 type.

Three phase motors started 'direct on line' shall have squirrel cage rotors and stators wound for operation on voltages between 400 and 440 volts, 50 Hertz supply.

The mechanical trade shall supply details of starting torque and locked rotor current for each three phase motor, and ensure that they comply with Supply Authorities regulations.

Single phase motors shall be of the capacitor start capacitor/induction run, or repulsion-induction type. Single phase motors started light shall be of the split phase type.

Motor Speed

Unless otherwise specified motors shall have a synchronous speed not exceeding 25rev/s.

Motor Bearings

Motors up to and including 4kW shall be equipped with sealed ball bearings at both ends.

Motors above 4kW shall have sealed roller bearings at the driving end and deep groove sealed ball bearings at the non driving end.

Motor Winding Insulation

Smoke control supply, exhaust and stair pressurisation fan motor shall have the type of insulation as required under AS 1668 Part 1 Clause 4-8 and other motors shall have class E insulation and shall be continuously rated at an ambient temperature of 40°C.

Motor Terminals

All motors shall be equipped with an enclosed terminal block.

Wiring to Motor

Wiring from the motor isolating switch to the motor terminal block shall consist of thermoplastic insulated conductors installed in flexible conduit (or fire rated as required).

Motor Isolating Switches

Every motor shall have installed adjacent to it a quick make/quick break air break switch in a standard drip-proof enclosure appropriate to the location.

Motor Starters

Provide in accordance with 'NATSPEC SERVICES' – and current amendments as per 'Switchboards' Clause 12.2 and 12.3.

- Direct-on-Line (DOL) type - Any single phase motor
- Three (3) phase motors up to 15 kW rating maximum (unless indicated otherwise on drawings).
- Auto-transformer or Star-Delta type VSD or
- Three (3) phase motors above 15 kW rating other than soft start.
- Variable Speed drives (Soft start)
- Three (3) phase motors above and below 15 kW rating where nominated in the control schematic diagram (for VAV fans) or the relevant equipment specification/ schedule. Provide suppression for radio frequency interference and filtering of harmonics and line transient in accordance with the following:

Harmonics

- The maximum AC network harmonics distortion, including voltage notching caused by the VSD controller at the point of common coupling, shall not exceed the limits the set down by AS 2279 Part 2.
- The harmonics generated by the VSD controller shall be limited through appropriate selection of AC line side or DC bus reactors and supplied as part of the contract.
- The fault level at the point of the common coupling and existing level of harmonic distortion on the network shall be established to enable selection of the harmonic filters.

Electromagnetic Interference

- Electromagnetic Interference (Radio frequency Interference) generated by the VSD controller shall be within the limits stipulated by AS 2064. The VSD supplier shall provide full installation instructions for the equipment to minimise the Electromagnetic Interference. If necessary, the generated Electromagnetic Interference shall be limited through appropriate selection of equipment such as RFI filters.

10.5 ELECTRICAL EARTH SYSTEM

All metal enclosures of electrical equipment, switchgear, conduits, trays, electrical ductwork and cable armouring shall be effectively bonded to earth and the earthing of the complete installation shall comply in all respects with the requirements of the SAA Wiring Rules and those laid down by the local Supply Authority.

10.6 BALANCE OF LOAD

The mechanical trade shall balance the electrical load as far as possible between the individual phases of supply. Particular attention in this regard is directed to the rewiring or connection to existing services. The balancing must be carried out to the satisfaction of the Superintendent and the local Supply Authority.

10.7 LABELLING AND PAINTING

Every switch outlet and switchboard/MCC control shall be labelled in an approved manner so as to provide ready identification of each and all circuits.

A schedule of circuits shall be provided, mounted in a metal frame complete with plastic front protective cover, and hung adjacent to the respective switchboard/ MCC.

The size of an incoming cable to any switchboard/ MCC shall be indicated by an approved engraved laminated plastic tag as above on the outside of the cubicle in the proximity of the main control.

All electrical motors, conduits (including PVC conduits), cable trays, and switchboards shall be colour coded No. 5777 'Light Orange' in accordance with AS 2700 endorsement of BS 3818-1964 'Colour for Specific Purposes'.

Motor control centres shall be colour coded Orange X15. (Refer to clause 'Motor Control Centres').

10.8 TESTS

On completion of manufacture at maker's works and after erection at site, the mechanical trade shall arrange for witnessed test to be carried out together with such other tests as may be considered necessary by the Superintendent in order to prove compliance with this specification.

11 PAINTING AND IDENTIFICATION

11.1 PAINTING

General

All items of equipment and all piping and ductwork in the plantrooms and outside the building shall be painted. All equipment and ductwork within the outdoor air plenum shall be painted. External insulation shall be sheathed before painting.

All supports, hangers, structural steel frames, lintels, access panels, tank stands, fan casing, machinery bases, dampers, filter housing, etc. in the plantroom and outside the building shall be included.

All exterior metal surfaces except copper and stainless steel, all exterior support steel, all exterior pipework and all exterior ductwork and supports shall be coated with two (2) coats of asphalt aluminium paint or equivalent. All metal surfaces shall be cleaned of all rust, oil, dirt, etc. before painting.

Paint materials shall be best quality trade name brands delivered to the building in their original labelled and sealed cans or containers with their labels intact and seals unbroken.

Brand names, colours, samples and types shall be submitted for approval before use.

No exterior painting shall be done in rainy, damp or dusty weather or on damp surfaces.

Finish paint all items in the building (less factory finished items) with two coats of alkylid enamel gloss paint.

All galvanised surfaces shall be prime etched before painting; all non-galvanised surfaces shall have a prime shop coat of grey rust inhibitive paint.

Sheet Metal Work

Paint the inside of all ducts adjacent to the diffusers, registers, grilles and louvres with two (2) coats of matt black paint. Paint all exposed ducts inside and outside the building with etch primer, one (1) coat of zinc rich paint and two (2) coats of finishing paint to a colour approved by the Superintendent.

Equipment

Deliver all apparatus and equipment including its piping furnished under this specification to the site with a least one (1) coat of shop paint. This shall include but not be limited to fans, motors and air handling units.

Finish all equipment with two (2) coats of paint; colour to be selected by the Superintendent. All items furnished with a factory finish shall be touched up after installation whenever or otherwise damaged. Leave in a completely finished condition.

Pipework and Fittings

Exposed piping in plantrooms, basements and other such areas, both bare and insulated, shall be painted and identified. Prepare all piping by cleaning, degreasing, removing weld/brazing dags and prime coating. Apply two (2) finish coats of gloss enamel.

11.2 IDENTIFICATION OF EQUIPMENT

General

Furnish and install identification labels for all items of equipment which shall include where applicable but not limited to, all equipment, pipework and fittings, sheet metal work, automatic controls and electrical equipment, conduits and wiring.

Comply with specific labelling requirements of AS 1668 and other statutory/ inspecting authorities.

Furnish and install all valve and lubrication charts.

All identification label types and charts to be submitted for approval.

Nameplates

Nameplates shall be installed on or adjacent to all items of equipment.

Nameplates shall clearly identify each item of equipment with the nomenclature as used throughout this contract. They shall be of Trafolyte type, not less than 65mm x 20mm x 3mm thick with bevelled edges and with black cored letters on a white background. They shall be secured with either suitably plated brass screws or suitable adhesive depending on the application.

Pipe and Duct Markers

Directional flow arrows shall be provided on all pipes. Arrows shall not be less than 150mm in length and shall be spaced at not greater than 3 metre centres in plantrooms and not greater than 6 metre centres elsewhere.

Arrows may either be painted onto the pipe or be of vinyl markers of the pressure sensitive self-adhesive type similar and equal to 'Safetyman'.

Directional flow arrows shall be adjacent to, but shall NOT be superimposed on supplementary colour bands. The arrows shall have the name of the particular system printed on it.

Duct markers shall be similar to pipe markers with the direction of flow arrow having the system designation number.

Valve Tag

All valves used for balancing shall be fitted with removable tags suitable for stamping the balancing point of the valve thereon.

12 TESTING AND COMMISSIONING

12.1 TESTING

12.1.1 General

Tests shall be divided into three groups, all tests in group one shall be completed and approved before tests in groups two and three are started. However, tests in groups two and three may be carried out simultaneously with the approval of the Superintendent or his representative. Should such tests prove unsatisfactory, individual tests shall be carried out to the satisfaction of the Superintendent or his representative.

Group One - Shall be defined as those tests which are necessary for any work or equipment supplied or installed by the mechanical trade and are built-in to the building finishes or structure.

Group Two - Shall be defined as those tests which shall be carried out and approved before the issue of the Certificate of Completion.

Group Three - Shall be defined as those remaining tests which need to be carried out during the defects liability/warranty period, prior to the issue of a final certificate, such as capacity tests.

All tests shall be made in the presence of the Superintendent or his representative.

The mechanical trade shall either engage a suitable NATA registered commissioning agent for carrying out tests or show adequate written evidence to the Superintendent of this ability to provide equivalent unbiased testing. Only certified and calibrated instruments shall be used for testing and commissioning.

When the mechanical trade is ready to commence tests, five (5) working days' notice shall be given to the Superintendent or his representative to enable him to be present at such tests. Tests need not necessarily be commenced on the one day may be completed separately at the direction of the Superintendent.

All necessary labour, maker's representatives, instruments, manufacturer's literature and fuel shall be made available. Record manufacturer's name and model number of each instrument used in all tests and last date of calibration.

Three (3) copies of all test results shall be submitted in loose leaf bound form to the Superintendent within two (2) weeks of completion of tests. Submit draft for approval.

Tests which are to be carried out under certain atmospheric conditions may be submitted later for insertion into the test binder. All test data shall be on A4 size paper for inclusion into the binder. Manufacturer's literature, apart from published drafts or tables, will not be accepted. All test data will be tabulated with design requirements. All test data shall be signed and dated by the mechanical trade's representative, with details of his official position.

12.2 TESTING- GROUP 1

Testing of Piping, Equipment and Fittings for Water System

Pipework, equipment and fittings for all water supply and return. Systems shall be hydrostatically tested, cleaned out and proportionally dosed in accordance with 'Water Treatment' Section.

Air heating and cooling coils shall be factory tested.

Testing of Low Pressure Ductwork, Air Intake Cavity Wall, Raised Floor Plenum, Equipment and Fittings

All ductwork for air pressures exceeding 0.6 kPa shall be tested for air leaks before any section is built in or externally insulated.

The method of testing shall provide for each fan system of ducting, or part of a system, to be blanked off and connected to a test blower arrangement incorporating an orifice plate and manometer.

During testing in minimum pressure of 2 kPa shall be maintained. Where the design pressure exceeds this figure, a 20 per cent margin over and above the design figures shall operate.

At all times the air flow through the orifice plate shall not exceed one half per cent of the design flow in the section of the duct system under test and there shall be no noisy leaks. The total leakage of any one fan system shall not exceed 2.5 per cent of the design air flow.

Testing shall be carried out after the ducting systems have been cleaned out.

Equipment

All equipment shall be factory tested for proper operation.

12.3 COMMISSIONING AND TESTING -GROUP 2

General

Commissioning and testing shall not begin until each system has been completed and is in full working order. The mechanical trade shall put all systems and equipment into full operation and shall continue the operation of same during each working day of testing and balancing.

During the commissioning period the mechanical trade shall provide technical staff on site to man the installation.

The testing and commissioning of each system shall include all items of equipment as specified individually. Equipment susceptible to damage under the test pressure shall be isolated and tested and commissioned separately. Verify that all drain connections and vents are clear.

The installation shall be adjusted as necessary to establish balanced flow rates as required for the efficient performance of the system.

All equipment shall be tested on site.

Commissioning of Water System

The heating hot water, chilled water, condenser water and cold water systems shall be commissioned by carrying out an approved systematic routine of procedures to bring each system into full operation in accordance with 'Water Balance' subsection.

Commissioning shall be carried out in conjunction with any related systems, equipment and controls.

Perform such additional tests as are necessary, or as directed by the Superintendent to establish correct operation and function of each complete system to the requirements of the specification and relevant codes.

Commissioning of Water Treatment

Each water system shall be tested and dosed with chemicals in accordance with 'Water Treatment' section in conjunction with the testing of each system.

Commissioning of Air Handling Systems

The air handling systems, including packaged air conditioning units, mechanical ventilation and exhaust systems and toilet exhaust systems shall be cleaned and tested.

Each complete system shall be commissioned by carrying out an approved systematic routine of procedures to bring each system into full operation in accordance with 'Air Balance' subsection.

Perform such additional tests as are necessary or as directed by the Superintendent to establish correct operation and function of each complete system to the requirements of the specification and relevant codes.

All flow rates shall be finally adjusted through all equipment.

All automatic volume dampers shall be set for the minimum air quantities and recorded.

Sound testing shall be carried out in accordance with 'Noise Level Measurement' subsection.

All tests shall be carried out in the presence of the Contractor and sample witnessing will be carried out to the satisfaction of the Superintendent.

Commissioning of Volume Control Dampers

Each volume control damper shall be set and sealed..

Manual dampers shall have the air balance position marked in red paint.

Verify and sign off on test sheet.

Commissioning of Fire Dampers

Each fire damper shall be checked to ensure the fusible links are set. Check access panels. Set maximum, minimum and smoke control positions, mark and verify and Sign off on test sheet.

Instruments

Each thermometer, pressure gauge and temperature gauge shall be commissioned by checking the calibration against certified instruments, setting all pointers and marking the set point.

Each draught gauge across each filter bank shall be commissioned by setting and sealing the bezels. Verify and sign off on data sheet.

Commissioning of Automatic Controls (DDC)

All controls shall be calibrated in accordance with approved Mechanical trade's Documents.

All equipment shall be set and adjusted as follows:

- a) All set points shall be verified by measurements of the controlled medium.
- b) All valves and dampers motors shall be adjusted for correct sequence and spring range operation.
- c) All switches shall be calibrated for correct set point and switching differential.
- d) All safety and alarm circuits shall be proven by operation or simulation of an alarm or unsafe condition.
- e) All pressure reducing stations set for the correct pressures.
- f) Each system shall be demonstrated to operate as specified.

Perform such additional tests as are necessary, or as directed by the Superintendent, to establish correct operation and function of each complete system to the requirements of the specification and relevant codes.

All control instruments shall be finally adjusted, set and sealed in conjunction with manufacturer's recommendations.

Also refer to controls section.

Verify and sign off on data sheet.

Commissioning of Electrical Installation

The complete electrical system shall be inspected and passed by the local authority and tested for electrical safety.

All equipment shall be set and adjusted as follows:

- a) All safety controls and interlocks shall be proven by the operation of each individual drive and interlock.
- b) All starting sequences shall be checked.
- c) All fail-safe and automatic start drives shall be checked.
- d) All motors shall be checked for the direction of rotation.

- e) All switches and controls shall be checked and proven to operate as specified.
- f) All switches and relays shall be calibrated for correct set point and switching differential.
- g) All safety and alarm circuits shall be proven by operation or simulation of an alarm or unsafe condition.
- h) All other electrical items installed under this mechanical works.

Perform such additional tests as necessary or as directed by the Superintendent, to establish correct operation and function of all the systems to the requirements of the specification and relevant codes.

Set all times, interlocks and relays. Verify and sign off on data sheets.

12.4 AIR BALANCE

General

Ambient conditions of temperature and humidity shall be recorded together with the test results for each day.

Perform the tests and balance the system in accordance with the following requirements:

Procedures

Check direction of rotation of fan.

Test and adjust for design air flow from fan within +5%

Test and adjust for design recirculated air flow within +5%

Test and adjust for design outside air volume within +5%

Adjust all main supply and return air ducts to design air volume within +5%

Adjust all zone supply and return air ducts to design air volume within +5%

Test and adjust each diffuser, grille and register to within +5% of design requirements.

Note: For VAV systems, test and adjust for the peak design flow.

Test and record supply air temperature (WB and DB heating and cooling).

Test and record leaving air temperature (WB and DB heating and cooling).

Adjust each outlet to provide proper throw, distribution and terminal velocities in the working zone in excess of 0.375 m/second are to be reported to the Superintendent.

Test and record system static pressure, suction and discharge.

Ensure that setting has been carried out for automatically operated dampers etc., to operate as required in conjunction with the automatic controls installed.

Prepare a report of air volumes from all inlets and outlets together with comments on any aspects of the installation or operation requiring attention.

The mechanical trade shall make any changes in the pulleys, belts and dampers, or add any dampers, as required for the correct balance at no additional cost to the contract.

12.5 WATER BALANCE

General

Perform the tests and balance each system in accordance with the following preparation and procedure.

Preparation

Check rotation of pumps.

Ensure that strainers are clean.

Open all valves to full open position, including coil isolating valves. Close bypass valves.

Check that system is full of clean and treated water.

Set all temperature controls so that all units are calling for full cooling. This should close all automatic bypass valves at coils.

Check the operation of automatic bypass valves.

Check and set the operating temperature of refrigeration machines to design requirements.

Procedure

Set all water pumps to correct delivery volume.

Check pressure drop through air handling units.

Check leaving water and return water temperatures. Reset to correct design temperatures.

Check water temperature at inlet side of air handling units. Note rise or fall of temperature from source.

After making adjustments, recheck settings at pump. Re-adjust if required.

Upon completion of adjustments and flow readings, indelibly mark all settings and record all data.

Using pressure gauges on each coil, read pressure drop through coil at set flow rate for full cooling.

Check and record the following items at each cooling element:

Inlet water and air temperatures

Leaving water and air temperatures.

Pressure drop of each air handling unit.

Pressure drop across valves.

Pump operating suction and discharge pressures.

All mechanical specifications of pumps.

Rated and actual running amperage of pump motors.

Water meter device readings.

Prepare a report neatly presenting readings of all items required and recording any aspect of the installation or its operation requiring attention.

12.6 COMMISSIONING - GROUP 3

General

Final proof and acceptance tests shall be carried out after a ten (10) day period of operation during which time the entire plant shall be adjusted and checked ready for final tests.

Top up and/or ensure all systems have the correct refrigerant charge, water treatment chemicals, lubricating oils, etc.

Air Systems

The whole supply, return and exhaust air systems shall be finally adjusted. Air quantities shall be noted on schematic diagrams; all figures shall be given and noted in litre/s to within +5%/-0% of the design figures. For all fans, record the speed in rev/s, total litre/s and static pressure across fan in Pascals.

Motors Generally

All motors shall be tested as described. All motors nameplate current readings and actual current determined in the field at starters shall be tested and recorded. Stamp current taken on brass tag wired to motor.

Cooling Coil Performance Tests

These tests shall be carried out only after:

Air quantities across cooling coil have been adjusted and approved.

Air quantities to individual take offs have been adjusted and approved.

Fan performance tests have been performed and approved.

Cooling coil test shall only be conducted when the outside **wet bulb** temperature is 19°C or above. The outside and return air dampers shall be adjusted to produce an **ON** coil load equal to enthalpy at saturation of the coil conditions specified.

The following shall be recorded:

- Coil air quantities in litre/s.
- Coil water pressure drop with automatic valve open in kPa.
- Air on conditions DB°C, WB°C.
- Air off conditions DB°C, WB°C.
- Chilled or condenser water in temperature, °C
- Chilled or condenser water out temperature, °C

Refrigerant Equipment

The mechanical trade shall prove the actual full load refrigeration tonnage delivered to the evaporator when operating at the specified full load conditions.

The equipment shall be held at full load if necessary by artificial loading for a continuous period of four (4) hours during which time the temperatures and pressures, volts and amps shall be recorded each 15 minutes.

The load specified shall be the minimum load acceptable, any manufacture tolerances shall be applied above this minimum figure.

All controls including capacity steps and head pressure shall be demonstrated to operate correctly by simulation of faults and loads. Record all actual and manufacturer's specified cut-out points etc.

Adjust all controls for normal operation.

12.7 FINAL CHECKS

Prior to the issue of the 'Final Certificate' verify the performance of all safety and control functions of each system by way of certified report from the respective manufacturers or suppliers. Such checks shall be undertaken not earlier than one (1) month before the schedule expiry date of the Defects Liability Period.

12.8 USER TRAINING

The Mechanical trade shall allow for time and labour after commissioning of all plant to undertake a separate user training programme. (Within one (1) month after completion)

Submit a detailed programme at least 3 months prior to Completion date. The USER TRAINING PROGRAMME shall be based on and include detailed numbers and time for:

- Proposed training staff and qualifications
- Duration and timetable for training
- General content of training programme
- General description of training materials.

The superintendent shall advise the number and qualifications of user's engineering staff who will attend the programme.

All operating and instruction manuals and "as-installed" drawings shall be ready in their final approved form at the commencement of the programme.

The training programme shall be conducted in a formal professional manner using a nominated classroom together with on-site instructions and over-the-shoulder trials by each nominated member of the user staff. The mechanical trade shall provide a written format for such trials so that user's staff can mark and self-access their ability to carry out operational and maintenance procedures.

12.9 USER ACCEPTANCE TESTS

Allow for time and labour to carry out final tests with trained user staff in the presence of the Superintendent.

During this period, selected operational and maintenance procedures shall be trialed using the test results previously submitted as a basis for trial and the Operating and Maintenance Manuals as the directive.

The trial shall be conducted in the presence of the Contractor and performed within the limits of settings or adjustments provided and/or specified.

Acceptance shall be given for all trials which enable the user (unaided) to return the system to original test figures and performance. The mechanical trade shall carry out all necessary corrective actions, modifications to plant or equipment or rewrite and re-issue any parts of the Operating and Maintenance Manuals as a result of trial failure.

COMPRESSORS:

- Check oil level and adjust if necessary.
- Check safety controls.
- Check the operation of the crankcase heater.

PUMPS:

- Check glands and seals.
- Check alignment and wear.

-
- Check and clean drip trays and waste pipes.

MOTORS:

- Check cleanliness and air-way passages, bearing noise.

CEILING MOUNTED FAN COIL UNITS AND AIR HANDLING UNITS:

- Check coils, drip trays, and drain for cleanliness.
- Check fans.

In addition to the monthly service producers:

GENERAL:

- Inspect the system generally and report any necessary work not otherwise listed below.
- Check the operation of circuit breakers, thermal overloads, and other electrical controls and interlocks.
- Check electric motors for excessive noise and temperature.
- Check control panels for the correct operation of indicator lights, and repair and switches as necessary.
- Check water treatment for correct operation.
- Remove corrosion and touch up paint where necessary.

PUMPS:

- Check flexible couplings for noise, alignment or wear.

MOTORS:

- Check bearings and lubricate to manufacturers recommendations.

13 PREVENTATIVE MAINTENANCE

The mechanical trade shall include for a complete twelve (12) months preventative maintenance program of the installed plant:

- Carry out three (3), six (6) and twelve (12) monthly activities coincident with the monthly program.
- Read these guidance schedules in conjunction with the instructions supplied by the manufacturers' for individual equipment. The following schedules are for guidance only and the mechanical trade shall refer to the Operating and Maintenance Manuals for specific components.
- The 'Activities' described in the schedules are self explanatory. More detailed instructions giving necessary procedures are found under general maintenance in the manufacturers' instructions.
- Record all the major repair and service work in the log.

13.1 MONTHLY SERVICE

GENERAL:

- Check the functioning of all controls. Adjust as necessary.
- Check proper functioning of all systems.
- Check filters and clean/replace if necessary. Clean strainers, drains and the like.
- Check couplings, guards, shaft seals, etc. and adjust if necessary.
- Check bearings and lubricate to manufacturers' recommendations.
- Check isolation mountings and repair as necessary.
- Check and test for water treatment procedures.



MCKENZIE
GROUP CONSULTING

TRANSMITTAL FORM

To:	Pittwater Council	Project No:	01028
Address:	DX 9018 Mona Vale		
Attention:	Customer Service	Date:	20 May 2003
Project:	Village Park Mona Vale		
From:	Robert Lee		
Method of Delivery:	<input type="checkbox"/> Mail <input type="checkbox"/> Courier <input type="checkbox"/> By Hand <input type="checkbox"/> Collected <input checked="" type="checkbox"/> DX		
Subject:	Construction Certificate		

Dear Sir or Madam:

Please find enclosed one (1) copy of the Construction Certificate No. 03/738-1 and it's attachment in accordance with Clause 151 (2) of the Environmental Planning & Assessment Regulation 2000, issued for the above project together with a cheque of \$26.00 being the lodgement fee.

Plans and specifications approved

- Architectural plans prepared by Brewster Hjorth Architects, drawing numbers: A01 - 30 / A, F01 & 02;
- Landscape plans prepared by Taylor Brammer, drawing numbers: LA001/03, LA002/03, LA00 to 05/D, 06/B & 07/C;
- Structural /Civil plans prepared by Connett Mott MacDonald, drawing numbers: DS00-002/3, 005-013/3, 015-21/3, CA001/3 & 002/3;
- Hydraulic plans prepared by Acor, drawing numbers: H01-08/D, SP01/B;
- Hydraulic Specifications
- Mechanical plans prepared by Steensen Varming (Aust) Pty Ltd, drawing numbers: 01832-M1000-1002/B, 1002/B, 1003/C, 2001-2002/B, 3001/B, 4001/B, 5001/B, 6001-6002/B, 7001/B, 8001/B, 9001/B, 9002/C;
- Mechanical specifications;
- Electrical plans prepared by Steensen Varming (Aust) Pty Ltd, drawing numbers: 01832-E000, 01-08/B;
- Electrical specifications.

Attachments

- Fire safety schedule

BUILDING REGULATIONS CONSULTANTS

Level 6 / 189 Kent Street Sydney New South Wales 2000
 Telephone 02 8298 6800 Facsimile 02 8298 6899 email@mckenzie-group.com.au
 www.mckenzie-group.com.au

Transmittal Form - Council

Offices in Melbourne and Brisbane

Issued 13.2.03

- Application form for Construction Certificate
- Evidence of Long Service Levy payment;
- Structural design compliance certificate prepared by Connell Mott MacDonald, dated 14 March 2003;
- Drainage design report prepared by Connell Mott MacDonald, dated 13 March 2003;
- Fire & hydraulic design compliance certificate prepared by Acor, dated 17 March 2003;
- Electrical and mechanical compliance certificate prepared by Steesen Varming (Aust) Pty Ltd;
- Landscape design compliance certificate prepared by Brammer, dated 25 March 2003;
- Design certification for roadworks, Park St, Mona Vale prepared by Colin Malhison, dated 10 April 2003;
- Access design compliance certificate prepared by Morris-Goding Accessibility Consulting, dated 15 April 2003;
- Acoustic certificate prepared by Hyder Consulting (Aust) Pty Ltd, dated 22 April 2003; and
- Contamination assessment prepared by Douglas Partners Pty Ltd, dated 26 February 2003.
- General Construction Notes

Please provide a receipt upon completion of payment process and note our reference.

If you require further information please contact me on (02) 8298 6800.

Regards,

per Robert Lee

Robert Lee
Senior Building Surveyor
McKenzie Group Consulting (NSW) Pty Ltd
ACN 093 211 995

Copy To:	Attention:	Address:
Brester Hjorth Architects	Andrew Hjorth	Level 2, 201 Kent Street, Sydney NSW 2000





M C K E N Z I E
GROUP CONSULTING

CONSTRUCTION CERTIFICATE No. 03/738-1

Issued under the Environmental Planning and Assessment Act 1979 Sections 109C(1)(b), 81A(2) and 81A(4)

Owner

Name: Pittwater Council
Address: PO Box 882, Mona Vale NSW 1660

Property details

Address: Mona Vale Village Park, 1 Park Street, Mona Vale
Lot No: 100 and 101
DP No: 1047405 and 1047405
Municipality: Pittwater Council

Description and value of development

Description: Refurbishment of existing library building for Council offices and Customer Service and construction of new library & associated external works
Value of work: \$4,600,000.00

Building Code of Australia building classification

Part: Whole
Use: Offices and Library
BCA classification: 5 & 9b

Determination

Approved/Refused: Approved
Date of Determination: 9 May 2003

Plans and specifications approved

- Architectural plans prepared by Brewster North Architects, drawing numbers: A01 - 30 / A, F01 & 02;
- Landscape plans prepared by Taylor Brammer, drawing numbers: LA001/03, LA002/03, LA00 to 05/D, 06/B & 07/C;
- Structural /Civil plans prepared by Connell Mott MacDonald, drawing numbers: DS00-002/3, 005-013/3, 015-21/3, CA001/3 & 002/3;
- Hydraulic plans prepared by Acor, drawing numbers: H01-08/D, SP01/B;
- Hydraulic Specifications
- Mechanical plans prepared by Steensen Varming (Aust) Pty Ltd, drawing numbers: 01832-M1000-1002/B, 1002/B, 1003/C, 2001-2002/B, 3001/B, 4001/B, 5001/B, 6001-6002/B, 7001/B, 8001/B, 9001/B, 9002/C;
- Mechanical specifications;
- Electrical plans prepared by Steensen Varming (Aust) Pty Ltd, drawing numbers: 01832-E000, 01-08/B;
- Electrical specifications.

BUILDING REGULATIONS CONSULTANTS

Level 6 / 189 Kent Street Sydney New South Wales 2000
Telephone 02 8298 6800 Facsimile 02 8298 6899 email@mckenzie-group.com.au
www.mckenzie-group.com.au

Offices in Melbourne and Brisbane

Attachments

- Fire safety schedule
- Application form for Construction Certificate
- Evidence of Long Service Levy payment;
- Structural design compliance certificate prepared by Connell Mott MacDonald, dated 14 March 2003;
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- Electrical and mechanical compliance certificate prepared by Steesen Varming (Aust) Pty Ltd;
- Landscape design compliance certificate prepared by Brammer, dated 25 March 2003;
- Design certification for roadworks, Park St, Mona Vale prepared by Colin Mathison, dated 10 April 2003;
- Access design compliance certificate prepared by Morris-Goding Accessibility Consulting, dated 15 April 2003;
- Acoustic certificate prepared by Hyder Consulting (Aust) Pty Ltd, dated 22 April 2003; and
- Contamination assessment prepared by Douglas Partners Pty Ltd, dated 26 February 2003.
- General Construction Notes

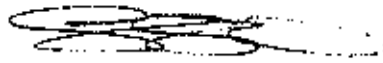
Development Consent

Certificate no.: N0730/02
Date of Determination: 21 November 2002

Certificate / Certifying Authority

I, Stephen Natili certify that the work, if completed in accordance with these plans and specifications will comply with the Environmental Planning and Assessment Regulation 2000 as referred to in Section 81A(5) of the Environmental Planning and Assessment Act 1979.

Signature



Stephen Natili
Planning NSW Registration No. 25
McKenzie Group Consulting (NSW) Pty Ltd
ACN 093 211 995

Date of endorsement 9 May 2003
Certificate Number 03/738-1

Note: Prior to commencement of work sections 81A(2)(b), 81A(2)(c), 81A(4)(b) and 81A(4)(c) of the Environmental Planning and Assessment Act 1979 must be satisfied.



**ATTACHMENT 1
Fire Safety Schedule**

(Pursuant to Clause 168 of the Environmental Planning and Assessment Regulation 2000)

Items to be inspected or tested as nominated by the relevant authority	Deemed to satisfy installation standard/code/conditions of approval	Nature of inspection and/or test frequency
Structural Fire Protection and Compartmentation		
(a) Penetrations in fire-rated construction	BCA Part C2.4	Annual Inspection
(b) Warning Systems associated with Lift (including Signs)	BCA Part E3	Annual Inspection
(c) Fire resistant materials applied to building elements	Section C of Vol 1 of the BCA	Annual inspection for damage or deterioration
(d) Early fire hazard indices for linings and surface finishes	Specification C1.10 of Vol 1 of the BCA	Annual inspection for compliance with Specification C1.10 of Vol 1 of the BCA
Means of Egress		
Exits and paths of travel exits including doors, doorways, operation of latches (including automatic closing or unlocking devices), handrails, stair treads and clearance from obstructions	Section D of Vol of the BCA	Three monthly inspection to ensure compliance with Section D of Vol 1 of the BCA and to ensure paths are clear of obstructions
Signs		
(a) Illuminated exit signs	Clauses E4.5 and E4.8 of Vol 1 of the BCA and AS/NZS 2293.1	Monthly test to ensure operation and visual inspection for avoidance from obstruction and power availability and six monthly inspection as prescribed in AS/NZS 2293.2.
Emergency Lighting		
Emergency lighting	Clause E4.2 and E4.4 of Vol 1 of the BCA, and (i) equipment manufactured to AS/NZS 2293.3, and Designed and installed to AS/NZS 2293.1.	As prescribed in AS/NZS 2293.2 and monthly inspection for power availability.
Fire-Fighting Services and Equipment		
(a) Fire hydrant installations	Clause E1.3 of Vol 1 of the BCA and AS 2419.1	AS prescribed in AS 1851.4
(b) Fire hose reels	Clause E1.4 of Vol 1 of the BCA and AS 2441	As prescribed in AS 1851.2
(c) Portable fire extinguishers	Clause E1.6 of Vol 1 of the BCA and AS 2444	As prescribed in AS 1851.1





brewster hjorth
ARCHITECTS

REF: 20151 0079
26 March 2003

Senior Building Surveyor
McKenzie Group Consulting
Level 6
189 Kent Street
SYDNEY NSW 2000

At: Robert Lee

Dear Robert

**VILLAGE PARK MONA VALE REDEVELOPMENT
CONSTRUCTION CERTIFICATE SUBMISSION**

Please find attached the Construction Certificate Submission for the above project, as follows:

1. Completed application for Construction Certificate.
2. Title Plan, indicating new lot and DP numbers.
3. Receipt for payment to Long Service Payments Corporation made by Pittwater Council.
4. Four copies of Architectural drawings, refer attached transmittal.
5. Four copies of Structural and Civil drawings, refer attached transmittal.
6. Four copies of Hydraulic drawings, refer attached transmittal.
7. Four copies of Mechanical drawings, refer attached transmittal.
8. Four copies of Electrical drawings, refer attached transmittal.
9. Four copies of Landscape drawings, refer attached transmittal.
10. Four copies of Architectural and Structural specification.
11. Four copies of Hydraulic specification.
12. Four copies of Mechanical specification.
13. Four copies of Electrical specification.
14. Four copies of Landscape specification.
15. Certification of Structural Drawings for Construction Certificate prepared by Connell Mott MacDonald, dated 14 March 2003.
16. Balustrading Adequacy (BA-1) Certificate.
17. OSD design report, prepared by Connell Mott MacDonald, dated 14 March 2003.
18. Certificate of Compliance, prepared by Acor for hydraulic design, dated 17 March 2003.
19. Statement of Design Compliance - Electrical and Mechanical, prepared by Steensen Varming, dated 13 March 2003.
20. Certificate of Landscape Documentation, as required by DA Condition B45, prepared by Taylor Brammer.

Consultants

*Tim Brewster
B ARCH UNSW
University Medal 1988*

*Andrew Hjorth
B ARCH UNSW
Hons 1st PART*

Associates

*Larry Melocco
B ARCH Sydney Uni*

*Paul Johns
B ARCH UNSW*

*Max Ruston
B ARCH Sydney Uni
1st Class Hons 1*

**The Grafton
Bond Store
201 Kent Street
Sydney**

**PO Box N565
Grosvenor Place
NSW 1220**

**Facsimile
02 9251 8756**

**Telephone
02 9251 8411**

**BrewsterHjorth
Pty Limited
ACN 052 113 153**



We will forward the following items once they are completed, for your assessment of the Construction Certificate matters:

1. Confirmation of Council approval of external finishes and colours.
2. Statement of Compliance from Access Consultant.
3. Acoustic Certification as required by DA condition D107.
4. Report in regards to site suitability as required by DA condition C11.

We trust the information provided is as required for you to complete the Construction Certificate. If however you have any questions please do not hesitate to contact me.

Yours sincerely

Andrew Hjorth
Director
Brewster Hjorth Architects

T: 02 9251 8411
F: 02 9251 8756
e: andrew.hjorth@brewsterhjorth.com.au



DEPARTMENT OF ENVIRONMENT AND HERITAGE
DEVELOPMENT SERVICES

APPLICATION FOR CONSTRUCTION CERTIFICATE

Form 1000 - To be completed by the applicant and returned to the Department of Environment and Heritage, Locked Mail Bag 961, North Sydney NSW 1585

Applicant		Name: Pittwater Council
		Address: PO Box 982 Mona Vale NSW 1660
		Phone: 9570 1111 Fax: 9570 7150
Owner of building (if not Applicant)		Name: AS ABOVE
		Address:
		Phone:
Consent of a Council (if required)		Name of Council: NATHAN HUON (PRINCIPAL OFFICER - PITTWATER COUNCIL)
Subsidiary		Address: Mona Vale Village Park 1 Park Street Mona Vale Postcode: 7080 Lot/Section: 7104 Section 750007 Planning Code: 93805 Proposed by: Pittwater Council
Description of development <input checked="" type="checkbox"/> Building work		Description: Refurbishment of existing library building for Council offices and customer service, construction of new library and associated external works.
Development Consent (Development Consent No and date of determination)		Development No: NO 730/02 Date of determination: 21 November 2002
Building Code of Australia building class/section (nominal code of the class/section consent)		EC-Code: Band 9b

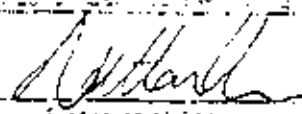
* NOTE: New Lot /DP numbers are as follows:

- LOT 100 DP 1047405
- LOT 101 DP 1047405

REFER ATTACHED DP 1047405

DEPARTMENT OF ENVIRONMENT AND HERITAGE
DEVELOPMENT SERVICES
Locked Mail Bag 961, North Sydney NSW 1585
Phone: 9570 1111 Fax: 9570 7150
www.environment.nsw.gov.au

Builder owner/builder (if known to be completed in the case of proposed residential building work)	Name Address License No./Permit No.
Value of work (in \$)	\$ 4,600,000
Schedule	The proposed schedule is required to be completed for the purposes of attaching information to the AUBS by the Bureau of Statistics
Date of receipt (to be completed by certifying authority)	Date 27 March 2003
Right of appeal	Under s 109K where the certifying authority is a council or an authority, the appeal is to the Land and Environment Court regarding the refusal of issue of Certificate of Building Approval. The appeal must be made on or before the date of the appeal.


 Signature of Approver

Schedule to Construction Certificate Application

Particulars of the Proposal

What is the area of the land (m²) 7105

Gross floor area of existing building (m²) 664

What are the current uses of all or parts of the building(s) and/or land? (If vacant state vacant)

- Location: Existing building to Park St. frontage Use: Library
- Location: Existing building between Park St and Pittwater Road Use: Community Hall
- Location: Existing building to Pittwater Road frontage Use: Early Childhood Centre
- Location: Use:

Does the site contain a dual occupancy? Yes No

What is the gross floor area of the proposed addition or new building (m²) 1849

What are the proposed uses of all parts of the building(s) and/or land?

- Location: Existing building to Park St. frontage Use: Council offices, customer service centre and Early Childhood Centre
- Location: new building to centre of site Use: Library
- Location: Existing building between Park St and Pittwater Road Use: Community Hall
- Location: Use:

Materials to be Used

Place a tick (✓) in the box which best describes the materials the new work will be constructed of:

Walls		Code	Roof		Code
<input checked="" type="checkbox"/>	full brick/single brick/concrete block	11	<input checked="" type="checkbox"/>	concrete/terracotta tiles or shingle	10
<input checked="" type="checkbox"/>	brick veneer	12	<input type="checkbox"/>	concrete/slate	20
<input checked="" type="checkbox"/>	concrete/masonry	20	<input type="checkbox"/>	fibrous cement	30
<input type="checkbox"/>	fibrous cement/hardiplank	30	<input checked="" type="checkbox"/>	steel	60
<input type="checkbox"/>	timber/weatherboard	40	<input type="checkbox"/>	aluminum	70
<input type="checkbox"/>	curtain glass	50	<input type="checkbox"/>	fibreglass/other	80
<input type="checkbox"/>	steel	60			
<input type="checkbox"/>	cladding-aluminum	70			
<input type="checkbox"/>	other	80			
<input type="checkbox"/>	unknown	90			
Floor		Code	Frame		Code
<input type="checkbox"/>	timber	10	<input type="checkbox"/>	timber	40
<input checked="" type="checkbox"/>	concrete	20	<input checked="" type="checkbox"/>	steel	60
<input type="checkbox"/>	other	80	<input checked="" type="checkbox"/>	other (concrete)	80
<input type="checkbox"/>	unknown	90	<input type="checkbox"/>	unknown	90

Notes for completing Construction Certificate Application

Note 1 The following information must accompany an application for a construction certificate for building and subdivision work:

Building Work

In the case of an application for a construction certificate for building work:

- a) copies of compliance certificates relied upon
- b) four (4) copies of detailed plans and specifications

The plan for the building must be drawn to a suitable scale and consist of a general plan and a block plan. The general plan of the building is to:

- show a plan of each floor section
- show a plan of each elevation of the building
- show the levels of the lowest floor and of any yard or unbuilt on area belonging to that floor and the levels of the adjacent ground
- indicate the height, design, construction and provision for fire safety and fire resistance (if any)

Where the proposed building work involves any alteration or addition to, or rebuilding of, an existing building the general plan is to be coloured or otherwise marked to the satisfaction of the certifying authority to adequately distinguish the proposed alteration, addition or rebuilding.

Where the proposed building work involves a modification to previously approved plans and specifications the general plans must be coloured or otherwise marked to the satisfaction of the certifying authority to adequately distinguish the modification.

The specification is:

- to describe the construction and materials of which the building is to be built and the method of drainage, sewerage and water supply
 - state whether the materials proposed to be used are new or second hand and give particulars of any second hand and give particulars of any second hand materials to be used
- c) where the application involves an alternative solution to meet the performance requirements of the BCA, the application must also be accompanied by:
 - details of the performance requirements that the alternative solution is intended to meet, and
 - details of the assessment methods used to establish compliance with those performance requirements
 - c) evidence of any accredited component, process or design sought to be relied upon
 - e)
 - except in the case of an application for, or in respect of, a Class 1a or Class 10 building: a list of any fire safety measures that are proposed to be implemented in the building or on the land on which the building is situated, and
 - if the application relates to a proposal to carry out any alteration or rebuilding of, or addition to, an existing building, a separate list of such of those measures as are currently implemented in the building or on the land on which the building is situated

The list must describe the extent, capability and basis of design of each of the measures concerned

Subdivision Work

in the case of an application for a construction certificate for subdivision work:

- a) copies of compliance certificates relied upon
- b) four (4) copies of detailed engineering plans. The detailed plans may include but are not limited to the following:
 - earthworks
 - roadworks
 - road pavement
 - road furnishings
 - stormwater drainage
 - water supply works
 - sewerage works
 - landscaping works
 - erosion control works

Where the proposed subdivision work involves a modification to previously approved plans the plans must be coloured or otherwise marked to the satisfaction of the certifying authority to adequately distinguish the modification.

Note 2 Home Building Act Requirements

In the case of an application for a construction certificate for residential building work (within the meaning of the *Home Building Act 1989*), attach the following:

- a) in the case of work by a licensee under that Act:
 - i) a statement detailing the licensee's name and contractor licence number and
 - ii) documentary evidence that the licensee has complied with the applicable requirements of the Act*, or
- b) in the case of work done by any other person:
 - i) a statement detailing the person's name and owner-builder permit number, or
 - ii) a declaration signed by the owner of the land, to the effect that the reasonable market cost of the labour and materials involved in the work is less than the amount prescribed for the purposes of the definition of *owner-builder work* in Section 29 of that Act.

* A certificate purporting to be issued by an approved insurer under Part 5 of the *Home Building Act 1989* to the effect that a person is the holder of an insurance contract issued for the purposes of that Part, is sufficient evidence that the person has complied with the requirements of that Part.

Existing Fire Safety Schedule

Essential Services to be Inspected or tested	Installation standards/level of performance	Currently installed within the building
General		
Exit doors & paths of travel to exits	BCA Section D	Yes No
Fire-rated or smoke-rated doors, panels or windows	BCA Spec C3.4 AS 1905.1	Yes No
Fire extinguishers (portable)	BCA E1.8 AS 2444	Yes No
Fire indices for materials	BCA C1.10 AS 1537.1	Yes No
Fire resisting structures & exits	BCA Sections C and D	Yes No
Penetrations in fire-rated construction	BCA Part C3	Yes No
Fire curtains	BCA Spec H1.3	Yes No
Fire control centres	BCA Spec E1.8	Yes No
Emergency vehicular perimeter access	SCA C2.4	Yes No
Emergency lifts	SCA E3.4 AS 1735.2	Yes No
Warning systems associated with lifts (including signs)	BCA Part F3	Yes No
Mechanical services		
Air conditioning & mechanical ventilation systems	BCA E2.2 G3.6 Spec H1.2 AS 1558	Yes No
Stairwell pressurisation systems	BCA E2.2 AS 1558	Yes No
Smoke vents	BCA E2.4 G3.8 AS 2565	Yes No
Fire dampers	AS 1552.2	Yes No
Electrical services		
Fire detectors and alarm systems	SCA 2.2 AS 1570	Yes No
Fire control panels & brigade connections	BCA Spec E1.7 Vic H101.9 Vic H103 AS 1570	Yes No
Smoke alarms	BCA E1.7 G3.6 Vic H101.9 Vic H103	Yes No
Emergency warning and intercommunication systems	BCA E4.9 Spec E1.5 Spec E1.7 AS 2020	Yes No
Emergency lighting & exit signs	BCA Part E4 AS 2250.1	Yes No
Emergency power supply	BCA Spec G3.8	Yes No
Hydraulic services		
Fire hydrants & mains	BCA E1.3 AS 2419.1	Yes No Refer Note 1
Sprinkler systems	BCA E1.5 AS 2118 Code of practice for installation of residential life safety sprinkler systems	Yes No
Fire hose reel	BCA E1.4	Yes No
Static water storage	BCA Part E1 AS 2118 AS 2419.1	Yes No

Note 1: Existing hydrant protection provided by external street hydrants

Proposed Fire Safety Schedule

Essential Service to be inspected or tested	Installation standards/level of performance	Currently installed within the building (Yes/No)
General		
Exit doors & paths of travel to exits	BCA Section D	Yes No
Operated or smoke-rated doors, panels or windows	BCA Spec 03.4, AS 1530.3	Yes No
Fire extinguishers (portable)	BCA E1.6, AS 2444	Yes No
Fire indices for materials	BCA C1.10, AS 1530.3	Yes No
Fire resisting structures & exits	BCA Sections C and D	Yes No
Penetrations in fire-rated construction	BCA Part C3	Yes No
Fire curtains	BCA Spec H1.3	Yes No
Fire control centres	BCA Spec E1.8	Yes No
Emergency vehicular perimeter access	BCA C2.4	Yes No
Emergency lifts	BCA E3.4, AS 1735.2	Yes No
Warning systems associated with lifts (including signs)	BCA Part E3	Yes No
Mechanical services		
Air conditioning & mechanical ventilation systems	BCA E2.2, G3.8, Spec H1.1, AS 1668	Yes No
Stairwell pressurisation systems	BCA E2.2, AS 1668	Yes No
Smoke vents	BCA E2.4, G3.8, AS 2685	Yes No
Fire dampers	AS 1682.2	Yes No
Electrical services		
Fire detectors and alarm systems	BCA 2.2, AS 1570	Yes No
Fire control panels & brigade connections	BCA Spec E1.7, Vic H101.8, Vic H103, AS 1670	Yes No
Smoke alarms	BCA E1.7, G3.8, Vic H101.9, Vic H103	Yes No
Emergency warning and intercommunication systems	BCA E4.9, Spec E1.5, Spec E1.7, AS 2220	Yes No
Emergency lighting & exit signs	BCA Part E4, AS 2293.1	Yes No
Emergency power supply	BCA Spec G3.8	Yes No
Hydraulic services		
Fire hydrants & mains	BCA E1.3, AS 2419.1	Yes No
Sprinkler systems	BCA E1.5, AS 2118, Code of practice for installation of residential life safety sprinkler systems	Yes No Refer Note 1.
Fire hose reel	BCA E1.4	Yes No
Static water storage	BCA Part E1, AS 2118, AS 2419.1	Yes No

Note 1: Fire hydrant protection provided by external street hydrants

44-19 20 10 20

DP1047405

STATE OF DETROIT WATER

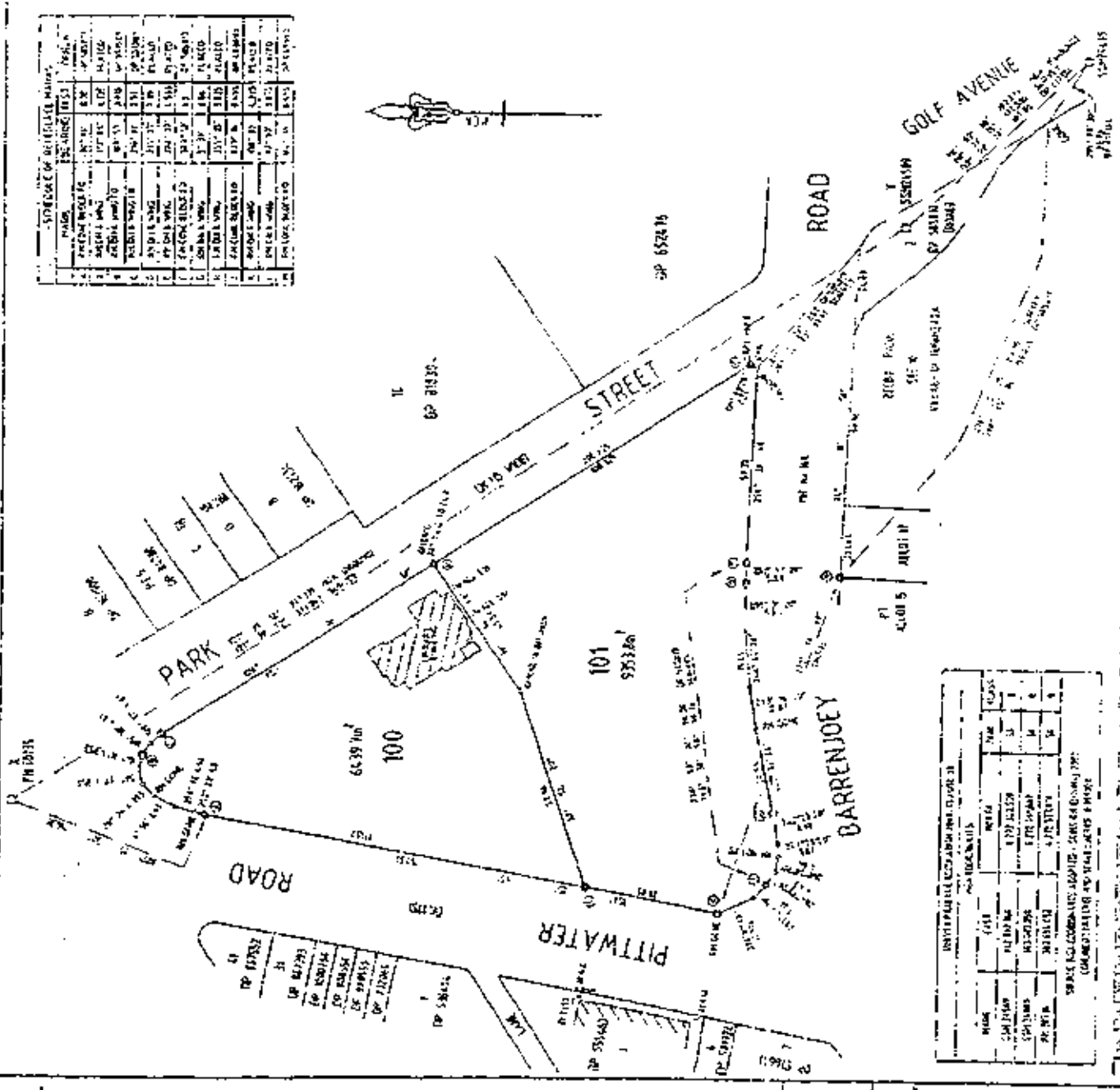
PLAN	DATE	FILE	NO.	AREA
1. PRELIMINARY	10/1/84	88	101	1.0000
2. PROPOSED	10/1/84	88	101	1.0000
3. FINAL	10/1/84	88	101	1.0000
4. FINAL	10/1/84	88	101	1.0000
5. FINAL	10/1/84	88	101	1.0000
6. FINAL	10/1/84	88	101	1.0000
7. FINAL	10/1/84	88	101	1.0000
8. FINAL	10/1/84	88	101	1.0000
9. FINAL	10/1/84	88	101	1.0000
10. FINAL	10/1/84	88	101	1.0000
11. FINAL	10/1/84	88	101	1.0000
12. FINAL	10/1/84	88	101	1.0000
13. FINAL	10/1/84	88	101	1.0000
14. FINAL	10/1/84	88	101	1.0000
15. FINAL	10/1/84	88	101	1.0000

PLAN: OF
CROWN LAND CLEARANCE
CROWN LAND CLEARANCE
30 TOWN OF DETROIT, MICHIGAN
ACRES 0.0000

TOWN: PITTWATER
WARD: MOVA VALL
CITY: MARSHFELD
COUNTY: CUMBERLAND

PLAT: OF
CROWN LAND CLEARANCE
CROWN LAND CLEARANCE
30 TOWN OF DETROIT, MICHIGAN
ACRES 0.0000

PLAT: OF
CROWN LAND CLEARANCE
CROWN LAND CLEARANCE
30 TOWN OF DETROIT, MICHIGAN
ACRES 0.0000



UNITS AVAILABLE FOR RENT

UNIT	NO. AVAILABLE	NO. OCCUPIED	NO. VACANT
1-2	1	1	0
3-4	1	1	0
5-6	1	1	0
7-8	1	1	0
9-10	1	1	0
11-12	1	1	0
13-14	1	1	0
15-16	1	1	0
17-18	1	1	0
19-20	1	1	0
21-22	1	1	0
23-24	1	1	0

STATE OF MICHIGAN
COUNTY OF CUMBERLAND

PLAN FORM 2

NOTES: ...

NOTES: ...

NOTES: ...

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NOTES: ...



Pittwater Council

11 Pittwater Drive
P.O. Box 99
Mona Vale NSW 1502

Mona Vale
P.O. Box 99
Mona Vale NSW 1502
Tel: 0025 9796 106

11 Pittwater Drive
P.O. Box 99
Mona Vale NSW 1502
Tel: 0025 9796 106

11 Pittwater Drive
P.O. Box 99
Mona Vale NSW 1502
Tel: 0025 9796 106

FACSIMILE


To:	BREWSTER HJORTH	From:	NATHAN HJORTH
Attn:	ANDREW HJORTH	Tel (Direct):	(02) 9970 3133
Fax No:	9251 8756	Fax (Direct):	(02) 9970 3133
		Mobile:	0407 224 111
No of Pages:	2 including this page	Date:	MONDAY, 17 MARCH 2003

Re: Village Park, Mona Vale

Andrew,

Please find attached proof of Long Service Leave Levy payment to be forwarded to the Finance Committee of the CC

Regards



Nathan Hjorth

CONFIDENTIALITY NOTICE TO RECIPIENTS EXTERNAL TO PITTWATER COUNCIL

The information in this facsimile is intended for the named recipient only. If you are the intended recipient, you should check the details of the facsimile to any person, firm or organisation. If you are not the intended recipient, you should not disseminate, copy, reproduce, or otherwise use the information. If you have received this facsimile in error, please notify the sender immediately by reverse message. If you are not the intended recipient, you should not disseminate, copy, reproduce, or otherwise use the information.

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Pittwater Council

OFFICIAL RECEIPT

24/03/2003 Receipt No 111 488

To PITTWATER COUNCIL

P.O. 507 887
YONGA VALE 2110

Applic	Reference	Amount
GL- Re	0LSL-Rusi CA 40710/02 NONA VALE VIL	49,200.00

Total: 49,200.00

Amounts Tendered

Cash	49.00
Cheque	49,200.00
Card	49.00
Money Order	49.00
Agency Fee	49.00
Total	49,106.00
Rounding	49.00
Change	49.00
Nett	49,206.00

Printed 24/03/2003 2:47:25

Cashier (treas)

14 March 2003

General Manager
Pittwater Council
5 Yuko Place
WARRIEWOOD, NSW 2102

Connell Wagner Pty Ltd
ABN 64 005 139 873
116 Military Road
(PO Box 538)
Kurlba, Bay
N.S.W. 2089 Australia

Telephone +61 2 9466 1699
Facsimile +61 2 9466 5656
Email: cwsyd@connwag.com
www.connmottmac.com

Dear Sir

Village Park Redevelopment Mona Vale – Certification of Structural Drawings for Construction Certificate

Pursuant to the provisions of Clause A2.2 of the Building Code of Australia, I hereby certify that the design provided on the Connell Mott MacDonald structural drawings listed below will be in accordance with normal engineering practice and meet the requirements of the Building Code of Australia, Part 8 of the Environmental Planning and Assessment regulation, relevant Australian Standards and relevant conditions of Development Consent.

Structural Drawing List:

BS001/02, BS002/02, BS005/02, BS006/02, BS007/02, BS008/02, BS009/02, BS010/02, BS011/02, BS012/02, BS013/02, BS015/02, BS016/02, BS017/02, BS018/02, BS019/02, BS020/02, BS021/02

I am an appropriately qualified and competent person in this area and as such can certify that the design and performance of the design systems comply with the above.

Yours faithfully



John Webb
Principal



Pittwater Council
Component Certificate

DA No: N0730/02

CC No:

Property: MONA VALE VILLAGE PARK 1 PARK STREET MONA VALE
NSW 2103

Balustrading Adequacy

BA-1

I, John Webb of Cornell Mott MacDonald
(Name) (Business)

at _____
(Mailing Address)

being an:

- accredited certifier
- structural engineer

with corporate membership of the Institute of Engineers Australia (MIE), or eligible to become a Corporate member and having appropriate experience and competence in the related field, my qualifications being:

BE (Hons) MEng Sc MIEAust

hereby certify that the balustrading has been designed ~~and constructed~~ in accordance with Part 3.9, 2.3(d) ~~of the~~ "Balustrades" of the Building Code of Australia Housing Provisions, AS 1170.1-1989 "Minimum design loads on structures - Dead and live loads and load combinations", and the relevant conditions of Development Consent.

Further, I am appropriately qualified and experienced to provide the certification for this component of the project.

Signature John Webb Date 13/3/03

14 March 2003

Nathan Huon
Senior Projects Officer
Pittwater Council
PO Box 882
Mona Vale NSW 1660

Connell Wagner Pty Ltd
ABN 54 205 139 373
116 Military Road
PO Box 538
Neutral Bay
NSW 2089 Australia

Telephone: +61 2 9465 5599
Facsimile: +61 2 9465 5598
Email: cwsyd@connwag.com
www.connwag.com

Dear Sir,

Drainage Design Monavale Village Park Library

We have undertaken the drainage design for the proposed development at the above site. The proposed drainage layout is shown on Drawing CA001-03. Our report describing the design is detailed below.

Site Description

The subject site, which has a total area of approximately 10550 m², is located on the northern corner of the intersection of Pittwater Road and Barrenjoey Road. The site contains various buildings, and a public park. The percentage of impervious area is approximately 9%. The highest point of the ground is at RL 8.0 and the lowest point is at RL 5.3.

The proposed development consists of a new library building, landscaping, paved areas and an extension to the existing library. The majority of the roof area of the proposed building will be covered with landscaping and paving. The total post-development area is approximately 10,820 m² and the percentage of impervious area will be approximately 15%.

Existing Drainage

The drainage lines from the existing buildings and the park connect into the Council's drainage systems running under Park Street and Barrenjoey Road. The roof area of the existing library drains into the Park Street pipe system and the remaining areas drain into the park. The last pit located in the park discharges into a gully pit located in Barrenjoey Road with a 450 mm diameter pipe.

The Council has informed to us in a meeting that the area experiences frequent flooding near the intersection due to the low capacity of the culvert drainage system discharging into the golf course across the road.

Proposed Drainage System

The proposed drainage system will consist of new pipelines, pits, subsoil drainage lines, a pump out system and an on-site detention system. The total area of proposed development will discharge into the Barrenjoey Road drainage system including the roof area of the existing library. This is in order to improve the drainage conditions in Park Street.

The on-site detention (OSD) system, which will attenuate flows discharging into Barrenjoey Road, will be located above ground in the park. At present, the park serves as an on site detention system for the catchment. The existing storage volume is approximately 740 m³.

Minor regrading works and subsoil drainage will be required in some areas of the park. The maximum water depth for the 100 year ARI storm event will be approximately 500mm. The batter slopes will be at 1 (vertical) to 3 (horizontal). A 7m long spillway at RL 5.75 will be located at the downstream end of the basin. The volume of the storage will be increased to approximately 825 m³.

On-site Detention Storage Analysis

The requirements for OSD are described in the Council's 'Guidelines for On-site Detention of Stormwater' handbook (DA Condition B10). The equations for the calculations for the required OSD storage volume shown in the guidelines were not adopted for the analysis. This was due to the submerged outlet conditions of the OSD outlet which the equations do not take into account. In addition, hydrologic modelling of the existing OSD was necessary in order to check the existing and post-developed flows.

The analysis of the OSD storage was undertaken using the DRAINS computer program. The model was run for the 5, 20 and 100 year ARI storm events for existing and post-developed conditions to check the performance of the OSD storage.

The assumed tail water level for the 5 and 20 year ARI storm events was 5.50 which is the gutter level near the outlet in Barrenjoey Road where the system connects. The assumed tail water level for the 100 year ARI storm event was RL 5.75 which is slightly higher than the footpath at this point.

The resulting peak water levels for each storm event are shown in Table 1.

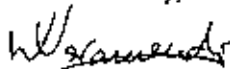
Table 1 Peak Flows at Outlet of the OSD Storage

ARI	Existing Conditions		Post-Developed Conditions	
	Pipe Flow (m ³ /s)	Spillway Flow (m ³ /s)	Pipe Flow (m ³ /s)	Spillway Flow (m ³ /s)
5 year	0.139	0.00	0.106	0.00
20 year	0.166	0.00	0.125	0.00
100 year	0.064	0.216	0.071	0.113

The above results show that the post-development peak flows will be less than existing conditions.

We trust that the above satisfies Council's requirements and if you have any questions do not hesitate to contact the undersigned.

Yours faithfully,



William Veramendi CPEng NPER

Enc: The DRAINS summary print out and drawing CAC01-03 are attached.

PIT/NODE DETAILS

Name	Max HGL	Max Surface Flow Area (cu.m/s)	Max Pond Volume (cu.m)	Version 5 Min Freeboard (m)	Overflow (cu.m/s)	Consistent
Pro	5.5	0	0			
Exi	5.5	0	0			

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved To (mm)	Grassed To (mm)	Scup To (mm)	Due to Storm
Proposed	0.425	0.373	0.353	5	8	8	5 AR&R 5 year, 25 minutes storm, average 83 mm/h, Zone 1
Existing	0.411	0.043	0.358	5	8	8	5 AR&R 5 year, 25 minutes storm, average 83 mm/h, Zone 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max O/S HGL (m)	Due to Storm
Propo	0.106	0.7	5.81		5.5 AR&R 5 year, 1 hour storm, average 53 mm/h, Zone 1
Exis	0.139	0.6	5.508		5.5 AR&R 5 year, 1.5 hours storm, average 41.0 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Channelage (m)	Max HGL (m)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q O/S	Safe Q	Max O	Max O x V	Max Width	Max V	Due to Storm
OF242	0	0	1.931	0	0	0	0	
OF275	0	0	1.931	0	0	0	0	

DEFLECTION BASIN DETAILS

Name	Max Vol	Max Vol	Max Q Total	Max Q Low Level	Max Q High Level
Proposed	5.64	420.8	0.106	0.106	0
Existing	5.61	367.7	0.139	0.139	0

CONTINUITY CHECK for AR&R 5 year, 25 minutes storm, average 83 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Ch (cu.m)	Cr Difference %
Proposed	341.73	352.72	12.78	.7
Pro	352.72	352.72	0	0
Existing	331.14	344.41	0.96	-4.3
Exi	344.41	344.41	0	0

Run Log for QSD file run at 12:44:10 on 25/12/2003

PIPERNODE DETAILS

Version 3

Name	Max HGL	Max Suddr	Max Pond	Min	Overflow	Constraint
		Flow Area	Volume	Freeboard	(cu m/s)	
		(cu m/s)	(cu m)	(m)		
Pro	5.5	7				
Exr	5.5	0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q	Paved	Grossed	Paved	Grossed	Supp	Due to Storm
	(cu m/s)	Max O	Max O	To	To	To	
		(cu m/s)	(cu m/s)	(mm)	(mm)	(mm)	
Proposed	0.559	0.095	0.464	5	8		5 AR&R 20 year, 25 minutes storm, average 108 mm/h, Zone 1
Existing	0.54	0.055	0.484	5	9		5 AR&R 20 year, 25 minutes storm, average 108 mm/h, Zone 1

PIPE DETAILS

Name	Max Q	Max V	Max D/S	Max C/S	Due to Storm
	(cu m/s)	(m/s)	HGL (m)	HGL (m)	
Proco	0.125	0.8	5.514		5.5 AR&R 20 year, 1.5 hours storm, average 55 mm/h, Zone 1
Exis	0.166	0.7	5.511		5.5 AR&R 20 year, 1.5 hours storm, average 55 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q	Channelage	Max	Due to Storm
	(cu m/s)	(m)	HGL (m)	

OVERFLOW ROUTE DETAILS

Name	Max Q L/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF242	0	0	1.931	0	0	0	0	0
OF278	0	0	1.931	0	0	0	0	0

DEFENTION BASIN DETAILS

Name	Max WL	Max Vol	Max Q	Max Q	Max Q
			Total	Low Level	High Level
Proposed	5.59	546.1	0.125	0.125	0
Existing	5.86	475.7	0.166	0.166	0

CONTINUITY CHECK for AR&R 20 year, 25 minutes storm, average 108 mm/h, Zone 1

Node	Inflow	Outflow	Storage Cr	Difference
	(cu m)	(cu m)	(cu m)	%
Proposed	454.15	441.71	35.03	-5
Pro	441.71	441.71	0	0
Existing	440.79	459.29	0.97	-4.4
Exi	459.29	459.29	0	0

Run Log for OSD dm run at 12:44:10 on 25/2/2003

PIPE NODE DETAILS

Name	Max HGL	Max Surf Flow Area (sq.m)	Max Pond Volume (cu.m)	Version Min Freeboard (mm)	Overflow (mm)	Constraint
Prop	5.75	0	0			
Exi	5.75	0	0			

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Pc (mm)	Grassed Tc (mm)	Supp Tc (mm)	Due to Storm
Proposed	0.663	0.111	0.552		5	5	5 AR&R 100 year, 25 minutes storm, average 141 mm/h, Zone 1
Existing	0.542	0.065	0.577		5	5	5 AR&R 100 year, 25 minutes storm, average 141 mm/h, Zone 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max O/S HGL (m)	Due to Storm
Propo	0.071	0.4	5.755	5.75	AR&R 100 year, 9 hours storm, average 23.4 mm/h, Zone 1
Exis	0.064	0.3	5.752	5.75	AR&R 100 year, 2 hours storm, average 60 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Charnage (m)	Max HGL (m)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S (cu.m/s)	Max Q O/S (cu.m/s)	Sale Q (cu.m/s)	Max Q (cu.m/s)	Max QxV	Max Width	Max V	Due to Storm
OF242	0.113	0.113	1.931	0.083	0.07	3.34	0.91	AR&R 100 year, 9 hours storm, average 23.4 mm/h, Zone 1
OF279	0.216	0.216	1.931	0.106	0.1	4	0.96	AR&R 100 year, 2 hours storm, average 60 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max WL	Max Vol	Max Q Total	Max Q Low Level	Max Q High Level
Proposed	5.81	825.3	0.194	0.071	0.113
Existing	5.77	739.3	0.279	0.064	0.215

CONTINUITY CHECK for AR&R 100 year, 25 minutes storm, average 141 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage (cu.m)	Cr %	Difference
Proposed	632.36	74.61	534.44	-1.1	0
Pro	74.61	74.61	0	0	0
Existing	585.34	202.8	405.54	-3.9	0
Exi	202.41	202.41	0	0	0

CERTIFICATE OF COMPLIANCE


DESIGN OF PROPOSED BUILDING FIRE AND HYDRAULIC SERVICES

*City/Municipality/Shire of: **Pittwater Council**
 Date of Certificate: **17th March 2003**
 Building No. or Name: **Mona Village Library** Street: **1 Park Street**
 *District/Town/Village: **Mona Vale**
 Owner's Name: **Pittwater Council**

This certificate is applicable to the library building and re-furnished existing building located at 1 Park Street, Mona Vale Village Park, Sydney.

Nature of Service	Date	Name and address of person(s) by whom design was performed.	Have the documents Issued for Tender been designed to the relevant standard? (YES,NO)
Fire Hydrants(external street hydrant protection)	17/03/2003	Brian Aleasid Hydraulic Services Designer	YES BCA CL E1.3 AS2419
Fire hose reels		ACOR Consultants P/L 24 Falcon St Crows Nest NSW 2065	BCA CL E1.4 AS2441.7 AS1321
Portable Fire Extinguishers			BCA CL E1.6 AS2444
Plumbing Services			Sydney Water requirements AS3500
Stormwater disposal			AS3500.3 Pittwater Council requirements

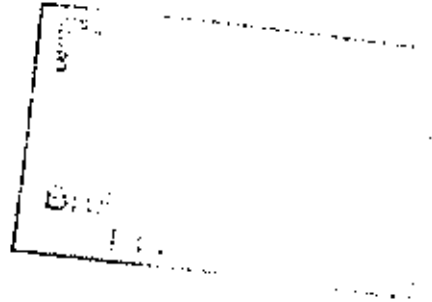
I, Robert Gruber of ACOR Consultants P/L certify that the hydraulic services as shown on drawings H-01 through to H-08 and Hydraulic services specification have been designed in accordance with the relevant Statutory Codes.

Signed.......... (Director)

01832cc0106/MH/ph

13th March 2003

Brewster Hjorth Architects
The Grafton Bond Store
201 Kent Street
Sydney 2000



Attention: Andrew Hjorth

Dear Andrew,

Project : Village Park Mona Vale

Statement of Design Compliance - Electrical & Mechanical

We hereby certify that the design of the Electrical & Mechanical Services for the following areas:

New Public Library;
Link;
New Council Offices and extensions to existing building

have been designed to comply with the Deemed-To-Satisfy requirements of the Building Code of Australia and associated Australia Standards and Statutory Requirements as detailed below:

- o AS 2293 Emergency Lighting
- o AS/NZS 1680 Interior Lighting
- o AS 1668.2 2002 Ventilation design for indoor air contaminant control

We also comment on the following DA and other items as follows:

Clause D7

Lighting

Lighting to comply with AS1428.2 cl19.1. We note that this requirement is beyond the basic BCA requirement.

The new building will comply with these lighting levels.

Some existing lighting in the existing building will not fully comply.



External Lighting

The external lighting requirement of 150 lux exceeds the recommended levels in AS1158.

Steensen Varming has designed external illumination in accordance with AS1158. A higher illumination will cause glare, visual discomfort and uniformity problems with street lighting.

Smoke Detection

Reference is made to domestic style AC/ DC smoke detectors by way of the Smoke Alarms Component Certificate. Steensen Varming understands that smoke detectors in accordance with AS1670 are not required by the BCA.

The existing building does have some detectors which are linked to the Security System. A similar system has been designed for the new Library and child care areas.

Security Doors

BCA D2.21 (d)

Door locks shall be linked to the security system smoke detection. In the event of a local smoke alarm the security system will unlock the nominated doors.

BCA D2.21 (c)

The doors have a centrally located door release button at the Main Counter for Fire Wardens / Staff to unlock in the event of an emergency.

Yours sincerely

Michael Harrold
Associate



Certification of Landscape Documentation

Project: Village Park Mona Vale
Project No: 01130/bia
DA No: 0730/02

In accordance with DA Condition No B45 we certify that the landscape documentation issued for Construction Certification (Dwg No's LA01 issue D, LA02 issue D, LA03 issue D, LA04 issue D, LA05 issue D, LA06 issue B, LA07 issue C) provides for the works to be carried out in accordance with Councils DCP No 23 – Landscape Vegetation Management.

Iain Brammer BArch AA/LA
Registered Landscape Architect
Director

Colin Mathison
49 Dareen Street
Frenchs Forest 2086

10th April 2003

McKenzie Group Consulting
189 Kent Street
Sydney NSW 2000
Attention: Robert Lee
Senior Building Surveyor

Dear Mr Lee

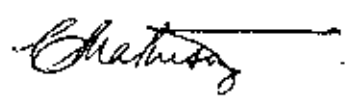
Re: DESIGN CERTIFICATION - ROADWORKS, PARK STREET MONA VALE

This is to certify that the roadworks and footpath pavement details have been designed and comply with the requirements of:

- AUSTRROADS – Pavement Design
- AUSSPEC No.1 – Design
- DCP E3/AS 2890.1 & 5 - 1993

Relevant drawings are: 9475E Sheets 1 to 4 (Issue C)

Yours faithfully



C J Mathison
B.E. (Civil), M.I.E. (Aust.) C.P. Eng. (Civil)



brewster hjorth
ARCHITECTS

REF: 20151 C083
30 April 2003

Senior Building Surveyor
McKenzie Group Consulting
Level 6
189 Kent Street
SYDNEY NSW 2000

Att: Robert Lee

Dear Robert

**VILLAGE PARK MONA VALE REDEVELOPMENT
CONSTRUCTION CERTIFICATE SUBMISSION**

Please find attached the following outstanding documents required for the Construction Certificate:

- 1 Statement of Compliance from Access Consultant, as required by Development Consent Condition D10.
- 2 Confirmation from Council that external colours and materials have been approved.
- 3 Acoustic Certificate, as required by Development Consent Condition D107.
- 4 Contamination Assessment by Douglas Partners outlining site suitability, as required by Development Consent Condition D11.

We now believe that all matters pertaining to the Construction Certificate have been addressed and await receipt of the Certificate.

Should you have any queries or require any further information please do not hesitate to contact me.

Yours sincerely

Andrew Hjorth
Director
Brewster Hjorth Architects

T: 02 9251 8411
F: 02 9251 8756
e: andrew.hjorth@brewsterhjorth.com.au

Directors

*Tim Brewster
B ARCH UNSW
University Medal, FAIA*

*Andrew Hjorth
B ARCH UTS
2 Stars RIBA*

Associates

*Larry Melocco
B ARCH Sydney Uni*

*Paul Jones
B ARCH UNSW*

*Vicki Rushon
B ARCH Sydney Uni
(1st Class Hons)*

**The Grafton
Bond Store
201 Kent Street
Sydney**

**PO Box N565
Grosvenor Place
NSW 1220**

**Facsimile
02 9251 8756**

**Telephone
02 9251 8411**

**BrewsterHjorth
Pty Limited
ACN 002 513 131**

MORRIS-GODING Accessibility Consulting

15th April 2003

Andrew Hjorth
Brewster Hjorth Architects
PO Box N565
Grsvenor Place Sydney 2000

Dear Sir,

Re: **Village Park Mona Vale**

I hereby certify that the above design is in accordance with normal disability access practice and meets the requirements of the Building Code of Australia and relevant Australian Standards.

In particular the design is in accordance with the following:

- AS 1428.1 - 80% of people with disabilities accommodated
- AS 1428.2 - 90% of people with disabilities accommodated
- AS 1428.4 - Tactile Ground Surface Indicators
- AS 1732.12 - Lift Facilities for Persons with Disabilities
- BCA - Building Code of Australia
- DDA - Disability Discrimination Act

I am an appropriately qualified and competent person in this area and as such can certify that the design systems ensure reasonable compliance with the DDA and the above Australian Standards. The design systems have been based on recommendations contained within the disability access report dated 19th August 2002 and the CC Review dated 1st April 2003.

Full Name: David Goding
Company: Morris-Goding Accessibility Consulting
Qualifications: Bachelor of Civil Engineering
Grad Dip of Business Management
Address: Suite 33, 61 Marlborough Street, Surry Hills, NSW 2010
Phone No. 02 9310 5732 Fax. 02 9310 1794

Yours faithfully,



David Goding
Director

From: Nathan Huxton [mailto:nathan.huxton@pittwater.nsw.gov.au]
Date: Wed Apr 9, 2008 3:52:58 PM Australia/Sydney
To: andrew.hjorth@brewsterh.com.au
Subject: Re: Village Park - Colour Schedule

Andrew

Client signal of external Colours by Councils - Senior Development Officer as required for CC.

Regards

Nathan

Forwarded by Nathan Huxton, Pittwater Council, 9 April 2008 09:22 AM

Greg Boston

03/04/2008 09:27 AM

To: Nathan Huxton [mailto:nathan.huxton@pittwater.nsw.gov.au]
cc: Greg Boston [mailto:greg.boston@pittwater.nsw.gov.au]
Subject: Re: Village Park - Colour Schedule

Yes, I agree.

Nathan Huxton

03/04/2008 09:44 PM

To: Greg Boston [mailto:greg.boston@pittwater.nsw.gov.au]
cc: Nathan Huxton [mailto:nathan.huxton@pittwater.nsw.gov.au]
Subject: Village Park - Colour Schedule

Greg,

As confirmation of Saturday's Council Inspection at Village Park Maria Vale

The Council has resolved as follows

External Colour Scheme as set forward by Council's Architects was generally adopted as follows

- Steel Laminated Structure - Rusty red as per BHA sample board
- Roof of new structures - metal cladding (Armour Grey)
- Roof of existing library extensions (where visible) - concrete tile (to match armour grey)
- Paving (Header Course) - Blonds as per sample
- Paving (Body) - Medium Grey as per sample
- Painting of Existing library brickwork (cream colour) - subject to signal by original architect.

Could you please confirm this to be your record of Saturday's meeting via return email

Thanks

Nathan

This email and any materials contained or attached to it ("Contents") may contain confidential information. If you are not the intended recipient, you should not disseminate, distribute or copy this e-mail. Please notify the sender immediately by e-mail if you have received this e-mail by mistake and delete this e-mail from your system. If you are not the intended recipient you should not disseminate, distribute or copy this e-mail. The contents may also be subject to copyright. Any unauthorised copying, disclosure or distribution of the contents is strictly prohibited. Any views expressed in the contents are those of the individual sender, except where the sender specifically states them to be otherwise.
Pittwater Council
www.pittwaterlga.com.au



2003/04/22 10:00:00 AM
2003/04/22 10:00:00 AM
2003/04/22 10:00:00 AM

Hyder Consulting
(Australia) Pty Ltd
ABN 34 000 579 046
Level 5, 116 Miller Street
North Sydney NSW 2060
Australia
Tel: +61 2 8907 9194
Fax: +61 2 8907 9001

22 April, 2003

pl_u28701ah / 84560

Brewster Hjorth Architects
The Grafton Bond Store
201 Kent Street
Sydney NSW 2000

Attention : Andrew Hjorth

Dear Andrew

Mona Vale Village Park Redevelopment

The proposed plant installation as shown on the architectural plans will comply with noise limits specified in Table 1 of the Acoustic Impact Report prepared by Hyder Consulting (pr_u28701rf).

Yours faithfully
HYDER CONSULTING (AUSTRALIA) PTY LTD
ACOUSTIC SERVICES GROUP

Robert Fitzell

per Robert Fitzell



Douglas Partners
Geotechnics · Environment · Groundwater

Douglas Partners Pty Ltd
ABN 75 053 980 117
56 Hermitage Road
West Ryde NSW 2114, Australia

FACSIMILE TRANSMISSION

Our Fax No: (02) 9809 4095

Our Phone No: (02) 9809 0666

e-mail: dpenviro@douglaspartners.com.au

TO:	Pittwater Council	FAX No:	99707384
ATTENTION:	Nathan Huon	DATE:	26 February 2003
CC:		FAX NO:	
FROM:	POLO FOO	PAGE	1 of 1

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SUBJECT:	Advance Copy of Final Report for Stage 1 Contamination Assessment Village Park, Mona Vale	PROJECT:	302968
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Nathan,

Please find attached advance copy of the Final Report on Stage 1 Contamination Assessment for the subject site. The final hard copy with appendices should be available next week.

Please do not hesitate to contact me at 98090666 for further queries.

Yours faithfully
DOUGLAS PARTNERS PTY LTD

Polo Foo
Environmental Engineer

Integrated Practical Solutions



Offices: Sydney, Newcastle, Brisbane, Melbourne, Perth, Wollongong, Cairns, Townsville, Gold Coast, Brisbane, Darwin, Warrungah, Darwin
 Managers: J.C. Bradstone, A.R. Bullock, G. Gibson, J.P. Harvey, S.R. Jones, P. Macdonald, P. Macdonald, G.W. McLaughlin, J. Macdonald, A.J. Taylor, M.J. Smith, R. Stone, G.A.D. Wilson, T.J. Wilson, N.J. Wilson, G.R. Wilson
 Senior Associates: N.R. Beggan, K.A. Bogan, M.Y. Brice, D.S. Ford, J.C. Gorman, B.W. Hall, A. Hill, R.W. Lumsden, S.J. Macpherson, A.M. Prange, G.S. Young
 Associates: G. Bachonik, A. Ceballos, C.M. Deegan, G.S. Evans, P.K. Evans, A.K. Floyd, D.S. Hill, D. Macdonald, G.G. Murray, I.G. Peck, O.L. Quilley, K.B.P. Quilley, K. Smyth, C.J. Stewart, D.P. Walker, M.M. Yess



On the basis of these analytical findings, it is considered that the site is suitable for the proposed construction/extension of a new partially below ground level library built above the new library, the relocation of the Early Childhood Centre (baby clinic), the refurbishment of the Community Hall and retention of part of the site as parkland, subject to the removal of stockpiled material in which PAH concentrations were recorded that exceeded the site assessment criteria.

Based on the results, the filling and stockpiled material can be classified as *Inert Waste* and the natural materials is classified as *VENM (Inert Waste)* in accordance with the NSW EPA (1999) *Environmental Guidelines. Assessment, Classification and Management of Liquid and Non-Liquid Wastes*. The filling material from the site can also be retained on-site.

It should be noted that *Inert Waste* can either be disposed of off-site to a EPA licenced facility or reused in other sites, subject to prior approvals/consent from the receiving site and relevant authorities.



The aims of the current assessment were to:-

- provide an assessment of the general level of contamination resulting from past and present site uses.
- assess the potential for off-site migration of contamination; and
- assess the suitability of the site for the proposed development.

This report presents details of the field work and laboratory results, and provides comments relating to the level of contamination, in the subsoils, if any, and assesses the suitability of the site for its intended purpose and determines the risks of off-site contaminant migration and waste classification for disposal purposes.

2. SITE DESCRIPTION

2.1 Site Identification

The subject site is a rectangular allotment situated on the corner of Pittwater Road and Park Street, Mona Vale and is identified as Lot 100 in DP 1047405 in the Parish of Narrabeen, County of Cumberland. The site covers an estimated area of 0.42 hectares. The local government authority is Pittwater Council. Under section 149(2) of the Environmental Planning and Assessment Act (1979) and Pittwater Local Environmental Plan 1993, the subject site is currently zoned 6(a) Existing Recreation "A".

A site plan and locality map is shown in Drawing 1, Appendix A.

2.2 Site History

A site historical information review was conducted, comprising a review of aerial photographs and a site history/title deed search for the approximately the past 100 years by Peter S. Hopley Pty Limited, Legal Searchers. The results of the search indicated that it was Crown Land before the current title is being issued in the name of The State of New South Wales. It appears that from the search that the subject site forms part of the land reserved



The subject site is generally flat except for a moderate cross-fall from the northern (base of the brick retaining wall separating the Community Hall and the park) to the southern portion of the site, with an overall level difference in the order of 1.0 m. The volume of stockpiled material at the western and central portion of the site is approximately 300m³.

A site location plan and site layout are shown on Drawing 1 (Appendix A).

2.2 Proposed Development

It is understood that the proposed development will comprise the construction of a new partially below ground level library behind the existing library, with Central Plaza built above the new library, the relocation of the Early Childhood Centre (baby clinic), the refurbishment of the Community Hall and retaining part of the site as parklands.

3. GEOLOGY AND HYDROGEOLOGY

Reference to the Sydney 1:100 000 Geological Series Sheet indicates that the site is underlain by interbedded siltstones, shales and sandstones belonging to the Narrabeen Group of rocks of Triassic Age close to the boundary of Quaternary age alluvial sediments. The sediments comprise sands, silts and clays, which extend in an easterly direction towards Mona Vale Beach.

The field investigations for the current assessment encountered varying natural sandy clayey silt, underlain by sandstone, generally confirming the geological mapping. The measured depth to groundwater in two piezometers installed at the northern and eastern portion of the site was between 3.76 m and 3 m below ground level, respectively.

Groundwater bore searches with the Department of Land and Water Conservation (DLWC) indicated that 12 registered bore are located in a radius of approximately 2 km. Work summaries from the bore search indicated that the authorised and intended purposes of the groundwater bores were for waste disposal, irrigation and general supply purposes.



- Excavate 6 test pits using a backhoe to nominal depths of 0-0.5 m, 1.5 m and 3 m, or 1 m into natural material or upon signs of contamination, in the areas designated for the proposed development for the purposes of environmental sampling.
- Collect samples of soil/filling (including field replicates for QA/QC requirements) from the backhoe bucket from all test pits at regular depth intervals or changes in the subsoil profile and at the base of the pit (nominally 1.5 m). Collect 3 samples from the stockpiled material
- Measure depths to groundwater and collect a groundwater sample from existing groundwater monitoring bores 101 and 103 (installed by DP in June 2002) following full bore development and purging.
- Screen all soil samples with a calibrated photoionisation detector (PID) to detect the presence of volatile organic compounds.
- Conduct laboratory analysis on selected soil samples at a NATA accredited analytical laboratory for a range of the following potential contaminants:-
 - Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn);
 - Total Recoverable Hydrocarbons (TRH);
 - Monocyclic Aromatic Hydrocarbons (Benzene, Toluene, Ethylbenzene and Xylene - BTEX);
 - Polycyclic Aromatic Hydrocarbons (PAH);
 - Polychlorinated Biphenyls (PCB);
 - Organochlorine Pesticides (OCP); and
 - Asbestos
- Conduct laboratory analysis on the groundwater samples at a NATA accredited analytical laboratory for the following analytes:-
 - Metals (As, Cd, Cr, Cu, Hg, Pb, Ni, Zn);
 - Total Recoverable Hydrocarbons (TRH);



For waste classification purposes, the following criteria are adopted:-

- NSW EPA's *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Waste* (1999)

5.3.1 Groundwater

- ANZECC *Australian Water Quality Guidelines for Fresh and Marine Waters with 95% Level of Species Protection* (2000);
- Threshold Concentration for Water, Health-based protection of Drinking Water, from NSW EPA *Guidelines for Assessing Service Station Sites*, 1994;
- Threshold Concentrations for Water, Protection of Aquatic Ecosystem, from NSW EPA *Guidelines for Assessing Service Station Sites*, 1994; and
- Environmental Quality Objectives in the Netherlands 'Dutch Guidelines', *Intervention Value for Mineral Oil*, 1994.

5.4 Sampling Methodology

Environmental sampling was performed according to standard operating procedures outlined in the *DP Field Procedures Manual*. All sampling data was recorded on DP chain of custody sheets, and the general sampling procedure comprised:-

- decontamination of all sampling equipment using a 3% solution of phosphate free detergent (Decon 90) and distilled water prior to collecting each sample;
- transfer of samples into laboratory-prepared glass jars, and capping immediately;
- collection of field duplicate samples for QA/QC purposes;
- labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;
- placement of the sample jars into a cooled, insulated and sealed container for transport to the laboratory;
- collection of an additional replicate set of samples in sealed plastic bags for screening with a photoionisation detector (PID), which is capable of detecting over 300 volatile organic compounds in the headspace of a sample; and

Table 1 – Data Quality Objectives

DQO	Procedure
Documentation completeness	<ul style="list-style-type: none"> Completion of laboratory chain of custody documentation Completion of test pit report sheets (Appendix D)
Data completeness	<ul style="list-style-type: none"> Determination of sampling density in accordance with Table A, NSW EPA Contaminated Sites: Sampling Design Guidelines (1995) (Section 5.1) Analysis of appropriate potential contaminants based on site history and on-site observation (Sections 2.2 and 4)
Data comparability	<ul style="list-style-type: none"> Use of NATA accredited laboratories Use of consistent sampling technique (Section 5.4)
Data representivity	<ul style="list-style-type: none"> Sampling from a general grid pattern across the site and from a range of depths in order to obtain samples which are representative of soil conditions on site (Section 6.3)
Precision and accuracy for sampling and analysis	<ul style="list-style-type: none"> Ensure achievement of 30% RPD for replicate analysis and acceptable levels for laboratory QC criteria (Section 6.8.1)

The procedures adopted for achieving the DQOs are standard procedures for contamination assessments conducted by DP. In the event that the precision and accuracy DQOs for sampling and analysis are exceeded, review of the analytical results and consultation with the laboratory will be undertaken to determine the implication of the exceedance on the data set and whether retesting or additional analysis is required.

6. RESULTS OF INVESTIGATION

6.1 Field Observations

Details of the sub-surface conditions encountered during the course of the investigation are included in the Test Pit Report Sheets together with notes describing the classification methods and descriptive terms (Appendix C).

The conditions encountered in the test pits were relatively uniform, with sandy clayey silt observed at from the surface to a maximum thickness of 0.8 m in six test pits. Filling material were encountered in Test Pits 204 and 208 to a maximum depth of 0.4 m. The material underlying the fill is sandy clay, which is then underlain by sandstone.

The stockpiled materials comprised sandy clay filling with gravels, bitumen and brick fragments and general building rubble.

Table 3 - TOPIC Results

Sample ID	TOPIC (ppm)	Sample ID	TOPIC (ppm)
TP201/0-0.5	<1	TP205/1.5	<1
TP201/1.5	<1	TP206/C-0.5	<1
TP202/0-0.5	<1	TP207/0-0.5	<1
TP202/1.5	<1	TP207/1.3	<1
TP203/0-0.5	<1	TP208/0-0.5	<1
TP203/1.5	<1	TP208/1.3	<1
TP204/C-0.5	<1	S209	<1
TP204/1.5	<1	S210	<1
TP205/0-0.5	<1	S211	<1

6.4 Analytical Results for Soil Samples

The results of laboratory analysis for inorganic and organic contaminants (see Appendix D) in the soil samples are summarised in the following tables:-

- *Table 4 - Results of Laboratory Analysis for Heavy Metals;*
- *Table 5 - Results of Laboratory Analysis for TRH/BTEX;*
- *Table 6 - Results of Laboratory Analysis for PCB, PAH and Phenols;*
- *Table 7 - Results of Laboratory Analysis for OCP; and*
- *Table 8 - Results of Laboratory Analysis for Asbestos*



Sample ID	As		Cd		Cr		Cu		Pb		Ni		Zn		Hg	
	SCC (mg/kg)	TCLP (mg/L)	SCC (mg/kg)	TCLP (mg/L)	SCC (mg/kg)	TGLP (mg/L)	SCC (mg/kg)	TGLP (mg/L)	SCC (mg/kg)	TCLP (mg/L)	SCC (mg/kg)	TCLP (mg/L)	SCC (mg/kg)	TCLP (mg/L)	SCC (mg/kg)	TCLP (mg/L)
Solid Waste (C12)	100		20		100		ND		100		40		ND			
Industrial Waste (C13)	400		80		400		ND		400		100		ND		16	
Soil Waste	500	0.5	100	0.1	1900	0.5	NO		1500	0.5	1050	0.2	ND		50	0.02
Solid Waste	500	5.0	10	100	1900	5	ND		1500	5	1050	2	ND		10	0.2
Industrial Waste	2000	20	400	4	1900	20	ND		6000	20	4200	8	ND		200	0.8

Waste Classification Threshold Criteria (with TCLP)

Notes:

1. Denotes field replicate of TP2010.5.
2. Specific Contaminant Concentrations (Total Concentration)
3. Toxicity Characteristic Leaching Procedure.
4. Not defined.
5. NSW EPA Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (1998). Health Based Investigation Levels for parks, recreational open space, playing fields including secondary schools.
6. NSW EPA Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (1998). Environmental Investigation Levels for sandy soils of pH 6-8.
7. NSW EPA (1998) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Table A1: Contaminant Threshold Values for Waste Classification of Non-Liquid wastes without doing the Leaching Test.
8. NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Table M: Leachable Concentration (TCLP) and Total Concentration (SCC) Values for Non-Liquid Waste Classification.

#	Specific Contaminant Concentration (Total Concentration), Toxicity Characteristics Leaching Procedure, Not applicable.
#1	NSW EPA (1984) Contaminated Sites: Guidelines for Assessing Surface Contaminants.
#2	NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Table A3: Contaminant Threshold Values for Waste Classification of Non-Liquid wastes without the Leaching Test.
#3	NSW EPA (1998) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Table A4: Leachate Concentration (TCUP) and Total Concentration (SC) Values for Non-Liquid Waste Classifications.



- 1 NSW EPA Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (1998), Health based Investigation Levels, for parks, recreational open space, playing fields including secondary schools.
 - 2 NSW EPA Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (1998), Provisional Toxicity Based Investigation Levels for slurry farms of pH 6-8.
 - 3 NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Table A3. Contaminant Threshold Values for Waste Classification of Non-Liquid wastes without using the Leaching Test
 - 4 NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Table A4. Contaminant Concentration (TCLP) and Total Concentration (SCC) Values for Non-Liquid Waste Classification.
- Bold** indicates exceedance of health-based assessment criteria.
Outlined indicates exceedance of inert Waste Total Concentration (with TCLP)

Stage 1 Contamination Assessment
Private Library
Village Park, Park Street, Mona Vale
Municipal Council

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Table 9 - Groundwater Level Measurements

Bore	RL	SWL ¹ (m bgl ²)	SWL (m AHD)
101	5.79	3.00	2.79
103	6.57	3.76	2.81

Notes:

- 1 Reduced Level
- 2 Standing Water Level
- 3 Below Ground Level
- 4 Australian Height Datum

Whilst groundwater contouring cannot be conducted on the basis of two water level measurements, the inferred groundwater flow direction is in a southerly direction, towards the Mona Vale Beach. In this respect, piezometer 103 is situated on the up-gradient side of the site and may represent "background" groundwater quality in the locality.

6.7 Analytical Results for Groundwater

Groundwater samples were collected from both groundwater monitoring bores and analysed for a range of indicator analytes. Detailed laboratory reports and laboratory QA/QC procedures are given in Appendix D. The results of the analyses are summarised as follows:-

- Table 10: Results of Groundwater Laboratory Analysis for Metals;
- Table 11: Results of Groundwater Laboratory Analysis for TRM/BTEX and PAH;
- Table 12: Results of Groundwater Laboratory Analysis for PCB, OCP and Phenols.

Table 10 – Results of Groundwater Laboratory Analysis for Metals
(all results in µg/L unless otherwise stated)

Sample ID	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Mercury
GW101	<5	0.6	<5	1	<5	1	140	0.1
GW103	<5	0.8	<5	-	<5	<1	42	<0.1
GW2*	<5	0.8	<5	1	<5	<1	100	<0.1
Guideline ¹	70	5.5	27.4	1.3	70	4.4	15	0.4

Notes:

- * Denotes field replicate sample of GW103
- ID Insufficient Data
- 1 ANZECC 2000 Australian Water Quality Guidelines for Fresh and Marine Waters, Trigger values for marine water for 95% level of protection of species
- BOLD Exceedance of guideline



of which was a replicate sample (Z201 = TP201/0-0.5 for soil; GRW = GW103 for groundwater). Replicate samples Z201 and GRW and its respective original sample were submitted for analysis along with 20 other selected soil and groundwater samples. The soil replicate was analysed for heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), groundwater replicate was analysed for heavy metals, PAH, IRII/BTEX, OCP, OCB, Phenols. Comparative results of analysis are included in Tables 13 - 16. Relative Percentage Differences (RPD) were calculated as an assessment of the result consistency.

Relative Percentage Difference

A measure of the consistency of results is derived by the calculation of relative percentage differences (RPDs) for replicate samples. Generally, an RPD of = 30% is considered acceptable by the EPA, however, certain exceptions apply. The RPDs, which were calculated using the heavy metal concentrations, for the replicate sample (Z201) and its respective original sample (TP201/0-0.5) are tabulated below.

Table 13 - RPD Results (Soil)

Sample ID	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
TP201/0-0.5	<3	<0.5	3	<0.5	<2	<0.05	0.4	0.7
Z201	<3	<0.5	4	<0.5	2	<0.05	0.3	<0.5
%RPD	0	0	29	0	0	0	29	33
PQL*	<3.0	<0.5	<0.5	<0.5	<2	<0.05	<0.2	<0.5

*Practical Quantitation Limit

Table 14 - RPD Results (Groundwater)

Sample ID	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Mercury
GW103	<5	0.3	<5	1	<5	<1	42	<0.1
GWZ*	<5	0.2	<5	1	<5	<1	100	<0.1
RPD	0	0	0	0	0	0	82	0

Table 15 - RPD Results (Groundwater)

Sample ID	Mono Aromatic Hydrocarbons			Total Recoverable Hydrocarbons (TRH)				Polycyclic Aromatic Hydrocarbons (PAH)		
	Benzene	Ethylbenzene	Toluene	Total Xylenes	C8-C9	C10-C14	C15-C20	C21-C25	Benzo(a)pyrene	Total PAH
GW103	<1	<1	<1	<3	<40	<100	<200	<200	<0.5	0.00
GWZ*	<1	<1	<1	<3	<40	<100	<200	<200	<0.5	0.00
RPD	0	0	0	0	0	0	0	0	0	0

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 Projected Library
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 Portwater Council

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02 1 1307 02

02002704 0970100

23 8 0003 0970100

Table 17 - Spike Recovery Results (Soil)

Analyte	Acceptable Range	Actual Range
Metals	70%-130%	84%-113%
TRH	60%-140%	70%-110%
BTEX	60%-140%	55%-76%
PAH	60%-140%	91%-101%
PCB	60%-140%	100%-102%
OCP	60%-140%	53%-110%

Table 18 - Spike Recovery Results (Groundwater)

Analyte	Acceptable Range	Actual Range
Metals	70%-130%	96%-100%
TRH	60%-140%	72%-123%
BTEX	60%-140%	95%-97%
PAH	60%-140%	89%-106%
PCB	60%-140%	107%
OCP/OPP	60%-140%	77%-165%

The spike recovery results all fell within the acceptable range thus the spike recovery results are considered to be acceptable.

7. DISCUSSION OF RESULTS

7.1 Soil

7.1.1 Heavy Metals

The analytical results indicated generally low levels of heavy metal contaminants in the soil samples analysed. All soil samples fell within the NSW EPA Health-Based Investigation Levels (HIL) parks and recreational open space and Provisional Phytotoxicity-Based Investigation Levels (PIL). The results suggests that the site is not impacted by heavy metals contamination.

7.1.2 TRH and BTEX

Selected soil samples were analysed for TRH and BTEX and the majority of TRH and BTEX concentrations were below the laboratory practical quantitation limits with the exception of stockpile sample S209 which recorded detectable medium to long chain hydrocarbons (700mg/kg). Despite the detection of medium to long chain hydrocarbons, the results are within the guideline criteria for sensitive sites.



7.1.4 OCP

Samples that were analysed for OCP had concentrations that were below the detectable limits and well within the site assessment criteria. It is therefore considered that the site is not impacted by OCP contamination.

7.1.5 Asbestos

No asbestos was detected in all samples that were analysed sent for asbestos analysis. The site is therefore not impacted by asbestos contamination.

7.2 Groundwater

The analytical results for groundwater can be summarised as follows:-

- Dissolved metal concentrations were either below the adopted guideline or not detectable in the majority of samples, except for zinc in all samples. The source of these exceedances is unknown and it is considered possible that background zinc levels may naturally be elevated due to common service leakage or infiltration from road runoff in the urban environment. Furthermore, it was noted that the screened interval in groundwater bore is located at the natural sub-soil's horizons and zinc concentrations in all soil samples analysed from the site were well within the most stringent investigation levels.
- TRH and BTEX compounds were not detected in any of the groundwater samples, indicating that it is not impacted by TRH or BTEX contamination.
- Benzo(a)pyrene and PAH was not detected in all groundwater samples taken, although practical quantification limits of the Benzo(a)pyrene were higher than the established guideline levels. It is noted from the NATA registered laboratories that the ANZECC guidelines specified for many organic species are not practically and routinely achievable.

The filling material from the site is suitable for retention on-site or dispose of offsite as *Inert Waste*.

Whilst sampling was not undertaken from the stockpile material located in the central portion of the park, it is understood from the client that both stockpiles came from the same source. On this basis, DP have assumed that both stockpile matrices are similar. Therefore, analytical results from stockpile samples S209-S211 taken from the western portion of the site is assumed to be similar. Accordingly, it is reasonable to classify both stockpile materials as *Inert Waste* for disposal at a licenced facility. It should however be noted that the stockpile material is not suitable for reuse on-site.

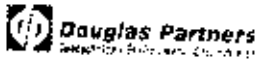
It should be noted that *Inert Waste* can either be disposed of off-site to a licenced facility or reused in other sites, subject to prior approvals/consent from the receiving site and relevant authorities.

The underlying in-situ natural dark brown sandy clayey silt with rootlets and vegetation in the top 0.15 m of the overlying sandy clay and clayey is classified as Virgin Natural Excavated Material (VENM). The VENM material may be reused on other sites subject to prior approvals/consents from the receiving site and relevant authorities, as required, or disposal as *Inert Waste* (VENM).

8. CONCLUSIONS AND RECOMMENDATIONS

The present investigation has revealed a generally low level of contamination at the subject site. All reported contaminant concentrations for the identified range of inorganic and organic analytes were well within the NSW EPA Health-Based Investigation Levels for soils on parks, recreational open space, playing fields including secondary schools. Similarly, the all heavy metal concentrations were within the Provisional Phytotoxicity-Based Investigation Levels.

Groundwater does not appear to be significantly impacted by organic and inorganic contamination. It is therefore considered that the potential for migration of contaminants either through the subsoils or off-site would be minimal. Furthermore, groundwater levels



the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to DP's investigations and assessment.

This report, its associated documentation and the information herein have been prepared solely for the use of Pittwater Council. Any reliance assumed by third parties on this report shall be at such parties' own risk. Any ensuing liability resulting from use of the report by third parties cannot be transferred to DP.

DOUGLAS PARTNERS PTY LTD

Reviewed by:

Handwritten signature of Polo Foo in black ink.

Polo Foo
Environmental Engineer

Handwritten signature of J.M. Nash in black ink.

J.M Nash
Director, Environmental Services

Village Park Redevelopment Mona Vale

Development Consent Schedule of Required Actions

List of Abbreviations:

BHA	Brewster Hjorth Architects
PC	Pittwater Council
CMM	Connell Mott MacDonald
TBLA	Taylor Brammer Landscape Architects
SV	Steensen Varming

	Condition (Summary)	Comments	Action
A.	Prescribed Conditions		
A1. ✓	Works to be carried out with provisions of Clause 1.98 of EP&A Regulation	Works must be carried out in accordance with BCA	BHA/ Contractor
A2. ✓	All works to be carried out in accordance with BCA		BHA/ Contractor
A3. ✓	Excavation and backfilling	Requirements on Construction Standards	Contractor
A4. ✓	Retaining walls and drainage	Retaining walls with appropriate drainage required	BHA
A5. ✓	Support of neighbouring buildings	Associated with neighbouring allotments not applicable	
A6.	Protection of public places	Requirements for enclosures and hoardings	Contractor
A7.	Signs to be erected on building sites	Requirement for construction signage	Contractor
A8.	Toilet facilities	Requirement for toilets during construction	Contractor
B.	Matters to be Satisfied Prior to Issue of CC		
B3. ✓	Engineering plans and specifications	Only stormwater drainage disposal and on-site detention apply to building works, remainder by council as part of road works.	CMM/PC
B4. ✓	Engineering design certification	<ul style="list-style-type: none"> • Drainage • OSD • Roadway 	CMM CMM ✓ PC
B5. ✓	Stormwater and OSD	Must comply with concept plan by CMM	CMM
B10.	Detailed working drawings	4 3 sets to be issued prior to release of CC	BHA

Village Park Redevelopment Mona Vale

Development Consent Schedule of Required Actions

Condition (Summary)	Comments	Action
B19. ✓ OSD details	<ul style="list-style-type: none"> • 3 sets of drawings • Certification 	CMM
B45. ✓ Landscape details	<ul style="list-style-type: none"> • 3 sets of drawings • Certification works in accordance with DCP23 	TBLA
B45a. ✓ Landscape details	<ul style="list-style-type: none"> • Outlines details required to be included in landscape drawings 	TBLA ✓
B60. ✓ Structural details	<ul style="list-style-type: none"> • 3 sets of drawings • Documents to be signed by engineer • Balustrading adequacy certificate (BA-1) 	CMM
B61. > Colours and Materials	<ul style="list-style-type: none"> • Sample board with colours and materials to be submitted to council for approval 	BHA ✓
C. Matters to be Satisfied Prior to Commencement of Work		
C6. ✓ Certification of building components	<ul style="list-style-type: none"> • Certificates required to be issued to PCA: <ul style="list-style-type: none"> • Building setout (BS-1) • Erosion controls (ER-1) ✓ • Protection fencing (PF-1) 	Contractor Contractor Contractor
C10. Removal of asbestos	<ul style="list-style-type: none"> • Requirements for removal 	Contractor
C11. Site suitability	<ul style="list-style-type: none"> • Submission required to PCA of a report from a NSW EPA accredited auditor certifying that the site is suitable for the proposed purposes 	PC
D. Conditions to Minimise the Impact of Development		
D1. Internal floor tiles/carpet	<ul style="list-style-type: none"> • Requirement for slip resistance with texture to AS 3661 	BHA
D2. ✓ Stairs	<ul style="list-style-type: none"> • Carpet pile less than 6 mm 	BHA
D3. ✓ Lift	<ul style="list-style-type: none"> • Requirements and locations for tactile indicators • Required access requirements for lift 	BHA/TBLA BHA

Village Park Redevelopment Mona Vale

Development Consent Schedule of Required Actions

Condition (Summary)	Comments	Action
D4. ✓ Doors	<ul style="list-style-type: none"> Height of door handles to be 1100 mm 	BHA
D5. ✓ External pathways	<ul style="list-style-type: none"> Lever handles required Slip resistance Provision of tactile indicators Drainage grates to allow accessible travel over Rest seating at 60 m spacings on path of travel (with armrests) 	TBLA
D6. ✓ Accessible toilets	<ul style="list-style-type: none"> 850 clear doorway Outward opening door (removable) D-shaped lever handles WC pans must face along length of the toilet 1100 mm clearance between pan and basin Wash basin at 680 mm high Slip resistant floor 	BHA
D7. ✓ Signage	<ul style="list-style-type: none"> Library signage for accessible paths and WC External accessible directions 	BHA
Lighting	<ul style="list-style-type: none"> Details on signage design Internal lighting to be in accordance with AS1428.2cl19.1 150 lux illumination to paths of travel 	SV
Telephones	<ul style="list-style-type: none"> External lighting requirements Wheelchair accessible telephone with every bank of telephones 	PC
Hearing Loop	<ul style="list-style-type: none"> Portable Hearing Loop required in Conference Room 	SV
D8. ✓ Miscellaneous	<ul style="list-style-type: none"> Information desk to incorporate desk at accessible height of 870 mm. Security gates to library must be 1000 mm clear width 	BHA BHA/PC

Village Park Redevelopment Mona Vale

Development Consent Schedule of Required Actions

	Condition (Summary)	Comments	Action
D9. ✓	Carparking <i>Common carpark</i>	Requirements for accessible parking spaces	PC
D10. ✓	Access Certification	Accredited access adviser to certify D1 to D9 are met	Contractor ✓
D11.	Demolition	Requirements for undertaking works	Contractor
D12.	Asbestos	Reuse or sale prohibited	Contractor
D20.	Erosion Control	Requirements for sediment and erosion control	Contractor
D60.	Footpath	Footpaths to be kept clear during construction	Contractor
D76.	Stamped Plans	Copy of approval plans to be kept on site. PC to organise copy	PC
D77.	Plumbing	All plumbing and drainage fixtures are to be concealed and not exposed to public view on building over one storey in height	Acor
D89.	Hours of Construction	Nominates construction hours	Contractor
D105.	Landscape Maintenance	Requirement to Maintain	PC
D106.	Construction Management Plan	Plan to be prepared and issued to PCA	Contractor
D107.	Plant Specifications	Submission of details that plant complies with noise limits	SV ✓
D108.	Demolition	Work to be in accordance with AS 2601	Contractor
E. Matters to be Satisfied Prior to Occupation Certificate			
E. Note	Interim or partial occupation certificate	Staging Plan required to be approved by PCA	PC
E6.	Roadworks	Certification of roadworks, separate to building works	PC

Village Park Redevelopment Mona Vale

Development Consent Schedule of Required Actions

Condition (Summary)	Comments	Action
E10. Certification that the following building components be carried out in accordance with BCA	D - Pest control (PST-1)	Contractor
	C - Ground floor levels (FL-1)	Contractor
	D - Footings/slab/piers (FN-1)	CMM
	E - Beavers and joists (BJ-1)	CMM
	F - Wall, roof frames and window location (FM - 1)	CMM
	G - Wet areas (WA-1)	Contractor
	I - Subsequent floor levels (FL-2)	Contractor
	J - Stair construction (ST-1)	Contractor
	K - Balustrading adequacy (BA-1)	CMM
	L - Glazing (GL-1)	Contractor
	M - Artificial lighting and mechanical ventilation (LV-1)	Contractor
	N - Roof cladding	Contractor
	O - Roof ridge levels (RL-1)	Contractor
	P - Smoke alarms (SA-1)	Contractor
R - Onsite stormwater detention (OSD-1)	CMM	
T - Excavation and/or filling (EX-1)	Contractor	
W - Landscaping (LS-1)	TBLA	
E16. Fire Safety Certificate	Essential fire safety certificates to be submitted	Contractor
E86. Occupation	Building is not to be occupied until occupation certificate is issued	Contractor
E87. Café	Separate DA required for use and fitout of café	PC
E88. Development Signage	DA for signage required except where signage does not require consent by planning controls	PC
E89. Works as executed plan	Plans required by surveyor for works on public land	Contractor
G. Advice		
G23. Failure to comply	Penalty notices may result for non compliance	Contractor
G24. Inground services	Check inground services in excavated areas	Contractor

Village Park Redevelopment Mona Vale

Development Consent Schedule of Required Actions

	Condition (Summary)	Comments	Action
G25.	Lodgement of Certificates	Certificates to be lodged to Council	PC/ Contractor
G26.	Commencement	2 year requirement to commence	PC
G27.	Date of Determination		Note
G28.	Appeals to Determination		Note
G29.	Court Appeals		Note

1 LANDSCAPE WORKS - SOFTWARES

1.1 QUALITY

1.1.1 CROSS REFERENCES

General

Refer to the *General requirements* worksection.

Related worksections

Refer to the following worksections:

- SITE PREPARATION: For site management and clearing. Particularly retention of existing trees.
- TREES SUPPLY: For requirements of tree supply.
- PAVING: For details of segmental paving and in situ concrete.
- FENCING: For temporary fencing, handrails and permanent fencing.
- STORMWATER: For subsoil drainage details.
- WATERPROOFING: For details of membranes to planter walls

1.1.2 STANDARDS

General

The following standards are referred to in this section:

- | | |
|----------------------|--|
| AS 1289 | Methods of testing soils for engineering purposes |
| AS 1289.5.4.1 (1993) | Compaction control test - dry density ratio, moisture variation and moisture ratio |
| AS 3743 (1996) | Potting mixes |
| AS 4373 (1996) | Pruning of amenity trees |
| AS 4419 (1998) | Soils for landscaping and garden use |
| AS 4454 (1997) | Composts, soil conditions and mulches. |
| AS 1289 | Methods of testing soil for engineering purposes |
| AS 1289.5.2.1 (1993) | Soil compaction and density tests
Determination of the dry density / moisture content relation of a soil using modified compactive effort |
| AS 1289.5.4.1 (1993) | Soil compaction and density tests -
Compaction control test - Dry density ratio |
| AS 1289.5.6.1 (1998) | Soil compaction and density tests -
Compaction control test - Density index method for a cohesionless material |
| AS 1972 (1997) | Portland and blended cement |
| AS/NZS 4455 (1997) | Masonry units and segmental pavers |
| AS/NZS 4456 | Masonry units and segmental pavers - Methods of test |
| AS/NZS 4586 (1999) | Slip resistance of new pedestrian surface materials |

1.1.3 INTERPRETATION

Definitions

Site rock: Rocks approved for salvage.

Site topsoil: Soil excavated from the site which has the following characteristics:

- Contains organic matter.
- Supports plant life.
- Free from unwanted matter.

Unwanted matter (in topsoil):

- Stones over 25 mm diameter.
- Clay lumps.
- Weeds and tree roots.
- Sticks and rubbish.
- Material toxic to plants.

Imported topsoil:

- Fine: Clay loam, fine sandy loam, sandy clay loam, silty loam, loam.
- Medium: Sandy loam, fine sandy loam.
- Coarse: Sand, loamy sand.

