

WELLINGTON CITY COUNCIL Building Permit Application

WORKS DEPARTMENT RECEIVED 28 NOV 1986

1

To The City Engineer

I, the undersigned hereby apply for permission to carry out the works described in the attached plans and specifications deposited herewith and in accordance with the bylaws of the Wellington City Council.

PAGES 1 & 2 TO BE COMPLETED BY THE APPLICANT

ADDRESS OF PROPOSED WORK

Address Street No. and Name 101-117 CUBA STREET

Suburb WELLINGTON

OWNER

Name THE TRUSTEES, WGTN WORKINGMEN'S CLUB

Address PO Box 6354

LEGAL DESCRIPTION (from property rates demand available)

Lot No. 1 D.P. No. 15298

BUILDER (if owner builder, tick)

Name of Company DIXON & MCKINLAY

Postal Address PO Box 40080 UPPER HUTT

Phone No. 289 789

Description of Proposed Work

New Building Conversion Addition Demolition Alteration Repile

Description of Use and Main Purpose of Building

ie Dwelling: Flats: Business: Other Building: CLUB PREMISES

ESTIMATED VALUE OF WORK

Building \$1,611,000

Mechanical Services \$20,000 less materials 8611095 balance

Drainage \$9000 - \$3000 = \$6000

Plumbing \$90000 - \$30000 = \$60000

Total \$1,730,000

Note Plan Examination Fee: A plan examination fee based on the total estimated value above is payable upon lodging this application. This will be forfeited if the building permit is not collected or is cancelled for any reason, but will be deducted from any fees paid upon collection.

TURN TO PAGE 2

FOR OFFICE USE

1-500 Sheet No. Q28 Drainage Plan No. 8170

Building District Te Aro

DETAILS OF PROPOSED BUILDING

Scope of Application

Complete project Partial project

(state nature of partial work)

Number of Dwelling Units Number of Occupants

AREA OF BUILDING NEW BUILDING

Area of Addition Ground Floor M2 205

1st Floor M2 205

If additions to existing building give area of new work here

Area of Adds 4th Floor M2 345

M2 1100

5th Floor M2

6th Floor M2

Total 13.05

APPLICANT (signed by person making application)

Name J. J. Blake P.P. Dixon & McKinlay

Address P.O. Box 400-80 UPPER HUTT

Contact Phone No's 289-705 Signed J. J. Blake

FOR OFFICE USE

DOCUMENTS ATTACHED AS PART OF THIS APPLICATION WHICH ARE APPLICABLE:

Drawings - two sets Specifications 2

Calculations Water Form Govt. Clearance

Bracing Schedule Drainage Plan Architects Signature

Parking Area

Application Received By: Signed

Plans Show: Elevations Sections Construction

Full Dimensional Site Plan

Contour Plans & longitudinal section through vehicle access from kerb

ACTION TAKEN ON ABOVE

SPECIAL LICENCES ETC. Refer to:

MISCELLANEOUS NOTES:

HISTORY SHEET

REFER TO APPROVED BY DATE

1. Water Supply

2. Town Planning

3. Plumbing & Drainage

4. Streetwork Design

5. Health Branch

6. Parks & Recreation

7. Structural

8. Other

REQUIREMENTS OF VARIOUS DEPARTMENTS

STRUCTURAL

SPECIAL FEES

Cellar Registration Fee

Reserves Contribution

Water Fee

Plan Examination Fee

DISTRICT BUILDING INSPECTOR

Excavation Retaining Disposal of Soil

Ground Conditions Fill Natural

Demolitions Hoardings Gantry

Encroachments approved Building Line Restrictions

Egress Refer to

Signed by District Inspector

Date

APPLICATION APPROVED

Signed

Date

PLUMBING AND DRAINAGE REQUIREMENTS

Sewer drainage to be refitted to suit new fittings refer addenda sheet.

Stormwater drainage to be refitted to suit new down pipes refer addenda sheet.

Plumbing as proposed refer addenda sheet. No pipe work to be concealed without approval of inspector.

WORKS, BY LICENSED CRAFTSMAN PLUMBER UNDER SEPARATE PERMIT.

DRAINAGE WORKS, BY LICENSED DRAINLAYER UNDER SEPARATE PERMIT.

ALL WORKS TO COMPLY WITH DRAINAGE AND PLUMBING REGULATION 1978 AND W.C.C. CONSOLIDATED BY-LAWS AND REQUIREMENTS.

BUILDING REQUIREMENTS

See Addenda Sheet

WELLINGTON CITY COUNCIL WORKS DEPT. COPY OF APPROVED PLAN To be retained on Works and Produced on Request of Building Inspectors Date 19-3-87 Building Supt. 005936 \$29662-50

1. **Introduction**
 2. **Methodology**
 3. **Results**
 4. **Discussion**
 5. **Conclusion**
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[illegible]

BUILDING PERMIT
(Office Copy)

**WELLINGTON CITY COUNCIL
WORKS DEPARTMENT**

No. D 005936

Date Issued 20 / 3 / 87

OWNER	
Name	<u>THE TRUSTEES, WGTN</u>
Mailing Address	<u>WORKING CLUB</u> <u>P. O BOX 6354</u> <u>WGTN</u>

BUILDER	
Name	<u>DIXON & MCKINLAY</u>
Mailing Address	<u>P.O BOX 40080</u> <u>UPPER HUTT</u>

PROPERTY ON WHICH BUILDING IS TO BE ERECTED/DEMOLISHED

SITE	
Street No.	<u>101 - 117</u>
Street Name	<u>CUBA ST</u>
Town/District	<u>CENTRAL</u>
Riding	

LEGAL DESCRIPTION	
Valuation Roll No.	
Lot	<u>1</u>
D.P.	<u>15298</u>
Section	
Block	
Survey District	

DESCRIPTION OF PROPOSED WORK AND MAIN PURPOSE OF USE

ADDITION & ALTERATION - CLUB PREMISES
- SEISMIC UPGRADE & EXTENSIONS

FLOOR AREA		DWELLING UNITS	
Whole Sq. Metres		Number Erected	
ESTIMATED VALUES			
	Building	<u>1631000</u>	
	Plumbing	<u>90000</u>	
	Drainage	<u>9000</u>	
	TOTAL	<u>1730000</u>	

NATURE OF PERMIT (TICK BOX)	
<input type="checkbox"/>	NEW BUILDING — exclude domestic garages and domestic outbuildings
<input type="checkbox"/>	FOUNDATIONS ONLY
<input checked="" type="checkbox"/>	ALTERED, REPAIRED, EXTENDED, CONVERTED, RESITED — include installation of heating appliances
<input type="checkbox"/>	NEW CONSTRUCTION OTHER THAN BUILDINGS — include demolitions
<input type="checkbox"/>	DOMESTIC GARAGES AND DOMESTIC OUTBUILDINGS

FEES APPLICABLE				FEES APPLICABLE			
		\$	c			\$	c
294-902	Water Fee	337	50	263-939	Sewer Connections	120	
065-955	Inspection of Work/Documents	7115		263-939	Stormwater Connections	120	
061-902	Plumbing Permit Fee	9750		263-941	Manhole/LH CE Raise/Lower		
061-902	Drainage Permit Fee	975		Dep. No.	Demolition Deposit Rd/Path		
704-902	Building Research Levy	1730		263-940	Sewer Disconnections		
745-909	Reserves Contribution	9515		263-940	Stormwater Disconnections		
Dep No.	Access Guarantee Deposit	-		294-940	Water Disconnections		
Dep No.	Footpath Damage Deposit	-			Exc. GST	26965.91	
225-971	L.D. Crossing & Conc. Cutting	-			GST =	2696.59	
225-971	Stormwater Alteration	-			TOTAL INC GST	29662.50	
225-970	H.D. Crossing	-		Received From	<u>Builder</u>		
225-972	Builders Road Fee			Address			
225-972	Drainlayers Footpath Fee			Machine Receipt No.	<u>C03 69551</u>	Date	<u>20.3.87</u>
225-972	Drainlayers Road Fee			The above fees are payable in addition to the plan examination fee of \$785 - already paid. Refer receipt.	<u>103 42627</u>	Date	<u>19.11.86</u>
Dep. No.	Drainlayers Deposit Road/Path						

NOTICE TO APPLICANT

PERMISSION IS HEREBY GRANTED YOU, subject to conditions endorsed hereon, to carry out the work as proposed in your application, and in accordance with the Plans, Specifications, and other documents submitted to me. Such work is to be subject, at any time during progress, to my inspection, and to be carried out in strict compliance with all the requirements of the By-Laws of the City of Wellington, and with the attached "General Requirements for the Control of Building Construction Projects Affecting City Streets and Footpaths" and "General Requirements for Vehicular Access Construction".

NOTE THIS PERMIT IS VALID ONLY WHEN PAYMENT OF THE ABOVE FEES HAS BEEN MADE TO THE COUNCIL.

FOR CITY ENGINEER	
<u>[Signature]</u>	
DATE <u>20.3.87</u>	

1. Introduction

2. Methodology

2.1. Data Collection

2.2. Data Analysis

3. Results

3.1. Descriptive Statistics

3.2. Inferential Statistics

4. Discussion

4.1. Limitations

4.2. Future Research

4.3. Conclusion

5. References

6. Appendix

7. Acknowledgments

8. Bibliography

WORKS DEPARTMENT
CHECKING & COMMENTS FORM
 Structural Branch to Building Branch

Code

3

8979

CE R695

NATURE OF WORK <i>Stage 2 Extension to Club Rooms</i>		Dates when Plans Deposited	1 <i>20-11-86</i> 2 3
NAME OF OWNER <i>Hellington W.M.C. & L.I.</i>		Dates received Structural Office	1 <i>25-11-86</i> 2 3
ADDRESS OF NEW WORK <i>111-117 Cuba St</i>		Date Calculations Received in Structural Office	1 <i>25-11-86</i> 2 3
CONSULTING ENGINEER <i>B.M.R.S. (Site) Smith, Leuchars Ltd</i>		Date of Inspection Time	A.M. P.M. <i>25-11</i>
ARCHITECT <i>Keith Wilson</i>		Dates Returned to Building Branch	1 <i>25-11</i> 2 3
BUILDER		Date Letter Sent File	1 2
PROPOSAL	REFERRED BACK ACCEPTED	Signature <i>[Signature]</i>	Date <i>25-11</i>

ACCEPTANCE SUBJECT TO FOLLOWING CONDITIONS:-

Engineer to supervise.
Soils engineer to be consulted on results of site investigation.

Note: Where new foundations are involved the building inspector is to be given 24 hours notice before concrete is placed.



6/2087 PR:MD

Building Branch
Works Department
WELLINGTON CITY COUNCIL

26 February 1987

A D D E N D A S H E E T

WELLINGTON WORKING MENS CLUB (STAGE 2)
SEISMIC UPGRADING AND EXTENSIONS
101 - 117 CUBA STREET, TE ARO
WELLINGTON

1. Prior to excavation for foundations etc being commenced, the validity of the site boundaries is to be established to the satisfaction of the City Engineer in writing by notification from a Registered Surveyor that the site boundaries have been accurately defined by the correct placing of required pegs with offset reference marks where necessary.
2. The Contractor shall, before any reinforcing steel is placed, or concrete poured, satisfy the City Engineer that the building is correctly set out and adequate notice must be given to the Building Inspector concerned to enable the setting out to be checked to ensure no encroachment on Council or other adjoining properties.
3. The Contractor shall ensure that the official stamped copy of the plans and specifications as approved for permit purposes by the Wellington City Council are available on the site at all times during the period of the contract and that no deviation from the approved documents will be permitted until revised drawings and/or specifications have been submitted to and approved by the Building Branch, Works Department.
4. Should excavations be taken below the foundations of adjoining properties or retaining walls, the proposed method of shoring or underpinning these walls is to be to the approval of the engineering advisers to the affected parties.
Copies of letters of approval for this work are to be lodged with this department prior to work commencing.
5. The Contractor is responsible for the location and protection of any services within the affected area or on Road Reserve and is to notify the respective Authority including the Municipal Electricity Department, the Transport Department, Waterworks and Drainage Branches, Post Office and Wellington Gas Company of any services that may be affected at least 7 days prior to the commencement of the work, to enable the necessary disconnecting to be carried out.
6. The emergency lighting system is to be extended to cover all newly formed areas including exterior fire escapes to NZS 6742.
7. Exit and directional signs are to be illuminated by both mains and emergency power supplies.

Note - letters are not to be less than 100mm in height.





1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.
2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the team.
3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete each task.
4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress regularly to ensure that the project is on track.
5. The final step is to evaluate the results of the project. This involves comparing the actual outcomes with the objectives and goals to determine the effectiveness of the project and identify areas for improvement.

8. The existing fire alarm system is to be extended to give complete coverage to NZS 4561 and the thermal detection system is to be amended accordingly(including the shops to ground floor).
9. Fire hose reels are to cover all floor areas.
Maximum permitted length of 12mm diameter hose is 25 metres.
10. Ducts, vents and false ceilings are to meet the provisions of NZS 1900 chapter 5 clause 5.23.
11. The surface finish of walls and ceilings early fire indices to where public have access is to be as follows:

EXITWAYS	Spread of flame index	0
	Smoke developed index	3
ALL OTHER	Spread of flame index	2
	Smoke developed index	5
DRAPEES	Exitways index	6
	All other index	12

Any drapes or curtains are to be either made from non-combustible material or to be suit ably treated with an approved fire retardent solution. A certificate of this undertaking will be required.

12. Floors and floor coverings are to comply with the requirements of NZSS 1900, chapter 5, clause 5.68.
13. Access and facilities for the disabled are required and are to be provided to the satisfaction of this Department in conformity with the Code of Practice NZS 4121.
14. Plumbing and Drainage Requirements:

Stormwater Drainage

- (a) Surcharge via yard sump on drainage plans interception requir ed.

Sewer Drainage

- (b) Surcharge via gully traps interception required.

Plumbing

- (c) Main combined waste from urinals on first floor to be carried up as 80mm not 40mm as detailed on plan.
- (d) All floor wastes to discharge to approved positions not into soil pipes as detailed on plans.
- (e) All lobbies and sanitary rooms to be ventilated as required by Plumbing and Drainage Regulations 1978, Regulations 39 & 40.
- (f) 50mm floor drain from tank room to be trapped and discharged via open channel to a sewer gully trap.

19/3/87 Manager WWHL
df/b

1. What is the purpose of the study?

2. What are the research objectives?

3. What is the scope of the study?

4. What is the significance of the study?

5. What is the methodology used?

6. What are the results of the study?

7. What are the conclusions of the study?

8. What are the limitations of the study?

9. What are the implications of the study?

10. What are the future research directions?

11. What is the conclusion of the study?

12. What is the conclusion of the study?

13. What is the conclusion of the study?

14. What is the conclusion of the study?

15. What is the conclusion of the study?

16. What is the conclusion of the study?

17. What is the conclusion of the study?

18. What is the conclusion of the study?

19. What is the conclusion of the study?

20. What is the conclusion of the study?

Plumbing (continued)

- (g) All sanitary fittings to be vented as required in Plumbing and Drainage Regulations 1978.
- (h) Water storage tank overflows to be fitted with W.C.C. approved visual or audible alarm system.
- (i) No pipe works to be concealed without approval of the Inspector.
- (j) 24 hours notice required for all inspections.
- (k) In addition to all the items, anything contrary to the Drainage and Plumbing Regulations 1978 and amendments and W.C.C. Consolidated Bylaws shall be amended to comply.
- (l) Water supply to urinals to be controlled through approved water saving devices.
- (m) All hot water cylinders installed to manufacturers code of practice and W.C.C. requirements.

ALL WORKS TO COMPLY WITH DRAINAGE AND PLUMBING REGULATIONS 1978 AND W.C.C. CONSOLIDATED BYLAWS AND REQUIREMENTS.

15. Structural Requirements:

- (a) Engineer to supervise.
- (b) Soils engineer to be consulted on results of site investigation.

CONTRACTORS FULL NAME:

Dixon & McLennan

UPLIFTED BY:

A. J. Blake

DATE:

19-3-87

QUESTION

- 1. The following are the main components of the business system:
 - a. **Business System** - The overall system of business operations.
 - b. **Business Process** - The sequence of steps involved in the business.
 - c. **Business Model** - The way the business operates and generates revenue.
 - d. **Business Strategy** - The plan of action for the business.
 - e. **Business Plan** - The document that outlines the business's goals and objectives.
 - f. **Business Structure** - The way the business is organized.
 - g. **Business Culture** - The values and beliefs that guide the business.
 - h. **Business Environment** - The external factors that affect the business.
 - i. **Business Resources** - The assets and capabilities that the business uses.
 - j. **Business Performance** - The results of the business's operations.

ANSWER

- 1. The following are the main components of the business system:
 - a. **Business System** - The overall system of business operations.
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QUESTION

ANSWER

QUESTION

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- i. **Business Resources** - The assets and capabilities that the business uses.
- j. **Business Performance** - The results of the business's operations.

Dear Sirs

Expiry date:/...../19~~87~~⁸⁷

**The Economic Stabilisation (Building Registration and Construction)
Regulations 1974**

Registration
number

8	6	1	1	0	9	5
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Pursuant to these regulations the issue of a building permit has been considered and is authorised immediately/~~deferred~~
to allow construction to commence in^{2nd}.....(month) ¹⁹⁸⁶.....(year). If the building permit is not
uplifted by the expiry date or construction is abandoned, this certificate shall lapse. Please quote registration number
when making inquiries.

Yours faithfully,

①5936


~~P.A. Williamson~~
Building Projects Authority

P.W. 753A (Rev. 11/74)
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WELLINGTON CITY COUNCIL

BUILDING BRANCH

WORKS DEPARTMENT

CITY ENGINEER N. FYFE

Municipal Office Building, 5 Mercer Street, P.O. Box 2199, Wellington 1, New Zealand

Reply to City Engineer

Attention:

Mr P. Robinson

Telephone: 724-599

Extension: 601

Please Quote:

6/2087 PR:MD

Keith Wilson Architects,
P.O. Box 12-321,
Wellington North.

Attention Mr J. Mills

Dear Sir,

WELLINGTON WORKINGMENS CLUB
101-117 CUBA STREET, TE ARO

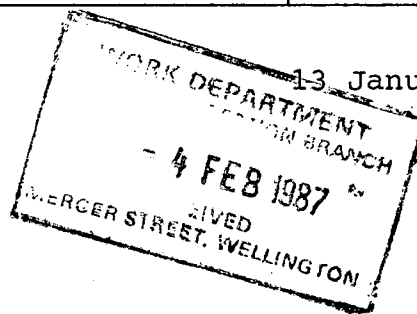
With reference to the aforementioned premises and previous discussions with the District Building Inspector, Mr P. Robinson, I wish to confirm that the following requirements will be necessary to satisfy the provisions of NZS 4121:

- (a) A complying lift serving all new floor areas is required.
- (b) Stair 2 is to be fully complying to second floor level and stair 1 from second floor level to level 4.
- (c) Ramped access is to be provided to the first floor level main bar area b.
- (d) Ramped gradients throughout the building are not to exceed 1:12.
- (e) Rifle range and ten pin bowling facilities must be made possible to the wheelchair bound.
- (f) All fittings and fixtures are to be of an approved height and type.

To expedite permit approval for this staged proposal, items a, b and c must be amended to comply and forwarded to this Department at your earliest convenience.

Yours faithfully,

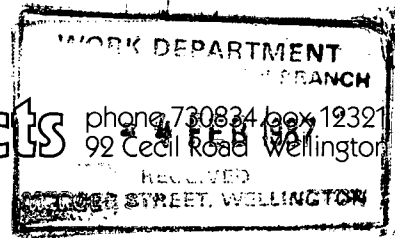
BUILDING SUPERINTENDENT
for CITY ENGINEER



13 January 1987

Gratiana Whitefield

keith wilson architects



2. Feb 87

Mr G. Whitfield
W.C.C. Box 2199
Wgtn

Sir

Wellington Workingmen's Club.

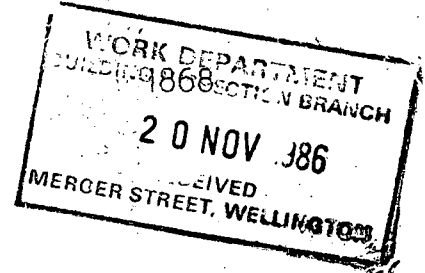
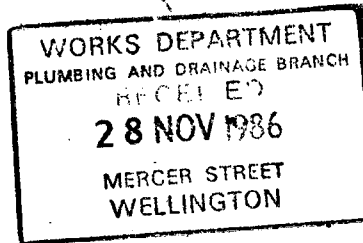
I enclose copies of Phil Robinson's
and the Department of Social
Welfare's letter with regard
compliance with NZS 4121, as
requested.

Please contact the writer if you
require any further information.

Yours faithfully

Keith Wil





CONDITIONS OF CONTRACT AND SPECIFICATION
OF THE
WORKS TO BE EXECUTED AND MATERIALS TO BE USED
IN THE
STAGE II STRENGTHENING AND EXTENSIONS
OF THE SOUTH BUILDING
AT
WELLINGTON WORKINGMEN'S CLUB & LITERARY INSTITUTE
CUBA STREET
WELLINGTON
FOR
THE TRUSTEES

ENGINEER

Smith Leuchars Ltd
P.O. Box 27-349
212 Willis Street
WELLINGTON

QUANTITY SURVEYOR

Knapman Clark & Company
P.O. Box 358
WELLINGTON

ARCHITECT

Keith Wilson Architects
P.O. BOX 12-341
WELLINGTON

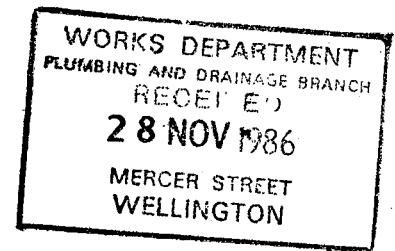
October 1986

CUBA ST
5936



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Special Conditions

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B Piling

C Concrete & Reinforcement

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E Structural Steel

ARCHITECTURAL & SERVICES TRADES



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CONDITIONS OF CONTRACT

GENERAL CONDITIONS

Except where modified by the Special Conditions, the Contract shall be governed by the document entitled:

"CONDITIONS OF CONTACT FOR BUILDING AND CIVIL
ENGINEERING CONSTRUCTIONS, NZS 623"

including all current additions and alterations to that document..

The Contractor shall familiarise himself with all the provisions of this document which shall form part of the Contract.

SPECIAL CONDITIONS

General Instructions

Definitions

The Principal is:

THE TRUSTEES
WELLINGTON WORKINGMEN'S CLUB & LITERARY INSTITUTE
WELLINGTON

The term Builder, Contractor or General Contractor is to be taken as referring to the party contracting for the complete works as set out in the specification, and the words "Building Contract, General Contract or Contract" shall mean the contract to be let to the Contractor.

Subcontractor and approved firm refers to parties providing labour and/or materials, and employed by the Contractor. Approved firms are those firms approved or selected by the Engineer. Wherever the term "approved" or "selected" is used in this specification, the Engineer or his authorised agent shall be the sole judge and shall determine what is, and what is not, approved or selected.

The word "Engineer" shall mean Smith Leuchars Limited, P.O. Box 27-349, Wellington.

The word "Quantity Surveyor" shall mean Knapman Clark & Company, P.O. Box 358, Wellington.

The word "Architect" shall mean Keith Wilson Architects, P.O. Box 12-341, Wellington.

Where the terms "provide" or "fix" are used each shall be interpreted as meaning "provide and fix" unless otherwise indicated.

No expression of the Engineer's reasonable satisfaction shall be deemed to be acceptance of defective materials or workmanship within the terms of the Contract or an authority for any variation except where such variation is authorised as provided in the contract, nor shall it relieve the Contractor from his responsibility to properly co-ordinate all sections of the works and to fulfill the contract requirements and complete the works to the satisfaction of the Engineer.

EXTENT OF WORK

The work included in this contract includes but is not necessarily restricted to the following:-

- a) Demolition of rear buildings & other sundry demolition as required.
- b) The construction of a new 6-storey building at the rear.
- c) Strengthening & upgrading of the existing south building.
- d) New 2-storey extensions over the north building.
- e) Fittings & finishes to the above.

TIME

The time for completion shall be nominated by the contractor.

1. Time Schedules & Programming of Work

It is essential that the construction work be programmed so that a minimal disruption and loss of facilities is imposed on the club and its tenants. A broad outline of the club's wishes is shown on the sequence programme included in the Temporary Works section of the Specification.

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 3, 1862. It is a very important document, as it contains the President's views on the state of the Union and the progress of the war.

2. The second part of the document is a report from the Secretary of the War Department, dated January 10, 1862. It contains a detailed account of the military operations of the Army during the year 1861.

3. The third part of the document is a report from the Secretary of the Navy, dated January 10, 1862. It contains a detailed account of the naval operations of the Navy during the year 1861.

4. The fourth part of the document is a report from the Secretary of the Interior, dated January 10, 1862. It contains a detailed account of the operations of the Department during the year 1861. It also contains a list of the lands that have been surveyed and a list of the lands that have been reserved for the use of the Government.

5. The fifth part of the document is a report from the Secretary of the Treasury, dated January 10, 1862. It contains a detailed account of the operations of the Department during the year 1861.

6. The sixth part of the document is a report from the Secretary of the War Department, dated January 10, 1862. It contains a detailed account of the military operations of the Army during the year 1861.

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The Construction Programme shall be finalised in accordance with the club's requirements.

Two copies of the finally agreed programme and of all subsequent programmes shall be supplied to the Engineer and the Contractor shall keep a copy up to date in his site office for the duration of the Contract.

The Contractor shall be held to the programme in accordance with the Conditions of Contract and shall execute the works generally in accordance with the programme, subject only to approved extensions of time as below.

2. Extension of Time

In order to ascertain the time provided by the Contract there shall be added to the period actually stipulated for completion a reasonable extension of time in all cases where the completion of the works shall be delayed or suspended:-

- a) By reason of any combination of workmen, strike or lockout actually delaying the works.
- b) By reason of destruction to the works or to any part thereof by fire, earthquake or other inevitable accident beyond the control of the Contractor.
- c) By reason of the Engineer ordering variations to the works. Provided that if when a variation is ordered the time is agreed upon, such time shall constitute the extra. Where no additional time is claimed at the time a variation is ordered, no extension of time shall be permitted by way of the variation. In all cases the time extension in respect of any variation shall be the length of time agreed, irrespective of the actual completion date of the work involved.
- d) By failure of the Engineer to supply the Contractor with such details or instruction in connection with the work as shall be reasonably necessary and shall have been applied for in writing by the Contractor.

In addition to the foregoing provisions for the extension of time the Engineer may at any time by writing give to the Contractor such extension of time as he may in his absolute discretion think the circumstances of the case require; the Contractor shall nevertheless use his best endeavour to prevent delay and shall do all that may reasonably be require to expedite the works.

If any delays are incurred through extra work or other causes, the extended times are to be agreed to in writing by the Engineer and such added to the Contract time for completing and handing over the works. Claims due to extra work shall not be accepted unless previously instructed by the Engineer in writing and shall be submitted before such extra work is commenced and advice of delays through other causes shall be submitted immediately such causes of delay are known.

No extensions of time shall be made because of inclement weather.

CONTRACT DOCUMENTS

The Contract Documents shall mean the following:

- a) the Conditions of Contract NZS 623: 1984;
- b) the Specification;
- c) the Contract Drawings;
- d) the Schedule of Quantities;
- e) the Contractor's Tender;
- f) the Letter of Acceptance.

A reference to a standard, a specification or a code of practice in the Contract Documents shall, unless the Contract, otherwise requires, be deemed to be a reference to the edition of that document which was current at the date of closing of tenders.

1. The first step in the process of creating a business plan is to conduct a market research. This involves gathering information about the industry, the target market, and the competition. The next step is to develop a marketing strategy, which includes determining the target market, the marketing mix, and the promotional activities. The third step is to develop a financial plan, which includes determining the start-up costs, the operating costs, and the revenue projections. The final step is to write the business plan, which is a document that outlines the business's goals, strategies, and financial projections.

2. The purpose of a business plan is to provide a clear and concise overview of the business's goals, strategies, and financial projections. It is a document that is used to attract investors, secure financing, and guide the business's operations. A business plan also serves as a tool for monitoring the business's progress and making adjustments as needed.

3. The business plan should be updated regularly to reflect changes in the market, the business's operations, and the financial projections. It is a living document that should be revised as the business grows and evolves. The business plan should also be used as a tool for communication, as it provides a clear and concise overview of the business's goals, strategies, and financial projections. It is a document that is used to attract investors, secure financing, and guide the business's operations.

4. The business plan should be written in a clear and concise manner, using simple language and avoiding jargon. It should be easy to read and understand, and it should provide a clear and concise overview of the business's goals, strategies, and financial projections.

5. The business plan should be written in a professional and polished manner, using a standard business format. It should be easy to read and understand, and it should provide a clear and concise overview of the business's goals, strategies, and financial projections.

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NATURE OF CONTRACT

The Contract is a Lump Sum contract based on this specification, the drawings, the schedule of quantities for preliminaries and the schedule of Provisional Sums for all trades.

SITE

The site is situated at Cuba Street, Wellington.

The Contractor shall check the conditions at the site and shall lodge any objection or complaint of such condition with the Engineer within two weeks of possession of the site.

SCHEDULE OF QUANTITIES

The Schedule of Quantities have been prepared generally in accordance with NZS 4202: 1975.

Trade Schedules will be issued for pricing as they are completed.

SUBCONTRACTORS

Trades to be sub-contracted are to be let by tender to a minimum of 3 subcontractors.

Tenders are to be opened in the presence of the Engineer.

Subcontractors who are members of the club are to be given the opportunity to price for work. A list of such subcontractors will be given to the Contractor, who has the right to object to any or all subcontractors putting their name forward.

The Contractor shall ensure that any sub-letting of the work shall be by way of written subcontract, incorporating the provisions of NZS 623 and relevant portions of these Contract Documents.

Before the Contractor places any order to commence any work specified herein to be of "approved material" or "done by an approved firm" he shall obtain the written consent and authority from the Engineer to do so.

Subcontractors employed for any section of the works will be required to conform strictly to the general requirements and discipline of the job as imposed on the Contractor. They will be required to commence their work and to deliver their material and equipment at such times as to suit the Contractor's programme.

Each subcontractor shall keep a competent foreman upon the subcontract works during such time as the said works are in progress.

INSURANCE

1. The Employer shall be responsible to insure the existing structure and the Works against all risks, fire, earthquake damage, etc. The Employer shall make the necessary arrangements with his Insurers to endorse the current insurance policy to include the full value of the Works and take out "Contract Works" insurance policy covering the existing structure as well as the "Works". Such policies shall cover the respective rights and interests of the Employer and the Contractor. Such policy shall cover All Risks including those incurred during the construction period.

Note:

There shall be a minimum value for claims under this insurance cover. Any claims less than \$1,000.00 shall be carried by the Contractor. Likewise \$1,000.00 shall be deducted from any claims in excess of that amount.

2. The Contractor shall take out Public Liability Insurance for an amount of not less than \$1,000,000 in respect of any one claim, unlimited as to the number of claims, extended so that the risks of fire and explosion, damage to property and land by removal of support or by vibration and liability for property damage shall not be exceptions to the liability.
3. The Contractor shall carry his own insurance in respect of plant and equipment owned or hired by the Contractor or his subcontractors where these are related to the Works.

Should the Contractor agree to any exclusions or excesses to the risks covered by the above policies, the Contractor shall indemnify the Principal against any claims arising. The insurances required by this clause shall not relieve the Contractor from any liability or obligation for which he would otherwise be responsible under this contract or by law.

The Contractor shall not enter into the site with plant or commence any work until the Public Liability Insurance has been effected. The cost of complying with the insurance requirements of the contract shall be included in the Contract Price. The costs of any additional premiums necessitated by extensions of time awarded by the Engineer shall be added to the Contract Price.

GUARANTEES

When guarantees are called for, the Contractor shall obtain a written guarantee from the firm supplying materials or doing the work and shall deliver these to the Engineer on completion of the work.

The guarantee shall state that workmanship, materials and installation are guaranteed for a period as specified from the date of issue of the Maintenance Certificate and that any defects that may arise during that period shall be made good and any such work in other trades resulting from such making good shall be done at the expense of the Guarantor, upon written notice from the Engineer to do so.

A guarantee will not be enforced if the work is damaged by structural defects in the works in which case the responsibility for replacement will rest entirely with the Contractor.

The Engineer shall be the sole judge of what cause is responsible for defects in the work and this ruling shall be final and binding.

PAYMENT

1. General

Within 15 working days of being awarded the Contract the Contractor shall submit to the Engineer a schedule of estimated amounts of Progress Payments, and estimated dated dates on which such payments will be claimed. No request for such payment will be considered until this instruction has been carried out.

Payments will be made in accordance with Clause 17 of the General Conditions of Contract NZS 623 on progress certificates in amounts at the Engineer's discretion. The Contractor shall set out each Statement of Claim for such payment in detail as required by the Engineer for his checking before issue of a Certificate of Payment.

If the Contractor shall fail to comply with any condition or requirements on the Contract the Engineer may withhold the issue of a Certificate of Payment or reduce the amount thereon until the Contractor shall have complied with such condition or requirement to the Engineer's satisfaction. This shall include the submission of an approved critical path programme in accordance with clause Time Schedules and Programming of Work.

Materials

Payment for materials will normally be made only on the value of materials actually delivered to the site but payment may be allowed for materials or items specifically programmed and approved which are purchased for the Contract but are not stored on the site providing that the following conditions are met in respect of these materials:-

- a) the Statement of Claim separately designates such materials, with values, for which payment is sought;
- b) the Contractor shall provide evidence that he has paid for such materials;
- c) the materials are stored in a location and under conditions approved by the Engineer, are readily identifiable and are sorted in a manner ensuring that same will not be used for any purpose other than fulfilling said Contract;
- d) access to these materials, for the purposes of inspection, shall be available to the Principal or the Engineer or the accredited representative of either, at any time by arrangement and the Contractor shall allow all reasonable facilities to permit such an inspection;
- e) the materials are adequately insured.

■ _____

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In consideration of the payment by the Principal herein provided no extra cost will be considered in respect of expense incurred by the Contractor for storage, insurance, handling, transport or any other costs involved in meeting these conditions.

2. Variation Procedures

In accordance with NZS 623 clause 13.2 all variations are to be confirmed by an order in writing from the Engineer. The normal procedure to be adopted for the documenting of alterations shall be as follows:-

- a) a written "Site Instruction" will be prepared by the Engineer for the Contractor, describing the variation requested. In the event of adjustments to the schedule being required following measurement, step (a) may be omitted;
- b) a "Variation Price Request" will then be prepared by the Engineer and supplied for the Contractor to price and submit to the Engineer for approval;
- c) following approval of the variation price the Engineer will issue a "Variation Order" authorising the work to be carried out.

RETENTIONS

Retention will be at the rate of 10% of the value of the work certified by the Engineer as having been carried out. This retention shall include the amount retained in accordance with the Wages Protection and Contractors' Liens Act.

The provisions of Clause 17.4 of NZS 623 shall not apply to this Contract. Retention money in excess of that required to be held under the Wages Protection and Liens Act will become due thirty-one days after the Engineer has issued a Certificate of Substantial Completion. The remaining retention money shall become due thirty-one days after the Engineer has issued a Maintenance Certificate. Payments of the retention money shall be limited so that the amount held by the Principal always complies with the provisions of the Wages Protection and Contractors' Liens Act, 1939.

1. The first part of the paper discusses the importance of the research and the objectives of the study. It also provides a brief overview of the methodology used in the study.

2. Literature Review

The literature review section provides a comprehensive overview of the existing research on the topic. It identifies the key findings and gaps in the literature, and discusses the theoretical framework that guides the study.

The first sub-section discusses the importance of the research and the objectives of the study. It also provides a brief overview of the methodology used in the study.

The second sub-section discusses the importance of the research and the objectives of the study. It also provides a brief overview of the methodology used in the study.

The third sub-section discusses the importance of the research and the objectives of the study. It also provides a brief overview of the methodology used in the study.

3. Methodology

The methodology section describes the research design and the data collection methods used in the study. It also discusses the statistical analysis techniques used to analyze the data.

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No advances will be made against the value of any item of Contractor's plant or equipment.

MAINTENANCE

Except as otherwise mentioned in this clause maintain the works included in this Contract including preventative maintenance as required by this specification for a period of 90 days (180 days for Plumbing and Drainage, Ventilation and Electrical Works) from the date of completion in accordance with Parts 12 and 17 of the General Conditions of Contract. If any defects requiring attention under these Clauses are of such a nature as to endanger or prevent the operation of any plant, the Contractor on advice from the Principal or his agents, shall arrange for such work to be carried out immediately. If the Contractor is unable to arrange for such work to be carried out immediately, the Principal shall have the right to have defects rectified by others at the Contractor's risk and expense.

COMPLETION

1. Maintenance Certificate

Before the issue of a Maintenance Certificate in accordance with Part 17 of the General Conditions of Contract, NZS 623, The Contractor shall lodge with the Engineer:-

- a) all guarantees specified;
- b) a statement that he will not make any further claims for variations or otherwise in respect of the contract;
- c) certificates of approval from all Authorities issuing such approval and having jurisdiction of the Works;
- d) Contractor's Completion Certificate as noted in Clause below.

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2. The second part is a list of the names of the members of the committee.

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24. The twenty-fourth part is a list of the names of the members of the committee.

2. Contractor's Certificate

The Contractor's Certificate shall include the following information:-

- a) a statement certifying that he has completed the work in full accordance with the Contract requirements;
- b) a statement that he has notified all sub-contractors, suppliers and others having the right to claim under the Wages Protection and Contractors' Liens Act, 1939, that he intends to give such notice;
- c) a statement that the Works have been checked and that to the best of his knowledge and belief they qualify for completion as defined.

COST FLUCTUATIONS

The provisions of Appendix A to NZS 623 shall apply to this Contract, except that the allowance in Clause A22.01.2 shall be 18%.

PERMITS AND FEES

Please refer to Clause 8.18 of the General Conditions of Contract.

1. Introduction

2. Background and Context

3. Methodology

4. Results and Discussion

5. Conclusion

6. References

7. Appendix

8. Index

9. Table of Contents

PRELIMINARY AND GENERAL

1. Site Access and Availability

Refer to Site Plan.

The Contractor is to co-operate with the Principal at all times regarding access to the site.

Access to the site is available from the Right of Way off Leeds Street.

2. Management and Staff

Project Manager

A senior member of the Contractor's firm will be appointed as Project Manager and shall be available at times for consultation. He will be required to be available for meetings and site inspections. He will be empowered to make all necessary management decisions.

General Foreman

A high experienced foreman shall be appointed to ensure the proper execution of the detailed construction, also practical co-ordination of all services and subcontractors. Any instructions given to the General Foreman By the Engineer will be deemed to be given to the Contractor.

When tendering, tenders may submit for consideration in alternative management organisation to that indicated above.

The Contractor shall be fully responsible to ensure all subcontractors appoint experienced and competent foremen to perform their subcontract works.

The Contractor shall employ on site a trained Safety Officer. Full details of any reportable accident which may have occurred shall be reported to the Engineer. The Safety Officer shall immediately advise the Insurers of any accident.

1. **Introduction**

2. **Background**

3. **Methodology**

4. **Results**

5. **Discussion**

6. **Conclusion**

7. **References**

8. **Appendix**

9. **Index**

10. **Summary**

11. **Notes**

12. **References**

13. **Appendix**

SECURITY

The Contractor is to provide lock up facilities and security lighting to all access ways into the building area and is to provide the Principal with keys to the same.

The Contractor is advised that the Principal's security provisions will be active during the contract period. The Contractor and all subcontractors shall co-operate with Principal's officers and comply with the general security requirements and any additional security requirements that the Principal may impose.

These may include:-

- a) identification of all personnel;
- b) supervision by the Principal's security officers;
- c) restricted access through the premises and/or special provisions for out of hours work.

PROTECTION OF EXISTING PROPERTY

1. General

The Contractor shall be held responsible for the adequate protection of the existing building, fixtures and services and shall make good any damage to them caused by all contract and subcontract operations.

The interests of the Principal must be safeguarded in every way.

All materials affected by the weather shall be covered and protected so as to keep them free from damage whilst being transported to the site. The Contractor will be responsible for the proper care and protection of all materials and equipment when they have been delivered to the site.

2. Services

The Contractor shall be responsible for locating services in the vicinity of his operations, and take all necessary precautions to protect them from damage. Any damage and consequential losses caused by the Contractor shall be made good by him at his expense.

QUESTION

1. A company is considering a new investment project. The project has a 50% chance of being successful and a 50% chance of failing. If successful, the project will generate a cash flow of \$100,000. If it fails, the project will generate a cash flow of \$0. The company's cost of capital is 10%.

2. A company is considering a new investment project. The project has a 50% chance of being successful and a 50% chance of failing. If successful, the project will generate a cash flow of \$100,000. If it fails, the project will generate a cash flow of \$0. The company's cost of capital is 10%.

ANSWER

1. The expected cash flow of the project is \$50,000. The expected NPV of the project is \$45,455.
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ANSWER

1. The expected cash flow of the project is \$50,000. The expected NPV of the project is \$45,455.

2. The expected cash flow of the project is \$50,000. The expected NPV of the project is \$45,455.

TEMPORARY WORKS

1. Scaffolding, Railings and Hoardings

All scaffolding used internal or external to the building shall be stable and shall comply with all governing regulations. Particular care shall be exercised to prevent damage to internal fittings and the fabric of the existing building.

The Contractor shall securely screen off all sections of the site and temporary works and provide adequate signs and lighting to protect the works in accordance with the construction areas and sequence as shown on the drawings.

All barriers shall be to the approval of the Engineer and shall be maintained in first class order of effectiveness by the Contractor.

2. Temporary Buildings

The Contractor shall provide suitable accommodation facilities as follows:-

- a) Offices for the Contractor's foreman and other site staff including subcontractors complete with telephone and pay all charges.
- b) An office measuring 3m x 3m complete with desk and drawing layout area and telephone and electric light and power for use by Engineer's staff and Clerk-of-Works.

The Contractor's particular attention is drawn to the Principal's requirement that access for the Contractor and subcontractor staff through Club areas outside the defined construction site shall be kept to the essential minimum.

Completely removal all temporary buildings from site upon completion of work.

Provide and place in the temporary site offices where and as directed by the Engineer two fire extinguishes for first aid fire fighting purposes. Extinguishes shall be as follows:-

- a) One (1) Dry Chemical-Type Extinguisher having a net chemical content of not less than 7 kg for use on oil, gasoline, paint and grease fires and for electrical fires.
- b) One (1) Pump Tank Water-Type Extinguisher having a capacity of not less than 25 litres of water for wood, textile, paper and rubbish fires.

The extinguishers furnished shall be new equipment, adequately tested. All extinguishers shall be checked once a week to see if they are in first-class operating condition. Extinguishers shall be serviced when and as required. If extinguishers are removed from the authorised locations, or used for extinguishing a fire, or in any way damaged, the Contractor will be held responsible for immediately replacing, recharging or repairing the extinguisher. All equipment damaged or lost shall be replaced immediately with the same type and quantity in serviceable condition. At the completion of the construction work covered by this specification, the extinguishers shall remain the property of the Contractor.

3. Weatherproofing

The Contractor will be held responsible for the continued watertightness of the premises in those areas affected by the works involved in this contract. The Contractor's particular attention is drawn to the necessity to provide and maintain suitable temporary weathering including the provision of any temporary downpipes, gutters, drains, etc. to effect this requirement.

4. Temporary Services

Water supplies and power supplies for light loading will be made available by the Employer. The Contractor shall make the connection to these supplies as necessary for temporary services, and he shall install all necessary meters, valves and switchboard. He shall make available to all subcontractors temporary services as required. For power for high loading such as welding machines the Contractor shall make available at his own expense an independent power supply or supply portable generating sets as and when required.

TOOLS AND PLANT

The Contractor shall provide all tools, plant and equipment necessary to carry out the works and maintain them in good working order and he shall ensure that all subcontractors are similarly equipped. The Contractor shall allow use of planking, scaffolding and ladders as required to all subcontractors.

The insurance of all the above tools and plant shall be the responsibility of the Contractor.

MATERIALS AND WORKMANSHIP

All materials and workmanship shall be best quality throughout and subject to the approval of the Engineer and generally in accordance with the requirements of the relevant current SANZ, SAA and BSI codes.

Keep on the job for the duration of the contract a copy of each standard specification and code applicable to this Contract.

Keep on the job copies of manufacturer's instructions for all materials and equipment specified to be handled, applied or fixed in accordance with manufacturer's instructions. Unless otherwise specified all materials shall be new and applied or fixed in accordance with the manufacturer's instructions.

The Engineer shall be entitled to have any part of the work opened up or cut away for inspection. If it is found to be defective it shall be removed and made good at the Contractor's expense and if not at the Employer's expense.

Make such tests as may be required to show that the requirements of the specifications have been fulfilled. All final tests shall be made under the supervision of the Engineer. Provide all necessary services, materials, and labour and apparatus. Prepare, adjust and run field tests before asking the Engineer to inspect them. Submit the work to laboratory tests as may be directed by the Engineer.

The costs of such laboratory tests shall be borne by the Employer unless they disclose faulty materials or workmanship, in which case the faulty materials and the cost of such tests shall be borne by the Contractor.

The following table shows the results of the regression analysis for the dependent variable "Number of children in the household" (N = 1,000). The independent variables are "Age of the head of household" and "Gender of the head of household". The table includes the coefficient estimates, standard errors, t-statistics, and p-values for each variable.

1. *Journal of the American Medical Association*, 2000; 284: 2689-2695.

A 3x15 grid of squares. The top row has 15 squares, mostly light gray. The middle row has 15 squares, with varying shades of gray, including some darker ones. The bottom row has 15 squares, mostly light gray.

[illegible]

1. The first step is to identify the problem or question that needs to be addressed. This involves understanding the context and the specific requirements of the task.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

The following table shows the results of the regression analysis for the dependent variable "Perceived Organizational Support" (POS). The independent variables are "Organizational Commitment" (OC) and "Organizational Identification" (OI). The table includes the regression coefficients (B), standard errors (SE), t-statistics, and p-values for each variable.

Variable	B	SE	t	p
Intercept	1.234	0.056	21.856	<.001
OC	0.456	0.023	19.823	<.001
OI	0.321	0.018	17.812	<.001
Adjusted R-squared	0.789			

Abstract

The first part of the paper discusses the importance of the
 second part of the paper discusses the importance of the
 third part of the paper discusses the importance of the
 fourth part of the paper discusses the importance of the
 fifth part of the paper discusses the importance of the
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 ninth part of the paper discusses the importance of the
 tenth part of the paper discusses the importance of the

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

Make written request to the Engineer for approval of the Substitution of any materials or construction other than those mentioned as standard in the specification or indicated on the drawings and of materials, goods or construction specified to be "approved". When the substitution of one material for another is approved by the Engineer at the request of the Contractor, no additional cost will be allowed in respect of extra work caused by such substitution unless the substitutions is made because of non-availability of the materials specified. Where proprietary names are used in this specification they denote the standard required and the Contractor may submit for approval substitutions of equivalent standard. Nameplates, decals, trade names and signs of manufacturers' names and similar information shall not appear on any items of equipment without the Engineer's approval.

Obtain all necessary licences for imported materials and place all orders to ensure the delivery of all materials to suit the time programme for the Contract. Where it is not possible to store materials or goods on site arrange for storage elsewhere to the Engineer's satisfaction.

All materials, apparatus, equipment and work not in accordance with the specification are liable to rejection. All rejected items shall be removed from the site on written notice from the Engineer. Should the Contractor fail to do so, the Engineer reserves the right to have such items removed by others and deduct and cost of removal from moneys due to the Contractor.

ATTENDANCE

The Contractor shall allow for providing the following facilities or services without charge to all subcontractors. The extent of such attendance is to be clarified by Tenderers and to be allowed for when tendering.

Undertaking full responsibility for the supervision and control of the nominated subcontractors and for his own subcontractors and being responsible for seeing that all work carried out and materials supplied by the nominated subcontractors and his own subcontractors is in accordance with the subcontractors and is delivered and erected to suit the building programme.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for ensuring the integrity and transparency of the financial system. This section also outlines the various methods used to collect and analyze data, highlighting the role of technology in streamlining these processes.

2. The second part of the document focuses on the challenges faced by organizations in implementing effective risk management strategies. It identifies key areas such as market volatility, regulatory changes, and operational risks, and provides practical advice on how to mitigate these risks. The text stresses the need for a proactive approach to risk management, involving regular monitoring and assessment of potential threats.

3. The third part of the document explores the impact of globalization on the financial markets. It discusses how international trade and investment have led to increased market integration and volatility. This section also examines the role of multinational corporations in shaping global economic trends and the implications for local economies.

4. The fourth part of the document addresses the issue of financial inclusion and the role of digital finance in promoting economic growth. It highlights the benefits of digital banking services, such as increased access to credit and financial products, and discusses the challenges of ensuring that these services are available to all segments of the population.

5. The fifth part of the document concludes by summarizing the key findings and recommendations. It reiterates the importance of maintaining accurate records, implementing robust risk management strategies, and promoting financial inclusion through digital finance. The text also provides a brief overview of the future outlook for the financial system, noting the potential for continued growth and innovation.

6. The sixth part of the document provides a detailed analysis of the current state of the global economy. It examines the impact of the COVID-19 pandemic on various sectors and discusses the recovery efforts being undertaken by governments and international organizations. This section also highlights the role of central banks in managing monetary policy and maintaining financial stability.

7. The seventh part of the document discusses the importance of sustainable finance and the role of ESG (Environmental, Social, and Governance) factors in investment decisions. It explores how sustainable investing can contribute to long-term value creation and risk reduction, and provides examples of successful sustainable finance initiatives.

8. The eighth part of the document focuses on the role of artificial intelligence and machine learning in the financial industry. It discusses how these technologies are being used to improve risk management, fraud detection, and customer service, and highlights the potential for further innovation in this area.

9. The ninth part of the document addresses the issue of cybersecurity and the need for robust security measures to protect financial data. It discusses the various threats to financial systems, such as phishing attacks and ransomware, and provides recommendations for how to enhance security protocols and incident response plans.

10. The tenth part of the document concludes by providing a final summary of the key points discussed throughout the report. It emphasizes the need for continued collaboration and innovation in the financial system to ensure its long-term success and stability.

11. The eleventh part of the document provides a detailed overview of the regulatory framework governing the financial system. It discusses the role of regulatory bodies in ensuring compliance and protecting investors, and highlights the challenges of keeping regulations up-to-date in a rapidly changing environment. This section also provides information on the latest regulatory developments and the impact of these changes on the industry.

12. The twelfth part of the document discusses the role of financial education in promoting economic growth and financial stability. It highlights the importance of providing individuals with the knowledge and skills needed to make informed financial decisions, and discusses various initiatives and programs aimed at improving financial literacy.

13. The thirteenth part of the document focuses on the role of financial innovation in driving growth and efficiency in the financial system. It discusses the emergence of new financial products and services, such as blockchain-based solutions and robo-advisors, and highlights the potential for these innovations to transform the industry.

14. The fourteenth part of the document addresses the issue of financial stability and the need for effective crisis management. It discusses the various factors that can lead to financial instability, such as excessive leverage and market speculation, and provides recommendations for how to prevent and manage financial crises.

15. The fifteenth part of the document concludes by providing a final summary of the key points discussed throughout the report. It emphasizes the need for continued collaboration and innovation in the financial system to ensure its long-term success and stability.

Appendix A

1. This appendix provides a detailed list of the data sources used in the study. It includes information on the various databases, surveys, and other sources of information that were consulted to gather the data for the report. This section also provides information on the methods used to collect and analyze the data, ensuring the accuracy and reliability of the findings.

2. The second part of the appendix provides a detailed overview of the statistical methods used in the study. It discusses the various statistical tests and models that were used to analyze the data, and provides information on the assumptions underlying these methods. This section also provides information on the software and tools used for data analysis, ensuring the transparency and reproducibility of the results.

3. The third part of the appendix provides a detailed overview of the various charts and graphs used in the report. It includes information on the data sources for these visualizations, as well as the methods used to create them. This section also provides information on the interpretation of these visualizations, ensuring that the information is presented in a clear and concise manner.

4. The fourth part of the appendix provides a detailed overview of the various tables and figures used in the report. It includes information on the data sources for these tables, as well as the methods used to create them. This section also provides information on the interpretation of these tables and figures, ensuring that the information is presented in a clear and concise manner.

5. The fifth part of the appendix provides a detailed overview of the various footnotes and references used in the report. It includes information on the sources of the information cited in the report, as well as the methods used to verify the accuracy of this information. This section also provides information on the copyright and other legal issues related to the use of this information.

Allowing the subcontractors to use scaffolding, ladders and other facilities upon the site.

Taking delivery and hoisting the subcontractors' materials and equipment.

Providing suitable lockable storage place for the subcontractors' use.

Conferring with the subcontractors and arranging for the forming or cutting away for the building in all plugs, brackets, sleeves, plant and equipment, forming and/or cutting holes, chases, recesses, etc. as required by the subcontractors and making good after all trades.

Protection of the subcontractors' work and making good or replacing any of the subcontractors' work which is damaged or which is defective.

Removal of rubbish as it accumulates and cleaning up after the subcontractors have left the site.

Protect all fittings, plant and equipment from dirt, plaster, moisture and damage.

CLEANING

The General Contractor shall, weekly or as it accumulates during the progress of the works, remove all rubbish from the site and keep the site and buildings clean to the satisfaction of the Engineer. On completion of the work and whenever directed, leave the building and site clean and tidy to the satisfaction of the Engineer or the Principal.

Trucks and vehicles shall be carefully loaded to prevent dropping materials on existing pavements or on the surrounding property. Any materials spilled should be removed immediately by the Contractor at his own expense.

SAFETY REGULATIONS

Throughout the work the Contractor shall provide adequate protection against fire and arc flash hazard from welding operations.

The Contractor shall be responsible for the carrying out of the whole of the works and the requirements of the Contract and to see that they are carried out by subcontractors and others concerned in a thoroughly safe and satisfactory manner, and in particular shall:-

- a) strictly conform to the requirements of any Act of Parliament and all regulations, by-laws or orders relating to the safety of persons on or about the site made by any public authority having jurisdiction in the matter;
- b) ensure that all tackle, gear, stagings, scaffolding, ladders, machines, winding arrangements and other equipment used in connection with the works shall conform to the requirement of any Government regulations in relation thereto and in any case be adequately strong and safe for use;
- c) immediately discontinue any practice or remove any equipment which becomes or is likely to become dangerous or unsafe;
- d) remove from the works promptly any of his employees or representatives who by their conduct could create any danger to themselves or others;
- e) the Contractor shall employ on this project a safety officer with authority to act on any matters pertaining to safety.

CONSTRUCTION LOADS

If necessary provide competently computed temporary supports to transfer loads to other parts of sufficient carrying capacity. Provide computations if required by the Engineer.

NUISANCE

The work shall be carried out in such a manner as to cause the least inconvenience to the Principal and the club and to keep the level of noise to a reasonable minimum. All plant working on the site including trucks transporting materials to and from the site shall have a noise level not

1. The first step in the process of identifying a problem is to recognize that a problem exists. This involves gathering information about the situation and identifying the specific issue that needs to be addressed.

2. Once a problem has been identified, the next step is to define the problem clearly. This involves stating the problem in a concise and specific manner, identifying the scope of the problem, and determining the goals that need to be achieved.

3. The third step in the process is to generate potential solutions. This involves brainstorming ideas and considering different approaches to solving the problem. It is important to consider both short-term and long-term solutions, as well as the feasibility of each option.

4. The fourth step is to evaluate the potential solutions. This involves comparing the different options and determining which one is the most effective and feasible. It is important to consider the costs and benefits of each solution, as well as the potential risks involved.

5. The final step in the process is to implement the chosen solution. This involves putting the solution into action and monitoring its progress. It is important to communicate the solution to all relevant parties and to ensure that the solution is implemented correctly.

6. The final step in the process is to evaluate the results of the solution. This involves assessing the effectiveness of the solution and determining whether the goals have been achieved. It is important to document the results and to share them with others.

7. The final step in the process is to reflect on the experience and learn from it. This involves considering what worked well and what could be improved in the future.

8. The final step in the process is to communicate the results of the solution. This involves sharing the results with others and providing feedback. It is important to ensure that the results are communicated clearly and effectively.

9. The final step in the process is to maintain the solution. This involves ensuring that the solution continues to be effective and that it is updated as needed.

10. The final step in the process is to celebrate the success of the solution. This involves acknowledging the efforts of all those who contributed to the solution and celebrating the achievement. It is important to take time to reflect on the success and to share the喜悦 with others.

exceeding 85 dB the "A : Scale at 7 metres". All internal combustion engines used on the site shall be fitted with exhaust scrubber or an alternative approved method on minimising exhaust fumes. Rubbish and rubble shall be sprinkled with water and kept damp as necessary to prevent dust arising. The Contractor shall be responsible for any damage or annoyance and for the settlement without cost to the Employers of any claims arising therefrom.

ALTERATIONS

Alterations to any part of the work required or ordered by the Authority having jurisdiction over that part of the work shall immediately be referred to the Engineers and, except in case of emergency, the alteration shall not be put into effect without prior confirmation by the Engineer.

Any such alteration shall then be recorded by the Contractor on the site documents as appropriate.

SUBSTITUTION

The substitution of goods, materials, proprietary products, workmanship, method and equipment may be approved by the Engineer on the Contractor's written request, giving technical information and certifying that it is of equal or better quality and effectiveness and price adjustment.

Any saving in cost resulting from substitution shall be deducted from the Contract Sum.

The Principal shall not be responsible for payments of extra costs because of non-approval by the Engineer of alternative products.

Should import licenses be unobtainable for the materials nominated, even though application has been made in adequate time, alternative materials may be substituted to the Engineer's approval and adjustment of costs made by variation to contract.

PROPRIETARY PRODUCTS

All proprietary products used shall be installed in strict accordance with the manufacturer's recommendations.

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 3, 1801. It is a very important document, as it is the first time that the President has addressed the Congress since the establishment of the office. The letter is a very formal and dignified one, and it is a very good example of the style of the time.

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NOTICEBOARD

The Contractor shall erect and maintain in a prominent position at the entrance to the site an approved 3m x 2m signboard displaying the name of the project, the name of the Principal, Engineer, Architect, Quantity Surveyor, and Contractor, and telephone numbers indicating where the Contractor's Representative may be contacted after working hours.

SITE MEETINGS

The Contractor shall allow for two weekly site meetings with an average duration of two hours per meeting. Provide for subcontractor's attendance when required.

FORMAT

The site meetings shall generally be conducted under the following format:-

- a) Apologies.
- b) Minutes of Last Meeting,
Verification of receipt and acknowledgement.
- c) Matters arising.
Items requiring comment from previous meetings.
- d) Contractor's Report.
The Contractor shall provide copies of a report for the period outlining:-
 - i) Progress/Programme:

A summary of works undertaken and their relative progress.
An update of the Contract Programme.
The number of employees utilised in each trade.
 - ii) Information required.

QUESTION

1. A company is considering a new investment project. The project has a 5-year life and is expected to generate cash flows of \$100,000 per year. The initial investment is \$500,000. The company's cost of capital is 10%. What is the NPV of the project?

ANSWER

The NPV of the project is calculated as follows:

NPV = $\sum_{t=0}^T \frac{CF_t}{(1+r)^t}$

Where:

NPV = Net Present Value

CF_t = Cash flow at time t

r = Cost of capital (10%)

T = Time period (5 years)

NPV = $\frac{-500,000}{(1+0.1)^0} + \frac{100,000}{(1+0.1)^1} + \frac{100,000}{(1+0.1)^2} + \frac{100,000}{(1+0.1)^3} + \frac{100,000}{(1+0.1)^4} + \frac{100,000}{(1+0.1)^5}$

NPV = $-500,000 + 90,909 + 82,645 + 75,131 + 68,056 + 61,861$

NPV = $-500,000 + 378,602$

NPV = $-121,398$

iii) Time Extensions:
Any pending or current claims.

e) Variations.

f) New Business.

g) Next Meeting.

DAYWORKS

Wherever possible variations to the Contract will be measured at Schedule of Quantities rates (or agreed prorata rates), or by obtaining quotations if appropriate.

Where the above conditions do not apply the work will be paid for by day work hours and materials.

Where the Contractor believes that the work to be done must be charged by dayworks, he shall first notify the Engineer. The Engineer shall confer as necessary with the Quantity Surveyor to confirm the need for dayworks charges.

Daywork hours shall be recorded on employee's time sheets and material payments will be on invoice. The invoices shall be stamped and initialled by the Engineer "DAYWORKS PAYMENT ONLY" and shall be initialled as necessary by the Engineer and the Contractor shall abstract hours and materials onto a daywork charge sheet.

Wherever possible the Engineer will supervise work carried out on day work charges.

Site diary records will not be acceptable for daywork charges whether countersigned or not.

Approved daywork charges may be paid up to 80% of value in Progress Claims. Full payment will be made when the dayworks have been processed as a Variation Order.

Approved daywork charges may be paid up to 80% of value in Progress Claims. Full payment will be made when the dayworks have been processed as a Variation Order approved by the Client.

1. What is the purpose of the study?

2. What are the objectives?

3. What is the significance?

4. What is the scope?

5. What is the methodology?

The study is a quantitative research that aims to investigate the relationship between the variables and the effect of the independent variable on the dependent variable in the context of the study.

The study is descriptive and correlational in nature. It aims to describe the relationship between the variables and the effect of the independent variable on the dependent variable in the context of the study.

The study is quantitative in nature. It aims to investigate the relationship between the variables and the effect of the independent variable on the dependent variable in the context of the study.

The study is descriptive and correlational in nature. It aims to describe the relationship between the variables and the effect of the independent variable on the dependent variable in the context of the study.

The study is quantitative in nature. It aims to investigate the relationship between the variables and the effect of the independent variable on the dependent variable in the context of the study.

The study is descriptive and correlational in nature. It aims to describe the relationship between the variables and the effect of the independent variable on the dependent variable in the context of the study.

The study is quantitative in nature. It aims to investigate the relationship between the variables and the effect of the independent variable on the dependent variable in the context of the study.

The study is descriptive and correlational in nature. It aims to describe the relationship between the variables and the effect of the independent variable on the dependent variable in the context of the study.

B1.0 DEMOLITION

B1.1 General

Refer to Section A of this specification which is binding on all sections. This section is to be read in conjunction with Section B2.0 TEMPORARY WORKS.

B1.2 Scope

The work in this section comprises all of the demolition work as detailed or inferred in the documents and as required for the satisfactory completion of the contract. The demolition shall include but is not necessarily limited to the following:-

- i) Rear buildings at ground level including foundation.
- ii) Brick masonry wall to east side of existing building.
- iii) Brick masonry flat & concrete slab at roof level of north existing building including timber access stairs.
- iv) Interior partitioning including fixtures & fittings.
- v) Miscellaneous work in forming new openings.
- vi) Existing ceilings & floor coverings.

B1.3 Site

The site is situated at 111 Cuba Street. The extent of the site is shown on the drawings.

B1.4 Site Inspection

The buildings will be available for inspection during the tender period and tenderers are required to respect the rights of the remaining tenants still in occupation.

Tenderers will be deemed to have inspected the site and made themselves familiar with the existing conditions and buildings adjacent to the site.

B1.5 Protection of Public

The Contractor shall take all precautions to protect the public throughout the contract.

B1.6 Responsibility

The Contractor shall be solely responsible for the execution and completion of the Contract and entirely responsible for ensuring that all operations, methods, workmanship, equipment and materials are safe, sufficient and in accordance with the Contract documents. No inspection by the Engineer and no instruction given or certificate issued by the

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Engineer shall be deemed to imply that the Engineer has assumed or taken over any part of the Contractor's responsibility.

No variation of the Contract Sum shall be made on the Grounds of injunctions against the Contractor or the Principal which restricts the Contractor's working hours or type of equipment which may be used.

B1.7 Regulations and Fees

The Contractor shall comply with all regulations of all Authorities having jurisdiction over the works. He shall obtain all licences, consents and permits of these Authorities and he shall give all notices and pay all fees and customary charges.

The demolition permit will have separately been applied for by the Principal but should be uplifted and paid for by the Contractor.

The Contractor shall comply with Labour Department Regulations.

B1.8 Access

All work shall be confined within the legal boundaries of the site. The Contractor shall comply with WCC Streetworks requirements regarding access to the site.

The Contractor shall keep the right of way clear and maintain a clear accessway from existing fire escapes at the rear at all times during non-working hours.

B1.9 Demolition

The whole of the demolition work shall be carried out by a specialist firm of Demolition Contractors employing skilled workmen experienced in this type of work.

All demolished materials and equipment shall become the property of the Contractor and shall be removed from the site as demolition proceeds, except for items scheduled to be stored for re-use which shall be carefully removed, damage free.

The Contractor shall dispose of or re-use all the demolished materials as he sees fit. No materials shall be sold direct to the public from the site. The Contractor shall pay all the cartages and tip fees. No materials whatsoever shall be burnt or buried on the site, the lighting of any fires on the site is forbidden.

All of the buildings on the rear of the site are required to be demolished and removed including foundations.

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 3. **Formulate hypotheses or research questions.**
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 5. **Collect and analyze data.**
 6. **Draw conclusions and discuss implications.**

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Demolition shall be done in a careful manner in small sections to reduce noise and dust nuisance. All falling materials to be dropped and contained within the site during demolition and prior to removal. Blasting will not be permitted on site.

The Contractor shall employ an independent registered engineering consultant to ensure that the proposed methods of demolition maintain necessary levels of safety and ensure the structural stability of all works during all stages of the contract.

Bl.10 Fire Protection

The Contractor shall keep a water supply available to the site from a street hydrant with Fire Brigade approval at all times for wetting down.

Two fully charged CO² fire extinguisher cylinders shall be kept on site at all times. Two fully charged powder extinguishers shall be kept on site at all times.

Bl.11 Site Supervisor and/or Foreman

The Contractor is to retain on site, at all times during carrying out of demolition works, a competent site supervisor and/or foreman. Any instructions or explanations given by the Engineer to such site supervisor and/or foreman shall be held to have been given to the Contractor.

There shall be the same site supervisor and/or foreman on the site throughout the demolition works except through sickness or through leaving the Contractor's employ or with the Engineer's written approval following written applications.

Bl.12 Adjoining Properties

The Principal will have a photographic survey made of the adjoining buildings to record their present condition. The Contractor is required to carry out an inspection of these adjoining buildings in the company of the Engineer and a representative of the adjoining owners before commencing any work in order to agree that the photographic survey is correct. On completion of the demolition works the Contractor, in the presence of the Engineer and in company with a representative of the adjoining owners is to carry out an inspection of the previously surveyed properties.

Any damage or defects recorded which are not shown in the survey documents referred to above and which in the opinion of the Engineer are due to demolition work shall be made good by the Contractor at his cost without delay.

The Contractor shall carry out the demolition to cause the minimum of interference to adjoining properties. The demolition work required on the party wall is to be carried out of normal working hours.

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No activity on site shall generate a noise level of greater than 80 dbA during normal working hours. The Engineer shall have the right to restrict the Contractor's activities which cause unnecessary noise or undue distress to the occupants of the neighbouring properties, and instruct this work to be continued out of normal working hours at no variation to the contract.

Normal working hours are deemed to be 8.30a.m. to 5.00p.m., Monday to Friday.

The Contractor is required to submit a detailed proposal covering the methods of demolition, aspects of safety, protection and nuisance requirements to the neighbouring properties along with his tender submission.

B1.13 Protection of Property

The Contractor, whenever required by a requirement of any public or other authority and whenever necessary or prudent shall take all such precautions to ensure the safety and freedom from damage (whether directly or indirectly caused) of all adjoining or nearby services, land or buildings, footways, roadways, public or private services or of any other real or personal property whatsoever which may be, or may come to be, in the vicinity of the site, and also for ensuring the safety of persons and animals who or which may be at any time upon or in the vicinity of the site.

The Contractor shall comply with the foregoing prior to commencing any other work on the site and shall be responsible for the adequacy and timing of all such precautions and work.

The Contractor shall be responsible for and make good any property damage and be responsible for costs or losses that may be sustained to the works or to nearby buildings, properties and their contents, to nearby roads, lane-ways, or other constructions and to any persons, vehicles or animals therein or thereon whether the aforesaid bodily injury and/or property damage costs or losses arise directly or indirectly out of the works of this contract.

The Contractor is to make good as directed, flashings and similar parts of adjoining buildings disturbed by demolition.

The Contractor shall take appropriate measures to restrict unauthorised access to the site.

B1.14 Railings and Hoardings

Where required by the Local Authority or the Engineer and as necessary for public safety, the Contractor shall erect and maintain temporary railings, hoardings and other measures to ensure the protection of workmen and others to the satisfaction of the Engineer. Hoardings, railings and other guards at roads and footways shall be adequately lit at night.

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No advertisements of any kind will be permitted on the hoardings or elsewhere. The Contractor shall leave the hoardings and railings etc. fixed in position on the site at the completion of the works.

Bl.15 Utilities

The Contractor shall arrange disconnection and removal, plugging or alterations of all utilities including gas, electricity, telephones, sprinklers, transport, water and stormwater drainage.

The Contractor shall notify the NZ Fire Service and the Wellington Regional Water Board should it be necessary to terminate and remove an existing sprinkler system. The Contractor shall cooperate with the appropriate authorities should retrieval of any redundant services be required.

Bl.16 Tidiness

The Contractor shall prevent the spillage of earth and/or demolition materials onto the adjacent roadways, footways or other private or public property and shall clear up and remove any such spillage immediately on notice from the Engineer or Local Authority.

On conclusion of this contract, the Contractor shall vacate the site and leave the site in a tidy state to the satisfaction of the Engineer.

Bl.17 Support and Shoring

The Contractor shall provide any necessary shoring, needling, strutting, planking, sheet piling and the like to adjoining buildings and other property. If in the opinion of the Engineer and such provision is insufficient he may order additional provision at the demolisher's expense. Any such instruction shall not relieve the Contractor of sole responsibility for sufficient support of the buildings or other property.

The Contractor shall alter, adapt and maintain all such temporary works as necessary and strike or withdraw them progressively as the work proceeds. Written consent of the Engineer shall be obtained if any such works are to be left in position at the completion of the work.

Bl.18 Breaking Out

Breaking out work shall be to the extent shown on the drawings or to the minimum required for the satisfactory completion of the other trades for which it is carried out.

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Abstract The purpose of this study was to determine whether there were differences in the prevalence of self-reported depression between men and women who had been exposed to violence by intimate partners. Data from the National Longitudinal Study of Women's Health are used. Results show that among women who reported exposure to partner violence, 10% reported depression compared to 6% of those who did not report exposure to partner violence. This finding suggests that exposure to partner violence may increase the risk of depression.

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Abstract

1. **Identify the main components of the system.**
 2. **Define the objectives and scope of the study.**
 3. **Formulate hypotheses or research questions.**
 4. **Design the methodology and data collection process.**
 5. **Analyze the results and draw conclusions.**
 6. **Discuss the implications and future research directions.**

When constructing new openings in walls provide a sawcut on both faces around perimeter and break own plumb square and accurately to site.

B1.19 Co-Operation

Co-operate with other trades as necessary to seal off, disconnect or relocate services or equipment effected by the demolition work.

B1.20 Cleaning

Remove all demolition debris from the site as the work proceeds and leave work areas clean and tidy.

B1.21 Preparation for Making Good

The Contractor shall be responsible for demolishing structure, fittings, materials etc. to the lines, levels and dimensions required for making good by other trades.

Unless indicated otherwise in the Contract Documents all bolts, screws, nails and other fixings into remaining structure following demolition shall be removed to suit making good by other trades.

B1.22 Encroachment

Should demolition reveal that adjoining property encroaches onto the site, or the demolition encroaches onto the adjoining property, then the Contractor shall refer to the Engineer for instructions before proceeding with that portion of the work.

Allow to arrange for, and pay any local authority approval and damages for encroachment necessary on to public streets as required to undertake the contract.

B1.23 Backfilling

Backfilling of any voids left by removal of buildings, foundations or underground utilities is not required.

1. **THE FIRST PART OF THE REPORT**

2. **THE SECOND PART OF THE REPORT**

3. **THE THIRD PART OF THE REPORT**

4. **THE FOURTH PART OF THE REPORT**

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11. **THE ELEVENTH PART OF THE REPORT**

12. **THE TWELFTH PART OF THE REPORT**

13. **THE THIRTEENTH PART OF THE REPORT**

B2.0 TEMPORARY WORKS

B2.1 General

Refer to section A of this specification which is binding on all sections. Refer to section 1.0 DEMOLITION.

B2.2 Scope

This section covers all temporary works required to maintain the operations of the Wellington Workingmen's Club during and following demolition and during the various construction phases.

The work includes, but is not necessary restricted to the following:-

- i) Temporary east wall from ground to roof including waterproofing of floor.
- ii) Dividing wall to South tenancy.
- iii) Access hatch & chute from first floor to South tenancy.
- iv) 2 portaloos on low roof to north building.
- v) Shift north building WC's and install temporary drainage.
- vi) Dividing wall to billiard room and main bar entrance adjacent to lift.
- vii) Access to right of way. Keep clear.
- viii) Dividing wall to lounge 1 on entrance to lounge 2 adjacent to lift.
- ix) Floor protection to foyer and passage at top of stairs (second).
- x) Miscellaneous electrical wiring when south building sub-boards removed.
- xi) Maintain water tanks and supply FHR's.
- xii) Waterproof roof area when flats and lower roof removed.
- xiii) Waterproof new truss roof over kitchen and lounge 1.
- xiv) Maintain services to Main Bar (Plumbing and drainage).
- xv) Maintain chiller unit to kitchen (on roof).
- xvi) Upgrade ground level north end toilets.

Construction details for temporary works, plumbing and drainage etc are shown on the drawings.

B2.3 Permits & Fees

Obtain all permits and pay associated fees necessary for temporary works.

B2.4 Maintaining Temporary Works

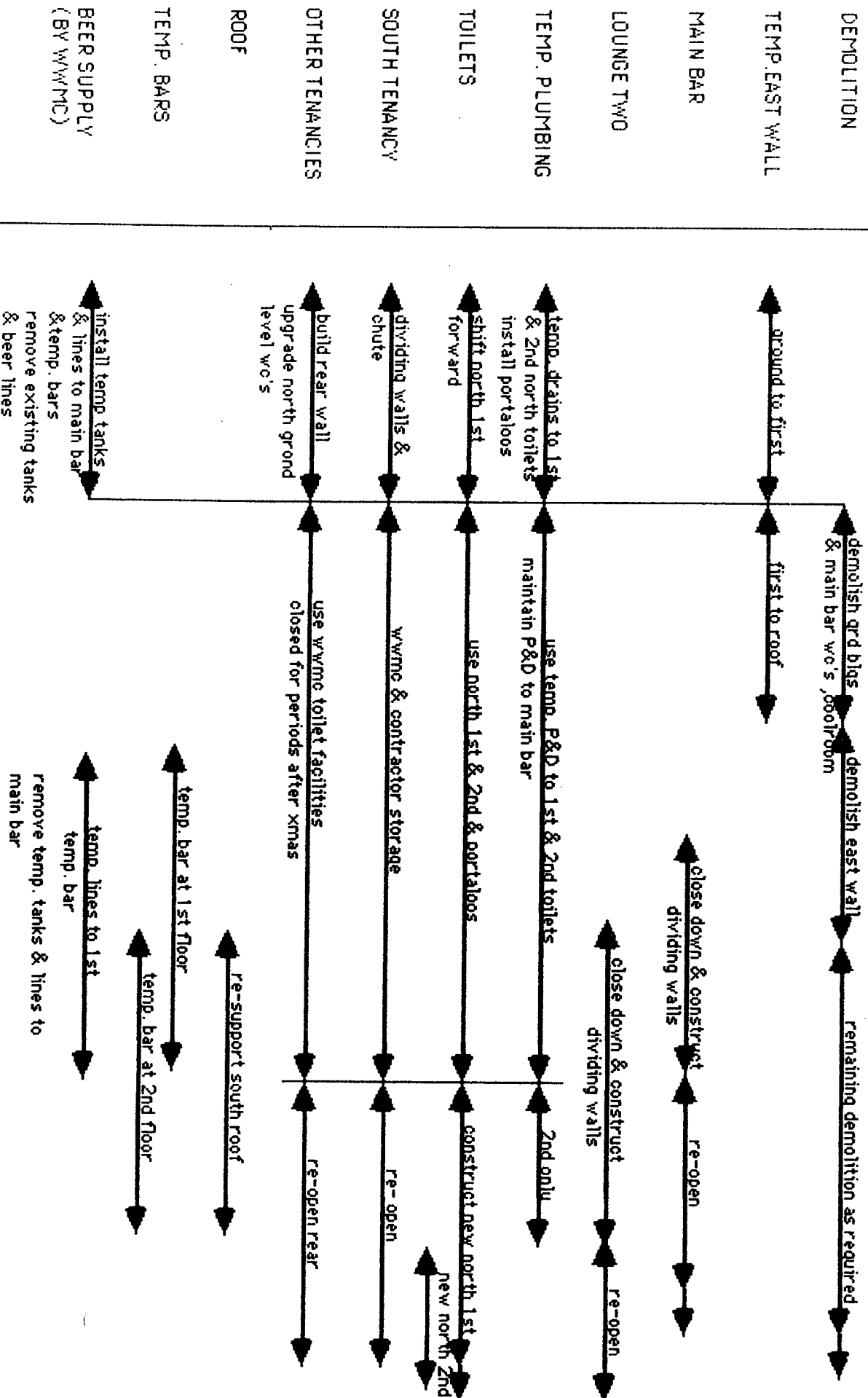
Allow to maintain the temporary works for as long as they are required and allow to remove off site when no longer required.

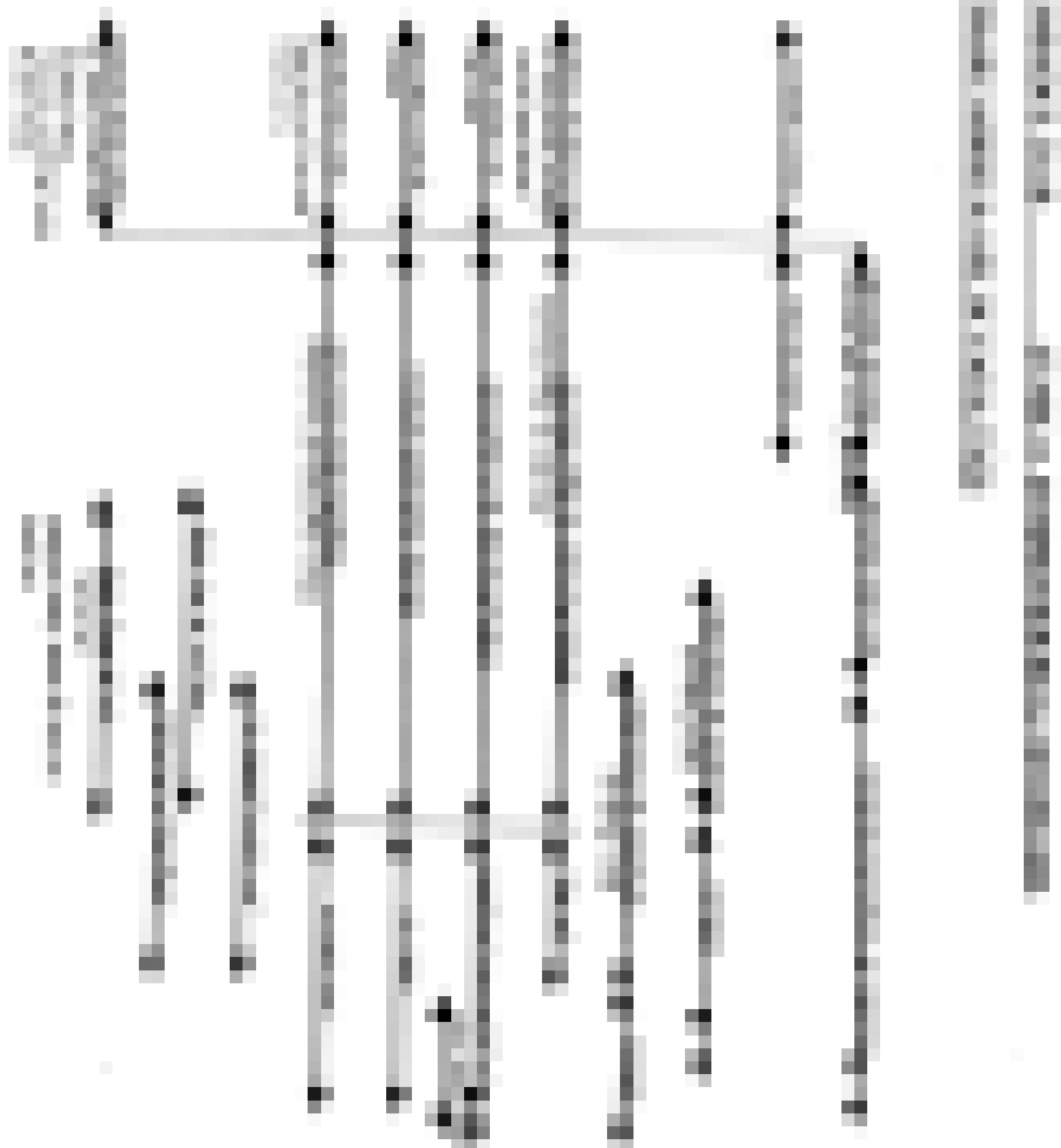
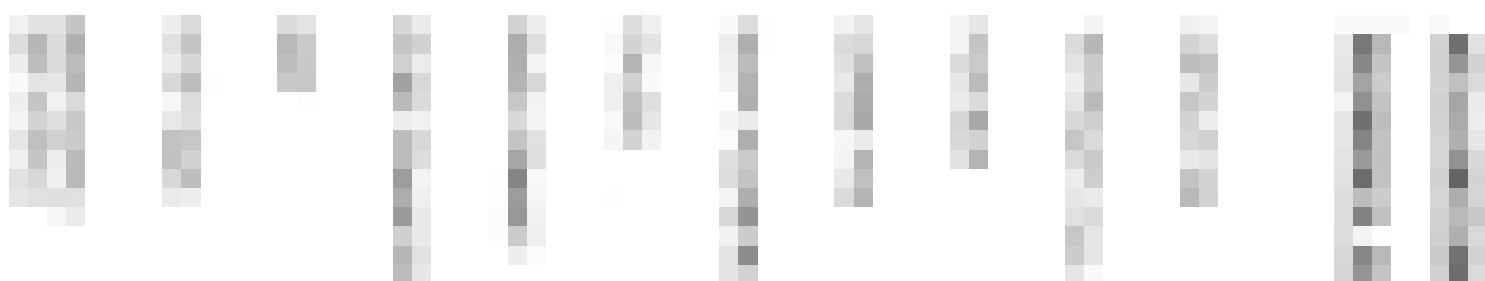
B2.5 Time Programme

Temporary works are to be maintained according to the Main Contractor's Construction Programme and in line with the attached sequence of Temporary Works and Use of Facilities.

B2.6 Co-operation

Allow to co-operate and liaise with the Club's management when carrying out temporary works, particularly as regards notifying the Club of imminent work. At least 2 weeks' notice is to be given to the Engineer.

SEQUENCE OF TEMPORARY WORKS & USE OF FACILITIES



A EXCAVATION & FILLING

1. SCOPE

This section of the specification covers the excavation, filling and subfloor drainage required for the building works and foundations. The extent of work is to include the stripping to waste any areas of unsuitable soil, replacing these soils with compacted in-place quarried material and the supply and placing of hardfill, filter material, drainage material, and subfloor drains.

The Contractor shall supply materials, plant, labour and supervision required to carry out the works as specified.

2. SETTING OUT

All setting out and establishment of bench marks and levels shall be done in accordance with the Drawings.

3. PROTECTION

The Contractor shall be responsible for providing all temporary structures, underpinning, shoring, needling, planking and strutting and other supports required by the nature of the works and of the surroundings. Refer also to Section 1.18.

Maintain and support as necessary all roadways and footpaths which may be affected in any way by the works of this Contract.

Preserve from damage all public and private services.

Alter all such temporary works as required during the progress of the Contract, maintain in sound condition and finally ease, strike, demolish and take away.

4. SERVICES

Before commencing any excavations the Contractor shall check the location and be satisfied as to the locations of all services in the area and shall arrange to disconnect, seal off or divert any such services where required.

1. **Introduction**

2. **Methodology**

The methodology of this study is based on a combination of qualitative and quantitative research methods. The qualitative component involves semi-structured interviews with 15 participants, while the quantitative component consists of a survey of 100 participants. The data collected from both sources are analyzed using thematic analysis and statistical methods.

The study was conducted in a controlled environment, with participants recruited from a variety of sources to ensure a diverse sample. The data collection process was rigorous and followed a standardized protocol.

3. **Results**

The results of the study indicate that there is a significant correlation between the variables studied. The findings suggest that the proposed model is valid and can be used to predict the outcomes of the study.

4. **Conclusion**

In conclusion, the study has provided valuable insights into the relationship between the variables. The findings have implications for both theory and practice, and further research is needed to explore the underlying mechanisms.

The study was limited by the sample size and the self-reported nature of the data. Future research should aim to address these limitations and provide a more comprehensive understanding of the phenomenon.

5. **References**

The following references were consulted during the research process:

- Smith, J. (2010). *Qualitative Research Methods*. London: Sage Publications.
- Johnson, A. (2015). *Quantitative Research Methods*. New York: Routledge.

6. **Appendix**

The appendix contains the full list of references, the survey instrument, and the interview schedule. These materials are available upon request from the author.

5. NUISANCE

The Contractor shall carry out the work in such a manner as to cause the least possible inconvenience to the Principal. Sprinkle rubbish and rubble with water to keep damp to prevent dust arising.

The Contractor shall be responsible for any damage or annoyance and for the settlement of any claims arising therefrom without cost to the Principal.

6. EXCESSIVE EXCAVATION

Should the Contractor take any subgrade excavation to a greater depth than required without instruction to do so from the Engineer, he shall fill to the correct level with Site Concrete or basecourse, as directed by the Engineer, at his own expense.

7. DISPOSAL OF SPOIL

All excavated material from excavations made on the site, shall be disposed of away from the site. The Engineer may direct that some site materials be retained for future use. The Contractor shall stockpile these materials on the site away from areas of work and in such a manner that they are undisturbed by ongoing activities on the site.

8. TEMPORARY DRAINAGE

The Contractor shall provide and maintain during the whole period of the Contract, such culverts, ditches and sumps as may be necessary to effectively control stormwater, runoff, on, over, and from construction areas, and to control erosion and prevent damage to or fouling of work in progress or completed. The Contractor shall be responsible for making good any work or property damaged by neglecting such provisions. The contractor shall provide temporary drainage as shown on the drawings and shall take any other measures necessary to lower the water table over the excavation to beneath the basement slab.

9. PUMPING

Keep all excavated areas, sumps and pits free from water during the progress of the works by pumping or other suitable means. Provide adequate means of disposing of such water to the approval of the Engineer and Local Authority.

1. Introduction

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants. The study was conducted in a controlled environment and the results are presented in the following sections.

The study was designed to evaluate the impact of the system on the participants' performance. The participants were divided into two groups: a control group and an experimental group. The control group did not use the system, while the experimental group used the system throughout the study.

2. Methodology

The study was conducted in a controlled environment. The participants were recruited from a pool of volunteers. The study was divided into two phases: a pre-test phase and a post-test phase. The pre-test phase was used to determine the baseline performance of the participants. The post-test phase was used to measure the performance of the participants after using the system.

3. Results

The results of the study show that the proposed system had a significant positive effect on the performance of the participants. The participants in the experimental group performed significantly better than the participants in the control group. The results are presented in the following table.

4. Discussion

The results of the study suggest that the proposed system is effective in improving the performance of the participants. The system may be useful in a variety of applications, including training and performance evaluation. The study was limited by the small sample size and the controlled environment. Further research is needed to confirm the results of this study.

5. Conclusion

The study concluded that the proposed system had a significant positive effect on the performance of the participants. The system may be useful in a variety of applications, including training and performance evaluation. The study was limited by the small sample size and the controlled environment. Further research is needed to confirm the results of this study.

10. EXCAVATION

The Contractor shall carry out the excavation in an ordered sequence to minimise disturbance to the exposed site soils. The Contractor shall employ the use of tracked backhoe excavators fitted with smooth edge ditching bucket. These machines shall operate not closer than 0.5 metres above the final subgrade level and outside the areas finally trimmed to subgrade level.

Construction plant of other than that specified above shall not be permitted on to the exposed subgrade. The Engineer shall be notified in advance of the excavator commencing in order to be represented on the site to inspect the subgrade as exposed.

11. INSPECTION

Give the Engineer and the Local Authority ample notice of completion of the excavation to enable inspections to be made. Do no further work in these areas until they have been approved.

12. OVER-EXCAVATION

The Engineer may instruct the Contractor to carry out some over-excavation in the areas where unsuitable soils are exposed at subgrade level. Where these areas are located away from the digging face a temporary earth ramp shall be pushed out over the subgrade to enable suitable location of the excavator and trucks without damaging the approved subgrade. Such excavation is to be carried out under the on-site direction of the Engineer. The Contractor shall provide all means of controlling ground-water inflows in these areas of over-excavation.

13. BACKFILL

The backfill for the areas of over-excavation as directed by the Engineer shall comprise imported quarried material which complies with the NRB Specification M4: June 1965 "Crushed Basecourse Aggregate", Grading A. This material is also termed "Standard Grade". The prepared material shall comply strictly with the grading, plasticity and broken face criteria but may be relaxed for aggregate hardness. The Contractor shall supply to the Engineer a sample of the material to be used for independent analysis. The Engineer reserves the right to reject any material and/or supply of material for use on the site.

1. Introduction

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants. The study was conducted in a controlled environment, and the results are presented in the following sections. The study was designed to evaluate the impact of the system on the participants' performance, and the results are presented in the following sections.

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2. Methodology

The study was conducted in a controlled environment, and the results are presented in the following sections. The study was designed to evaluate the impact of the system on the participants' performance, and the results are presented in the following sections.

2.1. Participants

The study was conducted in a controlled environment, and the results are presented in the following sections. The study was designed to evaluate the impact of the system on the participants' performance, and the results are presented in the following sections.

2.2. Procedure

The study was conducted in a controlled environment, and the results are presented in the following sections. The study was designed to evaluate the impact of the system on the participants' performance, and the results are presented in the following sections.

The Contractor shall arrange to have tests carried out on the supplied quarried material in accordance with the criteria set by the NRB/M4: June 1965 Specification. The tests shall be provided as follows:

- (i) Before construction - three sets of tests carried out within two months of supply.
- (ii) During construction - one set of tests performed for every 100 cubic metres provided to the site.

Where the test results do not comply with the requirements of the NRB/M4: June 1965 specification, material will be rejected. Deficient materials placed on the site shall be removed and replaced with conforming material at the Contractor's expense.

The use of 'crusher run' or 'lime stabilised' materials are not permitted as a substitute for the specified materials.

Site material may not be used for backfilling.

14. PLACEMENT AND COMPACTION OF SUBGRADE FILLING

Basecourse material shall be placed and compacted in layers with an uncompacted thickness not exceeding 150 mm and not less than 100 mm. Each layer shall be compacted by multiple passes of a smooth steel wheeled roller or other plant approved by the Engineer, to not less than 95% relative standard compaction in terms of NZS 4402: Part 2, 1981
Test 14.

Compaction of basecourse shall take place at a water content appropriate to the plant being used. If water is required to be added, a fine mist spray shall be used and excess water shall be prevented from damaging the subgrade or sub-base.

The Contractor shall provide daily site tests to monitor the compaction being achieved. Tests shall be carried out at the rate of one test for every twenty cubic metres of filling placed. The laboratory engaged by the Contractor to provide the testing service is to be approved by the Engineer before backfilling commences.

The first step in the process of developing a business plan is to conduct a thorough market research. This involves identifying the target market, understanding the needs and preferences of the customers, and analyzing the competitive landscape. The second step is to develop a clear and concise business model, which outlines the company's revenue streams, cost structure, and overall value proposition.

Once the business model is established, the next step is to create a detailed financial plan. This includes projecting the company's income, expenses, and cash flow over a period of time, typically three to five years. The financial plan should also include a break-even analysis to determine the point at which the company becomes profitable.

After the financial plan is completed, the next step is to develop a marketing and sales strategy. This involves identifying the most effective channels for reaching the target market, determining the pricing strategy, and outlining the sales process. The marketing and sales strategy should be integrated with the overall business plan to ensure a cohesive and effective approach.

The final step in the process is to create a comprehensive business plan document. This document should include all the information gathered in the previous steps, presented in a clear and organized manner. The business plan is a critical tool for securing financing, as it provides potential investors and lenders with a detailed overview of the company's operations, financials, and growth potential.

In addition to the business plan, it is also important to develop a strong management team. The management team should consist of individuals with relevant experience and skills, who are committed to the company's vision and mission. A strong management team is essential for the successful execution of the business plan.

Overall, the process of developing a business plan is a complex and iterative one. It requires a deep understanding of the market, a clear vision of the company's future, and a commitment to thorough planning and execution. By following these steps, entrepreneurs can increase their chances of success in the competitive business environment.

The business plan is a living document that should be reviewed and updated regularly as the company grows and the market evolves. It is a key tool for managing the company's resources and achieving its long-term goals.

One of the most important aspects of the business plan is the financial plan. This section provides a detailed overview of the company's financial performance, including its income, expenses, and cash flow. The financial plan is based on realistic assumptions and projections, which are derived from market research and industry trends. It is a critical tool for assessing the company's financial health and determining its ability to sustain its operations over the long term.

The marketing and sales strategy is another key component of the business plan. This section outlines the company's approach to reaching its target market and generating revenue. It includes a detailed analysis of the competitive landscape, as well as a clear and concise description of the company's unique value proposition. The marketing and sales strategy should be integrated with the overall business plan to ensure a cohesive and effective approach.

The business plan is a critical tool for securing financing, as it provides potential investors and lenders with a detailed overview of the company's operations, financials, and growth potential. It is a key document that should be reviewed and updated regularly as the company grows and the market evolves. By following these steps, entrepreneurs can increase their chances of success in the competitive business environment.

15. FILTER MATERIAL

The filter material to be placed beneath the basement slab shall comprise NRB type F2 graded filter material. The Contractor shall supply to the Engineer a sample of the material to be used for independent analysis. The Engineer reserves the right to reject any material and/or supply of material for use on the site.

The filter material should be placed and compacted in accordance with section 14 above. Extreme care should be taken to prevent contamination of the filter layer during placing and compaction. The subfloor Novaflo drains should be protected with a minimum of 100 mm thickness of filter material all around to prevent contamination and possible blocking of the drains.

16. DRAINAGE MATERIAL

The drainage material to be placed within the drainage tunnels formed within the basement slab shall comprise washed rounded pebbles of size 13 mm to 20 mm. The pebbles must be clean and free of contamination or fines. Crushed stones are not acceptable.

17. DRAINS

Supply and place the Novaflo drains as detailed on the drawings and in accordance with the manufacturers instructions. Splice separate lengths of Novaflo carefully to prevent fouling of the drains.

The subfloor drains shall be placed beneath the basement slab and located within the filter material such that there is a minimum of 200 mm of filter material on top of the Novaflo and 100 mm of filter material around the other sides of the Novaflo. Connect these drains to the spigots cast in to the sides of the main drainage channel.

The subfloor drains are provided to protect the basement slab against uplift until sufficient of the superstructure has been completed to counter-balance the uplift forces.

UNDER NO CIRCUMSTANCE SHOULD THE SUB FLOOR DRAINS BE CAPPED UNTIL THE ENGINEER HAS GIVEN HIS WRITTEN APPROVAL.

1. Introduction

The purpose of this study is to investigate the effects of various factors on the performance of a system. The study is organized as follows: Section 2 describes the methodology used in the study. Section 3 presents the results of the study. Section 4 discusses the implications of the findings. Section 5 concludes the study.

The study is based on a series of experiments conducted over a period of six months. The experiments were designed to test the hypothesis that the system's performance is affected by the number of users, the amount of data, and the complexity of the tasks. The results of the experiments are presented in Section 3.

2. Methodology

The methodology used in this study is based on a series of experiments. The experiments were designed to test the hypothesis that the system's performance is affected by the number of users, the amount of data, and the complexity of the tasks. The results of the experiments are presented in Section 3.

3. Results

The results of the experiments show that the system's performance is significantly affected by the number of users, the amount of data, and the complexity of the tasks. The performance decreases as the number of users increases, as the amount of data increases, and as the complexity of the tasks increases.

The results also show that the system's performance is not significantly affected by the type of tasks. The performance is similar for all types of tasks, regardless of their complexity. This suggests that the system is designed to handle a wide range of tasks.

The results of the experiments are summarized in Table 1. The table shows the performance of the system for different numbers of users, different amounts of data, and different types of tasks.

The results of the experiments are summarized in Table 1. The table shows the performance of the system for different numbers of users, different amounts of data, and different types of tasks.

The drainage tunnels within the basement slab itself are provided to protect the upper slab in the event that some slight leaks occur through the lower slab. Place Novaflo drains within the 150 mm cast-in sleeves to connect the drainage tunnels to each other and to the main drainage channel. Fill the drainage tunnels with drainage material as specified in section 16.

18. PRESSURE RELIEF PORTS

Provide pressure relief ports through the lower part of the basement slab as shown on the drawings. These ports are provided to further protect the basement slab from uplift in the event that the sub floor drains become blocked. These ports must be capped once sufficient superstructure has been completed to counter-balance the uplift forces.

UNDER NO CIRCUMSTANCES SHOULD THE PRESSURE RELIEF PORTS BE CAPPED UNTIL THE ENGINEER HAS GIVEN HIS WRITTEN APPROVAL.

19. SHORING AND UNDERPINNING

Carry out the shoring and underpinning as shown on the drawings.

Refer to the piling specification for the driving of the shoring piles.

The underpinning details are based on assumed foundations for the neighbouring buildings. These will need to be confirmed during excavation of the site. The Contractor shall notify the Engineer when each foundation is exposed and shall not carry on with the underpinning work until written approval has been given by the Engineer.

The underpinning shall be carried out in stages with every second soldier completed initially and then the remaining soldiers completed during the second stage. The Contractor shall be responsible for the stability and integrity of the neighbouring buildings and shall make good any damage caused.

The following information is provided for the purpose of illustrating the application of the provisions of the Act. It is not intended to constitute a contract or any other legal instrument. The information is provided for the purpose of illustrating the application of the provisions of the Act. It is not intended to constitute a contract or any other legal instrument.

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B PILING

1. SCOPE

This section includes but is not limited to the supply in place of all piles, including reinforcing, as detailed on Smith Leuchars Ltd drawings and summarised below:

- (i) the installation of the steel shoring piles
- (ii) the boring and installation of reinforced concrete foundation piles, including belled bases
- (iii) the driving and installation of reinforced concrete bulbed piles.

2. SAFETY

Notwithstanding the requirements of this specification, nothing contained herein shall absolve the Contractor from responsibility for the temporary and permanent safety of the concrete work.

Where, in the opinion of the Contractor anything contained in this specification, the drawings or Engineer's instructions would impair the safety of the work, he shall immediately inform the Engineer in writing requesting further instructions, and shall thereafter carry out such instructions.

3. SUPERVISION

The Contractor shall be wholly responsible for producing concrete with the specified properties. Produce and place all concrete under the supervision of a foreman experienced in this class of work, under the control of a registered Engineer all as described in NZS 3109 (1980).

No concrete placing shall commence until the Engineer is satisfied that all provisions of this specification with respect to foundations, formwork, reinforcing, construction joints, etc. have been complied with. The Contractor shall give the Engineer at least 24 hours notice of intention to pour.

1. **Introduction**

2. **Methodology**

The study was conducted using a qualitative approach, involving interviews with participants who were selected through purposive sampling. The data was collected through semi-structured interviews and analyzed using thematic analysis.

3. **Results and Discussion**

The results of the study indicate that there is a significant relationship between the variables studied. The findings suggest that the proposed model is valid and can be used to predict the outcome of the study.

4. **Conclusion**

5. **References**

1. Smith, J. (2010). The impact of social media on communication. *Journal of Communication*, 40(1), 1-15.

2. Jones, A. (2012). The role of technology in education. *Education Research Review*, 15(1), 1-10.

3. **Appendix**

4. **Table 1**

5. **Table 2**

4. STANDARDS

Unless noted to the contrary in this specification materials for and the construction of reinforced concrete shall be in accordance with NZS 3109 (1980) (metric version) including all current amendments; a copy of this standard shall be kept on site.

The related documents listed on page 6 of NZS 3109 (1980) (or their current metric equivalents) shall also be taken to be requirements of this specifications.

Where there is any conflict in requirements between this section of the specification and NZS 3109 (1980) the former shall take precedence.

5. ORDER OF WORK

The order of carrying out the Concretor's work shall be agreed with the Engineer and shall conform to the agreed programme for the work as a whole and the Contractor shall adhere to this schedule.

6. DRAWINGS

All concrete work specified hereafter shall be carried out in strict accordance with the drawings and instructions as issued.

7. ADMIXTURES

Incorporate no admixtures in the concrete unless specified or otherwise approved in writing by the Engineer. If approved, use strictly in accordance with the Manufacturer's directions and carefully measure the correct quantities under expert supervision. Calcium chloride or any derivative thereof will not be permitted under any circumstances.

8. AGGREGATES

Coarse and fine aggregates shall comply with the requirements of NZS 3121. Coarse aggregate shall have a maximum size of 20 mm.

9. CEMENT

Cement shall comply with the requirements of NZS 3122 Portland Cement (ordinary and rapid hardening) and all subsequent amendments. All cement shall be delivered in the original sealed bags of the manufacturer or in bulk

QUESTION

1. A company is considering a new investment project. The project has a 50% chance of being successful and a 50% chance of failing. If successful, the project will generate a cash flow of \$100,000. If it fails, the project will generate a cash flow of -\$50,000. The company's cost of capital is 10%. What is the NPV of the project?

2. A company is considering a new investment project. The project has a 50% chance of being successful and a 50% chance of failing. If successful, the project will generate a cash flow of \$100,000. If it fails, the project will generate a cash flow of -\$50,000. The company's cost of capital is 10%. What is the NPV of the project?

3. A company is considering a new investment project. The project has a 50% chance of being successful and a 50% chance of failing. If successful, the project will generate a cash flow of \$100,000. If it fails, the project will generate a cash flow of -\$50,000. The company's cost of capital is 10%. What is the NPV of the project?

ANSWER

1. The NPV of the project is \$25,000. The expected cash flow is \$25,000, and the present value of the expected cash flow is \$25,000 / 1.1 = \$22,727.27. The NPV is \$22,727.27 - \$0 = \$22,727.27.

QUESTION

2. A company is considering a new investment project. The project has a 50% chance of being successful and a 50% chance of failing. If successful, the project will generate a cash flow of \$100,000. If it fails, the project will generate a cash flow of -\$50,000. The company's cost of capital is 10%. What is the NPV of the project?

ANSWER

2. The NPV of the project is \$25,000. The expected cash flow is \$25,000, and the present value of the expected cash flow is \$25,000 / 1.1 = \$22,727.27. The NPV is \$22,727.27 - \$0 = \$22,727.27.

QUESTION

3. A company is considering a new investment project. The project has a 50% chance of being successful and a 50% chance of failing. If successful, the project will generate a cash flow of \$100,000. If it fails, the project will generate a cash flow of -\$50,000. The company's cost of capital is 10%. What is the NPV of the project?

ANSWER

3. The NPV of the project is \$25,000. The expected cash flow is \$25,000, and the present value of the expected cash flow is \$25,000 / 1.1 = \$22,727.27. The NPV is \$22,727.27 - \$0 = \$22,727.27.

container approved by the manufacturer. Rapid hardening cement may be used only when the brand and the proposed method of use are approved by the Engineer.

When cement is stored it shall be protected to prevent deterioration. Any damp, lumpy or otherwise defective cement shall not be used. The system of storage shall be such that cement consignments are used in order of delivery and each consignment is to be kept separate and distinguished from other deliveries. If, in the opinion of the Engineer, cement has been damaged in transit or during storage, then it shall be immediately removed from the site.

10. WATER

Use only fresh clean water of drinking quality for concrete, mortar, grout, cleaning out and wetting formwork, washing materials and for curing.

11. REINFORCEMENT

Reinforcement steel shall be to the varying requirements of type as shown on the drawings. Steel shall comply with the following standards or their metric equivalents:

- | | |
|-----------------|---|
| NZS 3421: 1975 | Hard drawn mild steel wire concrete reinforcement. |
| NZS 3402P: 1973 | Hot rolled steel bars for concrete reinforcement. |
| NZS 3422: 1975 | Welded fabric of drawn steel wire for concrete reinforcement. |

Steel reinforcement shall be free from all paint, grease, mill or rust scale or other coatings that will destroy or reduce the bond. Steel which has been allowed to oxidise to the extent that resultant pitting has reduced the effective cross sectional area to less than the permitted rolling minimum shall be rejected.

Where reinforcement is not particularly specified or detailed for concrete, the Contractor shall ask the Engineer for his instructions.

Review of any placing drawings and lists by the Engineer shall in no way relieve the Contractor of his responsibility for the accuracy of these drawings and for the correctness of the fabrication and placing, setting out and erection of the reinforcing steel, and the cost of rectifying any errors shall be at the Contractor's sole expenses. Supply and incorporate

in the work all reinforcement complete with tie wire, spacer bars, support bars and bar chairs and the like all as necessary to complete the work.

Where concrete spacers are used these are to be manufactured from structural concrete as used in the work with embedded ties which are to be of stainless steel or non-corrosive wire.

Supply copies of the steelworks test certificates for the piling reinforcement to the Engineer for check against design criteria.

12. STORAGE AND HANDLING

Storage and handling of materials shall be to the requirements of NZS 3109 and related documents.

13. READY MIXED CONCRETE

The use of ready mixed concrete for the production of any concrete elements associated with the works shall be permitted provided it is from a supplier who has satisfied the Engineer that the production of his concrete complies in all respects with the requirements of NZS 3104 and of this specification. Before any concrete is placed in the works the various mix designs shall be submitted to the Engineer for review.

14. CONCRETE GRADES AND STRENGTHS

Concrete grades and strengths for the various parts of the building shall be as noted on the drawings and shall be in accordance with NZS 3109 (1980) in respect to design, placing and testing, except where modified by this specification.

Concrete for the piles shall be 25 MPa unless noted otherwise.

Unless otherwise specifically stated slump values shall not vary from the values given in Table 6 of NZS 3109 (1980) by more than + 25 mm.

15. SAMPLING AND TESTING OF CONCRETE

15.1 Concrete Testing

Compression tests and slump tests shall be carried out during the progress of the work generally to the requirements of NZS 3109 9.5 except that four cylinders are to be cast. One cylinder shall be tested at 7 days and

the other three at 28 days and this latter will constitute a 28 day set. Allow for an additional five comparison tests (four cylinders each) to be prepared as and when directed by the Engineer. The Contractor shall provide at his own cost sufficient standard moulds for concrete specimens 100 mm diameter x 200 mm high, one standard slump mould and any other apparatus required to carry out the tests and shall be responsible for maintaining all apparatus in good order and condition. On completion of the contract all apparatus will remain the property of the Contractor. The Contractor shall be responsible for the casting, marking, advice and delivery to the laboratory of the concrete specimens to the satisfaction and under the supervision of the Engineer. All compression tests shall be carried out in an independent testing laboratory and the 7 day strength shall be at least 70% of the 28 day strength called for on the drawings. The cost of the compression and slump tests is to be allowed for in the basic concrete rates.

15.2 Certificates

Retain on site one copy of the manufacturer's certificate for each batch of ready-mix concrete delivered to site.

16. REJECTION

The Engineer may reject any concrete because of failure to conform with the requirements of this specification.

Upon request, the Engineer's approval may be given for the Contractor to carry out suitable tests on the rejected concrete and the Contractor shall bear the cost of such tests and of all labour and materials required for the provision of such tests and making good on completion of the tests.

Rejected concrete for which testing approval was sought and not approved, for which testing approval was not sought, which failed to withstand suitable tests, and which it was impracticable to test, shall be cut out within the limits defined by the Engineer removed from the site and replaced with new concrete conforming to the requirements of this specification at the Contractor's expense.

The Engineer may reject any truckload of ready mixed concrete because of failure to conform with the requirements of this specification or failure to provide or complete the concrete manufacturer's delivery docket.

The first part of the paper discusses the importance of the research and the objectives of the study. It then presents a literature review of the existing research on the topic. The second part of the paper describes the methodology used in the study, including the data collection and analysis techniques. The third part of the paper presents the results of the study, and the fourth part discusses the implications of the findings. The paper concludes with a summary of the main findings and a list of references.

References

1. Smith, J. (2010). The importance of research.

2. Jones, A. (2011). The methodology used in the study.

3. Brown, C. (2012). The results of the study.

4. White, D. (2013). The implications of the findings.

5. Black, E. (2014). The summary of the main findings.

6. Green, F. (2015). The list of references.

7. Grey, G. (2016). The importance of research.

17. PLACING REINFORCEMENT

The reinforcing for each pile shall be of the sizes given and fabricated in rigid cages as shown on the drawings. If practicable main longitudinal bars shall be supplied in single lengths but when necessary laps in the main bars shall be 60 diameters unless shown otherwise on the drawings. Lapped bars must be tied to the spiral binding at sufficient points to ensure that the whole cage is rigid, and can be handled without distortion or damage. The specified cover shall be maintained by welding approved steel spacers to 100 mm x 10 mm stiffened hoops. The cages shall be adequately supported at the top to hold the bottoms of the main bars 75 mm above the final founding level. The cages will not be permitted to extend into any spigot that may have been formed. Welding of grade 380 steel shall be subject to the Engineer's approval, providing a welding supervisor is engaged and provided the bars are preheated and treated to the steel manufacturers specifications. Tenderers shall allow for all shop drawings and bar bending schedules that may be required for the production of the cages.

