STEVEN YOUNG & ASSOCIATES LTD
Consulting Engineers
P O Box 6168, Wellington
syoung@stevenyoung.co.nz 021 932 352

10 July 2025

**69 WAIONE STREET, PETONE – 6 BUILDING COMPLEX**

We have been engaged by Eddie Hawkins to review and summarise a Detailed Seismic Assessment report prepared by Spencer Holmes for the complex at the above address.

Interested parties are encouraged to read their report.

SH concluded that the %NBS ratings of the six buildings were as follows:

| Assessed *%NBS* Rating | Building 1: 50%*NBS*<br>Building 2: 40%*NBS*<br>Building 3: 30%*NBS*<br>Building 4: 60%*NBS*<br>Building 5: 30%*NBS*<br>Building 6: 100%*NBS* |
|---|---|

SH recommended that Buildings 3 and 5 be strengthened to 40%NBS or alternatively Buildings 2, 3, and 5 be strengthened to 50%NBS.

It appears from our review of the SH calculations:

- They are unduly conservative – eg assigning a ductility of 1 instead of 1.5 or 2 to steel structures which significantly affects the Seismic Coefficient.
- Contains some structural modelling and computational errors.
- Furthermore, they have failed to note the absence of some simple but essential bracing, now required by the current steel code.

**We have re-analysed all the buildings using the correct parameters and designed, detailed and costed the necessary remedial work to bring all six buildings to 70%NBS.**

STEVEN YOUNG & ASSOCIATES LTD

# INDEX

Summary of SH report

SYAL reviewer's comments

Schedule of adjustments to SH DSA Assessment

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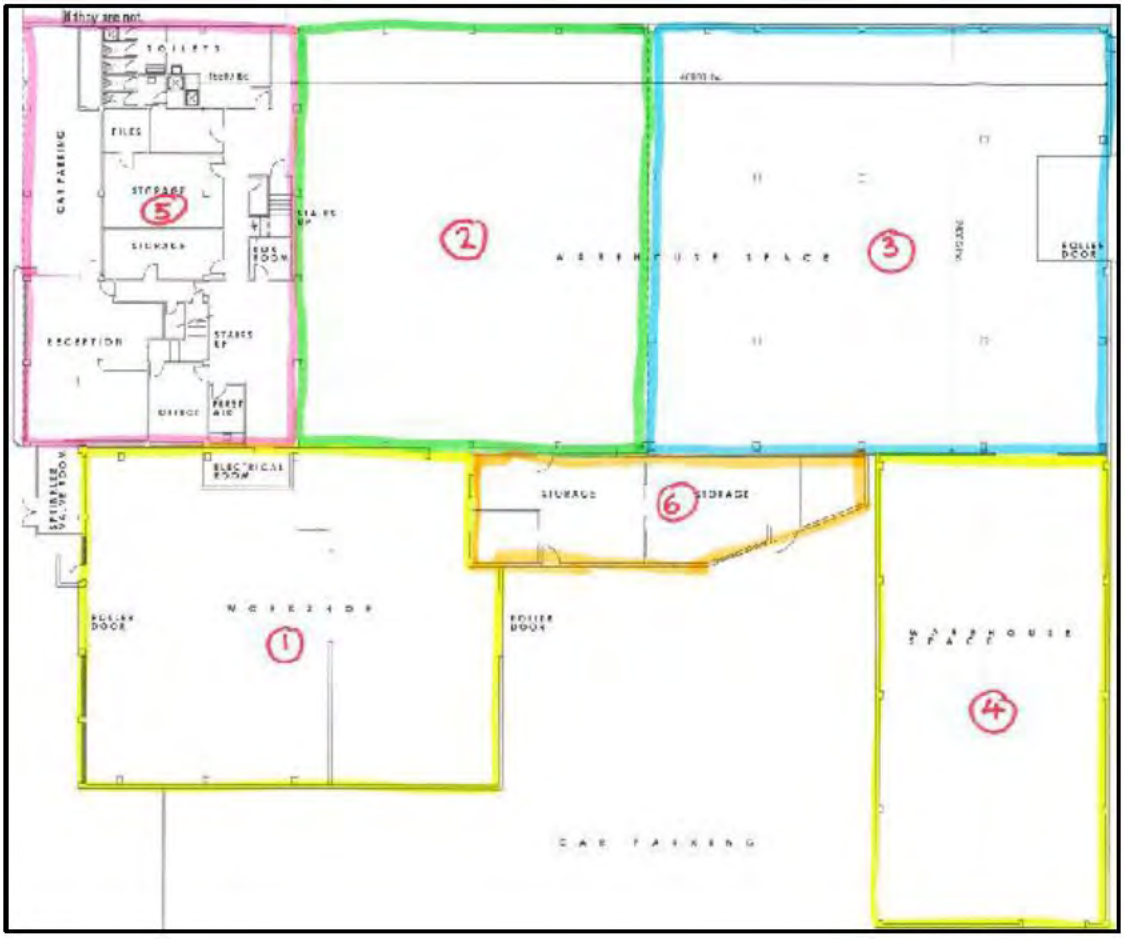
| APPENDIX A | Original drawings |
| APPENDIX B | Strengthening details |
| APPENDIX C | Cost to strengthen. |

SYAL Summary of Spencer Holmes'

## Detailed Seismic Assessment

**69 Waione Street,**
**Petone,**
**Lower Hutt**

69 Waione Street is comprised of six parts comprising their own structural systems. For ease of assessment, these have been labelled




Building 1-4 and 6: Single-Storey
Building 5: Two-Storey

## BUILDING AREAS

Building 1: 487m$^2$
Building 2: 610m$^2$
Building 3: 638m$^2$
Building 4: 464m$^2$
Building 5: 391m$^2$
Building 6: 121m$^2$

## BUILDING YEAR OF CONSTRUCTION

Building 1: 1967
Building 2: 1964
Building 3: 1974
Building 4: 1991
Building 5: 1960
Building 6: 1972

## BUILDING STRUCTURAL SYSTEMS

| BLDG | GRAVITY LOADS SYSTEM | EQ LOAD SYSTEM | ROOF DIAPHRAGM | FOUNDATION |
|---|---|---|---|---|
| | | | | |
| 1 | Portal frames, encased | Porta l frames, encased, brick walls | Cross bracing | Shallow |
| | | | | |
| 2 | Portal frames, encased | Porta l frames, encased, brick walls | Cross bracing | Shallow |
| | | | | |
| 3 | Beams, four columns | Concrete frames, blockwork one side | Cross bracing | Shallow |
| | | | | |
| 4 | Portal frames, block pilasters | V braces onto block walls | Cross bracing | Shallow |
| | | | | |
| 5 | Concrete (G) Timber (upper) | Steel frames, some columns encased | Timber rafters, joists | Shallow |
| | | | | |
| 6 | Blockwork | Blockwork | NA | Shallow |
| | | | | |
| | The buildings are NOT structurally linked to act as a single unit. | | | |

## IMPORTANCE LEVEL OF THE BUILDINGS

The buildings are designated IL2 – Ordinary buildings.

## INSPECTION DATES

Spencer Holmes inspected the building May 2025

STEVEN Young & Associates Inspected the building 30 June 2025.

## SITE HAZARD FACTORS

In accordance with the current design standard for earthquake actions, NZS 1170.5:2004;

- The Seismic Hazard Factor, Z, for the building is 0.40, being located in Lower Hutt.

The Wellington Regional Council's Emergencies Hazards Maps Series (Earthquake) indicates:

- Fault Line Proximity – the site is located approximately 2 kilometers east of the Wellington Fault zone which is a major fault requiring consideration of the "Near-fault factor" in accordance with NZS 1170.5: 2004 for buildings with periods of 1.5 seconds and above. The period for this building is significantly below the 1.5 second threshold,

- Ground Shaking Hazard - the site is located within Zone 5 (High). Zone 1 being the least shaking, and Zone 5 has the greatest shaking of the five-zone assessment,

- Liquefaction Potential - the site is located within Zone 3 (High) liquefaction potential. Where Zone 1 has the least potential, and Zone 4 has the greatest potential for liquefaction,

- Earthquake Induced Slope Failure – the site is located within Zone 1 (low) slope failure susceptibility zone, being the most favourable zone,

- Combined Hazard – the site is located within Zone 5 (High) combined hazard zone,

- Type D soils – Deep soil sites

**SPENCER HOLMES ASSESSED %NBS RATINGS**

| | |
|---|---|
| Assessed *%NBS* Rating | Building 1: 50%*NBS*<br>Building 2: 40%*NBS*<br>Building 3: 30%*NBS*<br>Building 4: 60%*NBS*<br>Building 5: 30%*NBS*<br>Building 6: 100%*NBS* |

## SYAL REVIEWER'S COMMENTS

The implications of SH assessment are:

Building 3 and Building 5 are less than 34%NBS and therefor EARTHQUAKE PRONE and will require strengthening in the near future date (that date is currently under review MBIE.)

Buildings 1, 2, and 4 are greater than 34%NBS but less than 67%NBS and therefore considered EARTHQUAKE RISK and as such are likely not viewed favourably by the market.

SH's suggestion to strengthen Building 3 and Building 5, (and perhaps Building 2) to 50%NBS has no value in the property market as they would still be EARTHQUAKE RISK.

We have reviewed the SH calculations and note that:

1. **Some design assumptions are overly-conservative eg**

   Steel frames have been assigned a Ductility factor of 1, where they should be assigned a ductility factor of 1.5 or 2. This significantly reduces the Seismic Coefficient Cd.

2. **Some calculated roof weights do not take advantage of the reduction available for large roofs.**

   During an EQ, the load on the roof is likely very low.

3. **EQ loads** have been incorrectly applied to the respective models.

4. **On the other hand,** the lack of fly-braces to stabilise the large rafters (a "recent" code requirement) has not been identified.

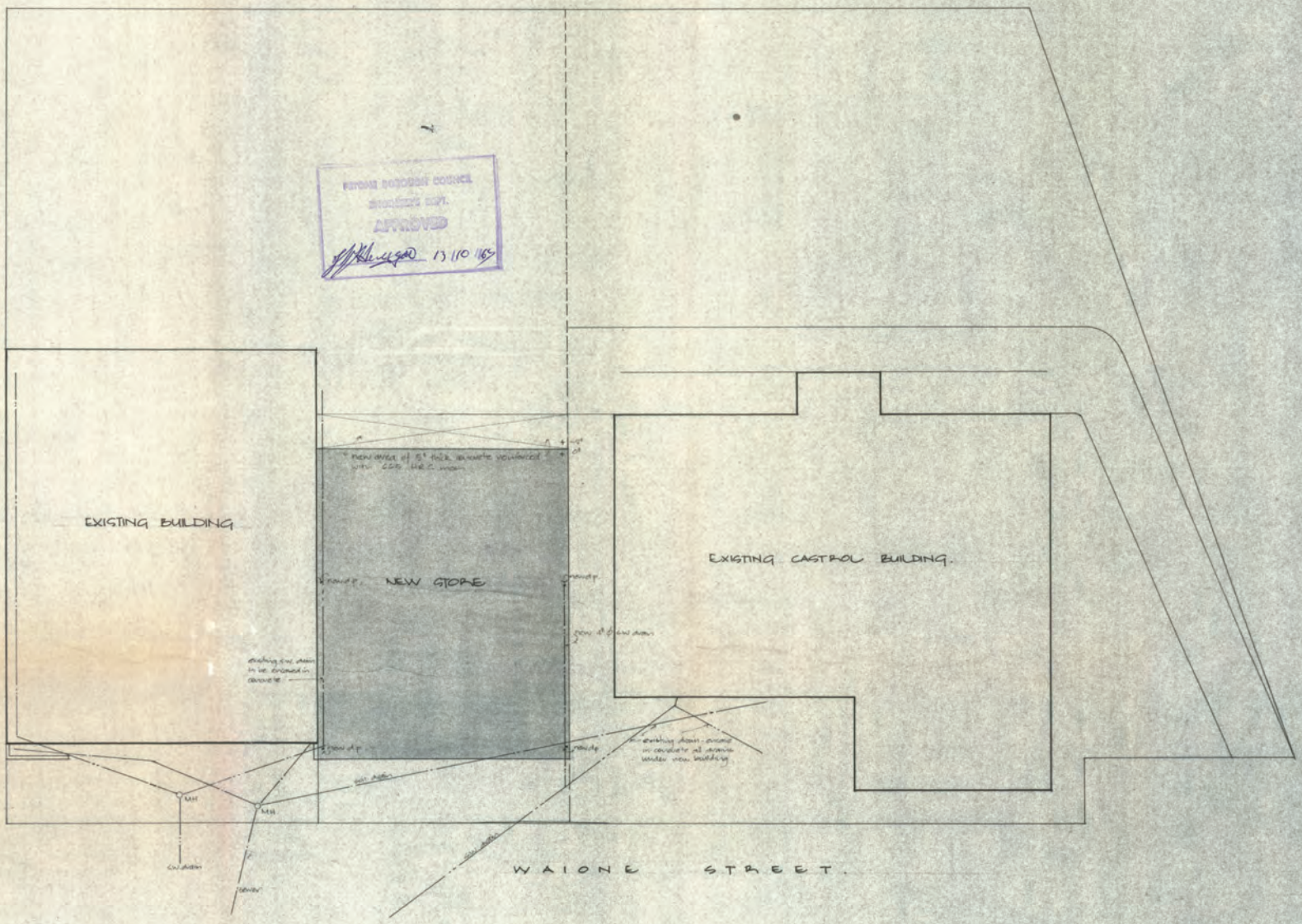
ACCORDINGLY, we have re-analysed all the buildings, and prepared details for each of the 5 buildings (Building 6 is already 100%NBS) to bring each of them to 70%NBS.

See APPENDIX B

Furthermore, we have costed the work for each building in APPENDIX C.