Topsoil mixture: Topsoil and compost or other additives, thoroughly mixed before placing.

1.2 QUALITY

1.2.1 INSPECTION

Witness points

Give two (2) days minimum notice so that inspection may be made at the following stages:

- Trees marked for removal : tree enclosures complete.
- Plants available for inspection at point of supply.
- Planting beds setout.
- Planting bed preparation complete.
- Plants laid out prior to planting
- Planting works complete.
- Turf areas setout.
- Turf area subgrade and topsoil installed.
- Turfing complete.
- Paving: setout complete.
- Paving: subgrade : basecourse preparation complete.
- Paving: trial paving complete.
- Paving: installation complete.
- Fencing: setout of posts for fencing.
- Fencing: installation complete.
- Walls: retaining walls setout with heights indicated.
- Walls: retaining walls installed with drainage and waterproofing prior to backfilling.
- Hosesets: setout complete.
- Irrigation setout
- Irrigation complete
- Completion of Planting Establishment work.

1.2.2 TESTS

1.2.2.1 Soil tests

Sampling: As recommended in AS 4419 Appendix A.

1.2.3 SAMPLES

General

General: Submit representative samples of each material, packed to prevent contamination and labelled to indicate source and content.

Bulk materials

Submit a 1 kg sample of each type specified. Submit bulk material samples, with required test results, at least 5 working days before bulk deliveries.

Plant materials

Quantity: Submit one plant sample for each 100 of each species or variety, in the condition in which it is proposed to supply that plant to the site.

Samples schedule

Item	Quantity
Planting Mix	1kg
Raised Planter Box Mix	1kg
Mulch (leaf litter)	1kg
Mulch (decomposed granite)	1kg

Item	Quantity
Mulch (decorative gravel)	1kg
Turf	400x400mm
Turf underlay	1kg
Fertiliser (each type)	1kg
Paving (each type)	5 units
Terrabond Gravel Finish	1kg
Drainage - subsoil drain	500mm length
Drainage - drainage cell	1 panel
Tactile paver	1 unit

1.2.4 SUBMISSIONS

Suppliers

Submit statements from suppliers of plants, soil mixes, mulch, turf giving the following, where applicable:

- Particulars of the supplier's experience in the required type of work.
- Production capacity for material of the required type, sizes and quantity.
- Lead times for delivery of the material to the site.

Materials

Supplier's data: Submit supplier's data including

- certificate identifying seed species, purity, age and germination viability; and
- material source of supply.

Compost: Submit a certificate of proof of compost pH value.

Execution

Program: Submit a work program in the form of a bar chart, for the landscape works.

Maintenance program: Submit a proposed planting maintenance program.

Planting machine: If a planting machine is to be used as an alternative to hand planting, submit proposal.

Spraying: Submit proposal

1.3 SITE AND SOIL

1.3.1 PREPARATION

Weed eradication

Herbicide: Eradicate weeds using environmentally acceptable methods, such as a non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

Manual: Regularly remove, by hand, rubbish and weed growth throughout grassed, planted and mulched areas. Remove weed growth from an area 750 mm diameter around the base of the trees in grassed areas. Continue eradication throughout the course of the works and during the planting establishment period.

Vegetative spoil

Remove vegetative spoil from site. Do not burn.

1.3.2 SUBSOIL

Ripping

General: Rip parallel to the final contours wherever possible. Do not rip when the subsoil is wet or plastic. Do not rip within the dripline of trees and shrubs to be retained.

Ripping depths: Rip the subsoil to the following typical depths:

- Compacted subsoil: 300 mm.

Planting beds

Refer to landscape drawings for details of excavation depths.

Cultivation

Cultivation depths (mm):

- Grassed areas (seeded, turf, strip turf, stolonized): 150mm
- Planting areas: 300mm

Services and roots: Do not disturb services or tree roots, if necessary cultivate these areas by hand.
Cultivation: Thoroughly mix in materials required to be incorporated into the subsoil. Cultivate manually within 300 mm of paths or structures. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. Trim the surface to design levels after cultivation.

Subsoil preparation schedule

Location	Cultivation method
Existing Trees	By Hand
Mass Planting Beds	Machine / Rotary Hoe
Turf Areas	Machine / Rotary Hoe

Additives

General: Apply additives after ripping or cultivation and incorporate into the upper 100 mm layer of the subsoil.

Gypsum: Incorporate at the rate of 0.25 kg/m².

1.3.3 TOPSOIL / PLANTING MIX

Source

General: Import topsoil planting mix for use on the site.

Schedule

Area	Type	Available
Mass Planting	"Greenlife" Garden Mix"	Australian Native Landscapes
Planting over concrete slab	"Planter Box Mix"	Australian Native Landscapes
Turf	"Turf Underlay"	Australian Native Landscapes

Topsoil particle size table (% passing by mass)

AS sieve aperture	Soil textures		
	Fine	Medium	Coarse
2.36	100	100	100
1.18	90 - 100	95 - 100	95 - 100
0.60	75 - 100	75 - 100	70 - 90
0.30	57 - 90	55 - 85	30 - 46
0.15	45 - 70	38 - 55	10 - 22
0.075	35 - 55	25 - 35	5 - 10
0.002		2 - 15	2 - 8

Topsoil properties schedule

Property	Type	Amount
Nutrient levels	Phosphorus (P) (mg/L)	0.7 - 4
	Potassium (K) (mg/L)	35 - 250
	Sulfur (S) (mg/L)	> 40
	Calcium (Ca) (mg/L)	50 - 350
	Nitrogen (N) (mg/L)	Refer AS4419 Clause 5.8
	Manganese (Mn) (mg/L)	1 - 15
	Nitrogen drawdown	Refer AS4419 Clause 5.12
Other properties	Organic matter (% by mass)	20 maximum
	Wettability	Refer AS4419 Clause 5.5
	Soil reaction (pH)	6.0 - 7.0
	Electrical conductivity (dS/m)	Refer AS4419 Clause 5.7

Property	Type	Amount
	Dispersibility	Refer AS4419 Clause 5.10
	Soluble salts (% by mass)	0.1
	Moisture content (% by mass)	
	Toxicity index to AS 3743	Refer AS4419 Clauses 5.8 and 5.11
	Permeability	Refer AS4419 Clause 5.13

Placing topsoil / Planting mix

General: Spread the topsoil on the prepared subsoil and grade evenly, making the necessary allowances to permit the following:

- Required finished levels and contours may be achieved after light compaction
- Grassed areas may be finished flush with adjacent hard surfaces such as kerbs, paths and mowing strips.

Contamination: Where diesel oil, cement or other phytotoxic material has been spilt on the subsoil or topsoil, excavate the contaminated soil, dispose of it off the site, and replace it with site soil or imported topsoil to restore design levels.

Finishing: Feather edges into adjoining undisturbed ground. Allow for finish level to finish 25mm below adjoining surfaces.

Consolidation

Compact lightly and uniformly in 150 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which has the following characteristics:

- Finished to design levels.
- Smooth and free from stones or lumps of soil.
- Graded to drain freely, without ponding, to catchment points.
- Graded evenly into adjoining ground surfaces.
- Ready for planting.

Topsoil and Planting Mix Depths

Refer to landscape drawings.

Surplus topsoil

General: Dispose off site.

1.3.4 COMPOST AND FERTILISER

Fertiliser

Provide proprietary fertilisers, delivered to the site in sealed bags marked to show manufacturer or vendor, weight, fertiliser type, N:P:K ratio, recommended uses and application rates.

Fertiliser schedule

Location	N:P:K ratio
Turf Areas	10:4:6 (Lawn Food)
Mass Planting	63:18:28

1.4 GRASS

1.4.1 TURFING

Turf

Obtain turf from a specialist grower of cultivated turf. Provide turf of even thickness, free from weeds and other foreign matter.

Supply

Deliver the turf within 24 hours of cutting, and lay it within 36 hours of cutting. Prevent it from drying out between cutting and laying.

Fertilising

Mix the fertiliser thoroughly into the topsoil before placing the turf. Apply lawn fertiliser every 10-12 weeks for first nine months.

Laying

General: Lay the turf in the following manner:

- In stretcher pattern with the joints staggered and close butted.
- Parallel with the long sides of level areas, and with contours on slopes.
- To finish flush, after tamping, with adjacent finished surfaces of ground, paving edging, or grass seeded areas.

Tamping

Lightly tamp to an even surface immediately after laying. Do not use a roller.

Watering

Water immediately after laying until the topsoil is moistened to its full depth. Continue watering to maintain moisture to this depth. Keep the grass in a healthy condition.

Mowing

Mow to maintain the grass height within the required range. Do not remove more than one third of the grass height at any one time. Carry out the last mowing within 7 days before the end of the planting establishment period. Remove grass clippings from the site after each mowing.

Turfing schedule

Species or variety	Minimum thickness (mm)	Turf roll size (mm)	Location	Mowing height (mm)
Kikuyu	50mm	2500x400 wide	Refer Dwg5	20-25

Maintenance

General: Maintain turfed areas until the attainment of a dense continuous sward of healthy grass over the whole turfed area, evenly green and of a consistent height.

Failed turf: Lift failed turf and relay with new turf

Levels: Where levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.

Top dressing

When the turf is established mow, remove cuttings and lightly top dress to a depth of 10 mm. Rub the dressing well into the joints and correct any unevenness in the turf surface.

1.5 PLANTS

1.5.1 PLANTING

Plants

General: Provide plants with the following characteristics:

- Large healthy root systems, with no evidence of root curl, restriction or damage.
- Vigorous, well established, free from disease and pests, of good form consistent with the species or variety.
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Trees: Provide trees which, unless required to be multi-stemmed, have a single leading shoot.

Replacement: Replace damaged or failed plants with plants of the same type and size.

Plant containers

General: Supply plants in weed-free containers of the required size. Remove all containers from site after planting completed.

Open rooted stock: If trees are to be supplied as open rooted stock, ensure this is appropriate to the species, variety, size, and time of year for planting.

Potting-on: Do not carry out potting-on.

Plant schedule

Refer to landscape drawings for plant schedule details. Note that the plant quantities on the plan supersede the quantities in the schedule. Any differences are to be brought to the attention of the Landscape Architect at time of tender.

Labelling

Label at least one plant of each species or variety in a batch with a durable, readable tag. At practical completion remove all plant labels from site.

Storage

Deliver plant material to the site on a day to day basis, and plant immediately after delivery.

MONA VALE VILLAGE PARK**Locations**

If it appears necessary to vary plant locations and spacings to avoid service lines, or to cover the area uniformly, or for other reasons, give notice.

Planting conditions

Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. In other than sandy soils, suspend excavation when the soil is wet, or during frost periods.

Watering

Thoroughly water the plants before planting, immediately after planting, and as required to maintain growth rates free of stress.

Placing

Remove the plant from the container with minimum disturbance to the root ball, ensure that the root ball is moist and place it in its final position, in the centre of the hole and plumb, and with the top soil level of the plant root ball level with the finished surface of the surrounding soil.

Fertilising

Pellets: In planting beds and individual plantings, place fertiliser pellets around the plants at the time of planting. Rates are to comply with the manufacturers recommendations.

Backfilling

Backfill with topsoil mixture. Lightly tamp and water to eliminate air pockets. Ensure that topsoil is not placed over the top of the root ball, so that the plant stem remains the same height above ground as it was in the container.

Watering basins for plants in grass

Except in irrigated grassed areas and normally moist areas, construct a watering basin around the base of each individual plant, consisting of a raised ring of soil capable of holding at least 10 L.

1.5.2 MULCHING**Mulch**

General: Provide mulch which is free of deleterious and extraneous matter such as soil, weeds and sticks.

Standard: To AS 4454.

Organic mulches types

Free of stones.

"Leaf Litter" as available from Australian Native Landscapes.

Inorganic mulch types

Crushed quartz: Uniform size or graded material in the size range 5 - 7 mm, of uniform white colour.

Location: Courtyard sitting area

Placing mulch

General: Place mulch to the required depth, clear of plant stems, and rake to an even surface flush with the surrounding finished levels. Spread and roll mulch so that after settling, or after rolling, it is smooth and evenly graded between design surface levels sloped towards the base of plant stems in plantation beds, and not closer to the stem than 50 mm in the case of gravel mulches.

In mass planted areas: Place after the preparation of the planting bed but before planting and other work.

In smaller areas (e.g. planter boxes): Place after the preparation of the planting bed, planting and other work.

Application: Place mulch clear of plant stems, and rake to an even surface flush with the surrounding finished levels.

Depths: Spread organic mulch to a depth of 75 mm, and gravel mulch to a depth of 50 mm.

1.5.3 SPRAYING**Notice**

Immediately give notice of evidence of insect attack or disease amongst plant material

Spraying

Where required, spray with insecticide, fungicide or both.

1.5.4 STAKES AND TIES**Stakes**

Material: Hardwood, straight, free from knots or twists, pointed at one end.

Installation: Drive stakes into the ground at least one third of their length, avoiding damage to the root system. Locate stake on the predominant windward side.

Stake sizes:

- For plants \geq 2.5 m high: Three 50 x 50 x 2400 mm stakes per plant.
- For plants 1 - 2.5 m high: Two 50 x 50 x 1800 mm stakes per plant.
- For plants $<$ 1 m high: One 38 x 38 x 1200 mm stake per plant.

Ties

General: Provide ties fixed securely to the stakes, one tie at half the height of the main stem, others as necessary to stabilise the plant.

Tie types:

- For plants \geq 2.5 m high: Two strands of 2.5 mm galvanized wire neatly twisted together, passed through reinforced rubber or plastic hose, and installed around stake and stem in a figure of eight pattern.
- For plants $<$ 2.5 m high: 50 mm hessian webbing stapled to the stake.

1.5.5 TREE SURGERY

Notice

Give sufficient notice before commencing tree surgery.

Qualifications

Employ suitably qualified Arborist to carry out tree surgery work in a safe and progressive manner.

Pruning

General: Comply with the recommendations of AS 4373.

Operations

Remove dead and decayed wood or limbs that have been broken. Make cuts into live wood. If the trees show signs of deterioration after the work has been done, carry out a program of feeding or soil amelioration such as soil aeration, irrigation or incorporation of organic material. Continue this program until the end of the planting establishment period.

Precautions

Avoid damage to trees being treated or to nearby trees and surroundings. Do not use trees as anchors for winching operations or bracing. Provide bracing as necessary before cutting to prevent uncontrolled breakages and damage to surroundings.

Dressing

Prevent incursion of rot or disease after cutting.

Root pruning

Do not unduly disturb the remaining root system.

1.6 COMPLETION

1.6.1 PLANTING ESTABLISHMENT

Period

Commencement: The planting establishment period commences at the date of practical completion of the entire building works.

Required period: Fifty Two (52) weeks.

Existing planting and grass

Where existing grass or planting is within the landscape contract area, maintain it as for the corresponding classifications of new grass or planting.

Recurrent works

Throughout the planting establishment period, carry out maintenance work including, watering, mowing, weeding, rubbish removal, fertilising, pest and disease control, reseeding, returfing, staking and tying, replanting, cultivating, pruning, hedge clipping, aerating, reinstatement of mulch, renovating, top dressing, and keeping the site neat and tidy. The landscape contractor shall attend the site on a weekly basis.

Watering

Grass, trees and garden areas shall be watered regularly so as to ensure continuous healthy growth.

Rubbish Removal

During the term of the maintenance period the landscape contractor shall remove rubbish that may occur and reoccur throughout the maintenance period. This work shall be carried out regularly so that at weekly intervals the area may be observed in a completely clean and tidy condition.

Replacements

The landscape contractor shall replace all plants that are missing, unhealthy or dead at the Landscape Contractors cost. Replacements shall be of the same size, quantity and species as the plant that has failed unless otherwise directed by the Landscape Architect. Replacements shall be made on a continuing basis not exceeding two (2) weeks after the plant has died or is seen to be missing.

Stakes and Ties

The landscape contractor shall replace or adjust plant stakes, and tree guards as necessary or as directed by the Landscape Architect. Remove stakes and ties at the end of the maintenance period if so directed.

Pruning

Trees and shrubs shall be pruned as directed by the Landscape Architect. Pruning will be directed at the maintenance of the dense foliage or miscellaneous pruning and beneficial to the condition of the plants. Any damaged growth shall be pruned. All pruned material shall be removed from the site.

Mulched Surfaces

All mulched surfaces shall be maintained in a clean and tidy condition and be reinstated if necessary to ensure that a depth of 75mm is maintained. Ensure mulch is kept clear of plant stems at all times.

Pest and Disease Control

The landscape contractor shall spray against insect and fungus infestation with all spraying to be carried out in accordance with the manufacturers directions. Report all instances of pests and diseases (immediately that they are detected) to the Landscape Architect.

Grass and Turf Areas

The landscape contractor shall maintain all grass and turf areas by watering, weeding, reseeding, rolling, mowing, trimming or other operations as necessary.

Seed and turf species shall be the same as the original specified mixture.

Grass and turf areas shall be sprayed with approved selective herbicide against broad leafed weeds as required by the Landscape Architect and in accordance with the manufacturers directions.

Irregularities in the grass and turf shall be watered in immediately after application. Grass and turf areas shall be kept mown to maintain a healthy and vigorous sward.

Weed Eradication

Eradicate weeds by environmentally acceptable methods using a non-residual glyphosate herbicide (eg. Roundup) in any of its registered formulae, at the recommended maximum rate. Regularly remove by hand, weed growth that may occur or reoccur throughout grassed, planted and mulched areas. Remove weed growth from an area 750mm diameter around the base of trees in grassed areas. Continue eradication throughout the course of the works and during the maintenance period.

Soil Subsidence

Any soil subsidence or erosion which may occur after the soil filling and preparation operations shall be made good by the landscape contractor at no cost to the client.

Log book

Keep a log book recording when and what maintenance work has been done and what materials, including toxic materials, have been used. Make the log book available for inspection on request.

1.6.2 COMPLETION**Product warranty**

Submit the supplier's written statement certifying that plants are true to the required species and type, and are free from diseases, pests and weeds.

Maintenance manual

Submit recommendations for maintenance of plants.

Cleaning

Stakes and ties: Remove those no longer required at the end of the planting establishment period.

Temporary fences: Remove temporary protective fences at the end of the planting establishment period.

Plant Tags: Remove all plant tags from plants.

2 LANDSCAPE - TREES SUPPLY

2.1 GENERAL

2.1.1 INTERPRETATION

Definitions

Calliper: Measured at 300 mm above ground.

Size index: Product of height (m) x calliper (mm).

Tubestock: Trees grown in containers, height:diameter ratio $\geq 2:1$, typically $< 1:1$.

Small trees: Trees grown in containers < 20 L (other than tubestock), and balled and burlapped or root control bag (RCB) grown trees of size index < 35 .

Other than tubestock or small trees: Trees grown in containers ≥ 20 L, and balled and burlapped or RCB grown trees of size index ≥ 35 .

2.2 QUALITY

2.2.1 INSPECTION

Partial sampling

Method: Expose a small section of the rootball, by washing, sufficient to permit inspection of root development from the stem to the outer extremity. After inspection, carefully replace soil.

Rates: Inspect root systems using partial sampling at the following rates:

- < 20 trees: 1 tree sampled.
- 21 - 50 trees: 2 trees sampled.
- ≥ 51 trees: 4%.

2.2.2 TESTS

Rootball occupancy test

Procedure: Shake or handle unsupported rootball.

Acceptance criterion: $> 90\%$ of soil volume remains intact.

Small trees rootball:shoot ratio test

Procedure: Hold stem at 80% of height above ground, deflect 30° from vertical, side to side.

Acceptance criterion: Container or rootball remains flat on the ground.

Reports

Forward order contracts: Submit regular reports in writing to the contract administrator. Include checks against specification requirements, and current photographs.

- Inspection frequency: 3 months.
- Report frequency: 3 months.

Materials

Substitution: If non-complying trees are proposed, submit proposal. Submit a copy of the approval of substitution with the non-complying trees.

Execution

Holding methods: Submit proposed methods for holding trees beyond specified dates so that trees will continue to comply.

2.3 TREES

2.3.1 ABOVE GROUND

True to type

Type: Supply trees which are true to type.

Health and vigour

Health: Supply trees with foliage size, texture and colour consistent with that shown in healthy specimens of the species.

Vigour: Supply trees with extension growth consistent with that shown in vigorous specimens of the species.

Freedom from pests and disease

Foliage: Restrict attack by pests and disease to < 10% of the foliage, such that potential for long term success of the trees is not affected.

Balance of crown

Maximum variation in crown bulk on opposite sides of stem axis: $\pm 20\%$.

Uniformity of growth

Longest internode: Maximum 1.2 x shortest internode.

Stem taper

Support: Supply trees which are self-supporting unstaked.

Other than tubestock or small trees:

- Calliper: At least 1.2 x calliper at 1 m above ground.

Pruning history

General: Comply with the recommendations of AS 4373.

Pruning wounds: Confine fresh pruning wounds to < 25% of the clean stem height.

Wound diameter: < 50% of stem diameter immediately above point of pruning.

Pruning location: Clean cut at branch collar.

Included bark

Bark ridge: Convex (outwardly pointing) at junctions between co-dominant stems, and stems and branches.

Grafted varieties or cultivars

Union between scion and rootstock: Sound for perimeter of graft.

Diameter of scion immediately above graft: Equal to diameter ($\pm 20\%$) of rootstock immediately below graft.

Apical dominance

Apical bud: If appropriate for the species, supply trees which have a defined central leader and intact apical bud.

Indication of north

Trees grown in containers ≥ 100 L and balled and burlapped or RCB grown trees of size index > 130 : Indicate northerly aspect in the nursery using a permanent peg embedded in the rootball 50 mm north of the centre of the stem.

2.3.2 BELOW GROUND

Root division

Root systems: Fibrous with repeated and sequential division, complying with the Root division table.

Root direction

Roots growing out or down: $> 90\%$ of roots within rootball at every stage of development.

Non-suckering rootstock

Grafting: If appropriate for variety or cultivar, graft trees onto non-suckering rootstock.

Root division table

Tree sizes		Root division
Container volume (L)	Size index (balled and burlapped or RCB grown trees)	
< 20	< 35	Major divisions at maximum 50 mm intervals
> 20, < 100	> 35, < 130	Major division by 15 L container, or 250 mm diameter x 300 mm deep rootball, and at maximum 100 mm intervals beyond this size
> 100, < 200	≥ 130 , < 230	Major division by 75 L container, or 450 mm diameter x 450 mm deep rootball, and at maximum 100 mm intervals beyond this size
≥ 200	≥ 230	Major division by 150 L container, or 650 mm diameter x 450 mm deep rootball, and at maximum 100 mm intervals beyond this size

2.3.3 BALANCE

Rootball:shoot ratio (tubestock and small trees)

Tubestock height above soil level: 2 x height of tube = 25%.

Rootball:shoot ratio (other than tubestock or small trees)

Rootball:shoot ratio equations:

- Container grown trees: Size index = Conversion factor (CF) x Container volume (L) (+ 10%).
- Balled and burlapped or RCB grown trees:
 Rootball volume (L) (- 10%) = Size index:CF.

CF values table

Container grown trees		Balled and burlapped or RCB grown trees	
Container volume (L)	CF	Size index	CF
≥ 20, < 60	1.5	≥ 35, < 90	1.8
≥ 60, < 100	1.3	> 90, < 130	1.56
≥ 100, < 150	1.21	≥ 130, < 180	1.45
≥ 150, < 200	1.14	≥ 180, < 230	1.37
> 200, < 300	1.07	≥ 230, < 320	1.28
≥ 300, < 600	0.97	> 320, < 580	1.16
> 600, < 1000	0.93	≥ 580, < 930	1.12
≥ 1000	0.9	≥ 930	1.08

2.3.4 SCHEDULES

Plant schedule

Plant species	Number	Rootball or container volume (L)	Height (m)	Calliper (mm)
Angophora costata	9	45	2.3	40
Eucalyptus haemastoma	7	45	2.3	40
Livistona australis	8	800	4.7	160
Lagerstroemia	6	75L	2.2	45
Ulmus parvifolia	3	100L	2.4	50

3 LANDSCAPE – SUPPLY AND INSTALLATION OF MATURE PALMS

3.1 GENERAL

3.1.1 SCOPE OF WORKS

Work will involve the supply, delivery, installation, protection and management of six (6) *Livistona australis* (Cabbage Tree Palm). This work will include but is not limited to:

- Containerisation of the palms.
- Lifting and crange onto transport.
- Transport to site.
- Replanting in nominated location.
- Supply and incorporation of organic matter and soil amendments.
- Supply and installation of mulch, temporary irrigation, tree supports and guys.
- Re-establishment and maintenance up to 101 weeks following replanting. Period of maintenance to be determined during the course of the building works.

This specification describes the appropriate techniques to be used to deliver, replant and successfully re-establish the palms. There may be allowance for some variation to the techniques to be used by the contractor, providing they are approved by the Contract Administrator prior to work being carried out.

3.1.2 REQUIREMENTS

The required trees are to be mature *Livistona australis* (Cabbage Tree Palm). The palms are to be a healthy plant devoid of pests and diseases other than might reasonably be expected with a mature tree.

3.1.3 WORK BY OTHER TRADES

The contractor will be responsible for co-ordination with the builder and other trades and provide adequate protection from concurrent works.

Co-ordination with other trades will include but is not limited to:

- Shorting and piling
- Bulk earthworks
- Services
- Soil scientist: soil sample collection
- Tree surgery
- Landscape
- Civil works

3.1.4 STANDARDS

All work should be in accordance with the relevant standards. The following standards are referred to in this section:

- AS4419 Soils for landscaping and garden use - 1998
- AS4454 Composts, soil conditions and mulches - 1997
- AS4373 Pruning of amenity trees - 1996
- AS1725 Galvanised railless chain wire security fences and gates

3.1.5 SUBMISSIONS

Maintenance:

Prior to the commencement of work, a schedule indicating the frequency that maintenance will be carried out and itemising all tasks to be carried out during the maintenance period shall be submitted. Monthly maintenance records of actual maintenance work carried out during the maintenance period shall be submitted with monthly claims for payment.

3.1.6 INSPECTIONS

The contractor is to give not less than two days notice so that inspections can be made by the Contract Administrator of the following:

- Wrapping/containerisation in its current location.
- Lifting, loading/relocation operations.
- Planting hole excavated and prepared for planting, including installation of subsoil drainage.
- Orientation of tree prior to final placing and backfilling.
- Backfilling and guying/stabilising.
- Establishment of irrigation.
- Significant changes in plant condition/deterioration.

3.1.7 EXPERTISE

All work will be carried out by a qualified contractor with a high degree of experience in the field of large-scale tree transplantation and establishment.

3.1.8 EXISTING SERVICES

The principal builder is responsible to check the locations of existing services and to protect against damage as required throughout the works. Protect or temporarily disconnect all services and obstructions along the relocation route including but not limited to:

- Stormwater and sewerage lines.
- Underground electrical conduits and lighting.
- Water and irrigation lines.

3.2 MATERIALS

3.2.1 ENCLOSURES

Allow for the installation of temporary tree protection fence, minimum 1800mm high galvanised chain wire fence with lockable gates to AS1725.

3.2.2 ENCLOSURE SIGNS

600mm x 600mm minimum signs bearing the following:

TREE PROTECTION AREA

DO NOT REMOVE FENCE
DO NOT STORE MATERIAL
OR STOCKPILE IN THIS AREA

3.2.3 WATER

Provide temporary irrigation as required to maintain the Palms in peak condition at all times by having the capacity to apply a summer weekly target application of 25mm of water. Connection points for water are to be provided.

3.2.4 SUBSOIL DRAINAGE

Drainage pipes and fittings:

Slotted, flexible corrugated 90mm diameter PVC pipe and fittings minimum to AS2439 Part 1 of Type 1 (corrugated) and class 200.

Drainage medium:

Washed coarse river sand 0.25mm to 2.0mm diameter.

3.2.5 FERTILISERS

Apply fertilisers of the type and at rates indicated by Soil Scientist following soil chemical analysis (Refer to 3.5 - Soil Analysis).

Continue to apply fertiliser as required during the maintenance period. Where alternative fertilisers are proposed, obtain approval from Contract Administrator prior to applying for type and rate.

3.2.6 HORTICULTURAL CHEMICALS

Comply with legislation dealing with horticultural chemicals and apply in strict accordance with the manufacturers recommendations.

Herbicide:

Apply Glyphosate herbicide only for control of weeds unless the Contract Administrator approves an alternative method.

Anti-transpirant:

Allow for applications of "Keep Em Green", "Envy" or similar approved alternative as required or as directed by the Contract Administrator.

Root including hormones:

Apply "Auxinome" as a soil drench at re-planting. Apply at a solution rate of 100ml per 100lts.

Soil wetting agent:

Allow for applications of "Wetta Soil" or approved alternative as required based on soil moisture conditions or as directed by the Contractor Administrator.

3.2.7 SOILS

Soil mix components will conform to the following definitions:

Imported topsoil:

Commercially available premium grade loamy sand conforming to AS4454.

Organic matter:

Pursuant to soil chemical analysis results, organic matter will be Greenlife aged and composted green waste or approval equivalent, free of weeds, debris or other deleterious material

Backfill soil mix:

Backfilling soil to tree will be as an "A" and "B" horizon comprising Type "A" and Type "B" soil mixes respectively.

Type A 80% topsoil by volume
 20% organic matter by volume

plus amendments as determined by soil chemical analysis results to achieve pH and fertility requirements.

Type B 100% imported soil

plus amendments as determined by soil chemical analysis results to achieve pH and fertility requirements.

3.2.8 SUPPORTS, TIES AND GUYS

Provide support structures or guys where necessary to maintain stability and safety.

Ties And Guys:

Install purpose made ties as necessary. Guys will galvanised steel cables, eyelets and turnbuckles. Provide adequate pacing between ties guys and the palms to avoid damage.

3.3 PREPARATION FOR DELIVERY AND INSTALLATION

3.3.1 VIEWING AND ACQUISITION

The tree to be supplied will be viewed and secured by acquisition prior to commencement of works.

3.3.2 SERVICES

Existing services are to be identified and located in the excavation area and along the tree transport route, prior to commencement of work, and arrange for appropriate protection/disconnection measures. Reinstall as necessary.

3.3.3 IRRIGATION

Thoroughly water root zone of the palms to provide adequate soil moisture conditions over a period of at least two weeks prior to lifting so as to raise soil moisture levels to field capacity.

3.3.4 ORIENTATION

Mark the tree or root ball with a temporary tag/mark to indicate the north point at the existing location.

3.3.5 TREE SURGERY

All pruning work will be carried out in accordance with AS4373-1996.

Excessive pruning shall not be carried out. Pruning may be required to physically transport the tree along public roads to the site.

3.4 TRANSPLANTING

3.4.1 ROOTBALL

The rootball size will be approximately of 1.0 metres x 1.0 metres square and approximately 0.8 metres deep.

3.4.2 CONTAINERISATION

The rootball is to be supported by a solid structure and enclosed by a solid framework and the soil retained by providing a box structure of solid sides such as timber or steel. Alternative methods of retaining the soil

(eg. Hessian, geotextile fabric or similar) may be acceptable.

3.4.3 LIFTING

A crane of suitable size shall be utilised to lift the palms. The palms is to be lifted by the framework supporting the rootball. Trunks and branches shall not be used to lift the tree. Protective packing shall be provided, such as hessian, rubber or other suitable material, to trunk, branches or other parts of the tree that may be damaged by abrasion from slings or rigging.

3.4.4 ANTI-TRANSPIRANTS

Allow for the use of approval anti-transpirants to be applied to the crown of the palms to reduce transpiration. Apply at the time of transplanting as required or as directed by the Contract Administrator. Use will depend upon weather conditions and the extent of leaf cover at the time of transplanting.

Continue to apply anti-transpirants during the maintenance period.

3.5 TRANSPORT

3.5.1 TRANSPORT ROUTE

Verification of the route into the site shall be made with the Contract Administrator prior to relocating the palms.

Construction of adequate temporary access roads or ramps as necessary to transport the palms safely through the site shall be the responsibility of the principal builder

3.5.2 TRANSPORT

A heavy haulage, oversized transporter shall be utilised to deliver the Palms. Excessive disturbance to the palms and rootball, during transport to the new planting location shall be avoided.

Prevent the rootball from drying out during the transport phase by installing protective coverings, as required, during transport.

3.6 REPLANTING

3.6.1 PLANTING LOCATION

Identify and confirm the new planting locations with the Contract Administrator. If it appears necessary to vary the planting location to avoid services, notify the Contract Administrator.

3.6.2 PLANTING HOLE EXCAVATION

Excavate planting hole to a depth no greater than the excavated rootball of the palms. Allow for any additional depth of framework to be retained beneath the palms.

The width and length of new planting holes at the soil surface should be a minimum 1 metres larger than the excavated rootball on all sides (eg. 5 metres x 5 metres).

Excavate the base of the planting hole with cross-falls to subsoil drainage lines of a minimum 1 in 50.

Notify the Contract Administrator immediately where excavation of any planting hole reveals hardpans, rock or compacted fill material.

3.6.3 PLANTING

Remove boxing materials and excess steel framework from around rootball prior to backfilling. If required, retain adequate steel framework with appropriate attachment points under the rootball to be used for guying.

3.6.4 ORIENTATION

Seek approval from the Contract Administrator that the palms are correctly positioned and orientated prior to backfilling.

3.6.5 DRAINAGE

Install adequate subsoil drainage lines beneath and to the sides of the final rootball position. Ensure that trenches and lines have a minimum fall of 1 in 50, without irregularities that would cause water to pond. Install drainage medium to trench and over subsoil drainage line with a minimum cover of 50mm. Connect the subsoil drainage connection points and outlets that will be installed by the builder. Give sufficient notice so that inspection may be carried out before backfilling. Deal with existing services as necessary to complete the work. Ensure open end is capped to prevent silt into the pipe.

3.6.6 BACKFILLING

Backfill around the exposed rootball of the palms tree with replanting backfill mix so as to reinstate the A and B soil horizons. Gradually backfill the B horizon with Type B mix to a depth 30mm below the top of the rootball. Lightly compact. Compaction by flooding + watering is acceptable. Ensure all voids around and under rootball are filled and that no air pockets are retained. Backfill the A horizon with amended Type A mix to a maximum depth of 300mm. Lightly compact. Ensure all voids around rootball are filled and that no air pockets are retained.

3.6.7 WATERING

Hand water transplanted palms immediately after backfilling. Raise soil moisture to field capacity. Ensure rootball is thoroughly wetted through the entire soil profile. Where practicable, construct a watering basin around fog to direct water into the transplanted rootball unless otherwise directed by the Contract Administrator.

3.6.8 ROOT HORMONE SOLUTION

Apply root hormone solution as soil drench, as specified, to edges of rootball.

3.6.9 SUPPORTS

Install appropriate anchors, ties and guys or supports to ensure that the tree remains stable during re-establishment. Supports should be located to accommodate paving and landscape finishes. Co-ordinate with Contract Administrator regarding location and type of guys and supports.

3.6.10 MULCHING

Install mulch over the entire rootball surface, and backfilled areas, to a depth of 100mm after settling, immediately following planting.

3.6.11 TREE PROTECTION ZONE (TO BE CARRIED OUT BY PRINCIPAL BUILDER)

Establish a chain link mesh fence to AS1728 around the transplanted tree as directed by the Contract Administrator. Provide a lockable gate to the protective fence for inspection and maintenance. The fence and gate shall be clad with shade cloth to prevent wind blown debris falling into the enclosed area.

Install enclosure signs bearing the inscription as specified. Signs shall be attached to all sides of the fence at regular intervals.

Co-ordinate with landscape contractor to remove fence to permit landscape works.

3.7 POST TRANSPLANTING MAINTENANCE

3.7.1 ESTABLISHMENT MAINTENANCE

Commence maintenance of the palms immediately after planting.

3.7.2 MAINTENANCE PERIOD

The contract maintenance period will be for a period up to 104 weeks following the final in ground planting, as determined by the Contract Administrator

3.7.3 CO-ORDINATION

The transplant contractor will co-ordinate with the builder and landscape sub-contractor to ensure adjustment or removal of supports and guys to permit paving and landscape construction to proceed.

3.7.4 PERFORMANCE

Maintain the palms in a state of continuing healthy growth and optimum physical and aesthetic condition.

3.7.5 HEALTH MONITORING

Continue to monitor the condition of the palms during the maintenance period.

Bring to the attention of the Contract Administrator and specific problems detected with the tree and proposed remediation during this period.

3.7.6 PESTS AND DISEASE

Monitor and control all pests and disease that may significantly affect the health of the tree. Notify the Contract Administrator of the presence of pests or diseases and indicate control methods to be used.

3.7.7 MULCH

Continue to apply mulch as required to maintain a mulch depth of 100mm after settling. Do not use recycled tree chippings from the site adequately composted.

3.7.8 IRRIGATION

The irrigation system will indicate above ground spray heads to provide even water application.

Soil moisture levels will be frequently inspected and adjustments made to the frequency and rate of water application as tree condition and weather conditions require. The irrigation system shall be managed so as to avoid excessive watering of the trees and to allow for soil aeration yet maintain soil moisture at or near field capacity. Allowance should be made for natural rainfall.

The irrigation system shall be inspected on a regular basis and maintained in fully functioning condition throughout the duration of the contract maintenance period.

3.7.9 SOIL FERTILISATION AND AMELIORATION

Apply fertilisers and soil ameliorants, as determined by the soil analysis results and in conjunction with the soil scientists recommendations, to the root zone area of the tree. Do not apply high nitrogenous fertilisers during the first growth period immediately following planting to avoid the risk of root burn.

3.7.10 WEED CONTROL

Remove grass and weeds by hand or by spot spraying with Glyphosate herbicide at the manufactures recommended rates. Prevent over spray of herbicide. Remove weeds on a regular basis throughout the duration of the contract maintenance period.

3.7.11 HORMONE SOLUTION

Apply root hormone solution as a spray or drench to the rootball surface. Continue to apply hormone solution at low rates recommended by the manufacturer at regular intervals during the growing season.

3.7.12 MAINTENANCE RECORDS

Inspection results and the maintenance procedures are to be recorded and submitted to the Contract Administrator at the end of each calendar month.

The various ongoing maintenance practices will be carried out under the supervision of the Contract Administrator.

3.8 COMPLETION

3.8.1 SUPPORT AND GUYS

Remove supports and guys considered no longer necessary to support the tree at the end of the contract maintenance period or as directed by the Contract Administrator. Seek direction from Contract Administrator if supports are still required.

4 LANDSCAPE - IRRIGATION

4.1 GENERAL

4.1.1 CROSS REFERENCES

General

Refer to the *General requirements* worksection.

4.1.2 STANDARDS

Water supply

General: To AS/NZS 3500.1.2.

4.1.3 LOCATION

Independent automatic irrigation systems are to be installed to the library courtyard area, and turf on slab areas.

4.2 QUALITY

4.2.1 SUBMISSIONS

Shop drawings

Submit drawings and schedules showing the layout and details of the system, including

- micro-irrigation stake layout; and
- irrigation controller cabinets,
- operations manual for the system (including warranties).

Irrigation is to be design by a fully qualified irrigation designer.

4.3 AUTOMATIC WATERING SYSTEMS

4.3.1 FIXED LOCATION SYSTEMS

Heads

General: Provide heads which maintain a preset arc of throw, adjustable for radius, during watering operations and which are as vandal-resistant as practicable.

Pop-up type heads: Designed to rise out of their housings under supply pressure, to a height of at least 50 mm. Provide wiper seals, stainless steel return springs and removable internal filters.

Anti-drain valves: On rotating heads 300 mm below the highest head on the same automatic valve, fit internal or external anti-drain check valves to prevent low head drainage.

Risers

Mount in-ground heads on reticulated risers.

Automatic control valves

24 V solenoid actuated hydraulic valves with flow control and a maximum operating pressure rating 1 MPa. Provide stainless steel bonnet holding down bolts and internal metal parts of stainless steel, able to be serviced without removal from the line. Provide a gate valve of the same size immediately upstream of each automatic control valve. House both valves in a high impact plastic valve box with high impact plastic cover at finished ground level, 150 mm below the surface. Support the box on bricks at each side.

Pressure regulating valves

Provide pressure regulating valves at off take points, which are adjustable between 100 - 700 kPa. Provide an 800 µm filter sized to suit the flow immediately upstream from the pressure regulating valve, and provide gate valves upstream from the filter and downstream from the pressure regulating valve. Mount the assembly in an accessible position in a valve box, access pit or adjacent building, and provide backflow prevention.

Control wires

Connect the automatic control valves and soil moisture sensors to the controller with double insulated underground cables laid alongside piping where possible. Lay intertwined for their full length without joints except at valves, sensors and branches off common wires. Provide waterproof connectors. Provide expansion loops at changes of direction and at joints.

Irrigation controllers

General: Provide manual cycle and individual station operation, manual on/off operation of irrigation without loss of program, 240 V input and 24 V output capable of operating 2 control valves simultaneously, 24 hour battery program backup and power surge protection.

Cabinet: In external locations, mount in a weatherproof lockable cabinet.

Electrical connection: Provide 240 V supply, with an isolating switch at the controller.

4.4.1 MICRO-IRRIGATION SYSTEMS

Polyethylene micro-irrigation pipe

Standard: To AS 2698.1 Class IRRIG with barbed fittings of similar pressure rating fastened with ratchet type clamps

Installation: Lay polyethylene pipe on finished ground surface under planting bed mulch and anchor at 1.5 m maximum intervals with U-shaped stakes. Connect micro-tube laterals with proprietary push in or screw in fittings.

Microsprays

Mount microsprays 300 mm above ground on stakes and connect to the piping with appropriately sized micro-tubes.

Micro-irrigation valve boxes

High impact plastic with snap lock covers at finished ground level, each housing a stop cock, filter (200 µm for microsprays, 100 µm for drippers), pressure reducing valve (170 kPa outlet pressure) and automatic control valve. Support the box on bricks at each side.

5 LANDSCAPE - PAVING

5.1 GENERAL

5.1.1 INTERPRETATION

Definitions

Class A foundation: Most sand and rock sites.

Class S foundation: Most silt and some clay sites.

Class M foundation: Moderately reactive clay sites.

Light traffic: Vehicles with a gross mass < 3 t.

Medium traffic: Vehicles with a gross mass between 3 t and 10 t, with infrequent use by heavier vehicles.

Density ratio: Percentage of the maximum density at optimum moisture content as determined by AS 1289.5.2.1.

5.2 QUALITY

5.2.1 SAMPLES

Finishes

General: Submit samples of the pavement finishes, showing the full range of texture and colour of the material.

Sample panels

General: Prepare sample panels of designated pavement finishes, including samples of junction details and trim.

Segmental paving pattern: Prepare a trial set-out for each area.

5.2.2 SUBMISSIONS

Execution

Segmental pattern: If it appears that minor variations to joint widths will obviate cutting, submit proposals.

5.3 MATERIALS AND COMPONENTS

5.3.1 MATERIALS

General

Fill for subgrade: Sand, gravel or quarry rubble. Refer to Structural Engineering Specification.

Subbase: Refer to Structural Engineers Drawings.

Concrete pavements

Materials and construction: To AS 3600.

Concrete: To AS 1379.

Segmental pavements

Bedding sand: Coarse, well-graded, washed, free from deleterious material including organic material and soluble salts or other contaminants liable to cause efflorescence or reduce slip resistance.

- Grading: Maximum particle size 4.75 mm, not more than 30% passing 0.3 mm sieve.

Concrete for edging

Concrete: To AS 1379.

Grade: N20.

Stabilised gravel pavements

Cement: Type GP to AS 3972.

Mix: 30:1 selected natural stone gravel:cement.

Gravel grading: Maximum particle size 10 mm, 30 - 40% passing 5 mm sieve.

Gravel source: Australian Native Landscapes Decomposed Granite - Brown

5.3.2 COMPONENTS

Segmental pavers

Standard: To AS/NZS 4455.

Dimensional category: DPA1 and DPB1.

Minimum thickness: 50mm

Potential to effloresce (maximum): Nil

Abrasion index (minimum): 2.7

Resistance to salt attack category: Pass 40 Cycles.

Unconfined compressive strength (fired clay units) (minimum): 50 MPA.

5.4 EXECUTION

5.4.1 GENERAL

Drainage

Finished surface crossfalls: Between 1% and 10%.

Ponding: Grade pavements to even falls so as to drain away from buildings to drainage outlets and street kerbs without ponding.

Surface run-off: Provide channels and drains to discharge points.

General tolerances

Surfacing layer thickness: ± 3 mm

Surfacing layer level: ± 10 mm. Over 3m length of design profile, ± 3 mm.

Maximum deviations:

- Across junctions between adjacent pavement surfaces: 2 mm.
- Across junctions between adjacent pavement unit surfaces: 2 mm.

5.4.2 CONCRETE PAVEMENT & SITTING WALL

Standard

General: To AS 3600.

Refer to Structural Engineers details and specification.

Finishes

Refer to structural engineers specification for finishes schedule

Shot Blasted finishes:

Blast the cored surface using hard, sharp graded abrasive fine aggregate particles until the coarse aggregate is in uniform relief.

Finished pavement surface: Uniform in appearance and free from depressions in which water can lie, with a texture depth of 2 – 2.5 mm.

Tolerance

Level: Over 3 m length of design profile, ± 6 mm.

5.4.3 SEGMENTAL PAVEMENTS

Basecourse thickness

Refer to Structural Engineers details.

Bedding sand course

Thickness: Roughly uniform, maximum 30mm after compaction. Do not disturb the bedding course before the units are laid.

Placing

Laying: After laying, tamp the units using a vibrating plate compactor.

Segmental paving pattern: Stretcher bond. Refer to landscape drawings.

Cutting

Where paving pattern requires to be cut against building / banding the unit paver is to vary in length as determined by pattern.

Minimum cut unit length: 200mm.

Joints

Thickness: 3 mm nominal, except where spacer ribs are provided.

Dry joints: Fill the joints flush with clean, fine sand or screened bedding sand passing a 1.18 mm sieve, vibrated into the joints using a vibrating plate compactor.

Paving Schedule

Location: General Paved Area
Type: Urbanstone Commercial Paving
Dimension: 600 x 300 x 40mm
Finish: Shot blast
Colour: Golden Gunmetal 777

Location: Paving Bands
Type: Urbanstone Commercial Paving
Dimension: 600 x 300 x 40mm
Finish: Honed
Colour: Ivory 510

Location: Tactile Paving Units
Type: Urbanstone Commercial Paving
Dimension: 300 x 300 x 40mm
Finish: Shot blast
Colour: Silver Grey 100

Location: Edge to Buildings and Gardens
Type: Urbanstone Commercial Paving
Dimension: 300 x 200 x 40mm
Finish: Shot blast
Colour: Golden Gunmetal 777

5.4.4 EDGING

Lateral restraint to segmental pavements

Perimeter: Provide edge restraints to bedding and units, where not possible by other structures.
Type: Unexposed cement mortar haunch 200 x 200mm.

Sawn timber edging

General: Set edging flush with adjoining surfaces to define asphalt paving. Fix to pegs using galvanised nails, two per fixing. Drive pegs into the ground at 1200mm centres on the paving side of the edging and on both sides of joints between boards, with peg tops 15mm below to top of the edging.

Curving: Where the timber edge is to be curved, space the pegs to hold it to a uniform curve. Reduce edging thickness to 15mm if required to enable it to be bent.

Concrete edging

General: Place in a shallow trench between timber forms. Wood float finish flush with the adjacent finished grass level. Provide movement joints, filled with resilient bituminous material, at 3 m maximum centres.

5.4.5 ASPHALT PAVEMENTS

Subgrade

Spray with a soil steriliser.

Basecourse

Surface: Firm, free of surface water, oils, greases, retarders, loose material, dust. Tack coat immediately before placing asphalt.

Tack coating: Bituminous emulsion spray to the recommendations of AS 2734.

Basecourse thickness: 100mm.

Asphalt

Mixing, laying and compaction: To the recommendations of AS 2734.

Surface finish

Depth: 20mm

Nominal size: 7mm

Finish: Dense, smooth, free of roller marks and loose material. To match existing.

Compaction: While above 140°C.

Site density (minimum): 95% of the 50 blow Marshall density of the laboratory compacted mix.

Level tolerance: \pm 10mm.

Joints with existing pavement: Cut straight edge perpendicular to alignment of path. finish new pavement level flush with existing.

5.4.6 TERRABOND® POROUS GRAVEL PAVEMENTS

Subgrade

Spray with a soil steriliser.

Basecourse

Well-graded blue metal gravel, free from deleterious material. Particle size 14 mm. Uniformly graded.

Moisture content: Nil. Kiln dry if necessary

Basecourse thickness: 70mm

Gravel Aggregate

Uniform size or graded material in the size range 7-10mm minus, of uniform colour and low plasticity. Keep clear of plant stems. Colour: Cowra White.

Surface finish

Allow 100mm clearance from tree collar. Fill with aggregate fines.

Uniform in appearance and free from depressions in which water can lie. Flush with adjacent pavements.

5.4.7 STABILISED GRAVEL PAVEMENTS

Laying

General: Lay the mix damp but not wet, to finish 100 mm thick after compaction, with an even surface, flush with edgings where provided.

Compaction: Compact to achieve a dry density ratio of 95% when tested to AS 1289.5.4.1 (standard compaction).

5.5 DRAINAGE

5.5.1 On Slab Drainage

Supply and lay 30mm depth Atlantis drainage Cell or similar to that supplied by Atlantis Corporation, Suite 401, 781 Pacific Highway, Chatswood Tel: 9419 6000 to all planted areas on slab

Overlay the drainage cell with Geofabric PGIM 14 as made by Polyfelt.

Supply and install to a depth of 30mm double washed river sand on top of geofabric. Supply and install planter soil mix as specified in soilmix schedule to depths as shown.

Waterproofing to inside of planters by others.

5.5.2 Subsoil Drainage

To Civil Engineers details.

5.6 COMPLETION

5.6.1 MAINTENANCE

Segmental pavements

Refill joints as required.

Cleaning

Leave pavements clean on completion.

Final inspection

Cracking in bound pavements: Width < 1.5 mm.

Subsidence: Offset under 1.5 m length of the design profile. < 15 mm.

Stepping: Between adjacent elements within the pavement area, < 5 mm.

Chipping and spalling to pavement units: Maximum 10 per 100 units with chipped or spalled arises.

Ponding: Maximum 10 mm deep 15 minutes after rain ceases.

6 LANDSCAPE - FURNITURE

6.1 FURNITURE

6.1.1 Furniture Schedule

Location: Refer drawing LA01.

Type: Seats – Retain existing seats on site. Store undercover during construction period.

Finish: Refinish metal structure of seats in satin black powder coat paint finish.

Installation: Form up reinforced concrete footing 400 x 400 x 300mm deep to locations shown on plans

Add grey oxide to concrete footing mix to match General Paved Area colour.

Surface mount seats to concrete footing to manufacturers recommendations.

Location: Refer drawings LA01

Type: Litter bin – Town and Park Furniture, subsurface mount 82litre, LBN 5(82):SS

Finish: Timber planking

Installation: Form up reinforced concrete footing 400 x 400 x 300mm deep to locations shown on plan.

Add grey oxide to concrete footing mix to match General Paved Area colour. Sub surface mount to manufacturers recommendations.

SPECIFICATION

APPROVED

VERTICAL TRANSPORTATION

**MONA VALE LIBRARY
SYDNEY AUSTRALIA**

**PRODUCED FOR:
BREWSTER HJORTH ARCHITECTS**

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QUALITY ASSURANCE			
Issue	A	Initials	Date
Revision	1		
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1 SCOPE OF WORKS

The Scope of Work includes the supply, installation, testing, detail design, commissioning and 12 months comprehensive warranty of the following items;

- 1 off Electric Traction Machine Room Less Lift and associated works in accordance with the Australian Standards, this specification and Architectural Drawings.

2 GENERAL

2.1 CROSS REFERENCES

2.1.1 General

Read and note all clauses in the General Conditions of Contract and Annexure and Preliminaries as applicable to this Trade

Provide all plant, Labour & Materials to complete the Works & co-ordinate & co-operate with all other Trades associated with this trade work.

2.2 COMPLIANCE WITH STANDARDS

The works shall be designed, manufactured, installed and tested in accordance with Australian and AS/NZ Standards or with other approved standards where the Australian Standards are not applicable.

All works shall be in accordance with this specification and the current Australian Standards and codes detailed within.

BUILDING CODE OF AUSTRALIA (BCA)

A.S. 1735.1 AUST. LIFT CODE - GENERAL REQUIREMENTS

A.S. 1735.2 AUST. LIFT CODE - PASSENGER & GOODS LIFTS - ELECTRIC

A.S. 1735.12 AUST. LIFT CODE - FACILITIES FOR PERSONS WITH DISABILITIES

A.S/NZS 3000 WIRING RULES

A.S. 1657 STAIRWAYS, LADDERS AND PLATFORMS

A.S. 1170.4 MINIMUM DESIGN LOADS ON STRUCTURES - EARTHQUAKE LOADS

The lift shall comply with AS 1735 part 2, 2001.

2.3 WORKSHOP DRAWINGS

Provide complete manufacturing and installation Shop Drawings and all necessary technical data covering the Work under the Contract. Drawings are to be prepared on a CAD system.

Provide penetration drawings as a separate set of drawings to the actual cable and equipment layouts. Drawings shall include the set out dimensions from columns and the architectural boundaries. Penetration sizes shall be actual and include correct clearances and the allowance for insulation, flanges cable trays and the like.

Prepare on CAD base from architectural layouts of the latest agreed Revision number. Nominate the building element and material being penetrated. Submit to the Superintendent for review.

Overlay penetrations with duct work, electrical cabling, fire services and water piping drawings for full co-ordination of ceiling services before submitting drawing for review.

Supply documents such as Shop Drawings, technical schedules, or other written information, to the Principal for examination at such times to make allowance for amendment and resubmission to be made and ordering, fabrication or manufacture to commence in accordance with the Contract Program.

All Shop Drawings shall be submitted by the Contractor in reproducible form (CAD disk) together with two (2) prints.

Two (2) copies of the revised Shop Drawings shall be submitted by the Contractor to the Principal for distribution to the Consultants and further copies shall be submitted to the appropriate authorities as necessary.

The Shop Drawings to be prepared and submitted by the Contractor shall be 1:50 scale for floor plans and 1:20 scale for plantrooms and equipment details.

Additional drawings are required for:

- Manufacturer's drawings of purpose made equipment.
- Details of labelling and engraving.

2.4 SAMPLES

Submit to the Superintendent Samples of the proposed installation. Samples to be submitted include:

- Luminaires
- Accessories
- Finishes

Make allowance for amendment and resubmission to be made and ordering, fabrication or manufacture to commence in accordance satisfy the Contract Program.

2.5 OCCUPATIONAL HEALTH & SAFETY (OH&S)

Ensure adequate space be provided for servicing of equipment and parts in plant rooms and the general areas. Equipment shall be installed to ensure adequate serviceability without the

need for unsafe work practices. Reference should be made to:

- Manufacturer's installation instructions
- Workcover requirements
- Australian Standards

Where Building Maintenance Units (BMUs) & special equipment is proposed, provide all necessary operating details of such equipment.

2.6 WORK AS EXECUTED DRAWINGS

Submit two (2) copies of each drawing showing the work as completed. Drawings required may be updated Contractor's Drawings or updated tender Drawings.

In addition to 'Work As Executed' drawings, the Contractor shall obtain and provide two (2) sets of manufacturer's detailed drawings of all items of equipment suitably titled and with all drawing reference numbers noted.

Submit drawings on sheets the same size and format as the Contract Drawings.

Provide two (2) sets of CAD disks based upon the working drawings showing the sizes and positions of all wiring and equipment 'As Installed'.

The drawings shall be to the same scales as approved for Shop Drawings and shall record details of the work actually installed and entitled 'WORK AS EXECUTED'.

Symbols shall be shown on all 'Work As Executed' drawings.

In order to achieve accurate drawings, all relevant information relating to the contract work shall be entered on to Working Drawings prints immediately the Work has been carried out. The Drawings shall appear 'as new'. No previous examined stamps, hand written notes or erase markings shall be evident. New Drawings shall be provided if necessary.

Evidence of progressive completion of 'Work As Executed' Drawings, Documents, Manuals and the like will be required at site meetings.

Drawings are to be prepared on a CAD system using drawing standards and symbols compatible with each of the trades being drawn and to the approval of the Superintendent. The CAD system proposed must be readily able to transfer to other systems without loss of drawing content or other difficulties.

Drawings submitted for approval may be hard copies in the first instance. When returned by the Superintendent, the Contractor shall carry out a full co-ordination of all trades drawings by overlaying the 1:50 returned plots. As evidence of this action, each plot shall be initialled by the Contractor and resubmitted to the Superintendent who shall examine the plot, initial it and take a record copy. The plot shall then be returned to the Contractor who shall then arrange for a final corrected ink plot for approval.

Supply 'Shop' and 'As executed' Drawings in digital format according to the following requirements:

- MEDIA - 3 1/2 floppy disks
 - AutoCAD DXF format
 - If compression of files used, supply decompression software with files.

When Drawings have been approved, submit one (1) bound set on heavy weight paper

together with the final CAD disks.

The works or relevant separable portion will not be complete until the above requirements have been satisfactorily complied with.

2.7 OPERATING AND MAINTENANCE MANUAL

The contractor shall submit to the Superintendent prior to Completion Operating and Maintenance Instruction Manuals which shall comprise a description of each installation, its operation and the regular operating and maintenance routines to be adopted.

Two (2) sets of Operating Instruction Manuals shall be provided, printed on A4 size paper adequately bound into volumes with rigid covers of plastic finish to withstand continual usage.

Manuals shall include:

1. General Description Equipment

Include brief overall description of equipment, design references and description of each individual system and equipment involved.

2. Operating of Systems and Equipment

Include general operation of plant, operation of each system and the equipment involved, starting up and shutting down of all systems, location of starting gear, etc. and normal operation of system, including all control settings and tolerances.

3. Maintenance of Systems and Equipment

Include maintenance duties in general, daily and all other periodic maintenance, lubrication chart and spare parts list.

4. Schedules

Include schedules of equipment showing quantity, location, type, supplier, etc. and a schedule of all suppliers with addresses and telephone numbers.

5. Manufacturer s Literature

Include manufacturer s data or maintenance and operation of all equipment installed. Do not include irrelevant data that does not pertain to the model of equipment actually installed. Such irrelevant information shall be deleted from data sheets, etc.

6. Miscellaneous

Include any miscellaneous charts, graphs, descriptions, data, etc. needed for complete maintenance and operating instruction of all systems and equipment installed.

7. Spare Parts

Prior to the Completion, the contractor will be required to submit a schedule of the spare parts that he recommends and should be supplied together with their individual current

prices.

These parts may or may not be ordered.

2.8 TRAINING

The Principal's nominated staff shall be fully instructed by the Contractor in the operation and maintenance of the installed services, and this shall commence with the commissioning of engineering services.

This instruction shall extend over the whole of the commissioning, running-in and maintenance periods and shall include "hands on" instruction to provide familiarity with the whole system. At the same time "class room" type instruction shall be given to cover major components.

The instruction shall be carried out by specialist engineers to the satisfaction of the Principal. Provide all certificates necessary to occupy and operate the building.

Perform all necessary training to ensure satisfactory operation of the system by the users of the system.

The training shall take the form of two (2) days on-site with six nominated end-users of the system covering all aspects of the operation of the installed System.

2.9 NOTICES AND FEES

The contractor shall throughout the course of the works give all notices, pay all fees, charges, levies and deposits and otherwise conform with the requirements of all properly constituted authorities with respect to the scope of work.

2.10 OPERATIONAL & PERVENTATIVE MAINTENANCE

Provide 12 months operational maintenance for all services and items within the works, including but not necessarily limited to:

1. 12 months warranty on all plant and equipment installed, including labour costs that may be involved in replacements;
2. 12 months preventative maintenance in accordance with manufacturers recommendations and the Australian Standards. Including regular maintenance visits, prompt answering of breakdown calls, replacement of defective parts, regular replacement of defective equipment;
3. Full coordination and supervision as may be required by the Principal, shall be provided by the Contractor for all maintenance, and in particular for all breakdown calls;
4. Provision of comprehensive maintenance plans and programmes to be submitted to the Principal prior to Contract completion;
5. Provision of regular preventative maintenance reports, and particular and prompt reports in the case of emergency breakdowns together with all necessary maintenance logs. All maintenance shall be undertaken in the presence of the Principal and shall include full instruction as required for the commissioning and running-in periods.

2.11 CERTIFICATION

Prior to Contract completion, the Contractor shall provide to the Superintendent one copy of a file containing all Certification required under the Contract, including but not limited to:

- All design and documentation Certification provided by the Contractor's design team, including copies of all supporting material such as correspondence from authorities, minutes of meetings and the like
- all construction Certification provided by the Contractor's installers, including all support material as above
- a covering certificate from the Contractor confirming the works as designed and constructed comply with all relevant Codes, regulations and requirements.
- the file of Certification shall commence with a detailed list of contents, followed by the Contractor's Certificate, and then followed by general Certification.

2.12 WORK ASSOCIATED WITH LIFT SERVICES

The following works shall be completed by the relevant associated trades in coordination with the Vertical Transportation (Lift) Trade.

Arrange, co-ordinate or provide in conjunction with associated trades the following works to enable the lift installation to be satisfactorily completed in accordance with the Standards.

Provide detailed drawings as required for the guidance of associated trades and supply all necessary templates, masonry inserts, pit ladders, beams/eyes and S.W.L. notice pertaining to the lift installation for installation by the Trades below.

2.12.1 Building / Structural Trade

- Construct lift well complete with guide rail support structure, penetrations and plinths to Architectural, Structural and Lift Trade shop drawings.
- Install masonry inserts and construct the supports for guide rails to detailed dimensions provided by this Lift Trade.
- Construct the dry lift over-run pit and sump.
- Install lifting beams/eyes to machine room and lift well as detailed in shop drawings by Lift Trade. Beams/eyes and S.W.L. notice to be supplied by this Lift Trade.
- Provide all other penetrations as detailed on approved workshop drawings including a 300mm x 300mm x 300mm dry sump in pit floor.
- All Painting
- Scaffolding.
- Provision of 415/240 volts, 4-wire power for trade s use in operation of hand tools, welding equipment.
- Provision of 415/240 volts, 4-wire power for testing of the plant, also outlets for temporary lighting.
- Space to accommodate the UPS and other Lift Manufacture Equipment.

2.12.2 Electrical Trade

- Supply, install and terminate three phase and neutral appropriate fire rated submains to lift machine control panel circuit breaker.

2.12.3 Communications Trade

- Provide one (1) telephone lines to a junction box outside and adjacent to the main lift control panel.

3 VERTICAL TRANSPORTATION SERVICES

Arrange, co-ordinate or provide in conjunction with associated trades the following works to enable the lift installation to be satisfactorily completed in accordance with the Standards.

Provide detailed drawings as required for the guidance of associated trades and supply all necessary templates, masonry inserts, pit ladders, beams/eyes and S.W.L. notice pertaining to the lift installation for installation by the Trades below.

3.1 LIFT CAR FINISHES

Front Wall: Front wall panels, brushed Stainless Steel
Flooring: Carpet to match Council Customer Service Area
Ceiling: Brushed Stainless and partial lighting
Walls: Laminate: Colour to be selected
Skirting: Brushed stainless steel
Corners: Square profile, Brushed stainless steel
Handrails: Brushed aluminium.

3.2 LIFT CAR LIGHTING

To comply with AS1735.12. Luminaires shall be concealed in suspended ceiling.
Provide a minimum illuminance on floor of 100 lux.

3.3 LIFT CAR VENTILATION

Provide ventilation fan for lift car.

3.4 OTHER REQUIREMENTS

Control Panels & Indicators

Control Panel at each end of Lift Car .

Buttons to be round recessed type.

Provide fire service key switches as per AS1735.

Provide corridor/external alarm bells as per AS1735

Provide all the required information annunciators, both visible and audible, in all passenger lift cars, in accordance with AS 1735.12-1999.

Provide Hall Indicators to each lift informing the following:

- EMERGENCY USE when under Independent Service Control or Fire Service.
- OUT OF SERVICE when out of service.
- POSITION & DIRECTION under normal operation.

Emergency Telephone

Concealed, autodial telephone, pushbutton operated in accordance with AS1735.
Also provide remote monitoring of lift installation.

Emergency Stop

Consideration shall be given to have the emergency stop button concealed behind a separate panel.

Emergency Lighting

Lights shall be 4 hour instantaneous self contained units. To provide 20lux on relevant call buttons and have battery recovery, all to comply with AS1735. The emergency lighting system shall be compatible with the building's proposed exit & Emergency central computer monitoring system.

Car GPO

GPO(RCD protected) with stainless steel faceplate below car operating panels.

Protective Blankets

Provide 1 set of Protective blankets for the lift. Blankets are to sized to fully protect the cars and be made from suitable material. Provide a suitable means for hanging the coverings.

3.5 ENHANCED ACCESS REQUIREMENTS

The following are items relating to the enhanced disabled access provisions.

The lifts shall be compliant with AS1735.12 and AS1428.1 & 2.

Install a new 3D principle passenger protection system. The units shall be capable of reversing the doors if an object (75mm rod) and person is sensed between 50mm & 1600mm and other standard type features. The system is to comply with AS1735.2 & AS1735.12.

The system shall be capable of dwell times as indicated in section 7 of AS1735.12 however the actual dwell times shall be set to ensure the lifts satisfies this specification performance requirements.

The lift cars shall have an oral announcement facility with an Australian accent to indicate the level of arrival, etc.

Provide the costs associated with the enhanced access requirements of AS1735.12 and AS1428.2 which are more than the minimal BCA code requirements in the schedule provided.

Provide tactile, Brail, Audio & Visual indication in accordance with AS1735.12. Provide visual confirmation of the call acceptance of the hands free telephone.

3.6 PERFORMANCE

The tenderer shall submit the performance criteria of the lifts proposed scheduled against the figures below. The lifts shall maintain the following performance:

Noise

Assuming an Ambient Noise Level of 45dB(A) the maximum noise from the lift shall be:

Lift passing Landing — 52dB(A) measured 1m AFFL at landing, 1m from door.

Lift doors open and close - 58dB(A) measured 1m AFFL at landing, 1m from door.

Travelling in Lift Car with exhaust fan on - 58dB(A) measured 1m AFFL in car.

Levelling

+ 6mm

Lateral Quaking

20 GAL max. peak to peak

Vertical Vibration

5 GAL max. RMS

3.7 ELECTRIC MOTORS

3.7.1.1 General

Dimensions and performance: To AS 1360.11.

Installation: To AS 1359.107.

Motors \geq 0.37 kW: Three phase unless specified otherwise.

Noise and vibration: Support motors to minimise noise and vibration.

Noise and vibration limits: To AS 1359.109 and AS 1359.114.

3.7.1.2 Motor selection

Select motors in accordance with AS 1359.101, motor manufacturers recommendations and the following:

- Starting performance: To IES 80034-12 and AS 1359.41.
- Speed and torque: To suit required by the driven equipment. Ensure each motor develops torque relative to the starting load of the driven machine such that it runs up to full speed steadily and within a time period compatible with motor winding temperatures, class of insulation and rating of the starting equipment.
- Starting method: As specified or, if none specified, appropriate to the driven equipment, electrical services infrastructure and supply authority requirements.
- Motor operation: Select motor for mode of operation, appropriate to the duty e.g. continuous, frequent starting and stopping.
- Motor power rating: The greater of:
 - The specified minimum motor capacity and
 - 110% of the maximum load of the driven equipment.
- Temperature rating: Select motors for continuously operation at an ambient \geq 40°C unless specified otherwise.

- Motor enclosure: As specified or, if none specified, as appropriate to the environment in which the motor operates. Enclosure classification to conform to AS 1359.20 and AS 1939.
- Motors supplied from variable frequency drives:
- Select for low noise and vibration under all operating conditions.
- Provide class F insulation, with class B temperature rise or better.

3.7.1.3 Overload protection

Provide each motor with overload protection.

Motors ≥ 22 kW: Fit embedded winding temperature thermistors complying with AS 1023.1 in each phase. Match trip operating temperature to motor winding insulation classification.

3.7.1.4 Motor efficiency and power factor

Motors specified as high efficiency: To AS/NZS 1359.5 Section 3.

All other motors: To AS/NZS 1359.5 Section 2.

Power factor: Not less than the value in the Minimum power factor table for the respective motor size.

3.7.1.5 Minimum power factor table

Rated output kW	Minimum power factor at rated output
≤ 0.37	0.72
>0.37 to ≤ 0.55	0.76
>0.55 to ≤ 3.0	0.83
>3.0 to ≤ 18.5	0.86
>18.5 to ≤ 37	0.87
>37	0.88

3.8 VARIABLE SPEED DRIVES

GENERAL

The variable speed drive controllers shall be variable voltage, variable frequency devices.

Equipment from manufactures who do not have an authorised sales/service office in NSW that can provide reliable service and back-up will not be acceptable.

MAINS SUPPLY

The VSD controllers shall be capable of operation with \pm or \neq 10% voltage variation of the mains supply. Fluctuation beyond these values shall not cause component failure and shall initiate a controlled shutdown of the speed controller.

The fundamental frequency line side power factor shall be >0.9 .

HARMONICS

The maximum AC network harmonics distortion, including voltage notching caused by the VSD controller at the point of common coupling, shall not exceed the limits set down by AS 2279 Part 2.

The harmonics generated by the VSD controller shall be limited through appropriate selection of AC line side reactors which shall be supplied as part of this contract.

The fault level at the point of common coupling will be provided to enable the selection of the harmonic filters.

ELECTROMAGNETIC INTERFERENCE

Electromagnetic interference (Radio Frequency Interference) generated by the VSD controller shall be within the limits of AS 2064. The VSD supplier shall provide full installation instructions for the equipment to minimise the Electromagnetic Interference. If necessary, the generated Electromagnetic Interference shall be limited through appropriate selection of equipment such as RFI filters.

OPERATING ENVIROMENT

The VSD controller shall be capable of operating continuously without de-rating within the following parameters:

Temperature:	\neq 10 to \neq 40 deg C
Humidity:	20 to 90% RH (non condensing)
Altitude:	up to 1 000 metres

The enclosures shall be manufactured in accordance with the switchboard section of this specification and have an IP55 five rating as a minimum form of protection

EFFICIENCY

The VSD controller's efficiency shall not be less than 95% when operating at it's rated load and frequency and not less than 85% when operating at half the rated frequency.

ACCURACY

The VSD controller shall have frequency holding accuracy of \pm 0.5% throughout the frequency range. The frequency setting resolution shall be at least 0.1 Hz.

OPERATIONAL FEATURES

The VSD controller shall have the following minimum operational features:

- Output frequency range of 1 to 400Hz
- Adjustable maximum and minimum frequency limit
- Separately adjustable acceleration and deceleration time periods of 1 to 999 seconds with a possibility of setting dual ramp up/ ramp down rates. Linear and curved ramps should be possible to be easily selectable.
- Start / Stop / Reverse operation commands from digital keypad and via control terminals.
- Up to seven preset speeds selectable from control terminals
- Selectable VF patterns with at least one programmable curve.
- Adjustable jog frequency setting.
- Remote frequency set point setting through
- External potentiometer (0-5v 0-10v)
- Current source (0-20mA/ 4-20mA)
- Low frequency torque boost facility.
- DC injection braking with adjustable start point and time period for braking.
- 150% overload for 1 min. for constant torque and at least 115% for 30 sec. For variable torque applications.
- Instantaneous overcurrent limit of 180%.
- Power loss ride through facility for a minimum of 15 mSec.
- Resonance frequency jump control.
- Auto start facility to attempt a restart in case of tripping after momentary power failure.
- Local emergency stop facility.
- Voltage free fault relay output.
- Auto tuning facility for easy commissioning.
- Fault memory storage for at least 3 previous faults.
- 0-10V or 4-20mA signal representing output frequency for Master/Slave operation.
- RS485 communication port for communication with higher level automation systems.
- Motor slip compensation.
- At least one programmable input/output terminal.

PROTECTION

The VSD controller shall have protection against the following:

- Over voltage.
- Under voltage.
- Overcurrent.
- Over temperature.
- Earth Fault.
- Motor Overload.
- Motor Stall.

FAULT AND DIAGNOSTIC DISPLAY

The VSD controller shall have an Alpha-Numeric diagnostic display with fault indications to include, but not limited to the following:

- Supply over voltage.
- Supply under voltage.
- Overcurrent during starting.
- Overcurrent during acceleration.
- Overcurrent during deceleration.
- Heat sink over temperature.
- Emergency stop operated.
- Control board failure.

Additionally, the following status displays shall be available on the VSD controller:

- Power on.
- Forward run.
- Reverse run.
- Function parameter locked.
- Motor speed in Hz/RPM.
- Setting error.

3.9 LONG TERM MAINTENANCE PROPOSAL

Submit a proposal for Long Term Maintenance contract for optional acceptance by the Principal.

The maintenance shall be comprehensive for a period of 5 years. It shall include all necessary statutory and preventative maintenance tasks.

It should state clearly of the inclusions and exclusions.

3.10 SCHEDULE OF TECHNICAL DATA

The Tenderer shall submit a Schedule of Technical Data based items listed in the Equipment Schedule below but providing actual figures & equipment being offered.

4 EQUIPMENT SCHEDULE

	Lift 1	Contractors Comments
Classification	Passenger	
Type	Electric Traction Machine Room Less	
* Rated Capacity	11 Passenger	
* Speed	1m/s Min.	
Shaft Size	As per Architect s Drawing	
Shaft Details	As Per Architect s Drawings	
* Car Size	AS per Architect s Drawings	
Lift Car Ventilation	Yes.	
Door Opening	900mm Wide 2100m High Front & Rear Centre Parting	
Passenger Door Protection	Multiple Infrared 3D Light Beam	
Overrun	AS per Architect s Drawings	
Pit Depth	AS per Architect s Drawings	
Travel	AS per Architect s Drawings	
Floor Served Through Car	Library Rear Door Opening Council Level 1Front Door Opening Council Level 2Front Door Opening	
Levelling Accuracy	-6mm	
Lift Motor Room	Part of Shaft Access via highest floor served	
Motor System Rated Starts	Minimum 120 Starts per hour.	

Note

* - These figures are minium and it possible to offer higher however the lift shaft sizes are set.

5 SCHEDULE OF PRICES

LIFT DESCRIPTION	TENDER PRICE BREAKDOWN
Lift 1	\$
Lift Car Fitout	\$
Enhanced Access Provisions	\$
Alternative Power Supply / UPS	\$
Air Conditioning of Lift Car	\$
Interfaces	\$
Special Remote Monitoring of Lift System	\$
Drawings	\$
Certification & Testing	\$
12 Months Maintenance	\$
TOTAL	\$

Quotation for Comprehensive Maintenance
following warranty period

\$..... per / year

Company Name ..

Witness Signature

Date Date

**MONA VALE LIBRARY
PITTWATER COUNCIL**



**ELECTRICAL SERVICES
SPECIFICATION**

Steenzen Varming (Australia) Pty Ltd

Sydney
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Northbridge NSW 2063

Melbourne
Level 4, 150 Albert Road
South Melbourne VIC 3205

Brisbane
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Coffs Harbour
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Coffs Harbour NSW 2450

AUSTRALIA

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INTERNATIONAL

SPECIFICATION

ELECTRICAL SERVICES

MONA VALE LIBRARY SPECIFICATION

PRODUCED FOR:
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201 Kent Street
SYDNEY NSW 2000

ENGINEER:
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QUALITY ASSURANCE			
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1 GENERAL

1.1 SCOPE OF WORKS

Generally the scope includes a new Library consisting of approximately 1191 sqm and the refurbishment of the existing Library Building into office accommodation. The Existing Library also has additional extension to cater for the Child Care Facilities. Other Associated works include alternations to the external lighting and Café.

The Works shall include but not limited to the supply, delivery, installation, commissioning, testing, maintenance, certification and warranty of the electrical services as specified and indicated on the drawings.

The extent of work includes, but is not limited to the following:-

- Enabling Works, site services diversions.
- New Mains from Existing Substation
- Sub-mains
- Provision of all external HD UPVC underground conduits and cable pits.
- Equipment and wiring required for Authority Metering.
- New Main Switchboard.
- Distribution boards throughout new building.
- Earthing systems throughout new building.
- Cables and wiring management systems, enclosures and supports
- Provision for Future Power Factor Correction
- Installation of UPS
- Luminaires and wiring and mounting systems.
- External Lighting
- Emergency luminaires and wiring and mounting.
- Telecommunications Structured Cabling
- MATV System
- Security System complete with Smoke Detectors
- PA System
- Modifications, adjustments and all necessary works within the existing Building.
- All works and equipment of a minor nature not specifically mentioned but necessary for the operation of the above mentioned equipment.
- Workshop Drawings
- As Built Drawings and Manuals.

1.2 WORK ASSOCIATED WITH ELECTRICAL SERVICES

These lists are provided to assist the contractor and the trades at interface points.

BUILDING TRADE

- Penetration through floors, ceiling, walls and roof for pipe work, conduits, cables, sleeves, etc. and make good around all penetrations after installation.
- All permanent access openings and removable access panels in ceilings, walls, shafts etc. Panels to be fire rated where part of a firewall.
- Chasing
- Making good after chasing, drilling and placing of sleeves etc.
- Provisions for rubbish collection and dumping from all working floors and for regular rubbish removal from site.
- Scaffolding.
- Provision of 415/240 volts, 4-wire power for trade's use in operation of hand tools, welding equipment.
- Provision of 415/240 volts, 4-wire power for testing of the plant, also outlets for temporary lighting & power.

MECHANICAL TRADE

- Air conditioning and exhaust systems.
- Controls for air conditioning & ventilation.

HYDRAULIC TRADE

- All hydraulic plant and controls.

LIFT TRADE

- All Lift Services including Shaft Lighting and Lift Control Panel.

1.3 WORK BY OTHERS ASSOCIATED WITH ELECTRICAL SERVICES

This list is provided to assist the contractor and the trades at interface points.

The following shall be provided by the Client or nominated Contractors:

- PABX
- Communication Patch Leads and Fly Leads
- Supply of UPS

1.4 CROSS REFERENCES

Read and note all clauses in the General Conditions of Contract and Preliminaries as applicable to this Trade

Provide all plant, Labour & Materials to complete the Works & co-ordinate & co-operate with all other Trades associated with this trade work.

1.5 LOCATION OF EQUIPMENT

The drawings indicate the approximate location of the services. The exact location shall be determined on site in conjunction with the Architect details. For the purpose of tendering the position of the services shall be anywhere in the relevant room.

1.6 REFERENCED DOCUMENTS

The whole of the works shall be generally designed, manufactured, installed and tested in accordance with Australian and AS/NZ Standards or with other approved standards where the Australian Standards are not applicable.

All electrical works shall be in accordance with this specification and the following Australian Standards and standards referenced within these standards:

- AS/ NZS 3000: 2000 Wiring Rules.
- AS / NZS 3008 1998 Selection of Cables.
- AS 2293 Emergency Lighting
- AS 3080 Telecommunications

1.7 CONTRACTOR'S DOCUMENTS

Provide complete manufacturing and installation Shop Drawings and all necessary technical data covering the Work under the Contract. Drawings are to be prepared on a CAD system.

Provide penetration drawings as a separate set of drawings to the actual cable and equipment layouts. Drawings shall include the set out dimensions from columns and the architectural boundaries. Penetration sizes shall be actual and include correct clearances and the allowance for insulation, flanges cable trays and the like.

Prepare on CAD base from architectural layouts of the latest agreed Revision number. Nominate the building element and material being penetrated. Submit to the Contract Administrator.

Overlay penetrations with duct work, electrical cabling, fire services and water piping drawings for full coordination of ceiling services before submitting drawing for review.

Supply documents such as Shop Drawings, technical schedules, or other written information, to the Contract Administrator for examination at such times to make allowance for amendment and resubmission to be made and ordering, fabrication or manufacture to commence in accordance with the Contract Program.

All Shop Drawings shall be submitted by the Contractor in reproducible form (CAD disk) together with two (2) prints - to the Project Manager.

Two (2) copies of the revised Shop Drawings shall be submitted by the Contractor to the Contract Administrator for distribution to the Consultants and further copies shall be submitted to the appropriate authorities as necessary.

The Shop Drawings to be prepared and submitted by the Contractor shall be 1:50 scale for floor plans and 1:20 scale for plant rooms and equipment details.

Additional drawings are required for:

- Manufacturer's drawings of purpose made equipment.
- Details of labelling and engraving.

1.8 WORK AS EXECUTED DRAWINGS

Submit two (2) copies of each drawing showing the work as completed. Drawings required may be updated Contractor's Drawings or updated tender Drawings.

In addition to 'Work As Executed' drawings, the Contractor shall obtain and provide two (2) sets of manufacturer's detailed drawings of all items of equipment suitably titled and with all drawing reference numbers noted.

Submit drawings on sheets the same size and format as the Contract Drawings.

Provide two (2) sets of CAD disks based upon the working drawings showing the sizes and positions of all wiring and equipment 'As installed'.

The drawings shall be to the same scales as approved for Shop Drawings and shall record details of the work actually installed and entitled 'WORK AS EXECUTED'.

Symbols shall be shown on all 'Work As Executed' drawings.

In order to achieve accurate drawings, all relevant information relating to the contract work shall be entered on to Working Drawings prints immediately the Work has been carried out. The Drawings shall appear 'as new'. No previous examined stamps, hand written notes or erase markings shall be evident. New Drawings shall be provided if necessary.

Evidence of progressive completion of 'Work As Executed' Drawings, Documents, Manuals and the like will be required at site meetings.

Drawings are to be prepared on a CAD system using drawing standards and symbols compatible with each of the trades being drawn and to the approval of the Contract Administrator. The CAD system proposed must be readily able to transfer to other systems without loss of drawing content or other difficulties.

Drawings submitted for approval may be hard copies in the first instance. When returned by the Contract Administrator, the Contractor shall carry out a full coordination of all trades drawings by overlaying the 1:50 returned plots. As evidence of this action, each plot shall be initialled by the Contractor and resubmitted to the Project Manager who shall examine the plot, initial it and take a record copy. The plot shall then be returned to the Contractor who shall then arrange for a final corrected ink plot for approval.

Supply 'Shop' and 'As executed' Drawings in digital format according to the following requirements:

- MEDIA- CD
- AutoCAD DXF format
 - If compression of files used, supply decompression software with files.

When Drawings have been approved, submit one (1) bound set on heavy weight paper together with the final CAD disks.

The works or relevant separable portion will not be complete until the above requirements have been satisfactorily complied with.

1.9 OPERATING AND MAINTENANCE INSTRUCTIONS

The contractor shall submit to the Project Manager prior to Completion Operating and Maintenance Instruction Manuals which shall comprise a description of each installation, its operation and the regular operating and maintenance routines to be adopted.

Two (2) sets of Operating Instruction Manuals shall be provided, printed on A4 size paper adequately bound into volumes with rigid covers of plastic finish to withstand continual usage.

Manuals shall include:

1. GENERAL DESCRIPTION EQUIPMENT

Include brief overall description of equipment, design references and description of each individual system and equipment involved.

2. OPERATING OF SYSTEMS AND EQUIPMENT

Include general operation of plant, operation of each system and the equipment involved, starting up and shutting down of all systems, location of starting gear, etc. and normal operation of system, including all control settings and tolerances.

3. MAINTENANCE OF SYSTEMS AND EQUIPMENT

Include maintenance duties in general, daily and all other periodic maintenance, lubrication chart and spare parts list.

4. SCHEDULES

Include schedules of equipment showing quantity, location, type, supplier, etc. and a schedule of all suppliers with addresses and telephone numbers.

5. MANUFACTURER'S LITERATURE

Include manufacturer's data on maintenance and operation of all equipment installed. Do not include irrelevant data that does not pertain to the model of equipment actually installed. Such irrelevant information shall be deleted from data sheets, etc.

6. MISCELLANEOUS

Include any miscellaneous charts, graphs, descriptions, data, etc. needed for complete maintenance and operating instruction of all systems and equipment installed.

7. SPARE PARTS

Prior to the issue of a Certificate of Completion, the contractor will be required to submit a schedule of the spare parts that he recommends and should be supplied together with their individual current prices.

These parts may or may not be ordered.

1.10 TRAINING

The Principal's nominated staff shall be fully instructed by the Contractor in the operation and maintenance of the installed services, and this shall commence with the commissioning of engineering services.

This instruction shall extend over the whole of the commissioning, running-in and maintenance periods and shall include "hands on" instruction to provide familiarity with the whole system. At the same time "class room" type instruction shall be given to cover major components.

The instruction shall be carried out by specialist engineers to the satisfaction of the Principal. Provide all certificates necessary to occupy and operate the building.

Perform all necessary training to ensure satisfactory operation of the system by the users of the system.

The training shall take the form of one (1) day on-site with up to six (6) nominated end-users of the system covering all aspects of the operation of the installed System.

1.11 OPERATIONAL AND PREVENTATIVE MAINTENANCE

Provide 12 months operational maintenance for all services and items within the works, including but not necessarily limited to:

1. 12 months warranty on all plant and equipment installed, including labour costs that may be involved in replacements;
2. 12 months preventative maintenance in accordance with manufacturers recommendations and the Australian Standards. Including regular maintenance visits, prompt answering of breakdown calls, replacement of defective parts, regular replacement of defective equipment;
3. Full coordination and supervision as may be required by the Principal, shall be provided by the Contractor for all maintenance, and in particular for all breakdown calls;
4. Provision of comprehensive maintenance plans and programmes to be submitted to the Principal prior to Contract completion;
5. Provision of regular preventative maintenance reports, and particular and prompt reports in the case of emergency breakdowns together with all necessary maintenance logs. All maintenance shall be undertaken in the presence of the Principal and shall include full instruction as required for the commissioning and running-in periods.

1.12 OCCUPATIONAL HEALTH AND SAFETY (OH&S)

Ensure adequate space be provided for servicing of equipment and parts in plantrooms and the general areas. Equipment shall be installed to ensure adequate serviceability without the need for unsafe work practices. Reference should be made to:

- Manufacturer's installation instructions
- Workcover requirements
- Australian Standards

Where Building Maintenance Units (BMUs), & special equipment is proposed, provide all necessary operating details of such equipment.

1.13 SAMPLES

Submit to the Principal Samples of the proposed installation. Samples to be submitted include:

- Luminaires
- Accessories
- Speakers
- Security Devices

Make allowance for amendment and resubmission to be made and ordering, fabrication or manufacture to commence in accordance satisfy the Contract Program.

1.14 CERTIFICATION

Prior to Contract completion, the Contractor shall provide to the Principal one copy of a file containing all Certification required under the Contract, including but not limited to:

1. All design and documentation Certification provided by the Contractor's design team, including copies of all supporting material such as correspondence from authorities, minutes of meetings and the like
2. All construction Certification provided by the Contractor's installers, including all support material as above
3. A covering certificate from the Contractor confirming the works as designed and constructed comply with all relevant Codes, regulations and requirements.

The file of Certification shall commence with a detailed list of contents, followed by the Contractor's Certificate, and then followed by general Certification.

1.15 SITE VISIT

Prior to submitting a tender visit the site and take all necessary and relevant notes to provide a detailed and comprehensive tender.

2 ELECTRICAL WORKS

2.1 ENABLING WORKS

The new building footprint is located on an area that contains some existing services infrastructure. These services are to be relocated prior to the start of the new building works. As the Library is occupied and 'In use', the works will be required to be completed to allow the Library to continue to operate.

The drawings provide a guide to the approximate location of existing and proposed works. Using up-to-date survey drawings and information from the supply authorities provide a Workshop Drawing indicating the proposed works, complete with a Work Method Statement for approval.

Generally the existing site services include external lighting, and power supplies for local final subcircuits and some communications cabling.

2.2 EXISTING BUILDING

The existing building is a unique structure of sloped ceilings and skylights constructed of concrete. The building is not ideal for cabling reticulation and it is envisaged that existing circuits will be used to either pull through new wiring or form part of the finished product. The building slabs will require chasing to allow new cabling to be installed via embedded conduits.

Where existing cabling is to be used to as part of the finished product, then the cabling must be tested and fully comply with the specification and contract documents. Thus where existing cabling is used then the system must be covered in the warranty of the installation. On the other hand were light fittings are reused these fittings will not form part of the warranty.

The existing library building will undergo some alterations and extensions. The building has a number of existing services that shall be **retained** that may not all be located on the drawings. These include **security devices, Lighting and smoke detectors**.

Existing Block Telecommunications Block & Data Cabling shall be completely removed. GPO circuits may be reused if possible.

2.3 POWER SUPPLY

The site is made up a number of separate authority power supplies.

- Park External Lighting & Power
- Hall Building
- Existing Library

The existing Hall Building shall be retained as a separate installation and does not form part of the scope. However the existing library supply shall be replaced with a new supply from Pittwater Road to a new Main switchboard which shall support the proposed office building, child care facility and new Library.

Energy Australia have advised that there is sufficient spare capacity in the existing

Substation to cater for the new Library Building and Associated Building Works.

The mains shall run underground from the existing substation to the New Main Switch Room located in the new Library Building.

The electrical contractor shall supply and install the mains from the main switchboard to the kiosk substation and shall closely liaise with Energy Australia to arrange electricity connection, pay all fees and charges for the connection.

Arrange for the disconnection of the existing Library Supply.

2.4 CONSUMER MAINS

Supply and install consumer mains from the kiosk substation to the Site main switchboard as indicated on the drawings. The contractor shall terminate the consumer mains onto the main switchboard and arrange for Energy Australia to terminate the cables onto the kiosk substation. Pay any charges by Energy Australia for this work.

2.5 METERING

The existing Meters shall be removed and replaced with new units at the new location.

Supply and install fully sealed and segregated chambers within the main switchboard for accommodating the current transformers and metering equipment. The main switchboard shall be fitted with removable links in the busbar to enable fitting of the current transformers.

The contractor shall liaise with Energy Australia to ensure the switchboard arrangement and position of links and metering equipment meets with their approval.

Energy Australia shall supply the meters and undertake final connections.

The contractor shall submit to Energy Australia a main switchboard arrangement drawing for written approval to be obtained prior to commencement of the switchboard manufacturer.

It is proposed that the new electricity metering be arranged with the new power supply. The Existing Hall metering will be retained.

The Café and Child Care Facilities shall have separate Private Kwh meters.

2.6 PRIVATE METERING

Private Power Monitoring Metering shall be installed on the nominated power sub-mains, switchboards as indicated on the Single Line Diagram and in accordance with the technical details with the Switchboard section of the Specification.

2.7 EARTHING

Supply and install a combined MEN earthing system for this installation as detailed in AS/NZS 3000.

The system shall be supplied and installed by the contractor and shall fully comply with the requirements of the Energy Australia, AS/NZS 3000.

Each electrode shall be protected by an aluminium alloy earth electrode connecting box flush with the finished ground level.

An engraved brass label shall be fixed to each electrode in an approved manner, the engraving reading: -

SAFETY ELECTRICAL EARTH (6.5mm high lettering)
DO NOT REMOVE

3 SWITCHBOARDS

3.1 INTERPRETATIONS

Proprietary assemblies: Low voltage switchgear and control gear assemblies available as a catalogue item, consisting of manufacturer's standard layouts and equipment.

Custom-built assemblies: Low voltage switchgear and control gear assemblies manufactured to order.

Rated currents: Rated currents are continuous uninterrupted current ratings within the assembly environment under in-service operating conditions.

TTA: Type tested assemblies.

NTTA: Non-type tested assemblies.

PTTA: Partially type tested assemblies.

3.2 DESIGN

LAYOUT

Position equipment to provide safe and easy access for operation and maintenance. Consider functional relationships between items of equipment in the laying out of equipment on the assembly. Clear Access of a minimum of 600mm shall be provided in front of all switchboards.

RATED CURRENT

Rated currents: Minimum continuous uninterrupted rated currents within the assembly environment, under in-service operating conditions.

FAULT LEVELS

Rated short-circuit currents: Maximum prospective symmetrical r.m.s. current values at rated operational voltage, at each assembly incoming supply terminal, excluding effects of current limiting devices.

Assembly short-circuit capacity characteristic: Rate main circuit supply and functional units as follows:

Back-up protective device not provided: Rated short-circuit current for 1 s.

Back-up protective device provided: Rated short-circuit current for the maximum opening time of the associated protective device.

Tested levels: Do not use equipment at fault levels higher than tested levels, unless provided with fault current limiting back-up protection.

3.3 PROPRIETARY ASSEMBLIES

MODIFICATIONS

Carry out to the original manufacturer's standards and methods of construction.

DOORS

Provide lockable doors with a circuit cardholder unless enclosed in cupboards.

3.4 CUSTOM-BUILT ASSEMBLIES

CONSTRUCTION

Provide rigid, ventilated, insect-screened enclosures consisting of panels, doors, or both, giving the designated enclosure, separation and degree of protection.

The enclosure shall have overall dimensions suitable for maintaining the statutory clearances in the space allocated.

TTAS AND PTTAS

Use construction methods verified by required tests to at least the nominated fault level and temperature-rise limits and internal arcing-fault containment and venting.

NTTAS

Fabricate from sheet metal of rigid folded and welded construction. Obtain approval for non-welded forms of construction.

LAYOUT

Compartments: Separate shipping sections, subsections, cable and busbar zones, functional unit modules and low voltage equipment compartments using vertical and horizontal steel partitions which suit the layout and form of separation.

Form 1 enclosure: Separate into compartments using partitions at 1.8 m maximum centres.

Equipment mounting heights above floor to the centre line of the equipment:

- Toggles and handles of circuit breakers, fused switch units and isolators:
 - Wall mounted assemblies: 500 - 900 mm.
 - Floor mounted assemblies: 200 - 1900 mm.
- Control switches, indicating lights, meters and instruments on doors:
 - Wall mounted assemblies: 1 - 1.7 m.
 - Floor mounted assemblies: 200 - 1800 mm.
- Push-button emergency switching devices: 800 - 1600 mm.

Equipment on doors: Set out in a logical manner in functional unit groups, so it is accessible without the use of tools or keys.

Autotransformers: Locate each motor starter transformer in a separate, ventilated compartment.

- Degree of protection: Minimum IP4X.

ENCLOSURES

Steel enclosures:

- General: Minimum 2.0 mm thick zinc-anneal sheet steel.
- Outdoor assemblies: Coating class Z450.

INSECT PROOFING

Cover ventilation openings using non-combustible and non-corroding 1 mm mesh.

EQUIPMENT MOUNTING PANELS

General: Strong enough to support the weight of mounted equipment. Construct using minimum 3 mm thick metal or non-metallic board with heavy metal angle supports or plates bolted or welded to enclosure sides.

Non-metallic boards: To AS 1795.1.

Front or rear accessible cable zones: 450 mm minimum width.

EQUIPMENT FIXING

Spacing: Provide sufficient thermal, mechanical and electrical clearance between equipment to ensure proper functioning. Provide 50 mm minimum clearance between:

- Busbars for lifts, fire services and building emergency services
- General installation services, busbars and equipment.

Mounting: Use bolts, set screws fitted into tapped holes in metal mounting panels, studs or proprietary attachment clips. Provide accessible equipment fixings which allow equipment changes after assembly commissioning.

Installation: For lightweight equipment, use combination rails and proprietary clips.

EARTH CONTINUITY

Effectively bond equipment and assembly cabinet metal frame to the protective earth conductor. Strip painted surfaces and coat with corrosion resistant material immediately before bolting to the earth bar. Provide serrated washers under bolt heads and nuts at painted, structural metal-to-metal joints.

LIFTING PROVISIONS

For assemblies with shipping dimensions exceeding 1.8 m high x 600 mm wide, provide fixings in the supporting structure and removable attachments for lifting.

SUPPORTING STRUCTURE

Provide concealed fixings or brackets to allow assemblies to be mounted and fixed in position without removing equipment.

WALL-MOUNTING

Reinforce at boltholes. For flush or semi-flush assemblies, provide angle trims of the same material and finish as the enclosure.

FLOOR-MOUNTING

Provide mild steel channel plinth, galvanized to class Z600, with toe-out profile, nominal 75 mm high x 40 mm wide x 6 mm thick, for mounting complete assemblies on site. Drill M12 clearance holes in assembly and channel and bolt assemblies to channel. Prime drilled holes using zinc rich organic binder to GPC-C-29/16.

CABLE ENTRIES

Provide cable entry facilities within assembly cable zones for incoming and outgoing power and control cabling. Provide sufficient clear space within each enclosure next to cable entries to allow incoming and outgoing cables and wiring to be neatly run and terminated, without undue bunching and sharp bends.

COVER AND GLAND PLATES

Gland plates: Provide removable gland plates fitted with gaskets to maintain the degree of protection.

Materials: 1.5 mm thick steel, 5 mm thick composite material or laminated phenolic. Use 6 mm thick brass for MIMS and single core cables and cable glands.

DOORS AND COVERS

WIDTH

Maximum: 750 mm.

DOOR SWING

At least 135°.

DOOR STAYS

General: Provide stays to outdoor assembly doors.

Adjacent doors: Space adjacent doors to allow both to open to 90° at the same time.

CONSTRUCTION

All doors shall be hinged and removable and shall be of folded construction, fabricated from minimum 1.6mm thickness zinc coated sheet steel, adequately stiffened by a "Top Hat Section" where necessary and with all corners welded and ground to a smooth square finish.

All gaskets for dust proofing shall be of an approved non-flammable material such as neoprene or equivalent and shall be retained in position by a channel section.

HANGING

Provide corrosion-resistant pintle hinges or integrally constructed hinges to support doors. For removable doors, provide staggered pin lengths to achieve progressive engagement as doors are fitted. Provide 3 hinges for doors higher than 1 m. Provide restraining devices and opposed hinges for non lift-off doors.

DOOR HARDWARE

Provide the following:

- Corrosion-resistant lever-type handles, operating a latching system with latching bar and guides strong enough to withstand explosive force resulting from fault conditions within the assembly.
- Dual, edge mounted, corrosion-resistant "T" handles with provision for key locking cylinder.
- Captive, corrosion-resistant knurled thumbscrews.

LOCKING

General: Incorporate cylinder locks in the latching system. Key alike.

Number of keys: 2 per assembly.

PROTECT OR SHROUD DOOR MOUNTED

Door mounted equipment and terminals to prevent inadvertent contact with live terminals, wiring, or both.

EARTHING

Maintain earth continuity to door mounted indicating or control equipment using multi-stranded, flexible earth wire, or braid of equal cross-sectional area, bonded to the door.

COVERS

Maximum dimensions: 750 mm wide and 1.2 m² surface area.

Fixing: Fix to frames using at least 4 fixings. Provide corrosion-resistant acorn nuts if the cover exceeds 600 mm in width. Rest cover edges on the cubicle body or on mullions. Do not use interlocked covers.

Handles: Provide corrosion-resistant "D" type handles.

ESCUTCHEONS

For doors enclosing circuit breakers, provide escutcheon plates as barriers between operating mechanisms and live parts.

ESCUTCHEON PLATES

General: Provide plates or removable covers with neat circuit breaker toggle cut-outs allowing inter-changeability of 1, 2 and 3 pole circuit breakers. Provide corrosion-resistant lifting handles or knobs. Provide unused circuit breaker toggle cut-outs with blanking in-fill pole covers.

Maximum dimensions: 750 mm wide and 1.2 m² surface area.

FACTORY FINISHES

Apply protective coatings to internal and external metal surfaces of assembly cabinets including covers, except to stainless steel, galvanized, electroplated, or anodized surfaces and to ventilation mesh covers.

FINISH COATS

Thermoset powder coating or two-pack liquid coating.

BUSBARS

GENERAL: Provide main circuit supply busbars within assemblies, extending from incoming supply terminals to the line side of protective equipment for outgoing functional units and for future functional units.

DEFINITIONS

Incoming busbars: Busbars connecting incoming terminals to line side terminals of main switches.

Main circuit supply busbars: Busbars connecting incoming functional unit terminals, or incoming busbars where no main switches are included, to outgoing functional unit terminals or outgoing functional unit tee-offs.

Tee-off busbars: Busbars connecting main busbars to incoming terminals of outgoing functional units.

MATERIAL

Hard-drawn high-conductivity electrolytic tough pitched copper alloy bars, designation 110.

TEMPERATURE RISE LIMITS - ACTIVE AND NEUTRAL CONDUCTORS

Maximum rated current temperature rise limits: 65 ± 1.5 °C by type test or calculation to AS 3768 or IEC 890.

Maximum short-circuit withstand current temperature rise limits: 160 °C by calculation to AS 3865.

CROSS SECTION

Rectangular with radiussed edges.

SUPPORTS

General: Sufficient to withstand thermal and magnetic stresses due to maximum prospective fault currents.

Material: Non-hygroscopic insulation capable of holding busbars at 105 °C.

PHASE SEQUENCE

For main busbars and connections to switching devices, setout phase sequence for phases A, B and C, from left-to-right, top-to-bottom and back-to-front when viewed from the front of the assembly.

COLOUR CODING

General: Provide 25 mm minimum width colour bands permanently applied to busbars at 500 mm maximum intervals with at least one colour band for each busbar section within each compartment.

Active busbars: Red, white and blue respectively for the A, B and C phase.

Neutral busbar: Black

MEN link: Green-yellow and black.

Protective earth busbar: Green-yellow.

Restrictions: Do not use adhesive type colour bands.

BUSBAR SYSTEMS

Use multi-pole proprietary busbar assemblies or busbar systems, which have been verified for short circuit capacity and temperature rise-limits by type tests.

CURRENT CARRYING CAPACITY

Active conductors: Take into account thermal stresses due to short circuit current, assuming magnetic material enclosures located indoors in well-ventilated rooms and 90°C final temperature.

Neutral conductors: Size to match incoming neutral conductor current carrying capacity.

Protective earth conductors: Size for at least 50% of the rated short circuit withstand current for 100% of the time duration.

TEE-OFF BUSBARS CURRENT RATING

For individual outgoing functional units: Equal to maximum frame size rating of the functional unit.

For multiple functional units: Equal to the diversity factors of AS 3439.1, based on frame size rating.

MEN LINKS

MEN links >10 mm dia. in section: Bolted removable busbar links stamped "MEN LINK", located outside the Supply Authorities metering cubicle and connected between neutral and earth busbars.

BUSBAR LINKS

For current transformers, provide removable busbar links <450mm long.

CABLE CONNECTION FLAGS

General: Provide and support busbar flags for equipment with main terminals too small for cable lugs. Use flags sized to suit cable lug termination, with current rating of at least the maximum equipment frame size.

Phase isolation: Provide phase isolation between flags where the minimum clearance distances phase-to-phase and phase-to-earth is below the component terminal spacing.

FUTURE EXTENSIONS

Pre-drill the main circuit supply busbar for future extensions and extend busbar droppers into future functional unit locations.

JOINTING

Use high tensile steel bolts, washers and nuts, with lock nuts or locking tabs. Do not use tapped holes and studs or the like for jointing current carrying sections. The joints shall be fully lapped.

3.5 SWITCH-ISOLATOR AND COMBINATION FUSE-SWITCH UNITS

TYPE: Poles: 3.

Rated current: To suit unit installed in enclosure.

RATED FAULT CAPACITY: Short circuit making capacity: At least the fault level at assembly incoming terminals.

Breaking capacity: At least the rated full load current.

Utilization category

Circuits consisting of motors or other highly inductive loads: At least AC-23.

Other circuits: At least AC-22.

RATED DUTY: Uninterrupted in non-ventilated enclosure.

OPERATION: Independent manual operation including positive "ON/OFF" indicator.

LOCKING: Provide for padlocking in the "OFF" position.

HANDLES: Removable only when switch is in open position.

CONSTRUCTION

GENERAL: With full and direct shrouding to fixed live parts of switches and fuses, so that insertion of a screwdriver does not cause faults between phases.

Shrouding: Effective over range of air break switch positions.

Contact position shall be clearly indicated whether cover is in place or not. For fuses mounted in withdraw able carriage ensuring isolation from supply before access to fuses is possible, secondary indication may be omitted.

FUSE-SWITCH UNITS

General: Provide an extended operating handle, at least 100 mm above the floor, which remains clear of other equipment over the range of positions.

Fuse links: Isolated when switch contacts are open. Provide 3 phase sets of high rupturing capacity (HRC) fuse links.

3.6 AIR CIRCUIT BREAKERS

TYPE: Open construction, withdraw able 3 pole, back connected, trip free.

RATED DUTY: Based on uninterrupted duty in a non-ventilated enclosure.

UTILIZATION CATEGORY: Type B for partial and full discrimination.

Rated service short-circuit breaking capacity
At least the fault level at incoming terminals of the assembly.

CLOSING OPERATION: Provide trip free closing mechanisms for operation, with positive mechanically operated "ON/OFF" indications.

OPENING OPERATION: Provide mechanically operated release for opening.

AUXILIARY SWITCH CONTACTS: Provide contacts with minimum rated operational current of 6 A at 240 V, 50 Hz. Provide at least one spare normally open and one spare normally closed contact. Provide shunt trip release coil circuits with an early-make/late-break series connected auxiliary contact.

PROTECTION SYSTEM: Integral to the circuit breaker, incorporating a solid-state protection relay.

COMPARTMENT: House each circuit breaker in a separated self-contained enclosed subsection module within the assembly.

LOCKING:
Provide for circuit breakers to be padlocked in the open position.

Interlocking Electrical: Interlock control circuitry of functional units using normally-opened and normally-closed auxiliary contacts.

MECHANICAL: Required on ATS's.

Coded key: Captive type with squared face key with alphabetical or numerical coded operating face.

DOOR INTERLOCK: Except for compartment doors serving only as covers, provide interlocks preventing compartment doors being open while circuit breakers are closed.

ABNORMAL OPERATIONS

Provide breakers, which cannot be used in the following operations:

- Slow closing or opening of contacts.
- Manual independent hand closure, if springs fail.
- Release of charged springs while contacts are closed.

WITHDRAW ABLE TYPE

Mounting: Mount circuit breaker on a withdraw able carriage with racking gear for racking in or withdrawing, and for positively fixing the unit into any of the 3 following positions:

- Connected.
- Test/isolated.
- Disconnected.

Auxiliary contacts: Use contacts which remain connected in the test/isolated position.

Interlocking: Provide interlocking which prevents circuit breaker being racked in or withdrawn unless it is in a tripped condition and prevents the circuit breaker being closed unless located in either the connected or test/isolated position. Provide stored energy devices which are automatically discharged by any racking operation.

Shutters: Provide automatic shutters, which can be padlocked, covering busbar and incoming/outgoing circuit connections and labelled "BUSBARS" and "CIRCUIT" respectively.

Earthing: Provide earthing connection between withdraw able carriage and assembly earth busbar which makes before, and breaks after, other contacts on the circuit breaker carriage.

MAINTENANCE: Provide for slow closing of the circuit breaker and for adjustment when disconnected.

3.7 MOULDED CASE AND MINIATURE CIRCUIT BREAKERS

MINIATURE CIRCUIT BREAKERS

For circuits rated at or less than 100A use miniature overcurrent circuit breakers.

FAULT LEVEL

Where the prospective fault level at the point of installation of miniature overcurrent circuit breakers (MOCBs) is greater than the short circuit capacity of the circuit breaker, the following methods of cascading protection shall be provided:

Where the current rating of the submain supplying the MOCBs is equal to or less than the maximum rating of a fault limiting circuit breaker capable of protecting the MOCBs against short circuit, the submain circuit breaker shall be of the fault limiting type and suitably rated.

Where the current rating of the submain supplying the MOCBs is greater than the maximum rating of a fault limiting circuit breaker capable of protecting the MOCBs against short circuit, the distribution board shall be segregated such that MCCBs rated greater than 100A if not rated for the prospective fault level, are protected by a fault limiting submain circuit breaker suitably rated and the MOCBs shall be protected by one or more fault limiting MCCBs within the distribution board.

MOUNTING

Mount circuit breakers so that the "ON/OFF" and current rating indications are clearly visible with covers or escutcheons in position. Align operating toggles of each circuit breaker in the same plane.

UTILISATION CATEGORY

Full discrimination: Type B.

ADJUSTABLE CURRENT SETTINGS

Settings must be visible for Supply Authority inspection.

If trip current adjustment control is exposed with covers in position, provide for sealing to prevent tampering.

Labels: Provide labels indicating trip settings.

TRIP SETTINGS

Adjustable short circuit trip settings: Set to *provide discrimination with other units*.

LOCKING

Provide for locking circuit breakers in the open position.

CLIP TRAY CHASSIS

For miniature overcurrent circuit breakers provide clip tray assemblies capable of accepting single, double, or triple circuit breakers, and related busbars. Provide moulded clip-on pole fillers for unused portions.

ACCESSORIES

Rotary handle: Provide "ON/OFF" indication, and override release to open door padlocking facility.

Motor operators: Provide selector switches, controls and indicators.

Auxiliary contacts: Minimum rating 5A.

3.8 NEUTRAL AND EARTH LINKS

TERMINALS: Provide terminals for future circuits.

LINKS

Assembly capacity >36 poles: Provide neutral and earth links at the top and bottom of the circuit breaker section.

Assembly capacity <36 poles: Provide links at the point of entry of incoming supply cables.

Mounting: Mount neutral links on an insulated base.

Control circuits: Provide separate neutral and earth links.

Labels: Provide labels for neutral and earth terminals.

Cables >10 mm²

Provide bolts or studs.

3.9 WIRING

CABLE TYPE

Provide 0.6/1 kV copper cables. Use V-90HT insulation where directly connected to active and neutral busbars.

CABLE INTERCONNECTIONS

General: For the main circuit supply, provide cable interconnections as follows:

- Use 1.5mm² (minimum) internal cables, with minimum V75 insulation rating with stranded copper conductors rated to AS 3008.1. Use cables with current ratings suitable for the internal assembly ambient air temperature and for temperature raise limits of equipment within the assembly.
- Run cables clear of busbars and metal edges.

Provide cables capable of withstanding maximum thermal and magnetic stresses associated with relevant fault level and duration.

Run cables neatly. Provide slotted trunking sized for future cables or tie at 150 mm maximum intervals using ties strong enough to withstand magnetic stresses created at the specified fault current. Do not use adhesive supports.

Ensure wiring for future equipment can be installed without removal of existing equipment.

Identify power and control cables at both ends using neat fitting ring type ferrules agreeing with record circuit diagrams. Mark to AS 1103.

Terminate control cables and motor control circuits in tunnel terminals or, if necessary, use suitable palm type lugs and correct crimp tool.

For equipment mounted on hinged doors run cables on the hinge side to avoid restricting the door opening. Bundle cables using spiral wrap PVC.

If recommended by device manufacturers, provide shielded wiring.

Adjacent circuit breakers: If suitable proprietary multi-pole busbar assemblies are available to link adjacent circuit breakers, do not use cable interconnections.

Cables > 6 mm²
Terminations:

- Tunnel terminals: Single cables.
- Other connection points or terminals: >2cables.

Doors: Do not run cables to hinged doors or removable panels.

Supports:

- Spacing at enclosure: >200mm from a termination.
- Spacing generally: >400mm.
- Strength: Capable of withstanding forces exerted during fault conditions.

Single core cables rated >300A: Do not use ferrous type metal cable saddies.

Marking: Terminate marked cables for connection to external controls in correspondingly marked terminals within the assembly.

Control and indication circuits

General: Provide conductors sized to suit the current carrying capacity of the particular circuit.

Minimum size: 1mm² with 32/0.2 stranding.

CABLE COLOURS

Colour code wiring as follows:

- A phase: Red.
- B phase: White.
- C phase: Blue.
- Neutral: Black.
- Earthing: Green-yellow.

3.10 TERMINATIONS

Sub-mains, light and power circuits

Connect direct to the circuit breaker terminals.

OTHER CIRCUITS

Connection to circuits <16 mm²: Provide DIN-type tunnel terminal blocks.

Connection to circuits >16 mm²: Provide stud-type terminals 35mm diameter, sized to continuously carry the load.

Cables > 70mm²: Stud type terminals, fixed to a DIN-type or G rail.

Tunnel terminals: Provide insulated sleeve ferrules to flexible cables terminated in tunnel terminals.

Identification: Identify cables at both ends using neat ring-type ferrules.

Type: Screw-tightened, clip-on, 35mm DIN-type, flexible, non-flammable and, as a minimum, suitable for the insertion of a screwdriver blade.

Shrouded terminations:

Form 2 separation: All connection shall be protected or insulated

- Degree of protection: IP2X minimum.

Form 3b separation: Cut and shaped polycarbonate solid sheet rigidly fixed into position, with cable cutouts to underside.

- Degree of protection: IP2X minimum.

Location: Locate terminals to provide ready access to outgoing terminations.

Mounting rails: Screw or rivet mounting rails to assembly at 500mm centres. Provide sufficient length to accept a further 20% terminals or 3 terminals, whichever is the greater.

Arrangement: Terminate internal wiring to one side of the terminal block, leaving the other side for outgoing circuits.

Grouping: Provide separate terminal groups for final sub-circuit and control wiring. Provide oversized barriers between each group of terminals having different voltages and terminal size.

Terminals for power wiring: 3 phases or single phase and neutral.

Control terminals: In alphabetical or numerical order of wire identification, with the lowest number or letter next to the power terminals.

Shipping breaks: Provide terminal blocks for interconnecting wiring on each side of shipping breaks.