18. TOLERANCES

The reinforcing cage shall be nowhere less than the nominal diameter given on the drawings. The maximum and minimum diameters of the pile cage measured at any given level shall not differ by more than 50 mm.

When a plumb line is passed through the centre of the pile at the top of the casing then:

- (a) This line shall pass within 75 mm of the pile's design vertical axis as given on the drawings.
- (b) The line shall pass within 50 mm of the centre of the reinforcing cage at any point within 3.0 m of the casing top and 75 mm at any point lower down the pile.

19. PLACING AND VIBRATION OF CONCRETE

The mix design and full details of the proposed method of placing the concrete must be submitted to the Engineer for his approval before commencing work on the site, and shall be such that the reinforcing is not displaced and the completed pile contains no voids, and provides complete protection for the reinforcement.

1. Introduction

The purpose of this study is to investigate the effects of a new educational program on student performance. The program, which was implemented in the first semester of the 2023-2024 academic year, aims to improve students' understanding of the subject matter and their ability to apply the knowledge in practical situations. The study will focus on the following research questions:

- What are the effects of the program on students' knowledge and skills?
- How do students perceive the program and its impact on their learning?
- What factors influence the effectiveness of the program?

The study will be conducted using a quasi-experimental design, comparing the performance of students who participated in the program (experimental group) with those who did not (control group). The data will be collected through pre-test and post-test assessments, as well as questionnaires and interviews. The results of the study will be used to evaluate the program's effectiveness and to provide feedback for its improvement.

2. Literature Review

The literature review examines the existing research on the effectiveness of educational programs. It highlights the importance of evaluating the impact of such programs and the various factors that can influence their success. The review also identifies the gaps in the current knowledge and the need for further research in this area.

The review focuses on the following aspects:

- Theoretical framework: The review discusses the theoretical basis of the program, including the learning theories and models that inform its design.
- Empirical evidence: The review summarizes the findings of previous studies that have evaluated the effectiveness of similar programs.
- Methodological considerations: The review discusses the challenges and limitations of conducting such studies and the importance of using rigorous research methods.

The review concludes that there is a need for more research on the effectiveness of educational programs and that the current study will contribute to this body of knowledge by providing a detailed evaluation of the program's impact.

The review also identifies the following research gaps:

- The need for more studies that focus on the long-term effects of educational programs.
- The need for more studies that explore the role of individual factors (e.g., student motivation, prior knowledge) in the effectiveness of the program.
- The need for more studies that use mixed-methods approaches to evaluate the program's impact.

3. Methodology

The methodology section describes the research design, data collection methods, and data analysis techniques used in the study. The study uses a quasi-experimental design, which involves comparing the performance of two groups of students: the experimental group (those who participated in the program) and the control group (those who did not). The data will be collected through pre-test and post-test assessments, as well as questionnaires and interviews. The data analysis will involve statistical tests to compare the performance of the two groups and to identify the factors that influence the program's effectiveness.

The top concrete surface of the first stage of pouring is to be treated as a construction joint as described in NZS 3109, Section 5.6. This also applies to any other concrete surface where the placed concrete sets so that it cannot be made plastic by revibration.

20. SHORING PILES

20.1 Scope

This section covers the supply and installation of vertical structural steel soldier piles for the perimeter shoring of the excavation.

The Contractor shall supply store, pitch and drive the soldier piles at the locations shown on the drawing and in accordance with the requirements of this specification.

The Contractor shall provide all materials, plant, labour and supervision to carry out the works as specified.

20.2 Soldier Piles

Each soldier pile shall comprise unused steel sections of continuous lengths to provide for the cantilever and pile embedment as given on the drawings. The structural steel used for the soldier piles shall be in accordance with AS 1204 "Structural Steel Ordinary Weldable Grades".

20.3 Inspection

All materials and procedures shall be subject to inspection by the Engineer or his representative during any stage of fabrication and erection.

20.4 Rejections

Defective material or workmanship found at any time prior to the final acceptance of the work will be rejected. Defective materials shall be removed and replaced by the Contractor at his own expense and he shall be responsible for all delays caused by rejection. Any rejected work or material is to be repaired or replaced without delay.

20.5 Driving of Piles

The Contractor shall have available pile driving equipment to install the soldier piles to the embedded elevations as shown on the drawings.

Piles are to be top driven with a single action drop weight hammer fitted to a crane operated pile driving frame fitted with adequately sized leaders ties and straps. The use of vibrating plant without an adequate driving frame, leaders, etc. is not permitted.

The Contractor shall use all necessary driving helmets, cushions, packers, girders, etc. to fully protect the pile from damage due to top driving. Any damage to the piles resulting from the Contractor's overall operation while piles are stored, lifted, transported, positioned and driven, shall be made good at the Contractor's expense.

Piles shall be driven to the embedment elevations irrespective of the number of blows required.

If difficulty is experienced in fully driving the piles to the required depths, the Contractor may predrill and temporarily line vertical shafts extending from ground level to RL 0.0 metres. Piles shall be installed vertically inside the shafts and then driven to the embedment level. On completion of driving the temporary shaft liner shall be extracted.

20.6 Tolerances on Soldier Piles

All soldier piles shall be positioned and installed with tolerances as follows:

- (i) Vertical position at time of driving $\pm 50\text{mm}$
- (ii) Verticality on line of shoring 1 in 50 over cantilever length
- (iii) Verticality transverse to lined shoring 1 in 50 over full length of pile

Forcible corrections to the piles where as-driven they exceed the position and verticality tolerances specified above shall not be made.

Piles which exceed the tolerances specified shall be extracted, reset and redriven.

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 3, 1801. It is a very important document, as it is the first time that the President has addressed the Congress since the establishment of the office.

2. The second part of the document is a report from the Secretary of the Navy, dated January 10, 1801. It contains information about the state of the Navy and the progress of the construction of new ships.

3. The third part of the document is a report from the Secretary of the Treasury, dated January 15, 1801. It contains information about the state of the Treasury and the progress of the collection of taxes.

4. The fourth part of the document is a report from the Secretary of the War, dated January 20, 1801. It contains information about the state of the War and the progress of the military operations.

5. The fifth part of the document is a report from the Secretary of the Interior, dated January 25, 1801. It contains information about the state of the Interior and the progress of the settlement of the western lands.

6. The sixth part of the document is a report from the Secretary of the Education, dated February 1, 1801. It contains information about the state of the Education and the progress of the establishment of schools.

7. The seventh part of the document is a report from the Secretary of the Agriculture, dated February 5, 1801. It contains information about the state of the Agriculture and the progress of the cultivation of the land.

8. The eighth part of the document is a report from the Secretary of the Commerce, dated February 10, 1801. It contains information about the state of the Commerce and the progress of the trade.

9. The ninth part of the document is a report from the Secretary of the Marine, dated February 15, 1801. It contains information about the state of the Marine and the progress of the construction of new ships.

10. The tenth part of the document is a report from the Secretary of the Air, dated February 20, 1801. It contains information about the state of the Air and the progress of the construction of new ships.

20.7 Extraction

The shoring piles are provided for temporary ground retention only and may be withdrawn on completion of the level 2 slab and subsequent backfilling between the shoring and the basement walls. Any soldier piles used for underpinning should be cut free of the underpinning concrete prior to being extracted.

21. BORED PILES

Before drilling starts on any pile the positions of all piles and steel sections shall be set out and checked and certified by an Engineer or Registered Surveyor employed by the Contractor for this purpose. No work on any pile is to proceed until this certification has been delivered to the Engineer.

The pile shafts shall be drilled by machine to not less than the diameters shown on the drawings and to such depths that the bells if any are formed in material which is firm enough to stand safely after the sloping sides of the bells have been formed and, at the same time, the bases of the piles are founded on material which is capable of maintaining the design loadings.

Estimated founding depths have been determined from boring information and are shown on the drawings. The design pressures at these estimated founding depths have been based on the assumption that pile bases will be located in a layer of colluvium comprised primarily of grey wacke debris.

Every second pile shall be proof tested prior to drilling, under the supervision of approved Soils Engineering Consultants.

If the assumed conditions are not observed within the proving depth, the piles shall be deepened accordingly on the written instruction of the Engineer. The base of each pile shaft shall be hand cleaned and inspected prior to pouring concrete.

Final founding depths and levels shall be determined by the Engineer from the inspections of the founding materials and/or tests in each pile position.

All safety precautions necessary shall be provided to allow the Engineer to inspect the excavation, this shall include an air supply to the base of the shaft, electric light, assistance and full time attendance at the shaft by an experienced foreman. Pumps used in shafts shall have explosion proof

1. Introduction

The purpose of this study is to investigate the effects of the proposed system on the performance of the system. The study is divided into two main parts: a theoretical analysis and an experimental evaluation. The theoretical analysis is based on the principles of the system and the experimental evaluation is based on the results of the experiments.

2. Theoretical Analysis

The theoretical analysis is based on the principles of the system. It is divided into two main parts: a theoretical analysis of the system and a theoretical analysis of the results. The theoretical analysis of the system is based on the principles of the system and the theoretical analysis of the results is based on the results of the experiments.

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electric motors. The Contractor shall be responsible for the stability of the excavation and safety of his own workmen or other persons who may have to enter the excavation and shall comply with the requirements of the Construction Regulations 1967 and amendments.

Tenderers shall allow in their tender for the supply and driving of temporary protective steel casing or other temporary ground support if necessary extending from the level from which the piles are drilled down to the top level of the bells or rock below. The temporary support may be withdrawn or removed after concrete has been placed.

The protective casing shall be sufficiently strong to hold the surrounding material and to withstand being driven.

The casing shall be driven as drilling proceeds.

After drilling to the final founding level the bases of the piles shall be belled or shaped to the sizes shown on the drawings. Mechanical belling equipment may be used and the material then trimmed by hand where necessary to achieve the specified slope. The bases of the piles shall be horizontal over the whole area except that a central spigot to hold the belling equipment will be allowed to extend below the final founding level. The edges of such spigots shall be chamfered or rounded. All piles are to be inspected by the Engineer before concrete is poured.

After excavation and immediately before placing the reinforcing and concrete, the base of the excavation shall be cleaned of all loose material and all water removed by bailing or pumping.

The Contractor shall keep a complete record of each pile showing dates and times taken for excavation, driving, casing and concreting, the types and depths of materials encountered during excavation, the actual lengths of casing driven and reinforcing placed and the final founding level of the piles.

Allowance is to be made for 12 hours standing time per pile for plant, supervision and labour involvement between the hours of 9 am and 5 pm Monday through Friday to allow a decision on the founding levels.

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The eleventh is that the system is not a simple one, and that the results of the analysis are not always clear.

Concrete placing shall be co-ordinated with the withdrawal of casings to achieve the minimum 75 mm cover outside the spiral reinforcement, avoid ground water ingress, and ensure full compaction for the full diameter and length of every pile.

22. CONCRETE BULBED PILES

22.1 Scope

This section includes, but is not limited to, the supply in place of all reinforced concrete bulbed piles, including reinforcing.

The piles are detailed on Smith Leichars Ltd drawings.

Piles are detailed as driven bulb type (alternatively known as enlarged base type).

22.2 Load Capacities

The piles shall have the ultimate load capacities noted on the drawings.

In the building calculations, the ultimate capacities have been divided by 1.1 to derive allowable ultimate loads for seismic conditions, and by 1.8 to derive allowable ultimate loads for vertical dead plus reduced live load conditions, in accordance with the recommendations in NZS 4203: 1984.

Actual pile lengths shall be determined on site, and shall be related to a set to achieve the required loads, the relationship between such loads, and sets to be made by the use of formulae approved by the Engineer.

Tension piles shall not be shorter than specified. Allow to predrill as necessary to achieve this length.

The founding depth of all piles shall be subject to the Engineer's approval prior to pouring concrete.

22.3 Tolerances

The reinforcing cage shall be nowhere less than the nominal diameter given on the drawings nor cover to main steel less than 75 mm. The maximum and minimum diameters of the pile cage measured at any given level shall not differ by more than 50 mm.

When a plumb line is passed through the centre of the pile cage at the top of the casing then:

- (a) This line shall pass within 75 mm of the pile's design vertical axis as given on the drawings.
- (b) The line shall pass within 50 mm of the centre of the reinforcing cage at any point within 3.0 m of the finished pile top level and 75 mm at any point lower down the pile.

The top of the concrete in the pile is to be within 40 mm of the level shown on the drawings.

22.4 Records

The Piling Contractor shall keep records of the installation of each pile. These shall be made available to the Engineer at the end of each week's work. Any unexpected driving conditions shall be noted in the records.

The records shall include the following:

- (a) Contract
- (b) Pile reference number
- (c) Pile type
- (d) Nominal diameter
- (e) Date and time of driving
- (f) Date of concreting
- (g) Ground level at commencement of installation of pile
- (h) Depth from working level to pile toe

- (i) Toe level
- (j) Length of casing
- (k) Type, weight, drop and mechanical condition of hammer
- (l) Number and type of packings used and type and condition of dolly used during driving
- (m) Sets taken at intervals during the last 3 m of driving
- (n) Set of pile tube in mm per 10 blows or number of blows per 25 mm of penetration
- (o) Temporary compression of ground and pile from time of a marked increase in driving resistance until pile reaches its final level
- (p) Length and details of reinforcement
- (q) Concrete mix
- (r) Volume of concrete supplied to pile
- (s) All information regarding obstructions, delays and other interruptions to the sequence of work

22.5 Concrete Placing

Concrete placing shall be co-ordinated with the withdrawal of casings to achieve the minimum 75 mm cover outside the spiral reinforcing, avoid ground water ingress, and ensure full compaction for the full diameter and length of every pile.

Piles shall be over filled as required, depending on method of compaction of concrete, and cutting down of tops shall be sufficient to leave sound concrete.

1. **Introduction**

2. **Background**

3. **Methodology**

4. **Results**

5. **Discussion**

6. **Conclusion**

7. **References**

8. **Appendix**

9. **Index**

10. **Summary**

11. **Abstract**

12. **Keywords**

13. **Notes**

14. **References**

C. CONCRETE AND REINFORCING STEEL

1. GENERAL

1.1 Conditions of Contract

Refer to the Conditions of Contract which are binding on all sections.

1.2 Scope

The work in this section includes, but is not limited to, the supply and placing of concrete work together with sundry items in connection therewith including reinforcement and formwork.

1.3 Safety

Notwithstanding the requirements of this specification, nothing contained herein shall absolve the Builder from responsibility for the temporary and permanent safety of the concrete work.

Where, in the opinion of the Builder, anything contained in this specification, the drawings or Engineer's instructions would impair the safety of the work, he shall immediately inform the Engineer in writing requesting further instructions, and shall thereafter carry out such instructions.

1.4 Supervision

The Contractor shall be wholly responsible for producing concrete with the specified properties. Produce and place all concrete under the supervision of a foreman experienced in this class of work, under the control of a registered engineer all as described in NZS 3109 (1980).

No concrete placing shall commence until the Engineer is satisfied that all provisions of this specification with respect to foundations, formwork, reinforcing, construction joints, etc. have been complied with. The Contractor shall give the Engineer at least 24 hours notice of intention to pour.

1. **Introduction**

2. **Methodology**

3. **Results and Discussion**

4. **Conclusion**

5. **References**

The purpose of this study is to investigate the effects of the proposed system on the performance of the system. The study is divided into two main parts: a theoretical analysis and an experimental evaluation. The theoretical analysis is based on the principles of the system and the experimental evaluation is based on the results of the experiments.

6. **Appendix**

The appendix contains the detailed description of the system and the results of the experiments. The appendix is divided into two main parts: a theoretical analysis and an experimental evaluation. The theoretical analysis is based on the principles of the system and the experimental evaluation is based on the results of the experiments.

The results of the experiments show that the proposed system has a significant impact on the performance of the system. The results are presented in the following table. The table shows the results of the experiments for different values of the parameters. The results are presented in the following table.

7. **References**

The references are listed in the following table. The table shows the references for the theoretical analysis and the experimental evaluation. The references are listed in the following table.

The references are listed in the following table. The table shows the references for the theoretical analysis and the experimental evaluation. The references are listed in the following table.

1.5 Standards

Unless noted to the contrary in this specification materials for and the construction of reinforced concrete shall be in accordance with NZSS 3109 (1980) (metric version) including all current amendment; a copy of this standard shall be kept on site.

The Related Documents listed on page 6 of NZSS 3109 (1980) (or their current metric equivalents) shall also be taken to be requirements of this specification.

Where there is any conflict in requirements between this section of the specification and NZSS 3109 (1980) the former shall take precedence.

1.6 Order of Work

The order of carrying out the Contractor's work shall be agreed with the Engineer and shall conform to the agreed programme for the work as a whole and the Contractor shall adhere to this schedule.

1.7 Drawings

All concrete work specified hereafter shall be carried out in strict accordance with the drawings and instructions as issued.

1.8 Admixtures

Incorporate no admixtures in the concrete unless specified or otherwise approved in writing by the Engineer. If approved, use strictly in accordance with the Manufacturer's directions and carefully measure the correct quantities under expert supervision. Calcium chloride or any derivative thereof will not be permitted under any circumstances.

1.9 Work for Subcontractors

Build in fillets, cast in fastenings, bolts and sleeves, and form all holes, recesses and chases as required by all subcontractors.

1.10 Protection

The Contractor shall be wholly responsible for protecting the works. In particular, protect all brickwork and all fairface concrete work from damage staining and contamination of any sort, and keep all projecting bolts, lugs and other fixings free from damage.

During curing of concrete the work shall be protected from damage by workmen, equipment, overloading or any other cause.

During the concreting of beams on other structures take special measures as necessary to prevent leakage of grout or water into areas where permanent damage may occur.

1.11 Concrete Surface Finishes

ALL concrete surface finishes shall be to the type detailed within the Contract Documents and shall be in accordance with NZS 3114 (1980) including all current amendments.

1. **Introduction**

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants. The study was conducted in a controlled environment, and the results are presented in the following sections.

The study was conducted in a controlled environment, and the results are presented in the following sections.

The study was conducted in a controlled environment, and the results are presented in the following sections.

2. **Methodology**

The study was conducted in a controlled environment, and the results are presented in the following sections.

2. MATERIALS

2.1 Aggregates

Coarse and fine aggregates shall comply with the requirements of NZS 3121. Coarse aggregate shall have a maximum size of 20 mm.

2.2 Cement

Cement shall comply with the requirements of NZS 3122 Portland Cement (ordinary and rapid hardening) and all subsequent amendments. All cement shall be delivered in the original sealed bags of the manufacturer or in bulk container approved by the manufacturer. Rapid hardening cement may be used only when the brand and the proposed method of use are approved by the Engineer.

When cement is stored it shall be protected to prevent deterioration. Any damp, lumpy or otherwise defective cement shall not be used. The system of storage shall be such that cement consignments are used in order of delivery and each consignment is to be kept separate and distinct from other deliveries. If, in the opinion of the Engineer, cement has been damaged in transit or during storage, then it shall be immediately removed from the site.

2.3 Water

Use only fresh clean water of drinking quality for concrete, mortar, grout, cleaning out and wetting formwork, wash materials and for curing.

2.4 Reinforcement

Reinforcement steel shall be to the varying requirements of type as shown on the drawings. Steel shall comply with the following standards or their metric equivalents:

NZS 3421:1975	Hard drawn mild steel wire concrete reinforcement
NZS 3402P:1973	Hot rolled steel bars for concrete reinforcement
NZS 3422:1975	Welded fabric of drawn steel wire for concrete reinforcement

1. **Introduction**

2. **Background**

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants.

3. **Method**

The study was conducted using a between-subjects design. The participants were divided into two groups: the control group and the experimental group. The control group used the standard system, while the experimental group used the proposed system. The dependent variable was the time taken to complete the task.

The results of the study showed that the proposed system significantly reduced the time taken to complete the task compared to the standard system. This indicates that the proposed system is more efficient than the standard system.

4. **Conclusion**

The study concluded that the proposed system is more efficient than the standard system. This suggests that the proposed system should be used in future studies.

5. **References**

Smith, J. (2010). The effects of the proposed system on the performance of the participants. *Journal of Information Systems*, 34(2), 123-134.

6. **Appendix**

Table 1: Description of the proposed system.

7. **Table 1**

Table 1: Description of the proposed system.

8. **Table 2**

Table 2: Description of the proposed system.

Steel reinforcement shall be free from all paint, grease, mill or rust scale or other coatings that will destroy or reduce the bond. Steel which has been allowed to oxidise to the extent that resultant pitting has reduced the effective cross sectional area to less than the permitted rolling minimum shall be rejected.

Where reinforcement is not particularly specified or detailed for concrete, the Contractor shall ask the Engineer for his instructions.

Review of any placing drawings and lists by the Engineer shall in no way relieve the Contractor of his responsibility for the accuracy of these drawings and for the correctness of the fabrication and placing, setting out and erection of the reinforcing steel, and the cost of rectifying any errors shall be at the Contractor's sole expense.

Supply and incorporate in the work all reinforcement complete with tie wire, spacer bars, support bars and bar chairs and the like all as necessary to complete the work.

Bar chairs and/or spacers shall be of an approved metal, plastic or concrete type. Metal chairs shall be galvanised where the legs will be exposed in finished concrete surfaces.

Where concrete spacers are used these are to be manufactured from structural concrete as used in the work with embedded ties which are to be of stainless steel or non-corrosive wire.

2.5 Storage and Handling

Storage and handling of materials shall be to the requirements of NZS 3109 and related documents.

2.6 Ready Mixed Concrete

The use of ready mixed concrete for the production of any concrete elements associated with the works shall be permitted provided it is from a supplier who has satisfied the Engineer that the production of his concrete complies in all respects with the requirements of NZS 2086 and of this specification. Before any concrete is placed in the works the various mix designs shall be submitted to the Engineer for review.

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

1. **Identify the main components of the system.**
 2. **Define the scope and objectives of the study.**
 3. **Review the literature related to the topic.**
 4. **Develop a methodology for data collection and analysis.**
 5. **Collect and analyze the data.**
 6. **Draw conclusions and discuss the implications of the findings.**
 7. **Write the report and present the results.**

The following table shows the results of the regression analysis for the dependent variable "Perceived Organizational Support" (POS). The independent variables are "Organizational Commitment" (OC) and "Organizational Identification" (OI). The table includes the regression coefficients (B), standard errors (SE), t-statistics, and p-values for each variable.

Variable	B	SE	t	p
OC	0.12	0.03	3.87	0.000
OI	0.08	0.02	3.21	0.001
Constant	1.50	0.10	15.00	0.000

The regression equation is: $POS = 0.12OC + 0.08OI + 1.50$. The adjusted R-squared value is 0.45.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

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The following table shows the results of the regression analysis for the dependent variable "Number of publications" (N = 100). The independent variables are "Gender" (Male/Female), "Age" (20-30/31-40/41-50/51-60/61-70/71+), "Education" (Bachelor's/Master's/PhD), "Experience" (0-5/6-10/11-15/16-20/21-25/26-30/31+), and "Research Area" (Biology/Chemistry/Physics/Mathematics/Engineering/Medicine/Other). The table displays the coefficients, standard errors, t-statistics, and p-values for each variable.

3. CONCRETE

3.1 Concrete Grades and Strengths

Concrete grades and strengths for the various parts of the building shall be as noted on the drawings and shall be in accordance with NZS 3109 (1980) in respect of design, placing and testing, except where modified by this specification.

Unless noted otherwise on the drawings, concrete strengths shall be as follows:

Piles	25 MPa
Foundations & basement slab	25 MPa
Basement walls & shear walls	30 MPa
Precast frames	40 MPa
Precast floor units	25 MPa
unless specified otherwise	25 MPa

Unless otherwise specifically stated slump values shall not vary from the values given in Table 6 of NZS 3109 (1980) by more than ± 25 mm.

3.2 Sampling and Testing of Concrete

3.2.1 Concrete Testing

Compression tests and slump tests shall be carried out during the progress of the work generally to the requirements of NZSS 3109 9.5 except that four cylinders are to be cast. One cylinder shall be tested at 7 days and the other three at 28 days and this latter will constitute a 28 day set. Allow for an additional five comparison tests (four cylinders each) to be prepared as and when directed by the Engineer. The Contractor shall provide at his own cost sufficient standard moulds for concrete specimens 100 mm cdia x 200 mm high, one standard slump mould and any other apparatus required to carry out the tests and shall be responsible for maintaining all apparatus in good order and condition. On completion of the contract all apparatus will remain the property of the Contractor. The Contractor shall be responsible for the casting, marking, advice and delivery to the laboratory of the concrete specimens to the satisfaction and under the supervision of the Engineer. All compression tests shall be carried out in an independent testing laboratory and the 7 day

1. **Introduction**

2. **Background and Context**

The purpose of this study is to investigate the impact of the proposed changes on the overall system performance. The study is based on a series of experiments conducted over a period of six months. The results of the experiments are presented in the following sections.

The study is organized as follows: Section 3 describes the experimental setup and the data collection process. Section 4 presents the results of the experiments, and Section 5 discusses the conclusions and the implications of the study.

Experiment	Results
Experiment 1	Results of Experiment 1
Experiment 2	Results of Experiment 2
Experiment 3	Results of Experiment 3
Experiment 4	Results of Experiment 4
Experiment 5	Results of Experiment 5

The results of the experiments show that the proposed changes have a significant impact on the overall system performance. The results are presented in the following sections.

3. **Experimental Setup**

3.1. **System Configuration**

The experimental setup consists of a series of experiments conducted over a period of six months. The results of the experiments are presented in the following sections. The experiments are designed to investigate the impact of the proposed changes on the overall system performance.

The experiments are conducted using a series of test cases that are designed to simulate the real-world environment. The results of the experiments are presented in the following sections.

The results of the experiments show that the proposed changes have a significant impact on the overall system performance. The results are presented in the following sections.

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strength shall be at least 70% of the 28 day strength called for on the drawings. The cost of the compression and slump tests is to be allowed for in the basic concrete rates.

3.2.2 Certificates

Retain on site one copy of the manufacturer's certificate for each batch of ready-mix concrete delivered to site.

3.3 Rejection

The Engineer may reject any concrete because of failure to conform with the requirements of this specification.

Upon request the Engineer's approval may be given for the Contractor to carry out suitable tests on the rejected concrete and the Contractor shall bear the cost of such tests and of all labour and materials required for the provision of such tests and making good on completion of the tests.

Rejected concrete for which testing approval was sought and not approved, for which testing approval was not sought, which failed to withstand suitable tests, and which it was impracticable to test, shall be cut out within the limits defined by the Engineer, removed from the site and replaced with new concrete confirming to the requirements of this specification at the Contractor's expense.

The Engineer may reject any truckload of ready mixed concrete because of failure to conform with the requirements of this specification or failure to provide or complete the concrete manufacturer's delivery docket.

3.4 Placing Reinforcement

Placing of reinforcement shall comply with the requirements of NZSS 3109 (1980) and as follows:

Bars intended to be in contact at passing points shall be securely wired together at all such points with 1.6 mm dia annealed soft iron tying wire or approved clips.

Binders, stirrups and links shall tightly embrace the bars with which they are intended to be in contact.

Reinforcement projecting from work being concreted, or already concreted, shall not be set out of its correct position for any reason unless approved. It shall be protected from deformation and other damage.

Rods with kinks or bends not shown shall not be used. All reinforcing fabric shall be supplied on flat sheets.

Any reinforcement which has been damaged while fixing in position shall be replaced.

3.5 Inserts and Openings

Cast in to concrete pipe sleeves, service lines and other fixings and fittings and make provision for the penetrations required by other trades and subcontractors and set out the positions of such penetrations accurately in conjunction with the specialists concerned.

Provide and maintain securely in position all cast-in items, during the placement of concrete.

Cut off projecting sleeves to finish flush with the adjacent faces of structural concrete.

Form all holes, recesses, chases and openings to the sizes and in the positions shown on the drawings.

3.6 Mixing, Transporting and Placing

Do not deposit concrete in wet trenches or running water.

Deposit concrete as nearly as practicable to its final position. Free dropping of concrete from a height greater than 1.2 metres or dumping of a large quantity away from its final position and working it along the forms will not be permitted.

Concreting shall proceed at such a rate that it remains sufficiently plastic to be worked readily into the final position.

Do not place concrete at a rate greater than that which will permit satisfactory compaction, nor to a depth greater than 450 mm before compaction. Provide adequate labour to ensure that the concrete is compacted to these requirements.

1. The first step in the process of creating a new product is to identify a market need. This involves conducting market research to determine what consumers are looking for and what problems they are trying to solve.

2. Once a market need has been identified, the next step is to develop a concept for a product that meets that need. This involves brainstorming ideas and selecting the most promising one.

3. The third step is to create a prototype of the product. This allows the designer to test the product and make any necessary adjustments before moving forward with production.

4. The fourth step is to conduct a feasibility study. This involves assessing the technical, financial, and market viability of the product.

5. Once the feasibility study has been completed, the next step is to develop a business plan. This document outlines the company's goals, strategies, and financial projections, and is used to attract investors and secure funding.

6. The sixth step is to secure funding. This can be done through a variety of methods, including venture capital, angel investors, and crowdfunding.

7. Once funding has been secured, the next step is to develop a marketing plan. This involves identifying the target market and developing strategies to reach and persuade potential customers.

8. The eighth step is to produce the product. This involves manufacturing the product and distributing it to the market.

9. The final step is to monitor the product's performance in the market and make any necessary adjustments.

10. The process of creating a new product is an ongoing one, and it is important to continue to monitor the market and make improvements as needed.

11. The process of creating a new product is a complex one, and it requires a lot of time, money, and effort. However, if done correctly, it can result in a successful product that meets a market need and generates a profit.

12. The process of creating a new product is a continuous one, and it is important to stay up-to-date on the latest trends and technologies in the market.

13. The process of creating a new product is a team effort, and it is important to have a strong team of people with different skills and experiences working together.

Except where the use of construction joints is approved, place each monolithic portion of the work in one continuous operation. The order of placing shall be as required by the Engineer, and shall be so arranged that new concrete is continually being placed against unset concrete so that a monolithic structure shall result.

Before placing concrete around any steelwork, such steelwork shall be securely fixed in position on correct alignment, level and rigidly held in such a manner that it will not be displaced during placement of concrete.

Beams shall be poured to the full height of each unit. Vertical and horizontal construction joints shall be permitted in predetermined locations only after approval by the Engineer.

Runways along which concrete will be transported shall be built over the reinforcement and in an approved manner. All preparation work shall be inspected and approved by the Engineer before pouring is commenced.

3.7 Vibrating

All concrete except concrete in sprayed walls shall be vibrated sufficiently to produce dense concrete of a uniform texture. Concrete in vertical sections shall be placed in layers not exceeding 500 mm deep, and each layer shall be vibrated by methods which will not permit the ingredients to separate. Finished surfaces shall be smooth (unless otherwise specified) and free from voids.

Vibrators shall be of sturdy construction, adequately powered and capable of transmitting to the concrete not less than 4,500 impulses per minute when operating under load.

To ensure that full compaction of the concrete is attained the number of vibrators employed shall be related to the rate of placement of concrete such that vibration throughout the entire volume of each layer of concrete is completed.

Internal vibrators shall be employed at uniformly spaced points not farther apart than the diameter over which the vibrator is visibly effective and shall be applied close enough to the forms to vibrate the surface concrete effectively. Care shall be taken to avoid hitting the forms or reinforcements.

3.8 Curing and Protection

All concrete is to be cured.

Alternative wetting and drying will not be permitted during curing. Membrane curing is permitted.

Trowelled or other finished surfaces shall be shaded from the sun and effectively protected from premature drying as specified above. Stripping forms shall be carried out with care. Shaking must be avoided in stripping.

Work shall be protected from damage by workmen, equipment, overloading or any other cause.

Protect all concrete work from damage of any sort and keep all projecting bolts, lugs and other fixings free from damage.

3.9 Drilled in Dowels and Stirrups

Drill existing concrete and masonry elements to the depths shown on the drawings. Hole diameters shall be made a maximum of 6 mm larger than the diameter of the dowel or stirrup. Where possible and unless otherwise detailed on the drawing drill holes at a slope of 20° to the horizontal to facilitate filling with epoxy grout or neat cement grout.

After cleaning out holes and trial fitting of dowels or stirrups mix and place sufficient epoxy to a consistency to allow ready filling of holes for the full depth. Place sufficient grout to ensure that when inserted it just overflows from the hole fully enclosing the embedded dowel or stirrup.

Where holes are drilled to the specified slope to the horizontal use purpose made epoxy packs with sufficient material so that when inserted in the hole and mixed the volume completely surrounds the dowel or stirrup for the full embedded length.

3.10 Neat Cement Grout

Grout shall contain "Febgrout" or similar approved grout - expanding additive and shall be mixed according to the manufacturer's instructions and to a consistency suitable for its use.

1. **Introduction**

2. **Background**

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6. **Conclusion**

7. **References**

8. **Appendix**

9. **Notes**

10. **Footnotes**

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12. **Summary**

3.11 Epoxy Grout

In general, epoxy grout to be used for the purpose of bolt and reinforcing bar fixing shall be Araldite K80 or a similar approved epoxy.

4. JOINTS

4.1 Materials

Sealants

All sealants used shall be those manufactured by Expandite Ltd, or Epiglass Ltd or an approved equivalent, unless noted otherwise on the drawings. Joints to be sealed and the types of sealant to be used shall be as detailed on the drawings or as noted elsewhere in this specification. Joint surface preparation and sealant application shall be in strict accordance with the manufacturer's recommendations.

4.2 Construction Joints

A structural unit where mentioned in the specification shall mean a portion of the structure that must be poured in one continuous operation. Structural units shall start and finish at approved predetermined construction joints or levels.

Where concrete has taken its initial set by reason of placing being stopped or delayed before completion of that portion of the work, the point of stopping shall be deemed a construction joint.

1. Introduction

The purpose of this report is to provide a comprehensive overview of the current state of the market for renewable energy sources, with a particular focus on solar and wind power.

2. Market Overview

2.1 Global Market

2.1.1 Renewable Energy

The global market for renewable energy has experienced significant growth in recent years, driven by increasing awareness of the environmental benefits of clean energy and the need to reduce greenhouse gas emissions. Solar and wind power are the two most rapidly growing sources of renewable energy, with solar power leading the way in terms of capacity additions.

2.1.2 Renewable Energy

In addition to solar and wind power, other renewable energy sources such as hydropower, geothermal, and biomass also play a role in the global renewable energy market. However, their growth has been slower compared to solar and wind power.

The growth of the renewable energy market is expected to continue in the coming years, as governments around the world implement policies to support clean energy and reduce carbon emissions.

5. FORMWORK AND FALSEWORK

5.1 General

All staging, formwork and supports thereto shall be designed and constructed to the satisfaction of the Engineer, so braced and of such strength and stiffness as to safely support the loads directly and indirectly imposed upon them, and so that removal can be carried out without damage to the concrete. Soleplates shall be used for all supports which are supported on finished concrete surfaces.

Where concrete surfaces are scheduled to be plastered the surface forming the base of this finish shall be scarified with a stiff wire brush and thoroughly roughened by chipping or picking immediately the shuttering is removed to form a suitable base for the plastering. With the Engineer's approval a retarder may be used to assist the process but the responsibility for such use and the resulting reactions will be the Contractor's.

5.1.1 Types of Boxing

The Contractor may use any material for boxing provided that the requirements for texture and finish can be complied with and the materials used do not adversely affect the properties of the concrete.

5.1.2 Extent

All concrete work other than sprayed concrete walls shall be boxed unless the Engineer approves to the contrary in particular cases

5.1.3 Tightness and Rigidity of Forms

Joints being individual boards forming shutters, between adjoining shutters and elsewhere must be mortar tight at the time of pouring concrete and must remain so under the effects of the vibration necessary to give the full specified compaction to the concrete.

Forms shall be designed so that the deflection of the sheathing shall not exceed $1/300$ th of the span between joints or other supports and in any case shall not exceed 5 mm. They shall be of sufficient rigidity and strength to prevent distortion due to pressure from the concrete and other loads incidental to the construction operation, including the effects of vibration during the placing of concrete for which purpose, vibrated concrete shall be assumed to exert the same pressure as would a fluid of a density equivalent to that of unset concrete.

1. Introduction

1.1. Overview

The purpose of this document is to provide a comprehensive overview of the project's objectives, scope, and deliverables. This section will outline the key goals and the expected outcomes of the project, as well as the roles and responsibilities of the team members involved.

The project is designed to address the current challenges faced by the organization and to implement a new system that will improve efficiency and reduce costs. The project will be managed using a structured approach, with regular communication and reporting to ensure that the project stays on track and meets the required deadlines.

1.2. Project Objectives

The primary objectives of the project are to develop a new system that meets the requirements of the business and to ensure that the system is implemented successfully. The project will also aim to improve the overall performance of the organization and to provide a high level of customer satisfaction.

1.3. Scope

The project scope includes the development, testing, and deployment of the new system. It also includes the training of staff and the ongoing support and maintenance of the system after it has been implemented.

1.4. Project Organization

The project is organized into several teams, each responsible for a specific area of the project. The teams will work together to ensure that the project is completed on time and to the required quality standards.

The project manager will be responsible for overall project management, including planning, monitoring, and reporting. The project manager will also be responsible for ensuring that the project is completed within the allocated budget and that the project meets the required quality standards.

5.1.4 Vertical Surfaces

The methods of construction shall be such that vertical surfaces can be stripped without disturbing boxing or supports to soffits which may require to be left in place for a longer period.

5.1.5 Fillets, Chamfers and Bevels

Concrete which is to be left unfinished and elsewhere as indicated on the drawings shall have all internal and external corners filleted or bevelled 20 mm x 20 mm as appropriate.

Areas of concrete which are to receive applied finishes shall have all internal and external corners filleted or bevelled as appropriate to a dimension which will suit the applied finish and which will also ensure the easy removal of formwork without damage to the concrete.

At the top of all pours 25 mm grout checks shall be used to ensure clean, sharp, joint lines.

5.1.6 Temporary Fittings

Bolts and other temporary metal fittings used in formwork erection shall be placed so as to permit their easy removal to a depth of at least 50 mm from the face without injury to the concrete, and so that upon their removal the cavities left are of the smallest possible size. The cavities shall be filled to the Engineer's requirements. Where the face finish is Class F3 or better all joints and bolts shall be positioned to a regular pattern which has been approved by the Engineer.

5.1.7 Wire Ties

The use of wire ties for formwork is prohibited.

5.1.8 Re-use of Forms

Sound, unwarped forms may be re-used provided they will still satisfy the requirements of this specification.

1.1 Introduction

The purpose of this report is to provide a comprehensive overview of the current state of the art in the field of artificial intelligence (AI) and its applications. This report will discuss the various sub-fields of AI, including machine learning, natural language processing, and computer vision, and will explore the challenges and opportunities associated with these technologies.

1.1.1 Machine Learning

Machine learning is a subset of AI that focuses on the development of algorithms that can learn from data and make predictions or decisions based on that learning. This field has seen rapid growth in recent years, with applications ranging from spam filtering to self-driving cars.

One of the key challenges in machine learning is the need for large amounts of data to train models. This has led to the development of techniques for data augmentation and transfer learning, which allow models to learn from smaller datasets by leveraging knowledge from related tasks.

Another challenge is the interpretability of machine learning models. While these models can often achieve high accuracy, they can be difficult to understand, which can be a problem in applications where the decision-making process is critical.

1.1.2 Natural Language Processing

Natural language processing (NLP) is a sub-field of AI that focuses on the interaction between computers and human language. This field has seen significant advances in recent years, particularly in the area of machine translation and sentiment analysis. One of the key challenges in NLP is the need for large amounts of annotated data to train models. This has led to the development of techniques for data augmentation and transfer learning, which allow models to learn from smaller datasets by leveraging knowledge from related tasks.

1.1.3 Computer Vision

Computer vision is a sub-field of AI that focuses on the development of algorithms that can understand and interpret visual information from the world.

1.1.4 Robotics

Robotics is a sub-field of AI that focuses on the development of algorithms that can control robots and enable them to perform tasks in the real world. This field has seen significant advances in recent years, particularly in the area of autonomous navigation and manipulation.

5.1.9 Coating for Forms

The inside surface of all forms shall be given a coat of an approved parting-oil or similar which shall not adhere to or stain the concrete or they shall be saturated with water immediately prior to placing concrete. Except for water, such coatings shall be applied before placing reinforcing steel in order to avoid fouling steel surfaces. No oil based parting mediums may be used.

5.1.10 Cleaning

Immediately before any concreting is commenced, formwork shall be carefully examined to see that all dirt, shavings, sawdust and other refuse has been removed. See also Clause D6.1.11

5.1.11 Inspection of Doors

Openings shall be provided in the formwork to facilitate cleaning before concrete is poured. These openings together with any other openings provided for other purposes shall be fitted with closers equipped with fasteners capable of withstanding loads appropriate to the formwork design pressures.

5.1.12 Bulging

If during a pour, settlement, bulging or other defects become apparent in the formwork, the Contractor shall cease pouring and shall take all necessary steps to the satisfaction of the Engineer to remedy such defects.

5.2 Stripping and Removal

The stripping of formwork shall be done in accordance with Table 5 NZS 3109. Under special circumstances the Engineer may allow earlier or require later stripping times but no stripping shall take place until the concrete is 24 hours old.

Falsework shall be struck in such a manner as to permit the concrete to take the stress due to its own weight gradually and uniformly, without shock.

1. Introduction

The purpose of this study is to investigate the effects of various factors on the performance of a system. The study is organized as follows: Section 2 describes the system and the factors being studied. Section 3 presents the experimental design and the results of the experiments. Section 4 discusses the implications of the results and provides conclusions. Section 5 contains references.

2. System Description

The system under study is a computer system that performs a specific task. The factors being studied are the input data, the processing time, and the output results. The system is described in detail in the following sections.

3. Experimental Design

The experimental design consists of a series of experiments that are designed to test the system under different conditions. The results of the experiments are presented in the following sections. The experiments are designed to test the system's performance under different input data, processing times, and output results.

4. Results

The results of the experiments are presented in the following sections. The results show that the system's performance is affected by the input data, the processing time, and the output results. The results are discussed in detail in the following sections.

5. Conclusions

The conclusions of the study are that the system's performance is affected by the input data, the processing time, and the output results. The results of the experiments show that the system's performance is improved when the input data is improved, the processing time is reduced, and the output results are improved.

The study also shows that the system's performance is improved when the input data is improved, the processing time is reduced, and the output results are improved. The results of the experiments show that the system's performance is improved when the input data is improved, the processing time is reduced, and the output results are improved.

5.3 Remedial Treatment of Surfaces

Make no repairs to concrete unless specified or permitted by the Engineer.

Any remedial treatment to surfaces shall be carried out without delay and such treatment shall be agreed with the Engineer following an inspection immediately after the removal of the formwork.

The surface of any concrete which has been treated before being inspected by the Engineer shall be liable to rejection.

5.4 Tolerances

Tolerances shall be as specified in NZS 3109.

1. Introduction

2. Background

3. Methodology

4. Results

5. Conclusion

6. References

6. FLOORS

6.1 Floor Slabs

Where specified to have a screeded finish concrete floor surfaces shall be screeded to a level and uniform surface immediately on completion of vibration, the surface being worked no more than is essential and left until evaporation of all surface moisture has taken place. The surface shall be floated with a "Kelly" float or similar approved rotary power float when the concrete has hardened enough to prevent any excess of fine material and water being worked up to the surface. The concrete shall be finished to a smooth, hard surface which shall conform with the requirements of this specification, particularly in respect to tolerances and surface finish.

Immediately the required standard has been achieved a curing membrane shall be applied to the finished surface, refer to Clause 3.8.

Where specified to have a floated finish, hand float to a smooth and even surface.

Slabs specified to be prepared for future finishes shall be levelled to an even surface and treated as noted in the drawings.

Slab finishes are to be as ordered.

Power floating shall be carried out by an experienced operator and a test area shall be approved by the Engineer before general pouring of slabs is commenced. The test area shall be such as to enable the Contractor to show that he is able to comply with all aspects of this specification related to surface finish of floor slabs. Subsequent finishes shall conform to the approved area.

All surfaces visible on completion of the works shall be free from surface blemishes, entrapped air bubbles and ridges and surface displacements greater than 2 mm at joints.

Refer section 7.1 for prefinished precast floor slabs.

6.2 Floor Levels

Construct all concrete floor slabs accurately to the structural thickness shown on the drawings and to the correct levels to allow the full specified thickness of floor finish to be provided and finished to the correct datum.

The first step in the process is to identify the problem. This involves gathering information about the situation and understanding the needs of the stakeholders involved. Once the problem is identified, the next step is to develop a plan of action. This plan should outline the goals of the project, the tasks that need to be completed, and the resources that will be required. The third step is to implement the plan. This involves putting the plan into action and monitoring progress. The final step is to evaluate the results. This involves assessing the outcomes of the project and determining whether the goals have been achieved.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

1. *Journal of the American Medical Association*, 2000; 284: 2689-2695.

1. **Identify the main components of the system.**
 2. **Define the scope and objectives of the study.**
 3. **Review the literature related to the topic.**
 4. **Develop a methodology for data collection and analysis.**
 5. **Present the results and discuss their implications.**
 6. **Conclude the study and provide recommendations.**

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

1. **Identify the main topic of the passage.**
 2. **Identify the main purpose of the passage.**
 3. **Identify the main argument of the passage.**

6.3 Floor Joints

Floor joints shall be made as and where shown on the drawings.

Sawn joints shall be sawn as soon after pouring as the concrete shall have hardened sufficiently to permit this to be done without damaging the concrete. Sawn joints shall be cut 25 mm deep using a 5 mm blade. All sawing shall be done in straight continuous lines. As late as possible in the contract the sawn joints shall be filled flush with sealant.

Formed construction joints shall be cut as late as possible in the contract, the time for this being agreed with the Engineer before this work is started. The saw line shall be the exact line of the joint as disclosed by shrinkage. All sawing shall be done in straight continuous lines. Formed construction joints shall be cut 15 mm deep using a 5 mm blade. As late as possible in the contract, the formed construction joint shall be filled flush with sealant.

The Contractor shall ensure that foreign matter is prevented from entering a sawcut and that such sawcuts are clean and free from debris before filling.

All of this work shall be carried out by a specialist subcontractor approved by the Engineer.

Formed construction joints shall be roughened to produce a surface with peaks and valleys approximately 3 mm above and below the average level.

1. **Introduction**

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants.

The study was conducted in a controlled environment. The participants were recruited from a pool of volunteers. The study was approved by the ethics committee of the institution. The participants were informed of the purpose of the study and gave their informed consent. The study was conducted in a controlled environment. The participants were recruited from a pool of volunteers. The study was approved by the ethics committee of the institution. The participants were informed of the purpose of the study and gave their informed consent.

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7. PRECAST CONCRETE

7.1 Scope

This section covers all precast concrete work (other than proprietary precast floor units) and shall be read in conjunction with the remainder of this Specification as applicable.

The precast concrete units shall be manufactured and installed in accordance with the drawings and to the standards set down in this section of the specification.

7.2 Approved Sub-Contractor

The precast work shall be done by a specialist sub-contractor approved by the Engineer whose plant, materials and completed units are to be available for inspection by the Engineer at any reasonable time.

7.3 Shop Drawings

Submit to the Engineer for inspection three copies of the shop drawings of all precast concrete units indicating the location of each unit and its relationship to the adjacent building work. Indicate dimensions and profiles of each unit, reinforcement, location of lifting points and all fixing provisions and associated components. Two weeks is to be allowed for the processing of these drawings by the Engineer and no production may be commenced until the final drawings have been returned to the Contractor.

7.3 Responsibility

Inspection of shop drawings by the Engineer and permission to proceed shall in no way relieve the Contractor of his responsibility for the accuracy of these drawings and for the correctness of the fabrication, setting out and castings of the precast work. The cost of rectifying any errors shall be at the Contractor's sole expense.

7.4 Workmanship

Manufacture and handle precast concrete units in accordance with the requirements of the current CP 116 as published by the British Standards Institution.

1. Introduction

1.1. Overview

The purpose of this document is to provide a comprehensive overview of the project's objectives, scope, and deliverables. It serves as a reference for all stakeholders involved in the project.

The project aims to develop a new software application that will streamline the workflow of the department. The application will be designed to be user-friendly and efficient, ensuring that all team members can easily adopt it.

1.2. Project Objectives

The primary objectives of the project are to:

- Improve the efficiency of the current workflow.
- Reduce the time spent on manual tasks.
- Enhance the accuracy of data entry and reporting.

1.3. Scope

The project scope includes the development of a web-based application that will be accessible to all team members. The application will have the following features:

- User authentication and role-based access control.
- Data entry and management interface.
- Reporting and analytics module.
- Integration with existing systems.

The project will be completed within a timeline of 12 weeks, starting from the beginning of the year.

1.4. Deliverables

The project will deliver the following outputs:

- A fully functional web application.
- User manuals and training materials.
- Documentation of the system architecture and data flow.
- Final project report and evaluation.

1.5. Conclusion

This document provides a clear and concise overview of the project's goals and expectations. It is intended to serve as a guide for all team members and stakeholders involved in the project.

7.5 Rejection

The Engineer may reject any concrete because of failure to conform to the requirements of this specification.

7.6 Precast Spandrel

Where precast spandrels are specified, and prior to full production of precast spandrel units is commenced, provide for inspection and approval by the Engineer a prototype of a full assembly, comprising typical components and their fixings and sealing.

The prototype assemblies may be included in the building if approved by the Engineer.

7.7 Supervision

Carry out precast concrete work to all stages under the supervision of engineers and/or foremen experienced in the production and application of structural precast concrete.

The work is also subject to inspection by the Engineer at any stage. Give the Engineer written notice of not less than one working week of the commencement of production casting.

7.8 Identification

All units shall show a suitable identification mark indicating its position in the job, the concrete from which it was cast and the date on which it was cast.

7.9 Concrete Strength and Tests

The concrete used in precast work shall comply in all respects with the other clauses of this specification, unless specifically noted to the contrary on the drawings or elsewhere in this specification.

Concrete grades and strengths for the various units shall be as noted on the drawings.

7.10 Surface Finishes

Finish to all precast concrete units shall be as specified on the drawings.

1. **Introduction**

The purpose of this study is to investigate the effects of the proposed system on the performance of the system. The study is divided into two main parts: a theoretical analysis and an experimental evaluation.

2. **Theoretical Analysis**

In this section, we analyze the theoretical aspects of the proposed system. We start by defining the system's components and their interactions. We then discuss the system's performance metrics and the expected results of the proposed system.

The theoretical analysis shows that the proposed system is expected to improve the system's performance by reducing the system's complexity and increasing the system's efficiency.

3. **Experimental Evaluation**

In this section, we evaluate the proposed system experimentally. We describe the experimental setup, the data collection process, and the results of the experiments. The results show that the proposed system significantly improves the system's performance.

The experimental results show that the proposed system is effective in improving the system's performance. The results also show that the proposed system is robust and can handle various system configurations.

4. **Conclusion**

In conclusion, the proposed system is an effective solution for improving the system's performance. The system is robust and can handle various system configurations. The results of the experiments show that the proposed system significantly improves the system's performance.

5. **Acknowledgments**

We thank the anonymous reviewers for their valuable comments and suggestions. We also thank the funding agencies for their support of this research.

The authors would like to thank the anonymous reviewers for their valuable comments and suggestions. We also thank the funding agencies for their support of this research.

6. **References**

[1] J. Smith, "The effects of the proposed system on the performance of the system," *Journal of System Management*, vol. 10, no. 1, pp. 1-10, 1985.

7.11 Joints

Refer to drawings for joint locations.

Unless detailed otherwise provide joints of 12 mm minimum width between precast panels and between precast panels and cast in-situ elements.

The tolerance for joint widths shall be + 3mm.

Before sealing the joints provide concrete surfaces that are sound, smooth, clean and free of all mortar dust or other contaminants that may affect adhesion.

The whole of the joint preparation, cleaning, priming, sealing and finishing off shall be carried out strictly in accordance with the sealant manufacturer's written instructions and to the Engineer's approval.

7.12 Moulds

Provide accurate and rigid moulds conforming to the shape, lines and dimensions of the precast units to be produced and ensure the specified dimensional accuracy. All moulds shall be kept clean.

7.13 Reinforcement

Reinforcement shall comply in all respects with this specification.

On exposed faces the bar supports used to maintain the required cover and/or bar spacings shall be such as to present no visible evidence of their use after completion of the units.

7.14 Inserts

Cast in to the units all required inserts, including ferrules and fixings and mechanically bond them into the precast units by welding to the reinforcement. Ensure any surface plates and ferrules finish flush with the concrete surface.

Maintain all cast-in items securely in position during the placement of concrete.

1. **Introduction**

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants.

The study was conducted in a controlled environment, and the results were compared with the baseline data.

The following sections describe the methodology, results, and conclusions of the study.

The methodology section details the experimental design, including the participants, tasks, and data collection procedures.

The results section presents the data collected during the experiment, and the conclusions section summarizes the findings.

2. **Methodology**

The study was conducted using a controlled experimental design. The participants were divided into two groups: a control group and an experimental group.

3. **Results**

The results of the study are presented in the following table:

The table shows that the experimental group performed significantly better than the control group in all measured tasks.

4. **Conclusion**

The study concludes that the proposed system has a positive effect on the performance of the participants. The results suggest that the system can be used to improve performance in similar tasks.

The study also identifies some limitations and suggests areas for future research.

All precast panel connection brackets and all other cast-in components shall be galvanised in accordance with the requirements of the structural steelwork trade section and the weight of coating shall be not less than 380 gm/m^2 .

7.15 Compaction

All concrete shall be vibrated in accordance with the requirements of Clauses 3.6 and 3.7 or by alternative approved methods.

7.16 Curing

The minimum amount of curing of precast concrete sections shall consist of keeping the concrete moist for a period of at least 7 days if made with normal Portland cement, and for at least four days if made with high early strength cement.

Curing shall be carried out in accordance with the requirements of Clause 3.8 as applicable.

Steam curing methods may be employed. A minimum pre-setting period of two hours shall be allowed before the application of steam and this shall be followed by a minimum 8 hour period of steam curing. The temperature rise shall not exceed 2°C per minute. The minimum temperature shall be 54°C and the maximum 77°C .

During the curing period the temperature shall be maintained within $\pm 2^{\circ}\text{C}$ of the selected value. After cessation of steaming the product shall be allowed to cool gradually to air temperature.

Test cylinders representing the units poured shall be steam cured under identical conditions to ensure that they are truly representative.

If high early strength cement is used, adequate precautions shall be taken to avoid damage to the units by the inherently high heat of hydration.

Time for removal from moulds shall be related to the method of handling and the strength attained at such time and shall be subject to the Engineer's approval.

Units must have a minimum age of 21 days before they are delivered to the site or, alternatively, field control blocks may be used to establish a strength of at least 85% of the 28 day strength called for.

The first part of the paper is devoted to the study of the asymptotic behavior of the solutions of the system (1.1) as $t \rightarrow \infty$. It is shown that the solutions of the system (1.1) tend to zero as $t \rightarrow \infty$ if and only if the matrix A is Hurwitz.

2. Preliminary results

Let A be a constant matrix. We denote by $\lambda_1, \lambda_2, \dots, \lambda_n$ the eigenvalues of the matrix A . We assume that the matrix A is Hurwitz, i.e., $\operatorname{Re} \lambda_i < 0$ for all $i = 1, 2, \dots, n$.

3. Main results

The first main result of the paper is the following theorem. Let A be a constant matrix and let $x(t)$ be a solution of the system (1.1). Then, as $t \rightarrow \infty$, the solution $x(t)$ tends to zero if and only if the matrix A is Hurwitz.

The second main result of the paper is the following theorem. Let A be a constant matrix and let $x(t)$ be a solution of the system (1.1). Then, as $t \rightarrow \infty$, the solution $x(t)$ tends to zero if and only if the matrix A is Hurwitz.

Let us now consider the case when the matrix A is not Hurwitz. In this case, the solutions of the system (1.1) do not tend to zero as $t \rightarrow \infty$. However, it is possible to find a particular solution of the system (1.1) which tends to zero as $t \rightarrow \infty$. This particular solution is called the asymptotic solution of the system (1.1).

The asymptotic solution of the system (1.1) can be found by the method of variation of constants. Let $x(t)$ be a solution of the system (1.1). Then, the asymptotic solution of the system (1.1) is given by the formula

where $\Phi(t)$ is the fundamental matrix of the system (1.1) and c is a constant vector.

It is easy to see that the asymptotic solution of the system (1.1) tends to zero as $t \rightarrow \infty$ if and only if the matrix A is Hurwitz.

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7.17 Deliveries

The Contractor shall arrange deliveries to suit the general programme of the work. No extra cost will be allowed due to deliveries being either too early or too late for the programme.

7.18 Handling and Transportation

After curing, sections shall be stored, loaded and transported, unloaded and placed such that no longitudinal or transverse cracks develop. Adequate instructions are to be given to handlers and as far as possible only experienced men should be put in charge of this phase of work.

Units are to be stored in such a fashion that permanent sets do not occur due to solar effects.

To ensure the eventual placement of the sections in the structure without cracks, the handling whether manually or in slings or cradles, shall be done in such a manner that bending about either the vertical or the horizontal axis of the cross section will be reduced to a minimum. The final proposed method of handling the sections during erection is to be approved by the Engineer before work proceeds.

Provide lifting hooks adequate to handle all the loads involved and securely anchored to reinforcement. After erection, hooks shall be burnt off flush with the surface and given two coats of an approved zinc-rich primer.

7.19 Temporary Protection

Protect precast units adequately at all stages against damage and staining. Sub-standard or damaged units may be rejected at any stage and shall be replaced without additional cost to the Principal.

7.20 Patching

Make no repairs to precast units unless permitted by the Engineer, and then in strict accordance with this specification. Use only personnel experienced and skilled in precast concrete repair work.

1. **Introduction**

The purpose of this study is to investigate the effects of the proposed system on the performance of the system. The study is divided into two main parts: a theoretical analysis and an experimental evaluation.

2. **Theoretical Analysis**

The theoretical analysis is based on the assumption that the system is a linear system. The analysis is performed using the Laplace transform, which allows us to convert the differential equations governing the system into algebraic equations. The results of the analysis are presented in the following sections.

3. **Experimental Evaluation**

The experimental evaluation is performed using a computer simulation. The simulation is based on the mathematical model of the system. The results of the simulation are compared with the results of the theoretical analysis. The comparison shows that the simulation results are in good agreement with the theoretical results.

4. **Conclusion**

5. **References**

6. **Appendix**

7. **Index**

8. **Summary**

7.21 Tolerances

Permitted tolerances for finished concrete members shall be:

Transverse breadth and depth:	$\pm 3\text{mm}$
Overall length:	$\pm 3\text{mm}$
Deviation from straight	$\frac{L}{500}$

7.22 Precast Concrete Beams and Frames

Precast concrete beams shall be manufactured by a specialist sub-contractor approved by the Engineer. Shop drawings of all beams shall be submitted to the Engineer for inspection indicating the location of each unit and its relationship to the adjacent building work. Seven days is to be allowed for the processing of these drawings by the Engineer.

Inspection of shop drawings by the Engineer and permission to proceed shall in no way relieve the Contractor of his responsibility for the accuracy of these drawings and for the correctness of the fabrication, setting out and castings of the precast work. The cost of rectifying any errors shall be at the Contractor's sole expense.

All construction joints shall be roughed to produce a surface with peaks and valleys approximately 3 mm above and below the average level.

7.23 Precast Prefinished Floor Units

The precast floor units have been designed as prefinished and must therefore be cast and placed in position with sufficient accuracy to produce a level and uniform surface without humps, hollows or other discontinuities. The Contractor shall repair unsatisfactory areas of the floor at his own expense.

1. **Introduction**

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants.

The study was conducted in a laboratory setting. The participants were divided into two groups: the control group and the experimental group. The control group used the standard system, while the experimental group used the proposed system. The results of the study are presented in the following sections.

2. **Methodology**

The study was conducted in a laboratory setting. The participants were divided into two groups: the control group and the experimental group. The control group used the standard system, while the experimental group used the proposed system. The results of the study are presented in the following sections.

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3. **Results**

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8. PROPRIETARY PRECAST FLOORING

8.1 Alternative

The following specification is written to cover DY-CORE flooring, without in any way whatsoever wishing to limit competition by any other suitable equivalent alternative. Should a Tenderer wish to do so, he may submit an alternative Tender based on an equivalent suspended floor system. In that case, he shall advise the Engineer of all details of his proposed alternative with the Tender. The Engineer reserves the right at his absolute discretion, to reject any alternative he considers will not meet his requirements. Where an alternative system is used, the proprietor's instructions shall be exactly followed, should they be at variance with the following subclauses and no extra cost shall rise therefrom. The Tenderer will be required to demonstrate that such alternatives meet the requirements of the specification together with the maximum self weight, superimposed loading and fire rating criteria shown on the drawings.

8.2 General

Where shown on the Drawings, the suspended floor slabs shall be DY-CORE as manufactured by Stresscrete Limited under licence, and who shall be responsible for:

- (i) Design fully complying with NZS 4203: 1976 and NZS3101: 1982 and the preparation of the necessary suspended slab drawings and submission, in duplicate, of all calculations and drawings for review by the Engineer. Such review shall be to check the drawings generally and to verify that the seismic provisions of the overall building design (as shown on the drawings) are effectively incorporated into the flooring design. Comment or lack of comment by the Engineer after such review shall not be taken to mean that the Engineer accepts responsibility for the structural sufficiency of the flooring, which responsibility shall remain with the supplier at all times.

The live load and fire resistant rating for which the floor shall be designed is as shown on the drawings.

The first step in the process is to identify the problem. This involves gathering information about the situation and the people involved. Once the problem is identified, the next step is to analyze it. This involves breaking the problem down into its components and understanding how they are related. The third step is to develop a plan. This involves deciding on the best way to solve the problem and the steps that need to be taken. The fourth step is to implement the plan. This involves putting the plan into action and making sure that it is followed. The final step is to evaluate the results. This involves checking to see if the problem has been solved and if the solution is sustainable.

1. **Identify the main components of the system.**
 2. **Define the objectives and scope of the study.**
 3. **Formulate hypotheses or research questions.**
 4. **Design the methodology and data collection process.**
 5. **Analyze the data and draw conclusions.**
 6. **Present the findings and discuss their implications.**
 7. **Conclude the study and provide recommendations.**

The first part of the paper discusses the importance of the research and the objectives of the study. It then presents a literature review of the existing research on the topic. The second part of the paper describes the methodology used in the study, including the data collection and analysis techniques. The third part of the paper presents the results of the study, and the fourth part discusses the conclusions and implications of the findings.

[illegible]

- (ii) Provision of a written Design Certificate by a Registered Engineer of structural performance and sufficiency of the floor slab by the manufacturer, (which certificate may be tagged to the effect "providing that the construction, workmanship and materials are as specified"). Any deviations from this Specification required by the manufacturer must be brought to the notice of the Engineer by the Contractor before Tenders close, and written consent for such changes obtained from the Engineer.
- (iii) Direction and supervision during the unloading and placement of the prestressed slabs and during the pouring of the concrete topping.

8.3 Handling, Support and Placing of Members

This shall all be strictly in accordance with the manufacturer's written instruction. If temporary propping of the units is required until the floor reaches its design strength then an allowance to cover the cost of such propping shall be included in the rates.

8.4 Services

No holes may be made in the floor and no services may be accommodated within the structural topping concrete unless shown on the drawings or agreed in advance by the manufacturer and the Engineer.

8.5 Reinforcement

Refer also Section 2.4 of the specification.

Continuity reinforcing (for live load only) over the beams and topping reinforcing has been detailed on the drawings and the Contractor shall ensure that this reinforcing is satisfactory for the floor system being used. If this reinforcing is not satisfactory the Contractor shall allow in his Tender for the supply and placing of any additional reinforcing considered necessary.

Supply and fix mesh and other reinforcement as shown in the drawings, the cover to which shall be 20 mm. Diaphragm reinforcement from slab to beam or wall shall be as per detailed on the drawings, but in any case not less than D10 at 300 mm, and it shall be fully anchored.

The first step in the process is to identify the problem. This involves gathering information about the situation and the people involved. Once the problem is identified, the next step is to analyze it. This involves breaking the problem down into its components and understanding how they are related. The third step is to develop a plan. This involves deciding on the best way to solve the problem and the steps that need to be taken. The fourth step is to implement the plan. This involves putting the plan into action and making any necessary adjustments. The final step is to evaluate the results. This involves checking to see if the problem has been solved and if the solution was effective.

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

Abstract

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

The following table shows the results of the regression analysis for the dependent variable "Number of children in the household" (N = 1,000). The independent variables are "Age of the head of household" and "Gender of the head of household". The table includes the coefficient estimates, standard errors, t-statistics, and p-values for each variable.

[illegible]

8.6 Formwork and Screeds

Provide and fix formwork as required at slab perimeters, cutouts etc. The ends of all precast units are to be blanked off before pouring the structural screed.

Set screeds for the topping concrete to the required levels. The average thickness of topping concrete shall be 65 mm; however, the topping thickness at any point over the floor shall not be less than 50 mm.

Adequate shear connection shall be provided between the precast units and the screed.

8.7 Construction Joints

The location of all construction joints are to be agreed with Stresscrete and the Engineer before this work starts. Construction joints at right angles to units are not permitted without express approval from Stresscrete and the Engineer.

8.8 Concreting

Concrete in the suspended floor slabs and beams supporting the slabs shall be in accordance with this specification except it shall have:

Maximum aggregate size	-	12 mm
Maximum slump	-	115 mm
Compressive strength at 28 days	-	25 MPa

Thoroughly hose down the units prior to pouring the topping, making sure that the upper surface of the units is washed clean of all dirt. Place the topping concrete to the thickness specified in clause 8.6 above, ensuring that it is well vibrated around the reinforcement.

8.9 Timber Infills

These may be used with the Engineer's approval under certain circumstances. Timber shall comply with T.P.A. Specification C7.

1. Introduction

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants. The study was conducted in a controlled environment and the results are presented in the following sections.

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2. Methodology

The study was designed to evaluate the impact of the proposed system on the performance of the participants. The study was conducted in a controlled environment and the results are presented in the following sections.

3. Results

The results of the study show that the proposed system has a significant positive effect on the performance of the participants. The results are presented in the following sections.

Participant	Score
1	85
2	78
3	92
4	88
5	75

The results of the study show that the proposed system has a significant positive effect on the performance of the participants. The results are presented in the following sections.

4. Conclusion

The study concludes that the proposed system has a significant positive effect on the performance of the participants. The results are presented in the following sections.

8.10 Removal of Props

Temporary supports may be removed after ten days or when the concrete has developed a proven compressive strength of 17.5 MPa. For construction purposes, the floor may be loaded before prop removal (but not sooner than 48 hours after pouring of topping) in a manner approved by Stresscrete.

8.11 Fixings

The size and location of fixings which may be drilled into the DY-CORE units has been determined and these are shown on Sketch SK1, a copy of which is bound into this Specification at the end of this Section. Under no circumstances will drilling into units at other locations or any other alteration to the Units be permitted except with the express authority of the Engineer.

8.12 Surface Finish

U3X - as for U3 except for abrupt changes.

Consult with the Floor Coverings Subcontractor to ensure that the surface will enable him to achieve a perfect end result without any further preparatory work being required.

8.13 Concrete Floor Units

8.13.1 Strength and Quality Control

The nominal strength at 28 days shall be a minimum of 40 MPa.

8.13.2 Workability and Compaction

The concrete for the precast units shall always be of such workability as to satisfy all requirements for the surface finish and to produce a homogeneous mass which completely fills all the space, including all corners, and perfectly surrounds all reinforcement. The slump shall not exceed 50 mm.

Concrete shall be properly vibrated by internal or external vibrators. The use of vibrators shall not at any stage cause displacement of reinforcement, embedded fixtures, or disturb the formwork.

1. Introduction

The purpose of this study is to investigate the effects of various factors on the performance of a system. The study is organized as follows: Section 2 describes the system and the factors being studied. Section 3 presents the experimental design and the results of the experiments. Section 4 discusses the implications of the results and the conclusions of the study.

2. System Description

The system under study is a complex system with many components. The factors being studied are the input variables that affect the system's performance. The system's performance is measured by the output variables. The system is modeled as a black box, and the input variables are varied to observe the effect on the output variables.

3. Experimental Design

3.1. Factorial Design

The experimental design is a factorial design, which allows for the study of the main effects and the interactions between the factors. The factors are the input variables, and the levels are the values of the input variables. The output variables are the performance measures.

3.2. Data Collection

The data were collected by running the system for each combination of the factors.

The data were analyzed using statistical methods to determine the main effects and the interactions between the factors.

3.3. Results

The results of the experiments show that the system's performance is affected by the input variables. The main effects and the interactions between the factors are discussed in detail. The results are presented in tables and graphs.

The conclusions of the study are that the system's performance is significantly affected by the input variables. The main effects and the interactions between the factors are important in determining the system's performance.

8.13.3 Concreting and Curing

Units shall be cured either by being kept continuously moist until the required release strength is achieved, or by low pressure steam curing.

All concrete shall be protected from the effects of frost, drying winds or other harmful conditions for 14 days after casting.

8.13.4 Floor units shall be supplied free from cracking, broken edges, hogging or sag and twisting and any units considered unsatisfactory by the Engineer shall be removed from site.

8.14 Finishes to Concrete Floor Units

Finishes to the concrete floor units shall meet the following requirements:

- (i) The finish to the underside of precast concrete floor units shall be general commercial fair face finish. However, panels which have honey-combing, are broken or which have defects which will in any way impair their strength will not be accepted.
- (ii) The upper surface of all concrete units shall be sufficiently rough in order to provide satisfactory bond with the in-situ concrete to the requirements of N.Z.S.R.32.

8.15 Openings

Where any flooring units are terminated by an opening and cannot be carried through to the main supporting structural member, then the supplier shall be responsible for the design and detailing of the trimming required to accommodate such openings.

1. Introduction

The purpose of this study is to investigate the effects of the proposed system on the performance of the system. The study is divided into two main parts: a theoretical analysis and an experimental evaluation.

The theoretical analysis is based on the assumption that the system is designed to improve the performance of the system. The experimental evaluation is based on the assumption that the system is designed to improve the performance of the system.

The results of the study show that the proposed system has a significant positive effect on the performance of the system. The results are consistent across all the experiments conducted.

2. Theoretical Analysis

The theoretical analysis is based on the assumption that the system is designed to improve the performance of the system. The study is divided into two main parts: a theoretical analysis and an experimental evaluation.

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The results of the study show that the proposed system has a significant positive effect on the performance of the system. The results are consistent across all the experiments conducted.

3. Experimental Evaluation

The experimental evaluation is based on the assumption that the system is designed to improve the performance of the system. The study is divided into two main parts: a theoretical analysis and an experimental evaluation.

D. CONCRETE MASONRY

1. SCOPE

The work specified in this section includes the supply and construction of the concrete masonry.

2. STANDARD SPECIFICATIONS

Masonry shall comply with the appropriate clauses in NZS 4210P: 1981 and current amendments.

3. TESTS

At the beginning of all masonry work at least one test sample of the mortar and grout shall be taken on each of three successive working days and continuously stored in moist air until tested, for each test given in the table below, and these shall meet the minimum strength given therein.

Additional samples shall be taken whenever any change in materials or job conditions occur or whenever in the opinion of the Engineer such tests are necessary.

In making the mortar test specimens, the mortar shall be taken from the unit soon after spreading. After moulding, the mould shall be carefully protected by a covering which shall be kept damp for at least 24 hours after which specimens shall be stored and treated as required for concrete cylinders.

Grout prisms may be made by filling the cell of a block similar to that proposed for the construction. The shell of the unit shall be removed prior to the compression test.

4. MORTAR AND GROUT STRENGTHS

Minimum mortar and grout strengths shall be as follows:

	<u>7 days</u>	<u>28 days</u>
Mortar	6.20	12.4
Grout	8.20	17.3

1. **Introduction**

2. **Background**

3. **Methodology**

4. **Results**

5. **Discussion**

6. **Conclusion**

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14. **References**

If compression tests fail to develop a minimum compression strength at 28 days, the work may be deemed to be defective and shall be replaced without cost to the Employer.

5. CONCRETE BLOCKS

Concrete blocks shall be modular concrete masonry units nominally 390mm long, 190 mm high and either 140 mm or 190 mm wide as indicated on the drawings. Use correspondingly fractional blocks for bond and closures.

Blocks shall be machine made, of uniform shape, obtained from an approved source and constructed with a well compacted concrete having a low water cement ratio and shall be manufactured in accordance with NZS 3102 and shall be "Vibrapac" or similar approved by the Engineer.

Use open end blocks, lintel blocks, etc for building around reinforcing.

"Knock in" bond beams shall not be used unless approved by the Engineer.

Concrete blocks shall be carefully handled and stacked to preserve clean, sharp arrises. Blocks shall be covered with tarpaulins if stacked without weather protection.

Where any form of masonry anchor or bolting is required for securing plates or fittings to the walls, place expanded metal in the cavities affected and fill solid with mortar.

Bond beams and lintel blocks, where required to reinforce heads of walls and to trim door openings, shall be of similar thickness to wall blocks and of same manufacture and to same standard.

Blocks with chipped or broken arrises or corners will be rejected. Where cut blocks are required, blocks shall be machine cut.

6. MORTAR

Cement, sand, water and waterproofing compounds shall conform to Section 2. of the "Concrete and Reinforcing Steel" Section of the specification. All mortar shall be machine mixed and shall be in accordance with NZS 1900, Chapter 9.2, which requires a minimum crushing strength of 12.4 MPa at 28 days. Proportion of cement to sand shall be 1.4 by weight. An approved plasticising agent may be added to the gauging water in strict accordance with the manufacturer's instructions, and with the Engineer's approval.

the following information is required to be provided to the public:

1. The name of the person or entity

2. The address of the person or entity

3. The nature of the business or activity

4. The date of the last inspection

5. The name of the inspector

6. The date of the next inspection

7. The name of the person or entity responsible for the inspection

8. The name of the person or entity responsible for the inspection

9. The name of the person or entity responsible for the inspection

10. The name of the person or entity responsible for the inspection

11. The name of the person or entity responsible for the inspection

12. The name of the person or entity responsible for the inspection

7. TIES AND REINFORCEMENT

Starter rods for securing brick walls to concrete work and existing work are shown on the drawings.

Reinforce all cavity brick walls as shown on the structural drawings.

Reinforcement shall be as specified in the "Concrete and Reinforcing Steel" section of the specification.

8. GROUT FOR FILLING BRICKWORK CAVITIES

The whole of the work to be in accordance with NZS 4210P, 1981. All cavities shall be filled solid.

The nominal mix proportions for cement for filling the cells shall be composed of one part Portland cement, two parts sand, two parts 12.5 mm aggregate. The water cement ratio shall not exceed 0.7.

When the cells of the hollow masonry exceed 100 mm in least dimensions, concrete of maximum size aggregate of 20 mm may be used. The mix shall have a minimum compressive strength of 17.5 MPa at 28 days.

9. WORKMANSHIP STANDARDS

All masonry work shall be laid in accordance with NZS 1900 Chapter 9.2 by experienced brick or block layers under the direct supervision of a registered brick or block layer.

10. RETEMPERING MORTAR

Any mortar which has stiffened within one hour of mixing may be retempered with sufficient water to regain the slump specified above. Retempering water shall be added into a basin formed in the mortar and carefully and completely worked in. Retempering by splashing water over mortar without full mixing will not be permitted.

11. LAYING

All concrete blocks shall be laid dry. Lay blocks generally in stretcher bond. No portion of the work shall be carried up more than 1.2 metres above any adjoining part. All blockwork shall be fairface finished. The joints

1. Introduction

The purpose of this study is to investigate the effect of the proposed method on the performance of the system.

The results of the study are presented in the following sections.

The study is organized as follows. Section 2 describes the proposed method. Section 3 presents the experimental results. Section 4 concludes the study.

2. Proposed Method

The proposed method is based on the following steps:

1. Data Collection: The data is collected from the system.

2. Data Preprocessing: The data is preprocessed to remove noise and outliers.

3. Experimental Results

The experimental results are presented in the following tables.

4. Conclusion

The study concludes that the proposed method has a significant effect on the performance of the system.

5. References

[1] Author, "Title of the reference," *Journal Name*, vol. X, no. Y, pp. Z, 20XX.

shall be neatly and uniformly finished with joints formed to slightly concave profile flush at the edges with the surface of the blocks, and the blocks set perfectly flush in position. All other work shall have mortar struck off the joints as the work arises.

All reinforced masonry shall be built to preserve vertical continuity of the cells to be filled so that a minimum continuous clear flue is not less than 75 mm x 50 mm and the cross webs of these cells shall be fully bedded in mortar.

Mortar overhangs and droppings not otherwise accessible shall be removed by hosing with a jet stream at least twice per day and no excess mortar shall be allowed to harden before removal.

Where cut blocks are required at either horizontal or vertical joints, they shall be machine cut. Leave block openings at bottom of walls to facilitate cleaning out and block up on completion.

12. GROUTING

Grouting of the wall may be carried out using either the low lift grouting method or the high lift grouting method as specified in NZS4210P: 1981.

Where cut blocks are required at either horizontal or vertical joints, they shall be machine cut. Leave block openings at bottom of walls to facilitate cleaning out and block up on completion.

12.1 Low Lift Grouting Method

The maximum height of pour shall generally be 1200 mm except that this height shall be restricted to 400 mm when using 100 mm blocks. All grout must be fully compacted by vibrating.

12.2 High Lift Grouting Method

The maximum height of pour shall be 3.6 m as a semi-continuous operation with each separate lift not exceeding 1200 mm in height. After each separate lift the grout shall be fully compacted by vibrating and then left for a period of time for the grout to settle. This period of time shall be sufficient for the grout to become plastic but not so that it takes on any permanent set, and in any case, shall be not less than 15 mins. nor more than 60 mins. After the settling period, the next lift may be grouted and the complete sequence repeated for each lift.

1. The first step in the process of identifying a problem is to recognize that a problem exists. This involves gathering information about the situation and identifying the specific issue that needs to be addressed.

2. Once a problem has been identified, the next step is to define the problem clearly. This involves stating the problem in a concise and specific manner, and identifying the goals that need to be achieved to solve the problem.

3. The third step in the process is to generate potential solutions. This involves brainstorming ideas and considering different approaches to solving the problem. It is important to consider a wide range of options and to evaluate the potential benefits and drawbacks of each.

4. The fourth step is to select the best solution. This involves evaluating the potential solutions and choosing the one that is most likely to be effective and feasible. It is important to consider the resources available and the potential risks of each solution.

5. Implementing the solution

5. The fifth step is to implement the chosen solution. This involves putting the solution into action and monitoring its progress. It is important to communicate the solution to all relevant parties and to ensure that everyone is working towards the same goal.

6. The sixth step is to evaluate the results. This involves assessing the effectiveness of the solution and identifying any areas for improvement. It is important to gather feedback from all relevant parties and to use this information to make adjustments as needed.

7. Monitoring and evaluating the solution

7. The seventh step is to monitor and evaluate the solution. This involves tracking the progress of the solution and assessing its impact. It is important to gather data and to use this information to make adjustments as needed.

8. Communicating the results

8. The eighth step is to communicate the results. This involves sharing the findings of the evaluation with all relevant parties and to use this information to make adjustments as needed. It is important to communicate the results in a clear and concise manner and to ensure that everyone is working towards the same goal.

13. BUILDING IN

Build in all necessary plugs, bolts, ties, metal clamps, metal flashings, dowels, fastenings, and fixings required by this and other trades, and allow to fully co-operate with other trades in order for this to be carried out.

14. GAUGE

The gauge rod for concrete blockwork shall be 800 mm to four courses for full height blocks.

15. CHASES AND RECESSES

Chases and recesses shall be formed only where shown on the drawings.

16. CUTTING OUT

Cutting out of concrete blockwork by other trades will not be permitted. The Blocklayer is to leave the necessary holes in the structure for pipes and other works required by any subcontractor. He shall do whatever cutting is necessary and all patching and making good required after all trades have completed their work. Cut all chases necessary for metal flashings.

17. BLOCKWORK PERIMETER PANELS

All blockwork panels adjoining existing and new concrete work shall have the external joints around the entire panel (i.e. on all abutting concrete surfaces), raked out for approximately 9 mm cleaned completely and fitted with an approved joint sealer (Formrok 28T or similar), or shall be fitted with an approved mineral fibre fireproof rope where specifically indicated on the drawings.

18. CLEANING

On completion wash and clean down masonry as necessary before scaffolding is removed, removing all efflorescence and excess mortar from exposed masonry faces and adjoining surfaces and floors, leaving the work perfectly clean.

■ 問題文

図1は、ある物質の溶解度と温度との関係を示すグラフである。このグラフから、この物質の溶解度について、次の問いに答えよ。

■ 問題

この物質の溶解度を、20℃で100gの水に溶かすことができる最大の質量を求めよ。

■ 解答

20℃のとき、溶解度は100gの水に溶かすことができる最大の質量である。

■ 解説

図1のグラフから、20℃のときの溶解度は、100gの水に溶かすことができる最大の質量である。したがって、20℃のときの溶解度は、100gの水に溶かすことができる最大の質量である。

■ 問題文

図2は、ある物質の溶解度と温度との関係を示すグラフである。このグラフから、この物質の溶解度について、次の問いに答えよ。

■ 問題

■ 問題

この物質の溶解度を、20℃で100gの水に溶かすことができる最大の質量を求めよ。

19. CO-OPERATION

The work in this section of the specification shall be carried out in full co-operation with all other trades to ensure that all work is fully co-ordinated and in particular with the Concretor to ensure the correct placing and spacing of reinforcement starters.

1. The first part of the document is a list of the names of the members of the committee.

2. The second part of the document is a list of the names of the members of the committee who have been elected to the office of the chairperson.

E. STRUCTURAL STEEL

1. SCOPE

The work covered by this section includes all structural steel as called up on the drawings.

2. STANDARDS

The whole of the structural steel shall be of a standard required by the relevant standard specification. Copies of all relevant standard specifications shall be available at all times.

NZS 3404: 1977	Code for design of steel structures and related documents
NZS 4711: 1973	Qualification tests for Manual Metal-Arc Welders
BS 5135: 1984	Specification for the process of arc-welding of Carbon and Carbon Manganese steels

3. DRAWINGS

All work and materials shall be in accordance with the specification and the drawings. If any discrepancies are found within those documents refer to the Engineer for instructions before proceeding.

The structural steel drawings are intended to be complementary to the rest of the contract drawings and are to be read in conjunction with them. The Contractor is to consult all of the drawings for materials and details not shown on the structural steel drawings and is to take into consideration the work of other trades as they may affect the structural steelwork.

The Contractor shall provide all necessary holes for all other trades, as advised prior to proceeding through the shop.

1. Introduction

2. Background

The purpose of this study is to investigate the effects of the proposed system on the performance of the system.

3. Methodology

The study was conducted using a controlled experiment. The participants were divided into two groups: the control group and the experimental group. The control group used the standard system, while the experimental group used the proposed system.

Dependent Variable:

Time taken to complete the task.

Independent Variable:

System (Standard vs. Proposed).

Control Group:

Standard system.

4. Results

The results of the experiment showed that the proposed system significantly reduced the time taken to complete the task compared to the standard system.

The data was analyzed using a t-test, and the results were statistically significant. The proposed system was found to be more efficient than the standard system.

The study concludes that the proposed system is a viable alternative to the standard system.

4. SUBSTITUTION

Where any sections shown on the drawings are not available, allowance must be made for the substitution of equivalent plain or built up sections which are available. The prior approval of the Engineer to such substitutions is to be obtained before the work is proceeded with and such substitution shall not delay the normal progress of the work.

5. ACCESS TO WORKS

The Engineer shall have access to the fabrication shop at all reasonable times during fabrication and shall be provided with all facilities as will allow the works of this contract to be inspected.

6. INSPECTION

All materials and procedures shall be subject to inspection by the Engineer or his representative during any stage of fabrication and erection.

7. REJECTIONS

Defective material or workmanship found at any time prior to the final acceptance of the work will be rejected. Defective materials shall be removed and replaced by the Contractor at his own expense and he shall be responsible for all delays caused by rejection. Repair or replace any rejected work or materials without delay.

8. WORKMANSHIP

Workmanship shall comply with the requirements of NZS 3404 and related documents.

Grind smooth all welds, sharp corners and marred or roughened edges on steelwork exposed to view.

8.1 Splices

All members indicated on the drawings shall be in one length without splicing other than at positions shown on the drawings. If additional splicing is found to be necessary or should the Contractor desire to position splices elsewhere submit details of the design and position of the proposed splices to the Engineer for approval. Do not proceed with fabrication until this approval has been obtained.

1. Introduction

The purpose of this study is to investigate the effects of various factors on the performance of a system. The study is organized as follows: Section 2 describes the system and the factors being studied. Section 3 presents the experimental design and the results of the experiments. Section 4 discusses the implications of the results and the conclusions of the study.

2. System and Factors

The system under study is a complex system with many components. The factors being studied are the input variables that affect the performance of the system. These factors are: (1) the input data, (2) the input parameters, and (3) the input conditions.

2.1 Input Data

The input data is the first factor that affects the performance of the system. It is the data that is used to train the system and to test the system. The input data is divided into two parts: the training data and the test data.

2.2 Input Parameters

The input parameters are the second factor that affects the performance of the system. They are the parameters that are used to configure the system. The input parameters are divided into two parts: the training parameters and the test parameters. The training parameters are the parameters that are used to train the system, and the test parameters are the parameters that are used to test the system.

2.3 Input Conditions

The input conditions are the third factor that affects the performance of the system. They are the conditions that are used to run the system. The input conditions are divided into two parts: the training conditions and the test conditions.

The input conditions are the conditions that are used to run the system. They are the conditions that are used to run the system. The input conditions are divided into two parts: the training conditions and the test conditions.

3. Experimental Design

The experimental design is the design of the experiments that are used to study the effects of the factors on the performance of the system. The experimental design is divided into two parts: the training experiments and the test experiments. The training experiments are the experiments that are used to train the system, and the test experiments are the experiments that are used to test the system.

8.2 Connections

Connections and joints shall be as detailed, or in the absence of any specific detail, in accordance with relevant codes. Submit any suggested variations from drawings for approval, prior to fabrication. No extra will be allowed for variation to drawings unless approved in writing by the Engineer.

All connections except where specifically detailed may be regarded as typical standard connections developing full strength of members.

9. APPROVED SUBCONTRACTORS

The Contractor shall not sublet the work of this trade or any section of this trade without the approval of the Engineer.

10. RESPONSIBILITY

Inspection of shop drawings by the Engineer and permission to proceed shall in no way relieve the Contractor of his responsibility for the accuracy of these drawings and for the correctness of the fabrication, setting out and erection of the steelwork. The cost of rectifying any errors shall be at the Contractor's sole expense.

11. WELDING SUPERVISION

Welding shall be carried out only under the constant supervision of a skilled welder who can satisfy the Engineer of his responsibility, training, experience and competence in the type of welding to be used.

12. WELDING INSPECTION

The Engineer shall be given reasonable notice when each section of the work is prepared and ready for welding, and shall be given every opportunity to arrange for inspection and to satisfy himself as to the competence of the operators and as to the quality of the work. Welding inspection will be arranged by the Engineer and may include radiographic testing. The Contractor shall provide all necessary facilities, ladders and light scaffolding required for adequate inspection and radiography.

The Contractor shall arrange the sequence of work where required to facilitate random radiographic testing. The Contractor shall meet all costs for welding inspections arranged by the Engineer.

1. Introduction

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants. The study was conducted in a laboratory setting with a sample of 30 participants. The participants were divided into two groups: a control group and an experimental group. The control group used the traditional system, while the experimental group used the proposed system. The results of the study are presented in the following sections.

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2. Methodology

The study was conducted in a laboratory setting with a sample of 30 participants. The participants were divided into two groups: a control group and an experimental group. The control group used the traditional system, while the experimental group used the proposed system. The results of the study are presented in the following sections.

3. Results

The results of the study are presented in the following sections. The study was conducted in a laboratory setting with a sample of 30 participants. The participants were divided into two groups: a control group and an experimental group. The control group used the traditional system, while the experimental group used the proposed system. The results of the study are presented in the following sections.

4. Discussion

The results of the study are presented in the following sections. The study was conducted in a laboratory setting with a sample of 30 participants. The participants were divided into two groups: a control group and an experimental group. The control group used the traditional system, while the experimental group used the proposed system. The results of the study are presented in the following sections.

5. Conclusion

The results of the study are presented in the following sections. The study was conducted in a laboratory setting with a sample of 30 participants. The participants were divided into two groups: a control group and an experimental group. The control group used the traditional system, while the experimental group used the proposed system. The results of the study are presented in the following sections.

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13. STEEL

Steel shall be 250 Grade steel to AS 1204 or Grade 43A to BS 4360, see NZS 3404, unless noted otherwise.

14. FASTENERS

All mild steel bolts and nuts shall be Grade 4.6, to the requirements of AS 1111 and AS 1112. See NZS 3404.

High Strength steel bolts and nuts shall comply with the requirements of AS 1252.

15. WELDING ELECTRODES

Mild steel electrodes shall comply with the requirements of BS 5135: 1984.

16. STRUCTURAL STEEL SECTIONS

Structural steel sections shall comply with the appropriate Australian or British Standard as specified in NZS 3404 2.1.1 Specification.

17. CERTIFICATION

If requested the Contractor shall supply the Engineer with copies of certificates from the supplier of the steel.

18. HANDLING AND STORAGE

All steelwork shall be placed upon substantial shores or blocking, of sufficient size and strength to prevent any steelwork touching the ground. Each piece shall be placed so that water cannot stand thereon and in such a manner that bending under its own weight or superimposed weights or any other cause will not injure the piece.

The Contractor shall use care in storing, handling and erecting all material and shall support it carefully at all times to ensure that no piece will be bent, twisted or otherwise injured. The Contractor shall notify the Engineer in writing of any defects or damage in material before it is erected. If such defects or damage cannot be corrected in the field, the material shall be returned to the shop for new parts, furnished as the Engineer directs, and the Contractor shall pay all expenses therefore if such defects or damages are due to his negligence.

1. Introduction

The purpose of this study is to investigate the effects of various factors on the performance of a system. The study is organized as follows:

2. Methodology

The methodology used in this study is a combination of experimental and analytical methods. The experimental method involves the use of a test system to measure the performance of the system under different conditions.

The analytical method involves the use of mathematical models to predict the performance of the system under different conditions. The results of the experimental and analytical methods are compared to validate the models.

3. Results and Discussion

The results of the experimental and analytical methods are presented in this section. The experimental results show that the performance of the system is significantly affected by the input parameters.

3.1. Experimental Results

The experimental results show that the performance of the system is significantly affected by the input parameters. The results are presented in Table 1.

3.2. Analytical Results

The analytical results show that the performance of the system is significantly affected by the input parameters. The results are presented in Table 2.

3.3. Comparison of Results

The results of the experimental and analytical methods are compared in this section. The results show that the experimental results are in good agreement with the analytical results. This indicates that the models used in the analytical method are valid.

The results of the experimental and analytical methods are compared in this section. The results show that the experimental results are in good agreement with the analytical results. This indicates that the models used in the analytical method are valid. The results are presented in Table 3.

The acceptance of damaged material which has been improperly piled, stacked or stored will be entirely at the discretion of the Engineer.

Store fasteners in water-tight premises.

Handle and store electrodes, and electrode wire and flux in accordance with the following requirements:

- (a) Electrodes which have been wet shall not be used, whether dried out or not.
- (b) Flux which has become damp shall not be dried and reused, nor shall flux fused in the welding process be ground and reused. Flux shall be dry and free from contamination from dirt, mill scale, rust or other foreign material.
- (c) Electrode wire shall be clean and free from rust, oil, grease and any other deleterious substance.
- (d) Electrode wire and flux shall be stored in their original containers, in a dry and weatherproof location.

19. IMPORTED STEEL

All structural steel for this contracted shall be obtained from sources approved by the Engineer. Tenderers shall state in their tender any ways in which the work may be affected by the need to obtain import or other licences and shall set out their proposals for obtaining any materials or plant so affected.

20. FABRICATION

Fabrication of steelwork shall conform to the requirements of NZS 3404 and related documents as appropriate, including provisions as to straightening, clearances, cutting, machining, holing, assembly, rivetting, bolting, and welding.

Steelwork shall be of the sections and dimensions shown on the drawings or specified hereafter and fabricated at an approved workshop in accordance with the detail drawings or approved shop drawings.

1. The first step in the process of creating a new product is to identify a market need. This involves conducting market research to understand what consumers want and what problems they are trying to solve.

2. Once a market need is identified, the next step is to develop a concept for a product that addresses that need. This often involves brainstorming and prototyping.

3. After developing a concept, the next step is to create a business plan. This document outlines the financial aspects of the product, including costs, revenue projections, and a marketing strategy.

4. The next step is to secure funding. This can be done through various means, such as seeking investors, applying for grants, or crowdfunding.

5. Once funding is secured, the next step is to develop a prototype. This is a preliminary version of the product that allows you to test its functionality and gather feedback from potential users.

6. After developing a prototype, the next step is to conduct a pilot test. This involves releasing a small quantity of the product to a select group of users to gather feedback and make necessary adjustments.

7. Once the pilot test is complete, the next step is to launch the product. This involves marketing the product to a wider audience and making it available for purchase.

8. Finally, the last step is to monitor the product's performance. This involves tracking sales, customer feedback, and market trends to ensure the product remains competitive and profitable.

9. The final step in the process is to evaluate the overall success of the product. This involves comparing the product's performance against the goals set in the business plan and making adjustments as needed for future products.

10. The final step is to continue to innovate and improve the product over time.

11. The final step is to continue to innovate and improve the product over time, ensuring it remains relevant and competitive in the market.

12. The final step is to continue to innovate and improve the product over time, ensuring it remains relevant and competitive in the market.

21. FABRICATION TOLERANCES

Steel after fabrication shall conform with the tolerances given in AS 1250 Clause 11.2 being part of NZS 3404.

21.1 Straightness

All material before and after fabrication shall be straight unless shown on the plans as required to be curved. It shall also be free from twists.

21.2 Clearances

The clearances where specified on the drawings shall be adhered to. The erection clearances for cleated ends of members (shear connections) connecting steel to steel shall not be greater than 1.5 mm at each end. The erection clearances at ends of beams without web cleats (bearing connections) shall not be more than 3.0 mm at each end.

22. CUTTING

Cutting shall be performed by either shearing, cropping, sawing or machine flame cutting. Hand flame cutting will NOT be permitted.

Shearing and cropping shall be neatly and accurately done and all portions of the work exposed to view neatly finished. In medium steel over 20 mm thick, all sheared edges shall be planed and all holes shall be drilled or reamed to a diameter 3.0 mm larger than punched holes to remove sheared surface of metal. Steel that does not satisfy the drifting test must have holes redrilled.

The several pieces forming one built up member shall be straight and fit closely together and finished members shall be free from twists, bends and open joints. Abutting joints shall be cut or dressed true and straight and fitted closely together, especially where open to view. In compression joints depending on contact bearing, the surfaces shall be truly faced so as to have even bearing after the completion of each joint.

Flame cutting may be used only where permitted by the Engineer and shall be permissible only if the metal is not carrying stress during the cutting. Stresses shall not be transmitted through a flame cut surface.

1. **Introduction**

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants. The study was conducted in a controlled environment and the results are presented in the following sections.

2. **Methodology**

The study was conducted using a between-subjects design. The participants were divided into two groups: the control group and the experimental group. The control group used the standard system, while the experimental group used the proposed system.

3. **Results**

The results of the study show that the proposed system significantly improved the performance of the participants. The experimental group showed a higher mean score than the control group. The difference was statistically significant, indicating that the proposed system is effective in improving performance.

4. **Conclusion**

The study concludes that the proposed system is effective in improving the performance of the participants. The results suggest that the system can be used in a variety of settings to improve performance.

The study also identified some limitations. The sample size was small, and the study was conducted in a controlled environment. Future research should investigate the effects of the proposed system in a more natural setting and with a larger sample size.

The study was funded by the National Science Foundation. The authors would like to thank the participants for their contribution to the study. The authors also would like to thank the reviewers for their comments and suggestions.

The authors declare that they have no conflict of interest. The authors also declare that they have no financial interest in the proposed system.

23. WELDING

All welding shall conform to BS 5135: 1984.

All surfaces to be welded shall be cleaned of loose scale, slag, rust, grease, paint and other foreign matter by vigorous wire brushing.

All sections to be fillet welded shall be in close contact. In no case shall separation be greater than 2.0 mm. Sections to be butt-welded shall not be put out of alignment by more than 3.0 mm. Work is to be positioned for flat welding whenever possible.

Preparatory work procedure and sequence of welding shall be such as to obviate distortion and minimise shrinkage stresses. Where necessary to ensure satisfactory welds preheating of the steel sections shall be carried out.

The Contractor shall arrange for the testing of all welders employed on the work. Testing is to be carried out by welding inspectors nominated by the Engineer. The welders shall only be employed on the types of weld for which tests have been satisfactorily completed. The Contractor shall be responsible for payment of all costs in respect of testing of welders. All testing of welders shall be in accordance with NZS 4711. The whole of the welding shall be subject to welding inspection by inspectors nominated by the Engineer.

Testing of welds will be carried out as follows:

The Engineer will direct tests to be made in a selected laboratory. Such test may include radiographic testing of welds and other methods of testing as may be considered necessary by the inspector. The Contractor shall comply with all reasonable demands and shall supply the plant necessary for the purpose. "Reasonable" shall mean the cutting out of not more than 25 mm per 2500 mm of the total welding; except that where a particular weld is under suspicion or after discovery of a defect, the Contractor shall cut out such additional amounts as the inspector may require.

23.1 Unacceptable Defects

The following defects discovered by visual, radiographic or other means shall not be acceptable.

1. Introduction

1.1. Background and Motivation

The purpose of this research is to investigate the impact of various factors on the performance of a system. The study aims to identify the key variables that influence the system's output and to develop a model that can predict the system's behavior under different conditions.

The research is motivated by the need to understand the complex interactions between different components of the system. By identifying the factors that have the most significant impact on performance, we can optimize the system's design and operation. This research is also motivated by the desire to improve the efficiency and reliability of the system, which is crucial for its successful implementation.

The research is organized as follows. Section 2 describes the system and the variables that are being studied. Section 3 presents the methodology used for the data collection and analysis. Section 4 discusses the results of the study, and Section 5 concludes the research and provides recommendations for future work.

The research is based on a series of experiments that were conducted under controlled conditions. The data collected from these experiments were analyzed using statistical methods to identify the relationships between the variables. The results of the analysis show that there are several factors that have a significant impact on the system's performance. These factors include the input variables, the system's configuration, and the environment in which the system is operating. The research also identifies the factors that have the most significant impact on the system's performance, which can be used to optimize the system's design and operation.

1.2. Scope and Limitations

The scope of this research is limited to the study of the system's performance under specific conditions. The research does not cover the entire range of possible conditions, but it provides a detailed analysis of the system's behavior under the conditions that are most relevant to the study. The research is limited by the availability of data and the complexity of the system. The results of the study are based on the data that was collected, and the model that was developed is only a simplified representation of the system's behavior. The research also has some limitations in terms of the methods used for data collection and analysis, which may affect the accuracy of the results.

2. System Description

The system is a complex system that consists of several components that interact with each other. The system is designed to perform a specific task, and its performance is measured by the time it takes to complete the task. The system is composed of several modules, each of which has its own set of variables and parameters. The system's performance is influenced by the configuration of these modules and the environment in which the system is operating.

- (a) Any crack, suspected crack, lack of fusion, incomplete root penetration, overlap, incompletely filled groove, or excessive undercut.
- (b) Porosity shall be unacceptable where the total area of gas pores shown on any 625 mm² of radiograph is greater than either 2% of the radiograph of plate up to 12 mm thickness or 3% of the radiograph of plate 12 mm and over in thickness, except that, where any defect acceptable under the provisions of this specification occurs with porosity, the allowance limit for porosity shall be reduced by 1%.
- (c) Inclusion of blow holes shall be unacceptable if it can be shown by radiograph or other means that:
 - (i) the length of any such defect along the weld is greater than $T/3$ where T is the thickness of the thinner plate welded, except that any such defect shorter than 6 mm shall be acceptable for all plate thicknesses and that the maximum length of any such defect shall be 19 mm for all plate thicknesses; or
 - (ii) the ratio of the depth of any such defect to the depth of the weld is greater than $T/12$; or
 - (iii) there are two such defects along the weld within the above limits separated by less than $6L$ of acceptable weld metal where L , the length of the larger defect exceeds $T/12$; or
 - (iv) there are several such defects within the above limits the sum of the largest dimensions of all defects exceeding T in the weld length of $12T$, or where length of weld is less than $12T$, the sum of the largest dimensions exceeding $1/12$ the length of the weld; or
 - (v) the total width of defects across the width of a weld at any section exceeds $T/4$.

Notwithstanding the above, any defects shall be considered acceptable if the thickness in the depth of the weld is less than 2% of T .

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23.2 Repair of Defects

- (a) If in the opinion of the inspector, the total amount of repair in any one welded seam is excessive, the whole of the seam shall be cut out and rewelded.
- (b) In the case of a crack at least 50 mm of welded seam beyond each end of the crack shall be cut out for other defects the cutting out shall be to sound metal and shall be sufficient to allow the repair to be effected.

Defects shall be cut out by flame gouging. The gouging head shall be the smallest necessary to satisfactorily cut out the defect.

The inspector shall examine all seams from which defects have been cut out and his approval obtained before rewelding is commenced. Rewelding shall be executed in a manner and by practices acceptable under this specification. Where practicable, the rewelding shall be by the same process as used in the original welding.

Preheating shall be used for all weld repairs.

The cost of repairs to all defects shall be borne by the Contractor.

All butt welds except those produced with the aid of backing material shall have the root or initial layer gouged or clipped out from the back side before welding is started from the side. Ends of butt welds shall have the start and stop zones removed by the use of run-on run-off places. Remove such plates after use.

24. HOLING

Form holes for bolts as specified in AS 1250 being part of NZS 3404.

Where holes are drilled in one operation through two or more separate parts, these parts shall be separated after drilling and the burrs removed.

25. ASSEMBLY

Accurately assemble the parts as shown on the drawings and follow match marks.

1000. **Answer: A**

1001. **Answer: B** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI). The patient's symptoms include dysuria, frequency, and urgency, which are all common symptoms of a UTI.

1002. **Answer: C** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI). The patient's symptoms include dysuria, frequency, and urgency, which are all common symptoms of a UTI.

1003. **Answer: D** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI). The patient's symptoms include dysuria, frequency, and urgency, which are all common symptoms of a UTI.

1004. **Answer: E** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI). The patient's symptoms include dysuria, frequency, and urgency, which are all common symptoms of a UTI.

1005. **Answer: A** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI).

1006. **Answer: B** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI).

1007. **Answer: C** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI). The patient's symptoms include dysuria, frequency, and urgency, which are all common symptoms of a UTI.

1008. **Answer: D**

1009. **Answer: E** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI).

1010. **Answer: A** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI).

1011. **Answer: B**

1012. **Answer: C** The patient's symptoms are consistent with a diagnosis of a urinary tract infection (UTI).

The component parts shall be assembled in such a manner that they are neither twisted nor otherwise damaged and shall be so prepared that the specified cambers are obtained if required. All tubular members shall be sealed so as to prevent the ingress of moisture to the inside of the members.

Mild steel flat and angle section braces shall be erected true to line and shall be drifted or preheated before welding in position to achieve drum tightness.

All steel members including girts which may be capable of holding water such as upturned channels, horizontally placed beams, composite members etc. shall be punched with weep holes to prevent accumulation of water during construction or of condensation afterwards. These weep holes shall be clearly shown on the shop drawings.

25.1 Bolted Construction

- (a) All parts of bolted members shall be well pinned or bolted and rigidly held together. Drifting done during assembly shall not distort the metal or enlarge the holes. Holes that must be enlarged to admit the bolts shall be reamed. Poor matching holes shall be cause for rejection.

- (b) Bolts

Washers shall be provided tapered or otherwise suitably shaped to give the heads and nuts of bolts a satisfactory bearing. The threaded portion of each bolt shall project through the nut at least one thread. In no case shall the threaded portion of the bolts come within the thickness of the parts bolted together.

After the nuts of the bolts have been drawn up the threads of the bolts shall be either mutilated with an old chisel or tack welded to maintain a tight connection.

- (c) Drilled in Bolts

All drilled in Chemset Anchorage Bolts, Rawl Bolts and Ramset Masonry Anchors shall be fixed according to the manufacturer's specifications.

the Commission shall be responsible for the implementation of the measures taken by the Council in accordance with the provisions of the Treaty and the Commission shall be responsible for the implementation of the measures taken by the Council in accordance with the provisions of the Treaty and the Commission shall be responsible for the implementation of the measures taken by the Council in accordance with the provisions of the Treaty.

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ARTICLE 10

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ARTICLE 11

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ARTICLE 12

The Council shall be responsible for the implementation of the measures taken by the Council in accordance with the provisions of the Treaty and the Council shall be responsible for the implementation of the measures taken by the Council in accordance with the provisions of the Treaty.

Notwithstanding this all drilled in anchorages shall be tightened to the torque levels set out in the following:

<u>Bolt Designation</u>	<u>Torque</u>
M12	55 Nm
M16	100 Nm
M20	160 Nm
M24	230 Nm

26. MARKING

Before leaving the shop, every member shall be clearly marked in accordance with the general arrangement drawings and shall bear all marks required to facilitate site erection. Markings must be adequate but shall be such that finish painting will completely obliterate them.

27. ENCASED STEELWORK

Steelwork which is to be encased in concrete shall not be painted. All such surfaces shall be left in a perfectly clean condition free from all dirt, dust, grease or paint spots immediately prior to the placing of the encasement.

28. SHOP PAINTING

All structural steel, including bolts, nuts, washers, fittings, etc which is not to be encased in concrete or similarly treated is to be painted with two coats of an approved primer before delivery to the site.

Before painting, steelwork shall be thoroughly cleaned of all loose scale, rust, oil, paint, etc to Swedish Standard ST2 and left dry. Use metal brushes, scrapers, chisels, hammers, sandpaper, etc for such cleaning and bristle brushes for removing dirt.

Apply paint by brush only to dry dust free surfaces in accordance with the manufacturer's instructions, each paint coat to be thoroughly dry before the next is applied. Lack of complete coverage and/or of uniform texture will be cause for rejection. Surfaces not accessible for painting after shop assembly shall be painted before assembly.

To ensure complete coverage of the steelwork the second primer coat shall be colour tinted.

All painting damaged during erection shall be made good.

29. DELIVERY

Deliver steelwork to the site at the times and sequences as set out in the works schedule. Transport and handle structural steel carefully and protect from damage at all times.

The Contractor shall deliver steelwork to the site, unload and site assemble subsections where necessary, touch up priming paint as necessary and stack and protect. All damage to the steelwork shall be made good by the Contractor.

The Contractor shall arrange for a delivery of all long lengths of steelwork at times to avoid peak traffic periods and shall make arrangements with the Traffic Authorities regarding transport of sample.

30. ERECTION

The Contractor shall give at least 48 hours notice of the time when he proposes to start erection in order that the proper inspection can be provided. The Contractor shall be responsible for the accurate bearing of the steel on the foundation and for the correct location and verticality of columns. Bases and bearing plates which require to be grouted shall be supported exactly to the established lines and levels.

Detailed proposals setting out the method of erection and erection equipment to be used are to be submitted in advance for approval in principle by the Engineer.

31. CO-OPERATION WITH OTHER TRADES

Co-operate with all other trades as necessary to ensure an orderly progress of the work, and in particular with those responsible for concrete and carpentry as they affect this section of the specification.

the following information is to be provided to the appropriate authorities in the event of a fire:

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32. PLANT AND EQUIPMENT

Provide falsework and all the tools, machines and appliances including pilot and driving nuts, drift pins and fitting up bolts necessary for the expeditious handling of the work. Remove from the site after completion

33. TEMPORARY BRACING

Provide and install and afterwards remove if necessary, sufficient temporary bracing to keep the structure plumb and in true alignment until other structural units provide the necessary permanent bracing. The steelwork shown on the drawings is that required in design for the finished structure only and is not necessarily adequate for construction purposes. Any failure to make proper and adequate provision against damage during erection shall be entirely the responsibility of the Contractor. The temporary guying and bracing should be adequate to resist all wind and earthquake forces on the structure during the erection period.

Do not use bracing to force the structural frame into its correct plumbed position. Tighten bracing only after the frame has been squared and plumbed or if inserted at an earlier time, loosen to permit plumbing.

34. ERECTION TOLERANCES

Erect steel to conform to the tolerances given in AS 1250 being part of NZS 3404, Clause 11.4.2.

35. GROUTING

Bedding of stanchion bases and tie rods etc shall be carried out with Portland cement mortar mixed as dry as possible and having a thickness as required by the drawings. The mortar shall be not leaner than 1:2 cement to fine aggregate and shall contain "Febgrout" or similar approved grout - expanding additive mixed according to the manufacturer's instructions. Consolidate grout in position by thoroughly ramming with a suitable blunt rammer against properly fixed supports until the space has been completely filled.

Keep grout damp for seven days by wrapping in hessian continuously kept moist or by other approved means. Remove any adjusting wedges after grout has set, fill wedge holes and point up around steel.