# APPENDIX A

AVAILABLE FILE DRAWINGS OF THE BUILDINGS




HUTT BOROUGH COUNCIL
BUILDING DEPT.
APPROVED
13/10/69

5729

| | | | | | |
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| | | | SCALE. | | |
| | | | DRAWN. | | |
| | | | CHECKED. | | |
| MOD. | REVISION. | SIG. | DATE. | | |

**WILKINS & DAVIES CONSTRUCTION CO. LTD.**

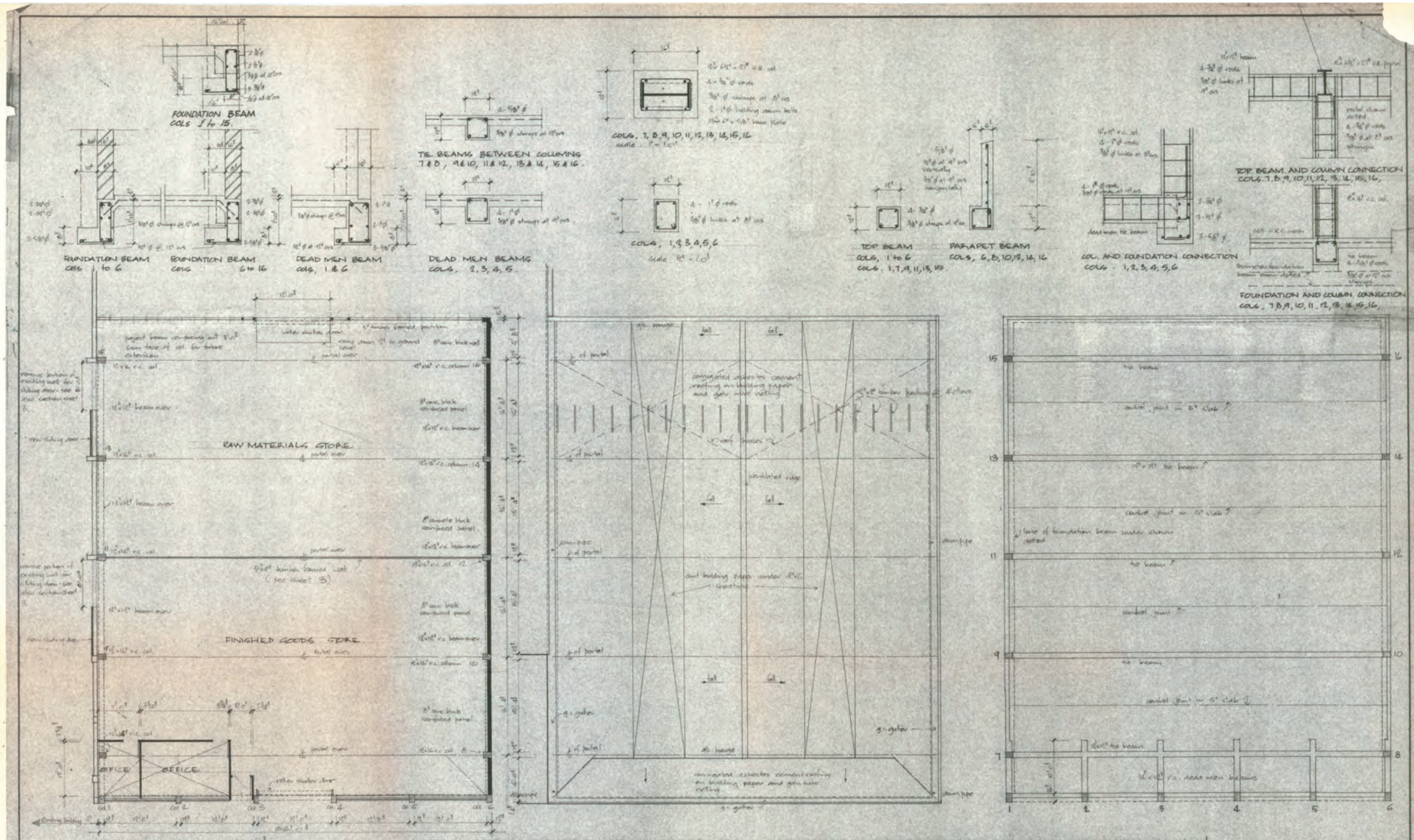
DIVISION:

TITLE: PROPOSED EXTENSIONS TO FORM RAW MATERIALS AND FINISHED GOODS STORE FOR EXPANDITE (N.Z.) LTD.

JOB No. 257/2

DRAWING No. 1 C

SHEET No 1 OF 6 SHEETS

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DIVISION:

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JOB No 257/2

DRAWING No 2 C

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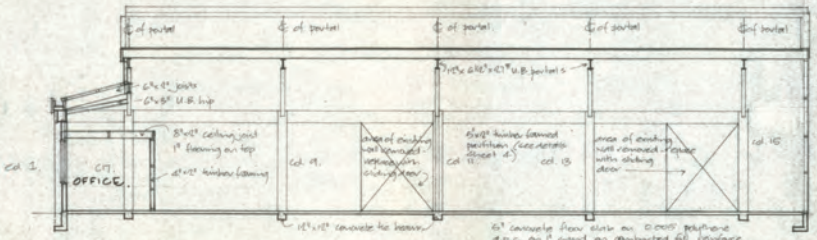
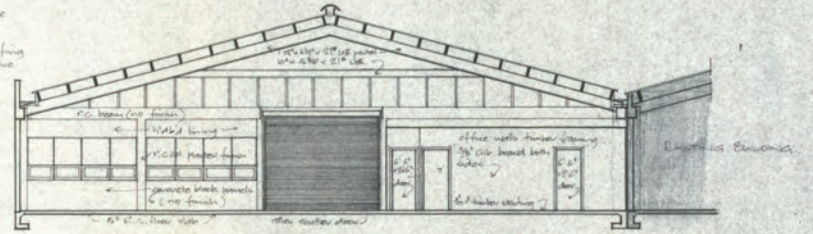
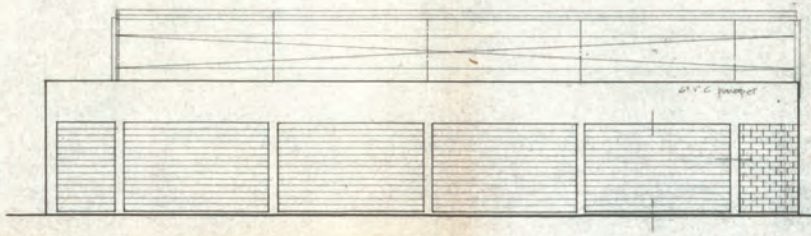


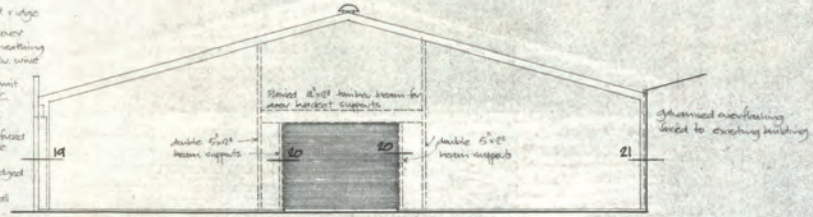

LONG SECTION scale 1/8" = 1'0"



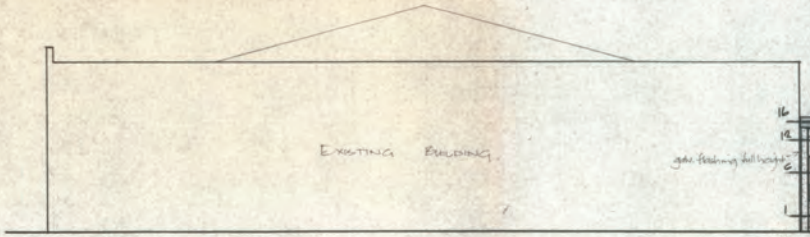

CROSS SECTION. scale 1/8" = 1'0"

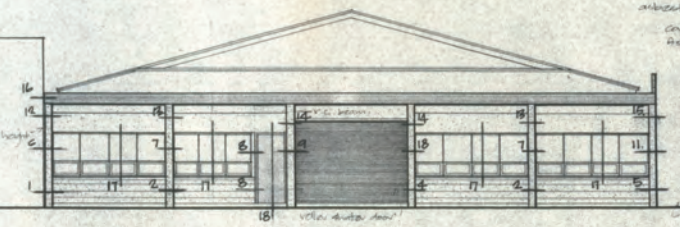



SIDE ELEVATION scale 1/8" = 1'0"




REAR ELEVATION scale 1/8" = 1'0"




ELEVATION FROM WAIONE STREET. scale 1/8" = 1'0"

| | | | |
|---|---|---|---|
| | | SCALE. | |
| | | DRAWN. | |
| | | CHECKED. | |
| 403. | REVISION. | 516. | DATE. |

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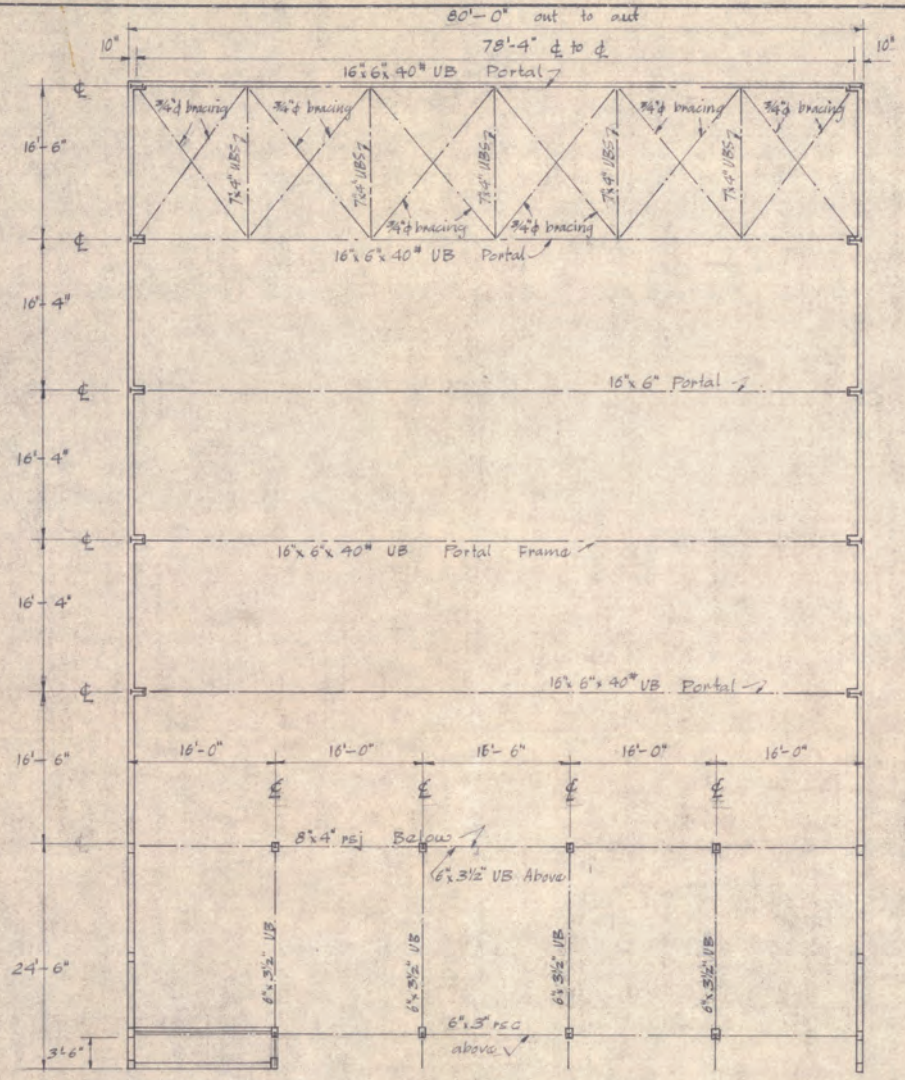
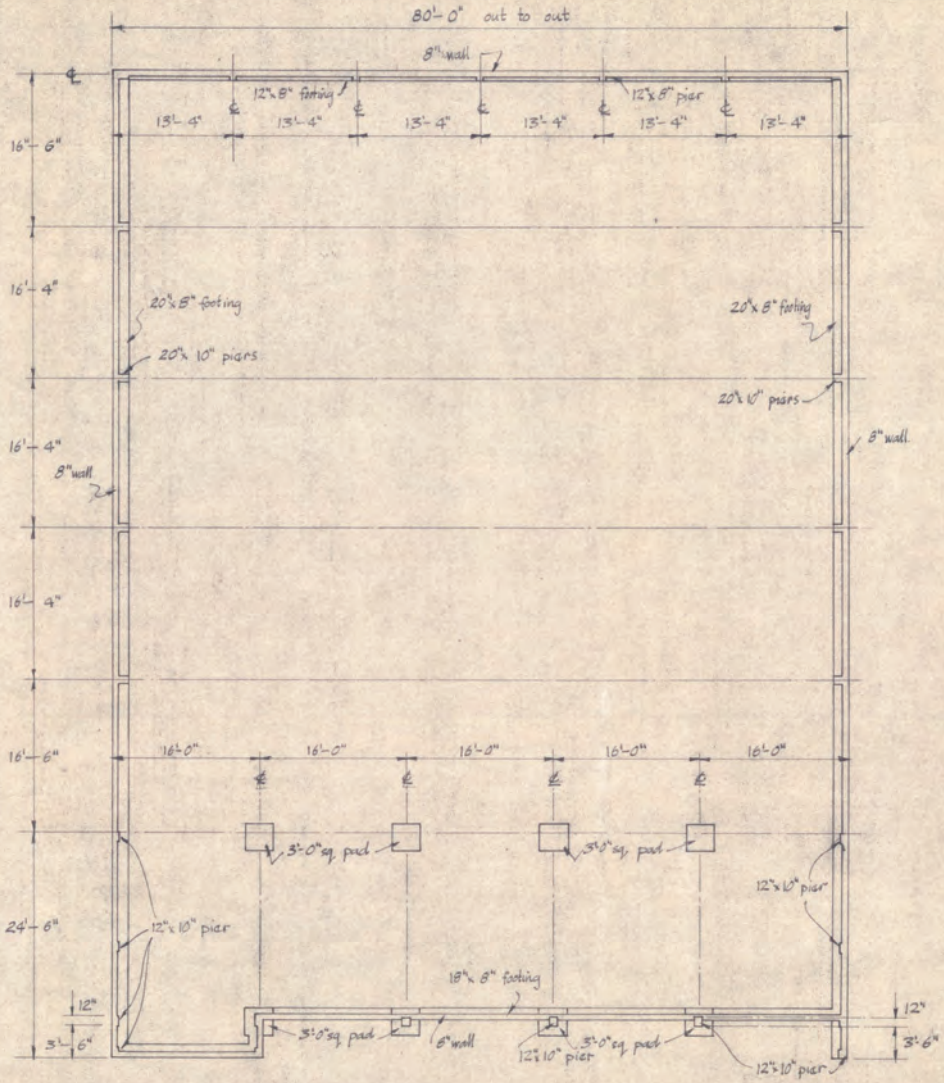
JOB Nº 257/2

