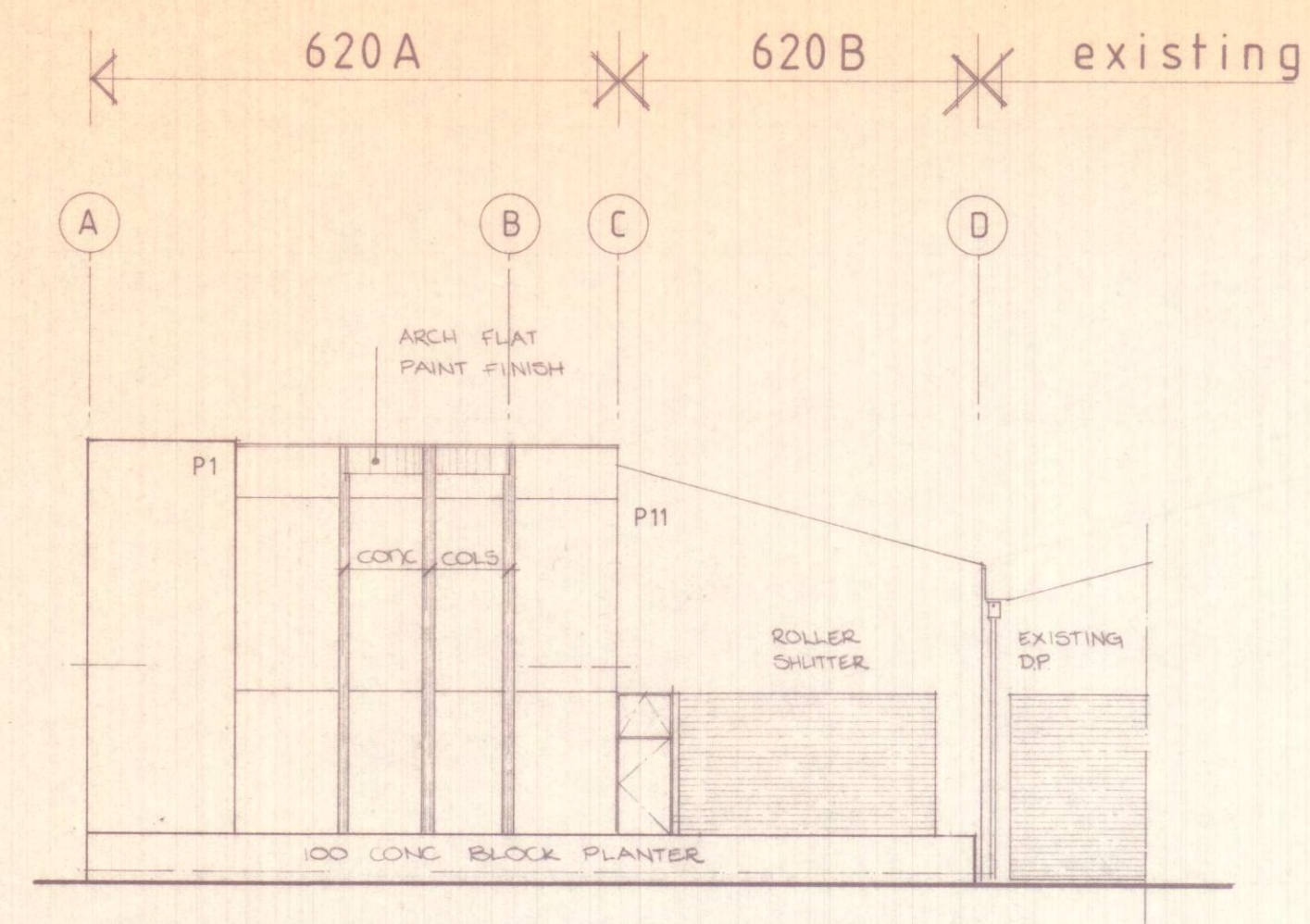
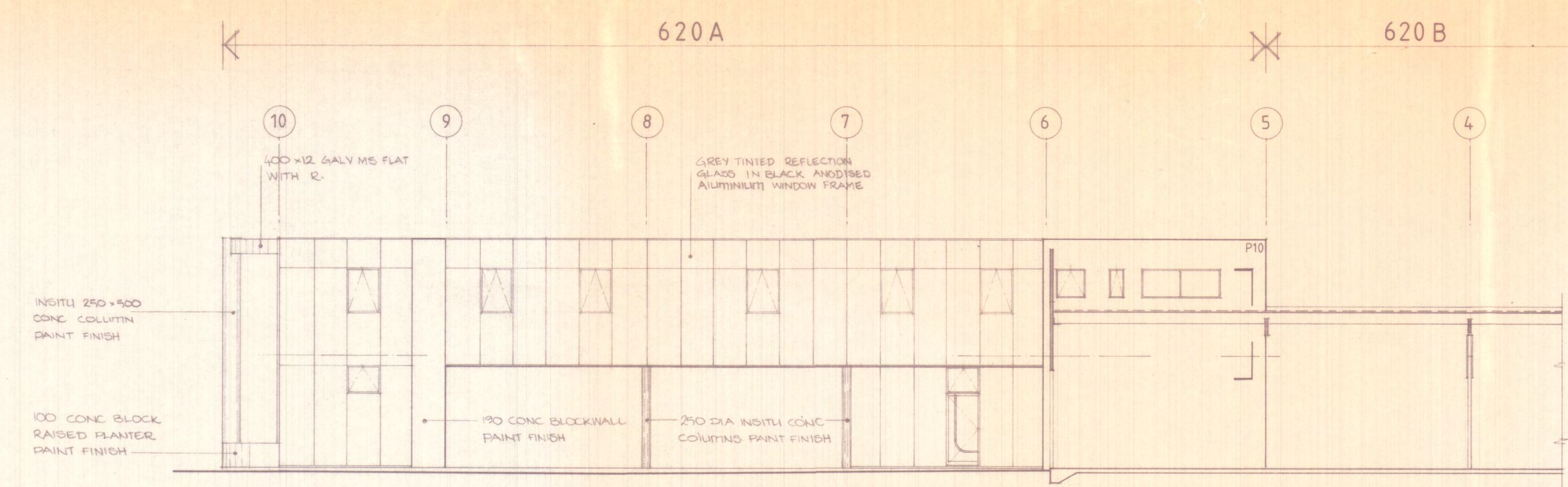
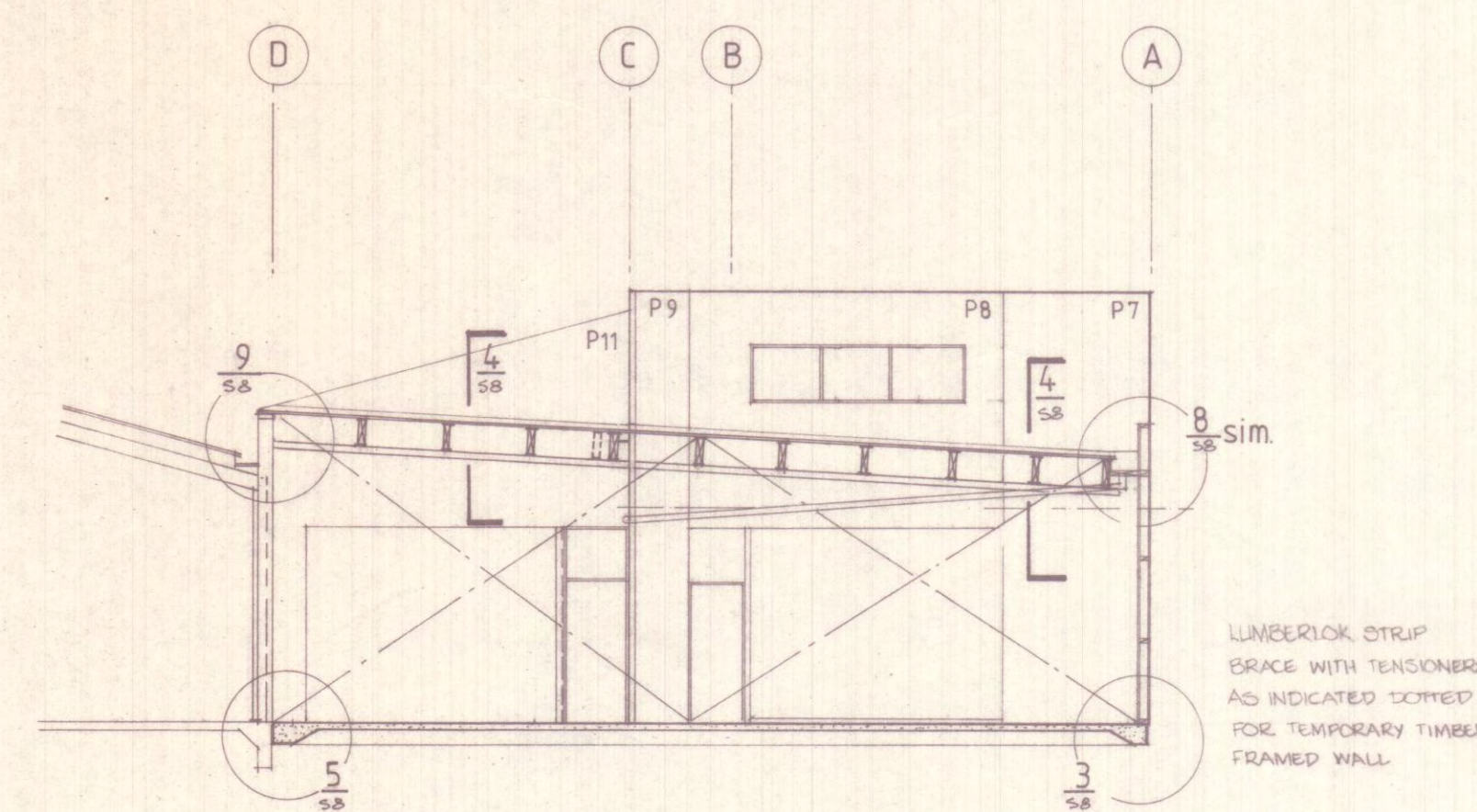




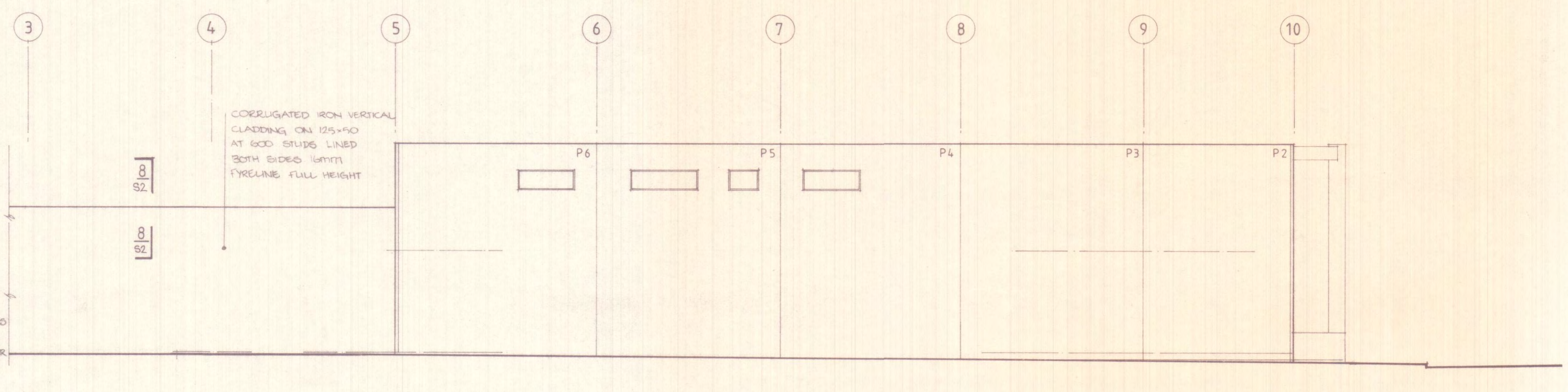
north elevation



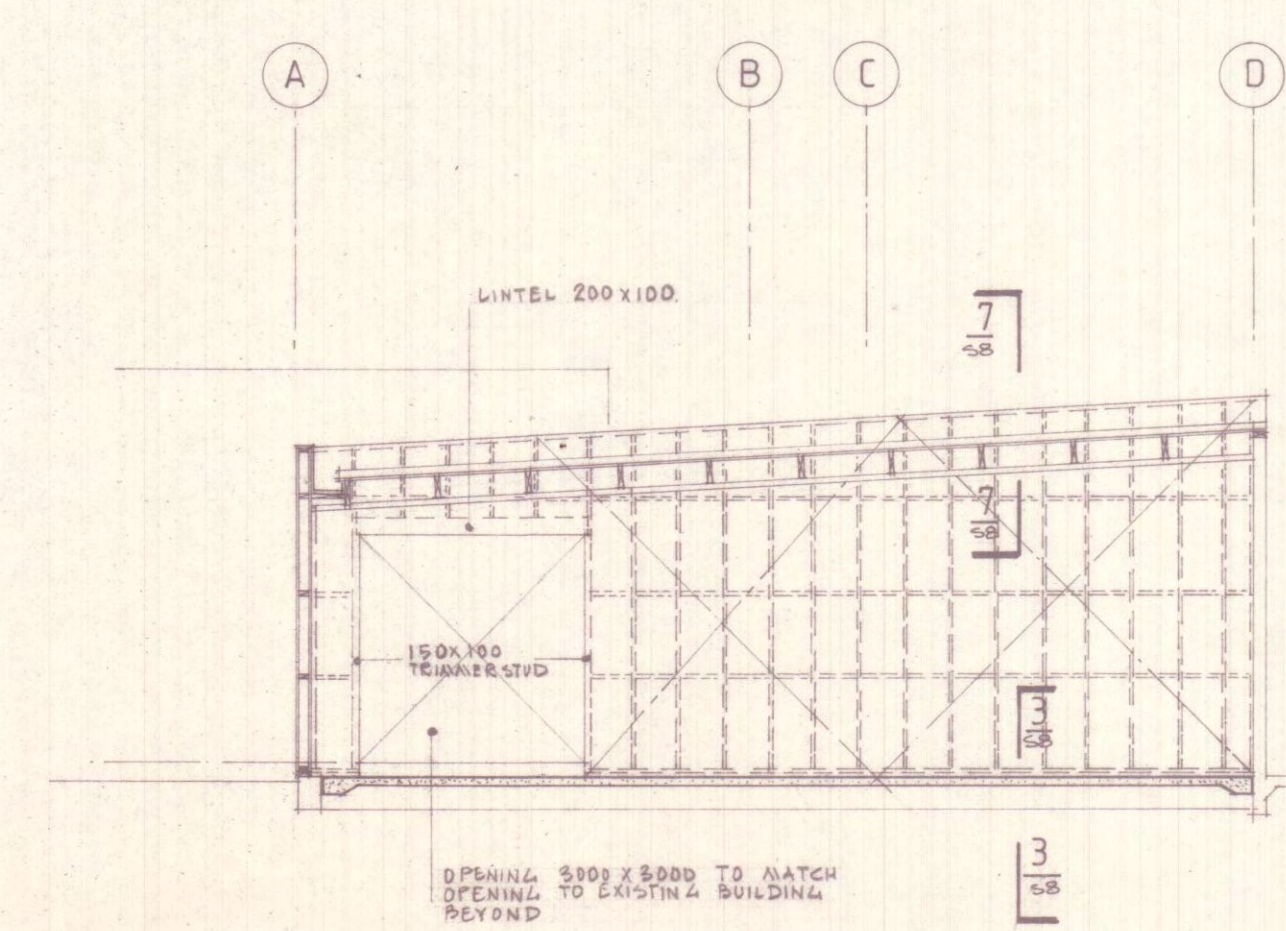
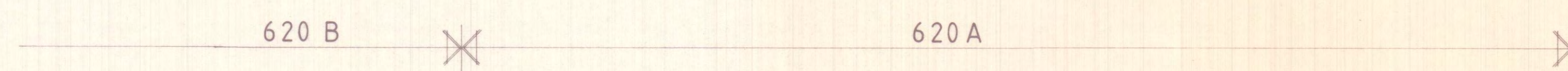
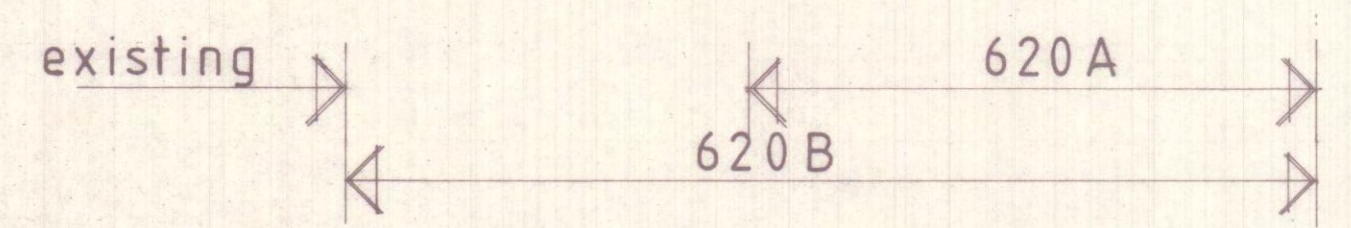
west elevation



south elevation 620A 2 STOREY UNIT
north wall 620B



east elevation



south wall 620B

TIMBER FRAMED WALL
150x50 AT 600 C/S STUDS @
AT 1200 C/S DWANG. LINED
BOTH SIDES 16MM FIRELINE
& CORRUGATED CLADDING ON
BUILDING PAPER FACE
LUMBERLOK STRAP BRACING
WITH TENSIONERS NEAR FACE
AS SHOWN

88-1833
Sheet 4

26 07 88 permit
REVISIONS

NEW CONCRETE
TWO STOREY UNIT &
NEW TIMBER FRAMED
STRUCTURE
78 BYRON STREET

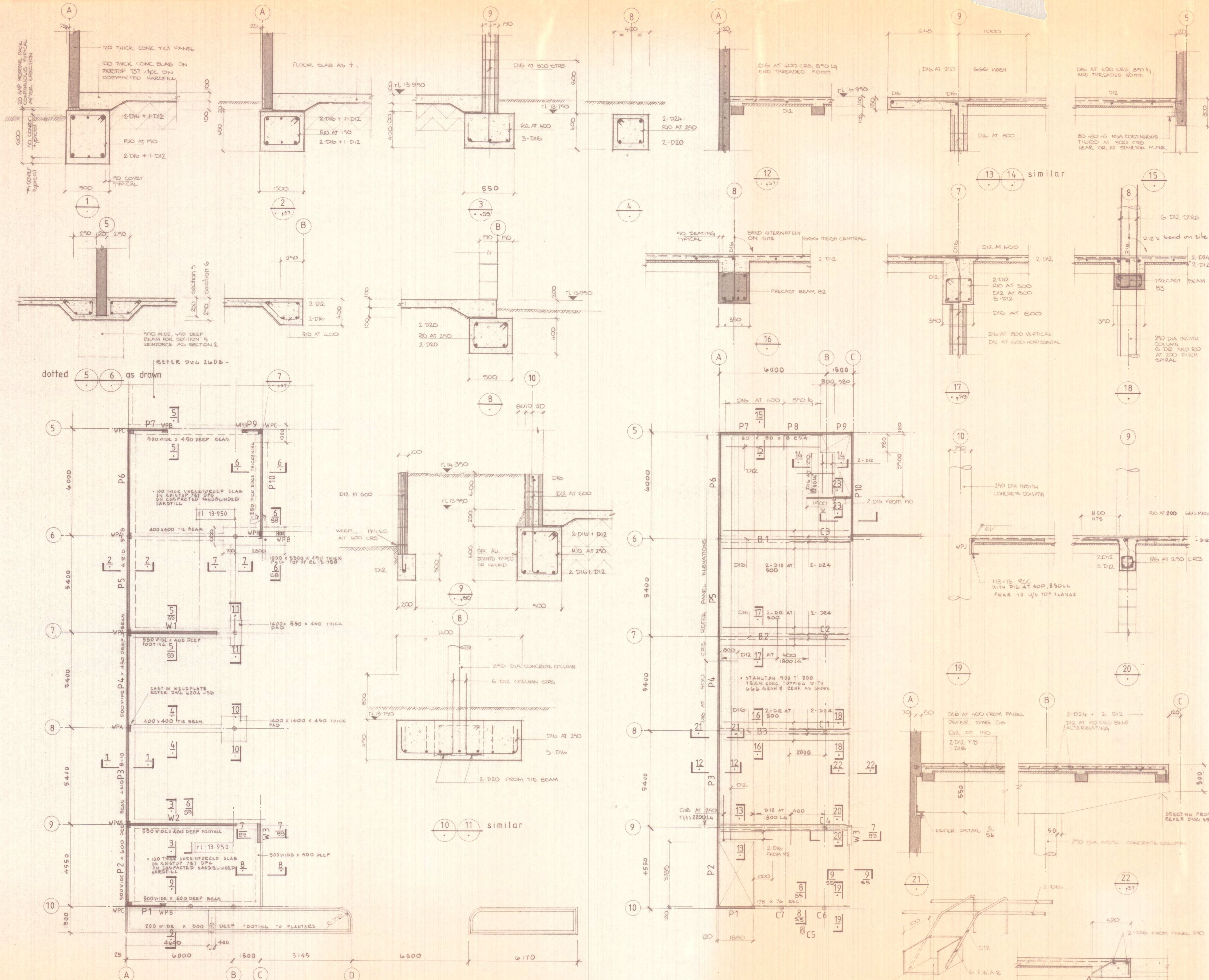
CHRISTCHURCH CITY COUNCIL
Approved Subject to the By-Law
1 SEP 1988
For Engineer

Buchanan &
Fletcher Ltd
CONSULTING STRUCTURAL ENGINEERS
ST EMERGENCY at Heron Rd
CHRISTCHURCH 85 10 000 1 132
PHONE 03 363 308 FAX 03 363 011

DRAWN g.j.h. DATE 18 07 88
APPROVED: SCALE 1:100

elevations

THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK



88-1833
Sheet 5

CHRISTCHURCH CITY COUNCIL
Approved subject to the By-Laws
1 SEP 1988
Drake
For Engineer

REVISIONS

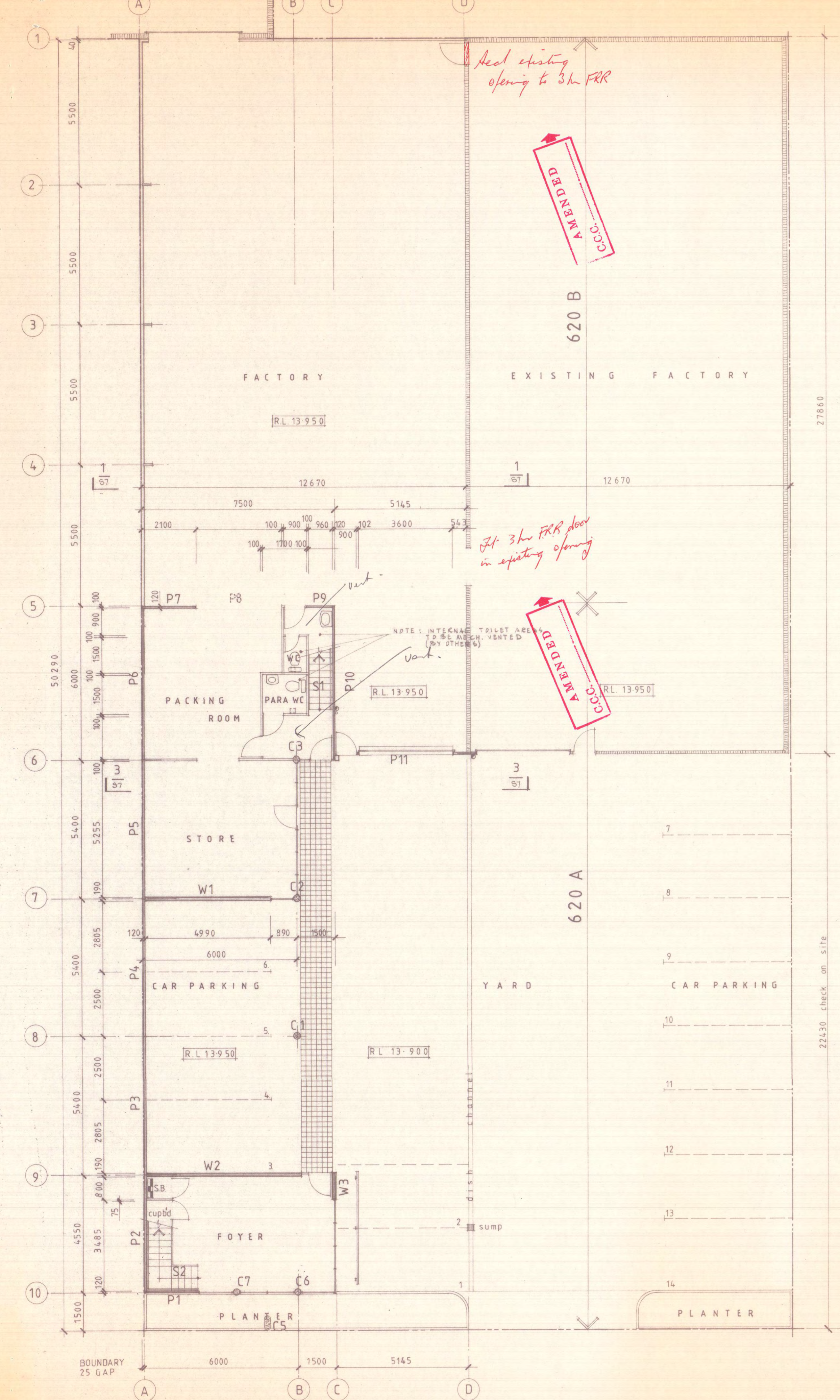
NEW CONCRETE
TWO STOREY UNIT
78 BYRON ST
for MR and MRS
STEWART

Buchanan & Fletcher Ltd
CONSULTING STRUCTURAL ENGINEERS
St Elmo Court 47 Mervin St
Christchurch 82 P.O. Box 123
Phone (03) 334 304 Fax (03) 334 7901

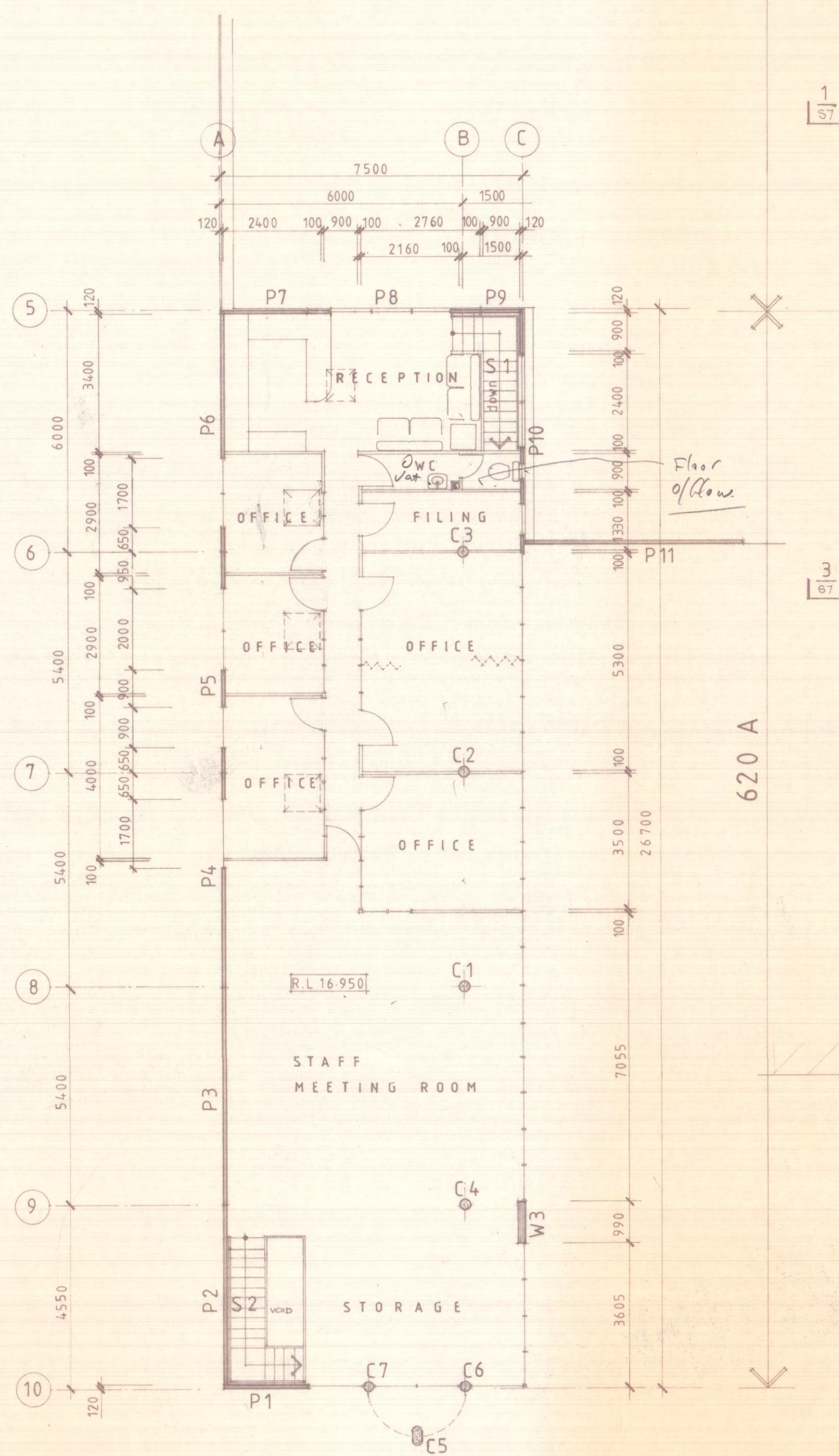
DRAWN G.J.H. DATE 26.07.88
APPROVED SCALE 1:100 1:20

foundation plan
floor plans
structural

JOB 620A DRAWING S4 REV.



ground floor plan
BYRON STREET



u p p e r f l o o r p l a n

roof plan

26 07 88 permit
REVISIONS

NEW CONCRETE
TWO STOREY UNIT
AND NEW TIMBER
FRAMED STRUCTURE
78 BYRON STREET

Buchanan & Fletcher Ltd
CONSULTING STRUCTURAL ENGINEERS
51 Elm Court 47 Hereford St.
Liverpool L1 1 2JF Tel: 051 236 1732
Phone (03) 86-304 Fax (03) 795 0111