3.11 CURRENT TRANSFORMERS (METERING)

TEST LINKS

Provide test links for connection of calibration instruments and meters and for shorting of current transformer secondaries. Provide energy meters, maximum demand meters, ammeters and protection relays, with sets of rail-mounted links consisting of screw-clamped slide links and an earth link.

TEST STUDS

For energy and demand meters provide rail-mounted potential test studs or plug connections next to associated current transformer links. Provide at least one set of test studs for each compartment.

ACCURACY CLASSIFICATION

Energy measurements: Class 0.5M.

Indicating instruments: Class 2M.

RATINGS

Rated short time current: At least the short time withstand current equivalent of the circuit in which the transformer is installed.

Rated primary current: At least equal to the current rating of the functional unit.

Secondary windings: Rated at 5 A, burden of 0.4 W (10 VA) with star point earthed.

TYPE

If practicable, use cast resin encapsulated window-type with busbar clamping devices. Otherwise use wound-primary type with mounting feet.

INSTALLATION

General: Install transformers to permit easy removal.

Removable links: Provide removable links of minimum lengths for transformers fitted on busbar systems.

3.12 INSTRUMENTS AND METERS

CONSTRUCTION

Indicating and recording instruments: Provide damped movements and impact resistant glass cover. Provide for external adjustment of the zero. Support moving elements of indicating instruments between shock resistant jewel bearings.

Transducers: Totally enclose in flame-retardant, rail-mounted moulded cases.

- Minimum degree of protection: IP52.

METER SCALES

Direct reading analogue type with black lettering on white background with black pointer, capable of indicating the maximum value of the measured variable.

TRANSDUCERS

If necessary for transducer operation, provide auxiliary supply. Connect outputs to dedicated rail-mounted isolating type terminals.

ACCURACY

Indicating instruments and accessories: Accuracy class 1.5 or lower class index number except Class 3 for thermal maximum demand indicators.

Electricity meters: Class 0.5.

Power factor meters, phase angle meters and synchrosopes: 2 electrical degrees maximum error.

Transducers: Class 0.5.

ACCESSORIES

General: Mount next to associated instruments, inside cabinets.

Power distribution assemblies: Provide meters of the same style and size, with bezel minimum 96 x 96 mm and 90°-quadrant scale.

Motor control assemblies: On motor starter modules, provide bezel 72 x 72 mm with 90°-quadrant scale.

MOUNTING

Flush mount meters on hinged panels. Wire with multi stranded flexible cables.

PROTECTION DEVICES

Meter potential protection devices: Group together behind associated meter cover or hinged door, preferably next to current transformer test links.

LABELS

If associated exclusively with one phase, label meters "RED", "WHITE", or "BLUE" as applicable.

AMMETERS

Type: Moving iron type oil dampened for motor starter circuits.

Overscale: For ammeters subject to motor starting currents, overscale to at least 5 x full load current.

Selector switches: 4-position type with positions designated "R/W/B/OFF". Mount under or next to relevant ammeters.

MAXIMUM DEMAND INDICATORS

General: Provide a meter in each phase with 15-minute response time. Provide for sealing the reset mechanism. Provide a combination 3 point indicator consisting of an instantaneous red ammeter pointer, a red maximum demand slave pointer with external reset facility, and a white maximum demand pointer.

Instantaneous type: Combined type with bi-metal maximum demand ammeter element and moving iron instantaneous ammeter element.

Thermal type: Combined type with bi-metal maximum demand ammeter element.

ACCURACY CLASS

Instantaneous: Class 1.5.

Maximum demand: Class 3.

VOLTMETERS

Type: Moving iron.

Selector switches: 7-position voltage transfer type for measurement of phase-to-phase and phase-to-neutral voltages with off. Mount under or next to relevant voltmeters.

WATTMETERS AND VARMETERS

Suitable for balanced 3 phases, 4 wire loads. Connect to measurement transducers.

Scale

Horizontal linear digits.

WATTHOUR METERS

Type: If metering is connected across 3 phases, use polyphase meters suitable for balanced 3 phases, 4 wire loads. Use single-phase meters for 2 or 1 phase metering only. Meters shall be capable of providing information to a BMCS for energy management.

Current rating: To suit load and overload conditions. Uses direct connect meters suitable for current range of 15 - 100A and meters with current transformers suitable to 5A secondary.

Register: Provide a direct reading register of the large figure type. Mark on the scale the metering transformer ratios and the multiplying factor applied to the meter constant.

Covers: Seal main covers.

Frequency meters

Type: Either an analogue type, or vibrating reed type with 7 reeds.

Analogue type: Graduated in 0.1 Hz increments.

Scales:

- Analogue: Graduated 45/65 Hz.
- Vibrating reed: Horizontal reed bar graduated 47/53 Hz.

SYNCHROSCOPES

General: Continuously rated, 360° scale, rotating vane type movement, with spring loaded

bearings and silicon fluid dampening, positive and negative arrows, black pointer and 12 o'clock marking.

PHASE ANGLE METERS

General: Provide for 3 phase, 4 wire balanced loads.

Scales: 0.5 leading to 0.5 lagging.

POWER MONITORS

Provide microprocessor based power monitors where shown on the drawings and/or schedules.

The monitors shall be capable of communicating with BMCS units and shall be suitable for displaying and transmitting selected data such as:

- voltage
- current (each phase)
- frequency
- kilowatts
- kilowatt demand (15 min. cycle)
- kilowatt hours
- kVA
- power factor

3.13 INDICATOR LIGHTS

Degree of protection

At least that of the assembly/operating face.

Incandescent indicators

Type: Incandescent oil tight type minimum 22mm diameter or 22 x 22mm.

Lamps: Changeable from front of panel without removing the holder.

Lamp rating: 1.2 - 5 W.

Neon indicators

240 V, 12mm diameter with in-built resistor.

LED indicators

12 or 24 V as necessary, in corrosion-resistant bezel, nominal 5mm diameter.

Press-to-test

Compartments/subsections with <5 indicating lights: Provide each indicating light with a fitted integral press-to-test lamp actuator.

Compartments/subsections with 35 indicating lights: Provide a common press-to-test lamp push-button.

3.14 PROTECTION RELAYS

GENERAL

Provide protection relays as shown on the drawings which provide for tripping in the event of relay operation, and for manually resetting. Provide operation indicators with a set of change over voltage free alarm contacts, for connection to an alarm circuit.

MOUNTING

Integral type: Readily accessible for viewing and adjustment with doors and covers in position.

External type: Flush.

3.15 CURRENT TRANSFORMERS (PROTECTION)

Type

Cast resin encapsulated window type with busbar clamping devices.

Rated short time current

At least the short time current equivalent to the assembly fault level.

Rated short-time

At least the maximum time setting of the related protective relay. Minimum 1 s.

Rated primary current

Equal to assigned current rating of the associated functional unit.

Rated secondary current

5A. Connect star point to earth.

Interposing transformers

As recommended by the protective relay manufacturer.

Characteristics

As recommended by the protective relay manufacturer.

Test links

Provide test terminals and current transformer secondary shorting links in accessible positions within instrument panels. Provide a set of DIN-type rail mounted test links, consisting of screw clamped slide links and earth links, for each current transformer group.

Installation

General: Install transformers to permit easy removal.

Removable links: Provide removable links of minimum lengths for transformers fitted on busbar systems.

Markings: Mount transformers in the assembly enclosure, so that polarity markings and nameplate details are readily viewed right side up without removing the transformers.

3.16 RESIDUAL CURRENT DEVICES

Integral type

General: Incorporate earth leakage in circuit breaker protection operation.

Mounting: Comply with Moulded case and miniature circuit breakers, in the Circuit breakers clauses.

Tripping

Residual current classification: Type II.

Maximum tripping current: 30 mA.

3.17 FUSES WITH ENCLOSED FUSE LINKS

General: Provide fuses suitable for the fault level at the assembly, and which discriminate with other protective equipment.

Let-through energy and peak cut-off current: To suit protected equipment.

Utilization category

Motor circuits: gG.

Back-up protection: gG.

Distribution/general purpose: gG.

Fuse-holders

Mount fuse-holders so that fuse carriers may be withdrawn directly towards the operator and away from live parts. Provide fixed insulation which shrouds live metal when the fuse carrier is withdrawn.

Unenclosed fuses

Provide barriers on both sides of each fuse link, preventing inadvertent electrical contact between phases by the insertion of screwdriver.

Fuse links

Type: Enclosed, high rupturing capacity type mounted in a fuse carrier. If necessary for safe removal and insertion of the fuse carrier, provide extraction handles. Mount on clips within the spares cabinet.

Identification: Clearly indicate Australian manufacturer or distributor.

Busbar mounted fuse holders

Provide fuse carriers with retaining clips, minimum fuse holder 32A.

Spares

Provide 3 spare fuse links for each rating of fuse link on each assembly. Mount spares on clips within the spares cabinet.

3.18 MARKING

General Labelling to comply with NSW Service and Installation Rules and AS3000.
Provide labels including control and circuit equipment ratings, functional units, notices for operational and maintenance personnel, incoming and outgoing circuit rating, sizes and origin of supply and kW ratings of motor starters.

Identifying labels

Provide labels fixed to access panels, doors, covers and escutcheon panels and internal equipment, indicating the relevant section and component. Traffolyte labels to be used.

Minimum lettering heights

Main assembly designation: 25mm.

Distribution assembly designations: 15mm.

Small proprietary distribution boards: 10mm.

Main switches: 10mm.

Outgoing functional units: 8mm.

Identifying labels (on outside of cabinet rear covers): 4mm.

Danger, warning and caution notices: 10mm for main heading, 5mm for remainder.

Other labels including equipment labels within cabinets: 3mm.

Label colours

Generally: Black lettering on white background.

Main switch and caution labels: Red lettering on white background.

Danger, warning labels: White lettering on red background.

Fixing

General: Fix labels securely.

Method: Select from the following:

- Screws and double-sided adhesive.
- Fixed in extruded aluminium sections fixed to panels using rivets or countersunk screws.

Aluminium labels: Use aluminium or monel rivets.

Restrictions: Do not use self-tapping or thread-cutting screws.

Set-out

Align horizontally and vertically with adjacent labels.

Labels on assembly exteriors

Manufacturer's name: Required.

Assemblies: Label with essential markings and on main switchboards identifies the

switchboard, the source and location of supply, fault level at the switchboard and the incoming cable size and type.

Designation labels: For other than main assemblies, provide designation label stating source of electrical supply. Identify separate sections of enclosures.

Assembly controls: Label controls and fault current limiters, including the following:

- Circuit designation for main switches, main controls and submains controls.
- Details of consumers' mains and submains.
- Incoming busbar or cable rating to first tee-off.
- Fuse link size.

Labels on assembly interiors

General: Provide labels for equipment within assemblies. Locate so that it is clear which equipment is referred to, and lettering is not obscured by equipment or wiring.

Moulded case circuit breakers: If circuit breaker manufacturer's markings are obscured by operating handle mechanisms or motor operators, provide additional markings open to view on or next to the circuit breaker.

Danger, warning and caution notices

Busbars: If polymer membrane coating is used without further insulation, provide warning notices on the front cover near the main switch or local main switch, and on rear covers, indicating that busbars are not insulated.

Externally controlled equipment: To prevent accidental contact with live parts, provide warning notices for equipment on assemblies not isolated by main switch or local main switch.

Stand-by power Provide warning notices stating that assemblies may be energised from the stand-by supply at any time.

Anti-condensation heaters: To prevent accidental switching off, provide caution notices for anti-condensation heaters.

Custom-built assemblies: For insulation or shrouding requiring removal during normal assembly maintenance, provide danger notices with appropriate wording for replacement of insulation shrouding before re-energising assemblies.

3.19 POSITIONING

Locate notices so that they can be readily seen, next to or, if impracticable, on busbar chamber covers of functional units, and behind the front cover of functional units. Provide circuit identification labels in the cabling chamber of each functional unit, located next to external terminations.

3.20 ASSEMBLY INSTALLATION

Before making inter-panel connections, fix assemblies and metering equipment enclosures into position, level and plumb.

3.21 ASSEMBLY ENTRIES

Cable entries

Neatly adapt one or more cable entry plates, if fitted, to accept incoming cable enclosure. Use the minimum number of entry plates to leave spare capacity for future cable entries. Do not run cables into the top of weatherproof assemblies.

Single core cables rated > 300 A: Pass separately through non-ferrous gland plates. Do not use metal saddles.

Cable enclosures

Continue cable enclosures to or into assemblies and fit cable entry plates so that the IP rating of the assembly and the fire rating of the cable are maintained.

Cable supports

Support or tie mains and submains cables within 200 mm of terminations. Provide cable supports suitable for stresses resulting from short circuit conditions.

4 DISTRIBUTION BOARDS

4.1 GENERAL

Distribution boards shall be proprietary for this project and shall be complete with all integral CTs, metering equipment, circuit breakers, switches, time switches and contactors.

All distribution boards 1500mm high or larger shall be floor-mounted type on a 75mm high-galvanised steel plinth.

The main switches shall be mounted between 1500 and 1800 mm AFFL.

Distribution boards shall contain a minimum of 25% spare capacity for future services. The number of poles indicated in the drawings and/or schedules shall apply to the number of circuit breaker poles required. Pole spaces for RCDs and other devices shall be added to the specified number of poles.

Locks on all switchboards shall be keyed alike.

Escutcheon plates shall be fitted with at least two handles.

A typewritten schedule and schedule holder is required at each switchboard. Submit prototype for approval.

The distribution switchboards shall be designed to fit within the appropriate riser distribution cupboards.

The contractor is to submit for approval shop drawings for all distribution switchboards.

A traffolyte label (12mm minimum black lettering on white background) is required on each distribution board detailing DB No., source of supply and incoming cable size, number of cores etc.

4.2 CIRCUIT SCHEDULE

For general light and power distribution boards, provide schedule cards of minimum size 200 x 150mm, with typewritten text showing the following as-installed information:

- Submain designation, rating and short-circuit protective device.
- Light and power circuit numbers and current ratings, cable sizes and type and areas supplied.

Mounting: Mount schedule cards in a holder fixed to the inside of the assembly or cupboard door, next to the distribution circuit switches. Protect with hard plastic transparent covers.

SINGLE-LINE DIAGRAMS

Custom-built assemblies: Provide single-line diagrams.

Format: Non-fading print, at least A3 size, shows the as-installed situation.

Mounting: Enclose in a non-reflective glazed metal frame and wall mount close to assembly.

5 WIRING SYSTEMS

Use the following systems:

- Cast concrete slabs: Unsheathed cable in heavy duty UPVC conduit.
- Accessible spaces: Thermoplastic insulated and sheathed cables.
- Concealed spaces: Unsheathed cable in UPVC conduit.
- Plant rooms: Unsheathed cable in heavy duty UPVC conduit.
- Plastered or rendered surfaces: Cable in UPVC conduit.
- Stud walls without bulk insulation: Thermoplastic insulated and sheathed cables.
- Stud walls with bulk insulation: Cable in UPVC conduit.
- Within false ceiling spaces: Sheathed cable supported by catenary.

5.1 INSTALLATION

Installation Methods Table

WALL CONSTRUCTION	INSTALLATION AND CONCEALED CABLING FACILITIES
Rendered masonry partition	Flush wall box - conduit chased into wall
Double sided face brick partition	Vertically mounted flush wall box with conduit concealed in cut bricks
Face brick external cavity wall	Flush wall box with thermoplastic insulated cables in conduit run in cavity and tied against inner brick surface, or thermoplastic sheathed cables run in cavity
Stud partition	Rewireable
Fire rated or acoustic STC50 walls	HPM Firebox 430 wall boxes or equal

NOTE THAT THE NEW LIBRARY IS BELOW GROUND WITH NO FALSE CEILING IN MOST CASES. CAST IN CONCRETE CONDUITS ARE REQUIRED FOR LIGHTING AND CEILING MOUNTED SERVICES IN MOST CASES. A RAISED FLOOR IS PROVIDED TO FACILITATE AIR CONDITIONING AND CABLE RETICULATION.

Single core cables

All single core cables shall be installed in trefoil formation and arranged to minimise the effects of electromagnetic interference.

Penetrations

Do not penetrate structural members without approval from the Project Manager. The services

above ceiling spaces should be arranged to minimise the number of penetrations through fire compartment walls. The contractor shall seal all penetrations in fire compartment structures to maintain the fire ratings properties of the wall, floor or slab.

Do not penetrate damp proof membrane.

In floor slabs run conduits entering a building at ground level under the waterproof membrane and vertically penetrate the membrane and the floor slab.

In roofs provide a suitable seal between the conduit and the roofing material.

Obtain approval for penetrations through existing structures.

Fit a UPVC sleeve for each penetration through ground floor slabs, ground floor beams and external walls for cables not enclosed in conduit. In addition, for MIMS cables fit a sleeve for each masonry penetration.

Provide a penetration of a diameter 10mm greater than the conduit or sleeve diameter for conduits and sleeves penetrating existing external walls, ground slab, or ground floor beams.

Seal penetrations around conduits and sleeves with a material or product sufficient to provide the necessary fire rating properties.

Fire Barriers

All Standby power cables that pass through a fire compartment or pass from one fire compartment into another shall be fire rated polymeric or MIMS cables. All fire compartments walls are indicated on the drawings.

Handling cables

Report damage to cable insulation, serving or sheathing.

Straight-through joints

Unless unavoidable due to length or difficult installation conditions, run cables without intermediate straight-through joints.

Cable joints

Where permitted, locate in accessible positions in junction boxes.

Extra-low voltage circuits

Individual wiring of extra-low voltage circuits: Tie together at regular intervals.

Conductor colours

For fixed wiring, use coloured conductor insulation. If this is not practicable, slide at least 150mm of close fitting coloured sleeving on to each conductor at the termination points.

Active conductors in single-phase circuits: Red.

Active conductors in polyphase circuits:

- A phase: Red.
- B phase: White.
- C phase: Blue.

Tagging

Identify multicore cables and trefoil groups at each end using stamped non-ferrous tags clipped around each cable or trefoil group.

5.2 POWER CABLES

Use multi-stranded copper cable generally, except for MIMS.

Minimum size:

- Lighting sub-circuits: 2.5mm².

Power sub-circuits: 2.5mm².

Sub-mains: 6mm².

UNSHEATHED

Use permanently fixed conduit enclosures assembled before installing wiring. Use draw wires to pull in conductor groups from outlet to outlet, or use ducts with removable covers. Joints are not permitted in ducts.

5.3 FIRE-RATED (OTHER THAN MIMS)

General

If exposed to mechanical damage, provide protection to Australian Standards AS3013.

6 TERMINATIONS

6.1 COPPER CONDUCTORS

General

Other than for small accessory and luminaire terminals, terminate copper conductors to equipment, using compression-type lugs of the correct size for the conductor. Compress using the correct tool or use soldering.

Within assemblies and equipment

General: Loom and tie together conductors from within the same cable or conduit from the terminal block to the point of cable sheath or conduit termination. Neatly bend each conductor to enter directly into the terminal tunnel or terminal stud section, allowing sufficient slack for easy disconnection and reconnection.

- Alternative: run cables in UPVC cable duct with fitted cover.

Provide durable numbered ferrules fitted to each core, and permanently marked with numbers, letters or both to suit the connection diagrams.

Identify spare cores and terminate into spare terminals, if available. Otherwise, neatly insulate and neatly bind the spare cores to the terminated cores.

7 WIRING ENCLOSURES AND CABLE SUPPORTS

7.1 CONDUITS

Minimum Sizes

Metallic and non-metallic conduits, 20mm.

Galvanized water pipes, 20mm nominal bore medium or heavy duty.

Rigid Conduits

Provide straight long runs, smooth and free from rags, burrs and sharp edges. Set conduits to minimise the number of fittings.

Galvanizing

Galvanize all mild steel wiring enclosures and support systems.

Inspection Fittings

Locate in accessible positions.

Draw Cords

Provide draw cords in conduits not in use. Leave 1m of cord coiled at each end of the run.

The cords shall be polypropylene cord.

Draw-in Boxes

Provide draw-in boxes at intervals not exceeding 30m in straight runs, and at changes of level or direction.

Underground draw-in boxes: Provide gasketed covers and seal against moisture.

7.2 EXPOSED CONDUITS

Set Out

Conduits exposed to view shall:

- Be installed in parallel runs with right angle changes of direction.
- Be erected to avoid formation of moisture traps.
- Be secured by spacer bar type saddles to provide a minimum of 3mm clearance from the fixing surface.

7.3 CONCEALED CONDUITS

Routes: Conduits concealed in wall chases, embedded in floor slabs or installed in inaccessible locations: Run directly between points of termination, minimising the number of sets. Do not use inspection fittings.

Conduits in concrete slabs

Route: Do not run in concrete toppings. Do not run within pre-tensioning cable zones; cross pre-tensioning cable zones at right angles. Route to avoid crossovers and minimise the number of conduits in any location. Space parallel conduits at least 50 mm apart.

Minimum cover shall be conduit diameter or 20mm.

Maximum conduit size shall be 25mm maximum diameter.

Fix directly to top of the bottom layer of reinforcing where the conduits pass above a single layer of reinforcing.

Prohibited floor slabs

Do not run conduits in the floor slabs of boiler rooms, plant rooms and tank rooms.

Hollow block floors

Locate conduits in the core-filled sections of precast hollow-block type floors.

Columns

Do not place more than four 25mm (maximum) diameter conduits centrally in each column.

Enter columns via bends with minimum radius of 150mm.

Do not chase columns.

METALLIC CONDUITS AND FITTINGS

Standard

Metallic conduits and fittings manufactured to Australian Standards.

Type

Galvanized screwed steel.

Corrosion protection

For steel conduits, paint ends and joint threads with zinc rich organic binder.

Expansion joints

Provide flexible couplings consisting of flexible conduits and fittings,

- At structural expansion joints; and
- In long straight runs if the ambient temperature varies by more than 40°C.

Maintain electrical conductivity between the two ends of rigid metallic conduit.

Provide conduit support saddles close to flexible couplings to permit free movement for expansion and contraction.

7.4 NON-METALLIC CONDUITS AND FITTINGS

Standard: Non-metallic conduits and fittings to Australian Standards.

Conduits in roof spaces

Locate below roof insulation and sarking. In accessible roof spaces, provide mechanical protection for light-duty conduits.

Conduit in slabs

Use high compression corrugated conduit and restrain at regular intervals to achieve a nominally straight run.

Category A conduit

For direct buried installations requiring the use of Category A conduit, use protective cover strips and corrugated conduit.

Flexible conduit

Use for equipment and plant subjected to vibration. If necessary, use for adjustment or ease of maintenance. Provide the minimum possible length.

Associated fittings

Use fittings of the same type and material as the conduit.

For special size wall boxes not available in UPVC, use prefabricated earthed metal boxes.

Inspection fittings

Use inspection-type fittings only in accessible locations and where exposed to view.

Joints

Use cemented or snap on joints.

If encased in concrete, do not use bellows type.

7.5 DUCTED WIRING ENCLOSURES

Standard: To Australian Standards.

Ducting

Provide purpose-made ducts, skirting ducts and floor ducts, incorporating segregation where used for multiple services, and rigidly supported. Round off sharp edges and provide PVC bushes for cable entries into metallic ducting.

Accessories

Provide purpose-made accessories and covers to match the duct system. Use screw-fixed covers, or clip-on covers removable only with the use of tools.

Except for horizontal runs where the covers are on top, support wiring using retaining clips at intervals of not more than 1 m.

7.6 CABLE SUPPORTS

System: Provide a complete cable support system consisting of trays, ladders or catenaries and including brackets, fixings and accessories. Fabricate brackets, racks and hangers using structural steel sections or other materials in sections of equivalent strength. Galvanize after manufacture.

Manufacture

Use proprietary trays, ladders and accessories from a single manufacturer in the same application.

Cable Trays

Materials:

Interior: Zinc-coated steel, or steel with two-pack liquid coating, air-drying enamel or stoving enamel finish.

Exterior: Hot dip galvanized steel.

Minimum steel thickness:

- Trays < 150mm wide: 1mm.
- Trays > 50mm, < 300mm wide: 1.2mm.
- Trays > 300mm wide: 1.6mm.

Perforations: To Admiralty pattern, reverse stamping.

Cable trays shall conform to the following:

- Be fitted with propriety standard fittings for all changes of direction and joints.
- Be located where access is readily accessible.
- Be fixed to steel brackets or hangers which provide sufficient air space for air circulation for heat dissipation.
- Be installed parallel or at right angles to the building structure or planning grid.
- Be sized to provide 20% spare space when the installation is completed.

Cable Ladder

Use 2 folded steel or extruded structural grade aluminium side rails with cable support rungs between the rails.

Steel ladders shall be galvanized.

Rung spacing shall be 300mm maximum.

Run cables less than 13mm diameter in cable trays or ducts.

Structural sections:

- Angles and bars: 6.5mm minimum thickness.
- Rods: 10mm minimum diameter.

The ladders shall be suitable for loads of 120kg/m with supports at 3 metre intervals for ladders up to 300mm wide and for ladders greater than 300mm wide they shall be suitable for loads of 180 kg/m with supports at 3 metres.

Supports for cable ladders shall be designed for a safety factor of 2:1 and be spaced to coordinate with the building structure and other services.

Catenary Systems

Where catenary wires are used to support cables in false ceiling spaces they shall:

Comprise stranded galvanized steel or stainless steel wire (minimum 7 strand).

Be provided with means of adjusting the tension on the wire.

Be securely fixed to the building structure.

Have cables strapped to the wire at intervals not greater than 600mm.

Be provided with intermediate supports for lengths exceeding 10 metres.

Not be used to support more than eight $2C+E$ 2.5 mm^2 or the equivalent.

Fixing to building structure

Fix supports to the building structure or fabric using direct fixing, hangers or brackets.

Spacing

Space supports at maximum intervals of 1.5m for trays and 3m for ladders.

Access

Provide a minimum of 150mm free space above and 600mm free space on one side of trays and ladders.

Cable fixing

Provide slats or rails suitable for fixing cable ties, strapping or saddles.

Bend radius

Provide bends with a minimum inside radius of 12 times the outside diameter of the largest

diameter cable carried.

Cable protection

Provide rounded support surfaces under cables where they leave trays or ladders.

Cable strapping

Use steel straps on MIMS cables.

Minimum clearances

From hot water pipes shall be 200mm.

From boilers or furnaces shall be 500mm.

7.7 UNDERGROUND SERVICES

Cables in Trenches

Sand bed and surround

Provide clean sharp sand around cables and conduits installed underground.

Sealing ducts and conduits

Seal buried entries to ducts and conduits using waterproof seals. Seal spare ducts and conduits immediately after installation. Seal other ducts and conduits after cable installation.

Cable Pits

General

Sizes given for pits are internal dimensions.

Proprietary cable pits

For pits < 1.2 x 1.2m, provide proprietary concrete or polymer moulded pits.

In site construction

For pits > 1.2 x 1.2m, select from the following:

- Proprietary cable pits.
- Construct walls and bottoms using rendered brickwork or 75mm thick reinforced concrete. Incorporate a waterproofing agent in the render or concrete.

Pit covers

Provide pit covers to suit expected loads. Fit flush with the top of the pit.

Covers to Australian Standards.

Maximum weight shall be 40kg for any section of the cover.

Lifting handles to be provided each size of cover section.

Drainage

Provide drainage from the bottom of cable pits, either to absorption trenches filled with rubble or to the stormwater drainage system.

The minimum size for absorption trenches is 300 x 300 x 2000mm.

Underground Cable Routes

Survey

Accurately record the routes of underground cables before backfilling.

Location marking

Accurately mark the location of underground cables using route markers consisting of a marker plate set flush in a concrete base.

Place markers at each joint, route junction, change of direction, termination and building entry point and in straight runs at intervals of not more than 100m.

Concrete bases shall be 200mm diameter x 200mm deep, minimum.

Show the direction of the cable run using direction arrows on the marker plate. Indicate distance to the next marker.

Plates shall be brass, minimum size 75 x 75 x 1mm thick.

Fix with waterproof adhesive and 4 brass or stainless steel countersunk screws.

Set the marker plate flush with paved surfaces, and 25mm above other surfaces.

Marker tape

Where electric bricks or covers are not provided over underground wiring, provide a 150mm wide yellow or orange marker tape bearing the words "WARNING - electric cable buried below", laid in the trench 150mm below ground level.

Trenches

Existing surfaces

Before excavating trenches, saw-cut existing concrete and bituminous surfaces on each side of the trench to provide a straight even joint. Lift and store unit paving for later reinstatement.

Excavation

If practicable, make trenches straight between pits, personnel access ways, junctions and changes in cable route, with vertical sides and uniform grades.

If excavated material cannot be used for filling or backfilling, remove it from the site.

Trench widths

Keep trench widths to the minimum consistent with the laying and bedding of services, and the construction of personnel access ways and pits.

Trench depths

If excavation is necessary below the level of adjacent footings, seek approval, and provide necessary support for the footings.

Obstructions

Clear trenches of sharp projections. Cut back roots to at least 600mm clear of services. Remove other obstructions including stumps and boulders, which interfere with services or bedding. If rock is encountered, give notice.

Dewatering

Keep trenches free of water. Place bedding material, services and backfilling on firm ground free of surface water.

Excess Excavation

If trench excavation exceeds the correct depth, reinstate to the correct depth and bearing value using compacted bedding material or grade N20 concrete.

Backfilling

Backfill trenches as soon as possible after approval of laid and bedded service. Place the backfill in layers < 150mm thick and compact to the density which applies to the location of the trenches to minimize settlement, and so that pipes are buttressed by the trench walls.

Provide underground marking tape: To AS/NZS 2648.1.

Backfill Material

Under roads and paved areas provide coarse sand, controlled low strength material or fine crushed rock.

In topsoil areas complete the backfilling with topsoil for at least the top 50mm.

In reactive clay sites classified M, H or E to AS 2870.1, use an impervious material if trenches fall towards footings.

Elsewhere provide well-graded, inorganic, non-perishable material, maximum size 75mm, and plasticity index <55%. Do not place stones greater than 25mm within 150mm of services.

Boring

If required by statutory authorities, provide under road boring, carried out by a suitably qualified person, in lieu of trenches. Ensure a tight fit to the service conduits. If voids are encountered, fill by pressure grouting.

Reinstatement

Lawn areas

Provide 150mm of loam and reseed the lawn over the trench and other disturbed areas.

Paving and roads

Reinstate to match adjacent work, paved surfaces and assets disturbed or removed during excavation of trenching.

Concrete surfaces

Reinstate concrete surfaces to the original level. If necessary, provide steel reinforcement keyed to the adjacent concrete and laid to prevent the reinstalled concrete from subsiding and cracking.

Bituminous surfaces

Provide crushed rock base and sub base to match the existing pavement. Prime coat the edges of the existing surfacing with bitumen. Lay and compact hot-mix asphalt so that the edges are flush and the centre is cambered 10 mm above the existing pavement. If hot pre-mix is not available, cold pre-mix may be accepted.

Minimum asphalt thickness: 50mm or the adjacent pavement thickness, whichever is thicker.

Unit paving

Provide sand bedding and, if necessary, compacted crushed rock base. Reinstate the paving units.

8 ACCESSORIES

8.1 LIGHTING AND SOCKET OUTLET SWITCHES

Minimum rating
10A, 240V a.c.

Mechanism
Construct the faceplate and mechanism so that the mechanism cannot be displaced during normal operation, using retaining screws.

Indicators
Provide red indicators above switch toggles, to be visible with switches "on".

8.2 GENERAL PURPOSE OUTLETS

Pin arrangement
Mount outlets with the earth pins at the 6 o'clock position.

Mounting on fire rated and acoustic walls
On fire rated and acoustic STC50 walls use HPM Firebox 430 wall boxes. On STC45 walls, provided outlets are not back-to-back and are separated by at least one metre no special mounting is required. If closer than one metre then use firebox 430 wall boxes.

8.3 THREE PHASE OUTLETS

Minimum rating
10A, 500V a.c.

Pin arrangement
Five round pins mounted with earth pins at the 6 o'clock position, neutral pins in the centre, and the red, white and blue phases in a clockwise sequence when viewed from the front of the outlet.

Plug
Provide a matching plug top for each outlet.

Construction
Surface mounted type of high-impact resistant plastic, with flap lid on the outlet.

8.4 LIGHTING OUTLETS

Pin arrangement
Standard outlets, 3 flat pin with looping terminal.

Emergency lighting outlets, 4 flat pin if self-contained emergency lighting is to be connected.

Performance lighting outlets – 3 phase 32A, 5 pin.

8.5 INSTALLATION

General

Provide flush mounted accessories except in plant rooms.

Surface mounting

Use proprietary mounting blocks.

Restricted location

Do not install wall boxes across junctions of wall finishes.

Marking

Label isolating switches and outlets to identify circuit origin.

8.6 COLOUR CODING

Outlets and accessories associated with the works shall be colour coded in the following manner.

- i) Light Switches: - White plate with white rocker
- ii) GPOs: - White plate with white rocker
- iii) Cleaners GPOs: - White colour with white rocker
- iv) AV points - White with special label indicating "AV only"
- v) RJ45 Outlets - White colour

Outlets and accessories shall be as above unless otherwise stated on the finishes schedule.

8.7 MARKING IDENTIFICATION

Circuit numbers have been provided on the drawings for all special power outlets and known fixed equipment loads.

For all other normal power outlets, a required number of circuits is scheduled on the drawings and the contractor is free to allocate the outlets to these circuits to best suit his cabling layout. However in order to ensure adequate spare capacity for future expansion, the number of circuits allocated in the schedules is the minimum required to be installed and the power outlets shall be evenly distributed over this number of circuits.

Complete details of the circuit allocations shall be provided on the As Built drawings.

All GPO switches and power outlets shall be suitably labelled to indicate circuit reference and distribution board reference (e.g. CB12, DB2.3 defines circuit breaker 12 on distribution board No 3 on Level 2).

All GPOs and Light Switches shall have traffolyte labels. Provide details & samples prior to installation and order.

9 UNINTERRUPTABLE POWER SUPPLY

9.1 SCOPE OF WORKS

The supply of the UPS shall be by Others, however the installation forms part of this contract. The UPS is to support the four power circuits forming part of the communication Equipment Racks.

10 PUBLIC ANNOUNCEMENT (PA)

10.1 SCOPE OF WORKS

Supply and Install a standard library PA system for general announcements. The system shall include a desk mounted Microphone complete with isolate switch.

Amplifier: 250watt Audiotelex ACM250.
Desk Microphone: AMX526
Speaker: Audiotelex QF8 Quickfix speaker with special concrete mounting.

EWIS grade speaker units suitable for recessing into concrete soffit ceiling shall be installed in the positions as indicated on the drawings.

The amp is to be mounted below desk and have at least two inputs with variable volume and tone controls for the outputs.

11 LUMINAIRES

11.1 SCHEDULE OF LUMINAIRES

Luminaires required are listed on the Legend Sheet and shall be installed complete with incandescent lamps, fluorescent lamps, metal halide lamps, control gear and accessories necessary for their proper functioning and shall be in accordance with the provisions specified herein.

11.2 SUPPLY OF LUMINAIRES

The catalogue numbers of trade designations used in the Schedule of Luminaires are not intended to indicate a preference for that particular make, but merely to indicate the quality, style and performance of luminaires required.

The luminaires stated, shall be allowed for by the Contractor. Any alternative offers of luminaires shall be clearly indicated in the tender together with the price variation that would result.

Samples of all luminaires specified shall be submitted to the Project Manager for permission to use prior to commencement of manufacture or the placement of orders.

11.3 INSTALLATION OF LUMINAIRES - GENERALLY

All screw, battens, roses, noggins, trims, packing, etc., necessary for the proper fixing of luminaires, shall be provided by the Subcontractor as part of the works, whether individually specified or not. Packing pieces shall be fitted where required to level the luminaires and to prevent distortion.

In rooms with only one (1) luminaire, the luminaire shall be centrally placed wherever possible for even illumination.

Where painted surfaces are damaged, they shall be made good. Such repairs shall be of the same standard as the original paintwork subject to approval.

All luminaires shall be effectively earthed.

Generally, fluorescent luminaires shall be securely fixed to structural members of the ceilings or walls, or fixed by hangers, brackets or the like which are themselves securely fixed to building members.

Where a building member does not exist in the position required, the Subcontractor shall supply and install a suitable fixing. Metal sections provided in suspended ceilings shall not be smaller than the main framing of the suspended ceiling.

The minimum size of fixings for luminaires, hangers or brackets for various surfaces shall be as follows: -

- | | |
|-------------------------|---|
| Fixing to concrete | - approved screw expanding bolts. |
| Fixing to hollow blocks | - at deep cast junction boxes with 4.5 mm dia. Metal screws at the centre of the luminaires, with approved expanding fixings at each end. |

All fixings shall be corrosive resistant hot dipped galvanised or equal.

The following additional provisions apply to fluorescent luminaires or any other luminaires of the same configuration:

Luminaires shall be supported by two fixings at each end, although one fixing at each end will be accepted where additional support is provided by a centrally positioned junction box.

End to end luminaires shall be correctly aligned using packing strips where necessary.

Luminaires shall not be used for illumination during construction. Internal low brightness troffer luminaires shall be sealed with plastic wrapping to prevent dust entering the fitting which shall be removed as directed by the Subcontractor prior to Completion.

11.4 WIRING OF FLUORESCENT LUMINAIRES IN SUSPENDED CEILINGS

The contractor shall supply and install a loom wiring type system to reticulate sub-circuit wiring to luminaires.

The loom shall consist of a 4 wire system being in TPS wiring as follows:

- Active
- Switchwire
- Earth
- Neutral

The contractor shall terminate the four wire system to a 4 pin plug base but only wire each fitting in a 3 core flexible cable and plug.

The active would remain as spare for use on 24 hour lights, emergency lighting or for lighting control.

11.5 LUMINAIRE TYPES

Recessed Low Energy Low Brightness Luminaires

The chassis for the clip in louvre assembly will be supported by two (2) flip-out brackets or equivalent at each end of the chassis which will clamp-on to the main ceiling infill panel or forming channel support. It shall be the Subcontractors responsibility to obtain all details of the ceiling system and to design the light fitting to be easily installed into and removed from the respective ceilings.

Construction

The luminaires shall comprise a fully recessed, low brightness, low energy, two tube, 36 watt triphosphor fluorescent fittings as indicated on the drawings.

All major components used in the fittings shall be of first quality and in accordance with AS 3137 – "Luminaires".

The use of self-tapping screws is strictly prohibited.

Workmanship is to be of the highest quality throughout and all components, fittings and accessories are to be strictly in accordance with the SAA Wiring Rules, the SAA Approvals

and all other relevant Australian Standards.

Brackets

Fixed mounting brackets to suit the ceiling system are to be provided. Two (2) brackets at each end of the fitting are required and each bracket is to be provided with clamping or 'locking-on' facility to the 'T'-rail support. This provision will prevent movement of the chassis when louvres are installed (both initially and following relamping). A similar clamping facility shall be provided for plasterboard ceiling installation.

Louvre Assembly Support

The louvre assemblies are to be supported via a clip arrangement at each end of the luminaire. Louvres, when removed, are to be suspended from the chassis via support wires, chains, etc. These supports must also allow for disengaging of the louvre assembly, if required, with the luminaire installed.

Clipping the reflector units into the fitting bodies shall incorporate the following:-

Positive action

- At least four (4) clips or holding points per louvre assembly
- Allow some horizontal movement of the louvre assembly after it has been clipped into the body.
- Not liable to wear with frequent use
- Robust construction
- Not visible from below
- Allows easy installation and removal of the louvre assembly
- Not liable to cause damage to the louvre system

Dimensional Restrictions

The length and width dimension are to be 1200 x 300 mm and be suitable for the ceiling type. The overall height of the luminaire shall not exceed 150 mm when measured from the underside of the T-bar or plasterboard ceiling.

Noise in Fittings

Installed luminaires which are noisy when operating due to control gear, fixings or metal/metal contact will be rejected until repaired.

Additionally noise from luminaires when switched ON/OFF should be minimised, otherwise luminaires will again be rejected.

Louvre Assembly

A ten cell louvre assembly with parabolic sides and cross louvres is to be provided.

The construction of the louvred reflector units is to be such as to permit ease of removal in one piece (to facilitate relamping and replacement), without undue distortion.

Curves in reflectors are to be accurate, smooth and as free as practicable from fluting due to pressing, rolling or other means of forming. The main louvre cross louvres shall not be flashed by the lamp when viewed below the shielding angle.

The finished reflectors shall not exhibit any prismatic effects (ie. "rainbowing" of the light being reflected) when used with the lamps specified.

Wiring

The wiring, earthing and cabling entry hole shall be in accordance with the rules.

Each luminaire shall be provided with a minimum of 2 m length flex and a three, flat pin plug.

Lamps

The fittings shall be supplied complete with 36W, 26mm dia. Triphosphor fluorescent lamps of colour temperature 4000K, colour rendering index greater than 85 and suitable for switch start operation. Lamps shall be equal to Phillips TLD 84 Series.

Working Drawings, Samples and Testing

Tenderers shall submit, with their tenders, louvre assemblies and photometric data to demonstrate that their offer complies with this specification.

Delivery and Packaging

The light fittings shall be delivered packed in substantial corrugated cardboard cartons of sufficient strength to prevent damage during normal delivery, site handling and storage. Cartons shall be clearly marked with the fitting type and identification numbers. The bodies, louvres and lamps shall be packed in separate individual cartons suitable for storage on site.

The bodies and louvre assemblies shall be individually wrapped in plastic within their separate cartons.

The wrapping of the louvre assembly shall be designed to remain in place after the louvres are installed and shall be further designed for easy removal immediately prior to occupation of the building.

Guarantees

In addition, ballasts operating in fitting in ambient from temperatures up to 35°C and at supply voltages up to 240 volt + 6% shall be guaranteed against an epidemic of failures for an additional three (3) years. An epidemic of failures is considered to occur if the casual failure rate in any one manufactured batch exceeds 0.5%, following which all the ballasts in this Contract from that batch shall be replaced without cost to the Client. Each different batch of ballasts shall be distinctively marked for identification.

11.6 COMPACT FLUORESCENT DOWNLIGHTS

Compact fluorescent fittings shall be supplied and installed in locations as shown on plans.

These fittings shall be provided with silver reflectors and 1.5 m of flex with plug where recessed.

Control gear is to be separately supported from the building structure.

11.7 FLUORESCENT BALLASTS

Magnetic Ballasts: Ballasts are to be "low-loss" lagging type, rated for 240V, 50Hz operation, with a maximum hot losses of 5.5W for 18W or 36W tubes with a ballasts factor of 1.0. The ballasts are to be suitable for switch start operation of fluorescent tubes and are to comply wherever applicable with AS 2643 and AS 3169. Ballasts are to be designed to supply uncorrected line current of 430mA (max).

All ballasts shall be fitted with terminal strips and be selected and fitted in such a way as to reduce "hum" to a minimum.

Each ballasts shall have a ready means of identification of the batch in which it was manufactured and also be clearly marked with other identification and rating details.

Dimmable/Controllable and Electronic Ballasts

Where controllable or dimmable ballasts are specified, the ballasts shall comply with the following:

Be controlled by a 1 to 10V dc control signal in accordance with AS 3963 (EN60929)

Provide smooth dimming in both directions, between 5% and 100% light output (10% and 100% for any TC-DEL and TC-TEL lamps).

Start at any dimmed level without pulsing or flashing. Ballasts that give a lighting pulse to start at any level shall not be acceptable.

Maintain a power factor of no less than 0.8 at all dimmed levels.

Be approved by the lighting control system supplier as suitable to work with the control system being installed.

Comply with all relevant Australian Standards.

Capacitors

Fittings are to be fitted with capacitors to give power factor correction of 0.9 lagging minimum. They shall be of metallised polypropylene solid dielectric type.

Tenderers shall ensure that the ratings of the capacitors will give the required power factor correction, at rated voltage, with the fitting operating at 35°C room ambient temperature and all manufacturing tolerances taken into account.

Capacitors are to be rated for operating at the end of the fitting and be rated for a minimum temperature of 85°C. Capacitors shall be accordance with AS 2644.

Fluorescent Lampholders

Lampholders shall be suitably rated 'unbreakable' plastic of medium bi-pin locking type. Terminals shall be spring loaded type, suitable to accept single core cable. Fixing of the lampholder to the metal work via 'snap-in' lugs into pre-punched holes will be accepted except for the low energy brightness fittings.

Preference will be given to lampholders which hold the lamps in position (when the fittings are installed) when the lamps are not turned to the locking position.

Lampholders shall be specifically designed to suit 26 mm dia. Fluorescent lamps.

Starters

Each luminaire is to be fitted with glow switch starter capable of reliability starting 26 mm lamps and to be fitted with a terminal cut-out to disconnect the starter if successive attempts to strike the lamp fail. The starter should be similar or equal to the WOTAN DEOS starter.

11.8 DIMMABLE BALLASTS

The Contractor shall supply and install dimmers and dimmer controls as indicated in the drawings. Each dimmer shall be sized to suit its lighting load.

Dimmers shall be located within the electrical cupboards or located in accessible false ceiling spaces.

Dimmers and dimmer control shall be compatible with each other. Pot type dimming is acceptable.

Dimmers shall be suitable for operation with permanently connected incandescent or fluorescent lamps.

As far as possible, all dimmers shall be of the same design and manufacture with maximum feasible interchange ability of components.

For incandescent loads each dimmer shall be a self-contained unit regulation of lighting load to be by thyristor control and protected by approved MCB's or MRC fuse.

For fluorescent loads each dimmer channel shall provide a switched output for power together with associated 0-10V-control signal to provide full range of dimming 100% to 10%.

Dimmers may be hard wired or plug connected, provided all specified requirements are satisfied.

Each dimmer shall be rated to carry full tungsten lamp in rush current and to operate continuously at any level. There shall be no restriction to the addition of load to a partially loaded dimmer provided the total does not exceed the rated capacity of the dimmer channel.

Ensure the heat from the units is controlled to manufacturers recommendations. Provide adequate space and ventilation for cooling and maintenance.

11.9 LAMPS

Fluorescent and Incandescent Lamps

Unless otherwise indicated, fluorescent lamps shall comprise straight fluorescent tubes of standard lengths, with bi-pin connection, switch start and be 26 mm diameter, triphosphor lamps with a colour temperature of 4000K and a colour rendering index greater than 85. Lamps shall be equal to Philips TLD4 or equal series.

PL or PLC fluorescent lamps shall be or equal to Phillips or Osram and shall have a colour temperature of 4000K. Unless specified otherwise.

Extra Low Voltage Lamps

All Extra Low Voltage Lamps shall be of GE Precise or Osram IRC manufacture or equal.

Metal Halide Lamps

All fittings with Metal Halide fittings shall be fitted with Phillips CDM 35W, 70W and 150W lamps or equal and shall have a colour temperature of 3000°K.

The Subcontractor shall replace all lamps which have inconsistency in colour.

Lamps to be used in the same area shall be of the same manufacturing batch to avoid major

colour distribution.

11.10 LIGHTING SWITCHES

Lighting switches shall be of a suitable manufacture and rating and be in compliance with AS 3133. Light switches shall comply with the following requirements:

Unless otherwise indicated, light switches shall be of the flush type, fixed in wall boxes to suit the installation, located as indicated on the drawings.

Unless otherwise indicated, switch plates for switches other than metal, shall be impact resistant plastic reinforced of selected colour and finish.

Iron clad switches shall have the toggle fully recessed or protected by shrouds.

All switches shall be equipped with mechanisms of minimum of 15A rated capacity.

Light switches installed adjacent to the door openings shall be installed on the lock side of the door. Flush mounted wall switches shall be located vertically in a horizontal or vertical wall box with a maximum of three switches in a single gang box and six switches in a two gang box.

Adjacent switches, connected to different phases, shall be separated by a fixed partition in the wall box.

Wall boxes installed in face block work shall be located so that the centre line of the box coincides with the horizontal centre line of the row of blocks nearest to the specified height for the box. Plastic wall boxes shall be of the deep pattern type only and shall be securely fixed directly to the block work.

Alternatively, wall boxes may be installed vertically if indicated specifically on the drawings.

Wall boxes having sliding-type lugs for attaching flush plates, will not be accepted. Switches and wall boxes must not be installed across the junction between different wall finishes.

The method to be adopted for installing lighting switches and wall boxes is shown in the following table. The mounting heights for switches shall be at the height shown in the table, unless otherwise indicated on the drawings.

LOCATION OF WALL CONSTRUCTION	INSTALLATION REQUIREMENTS	MOUNTING HEIGHT ABOVE FLOOR LEVEL TO TOP OF WALL BOX
Rendered blockwork partition	Flush wall box-conduit chased into wall - only if solid blockwork	Approx. 1.10 metres
Face blockwork partition	In hollow block cavity	1.10 meters from floor to bottom of switchplate
Face blockwork internal cavity wall	Flush wall box - conduit run in cavity and tied against inner block surface	Approx. 1.10 metres
Internal Dry Wall	Flush wall box - conduit run in cavity	Approx. 1.10 metres

11.11 MULTI-GANG SWITCH PANELS

The contractor shall supply and install flush stainless steel switch panels where indicated on the drawings.

The panels shall be stainless steel 1.6 mm thick construction vertical grain.

The contractor shall supply all the necessities such as correct size wall boxes, etc. for the proper installation of the relevant panels.

11.12 PHOTO-ELECTRIC CELLS

The contractor shall supply and install an external weatherproof photo-electric cell to the location indicated on the drawings for connection to the lighting control.

The photocell shall operate in the "photo resistive" mode with electronic control and adjustable level.

The exact location of the cell shall be determined on-site.

12 EXIT AND EMERGENCY LIGHTING

12.1 SCOPE OF WORKS

Emergency and Exit lighting shall be provided throughout all areas including lobbies, corridors, fire stairs in accordance with AS2293 and BCA.

The style and type of emergency fittings will be selected to suit the area in which it is located. Architects input will be required to finalise selection.

Supply and install all Emergency and Emergency Exit Lighting luminaires as shown on the drawings. NOTE that some fittings shall be custom installed to form part of the suspended tube fittings.

Emergency luminaires shall be Non Maintained & Sustained type, self-contained purpose made single point units installed to convert fluorescent luminaires into emergency types.

The Emergency luminaires shall be connected to the adjacent lighting circuit and be connected via a test switch located in each respective house electrical distribution board. The system shall be wired to allow the units to be centrally tested without disruption to the normal lighting circuits.

Emergency Exit luminaires shall be maintained type single point units with exit legend and direction arrows where shown on the drawings.

The Exit and Emergency lighting shall be equal to Stanilite.

The existing building has existing fittings that shall be made good and reused in where indicated on the drawings.

12.2 SINGLE POINT SYSTEMS

EMERGENCY POWER SUPPLY: To AS 2298.

BATTERY: Indelibly stamp each battery with its date of manufacture. Provide the manufacturer's warranty on the battery life with the luminaire operating under normal conditions at an ambient temperature of 25°C.

BATTERY CHARGER: Two-rate, constant, current, constant voltage, temperature compensated type with automatically selected boost and float charging rates.
Visual indicator light: To AS 1431. 2, coloured red.

TESTING FACILITIES: To AS 2293. 1. Provide a test switch on each luminaire.
All new and existing boards forming part of the refurbishment shall be complete with a new manual Emergency Lighting test switch.

ISOLATING SWITCH: To AS 2293. 1. Provide an isolating switch on each luminaire and maintain the switch in the open position during construction until mains supply is permanently connected.

INVERTER SYSTEM: Protect the inverter system against damage whilst in operation in the event of failure, removal or replacement of a lamp.

13 COMMUNICATIONS

13.1 SCOPE OF WORKS

The Contractor shall provide communications cabling as indicated on the drawings including:

- Equipment Racks
- Voice Backbone cabling (copper)
- Optical Fibre Link Cabling
- Conduits only for future fibre optic backbone

The Telstra drawings indicate that the existing incoming Telstra cables reticulate into the existing Library Building. This connection shall be made redundant by the installation of a new lead service from Pittwater Road.

13.2 APPROVED INSTALLERS

The installation and commissioning of the communications system is a specialised function which should only be performed by companies and personnel who have an established record in this area.

The Project Manager shall consider application from installers who submit a detailed schedule of experience, in the particular system to be installed and reference sites utilising the system.

The installer shall hold either an existing relevant Austel/ACA license or be suitably registered with an approved registrar. All supervision, terminations, testing and commissioning shall be undertaken by an individual with the relevant license or registration. The CVs of the relevant staff shall be included in the tender return.

13.3 APPROVED MANUFACTURER OF SYSTEM EQUIPMENT

The following manufacturers have been approved for the supply of equipment for the installation. Other manufacturers may be considered but the tender should include only components from the manufacturers below. Alternatives will be considered separately. Preference will be given to tenders that offer a complete solution from a single manufacturer. All components are to be UL(Underwriter's Laboratories) verified for compliance with the relevant standard.

Panduit

Others are subject to approval.

13.4 SYSTEM PERFORMANCE REQUIREMENT

The system is to be fully compliant with the following:

Category 6 RJ45 system
Power Sum compliant as defined by AS 3080
use on 350 mhz applications.
A recognised proprietary Category 6 system

The system must be tested, verified, and certified as meeting this requirement. Documentary evidence shall be returned prior to final payment being made.

The system must be tested for full LINK compliance including performance requirements for Class D including Power Sum NEXT, Power Sum ACR and Power Sum ELFEXT.

The completed communications system will be required to support at least the following:

IEEE 802.3 10 BaseT Ethernet @ 10Mbps.

100BaseT Ethernet @100Mbps.

1000BaseT Ethernet @1000Mbps

RS232 Asynchronous Communications @19.2Kbps.

ISDN (Microlink).

Digital PABX System Integrated Handsets

Analogue Voice Telephony.

Apple Talk LAN.

ISO 9314 FDDI at 100Mbps.

Asynchronous Transfer Mode @155Mbps.

Video Conferencing.

13.5 INSTALLATION

Compliance

The installation shall comply with the ACA requirements, AS 3080 and as detailed within.

The installation shall comply with the requirements of the manufacturer of ALL equipment.

If a cable is damaged during installation, including the sheath, the entire length shall be replaced.

Cable Management

Panduit Vertical Management System shall be used.

A complete cable management system is to be provided. In particular, conduits and cable trays are to be provided for cable reticulation and cables are to be supported independent of the structural supports at all times.

Cable trays, suitable metallic ducts or other approved cable support system are to be used in all vertical risers and horizontal areas for the support of backbone cabling.

For final outlet reticulation in the ceiling space catenary wires may be proposed, then a maximum of twenty-four (24) UTP cables may be supported on one catenary. Support the cable at a maximum of 300mm using wide, reusable, cable ties. Ratchet cable ties, which are pulled tight on the cables, are not permitted.

Where catenary wires are used cable trays shall be used in horizontal areas serving greater than twenty-four (24) UTP cables.

Alternatively for the reticulation to the final outlet point openable bags or purpose constructed proprietary J hooks may be used. Cables shall be supported at least every 1200 mm with no individual hook supporting more than as shown in the following table. No more than 408 four pair UTP cables shall be supported by a single openable bag. The sag in the cables between J hooks or openable bags shall be no more than 300mm.

Hook Diameter	No. four pair UTP cables supported
From 19mm to 32mm	12
From 33mm to 49mm	48
Greater than 50mm	72

To provide an organised patching facility in the telecommunications racks, vertical and horizontal cable rings will be used to route patch leads around the front of the patch panels. The Contractor shall supply one rack unit of horizontal cable management for each rack unit of patching.

The spacers between the equipment racks will be used for mounting vertical cable rings and cable mesh. The vertical ring supports the patch leads and provides adequate room for storing slack in the patch leads.

Strain relief bars mounted on the rear of each patch panel are to be used for supporting cables terminating on the rear of all patch panels.

Manufacturer published cable bending radii are to be observed at all times, kinks and tight bends will not be accepted. The bending radii of UTP cable shall be limited to four times the

diameter of the cable. The bending radii of fibre optic cable shall be limited to ten times the diameter of the cable or 30 mm, whichever is largest.

Segregation: Segregation shall be maintained between telecommunications cabling and power cabling. The following methods are acceptable methods to avoid interference.

Maintaining physical separation between parallel cables. The cables shall be separated as given in the table below.

SEPARATION BETWEEN POWER AND TELECOMMUNICATIONS INCLUDING TELECOMMUNICATION EARTHING CABLES

Circuit Rating (kVA)	Unshielded Power Cables (mm)	Shielded Power Cables (mm)
< = 5	300	25
> < = 2	450	50
>2 < = 5	600	150
>5	1500	300

Using shielding of the cables. The cables shall be separated by an earthed metal barrier enclosing either or both sets of cables and maintaining total isolation between the cables. The barrier shall be earthed at only one point to minimise transient currents.

Skirting Duct is acceptable where an earthed metallic barrier separates the local circuit power and communications conductors and the maximum length of parallel run is 10m.

13.6 TELECOMMUNICATIONS CABINETS/RACKS

EQUIPMENT CABINETS/RACKS

Supply and install equipment cabinets equal to the following:

Position	Type	Internal RU	Depth (mm)	Quantity
As indicated on drawings	19"	45	855	2

Manufacturer: MFB

Frame: Fixed frame
Front Door: No Door
Rear Door: No Door
Side Walls: Nil
Ventilation: Nil
Shelves: Perforated steel capable of holding 20 kg safely and adequately. No greater than 2RU on face mount.
Council Rack - 4 fixed removable
Library 3 fixed removable & 3 Pull out shelves (one for keyboard.)

Nuts & Bolts: Cage nuts x 50 and bolts x 50
Cable Entry: From top & bottom of rack. Provide cable management to the sides.
Power Outlets: 2 x 10 Single GPOs per rack ; mounted vertically down the rack
Colour: Beige, with black frame

13.7 CROSS CONNECT PANELS

Main Distribution Frame

The main distribution for voice services shall be constructed from the approved displacement connection frame type and is used to terminate incoming copper cables, tie cables to voice cross connects and tie cables to PABX/telephone systems. The frame will consist of one or more verticals mounted adjacent to each other. All verticals to be of equal height.

The location of the incoming cables is the bottom left hand corner and working upwards with overflow onto adjacent verticals.

The Contractor shall include for jumpering of all cables.

Cross Connect Panels for Voice Services

The cross connect panels for the voice services is to consist of approved termination panels of the selected patching system. The panels shall be installed in the 19" racks/cabinets. cross connect panels shall be connected to the main distribution frame using Cat 3 tie cables.

Cross Connect Panels for Data Services

The cross connect panels for the voice services is to consist of approved termination panels of the selected patching system. The panels shall be installed in the 19" racks/cabinets.

13.8 PATCH LEADS

Patch Leads for Telephones and Data Services shall be provided by the Council.

13.9 FLY LEADS

Fly Leads for Telephones and Computers shall be provided by the Council.

13.10 PIN OUT ASSIGNMENT

Communications Outlets: The pin out assignment is to be in accordance with AS3080 clause 9.2.5. Pair assignment is to be implemented with AS3080 Appendix G Table G.3 Voice services are to have an allowance for one (1) pair each per 8-way modular socket

Cross Connect Panels: Outlet cables are to be terminated on frames working sequentially from left to right top to bottom. Where double outlets are installed (nominally outlets A and B for the purpose of explanation), they are to be terminated next to each other with the A outlet cable on the left of the B outlet, as illustrated below.

If multiple outlets or consolidation points are used then the designation will be (A, B, C).

13.11 PROTECTIVE EARTH

Standard

To ACA Customer Premises Cabling Manual and AS 3000.

Requirements

Install an protective earthing distribution system exclusive to the communication system.
Maximum Earth Resistance 10Ω to the mass of earth.

Bonding

Bond the earthing system to the building power supply earth using 6mm² (minimum) multistrand green/yellow PVC insulated copper cable.

Accessibility

The electrode/earth cable connection is to be accessible for maintenance, inspection and testing purposes.

13.12 TELECOMMUNICATIONS REFERENCE CONDUCTOR

A telecommunications reference conductor (TRC) is to be installed in accordance with the ACA requirements in accordance with TS 009.

The TRC is to be extended to each telecommunications closet, interconnect panel, and equipment room.

13.13 ROUTE LENGTH

The maximum length of any run of twisted pair cable from the patch panel to the final outlet is ninety metres (90 m).

The maximum work area subsystem cable, (flylead) is ten metres (10 m).

13.14 LABELLING

The entire system shall be labelled to an approved scheme. The numbering of outlets shall be provided by the Project Manager.

Telecommunication Cabinets

Cabinets are to identified by the following methods:

- a. Engraving the exterior exposed frame
- b. Traffolyte label fixed to the exposed frame.

Patch Panels & Communications Outlets

Patch panels and communications outlets are to be labelled with paper inserts into proprietary plastic covers integral to the patch panel or communications outlet. The outlet labels shall be printed using a laser printer. Hand written labels will not be accepted.

Cable Supports

Cable trays and catenary wires shall be clearly labelled at 5 m intervals, with TELECOMMUNICATION CABLES, engraved on a traffolyte label 125mm x 20mm and fixed with ratchet type cable ties.

Cables

All cables must be numbered and clearly marked at both ends and at any penetration through structural walls using one of the following techniques:

1. Metal tag with numbers stamped into the surface and secured with a metal band.
2. Adhesive label.

13.15 ACCESSORIES

Supply and fit backmounts (including those required for Telstra use) non - isolating termination modules for subscriber cables and jumper rings.

13.16 PASSIVE FIBRE OPTIC PATCH PANEL SCHEDULE

Design brief: Multimode with all cores terminated on Duplex ST connectors
12 ports per RU. Confirm with PRINCIPAL types of fibre optic connectors before installation.

Note: All fibre optic patch panels are to be fitted with SC through adapters.

All fibre optic patch panels are to be completely populated with through adapters.

All unused ports shall be covered with protective caps.

Allowance shall be made in the tender proposal to provide these protective caps.

Quantities of Passive Fibre Optic Patch Panel for the respective Communications rooms in the various zones shall be Configured based on the quantity of outlets required in the respective zone.

Provide layouts of Communications cabinets on "Work Shop" Drawings before installation. Installation will only be commenced After gaining approval for the proposed layouts.

Make allowances for 30% spare capacity for future outlets in each Communications cabinets.

13.17 FIBRE OPTIC BREAKOUT (SPLICE) TRAY SCHEDULE

Design brief: Multimode with all cores terminated on Duplex SC connectors
24 ports per RU
Recessed Type

Note: All fibre optic breakout (splice) trays are to be fitted with SC through Adapters.

All fibre optic breakout (splice) trays are to be completely populated with through adapters.

All unused ports shall be covered with protective caps.

Quantities of Fibre Optic Breakout Trays for the respective Communications rooms in the various zones shall be Configured based on the quantity and type of cores reticulated to the respective Communications cabinets.

Provide layouts of Communications cabinets on "Work Shop" Drawings before installation. Installation will only be commenced After gaining approval for the proposed layouts.

Make allowances for 30% spare capacity for future outlets in each Communications room.

13.18 TESTING

Electrical or Optical tests shall be carried out on cables used for the distribution of Voice, Data, Text, Image and Video services. These tests are to be carried out following the termination and labelling of the cabling.

Horizontal UTP Cabling

The following checks are to be undertaken by the installer on every pair of every cable. The test results are to be for the LINK as defined by AS3080. The minimum acceptable results are defined in AS3080 and the performance as defined in section 0 - 13.4 SYSTEM PERFORMANCE REQUIREMENT.

Signal to Noise Ratio (SNR)
Near End Cross Talk (NEXT)
Attenuation
Noise
Cable Route Length
Continuity
Pin Assignment
Power Sum

The testing instrument is to be EIA, TSB 67 Level II compliant, and calibration is required before use.

Telecommunications Reference Conductor (TRC)

The TRC shall be tested for the following:

- Resistance from the CD/MDF to ground
- Resistance from the FD's/IDF's to ground
- Resistance from the specified number of LD/FDP to the BD/MDF

Copies of all test results are to be retained and provided to the Project Manager on completion. The test results shall be provided on a magnetic media in format readable by standard personal computers and as printed documents.

A copy of the test results shall also be included in the "As Installed" manuals for future reference.

The Project Manager is to be notified 5 days prior to the commencement of testing and test results are to be provided in full prior to commissioning the system.

Insufficient notice or failure to notify may result in the Project Manager requiring the tests to be repeated.

The Project Manager will perform a live working test on a sample of installed cabling before acceptance. This is to take the form of data transfer via selected computer systems.

Fibre Optic Cabling

- 100% Insertion Loss (light source and power meter) testing of all terminated fibres shall be performed in both directions at 850nm for multi mode cables and 1310nm for single mode cables.
- OTDR tests shall be performed at high wavelength, if the distance is greater than 500m at 1310nm for multi mode cables and greater than 1000m at 1550nm for single mode cables.
- Optical loss covers the total loss between two corresponding optical ports and must include allowances for losses due to fibre, connectors, passive optical components, splices and any margin for maintenance. This loss shall not exceed 5dB.
- The optical fibre link shall meet Optical Class Link performance testing as specified in AS 3080 - 1996.
- Copies of all test results are to be retained and provided to the Principal on Handover Milestone of the project. The test results shall be provided on a magnetic media in format readable by standard personal computers and as printed documents.

A copy of the test results shall also be included in the "As Installed" manuals for future reference, in accordance with the Contract conditions.

13.19 RECORDS

The following records shall be kept on site; and written in a hard cover bound book designed for the purpose.

Main Equipment Room/Primary Node

A cabling schematic showing the overall system and the physical location of every intermediate cross connection and telecommunications closet. This shall include size of all backbone cables and labelled to match the physical labels used

The drawings referred to are to be at A3 size, laminated, and attached to the wall adjacent to the patch level.

A cable/patch record book detailing all incoming and outgoing cables and interconnections. All entries in the cable/patch record book shall be made in pencil.

All Telecommunications Closets/Secondary Nodes

A cable/patch record book detailing all incoming and outgoing cables and interconnections. All entries in the cable/patch record book shall be made in pencil.

Cabling schematic diagram for the area supplied from the Telecommunications Closet/Secondary Nodes showing the location and designation of each outlet.

13.20 COMMISSIONING

The complete system is to be finally commissioning with all power equipment operational and at an operating transmission rate of 1000 Mbps for UTP cables.

In the event of the failure of the system to meet the specification, then the installing contractor is required to rectify all faults immediately.

All arrangements for testing shall be the responsibility of the contractor. The contractor shall provide all necessary personnel and equipment for the commissioning. Authorities having jurisdiction shall have the right to check any aspect of the work, using equipment other than those provided by the contractor.

The contractor shall supply commissioning and preliminary test figures to the Project Manager not less than seven (7) days before acceptance tests are scheduled to commence.

13.21 PERFORMANCE GUARANTEES

The installing contractor is required to certify that the system is complete and operating satisfactorily to meet the requirements of the systems defined in this specification. The installing contractor is required to guarantee the performance of the system as installed for a minimum of five (5) years. The guarantee is to cover materials and workmanship.

In the event of failure of any part of the originally installed system, the installing contractor is required to rectify the fault within 24 hours at no cost to the client.

13.22 OPERATIONAL MAINTENANCE

Provide twelve (12) months operational maintenance commencing from the date of final acceptance of the commissioning tests for the complete system.

13.23 TOOLS

Provide two (2) spare sets of specialist installation tools to be located in the communication rooms and/or cupboards.

13.24 STANDARDS

The following standards are referenced in this specification and apply to this project.

AS 1768	Lightning Protection
AS 2834	Computer Accommodation
AS 3000	AS Wiring Rules, Electrical - Buildings, structures and premises.
AS 3015	1993 Extra Low Voltage D.C. Power Supplies within Public Telecommunications Networks

AS 3080	2000	Integrated communications cabling systems for commercial premises
AS 3548		Electromagnetic interference - Limits and methods of measurement of information technology equipment
AS 3594 (ISO 8877)		Information Processing Systems – Interface Connector and Contact Assignments for ISDN basic interface located at reference points S & T.
AS 9000 Series		Quality Systems
Code of Practice		Issued by Telecom and ESAA for Earth Potential Rise
CPCM		ACA Customer Premises Cabling Manual
IEEE 802.3		Ethernet
IEEE 802.5		Token Ring
TS 001 – 011		ACA Technical Specifications

This specification has been compiled based on AS 3080 and we acknowledge that some sections and tables have been reproduced for clarity, to ensure that there is no ambiguity.

14 MATV

14.1 GENERAL

The library may have an existing MATV. In any case allow for a new antenna on the existing library building with cabling back to the new library in the positions marked on the drawings.

14.2 SCOPE OF WORKS

Supply and install a MATV system comprising free to air reception throughout the new complex as shown on the drawings. The system shall consist of a new MATV UHF / VHF antenna located on the new building and cabled to the new AV head end.

14.3 STANDARDS

REFERENCED DOCUMENTS:

The following standards shall apply to this section of the works.

AS 1367	Multiple outlet distribution systems - Sound and vision
AS 1417	Rules for antennas for the reception of radio and television broadcasting For the range 30 to 1000 MHz Part 1 - Construction and installation
IEC 96-3	Radio Frequency Cables Part 3 General requirements and tests for single-unit coaxial cables for use in cabled distribution systems

14.4 SAMPLES

Submit a sample of each of the following:

- Outlets
- Antenna

14.5 LOCAL BROADCAST RECEPTION

The MATV antenna system shall receive all local broadcast television signals without ghosting interference or electrical noise.

The MATV antenna system shall receive the following local broadcast radio and television signals

- Channels SBS , 31, ABC, 7, 9 & 10.

14.6 MATV HEADEND

The head-end will be provided by a separate contractor and located in the AV room in the new building. All cabling shall be wired back to this location.

14.7 CABLES AND OUTLETS

Cables and outlets shall be supplied and installed in this contract.

Cable Type	-	Coaxial RG6 and RG11
Outlets	-	Coaxial.

14.8 TESTING AND COMMISSIONING

Carry out tests required by regulatory authorities and tests necessary to demonstrate compliance with the performance and other requirements of this design brief, in the presence of the Principal and, where applicable from the relevant authority.

Provide the equipment, apparatus and materials necessary to perform the tests, including field strength meter and portable TV receiver.

Correct the system, and replace components without extra cost, as necessary to achieve compliance.

Integrity of all backbone cables shall be fully tested after termination by the Contractor using a time domain reflectometer. A printout of the result for each cable shall be made. Records shall be bound in the technical manual and presented to the Principal at the Handover Milestone.

Signal levels for all channels at each node, shall be checked against design brief and plotted using a spectrum analyser with a plotter output. Records shall be bound in the technical manual specified above.

Picture Quality tests shall be carried out at a sample 20% of the MDP's, randomly selected by the Principal.

CCIR Recommendation 500 - One shall be used to categorise picture quality as follows:

- Imperceptible impairment to any single parameter

- Perceptible, not annoying impairment to any single parameter
- Slightly annoying impairment to any single parameter
- Annoying impairment to any single parameter
- Very annoying impairment to any single parameter

Outlets:

At each designated outlet, measure and record:

- The signal's strength and the carrier-to-noise ratio of each nominated service:
- The inter-modulation between services: and
- Isolation between outlets.

Amplifiers:

Measure and record carrier-to-noise ratio at head amplifier and distribution amplifiers.

15 SECURITY SYSTEM

15.1 SCOPE OF WORKS

This section of the specification covers the, supply, installation and commissioning of a multi-zone electronic security system with passive infra-red detectors, key pads, reed switches for doors, etc., as indicated on the drawings.

The whole security (intruder alarm) system shall comply fully with the requirements of the Local Authority, AS 2201 and as directed.

The existing Security system in the existing building shall be retained and modified to suit the campus wide Pittwater Council Card Access System.

The system shall monitor and provide notification of Smoke Alarms. On the receipt of a smoke alarm relevant access controlled doors shall disarm and allow free egress from the building.

Battery systems that support the unlocking of secured doors shall be installed and tested to satisfy the Building Code of Australia.

On a general power failure, a fail safe arrangement on the internal secured side of the door to facilitate egress shall be provided.

15.2 SECURITY CONTROL PANEL (SCP)

The Security Control Panel (SCP) shall be capable in acceptable inputs form all door reed switches, detectors and all devices indicated on the drawings.

The control panel shall have capacity to handle all alarms indicated and specified herein with a minimum of 20% spare alarm sectors, including all necessary hardware control circuits.

The control panel shall constantly poll all input wiring. End of line modules shall be provided on all sectors and shall be input on a time or event initiated basis.

The control panel shall be complete with a self-contained battery backed power supply. Batteries shall be sealed lead-acid (or approved equivalent) and shall back-up the control panel for minimum two (2) hours full operation during a power failure.

Batteries shall recharge automatically on restoration of power. A low battery cut-out shall be incorporated to prevent batteries discharging below the recommendation level.

The control panel shall be provided with a keypad based control of access to the panel control functions. The keypad shall permit only one operator access at any given time and shall be laid in a logical manner.

The Security Control Panel shall be interfaced with the lighting control system. The interface shall operate so that the lights are switched on when an alarm occurs.

15.3 PASSIVE INFRE-RED DETECTORS (PIR)

Passive Infra-Red Detectors (PIR) shall be supplied and installed where indicated on the drawings.

The detectors shall be dual technology types using passive infrared and microwave detectors, and alarming only if both sensors are activated.

Detectors shall be so positioned that they will only detect movement on excess of one (1) metre by a person within the areas to be protected.

Detectors within the building shall not be affected by movement external to the building.

Detectors shall be:

- Wired and connected to the control panel as individual sectors.
- Fitted with a tamper alarm circuit such that interference with the detector cover if removal of the detector will energise an alarm at any time.
- Contained an active encrypted end-of-line module to enable the circuit to be monitored.
- Installed in accordance with the manufacturer's recommended requirements.

Wiring to all detectors shall be in minimum 20mm diameter UPVC conduits concealed within the building structures.

15.4 MAGNETIC REED SWITCH

Magnetic reed switches shall be provided on all doors indicated on the drawings.

Wherever possible, reed switches shall be located flush in the head of the doorframe.

Contacts shall be installed to operate when the door is opened a minimum of thirty (30) mm. Both leaves of double doors shall be provided with reed switches on each leaf.

Magnetic reed switches for the automatic doors shall be provided to suit the operation of the doors and exact locations shall be co-ordinated with the supplier of the automatic doors.

15.5 CENTRAL STATION MONITORING

The whole security system as described herein and above shall be monitored by an approved external Central monitoring Station.

All necessary facilities shall be included in the control panel for the connection to the external Central monitoring Station via the telephone cabling network.

Pay all charges required for the provision of the connection to the Central Monitoring Station and monitoring by the Central Monitoring Station for twelve (12) months from the day of Practical Completion.

15.6 KEYPADS

Keypads shall be provided.

All keypads shall be flush mounted type and where located inside the building, shall be weatherproof.

Internal keypads shall be twenty (20) key backlit keypad and backlit LCD display allow the user to easily perform user operations, review system activity and programme options.

15.7 ELECTRIC LOCKS

The drawings indicate where electric locks are required. These shall be either Electric Strike, Magnetic lock or interfaced to automatic door controllers. The details of these shall be as per the Architectural Documents.

15.8 CARD ENTRY DEVICES

Supply and Install Card Entry Devices to match the existing Pittwater Council Security System. The card readers shall be vandal resistant, tamper proof and have LED indication of card acceptance.

Provide additional 20 access cards.

15.9 PROGRAMMING OF SYSTEM

The contractor shall provide all necessary programming of individual doors and controls to suit the operating periods of the departments.

In the event of a power failure all doors are to 'fail safe', i.e. unlock.

Detail access programming on of existing individual card holders shall be carried out by the Principal. Guidance and training is required under this contract. The System shall be such that individual doors will have individual time accessed and access permits for nominated card holders.

APPENDIX A

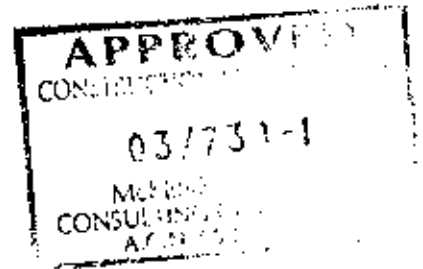
TENDER SCHEDULES

Complete the Schedule by inserting under LUMP SUM AMOUNT the tendered Lump Sum for the items of work.

ITEM NO	ITEM DESCRIPTION	LUMP SUM AMOUNT
1.	Enabling Works Electrical	\$
2.	Enabling Works Communications (Telstra)	\$
3.	New External Lighting Works	\$
4.	Supply Authority Costs	\$
5.	Consumer Mains	\$
6.	Sub-Mains	\$
6.	Main Switchboard	\$
7.	Distribution Boards	\$
8.	Earthing Systems	\$
9.	UPSs installation	\$
10.	GPO's, Power outlets and points	\$
	Subtotal	\$

ITEM NO	ITEM DESCRIPTION	LUMP SUM AMOUNT
11.	Lighting Supply	\$
12.	Lighting installation	\$
13.	Exit & Emergency Lighting	\$
14.	Relocation of existing External Lights and Power	\$
15.	PA SYSTEM	\$
16.	Skirting Ducting	\$
17.	Communications	\$
18.	Security	\$
19.	MATV	\$
20.	Drawings	\$
21.	Testing & Commissioning	\$
22.	As Built Drawings and Manuals	\$
23.	Items not listed above (provide details)	\$
	Sub Total	\$
	GST	\$
	Grand Total	\$

X



**Architectural &
Structural
Specification**

VILLAGE PARK REDEVELOPMENT MONA VALE
Tender Number T01/3



brewsterhorth Architects

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ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

VILLAGE PARK REDEVELOPMENT MONA VALE

Project Manager

Architect

Brewster Hjorth Architects

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VILLAGE PARK REDEVELOPMENT MONA VALE

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Section 2	Schedule of Documents	2.1 -	2.6
Section 3	General Requirements	3.1 -	3.22
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Section 5	Document Submissions	5.1 -	5.4
Section 6	Adhesives, sealants and fasteners	6.1 -	6.4
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VILLAGE PARK REDEVELOPMENT MONA VALE

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Tendering

T1

VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects

February 2003

20151 SP100A

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

VILLAGE PARK REDEVELOPMENT MONA VALE

T1 CONDITIONS OF TENDERING

T1.1 GENERAL

Status

These conditions of tendering will not form part of the contract.

The *Tender Schedules* shall be incorporated into the *Tendered Schedules* Subsection of the *General Requirements* Section of the Specification.

Definition

In these conditions of tendering, the word "principal" has the same meaning as "proprietor".

"The Superintendent" has the same meaning as "the Architect". The Superintendent is a person or corporation appointed by the Proprietor to carry out specific or general functions as nominated.

T1.2 PROJECT INFORMATION

Outline description of the works

The project includes but is not limited to the demolition of the existing building and external works, the refurbishment of existing library, and the construction of a new library building and external works, to house Mona Vale Library, Early Childhood Centre and Council Customer Service Centre. The works will also include refurbishment of the interface of the existing hall (to be retained) with the new works.

Description of the site

Location: Mona Vale Village Park, bounded by Park Street and Pittwater Road, and comprising of Lot 7089, DP759007, R1001139 and Lot 7104, DP93805, R10001148.

Tender documents

The tender documents comprise the following:

- These conditions of tendering (T1)
- *Tender Schedules* (T2).
- *Conditions of contract* (including general conditions, special conditions and completed annexures to contract) as included in the Architectural and Structural Specification.
- Specifications.
- Drawings.

For a detailed list of specifications and drawings refer the *Schedule of Documents* section of the specification.

Site information

The following documents are supplied for information only:

- Geotechnical report; prepared by Douglas Partners, March 2002
- Summary of Ground Water Observations; between 25 February 2002 and 27 February 2003.
- Survey drawings, prepared by Steve Davey and Associates and, Sutter and Associates

These documents are not a complete description of conditions existing or below ground level. These documents could be incorrect.

The contractor shall make their own assessment of the effect that conditions below ground level including likely fluctuations in ground water levels may have on the works.

VILLAGE PARK REDEVELOPMENT MONA VALE

These documents will not be included as Contract Documents.

Accuracy: Any inaccuracy in the information provided or any unanticipated effect of ground water will not be the basis for a Contract Sum Adjustment or an Extension of Time.

Furniture Information

The following documents are supplied for information only and outline the loose furniture and fit out to be supplied by separate Suppliers and Sub Contractors.

These works do not form part of the Contract Works.

- Furniture Drawings FO1 and FO2 prepared by Brewster Hjorth

Contract details

Particular provisions applicable to the proposed contract include the following:

- General conditions of contract:
 - Type: AS 2124 -1992.
 - Available from: Standards Australia.
 - The standard form of Contract has been amended, and these changes are included in the *General Conditions of Contract* Subsection of the specification.
- Cost adjustment: The work is not subject to cost adjustment for labour and materials.
- Separable parts: The work will consist of separable portions as described in the Conditions of Contract.
- Contract period: To be nominated by the tenderer.
- Liquidated damages: Refer *General Conditions of Contract* Subsection of specification.

11.3 FURTHER INFORMATION**Contact person**

Refer inquiries to the following:

- Name: Andrew Hjorth of Brewster Hjorth Architects
- Telephone: 02 9251 8411
- Facsimile: 02 9251 8756
- Email: andrew.hjorth@brewsterhjorth.com.au

Note: During the Tender process tenders must only contact those persons nominated and any unauthorised contact with Council, or its agents may lead to the tenderer being disqualified.

Site Inspections

Parts of the site are open to the public. Tenderers may visit these parts of the site at any time during opening hours during the tender period. Tenderers may organise access to other areas of the site by contacting Cathy Howie at Mona Vale Library, Telephone: (02) 9970 1198.

Addenda

Tenderers may ask for clarification of anything in the Tender Documents. Any instruction resulting from such request will be issued in writing to all Tenderers in the form of an Addendum which shall then become part of the Tender Documents. Similarly, should the Principal require documents to be amended an Addendum shall be issued.

No explanation or amendment to the Tender Documents shall be recognised unless in the form of a written Addendum thereto issued by the Superintendent, receipt of which shall be acknowledged in writing by Tenderers.

VILLAGE PARK REDEVELOPMENT MONA VALE

Discrepancies, Errors and Omissions

A Tenderer who finds any discrepancy, error or omission in the Tender Documents shall notify the Superintendent in writing thereof on or before the closing date for Tenders.

If any item appears in either the Drawings or the Specification and not in the other, it shall be allowed for in the Tender. If any process, finish or treatment normally considered good building practice, or any manufacturers recommendation has not been specified, it shall be deemed to be allowed in the Tender.

T1.4 PREPARATION OF TENDERS**Documents to be lodged**

Notwithstanding any other Conditions of Tendering, the following documents shall be completed in full and submitted with the Tender, one copy of each, unless noted otherwise:

- The *Tender Form*;
- The *Tender Schedules*;
- Preliminary programming information; and
- Preliminary site management plan

Any Tender that is not accompanied by these completed Documents required under this clause may be rejected.

Tender form

Form: Submit the tender on the *Tender form* provided.

Addenda: Confirm on the *Tender form* that allowance has been made of each addendum and any extensions of the tender period.

The Tenderer shall set forth name, ACN and registered office address of the company.

Address for service of notices: Include on the *Tender form* an address for service of notices for the purpose of this tender and any subsequent contract arising out of this tender.

Execution: Sign the *Tender form* or, if a company, comply with the relevant provisions of the Corporations Law and regulations.

Scope

Tender for the whole of the work described in the tender documents.

Alterations: Do not alter or add to tender documents except as may be required by these conditions of tendering.

Alternatives

Alternative proposals may be submitted with the tender for consideration, but

- a conforming tender must be submitted, which complies with the tender documents; and
- a detailed description of the alternative must be submitted, stating clearly the manner in which it differs from the requirements of the tender documents whilst complying with the principal's commercial and technical objectives.

For the purpose of preparing an alternate tender tenderers should note the principal's operational requirements set out 3.5.3 of the General Requirements section of the specification "Staging / Working Restrictions". Tenderers may, as part of an alternate tender submission, consider other solutions to staging and site management that may meet the principal's operational requirements.

VILLAGE PARK REDEVELOPMENT MONA VALE

T1.5 SUBMISSION OF TENDERS

Lodgement

Tenders are to be placed in a sealed envelope marked:

**TENDER- CONSTRUCTION OF VILLAGE PARK
REDEVELOPMENT MONA VALE
Tender Number T01/03**

lodged in the tender box located at Council's offices. Tenders sent by prepaid post or courier must reach the Tender Box prior to the closing time.

Submission by Facsimile

Tenders submitted by facsimile must be received in time for the General Manager or nominee to put the tender in a sealed envelope in the Tender Box by the date and closing time.

Council is bound to consider tenders in accordance with the Local Government (Tendering) Regulation 1999. Your attention is specifically drawn to the following provisions:

Consideration of Tenders:

- (1) As soon as practicable after the tenders for a proposed contract have been opened, the council must assess the tenders.
- (2) A council must not consider a tender that is not submitted to the council by the deadline for the closing of tenders. This subclause is subject to subclauses (3) and (4).
- (3) A council must consider a tender submitted to it by facsimile machine or electronic means, but only if:
 - (a) in the case of transmission by electronic means, that means of transmission was specified in the relevant tender documents;
 - (b) the transmission was received before the deadline for the closing of tenders, and
 - (c) the tender is complete.This subclause is subject to subclause (4).
- (4) If, in the relevant tender documents issued by the council, a council has specified that a tender will not be considered unless formal tender documents are submitted to the council, then despite subclause (3), the council is not obliged to consider a tender transmitted to it in accordance with that subclause unless:
 - (a) the tenderer is able to satisfy the council that formal tender documents and all other requisite essential information were posted or lodged at a Post Office or other recognised delivery agency before the deadline for the closing of tenders; and
 - (b) the council actually receives those documents within such period as it decides to be reasonable in the circumstances.
- (5) A council must also consider a tender received within such period after the deadline for the closing of tenders as it decides to be reasonable in the circumstances if the tenderer satisfies the council that the tender documents and all other requisite essential information were posted or lodged at a Post Office or other recognised delivery agency in sufficient time to enable the documents to have been received by the council in the ordinary course of business before that deadline.

Tenders submitted by fax or email will not be accepted unless the Tenderer is able to satisfy Council that formal Tender documents and all other requisite essential information were posted or lodged at a Post Office or other recognised delivery agency before the deadline for the closing of Tenders and Council actually receives those documents within such period as Council decides to be reasonable.

VILLAGE PARK REDEVELOPMENT MONA VALE

Closing of tenders

Date: Friday 28 March 2003

Time: 4.00 pm.

Place for lodgement

Tender box location: Pittwater Council Administration offices, Unit 11, 5 Vuko Place, Warriewood.

Address for postal submissions: Pittwater Council, PO Box 882, MONA VALE, NSW, 1660.

T1.6 PROCEDURES AFTER TENDER PERIOD**Tender validity period**

Unless withdrawn, tenders must remain valid from the date and time for closing of tenders, for the following period: 90 days.

Informal Tenders

Any Tender may be rejected which does not comply with the requirements of, or contains provisions not required or allowed by, the Tender Documents. The Proprietor reserves the right to waive any Conditions of Tendering.

Tender Assessment

It is anticipated that after the opening of Tenders, the Superintendent will have a limited time for the preparation of their Tender Report for the Proprietor to meet the currently scheduled Committee and Council Meeting dates. It is unlikely that there will be time for the Superintendent to request clarification, or Tenderers to submit additional information during this period. Therefore it is important that all information requested is clearly provided.

Selection criteria: The Principal reserves the right to accept any conforming tender or any alternative tender, submitted in accordance with these conditions which, in the view of the Principal, offers the best value for money. A tender will be deemed to be conforming if it satisfies the conditions of Tendering and is based on materials, methods of construction or other details designated in the drawings, specifications and other documents provided to the Tenderer and does not exclude work or obligations set out on the documents.

Value for money: In forming a view of the best value for money the Principal will, among other things:

- compare the Tenderer's Preliminary Programming Information and tendered sum with the Principal's previous estimates and budgets and with other tenders, and
- review all other information provided in the *Tender Schedules*;

to form a view as to the likelihood of the work being brought to Practical Completion within time and budget, the likely quality of the work and the likelihood of unwarranted contractual or procedural disputes.

Rejection: The Principal reserves the right to reject all Tenders if no Tender satisfies its requirements including, by not limited to, time and / or cost budget constraints. Unsuccessful Tenderers will be notified in writing that their tenders have not been successful.

VILLAGE PARK REDEVELOPMENT MONA VALE

Evaluation of tenders

Council anticipate that a panel will carry out the selection process. The following outlines the evaluation criteria.

Criteria	Weighting (%)
Corporate Capacity	20
Corporate Experience	20
Products / Services to be provided	30
Value Added Services	30

Council may choose to carry out a technical evaluation of the service or product offered. The Tenderer may at its cost, be required to submit to a reasonable technical evaluation of the product or service offered.

Corporate Capacity:

Council requires the Tenderer to provide evidence of the following :

- Corporate & financial capacity: The tenderer is required to provide Audited Annual financial statements (Last 3 years).
- Project Personnel: The tenderer is required to nominate and provide detailed curriculum vitae and references.
- Total Quality Management: The tenderer is required to provide details of their Quality and Service plan associated with the Tender.
- Current contractual commitments: The tenderer is required to provide a schedule of current contractual commitments.

Corporate Experience

Council requires the Tenderer to provide evidence of the following on similar projects:

- Three References (including telephone contact details);
- Evidence of demonstrated ability to perform; and
- List of similar projects over last 3 years.

Products / Services to be provided

The tenderer must indicate how they will meet the tender objectives as follows:

- Compliance with Contract Documents.
- Construction Period: The principal would like the tenderer to advise their proposed construction period.
- Demonstrate the proposed programming / staging of the works.
- Demonstrate their proposed site management plan

Value Added Services

- Other features of the service offered which may be a benefit to Council. Particularly, the Tenderer should detail any benefits that the Tenderer will provide to Council that exceed the specification.

VILLAGE PARK REDEVELOPMENT MONA VALE

Other Information

The tenderer may submit any other information necessary to allow Council to fully appreciate the benefit of its tender.

The tendered sum will include allowance for any obligation to pay GST in relation to any aspect of the work. There will be no adjustments to the tendered sum due to any failure on the part of the tenderer to correctly account for the impact of GST on the cost of any aspect of the work. Council must be supplied with the company's Australian Business Number (ABN) on any invoice submitted.

Qualifications: Tenders containing unauthorised alterations, additions or qualifications may be rejected.

Unpriced items: Costs relating to items not priced will be assumed to have been included elsewhere in the tender.

Additional information

If required, submit additional information, by the stipulated date and time, to allow further consideration of the tender before any tender is accepted. Failure to meet this requirement may result in the tender being rejected.

Confidentiality

Treat as confidential any information provided after the tender period.

Acceptance of tender

Non-acceptance: The principal is not bound to accept the lowest or any tender, nor to give reasons.

Acceptance: A tender is not accepted until notice in writing of acceptance is

- handed to the tenderer;
- sent by prepaid post to, or left at, the address for service of notices stated in the *Tender form*; or
- transmitted by facsimile to the tenderer's facsimile number.

The Principal is not responsible for, or will pay for any, expenses or losses which may be incurred by any Tenderer in the preparation of his Tender.

Formal instrument of agreement: On acceptance of the Tender the Proprietor shall execute a formal instrument of agreement as required by the General Conditions of Contract.

Unless and until a formal instrument of agreement is executed the Tender and The Tender Documents together with the notice in writing of acceptance of the Tender shall constitute the Contract between the Principal and the successful Tenderer.

Tender Schedules

T2

VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects

February 2003

20151 SP105

ISSUE	DATE	ISSUE
A		Preliminary
B	28.03.02	Tender Issue



VILLAGE PARK REDEVELOPMENT MONA VALE

T2.1 TENDER FORM

T2.1.1 PROJECT DETAILS

Project Number: 20151

Tender Number: T01/03

Project Name: Village Park Redevelopment, Mona Vale

Project Address: Park Street and Pittwater Road Mona Vale

T2.1.2 TENDERERS DETAILS

Name of Tenderer:

Australian Company Number:

Registered Address:

Address for service of notices:

Name of contact:

Telephone:

Facsimile:

Email:

T2.1.3 ACCEPTANCE OF CONDITIONS

I/We, the undersigned, have examined all of the Tender Documents for the Project and submit our Tender in accordance with all the conditions and requirements contained therein.

IT IS A CONDITION OF TENDERING THAT THIS DOCUMENT BE COMPLETED IN FULL AND ACCOMPANY THE FORM OF TENDER (REFER TO SUBMISSION OF TENDER - IN TENDER CONDITIONS)

Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

12.1.4 TENDER

Lump Sum Price
(State amount in words and
figures. Include any
provisional sums):

.....
.....
(\$

GST:

.....

Time for completion

Separable Portion A weeks from Date of Acceptance
of Tender

Separable Portion B weeks from Date of Possession
of Portion B

Separable Portion C weeks from Date of Possession
of Portion C

Type of security to be
provided:

Bank Guarantees

Receipt of Addenda:

We acknowledge the receipt of addenda numbered
and due allowance has been made for their provisions in the
Tender.

Other information:

.....
.....

Signature:

.....

Name of signatory:

.....

Position:

.....

Signature of witness:

.....

Name of witness:

.....

Address:

.....

IT IS A CONDITION OF TENDERING THAT THIS DOCUMENT BE COMPLETED IN FULL AND ACCOMPANY THE
FORM OF TENDER (REFER TO SUBMISSION OF TENDER - IN TENDER CONDITIONS)

Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

T2.2 SCHEDULE 1 - CORPORATE CAPACITY

T2.2.1 CORPORATE AND FINANCIAL CAPACITY

The Tenderer shall append to Schedule 1 an audited annual financial statement for the last three financial years.

T2.2.2 PROJECT PERSONNEL

Off-site Staff

Name:	Proposed Responsibilities:	Percentage of their time dedicated to the project:
.....
.....
.....
.....
.....

On Site Staff

Name:	Proposed Responsibilities:	Percentage of their time dedicated to the project:
.....
.....
.....
.....
.....

The tenderer shall append to Schedule 1 the resumes for each of the nominated staff.

T2.2.3 TOTAL QUALITY MANAGEMENT

The Tenderer shall append to Schedule 1 details of Quality and Service plan for the project.

The Tenderer should indicate their compliance (full, partial or non-compliance) with requirements of quality assurance system.

IT IS A CONDITION OF TENDERING THAT THIS DOCUMENT BE COMPLETED IN FULL AND ACCOMPANY THE FORM OF TENDER (REFER TO SUBMISSION OF TENDER - IN TENDER CONDITIONS)

Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

T2.2.4 CURRENT CONTRACTUAL COMMITMENTS

Project:	Principal:	Value:	Anticipated Date of Completion:
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 IT IS A CONDITION OF TENDERING THAT THIS DOCUMENT BE COMPLETED IN FULL AND ACCOMPANY THE FORM OF TENDER (REFER TO SUBMISSION OF TENDER - IN TENDER CONDITIONS)

Tenderer's Name

Signature..... Date

T2.3 SCHEDULE 2 - CORPORATE EXPERIENCE

T2.3.1 REFERENCES

Project:	Project Description:	Contact Details Date of Completion:
1
2
3

T2.3.2 EVIDENCE OF DEMONSTRATED ABILITY TO PERFORM

The Tenderer shall append to Schedule 2 evidence of the Tenderers demonstrated ability to complete the works. The response should include ability to comply with terms of proposed agreement.

T2.3.3 PROJECT EXPERIENCE

Please provide details of 3 projects of a similar scale, type and complexity.

Project:	Project Description:	Contact Details Date of Completion:
1
2
3

IT IS A CONDITION OF TENDERING THAT THIS DOCUMENT BE COMPLETED IN FULL AND ACCOMPANY THE FORM OF TENDER (REFER TO SUBMISSION OF TENDER - IN TENDER CONDITIONS)

Tenderer's Name

Signature Date

T2.4 SCHEDULE 3 - PRODUCTS/SERVICES TO BE PROVIDED

T2.4.1 COMPLIANCE WITH CONTRACT DOCUMENTS

We have fully assessed the Contract Documents, and confirm our tender has made due allowance for all works described within, with no clarifications or alterations/with the following clarifications and alterations (cross out which ever is not applicable).

.....
.....
.....
.....
.....

We have assessed the product/workmanship warranties required within the contract documents and confirm:

- We can provide all required warranties;
- We can provide all warranties expected those noted below (cross out which ever is not applicable).

.....
.....
.....
.....
.....

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Tenderer's Name

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

T2.4.2 SITE MANAGEMENT PLAN AND PROGRAM

Generally

Council's objective is to undertake the works with as little disruption to the existing services and facilities within the Village Park as possible. Specific operational requirements for each facility are set out in the general requirements section of the specification.

Tenderers should clearly demonstrate innovative solutions to managing the project particularly with regard to:

- Site management (eg. site area required, stockpiling, material deliveries, etc)
- Staging of works (eg. continued operation of Library and other facilities throughout the works)
- Program

Tenderers should be aware that Council would be looking to establish an appropriate balance between these issues.

Separable Portions

Council envisages that the works will be undertaken in three separable portions as follows:

Separable Portion:	Description:
Separable Portion A	New library building, including new link building and associated external works
Separable Portion B	Refurbishments to existing Memorial Hall
Separable Portion C	Extension to existing library building adjacent Park Street, (for Early Childhood Centre) including adjacent external works and Internal Refurbishment of Existing Library building and all other works required to complete the contract works.

Site Management Plan

Tenderers shall append to Schedule 3 a site management plan describing the proposed site management methodology, staging and construction program taking into consideration Council's operational requirements set out in the General Requirements Section of the specification.

The site management plan shall include a preliminary program shall show the following:

- Sequence of work.
- Periods within which various stages or parts of the work are to be executed.
- Critical paths of activities related to the work.
- Allowance for holidays.
- Restraints imposed by the contract documents.
- Significant milestones including separable parts, if any.
- Activity inter-relationship, including those activities to be undertaken by subcontractors and suppliers, both on and off site.

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

- External dependencies including provision of access, document approvals and work by other.

T2.4.4 WORKING HOURS

The tenderer shall nominate the working hours to be worked each day to assist in the assessment of delay claims and extensions of time and any work that is planned to be carried out "out of hours". Tenderers shall nominate rostered days off so that these may be excluded from working days.

This statement will not apply to conditions related to the Contractor not being able to comply with the Construction Program.

Working Hours (Monday to Friday):

Working Hours (Saturday):

Rostered days off:

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Tenderer's Name

Signature..... Date

12.5 SCHEDULE 4 - PRICE AND VALUE ADDED SERVICES

12.5.1 SCHEDULE OF RATES

Complete the Schedule by inserting under RATE the tendered rates.

Item	Description	Unit	Rate
1.0	Preliminaries		
1.1	<p>Costs resulting from extensions of time (AS 2124-1997 (Clause 36))</p> <p>The tenderer shall state rates, expressed in dollars per working day, to apply as a uniform rate to account for all costs, which result from extensions of time which are due to the Contractor under the General Conditions of Contract.</p> <p>These rates shall be used during the Contract against delays for which costs may be claimed under the General Conditions of Contract.</p>		
	Rate for Separable Portion A	\$/day	\$.....
	Rate for Separable Portion B	\$/day	\$.....
	Rate for Separable Portion C	\$/day	\$.....
2.0	Building Works		
	Rates shall be for the complete supply, installation, testing, commissioning, etc, in accordance with the Specification and the Drawings, and all miscellaneous minor works shall be deemed to be included as required in each case.		
2.1	Cement render including paint finish as specified to existing brickwork walls	m ²	\$.....
2.2	Ditto to reveals and narrow widths not exceeding 100 mm wide	m ²	\$.....
2.3	New set plasterboard ceiling, including support framing and painting	m ²	\$.....
2.4	New set plasterboard lining over existing wall	m ²	\$.....

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Tenderer's Name.....

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

3.0 Electrical Services

All rates offered shall be for the complete supply, installation testing, commissioning, etc in accordance with the Specification and the Drawings, ie all miscellaneous minor works, fixings, cable ties brackets etc shall be deemed to be included as required in each rate.

Item No	Description	Unit Rate Addition / Deduction
3.1	Supply and installation or deletion of wiring for one (1) only luminaire wired above ceiling within 6 metres of an existing outlet.	\$
3.2	Supply and installation or deletion of one (1) only double GPO looped in from an existing outlet (wall flush mounted type) (10 m cable).	\$
3.3	Installation of one (1) only luminaire (2 x 36W) excluding supply of luminaire.	\$
3.4	Supply and installation or deletion of 2C + E 2.5mm ² TPS cable installed via ceiling space.	\$
3.5	Supply and installation or deletion of 2C + E 4mm ² TPS cable installed in conduit or cable duct.	\$
3.6	Supply and installation or deletion of 2C + E 4mm ² TPS cable installed via ceiling space.	\$
3.7	Outlets	
3.7.1	Supply, installation and connection of a typical double 10A GPO including 30 metres of 2C + E 2.5mm ² TPS cable installed in conduit and/or fixed in ceiling space.	\$
3.7.2	As above but single 15A socket outlet	\$
3.7.3	Supply and install 2 gang light switch mounted with cable concealed in building fabric including wiring to luminaire within 20 metres.	\$
3.7.4	Supply, installation and connection of the following power outlets including 30 metres of wiring installed in conduit and/or fixed in ceiling space. Include for circuit breakers at local distribution board. - 15A TP&N with isolator - 32A TP&N with isolator	\$

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Item No	Description	Unit Rate Addition / Deduction
3.7.5	Supply, installation and connection of the following fixed connections including 30 metres of wiring installed in conduit and/or fixed in ceiling space. - 20A single phase - 20A three phase	\$
3.7.6	Supply, installation and connection of the following isolators. - 20A single phase - 20A three phase	\$
3.8	Luminaires Supply and installation of each type of lighting luminaires including diffusers, lamps and starters and connection of supply with up to 10 metres of wiring as specified. Provide separate price for each luminaire specified in the legend.	\$
3.9	Cost per fitting of each type of light including replacement of existing	
3.10	Cable Trays Supply and installation of cable tray including support brackets and fixings as specified. - 300 mm - 450 mm - 600 mm	\$ \$ \$

4.0 Mechanical Services

The following schedule of unit rates (on fixed price basis) shall apply to all authorised variations for additions and omissions.

Rates include for all labour and material necessary for the installation, coordinating and co-operating with other trades, testing and commissioning including all costs associated with the testing, drawings, supervision, overheads, site allowance and profit.

Rates include for all fabrication work and fixing, sockets, running joints, connectors, backnuts, nipples and pipe fixings such as support clips, saddles, brackets, hangers, straps, screws, nails, explosive and low velocity total fastening and other metal fastenings, anchors and the like.

Rates for piping less than 32 nominal diameter include for all elbows, bends, tees, reducers and similar pipe fittings. Above 32 nominal diameter they will be measured separately.

Rates also include for pipe sleeves and fire rated packing. Rates include for painting where required.

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Rates for valves include for all connections or joints to pipe or equipment. Rates for valves also include all necessary unions, compression unions, flanges, bolts and gaskets, etc.

Rates for ductwork include for all fabrication work, installation flanges, joints, stiffeners, turning, connections and duct fixings such as brackets, straps, screws, nails explosive and low velocity tool fastenings, anchors and the like.

Item No	Description	Unit Rate Addition / Deduction
4.1	Supply and installation of air diffuser and three metres of flexible ductwork - 200 diameter	\$
4.2	Repair of air diffuser	\$
4.3	Replacement of air diffuser	\$
4.4	Supply and installed cost per square metre of plain ductwork. Sheetmetal thickness:	
	- 0.6 mm	\$
	- 0.8 mm	\$
	- 1.0 mm	\$
	- 1.2 mm	\$
4.5	Supply and installed cost per square metre of ductwork including 25mm external insulation Sheetmetal thickness:	
	- 0.6 mm	\$
	- 0.8 mm	\$
	- 1.0 mm	\$
	- 1.2 mm	\$
	- 1.6 mm	\$
4.6	Supply and installed cost per square metre of ductwork including 50mm external insulation Sheetmetal thickness:	
	- 0.6 mm	\$
	- 0.8 mm	\$
	- 1.0 mm	\$
	- 1.2 mm	\$

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Item No	Description	Unit Rate Addition / Deduction
4.7	Supply and installed cost per square metre of ductwork including 25mm external insulation Sheetmetal thickness:	
	- 0.6 mm	\$
	- 0.8 mm	\$
	- 1.0 mm	\$
	- 1.2 mm	\$
4.8	Supply and installed cost per square metre of ductwork including 50mm external insulation Sheetmetal thickness:	
	- 0.6 mm	\$
	- 0.8 mm	\$
	- 1.0 mm	\$
	- 1.2 mm	\$
4.9	Fire rating to sheetmetal ductwork - \$/m ²	\$
4.10	Supply and installed cost per lineal metre of insulated of flexible ductwork Flexible duct diameter:	
	- 150 mm	\$
	- 200 mm	\$
	- 250 mm	\$
	- 300 mm	\$
	- 350 mm	\$
	- 400 mm	\$

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Item No	Description	Unit Rate Addition / Deduction
4.11	Supply and installed cost per lineal metre of insulated chilled water copper pipework - Copper "B".	
	Pipe size:	
	- 25 mm 25mm insulation thickness	\$
	- 32 mm 25mm insulation thickness	\$
	- 40 mm 25mm insulation thickness	\$
	- 50 mm 25mm insulation thickness	\$
	- 65 mm 40mm insulation thickness	\$
	- 80 mm 40mm insulation thickness	\$
	- 100 mm 40mm insulation thickness	\$
	- 125 mm 40mm insulation thickness	\$
	- 150 mm 40mm insulation thickness	\$
	- 200 mm 40mm insulation thickness	\$
	- 250 mm 40mm insulation thickness	\$
	- 300 mm 40mm insulation thickness	\$

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Item No	Description	Unit Rate Addition / Deduction
4.12	Supply and insulated cost per lineal metre of lincal metal sheathed insulated chilled water copper pipework (Material maybe alternatively stainless steel. Please indicate below). Pipe size:	
	- 25 mm 25mm insulation thickness	\$
	- 32 mm 25mm insulation thickness	\$
	- 40 mm 25mm insulation thickness	\$
	- 50 mm 25mm insulation thickness	\$
	- 65 mm 40mm insulation thickness	\$
	- 80 mm 40mm insulation thickness	\$
	- 100 mm 40mm insulation thickness	\$
	- 125 mm 40mm insulation thickness	\$
	- 150 mm 40mm insulation thickness	\$
	- 200 mm 40mm insulation thickness	\$
	- 250 mm 40mm insulation thickness	\$
	- 300 mm 40mm insulation thickness	\$
	- 350 mm 40mm insulation thickness	\$
	- 400 mm 40mm insulation thickness	\$
	- 450 mm 40mm insulation thickness	\$
4.13	Supply and installed cost per lineal metre of insulated hot water steel pipework. Pipe size:	
	- 25 mm 25mm insulation thickness	\$
	- 32 mm 25mm insulation thickness	\$
	- 40 mm 25mm insulation thickness	\$
	- 50 mm 25mm insulation thickness	\$
	- 65 mm 40mm insulation thickness	\$
	- 80 mm 40mm insulation thickness	\$
	- 100 mm 40mm insulation thickness	\$
	- 125 mm 40mm insulation thickness	\$
	- 150 mm 40mm insulation thickness	\$

IT IS A CONDITION OF TENDERING THAT THIS DOCUMENT BE COMPLETED IN FULL AND ACCOMPANY THE FORM OF TENDER (REFER TO SUBMISSION OF TENDER - IN TENDER CONDITIONS)

Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Item No	Description	Unit Rate Addition / Deduction
4.14	Supply and installed cost per lineal metre of metal sheathed insulated high temperature hot and hot water steel pipework.	
	Pipe size:	
	- 25 mm 25mm insulation thickness	\$
	- 32 mm 25mm insulation thickness	\$
	- 40 mm 25mm insulation thickness	\$
	- 50 mm 25mm insulation thickness	\$
	- 65 mm 40mm insulation thickness	\$
	- 80 mm 40mm insulation thickness	\$
	- 100 mm 40mm insulation thickness	\$
	- 125 mm 40mm insulation thickness	\$
	- 150 mm 40mm insulation thickness	\$
4.15	Supply and installed cost per lineal metre of copper pipework - excluding valves and insulation	
	Pipe size:	
	- 25 mm	\$
	- 32 mm	\$
	- 40 mm	\$
	- 50 mm	\$
	- 65 mm	\$
	- 80 mm	\$
	- 100 mm	\$
	- 125 mm	\$
	- 150 mm	\$
	- 200 mm	\$
	- 250 mm	\$
	- 300 mm	\$

IT IS A CONDITION OF TENDERING THAT THIS DOCUMENT BE COMPLETED IN FULL AND ACCOMPANY THE FORM OF TENDER (REFER TO SUBMISSION OF TENDER - IN TENDER CONDITIONS)

Tenderer's Name

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Item No	Description	Unit Rate Addition / Deduction				
4.16	Supply and installed cost per lineal metre of metal sheathed insulated steel steam pipe. Pipe size:					
	- 25 mm 40mm insulation thickness	\$				
	- 32 mm 40mm insulation thickness	\$				
	- 40 mm 40mm insulation thickness	\$				
	- 50 mm 40mm insulation thickness	\$				
	- 65 mm 40mm insulation thickness	\$				
	- 80 mm 50mm insulation thickness	\$				
4.17	Supply and installed cost per lineal metre of PVC pipe for drain and condensate. Pipe size:					
	- 15 mm	\$				
	- 20 mm	\$				
	- 25 mm	\$				
	- 32 mm	\$				
	- 40 mm	\$				
	- 50 mm	\$				
4.18	Supply and installation of valves. Pipe size:					
		Gate	Globe	Butterfly Valve	Strainer	Stat Valve
	15mm	\$	\$	\$	\$	\$
	25mm	\$	\$	\$	\$	\$
	32mm	\$	\$	\$	\$	\$
	40mm	\$	\$	\$	\$	\$
	50mm	\$	\$	\$	\$	\$
	65mm	\$	\$	\$	\$	\$
	80mm	\$	\$	\$	\$	\$
	100mm	\$	\$	\$	\$	\$
	125mm	\$	\$	\$	\$	\$
	150mm	\$	\$	\$	\$	\$
	200mm	\$	\$	\$	\$	\$
	250mm	\$	\$	\$	\$	\$
	300mm	\$	\$	\$	\$	\$

IT IS A CONDITION OF TENDERING THAT THIS DOCUMENT BE COMPLETED IN FULL AND ACCOMPANY THE FORM OF TENDER (REFER TO SUBMISSION OF TENDER IN TENDER CONDITIONS)

Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

4.19	Supply and installation cost for providing variable air volume box including DDC controls.		
	Capacity:		
	- 900l/s		\$
	- 800l/s		\$
	- 700l/s		\$
	- 600l/s		\$
	- 500l/s		\$
	- 400l/s		\$
	- 300l/s		\$
	- 200l/s		\$
4.20	Supply and installed cost of providing DDC points for addition purpose only.		
	- Analog Type	Input/Output	\$
	- Digital Type	Input/Output	\$

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Tenderer's Name

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

5.0 Labour Rates

The tenderer shall state the gross rate, or rates which shall be paid for each hour spent working on Site, for performance of work both during normal hours and out of hours. These rates shall be inclusive of all allowances, on costs, profits, travelling time, site allowances, etc. as specified in the Contract Documents. Nominate the days of the week and the times during those days to which each rate applies.

		Within working hours	Out of hours
5.1	Site Personnel Generally		
	Site supervisor	hour \$	\$
	Foreman	hour \$	\$
	Leading hand	hour \$	\$
	Bricklayer	hour \$	\$
	Carpenter and joiner	hour \$	\$
	Glazier	hour \$	\$
	Roofer	hour \$	\$
	Carpet layer	hour \$	\$
	Painter	hour \$	\$
	Plasterer	hour \$	\$
	Labourer (Grade one)	hour \$	\$
	Labourer (Grade two)	hour \$	\$
	Labourer (Grade three)	hour \$	\$
	Labourer (Grade four)	hour \$	\$
5.2	Plumbers		
	Plumber/gas fitter (licensed)	hour \$	\$
	Drainer (licensed)	hour \$	\$
5.3	Electrical		
	Electrical Project Manager	hour \$	\$
	Electrical Foreman/ Supervisor	hour \$	\$

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Tenderer's Name

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VILLAGE PARK REDEVELOPMENT MONA VALE

	Tradesperson assistant	hour	\$	\$
	Tradesperson	hour	\$	\$
	Charge Hand	hour	\$	\$
5.4	Mechanical			
	Duct work , manufacture and installation	hour	\$	\$
	Pipework installation	hour	\$	\$
	Insulation installation	hour	\$	\$
	Drawing office	hour	\$	\$
	Pipework fitter	hour	\$	\$

Classification of Builders' Labourers Grouping:

Group one: Rigger, Drainer, Dogman.

Group two: Scaffolder, Powder Monkey, Hoist or Winch Driver, Concrete Finisher, Steel Fixer, etc.

Group three (Labourer - Skilled): Bricklayers Labourer, Plasterers Labourer, Assistant Rigger, Gear Hand, Pile Driver, Jack Hammer Hand, Concrete Mixer Driver, Steel Erector, Crane Hand, Concrete Floater, Steel Bender, Formwork Stripper, Cement Gun Operator, Dump Cart Operator, etc.