DRAWING Nº 3 C

SHEET NO 3 OF 6 SHEETS




ROOF FRAMING PLAN : ⅛" to 1'-0"




FOUNDATION PLAN ⅛" = 1'-0"

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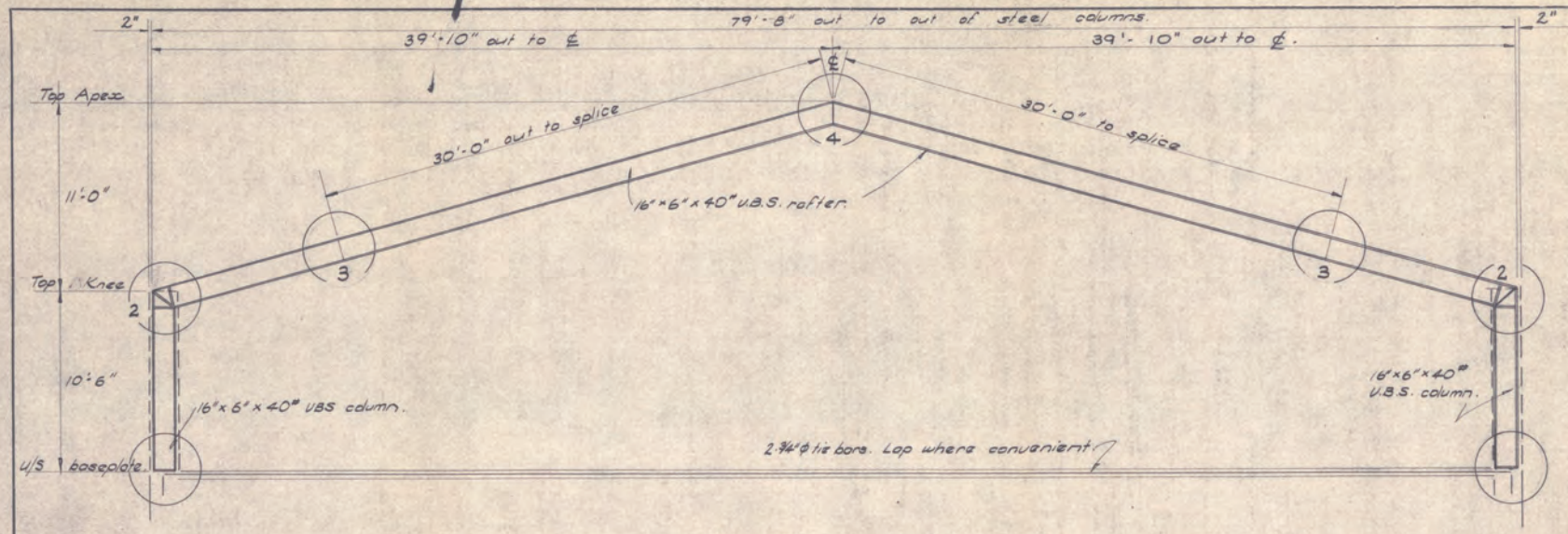
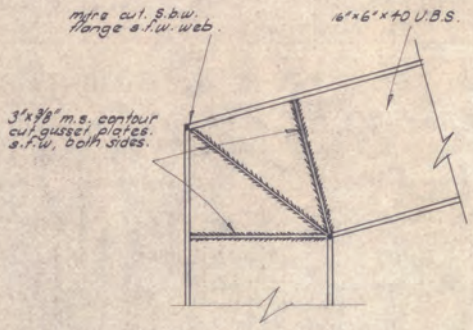
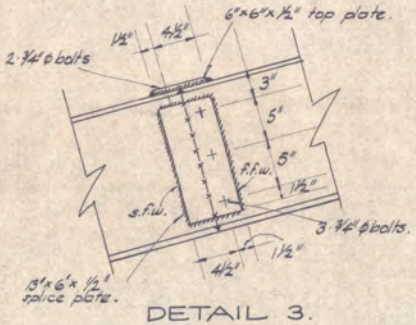
|---|---|---|---|---|---|
| **BERNARD T. CROSSLEY**<br>REGISTERED STRUCTURAL ENGINEER<br>19 MOUNT STREET, AUCKLAND, C.1<br>TELEPHONE 49-138, 49-139 | TECHNITRADES, LTD.<br>112 Newton Road:<br>Auckland:<br>ph: 45-656: | FACTORY FOR CASTROL LTD.<br>AT WAIONE RD. PETONE WELLINGTON: | Roof framing and foundation plan: | SCALE: Shown<br>DATE: Dec '64 | SHEET No. 1/6 |



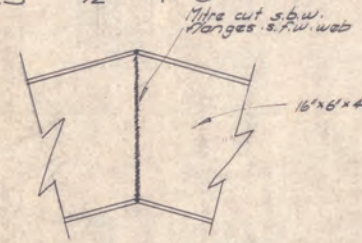

5-off ELEVATION OF PORTAL FRAMES ½" - 1'-0"



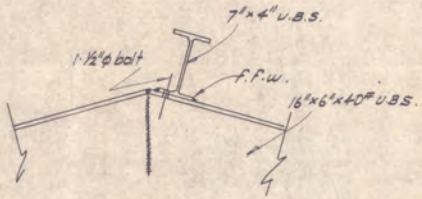

DETAIL 2



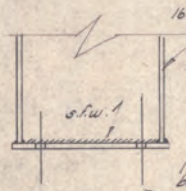

DETAIL 3.



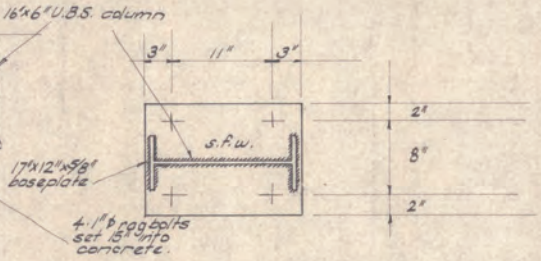

DETAIL 4



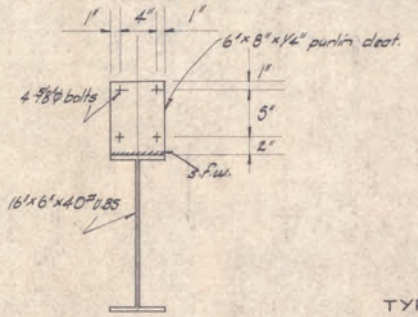

TYPICAL DETAIL OF 7"×4" U.B.S. BRACING CONNEXION TO 16"×6" U.B.S. RAFTER: 1½" - 1'-0"



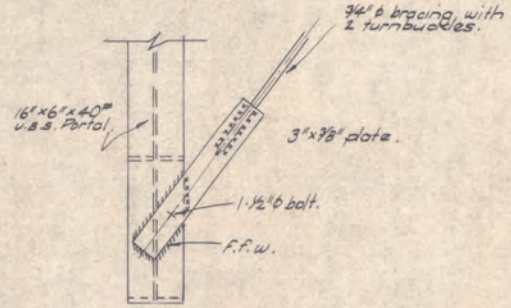

DETAIL 1




PLAN DETAIL




TYPICAL PURLIN CLEAT.




TYPICAL PLAN OF BRACING CONNEXION ½" - 1'-0"

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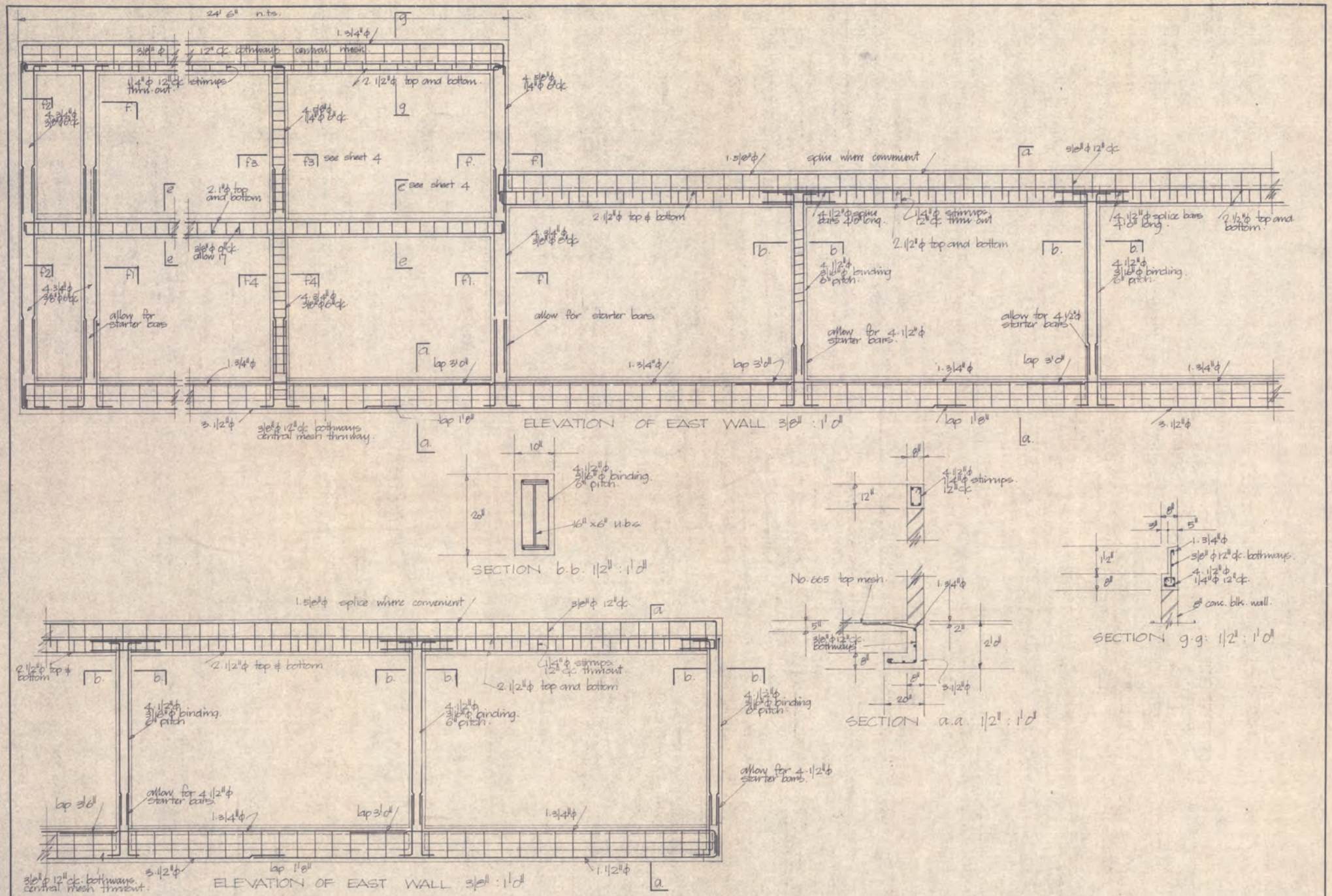
|---|---|---|---|---|---|
| **BERNARD T. CROSSLEY**<br>REGISTERED STRUCTURAL ENGINEER<br>19 MOUNT STREET, AUCKLAND, C.1<br>TELEPHONE 49-138, 49-139 | TECHNITRADES LTD.<br>112 Newton Road:<br>Auckland:<br>ph: 45-656. | FACTORY FOR CASTROL LTD.<br>AT WAIONE RD. PETONE WELLINGTON 8. | frame elevations details | SCALE Shown<br>DATE Dec '64 | SHEET No. 2/6 |