1. Introduction

The purpose of this paper is to investigate the effect of the introduction of a new technology on the productivity of a firm. The study is based on data from a large sample of firms in the manufacturing sector of the United Kingdom.

2. Data and Sample

The data used in this study are derived from the 1997 Survey of Manufacturing Industries (SMI), which is a comprehensive survey of the manufacturing sector in the United Kingdom. The sample consists of 1,200 firms, which are representative of the manufacturing sector as a whole. The data include information on the firm's characteristics, such as its size, age, and location, as well as information on its production process, including the use of new technology. The data are used to estimate the effect of the introduction of new technology on the firm's productivity.

The data are divided into two groups: firms that have introduced new technology and firms that have not. The firms that have introduced new technology are further divided into two groups: firms that have introduced new technology in the last five years and firms that have introduced new technology in the last ten years.

3. Methodology

The methodology used in this study is based on the following steps:

4. Results

The results of the study show that the introduction of new technology has a positive effect on the productivity of a firm. The effect is larger for firms that have introduced new technology in the last five years than for firms that have introduced new technology in the last ten years. The effect is also larger for firms that are larger in size than for firms that are smaller in size. The effect is also larger for firms that are located in the South of England than for firms that are located in the North of England.

The results of the study suggest that the introduction of new technology is a key factor in the productivity of a firm. The study also suggests that the effect of the introduction of new technology on the productivity of a firm is larger for firms that are larger in size and for firms that are located in the South of England.

36. FIELD WELDING

Field welding shall comply with the provisions of Clause E3.4.

Except where shown on the structural drawings, field welding will NOT be permitted.

37. PURLINS

All purlins shall be delivered to site pre-primed.

1. **Introduction**

The purpose of this report is to provide a comprehensive overview of the current state of the market for [Product/Service] and to identify key trends and opportunities for growth.

The report is structured as follows: Section 2 provides a detailed analysis of the market environment, including an overview of the industry and a comparison of the company's performance against its competitors. Section 3 discusses the company's strategic vision and the key initiatives that will drive its growth over the next five years. Section 4 outlines the company's financial performance and its outlook for the future. Finally, Section 5 provides a summary of the key findings and recommendations.

2. **Market Environment**

2.1 **Industry Overview**

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.

2. Materials: Cement and water shall be as specified under 'Concretor'. Sand shall be clean and graded in accordance with N.Z.S. 2129, Class A, for all work except fine smooth steel trowelled surfaces which shall be Class B graded.

All plaster mixes shall be appropriately tempered with either hydrated Lime or J.H.M. Carpenter's 'Mortarlox' or similar approved, in accordance with the Plasterer's preference. Proprietary agents shall be used in strict accordance with the manufacturer's instructions.

It is the responsibility of the Plasterer to produce an impervious plaster finish of adequate strength and completely bonded to the base material and to this end it is at his discretion whether or not to use proprietary bonding agents or similar to provide a key or to control suction.

3. Workmanship: All work by experienced tradesmen and in accordance with best trade practice. Cover and protect work of other trades. Inspect surfaces to be plastered and adjust or treat as necessary to obtain proper conditions for satisfactory results. Cover or protect new plaster from drying winds, rain or other damaging conditions. Properly cure all plaster. Imperfect or drummy work to be neatly cut out and made good.

4. Plaster: For sand plaster the cement (plus tempering agent) content shall be kept as low as practicable consistent with good results in order to minimise shrinkage cracking (endeavour to obtain accurately graded sand to assist in cement reduction). Hardwall plaster mixes shall be as strong as possible with just sufficient workability to achieve finely finished surfaces.

Plaster shall be used within 1 hour of first contact between cement and water and no retempering of partially set or dried material shall be permitted and all such material shall be discarded.

5. Preparatory Coats: A well bonded slurry coat shall be applied to all masonry or concrete or other hard (i.e. asbestos or similar) surfaces.

A flanking coat (properly screeded to smooth finish areas) approximately 12mm minimum thickness and lightly combed to a horizontal wavy pattern shall be applied to all mesh base and/or smooth finish areas.

6. Plastering: All work shall comply with NZS 4251:1974 (Code of practice for solid plastering). Allow to hardwall beam soffits exposed in 'operations' areas, cement plaster where existing window sills are raised and plaster elsewhere as necessary to make good.

The first part of the document discusses the importance of maintaining accurate records of all transactions and the role of the accounting department in ensuring the integrity of the financial data.

The second part of the document outlines the various methods used to collect and analyze financial data, including the use of statistical software and the importance of regular audits.

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1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.
2. Standards: All framing and general work shall conform to N.Z.S. 3604 and the related Standard Specifications mentioned on Page 10 of that Code. Heavy timber construction shall conform to N.Z.S. 1900, Chapter 9.1, and boxing and preparation for concrete shall conform to N.Z.S. 1900, Chapter 9.3 as appropriate.

3. General: This section includes the measuring, ordering, receiving, stacking and storage of all Carpenter's materials and the fabrication, erection and fixing of all framing and finishing timbers, including work incidental to neatly finishing in other trades and all temporary work and temporary bracing. Supply, erect and afterwards strip and remove all form-work for concrete as specified under Concretor.

The Carpenter shall attend upon all trades. He shall coordinate their work and determine their timing and sequence of operations. The Carpenter shall supply and fix all obviously necessary but not specifically mentioned fixings and materials.

4. Timber: All timber shall be true to N.Z.S. 3631 (National Grading Rules) and equal or better than No. 1 Framing for all framing timbers and Dressing A for all finishing timbers. All timber which in the opinion of the Architect is sub-standard shall be removed from the site.

All timber shall be seasoned to the stable moisture content suitable for its location in the finished work (approximately 18% for framing timbers, 12% for finishing timbers) and if the use of inadequately seasoned timber results in damage or opening joints in finished work the timber shall be replaced. All kiln dried, dressed or finishing timber shall be stacked under cover on delivery to the site. All timber shall be to the nominal sizes specified or shown, subject only to normal cutting and dressing tolerances.

All non-heart timber used, including cores to doors, coreboard etc. shall be treated. Treat timber in accordance with the provisions of 'Timber Preservation in New Zealand II : Specifications', issued by the Timber Preservation Authority, 1963. All treated timber shall be suitably identified and marked as specified in the Code. Re-season to correct moisture content after treatment. All finishing timber shall have all machine marks, roughness and stains removed and shall be sanded smooth.

Ensure that the Painter fully primes all enclosed surfaces of exterior finishing timber or joinery before fixing. The Painting Subcontractor shall carry out the priming of all those surfaces on which he will be responsible for further coats.

Unless subsequently specified otherwise, timbers as follows (the use of alternate grades and varieties to those specified is subject to approval in each instance) :

B.A. Ht. Rimy or	Exterior exposed sawn framing.
No. 1 10kg/m ³ (C4) tanalised radiata	Plates etc. in contact with concrete.
No. 1 5kg/m ³ (C7) tanalised radiata	Subfloor framing.
No. 1 Equivalent Boric N.I. Douglas Fir	Interior exposed framing (usually sawn finish).
No. 1 Boric Radiata	Enclosed framing (usually gauged).

Finishing 5kg/m ³ (C7) Tanalised Radiata	Weatherboards and any exterior dressed timber specified painted.
D.B. Boric Rimu	Sawn exterior facings, barges etc.
D.A. Rimu	Finishings and facings specified clear finish.
Finishing Boric Radiata	Finishings and facings specified painted.

5. Workmanship: All work shall be carried out under the supervision of competent and experienced tradesmen in accordance with the best and latest trade practice.

Fix 3ply bituminous fabric dampcourse under or behind all timber where it abutts masonry or concrete to provide complete separation. Line behind all exterior wall coverings with saturated heavyweight building paper, fixed horizontally. Lap not less than 100mm, 150mm each way around corners, and staple at 300mm centres.

All timberwork joints shall be accurately fitted to ensure close contact over the full surface of the joint. All exposed nailing shall be carefully punched and all bruises and tool marks shall be removed. Split timber and hammer marked finishing timber shall be replaced.

Acceptable defects in timber shall be distributed so as not to impair the strength of appearance of the finished work. Checking and cutting away of timbers shall be avoided whenever possible and shall be limited to such dimensions as will not prejudice the purpose for which the timber is used. Wherever possible beams and joists shall be holed at the neutral axis and the hole size shall be limited to one-fifth of the depth of the member. Holing or checking (other than checking over plates) within 600mm of the ends of members shall be avoided. No studs shall be cut across the grain to straighten them.

Ensure that dead air spaces in timber framed walls, ceilings etc. are positively ventilated and vermin proofed. Build in as work proceeds all necessary flashings to windows, doors etc. supplied by Plumber.

6. Nailing: Substantially nail all timber contacts and intersections (all framing skew-nailed). Generally nails to penetrate the second timber $1\frac{1}{2}$ times the thickness of timber fastened. Finishing brads to all finishing timbers, punched to diameter of nail below surface. Nails fixing exposed timbers, nails in Cedar, Redwood or Totara, and nails which will be covered with plaster or similar shall be galvanised. Bore slightly undersize holes for any nailing which is likely to cause splitting.

7. Screw Fixing: Unless otherwise specified screws shall be of steel and of suitable gauge and length to obtain secure fastening. Screws fastening hardware or metal work shall be of same material and finish and screws exposed to the weather shall be brass.

8. Bolts: Unless otherwise specified or shown, holding down bolts for plates on horizontal surfaces shall be 12mm ϕ at 1000mm maximum centres, bolts holding plates against vertical surfaces to support joists shall be 12mm ϕ at the same spacing as the joists and bolts holding vertical timbers against concrete or masonry shall be 12mm ϕ at 600mm maximum centres. In all cases there shall be a bolt within 300mm of each end of the timber.

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All bolts shall have hexagonal heads and nuts and have heavy gauge washers bearing on the timber. Bolts to project through nuts at least one full thread after tightening and nuts secured by punching thread. Bolts set 150mm into concrete and where closer than 80mm to edge to be bent into the body of concrete. All bolts exposed to weather shall be galvanised. Bolts required for fixing or joining exposed timber framing shall be as separately specified.

9. Percussion Fastenings: Shall be of gauge and charge strength suitable to application involved, of recognised manufacture and carried out by experienced operators. Percussion fastenings used for shear load applications only; do not use for withdrawal load applications.

10. Framing Hardware: Trip-L-Grip, Multigrips, joist shoes, gang nail plates etc. shall be used to provide necessary joint rigidity, or with the Architect's permission to obviate traditional jointing procedures. Items shall be galvanised, free from distortion and fixed in accordance with the manufacturer's recommendations.

11. Mastics: Excepting where otherwise noted or specified, use Seelastic for back beading and general caulking which is not exposed and Thioflex 1 in all positions exposed to sunlight. Surface cleaning and priming, and use of mastic all completely in accordance with the manufacturer's instructions. All exposed fillets kept as fine as possible and finished to neat even line.

12. Adjustments: On completion and again at the end of the maintenance period ensure that all window sashes, interior and exterior doors, and fittings' doors neatly fit the openings with regular tolerances on all edges and that all drawers slide freely. Ensure that all locks, latchsets, closers, sliding door gear, stays etc. are operating correctly and are appropriately oiled or greased.

13. Joinery Fixing: Take delivery of and install in the positions shown, and accurately plumb, square and level, and securely fix in accordance with best trade practice all windows, doors and frames, fittings and sundry other items supplied by the Joiner. Window and door frames full width and exact thickness packed at each fixing position (minimum three per jamb more than 1200 length, two per window jamb less than 1200). Frames generally nail fixed to framing and Dynascrewed to masonry except where concealed fixings are detailed, and flashings (supplied by Plumber) incorporated where detailed. Finish with neat mastic fillets as detailed or directed.

Carcases accurately fitted to adjoining work and loose supplied tops generally countersunk screw fixed from underneath at approximately 400 centres. Protect all installed joinery until contract completion, and make good any damage as directed.

14. Hardware: Allow the net sum as noted on the drawings for the supply only of selected hardware to be installed, oiled and adjusted for smooth operation by the Contractor, and protected until completion. This sum shall include door latchsets, door knobs and locks, window casement or telescopic stays, window catches, coat hooks, barrel bolts, cupboard handles, curtain tracks and sundry other finishing hardware, but does not include door hinges, window hinges or Interloc stays, floor springs, sliding door gear or other hardware specified or noted elsewhere.

The first step in the process of identifying a problem is to define the problem. This involves a clear and concise statement of the problem, its scope, and its impact. Once the problem is defined, the next step is to identify the causes of the problem. This can be done through a variety of methods, including interviews, surveys, and data analysis. Once the causes are identified, the next step is to develop a plan of action to address the problem. This plan should be realistic, achievable, and measurable. Finally, the plan should be implemented and the results monitored.

The second step in the process of identifying a problem is to identify the causes of the problem. This can be done through a variety of methods, including interviews, surveys, and data analysis. Once the causes are identified, the next step is to develop a plan of action to address the problem. This plan should be realistic, achievable, and measurable. Finally, the plan should be implemented and the results monitored.

The third step in the process of identifying a problem is to develop a plan of action to address the problem. This plan should be realistic, achievable, and measurable. Finally, the plan should be implemented and the results monitored.

The fourth step in the process of identifying a problem is to implement the plan of action. This involves putting the plan into action and monitoring the results. Once the plan is implemented, the next step is to evaluate the results. This can be done through a variety of methods, including interviews, surveys, and data analysis. Once the results are evaluated, the next step is to make any necessary adjustments to the plan.

The fifth step in the process of identifying a problem is to evaluate the results. This can be done through a variety of methods, including interviews, surveys, and data analysis. Once the results are evaluated, the next step is to make any necessary adjustments to the plan.

The sixth step in the process of identifying a problem is to make any necessary adjustments to the plan. This involves revising the plan to better address the problem. Once the plan is revised, the next step is to implement the revised plan and monitor the results. This process may need to be repeated several times before the problem is fully resolved.

The seventh step in the process of identifying a problem is to monitor the results. This involves keeping track of the progress of the plan and making any necessary adjustments. Once the results are monitored, the next step is to evaluate the results. This can be done through a variety of methods, including interviews, surveys, and data analysis. Once the results are evaluated, the next step is to make any necessary adjustments to the plan.

The eighth step in the process of identifying a problem is to make any necessary adjustments to the plan. This involves revising the plan to better address the problem. Once the plan is revised, the next step is to implement the revised plan and monitor the results. This process may need to be repeated several times before the problem is fully resolved.

15. Exposed Framing: Accurately set up, temporarily brace and fix as noted or detailed all sawn timber posts, beams, braces, rafters, handrails etc. as shown on the drawings. Except where specifically noted otherwise bolts in exposed timber framing shall be 16mm diameter with hexagonal heads and nuts, heavy washers each side and when finally tightened the bolt shall project at least one full thread through the nut for securing by punching thread. Bolted connections may be temporarily nailed during erection provided nails are withdrawn after bolting and no splitting or surface bruising results. Posts shown with their bottoms flush with the floor shall be 12mm diameter by 150mm long galvanised steel dowelled unless detailed otherwise. Very slightly arris sawn edges where appropriate to avoid splintering and accurately cut rebates, flashing gooves etc. as detailed or required, before erection.

16. Enclosed Framing: All enclosed framing shall be thickened, true to line, plumb and square with maximum tolerance of 10mm in 2400mm without local irregularities. Plates accurately positioned, true and level, scarf joined and bolted or well nailed as appropriate. Construct wall framing where shown with full height studs at 400mm centres, skew nailed at both ends, dwangs cut in at 45° where necessary. Accurately set up enclosed floor, roof or ceiling framing and sundry other work as required and securely skew nail; cut in blockings as shown or required to suit linings, services etc. Security of framing fixings to Architect's approval, and Carpenter shall increase or adjust if directed.

17. Particle Board Work: All material shall be 19mm thick high density temporary weather proofed particle board ("Plycopyne" or "Fina-floor" only). All sheets accurately cut to size with edges shot as necessary to provide tight butt joints and nailed with 65mm galvanised finishing nails at 100mm centres around edges and at 200mm centres along every intermediate support. Commence laying at centre of each area and work to outside edges. Sand flooring areas to an even finish and hand sand as required at edges and corners, taking care to avoid damage to finished work. Punch nails immediately before sanding and stop after first polyurethane coat.

18. Gibraltar Board Work: To all exterior walls and ceilings as required shall be 9.5mm 'Gibfoil' board and to all internal walls shall be 9.5mm 'Gibraltar' board. Fix board in full length sheets, space 3mm apart to give key for stopping and nail as recommended by the manufacturer. Finish projecting corners with 32x32mm timber beads and stop and sand down ready for painter work. (Use Gibfoil to fibreglass insulated roofs to provide vapour barriers.)

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.

2. Timber: All timber shall be equal to or better than N.Z.S. 3631 : Dressing A unless noted otherwise. All timber shall be properly seasoned before machining to the stable moisture content suitable for its location in the finished work (approximately 10-12% for interior work and 12-14% for exterior frames etc.) and if the use of inadequately seasoned timber results in warping, twisting, winding or shrinkage opening of joints during the maintenance period the timber shall be replaced as directed (excepting where the damage results from excessive heating, placing in direct sun, or other improper use.) All non-heart timber used shall be treated as specified under Carpenter.

Unless noted or subsequently specified otherwise, timbers as follows (the use of alternate grades and varieties to those specified is subject to approval in each instance) :

D.A. Ht. Rimu or	Window frames, exterior door frames,
D.A. Ht. Matai	exterior glazed doors.
1st quality Redwood	Sashes, exterior door sheathing.
D.A. Rimu	Interior door frames, interior doors (except hollow core), Cabinets and Carcases specified clear finish.
Finishing Boric Radiata	Cabinets and Carcases for paint finish.
Finishing Tanalised Radiata	Window frame facings painted.

3. Hardware: Prehang all doors and casement windows larger than 1m² or higher than 1500mm on 1½ pairs butts, and if smaller 1 pair. Use galvanised fixed brasspin butts for casements and exterior doors, b.m.a. or bronzed or brass as noted for fittings doors, sizes as appropriate, broad butt as noted or appropriate for full opening, and with all screws finished to match hinges. Interloc stays size selected assuming always exposed conditions.

4. Workmanship: All work shall be carried out by or under the direct supervision of competent joiners in accordance with recognised good trade practice and in a properly established shop complete with all mechanical equipment appropriate for the work. All work shall be in strict accordance with the drawings and must be inspected and approved prior to fixing.

Confer with the Main Contractor to check openings sizes, fittings limiting dimensions and available access sizes (and make provision for site assembly of large units if appropriate). Additional dimensions will be supplied by the Architect as requested.

All items shall be assembled by means of the appropriate joints customarily employed in good quality work. All joints shall be accurately cut, fitted and full surface glued (glue types and use as per N.Z.S. 523) and shall be tongued, mortice and tenon, dowelled or housed in preference to scarfed or mitred. Screws shall be used in preference to nails or brads, and where liable to corrosion shall be non-corrodible or galvanised. Fix glue blocks in appropriate positions. Screws etc. may only be used in visible positions in clear finished cabinets when specifically approved.

Adjacent veneers and boards shall be carefully selected to provide reasonable continuity of colour and grain pattern in the finished work; this particularly applies to clashing strips on veneered chipboard which shall be 3mm minimum thickness.

Fine machine sand all visible surfaces and handsand finish to a clean, even surface all fittings specified for clear finishing. Lightly sand arris all projecting edges and neatly punch all nails or brads.

The following are generally unacceptable defects and are thus liable to be rejected :

- a. Scratches, bruises, machine or hammer marks on exposed surfaces;
- b. Glue stains on clear finish specified items;
- c. Iron-on veneers unless specifically approved;
- d. Corrugated fasteners and machine staples unless specifically approved;
- e. Chipboard showing through veneers through excessive sanding (including inside of doors).

5. Delivery: Brace and/or crate all items as required to prevent distortion or disfigurement during transit. Arrange for delivery to the site, not during inclement weather, and attend upon the Carpenter to identify units and instruct in assembly procedures as required.

6. Windows and Exterior Doors: All timber sections for window and exterior doors joinery shall be to exact sizes, and profiles rebated, throated, grooved, sunk etc. as shown on the drawings or as required to suit weather-proofing, linings, trim etc. (all sash or door frame rebates twice 6mmx6mm weathergrooved as a minimum where no specific detail). After checking rough opening sizes on job adjust actual frame sizes if necessary to suit edge conditions as detailed. Unless otherwise approved fabricate frames with housed and checked joints, exterior doors with mortice and tenon joints and sashes with tenoned and dowelled joints (all full surface waterproof glued).

All fixed glass windows beaded directly into frames (no sub-sash) and all glazed doors beaded. Beads shall project slightly from frame face and shall be square profile to heads and jambs and weathered to sills. Ensure that all rebates, beads etc. are fully primed before glazing and where appropriate full frames shall be primed by Painter before leaving workshop.

Make appropriate allowance for hardware, particularly in rebate depths where Interloc stays are fitted.

7. Interior Flush Doors: Shall be of approved manufacture, hollow core unless noted otherwise and shall be plywood surfaced. Doors specified clear finished shall have selected heart Rimu faces with colour matched clashing strips to both edges and doors specified painted shall have ordinary Rimu faces and leading edge only clashed. Doors which warp or twist during the maintenance period shall be replaced.

Frames shall be d.a. Rimu finished 25mm thickness (+ 2mm to suit economical cutting from stock) by the full width of the specified framing and linings and shall have 14x45mm tightly fixed planted stops.

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8. Fittings: Site check overall dimensions where appropriate and allow 10mm positioning tolerance at each end of fittings shown full length between walls. Carcases assembled true and square basically from 19mm timber although selected veneered chipboard may be used providing front rails and divisions front 60-90mm is matching solid timber members. All carcases shall have full surface backs of plain white seratone or 4.75mm Bisonboard as noted. All divisions between cupboards are full depth. Substrate for tiles where shown is 9.5mm chipboard recessed into top rails. Where appropriate supply bases forming toe recesses loose and with sufficient cross bearers to fully support carcase.

Cupboard doors clashed veneered chipboard. Drawers all 19mm and 12mm timber (no chipboard) with plain white Seratone or Bisonboard bottoms as noted and drawer sides and runners ht. Rimu or Matai, full depth of carcase irrespective of depth of drawer. Allow 2mm painting (or varnishing) tolerance all around doors and drawer fronts.

Supply all exposed shelves in kitchens etc. where specified varnished and assemble complete where finite dimensions are given.

9. Plastic Laminates: Where shown for fittings tops shall be Architect selected plain colour satin finish laminate applied to the chipboard substrate by an approved specialist firm in accordance with recognised good practice for this trade. Heat worked 'post forming grade' shall be used wherever radiused corners are required. Substrate surfaces shall be appropriately prepared to receive laminates, and use resorcinal or ureaformaldehyde glues strictly in accordance with the glue manufacturer's instructions. All exposed edges shall be laminated, all joints shall be accurately cut and tightly butted, all external corners shall be lightly arrised and sanded smooth and all internal cutouts shall be small radiused in corners to prevent stress cracking. Any chipped, scratched or bubbled laminates shall be replaced.

1. Introduction	The purpose of this study is to investigate the effects of...
2. Methodology	The study was conducted using a quantitative approach...
3. Results	The results of the study are presented in the following...
4. Discussion	The findings of this study have several implications...
5. Conclusion	In conclusion, the study has shown that...
6. References	The following references were consulted during the study...
7. Appendix	The appendix contains additional data and figures...
8. Acknowledgements	The author wishes to thank the following individuals...
9. Contact Information	For further information, please contact the author at...
10. Disclaimer	The information provided in this document is for informational purposes only...
11. Glossary	The following terms are defined in this section...
12. Index	The index provides a quick reference to the various sections...
13. Bibliography	The bibliography lists the sources used in the study...
14. Appendix	The appendix contains additional data and figures...
15. Acknowledgements	The author wishes to thank the following individuals...

R O O F E R

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.
2. Guarantees: The whole of the roof covering work shall be complete in all respects and absolutely watertight. The commencement of roofing by any Subcontractor indicates their agreement to and acceptance of an unwritten guarantee to maintain the whole of their work in a satisfactory and watertight condition, and to arrange and pay for any damage consequential upon the failure of their roofing, for the periods stated below, irrespective of the general maintenance 90 day period. (Refer to Preliminaries, Clause 11, Responsibility.)
 - a. Butylclad roofer, five years after completion.
 - b. Steel roofer, two years after completion.
3. Cooperation: Roofers shall cooperate fully with the Carpenter to ensure that each section is weatherproofed as soon as possible after the Carpenter work is complete, and in no instance shall finished timber work be left uncovered for more than ten days.
4. Butylclad Roofing: Ensure that the plywood substrate has been satisfactorily fixed, that all timber fillets etc. are in place and that the surface is thoroughly clean. Full surface glue down 1.5mm Butylclad roofing with laps, junctions, upstands, edges etc. all neatly formed fully in accordance with the manufacturer's recommendations, and to the Architect's reasonable satisfaction.
5. Iron Roofer: Fix heavyweight Duroid building paper and sheath with 0.55xG250xZ400 corrugated galvanised steel in full length sheets. Side laps 1½ corrugations. Fix with appropriate nails in straight rows at each point of support and at every second corrugation.
6. Flashings: All flashings required in conjunction with the roofing surface for ridges, barges, upstands, skylights, vents and other penetrations etc. are the responsibility of the Roofing Contractors. Form these flashings in 0.6mm galvanised flat steel, all machine folded and rivetted to profiles shown or required with lead edges as necessary and with stop-ends, external angles and junctions neatly soldered.
Overflashings requiring dissimilar metals and electrolytic separation shall be the responsibility of the Plumber.

The first part of the paper discusses the importance of the research and the objectives of the study. It also outlines the structure of the paper and the main findings.

The second part of the paper discusses the methodology used in the study. It includes a description of the data sources, the sample size, and the statistical methods used to analyze the data.

The third part of the paper discusses the results of the study. It includes a description of the main findings and the conclusions drawn from the data.

The fourth part of the paper discusses the implications of the study. It includes a description of the policy implications and the recommendations for future research.

The fifth part of the paper discusses the limitations of the study. It includes a description of the weaknesses of the study and the areas for future research.

The sixth part of the paper discusses the conclusion of the study. It includes a summary of the main findings and the overall conclusions drawn from the study.

The seventh part of the paper discusses the references. It includes a list of the sources used in the study and the references cited in the text.

The eighth part of the paper discusses the appendix. It includes a list of the figures and tables used in the study and the appendix material.

P L U M B E R

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.

2. General: All plumbing shall comply with all provisions of the Drainage and Plumbing Regulations and any amendments thereto all as currently in operation, together with the appropriate Local Bylaws and the requirements of the Health Department Regulations where appropriate. The Plumbing Subcontractor shall obtain all necessary permits and consents, serve all notices, arrange for all tests and pay all fees and customary charges in connection with his work.

The Plumber shall carry out all of the works required to leave the water, wastes and vents systems serving the sanitary fittings and plumbing hardware shown on the drawings and specified hereunder in correct working order and complete with all normal incidental works customarily performed by this trade, notwithstanding any omission herein.

Cooperate with all other trades and attend upon the Concretor, Drainlayer and Carpenter to set out the exact positions of pipe runs before adjacent work is put in hand and ensure that all pipes, sleeves, fixings, flashings etc. are correctly incorporated as work proceeds.

3. Workmanship: All plumbing work shall be carried out by, or under the direct control of, properly qualified tradesmen, and shall be to recognised high standards of performance.

The cutting away and checking of timbers shall be limited to such dimensions as will not prejudice the purpose for which the timber is used, and wherever possible beams and joists shall be holed at the neutral axis and the hole limited to one-fifth of the depth of the member. The cutting away and checking of other materials shall be always subject to the Architect's approval.

Adequately protect all surfaces. Any damage to fittings or surfaces shall be made good by the appropriate trade at the Plumber's expense.

Bending and folding of sheet metals shall be done by machine wherever possible. All joints between pipes of different materials shall be to the complete satisfaction of the plumbing inspector.

4. Pipework: All pipework in the building shall be concealed except where otherwise indicated or approved and all exposed pipework shall be accurately and neatly run with smooth bends, junctions etc. Arrange all pipes (and especially traps) in a manner which will allow the utmost future accessibility for repairs and maintenance, arrange for the Main Contractor to provide access panels to important maintenance positions and provide accessible gate valves and 'Ballofix' valves to close off the supply to each section of the system for the replacement of washers etc.

Where pipes are to be covered by nail fixed linings or other finish, special care shall be exercised to mark their locations after the linings are fixed to minimise the hazard of further nailings penetrating pipes and all such damage arising from nailings or otherwise shall be remedied without delay with all consequential work made good.

Waterpipes shall be set out in straight runs and in even gradients, with easy bends, and unless unavoidable elbow fittings shall not be used. Where rigid p.v.c. pipes are used for pressure systems, adequate precautions shall be taken to ensure that no hammer effect occurs in the completed system.

1. Introduction

2. Methodology

3. Results

4. Discussion

5. Conclusion

6. References

7. Appendix

8. Acknowledgments

9. Contact Information

10. Declaration of Interest

The purpose of this study is to investigate the effects of various factors on the performance of the system. The study is divided into two main parts: a theoretical analysis and an experimental investigation. The theoretical analysis is based on the principles of thermodynamics and fluid mechanics, while the experimental investigation is based on the use of a specially designed apparatus.

The results of the study show that the performance of the system is significantly affected by the temperature and the pressure of the fluid. The theoretical analysis predicts that the performance will increase as the temperature and the pressure increase, while the experimental investigation confirms this prediction.

The study also shows that the performance of the system is affected by the geometry of the apparatus. The theoretical analysis predicts that the performance will increase as the diameter of the pipe increases, while the experimental investigation confirms this prediction.

In conclusion, the study shows that the performance of the system is significantly affected by the temperature, the pressure, and the geometry of the apparatus. The theoretical analysis and the experimental investigation both confirm these findings.

The study is based on the use of a specially designed apparatus, which is described in detail in the Appendix. The apparatus is used to measure the performance of the system under various conditions of temperature, pressure, and geometry.

The results of the study are presented in the form of graphs and tables. The graphs show the relationship between the performance of the system and the various factors, while the tables provide the numerical data for the experiments.

The study is a preliminary investigation, and further work is needed to confirm the findings. The study is based on the use of a specially designed apparatus, and the results may be affected by the design of the apparatus.

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Supply all necessary fixings to adequately secure all pipes throughout their length, both vertically and horizontally, to prevent sagging or vibration. Fixings of same material as the pipe for internal work. Fittings, brackets, bolts, screws etc. for external pipework generally brass or copper.

All sleeves for exposed pipework penetrating concrete or masonry shall be heavy gauge galvanised steel, 1" greater internal diameter than the outside diameter of the pipe and of length to finish flush with the finished surfaces as appropriate. Pack with mastic or compo or flash as necessary to seal around pipe.

5. Materials: Materials not otherwise specified shall be the best of their respective kinds. All materials shall conform to the relevant N.Z. Standard and unless otherwise specified or detailed shall be of weights, gauges etc. as specified hereunder. All incidental materials (fittings, fixings, jointing compounds etc.) shall be appropriate for the application involved and shall be used in accordance with the manufacturer's instructions. All pipes, and especially cast iron pipes, shall be smooth, full bore and to the full diameter throughout all joints and junctions.

Cast Iron pipes (N.Z.S. 286 and 512).

Screwed galvanised wrought iron pipes (N.Z.S. 219) Water quality.

Lead pipes (N.Z.S. 1053).

Copper tube (N.Z.S. 546) 12mm and 19mm internal diameter, 1mm wall thickness. 25mm, 32mm and 38mm internal diameter, 1.2mm wall thickness.

Rigid p.v.c. pipes for pressure systems (N.Z.S. 7648).

Galvanised steel sheet (N.Z.S. 1343) 0.6mm.

Aluminium sheet (N.Z.S. 1418) 0.8mm soft alloy.

Copper sheet (N.Z.S. 835). For flashings etc. 450g soft (roofing temper). For unsupported work 450g hard (cornice temper).

Zinc sheet. 'Century' or equivalent. For flashings etc. half hard Titan grade. For unsupported work hard Titan grade.

Lead sheet. 25kg/m² grade.

6. Separation of Materials: Wherever dissimilar metals occur in circumstances which could produce contact or electrolytic action by a water film, full precautions shall be taken to ensure adequate separation by use of bituminous felt separators and bituminous paint. Wherever pipes are in contact with or built into concrete or masonry work, they shall be spiral wrapped with Denso Tape or similar material to provide separation and freedom of movement.

7. Temperature Movement: All plumbing work shall be carried out in a manner which will respect in full the adjustments arising from contraction or expansion under temperature changes. All such plumbing work shall be arranged with tolerances and form of jointing which will allow for full temperature movement without risk of prejudice to watertight conditions, or damage from straining to pipes which will generate failures and leaks.

8. Testing: All water or other plumbing services shall be completed in stages which will allow for proper testing under normal working pressures prior to the application of insulation, concealment or other enclosures to pipework. All leaks disclosed from such testing shall be remedied and retested before proceeding. On completion the whole of the plumbing service shall be subjected to full operational tests in the presence of the plumbing inspector with all defects properly remedied.

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9. Water Seal at Bolts etc.: Wherever bolts, screws or other fastenings or pipes pass through exterior finish such as roofing, sheathing, plaster-work etc. such bolts or other fastenings shall be provided with a suitable compressible weather seal gasket of the correct size bedded both sides in mastic and compressed to ensure absolute security of weather seal.

10. Wastes and Vents: All wastes shall be in copper tube in Densotape in concrete, elsewhere rigid P.V.C. All vents where accessible shall be rigid P.V.C., where inaccessible copper tube. All fittings shall be trapped and vented in accordance with the local bylaws, and where allowed anti-siphonage traps shall be used to avoid venting. Note that gulley traps are back inlet type.

11. Stainless steel benches: Supply for fixing by Carptenter 1mm thick stainless steel sink benches as required with 150mm upstands to walls (including ends where appropriate) and standard domestic spillage lips to free edges, complete with pinex softboard underlinings and 19mm timber subframes. Check all dimensions on site and confirm with Carpenter and/or Joiner before fabrication.

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DRAINLAYER

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.
2. Standards: All work shall comply with all provisions of the Drainage and Plumbing Regulations and all amendments thereto and all Local Authority Drainage Bylaws. The Drainlayer shall obtain all necessary permits, pay all fees and serve all notices in connection with the work. All work shall comply with N.Z.S. 671 and shall be carried out by, or under the direct control of, registered tradesmen.
3. Building In: Cooperate with the Carpenter and Concretor to build in soil and stormwater drains which pass through foundations and under slabs etc. in their exact locations as work proceeds or alternatively supply sleeves for casting in. Isolate drains from masonry with a full spiral binding of Denso Tape, and pack between drains and sleeves with bitumastic.
4. Trenches: All trenches and backfilling work is specified under Excavator. Check all levels, gradients and positions as work proceeds and immediately prior to laying of pipes.
5. Gulley Traps: Check position and levels of all wastes and set gulley traps on concrete beds. Gullies shall be level inlet type without dished top and shall be fitted with 110mm glazed earthenware lining extensions encased in concrete to not less than 100mm above permanent ground level. Movable gratings shall be fitted flush with extension tops and waste pipes shall pass through the side of the extensions. The extensions shall be as short as practicable and not more than 600mm long. Waste pipes shall finish flush with the interior surface of the extensions.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions.

2. It is essential to ensure that all data is entered correctly and that the system is updated regularly.

3. The second part of the document outlines the procedures for handling customer inquiries and complaints.

4. It is important to respond to customers promptly and to provide them with the information they need.

5. The third part of the document describes the various methods used to collect and analyze data.

E L E C T R I C I A N

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.

2. General: The work comprises the supply, delivery and installation of all materials, including all minor and incidental items necessary for proper completion, and testing of all of the Electrical Services specified and/or shown on the drawings. Provide all temporary works, ladders and tools, specialised equipment etc. as required and allow to make all tests prescribed by the Electrical Wiring Regulations, Part 9. The Contract shall not be deemed to be completed until the Electrician has filed his 'Notice of Completion' with the Local Supply Authority and the installation has been authorised for service by its Inspector.

Leave the works clean and tidy, in full operational order and deliver all equipment guarantees and instructions to the Architect.

3. Setting Out: The positions of all switches, light and power outlets and other fittings, although shown specifically in some cases are in general only shown diagrammatically. Exact location and height above floor will be determined on the works by the Architect; the Subcontractor shall give reasonable notice of when this information is required.

Any items positioned in contravention of this shall be repositioned if so directed by the Architect, including re-wiring of the circuit if insufficient cable has been run, all at the Electrician's expense.

4. Workmanship: All work shall be by Registered Tradesmen and shall comply in all respects with the 1976 N.Z. Electrical Wiring Regulations, its amendments (and in detail with the 1980 handbook thereto), and the local Supply Authority's requirements. Obtain all permits and pay all fees

Workmanship shall be in accordance with accepted best trade practices, and such as to leave an efficient, robust and neat installation. Materials, fittings and equipment shall be installed exactly in accordance with the manufacturer's recommendations.

Cooperate with all trades to ensure the efficient progress of the works, and with the Concretor to ensure that all necessary sleeves, holes, conduit, flush boxes, fixings etc. (provided by Electrician) are incorporated in their exact positions as work proceeds. Electrician shall allow for normal drilling, cutting away or chasing of masonry, and notching or drilling of timbers, but no work of other trades shall be so cut that damage is caused to structural or finished work. Carpenter will provide and fix all necessary dwangs and timber supports in exact locations determined by Electrician.

Neatly label switchgear and fuseboards to identify each circuit and which circuits are controlled by each switch.

5. Materials: Attention is directed to the appropriate Standards of the Standards Association, Wellington, and their provisions shall be deemed to be included in this Contract. Where no special reference is made and where a Standard provides for an alternative the best quality of materials and the highest standard of workmanship shall be deemed to be required.

6. Wiring: Conceal all wiring except as specifically noted otherwise or as approved on site by the Architect. All circuits shall be wired to carry the maximum design loading plus not less than 25% margin except where specified or noted otherwise. Mineral insulated metal sheathed cables, neutral screened cables, and P.V.C. insulated power and lighting cables shall comply with N.Z.S.6401. Flexible cords shall comply with N.Z.S.6402.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for ensuring the integrity and transparency of the financial system. The document also highlights the need for regular audits and reviews to identify any potential issues or discrepancies.

In addition, the document outlines the responsibilities of all personnel involved in the financial process. It stresses that everyone must adhere to the established policies and procedures to ensure consistency and accuracy in all financial reporting.

The document further details the specific steps and procedures for handling financial transactions, from initial recording to final reporting. It provides clear guidelines on how to handle various types of transactions, including income, expenses, and transfers.

Finally, the document concludes by reiterating the importance of ongoing communication and collaboration between all departments. It encourages a proactive approach to financial management, where potential issues are identified and addressed before they become significant problems.

Overall, the document serves as a comprehensive guide for all financial activities, ensuring that everyone is on the same page and working towards the same goals.

The document is intended to be a living document, subject to updates and revisions as the financial system evolves and new challenges arise.

It is the responsibility of all personnel to stay informed of any changes and to implement them correctly. The document is a key tool for ensuring the success and stability of the financial system.

Wiring shall be properly supported throughout its entire length with clips or saddles so spaced as to obviate any sagging; Catenary wires will not be permitted. The earth continuity wire shall be separately insulated incorporated within the cables, and where Tee or other joints are required, joint boxes of all insulated pattern and of substantial construction may be used.

Conduit where required or directed shall be rigid p.v.c. complying with N.Z.S.2250 neatly installed in exactly straight vertical and horizontal runs with a minimum of bends.

7. Distribution Elements: Miniature circuit breakers shall be time delay type with instantaneous tripping on fault conditions complying with N.Z.S.2205. Use front connected N.Z. Insulators S901 M.C.B.s mounted by means of front accessible studs unless otherwise indicated.

H.R.C. fuses and semi-enclosed (rewirable) fuses where noted shall comply with N.Z.S.1951. Switches on boards shall comply with N.Z.S.388 and be P.D.L. cat's 2/S, 3/S, 4/S, 5/S or 7/S unless otherwise required or directed.

Outlet boxes for use with all flush mounted accessories shall comply with 1201 and be P.D.L. cat 141 for concrete block walls, P.D.L. cat 144 for framing and P.D.L. cat 140 for concrete walls.

8. Accessories:

- a. Power outlets complying with N.Z.S.2065 shall be P.D.L. cat 292 generally, with P.D.L. cat 291SH where specifically indicated. Wire circuits with 3/7/0.67 from 20 amp M.C.B.s with a maximum of six outlets per circuit.
- b. Service switches for fixed equipment shall comply with N.Z.S.2065 and for water heaters, cupboard heaters etc. be P.D.L. cat 253 where flush, cat 10 where surface mounted. Where required to suit loadings use P.D.L. cat 1F1, 2F1, 3F1 or 4F1.
- c. Shaving outlets complying with N.Z.S.1524 shall be P.D.L. cat 63.
- d. Lights. Wire circuits with 3/7/0.5 from 10 amp M.C.B.s with a maximum of ten outlets per circuit. Switches complying with N.Z.S. 2065 shall generally be P.D.L. cat 281 or 282 (do not use cat 283 - group switches); where narrow switches are required use C.P.I. Ring-grip cat CMS1A or CMS2A, where dimmers are required use P.D.L. cat 220. Ceiling roses shall be cord grip pattern complying with N.Z.S.354, P.D.L. cat 44 (white on white or black on black only - black on white is not acceptable). Lampholders complying with N.Z.S.144 shall be P.D.L. cat 26 suspended on white 3/16/0.2 flexible cord round profile, heights as directed on site by Architect. Provide 100 watt (or less if so indicated on selected fitting) bulbs and fluorescent tubes to all positions.

9. Hot Water Cylinder Complete with heating element and thermostat shall be provided and installed by others in the position shown on the drawings but Electrician shall make all necessary electrical connections.

10. Lighting Fittings: Include the sum of \$2500.00 (Two Thousand, Five Hundred Dollars) for the purchase of lighting fittings selected by the owner. Electrician shall take delivery and install fittings where directed. Electrician shall allow in his tender for fixing selected fittings and providing incandescent lamps, lamp holders, ceiling roses, flexes.

1. *What is the main purpose of the study?*
 2. *What are the research objectives?*
 3. *What is the research methodology?*
 4. *What are the findings of the study?*
 5. *What are the conclusions of the study?*
 6. *What are the limitations of the study?*
 7. *What are the implications of the study?*
 8. *What are the future research directions?*
 9. *What are the contributions of the study?*
 10. *What are the key words of the study?*

1. *Journal of the American Medical Association*, 2000; 283: 2639-2645.

Abstract

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

— *Journal of the American Medical Association*, 1997

1. *Journal of the American Medical Association*, 2000; 284: 2689-2695.

1. **Introduction**
 2. **Background**
 3. **Methodology**
 4. **Results**
 5. **Conclusion**
 6. **References**

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

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1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

Abstract

11. Demolition: Remove all redundant wiring and elements from new mezzanine space. The fittings remain the property of the Employer and several may be re-used in the new work.

12. Switchboard: Existing switchboard retained and modified only to approval to accommodate additional equipment required. Note that most of the existing surface distribution wiring will have to be re-routed as directed (allow to re-route - but not to extend).

GLAZIER

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.

2. Glass: All glass shall be in accordance with N.Z.S. 2258 (1969) and shall be Ordinary Glazing Quality, free from defects other than those acceptable within this grade.

Thicknesses for individual panes shall be in accordance with the following except where specifically noted otherwise on the drawings : Fixed panes less than 0.5m², 4mm glass, Fixed panes between 0.5m² and 1m², 5mm glass, Fixed panes greater than 1m², 6mm glass. 'Fixed panes' applies only to vertical windows glazed four edges. For sloping panes (glazed three edges); opening sashes and glazed doors double the area to obtain the glass thickness required.

3. Putty: All putty or other bedding shall be appropriate for the purpose for which it is to be used. Glazing in wood frames shall be with good oil putty of recognised manufacture and where to be finished other than by painting putty shall be stained as necessary to match adjoining work. Glazing with wood beads shall be bedded and sealed with approved butyl glazing compound, glazing into steel frames shall be with Expandite Mica Metal Casement Putty or approved equal and skylights glass shall be bedded in Expandite Seelastrip BR606 and face beaded with polysulphide or polyurethane elastomeric sealant. Internal glazing shall have all edges 'capped' with approved resilient glazing strip.

4. Glazing: All glazing work shall be carried out in accordance with best trade practice for the nature of work concerned. All glass shall be cut to full size of openings subject only to proper edge tolerances to allow for temperature movement spacing and bedding required. All rebates shall be primed or oiled before glazing. All glass shall be evenly bedded on the back and edges, seated and spaced with neoprene blocks at quarter points, sprigged at 300mm centres and finished with clean straight putty fillets finishing slightly below the line of the bedding putty. External glazing with beads shall have bedding on back, edges and face of glass under beads and bedding shall be applied so as to completely fill all voids when beads are placed and secured.

Skylight frames shall be primed with Expandite Primer, porous or non-porous as appropriate, before placing BR606, and glass edges shall be meths cleaned before positioning. Use of BR606 and face beading shall be exactly in accordance with the manufacturer's instructions.

5. Completion: Replace any cracked, broken or otherwise defective glass and make good. Leave the whole of the glazing work completely watertight and leave all glass properly cleaned and ready for occupation.

6. Mirrors: Shall be 6mm float glass silvered, polished, and with edges and corners rounded and polished. Fix with a ventilating space behind with screws through drilled holes with domed caps tapped into screw heads. All mirrors in 'wet' areas shall be backed by an approved specialist firm.

P A I N T E R

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.

2. Preparation of Surfaces: No painting, varnishing, oiling or other surface coating shall be undertaken unless the surfaces to be coated are in a fit and proper condition to ensure first class results.

The Painter shall inspect the work of other trades upon which his material is to be applied and report to the Architect and Main Contractor any defects or irregularities in the work that would prevent the satisfactory execution or permanency of his work, and he shall not proceed until all such unsatisfactory preparatory work has been corrected. Failure to examine and report will be construed as an acceptance that preparatory work is satisfactory.

This clause does not relieve the Painter of any of the normal preparatory work of surfaces customarily performed by this trade.

3. Protection: All surfaces to receive Painter work shall be thoroughly swept and wiped down and all dust, rubbish etc. shall be completely removed from the areas involved immediately prior to commencement. Take adequate precautions during and after operations, both inside or out, to protect work from dust, dirt or any disfigurement whatsoever.

No Painter work shall be carried out on surfaces which are not perfectly dry, and no external work shall be done during frosty or unsuitable weather. Take adequate precautions to prevent paint spots etc. from falling on floors and similar surfaces, and extreme care to keep absorbent surfaces scheduled unpainted (i.e. fairface concrete, brickwork) clean during adjacent Painter work.

4. Workmanship: All work shall be of the highest reasonable standard and shall be executed by skilled tradesmen to the satisfaction of the Architect. Manufacturers' instructions shall be strictly adhered to.

In all finishes any irregularities, brushmarks, dust etc. in each preceding coat shall be rubbed down to provide a smooth and clean surface for the following coat. Each coat shall be finished one coat over all surfaces before a further coat is applied, and each coat shall be perfectly dry before subsequent coats.

All painting of putties shall be carried out within one month of the glass being glazed. Paint shall impinge upon the glass for weather protection.

All locks, fastenings and other hardware shall be removed while painting work is in progress and refixed when complete. Knuckles of hinges and butts must not be painted.

Wallpapers and lining papers, where scheduled, shall be hung plumb, true and square and patterns shall be accurately matched. All edges shall be neatly and accurately trimmed and the paste shall include an appropriate fungicide.

5. Painter Work: The Main Contractor shall assign to the Painter a separate portion of the premises for the general storage and mixing of his materials.

The schedules indicate the general extent of the works but are in no way exhaustive in their description of actual items for Painter work. All items and portions of items reasonably inferable but not specifically mentioned are deemed included, i.e. the interiors of all cupboards, the tops and bottoms of doors, etc. All cupboard doors shall have equal Painter work on each side.

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All stopping work shall be carried out immediately priming coat or sealing coat is dry, and shall be solidly placed to finish clean and smooth. Stopping tinted to match timber for clear varnish work, and tinted to match anticipated final colour for oiled timber work.

6. Materials Generally: All materials ready mixed highest quality reputable manufacture delivered in unopened containers. Where a maker's name is specified this does not preclude the use of other brands providing approval is first obtained.

Materials shall be used only for the purpose and in the manner intended by the manufacturer, and any apparent scheduled discrepancy in this respect shall be immediately referred to the Architect for clarification.

Where work is specified to be finished in a particular material or manner, all preparatory work, priming or undercoating necessary to ensure proper finish shall be provided, notwithstanding any omission herein.

7. Priming: Various materials shall be primed before fixing as specified under the Sectional Trades concerned.

Timber work shall have the priming thoroughly brushed in to ensure the whole surface is completely covered and all exterior timberwork shall be primed within one week of fixing, and should more than two months elapse between priming and undercoating of any surface it shall be reprimed.

Steel windows will be primed by the manufacturer before delivery but this coating shall be checked immediately before fixing and any damage shall be corrected.

8. Completion: Allow to touch up to approval any Painter work damaged during finishing work by other trades. On completion thoroughly clean all paint marks, smears etc. from glass, hardware, and other surfaces and leave ready for occupation. Avoid scratching glass or hardware when cleaning.

9. Schedules: The schedules below indicate the general extent of the work but no painting whatsoever shall be undertaken until each specific item has been confirmed in writing by the Architect. A detailed schedule of specific colours and finishes will be issued during construction.

10. Exterior: Allow to single oil coat and two acrylic coat all galvanised steel surfaces, to three coat acrylic coat all concrete and masonry surfaces and to three oil coat all timber surfaces.

11. Interior: Allow to single oil and two acrylic coat ALL new and reinstated interior wall and ceiling surfaces (except prefinished surfaces i.e. Aquapanel and Rocfibre).

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part outlines the specific procedures and protocols that must be followed when recording transactions. This includes details on how data should be collected, stored, and reviewed to ensure its integrity and accuracy.

3. The third part addresses the role of the management team in overseeing the record-keeping process. It highlights the need for regular communication and collaboration between different departments to ensure that all relevant information is captured and analyzed.

4. The fourth part discusses the importance of maintaining up-to-date records and the consequences of failing to do so. It notes that outdated or incomplete records can lead to significant errors in decision-making and reporting.

5. The fifth part provides a summary of the key points discussed in the document and reiterates the commitment to maintaining high standards of record-keeping. It concludes by stating that this is a continuous process that requires ongoing attention and improvement.

6. The sixth part includes a list of references and sources used in the document, providing a clear path for further research and information gathering. This section is designed to support the claims and data presented throughout the report.

7. The seventh part contains a detailed appendix of data and figures, which are essential for understanding the scope and impact of the findings. These visual aids help to clarify complex information and provide a more comprehensive view of the data.

8. The eighth part discusses the implications of the findings for the organization's future strategy and operations. It suggests ways in which the insights gained from the analysis can be used to inform decision-making and drive positive change.

9. The ninth part provides a final summary and conclusion, reinforcing the main message of the document. It emphasizes the importance of the findings and the need for continued vigilance in maintaining accurate records.

10. The tenth part includes a list of contact information for the authors and stakeholders involved in the project. This section is intended to facilitate further communication and collaboration as needed.

S H E E T V I N Y L W O R K E R

1. Preliminary: Refer to the General Conditions of Contract and to all provisions of the Preliminary Section of this Specification as appropriate.
2. Guarantee: Sheet Vinyl Subcontractor shall provide a written guarantee covering the whole of the workmanship and materials used for a period of two years.
3. Substrate: Before commencing work on any space the Sheet Vinyl Subcontractor shall satisfy himself that all surfaces are fit for covering, dry and suitable to provide a first class finish. Commencement of work will be deemed acceptance of all matters affecting production of a first quality finish.
4. Completion: On completion of work thoroughly clean and polish surfaces and remove all waste, glue stains, offcuts, etc.
5. Sheet Vinyl Work: All sheet vinyl shall be selected colour, fully flexible vinyl sheet as manufactured by Polyfloor Products (N.Z.) Limited or similar approved. All vinyl shall be fixed with contact type neoprene adhesives, spray or roller applied, and all adhesives shall be waterproof, mildew resistant, strong bonding and have good ageing characteristics. Allow to prime substrate as required.

All work shall be executed by competent experienced tradesmen in accordance with best recognised trade practice. Use as large sheets as possible with a minimum of joints and scribe all edges neatly to perimeters, coved as required. All joints shall be tightly butted and true to line.

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STRUCTURAL CALCULATIONS

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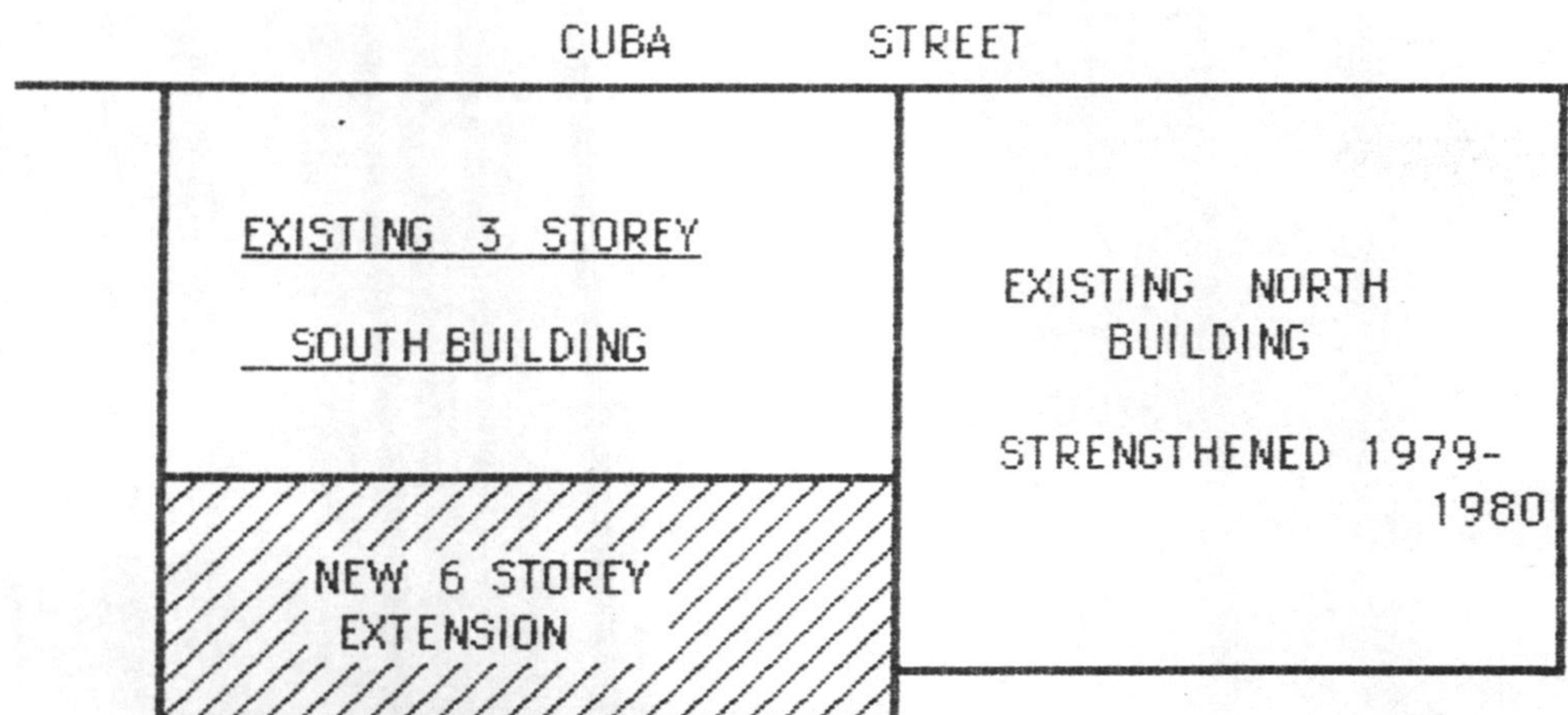


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WELLINGTON WORKINGMEN'S CLUB & LITERARY INSTITUTE
STAGE II STRENGTHENING & EXTENSIONS

Introduction



SITE PLAN

Description

The Wellington Workingmen's Club comprises basically 2 three-storey buildings separated by a common wall. At the rear of the South building there is a single-storey attached building. Both buildings consist of brick masonry walls supporting timber and concrete floors. The North building has been strengthened, as a Stage I contract, to 2/3 the earthquake loadings required under NZS 1900, chap. 8:1965. This was done by incorporating new concrete frames and shear walls within the confines of the existing building.

Strengthening

The South building is now being strengthened to the same level as the North building, principally by tying it to a new 6-storey extension located at the rear of the building. The strengthening generally consists of strapping brick walls for face loading and connecting the various elements of the existing building to the new extension by means of diagonal bracing.

6-Storey Extension

The extension at the rear of the South building consists of proprietary precast flooring supported by reinforced concrete frames and shear walls. The primary earthquake structure has been designed to the same level of earthquake loading as the North building (2/3 NZS 1900, Chap. 8:1965) and as to deflect comparably with the North building frames. Limited ductility has been applied. Far North-South loading, all torsion has been assigning to the new and shear walls.

Foundations

The 6-storey extension is to be supported on bored cast-in-place piles founded in alluvial gravels.

The final positioning of the piles, and thus the ground beam design, has yet to be determined as it is dependent on the location of a stormwater culvert running under the building. This will be done

<p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p>
<p>_____</p>	<p>_____</p>

immediately following demolition.

Foundation Investigation

A foundation investigation has been carried out and the report is attached.

Design Codes

NZS 1900, Chap. 8:1965

NZS 4203:1984

NZS3101:1982

NZS3404:1977

NZS4203P:1985

(M.J. Orsman, MIPENZ)

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JOB No. 5002

PAGE 1

JOB WELLINGTON WORKING MENS CLUB, CUBA ST.

BY WZM

DATE 18/8/86

Seismic	Building	Masses	
Old Bldg			
1st floor			
D	Walls	N	$24 \times .45 \times 4 \times 15 = 648$
	Conc. Interior		$4 \times 24 \times .23 \times 2.1 \times 15 = 696$
		S	648
		W (Cols)	$6 \times 24 \times 2 \times 3 \times .8 \times 5 = 1132$
		W	$24 \times .6 \times 2 \times 21 = 605$
	Tbr Interior		$.5 \times 2.1 \times 40 = 42$
	Floor		$1 \times 21 \times 15 = 315$
			<u>3086</u>

L $L/3 = 1 \text{ kPa}$ 3152nd floor

D	Walls	N&S	$2 \times 24 \times .45 \times 2.0 \times 15 = 648$
		N&S	$2 \times 24 \times .35 \times 1.8 \times 15 = 454$
		W	$24 \times .6 \times 3.8 \times 21 = 1149$
		Tbr	$.5 \times 2.1 \times 40 = 42$
			$.5 \times 1.8 \times 40 = 36$

Floor $\frac{315}{2644}$

L 315

3rd floor (roof)

D	Walls	N&S	$2 \times 24 \times .35 \times 1.8 \times 15 = 454$
		N&S	$2 \times 24 \times .23 \times 2.5 \times 15 = 414$
		W	$24 \times .6 \times 5 \times 21 = 1512$
		Tbr	$.5 \times 1.8 \times 40 = 36$

Roof $\frac{158}{2573}$

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BY WFM

DATE 18/8/86

New Bldg

Mezz Floor

		S	$24 \times .15 \times 2.5 \times 9 =$	81
D	Walls	E	$4 \times 2.5 \times 21 =$	210
		tblr	$.5 \times 2.5 \times 20 =$	25
	floor		$4 \times 21 \times 9 =$	756
	beams		$2 \times 24 \times 1 \times .6 \times 20 =$	576
	cols		$10 \times 24 \times 1.0 \times .6 \times 2.5 =$	288
				<u>1936</u>

L $1.67 \times 21 \times 9 = 316$

1st floor

		S	$24 \times .15 \times 3 \times 9 =$	97
D	walls	E	$4 \times 3 \times 21 =$	252
		tblr	$.5 \times 3 \times 20 =$	30
	floor			756
	beams			576
	cols			<u>288</u>
				<u>1999</u>

L $1 \times 21 \times 9 = 189$

2nd floor, 3rd floor

D	walls	S	$24 \times .15 \times 3.7 \times 9 =$	120
		E	$4 \times 3.7 \times 21 =$	311
		tblr	$.5 \times 3.7 \times 20 =$	37
	floor			<u>756</u>
	beams			576
	cols			<u>288</u>
				<u>2088</u>

L 189

4th floor

D	bas. above			2088
	roof			95
	walls			120
				<u>2303</u>

L 316

$\left. \begin{array}{l} 2088 \\ 95 \\ 120 \end{array} \right\} \div 10\% \Rightarrow \text{OK}$

Date		Time		Location		Weather		Remarks	

<u>Final Seismic Masses</u>					
LEVEL	OLD D	BLDG L/3	NEW D	BLDG L/3	Wt
4	—	—	2303	316	2619
3	2573	—	2088	189	4850
2	2644	315	2088	189	5236
1	3086	315	1999	189	5589
M	—	—	1936	316	2252
					<u>20546</u>

Seismic Coefficient

Design to 2/3 1965 code reqmts

$$V = KC W_t$$

$$2/3 KC = 2/3 \times 1.25 \times .12 = 0.1$$

$$V = 0.1 W_t = 2055 \text{ kN}$$

LEVEL	h _x	W _x	W _x h _x	F _x	V _x	FRAME DESIGN FORCES	
						F _x	V _x
4	3.7	16.4	2619	42952	476	238	238
3	3.7	12.7	4850	61595	682	341	579
2	4.0	9.0	5236	47124	522	261	840
1	2.4	5.0	5589	27945	310	155	995
M	2.6	2.6	2252	5855	65	33	1028
			<u>185471</u>				

$$F_x = \frac{V W_x h_x}{\sum W_x h_x}$$

$$h/l = 16.4/21 = .8 < 3$$

⇒ No 0.1 V @ top.

Have two identical frames & torsion will be taken out by shear walls in opposite dirn

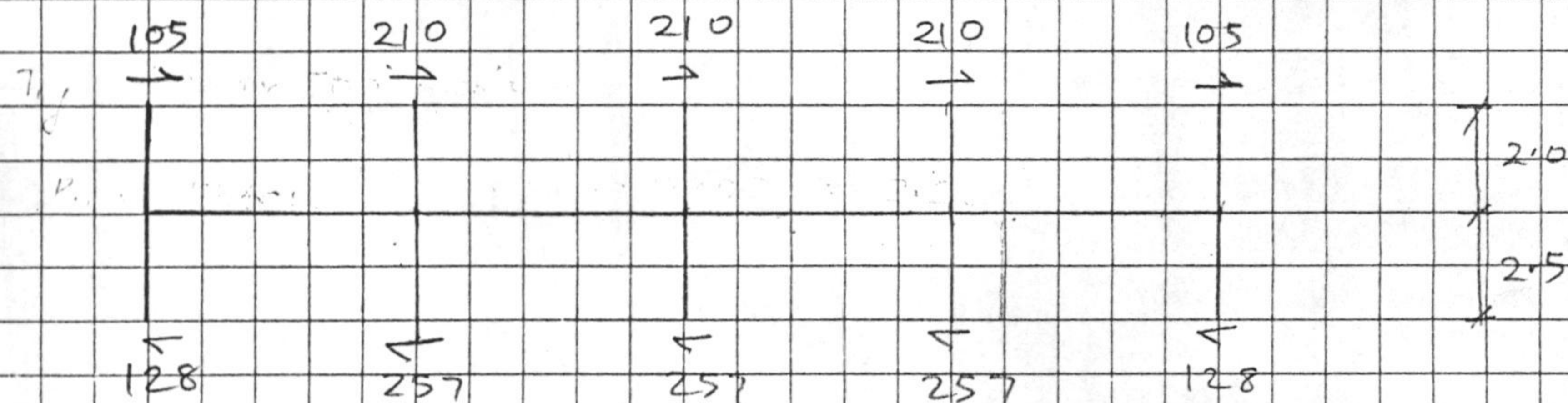
⇒ Design forces for frame are 50% of total

Scheme

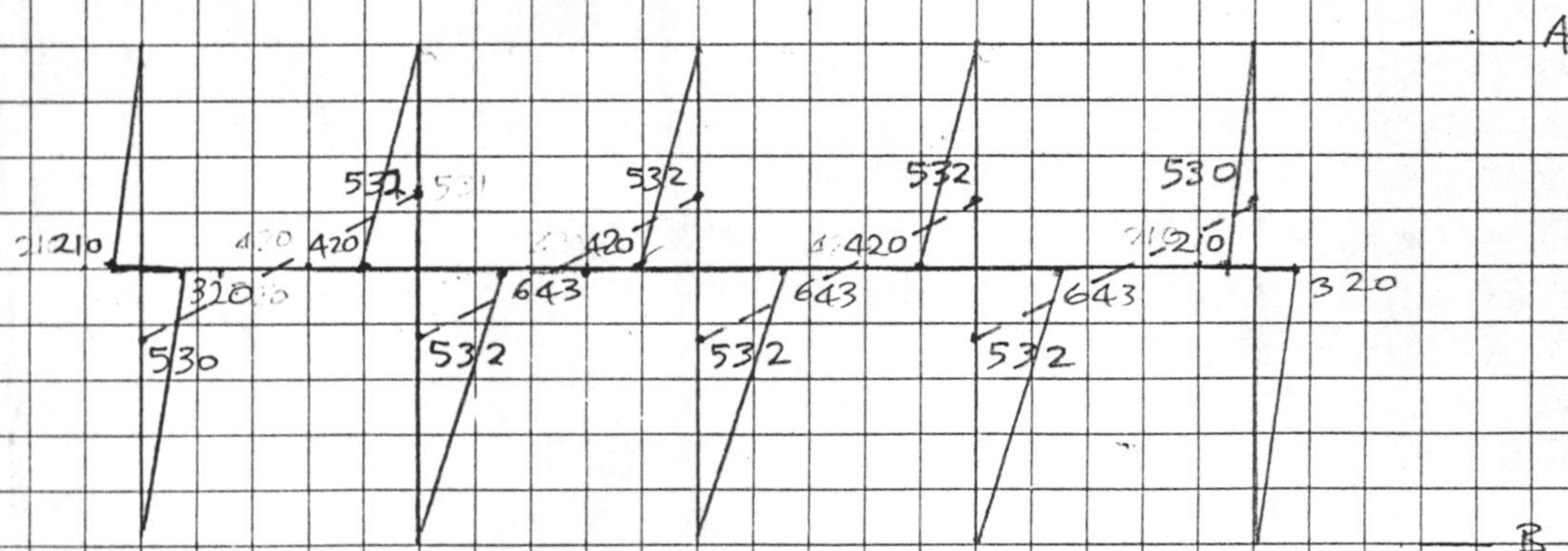
Assume = pt. of contraflexure @ mezzanine level
(Ignore mezz. level for purpose of scheme)

Shear Forces levels G-1, 1-2

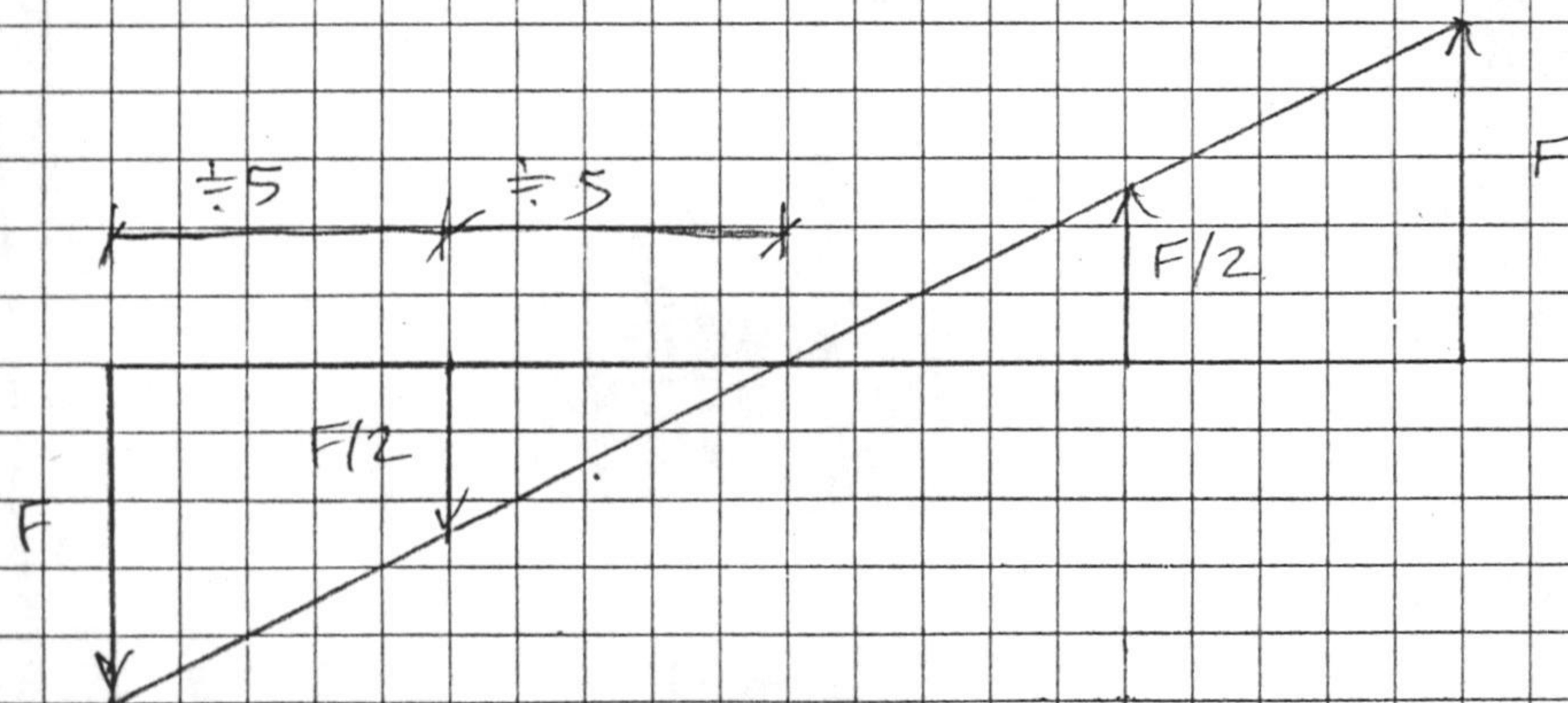
Assume end cols \Rightarrow Equivalent of
have $I = 0.5$ internal cols 8 cols



BMD



Axial Forces in cols - assume axial forces in cols are proportional to distance from centroid of cols.



$$[(F \times 10) + (F/2 \times 5)] \times 2 = 25 F$$

[illegible]

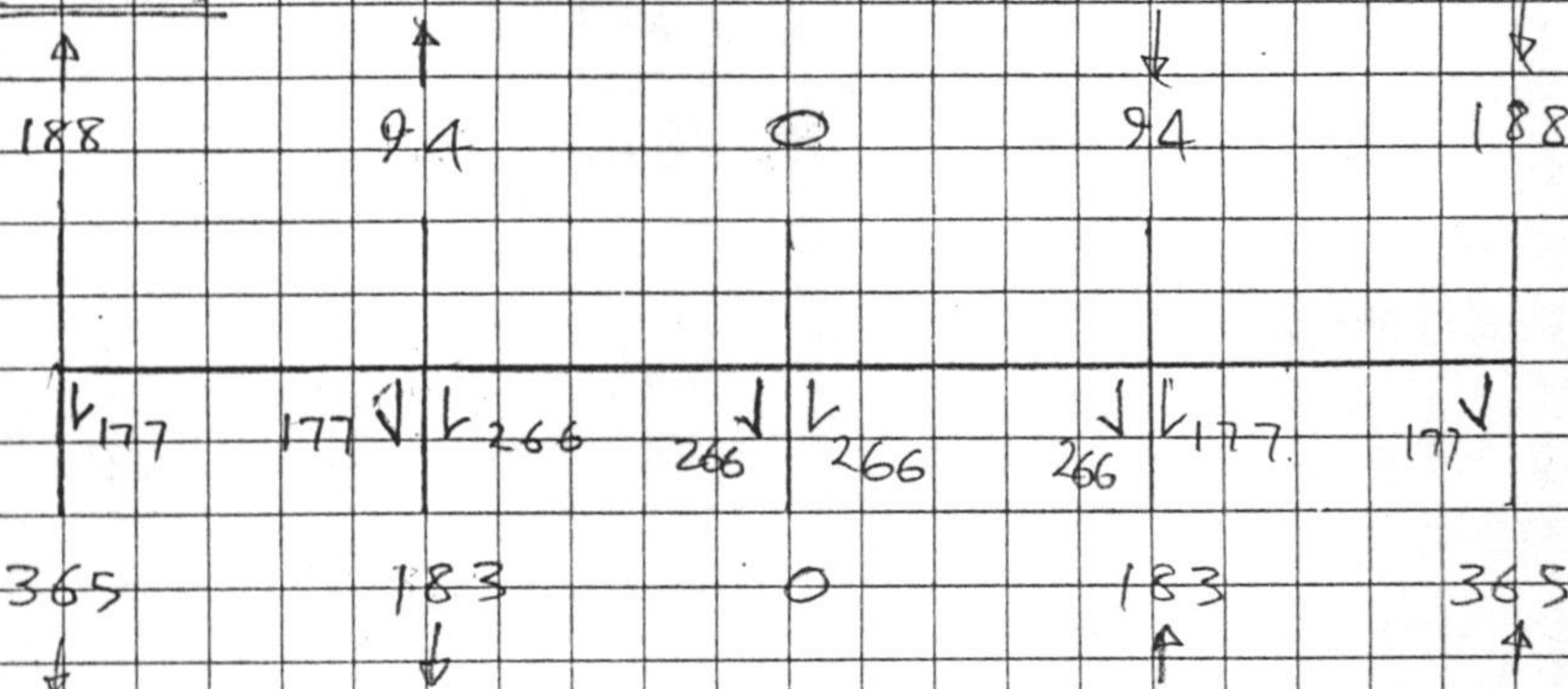
$$\text{Moment @ A} = 238 \times 9.4 + 341 \times 5.7 + 261 \times 2 = 4703 \text{ kNm/frame}$$

$$\text{Moment @ B} = 238 \times 13.9 + 341 \times 10.2 + 261 \times 7.5 + 155 \times 2.5 = 9131 \text{ kNm/frame}$$

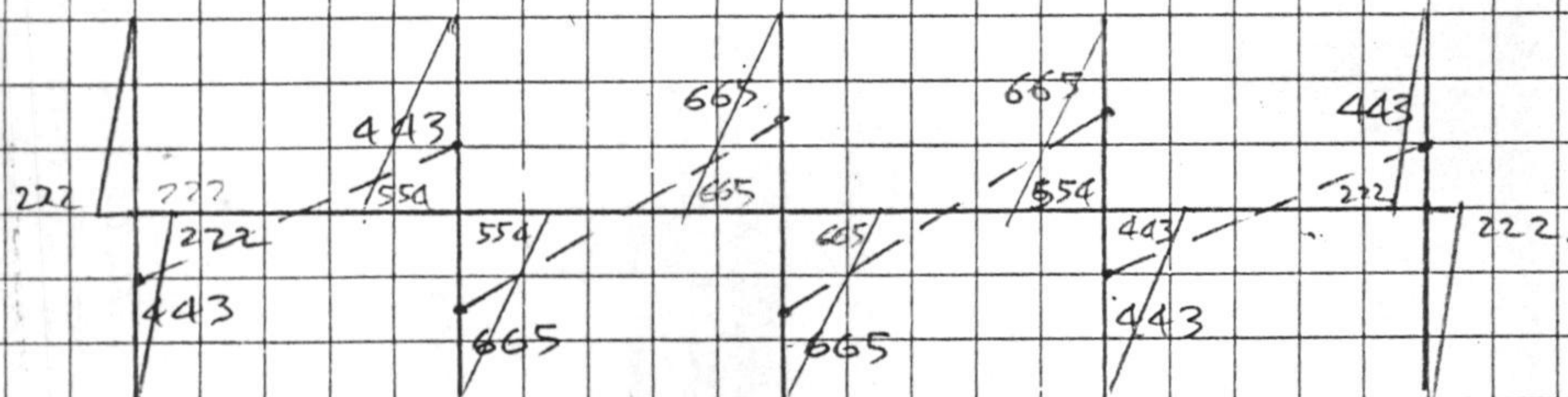
$$\Rightarrow \text{At A } 25F = 4703 \Rightarrow F = 188 \quad F/2 = 94 \text{ kN}$$

$$\text{B } 9131 \quad 365 \quad 183$$

axial Forces



BMD (check only)



\Rightarrow Consider worst cases - cols. col in tension

$$\left. \begin{array}{l} M_E = 320 \text{ kNm} \\ P_E = 365 \text{ kN tension} \end{array} \right\}$$

$$\left. \begin{array}{l} M_E = 665 \text{ kNm} \\ P_E = 183 \text{ kN tension} \end{array} \right\}$$

Beams - $M_E = 665 \text{ kNm}$

$$\text{Try } 850 \times 500 \quad R_u = 2.77 \quad \rho = 0.008 \quad A_s = 2920$$

$$\rho = 0.010 \quad (f_y = 300) \quad A_s = 3650$$

\Rightarrow 4HD32 or 5D32

\Rightarrow Probably OK

1st = 1st in (top col)

Gravity

Internal beam - level 2

Span = 11.0 m

Includes SDL 0.5 kPa

$$\begin{array}{l} \text{D floor (900 Ti 250)} \quad 3.2 \times 4.5 \times 11 = 158 \\ \text{beam} \quad 24 \times 1.2 \times 1.5 \times 11 = 158 \\ \hline 316 \end{array}$$

$$\begin{array}{l} \text{D PL - floor } 1.2 \times 1.8 \times 5.7 = 10 \\ \text{- beam } 24 \times 1.5 \times 3 \times 1.8 = 6 \\ \hline 16 \end{array}$$

$$\begin{array}{l} \text{L UDL} \quad 3 \times 5.7 \times 11 = 165 \quad A = 55 \quad R = 1.67 \quad L_R = 111 \\ \text{PL} \quad 3 \times 1.8 \times 5.7 = 31 \quad A = 10 \quad L_R = 21 \end{array}$$

D	166		D	166
LL	98		LL	98
L _R	66		L _R	66
1.4D + 1.7L _R	345		1.4D + 1.7L _R	345

FEM

MSM

D	290 + 22 = 312	145 + 22 = 167
L _R	102 + 29 = 131	51 + 29 = 80
1.4D + 1.7L _R	660	370

$$\text{Redist.} \Rightarrow M_u^- = 0.7 \times 660 = 462 \text{ kNm}$$

$$M_u^+ = 568 \text{ kNm}$$

$$R_u = 568 \times 10^6 / (0.9 \times 500 \times 730^2) = 2.37$$

$\Rightarrow 800 \times 500$ OK as for seismic

Date		Description		Amount	
1900	Jan 1	Balance		100.00	
1900	Jan 15	Received from A. B.		50.00	
1900	Feb 1	Received from C. D.		25.00	
1900	Feb 15	Received from E. F.		75.00	
1900	Mar 1	Received from G. H.		100.00	
1900	Mar 15	Received from I. J.		150.00	
1900	Apr 1	Received from K. L.		200.00	
1900	Apr 15	Received from M. N.		250.00	
1900	May 1	Received from O. P.		300.00	
1900	May 15	Received from Q. R.		350.00	
1900	Jun 1	Received from S. T.		400.00	
1900	Jun 15	Received from U. V.		450.00	
1900	Jul 1	Received from W. X.		500.00	
1900	Jul 15	Received from Y. Z.		550.00	
1900	Aug 1	Received from A. B.		600.00	
1900	Aug 15	Received from C. D.		650.00	
1900	Sep 1	Received from E. F.		700.00	
1900	Sep 15	Received from G. H.		750.00	
1900	Oct 1	Received from I. J.		800.00	
1900	Oct 15	Received from K. L.		850.00	
1900	Nov 1	Received from M. N.		900.00	
1900	Nov 15	Received from O. P.		950.00	
1900	Dec 1	Received from Q. R.		1000.00	
1900	Dec 15	Received from S. T.		1050.00	
1900	Dec 31	Balance		1100.00	

ColTry 800x500 col

$$\left. \begin{aligned} M_i / f_c b h^2 &= 665 \times 10^6 / .9 \times 25 \times 500 \times 800^2 = .092 \\ P_i / f_c b h &= -183 \times 10^3 / .9 \times 25 \times 500 \times 800 = -.02 \\ g &= 660 / 800 = .8 \end{aligned} \right\} \rho_{tm} = .30$$

$$\left. \begin{aligned} M_i / f_c b h^2 &= 320 \times 10^6 / .9 \times 25 \times 500 \times 800^2 = .044 \\ P_i / f_c b h &= -365 \times 10^3 / .9 \times 25 \times 500 \times 800 = -.04 \end{aligned} \right\} \rho_{tm} = .16$$

$$\rho_t = .0168$$

$$A_s = 6720 \text{ mm}^2 \Rightarrow 10 \text{ HD } 32$$

 $\Rightarrow 800 \times 500 \text{ col OK}$

[illegible]

Gravity Loadings

West frame

L.W

Level 4

D	roof	$.5 \times 4.5$	=	2.3	
	walls	$.5 \times 4$	=	2.0	
	floor	3.2×4.5	=	14.4	
	beam	$24 \times .8 \times .5$	=	9.6	
				28.3	KN/m say 30

L $3.25 \times 5 = 16.3$ say 17

Level 3

D	floor			14.4	
	beam			9.6	
	roof	$.5 \times 7$	=	3.5	
	walls	$.5 \times 3.7$	=	1.9	
				29.4	say 30

L $3 \times 5 = 15.0$
 $.25 \times 7 = 1.8$
 16.8 say 17

Levs 2 & 1

D	floor	3.2×4.5	=	14.4	
	beam			9.6	
				24.0	KN/m

PL 16.0 KN

L $3 \times 5 = 15$ KN/m

PL 31 KN

Lev M

D	floor	3.42×4.5	=	15.4	(900 T; 300)
	beam			9.6	
	walls	$.5 \times 2.4$	=	1.2	
				26.2	say 27

L $5 \times 5 = 25$ KN/m

Levs 4 & 3 D 30 KN/m
 L 17 KN/m

*Note
 PL $\hat{=}$ midspan
 @ lev 2 but @
 lev. 1 PL is
 just away from
 col. pos $\hat{=}$ under

1. The first part of the document is a title page. It contains the title of the document, the author's name, and the date of the document.

2. The second part of the document is an abstract. It provides a brief summary of the main points of the document.

3. The third part of the document is an introduction. It provides a more detailed overview of the document's content.

4. The fourth part of the document is a body of text. It contains the main content of the document, including data, analysis, and conclusions.

5. The fifth part of the document is a conclusion. It summarizes the main findings of the document and provides a final statement.

6. The sixth part of the document is a bibliography. It lists the sources of information used in the document.

7. The seventh part of the document is an appendix. It contains additional information that is not included in the main body of the document.

8. The eighth part of the document is a list of figures. It provides a summary of the figures included in the document.

East FrameLer 4

D	roof	2.3	
	walls	$11.4 \times 4 =$	16.0
	floor	14.4	
	beam	9.6	
		<u>42.3</u>	say 43 kN/m

L		16.3	say 17 kN/m
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Lers 3, 2 & 1

D	floor	14.4	
	beam	9.6	
	walls	$4 \times 3.2 =$	12.8
		<u>36.8</u>	say 37 kN/m

L		15.0	
---	--	------	--

Ler M

D	floor	15.4	
	beam	9.6	
	walls	$4 \times 1.6 =$	6.4
		<u>31.4</u>	say 32 kN/m

L	$5 \times 5 =$	25	kN/m
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Shear Walls

Torsion $e_{max} = .16 = .1 \times 25 = 2.5 \text{ m}$ from COM

Centre of stiffness = midway btm frames $x = 20 \text{ m}$

Assume COM @ mid-way of bldg = 12.5 m

N-S

\Rightarrow Torsional Moment = $V \times (7.5 + 2.5) = 10V \Rightarrow T = (10/21)V = .48V$

\Rightarrow E-W $\dots TM = V \times 2.1 \Rightarrow T = 2.1/21 V = .10V \Rightarrow$ Design Force = $0.60V$

LEV	Total Force	Design Force	h	Meq (MNm)	Veq (kN)
4	476	286	16.4	1.0	286
3	682	409	12.7	1.302	695
2	522	313	9.0	2.472	1008
1	310	186	5.0	7.662	1494
M.	65	39	2.6	12.478	1233
				13.733	

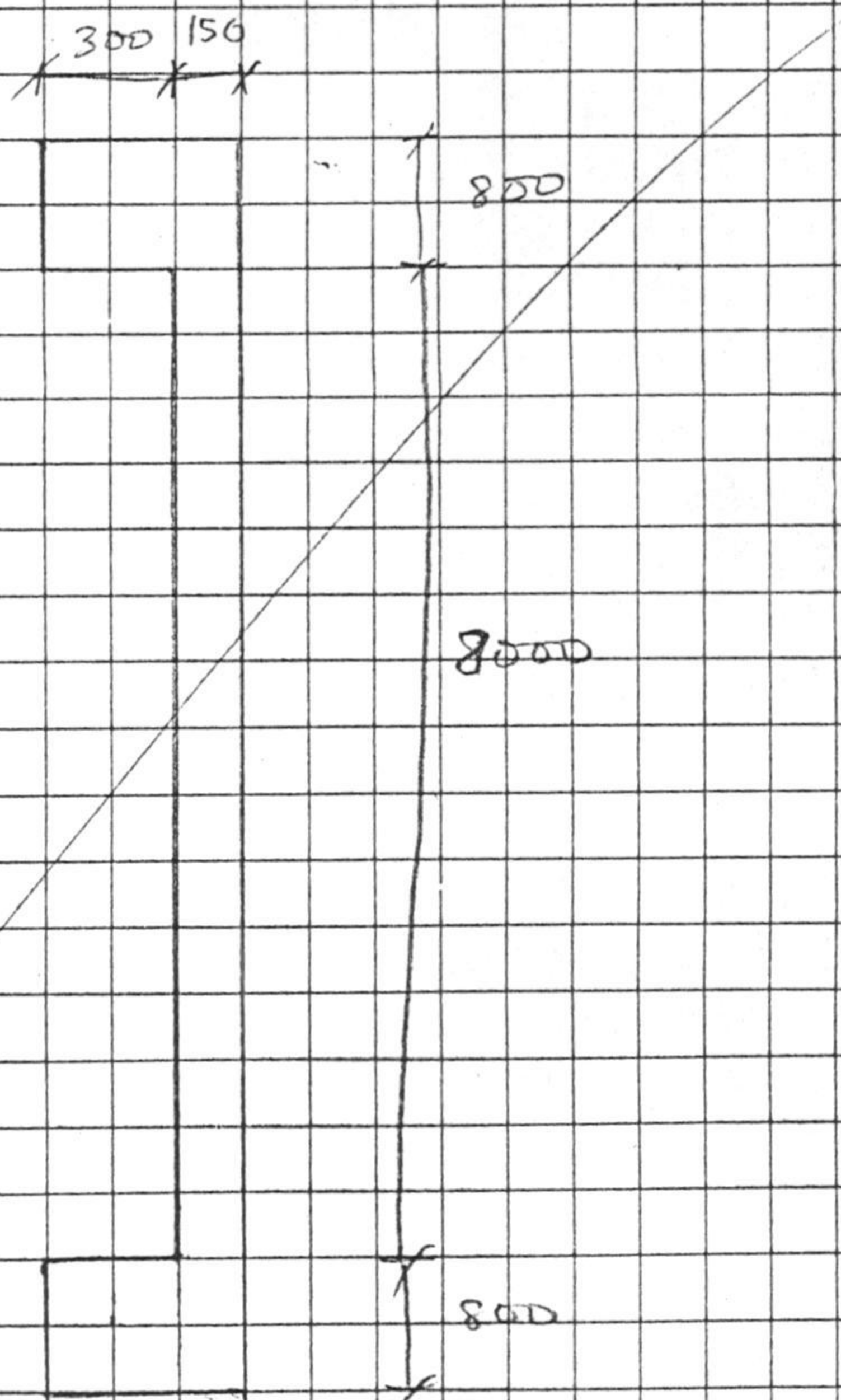
$l_w = 9600$ } End region = 9600
 $H/6 = 2733$ }

Try 150 R.C.

Effective Section

$$\bar{x} = \int x da / A$$

$$= 4800$$



Flex. Capacity

$$\text{Assume } P_i = D1L_0/\phi = 0$$

$$\Rightarrow C = T$$

$$C_{max} = .3l_w = 2880 \quad 10.5.2$$

$$\text{Try } C = 800$$

$$C_c = .85 f'_c ab = .85 \times 25 \times .85 \times 800 \times 450 = 6.50$$

$$C_s = 3968 \times .380 = 1.51$$

$$T_{col} = 1.51$$

$$\text{Wall - min steel } 2 \text{ HD10 @ } 300 \quad (s_{max} = 2t = 300)$$

(Use HD16 @ 300)

$$T_{web} = 2 \times 78.5 \times 8 / .3 \times 380 = 1.59$$

$$C = 6.50 + 1.51 = 7.51$$

$$T = 1.51 + 1.59 = 3.10$$

$$\text{Try } C = 400$$

$$C_c = 3.25$$

$$\text{Assume } C_s = T_s \quad (col)$$

$$T_{web} = 1.59 \quad \left. \begin{array}{l} \\ \end{array} \right\} 3.10$$

$$T_{col} = 1.51 \quad \left. \begin{array}{l} \\ \end{array} \right\}$$

$$\text{Try } C = 380$$

$$C_c = 3.09 \quad \left. \begin{array}{l} \\ \end{array} \right\} \text{OK}$$

$$T = 3.10$$

Take moments about centroid

$$M_i = 3.09 \times (4.8 - .85 \times .38 / 2) = 14.33$$

$$1.59 \times 0 =$$

$$1.51 \times (4.8 - .4) = 6.64$$

$$20.97$$

$$M_u = \phi M_i = 18.9 \text{ kNm}$$

$$M_u \text{ reqd} = 12.59 \text{ MNm} \Rightarrow \text{OK}$$

Shear Walls

150 RC

HD16 @ 300 vert.

Shear

$$v_i = 11.31 \times 10^3 / .85 \times 150 \times (.8 \times 9600) = 1.16 \text{ MPa}$$

$$.2 f'_c = 5 \text{ MPa} \Rightarrow \text{OK}$$

$$.3 \sqrt{f'_c} = 1.5 \text{ MPa}$$

$$v_i > 1.5 \Rightarrow 2 \text{ layers of } \text{not } \text{reqd.}$$

$$v_c = 0.6 \sqrt{\frac{P_c}{A_g}}$$

$$A_g = 1.92 \text{ m}^2$$

$$P_c = D = 24 \times 16.4 \times [(15 \times 8) + (2 \times 45 \times 8)] = 756 \text{ kN}$$

$$v_c = .6 \sqrt{\frac{756000}{1.92 \times 10^6}} = .38 \text{ MPa}$$

$$v_s = 1.16 - .38 = 0.78$$

$$A_v = v_s bws / f_y$$

$$A_{vmin} = .7 bws / f_y$$

$$\text{HD10} \quad S_{max} = 2201.5 \times 380 / 0.78 \times 150 = 653$$

$$\Rightarrow \text{HD16 @ 300 horiz. OK}$$

Shear Walls

150 R.C

HD16 @ 300 horiz

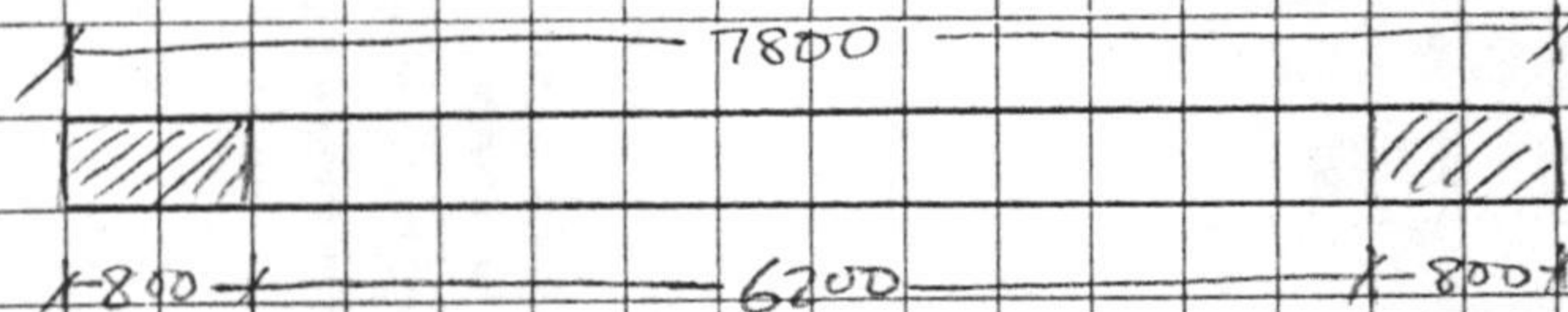
Total rco for walls

HD16 @ 300 BW

917 kg/m²

(Total 1500 kg)

Effective Section



Flex. Capacity

Try c = 500

$$C_c = .85 f_c' a b = .85 \times 25 \times .85 \times 500 \times 150 = 1.35 \text{ MN}$$

$$\begin{aligned} T_w &= 1.58 \\ T_{col} &= 1.51 \end{aligned} \quad \left. \vphantom{\begin{aligned} T_w &= 1.58 \\ T_{col} &= 1.51 \end{aligned}} \right\} 3.09$$

Try c = 600

$$\begin{aligned} C_c &= 1.63 \\ C_s &= 1.03 \end{aligned} \quad \left. \vphantom{\begin{aligned} C_c &= 1.63 \\ C_s &= 1.03 \end{aligned}} \right\} 2.66$$

HD24 @ 100.

$$\begin{aligned} T_s &= .34 \\ T_w &= 1.58 \\ T_{col} &= 1.37 \end{aligned} \quad \left. \vphantom{\begin{aligned} T_s &= .34 \\ T_w &= 1.58 \\ T_{col} &= 1.37 \end{aligned}} \right\} 3.29$$

Try c = 700

$$\begin{aligned} C_c &= 1.90 \\ C_s &= 1.20 \end{aligned} \quad \left. \vphantom{\begin{aligned} C_c &= 1.90 \\ C_s &= 1.20 \end{aligned}} \right\} 3.1$$

$$\begin{aligned} T_s &= .14 \\ T_w &= 1.58 \\ T_{col} &= 1.37 \end{aligned} \quad \left. \vphantom{\begin{aligned} T_s &= .14 \\ T_w &= 1.58 \\ T_{col} &= 1.37 \end{aligned}} \right\} 3.09$$

$$\begin{aligned} M_i &= 1.9 \times (3.9 - .85 \times 7/2) = 6.84 \\ &1.2 \times (3.9 - .35) = 4.26 \\ &-.14 \times (3.9 - .75) = -0.44 \\ &1.58 \times 0 = 0 \\ &1.37 \times (3.9 - .4) = 4.80 \\ &\quad \quad \quad 15.46 \end{aligned}$$

$$M_u = \phi M_i = 13.91$$

$$M_u \text{ reqd} = 13.73 \text{ MNm} \Rightarrow \text{OK}$$

Lev 1

Try 8HD20, HD12 @ 300

Try $c = 500$

$$\left. \begin{array}{l} C_c = 1.63 \\ C_s = .72 \end{array} \right\} 2.35$$

$$\left. \begin{array}{l} T_s = .24 \\ T_w = .89 \\ T_{tot} = .96 \end{array} \right\} 2.09$$

Try $c = 550$

$$\left. \begin{array}{l} C_c = 1.49 \\ C_s = .66 \end{array} \right\} 2.15$$

$$\left. \begin{array}{l} T_s = .30 \\ T_w = .89 \\ T_{tot} = .96 \end{array} \right\} 2.15$$

$$\begin{array}{rcl} M_i & 1.49 \times (3.9 - .85 \times .55/2) & = 5.46 \\ & .66 \times (3.9 - .275) & = 2.39 \\ & -.30 \times (3.9 - .675) & = -0.97 \\ & .89 \times 0 & \\ & .96 \times (3.9 - .4) & = 3.36 \\ & & \hline & & 10.24 \end{array}$$

$$M_u = 9.22$$

$$M_u \text{ reqd} = 7.662 \Rightarrow \text{OK}$$

North Wall

150 RC
25 MPa.
Vert Reo
Levs G-1
8HD20 @ 100
beside door
HD16 @ 300 web
Levs 1-
8HD20 @ 100
beside door
HD12 @ 300 web
Horiz Reo
Levs G-1
HD16 @ 300
Lev 1-
HD12 @ 300

Lev 6-M

$$v_i = 11.31 \times 10^3 / .85 \times 150 \times .8 \times 7800 = 1.42$$

$$.2 f'_c = 5 \text{ MPa} \Rightarrow \text{OK}$$

$$.3 \sqrt{f'_c} = 1.5 \quad v_i < 1.5 \Rightarrow \text{One layer OK}$$

$$P_e = D = 461 \text{ kN} \quad v_c = .6 \sqrt{\frac{P_e}{A_g}} = .6 \sqrt{\frac{461,000}{1.17 \times 10^6}}$$

$$v_c = .38$$

$$v_s = 1.04$$

$$A_{v \text{ min}} = .7 \text{ bars / fy}$$

$$s_{\text{max}} = 2t = 300$$

$$\text{HD16} \quad s_{\text{max}} = 201 \times 380 / 1.04 \times 150 = 490$$

Lev 1-2

$$v_i = 1.16 \quad v_c = .25 \quad v_s = .91$$

$$\text{HD12} \quad s_{\text{max}} = 315$$

South Wall

$$A_{\text{min horiz}} = .002 \times 175 \times 1000 = 350 \text{ mm}^2/\text{m}$$

\Rightarrow Detail as for North Wall

Door Opening

Trim with HD16 bars

South Wall

175 RC
25 MPa

Levs G-1

HD16 @ 300 BW

excl. 1st

Levs 1-4

HD12 @ 300 BW

②

Frame Analysis

Gravity Loadings

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

[illegible]

$\frac{1}{2} \times 10 \times 10 = 50 \text{ kN}$

[illegible]

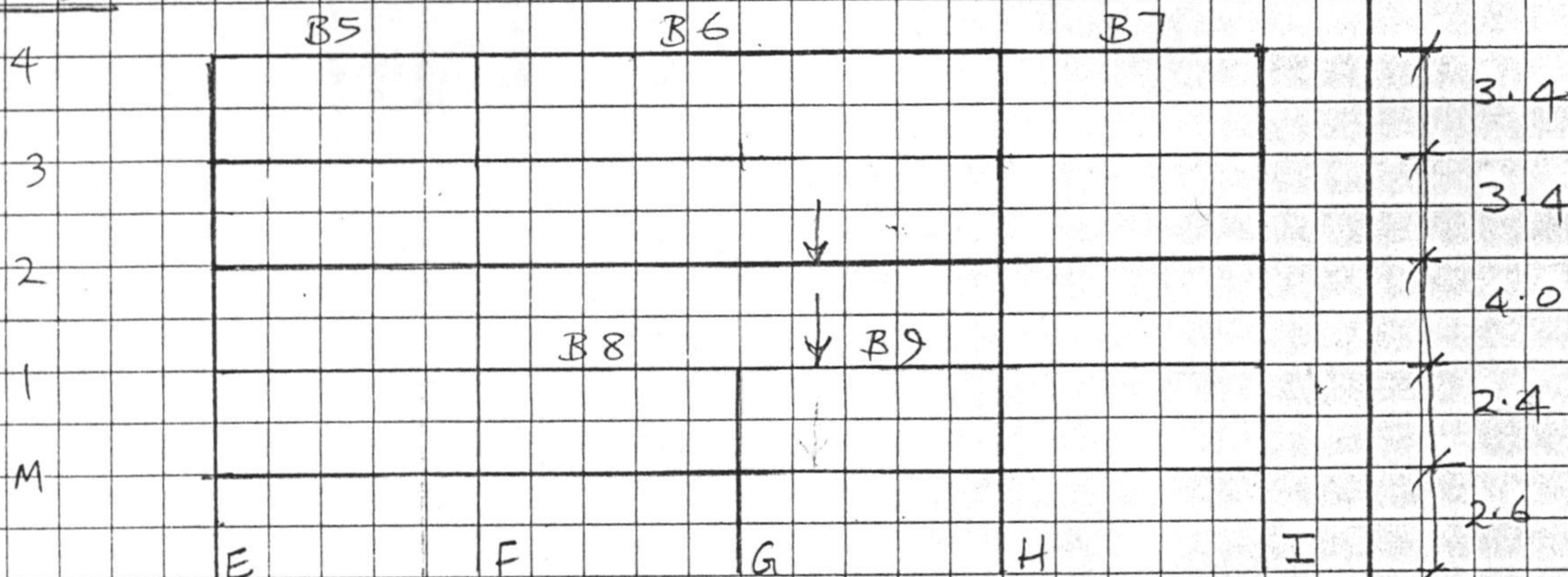
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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E				N		
---	--	--	--	---	--	--

North End

South End

West	Frame
------	-------



d dimensions

4	.	3
---	---	---

5.3

1.5

4.8

4-6.

East Frame

A

81

B2

BB

B4

3

2

1

N

A

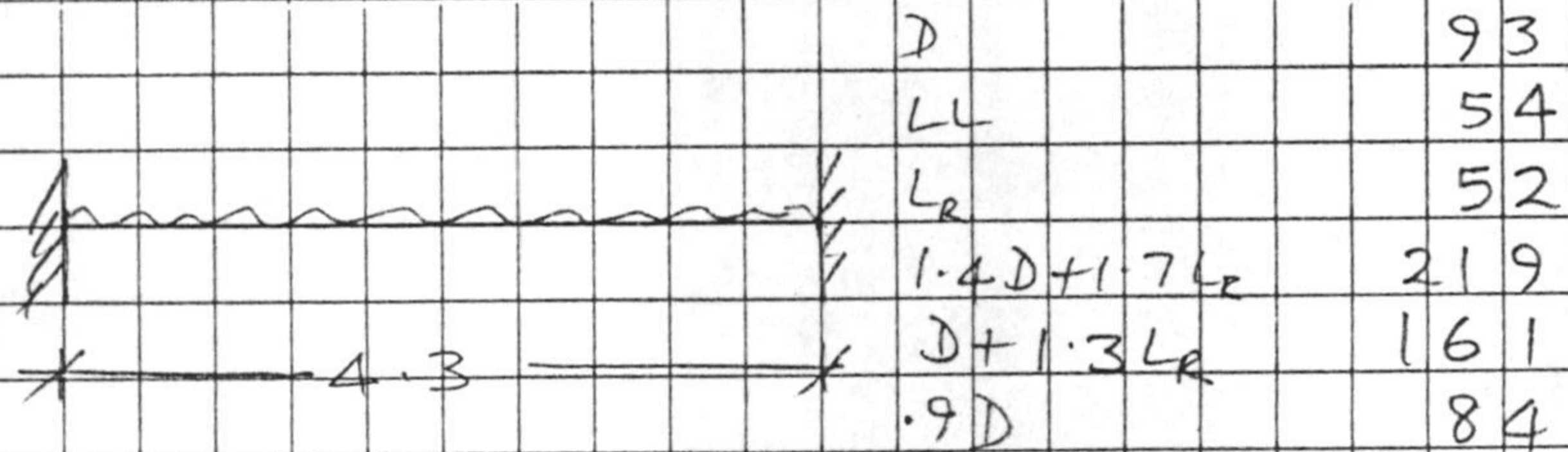
R

①

5

~~4~~4.3
$$5.3$$
 $\frac{1}{6} \cdot 1$ $\times 4.6$

Beams 4-MB1, 4-MB5



$$D \quad 43 \times 4.3 = 185 \text{ kN}$$

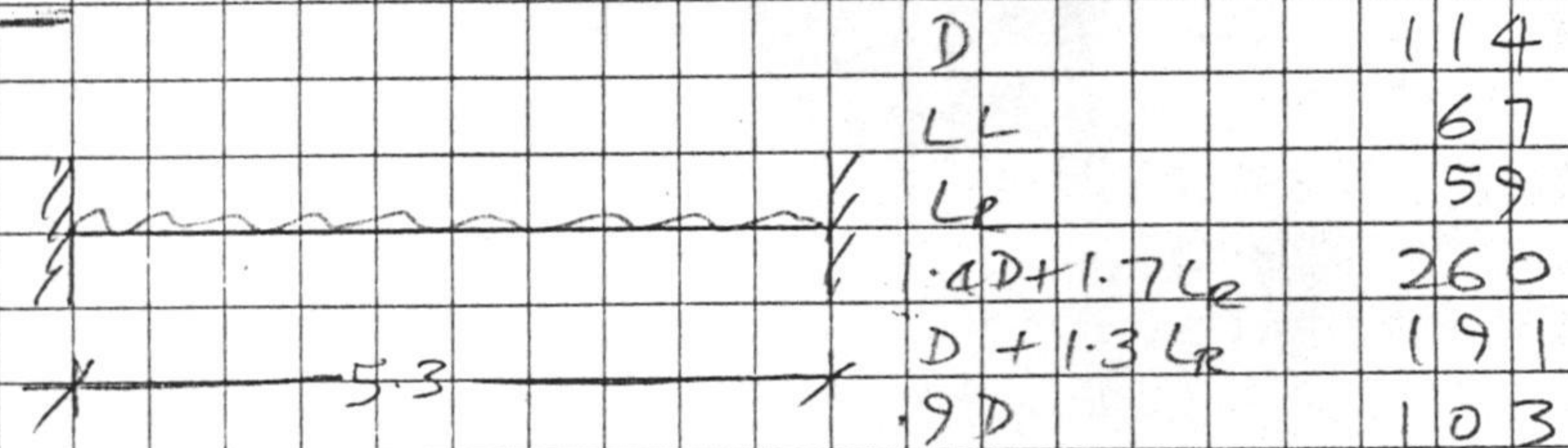
$$LL \quad 25 \times 4.3 = 108 \quad A = 21.5 \quad R = .95 \quad L_R = 103 \text{ kN}$$

FEM

MSM

D	66	33
L_R	37	18
$1.4D + 1.7L_R$	155	77
$D + 1.3L_R$	114	56
$.9D$	59	30

4-MB2, 1-MB8



$$D \quad 43 \times 5.3 = 228$$

$$LL \quad 25 \times 5.3 = 133 \quad A = 26.5 \quad R = .88 \quad L_R = 117$$

FEM

MSM

D	101	50
L_R	52	26
$1.4D + 1.7L_R$	230	114
$D + 1.3L_R$	169	84
$.9D$	91	45

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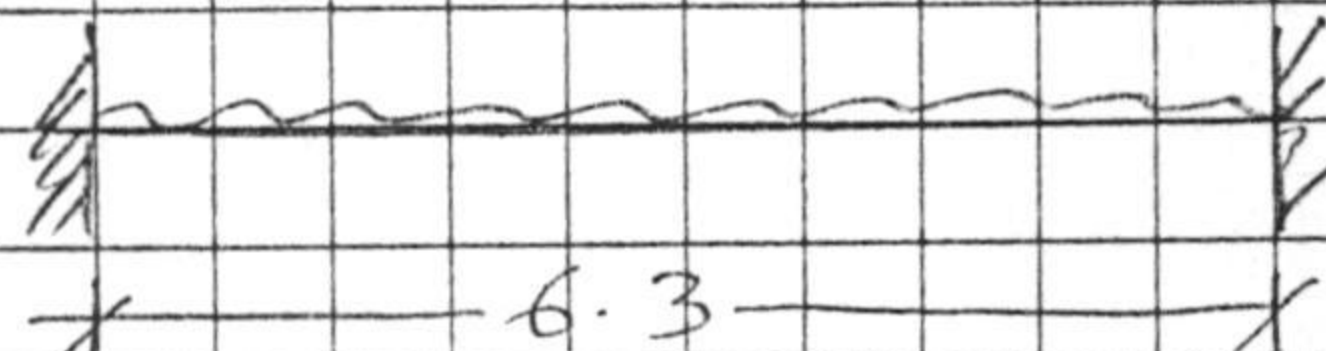
PAGE 18

JOB _____

BY WJM

DATE 26/8/86

4-MB3, MB9



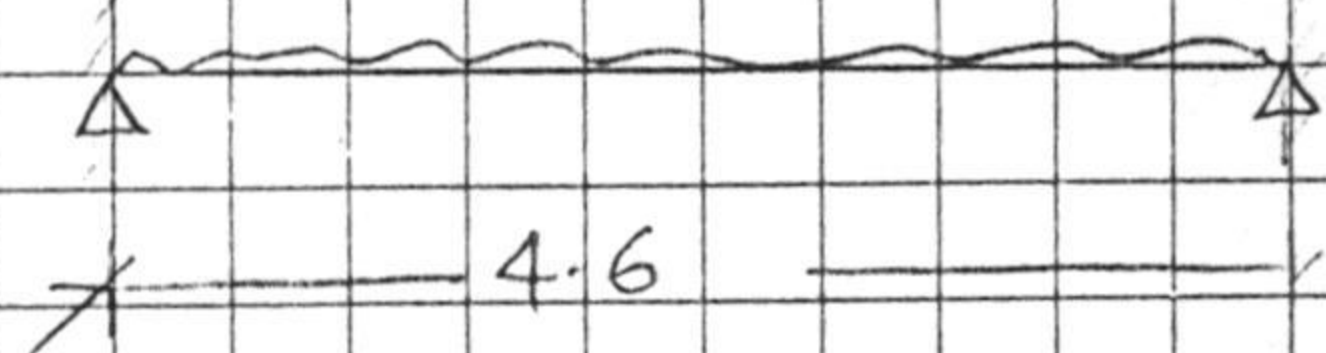
D	136
LL	79
L _R	66
1.4D + 1.7L _R	303
D + 1.3L _R	222
.9D	122

D 43 x 6.3 = 271

LL 25 x 6.3 = 158 A = 31.5 R = .83 L_R = 131

	FEM	MSM
D	142	71
L _R	69	34
1.4D + 1.7L _R	316	157
D + 1.3L _R	232	115
.9D	128	64

4-MB4, MB1



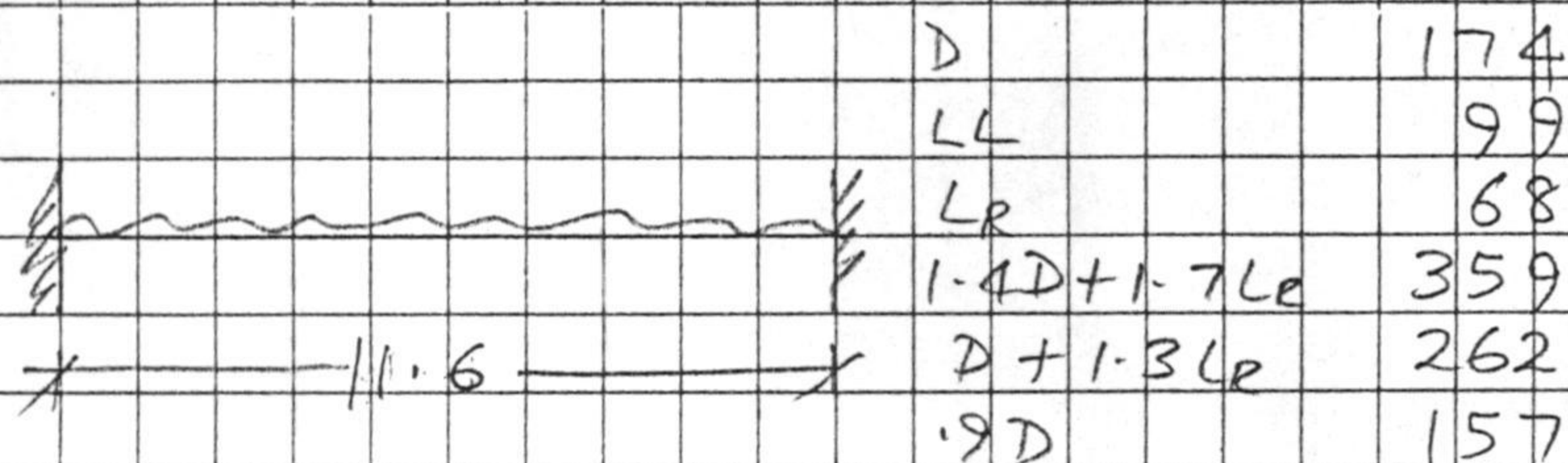
D	99
LL	58
L _R	54
1.4D + 1.7L _R	230
D + 1.3L _R	167
.9D	89

DL 43 x 4.6 = 198

LL 25 x 4.6 = 115 A = 23 R = .93 L_R = 107

	SSM
D	114
L _R	62
1.4D + 1.7L _R	265

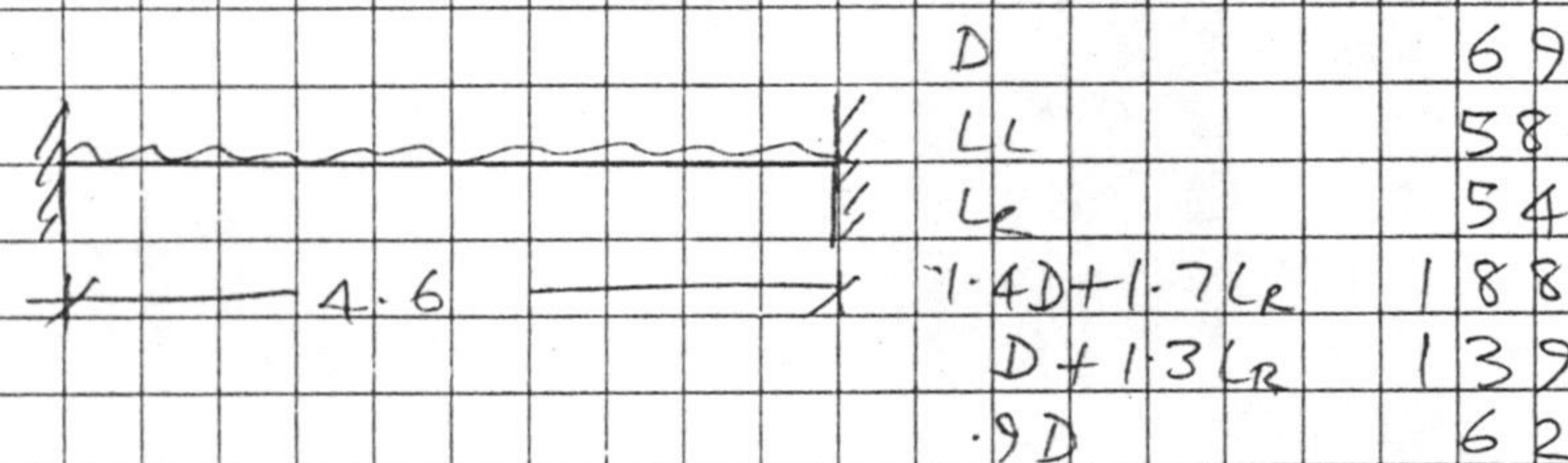
Table 1: Summary of Data	
Category	Value
Item 1	10
Item 2	20
Item 3	30
Item 4	40
Item 5	50
Item 6	60
Item 7	70
Item 8	80
Item 9	90
Item 10	100

Beams 4-3 B6

$$DL \quad 30 \times 11.6 = 348 \text{ kN}$$

$$LL \quad 17 \times 11.6 = 197 \quad A = .58 \quad R = .69 \quad L_R = 136$$

	FEM	MSM
D	336	168
L _R	131	66
1.4D + 1.7L _R	693	347
D + 1.3L _R	506	254
.9D	302	151

Beams 4-MB7

$$DL \quad 30 \times 4.6 = 138$$

$$LL \quad 25 \times 4.6 = 115 \quad A = .23 \quad R = .93 \quad L_R = 107$$

	FEM	MSM
D	53	26
L _R	41	21
1.4D + 1.7L _R	144	72
D + 1.3L _R	106	53
.9D	48	23

The image is a severely degraded, low-resolution scan of a document. It is characterized by extreme pixelation and a loss of fine detail, resulting in a blocky, high-contrast appearance. The layout is difficult to discern, but it seems to follow a standard document structure with a header, body text, and a footer or table at the bottom. The text is completely illegible due to the quality of the scan.