Group four (Labourer - Ordinary): Labourer other than the above.

T2.5.2 DISSECTION OF TENDER PRICE

This Schedule is to assist in making valuations of works carried out but the Superintendent is not bound to use it. The total of each trade shall add up to the total in trade break-up.

Architectural

Preliminaries - Site establishment:	\$
Preliminaries - On going over construction period:	\$
Preliminaries - Allowance for work during Defects Liability Period:	\$
Demolition - Demolition of existing buildings:	\$
Demolition - Demolition to existing memorial hall:	\$
Demolition - Demolition to interior of existing library:	\$
Groundworks - Site preparation:	\$

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Groundworks – Bulk earthworks:	\$
Groundworks – Detailed earthworks for slabs and footings:	\$
Groundworks – Fill following construction of structure:	\$
Concrete – Concrete slab to level 1 (Library):	\$
Concrete – Circular columns (Library):	\$
Concrete – Concrete slab to level 2 (Podium and Library roof):	\$
Concrete – Concrete slab to level 1 link building:	\$
Concrete – Concrete slab to level 2 link building:	\$
Concrete – Concrete slabs for external works:	\$
Concrete – Concrete infills to existing library:	\$
Masonry - Blockwork Library:	\$
Masonry – Brickwork to link area:	\$
Masonry - Brickwork to Early Childhood Centre:	\$
Structural Steel – Lantern:	\$
Structural Steel - Early Childhood Centre:	\$
Structural Steel – link area:	\$
Structural Steel – Internal to existing library:	\$
Metalwork – Internal balustrades:	\$
Metalwork- External balustrades:	\$
Metalwork- fittings:	\$
Woodwork – Timber flooring library nad link building:	\$
Woodwork – Timber decking:	\$
Woodwork – new floors to existing library building:	\$
Woodwork – Trim (inc skirtings) to library:	\$
Woodwork – Trim (inc skirtings) to early childhood building:	\$
Woodwork – Trim (inc skirtings) to existing library building:	\$
Woodwork – Existing memorial hall:	\$
Woodwork – Cladigns to café and awnings:	\$

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Tenderer's Name.....

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Joinery – New library:	\$
Joinery – Early Childhood Centre:	\$
Joinery – Existing library building:	\$
Roofing – Metal Sheeting:	\$
Roofing - Concrete Tiles:	\$
Waterproofing – Under slab:	\$
Waterproofing – Retaining Walls:	\$
Waterproofing – Library Roof:	\$
Waterproofing – Library Courtyard:	\$
Waterproofing – Wet areas:	\$
Suspended ceilings – New library:	\$
Suspended ceilings – Link building:	\$
Suspended ceilings – Early Childhood centre:	\$
Suspended ceilings – Existing Library building	\$
Windows– To library exterior	\$
Windows– To library glazed partitions	\$
Windows – To link building	\$
Windows – To Early Childhood Centre (inc glazed partitions):	\$
Windows – To Existing building (inc glazed partitions):	\$
Doors – Door frames:	\$
Doors –Flush doors:	\$
Doors – Door hardware:	\$
Tiling – Wall tiles to toilets:	\$
Tiling - Floor tiling to toilets:	\$
Resilient finishes:	\$
Plastering – Cement render:	\$
Plastering - White set ceilings:	\$
Painting – Structural steel:	\$

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Tenderer's Name

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Painting – Timber flooring and deck:	\$
Painting – External claddings:	\$
Painting – Internal walls to new library and link building:	\$
Painting – Internal walls to early childhood centre:	\$
Painting – Internal walls to existing library:	\$
Painting – Ceilings to new library and link building:	\$
Painting – Ceilings to early childhood centre:	\$
Painting – Ceilings to existing library:	\$
Painting – Doors	\$
Graphics:	\$
Carpet – to new library:	\$
Carpet – to new link building, early childhood centre and existing library:	\$
Lift	\$

Electrical

Enabling Works Electrical	\$
Enabling Works Communications (Telstra)	\$
New External Lighting Works	\$
Supply Authority Costs	\$
Consumer Mains	\$
Sub-Mains	\$
Main Switchboard	\$
Distribution Boards	\$
Earthing Systems	\$
UPSs installation	\$
GPO's, Power outlets and points	\$
Lighting Supply	\$
Lighting installation	\$

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Exit & Emergency Lighting	\$
Relocation of existing External Lights and Power	\$
PA System	\$
Skirting Ducting	\$
Communications	\$
Security	\$
MATV	\$
Drawings	\$
Testing & Commissioning	\$
As Built Drawings and Manuals	\$
Items not listed above (provide details)	\$
Sub Total	\$
GST	\$
Grand Total for Electrical Services	\$

Mechanical

Workshop drawings	\$
Supply and installation of pumps	\$
Supply and installation of pipe work	\$
Supply and installation of all fan coil units and AHUS	\$
Supply and installation of dry media air filters	\$
Supply and installation of all fans	\$
Supply and installation of insulation	\$
Supply and installation of sound attenuators	\$
Supply and installation of all sheetmetal work, supports, dampers, access panels, flexible connections and diffusers	\$
Supply and installation of plenum acoustic insulation	\$
Supply and installation of all fire spray to ductwork and sheetmetal plenums	\$

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Supply and installation of split AC / heat pump units	\$
Supply and installation of all electrical work including MCC'S, MCPs, power and control wiring etc.	\$
Supply and installation of chiller equipment	\$
Pressure vessels, etc	\$
Boiler plant	\$
Under floor heating	\$
Supply and installation of all automatic controls /DDC	\$
Supply and installation of water treatment	\$
Testing and Commission	\$
User Training and User Acceptance Testing	\$
Trade's Documents, O/M manuals 'as installed' drawings	\$
Twelve (12) months preventative maintenance	\$
Sub Total	\$
GST	\$
Grand Total for Mechanical Services	\$

Hydraulic Services

Preliminaries	\$
Stormwater Drainage	\$
Perimeter subsoil drainage and dry inspection pit	\$
Sewer Drainage	\$
Grease Waste Drainage	\$
Sanitary Plumbing	\$
Domestic Cold Water	\$
Domestic Hot Water	\$
Fire Hose Reel Service	\$
Downpipes	\$
Sanitary Fixtures & Appliances	\$

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Tenderer's Name

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

As installed drawings and maintenance manuals	\$
12 month defect liability period and routine maintenance	\$
Sub Total	\$
GST	\$
Grand Total for Hydraulic Services	\$

External Works

Site preparation and in ground works:	\$
Hard landscaping:	\$
Fences and external walls:	\$
Soft landscaping:	\$

T2.5.3 TRADE BREAKUP

The tenderer shall lodge with their Tender, a break-up of his lump sum price into the categories nominated.

The break-up shall show the monetary value of the work in each category, including in each instance, allowance for overheads and profit. Each category shall strictly cover only that work in the corresponding Section of the Specification.

The break-up may be used as the basis for valuation of the Works by the Superintendent for progress payments.

Trade	Specification Sections	Amount
Preliminaries:		\$
Demolition:	Demolition	\$
Groundworks:	Site Preparation Earthworks Service Trenching	\$
Concrete:	Concrete Formwork Concrete Reinforcement In situ Concrete Concrete Finishes	\$
Masonry:	Brick & Block Construction	\$
Structural Steel:	Structural Steel	\$
Metalwork:	Metal Fixtures	\$

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Woodwork: (Carpentry):	Woodwork	\$
Woodwork: (Joinery):	Timber Fixtures	\$
Roofing:	Roofing Insulation and Barriers	\$
Claddings:	Cladding Insulation and Barriers	\$
Waterproofing:	Waterproofing	\$
Suspended Ceilings:	Suspended Ceilings	\$
Windows:	Aluminium Windows and doors glazing	\$
Doors:	Doors & Hatches Door & Window Hardware	\$
Tiling:	Tiling	\$
Resilient Finishes:	Resilient Finishes	\$
Plastering:	Plastering	\$
Painting:	Painting	\$
Graphics:	Graphics	\$
Carpets:	Carpets	\$
Lift:		\$
Hydraulics:		\$
Electrical:		\$
Mechanical:		\$
External Works	Landscaping Paving Fences and External Walls	\$
<hr/>		
Contract Sum:		\$
GST:		\$

T2.5.4 SCHEDULE OF OPTIONAL DELETIONS AND ADDITIONS

This schedule is to assist the Superintendent assess a number of options for deleting items prior to letting of Contract if required by Principal.

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

- 1 Delete joinery item JC2.10.
Total Saving: \$
- 2 Delete notice boards JL109, JL1.10, JL1.11
Total Saving: \$
- 3 Delete roller blinds to WL1.04 and WL1.11.
Total Saving: \$
- 4 Delete new windows WC2.09, WC2.10 and WC2.11, including demolition of openings.
Total Saving: \$
- 5 Delete JL103, and cap off new plumbing in under floor area for future installation.
Total Saving: \$
- 6 Delete sealer to concrete slab and walls to Access Cavity SL1.35.
Total Saving: \$
- 7 Retain existing carpet Level 1 Council offices, and patch as necessary with carpet removed from Level 2 Council offices.
Total Saving: \$
- 8 Delete refurbishment of existing meeting room in existing hall
Total Saving: \$
- 9 Delete refurbishment of eastern façade of existing hall.
Total Saving: \$
- 10 Delete grease arrestor for café tenancy
Total Saving: \$

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Tenderer's Name

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

- 11 Delete drainage cell to external walls of library along with perimeter subsoil drainage and dry inspection pit, and add polyethylene protection board.
Total Saving: \$
- 12 Delete in ground lights (Light type Q) to palm trees, including associated cabling and replace with pavers to match adjacent areas.
Total Saving: \$
- 13 Delete 15 off data points and cabling to future nominated locations
Total Saving: \$
- 14 Delete 15 off double GPOs to future nominated locations
Total Saving: \$
- 15 Delete Public Address system to library
Total Saving: \$
- 16 Delete smoke detection system to new works
Total Saving: \$
- 17 Replace category 6 communications cables with category 5(e) communications cables.
Total Saving: \$
- 18 Delete irrigation to Library Courtyard.
Total Saving: \$
- 19 Delete bitumen pathway within Village Park and from Pittwater Road to pathway in Village park.
Total Saving: \$

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Tenderer's Name
Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

- 20 Add removal and replacement of existing roof tiles to existing Library building. Roof tile as specified.
Total Addition: \$
- 21 Delete water repellent to Library blockwork retaining walls.
Total Saving: \$
- 22 Replace 600 x 300 pavers with 300 x 300 pavers.
Total Saving: \$
- 23 Delete wall tiling to Toilets and replace with 100 mm high skirting tile and paint finish to walls.
Total Saving: \$
- 24 Delete dimmers to lights in SL113 Multipurpose Room and SC203 Meeting Room 2.
Total Saving: \$
- 25 Delete JH101.
Total Saving: \$
- 26 Delete cleaning existing brickwork to existing Library.
Total Saving: \$
- 27 Add clean existing Library brickwork and paint with semi-gloss latex. Colour: Dulux Buff-It P11-B1
Total Addition: \$
- 28 Delete White set plaster to library ceiling and paint concrete only
Total Saving: \$
- 29 Reduce height of glazing to handrail type 5 to an overall height of 1350 mm in all locations
Total Saving: \$

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 FORM OF TENDER (REFER TO SUBMISSION OF TENDER - IN TENDER CONDITIONS)

Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

30 Delete external signage

Total Saving: \$

31 Delete sign type N

Total Saving: \$

T2.5.5 ESTIMATED EXPENDITURE

Month:	Estimated Expenditure:
Month 1	\$
Month 2	\$
Month 3	\$
Month 4	\$
Month 5	\$
Month 6 etc	\$

T2.5.6 VALUE ADDED SERVICES

The tenderer shall append to Schedule 4 details of any additional services, features, which the tenderer offers that exceed the Specification.

The tenderer should detail how the services or features, which the tenderer offers provide value for Money.

T2.5.7 ELECTRICAL - SCHEDULE OF EQUIPMENT

Item of Equipment	Manufacturer, Supplier or subcontractor as applicable	Model No, Figure No or List No as applicable	Lead Time from date of order
Distribution Boards			
Type of circuit breaker (MCBs)			
PA - Full Details Required			
Emergency Lighting System			
Accessories			

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Skirting Duct

Communications

Lighting
(details of fittings long lead times over 6 weeks.)

Any alternative offers to specified equipment (attach details if applicable)

T2.5.8 MECHANICAL - BAC SCHEDULE

BACnet Protocol Implementation Conformance Statement

Tenderers shall complete the following statement to demonstrate that the DDC control system is BAC-net compliant and that it will meet the future needs of the design brief in respect to interfacing with a BMS system.

Vendor Name:

Product Name:

Product Model Number:

Product Description

BACnet Conformance Class Supported

- Class 1 Class 4
- Class 2 Class 5
- Class 3 Class 6

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

BACnet Functional Groups Supported

Clock	<input type="checkbox"/>	Files	<input type="checkbox"/>
Hand-Held Workstation (HHWS)	<input type="checkbox"/>	Reinitialise	<input type="checkbox"/>
Personal Computer Workstation (PCWS)	<input type="checkbox"/>	Virtual Operator Interface	<input type="checkbox"/>
Event Initiation	<input type="checkbox"/>	Virtual Terminal	<input type="checkbox"/>
Event Response	<input type="checkbox"/>	Device Communications	<input type="checkbox"/>
COV Event Initiation	<input type="checkbox"/>	Time Master	<input type="checkbox"/>
COV Event Response	<input type="checkbox"/>		

BACnet Standard Application Services Supported

Application Service	Initiate Requests	Execute Requests
Acknowledge Alarm	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed COV Notification	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed Event Notification	<input type="checkbox"/>	<input type="checkbox"/>
Get Alarm Summary	<input type="checkbox"/>	<input type="checkbox"/>
Get Enrolment Summary	<input type="checkbox"/>	<input type="checkbox"/>
Subscribe COV	<input type="checkbox"/>	<input type="checkbox"/>
Unconfirmed COV Notification	<input type="checkbox"/>	<input type="checkbox"/>
Unconfirmed Event Notification	<input type="checkbox"/>	<input type="checkbox"/>
Atomic Read File	<input type="checkbox"/>	<input type="checkbox"/>
Atomic Write File	<input type="checkbox"/>	<input type="checkbox"/>
Add List Element	<input type="checkbox"/>	<input type="checkbox"/>
Remove List Element	<input type="checkbox"/>	<input type="checkbox"/>
Create Object	<input type="checkbox"/>	<input type="checkbox"/>
Delete Object	<input type="checkbox"/>	<input type="checkbox"/>
Read Property	<input type="checkbox"/>	<input type="checkbox"/>
Read Property Conditional	<input type="checkbox"/>	<input type="checkbox"/>
Read Property Multiple	<input type="checkbox"/>	<input type="checkbox"/>
Write Property	<input type="checkbox"/>	<input type="checkbox"/>

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Tenderer's Name.....

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Application Service	Initiate Requests	Execute Requests
Write Property Multiple	<input type="checkbox"/>	<input type="checkbox"/>
Device Communication Control	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed Private Transfer	<input type="checkbox"/>	<input type="checkbox"/>
Unconfirmed Private Transfer	<input type="checkbox"/>	<input type="checkbox"/>
Reinitialise Device	<input type="checkbox"/>	<input type="checkbox"/>
Confirmed Text Message	<input type="checkbox"/>	<input type="checkbox"/>
Unconfirmed Text Message	<input type="checkbox"/>	<input type="checkbox"/>
Time Synchronization	<input type="checkbox"/>	<input type="checkbox"/>
Who-Has	<input type="checkbox"/>	<input type="checkbox"/>
I-Have	<input type="checkbox"/>	<input type="checkbox"/>
Who-Is	<input type="checkbox"/>	<input type="checkbox"/>
I-Am	<input type="checkbox"/>	<input type="checkbox"/>
VT-Open	<input type="checkbox"/>	<input type="checkbox"/>
VT-Close	<input type="checkbox"/>	<input type="checkbox"/>
VT-Data	<input type="checkbox"/>	<input type="checkbox"/>
Authenticate	<input type="checkbox"/>	<input type="checkbox"/>
Request Key	<input type="checkbox"/>	<input type="checkbox"/>

BACnet Standard Object Types Supported

Object Type	Supported	Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties
Analog Input	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Analog Output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Analog Value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Binary Input	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Binary Output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Binary Value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Calendar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Command	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Event Enrolment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
File	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Loop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Multi-state Input	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Multi-state Output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Notification Class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____
Schedule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____

Data Link Layer Option

- | | |
|--|--|
| <input type="checkbox"/> ISO 8802-3, 10BASE5 | <input type="checkbox"/> ARCNET, COAX STAR |
| <input type="checkbox"/> ISO 8802-3, 10BASE2 | <input type="checkbox"/> ARCNET, coax bus |
| <input type="checkbox"/> ISO 8802-3, 10BASET | <input type="checkbox"/> ARCNET, twisted pair star |
| <input type="checkbox"/> ISO 8802-3, Fibre | <input type="checkbox"/> ARCNET, twisted pair bus |
| | <input type="checkbox"/> ARCNET, fiber star |
| <input type="checkbox"/> MS/TP master, baud rate(s): | _____ |
| <input type="checkbox"/> MS/TP slave, baud rate(s): | _____ |
| <input type="checkbox"/> Point-to-Point, EIA232, baud rate(s): | _____ |
| <input type="checkbox"/> Point-to-Point, modem, baud rate(s): | _____ |

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Tenderer's Name

Signature Date

VILLAGE PARK REDEVELOPMENT MONA VALE

Lon Talk, medium: _____

Character Sets Supported

Indicating support for multiple character sets does not imply that they can be supported simultaneously.

- ANSI X3.4 IBM/Microsoft DBCS JIS C 6226
- ISO 10646 (ICS-4) ISO 10646 (UCS2) ISO 8859-1

Special Functionality

- Segmented Requests Supported YES NO Window Size _____
- Segmented Responses Supported YES NO Window Size _____
- Router YES NO

Describe the supported routing capabilities not supported

.....

.....

.....

.....

.....

T2.5.9 MECHANICAL - SCHEDULE OF TECHNICAL DATA

Item of Equipment	Manufacturer, Supplier or Contractor	Range or type	Model or Figure No.
Type of Circuit Breaker (MCC)			
Motor Control Centres/Switchgear			

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Tenderer's Name.....

Signature..... Date

VILLAGE PARK REDEVELOPMENT MONA VALE

- Controls/DDC System
- Fans
- Water Treatment
- Pumps
- Fan Coil Units
- Air Filters
- Grilles and Diffusers
- Chiller / Heat pumps
- Valves
- Pressure Vessels
- AHUS
- Fire Rating to Ductwork
- Duct Insulation
- Boiler
- Under Floor Heating
- Split AC Units / Heat Pumps
- Floor plenum acoustic insulation

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Tenderer's Name.....

Signature..... Date



Conditions of Contract

1

VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhjorth Architects
February 2003
20151 SP141

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

1.1 GENERAL CONDITIONS OF CONTRACT**1.1.1 CONDITIONS OF CONTRACT****General Conditions of Contract**

AS 2124 General Conditions of Contract, 1992 edition issued by Standards Australia.

The Tender Documents do not include a copy of the General Conditions of Contract. A copy of the General Conditions of Contract is available from Standards Australia.

1.1.2 ANNEXURE TO THE CONDITIONS OF CONTRACT PART A- GENERAL CONDITIONS OF CONTRACT

The law applicable is that of the State of Territory of: (Clause 1)	New South Wales
Payments under the Contract shall be made at: (Clause 1)	Sydney, New South Wales
The Principal: (Clause 2)	Pittwater Council
The address of the Principal:	Pittwater Council Unit 11, 5 Vuko Place WARRIEWOOD NSW 2102
The Superintendent: (Clause 2)	Brewster Hjorth Architects Level 2, The Grafton Bond Building 201 Kent Street SYDNEY NSW 2000
Limits of accuracy applying to quantities for which the Principal accepted a rate of rates: (Clause 3.3 (b))	Not applicable
Bill of Quantities - the alternative applying: (Clause 4.1)	Alternative 2
The time for lodgement of the priced copy of the Bill of Quantities: (Clause 4.2)	Not applicable
Contractor shall provide security in the amount of: (Clause 5.2)	Refer separable portions
Principal shall provide security in the amount of: (Clause 5.2)	Refer separable portions
The period of notice required of a party's intention to have recourse to retention moneys and/or to convert security: (Clause 5.5)	Refer separable portions
The percentage to which the entitlement to security and retention money is reduced:	

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(Clause 5.7)	50%
Interest on retention moneys and security - the alternative applying: (Clause 5.9)	Alternative 1
The number of copies to be supplied by the Principal: (Clause 8.3)	3 copies
The number of copies to be supplied by the contractor: (Clause 8.4)	3 copies
The time within which the Superintendent must give a direction as to the suitability and return the Contractor's copies: (Clause 8.4)	10 working days or if more than 5 documents are submitted in any one day, 30 working days.
Work which cannot be subcontracted without approval: (Clause 9.2)	Any work under the Contract.
The percentage for profit and attendance (Clause 11 (b))	Not applicable
The amount or percentage for profit and attendance: (Clause 11 (c))	Not applicable
Insurance of the Works - the alternative applying: (Clause 18)	Alternative 1
The assessment for insurance purposes of the costs of demolition and removal of debris: (Clause 18(ii))	\$250,000
The assessment for insurance purposes of consultant's fees: (Clause 18 (iii))	\$150,000
The value of materials to be supplied by the Principal: (Clause 18 (iv))	Nil
The additional amount or percentage: (Clause 18 (v))	10%
Public Liability Insurance - the alternative applying: (Clause 19)	Alternative 1
The amount of Public Liability Insurance shall be not less than: (Clause 19)	\$20,000,000
The time for giving possession of the Site: (Clause 27.1)	Refer Separable Portions
The date for Practical Completion: (Clause 35.2)	Refer Separable Portions

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Liquidated Damages per week or part thereof: (Clause 35.6)	Refer Separable Portions
Limit of Liquidated Damages: (Clause 35.7)	Refer Separable Portions
Bonus per day for early Practical Completion: (Clause 35.8)	Refer Separable Portions
Limit of Bonus: (Clause 35.8)	Refer Separable Portions
Extra costs for Delay or Disruption: (Clause 36)	Refer Separable Portions
The Defects Liability Period: (Clause 37)	Twelve months after the Date of Practical Completion for each separable portion.
The charge for overheads, profit, etc. for Daywork: (Clause 41(f))	10%
Times for payment claims: (Clause 42.1)	For the first payment claim, the date being 1 month after the date upon which the Contractor is given possession of the Site and, thereafter, on the same day in each month occurring after that date (subject to Clause 42)
Unfixed plant and materials for which payment claims may be made notwithstanding that they are not incorporated in the Works: (Clause 42.1 (ii))	No items
Retention moneys on: (Clause 42.3)	Not applicable
Unfixed Plant or Materials - the alternative applying: (Clause 42.4)	Alternative 1
The rate of interest on overdue payments: (Clause 42.9)	The maximum rate last quoted by the Reserve Bank of Australia plus 2% p.a.
The delay in possession of the Site which shall be a substantial breach: (Clause 44.7)	Three months
The alternative required in proceeding with dispute resolution: (Clause 47.2)	Alternative 2
The person to nominate an arbitrator: (Clause 47.3)	The President of the Royal Australian Institute of Architects.
Location of arbitrator (Clause 47.3)	New South Wales

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Separable Portion A

1	Separable Portion:	New library building, including new link building and all external works other than those immediately adjacent to the new early Childhood Centre.
2	Contractor shall provide security in the amount of: (Clause 5.2)	On the terms set out in Clause 5 of the AS 2124 - 1992 the Contractor shall provide security in the amount of 5% of the Contract Sum to secure performance of all separable portions and that Sum shall be held until Practical Completion of the whole of the Works and then half of that Sum shall be returned, with the balance to be returned on Final Completion of the whole of the Works.
	Principal shall provide security in the amount of:	Nil
	The period of notice required of a party's intention to have recourse to retention moneys and/or to convert security: (Clause 5.5)	5 days
3	The time for giving possession of the site a (Clause 27.1)	1 week after acceptance of tender
3	The Date for Practical Completion b (Clause 35.2)	To be advised by Tenderer
4	Liquidated Damages per day: (Clause 35.6)	\$1500.00 per day
5	Limit of Liquidated Damages (Clause 35.7)	No Limit
6	Bonus per day for early Practical Completion: (Clause 35.8)	Not Applicable
7	Limit of Bonus: (Clause 35.8)	Not Applicable
8	Extra Costs for Delay or Disruption:	Clause 35.5 (b) (i), (Principal's delays), 35.5 (b) (iii), (latent conditions), 35.5 (b) (iv) (variations), shall be paid at the tendered rate applicable for the Separable Portion, but all other extensions of time shall be at the Contractors cost entirely.
9	Defects Liability Period	12 months from the date of Practical Completion of the whole of the works.

Separable Portion B

1	Separable Portion:	Refurbishment of existing Memorial Hall
2	Contractor shall provide security in the amount of: (Clause 5.2)	On the terms set out in Clause 5 of the AS 2124 - 1992 the Contractor shall provide security in the amount of 5% of the Contract Sum to secure performance of all separable portions and that Sum shall be held until Practical Completion of the whole of the Works and then half of that Sum shall be returned, with the balance to be returned on Final Completion of the whole of the Works.
	Principal shall provide security in the amount of:	Nil
	The period of notice required of a party's intention to have recourse to retention moneys and/or to convert security: (Clause 5.5)	5 days
3 a	The time for giving possession of the site (Clause 27.1)	1 January 2004
3 b	The Date for Practical Completion (Clause 35.2)	31 January 2004
4	Liquidated Damages per day: (Clause 35.6)	\$500 per day
5	Limit of Liquidated Damages (Clause 35.7)	No Limit
6	Bonus per day for early Practical Completion: (Clause 35.8)	Not Applicable
7	Limit of Bonus: (Clause 35.8)	Not Applicable
8	Extra Costs for Delay or Disruption:	Clause 35.5 (b) (i), (Principal's delays), 35.5 (b) (iii), (latent conditions), 35.5 (b) (iv) (variations), shall be paid at the tendered rate applicable for the Separable Portion, but all other extensions of time shall be at the Contractors cost entirely.
9	Defects Liability Period	12 months from the date of Practical Completion of the whole of the works.

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Separable Portion C

- | | | |
|---|---|--|
| 1 | Separable Portion: | Extension to existing library building adjacent to Park Street, (for Early Childhood Health Centre) including adjacent external works and;

Internal Refurbishment of Existing Library building and all other works required to complete the contract works. |
| 2 | Contractor shall provide security in the amount of:
(Clause 5.2) | On the terms set out in Clause 5 of the AS 2124 - 1992 the Contractor shall provide security in the amount of 5% of the Contract Sum to secure performance of all separable portions and that Sum shall be held until Practical Completion of the whole of the Works and then half of that Sum shall be returned, with the balance to be returned on Final Completion of the whole of the Works. |
| | Principal shall provide security in the amount of: | Nil |
| | The period of notice required of a party's intention to have recourse to retention moneys and/or to convert security:
(Clause 5.5) | 5 days |
| 3 | The time for giving possession of the site
a
(Clause 27.1) | 1 week after Date for Practical Completion of Separable Portion A |
| 3 | The Date for Practical Completion
b
(Clause 35.2) | To be advised by Tenderer |
| 4 | Liquidated Damages per day:
(Clause 35.6) | \$1500.00 per day |
| 5 | Limit of Liquidated Damages
(Clause 35.7) | No Limit |
| 6 | Bonus per day for early Practical Completion:
(Clause 35.8) | Not Applicable |
| 7 | Limit of Bonus:
(Clause 35.8) | Not Applicable |
| 8 | Extra Costs for Delay or Disruption: | Clause 35.5 (b) (i), (Principal's delays), 35.5 (b) (iii), (latent conditions), 35.5 (b) (iv) (variations), shall be paid at the tendered rate applicable for the Separable Portion, but all other extensions of time shall be at the Contractors cost entirely. |
| 9 | Defects Liability Period | 12 months from the date of Practical Completion of the whole of the works. |

1.2 SPECIAL CONDITIONS OF CONTRACT

This section outlines Special Conditions to the Contract and is referred to as Annexure Part B to the Australian Standards AS 2124 - 1992 General Conditions of Contract

1.2.1 FORM OF SECURITY

Amend the GENERAL CONDITIONS OF CONTRACT, Clause 5.3, Form of Security as follows:

Delete the first paragraph and replace with:

"The security shall be in the form of cash or an approved unconditional undertaking given by an approved financial institution".

1.2.2 NOTIFICATION

Amend the GENERAL CONDITIONS OF CONTRACT, Clause 12.2 Notification as follows:

The first two lines of the second paragraph are amended as follows:

"The Contractor shall provide in that notice to the Superintendent a statement in writing specifying—"

1.2.3 PAYMENT WHERE THERE IS NO VARIATION:

Amend the GENERAL CONDITIONS OF CONTRACT, Clause 14.2, Payment Where There is No Variation as follows:

Delete the following words from item (a):

"The 28th day prior to".

1.2.4 NOTICES AND FEES

Amend the GENERAL CONDITIONS OF CONTRACT, Clause 14.3 Notices and Fees as follows:

Amend the first sentence of paragraph 4 to read:

"If after the closing of tenders, there is required to be paid by the Contractor to a municipal, public or statutory authority in relation to the Works or the Temporary works —".

1.2.5 SETTING OUT THE WORKS

Delete the GENERAL CONDITIONS OF CONTRACT, Clause 28.1 setting out.

1.2.6 WORKING DAYS

Amend the GENERAL CONDITIONS OF CONTRACT, Clause 32 Working Days as follows:

The following three paragraphs replace the two paragraphs:

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"The permissible working hours and working days shall be as stated in the Contract and shall not be varied without the prior approval of the Superintendent except when in the interests of safety of the work under the Contract or to protect life or property the Contractor finds it necessary to carry out work outside the working hours or on other than the working days stated in the Contract. In such cases the Contractor shall notify the Superintendent in writing of the circumstances as early as possible.

All costs attributable to the supervision by or on behalf of the Principal of work during times approved pursuant to the last paragraph shall be borne by the Principal, except where a variation to the working hours or working days is approved by the Superintendent for the convenience of the Contractor."

1.2.7 EXTENSION OF TIME FOR PRACTICAL COMPLETION

Amend the GENERAL CONDITIONS OF CONTRACT, Clause 35, Extension of Time for Practical Completion as follows:

(a) Insert after the word "promptly" in the first paragraph the words:

"and in any event within five working days of it becoming evident to the Contractor or the delay occurring, whichever is sooner."

(b) Amend item (a), line commencing with "reasonable control" by deleting the words "including but not" and replacing the words "-industrial conditions" (page 28 line 48) with:

"an industrial strike which is industry wide and not specific to the site or the Contract."

(c) Amend item (b), as by deleting items (ii) and (v).

(d) At page 28 line 37 insert the following:

"The Contractor shall not be entitled to an extension of time unless the Contractor has taken all practical steps to keep any such delay and disruption to a minimum and has notified the Superintendent in writing as required by clause 35.5."

(d) Delete the paragraph beginning "If the Contractor is or will" (page 28 lines 40-44) and include the following:

If the Contractor desires an extension of time for Practical Completion, the Contractor shall within twenty-eight days after a delay occurs give the Superintendent a written claim. Claims for extension of time shall include:

- (i) the nature, principal cause and extent of the delay
- (ii) the times, day and dates on which a delay is claimed
- (iii) a copy of the current construction schedule marked to show the trades and the areas of the project in which those trades were working at the date of the delay claimed, and how the delay has caused Practical Completion to be delayed, and
- (iv) where applicable, any documentary evidence which may support the claim.

With the claim, the Contractor shall give the Superintendent written notice of the number of day's extension claimed. Where the claim includes a claim for monetary costs due to the delay, this shall be stated in the claim, together with all evidence of all those things stated.

Claims for extensions of time shall be assessed on the basis of the information presented and other information available to the Superintendent. Claims which do not include the above information may be rejected on the basis that insufficient information has been made available to properly assess the claim.

The smallest delay shall be one quarter of a day. Claims for less than one-quarter of a day will not be considered.

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At the start of the paragraph commencing "Notwithstanding" (page 29 line 39) insert the following words:

"For the benefit and at the written request of the Principal."

Amend the GENERAL CONDITIONS OF CONTRACTS Clause 36 is deleted and replaced with the following:

1.2.8 DELAY AND DISRUPTION COSTS

Amend the GENERAL CONDITIONS OF CONTRACT Clause 36 Delay or Disruption Costs as follows:

Delete Clause 36 and replace with the following:

36. Delay or Disruption Costs

36.1 Extra Costs

Where the Contractor has been granted an extension of time for the Date for Practical Completion under Clause 35 for any delay caused by the Principal, the Superintendent or the Principal's employees, consultants, other contractors or agents of the Principal or for a variation or latent condition, the Principal shall pay the Contractor such extra costs by reason of the delay at the rate per day stated in the Annexure A as full satisfaction for any cost, loss or damage by reason of the delay.

36.2 Release

The Principal's liability for cost, loss or damage arising out of or associated with the delay or for the act, omission, default or the breach of contract or tort or breach of statutory or other duty arising out of or associated with the delay or its cause shall be fully discharged and satisfied by payment of the amount required by Clause 36.1.

1.2.9 GOODS AND SERVICES TAX

The GENERAL CONDITIONS OF CONTRACT shall include the following additional clause Goods and Services tax as follows:

The Contract Sum will be GST exclusive. With each progress claim the contract shall itemise separately the GST payable on that claim.

Each party to the Agreement warrants that at the time any supply is made under this Agreement that it is or will be registered under the GST legislation. If either party requests evidence of such registration the other will promptly produce evidence satisfactory to the party seeking the evidence.

1.2.10 ADDITIONAL SPECIAL CONDITIONS

Add to the GENERAL CONDITIONS OF CONTRACT the following special conditions:

1. Principal Contractor

The Owner hereby appoints the Contractor as Principal Contractor for the Site and authorities and directs him to take all necessary steps to ensure all necessary and prudent health and safety precautions are taken and all statutory and other responsibilities are fully discharged as required by the Occupational Health and Safety Act 2000 and the Occupational Health and Safety Regulations 2001.

2. Handover Plan and Procedures

1. The contractor shall in consultation with the Superintendent produce a handover plan to the Superintendent's satisfaction at least 30 days prior to the Date for Practical Completion nominated in this Contract and provide the Superintendent and the Principal with a copy.
2. The Handover Plan shall specify in detail the procedures to be followed by the Contractor to ensure that the Works are fully and finally complete by the date for Practical Completion.

3. Notification of Claims

Notwithstanding anything contained herein and without limiting the generality of any thing herein contained, any claim by the contractor for other than or additional to the amount of the Contract Sum as at the date of the contract including any claim for variation, or latent conditions, must be notified to the Superintendent in writing within 14 days of the first of the events on which the Contractor relies to establish the entitlement or earlier if so required by any other clause of this contract. The notification must include full details of the basis of the claim and the facts and circumstances on which is based, including reference to any instruction which may have been provided by the Superintendent and full details of any amount claimed including a calculation, clearly set out and including all workings of all those items which form the total claimed adjustment using the various rates for costs of labour and materials taken from the agreed rates included in the Contract. If notification in accordance with this clause is not given as required by this clause the claim shall be barred and if given shall be limited in any event to the amount of the amount so notified.

4. Payment

Any payment required of the Principal under this Contract is subject to any proper defence or set off under the Contract or otherwise.

BREWSTER HJORTH ARCHITECTS

Conditions of Contract

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Schedule of Documents

2

VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhjorth Architects

February 2003

20151 SP135

ISSUE	DATE	ISSUE
A	26.02.03	Preliminary
B	28.02.03	Tender Issue

VILLAGE PARK REDEVELOPMENT MONA VALE

2.1 GENERAL

Specified in this Section

This Section lists the Drawings and Specifications that are part of the Contract.

2.2 DRAWINGS

Architectural No.	Drawing	Issue
A01	Cover Sheet	A
A02	Site Plan / Staging	A
A03	Site Demolition Plan	A
A04	Level 1 Plan - Library	A
A05	Level 1 RCP- Library	A
A06	Level 2 Plan - Podium	A
A07	Level 2 RCP & Roof Plan - Podium	A
A08	Level 1 & 2 Council Offices - Demolition & New Works	A
A09	Level 1 & 2 Council Offices - Roof Plan & RCP's	A
A10	Sections & Elevations, Sheet 1	A
A11	Sections & Elevations, Sheet 2	A
A12	Sections & Elevations, Sheet 3	A
A13	Wall Sections, Sheet 1	A
A14	Wall Sections, Sheet 2	A
A15	Wall Sections, Sheet 3	A
A16	Wall Sections, Sheet 4	A
A17	Wall Sections, Sheet 5	A
A18	Wall Sections, Sheet 6	A
A19	Plan Details	A
A20	Construction Details Sheet 1	A
A21	Construction Details Sheet 2	A

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A22	Stair/Ramp/Handrail Details	A
A23	Window Schedule Sheet 1	A
A24	Window Schedule Sheet 2	A
A25	Window Schedule Sheet 2	A
A26	Wet Area Details Sheet 1	A
A27	Wet Area Details Sheet 2	A
A28	Joinery Details 1	A
A29	Joinery Details 2	A
A30	Joinery Details 3	A
Structural No.	Drawing	Issue
BS000	Cover Sheet	02
BS001	General Notes - Sheet 1	02
BS002	General Notes - Sheet 2	02
BS005	Library Level 1 Concrete Profile Plan	02
BS006	Library Level 1 Bottom Reinforcement Plan	02
BS007	Library Level 1 Top Reinforcement Plan	02
BS008	Library Level 1 Details - Sheet 1	02
BS009	Library Level 1 Details - Sheet 2	02
BS010	Library Level 2 Concrete Profile Plan	02
BS011	Library Level 2 Bottom Reinforcement Plan	02
BS012	Library Level 2 Top Reinforcement Plan	02
BS013	Library Level 2 Details	02
BS015	Early Childhood Centre and Existing Building Ground Floor Modification Plans and Details	02
BS016	Existing Building Level 2 Modification Plans	02
BS017	Existing Building Level 2 Modification Details	02
BS018	Early Childhood Centre and Existing Building Roof Modification Plan and Elevations	02

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BS019	Early Childhood Centre and Existing Building Roof Details	02
BS020	Lantern Steel Work Roof Framing Plan and Sections	02
BS021	Lantern Steel Work Details	02

Hydraulic No.	Drawing	Issue
H01	Hydraulic Services - Cover, Notes and Legend	D
H02	Existing Hydraulic Services - Site Plan	D
H03	Hydraulic Services - Level 1 Sanitary Drainage	D
H04	Hydraulic Services - Level 1 Water and Gas Supply	D
H05	Hydraulic Services - Level 2 Sanitary Drainage	D
H06	Hydraulic Services - Level 2 Water and Gas Supply	D
H07	Hydraulic Services - Offices Sanitary Drainage	D
H08	Hydraulic Services - Offices Water and Gas Supply	D

Electrical No.	Drawing	Issue
01832-E-01	Legend	B
01832-E-02	Electrical Site Plan	B
01832-E-03	New Library Level 1 Power, Communications and Security Layout	B
01832-E-04	Council Offices Power, Communications and Security Layout	B
01832-E-05	New Library Level 1 Lighting, Fire Detection and PA Layout	B
01832-E-06	New Library Podium Level Lighting Layout	B
01832-E-07	Council Offices Lighting, Fire Detection Layout	B
01832-E-08	Electrical Single Line Diagram and Communications Details	B

Mechanical No.	Drawing	Issue
01832-M-1001	Legend	B

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01832-M-1002/1	Duct Installation Details Sheet (1 of 2)	B
01832-M-1002/2	Duct Installation Details Sheet (2 of 2)	B
01832-M-1003	New Library and Existing Building Equipment Schedules	B
01832-M-2001	New Library Ground Floor AC and Ventilation Layout	B
01832-M-2002	New Library Ground Floor AC and Ventilation Details	B
01832-M-3001	New Library Heating and Chilled Water Layout	B
01832-M-4001	New Library Air Handling Plantroom Layout	B
01832-M-5001	New Library Air Handling Plantroom Sections	B
01832-M-6001	New Library Air Side Control Schematic	B
01832-M-6002	New Library Heating and Chilled Water Control Schematic	B
01832-M-7001	New Library Single Line Power Diagram	B
01832-M-8001	New Library Heating and Chilled Water Schematic	B
01832-M-9001	Council Office Existing Services Layout	B
01832-M-9002	Council Office and Community Hall AC and Ventilation Layout and Controls	B

Civil Drawing No.	Drawing	Issue
CA001	Sediment and Erosion Control Plan	02
CA002	Stormwater Layout Plan	02

Landscape No.	Drawing	Issue
LA00	Cover Sheet	D
LA01	Courtyard and Community	D
LA02	Library Podium Layout Plan	D
LA03	Library Podium Planting Plan	D
LA04	Grass Terraces	D
LA05	Landscape Sections 1	D
LA06	Landscape Sections 2	D

2.3 SPECIFICATIONS

- Architectural and Structural (this document)
- Electrical Services Specification
- Mechanical Services Specification
- Hydraulic Services Specification
- Lift specification
- Landscape Specification

**General
Requirements**

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects
February 2003
20151 SP120

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

3.1 GENERAL

3.1.1 SCOPE

Specified in this Section

This Section includes, but is not limited to general administrative requirements essential to the use and interpretation of the Specification.

3.1.2 REFERENCED DOCUMENTS

Generally

Australian standards and other documents are referenced by their standard number throughout the specifications. Refer to *Referenced Documents* clause in each section for details.

Where a more current standard has been published this will take precedent to the nominated standard. Current editions will include editions up to date of commencement of tender.

3.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1742.3	1996	Manual of uniform traffic control devices - Traffic control devices for works on roads
AS/NZS 1801	1997	Occupational protective helmets
AS 2436	1981	Guide to noise control on construction, maintenance and demolition sites

3.1.4 INTERPRETATION

General

Unless the context otherwise requires, the following definitions apply:

- Directed: "directed", "required", "rejected", and similar expressions, shall mean approved, directed, required, rejected, and the like, by the Superintendent unless otherwise stated.
- Supply: "Supply", "allow", "provide", "install", "carry out" and similar expressions, shall mean "supply and fix" or "supply and install" unless expressly stated to the contrary. If in doubt, refer to the Superintendent.
- Review: "Reviewed", "directed", "rejected", "endorsed" and similar expressions mean "reviewed (directed, rejected, endorsed) in writing by the Superintendent" unless otherwise stated.
- Give notice: "Give notice", "submit", "advise", "inform" and similar expressions mean "give notice (submit, advise, inform) in writing to the Superintendent" unless otherwise stated.
- Obtain: "Obtain", "seek" and similar expressions mean "obtain (seek) in writing from the Superintendent".
- Include: "including" (includes, include and the like) shall mean "including, but not limited to".
- Element: "element" generally has the same meaning as item or object.

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- Authority: "Authority" means all Commonwealth, State, Territorial or Local Government departments, bodies, instrumentalities and other public authorities which in any way affect or are applicable to the performance of the Works.
- Proprietary: "Proprietary" mean identifiable by naming manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
- Samples: Includes samples, prototypes and sample panels.

Technical

Zinc-coated steel: Includes zinc-coated steel, zinc/iron alloy-coated steel, and aluminium/zinc-coated steel.

Pipe: Includes pipe and tube.

Maintenance Period

Co-extensive with the defects liability period.

3.1.5 DIRECTIONS TO CONTRACTOR**Imperatives**

Directions, instructions and the like given in this Specification, whether or not they include the expression "the Contractor shall" or equivalent, shall be deemed to be given to and accepted by the Contractor, unless otherwise stated in the Contract.

3.2 STATUTORY REQUIREMENTS**3.2.1 COMPLIANCE****Requirement**

The Authorities, their statutes, regulations and by-laws, may include the following:

- The Pittwater Council applicable building and health requirements including those things specifically contained in the Development Consent.
- The Australian Telecommunications Authority (Austel).
- The Fire and Accidents Underwriters.
- Energy Australia.
- NSW Fire Brigade, Fire Safety Division.
- Roads and Traffic Authority.
- Sydney Water.

Compliance

Fulfil the proprietor's obligations under the Development Consent, specifically the following conditions.

Development Consent: NO730/02, dated 26 November 2002.

- Conditions: *The Development Consent Schedule of Required Actions* nominates conditions which are required to be completed by the Contractor as part of the Contract works.

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- Some conditions refer to requirements in Australian Standards. The Contract Documents outline the design to comply with these Standards, unless otherwise stated. The Contractor shall construct the works in accordance with the Contract Documents and any additional construction and installation requirements of the standard.

Construction Certificate dated: *to be advised*

The contractor shall fulfil the proprietor's obligations under the Construction Certificate.

3.2.2 TRAFFIC & PEDESTRIAN SAFETY

Requirement

Ensure minimal disruption to the flow of traffic to Pittwater Road, Park Street and Barrenjoey Road caused by the construction works. The Contractor shall provide all traffic controls to ensure the safety of all persons using the roadway and all persons on site. All traffic control facilitates and procedures shall be undertaken in accordance with AS 1742.3.

Ensure safety management plan is put in place to ensure pedestrian safety from and adjacent to site.

Diversion: If necessary provide for the diversion of vehicular and/or pedestrian traffic, either by an alternate route or by some other method approved by the local Authority.

Do not:

- Obstruct public roads;
- Obstruct footpath;
- Damage public or private utilities, telegraph lines, etc; and
- Obstruct any drain or watercourse.

Cost: Should any obstructions or damage occur, promptly restore access and repair damage. In addition to any other remedy, the cost of such rectification work shall be a debt due from the Contractor to the Principal.

Trained Traffic Controllers

The contractor shall advise the superintendent of the names of all proposed traffic controllers with a signed declaration that they are appropriately trained in the duties of traffic controllers in accordance with AS 1742.3

All personnel working in close proximity to traffic shall wear high visibility clothing to the requirements of AS 1742.3

3.3 SPECIALIST CONTRACTORS

3.3.1 APPROVED LANDSCAPE CONTRACTOR

Requirement

The Landscape subcontractor, undertaking all works outlined in Landscape Architects documents is required to be a member of NSW Landscape Contractor's Association.

The Contractor shall provide details of the Landscape subcontractor for approval prior by Superintendent to commencing landscape works.

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3.3.2 WORK BY OTHERS**Requirement**

During the Contract, work may be carried out by separate Contractors for work adjacent to the site. These separate contractors will be engaged by the principal. The Contractor shall allow for the coordination of the separate Contractors works with the Contract Works. All allowances for such coordination shall be included as part of the Contract Sum.

Separate Contractors

- Upgrading of Park Street and Public car park west of existing hall (Bulk of works to be completed prior to Commence of Contract Works).
- Library book security system.
- Electronic customer ticketing systems to Council Customer Service Area
- Loose Furniture and Fitout
- General Data and Communication Systems hardware and equipment fitout, installation and testing.

3.4 DOCUMENTS**3.4.1 CONTRACT DOCUMENTS****Minor items**

The Contractor shall, without adjustment to the Contract Sum, supply and execute minor items not expressly mentioned in the Contract but necessary for the proper execution, completion and performance of the work under the Contract.

Work not fully detailed

Where any item of work is not wholly indicated and/or detailed on the Drawings, carry out and complete the item so as to correspond with work of a similar nature drawn in detail elsewhere on the Drawings, and in accordance with the Specification. If in doubt, refer to the Superintendent.

Continuity of drawings

In the case of Drawings which continue over two or more pages, notes on one page referring to elements of the works will apply to those elements of the Works as they continue on adjoining Drawings subject to the Superintendents direction.

Subcontractor's information

No variation shall be entertained by the Superintendent due to Subcontractors or suppliers being provided insufficient Contract Documents or amended Contract Documents. All subcontractors and suppliers should be provided with a complete set of documentation.

Diagrammatic layouts

Layouts of service lines, plant and equipment shown on the drawings are diagrammatic only, except where figured dimensions are provided or calculable. Before commencing work, obtain measurements and other necessary information.

Service layouts

The layout of service routes is approximate only. In setting out they shall be read in conjunction with and coordinated with the other services Drawings for the Project. Make due allowance for all necessary diversions from the straight line, rise and fall and adjustment and positions of equipment as may be required for the proper execution of the works.

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Existing work

If the Works include alterations and/or additions to existing work, verify the dimensions of the existing work before proceeding, and notify discrepancies as required by the Contract.

Levels

Spot levels take precedence over contour lines and ground profile lines.

Complementary Documents

The Contract Documents shall be read as complementary documents and what is required by or contained in one of them shall be as binding as if required by or contained in all of them.

Precedence

Where any discrepancy or inconsistency involves figured dimensions and scaled dimensions then figured dimensions shall take precedence over scaled dimensions. Drawings made to larger scales and those showing particular parts of the Works shall take precedence over drawings made to smaller scales and those for more general purposes.

Mutually Binding

Items shown on one Drawing or Drawings, but not on others, shall be assumed to be included in the Contract, unless deleted by the Superintendent. Note this includes item of work which may be shown on either architectural or engineering documents.

Conflicting Quantities

If the quantity of an item varies between the Drawings and/or the Specification, it shall be assumed that the larger quantity has been included in the Contract, unless otherwise directed by the Superintendent.

Conflicting Requirements

If doubt exists as to whether the design is able to comply with the relevant authorities regulations, a referenced standard, or a conflict exists between referenced standards, notify the Superintendent prior to the commencement of any work. No consideration of a claim for redundant work shall be considered if the Superintendent is not notified.

Conflicting Items

If an item varies between documents, it shall be assumed that the work of the larger value has been included in the Contract, unless otherwise directed by the Superintendent.

3.5 ADMINISTRATION**3.5.1 PROGRAM OF WORK****Construction Program**

Not later than two weeks after the Date for Possession of the Site, supply a construction program showing the sequence of work, the critical path of activities related to the work, the dates by which or the time within which the various stages or parts of the work are to be executed, and any other information specified to be provided.

Revisions

Revise the construction program each fortnight in the light of the progress of the work and submit a revision with each progress claim.

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Construction Program Chart

Mount and display in the Contractor's site office a bar chart or network diagram based on the construction program and kept up to date.

Information: The program shall show:

- Which days are workdays. Allow for restrictions on working time and contingencies for which the Contractor is responsible under the Contract. This shall include, but not be limited to weekends, holidays, Christmas closedown, union designated and other days off and manufacture and trade delays.
- The order of, and the periods allowed for, all significant activities.
- Details of the programmed Works, and the time relationship to the Works of all significant tasks specified to be undertaken or proposed to be undertaken by subcontractors and suppliers, both on and off site.
- The relevant time, site or the like restraints imposed by the contract documents and the significant milestones including separable portions, if any.
- Appointment of Subcontractors and their construction program.
- Order dates, supply lead time and Site delivery dates for all major items, including those to be supplied by the Principal, as well as details of off-site manufacturing and fabrication activities.
- The time allowed for testing and commissioning of major items of plant or equipment.
- The sequence of the activities which form the critical path(s) for the project.
- The dates by which or the time within which the various stages or parts of the work are to be executed.
- The differences or divergences from the Tender Program.

3.5.2 SCHEDULE OF SUBMISSIONS**Requirement**

The Contractor must forward to the Superintendent prior to submitting the first progress payment a procurement schedule for submissions required by the Contractor as part of the Contract.

The program shall show dates when the following are to occur:

- Provision and review of shop drawings.
- Supply of samples required.
- Supply of specialised materials and off site activities, such as the manufacture or prefabrication of key items.
- Supply of imported or long lead time items such as tiling and light fittings.

Revisions

When in the opinion of the Superintendent, an updated schedule is required, the Contractor must promptly prepare an updated schedule which must incorporate all or any changes in the items set out above.

3.5.3 PROJECT STAGING/APPROVED WORKING HOURS**Working Hours**

The permitted working times on site shall be in accordance with Pittwater Councils Development Consent - Condition D89.

Staging/Working Restrictions

The contractor must cater for the following minimal operational requirements for facilities within the Village Park precinct during the construction period:

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Element	Restriction
Existing Library Building	<p>The existing library is to operate until it can be relocated into the new library area following Practical completion of Separable Portion A.</p> <p>The contractor shall maintain safe and convenient public access to the library at all times during the works. The contractor should note that the average visitations to the library is in excess of 800 people per day.</p> <p>The hours of operation of the library are as follows:</p> <ul style="list-style-type: none"> - Mon – Wed (8:00am to 7:00pm) - Thurs – Fri (8:00am to 6:00pm) - Sat (9:00am to 2:00pm) - Sun (12:00am to 5:00pm) <p>The south western corner of the library may be vacated from the commencement of construction to allow the construction of the link building to proceed.</p> <p>For operational reasons Councils preference would be to maintain the existing library entrance until relocation into the new library facility.</p> <p>Miscellaneous works, which will not effect the operation of the library, can be undertaken outside library opening hours. Prior approve is required before undertaking any such works.</p>
Existing Early Childhood Centre	<p>This building is available for demolition from date of Possession.</p> <p>The Early Childhood Health Centre will be temporarily relocated during the construction period. No access to the site will be required prior to Practical Completion (Separable Portion B).</p>
Existing Memorial Hall Building	<p>Council uses the Memorial Hall every Monday night for Council Meetings throughout the year with the exception of the month of January where Council meetings are not held. In addition the hall has regular bookings from individuals and community groups during all months of the year. Council is keen to minimise the disruption to these bookings during this portion of the works.</p> <p>The contractor shall maintain safe and convenient access to the Memorial Hall at all times during the works. This would include access to the main entrance door and western entrance door.</p> <p>Public access to the eastern exit doors may be restricted during the works however the contractor shall note that these doors will be required to operate as emergency exits at all times the hall is in use.</p> <p>Access to the external accessible toilet must also be maintained at all times.</p> <p>The contractor shall maintain the integrity of existing security for the hall at all times during the project.</p> <p>Maintain safe and clear pedestrian access around the site at all times via the existing pathway on the western side of the hall.</p>
Existing Public Amenities in	<p>The contractor shall maintain at all times safe and convenient access to the</p>

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Park Street	existing public toilets attached to the northern side of the Memorial Hall.
Village Park (east)	<p>Generally access through the park to the site shall not be permitted unless agreed to by the principal. Works within the park area (eg. stormwater drainage / detention and approved stockpiling of excavated materials only) shall be undertaken in a manner, which minimises public inconvenience or disruption.</p> <p>Stockpiling of other building materials / site sheds etc will not be permitted within the grassed park area.</p> <p>Council operates a regular noodle market on Friday nights throughout the summer months. Many thousands of people often attend these markets. As such the contractor shall ensure that the works do not effect the operation of these markets. Further the contractor should pay particular attention to site fencing and public safety.</p> <p>Safe and convenient access to the existing children's playground shall be maintained at all times during the works.</p> <p>All stockpiles and/or sedimentation controls etc shall be wholly maintained within the secure site fencing provided by the contractor</p> <p>The contractor will be required from time to time to adjust the location of site fencing to maximise the space available for public use of the park and it's surrounds.</p>

3.5.4 SITE MEETINGS**Required Meetings**

Throughout the duration of the Contract, attend meetings (as required by the Superintendent) and arrange for attendance of appropriate Subcontractors.

Notice to Attend

Provide all persons required to attend each site meeting with a minimum of three working days notice prior to each meeting.

Contacts

At the first site meeting submit the names and telephone numbers of all responsible persons who may be contacted after hours during the course of the Contract.

3.5.5 INSPECTION**Notice**

Give notice, nominated in specific specification section so that the Superintendent may attend and inspect items under the Contract. When applicable, similarly organise but with sufficient notice, the authorised representative of the relevant authority(s).

Days

The Superintendent shall not be available for inspections on:

- Saturdays and Sundays
- Statutory or Public Holidays
- one working day prior to Christmas Eve until one working after the New Years Day Statutory Holiday, inclusive.

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Covering Up

If the Specification requires notice of inspection to be given in respect of any part of the work under the Contract, that part of the work shall not have further work placed thereon or be covered up or put out of view without the prior approval of the Superintendent.

Insufficient Notice

If the Superintendent is unable to attend an inspection due to insufficient notice, the Superintendent may order the test to be repeated at the Contractor's cost. No claim for delay shall arise from the giving of insufficient or unreasonably short notice.

3.5.6 QUALITY REQUIREMENTS**Quality Requirements**

The Contractor Shall:

- (a) Comply with all the quality requirements as provided in the contract documents for all works under the Contract.
- (b) Ensure that each of its Subcontractors and Consultants comply in like manner.
- (c) Demonstrate to the Principal whenever required that all the quality requirements of the contract are being met.

Where inappropriate or inadequate provision of quality supervision by the Contractor or Contractor's Subcontractor results in costs, losses or damages incurred by the Principal or claims by third parties against the Principal for either direct or consequential costs, losses or damages, the Contractor shall be liable for costs, losses or damages associated with any claim including but not limited to administration costs incurred by the Principal in resolving such claim.

3.5.7 OCCUPATIONAL HEALTH AND SAFETY (OH&S)**General**

The contractor shall ensure that all

- Staff of the Contractor;
- Separate Contractors;
- Sub-contractors and
- All other parties providing labour, equipment or services on site;

Comply with the provisions of the Occupational Health and Safety Act 2000 and the Occupational Health and Safety Regulation 2001 as amended from time to time.

Risk Assessment

The Principal Contractor will conduct and document a Risk Assessment of the site and any foreseeable hazards that have the potential to harm the health or safety of any person accessing, using or egressing the site. Appropriate control measures to minimise the risk shall be implemented. Monitoring and review of the control measures will be undertaken regularly.

OHS&R Induction Training

The Principal Contractor will ensure that all staff on site have attended Occupational Health & Safety Induction training and records for this training will be maintained for a period of three years.

Safety Management Plan

Prepare and submit a Safety Management Plan for the work under the Contract. Include in the Plan the following:

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Part A - Statement of Responsibilities

List in the Statement of Responsibilities the names and positions of persons who will be responsible on the Site to:

- manage compliance with occupational health, safety and rehabilitation legislation, regulations, standards and codes;
- assess subcontractors' capabilities initially and ensure they meet occupational health and safety requirements during the Contract;
- manage the acquisition and dissemination of occupational health, safety and rehabilitation information to managers, supervisors and the work force;
- conduct induction and safety training;
- maintain first aid stocks and provide first aid; and
- manage accident and emergency procedures.
- The Principal Contractor will maintain a Hazardous Substance Register notifying all Hazardous materials on site.

Where more than one person is responsible for any one of these functions indicate the extent of each person's responsibilities.

Ensure a copy of the Statement of Responsibilities is provided to all persons named as having responsibilities.

Incident Management

Before commencing any work under the Contract, nominate the persons who will be available during and outside normal working hours, to prevent, prepare for, respond to and recover from incidents. Nominate procedures for contacting them. Notify superintendent promptly of any changes to such nominations and procedures.

Part B - Site Safety Rules

Prepare Site Safety Rules and ensure they are displayed on notice boards and other suitable locations on the Site and are provided to all personnel who may work on the Site or visit the Site. Include rules for:

- induction and safety training - ensuring adequate training is provided to personnel working on the Site;
- ensuring safety helmets (to AS/NZS 1801) and safety footwear are worn by all Contractor's employees, agents and visitors on the Site;
- entry to, movement on, and exit from the Site - ensuring only authorised access to the Site and to areas of work, and ensuring the safe movement of persons, vehicles and equipment whilst on the Site;
- accident and emergency procedures - ensuring first aid and facilities are clearly identified and all persons are made aware of accident and emergency procedures;
- protection of all workers and the public on or near the Site - ensuring the use of effective barricades, fencing and overhead protection;
- working at or above 1.8 metres in height - ensuring all such work is performed in accordance with the WorkCover Code of Practice for Safe Work on Roofs and relevant construction safety legislation, regulations, standards and codes; and
- electrical work, installations and equipment - ensuring all such work and equipment complies with the WorkCover Code of Practice - Electrical Practices for Construction Work and construction and electrical safety legislation, regulations, standards and codes.

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Part C - Safe Work Method Statements

Prepare Safe Work Method Statements for all work activities with a significant risk (such as working at or above 1.8 metres in height, working with or near hazardous substances, working in confined spaces, working in deep excavations). Include in Safe Work Method Statements:

- description of the work;
- name and qualifications of the person or persons who will supervise the work;
- name and qualifications of the person or persons who will inspect and approve work areas, work methods, protective measures, plant, equipment and power tools;
- potential risks associated with the work;
- identification of health and safety related standards or codes applicable to the work and where these are kept;
- what training is given to persons involved with the work;
- all precautions to be taken to protect health and safety; and
- all health and safety instructions to be given to employees involved with the work.

Submission

Supply Parts A and B of the Plan to the Superintendent no later than 7 days before commencement of work on the Site. Supply Safe Work Method Statements (PART C) to the Superintendent no later than 7 days before affected parts of the work under the Contract commence.

Prohibition and Improvement Notices (PIN's) and on-the-spot fine

Immediately notify the Superintendent of any PIN or on-the-spot fine issued by WorkCover Authority. Provide the Superintendent with a copy of the PIN or fine notice and written details of the corrective action taken by the Contractor to rectify the OH&S non-conformance and to prevent recurrence.

Serious Accident and Dangerous Occurrence Reports

Immediately notify WorkCover and the Superintendent of any serious accident or dangerous occurrence. Then formally notify WorkCover in accordance with the Occupational Health and Safety Act (Notification of Accidents) Regulation, 1990, using the prescribed form, and immediately supply an additional copy to the Superintendent.

If requested, supply a written report to the Superintendent in the form directed.

Construction Work Site Checklist

Supply to the Superintendent at each regular site meeting a completed copy of a Construction Work Site Checklist confirming reasonable health and safety precautions have been taken. Copies of Checklists are available from the Superintendent for this purpose.

Audit

Make available, on request, all relevant OHS&R records including those of subcontractors and suppliers, for the purpose of audit and surveillance. Provide all reasonable assistance during the audits including attendance by the Contractor.

Failure to comply

If at any time the Contractor has not prepared and supplied to the Superintendent any part of the specified Safety Management Plan, the specified Serious Accident and Dangerous Occurrence Reports, or the specified Construction Work Site Checklist, then notwithstanding Clause 42.1 of the General Conditions of Contract, the Principal shall not be required to make payments to the Contractor until the 7th day after the specified action has been carried out.

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Safety Coordination Committee

In the absence of an Occupational Health and Safety (OHS) Workplace Committee, the Superintendent may direct the establishment of a Safety Coordination Committee. Such a Committee will be chaired by the Superintendent or nominee and shall comprise representatives of the Principal, Contractors, Subcontractors and workers and if so directed, the Contractor shall effect recommendations of the Committee.

3.6 SITE**3.6.1 SITE IDENTIFICATION AND RESTRICTIONS****Definition**

The Site shall be the land and other places to be made available and any other lands and places made available to the Contractor by the Principal for the purpose of the Contract, as shown on drawings.

Activities

All construction activities including the loading and unloading of vehicles shall take place on the Site.

Restrictions

The Contractor's access on to and around the Site, and use of the Site for Constructional Plant, including working and storage areas, location of offices, workshops, sheds, roads, parking and the like, shall be restricted to those areas shown on the Drawings or approved by the Superintendent, and subject to such conditions as are stated in the Contract or may be imposed by the Superintendent.

Site Access Requirements

Protect, as required, existing areas forming access to the Site, from any damage which may occur as a result of their use by the Contractor. Reinstall any damage which may occur, to satisfaction of the Superintendent.

3.6.2 GUTTER CROSSING**Provide Crossings**

Arrange with the local authority for the provision of temporary gutter and footpath crossings, and pay all fees in connection with this work.

3.6.3 SECURITY REQUIREMENTS

The contractor shall note that the site of works is within an active recreational area and as such particular attention should be paid to site safety and security.

Vandalism and damage is not uncommon within the park given the close proximity to Mona Vale Hotel. The contractor shall allow all necessary security and shall be responsible (on handover) for any damage / vandalism resulting there from.

During the Works, the existing building is required to be maintained as secure against entry by unauthorised persons. The Contractor shall be required to comply with the following:

- Maintain the external walls, and doors of the building secure by maintaining all doors closed and by the installation of temporary protection to any other openings.
- All existing alarm systems to be maintained in full operating condition at all times.

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3.6.4 OCCUPIED PREMISES**Occupancy of Principal**

The Principal or persons authorised by the Principal will continue in possession and occupancy of the parts of the Site and/or existing buildings shown on the Drawings.

Access

Provide safe access to occupied premises for the Principal and such authorised persons as shall be notified to the Contractor, and prevent unauthorised access.

Comfort and Safety

Arrange work in occupied or partially occupied premises to minimise nuisance to the occupants and ensure their safety.

Protection

Protect the occupants against weather, dust, dirt, water or other nuisance by means of temporary screens or the like.

Proposals

Submit details of proposed methods.

3.6.5 CARE OF THE WORK AND REINSTATEMENT OF DAMAGE TO PROPERTY OTHER THAN THE WORKS**General**

Damage to services: Do not obstruct or damage roadways and footpaths, drains and watercourses and other existing services in use on or adjacent to the site. Determine the location of such services. Rectify immediately any obstruction or damage to such services and provide temporary services whilst repairs are carried out.

Damage to property: Do not interfere with or damage property which is to remain on or adjacent to the site, including adjoining property encroaching onto the site, and trees. Rectify immediately any interference or damage to such property.

3.6.6 EXISTING SERVICES**Generally**

Deal with existing services (such as drains, watercourses, public utility, private utility and other services) encountered, obstructed, or damaged in the course of performing the work under the Contract, as follows:

- If the service is to be continued: Repair, divert, relocate as required.
- If the service is to be abandoned: Cut and seal or disconnect, and make safe.

Cost

The cost of dealing as above with "live" services not visible or the location of which could not be ascertained by the Contractor from the appropriate authority or from the Contract will be valued as a variation to the work under the Contract provided that the Contractor has taken all reasonable precautions to determine the location of existing services and safeguard them before trenching, re-levelling, roadmarking, demolition, or similar operations are commenced. The contractor is to notify the Superintendent immediately upon the discovery of services or obstructions not shown on the Drawings.

VILLAGE PARK REDEVELOPMENT MONA VALE**Notification**

Failure to notify the Superintendent will result in all costs arising from an unauthorised disruption to services, including any consequential damage arising there from, being met by the Contractor.

3.7 ENVIRONMENTAL PROTECTION**3.7.1 ENVIRONMENTAL SYSTEMS PLANNING****Environment Systems Planning**

The Contractor must:

- (a) Comply with all requirements of the Contract and statutory requirements for protection of the environment.
- (b) Ensure that each of its Subcontractors and Consultants comply in like manner.
- (c) Demonstrate to the Principal by mutual inspection and/or documentation whenever requested that requirements of the Contract and statutory requirements for the protection of the environment are being met.
- (d) Prior to the commencement of work, provide the Principal with certification that the requirements of the Contract and statutory requirements for the protection of the environment are capable of being met by the Contractors' organisation and management.
- (e) If the period of the contract exceeds three months the Contractor is to provide the Principal with a monthly certification that the requirements of the Contract and statutory requirements for protecting the environment are being met.
- (f) The Contractor is responsible for and must at its own cost make good any damage to the environment caused by the execution of the works.

Where inappropriate or inadequate provision of environmental management by the Contractor or Contractor's Subcontractor results in costs, losses or damages incurred by the Principal or claims by third parties against the Principal for either direct or consequential costs, losses or damages, the Contractor shall be liable for costs, losses or damages associated with any claim including but not limited to administration costs incurred by the Principal in resolving such claim.

3.7.2 DISPOSAL OF CONTAMINANTS**Generally**

Properly dispose of solid, liquid and gaseous contaminants in accordance with all statutory and contractual requirements.

Gaseous Contaminants

Discharge in such a manner that they will be diluted with fresh air sufficiently to reduce toxicity to an acceptable level.

Liquid Contaminants

Subject to statutory and local requirements, liquid contaminants may be diluted with water to a level of quality acceptable in the sewer system. If this is not permitted, store in vessels for disposal.

3.7.3 EXISTING FLORA**Protection**

Protect from damage all trees and other plants which:

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- Are shown or specified to be retained, or
- Are beyond the limits allowed to the Contractor, or
- Need not be removed or damaged for construction operations.

3.7.4 DUST AND NOISE**Dust Control**

Restrict dust caused by the Works to a minimum.

Noise Control

Take all practicable steps to minimise noise resulting from the Works. Fit all construction equipment with noise suppressors and use so that noise is minimised. Do not use loud hailers.

Jackhammer Silencing

Fit jackhammers and other noisy hand-held tools used in the performance of the work with effective silencers of a type recommended by the jackhammer manufacturer. Keep tools and silencers in first class condition. Supervise operators of jackhammers to ensure that the silencers are always in place while the tools are being used.

Compressor Silencing

Fit compressor sets used in the performance of the work with effective acoustic canopies and special engine exhaust silencers of a type recommended by the compressor manufacturer. Alternatively use compressor sets specially designed for quiet operation. Keep compressor sets and canopies in first class condition. Keep any access panels in acoustic canopies closed while sets are running.

Requirement

The noise level generated by plant and equipment on Site shall not exceed the limits set by AS 2436, where limits are not set by any Act or Regulation.

3.8 PLANT

3.8.1 HOARDING**Requirement**

Construct and maintain hoardings and fences in accordance with the requirements of the appropriate regulatory authorities and as outlined on drawings and schedule.

Maintenance

Maintain the hoarding and fences in a good state of repair throughout the duration of the Contract. Remove prior to Practical Completion.

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Schedule

Location	Requirement
To eastern site of works adjacent Village Park and the existing Children's Play ground and southern boundary along Pittwater Road.	Provide and maintain a security fence for the full duration of the works. Relocate fencing where directed by the superintendent to maximise available space for public use of the park.
To Park Street adjacent new building works	Provide and maintain hoardings and fences in accordance with the requirements of the appropriate regulatory authorities.
Adjacent existing Memorial Hall to allow egress	Provide and maintain hoardings and fences in accordance with the requirements of the appropriate regulatory authorities.
To interface between existing library and new link building	Provide temporary wall/screen to maintain security and water tightness to existing building.

3.8.2 SERVICES DURING CONSTRUCTION**Extent**

The Contractor shall check the adequacy of supply and shall be responsible for connecting to such of this supply as may be required for the Works. Provide and maintain services necessary for the execution of the work under the Contract.

Additional Services

Install such temporary services in accordance with the requirements of the relevant authorities. Pay charges in connection with the installation and use of such services. Make such services available to Subcontractors. On completion, disconnect temporary services and clear away all traces.

3.8.3 SITE OFFICE**Requirement**

Provide a site office, including an area with meeting table to seat six people for site meetings.

3.8.4 TEMPORARY PROTECTION**Requirement**

Provide temporary protection to existing finishes, equipment and furniture to existing library if any preliminary works are under taken in this area prior to temporary closure of Library. Make good of any areas damaged as a result of the works.

3.8.5 TEMPORARY TELEPHONES**Requirement**

Provide the following for use by the Superintendent and Principal:

- at least one temporary telephone
- one facsimile machine.

Each shall be on a separate line. Pay charges for installation, rental and calls. Ensure that the facsimile machine is maintained in working order, and with paper stocks. Pay charges for removal of all temporary services on completion.

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3.8.6 PROTECTIVE CLOTHING**Helmets for Visitors**

Provide safety helmets for temporary use whilst on the Site of visitors whose presence on the Site is authorised, permitted or necessary under the provisions of the Contract.

The contractor must ensure that visitors to the site are wearing footwear and such other equipment or apparel, appropriate to ensure their safety at the location.

3.8.7 SIGNBOARD**Installation**

Erect the signboards on the site where directed. Maintain in good condition until Practical Completion, then dismantle and remove. The sign is to include the Project Name, Description, Clients Name and Logo, Name and address and phone number of Contractor, Name address and phone number of architect and all major consultants. Submit proposed layout and detail of sign to superintendent prior to erection.

Location

Signboards shall be displayed on both the Pittwater Road and Park Street frontages of the site. The location of the signboards shall be confirmed on site with the superintendent.

Ownership

The signboard shall remain the property of the Contractor.

Maintenance

Maintain in good condition, legible and free of graffiti / damage from the date of erection until Practical Completion.

3.8.8 PLANT, EQUIPMENT AND OPERATORS

The Contractor will ensure that **all** plant and equipment (whether owned, leased or subcontracted) engaged on any part of the works or involved in any activity associated with the works:

- meets all statutory requirements;
- is in safe working order;
- has been regularly serviced and maintained;
- is suitable for the nature of work for which it is intended to be used; and
- is in a condition fit for its intended use.

The Contractor will also ensure that the operators of **all** plant and equipment engaged on any part of the works or involved in any activity associated with the works (whether employees or subcontractors):

- have appropriate licences; and
- are suitably qualified and experienced to operate that plant or piece of equipment for the work or activity being performed.

The Principal's acceptance or otherwise of proposed subcontractors shall not limit in any way the Contractor's obligations under this clause.

Where inadequate or inappropriate action by the Contractor results in costs, losses or damages incurred by the Principal or claims by third parties against the Principal for either direct or consequential costs, losses or damages, the Contractor shall be liable for costs, losses or damages associated with any claim including but not limited to administration costs incurred by the Principal in resolving such claim.

3.9 COMPLETION

3.9.1 CLEANING UP

Progressive Cleaning

Keep the work clean and tidy as it proceeds and regularly remove from the Site rubbish and surplus material arising from the execution of the work including any work performed during the Defects Liability Period or any operational maintenance period specified.

Roads: Be responsible for maintaining clean roads and access. Remove and clean away mud, building debris from footpaths, gutters, drains, walls etc. when such occurs.

Final Cleaning

On completion of the Works clean both the inside and outside of the building, external paved areas and both sides of glazing. Examples of required cleaning are:

- Remove labels which are not required as permanent labels.
- Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances which are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.
- Clean exposed exterior and interior hard surfaces finished, to a dirt free condition, free of dust, stains, fingermarks, films and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.
- Wipe clean surfaces of mechanical and electrical equipment.
- Remove debris and surface dust from limited access spaces.
- Clean concrete floors broom clean.
- Vacuum clean carpet and similar soft surfaces.
- Clean plumbing fixtures to a sanitary and polished condition, free of stains including those resulting from water exposure.
- Clean light fixtures and lamps so as to function with full efficiency.
- If permanent lighting fixtures have been used for construction purposes replace globes with new.
- Clean project site, including planted sections and footpaths, of litter and foreign substances. Sweep paved areas to a broom clean condition; remove stains, petrol chemical spills and other foreign deposits.

3.10 MATERIALS AND WORKMANSHIP

3.10.1 TESTS

Notice

General: Give three working days notice so that designated tests may be witnessed.

Testing Authorities

General: Except for site tests, have tests carried out by authorities accredited by NATA to test in the relevant field, or an organisation outside Australia recognised by NATA through a mutual recognition agreement. Cooperate as required with testing authorities.

VILLAGE PARK REDEVELOPMENT MONA VALE

Site tests: Use instruments calibrated by authorities accredited by NATA.

Reports

General: Submit copies of test reports, including certificates for type tests, showing the observations and results of tests and compliance or non-compliance with requirements.

Endorsement

If tests are to be carried out on parts of the works, do not conceal those parts and do not commence further work on those parts until the tests have been satisfactorily completed.

3.10.2 MATERIALS, LABOUR AND CONSTRUCTIONAL PLANT**Manufacturers' or Suppliers Recommendations**

General: Select, if no selection is given, and transport, deliver, store, handle, protect, finish, adjust, prepare for use, and use manufactured items in the Works in accordance with current published recommendations of the manufacturer or supplier relevant to such use.

Project modifications: Advise of activities that supplement, or are contrary to, manufacturers or suppliers' written recommendations and instructions.

Sealed Containers

If materials or products are supplied by the manufacturer in closed or sealed containers or packages, bring the materials or products to point of use in the original containers or packages.

Consistency

For the whole quantity of each material or product use the same manufacturer or source and provide consistent type, size, quality and appearance.

Protection of Materials

The Contractor shall at his own cost provide adequate storage and protection for materials so as to preserve their quality and fitness for the Works.

Labour

Skilled in its particular craft and all work shall be done by workmen in a thorough, faithful and workmanlike manner.

3.10.3 CONTRACTOR'S SUBMISSIONS**Timing**

General: Submit documents in a timely manner, to suit the construction program. Advise if any of the documents are to be returned.

Delays: Coordinate submissions of related items. Do not cause delays by making late or inadequate submissions. No claims for Extension of Time will be considered for delays caused by late or inadequate submissions.

Identification

Identify the project, contractor, subcontractor or supplier, manufacturer, applicable product, model number and options, as appropriate and include pertinent contract document references. Include service connection requirements and product certification. Identify non-compliances with project requirements, and characteristics which may be detrimental to successful performance of the completed work.

Endorsement

Witness points: Give notice before commencing work affected by contractor's submissions, unless the submissions have been endorsed as satisfactory.

VILLAGE PARK REDEVELOPMENT MONA VALE

Hold points: Do not commence work affected by contractor's submissions until the Superintendent has inspected the submission.

Errors: If a document contains errors, submit a new or amended document as appropriate, indicating changes since the previous submission.

Design

General: If part or all of an installation is to be designed by the contractor, submit documents showing the layout and details of the installation.

Variation documents: If it is proposed to change the installation from that shown on the contract documents, or if changes are required by statutory authorities, submit variation documents showing the proposed changes.

Shop Drawings

Diagrammatic layouts: Coordinate work shown diagrammatically in the contract documents, and submit dimensioned setout drawings.

Authorities

Correspondence: Submit copies of correspondence and notes of meetings with authorities.

Authorities' approvals: Submit documents showing approval of the authorities whose requirements apply to the work.

3.10.4 SAMPLES**Timing**

Delays: Coordinate submissions of related samples. The Contractor shall be solely responsible for the consequences of delay resulting from failure to allow reasonable time for the assessment of samples, or from the rejection of samples which do not comply with the Specification.

Identification

Identify samples with a securely attached label giving the manufacturer's name, product trade name and number, material type, Specification clause name, project name, Contractor's name, Subcontractor's or Suppliers name and the date of submission. Include service connection requirements and product certification. Identify non-compliances with project requirements, and characteristics which may be detrimental to successful performance of the completed work. Accompany each sample with an itemised transmittal form.

Delivery

Before delivery confirm with the Superintendent the delivery address. Pay all costs and deliver to the Superintendent's office, the Superintendent's representative's office, the Site or a testing laboratory as directed. Samples generally shall not be returned unless specifically requested. Return packaging and delivery shall be paid by the Contractor.

Size and Range

Samples shall be of adequate size and/or number to permit proper evaluation, and showing the full range of colours, textures, dimensions and other variable characteristics expected. Samples of different items that must match or whose finishes relate shall be delivered at the same time to facilitate coordination.

VILLAGE PARK REDEVELOPMENT MONA VALE**3.10.5 PROPRIETARY ITEMS****Definition**

A proprietary item shall be any item identified by graphic representation on the Drawings, or by naming one or more of the following: manufacturer, supplier, installer, trade name, brand name, catalogue or reference number, and the like.

Implication

The identification of a proprietary item shall not necessarily imply exclusive preference for the item so identified, but shall be deemed to indicate the required properties of the item.

Information

When offering an alternative provide all available technical information, and any other relevant information requested by the Superintendent. If so requested, obtain and submit reports on relevant tests by an independent testing authority.

Alterations

State whether the use of the alternative will require alteration to any other part of the Works, and any consequent variation to the Contract Sum.

Claims

No claim shall arise from any rejection, nor, unless otherwise agreed, shall adoption of an alternative be ground for any claim for variation to cost or time.

3.10.6 PROPRIETARY NAMES**Requirement**

Proprietary, trade, Contractor's, Subcontractor's or Supplier's names shall not be visible in the completed works, unless specified or previously agreed with or directed by the Superintendent.

3.10.7 JOINING UP**Requirement**

Carry out the joining of new work to existing work, and any consequent cutting away, in a manner appropriate to the materials, and make good to match existing adjacent work in all respects.

3.11 STATUTORY APPROVAL ATTACHEMENTS**3.11.1 DEVELOPMENT CONSENT****Consent Document**

The consent details from Pittwater Council; are attached as follows:

Date of consent: 23 November 2002.

Schedule

The schedule of required actions is attached and details the parties responsible for completing each of development conditions.

3.11.2 CONSTRUCTION CERTIFICATE

The consent details from the Principal Certifying Authority; are attached as follows:

VILLAGE PARK REDEVELOPMENT MONA VALE

Date of Certificate: To be confirmed

Warranties

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects

February 2003

20151 SP142

ISSUE DATE

A

B

28.02.03

ISSUE

Preliminary

Tender Issue

4.0 GENERAL

4.1 SCOPE

Specified in this section

The Works include, but are not limited to the supply of warranties.

Specified in other sections

Additional terms and the warranty periods.

4.2 WARRANTIES

Requirement

Provide warranties under all specified nominated subcontracts, nominated supply agreements and where so specified under other trades. The provision of warranties shall not relieve the Contractor of any of his liabilities or obligations under the Contract.

Form

As set out below and handed over by the Contractor to the Superintendent prior to the Date of Practical Completion. The warranty shall be signed and sealed by all parties.

Amendment: The form may require amendment, either:

- to suit a particular type of work, or
- where the Warrantor's liability is to be different, such as where particular components are the excluded from the warranty, or where in a supply-and-fix contract the Warrantor's liability is to be limited to supply a new article only.

Should the materials installation, etc, be covered by the warranty be subject of a direct contract between the Proprietor and supplier or subcontractor then only these parties would be involved and appropriate amendments would be required. A similar consideration would apply where the warranty is to be given by the Contractor. In these cases the Contractor shall notify the Superintendent in writing before the work proceeds, or the item is ordered, and seek approval of the proposed warranty.

Paper type: Bond paper. Do not use "thermal" paper (facsimile paper) which will fade.

4.3 FORM OF WARRANTY

4.3.1 DATE AND PARTIES

THIS DEED is made on the date stated in Item A of the Appendix between the Warrantor, the Builder and the Proprietor.

4.3.2 DEFINITIONS

In this Deed the following works and phrases shall, except where there is something or some matter in the subject of context inconsistent therewith, have the meanings given to them as follows:

- The Proprietor: The person, partnership or corporation named in Item B1 of the Appendix.
- The Contractor: The person, partnership or corporation named in Item B2 of the Appendix.

VILLAGE PARK REDEVELOPMENT MONA VALE

- The Warrantor: The person, partnership or corporation named in Item B3 of the Appendix.
- The Superintendent: The person, partnership or corporation named in Item B4 of the Appendix, or any other person, partnership or corporation appointed by the Proprietor to act as Superintendent and including persons with authority to act on behalf of the Superintendent.
- The Works: The Works described in Item B5 of the Appendix.
- The Subcontract Works: The Works described in Item B6 of the Appendix.
- The Site of the Works: The location described in Item B7 of the Appendix.

4.3.3 WHEREAS

- The Contractor has entered into a contract with the Proprietor on the date stated in Item B8 of the Appendix for the execution and completion of the Works ("the Contract");
- The said Works shall be carried out in accordance with the Contract and with drawings and specifications prepared by Brewster Hjorth Pty Limited; and
- The Warrantor has agreed to contract with the Contractor for the Subcontract works ("the Subcontract).

In consideration of awarding the Contract for the Subcontract Works to the Warrantor,

- The Warrantor has agreed to give warranty and indemnity to the Contractor and to the Proprietor in respect of the Subcontract Works.

4.3.4 IT IS HEREBY AGREED AS FOLLOWS:

- The Warrantor warrants to the Contractor and also (as a separate warranty) to the Proprietor that all work performed and all materials or parts supplied by the Warrantor in the course of the Subcontract Works shall be in accordance with the quality and/or standard not lower than the quality and/or standard stipulated by the Contract and/or the Subcontract, and the relevant drawings and specifications, and to the extent that quality and/or standard is not so stipulated, shall be of good workmanship and materials, and of merchantable quality, and be fit for the purpose or purposes for which the same are required.
- This warranty shall be in addition to and shall not derogate from any manufacturer's warranty or warranty implied by law, attaching to any materials or goods forming part of the Subcontract Works.
- The Warrantor covenants with the Contractor and also (as a separate covenant) with the Proprietor to replace and/or make good to the reasonable satisfaction of the Superintendent, but at the expense of the Warrantor, so much of the Subcontract Works, including making good and/or replacing any damage to a building and/or its contents resulting from or consequential upon the Subcontract Works failing to comply with the warranty expressed in Clause 3.1 as within the period of time stated in Item B9 of the Appendix commencing from the Date of Practical Completion of the Works (as defined in the Contract) shall be found to be of a lower quality or standard than that referred to in Clause 3.1 or shall show deterioration to such extent that in the opinion of the Superintendent it ought to be made good or replaced in order to achieve fitness for the purpose or purposes for which the Subcontract Works were performed or supplied and whether on account of utility, performance, appearance or otherwise, provided however that this covenant shall not apply to deterioration or damage caused solely by excessive movement of building structure or by exceptional physical or other external cause or agency beyond the control of the Warrantor for which it could not reasonably have been expected to foresee or provide against.
- The Warrantor further covenants with the Contractor and also (as a separate covenant) with the Proprietor to meet the reasonable cost of any work necessary to enable the requirements of Subclause 3.2.1 of this Warranty to be carried out and/or necessary to make good the Works afterwards.

VILLAGE PARK REDEVELOPMENT MONA VALE

- The decision of the Superintendent as to:
 - any work or materials failing to comply with quality or standard as above mentioned or otherwise failing to comply with the foregoing warranty
 - as to the extent of replacement and/or making good which shall be necessary to properly remedy the defects
 - as to the extent of any work required under Subclause 3.2.2 of this warranty shall be notified in writing to the Warrantor and a copy of the notice shall be given to the Contractor, and thereupon shall be final and binding upon the parties subject only to Clause 3.3.
- The Warrantor further covenants that within a reasonable time after written notification to the Warrantor of a decision of the Superintendent as to remedial work required as aforesaid, the Warrantor will replace and/or make good the Subcontract works or parts thereof and meet the cost of any work required by Subclause 3.2.2 of this Warranty accordingly.
- If within the time aforesaid (and the Superintendent's decision as to what is a reasonable time in any case shall be final and binding upon the parties) the Warrantor shall fail to fully and properly carry out the said remedial work, the Contractor and/or the Proprietor may carry out such work, or cause the same to be carried out, and the Warrantor hereby agrees to indemnify and keep indemnified the Contractor and Proprietor against all the costs and expenses of and incidental to the carrying out of the remedial work and also against any consequent or subsequent loss or damage sustained by the Contractor and/or the Proprietor as result of the Warrantor's failure as aforesaid.
- In the event that any dispute or difference whatsoever shall arise from the performance or as to the meaning of this document, such dispute or difference shall be submitted to Arbitration in accordance with and subject to The Institute of Arbitrators Australia, Rules for Conduct of Commercial Arbitrations.
- So far as shall be practicable the provisions of this document shall have effect as between the Warrantor and the Contractor as soon as it has been executed by them, notwithstanding that it may not have been or may not thereafter be executed by the Proprietor.

VILLAGE PARK REDEVELOPMENT MONA VALE

APPENDIX
Reference:

A 1.1 Date of Deed day of 19.....

B1 1.2.1 The Proprietor.....

(ACN)

of

B2 1.2.2 The Contractor.....

(ACN)

of

License Number

(where applicable)

B3 1.2.3 The Warrantor.....

(ACN)

of

VILLAGE PARK REDEVELOPMENT MONA VALE

- B4 1.2.4 The Superintendent
.....
(ACN)
of.....
.....
.....

- B5 1.2.5 The Works.....
.....
.....
.....

- B6 1.2.6 The Subcontract Works.....
.....
.....
.....

- B7 1.2.7 The Site of the Works
.....
.....
.....

- B8 2.1 Date of Contract day of 19.....
.....
between Contractor
and Proprietor

- B9 3.2.1 Warranty period..... years



VILLAGE PARK REDEVELOPMENT MONA VALE

- IN WITNESS WHEREOF the parties hereto have executed this Warranty on the dates hereafter shown.

* Signed, sealed and delivered by the Warrantor in the presence of

.....

‡ The common seal of the Warrantor was hereby affixed in accordance with its articles of association in the presence of

Date of execution:

.....

* Signed, sealed and delivered by the Contractor in the presence of

.....

‡ The common seal of the Contractor was hereby affixed in accordance with its articles of association in the presence of

Date of execution:

.....

* Signed, sealed and delivered by the Proprietor in the presence of

.....

‡ The common seal of the Proprietor was hereby affixed in accordance with its articles of association in the presence of

Date of execution:

BREWSTER HJORTH ARCHITECTS

Warranties

VILLAGE PARK REDEVELOPMENT MONA VALE

**Document
Submissions**

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhjorth Architects

February 2003

20151 SP143

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

VILLAGE PARK REDEVELOPMENT MONA VALE

5.1 GENERAL**5.1.1 SCOPE****Specified in the section**

The Works include, but are not limited to the supply of documents.

5.1.2 CONTRACTOR'S DOCUMENTS**Requirement**

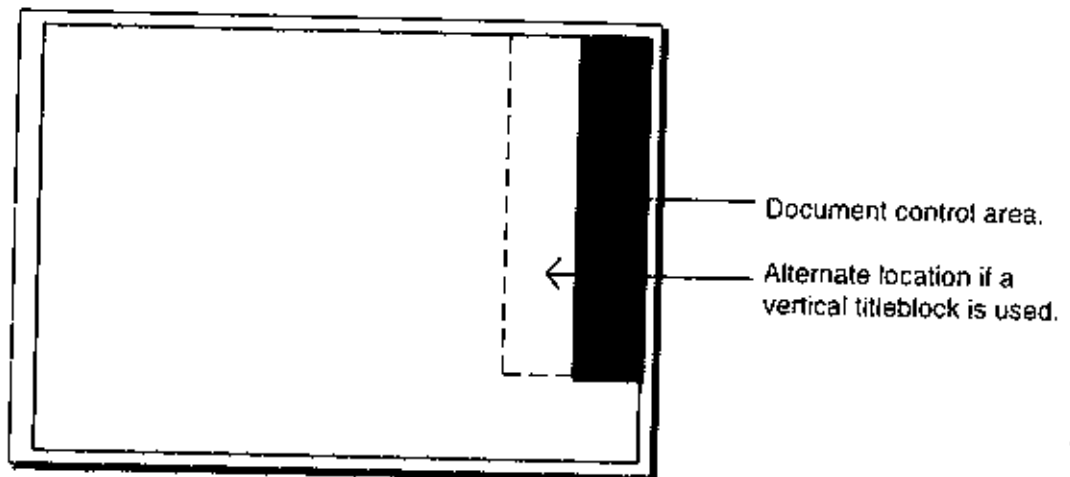
Where the Contract requires the Contractor to supply documents such as shop drawings, technical schedules, or other written information, supply sufficient copies so that:

- a copy may be retained by each interested party, which may include:
- the Contractor
- the Superintendent
- other relevant consultants, such as the Structural Engineer, the Mechanical Consultant, or the Electrical Consultant
- and the Proprietor, and
- after examination, the copies required by the Contractor for his own use may be returned to him, together with a copy to be kept on site and available for reference.

Format

Comply with the following:

- Generally: Where appropriate use A1 sheet size with a margin and vertical titleblock, similar to that used by the Architects. On request the Superintendent will supply, at commercial rates, transparent copies of the Contract Drawings as the basis for Contractor's Drawings.
- Paper type: Bond paper, heavy weight (minimum 110 gsm) tracing paper or plastic based material. Do not use "thermal" paper (facsimile paper) which will fade.
- Titles: All documents shall have a project title, Contractor's, subcontractors and/or manufacturer's name, drawing title and the issue date. Drawings shall have a drawing number. Do not use numbers which will conflict with Contract Drawing Numbers.
- Document Control area: Each drawing shall contain a ruled vertical area 90 mm wide x 450 mm high in the top right hand corner of the drawn area, as shown in the following diagram. This area shall not be used by the Contractor or his Subcontractors. It shall be used for placing "received" and when necessary "examined" stamps.



- **Contractor's Documents Register:** Show drawings being prepared, submitted for examination, returned suitable or not suitable. Issue the Register with each issue of Drawings.
- **Drafting:** Drawings shall be prepared by a competent drafts person, generally complying with relevant Australian Standards and shall be clean and legible when reduced to A3 size.
- **Approval:** Indicate compliance on the Shop Drawing if the work is subject to inspection by an Authority having jurisdiction over the work.

Suitability

The Superintendent shall advise the Contractor that the document is suitable or not suitable, provided that:

- sufficient documents are available and/or sufficient particulars are given on such documents that are received to enable a proper review to be accomplished
- such advice shall not constitute an instruction under the Contract, nor shall it relieve the Contractor from responsibility for the Contractor's errors or omissions or compliance with the requirements of the Contract, and
- the Superintendent shall not reject as unsuitable documents which are in accordance with the requirements of the Contract.

Time

Where the Contract requires the Contractor to supply documents such as shop drawings, technical schedules, or other written information, supply them in sufficient time for examination, and revision if necessary, to occur before they are required for use. Do not commence fabrication or the like, using the documents until they are found suitable. Extensions of time will not be granted for delays caused by documents not meeting the requirements and requiring subsequent amendment, resubmission and further review.

Rejection

If a document is rejected, submit a new or amended document.

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5.1.3 WORK-AS-EXECUTED DRAWINGS**Requirement**

Where work-as-executed drawings are called for in the Contract, prepare drawings showing the "as installed" locations of building items, plant, equipment and the like. Show co-ordinate dimensions where applicable. Submit two copies of each drawing.

Format

Show co-ordinate dimensions where applicable. When drawings have been approved submit on heavy weight (minimum 110 gsm) tracing paper or plastic based material.

Drawings in Manuals

Where operation and maintenance manuals are called for in the Contract, include in each manual a copy of each work as executed drawing relevant to that portion of the Works, revised to show any changes found necessary for the satisfactory operation and maintenance of plant and equipment.

Practical Completion

Without limiting the definition of Practical Completion contained elsewhere, Practical Completion for the Works or relevant Separable Portion will not be reached until the above requirements have been satisfactorily complied with.

**Adhesives Sealants
& Fasteners**

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects

February 2003

20151 SP150

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

VILLAGE PARK REDEVELOPMENT MONA VALE

6.1 GENERAL

6.1.1 CROSS REFERENCES

General

Refer to the *General requirements* section.

6.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS/NZS 1110		ISO metric precision hexagon bolts and screws - Product grades A and B.
AS 1110.1	2000	Bolts
AS 1110.2	2000	Screws
AS 1111	2002	Isometric hexagon bolts and screws - Product grade C
AS 1111.1	2000	Bolts
AS 1111.2	2000	Screws
AS 1112	2002	Isometric hexagon nuts
AS 1112.1	2000	Style 1 - Product grades A and B
AS 1112.2	2000	Style 2 - Product grades A and B
AS 1112.3	2000	Product grades C
AS 1112.4	2000	Chamfered thin nuts - Product grades A and B
AS 1214	1983	Hot-dip galvanised coatings on threaded fasteners (ISO metric coarse thread series)
AS/NZS 1390	1997	Cup head bolts with ISO metric coarse pitch threads
AS/NZS 1393	1996	Coach screws (Metric series) (with ISO hexagon heads)
AS 1420	2001	ISO metric hexagon socket head cap screws
AS/NZS 1421	1996	ISO metric hexagon socket set screws
AS/NZS 1427	1996	ISO metric machine screws
AS 1873		Powder-activated (PA) hand-held fastening tools
AS/NZS 1873.4	1994	Fasteners
AS 1897	1976	Electroplated coatings on threaded components (metric coarse series)
AS 2329	1999	Mastic adhesives for fixing wallboards
AS 2334	1980	Steel nails - Metric series
AS/NZS 2465	1999	Unified hexagon bolts, screws and nuts (UNC and UNF threads)
AS 2754		Adhesives for timber and timber products
AS 2754.2	1985	Polymer emulsion adhesives
AS 2754.3	1988	Adhesives for non-structural applications
AS 3566		Self-drilling screws. For the building and construction industries
AS 3566.1	2002	General requirements and mechanical properties.
AS 3566.2	2002	Corrosion resistance requirements.

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AS 4397	1996	Electroplated coatings of zinc on steel fasteners with imperial threads
AS/NZS 4402	1996	Hexagon head tapping screws
AS/NZS 4403	1996	Slotted pan head tapping screws.
AS/NZS 4404	1996	Slotted countersunk (flat) head tapping screws (common head style)
AS/NZS 4405	1996	Slotted raised countersunk (oval) head tapping screws (common head style)
AS/NZS 4406	1996	Cross recessed pan head tapping screws.
AS/NZS 4407	1996	Cross recessed countersunk (flat) head tapping screws (common head style)
AS/NZS 4408	1996	Cross recessed raised countersunk (oval) head tapping screws.
AS/NZS 4409	1996	Hexagon washer head tapping screws.
AS/NZS 4410	1996	Hexagon flange head tapping screws
AS 4680	1999	Hot-dip Galvanized (zinc) coatings on fabricated ferrous articles
TT-S-1543B	1996	Sealing Compound; Silicone Rubber Base (for Calking, Sealing, and Glazing in Buildings and Other Structures)
ASTM C920	2001	Standard Specification for Elastometric Joint Sealants

6.2 MATERIALS AND COMPONENTS

6.2.1 ADHESIVES

Performance

Provide adhesives capable of transmitting imposed loads, sufficient to ensure the rigidity of the assembly, and which will not cause discolouration of finished surfaces.

Adhesive types

Mastic adhesive: To AS 2329.

Non-structural adhesive for timber: To AS 2754.3.

Polymer emulsion adhesive for timber: To AS 2754.2, not inferior to Type 3 if required to be water-resistant.

6.2.2 SEALANTS

Elastomeric sealants

Sealing compound (polyurethane, polysulphide, acrylic):

- Single component: To ASTM C920.

Sealing compound (silicone):

- Single component: To TT-S-1543B.

6.2.3 FASTENERS

Performance

Provide fasteners capable of transmitting the loads imposed, and sufficient to ensure the rigidity of the assembly.

VILLAGE PARK REDEVELOPMENT MONA VALE

General

Masonry anchors: Purpose-made proprietary expansion or chemical types.

Metal washers: To provide washers to the heads and nuts of bolts and coach screws.

Plugs: Purpose-made plastic.

Powder-actuated fasteners: To AS/NZS 1873.4.

Steel nails: To AS 2334.

- Length: At least $2\frac{1}{2}$ x the thickness of the member being secured, and at least 4 x the thickness if the member is plywood or building boards < 10 mm thick.

Unified hexagon bolts, screws and nuts: To AS/NZS 2465.

Bolts

Coach bolts: To AS/NZS 1390.

Hexagon bolts Grades A and B: To AS 1110.1.

Hexagon bolts Grade C: To AS 1111.1.

Nuts

Hexagon chamfered thin nuts Grades A and B: To AS 1112.4.

Hexagon nuts Style 1 Grades A and B: To AS 1112.1.

Hexagon nuts Style 2 Grades A and B: To AS 1112.2.

Hexagon nuts Grade C: To AS 1112.3.

Screws

Coach screws: To AS/NZS 1393.

Hexagon screws Grades A and B: To AS 1110.2.

Hexagon screws Grade C: To AS 1111.2.

Hexagon socket screws: To AS 1420 and AS/NZS 1421.

Machine Screws: To AS/NZS 1427.

Self-drilling screws: To AS 3566.1.

- Corrosion resistance: Class 2 to AS 3566.2, Table 1.

Tapping screws: To AS/NZS 4402, AS/NZS 4403, AS/NZS 4404, AS/NZS 4405, AS/NZS 4406, AS/NZS 4407, AS/NZS 4408, AS/NZS 4409 and AS/NZS 4410.

Finishes

Electroplating:

- Metric thread: To AS 1897.
- Imperial thread: To AS 4397.

Galvanising:

- Threaded fasteners: To AS 1214.
- Other fasteners: To AS 4680.

Mild steel fasteners: Galvanise where

- exposed to weather;
- embedded in masonry;
- in external timbers such as weatherboards or decking; or
- in contact with chemically treated timber.

Metals & Prelinishes 7

VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects
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20151 SP151

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B	26.02.03	Tender Issue

7.1 GENERAL

7.1.1 CROSS REFERENCES

General

Refer to the *General requirements* section.

7.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1163	1991	Structural steel hollow sections
AS 1167.1	1993	Filler metal for brazing and braze welding
AS 1192	1982	Electroplated coatings - Nickel and chromium
AS 1231	2000	Aluminium and aluminium alloys - Anodic oxidation coatings
AS 1397	1993	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated
AS 1443	1994	Carbon steels and carbon-manganese steels - Cold-finished bars
AS 1450	1983	Steel tubes for mechanical purposes
AS/NZS 1554.1	2000	Welding of steel structures
AS/NZS 1554.6	1994	Welding stainless steels for structural purposes
AS 1565	1996	Copper and copper alloys - Ingots and castings
AS 1567	1997	Copper and copper alloys - Wrought rods, bars and sections
AS/NZS 1595	1998	Cold-rolled unalloyed steel sheet and strip
AS 1627		Metal finishing - Preparation & pretreatment of surfaces
AS 1627.1	1997	Limes for building
AS 1665	1992	Welding of aluminium structures
AS/NZS 1734	1997	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
AS 1769	1975	Welded stainless steel tubes for plumbing applications
AS 1789	1984	Electroplated coatings - Zinc on iron or steel
AS/NZS 1865	1997	Aluminium and aluminium alloys - Drawn wire, rod, bar and strip
AS/NZS 1867	1997	Aluminium and aluminium alloys - Drawn tubes
AS 1897	1976	Electroplated coatings on threaded components (metric coarse series)
AS/NZS 2728	1997	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS/NZS 3679.1	1996	Hot-rolled bars and sections
AS 3715	1989	Metal finishing - Thermoset powder coatings for architectural applications
AS/NZS 4506	1998	Metal finishing - Thermoset powder coatings
AS/NZS 4534	1998	Zinc and zinc/aluminium-alloy coatings on steel wire
AS/NZS 4680	1999	Hot-dip galvanised (zinc) coatings on fabricated ferrous articles

VILLAGE PERK REDEVELOPMENT MONA VALE

AS 4750 (Int)	2000	Electrogalvanised (zinc) coatings on ferrous hollow sections
AS 4751 (Int)	2000	Electrogalvanised (zinc) coatings on ferrous hollow sections
GPC P-65	1995	Paint, priming for metal, stoving
GPC F-66/3	1996	Full gloss
GPC-P-155/1	1991	Interior grade (ferrous substrate)
GPC-P-155/2	1991	Exterior grade (ferrous substrate)
GPC-P-155/4	1991	Interior grade (non-ferrous substrate)
GPC-P-155/5	1991	Exterior grade (non-ferrous substrate)
ASTM A240/A240M	2000	Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Steel and Strip for Pressure Vessels
ASTM A554	1998	Standard Specification for Welded Stainless Steel Mechanical Tubing
ISO 2063	1991	Metallic and other inorganic coatings; thermal spraying; zinc, aluminium and their alloys

7.2 MATERIALS AND COMPONENTS

7.2.1 METALS

Steel

Structural hollow section: To AS 1163.

Structural bars and sections: To AS/NZS 3679.1.

Sheet: To AS/NZS 1595.

Steel for prefinishes

Electric resistance welded pipe: To AS 1450 "bright".

Cold rolled bar: To AS 1443 "bright".

Cold rolled sheet: To AS 1595.

- Designation: CA2S-E.

Coated steel

Galvanised structural hollow sections: To AS 1163.

Zinc-coated sheet: To AS 1397.

- Coating class for sheet: Comply with the recommendations of AS 1397 Appendix D.

Thickness: Metal thicknesses specified are base metal thicknesses.

Stainless steel

Plate, sheet and strip: To ASTM A 240/A 240M.

Bar: To ASTM A 277.

Welded pipe (round): To AS 1769.

Welded pipe (square): To ASTM A 554.

Aluminium and aluminium alloys

Drawn rod, bar and strip: To AS/NZS 1865.

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Extrusions: To AS/NZS 1867.

Drawn pipe: To AS/NZS 1867.

Plate and sheets: To AS/NZS 1734.

Copper and copper alloys

Casting: To AS 1565.

Plate, sheet and strip: To AS 1567.

Rods, bars and sections: To AS/NZS 1567.

7.3 METAL FINISHING**7.3.1 WORKMANSHIP****Preparation**

General: Before applying decorative or protective prefinishes to metal components, complete welding, cutting, drilling and other fabrication, and prepare the surface using a suitable method.

Standard: To AS 1627.

Priming steel surfaces: Where site painting is specified to otherwise uncoated mild steel or similar surfaces,

- prime after fabrication and before delivery to the works; and
- after installation, repair damaged priming and complete the coverage to unprimed surfaces.

Welding

Steel: To AS/NZS 1554.1.

Aluminium: To AS 1665.

Stainless steel: To AS/NZS 1554.6.

Brazing

General: Ensure brazed joints have sufficient lap to provide a mechanically sound joint. For butt joints do not rely on the filler metal fillet only.

Filler metal: To AS 1167.1.

Finishing

Visible joints: Finish visible joints made by welding, brazing or soldering using methods appropriate to the class of work (including grinding or buffing) before further treatment such as painting, galvanising or electroplating. Ensure self-finished metals are without surface colour variations after jointing.

Damage

If prefinishes are damaged, including damage caused by unauthorised site cutting or drilling, remove and replace the damaged item.

7.3.2 ELECTROPLATING**Electroplated coatings**

Zinc on iron or steel: To AS 1789.

Chromium on metals: To AS 1192.

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Nickel on metals: To AS 1192.

Threaded components: To AS 1897.

Service condition number: At least two.

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7.3.3 GALVANISING**Galvanising**

Fabricated ferrous articles: To AS/NZS 4680.

Ferrous hollow sections by electrogalvanising: To AS 4750 (Int).

- Minimum coating class: ZE300/300.

Ferrous open sections by a continuous or specialised process: To AS/NZS 4751 (Int).

- Minimum coating class: ZE 300.

Steel wire: To AS/NZS 4534.

- Minimum coating class: W10Z.

Components in contact with concrete

Passivate galvanised surfaces to be cast into or in contact with concrete by dipping in 0.2% sodium dichromate solution.

Coating quality

General: Continuous, adherent, smooth or evenly textured and uniform, free from defects detrimental to the end use of the finished article, such as lumps, blisters, gritty areas, uncoated spots, acids and black spots, dross and flux.

7.3.4 ANODISING**Anodising**

Standard: To AS 1231.

Thickness Grade:

- Indoor applications: At least AA10.
- Outdoor applications: At least AA25.

7.3.5 METAL SPRAYING**Metal spray**

Standard: To ISO 2063.

Process: Electric arc.

Minimum thicknesses:

- Outdoor applications: 175 mm.
- Indoor applications: 125 mm.

Seal coat: Cover the metal spray finish with two coats of vinyl seal to a total dry film thickness of 80 mm.

7.3.6 POWDER COATING**Thermoset powder coating**

Standards: To AS 3715 or AS/NZS 4506, as appropriate.

Internal use: GPC P-155/1 or 4.

External use: GPC P-155/2 or 5.

Finish: Full gloss.

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Preparation

General: Use chemical pretreatments. If recommended, provide conversion coatings.

Unprotected steel: Remove rust to AS 1627.1 Class 2¹/₂, clean by immersing in trichloroethylene or an alkaline solution, and apply a coat of iron phosphate.

Galvanised steel: Clean by immersing in a suitable alkaline or acidic solution, apply a zinc phosphate chemical conversion coating, rinse and degrease.

Aluminium: Pretreat as recommended in AS 3715 Appendix B, including the application of a conversion coating.

7.3.7 PREPAINTING**Prepainted metal products**

Standard: To AS/NZS 2728.

Product type: Not lower than the type appropriate to the field of application.

Stoving enamel

Internal use:

- Primer: To GPC P-65.
- Topcoat: To GPC E-66/3.

Application: Spray or dip.

**Timber Finishes &
Treatment.**

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects
February 2003
20151 SP153

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A		Preliminary
B	28.02.03	Tender Issue

8.1 GENERAL

8.1.1 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Woodwork*: For construction in timber generally.
- *Doors*: For timber doors.
- *Timber Fixtures*: For timber fixtures generally.
- *Painting*: For specific details of paint systems to timber substrates.

8.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS/NZS 1080		Timber - Methods of test
AS/NZS 1080.1	1997	Moisture content
AS/NZS 1148	2001	Timber Nomenclature Australian, New Zealand and imported species
AS 1604	2002	Specification for preservative treatment
AS 1604.1	2000	Sawn and round timber
AS 1604.2	2002	Reconstituted wood based products.
AS 1604.3	2002	Plywood
AS 2796		Timber Hardwood - Sawn and milled products
AS 2796.1	1999	Product specification
AS/NZS 2270	1999	Plywood and blockboard for interior use,
AS/NZS 4491	1997	Timber - Glossary of terms in timber-related Standards
AS 4785		Timber-Softwood-Sawn and milled products.
AS 4785.1	2002	Product Specification.
APAS-0096	2001	Water repellent solution for treatment of timber (buildings).

8.1.3 INTERPRETATION

Definitions

Plywood: To AS/NZS 4491.

"Standard trade common names": To AS/NZS 1148.

Groups of timbers: Terms employed for that purpose in relevant Australian standards.

8.2 QUALITY

8.2.1 SUBMISSIONS

Materials

Rainforest species: Submit source certification.

Pressure preservative treatment: For timber required to be pressure treated, submit a certificate or other satisfactory evidence showing that the timber has been treated.

8.3 MATERIALS

8.3.1 TIMBER

Durability

General: Provide timbers having natural durability appropriate to the conditions of use, or preservative-treated timber of equivalent durability.

Natural durability classification: To AS 1604.1 Table F2.

Minimum requirements:

- Class 1: Timbers in contact with ground.
- Class 2: Timbers above ground, not in continuous contact with moisture, well ventilated, protected from moisture but exposed to the weather.
- Class 3: Timbers above ground, not in continuous contact with moisture, well ventilated, protected with a finish, and well maintained.
- Class 4: Timbers fully protected from moisture, indoors, above ground, and well ventilated.

Lycus susceptible timbers

Do not provide timbers containing Lycus susceptible sapwood.

Preservative treatment

Plywood: To AS/NZS 1604.3.

- Hazard classification: To Table A1.

Reconstituted wood-based products: To AS/NZS 1604.2.

- Hazard classification: To Table A1.

Sawn and round timber: To AS/NZS 1604.1.

- Hazard classification: To Table D1.

Water-repellent treatment

Repellent: To APAS-0096.

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Moisture content

Tolerance: Make milled and dressed products from timbers seasoned:

- To within 3% of the equilibrium moisture content appropriate to the timber and its intended conditions of use;
- To 10 - 15% moisture content; and
- With no more than 3% difference between any 2 pieces in any one group.

Test: To AS/NZS 1080.1.

Protection: Protect timber and timber products stored on site from moisture and weather. For milled, prefinished, prefabricated and similar elements which are protected in the final structure, provide temporary weather protection until the permanent covering is in place.

Finished sizes

General: Provide milled timbers with actual dimensions which are at least the stated dimensions, except for dimensions qualified by a term such as "nominal" or "out of" to which industry standards for finished sizes apply.

Unseasoned timber

If unseasoned timber is used, or if variations in moisture are likely, allow for shrinkage, swelling and differential movement.

Surface finish

Hardwood: To AS 2796.1 Table B1.

Softwood: To AS 4785.1 Table B1.

8.3.2 VENEERS**Timber veneer**

Veneer quality: To AS/NZS 2270.

Grades (minimum requirement):

- Select grade, veneer quality A, for visible surfaces to have clear finish to have no coated finish.
- General-purpose grade, veneer quality B, for other visible surfaces.

8.4 EXECUTION**8.4.1 WORKMANSHIP****Ploughing**

Back plough boards liable to warp (eg. if exposed externally on one face). Make the width, depth and distribution of ploughs appropriate to the dimensions of the board and degree of exposure.

Painting

Edges: Chamfer edges of work to receive paint or similar coatings.

Priming: For woodwork to be painted, prime hidden surfaces before assembly.

**Disposal
Records**

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects
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A	14.02.03	Preliminary
B	26.02.03	Tender Issue

9.1 GENERAL

9.1.1 SECTION CONTENT

Specified in this section

The Works include, but are not limited to the dilapidation record.

Specified in other sections

Refer to the following Sections:

- *General Requirements.*
- *Demolition:* For demolition of existing buildings, structures and services.

9.2 DILAPIDATION RECORDS

9.2.1 DAMAGE ASSESSMENT

Requirement

The Dilapidation Record, amongst other things, shall be used as a means of assessing the responsibility for damage and/or making good arising out of the performance of the work under the Contract.

9.2.2 DILAPIDATION RECORDS

Requirement

Dilapidation records are required of the following:

- all existing building finishes and materials adjoining areas of proposed works;
- access paths to areas affected by the works;
- adjacent children's play ground;
- the footpath, kerb and guttering surrounding the Site.
- all trees to be retained on or adjacent the site
- adjoining park area including grass, trees and planting;
- stormwater pits adjacent to the site; and
- existing public car parking, west of existing hall.

Inspections

Prior to the commencement and on completion of the Works arrange a joint inspection with the Superintendent and the following people:

- The owners and occupants of adjoining properties.
- Representatives of the Proprietor.
- The Superintendent.