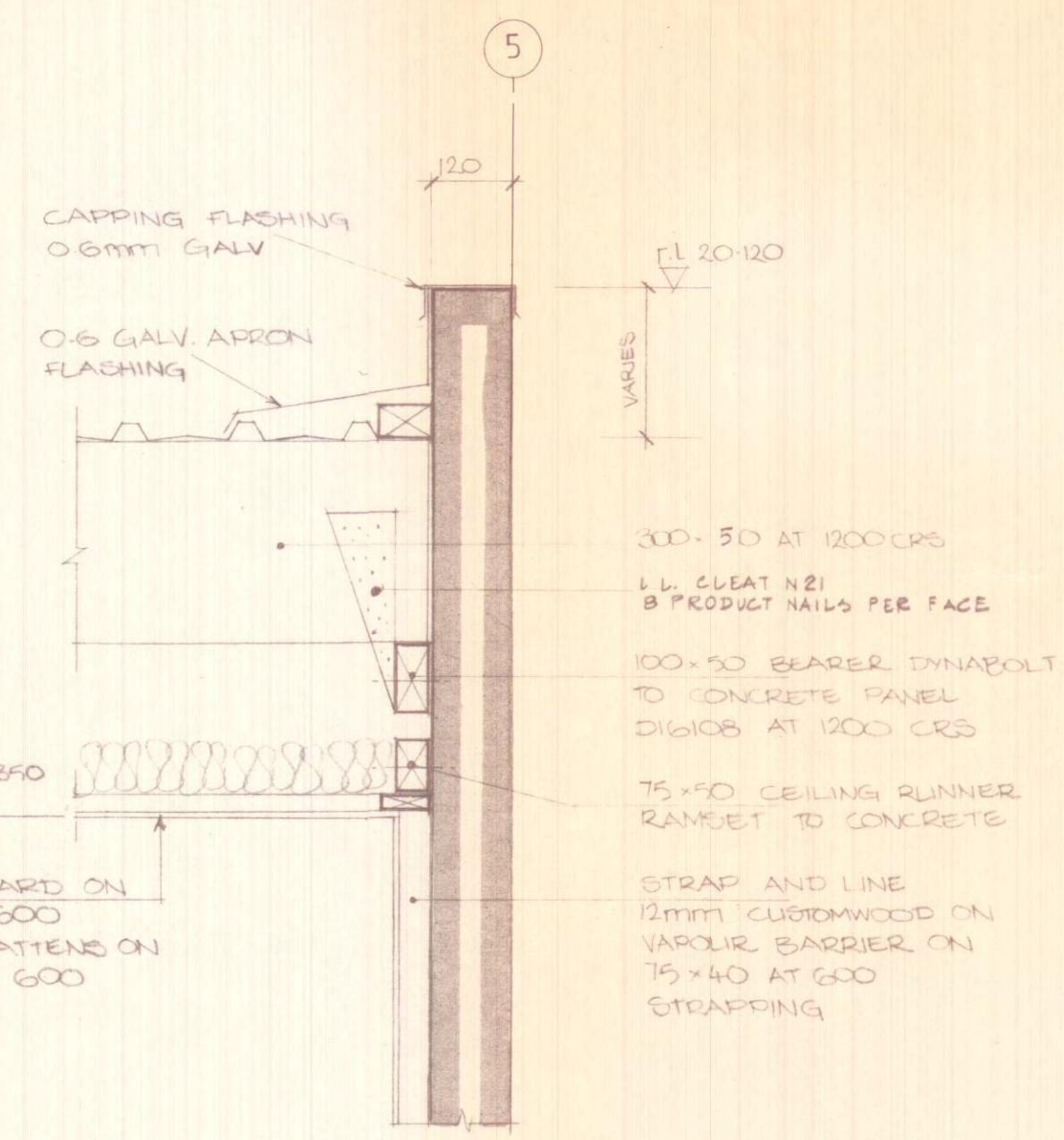
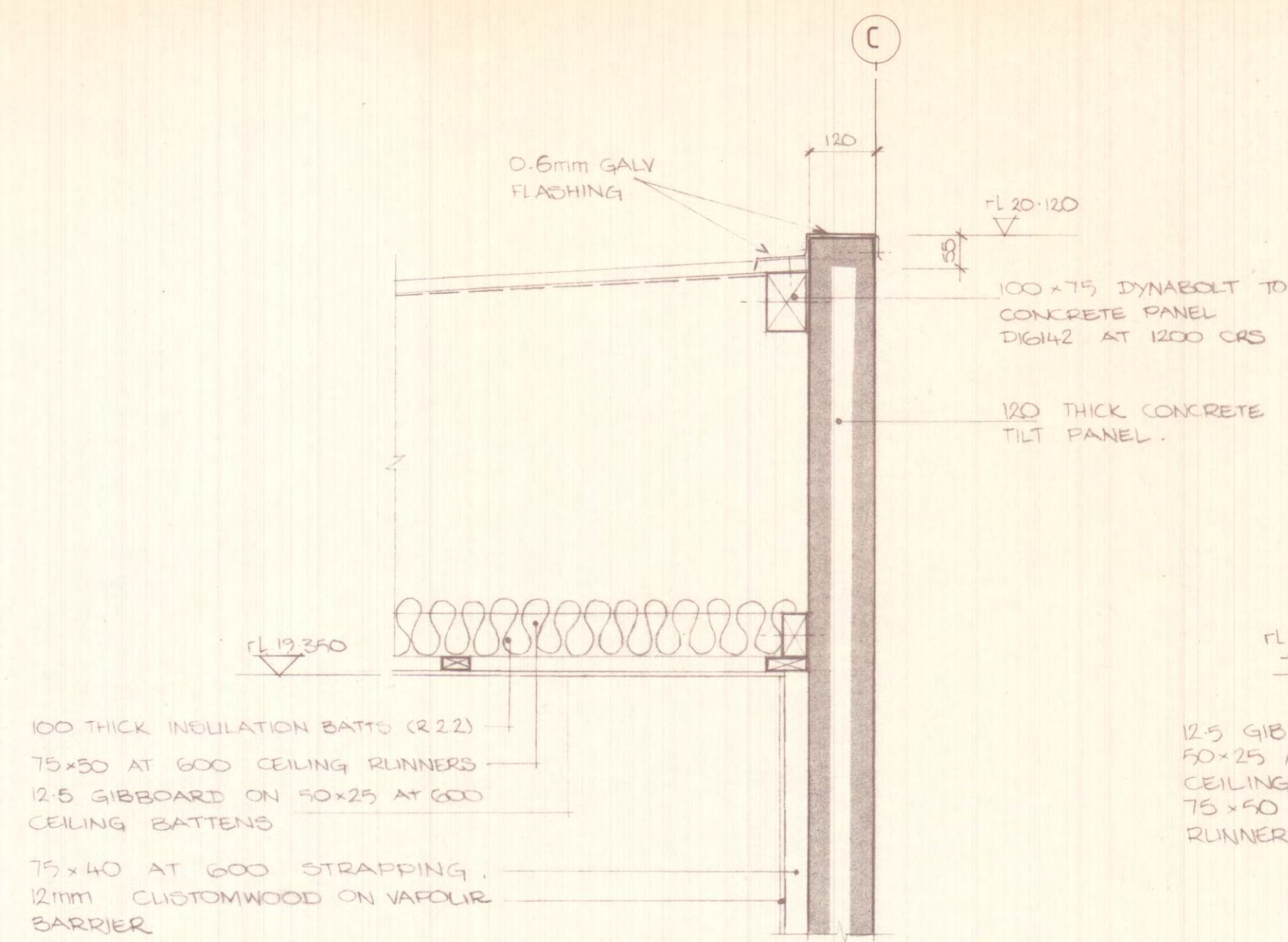
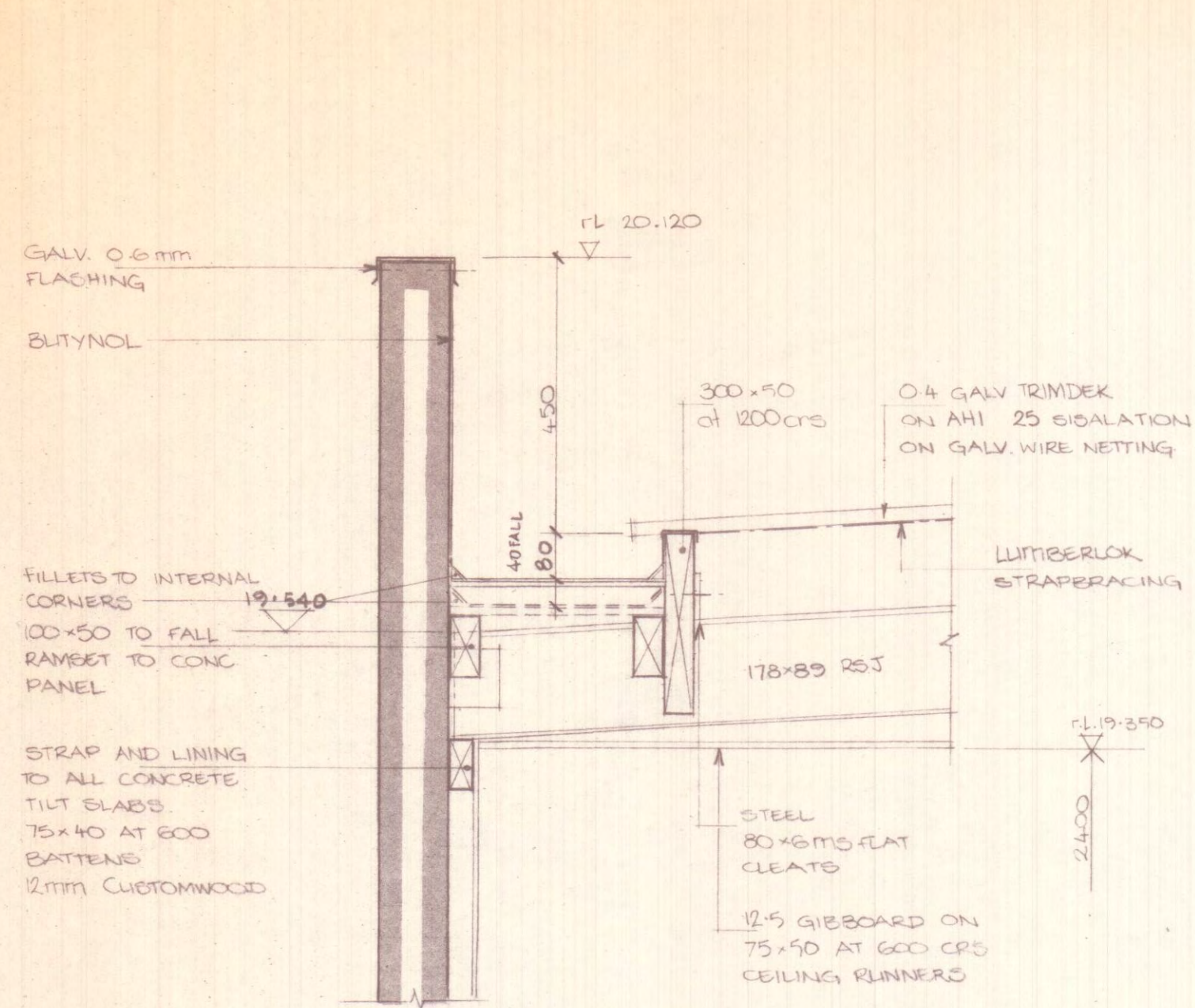
DRAWN : g.j.h. DATE : 18 07 88

APPROVED : SCALE : 1:100

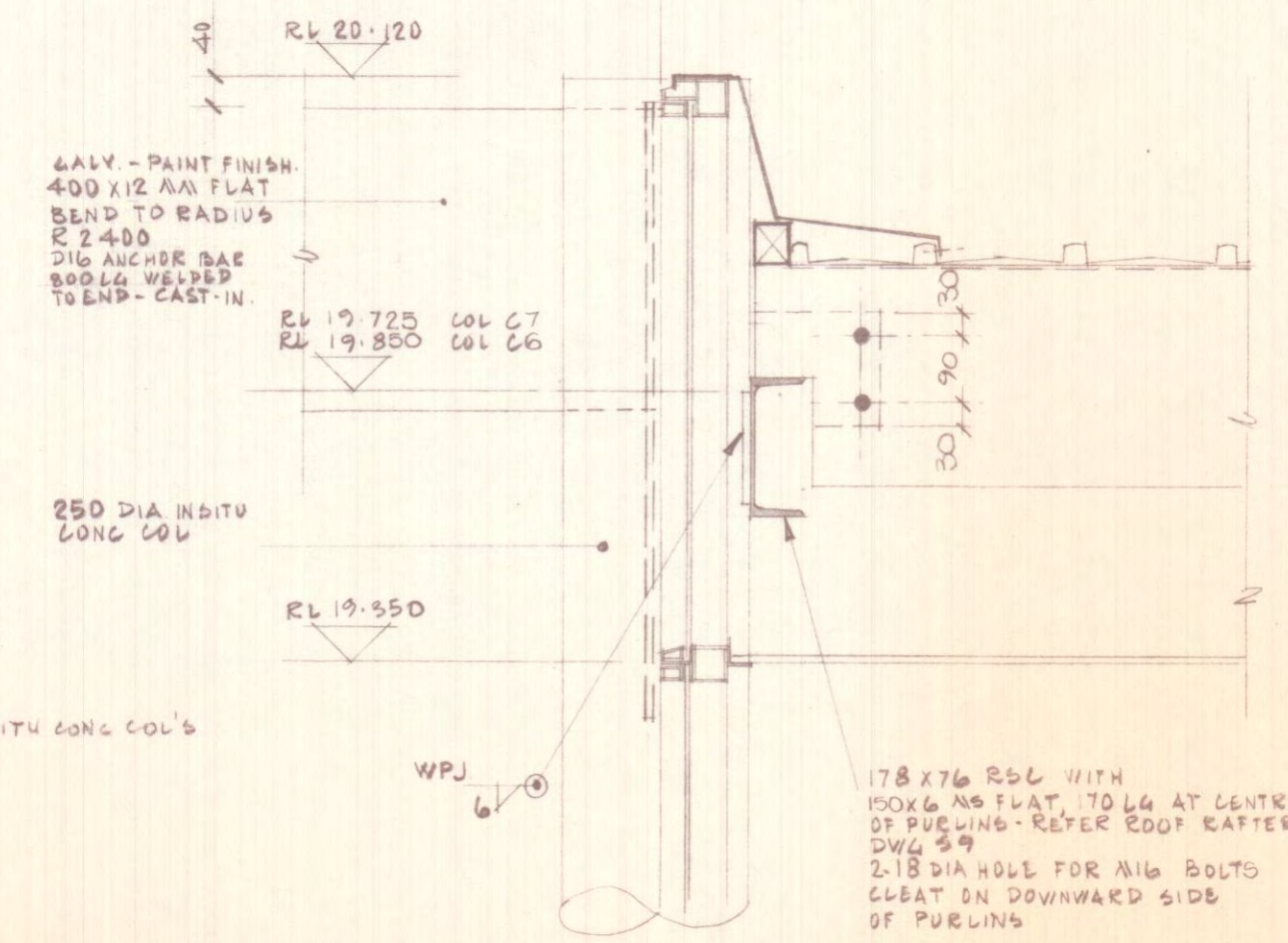
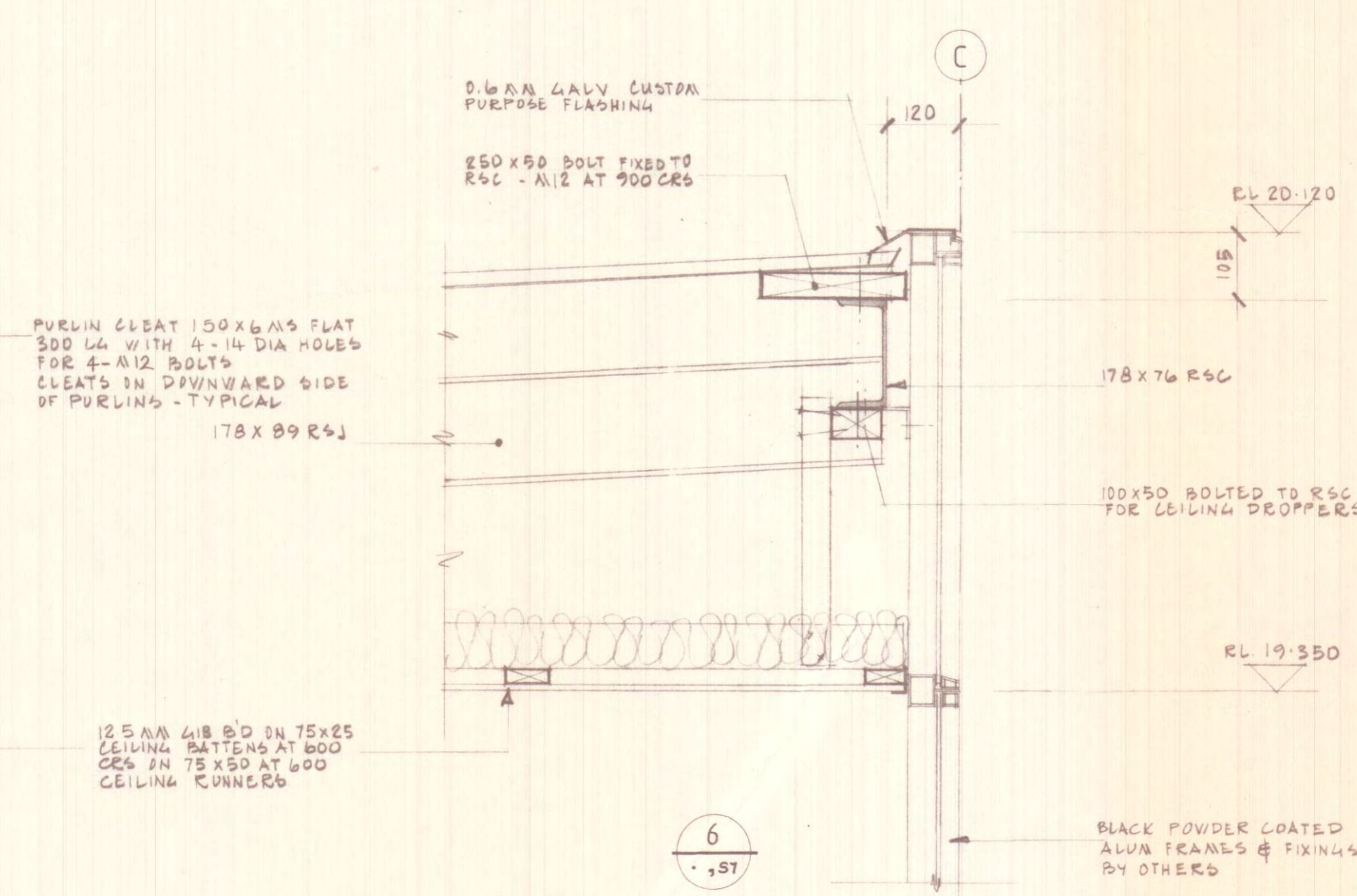
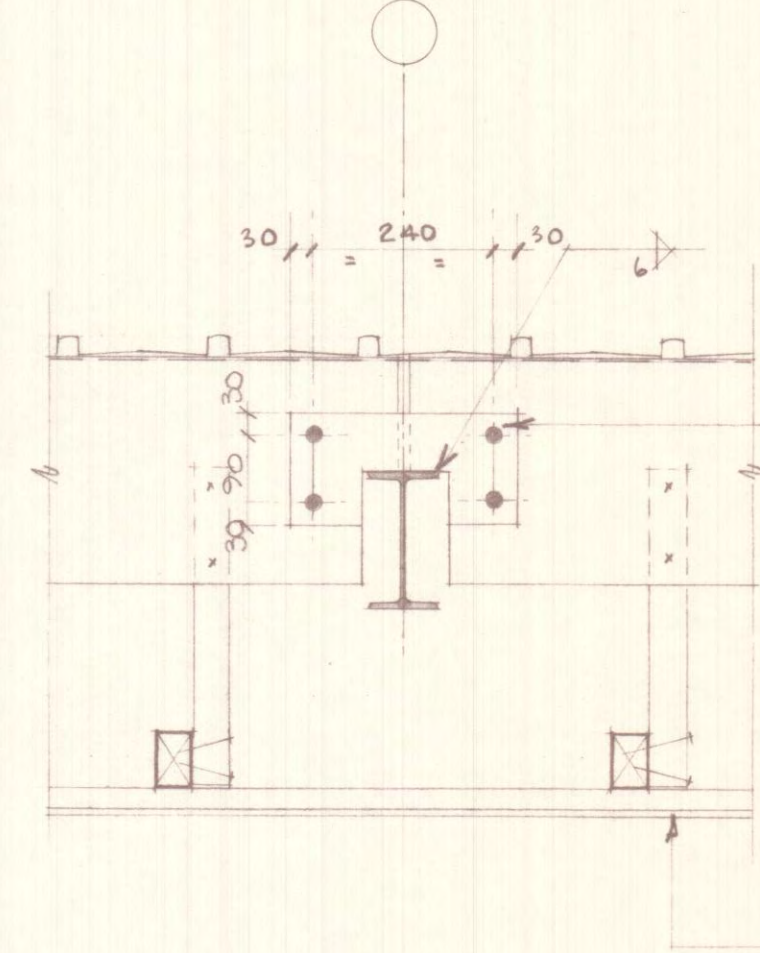
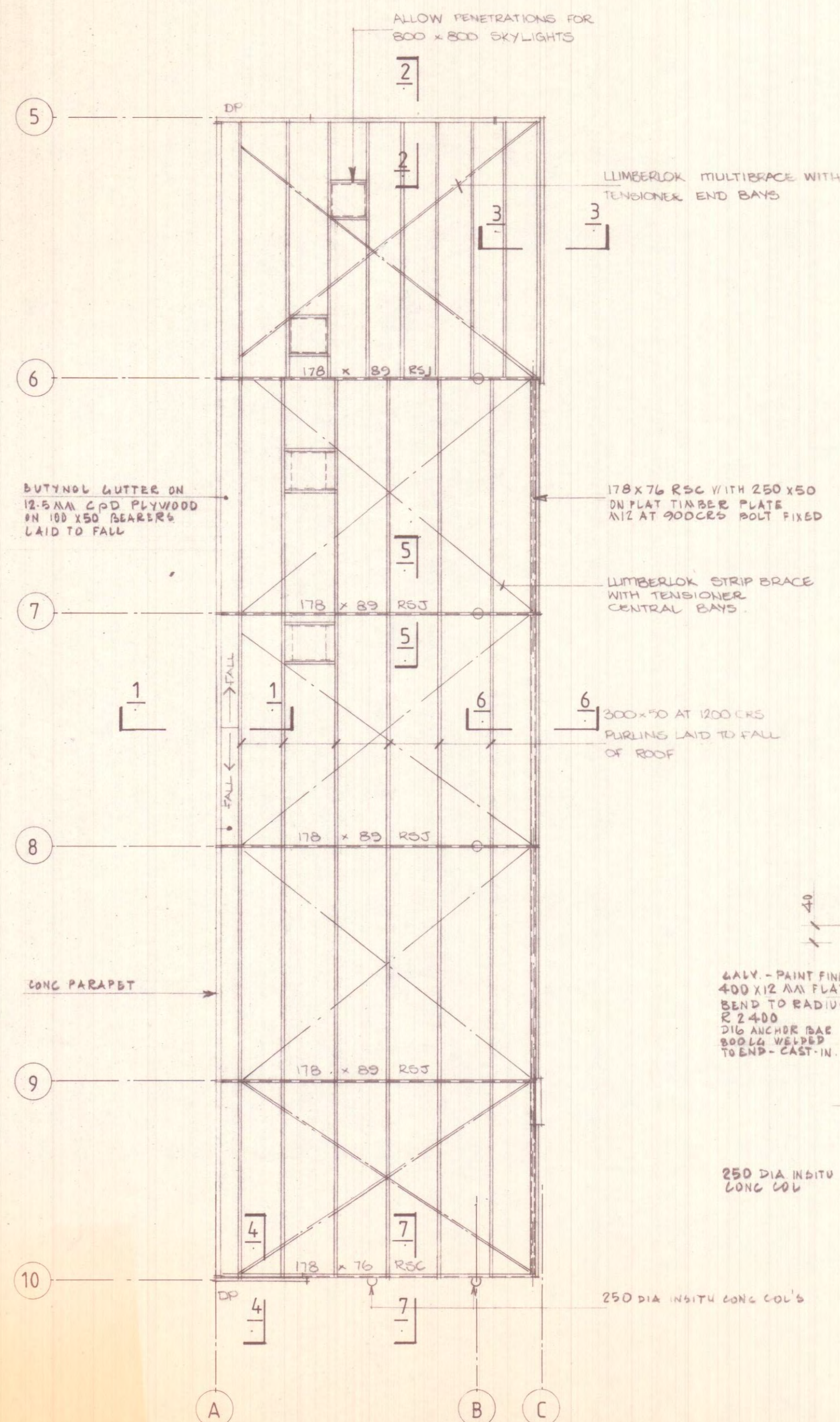
ground floor plan
upper floor plan
roof plan

JOB	DRAWING	REV
620A & B	S3	

NOTE: ALL STRUCTURAL MEMBERS BEHIND GLAZING TO BE PAINTED BLACK BEFORE GLASS IS PLACED



3 4 opp hand



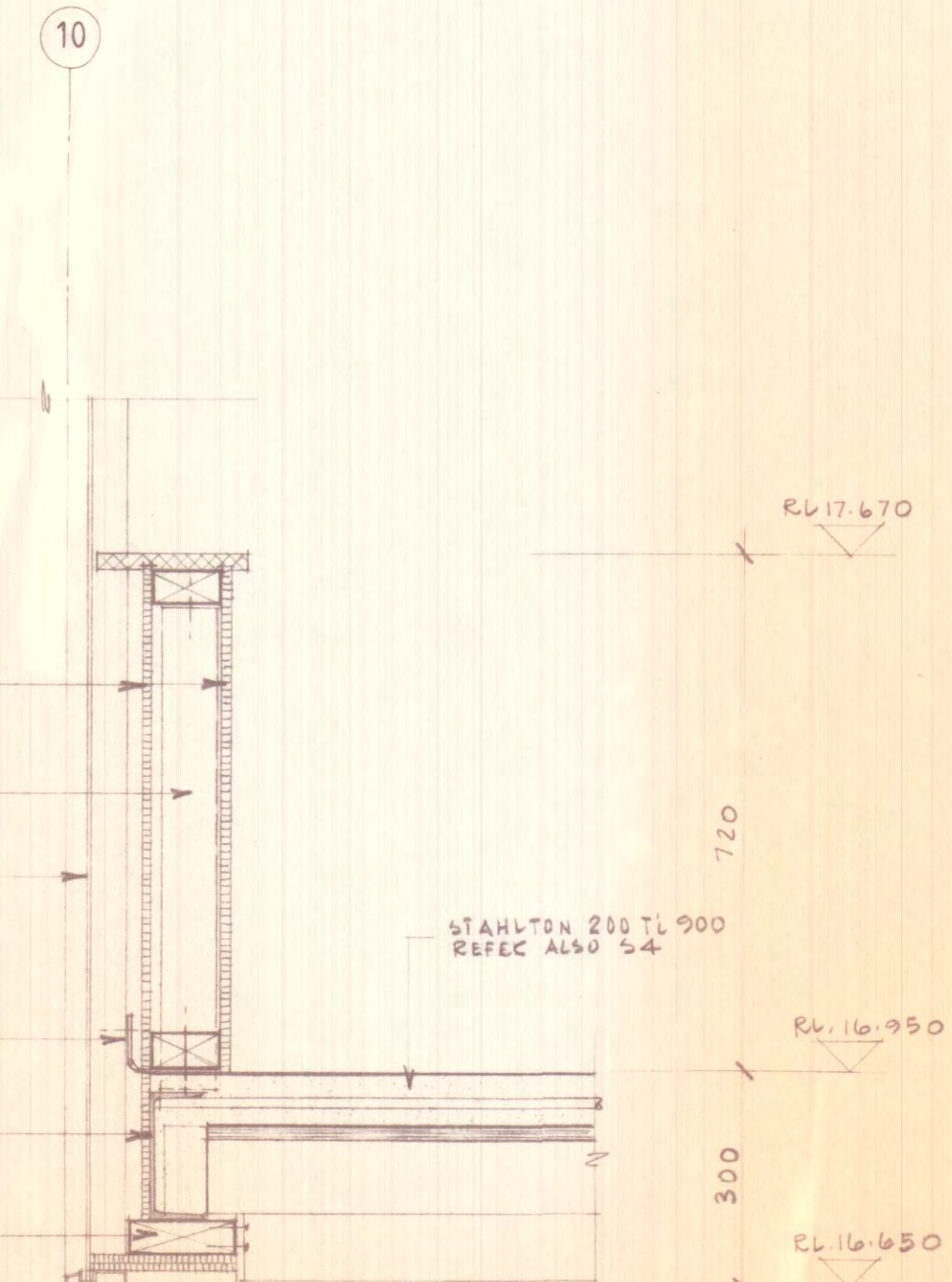
16mm TYRELINE BOTH SIDES TO 100x50 AT 600 CRS FRAMING (100mm INSULATION NOT SHOWN)

76x58 R46 POSTS AT 1500 CRS WELDED TO R56 OR BOLTED TO FLOOR WITH BASE PL 400x12mm REFLECTIVE GLAZING

6mm AS FLAT BRACKETS TO AULLIONS BY OTHERS

178x76 R56

50x50 CONTINUOUS PLATE RAMJET TO R56 WITH 2-16mm LAYERS TYRELINE



8 9 sim SUSPENDED CEILING SYSTEM

TYPICAL SPANDREL DETAIL

REVISIONS

NEW CONCRETE
TWO STOREY UNIT
78 BYRON ST
for MR and MRS
STEWART

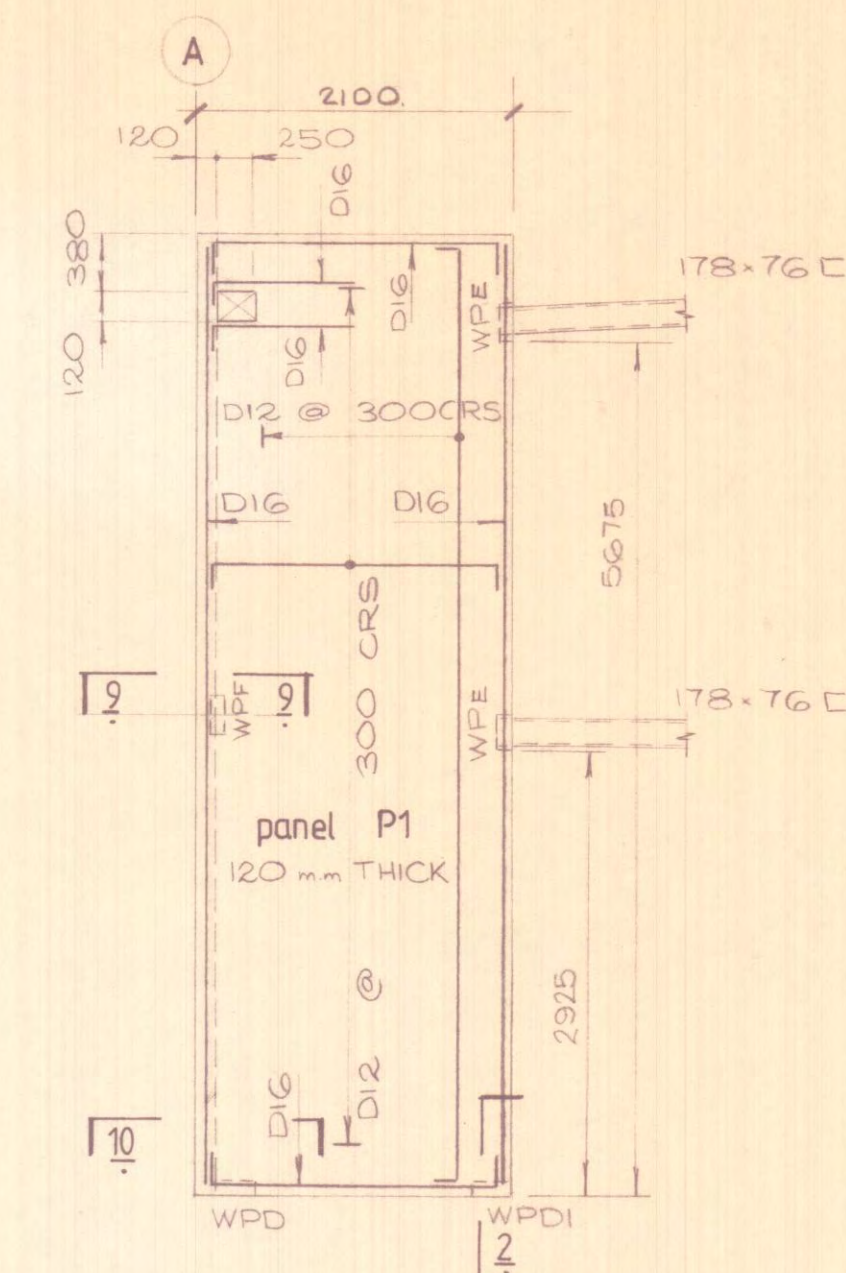
Buchanan & Fletcher Ltd
CONSULTING STRUCTURAL ENGINEERS
ST EBRAS COURT, 47 HERBERT ST
CHRISTCHURCH, NZ 8013
PHONE 03 366 5000 FAX 03 366 5001

DRAWN: G J H DATE: 26 07 88
APPROVED: SCALE: 1:100

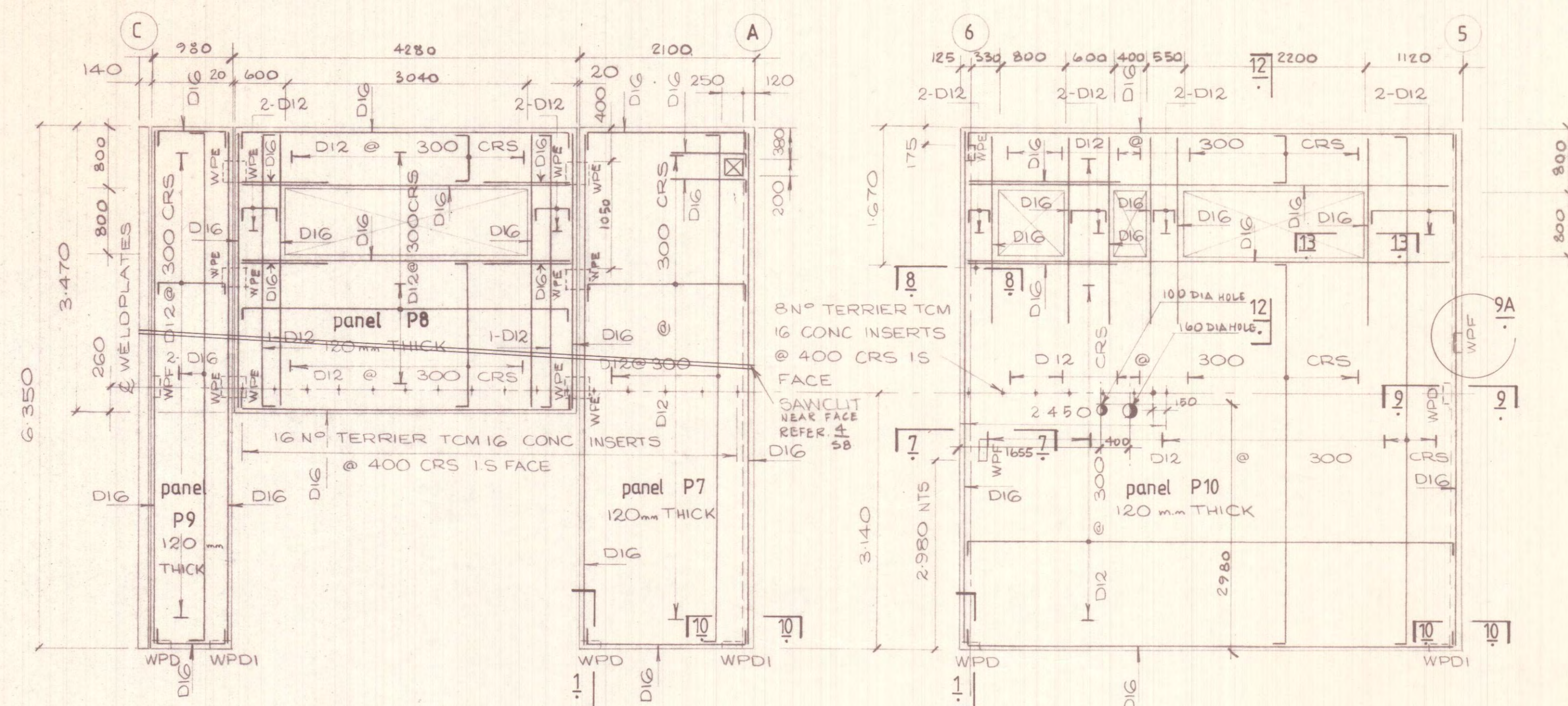
CHRISTCHURCH CITY COUNCIL
Approved Subject to the By-Laws
1 SEP 1988
M Drake
For Engineer

roof framing plan
sections

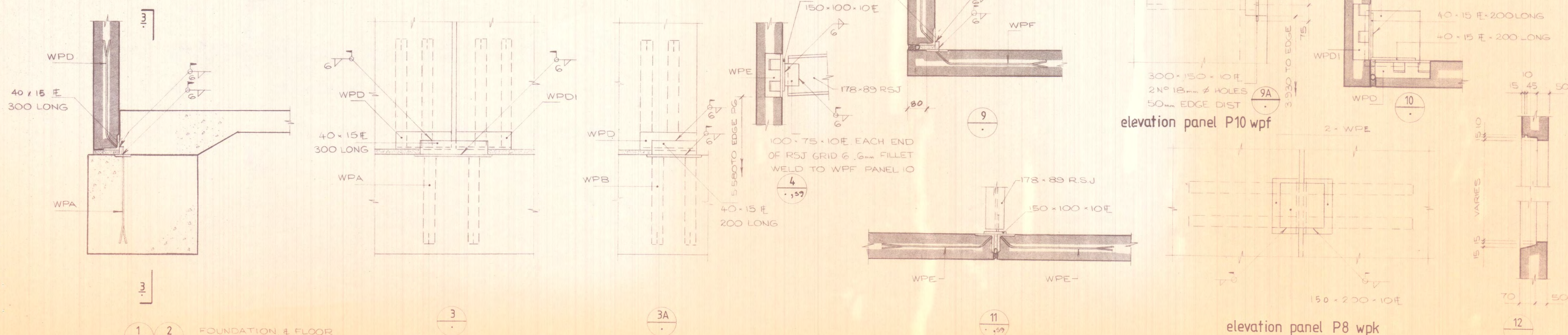
JOB: 620A DRAWING: S5



elevation of wall on line 10



elevation of wall on line C



NOTE: PANELS ARE DRAWN VIEWED FROM OUTSIDE

CHRISTCHURCH CITY COUNCIL
Approved Subject to the By-Laws
1 SEP 1988
M Drake
For Engineer

REVISIONS

NEW CONCRETE
TWO STOREY UNIT
78 BYRON STREET
for MR and MRS
STEWART.