Beam 2B6

D	146		D	148
LL	100		LL	105
L _e	66		L _e	69
1.4D+1.7L _e	317		1.4D+1.7L _e	325
D+1.3L _e	232		D+1.3L _e	238
.9D	131		.9D	133

$$DL-UDL \quad 24 \times 11.6 = 278$$

$$-PL \quad 16$$

$$294$$

$$LL-UDL \quad 15 \times 11.6 = 174$$

$$-PL \quad 31$$

$$205$$

$$A = 68 \quad R = .66 \quad 45$$

FEM_AFEM_B

MSM

D	284 + 19 = 303	284 + 26 = 310	142 + 22 = 164
L _e	168 + 36 = 204	168 + 51 = 219	84 + 42 = 126
1.4D+1.7L _e	771	806	444
D+1.3L _e	568	595	328
.9D	273	279	148

Beam 1B9

D	88		D	79
LL	71		LL	55
L _e	54		L _e	42
1.4D+1.7L _e	215		1.4D+1.7L _e	182
D+1.3L _e	158		D+1.3L _e	134
.9D	79		.9D	71

$$DL \quad UDL \quad 24 \times 6.3 = 151$$

$$PL \quad 16$$

$$167$$

$$LL \quad UDL \quad 15 \times 6.3 = 95$$

$$PL \quad 31$$

$$126$$

$$A = 42 \quad R = .76 \quad L_e = 96$$

FEM_AFEM_B

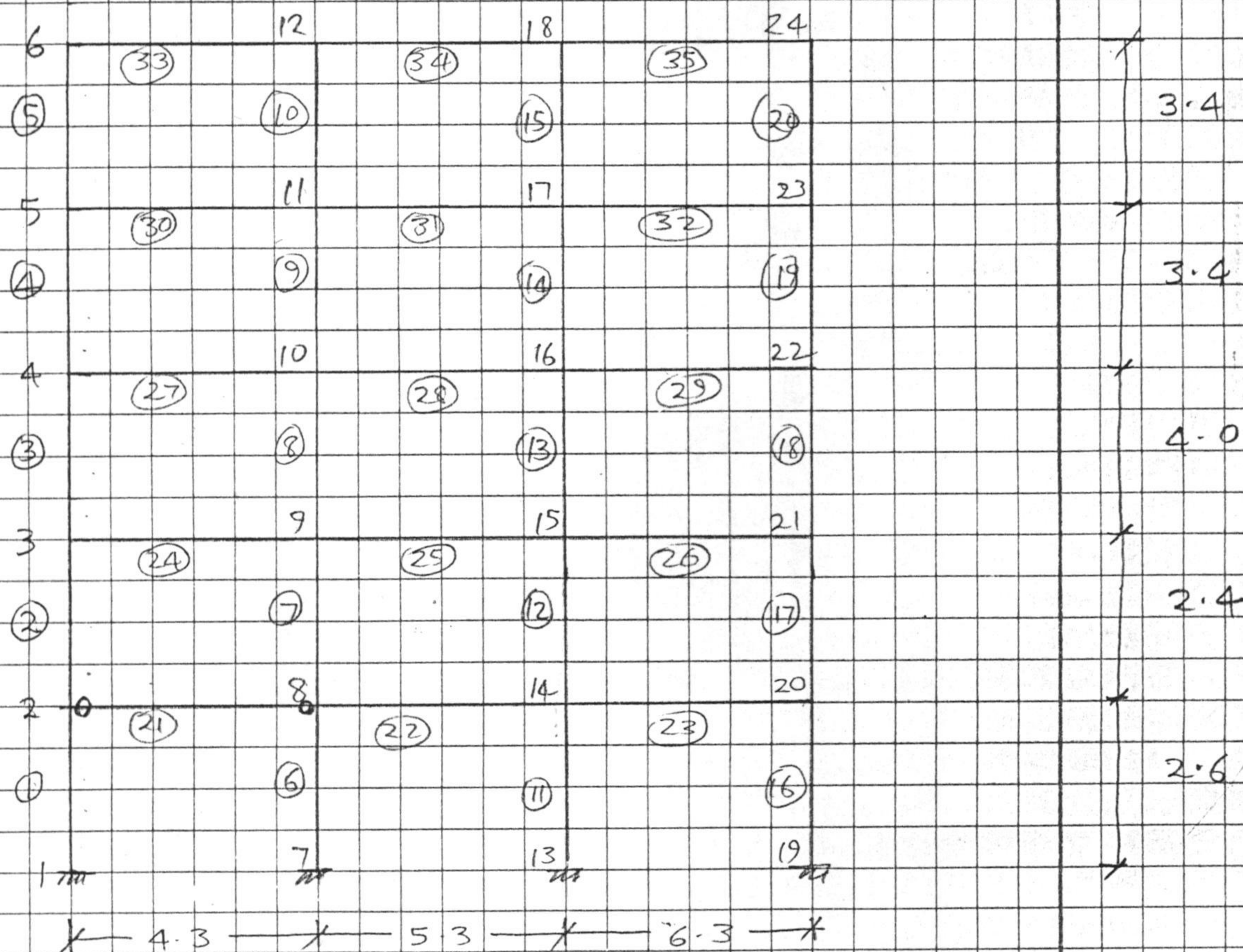
MSM

MSM

D	79 + 14 = 93	79 + 4 = 83	10 + 7 = 17	40 + 5 = 45
L _e	38 + 27 = 65	38 + 8 = 46	5 + 13 = 18	19 + 9 = 28
1.4D+1.7L _e	241	194	154	111
D+1.3L _e	178	143	40	81
.9D	84	75	45	41

Computer Model - Frame 80

East Frame



24 joints
35 mbrs
4 supports

$$E = 4700 \sqrt{f'_c} = 2.35 \text{ E+07 kPa}$$

Max node difference = 6

Mbrs	x/s Area (m ²)	I _{xx} (m ⁴)	Type
1-5	350 x 800	0.28	1
6-20	800 x 500	0.40	1
21	500 x 500	0.25	4? ← Look up
22-35	800 x 500	0.40	1

Look up
book
(p. 25
also)
mbr pinned
both ends

Assume $A = A_g$
 $I_{cr} = .75 I_g$ for consistency with
existing building analysis

Table 1: Summary of Data	
Category	Value
Item 1	10
Item 2	20
Item 3	30
Item 4	40
Item 5	50
Item 6	60
Item 7	70
Item 8	80
Item 9	90
Item 10	100

Coords

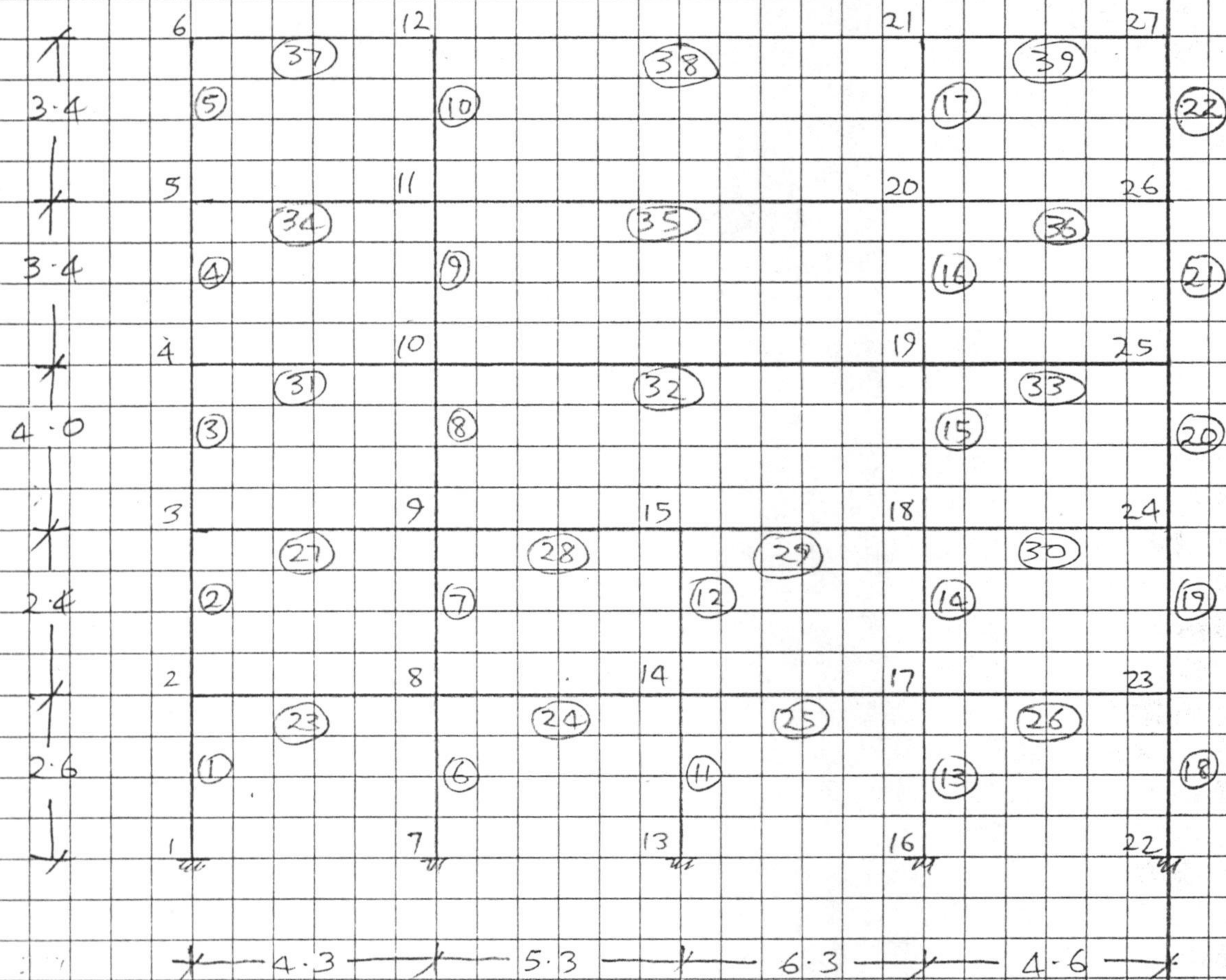
	x	y		x	y
1	0	0	13	9.6	0
2	0	2.6	14	9.6	2.6
3	0	5	15	9.6	5
4	0	9	16	9.6	9
5	0	12.4	17	9.6	12.4
6	0	15.8	18	9.6	15.8
7	4.3	0	19	15.9	0
8	4.3	2.6	20	15.9	2.6
9	4.3	5	21	15.9	5
10	4.3	9	22	15.9	9
11	4.3	12.4	23	15.9	12.4
12	4.3	15.8	24	15.9	15.8

Nodal Loads

Load Case	Joints				P-X (kN)	P-Y (kN)
(1) E	2	8	14	20	8	
	3	9	15	21	39	
	4	10	16	22	65	
	5	11	17	23	85	
	6	12	18	24	60	

Date		Description		Amount	
1900	Jan 1	Balance			
1900	Jan 2	Jan 2			
1900	Jan 3	Jan 3			
1900	Jan 4	Jan 4			
1900	Jan 5	Jan 5			
1900	Jan 6	Jan 6			
1900	Jan 7	Jan 7			
1900	Jan 8	Jan 8			
1900	Jan 9	Jan 9			
1900	Jan 10	Jan 10			
1900	Jan 11	Jan 11			
1900	Jan 12	Jan 12			
1900	Jan 13	Jan 13			
1900	Jan 14	Jan 14			
1900	Jan 15	Jan 15			
1900	Jan 16	Jan 16			
1900	Jan 17	Jan 17			
1900	Jan 18	Jan 18			
1900	Jan 19	Jan 19			
1900	Jan 20	Jan 20			
1900	Jan 21	Jan 21			
1900	Jan 22	Jan 22			
1900	Jan 23	Jan 23			
1900	Jan 24	Jan 24			
1900	Jan 25	Jan 25			
1900	Jan 26	Jan 26			
1900	Jan 27	Jan 27			
1900	Jan 28	Jan 28			
1900	Jan 29	Jan 29			
1900	Jan 30	Jan 30			
1900	Jan 31	Jan 31			
1900	Feb 1	Feb 1			
1900	Feb 2	Feb 2			
1900	Feb 3	Feb 3			
1900	Feb 4	Feb 4			
1900	Feb 5	Feb 5			
1900	Feb 6	Feb 6			
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1900	Feb 9	Feb 9			
1900	Feb 10	Feb 10			
1900	Feb 11	Feb 11			
1900	Feb 12	Feb 12			
1900	Feb 13	Feb 13			
1900	Feb 14	Feb 14			
1900	Feb 15	Feb 15			
1900	Feb 16	Feb 16			
1900	Feb 17	Feb 17			
1900	Feb 18	Feb 18			
1900	Feb 19	Feb 19			
1900	Feb 20	Feb 20			
1900	Feb 21	Feb 21			
1900	Feb 22	Feb 22			
1900	Feb 23	Feb 23			
1900	Feb 24	Feb 24			
1900	Feb 25	Feb 25			
1900	Feb 26	Feb 26			
1900	Feb 27	Feb 27			
1900	Feb 28	Feb 28			
1900	Mar 1	Mar 1			
1900	Mar 2	Mar 2			
1900	Mar 3	Mar 3			
1900	Mar 4	Mar 4			
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1900	Mar 9	Mar 9			
1900	Mar 10	Mar 10			
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1900	Mar 21	Mar 21			
1900	Mar 22	Mar 22			
1900	Mar 23	Mar 23			
1900	Mar 24	Mar 24			
1900	Mar 25	Mar 25			
1900	Mar 26	Mar 26			
1900	Mar 27	Mar 27			
1900	Mar 28	Mar 28			
1900	Mar 29	Mar 29			
1900	Mar 30	Mar 30			
1900	Mar 31	Mar 31			
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1900	Apr 3	Apr 3			
1900	Apr 4	Apr 4			
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1900	Apr 7	Apr 7			
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1900	Apr 14	Apr 14			
1900	Apr 15	Apr 15			
1900	Apr 16	Apr 16			
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1900	Apr 29	Apr 29			
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1900	May 1	May 1			
1900	May 2	May 2			
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1900	May 4	May 4			
1900	May 5	May 5			
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1900	May 7	May 7			
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1900	May 14	May 14			
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1900	May 21	May 21			
1900	May 22	May 22			
1900	May 23	May 23			
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1900	May 25	May 25			
1900	May 26	May 26			
1900	May 27	May 27			
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1900	May 30	May 30			
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1900	Jun 12	Jun 12			
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1900	Oct 15	Oct 15			
1900					

West Frame



27 joints
39 mbrs
5 supports

$$E = 2.35 \times 10^7 \text{ kPa}$$

$$\text{Max node } \Delta = 9$$

Mbrs	X/S Area (m ²)	I _{xx} (m ⁴)	Type
1-17	800x500	0.40	1
18-22	350x800	0.28	1
23-39	800x500	0.40	1
31-39	1000x400	0.40	1

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JOB No. _____

PAGE 24

JOB _____

BY WFM

DATE 28/8/86

Coords

	x	y		x	y
1	0	0	15	9.6	5
2	0	2.6	16	15.9	0
3	0	5	17	15.9	2.6
4	0	9	18	15.9	5
5	0	12.4	19	15.9	9
6	0	15.8	20	15.9	12.4
7	4.3	0	21	15.9	5.8
8	4.3	2.6	22	20.5	0
9	4.3	5	23	20.5	2.6
10	4.3	9	24	20.5	5
11	4.3	12.4	25	20.5	9
12	4.3	15.8	26	20.5	12.4
13	9.6	0	27	20.5	15.8
14	9.6	2.6			

Modal Loads

<u>Load Case</u>	<u>Joints</u>					<u>P-X</u>
① E	2	8	14	17	23	7
	3	9	15	18	24	31
	4	10		19	25	65
	5	11		20	26	85
	6	12		21	27	60

461830

85889

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FRAME 80 V1.0
FRAME 80 V1.0

STRUCTURE TITLE : WMCE

LOAD CASE TITLE : 1A(E)

JOINT DISPLACEMENTS

JOINT	D-X	D-Y	R-Z
1	0.0000E+00	0.0000E+00	0.0000E+00
2	3.1128E-03	1.7016E-04	-2.1827E-03
3	7.3085E-03	3.2723E-04	-1.6493E-04
4	1.6336E-02	4.9024E-04	-2.4032E-04
5	2.1275E-02	5.5026E-04	-2.1605E-04
6	2.3707E-02	5.6529E-04	-1.2541E-04
7	0.0000E+00	0.0000E+00	0.0000E+00
8	3.0722E-03	8.1169E-05	-1.4313E-03
9	7.2833E-03	1.0523E-04	-1.2701E-03
10	1.6312E-02	1.2819E-04	-1.1739E-03
11	2.1252E-02	1.3795E-04	-6.8925E-04
12	2.3692E-02	1.4189E-04	-3.0992E-04
13	0.0000E+00	0.0000E+00	0.0000E+00
14	3.0334E-03	-4.3191E-05	-1.0963E-03
15	7.2439E-03	-6.7910E-05	-1.3198E-03
16	1.6296E-02	-9.3750E-05	-1.1381E-03
17	2.1241E-02	-1.0401E-04	-6.8679E-04
18	2.3687E-02	-1.0650E-04	-2.8149E-04
19	0.0000E+00	0.0000E+00	0.0000E+00
20	2.9719E-03	-1.5709E-04	-1.4011E-03
21	7.2624E-03	-2.6638E-04	-1.6753E-03
22	1.6287E-02	-3.7761E-04	-1.5313E-03
23	2.1252E-02	-4.1912E-04	-8.5023E-04
24	2.3703E-02	-4.3109E-04	-4.0376E-04

MEMBER FORCES

MEMBER J--J			<----- J A ----->			<----- J B ----->		
			AXIAL	SHEAR	MOMENT	AXIAL	SHEAR	MOMENT
1	1	2	-4.31E+02	8.83E+00	5.09E+01	4.31E+02	-8.83E+00	-2.80E+01
2	2	3	-4.31E+02	5.62E+01	2.80E+01	4.31E+02	-5.62E+01	1.07E+02
3	3	4	-2.68E+02	7.24E+01	1.46E+02	2.68E+02	-7.24E+01	1.44E+02
4	4	5	-1.16E+02	5.97E+01	1.01E+02	1.16E+02	-5.97E+01	1.02E+02
5	5	6	-2.91E+01	2.66E+01	4.39E+01	2.91E+01	-2.66E+01	4.64E+01
6	6	7	-2.93E+02	3.11E+02	6.11E+02	2.93E+02	-3.11E+02	1.97E+02
7	7	8	-9.42E+01	3.16E+02	3.54E+02	9.42E+01	-3.16E+02	4.05E+02
8	8	9	-5.40E+01	2.92E+02	5.75E+02	5.40E+01	-2.92E+02	5.93E+02
9	9	10	-2.70E+01	2.03E+02	2.92E+02	2.70E+01	-2.03E+02	3.99E+02
10	10	11	-1.09E+01	8.51E+01	1.03E+02	1.09E+01	-8.51E+01	1.87E+02
11	11	12	1.56E+02	4.13E+02	6.95E+02	-1.56E+02	-4.13E+02	3.78E+02
12	12	13	9.68E+01	4.28E+02	5.49E+02	-9.68E+01	-4.28E+02	4.79E+02
13	13	14	6.07E+01	2.92E+02	5.66E+02	-6.07E+01	-2.92E+02	6.00E+02
14	14	15	2.84E+01	2.12E+02	3.10E+02	-2.84E+01	-2.12E+02	4.10E+02
15	15	16	6.88E+00	9.18E+01	1.11E+02	-6.88E+00	-9.18E+01	2.01E+02
16	16	17	5.68E+02	2.95E+02	5.87E+02	-5.68E+02	-2.95E+02	1.81E+02
17	17	18	4.28E+02	1.95E+02	2.78E+02	-4.28E+02	-1.95E+02	1.92E+02
18	18	19	2.61E+02	1.84E+02	3.55E+02	-2.61E+02	-1.84E+02	3.82E+02
19	19	20	1.15E+02	1.05E+02	1.04E+02	-1.15E+02	-1.05E+02	2.54E+02
20	20	21	3.31E+01	3.66E+01	1.28E+01	-3.31E+01	-3.66E+01	1.12E+02
21	21	22	5.54E+01	0.00E+00	0.00E+00	-5.54E+01	0.00E+00	0.00E+00
22	22	23	6.88E+01	-1.99E+02	-5.52E+02	-6.88E+01	1.99E+02	-5.04E+02
23	23	24	9.19E+01	-1.40E+02	-4.22E+02	-9.19E+01	1.40E+02	-4.59E+02
24	24	25	5.52E+01	-1.62E+02	-2.53E+02	-5.52E+01	1.62E+02	-4.46E+02
25	25	26	6.97E+01	-2.03E+02	-5.34E+02	-6.97E+01	2.03E+02	-5.41E+02
26	26	27	-2.76E+01	-1.67E+02	-5.04E+02	2.76E+01	1.67E+02	-5.46E+02
27	27	28	5.23E+01	-1.52E+02	-2.45E+02	-5.23E+01	1.52E+02	-4.08E+02
28	28	29	2.88E+01	-1.79E+02	-4.77E+02	-2.88E+01	1.79E+02	-4.72E+02
29	29	30	1.38E+01	-1.47E+02	-4.38E+02	-1.38E+01	1.47E+02	-4.85E+02
30	30	31	5.18E+01	-8.71E+01	-1.46E+02	-5.18E+01	8.71E+01	-2.29E+02
31	31	32	1.85E+01	-1.03E+02	-2.74E+02	-1.85E+01	1.03E+02	-2.73E+02
32	32	33	-1.63E+01	-8.17E+01	-2.48E+02	1.63E+01	8.17E+01	-2.67E+02
33	33	34	3.34E+01	-2.91E+01	-4.64E+01	-3.34E+01	2.91E+01	-7.87E+01
34	34	35	8.36E+00	-4.00E+01	-1.08E+02	-8.36E+00	4.00E+01	-1.04E+02
35	35	36	-2.34E+01	-3.31E+01	-9.69E+01	2.34E+01	3.31E+01	-1.12E+02

SUPPORT REACTIONS

JOINT	R-X	R-Y	R-Z
1	-8.8320E+00	-4.3064E+02	5.0939E+01
7	-3.1101E+02	-2.9346E+02	6.1131E+02
13	-4.1285E+02	1.5615E+02	6.9525E+02
19	-2.9534E+02	5.6795E+02	5.8656E+02

LOAD SUMMATION

HORIZONTAL APPLIED	1028.00	REACTION	-1028.04	BALANCE	-0.04
VERTICAL APPLIED	0.00	REACTION	0.00	BALANCE	0.00

461838

FRAME 80 01:0

STRUCTURE TITLE : WMCW

LOAD CASE TITLE : 1A(E)

JOINT DISPLACEMENTS

JOINT	D-X	D-Y	R-Z
1	0.00000E+00	0.00000E+00	0.00000E+00
2	1.8584E-03	2.4133E-04	-3.2041E-04
3	4.7057E-03	4.2427E-04	-1.2624E-03
4	1.3342E-02	6.2826E-04	-1.4783E-03
5	1.8733E-02	7.0151E-04	-9.5317E-04
6	2.1686E-02	7.1990E-04	-5.5511E-04
7	0.00000E+00	0.00000E+00	0.00000E+00
8	1.8962E-03	-1.4912E-04	-6.3944E-04
9	4.6417E-03	-2.7704E-04	-1.0074E-03
10	1.3348E-02	-4.4065E-04	-1.2880E-03
11	1.8740E-02	-4.9672E-04	-3.4734E-04
12	2.1679E-02	-5.0914E-04	-4.3316E-04
13	0.00000E+00	0.00000E+00	0.00000E+00
14	1.9514E-03	-1.7834E-05	-7.7804E-04
15	4.5234E-03	-2.6011E-05	-3.9981E-04
16	0.00000E+00	0.00000E+00	0.00000E+00
17	1.9207E-03	5.9976E-05	-6.9919E-04
18	4.6153E-03	1.1464E-04	-1.1143E-03
19	1.3393E-02	1.8806E-04	-1.4317E-03
20	1.8795E-02	2.1398E-04	-3.7744E-04
21	2.1694E-02	2.1892E-04	-4.2630E-04

22	0.0000E+00	0.0000E+00	0.0000E+00
23	1.9392E-03	-1.9192E-04	-2.3653E-04
24	4.6230E-03	-3.3695E-04	-3.0322E-04
25	1.3423E-02	-4.9952E-04	-2.5800E-04
26	1.8819E-02	-5.6108E-04	-2.9392E-04
27	2.1709E-02	-5.7668E-04	-2.0278E-04

MEMBER FORCES

MEMBR J--J <----- J A -----> <----- J B ----->

			AXIAL	SHEAR	MOMENT	AXIAL	SHEAR	MOMENT
1	1	2	-8.72E+02	2.03E+02	3.83E+02	8.72E+02	-2.03E+02	1.46E+02
2	2	3	-7.17E+02	1.14E+02	2.06E+02	7.17E+02	-1.14E+02	6.70E+01
3	3	4	-4.79E+02	2.22E+02	4.65E+02	4.79E+02	-2.22E+02	4.25E+02
4	4	5	-2.03E+02	1.44E+02	1.87E+02	2.03E+02	-1.44E+02	3.03E+02
5	5	6	-5.08E+01	4.47E+01	3.19E+01	5.08E+01	-4.47E+01	1.20E+02
6	7	8	5.39E+02	2.73E+02	4.48E+02	-5.39E+02	-2.73E+02	2.63E+02
7	8	9	5.01E+02	2.51E+02	3.59E+02	-5.01E+02	-2.51E+02	2.44E+02
8	9	10	3.84E+02	2.90E+02	6.07E+02	-3.84E+02	-2.90E+02	5.54E+02
9	10	11	1.55E+02	2.02E+02	2.95E+02	-1.55E+02	-2.02E+02	3.93E+02
10	11	12	3.43E+01	8.75E+01	1.03E+02	-3.43E+01	-8.75E+01	1.95E+02
11	13	14	6.45E+01	2.41E+02	4.26E+02	-6.45E+01	-2.41E+02	2.01E+02
12	14	15	3.20E+01	3.78E+02	3.94E+02	-3.20E+01	-3.78E+02	5.13E+02
13	16	17	-2.17E+02	2.60E+02	4.39E+02	2.17E+02	-2.60E+02	2.37E+02
14	17	18	-2.14E+02	1.69E+02	2.68E+02	2.14E+02	-1.69E+02	1.38E+02
15	18	19	-1.73E+02	2.60E+02	5.49E+02	1.73E+02	-2.60E+02	4.90E+02
16	19	20	-7.17E+01	1.69E+02	2.27E+02	7.17E+01	-1.69E+02	3.49E+02
17	20	21	-1.37E+01	7.85E+01	8.35E+01	1.37E+01	-7.85E+01	1.83E+02
18	22	23	4.86E+02	5.24E+01	7.23E+01	-4.86E+02	-5.24E+01	6.38E+01
19	23	24	3.98E+02	8.31E+01	1.01E+02	-3.98E+02	-8.31E+01	9.84E+01
20	24	25	2.67E+02	6.77E+01	1.35E+02	-2.67E+02	-6.77E+01	1.36E+02
21	25	26	1.19E+02	6.40E+01	1.09E+02	-1.19E+02	-6.40E+01	1.08E+02
22	26	27	3.02E+01	2.94E+01	4.86E+01	-3.02E+01	-2.94E+01	5.12E+01
23	2	8	-8.27E+01	-1.56E+02	-3.51E+02	8.27E+01	1.56E+02	-3.19E+02
24	8	14	-9.80E+01	-1.18E+02	-3.02E+02	9.80E+01	1.18E+02	-3.22E+02
25	14	17	4.58E+01	-8.54E+01	-2.74E+02	-4.58E+01	8.54E+01	-2.64E+02
26	17	23	-3.77E+01	-8.81E+01	-2.40E+02	3.77E+01	8.81E+01	-1.65E+02
27	3	9	1.40E+02	-2.37E+02	-5.32E+02	-1.40E+02	2.37E+02	-4.88E+02
28	9	15	2.10E+02	-1.21E+02	-3.63E+02	-2.10E+02	1.21E+02	-2.77E+02
29	15	18	-1.37E+02	-8.86E+01	-2.36E+02	1.37E+02	8.86E+01	-3.22E+02
30	18	24	-1.56E+01	-1.30E+02	-3.66E+02	1.56E+01	1.30E+02	-2.33E+02
31	4	10	-1.31E+01	-2.77E+02	-6.12E+02	1.31E+01	2.77E+02	-5.79E+02
32	10	19	-3.60E+01	-4.74E+01	-2.70E+02	3.60E+01	4.74E+01	-2.80E+02
33	19	25	-6.13E+01	-1.48E+02	-4.37E+02	6.13E+01	1.48E+02	-2.45E+02
34	5	11	-1.47E+01	-1.52E+02	-3.35E+02	1.47E+01	1.52E+02	-3.17E+02
35	11	20	-4.44E+01	-3.10E+01	-1.79E+02	4.44E+01	3.10E+01	-1.81E+02
36	20	26	-5.04E+01	-8.90E+01	-2.52E+02	5.04E+01	8.90E+01	-1.57E+02
37	6	12	1.53E+01	-5.08E+01	-1.20E+02	-1.53E+01	5.08E+01	-9.86E+01
38	12	21	-1.22E+01	-1.65E+01	-9.60E+01	1.22E+01	1.65E+01	-9.56E+01
39	21	27	-3.06E+01	-3.02E+01	-8.77E+01	3.06E+01	3.02E+01	-5.12E+01

SUPPORT REACTIONS

JOINT	R-X	R-Y	R-Z
1	-2.0327E+02	-8.7249E+02	3.8290E+02
7	-2.7338E+02	5.3914E+02	4.4787E+02
13	-2.4131E+02	6.4478E+01	4.2622E+02
16	-2.5974E+02	-2.1683E+02	4.3877E+02
22	-5.2360E+01	4.8571E+02	7.2343E+01

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REORDER REF. 1110 GL

TABLE 1						
Summary of the Results of the Survey of the Faculty of the University of Chicago						
I. General Information						
A. Demographic Data						
Age	35-44	45-54	55-64	65-74	75+	Total
Gender	Male	Female	Male	Female	Male	Female
Marital Status	Married	Single	Married	Single	Married	Single
Years of Service	0-5	6-10	11-15	16-20	21-25	26+
Rank	Assistant Professor	Associate Professor	Full Professor	Emeritus	Retired	Other
Department	Physics	Chemistry	Biology	Mathematics	Engineering	Other
B. Academic Data	Research Productivity	Teaching Effectiveness	Service to the University	Satisfaction with Work	Overall Health	Other Factors
C. Research Data						
D. Teaching Data						
E. Service Data						
F. Satisfaction Data						
G. Other Data						

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

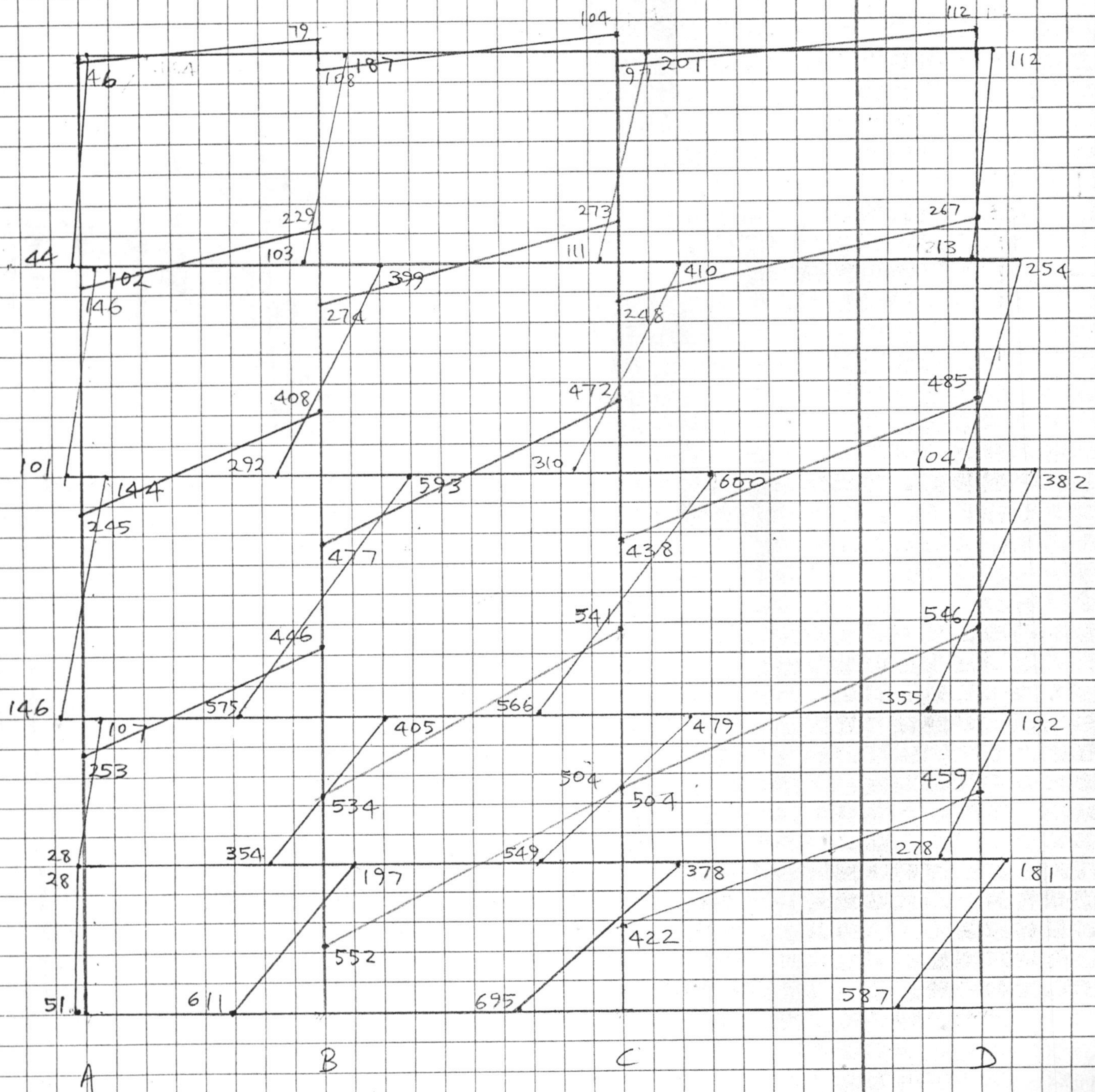
LOAD SUMMATION

1	-----					
2						
3	HORIZONTAL APPLIED	1030.00	REACTION	-1030.06	BALANCE	-0.06
4	VERTICAL APPLIED	0.00	REACTION	0.00	BALANCE	0.00
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THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth, struggle, and achievement. From the first European settlers to the present day, the nation has evolved through various challenges and triumphs. The early years were marked by the search for a stable government and the expansion of territory. The American Revolution was a pivotal moment, leading to the birth of a new nation. The 19th century was a period of rapid growth and change, with the Industrial Revolution transforming the economy and society. The Civil War was a defining event, resolving the issue of slavery and preserving the Union. The 20th century brought further challenges, including the Great Depression, World War II, and the Cold War. The nation has continued to grow and change, facing new challenges in the 21st century. The history of the United States is a testament to the resilience and spirit of its people.

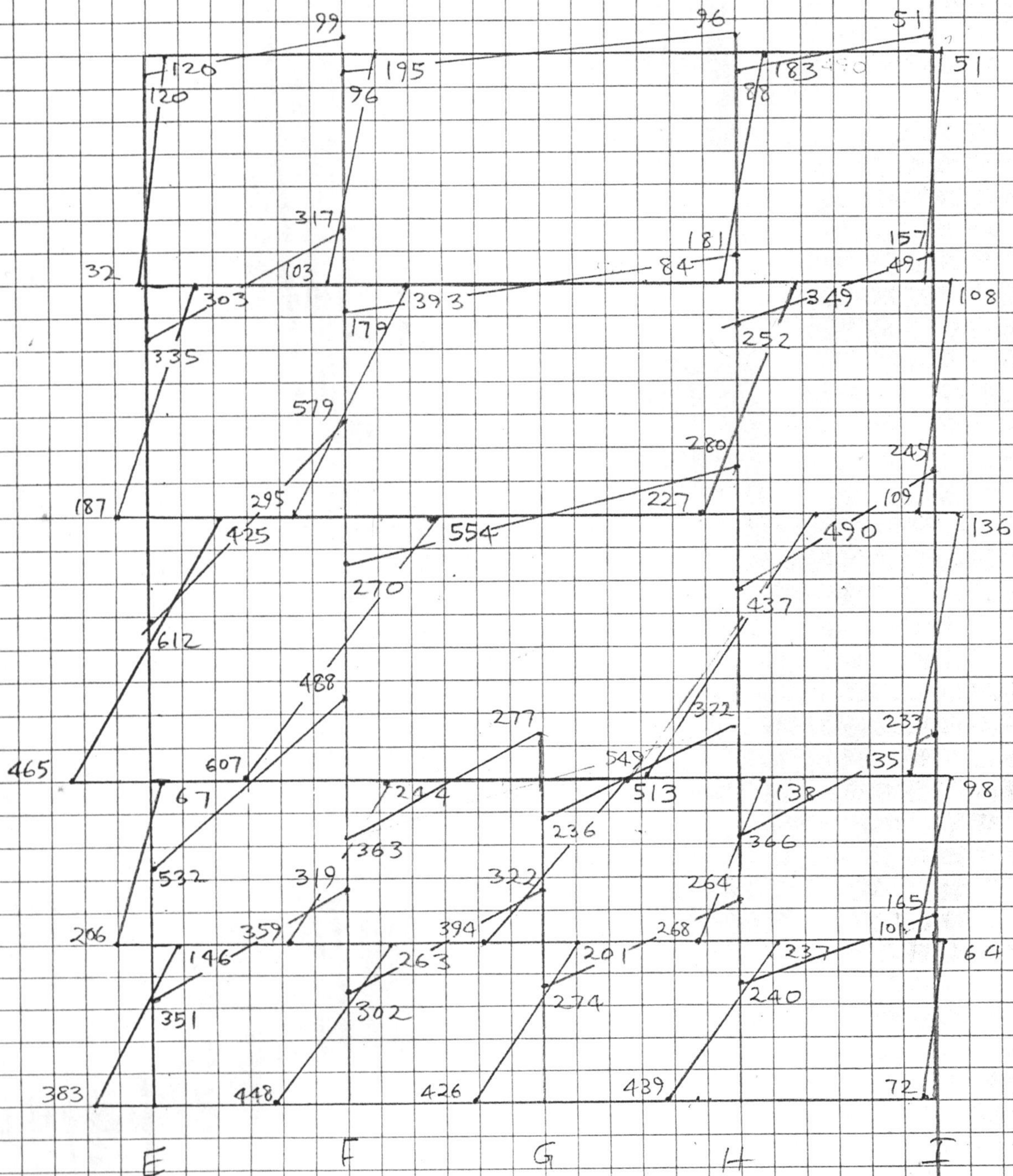
WMCE



Lier	Δ_{new}	$\Delta_{exist. (Stage I)}$
4	23.7	
3	21.3	26
2	16.3	21
1	7.3	11
M	3.1	—

⇒ Frame is of right order of stiffness to be compatible with existing stage 1 bldg

WMCW



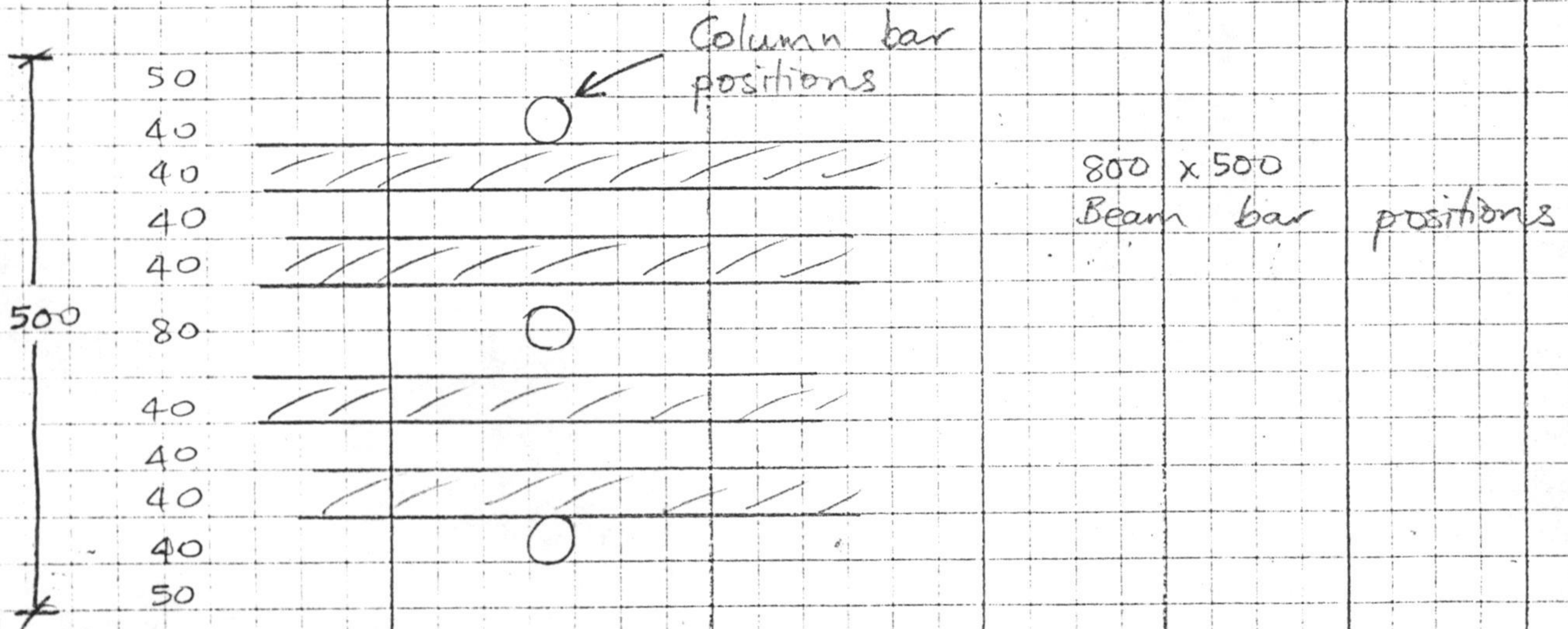
Low.	Δ_{new}	Δ (stage I)	
4	21.7		
3	18.7	26	
2	13.3	21	\Rightarrow OK
1	4.7	11	
M	1.9		

Beam Section 800 x 500

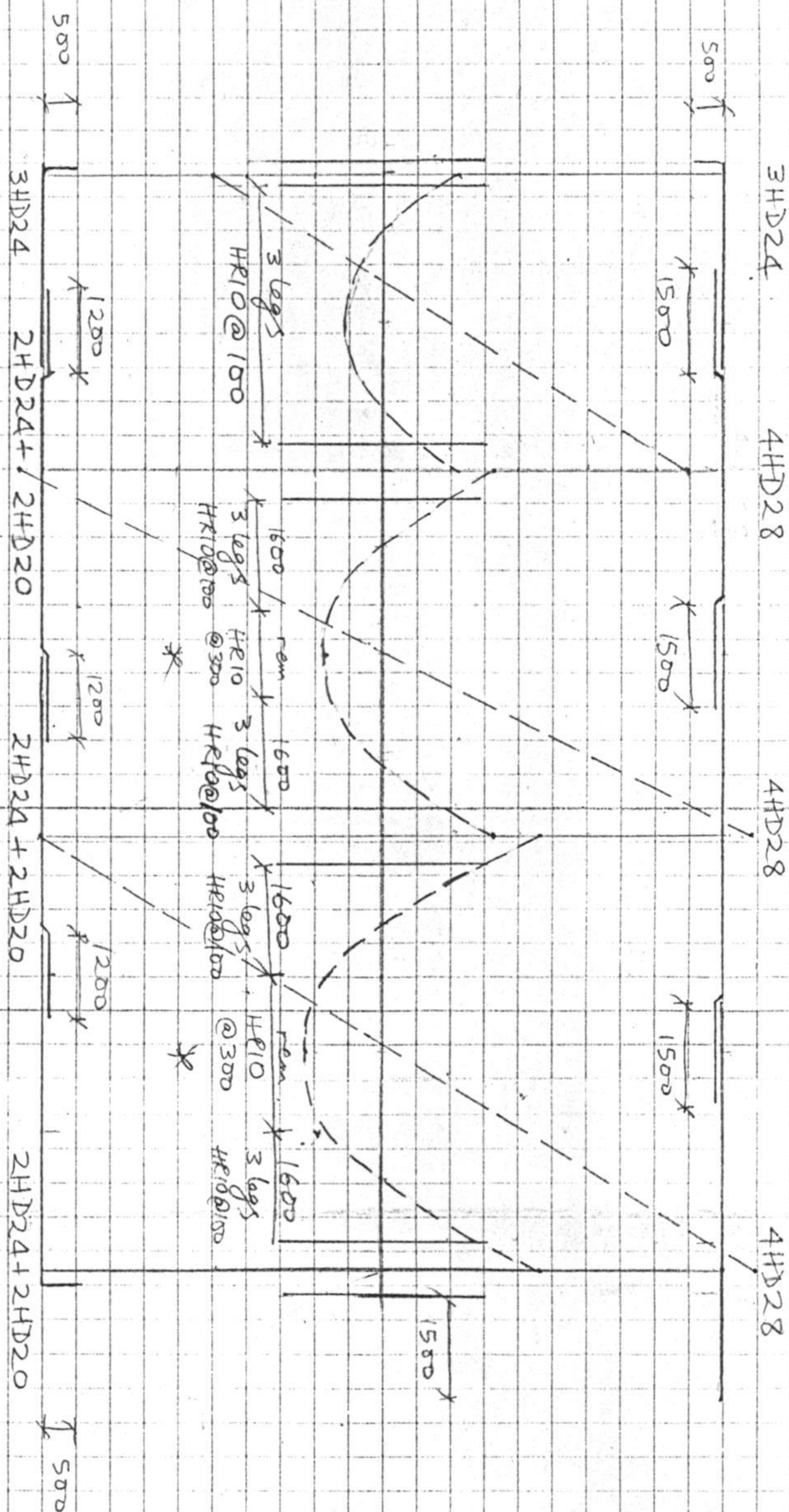
$f_y = 380$ $\rho_{min} = 0.0037$

$f'_c = 25 \text{ MPa}$
 $\rho_{max} = 0.75 \rho_b$
 $= 0.0218$

Bars	$A_s \text{ (mm}^2\text{)}$	$d \text{ (mm)}$	ρ	R_u	$M_u \text{ (kNm)}$	$M_o \text{ (kNm)}$
3HD24	1357	730	0.0037	1.34	321	
2HD24 + 2HD20	1533	730	0.0042	1.50	360	
4HD24	1810	730	0.0050	1.80	432	
4HD28	2463	730	0.0067	2.38	571	
4HD32	3217	730	0.0088	3.12	748	



East Frame - 800x500 beams - all levels same except for pinned beams



* Transverse Rao Note

If transverse Rao region @ midspan becomes larger than 1000, extend end region transverse Rao for full length of beam.

D+1.3Le	80	60	60	100	90	100	140	120	140
E(±)	220	370	450	460	420	560	480		
D+1.3Le+E	-350	+310	-550	+360	-560	+280	+340		
D+1.3Le-E	+140	-430	+350	-560	+280		-620		
D+1.3Le-E resist.	+210	-360	+350	-560	+330		-570		
Design Mu-	-300	-550		-360			-570		
Design Mu+	+210	+350		+360			+340		

Seismic SF	163	219	260	203	260	303	167	303
Vu 1.4D+1.7Le	219	161	191	394	389			
Vu D+1.3Le	161	324	394					
Vu max	324							

JOB

BY

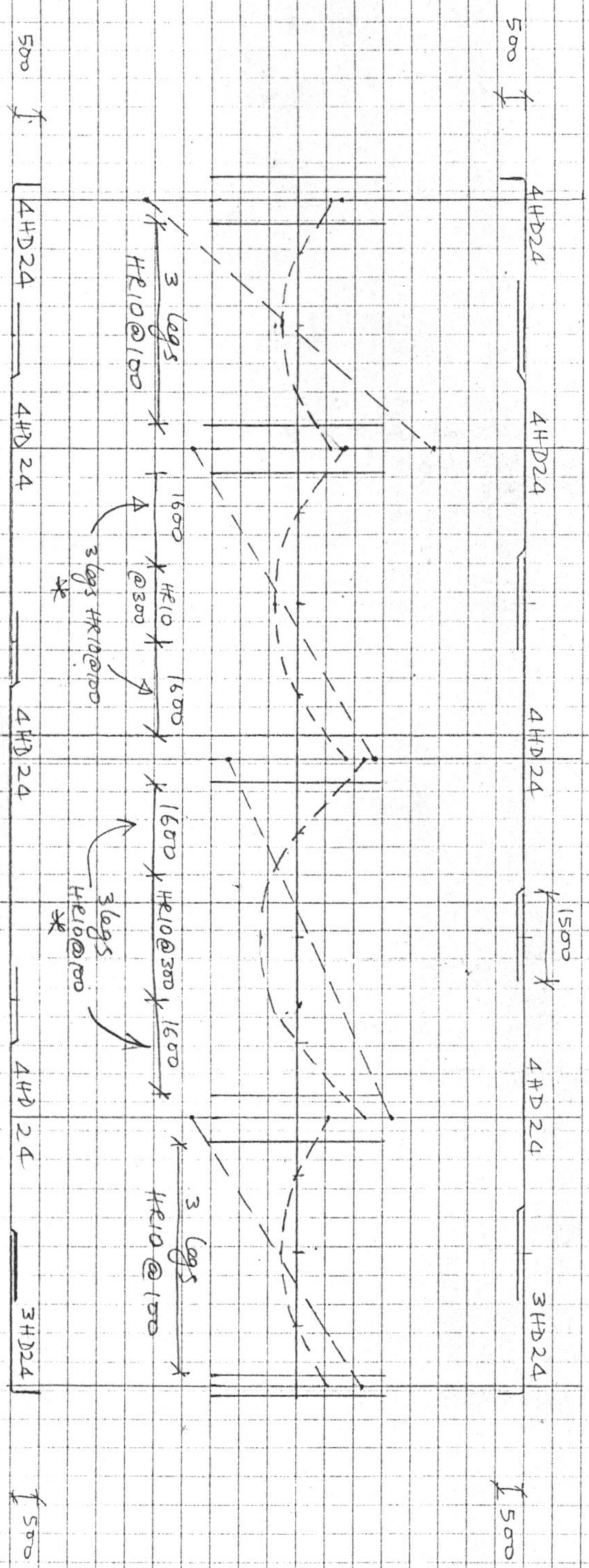
JOB

BY

DATE

DATE

West Frame - levels M, 1



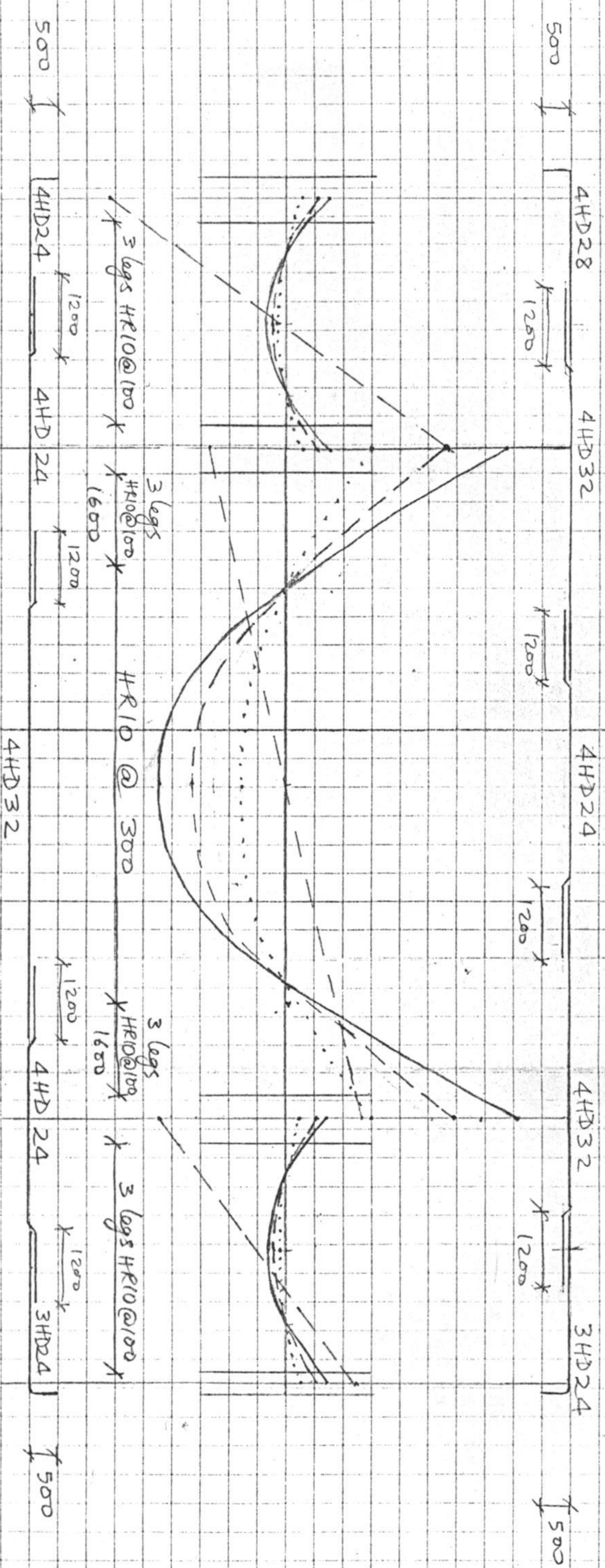
D+1.34E	80	60	80	100	90	100	-170	120	-170	-70	50	90
E(1)	430		380	310		220	200		300	310		200
D+1.34+E	-510		+300	-410		+120	-370		+130	-380		+110
D+1.34-E	+350		-460	+210		-320	+30		-470	+240		-290
D+1.34+E redit	-430		+380	-410		+120	-370		+130	-380		+110
D+1.34-E redit	+380		-430	+210		-320	+70		-430	+240		-290

Series SF	237				121			39			130	
V _u 1.4D+1.7E	219	219	260		260	303		303	188		188	
D+1.34E	161	161	191		191	222		222	139		139	
V _u max	398	398	312		312	311		311	269		269	

Transverse Rod
* Delete middle zone if becomes less than 1000 long



West Frame - Levels 2-4



1.4D+1.7L _p	50	50	50	620	450	650	50	50	90
D+1.3L _p	30	30	30	450	330	490	50	50	40
E(±)	500	460	250	330	250	250	380	210	210
D+1.3L _p +E	-550	+390	-700	330	-240	-430	+330	+120	-300
D+1.3L _p -E	+450	-510	+200	330	-740	+330	-300	+170	-250
.9D+E	-530	+430	-480		+10	-410			
.9D-E	+470	-490	+20		-490	+350			
D+1.3L _p -E redist.	+430	-530							
.9D-E redist.	+430	-530							

Design M _u	-550	-700							
	+430	+430							

Seismic SF	277		47		148	
V _u 1.4D+1.7L _p	219	219	359		359	188
D+1.3L _p	161	161	262		262	139
V _u max	438	438	359		359	287

Design done with no redistribution to reduce possibility of midspan hinge

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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Transverse Reo 6.53

PH Regions $s_{max} = d/4 = 183$ $6d_b = 12 \times 150$

$$A_{te} = 1.5 \times 804 \times 380 \times 150 / 16 \times 380 \times 100 = 113 \text{ mm}^2$$

\Rightarrow HR12 @ 150 OK (3 legs)
or HR10 @ 100 (3 legs)

PH Region Assume $v_c/2$

$$v_i = 438 \times 10^3 / .85 \times 500 \times 730 = 1.41 \text{ MPa}$$

$$p_w = 1.0050 \quad v_c = .6 \quad v_c/2 = .3 \quad v_s = 1.01$$

$$A_v = v_s bws / f_y = 1.01 \times 500 \times 150 / 380 = 199$$

(\Rightarrow 3 legs HR10 @ 150 OK)

Outside PH region $s_{max} = 730/2 = 365$

Middle spans only

$$v_i = 191 \times 10^3 / .85 \times 500 \times 730 = .62$$

$$v_s = .62 - .6 = .02$$

$$A_{vmin} = .35 bws / f_y$$

$$= .35 \times 500 \times 300 / 380 = 138$$

\Rightarrow HR10 @ 300 OK

Transverse Reo

PH Regions

1500 from face
3 legs HR10 @ 100

Remn

HR10 @ 300

Gravity Beams

Beams MB1, 4-MB4

$$M_u = 265 \text{ kNm} \quad V_u = 230 \text{ kN}$$

Try 500x500

$$P_u = 265 \times 10^6 / .9 \times 500 \times 430^2 = 3.18 \quad \rho = .009$$

$$A_s = 1935 \text{ mm}^2$$

⇒ 4HD28

$$v_c = 230 \times 10^3 / .85 \times 500 \times 430 = 1.26 \text{ MPa}$$

$$\rho_w = .011 \quad v_c = .92 \quad v_s = .34$$

$$A_{rmin} = .35 bws / f_y \quad s_{max} = d/2 = 215$$

$$= .35 \times 500 \times 200 / 380 = 92 \text{ mm}^2$$

⇒ HR10 @ 200 OK

Pinned End Detail

Try 300x500 connection

$$v_c = 230 \times 10^3 / .85 \times 500 \times 230 = 2.35$$

$$.2 f'_c = 5 \text{ MPa} \rightarrow \text{OK}$$

$$A_{vf} = V_u - P_u / \phi \mu f_y = 230 \times 10^3 / .85 \times .7 \times 380 = 1017 \text{ mm}^2$$

⇒ 6HD16 (3T & 3B)

End steps to take reaction

$$A_v = 230 \times 10^3 / .9 \times 380 = 673 \text{ mm}^2$$

$$\Rightarrow 673 / 157 = 4.3$$

$$673 / 226 = 3.0$$

$$673 / 339 = 2.0$$

Shear

$$\rho_w = .0052 \quad v_c = .61 \quad v_s = 1.74$$

$$A_v = v_s bws / f_y = 1.74 \times 500 \times 50 / 380 = 114 \text{ mm}^2$$

⇒ HR10 @ 50 OK

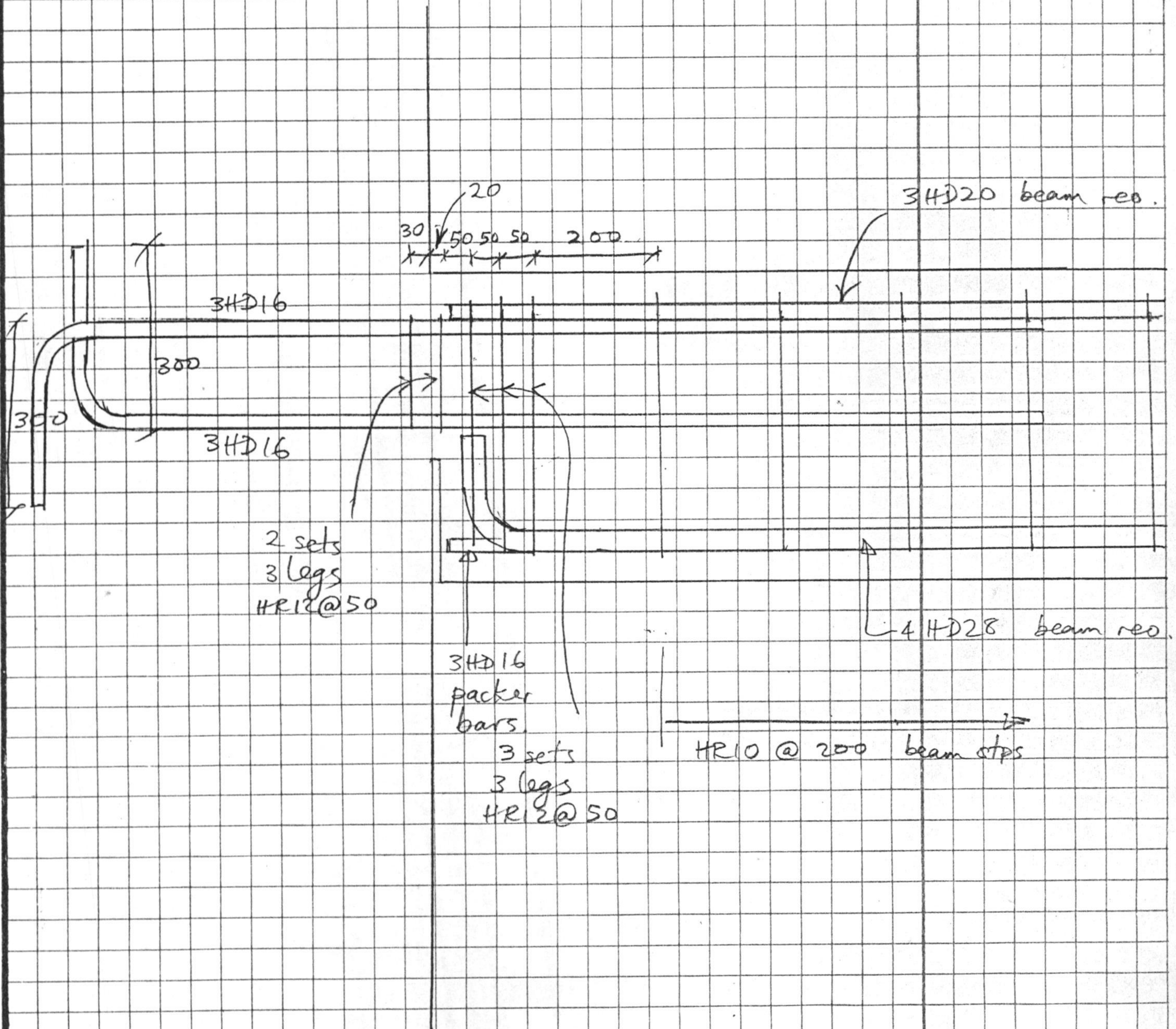
Date		Time		Location		Activity		Remarks	
</									

Gravity Beams — 500 x 500

East Frame — North end level M
— South end levels M-4
(refer pinned end beams shown
on frame p. 32)

3HD20 T
4HD28 B
HR10 @ 200.

Pinned End Detail



CIVIL, STRUCTURAL AND EARTHQUAKE ENGINEERS

JOB No.

PAGE

30

BY

WFM

DATE _____

2/10/86

Have ignored LL red $\hat{=}$ factor (cumulative) \Rightarrow conservative

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

COLUMN AXIAL LOADS - WEST FRAME								
COL	LEV	D	LR	E°	D + LR	1.4D + 1.7L _p	2.43E + E°	1.9D + E°
E	4	93	52	51	145	219	212	33
	3	186	104	203	290	437	524	-36
	2	279	156	479	435	656	961	-228
	1	372	208	717	580	874	1359	-382
	M	465	260	872	725	1093	1675	-454
F	4	267	120	34	387	578	457	206
	3	534	240	155	774	1156	1001	326
	2	773	358	384	1131	1691	1622	312
	1	980	469	501	1449	2169	2091	381
	M	1187	580	539	1767	2648	2480	529
G	1	202	113	32	315	475	381	150
	M	250	238	65	488	755	624	160
H	4	243	122	14	365	548	416	205
	3	486	244	72	730	1095	875	365
	2	703	367	173	1070	1608	1353	460
	1	851	463	214	1314	1979	1667	552
	M	1056	583	217	1639	2470	2031	733
I	4	69	54	30	123	188	169	32
	3	138	108	119	246	377	397	5
	2	207	162	267	369	565	685	-81
	1	276	216	398	492	754	955	-150
	M	345	270	486	615	942	1182	-176

Col

$$\begin{aligned} 6.4. \text{ Max axial} &= .85 \phi P_o \\ &= .85 \phi [.85 f'_c (A_g - A_{st}) + f_y A_{st}] \\ &= .85 \times .7 [.85 \times 25 (500 \times 800 - 3968) + 380 \times 3968] \\ &= 5904 \text{ kN.} \end{aligned}$$

$$\begin{aligned} 6.5. \text{ Max axial} &= .7 \phi f'_c A_g = 4900 \text{ kN.} \\ \text{or} \quad .7 \phi P_o &= .7 \phi [.85 f'_c (A_g - A_{st}) + f_y A_{st}] \\ &= 4861 \text{ kN} \end{aligned}$$

$$\text{Max. } P_u = 2813 \text{ kN} \Rightarrow \text{OK}$$

$$\phi = 0.7$$

$$800 \times 500 \quad g = .8$$

$$350 \times 800 \quad g = .6$$

$$6\text{HD}24 + 4\text{HD}20 \quad A_s = 3971 \quad \rho = .0099 \quad \rho_m = .177 \quad (f'_c = 25) \quad 800 \times 500$$

$$10\text{HD}20 \quad A_s = 3142 \quad \rho = .0112 \quad \rho_m = .200 \quad (f'_c = 25) \quad 350 \times 800$$

1. The first part of the document discusses the importance of maintaining accurate records.

2. The second part of the document discusses the importance of maintaining accurate records.

3. The third part of the document discusses the importance of maintaining accurate records.

4. The fourth part of the document discusses the importance of maintaining accurate records.

5. The fifth part of the document discusses the importance of maintaining accurate records.

6. The sixth part of the document discusses the importance of maintaining accurate records.

7. The seventh part of the document discusses the importance of maintaining accurate records.

8. The eighth part of the document discusses the importance of maintaining accurate records.

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10. The tenth part of the document discusses the importance of maintaining accurate records.

11. The eleventh part of the document discusses the importance of maintaining accurate records.

12. The twelfth part of the document discusses the importance of maintaining accurate records.

13. The thirteenth part of the document discusses the importance of maintaining accurate records.

14. The fourteenth part of the document discusses the importance of maintaining accurate records.

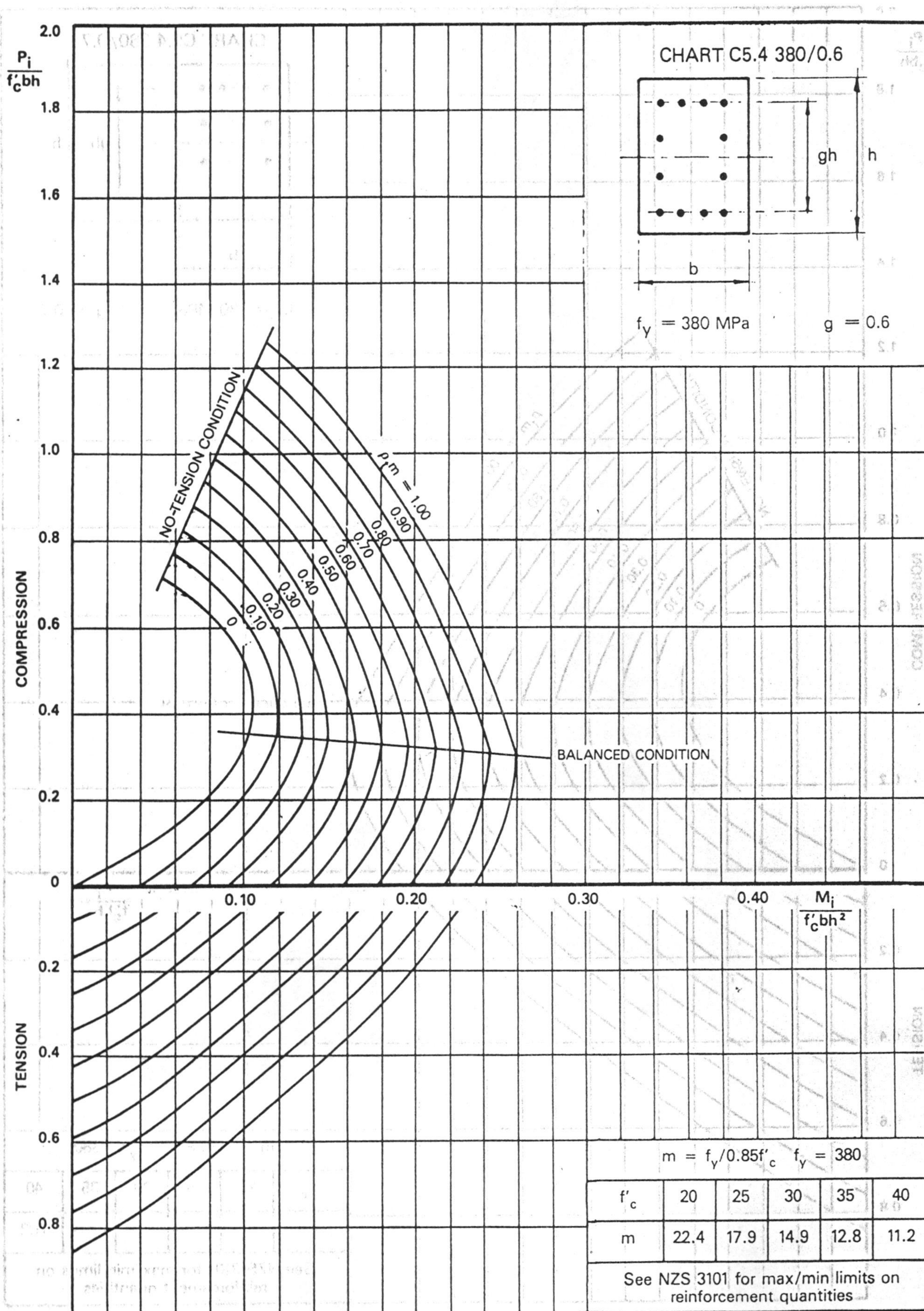
15. The fifteenth part of the document discusses the importance of maintaining accurate records.

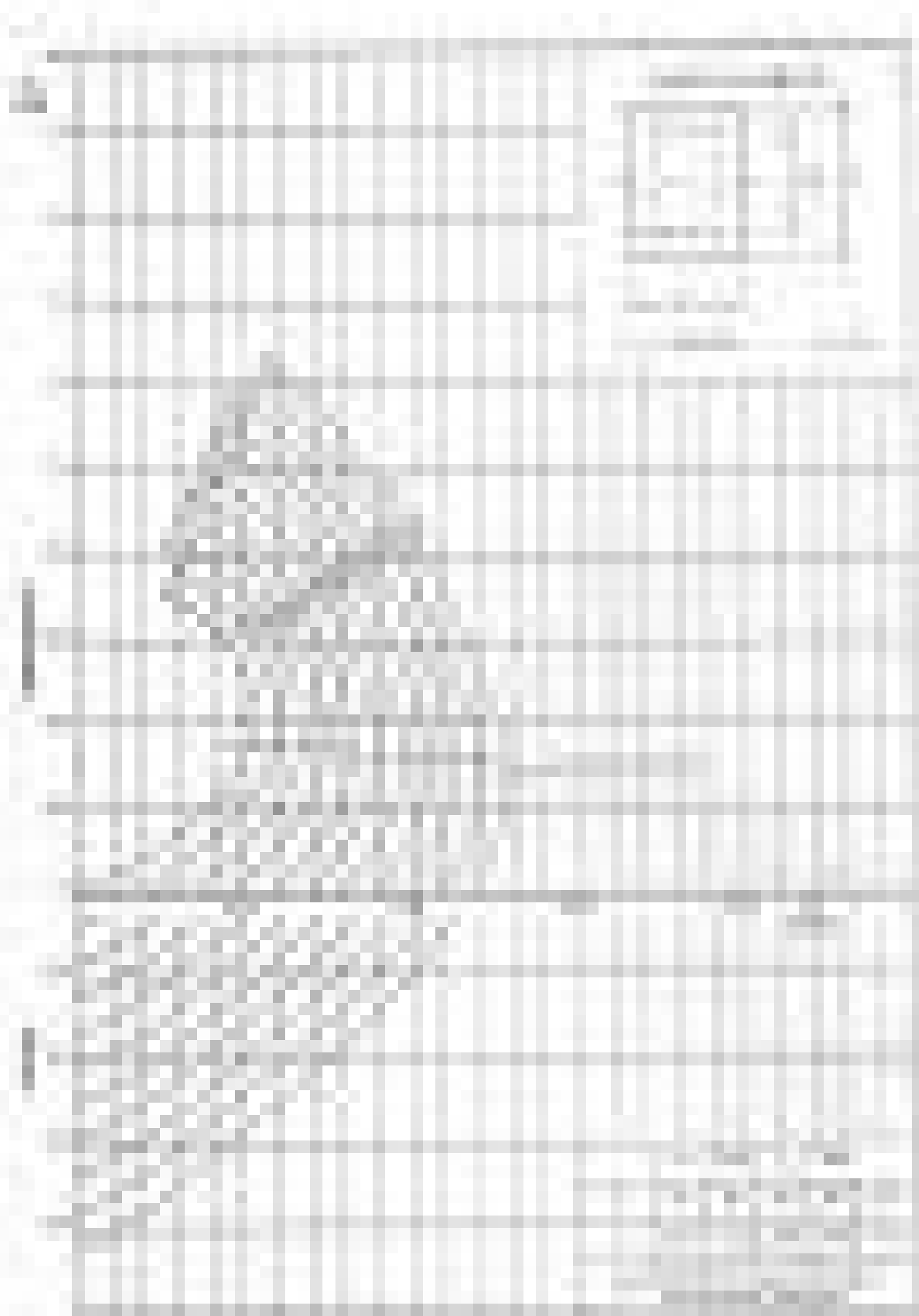
16. The sixteenth part of the document discusses the importance of maintaining accurate records.

17. The seventeenth part of the document discusses the importance of maintaining accurate records.

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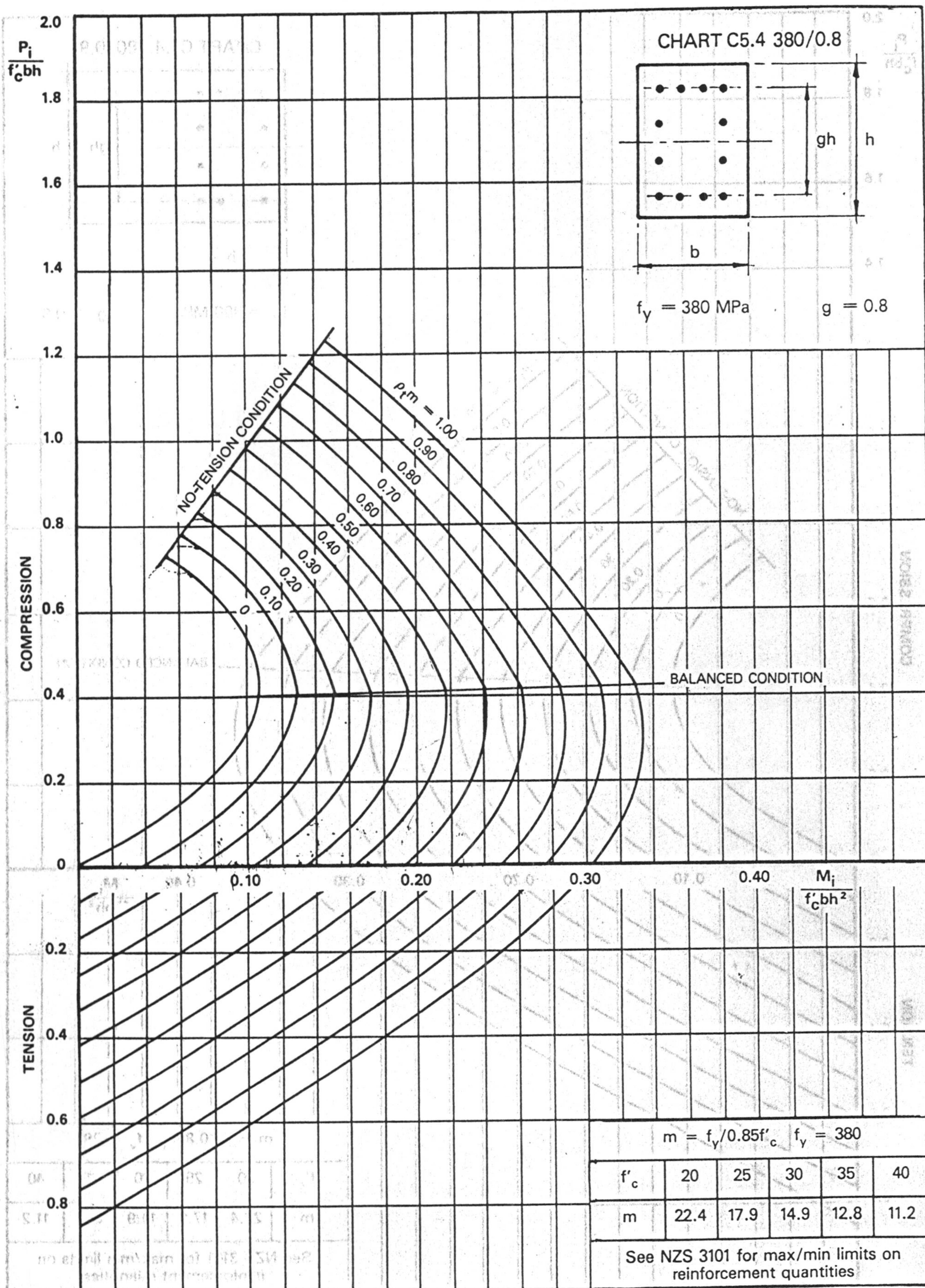
C5.4 COLUMN DESIGN CHART

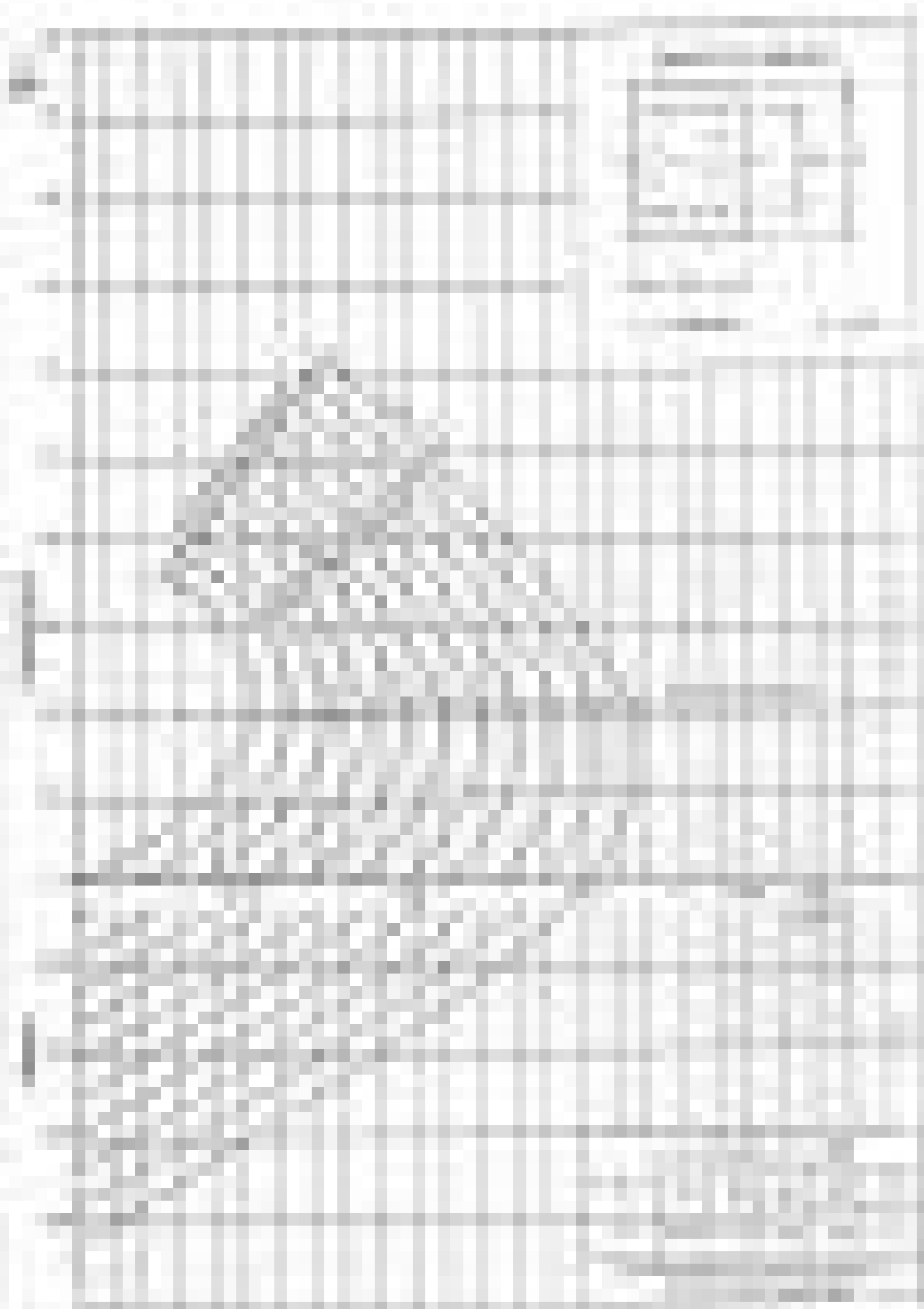




C5.4 COLUMN DESIGN CHART

TRANSFORMED COLUMN DESIGN CHART





COLUMNS - EAST FRAME										
$\phi = .9 \quad \phi = .9$										
LEV	$P_{i \max}$ D+F+3L+E	$P_{i \min}$ -9D+E	M_u	$P_i/f'_c b h$ max	$M_u/f'_c b h^2$ min	P_{tm}	P_t	A_s	BARS	f'_c
COL	A	350X	800							
4	190	55	46		.01	.021	<.20	min	10HD20	25
3	437	51	102		.01	.046			"	"
2	750	-17	146		—	.066			"	"
1	1073	-96	107		—	.02	.049		"	"
M	1243	-7	51	.25	—	.023			"	"
COL	B	800X	500							
4	362	175	187		.02	.026	<.177		6HD24+4HD20	25
3	730	346	399		.04	.055			"	"
2	1108	505	593		.06	.082			"	"
1	1499	651	405		.08	.056			"	"
M	2058	644	611	.29	.08	.085			"	"
COL	C	800X	500							
4	420	218	201		.03	.028	<.177		6HD24+4HD20	25
3	1853	422	410		.05	.057			"	"
2	1299	614	600		.08	.083			"	"
1	1747	803	549		.11	.076			"	"
M	2219	969	695	.32	.14	.097			"	"
COL	D	800X	500							
4	424	179	112		.02	.016	<.177		6HD24+4HD20	25
3	1897	308	254		.04	.035			"	"
2	1434	374	382		.05	.053			"	"
1	1992	418	278		.05	.039			"	"
M	2523	490	587	.36	.06	.082			"	"

\uparrow

M_u values $\phi = .7 - .9$
are @
 ϕ
 \Rightarrow
Conservative.

\uparrow
 M_u values $\phi = .7 - .9$
 are @
 ϕ
 \Rightarrow
 Conservative.

COLUMNS - WEST FRAME										
LEV	P_u max D.L. + S.L. + E	P_u min D.L. + E	M_u	$P_u/f_c b h$ max min	$M_u/f_c b h^2$	ρ_{tm}	ρ_t	A_s	BARS	f_{lc}
COL E			800 x 500							
4	212	33	120	—	.017	<.177			6HD24+4HD20	25
3	524	-36	303	—	.042				"	"
2	961	-228	465	-.03	.065	.20	.0112	4480	6HD28+4HD20	"
1	1359	-382	206	-.04	.029				"	"
M	1675	-454	383	.24 -.05	.053	.20			"	"
COL F			800 x 500							
4	457	206	195		.02	.027	<.177		6HD24+4HD20	25
3	1001	326	393		.04	.055			"	"
2	1622	312	607		.04	.084	.20		6HD28+4HD20	"
1	2091	381	359		.05	.050			6HD24+4HD20	"
M	2480	529	448	.35	.07	.062			"	"
COL G			800 x 500							
1	381	150	513		.02	.071	<.177		6HD24+4HD20	25
M	624	160	426	.08	.02	.059			"	"
COL H			800 x 500							
4	416	205	183		.02	.025	<.177		6HD24+4HD20	25
3	1875	365	349		.04	.048			"	"
2	1353	460	513		.06	.071			"	"
1	1667	552	268		.07	.037			"	"
M	2031	733	439	.29	.10	.061			"	"
COL I			350 x 800							
4	169	32	51	—	.023	<.200			10HD20	25
3	397	5	109	—	.049				"	"
2	685	-81	136	-.01	.062				"	"
1	955	-150	101	-.02	.046				"	"
M	1182	-176	72	.24 -.03	.033				"	"
				$\phi = .7 \rightarrow .9$	$\phi = .9$					

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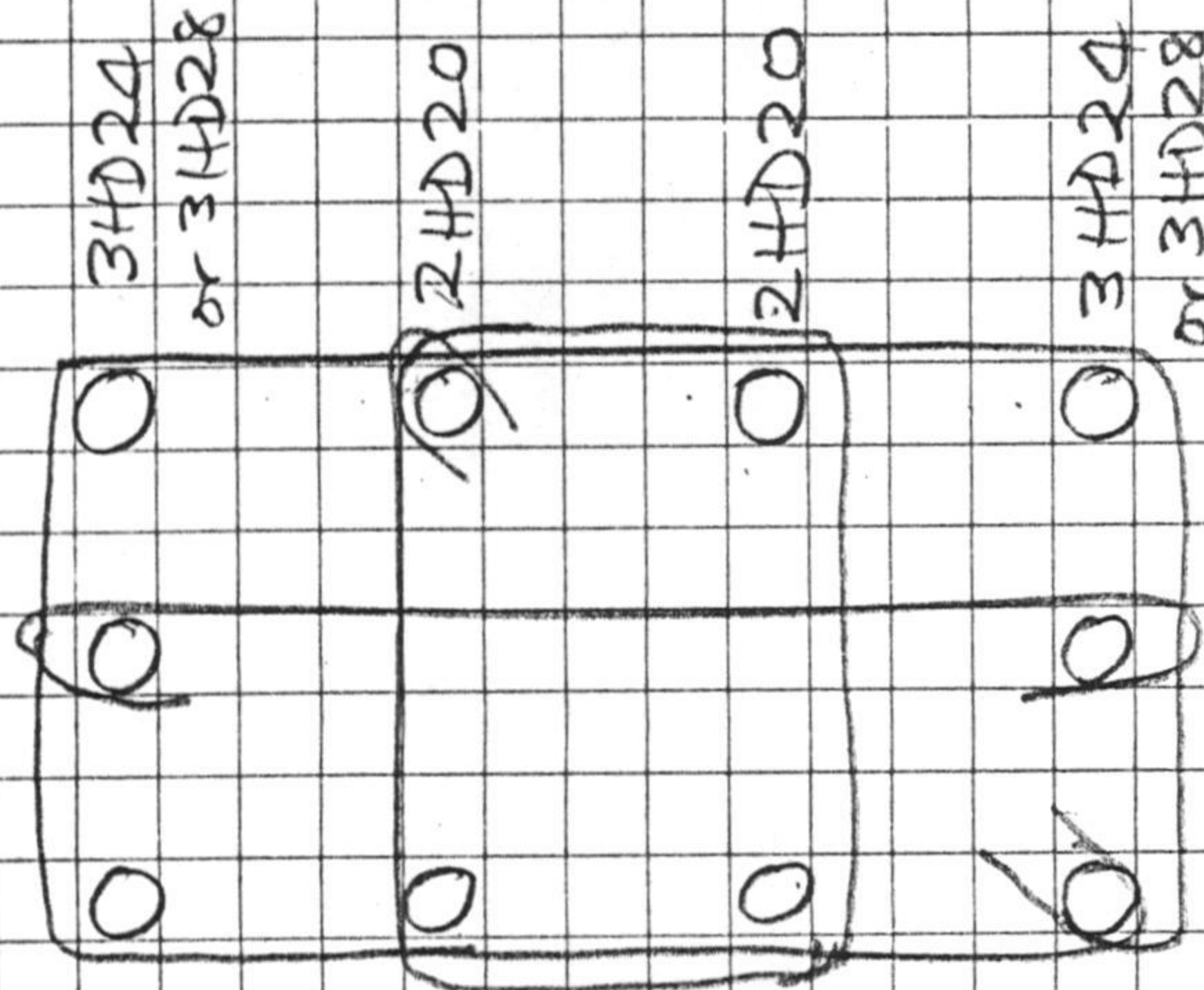
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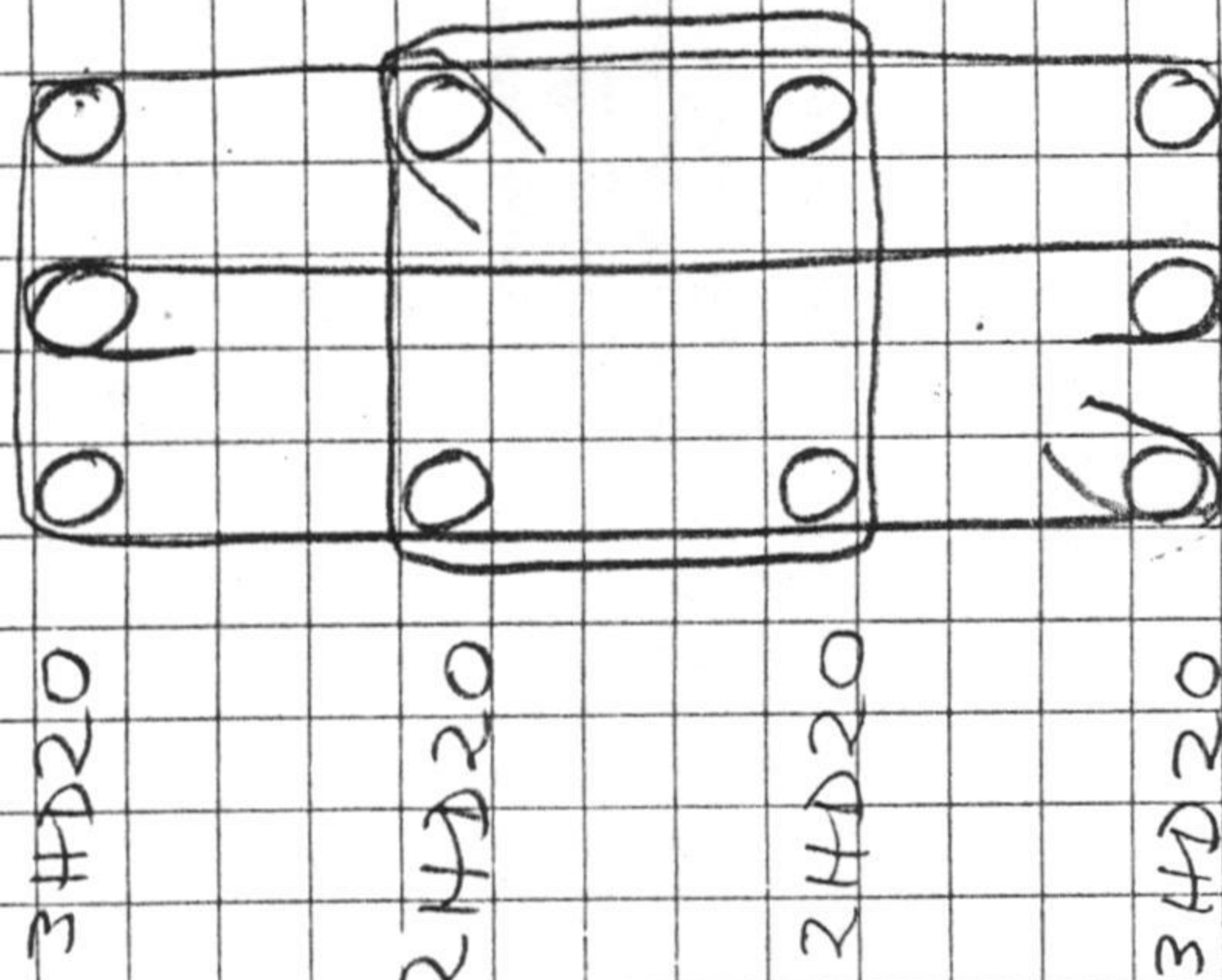
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Cols



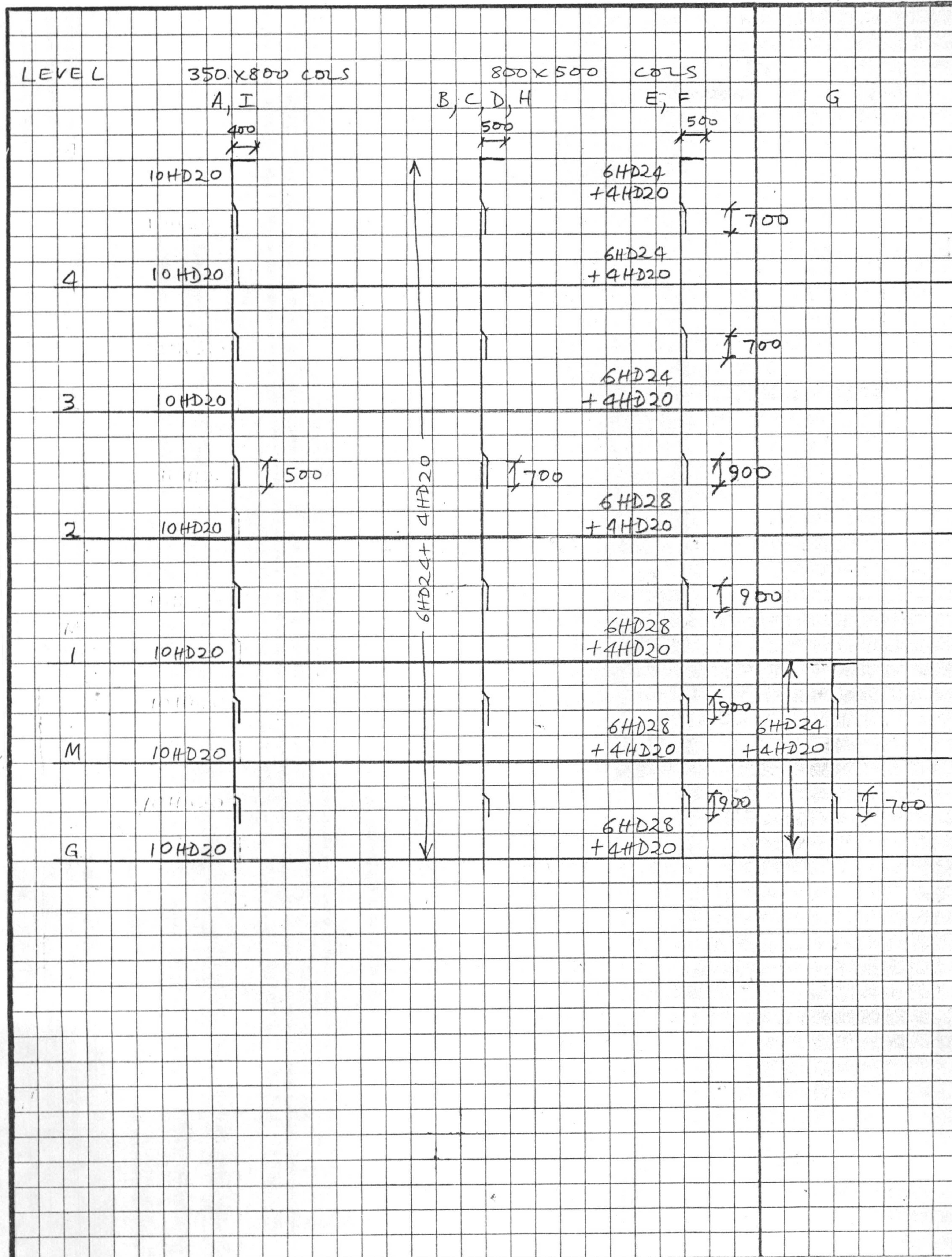
800 x 500



350 x 800

Note i) 50 cover to all bars

ii) ...



[illegible]

Transverse Reo.

Confinement Reo - Ltd Ductile End Regions

$$\gamma = \frac{M_e^* + .3 f_c' h}{.6 \phi f_c' A_g^* h} = \frac{(695 \times 10^6 + .3 \times 2219 \times 10^3 \times 800)}{.6 \times .9 \times 25 \times .2 \times 800 \times 500 \times 800}$$

$$= 1.42$$

$$\gamma = \frac{.587 \times 10^6 + .3 \times 2523 \times 10^3 \times 800}{.6 \times .9 \times 25 \times .2 \times 800 \times 500 \times 800} = 1.38$$

$$R_c = \frac{\gamma}{1 + \rho^* m} - 1 = \frac{1.42}{\left(1 + \frac{1848}{500 \times .2 \times 800} \times \frac{380}{.85 \times 25}\right)} - 1$$

$$= .005$$

$$A_{sh} = R_c (.025 s_h h f_c' / f_y h) = .005 (.02 \times 150 \times 800 \times 25 / 380)$$

$$= 0.8 \text{ mm}^2$$

⇒ OK

$$S_{max} = 10 \times 20 = 200$$

$$V_u \text{ max} = 447 \text{ kN}$$

$$v_c = 447 \times 10^3 / .85 \times 500 \times 680 = 1.55$$

$$v_c = .4 \sqrt{P_e / A_g} = .4 \sqrt{969 \times 10^3 / 500 \times 800} = .62$$

$$v_s = .93 \quad s_{max} = 680 / 4 = 170$$

$$A_v = v_s b w s / f_y = .93 \times 500 \times 150 / 380 = 184 \text{ mm}^2$$

⇒ 3 legs HR10 @ 150 OK

$$6.4 \quad S_{max} = 500, 16 \times 20 = 320, 480$$

⇒ End Regions HR 10 sets @ 150 - OK

End Regions 800 from face

Outside ER

τ_c 7.3.2

$$p_w = \frac{3 \times 616 + 2 \times 314}{500 \times 680} = 0.0073$$

$$\tau_b = 0.72$$

$$\left(1 + \frac{3 p_w}{A_g f_c}\right) \tau_b = \left(1 + \frac{3 \times 969 \times 10^3}{500 \times 800 \times 25}\right) \cdot 0.72 = 0.93$$

$$\tau_s = 1.55 - 0.93 = 0.62$$

$$A_v = \tau_s b_w s / f_y$$

$$\Rightarrow s_{max} = 236 \times 380 / 0.62 \times 500 = 289$$

$$\Rightarrow \text{HR10 sets @ 250}$$

Joint Rev

Design M_u beam - 560 + 330

$$T_{top} = 560 / 0.73 = 767 \text{ kN}$$

$$T_{bottom} = 330 / 0.73 = 452 \text{ kN}$$

$$V_{col} = 2 \left(\frac{l_1}{l_{in}} M_1 + \frac{l_2}{l_{in}} M_2 \right) / (l_c + l_c')$$

$$V_{col} = 2 \left(\frac{5.3}{4.5} \times 330 + \frac{6.3}{5.5} \times 560 \right) / 6.6 = 312 \text{ kN}$$

$$V_{jh} = 767 + 452 - 312 = 907 \text{ kN}$$

$$V_{jv} = V_{jh} \frac{h_b}{h_c} = 907 \text{ kN}$$

$$\tau_{jh} = V_{jh} / b_j h_c = 907 \times 10^3 / (500 \times 800) = 2.27 \text{ MPa}$$

$$1.5 \sqrt{f_c'} = 7.5 \Rightarrow \text{OK}$$

$$V_{sh} = 0.5 V_{jh} \left(1 + \frac{G_j p_w}{0.4 A_g f_c'} \right) = 0.5 \times 907 \left(1 + \frac{614 \times 10^3}{0.4 \times 500 \times 800 \times 25} \right) = 523 \text{ kN}$$

$$V_{sh} = 907 / 1.85 - 523 = 544 \text{ kN}$$

$$A_{sh} = V_{sh} / f_y = 544 \times 10^3 / 380 = 1432 \text{ mm}^2$$

$$\text{Clear space} = 620 \quad 1432 / 236 = 6$$

$$\rightarrow \text{HR10 sets @ 100} \quad (A_s = 1652 \text{ mm}^2)$$

$$V_{cv} = \frac{A_{sh}}{A_{sc}} V_{jv} \left(0.6 + \frac{C_j P_u}{A_g f_c'} \right) = 1 \times 907 \left(0.6 + \frac{614 \times 10^3}{500 \times 800 \times 25} \right) = 600 \text{ kN}$$

$$V_{sv} = 907 / 0.85 - 600 = 467 \text{ kN}$$

$$A_{jv} = V_{sv} / f_y = 1229$$

$$A_{jv} \text{ provided} = 4 \times 314 = 1256 \Rightarrow \text{OK}$$

350 x 800

$$\text{Max. } V_u = 77 \text{ kN}$$

$$v_c = 77 \times 10^3 / 0.85 \times 800 \times 290 = 0.39 \text{ MPa}$$

$$0.07 f_c' = 1.75 \Rightarrow \text{OK} \quad s_{\max} = d/2 = 145$$

$$\Rightarrow \text{HR10 @ 100}$$

Outside PHR HR10 @ 150

800 x 500 Col
Transverse Rep

HR10 @ 100 joint
HR10 @ 150 for 800
from face
HR10 @ 250 rem.

350 x 800 Col

HR10 @ 100 joint
HR10 @ 100 for 800
from face
HR10 @ 150 rem.

Note - All cols.

Middle zone (rem.)
levels 2-4 only.
Levels G-2
one zone for full
height between beam
faces.