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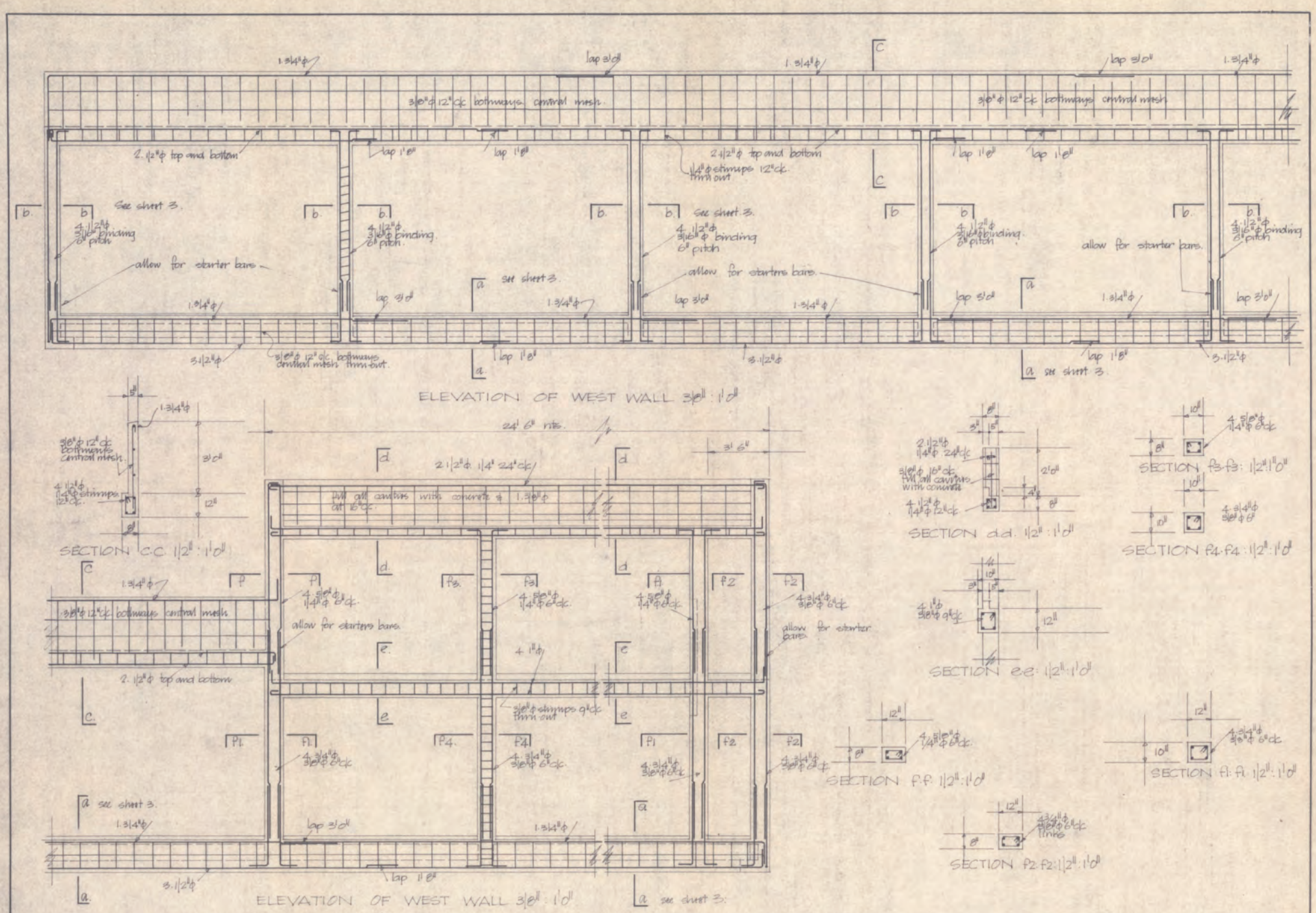
| **BERNARD T. CROSSLEY**<br>REGISTERED STRUCTURAL ENGINEER<br>19 MOUNT STREET, AUCKLAND, C.1<br>TELEPHONE 49-138, 49-139 | TECHNITRADES LTD.<br>112 Newton Road.<br>Auckland:<br>ph. 45-656: | FACTORY FOR CASTROL LTD.<br>AT WAIONE RD., PETONE, WELLINGTON: | wall elevations, sections: | SCALE: Shown<br>DATE: Dec. 1 64. | SHEET No. 3/6 |

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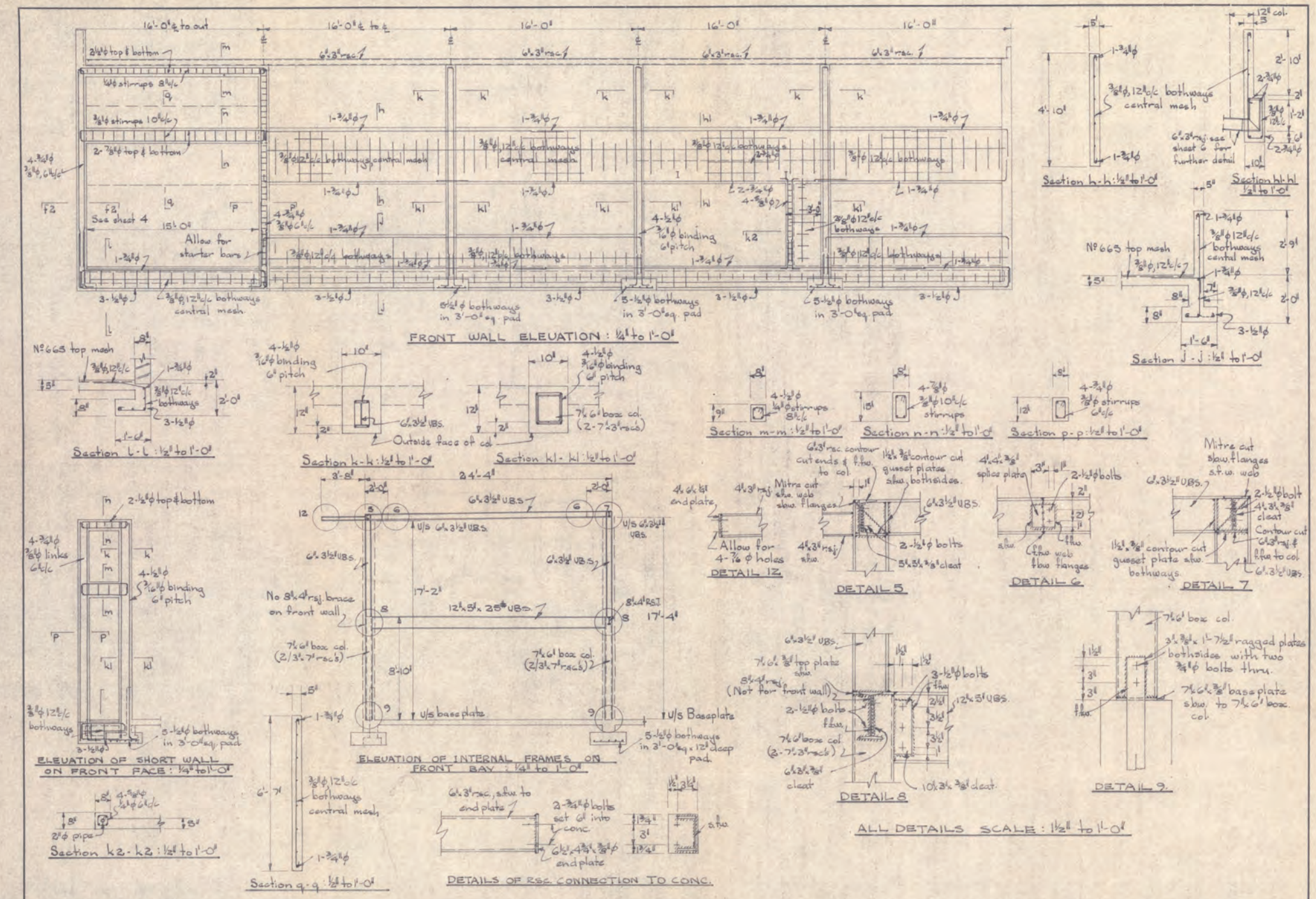
| **BERNARD T. CROSSLEY**<br>REGISTERED STRUCTURAL ENGINEER<br>19 MOUNT STREET, AUCKLAND, C.1<br>TELEPHONE 49-138, 49-139 | TECHNITRADES LTD.<br>112 Newton Road:<br>Auckland:<br>ph: 45:656: | FACTORY FOR CASTROL LTD.<br>AT WAIONE RD, PETONE WELLINGTON: | wall elevations and sections: | SCALE Shown<br>DATE Dec. 1'64. | SHEET No. 4/6 |

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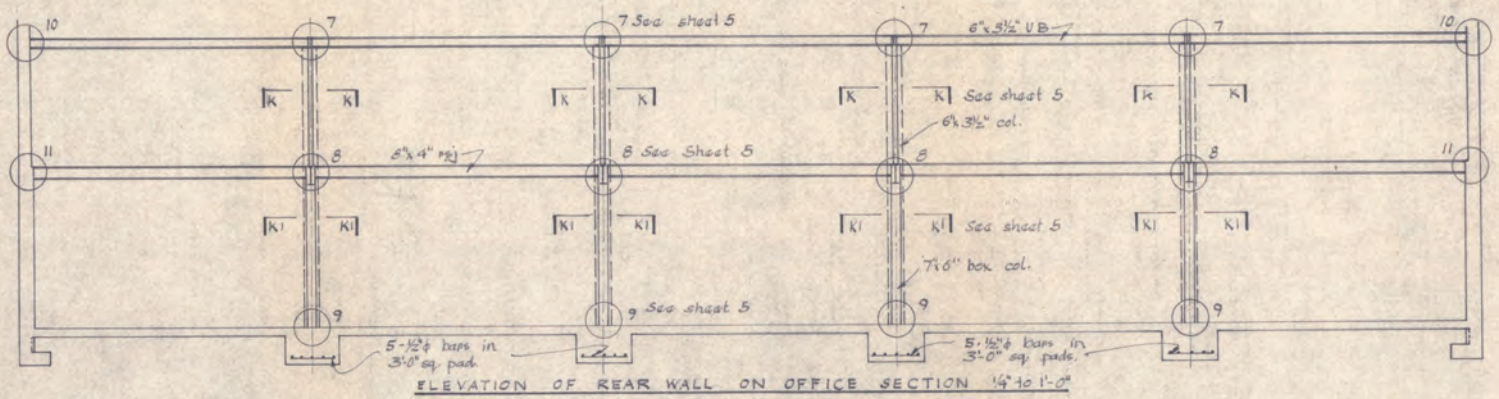
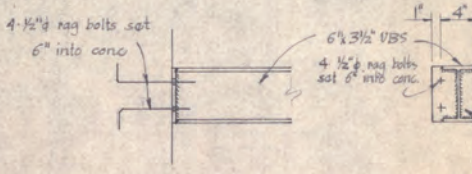
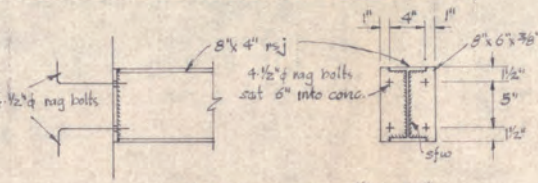
|---|---|---|---|---|---|
| **BERNARD T. CROSSLEY**<br>REGISTERED STRUCTURAL ENGINEER<br>19 MOUNT STREET, AUCKLAND, C.1<br>TELEPHONE 49-138, 49-139 | TECHNITRADES. LTD.<br>12 Newton Road:<br>Auckland:<br>ph. 45:656. | FACTORY FOR CASTROL LTD.<br>AT WAIONE RD. PETONE WELLINGTON. | wall elevations and details: | SCALE: Shown<br>DATE Dec 1'64 | SHEET No. 5/6 |



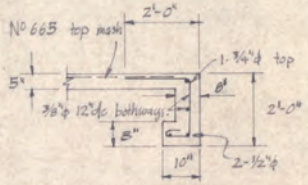

ELEVATION OF REAR WALL ON OFFICE SECTION 1/4" to 1'-0"



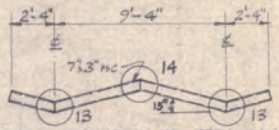

DETAIL 10 : 1½" to 1'-0"



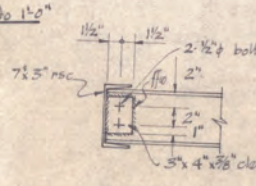

DETAIL 11 : 1½" to 1'-0"



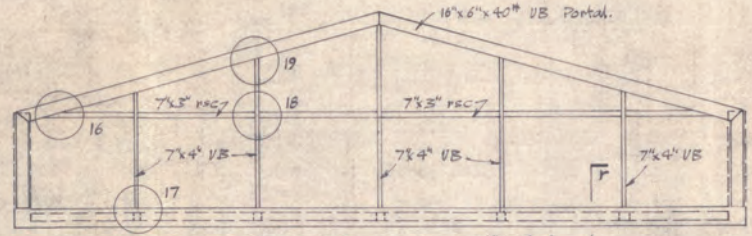

Section r-r Typical for rear wall
½" to 1'-0"



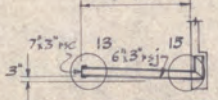

FRONT ELEVATION OF VERANDAH FACIA
¼" to 1'-0"



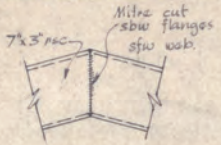

DETAIL 13 : 1½" to 1'-0"



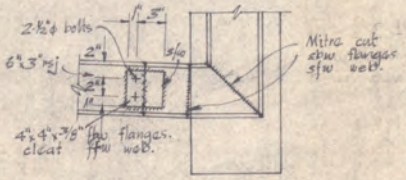

ELEVATION OF REAR WALL : 1/8" to 1'-0"



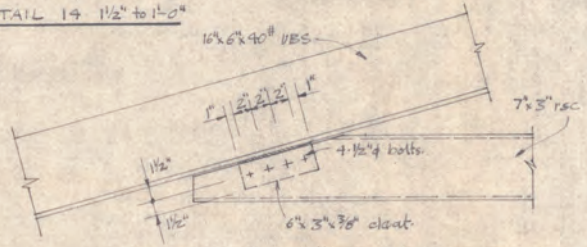

SIDE ELEVATION OF VERANDAH
¼" to 1'-0"



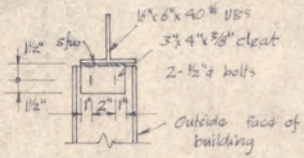

DETAIL 14 1½" to 1'-0"



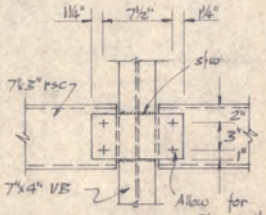

DETAIL 15 : 1½" to 1'-0"



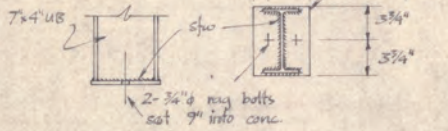

DETAIL 16 : 1½" to 1'-0"