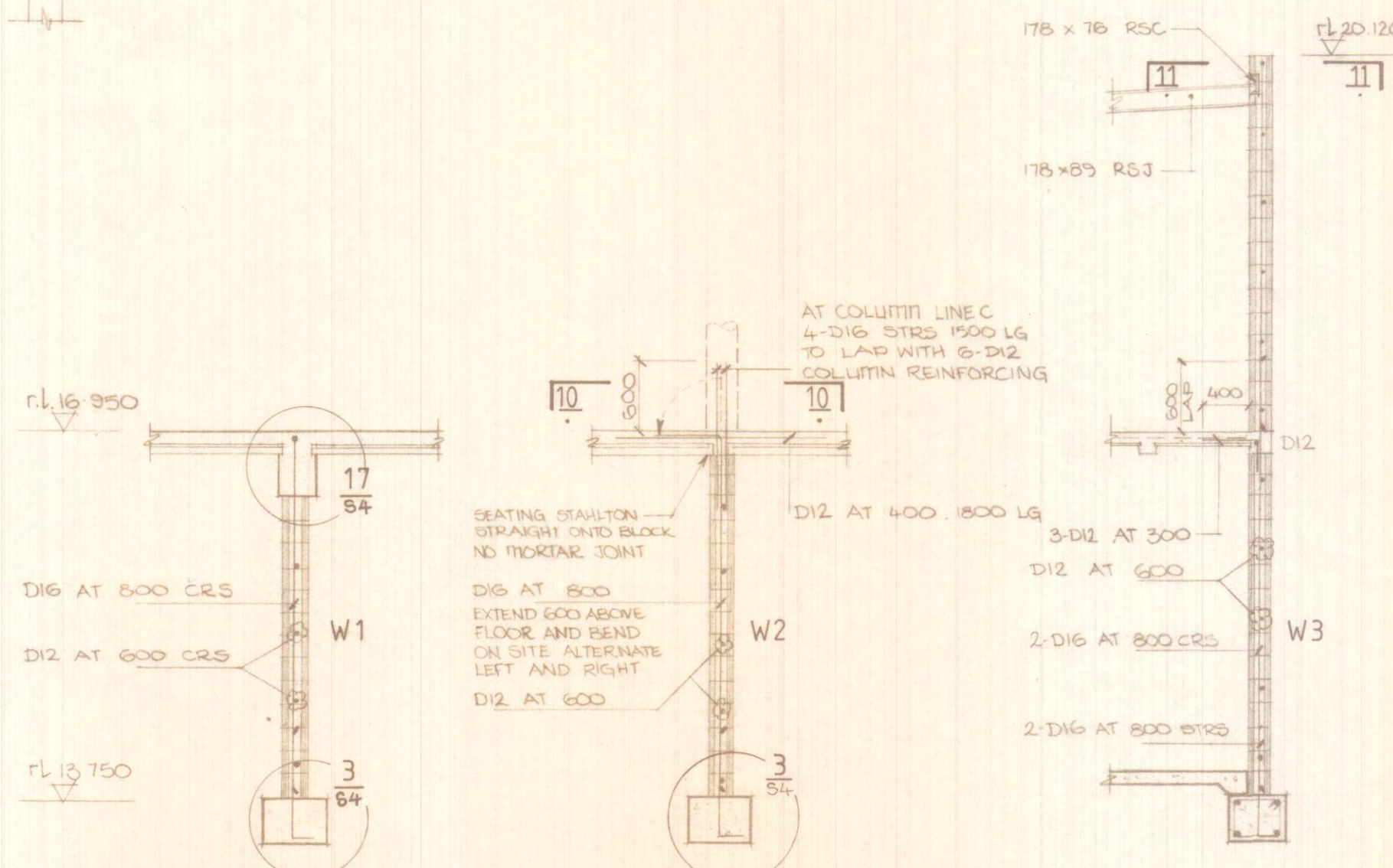
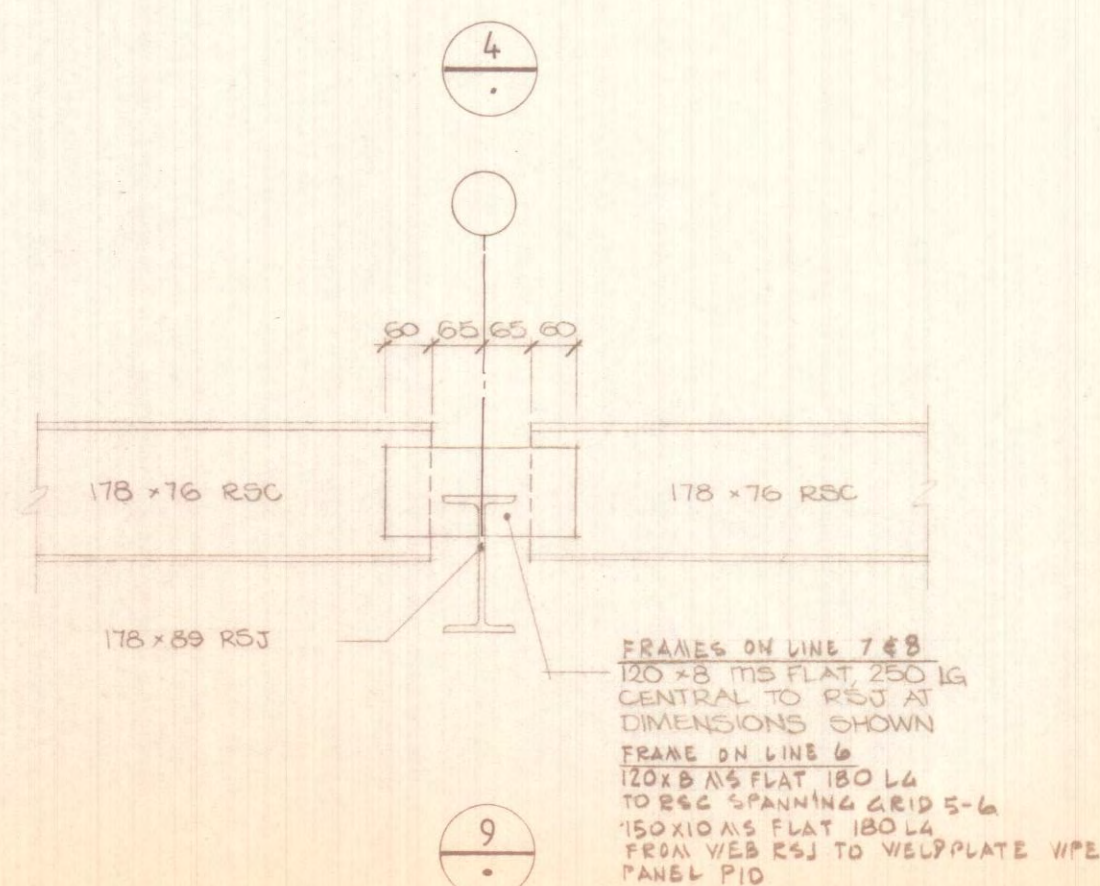
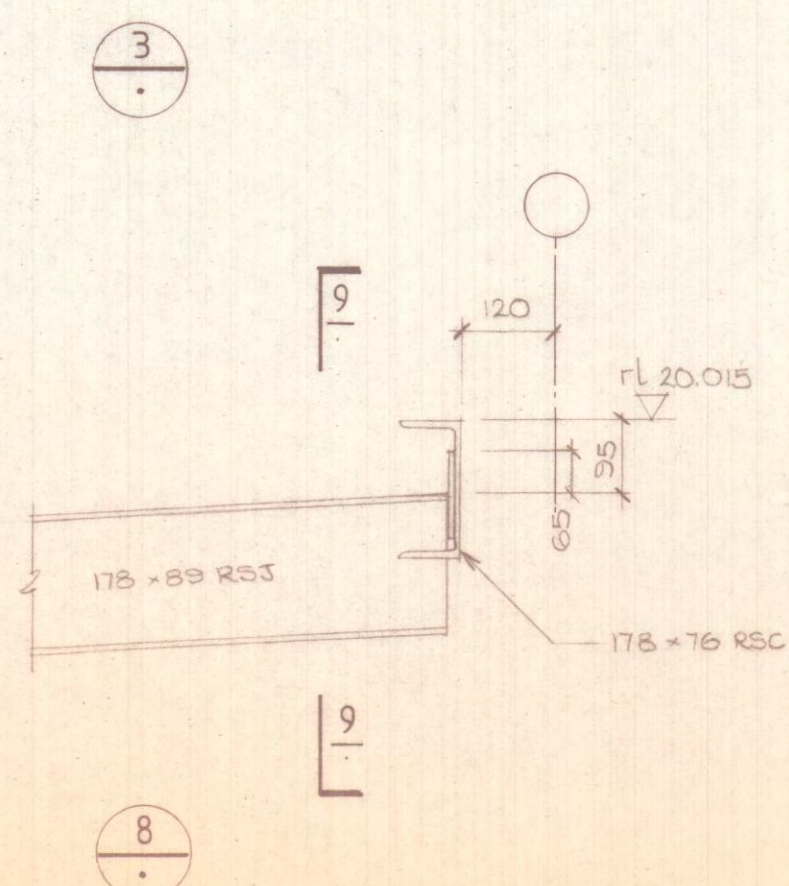
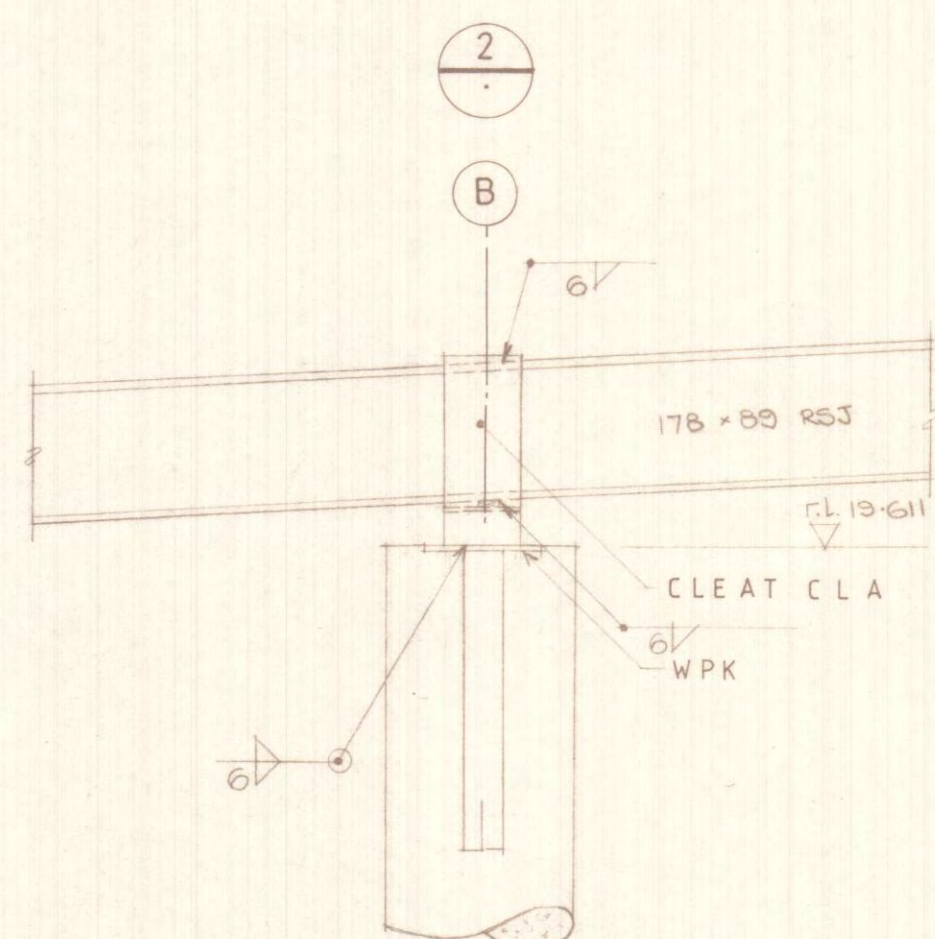
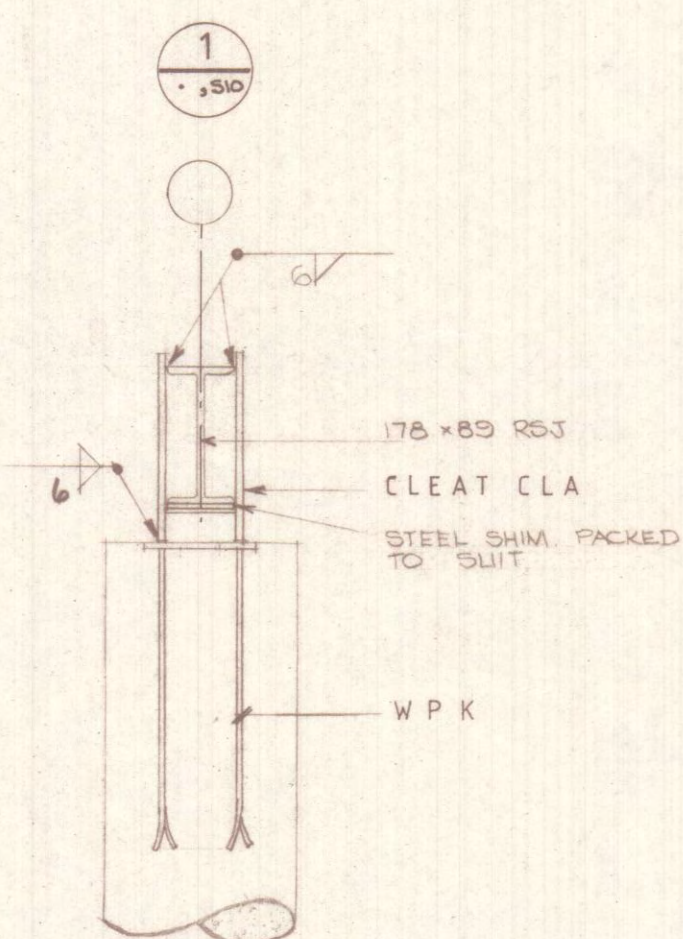
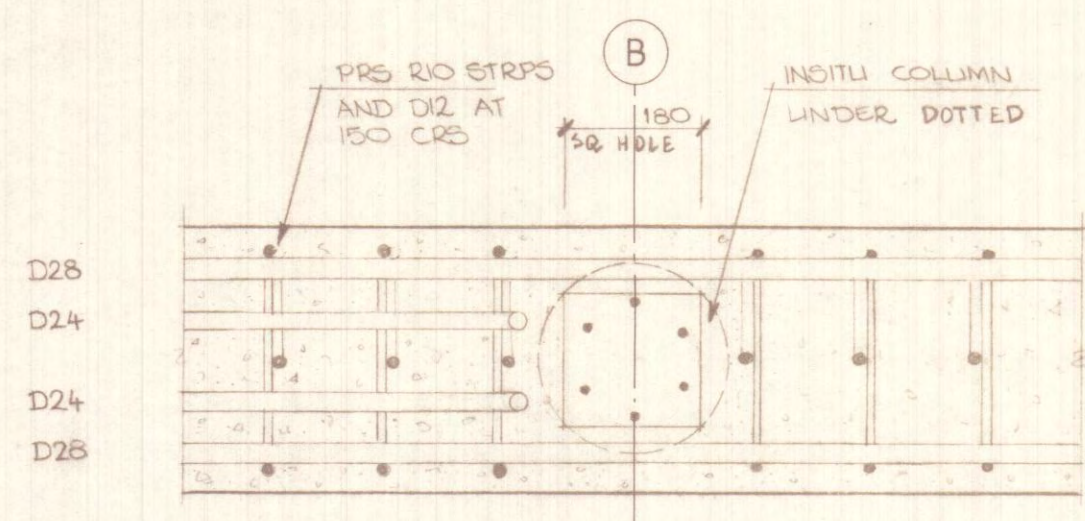
Buchanan & Fletcher Ltd
CONSULTING STRUCTURAL ENGINEERS
St. Elmo Courts 47 Hereford St.
Christchurch NZ PO Box 1232
Phone (03) 63-304 Fax (03) 795-011

DRAWN B.L.S. DATE: 26.07.88

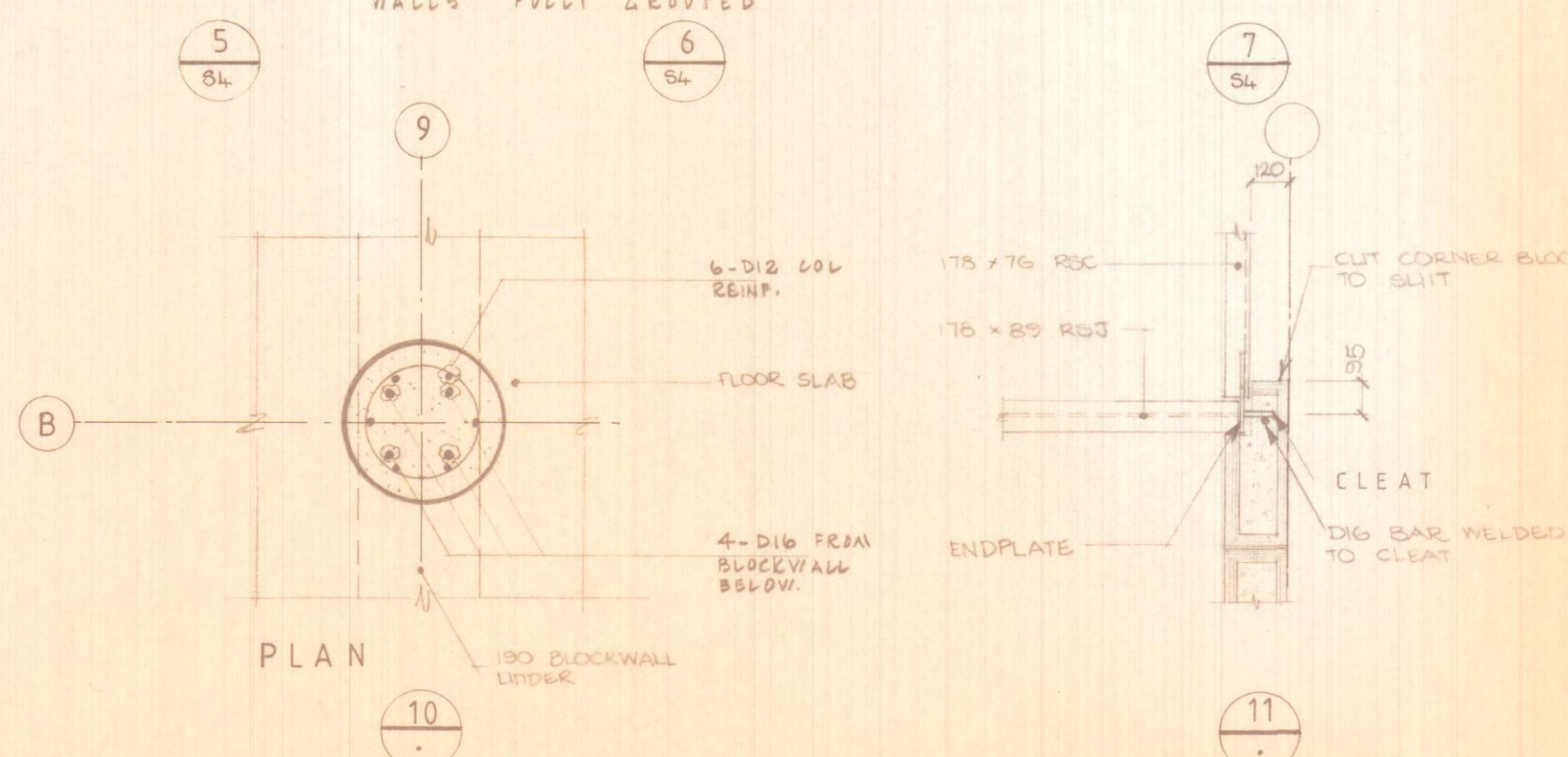
APPROVED: SCALE: 1:50 1:10

P1 - P11
connection details

JOB	DRAWING	R
620A	S6	



WALLS FULLY GROUTED



REVISIONS

Buchanan & Fletcher Ltd
CONSULTING STRUCTURAL ENGINEERS
S1 Elm Court 47 Hereford S1
Christchurch M7 PO Box 1232
Phone (03 80-304 Fax (03) 795-011

Precast panel P11
frame on lines 6,7 8
blockwalls

JOB	DRAWING	REV.
620 A	S9	

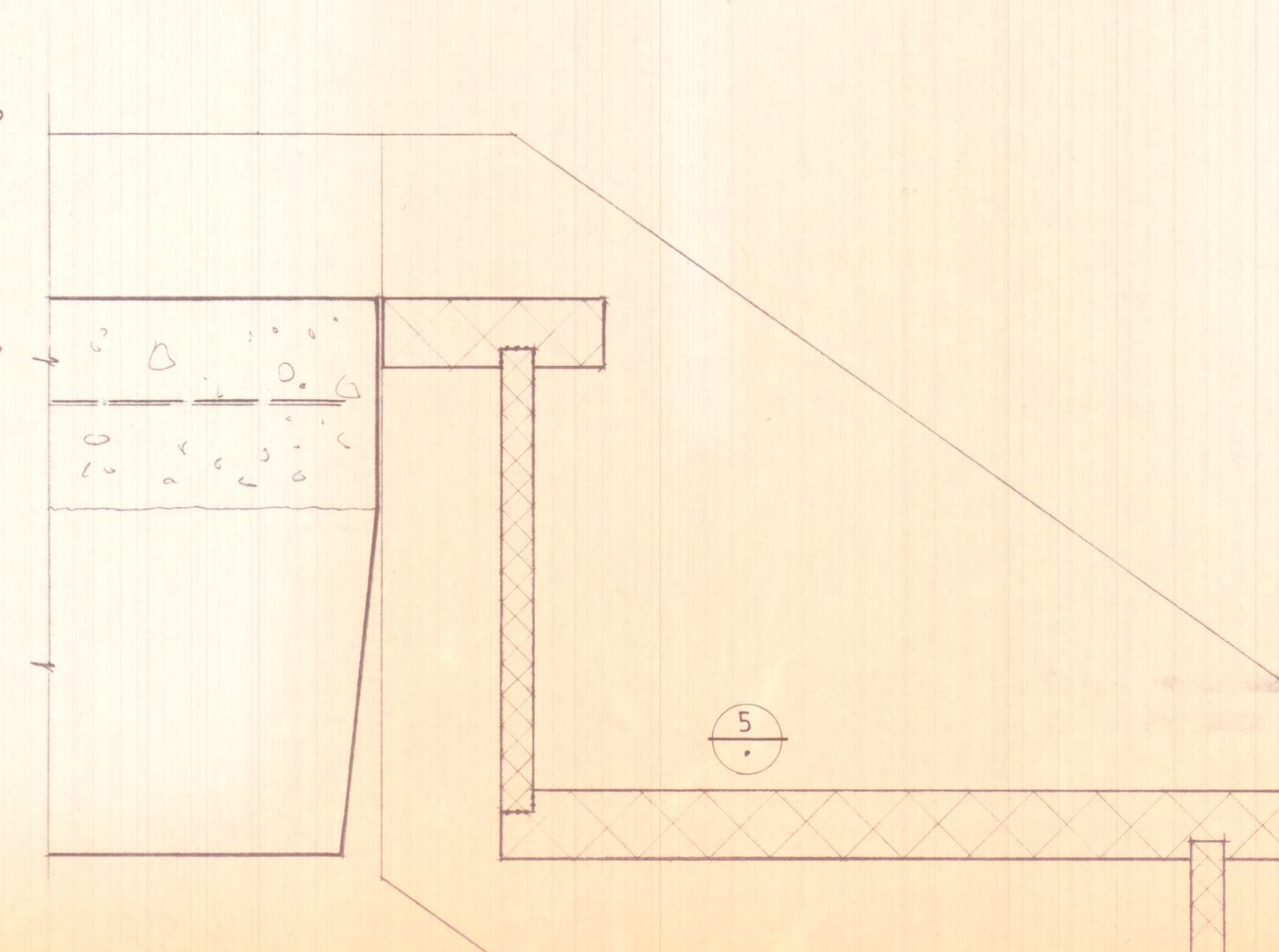
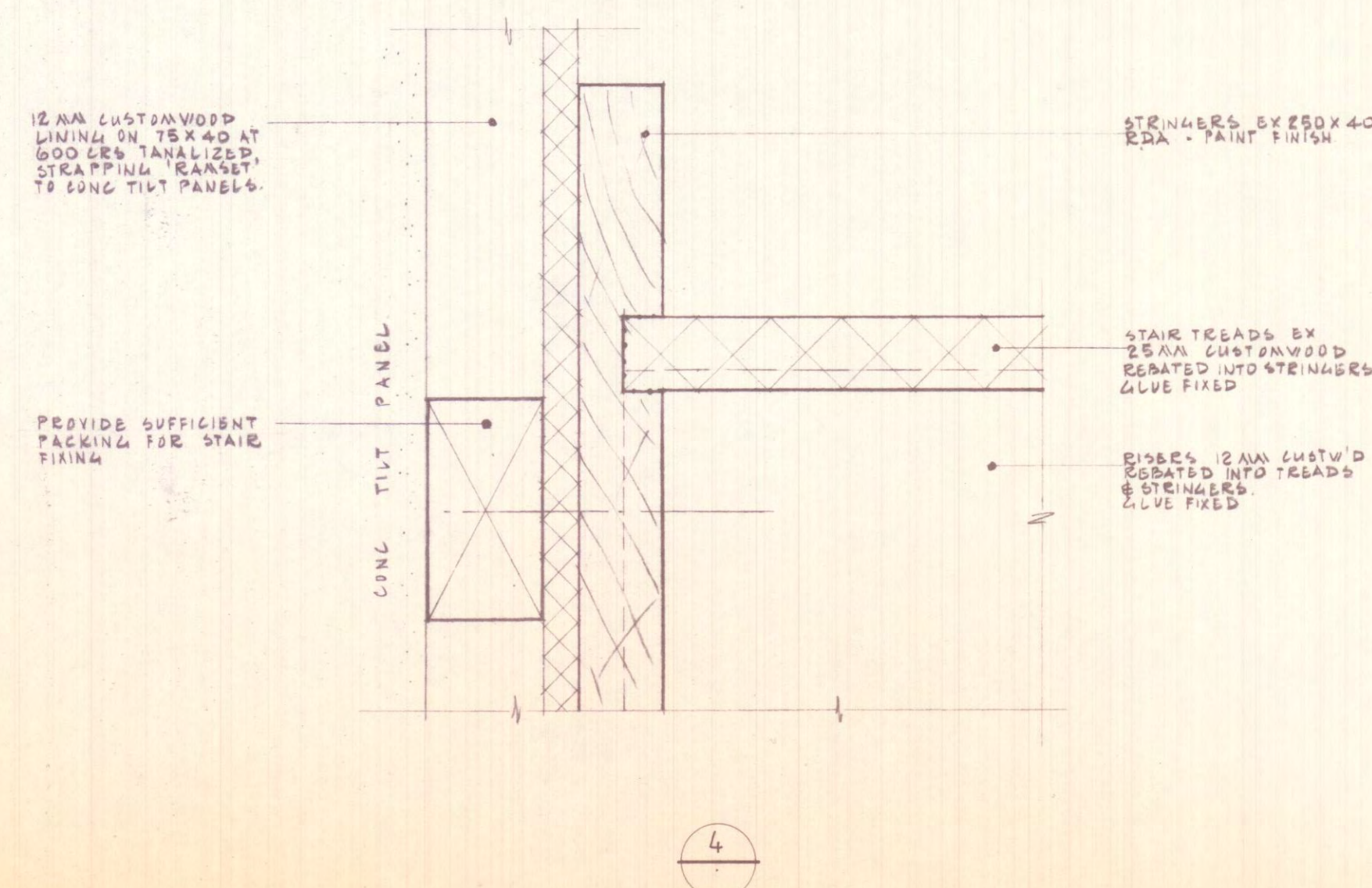
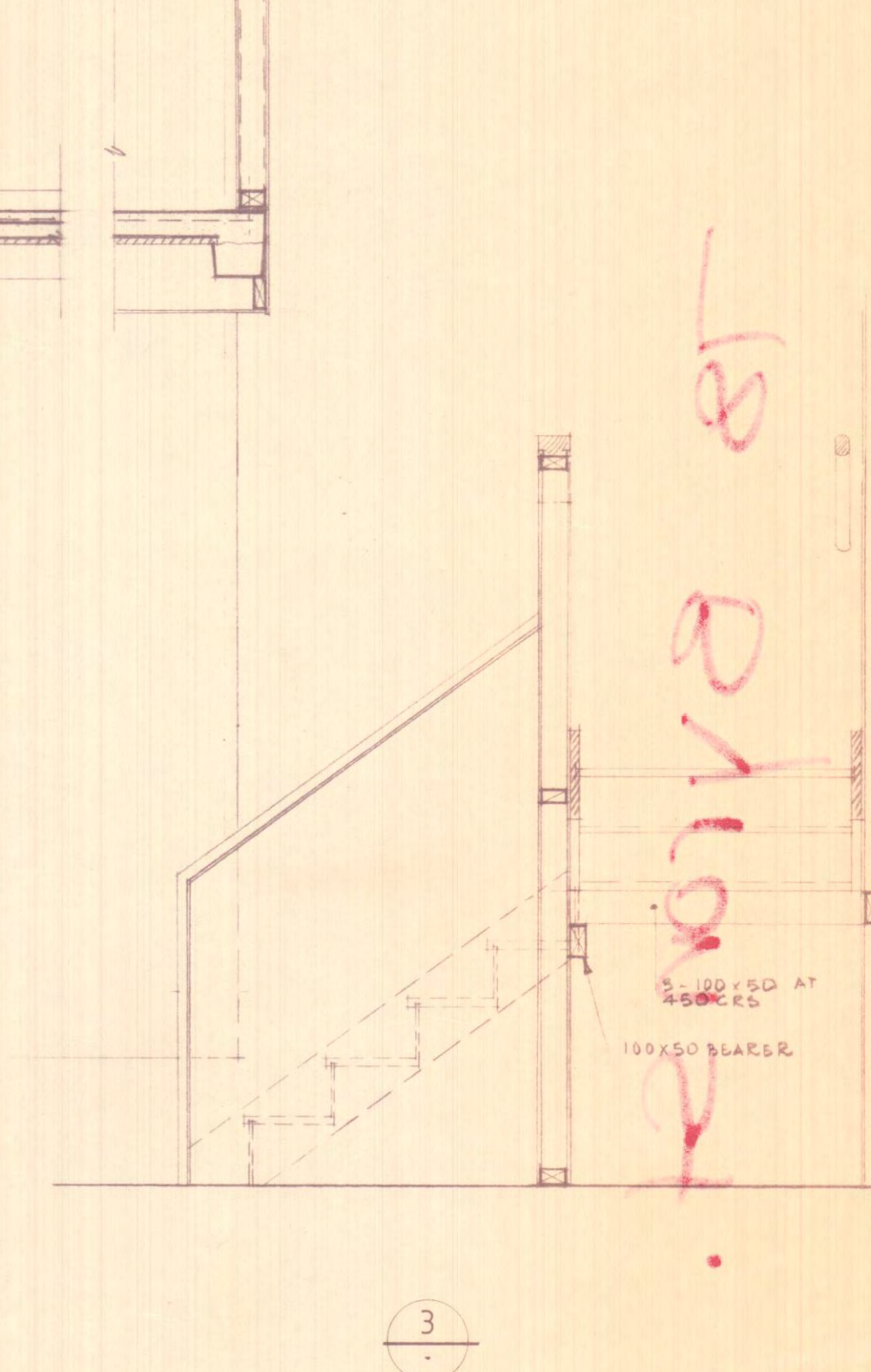
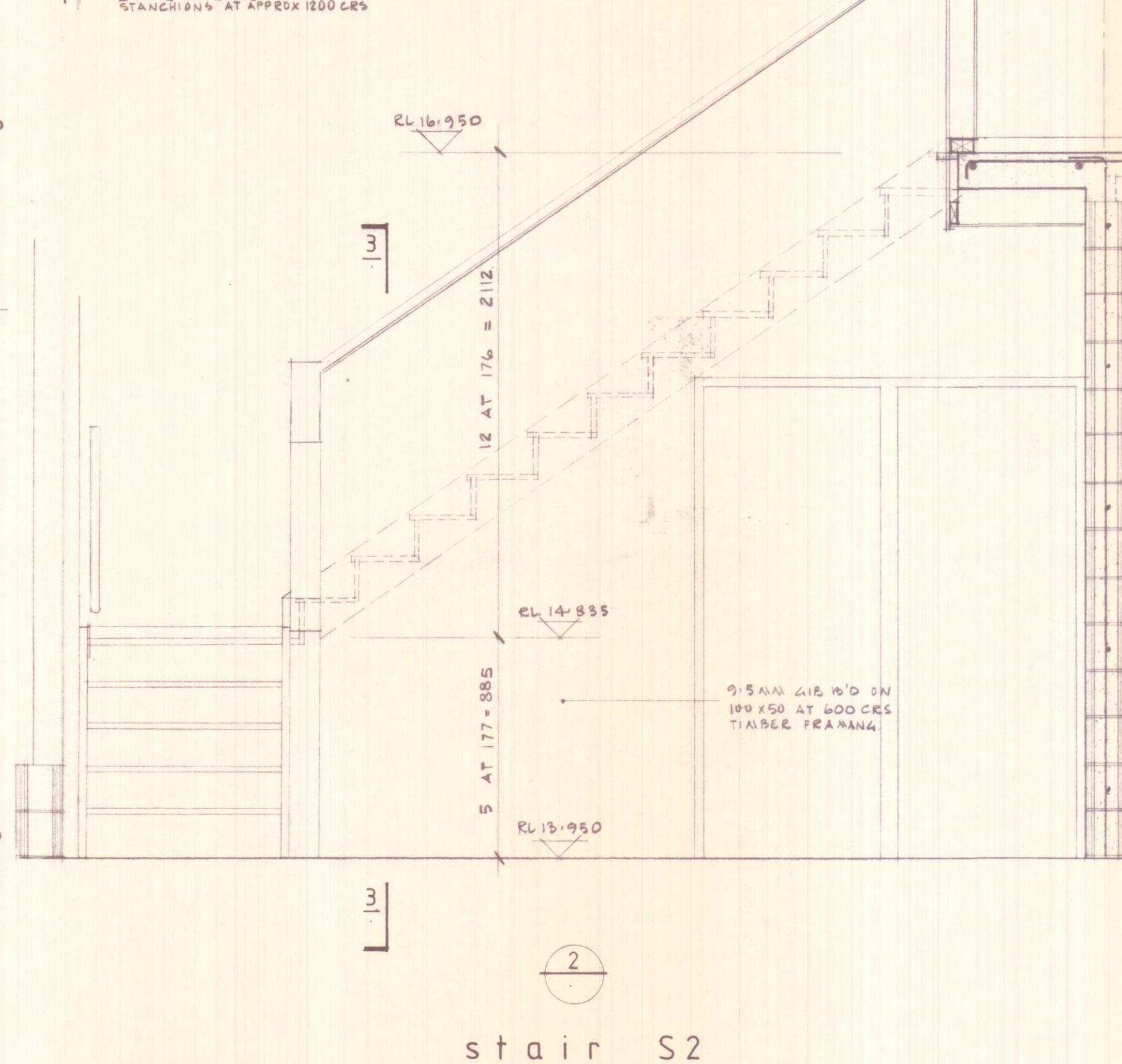
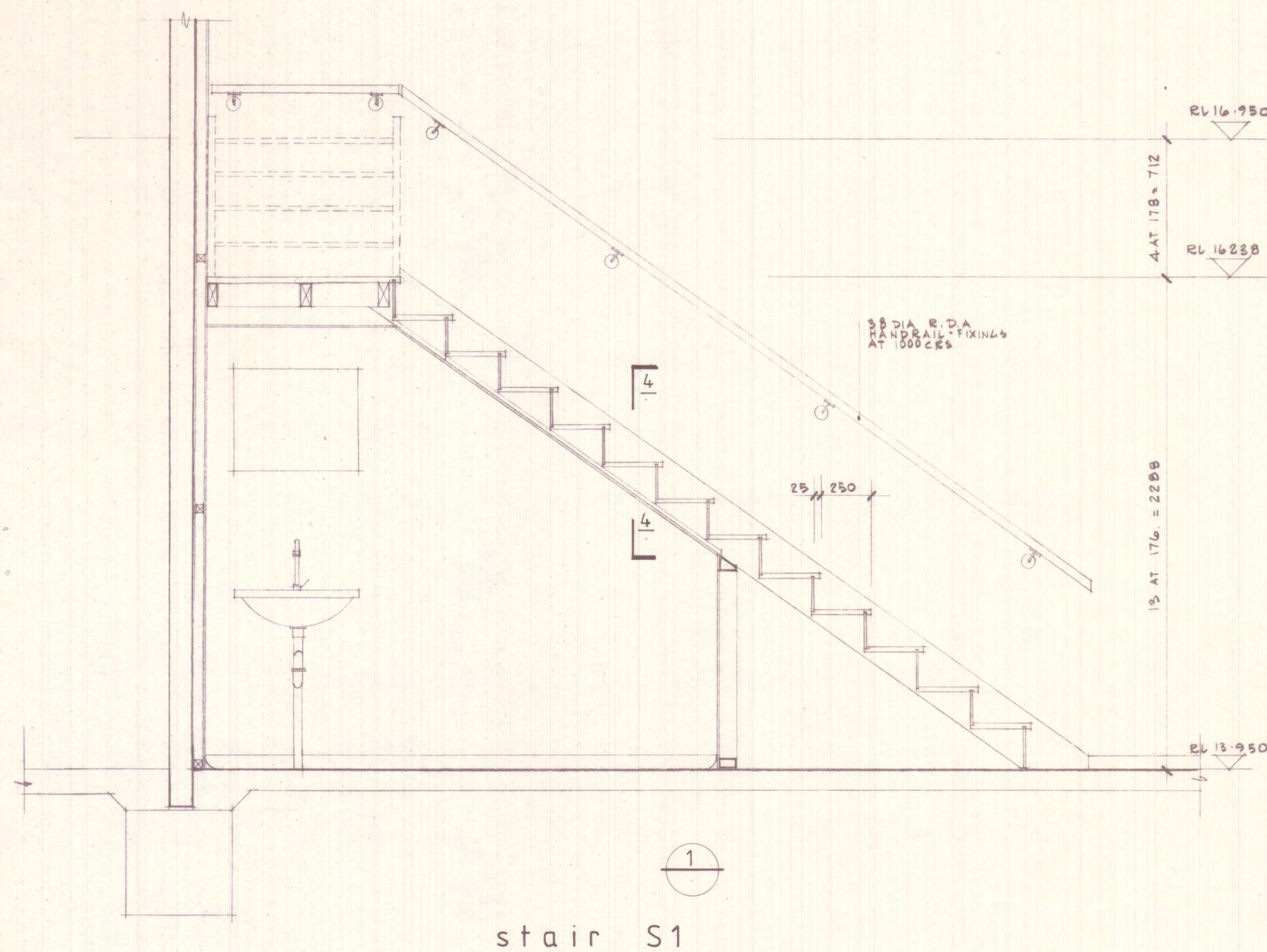
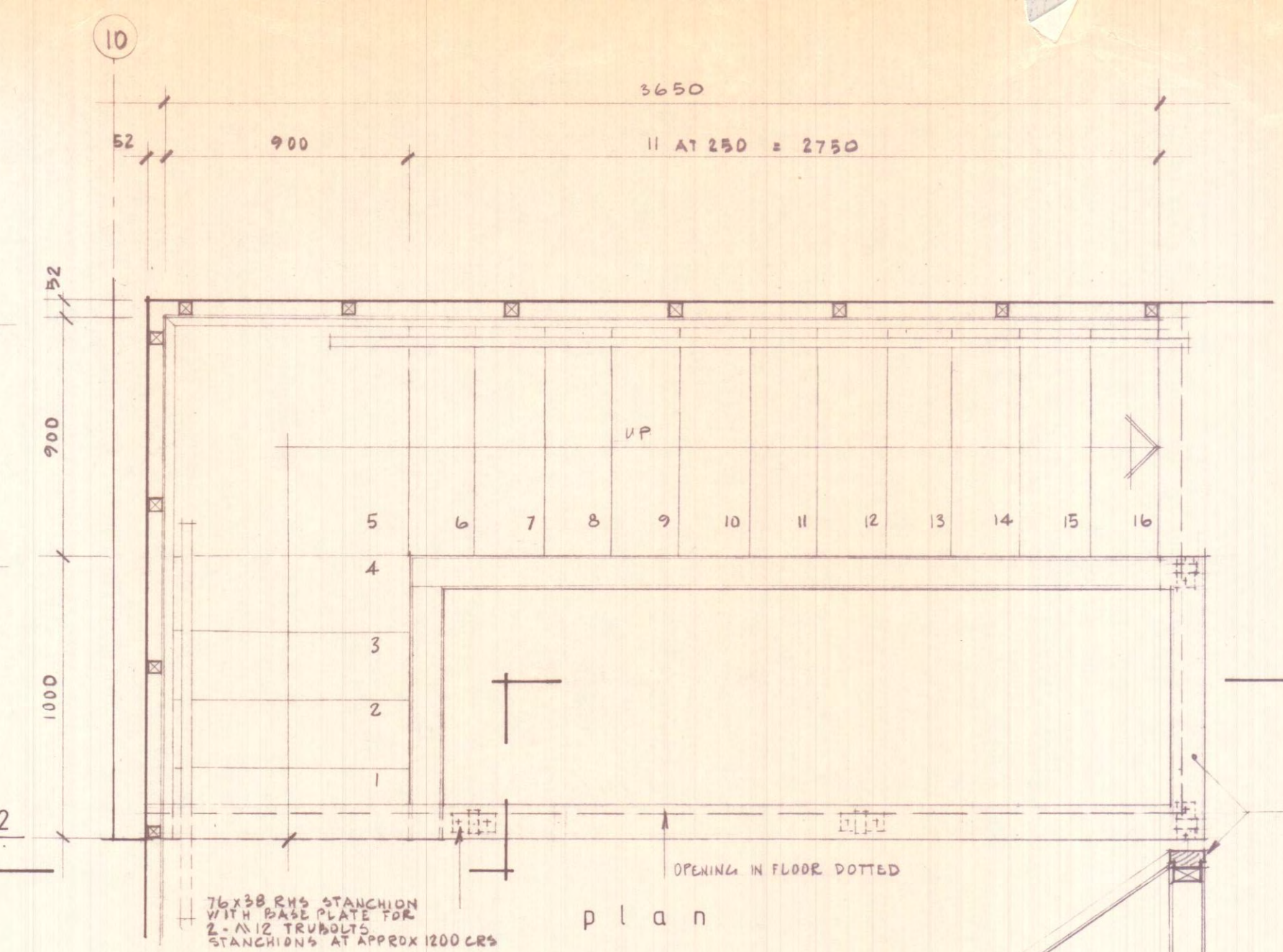
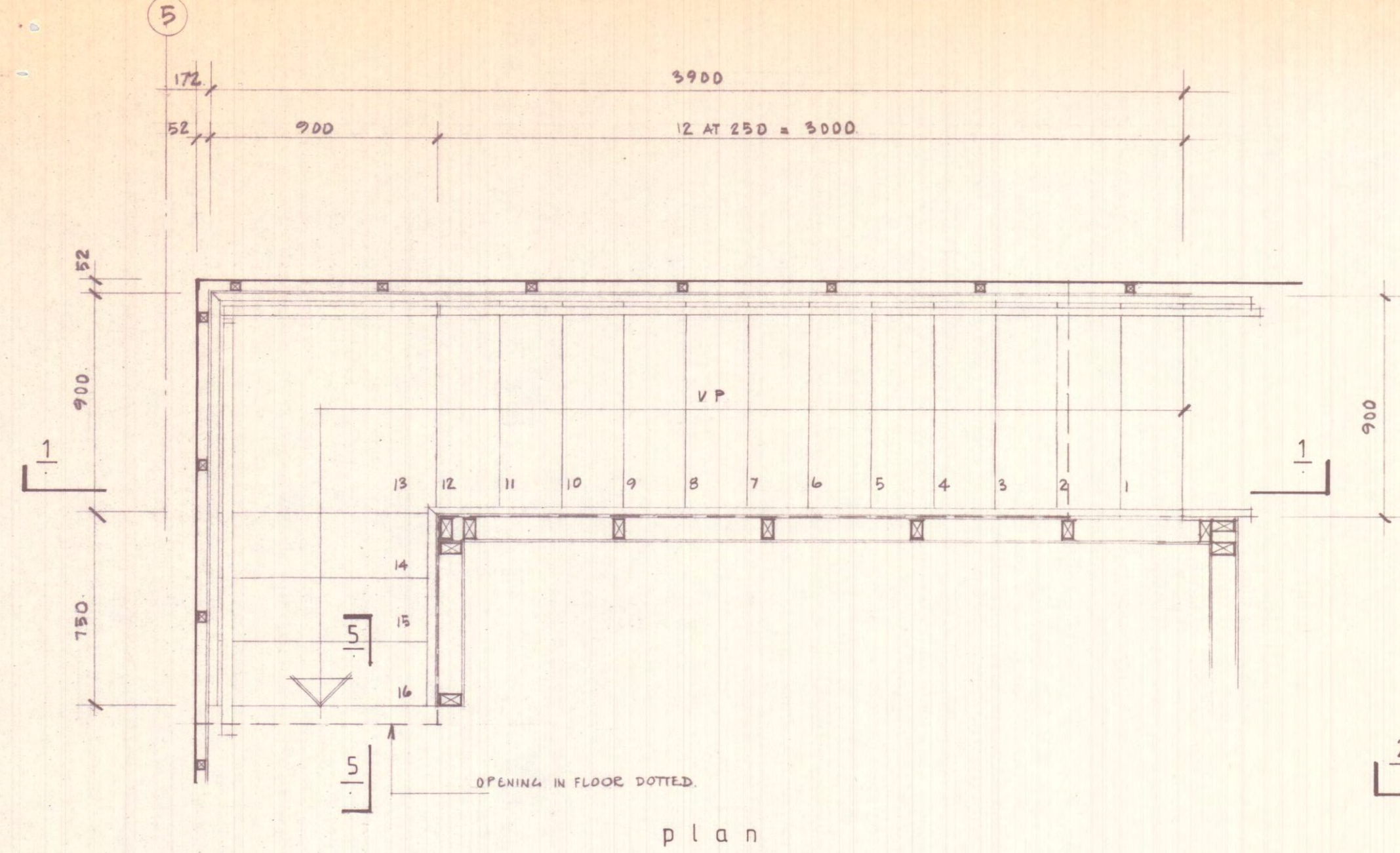
column C5