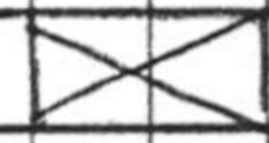
Refer P.
for stirrup sets

Level 4 frame

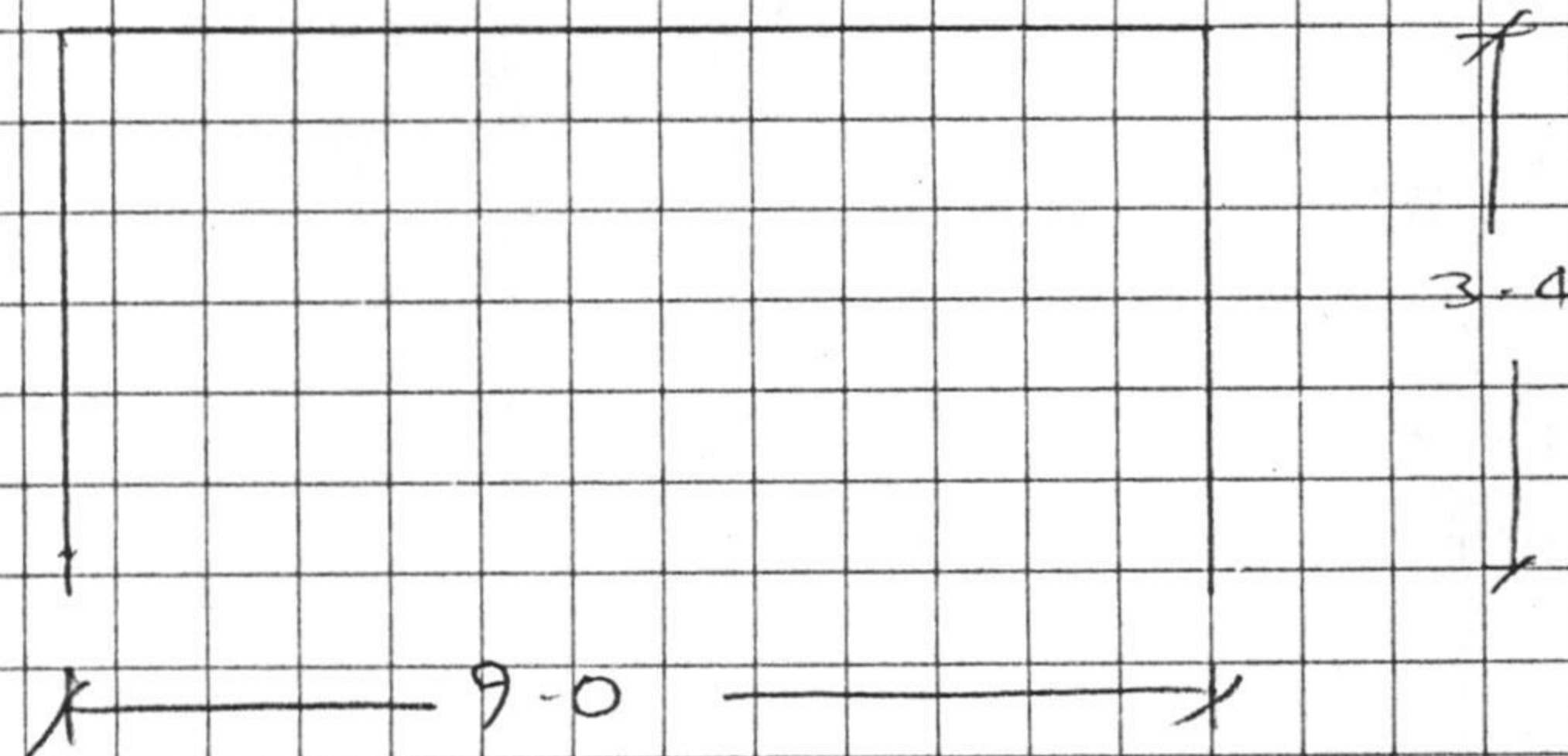
500 x 800



800 x 500



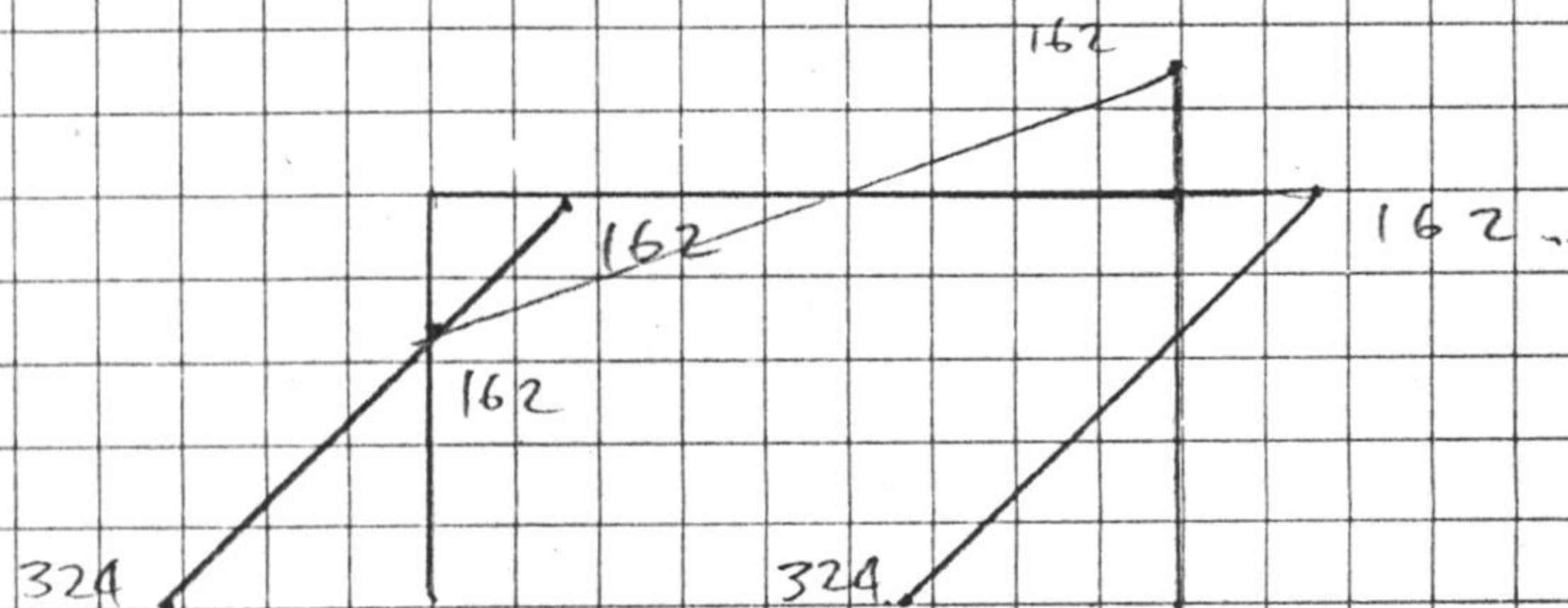
500 x 350



Assume conservatively frame takes $\sqrt{2}$ + torsion

$$F = (476/2) + 48 = 286 \text{ kN}$$

BMD - assume pt of contraflexure @ $2/3$ ht.



$$\text{Cols } M_i / f_c b h^2 = 324 \times 10^6 / .9 \times 25 \times 800 \times 500^2 = .072$$

$$f_{cm} = .20$$

$$f_t = .0112$$

$$A_s = 4480$$

\Rightarrow 10 HD24

Col E

$$M_i / f_c b h^2 = 324 \times 10^6 / .9 \times 25 \times 350 \times 500^2 = .165$$

\Rightarrow NG

\Rightarrow Try 2 frames

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Distribute shears according to col. stiffnesses

$$f = H/AE \cdot [(H/L)^2 + 3]$$

$$500 \times 800 \quad f = \{3.4 / .5 \times .8 \times 23500 [(3.4/.5)^2 + 3]\} \times 10^3 = 17.81$$

$$500 \times 350 \quad f = 40.71$$

$$S = 1/f$$

$$500 \times 800$$

$$S = .056 \times 3 = .168$$

$$500 \times 350$$

$$.025$$

$$.193$$

Shear

$$500 \times 800$$

$$V = [.168 / .193 \times 286] / 3 = 83 \text{ kN}$$

$$500 \times 350$$

$$V = .025 / .193 \times 286 = 37 \text{ kN}$$

$$500 \times 800$$

$$M = 188 \text{ kNm}$$

$$M_i / f_c' b h^2 = .042$$

⇒ Min steel OK

$$500 \times 350$$

$$M = 84 \text{ kNm}$$

$$M_i / f_c' b h^2 = .043$$

⇒ Min steel OK

$A_s \text{ min} = 8\text{HD}16$ but have HD20's below

⇒ 8HD20

Beams - Tray 800x500

$$M_E = 94 \text{ kNm}$$

$$W_D = 24 \times .8 \times .4 + 5 \times 1 + 1 \times 3 = 15.7 \text{ kN/m}$$

$$W_{LR} = 3 \times 4 = 12 \text{ kN/m}$$

$$W_u = 1.4 \times 15.7 + 1.7 \times 12 = 42.4 \text{ kN/m}$$

$$M_u = 42.4 \times 9^2 / 12 = 286 \text{ kNm}$$

Cantilever

$$P_u = 1.4 \times 24 \times .8 \times .4 \times 5 + 1.4 \times 60 + 1.4 \times 5 \times 5 \times .8 = 166 \text{ kN}$$

$$W_u = 1.4 \times 24 \times .8 \times .5 = 13.4 \text{ kN/m}$$

$$M_u = 13.4 \times 2^2 / 2 + 166 \times 2 = 359 \text{ kNm}$$

$$3 + 1.3L_r + E \quad M_u = 305 \text{ kNm}$$

⇒ 4HD24 T & B

Date		Time		Location		Activity		Remarks	

Shear

$$V_u = 166 + 13.4 \times 2 = 193 \text{ kN} \quad \text{or} \quad 42.4 \times 9/2 = 191 \text{ kN}$$

$$v_c = 193 \times 1000 / (.85 \times 500 \times 730) = .62$$

$$p_w = .0050 \quad v_c = .60$$

$$A_{smin} = .35 bws / f_y$$

$$s_{max} = 157 \times 380 / (.35 \times 500) = 341$$

→ 3 logs HR10 @ 100 for 1600 from face

HR10 @ 300 rem.

Edge Beam — Try 600 x 300

$$W_{pl} = 1.4 \times 24 \times .8 \times .4 + 1.4 \times 5 \times .8 + 1.4 \times 10 \times .3 = 30.8$$

$$M_u = 30.8 \times 2^2 / 2 = 62 \text{ kNm}$$

$$\text{or} \quad 30.8 \times 5^2 / 8 = 96 \text{ kNm}$$

$$R_u = 96 \times 10^6 / (.9 \times 300 \times 530^2) = 1.27 \quad \rho = .0035$$

$$A_s = .0037 \times 300 \times 530 = 588 \text{ mm}^2$$

⇒ 2HD24 T & B

$$V_u = 30.8 \times 5/8 \times 5 = 96 \text{ kN}$$

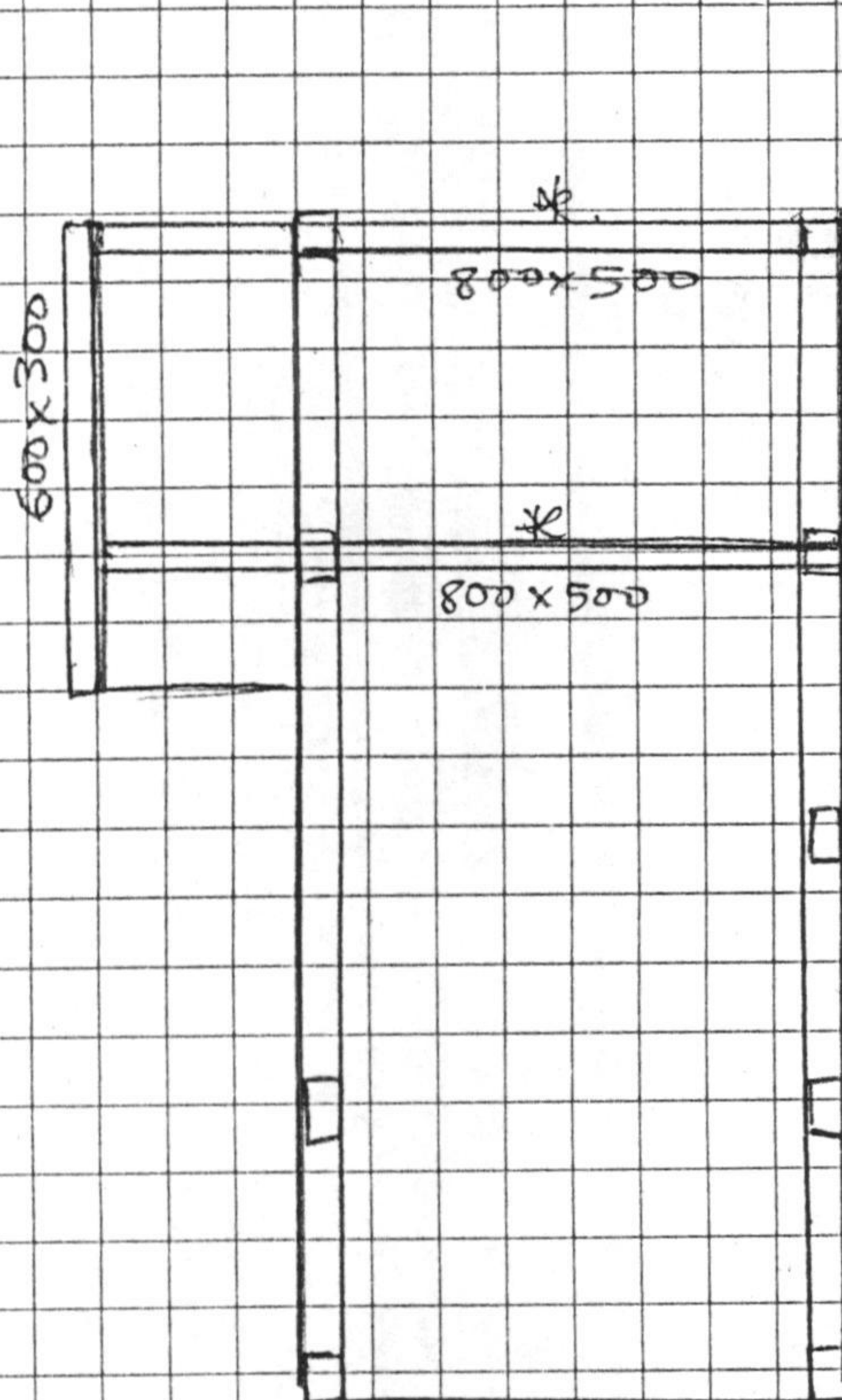
$$v_c = 96 \times 10^3 / (.85 \times 300 \times 530) = .71$$

$$p_w = .0057 \quad .64$$

$$s_{max} = 157 \times 380 / (.35 \times 300) = 568$$

⇒ HR10 @ 200

Level 4 Frames



800 x 350
Col. reduced to
500 x 350 @ lev. 3
(Reduce long req.
from 10HD20 to 8HD20)

* 800 x 500 beams

4HD24 T & B

3 legs HR10 @ 100 for 1600 from face (not on cantilever)

HR10 @ 300 rem.

HR10 @ 200 cantilever.

600 x 300 beam

2HD24 T & B

HR10 @ 200



Figure 1

Figure 1 shows a rectangular box with a vertical line extending downwards from its bottom center.

600x300 beam connection

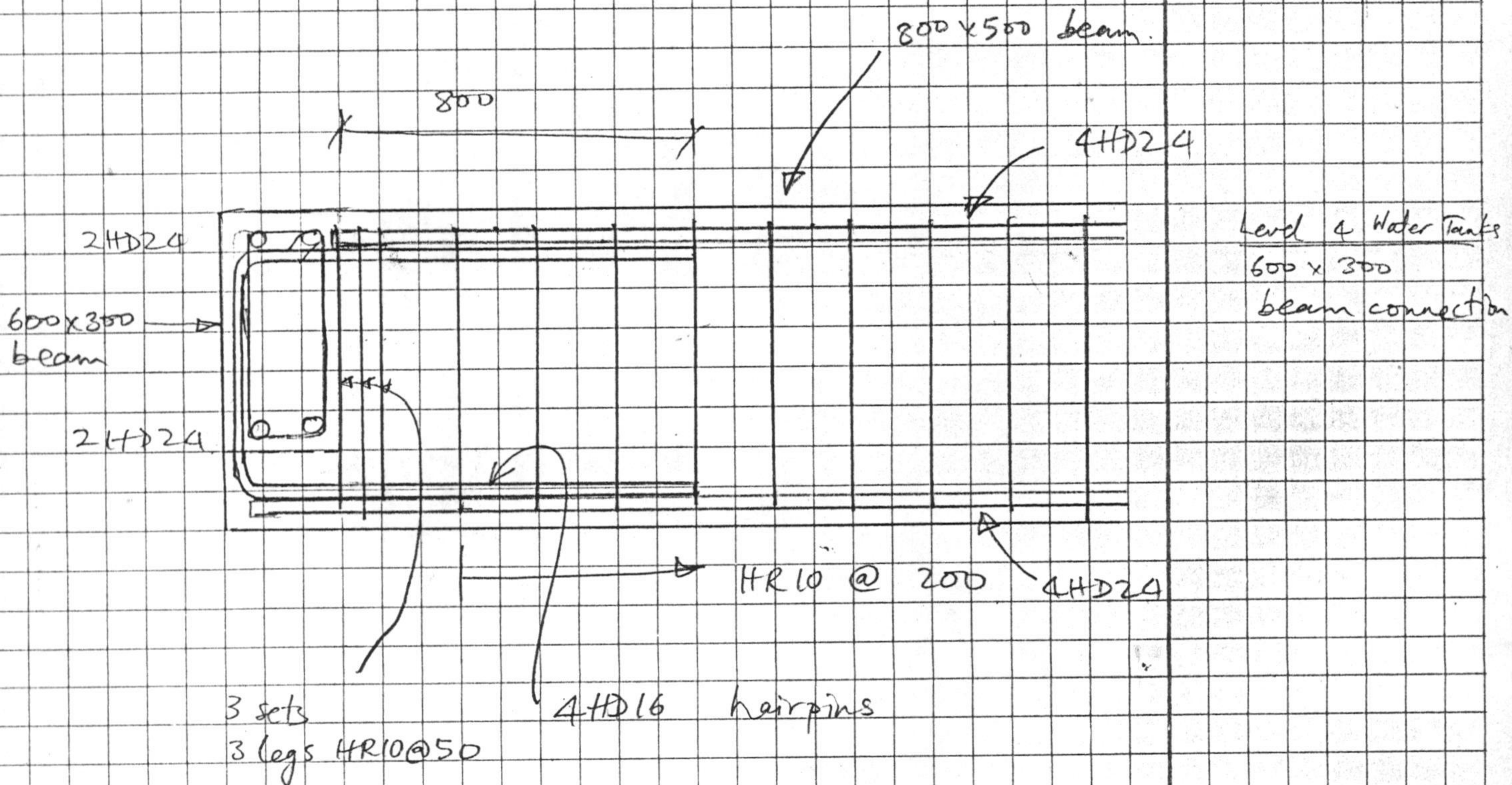
$$A_{sf} = V_u - P_u / \phi \mu f_y = 166000 / .85 \times .7 \times 380 = 734 \text{ mm}^2$$

⇒ 4HD16

$$A_v = V_u / \phi f_y = 166 \times 10^3 / .85 \times 380 = 514 \text{ mm}^2$$

514 / 236 = 2.2 sets 3 legs HR10 w/c d/2 = 365 of beam

Require 3 sets 3 legs HR10 @ 50



Date		Time		Location		Activity		Remarks	
		</							

Roof Cols - H. 3.2m

$$W_p = 1 \times 8 \times 5 = 40 \text{ kN}$$

$$R_p = 1.5 \quad C_{p \text{ max}} = 1.6 \quad C_{p \text{ min}} = .3$$

$$C_p = 1.5 K_z S_p M_p R_p C_d$$

$$C_p = 1.5 \times \frac{19}{9} \times 1 \times .8 \times 1.5 \times .1 = .38$$

$$\alpha K_z Z R C_{p \text{ min}} = \frac{9}{15.8} \times \frac{19}{9} \times 1 \times .3 = .36$$

$$F_p = .38 \times 40 = 15.2 \text{ kN}$$

$$M = 15.2 \times 3.2 = 49 \text{ kNm}$$

$$R_u = 49 \times 10^6 / .9 \times 800 \times 430^2 = .37$$

\Rightarrow OK. (Cols OK for min steel)

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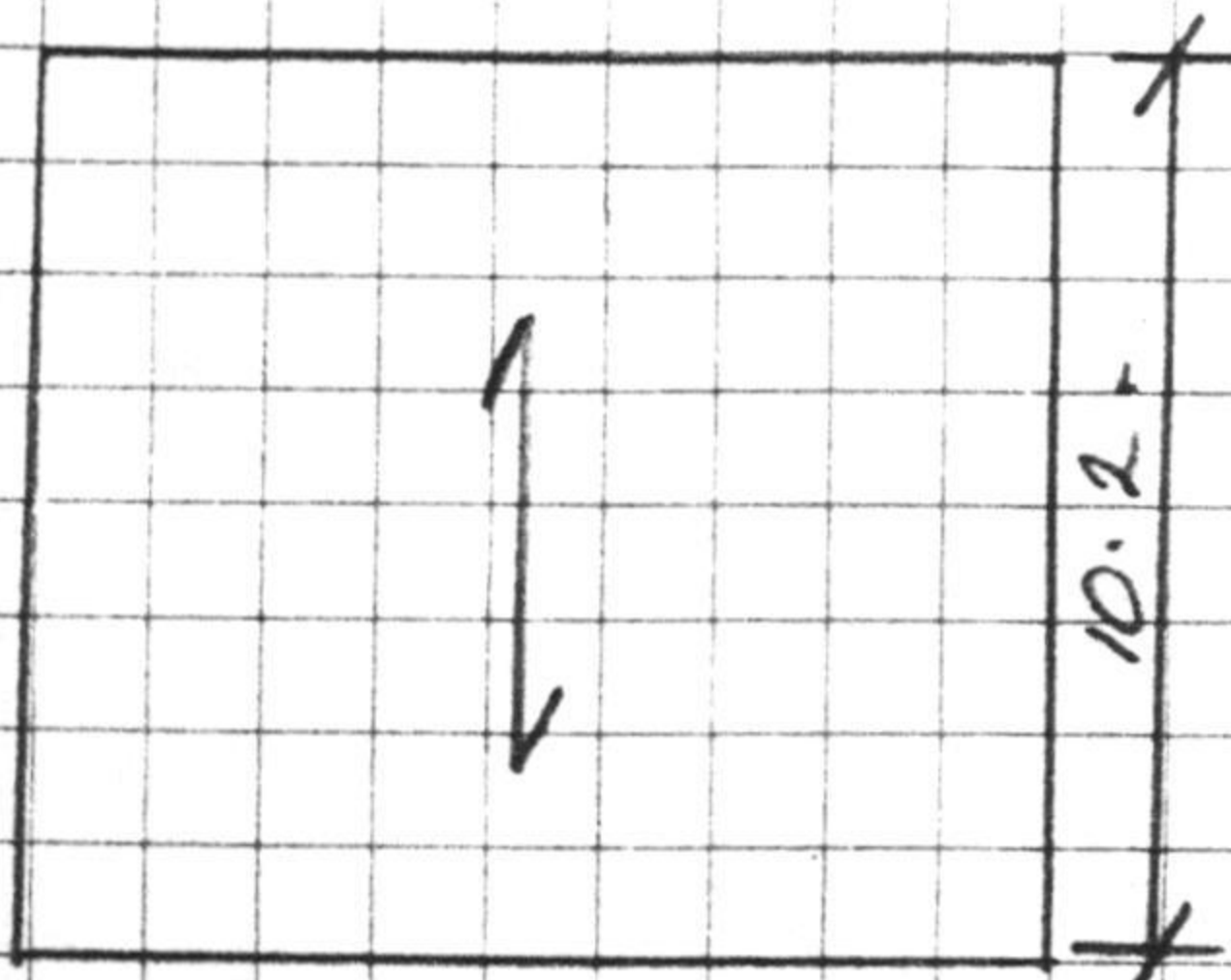
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NORTH EXTENSION.

New 4th floor

Option 1



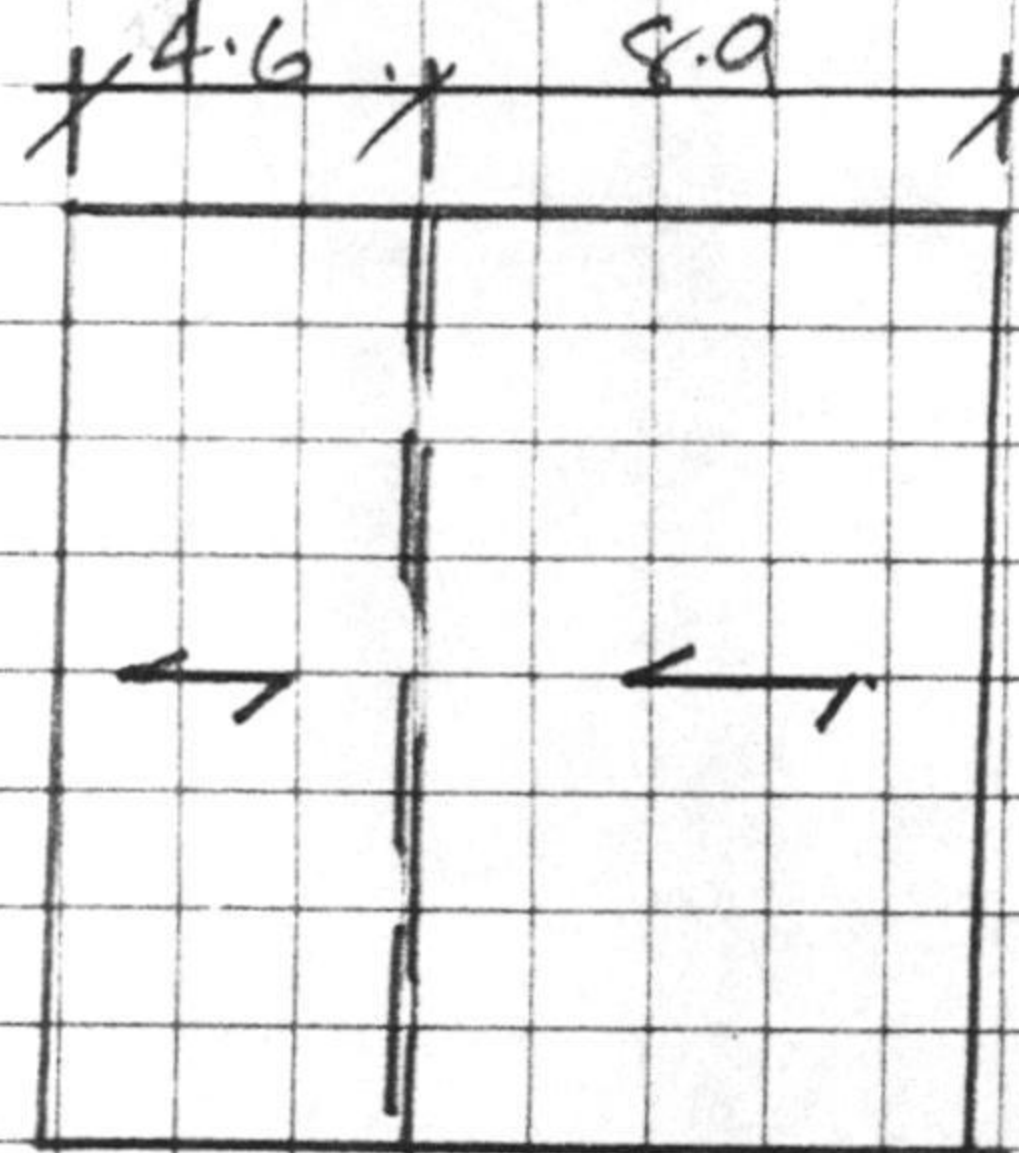
Live load = 3.0 KPa

900 ti 300.

(2.92 KPa).

$$\frac{10.2}{35} = .291.$$

Option 2



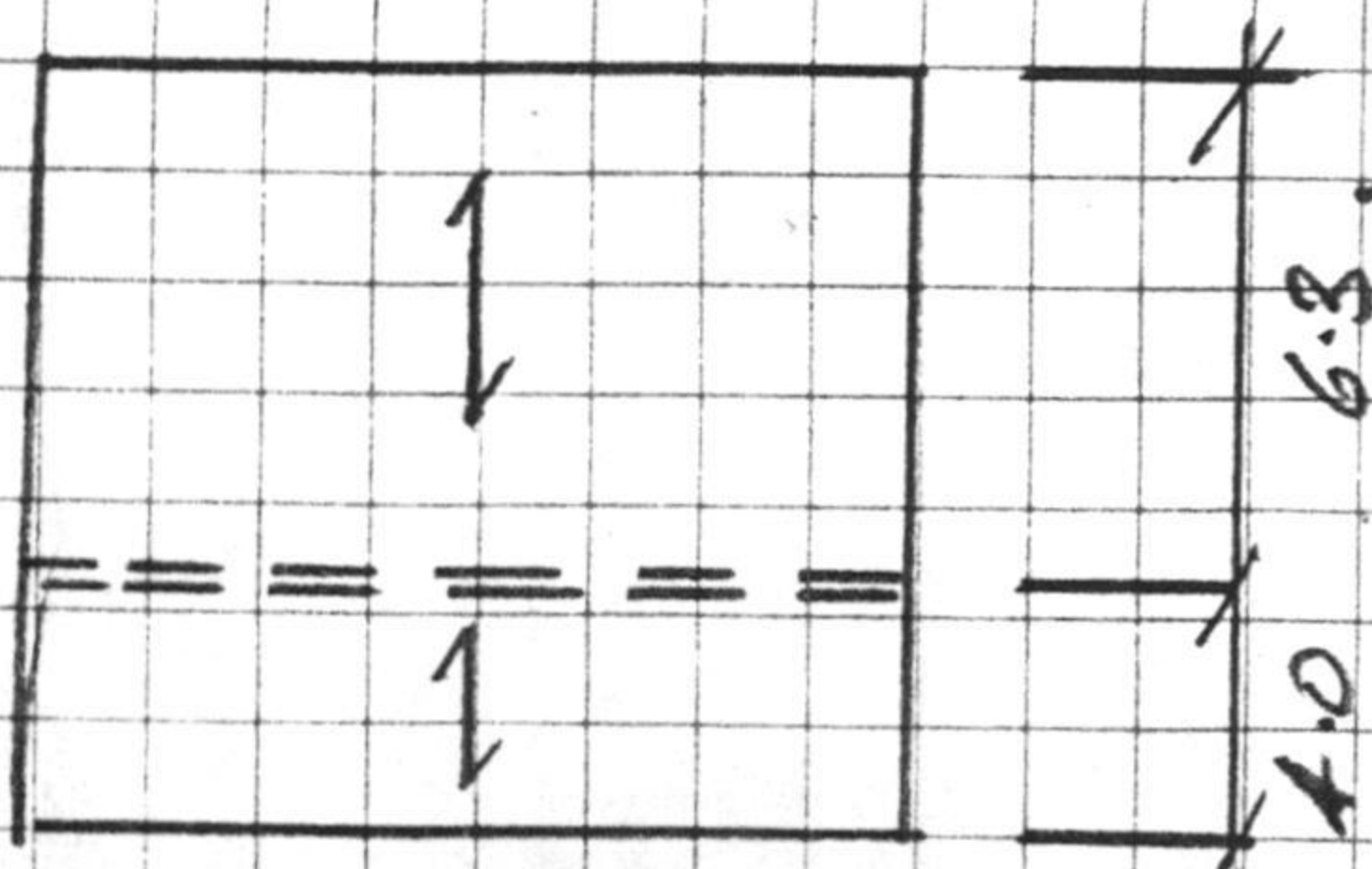
900 ti 160

(2.27 KPa)

900 ti 250.

(2.7 KPa)

New 3rd Floor



Existing 350x65 - 400.
Load Cap = 5.42 KPa.
See page A/14

4m Span.

Dead = .8 KPa.

Live = 3 KPa.

$$40000. \quad M = 4 \times 3.8 \times \frac{4^2}{8} = 3.04 \text{ KNm}$$

$$\frac{3.04}{1.35 \times .006} = 375 \text{ cm}^3.$$

$$\sqrt{\frac{375 \times 6}{4.6}} = 22 \text{ cm}.$$

250x50 - 400.

<p>Figure 1</p>	<p>Figure 2</p>
-----------------	-----------------

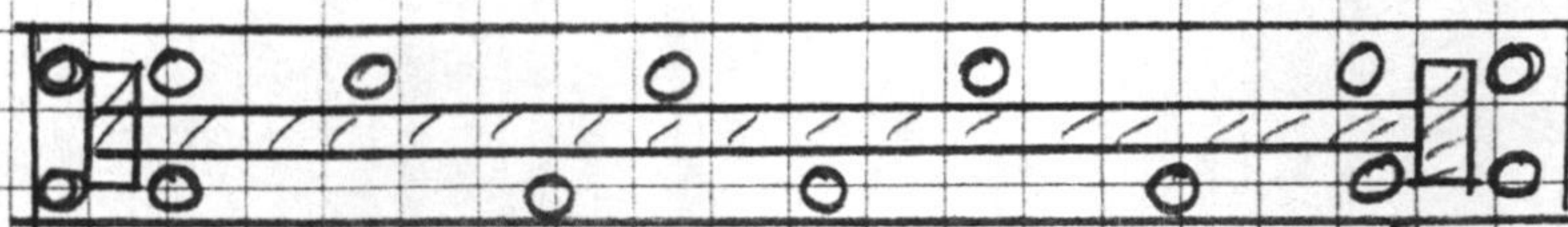
$$I_{live} = \frac{5 \times 3 \times 4 \times 4000^4}{384 \times 8000 \times 55.7 \text{ EG}}$$

$$= 9 \text{ mm} = (.0022 \text{ L})$$

Use 250x50-40000.

Check Existing Foundations

Wall Grid G.



groups of 4
under piers.



14" steel encased conc.
piers - 1200 centres
alternate.

Existing Loading

1. UDL

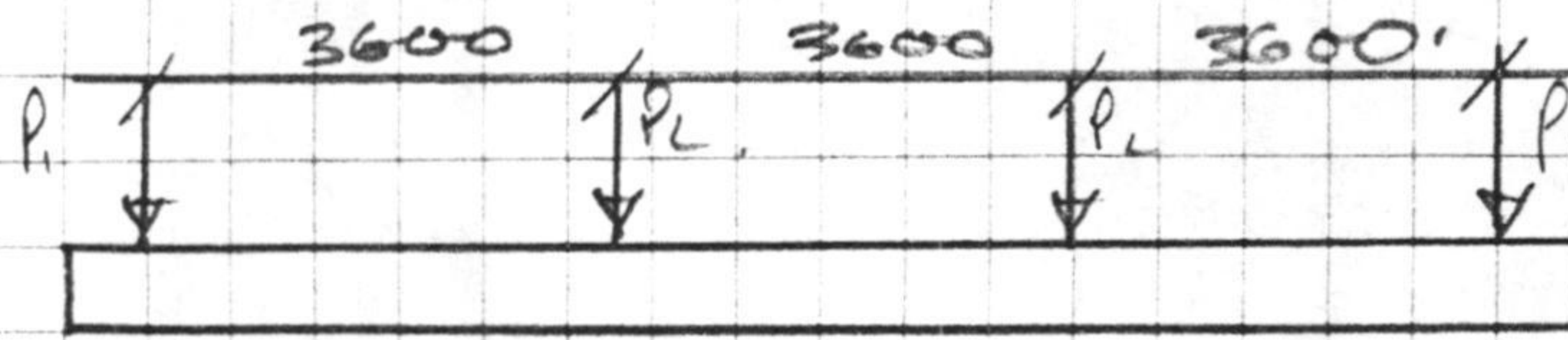
Roof. $1.1 \times \frac{6.3}{2} = 3.46.$

Brick wall $22 \times (35 \times 7.33 + 48 \times 5.5) = 114$
footing. $24 \times 1 \times 1 = 24$

2nd floor $0.8 \times \frac{6.3}{2} = 2.52.$

$\Sigma = 144.5 \text{ KN/m.}$

live say $2.25 \times \frac{6.3}{2} = 7.1 \text{ KN/m.}$

2. Point Loads.P₁.

Dead.

$$\begin{aligned}
 \text{Roof} & \cdot 7 \times \frac{10}{2} \times \frac{4.4}{2} & = 15.4 \\
 \text{Col.} & \cdot 51 \times .48 \times 24 \times 12.33 & = 72 \\
 \text{Beams} & \cdot (.45 + .65) \times .25 \times 24 \times \frac{4}{2} & = 13.2 \\
 \text{Shear wall} & \cdot 18 \times 5 \times 24 \times \frac{3.6}{2} & = 39.0 \\
 \text{Existing bms} & \cdot 6 \times .5 \times 24 \times \left(\frac{4}{2} + 6.3\right) & = 60.0 \\
 \text{1st floor} & \cdot 23 \times 24 \times \frac{10.3}{2} \times 3.6 & = 102 \\
 \text{2nd floor} & \cdot \left(.8 \times \frac{10}{2} \times \frac{10.3}{2}\right) + \left(3.3 \times \frac{11.2}{2} \times \frac{4}{2}\right) & = 58
 \end{aligned}$$

Σ 359 kN.

$$\text{Live} \cdot 3.0 \times \left(\frac{10.3}{2} \times 3.6 + \frac{10}{2} \times \frac{10.3}{2} + \frac{11.2}{2} \times \frac{4}{2}\right) = 166 \text{ kN}.$$

P₂

Dead.

$$\begin{aligned}
 \text{Col.} & \text{ Same as } P_1 & = 72 \\
 \text{Existing bms} & \text{ " " } & = 60 \\
 \text{Shear wall} & \text{ " " } & = 39 \\
 \text{1st Floor} & \text{ " " } & = 102
 \end{aligned}$$

Σ 273 kN

Live.

$$3.0 \times \frac{10.3}{2} \times 3.6 = 56 \text{ kN}.$$

Pile Loads.

	Dead	Live	Total	
End piles (4 off)	144	44	188	
Under wall (1200)	173	8.4	181.4	
Under P ₂ .	446	64.4	510.4	*
(if 2 piles)	(223)	(32.2)	(255.2)	

1. Introduction

The purpose of this study is to investigate the effects of the proposed system on the performance of the participants.

The study was conducted in a laboratory setting with a sample of 30 participants. The participants were divided into two groups: a control group and an experimental group.

The control group consisted of 15 participants.

The experimental group consisted of 15 participants who used the proposed system during the experiment.

The results of the study showed that the proposed system had a significant positive effect on the performance of the participants in the experimental group.

The study also found that the proposed system was easy to use and did not cause any adverse effects on the participants.

2. Method

The study was conducted in a laboratory setting.

The participants were divided into two groups: a control group and an experimental group. The control group consisted of 15 participants.

The experimental group consisted of 15 participants who used the proposed system during the experiment. The results of the study showed that the proposed system had a significant positive effect on the performance of the participants in the experimental group.

14" steel encased piles

If ultimate load capacity (soils).

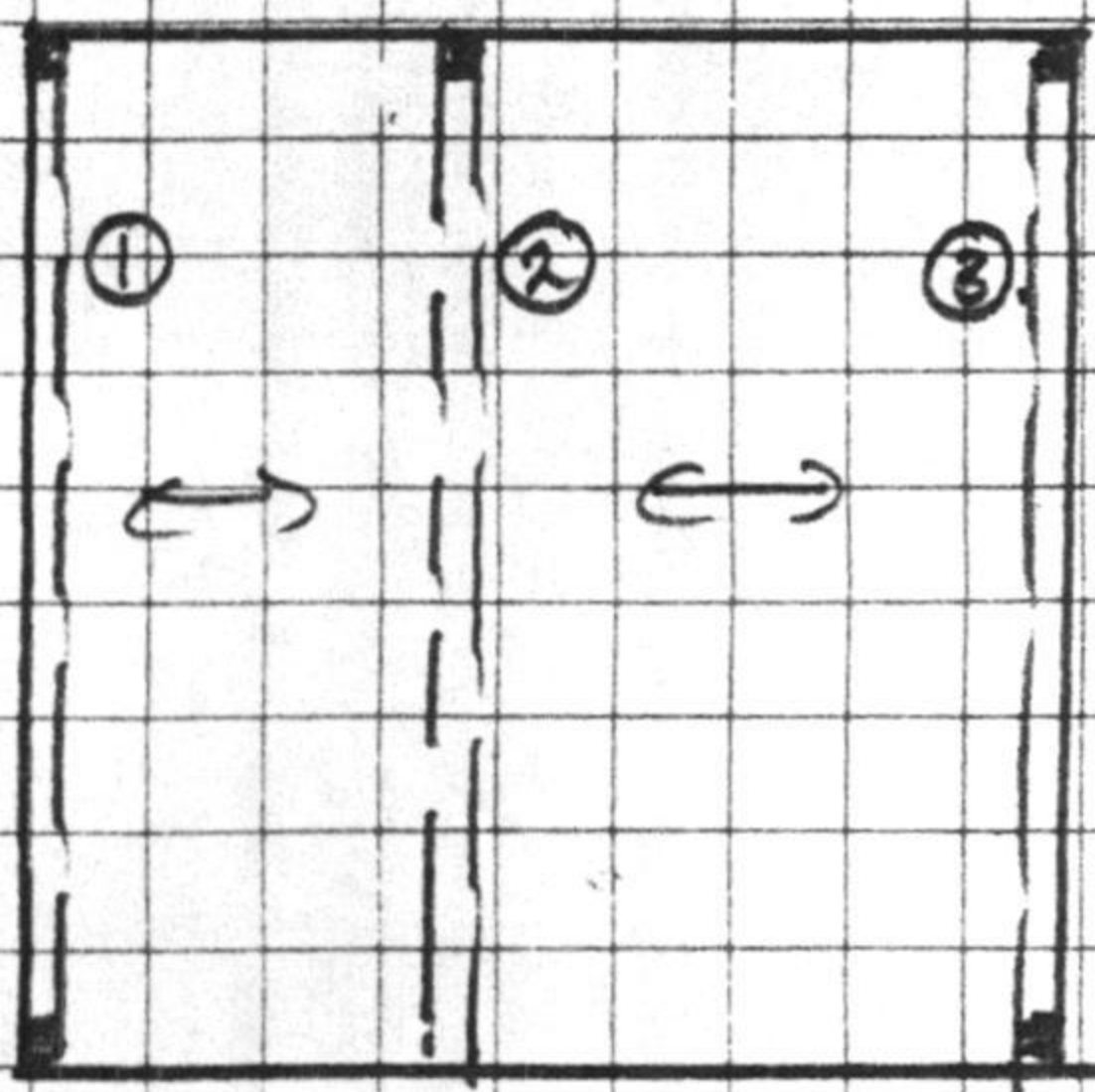
= say 1200 kN (All = 400 kN).

& $f_c = 20 \text{ MPa}$. (All = say ~~10~~ 8 MPa).

Then additional load capacity of piles could be:

	Existing load	Capacity conc.	pile	Add'l Capacity
End piles	188	770	400	212 kN
Wall	182	770	400	218 "
Middle piers	255	770	400	145 "

New 4th Floor. Using Option 2



Beam ①

$$\text{Span} = 10.2 \text{ m}$$

$$W_u = 1.7 \times 3 \times \left(\frac{4.6}{2} \right) + 1.4 \times \left(2.29 \times \frac{4.6}{2} + 6 \times 4 \times 24 + 1.5 \times \frac{4.6}{2} + 6 \times 3 \right)$$

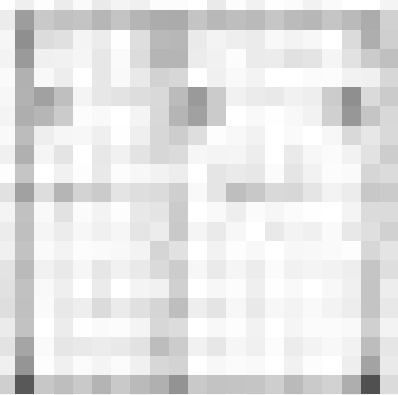
$$= 11.7 + 19.5 = 31.2 \text{ kN/m}$$

$$M_u = 31.2 \times \frac{10.2^2}{8} = 406 \text{ kNm}$$

$$V_u = 31.2 \times \frac{10.2}{2} = 159 \text{ kN}$$

The first of the two issues combined annually is the January issue, which contains the annual report of the American Medical Association. The second issue is the February issue, which contains the annual report of the American Medical Association. The third issue is the March issue, which contains the annual report of the American Medical Association. The fourth issue is the April issue, which contains the annual report of the American Medical Association. The fifth issue is the May issue, which contains the annual report of the American Medical Association. The sixth issue is the June issue, which contains the annual report of the American Medical Association. The seventh issue is the July issue, which contains the annual report of the American Medical Association. The eighth issue is the August issue, which contains the annual report of the American Medical Association. The ninth issue is the September issue, which contains the annual report of the American Medical Association. The tenth issue is the October issue, which contains the annual report of the American Medical Association. The eleventh issue is the November issue, which contains the annual report of the American Medical Association. The twelfth issue is the December issue, which contains the annual report of the American Medical Association.

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$$d = \sqrt{\frac{3.68 \times 406E6}{15 \times 400}} = 386$$

$$\frac{10200}{17} = 600$$

Try 700x400 Beam.

$$d = 700 - 50 - 50 = 600$$

$$R_u = 3.13$$

$$\rho = .009$$

$$A_s = 2160 \text{ mm}^2 \quad 4 - \text{HD28}$$

$$\sigma_c = \frac{1540000}{.55 \times 600 \times 400} = .79 \text{ MPa}$$

$$\sigma_b = (.004 \times 10 + .07) \times 5 = .55$$

Use min. A_{vs}

$$\frac{A_{vs}}{s} = \frac{.55 \times 400}{2.5} = .51 \text{ mm}^2/\text{mm}$$

$$s = 300 \quad A_{vs} = 152$$

$$2 - \text{R10} - 300$$

Beam ①

700 x 400

4 - HD24 B

2 - HD20 T

2 - R10 - 300

Beam ②

$$W_u = 1.7 \times \left(\frac{8.9 + 4.6}{2} \right) \times 5.0 + 1.4 \times \left(2.2 \times \frac{4.6}{2} + 2.7 \times \frac{8.9}{2} + .8 \times 5 \times 24 + 1.8 \right)$$

$$= 34 + 40 = 74.5 \text{ kN/m}$$

$$M_u = 969 \text{ kNm}$$

$$V_u = 380 \text{ kN}$$

Try 800x500 Beam.

$$(4 - \text{HD28} - M_u = 585 \text{ kNm})$$

$$(4 + 2 \text{HD28} - M_u = 824 \text{ kNm})$$

$$R_u = 4.39 \text{ MPa}$$

$$\rho = .013$$

$$A_s = 4550 \text{ mm}^2 \quad 4 + 4 - \text{HD28}$$

$$d = 800 - 50 - 30 - 15 = 705$$

Assume 700.

$$\sigma_c = 1.27 \text{ MPa}$$

$$\sigma_b = .55 \text{ MPa}$$

No.	Title	Author
1	The evolution of the human brain	J. H. J. van der Linde
2	The evolution of the human brain	J. H. J. van der Linde
3	The evolution of the human brain	J. H. J. van der Linde
4	The evolution of the human brain	J. H. J. van der Linde
5	The evolution of the human brain	J. H. J. van der Linde
6	The evolution of the human brain	J. H. J. van der Linde
7	The evolution of the human brain	J. H. J. van der Linde
8	The evolution of the human brain	J. H. J. van der Linde
9	The evolution of the human brain	J. H. J. van der Linde
10	The evolution of the human brain	J. H. J. van der Linde
11	The evolution of the human brain	J. H. J. van der Linde
12	The evolution of the human brain	J. H. J. van der Linde
13	The evolution of the human brain	J. H. J. van der Linde
14	The evolution of the human brain	J. H. J. van der Linde
15	The evolution of the human brain	J. H. J. van der Linde
16	The evolution of the human brain	J. H. J. van der Linde
17	The evolution of the human brain	J. H. J. van der Linde
18	The evolution of the human brain	J. H. J. van der Linde
19	The evolution of the human brain	J. H. J. van der Linde
20	The evolution of the human brain	J. H. J. van der Linde

$$\frac{A_{vs}}{s} = \frac{72 \times 500}{275} = 1.31 \text{ mm}^2/\text{mm}$$

$$s = 200$$

$$A_{vs} = 261$$

$$4 - R10 - 200$$

$$2 - R10 - 300$$

$$\frac{A_{vs}}{s} = .533$$

$$\times \frac{275}{500} = .293$$

$$+ .6 = 0.9 \text{ MPa}$$

$$.9 \times \frac{705 \times 500}{1} \times .85 = 268 \text{ KN}$$

$$380 - 74.5 \times x = 268$$

$$\Rightarrow x = 1.5 \text{ m}$$

Beam (2)

800 x 500

4+4 - HD28

4-R10

4-R10-200-200

then 2-R10-300

Beam (3)

$$W_u = 1.7 \times 30 \times \frac{8.9}{2} + 1.4 \left(.8 \times .5 \times 24 + 2.7 \times \frac{8.9}{2} + 0.5 \times \frac{8.9}{2} + 0.6 \times 3 \right)$$

$$= 22.7 + 25.6 = 48.3 \text{ KN/m}$$

$$M_u = 628 \text{ KNm}$$

$$V_u = 246 \text{ KN}$$

800 x 500

$$R_u = 2.85 \text{ MPa}$$

$$\rho = .0085$$

$$A_s = 2975 \text{ mm}^2 \quad 3+2 - \text{HD28}$$

$$v_c = .826$$

$$(3 - \text{HD28})$$

$$M_u =$$

$$v_b = .55$$

$$\therefore \text{Min } \frac{A_{vs}}{s} = .636$$

$$2 - R10 - 250$$

Beam (3)

800 x 500

3+2 - HD28

2-R10-250

Change Beam (3)

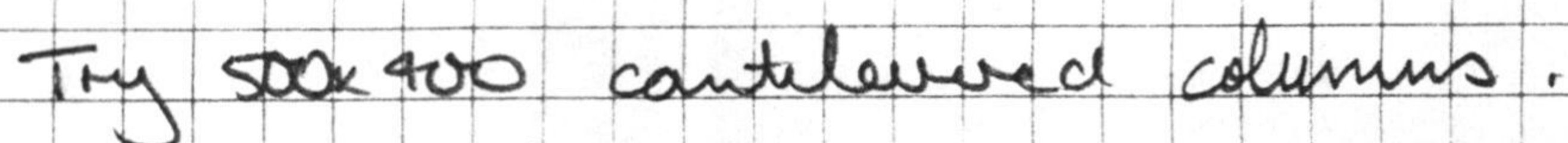
to

700 x 400

4+2 - HD28

2 - R10 - 250

Name		Address		Occupation		Religion		Marital Status		Children		Remarks	
John Smith		123 Main St		Teacher		Methodist		Married		2			
Mary Jones		456 Oak St		Homemaker		Catholic		Single		0			
Robert Brown		789 Pine St		Engineer		Protestant		Married		3			
Elizabeth White		101 Elm St		Nurse		Anglican		Single		0			
James Wilson		202 Cedar St		Farmer		Baptist		Married		4			
Sarah Davis		303 Birch St		Shopkeeper		Jewish		Single		0			
Thomas Miller		404 Spruce St		Doctor		Presbyterian		Married		2			
Anna Clark		505 Willow St		Teacher		Lutheran		Single		0			
George Taylor		606 Ash St		Merchant		Quaker		Married		3			
Helen Adams		707 Hickory St		Homemaker		Catholic		Single		0			
William Baker		808 Maple St		Engineer		Protestant		Married		2			
Margaret Green		909 Poplar St		Nurse		Anglican		Single		0			
Charles Hall		1010 Walnut St		Farmer		Baptist		Married		4			
Frances King		1111 Chestnut St		Shopkeeper		Jewish		Single		0			
Edward Lewis		1212 Elm St		Doctor		Presbyterian		Married		2			
Alice Young		1313 Oak St		Teacher		Lutheran		Single		0			
Frank Reed		1414 Pine St		Merchant		Quaker		Married		3			
Grace Cook		1515 Cedar St		Homemaker		Catholic		Single		0			
Henry Scott		1616 Birch St		Engineer		Protestant		Married		2			
Irene Hill		1717 Spruce St		Nurse		Anglican		Single		0			
Joseph Ward		1818 Willow St		Farmer		Baptist		Married		4			
Lillian Allen		1919 Ash St		Shopkeeper		Jewish		Single		0			
Nathan Black		2020 Hickory St		Doctor		Presbyterian		Married		2			
Olive Bell		2121 Maple St		Teacher		Lutheran		Single		0			
Philip Carter		2222 Poplar St		Merchant		Quaker		Married		3			
Rebecca Evans		2323 Walnut St		Homemaker		Catholic		Single		0			
Samuel Foster		2424 Elm St		Engineer		Protestant		Married		2			
Tina Gibson		2525 Oak St		Nurse		Anglican		Single		0			
Victor Grant		2626 Pine St		Farmer		Baptist		Married		4			
Wendell Harris		2727 Cedar St		Shopkeeper		Jewish		Single		0			
Yvonne Ives		2828 Birch St		Doctor		Presbyterian		Married		2			
Zachary Jones		2929 Spruce St		Teacher		Lutheran		Single		0			
Amanda Keith		3030 Willow St		Merchant		Quaker		Married		3			
Benjamin Lamb		3131 Ash St		Homemaker		Catholic		Single		0			
Cecilia Lee		3232 Hickory St		Engineer		Protestant		Married		2			
Dennis Mack		3333 Maple St		Nurse		Anglican		Single		0			
Evelyn May		3434 Poplar St		Farmer		Baptist		Married		4			
Frederick Neal		3535 Walnut St		Shopkeeper		Jewish		Single		0			
Gladys Olsen		3636 Elm St		Doctor		Presbyterian		Married		2			
Harold Parker		3737 Oak St		Teacher		Lutheran		Single		0			
Isabel Quinn		3838 Pine St		Merchant		Quaker		Married		3			
Jacob Reed		3939 Cedar St		Homemaker		Catholic		Single		0			
Katherine Scott		4040 Birch St		Engineer		Protestant		Married		2			
Leo Smith		4141 Spruce St		Nurse		Anglican		Single		0			
Mabel Taylor		4242 Willow St		Farmer		Baptist		Married		4			
Norman White		4343 Ash St		Shopkeeper		Jewish		Single		0			
Olivia Young		4444 Hickory St		Doctor		Presbyterian		Married		2			
Percy Adams		4545 Maple St		Teacher		Lutheran		Single		0			
Ruth Baker		4646 Poplar St		Merchant		Quaker		Married		3			
Stanley Clark		4747 Walnut St		Homemaker		Catholic		Single		0			
Theresa Evans		4848 Elm St		Engineer		Protestant		Married		2			
Ulysses Foster		4949 Oak St		Nurse		Anglican		Single		0			
Vernon Grant		5050 Pine St		Farmer		Baptist		Married		4			
Walter Harris		5151 Cedar St		Shopkeeper		Jewish		Single		0			
Xavier Ives		5252 Birch St		Doctor		Presbyterian		Married		2			
Yvonne Keith		5353 Spruce St		Teacher		Lutheran		Single		0			
Zachary Lamb		5454 Willow St		Merchant		Quaker		Married		3			
Amanda Mack		5555 Ash St		Homemaker		Catholic		Single		0			
Benjamin May		5656 Hickory St		Engineer		Protestant		Married		2			
Cecilia Neal		5757 Maple St		Nurse		Anglican		Single		0			
Dennis Olsen		5858 Poplar St		Farmer		Baptist		Married		4			
Evelyn Parker		5959 Walnut St		Shopkeeper		Jewish		Single		0			
Frederick Quinn		6060 Elm St		Doctor		Presbyterian		Married		2			
Gladys Reed		6161 Oak St		Teacher		Lutheran		Single		0			
Harold Scott		6262 Pine St		Merchant		Quaker		Married		3			
Isabel Taylor		6363 Cedar St		Homemaker		Catholic		Single		0			
Jacob White		6464 Birch St		Engineer		Protestant		Married		2			
Katherine Young													



Use $V = \frac{2}{3} \times 3 \times .12 \times \omega t = .24 \omega t$.

$$\text{Max } \frac{P_u}{A_g} = 19 \text{ MPa} = 0.76 f'_c.$$

$$\text{Total Mass} = \left(\frac{25.6 + 40 + 19.5}{1.4} \right) \times 10.2 = 620$$

$$+ \text{Seismic live} = \frac{3}{3} \times (8.9 + 4.6) \times 10.2 = 137.7$$

$$\underline{\underline{758 \text{ kN}}}$$

$$V_{col} = \frac{758}{3} \times 24 = 60.6 \text{ kN}$$

$$M_H = 60.6 \times \frac{36}{2.845} = 218$$

$$V_H = 60.6 \text{ kN}$$

$$d = 435 \text{ mm}$$

$$R_y = \cancel{254 \text{ MPa}} \cdot 3.2 \text{ MPa}$$

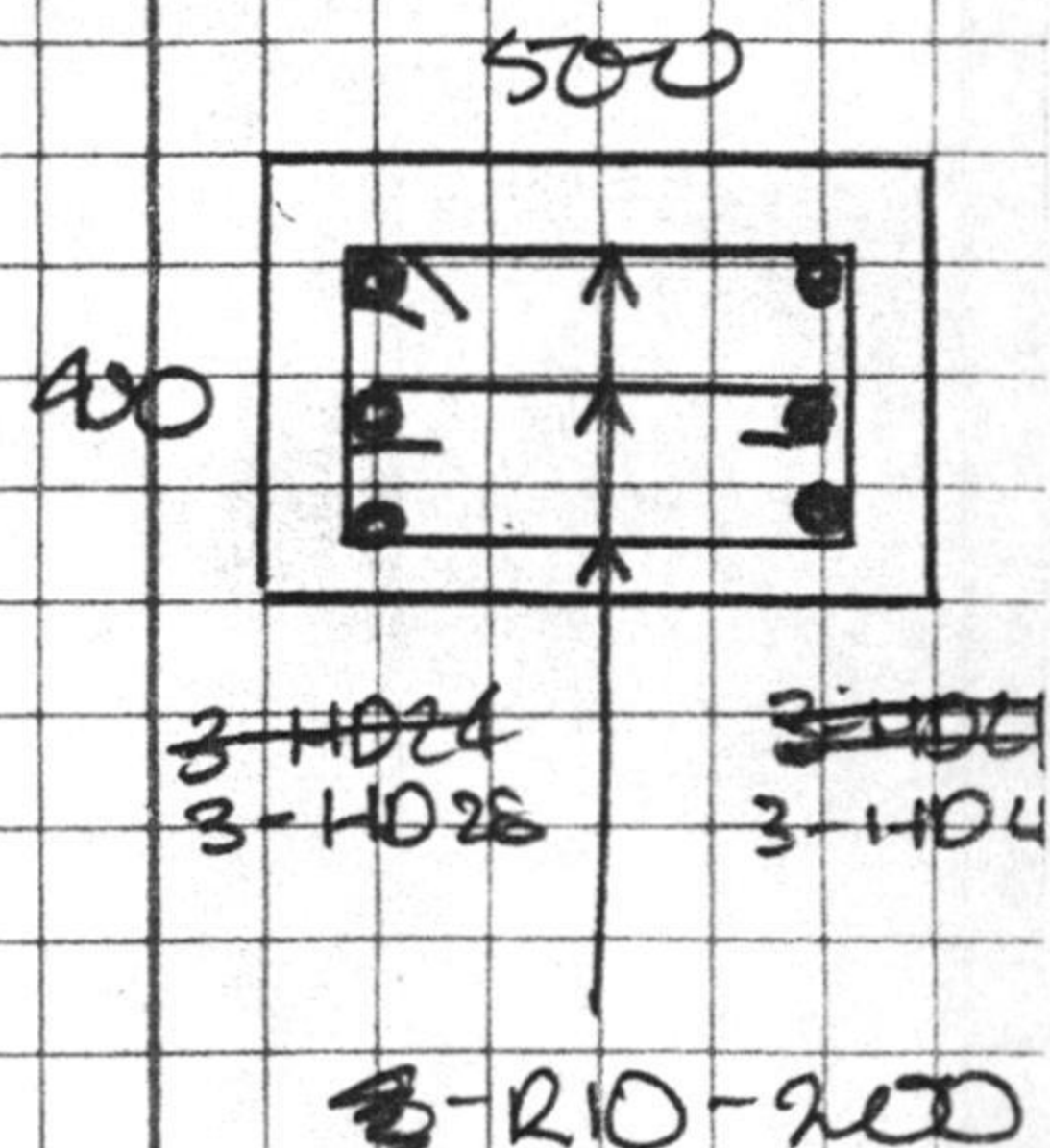
$\phi = \cancel{000}$

1566.

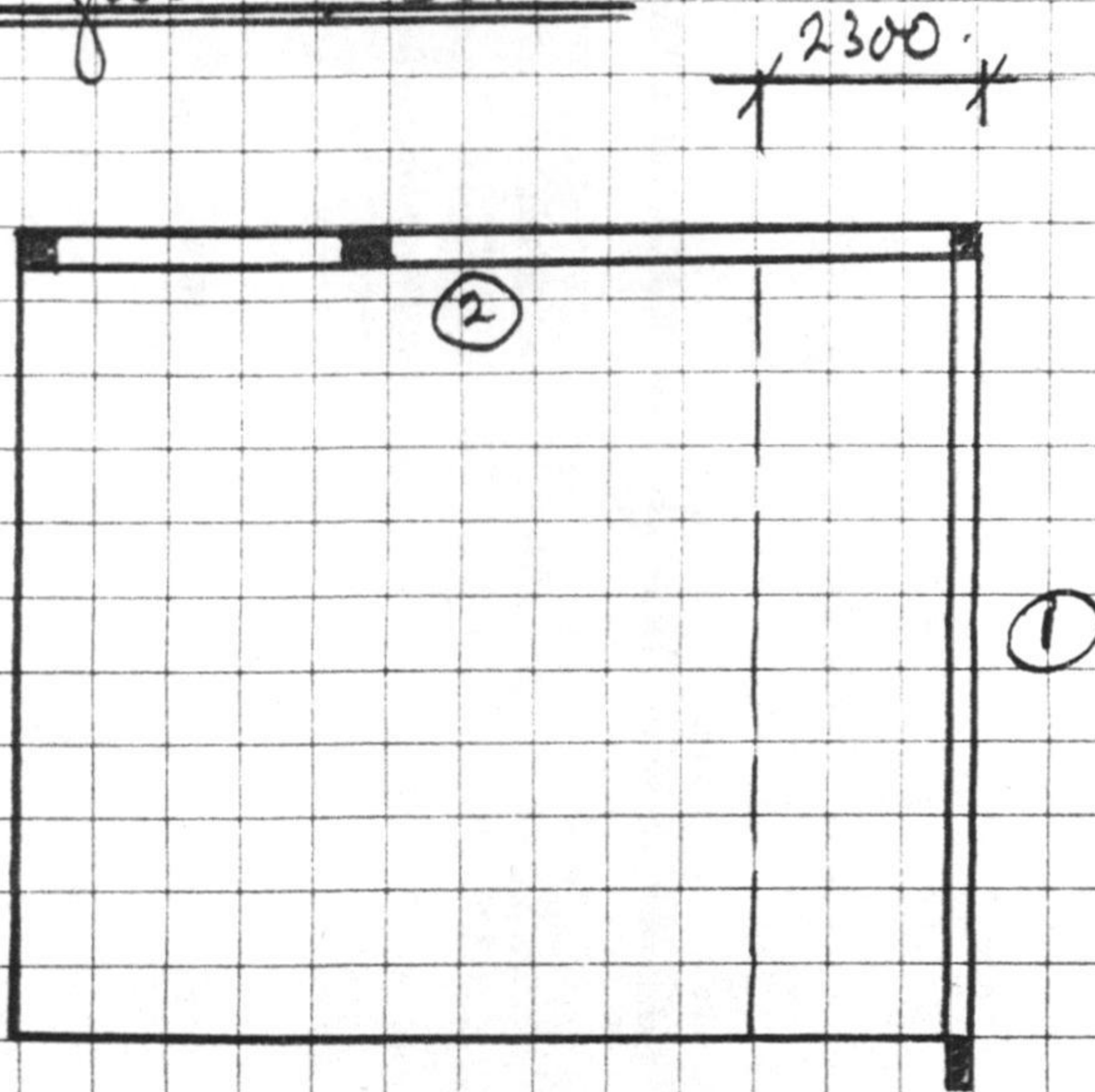
$$A_3 = \underline{\underline{1270 \text{ mm}^2}}$$

$$\sigma_i = 400 \text{ MPa}$$

Use 3-R10-200



[illegible]

3rd floor BeamsBeam ①

$$W_u = 1.7 \times 3 \times \frac{2.3}{2} + 1.4 \left(1 \times \frac{2.3}{2} + 8 \times 5 \times 2.4 + .8 \times 3 \right)$$

$$= 5.9 + 18.41 = 24 \text{ kN/m}$$

$$M_u = 24 \times \frac{10.8^2}{8} = 190 \text{ kNm}$$

$$V_u = 130 \text{ kN}$$

Try 700 x 400 Beam.

$$d = 700 - 50 - 15 = 635 \text{ mm}$$

$$R_u = 1.3 \text{ MPa}$$

$$Min A_s = .004 \times 635 \times 400 = 1016$$

2-HD28

$$v_i = .602$$

Min $\frac{A_{vs}}{s}$

2-R10-300

Could use

650 x 300
3-HD24
2-R10-300

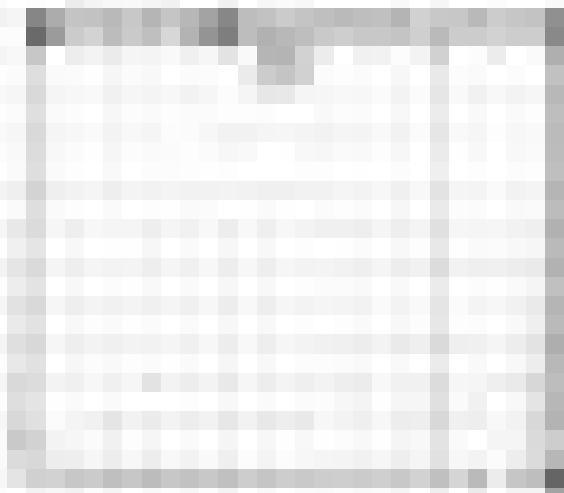
Beam ①

700 x 400

2-HD28

2-R10-300

1. Introduction



2. Methodology

2.1. Experimental Setup

2.1.1. Equipment and Materials

2.1.2. Procedure

2.2. Data Collection

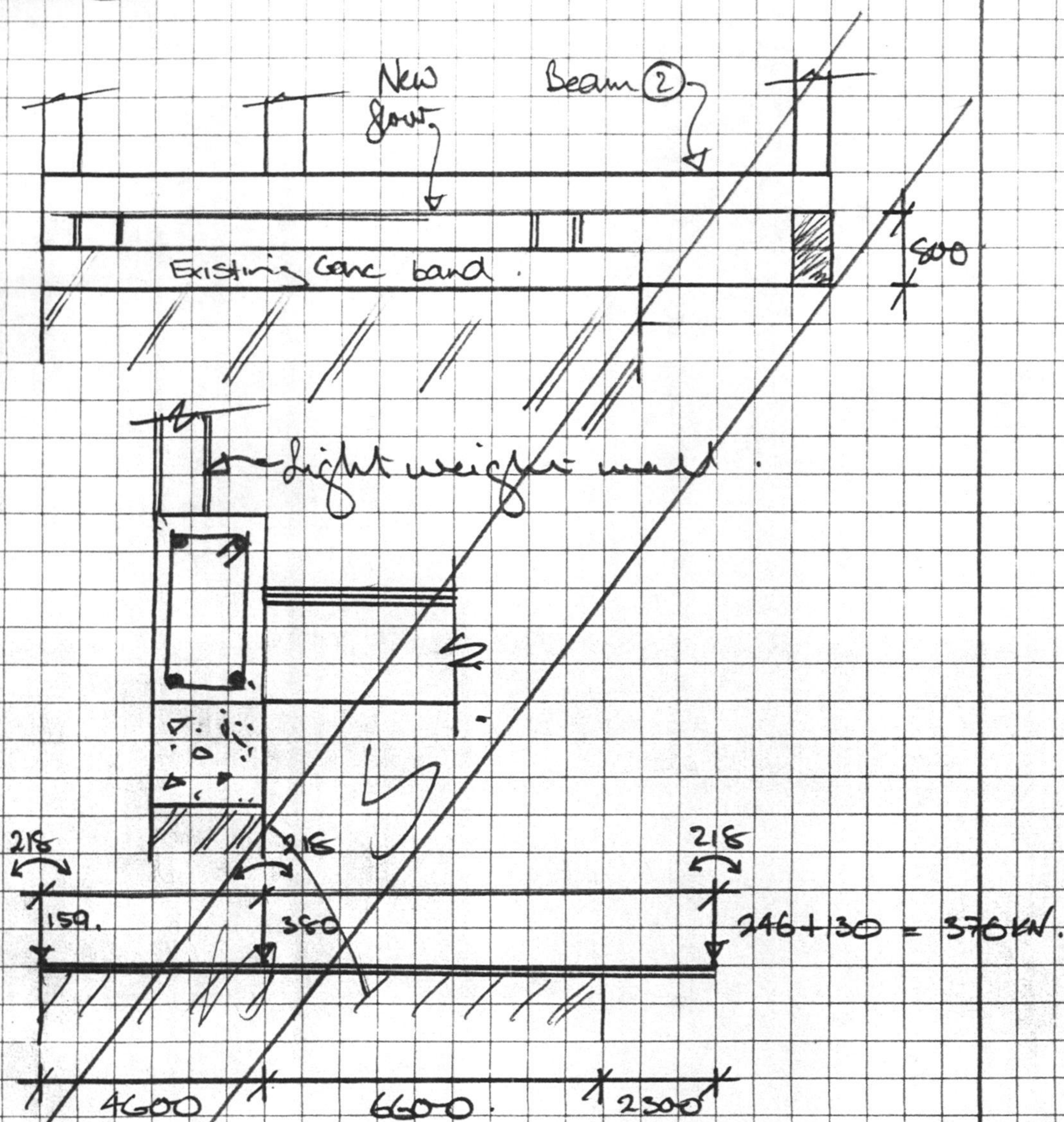
2.2.1. Parameter Settings

2.2.2. Results and Analysis

2.2.3. Conclusion

2.3. Discussion

2.4. References

Beam (2)

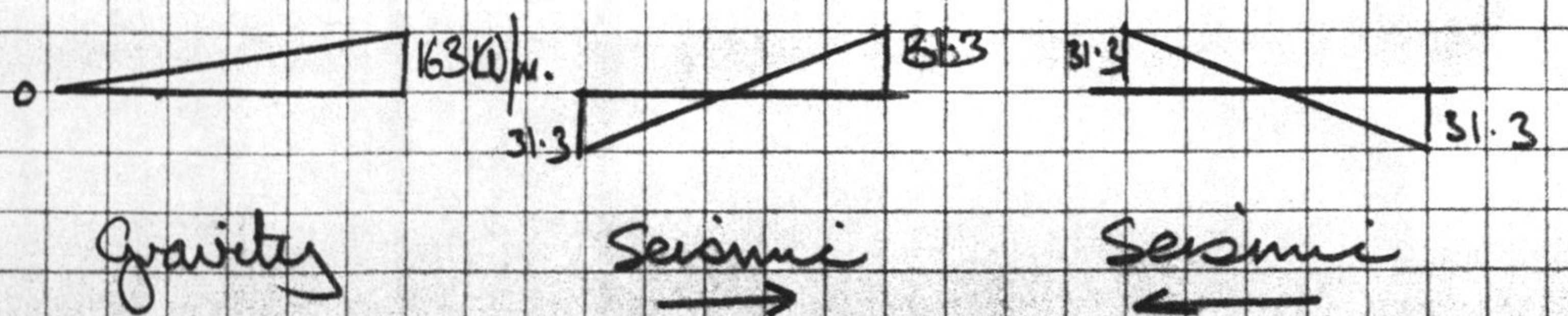
Assume Elastic distribution.

$$C.O.M. = \frac{350 \times 4.6 + 376 \times 13.5}{159 + 350 + 376} = 7.46m$$

$$e_{grav.} = \frac{11.2}{2} - 7.46 = 1.86m$$

$$e_{seismi} = \pm \frac{3 \times 218}{159 + 350 + 376} = \pm 0.715m$$

$$\Delta = \frac{P}{L.B} (1 \pm \frac{6e}{L}) \quad P = 915 kN$$



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Page 1 of 1

$$\text{Max. Buck Stress} = \frac{163+31.3}{.35} = 555 \text{ KPa}$$

$$\text{Max tension} = \frac{31.3}{.35} = 89 \text{ KPa}$$

Max Cantilever moment

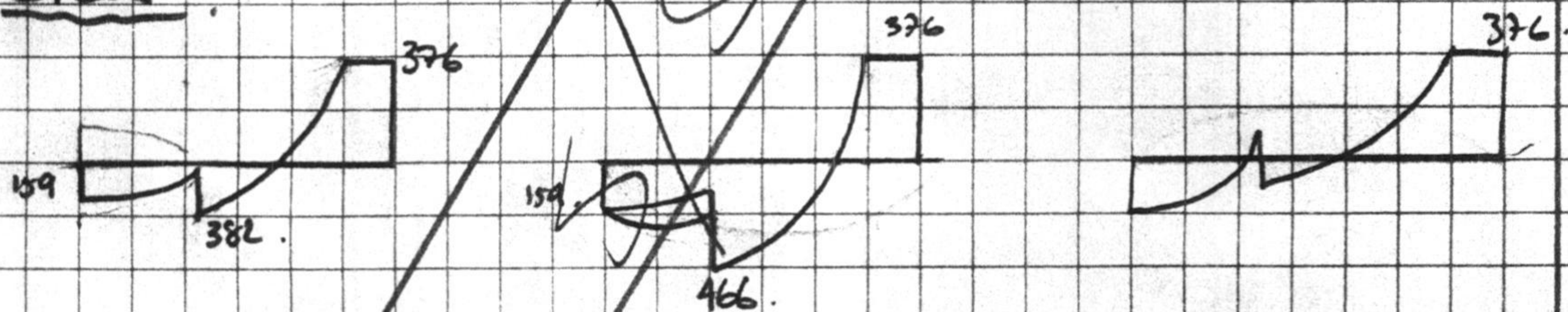
$$= 218 + 376 \times 2.5 = 1082 \text{ kNm}$$

Say $1200 \times 900 \text{ mm}$

$$R_u = 2.48 \text{ MPa} \therefore \text{OK}$$

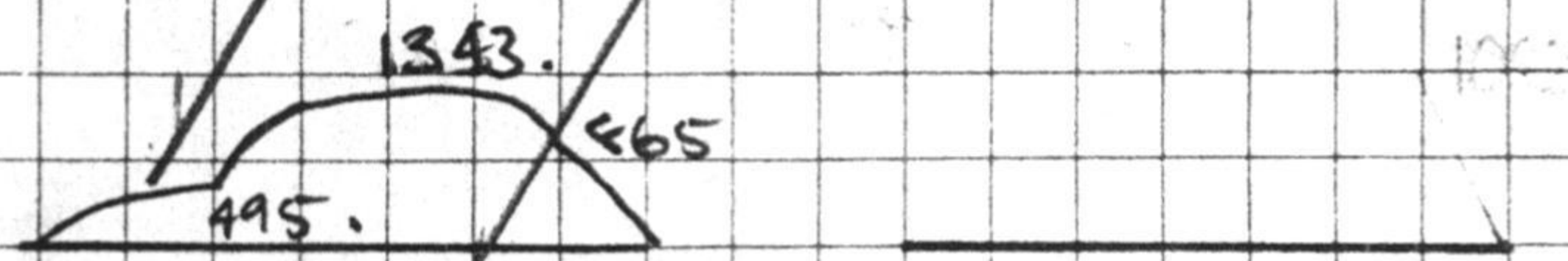
Beam Design

Shear:



$$\text{Max } V_u = 466 \text{ kN}$$

B.M.



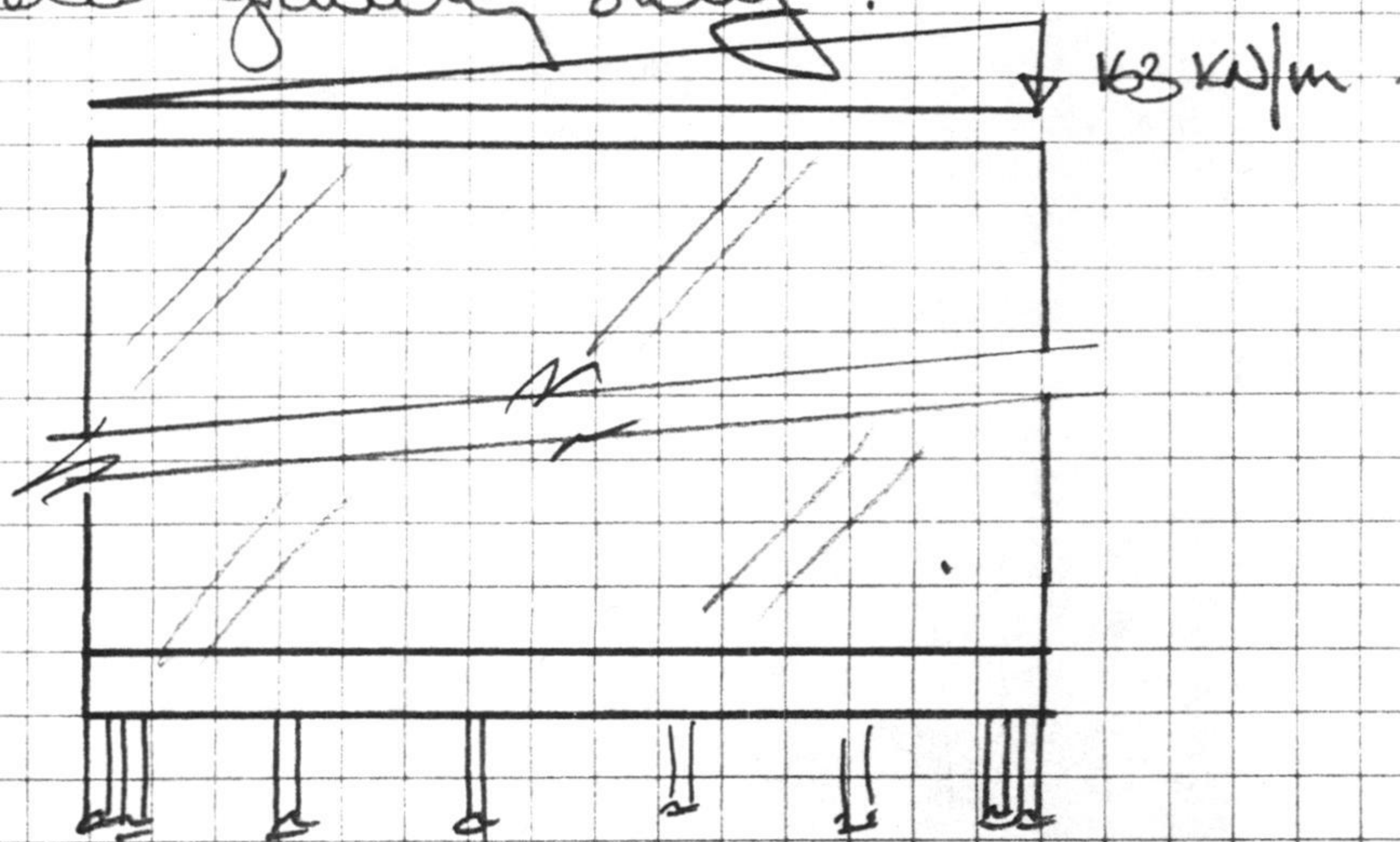
CONTENTS	
1	Editorial
1	Book Reviews
1	Reviews
1	Notes
1	Correspondence
1	Obituary
1	Index
1	Advertisements

Additional loads to Piles.3rd live $3 \times \frac{6.3}{1}$ Beam $800 \times 400 \times 24$

$= 9.5 \text{ kN/m}$

$= \frac{7.7}{17.13 \text{ kN/m}}$

Consider Gravity only.



Max add'l load to end piles

$$\approx 163 \times \frac{1.5}{4} = 61 \text{ kN} \ll 212$$

Add'l load to P_2

$$= 163 \times \frac{11.2 - 3.8}{11.2} \times 1.2/2 = 65 \text{ kN} \ll 145 \text{ kN}$$

Refer
page
NE/4.

Conservative as ultimate loads used



1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26



Abstract

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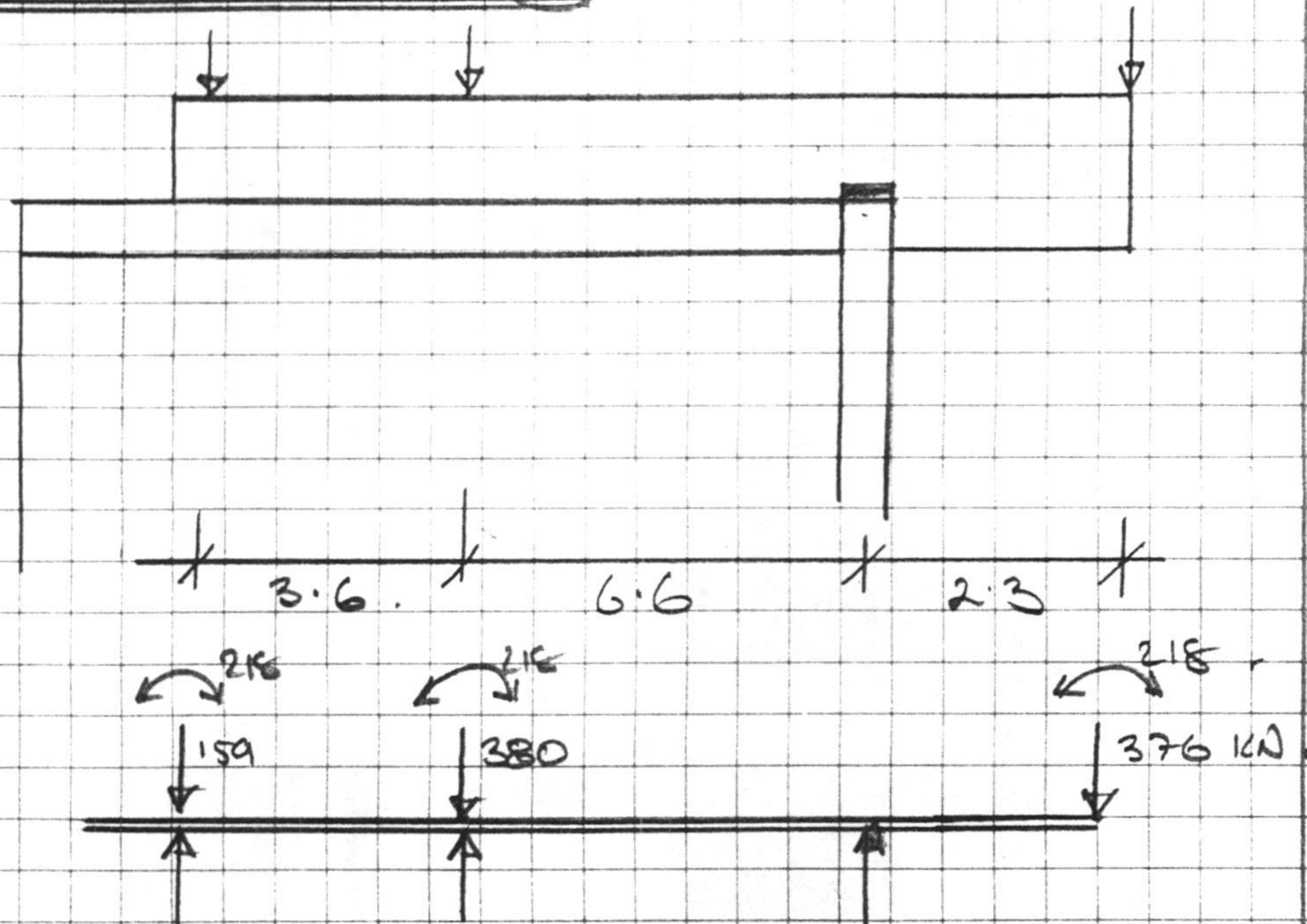
Abstract

Abstract

Abstract

100

Alternative Beam ②



$$\frac{1}{3.6} + \frac{1}{6.6} = .429$$

$$Df. 3.6 = .65$$

$$Df. 6.6 = .85$$

$$\frac{1}{3.6} \rightarrow .65 \quad .35 \quad \leftarrow \frac{1}{6.6}$$

FEM.
CO.
Bal.

				-864
			-432	
	281	151		
0	281	-281		-864

Shear.

-78	-78	173	173	-376			
159	380	376	376	81	139	549	
81	139	549					

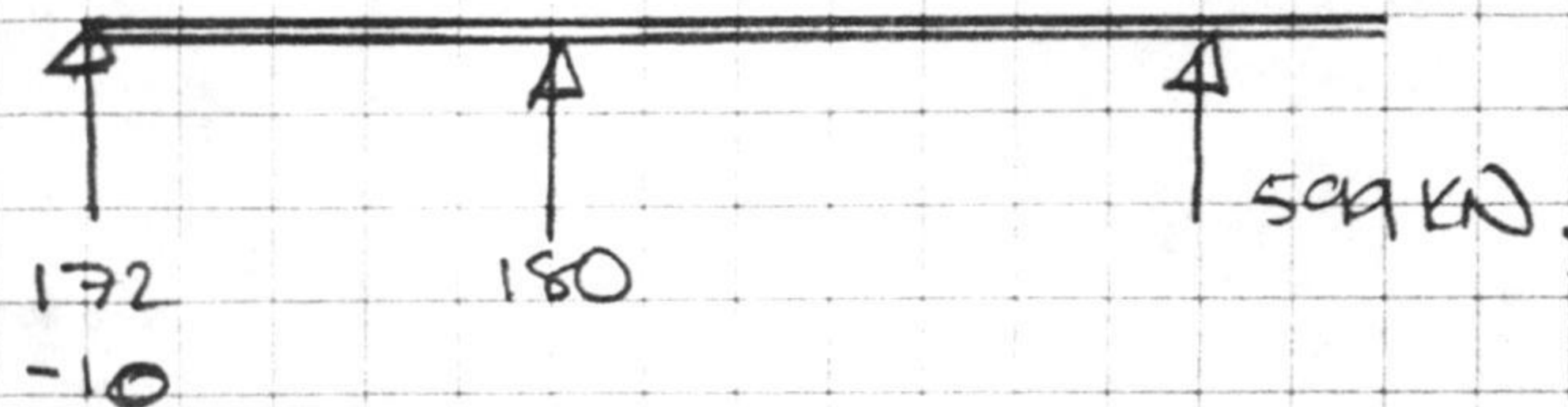
FEM.
CO.
Bal.

-218	-142	-76	-218	
	-109	-109		
	142	76		
-218	-109	-109	-218	

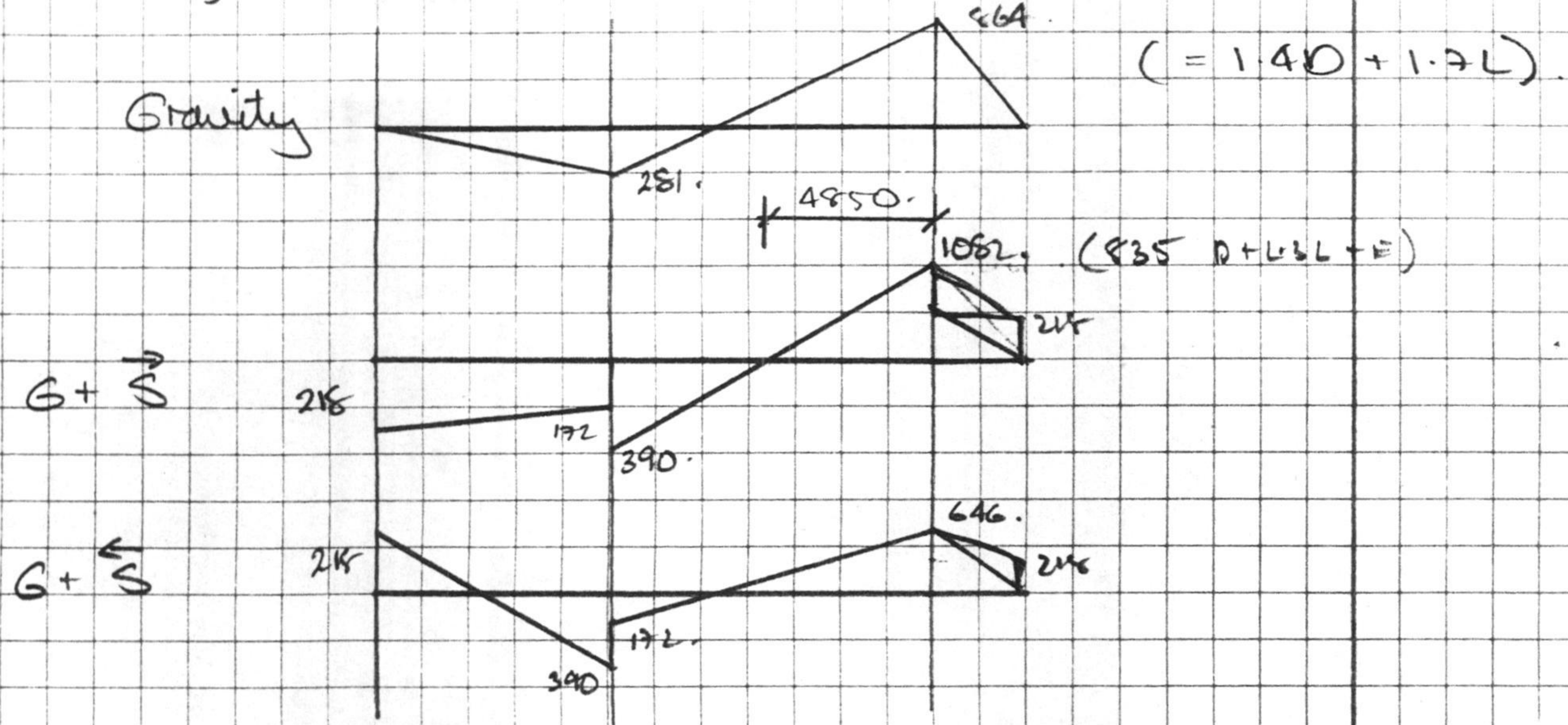
Shear.

-91	-91	-50	-50				
91	41	50					

Max Reactions



Bending Moments



(D+1.3L+E) Max $M_u = \frac{864}{1.4} + 218 = 835 \text{ kNm}$.

Require $d \geq 554$

800 x 400 Beam.

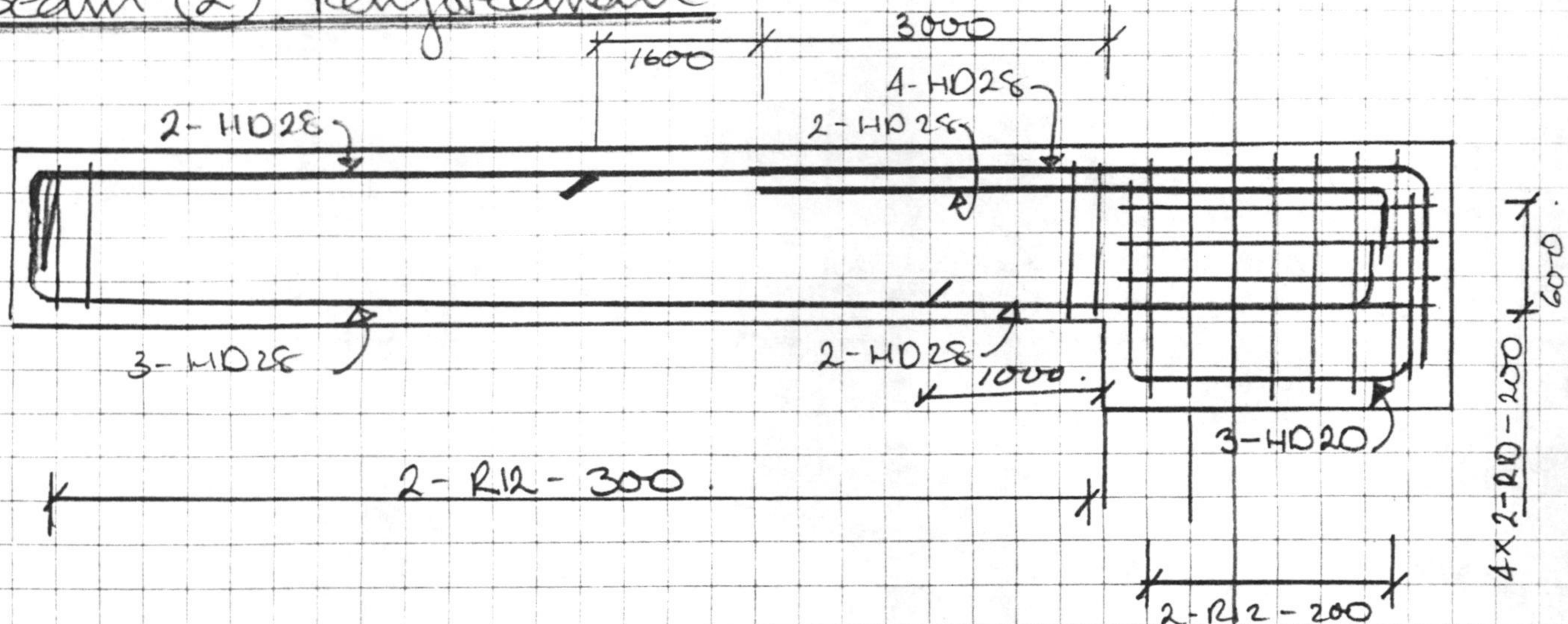
$R_u = 4.73$
 $\rho = 0.0142$
 $A_s = 3978$

4 + 2 - HD 28.

Max $V_u = 376 \text{ kN}$.

$v_c = \frac{376000}{0.85 \times 400 \times 700} = 1.58 \text{ MPa}$.

Beam (2) Reinforcement



Negative Leo:

2-HD28 $M_u = 300 \text{ kNm}$

+ve Leo:

$$R_u = \frac{300000000}{9 \times 400 \times 335} = 2.0$$

$$p = 0.0055 \quad A_s = 1617 \text{ mm}^2$$

3-HD28

Shear:

800 x 400 section

$$\text{Max } V_u = 173 + 50 = 223 \text{ kN}$$

$$v_c = 0.936 \text{ MPa}$$

$$v_b = \text{say } 5 \text{ MPa}$$

$$\frac{A_{vs}}{s} = 634 \quad - \quad 2-R12-300$$

$$\frac{376000}{0.85 \times 900 \times 400} = 1.23 \text{ MPa}$$

$$\frac{A_{vs}}{s} = 1.06$$

2-R12-200



1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for ensuring the integrity of the financial system and for providing a clear audit trail.

2. The second part of the document outlines the specific procedures for recording transactions. It details the steps that must be followed, from the initial entry to the final review and approval.

3. The third part of the document discusses the role of the accounting department in maintaining these records. It highlights the need for regular communication and collaboration between the accounting department and other departments.

4. The fourth part of the document discusses the importance of training and education for all staff involved in the recording process. It stresses that ongoing training is essential to ensure that everyone is up-to-date on the latest procedures and standards.

5. The fifth part of the document discusses the importance of regular audits and reviews. It explains that these are necessary to identify any discrepancies or errors and to ensure that the system is working as intended.

6. The sixth part of the document discusses the importance of maintaining the confidentiality and security of the records. It outlines the measures that must be taken to protect the data from unauthorized access or disclosure.

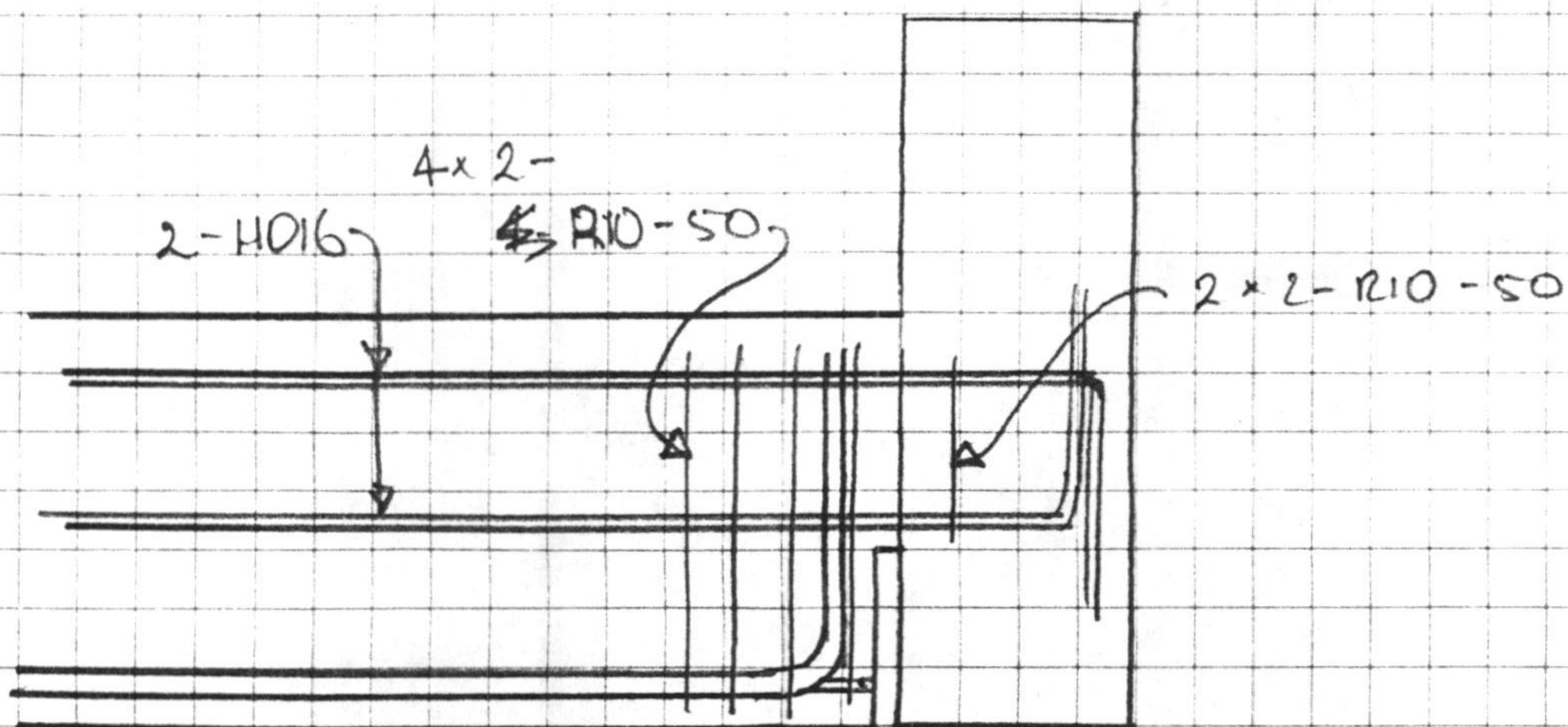
7. The seventh part of the document discusses the importance of keeping the records up-to-date and current. It explains that this is essential for ensuring that the information is accurate and reliable.

8. The eighth part of the document discusses the importance of providing clear and concise reports to management. It outlines the format and content of these reports, ensuring that they are easy to understand and provide the necessary information.

9. The ninth part of the document discusses the importance of maintaining a good working relationship with the external auditors. It explains that this is essential for ensuring that the audit process is smooth and that any issues are resolved quickly.

10. The tenth part of the document discusses the importance of keeping the records for the required period of time. It outlines the specific retention periods for different types of records and the consequences of not following these rules.

Pinched End for beam ①



Beam reaction = 130 kN.

Try 300 x 300 connection

$$v_c = 2.12 \text{ MPa.}$$

$$A_v f = \frac{130000}{185 \times 7 \times 350} = 574 \text{ mm}^2$$

Use 4-H016.

Beam reaction stirrups

$$A_v = \frac{130000}{185 \times 2 \times 5} = 556 \text{ mm}^2$$

$$\frac{556}{160} = 3.47$$

Shear.

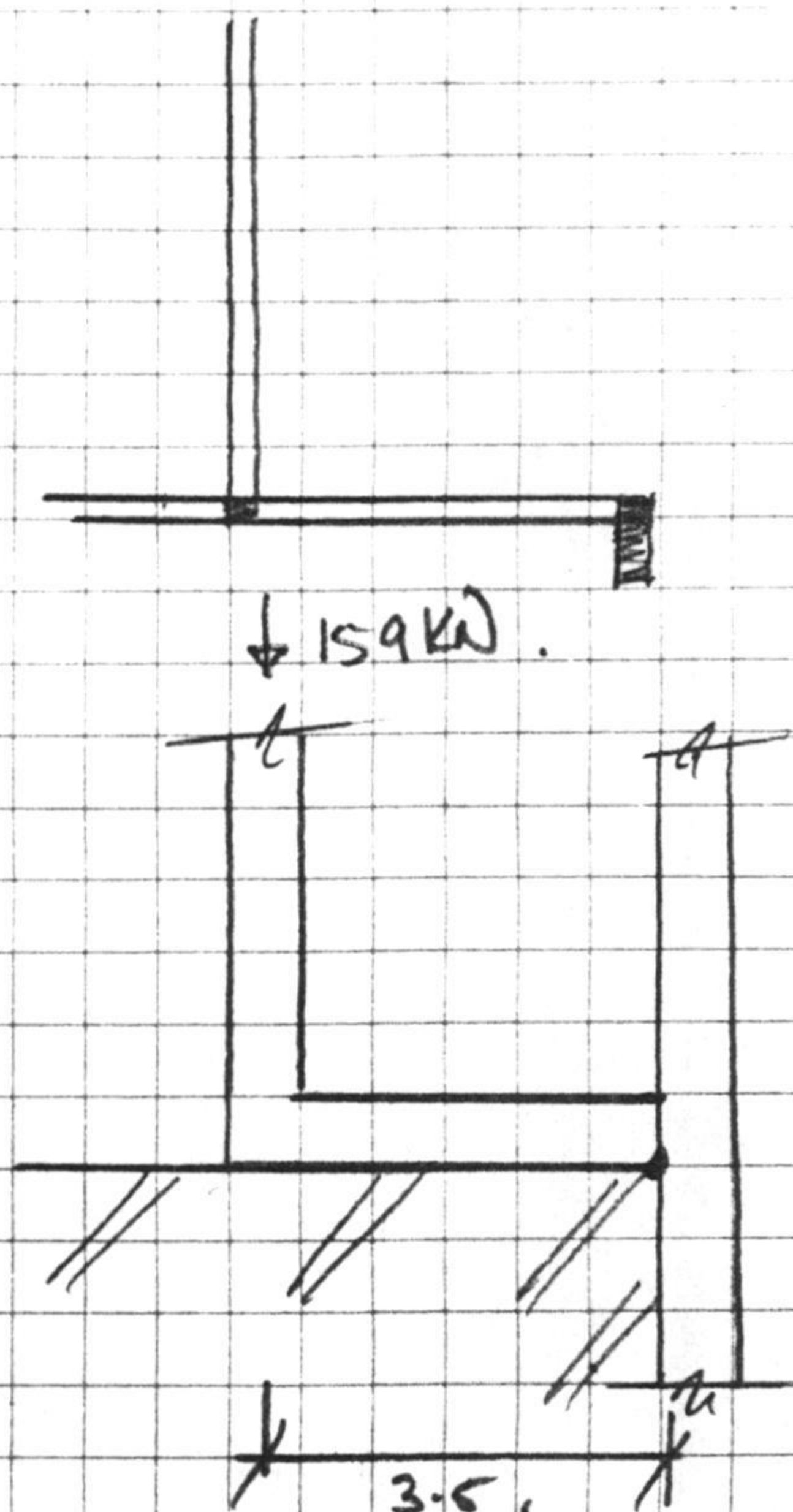
$$v_c = 2.12 \text{ MPa.}$$

$$v_c - v_b = 1.77 \text{ MPa.}$$

$$A_v = \frac{1.77 \times 300 \times 50}{2 \times 5} = 96 \text{ mm}^2$$

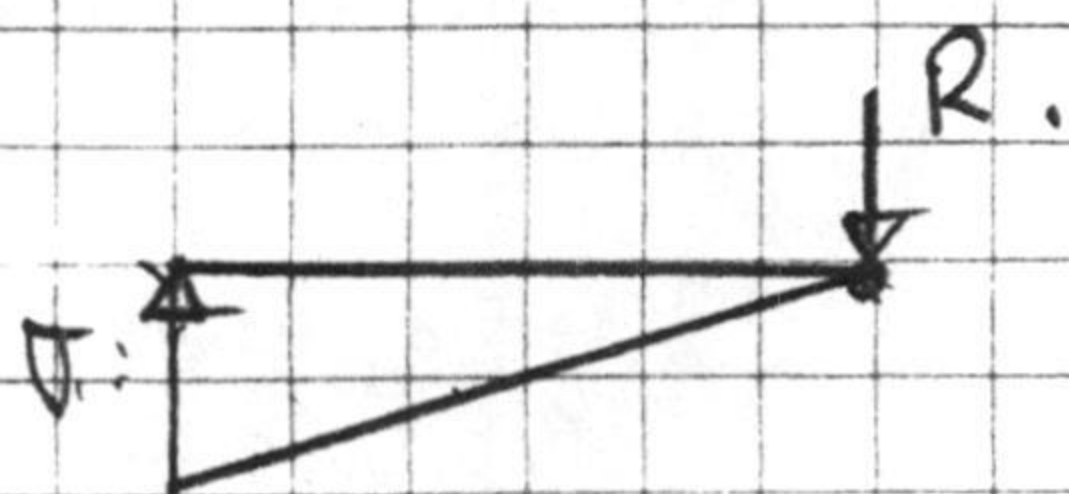
2-R10-50 OK.

E W334 Beam Support (surch)



$$\begin{aligned} & 79.5 \times 3.5 \\ & - 136/2 \times 3.5 \times \frac{3.5}{3} \\ & = 0. \end{aligned}$$

Assume elastic reaction.



$$\frac{R}{2} \times 3.5 = R + 159.$$

$$159 \times 3.5 = \frac{R}{2} \times 3.5 \times \frac{2}{3} \times 3.5$$

$$\therefore R = 136 \text{ kN/m.}$$

$$R = 79.5 \text{ kN.}$$

$$\begin{aligned} \text{Max Buck load} &= \frac{136 \times 4 \times 1000}{400 \times 350} \\ &= 389 \text{ MPa.} \end{aligned}$$

400 x 350.
2-M24 + 1-M16
2-R12 - 150

$$\begin{aligned} \text{Max Moment @ } x &= \frac{136}{3.5} \times 3.5 \times \frac{x}{2} = 0. \\ &= 2. \end{aligned}$$

$$M = 79.5 \times 2 - 79.5/2 \times 2 \times \frac{2}{3} = 106 \text{ kNm.}$$

$$\begin{aligned} 400 \times 350 : & \quad R_u = \frac{106 \times 6}{400 \times 350} = 3.0 \\ & \quad P = 0.045 \quad 996 \text{ mm}^2 \quad 2-M24 + 1-M16 \\ & \quad \sigma_c = 1.54 \quad 2-R12 - 150. \end{aligned}$$

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1

2

3

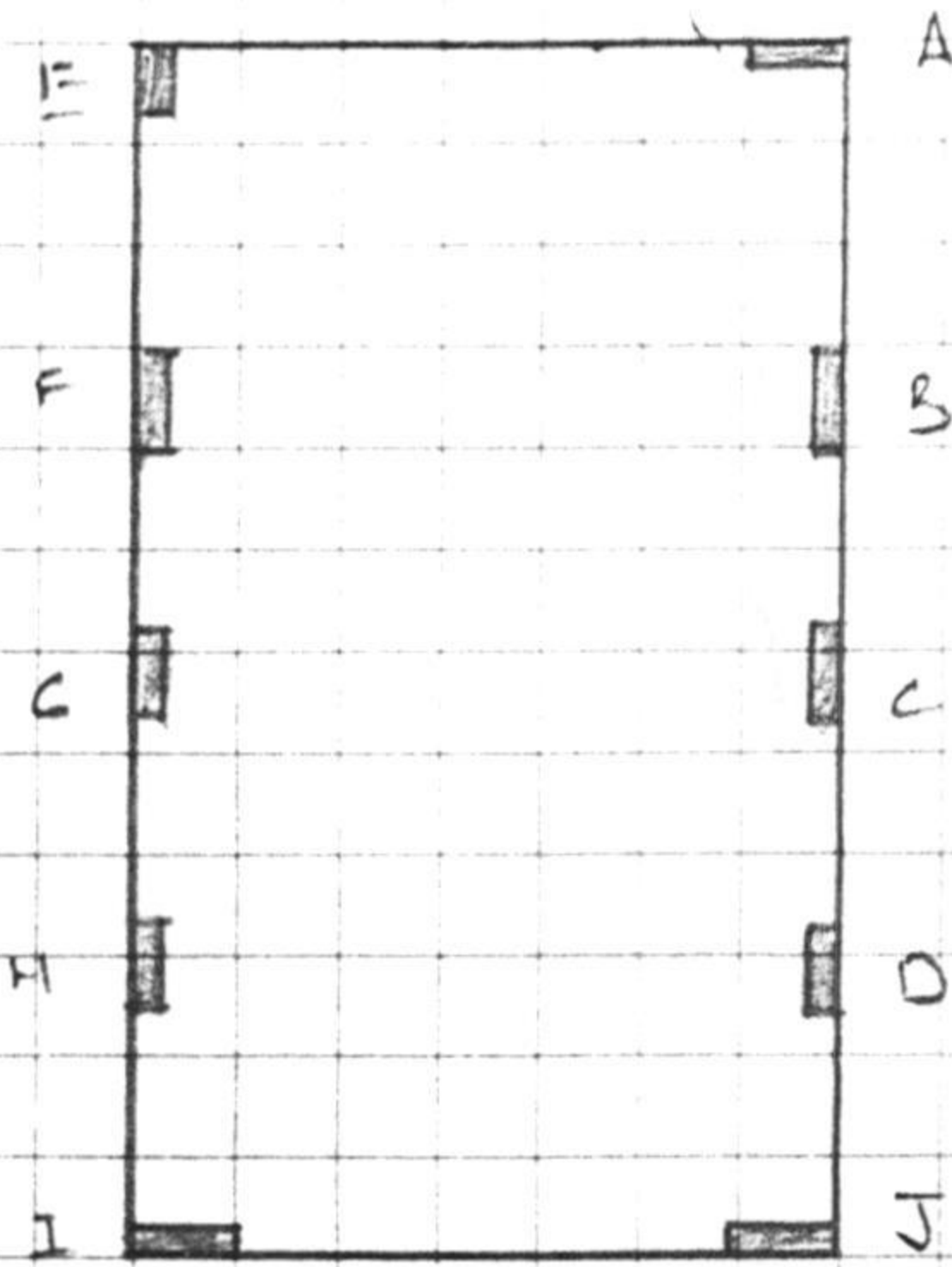
4

5

6

7

8



N-S torsion

$$1530 \times \frac{.48}{.6} = \pm 1224$$

$$\text{Gravity } Q_A = \frac{3000}{3} = 1000 \text{ kPa.}$$

$$\text{Seismic } Q_A = \frac{3000}{2} = 1500 \text{ kPa.}$$

Uplift $2m \phi$, 7-in depth.