DETAIL 19

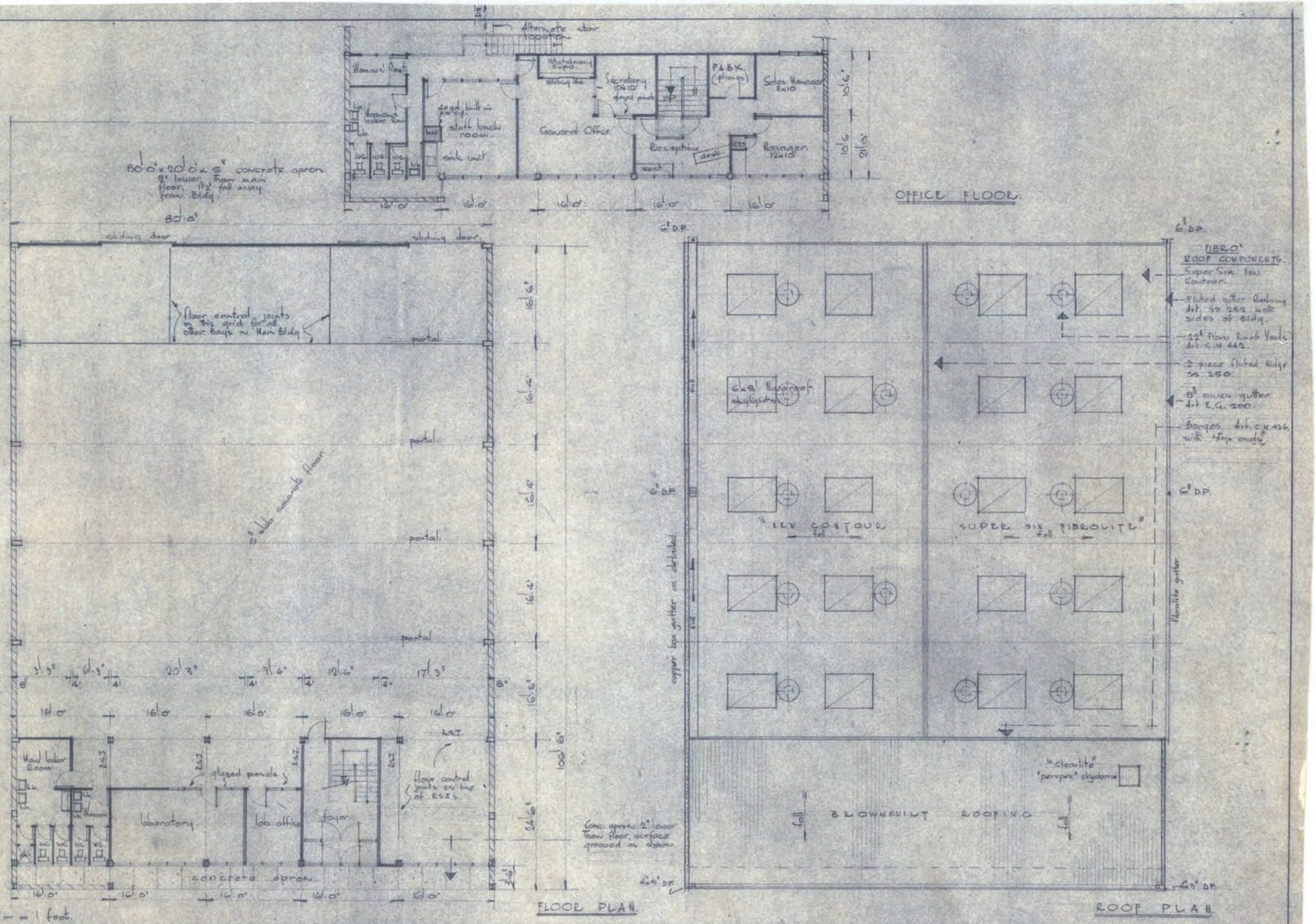



DETAIL 18 1½"=1'-0"




DETAIL 17

| | | | | |
|---|---|---|---|---|
| BERNARD T. CROSSLEY<br>REGISTERED STRUCTURAL ENGINEER<br>19 MOUNT STREET, AUCKLAND, C.1<br>TELEPHONE 49-138, 49-139 | TECHNITRADES LTD.<br>112 Newton Road:<br>Auckland:<br>ph. 45-656 | FACTORY FOR CASTROL LTD.<br>AT WAIONE RD. PETONE WELLINGTON 8. | wall elevations and details: | SCALE Shown<br>DATE Dec 1 '64. | SHEET No. 6/6 |

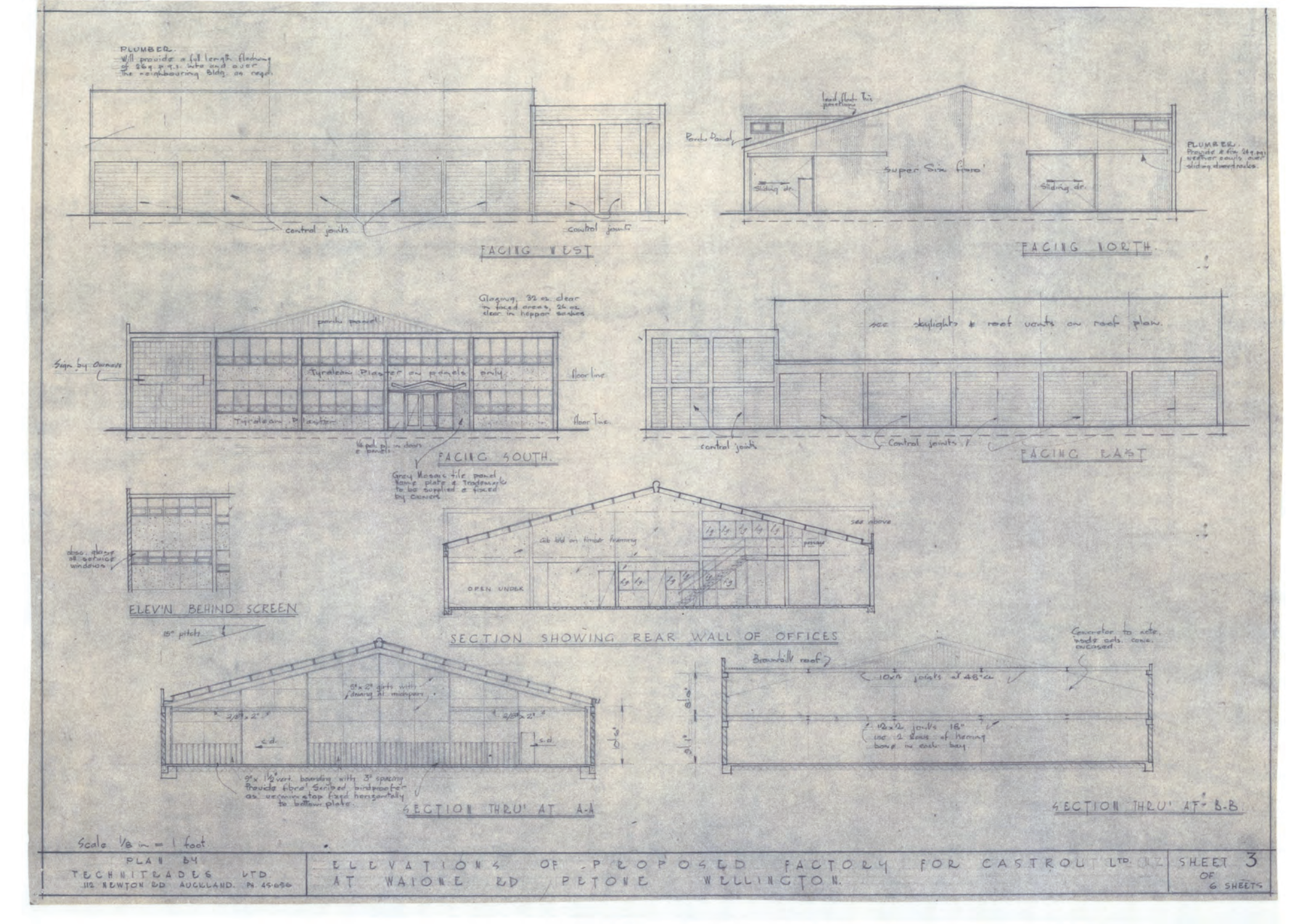


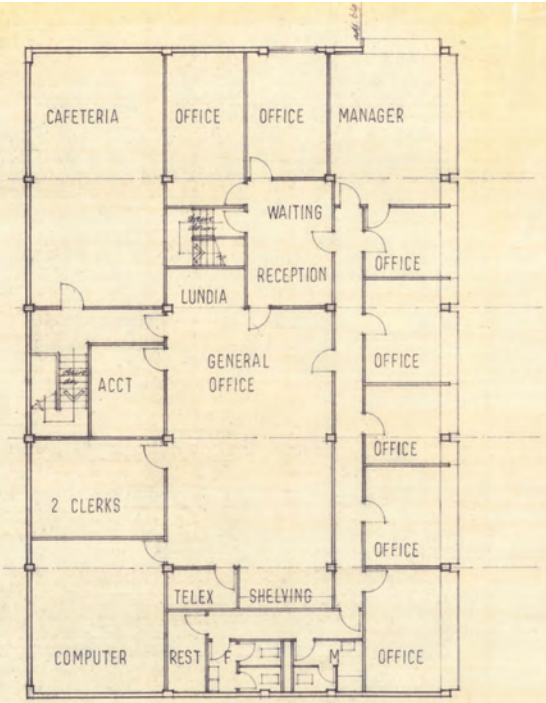

PLAN 84

TECHNITRADES LTD
112 NEWTON RD AUCKLAND PH. 45-656

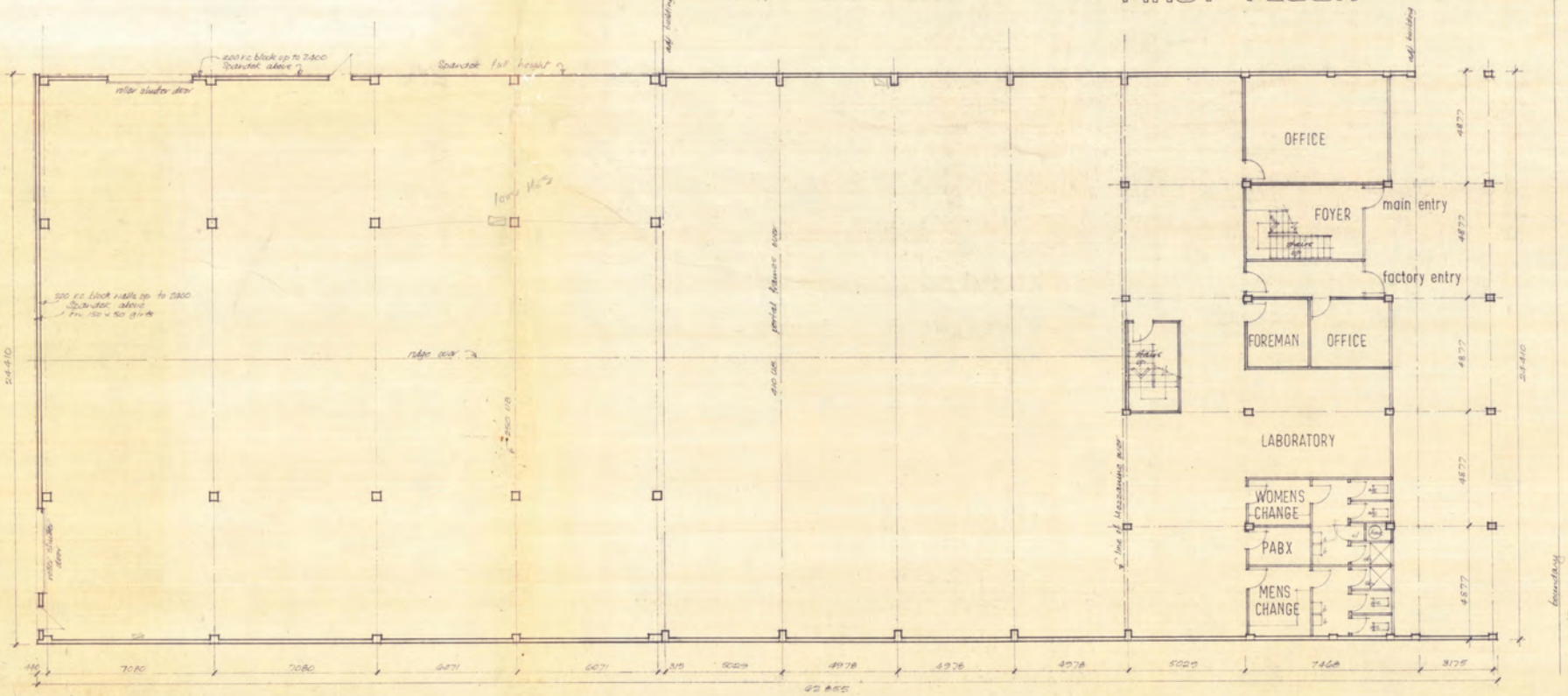
FLOOR & ROOF PLANS OF PROPOSED FACTORY FOR CASTROL LTD
AT WAIONE RD PETONE WELLINGTON