NEW CONCRETE
TWO STOREY UNIT
78 BYRON ST
for MR and MRS
STEWART

Buchanan & Fletcher Ltd
CONSULTING STRUCTURAL ENGINEERS
St Elmo Courts 47 Hereford St
Christchurch N.Z. PO Box 1237
Phone (03) 60-304-fax(03) 796-011

frame on line 10
column C5

JOB	DRAWING	REV
620 A	S10	



CHRISTCHURCH CITY COUNCIL
Approved subject to the By-Laws
1 SEP 1988
M. Drake
For Engineer

REVISIONS		
ADDITIONS & ALTERATIONS 78 BYRON ST for HALL SHOPFITTING		
Buchanan & Fletcher Ltd CONSULTING STRUCTURAL ENGINEERS 51 Otago Centre 47 Heretaf Road Christchurch 8142 P.O. Box 1237 Phone (03) 80-004 Fax (03) 790011		
DRAWN	G J H	DATE 26.07.88
APPROVED		SCALE 1:20 1:5
stairs S1, S2		
JOB	DRAWING	REV.
620	S11	

090 88-1833

01/11/1

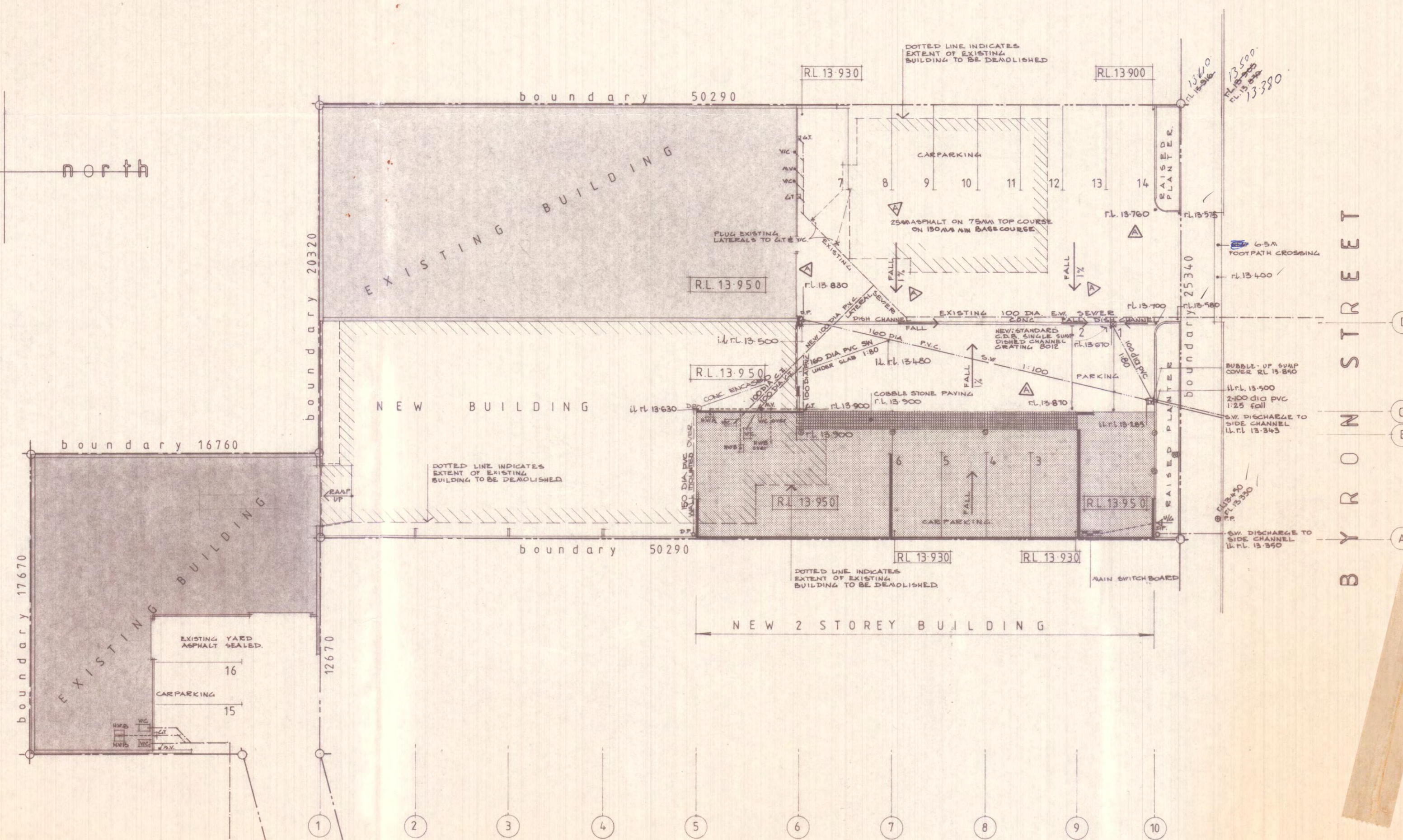
100x50 BLADE

GROUND LEVEL	13.950	13.950
INVERT LEVEL	13.950	13.950
OUT TO INVERT	0.40	0.40
DISTANCE	0.00	2.10
GRADIENT	1:100	

ELEVATION 160 DIA SW V=1:50 H=1:500

GROUND LEVEL	13.950	13.950
INVERT LEVEL	13.950	13.950
OUT TO INVERT	0.42	0.42
DISTANCE	0.00	12.00
GRADIENT	1:20	

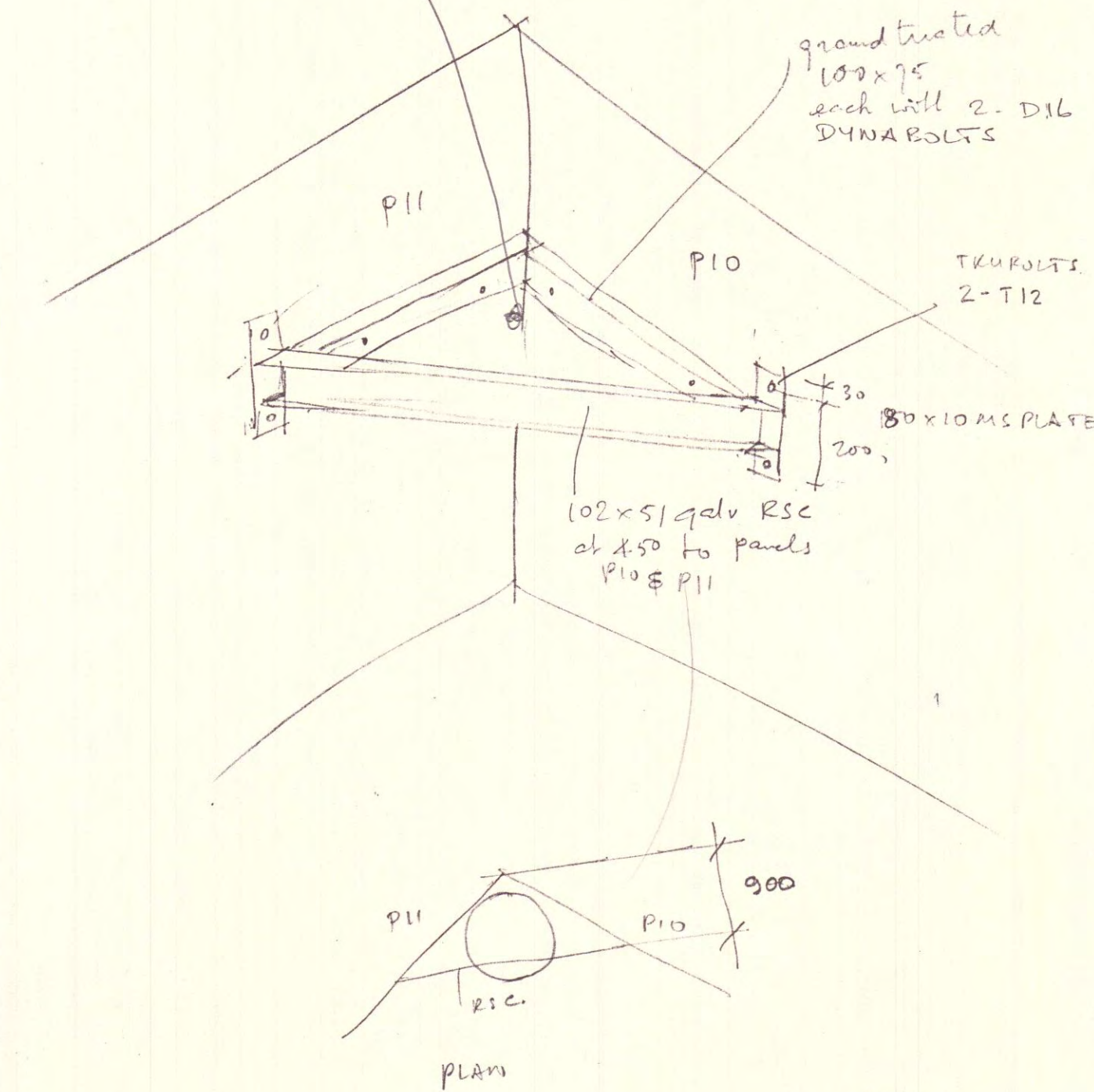
ELEVATION 160 DIA SW LATERAL V=1:50 H=1:500



LAND DESCRIPTION
 D.P. 2 PART LOT 215
 D.P. 2 PART LOT 214, 215, 216
 D.P. 50440 PART # 213, 214, 215, 216

8.888
 7.441 0.60
 1/8 Bryan St 1250 Ltr tank
 A/646

Buchanan & Fletcher Ltd
 CONSULTING STRUCTURAL ENGINEERS
 11 Sims Court, 47 Mervin St
 Christchurch, New Zealand
 Phone (03) 600-304



CHRISTCHURCH CITY COUNCIL
 Approved Subject to the By-Laws
 1 SEP 1988
 W. Drake
 For Engineer

NEW CONCRETE
 TWO STOREY UNIT
 AND NEW TIMBER
 FRAMED STRUCTURE
 78 BYRON STREET

Buchanan & Fletcher Ltd
 CONSULTING STRUCTURAL ENGINEERS
 11 Sims Court, 47 Mervin St
 Christchurch, New Zealand
 Phone (03) 600-304 Fax (03) 600-301

DRAWN G.J.H. DATE 18 07 88
 APPROVED SCALE 1:200

CHRISTCHURCH CITY COUNCIL
 Approved Subject to the By-Laws
 1 SEP 1988
 W. Drake
 For Engineer

site and drainage plan

JOB 620 A&B DRAWING S1 REV. A

CHRIS [REDACTED] RCH

DRAIN

BOARD

BOX 13006

DISTRICT No.	BOOK No.
3	40

0037

Foul Water Drainage	✓	Block Plan	Sep 12
Stormwater Drainage	CCF	J.H.S.	
Sanitary Plumbing	✓	Letter Ref.	

INSPECTOR *W. Moore*

DATE 4.8.88

CCC 1646

I. M.D. & M.A Stewart

47 Waimea Tce

Sub. Pt. 78/80 Byron St.
Sydney.

Lot Nos. 213-216 D.P. 2.

Stage 1. New Timber Framed structure

Stage 2. New 2. Storey concrete structure

All disused foul water
drains must be cut & sealed.Separate run of cast iron maybe
needed for each ground floorW.C. and separate cast iron for
soil pipe. min of 0.25 m.of fixed ventilation for W.C
lobbies. Floor offflows for upstairs
bath rooms is required. All San
plumbing & foul water drainage to
C.D.B. By-laws & H/Act Regs 1978.



Christchurch
Drainage Board

O.K. By Laws and
Services Division

18/8/88

To the Foreman

No. 2982

Northern
FerryheadEastern
Southern

PRELIMINARY / BUILDING PERMIT CONDITIONS

Name:

J. B. A.

Application No:

1646

Address:

78/80 Byron Street

Type of Building:

Wanchoore

1. Vehicle Crossings:

One commercial vehicle crossing extension 1.5m long being installed charge \$525 - as.

2. Any existing vehicle crossing(s) being removed.

3. All areas used by motor vehicles, being formed and sealed.

4. Front fence or effective vehicle barrier being erected and maintained along entire street frontage, except opposite vehicle crossing(s).

5. Vehicle crossing(s) being kept free of loose metal, chips, etc. at all times.

6. ^{where applicable} All stormwater from buildings, concrete and/or sealed areas being piped to side channel and pipes being kept clear of vehicle crossing(s).

7. Property ground levels being not lower than existing back of path or crown of road, whichever is the higher. All levels to be in terms of C.C.C. bench marks and any queries to be referred to Design Office.

8. Only stormwater being discharged to street side channel.

9. Stormwater pipes being at least 1ft. 6ins. apart at kerb line.

10. All new or altered downpipes, gully traps etc. being recessed behind street boundary line.

11. Fuel filler points being located on private property.

12. All formwork or shoring being supported from within the site where excavation is below ground level.

13. Disposal of wellpoint water being the responsibility of the builder. Discharge to street side channel only being permitted by specific prior approval.

14. Loading dock:

Conditions No

1. 3 - 4 - 6

will

4/8/88
Date

per Streetworks Man.

78 Byron St.
New Factory.

A 1646
25.8.88.

38

Subject to:-

- ① No 4.
- ② The windows in the East Wall being constructed as fire windows in accordance with NZS 4232.
- ③ ~~Both~~ Both stairs being separated from each level by partitions capable of providing a 1 hour FRR. (Any openings in these partitions must be protected by fire smoke stop doors or fire windows constructed in accordance with NZS 4232.)

Details of items 2 & 3 must be submitted to this office for approval before construction commences.

- ④ A sufficient number of fire fighting hose reels being installed to provide complete coverage of the building

⑤ No 39

RO

CONT.

NEW CONCRETE 2 STOREY UNIT

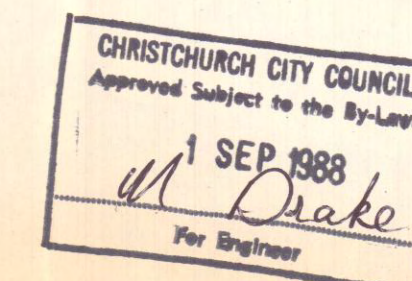
NEW TIMBER FRAMED STRUCTURE

78 BYRON STREET

PLEASE FILE AS ROLL WITH SPECIES

C.C.C. COPY

1st copy



CITY OF CHRISTCHURCH

CITY WORKS AND PLANNING DEPARTMENT

P.O. BOX 237, CHRISTCHURCH, NEW ZEALAND

J Hall & Co Ltd

31 August

198

78 Bryon Street

CHRISTCHURCH

re Building Application No. 1646 BU/40/147/78
Mr G Whelan

Dear Sir/Madam, your application for permission to

erect timber framed structure (Stage I), and concrete 2 storey structure (Stage II)
at 78 Bryon Street

has now been approved. Before work is commenced the undermentioned fees must be paid
and a building permit uplifted from this office.

Water Connection Charge	\$
Subdivision Fee	
Building Permit Fee	1,027.00
Building Research Levy	218.90
Vehicle Crossing	525.00
Drainage Permit/ Footpath Opening Fee	130.00
	<u>Indemnity required</u>
Total GST Inclusive	<u>1,900.90</u>

The Building Permit Application is approved subject to the following amendments to your
proposal.

Conditions attached

Note: A Reserve Contribution levy of \$1,226.50 GST Inclusive for a development
notification is to be paid before the permit can be issued.

88-1833
Sheet 1.

If the permit is not uplifted within three months of this date the application will be cancelled and the plans
disposed of.

Yours faithfully

M Drake

For City Engineer

cc I McD & M A Stewart
47 Waimoa Terrace
CHRISTCHURCH

Buchanan & Fletcher
St Elmo Courts
47 Hereford Street
CHRISTCHURCH

BUILDING PERMIT CONDITIONS FOR 78 BYRON STREET

1. Compliance with the amendments shown on the plans.
 2. The windows in the East wall being constructed as fire windows in accordance with NZS 4232.
 3. Both stairs being separated from each level by partitions capable of providing a 1 hour FRR. (Any openings in these partitions must be protected by smoke stop doors or fire windows constructed in accordance with NZS 4232.)
- Details of items 2 & 3 must be submitted to this office for approval before construction commences.
4. A sufficient number of fire fighting hose reels being installed to provide complete coverage of the building.
 5. Where fire fighting hose reels are to be fitted, all high pressure water piping in or within 3 metres of the building shall be metallic.
 6. The Engineer responsible for the structural design (including the foundation system) confirming in writing that the intent of his design has been complied with before the internal linings are fixed.
 7. Compliance with the Director of Environmental Health's requirements attached to the plans.
 8. Any advertising signs being the subject of a separate permit application.
 9. One commercial vehicle crossing extension 1.5m long being installed.
 10. All areas used by motor vehicles, being formed and sealed.
 11. Front fence or effective vehicle barrier being erected and maintained along entire street frontage, except opposite vehicle crossing.
 12. Where applicable all stormwater from buildings, concrete and/or sealed areas being piped to side channel and pipes being kept clear of vehicle crossing.



CHRISTCHURCH CITY COUNCIL

BUILDING PERMIT APPLICATION

APP No: 1646
ZONE: I3

To: The City Engineer,
Christchurch City Council

Date 28 July 1988

I/we hereby apply for a Building Permit for the work described below and in accordance with the plans and specifications deposited herewith in duplicate:

DESCRIPTION OF WORK: Stage 1 - New timber framed structure
Stage 2 - New concrete 2 story structure
PROPOSED USE: Shop fitting Manufacturer

SITE AND LEGAL DESCRIPTION

Street Address: 78 ~~Byron~~ St
Sydenham
Parts Lot No. 213 - 216 DP No. 2. 50440
Site Area 1570.5 CT No.

FLOOR AREA (M²)

New Building: 357m² Additions: 316m²
\$ 199,000 ✓
Estimated Value: ~~140,000.00~~

OWNER OF SITE

Name: I.M.D. & M.A. Stewart
Address: 47 Waimea Tee
Christchurch 2

BUILDER

Name: J. Hall & Coy Ltd
Address: 78 Byron St
Christchurch 2
Contact Phone No. 666.829

EMPLOYER FOR WHOM WORK IS BEING CARRIED OUT

Name: J. Hall & Coy Ltd
Address: 78 Byron St
Christchurch 2
666.829

DESIGNER

Name: Buchanan & Fletcher
Address: St Elmo Courts
47 Hereford St.
Contact Phone No. 660.304

Name of Applicant: J. Hall & Coy Ltd
(PLEASE PRINT) 15 AUG 1988

Signature of Applicant: [Signature] Return to G. WHELAN

OFF	PLAN ROOM	WWI	WW FEES	CDB	TP	TE	SW	STR	EGR	DES	HI	P & R	SUR	DBI	CBI
[initials]	[initials]	R 350 28/88	C/- SW \$130.00		DerR	[initials]	[initials]	[initials]	[initials]	[initials]	[initials]		[initials]	[initials]	[initials]

Could the date of completion for both stages, 24 months from this date 28/7/88 dwell.
[Handwritten notes and signatures]

Christchurch City Council
BUILDING PERMIT APPLICATION ADDENDUM
GENERAL FEATURES SUMMARY

dominant comment by District Building Inspector on initial
 site inspection: Where appropriate

Tick appropriate

<u>SITE</u>	Front ☐	Rear ☐	Corner ☐	APP NO. _____ ZONE _____
Street Number	OK ☐	Check ☐		
ROW Access	Yes ☐	No ☐		
C/T Attached	☐	Letter Sent ☐		
Pegging Cert	Required ☐			

BUILDING INSPECTORS CHECK

<u>DISTRICT</u>	Topography	Sloping ☐	Flat ☐	Fire Zone Siting Light & Vent. Room & Stud Heat & Store WC & Laundry Insulation Stormwater Levels Commercial Entrance level Projections/St Verandahs Hoardings Structural Stab. Egress
<u>SCHEME</u>	Site Coverage	OK ☐	Check ☐	
	Crossing - Existing	OK ☐	Length m	
		Required ☐	Position	
	Street Poles/Manholes	☐	Position	
	Sealed Areas - Existing	☐	Required ☐	
	Vehicle Barriers - Existing	☐	Required ☐	
	Landscaping - Existing	☐	Required ☐	
	Trees - Site	Street OK ☐	Refer to TP ☐	

<u>BYLAWS</u>	Boundary Pegs -	Yes ☐	No ☐	Entrance level Projections/St Verandahs Hoardings Structural Stab. Egress
	Earthworks Permit -	Yes ☐	No ☐	
	Site Levels	OK ☐	Low ☐	
	Ground Conditions -	OK ☐	Suspect ☐	
	Stormwater	CDB ☐	Soak Pit ☐	
	Under/channel	☐ To side channel	Via existing (Ind) ☐	

Opening fee required ☐

<u>BI</u>	<i>Plans see attached.</i>
<u>TP</u>	\$1226.5 <i>To pay includes G.S.T.</i> <i>Signs separate application</i> <i>8/8/88 Landscape details required</i>
<u>TE</u>	
<u>WWI</u>	37, 38 (1165 litres), 41, 45

PAID # 34929
1-9-88
APP.

BUILDING PERMIT CONDITIONS



CHRISTCHURCH CITY COUNCIL

P.O. BOX 237 CHRISTCHURCH NEW ZEALAND

IN REPLY PLEASE QUOTE
IF CALLING PLEASE ASK FOR

BU/40/167/1
Mr. *24*
Ext. *674*

6th August 1988

1165 and 1166 Ltd

75 Byron St

Christchurch 2

Dear *Sir*

RESERVE WATER SUPPLY
BUILDING PERMIT APPLICATION *1646*

1165 and 1166, Ltd

To comply with the requirements of the Christchurch City Bylaw 107 (14.2) and the Drainage and Plumbing Regulations 1978 (33)(5), the building you are proposing to erect requires a storage tank or tanks with a total capacity of *1165* litres to be incorporated in the building design.

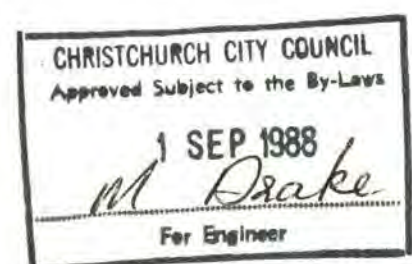
A plan showing the position of the tank or tanks and the intended pipe carcassing is to be approved, before the building permit can be issued.

Yours faithfully,

for CITY ENGINEER

BUILDING PERMIT CONDITIONS FOR 78 BYRON STREET

1. Compliance with the amendments shown on the plans.
 2. The windows in the East wall being constructed as fire windows in accordance with NZS 4232.
 3. Both stairs being separated from each level by partitions capable of providing a 1 hour FRR. (Any openings in these partitions must be protected by smoke stop doors or fire windows constructed in accordance with NZS 4232.)
- Details of items 2 & 3 must be submitted to this office for approval before construction commences.
4. A sufficient number of fire fighting hose reels being installed to provide complete coverage of the building.
 5. Where fire fighting hose reels are to be fitted, all high pressure water piping in or within 3 metres of the building shall be metallic.
 6. The Engineer responsible for the structural design (including the foundation system) confirming in writing that the intent of his design has been complied with before the internal linings are fixed.
 7. Compliance with the Director of Environmental Health's requirements attached to the plans.
 8. Any advertising signs being the subject of a separate permit application.
 9. One commercial vehicle crossing extension 1.5m long being installed.
 10. All areas used by motor vehicles, being formed and sealed.
 11. Front fence or effective vehicle barrier being erected and maintained along entire street frontage, except opposite vehicle crossing.
 12. Where applicable all stormwater from buildings, concrete and/or sealed areas being piped to side channel and pipes being kept clear of vehicle crossing.





FILE COPY

CHRISTCHURCH CITY COUNCIL

P.O. BOX 237 CHRISTCHURCH NEW ZEALAND

IN REPLY PLEASE QUOTE
IF CALLING PLEASE ASK FOR
EXTENSION NO.