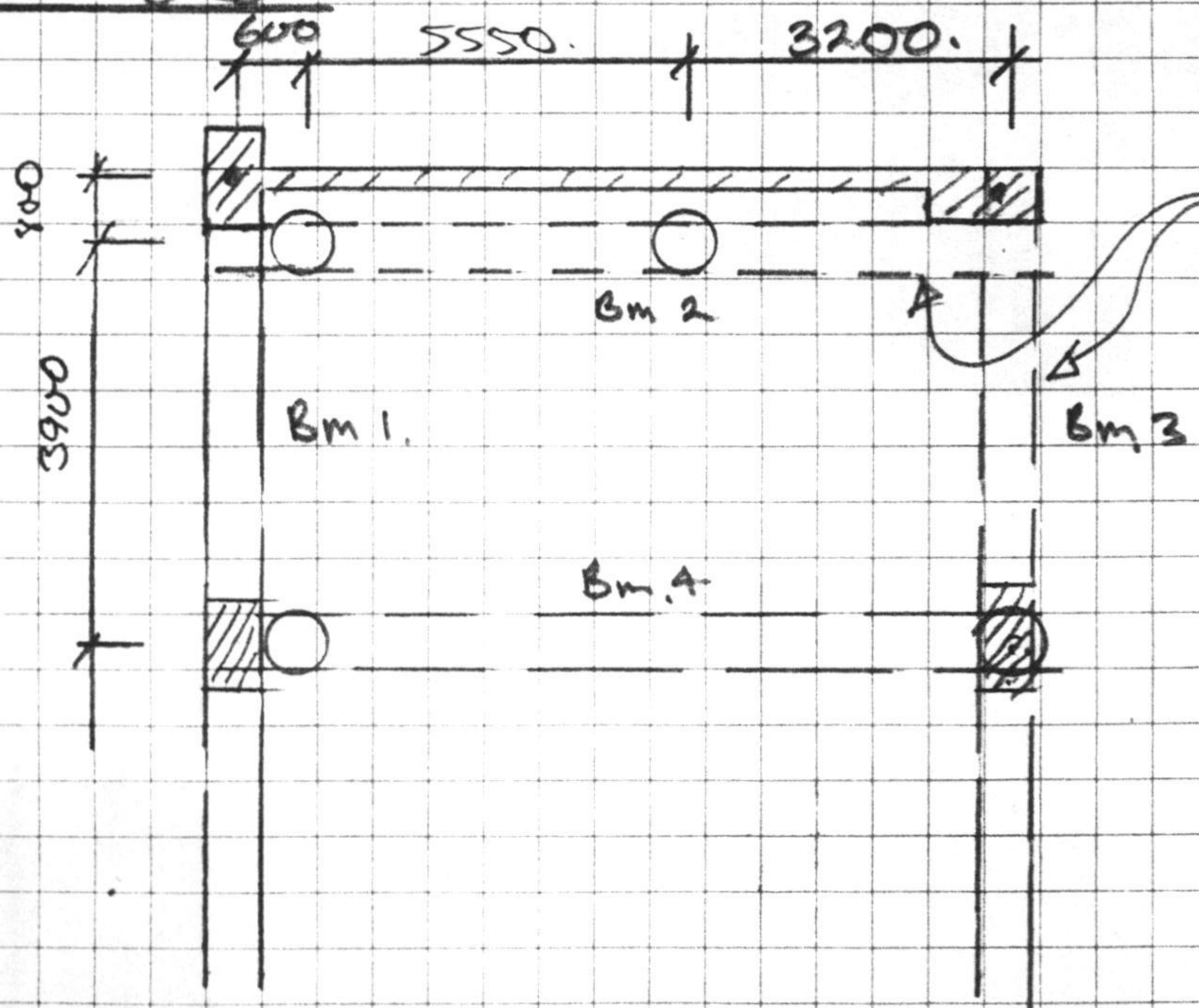
$$\text{Allowable} = \frac{5000}{2} = 2500 \text{ kN.}$$

Column	D	L	D+L	E'Quake				D+L+.8E	.7D+.8E
				E	W	N	S		
A	705	262	967	1530	-1530	431 1224	-431 -1224	2291	-831
B	1041	557	1598			293	-293	1832	
C	1250	625	1875			156	-156	2000	
D	1175	600	1775			-568	568	2229	
E	700	260	960	-1530	1530	872 -1224	-872 1224	2184	-734
F	1187	580	1767			-539	539	2198	
G	250	238	488			-65	165	540	
H	1056	583	1639			+217	-217	1813	
I	761	270	1031	-1530	1530	-486 1224	486 -1224	2255	-692
J	700		700	1530	-1530	-	-	1924	-734

Pile	O+L	O+L+SE	O+L+SE	Pile Area G.	Pile Area S.	Pile Bell g.
A	967	2291	-831	0.967	1.53	1400
B	1598	1832		1.598	1.22	1426
C	1875	2000		1.875	1.33	1545
D	1775	2229		1.775	1.49	1503
E	960	2184	-734	0.96	1.46	1363
F	1767	2198		1.767	1.47	1500
G	488	540		0.488	0.36	788
H	1639	1813		1.639	1.21	1444
I	1031	2255	-692	1.031	1.50	1382
J	967 700	2291	-734	0.967	1.53	1400

Piles shifted to avoid Tunnel

North End.



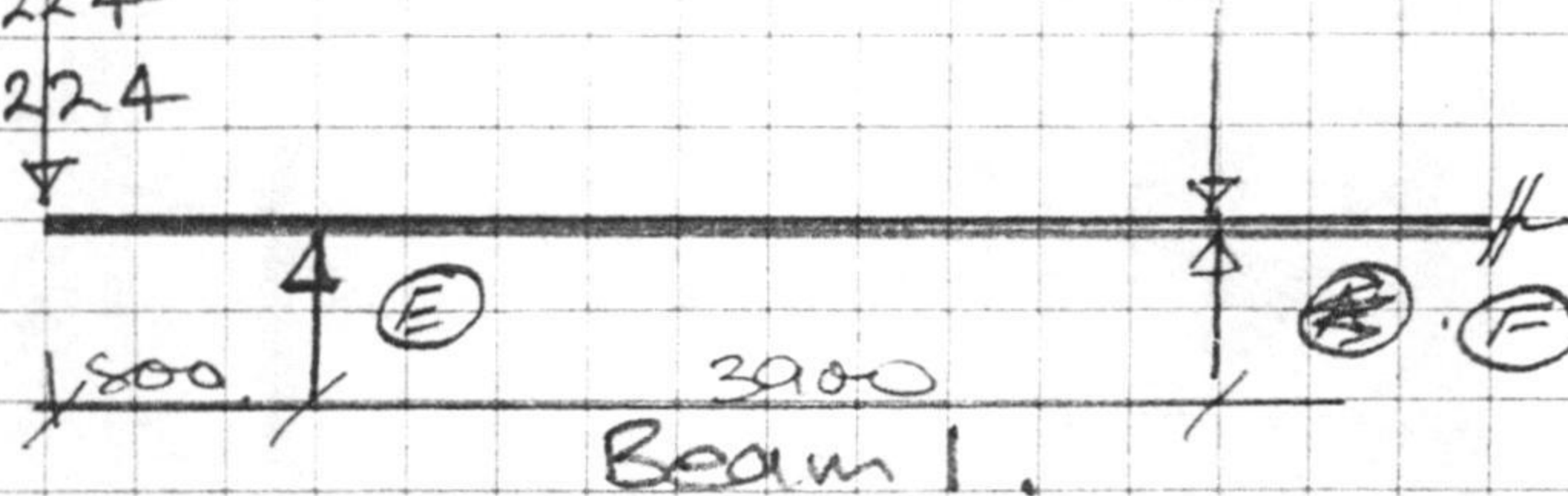
Assume share
load 50/50

Section 1				Section 2		Section 3				
1	2			3	4	5				
	6			7	8	9				
	10			11	12	13				
	14			15	16	17				
	18			19	20	21				
	22			23	24	25				
	26			27	28	29				
	30			31	32	33				
	34			35	36	37				
	38			39	40	41				
Section 4				Section 5		Section 6				
42				43		44				
45				46		47				
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378				379		380				
381				382		383				
384										

D+L 960
8E (N) -107
8E (S) 107
8E (E) -1224
8E (W) +1224

1767.
431
-431

BEAM 1



Reactions

$$\frac{8}{300} = .205$$

$$1 + \frac{3}{2} \times .205 = 1.307$$

$$\frac{3}{2} \times .205 = .307$$

D+L 1255
8E (N) -140
" (S) 140
" (E) -1600
" (W) 1600.

1767 - 233 = 1534
431 + 43 = 474
-431 - 43 = -474
376
-376.

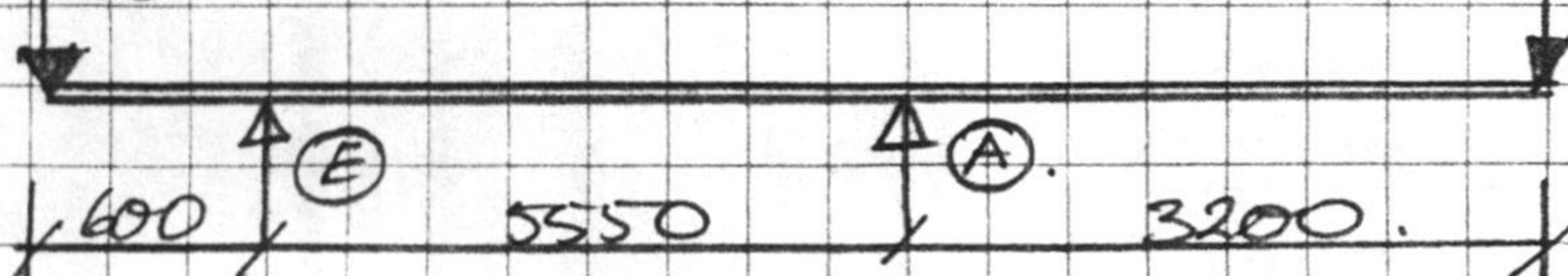
Moments

D+L -768.
8E N 86
" S -86
" E 979
" W -979.

Beam 2

D+L 1255
8E N -140
" S 140
" E -1600
" W 1600.

967/2 = 484
1655/2 = 828
-1655/2 = -828
1224/2 = 612
-1224/2 = -612.



Reactions:

$$\begin{aligned} & \times \frac{6.15}{5.55} = \times \frac{3.2}{5.55} - \times \frac{.6}{5.55} + \frac{8.25}{5.55} \\ & = \times 1.1 - \times .58 = 1.58x - .12 \end{aligned}$$

D+L 1100 614
8E N -634 1325
" S 634 -1325
" E -2115 1159
" W 2115 -1159.

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Moments.

D+L	-753	-1549
SE N	84	-2650
" S	-84	2650
" E	960	-1958
" W	-960	1958

Beam 3.

D+L	484	1598	1875
SE N	828	234	125
" S	-828	-234	-125
" E	612	-	-
" W	-612	-	-

Reactions.

	$\times \frac{9.5}{5.0}$	$- \frac{1.5}{5}$
D+L	2517	1439
SE N	1807	-620
" S	-1807	620
" E	1162	-551
" W	-1162	551

Moments.

-2178
-3726
3726
-2754
2754

Max. Pile loads.

Pile	D+L ↓	+0.8E ↑	D+L ↑	+0.8E ↓	Area load	φ, mm
A	614	1939	—	711	1.29	1281
B	2517	4324	—	—	2.88	1915
E	1100	3215	—	-1015	2.14	1651
F	1534	2008	—	—	1.53	1396

Date	Time	Location	Remarks
10/10/2020	10:00	10:00	10:00
10/10/2020	10:00	10:00	10:00
10/10/2020	10:00	10:00	10:00
10/10/2020	10:00	10:00	10:00
10/10/2020	10:00	10:00	10:00
10/10/2020	10:00	10:00	10:00
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10/10/2020	10:00	10:00	10:00
10/10/2020	10:00	10:00	10:00
10/10/2020	10:00	10:00	10:00

Ground Beams

Beam 1

$$\text{Max } V_u = 1.48 \times 960 + \frac{1600}{.8} = 3420 \text{ KN}$$

$$\text{Max } M_u = 1.48 \times 768 + \frac{979}{.8} = 2360 \text{ KNm}$$

$$2 \sigma_c \leq .2 \times 25 = 5 \text{ MPa}$$

$$\text{Require b.d} = \frac{3420000}{.85 \times 5} = 804894 \text{ mm}^2$$

(600 x 1340)

Say 1500 x 600 beam.

$$R_u = \frac{2360 \text{ EG}}{.9 \times 1500^2 \times 600} = 2.59 \text{ MPa}$$

OK

Beam 1
1500 x 600

Beam 2

$$\text{Max } V_u = 1.48 \times 1255 + \frac{1600}{.8} = 3857 \text{ KN}$$

Only 600 long \therefore corbel.

At other End.

$$V_u = 1.48 \times 484 + \frac{828}{.8} = 1751 \text{ KN}$$

$$M_u = 1549 \times 1.48 + \frac{2650}{.8} = 5605 \text{ KNm}$$

1500 x 800 beam.

$$R_u = 4.6 \text{ MPa}$$

Beam 2
1500 x 800

Beam 3

$$M_u = 1.48 \times 2178 + \frac{3726}{.8} = 7880 \text{ KNm}$$

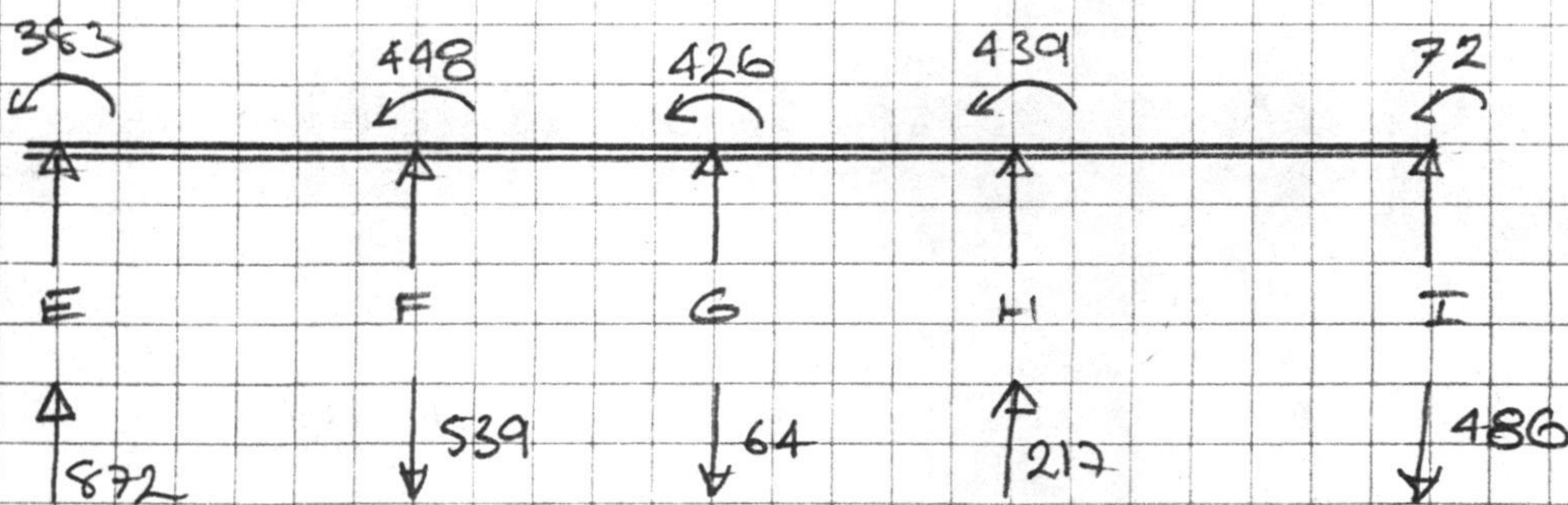
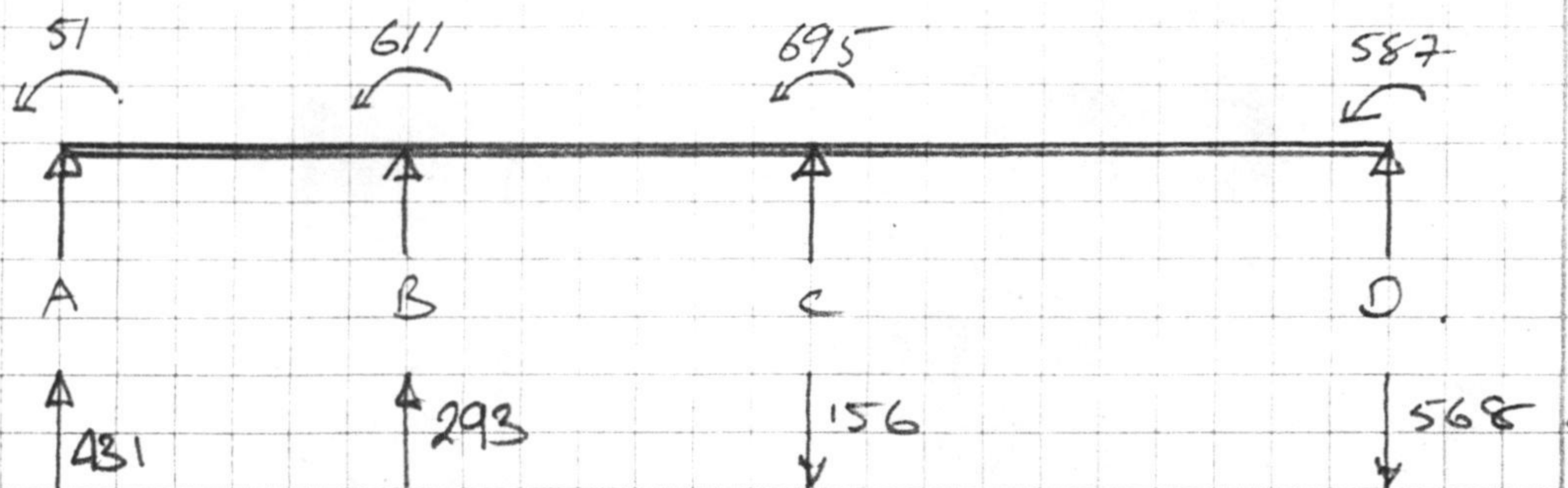
2000 x 800 beam.

$$R_u = 3.38 \text{ MPa}$$

Beam 3
2000 x 800

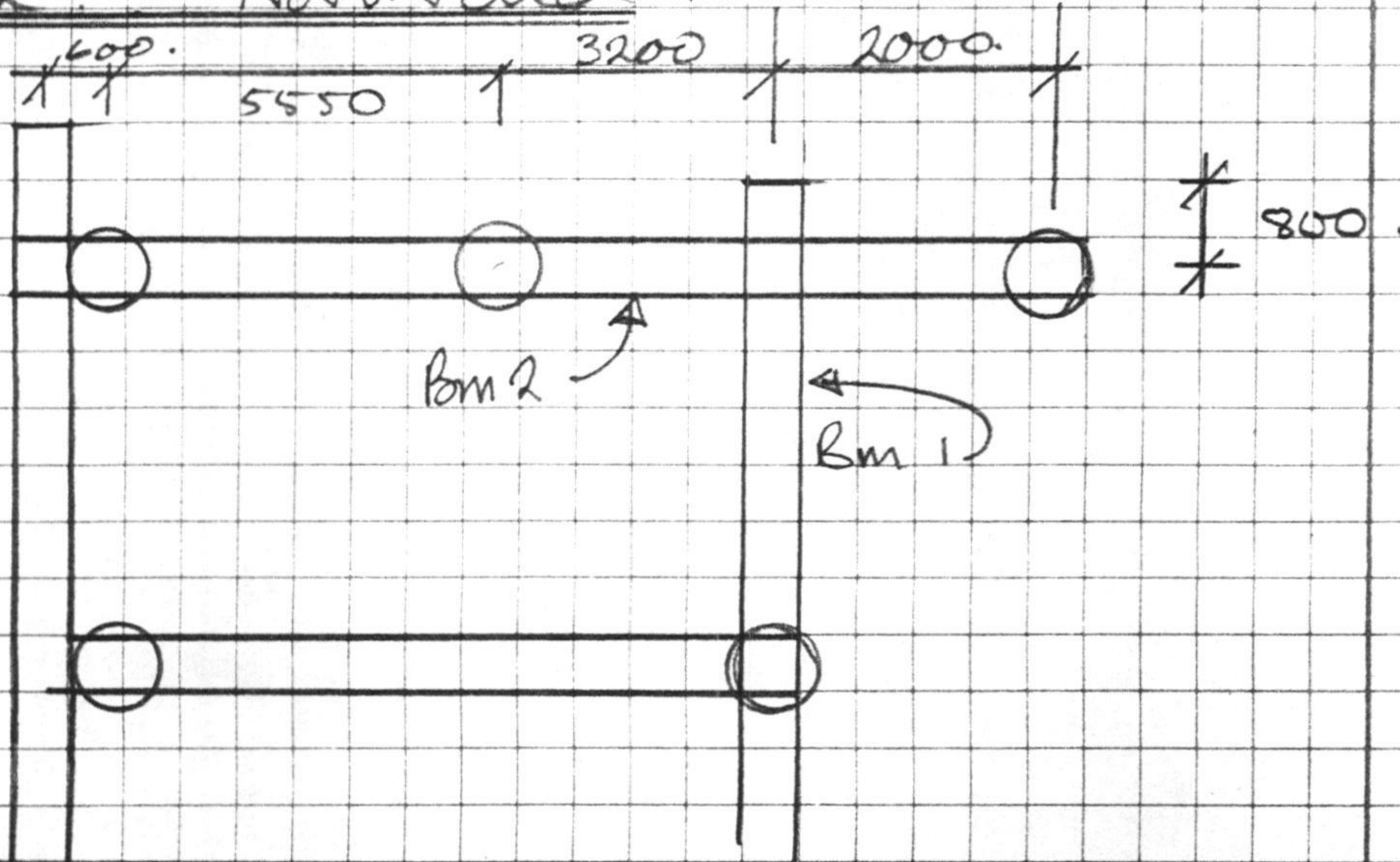
Date		Time		Place		Remarks	

Ground beam forces from Seismic Frame.
Refer Sheets 21 - 32



Must add column base moments.
When N-S earthquake critical.

Option 2 - North End



Beam 1.

D+L	1	967	1598
SE	N	1655	234
"	S	-1655	-234
"	E	1224	
"	W	-1224	
		1.267	-267
D+L		1224	1340
SE	N	2096	-207
"	S	-2096	207
"	E	1550	-326
"	W	-1550	326

Beam 2.

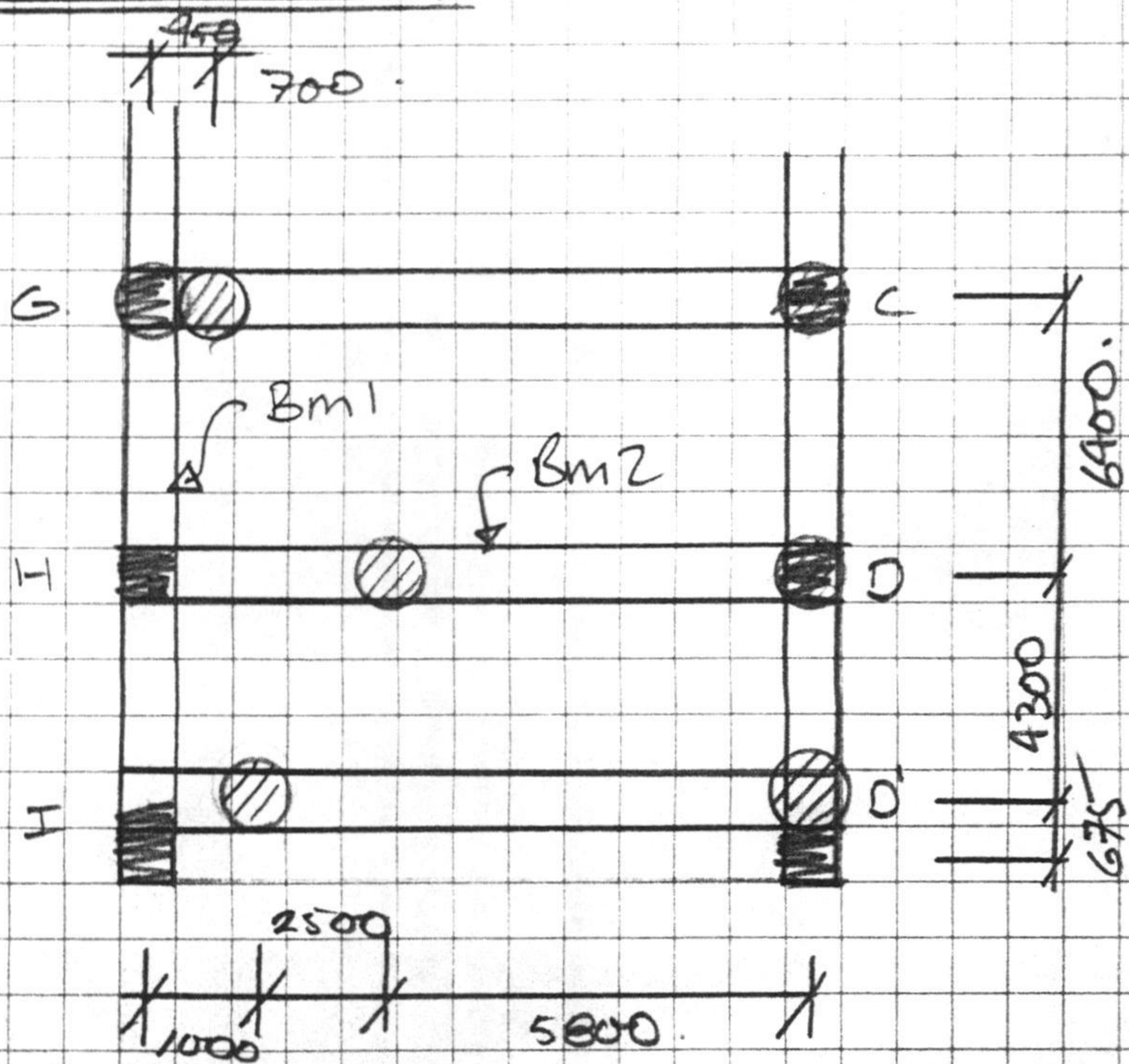
D+L		1255	1244
SE	N	-140	2096
"	S	140	-2096
"	E	-1600	1550
"	W	1600	-1550
		0.6	5.55
		3.2	2.0

Approx reactions:

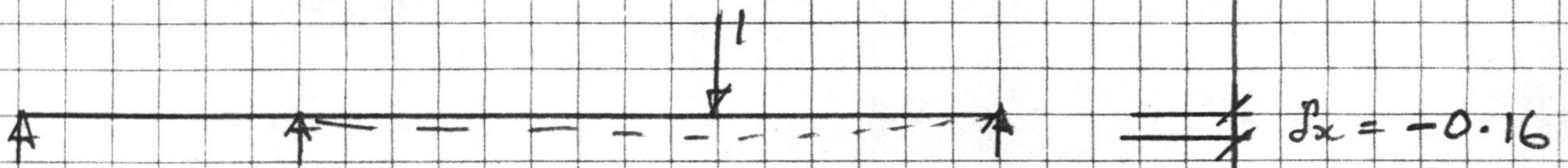
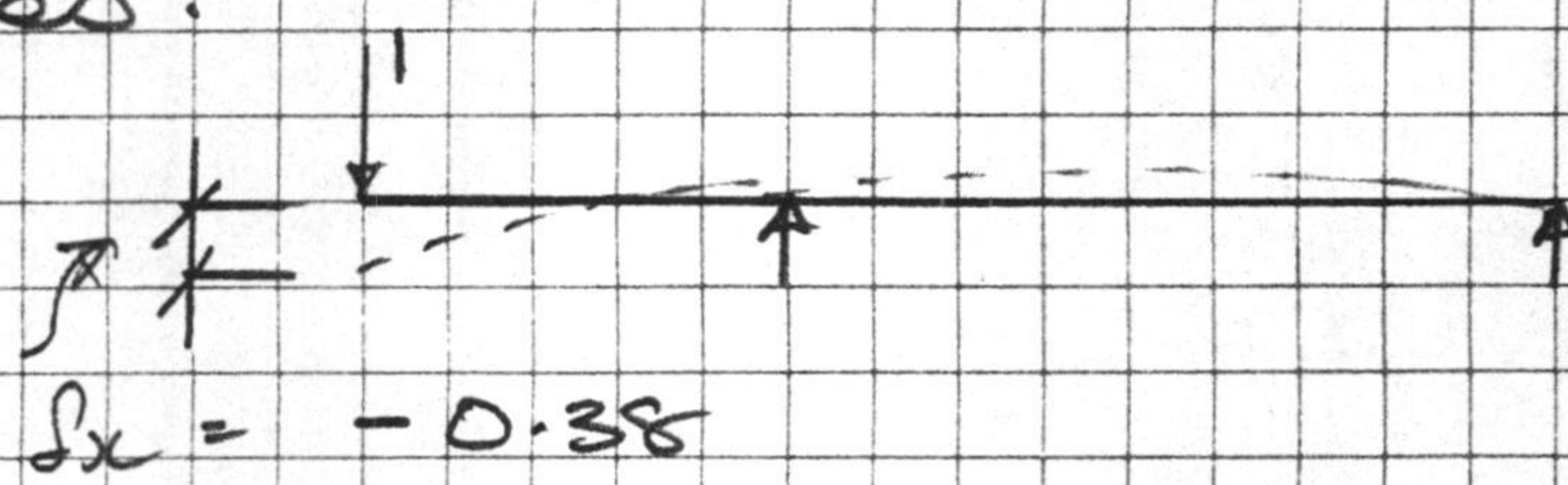
1343	458	660	D+L
-306	1155	1110	SE
306	-1155	-1110	N
-1932	1109	821	"
1932	-1109	-821	S
			"
			E
			W

[illegible]

South End



Stiffness:



\approx

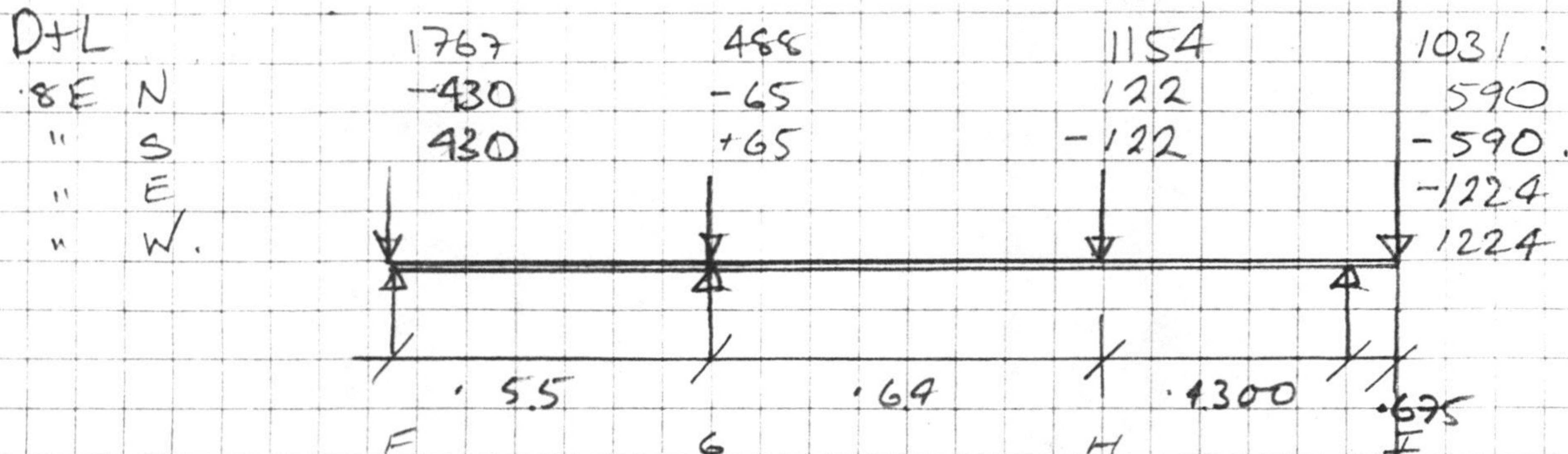
Bm 1	:	Bm 2	load share
1	:	0.421	
(70.4%)		(29.6%)	

Load.

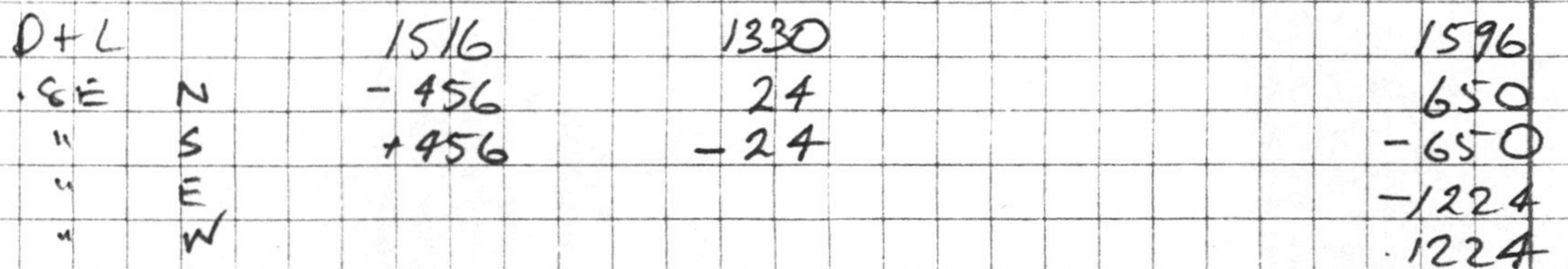
Bm 1	Bm 2
------	------

D+L		1639	1154	485
8E	N	217	153	64
"	S	-217	-153	-64
"	E	-	-	-
"	W	-	-	-

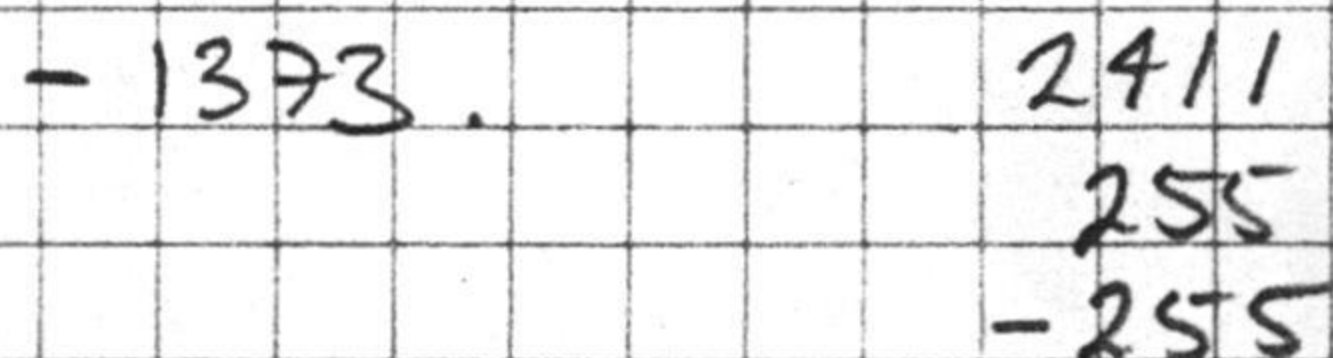
Beam 1:



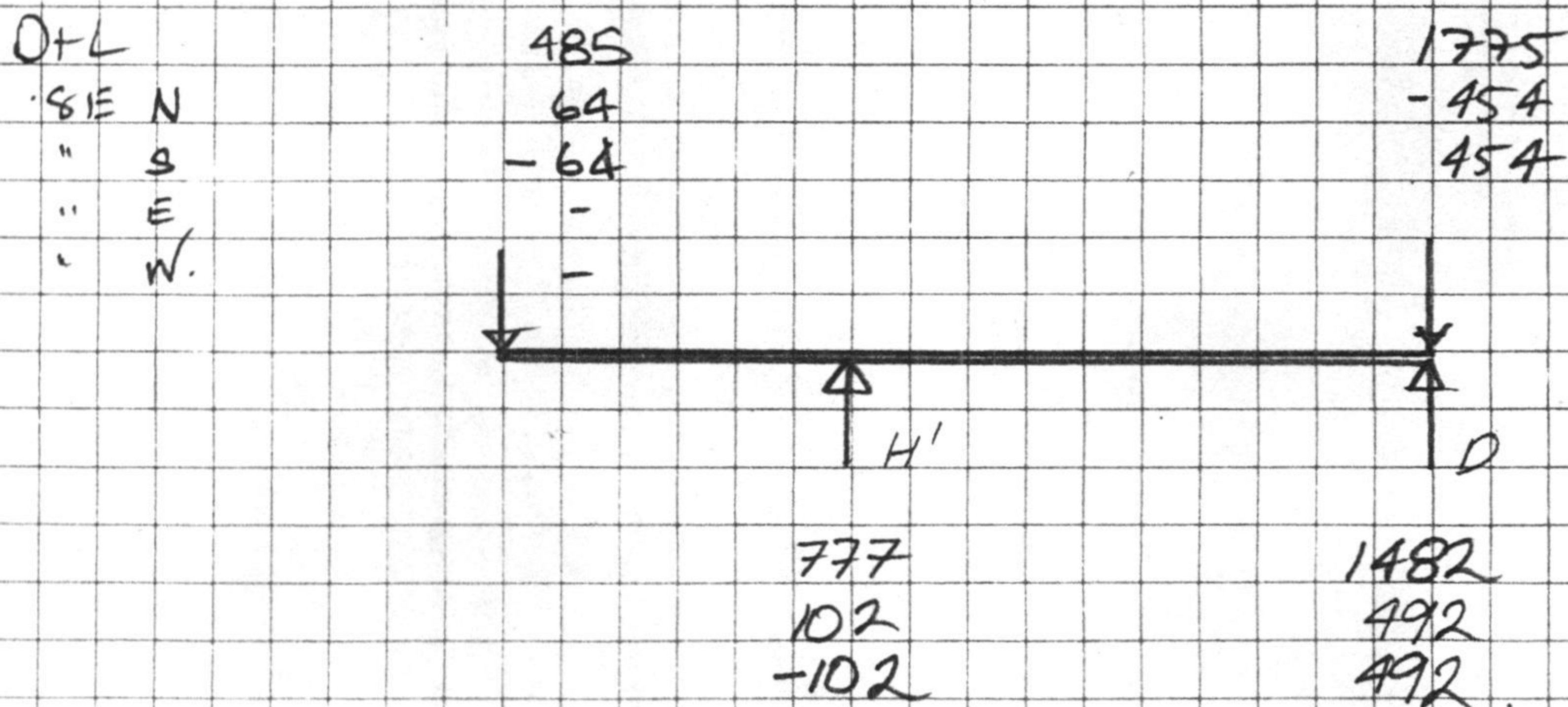
Reactions:



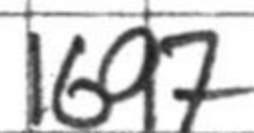
Moments:



Beam 2:



Moments:

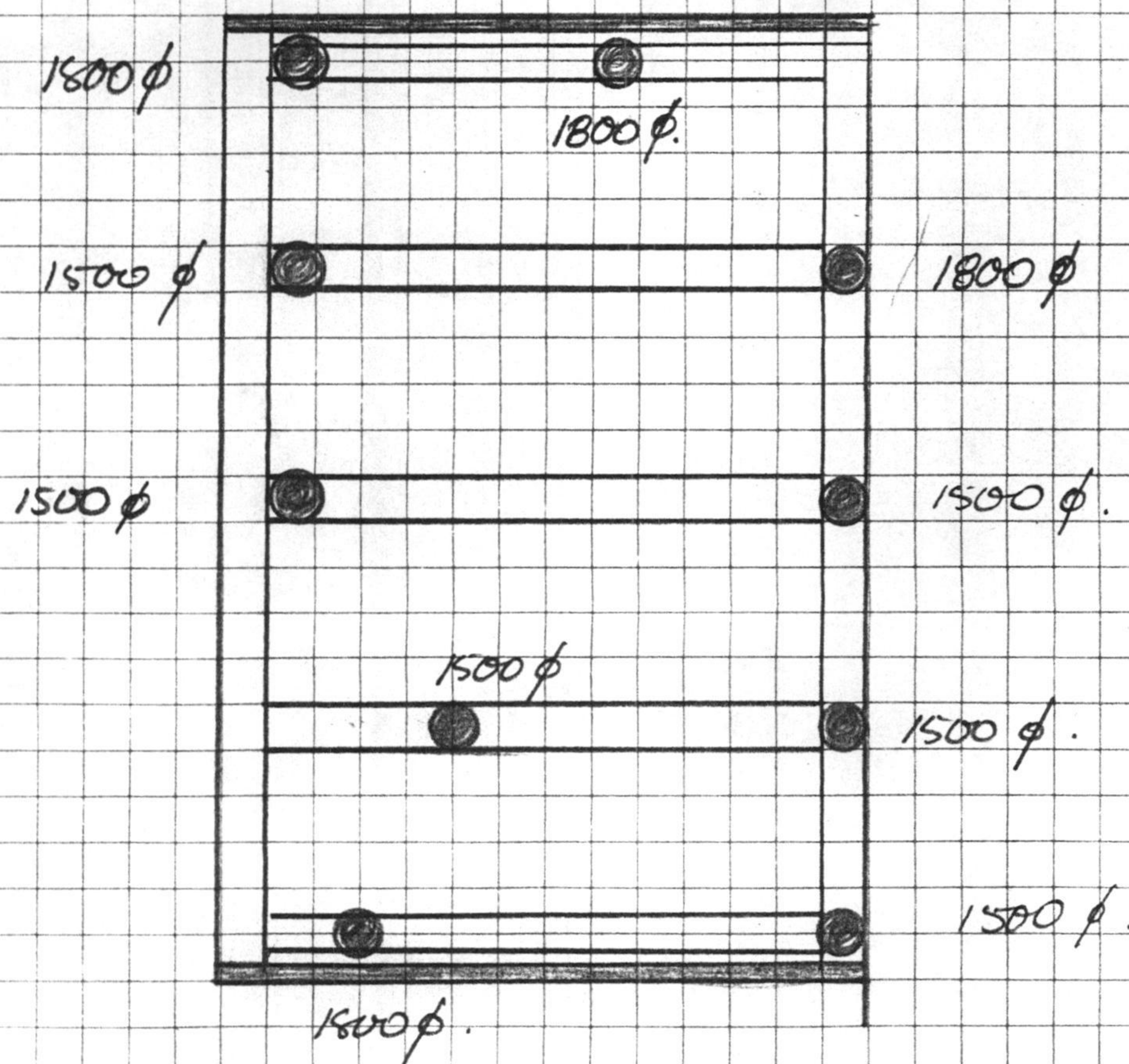


Date	Time	Place	Remarks	Remarks
10/10/1911	10.00	10.00	10.00	10.00
10/10/1911	10.00	10.00	10.00	10.00
10/10/1911	10.00	10.00	10.00	10.00
10/10/1911	10.00	10.00	10.00	10.00
10/10/1911	10.00	10.00	10.00	10.00
10/10/1911	10.00	10.00	10.00	10.00
10/10/1911	10.00	10.00	10.00	10.00
10/10/1911	10.00	10.00	10.00	10.00
10/10/1911	10.00	10.00	10.00	10.00

Piles

	D+L	+0.8E	D+L	+0.8E.	Pile Area	ϕ mm.
F	1516	1972			1.52	1391
G	1330	1354			1.33	1301
I	1596	2820			1.88	1547
H'	777	879			.78	997
D	1482	1974			1.48	1372

NO TENSION

All pile stems. 900 ϕ .

Lateral load

$$V_b = 2055 \text{ kN}$$

V_{passive}

$$P_p = k_p \cdot d \cdot 3 \times 18 \times 1.5 = 81 \text{ kPa}$$

$$P_p = 0.5 \times 81 \times 1.5 = 60.8 \text{ kN/m}$$

$$V = 2 \times 9.6 \times 60.8 = 1167 \text{ kN}$$

$$V_{\text{piles}} \text{ reqd} = 2055 - 1167 = 888 \text{ kN}$$

$$\Rightarrow V/\text{pile} = 89 \text{ kN/pile}$$

Say pile fixed 1 D into rock

$$M_u = 89 \times 7.4 = 659 \text{ kNm} \quad g = 0.8$$

$$M_u/f_c D^3 = 0.040 \quad \left. \begin{array}{l} P_u = 0 \\ P_u = 0 \end{array} \right\} \quad P_u = 0.15 \quad f_c = 0.0089 \rightarrow \text{OK}$$

Check beam cap for lateral pressure

$$W_u = 60.8 \text{ kN/m} \quad W = 60.8$$

$$M_u = 2Wa/3 = 2 \times 60.8 \times 1.5/3 = 60.8 \text{ kNm}$$

$$R_u = 60.8 \times 10^6 / (0.9 \times 1000 \times 520^2) = 0.25 \quad p = 0.0005$$

$$A_s = 260 \text{ mm}^2/\text{m} \Rightarrow \text{HR10 @ 300 OK}$$

Try full load on piles - Reese & Matlock

$$P = P_T/n = 2055/10 = 205.5 \text{ kN} \quad f = 7 \text{ kPa/mm}$$

$$T = (EI/f)^{0.2} = (23.5 \times 10^6 \times 3.22 \times 10^{-2} / 7 \times 10^3)^{0.2} = 2.551$$

$$L/T = 7/2.551 = 2.74$$

$$z = \text{depth}/T$$

Depth	z	F _d '	F _m '	δ _p (mm)	M _p (kNm)
0	0	1.05	-0.95	4.7	-498
1	.39	1.00	-0.57	4.5	-299
2	.78	0.80	-0.22		-115
3	1.18	0.65	-0.07		-37
4	1.57	0.38	0.06		31
5	1.96	0.22	0.08	OK	42
6	2.35	0	0.04		21
7	2.74	-0.15	-0.02		-10

$$\delta_p = F_d' \left(\frac{PT^3}{EI} \right) = F_d' \left(\frac{205.5 \times 2.551^3}{23.5 \times 10^6 \times 3.21 \times 10^{-2}} \right) = 4.508 \times 10^{-3} F_d' \text{ (m)}$$

$$= 4.508 F_d' \text{ (mm)}$$

$$M_p = F_m' (PT) = F_m' (205.5 \times 2.551) = 524.23 F_m'$$

$$M_u / f_c D^3 = 498 \times 10^6 / .9 \times 25 \times 900^3 = .030$$

$$\text{From } P_u \text{ are } = 0 \text{ (conservative)} \Rightarrow f_{tm} = .10 \quad f_t = .0056$$

$$A_g = .636 \times 10^6 \text{ mm}^2$$

$$A_{t \text{ min}} = 2200 / f_y \sqrt{2 A_g} = .0051$$

$$A_t = .0056 A_g = 3562 \text{ mm}^2$$

⇒ 12HD20 OK

$$\text{Shear } V_u = 205.5 \text{ kN}$$

$$V_c = 205500 / .85 \times 600 \times 600 = .67 \text{ MPa}$$

$$V_c = .61$$

$$V_s = .06$$

$$A_{t \text{ min}} = .35 b_w s / f_y$$

$$s_{max} = 151 \times 320 / .35 \times 600 = 281 \Rightarrow 110 \text{ (250 spiral min.)}$$

100

Dimensions: 12.5 x 2.5 x 6.5 x 4.3

Area: 900/3 = 180
6 x 2 = 120
200

$$0.45 \left(\frac{A_g}{A_c} - 1 \right) = 0.45 \left(\frac{\pi \times 450^2}{\pi \times 385^2} - 1 \right) = 0.168$$

$$P_s = 0.168 \frac{f_c}{f_y} \left(2.5 + \frac{1.25 \times 3897}{\phi f_y A_g} \right) \quad \phi = 0.75 \times 0.3 = 3897$$

$$= 0.168 \times \frac{25}{380} \left(2.5 + \frac{1.25 \times 3897 \times 10^3}{0.75 \times 25 \times \pi \times 450^2} \right) = 0.0091$$

$$\frac{A_s}{s \times d_s} = \frac{4 A_s}{s \times d_s}$$

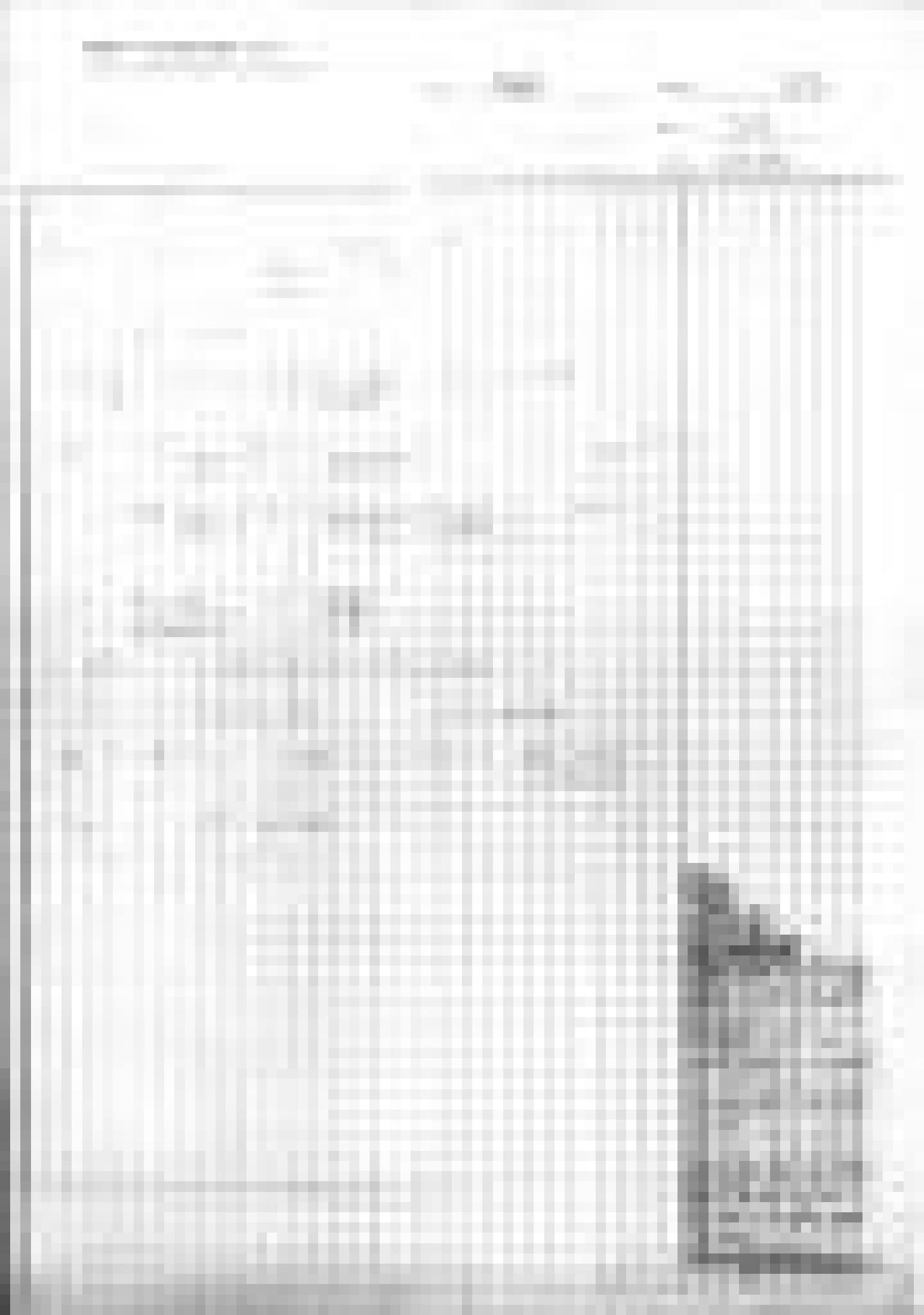
$$HP12 \quad 0.0091 = 4 \times 113 / s \times 770$$

$$s = 65 \Rightarrow HP12 @ 60$$

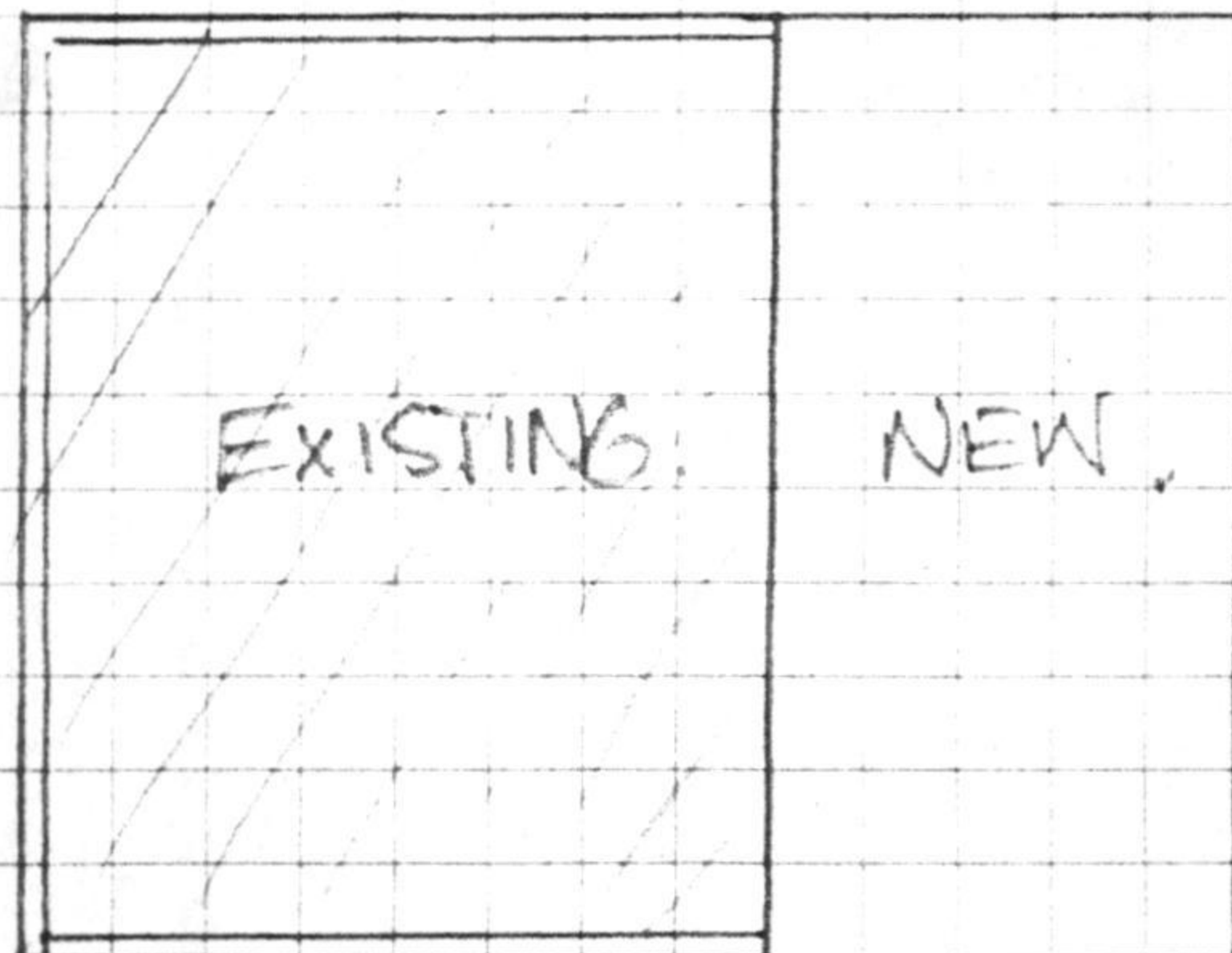
$$Ad \quad PH \quad 2700 \quad 0.5 P_s \Rightarrow 4 \times 12 @ 120 \quad \text{for } 2700 \quad (3 \text{ pile } \phi)$$

$$\text{Rem} \quad HP12 @ 300$$

Piles
900 ϕ
25 MPa
12-HDRO
Shear Wall (corner)
piles 1800 ϕ bell
Middle pile on
west frame - no bell
Remainder 1500 ϕ
bell
HR12 @ 60 for 900
from beam face
HR12 @ 120 for next
2700
HR12 @ 300 rem.



Strengthening of Existing Bldg.



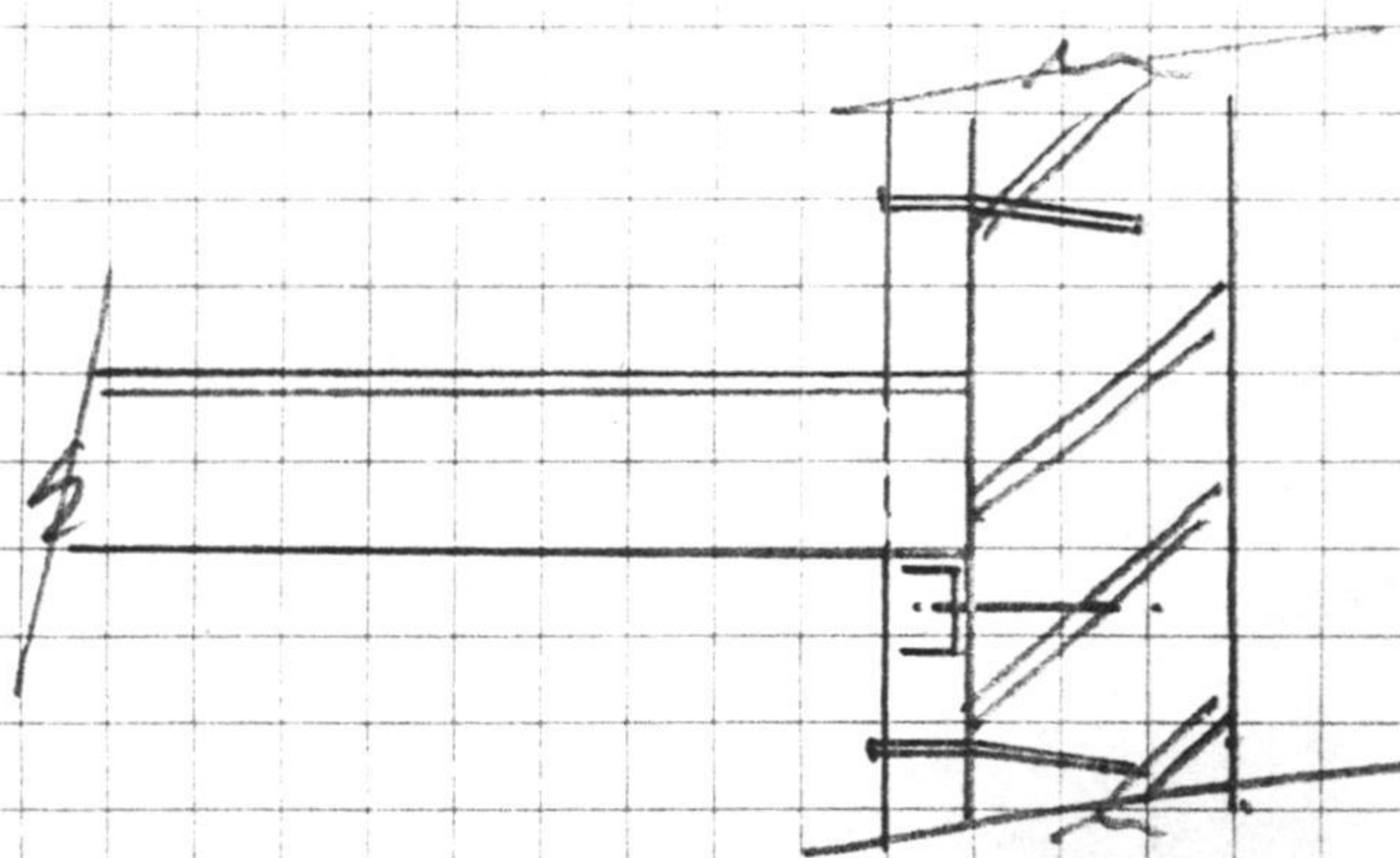
Design Philosophy

1. Strengthen to $\frac{2}{3}$ P165
2. Tie existing to new for overall earthquake loads by diagonal steel bracing.
3. Strengthen all existing brick walls & parapets for face loading with structural steel members dowelled to brickwork. Centres determined by brick strength spanning horizontally.
4. Carry floor level reactions to diagonal bracing by a combination of diaphragm action and steel trussing members. (which will also carry existing floor joists should brick walls fail)

Existing Walls

Design Assumptions

Design to support wall face loads
+ Floor gravity.



Face Loading:

$$\frac{2}{3} \times 1965$$

Treat as veneer:

$$\text{Veneer} = \frac{2}{3} \times 6 \times 12 = .48$$

$$\text{connections} = \frac{2}{3} \times 2 \times = .96$$

N7S 4203

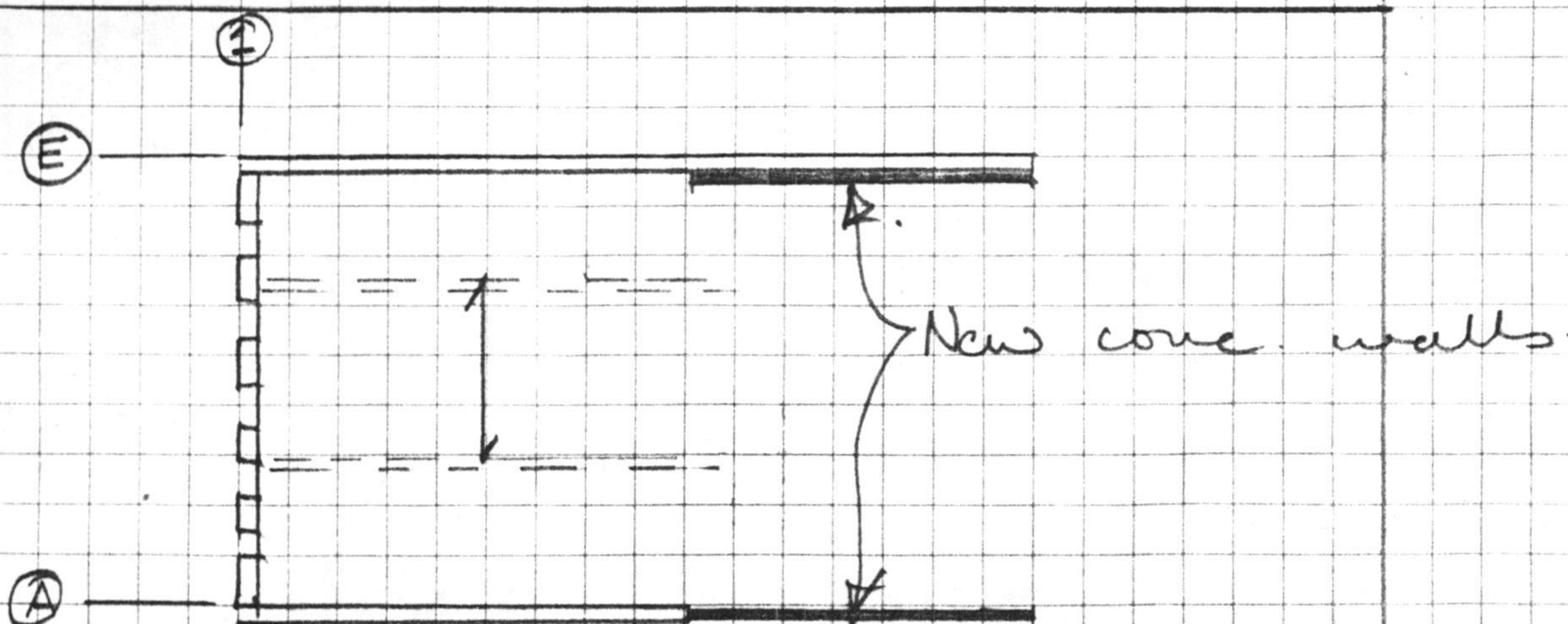
$$C_p = 2.0$$

Use

$$C_p = 0.48$$

$$C_p = 1.0$$

for walls
for connections



1870

1871

1872

1873

1874

1875

1876

1877

1878

1879

1880

1881

1882

1883

1884

1885

Wall type (A) & (E).

Flow span = 4.5 m.

2 → C = 240 brick

C → 2 = 360 "

2 → G = 480 "

Brick strength spanning horizontally.

Allowable Tensile = say $2 \times 10 = 20 \text{ psi} (= 136 \text{ KPa})$.

$$M = \frac{WL^2}{10} \text{ say}$$

$$W = t \times 22 \times 48 = 106t \text{ KN/m/m.}$$

$$f_{bt} = \frac{M}{Z}, \quad Z = \frac{1 \times t^2}{6} = \frac{t^2}{6} \text{ m}^3/\text{m.}$$

$$136 = \frac{10.6t \times L^2 \times 6}{10 \times t^2}$$

$$\therefore L = 4.62t \text{ m.}$$

240 wall : Max Brick span = 2.27 m.

360 " " " " = 2.77 m

480 " " " " = 3.2 m.

Use 3.0 steel c/s for 360 & 480 walls.
& 2.3 " " " 240 walls.

$$10.6 \times 24 \times 2.3 \times 1.2 \overset{\text{continuity}}{=} 7 \text{ KN/m.}$$

$$10.6 \times 48 \times 3.0 \times 1.2 = 18.3 \text{ KN/m.}$$

Steel: Assume steel fully laterally supported.

[illegible]

Floor/Floor!	Span	loads axial face	Calc.	Size	
Roof \rightarrow 2nd c	2400.	10 kN	5 kNm.	$\frac{5}{1.33 \times 165} = 23 \text{ cm}^3$	102 x 51 E
2nd c \rightarrow G.	5000 max.	10 + $2 \times 2 \times \frac{4.5}{2} \times 3$ = 37	57 kNm.	$\frac{57}{.2} = 286 \text{ cm}^3$ $f_{ac} = \frac{37000}{3600} = 10 \text{ MPa.}$ $\delta = \frac{5 \times 5000^4 \times 18.3}{384 \times 21 \times 10^9 \times 29.466}$ $= 24 \text{ mm} (= 0.05 L)$	200 WB 36
Will refine for δ smaller spans & wall c's later.					
<u>Floor Support.</u> (if wall collapses).					
Span = 3 m.					
load $\approx (1.5 + 1.5) \times \frac{4.5}{2} = 4.5 \text{ kN/m.}$					
M = 5 kNm.					
$\frac{5}{.165} = 31 \text{ cm}^3$					
102 x 51 E OK.					
102 x 51 E.					
<u>Ground \rightarrow 1st Partitions</u>					
Span = 4.267.					
240 mm brick					
Support at say 2.3 m c/c.					
M = $7 \times \frac{4.267^2}{8} = 16 \text{ kNm.}$					
Axial = 15 kN.					
$\frac{16}{1.33 \times 165} = 73 \text{ cm}^3$					
127 x 64 E.					

Name		Address		Occupation		Remarks	
John Smith		123 Main St		Teacher		Married, 3 children	
Mary Jones		456 Oak St		Homemaker		Single, no children	
Robert Brown		789 Pine St		Farmer		Married, 2 children	
Elizabeth White		101 Elm St		Shopkeeper		Married, 1 child	
James Wilson		202 Cedar St		Blacksmith		Married, 4 children	
Sarah Davis		303 Birch St		Nurse		Single, no children	
Thomas Miller		404 Spruce St		Carpenter		Married, 2 children	
Anna Clark		505 Willow St		Dressmaker		Married, 1 child	
George Taylor		606 Ash St		Merchant		Married, 3 children	
Charlotte Adams		707 Hickory St		Schoolteacher		Single, no children	
William Baker		808 Sycamore St		Blacksmith		Married, 2 children	
Elizabeth Green		909 Magnolia St		Homemaker		Married, 1 child	
John Lee		1010 Poplar St		Farmer		Married, 4 children	
Mary Hall		1111 Chestnut St		Shopkeeper		Single, no children	
Robert King		1212 Walnut St		Carpenter		Married, 2 children	
Sarah Young		1313 Elm St		Nurse		Single, no children	
Thomas Wright		1414 Oak St		Merchant		Married, 3 children	
Anna Scott		1515 Pine St		Dressmaker		Married, 1 child	
George Walker		1616 Cedar St		Blacksmith		Married, 2 children	
Charlotte Allen		1717 Birch St		Homemaker		Married, 1 child	
John Evans		1818 Spruce St		Farmer		Married, 4 children	
Mary Hill		1919 Willow St		Shopkeeper		Single, no children	
Robert Black		2020 Ash St		Carpenter		Married, 2 children	
Sarah Baker		2121 Hickory St		Nurse		Single, no children	
Thomas Green		2222 Sycamore St		Merchant		Married, 3 children	
Anna White		2323 Magnolia St		Dressmaker		Married, 1 child	
George Brown		2424 Poplar St		Blacksmith		Married, 2 children	
Charlotte Davis		2525 Chestnut St		Homemaker		Married, 1 child	
John Miller		2626 Walnut St		Farmer		Married, 4 children	
Mary Wilson		2727 Elm St		Shopkeeper		Single, no children	
Robert Taylor		2828 Oak St		Carpenter		Married, 2 children	
Sarah Adams		2929 Pine St		Nurse		Single, no children	
Thomas Clark		3030 Cedar St		Merchant		Married, 3 children	
Anna Baker		3131 Birch St		Dressmaker		Married, 1 child	
George Miller		3232 Spruce St		Blacksmith		Married, 2 children	
Charlotte Wilson		3333 Willow St		Homemaker		Married, 1 child	
John Taylor		3434 Ash St		Farmer		Married, 4 children	
Mary Adams		3535 Magnolia St		Shopkeeper		Single, no children	
Robert Clark		3636 Poplar St		Carpenter		Married, 2 children	
Sarah Miller		3737 Chestnut St		Nurse		Single, no children	
Thomas Baker		3838 Walnut St		Merchant		Married, 3 children	
Anna Wilson		3939 Elm St		Dressmaker		Married, 1 child	
George Adams		4040 Oak St		Blacksmith		Married, 2 children	
Charlotte Miller		4141 Pine St		Homemaker		Married, 1 child	
John Baker		4242 Cedar St		Farmer		Married, 4 children	
Mary Wilson		4343 Birch St		Shopkeeper		Single, no children	
Robert Adams		4444 Spruce St		Carpenter		Married, 2 children	
Sarah Miller		4545 Willow St		Nurse		Single, no children	
Thomas Wilson		4646 Ash St		Merchant		Married, 3 children	
Anna Baker		4747 Magnolia St		Dressmaker		Married, 1 child	
George Adams		4848 Poplar St		Blacksmith		Married, 2 children	
Charlotte Miller		4949 Chestnut St		Homemaker		Married, 1 child	
John Wilson		5050 Walnut St		Farmer		Married, 4 children	
Mary Adams		5151 Elm St		Shopkeeper		Single, no children	
Robert Miller		5252 Oak St		Carpenter		Married, 2 children	
Sarah Wilson		5353 Pine St		Nurse		Single, no children	
Thomas Baker		5454 Cedar St		Merchant		Married, 3 children	
Anna Adams		5555 Birch St		Dressmaker		Married, 1 child	
George Miller		5656 Spruce St		Blacksmith		Married, 2 children	
Charlotte Wilson		5757 Willow St		Homemaker		Married, 1 child	
John Adams		5858 Ash St		Farmer		Married, 4 children	
Mary Miller		5959 Magnolia St		Shopkeeper		Single, no children	
Robert Wilson		6060 Poplar St		Carpenter		Married, 2 children	
Sarah Baker		6161 Chestnut St		Nurse		Single, no children	
Thomas Adams		6262 Walnut St		Merchant		Married, 3 children	
Anna Miller		6363 Elm St		Dressmaker		Married, 1 child	
George Wilson		6464 Oak St		Blacksmith		Married, 2 children	
Charlotte Adams		6565 Pine St		Homemaker		Married, 1 child	
John Miller		6666 Cedar St		Farmer		Married, 4 children	
Mary Wilson		6767 Birch St		Shopkeeper		Single, no children	
Robert Adams		6868 Spruce St		Carpenter		Married, 2 children	
Sarah Miller		6969 Willow St		Nurse		Single, no children	
Thomas Wilson		7070 Ash St		Merchant		Married, 3 children	
Anna Baker		7171 Magnolia St		Dressmaker		Married, 1 child	
George Adams		7272 Poplar St		Blacksmith		Married, 2 children	
Charlotte Miller		7373 Chestnut St		Homemaker		Married, 1 child	
John Wilson		7474 Walnut St		Farmer		Married, 4 children	
Mary Adams		7575 Elm St		Shopkeeper		Single, no children	
Robert Miller		7676 Oak St		Carpenter		Married, 2 children	
Sarah Wilson		7777 Pine St		Nurse		Single, no children	
Thomas Baker		7878 Cedar St		Merchant		Married, 3 children	
Anna Adams		7979 Birch St		Dressmaker		Married, 1 child	
George Miller		8080 Spruce St		Blacksmith		Married, 2 children	
Charlotte Wilson		8181 Willow St		Homemaker		Married, 1 child	
John Adams		8282 Ash St		Farmer		Married, 4 children	
Mary Miller		8383 Magnolia St		Shopkeeper		Single, no children	
Robert Wilson		8484 Poplar St		Carpenter		Married, 2 children	
Sarah Baker		8585 Chestnut St		Nurse		Single, no children	
Thomas Adams		8686 Walnut St		Merchant		Married, 3 children	
Anna Miller		8787 Elm St		Dressmaker		Married, 1 child	
George Wilson		8888 Oak St		Blacksmith		Married, 2 children	
Charlotte Adams		8989 Pine St		Homemaker		Married, 1 child	
John Miller		9090 Cedar St		Farmer		Married, 4 children	
Mary Wilson		9191 Birch St		Shopkeeper		Single, no children	
Robert Adams		9292 Spruce St		Carpenter		Married, 2 children	
Sarah Miller		9393 Willow St		Nurse		Single, no children	
Thomas Wilson		9494 Ash St		Merchant		Married, 3 children	
Anna Baker		9595 Magnolia St		Dressmaker		Married, 1 child	
George Adams		9696 Poplar St		Blacksmith		Married, 2 children	
Charlotte Miller		9797 Chestnut St		Homemaker		Married, 1 child	
John Wilson		9898 Walnut St		Farmer		Married, 4 children	
Mary Adams		9999 Elm St		Shopkeeper		Single, no children	

Rein Vertical face loading Steelwork

Roof \rightarrow 2nd Ceiling:

$$\text{Span} = 2.0 \text{ m.}$$

$$W = 7 \text{ kN/m}$$

$$M = \frac{2^2}{8} \times 7 = 3.5 \text{ kNm.}$$

$$\frac{3.5}{.2} = 17.5 \text{ cm}^3$$

Use 102x51 MSC. (E). (or 70x70x3.6 RHS).
2.3 m c/c

Second Floor

$$\text{Span} = 3.3 \text{ m}$$

$$W = 18.3 \times \frac{36}{48} = 13.7 \text{ kN/m}$$

$$M = 18.7 \text{ kNm}$$

$$Z = \frac{18.7}{.2} = 93 \text{ cm}^3$$

Use 120x80x8 RHS. - 3000 c/c

First Floor

$$\text{Span} = 3.6 \text{ m}$$

$$W = 18.3 \text{ kN/m}$$

$$M = 29.6 \text{ kNm}$$

$$Z = 148 \text{ cm}^3$$

Use 200x100x6.3 RHS. - 3000 c/c

Ground Floor

480 wall.

$$M = 18.3 \times \frac{4.2^2}{8} = 40.3$$

$$Z = 201 \text{ cm}^3$$

Use 200x100x8 RHS. 2000 c/c

240 wall.

$$M = 16 \text{ kNm}$$

$$Z = 73 \text{ cm}^3$$

Use 100x100x6.3 RHS.



THE FIRST PART OF THE HISTORY OF THE
LIFE OF THE LATE LORD OF THE TREASURY

OF THE GREAT BRITAIN

AND OF THE KINGDOM OF IRELAND

BY THE SAME AUTHOR

IN TWO VOLUMES

VOLUME THE FIRST

THE HISTORY OF THE LATE LORD OF THE TREASURY

OF THE GREAT BRITAIN

AND OF THE KINGDOM OF IRELAND

BY THE SAME AUTHOR

IN TWO VOLUMES

VOLUME THE FIRST

THE HISTORY OF THE LATE LORD OF THE TREASURY

OF THE GREAT BRITAIN

AND OF THE KINGDOM OF IRELAND

BY THE SAME AUTHOR

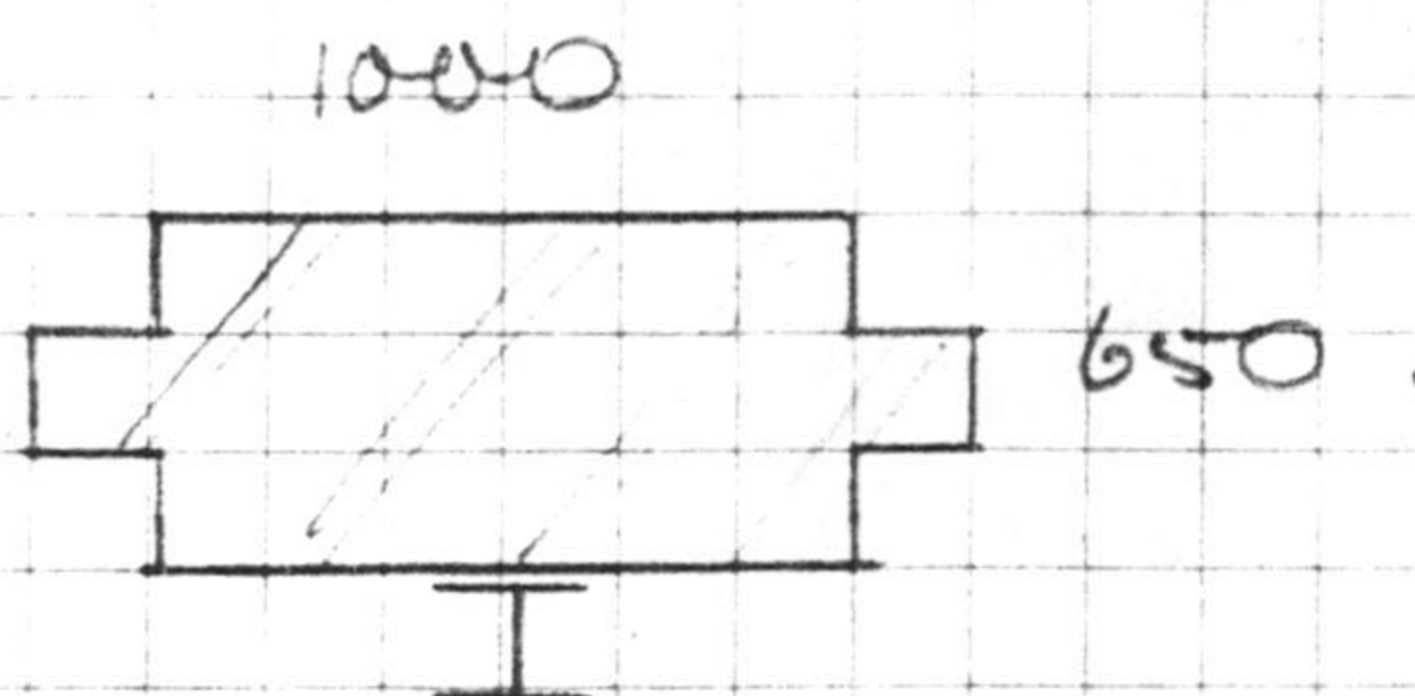
IN TWO VOLUMES

VOLUME THE FIRST

THE HISTORY OF THE LATE LORD OF THE TREASURY

Wall type ①.

Large Piers:



$$\text{Max span} = 4000.$$

$$W = 1.0 \times 65 \times 22 \times 48 = 6.86 \text{ kN/m}.$$

$$M = 6.86 \times \frac{4^2}{8} = 13.7 \text{ kNm}.$$

$$\frac{13.7}{1.2} = 68.5 \text{ cm}^3.$$

$$152 \times 76 \text{ L. } (Z = 112 \text{ cm}^3) \quad 152 \times 76 \text{ L}$$

$$I = 12.8 \text{ mm} = 0.032 \text{ L} \therefore \text{OK.}$$

100x100x6.3 RHS

Small piers.

$$500 \times 650$$

$$M = \frac{13.7}{2} = 6.9 \text{ kNm}.$$

$$\frac{6.9}{1.2} = 38 \text{ cm}^3$$

$$102 \times 51 \text{ L.}$$

102x51 L
or 90x90x3.6 RHS

Connections.

From previous testing use max. all. load = 15 kN (D12 dowels).

$$\text{Max loading} = 15.3 \text{ kN/m}.$$

\therefore use D12 (M12) dowels.

a) say 600 as max.

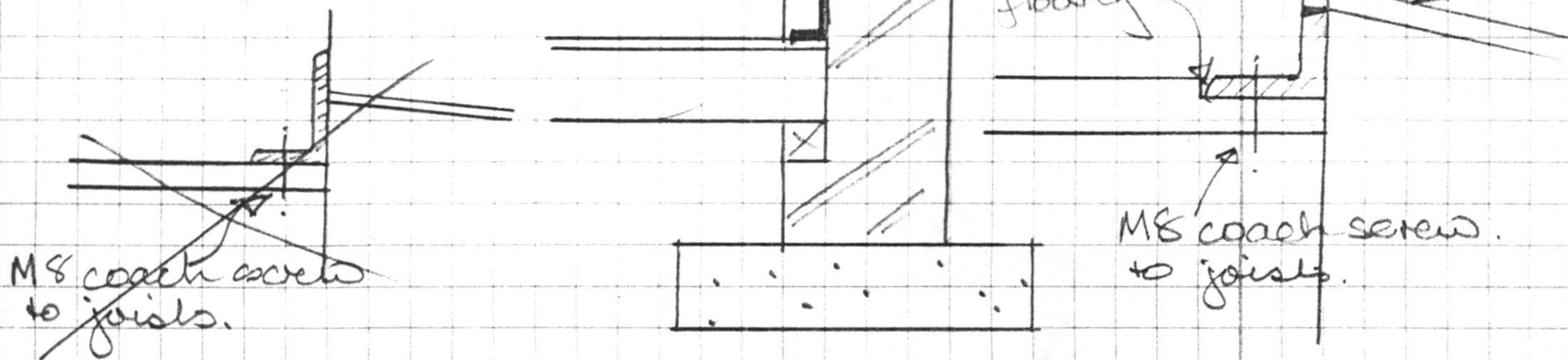


120 short.

[illegible]

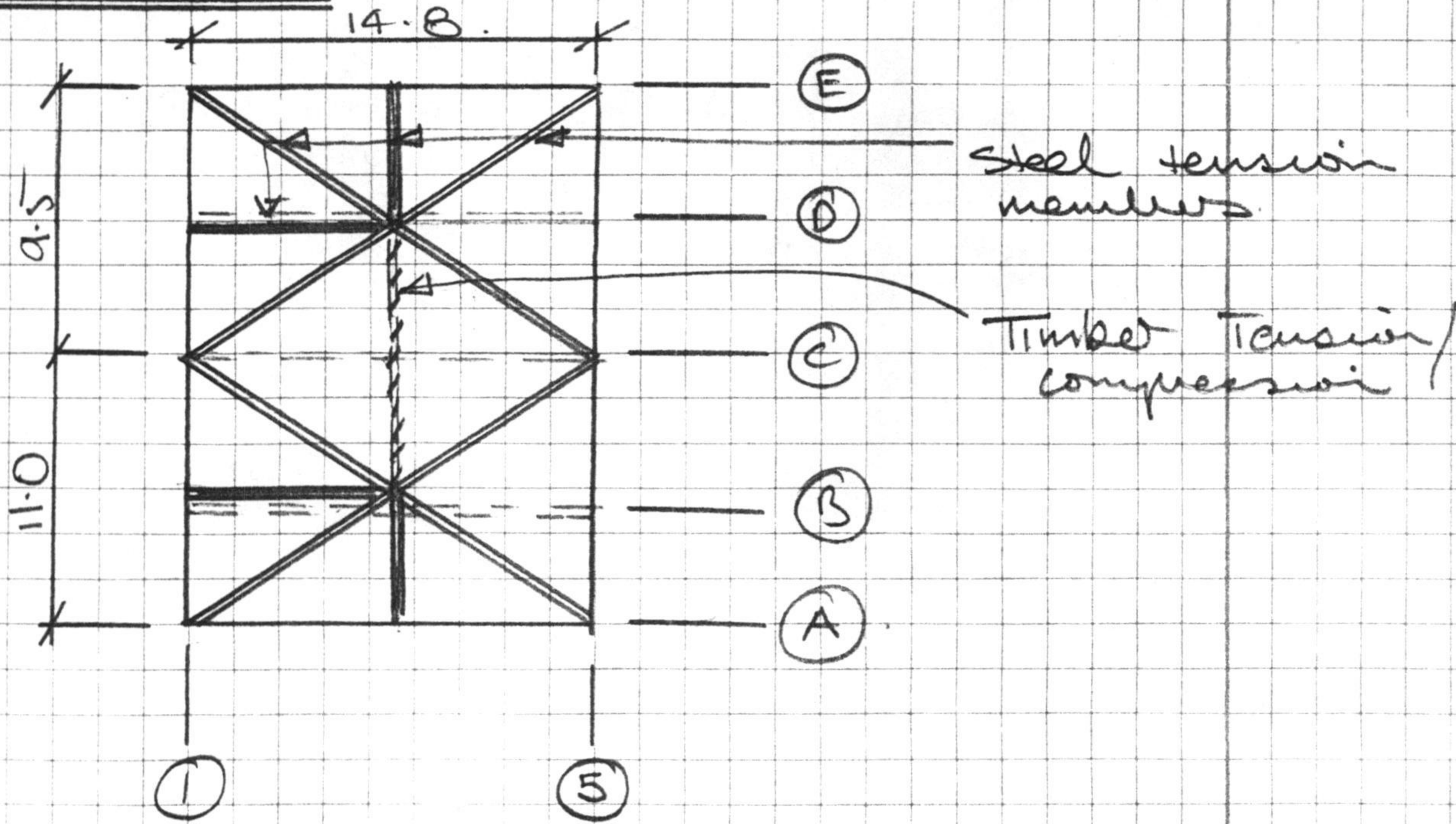
Floor trimming & Bracing

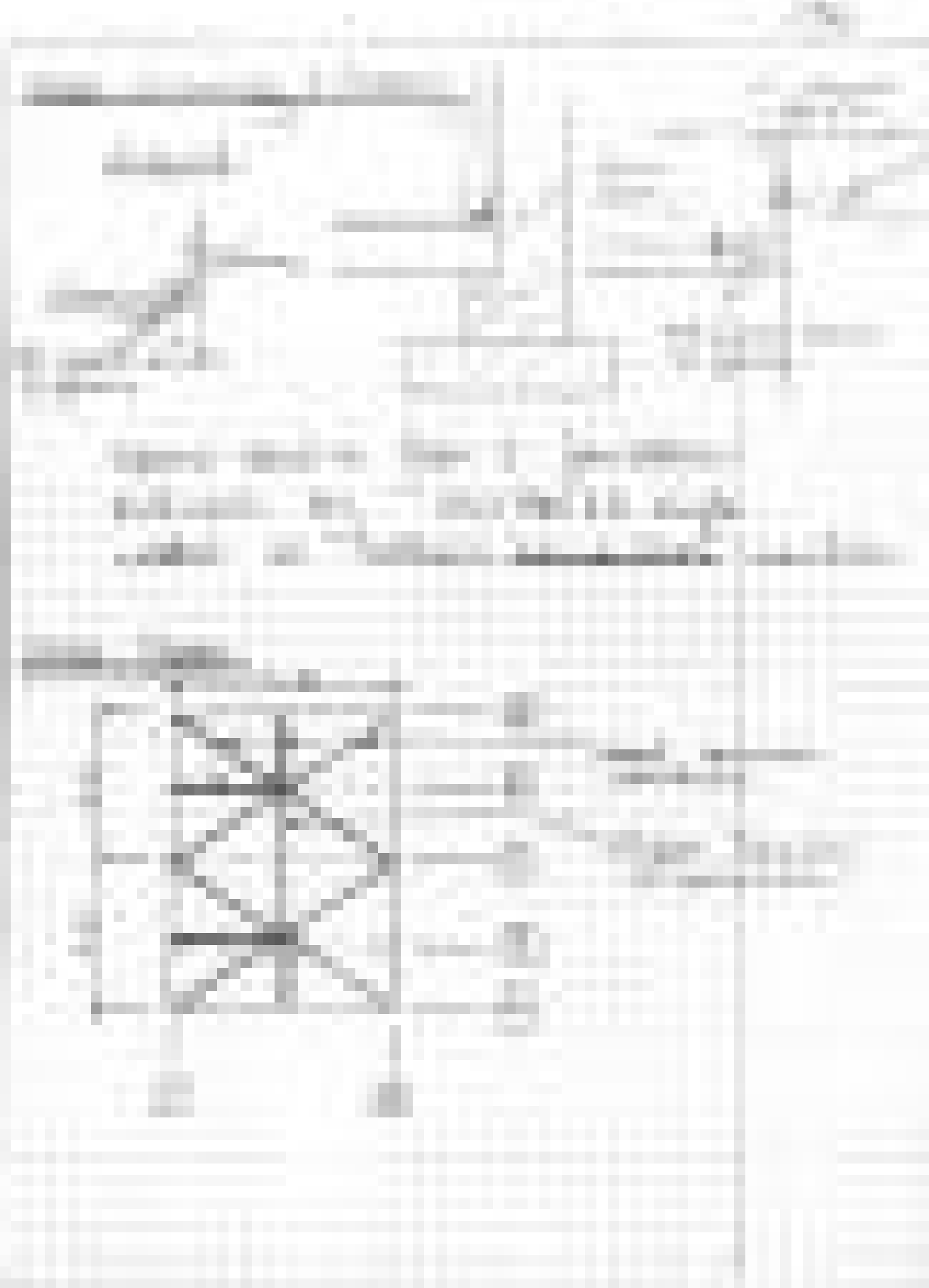
Ground:



Spread load to floor & foundation
brickwork by 102 x 76 x 6.5 angle.
welded to vertical ~~members~~ members.

First Floor:

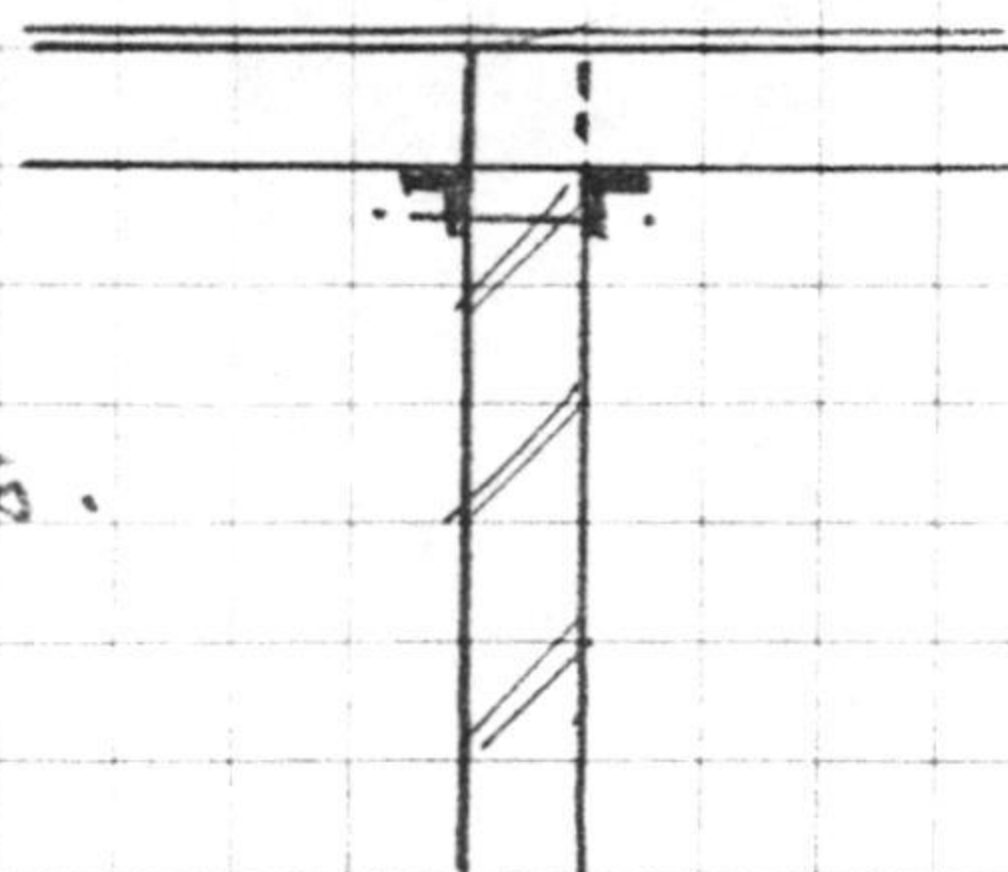




Floor Truss

Walls B, C & D.

Connect walls & vertical steel to central floor joists which transfer load to diagonal bracing.



Use angles each side - composite action.

$$\text{Span} = \frac{14.8}{2} = 7.4 \text{ m}$$

$$\text{Load} = 7 \times \frac{4.7}{2} \times \frac{1}{2.3} = 7.15 \text{ kN/m}$$

$$M = 7.15 \times \frac{7.4^2}{8} = 49 \text{ kNm}$$

$$T = C = \frac{49}{2.5} = 19.6 \text{ kN}$$

$$\text{At } F_T = F_C = 150 \text{ MPa}$$

Use 80x80x8 L.

$$\text{End reaction} = 7.15 \times \frac{7.4}{2} = 26 \text{ kN}$$

$$\text{Horizontal shear} = \frac{26}{2.5} = 10.4 \text{ kN/mm}$$

Too high.

~~See~~ Thin tops of RHS sections - with ~~the~~ 80x80x8 L and use diaphragm action to transfer load to central floor joists.

Check. Joist load: $= 26 \text{ kN} \times 3 = 78 \text{ kN}$

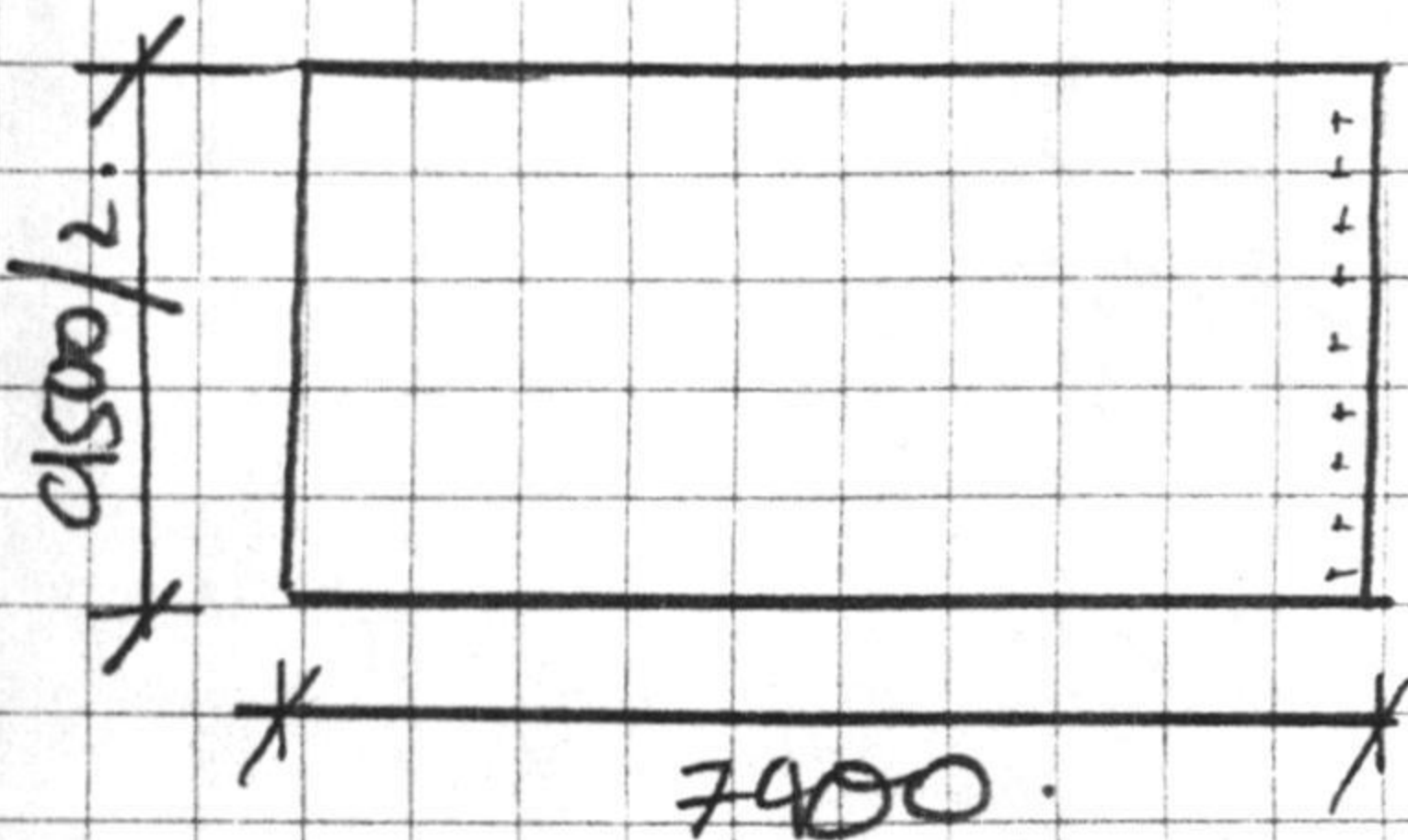
$$350 \times 57 \text{ joists: } f_{ac} = \frac{78}{35 \times 57} = 3.91 \text{ MPa} \therefore \text{OK}$$

Project Overview	
Project Name	Project Alpha
Project Manager	John Doe
Start Date	2023-01-01
End Date	2023-12-31
Project Status	In Progress
Project Budget	\$1,000,000
Project Scope	Develop a new web application for customer management.
Project Risks	High risk of budget overruns due to scope creep.
Project Deliverables	Web application, User manual, Training materials.
Project Milestones	Project Kick-off, Requirement gathering, Design, Development, Testing, Deployment.
Project Team	Project Manager, Business Analysts, Developers, QA, Support.
Project Communication	Weekly status meetings, Monthly steering committee meetings.
Project Reporting	Weekly status reports, Monthly progress reports.
Project Documentation	Project charter, Requirements document, Design document, Test plan, User manual.
Project Change Management	Change requests must be approved by the project manager and steering committee.
Project Risk Management	Risks are identified, assessed, and mitigated throughout the project lifecycle.
Project Quality Management	Quality is ensured through regular testing and reviews.
Project Stakeholder Management	Stakeholders are identified, engaged, and kept informed throughout the project.
Project Procurement Management	Procurement is managed through a formal process, including vendor selection and contract management.
Project Integration Management	Integration is managed through regular communication and collaboration between all project teams.

Walls. (A) & (E) similar. except use DRSIC under.
As is wall (1).

Diaphragm & fixing

20mm Particle board.



Max Shear =

$$\text{Load} = \frac{3.3+3.6}{2} \times 18.3/3 = 21 \text{ KN/m} \times 4.8$$

$$21 \times \frac{2.4}{2} = 78 \text{ KN}.$$

$$\frac{78000}{9500 \times 20} \times 2 = .82 \text{ MPa}.$$

$$\frac{78}{9.5} \times 2 = 16 \text{ KN/m}.$$

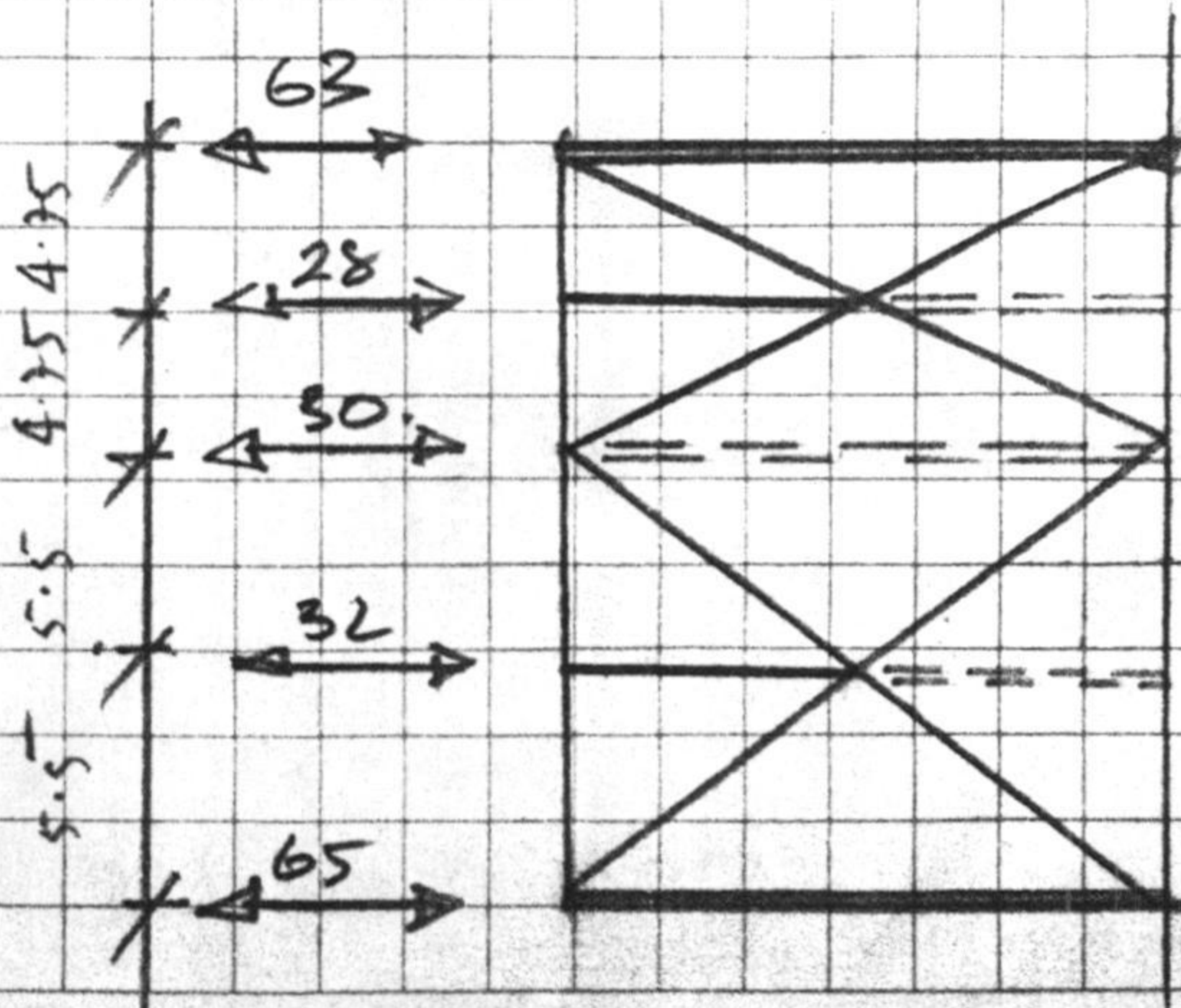
Use 4mm of nails @ $\frac{.98}{16} = 60 \text{ mm}$ centres.

Note: have used $K_x = 4.8$.

Steel Bracing

Floor weight	= particle board	= .116
	for board	= .10
	flooring	= .18
	ceiling	= .29
	joints	= .22
		<u>.90 kPa.</u>

E-W Earthquake



$$F_s = C \cdot K_x \cdot W_s$$

$$K_x = \frac{F_x}{C \cdot W_s}$$

$$= \frac{23.4}{.1 \times 40000} < 1.$$

$$\text{Use } C = .1$$

$$K = 1.0.$$



Author	Title	Page
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[Illegible]	[Illegible]	[Illegible]

Wall (E) & (A) load = $492 \times 0.1 = 49.2 \text{ kN}$.

UDL = $(290 + 470 + 161 + 322) \times 0.1 / 21.5 = 5.8 \text{ kN/m}$.

$$\begin{aligned} 49.2 + 5.8 \times \frac{9.5}{4} &= 63 \text{ kN} \\ 49.2 + 5.8 \times \frac{11}{4} &= 65 \\ 5.8 \times 4.75 &= 28 \\ 5.8 \times 5.5 &= 32 \\ 5.8 \times \frac{5.5 + 4.75}{2} &= 30 \end{aligned}$$

Line (E) & (A) ties: Have provided

102 x 51 E : $T_{all} = 1330 \times 0.2 = 266 \text{ kN}$.

Lines (B) (C) & (D) Compression.

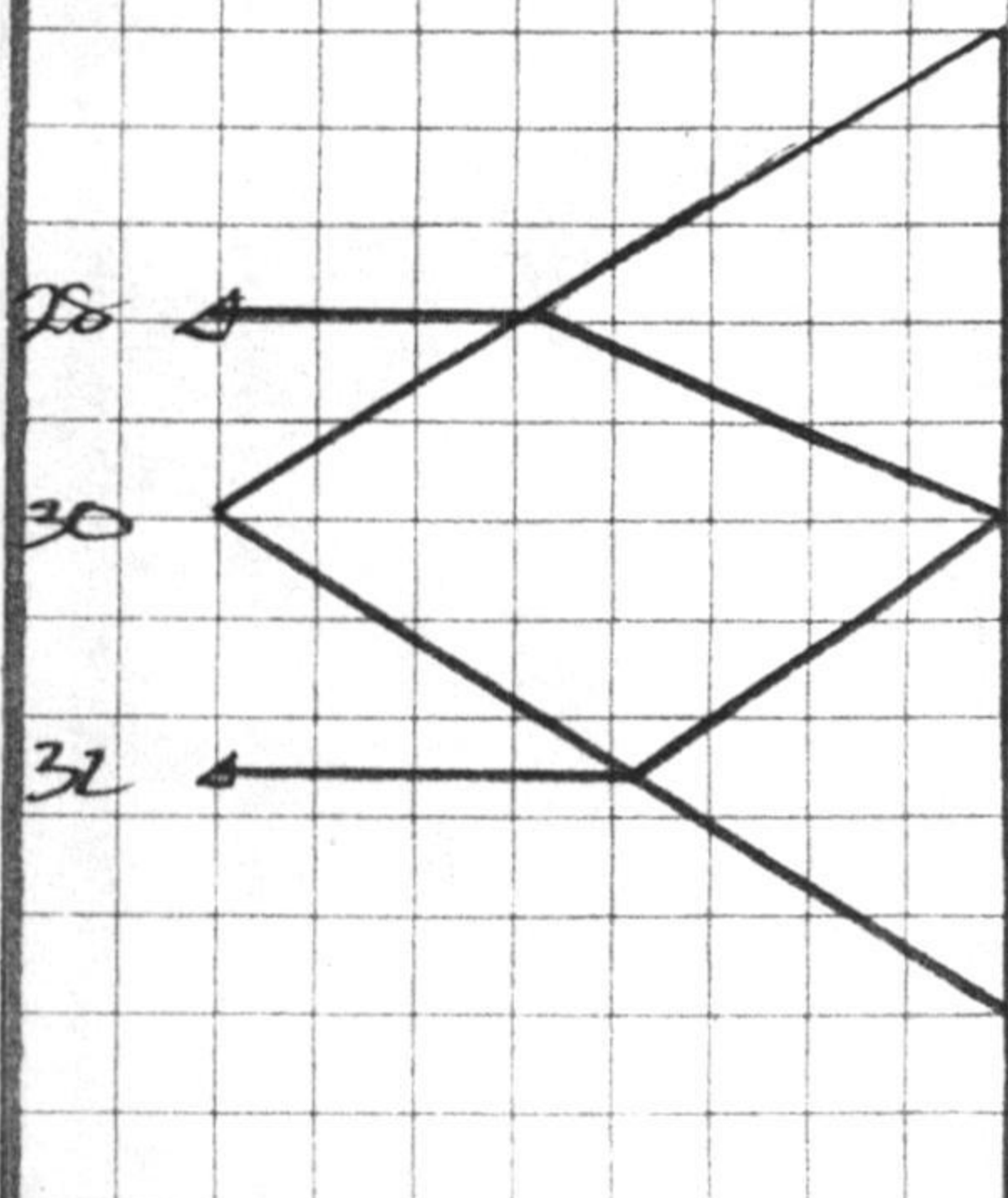
Max C = 32 kN.

a) $F_{ac} = 1.5 \times 7.1 = 10.65 \text{ MB}$.

need 3004 mm^2 .

Use 150 x 50 timber blocking.

Bracing



Max Tie force

$$\leftarrow \left(32 + \frac{30}{2} \right) \times \frac{\sqrt{5.5^2 + 7.1^2}}{7.4} \quad (9.22)$$

$$= 58 \text{ kN}$$

\therefore need $\frac{58}{0.2} = 292 \text{ mm}^2$ steel.

30 x 10 R
or 60 x 5 R.

Max reactions

Line.