SHEET 2 OF SIX SHEETS

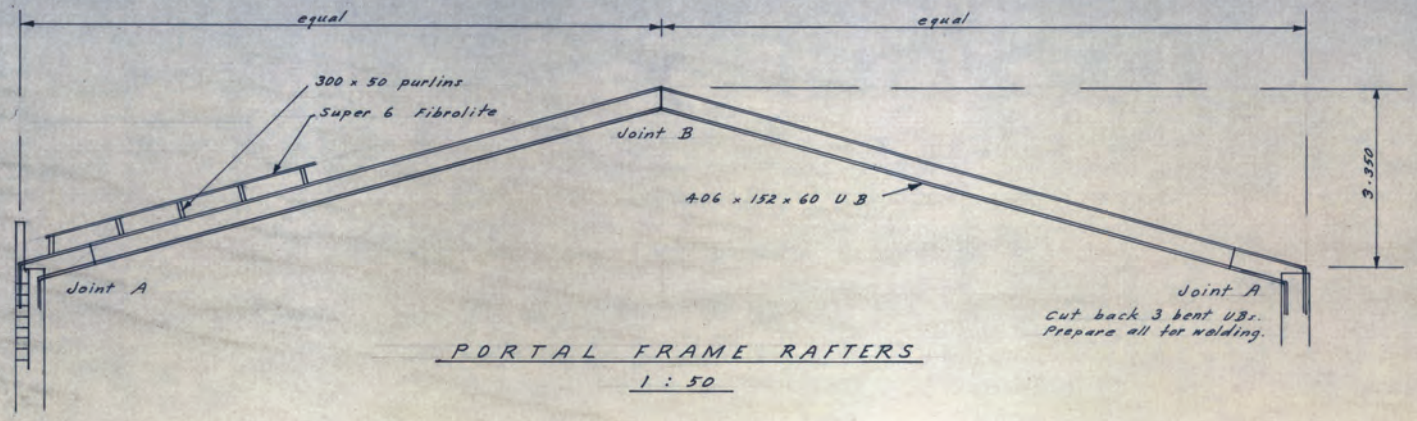

PLUMBER.
Will provide a full length flashing of 26g. g.i. into and over the neighbouring Bldg. as req'd.
control joints
control joints
FACING WEST
Lead flash. Tin gutter fixing
Porch Panel
Super Sim fibro
Sliding dr.
Sliding dr.
PLUMBER.
Provide & fix 26g. g.i. weather aprons over sliding door tracks.
FACING NORTH.
Glazing, 32 oz. clear in fixed areas, 24 oz. clear in hopper sashes
porch panel
Sign by Owners
Tyrolean Plaster on panels only.
floor line
Tyrolean Plaster
floor line
Vapor pp. in doors & panels.
FACING SOUTH.
see skylights & roof vents on roof plan.
control joints
Control joints
FACING EAST
Grey Mosaic tile panel Name plate & Trademark to be supplied & fixed by owner.
Glass glazing all service windows
ELEV'N BEHIND SCREEN
see above
cib bld on timber framing
OPEN UNDER
SECTION SHOWING REAR WALL OF OFFICES
15° pitch
9"x 2" girts with dwang at midspans
2/3"x 2"
2/3"x 2"
c.d.
c.d.
9"x 1½" vert. boarding with 3" spacing. Provide fibre' Scribed 'windproofer' as' vermin stop fixed horizontally to bottom plate.
SECTION THRU' AT A-A
Generator to acte. works acts. conc. encased.
Brownhill roof
10x2 joists @ 48" c.c.
12x2 joists 18" use 2 rows of herring bone in each bay
SECTION THRU' AT B-B
Scale 1/8 in = 1 foot.
PLAN BY
TECHNITRADES LTD.
112 NEWTON RD AUCKLAND. PH. 45-656
ELEVATIONS OF PROPOSED FACTORY FOR CASTROL LTD.
AT WAIONE RD PETONE WELLINGTON.
SHEET 3 OF 6 SHEETS




FIRST FLOOR

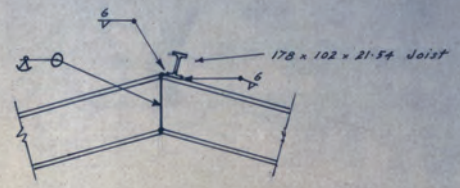



PAROOT BOROUGH COUNCIL
ENGINEER'S DEPT.
APPROVED
23 / 4 / 91



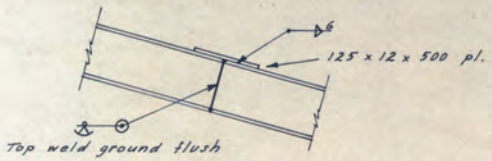

PORTAL FRAME RAFTERS

1 : 50



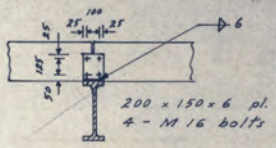

JOINT B

1 : 20



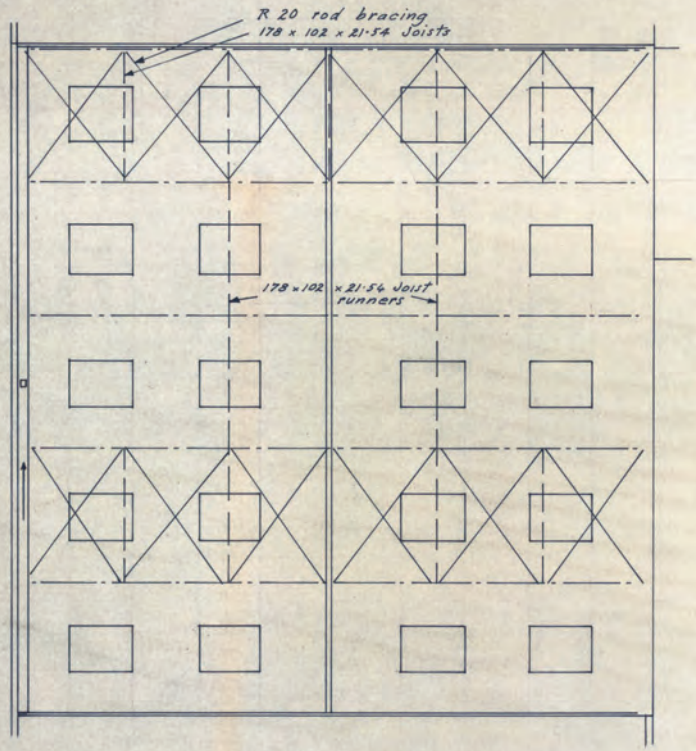

JOINT A

1 : 20



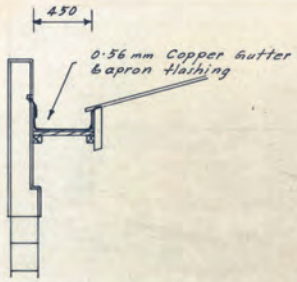

PURLIN CLEATS

1 : 20



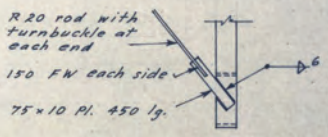

ROOF PLAN

1 : 100




WEST WALL GUTTER

1 : 20




BRACING FIXING

1 : 20

**BUILDING 3**

| No. | AMENDMENT | | |
|---|---|---|---|

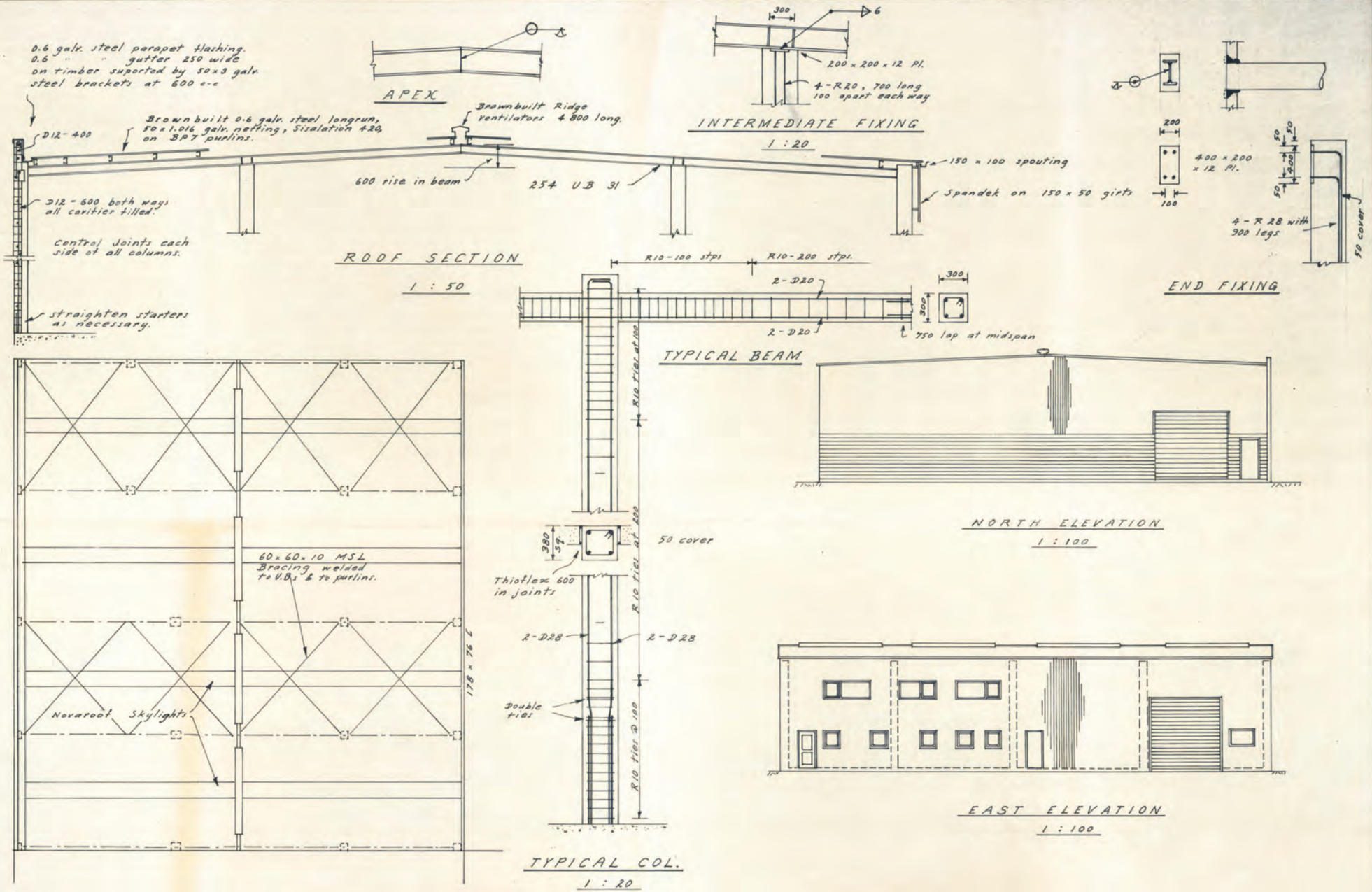
# EXPANDITE LTD., WAIONE ST.
# FIRE REINSTATEMENT


J. K. CLIMIE
CONSULTING ENGINEER
3 EATWELL AVENUE, PARAPARAUMU BEACH
P.O. BOX 1611, TELEPHONE 88867


DRAWN: JKC | DATE: Nov. '80 | THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE

2463

2




# BUILDINGS 4 & 5

| No. | AMENDMENT | | |
|---|---|---|---|

# EXPANDITE LTD., WAIONE ST.
# FIRE REINSTATEMENT


J. K. CLIMIE
CONSULTING ENGINEER
3 EATWELL AVENUE
PARAPARAUMU BEACH
P.O. BOX 1611
TELEPHONE 88867


DRAWN: JKC | DATE: Nov. '80 | THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS ON SITE