TP/8/147/78-80
Mr McIntosh
631

15 August 1988

The Manager
J Hall & Co Ltd
78 Byron Street
CHRISTCHURCH 2

Dear Sir

NOTIFICATION OF DEVELOPMENT NO 27/147/78-80
SECTION 293 LOCAL GOVERNMENT ACT

With reference to your Notification of Development dated 28 July 1988 relating to proposed factory and office additions at 78 Byron Street compliance with the following conditions is required.

(a) Reserve Contribution

\$1,226.50 including GST based on a value of \$223,000.

The Reserve Contribution is to be paid prior to the issue of a Building Permit. Prompt payment will ensure less delay in issuing a Building Permit as administration formalities can take some days to complete.

(b) Preservation of Trees, Planting and Buildings of Historic Interest

Details of species of tree and shrub planting to be submitted for approval in the landscaped areas.

Additional comments for your information and guidance are:

✓ Title amalgamation is required or a Certificate issued under Section 643 of the Local Government Act.

Would you please note that further requirements relating to these and other matters pursuant to the Bylaws and the District Planning Scheme, will need to be complied with, prior to, or at the time of the issue of a Building Permit.

Yours faithfully


J G Dryden
CITY PLANNER

RMcI:AJF

ANTHONY HARPER

BARRISTERS & SOLICITORS

PARTNERS:

THOMAS MURRAY ABBOTT, LL.B. (Hons) Barrister
 FREY MARTIN BRODIE, LL.B.
 RICHARD GEORGE CHETWIN, LL.B.
 ARD COCKFIELD GRAY, LL.B. (Hons) LL.B.
 GENTLE, LL.B.
 MATTHEW, LL.B. (Hons)
 JACK, LL.B. & Co.
 N, LL.B.
 WELLS, LL.B. & Co.

MARK SEAN HANMER SMITH, LL.B.
 MICHAEL FRANCIS TOOMEY, LL.B.
 MAURICE JOHN WALKER, LL.B.
 MURRAY ALAN WEARLEY, LL.B. (Hons)
 CHRISTOPHER GRAHAM WEIR, LL.B.
 ASSOCIATE
 PATRICIA MARGARET SMITH LL.B.
 CONSULTANT
 NEAL HARENESS BUCHANAN, BA LL M

LEVELS 4 & 5
 115 KILMORE STREET
 CHRISTCHURCH 1
 NEW ZEALAND

FAX:
 NATIONAL: (03) 669-277
 INTERNATIONAL: (64 3) 669-277

P.O. BOX 2646
 CHRISTCHURCH 1
 NEW ZEALAND

DX 2

TELEPHONE:
 NATIONAL: (03) 790-920
 INTERNATIONAL: (64 3) 790-920

PLEASE YOUR REPLY TO: S.G. Mortlock

22 July 1988

Town Clerk
 Christchurch City Council
 PO Box 237
 CHRISTCHURCH

Dear Sir

RE: D & M STEWART - BYRON STREEN AMALGAMATION SURVEY

Our clients have applied to the Christchurch City Council to grant a permit to carry out certain improvements on their property at 78 Byron Street.

We are authorised to advise you that our clients have through this office instructed Davis Ogilvie & Partners to amalgamate titles 5C/1127 and 30A/1190.

We enclose a letter from Davis Ogilvie & Partners dated 17th June 1988 confirming that they have received instructions. The matter is now proceeding and would expect to conclude amalgamation within the time frame specified in Davis Ogilvie & Partners' letter.

Yours faithfully
ANTHONY HARPER

PP. 

S G Mortlock

ajc/27



Davis Ogilvie & Partners

Consulting Civil and Structural Engineers
Registered Surveyors
Planning Consultants

BNZ Building 137 Armagh Street
Christchurch, New Zealand.
P.O. Box 679 Telephone 61-653
Also at Wanaka 7461.

PARTNERS

PETER YEOMAN B1 MIPENZ, MPPI
BARRY GREIG MNZIS, MPPI
ALAN FAZACKERLEY MNZIS, MPPI
VAUGHAN McMILLAN BE (Hons), MIPENZ

ASSOCIATES

BRUCE ALEXANDER Dip TP, MNZPI, MNZIS, MPPI
GUY CARNABY AMNZIS

Anthony Harper
Barristers and Solicitors
P O Box 2646
CHRISTCHURCH

BG/13804

17 June

Attention Mr S G Mortlock

Dear Sirs

RE: I AND M STEWART - BYRON STREET AMALGAMATION SURVEY

Thank you for your instruction of 7 June regarding the amalgamation of titles 5C/1127 and 30A/1190 in Byron Street.

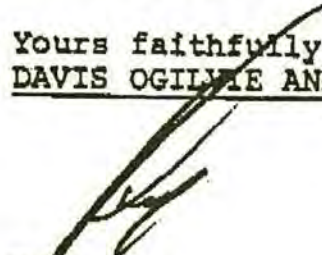
We have carried out a search of the available title and survey information in the area at the Department of Survey and Land Information and can advise that, having defined the extent of survey work required, the survey fees involved to a point where a plan is produced and lodged with the Department of Survey and Land Information for survey approval and eventual deposit for the issue of a title will be \$1,595 inclusive of GST.

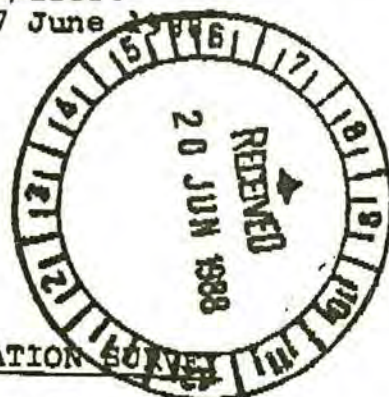
Fees will also be payable to the Department of Survey and Land Information for the lodgement of this plan for processing to survey approval including deposit fee which, in total and including GST, will amount to \$265. In that regard, you should allow a total of \$1,860 for fees and survey costs to effect the amalgamation survey.

The survey will be completed prior to the 30th of June and plans available for lodging by 8 July. We would anticipate approximately six weeks from that date to survey approval at which time of course the District Land Registrar will deposit the plan when he receives an application for a new title.

Would you kindly advise the writer if your clients are happy for us to proceed with the survey.

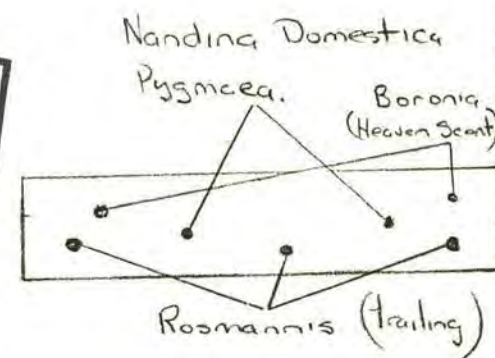
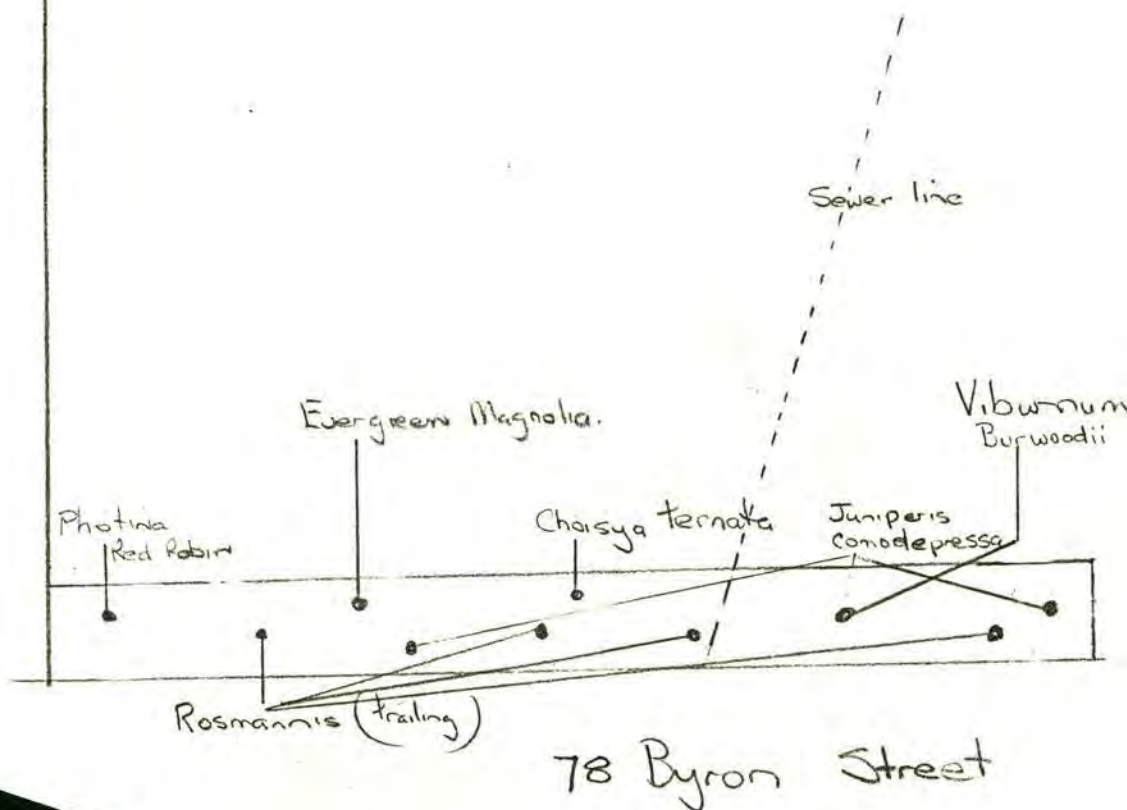
Yours faithfully
DAVIS OGILVIE AND PARTNERS


H.B. Greig



No 1646

Proposed Plants and Shrubs, etc, for 78 Byron Street



Scale 1:100
31.8.88

A 1646

Cont.

88-1833

Sheet 2.

(6) 10 B

(7) 4

(8) 17

(9) 18

(10)
11
12
13 } Steel works cands

(14) Landscaping details being submitted for approval and the required planting being completed before the buildings are occupied.

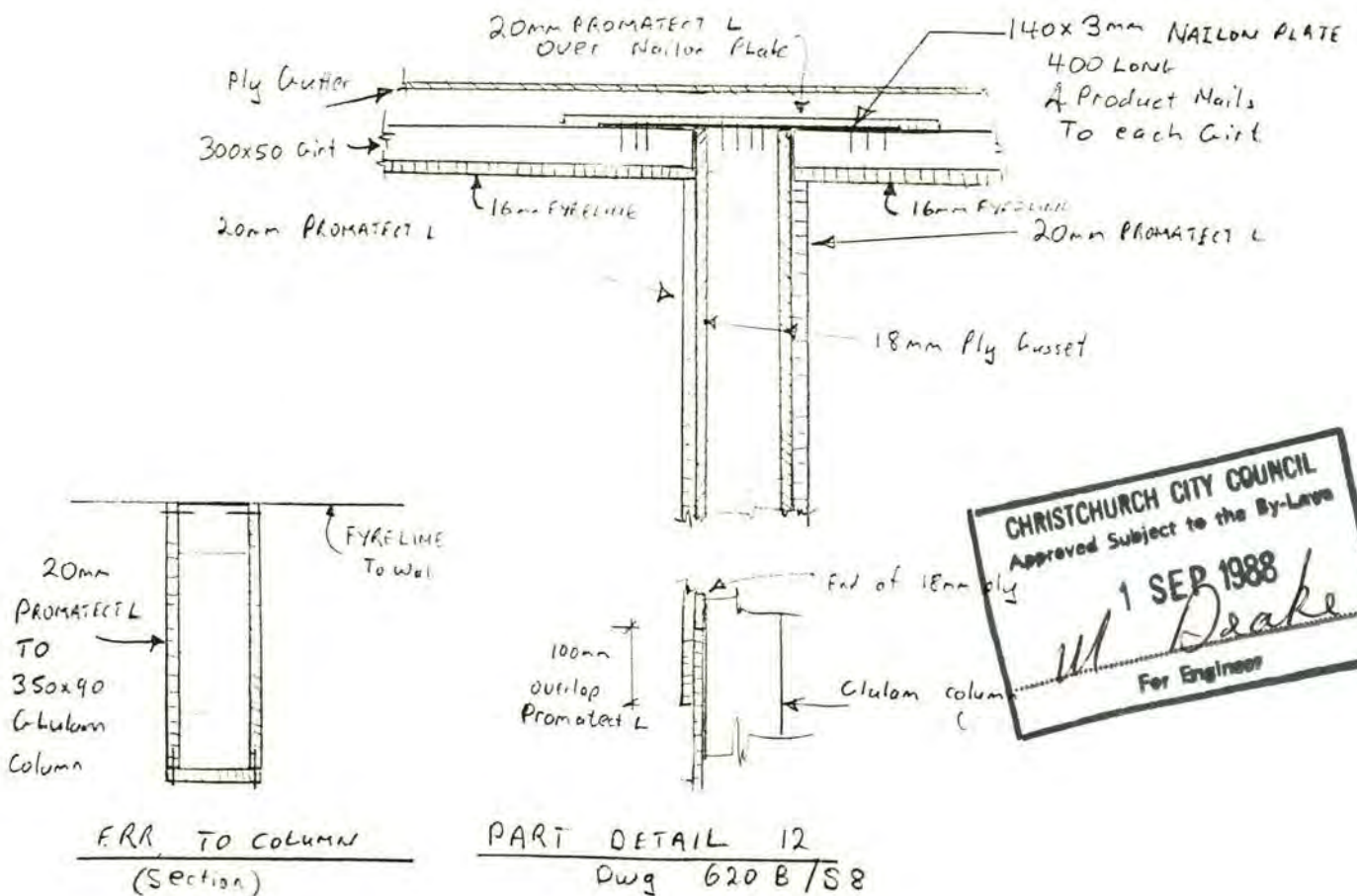
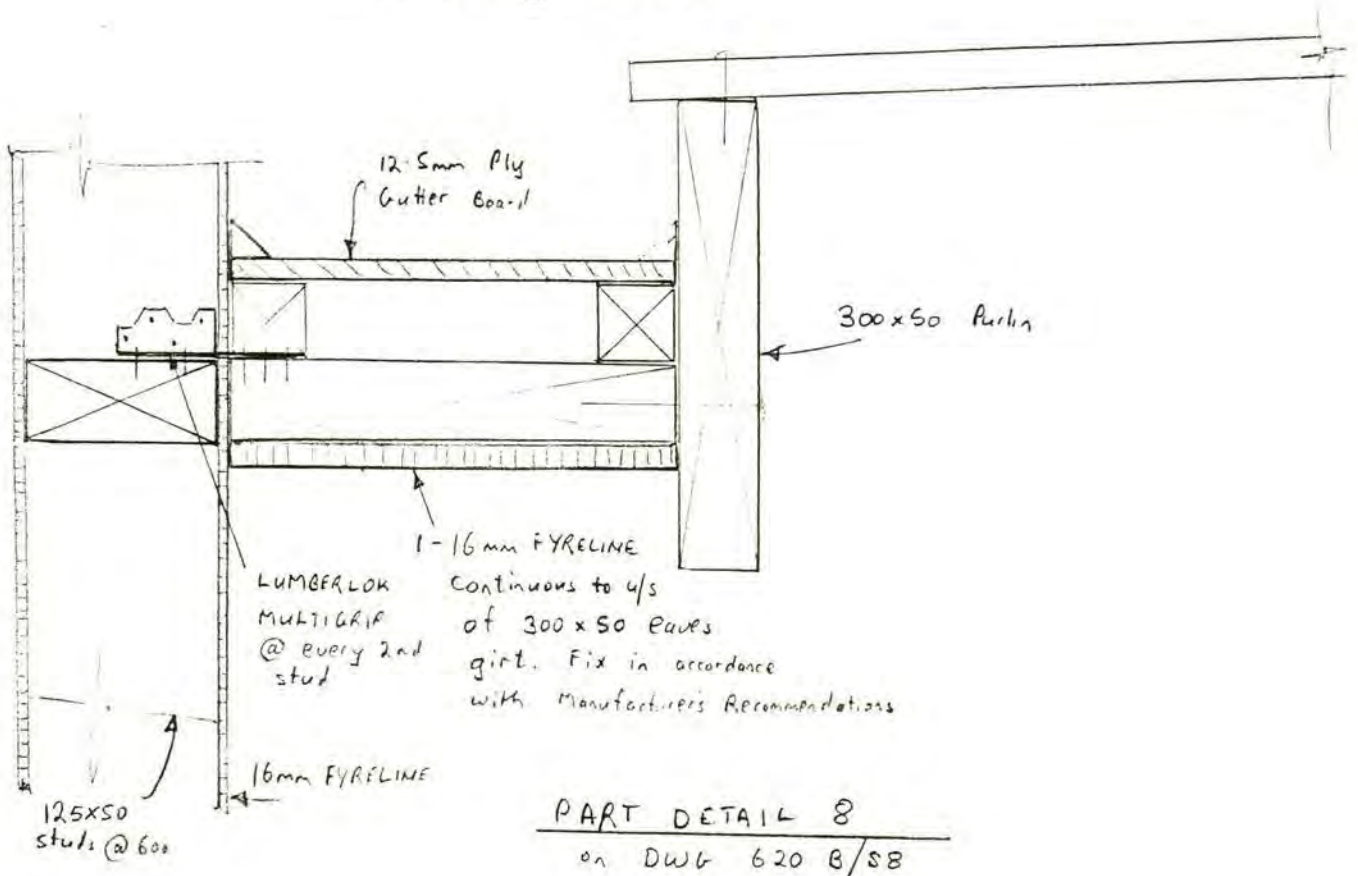
DEV TO PAY.

\$1226.50

78 BYRON STREET
 HALL SHOPFITTING

6208
 22/8/88

Fire Lining Revisions



DESIGN CERTIFICATE

A.1646.



To The City Engineer
Christchurch City Council
CHRISTCHURCH

re HALL SHOPFITTING
(Project Title)

I, Michael Ronald Fletcher, being a Registered Engineer and holding a current Annual Practising Certificate and being a Member of the Association of Consulting Engineers New Zealand and a Principal/Director of Buchanan and Fletcher Ltd, hereby certify that:

- This Consulting Practice has been engaged to design and execute the appropriate engineering calculations for a timber framed single storey industrial building
(Description & Type of Structure)

proposed to be constructed for Hall Shopfitting
(Name of Owner)

located at 78 Byron Street
(Street Address)

on lots 213, 214, 215, 216 on DP's 2 and 50440
(Legal Description of Site)

- The accompanying 5 sheets of Drawings titled and numbered New Timber Framed Structure 620 B/S1, 2, 3, 7 and 8 and dated 18/07/88 and Specification Sections numbered 1, 2, 3, 6, 7, 8, 9, 10 adequately illustrate the design of the structure.
- I have exercised reasonable control over the design processes for the works defined above which have been designed in accordance with sound and widely accepted engineering principles to support the loads specified in NZS 4203 : 1984 and various aspects of the design are in accordance with the following relevant authorities NZS 3603 : 1981 NZS 3101 : 1982 NZS 3404 : 1977
- I believe the stresses in the various materials of construction and force resisting elements of the structure including the foundation strata under the above loads are such as to ensure the safety and stability of the structure if the works are constructed in accordance with the above described drawings and specifications.

The name and qualifications of the principal structural designer are

Signature of ACENZ Member [Signature] Date 17/08/88
Professional Qualifications BE(Hons), DBA, MIPENZ Registration No. 6055
For and on behalf of Buchanan and Fletcher Ltd
Address P.O. Box 4571
47 Hereford Street
CHRISTCHURCH

ASSOCIATION OF
CONSULTING ENGINEERS NEW ZEALAND
A Division of
the Institution of Professional Engineers New Zealand

SPECIFICATION

of works to be done and
materials to be used in

NEW BUILDINGS AT

78 BYRON STREET

CHRISTCHURCH

according to drawings prepared by
the Consulting Engineer

BUCHANAN AND FLETCHER LIMITED

Consulting Structural Engineers
47 Hereford Street
CHRISTCHURCH



CONTENTS:

1. PRELIMINARY & GENERAL
2. EXCAVATOR
3. CONCRETOR
4. PRECAST CONCRETOR
5. CONCRETE BLOCKLAYER
6. REINFORCING STEELWORKER
7. STRUCTURAL STEELWORKER
8. STRUCTURAL TIMBER
9. PLUMBER
10. DRAINLAYER
11. SITEWORKS

SECTION 1

1.1

PRELIMINARY AND GENERALPG.1 LOCATION OF WORK

The site is at 78 Byron Street, Christchurch.

PG.2 EXTENT OF WORK

This Contract is for a new single storey timber-framed factory building; a new two storey office building framed in timber, steel and concrete; and associated siteworks.

PG.3 CONTRACT DOCUMENTS

The Contract Documents for this Contract comprise:

1. The Contract between the Owner and the Contractor.
2. This Specification, sections 1-11.
3. Drawings: 620/S1 to S11 and sketches 620/1 to 9 by Buchanan and Fletcher Ltd.

Together with any further documents which the Engineer may from time to time issue to clarify or amend details.

PG.4 PROGRAMME OF WORKS

The Contractor shall make every effort to carry out the agreed programme to ensure the orderly completion of the work.

PG.5 CONSTRUCTION ACT 1973

The whole of the works shall be carried out within the requirements of the Construction Act 1973 and subsequent amendments especially in relation to timbering of excavations and scaffolding.

PG.6 SCAFFOLDING AND PLANT

The Contractor shall provide all materials, plant, scaffolding, timbering, labour and other requirements for the safe execution and completion of the work.

PG.7 SITE ESTABLISHMENT

The Contractor shall make his own arrangements for and pay all necessary charges for all services he may require.

PG.8 MATERIALS AND WORKMANSHIP

All materials and workmanship shall comply with the relevant requirements of every appropriate NZ Standard Specification and the Building By-Laws and the Local Authority. Where no such specification is available then the relevant British Standard shall apply.

Materials throughout shall be of first quality and the best of their respective kinds. All workmanship is to be carried out in accordance with the best trade practice, accurately set out, structurally sound, neatly executed and finished.

Wherever a manufacturer provides printed instructions as to the best manner in which to use a material, such printed instructions shall be deemed part of this Specification, except that in the event of detailed drawings or specification varying from the manufacturer's recommendations, instructions shall be sought from the Owner.

Work that is not in accordance with this and any work that is defective is liable for removal and replacement at the Contractor's expense.

PG.9 CLEARING OF SITE

The Contractor shall not allow rubbish to accumulate around the site of the contract works during the currency of the contract.

At the completion of all works the Contractor shall tidy up the site and leave it free from all his building, plant, materials, or rubbish and leave the whole area clear to the satisfaction of the Owner.

PG.10 MEANING OF WORDS

"Approved", "directed", or "selected" shall mean the approval, direction or selection of or by, the Owner.

"Best" as applied to materials, articles or workmanship shall mean, that in the opinion of the Owner, there is no more superior quality of materials or finished articles on the market and no better class of workmanship.

"Provide", "fix", "supply" and "place" used separately shall be taken to mean "provide and fix" unless otherwise mentioned.

PG.11 TRADE SECTIONS

The Specification has been divided into trade sections for convenience and reference only, and it shall not be construed that each trade section is a complete and separate contract. While reasonable care has been taken to classify relevant items under each trade, no claims will be admitted from subcontractors for work not specifically mentioned in a trade section, but which is provided for, (expressly or implied) elsewhere in the specification or shown on the drawings.

PG.12 VERIFICATION OF MEASUREMENTS

It is the main Contractor's responsibility to verify all dimensions on the job for each trade, and he is responsible for the correct setting out of the job.

PG.13 SUPERVISION

A competent foreman shall be employed on the site from the date of commencement until the completion of all trades.

PG.14 ATTENDANCE ON ALL TRADES

The Contractor shall allow for all cutting and making good in all trades and after all trades.

PG.15 FINISHINGS

Should any tradesman consider that the work of another trade or the condition of any surface or type of base material is not in a satisfactory condition to ensure proper finishing for his work thereon, he shall so notify the Contractor and the Owner before any work is done and shall not proceed until the necessary alteration or improvement has been made. Failing such notice the trade concerned will not be relieved of responsibility for a poor result due to such unsatisfactory condition.

PG.16 DAMAGE TO PROPERTY

The Contractor shall be liable for and is to insure himself and indemnify the Employer, against any liability loss, claim or proceedings in respect of any injury or damage arising out of or in the course of, or by means of, the execution of the works and provided always that the same is due to the negligence, omission or default of the Contractor, his servants or agents of any subcontractor, or to any circumstances within the Contractor's control.

PG.17 MAINTAIN PUBLIC PROPERTY

The Contractor shall maintain and protect public property and that of drainage, electricity, gas, highway, water and telephone authorities and that of similar undertakings, and shall make good or pay for the reinstatement of all damage thereto.

All work shall be carried out in such a manner as to not cause unreasonable nuisance or inconvenience to neighbours. Any damage to adjoining properties shall be made good.

SECTION 2

2.1

EXCAVATOREX.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions of Contract which are equally binding on all trades. This section of the Specification shall be read in conjunction with all other sections.

EX.2 SCOPE

This section of the Contract consists of excavation, backfilling and hardfill, in connection with foundations and ground floor slabs. Note: excavation for siteworks is covered in the Siteworks section of this specification.

EX.3 NATURE OF THE SITE

This site is located on the southern side of Byron Street, Christchurch. It is generally level, to within 400mm. The single storey building is to be built on the site of an existing single storey building. The new two storey building is to be built over an existing metalled car park.

EX.4 STRIPPING OF SITE

Strip any topsoil and remove from the site leaving sufficient for landscaping. Excavate and remove any material necessary to obtain the minimum depth of hardfill below slabs and slab thickenings.

EX.5 EXCAVATE FOR FOUNDATIONS

Excavate for footing pads and foundation beams as detailed. Allow formwork for the depth of concrete.

Before pouring concrete the excavations should be clean and the bottom firm. Ram bottom if necessary.

EX.6 DEPTH OF FOUNDATIONS

Any soft spots found in excavations shall be reported to the Owner. Should it be found necessary to excavate to a greater depth than shown on the drawings, the contractor shall be paid for such greater excavation at a rate approved by the Owner in writing before such additional work is carried out.

EX.7 EXCAVATIONS TOO DEEP

Should the contractor excavate to a greater depth than called for by the drawings or by written instruction, he shall at his own cost fill to the proper level with site concrete as hereinafter described.

EX.8 MAINTAIN EXCAVATIONS

Secure and maintain excavations free from slips, erosion, water and other fluids or fallen materials. Provide and maintain all shoring, strutting, sheet piling, planking, pumps and other materials or plant necessary for carrying out and maintaining excavations and remove them when no longer necessary.

EX.9 BACKFILLING

Backfill around foundations with approved hardfill and thoroughly consolidate. Remove all timber, rubbish and other loose material before backfilling. Backfill and consolidate in 150mm thick layers by ramming or where possible using a vibrating roller or similar approved equipment.

EX.10 HARDFILL

Supply, lay and consolidate a minimum thickness of 150mm hardfill beneath the ground floor slabs. Where a hardfill thickness greater than 150mm is required, place hardfill and consolidate in 150mm layers as specified in Clause EX.9. Blind the surface with sand or clay ready to receive MOISTOP DPC.

Hardfill shall be well graded sand and gravel pitrun with a maximum stone size of 75mm. Loess may be present in the hardfill, but not in such quantities as to prevent consolidation, nor impair subsequent drainage.

EX.11 SURPLUS MATERIAL

Remove from site and dispose of all surplus material from the excavations.

EX.12 DRAINLAYER AND PLUMBER

Co-operate with DRAINLAYER and PLUMBER who will be laying drains, pipes and wastes.

SECTION 3

3.1

CONCRETORCON.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this specification and to the General Conditions of Contract, which are equally binding on all trades. This section of the specification shall be read in conjunction with all other sections.

CON.2 SCOPE

This section of the Contract consists of the supply, forming and casting of all insitu concrete and supply, forming, casting and erection of all precast tilt-up wall panels and erection of all precast concrete beams and floor units.

Supply and fixing of reinforcement is by REINFORCING STEELWORKER.

Supply and placing of grout for filling blockwork is by CONCRETE BLOCKLAYER.

CON.3 MATERIALS AND WORKMANSHIP

The Contractor shall adhere to all requirements of NZS3109:1987, except where specified otherwise herein or instructed otherwise by the Engineer. A copy of this standard shall be kept on the site and relevant parts read with the following clauses of this specification.

CON.4 CONCRETE

Site concrete and concrete required to make good excavations shall be 7 MPa at 28 days or better.

All other concrete shall be SPECIAL or HIGH GRADE as defined in NZS3109, Clause 6.2, from an approved ready mix plant.

Concrete shall have a 28 day crushing strength of 20 MPa in foundations and 25 MPa in tilt panels, floor slabs and all other insitu concrete.

Maximum aggregate size shall be 19mm.

CON.5 TESTS

The ready mix supplier shall make control tests in accordance with NZS3104, and shall pay the cost of such tests. Tests shall be made either at the ready mix plant, or at the site, except that if the Owner specifically calls for tests at the site as a result of any dissatisfaction with the plant testing procedure, these shall be done by the ready mix supplier.

CON.6 REINFORCEMENT

Reinforcement, including all necessary distance pieces required to maintain cover, shall be supplied and fixed by REINFORCING STEELWORKER. Provide and fix concrete inserts for threaded starters where detailed.

The foreman, or a competent workman, is to be responsible for checking that reinforcement is not displaced during concreting. Any reinforcement so displaced is to be corrected by the REINFORCING STEELWORKER, who is to be continuously on call during all concrete pours. Any reinforcing displaced or damaged through the contractor's neglect is to be remedied by the REINFORCING STEELWORKER and the cost borne by the contractor.

CON.7 VIBRATORS

Vibrators shall be used for the placing of all concrete. They shall be high frequency type of approved pattern.

Vibrators shall be moved to new positions as frequently as necessary to ensure uniform vibration of the whole mass and fully compacted concrete. On no account shall vibrators come within 12mm of the face of the formwork. Vibrators shall not be used to transfer concrete from one position to another.

CON.8 FORMWORK AND CONCRETING

Formwork and concreting shall conform to NZS3109, Sections 5 & 7. Formwork shall be so designed and constructed that concrete can be placed and thoroughly compacted without loss of grout. All joints shall be tight and close fitting to prevent leakage. To avoid stepping or ridges at construction joints, formwork shall be tightly secured against previously cast or hardened concrete. Fairface finishes are specified later.

Construction joints shall conform with NZS3109, clause 5.6.3, type B, and their position shall be as detailed on the drawings.

Before pouring commences, the Owner or his representative shall be notified and a reasonable opportunity given him to inspect formwork, reinforcement and construction joints. Pouring shall be between properly positioned stops.

Stripping times shall be as in NZS 3109, Clause 5.4.

Repair all defects in the concrete immediately after stripping.

CON.9 CURING AND PROTECTION

All concrete shall be cured as defined in NZS3109, clause 7.7.

Fairface concrete and slab surfaces shall be protected from damage at all times. Concrete surfaces shall be repaired or remade to the satisfaction of the Owner at no extra cost.

CON.10 REPAIRS AND CLEANING

After all the concrete work of the building has been completed and the majority of other trades finished, all finished exposed concrete surfaces throughout, including precast concrete, shall be closely inspected for faults in surface finish, damage to corners and edges, dirty marks, splashes or dribbles, and visible imperfections of every kind.

All such imperfections shall be removed by the Contractor to the Owner's complete satisfaction.

Patching or filling of fairface concrete and making good broken edges and corners shall be done with coloured sands and cement where necessary, to match precisely the colour of the surrounding concrete when dry. Epoxy or similar adhesives shall be used when required.

The removal of surface markings shall be most carefully done by appropriate methods such as wire brushing, pumice stoning, carborundum stone, or washing and scrubbing; such as will remove the marks without scratching, discolouring or otherwise affecting the surrounding or underlying concrete.

CON.11 FAIRFACE FINISHES

All concrete surfaces that will be visible in the finished job or covered with paint, Enduit plaster, or tiles, shall be finished fairface to meet the requirements of the F4 finish specified in NZS 3114:1980.

All concrete required to have a fairface finish shall be cast to a high standard using accurately constructed formwork and a high standard of workmanship. The finished surface shall conform for blowholes with Illustration 4 in NZS 3114 : 1980 "Specification for Concrete Surface Finishes".

In general, form fairface finish surfaces with standard sheets of plywood placed in a regular pattern and tightly butted together to avoid grout loss. The joints shall be sealed with plastic sealant strips or cover battens to prevent grout loss. Formwork shall be sealed with not less than two coats of polyurethane varnish on the concrete face.

Fairface formwork shall be constructed so as to provide straight and true angles and so as to produce cast surfaces within a tolerance of plus or minus 3mm on the given dimensions and without visible offsets, bulges, or misalignment of the concrete. Form clean, neat arrises.

CON.12 OTHER FORMED SURFACES

Other surfaces shall be cast with a minimum of grout leakage and honeycombing and without conspicuous offsets or bulges. Formwork shall be close butted to minimise grout leakage.

Fill honeycombing and repair defects immediately after stripping the formwork. Fill honeycombing with 1:2 cement:sand mortar. Major defects shall be referred to the Engineer.

CON.13 SLAB FINISHES

Where directed finish slabs with wood float to leave a non-slip finish varying not more than 6mm in 3 metres.

Elsewhere finish slabs with a steel trowelled finish as specified in NZS 3114:1980 Grade U3. Finish slabs with approved power floating and compacting machines to leave a dense level surface which does not vary more than 6mm in 3 metres. Local areas may be hand floated. Floating and subsequent finishing shall be at the correct times and intervals to obtain the quality of compaction and finish required. No trowelling in of fines or dry cement will be permitted.

The Contractor shall arrange the pouring of concrete to allow adequate time for floating and finishing. Calcium Chloride may not be added to concrete.

All trowelling ridges shall be removed while green or by subsequent light grinding. Slabs not fulfilling the standard of finish required shall be ground smooth or otherwise treated to the satisfaction of the Owner.

CON.14 CHASES, HOLES AND NIBS

Form all chases, holes, upstands and nibs as shown on the drawings or required by other trades. Chases and holes shall be accurately positioned and formed at the time of casting the concrete.

Set concrete shall not be cut or hacked unless specific approval is obtained from the Engineer.

CON.15 BUILDING IN

As the work proceeds, build in all necessary bolts and other fixings and where not supplied by other trades, supply these. The CONCRETOR shall ascertain from all other subcontractors all particulars relating to their work with regard to order of its execution and details of all such provision of fixings, sleeves, chases, holes, etc and of all necessary items to be built into concrete and shall ensure that all such items are provided for and/or positioned.

No claim will be recognised or allowed for extra cost of cutting away or drilling concrete work already executed in consequence of any neglect of the Contractor to ascertain these particulars and make the necessary provision beforehand.

All items detailed or specified to be built in and not shown to be supplied by other trades shall be supplied by CONCRETOR for building in by the trade concerned.

CON.16 PROTECTION OF BLOCKWORK

Protect blockwork from damage and extraneous loading during construction operations. Formwork shall be carefully fitted and sealed against blockwork as necessary and grout spills shall be removed before they set.

CON.17 FOUNDATIONS

Form and cast foundation pads, strip footings and beams as detailed.

Foundations are to be cast against formwork on each side.