VILLAGE PARK REDEVELOPMENT MONA VALE

Additional inspections: All the recording need not occur at the one inspection.

Purpose

- To ascertain the extent and nature of the record.
- Determine and finalise the extent of works for various elements such as plastering and metal ceiling restoration.

Record

The photographic and written record shall include the condition of the existing building, both internally and externally, adjoining buildings to be retained and/or properties and other relevant structures or facilities, especially structural defects and other damage or defacement. The record shall be used amongst other things as a means of assessing the responsibility for damage and/or making good arising out of the performance of the work under the Contract.

Format

- A4 white pages, bond or thin cardboard.
- **Binding:** Plastic or wire comb, or an A4 sized plain black plastic covered hardback folder, using lever arches, and three or four rings.
- **Covers:** A front and back cover of firm cardboard or plastic if plastic or wire combs are used.
- One or two photographs shall be mounted per page, with their location identified by one of the following:
 - A descriptive note
 - A small key plan with arrows indicating the direction of the view, or
 - A drawing in the same format as the Contract Drawings marked up with the photograph number and the direction of the view.
- Photographs shall include the entire length of kerbs and guttering.

Alternate format: Where agreed between the parties, VHS format video tapes are an acceptable alternative for recording the entire length of road pavements, footpaths, kerbs, gutters, catch drains and retaining walls. Clearly mark with title, date, and house in a stiff plastic case.

Approval

On completion of the Record, a copy shall be forwarded to the Superintendent for review. If approval is not given, the Contractor shall add to or alter the Record and resubmit for review until approval is given.

Endorse

Arrange for all the copies of the record, including drawings, written descriptions, and photographs, to be endorsed by the Principal and Contractor and others noted in the *Inspections* paragraph as evidence of conditions existing before commencement of work. No work which alters the condition of any existing buildings, structures or site features shall commence before the Record is approved.

Copies

Provide one endorsed copy of the record to the following:

- The Superintendent
- The Proprietor

Site copy: Keep one copy of the record on site, with the Contract Documents.

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Dilapidation Records

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Demolition

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects

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10.1 GENERAL

10.1.1 SECTION CONTENT

General

The Works include, but are not limited to demolition of existing buildings, structures and services including planning and execution of the work, protection and support of adjacent structures and removal of demolished material.

10.1.2 CROSS REFERENCES

General

Refer to the General requirements section.

Related sections

Refer to the following sections:

- *Dilapidation Record*: For recording requirements.
- *Services Engineers Specifications*: For demolition of existing services.
- *Landscaping Specification*: For demolition of existing landscape elements.

10.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 2601 1991 The demolition of structures

10.1.4 STANDARD

General

Demolition: To AS 2601.

10.1.5 INTERPRETATION

Demolished materials classes

Salvaged for re-use: Demolished materials scheduled for re-use in the works.

Salvaged for disposal: Demolished materials scheduled for salvaging for Principal's use elsewhere.

Demolished for re-use: Non-scheduled demolished materials proposed by contractor for re-use in the works.

Demolished for removal: Other demolished materials.

10.2 QUALITY

10.2.1 INSPECTION

Schedule of Inspections

Item	Inspection Type	Notice	References
Adjacent structure before demolition.	Hold point	3 days	<i>Interpretation Dilapidation Record</i>
Services before disconnection or diversion.	Hold point	3 days	
Trees specified to be retained before demolition.	Hold point	3 days	
Contents of building before demolition	Hold point	3 days	
Structure after stripping and removal of roof coverings and other external claddings.	Hold point	3 days	
Underground structural after demolition above them.	Hold point	3 days	
Excavations remaining after removal of underground work	Witness point	3 days	
Site after removal of demolished materials.	Witness point	3 days	
Services after reconnection or diversion	Witness point	3 days	

10.2.2 SUBMISSIONS

Authorities

Evidence of compliance: Before commencing demolition, submit evidence that:

- requirements of authorities relating to the work under the contract have been ascertained;
- a permit to demolish has been obtained from the appropriate authority;
- a scaffold permit has been obtained from the appropriate authority (if scaffolding is proposed to be used);
- precautions necessary for protection of persons and property have been taken and suitable protective and safety devices provided to the approval of the relevant authority;
- treatment for rodent infestation has been carried out and a certificate has been obtained from the appropriate authority; and
- fees and other costs have been paid.

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Demolition

Work plan: Submit the work plan before demolition or stripping work. Include the following information:

- The method of protection and support for adjacent property.
- Locations and details of necessary service deviations and terminations.
- If removal of asbestos or of material containing asbestos is required, the information specified in the NOHSC 2002 Code of Practice for the Safe Removal of Asbestos.

Records

Dilapidation record: Refer *Dilapidation Record* section for requirements.

10.3 MATERIALS AND COMPONENTS**10.3.1 DEMOLISHED MATERIALS****Demolished materials**

Ownership: Ownership of demolished materials is described in the **Demolished materials classes table**.

Re-use: If it is proposed to re-use demolished materials in the works, submit proposals.

Salvage: Recover without damage materials to be salvaged.

Removal: Remove from the site demolished materials which are the property of the contractor. Do not burn or bury on site.

- Transit: Prevent spillage of demolishing materials in transit.

Demolished materials classes table

<u>Class</u>	<u>Ownership</u>
Salvaged for re-use	Principal/ Proprietor
Salvaged for disposal	Principal/ Proprietor
Demolished for removal	Contractor

Salvaged materials for reuse schedule

<u>Item for re-use</u>	<u>Requirement</u>
Existing community notice board	Salvage for relocation by Contractor, refer drawings.
Existing external park benches	Salvage for relocation by Contractor, refer drawings.
Existing roof tiles to Library building	Salvage for reuse in repairing existing roof
Existing Data Rack in Library	Salvage for reuse by Principal
Existing palm tree adjacent pedestrian pathway from Park Street and Pitwater Road	Salvage for disposal by Principal Allow to excavate palm. Council will organise crange and transport for removal

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Existing light fittings to existing Library building and existing external light poles	Salvage for reuse, light fittings nominated on electrical drawings.
Existing electrical fittings (eg smoke detectors) and electrical cabling	Salvage for reuse, items nominated on electrical drawings.
Existing Library computer rack	Salvage for reuse, items nominated on electrical drawings.

10.4 EXECUTION

10.4.1 SUPPORT

Temporary support

Existing buildings: Until permanent support is provided, provide temporary support for sections of existing buildings which are to be altered and which normally rely for support on work to be demolished.

Ground support: Support excavations for demolition of underground structures.

Adjacent structures: Provide supports to adjacent structures where necessary, sufficient to prevent damage resulting from the works.

- Lateral supports: Provide lateral support at least that given by the structure to be demolished, using shoring.
- Vertical supports: Provide vertical support where necessary using piling or underpinning or both.

Permanent supports

If permanent supports for adjacent structures are necessary and are not described, give notice and obtain instructions.

10.4.2 PROTECTION

Encroachment

Prevent the encroachment of demolished materials onto adjoining property, including public places.

Weather protection

If walls or roofs are opened for alterations and additions or the surfaces of adjoining buildings are exposed, provide temporary covers to prevent water penetration. Provide covers to protect existing plant and equipment and materials intended for re-use.

Dust protection

Provide dust-proof screens, bulkheads and covers to protect existing finishes and the immediate environment from dust and debris.

Security

If a wall or roof is opened for alterations and additions, provide security against unauthorised entry to the building.

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Temporary screens

General: Fill the whole of designated temporary openings or other spaces using dust and weatherproof temporary screens, fixed securely to the existing structure.

Type: Timber framed screens sheeted with fibre cement and painted. Seal the junctions between the screens and the openings.

Designated openings: To any opening of existing building being occupied during the construction period, including the existing Library and Memorial hall buildings.

Temporary access

Provide a substantial temporary doorset fitted with a rim deadlock, and remove on completion of demolition.

Exposed surfaces

General: Where necessary protect and weatherproof the surfaces of adjacent structures exposed by demolition.

10.4.3 DEMOLITION**Dilapidation record**

Purpose: Use the dilapidation record to assess the responsibility for damage or making good, or both, arising out of demolition work.

Availability: Keep the records of the investigations on site and available for inspection until practical completion of the contract.

Encroachment

If encroachments from adjacent structures are encountered and are not described, give notice and obtain instructions.

Concrete slabs

Using a diamond saw, neatly cut back or trim to new alignment with a clean true face existing concrete slabs to be partially demolished or penetrated.

Explosives

Do not use explosives.

10.4.4 HAZARDOUS MATERIALS**Requirement**

The Contractor shall be deemed to have investigated and assessed the requirement and allowed to remove any hazardous materials, which form part of the finishes, claddings, linings and the like to existing buildings.

The Contractor shall be deemed to have allowed for the removal of synthetic Mineral Fibre insulation to existing roofs and walls to be demolished.

No variation to Contract Sum or Date of Practical Completion will be considered for such items.

If any other hazardous materials are discovered during the course of the works, the cost of removal of these materials will form an adjustment to the Contract Sum.

Additional hazardous materials

Give notice immediately hazardous materials or conditions are found, including the following:

- Asbestos or material containing asbestos.
- Flammable or explosive liquids or gases.

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- Toxic, infective or contaminated materials.
- Radiation or radioactive materials.
- Noxious or explosive chemicals.
- Tanks or other containers which have been used for storage of explosive, toxic, infective or contaminated substances.

Asbestos removal

Method: Use wet removal methods.

Covering: Use polyethylene sheet covering for non-asbestos surfaces in the working area.

Sealing: Seal in remaining fibres on the surface from which asbestos has been removed, with a spray adhesive.

Monitoring: Have dust monitoring performed by an independent testing authority.

10.5 COMPLETION

10.5.1 COMPLETION

Notice of completion

Give at least seven working days' notice of completion of demolition so that adjacent structures may be inspected following completion of demolition.

Support

Temporary support: Clear away at completion of demolition.

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Demolition

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Site Preparation

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Tender Number T01/3



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B	28.02.03	Tender Issue

VILLAGE PARK REDEVELOPMENT MONA VALE

11.1 GENERAL**11.1.1 SECTION CONTENT****General**

The Works include, but are not limited to clearing, environmental protection and trees to be retained.

11.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Demolition*: For demolition of existing buildings, structures and services, support of adjacent structures where affected by demolition.
- *Earthwork*: For topsoil removal, excavation, filling and compaction.
- *Service Trenching*: For service trenching.
- *Landscaping Specification*: For landscaping and paving.

11.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1744 1975 Standard alphabets for road signs.

11.2 QUALITY**11.2.1 INSPECTION****Schedule of Inspections**

Item	Inspection Type	Notice	References
Enclosures to trees to be retained.	Hold point	3 days	<i>Trees to be retained.</i>
Trees to be removed.	Hold point	3 days	
Prior to any work on trees to be retained.	Hold point	3 days	<i>Trees to be retained.</i> <i>Work on Trees</i>
Completion of marking of existing services.	Witness point	3 days	<i>Existing Services.</i> <i>Marking</i>

VILLAGE PARK REDEVELOPMENT MONA VALE**11.2.2 SUBMISSIONS****Execution**

Submit the methods and equipment proposed for the groundwork, including the following:

- Dewatering and groundwater control and disposal of surface water.
- Control of erosion, contamination and sedimentation of the site, surrounding areas and drainage systems.
- Dust control.

11.3 SITE MANAGEMENT**11.3.1 TREE PROTECTION****Warning sign**

General: Display a sign in a prominent position at each entrance to the site, warning that trees and plantings are to be protected during the contract. Remove on completion.

Lettering: Road sign type sans serif letters, 100 mm high, in red on a white background, to AS 1744.

11.3.2 TREES TO BE RETAINED**Marking**

General: Mark trees and shrubs to be retained using suitable non-injurious, easily visible and removable means of identification.

Tags: 100 x 50 mm zincanncal tags, painted yellow and lettered to conform with the tree number on the drawings. Secure tags to trees using loose galvanised steel wire bands.

Protection and repair

Protection: To protect from damage, the trees and shrubs to be retained, including those beyond the site area, both above and below ground.

Repair: Repair trees damaged during the work. All work is to be completed by an Arborist approved by Council and the Superintendent.

Tree enclosures

General: Provide temporary protective enclosures or guards at the drip line.

Wire enclosures: Four strands of fencing wire, or plastic mesh barrier, supported on star pickets spaced at not more than 4 m.

Mesh enclosures: F62 reinforcing mesh 1800 mm high wired to 2400 mm long star pickets, driven 600 mm into the ground, spaced 1800 mm apart at a minimum distance of 1 m from the tree trunk.

Sheeting to excavations: Where excavations are to be made near trees, add continuous 900 mm high corrugated galvanised steel sheeting, bedded 150 mm into the ground, wired to the enclosure.

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Tree enclosure schedule

Trees to be enclosed	Type of enclosure
Trees to be retained within 10 metres of excavations for new buildings.	Mesh enclosure
Trees and vegetation to be retained beyond 10 metres of excavations for new buildings	Wire enclosure

Work on trees

If it is proposed to perform work on trees, give notice and obtain instructions.

Qualified personnel: Any work permitted to be done on trees to be retained shall be performed by an approved tree surgeon.

Trimming or lopping: If tree branches are directed to be removed, cut them back properly to the trunk.

Repair: Repair trees damaged during the work. If the Superintendent permits repair work to be attempted on a tree damaged during the work under the Contract, perform the repair work at no extra cost.

Cuts and Wounds: Clean and paint with an approved dressing.

Removal

If a tree is damaged and repair work is considered impractical, or is attempted and fails, give notice and obtain instructions.

11.3.3 WORK NEAR TREES**Harmful materials**

Keep the area within the dripline free of construction material and debris. Do not place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks. Prevent wind-blown materials such as cement from harming trees and plants.

Damage

Prevent damage to tree bark. Do not attach stays, guys and the like to trees.

Work under trees

General: Do not remove topsoil from, or add topsoil to, the area within the dripline of the trees.

Excavation: If excavation is required near trees to be retained, give notice and obtain instructions. Open up excavations under tree canopies for as short a period as possible.

Hand methods: Use hand methods to locate, expose and cleanly remove the roots on the line of excavation. If it is necessary to excavate within the drip line, use hand methods such that root systems are preserved intact and undamaged.

Roots

Do not cut tree roots exceeding 50 mm diameter. Where it is necessary to cut tree roots, use means such that the cutting does not unduly disturb the remaining root system. Immediately after cutting, apply a bituminous fungicidal sealant to the cut surface to prevent the incursion of rot or disease.

Backfilling

Backfill to excavations around tree roots with a mixture consisting of three parts by volume of topsoil and one part of well rotted compost with a neutral pH value, free from weed growth and harmful materials. Place the backfill layers, each of 300 mm maximum depth, compacted to a dry density similar to that of the original or surrounding soil. Do not backfill around tree

VILLAGE PARK REDEVELOPMENT MONA VALE

trunks to a height greater than 300 mm above the original ground surface. Immediately after backfilling, thoroughly water the root zone surrounding the tree.

Compacted ground

Do not compact the ground under trees. If compaction occurs, give notice and obtain instructions.

Watering

Water trees as necessary, including when roots are exposed at ambient temperature $>35^{\circ}\text{C}$.

11.3.4 EXISTING SERVICES**Marking**

Before commencing earthworks, locate and mark existing underground services in the areas which will be affected by the groundworks operations including clearing, excavating and trenching.

Excavation

Do not excavate by machine within 1 m of existing underground services.

11.3.5 ENVIRONMENTAL PROTECTION**Erosion control**

General: Plan and carry out the work so as to avoid erosion, contamination, and sedimentation of the site, surrounding areas, and drainage systems.

Temporary erosion control measures

Staging: Stage operations (eg. clearing, stripping).

Restoration: Progressively restore disturbed areas.

Drains: Provide temporary drains and catch drains.

Dispersal: Divert and disperse concentrated flows to points where the water can pass through the site without damage.

Spreader banks or other structures: Disperse concentrated run-off.

Silt traps: Construct and maintain silt traps to prevent discharge of scoured material to downstream areas.

Temporary grassing: Required.

Temporary fencing: Required.

Maintenance: After each rain inspect, clean, and repair if required, temporary erosion and sediment control works.

Removal: Remove temporary erosion control measures when they are no longer required.

Proposed measures: At least two weeks before commencing clearing operations, submit documents showing the proposed temporary erosion control measures, including plans showing layouts, levels, temporary structures and the like, staging proposals and stormwater run-off calculations.

Dewatering

General: Keep groundworks free of water. Provide and maintain slopes, crowns and drains on excavations and embankments to ensure free drainage. Place construction, including fill, masonry, concrete and services, on ground from which free water has been removed. Prevent water flow over freshly laid work.

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Excavations: Prevent surface water and ground water from entering excavations for footings, trenches and the like. Remove any water, including seepage from excavations as soon as practical. Protect base of excavation from damage by constructing sumps, or other means of removing water. Delay removal of final 75 mm of material where water is likely to affect the base of the excavation.

11.3.6 SITE RESTORATION**Requirement**

Where existing ground surfaces are not required to be varied as part of the works, restore them to the condition existing at the commencement of the contract.

11.4 SITE CLEARING**11.4.1 SITE CLEARING****Extent**

General: Clear only the following site areas:

- Areas to be occupied by works such as buildings, paving, excavation, regrading and landscaping.
- Other areas designated to be cleared.

Contractor's site areas: If not included within the areas specified above, clear generally only to the extent necessary for the performance of the works.

Clearing operations

Removal: Remove everything on or above the site surface, including rubbish, scrap, grass, vegetable matter and organic debris, scrub, trees, timber, stumps, boulders and rubble.

Grubbing: Grub out stumps and roots over 75 mm diameter to a minimum depth of 500 mm below subgrade under buildings, embankments or paving, or 300 mm below finished surface in unpaved areas.

Old works: Remove old works, including slabs, foundations, pavings, drains and manholes found on the surface.

Retain grass: Do not remove grass.

Remove grass: Remove grass but remove as little topsoil as possible.

Existing grass: Remove grass to a depth just sufficient to include the root zone.

11.4.2 SPOIL**Off site disposal**

General: Remove surplus excavated material and surplus site clearance material from the site.

Mulch

Put cleared vegetation through a chipper. Reduce to pieces not larger than 75 x 50 x 15 mm and stockpile for re-use as mulch.

On site burial

Do not bury boulders, concrete fragments and the like on site.

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11.5 COMPLETION

11.5.1 COMPLETION

Temporary works

Tree enclosures: Remove temporary tree enclosures at completion.

Tree marking: Remove temporary marks and tags at completion.

Earthwork

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhjorth Architects

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20151 SP212

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

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12.1 GENERAL**12.1.1 SECTION CONTENT****General**

The Works include, but are not limited to topsoil removal, excavation, filling and compaction.

12.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Site Preparation*: For clearing, environmental protection and trees to be retained.
- *Service Trenching*: For service trenching.
- *Landscaping Specification*: For landscaping and paving.

12.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1289		Methods of testing soil for engineering purposes
AS 1289.5.1.1	1993	Soil compaction and density tests- Determination of the dry density/moisture content relation of a soil using standard compactive effort
AS 1289.5.2.1	1993	Soil compaction and density tests- Determination of the dry density/moisture content relation of a soil using modified compactive effort
AS 1289.5.3.1	1993	Soil compaction and density tests - Determination of the field density of a soil - Sand replacement method using a sand-cone pouring apparatus
AS 1289.5.3.2	1993	Soil compaction and density tests- Sand replacement method using a sand pouring can, with or without a volume displacer
AS 1289.5.3.5	1997	Soil compaction and density tests- Determination of the field dry density of a soil - Water replacement method
AS 1289.5.5.1	1998	Soil compaction and density tests- Determination of minimum and maximum dry density of a cohesionless material - Standard method
AS 1289.5.6.1	1998	Soil compaction and density tests- Compaction control test- Density index method for a cohesionless material
AS 1289.5.7.1	1993	Soil compaction and density tests - Compaction control test - Hilf density ratio and Hilf moisture variation (rapid method)
AS 1289.5.8.1	1995	Soil compaction and density tests - Determination of field density and field moisture content of a soil using a nuclear surface moisture-density gauge - Direct transmission mode

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AS 1289.5.8.4	1986	Soil compaction and density tests- Calibration of nuclear surface moisture-density gauge using standard blocks
AS 1289.6.1.1	1977	Soil strength and consolidation tests- Determination of the California Bearing Ratio of a soil - Standard laboratory method for a remoulded specimen
AS 1289.6.1.2	1977	Soil strength and consolidation tests - Determination of the California Bearing ratio of a soil - Standard laboratory method for an undisturbed specimen
AS 1289.6.1.3	1998	Soil strength and consolidation tests- Determination of the California bearing ratio of a soil - Standard field-in-place method
AS 1726	1993	Geotechnical site investigations
AS 3705	1990	Geotextiles - Identification, marking, and general data
AS 3798	1996	Guidelines on earthworks for commercial and residential developments

12.1.4 INTERPRETATION

Definitions

General: To AS 1348.

Description and classification of soils: To AS 1726.

Bad ground: Ground unsuitable for the purposes of the works, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground which is or becomes soft, wet or unstable.

Discrepancy: A difference between contract information about the site and conditions encountered on the site, including but not limited to discrepancies concerning:

- The nature or quantity of the material to be excavated or placed;
- Existing site levels; and
- Services or other obstructions beneath the site surface.

Line of influence: A line extending downward and outward from the bottom edge of a footing, slab or pavement and defining the extent of foundation material having influence on the stability or support of the footings, slab or pavement.

Rock: Monolithic material with volume greater than 0.5 m³ which cannot be removed until broken up either by explosives or by rippers or percussion tools.

Other than rock: All material encountered in excavations, other than rock.

Subgrade: The trimmed or prepared portion of the formation on which the pavement or slab is constructed.

Services: Pipes, cables, ducts, associated structures or similar objects, including electrical, communication and control cables, drains, sewers, water pipes, gas pipes, and the like.

12.1.5 SITE INVESTIGATION

Notice

If the following are encountered, give notice immediately and obtain instructions before carrying out any further work in the affected area:

- Bad ground.
- Discrepancies.
- Rock.
- Springs, Seepages.

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- Topsoil > 100 mm deep.

Report

A site investigation was made and a copy of the report is included in the *General Requirements* section. Together with any diagrammatic data that may be included on the Drawings, it is included for information on the nature of the ground at each tested part. It is not a complete description of conditions existing at or below ground level.

Accuracy: The accuracy of the information is not guaranteed and will not be the basis for a Contract Sum Adjustment or an Extension of Time.

Notice

If differences between Contract information about the site and conditions encountered on the site are encountered, give notice immediately:

- The nature or quantity of the material to be excavated or placed
- Existing site levels, and
- Services or other obstructions beneath the site surface.

12.2 QUALITY**12.2.1 INSPECTION****Schedule of Inspections**

Item	Inspection Type	Notice	References
Areas to be cleared and/or stripped of topsoil	Witness point	3 days	
Areas stripped of topsoil	Witness point	3 days	<i>Removal of topsoil</i>
Excavation completed to contract levels or founding material	Witness point	3 days	
Subgrade before placing sub-base, base, working base, filter fabric or membrane, as applicable	Witness point	3 days	
Filter fabric in place before backfilling	Witness point	3 days	
Base completed to contract levels	Witness point	3 days	
Stockpiled topsoil before spreading	Witness point	3 days	
Bad ground where encountered	Hold point	Immediate	
Discrepancies where encountered	Hold point	Immediate	

12.2.2 TESTS**Geotechnical Testing Authority**

General: Use an independent testing laboratory certified for this work by an organisation accredited by JAS-ANZ.

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Testing

Compaction (density): Test for compliance.

Retesting: Rework and retest areas which do not achieve the required density until that density is achieved.

Field density

Field dry density: To AS 1289.5.3.1, AS 1289.5.3.2, AS 1289.5.3.5 or AS 1289.5.8.1. If using AS 1289.5.8.1 calibrate the surface moisture-density gauge in accordance with AS 1289.5.8.4 before use.

Varying: Do not vary the test procedure for a given soil type.

Density index: To AS 1289.5.6.1.

Reference density

Standard maximum dry density: To AS 1289.5.1.1.

Modified maximum dry density: To AS 1289.5.2.1.

Minimum and maximum dry density, cohesionless soil: To AS 1289.5.5.1.

Hilf density ratio and moisture variation: To AS 1289.5.7.1.

Varying: Do not vary the test procedure for a given soil type.

Sampling: Follow the recommendations in AS 3798 clause 7.4.

Moisture curing of samples: Allow adequate curing times, or make appropriate allowances for poorly conditioned compaction curves.

California bearing ratio: Sample and test to AS 1289.6.1.1, AS 1289.6.1.2 or AS 1289.6.1.3, as appropriate.

Field density test locations

Fill: Test the areas of fill which are to support non-spanning concrete ground slabs, roads and paved areas, and areas of uncertain compaction.

Field density test frequency

Site area > 1500 m²: At least

- 1 test per layer or 200 mm thickness per material type per 2500 m²; or
- 1 test per 500 m³ distributed evenly throughout full depth and area; or
- 3 tests per visit;

Whichever requires the most tests.

Site area 500 – 1500 m²: At least

- 1 test per layer or 200 mm thickness per 1000 m²; or
- 1 test per 200 m³ distributed evenly throughout full depth and area; or
- 1 test per allotment per layer;

whichever requires the most tests.

Site area < 500 m²: At least

- 1 test per layer or 200 mm thickness per 500 m²; or
- 1 test per 100 m³ distributed evenly throughout full depth and area; or
- 3 tests per visit;

whichever requires the most tests.

Confined operations: 1 test per 2 layers per 50 m².

VILLAGE PARK REDEVELOPMENT MONA VALE**12.2.3 SAMPLES****General**

Submit samples of the following:

- Each type of filter fabric.
- Each type of imported fill.

12.2.4 SUBMISSIONS**Design**

Calculations: Submit calculations to show that proposed excavations and temporary supports, including where applicable supports for adjacent structures, will be stable and safe.

Tests

Imported fill: Submit certification or test results which establish the compliance of imported fill with the contract.

Materials

Submit details of materials proposed, including the following:

- Sources of imported fill.

Execution

Submit the methods and equipment proposed for the groundworks, including the following:

- Excavation methods, stages, clearances, batters and temporary supports.
- Stockpiles and borrow pits.
- Placing and compaction methods and stages.

12.3 Materials and Components

12.3.1 FILL**Fill Material**

General: Inorganic, non-perishable material.

Sulfur content: Do not provide filling with sulfur content exceeding 0.5% within 500 mm of cement bound elements (for example concrete structures or masonry) unless such elements are protected by impermeable membranes or equivalent means.

Structural fill

Excluded materials:

- organic soils;
- materials contaminated through past site usage;
- materials which contain substances which can be dissolved or leached out, or which undergo volume change or loss of strength when disturbed and exposed to moisture;
- silts or silt-like materials;
- fill containing wood, metal, plastic, boulders or other deleterious material.
- Clays of high plasticity;
- Material containing large particles after compaction;
- Overwet materials;

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- Gravels or rock fill which leave voids;
- Saline soils;
- Carbonate soils; and
- Demolition rubble.

Sources

Provide fill imported on to the site from suitable sources unless the fill type can be provided from

- spoil recovered from the excavations; or
- borrow material from designated borrow pits.

Fill types

General fill: Well-graded material, maximum particle size 75 mm, plasticity index $\leq 35\%$.

Select fill: Granular material complying with the following:

- Particle size: 75 mm maximum.
- Proportion passing 0.075 mm sieve: 25% maximum.
- Plasticity index: $\geq 2\%$, $\leq 15\%$.
- Hardcore: Graded hard material capable of being compacted to an even stable surface.
- Particle size: 120 mm maximum.
- Proportion exceeding particle size of 50 mm: 75% minimum.

Embankment fill: Graded material for road embankments with maximum particle size determined by location and layer thickness, but in any case not exceeding two-thirds of the compacted layer thickness.

Hand-packed hardcore: Hardcore packed by hand to an even surface before compaction.

Subsoil filter

Subsoil filter: Coarse sand or crushed stone graded to the Subsoil grading table.

Subsoil grading table

Sieve aperture (mm)	Percentage passing (by mass)		
	Fine filter	Coarse filter	Combined filter
26.5		100	100
19.0		90 - 100	95 - 100
9.5	100	75 - 90	90 - 97
4.75	80 - 100		75 - 90
2.36	65 - 90		60 - 78
1.18		10 - 30	35 - 55
0.60		0 - 2	18 - 25
0.30	7 - 16		5 - 10
0.15	0 - 4		0 - 3

VILLAGE PARK REDEVELOPMENT MONA VALE**Fill subgrades**

Provide material in the top 150 mm which has a maximum particle size of 75 mm.

12.3.2 FILTER FABRIC**Material**

Type: Polymeric fabric formed from a plastic yarn composed of at least 85% by weight of propylene, ethylene, amide or vinylidenechloride and containing stabilisers or inhibitors to make the filaments resistant to deterioration due to ultraviolet light.

Identification and marking: To AS 3705.

Protection

Provide heavy duty protective covering. Store clear of the ground and out of direct sunlight. During installation do not expose the filter fabric to sunlight for more than 14 days.

12.4 EXCAVATING**12.4.1 CONTAMINATED EXCAVATED MATERIAL****Requirement**

Remove from site or treat all contaminated fill excavated during the course of the works. Contaminated fill shall not be used as filling.

It should be noted that existing landscape mounds located on the site may contain such contaminants Asphalt removed from previous roadway works.

The Contractor shall be deemed to have allowed for the removal of bitumen material found in groundworks.

No variation to Contract Sum or Date of Practical Completion will be considered for such items.

If any other hazardous materials are discovered during the course of the ground works, the cost of removal of these materials will form an adjustment to the Contract Sum.

12.4.2 GROUND WATER**Requirement**

The maximum height of ground water is unknown. The subgrade may at times be affected by ground water. A *Summary of Ground Water Observations*, is provided for information only, and does not form part of the contract. This information may not be complete or accurate.

The Contractor shall be deemed to have allowed for ground water found and dewatering as required to undertake the works.

Where to ground water level rises above works, implement suitable de-watering measures.

No variation to Contract Sum or Date of Practical Completion will be considered for undertaking works in subgrades affected by moisture, dewatering and the like.

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12.4.3 TOLERANCES

Surfaces

Finish groundworks to reasonably smooth and uniform surfaces conforming to the required tolerances.

Subgrades

General: The tolerances in the Subgrade tolerances table apply to finished subgrade levels unless overridden by the specific requirements (including tolerances) for finished surface levels and thicknesses of covering materials.

- Absolute level tolerance: Maximum deviation from design level.
- Relative level tolerance: Maximum deviation from a 3 m straight edge laid anywhere on each plane surface.

Subgrade tolerances table

Item	Level tolerance (maximum)	
	Absolute	Relative
Cut subgrade in earth and fill subgrade	+ 0 - Unspecified	20 mm
Cut subgrade in rock	+ 0 - Unspecified	Unspecified

12.4.4 MATERIAL STOCKPILING

General

Extent: Areas to be cut, areas to be filled, and areas to be occupied by structures, pavements, embankments and the like.

Remove top soil and stock pile for reuse.

Separate clean excavated material into general fill and free draining granular fill for reuse in contract works. Remove all other excavated material from site.

Top soil

Stock pile topsoil suitable as reuse as landscape fill, refer *Landscape specification* for details.

Materials to be stripped:

- Soils not suited to support loads or to be incorporated in fills.
- Topsoils, where unsuitable and where needed for subsequent revegetation.

Maximum depth: 100 mm.

Excavated material stockpiles

Stockpile fill approved for re-use.

Establish stockpiles to heights not exceeding 1.5 m. Provide adequate drainage and erosion protection. Do not burn off or remove plant growth, which may occur during storage. Do not allow traffic on stockpiles.

If a stockpile is to remain for more than four weeks, sow with temporary grass. Protect the topsoil stockpiles from contamination by other excavated material, weeds and building debris.

Stock piles must be located within the designated fenced site areas.

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12.4.5 EXCAVATION**Extent**

Site surface: Excavate over the site to give correct levels and profiles as the basis for construction. Make allowance for compaction or settlement.

Footings: Excavate for footings, slabs on ground, pits, wells and shafts, to the required sizes and depths. Confirm that bearing capacity is adequate.

Landscaping: Excavate to give the correct levels and profiles to allow for imported landscape fill:

- areas of planting on grade: 300 mm;
- areas of turf on grade: 75 mm;
- paving on grade: 170mm;
- mature palms: 1100 mm
- gravel or bonded gravel surfaces: 100 mm

Existing footings

If excavation is required below the line of influence of an existing footing, use methods which maintain the support of the footing and ensure that the structure and finishes supported by the footing are not damaged.

Proof rolling

Extent: Proof roll excavations for pavements, filling and non-spanning slabs on ground to determine the extent of any bad ground.

Where existing site fill is to be utilised as subgrade to pavements, they should be compacted with a smooth drum roller to consolidate any soft or loose zones, and provide a uniform subgrade. The Contractor shall carefully observe the works to ensure no ongoing deformation is occurring during rolling.

Proof rolling method: refer to Structural Engineers drawings.

12.4.6 CONTRACT DEPTHS**Requirement**

Refer to Structural Engineers drawings for minimum bearing capacity requirements and slab thicknesses. Refer to Architect's drawings for slab levels.

Should excavation be required to deeper than indicated by the above to achieve the required bearing capacity, excavate to the required bearing level and fill with compacted fill placed to underside of footing level to meet bearing requirements.

Costing

The differences between the documented and actual depths shall not be adjusted.

12.4.7 ROCK EXCAVATION**Generally**

The contractor shall be deemed to have allowed for the cost of performing the required excavations in whatever materials may be encountered, and no contract Sum Adjustment or Extension of Time shall be considered.

12.4.8 EXPLOSIVES**General**

Do not use explosives.

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12.4.9 SUBGRADES AFFECTED BY MOISTURE

General

Where the subgrade is unable to support construction equipment, or it is not possible to compact the overlying pavement only because of high moisture content, perform one or more of the following:

- Allow the subgrade to dry until it will support equipment and allow compaction.
- Scarify the subgrade to a depth of 150 mm, work as necessary to accelerate drying, and recompact when the moisture content is satisfactory.
- Excavate the wet material and remove to spoil, and backfill excavated areas.

Method

The method of treatment is at the Contractor's discretion. Where the ground is allowed to dry, the additional delay shall not be grounds for an extension of time. Where wet subgrade could have been avoided by correct drainage or other measures that could reasonably have been taken, all expenses shall be the Contractor's.

12.4.10 BEARING SURFACES

General

Provide even plane bearing surfaces for loadbearing elements including footings. Step to accommodate level changes. Make the steps to the appropriate courses if supporting the works.

Deterioration

If the bearing surface deteriorates because of water or other cause, excavate further to a sound surface before placing the loadbearing elements.

Variations

The Contractor shall not be entitled to a Contract Sum Adjustment or an Extension of Time for excavation in excess of that required by the Contract, including excavation below required depths, or additional excavation which the Contractor may elect to undertake to permit the use of certain constructional plant, and any consequent additional backfilling, compacting or testing.

12.4.11 REINSTATEMENT OF EXCAVATION

General

Where excavation exceeds the required depth, or deteriorates, reinstate to the correct depth, level and bearing value.

Particular

Below or within the "line of influence" of footings, beams, or other structural elements: Concrete of strength equal to the structural element, minimum 15 MPa.

Below slabs or pavements: Provide selected filling compacted to the specified density. In cut subgrades if the over excavation is less than 100 mm, do not backfill, but make good by increasing the thickness of the layer above. Backfill rock depressions and over excavation of subsoil drains using coarse subsoil filter.

Line of influence

Angle from horizontal:

12.4.12 SUPPORTING EXCAVATIONS

Removal of supports

Remove temporary supports progressively as backfilling proceeds.

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Voids

Guard against the formation of voids outside sheeting or sheet piling if used. Fill and compact voids to a dry density similar to that of the surrounding material.

12.4.13 ADJACENT STRUCTURES**Temporary supports**

General: Provide supports to adjacent structures where necessary, sufficient to prevent damage arising from the works.

Lateral supports: Provide lateral support using shoring.

Vertical supports: Provide vertical support where necessary using piling or underpinning or both.

Permanent supports

If permanent supports for adjacent structures are necessary and are not described, give notice and obtain instructions.

Encroachments

If encroachments from adjacent structures are encountered and are not shown on the drawings, give notice and obtain instructions.

12.4.14 EXCAVATION IN PUBLIC AREAS**Approvals**

Before excavating any public area including roads, footpaths, reserves, and the like, obtain the approval of the relevant authorities and comply with their requirements for alternative traffic arrangements, excavation methods, backfilling, and reinstatement.

Reinstatement

Restore areas outside the limits of the Works, which have been disturbed by the Works, to their original condition on completion of the excavation. Reinstatate surfaces to their original level without subsidence and without cracking at junctions with existing surfaces. Restore pavements to match existing. Regrass grassed areas.

12.4.15 TIPPING**General**

The contractor shall allow for all tipping expenses at commercial rates where applicable.

It is anticipated that the contractor will consider various solutions to manage waste on site. These could include:

- Reuse of clean uncontaminated fill on site where possible
- Separation of materials for recycling eg. Brick / Concrete.
- Screening / treating materials prior to reuse / disposal

Kimbriki Recycling and Waste Disposal Centre

The Principal has special arrangements with Kimbriki Recycling and Waste Disposal Centre (Kimbriki Road, Terry Hills) and receives discounted rates for tipping materials at the centre.

Should the contractor use this facility for tipping the following procedure shall be followed:

- The principal will provide the contractor with a Job Number to use at the weighbridge at Kimbriki Tip.
- The contractor will advise on a daily basis the trucks proposed to tip at Kimbriki.

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- Council will fax Kimbriki Tip on a daily basis as required advising of the truck registration numbers to be using Council's account for the day / period.
- The contractor will tip on the account of the Principal
- The principal will pay the account from Kimbriki Recycling Centre.
- Kimbriki Tip will provide detailed reports setting out the rego number., date, receipt number, weighbridge code, weight and total cost.
- Using the quantities listed in the report together with the material code Council will apply the relevant commercial rate charged by Kimbriki (as applicable at the time of tipping) to calculate the total amount of tip fees included in the contract sum.
- This amount will be the basis of a deduction to the contract sum.
- Builder's profit and attendance will not apply to this variation.
- The contractor shall maintain copies of all weighbridge receipts from all loads taken to Kimbriki for their own verification and checking off against the printed report prepared by Kimbriki Recycling Centre.

Only waste generated from the contract works shall be tipped on Councils account.

12.5 PLACING AND COMPACTION**12.5.1 PREPARATION FOR FILLING****General**

Prepare the ground surface before placing fill (including topsoil fill), ground slabs or load bearing elements. Shape to assist drainage. Remove materials which will inhibit or prevent satisfactory placement of fill layers, loose material, debris and organic matter. Compact the ground exposed after stripping to achieve the required density of overlying fill, if any.

Under slabs, paving and embankments

Compact the ground to achieve the densities specified for these locations. If necessary loosen the ground to a depth of > 200 mm and adjust the moisture content before compaction to a density consistent with subsequent filling.

12.5.2 PLACING FILL**General**

Layers: Place fill in near-horizontal layers of uniform thickness, deposited systematically across the fill area.

Extent: Place and compact fill to the designated dimensions, levels, grades, and cross sections so that the surface is always self-draining.

Edges: At junctions of fill and existing surfaces, do not feather the edges.

Mix: Place fill in a uniform mixture.

Previous fill: Before placing subsequent fill layers, ensure that previously accepted layers still conform to requirements, including moisture content.

Placing at structures

General: Place and compact fill in layers simultaneously on both sides of structures, culverts and pipelines to avoid differential loading. Carefully place first layers of fill over the top of structures.

Concrete: Do not place fill against concrete until the concrete has been in place for fourteen days.

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Moisture content

Adjustment: Where necessary to achieve the required density or moisture content or both, adjust the moisture content of the fill before compaction. Ensure the moisture distribution is uniform, and avoid saturation at the specified density.

Rain: If rain is likely, crown the placed fill, seal using plant with rubber tyres or smooth wheels, and grade to prevent ponding.

Fill schedule

Location	Fill type
Generally	Clean fill retained from excavation or imported fill as required
Back fill behind retaining walls to 500 mm width	Free draining granular fill, either from excavated material or imported as required.

12.5.3 COMPACTING FILL**Tolerances**

Finish the surface to the required level, grade and shape within the following tolerances:

- Under slabs and loadbearing elements: + 0, - 25 mm.
- Other ground surfaces: ± 50 mm, provided the area remains free draining and matches adjacent construction where required. Provide smoothness as normally produced by a scraper blade.

Density

General: Compact each layer of fill to the required depth and density, as a systematic construction operation. Shape surfaces to provide drainage and prevent ponding.

Exposed ground surface: After stripping, compact to at least 150 mm deep.

Maximum rock and lump size in layer after compaction: 2/3 compacted layer thickness.

Fill batter faces: Either compact separately, or overfill and cut back. Form roughened surfaces to the faces.

Protection

Protect the works from damage due to compaction operations. Where necessary, limit the size of compaction equipment or compact by hand. Commence compacting each layer at the structure and proceed away from it.

Moisture content

Adjust the moisture content of fill at the time of compaction within the range of 85-115% of the optimum moisture content determined by AS 1289.5.1.1 or AS 1289.5.2.1 as appropriate, in order to achieve the required density.

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Minimum relative compaction table

Location	Cohesive soils.	Cohesionless soils.
	Minimum dry density ratio (standard compaction) to AS 1289.5.1.1 (std) or AS 1289.5.2.1 (mod)	Minimum density index to AS 1289.5.6.1
Residential:		
- Lot fill, house sites.	95 std	65
Commercial:		
- Fills to support minor loadings inc. floor loadings < 20 kPa and isolated pad or strip footings < 100 kPa.	98 std	70
Pavements:		
- Fill to support pavements	95 std	65
- Subgrade to 300 mm deep	98 std	80
- Sub-base courses	95 mod	N/A
- Base course, heavily loaded	98 mod	N/A
- Base course, other	95 mod	N/A

12.5.4 GRADING

External areas

Grade to give falls away from buildings, minimum 1:100.

Subfloor areas

General: Grade the ground surface under suspended floors to drain ground or surface water away from buildings without ponding.

12.5.5 SITE RESTORATION

Requirement

Where existing ground surfaces are not required to be varied as part of the Works, restore them to the condition existing at the commencement of the work under the Contract.

Settlement of Earthworks

Fill compact and trim all settlements of earthworks which take place during construction. Dig out soft spots or unsound areas and fill with sound material properly compacted to a condition equivalent to the surround material.

12.6 BARRIERS AND MEMBRANES

12.6.1 PROTECTION TO MEMBRANES

Protective covering

Do not disturb or damage the protective covering of membranes during backfilling.

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Generally

Protect waterproofing, waterproof membranes, vapour barriers, or tanking membranes from damage by subsequent operations including backfilling and the like.

Protective Covering

Refer *Waterproofing* section for details.

12.7 COMPLETION

Temporary works

Temporary supports: Remove temporary supports to adjacent structures at completion.

Service Trenching 13

VILLAGE PARK REFURBISHMENT MONA VALE

Tender Number T01/3



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VILLAGE PARK REFURBISHMENT MONA VALE

13.1 GENERAL**13.1.1 SECTION CONTENT****General**

The Works include, but are not limited to service trenching. This Section shall be used for all types of trenching.

13.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Site Preparation*: For clearing, environmental protection and trees to be retained.
- *Earthworks*: For topsoil removal, excavation, filling and compaction.

13.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1289.5.1.1	1993	Soil compaction and density tests- Determination of dry density/moisture content relation of a soil using standard compactive effort
AS 1289.5.3.2	1993	Determination of the field dry density of a soil - Sand replacement method using a sand pouring can, with or without a volume displacer
AS 1289.5.3.5	1997	Soil compaction and density tests- Determination of the field dry density of a soil - Water replacement method
AS 1289.5.4.1	1993	Soil compaction and density tests - Compaction control test - Dry density ratio, variation and moisture ratio
AS 1289.5.6.1	1998	Soil compaction and density tests- Compaction control test- Density index method for a cohesionless material
AS/NZS 2648.1	1995	Underground marking tape - Non-detectable tape
AS 4744.1	2000	Design

13.1.4 DESIGN**Shoring and Lining System**

Steel shoring and trench lining systems: To AS 4744.1.

VILLAGE PARK REFURBISHMENT MONA VALE

13.2 QUALITY**13.2.1 INSPECTION****Schedule of Inspections**

<u>Item</u>	<u>Inspection Type</u>	<u>Notice</u>	<u>References</u>
Service trenches excavated before laying the service.	Witness point	3 days	<i>Excavating</i>
Services laid in trenches and ready for backfilling.	Witness point	3 days	<i>Backfilling</i>

13.2.2 TESTS**Bedding density tests**

Testing authority: Have density tests of pipe bedding carried out by an authority accredited by NATA.

Test methods:

- Field dry density: AS 1289.5.3.2 or AS 1289.5.3.5.
- Maximum dry density: AS 1289.5.1.1.
- Dry density ratio: AS 1289.5.4.1.
- Density index: AS 1289.5.6.1.

13.3 SERVICE TRENCHES**13.3.1 EXCAVATING****Existing surfaces**

Before excavating trenches, saw-cut existing concrete and bituminous surfaces on each side of the trench to provide a straight even joint. Lift and store unit paving for later reinstatement.

Excavation

Excavate for underground services, to required lines, levels and grades. Generally make the trenches straight between personnel access ways, inspection points and junctions, with vertical sides and uniform grades.

Trench Locations

Unless otherwise directed no service trenches shall come within the drip zone of existing trees.

Trench widths

Keep trench widths to the minimum consistent with the laying and bedding of the relevant service and construction of personnel access ways and pits.

Trench lengths

Excavate trenches in sections of suitable length.

VILLAGE PARK REFURBISHMENT MONA VALE

Trench depths

General: As required by the relevant service and its bedding method.

Notice: If excavation is necessary below the level of adjacent footings, give notice, and provide necessary support for the footings.

Obstructions

Clear trenches of sharp projections. Cut back roots encountered in trenches to at least 600 mm clear of services. Remove other obstructions including stumps and boulders which may interfere with services or bedding.

Dewatering

Keep trenches free of water. Place bedding material, services and backfilling on firm ground free of surface water.

Excess excavation

If trench excavation exceeds the correct depth, reinstate to the correct depth and bearing value using compacted bedding material or grade N20 concrete.

13.3.2 BORING**Subcontractor**

If under road boring is required in lieu of trenches, engage a suitably qualified subcontractor to do the work.

Process

Ensure a tight fit to the service pipes. If voids are encountered, fill by pressure grouting.

13.3.3 BACKFILLING**General**

Backfill service trenches as soon as possible after the service has been laid and bedded, if possible on the same working day. Place the backfill in layers not exceeding 150 mm thick and compact to the density which applies to the location of the trenches to minimise settlement, and so that pipes are buttressed by the trench walls.

Marking services

Underground marking tape: To AS/NZS 2648.1.

Backfill material

General: General fill with no stones greater than 25 mm occurring within 150 mm of the service, or other materials as required for particular services or locations. Well graded, inorganic, non-perishable material, maximum size 75 mm, plasticity index \leq 55%.

Under roads and paved areas and within 4 m of buildings: Coarse sand, controlled low strength material or fine crushed rock.

In topsoil areas: Complete the backfilling with topsoil for at least the top 50 mm.

In reactive clay: In sites classified M, H or E to AS 2870, provide an impervious material where trenches fall towards footings.

VILLAGE PARK REFURBISHMENT MONA VALE

13.3.4 REINSTATEMENT OF SURFACES**General**

Reinstate existing surfaces removed or disturbed by trench excavations to match existing and adjacent work.

Lawn areas

Provide 150 mm of loam and resow the lawn over the trench and other disturbed areas.

Paving and roads

Reinstate to match adjacent work, paved surfaces and assets disturbed or removed during excavation of trenching. All such reinstatement shall be to best practice; or as required by relevant sections of specification; or to requirements of the authorities responsible for the surface, as required by the circumstances.

Concrete surfaces

Reinstate concrete surfaces to the original level. If necessary, provide steel reinforcement keyed to the adjacent concrete and laid to prevent the reinstalled concrete from subsiding and cracking.

Bituminous surfaces

General: Provide crushed rock base and subbase to match the existing pavement. Prime coat the edges of the existing surfacing with bitumen. Lay and compact hot-mix asphalt so that the edges are flush and the centre is cambered 10 mm above the existing pavement. If hot pre-mix is not available, cold pre-mix may be used.

Minimum asphalt thickness: 50 mm or the adjacent pavement thickness, whichever is thicker.

Unit paving

Provide sand bedding and, if necessary, compacted crushed rock base. Reinstate the paving units.

BREWSTER HJORTH ARCHITECTS

Service Trenching

VILLAGE PARK REFURBISHMENT MONA VALE



VILLAGE PARK REDEVELOPMENT MONA VALE

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14.1 GENERAL

14.1.1 SECTION CONTENT

General

The works include, but are not limited to the design and construction of concrete formwork.

14.1.2 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Concrete Reinforcement*: For concrete reinforcement.
- *Concrete Post-Tensioning*: For concrete post-tensioning.
- *In-situ Concrete*: For in-situ concrete.
- *Concrete Finishes*: For integral finishes to concrete.

14.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 3600	2001	Concrete structures
AS 3610	1995	Formwork for concrete

14.1.4 DESIGN

General

The contractor shall design and construct the formwork so that concrete, when cast in the forms, will have the dimensions, shape, location and surface finish required by the contract.

The Contractor shall be responsible for the sufficiency of the formwork, and for compensation for movement of formwork, under load.

Should any formwork be displaced during concreting, or within the period specified for the retention of the formwork, the following shall be undertaken. The Contractor shall remove the concrete between such limits as the Superintendent may determine, form construction joints, and reconstruct such section of concrete work after the formwork has been strengthened and adjusted, to the satisfaction of the Superintendent.

14.1.5 STANDARD

General

Formwork design and construction: To AS 3610.

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14.2 QUALITY**14.2.1 INSPECTION****Schedule of Inspections**

Item	Inspection Type	Notice	References
Formwork shop drawings.	Hold point	-	<i>Shop drawings</i>
Sample panel	Hold point	3 days	<i>Formwork test panel for class 2 finishes</i>
Completed formwork before concrete placing.	Witness points	3 days	<i>Formwork</i>
Evaluation of the finish.	Witness points	3 days	<i>Formed surface finish</i>
Used formwork, after cleaning and before reuse.	Witness points	3 days	
Surface repairs method statement	Hold point	3 days	<i>Surfaces repairs</i>

14.2.2 SAMPLES**Formwork test panels for class 2 surface finishes**

Provide in a suitable position a sample panel of concrete, which includes the following elements:

- Form joints;
- Corner and edge treatments;
- Colour control;
- Surface finish;
- Tie bolts; and
- Construction joints.

Location: Where approved by the Superintendent.

Minimum size: 2000 mm x 2000 mm.

Incorporation into the works: An approved panel, if suitably located, may be incorporated into the works. Otherwise remove all traces on completion.

VILLAGE PARK REDEVELOPMENT MONA VALE**14.2.3 SUBMISSIONS****Shop Drawings**

Documentation: Submit formwork documentation and details of proposed form linings, form facings, release agents and, where applicable reuse of formwork for all exposed off form concrete surfaces.

The location of joints and tie bolts is architecturally important. All joints should be designed to align with adjacent concrete elements as well as other building elements, including but not limited to walls, window framing and the like.

Documentation shall outline layout of form sheets indicating joint locations, tie bolt locations, construction joints, location of all embedments including but not limited to electrical fittings and hydraulic pipe work and fittings.

Construction of formwork shall not commence until shop drawings have been approved by Superintendent.

Surface Repairs

Before commencing repairs, submit a method statement for approval.

14.3 MATERIALS AND COMPONENTS**14.3.1 MATERIALS AND COMPONENTS****Form linings and facings**

Compatible with finishes applied to concrete.

Release agents

Compatible with applied finishes to concrete and the contact surfaces.

Void formers

Unwaxed cardboard or fibreboard, collapsible on absorption of moisture

Lost formwork

Permanent or lost formwork, chloride free, which will not impair the structural performance of the concrete members.

14.4 FORMWORK**14.4.1 FORMWORK****General**

General: Design and construct formwork so that the concrete, when cast in the forms, will have the required dimensions, shape, profile, location and surface finish. Allow for dimensional changes, deflections and cambers resulting from the application of prestressing forces, applied loads, temperature changes and concrete shrinkage and creep.

Openings: In vertical forms provide form openings or removable panels for inspection and cleaning, at the base of columns, walls and deep beams. For thin walls and columns, provide access hatches for placing concrete.

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Stability

Design the falsework to ensure the stability of the forms under the action of horizontal loads arising from wind, earthquake, lateral pressure of plastic concrete, prestressing forces, concrete dumping and stopping and starting of equipment. Provide diagonal bracing or shoring as required in accordance with AS 3610.

Deflection

Design the formwork to withstand the applied loads so that the sum of its deflection under load, falsework settlement and its initial inaccuracy in position will not exceed the absolute or relative deviations from true position permitted in AS 3610.

Falsework Settlement

Ensure foundations of sufficient capacity to carry the maximum loads imposed by formwork during construction on the ground through the soleplates, spread footings or pile footings. Take into account the settlements in falsework account including elastic and creep shortening, joint "take-up" and side-grain compression in timber members at horizontal joints.

Corners

Work above ground: Chamfer at re-entrant angles, and fillet at corners. Face of bevel 25 mm.

Openings: In vertical forms provide form openings or removable panels for inspection and cleaning.

Cleaning

Before placing concrete, remove free water, dust, debris and stains from the forms and the formed space.

Release agent

Before placing reinforcement, apply a release agent compatible with the contact surfaces, to the interior of the formwork, except where the concrete is to receive an applied finish for which there is no compatible release agent. Clean the reinforcement to remove all traces of release agent. Do not allow the release agent to "puddle".

Defective formwork

Remove rejected concrete, form construction joints, reconstruct the formwork and recast the concrete.

14.4.2 DIMENSIONAL TOLERANCES**Dimensional tolerances**

Position: Construct formwork so that the position of finished concrete is within the tolerances stated in the **Position tolerances table**.

Plumb of elements ≥ 8 m high:

Position tolerances table

Formwork class to AS 3610	1	2	3	4	5
Maximum deviation from correct position (mm)	10	15	20	25	40

14.4.3 FORMED SURFACE FINISH**Visually important surfaces**

For concrete of surface finish classes 1, 2 or 3, set out the formwork to give a regular arrangement of panels, joints, bolt holes, and similar visible elements in the formed surface. Form 45° bevels, 25 mm on the face on corners and angles.

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Formed surfaces schedule

Concrete element or surface	Surface finish class to AS 3610	Integral finish	Form lining type
Exposed Insitu concrete walls (excluding lift shaft)	Class 2c	Off form	Plastic faced plywood
Hidden Insitu concrete walls (excluding lift shaft)	Class 3	Off form	Plastic faced plywood
Lift core walls	Class 3	Off form	Plastic faced plywood
Exposed beam surfaces, concrete upturns and the like	Class 2c	Off form	Plastic faced plywood
Hidden beam surfaces, concrete upturns and the like	Class 3	Off form	Plastic faced plywood
Circular columns	Class 2c	Off form	FRC pipe tube
Exposed Rectangular columns	Class 2c	Off form	Plastic faced plywood
Hidden Rectangular columns	Class 3	Off form	Plastic faced plywood
Exposed slab soffits	Class 3	Off form	Plastic faced plywood

Surface finish class 2 formwork

Construct formwork from single sheets of plastic faced plywood, metal or other approved material carried to the full height, without horizontal joints. Set out vertical joints to a symmetrical pattern. Line vertical joints throughout at all levels.

Use tie bolts all of one approved type and locate them in two rows at heights to be nominated with not more than four tie bolts to each sheet. No bolts are permitted through internal columns.

Use of release agents compatible with painted finishes.

Seek approval for surface dressing or repairs.

Demolish all concrete specified as Class 2 that does not meet these requirements. No extension of time or costs will be allowed.

Surface finish class 3 formwork

Construct formwork from sheets of plastic faced plywood or metal fixed without the use of off-cuts or make up pieces of similar materials.

Set out joints between boards in a regular pattern with identical relationship to similar architectural textures in various locations and levels.

Carry out repairs to approval to ensure external walls are waterproof.

Tape all joints to prevent grout loss.

Use release agents compatible with the finish and use water emulsified release agents.

Remove fins by surface grinding as necessary.

Carry out repairs in accordance with AS 3610 Clause 5.6.5 and to approval.

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14.4.4 FORM TIE BOLTS**Removable bolts**

Remove the bolts without causing damage to the concrete.

Cover

Position formwork tie bolts left in the concrete so that the tie does not project within 50 mm of finished surface.

Bolt hole filling

General: Provide material matching the surface colour.

Recessed filling: Fill or plug the hole to 5 mm below the surface.

14.4.5 VOID FORMERS**General**

Cast designated suspended ground floor slabs and beams on unwaxed cardboard or fibreboard void formers which are collapsible on absorption of moisture. Keep void formers dry until use, place them on a firm level surface, cover with a waterproof membrane, and place reinforcement and concrete with minimum delay.

14.4.6 STRIPPING AND REMOVAL**Formwork removal**

Remove formwork, including formwork in concealed locations.

Timing: Do not disturb forms until concrete is hard enough to withstand it. Do not remove formwork until concrete is strong enough to support loads without unacceptable deflection.

Stripping of formwork

General: To AS 3600 where it is more stringent than AS 3610.

Permanent loading

Do not place permanent loads, including masonry walls, on the concrete structure while it is still supported by formwork.

**Concrete
Reinforcement**

15

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15.1 GENERAL

15.1.1 SECTION CONTENT

General

The Works include, but are not limited to concrete reinforcement.

15.1.2 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Concrete Formwork*: For concrete formwork.
- *In-situ Concrete*: For in-situ concrete and fibre reinforced concrete.
- *Concrete Finishes*: For integral finishes to concrete.

15.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1554.3	1983	Welding of reinforcing steel
AS 3600	2001	Concrete Structures
AS/NZS 4671	2001	Steel reinforcing materials
AS/NZS 4680	1999	Hot-dip galvanised (zinc) coatings on fabricated ferrous articles

15.1.4 STANDARDS

General

Steel reinforcing materials: To AS/NZS 4671.

15.2 QUALITY

15.2.1 INSPECTION

<u>Item</u>	<u>Inspection Type</u>	<u>Notice</u>	<u>References</u>
Reinforcement fixed in place.	Witness Point	3 days	
Cores and embedments fixed in place	Witness Point	3 days	

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15.2.2 SUBMISSIONS**Design**

Bending schedules: Submit marking plans and schedules showing location, shape, size and grade of reinforcement.

Tests

Certificate of compliance: Submit either the manufacturer's certificate of compliance with the relevant standard, or an independent testing authority's test certificates demonstrating compliance.

Execution

Changes: Submit proposed changes, if any, in the reinforcement shown on the drawings.

Mechanical splices: If mechanical bar splices are proposed or required submit details and test certificates for each size and type of bar to be spliced.

Damaged galvanising: If repair to AS/NZS 4680 Appendix E is intended, submit proposals.

Welding: Give notice before welding reinforcement.

Splicing: Submit details of any additional splicing not documented.

Provision for concrete placement: If spacing or cover of reinforcement does not comply give notice.

15.3 MATERIALS AND COMPONENTS**15.3.1 REINFORCEMENT****General**

Ductility grade: To AS/NZS 4671 class N.

Identification: To AS/NZS 4671 Section 9.

Surface condition: Free of loose mill scale, rust, oil, grease, mud or other material which would reduce the bond between the reinforcement and concrete.

Dowels

Standard: To AS/NZS 4671 grade 250N.

General: Provide each dowel in one piece, straight, with square cut ends free from burrs. Apply two coats of bitumen emulsion to half the length of the dowel at one end.

Tie wire

General: Annealed iron 1.25 mm diameter (minimum).

External and corrosive applications: Galvanized.

Bending

General: To AS/NZS 4671 Section 19.

Fabrication tolerances

General: To AS/NZS 4671 Subsection 19.2.

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15.3.2 PROTECTIVE COATED REINFORCEMENT**Extent**

Refer Structural Engineers drawings.

Epoxy coating:

General: High build, high solids chemically resistant coating.

Thickness: 200 μm minimum.

Damage

If damage occurs to the coating repair the damage to the *Epoxy coating* subclause.

15.4 EXECUTION**15.4.1 REINFORCEMENT SUPPORTS****Support Types**

General: Provide purpose-made concrete, metal or plastic supports, adequate to withstand construction and traffic loads, and in the form of chairs, spacers, stools, hangers and ties.

Exposure classification A1:

- Provide a protective coating to ferrous metal supports which extend to the surface of the concrete, or which are used with galvanised or zinc-coated reinforcement.

Exposure classifications more severe than A1: Provide either:

- plastic supports of adequate strength and of a shape appropriate to the location; or
- concrete supports of the same concrete quality as the concrete element.

Supports over membranes

Prevent damage to waterproofing membranes or vapour barriers. Place a metal or plastic plate under each support.

Support spacing

General: Provide supports in adequate numbers and spacing to maintain reinforcement in the correct position within the tolerances under the **Fixing requirements** subclause.

Minimum spacing:

- Bars: ≤ 60 diameters.
- Fabric: ≤ 750 mm.

Support Spacing

Bars: ≤ 60 diameters.

Fabric: ≤ 750 mm.

15.4.2 FIXING REINFORCEMENT

Fixing Requirements

General: Secure the reinforcement against displacement by tying at intersections with either annealed iron 1.25 mm diameter (minimum) wire ties, or clips. Bend the ends of wire ties away from nearby faces of forms so that the ties do not project into the concrete cover.

Mats: For bar reinforcement in the form of a mat, secure each bar at alternative intersections, and at other points as required.

Beams: Tie ligatures to bars in each corner of each ligature. Fix other longitudinal bars to ligatures at 1 m maximum intervals.

Columns: Secure longitudinal column reinforcement to all ligatures at every intersection.

Bundled bars: Tie bundled bars together so that the bars are in closest possible contact. Provide tie wire at least 2.5 mm diameter at centres ≤ 24 times the diameter of the smallest bar in the bundle.

Tolerances: To AS/NZS 4671 Section 19.

Dowels

Fixing: Embed the unpainted half of the dowels in the concrete placed first.

Tolerances:

- Location: \pm half the diameter of the dowel.
- Alignment: 2 mm in 300 mm.

Splicing

General: To AS 3600 Subsection 13.2, for splicing additional to that documented. Obtain approval under the **Submissions** clause before implementation.

Welding

General: Do not weld reinforcement.

- except where documented, or submitted and approved under *submissions* clause;
- within 75 mm of a bend with an internal radius < 6 bar diameters; or
- at points which have been re-bent.

Standard: To AS 1554.3.

In Situ Concrete 16

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16.1 GENERAL**16.1.1 SECTION CONTENT****General**

The Works include, but are not limited to in-situ concrete.

16.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Concrete Formwork*: for concrete formwork.
- *Concrete Reinforcement*: for concrete reinforcement.
- *Concrete Finishes*: for integral finishes and colour control to concrete.

16.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1012		Methods of testing concrete
AS 1379	1997	Specification and supply of concrete
AS 2870	1996	Residential slabs and footings - Construction
AS 3600	2001	Concrete structures
AS 3799	1998	Liquid membrane-forming curing compounds for concrete
AS 3972	1997	Portland and blended cements
AS 4100	1998	Steel structures

16.1.4 STANDARDS**General**

Materials and construction: To AS 3600.

Concrete: To AS 1379.

Concrete structures for retaining liquids: To AS 3735.

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16.1.5 INTERPRETATION

Definitions

Hot weather: Surrounding outdoor shade temperature $< 32^{\circ}\text{C}$.

Cold Weather: Surrounding outdoor shade temperature $< 10^{\circ}\text{C}$.

Contraction joint: An unreinforced joint with a bond-breaking coating separating the concrete joint surfaces.

Expansion joint: An unreinforced joint with the joint surfaces separated by a compressible filler.

Control joint: A weakened plane contraction joint created by forming a groove, extending at least one quarter the depth of the section, either by using a grooving tool, by sawing, or by inserting a premoulded strip.

Isolation joint: A joint without keying, dowelling, or reinforcement, which imposes no restraint on movement.

16.2 QUALITY

16.2.1 INSPECTION

Schedule of Inspections

Item	Inspection Type	Notice	References
Base or subgrade before covering.	Witness Point	24 hours	
Membrane or film underlay installed on the base.	Witness Point	24 hours	<i>Polymeric Film Underlay</i>
Completed formwork, and reinforcement, cores and embedments fixed in place.	Witness Point	24 hours	<i>Fixing and Embedded Items</i>
Commencement of concrete placing.	Witness Point	24 hours	<i>Placing and Compaction</i>
Surfaces or elements to be concealed in the final work before covering.	Witness Point	24 hours	

Rejection

Remove rejected concrete from the site.

16.2.2 CONCRETE QUALITY CONTROL

Concrete Quality Controller And Concrete Technologist

The Contractor shall provide a Concrete Quality Controller (CQC) and shall engage an independent Concrete Technologist at the Contractor's expense to advise the CQC. The Concrete Technologist shall be available for consultation on all problems of concrete technology relating to the supply of the concrete and shall attend meetings with the Contractor

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and Engineer to resolve such matters. The presence of the Concrete Technologist shall not remove from the Subcontractor the responsibility for the supply of concrete which shall comply in all respects with this Specification. The Subcontractor shall give all information to the CQC concerning the concrete to be supplied.

The Concrete Technologist shall be required to provide a written report on each mix design including precast concrete prior to its acceptance.

The Acceptor

The Contractor shall provide at least one person who is trained and competent to accept or reject concrete at the point of delivery (out of truck) and to supervise the sampling of concrete by the Testing Agency. The name of this person shall be given in writing to the Superintendent prior to placing any concrete. This person will be situated at the point of delivery of the concrete during all concreting operations and will be known as the Acceptor.

Trucks To Be Tested

The trucks from which concrete is to be tested shall be selected by the Acceptor before the concrete or the delivery docket, have been seen.

Slump Tests

So far as is practicable, the Acceptor shall witness the initial discharge of concrete from each truck and shall supervise a slump test after the discharge of . cubic metre of concrete on any delivery of which there is any uncertainty that slump conforms to Specification requirements. The first truck load in each pour and each truck load sampled for compression test cylinders shall in any case be slump tested.

Responsibilities Of The Concrete Quality Controller - Concrete Mix Designs
The CQC shall be supplied with copies of all approved mix designs. These shall be commented on in the first report from the CQC.

Concrete Charts

The CQC shall set up control charts for each concrete mix and shall be responsible for ensuring that they are kept up to date. The charts shall incorporate the following variations:

- slump
- concrete temperature at casting
- density of test cylinders on receipt of laboratory
- compressive strength at seven, twenty-eight days and fifty six days as necessary
- testing error (i.e. difference between pairs of strength results at 28 days)
- drying shrinkage
- other variables that during the course of the work appear as suitable for charting subject to the agreement of all parties.

Likely Defective Concrete

If, in the opinion of the CQC, any test of wet or hardened concrete gives grounds for suspicion that the concrete being supplied will in any way fail to meet the strict requirements of this Specification, the CQC shall immediately advise the Subcontractor and the Contractor who shall advise the Superintendent of the situation.

Subcontractor's Telephone Numbers

The Subcontractor shall nominate one (or a maximum of two) telephone numbers together with a list of persons in order of preference to be contacted in case of suspicion of defective concrete. The contacting of the given telephone number(s) and the leaving of any appropriate message shall constitute sufficient notification in the absence of the nominated person or persons.

VILLAGE PARK REDEVELOPMENT MONA VALE**Non-Conforming Concrete**

The CQC shall inform the Contractor (who shall inform the Superintendent) and the Subcontractor within twenty-four hours of any result which does not conform to this Specification. Within twenty-four hours of receiving such notification, the Subcontractor shall supply the CQC with any information requested at the time of notification.

Written Report

Once per month (on a date to be agreed) and whenever requested by the Superintendent, the CQC shall submit a written report on the current situation as regards concrete quality. Such report shall also contain a summary for each grade of concrete giving:

- number of samples taken
- cement content range
- the range of seven, twenty-eight day strengths and fifty six day strengths as necessary
- standard deviation
- characteristic strength

It shall also record such items as change in mix designs make general comments on strengths, slumps, or any other design relevant items and including the relevant charts referred to above.

The report shall contain the control charts for each grade of concrete for that month.

The independent Concrete Technologist shall provide a summary on concrete performance with each monthly report.

Copies

The Contractor shall submit three copies of the report to the Superintendent.

Liaison Between Cqc And Contractor

The Contractor shall keep the CQC informed of the Contractor's future concreting program.

Cqc To Supervise Acceptor

The CQC shall be responsible for supervisory control of the Acceptor.

Contractor's Delivery and Testing Report

The Contractor shall keep a concrete delivery and testing record on site which shall record the following data for concrete placed on site:

- date
- delivery docket
- mix type
- slump ordered
- location where placed
- how much concrete per truck
- number of cylinders if truck was sampled
- slump taken on site
- progressive total of concrete

Copy

This record shall be made available for the Superintendent's inspection when requested and a copy provided to the Superintendent once per month.

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Liaison Between Subcontractor And Cqc

The Subcontractor shall:

- report by telephone or facsimile to the CQC the densities, slump and seven and twenty-eight day results of the Plant Control Samples relative to the mixes for this project, the day such results are known. The Subcontractor's attention is drawn to the particular requirements of Section 20 of AS 3600.

Once a month, or less when especially required, post a written report to the CQC. Such report shall conform to the requirements of AS 3600.

Provide for the CQC access to the whole of the Plant Control Test Results obtained on the plants and grades of concrete employed for the Subcontract. This shall include, in addition to the data required to be available under AS 3600, such items as slumps, cylinder densities, early age or accelerated tests and any graphical or other analysis or results carried out by the concrete supplier. Access shall also be provided on request, to any and all records of testing on constituent materials of the concrete.

16.2.3 CONCRETE TESTS**Concrete testing**

Dissemination of production information: If concrete is manufactured off site, register the project in accordance with AS 1379 clause 6.4.3.

Test records

Records and reports: To AS 1012.

Control tests

Acceptance criteria:

- Average strength of all samples must exceed the required value.
- Strength of any one sample must be at least 0.85 of the required value.

Performance tests

General: Sample, test and assess the concrete for compliance.

Standard: To AS 1379.

Strength grade/Characteristic compressive strength: Spread the site sampling evenly throughout the pour. For concrete in columns and bearing walls, take one sample per batch. Use at least two specimens from each sample.

- Specimen size: 200 x 100 mm diameter but, if aggregate size exceeds 20 mm, 300 x 150 mm diameter.

Slump: Test at least one sample from each batch before placing concrete from that batch in the work.

Drying shrinkage: Test three specimens of each type of concrete every 3 months or every 3000 m³ placed concrete. Base assessments on the average of the three specimens test results. Conduct 2 sets of tests on trial mixes.

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Sampling frequency table

Number of batches for each type and grade of concrete per day	Minimum number of samples
1	1
2-5	2
6-10	3
11-20	4
Each additional 10	1 additional

16.2.4 SAMPLE PANELS

General

Refer to *Formwork* section for details.

16.2.5 SUBMISSIONS

Subcontractors

Submit names and contact details of proposed ready mixed concrete suppliers, and alternative source of supply in the event of breakdown of ready mixed or site mixed supply.

Shop drawings

Cores, fixings and embedded items: If the locations of these items are not shown or are shown diagrammatically, submit shop drawings showing the proposed locations, clearances and cover. Indicate proposed repositioning of reinforcement.

Tests

Material tests: Before supplying concrete submit test certificates based on samples from the most recent production or from stockpiles for the project, for the materials and properties listed in the **Material tests schedule**. Submit additional certificates at the scheduled frequency during the course of the works.

Dissemination of production information: Submit copies of the reports.

Embedded pressure pipes: Submit the results of leak tests.

Sampling and testing of specimens: Submit records providing the full history of sampling and testing. Submit test certificates, and retain results in tabular form on site.

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Materials

General: Submit details of proposed sources of materials.

Foamed concrete: Submit details, including aggregate grading and mix proportions.

Curing compounds: If it is proposed to use a liquid membrane-forming curing compound submit the following information:

- Efficiency index.
- Certified test results for water retention to AS 3799 Appendix B.
- Evidence that an acceptable final surface colour will be obtained.
- Evidence of compatibility with concrete, and with applied finishes, if any.
- Methods of obtaining the required adhesion for toppings and render.

Concrete mixes: Submit details, including proposed admixtures and use, if any, of fly ash or granulated slag.

Execution

General: Submit proposals for mixing, placing, finishing and curing concrete including the following:

- Site storage, mixing and transport methods and equipment, if applicable.
- Addition of water at the site.
- Handling, placing, compaction and finishing methods and equipment, including pumping.
- Temperature control methods.
- Curing and protection methods.
- Curing period for low-pressure steam curing, if proposed.
- Target strength, slump and proposed mix for each type and grade of concrete.
- High early strength cement.
- Placing under water.
- Cutting or displacing reinforcement, or cutting hardened concrete.
- Sequence and times for concrete pours, and construction joint locations and relocations.
- Changes to the plastic concrete mix.

Sawn joints: Submit proposed methods, timing and sequence of sawing joints.

Ready mixed supply

Delivery docket: For each batch, submit a docket listing the information required by AS 1379, and the following additional information:

- Name of concrete delivery supervisor.
- The concrete element or part of the works for which the concrete was ordered, and where it was placed.
- The total amount of water added at the plant and the maximum amount permitted to be added at the site.
- The amount of water, if any, added at the site.
-

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Method of placement and climate conditions during pour.

- Serial numbers of identification certificates of each batch.
- Project assessment carried out each day.
- For special class performance concrete, specified performances and type of cement binder.
- For special class prescription concrete, details of mix, additives, and type of cement binder.

16.3 MATERIALS

16.3.1 POLYMERIC FILM UNDERLAY

General

Under internal slabs on ground including integral ground beams and footings, (unless waterproof membrane is to be installed under slab) provide a vapour barrier or, in areas prone to rising damp or salt attack, a damp-proofing membrane.

Standard

Vapour barriers and damp-proofing membranes: To AS 2870.

Base preparation

According to base type, as follows:

- Graded stone base: Blind with sufficient sand to create a smooth surface free from hard projections. Wet the sand just before laying the underlay.
- Concrete working base: Remove projections above the plane surface, and loose material.

Installation

Lay over the base, lap joints at least 200 mm and seal the laps and penetrations with waterproof adhesive tape. Face the laps away from the direction of concrete pour. Take the underlay up vertical faces as far as the damp proof course where applicable, and fix at the top by tape sealing. Locate vertical laps only on vertical or inclined surfaces. Patch or seal punctures or tears before pouring concrete.

16.3.2 CONCRETE MATERIALS

General

Cementitious materials: Dry and uncontaminated.

Aggregate: Unsegregated and uncontaminated.

Admixtures: No deterioration.

Bagged cement

Standard: To AS 3972.

Type: GP.

Age: Less than 6 months old.

Chemical admixtures

Contents: Free of chlorides, fluorides and nitrates.

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Waterproofing Additive

Location: Roof slab to Library

Requirement: Include Xypex Admix C-Series waterproofing admixture or approved equivalent to concrete at the time of batching. Admixture is to be added strictly in accordance with manufacturer's details.

16.3.3 CONCRETE**Concrete performance**

General: Mix must work readily into corners and angles, and around reinforcement, without segregation or excess free water on the surface, producing sound concrete, with minimal plastic settlement and shrinkage cracking.

Drying shrinkage (maximum including tolerances): 0.65 mm for concrete up to and including strength grade 32; 0.7 mm for higher strength grades.

Ready mixed supply

Method: Use the batch production process. Deliver in agitator trucks.

Transport: Mode must prevent segregation, loss of material and contamination, and must not adversely affect piling or compaction.

Addition of water: Do not add water at the site after starting discharge.

Elapsed delivery time

Elapsed time between the wetting of the mix and the discharge of the mix at the site must be as short as possible, and must not exceed the criteria in the **Elapsed delivery time table**. Do not discharge below 10°C or above 32°C.

Elapsed delivery time table

Concrete temperature at time of discharge (°C)	Maximum elapsed time (hours)
< 24	2.00
24 - 27	1.50
27 - 30	1.00
> 30	0.75

Site mixed supply

Plant: Mix concrete in a plant located on the construction site.

Emergencies: Do not mix by hand.

16.4 CORE, FIXINGS AND EMBEDDED ITEMS**16.4.1 CORES FIXINGS AND EMBEDDED ITEMS****Adjoining elements**

For adjoining elements to be fixed to or supported on the concrete, provide for the required fixings. Where applicable provide for temporary support of the adjoining elements during construction of the concrete.

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Structural integrity

Fix cores and embedded items to prevent movement during concrete placing. In locating cores, fixings and embedded items, do not cut or displace reinforcement, or cut or core hardened concrete. Ensure that embedded pipes and conduits do not adversely affect structural integrity.

Placement

Maximum deviation from correct positions:

- Cores and embedded items generally: ± 10 mm.
- Fixings including anchor bolts: ± 3 mm.
- Anchor bolt groups for structural steel: To AS 4100.

Water tracking: Ensure fixings do not allow water to track to reinforcement.

Inserted fixings

Methods: Do not insert fixings using drilling (including masonry anchors), or using explosive tools.

Protection

General: Grease threads. Cover and protect embedded items against damage.

Corrosion: Galvanise inserts, anchor bolts and embedded fixings.

16.5 PLACING AND CURING**16.5.1 CONCRETE WORKING BASE****Material**

N20 concrete. Lay over the base or subgrade and screed to the required level.

Thickness

Minimum 50 mm.

Finish

Membrane support: Wood float finish or equivalent.

Surface tolerance

± 5 mm from the correct plane, ± 5 mm from a 2 m straight edge.

16.5.2 PLACING AND COMPACTION**Placing**

General: Use placing methods which minimise plastic settlement and shrinkage cracking. Avoid segregation. Avoid loss of materials. Between construction joints, maintain a plastic concrete edge.

Layers: Place concrete in layers ≤ 300 mm thick, such that each succeeding layer is compacted before previous layer has taken initial set.

Placing slabs and pavements: Place concrete uniformly over the width of the slab so that the face is generally vertical and normal to the direction of placing.

Construction joints: Thoroughly roughen hard concrete joint surface. Remove loose or soft material, foreign matter and laitance. Dampen joint surface using clean water and coat with neat cement slurry.

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Horizontal movement

Use suitable conveyors, clean chutes, troughs or pipes. Do not use water to facilitate the movement.

Vertical movement

In vertical elements, limit the free fall of concrete to 1500 mm per 100 mm element thickness, up to a maximum free fall of 3000 mm, using enclosed chutes or access hatches in forms. As far as practicable keep chutes vertical and full of concrete during placement, with ends immersed in the placed concrete.

Rain

Do not expose concrete to rain before it has set, including during mixing, transport or placing.

Sequence of pours

Minimise shrinkage effect by pouring the sections of the work between construction joints in a sequence such that there will be suitable time delays between adjacent pours.

Minimum time delay schedule

Between (pour locations)	Minimum period between adjacent pours (days)
Adjacent pours abutting vertical construction joints in walls	2
Adjacent pours abutting horizontal construction joints in walls or columns	1
Columns and slabs	1
Floor slab construction joints	1
Retaining wall construction joints	1
"Pour strips" and adjacent concrete	28

Compaction

General: Remove air bubbles and fully compact the mix.

Methods: Use immersion and screed vibrators accompanied by hand methods as appropriate.

Vibrators: Do not allow vibrators to come into contact with partially hardened concrete, or reinforcement embedded in it. Do not use vibrators to move concrete along the forms. Avoid over-vibration that may cause segregation.

Placing records

Keep on site and make available for inspection a log book recording each placement of concrete, including the following:

- Date.
- The portion of work.
- Specified grade and source of concrete.
- Slump measurements.
- Volume placed.

16.5.3 COLD WEATHER PLACING**General**

Formwork and reinforcement: Before and during placing maintain temperature at $>5^{\circ}\text{C}$.

Concrete: Maintain the temperature of the freshly mixed concrete within the limits shown in the Cold weather placing table. "Outdoor" air temperature applies to the air temperature at the time of mixing and to the predicted or likely air temperature at any time during the next 48 hours.

Cold weather placing table

Outdoor air temperature	Temperature of concrete	
	Minimum	Maximum
$\geq 5^{\circ}\text{C}$	10°C	32°C
$< 5^{\circ}\text{C}$	18°C	32°C

Admixtures

Do not provide calcium chloride, salts, chemicals or other material in the mix to lower the freezing point of the concrete.

Frozen materials

Do not allow frozen materials or materials containing ice to enter the mixer, and keep free of frost and ice any forms, materials, and equipment coming in contact with the concrete.

High early strength cement

Provide in severe weather conditions to enable the concrete to develop sufficient strength to permit formwork removal within the specified time. Do not provide as a substitute for the heating of materials or for adequate protection of placed concrete against low temperatures. Do not provide high alumina cement.

Heating

General: Heat the concrete materials, other than cement, to the minimum temperature necessary to ensure that the temperature of the placed concrete is within the limits specified.

Maximum temperature of water: 60°C when it is placed in the mixer.

16.5.4 HOT WEATHER PLACING**Mixing**

Surrounding outdoor shade temperature $> 38^{\circ}\text{C}$: Do not mix concrete.

Handling

Prevent premature stiffening of the fresh mix and reduce water absorption and evaporation losses. Mix, transport, place and compact the concrete as rapidly as possible.

Placing

Before and during placing maintain the formwork and reinforcement at $\leq 32^{\circ}\text{C}$ using protection, cold water spraying, or other effective means. When placed in the forms, the temperature of the concrete must not exceed the criteria in the Hot weather placing table.

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Hot weather placing table

Concrete element	Temperature limit
Normal concrete in footings, beams, columns, walls and slabs	35°C
Concrete in large mass concrete sections; or concrete of strength 40 MPa or greater, in sections exceeding 600 mm in thickness	27°C

Temperature control methods

Select one or more of the following methods of maintaining the specified temperature of the placed concrete:

- Use chilled mixing water.
- Spray the coarse aggregate using cold water.
- Cover the container in which the concrete is transported to the forms.
- Cool the concrete using liquid nitrogen injection before placing.

16.5.5 CURING**General**

Protection: Protect fresh concrete, during the curing period, from premature drying and from excessively hot or cold temperatures. Protect fresh concrete from physical and thermal shock, from traffic likely to damage the surface, and from rain. If temperature of surrounding air is >35°C, protect from wind and sun until the concrete can be covered. Maintain at a reasonably constant temperature with minimum moisture loss, during the curing period. Prevent rapid drying out at the end of the curing period.

Curing period: Cure continuously from initial set until the total cumulative number of days or fractions of days, during which the air temperature in contact with the concrete is above 10°C, is at least the following:

- Fully enclosed internal surfaces/Early high-strength cement concrete: 3 days.
- Other surfaces/Ordinary Portland cement concrete: 7 days.

Curing compounds

Standard: To AS 3799.

Substrates: Do not use wax-based or chlorinated rubber-based curing compounds on surfaces forming substrates to concrete toppings and cement-based render. Do not use PVA Compounds.

Application: Provide a continuous flexible coating without visible breaks or pinholes, which remains unbroken at least seven days after application.

Hot weather curing

Do not use curing compounds. After placement, either

- pond or continuously sprinkle with water;
- immediately cover the concrete using an impervious membrane, or hessian kept wet, until curing begins; or
- if the temperature exceeds 25°C or if not protected against drying winds, protect the concrete using a fog spray application of aliphatic alcohol evaporation retardant.

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Cold Weather Curing

Prevent plastic concrete from freezing, but do not use salt or chemicals. Maintain concrete temperature between 10-20 °C for curing period.

Visually important surfaces

Produce uniform colour on adjacent surfaces.

16.5.6 PROTECTION**Loading**

Notice: Give notice before loading the concrete structure.

Protection: Protect the concrete from damage due to load overstresses, heavy shocks and excessive vibrations, particularly during the curing period. Do not place construction loads on self-supporting structures which will overstress the structures.

Surface protection

Protect finished concrete surfaces from damage.

16.6 JOINTS**16.6.1 CONSTRUCTION JOINTS****Location**

Do not relocate or eliminate construction joints, or make construction joints not shown on the drawings. This includes emergency construction joints made necessary by unforeseen interruptions to the concrete pour.

Joint preparation

Roughen and clean the hardened concrete joint surface, remove loose or soft material, free water, foreign matter and laitance. Dampen the surface just before placing the fresh concrete.

Finish at construction joints

Butt join the surfaces of adjoining pours. In visually important surfaces make the joint straight, true, and free from impermissible blemishes relevant to its surface finish class.

16.6.2 EXPANSION JOINTS**Jointing materials**

Type: Provide jointing materials compatible when used together, and non-staining to concrete in visible locations.

Foamed materials (in compressible fillers): Closed-cell or impregnated types which do not absorb water.

Bond breaking: Provide back-up materials for sealants, including backing rods, which do not adhere to the sealant. They may be faced with a non-adhering material.

Joint filling

Preparation: Before filling, dry and clean the joint surfaces, and prime.

Joint filling: Fill with jointing materials. Finish visible jointing material neatly flush with adjoining surfaces.

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Watertightness: Apply the jointing material so that joints subject to ingress of water are made watertight.

16.6.3 DOWELS**Joint dowels**

Provide galvanised steel reinforcing rod dowels in expansion and contraction joints, where required. Embed dowels normal to the plane of the joint, so that half the dowel lies on each side of the joint. Heavily grease or bitumen coat one half and fit an expansion cap to that end.

16.6.4 WATERSTOPS**Locations**

Provide waterstops surrounded by fully compacted concrete, and located so that

- their correct positions in the finished work are ensured;
- the proper placing and compaction of the concrete is not inhibited; and
- reinforcement is not displaced from its correct position.

Waterstop types

Refer Structural Engineers drawings for details.

Concrete Finishes

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brewsterhorth Architects

February 2003

20151 SP224

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A		Preliminary
B	28.02.03	Tender Issue

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17.1 GENERAL

17.1.1 CROSS REFERENCES

Cross reference

The Works include, but are not limited to concrete finishes.

17.1.2 CROSS REFERENCES

Cross reference

Refer to the *General Requirements* Section.

Related sections

Refer to the following sections:

- *Concrete Formwork*: For concrete formwork.
- *Concrete Reinforcement*: For concrete reinforcement.
- *In-Situ Concrete*: For in-situ concrete.

17.2 QUALITY

17.2.1 SAMPLES

Sample panels

Surface treatment: Do not proceed with the related work until, for surface treatments, the accepted range of treatments has been determined.

17.3 FINISHES GENERAL

17.3.1 TOLERANCES

Tolerance classes

Determine tolerance classes using a straight edge placed anywhere on the surface in any direction.

Tolerances class table

Class	Measurement	Maximum deviation (mm)
A	3 m straight edge	3
B	3 m straight edge	6
C	600 mm straight edge	6

17.4 INTEGRAL FINISHES

17.4.1 UNFORMED SURFACES

Screeding

Finish slab surfaces to finished levels, to tolerance class B.

Finishing methods

Scored finish: After screeding, give the surface a coarse scored texture using a stiff brush or rake drawn across the surface.

Machine floated finish: After screeding consolidate the surface using a machine float. Hand float in locations inaccessible to the machine float. Cut and fill to tolerance Class B and refloat immediately to a uniform, smooth, granular texture.

Steel trowelled finish: After machine floating, use power trowels to produce a smooth surface relatively free from defects. Then, when the surface has hardened sufficiently, use steel hand trowels to produce the final consolidated finish free of trowel marks and uniform in texture and appearance, to tolerance Class A. Where floor coverings are to be installed, remove defects that would show through them.

Wood float finish: Produce the final finish using a wood float.

Broom finish: After floating use a broom to produce an even textured slip-resistant surface.

Shot blasted: Produce class 2 off form finish and shot blast 7 days after pouring concrete to expose the aggregate. Do not use silica sand. Depth of shot blasting required to be confirmed by Superintendent with samples for sign off.

Unformed Finishes Schedule

Location	Tolerance Class	Integral Finish
Internal concrete slabs generally	A	Steel trowelled
Internal concrete slabs below timber flooring	A	Machine floated finish
Internal concrete slabs to areas with sheet linoleum finishes	A	Steel trowelled
Internal concrete slabs to tiled areas	C	Machine floated finish
Roof slab to new library	C	Machine floated, to nominated falls
Roof slab to concrete blade wall to library	B	Wood float finish
External stairs, ramp, concrete edges to grass terraces and seating wall	B	Shot blast
Top edge of walls to access ramp	B	Steel trowelled finish
Top edge of upturn walls and beams	B	Steel trowelled finish

17.4.2 FORMED SURFACES

Evaluation of formed surfaces

If evaluation of formed surface tolerance or colour is required, complete the evaluation before surface treatment.

Off Form Finish

Surface Finishes

Cast concrete in accordance with AS 3610 and in accordance with the Formwork Specification.

Formwork Joints

Take care to avoid excessive bleeding at formwork joints.

Colour Control

Colour control is required for all exposed concrete surfaces (including to precast concrete elements), in accordance with AS 3600. The permitted tonal range of colours, shall be in accordance with AS 3610 figure B4.

Tonal range for class 2 concrete: 1.

Strip panels at the same time to provide colour consistency.

Formed Finishes

Refer to *Formed Surfaces Schedule* in *Formwork* section.



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18.1 GENERAL

18.1.1 SECTION CONTENT

General

The Works include, but are not limited to:

- Timber Flooring and Decking.
- Light timber framing including but not limited to floor and roof framing.
- Timber trims (including skirting and handrails)

18.1.2 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Timber Finishes and Treatment*: for timber and timber finishes generally;
- *Floor Sanding*: for floor sanding;
- *Painting*: for finishing systems;
- *Internal Finishes and Colour Schedule*: for materials and finishes; and
- *External Finishes and Colour Schedule*: for materials and finishes.

18.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1684		Residential timber-framed construction
AS1720		Timber Structures
AS 1720.1	1997	Design Methods
AS 1748	1997	Timber - Stress graded - Product requirements for mechanically stress-graded timber
AS/NZS 1859.1	1997	Particleboard
AS/NZS 1860	2002	Particleboard flooring - specifications
AS2082	2000	Timber - Hardwood - Visually stress - graded for structural purposes.
AS1884	1985	Floor coverings - Resilient sheet and tiles - Laying and maintenance practices
AS2047	1999	Windows in buildings - selection and installation
AS 2796.1	1999	Product specification
AS 2796.2	1999	Grade description

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AS2904	1995	Damp proof courses and flashings
AS/NZS 2908.2	2000	Flat sheets
AS 3519	1993	Timber - Machine proof-grading

18.1.4 INTERPRETATION

General

Timber decking: Timber flooring with plain, square, bevel or pencil round edge suitable for pedestrian or light vehicle loadings in balconies, decks and access ways.

18.1.5 STANDARD

General

Flooring: To AS 1684, Part 2, 3 or 4, as appropriate.

Light timber framing and flooring: To AS 1684, Parts 2,3 or 4, as appropriate.

Design: To AS 1720.1.

18.2 QUALITY

18.2.1 INSPECTION

Schedule of Inspections

<u>Item</u>	<u>Inspection Type</u>	<u>Notice</u>	<u>References</u>
Timber flooring battens prior to laying of timber flooring	Witness point	3 days	
Structural woodwork after erection but before it is covered.	Witness point	3 days	
Timber flooring and decking prior to final finishes	Witness point	3 days	

18.2.2 SUBMISSIONS

Materials**Identification:**

- Certification: Submit a supplier's certificate (which may be included on an invoice or delivery docket) verifying that the timber complies with the specification.
- Inspection: Submit the authority's certificate verifying that the timber complies with the specification.

Moisture content: Submit evidence of moisture content.

18.3 MATERIALS

18.3.1 MATERIALS

Timber grades

Milled timbers: Where the relevant Australian standard specifies more than one grade, provide the following:

- Timbers for transparent finishes: The highest grade.
- Timber for opaque finish: Select grade for hardwood, standard grade for softwood.
- Concealed timber: The lowest grade.

Structural timber grading standards

Hardwood: To AS 2082.

Softwood: To AS 2858.

Mechanical stress grading: To AS/NZS 1748.

Machine proof-grading: To AS 3519.

Timber flooring and decking

Hardwood: AS 2796.1.

Location	Grade to AS 2796.2:
Decking to Courtyard	Select grade (SL)
Internal Floor boarding	Medium feature (SL)
Timber stairs	Select Grade (SL)

Fibre cement flooring

Compressed sheets: To AS/NZS 2908.2.

Grade: Type A, Category 5.

Thickness (mm): 18 mm.

Particleboard flooring

Standard: To AS/NZS 1859.1.

Grade: Class 1 Flooring.

Thickness (mm): 25 mm.

Proprietary Item: Woodlogic 25 mm Blue Tongue.

18.4 EXECUTION

18.4.1 WORKMANSHIP

Extent

Perform the operations necessary and provide the accessories necessary for the satisfactory completion of the woodwork items. Ease and adjust moving parts, lubricate hardware and leave the completed work in a sound, clean, working condition.

Unseasoned Timber

Where unseasoned timber is used, or variations in moisture are likely, make allowance for shrinkage, swelling and differential movement.

Joints

Use timber in single lengths whenever possible. If joints are necessary make them over supports unless otherwise shown or specified.

Ploughing

Back plough boards liable to warping (example: if exposed externally on one face). Make the width, depth, number and distribution of ploughs appropriate to the dimensions of the board and degree of exposure.

Edges

Arris edges of work to receive paint or similar coatings. Arris or round off visible edges to approval.

Priming

Where woodwork is to be painted, prime the hidden surfaces before assembly.

Fixings

Where fixings are likely to cause splitting, adopt the following practices:

- Pre-drilling to eighty per cent of the diameter of the fixings for nail and screw fixings and one hundred per cent of the diameter plus one millimetre for bolt fixings.
- Stagger adjacent nails and screws
- Install adjacent nails and screws at slightly opposing angles.

18.4.2 VISIBLE WORK

Requirement

Where timber, including sawn timber, is required for visible work having clear or stained finishes, the visible faces, edges and corners shall be clean and free of visible blemishes such as branding marks, crayon marks, chalk marks, marks caused by machining, conveying and handling, and the like.

18.4.3 FASTENINGS

Requirement

Provide fixing and fastenings as necessary to transmit the loads imposed and to ensure the rigidity of the assembly.

Refer *Adhesives, Sealants and Fasteners* for details on fasteners.

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Nails

Use types appropriate for the purpose, as recommended by the manufacturer for the fixing of building boards or other manufactured sheets.

Nail length for fixing cladding, lining and the like: Not less than two and a half times the thickness of the member being secured, and not less than four times when the member is plywood or building board less than ten millimetres thick.

Adhesives

Provide adhesives of the types appropriate to their purpose, and apply them so that they transmit the loads imposed and ensure the rigidity of the assembly, without causing discolouration of finished surfaces.

18.5 FLOORING AND DECKING**18.5.1 SUBFLOORS****Timber joists and bearers**

Location:	Timber:	Size and Stress grade:	Preservative treatment:
Timber decking to Courtyard	Seasoned hardwood	Refer Structural Engineers drawings	Refer <i>External Finishes and Colour Schedule</i> for type and <i>Painting</i> section for details
Timber flooring to library	Machine Graded Pine	Refer Structural Engineers drawings	Nil
Fibrous Cement flooring to Public Toilets in Library	Machine Graded Pine	Refer Structural Engineers drawings	Nil
Fibrous Cement flooring to Staff Toilets in Library	Structural Steel refer Structural engineers details		
Fibrous Cement flooring to Ramp 2	Structural Steel refer Structural engineers details		
Fibrous Cement flooring to adjacent to DL113.	Structural Steel refer Structural engineers details		

18.5.2 FLOORING**Particleboard Flooring**

Installation: To AS/NZS 1860.

Fibre cement flooring

Installation: Lay the length of the sheets at right angles to the joists and continuous over at least 2 spans. Stagger the end joints and locate them centrally over joists. Butter edges of sheets with adhesive and firmly butt join together.

Fixing: Fix to joists with corrosion-resistant countersunk screws. Bond sheets to joists at intermediate bearing with square patches of adhesive.

Timber Flooring on joists and bearers**Strip flooring:**

- Location: *Refer Internal Finishes and Colour Schedule.*
- Timber species or group: *Refer Internal Finishes and Colour Schedule.*
- Size (width x thickness) (mm): 90 x 19
- Profile: Tongue and Groove.

Fixing:

Lay boards to evenly grade colour differentiation in timber colour in boards.

On visible flooring, sink the heads of fixings below the surface and fill the sinking flush with a material tinted to match the flooring and compatible with the surface finish.

Timber floors on slabs**Battens:**

- Timber species or group: Treated Radiata Pine
- Size (d x b) (mm): 50 x 50
- Spacing (mm): 450
- Preservative treatment: Required

Vapour barrier: Where the floor is supported on a concrete slab, provide a vapour barrier of 150 µm high-impact resistant polyethylene. Lap 150 mm and seal the laps with pressure-sensitive tape. Do not fix until the moisture content of the concrete slab is < 6% when tested to AS 1884, Appendix A.

Batten fixing: Fix the battens to the concrete floor at 900mm maximum centres with countersunk M10 masonry anchors. If packing is necessary to achieve level finish use corrosion resistant, non compressible material.

Joist packing: Corrosion-resistant non-compressible material.

Insulation: Lay insulation continuous between battens. Type refer *Insulation and Barriers* section.

Strip flooring:

- Location: *Refer Internal Finishes and Colour Schedule.*
- Timber species or group: *Refer Internal Finishes and Colour Schedule.*
- Size (width x thickness) (mm): 125 x 19
- Profile: Tongue and Groove.

Fixing:

Lay boards to evenly grade colour differentiation in timber colour in boards.

On visible flooring, sink the heads of fixings below the surface and fill the sinking flush with a material tinted to match the flooring and compatible with the surface finish.

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Timber stairs**Timber Treads:**

- Timber species: Refer *Internal Finishes and Colour Schedule*

Dimensions: Single width piece, refer drawings for details.

Slip resistant bars: to be installed along full length of front edge of all treads:

- dimension from outside of tread: 20 mm.
- dimension from front edge of tread: 15 mm.
- dimension between bars: 20 mm.
- bar dimensions: 6 x 20 mm.
- height of bar above tread surface: 3 mm.
- bar material: Stainless Steel, grade 304.

Installation: Fix treads through continuous packers with countersunk fixings, to be filled with material to match timber colour. Riser face to be housed into underside of tread.

Tactile Indicators: Refer *Metal Fixtures* section.

18.5.3 DECKING**Timber decking**

Species: Refer *External Finishes and Colour Schedule*.

Size (width x thickness) (mm): 90 x 30

Surface finish: Refer *External Finishes and Colour Schedule*. Note first finish application required prior to installation of decking.

Spacing (mm): Allow 8 mm gap between boards along length.

Arrises: Pencil rounded.

Installation: Lay in long lengths (minimum 3 spans) double nailed at each bearing with galvanized nails driven flush. Stagger joints and make them over joists. Leave 4 mm between edges of boards.

18.6 TRIM**18.6.1 TIMBER SKIRTINGS****Skirtings**

Provide skirtings to all spaces nominated in *Internal Finishes and Colour Schedule*. Fix to wall plugs in masonry walls. Nail fixings to be countersunk and filled to match timber colour. Screw fixings to be countersunk and covered with timber plugs, where timber finished with clear finish.

Type:

- Cross section: Rectangular.
- Thickness: 19 mm.
- Height: 150 mm.
- Material: Radiata Pine.

18.6.2 TIMBER SILLS AND SLAB EDGE TRIMS

Sills

Provide timber sills to all spaces nominated in *Internal Finishes And Colour Schedule*. Screw fixed to concrete upturns and walls, through wall plugs, or directly into timber packers.

Type:

- Cross section: Rectangular.
- Thickness: 19 mm.
- Width: Refer drawings.
- Material: *Internal Finishes and Colour Schedule*.

Slab edge trims

Provide timber edge trims to slabs and internal balustrades as shown on drawings and to all spaces nominated in *Internal Finishes And Colour Schedule*. Screw fixed to concrete upturns and walls, through wall plugs, or directly into timber packers. Screw fixings to be countersunk and covered with timber plugs, where timber finished with clear finish.

Type:

- Cross section: Rectangular.
- Thickness: 19 mm.
- Width or height: Refer to drawings.
- Material: *Internal Finishes and Colour Schedule*.

18.6.3 TIMBER HANDRAILS

Handrails

Provide timber handrails to all stair handrails and balustrades nominated on drawing. Handrails shall be continuous between floors unless noted otherwise and be concealed fixed to steel supports from underneath.

- Timber/ Finish: Refer *Internal Finishes and Colour Schedule*.
- Cross section: Circular
- Diameter: 50 mm.

18.7 TIMBER WINDOWS AND GLAZED TIMBER DOORS

18.7.1 STANDARDS

Windows

Selection and installation: To AS 2047.

18.7.2 MATERIALS AND COMPONENTS

Flashings

Standard: To AS/NZS 2904.

Materials: Provide flashings and weatherings which are corrosion resistant, compatible with the other materials in the installation, and coated with a non-staining compound where necessary.

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Fasteners

General: Provide fasteners of sufficient strength and quality to perform their required function.

18.7.3 CONSTRUCTION GENERALLY**Installation**

Install windows so that the frames:

- are plumb, level, straight and true within acceptable building tolerances;
- are adequately fixed or anchored to the building structure; and
- will not carry any building loads, including loads caused by structural deflection or shortening.

Joints

General: Make accurately fitted tight joints so that neither fasteners nor fixing devices such as pins, screws, adhesives and pressure indentations are visible on exposed surfaces.

Sealants: If priming is recommended, prime surfaces in contact with jointing materials.

Trim

General: Provide mouldings, architraves, reveal linings, and other internal trim using materials and finishes matching the window frames as noted. Install to make neat and clean junctions between frames and the adjoining building surfaces.

Flashing and weatherings

Install flashings, weather bars, drips, storm moulds, caulking and pointing so that water is prevented from penetrating the building between the window frame and the building structure under the prevailing service conditions, including normal structural movement of the building.

Fixing

Packing: Pack behind fixing points with durable full width packing.

Prepared masonry openings: Where fixing of timber windows to prepared anchorages necessitates fastening from the frame face, sink the fastener heads below the surface and fill the sinking flush with a material compatible with the surface finish.

Fasteners: Conceal fasteners.

Fastener spacing (nominal): 600 mm.

18.7.4 WINDOW ASSEMBLIES**Generality**

Timber: To match existing timber frames or timber approved by Superintendent.

Profiles: As noted on drawings.

Finishes: For paint systems and colours refer Internal Finishes and Colour Schedule and External Finishes and Colour Schedule.

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Tender Number T01/3



brewsterhorth Architects

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ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

19.1 GENERAL

19.1.1 SECTION CONTENT

General

The scope of work in this section includes, but is not limited to, the supply, fabrication, delivery, off-loading, erection of all structural steel in the buildings, and modification of the existing structures as necessary to facilitate erection of all structural steelwork.

19.1.2 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Light Steel Framing*: For cold-formed sections used in floor, wall and roof framing.
- *Partitions*: For cold-formed sections used in partition framing.
- *Painting*: For specific details of paint system to structural steel.
- *External Finishes and Colour Schedule*: For finishes to structural steel.
- *Internal Finishes and Colour Schedule*: For finishes to structural steel.

19.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1085.1	2000	Steel rails
AS 1163	1991	Structural steel hollow sections
AS 1397	1993	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated
AS/NZS 1554.1	2000	Welding of steel structures
AS/NZS 3678	1996	Structural steel - Hot-rolled plates, floor plates and slabs
AS/NZS 3679.1	1996	Hot-rolled bars and sections
AS/NZS 3679.2	1996	Welded sections
AS 4100	1998	Steel structures
AS/NZS 4600	1996	Cold-formed steel structures

19.1.4 STANDARD

General

Materials, construction, fabrication and erection: To AS 4100.

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19.1.5 ADJOINING ELEMENTS

General

Provide for the fixing of adjoining building elements to be fixed to or supported on the structural steel.

19.2 QUALITY

19.2.1 INSPECTION

Off Site - Inspections

<u>Item</u>	<u>Inspection Type</u>	<u>Notice</u>	<u>References</u>
Surface preparation before shop painting.	Witness Point	3 days	<i>Surface Preparation</i>
Completion of protective coating before deliver to site.	Witness Point	3 days	<i>Protective Coatings</i>

On Site - Inspections

<u>Item</u>	<u>Inspection Type</u>	<u>Notice</u>	<u>References</u>
Steelwork on site before erection.	Witness Point	3 days	
Steelwork and column bases erected on site, before grouting, encasing, site painting or cladding.	Hold Point	3 days	
Anchor bolts in position before casting in.	Witness Point	3 days	

19.2.2 TESTS

Welding Inspection Testing

An independent NATA registered Welding Inspector shall be appointed by the Steel Fabricator hereinafter referred to as the Welding Inspector, to carry out shop and field inspection of steel fabrication, weld preparation, welding and specialised erection procedures. Six weeks before welding commences, the Steel Fabricator shall submit for approval the name of the Welding Inspector and the proposed inspection and testing schedule. Before commencing fabrication, submit details of proposed welding procedures using the form in Appendix E of AS 1554.

The Welding Inspector shall carry out an overview inspection of the welding and other procedures being employed by the Steel Fabricator. Such inspections and/or destructive testing will be carried out on the welds by whatever methods are considered necessary by the Welding Inspector. Inspections for field work shall be completed promptly so that corrections can be carried out without unduly delaying the progress of the work. The Steel Fabricator shall give full cooperation and assistance for inspection and testing and shall make due allowance for this work in their program.

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All welds rejected by the Welding Inspector shall be repaired to the satisfaction of the Welding Inspector.

The Steel Fabricator shall make available to the Welding Inspector all Quality Assurance records, including Job Sequence Sheets, Inspection and Test Plans and Non-conformance and Disposition Records.

Three copies of the reports of the Welding Inspector shall be submitted to the Contractor, the Steel Fabricator and the Superintendent within a week following inspection.

Defective materials shall be removed and replaced by the Steel Fabricator at their own expense and the Steel Fabricator shall also be responsible for all the delay caused by rejection. The Steel Fabricator shall, after having any material or work rejected, repair or replace same without delay.

Non destructive weld examination

Standard: To AS/NZS 1554.1.

Radiographic and ultrasonic inspection: Have the examination performed by an independent testing authority.

Repairs: Repair faulty welds revealed by non-destructive examination and repeat the examination.

Non-destructive weld examination (NDE) table

Type of weld and category	Examination method	Extent (% of total length of weld type)
Fillet welds	Visual inspection	100
Butt welds, GP	Visual inspection	100
Butt welds, SP	Visual inspection	100
	Radiographic or ultrasonic inspection	10

19.2.3 SUBMISSIONS

Subcontractors

Submit names and contact details of proposed fabricator and installer.

Shop drawings

General: Submit shop drawings showing the following information:

- Relevant details of each assembly, component and connection.
- Information relative to fabrication, surface treatment, transport and erection.

Particular: Include the following information:

- Identification.
- Steel type and grade.
- Dimensions of items.
- Required camber, where applicable.
- Fabrication methods including, where applicable, hot or cold forming and post weld heat treatment.

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- Location, type and size of welds or bolts.
- Weld categories and bolting categories.
- Orientation of members.
- Surface preparation methods and coating system.
- Procedures necessary for shop and site assembly, and erection.
- Temporary works such as lifting lugs, support points, temporary cleats and bracing which are required for transport and erection of the structural steelwork.
- Required fixings for adjoining building elements.

Tests

Steel: Submit evidence that the steel used in the work complies with the cited material standards.

Acceptable evidence: Certified mill test reports, or test certificates issued by the mill.

Alternative: Have the steel tested by an independent testing authority for compliance with the chemical composition and mechanical test requirements of the cited material standard.

Materials and components

Masonry anchors: If masonry anchors are required or proposed for the support or fixing of structural steel, submit evidence of the anchor capacity to carry the load.

Execution

Splicing: If splicing of structural members is intended, submit proposals.

Welding procedures: Submit details of proposed welding procedures, using the form in Table C2 of AS/NZS 1554.1.

Erection: If members cannot be properly erected, give notice.

Identification marks: Submit details of proposed marking for high strength structural bolted connections in work exposed to view.

Distortions: If a member is distorted during the galvanising process, submit proposals for straightening.

19.3 MATERIALS AND COMPONENTS

19.3.1 STEEL TYPE AND GRADE

Standards

Cold-formed sections: To AS/NZS 4600.

Steel grade table

Type of steel	Grade
Universal beams and columns, parallel flange channels, large angles to AS/NZS 3679.1	300
Flat, small angles, taper flange beams and columns to AS/NZS 3679.1	250
Welded sections to AS/NZS 3679.2	300

CONNELL MOTT MACDONALD

Structural Steel

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Hot rolled plates, floor plates and slabs to AS/NZS 3678

250

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Hollow sections to AS 1163:

- Circular sections less than 265 mm outside diameter	C250
- Sections other than the above	C350

Cold formed purlins and girts to AS 1397	G450 Z350
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Steel rails to AS 1085.1	(one grade only)
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Standards

Steel shall be of the types and grades shown on the drawings, to the appropriate material standard, and to AS 4100, Section 2, or AS 1538, Clause 1.7 in the case of cold-formed sections.

Compliance With Standard

For each batch of steel supplied to the Works, provide the manufacturer's Certificate of Compliance and Test Certificates specified in AS 1227, Clause A5.

Independent Tests

Alternatively, have the steel independently tested to AS 1227, Clause A4, for compliance with the chemical composition and mechanical test requirements of the appropriate material standard.

Rejection

Steel which cannot be shown to comply with the appropriate material standard is liable to rejection.

19.3.2 BOLTS**Bolts, nuts and washers**

General: Hot-dipped galvanised, corrosion-free coated in oil and in serviceable condition.

19.4 EXECUTION**19.4.1 FABRICATION****Standard**

To AS 4100, Section 14.

Fabrication

Fabricate in a workshop approved by the Contractor unless otherwise permitted or specified.

Any required camber on beams shall be as documented on the Structural Engineer's drawings and shall have a tolerance of +3 mm. Beams without camber shall have the natural camber upwards.

Access To Works

The Superintendent shall have access to the Steel Fabricator's works at all reasonable times during fabrication and the Steel Fabricator shall provide all necessary facilities to enable the works of this Contract to be inspected.

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Inspection And Tests

All steel, materials and procedures shall be subject to inspection by the Superintendent during fabrication and erection, and their acceptance or rejection shall be final.

Splicing

General: Provide structural members in single lengths.

Beam camber

If beam members have a natural camber within the straightness tolerance, fabricate and erect them with the camber up.

Straightening

Do not injure the material when straightening or flattening members.

Site work

Other than work shown on the shop drawings as site work, do not fabricate or weld structural steel on site.

Tolerances

To AS4100 clause 15.3.

19.4.2 BOLTING**Bolting Symbols**

Generally bolts are required to be tightened to a snug tight fit only, and are designated S.

Bolts designated HSTB and HSTF shall be fully tensioned in accordance with AS 1511 using Coronet load indicating washers.

General

All bolts, nuts, and washers used for bolting galvanised members shall be galvanised.

Where the surfaces of bolted parts have a slope of more than 1:20 with respect to a plane normal to the bolt axis a bevelled washer shall be used to compensate for the lack of parallelism.

High Strength Fully Tensioned Joints (HSTB and HSTF)

Each bolt and nut shall be assembled with one washer under the head of the bolt and with another washer under the nut. The washers shall be either tapered or flat, according to the type of connection. Tapered washers shall be correctly fitted.

Alignment is to be maintained with drift pins until sufficient bolts have been tightened. Driving of bolts is not permitted.

Nuts and bolts shall always be tightened in a staggered pattern and where there are more than four in any one joint, they shall be tightened from the centre of the joints outwards. High strength tensioned bolts, nuts and washers may be used temporarily to facilitate assembly during erection; if so used, they shall not be finally tightened except in their correct sequence in the complete joint.

HSTB and HSTF bolted joints shall be tightened by use of the Direct-Tension Method (refer AS 1511, Clause 4.2.2.4) using CORONET LOAD INDICATOR washers installed in accordance with Ajax Bulletin No. 3/81, unless written approval otherwise is obtained from the Superintendent.

Indicators for M16 diameter bolts have four protrusions and M20 to M24 have five protrusions. It is essential that the correct diameter Coronet Load Indicator be used with each bolt diameter.

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Load indicator washers shall be placed on the bolt with protrusions bearing against the underside of the bolt head. In locations where the head is to be rotated in tightening, the load indicator shall be placed at the nut end of the bolt assembly with the protrusions bearing against a hardened flat washer to AS 1252. The protrusions must always bear against the bolt head or a nut face washer and not the structural member.

Important

A nut should not be slackened after full tensioning. If it is necessary to slacken a nut, the bolt and load indicator shall be rejected and a new bolt and load indicator used.

Connection bolts

For connection bolts not shown on the drawings, provide bolting category 8.8/TF.

Foundation bolts

General: Provide each foundation bolt with 2 nuts and 2 oversize washers and provide sufficient thread to permit the levelling nut to be set below the base plate.