2463

3

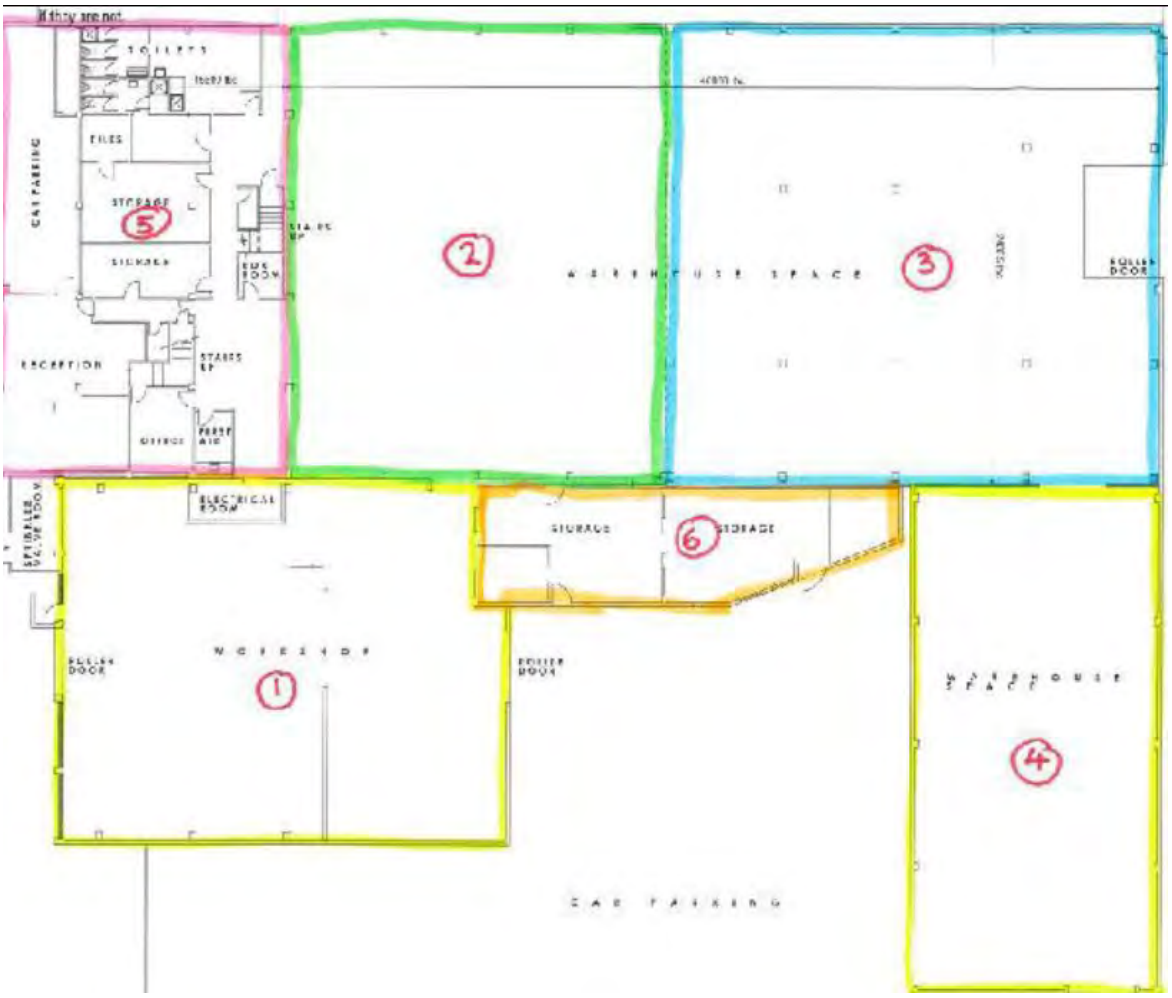
## APPENDIX B

Hawkins
69 Waione Street

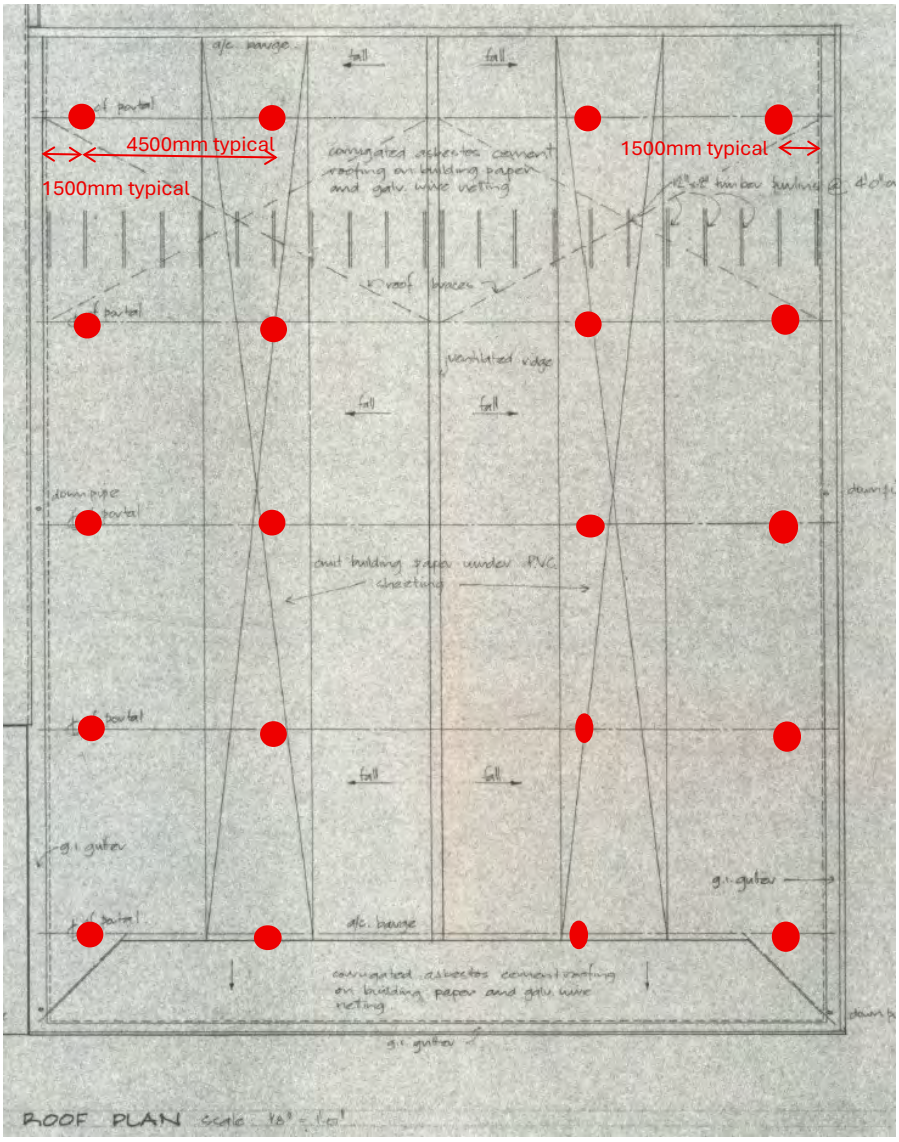
SH Calculations REVISED

| BUILDING 1 | SPENCER HOLMES ASSUMPTIONS | SYAL ADJUSTMENTS | REMEDIAL WORK | REMEDIATED NBS | FINAL STATUS |
|---|---|---|---|---|---|
| BUILDING 1 | 50%NBS, which is limited by the rating in longitudinal direction. The assessment used a ductility of 1 and assumed a pin base for portal frames. | Ductility could be at least 1.5 because the columns of portal frames are steel encased. In addition, the bases of the portal columns have some fixities because of the presence of the hold-downs and the axial load. We also identified a need for providing more fly-braces. | Fly braces added | 70%NBS | Not EQ Risk |
| | | | | | |
| | | | | | |
| BUILDING 2 | 40%NBS. The assessment assumed that the block panels span one-way vertically, leading to an overestimated loading action (the truth is the block panels spane two ways) by 32%. In addition, the top beams are continous at column supports but the moment demand was calculated using a simply beam assumption, leading to an increased moment action by 50%. | As such, we adjusted the moment demand of the top beam and the adjusted moment action is about 50% of SH's value. As such, we conclused a rating of over 70%NBS. We also identified a need for providing more fly-braces. | Fly braces added | 70%NBS | Not EQ Risk |
| BUILDING 3 | 30%NBS. The assessment identified a critical issue - the lack of bracing systems in eastern wall. | SYAL also idenifed that there are not adequate fly-braces to portal rafters. As such, it is suggested that fly-braces be added to portal rafters and cross braces be added to the eastern wall. | Cross braced frames are added to the eastern wall. Fly-braces are added. | 70%NBS | Not EQ Risk |
| BUILDING 4 | 60%NBS. The assessment did not reduce the live load based on the floor area, leading to significantly overestimated seismic mass. | As such, we adjusted the seismic mass (by about 50%). It is recommend that the V brace connection to block infills be strengthened and more fly-braces be added to porta rafetrs, similar to building #1. | Fly braces added. V brace connection to block infills be strengthened. | 70%NBS | Not EQ Risk |
| BUILDING 5 | 30%NBS. The assessment made a calcuation error in calcuating the seismic mass, leading to significantly overestimated seismic mass. | As such, we adjusted the seismic mass (by about 50%). It is recommended that roof braces be added. | Roof braces added. | 70%NBS | Not EQ Risk |