Cast in sleeves for all pipes through foundations as indicated on drawings or required by other trades.

Exposed foundation walls shall be finished fairface.

CON.18 DAMPCOURSE

Lay a MOISTOP 737 dampcourse under all slabs. Lap 100mm at joins and seal with pressure sensitive tape.

Before laying MOISTOP ensure that the blinding on the hardfill is smooth and even, and free from all stones or other irregularities. Repair all punctures with patching before pouring concrete. Protect from damage during pouring. Seal MOISTOP with tape to sides of foundation walls.

CON.19 SLABS ON GROUND

Form and cast 100mm thick unreinforced ground floor slabs on d.p.c. on blinded hardfill, with falls, steps, recesses, slots and local thickenings as detailed. Build in all items required by other trades.

The slabs shall be cast in keyed panels or shall be sawcut into panels within three days of pouring. Sawcuts shall be 25mm deep. Keys in construction joints shall be ex 50 x 25 and shall be centrally located. Joints or sawcuts shall be at not more than 4.5 metre centres in either direction.

Except where the floor is to be carpeted, fill sawcuts with cement grout finished flush with the surface. Filling is to take place as late as possible in the job.

Finish slabs as specified in Clause CON.13. No grinding is to be allowed on slabs exposed in the finished job. Slabs not fulfilling the required standard will be liable to breaking up, removing and recasting.

The edges of sawcuts shall be protected from damage during the period before filling. Any damage shall be made good to the satisfaction of the Engineer before the cuts are filled.

CON.20 INSITU COLUMNS AND BEAMS

Form and cast circular and oval columns as detailed.

Cooperate with CONCRETE BLOCKLAYER in forming and casting concrete beams on lines 7 and 9. Beams must not be cast in block filling grout. Note that beam line 7 is part precast, part insitu.

CON.21 ERECTION OF PRECAST BEAM UNITS

Take delivery of precast beam units and erect. Prelevel rebates in wall panels, and tops of columns with steel shims before erecting beams. Mortar pack around shims after erection.

Fill square holes in precast beams with concrete when pouring first floor slab.

Support beams as necessary until the suspended floor is cast and has reached its required 28 day crushing strength.

CON.22 SUSPENDED SLAB

The first floor slab consists of STAHLTON precast ribs and timber infills with an insitu concrete topping. There are some areas of insitu concrete.

STAHLTON ribs will be supplied by PRECAST CONCRETOR on trucks at the site. Timber infills shall be supplied by CONCRETOR.

Erect ribs to accurate line and level on concrete beams and steel members, bedding on a wet cement mortar slurry. Ensure ends have seating recommended by manufacturer. Cut timber infills to fit accurately and ensure all joints are tight. Place vertical boxing to seal ends and edges of slabs. Prop ribs as recommended by manufacturer.

Form topping concrete to STAHLTON floors as detailed. Topping shall be a minimum of 70mm and an average of 75mm thick, unless detailed otherwise.

Form insitu concrete sections as required. Props supporting formwork shall be extended to support the edge of each adjacent STAHLTON rib, and formwork shall be neatly cut and sealed against ribs to prevent grout loss.

Clean down tops of STAHLTON ribs and timber infills, spray lightly to dampen top surface, and cast topping and insitu sections. Concrete shall have 12mm maximum aggregate size, and shall be finished as specified in Clause CON.13.

CON.23 PRECAST TILT UP WALL PANELS

(a) General

It will be necessary for the Contractor to pre-plan all operations involving the construction, handling, placing and fixing of wall panels. Generally the panels shall be cast with the outside face on the slab. After the panels have gained minimum strength they shall be lifted into position and fixed in accordance with the drawings.

(b) Casting Surface

The floor slab on which the panels are to be cast shall be free from all dirt, moisture, pit-holes etc, and must be level to 6mm in 3 metres. Indentations in the casting surface shall be made good with plaster of paris or other approved fillers. All formwork shall conform to CON.8. Panels shall be cast in positions suitable for construction access and so that panels do not cross slab construction joints.

(c) Parting Compound

When the panel forms are complete and before reinforcement and fixings have been placed the casting bed shall be thoroughly cleaned and sprayed with a parting compound. A uniform film of compound shall be placed in accordance with the manufacturer's recommendations over the entire area. No foot or other traffic will be allowed on the parting compound. Touching up shall be completed prior to pouring.

(d) Reinforcement

The reinforcing steel shown on the drawings shall be placed in the form of a mat after the parting compound has been applied. All such mats shall be supported on chairs or approved supports and shall be sufficient in number to ensure that the steel remains on the panel centre during pouring. All fittings shall be positioned and tied in accordance with the drawings.

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F I R E R A T E D
C O N N E C T I O N S

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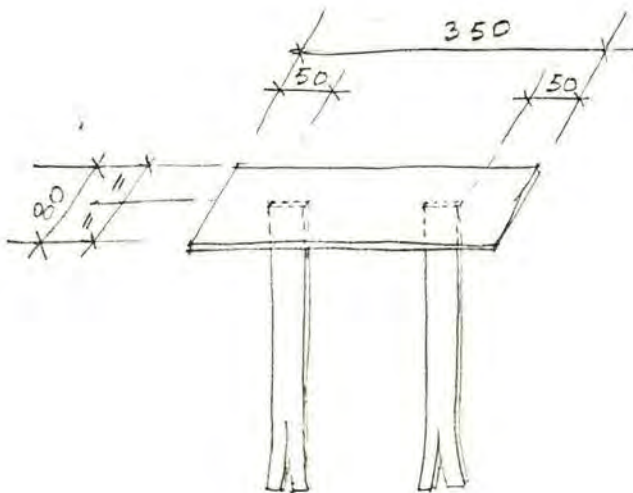
J O B 6 2 0

WELD PLATE VPA.

620A+E

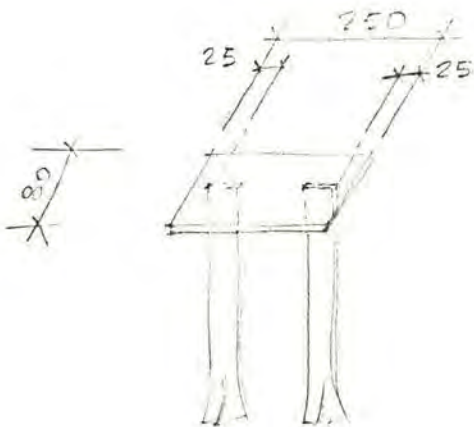
25 07 88.

1.



- 80 X 10 MS FLAT 350 LL WITH 2 - 50 X 6 MS FLAT ANCHORS 400 LL ENDS SPAYED
- 6 FILLET WELD ALL ROUND (FVAR)

WELD PLATE VPA



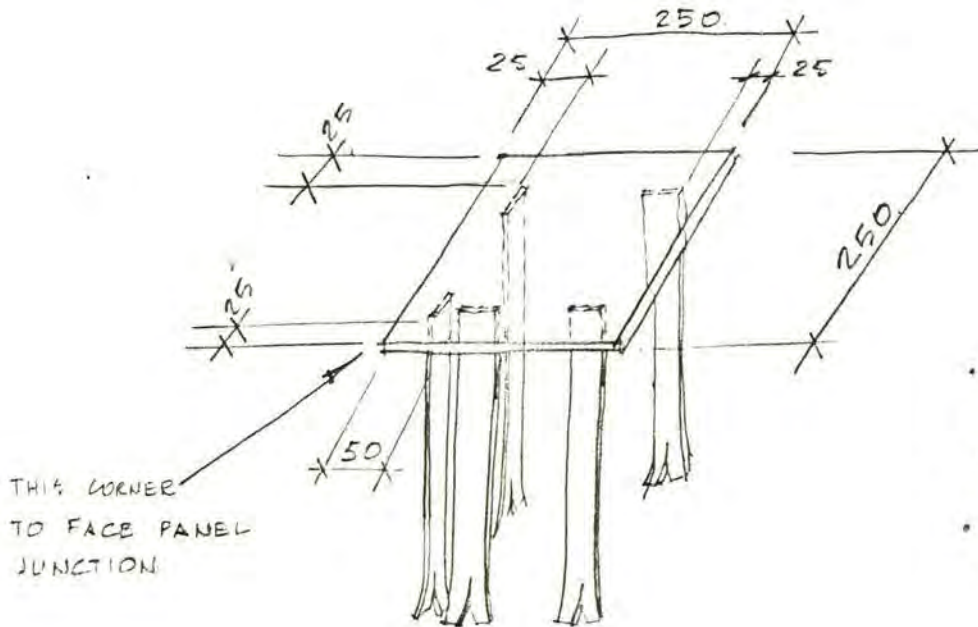
- 80 X 10 MS FLAT 250 LL WITH 2 - 50 X 6 MS FLAT ANCHORS AS VPA.

WELD PLATE VPC

620 A+E

25 07 88

2.

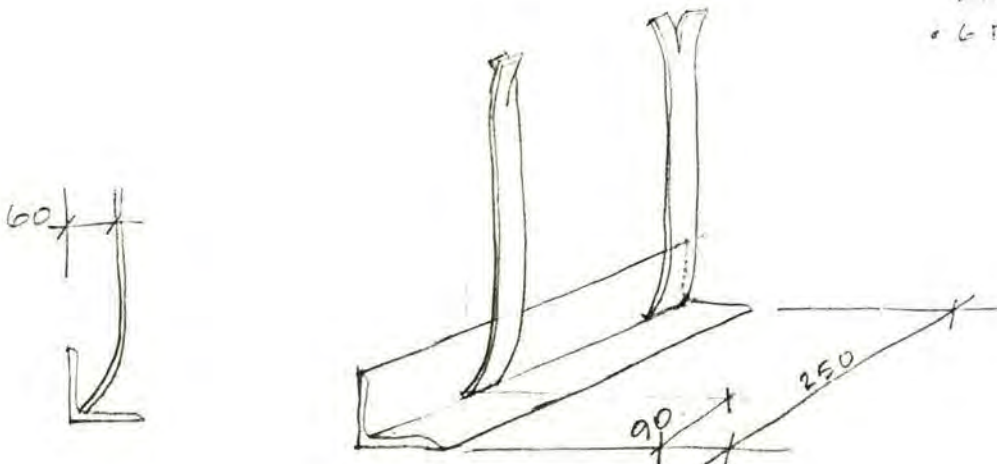


- 250x250x10 MS PLATE WITH 4 - 50x6 MS FLAT ANCHORS 400 LG - ENDS SPLAYED
- 6 FVAR ANCHOR TO PLATE

WELD PLATE VPD

VPD 1 = HANDED

- 80x80x10 MS ANGLE 250 LG WITH 2 - 50x6 MS FLAT ANCHORS 400 LG ENDS SPLAYED
- 6 FVAR ANCHOR TO ANGLE



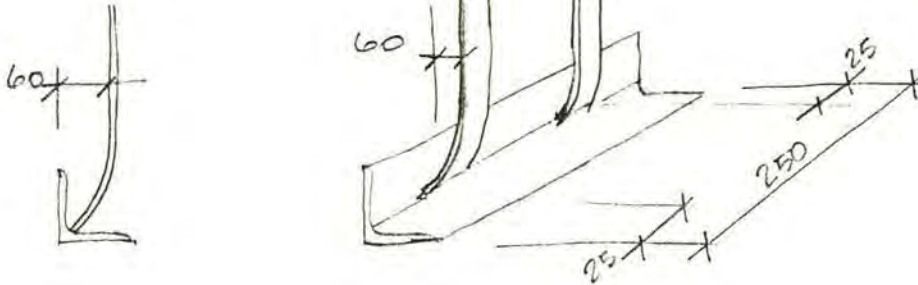
WELDPLATE V/P E

6204+E

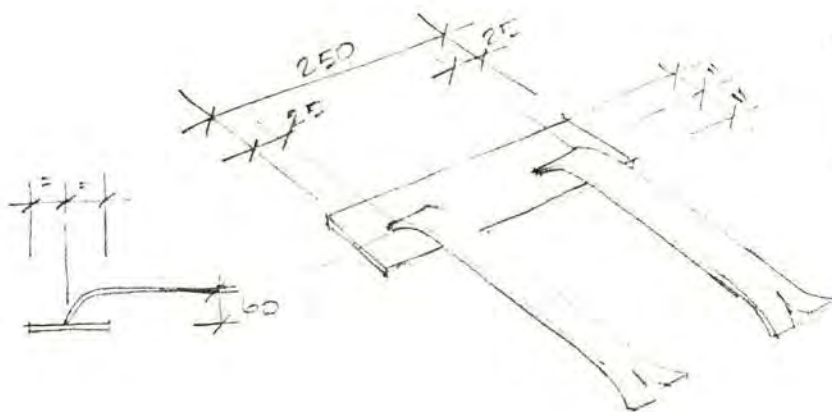
25 07 88

3.

- 80x80x10 MS ANGLE
250 LG WITH 2-50x6 MS FLAT
ANCHORS 400 LG - ENDS
SPRAYED
- ANCHOR 6 FVAR TO ANGLE



WELDPLATE V/P F



- 80x10 MS FLAT 250 LG WITH
2-50x6 MS FLAT ANCHORS
400 LG - ENDS SPRAYED
- ANCHOR 6 FVAR TO FLAT

WELDPLATE V/P G

620 A+P
250788
4.

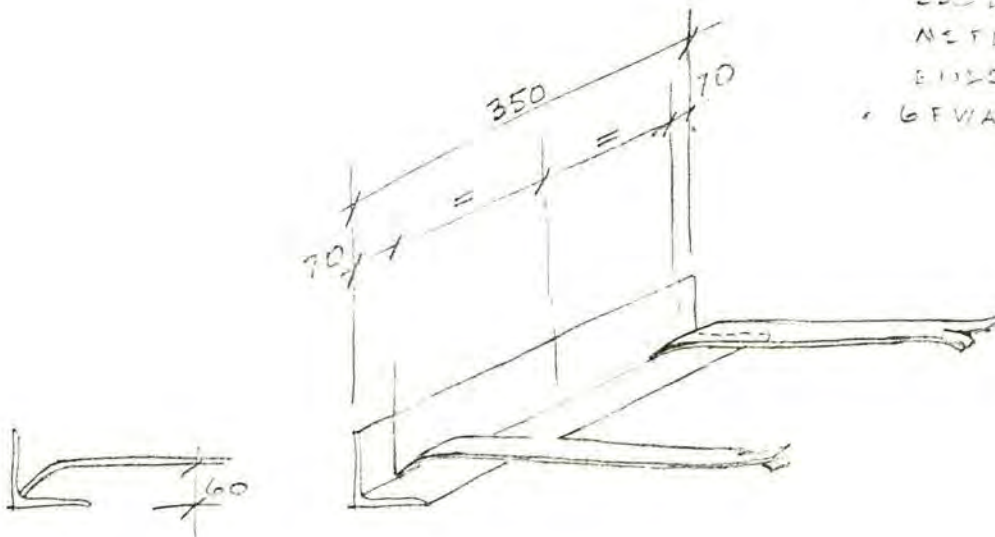
AS WELDPLATE V/P D EXCEPT

- 50x50x8 MS ANGLE
250 LG

WELDPLATE V/P G 1 = V/P G HANDED.

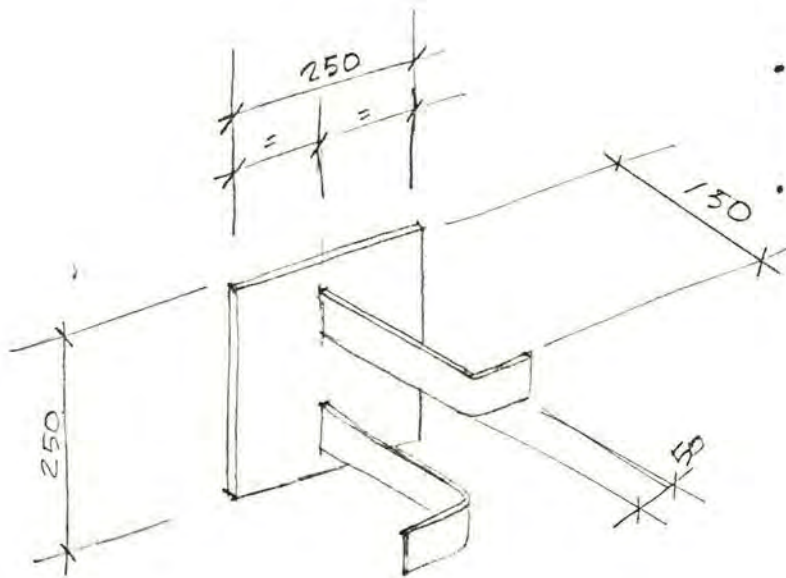
WELDPLATE V/P H

- 50x80x10 MS ANGLE
250 LG WITH 2-50x6
MS FLAT ANCHORS 1000 LG
SIDE SPLAYED
- 6 FWAR ANCHOR TO AIRWAY



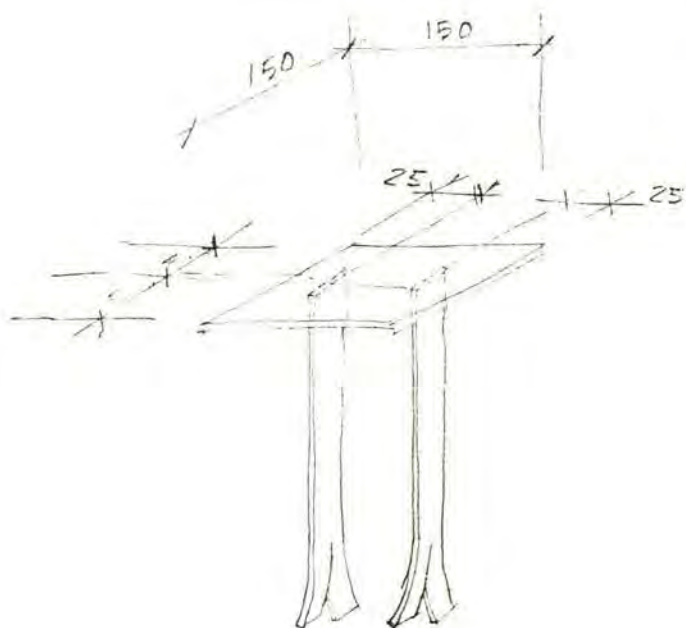
WELDPLATE V/P J

6 20 A+E
25 07 88
5,



- 250 X 250 X 10 MS PLATE WITH 2 - 50 X 6 MS FLAT ANCHORS EX 200 LG BENT AS SHOWN
- 6 FVAR ANCHOR TO PLATE

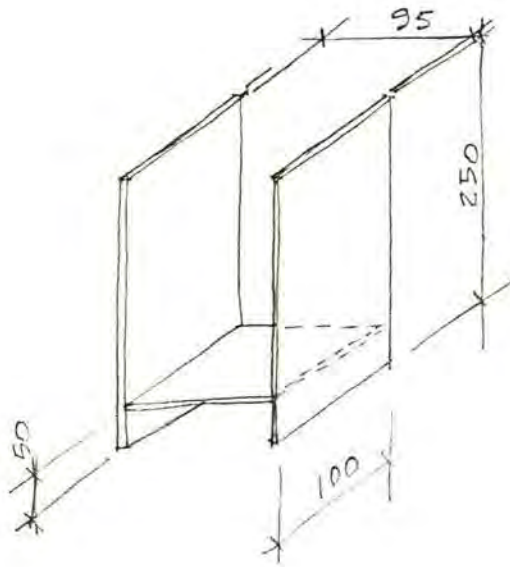
WELDPLATE V/P K



- 150 X 10 MS FLAT 150 LG WITH 2 - 50 X 6 MS FLAT ANCHOR BARS 400 LG ENDS FLARED
- 6 FVAR ANCHOR TO PLATE

CLEAT CL A

620 A+E
2507 BB
6

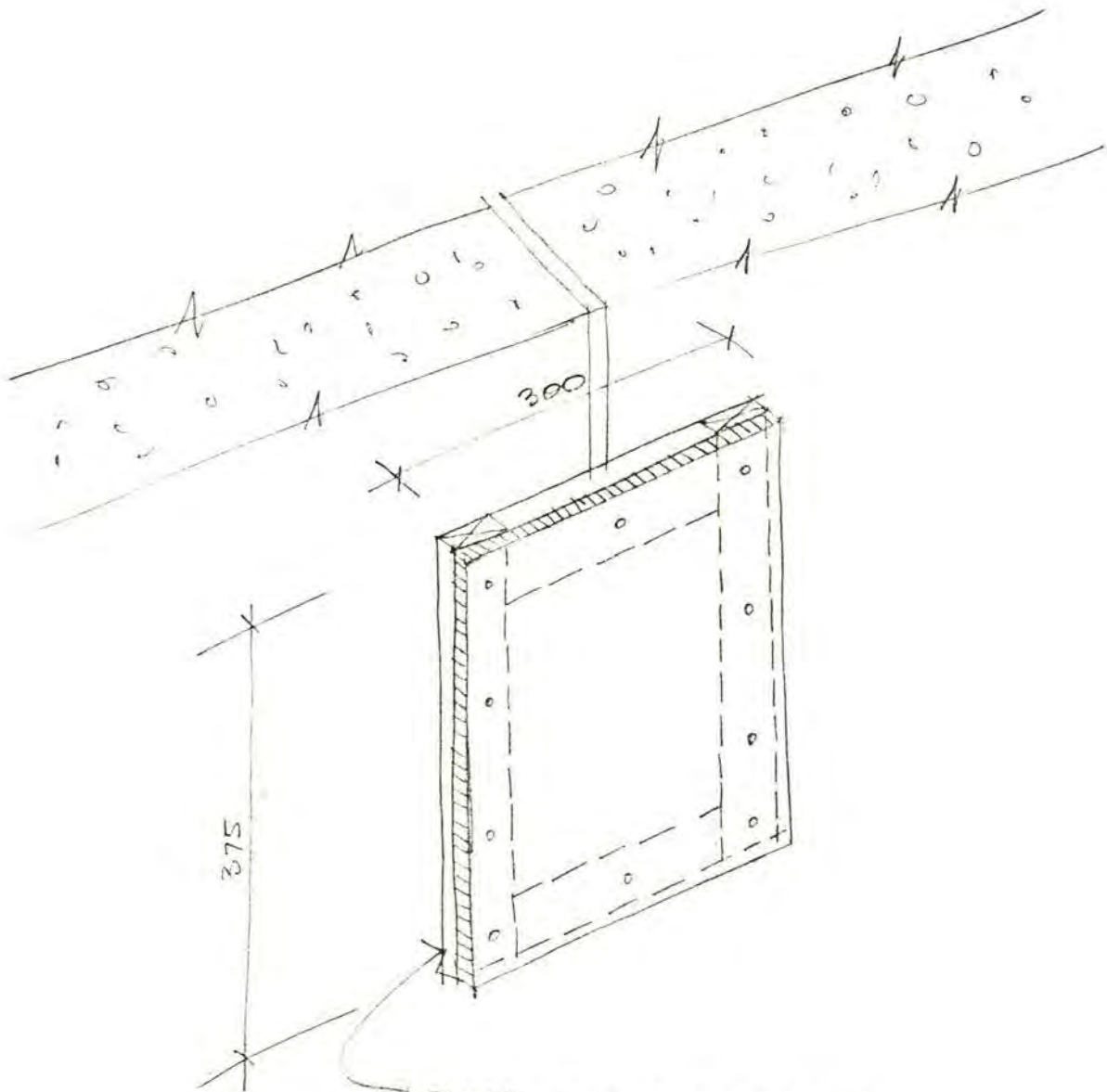


- 100 X 10 MS FLAT 250 L4
- 2- OFF & 100 X 10 MS FLAT 95 L4
- 6 FV/R

FIRE RATING CONC PANEL CONNECTIONS.

620A+B
26 07 88

T.



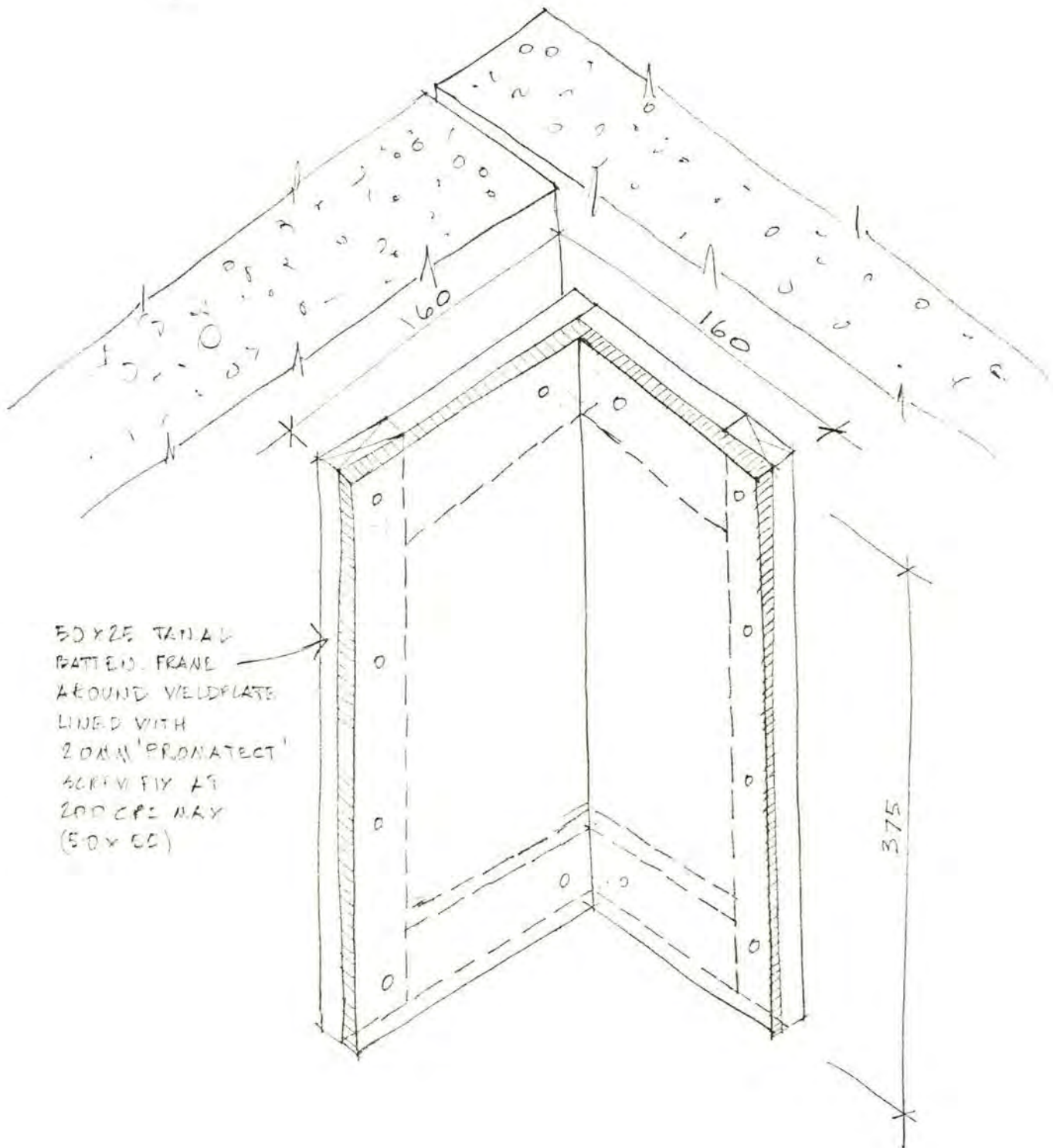
50x25 TIMBER BATTEN FRAME
'BATTEN' TO CONC PANELS.
LINED WITH 20MM 'PROMAT'
SCREW FIX (5.0x55) AT 200
C/S MAX

FIRE RATING CONC PANEL CONNECTIONS

620A+P.
26.07-88

CORNER DETAIL.

8

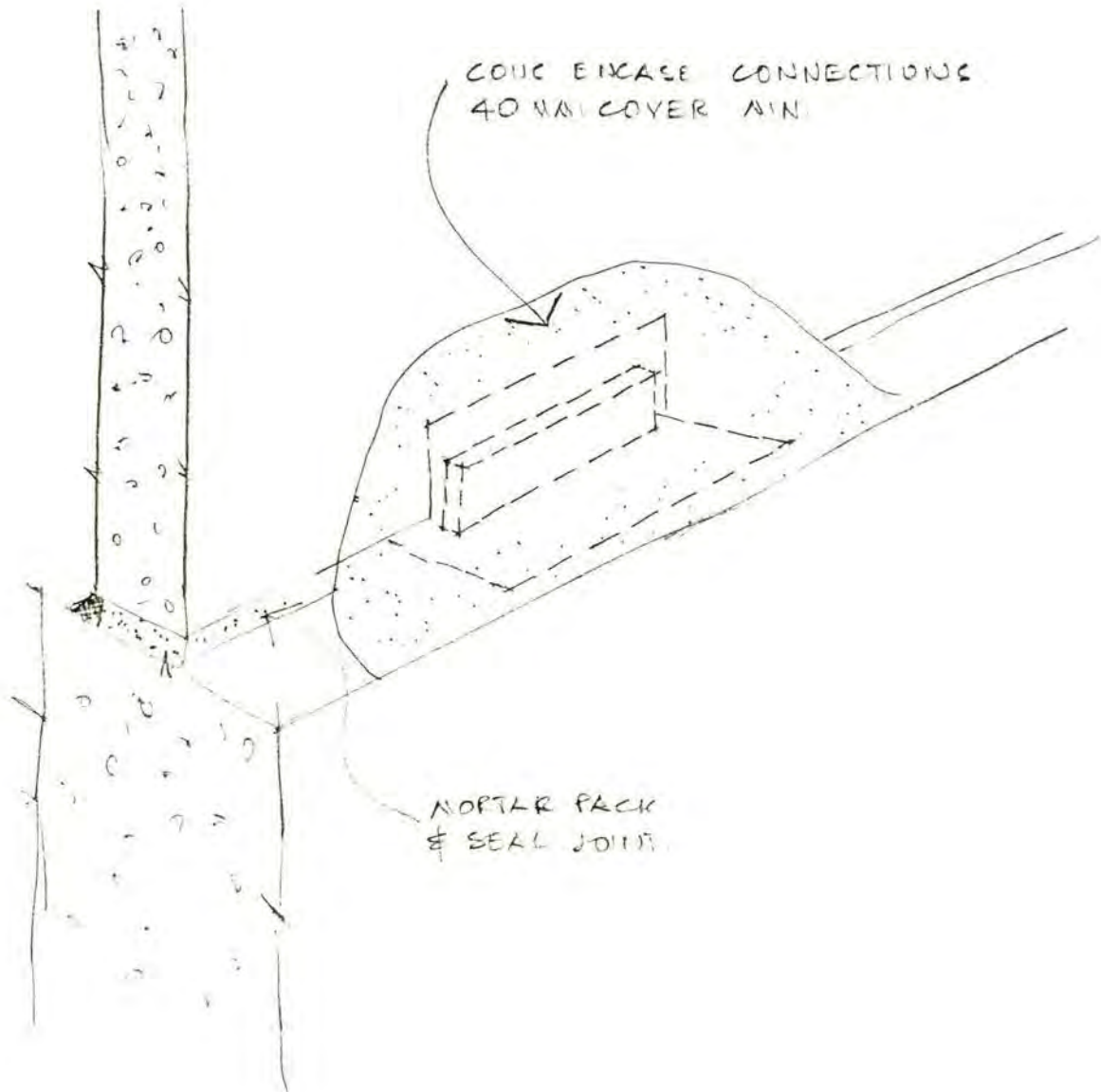


FIRE RATING LONG PANEL CONNECTIONS

620 A + R
26 07 88

BASE CONNECTIONS.

9.

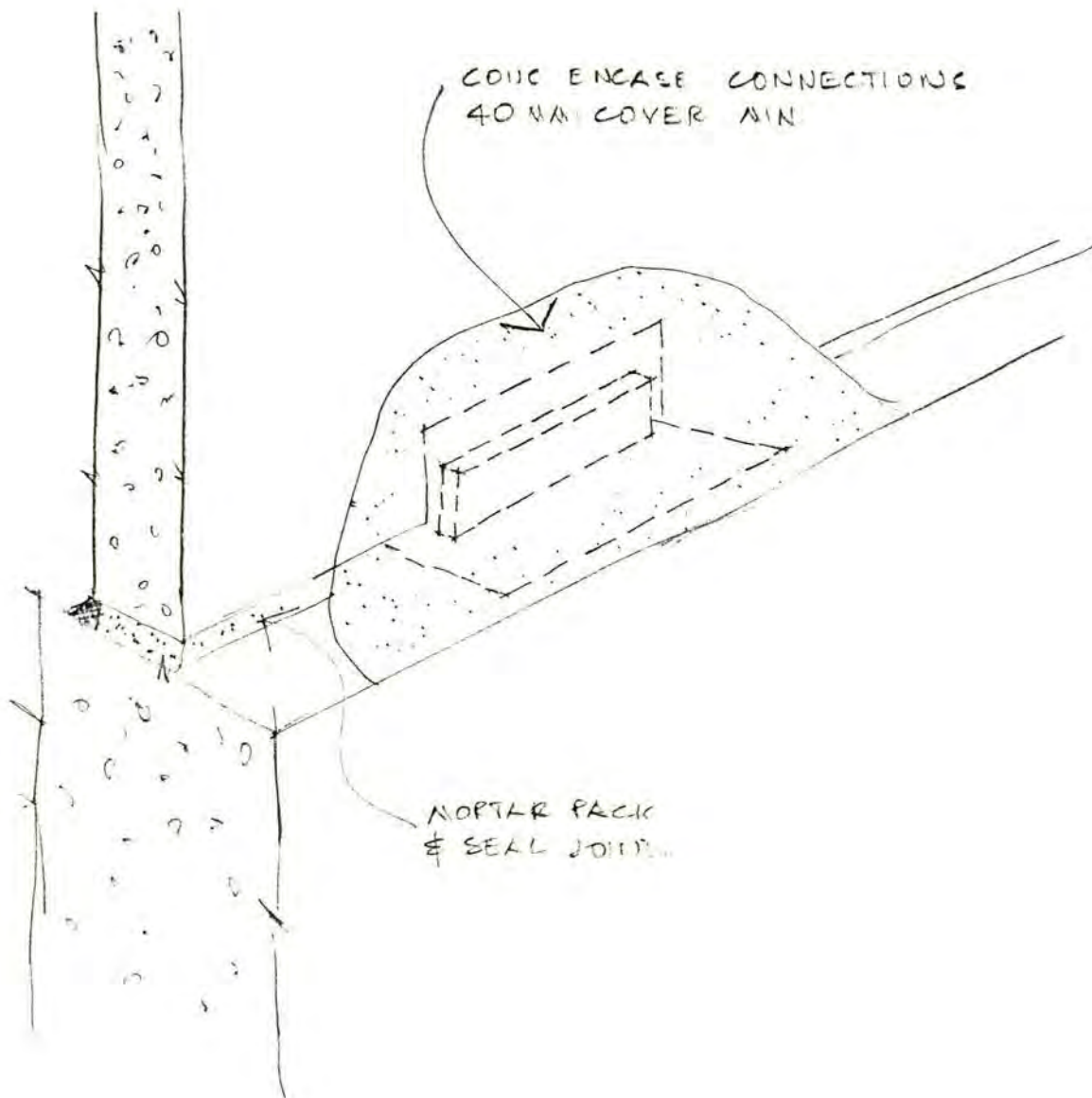


FIRE RATING CONC PANEL CONNECTIONS

620 A + P
26 07 88

BASE CONNECTIONS.