A
C
E

65
63

39
20 + 20
39

1888

1888

1888

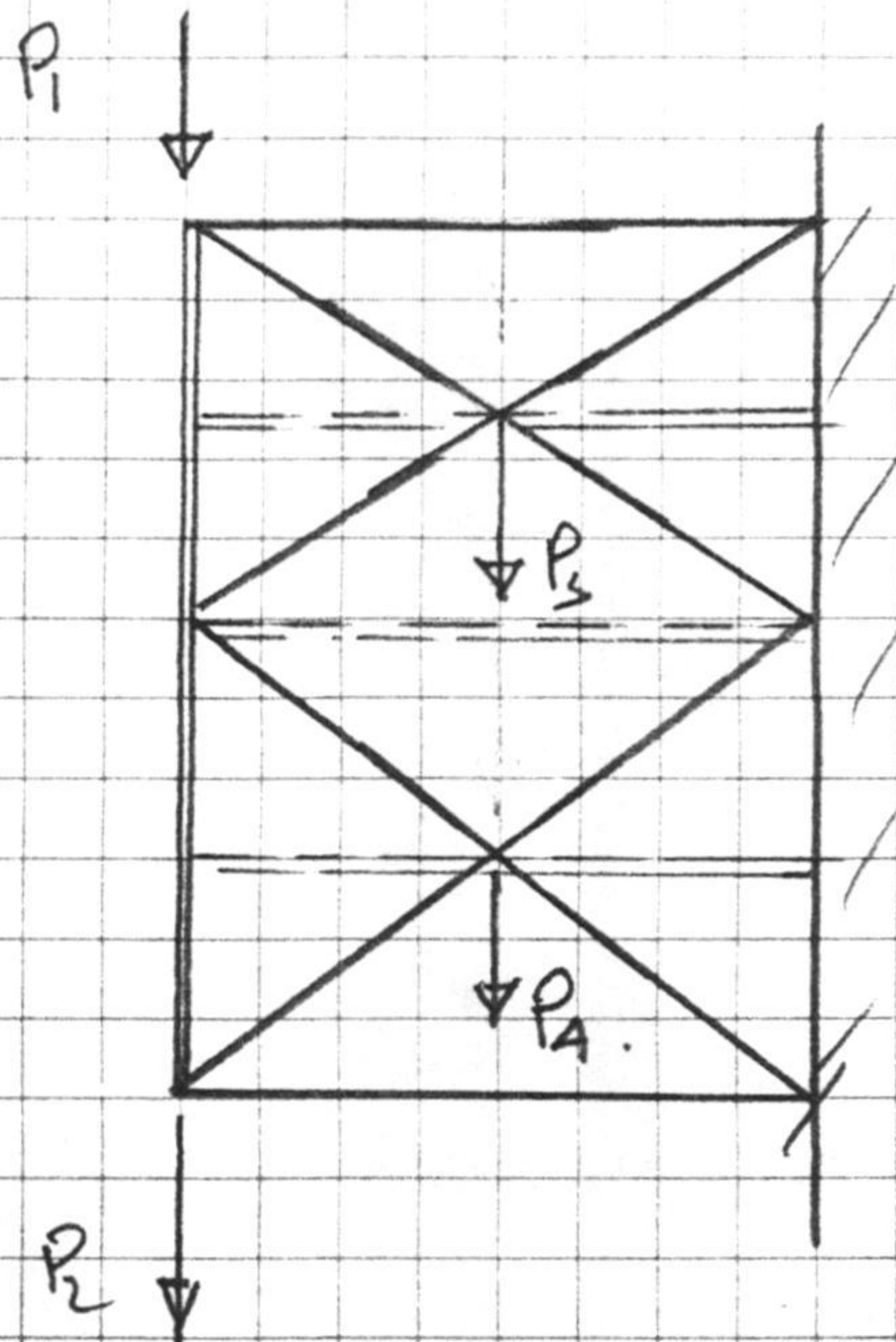
1888

1888

1888

North South E'Quake

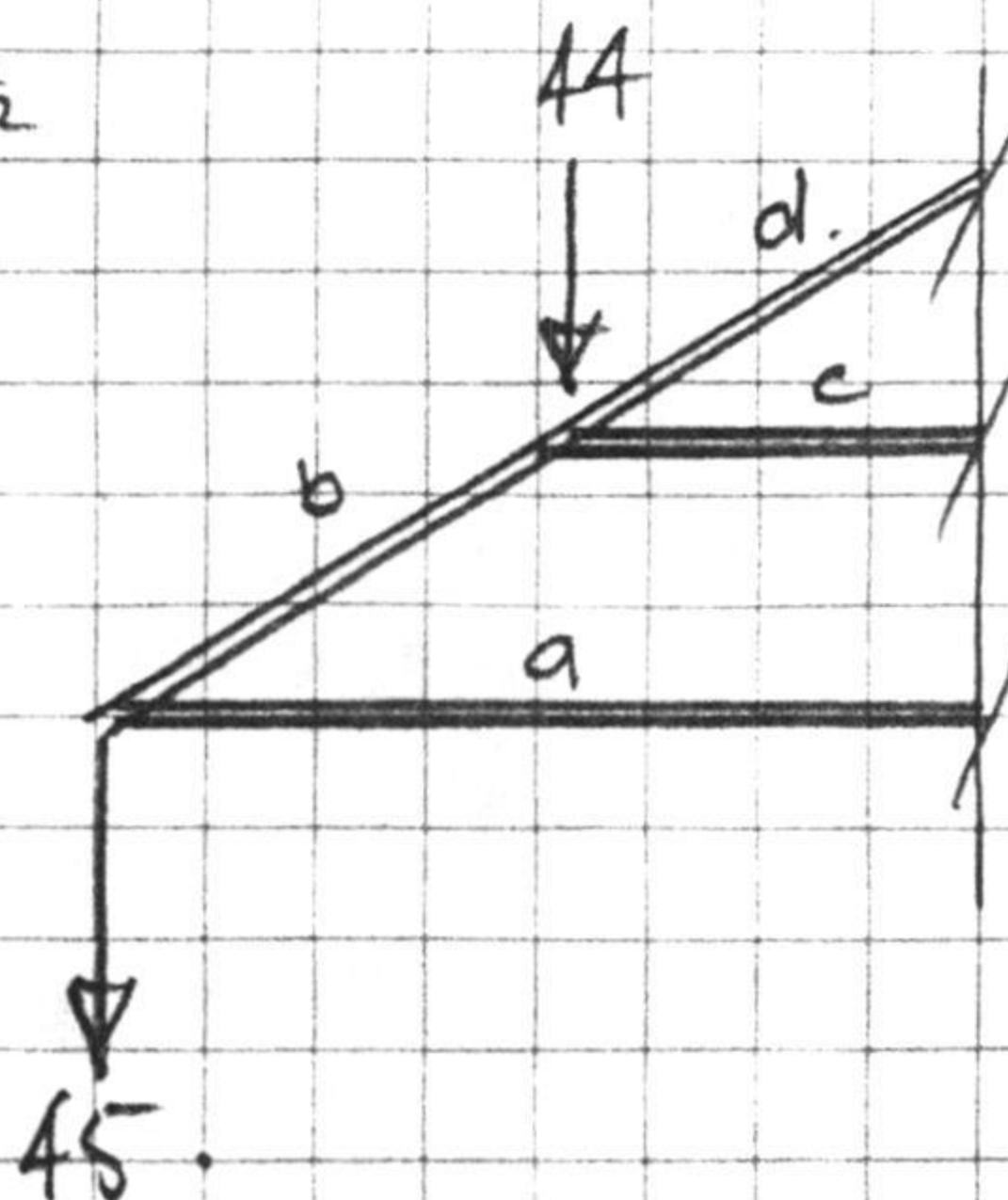
Note use 2nd floor E'Quake loads to maximum design.



$$P_1 = P_2 = \text{wall ①} + \text{walls ④ \& ⑤} + \text{floor } \frac{(322+161+290)}{14.8} \times \frac{14.8}{4} \times \frac{1}{2} = 45 \text{ kN.}$$

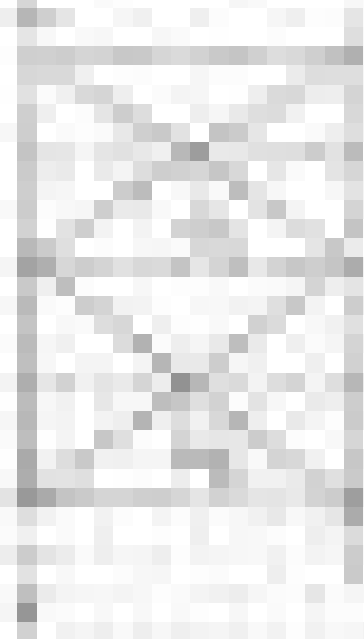
$$P_2 = P_3 = \text{Walls ④ \& ⑤} + \text{floor } \frac{12.3 \times 2}{9.7 \times 2} = 44.0 \text{ kN.}$$

$$(4.75^2 + 7.42^2)^{1/2} = 8.72$$



Member.	Force.
c	70
a	69
b	83
d	165

THE [illegible] OF [illegible]



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$$T = 83 \text{ kN} \quad A = \frac{83}{2} = 415 \text{ mm}^2 \quad : 50 \times 10 \text{ PL}$$

$$T = 165 \text{ kN} \quad : 100 \times 10 \text{ PL}$$

$$C = 70 \text{ kN}$$

$$F_{ac} = 10.65 \text{ MPa} \quad \therefore A = 6572$$

Use 150x100 blocking.

Reactions

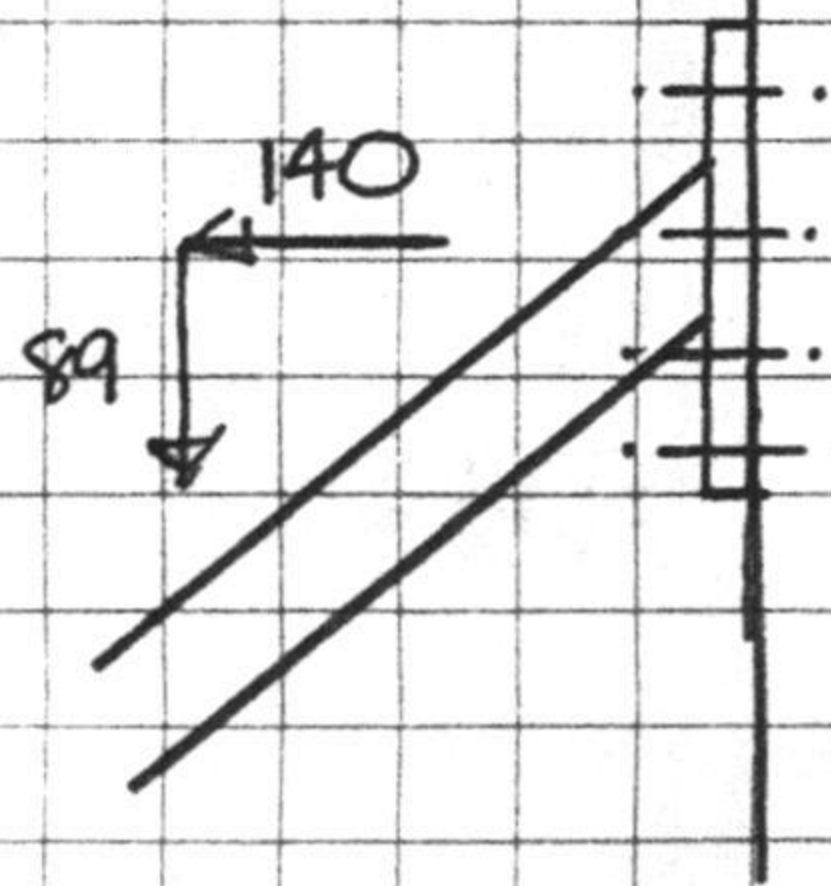


Welding

Using 8 mm FW
need $\frac{165}{0.77}$

= 214 mm weld.

\therefore Butth weld end
Plate.



Say have 8 bolts.

6 - M 20. bolts.

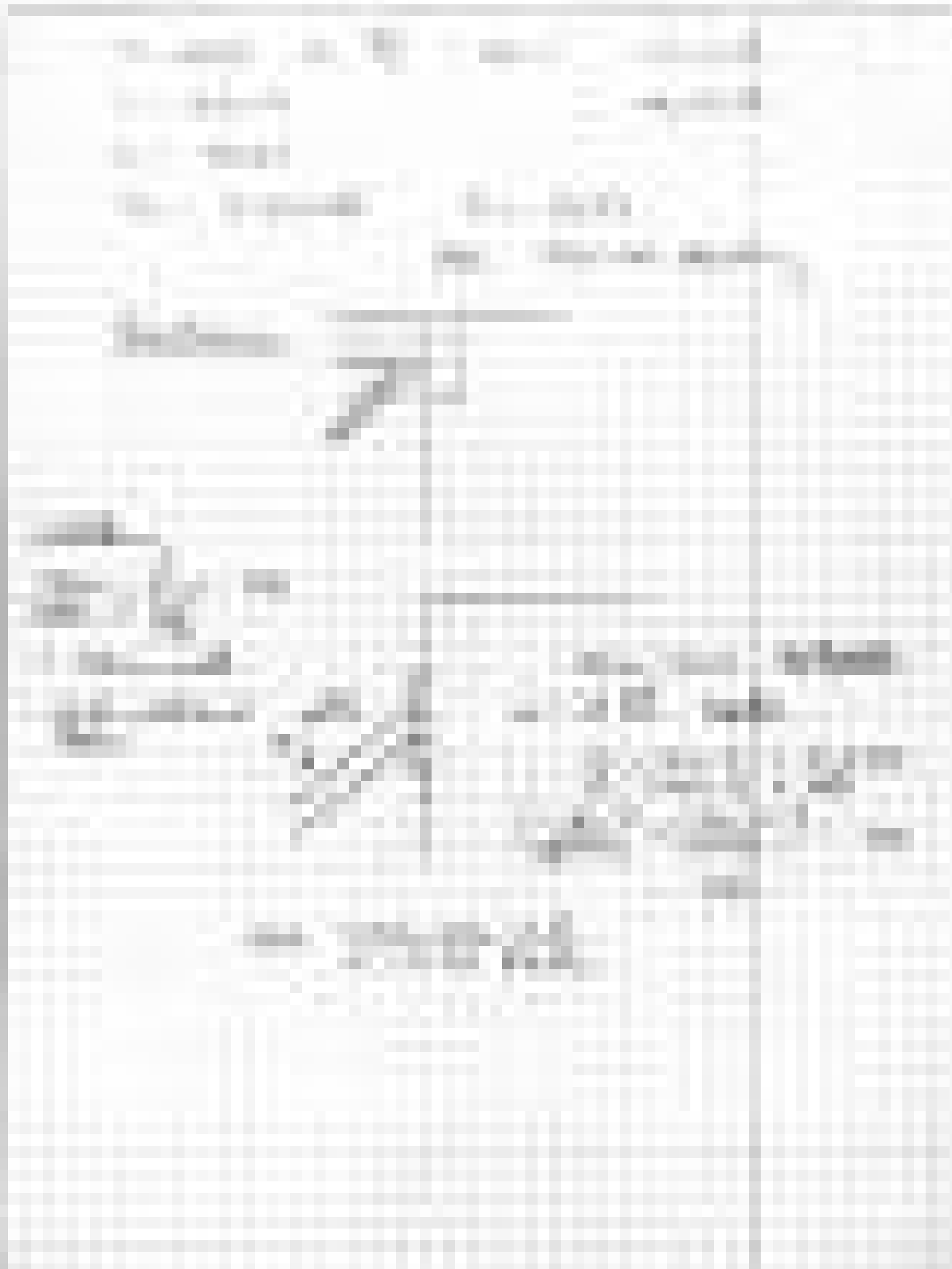
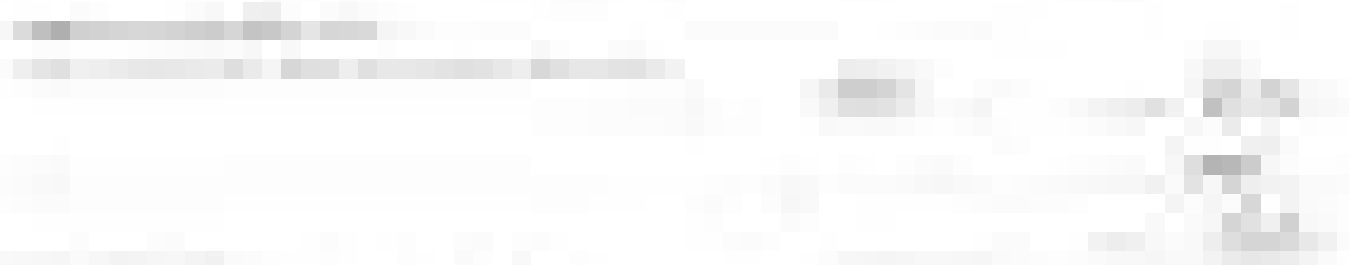
$$F_v = 18 \times 1.2 = 21.6 \text{ kN}$$

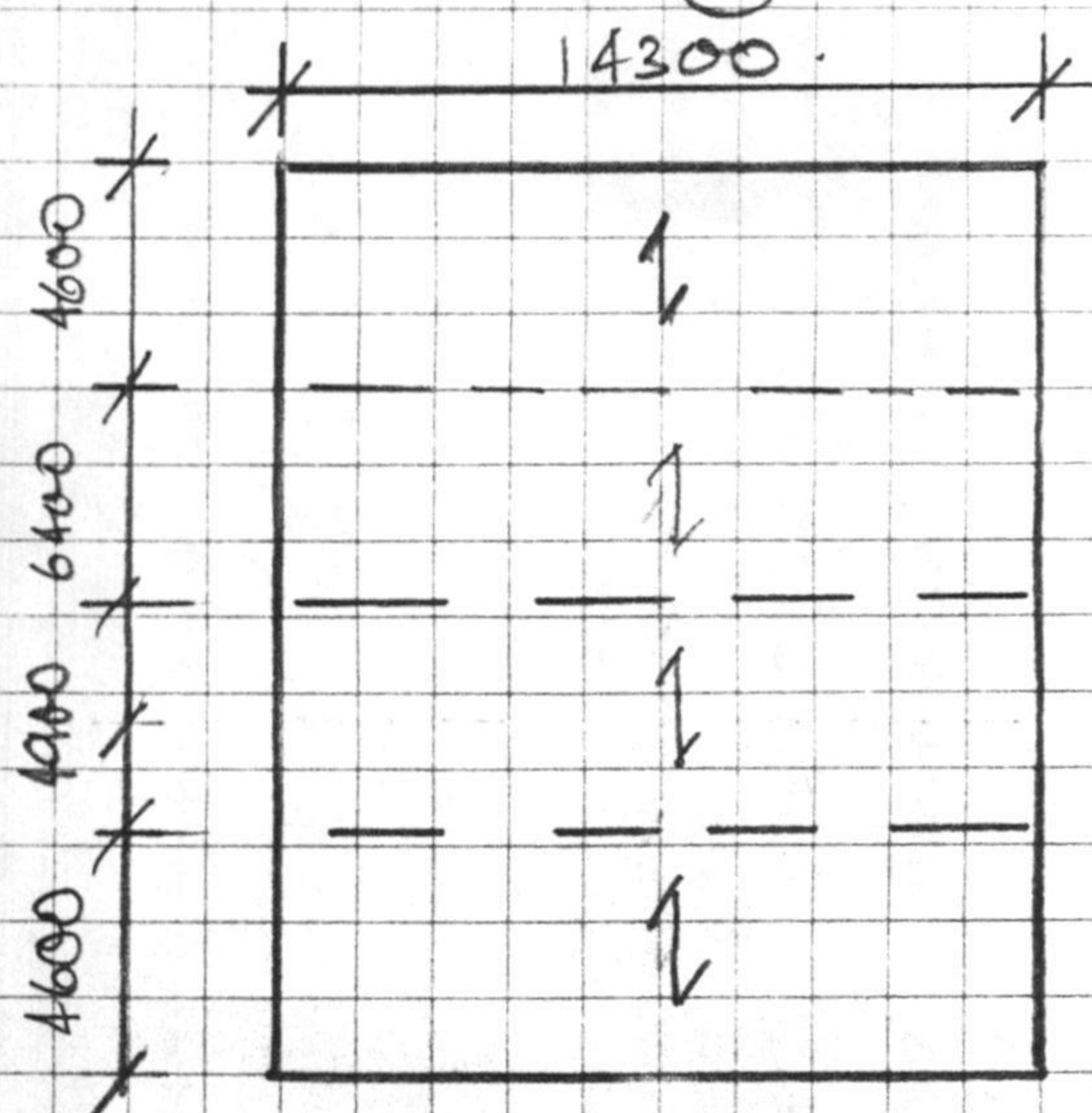
$$F_t = 35 \times 1.33 = 47$$

$$\left(\frac{89}{6 \times 21.6} \right)^2 + \left(\frac{140}{6 \times 47} \right)^2 = 0.847$$

\therefore OK.

Use 200x150x10 PL.
6 - M 20 Bolts.



Second Floor StrengtheningReplacement of Support Columns.

Dead :

Particle Board	=	0.14 kPa
Roofboard	=	0.13
Joists	=	0.19
Joists	=	0.27
Ceiling	=	0.26
	Σ	= 0.98 kPa

Live : = 3.0 kPa

Consider using a pair of beams :

Max. $W = 3.98 \times \left(\frac{6.4 + 4.9}{2} \right) + 2 \times 1 = 24.5 \text{ kN/m}$
 (Σ load = 350 kN)

Try ~~2~~ 2x 530 UB 92's

$Z = 2080 \times 2 \text{ cm}^3$
 $I = 554 \text{ cm}^4 \times 2$
 $r_y = 45.1$
 $r_x = 34.1$

$$W = 398 \times \left(\frac{6.4 + 4.6}{2} \right) + 2 \times 1 = 23.9 \text{ kN/m}$$

$$(\times 14.3 = 342 \text{ kN})$$

$$M = 23.9 \times \frac{14.3^2}{8} = 611 \text{ kNm}$$

2 beams @ 306 kNm each

@ $F_{bc} = 150 \text{ MPa}$

$$\text{Require } Z = 2036 \text{ cm}^3$$

$$\text{For } S_{lim} \leq 25 \text{ mm } (.0017L)$$

$$I \geq \frac{5 \times 3 \times 5.5 \times 14300^4}{384 \times 2 \times 2.1 \times 10^6 \times 25}$$

$$= 856 \text{ E6 mm}^4$$

610 UB125 available

$$I = 986 \text{ E6 mm}^4$$

$$Z = 3222 \text{ cm}^3$$

$$\frac{D}{T} = 81.2$$

$$\frac{T}{t} = \frac{19.6}{11.9} < 2.0$$

$$\frac{d_1}{t} = \frac{547}{11.9} = 46 < 85$$

THE HISTORY OF THE

REIGN OF

CHARLES THE FIRST

BY

JOHN BURNET

OF THE UNIVERSITY OF OXFORD

IN TWO VOLUMES

THE FIRST

VOLUME

1685

1685

1685

1685

1685

1685

1685

1685

1685

1685

1685

labrally restrain @ 2920 mm

$$M = 24.5 \times \frac{14.3^2}{8} = 626 \text{ KNm}$$

$$f_{bc} = \frac{626}{2 \times 2080} = 150 \text{ MPa}$$

$$\delta_{lve} = \frac{5 \times 3 \times 5.65 \times 14300^4}{384 \times 2.1 \times 10^5 \times 2 \times 554 \text{ EG}}$$

$$= 39.7 \text{ mm} = 0.0028 L \left(\frac{L}{360} \right)$$

$$\delta_{o+l} = 0.0028 \times \frac{24.5}{3 \times 5.65} = 0.004 L \left(\frac{L}{250} \right)$$

If restrict δ_{lve} to 25 mm

$$\text{Require } I = \frac{24.5 \times 5.65 \times 14.3^3}{2 \times 0.337} \times \frac{572}{500}$$

$$= 841 \text{ cm}^4 \text{ EG mm}^4$$

610 UB 113.

Use 610 UB 125.

$$\delta_{lve} = \frac{841}{985} \times 25 = 21.3 \text{ mm}$$

$$\times \frac{5.65}{5.65} = 20.8 \text{ mm}$$

100 mm long by 20 thick flange R.

$$\text{Swist Beamy} = 126 + 2.26 \times 100 + 20 \times 3.92$$

$$= 126 + 226 + 78 = 430 \text{ KN}$$

Consider removing replacing East col. of middle row.

$$\text{Span} = 7.0 \text{ m}$$

$$\text{Load} = \frac{24.5 \times 7}{3 \times 5.65 \times 7} = 172 \text{ KN} \quad (= 86/\text{beam})$$

310 UB 46.

$$f_{bc} = \frac{150}{0.648 \times 2} = 116 \text{ MPa}$$

<p>1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for ensuring the integrity of the financial data and for providing a clear audit trail.</p> <p>2. The second part of the document outlines the specific procedures for recording transactions. It details the steps involved in entering data into the system, including the use of standardized codes and the requirement for double-checking entries.</p> <p>3. The third part of the document describes the various reports that can be generated from the system. These reports provide a comprehensive overview of the financial performance and help in identifying trends and anomalies.</p> <p>4. The fourth part of the document discusses the security measures in place to protect the data. It highlights the importance of user access controls and the regular backup of data to prevent loss.</p> <p>5. The fifth part of the document provides a summary of the key findings and recommendations. It suggests areas for improvement and provides a timeline for implementing the recommended changes.</p>	<p>Page 1 of 1</p>
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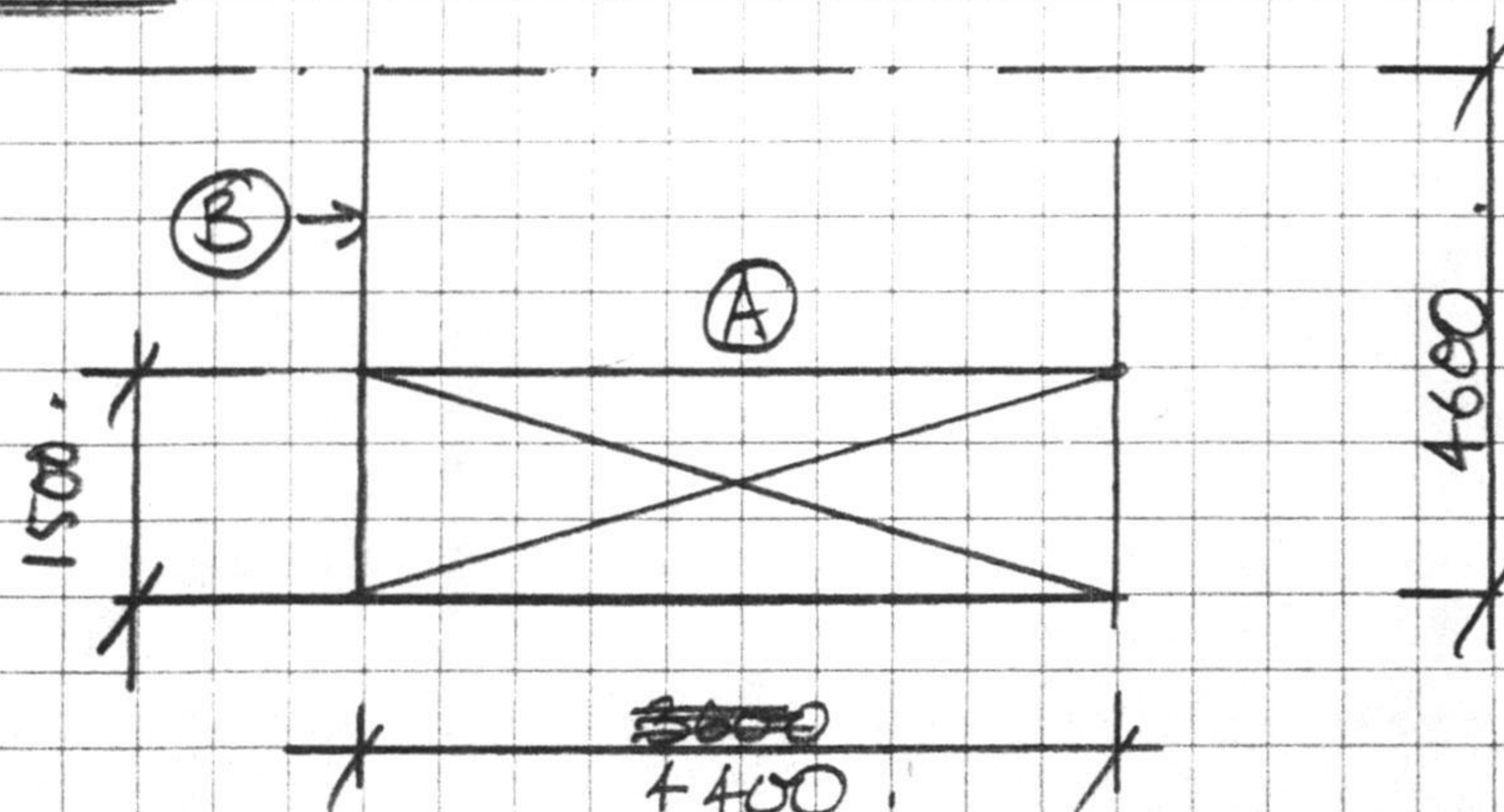
$$\begin{aligned} I_{live} &= \frac{5 \times 3 \times 5.65 \times 7000^4}{384 \times 2.1 \times 10^6 \times 2 \times 99.5 \times 10^6} \\ &= 12.7 \text{ mm} \quad (= .00181 L) \quad \left(\frac{L}{570} \right) \end{aligned}$$

Table 1: Summary of Data	
Category	Value
Item 1	10
Item 2	20
Item 3	30
Item 4	40
Item 5	50
Item 6	60
Item 7	70
Item 8	80
Item 9	90
Item 10	100
Item 11	110
Item 12	120
Item 13	130
Item 14	140
Item 15	150
Item 16	160
Item 17	170
Item 18	180
Item 19	190
Item 20	200
Item 21	210
Item 22	220
Item 23	230
Item 24	240
Item 25	250
Item 26	260
Item 27	270
Item 28	280
Item 29	290
Item 30	300
Item 31	310
Item 32	320
Item 33	330
Item 34	340
Item 35	350
Item 36	360
Item 37	370
Item 38	380
Item 39	390
Item 40	400
Item 41	410
Item 42	420
Item 43	430
Item 44	440
Item 45	450
Item 46	460
Item 47	470
Item 48	480
Item 49	490
Item 50	500
Item 51	510
Item 52	520
Item 53	530
Item 54	540
Item 55	550
Item 56	560
Item 57	570
Item 58	580
Item 59	590
Item 60	600
Item 61	610
Item 62	620
Item 63	630
Item 64	640
Item 65	650
Item 66	660
Item 67	670
Item 68	680
Item 69	690
Item 70	700
Item 71	710
Item 72	720
Item 73	730
Item 74	740
Item 75	750
Item 76	760
Item 77	770
Item 78	780
Item 79	790
Item 80	800
Item 81	810
Item 82	820
Item 83	830
Item 84	840
Item 85	850
Item 86	860
Item 87	870
Item 88	880
Item 89	890
Item 90	900
Item 91	910
Item 92	920
Item 93	930
Item 94	940
Item 95	950
Item 96	960
Item 97	970
Item 98	980
Item 99	990
Item 100	1000

2nd Floor Bracing

Identical to 1st Floor but
check realignment for stair opening.

Stair Trim



Trim Beam (A):

$$\begin{aligned} \text{Dead:} & \quad \text{Floor } 1 \times \frac{3.1}{2} = 1.6 \text{ kN/m} \\ & \quad \text{Partition } .5 \times 3.5 = 1.75 \\ & \quad \quad \quad = 3.35 \text{ kN/m} \end{aligned}$$

$$\text{Live } 3.0 \times \frac{3.1}{2} = 4.65 \text{ kN/m}$$

$$\text{Load} = 7.95 \text{ kN/m}$$

$$M = 19.2 \text{ kNm}$$

Try 300 x 100 green ganged.

$$Z = 1354 \text{ cm}^3$$

$$I = 199.1 \text{ E6 mm}^4$$

$$F_{bc} = 6 \times 1.25 = 7.5 \text{ MPa}$$

$$E = 20000 \text{ MPa}$$

$$f_{bc} = \frac{17.7}{1.354} = 13 \text{ MPa}$$

Try Steel.

$$F_{bc} = 150 \text{ MPa}$$

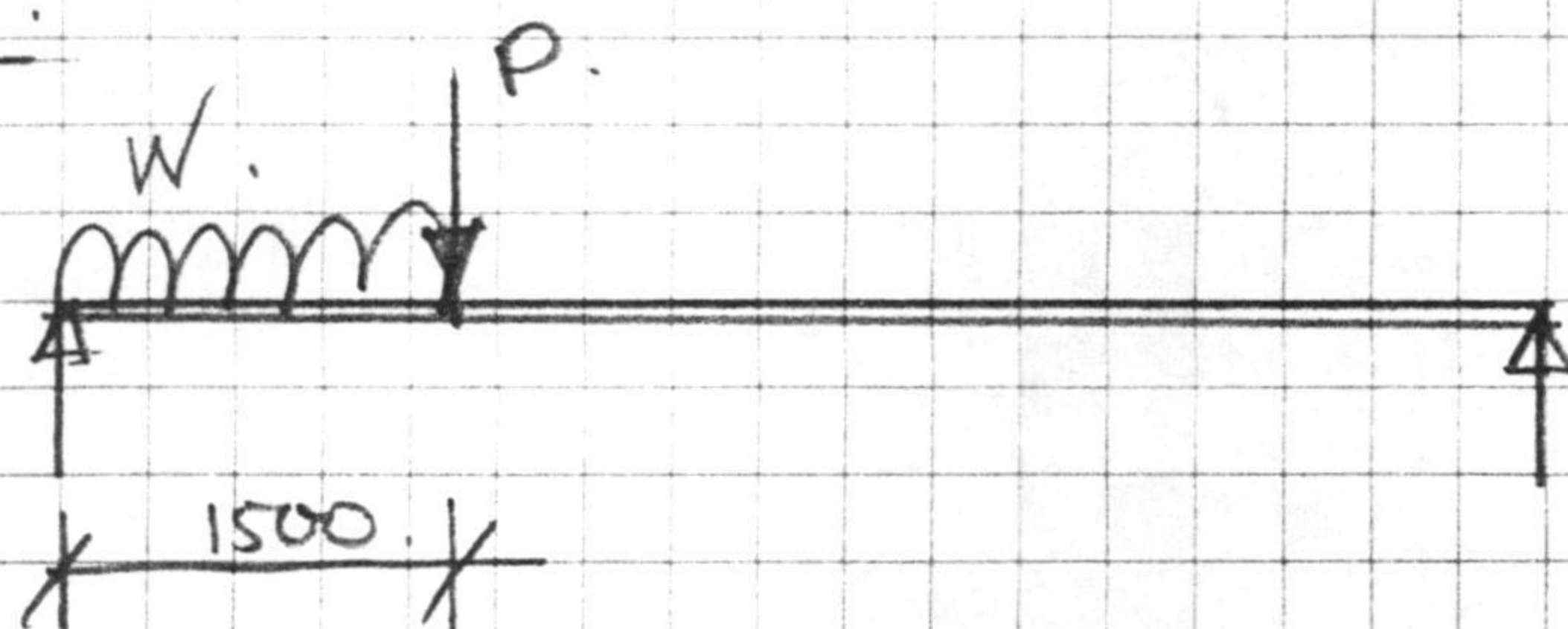
$$Z = 118 \text{ cm}^3$$

178 x 76 MSF

$$\text{Live } \delta = \frac{5 \times 6.9 \times 3600^4}{384 \times 2.1 \times 10^5 \times 13.6 \times 10^6} = 5.4 \text{ mm.}$$

$$= 0.0015 L.$$

Beam (B).



$$P = \frac{7.95 \times 4.4}{3.85} = 17.5 \text{ kN}$$

$$W = \text{slabs} = (1+3) \times \frac{5.7}{2} = 11.4 \text{ kN/m}$$

$$R_L = \frac{(17.5 \times 3.1 + 11.4 \times 1.5 \times 3.85)}{4.6} = 25.6 \text{ kN. } 26 \text{ kN}$$

$$\text{max } M = (25.6 \times 1.5) - (9.8 \times \frac{1.5^2}{2}) = 27 \text{ kNm.}$$

$$\text{requi } Z = \frac{27}{1.5} = 182 \text{ cm}^3$$

Use 203 x 76 MS L.

$$\text{Max } C_c = 29.8 \text{ kN.}$$

$$\text{Span} = 4.8 \text{ m (max).}$$

$$F_c = 7.1 \times 1.5 \times K_8 \text{ MPa.}$$

100 wide timber

$$\frac{da}{a} = \frac{4800}{100} = 48.$$

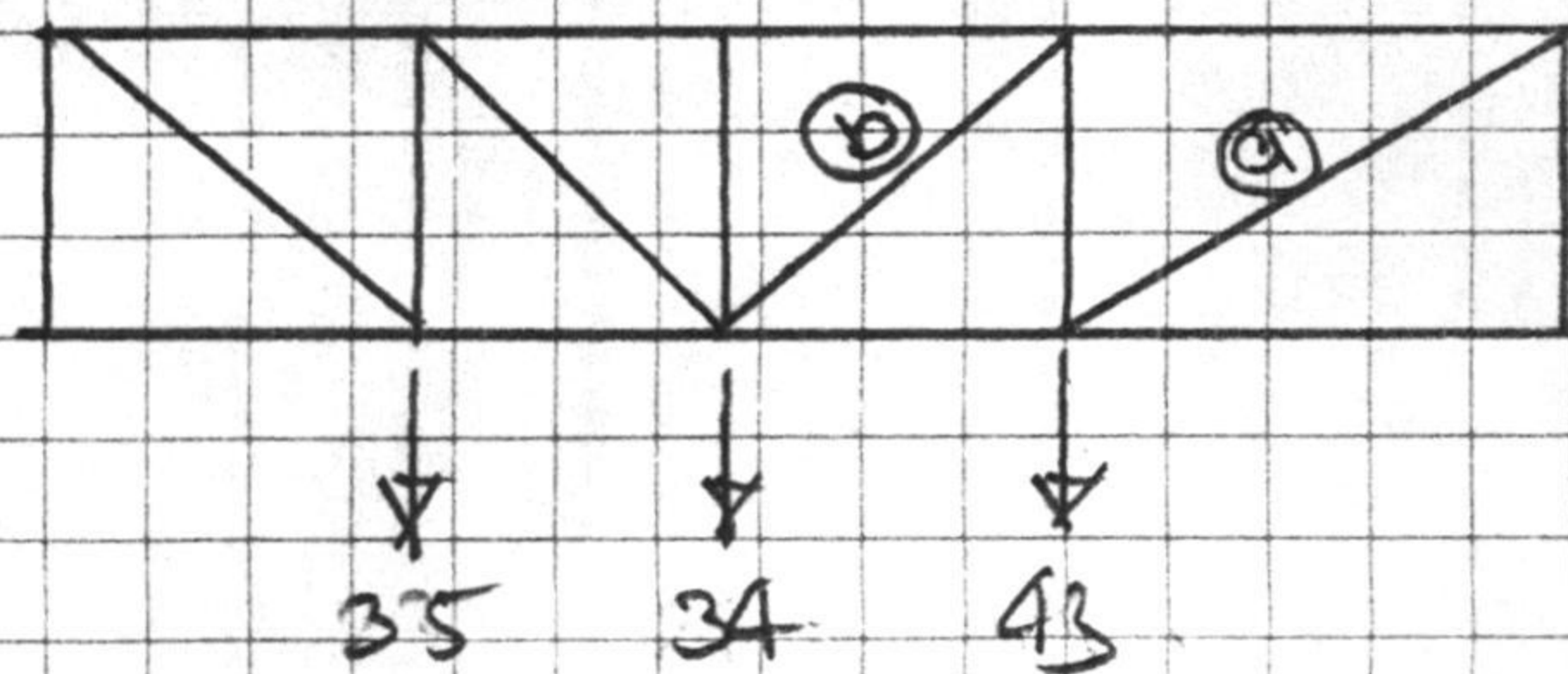
$$K_8 = .16.$$

$$\therefore \text{Require } d = \frac{29800}{.16 \times 7.1 \times 1.5 \times 100} = 174$$

Use 200x100 Blocking.

North South.

South end Truss.



2 walls

$$P = 2 \times \frac{18}{5} \times S + 11.8 \times \frac{21.5}{5 \times 14.8} \times S = 10.7 S \text{ kN.}$$

$$S: \quad 3.2 \text{ m} \quad 3.3 \text{ m} \quad 4 \text{ m.}$$

$$P: \quad 24 \quad 35 \quad 43$$

$$R_L = (35 \times 11.2 + 34 \times 8 + 43 \times 9.8) / 14.6$$

$$= 59.6 \text{ kN}$$

$$R_R = 112 - 59.6 = 52.4 \text{ kN.}$$

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the integrity of the financial system and for the ability to detect and prevent fraud.

2. The second part of the document outlines the specific procedures for recording transactions. It details the steps involved in the accounting process, from the initial entry of data into the system to the final review and approval of the records.

3. The third part of the document describes the various methods used to ensure the accuracy and reliability of the records. This includes the use of internal controls, such as segregation of duties and independent verification, as well as external audits to provide an objective assessment of the system's performance.

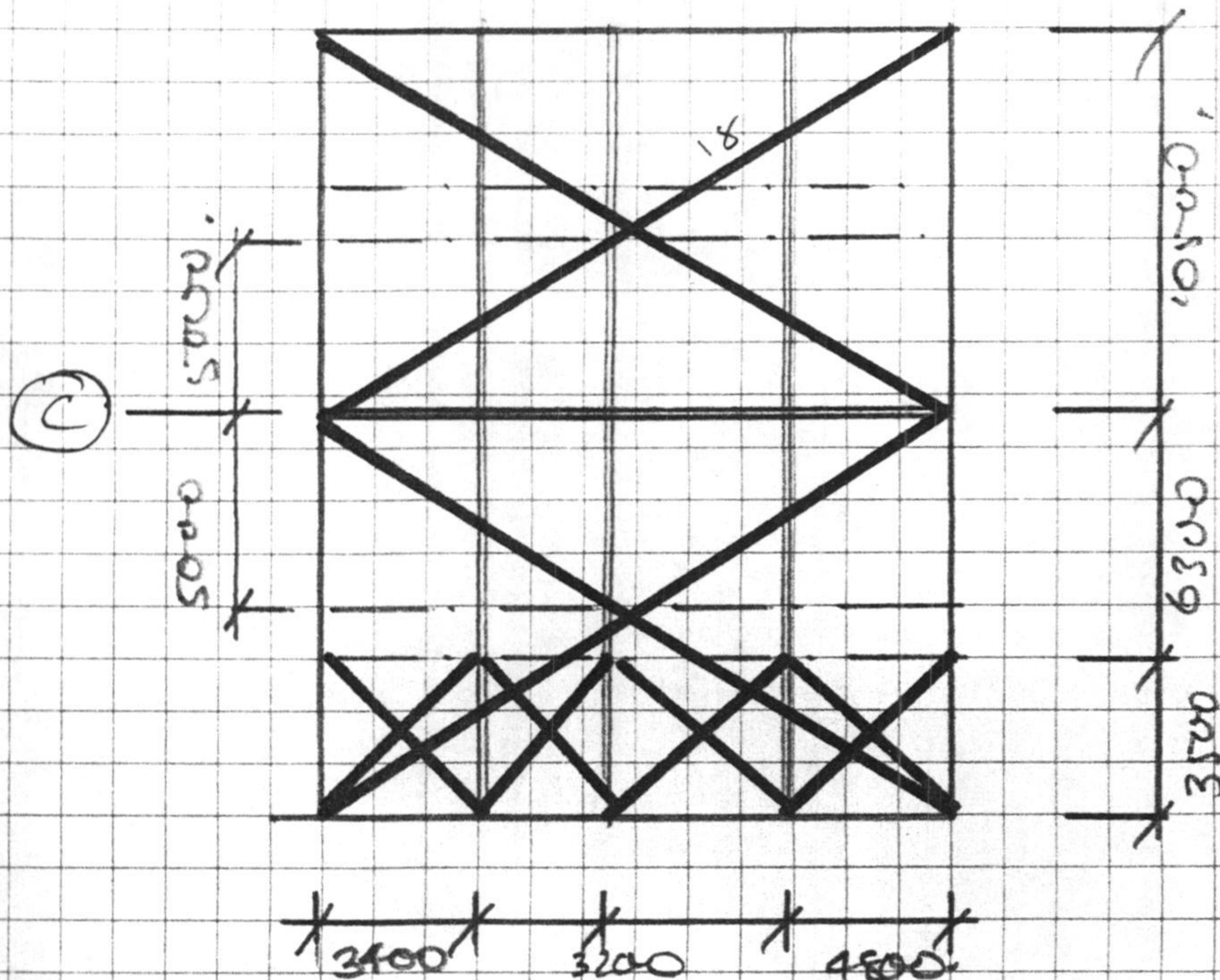
4. The fourth part of the document discusses the role of technology in modern accounting systems. It highlights the benefits of using computerized systems to automate routine tasks and to provide real-time access to financial data.

5. The fifth part of the document addresses the challenges faced by organizations in implementing and maintaining effective accounting systems. It discusses the importance of ongoing training and education for staff, as well as the need for regular updates to the system to keep it current with changing regulations and business needs.

6. The sixth part of the document provides a summary of the key points discussed in the previous sections. It reiterates the importance of accurate record-keeping and the need for a robust system of internal controls to ensure the integrity of the financial data.

7. The seventh part of the document concludes with a statement of the author's commitment to the highest standards of professional conduct and to the ongoing improvement of the accounting system.

Roof Bracing



East - West

Load Grid (C)

$$K_x = \frac{540}{4098} = 0.133$$

$$P = 0.133 \times (2.5 \times 24 \times 22 + \frac{3.5}{2} \times 36 \times 22) \times 5 = 18 \text{ kN}$$

$$+ \text{roof} \quad 1.2 \times 5 \times 14.8 \times 0.133 = 11.8$$

$$\underline{29.8 \text{ kN}}$$

Tension: $T = 29.8 \times \frac{\sqrt{14.6^2 + 10.5^2}}{14.6} = 51 \text{ kN}$

$$\frac{51}{0.2} = 255 \text{ mm}^2$$

$$25 \times 10 \text{ R } (50 \times 5 \text{ R})$$

$$\textcircled{a} \quad T = 52.4 \times \frac{\sqrt{4.8^2 + 3.5^2}}{3.5} = 88.6$$

$$A = \frac{88.6}{1.2} = 443$$

50x10 R

\textcircled{b} use 50x10R also.

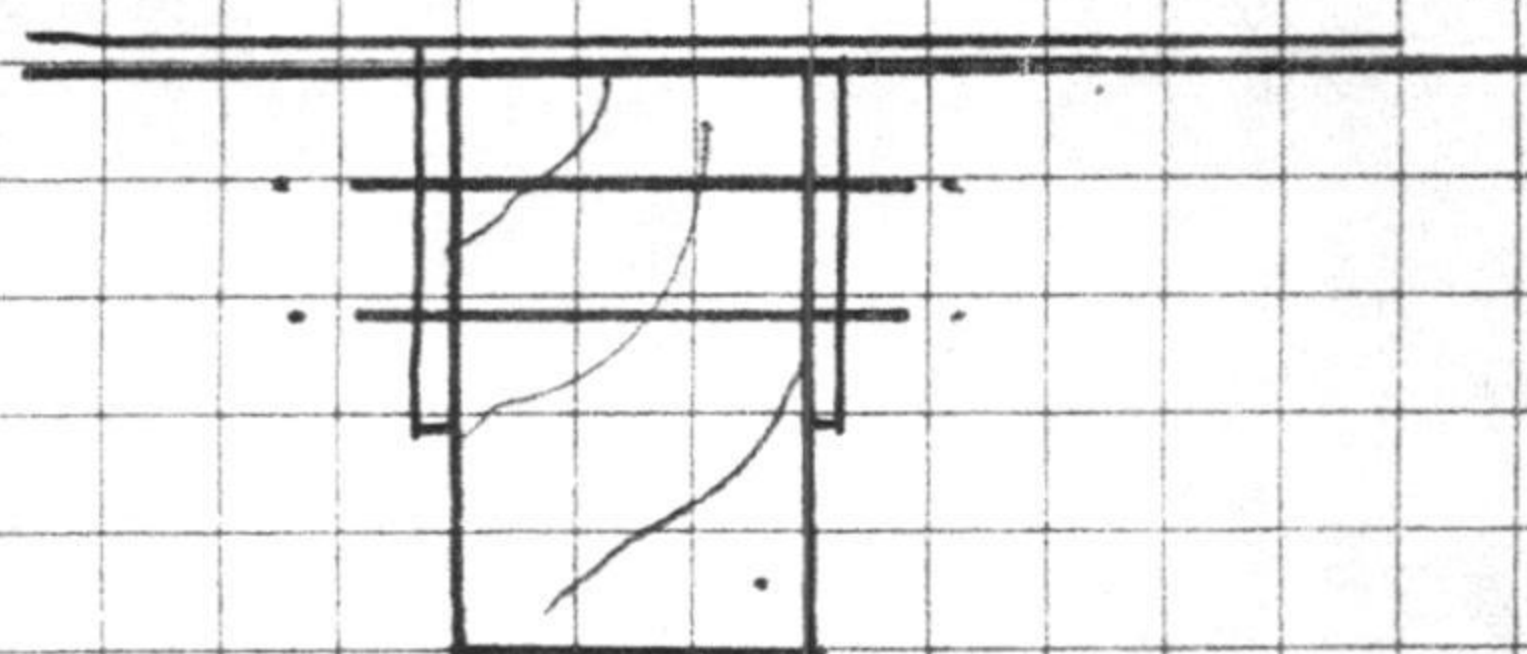
Thuss bottom chords to take Compression.

Max Tie/Spurl load.

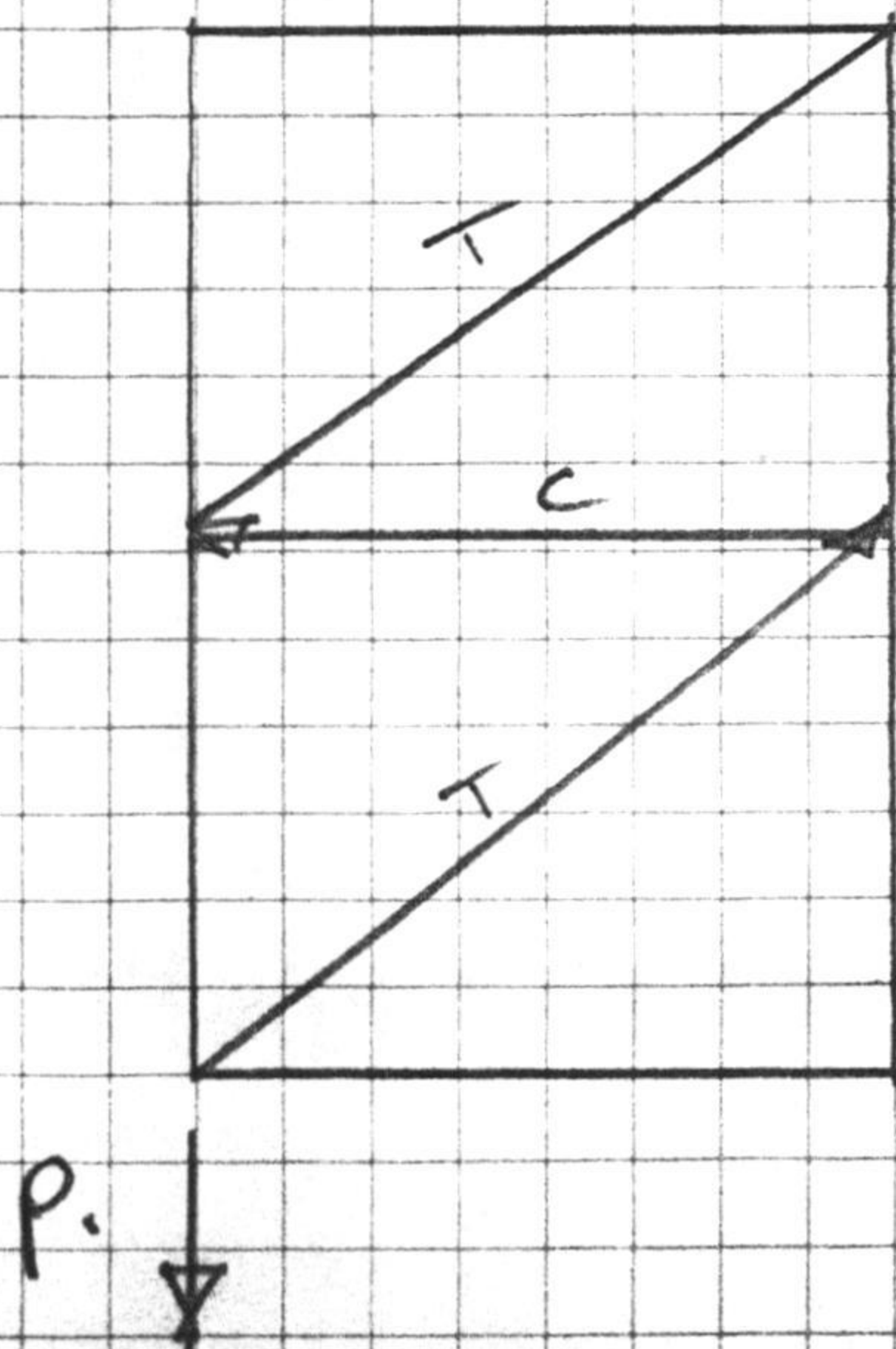
$$= 34.3 - 8.52.4 - 43 = 21.6 \text{ kN.}$$

$$\text{or } 59.6 - 35 = 24.6 \text{ kN.}$$

Require 2-M20 bolts.



Main Bracing.



$$P = 59.6 + \frac{18}{5} \times 21.5$$

$$= 137 \text{ kN.}$$

$$T = \frac{137}{2} \times \frac{18}{10.5}$$

$$= 117 \text{ kN.}$$

$$A = \frac{117}{1.2} = 587 \text{ mm}^2$$

60x10 R

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$$C = 117 \times \frac{14.8}{18} = 95 \text{ KN}$$

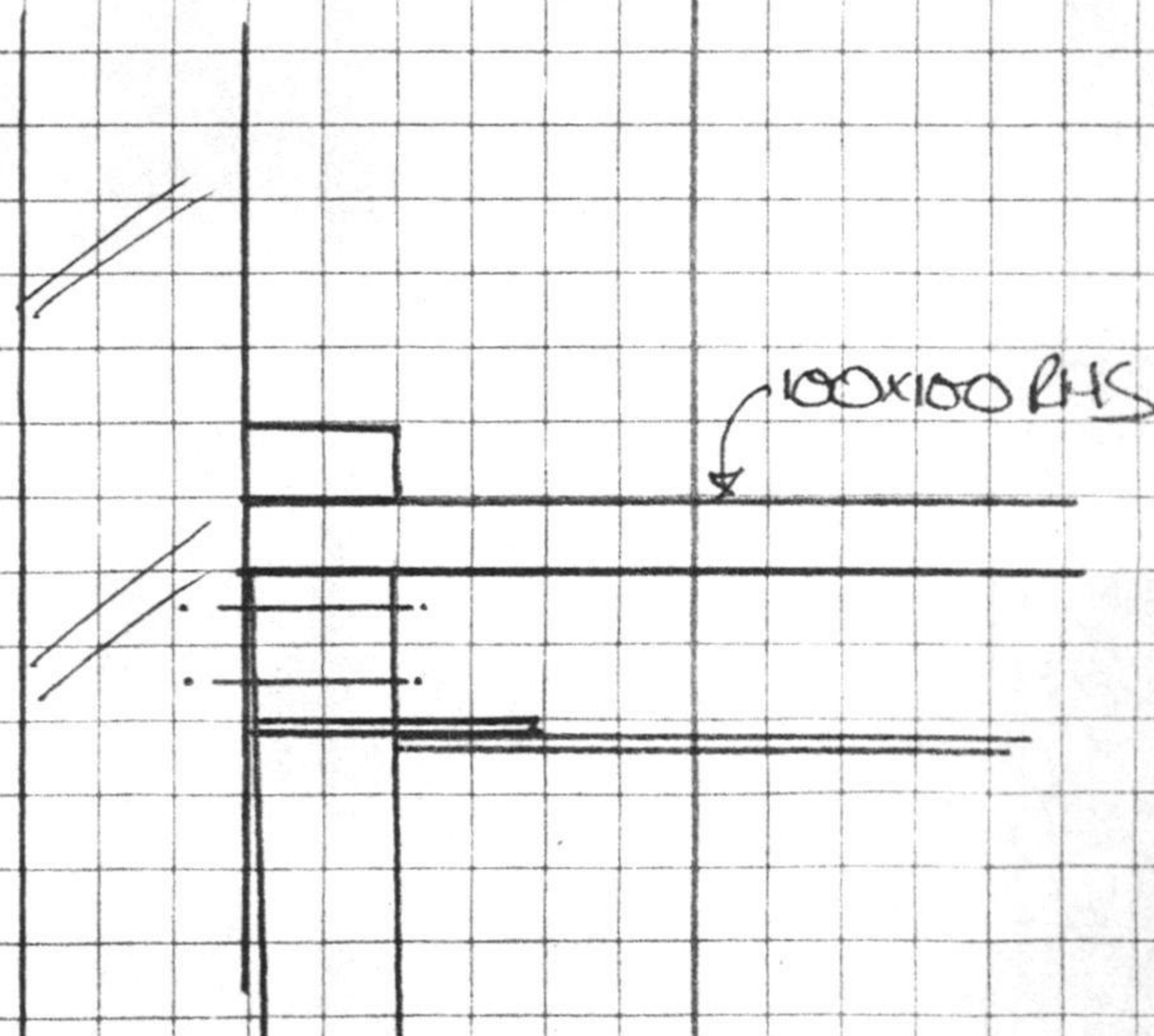
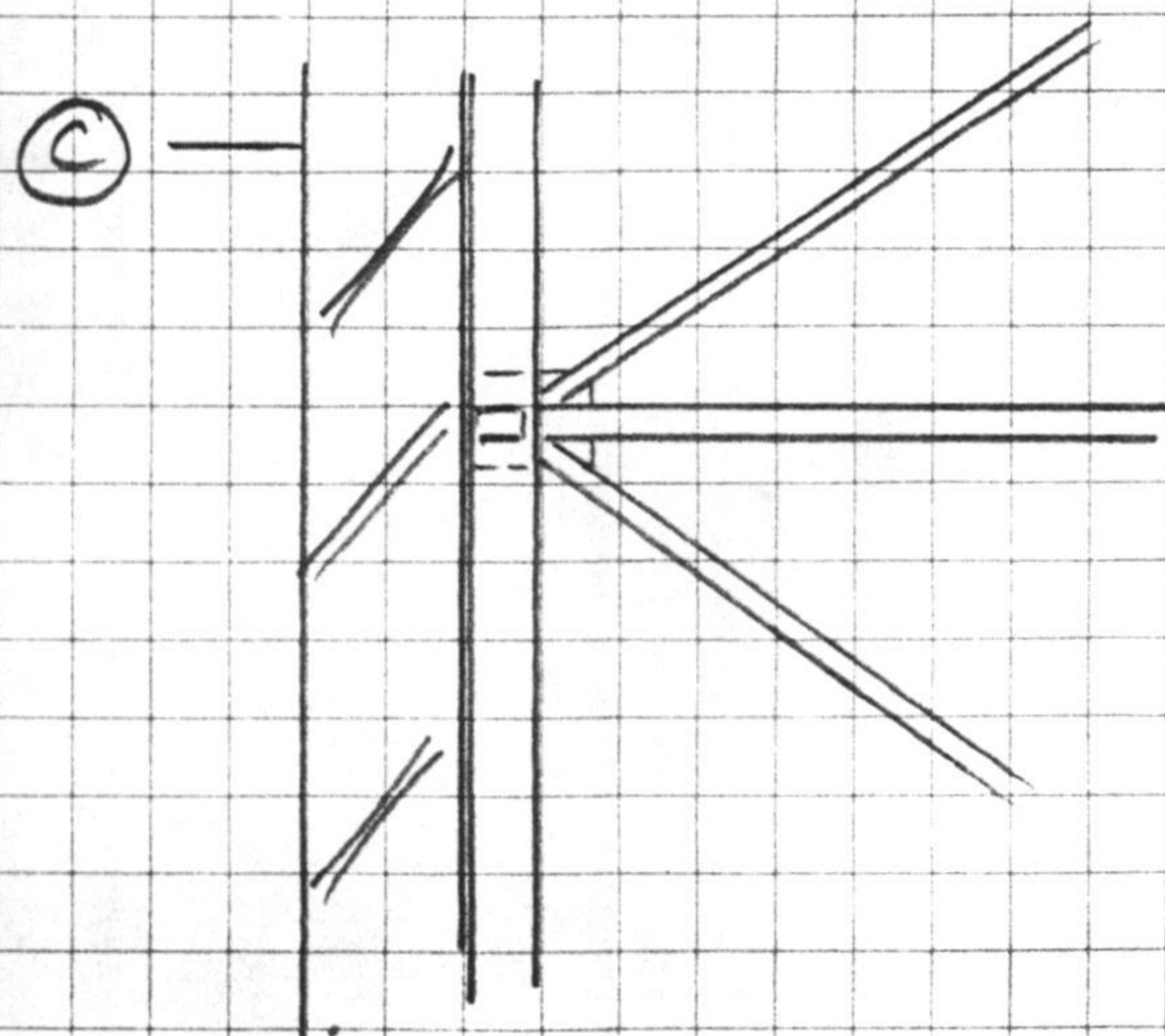
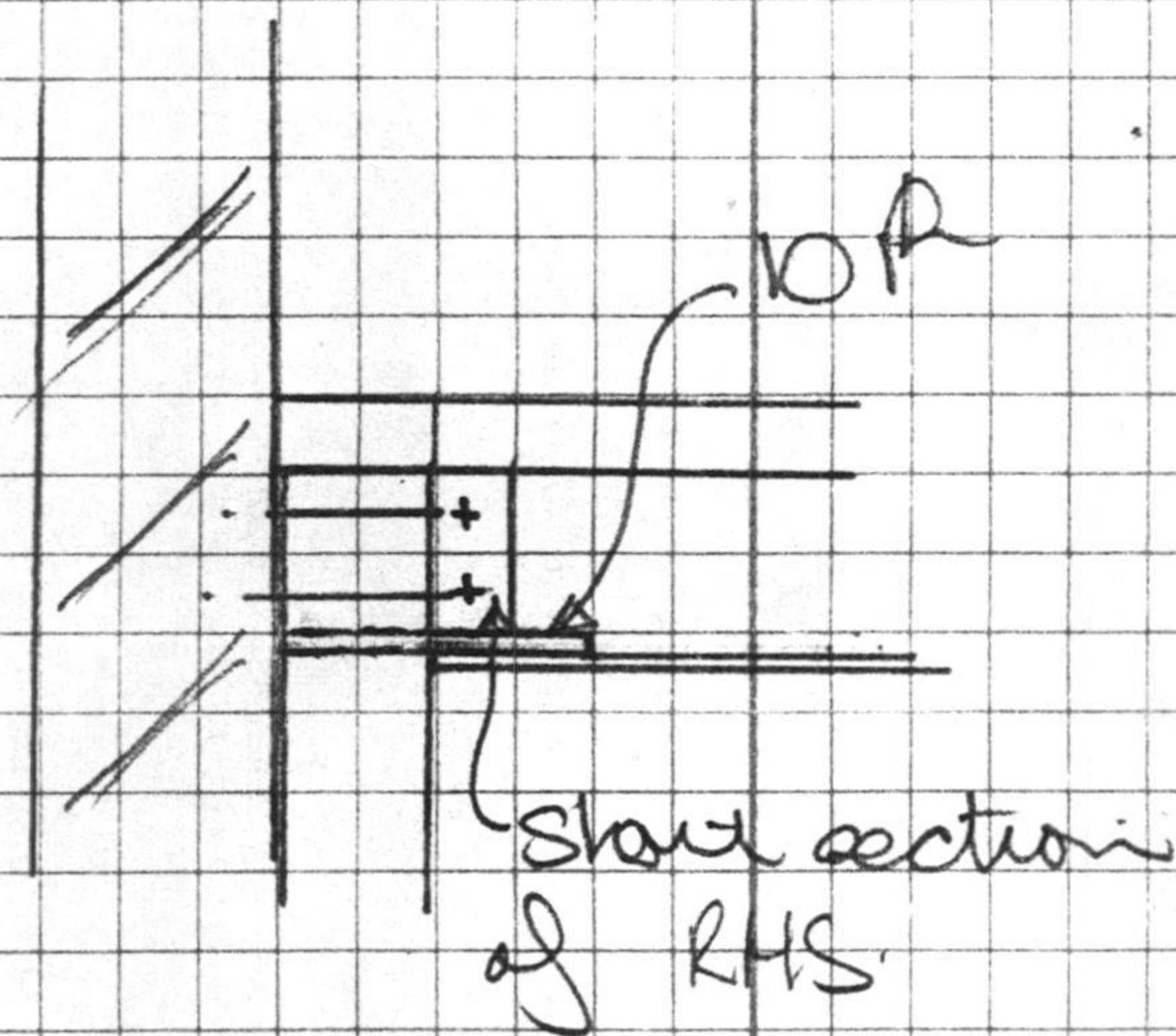
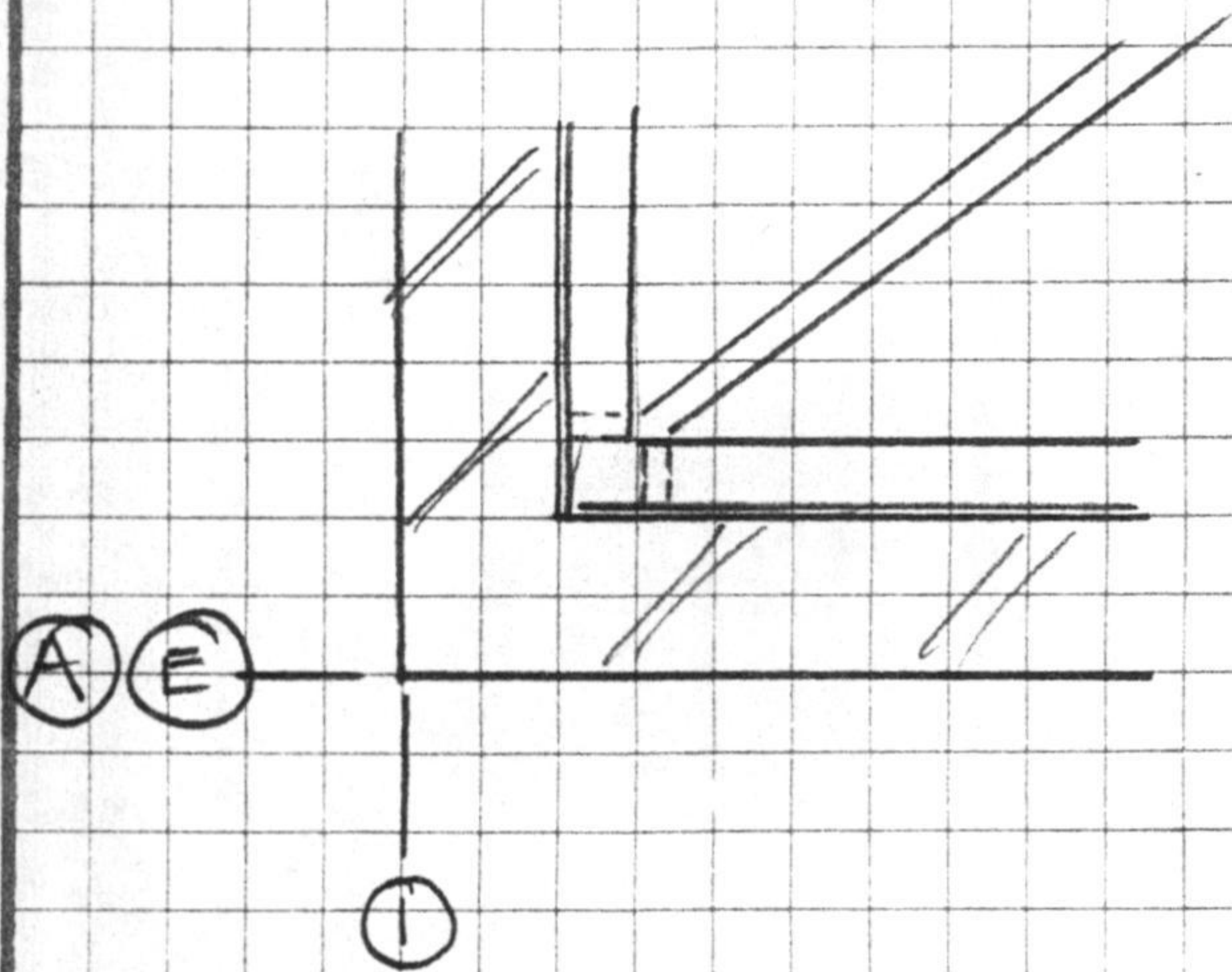
Try 100x100x4 RHS.

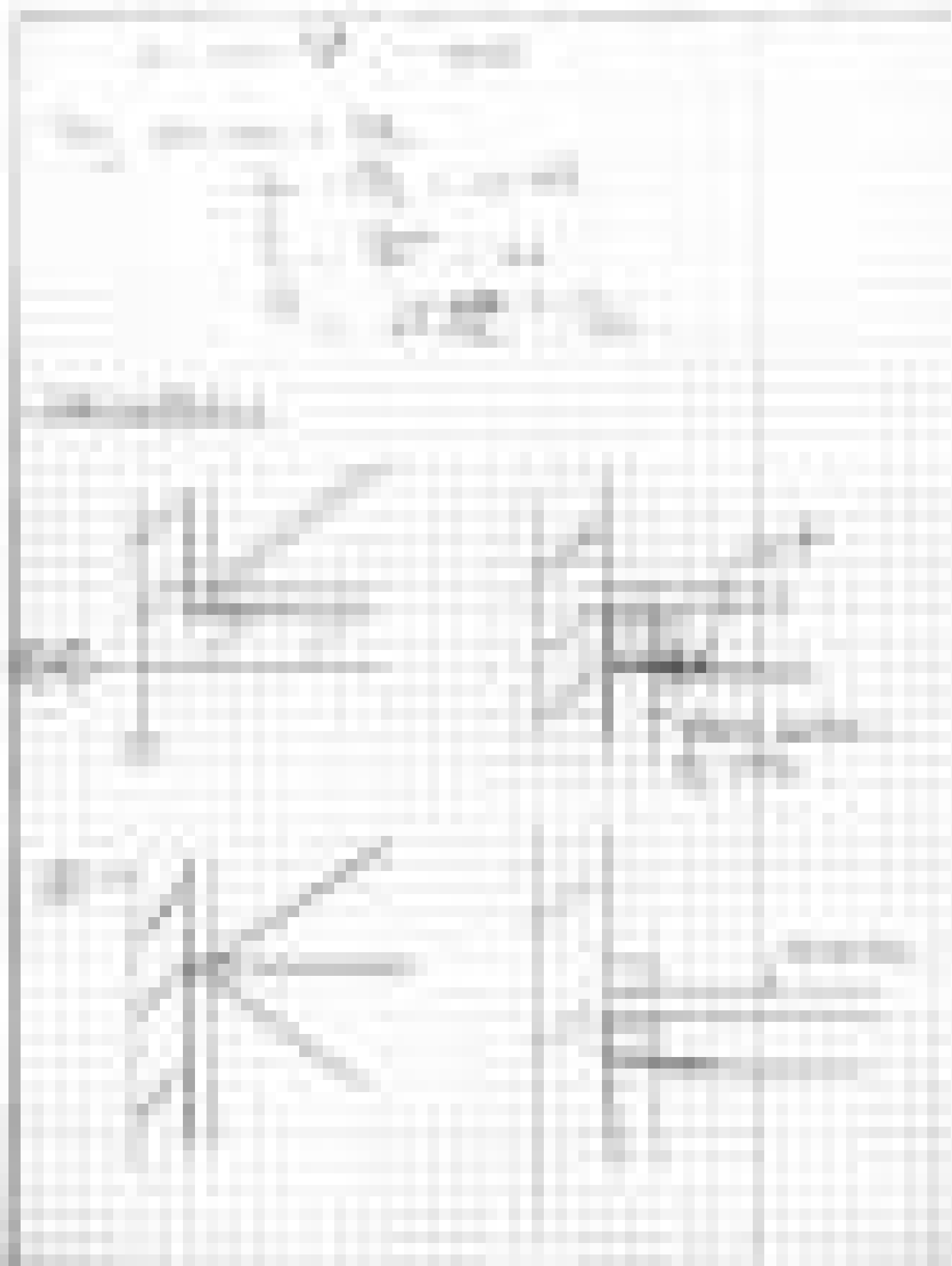
$$f_{ac} = \frac{95}{1.53} = 62 \text{ MPa.}$$

$$\frac{L}{r_y} = \frac{4800}{39.1} = 123$$

$$F_{ac} = 56 \text{ MPa} \times 1.33 = 74 \text{ MPa} \therefore \text{OK}$$

Connections







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52512

26 Sept., 1986

Smith Leuchars Ltd.,
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P.O. Box 27349,
WELLINGTON

Attention - Mr M. Orsman

Dear Sir,

LIMITED SUBSURFACE INVESTIGATION
PROPOSED REDEVELOPMENT
WELLINGTON WORKING MENS CLUB
CUBA STREET, WELLINGTON

This report presents the results of a one boring investigation of the subsoil conditions near the site for redevelopment of the Wellington Working Mens Club on Cuba Street, Wellington. The location of the site in relation to existing buildings is shown on the attached plate 1, Site Plan.

The area for redevelopment is rectangular in shape and is located at the rear (eastern side) of the existing Club buildings. The building is to be of multi level construction and have plan dimensions of about 10.0 metres by 13.6 metres. Structural loads imposed at ground level have been given in your Fax dated 12 September 1986. The perimeter columns will impose dead plus live loads up to 1850 KN. Under seismic loading the compression forces of columns are likely to be up to 2300 KN and tension forces some 130 kN.

At the time of our investigation the site was fully occupied by existing buildings which precluded drilling on the area for redevelopment. The only point where a drilling rig could be established near to the building was in a narrow service lane off Leed Street east of the site.

The boring was drilled using rotary wash equipment supplied and operated by Lemmon Piling and Drilling Limited of Seaview. The fieldwork was supervised on a full time basis by our field geologist who logged the soils encountered and specified the type and depth of insitu testing. A log of the boring as recorded in the field and amended where necessary from laboratory examination of the soils recovered, is given on Plate 2, Boring Log. Notes, abbreviations and symbols used on the Logs are given on Plate 2. The soils have been classified generally in accordance with the Unified System, a summary of which is given on Plate 3 Method of Soil Classification.

1. Introduction

2. Materials and Methods

3. Results

4. Discussion

5. Conclusions

6. Acknowledgments

7. Author Contributions

8. Funding

9. Data Availability

10. Conflicts of Interest

11. References

12. Appendix A

13. Appendix B

14. Appendix C

At the point explored by the boring, the subsurface soil conditions comprise alluvially deposited soils which extend beyond the depth explored. These soils comprise predominantly silty gravels which contain random inclusions of silt. These layers of fine grained soil were encountered at depths 3.3 metres, 6.3 metres and at 9.2 metres, and are generally between 0.3 metres and 0.5 metres thick. The surface gravels are moderately dense and become more dense with depth. At depth 4.7 metres, the gravels are dense.

Groundwater was encountered in the boring and at the time of drilling this was measured to be at depth 2.2 metres below ground surface.

You have advised us that design of the building is proceeding based on supporting the structure on a shallow founded raft slab. The alternative foundation option of supporting the proposed building on drilled cast-in-place piles has not at this time been discounted. Based on the results of the one boring drilled at the site, there is a third foundation system which may be appropriate to the site soils, that being a combination of isolated spread and strip footings. The three foundation alternatives are discussed under headings as follows:-

RAFT SLAB FOUNDATION

We understand the raft slab is likely to be about 0.6 metres thick with its upper surface comprising the ground floor. From the dead plus real live loads given, we estimate that a uniform rigid raft would apply a bearing stress of 83 kPa on the supporting soils.

For the purposes of raft slab design, we recommend soil stiffnesses as follows:-

	<u>Dead Plus Live Load</u>	<u>Factored Dead Plus Live Earthquake</u>
Centre of raft	3 kPa/mm	12 kPa/mm
Edge of raft	6 kPa/mm	24 kPa/mm
Corner of raft	9 kPa/mm	36 kPa/mm

- * It should be noted that the soil stiffnesses for dead plus live load conditions apply for stresses up to 85 kPa. Where permanently applied stresses exceed 85 kPa the soil stiffness should be reassessed by us. The effect of increased dead plus real live load pressure would be to reduce the design soil stiffness.

The soil stiffness increases towards the edges and corners of a uniformly loaded raft foundation and this is due to the localised edge effects. For the purposes of design, a linear variation may be taken over the centre to edge, edge to corner and centre to corner. This simplifies the correct distribution, however we expect this simplification to be within normal design tolerance.

The soil stiffnesses have been based on the typical soil profiles encountered at the boring location. We recommend that a sensitivity analysis be carried out using a range of soil stiffnesses to determine the effects of any variation on the raft foundation and superstructure

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Abstract

1. **Identify the main topic of the passage.**
 2. **Summarize the main idea in your own words.**
 3. **Identify the author's purpose.**
 4. **Identify the author's tone.**
 5. **Identify the author's bias.**
 6. **Identify the author's point of view.**
 7. **Identify the author's audience.**
 8. **Identify the author's style.**
 9. **Identify the author's language.**
 10. **Identify the author's structure.**

performance. For this analysis we suggest the range of values be 20 percent and 100 percent of the soil stiffnesses given above.

The excavation to underside of the raft slab foundation will expose naturally deposited gravels at the point explored. The uniformity and compactness of these gravels will have a large effect on the performance of the raft. We recommend that excavation and subgrade preparation works be carried out as follows:-

- (i) Excavate for the raft slab to required depth with a tracked backhoe fitted with a smooth edge ditching bucket. The excavator should operate from outside the excavation and trucks loaded on the upper level. The excavation should extend 150 mm below the underside of the bearing level or to sufficient depth to remove any unsuitable soils which are exposed at the bearing surface.
- (ii) Geotechnical engineer to inspect.
- (iii) Compact the exposed subgrade with several (not less than two) passes of a "Bomag" Tandem BW 100AD Vibrating Roller or equivalent.
- (iv) Make up the subgrade to underside of the raft slab with NRB:M/4 1984 AP40 basecourse placed in one layer and compact with three passes of the Vibrating Roller referred to in (iii) above.
- (v) Cover the prepared area with a concrete tidy slab.

While we did not encounter any unsuitable soils at the point explored, we recommend that provision be made to provide some overexcavation and replacement with selected on site material or imported well-graded 50 mm down low fines quarry material. Any backfill should be placed in horizontal layers of loose thickness not greater than 150 mm and be compacted to a uniform dense subgrade using plant described above.

The seismic base shear forces developed on the structure will be distributed to ground through the shear friction on the underside of the raft and some passive reaction due to its embedment. The development of shear friction requires the least amount of lateral displacement to be fully developed and, hence, will need to be overcome before the passive capacity at the raft edges is developed.

The following shear friction values may be used for the raft/soil interaction in assessing the foundation resistance to sliding:-

<u>Raft/Soil Interaction</u>	<u>Coefficient of Friction</u>
1. Raft concrete in direct contact with the naturally occurring site soils	0.6
2. Raft concrete separated from soil by DPC etc.	0.1

SHALLOW FOOTINGS

As an alternative to a raft slab foundation, the structure may be supported on shallow footings constructed to derive foundation support from the gravels at depth 2.0 metres below the ground surface.

For the purposes of foundation design, isolated pads and strip footings may be proportioned for a maximum bearing pressure of 600 kPa provided the following conditions are met:-

- (a) All foundations have minimum plan dimensions of at least 1.0 metre.
- (b) The bearing surface of individual footings is confined at least 0.5 metres below adjacent lowest final grade.
- (c) All footing excavations are inspected by a geotechnical engineer to ensure that the material exposed meets the design criteria given in this report.

Appropriate factors of safety should be applied to the maximum bearing capacity for shallow pad foundations as given above. The recommended maximum bearing capacity should be divided by an appropriate factor of safety as follows:-

<u>Design Procedure</u>	<u>Factor of Safety</u>
Strength Method	1.8 for factored loads
Capacity Design	1.1
Alternative Method	3.0 for dead plus live load
	2.0 for load combinations including earthquake and wind loads.

Footings should be dimensioned by considering all of the above criteria and using whichever gives the largest size.

The base shear forces transferred to ground through the foundations will apply inclined loads to the foundation bearing surfaces. The appropriate ultimate bearing pressures for inclined loads as applied to the full bearing surface reduces as the angle of force attack on the footing flattens. The following ultimate bearing capacities may be used for design:-

<u>Eccentricity of Load (c/b)</u>	<u>Reduced Ultimate Bearing Capacity (kPa)</u>
0	600
0.2	500
0.4	320
0.5	260
0.6	200

Settlement of foundations supporting columns on shallow footings is likely to be about 20 mm. The superstructure frame should be designed for differential settlement causing an angular rotation of 1:500 between adjacent columns.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the specific procedures and protocols that must be followed when conducting financial transactions. It details the steps from initial request to final approval and recording.

3. The third part of the document provides a detailed overview of the reporting requirements and the frequency of reports. It also includes information on the format and content of these reports.

4. The fourth part of the document discusses the role of the internal audit function in monitoring compliance with these procedures and protocols. It highlights the importance of regular audits and the consequences of non-compliance.

5. The fifth part of the document provides a summary of the key points discussed in the previous sections. It also includes a list of references and a glossary of terms used throughout the document.

6. The sixth part of the document contains a series of questions and answers that address common queries and concerns related to the procedures and protocols. This section is designed to provide clarity and guidance to all staff members.

7. The seventh part of the document provides a list of contact information for the relevant departments and personnel. This includes phone numbers, email addresses, and physical addresses.

8. The eighth part of the document contains a series of statements and declarations that must be signed by all staff members. These statements confirm that they have read and understood the procedures and protocols and agree to comply with them.

PILED FOUNDATIONS

Large diameter piles may be found on the gravel stratum at RL 2.0 metres at boring B1, and these piles may be either straight sided shafts for moderate compression loads or belled piles for high compression and tension loads. The depth to founding for belled piles required to resist tension forces may need to be deepened below the minimum elevations given above to provide resistance to pull-out. Both straight sided and belled cast-in-place piles may be designed for a suitably factored ultimate bearing capacity of 3.0 MPa provided the following parameters are included in the pile design:-

- (a) The stem diameters are at least 0.9 metres and the bell diameters to stem diameter ratio does not exceed 2.0.
- (b) The ratio of pile depth (i.e. net confinement below measured adjacent ground surface) to the bell diameter, is not less than 4.0.
- (c) Each pile bearing surface is proven by drilling investigation before the shaft is excavated and the results are interpreted by us in context with this report.
- (d) Each shaft base is inspected by us when it is at the design depth and before the bells are cut.

For design purposes the ultimate end bearing capacity for drilled piles as given above should be reduced by dividing by the appropriate factor of safety as given under shallow footings above.

The rupture uplift capacities for belled piles may be determined from the chart given on Plate 4, Ultimate Uplift Capacities for Belled Piles. The appropriate factor of safety as given above for bearing should also be applied to the rupture uplift capacity determined.

The lateral base shear developed on the structure due to seismic attack may be resisted by the piles acting laterally against the surrounding soil.

Piles subject to lateral load may be designed according to the "Reese and Matlock" analysis which is summarised on Plates 5A, 5B and 5C, Design Procedure for Laterally Loaded Piles. A coefficient of variation of soil modulus with depth (f) of 7 KPa/mm is appropriate.

SUBSOIL FLEXIBILITY

In terms of the criteria specified in Clause 3.4.3 of NZS 4203:1984 "Code of Practice for General Structural Design Loadings for Buildings", the site is "flexible".

FURTHER SUBSURFACE INVESTIGATION

The geotechnical recommendations contained in this report are based on the results of one boring drilled near to the site.

The feasibility of the raft slab foundation to support the building is dependent on the gravel stratum encountered in the boring occurring at similar depths over the entire site. If these gravels are discontinuous

Introduction

The purpose of this study is to investigate the effects of a new educational program on the learning outcomes of students. The program is designed to enhance the understanding of complex concepts through interactive learning methods. The study aims to determine whether the program is effective in improving student performance compared to traditional teaching methods.

The research is conducted in a controlled environment where the program is implemented for a specific duration. Data is collected from a sample of students who participate in the program. The study uses a quantitative approach to measure the learning outcomes, focusing on the improvement in test scores and the ability to apply knowledge in practical situations.

The findings of the study will provide valuable insights into the effectiveness of the program. The results will be used to inform the development of future educational programs and to guide the implementation of the current program in other educational settings.

The study is organized as follows: the first section provides an overview of the program and the research objectives. The second section describes the methodology used in the study, including the sample selection and data collection procedures.

The third section presents the results of the study, showing the improvement in learning outcomes for the participants. The fourth section discusses the implications of the findings and the limitations of the study.

The conclusion summarizes the main findings of the study and provides recommendations for further research. The study is expected to contribute to the field of educational research by providing evidence on the effectiveness of the program.

Methodology

The study uses a quantitative research design to measure the learning outcomes of students. The data is collected through a series of tests and assessments that are designed to evaluate the understanding of the concepts taught in the program.

Sample Selection

The sample consists of students who are enrolled in the program. The selection process is random, ensuring that the sample is representative of the population of students who participate in the program.

The data is collected over a period of six months. The tests and assessments are conducted at regular intervals to monitor the progress of the students. The results of the tests are used to calculate the learning outcomes for each student.

and/or at irregular depths across the site, then the displacement performance of the raft slab foundation may be significantly affected.

We recommend that, on completion of demolition, a series of relatively shallow borings be drilled on the vacant site to confirm the founding stratum for the raft slab and/or shallow footings. Three investigation borings should each extend to depth 8 metres and the soils encountered should be observed and sampled by a geotechnical engineer.

This additional investigation work should be carried out as soon as practically feasible to enable any changes to be made to the foundation in the event that below ground conditions are found to differ from those expected.

GENERAL

The following plates are attached to complete this report:-

Plate 1	Site Plan
Plate 2	Boring Log
Plate 3	Method of Soil Classification
Plate 4	Ultimate Uplift Capacities for Belled Piles
Plates 5A, 5B, 5C	Design Procedure for Laterally Loaded Piles

Yours faithfully,
pp BRICKELL MOSS RAINES & STEVENS LTD


J. H. TRAVERS

GCA:JHT:1cs

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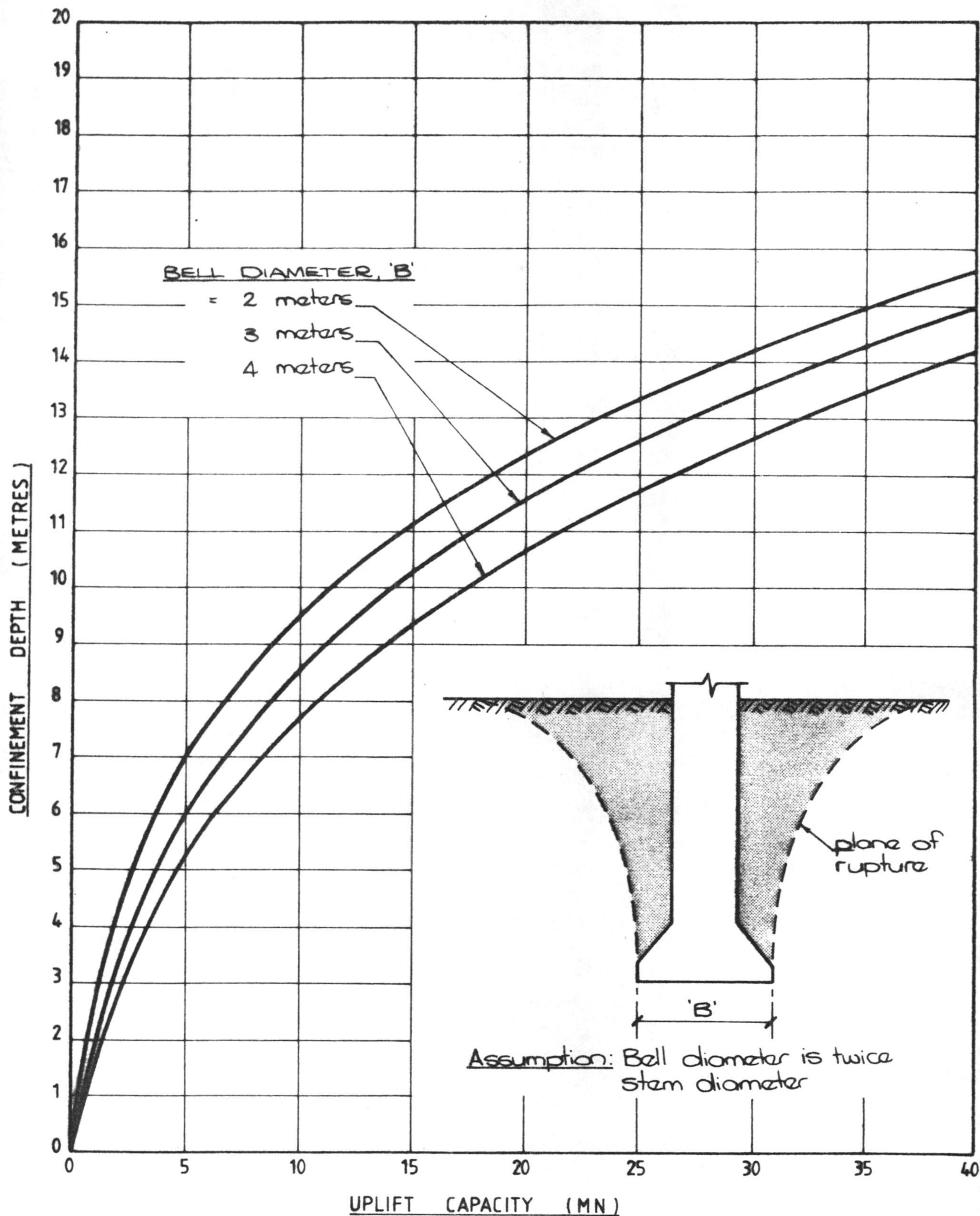
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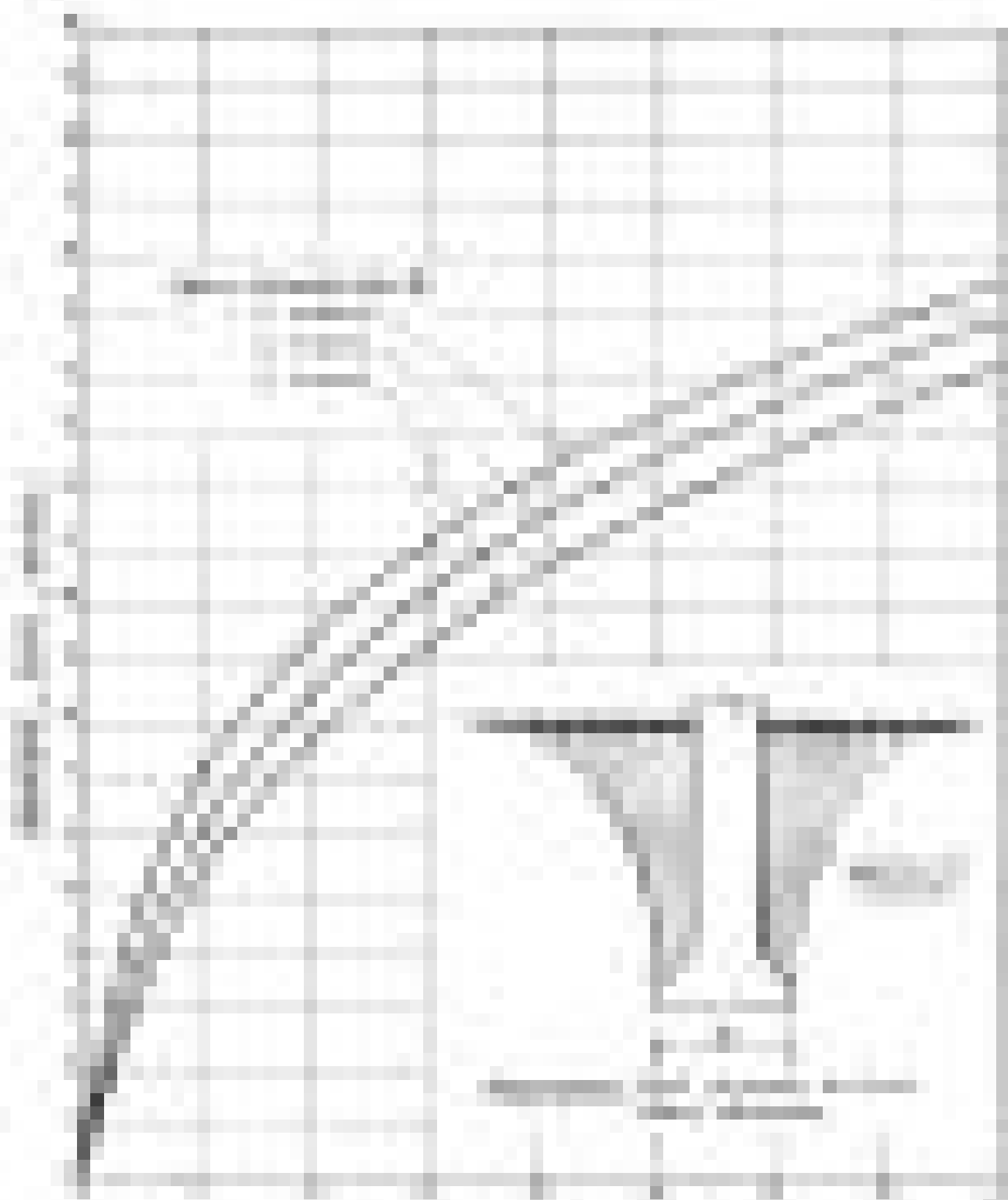


ULTIMATE UPLIFT CAPACITIES FOR BELLED PILES

REFERENCE: 'Resistance to breaking out of mushroom foundations for pylons,' by Dr. A. Balba.

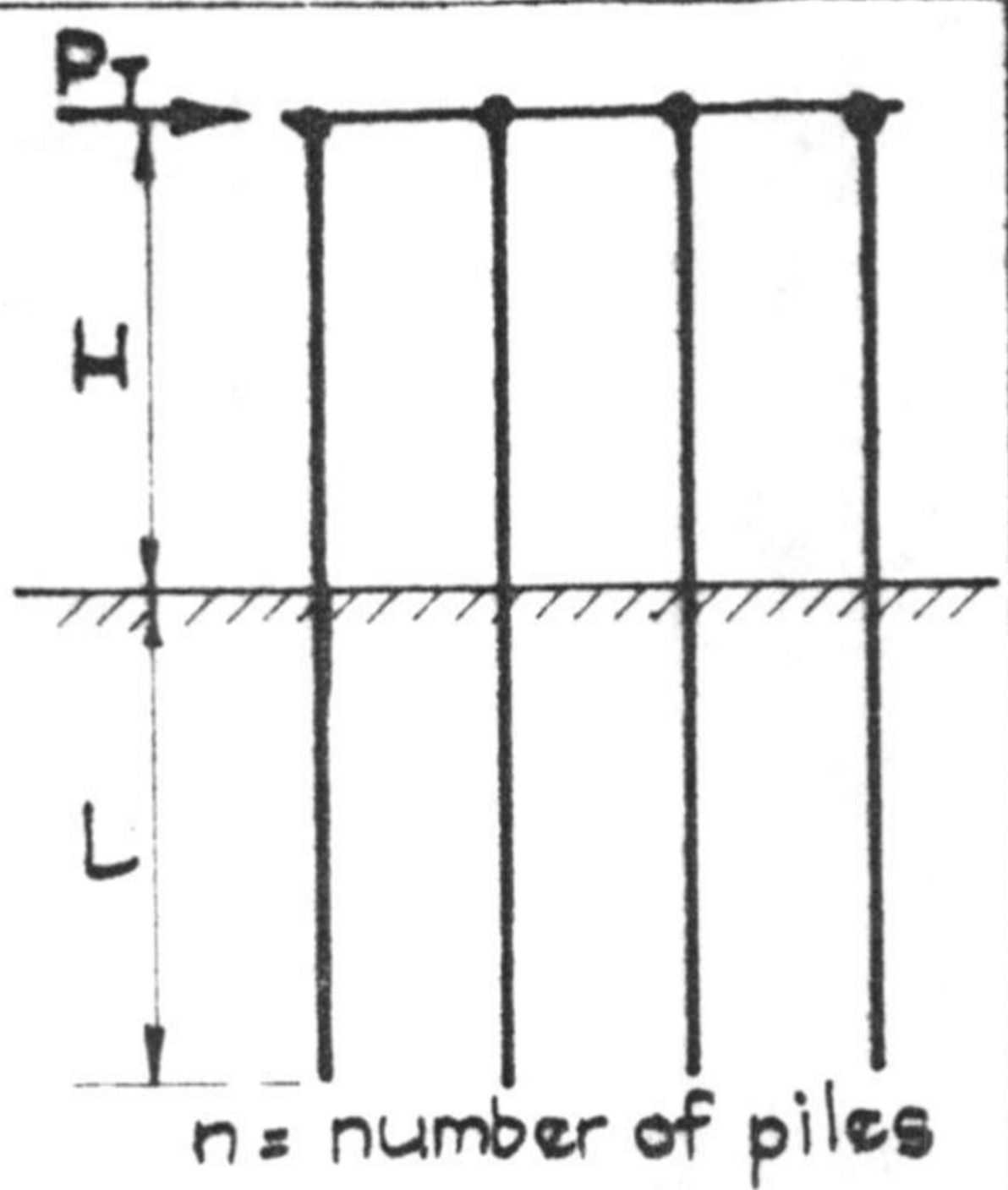

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PLATE 4

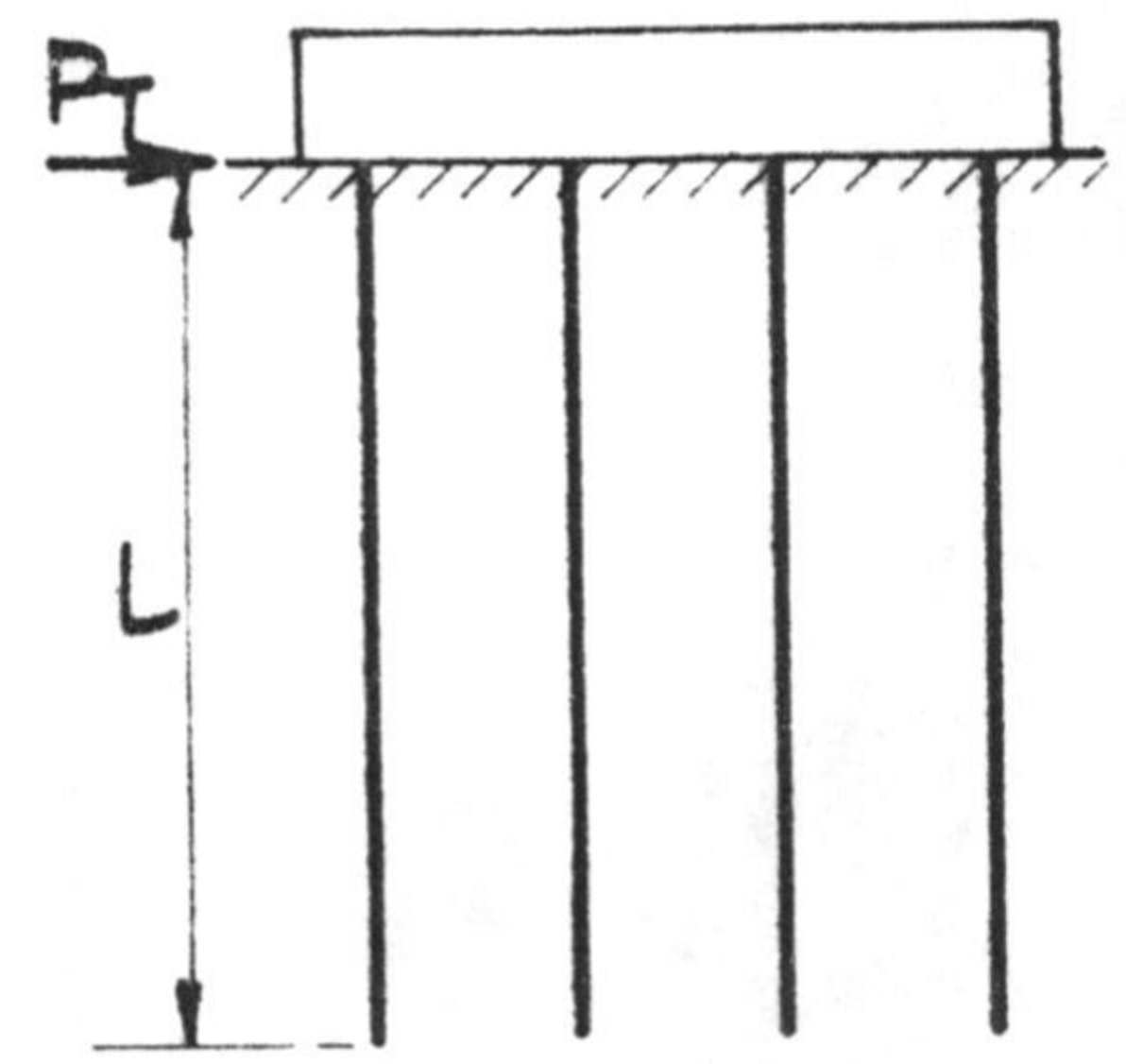



Source: U.S. Census Bureau

Percentage of U.S. population aged 18 and over who are married, divorced, or widowed, 1980-2000

CONDITION	LOAD AT GROUND LINE	DESIGN PROCEDURE
 <p>$n = \text{number of piles}$</p>	<p>For each pile</p> $P = \frac{P_T}{n}$ $M = PH$  <p>DEFLECTED POSITION</p>	<ol style="list-style-type: none"> 1. Compute relative stiffness factor $T = \left(\frac{EI}{f} \right)^{1/5}$ 2. Select curve for relevant $\frac{L}{T}$ 3. Obtain coefficients F_d, F_M, F_V, or F_d', F_M', F_V', at depths desired. 4. Compute deflection, moment and shear at desired depths, using formulae of Plate

CASE 1. PILES WITH FLEXIBLE CAP OR HINGED END CONDITION

		<ol style="list-style-type: none"> 1. Proceed as in step 1, case 1. 2. Compute deflection and moment at desired depths, using coefficients F_d', F_M' and formulae of Plate 3C 3. Maximum shear occurs at top of pile and equals $P = \frac{P_T}{n}$ in each pile.
---	--	---

CASE 2. PILES WITH RIGID CAP AT GROUND SURFACE

DEFINITIONS :	<p>P = Lateral force applied on pile</p> <p>H = Vertical distance between P and ground surface</p> <p>M = PH = Moment on pile applied at ground surface</p> <p>Z = Depth factor below ground to point to be checked, = $\frac{\text{depth}}{T}$</p> <p>f = Coefficient of soil modulus variation</p> <p>L = Length of pile below ground surface</p> <p>T = Relative stiffness factor</p> <p>E = Modulus of elasticity of pile</p> <p>I = Moment of inertia of pile cross section</p> <p>δ_p, M_p, V_p = Deflection, moment and shear at any depth, Z, due to force P</p> <p>δ_m, M_m, V_m = Deflection, moment and shear at any depth, Z, due to moment M</p>
----------------------	---

DESIGN PROCEDURE FOR Laterally Loaded PILES

REFERENCE : Reese & Matlock : 8th Texas Conference, SMFE . (NAVFAC DM7)

Table 1
Summary of the
results of the
analysis of variance
for the dependent
variables of the
study

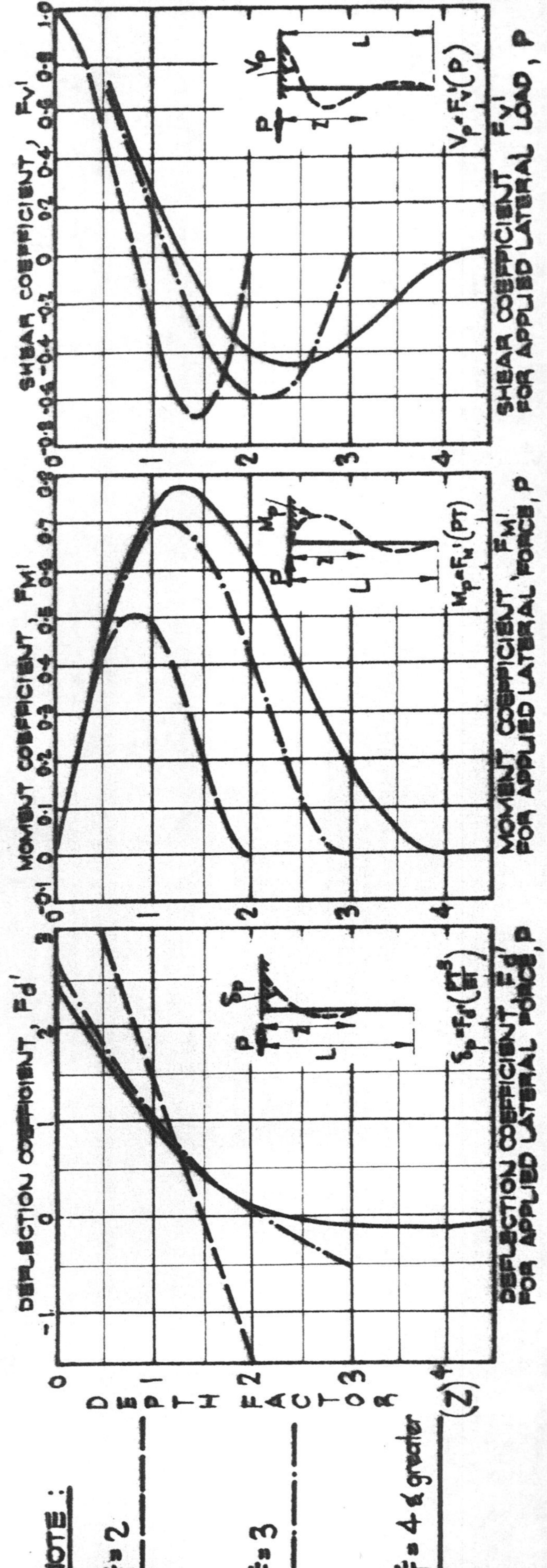
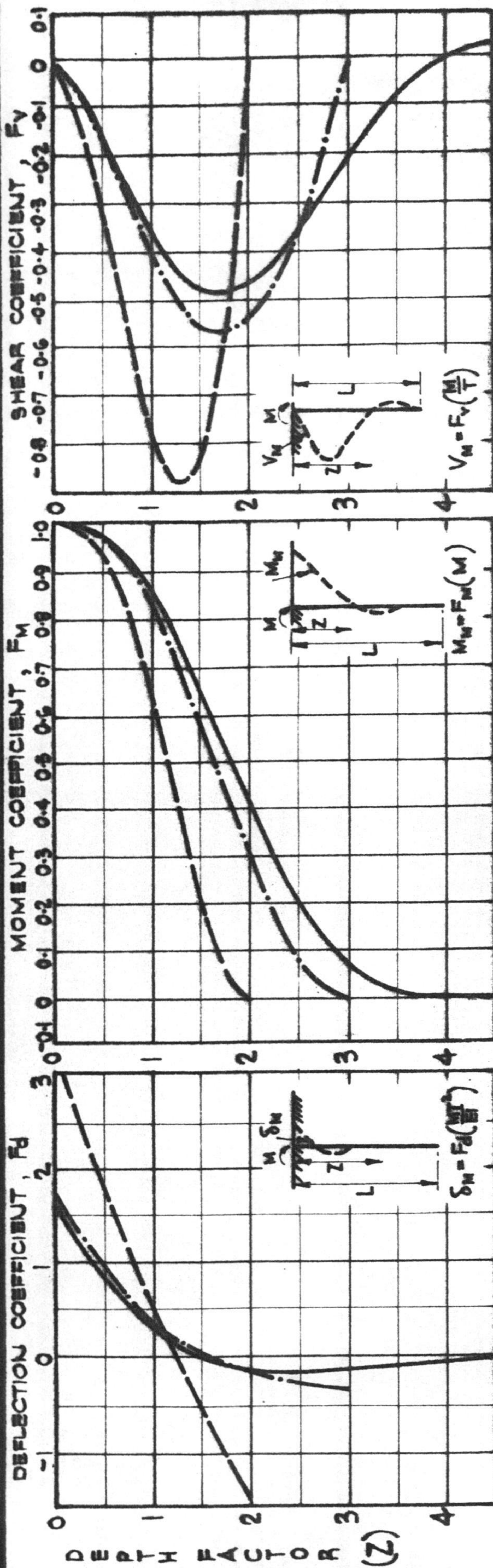
Table 2
Summary of the
results of the
analysis of variance
for the dependent
variables of the
study

Table 3
Summary of the
results of the
analysis of variance
for the dependent
variables of the
study

Table 4
Summary of the
results of the
analysis of variance
for the dependent
variables of the
study

Table 5
Summary of the
results of the
analysis of variance
for the dependent
variables of the
study

Table 6
Summary of the
results of the
analysis of variance
for the dependent
variables of the
study



NOTE:

$\frac{L}{T} = 2$

$\frac{L}{T} = 3$

$\frac{L}{T} = 4$ & greater

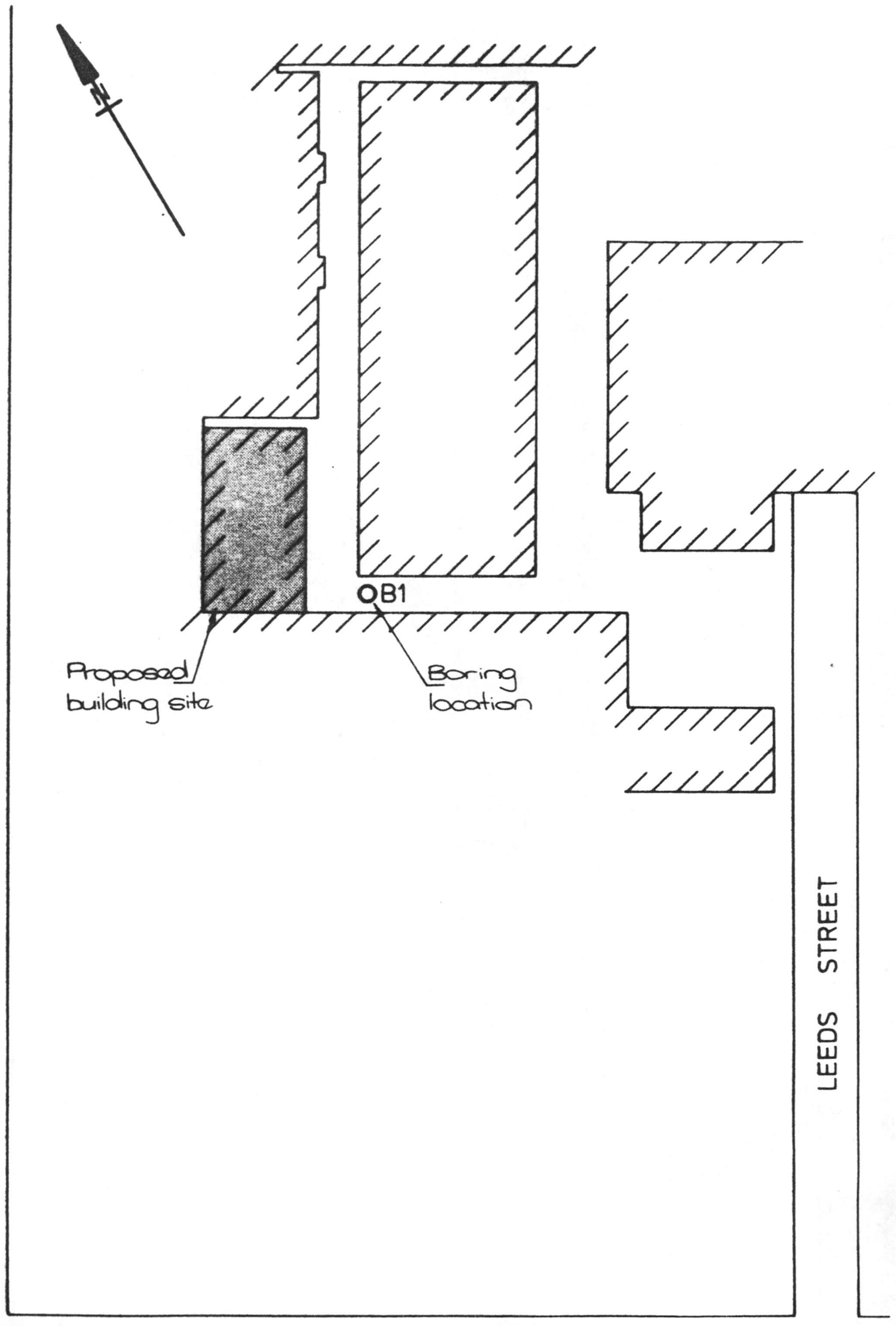
DESIGN PROCEDURE FOR Laterally Loaded PILES

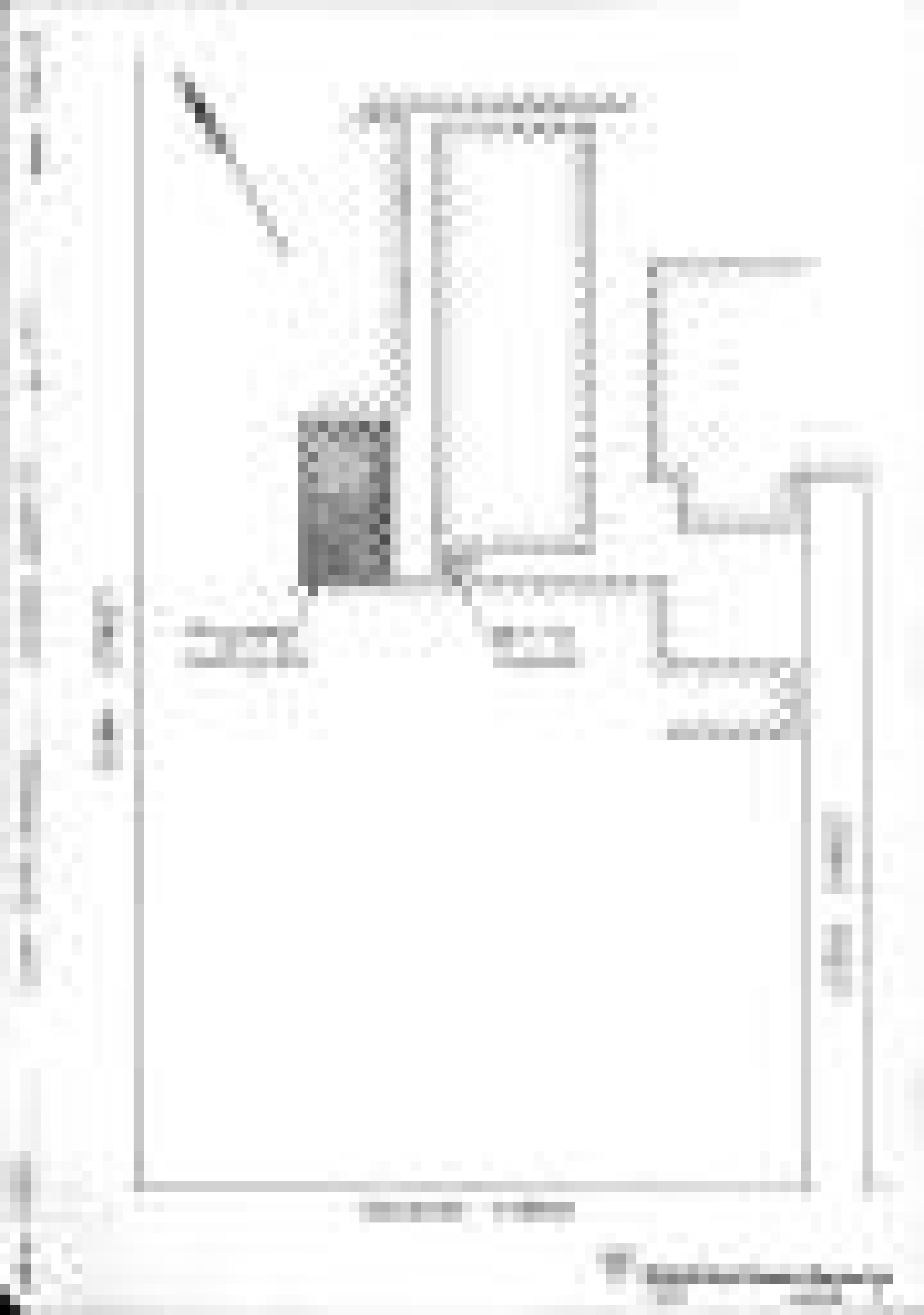
CASE 1 : FLEXIBLE CAP OR HINGED END CONDITION

CUBA STREET

LEEDS STREET

GHUZNEE STREET



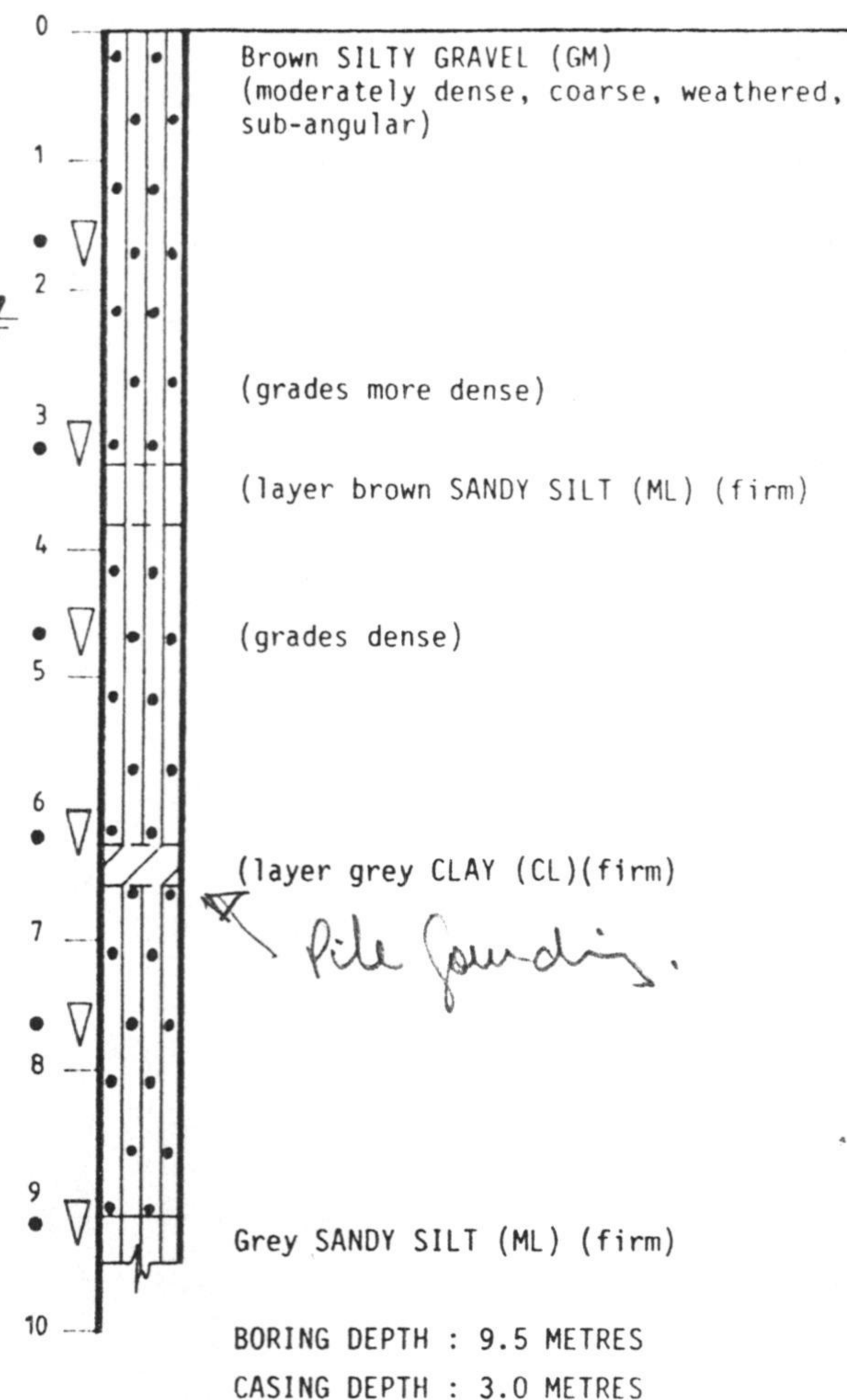


CLASSIFICATION DATA			STRENGTH DATA			WATER - DENSITY DATA		FIELD DATA
% FINES (-63µm)	LIQUID LIMIT	PLASTICITY INDEX	TYPE OF TEST	TEST SURCHARGE KPa	SHEAR STRENGTH KPa	NATURAL % WATER CONTENT	DRY DENSITY kg/m³	PENETRATION RESISTANCE
								N = 16
								N = 21
								N = 31
								N = 19
								N = 41
								N = 21

DEPTH IN
METRES

BORING B1

ELEVATION: 8.5 METRES



- The boring was drilled on 11 September 1986 with truck mounted rotary wash equipment.
- 100 mm size casing was used in the borings.
- ▽ Standard Penetration Test (SPT), performed in accordance with standard ASTM D1586-67.
- 50/285 Number of blows with SPT hammer and penetration (mm) of sampler.
- Disturbed observation sample.
- ▽ Observed ground water level.
- The elevations of the borings refer to New Wellington City Datum.
- Indicated depths are in metres below the existing ground surface.