Hexagonal commercial bolts: To AS/NZS 1111.1.

Hexagonal nuts: Class 5.

Lock nuts

General: Provide lock nuts for bolts in moving parts or parts subject to vibration and for vertical bolts in tension.

Tensioning of bolting categories 8.8/TB and 8.8/TF

Method: Do not use torque control.

Permanent bolting

Do not bolt until correct alignment and preset or camber have been achieved.

19.4.3 WELDING**Standards**

To AS 4100, Clause 9.7 and AS 1554.

Stud Welding

To AS 1554, Part 2.

All items of equipment for welding and gas cutting shall be of a suitable design and in good condition.

Surfaces to be welded shall be free from scale, slag, rust, grease, paint, and any other foreign material.

Joint preparation shall conform to the angles and dimensions of the details shown in AS 1554.

All butt welds, except when produced with the aid of backing material, shall have the root or initial layer gouged or chipped out on the back side before welding is started from that side. Butt welds made with the use of backing strip shall have the weld metal fused with the backing strip. Ends of butts shall have the start and stop zones removed by the use of run on and run off plates. Such plates shall be removed after use.

If the results of the tests do not comply with this Specification and the cost of the test and any result on rectification works shall be borne by the Steel Fabricator.

Welding shall be carried out under the immediate and continuous supervision of a supervisor employed by the Steel Fabricator. This person shall have qualifications as described in AS 1554, Section 4.11 and these qualifications shall be submitted to the Superintendent for examination prior to the commencement of fabrication.

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Welding shall be performed only by welders with qualifications as described in AS 1554, Section 4.11.

Balanced welding sequences shall be adopted for the fabrication of plate girders and trusses in order to control and minimise distortion and shrinkage. The sequence of welding for this structure shall be submitted to the Superintendent for review, including shrinkage calculations, prior to fabrication.

Pre-heating of plates and members shall be carried out in accordance with the recommendations of the AWRA TECHNICAL NOTE 1 'THE WELD ABILITY OF STEELS' and the associated commentary on the structural steel welding code.

Weld Categories

All welds shall be 6 mm continuous fillet welds, Category SP unless noted otherwise.

Qualification Of Welding Personnel

To AS 1554, Part 1, Clause 4.11.

Correction Of Faulty Welds

To AS 1554, Part 1, Clause 5.8. After correcting a faulty weld revealed by a required test, re-test it as specified under WELD TESTING.

Delivery To Site

The Steel Fabricator shall deliver steelwork to the site at the times required in the Contractor's schedule, and to locations as determined to suit the erection program. The structural steel shall be transported and handled carefully and be protected from damage in transit and handling. All members of structural steel to be assembled on site shall be match-marked in accordance with the shop details submitted for review. Bolts, nuts and washers to be separately bundled for each size and each bundle clearly marked for size and purpose of bolts.

19.4.4 ERECTION**Standard**

To AS 4100, Clause 15.

Erection Tolerances

To AS 4100 clause 15.3.

The Steel Fabricator shall give at least forty-eight (48) hours notice of the intention to commence erection in order that inspection can be made of the steelwork.

He shall check that the concrete structure on which steel is to be placed is at the correct levels to receive base plates and/or other fixings, and verify the correctness for location and/or level of all anchor bolts set in the bases, and immediately notify the Superintendent of any inaccuracies. The Steel Fabricator will be responsible for the accurate bearing of the steel on the concrete structure, for correct location, shimming to levels and placement of all members. After shimming to levels, test the steelwork for verticality in both directions and tighten holding down bolts. Grout shall be packed under the whole area of steelwork base plates. Carry out steelwork erection in a sequence and with sufficient bracing which will allow steelwork to be maintained vertical and stable in both directions throughout the frame.

The frame shall be erected in sections. Each section shall be plumbed and secured before erection of the next section commences.

Anchor Bolts

Provide all anchor bolts and positioning cages necessary for erection of steelwork.

Anchor bolts shall be of the diameter shown on the drawings, and shall be provided with hexagonal nuts with square washer at head of bolts and round washer under the nut. Inserts and bolts shall be set accurately in the concrete forms and shall be rigidly held during concreting

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operations. The length of anchor bolts and the elevation at which they are set shall be such that two full threads project above the nut when fully tightened.

Anchor bolts shall be tied together into a cage and held with round bar ligatures at not more than 300 mm centres.

Anchor bolt position tolerances:

- deviation of a bolt within a bolt group: + 3 mm.
- deviation between groups: + 6 mm.
- maximum accumulated deviation between groups: + 6 mm per 30m
- centre of bolt group off grid: not greater than 6 mm
- projection of bolt end: +25 mm, -5 mm.

19.4.5 Temporary Bracing - Structural Steel

Particular attention is drawn to the necessity of providing and installing, and afterwards removing, if necessary, sufficient temporary bracing to keep the structure plumb and in true alignment until other structural elements provide the necessary permanent bracing.

It is the responsibility of the Contractor to ensure that this bracing is adequate for construction purposes. The Contractor shall submit details of the temporary bracing for review by the Architect before any erection commences. This submission shall include drawings and computations prepared by a Chartered Engineer which accurately represent the proposal. Review of these details does not relieve the Contractor of their responsibility under the Contract.

19.4.6 Site Welding

Wherever possible, all welding is to be carried out in the fabrication shop. Where site welding is called up on the drawings or specified, this work shall be carried out by a qualified welder, skilled in this type of work and under the supervision of the Welding Inspector. Before welding, all surfaces must be cleaned of all dirt, grease and rust. All site welding shall be 8 mm continuous fillet weld unless shown otherwise on the drawings.

Weather protectors shall be provided at points on which major structural welding is being performed. Electrode ovens and proper electrode storage shall be provided in strict accordance with the manufacturer's recommendations.

Splices On Site

Members must be correctly aligned and levelled before splicing on site. The splicing, whether by welding or bolting, must be completed before any loads (including self dead load) are added to the member. Site welds shall not be carried out when the temperature of the component parts is less than 5 C.

All bolts in any single splice shall be fully tightened before proceeding to the next connection unless specifically detailed otherwise on the drawings.

19.4.7 Grouting of Base Plates

Surfaces to be grouted shall be clean and all loose material shall be blown clear using high pressure air hoses. Prior to grouting and after shimming to levels, the steelwork members and base plate shall be correctly aligned in both directions and firmly held in position by temporary braces and holding down bolts shall be tightened.

Prior to grouting, all grout seals and air bleed holes shall be inspected. Should leakage occur in the grout seal or containment, the Contractor shall disassemble the member and the grout void thoroughly cleaned to the satisfaction of the Superintendent prior to re-grouting.

Bases of all steel columns shall be grouted using a pre-mixed, non-shrink cementitious grout such as "Embeco 636" or other approved equivalent, having a minimum 28 days compressive

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strength of 40 MPa unless noted otherwise on the drawings. Grout shall be mixed and introduced into the grout cavity in a liquid flowable state strictly in accordance with the Manufacturer's instructions.

Grout shall cover the whole area of the base plate to be grouted.

Adequate supplies of the liquid grout shall be kept on site to allow the base plate to be grouted in one operation.

All grout shall be tested by an approved NATA laboratory for compressive strength at 28 days in accordance with AS 1012 and AS 2073 at the rate of 3 cubes per mixer batch. Full allowance shall be made by the Contractor for all costs associated with these tests and for submission of the results to the Superintendent.

The Steel Fabricator shall allow for any air bleed holes additional to those shown on the drawings to satisfactorily grout the base plate to the satisfaction of the Superintendent.

The Contractor shall submit details of their proposed grouting method and procedure to the Superintendent for review prior to carrying out work on site.

Survey

A set-out survey of reference grid lines will be provided by the Contractor.

The Steel Fabricator will carry out their own survey to ensure the work is within specified tolerances before offering completed sections of the work for check survey by the Contractor's Surveyor. The Steel Fabricator shall give a minimum of at least 48 hours notice of any check surveying requirement of the Contractor. No claims for delay will be recognised in connection with attendance of the Contractor's Surveyor.

Coordination

It shall be the responsibility of the Contractor to coordinate erection with all other trades especially in relation to heavy and large items of services equipment where it may be necessary to leave steelwork out until equipment is loaded into the building.

No claims shall be entered into due to the Contractor's failure to coordinate.

Concrete Encasing

To AS 3600.

Temporary connections

Do not attach cleats except as shown on shop drawings.

Temporary members

Fix temporary members so as not to weaken or deface permanent steelwork.

Hand flame cutting

Do not hand flame cut bolt holes.

Movements

Provide for thermal movements during erection.

Clearances

End clearances at connections (mm).

Anchor bolts

For each group of anchor bolts provide a template with setting out lines clearly marked for positioning the bolts when casting in.

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Grouting of supports

Preparation: Before grouting steelwork to be supported by concrete, masonry and the like, set steelwork on packing or wedges.

- Permanent packing or wedges: Form with solid steel or grout of similar strength to the permanent grout.
- Temporary packing or wedges: Remove before completion of grouting.

Temperature: Do not grout if the temperature of the base plate or the footing surface exceeds 38°C.

Minimum compressive strength (Mpa):	30
Minimum thickness (mm):	20
Maximum thickness (mm):	60

Handling

Do not overstress or deform members or components.

Drifting

Use only to bring members into position. Do not enlarge holes or distort components.

Work exposed to view

Welds: Grind smooth but do not reduce the weld below its nominal size.

Shearing, flame cutting and chipping: Perform carefully and accurately.

Corners and edges: Grind fair those corners and edges which are sharp, marred, or roughened.

19.5 FINISHES**19.5.1 FINISHES SCHEDULE****Schedule**

Location:	Protective Coating:
Exposed Structural Steel (including hidden surfaces of members)	<i>Refer Internal and External Finishes and Colour Schedules for system and Painting section for details of system</i>
Unexposed structural steel generally	Inorganic zinc silicate primer
Purlins and the like	Galvanised

19.5.2 IDENTIFICATION MARKS**General**

Provide marks or other means for identifying each member, and for the setting out, location, erection and connection of the steelwork. If the work includes more than one bolting category, mark bolted connections to show the bolting category.

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19.5.3 SURFACE PREPARATION**General**

Methods: To AS 1627.

Site connections: After completing the connection, prepare the surface of the connection, adjacent unprimed surfaces and surfaces damaged during erection.

Steel surfaces generally: Remove loose millscale, loose rust, oil, grease, dirt, globules of weld metal, weld slag and other foreign matter. Ensure surfaces are dry.

Abrasive blast cleaning

Do not use silica abrasive for dry blasting. Use phosphate inhibitors when wet blasting.

Marking

On the contact surfaces of friction type joints, confine the use of marking ink to the minimum necessary for marking hole positions.

19.5.4 INORGANIC ZINC SILICATE PRIMER**General**

Standard: Comply with the recommendations of AS/NZS 2312.

Shop work: Apply the primer coat or protective system to the structural steel before delivery to the site.

Transport and handling: Do not damage the paintwork.

Site work: After erection, repair damage to the shop coating and apply coating omitted at site connections.

Priming

Time delay: Prime the steel surface as soon as possible after surface preparation and before the surface deteriorates, and in any case within 4 hours for shop work and 2 hours for site work. If the surface is contaminated or rust bloomed, repeat surface preparation before priming.

Conditions: Do not prime in adverse ambient conditions.

Fast drying primers: Do not provide fast drying primers where surface preparation is less than class 1.5.

Concrete encasing: Where members are part concrete encased extend the priming 25 mm into the surface to be encased.

Clearances: Keep priming clear of members and components to be site welded, and surfaces against which concrete is to be poured (including concrete encasing except as noted above). On completion of site welding, of concrete pouring and of 8.8/TF bolting, prime to give complete coverage of exposed surfaces.

Inaccessible surfaces

Where surfaces will be in contact or near contact after fabrication or erection, apply the finish and allow it to dry before assembly.

19.5.5 GALVANISING

Cold worked items: Except for hollow sections, anneal to 650°C before galvanising.

Coating mass: Other than nut and bolt thread surfaces:

Minimum average: 600 g/m².

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Coating quality: Continuous, adherent, smooth, evenly distributed, free from defects detrimental to the end use of the finished article, such as lumps, blisters, gritty areas, uncoated spots, acids and black spots, dross and flux.

Hollow sections: Provide seal plates with breather holes.

19.5.6 REPAIRS**General**

Repair finishes to ensure the full integrity of each phase and each coating.

19.6 COMPLETION

19.6.1 COMPLETION**Temporary connections**

Remove temporary cleats on completion and restore the surface.



Light Steel Framing 20

VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



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20.1 GENERAL**20.1.1 SECTION CONTENT****General**

The Works include, but are not limited to light steel framing.

20.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Cladding*: for external claddings.
- *Linings*: for plasterboard linings to bulkheads.
- *Partitions*: for partitions generally, and metal stud sizes.
- *Adhesives, Sealants and Fasteners*: for fixings generally.
- *Metal and Prefinishes*: for metals and prefinishes generally.

20.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 3623	1993	Domestic metal framing
AS/NZS 4600	1996	Cold-formed steel structures
APAS-2916	1997	Organic zinc rich coatings for protection of steel.

20.1.4 STANDARDS**Standards**

Design, materials and protection: To AS/NZS 4600.

Design of domestic metal framing: To AS 3623.

20.2 QUALITY**20.2.1 INSPECTION****Schedule of Inspections**

<u>Item</u>	<u>Inspection Type</u>	<u>Notice</u>	<u>References</u>
Steel framing erected on site before lining or cladding.	Witness point	3 days	

VILLAGE PARK REDEVELOPMENT MONA VALE**20.2.2 SUBMISSIONS****Design**

Floor frame member sizes: Submit a schedule of proposed member sizes, certified by a suitably qualified person as meeting stated project requirements.

Shop drawings

Roof trusses: Submit shop drawings certified by a suitably qualified person

- stating that the trusses have been designed to AS/NZS 4600 for the span, spacing and loading;
- showing on an elevational diagram the size and section type of each member; and
- specifying the method of assembly, fixing, tying and bracing.

20.3 MATERIALS AND COMPONENTS**20.3.1 MATERIALS AND COMPONENTS****Corrosion protection**

Steel sheet and strip sections:

- Coating class (minimum): Z275 or AZ150.

20.4 EXECUTION**20.4.1 CONSTRUCTION GENERALLY****Fabrication**

Length: Cut members accurately to length so that they fit firmly against abutting members.

Service holes: Form holes by drilling or punching.

- Bushes: Provide plastic bushes or grommets to site cut holes.
- Swarf: Remove swarf and other debris from cold-formed steel framing immediately.

Fastening

Type: Select from

- self-drilling, self-tapping screws;
- blind rivets; or
- proprietary clinching system.

Welding

Type: Use the metal inert gas (MIG) technique or carbon arc welding.

Touch up: Clean the weld and coated areas affected by welding and touch up with zinc rich organic primer to APAS-2916.

Prefabricated frames

Protect frames from damage or distortion during storage, transport and erection.

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Bracing

Provide diagonal noggings or tensioned straps.

Metal separation

Install lagging to separate non-ferrous service pipes and accessories from the metal framing.

Earthing

Permanent earthing: Required.

Temporary earthing: Provide temporary earthing during erection until the permanent earthing is installed.

CCA treated timber

Do not fix in contact with cold-formed steel framing.

20.4.2 WALL FRAMING**Wall studs**

General: Provide studs in single lengths without splices. Place a stud under, or within 40 mm from, each structural load point from roof or ceiling (except for openings). Provide multiple studs at points of concentrated load.

Maximum stud spacing: 600 mm.

Heads to openings

Provide lintels consisting of either a stiffened top plate or a truss built up from frame members, depending on load and span.

Splicing

Splice plates at ends to maintain continuity and alignment.

Additional support

General: Provide additional support in the form of noggings, trimmers and studs for support and fixing of lining, cladding, hardware, accessories, fixtures and fittings.

Maximum spacing of noggings: 1350 mm centres.

Support to internal glazed partitions

Provide framing and support as required to create all necessary bracing and stability (including to head framing) to internal glazed partitions.

20.5 COMPLETION

20.5.1 COMPLETION**Cleaning**

On completion of framing remove debris from the cavities of members.

**Brickwork &
Blockwork**

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VILLAGE PARK REDEVELOPMENT MONA VALE

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VILLAGE PARK REDEVELOPMENT MONA VALE

21.1 GENERAL**21.1.1 SECTION CONTENT****General**

The Works include, but are not limited to masonry construction using masonry units (bricks or blocks) of clay, calcium silicate, concrete or other materials, including accessories such as wall ties, lintels, straps, damp-proof courses, flashings, trays and vents, and the necessary operations of laying, jointing, building-in, cleaning and the like.

21.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Landscaping Specification*: For paving.
- *metals and Prefinishes*: For these items generally.

21.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1672.1	1997	Lime for buildings
AS/NZS 2699.1	2000	Wall Tiles
AS/NZS 2904	1995	Damp-proof courses and flashings
AS 3700	2001	Masonry structures
AS 3972	1997	Portland and blended cements
AS/NZS 4600	1996	Cold-formed steel structures

21.1.4 STANDARD**General**

Materials, construction and detailing: To AS 3700.

Masonry units: To AS/NZS 4455

21.1.5 INTERPRETATION**Definitions**

Face units: Masonry units used in facework, including purpose-made units such as sills, sills and thresholds.

Criteria for face units: General good appearance free from defects outside the range of approved samples.

Facework: Masonry in which the form, or form and colour, of the face units and joints is visible in the completed works.

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Commons (includes the terms "seconds" and "reject face"): Masonry units used in work other than facework.

Fire rated units: Masonry units suitable for use in masonry required to have a specific fire resistance.

Pointing: The process of filling the outer part of the joints in stone and brick masonry where the bedding mortar has been deliberately left or raked back from the surface or where the original mortar has weathered back from the face.

21.2 QUALITY

21.2.1 INSPECTION

Schedule of Inspections

Item	Inspection Type	Notice	References
Samples and sample panel	Hold point	3 days	<i>Samples</i>
Damp-proof courses, in position	Witness point	2 Days	<i>Damp Proof Course</i>
Flashings in position	Witness point	2 days	<i>Cavity Walls, Flashings location and Flashings installation</i>
Control joints (before insertion of joint filler)	Witness point	2 days	<i>Control Joints</i>
Structural steelwork, including bolts and shelf angles in position	Witness point	2 days	
Lintels in position	Witness point	2 days	<i>Steel Lintels</i>
Bottom of cavities after cleaning out	Witness point	2 days	
Bottom of core holes, before grouting	Witness point	2 days	

21.2.2 SAMPLES

Masonry unit samples

General: Submit face units of each type illustrating the range of variation available, including colour, texture, surface irregularities, defective arrises, and shape.

Number of each type: 6.

Facework sample panels

General: Provide in a suitable position a sample panel of each type of facework including feature banding and face or pointing mortar.

Location: Where approved by the Superintendent.

Minimum size (face of panel) (mm): 2000 x 1500.

Footings: Adequate to support the panel.

Incorporation into the works: An approved panel, if suitably located, may be permitted to be incorporated into the works. Otherwise remove all traces on completion.

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Mortar: Several samples of mortar shall be included from which the Superintendent shall select the final mortar colour. White shall be one of the colours included.

Facework set-out

General: Provide a trial set-out of 2 courses for each panel of facework.

21.2.3 SUBMISSIONS**Fire Resistance Documentation**

Submit documentary evidence from the manufacturer of the masonry units, to the effect that the required units have been tested and have attained a specified fire resistance rating comply with the requirements. The evidence shall be submitted prior to ordering these units and shall be a copy of an NBTC or other approved testing authority certificate.

21.3 MATERIALS AND COMPONENTS**21.3.1 MATERIALS AND COMPONENTS****Masonry units schedule**

Locational Reference	Type	Manufacturing Dimensions
W1	Boral standard hollow concrete block.	190 x 190 x 390
W2	Dry pressed face brickwork to matching existing library building	230 x 110 x 76
W3	120/120/120 FR blockwork Boral scoria blend concrete block	80 x 190 x 390
W4	Cavity brickwork, with dry pressed face brickwork to matching existing library building	230 x 110 x 76
W5	-/120/120 FR blockwork Boral scoria blend concrete block.	140 x 190 x 390
W6	Boral standard hollow concrete block	90 x 190 x 390
W&	Boral standard hollow concrete block	140 x 190 x 390
W9	Cavity blockwork wall with Boral standard hollow concrete block	90 x 190 x 390

Steel Components

Durability classification to AS 3700.

- Steel products generally (including reinforcement) at least: Galvanised Steel.

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Connectors and Accessories

Durability classification to AS/NZS 2699.2.

Materials: General: Galvanised Steel.

Mortar Materials

Sand: Fine aggregate with a low clay content and free from efflorescing salts, selecting for colour and grading.

Admixtures: Do not provide add mixtures.

Cement type generally to AS 3972: GP. Where sulphate attack is possible Type SR.

White cement: Iron salts content not exceeding one per cent.

Lime: To AS 1672.1.

Mortar mix table

Mortar type to AS 3700	Mix proportions (cement:lime:sand)	Location
M3	1:0:5 + water thickener	Concrete or calcium silicate masonry
M4	1:0:4 water thickener	Grouted and reinforced masonry
M4	1:0 - 0.25:3	Underpinning, high strength masonry
M3	1:1:6	Other masonry

Grout

Characteristic concrete compressive strength (MPa): 15 MPa unless noted otherwise on structural engineers drawings.

21.4 EXECUTION**21.4.1 CONSTRUCTION GENERALLY****Generally**

Masonry shall be laid only by experienced tradespersons. Masonry units shall be laid dry unless otherwise shown. Cut masonry units neatly with a suitable saw to achieve dimensional fit.

Build in as necessary, reinforcement, arch bars, lintels, frames, straps, bolts, lugs, wall ties and metalwork. Carefully position openings for other trades to eliminate cutting.

Cleaning

General: Clean masonry progressively as the work proceeds. Clean facework to remove mortar smears, stains and discolouration. Do not use acid.

Concealed work

Joints: Cut flush, and leave unstruck.

"Grassing" of bricks

General: Do not lay clay bricks until they have been out of the kiln for at least 14 days.

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Joints and cutting

Set out: Set out masonry with joints of uniform width and minimise cutting of masonry units.

Holes, sleeves and chases: Build in during erection.

Rods

76 mm high units: 7 courses to 600 mm.

90 mm high units: 6 courses to 600 mm.

190 mm high units: 3 courses to 600 mm.

Bonds

Single leaf: Stretcher bond.

Facework: Stretcher bond.

Soldier course: Top course of all external face brickwork walls.

Tolerances (mm): 3 mm.

Bull in steel door frames

Fill the backs of jambs and heads solid with mortar as the work proceeds.

Monolithic structural action

General: Provide masonry header units, except in stretcher bond facework.

Location:

- Between leaves in solid masonry construction.
- At engagement of engaged piers.
- At intersections with supporting walls.

Building in

Requirement: Wherever practicable run services in the conduit holes of specially formed brickwork, otherwise provide holes, sleeves, and the like during the erection of the masonry to avoid cutting away and making good.

Co-ordination with Steel Structure

Requirement: Co-ordinate brickwork with steel structure, to conceal all structure shown on drawings including cutting of brickwork to run past structure as shown on drawings.

21.5 COMPONENTS

21.5.1 FACEWORK

Commencement

Position: Commence at least 1 full course for blockwork, or 2 full courses for brickwork, below adjacent finished ground level.

Perpends

Alignment: Vertically align perpends in alternate courses.

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Joints

Surface: Work with a jointing tool to a dense smooth surface, except where the surface is to be bagged.

Location	Joint profile:
Face brickwork generally	To match existing building face work
Internal face masonry walls	Flush
Internal masonry walls to be painted	Flush
Masonry walls to be rendered	Square raked

Colour mixing

General: Where the colour of the face units is visible, evenly distribute the colour range of units. Prevent colour concentrations and "banding".

21.5.2 DAMP-PROOF COURSES**Material**

Standard: To AS/NZS 2904.

Type: Bitumen coated aluminium 0.55 mm thick.

Location

General: Provide damp-proof courses in the following locations, if applicable:

- Walls adjoining infill floor slabs on membranes: In the course above the underside of the slab in internal walls and inner leaves of cavity walls. Project 40 mm and dress down over the membrane turned up against the wall.
- Cavity walls built off slabs on ground: In the bottom course of the outer leaf, continuous horizontally across the cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf 1 course above. Project 10 mm beyond the external slab edge and turn down at 45°.
- Masonry veneer construction: In the bottom course of the outer leaf, continuous horizontally across the cavity. Fasten to the inner frame 75 mm above floor level. Project 10 mm beyond the external slab edge and turn down at 45°.
- Internal walls built off slabs on ground: In the first course above floor level.
- At timber floors and decking: In the first course below the level of the underside of ground floor timbers in internal walls and inner leaves of cavity walls.

Installation

General: Lay in long lengths. Lap full width at angles and intersections and at least 150 mm at joints. Step as necessary, but not exceeding two courses per step. Sandwich damp-proof courses between mortar.

Junctions: Preserve continuity of damp-proofing at junctions of damp-proof courses and waterproof membranes.

Location: At least 150 mm above adjacent finished ground level.

Lap sealing: To slab by interfolding the damp-proof course.

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21.5.3 CAVITY WALLS

Minimum cavity width

Masonry walls: 50 ± 10 mm.

Masonry veneer walls: 25 mm, between the masonry leaf and the loadbearing frame and 40 mm between the masonry leaf and sheet bracing.

Openings

Closure: Do not close the cavity at the jambs of external openings.

Cavity fill

Height: Fill the cavity to 1 course above adjacent finished ground level with mortar weathered towards the outer leaf.

Flashings material

Standard: To AS/NZS 2904.

Type: Bitumen coated aluminium 0.55 mm thick.

Flashings location

General: Provide flashings and weatherings in the following locations, if applicable:

- Floors: Full width of outer leaf immediately above slab or shelf angle, continuous across cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf 2 courses above. Where the slab supports the outer skin and is not rebated, bed the flashing in a suitable sealant.
- Under sills: 30 mm into the outer leaf bed joint 1 course below the sill, extending up across the cavity and under the sill.
- Over lintels to openings in cavity walls: Full width of outer leaf immediately above the lintel, continuous across cavity, turned 30 mm into the inner leaf 2 courses above. Extend at least 50 mm beyond the lintels.
- Over lintels to openings in masonry veneer construction: Full width of outer leaf immediately above the lintel, continuous across cavity. Turn up against the inner frame and fasten to it. Extend at least 50 mm beyond the lintels.
- At abutments with structural frames or supports: Vertical flashing in the cavity using 150 mm wide material, wedged and grouted into a groove in the frame opposite the cavity.
- At stiles where cavities are closed: Full height flashing extending 75 mm beyond the closure into the cavity, interleaved with the sill and head flashing at each end. Fix to frame stiles.

Flashings installation

General: Sandwich flashings between mortar except where on lintels or shelf angles.

Lap sealing: Interfold at joints in flashings.

Pointing: Point up joints around flashings, filling voids.

Weepholes

Form: Open perpend.

Maximum spacing: 720 mm.

Location: Provide weepholes to external leaves of cavity walls in the course immediately above flashings, and cavity fill, and at the bottoms of unfilled cavities.

Wall ties

Durability classification to AS/NZS 2699.1

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All wall ties to be 316 grade stainless steel. Refer to Structural Engineers drawings for type.

Wall ties category table

Classification to AS/NZS 2699.1	Service conditions
Light duty	Masonry veneer
Medium duty	Normal cavity construction and at abutments
Heavy duty	Cavities > 60 mm wide

Wall ties installation

Install so that water cannot cross the cavity via the tie. Install wall ties so that they fall to the external leaf.

Fixing of masonry veneer ties at abutments:

- To timber frames: Clouts or integral spikes.
- To concrete: Masonry anchors.
- To steel frames: Stainless steel screws, 12 gauge.
- To structural supports: Stainless steel screws, 12 gauge.

Spacing: As follows unless noted otherwise on Structural Engineers drawings:

- Vertical spacing: 600 mm centres, 400 mm at support lines.
- Horizontal spacing: 600 mm centres, 400 mm at support lines

Embedment of wall ties

Cavities > 60 mm wide: 75 mm minimum.

Flexible wall ties

Type: Where ties or anchors extend across control joints, provide ties or anchors which do not impair the effectiveness of the joint.

21.5.4 CONTROL JOINTS**Requirement**

Construct control joints where shown on drawings or at maximum 7 metre centres and at the junctions of dissimilar materials. Where control joints are required and not shown on drawings seek approval for proposed location with Superintendent prior to construction of masonry.

Note retaining walls to Library do not include control joints, refer Structural Engineers details.

Depth

The full thickness of the masonry leaf.

Filler material

Type: Provide compatible sealant and bond breaking backing materials which are non-staining to masonry. Do not provide bituminous materials with absorbent masonry units.

Foamed materials: Closed-cell or impregnated, not water-absorbing.

Bond breaking materials: Non-adhesive to sealant, or faced with a non-adhering material.

Primer: Required. Equal to Sika SP202.

Backing Rod: Equal to Sika Denver.

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Sealant: Equal to SikaFlex 15LM.

Sealant Colour: To match colour of face brickwork or mortar as required.

Installation

Cleaning: Clean joints thoroughly before sealing.

Joint width vertical joints: 10 mm.

Sealant depth: 0.67 - 1.0 times joint width.

Toothed joints

General: Not permitted.

21.6 REINFORCEMENT**21.6.1 BED JOINT REINFORCEMENT****Reinforcement**

Material: Galvanised welded wire mesh.

Width: Equal to the width of the masonry leaf, less 15 mm cover from each exposed surface of the mortar joint.

Installation

General: Lap 450 mm at splices. Fold and bend at corners so that the longitudinal wires are continuous. Stop 200 mm short of control joints.

In brickwork: Extend 450 mm beyond each side of openings.

Location:

- In third bed joint above bottom of wall.
- In second bed joint below top of wall.
- In first 2 bed joints above and below openings.
- In first 2 bed joints above and below head and sill flashings to openings.

Maximum vertical intervals: 500 mm.

21.6.2 REINFORCED MASONRY**General**

Designation: Masonry strengthened with embedded steel reinforcement, other than bed joint reinforcement.

Cleaning core holes

Blockwork: Provide purpose-made cleanout blocks or machine cut a cleaning hole at the base of each reinforced core. Locate on the side of the wall which is to be rendered or otherwise concealed. Cover the hole with formwork and grout the core.

21.7 LINTELS

21.7.1 STEEL LINTELS

Material

Type: Mild steel galvanised to AS/NZS 4600, minimum coating mass 600g/m². Do not cut after galvanising.

Steel lintels table

Maximum span (mm)	Lintel dimensions (mm)
950	50 x 10
1050	75 x 10
1200	75 x 75 x 8
1350	90 x 90 x 8
1500	90 x 90 x 8
1650	100 x 75 x 8
1800	100 x 75 x 8
2100	125 x 75 x 10
2400	125 x 75 x 10
3000	150 x 90 x 12

Cold-formed lintels

Type: Proprietary flat-base type designed to AS/NZS 4600.

Type tests: Required.

Installation

General: Provide 1 lintel to each wall leaf. Do not cut on site. Keep lintels 6 mm clear of heads of frames. Pack mortar between the angle upstand and supported masonry units.

Minimum bearing each end:

- Span ≤ 1000 mm: 100 mm.
- Span > 1000 mm: 150 mm.

Propping: To prevent deflection or excessive rotation, temporarily prop proprietary cold-formed lintels until the masonry reaches its required strength.

- Minimum propping period: 3 days.

BREWSTER HJORTH ARCHITECTS

Brickwork & Blockwork

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**Insulation &
Barriers**

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VILLAGE PARK REDEVELOPMENT MONA VALE

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22.1 GENERAL**22.1.1 SECTION CONTENT****General**

The Works include, but are not limited to Insulation and Barriers.

22.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Roofing*: For Roof systems.
- *Suspended Ceilings*: For Ceiling systems.
- *Claddings*: For external wall claddings.
- *Linings*: For Internal Wall systems.
- *Woodwork*: For Floor systems.
- *Partitions*: For Partition systems.

22.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1530.2	1993	Test for flammability of materials
AS/NZS 1530.3	1999	Simultaneous determination of ignitability, flame propagation, heat release and smoke release
AS 2352	1980	Glossary of terms for thermal insulation of buildings
AS 2423	1991	Galvanised wire fencing products
AS 3742	1990	Mineral wool thermal insulation - Batt and blanket
AS 3999	1992	Thermal insulation of dwellings - Bulk insulation - Installation requirements
AS 4075	1993	Urea-formaldehyde foam thermal insulation - Installation requirements for in situ set foam
AS/NZS 4200.1	1994	Materials
AS/NZS 4200.2	1994	Installation requirements

22.1.4 INTERPRETATION**Definitions**

Terminology: To AS 2352.

Sarking-type material: Flexible membrane material normally used for waterproofing, vapour proofing or thermal reflectance.

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22.2 QUALITY**22.2.1 INSPECTION****Schedule of Inspections**

<u>Item</u>	<u>Inspection Type</u>	<u>Notice</u>	<u>References</u>
Sarking, vapour barrier and insulation may be inspected before they are covered up or concealed.	Witness point	3 days	<i>Installation</i>

22.3 MATERIALS AND COMPONENTS**22.3.1 MATERIALS AND COMPONENTS****Bulk Insulation**

Polyester: To AS 3742

Reflective Foil Laminate

Standard: To AS/NZS 4200.1.

Flammability index to AS 1530.2: ≤ 5 .

Spread of flame index to AS/NZS 1530.3: ≤ 5 .

Proprietary item: Equal to Insulation Solutions Sisalation, 433.

Vapour Permeable Sarking

Standard: To AS/NZS 4200.1.

Flammability index to AS 1530.2: ≤ 5 .

Spread of flame index to AS/NZS 1530.3: ≤ 5 .

Vapour proofing: Permeance to AS 3999.

Proprietary item: Equal to Insulation Solutions Flamestop 650 Fire retardant breather type building paper.

Fasteners and supports

Galvanised steel.

Mesh support to roof insulation

Wire netting: To AS 2423.

- Size: 51 mm mesh x 1 mm diameter.

22.4 EXECUTION

22.4.1 INSTALLATION

Bulk Insulation

Standard: To AS 3999 or AS 4075.

Batts and rigid sheets: Fit tightly between framing members. If support is not otherwise provided, staple nylon twine to the framing and stretch tight. To slab soffits adhesive fix sheet materials.

Roofs: Install over the roof support frame, reflective thermal insulation, and mesh support, so that the blanket is in continuous contact with the underside of the metal roofing sheets. The insulation to extend over whole of the roof area, to Eaves, overhangs, vents and openings.

Walls: Fit tightly between framing members. If support is not otherwise provided, staple nylon twine to the framing and stretch tight.

Reflective foil laminate

Standard: AS 4200.2.

To steel or aluminium: Double sided pressure sensitive tape.

Overlap (minimum): 150 mm and adhesive fix.

Wall sarking

Locations: Provide sarking under cladding which does not provide a permanent weatherproof seal including:

- Boards fixed vertically;
- Boards or planks fixed in exposed locations where wind driven rain can penetrate the joints.

Installation: Fix to the frame members with broad-head clouts, staples, screws or pop rivets spaced at 300 mm maximum centres. Apply to the outer face of external stud walls from the bottom plate up, over the flashing. At the top, seal across the wall cavity.

Mesh support to roof insulation

Installing wire netting: Lay over the roof framing providing sufficient slack or sag between members to suit the application.

Fixing wire netting: Staple to timber frame, wire to steel frame.

Internal Wall Membrane

Installation: Tape and lap all joints, abutments and penetrations with adhesive tape. Laps 150 mm. Turn up 100 mm against abutments and penetrations. Adhesive tape not inferior to double sided butyl adhesive tape.

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22.4.2 INSULATION SCHEDULE

Location	Insulation	Foil Laminate	Support/Installation
Below Timber T&G Floor on concrete slabs	50 mm polyester insulation, equal to Tontine Insuloft building blanket (density 10kg/m ³).	-	Vapour barrier, refer <i>Woodwork Section</i>
External fibre cement cladd walls	R2.0 polyester insulation equal to Tontine Insuloft building blanket 115 mm thick.	Reflective foil laminate	Friction fit installation
Acoustic panels to Ceiling over SC20t	Polyester insulation, equal to Tontine acoustic insulation 50 mm thick (density 32kg/m ³).	-	Insulation to be laid over Lanter cloth MA168.
Below all metal Roofs	R2.0 Polyester insulation equal to Tontine Insuloft building blanket 115 mm thick	Reflective foil laminate	Mesh support
Below new concrete tiled roofs	R2.0 Polyester insulation equal to Tontine Insuloft building blanket 115 mm thick	Reflective foil laminate (directly below tiles)	Mesh support (Below insulation)
Internal partitions nominated with insulation	Polyester insulation equal to Tontine acoustic insulation at 20kg/m ² and 50 mm thick, unless noted otherwise in <i>Partitions</i> section.	-	Friction fit installation.
Internal Partition Type P1	100 mm polyester insulation, equal to Tontine Insuloft building blanket	Internal wall membrane equal to 0.15 mm black polyethylene film.	Friction fit installation.
Return Air plenum above Ramp 2 SL1.15	Polyester insulation (density 32 kg/m ³) installed to slab soffit and walls above ceiling level, equal to Tontine Acoustisorb 2 MWPF, 50 mm thick (note foil backing to be perforated and facing into plenum)	-	-
External Timber cladd walls	-	Vapor Permeable sarking	-

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Insulation and Barriers

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Waterproofing

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



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23.1 GENERAL

23.1.1 SECTION CONTENT

General

The Works include, but are not limited to waterproofing.

23.1.2 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *In-situ concrete*, in Structural Specification: For concrete working base, concrete toppings and polymeric film underlays.

23.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 3740	1994	Waterproofing of wet areas within residential buildings
AS CA55	1970	Code of recommended practice for the design and installation of bituminous fabric roofing

23.2 QUALITY

23.2.1 SUBMISSIONS

Prior to Commencing Installation

Obtain and submit the following:

Product statement: The manufacturer's written statement certifying that the products comply with the specification and are suitable for their intended use.

Approval of installer: If the installation is not by the supplier, and the supplier's warranty is conditional on his approval of the installer, the supplier's written approval of the specialist installing firm.

Acceptance of substrate: The applicator's written statement certifying that the relevant subgrades, building structure or substrates are satisfactory for receiving the specified finishes.

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Prior to Practical Completion

Obtain and submit the following Warranties:

Item: For each membrane system.

Terms: The warrantor, at no cost to the Principal, shall replace any materials or items which deteriorate, failure become defective including, but not limited to the failure of any part of the system, and faulty workmanship or material. The warranty shall also cover replacing any material requiring replacement during replacement or repairs to the membrane systems that are damaged or removed to gain access to the defective membrane systems.

Warranty Period:

- Membrane system: Ten years from the Date of Practical Completion
- Sealants: Ten years from the Date of Practical Completion.

23.2.2 Inspections**Inspections Schedule**

Item	Inspection Type	Notice	Reference
Verification of falls to roof slab	Hold point	-	<i>Minimum falls to Substrate</i>
Base or sub grade prior to covering	Witness point	2 days	-
After priming	Witness point	2 days	-
Before and after subsequent layers	Witness point	2 days	-

The Contractor shall arrange for the membrane manufacturer's Project Manager to be in attendance at all inspections.

Supervision

The membrane applicator shall provide for the full duration of the preparation, application, detailing, flashing, testing, and laying of protection, a specialist foreman experienced in applying the membrane system.

23.3 EXECUTION**23.3.1 PROTECTION****Requirement**

Protect the waterproof membrane system from damage throughout the works. Keep the surfaces clear of debris and loose material throughout the work and leave it clean on completion.

Keep areas clear of foot traffic for not less than twenty four hours after installation.

Any damaged areas of membrane system shall be prepared to the manufacturer's recommendations.

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23.3.2 Thermal Movement**Provision**

Provide for thermal movement in the roof installation and the structure, including movement in joints and fastenings.

23.4 PREPARATION**23.4.1 Preparation Generally****Generally**

Surfaces to be waterproofed shall be sound, clean, dry and free from dirt, oil, grease, loose matter, paint and other coatings. Ensure surfaces are dry without any traces of residue or permanent dampness. Any area made damp or wet by rain shall not have the membrane system applied until dry, or seven days after drying commenced, whichever is the later. Any surface defects shall be made good and all protrusions which may pierce the membrane shall be removed.

Inspection

Inspect all substrates to ensure suitability to receive waterproofing membranes and notify any adverse defects for rectification.

Minimum Falls to Substrate

Minimum fall to be 1:100 to drainage point or as nominated on drawings.

Falls to library roof slab to be formed integrally with slab. Falls to be verified by Surveyor, prior to installation of membrane. Where minimum fall is not achieved to library roof slab proprietary cementitious topping of equal hardness to concrete is to be applied to manufacturers recommendations to achieve falls.

Substrate

Concrete: Concrete shall be not less than four weeks old prior to application. Finish to be steel trowelled finish, with a fine hair-broom finish.

Concrete Blockwork: Apply to fair face concrete blockwork. Allow to cure for not less than fourteen days prior to application.

Cement Render: Allow to cure for not less than fourteen days prior to application.

Sand and Cement Fillets: Allow to cure for not less than seven days prior to application.

Screeds: Screeds shall be allowed to cure for not less than two weeks prior to application.

23.5 SYSTEMS**23.5.1 Membrane System Schedule**

Location	Membrane System
To library slab, retaining walls and roof slab	Multicoat torch applied bituminous sheet tanking membrane system.
Planters boxes adjacent existing library building	Bitumen modified. Moisture Curing Polyurethane Tanking Membrane System.

VILLAGE PARK REDEVELOPMENT MONA VALE

Internal Wet Areas

Two part liquid applied co-polymer membrane system

23.5.2 Multicoat Torch Applied Bituminous Sheet Tanking Membrane System.

System Generally

Location	Substrate	Extent	No. of layers
Library floor slab	Concrete	To all areas under library floor slab, and turned up to join into wall system and including to all upturns and the like	3
Library masonry retaining walls	Concrete	To all surfaces of retaining walls	2
Library concrete retaining walls	Concrete blockwork with water repellent, refer <i>Brickwork and Blockwork</i> section for details.	To all surfaces of retaining walls	2
Library roof slab	Concrete slab with water stopping additive, refer <i>In situ Concrete</i> section for details.	To all surfaces of roof slab, and turned down to join with wall system, and including all upturns and the like	2
Planters.	To concrete slab over level 2 where extended beyond Northern External line at level 3	To base and all walls of planter, and to join into roof system where connected.	2
Library courtyard slab and upturn walls	Concrete and concrete blockwork	To slab and all upturn walls	1
Planter adjacent to concrete blade wall to library including upturn and retaining walls	Concrete and concrete blockwork	To slab and all upturn walls	1

Requirement

Provide protection from water and or moisture penetration through the use of a multi layer torch applied bituminous membrane system fully bonded to substrate and protected with nominated protection system.

Proprietary system: Tremco Tremproof 3000 APP modified bituminous torch applied membrane.

Standard: To AS CA55

Installation details: Membrane shall be installed in strict accordance with manufacturer's, technical requirements.

Blinding Slab

Provide a 50 mm thick concrete blinding slab to excavated area below water proofed floor slab system.

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Substrate Preparation

To AS CA55, Clause 3.4. Apply the waterproof membrane system to dry, smooth, firm continuous decking surfaces, clean and free of loose or foreign matter.

Where additive or the like has been added to substrate, confirm the curing time with the manufacturer to allow required adhesion of membrane prior to installation of membrane system.

Fillets: Provide solid 45° angle fillets or coves at junctions between horizontal and vertical surfaces.

Surface Priming

All surfaces must be adequately primed with an approved Bituminous primer, based on R105/17 bitumen and not containing white spirits, kerosene, oils or rubber, equal to Tremco bituminous primer. If more than twenty four hours have elapsed between priming and the laying of the membrane, the deck shall be reprimed at the same rate. The primer shall be applied at a density of 5 metres² / litre. The substrate shall be primed as to provide a continuous shiny black finish when dry. The primer shall perform the following:

- provide temporary waterproofing to substrate.
- enhance application ease.
- ensure adequate long term adhesion.

Type of Layers

First layer : Torch apply one layer of Tremproof 3000 membrane layer with side and end laps of 150 mm, fully heat welding to the primed substrate.

Subsequent layers: Torch apply each layer of Tremproof 3000 membrane layer with side and end-laps of 150 mm end laps fully heat welding to the base sheet. All laps to be staggered in relation to those of the previous layer. Extreme care shall be taken during the application to ensure overlaps are fully heat welded and finished with a heated spatula.

Protection

Protect exposed membranes with protection system nominated. Where necessary place a second layer of protection to protect joints.

- Profiled polypropylene sheet: Tremco Protection board., with taped joints. Mechanically hold sheets in place until backfill maintains sheets firmly against membrane.
- Fibrous cement: 9mm compressed fibrous cement sheet. Mechanically hold sheets in place until backfill maintains sheets firmly against membrane.
- Concrete topping: Install a slip sheet of heavy duty builder's plastic with a 30 mm concrete topping screed, with joints at 3500 mm maximum centres in both directions.
- Drainage cell: Proprietary polypropylene drainage cell refer *Landscape Specification* for details.
- Wall Panel: Proprietary polypropylene drainage cell, equal to Atlantis 30 mm wall panel.

Location	Protection
Under library Slab	Under slab a continuous blinding slab, with a concrete topping over
Up turns in library slab	Concrete block wall as shown on drawings
Concrete and block work retaining walls to library	Wall panels

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Top edge of retaining walls at junction with roof slab to library	Profiled polypropylene sheet, as show on drawings
Roof slab to library, including to planters adjacent existing building	Drainage Cell
Upturns to roof slab to library roof	Profiled polypropylene sheet, as show on drawings
Library courtyard slab and concrete slab to landscaping adjacent concrete blade wall to library	Drainage Cell
Upturn walls to Library courtyard and vertical concrete to landscaping adjacent concrete blade wall to library	Profiled polypropylene sheet, as show on drawings

23.5.3 Two Part Liquid Applied Co- polymer Membrane System

System Generally

Location	Extent	Protection
Internal Wet Areas generally	Membrane shall cover full floor area and be covered up surrounding walls to a height of 100mm above floor level, unless greater required by AS 3740.	-
Shower	Membrane shall cover full floor area and be covered up full height of surrounding walls, unless greater required by AS 3740.	

Requirement

Provide protection from water and or moisture penetration through use of a seamless two part acrylic based liquid membrane with glass fibre reinforcing mat reinforcing, applied by brush or roller, in accordance with the manufacturer's details.

Proprietary system: Tremco Tremproof 90, two part liquid applied co-polymer membrane with fibrous reinforcement.

Installation details: Membrane shall be installed in strict accordance with manufacturers, technical requirements.

Substrate

Substrate must be wood float finish or mechanically roughened where steel trowel finished.

Allow substrate to cure by a minimum of 28 days for reinforced concrete and 7 days for cement/ sand screeds or cement render before installing membrane system.

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Substrate Preparation

Apply the water proof membrane system to dry, smooth, firm, continuous surface, clean and free of loose or foreign matter. Any surface defects are to be made good and all protrusions, which may pierce the membrane, are to be removed.

Seal all movement joints with approved sealant.

Primer

Apply water based penetrating bonding liquid with roller or brush over whole of area to be covered with membrane. All surfaces must be adequately primed to manufacturers recommendation.

Allow primer to dry before applying membrane.

Proprietary item: Tremco Tremproof 90 Primer.

Application

Caution:

- Provide adequate ventilation when working in confined areas.
- Product shall be applied within six months of manufacture.
- Standard: To AS 3740.

Application:

- Apply a 10mm bead of silicone into all internal corners and joints around hydraulic service penetrations, and allow to cure.
- Apply into all internal vertical and horizontal corners, first coat of liquid membrane, with paint roller and immediately place glass fibre reinforcing mat into wet membrane and roll in two different directions.
- Apply first coat of liquid membrane with brush or paint roller over whole area to be covered, including the waste. Allow first coat to dry minimum 2 hours.
- Apply second coat of liquid membrane, with brush or paint roller over whole area to be covered at 90 degrees to first coat.
- Ensure membrane is taken down into the waste outlet, incorporating fibre matting reinforcement.

Minimum thickness: 1.2 mm minimum dry film thickness.

Curing time: Allow minimum 48 hours curing time, before tiling. Membrane must be completely dry before commencing tiling.

Protection of membrane: Provide protection to water proofed area, until tiling completed.

Proprietary item: Australian Building Adhesives Superflex two part bathroom, balcony and waterproof membrane system.

Cladding

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24.1 GENERAL

24.1.1 SECTION CONTENT

General

The Works include, but are not limited to the following cladding systems, including proprietary support framing, flashings, fixings, sealants and the like:

- Fibre cement cladding
- Timber boarded cladding

24.1.2 CROSS REFERENCES

General

Refer to the *General Requirements* section.

Related sections

Refer to the following sections:

- *Insulation*: For insulation, vapour barrier and sarking.
- *Light Steel Framing*: For support framing, generally.
- *Adhesives, Sealants and Fasteners*: For these items generally.
- *Painting*: For paint finishes to claddings
- *External Finishes and Colour Schedule*: For external colour descriptions.

24.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS/NZS 1562.3	1996	Plastic
AS 1604	1997	Timber - Preservative-treated - Sawn and round
AS 2334	1980	Steel nails - Metric series
AS 2796.1	1999	Product specification
AS 2796.2	1999	Grade description
AS/NZS 2904	1995	Damp-proof courses and flashings
AS/NZS 2908.2	2000	Flat sheets
AS 3566	1988	Screws - Self-drilling - For the building and construction industries

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24.2 QUALITY**24.2.1 INSPECTION****Schedule of Inspections**

Item	Inspection Type	Notice	References
Timber boarding sample	Hold point	2 days	
Framing complete with sarking and flashings ready to receive cladding.	Witness point	3 days	
Completed fixing of cladding including flashings and sealing of joints prior to removal of scaffolding.	Witness point	3 days	

24.2.2 SAMPLES**Requirement**

Provide sample of timber boarding, indicating profile, colour, texture, type and number of surface irregularities, straightness and trueness of board for approval by Superintendent.

Number: 3 lengths of 2 metres each.

24.3 MATERIALS AND COMPONENTS**24.3.1 MATERIALS AND COMPONENTS****Fibre cement**

Standard: To AS/NZS 2908.2.

Cladding, eaves and soffit linings: Type A Category 3 (modulus of rupture ≥ 7 megapascals).

Compressed cladding: Type A Category 5 (modulus of rupture ≤ 18 megapascals).

- Edges: Square.

Timber boards

Type: Refer *External Finishes and Colour Schedule*.

Hardwood: To AS 2796.1.

- Grade to AS 2796.2: Select Grade.

Durability

Use timbers having natural durability appropriate to the conditions of use, or preservative-treated timber of equivalent durability.

Classification: To AS 1604, Table F2.

Minimum requirements:

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- Class 2: Timbers above ground, not in continuous contact with moisture, well ventilated, protected from moisture but exposed to the weather.
- Class 3: Timbers above ground, not in continuous contact with moisture, well ventilated, protected with a finish, and well maintained.

Preservative treatment

To AS 1604.

Hazard classification: To AS 1604, Table D1.

Preservative: For softwood (other than cypress pine), use CCA Type 1.

Fasteners for timber boarding

- Steel nails: To AS 2334, hot-dip galvanised.
- Self-drilling screws: To AS 3566.

Flashings

Standard: To AS/NZS 2904.

Material: Zincalume steel with colorbond finish, colour to match cladding, 0.55 mm thick.
Profiles as shown on drawings.

24.4 EXECUTION

24.4.1 CONSTRUCTION GENERALLY

Substrates or framing

Before fixing cladding check and, if necessary, adjust the alignment of substrates or framing.

Fixing

Nail to timber framing, screw to steel framing.

Accessories and trim

Provide accessories and trim necessary to complete the installation.

24.4.2 METAL SEPARATION

Requirement

Prevent direct contact between incompatible metals, by providing a suitable separation layer of polyethylene film where required.

Guide

Use AS 1562, Table 3.2 as a guide to compatibility of metals.

24.4.3 THERMAL MOVEMENT

Provision

Provide for thermal movement in the cladding installation and the structure, including movement in joints and fastenings.

24.5 COMPRESSED FIBRE CEMENT CLADDING

24.5.1 CLADDING SYSTEM

Generally

The cladding system comprises of the following:

- Compressed fibre cement sheet cladding attached with screws to supporting substructure;
- A substructure and flashing system of proprietary components, including top hats mechanically fixed to building structure; and
- All necessary accessories, fixings and sealing necessary to complete the installation.

Technical and installation details: Unless specified otherwise, refer to James Hardie D3-1000 Façade System, Technical Manual.

Cladding Panels

Sheet thickness: 9 mm compressed fibrous cement sheet.

Panel Sizes and layout: Refer drawings.

Panel finish: Paint system, Refer *External Finishes and Colour Schedule*.

General: Smooth even edges free of imperfections such as chips, cut to suit the layout, allowing for a joint gap 10 mm wide between panels.

Substructure and Flashing System

Substructure: A system of proprietary top hat sections, installed over building structure at spacings required by sheeting manufacturers requirements, and to suit sheeting layout, design wind load pressures and to isolate differential movement of the panels.

- Material: Rolled galvanised steel sections.
- Gauge: 1.15 mm thick.
- Design wind pressure: 1.0 KPa.

Flashing system: Proprietary galvanised steel sections, specially designed to run continuously behind all vertical joints. Include a continuous sealant bead between top hat and cladding sheet.

Vertical strips: Snap fixed into top hat substructure, and butt jointed.

Additional supports: Provide all additional supports necessary to complete the works, including but not limited to galvanised steel angles behind external and internal corners.

Proprietary System: James Hardie D3-1000 Façade system, including but not limited to JH top hats, JH snap strips, and JH backing strip components.

Jointing

Vertical joints to be expressed negative joint. Locations as shown on drawings.

Flashings

Install preformed metal flashings to base of cladding and the likes as shown on the drawings or as necessary to make the cladding system water tight. Refer *Roofing* for details generally, of materials and requirements.

Fixing panels

Panel edges: Panels shall be exposed screw fixed to substructure at all panels edges, through predrilled fixing holes. Spacing of fixings shall be in strict accordance with panel manufacturer specification.

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Screw type: No 10 gauge x 30 mm zinc plated, chromate passivated countersunk self tapping screws.

Drilling: Pre-drill the panels 1 mm oversize for screw fixings and countersink so that the top of the screw is 2 - 3 mm below the surface.

Finish: Stop screw heads with epoxy filler smoothed and levelled upon application and sanded flush after curing.

Installation

The contractor shall install and accurately align top hat channels/ support framing at the required centres and provide all necessary gaskets, packers, adhesives, sealants, etc. in strict accordance with the manufacturer's recommendations. The contractor shall allow for the provision of all necessary panel supports, trim sections, and edge finishing, etc. to obtain a complete and uniform finish.

24.6 TIMBER BOARDING

24.6.1 CLADDING SYSTEM

Preparation

Boarding finish: Refer *Painting* section for details. Apply first coat to all surfaces (including rear surface) and edges prior to installation of cladding.

Cut surfaces: Treat freshly cut surfaces with water repellent before fixing.

Installation

Single lengths: Provide single lengths when installed vertically. Whenever possible provide single lengths of boards when installed horizontally. Refer *Insulation and Barriers* section for details of sarking.

Crossings: Fix twice to each crossing, except fix once to each crossing for sawn weatherboard, unseasoned hardwood and secret nailed profiles.

Nailheads: Treat visible nailheads as follows:

- In stained or clear finishes: Drive flush.
- In opaque finishes: Punch below the surface and fill flush with putty after the surface has been primed.

Joints

Overlapping joints: Lap boards at least 30 mm.

End grain joints: Install boards so that butt joints are in compression.

Internal and external corners: Butt against a stop bead of thickness at least that of the cladding.

Boards

Timber species:	Refer <i>External Finishes and Colour Schedule</i> .
Grade:	Select grade.
Profile:	Ship lap.
Thickness (mm):	25 mm dressed.
Width (mm):	126 mm cover.
Milled or sawn:	Milled finish.

Roof Tiling

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25.1 GENERAL

25.1.1 SECTION CONTENT

General

The Works include, but are not limited to concrete tile roof coverings and associated elements such as roof plumbing, and associated accessories and trim.

25.1.2 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Structural Steel*: For structural supports and framing
- *Adhesives, sealants and fasteners*: for sealants generally.
- *External Finishes and Colour Schedule*: For colours and finishes.

25.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1170		Minimum design loads on structures
AS 1170.2	1989	Wind loads
AS 1397	1993	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated
AS 1562		Design and installation of sheet roof and wall cladding
AS 2049	1992	Roof tiles
AS 2050	1995	Installation of roofing tiles
AS 2180	1996	Metal rainwater goods - Selection and installation
AS/NZS 2904	1995	Damp-proof courses and flashings
AS/NZS 3500.3.2	1998	Stormwater drainage - Acceptable solutions
AS/NZS 4389	1996	Safety mesh

25.2 QUALITY

25.2.1 PERFORMANCE CRITERIA

Minimum requirements

Provide a roofing system and associated work which:

- remains intact and waterproof under the local or regional ambient climatic conditions;
- provides adequate means of dealing with vapour pressure, condensation, corrosion and thermal movement;
- supports the specified imposed loads and types of roof access without impairment of performance; and
- satisfies other specified performance requirements.

Ambient climatic conditions

Wind loading to AS 1170.2: Region A CAT 3.

Roof Access

Requirement: Design and install a fall protection system to all building roofs, including existing library roof.

Refer to *Metal Roofing* section for details.

25.2.2 PROPRIETARY SYSTEM

Requirement

Supply the roof as a proprietary roofing system together with the associated work necessary to satisfy the specified performance criteria, installed by the roofing materials manufacturer or by a specialist firm approved by the manufacturer.

25.2.3 INSPECTION

Schedule of Inspections

Item	Inspection Type	Notice	References
Roof supports.	Witness point	3 days	
Those parts of the roofing, sarking, vapour barrier, insulation and roof plumbing installation which will be covered up or concealed.	Witness point	3 days	

25.2.4 SAMPLES

General

Submit samples of the following showing the range of variation available:

- All preformed metal flashing, capping, trims and the like profiles.

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25.3 MATERIALS AND COMPONENTS**25.3.1 MATERIALS AND COMPONENTS****Fasteners**

Fastenings to timber battens: Provide fastenings just long enough to penetrate the thickness of the batten without piercing the underside.

25.3.2 METAL SEPARATION**Requirement**

Prevent direct contact between incompatible metals, and between chemically treated timber and aluminium or coated steel.

Method of separation

Coating: Apply a suitable anti-corrosion low moisture transmission coating to contact surfaces.

Coating material: Two layers of approved zinc (or barium chromate) primer, or aluminium pigmented bituminous paint.

Separation layer material: Polyethylene film of adhesive tape or bituminous felt.

Guide

Use AS 1562, Table 3.2 as a guide to compatibility of metals.

25.4 EXECUTION**25.4.1 INSTALLATION****Protection**

General: Keep the roofing and rainwater system free of debris and loose material during construction, and leave them clean and unobstructed on completion. Repair damage to the roofing and rainwater system.

Touch up: If it is necessary to touch up minor damage to prepainted metal roofing, do not overspray onto undamaged surfaces.

Thermal movement

Provide for thermal movement in the roof installation and the structure, including movement in joints and fastenings.

25.4.2 SAFETY MESH**Standard**

General: To AS/NZS 4389.

Refer: *Insulation and Barriers Section* for details.

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25.4.3 TILING**Materials**

Standard: To AS 2049.

Accessories: Provide the accessories, compatible with the tiles, necessary to complete the tiling.

Tiling battens

Standard: To AS 2050, Section 3.

Timber species or group: Seasoned softwood.

Stress grade: F8 for unseasoned hardwood, F5 for Radiata pine or Douglas fir.

Minimum Size: 50 x 50 mm.

Tilting Fillet

Provide an appropriate sized batten to give the correct tilt to the first tile course.

Installation

Standard: To AS 2050.

Setting out: Set out the roof to give an even tile gauge in each course, with full or saw cut tiles at verges.

Wiring: if the battens are not accessible from beneath, run the wire diagonally across the roof and fix at each batten by winding around a galvanised glout.

Bedding and pointing: Bed and point accessories, including ridges, hips and verges, in coloured mortar.

- Colour: To match the tiles and accessories.

Pointed verge: Bed and point tiles on 100 x 5 mm fibre cement pointing strip.

Precautions against wind effects: Adopt the precautions given in AS 2050 Appendix A.

Bottom course: Overhang 50mm into eaves gutter.

Tile schedule

Type: Monier Wunderlich

Pattern: Waverly

Finish: Glazed

Colour: refer *External Finishes and Colour Schedule*

Spare tiles

Provide one spare matching tile for every fifty tiles (or part thereof) on the roof, and spare accessories in the same proportion. Stack spare tiles within the roof space in batches evenly distributed around the roof, and located where possible on, or adjacent to, lines of supporting walls

25.4.4 ROOF PLUMBING**General**

Standard: To AS/NZS 3500.3.2.

Provide the flashings, and cappings, to complete the roof system.

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Flashing material: To AS/NZS 2904.

Ridge capping

Finish off along ridge with purpose-made ridge capping.

Product Material and Finish: Colorbond Steel to AS1397, to match cladding.

Profile and Size: As shown on the drawings.

Thickness: 0.55 mm thick.

Colour: To match cladding.

Joining Method: Silicone and pop rivet to AS2180 Section 3.

25.5 COMPLETION**25.5.1 COMPLETION****Warranties**

Submit the roofing materials manufacturer's published product warranties.

Maintenance manual

On completion submit a manual of recommendations from the roof manufacturer or supplier for the maintenance of the roofing system including, frequency of inspection and recommended methods of access, inspection, cleaning, repair and replacement.

Spare tiles

Number: Provide one spare matching tile for every hundred tiles on the roof. Provide spare accessories in the same ratio.

Location: Stack spares within the roof space.

Designated locations: On or next to lines of supporting walls.

Metal Roofing

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26.1 GENERAL

26.1.1 SECTION CONTENT

General

The Works include profiled metal roof claddings and associated roof plumbing, flashings, roof projections and associated accessories and trim.

26.1.2 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Insulation and Barriers*: For insulation, vapour barriers, and sarking.
- *Structural Steel*: For structural supports and framing.
- *Adhesives, sealants and fasteners*: For these items generally
- *Light Steel Framing*: For support framing, including top hat sections.
- *External Finishes and Colour Schedule*: For colours and Finishes

26.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1391	1991	Methods for tensile testing of metals
AS 1397		
	2001	Steel sheet and strip - Hot - dipped zinc - coated or aluminium/zinc coated
AS 1562		Design and Installation of sheet roof and wall cladding
AS 1562.1	1992	Metal
AS/NZS 2179.1	1994	Metal shape or sheet rainwater goods and metal accessories and fasteners
AS 2180	1986	Metal rainwater goods - selection and installation
AS/NZS 2728	1997	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS/NZS 2904	1995	Damp-proof courses and flashings
AS/NZS 3500.3.2	1998	National plumbing and drainage - stormwater drainage - Acceptable solutions
AS 3566.1	2002	Self-drilling screw for the building and construction industries - General requirements and mechanical properties
AS/NZS 4389	1996	Safety mesh

26.2 QUALITY

26.2.1 PERFORMANCE CRITERIA

Minimum requirements

Provide a roofing system and associated work which:

- remains intact and waterproof under the local or regional ambient climatic conditions;
- provides adequate means of dealing with vapour pressure, condensation, corrosion and thermal movement;
- supports the specified imposed loads and types of roof access without impairment of performance; and
- satisfies other specified performance requirements.

Roof Access

Design and install a fall protection system to all building roofs, including existing library roof.

Type: Fixed anchor bolt system.

Submissions: Provide shop drawings outlining all details of system, including coordination with structure.

Standards:

- Work Cover Code of Practice - Safe work on Roofs - Part 1 Commercial and Industrial Buildings.
- Work Cover Code of Practice - Safety Line Systems.

Certification: Prior to Practical Completion provide certification that system complies with all statutory requirements.

26.2.2 PROPRIETARY SYSTEM

Requirement

Supply the roof as a proprietary roofing system together with the associated work necessary to satisfy the specified performance criteria, installed by the roofing materials manufacturer or by a specialist firm approved by the manufacturer.

26.2.3 INSPECTION

Schedule of Inspections

Item	Inspection Type	NOTICE	References
Roof supports.	Witness point	3 days	
Those parts of the roofing, sarking, vapour barrier, insulation and roof plumbing installation which will be covered up or concealed.	Witness point	3 days	

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Completed fixing of claddings including flashings and sealing of joints prior to removal of any scaffolding

Witness Point

3 days

Jointing sheet metal; and Flashings, cappings.

26.2.4 SAMPLES

Flashings, cappings, trims and accessories

Submit samples of the following showing the range of variation available:

- All preformed metal flashing, cappings, trims and the like profiles.
- Gutter brackets.
- Downpipe astagral.

26.3 MATERIALS AND COMPONENTS

26.3.1 MATERIALS AND COMPONENTS

Fasteners

Self-drilling screws: Corrosion resistance Class 3.

Finish: Prefinish exposed fasteners with an oven baked polymer coating to match the roofing material, or provide matching purpose-made plastic caps.

26.3.2 METAL SEPARATION

Requirement

Prevent direct contact between incompatible metals, and between chemically treated timber and aluminium or coated steel, by providing a suitable separation layer of polyethylene film.

Method of separation

Coating: Apply a suitable anti-corrosion low moisture transmission coating to contact surfaces.

Coating material: Two layers of approved zinc (or barium chromate) primer, or aluminium pigmented bituminous paint.

Separation layer material: Polyethylene film of adhesive tape or bituminous felt.

Guide

Use AS 1562, Table 3.2 as a guide to compatibility of metals.

26.4 EXECUTION

26.4.1 INSTALLATION

Protection

General: Keep the roofing and rainwater system free of debris and loose material during construction, and leave them clean and unobstructed on completion. Protect from adjacent

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construction processes to inhibit marking, scratching, staining and the like. Repair or replace any damage sections of the cladding, roofing and rainwater system.

Touch up: If it is necessary to touch up minor damage to prepainted metal roofing, do not over spray onto undamaged surfaces.

Thermal movement

Provide for thermal movement in the roof installation and the structure, including movement in joints and fastenings.

26.4.2 SAFETY MESH**Standard**

General: To AS/NZS 4389.

Refer: *Insulation and Barriers* section for details.

26.4.3 SHEET METAL ROOFING**General**

Type: Provide a proprietary system of preformed sheet and purpose-made accessories.

Prepainted and organic film/metal laminate products: To AS/NZS 2728.

Design and installation: To AS 1562.1.

Accessories: Provide material with the same finish as for cladding sheets.

Materials

Description:	Sheet Type 1:	Sheet Type 2:
Location:	Lower roof north of existing library and lower roof to link area.	Lantern and café roofs
Drawing notation:	MDR1	MDR2
Product type:	Lysaght klip-Lok 406	Lysaght Longline 305, tapered to suit curve in plan
Material:	Aluminium/zinc coated steel to AS 1391	Aluminium/zinc coated steel to AS 1391
Thickness (base metal) (mm)	0.48 mm	0.72 mm
Product finish:	Colorbond XRW	Colorbond XRW
Colour	Refer <i>External Finishes and Colour Schedule</i> .	Refer <i>External Finishes and Colour Schedule</i> .

Fastenings for concealed fixed sheets

Sheeting shall be fixed to purlins in accordance with the manufacturer's recommendations using proprietary full length metal fixing clips.

Fixing clips shall be fastened to purlins with screws in accordance with AS 3566, class 3 and attached every rib.

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Ridges and eaves

Treat ends of sheets as follows:

- Project sheets 50 mm into gutters.
- Close off ribs at bottom of sheets using mechanical means or with purpose-made fillers or end caps.
- Turn pans of sheets up at tops and down into gutters by mechanical means.
- Provide pre-cut notched eaves flashing and birdproofing where necessary.
- Close off ridges with purpose-made ridge fillers of closed cell polyethylene.

Cappings

Finish off along ridge and verge lines with purpose-made preformed metal cappings.

Product Material and Finish: Colorbond Steel to AS1397, to match cladding.

Profile and Size: As shown on the drawings.

Thickness: 0.55 mm thick.

Colour: To match cladding.

Joining Method: Silicone and pop rivet to AS2180 Section 3.

End laps

General: Where end laps are unavoidable, and the sheet profile is not suitable for interlocking or contact end laps, construct a stepped type lap.

Length of lap (mm): 250 mm.

26.4.4 ROOF PROJECTIONS GENERALLY**Description**

Provide the cut outs, flashings, cappings, trays and support necessary to complete the sealing of all penetrations for services to inhibit water penetration into the building.

Location

Locate as shown on architectural drawings, or if not shown, propose location to superintendent and await approval. Unless noted otherwise all vent pipes and the like will be located on non visible roof surfaces.

Program

The program for the installation of the penetrations by the Proprietor shall be confirmed by the Superintendent prior to installation of the roof. All such co ordination and work shall not constitute grounds for an Extension of Time or Variation of the Contract Sum under the Contract.

Schedule of Components

Location	System	Description/ Finish
To vent pipes and the like	Proprietary Sleeve Flashing	Equal to Deklite EPDM Pipe Flashing: Colour -- to match roof sheeting

26.4.5 ROOF PLUMBING**General**

Standard: To AS/NZS 3500.3.2.

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Provide the flashings, cappings, gutters, rainwater heads, outlets and downpipes necessary to complete the roof system.

Materials

Metal rainwater goods: To AS/NZS 2179.1 and AS 2180, including installation.

PVC rainwater goods and accessories: Refer Hydraulics Specification.

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Jointing sheet metal rainwater goods

Butt joints: Make joints over a backing strip of the same material.

Soldered joints: Do not solder aluminium or aluminium/zinc coated steel.

Sealing: Seal fasteners and mechanically fastened joints. Fill the holes of blind rivets with silicone sealant.

System: Silicon Seal with mechanical fastener (pop-rivet).

Flashings and cappings

Flashing material: To AS/NZS 2904.

Installation: Flash roof junctions, upstands, abutments and projections through the roof. Preform to required shapes where possible. Notch, scribe, flute or dress down as necessary to follow the profile of adjacent surfaces. Mitre angles and lap joints 150 mm in running lengths. Provide matching expansion joints at 6 m maximum intervals.

Upstands: Flash projections above or through the roof with two part flashings, consisting of a base flashing and a cover flashing, with at least 100 mm vertical overlap. Provide for independent movement between the roof and the projection.

Wall abutments: Provide overflashings where roofs abut walls, stepped to the roof slope in masonry and planked cladding, otherwise raking.

- In masonry: Build into the full width of the outer leaf. Turn up within cavity, sloping inward across the cavity and fixed to or built in to the inner leaf at least 75 mm above.

Fixing to masonry or concrete: Step in courses to the roof slope. Interleave with damp proof course, if any.

Fixing to pipes: Solder, or seal with neutral cured silicone rubber and either

- secure with a clamping ring; or
- provide a proprietary flexible clamping shoe with attached metal surround flashing.

Flashings and cappings schedule

Component	Material and finish	Thickness & grade	Profile and size	Jointing method
Flashings and cappings	Zincalume Steel Colorbond Finish	0.55 mm	As shown on drawing, if no dimensions noted seek approval from superintendent for proposed dimension prior to manufacture.	Silicone and pop rivet.

Gutters

General: Prefabricate gutters to the required shape where possible. Form stop ends, downpipe nozzles, bends and returns. Dress downpipe pops into outlets. Provide overflows to prevent back-flooding.

Material: Prefinished colorbond steel to AS 1397 to match roof sheeting.

Thickness of sheet: 0.55 mm.

Shape and size: As shown on drawings.

Anti-drumming damping: Underside of all box gutters to be painted with Pyrotek Soundguard, Sound paint. Paint system to be applied prior to gutter installation, to manufacturers recommended application procedures, and touched up as required to achieve a continuous painted

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surface to the underside of gutters following gutter installation.
Paint thickness: 1.0 mm.

Gutter and sump support: Provide straps and continuous support to support valley gutters, box gutters and sumps. Maximum spacings of support straps 1200 mm centres. Continuous support, equal to Spandek Hi-Ten metal sheeting.

Gratings and guards: Provide removable gratings over rainwater heads and sumps.

Expansion joints: Provide expansion joints in guttering longer than 30 m.

Downpipes

Refer Hydraulic Consultant's details for internal downpipes.

Refer Structural Engineers details for external downpipes.

Downpipe support: Provide supports and fixings for downpipes.

Straps: Material and thickness as specified for downpipes. At intervals of not more than two metres. Not less than two straps per downpipe.

Building in: Where pipes are built into masonry or concrete, spiral wrap the pipe (and insulation, if any) with building paper.

26.5 COMPLETION

26.5.1 COMPLETION

Warranties

Provide for each of the cladding systems a warranty for making good any materials and workmanship which do not comply with the Contract, or which are found to be defective under normal conditions when maintained as recommended by the manufacturer, including but not limited to the following:

- a deterioration of the system such that water penetration may occur,
- a deterioration of the surface finish,
- the structural adequacy of the fixings,
- faulty materials or workmanship.

If the manufacturer is not also the trades person, a separate warranty from the latter shall be necessary, covering the installed items.

Period: Ten years from the Date of Practical Completion.

Maintenance manual

On completion submit a manual of recommendations from the roof manufacturer or supplier for the maintenance of the roofing system including, frequency of inspection and recommended methods of access, inspection, cleaning, repair and replacement.

Doors & Hatches 27

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Tender Number T01/3



brewsterhorth Architects

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B	28.02.03	Tender Issue

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27.1 GENERAL**27.1.1 SECTION CONTENT****General**

The work includes, but is not limited to hinged, sliding and overhead doors, hatches and doorsets.

27.1.2 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1397	1993	Steel sheet and strip - Hot-dipped zinc-coated or aluminium/zinc-coated
AS/NZS 1905.1	1997	Fire-resistant doorsets
AS 1909	1984	Installation of timber doorsets
AS 2688	1984	Timber doors
AS/NZS 2904	1995	Damp-proof courses and flashings
AS 4085	1992	Automatic sliding door assemblies
AS 1428.1	2001	Design for access and mobility - General requirements for access - New building work

27.1.3 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Glazing*: For glass and glazing.
- *Door and Window Hardware*: For hardware and keying.
- *Woodwork*: For timber architraves and trims to door frames.
- *Door and Door Hardware Schedule*: For door and door hardware details.
- *Metal and Prefinishes*: For these items generally.
- *Adhesives, Sealants and Fasteners*: For these items generally.

27.1.4 INTERPRETATION**Definitions**

Doorset: An assembly comprising a door or doors and supporting frame, guides and tracks including the hardware and accessories necessary for satisfactory operation.

Door types: To AS 2688.

27.2 QUALITY

27.2.1 INSPECTION

Schedule of Inspections

Item	Inspection Type	Notice	References
Door frames in place before building in to masonry.	Witness point	3 days	
Door frames installed before fixing trim.	Witness point	2 Days	

Certification

Fire resistant doorsets: Submit certification from an independent testing authority showing compliance with the required fire rating.

27.3 MATERIALS

27.3.1 MATERIALS AND COMPONENTS

Flashings and weatherings

Standard: To AS/NZS 2904.

General: Provide flashings and weatherings which are corrosion resistant, compatible with the other materials in the installation, and coated with a non-staining compound where necessary.

Jointing materials

Provide recommended jointing and pointing materials which are compatible with each other and with the contact surfaces and non staining to finished surfaces. Do not provide bituminous materials on absorbent surfaces.

27.4 EXECUTION

27.4.1 CONSTRUCTION GENERALLY

Installers

Have proprietary doorsets installed by specialist firms.

Installation

Install doors so that the frames

- are plumb, level, straight and true within acceptable building tolerances;
- are adequately fixed or anchored to the building structure; and
- will not carry any building loads, including loads caused by structural deflection or shortening.

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Joints

Make accurately fitted tight joints so that neither fasteners nor fixing devices such as pins, screws, adhesives and pressure indentations are visible on exposed surfaces.

Operation

Ensure moving parts operate freely and smoothly, without binding or sticking, at correct tensions or operating forces and that they are lubricated where appropriate.

Hinged doorsets in two leaves

Provide rebated meeting stiles or fix equivalent metal "T" stop to one leaf unless the doors are double acting. Chamfer square edged doors as necessary to prevent binding between the leaves.

Protection

Surfaces: Protect surfaces to prevent damage or defacement.

Window and door assemblies

If doors are to be installed in window frames as part of a combined window and door assembly, provide a door frame as specified in the *Aluminium Windows and Doors* section for the relevant window type, plus appropriate modification and accessories necessary for the door installation.

Seals

Provide purpose-made proprietary seals to meet requirements for weather, draught, smoke and acoustic sealing. Provide fixings, rebates, grooves and clearances as necessary for installation and operation of the seals. Allow seals unwound from coils to settle before use.

Trim

General: Provide mouldings, architraves, reveal linings, and other internal trim using materials and finishes matching the door frames. Install to make neat and clean junctions between the frame and the adjoining building surfaces.

Timber: Solid timber at least 19 mm thick, mitred at corners.

Flashings and weatherings

Installation: Install flashings, weather bars, drips, storm moulds, caulking and pointing so that water is prevented from penetrating the building between the door frame and the building structure under the prevailing service conditions, including normal structural movement of the building.

27.5 COMPONENTS

27.5.1 TIMBER DOORS**Standards**

Flush doors and joinery doors: To AS 2688.

Installation: To AS 1909.

Door thickness (minimum)

Generally: 35 mm.

External doors and doors over 900 mm wide: 40 mm.

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Flush doors

Edge strips: Minimum thickness 10 mm. Increase overall thickness to at least 15 mm to accommodate the full depth of the rebate in rebated doors. Form rebates to suit standard rebated hardware.

Cut outs: If openings are required in flush doors (eg. for louvres or glazing) make the cut outs not closer than 120 mm to the edges of the doors.

Double doors: Provide a rebate edge to both doors.

Door Type:	Facing:
Internal solid core (core material blackboard or particleboard).	Paint grade
External solid core (core material blackboard or particleboard).	5 mm waterproof plywood to both faces.

Priming

Prime timber doors on top and bottom edges before installation.

27.5.2 STEEL DOOR FRAMES**General**

Type: Assemble frames from coated steel sections, including necessary accessories such as buffers, strike plates, spreaders, mortar guards, switch boxes, fixing ties or brackets, and cavity flashing with suitable provision for fixing hardware; prefinished with protective coatings, built in or fixed to prepared openings.

Sections

Rebates: All steel frames are to be single rebated. Rebates differ to suit the door size and types. Refer to *steel door rebate schedule* for the size of the rebate.

Coated steel sheet: To AS 1397.

Minimum steel sheet thickness:

- Generally: 1.1 mm.
- Fire rated doorsets: 1.4 mm.

Section sizes

Wall Type:	Size (overall):	Alignment:
Face brickwork/ blockwork walls.	50 mm x thickness of wall.	The surfaces of door frames are to be flush with both faces of adjoining wall.
Brickwork walls with applied finish (Cement render/ tiling)	50 mm x thickness of wall inclusive of finishes	The surfaces of door frames are to be flush with both faces of adjoining wall.
Cavity brickwork or blockwork walls	50 mm x 120 mm	The door frame is to be centred across the cavity.

Return Flanges: All frames to include 12 mm minimum return flanges to head of stiles.

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Assembly methods

Welded: Shop assemble fire rated and heavy duty frames by continuous welding. Grind the welds smooth and cold galvanise the welded joints before shop priming.

Finish

Prefinish: Zinc-iron.

Shop priming: Shop prime the sections for the painting system.

Hardware and accessories

General: Provide for fixing hardware including hinges and closers, using 4 mm backplates and lugs. Screw fix the hinges into tapped holes in the back plates.

Spreader: Removable spreader bar for frames to be built into masonry construction.

Hardware accessories: Mortar guards and reinforcing plates for the hardware.

Hinges: Recess hinges flush and screw fixing hinges to 150 x 45 x 6 mm thick mild steel backing plates fully welded to frames at each hinge point. Drill and tap backing plates to suit machine thread screws for hinges.

Buffers: Two resilient grommet type buffers.

Cavity flashing: For external frames in cavity masonry.

Switch boxes (for light switches on door frame): Form from steel sheet of the same type as the frame, with clearance hole top and bottom, and weld into position.

Conduits: Run wiring conduits in frames to door contact switches and the like to Electrical details.

Installation

Building in to masonry: Attach galvanised rod ties to stiles at 600 mm maximum centres. Build in and grout up solid.

Installing in existing masonry: To AS/NZS 1905.1, Appendix D. Fix with bonded hairpin anchors.

Fixing to stud frames: Clip galvanised brackets to frame jambs at 600 mm maximum centres and fasten to the stud frame.

Steel door frames rebate schedule

	Door Thickness	Rebate Width (mm)	Rebate depth (mm)
Solid Core Doors	35 mm door	15	41
	40 mm door	15	46
Fire Rated Door	To achieve fire rating	25	Door thickness + 6 mm

27.5.3 FIRE RESISTANT DOORSETS**Door leaf construction**

Fire resistant doorsets: To AS/NZS 1905.1.

Internal materials: Inert mineral materials containing no asbestos products.

Framing: Increase the width of door leaf members or provide additional members to accommodate hardware and grooves so that items of furniture are contained within framing members and do not encroach on the core materials.

Frames: Steel.

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Timber facings: Timber face veneers and edge strips.

Installation

Standard: To AS/NZS 1905.1.

27.5.4 SLIDING DOOR**Location**

Accessible Toilet SL109, Door Number DL107.

Requirement

Supply and install a proprietary in cavity sliding door assembly, including frame and jambs, track and carriages, door, bottom guide and all necessary hardware, fixings and supports. Operation and dimensions to comply with AS 1428.1).

Proprietary Item CS Cavity Sliders Easi-Open sliding door assembly, with all necessary handles and latches. Telephone: 9905 0588.

Latch: Privacy latch with lever handles, equal to CL100 Lavlock.

Door size:

- Height: 2340 mm
- Clear width: 850 mm.

Frame: Timber with timber architraves to match adjacent doors.

27.5.5 AUTOMATIC SLIDING DOOR ASSEMBLIES**General**

Standard: To AS 4085.

Location

Lobby S08, Door Number D16.

Requirement

Supply and install aluminium framed glazed sliding door operated by a proprietary electrically operated sliding door operator, with all required supports, miscellaneous hardware, fixings and the like. Installation to be in accordance with manufacturers details.

Operating Equipment

Heavy duty sliding door operator complying with AS 4085 class 3 duty rating, fully enclosed within an extruded aluminium housing, and to incorporate:

- a high torque type AC electric motor with electric motor lock;
- operator complying with the Building Code of Australia, clauses D2.19 and D2.21;
- a fully programmable micro-processor safety and door function controller with interface to the building fire alarm systems,
- climate control;
- dual sets of photo electric safety cells;
- P2 emergency egress button;
- Connection to after hours access proximity card reader, refer Electrical Engineers details;
- replaceable hard coat anodised track; and
- auto reloading fail safe device to open the doors in an emergency or mains power failure.

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Functions to include automatic operation, and continuous hold open. Locking is not required. The doors are to be activated by one way directional microwave movement sensors for entry and exit.

Proprietary item: BWN SL 300 Series low profile heavy duty standard sliding door operator.

Door Leaf

Refer *Aluminium Windows and Doors* for details.

Size: Refer to the drawings.

27.6 HATCHES**27.6.1 DUCT ACCESS HATCHES****Location**

As nominated on drawings and as required to provide service and maintenance access to the services located in wall spaces. This includes providing access panels whether shown on the Drawings or not. Where an access panel is required and is not shown on the Drawings, request an instruction for the exact location and size of the panel prior to installation.

Type

Proprietary system comprising a 1.2 mm formed steel sheet faced hinged duct cover, hinged to 1.2 mm steel frame inclusive of the necessary hardware and accessories.

Size: 300 mm wide x 600 mm high.

Locking: Cam lock.

Proprietary Item:

- For lightweight walls: Trafalgar APT/DW.
- For masonry walls: Trafalgar APT/WW.

Finish

Substrate: Factory-applied finish consisting of one coat zinc phosphate etch and one coat zinc chromate primer.

Finish: Painted to match wall, refer *Internal Finishes and Colour Schedule*.

27.7 COMPLETION**27.7.1 COMPLETION****Maintenance**

Submit manufacturers published recommendations for service use.

Protection

Temporary coating: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

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Hardware**

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28.1 GENERAL

28.1.1 SECTION CONTENT

General

The Works include, but are not limited to the supply and installation of selected hardware items specified either as proprietary items, in generic terms, or by reference to approved samples, including:

Door hardware:

- hinges, pivots, sliding tracks, and the like means of hanging doors
- locks, latches and associated door furniture
- keys and key systems
- door closers, door checks, bolts, keepers, stops, buffers and the like
- door pulls, plates, hooks, seals and the like miscellaneous items.

28.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS/NZS 1905.1 1997 Fire-resistant doorsets

28.1.3 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Door and Door Hardware Schedule*: For details of doors and door hardware.
- *Doors and Hatches*: For Doors.
- *Aluminium Windows and Doors*: For doors in glazed wall system.

28.2 MATERIALS

28.2.1 MATERIALS

Metal finishes

Generic items: The following minimal apply to the relevant finishes on hardware items described in generic terms (i.e. not as proprietary items):

- Coating class for steel sheet: At least Z275.
- Anodising class for internal applications: At least AA15.

Clear lacquer: Provide a factory applied clear lacquer finish on copper alloy surfaces liable to corrosion.

28.3 COMPONENTS

28.3.1 COMPONENTS GENERALLY

Supply

Deliver door hardware items, ready for installation, in individual complete sets for each door, each set:

- In a separate dust and moisture proof package;
- Clearly labelled to show its intended location; and
- Including the necessary templates, fixings and fixing instructions.

Operation

Ensure working parts are accurately fitted to smooth close bearings, without binding or sticking, free from rattle or excessive play, lubricated where appropriate.

Handling

Before supply, verify on site, the correct handling of hardware items.

28.3.2 HINGES

Butt hinge sizes

General: Minimum sizes are those in **Hinge table A** and **Hinge table B** (not applicable to cupboard doors), in which length (l) is the dimension along the knuckles, not including hinge tips, if any, and width (w) is the dimension across both hinge leaves when opened flat.

Steel, stainless steel, brass, bronze butt hinges for timber doors in timber or steel frames: To **Hinge table A**.

Aluminium hinges for aluminium doors, or for doors of other materials in aluminium frames: To **Hinge table B**.

Hinge table A

Nominal hinge size
l x w x t (mm)

Door leaves not exceeding any of the following:

	Door leaves not exceeding any of the following:		
	Mass (kg)	Width (mm)	Thickness (mm)
70 x 50 x 1.6	16	620	30
85 x 60 x 1.6	20	820	35
100 x 75 x 1.6	30	920	40
100 x 75 x 2.5	50	920	50
100 x 75 x 3.2	70	1020	50
125 x 100 x 3.2*	80	1220	50

* non standard to special order only.

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Hinge table B

Nominal hinge size l x w x t (mm)	Door leaf not exceeding mass (kg)	Minimum construction	
		Knuckles	Screws/hinge leaf
100 x 70 x 3	30	3	3
100 x 80 x 3.5	50	5	4
130 x 50* x 3.4	75	Interfold	3

* Interfold (Fast Fix) surface mounted

Number of hinges

Small door leaves: Door leaves not exceeding any of the following may have 2 hinges each:

- 2040 mm high.
- 820 mm wide.
- 30 kg mass.

Other door leaves: Provide 3 hinges for leaves between 2040 mm and 2340 mm high, and 4 for door leaves between 2340 mm and 3050 mm high. Provide at least 3 hinges for door leaves controlled by door closers.

Fire doors: To AS/NZS 1905.1.

Hinges per sash: Provide 3 hinges per sash to butt hinge-hung awning or hopper sashes over 1200 mm wide or casement sashes over 1200 mm high.

Hinge materials

Aluminium hinges: High tensile aluminium with fixed stainless steel pins in nylon bushes, and with nylon washers to each knuckle joint.

Doors fitted with closers: Provide low friction bearing hinges.

Brass hinges: For brass hinges used for door leaves exceeding 30 kg or door leaves controlled by door closers, provide bronze or stainless steel washers to each knuckle joint.

Wide throw

Where necessary provide wide throw hinges to achieve the required door swings in the presence of obstacles such as nibs, deep reveals and architraves.

Hinge pins

Exterior or security doors opening out: Provide fixed pin hinges or security hinges.

28.3.3 KEYING

Requirement

Supply and install a Bilock grandmaster locking system, with cylinder locks to all locks nominated in *Door and Door Hardware Schedule*. Abloy cylinders to be supplied by APL, 12 Frederick Street, St Leonards - Telephone: (02) 9439 6611.

Scheduling

The Contractor shall prepare a keying schedule for coordination with Principal's requirements and approval by Superintendent. The Contractor shall request information from Superintendent in sufficient time. The keying schedule shall nominate each lock, key code and number of keys to be supplied.

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Keying

The keying arrangement shall be supplied by Superintendent. Request the information in sufficient time.

Key material

Pin tumbler locks: Nickel alloy, not brass.

Identification

Supply each key with a purpose-made plastic or stamped metal label legibly marked to identify the key, attached to the key by a metal ring.

Stamping: Stamp keys and lock cylinders to show the specified key types.

Records

Obtain from the lock manufacturer, and furnish to the Principal, the lock manufacturer's record of the key coding system showing each lock type, type and number of keys supplied, key number for re-ordering, and the name of the supplier.

Contractor's keys

Immediately before Practical Completion, or at such other times as may be directed, replace any cylinders to which the Contractor has had key access during construction with cylinders which exclude the Contractor's keys.

Waiver: Replacement may be waived only if written approval is given to an alternative method of rendering the Contractor's keys inoperative.

Master key systems: The Contractor shall not use any key under a master key system unless written approval has been given, and then only on condition that the Contractor:

- records on a key control register, the keys issued, dates of issue and return, and person(s) accountable for the issued keys.
- does not duplicate or replace any key without written authority
- returns keys to the Superintendent when directed, and
- if a key is not returned, re-key the locks as necessary to exclude the missing key whilst retaining the specified key system, and provides replacement keys in the specified number.

Number of keys

Supply keys in not less than the following quantities.

Number of keys table

Key type	Minimum number of keys
Great grandmaster keys	2
Grandmaster keys	2
Master keys	2 per code group
Locks keyed to differ	2 per lock
Locks keyed alike:	
- 2 locks in code group	4
- 3-10 locks in code group	6
- 11-40 locks in code group	10
- 41 and over locks in code group	1 per 4 locks or part thereof

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Delivery

Great grandmaster, grandmaster and master keys: Arrange for the manufacturer or supplier to deliver direct to the principal/proprietor.

28.3.4 LOCKS AND LATCHES**Generally**

Provide locks and latches purpose-made for their intended use.

Furniture

Provide lock and latch furniture suitable for use with the lock or latch to which it is installed with the corresponding level of performance.

Strike plates

Use strike plates provided with the locks or latches. Do not provide "universal" strike plates.

Bolts

Provide bolts including barrel bolts, flush bolts and tower bolts with keepers, including lock plates, staples, ferrules or floor sockets.

Mortar guards

For steel doorframe installations provide mortar guards designed to enable the full extension of the lock tongue or similar devices and the correct operation of the locking mechanism.

Rebated doors

For mortice locks or latches to rebated doors, provide purpose-made rebated pattern items.

Sequencing to Double doors

Provide and install proprietary sequence devices where required to double doors to allow doors fully close in required sequence.

Fabrication

Fabricate locks and latches free from flaws and defects, with parts firmly joined and working parts accurately fitted to smooth close bearings, free from rattle and excessive play, appropriately lubricated.

Fixing

Provide concealed fixing to exterior plates and roses, by means of metal thread screws passing through the door from inside into tapped holes in the plate, or by an equivalent method.

28.4 EXECUTION**28.4.1 INSTALLATION****Fixings**

General: Provide materials compatible with the item being fixed, matching where exposed, and of sufficient strength, size and quality to perform their function. Provide a corrosion resistant finish to concealed fixings, and match exposed fixings to the material fixed.

Support: Provide appropriate back support (for example lock stiles, blocking, wall noggings and backing plates) for hardware fixings.

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- Hollow metal sections: Provide backing plates drilled and tapped for screw fixing, or provide rivet nuts with machine thread screws, not self tapping screws or pop rivets.

Security: Locate exposed fixings to lock furniture on the inside faces of external doors and on the inside faces of internal doors to lockable rooms.

Door hardware

Mounting heights: Mount locks and latches so that the centreline of the door knob or lever spindle is 1000 mm above finished floor.

Hinges

Timber doorsets: Install butt hinges in housings equal in depth to the thickness of the hinge leaf (except for hinges designed for mounting without housing), and fix with countersunk screws.

Metal frames: Fix hinges using metal thread screws.

Door stops

General: Fix on the floor skirting or wall, as appropriate, to prevent the door furniture striking the wall or other surface.

Floor springs

Form a recess in the floor slab for the floor spring box and grout the box in place so that the cover plate is flush with the finished floor.

28.5 COMPLETION

28.5.1 COMPLETION**Product warranties**

General: Submit the warranties offered by the manufacturer for the hardware items used in the works.

Maintenance manual

General: Submit the manufacturer's published recommendations for use, care and maintenance.

Adjustment

General: Leave the hardware properly adjusted with working parts in working order, and clean, undamaged, properly adjusted, and lubricated where appropriate.

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29.1 GENERAL

29.1.1 SECTION CONTENT

General

The Works include, but are not limited to aluminium framed windows and glazed doors consisting of proprietary lines (or "suites") of manufactured products supplied as complete systems, fabricated and assembled by specialist firms to their standard designs. Including installation and fixings, flashing, sealants, caulking, weather stripping and the like, necessary for the satisfactory functioning of the whole.

29.1.2 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Metals and Prefinishes*: For framing generally.
- *Adhesive, sealants and fasteners*: For these items generally.
- *Glazing*: For glazed components of systems.
- *External Finishes and Colour Schedule*: For external colours.
- *Internal Finishes and Colour Schedule*: For internal colours.
- *Door and Window Hardware*: For hardware.
- *Doors*: For hinges.
- *Door and hardware schedule*: For details of doors and door hardware.

29.1.3 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 2047	1999	Windows in buildings - Selection and installation
AS/NZS 2904	1995	Damp-proof courses and flashings

29.1.4 STANDARDS

Windows

Selection and installation: To AS 2047.

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29.1.5 INTERPRETATION

Definitions

Window: The term "window" used in this section also means "louvre grille" and "sliding glass door", where applicable.

29.1.6 PERFORMANCE

Requirement

Design, supply and install the window system shown on the drawings to comply with Australian Standards, including for structural adequacy and deflection. Allow for all necessary components to meet this requirement not explicitly noted in contract documents.

Standard

General: To AS 2047.

29.2 QUALITY

29.2.1 INSPECTION

Schedule of Inspections

Item	Inspection Type	Notice	References
Shop drawings.	Hold point	3 days	<i>Submissions</i>
Openings prepared to receive windows (where windows are to be installed in prepared openings).	Witness point	3 days	
Commencement of window installation.	Witness point	3 days	

29.2.2 SUBMISSIONS

Subcontractors

Submit names and contact details of proposed manufacturers and installers.

Shop drawings

Submit shop drawings showing the following information:

- Layout (sectional plan and elevation) of the window assembly.
- Full size sections of members.
- Methods of assembly.
- Methods of installation, including fixing, caulking and flashing.
- Provision for vertical and horizontal expansion.
- Junctions and trim to adjoining surfaces.
- Hardware, fittings and accessories.
- Lubrication requirements.

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- Glazing details.

Statement of Structural Adequacy

Submit a statement confirming structural adequacy of window system and its components to meet performance requirements.

Warranty

Obtain and submit prior to Practical Completion a warranty for the following:

- Item: Powdercoating to aluminium.
- Terms: Against deterioration in colour and appearance; and film integrity.
- Period: 10 years.

29.3 MATERIALS**29.3.1 MATERIALS AND COMPONENTS****Extrusions**

Fabricate from box section frames with clip-in beads to give an overall rectangular finished frame profile. Fixings shall be concealed.

Flashings

Standard: To AS/NZS 2904.

Materials: Provide flashings and weatherings which are corrosion resistant, compatible with the other materials in the installation, and coated with a non-staining compound where necessary.

Fasteners

General: Provide fasteners of sufficient strength and quality to perform their required function.

Window Thermoset Powder Coatings

Generally: Refer *Metals and Prefinishes*.

Pre-treatment: Substrate to be pre-treated with yellow chromate multistage chemical pre-treatment system, 24 hours before application of powder coat.

Finish coat: Dulux 958 line Duratec to 60-80 microns, baked to manufacturers printed details.

Location: Refer *Internal Finishes and Colour Schedule* and *External Finishes and Colour Schedule*.

Window anodised coatings

Generally: Refer *Metals and Prefinishes*.

Surface finish: Stain.

Thickness grade: 20 microns.

Location: Refer *Internal Finishes and Colour Schedule* and *External Finishes and Colour Schedule*.

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29.4 EXECUTION**29.4.1 CONSTRUCTION GENERALLY****Installers**

Have windows installed by their manufacturer or by a subcontractor recommended by the manufacturer.

Installation

Install windows so that the frames

- are plumb, level, straight and true within acceptable building tolerances;
- are adequately fixed or anchored to the building structure; and
- will not carry any building loads, including loads caused by structural deflection or shortening.

Joints

General: Make accurately fitted tight joints so that neither fasteners nor fixing devices such as pins, screws, adhesives and pressure indentations are visible on exposed surfaces.

Sealants: If priming is recommended, prime surfaces in contact with jointing materials.

Fasteners

Provide fasteners (including bolts, rivets, screws, pins, nails, dowels and the like) of sufficient strength and quality to perform their required function.

Machining

Cut edges, drilled hole, rivetted joints and flat sheets shall be clean, neat, free from butts and indentations. Remove sharp edges without excessive radiusing. Fit mitred joints accurately to a fine hairline.

Hardware

Door closers, panic exit devices and all other surface mounted door hardware screw fixed into aluminium sections shall be fixed with rivnuts.

Operation

Ensure moving parts operate freely and smoothly, without binding or sticking, at correct tensions or operating forces and that they are lubricated where appropriate.

Protection

Removal: Remove temporary protection measures from the following:

- Contact mating surfaces before joining up.
- Exposed surfaces.

Trim

General: Provide 25 x 25 x 1.6 mm aluminium angle trims, of finish to match window system unless noted otherwise on the drawings. Install to make neat and clean junctions between frames and the adjoining building surfaces.

Flashing and weatherings

Install flashings, weather bars, drips, storm moulds, caulking and pointing so that water is prevented from penetrating the building between the window frame and the building structure under the prevailing service conditions, including normal structural movement of the building.

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Fixing

Packing: Pack behind fixing points with durable full width packing.

Prepared masonry openings: Where fixing of timber windows to prepared anchorages necessitates fastening from the frame face, sink the fastener heads below the surface and fill the sinking flush with a material compatible with the surface finish.

Fasteners: Conceal fasteners.

Fastener spacing (nominal): 600 mm.

Fixing into steel structure: Provide screw fixings to framing which do not project through full depth of exposed steelwork.

Joining Materials

Use jointing and pointing materials, including sealants, mastic's, primers, gaskets, compressible fillers and the like, of the types shown on the Drawings or specified, as recommended by the material manufacturers for the location and function, compatible when used together, non-staining to finished surfaces. Do not use bituminous materials on absorbent surfaces.

Silicone sealants: Neutral cure silicone.

Priming: Where priming is recommended by the jointing material manufacturer, apply the appropriate primer to the surfaces in contact with jointing materials.

Foamed Material: (In compressible fillers, backing rods and the like): Closed-cell or impregnated types which do not absorb water.

Bond Breaking: Use backing rods and the like back-up materials for sealants, which do not adhere to the sealant.

Sealant Proportions: The depth of elastomeric sealant shall not be greater than the joint width, nor less than half the joint width or six millimetres, whichever is the greater.

Standards: Refer *Adhesive, Sealant and Fasteners* Section.

Clean up: Remove spilled or excess caulking material immediately and clean the affected surface during the work time of the materials with a suitable solvent.

Weather Seals

Generally: Install weather seals to door head, stiles and thresholds so that water is prevented from penetrating the building.

• **Type:** Brush seals. Contractor to provide details of seals for approval prior to installation, refer *Shop Drawings*.

Retractable weather seals: Provide proprietary weather seal installed within bottom rail, refer *Door and Door Hardware Schedule* for details.

29.5 COMPONENTS**29.5.1 WINDOW AND DOOR ASSEMBLIES****Requirement**

Provide and install aluminium framed window and door assemblies as specified, including all necessary fixings, internal stiffening, additional components and the like to complete window systems.

Refer drawings for sizes.

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Vary nominated extrusions within nominated suite as required to include extrusion profiles which allow weather seals as specified.

Refer to *Internal Finishes and Colour Schedule* and *External Finishes and Colour Schedule* for finishes.

Window and door assembly schedule

<u>Location:</u>	<u>Type:</u>	<u>Profiles:</u>
Fixed aluminium framing systems	Aluminium box extrusion with central glazing.	<p>Capral 400 Narrowline series standard or heavy frames as required to suit structural requirements of system with</p> <p>Sub sill generally: Capral EN 6523 sub sill</p> <p>Sub sill to library and lantern windows: Capral EN 6523 sub sill with down turn front leg removed</p>
Hinged aluminium doors, externally and internally	Aluminium box extrusion with central glazing.	<p>Capral 200 series doors, including the following Components:</p> <p>Door Stiles: Capral EK 7836 plain stiles, with EN 2258 glazing beads.</p> <p>Bottom rail: Capral EK 5885 bottom rail, with EN 2258 glazing beads.</p> <p>Top rail: Capral EK 5884 top rail, with EN 2258 glazing beads.</p> <p>Midrails: Capral EL 4057 mid rails, where shown on drawings</p>
Sliding aluminium doors DL135, DL136,	Aluminium box extrusions with central glazing.	<p>Capral series 200 doors, including the following components:</p> <p>Head Track: Capral 1061 track system, concealed fixed refer drawings for details.</p> <p>Threshold guide: Provide a recessed guide to door (guide is not to continue across door opening).</p> <p>Door Stiles: Capral EK 7836 plain stiles, with EN 2258 glazing beads.</p> <p>Bottom rail: Capral EK 5885 bottom rail, with EN 2258 glazing beads.</p> <p>Top rail: Capral EK 5884 top rail, with EN 2258 glazing beads.</p> <p>Midrails: Capral EL 4057 mid rails where shown on drawings.</p>

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Sliding aluminium doors DL122, DC109	Aluminium box extrusions with central glazing.	<p>Capral series 200 doors, including the following components:</p> <p>Track System: Capral 1022 track system with head track fixed to structure over.</p> <p>Door Stiles: Capral EK 7836 plain stiles, with EN 2258 glazing beads.</p> <p>Bottom rail: Capral EK 5885 bottom rail, with EN 2258 glazing beads.</p> <p>Top rail: Capral EK 5884 top rail, with EN 2258 glazing beads.</p> <p>Midrails (where nominated on drawings): Capral EL 4057 mid rails.</p>
Sliding aluminium doors DL203	Aluminium box extrusions with central glazing.	<p>Capral series 200 doors, including the following components:</p> <p>Track System: Capral 1061 track system with head track fixed to structure over and recessed floor channel fixed to side of concrete hob.</p> <p>Door Stiles: Capral EK 7836 plain stiles, with EN 2258 glazing beads.</p> <p>Bottom rail: Capral EK 5885 bottom rail, with EN 2258 glazing beads.</p> <p>Top rail: Capral EK 5884 top rail, with EN 2258 glazing beads.</p>

29.5.2 GLAZED LOUVRE ASSEMBLIES

Adjustable louvres

Description: Provide louvre blades clipped into blade holders pivoted to stiles or coupling mullions, linked together in banks, each bank operated by actuator.

Proprietary item: Breezeway Australia 152 mm glass blade Breezeway louvres, with 38 x 25 mm mullion, fixed to aluminium window system.

Allow for left and right handed louvre remote handles to co-ordinate with actuator control locations as required.

Installation: Screw fix stiles and mullions to the building structure. Provide weather strips to heads and sills.

Components

- Louvre gallery: Aluminium. Finish refer *External Finishes and Colour Schedule*.
- UV stabilised polypropylene clips. Colour: To be advised.
- Link or connecting bars to louvres: 304 stainless steel.

Weatherseals

- Head and Sill: Breezeway weatherseals complete with flexible PVC Seal with sealant to manufacturers installation details.

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- Jamb: flexible rubber breezeway U-shaped seal, to manufactures installation details.

Control Mechanisms to Louvres

Actuator Description: Aprimatec Aprilinear electric operated actuators, with remote operation, distributed by Ouseat Louvres Australia (Telephone: 9545 1033). Allow for connection to Mechanical Services system and manual over ride switch.

Mechanism:	Louvre Number:	Minimum Requirements:
Electric Operated	LL202, LL203 LL204, LL205, LL206 LL207 LL208, LL209, LL210, LL211, LL212, LL213	Breezeway single control handle Type B2 or dual control handle type B6 to suit operation, with all necessary link or connection bars to actuator. Material 304 Stainless Steel Actuator to each louvred section (6 bays of glass louvres) Actuator to be located on centre mullion with equal number of louvres on each side of motor.
Manual Handles	LL105, LL106, LL107, LL108, LL109, LC103, LC104	Breezeway standard ring handle type B13 Material 304 Stainless Steel

Manufacturer to determine final number of control mechanisms, operation and layout and provide shop drawings of assembly. The Contractor shall coordinate control mechanisms with other building elements.

29.5.3 METAL LOUVRE GRILLES**Type**

Provide metal louvre blades mounted in an 100x 50 mm extruded aluminium surround frame, installed as specified for window installations.

Louvres shall be assembled and fixed in continuous line panels in accordance with the manufacturers details.

Include the necessary sills, jambs, mullions, transoms, internal and external corners, beads, brackets, anchors, straps and accessories.

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Finish: Refer *External Finishes and Colour Schedule*.

System Types

Location:	Louvre type:	Backing to louvre:
External louvres LC101, LL201, LL103, LC204	Proprietary item: 50 deep CVS Equipment free flow louvres, MFL/F 050.	Bird proofing
Internal louvre LC102	Air Grilles Pty Ltd DFC Door/ Wall grilles, set centrally into aluminium framing	18 mm MDF backing below A/C intake set between aluminium framing
Internal louvres LC202, LL104	Air Grilles Pty Ltd DFC Door/ Wall grilles, set centrally into aluminium framing	

Bird Screens

Provide 12 mm x 12 mm welded galvanised wire mesh 1.0 mm diameter bird screens behind louvres.

29.6 COMPLETION**29.6.1 COMPLETION****Maintenance manual**

Submit the window manufacturer's published instructions for operation, care and maintenance.

Glazing

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30.1 GENERAL**30.1.1 SECTION CONTENT****General**

The Works include, but are not limited to glazing, determination of glass thickness, structural glazing and general performance requirements.

30.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Aluminium Windows and Doors*: For window and window systems.
- *Woodwork*: For Timber windows and glazed doors
- *Metal Fixtures*: For balustrade systems.

30.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1288	1994	Glass in buildings - Selection and installation
AS/NZS 2208	1996	Safety glazing materials in buildings
AS/NZS 4668	2000	Glossary of terms used in the glass and glazing industry
BS 952:1	1995	Classification
BS 2571	1990	Specification for general-purpose flexible PVC compounds for moulding and extrusion
BS 4255:1	1986	Specification for non-cellular gaskets
AAMA 800	1992	Voluntary Specifications and Test Methods for Sealants (describes products coded 802.3, 803.3, 804.3, 805.2, 806.3, 807.3)
ASTM C 1036	1997	Standard Specification for Flat Glass
ASTM C 1048	1997	Standard Specification for Heat Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass
ASTM C 920	2001	Standard Specification for Elastomeric Joint Sealants
ASTM D 897	2000	Standard Test Method for Tensile Properties of Adhesive Bonds
ASTM D 1002	1999	Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal to Metal)
ASTM D 3330M	1996	Standard Test Methods for Peel Adhesion of Pressure-Sensitive Tape at 180° Angle

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ASTM D 3652M	1999	Standard Test Method for Thickness of Pressure-Sensitive and Gummed Tapes
ASTM D 3654M	2000	Standard Test Method for shear Adhesion of Pressure-Sensitive Tapes
ASTM D 3715M	1998	Standard Practice for Quality Assurance of Pressure-Sensitive Tapes (Metric)
TT-S-001657	1996	Sealing Compound: Single Component, Butyl Rubber Based, Solvent Release Type (for Buildings and Other Types of Construction)

30.1.4 DESIGN**Glass type and thickness**

Determine the glass thickness and requirement for safety glazing in accordance with AS 1288, AS/NZS 2208, applicable regulations and the design wind pressure.

30.1.5 STANDARD**Standard**

Materials and installation: To AS 1288.

30.1.6 INTERPRETATION**General**

Terminology for work on glass: To AS 4668.

30.2 QUALITY**30.2.1 SUBMISSIONS****Design**

Certification: Submit an engineers' certificate confirming compliance with AS 1288.

Installation

Glass manufacturer's data: Submit statements from the manufacturers of the required glass types, certifying that the method of glazing and the sealants, materials, and conditions next to the glass:

- Will not be detrimental to the long term structural performance, weathering capabilities and visual qualities of the glass;
- Will not cause delamination or other impairment to laminated glass during the service life of the curtain wall system.

Opacified glass: Submit a statement by the manufacturer certifying that the proposed method of opacifying the glass will not be detrimental to the glass or detract in any way from the glass product warranty.

Glazier's data: Submit the glazing subcontractor's statement certifying that the assembled frame provides for the required glazing clearances and tolerances and maximum and minimum joint configurations, having regard to the bow, warp and kink characteristics of the required glass types, and is ready for glazing.

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Site glazing: If site glazing is intended, submit proposals.

30.3 MATERIALS AND COMPONENTS

30.3.1 GLASS

Glass types

Classification and description: To BS 952:1.

Glass and glazing materials

Glass and glazing materials generally: Free from defects which detract from appearance or interfere with performance under normal conditions of use.

Glass tolerances

Size, squareness and flatness: To AS/NZS 2208.

Plate and sheet (ie. not patterned): Roller wave: Maximum 0.15 mm.

Float glass quality

Glazing Select Quality q3 to ASTM C 1036.

Safety glasses

Standard: To AS/NZS 2208.

Standards Mark: Required.

Unacceptable blemishes in heat-treated flat glass (including tinted and coated glass)

Standard: To ASTM C 1048.

Glazing Schedule

Window Location:	Glass type:	Minimum glass thickness and safety glass requirements:
External aluminium framed glazed windows and doors	G James laminated (annealed) Optilight HL919 Clear	As required by AS 1288 and AS/NZS 2208.
Glazed louvres Library Lantern.	G James Toughened Optilight HL919 Clear	6 mm.
Internal glazed partitions	Clear float glass.	As required by AS 1288 and AS/NZS 2208.
Internal glazed louvres	Clear float glass.	Thickness: 6mm. Safety requirements as required by AS 1288 and AS/NZS 2208.

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Glazed balustrades	Clear toughened glass.	10 mm min. thickness. As required by AS 1288 and AS/NZS 2208.
Screens to joinery items JL102, JC203, JC204 and JC207.	Pilkington Series 0002 Colourback glass with ground and polished edges	6 mm minimum or as required by AS 1288 and AS/NZS 2208
Glazing to doors and windows to Existing Memorial hall	Clear float glass	As required by AS 1288 and AS/NZS 2208.

30.3.2 ADHESIVE FILM**Location**

Refer to Drawings.

Requirement

Provide and install translucent adhesive film to nominated panels, in single sheet film. Film to stop 10 mm short of all frames. Adhered film shall be without any ridges or bubbles.

Prior to installation confirm side of glass film to applied.

Proprietary Item: 3M Frosted Crystal Film.

30.3.3 GLAZING MATERIALS**General**

Glazing materials (including putty, glazing compounds, sealants, gaskets, glazing tapes, spacing strips, spacing tapes, spacers, setting blocks and compression wedges): Appropriate for the conditions of application and the required performance.

Jointing materials

Provide recommended jointing and pointing materials which are compatible with each other and with the contact surfaces and non staining to finished surfaces. Do not provide bituminous materials on absorbent surfaces.

Glazing tapes

Standards: To AAMA 804.3, 806.3, 807.3, as applicable.

Elastomeric sealants

Sealing compound (polyurethane, polysulphide, acrylic):

- Single component: Type II, Class A.
- Multi component: To ASTM C920.

Sealing compound (silicone):

- Single component: Class A.
- Multi component: To ASTM C920.

Sealing compound (butyl): To TT-S-001657.

Glazing compounds: To AAMA 802.3 (Types I or II), or 805.2, as applicable.

Narrow joint seam sealer: To AAMA 803.3.

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Exterior perimeter sealing compound: To AAMA 800.

Non drying sealant: To AAMA 800.

Expanded cellular glazing tape: To AAMA 800.

Very high bond pressure sensitive tapes: To ASTM D 897, ASTM D 1002, ASTM D 3330M, ASTM D 3652M, ASTM D 3654M, and ASTM D 3715M.