9.

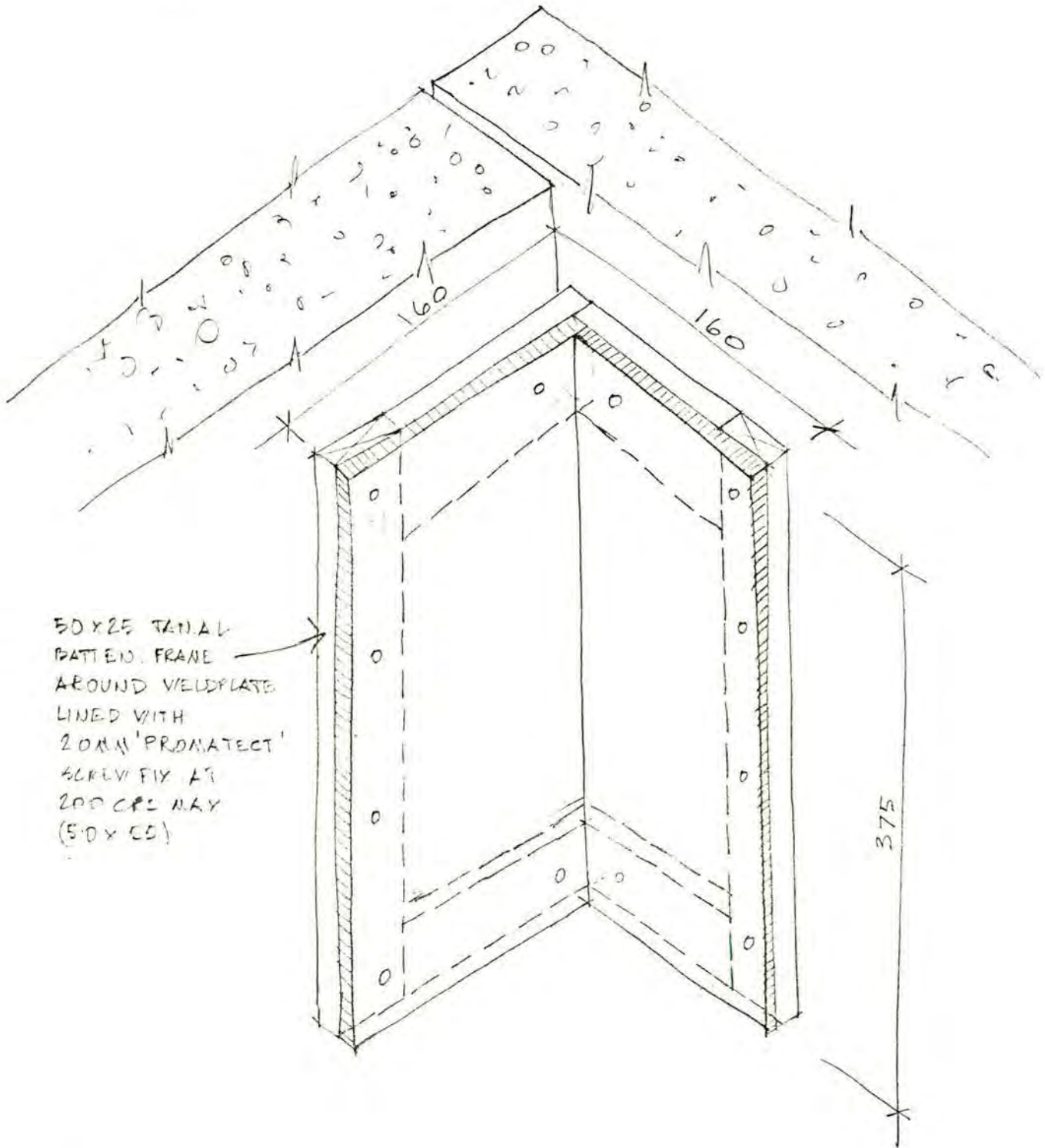


FIRE RATING CONC PANEL CONNECTIONS

620A+P.
26.07-88

CORNER DETAIL.

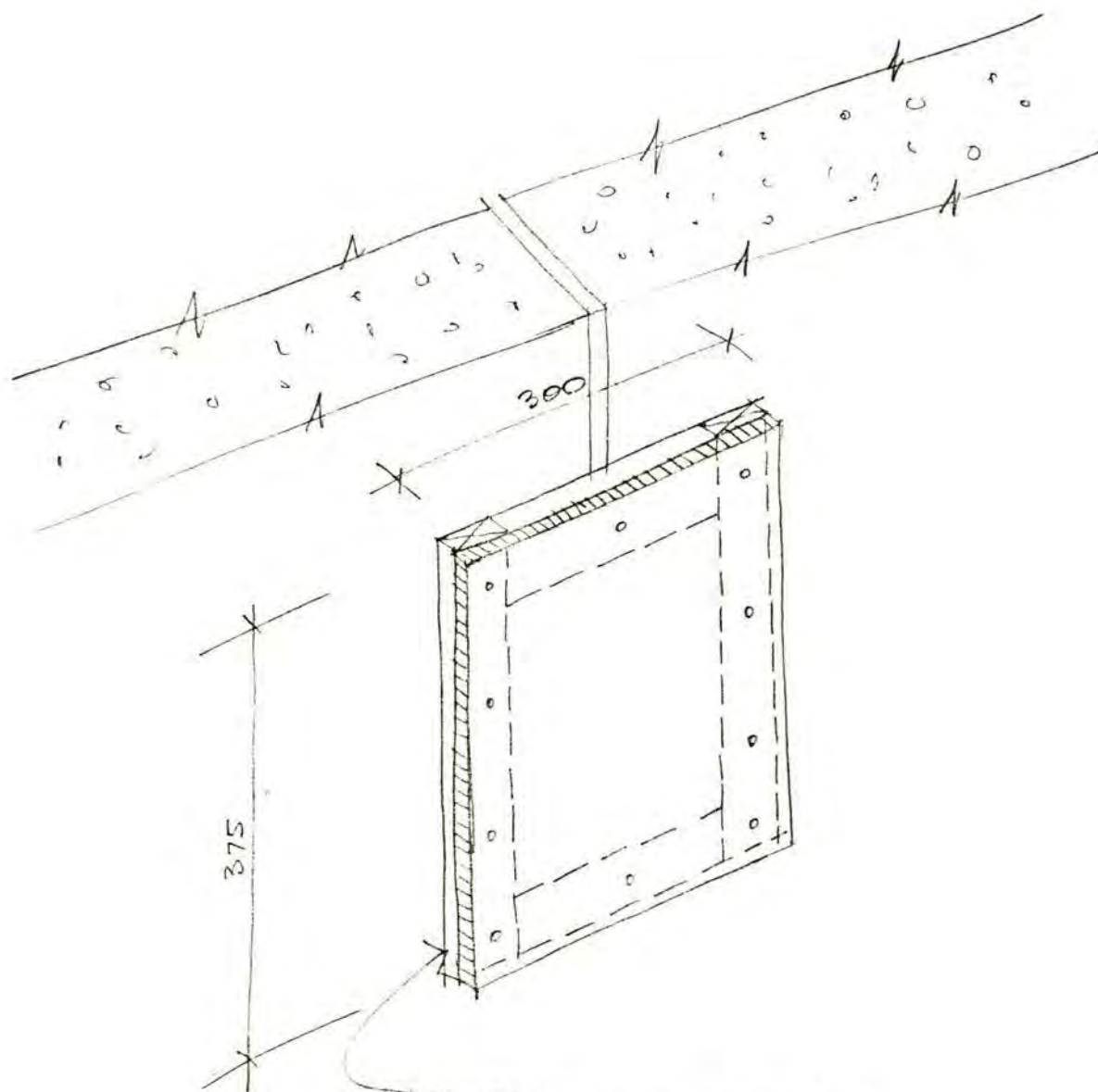
8.



FIRE RATING CONC PANEL CONNECTIONS.

620A+B.
26 07 88

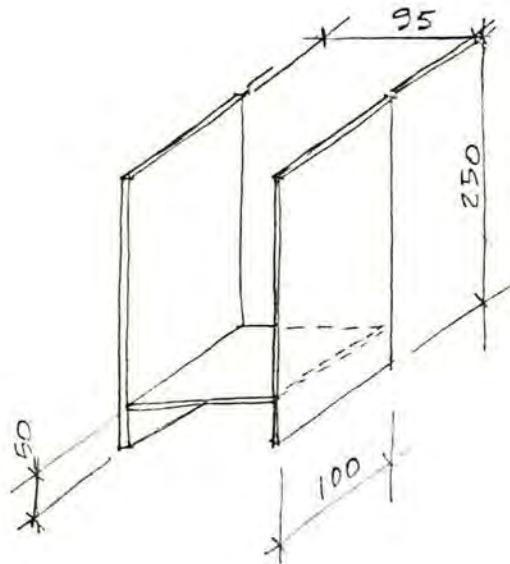
7.



50x25 TANGAL BATTEN FRAME
'BATTEN' TO CONC PANELS.
LINED WITH 20MM 'PROMATECT'
SCREWS FIX (5.0x55) AT 200
C/S MAX

CLEAT CL A

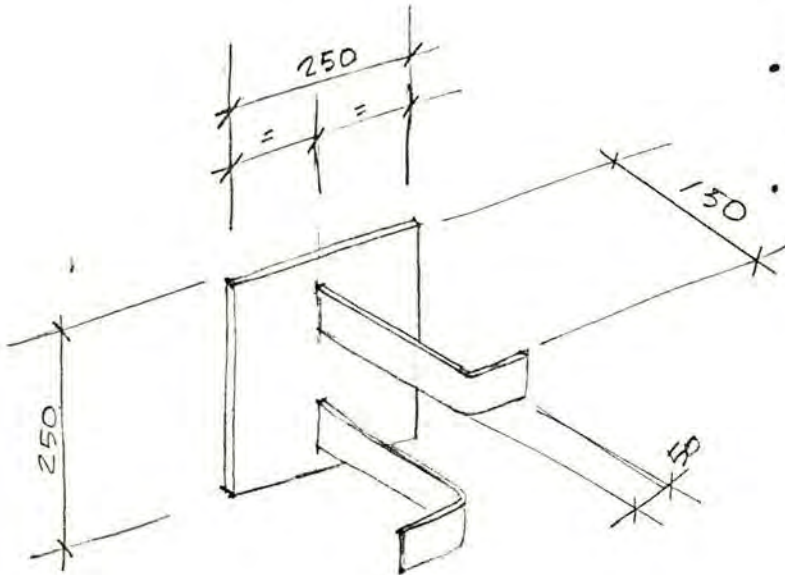
620 A+E
2507 BB
6.



- 100 X 10. MS FLAT 250 LG
- 2- OFF # 100 X 10. MS FLAT 95 LG
- 6 FVAR

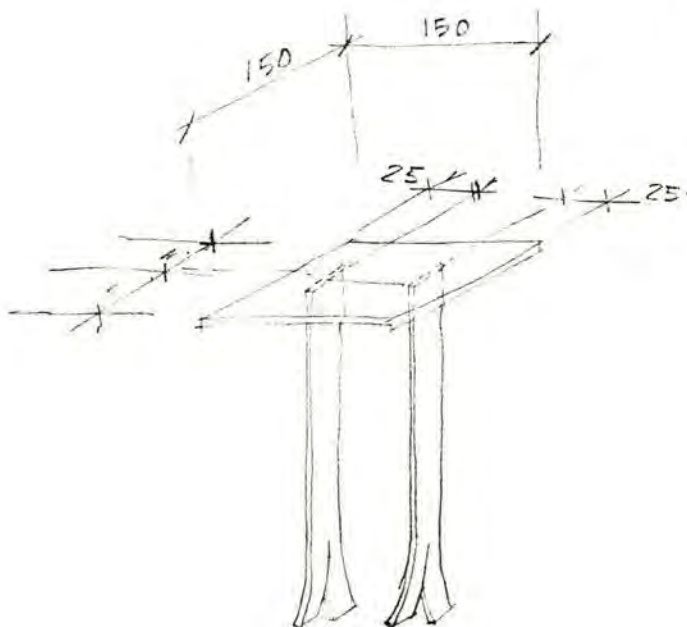
WELDPLATE VIPJ

6 20 A+E
25 07 88
5,



- 250 X 250 X 10 MS PLATE WITH 2 - 50 X 6 MS FLAT ANCHORS EX 200 LG BENT AS SHOWN
- 6 FVAR ANCHOR TO PLATE.

WELDPLATE VIPK



- 150 X 10 MS FLAT 150 LG WITH 2 - 50 X 6 MS FLAT ANCHOR BAKE 400 LG ENDS SPAYED
- 6 FVAR ANCHOR TO PLATE

WELD PLATE VPG

620 A+P

250788

AS WELD PLATE VPD EXCEPT

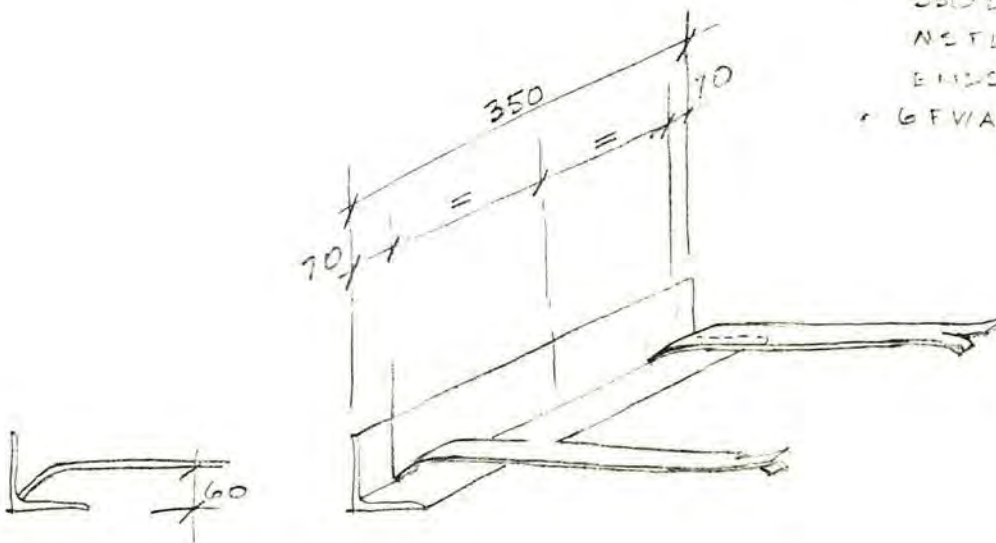
4.

- 50x50x8 MS ANGLE
250 LG

WELD PLATE VPG 1 = VPG HANDED.

WELD PLATE VPH

- 80x80x10 MS ANGLE
250 LG WITH 2-50x6
MS FLAT ANCHORS AND
ENDS SPAYED
• 6 FVAR ANCHOR TO AIR



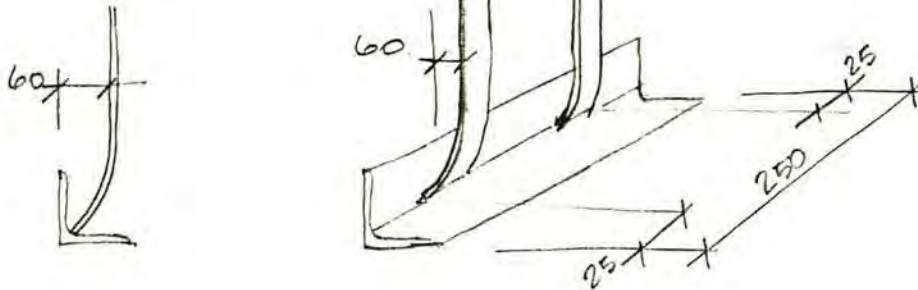
WELD PLATE V/PE

620 A+E

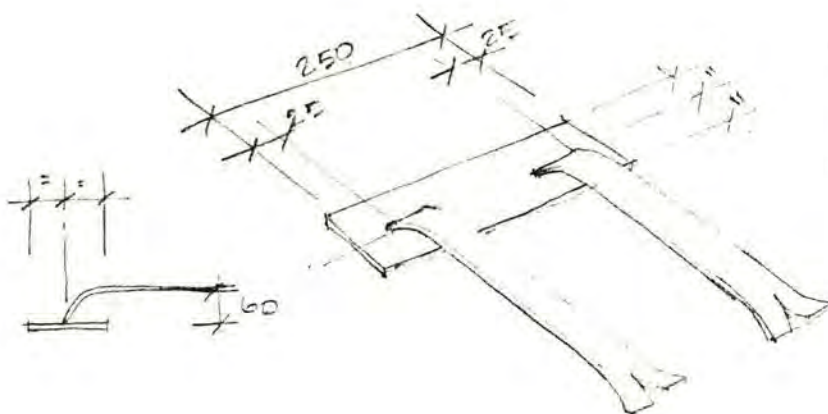
25 07 88

3.

- 80x80x10 MS ANGLE
250 LG WITH 2-50x6 MS FLAT
ANCHORS 400 LG - ENDS
SPRAYED
- ANCHOR 6 FVAR TO ANGLE



WELD PLATE V/PF



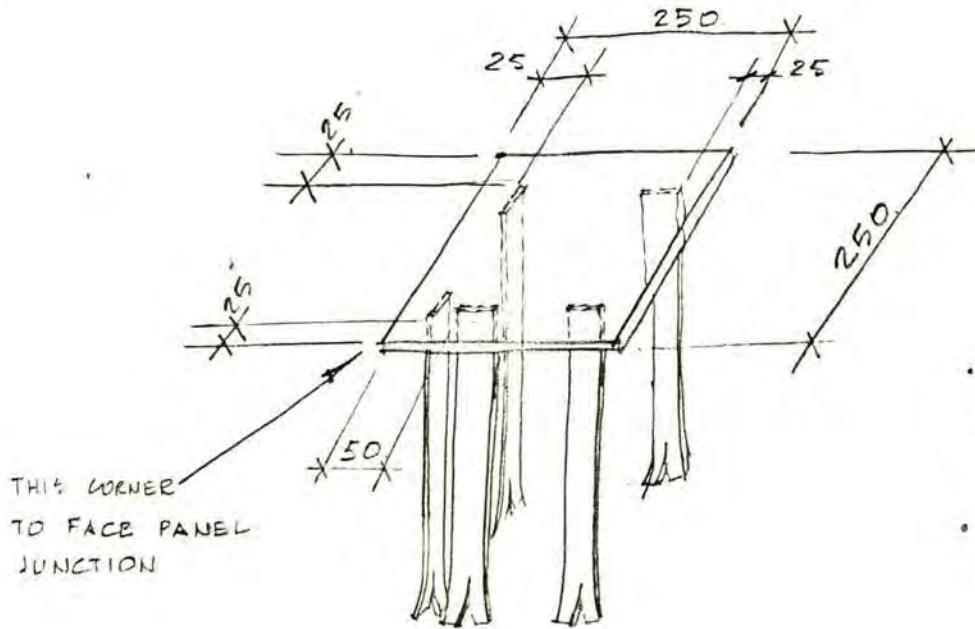
- 80x10 MS FLAT 250 LG WITH
2-50x6 MS FLAT ANCHORS
400 LG - ENDS SPRAYED
- ANCHOR 6 FVAR TO FLAT

WELD PLATE VPC

620A+E

25 07 88

2.

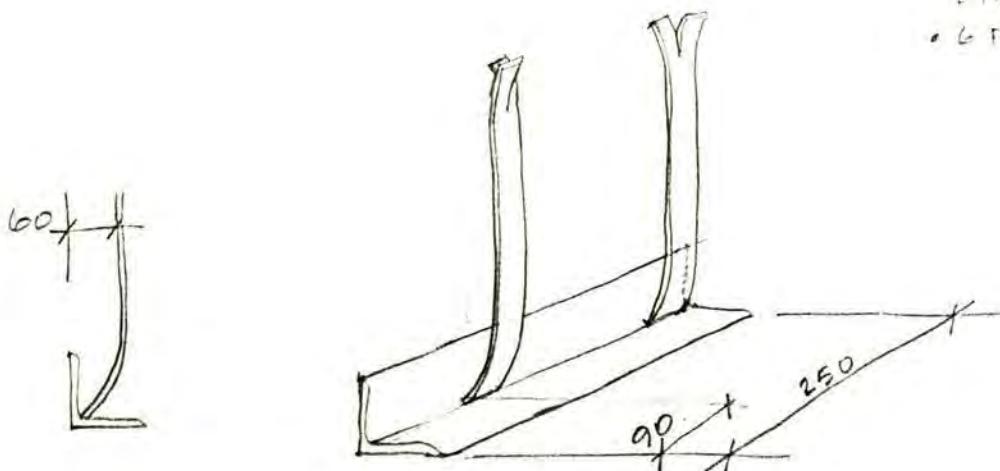


- 250x250x10 MS PLATE WITH 4 - 50x6 MS FLAT ANCHORS 400 LG - ENDS SPLAYED
- 6 FWAR ANCHOR TO PLATE

WELD PLATE VPD

VPD 1 = HANDED

- 80x80x10 MS ANGLE 250 LG WITH 2 - 50x6 MS FLAT ANCHORS 400 LG - ENDS SPLAYED
- 6 FWAR ANCHOR TO ANGLE

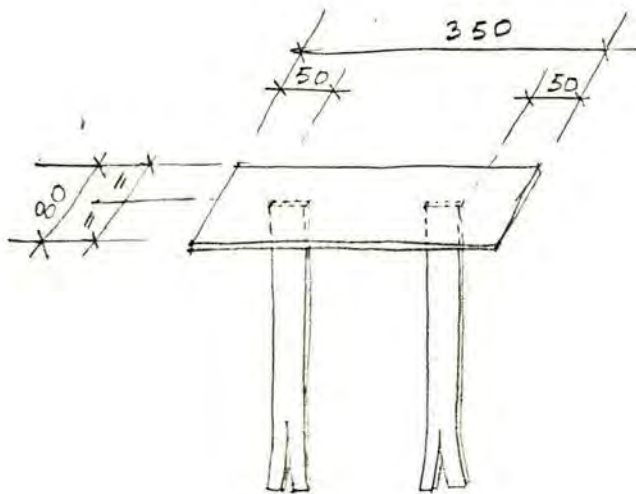


WELD PLATE V/PA.

620A+E

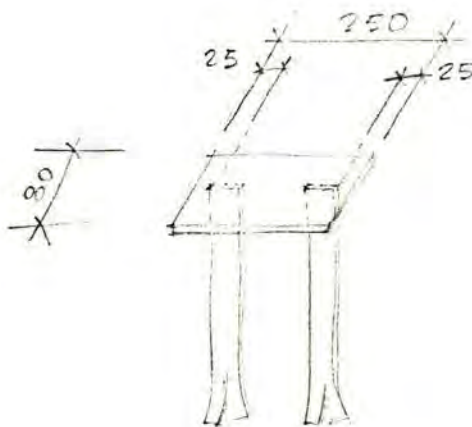
25 07 88.

1.



- 80 X 10 MS FLAT 350 LL WITH 2 - 50 X 6 MS FLAT ANCHORS 400 LL ENDS SPLAYED.
- 6 FILLET WELD ALL ROUND (FVAR)

WELD PLATE V/PB



- 80 X 10 MS FLAT 250 LL WITH 2 - 50 X 6 MS FLAT ANCHORS AS V/PA.

C L E A T S,
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a n d
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(e) Lifting

The Contractor shall be responsible for the lifting system including the number and positioning of the lifting inserts, and any additional reinforcing required for lifting. The design of the lifting system shall be such as to ensure that the panels do not crack during lifting and handling.

(f) Concreting

It is recommended that test cylinders be taken at regular intervals during each pour, to assist the Contractor in determining when panels can be lifted.

During casting walkboards shall be provided to keep all traffic off the casting bed. Each panel shall be cast in one operation without interruption and shall be mechanically vibrated with a vibrating screen over every section of the panel.

When firm the panels shall be power floated to a smooth uniform surface.

Panels are not to be poured in inclement weather and should be coated with an approved curing compound immediately after power floating.

(g) Panel Seating

Establish grout levelling pads on foundations to seat panels at correct elevation prior to erection. The minimum dimension shall be 200mm by 200mm.

Alternatively use steel packing plates and mortar up after panel erection ensuring that plates are thoroughly surrounded and protected against corrosion.

CON.24 HANDLING TILT-UP WALL PANELS

All handling and lifting procedures shall be the responsibility of the Contractor. Refer to Clauses CON.23(e) and (f).

When lifting the precast wall panels from their casting beds observe the following procedures and cautions:

- (a) To overcome the suction which develops between a panel and the casting surface, particularly if the surfaces are wet, take the full weight gently with the crane and wait two or three minutes whilst the slab frees itself rather than attempting to jerk it free. Jerking can cause cracking.
- (b) Alternatively the panel can be freed prior to lifting with thin steel wedges applied around the edges.
- (c) When freeing a panel it is important that the bottom be free. If the top (by lifting eyes) is free and the bottom stuck, lifting by the crane will cause a horizontal crack.
- (d) Care must be taken not to jerk a panel too much while it is in a horizontal position as this can cause cracking.
- (e) Any panels that have been cracked during lifting shall be immediately reported to the Engineer who shall have the power to reject such panels or order such remedial measures as he thinks necessary.

CON.25 ERECTION OF TILT-UP WALL PANELS

Lift panels onto levelling pads, line up and prop.

Make welded connections as detailed.

Remove props a minimum of 7 days after pouring first floor slab.

SECTION 4

4.1

PRECAST CONCRETORPREC.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions of Contract, which are equally binding on all Trades. This section of the Specification shall be read in conjunction with all other sections.

PREC.2 SCOPE

This section of the Contract consists of the manufacture and delivery on truck at site of all precast items, including precast beams and proprietary precast flooring units.

PREC.3 MATERIALS AND WORKMANSHIP

All formwork, concrete and concreting and finishing shall be in accordance with the relevant clauses of CONCRETOR except where noted otherwise in this section.

All reinforcement shall be supplied, bent and placed in accordance with the relevant clauses of REINFORCING STEELWORKER.

PREC.4 CONCRETE

All concrete shall be HIGH or SPECIAL GRADE complying with NZS 3109:1980 Clause 6.2, and from an approved ready mix plant.

Concrete shall have a minimum 28 days strength of 30MPa and sufficient cement content to ensure satisfactory surface finish and durability.

Aggregates shall satisfy the requirements of Clause 6.4 of NZS 3109 and shall be 12mm maximum size.

PREC.5 TOLERANCES

All precast units shall be manufactured to the following tolerances, unless otherwise stated on the drawings:

Length	+ or - 6mm
Cross Section	+ or - 3mm
Squareness (of cross sections and ends)	+ or - 3mm
Twist (dimension from plane containing the other 3 corners)	+ or - 5mm
Built in items	+ or - 5mm

PREC.6 FINISHES

Formwork shall be such as to produce a high quality fairface finish on all exposed surfaces. Formwork shall be dressed plywood treated with a polyurethane finish to a high quality smooth surface, steel or similar material.

In general finished surfaces shall be smooth and formed with moulds or by careful trowelling. Surfaces shall be free from honeycombing, grout loss, excessive air holes or other imperfections. Arrises shall be straight, clean and sharp and free from spalling or damage.

All exposed surfaces shall have a similar appearance and standard of finish. Surfaces finished by trowelling shall be finished to the same standard and uniformly match surfaces finished against formwork.

Formwork shall be sealed at all corners, joins and inserts to prevent all grout loss.

All surfaces against which concrete is later to be cast shall be left roughened by brooming the poured face while the concrete is still plastic. Clean surfaces thoroughly from all laitance and loose concrete.

PREC.7 HANDLING

A high standard of finish is required and handling shall be such as to prevent any damage to units.

Lifting devices or hooks shall be provided in all precast units. These shall be made available to the Contractor for erection purposes and removed cleanly after use.

Units shall be handled only by the hooks or devices provided. They shall be loaded and transported so that no forces are applied in excess of those occurring during normal lifting. Twisting forces shall not be permitted to occur. Units shall be strapped and secured to prevent movement or damage during transportation. Care shall be exercised at all times that hooks or devices suffer no bending or other damage.

The design and positioning of lifting hooks or devices is the responsibility of the PRECAST CONCRETOR. The design shall be such as to ensure that no cracking of precast units occurs during lifting or handling. Lifting hooks or devices set permanently in the units shall have a safety factor of at least 4 and for repetitive use shall have a safety factor of at least 6.

PREC.8 STACKING

Units shall be stacked on timber dunnage and suitable soft packing, but not pinex, placed under the lifting points. Stacking shall be at all times be such as to minimise the effects of creep and to avoid undue distortion of units.

Stacking of units shall be carried out on an area capable of withstanding the bearing pressures involved and in such a way that damage to units, lifting hooks, and to other embedded fixtures and to other units shall not occur.

PREC.9 MARKING

Mark all units with mark number, orientation in the finished job and date of casting. The marking shall not be permitted to affect the fairface finish.

PREC.10 INSPECTION

The Owner reserves the right to inspect the precast units at all stages of manufacture to check conformity with this Specification. Units which do not conform to the required tolerances, which show grout leakage, which have been damaged or which are otherwise defective shall be liable to rejection and may be used in the structure only at the Engineer's discretion. No repair work shall be done without specific instruction from the Engineer.

PREC.11 DELIVERY PROGRAMME

The subcontractor shall allow to cast units so that they are ready for inspection at least 2 weeks before the main contractor requires delivery. The subcontractor shall be responsible for notifying the Owner when units are ready for inspection. Units shall be stored at the subcontractor's factory or other suitable location so as to facilitate a thorough check of the units.

PREC.12 BEAM UNITS

Form and cast these units as detailed including square holes at columns. Take delivery of weldplates from STRUCTURAL STEELWORKER and cast in as detailed. Wrap edges of all weldplates with DENSOTAPE before casting in. Soffits and sides of beams shall have a fairface finish or be steel trowelled smooth. Roughen all surfaces that will later have concrete cast against them, including the insides of the square holes.

PREC.13 FLOORING UNITS

Flooring units shall be standard STAHLTON units designed by the manufacturer, who shall supply a Registered Engineer's Design Certificate for the units to the Owner. The design and any erection requirements shall be made available to the Contractor for his consideration before construction of units commences.

The slab system shall have a fire resistance rating of 1 hour.

In the composite condition with topping the floor is to be capable of supporting the following superimposed loads:

Dead Load	0.5 kPa
Live Load	2.5 kPa

PRECAST CONCRETOR shall provide a drawing showing the layout of units, and shape of each unit. This drawings must be issued to the Owner and main Contractor for comment before manufacture commences.

Top surfaces shall be roughened sufficiently to ensure an adequate key of topping concrete. Bottom surfaces shall not show a difference in level at adjacent units of more than 3mm after erection and casting topping.

SECTION 5

5.1

CONCRETE BLOCKLAYERBLK.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions of Contract, which are equally binding on all Trades. This section of the Specification shall be read in conjunction with all other sections.

BLK.2 SCOPE

This section of the Contract consists of the supply and laying of all concrete blockwork including filling with grout.

Supply and placing of reinforcing is specified in REINFORCING STEELWORKER.

BLK.3 WORKMANSHIP AND MATERIALS

Blocklaying shall be carried out by expert blocklayers employed by a Contractor specialising in the laying of concrete blocks. A foreman blocklayer who is a Registered Mason shall be on site at all times blocks are being laid.

Materials and workmanship shall conform with the requirements of the New Zealand Provisional Standard NZS 4210 P : 1981 except where specified otherwise below.

BLK.4 BLOCKS

All concrete blocks shall be manufactured by an approved manufacturer to the Vibrapac-Besser pattern in accordance with Provisional New Zealand Standard NZS 3121 : 1983. Blocks shall be manufactured using standard aggregates complying with NZS 3121, as specified in Clause 3.2.1. of NZS 3102:1983. Lightweight aggregate blocks shall NOT be used.

Blocks shall be of approved standard grey colour, properly cured, square and true to shape and size. Excessively damaged or otherwise irregular blocks will not be accepted. Blockwork shall be laid in stretcher bond throughout and all panels shall be carefully set out so as to avoid use of cut blocks wherever possible. The initial setting out of the bonding of all panels shall be approved by the Engineer before proceeding.

Blocks shall be cut as necessary to fit dimensions or to suit reinforcing. Cutting shall be done by means of a special hydraulic block cutting machine or carborundum saw and exposed edges shall be clean, square and even.

Where block types are not shown on the drawings, the blocks used shall be such as to achieve the joint patterns shown on the drawings, and be capable of being placed to reinforcing or steelwork already in place.

BLK.5 MORTAR

Mortar shall have a compressive strength of 12.5 MPa and shall conform with Clause 3 of NZS 4210 P : 1981. To achieve this strength special attention shall be paid to sand grading, and mix proportions of 1 cement to 3 sand are recommended.

Allow to test mortar as specified below.

Approved workability additives may be used as an alternative to lime.

BLK.6 REINFORCEMENT

Reinforcement is supplied by REINFORCING STEELWORKER. Starters in foundations are fixed by REINFORCING STEELWORKER and are built in by CONCRETOR. Co-operate with these trades.

In general vertical reinforcing must be positioned in advance of laying. Horizontal reinforcing will be positioned when the appropriate course is laid, and must be tied to every vertical bar crossed.

During filling around reinforcement ensure that its position is correctly maintained.

Reinforcement shall conform with Clause 6 of NZS 4210 P.

BLK.7 GROUT

Grout shall be coarse grout as defined in Clause 4 of NZS 4210 P and shall have a compressive strength of 17.5 MPa and aggregate in the 4mm to 13mm range.

Grout for all walls shall contain DAREXPAND admixture as specified in Clause BLK.12.

Allow to test grout as specified in Clause BLK.8 below.

BLK.8 MORTAR AND GROUT TESTS

Allow to test mortar and grout in accordance with Appendix B of NZS 4210 P. A set of test cylinders shall be taken in cylindrical moulds at least every 450 square metres of wall face area.

BLK.9 LAYING AND CLEANING OUT

Blockwork shall in general maintain running bond except where otherwise specified or shown on the drawings. Blocklaying shall conform with Clause 7 of NZS 4210 P and cleaning out shall conform with Clause 8.

Blockwork shall be so constructed that filling concrete is contained in the spaces around the reinforcement and does not leak from these spaces.

Build blockwork to vertical reinforcing with open ended type blocks and end closers. Provide bond beam and open ended bond beam type blocks, and end closers for horizontal reinforcement. Use special blocks or cut blocks as required.

All walls shall have clean-out openings at ground floor level. The walls shall be laid as follows:

Lay first course of inverted bond beam blocks by threading over the vertical starters. Sprinkle sand on the slab or foundation to prevent mortar droppings bonding to slab. Omit every 4th block in the first course to facilitate washing out of sand and mortar droppings. REINFORCING STEELWORKER will then place vertical reinforcement. On completion of laying, clean out vertical cores of excessive mortar likely to impede the free flow of filling concrete and then thoroughly clean out first course of all sand and mortar droppings. Mortar face shells of split blocks into gaps in first course and support these face shells against hydrostatic pressure as necessary during filling.