ASSESSED BY: Angela Liu PhD CPEng 216892
REVIEWED BY: ME CMEngNZ

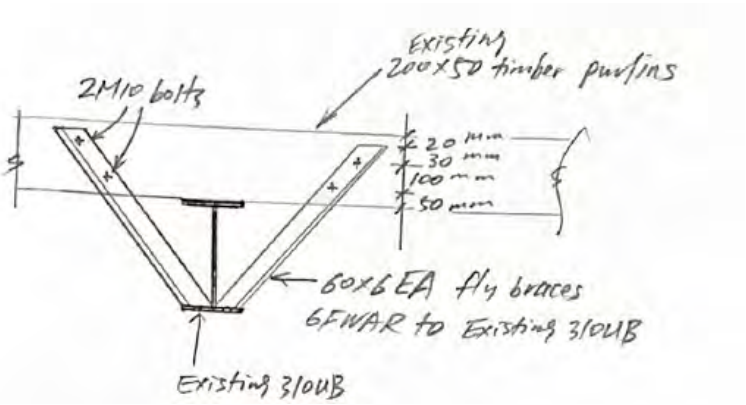



**Site plan of 69 Waione Street in Petone**



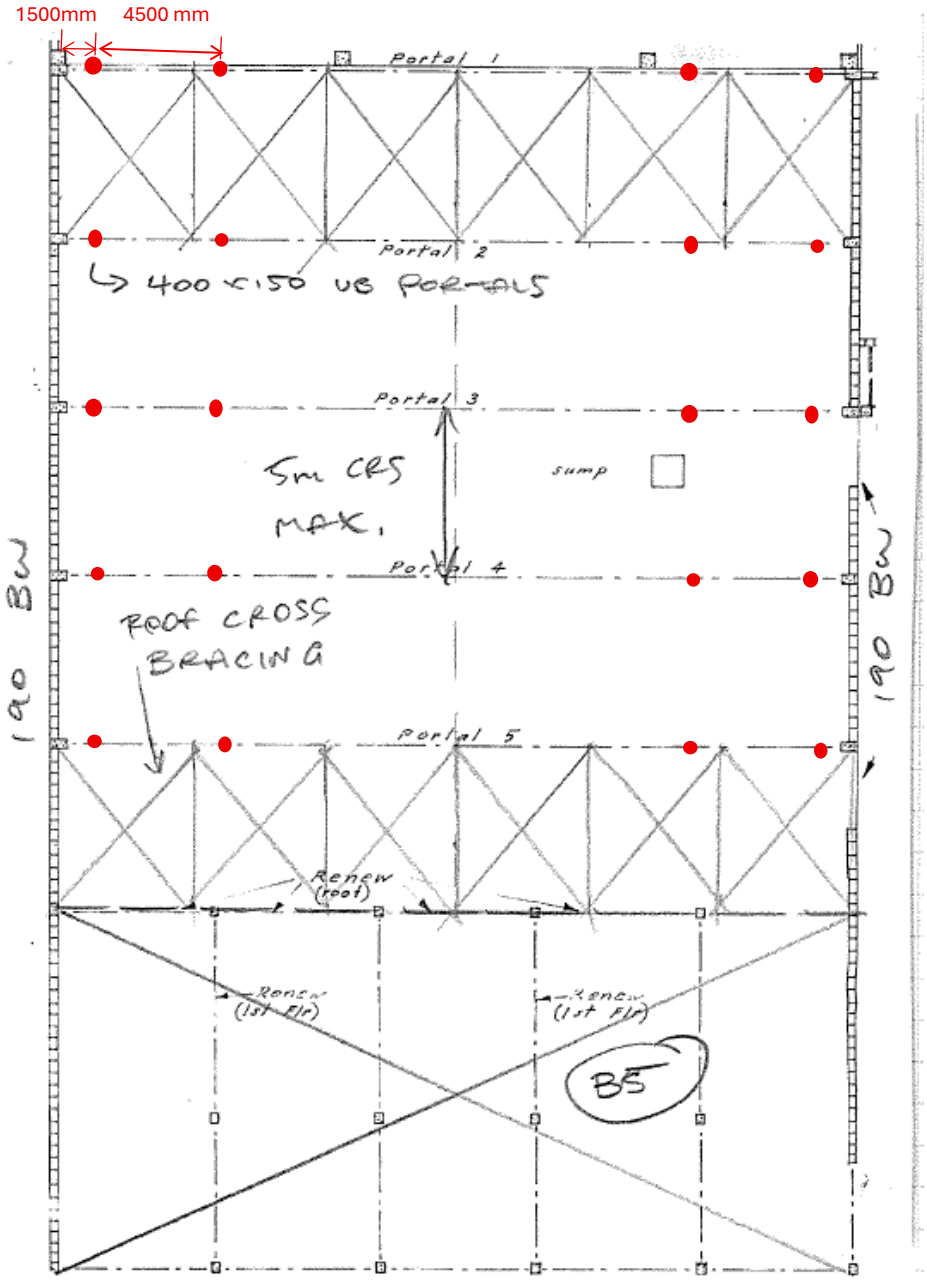

Fly brace locations

Roof plan showing the fly-brace locations



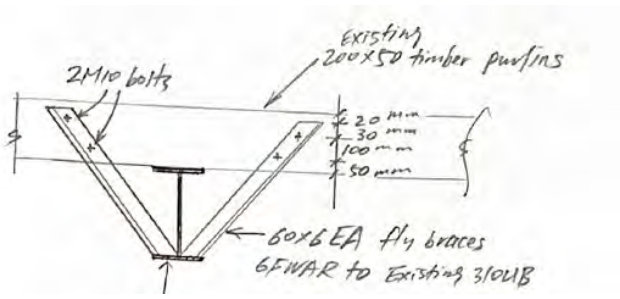

Fly-brace details

**Proposed roof strengthening plan of building #1 – 69 Waione Street**




Fly brace locations

Roof plan showing the fly-brace locations

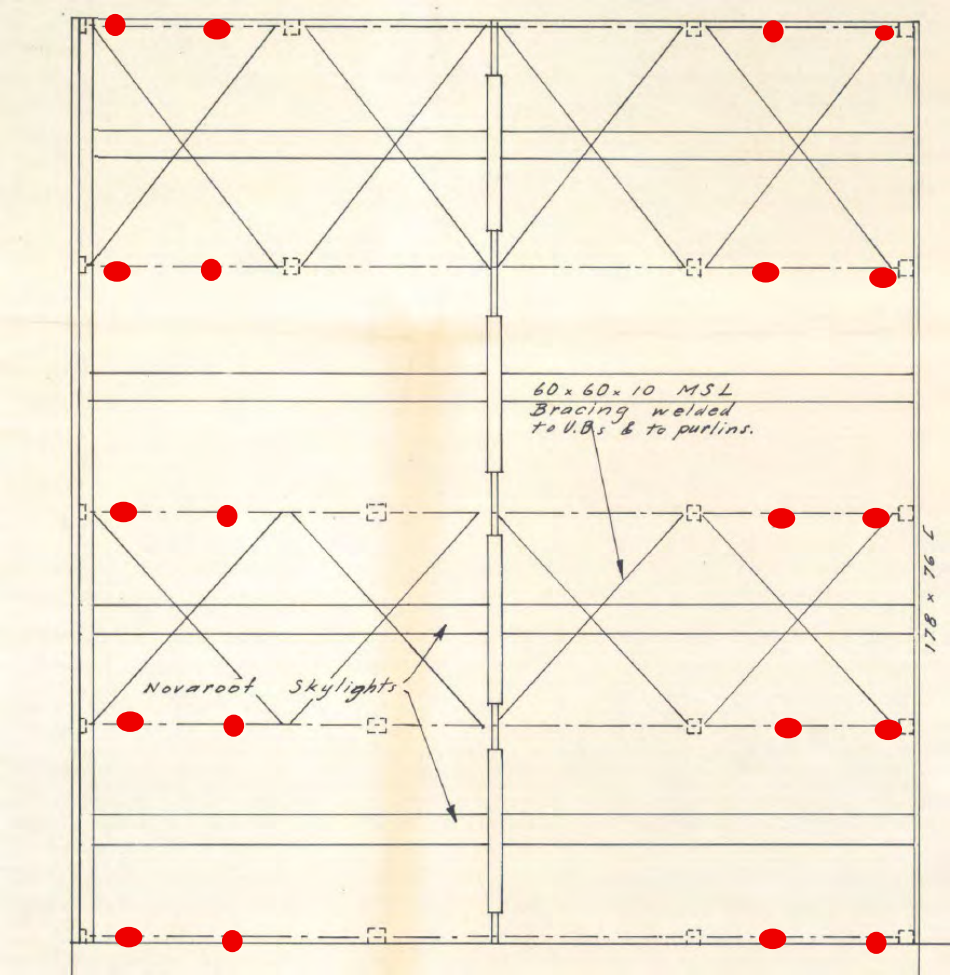



Fly-brace details

**Proposed roof strengthening plan of building #2 – 69 Waione Street**

**North**

West

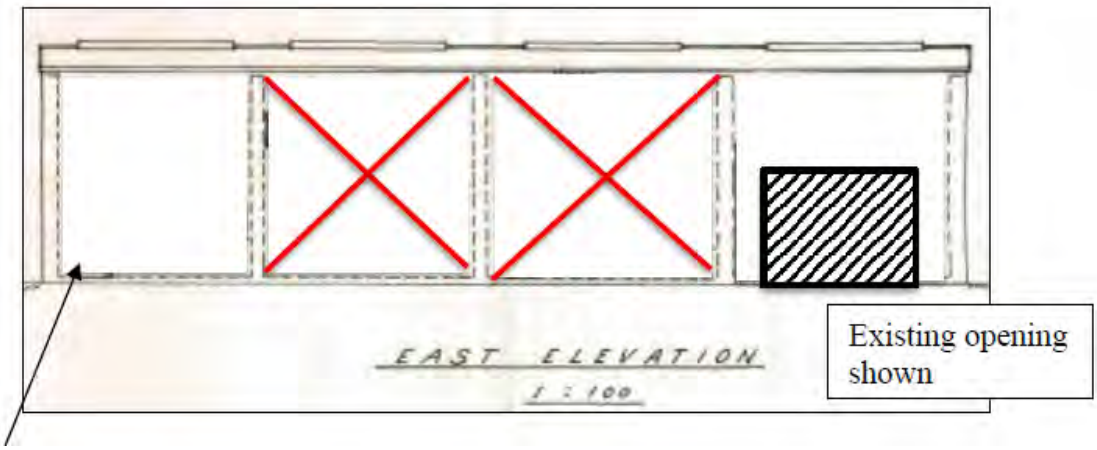



East

**Note: 1.5 from the knee joint and 6m from the knee joints**

Fly brace locations

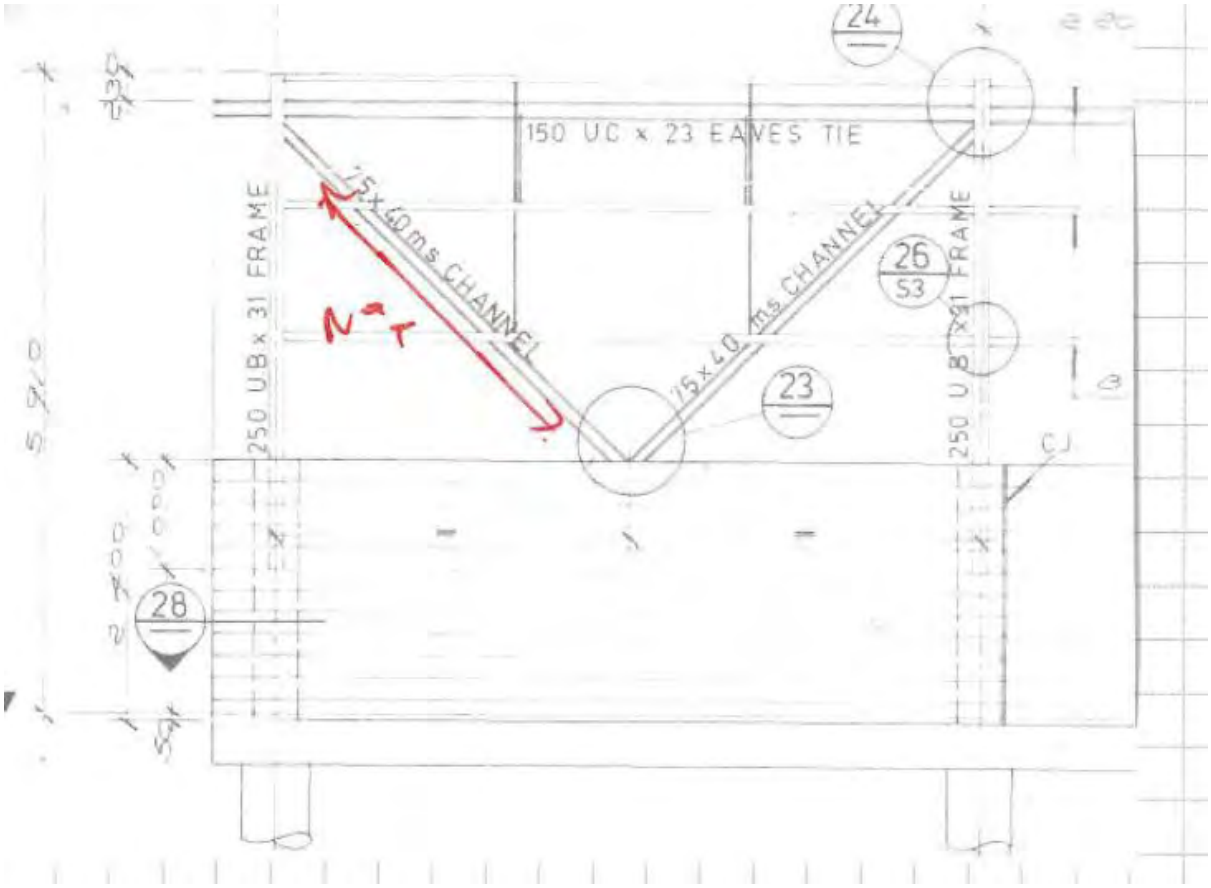
**Roof plan showing the proposed strengthening**



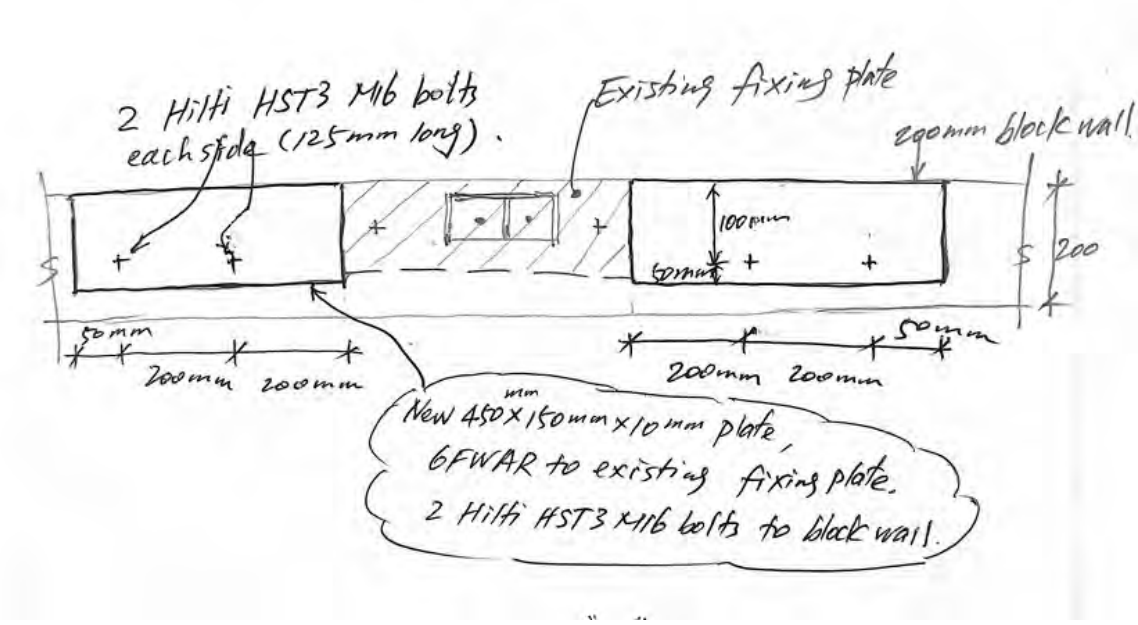

Braces are 60x60x10EA

**East wall elevation showing the proposed strengthening using cross braces**

**Proposed roof strengthening plan of building #3 – 69 Waione Street**



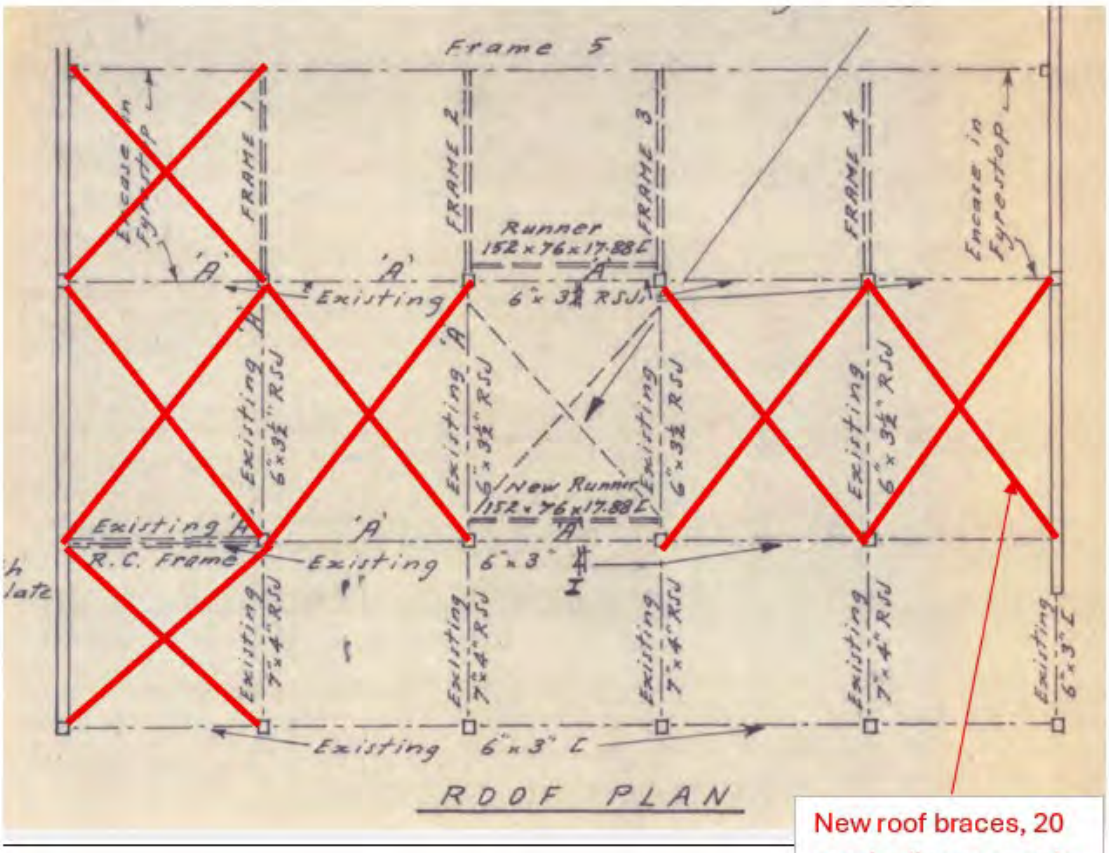

**Existing elevation showing the details from V braces to block wall (In totally, 4 sets)**




**Plan showing the proposed retrofit of the fixing details from V braces to block wall**

**Note: Add the missing fly-braces (Add one fly brace 1.5 meter from the knee on each side of the roof rafter)**

**Proposed retrofit for building #4 of 69 Waione Street**




New roof braces, 20 mm in diameter rods, as the existing roof braces for Building 5

**Building 5: Roof bracing strengthening**

**APPENDIX C**

Hawkins
69 Waione Street

**ESTIMATE OF COST TO STRENGTHEN BUILDINGS 1 TO 6**

| ITEM | Description | Size | Unit weight | Length | Weight | Rate | Unit Cost | Number | Cost |
|---|---|---|---|---|---|---|---|---|---|
| | | | kg/m | m | kg | $/kg | | | $ |
| | | | | | | | | | |
| 11 | Fly braces | 60 x 6 EA | 6 | 3 | 18 | 30 | $540 | 20 | $ 10,800.00 |
| 12 | | Equal Angle | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| | | | | | | | | | |
| 21 | Fly braces | 60 x 6 EA | 6 | 3 | 18 | 30 | $540 | 20 | $ 10,800.00 |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| | | | | | | | | | |
| 31 | Flybraces | 60 x 6 EA | 6 | 3 | 18 | 30 | $540 | 20 | $ 10,800.00 |
| 32 | Cross braces | 60 x 60 x 10 EA | 9 | 9 | 81 | 30 | $2,430 | 4 | $ 9,720.00 |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| | | | | | | | | | |
| 41 | Anchor to wall | 450 x 150 x10 p | 1 | 1 | 1 | 1 | $600 | 8 | $ 4,800.00 |
| 42 | Fixings | 2 Hilti | 1 | 1 | 1 | 50 | $200 | 16 | $ 3,200.00 |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| | | | | | | | | | |
| 51 | Rod bracing | 20mm dia | 4 | 10 | 40 | 30 | $1,200 | 12 | $ 14,400.00 |
| 52 | Make good ceiling | | | | | | | | $ 15,000.00 |
| 53 | Design fees analysis of 2 storey structure | | | 1 | 1 | 6,000.00 | 1 | 1 | $ 6,000.00 |
| 54 | | | | | | | | | |
| | TOTAL FOR STEELWORK | | | | | | | | $ 85,520.00 |
| | | | | | | | | | |
| 101 | Access scissor lift $3,000 x 6 buildings | | | | | | | | $ 18,000.00 |
| 102 | Other design fees | | | | | | | | $ 6,000.00 |
| 103 | Construction monitoring & PS4 | | | | | | | | $ 12,000.00 |
| 104 | Insurance | | | | | | | | $ 6,000.00 |
| 105 | Contingency | | | | | | | | $ 12,000.00 |
| | | | | | | | | | |
| | TOTAL | | | | | | | | $ 139,520.00 |
| | | | | | | | | | |

STEVEN YOUNG & ASSOCIATES LTD
Consulting Engineers

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2. Bayleys and the Vendor do not warrant the accuracy or completeness of the information and recommends that all recipients undertake their own due diligence, obtain their own reports to their satisfaction and seek independent advice prior to committing to purchaser.