Extruded gaskets and seals

Type: Non cellular (solid) elastopressive seals.

Material:

- Rubber products (neoprene, ethylene propylene diene monomer (EPDM) or silicone rubber): To BS 4255:1.
- Flexible polyvinyl chloride (PVC): To BS 2571, E type compounds, colour fastness grade B.

Priming

Apply the recommended primer to the surfaces in contact with sealant materials.

30.3.4 MIRRORS**Reflective surface**

Type: Silver layer deposited on the glass or glazing plastic.

Protective coatings: Electrolytic copper coating at least 5 µm thick, and 2 coats of mirror backing and edge sealing paint having a total dry film thickness of at least 50 µm.

Mirrors schedule

Location: Toilets Generally.

Size (mm): As shown on drawings.

Mirror type: Frameless, exposed fixed mirror.

Edge Finish: Bevelled and Polished edges.

30.3.5 PRODUCT IDENTIFICATION**Safety glazing materials**

Identify each piece or panel, to AS 1288.

30.4 EXECUTION**30.4.1 GLASS PROCESSING****General**

Processing: Perform required processes on glass, including cutting, obscuring, silvering and bending. Form necessary holes, including for fixings, equipment, access holes and speaking holes. Process exposed glass edges to a finish not inferior to ground arised.

30.4.2 INSTALLATION

General

General: Install the glass so that:

- Each piece is held firmly in place by permanent means which enable it to withstand the normal loadings and ambient conditions at its location without distortion or damage to glass and glazing materials;
- Building movements are not transferred to the glass; and
- External glazing is watertight and airtight.

Temporary marking: Use a method which does not harm the glass. Remove marking on completion.

Toughened glass: Do not cut, work, or permanently mark after toughening. Use installation methods which prevent the glass making direct contact with metals or other non-resilient materials.

Heat absorbing glass: In locations exposed to direct sunlight, provide wheel cut edges free from damage or blemishes, with minimum feather.

- Edge grinding or arising: Wet process, using grit no coarser than 120 - 180. Do not work across the edge from surface to surface.
- Temporary marking: Remove before installation.

Preglazing

Window assemblies and glazed doors: Supply inclusive of glazing, shop preglazed unless preglazing is impracticable.

Curtain walls: Supply inclusive of glazing, shop preglazed.

Glazing Method Schedule

<u>Window Location:</u>	<u>Glazing Method:</u>	<u>Comments:</u>
External windows and doors generally unless noted otherwise, and Internal glazed partitions.	Extruded gaskets	To aluminium window and door frame manufacturers requirements.
Glazed balustrades.	Patch fitting.	Refer to drawings and <i>Metal Fixtures Section</i> .
Timber windows and doors	Glaziers putty	

30.4.3 FIXING MIRRORS

Screw fixing

Direct to wall plugs with dome-headed chromium-plated screws in each corner and at 900 mm maximum centres around perimeter. Provide polyethylene sleeves and washers to prevent contact between screw and glass. Do not over-tension the screws.

Proprietary Item

Modric No 2205, 32mm fixing screw with 9mm cover.

30.5 COMPLETION

30.5.1 COMPLETION

Warranties

General: Submit a warranty, signed by the glazing subcontractor, undertaking to repair or replace glass and glazing materials which, within the warranty period, become defective or prove unsuitable for the specified application; provided that the manufacturers' recommendations for the maintenance of the material have been followed during the warranty period.

Toughened glass warranty: The manufacturer's warranty certifying that toughened glass supplied for use in curtain walls has been subjected to a heat soaking process which has converted at least 95% of the nickel sulphide content to the stable beta-phase.

Maintenance manual

Submit manufacturers' published recommendations for service use.

Cleaning

Replace damaged glass and leave the work clean, polished, free from defects, and in good condition.

Linings

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31.1 GENERAL**31.1.1 SECTION CONTENT****General**

The work includes, but is not limited to internal dry linings of plasterboard and cellulose fibre reinforced cement.

31.1.2 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 2131	1987	Adhesives - For bonding decorative thermoset laminates (contact adhesives)
AS/NZS 2588	1998	Gypsum plasterboard
AS/NZS 2589.1	1997	Gypsum plasterboard
AS 2753	1985	Adhesives - Mastic - For bonding gypsum plaster linings to wood and metal framing members
AS/NZS 2908.2	2000	Flat sheets

31.1.3 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Insulation*: For insulation and vapour barriers.
- *Lightweight Steel Framing*: For framing and support bulkhead linings.
- *Partitions*: For framing and system descriptions.
- *Suspended Ceilings*: For framing and system descriptions.
- *Woodwork*: For timber skirtings.

31.2 QUALITY**31.2.1 INSPECTION****Schedule of Inspections**

Item	Inspection Type	Notice	References
Substrate or framing before installation of linings.	Witness point	3 days	

31.3 MATERIALS AND COMPONENTS

31.3.1 MATERIALS AND COMPONENTS

Plasterboard

Standard: To AS/NZS 2588.

Fibre cement

Standard: To AS/NZS 2908.2.

Wall and ceiling linings: Type B category 2.

Fasteners

Steel nails: Hot dip galvanised.

Adhesives

Contact adhesives: To AS 2131.

For plasterboard: To AS 2753.

31.4 EXECUTION

31.4.1 CONSTRUCTION GENERALLY

Substrates or framing

Before fixing linings check and, if necessary, adjust the alignment of substrates or framing.

Battens

Fix at each crossing with structural framing members, or direct to solid walls or ceilings. Provide wall plugs in solid backgrounds. Do not provide explosive powered fastenings.

Accessories and trim

Provide accessories and trim necessary to complete the installation.

Adhesives

General: Provide adhesives of types appropriate to their purpose, and apply them so that they transmit the loads imposed, without causing discolouration of finished surfaces.

31.4.2 PLASTERBOARD LINING

Supports

General: Install timber battens or proprietary cold-formed galvanised steel furring channels:

- Where framing member spacing exceeds the recommended spacing; and
- Where direct fixing of the plasterboard is not possible due to the arrangement or alignment of the framing or substrate.

Transverse walls: Locate noggings:

- At least 150 mm from the horizontal joint; or
- Ensure that noggings do not protrude beyond the face of studs.

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Installation

Gypsum plasterboard: To AS/NZS 2589.1.

- Level of finish: Level 5.

Framed construction: Screw or nail or combine with adhesive.

Metal stud frames: Screw using galvanised self tapping screws, or retain using proprietary clamping straps and cover trims.

Masonry construction: Fix using adhesive direct to masonry, but do not fix direct to masonry as a substrate for tiled finish.

Suspended ceilings: Fix using screw or screw and adhesive to ceiling members.

To furring channels: Fix using screw or screw and adhesive.

Joints

Joint Type	Description
Flush joints	Use recessed edge sheets and finish flush using perforated paper reinforcing tape
Butt joints	Make joints over framing members or otherwise provide back blocking.
Control joints	Install purpose made zinc coated control joint beads in locations nominated on drawings or at not more than twelve metre centres in walls and to coincide with structural movement joints. Rondo R35 Plasterboard Expansion Joint
Ceiling to wall junctions	Rondo P50 Shadow stopping angle.
Stop junctions to walls, including to junction with window frames and the like	Ronda P12 or P13 Stopping Bead
Plasterboard corners	Rondo P01 Corner Bead
Plasterboard to the edge of doors	Rondo P12 or P13 Stopping Bead

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31.4.3 SHEET LINING

Sheet lining schedule

Type	Description	Location
Gypsum plasterboard	10 mm thick. Recessed edge. Flush joints.	To exposed ceilings generally. Noted as set plasterboard.
Gypsum plasterboard	13 mm thick. Recessed edge. Flush joints.	To exposed walls noted as set plasterboard.
Water Resistant plasterboard	10 mm thick water resistant. Recessed edge. Flush joints.	To ceilings in wet areas
Water Resistant plasterboard	13 mm thick water resistant. Recessed edge. Flush joints.	To walls in wet areas



**Suspended
Ceilings**

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Tender Number T01/3



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32.1 GENERAL

32.1.1 CROSS REFERENCES

General

The Works include, but are not limited to ceilings, bulkheads and external soffits suspended from a supporting structure including the supporting system, infills, trims and accessories required to complete the installation and making good the existing ceilings.

32.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS1397	2001	Steel Sheet and Strip-Hot dipped zinc-coated or aluminium/zinc-coated
AS/NZS 1530.3	1999	Simultaneous determination of ignitability, flame propagation, heat release and smoke release
AS/NZS 2270	1999	Plywood and blockboard for interior use
AS/NZS 2588	1998	Gypsum plasterboard
AS/NZS 2785	2000	Suspended ceilings - Design and installation

32.1.3 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related Sections

Refer to the following sections:

- *Linings*: For plasterboard linings.
- *Light Steel Framing*: For these items generally.
- *Adhesive Sealants and Fasteners*: For these items generally.
- *Metal and Prefinishes*: For these items generally.

32.1.4 STANDARDS

General

Suspended ceilings: To AS/NZS 2785.

32.1.5 INTERPRETATION

Definitions

The following are as defined in AS/NZS 2785: Ceiling, concealed system, exposed system, flush ceiling, lipping, panel, semi-exposed system (one-way exposed system), sheeted ceiling, soffit, strip ceilings, tile.

Bulkhead: Vertical or sloping section of a ceiling system spanning between two horizontal ceiling planes.

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Corridor supporting system: Suspended ceiling system in which primary support members occur only at walls. The ceiling, or ceiling plus secondary members, spans between the primary support members.

Suspension system: An assembly of ceiling components for suspending ceiling systems.

Supporting structure: The part or parts of the building to which the suspended ceiling system is attached.

Suspended ceiling system: A ceiling or external soffit and its suspension system, suspended from a supporting structure.

32.2 QUALITY

32.2.1 INSPECTION

Schedule Of Inspections

Item	Inspection Type	Notice	References
The suspension system before installation of the ceiling panels or lining.	Witness point	3 days	
Completed ceiling before site painting, if applicable.	Witness point	3 days	

32.3 MATERIALS AND COMPONENTS

32.3.1 SUPPORTS AND TRIM

Coated steel

General: To AS 1397.

- Coating class: Z200 or AZ150 as applicable.

32.3.2 PANELS

Plasterboard Panels

Plasterboard: To AS/NZS 2588.

Refer to *Linings* section for details.

Plywood Panels

Standard: To AS/NZS 2270.

32.4 PERFORMANCE

32.4.1 PERFORMANCE CRITERIA

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Strength

Upward wind load: The ceiling system shall withstand, without the failure of any component, a load equal to 0.8 times the dead load of the system plus twice the upward wind load over the central area of the test specimen equivalent in area to four tiles or panels and symmetrically disposed with regard to the four central hangers.

32.4.2 SERVICES**Access**

Concealed services shall be accessible for repairs or replacement by the removal of access panels where shown on the Drawings, or where approved by the Superintendent.

Services Penetrations

In fire or acoustic performing ceilings, provide openings for service pipes, ducts, conduits and other installations. Seal linings to all sides of each service penetrating the lining providing an airtight junction on each side of the wall.

32.5 EXECUTION**32.5.1 CONSTRUCTION GENERALLY****Proprietary Systems**

Provide suspended ceilings as complete proprietary systems, each fabricated by one manufacturer and installed by a specialist installer of demonstrated capacity.

Protection

Protect existing work from damage during the installation.

Stability

Install the ceilings level and fix so that under normal conditions there is no looseness or rattling of ceiling components.

Pressurised Plenum Systems

Air distribution: Incorporate a suitable method of distributing air evenly from the plenum above the ceiling to the space below, either through the panel or through the support grid.

Rate of flow: Incorporate slotted members with sliding closers, or an equivalent means of varying the rate of flow.

Structure-borne Sound

Provide a ceiling system which does not amplify structure-borne sound. Provide suitable means of reducing contact vibrations between structure and ceiling.

32.5.2 SUPPORTS INSTALLATION**Support Members**

General: Space the support members as required by the loads on the system and the type of ceiling, and allow for the installation of services and accessories, including ductwork, light fittings and diffusers. Provide additional back support or suspension members for the fixing of such items. Do not use screw fasteners in tension.

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Services: Do not suspend from services (eg. ductwork) unless the service has been designed to accept the ceiling load. In locations where services obstruct the ceiling supports, provide bridging and suspension on each side of the services.

Suspension system

Height adjustment: Provide height adjustment by means of a length adjustment device at each suspension point, permitting length variation of at least 50 mm. Do not attach the suspension system to the lip of purlins.

Failure: Provide a ceiling system such that failure of any one suspension point does not cause a progressive failure of the ceiling.

Bracing

Provide bracing to prevent lateral movement and to resist the imposed horizontal seismic force.

Fasteners

Install fasteners so that they are not visible in the finished ceiling. Do not use screw fasteners in tension.

Bulkheads

Construct bulkheads and other similar ceiling formations as an integral part of the ceiling structure. Brace bulkheads to prevent lateral movement. Provide for seismic requirements where the ceiling is terminated at a bulkhead.

Prefinishes

Repair damaged prefinishes by recoating.

Movement joints

Provide control joints in sheet finishes as required in the *Lining* section.

Alignment: Install the ceiling with control joints to correspond in location and direction to those in the structural frame. Do not bridge any control joint in the structural frame with the ceiling.

Abutments: Install the ceiling to allow for differential movement with abutting surfaces.

32.5.3 ACCESS PANELS**Non-demountable ceilings**

General: Provide access panels supported and anchored to permit ready removal and refixing.

Opening size (mm): As shown on drawings or appropriately sized to allow access required with a minimum size of 600 x 600.

Requirement

Provide access panels in non-demountable ceilings where shown on the Drawings and as required to provide service and maintenance access to the services located in the ceiling space. This includes providing access panels whether shown on the Drawings or not. Where an access panel is required and is not shown on the Drawings, request an instruction for the exact location and size of the panel prior to installation. Access panels which are not in the instructed location shall be removed, and the ceiling made good to the approval of the Superintendent at the Contractor's cost. Support and anchor access panels by methods which permit ready removal and refixing.

Proprietary Item: Trafalgar Products APT/WW/HGE.

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Finish

Match the ceiling panels in appearance and performance.

Reinforcement

Reinforce the back of the access panel to prevent warping and facilitate handling.

32.5.4 TRIM GENERALLY**Requirement**

Provide trim at junctions with other building elements and surfaces, example: walls, beams, penetrations, and the like, consistent with the style, materials and finishes of the ceiling system generally unless otherwise specified.

Trim to plasterboard: Refer *Linings* for details.

32.5.5 SERVICE PENETRATIONS**Requirement**

Provide openings for, and fit the ceiling system up to, services elements, example: light fittings, ventilation outlets, detectors, sprinklers, and the like. Trim as specified *Linings* section.

Co-ordinate all services exposed on the suspended ceiling systems, including:

- Ensuring service outlets do not coincide.
- Ensuring all service outlets are installed in the positions shown on the Reflected Ceiling Plans and the relevant services plans. Where different positions are shown for the same service outlet, seek an instruction.
- Ensuring service outlets are located in the centre of individual ceiling tiles or panels unless shown otherwise on the Drawings.

Service Outlets

Cut-outs to ceiling tiles, panels or sheet materials for service outlets shall be neat, uniform and straight (unless curved) with all edges entirely covered with trims to match the exposed ceiling grid system in both profile, materials and colour.

Support

Provide all support brackets, fixings, anchors or other form of support for service outlets to ensure that in their installed position in the ceiling, they do not distort, deflect or cause sagging to the suspended ceiling system.

32.5.6 DIFFUSERS AND LIGHT FITTINGS**Diffusers**

Co-ordinate with the Mechanical trade or Subcontractor to supply the prefinished metal ceiling diffusers to the ceiling trade or Subcontractor and incorporate them into the ceiling.

Diffusers

Co-ordinate with the Mechanical trade or Subcontractor to supply the metal ceiling diffusers to the ceiling trade or Subcontractor, and for the latter to finish them to match the ceiling, and incorporate them into the ceiling.

Light fittings

Co-ordinate with the Electrical trade or Subcontractor to install the light fittings for the ceiling trade or Subcontractor.

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Repair, rectify and make good existing ceilings, where shown on the Drawings, as follows:

- minor repairs to defects such as dents, scoring, damage to surface linings, holes
- cutting out and replacement of any sections which are water or moisture damaged, with material to match the existing
- cornices and trim shall be continuous between corners and wall openings
- demolished light fittings, sprinklers, conduits, pipe fixings and penetrations are made good and/or infilled
- relocate or replace ceiling panels that require exposed services, such as sprinklers, to be removed from or relocated in them. Finish to match existing ceilings.
- provision of new access openings and openings for new services, inclusive of light fittings and air-conditioning and ventilation registers.

Materials:

The Superintendent shall have stored near the construction site ceiling tiles and ceiling grid components of the existing ceiling system remaining from the demolition works. The Contractor may use these, but is required to supply any additional tiles or ceiling grid components necessary to make good and extend the existing ceiling grid system to complete the works.

Completion

Towards the end of the building works, when determined by the Superintendent, and probably after the removal of the dust and security screen, the Contractor is required to return and repair, rectify and complete the ceiling system.

32.6 SCHEDULE**32.6.1 SUSPENDED PLASTERBOARD CEILING SYSTEM****Location**

Refer Drawings and *Internal Finishes and Colour Schedule*.

Supporting System

Proprietary item: Rondo suspension system as described in CSR Gyprock Bulletin Number 540.

Type: Two way concealed grid.

Basic grid: (length x breadth): Primary members at 1200 mm centres maximum centres, secondary members at 600 mm centres.

Trim: Shadowline.

Finish: Paint Finish, refer *Internal Finishes and Colour Schedule*

Ceiling Material

Type: Refer *Linings* Section for details.

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32.6.2 PLYWOOD ACOUSTIC CEILING PANELS

Location

Refer Drawings and *Internal Finishes and Colour Schedule*

System

Plywood panels fastened to existing ceiling through timber battens.

Supporting System

50 x 50 timber battens at 600 mm centres maximum or as required to suit panel layout. Edge of each panel to include continuous batten set back 50 mm from each of plywood panel. Screw fix panels through existing ceiling to existing roof structure.

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Ceiling Material

Type: A Grade Floop Pine veneered plywood, with perforations.

- Proprietary Item: Decorply by Decorvent.
- Thickness: 9 mm.

Perforations:

- Perforations: 5mm holes at centres to achieve 25 % perforation area, drilled into finished sheets.
- Perforation pattern: Square pattern.
- Width of unperforated edges to sheet at butt joints in sheets: 35 mm from edge of sheet.
- Width of unperforated edges to sheet at edge of ceiling: 70 mm from edge of sheet.

Fire Retardant: Cut panels to be treated with fire retardant to AS 1530 part 3, to meet the following Early fire hazard properties:

- Spread of Flame Index: Not more than 6.
- Smoke Developed Index: Not more than 3.

Insulation: Refer *Insulation and Barriers* section for details.

Fixings: Fix panels to support structure with exposed countersunk phillips head screws at all edges and across width of sheet of sheet at 600 mm maximum spacing. Fixings to be spaced at maximum 300 mm centres. Conceal screw fix timber battens to back of panels to support insulation refer drawings for details.

- Finish: Refer *Internal Finishes and Colour Schedule*.

Partitions

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33.1 GENERAL

33.1.1 SECTION CONTENT

General

The Works include, but are not limited to proprietary or composite partition systems and ceiling bulkheads including, where applicable, frames, glazed and solid panels, linings, doors and other openings, accessories, minor work and trim necessary to complete the system and meet the specified performance.

33.1.2 CROSS REFERENCES

General

Refer to the *General Requirement* section.

Related sections

Refer to the following sections:

- *Insulation and Barriers*: For acoustic insulation.
- *Glazing*: For glazing to partitions.
- *Aluminium Windows and Doors*: For glazed internal partitions including aluminium framing.
- *Linings*: For internal dry linings including gypsum plasterboard.
- *Adhesives, Sealants and Fasteners*: For these items generally.
- *Metals and Prefinishes*: For these items generally.

33.1.3 INTERPRETATION

Definitions

Partition: Refers to both internal and external stud framed walls.

Partition system: The complete assembly of components comprising the partition, including frame if any, glazed and solid panels, linings, doors and other openings, and the accessories, minor work and trim necessary to complete the system and meet the specified performance.

33.1.4 PERFORMANCE

Strength and stability

Provide partitions which, under normal conditions of use (including the slamming of doors), remain stable and do not show signs of deflection, permanent deformation, or rattling.

33.2 QUALITY

33.2.1 INSPECTION

Witness points

Item	Inspection Type	Notice	References
Framing before installation of lining.	Witness point	3 days	

33.3 MATERIALS AND COMPONENTS

33.3.1 MATERIALS AND COMPONENTS

Coated steel

Coating class: Z200.

Mild steel panel facings and trim: A factory-applied high performance pigmented organic coating of minimum thickness 40 µm.

Aluminium

Framing members: Alloy 5005.

Metal fittings and hardware

Stainless steel surfaces: Satin self-finish.

Bright finished copper alloy surfaces: Clear lacquer.

Other surfaces: Chromium plate.

Recoating

Provide prefinishes, which do not require site recoating either before or after installation.

Fire hazard

General: Do not provide materials which, when subject to fire conditions, will emit excessive smoke or dangerous fumes.

Linings

Plasterboard: Refer *Linings* Section.

Glazed Panels

Framing: Refer *Aluminium Windows and Doors* section.

Glazing: Refer *Glazing* section.

Insulation

Refer: *Insulation and Barriers* Section.

33.4 EXECUTION

33.4.1 CONSTRUCTION GENERALLY

Preparation and protection

Preparation: Prepare the base to receive the partitions. If fixing partitions on carpet, fix bottom track over polyethylene film.

Protection: Protect existing work from damage during the installation and make good any damage. Provide temporary coverings if necessary.

Set out

General: Set out the partitions so that the partition grid, as expressed in panel joints and centrelines of frame members, coincides with the ceiling grid and the building grid, as applicable.

Misalignment (of adjoining surfaces at grid junctions): 1 mm maximum.

Deviation (from true grid lines and planes): 1:1000 up to 3 mm maximum.

Panel thickness: +1 mm maximum.

Installation

General: Install the partitions plumb, level, on their correct alignments, and firmly fixed.

Building movements: Provide clearances or movement joints so that partitions are not damaged by structural building movements such as long term slab deflection. Where fire resistance or acoustic properties are specified provide a resilient foam or mastic seal having properties equal to those required for the partition.

Incidental Work

Return linings into reveals, heads, sills, recesses, niches, and the like. Finish faces, ends, soffits and the like.

Fixing

Generally: Conceal fixings. Fastenings, including anchors, lugs, screws, rivets, and the like, shall be of an approved type, appropriate to the work, capable of transmitting the loads and stresses imposed, and sufficient to ensure the rigidity of the assembly.

Fastenings for Metal: Refer *Adhesives, Sealants and Fasteners* section.

Fixing to masonry: Provide expansion type masonry anchors. Do not provide explosive-driven fastenings.

Fixing to suspended ceilings: Provide adequate top support to the partition without damage to the ceiling components.

Exposed joints

Hairline: Edges sharp, square and in continuous contact.

Shadow line: Edges levelled, chamfered or splayed to 1 mm maximum radius, and in continuous contact.

Fully demountable partitions

Height adjustment: Provide a suitable height adjustment device in fully demountable systems, designed to minimise the permanent marking of building surfaces, and to permit height adjustment of the partition whilst remaining in contact with the floor.

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Acoustic installations

General: Preserve the sound reduction properties of R_w rated partitions by sealing flanking sound transmission paths during installation, including junctions between partitions and other building surfaces, air gaps around doorsets, recesses, such as pellets and blind boxes and cut-outs for services. Avoid cut-outs next to or back-to-back with each other.

Sealing methods: Use appropriate sealing methods, such as purpose-made solid profiled inserts, durable resilient gaskets or closed cell foam strips. Provide solid resilient materials in preference to foamed materials whenever possible.

Identification: Mark panels with a stamped or engraved code mark or equivalent means of identification, placed in an inconspicuous but accessible position.

33.4.2 METAL FRAMES**Type**

Proprietary non-load-bearing partition wall framing system comprising cold formed steel or extruded aluminium members, or both.

Additional support

Provide additional support in the form of noggings, trimmers and studs for fixing hardware, fixtures and fittings. Box studs to frame door openings, and provide additional top support independent of the ceiling, where the studs are fixed to the underside of an exposed grid ceiling.

Control joints

Provide for control joints in sheet finishes where required by the structural frame or the *Lining* section.

Erection

Fix bottom plates at 600 mm maximum centres generally, and 100 mm maximum from ends. Provide adequate top support by fixing the top plate to the ceiling structure or slab soffit, or stabilise the partition by lapping and fastening intersecting or butting plates together. Fix studs to the bottom plates at door frames, corners and intersections with self-tapping screws, not with pop rivets or crimping.

Stud spacing

Space the studs as required by the lining, but in any case at 600 mm maximum centres. Multiple studs shall be used at all points and concentrated load, door openings and where shown on drawings.

Bracing

Independently brace the partition if sufficient bracing is not provided by the building structure.

Nogging

Provide nogging channels as required to support or fix the linings, and in any case at not more than 1200 mm maximum centres.

Splicing

Splice plates at ends to maintain continuity and alignment.

Fastening

Assemble the frames at door openings with self-drilling self-tapping screws or with blind rivets.

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Additional Support

Provide additional support in the form of noggings, trimmers and studs for fixing hardware, fixtures, fittings and the like, and the support of handbasins, grabrails, access panels, and the like, in accordance with the stud framing and wall lining manufacturer's recommendations.

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Service holes

For services within the partition provide either factory precut flared holes, or site cut holes punched or drilled on the centre line of the member. Provide proprietary plastic bushes or grommets to site cut holes. Where service holes cut on site exceed $D/3$ provide additional strengthening to the member. D is the depth of the member.

33.4.3 SERVICES RETICULATION**General**

Conceal reticulation of associated building services, either within cavities in the partition structure, or within ducted skirtings supplied as part of the partition system, or both.

Access

Provide removable or demountable components of the partition system, for access to services concealed within partition cavities.

Services Penetration

Where sheet linings extend to the underside of the concrete slab over, provide openings for service pipes, ducts, conduits and other installations. Seal linings to all sides of each service penetrating the lining providing an air-tight junction on each side of the wall.

37.4.4 PARTITION SYSTEMS**Partition Type 1**

Location: Refer Drawings, nominated as P1.

Description: 1 x 13 mm plasterboard to habitable space side of partition and insulation / 92 mm steel stud / Internal wall membrane, refer *Insulation and Barriers* section for details.

Height: from structural slab level to underside of slab over.

Acoustic sealing: Required, refer *Acoustic installations*.

Wall to SL135 acts as separating habitable spaces from an air plenum. The partitions shall be sealed to achieve the following criteria:

- Pressure Class: Class A low pressure.
- Air leakage limit: $0.027 \times \Delta p^{0.65}$ (where Δp is the differential, pressure in pascals).

Insulation: Refer to *Insulation and Barriers*.

Finish: Paint Finish, refer *Interior Finishes and Colour Schedule*.

P2 - Partition Type 2

Location: Refer Drawings, nominated as P2.

Description: 1 x 13 mm plasterboard / 76 mm steel stud / 1 x 13 mm plasterboard.

Include studs at 450 mm centres and timber noggings to P2 partition between SL115 and SL128.

Height: from finished floor level to underside of beam and/or ceiling over, unless noted otherwise on drawings.

Finish: Paint Finish refer *Interior Finishes and Colour Schedule*.

Partition Type 3

Location: Refer Drawings, nominated as P3.

Description: 2 x 16 mm plasterboard / 92 mm staggered steel studs staggered at 450 centres with insulation / 2 x 16 mm plasterboard.

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Provide additional studs and timber noggings as required to fix handrails to wall.

Height: from structural slab level to underside of slab over, co-ordinate cut outs for air conditioning ductwork and plenum.

Acoustic sealing: required, refer *Acoustic installations*.

Insulation: 100 thick insulation, refer to *Insulation and Barriers*.

Finish: Paint Finish refer *Interior Finishes and Colour Schedule*.

Partition Type 4

Location: Refer Drawings, nominated as P4.

Description: 2 x 16 mm plasterboard to habitable space side of partition / 92 mm steel stud with insulation / 1 x 13 mm plasterboard.

Height: from finished floor level to underside of slab over.

Insulation: 100 mm thick insulation, refer to *Insulation and Barriers*.

Finish: Paint Finish refer *Interior Finishes and Colour Schedule*.

Partition Type 5

Location: Refer Drawings, nominated as P5.

Description: 13 mm plasterboard / 76 mm steel stud / 1 x 13 mm plasterboard.

Height: from finished floor level to underside of slab over.

Ceiling Space is being used as air conditioning plenum.

Finish: Paint Finish refer *Interior Finishes and Colour Schedule*.

Partition Type 6

Location: Refer Drawings, nominated as P6.

Description: 13 mm plasterboard / 76 mm steel stud with insulation / 1 x 13 mm plasterboard.

Height: from finished floor level to ceiling over.

Acoustic sealing: required, refer *Acoustic installations*.

Insulation: Refer to *Insulation and Barriers*.

Finish: Paint Finish refer *Interior Finishes and Colour Schedule*.

Partition Type 7

Location: Refer Drawings, nominated as P7.

Description: 2 sheets of 13 mm plasterboard / 92 mm steel stud with insulation / 1 x 13 mm plasterboard.

Height: from finished floor level to ceiling over.

Acoustic sealing: required, refer *Acoustic installations*.

Insulation: Refer to *Insulation and Barriers*.

Finish: Paint Finish refer *Interior Finishes and Colour Schedule*.

Partition Type 8

Location: Refer Drawings, nominated as P8.

Description: 13 mm plasterboard / 76 mm steel stud with insulation.

Height: from finished floor level to ceiling over.

Finish: Paint Finish refer *Interior Finishes and Colour Schedule*.

Partition Type 9

Location: Refer Drawings, nominated as P9.

Description: 13 mm plasterboard / with steel stud to create wall width to match existing wall or upturn/ 13 mm plasterboard.

Height: from finished floor level to ceiling over or as nominated on drawings.

Finish: Paint Finish refer *Interior Finishes and Colour Schedule*.

Operable Walls

34

VILLAGE PARK REDEVELOPMENT MONA VALE

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34.1 GENERAL**34.1.1 SECTION CONTENT****General**

The Works include, but are not limited to proprietary operable wall systems including, where applicable, frames, solid panels, linings, doors and other openings, accessories, minor work and trim necessary to complete the system and meet the specified performance.

34.1.2 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS/NZS 1276.1 1999 Airborne sound insulation

34.1.3 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Adhesives, Sealants and Fasteners*: For these items generally.
- *Metals and Prefinishes*: For these items generally.

34.2 QUALITY**34.2.1 INSPECTION****Witness points**

Item	Inspection Type	Notice	References
Overhead tracks installed before dividers hung	Witness point	3 days	

34.2.2 TESTS**34.2.3 SUBMISSIONS****Weighted sound reduction index**

Submit certification for operable room dividers required to have a particular weighted sound reduction index (R_w) rating, to AS/NZS 1276.1.

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Subcontractors

Submit names and contact details of proposed suppliers and installers.

Shop drawings

Submit shop drawings showing details of each assembly, component, connection, and information relevant to fabrication, surface treatment and installation.

34.3 COMPONENTS**34.3.1 OPERABLE ROOM DIVIDERS****General**

Type: Proprietary system comprising an overhead track and carriages supporting doors or panels which are linked, or can be linked, to provide a complete partition-type enclosure within defined limits, and which may be opened by sliding and stacking to the side or sides of the opening, inclusive of the manufacturer's standard operating gear, hardware, and accessories necessary for satisfactory performance.

Edge strips: Provide solid timber edge strips to the stiles of timber veneered room dividers.

- Thickness: 6 mm, minimum.

34.3.2 OPERABLE WALLS**Divider type**

Operable walls: Partition panels independently suspended and stackable, with provision for linking together at the vertical edges and for preventing lateral movement at the bottom when closed.

Operable walls schedule

Location:	Multi purpose room SL113
Proprietary System:	Hufcor Slimline 5000 series Operable Wall
Stacking arrangement	Side stacking
Track type:	Multi direction track
Panels:	
- Panel facings:	MDF with nominated finish, refer <i>Applicable Internal Finishes Schedule</i>
- Frame finish:	Powdercoated
Dimensions:	
- overall wall width:	Refer drawings
- panel width:	Equal panels with maximum width of 1200 mm
- panel height:	2700 mm
Closures and Jambs:	
- Jamb seals:	Bulb seal

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- Head and threshold seals: Hufcor type 2 seal

Weighted sound reduction index AS/NZS 1276.1 45 D_w
36 D_x

34.4 COMPLETION

34.4.1 COMPLETION

Maintenance manual

Submit manufacturers published recommendations for service use.

Cleaning

Temporary coating: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

Access Floors

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Tender Number T01/3



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VILLAGE PARK REDEVELOPMENT MONA VALE

35.1 GENERAL**35.1.1 SECTION CONTENT****General**

The works include, but are not limited to the supply and installation of access floor system, including all necessary supports, fixings, cut outs, and accessories to complete the system.

35.1.2 CROSS REFERENCES**General**

Refer to the General requirements section.

Related sections

Refer to the following sections:

- *Mechanical Specification* for under floor plenum ducts.
- *Carpets*: For finishes over access floor.
- *Resilient Finishes*: For Finishes over access floor.
- *Adhesives, sealants and fasteners*: For these items generally.
- *Metals and Prefinishes*: For these items generally

35.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS/NZS 1530.3	1999	Simultaneous determination of ignitability, flame propagation, heat release and smoke release
AS 4154	1993	General access floors (elevated floors)

35.1.4 STANDARDS**General**

Access floors: To AS 4154.

35.1.5 PERFORMANCE**Use**

Area function: Library with shelving stacks up to 1600 mm high and general office space.

Intended use of system:

- An air supply plenum; and
- A readily accessible underfloor space suitable for running electrical, communications services and the like

Surface Finish

The access floor shall have a bare panel surface finish ready to accept on site floor covering supplied by others..

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Stability

General: Provide a completed floor system which is rigid, free from vibration, creep, squeaking, and the like, which has a smooth and uniform finished surface, and which will maintain these conditions when sufficient panels have been removed for normal access.

Air tightness of air plenums

General: Provide an edge to edge fit of the panels which is air tight within the following limits:

Pressure Class: Class A low pressure.

Air leakage limit: $0.027 \times \Delta^{0.66}$ (where Δ is the differential, pressure in pascals).

Tolerances

Floor height: maximum variation of level of 3 mm over the entire space.

Horizontal dimensions: maximum deviation from true floor grid: 3 mm.

Panel size:

- size and squareness ± 0.25 mm.
- Flatness across diagonal of panel ± 0.5 mm.

Panels will accurately cut to fit around all permanent features: max gap of 2 mm.

Fire rating

All panels are to provide zero fire hazard indices. Under AS1530 for Ignitability, Spread of Flame, Heat Evolved and Smoke developed indexes.

Structural loading

The access floor will be medium grade, with a safety factor of three times the concentrated (design) load, and is capable of meeting medium static and dynamic loads under AS4154.

35.2 QUALITY**35.2.1 INSPECTION****Witness points**

Item	Inspection Type	Notice	References
Sealing of sub grade under access	Witness point	3 days	
Subfloor services installed before access floor installation.	Witness point	3 days	
Floor panels placed before surface covering, if not integral.	Witness point	3 days	

VILLAGE PARK REDEVELOPMENT MONA VALE**35.2.2 SUBMISSIONS****Shop drawings**

Submit shop drawings showing the relevant details of the access floor system including the following where applicable:

- Floor plan layout showing grid modules, interruptions to grid, location of stringers, panels requiring drilling or cut-out for services, location of non-standard panels (if any), grilles, registers, and perforated panels.
- Stringer section showing material and dimensions.
- Panel section showing construction, materials, dimensions and finishes.
- Pedestals showing material, dimensions, limit of vertical adjustment, method of locking, methods of attachment to floor and to stringers or panels.
- Edge details and junctions with adjoining work.

Materials and components

Manufacturer's data: Submit manufacturer's published product data including diagrams and illustrations.

35.3 COMPONENTS**35.3.1 SYSTEM GENERALLY****Description**

Proprietary medium grade access floor system, with stringerless underfloor under structure and metal clad concrete composite panels locked into position at each support.

Proprietary System: Tasman Access Floors Tascor Unifix Medium grade system with the following main components and including edge supports fixings accessories and the like to complete the system:

Panel Type: Tascor TC750U Unifix panel

Under structure: Tascor TC100 Unifix under structure

35.3.2 UNDERSTRUCTRE SYSTEM**Description**

Material: Steel.

Finish: galvanised

Head to panel connection: Proprietary cast aluminium head assembly

Floor fixing: Adhesive fixed to substrate.

Pedestals shall be provided with means of levelling and locking the assembly at a selected height, which requires a deliberate action to change the height setting, and which prevents vibration displacement.

Each pedestal field head shall be designed to receive a single locking screw to secure four adjacent panels so that the entire structural system is fully engaged as a structural membrane.

VILLAGE PARK REDEVELOPMENT MONA VALE**Adjustable floors**

Requirement: The assembly shall be fabricated with sufficient height to provide the required underfloor clearance.

Vertical adjustment shall be accomplished over a range of not less than plus or minus 25 mm without requiring the rotation of the pedestal head.

Height: 350 mm clearance is required under panels from structural floor level.

Fire rating

Non-combustible, made using materials with melting point $\geq 350^{\circ}\text{C}$.

Location

Under every corner of every panel.

35.3.3 PANELS**Description**

Form: Welded steel panels, with a flat full hard steel top and a die formed bottom pan with a corrosion resistant protection.

Core: Foamed lightweight concrete composite.

Finish: Proprietary epoxy paint finish

Dimensions

Coordinating size: 600 x 600 mm.

Overall thickness (mm): 32

Maximum weight: 18 kg.

Cut outs

General: Provide cut outs for cable access and air grilles as necessary as located on drawings.

Edge cut outs: Provide stringer or pedestal, or both, support.

Omitted panels: Permanently omitted panels are not permitted.

Labelling

Non-standard panels: Identify for relocation purposes.

Service identification labels: Provide self-adhesive labels identifying services and their direction. Fix to the visible surface of the floor panel, and under carpet finish if any.

35.3.4 ACCESSORIES**Lifting devices**

General: Required.

Marking: If panels must not be lifted from the side, mark lifting devices "Lift panel vertically at centre".

VILLAGE PARK REDEVELOPMENT MONA VALE**35.5 EXECUTION****35.5.1 INSTALLATION****Protection**

Provide temporary protection from surface damage and concentrated loads, during installation of access floor and of items which it supports.

Site cutting

Provide edge trim to site cut panels.

Substrate Sealing

Prior to installation of electrical cables, pipework and ductwork seal substrate with proprietary concrete sealer.

Proprietary item: Tasman Floors Taseal.

Substrate preparation

Do not proceed with installation until the sub floor surface is clean, dry, and ready to receive the access flooring.

Installation

Installation shall be carried out by installer authorised by Manufacturer and in accordance with manufacturer's installation instructions.

Provide all necessary supports for cut tiles to achieve integrity of system. Edge panels shall not rely on lateral stability from adjacent structures.

Cut edges of panels shall be sealed.

Adjust and Clean

Remove access floor installation debris as works progresses, maintaining the area under finished panels in a clean condition.

35.6 COMPLETION**35.6.1 COMPLETION****Maintenance manual**

General: On completion, submit bound recommendations for the care and maintenance of the access floor, and operating instructions for panel removal and height adjustment.

Contents: Include the following information:

- Limitation on maximum and minimum height of floor, cross-bracings, stringers or additional pedestal fixings required above a particular height.
- Limitation on Adjustability.
- Installed mass of system per square metre.
- Maximum number and positions of panels that may be temporarily removed during servicing without endangering safety of floor system.
- Method of cleaning of floor covering with particular reference to adhesives and panel substrate, wet mopping, and use of waxes and floor polishes.

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- Equipotential bonding method.

Spares

General: Supply pedestals, stringers and uncut floor panels (including finishes) of each type at a rate of 2% of total installation.

Making good

Corrosion: Replace corroded elements.

Cleaning

General: Clean access floor thoroughly, before delivery of items which it supports.

Air plenum: Vacuum underfloor area so it is free of dust, metal filings and the like.



Plastering

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VILLAGE PARK REDEVELOPMENT MONA VALE

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36.1 GENERAL

36.1.1 CROSS REFERENCES

General

The works include, but are not limited to the application of mortar like materials based on cement, lime or gypsum, to both internal and external surfaces, and gypsum based sheet linings including fibrous plaster, plasterboard, glass fibre plasterboard.

Related sections

Refer to the following sections:

- *Internal Finishes and Colour Schedule:* For cement render locations.

36.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1672.1	1997	Limes for Building
AS 2592	1983	Gypsum plaster for building purposes
AS 3972	1997	Portland and blended cements
AS CA27	1959	Code of recommended practice for internal plastering on solid backgrounds

36.1.3 INTERPRETATION

Definitions

The terms "plaster" and "plastering" include the terms "render" and "rendering", except where the context otherwise requires.

Background: the building element to which the material is to be applied. Includes "substrate".

Lining: the application and finishing of sheet lining products.

36.1.4 STANDARD

General

Plastering: To AS CA27.

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36.2 QUALITY**36.2.1 INSPECTION****Schedule of Inspections**

Item	Inspection Type	Notice	References
Background immediately before plastering.	Witness point	3 days	
Each completed coat before the application of subsequent coats.	Witness point	3 days	

36.2.2 SAMPLES**Sample panels**

Prepare in agreed positions, sample panels of sufficient area of each of the plaster and render finishes scheduled including samples of the junction details and trim.

Size: 2 square metres.

36.2.3 EXTENT

Hidden surfaces: Insides of cupboards are included, where applicable, in the plaster finish shown or specified to any area.

Incidental work: Return plastering into reveals, heads, sills, recesses, niches, and the like. Plaster faces, ends, and soffits of projections in the background, such as string courses, sills, pilasters, corbels and the like. Run throating on soffits of external projections neatly finished. Trim around openings.

Existing surfaces: Some of the existing walls and columns have an existing rendered surface. Where this matches the proposed finish it may be retained with approval and any new render that adjoins shall be married with it to match.

36.3 MATERIALS AND COMPONENTS**36.3.1 MATERIALS AND COMPONENTS****Plaster materials**

Cement type to AS 3972: GP.

Off-white cement: Iron salts content $\leq 2.5\%$.

Lime: To AS 1672.1.

Sand: To AS CA27, graded to Table 1 of the Appendix.

Gypsum plaster: To AS 2592.

Admixtures: Do not provide.

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Metal lath

Galvanised sheet steel expanded to a mesh by slitting and stretching: Coating class Z275 (minimum).

Self-furring type: Metal lath with staggered indentations, which hold the body of the sheet 10 mm clear of the substrate.

Base metal thickness (mm): 0.42 mm.

36.4 EXECUTION**36.4.1 SUBSTRATE****Correction of substrate**

Before plastering make good any defects in the substrate. Hack off excessive projections. Fill voids and hollows with a mix not stronger than the substrate nor weaker than the first coat.

Untrue substrate

One coat work: If the substrate is not sufficiently true to comply with the thickness limits for one coat, or has excessively uneven suction resulting from variations in the composition of the substrate, carry out the work in two coats.

Cleaning

Remove deleterious and loose material and leave the surface clean and dust free.

Embedded items

Ensure that water pipes and other embedded items are sheathed to permit thermal movement. If ungalvanised steel items are to be embedded in gypsum plaster, provide rust protection treatment not inferior to prime painting with zinc rich primer.

Chases

If chases or recesses are more than 50 mm wide, cover with metal lath extending at least 75 mm beyond each side of the recess.

Suction

Control suction by dampening if necessary. Avoid over-wetting.

Dense concrete

If not sufficiently rough to provide a mechanical key, roughen by scabbling or the like to remove 3 mm of the surface and expose the aggregate; then dash coat. If scabbling and dash coating does not provide a good key for external render, cover with a non-corrosive expanded metal lath.

Brickwork

If not rough-jointed, rake out joints 5 mm deep. If raking out is impracticable, hack at close intervals to roughen the surface, or cover with expanded metal lath.

Concrete blockwork

Apply a dash coat or a proprietary bonding agent.

Previously painted surfaces

Remove paint, hack at close intervals, or cover with expanded metal lath.

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Dash coat

Application: Mix to the consistency of a thick slurry and forcibly dash on to the background to give a roughcast coating 3 - 5 mm thick.

Curing: Allow the dash coat to harden in damp conditions and protect it from drying out before applying the next coat.

Fixing metal lath

Generally: Provide the necessary accessories. Run the long way of the mesh across supports. In vertical applications slope the strands inwards and downwards away from the background face. Lap ends at least 20 mm and sides at least 10 mm. Tie laps with 1.25 mm galvanised wire every 150 mm. Do not finish edges of sheets at corners but bend around.

Fixing: Fix lath to the background at edges and at supports with fixings of appropriate type spaced at 150 mm maximum centres. Place fixings in the mesh corners so that the heads cover two strands.

Fixing to masonry: Use non-corrosive masonry anchors, or masonry or concrete nails. Do not provide explosive powered fastenings.

36.4.2 PLASTERING**Thickness limits**

One coat work: 12 - 15 mm.

Multi-coat work:

- First coat: 9-15 mm.
- Floating coat (if any): 6-9 mm.
- Finishing coat (except setting coats): 6-9 mm.
- Setting coat: 2-3 mm.

Tolerances

Finish plane surfaces within a tolerance of 6 mm in 3 m, determined by a 3 m straight edge placed anywhere in any direction. Finish corners, angles, edges, and curved surfaces within equivalent tolerances.

Proportioning

Apply successive coats no stronger (ie. no richer in cement) than the substrate or undercoat to which they are applied.

Hidden surfaces

Insides of cupboards, if any, are included in the plaster finish required to any area.

Incidental work

Return plastering into reveals, beads, sills, recesses and niches. Plaster faces, ends, and soffits of projections in the substrate, such as string courses, sills, pilasters and corbels. Run throating on soffits of external projections neatly finished. Trim around openings.

Joining up

If joining up is unavoidable in a large area of work, make joints invisible in the finished work.

Keying

General: Press plaster through the apertures of metal lath, and wings of casing beads.

Keying undercoats: In multi coat work, scratch comb each undercoat in two directions when it has stiffened.

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Surface finishes

Wood Float: Provide an even texture by wood floating the finishing coat.

Fine sand textured finish: Provide an even surface by wood float and finish with a plastic foam float to a fine sand textured finish.

Steel trowel: Provide a smooth dense surface free from texture and free from shrinkage cracks, but not glass-like.

Curing

Cement-based work: Prevent rapid or uneven drying out.

Gypsum-based work: Keep dry after work has set.

White-set plaster

General: Provide 3:1 gypsum plaster:lime putty, applied as a skim coat direct to the substrate.

Thickness: Maximum 4 mm.

Cement render

Proportions (cement:lime:sand):

- Clay brick, concrete: 4:1:16.
- Concrete block: 1:0:6.
- Calcium silicate brick: 3:2:16.

Plastering schedule

Plaster type	Surface Finish	Location
Cement render	Wood float	Walls to be tiled
Cement render	Fine sand textured finish	Walls to be painted unless noted otherwise
White Set plaster	Steel trowelled	Soffits of slabs where scheduled

Location

For locations refer appropriate *Internal Finishes Schedule* for details.

36.4.3 JOINTS**Movement joints**

General: Provide movement joints in the finish which coincide with movement joints in the substrate. Ensure that the substrate joint is filled with the specified jointing material, and is not bridged during plastering.

Plastering on metal lath: Provide movement joints to divide the plastering area into rectangular panels not exceeding 10 m².

Depth: Extend the joint right through the plaster to the substrate.

Width: 3 mm, or the same width as the substrate joint, whichever is greater.

Joint filling (joints more than 3 mm wide): Fill with a resilient sealant.

Saw cut joints

Provide saw cut joints, cut right through the plaster to the substrate, at the following locations:

- Junctions between different substrate materials.

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- Abutments with other finishes.
- Abutments with metal door frames.
- Expansion Joints.

The saw cut shall be straight and true and cut right through the plaster to the background exactly on the line of the junction.

36.4.4 TRIM**Terminations**

Re-entrant corners: Finish square.

Salient angles: Finish up to a 1.6 mm radius corner bead.

Edge trim: Provide the necessary corner beads, casing beads and stop beads.

- Material: Purpose-made zinc coated steel sections.
- Fixing: Nail to structure at 300 mm centres. Wire to metal lath.

Proprietary items: Rondo building board and rendered plaster sections as follows:

- Rendered external corners: Rondo R03 or R04 external corner bead.
- Render stop junctions: Rondo R11 or R12 stopping bead
- Render expansion and control joints: Rondo R45 Rendered Plaster Expansion Joint

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Plastering

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VILLAGE PARK REDEVELOPMENT MONA VALE

37.1 GENERAL**37.1.1 SECTION CONTENT****General**

The Works include, but are not limited to terrazzo precast units, substrate preparation and installation.

37.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Adhesives, Sealants and Fasteners*: For these items generally.
- *Internal Finishes and Colour Schedule*: For locations and types.

37.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 2758.1	1998	Concrete aggregates
AS 3600	2001	Concrete structures
AS 3972	1997	Portland and blended cements
BS 1014	1975	Specification for pigments for Portland cement and Portland cement products

37.1.4 INTERPRETATION**General**

Substrate: The actual surface to which the terrazzo is to be bedded or attached.

37.2 QUALITY**37.2.1 INSPECTION****Schedule of Inspections**

Item	Inspection Type	Notice	References
Samples	Hold point	3 days	
Completion of substrate preparation.	Witness point	3 days	

VILLAGE PARK REDEVELOPMENT MONA VALE**37.2.2 SAMPLES****General**

Submit samples of the following:

- Terrazzo: Two sample panels, each at least 300 mm x 300 mm, of every type of surface colour, pattern and finish specified, showing the extremes of the range.

37.3 MATERIALS**37.3.1 MATERIALS****Water**

Free from matter harmful to terrazzo or to items embedded in it or in contact with it.

Cement

Type to AS 3972: GP.

Colour: Grey or white, or a blend of grey and white, as required by the surface colour.

Aggregates

Standard: To AS 2758.1.

Sand: Fine aggregate.

Coarse aggregate (in underbeds and cores): Dense natural rock aggregate.

Facing aggregate: Dense natural rock aggregate.

- Characteristics: Natural stone, angular in shape, as distinct from elongated or flaky, graded within the required sizes, free from dust, and free from deleterious material.
- Stone type: Marble.

Pigments

Standard: To BS 1014.

General: Resistant to lime bloom and efflorescence.

Pigment proportion: $\leq 5\%$ by weight of cement.

Reinforcement

Standard: To AS 3600.

Protective coating: Galvanised.

Reinforcement supports: Purpose-made concrete or plastic reinforcement supports, for supports which will be visible on the surface of the terrazzo in its final position.

37.4 EXECUTION**37.4.1 SUBSTRATE PREPARATION****Cleaning**

Remove deleterious materials which could adversely affect adhesion. Leave the surface dust-free and clean. If removal is not possible, render harmless using remedial treatment.

VILLAGE PARK REDEVELOPMENT MONA VALE**Substrates for adhesives**

Ensure that substrates which will receive adhesives are dry, with a moisture content below 6%. Cure concrete substrates before application.

Preparation for bonding

General: Prepare the substrate either by roughening the surface after screeding, or by removing the hardened surface to a depth of at least 2 mm. Expose the aggregate and leaving a clean, firm granular surface for the permanent adhesion of the finish.

Non-horizontal substrates: To vertical or steeply sloping surfaces or soffits, securely fix a non-corrosive steel mesh to the substrate.

37.4.2 FALLS AND LEVELS**Finished levels**

Maintain finished floor levels without step or break at changes of floor finish including carpet.

Tolerance

Deviation of the finished floor from its true form: Maximum 1:300.

37.4.3 PROTECTION**Generally**

Protect finished work from damage during building operations.

37.4.4 LAYING**Underbed Composition**

Shall consist of one part Portland cement and 4-5 parts clean sharp sand. Mix with sufficient water to produce workability. Generally, the bed shall be 13 mm thick.

Laying

Lay true to line and level, arrangement as shown on the drawings.

Joint Filling

Grout joints with cement grout to match the matrix of the units, thoroughly work in to fill all joints between units. Care must be taken to ensure that dirt and rubbish does not enter the joint prior to and throughout the operation.

37.4.5 FINISHING**Requirement**

Final machine rubbing shall not take place sooner than three days following the laying operation. All joint filing and grouting shall be removed by means of floor machines using No. 80 or finer gritstones. On completion of the final rubbing the terrazzo finish shall show an average of not less than 70-75% of marble chips.

37.4.6 PROTECTION**Generally**

Protect finished work from damage during building operations. Provide temporary coverings if necessary.

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Replacement

Replace defective or damaged work.

37.5 TERRAZZO

37.5.1 PRECAST UNITS**Type**

Terrazzo units, precast cured and finished under factory conditions.

Composition

Carry the facing mix right through, unless precast units consist of a facing or facings bonded to a core of different material, and the minimum facing thickness is maintained.

Facing

Mix proportions, by weight: 4:9 cement:facing aggregate.

Water:cement ratio: 18 L:40 kg water:cement.

Minimum thickness: 13 mm, or gauge of coarsest aggregate plus 3 mm, whichever is the greater.

Core materials

Cement, sand, coarse aggregate.

Fabrication

Cast the units in suitable moulds and compact. Fully bond the facing to the core by placing the second mix immediately after the first. Where units are designed for bedding, suitably key the bedding surface.

Finishing

Finish free edges to 3 mm radius.

Handling

Handle the units so as not to cause damage such as cracking, or deflections exceeding the specified limits. Do not subject units to handling stresses until they have attained their 28 day compressive strength, except that grinding of units may commence upon the attainment of half this strength.

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Tiling 38

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VILLAGE PARK REDEVELOPMENT MONA VALE

38.1 GENERAL**38.1.1 SECTION CONTENT****General**

The Works include, but are not limited to wall and floor tiling, accessories, fittings, substrate preparation, underbeds, joints and junctions.

38.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Internal Finishes and Colour Schedule*: For tile selections.
- *Adhesives Sealants and Fasteners*: For sealants generally.

38.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1672.1	1997	Limes for building
AS 2358	1990	Adhesives - For fixing ceramic tiles
AS 3958.1	1991	Guide to the installation of ceramic tiles
AS 3972	1997	Portland and blended cements
BS 6431	(Various)	Ceramic floor and wall tiles

38.1.4 INTERPRETATION**Definitions**

Substrate: The building element to which the tiles are to be bedded.

Underlay: An intermediate layer (e.g. render, screed or sheeting) applied to the substrate to provide a suitable surface for tile bedding.

Separation layer: A membrane laid on the substrate beneath the bedded finish to prevent the two elements from adhering to each other.

38.1.5 ORDERING**Requirement**

Order tiles in time to avoid delay to the construction program. Allow sufficient time for importation of tiles required to be ordered from overseas.

VILLAGE PARK REDEVELOPMENT MONA VALE

38.2 QUALITY

38.2.1 INSPECTION

Witness points

Item	Inspection Type	Notice	References
Sample Panel	Hold Point	3 days	<i>Sample panels</i>
Substrate immediately before tiling	Witness point	3 days	
Initial and trial setouts.	Witness point	3 days	
Control joints before sealing and grouting.	Witness point	3 days	
Completion of tiling.	Witness point	3 days	

38.2.2 SAMPLES

General

General: Submit labelled samples of tiles, including fittings, accessories, grout and sealants, illustrating the range of variation in colour and finish.

38.2.3 SAMPLE PANELS

General

Prepare sample panels of each type of finish. Include samples of junction details and trim. Preserve each approved panel until related work is complete.

Size: At least 2 m².

38.2.4 TRIAL SET-OUT

Trial setout: On horizontal surfaces make a trial setout for each area.

38.2.5 SUBMISSIONS

Execution

Grouting: Submit proposals for grouting methods and materials.

Margins: If it appears that minor variations in joint widths or overall dimensions will avoid cut tiles, submit a proposal.

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38.3 MATERIALS AND COMPONENTS**38.3.1 TILES AND ACCESSORIES****Ceramic tiles**

Standard: To BS 6431 for tolerance limits on dimensions, surface quality, physical and chemical properties relevant to the product type.

Tiles shall be even and regular in size, true to plane, free of warps, cracks, crazing, discolourations or defects and shall have undamaged arises.

Exposed edges

In positions where the edge is exposed provide purpose-made border tiles with the exposed edge (whether round, square or cushion) glazed to match the tile face. If such tiles are not available, mitre tiles on external corners.

Coves, nosings and skirtings

Provide matching stop ends and internal and external angle tiles moulded for that purpose.

38.3.2 ADHESIVES**General**

Standard: To AS 2358.

PVA (Polyvinyl Acetate) based adhesives: Do not provide in wet areas or externally.

Application: Mix and apply strictly in accordance with manufacturer's recommendations.

Type

Generally: Provide adhesives compatible with the materials and surfaces to be adhered, and in accordance with the adhesives manufacturer's recommendations for the conditions of use.

Prohibited uses: Do not provide the following combinations:

- Cement-based adhesives on wood, metal, painted or glazed surfaces, gypsum-based plaster.
- Organic solvent-based adhesives on painted surfaces.
- Organic PVC-based adhesives and organic natural rubber latex adhesives in damp or wet conditions.

Adhesives schedule

Adhesive Type	Location
Cement-based wall and floor tile adhesive equal to Australian Building Adhesives Abaflex	Wet area wall tiling generally
Multipurpose cementitious mastic adhesive equal to Australian Building Adhesives MPP (Multipurpose powder)	Wet area floor tiling and shower walls

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38.3.3 MORTAR

Materials

Cement type to AS 3972: GP:

- White cement: Iron salts content $\leq 1\%$.
- Off-white cement: Iron salts content $\leq 2.5\%$.

Lime: To AS 1672.1.

Sand: Fine aggregate with a low clay content selected for grading.

Water: To AS 3958.1.

Bedding mortar

Proportioning: Select proportions from the range 1:3 - 1:4 cement:sand to obtain satisfactory adhesion. Provide minimum water.

Mixing: To AS 3958.1.

38.3.4 GROUT

Cement based proprietary grout

Mix with water. Fine sand may be added as a filler in wider joints.

Proprietary item:

- Joints to 5 millimetres: ABA Flexigrout Ultrasmooth
- Joints over six millimetres: ABA Abacolour Quarry Grout

Portland cement based grout

Mix with fine sand. Provide minimum water consistent with workability.

- For joints < 3 mm: 1:2 cement:sand.
- For joints ≥ 3 mm: 1:3 cement:sand.

Pigments

Pigments for coloured grout: Provide colourfast fillers compatible with the grout material. For cement-based grouts, provide lime-proof natural or synthetic metallic oxides compatible with cement.

Grouting Schedule

Location:	Type:	Colour:
Floor tiling to toilets and showers	Portland Cement Base Grout	Colour to match tiles
Splashback and wall tiling generally	Cement based proprietary grout	White

38.3.5 SEALANTS

Requirements

Use a proprietary non-hardening mould resistant, one-part silicone or polyurethane sealant. Colour to match grout.

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Sealant Schedule

Location:	Type:
Generally	Proprietary non-hardening, mould resistant, one-part silicone or polyurethane sealant. Colour to match grout.
Floors	Two-pack self-levelling non-hardening mould resistant, one-part silicone or polyurethane sealant applied over a backing rod. Finish flush with the tile surface.
Walls	Two part polysulphide sealant.

38.4 EXECUTION**38.4.1 SUBSTRATES****Drying and shrinkage**

Before tiling, allow at least the following times to elapse (for initial drying out and shrinkage) for these substrates:

- Concrete slabs: 42 days.
- Concrete blockwork: 28 days.
- Toppings on slabs and rendering on blockwork: A further 21 days.

Preparation

Suitably prepare substrates to receive the bedded finish, including the following:

- Remove deleterious and loose material and leave the surface dust-free and clean.
- For mortar bedding wet the substrate as necessary to achieve suitable suction. Alternatively apply a bonding agent to the substrate to improve adhesion.

38.4.2 WATERPROOFING**Requirement**

Refer *Waterproofing* Section for details.

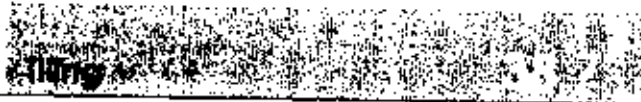
38.4.3 CHANGE OF SUBSTRATE**Treatment**

Where the substrate changes (example: from concrete to brick) fix a 600 mm wide strip of metal lath as specified in *Plastering* section over the full length of the junction with galvanised fixings at 150 mm maximum centres before applying cement-based tile beds, and form a movement joint as specified in *Movement Joints*.

38.4.4 TILING GENERALLY**Sequence**

Fix wall tiles before floor tiles. Cutting and laying.

Cutting: Cut tiles neatly to fit around fixtures and fittings, and at margins where necessary. Drill holes without damaging tile faces. Cut recesses where necessary for fittings such as soapholders. Rub edges smooth without chipping.



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Laying: Return tiles into sills, reveals and openings. Butt up to returns, frames, fittings, and other finishes. Strike and point up beds where exposed.

Variations

If necessary, distribute variations in hue, colour, or pattern uniformly, by mixing tiles or tile batches before laying.

Protection

Floor tiles: Keep traffic off floor tiles until the bedding has set and attained its working strength.

Cleaning: Keep the work clean as it proceeds and protect finished work from damage.

38.4.5 SETTING OUT

General

Joint widths: Set out tiles to give uniform joint widths within the following limits:

- Internal ceramic tiling: 1.5 - 3 mm.
- Vitrified floor tiling: 3 - 5 mm.

Joint alignment: Set out tiling with joints accurately aligned in both directions and wall tiling joints level and plumb, to a tolerance of ± 4 mm in 2 m from the design alignment.

Margins: Provide whole or purpose made tiles at margins where practicable, otherwise set out to give equal margins of cut tiles. If margins less than half tile width are unavoidable, locate the cut tiles where they are least conspicuous.

Fixtures: If possible position tiles so that holes for fixtures and other penetrations occur at the intersection of horizontal and vertical joints or on the centre lines of tiles. Continue tiling fully behind fixtures which are not built in to the tiling surface. Before tiling ensure that fixtures interrupting the tile surfaces are accurately positioned in their designed or optimum locations relative to the tile layout.

Trial Set-Out

On horizontal surfaces make a trial setout for each area and obtain approval before fixing.

38.4.6 FALLS AND LEVELS

General

General: Grade floor tiling to even and correct falls to floor wastes and elsewhere as required. Make level junctions with walls. Where falls are not required lay level.

Fall, general: 1:100 minimum.

Fall, in shower areas: 1:60 minimum.

Deviation: Maximum deviation of the finished floor level between points of contact under a 2 m straight edge laid in any direction on an area of uniform grade to be 1:300 or 3 mm, whichever is the lesser.

Change of finish: Maintain finished floor level across changes of floor finish including carpet.

38.4.7 BEDDING

Preparation of tiles

Adhesive bedding: Fix tiles dry; do not soak.

Mortar bedding: Soak porous tiles in water for half an hour and then drain until the surface water has disappeared.

VILLAGE PARK REDEVELOPMENT MONA VALE**Bedding**

Use bedding methods and materials which are appropriate to the tile, the substrate, the conditions of service, and which leave the tile firmly and solidly bedded in the bedding material and adhered to the substrate. Form falls integral with the substrate.

Thin adhesive beds

General: Provide only if the substrate deviation is less than 3 mm when tested with a 2 m straight edge. Cover the entire tile back with adhesive when the tile is bedded.

Thickness: generally: 1.5 - 3 mm.

Thick adhesive beds

General: Provide on substrates with deviations up to 6 mm when tested with a 2 m straight edge, and with tiles having deep keys or frogs.

Nominal thickness: 6 mm.

Mortar beds

For floor tiles: Either lightly dust the screeded bed surface with dry cement and trowel level until the cement is damp, or spread a thin slurry of neat cement, or cement-based thin bed adhesive, on to the tile back. Do not provide mortar after initial set has occurred.

- Nominal thickness: 25 mm

For wall tiles: Apply the bed to the substrate as a floated coat, bring up to a true surface with a wood float and allow to stiffen for up to 2 hours. Then either apply a back-up skim coat (1 - 2 mm thick) of 1:2 mortar to the bed, or butter the tile with 1:2 mortar or a cement based thin bed adhesive, before applying the tile to the bed.

- Nominal thickness: 15 mm.

Thick reinforced beds: Place mortar bed in two layers, and incorporate the mesh reinforcement in the first layer.

Mechanical fixing

Provide a proprietary system of support and fixing appropriate to the type of tile and the substrate conditions.

38.4.8 NOTCHED TROWEL METHOD**Description**

Apply adhesive mixture using notched trowel. Spread only one metre² at a time. The dry tiles are then beaten into the ribs of the adhesive before it skins. The whole of the back of the tile must be in good contact with the adhesive. No voids should be left beneath the tiles. The final bed must be not less than three millimetres thick or more than twelve millimetres thick. The maximum bed thickness is dependent on the adhesive used.

Notched Trowel Sizes

- 4.5 x 4.5 x 4.5 mm

- 6 x 6 x 6 mm

- 10 x 10 x 10 mm.

Use an appropriate notched trowel to achieve full coverage.

VILLAGE PARK REDEVELOPMENT MONA VALE**38.4.9 BUTTERING METHOD****Description**

Spread adhesive evenly to the back of tile to a thickness slightly greater than the final bed thickness. Position the tile and tap firmly in position so that excess adhesive exudes from the joint. Remove excess adhesive ready for later grouting.

Application

Deeply keyed quarry tiles and some extruded tiles may require buttering of the adhesive to the back of the tile to ensure one hundred per cent coverage.

Tiles in Awkward Locations

For tiles in awkward locations, the buttering method of fixing may be necessary to ensure full bedding, even though the notched trowel method has been specified.

38.5 JOINTS**38.5.1 TILE JOINTS****Joint Widths**

Set out tiles to give uniform joint widths within the following limits:

- Internal ceramic tiling: Minimum 1.6 mm - maximum 3.0 mm.
- Vitrified floor tiles: Minimum 3.0 mm - maximum 5.0 mm.

38.5.2 MOVEMENT JOINTS**General**

Location: Provide movement joints:

- over structural (isolation, contraction, expansion) joints;
- at internal corners;
- at junctions between different substrates;
- to divide large tiled areas into bays, maximum 5 m wide, maximum 16 m²;
- Vertical wall joints at not less than 3.5 metres along the length of a wall.

Depth of joint: Right through to the substrate.

Sealant width: 6 - 10 mm.

Depth of elastomeric sealant: One half the joint width, or 6 mm, whichever is the greater.

Movement joint materials

Preformed strip: A proprietary expansion joint consisting of a neoprene filler sandwiched between plates with lugs or ribs for mechanical keying. Set flush with the finished surface.

Sealant: Two-pack self-levelling non-hardening mould resistant, one-part silicone or polyurethane sealant applied over a backing rod. Finish flush with the tile surface.

Sealant: Refer *Sealant Schedule* for details.

Backing rod: Compressible closed cell polyethylene foam with a bond-breaking surface.

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38.5.3 GROUTED AND CAULKED JOINTS

Grouted joints

General: Commence grouting as soon as practicable after bedding has set. Clean out joints as necessary before grouting.

Face grouting: Fill the joints solid and tool flush. Clean off surplus grout. Wash down when the grout has set. When grout is dry, polish the surface with a clean cloth.

Edges of tiles: Grout exposed edge joints.

VILLAGE PARK REDEVELOPMENT MONA VALE**Caulked joints**

General: Provide caulked joints filled with sealant and finished flush with the tile surface as follows:

- Where tiling is cut around sanitary fixtures.
- Around fixtures interrupting the tile surface, for example pipes, brackets, bolts and nibs.
- At junctions with elements such as window and door frames and built-in cupboards.
- At internal corners.

Width: 5 mm.

Depth: Equal to the tile thickness.

Sealant

Sealants shall be selected for their suitability to the surface conditions and applied to the Superintendent's approval. Fill the joint with sealant and finish flush with the surface.

Refer *Sealant Schedule* for details.

38.5.4 JOINT ACCESSORIES**Floor finish dividers**

General: Finish tiled floors at junctions with differing floor finishes with a corrosion resistant metal dividing strip suitably fixed to the substrate, with top edge flush with the finished floor. Where changes of floor finish occur at doorways make the junction directly below the closed door.

Material: 25 x 25 x 5 mm stainless steel angle.

Fixing: Embed in solid finishes or screw fix to the substrate.

38.6 COMPLETION

38.6.1 COMPLETION**Spare tiles**

General: Supply spare matching tiles and accessories of each type for future replacement purposes. Store the spare materials on site.

Quantity: At least 1% of the quantity installed.

Cleaning

Clean tiled surfaces using an appropriate tile cleaning agent, and polish.

Floor Sanding

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VILLAGE PARK REDEVELOPMENT MONA VALE

39.1 GENERAL**39.1.1 SECTION CONTENT****General**

The Works include but are not limited to.

39.1.2 CROSS REFERENCES**General**

Refer to the *General Requirements* section.

Related sections

Refer to the following sections:

- *Woodwork*: For timber flooring.
- *Timber Finishes and Treatment*: For flooring finishes generally.
- *Painting*: For specific floor finishes.

39.2 QUALITY**39.2.1 SUBMISSIONS****Installation**

Finishing: Submit proposals for finishes.

39.3 EXECUTION**39.3.1 GENERAL****Type**

Carpeted or resilient finished: Basic sanding.

Clear finished: Fine sanding. Stop with matching filler.

Preparation

Punch nails 3 mm below the surface. Remove tacks. Fill open grained timber with materials compatible with those used in subsequent finishing operations.

39.3.2 STRIP FLOOR SANDING**Stopping**

Oil putty: Stop immediately before the last cut in basic sanding.

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Basic sanding

General: Remove irregularities due to capping or mismatching of the boards, using drum-type sanding machines, and coarse abrasive.

Uneven or hard flooring: First cut at 45° to the length of the boards, second cut at 90° to the first cut, and third cut parallel to the length of the boards.

Even or mild flooring: First cut at 45° to the length of the boards, and second cut parallel to the length of the boards.

Boundary areas: Bring to the same surface condition as the main sanded area, using disc sanding and coarse abrasive.

Inaccessible areas: Hand scrape to produce an even, plane surface.

Fine sanding

Removal of scratch marks: After basic sanding, cut twice parallel to the length of the boards. For the first cut use an intermediate abrasive, and for the second cut use a fine abrasive.

Boundary areas: Bring to the same surface condition as the main sanded area, using disc sanding and fine abrasive.

Inaccessible areas: Hand scrape to produce the same surface condition as the main sanded area.

39.4 COMPLETION

39.4.1 COMPLETION**Cleaning**

Clean free from dust. Apply liquid finishes immediately.

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Floor Sanding

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Resilient Finishes 40

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VILLAGE PARK REDVELOPMENT MONA VALE

40.1 GENERAL**40.1.1 SECTION CONTENT****General**

The Works include, but are not limited to:

- Sheet Finishes of resilient materials in linoleum and the like.
- Tile Finishes of resilient materials in linoleum and the like.

40.1.2 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1884	1985	Floor coverings - Resilient sheet and tiles - Laying and maintenance practices
AS 3541.1	1988	General principles
BS EN 685	1996	Resilient floor coverings - classification.
BS EN 688	1997	Resilient floor coverings - specification for cork linoleum.

40.1.3 CROSS REFERENCES**General**

Refer to the General requirements section.

Related sections

Refer to the following sections:

- *Adhesive, Sealants and Fasteners*: For these items generally.
- *Internal Finishes and Colour Schedule*: For colour and type.

40.1.4 STANDARD**General**

Laying: To AS 1884.

40.1.5 INTERPRETATION**Definitions**

Resilient floor coverings classification: To BS EN 685.

Synthetic sporting surfaces: To AS 3541.1.

Substrate: The building element to which the finish is to be applied. Includes "subfloor" as defined in AS 1884.

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40.2 QUALITY**40.2.1 INSPECTION****Witness points**

Item	Inspection Type	Notice	References
Sample panels	Hold point	3 days	<i>Sample Panels</i>
Substrate immediately before fixing sheets or tiles.	Witness point	3 days	
Completed installation.	Witness point	3 days	

40.2.2 SAMPLE PANELS**General**

General: Lay in suitable positions, or where directed, sample panels of sufficient area (at least 1 m²) of each type of resilient finish.

Incorporation into the works

An approved panel, if suitably located, may be permitted to be incorporated into the works. Otherwise, remove all traces on completion of Works.

40.2.3 SUBMISSIONS**Subcontractors**

Submit names and contact details of proposed suppliers and installers.

Acceptance of Substrate

The installing firms written statement, certifying that the building structure or substrate is satisfactory to receive the installation.

40.3 MATERIALS**40.3.1 MARKING****Identification**

Deliver materials to the site in the manufacturer's original sealed containers legibly marked to show the following:

- Manufacturer's identification.
- Product brand name.
- Product type.
- Dimensions and quantity.
- Product reference code and batch number.
- Date of manufacture.

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- Material composition and characteristics such as volatility, flash point, light fastness, colour and pattern.
- Handling and installation instructions.

40.3.2 SHEETS AND TILES**Edges of sheets and tiles**

Ensure edges are firm, unchipped, machine-cut accurately to size and square to the face, and that tile edges are square to each other.

Linoleum

Standard: To BS EN 548.

Adhesives

Standard: To AS 3553.

Sheet and tile types

Refer *Internal Finishes and Colour Schedule* for details.

40.4 EXECUTION**40.4.1 SUBCONTRACTORS****General**

Use specialist installers recommended by the materials manufacturers.

40.4.2 PREPARATION**Substrate**

General: Suitably prepare the substrate to receive the installation, including the following:

- **Repairs:** Make good to the surface finish as necessary. Fill depressions with a suitable filler, and remove high spots and projections. If necessary lay a steel-trowelled underlay to concrete substrates.
- **Fixtures and fittings:** Remove door stops and other fixtures, and refix in position undamaged on completion of the installation.

Concrete substrates:

- **Dryness:** Test concrete substrates for dryness using the hygrometer test method described in AS 1884 Appendix A. If necessary provide artificial means for drying out the substrate before installation.
- **Etching:** Acid etch concrete surfaces to receive epoxy base coats using a solution of hydrochloric acid and water in equal parts, applied at 0.5 L/m². After reaction, wash concrete and allow to dry.
- **Levelling compound:** Where substrate surface levels exceed maximum permissible tolerances, apply a proprietary levelling compound compatible with the adhesive.

Timber, plywood and particleboard substrates:

Allow the substrate to achieve equilibrium moisture content before installation.

VILLAGE PARK REDEVELOPMENT MONA VALE**Cleaning and protection**

General: Keep traffic off floors until bonding has set or for 24 hours after laying, whichever period is the longer. Do not allow water in contact with the finish for 7 days.

Reinstatement: Repair or replace faulty or damaged work. If the work cannot be repaired satisfactorily, replace the whole area affected.

Cleaning

Keep the surface clean as the work proceeds.

40.4.3 SHEET AND TILE INSTALLATION**Sheet set out**

Set out sheets to give the minimum number of joints. Run sheet joints parallel with the long sides of floor areas, vertically on walls. Obtain approval of trial setout before fixing.

Tile set out

General: Cut tiles to suit dimensions of access floor panels. Set out tiles from the centre of each access floor panel.

Joints

Non-welded: Butt edges together to form tight neat joints showing no visible open seam.

Junctions

Scribe neatly up to returns, edges, fixtures and fittings. Finish flush with adjoining surfaces.

Levels

Maximum deviation of the finished floor level: 1:300 or 3 mm, whichever is the lesser, measured between points of contact under a 2 m straight edge laid in any direction on an area of uniform grade.

Rolling

Where rolling is required, roll the finish in two directions before the adhesive sets, using a 70-kg multi-wheeled roller.

40.4.4 JOINTS AND ACCESSORIES**Junctions**

Finish junctions flush with adjoining surfaces. Where changes of floor finish occur at doorways locate the joint on the centreline of the closed door leaf.

Cover strips

General: Provide edge cover strips at junctions with different floor finishes and to exposed edges.

Metal cover strip: Extruded tapered strip 25 mm wide, of the same thickness as the sheet or tile. Fix with matching screws to timber bases or to masonry anchors in concrete bases, at 200 mm maximum centres.

- Material: Stainless Steel

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40.5 COMPLETION

40.5.1 COMPLETION

Maintenance manual

Submit manufacturers published use, care and maintenance requirements for each type of finish.

Spare materials

General: Supply spare matching covering materials and accessories of each type for future replacement purposes. Store the spare materials on site where directed.

Quantity: At least 1% of the quantity installed.

Cleaning

Clean the finished surface. Buff and polish. Before handover, mop and leave the finished surface clean and undamaged on completion.

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Carpets

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41.1 GENERAL

41.1.1 SECTION CONTENT

General

The Works include, but are not limited to the provision and installation of:

- carpet and carpet tiles including underlay, fixings, trim and associated work.
- Entry mats, fixings and trims.

41.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1385	1985	Textile floor coverings - Metric units and commercial tolerances for measurement
AS/NZS 2455.1	1995	General
AS/NZS 2455.2	1996	Carpet tiles
AS/NZS 3733	1995	Textile floor coverings - Cleaning maintenance of residential and commercial carpeting
AS 4288	1999	Soft underlays for textile floor coverings

41.1.3 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Internal Finishes and Colour Schedule*: for carpet and mat types.
- *Metal Fixtures*: For Tactile Indicators.

41.2 QUALITY

41.2.1 INSPECTION

Witness points

Item	Inspection Type	Notice	References
Subfloor prepared to receive the carpet installation.	Witness point	3 days	Substrate preparation
Completed carpet after cleaning and before covering for protection	Witness point	3 days	

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41.2.2 SAMPLES

Edge strip

Submit a 300 mm length of each type.

Underlay

Submit one labelled sample.

- Size: At least 600 x 600 mm.

41.2.3 SUBMISSIONS

Installation

Floor covering plan: Submit a floor covering plan before installation.

Acceptance of Substrate

Before commencing installation obtain and submit the installing firm's written statement certifying that the building's structure or substrate is satisfactory for the installation.

41.3 MATERIALS AND COMPONENTS

41.3.1 CARPET

Tolerances

Standard: To AS 1385.

Carpet tile edge dimensions: ± 2 mm, squares, maximum difference between length of diagonals, 2 mm.

Batching

Ensure that carpet laid in a single area and of a single specified type, quality, colour and design, comes from one manufacturing hatch and dye lot.

Insect resistance

Insecticide: Provide carpets and underlays composed entirely of materials either inherently resistant to insect attack, or treated against insect attack, including by moth and carpet beetle, by application of insecticide to the yarn during the dyeing or scouring process.

Standard: To IWS F-10.

41.3.2 CARPET TILES

Carpet tiles

Type: "Non-stick", non-curling tiles capable of being taken up without damage and then relaid in different positions.

Marking: On the back, showing recommended direction of laying.

Carpet tile tolerances:

- Edge dimensions: ± 2 mm.
- Squareness: Maximum difference of 2 mm between lengths of diagonals.

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41.3.3 UNDERLAYS**Standard**

General: To AS/NZS 2455.1.

Soft underlay

Standard: To AS 4288.

Needlefelt: 60% animal fibre and 40% jute, reinforced with polypropylene scrim with a minimum mass of 50 g/m², or hessian fabric with a minimum mass of 150 g/m².

- Tolerance on mass: +20%, -0%.

Cellular plastics (polymeric): High density polymeric foam sandwiched between reinforced carrier fabric.

Cellular rubber: Heavy-duty vulcanised rubber, waffle pattern, with a backing of reinforcing fabric.

- Reinforcing fabric: Either hessian, spun nylon, or polyester.

41.3.4 ADHESIVES AND TAPES**Standard**

General: To AS/NZS 2455.1.

Adhesives

General: Compatible with the floor covering material, and suitable for bonding it to the subfloor.

Hot-melt adhesive tapes

Commercial grade glass fibre and cotton thermoplastic adhesive coated tape 60 mm wide on a 90 mm wide metal foil base and backed with silicon-coated release paper.

41.3.5 STRIPS**Preformed gripper strips**

General: Commercial grade plywood carpet gripper strip with three rows of rust-resistant angled pins of length appropriate to the carpet type.

Size (minimum): 33 mm wide x 7 mm thick.

Location: At edges, except where edge strips are used. Provide double gripper strips to edges where recommended.

Edge strips

Type: Heavy-duty edge strip appropriate to the floor covering type (tackless or adhesive fixed), capable where necessary of accommodating different levels of adjacent floor finishes.

Form: Metal moulding or extrusion, with vinyl inserts.

Colour: To be confirmed.

Location: At exposed edges of the carpet, and at junctions with differing floor finishes or finishes of a different thickness. Where edge strips occur at doorways, locate the junctions directly below the closed door.

41.4 EXECUTION

41.4.1 SUBSTRATE

Standard

General: To AS/NZS 2455.1 or AS/NZS 2455.2, as appropriate.

Substrate preparation

General: Suitably prepare the substrate to receive the carpet installation, including the following:

- **Stripping and cleaning:** Remove deleterious and loose material, including existing floor coverings and surface treatments which could adversely affect adhesion. Leave the surface dust-free and clean.
- **Repairs:** Make good to the surface finish as necessary. Fill depressions with a suitable filler, and remove high spots and projections. If necessary lay a steel-trowelled underlay to concrete substrate.
- **Fixtures and fittings:** Remove door stops and other fixtures, and refix in position undamaged on completion of the installation.

Concrete substrate: Test concrete substrate for dryness using the hygrometer test method described in AS/NZS 2455.1 Appendix B. If necessary use artificial means for drying out the substrate before installation.

Timber Substrate: Basic Sand to produce an even plane surface.

41.4.2 LAYING CARPET

Standard

General: To AS/NZS 2455.1.

Setting out

General: Lay the carpet in continuous lengths without cross joints in the body of the area. Where unavoidable cross-joints occur at doorways, locate the joints directly below the closed doors.

Joints in underlay: Ensure joints in underlay do not coincide with carpet joints. Do not carry underlay over carpet grippers or edge strips.

Partition layout: Confirm that permanent partitions have been installed before starting carpet laying. All other partitions will be installed over the carpet.

Fixing underfelt

To timber floors: Secure underfelt with staples at 100 mm centres at edges and joints, in parallel lines 600 mm apart.

To concrete floors: Glue continuously at edges and joints with a 100 mm wide strip to each piece, and at 600 mm centres both ways with 150 mm diameter patches.

Seaming methods

Woven carpet: Machine or hand sew. Do not provide glued taped seams.

Tufted carpet: Seam with hot-melt adhesive tape.

Fixing

Permanent stick method: Immediately after laying, and again one hour later, roll the carpet from the centre diagonally towards each edge using a 65 kg multi-wheeled roller. Do not roll foam-backed carpet.

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Dual bonded underlay: Fix with adhesive between carpet and underlay, and between underlay and subfloor.

Gripping system: Preformed gripper strip and tackless edge strip. Space fixings at 150-mm maximum centres.

Fixing Schedule

Location	Underlay	Fixing Method
To new library generally	Not required	Loose laid generally, excepting cut tiles which are to be adhesive fixed.
To new library ramps	Not required	Direct fixed with proprietary adhesive
To existing library building	Required	Gripping system: Preformed gripper strip and tackless edge strip. Space fixings at 150-mm maximum centres
To existing library building stair and new link building stair	Not required	Direct fixed with proprietary adhesive
To new building north of existing library building and new link building	Required	Gripping system: Preformed gripper strip and tackless edge strip. Space fixings at 150-mm maximum centres
To meeting room in existing Memorial Hall	Required	Gripping system: Preformed gripper strip and tackless edge strip. Space fixings at 150-mm maximum centres

Cutting laid carpet

Method: Where penetrations through laid carpet are necessary for electrical, telephone or other outlets, cut the carpet either by cross cutting or by cutting rectangular or circular openings.

Cutting holes in concrete floors: Protect the carpet, remove concrete particles, and dust on completion. Replace the cut carpet over the opening without any signs of fraying or other damage, and fix with a peel-up adhesive, or re sew.

41.4.3 LAYING CARPET TILES**General**

Standard: To AS/NZS 2455.2.

Set out: Do not provide cut tiles which are less than half tile width. Provide full tiles in doorways. Keep joint lines straight.

Laying pattern: chequeboard unless otherwise recommended by the manufacturer.

Laying: Do not allow the pile to catch in the joint when laying. Do not tack or sew the tiles to the floor or to each other.

Fixing: Fix with friction compound under tiles in a 10 x 10-grid pattern. Do not fix other tiles.

Friction compound: Suitable for holding tiles in position without permanent sticking.

41.4.4 LAYING ON STAIRS**Fixing method**

To concrete stairs: Adhesive fixing.



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Laying method

Closed rise types: Apply the floor covering continuously to the treads and risers.

Stair nosing type

Aluminium: Approved extruded anti-slip aluminium nosing with black vinyl inserts.

- Proprietary item: Walmay Spectrum CDI.

Fixing to concrete stairs: Bed nosing in a levelling compound to raise the nosing level to carpet. Carpet not to run continuously under nosing. Allow drying period for levelling compound as recommended by manufacturer. Glue and screw fix nosing with a two part epoxy resin adhesive and 37 mm x eight gauge stainless steel countersunk screws at 200 mm centres. Where nosing at top tread abuts carpet laid on underfelt, provide a naplock to edge of carpet.

41.4.5 CLEANING AND PROTECTION

Cleaning up

Progressively clean the work. Remove waste, excess materials and adhesive.

41.5 Mats, Rugs

41.5.1 MAT SINKINGS

Requirement

Provide mat sinkings in paving or floor finishes of depth such that specified mats finish flush with adjoining finished paving or floor surfaces. Screed the base of the mat sinking in cement topping.

Depth

Such that specified mats finish flush with adjoining finished floor surfaces.

Floor

Screed the floor of the mat sinking in cement topping.

Surround Frame

Set each mat sinking within a surround frame consisting of angle sections fixed securely in place with the top edge flush with the surrounding finished paving.

Frame Material: Stainless Steel.

41.5.2 ENTRY MAT

Requirement

Provide an entry mat made to the exact dimensions of each mat recess where shown.

Proprietary Item

Monumat Entrance Mat, anodised aluminium extrusion with heavy duty rubber backing and polypropylene fibre insert.

Distributed by Walmay Architectural Products - Telephone: (02) 9624 3188.

Finishes:

- Extrusions: Clear Anodised.
- Fibre insert: refer *Internal Finishes and Colour Schedule*.

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4.6 COMPLETION**41.6.1 COMPLETION****Maintenance manual**

Contents: Submit a maintenance manual containing a technical specification of the carpet installation and setting out the manufacturer's recommendations, approved by the Australian Wool Corporation in the case of products containing wool, for its use, care and maintenance. Include the names and addresses of the suppliers and manufacturers of each component.

Standard: To AS/NZS 3733.

Spares

Spare material: Supply spare matching materials of each type, colour and design of carpet from the same batch for future replacement purposes.

Off-cuts: Retain carpet off-cuts exceeding 0.5 m² in area and 450 mm in both length and width.

Labelling: Label spare and off-cut material appropriately, including the location of the laid area corresponding to each batch. Securely and separately package each batch in a suitable wrapping.

Quantity of spare material: At least 1% of the quantity installed, in full or part length rolls.

Cleaning

Final cleaning: When the installation is complete, clean the carpet as necessary to remove extraneous matter, marks and soiling and to lift the pile where appropriate.

Protection: Leave the finished work undamaged on completion.

Painting

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Tender Number T01/3



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42.1 GENERAL**42.1.1 SECTION CONTENT****General**

The Works include but are not limited to materials, workmanship and equipment involved in the preparation for and application of:

- Painting systems over various substrates, including the priming coat or system for the protection of non-structural metals; and
- Clear finishing and transparent staining systems for high quality interior woodwork.

42.1.2 CROSS REFERENCES**General**

Refer to the *General Requirements* section.

Related sections

Refer to the following sections:

- *Structural Steel Section*: for preparation of structural steel.
- *Internal Finishes and Colour Schedule*: for colours and systems.
- *External Finishes and Colour Schedule*: for colours and systems.
- *Timber Finishes and Treatments*: For general requirements.

42.1.3 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1627.4	1989	Abrasive blast cleaning
AS/NZS 2310	1995	Glossary of paint and painting terms
AS/NZS 2311	2000	Guide to the painting of buildings
AS/NZS 2312	1994	Guide to the protection of iron and steel against exterior atmosphere corrosion
APAS-2916	2001	Organic zinc rich coatings for protection of steel

42.1.4 STANDARDS**General**

Painting: Comply with the recommendations of those parts of AS/NZS 2311 and AS/NZS 2312 which are referenced in this section.

42.1.5 INTERPRETATION**Definitions**

Standard: To AS/NZS 2310.

42.2 QUALITY

42.2.1 INSPECTION

Witness points

Item	Inspection Type	Notice	References
Sample Area.	Hold point	3 days	<i>Sample</i>
After application of prime or seal coats for painting.	Witness point	3 days	
After application of undercoat to painting.	Witness point	3 days	
After application of each subsequent coat of paint.	Witness point	3 days	

42.2.2 SAMPLES

Clear finish coated samples

Submit pieces of timber or timber veneer matching the timber to be used in the works, prepared, puttied, stained, sealed and coated in accordance with the specified system, of sufficient size so that, each piece can be cut into 4 segments, marked for identification, and distributed as directed.

Coated samples

Submit, on representative substrates, 1 m² samples of each coating system showing surface preparation, colour, gloss level, texture, and physical properties.

42.2.3 SUBMISSIONS

Before Commencing Installation

Obtain and submit the following:

Acceptance of substrate: The applicator's written statement certifying that the relevant building substrates are satisfactory for receiving the specified finishes.

Before Application of the Paint System

Obtain and submit the following:

Warranty:

- Item: Paintwork generally.
- Terms: Against deterioration and impairment of paint materials and workmanship.
- Period: Five years from the Date of Practical Completion.

Warranty:

- Item: Paintwork to steelwork painted with Full gloss two pack polyurethane system
- Terms: Against corrosion of the steel surface on greater than 5% of the surface, to AS 2312 in accordance with the manufacturer's conditions of specification.
- Period: Ten years from the Date of Practical Completion.

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42.3 MATERIALS**42.3.1 MATERIALS AND COMPONENTS****Proprietary Materials**

If the brand of paint has not been specified, or if an alternative to a specified brand is proposed, submit for approval not less than three weeks before paint is required, the proposed brand of paint and paint line, and change neither the approved brand nor the paint line without further approval.

Combinations

General: Do not combine paints from different manufacturers in a paint system.

Clear timber finish systems: Provide only the combinations of putty, stain and sealer recommended by the manufacturer of the top coats.

Delivery

Deliver paints to the site in the manufacturer's labelled and unopened containers.

Tinting

General: Provide only products which are colour tinted by the manufacturer or supplier.

Tinting by contractor: Add tinters or stainers only if this is without detriment to the durability or aesthetic performance of the product.

Putty

General: Oil-based or polymeric based.

Putty for timber finishes: Lacquer or water based. Do not provide oil based or glazing putty.

Thinners

Use only the type and quantity recommended by the paint manufacturer.

Toxic ingredients

Comply with the requirements of Appendix P "Uniform Paint Standard" to the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

42.4 EXECUTION**42.4.1 PAINTING****Standards**

General: To AS/NZS 2311 Sections 3, 6 and 7.

Protection of steelwork: To AS/NZS 2312 Sections 5, 8 and 10.

Order of work

Other trades: Before painting, complete the work of other trades as far as practicable within the area to be painted, except for installation of fittings, floor sanding and laying flooring materials.

Clear finishes: Complete clear timber finishes before commencing opaque paint finishes in the same area.

VILLAGE PARK REDEVELOPMENT MONA VALE**Protection**

Fixtures: Remove door furniture, switch plates, light fittings and other fixtures before starting to paint, and refix in position undamaged on completion of the installation.

Adjacent surfaces: Protect adjacent finished surfaces liable to damage from painting operations.

"Wet paint" warning

Place notices conspicuously and do not remove them until paint is dry.

Restoration

Clean off marks, paint spots and stains progressively and restore damaged surfaces to their original condition. Touch up damaged decorative paintwork or misses only with the paint batch used in the original application.

Substrate preparation

General: Prepare substrates to receive the painting systems.

Cleaning: Clean down the substrate surface. Do not cause undue damage to the substrate or damage to, or contamination of, the surroundings.

Filling: Fill cracks and holes with fillers, sealants, putties or grouting cements as appropriate for the finishing system and substrate, and sand smooth.

Clear finish: Provide filler tinted to match the substrate.

Clear timber finish systems: Prepare the surface so that its attributes will show through the clear finish without blemishes, by methods which may involve

- removal of bruises;
- removal of discolouration, including staining by oil, grease and nailheads;
- bleaching where necessary to match the timber colour sample;
- puttying; or
- fine sanding (last abrasive no coarser than 220 grit) to show no scratches across the grain.

Existing set plasterboard surfaces: remove all loose paint, fill cracks, sand smooth and apply a sealer to bond edges of existing paint to existing substrate.

Iron and steel

Remove weld spatter, slag, burrs, or any other objectionable surface irregularities. Degrease by solvent or alkaline cleaning.

Iron and Steel Blast Cleaning

To AS 1627.4, to the class specified in the specified protective treatment. Provide a surface roughness appropriate for the specified treatment.

Structural Steel

All exposed fixings including bolts, screws and the like, are to be painted to match adjacent steelwork paint system.

Concrete and Masonry

Before application to very smooth concrete, brick or masonry, acid etch, grind, or abrasive blast the surface as appropriate to provide a suitable key for the subsequently applied coating and to remove laitance. Remove loose friable matter before filling surface discontinuities.

Set Plaster Surfaces

Do not apply solvent-borne paint or other impervious coatings if the moisture content at the surface, tested with a moisture meter, exceeds twelve per cent.

VILLAGE PARK REDEVELOPMENT MONA VALE**Timber Surfaces**

Defects: Cut out large resinous knots and decayed areas, and replace with sound timber. Remove any defective putty and punch nails. Spot prime small knots, cracks, open joints, holes and bare timber with specified wood primer.

Sanding: Lightly sand dressed surfaces in the direction of the wood grain with appropriate grade "Free cut paper" and remove powdery deposits.

Moisture Content of Substrate: To AS/NZS 2311, Clause 3.2.5 at time of priming. Test the substrate with a moisture meter if required.

Drying

Use a moisture meter to demonstrate that the moisture content of the substrate is at or below the recommended maximum level for the type of paint and the substrate material.

Paint application

Apply the first coat immediately after substrate preparation and before contamination of the substrate can occur. Ensure each coat of paint or clear finish is uniform in colour, gloss, thickness and texture, and free of runs, sags, blisters, or other discontinuities.

Painting Conditions

Do not paint in dusty conditions, or otherwise unsuitable weather. Do not paint when the relative humidity exceeds eighty five per cent, or when the surface temperature of the substrate is less than 10°C or more than 50°C, unless the paint is suitable and recommended for such conditions.

Light levels

During preparation of surfaces, painting, and inspection, maintain light levels such that the luminance (photometric brightness) of the surface is equal to the specified permanent artificial illumination conditions or 400 lux, whichever is the greater.

Spraying

General: If the paint application is by spraying, use conventional or airless equipment which:

- Satisfactorily atomises the paint being applied;
- Does not require the paint to be thinned beyond the maximum amount recommended by the manufacturer; and
- Does not introduce oil, water or other contaminants into the applied paint.

Priming before fixing

Apply one coat of wood primer (2 coats to end grain) to the back of the following before fixing in position bottoms of external doors, timber trim and the like.

Sanding

Clear finishes: Sand the sealer using the finest possible abrasive (no coarser than 320 grit) and avoid cutting through the colour. Take special care with round surfaces and edges.

Repair of galvanising

General: For galvanised surfaces which have been subsequently welded, prime the affected area.

Primer: To APAS-2916, two pack.

Door Leaves

Doors shall be left in the open position to allow drying. Do not allow door hardware, accessories or the like to damage the door during the drying process (example: rubber bumpers adhering to the semi-dry paint over-night when the door is closed).

Exclusions

Exclude the following surfaces from paint systems:

- Flexible duct connections, rubber hoses and mountings and other non metallic flexible fittings.
- Metals plated or specially finished for appearance, bronze, brass, copper and stainless steel (except as specified in the *Pipe Identification* clause of the *Services* Sections).
- Aluminium frames.
- Prefinished aluminium frames to windows and doors, and trim.
- Metal floor duct covers.
- Raised access floors.
- Floors.
- Fair faced brickwork, blockwork, stonework, artificial stone and exposed aggregates.
- Sprayed vermiculite.
- Floors, paving, roads unless otherwise specified.
- Concealed timber roof structure.
- Plastic finishes generally
- Inside of service ducts, heat exchangers, pipes and valves.
- Shower seats, store shelving, work benches.
- Those parts of timber fixtures, such as insides of cupboards, not visible when doors are closed, unless otherwise specified. Insides of bathroom cabinets are not excluded and shall be painted.
- Self finished surface such as glass and plastic laminates.
- Door hardware, including hinges.

42.4.2 PAINT SYSTEMS**Paint system description**

Final coat: If a paint or clear finish system is referred to only by its final coat (for example by the manufacturer's brand name, or the generic name) provide in addition to the final coat, the appropriate stains, primers, sealers and undercoats, suitable for the substrate and compatible with the finish coat and each other.

No system description given: If a surface is to be painted but no system is nominated select the system from AS/NZS 2311 Clause 5.1, using System 1 where a choice is offered.

Number of coats

Unless specified as one coat or two coat systems, each paint system consists of at least 3 coats. Provide additional coats if necessary to

- prepare porous or reactive substrates with prime or seal coats consistent with the manufacturer's recommendations;
- achieve the total film thickness or texture; or
- achieve a satisfactory opacity, in the specified or required colour.

Tinting

Tint each coat of an opaque coating system so that each has a noticeably different tint from the preceding coat, except for top coats in systems with more than one top coat.

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Paint System Schedules

General: These schedules specify, for each of the paint systems listed in *Internal Finishes and Colour Schedule and External and Colour Schedule*, and for each substrate to which those systems are applied in the project:

- The number and order of coats; and
- The paint type for each coat.

Flat latex: Interior

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Fibre cement products, plasterboard, timber and concrete	Dulux Trade Acrylic Sealer Undercoat (16)	Dulux Trade High Opacity Wall & Ceiling Flat (6)	Dulux Trade High Opacity Wall & Ceiling Flat (6)	

The number in brackets refers to the Paint Ref. Number given in AS 2311.

Low gloss latex: Interior

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Concrete, and masonry, fibre cement products, plasterboard, timber & MDF.	Dulux Trade Acrylic Sealer Undercoat (16)	Dulux Wash and Wear interior Low Sheen Acrylic (7)	Dulux Wash and Wear interior Low Sheen Acrylic (7)	

The number in brackets refers to the Paint Ref. Number given in AS 2311.

Low gloss latex: Exterior

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Concrete, and masonry, fibre cement products, plasterboard, MDF.	Dulux Acra prime 501/1	Dulux Weathershield X10 low sheen	Dulux Weathershield X10 low sheen	

Paint system to be applied to manufacturers details, refer Duspec No. N1194.

Full gloss, solvent-borne: Interior

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Galvanised and zincalume Organic or inorganic zinc primed metal	Dulux Trade Galvanised Iron Primer (12)	Dulux Super Enamel High Gloss (5)	Dulux Super Enamel High Gloss (5)	
Shop primed (ROZP) red oxide primed metal.		Dulux Super Enamel High Gloss (5)	Dulux Super Enamel High Gloss (5)	
Timber and primed hardboard	Dulux Trade All Purpose Oil Based Undercoat (17)	Dulux Super Enamel High Gloss (5)	Dulux Super Enamel High Gloss (5)	

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The number in brackets refers to the Paint Ref. Number given in AS 2311.

Full Gloss, Solvent-Borne: Exterior

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Galvanised and zincalume Organic or inorganic zinc primed metal	Dulux Trade Galvanised Iron Primer (12)	Dulux Super Enamel High Gloss (5)	Dulux Super Enamel High Gloss (5)	
Timber and Pre-primed exterior grade board	Dulux Trade Oil Based primer, white (10)	Dulux Trade All Purpose Oil Based Undercoat (17)	Dulux Super Enamel High Gloss (5)	Dulux Super Enamel High Gloss (5)

The number in brackets refers to the Paint Ref. Number given in AS 2311.

Full Gloss Two Pack Polyurethane

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Mild Steel	Dulux Zincode 304, 75 microns dry film thickness.	Dulux Luxepoxy 4 White Primer 60 microns dry film thickness.	Dulux Weathershield HBR 100 microns dry film thickness.	Allow further coats as required to ensure dry film thickness achieved.
Mild Steel <i>Duspec N238</i>	Dulux Zincode 304, 75 microns dry film thickness.	Dulux Luxepoxy 4 White primer 60 microns dry film thickness.	Dulux luxathane R, 50 microns dry film thickness. Allow further coats to ensure dry film thickness achieved.	Allow further coats as required to ensure dry film thickness achieved.
Galvanised and zincalume finished metal	Dulux Luxepoxy 4 White Primer 60 microns dry film thickness.	Dulux Weathershield HBR 100 microns dry film thickness.	Allow further coats as required to ensure dry film thickness achieved.	

Note: 1st and second coats are to be applied in shop. 3rd Coats to be applied on site to all visible surfaces.

Surface preparation:

- Mild steel: with abrasive blast, to AS 1627.4 class 2.5.
- Galvanised: Clean and lightly sand

Repair any damage to shop applied coats prior to application of 3rd coat. Sand back damaged area and apply Dulux Durebuild STE to minimum 50 mm past damaged area.

Paint system to be applied to manufacturers details.

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Clear Co-polymer Floor Paint System: Interior

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Timber	Woodmans Floorclear apply 12-16 m ² /litre	Woodmans Floorclear apply 12-16 m ² /litre	Woodmans Floorclear apply 12-16 m ² /litre	

Gloss level: Satin.

Substrate Preparation: Punch nails, rough sand and putty nail holes acrylic wood fillers. Sand timber to fine (120 grit) with drum sander and finally with screen gauze (fine gauze 150 grit) backing on polishing machine. Thoroughly vacuum prior to applying paint system.

Application: System shall be applied in strict accordance with manufacturers written requirements.

Allow cross air flow ventilation during deployment and post application period to assist in drying process.

Restrict all traffic over floor for a 24 hour period following second application. All traffic within next seven days to strictly be "socks" only.

Clear Co-polymer Interior Timber Paint System

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Timber	Woodmans Everclear apply 12 m ² /litre	Woodmans Everclear apply 12 m ² /litre	Woodmans Everclear apply 12 m ² /litre	

Gloss level: Satin.

Substrate Preparation: Punch nails and sand entire surface smooth with fine grit paper. Thoroughly clean free of dust prior to applying paint system.

Application:

- Apply first coat, working along the length of surface and avoiding lap marks.
- Allow 4 hours for first coat to dry.
- Fill any nail holes or imperfections with acrylic wood fillers following application of first coat and sand entire surface with fine sanding paper. Thoroughly clean free of dust prior to applying paint system. Apply second and third coats.

System shall be applied in strict accordance with manufacturers written requirements.

Allow cross air flow ventilation during deployment and post application period to assist in drying process.

Clear Co-polymer Exterior Timber Paint System

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Timber	Woodman's Prime Prime All apply 12 m ² /litre	Woodmans Cladcoat apply 12 m ² /litre	Woodmans Cladcoat apply 12 m ² /litre	



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Substrate Preparation: Punch nails and sand entire surface smooth with fine grit paper. Thoroughly clean free of dust prior to applying paint system. If the timber is dense and oily or showing visible tannin stains and water marks, clean with Woodmans Woodwash.

Application:

- Apply saturation coat of primer to all surfaces of timber cladding prior to installation and allow 4 hours to dry.
- Apply finish coats, with 4 hours drying time between after cladding has been installed.

System shall be applied in strict accordance with manufacturers written requirements.

Clear Co-polymer Timber Decking Paint System

Substrate:	1st coat:	2nd coat:	3rd coat:	4th coat:
Timber	Woodman's Prime Prime - All apply 12 m ² /litre	Woodmans Decks apply 12 m ² /litre	Woodmans Decks apply 12 m ² /litre	

Substrate Preparation: Punch nails and sand entire surface smooth with fine grit paper. Thoroughly clean free of dust prior to applying paint system. If the timber is dense and oily or showing visible tannin stains and water marks, clean with Woodmans Woodwash.

Application:

- Allow timber to weather for 12 weeks.
- Apply saturation coat of primer and one finish coat to all surfaces of timber including support structure prior to installation allowing 4 hours to dry between coats.
- Apply final finish coat, once timber boarding has been laid.

System shall be applied in strict accordance with manufacturers written requirements.

Two Pack Clear Lacquer (two pack acid catalysed lacquer)

Substrate:	1st application:	2nd application:	3rd application:	4th application:
Timber	Mirotone Mirobild AC3600 selaer coats 100 microns dry film thickness	Mirotone Mirobild AC3600 selaer coat 100 microns dry film thickness	Mirotone Mirobild AC3600 top coats 100 microns dry film thickness	Mirotone Mirobild AC3600 top coats 100 microns dry film thickness

Gloss Level: 60% gloss level.

Substrate Preparation:

- Apply Miroputty WB 1600 or equivalent on all timber defects. Sand all surfaces smooth with 180 Fre cut paper and remove all dust prior to applying paint system.
- Note for exposed edges of plywood fill all imperfections to plys and sand all saw marks smooth.

Application:

- Apply 2 sealer coats. Sanding between coats with P320-P400 Frecut paper.
- Apply 2 top coats. Apply an additional third top coat where required to achieve consistent smooth finish. Sanding between coats with P320-P400 Frecut paper.

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Technical requirements: System shall be applied in strict accordance with manufacturers written requirements.

Water Based Concrete Sealer

Substrate:	1st application:	2nd application:	3rd application:	4th application:
Concrete	Epirez 123 Epoxy Primer/ Sealer, at 4- 8 m ² / litre			

Substrate Preparation:

- Remove all loose material. Grease and oil is to be removed from substrate with suitable degreaser.
- Hose off with high pressure water and allow to dry before application.

Application:

- Do not apply until concrete is at least 28 days old.
- Brush, roller or airless apply to all surfaces.

Technical requirements: System shall be applied in strict accordance with manufacturers written requirements.

42.5 COMPLETION**42.5.1 COMPLETION****Maintenance manual**

Submit the paint manufacturers published recommendations for maintenance.

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Tender Number T01/3



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VILLAGE PARK REDEVELOPMENT MONA VALE

43.1 GENERAL

43.1.1 SECTION CONTENT

General

The Works include but are not limited to Architectural Metalwork such as handrails, accessways, screens, guards, flagpoles, ladders, sunscreens and decorative items.

43.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1428.1	2001	Design for access and mobility - General requirements for access - New building work
AS 1428.2	1992	Design for access and mobility - Enhanced and additional requirements - Buildings and facilities
AS 1428.4	2002	Design for access and mobility - Tactile indicators
AS 1657	1992	Fixed platforms, walkways, stairways and ladders - Design, construction and installation
AS/NZS 1664.1	1997	Limit state design
AS/NZS 1664.2	1997	Allowable stress design
AS 1657	1992	Fixed platforms walkways, stairways and ladders - Design, construction and installation
AS 1665	1992	Welding of aluminium structures
AS 1796	1993	Certification of welders and welding supervisors
AS 2738	2000	Copper and copper alloys - Compositions and designations of refinery products, wrought products, ingots and castings

43.1.3 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Metals and Prefinishes*: For these items generally.
- *Light Steel Framing*: For metal framing systems.
- *Door and Window Hardware*: For these items generally.
- *Residential Fitment Schedule*: For residential metal fixtures and electrical fixtures.

43.2 QUALITY

43.2.1 INSPECTION

Witness points

Item	Inspection Type	Notice	References
Shop fabricated or assembled items ready for delivery to the site	Witness point	3 days	
Commencement of shop or site welding.	Witness point	3 days	
Site erected assemblies on completion of erection, before covering up by cladding and encasing.	Witness point	3 days	
Steel surfaces prepared for, and immediately before, site applied finishes.	Witness point	3 days	

43.2.2 TESTS

Weld testing

Have testing of welds, or test plates, performed by an independent testing authority. In the event of test failure, rectify the defect and repeat the test.

43.2.3 SAMPLES

General

Submit samples of the following:

- Each type of joint.
- Each type of finish.
- Sections for use in fabricated work.

43.2.4 SUBMISSIONS

Design

Calculations: Submit calculations and other data demonstrating detailed compliance with performance criteria.

Shop drawings

Submit shop drawings showing the following information:

- Details of fabrication and components.
- Information necessary for site assembly.

Tests

Stainless steel: Before fabrication commences, submit satisfactory evidence that relevant procedure test plates have passed the tests specified in AS/NZS 1554.6.

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Materials

Manufacturer's data: Submit manufacturer's published product data including standard drawings and details.

Stainless steel: For each batch of stainless steel supplied to the works, submit the certificate of compliance or test certificate specified in the applicable standard.

Execution

Welding procedures: Submit details of proposed welding procedures before fabrication.

Welding dissimilar metals: Submit the following details:

- Type and thickness of materials to be welded.
- Proposed joint preparation and welding procedures.
- Proposed filler metal.
- Expected dilution (proportion of fused parent metal in the weld metal).

Fastenings to aluminium (including aluminium alloys): If cadmium-plated steel fastenings are proposed, submit proposals.

43.3 MATERIALS**43.3.1 MATERIALS AND COMPONENTS****Metals**

Performance: Provide metals suited to their required function, finish and method of fabrication, in sections of strength and stiffness adequate for their purpose.

Copper alloys (brass, bronze, etc.)

Composition and designations: To AS 2738.

Rivets

Blind rivets where available in the required metal.

Masonry anchors

Proprietary types comprising screws or bolts in self-expanding sockets.

Masonry plugs

Screws in purpose-made resilient plastic sockets.

43.4 EXECUTION**43.4.1 CONSTRUCTION GENERALLY****Aluminium structures**

Standard: To AS/NZS 1664.1 or AS/NZS 1664.2.

Metals

Performance: Provide metals so that they transmit the loads imposed and ensure the rigidity of the assembly without causing deflection or distortion of finished surfaces.

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Incompatible metals: Separate using concealed layers of suitable materials in appropriate thicknesses.

Fasteners

Performance: Provide fasteners so that they do not cause galvanic corrosion.

Materials: Provide fasteners in materials of mechanical strength and corrosion resistance at least equal to that of the lowest resistant metal joined.

To copper and copper alloys: Provide copper or copper-alloy fixing devices only.

To aluminium and aluminium alloys: Provide aluminium alloy or non-magnetic stainless steel fixing devices only.

To stainless steel: Provide appropriate stainless steel materials only.

Fabrication

Workshop: Fabricate and pre-assemble items in the workshop wherever practicable.

Edges and surfaces: Keep clean, neat and free from burrs and indentations. Remove sharp edges without excessive radiusing.

Tube bends: Form bends in tube without visibly deforming the cross section.

Colour finished work: Match colours of sheets, extrusions and heads of fasteners.

Thermal movement: Accommodate thermal movement in joints and fastenings.

Fabrication tolerances

Structural work generally: ± 2 mm.

Joints

General: Fit joints to an accuracy appropriate to the class of work. Finish visible joints made by welding, brazing or soldering using grinding, buffing or other methods appropriate to the class of work, before further treatment.

Self-finished metals: Free of surface colour variations, after jointing.

Joints: Fit accurately to a fine hairline.

Marking

Provide suitable and sufficient marks or other means for identifying each member of site-erected assemblies, and for their correct setting out, location, erection and connection. Mark bolted connections to show the bolting category. Do not mark stainless steel by notching.

Splicing

Provide structural members in single lengths.

43.4.2 WELDING AND BRAZING**General**

Quality: Provide finished welds which are free of surface and internal cracks, slag inclusion, and porosity.

Site welds: Do not weld on site.

Butt weld quality level: Not inferior to the appropriate level recommended in AS 1665 Appendix A.

Brazing

General: Ensure brazed joints have sufficient lap to provide a mechanically sound joint. Do not use butt joints relying on the filler metal fillet only.

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43.4.3 STAINLESS STEEL FABRICATION**Surface finish**

2B unless noted otherwise.

Grade: Internal 304, External 316, or as nominated.

Welding stainless steel

Certification of welders: To AS 1796.

Riveting

Riveting may be used only to join stainless steel sheet or strip less than 1 mm thick. Drill (not punch) the rivet hole, and drive the rivet cold. On completion, clean and passivate the riveted assembly.

Soldering

Do not solder stainless steel.

Handling

Handle with care. Protective plastic coatings shall be used.

Storage

Store in a clean, dry, well-ventilated area. Test the adhesive power of the coating periodically, and immediately remove if any hardening is noted. All absorbent wrappings such as interleaved paper, cardboard, timber, etc shall be removed if wet, to prevent surface staining.

Bending

If required after severe bending, ragged edges shall be ground to remove burr and any work hardened areas. Grinding marks should be along and not across the sharp edge.

Cutting

Gas or arc should not be used, but if approved, the wide heat affected area shall be removed prior to fabrication. Plasma or laser cutting is preferred.