BLK.10 JOINTS

Joints both horizontal and vertical shall be level and plumb and of uniform thickness throughout, nominally 10mm, and perpends on alternate courses shall be in a vertical line.

Remove excess mortar and droppings as the laying proceeds, and in particular, keep spaces to be filled with concrete clear and clean.

BLK.11 POINTING AND CLEANING DOWN

Walls to be exposed in the finished work shall be neatly and expertly pointed with ruled concave joints of mortar as specified in Clause 7.7.2 of NZS 4210P as the work proceeds.

Walls to be covered in the finished work shall have joints compacted by tooling and left flush.

On completion of walls exposed in the finished work, clean down and remove all mortar projections and irregularities. Patch and make good around all pipes, conduits, etc., penetrating concrete block walls. Make good any faults in the pointing.

BLK.12 GROUTING

Fill all cores of blockwork walls solid, with grout containing DAREXPAND admixture.

A suitable concrete vibrator shall be used for consolidation. Walls may be filled in a single continuous pour of up to 3.6m in height. The top of each grout pour shall be trowelled to compact it, about two hours after the pour.

When the air temperature is less than 8° Celcius, DAREXPAND shall not be used and grouting shall be by the High Lift Grouting Method in accordance with Clause 14.2.1 of NZS 4210P:1981.

BLK.13 SWITCH AND OUTLET BOXES

Allow to drill and chisel out neat rectangular holes in the concrete blocks as work proceeds for electrical plug and switch boxes shown in electrical plan on concrete block faces. Holes shall be accurately positioned and carefully cut to exact sizes and be close fitting to flush boxes. Holes shall be completely concealed by flush plates. In any case where part of the hole is not fully covered it shall be very neatly patched and finished to match surrounding blockwork to the Owner's approval.

BLK.14 BUILDING IN

As the work proceeds, build into blockwork all necessary bolts, STEELWORK items, and other fittings and fixings as shown on the drawings or otherwise required for the work. The CONCRETE BLOCKLAYER shall ascertain from all other subcontractors all particulars relating to their work which affect blockwork with regard to order of the execution of the work, and details of all such provisions of fixings, sleeves, chases, holes, etc., and of all necessary items to be built into blockwork and shall ensure that all such items are provided for and/or positioned.

No claims will be recognised or allowed for extra cost of cutting away or drilling blockwork already executed in consequence of any neglect of the CONCRETE BLOCKLAYER to ascertain these particulars and make the necessary provisions beforehand.

SECTION 6

6.1

REINFORCING STEELWORKERREO.1 PRELIMINARY

Refer to the Preliminary and General Clauses of the Specification and to the General Conditions of Contract, which are equally binding on all Trades. This section of the Specification shall be read in conjunction with all other sections.

REO.2 SCOPE

This section of the Contract consists of the supply, bending and placing of all reinforcing for cast-in-place concrete, precast wall panels and reinforced blockwork including distance pieces and spacers.

Supply, bending and placing of reinforcing for all other precast concrete is to be by PRECAST CONCRETOR.

REO.3 MATERIALS AND WORKMANSHIP

All reinforcement shall conform to NZS 3402P:1973. Links and ties shall be plain bars, all other reinforcement shall be deformed steel.

Mesh shall be welded wire fabric manufactured from hard drawn mild steel wire. The wire shall conform to NZS 3421, and the finished fabric to NZS 3422.

All reinforcement and workmanship shall conform to the requirements of NZS 3109:1980, Section 3.

REO.4 ABBREVIATIONS AND SYMBOLS

Bar diameters are prefixed by letters as follows:

H	deformed grade 380
D	deformed structural grade
R	plain structural grade

Abbreviations on the drawings are as follows:

t	top	Tt	top mat, upper layer
b	bottom	Tb	top mat, lower layer
e.f.	each face	Bt	bottom mat, upper layer
n.f.	near face	Bb	bottom mat, lower layer
f.f.	far face		
alt.	alternate		
stgd	staggered		
c.i.s.	cast-in-sockets		

Bars bracketed thus () on the drawings are called up elsewhere. Starters are drawn open in section, thus "o".

REO.5 BENDING

Bars shall be cut and bent according to BS 4466:1981 and to the dimensions and shapes shown on the drawings. However bending radii shall generally be in accordance with the table at the end of this section. For stirrups and ties the bending radius shall be equal to the radius of the enclosed main bar, with a tolerance of -0, +3mm, unless this is smaller than the radius specified in the table. The ends of stirrups and ties shall be in accordance with Figure 1 of NZS 3109.

Cranks or sets at laps shall have their inclined portions 12 diameters or a minimum of 300 long unless specifically shown otherwise. Laps shall be in accordance with Clause REO.6.

It is the Contractor's responsibility to schedule the reinforcement and ensure the correct cutting and bending to the requirements of the drawings.

REO.6 LAPS AND STARTERS

Unless shown otherwise on the drawings, lap lengths in both concrete and blockwork shall be in accordance with the table below. The position of laps other than those detailed shall be discussed and agreed with the Engineer before fabrication.

Starters shall protect sufficiently to achieve the lap lengths below, with a minimum projection of 500mm.

This lap length table is for deformed reinforcing. Note for plain bars these lap lengths must be DOUBLED:

<u>Bar Dia</u>	<u>Grade 275</u>	<u>Grade 380</u>
10mm	400mm	600mm
12	500	700
16	600	900
20	800	1200
24	1000	1400
28	1200	1700

REO.7 FIXING

Steel fixing shall conform to NZS 3109:1980, clause 3.4. Bars shall be positioned accurately according to the drawings and securely tied with wire ties to form a rigid cage. The ends of ties shall be turned away from the concrete face. Particular attention shall be paid to the correct lapping of all steel and laps shall be checked after fixing.

REO.8 CLEANING STEEL

Reinforcement as fixed shall be clean and free from loose rust. Any mould oil on the steel shall be thoroughly cleaned off with kerosene or similar before concrete is placed.

REO.9 COVER

Cover shall be as in the table below except where specifically noted otherwise on the drawing. This table is generally in accordance with the provisions of NZ 3101:1982.

<u>Cast in Place Concrete</u>	<u>Cover mm</u>
Cast against and permanently exposed to earth	75
Exposed to earth or weather:	
Slabs, walls, ribs	40
Beams and columns:	
Principal reinforcement	50
Ties, stirrups, spirals	40
Not exposed to weather nor in contact with the ground:	
Slabs, walls, ribs:	
24mm through 32mm bars	30
20mm bars or wire, and smaller	20
Beams and columns:	
Principal longitudinal reinforcement	40
Ties, stirrups and spirals	25
<u>Precast Concrete (Manufactured under Plant Control Conditions)</u>	
Exposed to earth or weather:	
Slabs, wall, ribs:	
24mm through 40mm bars	40
20mm bars or wire, and smaller	30
Beams and columns:	
Principal longitudinal reinforcement	40
Ties, stirrips and spirals	30
Not exposed to weather nor in contact with the ground:	
Slabs, walls, ribs:	
24mm through 32mm bars	25
20mm bars or wire and smaller	15
Beams and columns:	
Principal reinforcement:	
16mm and larger bars	35
12mm and smaller bars	30
Ties, stirrups and spirals:	
16mm and larger bars	20
12mm and smaller bars	15

The reinforcing steelwork subcontractor shall supply and fix all necessary distance pieces and spacers to maintain cover. Distance pieces shall be wired-on mortar blocks, ABIT plastic pieces or similar. Mortar blocks must be accurately made to the appropriate dimensions.

Slab steel shall have the bottom layer supported on distance pieces. Purpose made wire chairs or plastic chairs seated on the formwork are the preferred means of supporting the top layer of slab steel.

Column and beam steel shall be securely tied to ties or links and shall have distance pieces to the formwork.

The system of distance pieces and spacers to be used shall be such as to firmly hold the steel against all reasonable Contractor's traffic. It shall be discussed in advance with the Engineer, and be to his approval. In general distance pieces and spacers shall be at 1200mm centres each way in suspended slabs, and less where mesh is used.

REO.10 SUPERVISION

The reinforcing steelwork sub-contractor shall be represented on the site by a competent leading hand while steel is being placed.

During pouring, the reinforcing steelwork subcontractor shall be on hand to correct any damage or displacement of reinforcing.

REO.11 CONCRETE

Supply and place all reinforcing for concrete as detailed on the drawings. Co-operate with CONCRETOR and fit in with his programme for construction sequence.

Straighten and clean all starters bent during pouring operations before placing steel for subsequent pouring.

REO.12 BLOCKWORK

Supply and place all reinforcing steel for blockwork as detailed on the drawings. Set out starters to suit block layout.

Vertical steel shall be placed in advance of blocklaying and temporary braces provided as necessary. BLOCKLAYER will build to this steel with open ended blocks. Horizontal steel shall be placed in bond beams as blocklaying proceeds and shall be securely tied to vertical steel.

REO.13 FIRST FLOOR SLAB MESH

Supply and place 666 mesh, or heavier grade if nominated by proprietary floor supplier, to the topping over STAHLTON floor units. Mesh shall lap 225mm minimum at all edges and sheets shall be cut diagonally at the corners to limit the sheets lapping to 2 of the 4.

Thread mesh over wall steel or where necessary cut cross wires to allow mesh to extend at least 100mm into walls including 1 cross wire.

REO.14 STARTERS FROM EXISTING WORK

Drill oversize holes into existing concrete and masonry where detailed, and epoxy grout in starters for new concrete and blockwork. The epoxy shall be one recommended by a manufacturer for this purpose, and shall be used in strict accordance with his recommendations.

MINIMUM BENDING DIAMETERS 'D' FOR BENDING REINFORCING BARS

Bar size	Main steel		Stirrups and ties			
	Grade 275	Grade 380	Grade 275		Grade 380	
			Round	Deformed	Round	Deformed
6	30	48	12	24	24	48
10	50	80	20	40	40	80
12	60	96	24	48	48	96
16	80	128	32	64	64	128
20	100	160	40	80	—	—
24	120	240	—	—	—	—
28	140	280	—	—	—	—
32	192	320	—	—	—	—
40	240	400	—	—	—	—

NOTE- In the case of stirrups and ties:

- (1) Minimum bend diameters for deformed bars are twice those for plain round bars.
- (2) Where the main bar size is greater than the minimum bending diameter, the main bar size will govern.

SECTION 7

7.1

STRUCTURAL STEELWORKERST.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions of Contract, which are equally binding on all Trades. This section of the Specification shall be read in conjunction with all other sections.

ST.2 SCOPE

This section of the Contract includes the following:

1. Supply and fabrication and painting of all structural steelwork including all brackets, cleats, bolts, rods and associated items.
2. Erection of all structural steelwork complete with all cleats and fixings.
3. Supply and fabrication of fixings for Structural Timber.
4. Supply and fabrication of bolts, weldplates and other items for casting in by CONCRETOR, PRECAST CONCRETOR and CONCRETE BLOCKLAYER.
5. Welding up of fixings for precast wall panels and floor beams.

ST.3 WORKMANSHIP AND MATERIALS

The Contractor shall adhere to all relevant requirements of NZS 3404:1977 "Code for Design of Steel Structures" and to NZS 4701:1981 "Metal Arc Welding of Steel Structures" for supply of all materials and in workmanship both on and off the site.

ST.4 STEEL

Steel shall be mild steel of approved origin and conforming to BS 4360:1979. The Contractor shall ascertain at the time of tendering whether the steel sizes detailed on the drawings will be available to the job. The Contractor shall supply with his tender the source of supply, price list and substitute sizes for those detailed where shortage of supply is anticipated. Extra cost of substitute sizes required but not notified at the time of tender will be borne by the Contractor.

ST.5 DIMENSIONS AND SET OUT

All dimensions shall be checked on site before commencing fabrication. The Contractor shall do the setting out of all works and shall be responsible for its accuracy.

Any discrepancies between the drawings and the actual conditions on site shall be reported to the Owner as soon as possible.

ST.6 WELDING

All welded connections shall be as shown on the drawings. Welding shall be done by qualified operators and strictly according to NZS 4701:1981. Welds exposed in the finished building and in particular butt welds of stock lengths shall be neatly finished. Butt welds shall be ground smooth.

ST.7 WELDING DEFECTS

Welding defects shall be assessed by the Engineer and if he so instructs, be cut out and remade.

Joints cut out shall be examined and passed by the Engineer before rewelding. Welds will not be expected to attain an unreasonably high standard of perfection, but the weld metal, as deposited, shall be free from cracks, slag inclusion, gross porosity, cavities and other deposition faults. The weld metal shall be properly fused with the parent metal without serious undercutting or overlapping at the toes of the weld. The visible surfaces of all welds shall be clean, regular and of consistently uniform colour.

When welding defects are disclosed, testing of further welds may be ordered at the Contractor's expense. If stiffeners or other concealing details have been added, these may be required to be removed to permit this additional testing.

ST.8 SITE WELDING

Where site welding is required facilities shall be provided to obtain the same standard of workmanship as in the shop. Welding in the air shall be reduced to a minimum by assembly and erection procedure. All welding in the air shall be from properly positioned platforms and wherever possible shall be designed to avoid overhead welding. Parts to be welded shall be firmly held by erection bolts. Tacking bolts or cleats, other than those detailed, shall be provided as needed. If required, tacking cleats will be removed after erection and erection bolt hole filled by welding.

ST.9 BOLTS AND BOLTING

All bolted connections shall be as shown on the drawings.

The bolts shall generally be galvanised mild steel, complete with galvanised washers all to AS1111:72, Grade 4.6 (Commercial Quality).

Holes for bolts shall be drilled or punched and not gas cut. Bolts shall be of the correct lengths and with a flat or taper washer under the nut.

Supply all bolts, nuts and washers for fixing steelwork, including those to be built in by CONCRETOR, PRECAST CONCRETOR and CONCRETE BLOCKLAYER.

All bolts for connecting timber to steelwork are to be supplied and fixed by CARPENTER.

Drill all holes required for all fixings of whatever kind shown or implied on the drawings.

ST.10 INTERIOR STEELWORK FINISHES

Grind all cut surfaces to remove sharp edges and corners, and thoroughly degrease steelwork. Thoroughly clean steelwork with power wire brushing and hand scrapers to remove all mill scale and rust in preparation for priming, as in NZS 1900 Clause 9.4.69.

Paint all steelwork except where built into concrete more than 5mm with 2 coats of primer in the shop to a minimum thickness of 0.1mm. Where site welding is required the priming shall be kept at least 75mm clear of the joint. After erection, all unpainted and damaged areas shall be cleaned and painted with two coats of primer. This includes all welded connections to precast concrete items which are not to be concreted over.

Primer shall be a grey/green zinc chromate primer, grey/green metallic lead primer or Carboline Rustbond 8HB applied in accordance with the manufacturer's recommendations. The first coat shall be applied by brush. The second coat may be brushed or sprayed.

Painting shall be done by experienced painters from properly constructed working platforms. All paint shall be applied in accordance with the maker's instructions. Avoid spills and runs.

Where timber members are fixed during the erection of the steelwork the STRUCTURAL STEELWORKER shall ensure that any cleats or steelwork inaccessible after such fixing are clean and primed under the timber.

ST.11 GALVANISING

Where indicated on the drawings, steelwork shall be hot dip galvanised. Clean by sand or grit blasting to Swedish Standard finish SA 2 1/2, and dip to leave a zinc coating density of 600gm/m². Areas damaged during erection shall be cleaned and painted with two good coats of zinc rich primer.

ST.12 CAST IN FIXINGS

Fabricate and supply to CONCRETOR, PRECAST CONCRETOR and CONCRETE BLOCKLAYER, all bolts, cleats, brackets, weldplates etc required for connecting structural steelwork.

ST.13 FIXINGS FOR STRUCTURAL TIMBER

Manufacture holding down bolts and steel angles at base of glulam columns, and supply to CONCRETOR for building in. Manufacture and supply fixing brackets for glulam rafters and supply to STRUCTURAL TIMBER subcontractor.

ST.14 ERECTION

The Contractor shall provide adequate temporary bracing and anchorage as necessary to stabilise the structure until all permanent bracing and associated elements of the structural system are completed.

Every effort shall be made to keep steelwork true to dimension, plumb and level. Final welding of erection connections shall be delayed until each section of the structure is proved true. Final welding up of all steelwork shall be completed before any further loads are added to the structure.

Packing under steel bases shall be steel.

STEELWORKER is to co-operate with other trades in erection of steelwork.

ST.15 MORTAR PACKING

After erection of steelwork is complete, mortar pack under baseplates and elsewhere as indicated on the drawings. Mortar shall be 1:3 cement:sand mix, just moist and tightly packed into the space. Finish off neatly where exposed.

ST.16 ATTEND ON SITE

Attend on site to complete all welding and painting of connections as detailed including precast concrete connections. Provide all scaffolding, ladders, planks etc required to carry out the work.

BASIC WELD SYMBOLS

ARC AND GAS

LOCATION	FILLET	EDGE OR SEAL	SQUARE BUTT	V BUTT	U BUTT	BEVEL BUTT	PLUG
ARROW SIDE							
OTHER SIDE							
BOTH SIDES							

RESISTANCE

SPOT	SEAM	STUD	FLASH BUTT

LOCATION SIGNIFICANCE

ARROW SIDE

The work is carried out from the same side of the joint as the arrow head is shown.

OTHER SIDE

The work is carried out from the opposite side of the joint to which the arrow head is shown.

SUPPLEMENTARY SYMBOLS

WELD ALL ROUND AND FIELD WELD	PROCEDURE OR SPECIFICATION	GRIND FLUSH	BACKING STRIP	BACKING OR SEALING RUN
 Weld all round indicated by larger open circle. Field weld indicated by smaller filled circle.	 Indicated by a tail on the arrow bearing a reference to a 'procedure schedule or specification clause'.	 Indicated by a line appearing above or below the symbol. Below for arrow side, above for other side.	 Butt welds only. Indicated by a double line on the root side of the symbol.	 Butt welds only. Indicated by a circle on the root side of the symbol.

WELD DIMENSIONS

SIZE OF FILLET WELDS	FILLET WELD WITH UNEQUAL LEGS	LENGTH OF WELDS	INTERMITTENT WELDS	INTERMITTENT STAGGERED WELDS
 Leg length of weld shown in mm ahead of weld symbol.	 Length of both legs shown in mm ahead of weld symbol. For orientation of weld refer to drg.	 Length of weld in mm follows symbol. If no length shown weld extends for full length of joint.	 Length of welds shown unbracketed. Length of spaces shown bracketed. All lengths are in mm and follow the symbol.	 Length of welds and spaces as for previous example.

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WELDING SYMBOLS

GENERALLY IN ACCORDANCE WITH BS 499 PART 2 1965

SECTION 8

8.1

STRUCTURAL TIMBERTIM.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions of Contract, which are equally binding on all Trades. This section of the Specification shall be read in conjunction with all other sections.

TIM.2 SCOPE

This section of the Contract includes the following:

1. Manufacture and supply of glulam columns and rafters for portal frames.
2. Manufacture and supply of all plywood gussets for portal frames.
3. Supply and bending of NAILON PLATES at bases of columns.
4. Assembly and erection of portal frames as detailed, using steel components supplied by STRUCTURAL STEELWORKER.

TIM.3 WORKMANSHIP AND MATERIALS

Workmanship and materials shall be of the highest standard, in accordance with the best trade practice.

Wood and wood based products, and construction and workmanship, shall be in accordance with the relevant New Zealand Standards, including the following, as appropriate:

NZS 3602:1975	Code of Practice for Specifying Wood and Wood-based Products for Use in Buildings.
NZS 3603:1981	Code of Practice for Timber Design.
NZS 3606:1987	Specification for the Manufacture of Glue Laminated Timber.
NZS 3616:1978	Specification for Finger Jointed Timber.
NZS 3631:1978	Classification and Grading of New Zealand Timbers.

TIM.4 GLULAM TIMBERManufacture

All glulam timber shall be fabricated in accordance with NZS 3606:1987, in a plant holding a current SANZ licence.

Adhesives

The adhesive for finger jointing and glulam shall be as specified in NZS 3606:1987 for exposure category A.

Adhesives shall be mixed, applied and cured strictly in accordance with the manufacturer's recommendations.

End Joints

End joints in laminating stock shall be finger joints in accordance with NZS 3616:1978.

Testing

Finger joints shall be tested as specified in NZS 3616:1978. Shear blocks shall be tested as specified in NZS 3606:1987

Grade

The laminates on the top and bottom quarter of each beam shall be No.1 framing grade. The inner laminates may be No.2 framing grade.

The limitations on pith given by Clause 101.2.1 of NZS 3606:1987 shall apply.

Camber

Precamber rafter by 20mm at midspan.

Treatment

The glulam beams are not required to be preservative treated. If not treated, a surface coat of approved insecticide shall be applied before applying the surface sealer.

Finish

Exposed surfaces shall be finished with a "Standard" finish in accordance with NZS 3606:1987.

Apply one coat of an approved water-resistant sealer to all surfaces before delivery.

Dimensions

Check all dimensions on site before cutting glulam members to final length.

TIM.5 PROTECTION

Protect all structural timber members from the weather and from damage of any kind.

Wrap or otherwise protect members from exposure to rain or other water. Store well clear of the ground.

Store and handle such that no damage occurs. Any damaged members will be liable for rejection or repair at no cost to the Owner.

TIM.6 PLYWOOD GUSSETS

Supply, manufacture and deliver plywood gussets as detailed.

The plywood thickness and the face grain direction shall be as shown on the drawings.

All nail locations shall be marked on the gussets in the factory, with waterproof ink.

TIM.7 STEEL FIXINGS

Holding down bolts will be built in by CONCRETOR, complete with steel angle. Fabricate bent NAILON plate as detailed.

Take delivery of rafter fixing bracket from STRUCTURAL STEELWORKER and fix to wall as detailed.

TIM.8 ERECTION

Take delivery of portal frame components, assemble, then erect to accurate line and level as detailed.

Make all fixings shown or implied on the drawings.

Supply all nails, bolts, etc required for fixing timber members to each other or to other materials. Repair any damage and remove any surface marks to the satisfaction of the Owner.

Provide temporary bracing to ensure the complete stability of the works at all times. Leave in place until the permanent bracing is complete.

TIM.9 METAL FRAMING BRACKETS

Supply and fix light metal framing brackets, joist hangers etc as detailed, or as found necessary for the stability of the works. Fix in accordance with manufacturers recommendations. Nails shall be 30mm minimum length for 50mm thick sawn timber, and 45mm minimum length for sawn timber or glulam 90mm or more in thickness.

All steel items shall be galvanised, or painted with an approved paint system, before erection. Nails shall be galvanised or electroplated.

SECTION 9

9.1

PLUMBERPL.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions of Contract, which are equally binding on all Trades. This section of the Specification shall be read in conjunction with all other sections.

PL.2 SCOPE

This section of the Contract consists of all the new plumbing required for the satisfactory completion of the work.

PL.3 WORKMANSHIP

The works shall be carried out in accordance with best trade practice by competent craftsmen, using equipment, materials and processes that are best suited for the purpose, and shall be of the very highest standard.

PL.4 REGULATIONS

All sanitary plumbing work shall be strictly in accordance with the New Zealand Standard Code of Sanitary Plumbing and Drainage Regulations and to the approval of the Local Authorities' Inspectors.

PL.5 CO-OPERATION

This sub-contractor shall co-operate with the Main Contractor and all other affected sub-contractors, in every way, to ensure the correct finished relationship both as to dimensions, details and finished between his work and other surrounding work.

He shall carry out his part of the Contract at such times and in such order as the Main Contractor may require and so as to finish the parts or the whole of this trade when required to fit in with the overall programme of work laid down by the Main Contractor.

PL.6 PIPEWORK GENERALLY

All pipes shall be concealed unless specified herein or agreed with the Owner to be otherwise.

Waste pipes shall be installed with even gradients and all other necessary precautions to avoid air locks; easy bends shall be used throughout and, unless unavoidable, elbow fittings shall not be used.

Proper and adequate provision shall be made in the installation of all pipework and in particular in all p.v.c. pipework to allow for thermal movements.

All waste pipes required to be run under concrete floors shall be continuous without joints and shall be set in hardfill, projecting through holes left in the foundations. They shall be well wrapped for their full length in 'Densotape'.

Properly tape and seal these pipes to d.p.c. where they penetrate same and plug ends of pipes until remainder of wastes are connected up.

PL.7 WASTE, SOIL & VENT PIPES

Provide and install complete all the soil pipes and waste pipes complete with their vent systems.

All piping shall be Garnite S'lon (or other equal) p.v.c. pipes and fittings, conforming and installed in strict accordance with the requirements and recommendations of the 'Code of Practice for the Installation of Unplasticised P.V.C. Pipe Systems'.

Connect wastes, vents, soil stacks and vent stacks.

All waste and soil pipes shall be fitted with all necessary cleaning eyes and/or inspection saddles.

When vents carry through the roof, finish with the least allowable projection after allowing for 100mm of flashing from the roofing material. Provide and fit p.v.c. flashing cones and a birdproof cage to each vent pipe.

PL.8 HOT & COLD WATER

Provide and install complete the water reticulation system for the building. The system shall be as agreed with the Owner.

Main supply and pipes to hose taps to be 19mm diameter. Otherwise all water supply pipes to be 15mm diameter.

Provide and install hot water cylinder complete with element and thermostat as directed by the Owner.

PL.9 TESTS

Subject all water installations to a full water pressure test. All fittings and fixtures shall be tested and left in perfect working order, to the satisfaction of the Owner.

PL.10 W.C.'s

Provide and install the W.C.'s in the building. The Owner will select the brand and colours.

Connect up stump to soil stack system with flexiseal kit.

Provide and install the cisterns as directed by the Owner. Fit up cisterns with flush pipe and flexiseal kits to w.c. pans. Arrange for cistern overflows to discharge out through exterior wall.

PL.11 WASH HAND BASINS

Provide and install the wash hand basins to toilets. Owner will select the brand and colours.

Connect all wash hand basins up with symmetrically arranged trap and exposed water supply pipes. Fit matching plugs and chains.

PL.12 TAPS & VALVES

Provide and install the taps and valves selected by the Owner. Leave in full working order.

PL.13 FLASHINGS

Provide and fix all flashings required for penetrations to all wall surfaces, ie windows, doors, fan, vents, etc. Fabricate from 0.55mm (24g) galvanised steel sheet.

PL.14 DOWNPIPES & RAINWATER HEADS

Supply and fix the rainwater heads and downpipes selected by the Owner.

SECTION 10

10.1

DRAINLAYERDR.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions of Contract, which are equally binding on all Trades. This section of the Specification shall be read in conjunction with all other sections.

DR.2 SCOPE

This section of the Contract consists of the supply and installation of the complete stormwater and sewer systems for the new buildings and carpark.

DR.3 SITE

The site is described in the EXCAVATOR section of this specification.

DR.4 LEVELS

Existing and new levels are shown on the drawings.

DR.5 REGULATIONS

The work shall be performed generally in accordance with the Local Authority and the Drainage and Plumbing Regulations 1978, and the Local Authority's by-laws, unless in conflict with the following clauses. Unless otherwise stated all clauses refer to both sanitary and stormwater drains.

All drainage work shall be done entirely to the satisfaction of the local authority's engineers and inspectors.

All permits required by any authorities shall be obtained and paid for and all necessary deposits, plans and specifications lodged as required before any drainage work is commenced.

All tests and inspections required by any of the above regulations or authorities shall be made at the appropriate time. Any work covered up before such required tests or inspections have been made shall be uncovered and opened up for testing and inspection at the Drainlayer's expense. All work failing to satisfy the required testing or inspection shall be remade or replaced to the required standards at the Drainlayer's expense.

DR.6 WORKMANSHIP

The work shall be carried out in accordance with best trade practice of sound repute by competent craftsmen using equipment, materials and processes that are best suited for the purpose and shall be of the very highest standard. Check all dimensions on the job.

DR.7 MATERIALS

All materials of every kind shall comply with all relevant New Zealand Standard Specifications. All materials shall be of the best quality of their respective kinds. All drains may be of earthenware or concrete. Drains of 150mm dia or smaller may be of PVC.

All concrete pipes shall comply with NZS 2238:1968 for concrete drainage pipes (precast).

All earthenware pipes and fittings for both sewer and stormwater shall be best quality glazed well burnt socketted earthenware complying with NZS 1823:1967 throughly sound and tough, and free from flaws and other defects.

All PVC pipes and fittings shall conform with NZS 7642.

All cast iron sewer pipes and fittings shall be extra heavy quality spigot and socket pipes and fittings complying in all respects with NZS 627:1951 and NZS 628:1958.

All steel reinforcement shall be as described in REINFORCING STEELWORKER section of this Specification.

All concrete shall be as described in CONCRETOR section of this specification. Concrete shall be ordinary Grade, 17.5 MPa crushing strength.

DR.8 TRENCHES

Excavate all necessary trenches, true to line and grade as shown and of sufficient width to allow all operations necessary for adjoining of pipes to be carried out with freedom. Where necessary secure and maintain sides of trenches with suitable timber placed so that it will not interfere with work of pipelaying and jointing.

Timber shall be withdrawn as trenches are being refilled. Before laying pipes maintain trenches free of water by pumping.

Remove all excavated material not allowed for backfilling from the site.

DR.9 PIPELAYING

All drains and fittings shall be set with a continuous solid base of 19mm crushed metal of minimum 100mm depth beneath the barrel of the pipes. Before backfill and after testing haunch up around pipes to their diameter with 19mm crushed metal. Backfill with good grade backfill only in non trafficked areas and if approved by the drainage authority.

All drains shall be started at point of outfall and worked back to highest point.

All pipes shall be laid with greatest possible accuracy to give true and even gradients. All branches and other connections, cleaning eyes, etc shall be put in as the work proceeds.

All joints in earthenware shall be of a flexible type, using rubber rings.

DR.10 STORMWATER DRAINS

Provide and lay stormwater drains as shown on the drawings.

Connect drains into sumps, manholes and side channel, and fall in even gradients between these as shown on the drawings.

Build in inspection junction at each junction.

Backfill with gravel hardfill in all sealed areas and consolidate. Concrete cover where ground cover over crown is less than 450mm, the extent of this to be checked on site.

At downpipes terminate drains in upstanding collar, finishing 100mm above surrounding finished ground.

DR.11 SEWER DRAINS

Lay new drains in PVC or approved other material, to connect to existing drains.

Backfill all drains under sealed areas with gravel hardfill, and consolidate. Concrete cover drains where ground cover is less than 450mm above crown of pipe, the extent of this to be checked on site.

Lay to terminal vents 100mm dia. where shown.

Allow to check all existing drains to ensure that they are in sound condition and able to accept new connections.

Seal off all drains from existing building not used in final work.

DR.12 SUMPS

Form and cast concrete sumps and manholes, to the appropriate CDB standards, where shown on the drawings. Supply and place 10mm mild steel plate cover drilled with 20mm holes at 65mm centres each way, complete with seating lugs to bring plate flush with top of concrete, hot dip galvanised after fabrication.

Build pipes into sumps and manholes as required.

DR.13 GULLY TRAPS

All separate gully traps shall generally be standard earthenware gullies with precast concrete surrounds all set in concrete or standard plastic formed components. Provide and fit hot dip galvanised cast iron gratings to the top of the surround.

SECTION 11

11.1

SITEWORKSSW.1 PRELIMINARY

Refer to the Preliminary and General Clauses of this Specification and to the General Conditions of Contract, which are equally binding on all Trades. This section of the Specification shall be read in conjunction with all other sections.

SW.2 SCOPE

This section of the Contract includes:

- (a) Stripping the site.
- (b) Supply and laying of basecourse.
- (c) Supply and laying of topcourse.
- (d) Supply and laying hot-mix asphaltic concrete.
- (e) Construction of planters in reinforced concrete and concrete blockwork.
- (f) Formation of footpath crossing.
- (g) Marking carparks.

SW.3 SITE PREPARATION

The house to the west of the site will be removed by others.

Over all areas shown to be paved or planted, clear all vegetation and rubbish and strip all topsoil. Break up any concrete paths etc.

Excavate as required so all areas to be paved are at least 250mm below finished level. Remove all spoil from the site.

SW.4 PAVEMENT CONSTRUCTION

Pavement construction shall consist of 25mm asphaltic concrete on 75mm of topcourse on a minimum of 150mm of basecourse.

SW.5 BASECOURSE

Supply and lay a minimum thickness of 150mm hardfill in the areas to be paved. Refer to clause EX.10.

SW.6 TOPCOURSE

Provide and lay 75mm thick stabilised topcourse over the areas to be sealed. This work shall be done after the drainage and concrete work have been completed.

Topcourse shall be of an approved grading and quality, 100% passing 20mm screen, with at least 50% of 5mm and above to be crushed stone, stabilised with not more than 10% of clay or other fines passing 100 mesh, or to NRB M4 basecourse specification.

Place topcourse in such a manner as to minimise the segregation of sizes. Consolidate the topcourse by rolling with approved steel rollers at optimum moisture content. In general, the laying, rolling and compaction of the topcourse layer shall comply with the National Roads Board Specification B/2 to give a firm compacted surface. Topcourse shall be left with a dense tight even surface ready for sealing.

The topcourse surface shall be tight and dust free, and evenly graded to falls and levels as shown.

Immediately prior to sealing, any areas not conforming with the Specification or Drawing shall be repaired.

SW.7 ASPHALTIC CONCRETE

Supply and lay asphaltic concrete 25mm thick over the whole of the area around the building.

The asphaltic material shall comply with requirements of M/10, July 1975. The bituminous binder shall be 90/100 penetration grade. Particular care is needed to obtain a correctly designed mix of maximum density and stability with minimum voids. Mixing temperatures shall be such that the materials can be well mixed and can arrive on the job at a temperature between 140°C and 165°C.

Prior to the laying of any bituminous material, the asphalt subcontractor shall satisfy himself that there are no irregularities or non compliance with the limits given in this Specification or the limits of surface finish given in NRB B/2 Specification.

A tack coat of bitumen shall be applied immediately ahead of the paving but not so far ahead that it cannot be covered with asphaltic material within two hours. The application rates shall be as approved depending on the surface texture of the metal course. The construction of all asphaltic pavement shall be in accordance with NRB P/9.

The surface shall be rolled smooth to finish with even grades and with no bumps or hollows exceeding 6mm from a 3 metre straight edge. Ensure there are no bumps that will hold water at sumps.

Finish neatly at all edges and against buildings. Finish neatly and at the same surface level at all channels, sump covers, and footpath.

SW. 8 PLANTERS & DISH CHANNEL

Construct planters, as shown on the drawings, in reinforced concrete and concrete blockwork. Refer to the CONCRETOR, CONCRETE BLOCKLAYER and REINFORCING STEELWORKER sections of this Specification.

Construct 300mm wide dish channel to falls, as indicated on the drawings.

SW.9 FOOTPATH CROSSING

Construct 1 - 6.5m wide footpath crossing to Byron Street, in accordance with the requirements of the Christchurch City Council.

SW.10 MARKING

Mark carparks as shown on drawing 620/S1. Lines to be 100mm wide and painted in Resene Road Marking Paint.