Installation

Ensure hydrochloric acid is not used near the stainless steel. Cleaning of brickwork usually uses this liquid. Avoid contamination with iron base metals such as filings, nails, screws, etc. Remove splashes of wet solid matter before they harden. Remove protective coatings after construction is completed. Wipe off residual adhesive with an organic solvent. A complete cleaning immediately after the construction is completed is important to ensure the stainless steel is in a clean and passive condition at the commencement of its service life. Do not use steel wool or metallic scrapers, and do not use cleaners containing harsh abrasives or high bleach contents.



43.5 ACCESS COMPONENTS

43.5.1 PLANTROOM ACCESS PLATFORM

Standard

Materials, design and construction: Comply with the recommendations of AS 1657.

43.6 HANDRAILS AND BALUSTRADES

43.6.1 HANDRAILS

Standard

Materials, design and construction: Comply with the recommendations of AS 1657.

Fabrication

Method: Welding.

Joints: Produce smooth unbroken surfaces at joints. Scribe the joints between posts and rails. Make end-to-end joints over an internal sleeve.

Bends: Make changes of direction in rails by evenly curved pipe bends.

Free ends: Seal the free ends of pipes with fabricated or purpose made spherical end caps.

Galvanising

If possible, complete fabrication before galvanising; otherwise apply a zinc-rich primer to affected joint surfaces.

43.6.2 CONSTRUCTION

Type 1 Handrail System (HR1)

Location: Internal handrail and balustrade system with glazed in fills, refer drawings for location.

Balusters: Provide 60 x 10 mm flat mild steel balusters welded to fixing plates as indicated on structural drawings a maximum spacing 1500 mm centres and to structural engineer's details. Fix to substrate with countersunk bolt fixings, to structural engineers details. Continuous weld fixing plates for glass in fills and handrail support to balusters as nominated on drawings

Install glazing with patch fixings in accordance with manufacturer's requirements. Refer to *Glazing Section* for details on glazing.

- Proprietary fittings: CDS Patch Fittings Aust Pty LTD, CD132, 32 mm diameter with 20 mm long wall spacer.

Handrail: Timber handrail 50 mm diameter, refer *Woodwork* section.

Finish: Mild steel. All joints to be butt welded, ground flush and paint finished. Refer to *Painting* and appropriate *Internal Finishes Schedule*.

Type 2 Handrail System (HR2)

Location: Internal handrail system, refer drawings for location.

Handrail support: continuous mild steel angle fixed to wall to structural engineers details.

Handrail: Timber handrail 50 mm diameter, refer *Woodwork* section.

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Finish: Mild steel. All joints to be butt welded, ground flush and paint finished. Refer to *Painting* and appropriate *Internal Finishes Schedule*.

Type 3 Handrail System (HR3)

Location: Internal handrail supported on balusters, refer drawings for location.

Balusters: Provide 60 x 10 mm flat mild steel balusters welded to fixing plates as indicated on structural drawings a maximum spacing 1500 mm centres and to structural engineer's details. Fix to substrate with countersunk bolt fixings, to structural engineers details.

Handrail: Timber handrail 50 mm diameter, refer *Woodwork* section.

Finish: Mild steel. All joints to be butt welded, ground flush and paint finished. Refer to *Painting* and appropriate *Internal Finishes Schedule*.

Type 4 Handrail System (HR4)

Location: External handrail supported on balusters, refer drawings for location.

Balusters: Provide 60 x 10 mm flat stainless steel balusters welded to fixing plates as indicated on structural drawings a maximum spacing 1500 mm centres and to structural engineer's details. Fix to substrate with countersunk bolt fixings, to structural engineers details.

Handrail: 50 mm diameter stainless steel tube.

Finish: 316 Grade stainless steel, with brushed finish

Type 5 Handrail System (HR5)

Location: External balustrade system with glazed in fills, refer drawings for location.

Balusters: Provide 60 x 10 mm flat stainless steel balusters welded to fixing plates as indicated on structural drawings a maximum spacing 1500 mm centres and to structural engineer's details. Fix to substrate with countersunk bolt fixings, to structural engineers details. Continuous weld fixing plates for glass in fills and handrail support to balusters as nominated on drawings

Install glazing with patch fixings in accordance with manufacturer's requirements. Refer to *Glazing Section* for details on glazing.

- Proprietary fittings: CDS Patch Fittings Aust Pty LTD, CD132, 32 mm diameter with 20 mm long wall spacer.

Handrail: 50 mm diameter stainless steel tube.

Finish: 316 Grade stainless steel, with brushed finish

Type 6 Handrail System (HR6)

Location: External handrail system, refer drawings for location.

Handrail support: continuous stainless steel angle fixed to wall to structural engineers details.

Handrail: 50 mm diameter stainless steel tube.

Finish: 316 Grade stainless steel, with brushed finish

Type 7 Handrail System (HR7)

Location: External handrail to stairs.

Description: As for type 4 with two handrails. Refer type 4 for details.

Type 8 Handrail System (HR8)

Location: External balustrade system with wire inserts, refer drawings for location.

Balusters: Provide 60 x 10 mm flat stainless steel balusters welded to fixing plates as indicated on structural drawings a maximum spacing 1500 mm centres and to structural engineer's details. Fix to substrate with countersunk bolt fixings, to structural engineers details.

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Continuous weld fixing eyes in fills and handrail support to balusters as nominated on drawings.

Wires:

Handrail: 50 mm diameter stainless steel tube.

Finish: 316 Grade stainless steel, with brushed finish

43.7 SUNSCREENS

43.7.1 EXTERNAL SUNSCREENS TO LIBRARY.

Description

Location: Refer Drawings.

Welding: To AS 1665.

A system of prefabricated sunshades with prefinished aluminium blades supported on steel support framing.

Blades: Hi light Industries aluminium grating with 50 x 3 load bars at 30 mm centres (HA type), with welded 6 mm thick x 50 mm high aluminium flats to either ends, and 50 x 30 x 3.0 aluminium geometric channel welded to side flats along front edge of each blade as shown on the Drawings.

Separation of different metals: All dis-similar metals shall be separated by neoprene washers.

Finish: Refer *External Finishes Schedule*.

43.8 WET AREA FITTINGS

43.8.1 GRAB RAILS

Locations

To all Accessible Toilets.

Standard

To AS 1428.1

Type

Tubular metal rail, bent twice with end flange plates all welded.

Rail

32 mm diameter x 3 mm wall thickness polished stainless steel tube. Bent as shown on the Drawings, by the Mandrel process.

Fixing

Secure to walls with 19 mm matching straight brackets and recessed wall plates, with concealed mounting plates.

Proprietary Item

Bradley 1428/ 1429.

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43.8.2 LIQUID SOAP DISPENSER**Location**

At each sink or basin, one per basin fixture. Locate over the sink to the left-hand side.

Proprietary item

Myton Bobrick (Model B-112) soap dispenser.

43.8.3 TOILET PAPER DISPENSER TYPE 1**Location**

One to each water closet in male and female toilets to Basement level B2, level 1 and level 2.

Proprietary item

Bowscott Jumboline 0800 stainless steel with lock.

43.8.4 TOILET PAPER DISPENSER TYPE 2**Location**

Two to each water closet in Accessible Toilet.

Proprietary Item

Efco 846 toilet roll holder.

Finish

Satin chrome plate (SCP).

43.8.5 CLOTHES HOOKS**Location**

Locations shall be as follows, unless noted otherwise on drawings:

- 1 To shower over change bench.
- 2 hooks at 900 mm centres over change benches in Accessible Toilets SL109 and SL104.

Proprietary item

Bradley Australia surface mounted coat hook Model number 9114

Finish

Stainless Steel satin finish surround.

Requirement

Provide and install three clothes hooks in locations to be confirmed on site.

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43.8.6 BABY CHANGE STATION**Location**

To Accessible Toilets SI109 and SI104.

Proprietary item

JD Macdonald baby change station, vertical model.

Requirement

Provide and wall mount baby change station, at 785 mm (height of underside of unit) above finished floor level, to manufacturer's written instructions.

43.8.7 SHOWER CURTAIN**Location**

Shower SC116.

Shower curtain rail

Rail: Chrome plated steel tube 19 mm diameter.

Brackets: Proprietary chrome plated steel socket end brackets.

Shower curtain

Heavy weight plastic curtain, one and one quarter times the opening width and hemmed and machine sewn on all edges, with hemmed and machine sewn openings to the top edge at maximum 38 mm centres for curtain rings. The foot of the curtain shall be 50 mm clear of the floor. Provide with plastic curtain rings, of a diameter to suit the curtain rail, to each of the support holes in the curtain.

Shower curtain colour

White.

43.8.8 SOAP HOLDER**Location**

One to each shower.

Proprietary item

Equal to Keuco 1657 corner soap holder.

43.9 BLINDS**43.9.1 LIBRARY BLINDS****Location**

To the following windows:

- Library: WL111, WL104 and WL106 as nominated on drawings.
- Early Childhood Centre: WC101, WC102, WC103 and WC104 as nominated on drawings.

Requirement

Supply and install chain operated straight drop blinds to windows nominated.

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Fixing

Fix blinds with the appropriate fixing brackets to manufacturer's requirements. Blinds are to be fixed square and plumb. Any creep in fabric is to be rectified.

Description

MASP Roller Solution Inc RS4 straight drop roller screen, with v-chain operation, and base rail. Roller tube 40 mm diameter.

Dimensions:

- Height (library): Full height of glazing with roller surface mounted on concrete beam directly behind window.
- Height (Early Childhood Centre): Full height of glazing with roller being concealed mounted in ceiling recess above window.
- Width of blinds: Refer drawings.
- Width of each drop: Each blind to be sized to suit width between each glazing mullion.

Fabric: EuroVeil Architectural Screens Dense Basket Weave 5300 range. Colour to be determined.

43.10 ELECTRICAL APPLIANCES**43.10.1 HAND DRYERS****Location**

One to each of the following spaces:

To all Public, Staff and Accessible toilets.

Proprietary Item

Macdonald Corporation product No. Touchdry 1000.

Requirement

Mount in accordance with manufacturers requirements. Hand dryers are to be permanently wire to the power supply. Coordinate the installation of the hand dryers with the Electrical Sub-contractor.

43.11 MISCELLANEOUS ITEMS**43.11.1 BOOK RETURNS CHUTES ^{C1}****Location**

To Returns Room SL108

Requirement

Supply and install including all necessary fixings and fittings a proprietary returns chute, with single fascia. And lockable chute flaps.

^{C1} 10.03.03 Proprietary item description and fascia panel size amended.

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Proprietary item: Wharlington International Pty Ltd, Chute to Shelf modified internal returns chute STS RC3-01, without engraved signage and with physical bolt lock.

Number of chutes: 2.

Fascia panel size: 360 mm high x 1650 mm wide.

Finish: Satin stainless steel.

43.11.2 CEILING GRILLE

Location

To ceiling of Ramp 2, SL115.

Requirement

Supply and install metal louvred ceiling panels, bolt fixed to concrete beam of steel studs as required to support panels securely, and tightly to avoid rattling and in a level alignment.

Type: Highlight Industries SS203/54 aluminium louvre profile, with aluminium flats to edges welded to blades to allow fixing to substrate.

Finish: Refer *Internal Finishes and Colour Schedule*.

43.11.3 CHAINWIRE MESH GATES

Standards

Materials, Design and Construction: Comply with AS1725, AS2423.

Description

System of galvanised mild steel tube frame with chain wire infill to provide security to designated external areas and with lockable access gates.

Location

DC118.

Material

Requirement: Provide and install swing gate to match fence constructed out of 19mm diameter galvanised mild steel circular hollow section punched onto and through top nail and into bottom nail.

Frame: Galvanised steel CHS pipe with not less than 32 Nominal Bore. Galvanised Steel.

Chainwire: 50 x 2.5 mm heavily galvanised chainwire.

Tie Wire: 1.6 mm dia wire.

Gates: Fit with bracket hinges and locking devices. Security locking by padlock with hasp and staple, and or 10mm hardened chain. Refer to *Hardware* section for keying requirements.

43.11.4 WHITEBOARDS

Requirement

Supply and install whiteboard including extruded aluminium pen tray with all necessary fittings and accessories, to Staff SL123.

Description

Charles Trims Pty Ltd Series 22 concealed wall fixed whiteboard, with extruded aluminium pen tray.

VILLAGE PARK REDEVELOPMENT MONA VALE**Finishes**

Whiteboard surface: Omniplate porcelain on steel surface.

Surface Colour: White.

Frame: Clear anodised aluminium.

Size

1200 mm long x 1200 high.

43.12 TACTILE INDICATORS**43.12.1 TACTILE INDICATORS****Location**

All internal tactile indicators.

Requirement

Provide and install tactile indicators to locations nominated on drawings to AS 1428.4.

Type: B

Material: Stainless Steel.

Setout to be as follows unless otherwise indicated on drawings:

- Full width of the accessible path;
- From edge of change in level : 300 mm.
- Width of indicator zone at top of change in level or at landings: 600 mm.
- Width of indicator zone at bottom of change in level: 300 mm.

Fixings: Screw fix individual indicators through carpet to slab. Fixings to be in accordance with manufacturers details.

Proprietary Item: Tactile Industries metallic Tactile Indicators. Telephone: 9380 4763 Mobile: 0412 275 956.

43.13 COMPLETION**43.13.1 COMPLETION****Maintenance manual**

Submit manufacturers published recommendations for service use.

Cleaning

Temporary coatings: On or before completion of the works, or before joining up to other surfaces, remove all traces of temporary coatings used as a means of protection.

Timber Fixtures

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VILLAGE PARK REDEVELOPMENT MONA VALE

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VILLAGE PARK REDEVELOPMENT MONA VALE

44.1 GENERAL

44.1.1 SECTION CONTENT

General

The Works include but are not limited to timber fixtures (joinery), using prefinished sheets, laminates, components and techniques.

44.1.2 REFERENCED DOCUMENTS

General

The following standards are referred to in this section:

AS 1786	1975	Joinery timber milled from Australian grown conifers (softwoods) (excluding radiata pine and cypress pine)
AS 1810	1995	Timber - Seasoned cypress pine - Milled products
AS/NZS 1859.1	1997	Particleboard
AS/NZS 1859.2	1997	Medium density fibreboard (MDF)
AS/NZS 1859.3	1996	Decorative overlaid wood panels
AS 2131	1987	Adhesives - For bonding decorative thermoset laminates (contact adhesives)
AS/NZS 2270	1999	Plywood and blockboard for interior use
AS/NZS 2271	1999	Plywood and blockboard for exterior use
AS 2796.3	1999	Timber for furniture components
AS/NZS 2924.1	1998	Classification and specifications
AS 3566	2002	Self-drilling screw for the building and construction industries

44.1.3 CROSS REFERENCES

General

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Structural steel, in structural specification*: For steel framing generally.
- *Adhesives, sealants and fasteners*: For these items generally.
- *Timber finishes and treatment*: For these items generally.
- *Painting*: For paint systems to timber.
- *Internal Finishes and Colour Schedule*: For paint systems.

VILLAGE PARK REDEVELOPMENT MONA VALE**44.2 QUALITY****44.2.1 INSPECTION****Witness points**

Item	Inspection Type	Notice	References
Timber veneer sheet at suppliers warehouse prior to delivery to Joiner	Hold point	3 days	
Items fabricated off site before delivery.	Witness point	3 days	

44.2.2 SUBMISSIONS**Shop drawings**

Submit shop drawings to a scale not smaller than 1:50, showing:

- Overall dimensions;
- Materials, thicknesses and finishes of elements including doors, divisions, shelves and benches;
- Type of construction including mitre joints and junctions of members;
- Hardware type and location;
- Temporary bracing, if required;
- Procedures for shop and site assembly and fixing;
- Locations of benchtop joints;
- Locations of sanitary fixtures, stoves, ovens, sinks, and other items to be installed in the units; and
- Relationship of fixture to adjacent building elements.

44.3 MATERIALS AND COMPONENTS**44.3.1 MATERIALS AND COMPONENTS****Joinery timber**

Seasoned hardwood: To AS 2796.3.

Seasoned Cypress pine: To AS 1810.

Australian grown conifers, other than radiata pine and cypress pine: To AS 1786.

Plywood

Interior use generally: To AS/NZS 2270.

Interior use, exposed to moisture: To AS/NZS 2271.

VILLAGE PARK REDEVELOPMENT MONA VALE**Particleboard**

Standard: To AS/NZS 1859.1.

Melamine overlaid Particleboard: Particleboard overlaid on both sides with low-pressure melamine.

Medium density fibreboard

Standard: To AS/NZS 1859.2.

Melamine overlaid medium density fibreboard: Medium density fibreboard overlaid on both sides with low-pressure melamine.

Decorative overlays

Standard: To AS/NZS 1859.3.

High-pressure decorative laminate sheets

Standard: To AS/NZS 2924.1.

Thickness (minimum):

- For horizontal surfaces fixed to a continuous background: 1.2 mm.
- For vertical surfaces fixed to a continuous background: 0.8 mm.
- For edge strips: 0.4 mm.

Timber Veneers

Veneer Quality (minimum requirements):

- Select grade, veneer quality A for visible surfaces to have clear finish.
- General purpose grade, veneer quality B for other visible surfaces.

Decorative timber veneer (grade S)

Quality: The timber veneer shall be a consistent colour and texture. Veneer sheet to be inspected at veneer supplies warehouse to select final batches for project.

Fasteners

Self-drilling screws: To AS 3566.

White Goods

Install all whitegoods in nominated locations to manufacturer's written recommendations. Co-ordinate with joinery layouts prior to construction.

44.4 FURNITURE**44.4.1 CONSTRUCTION GENERALLY****General**

Accuracy: Build components square and install plumb.

Joints: Provide materials in single lengths whenever possible. If joints are necessary make them over supports.

Framing: Frame and trim where necessary for openings, including those required by other trades.

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Accessories and trim

Provide accessories and trim necessary to complete the installation.

Fasteners

Use fasteners to transmit the loads imposed and to ensure the rigidity of the assembly, without splitting or otherwise damaging timber or sheets.

Visibility: Do not provide visible fixings except in the following locations:

- Inside cupboards and drawer units.
- Inside open units in which case provide proprietary caps to conceal fixings.

Visible fixings: Where fastenings are unavoidable on visible joinery faces, sink the heads below the surface and fill the sinking flush with a material compatible with the surface finish. In surfaces which are to have clear or tinted finish provide matching wood plugs showing face grain (not end grain). In surfaces which are to have melamine finish provide proprietary screws and caps finished to match.

Plugging: If fastenings are specified to be plugged, sink them below the surface and cover with flush matching wood plugs showing face grain (not end grain).

Stopping: If fastenings are specified to be stopped, fill flush with an approved colour matching putty, filler or dowel.

Joints: Scribe internal and mitre external joints.

Fixing to building structure: Provide screws with washers for fixing into timber or steel framing, or masonry anchors.

Adhesives

General: Provide adhesives to transmit the loads imposed and to ensure the rigidity of the assembly, without causing discolouration of finished surfaces.

Decorative laminated sheets: Contact adhesive to AS 2131.

44.4.2 EDGE STRIPS**Material**

To match the face veneers. Width such that the strip finishes flush with the outside surfaces of the panel facings. Solid timber strips generally, veneer strips on drawer fronts:

- Corners: Mitre or square butt solid edge strips meeting at corners.
- Fixing: PVAC adhesive to AS 2131, or equivalent.

Requirement: Cover the visible edges of built-up joinery panels with edge strips of material matching the panel face.

Solid Edge Strips: Provide solid timber edge strips to the following elements where surfaces are timber veneer finished:

- Visible edges of particleboard shelving
- Edges of work surfaces
- Edges of benchtops

Thickness of solid edge strips: Not less than six millimetres (including the rebated portion of rebated stiles) or such that edge fixed hinge screws do not enter the particleboard.

Veneer Strips: Edge strips not required to be solid timber may be matching veneer strips.

VILLAGE PARK REDEVELOPMENT MONA VALE**Finishing**

Junctions with structure: Scribe benchtops, splashbacks, ends of cupboards, kickboards and returns to follow the line of structure.

Joints: Scribe internal and mitre external joints.

Edge strips: Finish exposed edges of sheets with edge strips which match sheet faces.

Matching: For surfaces which are to have clear or tinted finish, arrange adjacent pieces to match the grain and colour.

44.4.3 CUPBOARD, SHELF AND DRAWER UNITS**Plinths**

Material: Select from the following:

- Exterior general-purpose plywood.
- High moisture resistant particleboard.
- High moisture resistant medium density fibreboard.

Thickness: 16 mm.

Fabrication: Form up with front and back members and full height cross members at not more than 900 mm centres.

Finish: As noted on drawings, and *Internal Finishes and Colour Schedule*.

Fasteners: Conceal with finish.

Installation: Scribe to floor and secure to wall to provide level platform for carcasses.

Carcasses

Requirement: Every cupboard shall be a whole, or part carcass unless noted otherwise on the Drawings. Cupboards without a complete carcass (when in place) shall be rejected.

Definition: A carcass shall consist of sides, back, base, fixed shelves and any subframing required for benchtops.

Material Generally: Select from the following:

- 18 mm medium density fibreboard.
- 18 mm high moisture resistant particleboard.

Material to wet areas: Select from the following:

- 18 mm moisture resistant medium density fibreboard.
- 18 mm high moisture resistant particleboard.

Joints: Select from the following:

- Proprietary mechanical connections.
- Dowels and glue.
- Screws and glue.
- Proprietary joining plates and glue.

Adjustable shelves: Support on proprietary pins in holes bored at equal centres vertically.

- Spacing: 32 mm.

Penetrations in cupboards: Internal penetrations and cut-outs to cupboard carcasses, divisions, bases, shelves for equipment and services shall be avoided and minimised where unavoidable. Where required, they shall be neatly arranged and finished as follows:

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- Edge stripped with to match material of panel surface.
- Maximum clearance between penetration or cut-out and installed fixture, fitting or service of 3 mm
- Where the penetration is to a concealed space, such as cupboard bases, the penetration shall be completely sealed after installation and approval of the service or fixture.

Penetration for boiling water unit: Where a boiling water unit is installed, coordinate with the boiling water unit trade to locate and size the hole. The hole have the minimum open space.

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Finish:

- Internally: Melamine. Colour: White.
- Externally: As noted on drawings, and *Internal Finishes and Colour Schedule*.

Fasteners: Conceal with finish.

Installation: Secure to walls at not more than 600 mm centres.

Support Framing

Location: As shown on drawings.

Requirement: Provide and install mild steel square hollow section support framing, size and extent as shown on drawings. All joints shall be fully welded. Fix frame to underside of bench or element nominated with countersunk screws.

Finish: Powdercoated, refer *Internal Finishes and Colour Schedule*.

Drawers, shelves and doors generally

Material Generally: Select from the following:

- Medium density fibreboard.
- High moisture resistant particleboard.

Material to wet areas: Select from the following:

- Moisture resistant medium density fibreboard.
- High moisture resistant particleboard.

Thickness:

- Drawer fronts and doors: 18 mm.
- Drawer sides: 12 mm.
- Drawer bottoms: 12 mm.

Maximum door size: 2400 mm high, 900 mm wide, 1.5 m² on face.

Drawer fronts: Route for drawer bottoms.

Finish:

- Internally: Shelves Melamine. Colour: White.
- Drawers and Doors: Finish to match external finish.
- Externally: As noted on drawings, and *Internal Finishes and Colour Schedule*.

44.4.4 BENCHTOPS**Benchtops**

Material: Select from the following:

- Medium density fibreboard.
- High moisture resistant particleboard.

Benchtop thickness: 33 mm unless noted otherwise on drawings.

Finish: As noted on drawings, and *Internal Finishes and Colour Schedule*.

Exposed edges: Extend laminate over shaped nosing, finishing > 50 mm back on underside.

Splay outside corners at 45°.

Front edge to laminate benchtops: post formed bullnose in profile.

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Sealing underside: Laminate undersides of benchtops if:

- The subject to excessive moisture from equipment such as dishwashers; or
- The benchtop is not restrained against warping by cupboard carcass or support framing.

Installation: Scribe to walls. Fix to carcass at least twice per 600 mm length of benchtop.

Joint sealing: Fill joint with sealant matching finish and clamp with proprietary mechanical connectors.

44.4.5 HARDWARE**Door Hinges**

Hinge types: Concealed metal hinges with the following features:

- Adjustable for height, side and depth location of door.
- Concealed wide opening (170 degrees) heavy duty.
- Self closing action.
- Hold open function.
- Nickel plated.

Hinges per cupboard leaf: Doors not exceeding any of the following may have two hinges per door leaf:

- 1500 mm high
- 820 mm wide
- 25 mm thickness
- Thirty kilogram mass.

Provide three hinges for all other doors.

Piano hinges: Chrome plated steel, extending full height of doors.

Folding Door Fittings

Location: JL103.

Requirement: Install bifold folding door fitting system including all necessary fixings, track, runners and the like.

Proprietary System: Hafele Hawa- Bifold 40 Folding door system.

Drawer hardware

Slides generally: Metal runners and plastic rollers with the following features:

- 30 kg loading capacity.
- Closure retention.
- Proprietary item: Hafele single extension soft roller 30 RES. Finish: Steel.

Slides where full extension required: Metal runners and plastic rollers with the following features:

- 50 kg loading capacity.
- Closure retention.
- Proprietary item: Hafele soft roller 50 KTS full extension drawer runner. Finish: Steel.

VILLAGE PARK REDEVELOPMENT MONA VALE**Cupboard and drawer handles**

Extruded aluminium handle:

- Type: Extruded aluminium profile running continuously along nominated edge of drawer door.
- Proprietary item: Hafele aluminium extruded handle Cat No 126.21.902.
- Finish: Silver anodised.

D Handles generally:

- Type: 136 x 35 Satin Chrome plated, matt d-handle.
- Proprietary item: Hafele Cat 117.97.401.

D Handles to JL1.03:

- Type: 1000 mm long x 10 mm diameter round d-handle.
- Proprietary item: Barben Industries Round Line BAC-421-9.
- Finish: Satin Stainless Steel.

Cupboard Locks

Requirement: Install locks at location nominated on drawings and *Internal Finishes and Colour Schedule*. Provide matching recessed escutcheons for all locks and install locks and escutcheons.

- Proprietary item: Hafele Symo 3000 locking system, components as required to complete locking in locations nominated.

Keying:

- Generally: All locks are to be keyed alike.
- IC2.02: Tender box door, requires two locks, each keyed differently to all other locks.

Installation: Install locks at the top leading edge of cupboard doors, unless nominated otherwise on drawings. Provide matching recessed escutcheons for all locks and install locks and escutcheons.

Monitor Support Brackets

Requirement: Install single or double swing arm monitor support bracket, with bolt fixing to benchtop and direct monitor mounting, as nominated on drawings. Installation shall be strictly to manufacturers installation details. Confirm with Superintendent the monitor model and brand prior to ordering.

Proprietary item: Atdec Spacedec swing arm monitor bracket.

Cash Drawers

Requirement: Install cash drawers in nominated locations including all cabling and fixings. Provide blocking as required to fit drawer to cabinet opening.

Proprietary item: Norwood Cash Drawer Model 107 M3 with insert type A.

Keying: All locks to be keyed alike.

File Hangers

Requirement: Install file hangers to drawers nominated as file drawers on drawings. Hanger to be parallel to front and back of drawer to hold standard A4 file holders. Height of hanger within drawer to be located to allow file tabs to clear drawer or carcass over. All file drawers to open to full extent to allow access to file hangers.

Proprietary item: Hafele Variant - SE 400.

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Cable Management Inserts

Cable management inserts: Where shown on drawings install cable management insert equal to Hettich 80 mm diameter 70 200 005 cable cap.

Colour: Black.

Ventilation grilles

Requirement: Where nominated on drawings install ventilation grilles with all required fixings and accessories.

Proprietary item: Hafele ventilation grille plates, Cat No: 575.24.900

Size: 570 mm wide x 57 mm high

Colour: Silver.

Paper Re-cycling Baskets

Requirement: Where nominated on drawings loose install wire basket in cupboard. Install plastic laminate finished stopper at back of bottom carcass member to locate basket directly behind door in closed position. Ensure door closes tightly.

Proprietary item: Hafele laundry basket, cat No 540.06.763.

Size: 400 mm wide x 500 mm deep x 450 mm high

Finish: Steel plastic coated, white.

Tea towel rail

Proprietary, water resistant rail, approximately 350 mm long, fixed to the back of the cupboard door under, or near the sink bowl. Rail shall be approximately 60 mm from face of door.

- Proprietary item: Hafele 124.22.936, Silver colour anodised, label and transparent cover included.

44.5 ELEMENTS**44.5.1 FABRIC PINBOARDS****Description:**

Fabric covered pin boards, within timber surround frame, concealed, fixed to walls.

Locations: Refer to drawings.

Size

Item No:	Width:	Height:
JL109	1200 mm	1200 mm
JL110	4000 mm (Confirm on site)	From top of skirting to underside of ceiling, 2750 mm
JL111	4000 mm	From top of skirting to underside of ceiling, 2750 mm
JC209	10000 mm (Confirm on site)	From top of skirting to line of splay in wall; 1900 mm approx confirm on site

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JC210	2100 mm (Confirm on site)	From top of skirting to ceiling, 1900 mm approx, confirm on site
JC211	3000 mm	1900 mm
JC212	2600 mm (Confirm on site)	From top of skirting to ceiling, 1900 mm approx, confirm on site

Panel sizes: panel size to suite fabric width. If a number of panels are required per board the number of panels, shall be equal and butted hard to the adjacent panels with no open joints.

Material:

- Fibreboard: Canite
- Frame to fibreboard: 30 mm (finished timber framing and bracing around fibreboard mitre at corners, and glue of pin to backing. The framing shall be concealed.
- Fabric: Macquarie Fabrics Integrity range, to be bonded to fibreboard.
- Overall Frame: 15 mm finished width, timber frame. Depth of timber frame to be overall board depth. Timber: Sydney Blue Gum. Finish: Clear coat 2 pack polyurethane refer *Painting* section for details.

Fixing

Continuous aluminium 'J' extrusions, concealed spines, or other approved method at the top and bottom, which allow the boards to be relocated. The fixing method shall be hidden from view and recessed from the edge.

44.5.2 TIMBER PANELLED WALLS**Location**

JC213, in Meeting Room 2 SC203.

Description

Timber veneered wall panels, laid out as shown on the drawings. Panels to be a mix of flush panels and perforated panels. Final locations of perforated panels to be advised. Contractor to allow 30% panelling to be perforated within Contact Sum.

Flush Material: 18 mm Medium Density Fibreboard, finished with Timber veneer. Refer *Internal Finishes and Colour Schedule* for type, and finish. Note all visible edges are to be timber veneered to match face of panels.

Perforated Material: 18mm medium density fibreboard, finished with timber veneer, with 4.5mm diameter holes at 25mm centres. Perforations to be equal to Acoustilux Decorply patten type 250. Refer *Internal Finishes and Colour Schedule* for type and finish.

Fixings: Concealed fixed with galvanised mild steel J brackets or split battens.

44.5.3 SHOWER CHANGE SEAT**Location**

SC116.

Description

Timber batten benches, supported on steel frame fixed to wall.

Size:

VILLAGE PARK REDEVELOPMENT MONA VALE

- Depth: 380 nominal
- Length: Refer to drawings.

Battens: Secure 75 x 38mm dressed timber battens to support brackets, through pre-drilled holes with galvanised countersunk screws. Chamfer edges of battens.

- Timber/finish: Refer to *Internal Finishes and Colour Schedule*.
- Setout: Back batten to be 10mm off wall with 10mm spaces between intermediate battens.

Brackets: Form brackets from galvanised mild steel comprising of horizontal and vertical member joined by a diagonal member, set 75mm in from ends of main members. All joints to be fully welded. Weld insert plate into exposed end of horizontal member, and grind smooth.

- Member sizes: 50 x 50 x 2 galvabond RHS.
- Finish: Powdercoat, refer *Internal Finishes and Colour Schedule*.

Bracket Spacing: Maximum 600mm centres.

Fixing: Fix securely to wall through vertical member. Allow for additional studs to wall as required to fix bench. Finish fixings to match brackets.



Graphics

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects

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A		Preliminary
B	28.02.03	Tender Issue

VILLAGE PARK REDEVELOPMENT MONA VALE

45.1 GENERAL**45.1.1 SECTION CONTENT****General**

The Works include but are not limited to graphics generally, including graphic symbols, sign and letter systems and the like.

45.1.2 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 1319	1994	Safety signs for the occupational environment
AS 1366.3	1992	Rigid cellular polystyrene - Moulded (RC/PS - M)
AS 1428.1	2001	Designing for access and mobility - General requirements for access - New building work.
AS 1874	2000	Aluminium and aluminium alloys - Ingots and castings
AS 2342	1992	Development, testing and implementation of information and safety symbols and symbolic signs
AS 2899		Public information symbol signs

45.1.3 CROSS REFERENCES**General**

Refer to the *General requirements* section.

Related sections

Refer to the following sections:

- *Adhesives, Sealants and Fasteners*: For these items generally.
- *Metals and Prefinished*: For metal finishes.
- *Door and Door Hardware Schedule*: For Door Hardware.

45.1.4 STANDARDS**Signs**

Signs generally - design and use: To AS 2342.

Public information signs: To AS 2899.

Safety signs - design and use: To AS 1319.



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45.2 QUALITY

45.2.1 INSPECTION

Witness points

Item	Inspection Type	Notice	References
Shop drawings	Hold point	3 days	
Graphics items delivered to site before installation.	Witness point	3 days	
Building locations or substrates prepared to receive graphics items before they are installed.	Witness point	3 days	

45.2.2 SAMPLES

General

Materials: Submit samples showing each colour and finish of exposed graphics materials and accessories. If there is a range of colours and/or textures for a particular item, submit samples showing the extremes and mean of the range.

45.2.3 SUBMISSIONS

Shop drawings

General: Submit shop drawings showing the following information where relevant:

- Layout, construction and fixing details for sign systems.
- Large scale (full size if practicable) lettering layouts for individual letter signs.
- Full size spacing templates for individually mounted characters.
- Location template drawings for anchorages to permanent construction. Show type of anchorage.

45.3 MATERIALS AND WORKMANSHIP

45.3.1 MATERIALS

Materials standards

Aluminium:

- Plate for engraving: Alloy and temper designation 6063-0.

Stainless steel: Surface finish designation 4 (general purpose polished).

Plastics:

- UPVC sheet: Semi-rigid sheet.
- Rigid cellular polystyrene: To AS 1366.3, class VH for cut-out shapes.

VILLAGE PARK REDEVELOPMENT MONA VALE**45.3.2 WORKMANSHIP****Production**

General: Form graphics items accurately with clean, well-defined edges or arises, free from blemishes.

Engraving: Precision machine engraving resulting in sharp edges and smooth excavated surfaces, filled with the colour, or excavated to expose the substrate in two-colour sheet plastic engraving.

Cut-out shapes: Cut from solid material and hand finish as necessary.

Built-up shapes: Fabricate individual three-dimensional shapes by building up the faces and edges from separate pieces neatly and securely joined.

Installation

General: Install signage level and plumb, securely mounted, with concealed theft-resistant fixings.

45.4 SIGNAGE

45.4.1 SIGNS**Sign Type A**

Locations: refer *Signage Schedule* and drawings.

Description: External single sided directional sign, with multiple slats supported on two posts, equal to Wood & Wood Paneltex signage system

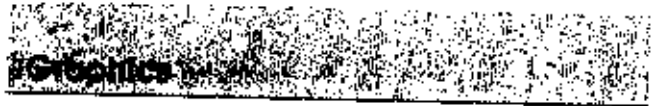
- type: 38 mm pole panels, complete with all fixings and accessories.
- Width: 600 mm
- Top Slat height: 150 mm
- Slat height generally: 100 mm

Lettering:

- Font: Helvetica medium.
- Colour: To be selected.
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

- Generally: 40 mm.
- Top slat font: 25 mm.



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Slat	Text	Arrow
Top	Council Logo on colour patch followed by Pittwater Council	
2 nd slat down	Mona Vale Library	Up
3 rd slat down	Accessible path to Park Street	Left
4 th slat down	Memorial Hall	Up
5 th Slat down	Customer Service Centre	45 degrees to right

Sign Type B

Locations: refer *Signage Schedule* and drawings.

Description: External double sided directional sign, with multiple slats supported on two posts, equal to Wood & Wood Paneltex signage system

- type: 38 mm pole panels, complete with all fixings and accessories.
- Width: 600 mm
- Top Slat height: 150 mm
- Slat height generally: 100 mm

Lettering:

- Font: Helvetica medium.
- Colour: To be selected.
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

- Generally: 40 mm.
- Top slat font: 25 mm.

Slat	Text	Arrow
Top	Council Logo on colour patch followed by Pittwater Council	
2 nd slat down	Accessible path to Mona Vale Library	Right
3 rd slat down	Accessible path to Park Street	Right

VILLAGE PARK REDEVELOPMENT MONA VALE

Slat	Text	Arrow
Top	Council Logo on colour patch followed by Pittwater Council	
2 nd slat down	Memorial Hall	Left
3 rd slat down	Pittwater Road	Left

Sign Type C

Locations: refer *Signage Schedule* and drawings.

Description: Typical refer sign B for details.

Slat	Text	Arrow
Top	Council Logo on colour patch followed by Pittwater Council	
2 nd slat down	Accessible path to Mona Vale Library	Right
3 rd slat down	Accessible path to Park Street	Right

Slat	Text	Arrow
Top	Council Logo on colour patch followed by Pittwater Council	
2 nd slat down	Memorial Hall	Left
3 rd slat down	Pittwater Road	Left

Sign Type D

Locations: refer *Signage Schedule* and drawings.

Description: Typical refer sign A for details.

Slat	Text	Arrow
Top	Council Logo followed by Pittwater Council	
2 nd slat down	Customer Service Centre	Up
2 nd slat down	Mona Vale Library	Up
3 rd slat down	Accessible path to Memorial Hall	Left
4 th slat down	Accessible path to Pittwater Road	Left

Sign Type E

Locations: refer *Signage Schedule* and drawings.

VILLAGE PARK REDEVELOPMENT MONA VALE

Description: Typical refer sign B for details.

Slat	Text	Arrow
Top	Council Logo followed by Pittwater Council	
2 nd slat down	Early Childhood Health Centre	Right

Slat	Text	Arrow
Top	Council Logo followed by Pittwater Council	
2 nd slat down	Early Childhood Health Centre	Left

Sign Type F

Locations: refer *Signage Schedule*.

Description: Laser cut aluminium letters mounted on aluminium plate or fixing rods.

Component	Description	Setout
Logo	Pittwater Council Logo Size: (height): 200 mm diameter Finish: Anodised or powdercoat Colour: To be selected.	To mounted 50 mm above main text. Lettering setout: - to align with left end of line.
Main Text	Text: Pittwater Council Size: (height): 150 mm high. Font: Helvetica Medium Finish: Anodised or powdercoat Colour: To be selected.	Fixed with rods set into timber cladding, with letters mounted 20 mm above line. Lettering setout: - to align with left end of line.
Line	Width: 5 mm Length: 2000 mm Finish: Anodised or powdercoat Colour: To be selected.	Fixed with rods set into timber cladding.
Lower text	Text: Customer Service Centre Mona Vale Library Size: (height): 60 mm. Font: Helvetica Medium Finish: powdercoat Colour: Dulux powdercoat to match Dulux architectural coating Pearl White S0277.	Fixed with rods set into timber cladding, with letters mounted 75 mm below line and 20 mm between each line. Lettering setout: - to align with left end of line.

VILLAGE PARK REDEVELOPMENT MONA VALE

Material: Aluminium

Cutout Letters: 5 mm thick

Rods: Minimum 35 mm long aluminium rod. Epoxy fix rod into façade, set with back face of lettering aligning with front face of line.

Line plate: 3 mm thick.

Sign Type G

Locations: refer *Signage Schedule*.

Description: Laser cut aluminium letters mounted on aluminium plate or fixing rods.

Component	Description	Setout
Logo	Pittwater Council Logo Size: (height): 200 mm diameter Finish: Anodised or powdercoat Colour: To be selected.	To mounted 50 mm Main text. Lettering setout: - to align with left end of line.
Main Text	Text: Pittwater Council Size: (height): 150 mm high. Font: Helvetica Medium Finish: Anodised or powdercoat Colour: To be selected..	Fixed with rods set into timber cladding, with letters mounted 20 mm above line. Lettering setout: - to align with left end of line.
Line	Width: 5 mm Length: 2000 mm Finish: Anodised or powdercoat Colour: To be selected.	Fixed with rods set into timber cladding.
Lower text	Text: Customer Service Centre Size: (height): 60 mm. Font: Helvetica Medium Finish: powdercoat Colour: Dulux powdercoat to match Dulux architectural coating Pearl White S0277.	Fixed with rods set into timber cladding, with letters mounted 75 mm below line and 20 mm between each line. Lettering setout: - to align with left end of line.

Material: Aluminium

Cutout Letters: 5 mm thick

Rods: Minimum 35 mm long aluminium rod. Epoxy fix rod into façade, set with back face of lettering aligning with front face of line.

Line plate: 3 mm thick.

Sign Type H

Locations: refer *Signage Schedule* and drawings.

Description: Wall mounted directional sign, with multiple slats, equal to Wood & Wood Infotex signage system

- Width: 900 mm

VILLAGE PARK REDEVELOPMENT MONA VALE

- Top Slat height: 150 mm
- Slat height generally: 100 mm

Lettering:

- Font: Helvetica medium.
- Colour: To be selected.
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

- Text font: 40 mm.
- Small font: 25 mm.

Slat	Text	Font size
Top	Council Logo on colour patch followed by Pittwater Council	Small font
2 nd slat down	Customer Service Centre	Text Font
3 rd slat down	Proceed up to level above Opening Hours Monday to Friday 8.30 am – 6.00 pm	Small font
4 th slat down	Mona Vale Library	Text Font
5 th Slat down	Proceed to left and down ramp Opening Hours Monday to Wednesday 8:00am - 7:00pm Thurs - Fri 8:00am - 6:00pm Saturday 9:00am - 2:00pm Sunday 1:00pm- 4:00 pm	Small font

Sign Type J

Locations: refer *Signage Schedule*.

Description: aluminium signage plate with self adhesive vinyl lettering and line. The lettering shall be placed directly on top of the line.

Plate:

- Material: 1.6 mm thick aluminium.
- Size: Generally 70 mm high x width of door leaf minus frame size. Length is to relate to door size. Generally doors are to have a 20 mm margin between edge of door and signage panel.
- Finish: Clear anodised.

Lettering:

- Font: Helvetica medium.
- Colour: To be selected.
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

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- Generally: 40 mm.
- Small font: 30 mm.

Lettering Setout:

- Underside of lettering: 20 mm to lettering generally.
- Left side of lettering: 80 mm from edge of plate.
- Lettering to be left justified.

Line: Provide line under letters.

- Width: 5 mm.
- Length: 600 mm.
- Setout from left side of plate: 25 mm.
- Setout from bottom of plate: 10 mm.
- Material: Self Adhesive vinyl sheet.
- Colour: To be selected

Plate Mounting Location (solid core doors):

- Vertically: Align bottom of plate at 1200 mm above floor level.
- Horizontally: Centred on door in closed position.

Plate Mounting Location (glazed doors):

- Vertically: To match solid core doors, unless noted otherwise in schedule.
- Horizontally: To match opening size between aluminium stiles to door.

Fixing Method: Direct stick to substrate.

Sign Type K

Locations: refer *Signage Schedule*.

Description: Raised tactile text, with raised symbols and braille text imbedded to aluminium signage plate. Equal to Pitt and Co (Aust) Visualise system (Telephone 07 4122 4199).

Standard: To AS1428.1 and Building Code of Australia.

Plate:

- Material: 1.6 mm aluminium
- Size: 150 mm high x width of door minus frame.
- Colour: To be selected.
- Pictogram height: 120 mm.

Fixing Method: Direct stick to substrate.

Sign Type L

Locations: refer *Signage Schedule*.

Description: Single sided sign suspension mounted from concrete beam over, with multiple slats, equal to Wood & Wood Infotex signage system

- Width: to suit text and arrows
- Slat height: 100 mm

VILLAGE PARK REDEVELOPMENT MONA VALE

Lettering:

- Font: Helvetica medium.
- Colour: To be selected.
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

- Generally: 40 mm.

Slat	Left Side	Right Side
Top slat	Arrow (pointing left) followed by Non Fiction	Fiction/ Large Print followed by arrow (Pointing up)
2 nd Slat down	Arrow (pointing left) followed by Childrens	Referecne followed by arrow (Pointing up)
3 rd slat down		Local Studies followed by arrow (Pointing up)

Sign Type M

Locations: refer *Signage Schedule* and drawings.

Description: Typical refer sign L. for details.

Slat	Left Side
Top slat	Arrow (pointing up) followed by ublic Toilets, followed by Accessible symbol

Sign Type N

Locations: refer *Signage Schedule*.

Description: Self adhesive vinyl lettering fixed directly to glazing. Each panel to include a maximum of 10 lines of text, equally spaced and set 50 mm off framing.

Text to be selected and advised.

Lettering:

- Font: Helvetica Light.
- Colour: White.
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

- Generally: 40 mm

Lettering Setout:

- Vertically: Align bottom of top line of text at 1000 mm above floor level.
- Vertically: Each line of text to be 40 mm apart.
- Horizontally: centred on door leaf or window division.

Fixing Method: Direct stick to substrate.

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Sign Type P

Locations: refer *Signage Schedule*.

Description: Typical refer sign H for details. Width: 600 mm.

Slat	Text	Font size and arrow
Top	Council Logo on colour patch followed by Pittwater Council	Small font
2 nd slat down	Mona Vale Library	Text Font/ Down
3 rd slat down	Public Toilets	Text Font/ Down

Sign Type Q

Locations: refer *Signage Schedule* and drawings.

Description: Double sided sign mounted projecting from column, with single slat, equal to Wood & Wood Infotex signage system

- Width: 600 mm
- Slat height: 150 mm

Lettering:

- Font: Helvetica medium.
- Colour: To be selected.
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

- Generally: 40 mm.

Sign Type R

Locations: refer *Signage Schedule*.

Description: self adhesive vinyl lettering fixed directly to glazing to joinery.

Lettering:

- Font: Helvetica Medium.
- Colour: To be selected.
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

- Generally: 40 mm

Lettering Setout: left justified, set 50 mm from top edge of glass.

Fixing Method: Direct stick to substrate.

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Sign Type S

Locations: refer *Signage Schedule*.

Description: Self adhesive vinyl lettering fixed directly to glazing.

Lettering:

- Font: Helvetica Light.
- Colour: To be selected
- Material: Self adhesive vinyl lettering.
- Case: upper and lower case lettering.

Lettering size height:

- Generally: 40 mm

Lettering Setout:

- Vertically: Align bottom of top line of text at 1000 mm above floor level.

Fixing Method: Direct stick to substrate.

Sign Type T

Locations: refer *Signage Schedule*.

Description: Laser cut aluminium letters mounted on aluminium plate or fixing rods.

Component	Description	Setout
Logo	Pitwater Council Logo Size: (height): 300 mm diameter Finish: Anodised or powdercoat Colour: To be selected.	Refer drawings
Main Text	Text: Pitwater Council Size: (height): 180 mm high. Small font 135 mm. Font: Helvetica Medium Finish: Anodised or powdercoat Colour: To be selected..	Fixed with rods set into timber. Refer drawings for setout.

Material: Aluminium

Cutout Letters: 3 mm thick

Rods: Minimum 25 mm long aluminium rod. Epoxy fix rod into MDF.

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45.5 Graphics Schedules**45.5.1 GRAPHICS SCHEDULE EXPLANATION****Graphic Number**

- First letter: G for Graphics.
- Following three digits: Graphic number, the first number refers to level of building sign located.

Location generally: Door or space number.

Type: Refer to the Specification for further descriptions.

Symbols: Symbol numbers refer to Australian Standards or other symbols. Refer to the Specification.

Location

Generally: Door or space number.

45.5.2 LIBRARY GRAPHICS SCHEDULE

Graphic Number	Type	Location	Sign/Graphics	Notes
GL101	H	SL101	Directional signboard	
GL102	J	DC117	Staff Only	A blank plate to be installed to opposite face of glass to conceal fixings
GL103	K	WC114	Public Toilets and "directional arrow"	A blank plate to be installed to opposite face of glass to conceal fixings
GL104	K	DL104	Unisex Toilet	To include male and female pictograms
GL105	K	DL105	Accessible Toilet/ Baby Change	To include accessible pictogram
GL106	J	DL106	Staff Only	A blank plate to be installed to opposite face of glass to conceal fixings
GL107	K	DL107	Accessible Toilet/ Baby Change	To include accessible pictogram
GL108	K	DL108	Toilets	To include male and female pictograms
GL109	K	DL109	Male Toilet	To include male pictogram
GL110	K	DL111	Female Toilet	To include female pictogram

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GL111	J	DL129	Staff Toilets	
GL112	J	DL132	Fire Hose Reel	
GL113	J	DL133	Fire Safety Door Do not obstruct	
GL114	J	DL134	Fire Safety Door Do not obstruct	
GL115	J	DL123	Staff Room	
GL116	J	DL122	Store	
GL117	J	DL125	Computer Systems	
GL118	S	DL121	Local Studies	
GL119	S	DL119	Study Room	
GL120	S		Local Studies Librarian	
GL121	S	DL117	Fire Safety Door Only Do not obstruct	
GL122	J	DL140	Fire Hose Reel	
GL123	J	DL128	Fire Safety Door Only Do not obstruct	To Public side of door
GL124	L	SL107	Hanging directional sign	To be hung from underside concrete beam at top of ramp 2
GL125	M	SL107	Hanging directional sign	To be hung from underside concrete beam adjacent to toilet entry
GL126	N	DL120		
GL127	N	WL109		
GL128	N	DL122		
GL129	N	DL121		
GL130	N	WL108		
GL131	N	DL119		
GL132	N	WL107		
GL133	N	WL102		
GL134	N	WL103		
GL135	N	WL104		
GL136	N	WL111		
GL137	N	DL116		
GL138	P	SL2.07	Wall mounted directional sign	To be wall mounted on wall to stair

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GL139	J	DL128	Fire Safety Door Do not obstruct	To Workroom Side of Door
GL140	R	JL102	Information	
GL141	R	JL102	Borrowing Enquiries	
GL142	Q	SL107	Borrowing	Above self check unit location on JL101

46.5.2 COUNCIL OFFICES GRAPHICS SCHEDULE

Graphic Number	Type	Location	Sign/Graphics	Notes
GC101	J	DC206	Meeting Room	A blank plate to be installed to opposite face of glass to conceal fixings
GC102	K	DC101	Monavale Early Childhood Health Centre Opening Hours Monday to Friday 9.00am - 4.30 pm Telephone (number to be advised)	
GC103	K	DC204	Pitwater Council Customer Service Centre Opening Hours Monday to Friday 8.30am - 6.00 pm	
GC104	J	DC107	Fire Hose Reel	
GC105	J	DC102	Consultation 1	
GC106	J	DC103	Consultation 2	
GC107	J	DC104	Consultation 3	
GC108	K	DC105	Toilet/ Baby Change	
GC109	J	DC106	Staff Only	
GC110	J	DC113	Shower	
GC111	J	DC204	Fire Safety Door Only Do not obstruct	To customer service side of door
GC112	J	DC204	Fire Safety Door Do not obstruct	To Utility Room Side of Door
GC113	J	DC203	Kitchenette	
GC114	J	DC205	Kitchenette	
GC115	J	DC202	Conference Room	

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GC115	R	JC203	Reception
GC116	R	JC204	Service Counter 1
GC117	R	JC207	Service Counter 2
GC118	R	JC206	Service Counter 3
GC119	T	JC202	Corporate Sign

46.5.2 EXTERNAL GRAPHICS SCHEDULE

Graphic Number	Type	Location	Sign/Graphics	Notes
GE101	A	Refer Drawings	Two sided directional sign	
GE102	B	Refer Drawings	Two sided directional sign	
GE103	C	Refer Drawings	Two sided directional sign	
GE104	D	Refer Drawings	Single sided directional sign	
GE105	E	Refer Drawings	Single sided directional sign	
GE106	F	Awning wall to Level 1 Entry	Building signage	
GE107	G	Building Façade adjacent level 2 entry	Building signage	

BREWSTER HJORTH ARCHITECTS

Graphics

VILLAGE PARK REDEVELOPMENT MONA VALE

**Internal Finishes &
Colour Schedule**

46

VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

BREWSTER HJORTH ARCHITECTS

Internal Finishes Schedule

VILLAGE PARK REDEVELOPMENT MONA VALE



brewsterhjorth Architects
February 2003
20151 SP550

VILLAGE PARK REDEVELOPMENT MONA VALE

46.1 GENERAL**46.1.1 REFERENCES**

- Refer to *Colour Generally - Painting* for description of "White".

46.1.2 DEFINITIONS**Colour Ranges:**

- Dulux references are to Dulux colour specifier colour range
- Taubmans references are Taubmans Spectrum range.

Colours:

Colour A:	Dulux Ecu P15.D1
Colour B:	Feature colour to be selected
Colour C:	Dulux Night Shade P47.B7
Colour D:	Dulux Henna Red P04.F9
Colour E:	Dulux Hokey Pokey P14.F6
Colour F:	Dulux Night Shade P47.B7
Colour G:	Dulux Lexicon PW1.G9
Colour H:	Dulux Tranquil retreat PG1.F1
Colour J:	Dulux Endless Dusk PG1.F3
Colour K:	Colour to be selected

46.1.3 NOTES

Note A: Remove all loose paint, fill damaged areas, sand flush and repaint.

46.2 LEVEL 1 LIBRARY SCHEDULE**46.2.1 SL1.01 - ENTRY FOYER**

Element	Finish	Type/ Colour
FLOOR:	Concrete / Timber Boarding	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
WALLS Existing Masonry:	Existing face brickwork	Clean existing brickwork
WALLS Masonry:	Face brickwork	Dry pressed facebrick to match existing library building

VILLAGE PARK REDEVELOPMENT MONA VALE

WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
WALLS Western wall:	Set plasterboard/ Paint	Low gloss latex Colour B
WALLS Lift shaft:	Concrete/ White set plaster/ Paint	Low gloss latex Colour A
STEEL FRAMING:	Steel/Paint	Full gloss two pack polyurethane Colour: D
CEILING:	Concrete/ White set plaster/ Paint	Flat latex Colour: Ceiling white
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: C
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: A
THRESHOLD External doors:	Terrazzo	To be confirmed, to match paving colour
WINDOW & GLAZED PARTITION FRAMING:	Aluminium / Anodised	Colour: Clear
ENTRY MAT:	Refer <i>Carpet</i> section for details	

46.2.2 SL1.02 - PASSAGE

Element	Finish	Type/ Colour
FLOOR:	Concrete / Timber Boarding	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
WALLS Existing Masonry:	Existing face brickwork	Clean existing brickwork
WALLS Masonry:	Face brickwork	Dry pressed facebrick to match existing library building
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
WALLS Existing Columns:	Existing Concrete/ Paint	Low gloss latex Colour G
CEILING:	Concrete/ White set plaster/ Paint	Flat latex Colour: Ceiling white

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SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
DOORS:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour C
GLAZED PARTITION FRAMES:	Aluminium / Anodised	Colour: Clear

46.2.3 SL1.03 - WC

Element	Finish	Type/ Colour
FLOOR:	Concrete / Ceramic tiles	Classic Ceramics 200 x 200 vitrified floor tile Colour: TK 2119
WALLS Light weight: generally	Set plasterboard/ Ceramic tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss
WALLS Western light weight	Set plasterboard / ceramic tiles	Classic Ceramics Vogue Range Ceramics 100 x 100 glazed ceramic Colour: In Giallo (interni) or Pervinea (interni) to be confirmed
CEILING:	Concrete/ White set plaster/ Paint	Flat latex Colour: Ceiling white
CEILING BULKHEADS:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour C
DOORS:	Timber/ Paint	Full gloss solvent borne Colour C

46.2.4 SL1.04- ACCESSIBLE WC

Element	Finish	Type/ Colour
FLOOR:	Concrete / Ceramic tiles	Classic Ceramics 200 x 200 vitrified floor tile Colour: TK 2119
WALLS Light weight: north and west	Set plasterboard/ Ceramic tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss

VILLAGE PARK REDEVELOPMENT MONA VALE

WALLS Light weight South:	Set plasterboard/ ceramic tiles	Classic Ceramics Vogue Range Ceramics 100 x 100 glazed ceramic Colour: In Giallo (interni) or Pervinca (interni)
WALLS Existing eastern wall:	Existing brickwork/ Cement render/ Ceramic tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss
CEILING:	Concrete/ White set plaster/ Paint	Flat latex Colour: Ceiling white
CEILING BULKHEADS:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour C
DOORS:	Timber/ Paint	Full gloss solvent borne Colour C

46.2.5 SL1.05 - LIBRARY ENTRY/ DISPLAY

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Masonry:	Face brickwork	Dry pressed facebrick to match existing library building
WALLS Walls under external glazed wall:	Off form concrete (Class 2)	-
STRUCTURAL STEEL:	Steel /Paint	Full gloss two pack polyurethane Colour: D
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
WINDOW AND DOOR FRAMING:	Aluminium / Anodised	Colour: Clear
BALUSTRADES:	Steel /Paint	Full gloss two pack polyurethane Colour: H
HANDRAIL:	Timber /Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system

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SLAB EDGE UNDER
BALUSTRADES: Timber /Paint
Timber: Blackbutt
Paint: Clear Co-polymer floor
paint system

46.2.6 SL1.06- RAMP 1
Typical refer SL1.05 – Library Entry/ Display.

46.2.7 SL1.07 – COLLECTION/ READING 1

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Concrete wall to ramp 1:	Off form concrete (Class 2)	-
WALLS Masonry (western side of lift shaft):	Face brickwork	Dry pressed facebrick to match existing library building
WALLS Lift Shaft:	Concrete/ white set plaster/ Paint	Low gloss latex Colour A
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
COLUMNS:	Off form concrete (class 2)	-
SILLS To external windows:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
CEILING Slabs between exposed beams:	Concrete/ White set plaster/ Paint	Flat latex Colour: Ceiling white
CEILINGS Exposed beams:	Off form concrete (Class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOORS Generally:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAMES Generally:	Steel/ Paint	Full gloss solvent borne Colour C
DOORS D135:	Timber/ Paint	Full gloss solvent borne Colour A

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DOOR FRAMES D135:	Steel/ Paint	Full gloss solvent borne Colour A
WINDOW FRAMES:	Aluminium / Anodised	Colour: Clear
JOINERY Generally: Veneer type 1, as nominated on drawings	Timber Veneer/Paint	Timber: Quarter Victorian Ash Paint: Two pack clear lacquer
JOINERY Generally: Veneer type 2, as nominated on drawings	Timber Veneer/Paint	Timber: Red Gum Paint: Two pack clear lacquer
JOINERY Cupboard fronts (PL1)	Plastic Laminate	Colour: Laminex Eggplant 483 Finish: Natural
JOINERY Shelving and surrounds (PL2)	Plastic Laminate	Colour: Abet Laminati 868 Finish: SEI
JOINERY JL105 Benchtop and carcass end	Timber Veneer/Paint	Timber: Quarter Victorian Ash Paint: Two pack clear lacquer
JOINERY JL105 Cupboard fronts	Plastic Laminate	Colour: Laminex Eggplant 483 Finish: Natural

46.2.8 SL1.08 - RETURNS

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour A
WALLS Western:	Set plasterboard/ Paint	Low gloss latex Colour E
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
COLUMNS:	Off form concrete (class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOORS:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour C

VILLAGE PARK REDEVELOPMENT MONA VALE

46.2.9 SL1.09- ACCESSIBLE WC

Element	Finish	Type/ Colour
FLOOR:	Compressed FC / Ceramic tiles	Classic Ceramics 200 x 200 vitrified floor tile Colour: TK 2119
WALLS Light weight: generally	Set plasterboard/ Ceramic tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss
WALLS Light weight: southern wall	Set plasterboard/ Ceramic tiles	Classic Ceramics Vogue Range Ceramics 100 x 100 glazed ceramic Colour: In Giallo (interni) or Pervinea (interni)
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour C
DOORS:	Timber/ Paint	Full gloss solvent borne Colour C

46.2.10 SL1.10- WC
Typical refer SL1.09 - Accessible WC.

46.2.11 SL1.11- WC
Typical refer SL1.09 - Accessible WC.

46.2.12 SL1.12- CORRIDOR

Element	Finish	Type/ Colour
FLOOR:	Compressed FC / Ceramic tiles	Classic Ceramics 200 x 200 vitrified floor tile Colour: TK 2119
WALLS 100 high Skirting:	Set plasterboard/ Ceramic tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour A
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES Generally:	Steel/ Paint	Full gloss solvent borne Colour C

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DOORS Generally:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAMES DL111:	Steel/ Paint	Full gloss solvent borne Colour A
DOORS DL111:	Timber/ Paint	Full gloss solvent borne Colour A

46.2.13 SL1.13 - MULTI-PURPOSE ROOM

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour A
COLUMNS:	Off form concrete (class 2)	-
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
OPERABLE WALL: Surface	Fabric	Type: Macquarie Fabrics, Maximum range Colour: To be selected
OPERABLE WALL: Frame	Anodised	Colour: Clear
JOINERY Vertical Dividers:	Timber Veneer	Timber: Red Gum Paint: Two pack clear lacquer
JOINERY External cupboard doors:	Timber Veneer/Paint	Timber: Victorian Ash Paint:
JOINERY Splashback:	Set Plasterboard/Ceramic Tiles	Type: Classic Ceramics Vogue Range 100 x 100 glazed ceramic Colour: In Nero
JOINERY Cupboard doors to tea area	Plastic Laminate	Colour: Laminex Eggplant 483 Finish: Natural

46.2.14 SL1.14- PLANT ROOM

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete	-

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FLOOR Access platform:	Steel/ galvanised	-
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour A
WALLS Masonry:	Face blockwork	-
CEILING:	Concrete soffit	-
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour A
DOORS:	Timber/ Paint	Full gloss solvent borne Colour A

46.2.15 SL1.15 - RAMP 2

Element	Finish	Type/ Colour
FLOOR:	Compressed FC / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Concrete wall external façade:	Off form concrete (Class 2)	-
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
SILLS To external windows:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
CEILING Suspended louvres:	Aluminium/ Powdercoat	Colour: MX2 White Satin 32312
CEILING Above louvres:	Insulation / Paint	Low gloss latex Colour: Black
WINDOW FRAMES:	Aluminium / Anodised	Colour: Clear
BALSTRADES:	Steel / Paint	Full gloss two pack polyurethane Colour: H
HANDRAIL:	Timber / Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system

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46.2.16 SL1.16 - CHILDREN'S AREA

Element	Finish	Type/ Colour
FLOOR & STAIR 2:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
WALLS Concrete wall external façade and to wall under courtyard:	Off form concrete (Class 2)	-
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
COLUMNS:	Off form concrete (class 2)	-
SILLS To external windows:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
THRESHOLD To DLI.17 and WLI.05:	Terrazzo	Colour: To be selected
CEILINGS Exposed beams:	Off form concrete (Class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
WINDOW AND DOOR FRAMES:	Aluminium / Anodised	Colour: Clear
BALSTRADES:	Steel /Paint	Full gloss two pack polyurethane Colour: H
HANDRAIL:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
JOINERY Pinboard	Fabric	Type: Macquarie Fabrics, Maximum range Colour: To be selected
JOINERY Pinboard Frame	Timber / Paint	Timber: Blackbutt Paint: Clear Co-polymer interior timber paint system

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46.2.17 SL1.17 - COLLECTION/ READING 2

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Concrete wall to Northern wall:	Off form concrete (Class 2)	-
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
COLUMNS:	Off form concrete (class 2)	-
SILLS To external windows:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
CEILING Slabs between exposed beams:	Concrete/ White set plaster/ Paint	Flat latex Colour: Ceiling white
CEILINGS Exposed beams:	Off form concrete (Class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOORS:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour C
WINDOW FRAMES:	Aluminium / Anodised	Colour: Clear
GLAZED PARTITIONS AND DOORS:	Aluminium / Anodised	Colour: Clear
JOINERY Benchtop and carcass end	Timber Veneer/ Paint	Timber: Quarter Victorian Ash Paint: Two pack clear lacquer
JOINERY Cupboard doors	Plastic Laminate	Colour: Abet Laminati 868 Finish: SEI

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46.2.18 SL1.18 - STUDY ROOM

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Concrete wall to Northern wall:	Off form concrete (Class 2)	-
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
COLUMNS:	Off form concrete (class 2)	-
SILLS To external windows:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
CEILING Exposed beams:	Off form concrete (Class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR D118:	Timber/ Paint	Full gloss solvent borne Colour A
DOOR FRAME D118:	Steel/ Paint	Full gloss solvent borne Colour A
WINDOW FRAMES:	Aluminium / Anodised	Colour: Clear
GLAZED PARTITIONS AND DOORS:	Aluminium / Anodised	Colour: Clear

46.2.19 SL1.19 - STORE

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A

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COLUMNS:	Off form concrete (class 2)	-
CEILINGS Exposed beams:	Off form concrete (Class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAME:	Steel/ Paint	Full gloss solvent borne Colour C

46.2.20 SL1.20 - STAFF

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
WALLS Eastern:	Set plasterboard/ Paint	Low gloss latex Colour E
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
COLUMNS:	Off form concrete (class 2)	-
CEILINGS Exposed beams:	Off form concrete (Class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAME:	Steel/ Paint	Full gloss solvent borne Colour C
JOINERY: Benchtop and cupboard fronts	Plastic Laminate	Colour: Abel Laminati 868 Finish: SEI
JOINERY: Splashback	Set plasterboard/Ceramic tiles	Type: Classic Ceramics Vogue Range 100 x 100 glazed ceramic tile Colour: In Nero

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46.2.21 SL1.21 - COMPUTER SYSTEMS

Element	Finish	Type/ Colour
FLOOR:	Access floor / Linoleum Tiles	Type: Forbo Marmoleum dual range Colour: 713 Calico
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
CEILINGS Exposed beams:	Off form concrete (Class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAME:	Steel/ Paint	Full gloss solvent borne Colour C

46.2.22 SL1.22- COMPACTUS
Typical refer SL1.22 - Store

46.2.23 SL1.23- LIBRARY MANAGER

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
COLUMNS:	Off form concrete (class 2)	-
CEILINGS Exposed beams:	Off form concrete (Class 2)	-
CEILING Suspended ceilings:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
GLAZED PARTITIONS AND DOORS:	Aluminium / Anodised	Colour: Clear

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46.2.24 SL1.24 - WORKROOM

Element	Finish	Type/ Colour
FLOOR:	Access floor / Carpet	Type: Interface www dot Com range Carpet tiles Colourway: To be selected Size: 450 x 450
WALLS Light weight generally:	Set plasterboard/ Paint	Low gloss latex Colour A
WALLS Southern:	Set plasterboard/ Paint	Low gloss latex Colour F
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour A
COLUMNS:	Off form concrete (class 2)	-
CEILING Slabs between exposed beams:	Concrete/ White set plaster/ Paint	Flat latex Colour: Ceiling white
CEILINGS Exposed beams:	Off form concrete (Class 2)	-
DOORS Generally:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAMES Generally:	Steel/ Paint	Full gloss solvent borne Colour C
DOORS DL127 & DL138:	Timber/ Paint	Full gloss solvent borne Colour A
DOOR FRAMES DL127 & DL138:	Steel/ Paint	Full gloss solvent borne Colour A
GLAZED PARTITIONS:	Aluminium/Anodised	Colour: Clear
JOINERY: Cupboard fronts (PL1)	Plastic Laminate	Colour: Laminex Eggplant 483 Finish: Natural
JOINERY: Shelving and surrounds (PL2)	Plastic Laminate	Colour: Abet Laminati 868 Finish: SEI

46.2.25 SL1.25- WC

Typical refer SL1.09 - Accessible WC

46.2.26 SL1.26- WC

Typical refer SL1.09 - Accessible WC

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46.2.27 SL1.27- AIRLOCK

Typical refer SL1.12 - Corridor

46.2.28 SL1.28- FHR

Element	Finish	Type/ Colour
FLOOR:	Compressed Fibrous Cement	
WALLS: Masonry:	Face block work/paint	Low gloss latex Colour: A
WALLS: Light weight	Set plasterboard/paint	Low gloss latex Colour: A
CEILING	Conc. Slab over	
DOOR	Timber / paint	Full gloss solvent borne Colour: C
DOOR FRAME	Steel / paint	Full gloss solvent borne Colour: C

46.2.29 SL1.29 - CORRIDOR

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete	-
WALLS Masonry:	Face blockwork	-
CEILING:	Concrete soffit	
DOOR:	Timber/ Paint	Full gloss solvent borne Colour C
DOOR FRAME:	Steel/ Paint	Full gloss solvent borne Colour C
HANDRAIL:	Steel/ Paint	Full gloss polyurethane Colour: H

46.2.30 SL1.30- MAIN SWITCHBOARD

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete	-
WALLS:	Face blockwork	-

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CEILING:	Concrete soffit over	
DOORS:	Timber / Paint	Full glass solvent borne Colour C
DOOR FRAMES:	Steel / Paint	Full glass solvent borne Colour C

46.2.31 SL1.31- ACCESS CAVITY

Element	Finish	Type/ Colour
FLOOR:	Concrete / Cement topping	
WALLS: Masonry	Face blockwork	
WALLS: Light weight	Partition membrane, refer <i>Partitions</i> section for details	
CEILING:	Concrete soffit over	

46.2.32 SL1.32- ACCESS CAVITY

Element	Finish	Type/ Colour
FLOOR:	Concrete / Cement topping / Sealer	Water based concrete sealer, refer <i>Painting</i> section for details
WALLS:	Face blockwork / Sealer	Water based concrete sealer, refer <i>Painting</i> section for details
CEILINGS:	Face blockwork / Sealer	Water based concrete sealer, refer <i>Painting</i> section for details

46.2.33 SL1.33- PUMP CONTROLS

Element	Finish	Type/ Colour
FLOOR:	Compressed fibrous cement	-
WALLS: Masonry	Face blockwork	-
WALLS: Light weight	Set plasterboard / paint	Low gloss latex Colour: A
CEILING:	Concrete soffit over	-
DOOR:	Timber / Paint	Full glass solvent borne Colour C

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DOOR FRAMES: Steel / Paint Full glass solvent borne
Colour C

46.2.34 SL1.34-FHR

Element	Finish	Type/ Colour
FLOOR:	Concrete	-
WALLS:	Set plasterboard / paint	Low gloss latex Colour: A
CEILINGS:	Concrete soffit over	-
DOOR:	Timber / Paint	Full glass solvent borne Colour C
DOOR FRAMES:	Steel / Paint	Full glass solvent borne Colour C

46.2.35 SL1.35-LOCAL STUDIES.2

Typical refer SL1.23 – Library Manager

46.2.36 SL1.36-UPPER LOCAL STUDIES.1

Typical refer SL1.23 – Library Manager

LEVEL 1 COUNCIL OFFICES SCHEDULE

46.3.1 SCI.01 – CONSULTATION ROOM 1

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS generally:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Splash back to basin:	Set plasterboard/ Ceramic Tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: G

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WINDOW SILL:	Timber/ Paint	Full gloss solvent borne Colour: G
WINDOW FRAMING:	Aluminium / Anodised	Colour: Clear
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: J
DOOR:	Timber/ Paint	Full gloss solvent borne Colour: J

46.3.2 SC102 - CONSULTATION ROOM 2
Typical refer SC101 - Consultation Room 1

46.3.3 SC1.03 - PARENTS ROOM

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS generally:	Set plasterboard/ Paint	Low gloss latex Colour G
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: G
WINDOW SILL:	Timber/ Paint	Full gloss solvent borne Colour: G
WINDOW FRAMING & GLAZED PARTITION:	Aluminium / Anodised	Colour: Clear

46.3.4 SC1.04 - ENTRY/ WAITING

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS generally:	Set plasterboard/ Paint	Low gloss latex Colour G

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WALLS Splash back to Tea Area:	Set plasterboard/ Ceramic Tiles	Type: Classic Ceramics Vogue Range 100 x 100 glazed ceramic tile Colour: In Nero
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: G
WINDOW SILL:	Timber/ Paint	Full gloss solvent borne Colour: G
WINDOW FRAMING:	Aluminium / Anodised	Colour: Clear
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: J
DOORS:	Timber/ Paint	Full gloss solvent borne Colour: J
JOINERY Cupboard doors:	Plastic Laminate	Colour: Abet Laminati 868 Finish: SH

46.3.5 SC105 - CONSULTATION ROOM 3

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS generally:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Existing Masonry:	Existing face brickwork / Set plasterboard adhesive fixed to existing wall /Paint	Low gloss latex Colour G
WALLS Splash back to basin:	Set plasterboard/ Ceramic Tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: J
DOORS:	Timber/ Paint	Full gloss solvent borne Colour: J
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: G

VILLAGE PARK REDEVELOPMENT MONA VALE

WINDOW SILL:	Timber/ Paint	Full gloss solvent borne Colour: G
WINDOW FRAMING:	Aluminium / Anodised	Colour: Clear

46.3.6 SC1.06 - CORRIDOR 1

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS generally:	Set plasterboard/ Paint	Low gloss latex Colour G
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: J
DOORS:	Timber/ Paint	Full gloss solvent borne Colour: J
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: G

46.3.7 SC1.07 - FHR

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete	-
WALLS generally:	Set plasterboard/ Paint	Low gloss latex Colour G
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: J
DOORS:	Timber/ Paint	Full gloss solvent borne Colour: J
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: G

46.3.8 SC1.08- CUPBOARD
Typical refer SC107 - FHR

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46.3.9 SC1.09- CUPBOARD (COMMS)
Typical refer SC106 - Corridor I

46.3.10 SC110- WC

Element	Finish	Type/ Colour
FLOOR:	Concrete / Ceramic tiles	Classic Ceramics 200 x 200 vitrified floor tile Colour: TK 2119
WALLS Light weight: Western wall	Set plasterboard/ Ceramic tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss
WALLS Light weight:	Set plasterboard/ Ceramic tiles	Classic Ceramics Vogue Range Ceramics 100 x 100 glazed ceramic Colour: In Giallo (interni) or Pervinea (interni)
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour J
DOORS:	Timber/ Paint	Full gloss solvent borne Colour J

46.3.11 SC111- STORE
Typical refer SC106 - Corridor I

46.3.12 SC1.12 - MEETING

Element	Finish	Type/ Colour
FLOOR:	Steel trowelled concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS generally:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Existing Masonry:	Existing face brickwork / Set plasterboard adhesive fixed to existing wall / Paint	Low gloss latex Colour G
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: G

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GLAZED PARTITION: Aluminium / Anodised Colour: Clear

46.3.13 SL1.13- FEMALE WCs

Existing WCs to be retained un renovated.

46.3.14 SL1.14-MALE WCs

Existing WCs to be retained un renovated.

46.3.15 SC1.15 - TEA ROOM 1

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / topped as required / Sheet Linoleum	Forbo Marmoleum Real Range Colour: Lava
WALLS generally:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Splash back to Tea Area:	Set plasterboard and existing masonry/ Ceramic Tiles	Type: Classic Ceramics Vogue Range 100 x 100 glazed ceramic tile Colour: In Nero
CEILING:	Existing slab soffit/ Paint (Note : A)	Flat latex Colour: Ceiling white
SKIRTINGS:	Timber/ Paint	Full gloss solvent borne Colour: G
JOINERY Benchtop and cupboards:	Plastic Laminate	Colour: Abet Laminati 868 Finish: SEI

46.3.16 SC1.16 - SHOWER

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / topped as required / Ceramic tiles	Classic Ceramics 200 x 200 vitrified floor tile Colour: TK 2119
WALLS:	Set plasterboard and existing masonry/ Ceramic tiles	Classic Ceramics 100 x 100 glazed ceramic Colour: Alaska gloss
CEILING:	Existing slab soffit/ Paint (Note : A)	Flat latex Colour: Ceiling white
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: J
DOORS:	Timber/ Paint	Full gloss solvent borne Colour: J

VILLAGE PARK REDEVELOPMENT MONA VALE

JOINERY Bench:	Timber/ Paint	Type: Blackbutt Paint: Clear Co-polymer floor paint system
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46.3.17 SC1.17 - OFFICE 1

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Existing Masonry:	Existing face brickwork	-
CEILING:	Existing set plasterboard/ Paint (Note : A)	Flat latex Colour: Ceiling white
GLAZED PARTITION:	Aluminium / Anodised	Colour: Clear

46.3.18 SC1.18 - ASSESSMENT OFFICERS

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Existing Masonry generally:	Existing face brickwork	-
WALLS Existing Masonry nominated on drawings to be cement rendered :	Existing face brickwork / Cement render/ Paint	Low gloss latex Colour G
COLUMNS Steel:	Existing steel/ Paint	Full gloss solvent borne Colour: G
COLUMNS Concrete:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
CEILING high level:	Existing set plasterboard/ Paint (Note: A)	Flat latex Colour: Ceiling white

VILLAGE PARK REDEVELOPMENT MONA VALE

CEILING Under mezzanine:	Existing concrete soffit/ Paint (Note: A)	Flat latex Colour: Ceiling white
GLAZED PARTITION:	Aluminium / Anodised	Colour: Clear
ALL OTHER Existing painted elements	Repaint	Low gloss or full gloss solvent borne to suit substrate. Colour: G
Exposed A/C ducts	Steel / Paint	Low gloss latex Colour: K

46.3.19 SC119- OFFICE 2.

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Northern existing masonry:	Existing face brickwork	-
WALLS Western existing masonry:	Existing face brickwork/ Cement render/Paint	Low gloss latex Colour G
WALLS A/C Duct bulkhead:	Medium Density Fibreboard/ Paint	Low gloss latex Colour G
CEILING:	Existing concrete soffit / Paint (Note: A)	Flat latex Colour: Ceiling white
GLAZED PARTITION:	Aluminium / Anodised	Colour: Clear

46.3.20 SC120- OFFICE 3

Typical refer SC119 – Office 2

46.3.21 SC121- PLANNING OFFICE

Typical refer SC118 – Assessment Office

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46.3.22 SC122- OFFICE 4

Element	Finish	Type/ Colour
FLOOR:	Particleboard / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Existing Masonry generally:	Existing face brickwork	-
WALLS Existing walls to stair :	Existing concrete/Cement / Paint (Note: A)	Low gloss latex Colour G
CEILING high level:	Existing set plasterboard/ Paint (Note: A)	Flat latex Colour: Ceiling white
CEILING Under mezzanine:	Existing concrete soffit/ Paint (Note: A)	Flat latex Colour: Ceiling white
GLAZED PARTITION:	Aluminium/Anodised	Colour: Clear

46.4 LEVEL 2 COUNCIL OFFICES SCHEDULE

46.4.1 SC2.01 - CUSTOMER SERVICE

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Southern wall to mezzanine:	Existing plasterboard/ Paint (Note: A)	Low gloss latex Colour G
WALLS Existing upturns:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
WALLS Existing columns:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
WALLS Northern wall to mezzanine:	Set plasterboard/ Paint	Low gloss latex Colour G
CEILING:	Existing plasterboard/ Paint (Note: A)	Flat latex Colour: Ceiling white

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CEILING Acoustic ceiling panels:	Timber / Paint	Timber: Hoop pine Paint: Co. Polymer clear internal timber paint system.
CEILING Exposed structure:	Existing steel/ Paint (Note: A)	Semi gloss latex Colour: G
Timberwork To walls northern side of mezzanine:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co polymer floor paint system
GLAZED PARTITIONS:	Aluminium / Powdercoat	Colour: P
JOINERY Workstations, timber vener (TV1)	Timber/ Paint	Timber: Quarter Victorian Ash Paint: Two pack clear lacquer
JOINERY Workstations, timber vener (TV2)	Timber/ Paint	Timber: Red Gum Paint: Two pack clear lacquer
JOINERY Cupboard doors:	Plastic Laminate	Colour: Abet Laminati 868 SE1
JOINERY Pinboards:	Fabric	Woven Image Utopia Range Colour: to be confirmed
ALL OTHER Existing painted elements	Repaint	Low gloss or full gloss solvent borne to suit substrate. Colour: G
Exposed A/C ducts	Steel / Paint	Low gloss latex Colour: K
JOINERY Pinboard surround:	Timber/ Paint	Timber: Blackbutt Paint: Co. Polymer Clear internal timber paint system
JOINERY: Workstations - cupboard fronts (PL3)	Plastic Laminate	Laminex Midnight 464 Finish: Flint
JOINERY: Workstations shelves (PL2)	Plastic Laminate	Colour: Abet Laminati 868 Finish: SE1

46.4.2 SC2.02 - WAITING 1

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey First Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Existing northern wall:	Existing face brickwork	-

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WALLS Upturns to western wall to mezzanine:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Existing columns:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
WALLS New area of eastern wall:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Eastern wall:	Existing plasterboard/ and concrete/ Paint	Low gloss latex Colour G
CEILING:	Existing plasterboard/ Paint (Note: A)	Flat latex Colour: Ceiling white
Timberwork To walls western side of mezzanine:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co-polymer floor paint system
GLAZED PARTITIONS:	Aluminium / Anodised	Colour: Clear
JOINERY Pinboards:	Fabric	Woven Image Utopia Range Colour: to be confirmed
JOINERY Pinboard surround:	Timber/ Paint	Timber: Blackbutt Paint: Clear Co. Polymer Clear internal timber paint system
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour J
DOORS:	Timber/ Paint	Timber: Quarter Victorian Ash Paint: Clear Co-polymer interior timber paint system
ALL OTHER Existing painted elements	Repaint	Low gloss or full gloss solvent borne to suit substrate. Colour: G
Exposed A/C ducts	Steel / Paint	Low gloss latex Colour: K

46.4.3 SC2.03 - MEETING ROOM 2

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Existing northern wall:	Existing face brickwork	-

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WALLS Western walls:	Existing face brickwork/ Set plasterboard adhesive fixed to existing masonry / Paint	Low gloss latex Colour G
WALLS Existing columns:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
WALLS Southern:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Eastern wall: JC213	Timber / Paint	Timber: Hoop pine Paint: Co polymer clear internal timber paint system.
WALLS Eastern wall:	Existing concrete / Paint (Note: A)	Timber: Hoop pine Paint: Co polymer clear internal timber paint system.
CEILING:	Existing plasterboard/ Paint (Note: A)	Flat latex Colour: Ceiling white
GLAZED PARTITIONS:	Aluminium / Anodised	Colour: Clear
AC LOUVRES:	Aluminium / Anodised	Colour: Clear
JOINERY Workstations, timber veneer (TVI)	Timber/ Paint	Timber: Quarter Victorian Ash Paint: Two pack clear lacquer
JOINERY Cupboard doors:	Plastic Laminate	Colour: Abet Laminati 868 SE1
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: J
DOORS DC202:	Timber/ Paint	Timber: Quarter Victorian Ash Paint: Clear Co-polymer interior timber paint system
DOORS DC203:	Timber/ Paint	Full gloss solvent borne Colour: J

46.4.4 SC2.04 - TEA ROOM 2

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Sheet Linoleum	Forbo Marmoleum Real Range Colour: Lava
WALLS Existing:	Existing concrete/ Paint	Low gloss latex Colour G
WALLS Existing columns:	Existing concrete/ Paint	Low gloss latex Colour G
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour G

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WALLS Splashback:	Set plasterboard/ Ceramic Tiles	Type: Classic Ceramics Vogue Range 100 x 100 glazed ceramic tile Colour: In Nero
SKIRTING:	Timber/ Paint	Full gloss solvent borne Colour G
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
JOINERY:	Plastic Laminate	Colour: Abet Laminati 868 Finish: SEI
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour J
DOORS:	Timber/ Paint	Full gloss solvent borne Colour J

46.4.5 SC2.05 - OFFICE 4

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Light weight:	Set plasterboard/ Paint	Low gloss latex Colour G
SKIRTING:	Timber/ Paint	Full gloss solvent borne Colour G
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white

46.4.6 SC2.06 - OFFICE 5

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Existing:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
WALLS Existing columns:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G

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WALLS New Light weight:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Existing Light weight:	Existing plasterboard/ Paint (Note: A)	Low gloss latex Colour G
SKIRTING:	Timber/ Paint	Full gloss solvent borne Colour G
CEILING:	Set plasterboard/ Paint	Flat latex Colour: Ceiling white
GLAZED PARTITION:	Aluminium/ Anodised	Colour: Clear
DOORS:	Timber/ Paint	Full gloss solvent borne Colour J

46.4.7 SC2.07 - UTILITY

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Existing stair:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
WALLS Existing columns:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
WALLS New Light weight:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Existing Light weight:	Existing plasterboard/ Paint	Low gloss latex Colour G
SKIRTING:	Timber/ Paint	Full gloss solvent borne Colour G
CEILING:	Existing plasterboard/ Paint (Note: A)	Flat latex Colour: Ceiling white
GLAZED PARTITION:	Aluminium/ Anodised	Colour: Clear
DOORS:	Timber/ Paint	Full gloss solvent borne Colour J
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour J
ALL OTHER Existing painted elements	Repaint	Low gloss or full gloss solvent borne to suit substrate. Colour: G

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Exposed A/C ducts Steel / Paint Low gloss latex
Colour: K

46.4.8 SC2.08 - STORAGE 2

Element	Finish	Type/ Colour
FLOOR:	Existing concrete / Carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue
WALLS Masonry:	Existing facebrick work	
WALLS Existing columns and upturn wall to mezzanine edge:	Existing concrete/ Paint (Note: A)	Low gloss latex Colour G
WALLS New Light weight:	Set plasterboard/ Paint	Low gloss latex Colour G
WALLS Existing Light weight:	Existing plasterboard/ Paint (Note: A)	Low gloss latex Colour G
SKIRTING:	Timber/ Paint	Full gloss solvent borne Colour A
CEILING:	Existing plasterboard/ Paint (Note: A)	Flat latex Colour: Ceiling white
GLAZED PARTITION:	Existing	
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour J
DOORS:	Timber/ Paint	Full gloss solvent borne Colour J

46.5 MEMORIAL HALL SCHEDULE

46.5.1 SH101 - MEETING ROOM

Element	Finish	Type/ Colour
FLOOR: Central area	Existing tiles/ underlay/ carpet	Godfrey Hirst Carpets Optima Range Colour: 93800.136.880 Colonial Blue

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FLOOR: Surround	Existing tiles	
WALLS:	Existing Face brickwork	
JOINERY Workstations, timber veneer (TV1)	Timber/ Paint	Timber: Quarter Victorian Ash Paint: Two pack clear lacquer
JOINERY Cupboard doors:	Plastic Laminate	Colour: Abet Laminati 868 SE1

46.5.2 SH102 - HALL

Extent of works is only to items nominated.

Element	Finish	Type/ Colour
WINDOWS AND DOOR FRAMES (to v/s existing ceiling):	Existing Timber sanded back / Paint (Note: A)	Clear Co. Polymer Interior Paint System
DOORS:	Timber / Paint	Timber: to match existing Paint: Clear Co. Polymer Interior Paint System



**External Finishes &
Colour Schedule**

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects

February 2003

20151 SP551

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

VILLAGE PARK REDEVELOPMENT MONA VALE

47.1 GENERAL

47.1.1 REFERENCES

GENERALITY - PAINTING for description of "White".

47.1.2 DEFINITIONS

- Dulux references are to Dulux master palette colour range
- Taubmans references are Taubmans Spectrum range.

47.1.3 NOTES

- Note A: Remove loose paint, fill damaged areas and sand flush and repaint.

47.2 LIBRARY SCHEDULE

Element	Finish	Type / Colour
WALLS Masonry :	Face brickwork	Dry pressed facebrick to match existing library building
CONCRETE :	Class 2 off form concrete	-
ROOFING:	Profiled metal cladding	Lysaghts Finish: Colorbond Colour: Armour Grey. Refer: <i>Metal Roofing</i> Section for details.
STEEL FRAMING: to lantern and café structure	Steel/ Paint	Full gloss two pack polyurethane Colour: Dulux Henna Red P04.F9
SUNSHADE: Aluminium components:	Aluminium/ Anodised	Colour: Clear
DECKING Courtyard:	Timber/ Paint	Timber: Dulux Henna Red P04 Paint: Clear co-polymer decking paint system
DOOR FRAMES:	Steel/ Paint	Full gloss solvent borne Colour: Dulux Buff-it P11.B1
DOORS:	Timber/ Paint	Full gloss solvent borne Colour: Dulux Buff-it P11.B1
DOWNPIPES AND GUTTER to Café Roof:	Colorbond	Lysaghts Finish: Colorbond Colour: Armour Grey. Refer: <i>Metal Roofing</i> Section for details.

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WALL CLADDING Café and awnings:	Timber/Paint	Timber: Sydney Blue Gum Paint: Clear co-polymer exterior paint system
CFC CLADDING:	Fibrous Cement/Paint	Low gloss latex Colour: Dulux Buff-it P11.B1
WINDOW FRAMING:	Aluminium / Anodised	Colour: Clear

47.3 COUNCIL OFFICES SCHEDULE

Element	Finish	Type / Colour
WALLS: Existing masonry:	Existing face brickwork	Clean existing brickwork
WALLS: Existing box gutter	Existing off form concrete	Clean all visible concrete surfaces.
WALLS: Existing painted	Existing painted surfaces to be repainted (Note A)	Semi gloss latex Colour: Dulux Buff-it P11.B1
WALLS Masonry :	Face brickwork	Dry pressed facebrick to match existing library
WALLS Awning cladding:	Timber/Paint	Timber: Sydney Blue Gum Paint: Clear co-polymer exterior paint system
ROOFING:	Concrete tiles	Type: Refer <i>Roof Tiling</i> Colour: Cottage Grey
ROOFING:	Profiled metal cladding	Lysaghts Finish: Colorbond Colour: Gull grey. Refer: <i>Profiled Metal Claddings</i> Section for details
EXPOSED STEELWORK:	Steel/ Paint	Full gloss two-pack polyurethane Colour: To be selected
WINDOW FRAMING:	Aluminium / Anodised	Colour: Clear
DOWNPIPES and RAINWATER HEADS:	Steel / Paint	Full gloss two-pack polyurethane Colour: To be selected
EAVES GUTTER to ENTRY:	Steel/ Colorbond	Lysaghts Finish: Colorbond Colour: Armour Grey. Refer: <i>Metal Roofing</i> Section for details.

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47.4 MEMORIAL HALL

Contract works include items noted below.

Element	Finish	Type / Colour
WINDOW AND DOOR FRAMES	Existing timber/ Paint (Note A)	Full gloss solvent borne Colour: To be selected
DOORS	Timber / Paint	Full gloss solvent borne Colour: To be selected

**Doof & Hardware
Schedule**

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhjorth Architects

February 2003

20151 SP552

ISSUE	DATE	ISSUE
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48.1 LEGEND

48.1.1 GENERAL

Door Swing

Refer to the Drawings to determine the swing of the door.

Finishes

Refer to the *Internal Finishes Schedule* for finishes to doors and frames.

Keying

Refer to *Hardware* section for details.

48.1.2 DOOR TYPES

Solid core

Refer to *Timber Doors in Doors* Section for details.

Fire rated

Refer to *Fire Resistant Doorsets in Doors* section for details. Number in brackets represents the number of minutes of fire rating required.

For example (90): 90/90/90 minute fire rating.

Aluminium

Refer to the *Doors and Aluminium Windows and Doors* sections for details.

(SL) refers to sliding aluminium framed glazed door.

48.1.3 DOOR FRAME TYPES

Steel

Refer to *Steel Door Frames* for details.

Aluminium

Refer to the *Doors and Aluminium Windows and Doors* section for details.

Timber

Refer to *Woodwork* section and drawings for details.

48.1.4 LATCH TYPES

Standard Mortice Latches

Requirement: Latches with all fixings and applicable accessories shall be to doors nominated in the *Schedule*.

Description:

- Type: Lockwood Series 3500 cylinder mortice locks and latches, for functions (ie Passage latch, classroom lock etc) refer to *Schedule*.

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- Cylinder: The contractor shall supply and install construction cylinders and keying during the progress of the works. Final cylinders and keying to be supplied and fitted by at completion, refer *Keying in Hardware* section.
- Lever handle and rose: Lockwood brass lever 70 D-lever handle and Lockwood 1370/1371 series Rose mortice lock and latch furniture.
- Finish: Satin Chrome.

Latch type functional types:

- Passage latch: Latch bolt operated by handles from either side. Not lockable. (Similar to lockwood series 3574.)
- Office locking latch: Opened from outside by handle except when handle is made inoperative by key from outside or turnknob inside. Key locks or unlocks outside handle. Inside opened by handle except when handle is made inoperative by key from either side. Key from either side locks and or unlocks both handles. (Similar to Lockwood series 3574.)
- Classroom latch: Opened by handle except when handle made inoperable by key from outside. Key locks and unlocks outside handle. Inside opened by handle at all times. (similar to Lockwood series 3572.)
- Storeroom locking latch: Opened from outside by key. Handle is always rigid. Opened from inside by handle at all times. (Similar to Lockwood series 3572.)
- Single action escape latch: outside opened by key. Inside opened by handle at all times. (Similar to Lockwood Series 3572.)
- Bathroom latch (Privacy Latch): Opened by handle from outside except when made inoperative by turnknob from inside. Handle may be unlocked from outside by coin or screw driver by operating the slotted emergency button. Opened by handle from inside except when made inoperative by turn knob. Turn knob locks and unlocks both handles. (Similar to Lockwood series 3574.)
- Deadlock: Locked or unlocked by key from outside. Locked or unlocked by turnknob from inside. (similar to Lockwood series 3571.)

Short Backset Latches

Requirement: Narrow stile latches with all fixings and applicable accessories shall be to doors nominated in the *Schedule*.

Description:

- Type: Lockwood series 3580 short backset cylinder mortice locks and latches. for functions (Office/ store lock etc) refer *Schedule*.
 - Cylinder: The contractor shall supply and install construction cylinders and keying during the progress of the works. Final cylinders and keying to be supplied and fitted by at completion, refer *Keying in Hardware* section.
 - Handle: Lockwood No 1070.
 - Plate: Lockwood Series 3580 rounded end plate.
- Finish: Satin Chrome.

Latch type function types:

- Short backset glass door locking latch: Opened from outside and inside by handle except when handle is made inoperative by key from either side. Key locks and unlocks both handles. (Similar to Lockwood series 3584.)

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- Short backset single action escape latch: Opened from outside by key at all times. Inside opened by handles at all times.
(Similar to Lockwood series 3582.)
- Short backset vestibule set: opened by key at all times from outside. Opened by handle from outside except when handle is made inoperative by turnknob from inside. Opened by handle from inside at all times. Turnknob locks or unlocks outside handle.
- Short backset office latch: opened by handle from outside except when handle is made inoperative by key from outside or by turnknob from inside. Opened by handle from inside, except when handle is made inoperative by key from outside or turnknob inside. Turnknob locks or unlocks both handles (similar to Lockwood series 3584)
- Short backset classroom latch: Opened by handle except when handle made inoperable by key from outside. Key locks and unlocks outside handle. Inside opened by handle at all times.
(Similar to Lockwood series 3582.)

Drop Bolt

Requirement: Mortice lock concealed within bottom rail of aluminium door frame with drop into floor, with all fixings and applicable accessories shall be to doors nominated in the *Schedule*. Allow for striker plates recess mounted into floor, one in open position and one in a closed position.

Description:

- Type: Lockwood 590 series single cylinder deadlock.
- Cylinder: Refer *Keying - Door Schedule*.
- Finish: satin chrome.

Electric Latch

Requirement: Supply and install an electric latch to nominated door, including all necessary fittings and accessories. Refer to electrical documents for wiring details.

Description:

- Type: Lockwood 3580 series short backset, electric lock
- Function: Opened by handle from outside except when handle is locked by solenoid. Opened by key from outside at all times. Opened by handle from inside at all times.
- Cylinder: Refer *Short Backset Latches* for details.
- Finish: Satin Chrome

46.1.5 MISCELLANEOUS HARDWARE**Door Stops**

Requirement: Floor mounted door stops with all fixings and applicable accessories, to doors nominated in the *Schedule*.

Description:

- Type: Boyd DS 110 or DS 111 cast brass Door stop. The Contractor shall select suitable type for specific location and floor finishes.
- Finish: Satin chrome plate.

Closers

Requirement: Door closers with all fixings and applicable accessories, to doors nominated in the *Schedule*.

Description:

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- Type: Dorma TS92 cam action door closers. Spring power of each closer shall be adjustable. Closer should have separate adjustments for latch speed, general speed, and back check. Back check shall cushion opening swing in advance of 90 degrees for any standard mounting. Provide mounting backplate or angle brackets to suit door frame as required.
- Face of door: The notation (example: S132) following the closer reference in *Schedule* refers to the face of the door the closer shall be installed. For example "Closer (S.132)" refers to closer mounted on face of door in space S.132.
- Allow for sequencers where required on double doors.
- Closers to glazed doors to be mounted on door head transom.
- Finish: Silver.

Flush Bolts (Aluminium doors)

Requirement: Flush bolts, with all fixings, and applicable accessories, to doors nominated in the *Schedule*.

Description:

- Type: 150 mm long Doric DN 202 flush bolts. Two bolts shall be installed to edge of inactive leaf. Bottom bolt to include matching floor ferrule. Where door leaf is over 2100 mm the top bolt shall include a 600 mm extension rod.
- Finish: Natural Anodised Aluminium.

Flush Bolts (Timber doors)

Requirement: Flush bolts, with all fixings, and applicable accessories, to doors nominated in the *Schedule*.

Description:

- Type: 150 mm long Delf 1918 flush bolts. Two bolts shall be installed to edge of inactive leaf. Bottom bolt to include matching floor ferrule. Where door leaf is over 2100 mm the top bolt shall include a 600 mm extension rod.
- Finish: Satin chrome plate

D Handles 1

Requirement: D handles with concealed fixing points, with all fixings, and applicable accessories, to doors nominated in the *Schedule*.

Description:

- Type: Barben Industries Pty Ltd BAH-147 Pull handles.
- Number: Handle required to both faces of each door leaf.
- Provide off set handle where located on single leaf aluminium framed door leaf.
- Diameter of pull handle: 32 mm.
- Height: 600 mm.
- Finish: Satin stainless steel.

D Handles 2

Requirement: D handles with concealed fixing points, with all fixings, and applicable accessories, to doors nominated in the *Schedule*.

Description:

- Type: Barben Industries Pty Ltd BAH-144 Pull handles.
- Number: Handle required to both faces of each door.

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- Diameter of pull handle: 32 mm.
- Height: 1700 mm.
- Finish: Satin stainless steel.

Panic Bars

Requirement: Push bars, with all fixings and applicable accessories, of appropriate width for doors and with appropriate height bolts to suit door height, to doors nominated in *Schedule*.

Proprietary item: Dorma AD4000 series panic bars.

Finish: Clear anodised satin aluminium.

Operation: For pair of solid core a push bar shall be used on the "inside" of the inactive doors leaf equal to Dorma 4400 series. The active leaf shall have an push bar on the "inside" equal to Dorma 4300 series.

Pivot hinges 1

Requirement: Pivot hinges, concealed mounted with ninety degree hold open, with all fixings and applicable accessories, to doors nominated in *Schedule*.

Proprietary item:

- Dorma 8062 frame pivot with 8064 cover, recess mounted within head of door and head frame.
- Dorma BTS 75V floor spring assembly with ninety degree hold open, installed in door threshold, and including cover plate to threshold.
- Dorma 7422 strap, recess mounted in bottom of door

Finish: Satin chrome.

Pivot hinges 2

Requirement: Pivot hinges, concealed mounted with ninety degree hold open, with all fixings and applicable accessories, to doors nominated in *Schedule*.

Proprietary item: Dorma RTS 85T PKT transom closer pack with hold open, recess mounted within head frame.

Finish: Satin chrome.

Door Seals

Requirement: Threshold Door Seals concealed within bottom stile of door frame in aluminium framed door and concealed mounted in base of timber doors, with all fixings and applicable accessories, to doors nominated in schedule.

Proprietary Item: Raven RP 8 bottom seal.

Acoustic Seals

Requirement: Smoke Seals, with all fixings and applicable accessories, to doors nominated in schedule.

Proprietary Item:

- Head and Jamb: Raven RP47.
- Meeting Stiles: Raven RP71, recessed into edge of doors.
- Threshold: Raven RP70, concealed in bottom of doors.

Finish: Clear Anodised. Seal material: Charcoal PVC.

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Parrots Beaks

Requirement: parrots beak with all fixings, to each door and applicable accessories, to doors nominated in the *Schedule*.

Proprietary item: Boyd 884, Parrots beak.

Finish: Stainless steel.

Electric Striker

Requirement: Supply and install electric strikers with all fixings, and applicable accessories, to doors nominated in the *Schedule*.

Proprietary item: Padde ES200 Electric door strikers.

Air Grilles

Location: Air grille with all fixings, and applicable accessories, to doors nominated in the *Schedule*.

Requirement:

- Type: Air grilles Pty Ltd aluminium DFC air grille.
- Size: 600 x 400 mm.
- Finish: Clear anodised.

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48.2 SCHEDULE

48.2.1 LEVEL ONE LIBRARY DOOR SCHEDULE

Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DL101	Auto	Refer Drawings				Refer doors section for details For electric's and security, refer Electrical Engineers details
DL102	Not used					
DL103	Aluminium	Refer drawings	Aluminium	Short backset single action escape latch	Electric latch Pivot hinges 1	For electric's, refer Electrical Engineers details Free handle to SL107 side of door
DL104	Solid Core	850 x 2255COS	Steel	Bathroom latch	Closer (SL103)	
DL105	Solid Core	850 x 2255COS	Steel	Bathroom latch	Closer (SL104)	
DL106	Aluminium	Refer Drawings	Aluminium	Shortback set office latch	Door stop	
DL107	Accessible sliding door set refer to <i>Doors and Hatches</i> Section for details					
DL108	Solid Core	850 x 2340	Steel	Passage latch	Closer (SL112)	Undercut door to meet mechanical requirements.
DL109	Solid Core	850 x 2340	Steel	Bathroom latch	Closer (SL110)	Undercut door to meet mechanical requirements.
DL110	Solid Core	850 x 2340	Steel	Bathroom latch	Closer (SL111)	Undercut door to meet mechanical requirements.
DL111	Solid Core	820 x 2340	Steel	Storeroom locking latch		
DL112	Operable wall refer to <i>Doors and Hatches</i> Section for details					

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Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DL113	Solid Core	1520 (2 x 760) x 2340	Steel	Storeroom locking latch	Flush bolts Acoustic seals	
DL114	Fire rated (120)	1640 (2 x 820) x 2040	Steel	Deadlock	Closers Flush bolts	
DL115	Fire rated (120)	680 x 2040	Steel	Deadlock	Closers	
DL116	Aluminium	Refer drawings	Aluminium	Short backset Glass door lock	Closers (SL116) Flush bolts Door seals	Closers to both leaves with hold open
DL117	Aluminium	Refer drawings	Aluminium	Short backset Glass door lock	Closer (SL116) Electric Striker	For electric's and security, refer Electrical Engineers details
DL118	Solid Core	820 x 2340	Steel	Storeroom locking latch	Acoustic Seals	
DL119	Aluminium	Refer Drawings	Aluminium	Short backset classroom locking latch	Door stop	
DL120	Aluminium	Refer Drawings	Aluminium	Short backset classroom locking latch	Door stop	
DL121	Aluminium	Refer Drawings	Aluminium	Short backset classroom locking latch	Door stop	
DL122	Aluminium (SL)	Refer Drawings	Aluminium	-	Flush bolts	Flush bolts to both sliding leaves
DL123	Solid Core	850 x 2340	Steel	Passage latch	Door stop	
DL124	Solid Core	870 x 2340	Steel	Passage Latch	Door stop Door grille	
DL125	Solid Core	850 x 2340	Steel	Office locking latch	Door stop Door grille	
DL126	Aluminium	Refer Drawings	Aluminium	Short backset office latch	Door stop	

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Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DL127	Solid Core	820 x 2340	Steel	Storeroom locking latch	Acoustic Seals	
DL128	Aluminium	Refer drawings	Aluminium	Short backset classroom locking latch	Closer (SL127) Electric Striker	For electric's, refer Electrical Engineers details
DL129	Solid Core	850 x 2340	Steel	Passage latch	Closer (SL130)	Confirm height on site to suit floor level. Undercut door to meet mechanical requirements.
DL130	Solid Core	850 x 2340	Steel	Bathroom latch	Closer (SL128)	Confirm height on site to suit floor level. Undercut door to meet mechanical requirements.
DL131	Solid Core	850 x 2340	Steel	Bathroom latch	Closer (SL129)	Confirm height on site to suit floor level. Undercut door to meet mechanical requirements.
DL132	Solid Core	820 x 2340	Steel	Passage Latch		No handle to inside of cupboard
DL133	Fire Rated (120)	850 x 2340	Steel	Passage latch	Closer (SL132)	
DL134	Solid Core	820 x 2040COS	Steel	Single action escape latch	Closer (SL132)	Confirm height on site head level to u/s of cone slab over
DL135	Aluminium (SL)	Refer Drawings	Aluminium	-	Flush bolts	
DL136	Aluminium (SL)	Refer Drawings	Aluminium	Drop bolt		
DL137	Solid Core	820 x 2255COS	Steel	Storeroom locking latch		

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Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DL138	Solid Core	820 x 2340	Steel	Storeroom locking latch		
DL139	Fire Rated (120)	820 x 2040	Steel	Storeroom locking latch	Closer (SL136)	
DL140	Solid Core	1640 (2 x 820) x 2340	Steel	Storeroom locking latch	Acoustic Seals Flushbolts	
DL141	Solid Core	820 x 2340	Steel	Passage latch		No handle to inside of cupboard

48.2.2 LEVEL TWO LIBRARY DOOR SCHEDULE

Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DL201	Not used					
DL202	Not used					
DL203	Aluminium	Refer drawings		Drop bolt	Flush bolts	Flush bolts to each door and drop bolt to each end door
DL204	Auto	Refer Drawings				Refer doors section for details For electric's and security, refer Electrical Engineers details
DL205	Not used					
DL206	Aluminium	Refer Drawings	Aluminium	Short backset Office locking latch	Door stop	

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Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
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48.2.3 LEVEL ONE COUNCIL OFFICES DOOR SCHEDULE

Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DC101	Aluminium	Refer Drawings	Aluminium	Short backset vestibule set	Flush bolts D-Handles 1 Closer (SC104)	Closer to active leaf
DC102	Solid Core	870 x 2040	Steel	Office locking latch	Door stop	
DC103	Solid Core	870 x 2040	Steel	Office locking latch	Door stop	
DC104	Solid Core	870 x 2040	Steel	Office locking latch		
DC105	Solid Core	870 x 2040	Steel	Bathroom latch	Closer (SC104)	
DC106	Solid Core	850 x 2040	Aluminium	Storeroom locking latch	Door stop	
DC107	Solid Core	820 x 2040	Steel	Passage latch		No handle to cupboard side of door
DC108	Solid Core	1640 x (2 x 820) x 2040	Steel	Deadlatch latch	Flush bolts	
DC109	Aluminium (SL)	Refer Drawings	Aluminium		D-Handle 1	
DC110	Solid Core	1640 x (2 x 820) x 2255COS	Steel	Deadlatch latch	Flush bolts	
DC111	Not used					
DC112	Not used					

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Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DC113	Solid Core	850 x 2255COS	Steel	Bathroom latch	Door stop Closer (SC116)	
DC114	Aluminium	Refer Drawings	Aluminium	Short backset office locking latch	Door stop	
DC115	Aluminium	Refer Drawings	Aluminium	Short backset office locking latch	Door stop	
DC116	Aluminium	Refer Drawings	Aluminium	Short backset single action escape latch	Closer (SC121) Door seal	
DC117	Aluminium	Refer Drawings	Aluminium	Short backset single action escape latch	Closer (SC118) Electric Striker	For electric's refer to Electrical Engineers details
DC118	Gate					Refer <i>Metalwork</i> section for details
DC119	Solid Core	To match existing	Steel	Storeroom locking latch	Flush bolts	Allow for air grille to existing mechanical exhaust

48.2.4 LEVEL TWO COUNCIL OFFICES DOOR SCHEDULE

Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DC201	Not Used					
DC202	Solid Core	2180COS (2 x 1090) x 1990COS	Steel	Classroom latch	D Handles 2 Flush bolts Pivot hinges 2	Note no rebates, to door frame
DC203	Solid Core	870 x 1990COS	Steel	Classroom latch	Door stop	Door height to match DC202

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Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DC204	Alum-inium	Refer drawings	Alum-inium	Short backset Office latch	Closer (SC207) Electric Striker	For electric's, refer Electrical Eng's details Free handle to be on SC207 side of door
DC205	Solid Core	870 x 2340	Steel	Office locking latch	Electric skriker Door stop Closer (SC204) Air grille	For electric's, refer Electrical Eng's details
DC206	Solid Core	850 x 2340	Alum-inium	Office locking latch	Door stop Air grille	
DC207	Solid Core	850 x 2340	Steel	Storeroom locking latch	Electric skriker Closer (SL204)	For electric's, refer Electrical Eng's details

48.2.5 LEVEL ONE EXISTING MEMORIAL HALL DOOR SCHEDULE

Door No	Door Type	Door leaf size (width x height)	Door Frame Type	Latch Type	Misc Hardware	Comments
DH101	Timber	Refer Drawings	Timber	-	Panic bolts Parrots beaks	
DH102	Timber	Refer Drawings	Timber	-	Panic bolts Parrots beaks	
DH103	Timber	Refer Drawings	Timber	-	Panic bolts Parrots beaks	
DH104	Timber	Refer Drawings	Timber	-	Panic bolts Parrots beaks	

**Sprayed Mineral
Fire Protection**

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VILLAGE PARK REDEVELOPMENT MONA VALE

Tender Number T01/3



brewsterhorth Architects

August 2001

20151 SP272

ISSUE	DATE	ISSUE
A		Preliminary
B	28.02.03	Tender Issue

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49.1 GENERAL**49.1.1 SCOPE****General**

The works include, but are not limited to sprayed mineral fire protection to air conditioning ductwork.

49.1.2 CROSS REFERENCES**General**

Refer to the *General requirements* section.

49.1.3 GENERAL STANDARDS**Sprayed mineral fire protection coatings**

Materials and components: To BCA96 Specification A2.3.

Execution: To BCA Specification A2.3.

49.1.4 REFERENCED DOCUMENTS**General**

The following standards are referred to in this section:

AS 2423	1991	Galvanized wire fencing products
AS 2592	1983	Gypsum plaster for building purposes
AS 3784.1	1990	Guide to selection and installation of sprayed mineral coatings
BS 3797	1990	Specification for lightweight aggregates for masonry units and structural concrete

49.2 QUALITY**49.2.1 INSPECTION****Witness points**

<u>Item</u>	<u>Inspection Type</u>	<u>Notice</u>	<u>References</u>
Substrate preparation completed.	Witness point	3 days	
Coating support installed.	Witness point	3 days	

49.2.3 SUBMISSIONS**Substrate**

Cleaning: Give notice of surface conditions which cannot be corrected by normal cleaning methods.

49.3 MATERIALS AND COMPONENTS

49.3.1 MATERIALS

Base

General: Either perlite or vermiculite.

Standard: To BS 3797.

Binding agent

Gypsum plaster: To AS 2592.

Fillers

Either hydrated lime or limestone.

49.3.2 COMPONENTS

Metal components

Either galvanized steel or stainless steel.

Expanded metal lath

Aperture: 10 - 20 mm.

Self-furring expanded metal lath

Aperture: 10 - 20 mm.

Ribs: V-shaped at 100 - 150 mm intervals.

Steel wire mesh

Welded rectangular mesh:

- Keying: Aperture 10 - 25 mm, wire diameter 0.7 - 1.6 mm.

Twisted hexagonal mesh: To AS 2423.

- Keying: Aperture 10 - 25 mm.

49.4 EXECUTION

49.4.1 EXECUTION GENERALLY

Applicators

Must be licensed by the coating manufacturer to install the coating.

Surface preparation

Sprayed to contour: Immediately before applying the coating, remove materials which will impair adhesion to the substrate, including mill scale, dirt, grime, oil, grease, dust, loose rust, non-compatible primers and paint.

Prime as required to achieve adequate adhesion fire protection.

Stable gaps and joints wider than 15 mm: Bridge with an appropriate supporting material before applying the spray.

Unstable gaps and joints: Provide a movement joint in the spray, with metal lath support on either side of the joint.

VILLAGE PARK REDEVELOPMENT MONA VALE**Protection of areas not to be coated**

Prevent damage from spillage, overspray, contamination and fallout.

Sequence

Apply coatings after installation of supports, fixings and other attachments, but before installation of items which may obstruct the application.

Sprayed fire protection coatings thickness schedule

Location:	Thickness:	Fire Rating
To air conditioning duct work in SL132	As required to achieve fire rating	120 minutes

Installation

To AS 3784.1.

Density of dry coating: Not to exceed 350 kg/m³.

Spraying

Provide good cohesion in the coating.

49.5 COMPLETION**49.5.1 CERTIFICATION****Requirement**

Provide certification system meets fire rating requirements.