BORING LOG NOTES

BORING LOG

Brickell, Moss & Partners

RELATIVE DENSITY OF COHESIONLESS SOILS

	Corrected SPT "N" value (blows/300 mm)
Very Loose	0 to 4
Loose	4 to 10
Moderately Dense	10 to 30
Dense	30 to 50
Very Dense	> 50

CONSISTENCY OF COHESIVE SOILS

Very Soft	- squeezes between fingers
Soft	- easily moulded by fingers
Firm	- moulded by strong finger pressure
Stiff	- dented
Very Stiff	- dented only slightly by finger pressure
Hard	- dented only slightly by pencil point.

GRAIN SIZE

BOULDERS	> 200 mm
GRAVEL	
Very coarse	200 mm to 60 mm
Coarse	60 mm to 20 mm
Medium	20 mm to 6 mm
Fine	6 mm to 2 mm

SAND

Coarse	2 mm to .6 mm
Medium	.6 mm to .2 mm
Fine	.2 mm to .06 mm

SILT & CLAY

< .06 mm

GRAIN SHAPE

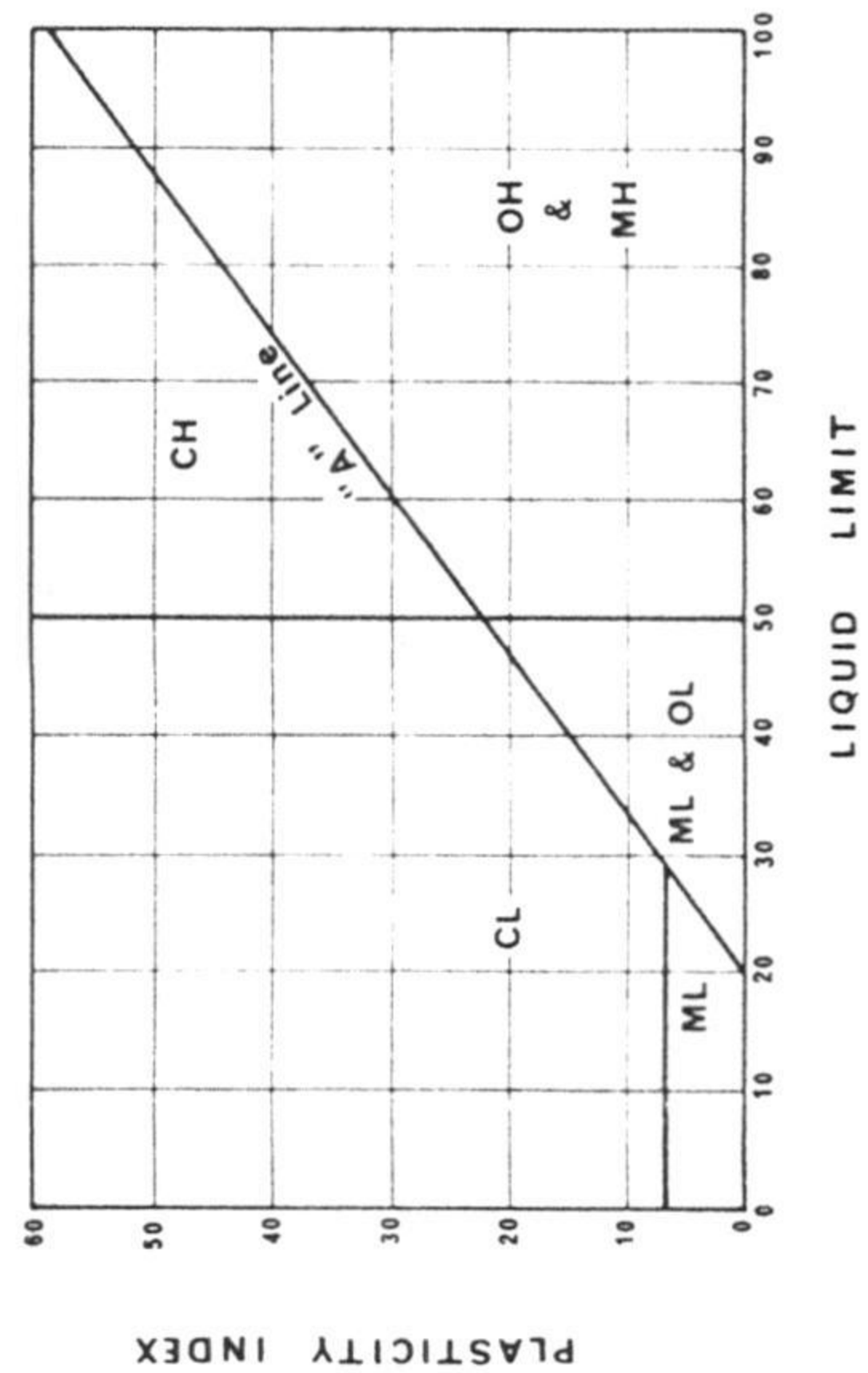
Angular	Showing little or no evidence of wear; edges and corners sharp, secondary edges present.
Subangular	Showing some effect of wear; faces virtually untouched but edges and corners slightly worn.
Subrounded	Showing considerable wear; edges and corners rounded off to smooth curves, original faces considerably reduced.
Rounded	Original faces almost completely destroyed, but some comparatively flat surfaces present. All original corners smoothed off to broad curves.
Well rounded	No original faces, corners or edges left. The entire surface consists of broad curves; flat areas absent - virtually spherical.

STRUCTURE

Layer	A relatively continuous planar unit of soil, limited by difference in composition, texture or structure.
Lens	A discontinuous unit of soil, usually of limited area and generally less than 300 mm thick.
Bed	One distinct soil unit of sedimentary origin, confined within distinct bedding planes.
Homogeneous	Uniform properties within a soil unit.
Interbedded	Alternate beds of soil within a major soil unit.

Laminated	Distinct, fine layers each generally less than 3 mm thick.
Banded	Alternate layers of soil with distinct colour differences.
Mottled	Irregularly marked with spots or zones of different colours.
Silken side	Smooth, polished sometimes striated planar structures resulting from insitu movement.

DEFINITIONS OF DESCRIPTIVE TERMS



PLASTICITY CHART

MAJOR DIVISIONS	BYMBOL	TYPICAL NAMES
GRAVELS (More than 1/2 of coarse fraction > 2 mm)	GW	Well graded gravels or gravel-sand mixtures, little or no fines.
	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
	GM	Silty gravels, gravel-sand-silt mixtures.
	GC	Clayey gravels, gravel-sand-clay mixtures.
SANDS (More than 1/2 of coarse fraction < 2 mm)	SW	Well graded sands or gravelly sands, little or no fines.
	SP	Poorly graded sands or gravelly sands, little or no fines.
	SM	Silty sands, sand-silt mixtures.
	SC	Clayey sands, sand-clay mixtures.
SILTS & CLAYS (L.L. < 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
	OL	Organic silts and organic silty clays of low plasticity.
	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
SILTS & CLAYS (L.L. > 50)	CH	Inorganic clays of high plasticity, fat clays.
	OH	Organic clays of medium to high plasticity, organic silty clays, organic silts.
HIGHLY ORGANIC SOIL	Pt	Peat and other highly organic soils.

CLASSIFICATION CHART

(Unified Soil Classification System)

METHOD OF

SOIL CLASSIFICATION

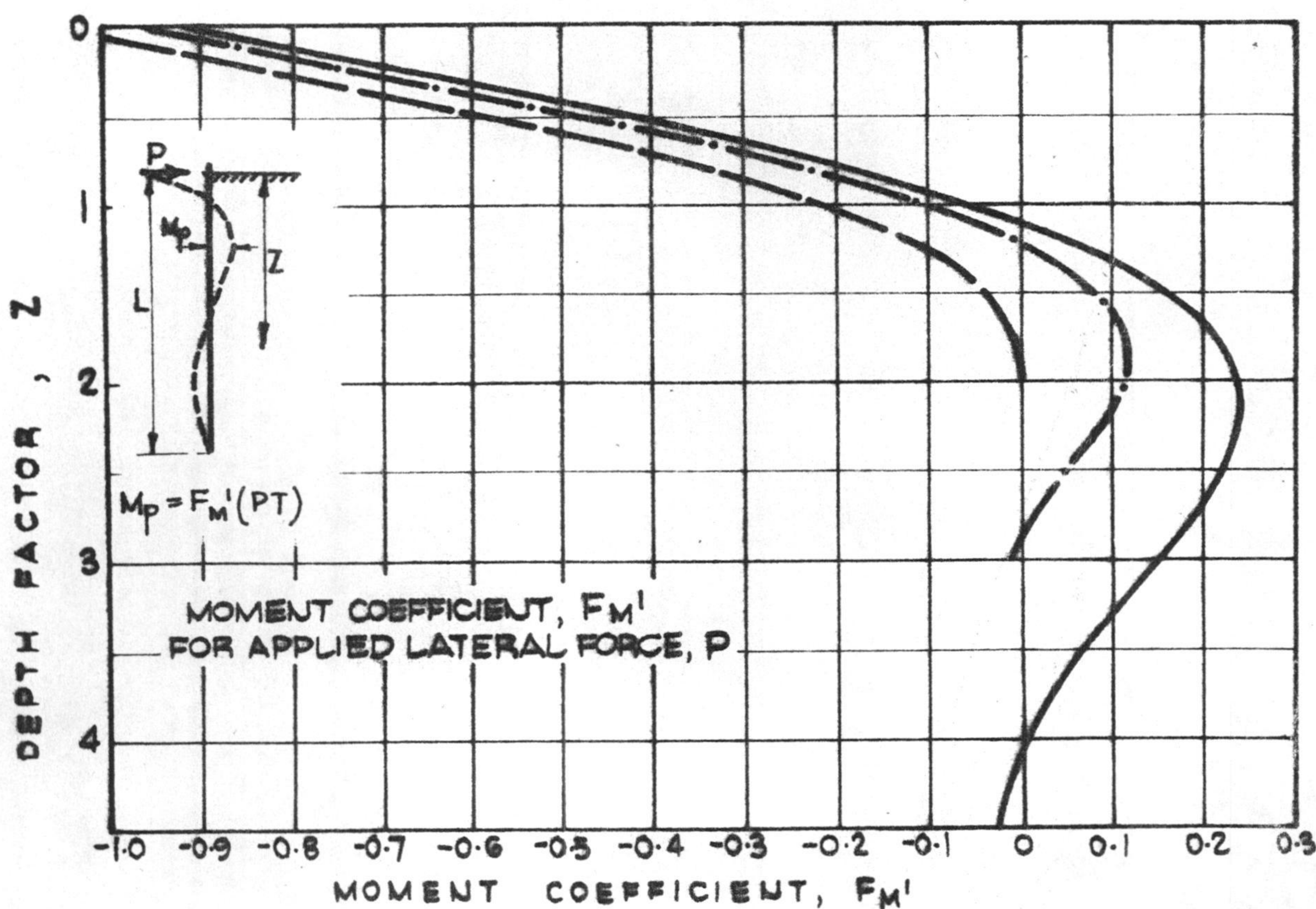
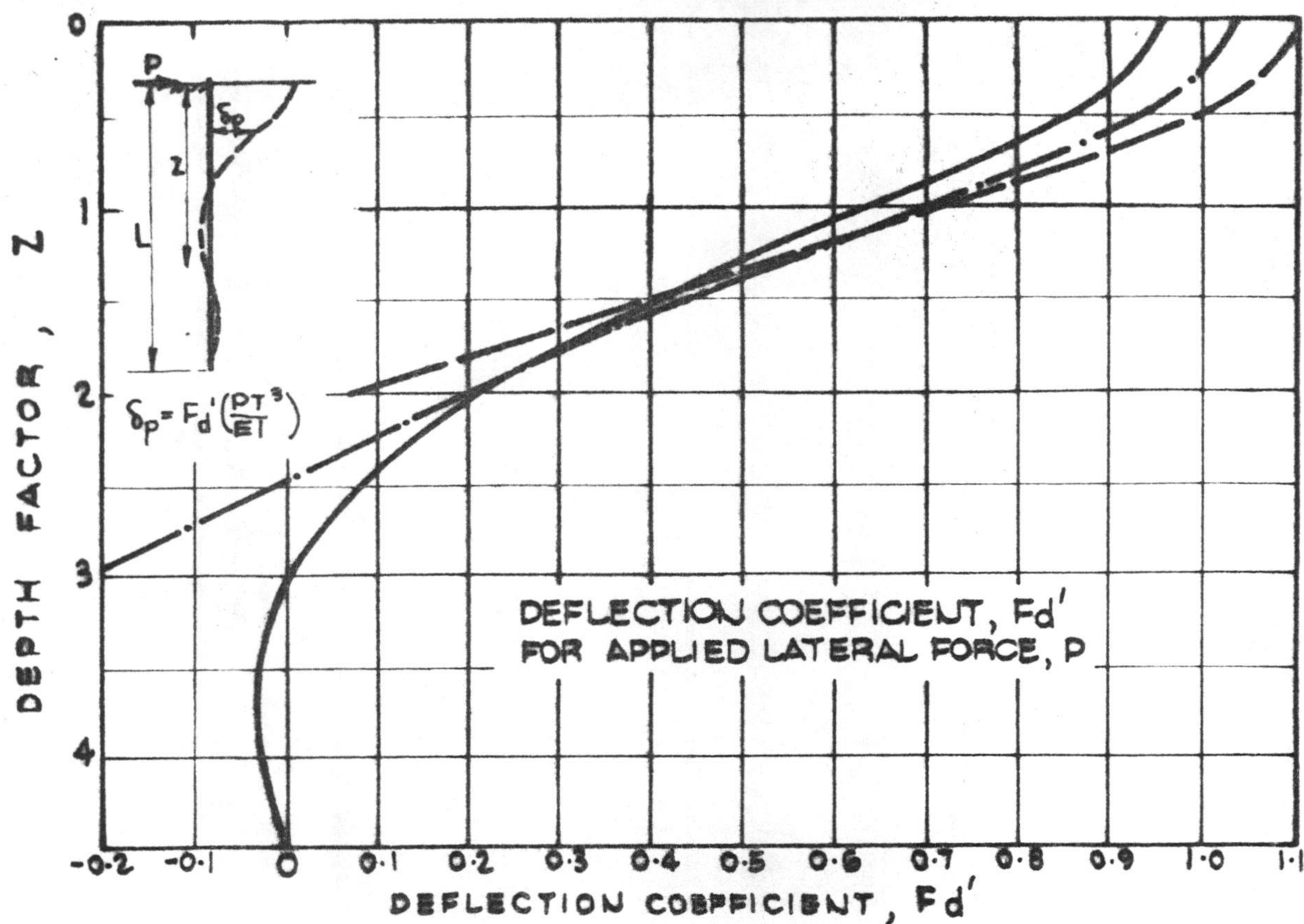
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CHECKED

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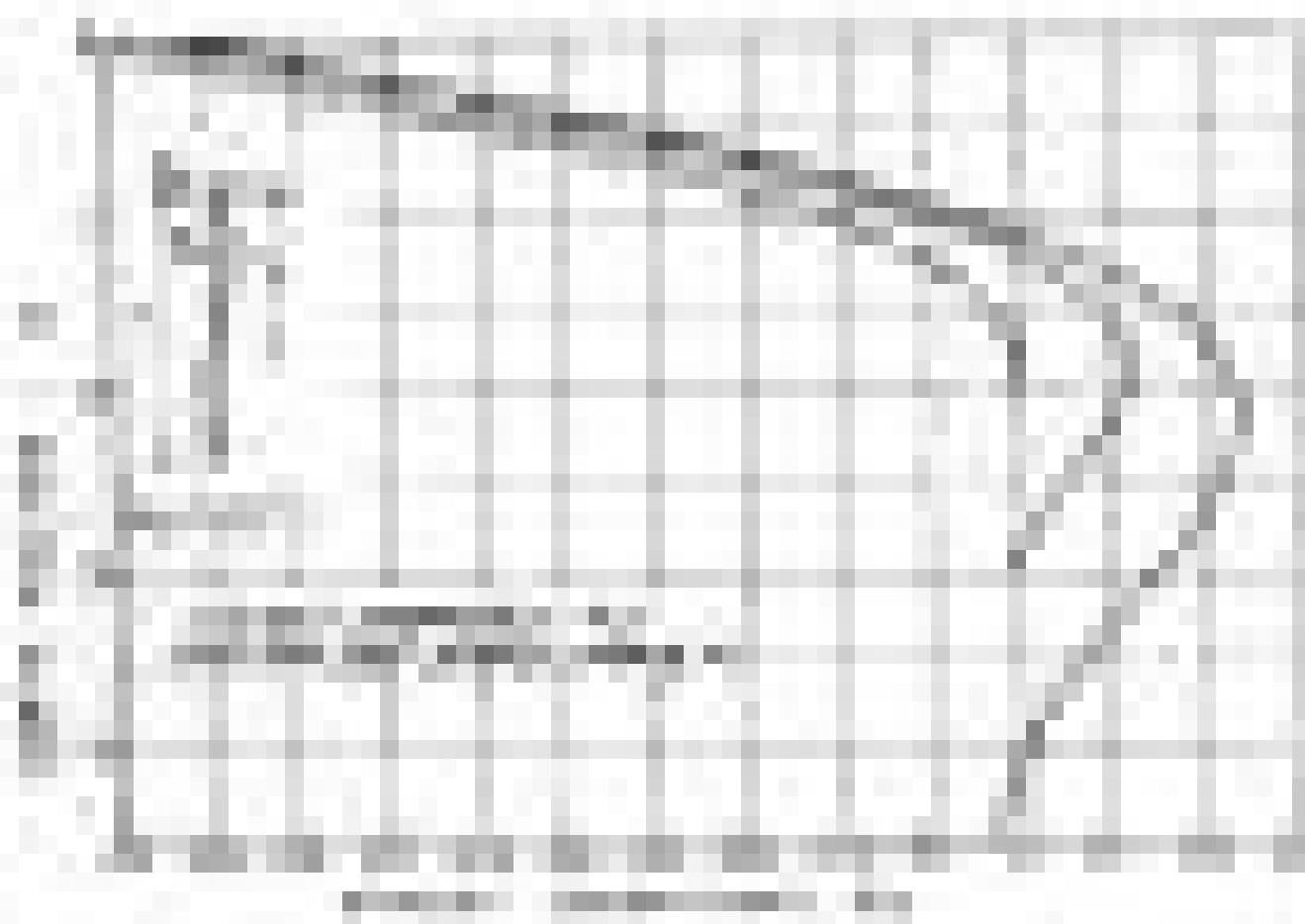
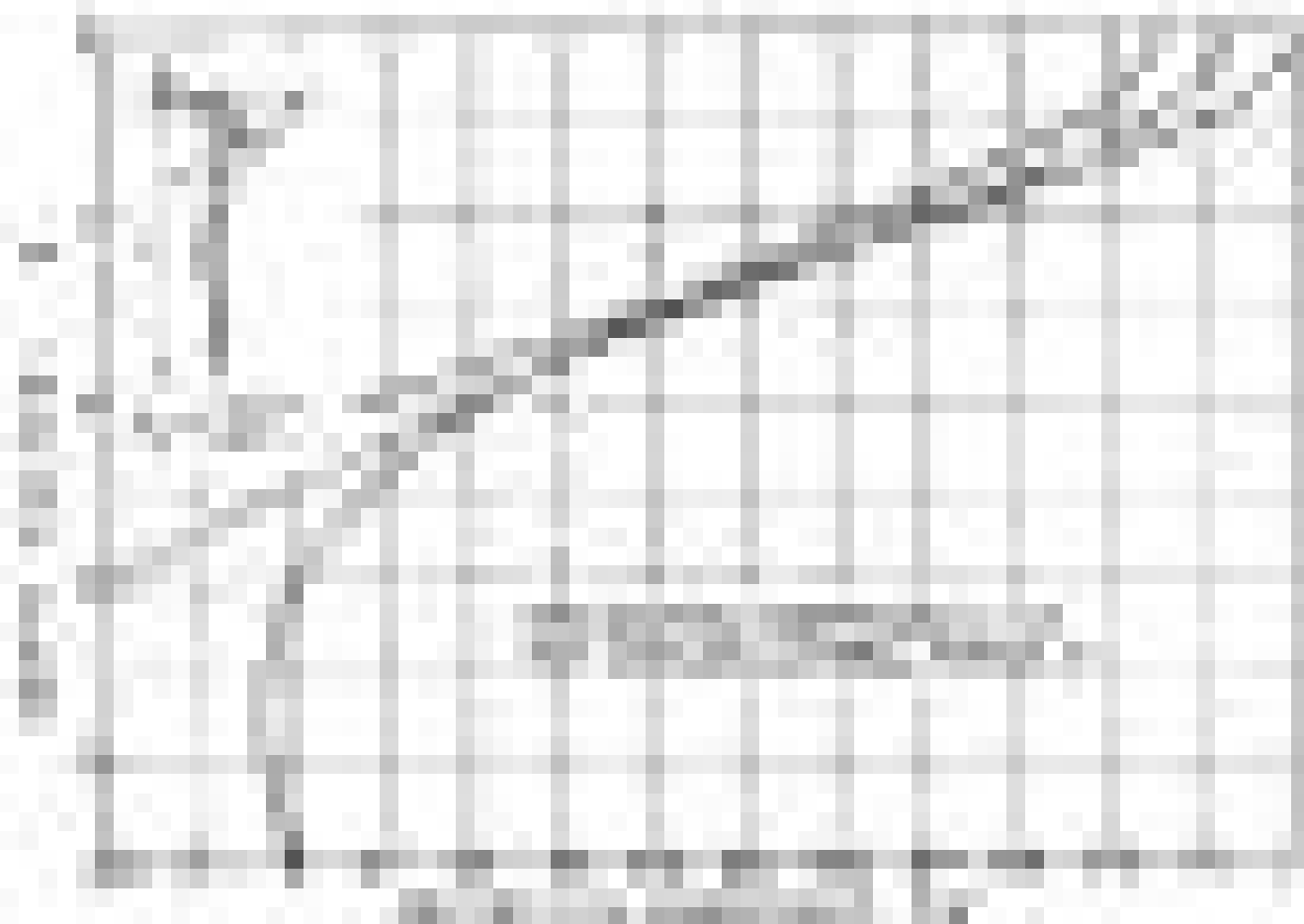
LOCATION

CLIENT



KEY :

 $L = 2$ ————— $L = 3$ ——— $L = 4 \text{ \& greater}$ —————**DESIGN PROCEDURE FOR Laterally LOADED PILES****CASE 2 : FIXED AGAINST ROTATION AT GROUND SURFACE**



Graph the parabola $y = 2x^2 - 12x + 16$ on the coordinate plane. The parabola opens upwards with vertex at (3, 2). The x-intercepts are at (2, 0) and (4, 0). The y-intercept is at (0, 16).

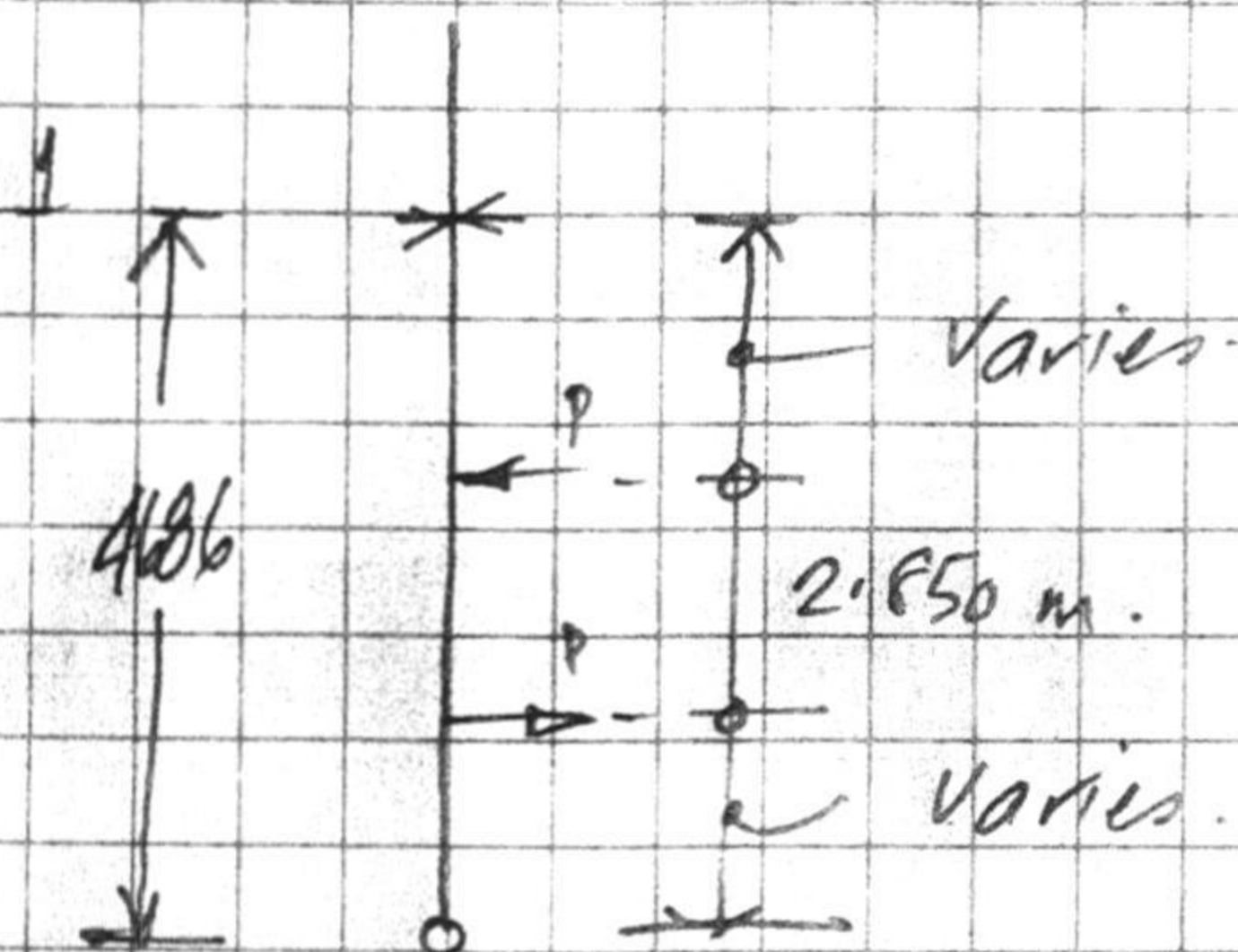
Graph the parabola $y = -x^2 + 6x - 8$ on the coordinate plane. The parabola opens downwards with vertex at (3, 1). The x-intercepts are at (2, 0) and (4, 0). The y-intercept is at (0, -8).

Structure:-

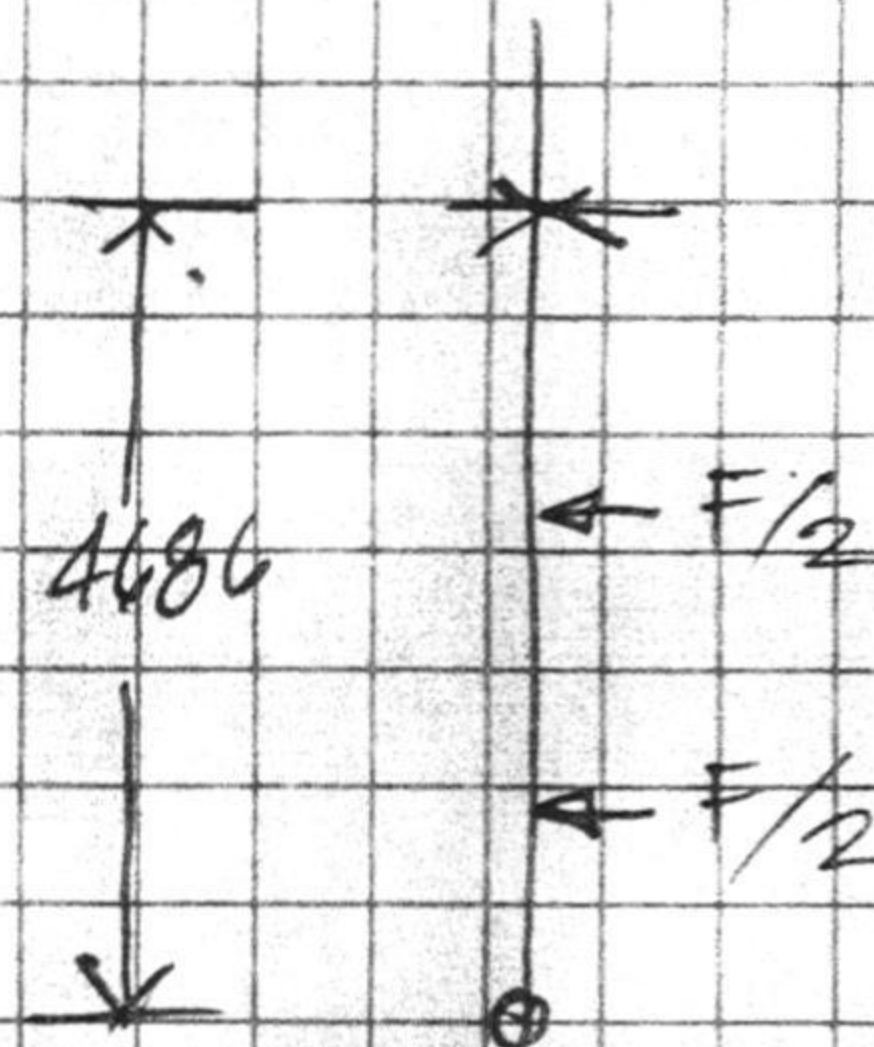
Lvl's Ex R to G incl.

- Building Floors restrain RHS posts

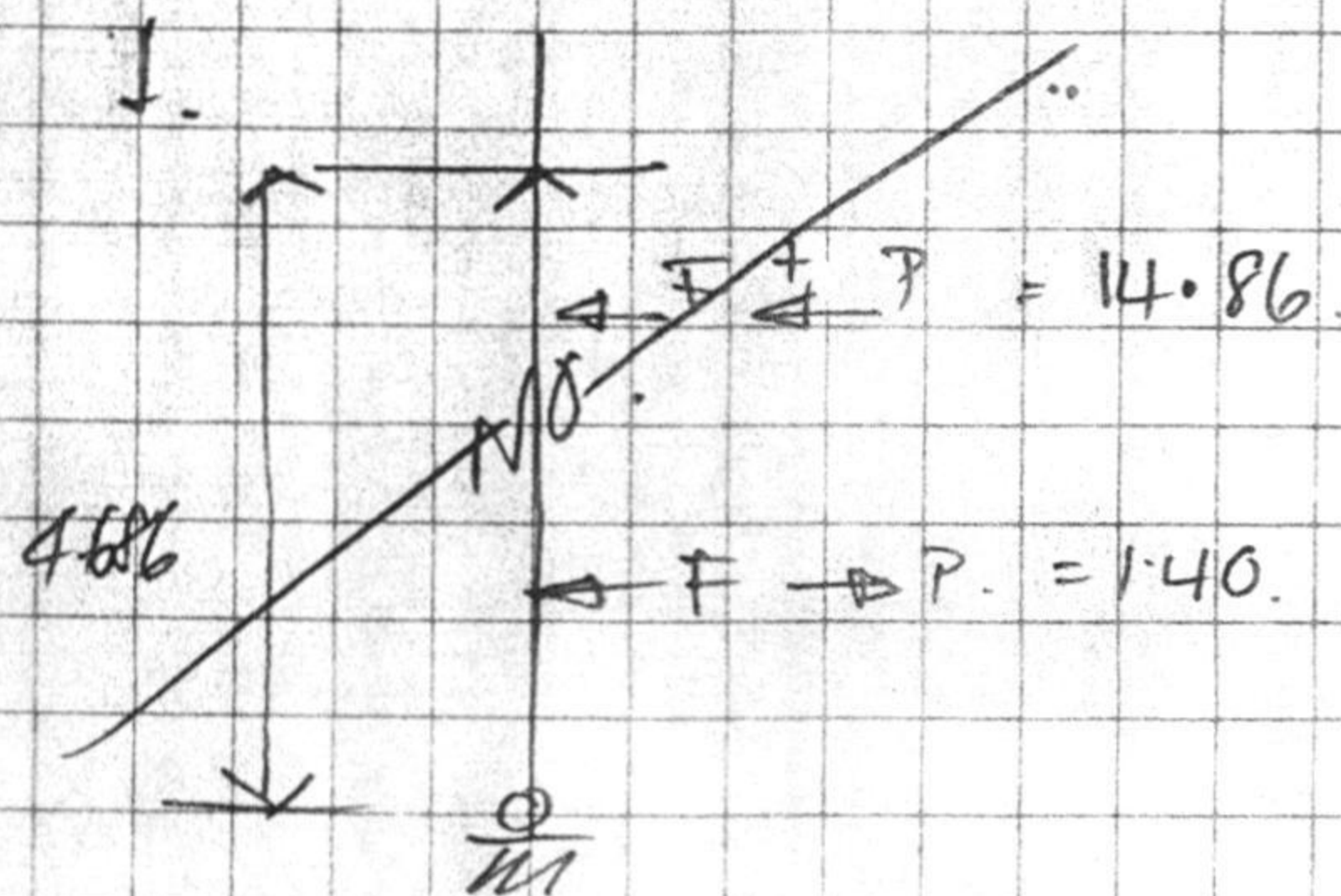
Max Span to Post = 4.69 m. - Continuous -



$$P = 8.13 \text{ kN}$$

CASE A
SAFETY GEAR

$$F = 6.73 \text{ kN}$$

CASE B.
SEISMIC

Max Moment in Stanchion =

- Case A

$$P \text{ at mid span} \Rightarrow M_{\max} = \frac{8.13 \times 4.686}{4} = 9.52 \text{ kNm}$$

CASE B

$$M_{\max} = 8.38 \text{ kNm}$$

CASE C

$$M_{\max} = 17.41 \text{ kNm} \text{ when top of car at mid of shaft.}$$

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ROYAL ANTHROPOLOGICAL INSTITUTE

Volume 10
Part 1
1880

Published by the
Royal Anthropological Institute
of Great Britain and Ireland
1880

HYDRAULIC LIFT

① Hoistway Clear Dims. Int.

2000 W x 2300 D

② Capacity 780 kg

③ Lifting Beam above U/S Roof 200 kg (2T)
at back of shaft & above buffers in Pit.

Impact Loads

- Base of Ram Cylinder Support 96 kN

* Check if this is carried by 2/203 x 76 C's.
- Appears to act on pit base as uncapped.

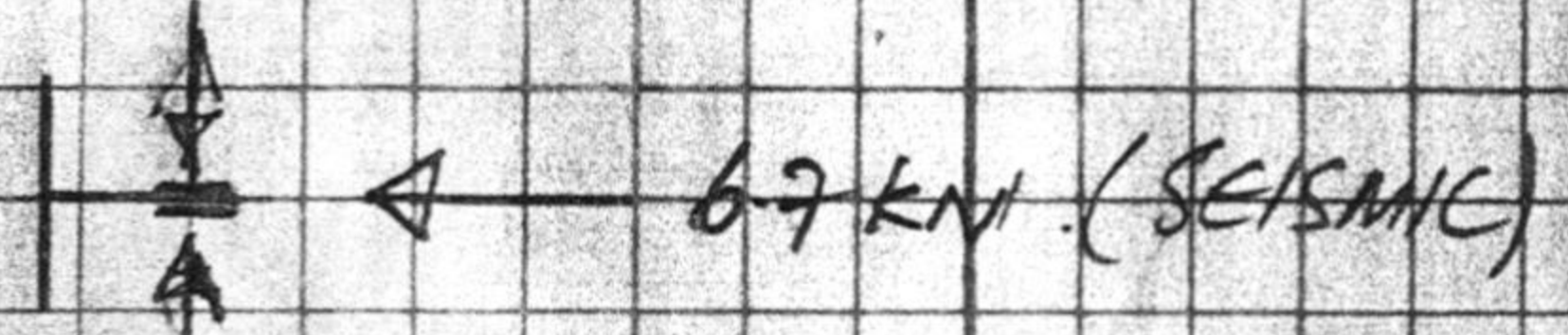
- Rope hitch to 2/203 x 76 C's = 39 kN.

- Acts on 2/203 x 76 C's.

Top Rail connections (restraint)

reqd at 1250 c/s. vertical.

Loads.



* 8.1 kN (Safety Gear Applic^N).

Top Rails: Loads P.

* Do these loads always oppose each other

* Pillar & Ram Support Brackets ? OK into
Studs ? timber.

Torsion = 1.67 kNm.

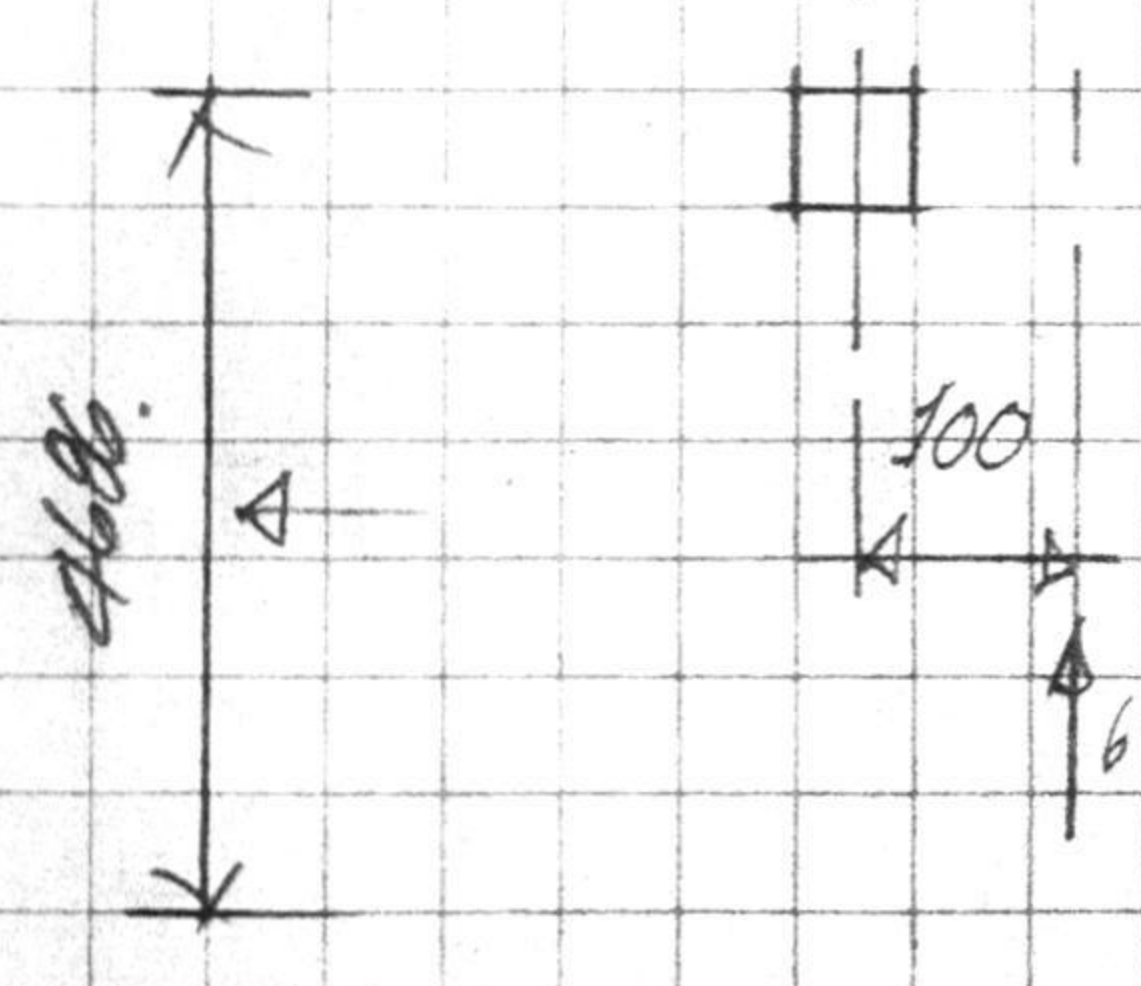
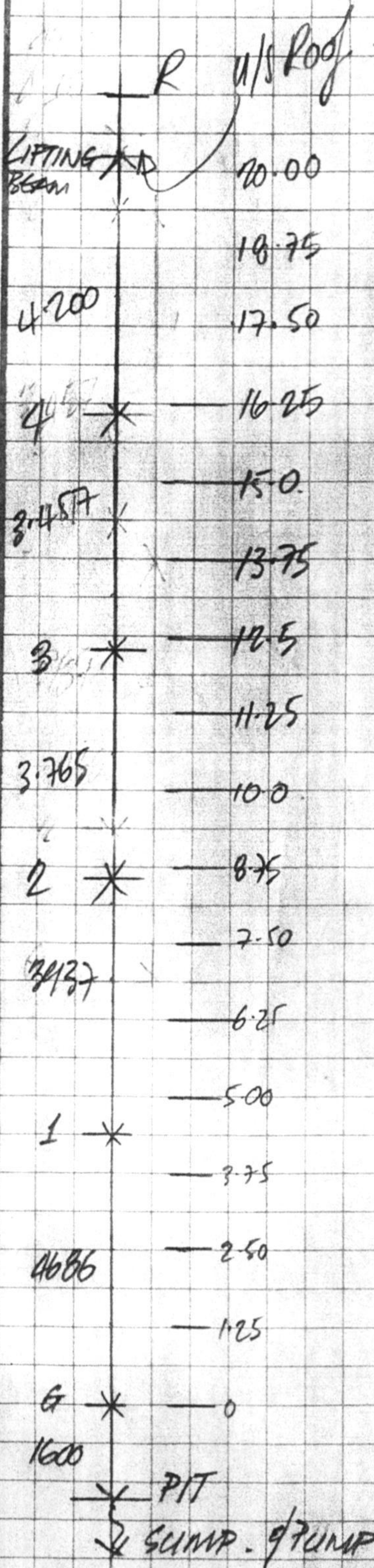
Moment = 7.7 kNm.

Combine Flexural Def'n
& Radial Def'n

to Limit deflection

67 kN.
(Breaking)

8.1 kN. (SEISMIC)



No.	Name	Sex	Age	Height	Weight
1	John Smith	M	25	5' 8"	150 lbs
2	Mary Jones	F	22	5' 4"	120 lbs
3	Robert Brown	M	30	6' 0"	180 lbs
4	Elizabeth White	F	28	5' 6"	130 lbs
5	William Black	M	35	6' 2"	190 lbs
6	Anna Green	F	32	5' 8"	140 lbs
7	Thomas Grey	M	40	6' 4"	200 lbs
8	Sarah Hall	F	38	5' 10"	150 lbs
9	James King	M	45	6' 6"	210 lbs
10	Emily Lee	F	42	5' 12"	160 lbs
11	George Clark	M	50	6' 8"	220 lbs
12	Frances Adams	F	48	5' 14"	170 lbs
13	Charles Baker	M	55	6' 10"	230 lbs
14	Isabella Miller	F	52	5' 16"	180 lbs
15	Henry Wilson	M	60	7' 0"	240 lbs
16	Charlotte Moore	F	58	5' 18"	190 lbs
17	Edward Taylor	M	65	7' 2"	250 lbs
18	Martha Young	F	62	5' 20"	200 lbs
19	Frederick Scott	M	70	7' 4"	260 lbs
20	Ann Hill	F	70	5' 22"	210 lbs
21	Alfred King	M	75	7' 6"	270 lbs
22	Elizabeth King	F	75	5' 24"	220 lbs
23	Samuel King	M	80	7' 8"	280 lbs
24	Elizabeth King	F	80	5' 26"	230 lbs
25	John King	M	85	7' 10"	290 lbs
26	Elizabeth King	F	85	5' 28"	240 lbs
27	William King	M	90	7' 12"	300 lbs
28	Elizabeth King	F	90	5' 30"	250 lbs
29	Thomas King	M	95	7' 14"	310 lbs
30	Elizabeth King	F	95	5' 32"	260 lbs

JOB WWMC - LIFT TOWER

BY RP

LOAD ONTO POST FROM LIFT LOBBIES

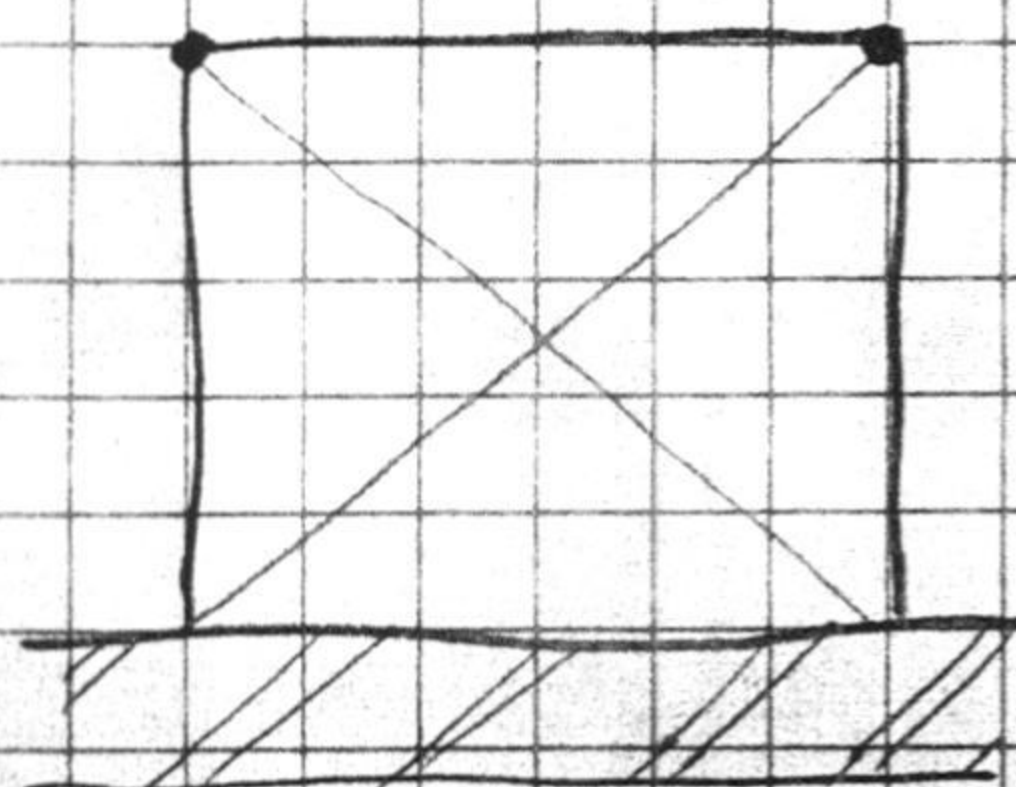
DATE 12/1/88

L4 nil

③ D+L = 4 kN

② D+L = 18 kN

① 23 kN



L4 D+L = 11 kN

③ D+L = 10 kN

② D+L = 18 kN

① 23

In the analysis of the tower posts the loading from levels 3 & 4 lift lobbies etc. was ignored. In the worst column this amounted to 21 kN. In comparison to the 89 kN post axial load from wind loading, this amounts to 24% extra loading.

Since, for wind loading it is permissible to apply a factor of 1.33 to allowable stress, the design is OK as it stands. (i.e. since 24% underdesigned loading < 33% overstress allowable).

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CIVIL STRUCTURAL & EARTHQUAKE ENGINEERS

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DOCUMENTS TRANSFER

TO Wellington City Council

DATE 4/2/88

JOB NUMBER 1868L

JOB NAME WNMC²
Lift Upgrading

ATTENTION Building Inspectors

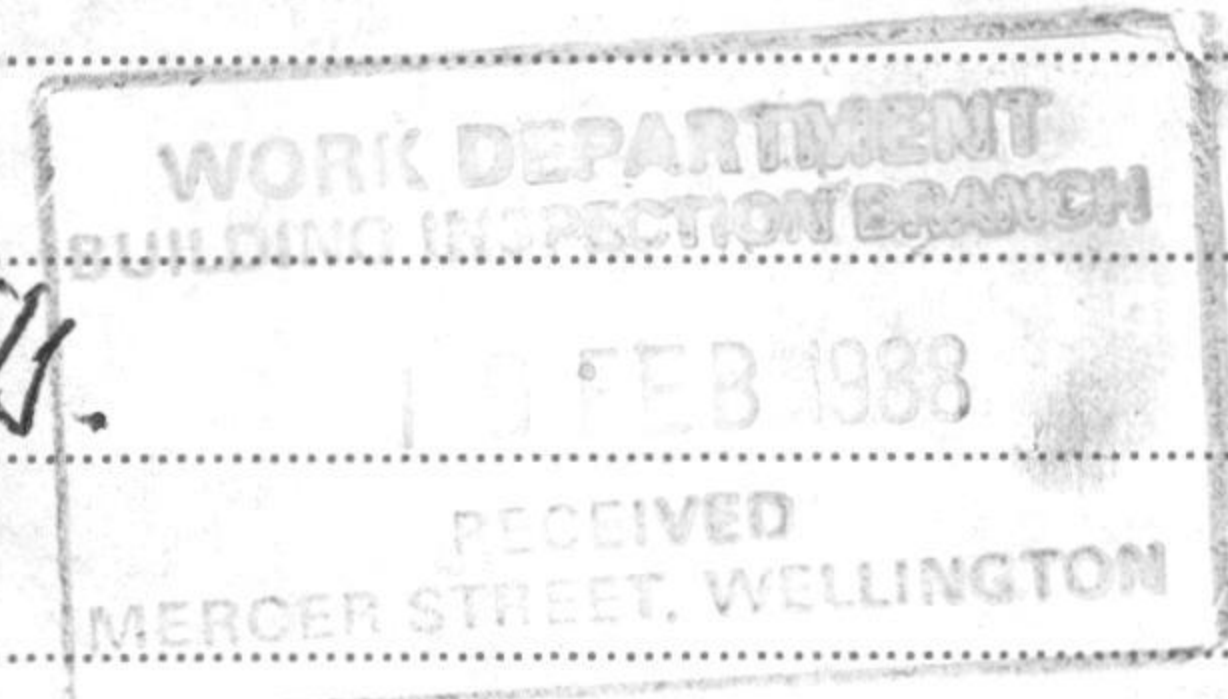
We are sending separately the following:
attached

Copies to:

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<input type="checkbox"/> photostats	<input type="checkbox"/> sketches	<input checked="" type="checkbox"/> client	<input type="checkbox"/> air mail
<input type="checkbox"/> specifications	<input type="checkbox"/> report	<input checked="" type="checkbox"/> architect	<input type="checkbox"/> SL consultants
<input type="checkbox"/> draft specification	<input type="checkbox"/> draft report	<input checked="" type="checkbox"/> quantity surveyor	<input type="checkbox"/> messenger
<input type="checkbox"/> tracings	<input type="checkbox"/>	<input checked="" type="checkbox"/> <u>WDC</u>	<input type="checkbox"/> recipients
			<input type="checkbox"/> messenger

No.	Drawing No.	Description
2	1868L/21	} Structural Steel & Reinforced Concrete Details.
	22	
	23	
	24	
2	7915 & A36	} Architectural Details.
1	Set of Calculations.	



Sent to you for the following reasons: Structural Documents in Satisfaction
of Permit Addenda for Stage 2 Works item 13.

Signature for Smith Leuchars Limited [Signature]

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Wellington Workingmen's Club
Roped Hydraulic Lift Tower.

237

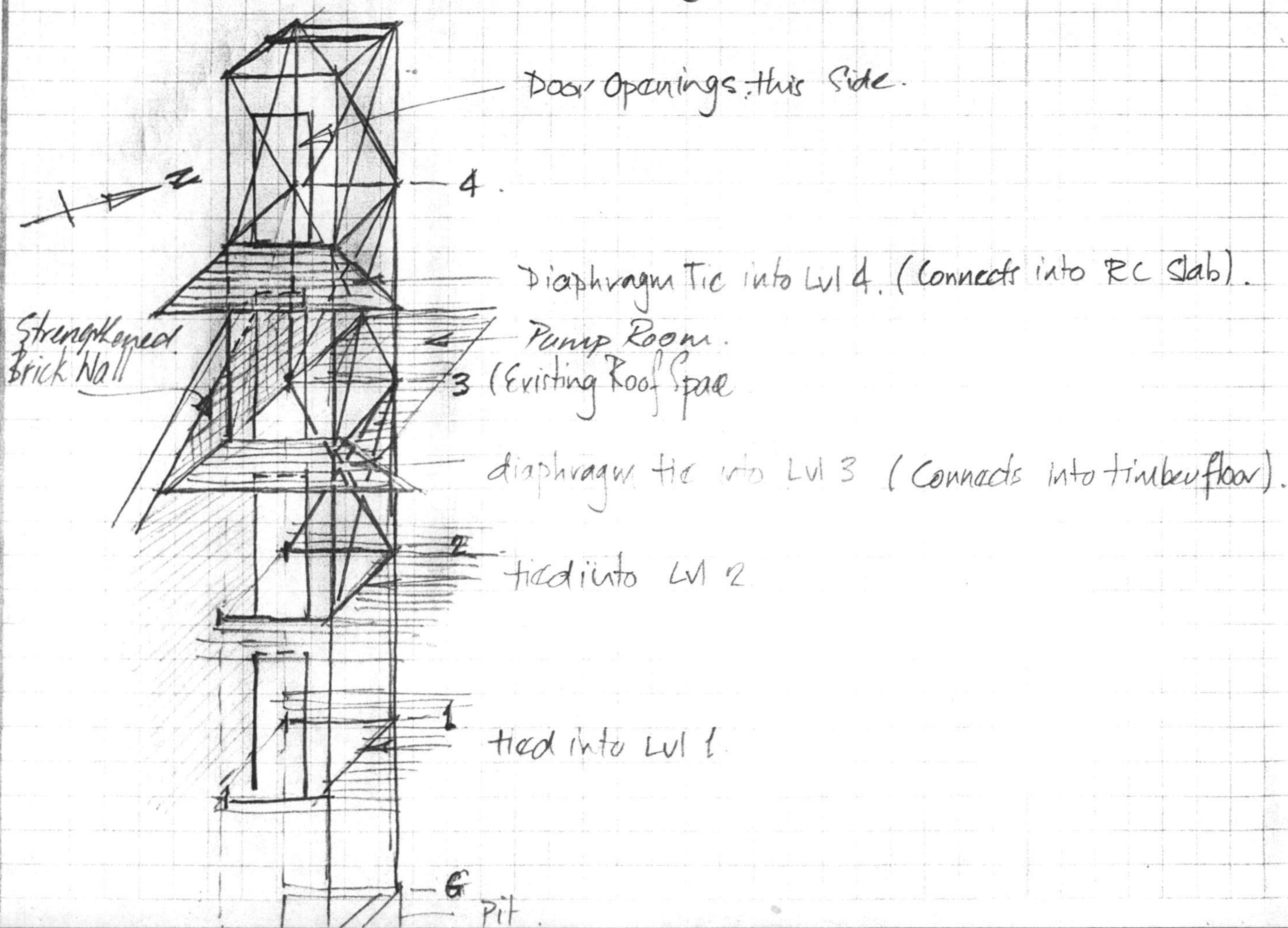
4/2/88

Design of Lift Tower to WHMC. -

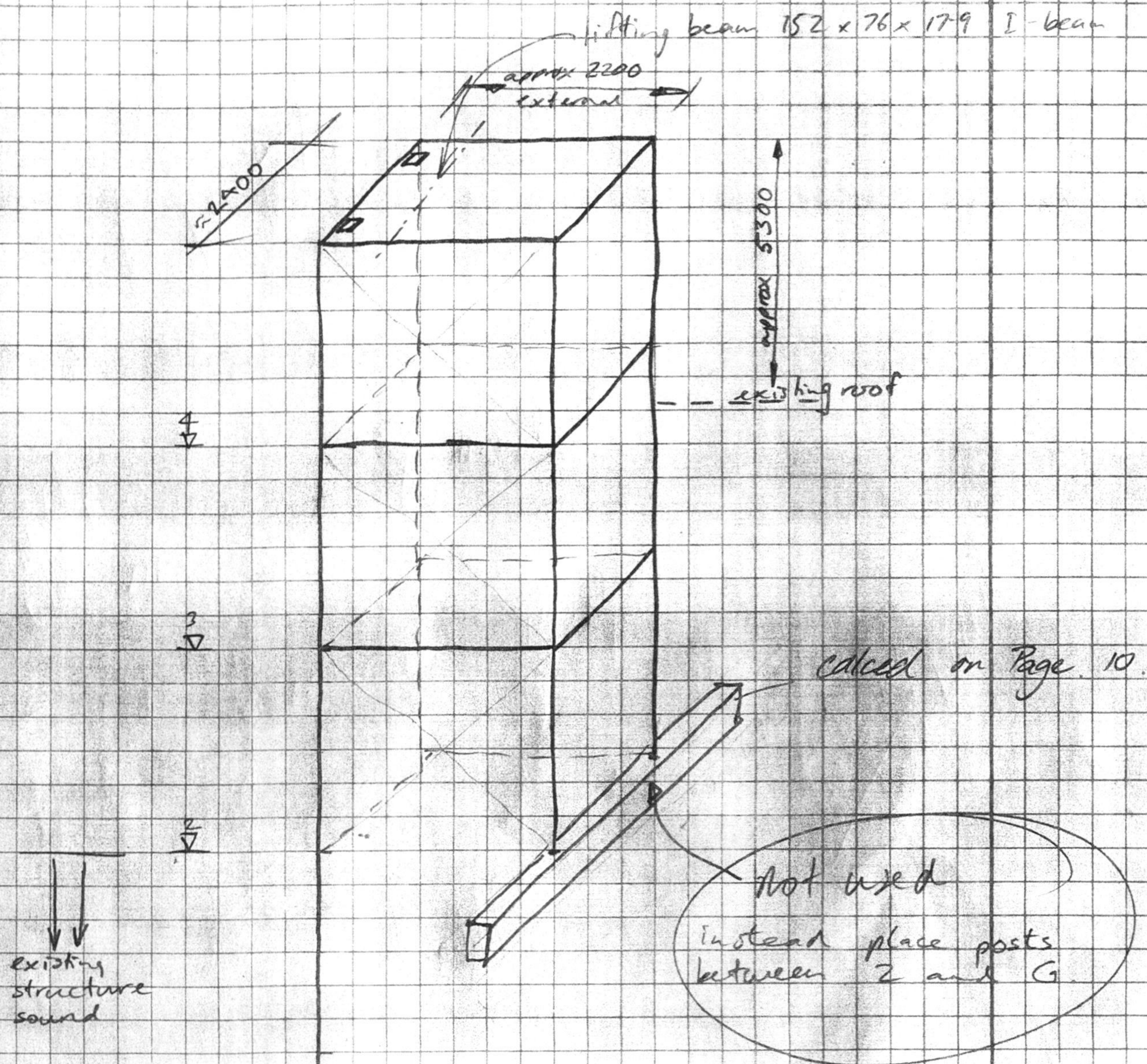
The following are the calculations for the design of the lift tower to the above building.

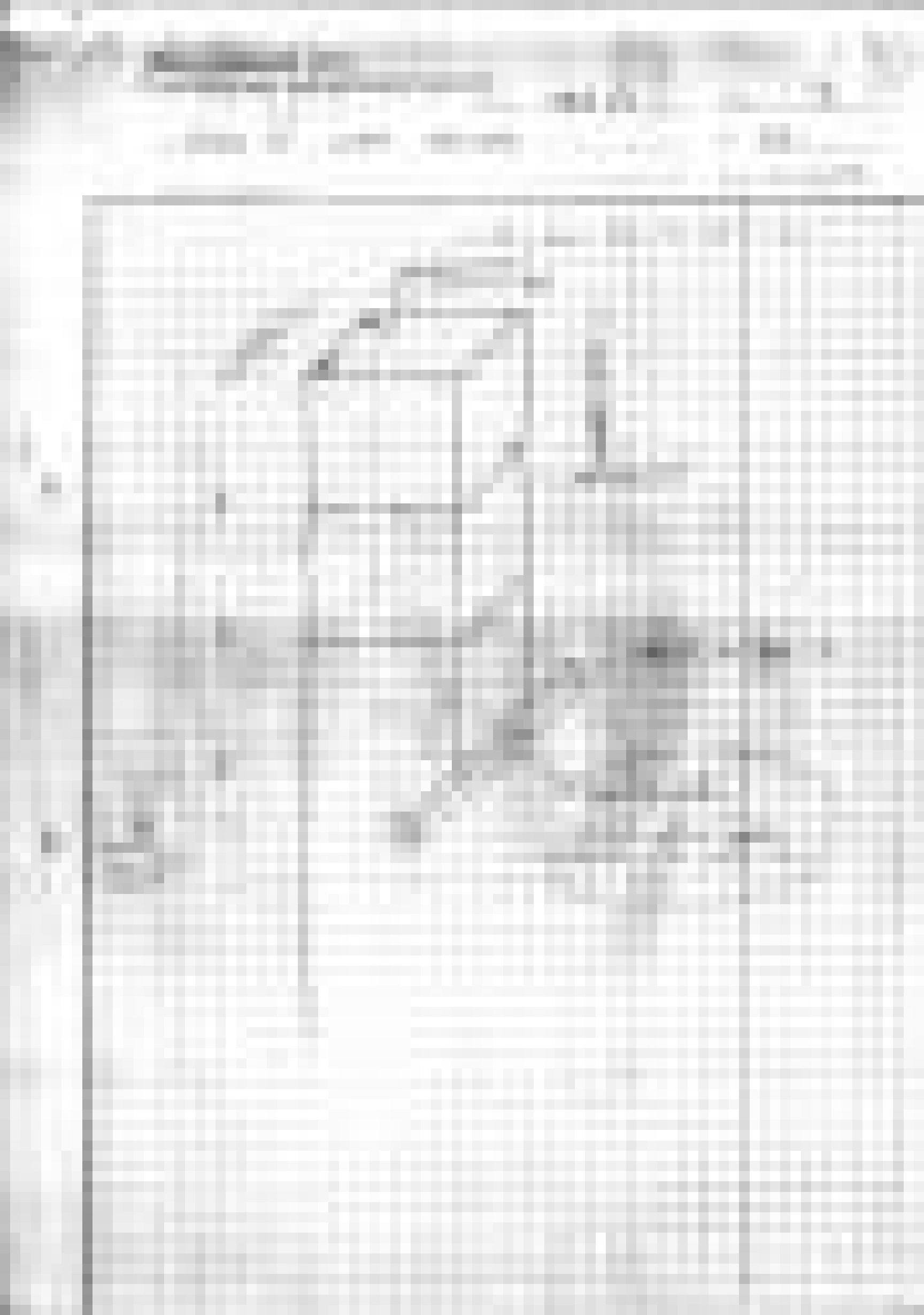
As the building will have been substantially strengthened to 2/3 NZS 1900 chapter 8 requirements by the time the work on the new lift tower is commenced. The building is considered to be of sufficient strength to adequately laterally support the lift car loads at each floor level.

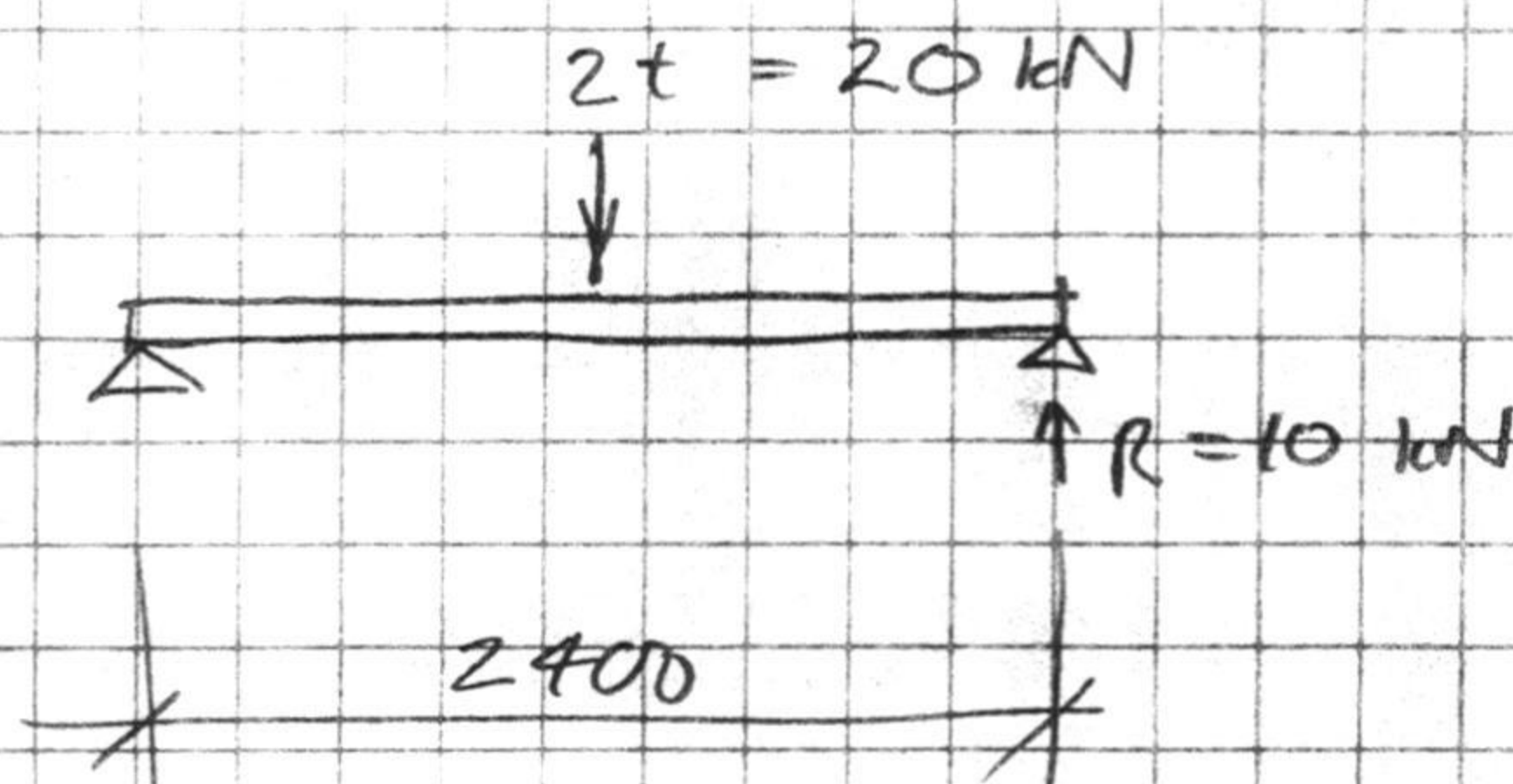
The Lift tower has been designed to cantilever above Level 2 slab and accordingly is cross braced above this level so that lateral induced loads are transmitted into the supporting corner steel members below this level which in turn are founded off the lift pit below ground level. Where existing strengthened brick walls bound the shaft, the lift tower is supported by direct connection into the wall. Secondary effects of direct connection of guide rail supports have been considered in sizing tower members.











$$M = 20 \times 24 / 4 = 120 \text{ kN.m}$$

estimate $Z = \frac{12 \times 10^6}{0.6 \times 250} = 80 \times 10^3 \text{ mm}^3$

Try 152 x 76 x 17.9 RSJ

$$M/F_y = \frac{2400}{16.3} = 147 > 160/F_y$$

\therefore C15.4 applies.

$$P/T = 15.9$$

$$T/L < 2$$

$$d/A = 23 < 85$$

\therefore use T 5.4.4 (3)

$$\Rightarrow F_b = 128 \text{ MPa}$$

$$f_b = \frac{12 \times 10^6}{115 \times 10^3} = 104 \text{ MPa}$$

$$f_b < F_b$$

\rightarrow O.K.

LIFTING BEAM

152 x 76 x 17.9 RSJ

CHECK SHEAR

$$f_v = \left(\frac{10000}{152 \times 5.84} \right) \times 2 = 11 \text{ MPa} \times 2$$

$$= 22 \text{ MPa} \rightarrow \text{N.C.} \therefore \text{O.K.}$$



The lifting beam is placed eccentrically at the top of the frame. Therefore we can conservatively assume that one corner column carries all the 20 kN reaction (20 kN since the load may be at one end of the lifting beam).

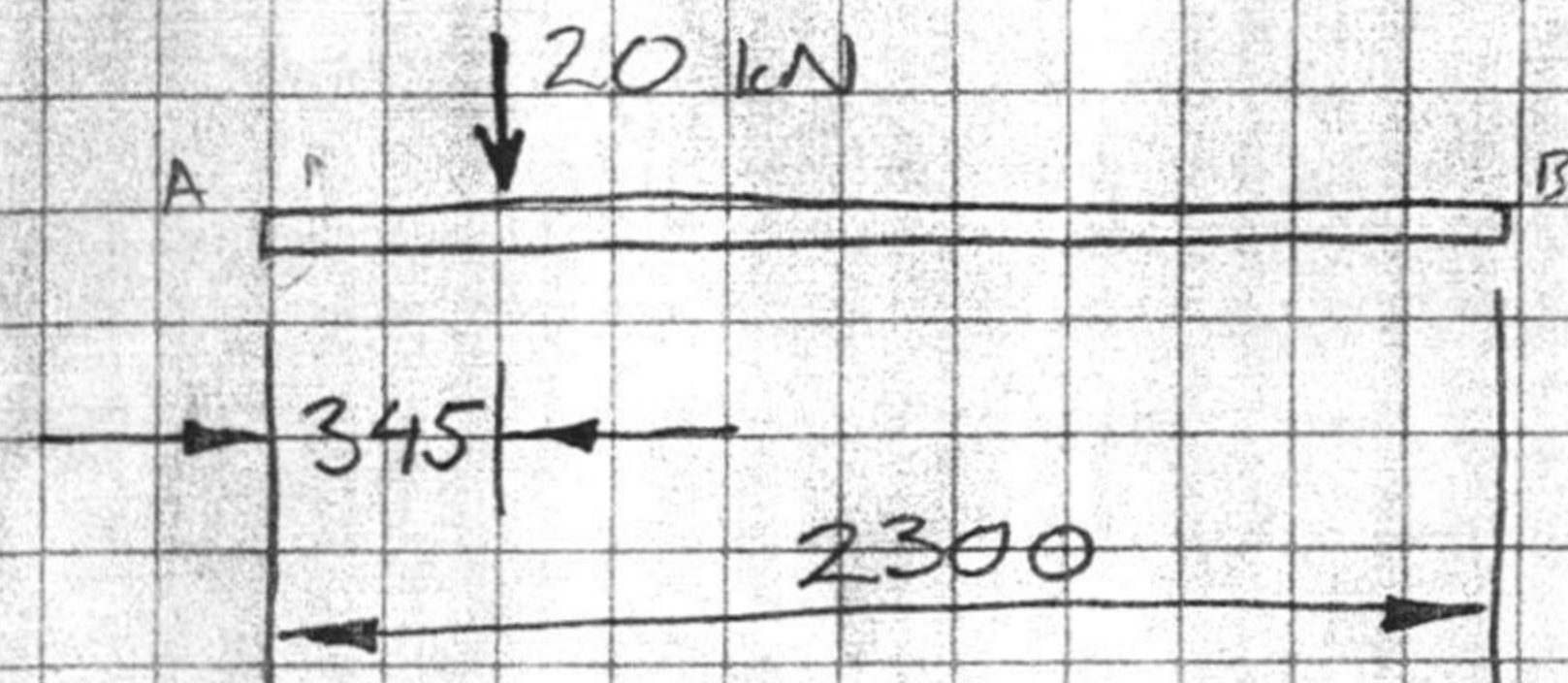
Check 100 x 100 x 8 L

$$\begin{aligned} r_g &= 20.0 \text{ mm} \\ \therefore l/r_g &= 4200/20 \\ &= 210 \\ T 6-1-1 \Rightarrow F_{ac} &= 21 \text{ MPa.} \end{aligned}$$

$$\begin{aligned} f_{ac} &= 20 \times 10^3 / 1540 \\ &= 13 \text{ MPa.} \end{aligned}$$

$$\therefore f_{ac} < F_{ac} \quad \therefore \text{OK!}$$

CHECK 100 x 100 x 8L TO SUPPORT THIS REACTION



$$Z_x = 20.4 \times 10^3$$

Simply supported:

$$\begin{aligned} M &= \frac{20 \times 1.955}{2.3} \times 0.345 \\ &= 5.9 \text{ kNm} \end{aligned}$$

FEM

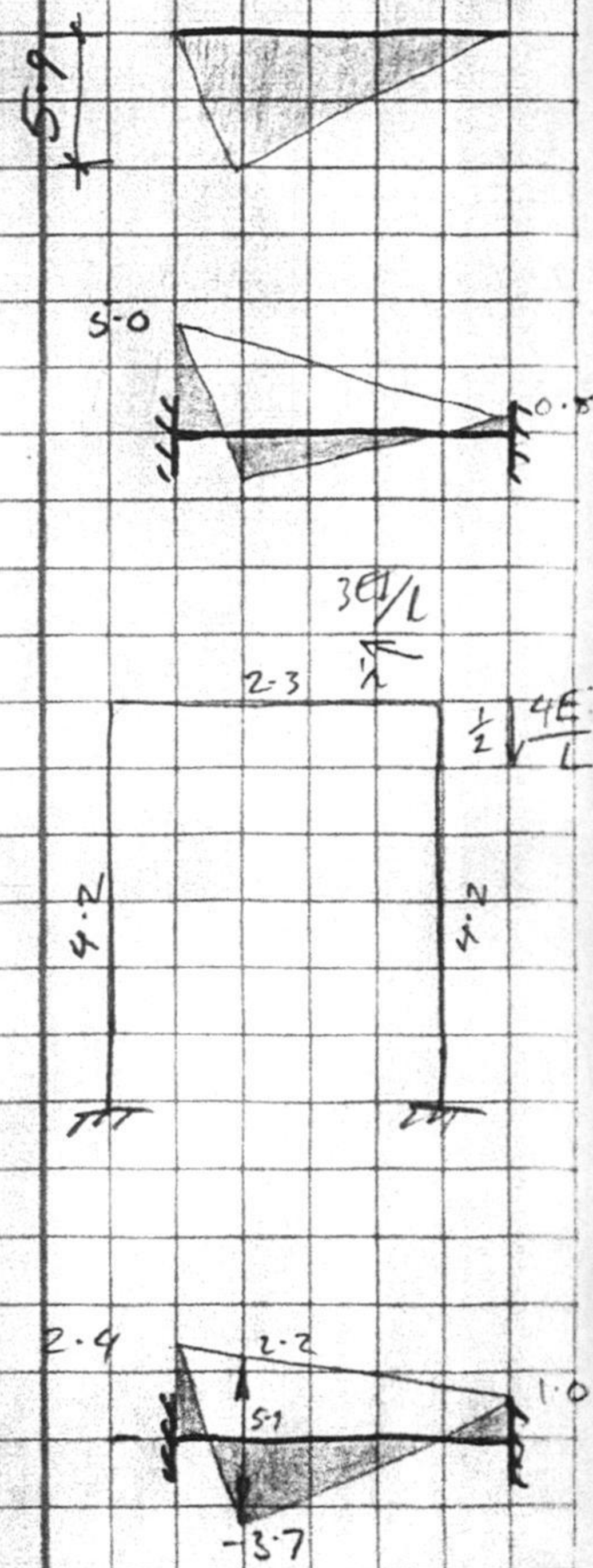
$$\begin{aligned} M_A &= \frac{20 \times 0.345 \times 1.955^2}{2.3^2} \\ &= -5.0 \text{ kNm} \\ M_B &= 5.0 \times 0.345 / 1.955 \\ &= +0.88 \text{ kNm} \end{aligned}$$

$$\begin{aligned} S_{\text{post}} &= \frac{4EI}{L} = \frac{4}{4.2} EI = 0.95 EI \\ S_{\text{horiz}} &= \frac{3EI}{L} = \frac{3}{2.3} EI = 1.30 EI \end{aligned}$$

$$\begin{aligned} \delta_{\text{post}} &= 0.47 \\ \delta_{\text{horiz}} &= 0.58 \end{aligned}$$

A		B	
post	horiz	horiz	post
0.42	0.58	0.58	0.42
	-5.0	+0.9	
+2.1	+2.9	-0.5	-0.4
	-0.3	+1.4	
+0.1	+0.2	-0.8	-0.6
	-0.4	+0.1	
+0.2	+0.2	-4.1	
2.4	-2.4	+1.0	-1.0

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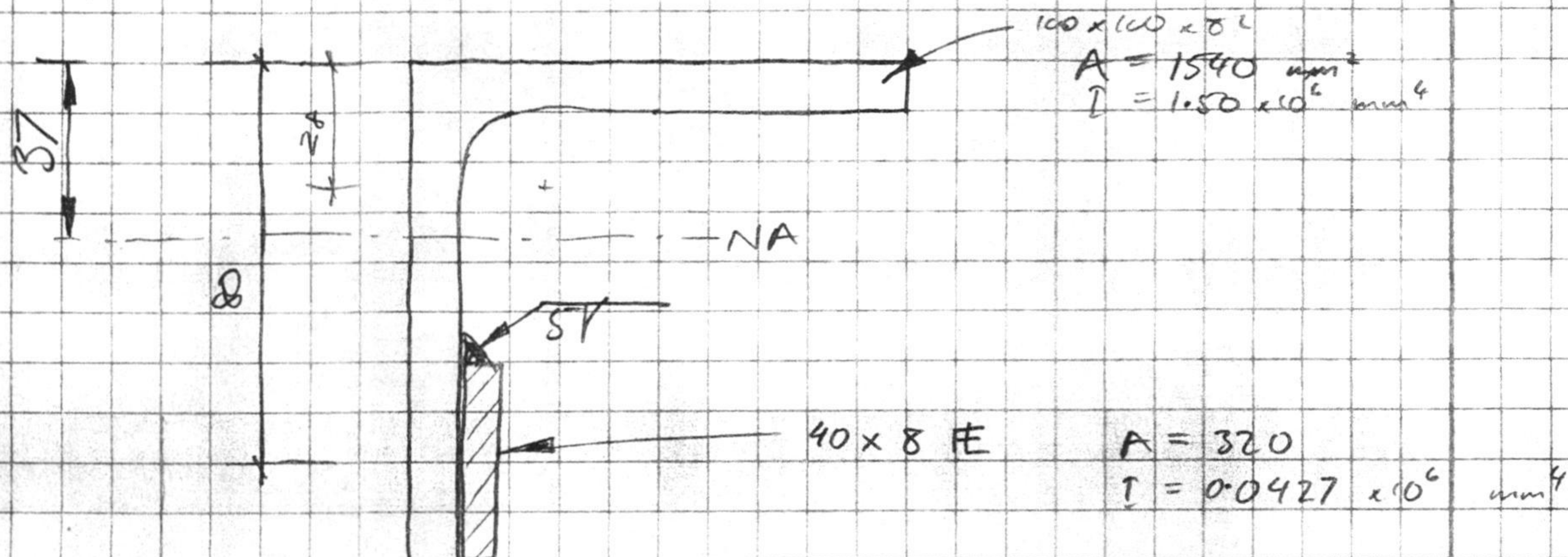
Abstract



Figure 1. The effect of the number of trials on the mean number of correct responses. The number of correct responses was significantly higher for the 10 trials condition than for the 5 trials condition. Error bars represent the standard error of the mean.

1. **Introduction**
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 216. **Figure 209**
 217. **Figure 210</**

Try a 40x8 \bar{A} welded to Angle



$$\bar{y} = \frac{(28 \times 1540) + (80 \times 320)}{1540 + 320}$$

$$= 37 \text{ mm}$$

$$I = (1.50 + 0.04) \times 10^6 + (1540 \times 7^2) + (320 \times 43^2)$$

$$= 1.54 + 0.12 + 0.59$$

$$= 2.26 \times 10^6 \text{ mm}^4$$

$$Z = \frac{2.26 \times 10^6}{(100 - 37)}$$

$$= 35.8 \times 10^3 \text{ mm}^3$$

$$f_b = \frac{37 \times 10^6}{35.8 \times 10^3}$$

$$= 103 \text{ MPa}$$

$$= 0.41 F_y \rightarrow \text{OK}$$

Check shear flow across weld.

shear flow

$$v = \frac{VQ}{I}$$

$$Q = (40 \times 16) \times (100 - 37 - 20)$$

$$= 27.5 \times 10^3 \text{ mm}^3$$

use

$$V = 20 \text{ kN}$$

\therefore

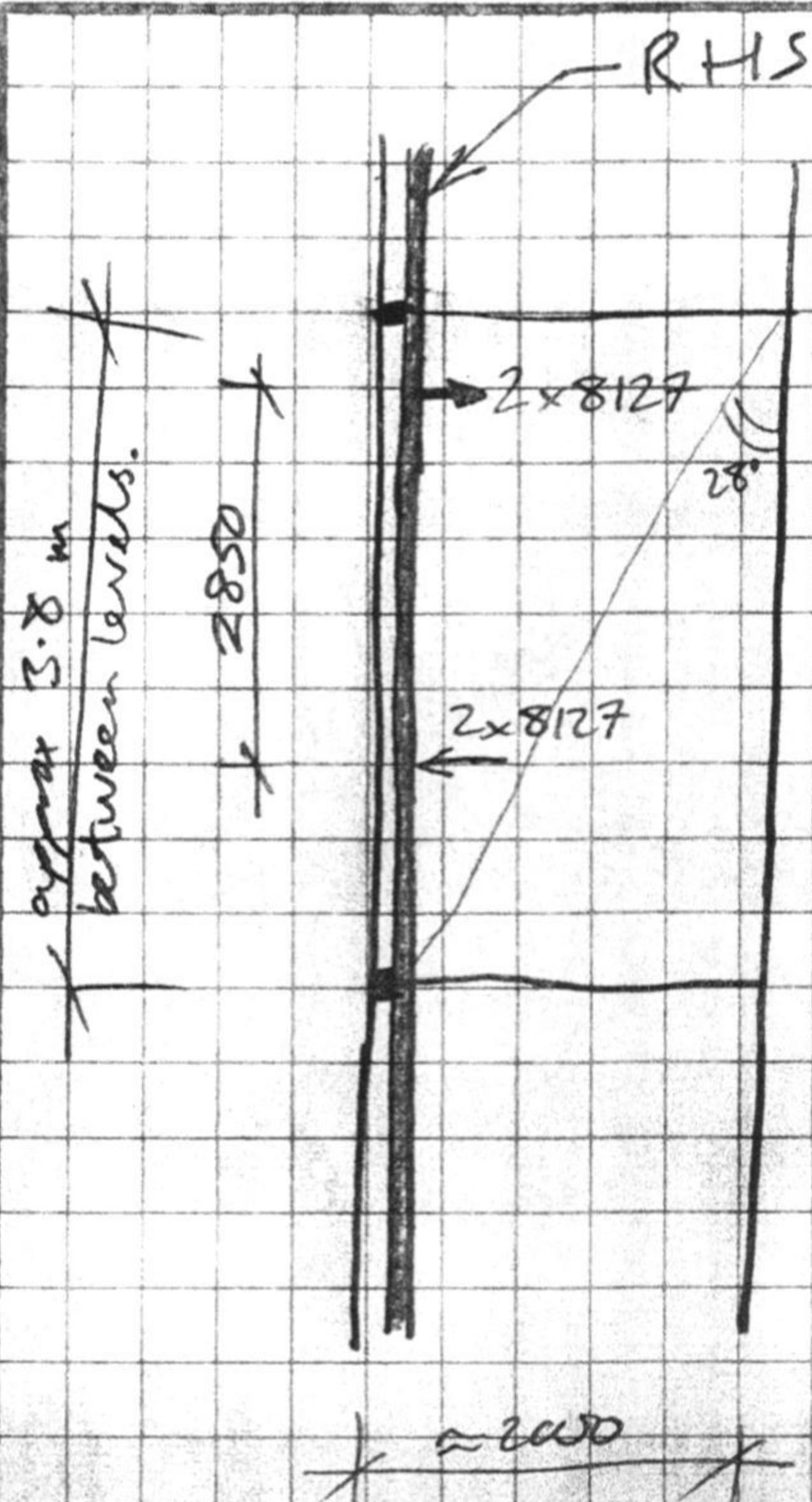
$$v = \frac{20 \times 27.5 \times 10^3}{2.26 \times 10^6} \text{ kN/mm}$$

$$= 0.24 \text{ kN/m}$$

\therefore

5 mm fillet OK

$$\text{allowable load} = 0.48 \text{ kN/m}$$



$$\begin{aligned} \text{Mom. onto RHS} &= 2 \times 8127 \times 2.85 \text{ N.m} \\ &= 46.3 \text{ kN.m} \end{aligned}$$

If this is resisted by forces at the floor level

$$\begin{aligned} F &= 46.3 / 3.8 \\ &= 12.2 \text{ kN} \end{aligned}$$

This force will be distributed between the diaphragm and the diagonal tension tie.

$$\begin{aligned} \text{force in diagonal } T &= 12.2 / \sin 28^\circ \\ &= 26 \text{ kN} \end{aligned}$$

$$\begin{aligned} \text{required } A_s &= 26000 / 250 \\ &= 105 \text{ mm}^2 \text{ i.e. negligible} \end{aligned}$$

provide 40 x 6 FE diagonals

Compression caused in column

$$\begin{aligned} 2 \times C &= 26 \times \cos 28^\circ \text{ kN} \\ &= 23.15 \text{ kN} \end{aligned}$$

Mom from cols

$$\begin{aligned} &= 2 \times 23.15 / 2 \times 2 \\ &= 46.3 \text{ kN.m} \\ &= \text{applied moment.} \end{aligned}$$

$$C = 12 \text{ kN}$$

$$\begin{aligned} F_{ac} &= 23.15 \times 10^3 / 1540 \times 10^3 \\ &= 15.0 \text{ MPa} < 21 = F_{ac} \therefore \text{OK} \end{aligned}$$

Date	Description	Amount
1/1/19	To Balance	100.00
1/2/19	By Cash	50.00
1/3/19	To Cash	25.00
1/4/19	By Cash	75.00
1/5/19	To Cash	100.00
1/6/19	By Cash	150.00
1/7/19	To Cash	200.00
1/8/19	By Cash	250.00
1/9/19	To Cash	300.00
1/10/19	By Cash	350.00
1/11/19	To Cash	400.00
1/12/19	By Cash	450.00
1/13/19	To Cash	500.00
1/14/19	By Cash	550.00
1/15/19	To Cash	600.00
1/16/19	By Cash	650.00
1/17/19	To Cash	700.00
1/18/19	By Cash	750.00
1/19/19	To Cash	800.00
1/20/19	By Cash	850.00
1/21/19	To Cash	900.00

JOB WWMC - LIFT TOWER

BY

RP

SEISMIC LOAD CASE

DATE 3/12/87

Assume car mass

$$M = 2.0 \text{ t}$$

Assume

$$C_d = 0.1$$

and is from the original strengthening rules and is based on $2/3$ of 1985 code.

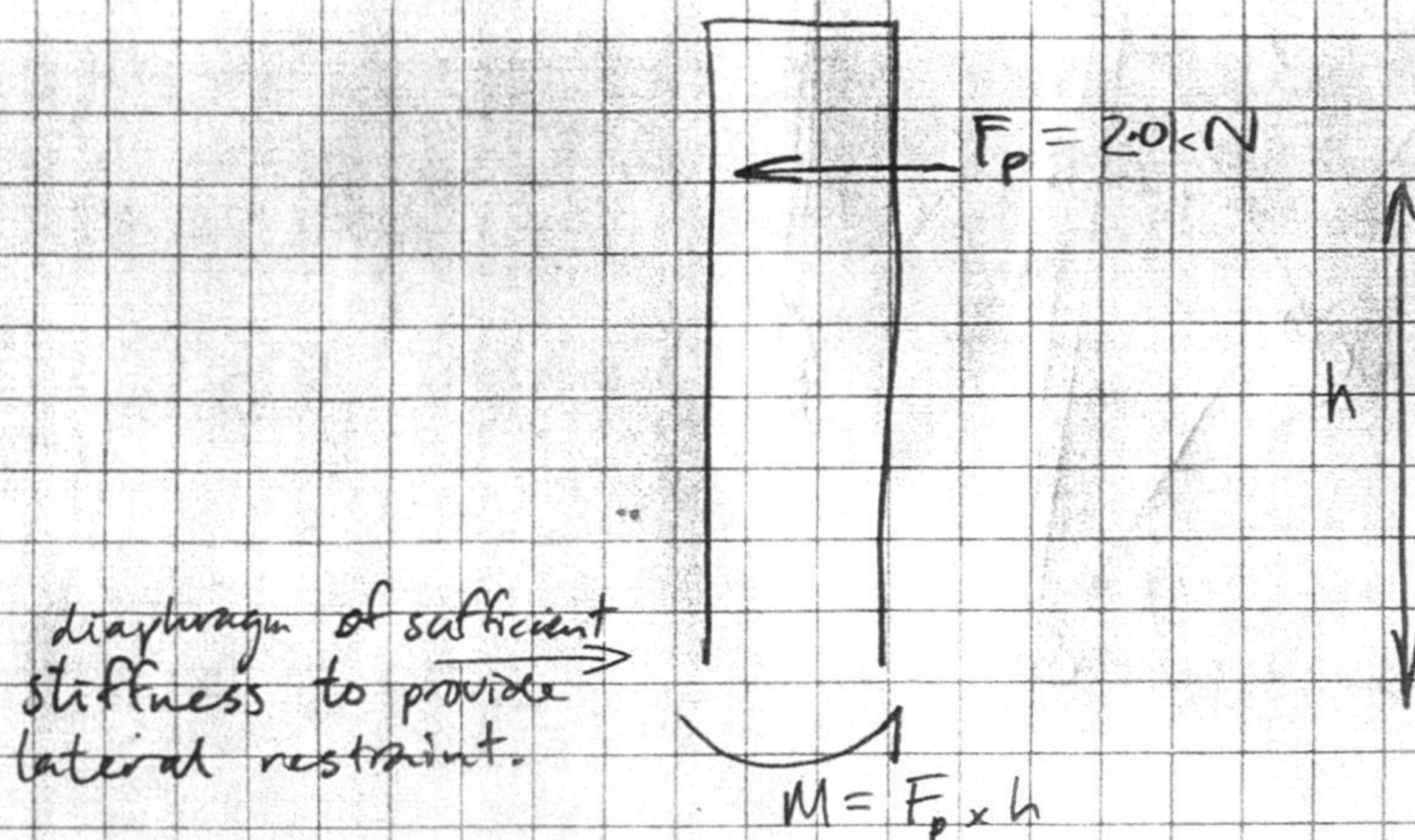
Seismic force

$$F_p = 0.1 \times 9.81 \times 2.0$$

$$= 2.0 \text{ kN}$$

This shear will easily be resisted by the diagonals detailed for the "safety gear" case.

This lateral force will cause a moment, lower down in the tower.



Since, for the load case "safety gear" the columns could resist the 46 kNm moment input; we can infer that h may be at least 23 m.

Clearly, therefore, this case is not critical.

→ OK
no seismic.

1870

1871

1872

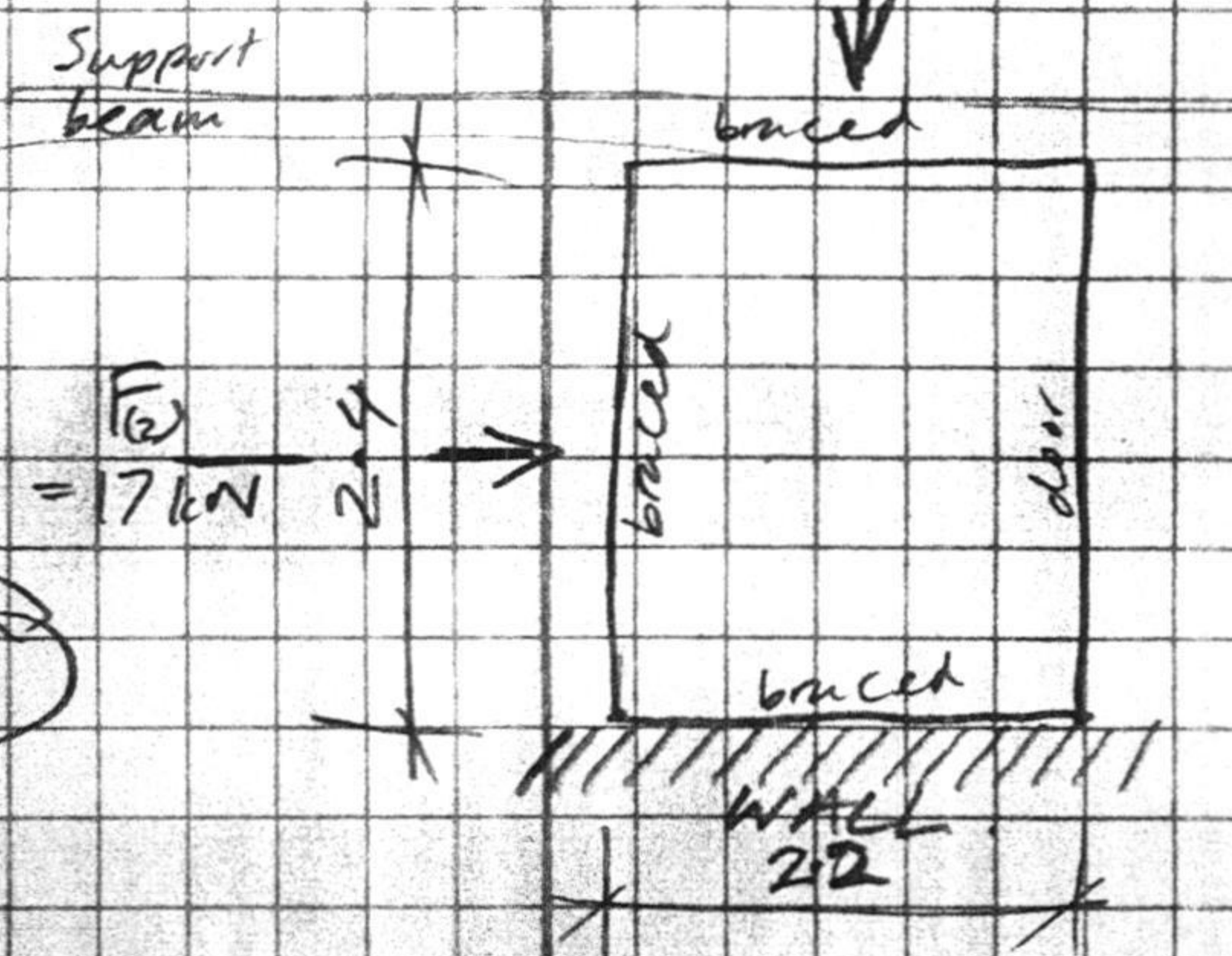
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$$\begin{aligned} V_s &= (s_1) (s_2) (V) \\ &= 1.0 \times 0.90 \times 50 \\ &= 45 \text{ m/s} \\ \Rightarrow q &= 1.24 \text{ kPa} \end{aligned}$$

$$\begin{aligned} \text{Use } C_{pi} &= 0.3 \\ C_{pe} &= 0.8 \\ \Rightarrow C_p &= 1.1 \end{aligned}$$

$$\begin{aligned} \therefore \text{wind pressure } P &= 1.1 \times 1.24 \\ &= 1.36 \text{ kPa} \end{aligned}$$

$$\begin{aligned} F &= 1.36 \times 2.2 \times 5.3 \\ &= 16 \text{ kN} \end{aligned}$$



DIRN 2:

$$\begin{aligned} \text{Calc. moment resistable by cols based upon} & F_{ac} = 21 \text{ MPa} \\ \text{Col. compression} &= 21 \times 1540 \text{ N} \\ &= 32.3 \text{ kN} \\ \therefore \text{Mom} &= 2 \times 32.3 \times 2.0 \text{ m} \\ &= 129 \text{ kN}\cdot\text{m} \end{aligned}$$

$$\begin{aligned} \therefore \text{max height above a stiff reaction point at which } F_{w1} \text{ may act is} \\ h &= 129 / 17 \text{ m} \\ &= 8 \text{ m} \end{aligned}$$

This is only a little less than the distance between LL2 and the centroid of the wind loaded area \therefore OK!

DIRN 1:

Assume the shear is resisted by the braced wall opposite the door, and torsion is absorbed by the 2 walls normal to F_{w1} .

Assume centroid of wind load is 9 m above restraint at level 2.

$$\begin{aligned} \text{A/ Shear: } M &= 16 \times 9 = 144 \text{ kN}\cdot\text{m} \\ \Rightarrow C_{ed,A} &= 144 / 2.4 = 60 \text{ kN} \\ \text{B/ Torsion: } T &= 16 \times 10 = 16 \text{ kN}\cdot\text{m} \\ V &= 160 / 2.4 = 7 \text{ kN} \\ C_{ed,B} &= 7 \times 9 / 2.2 = 29 \end{aligned}$$

$$\text{TOTAL, } C = 89 \text{ kN} \Rightarrow f_{ic} = 58 \text{ MPa}.$$

A black and white photograph of a large, multi-story building with a prominent central tower and many windows, likely a government or institutional building. The building is surrounded by trees and a paved area.

$$\begin{array}{lcl} F_x & = & 250 \\ \text{and} & & F_{ac} = 59 \\ T6-1.1 \Rightarrow & & \sqrt{r_y} = 120 \\ & \Rightarrow & l = 2400 \quad (r_y = 20 \text{ mm}) \end{array}$$

This can be accommodated by bolting (?)
into the masonry in the wall on the
opposite side to the lift door

is OK

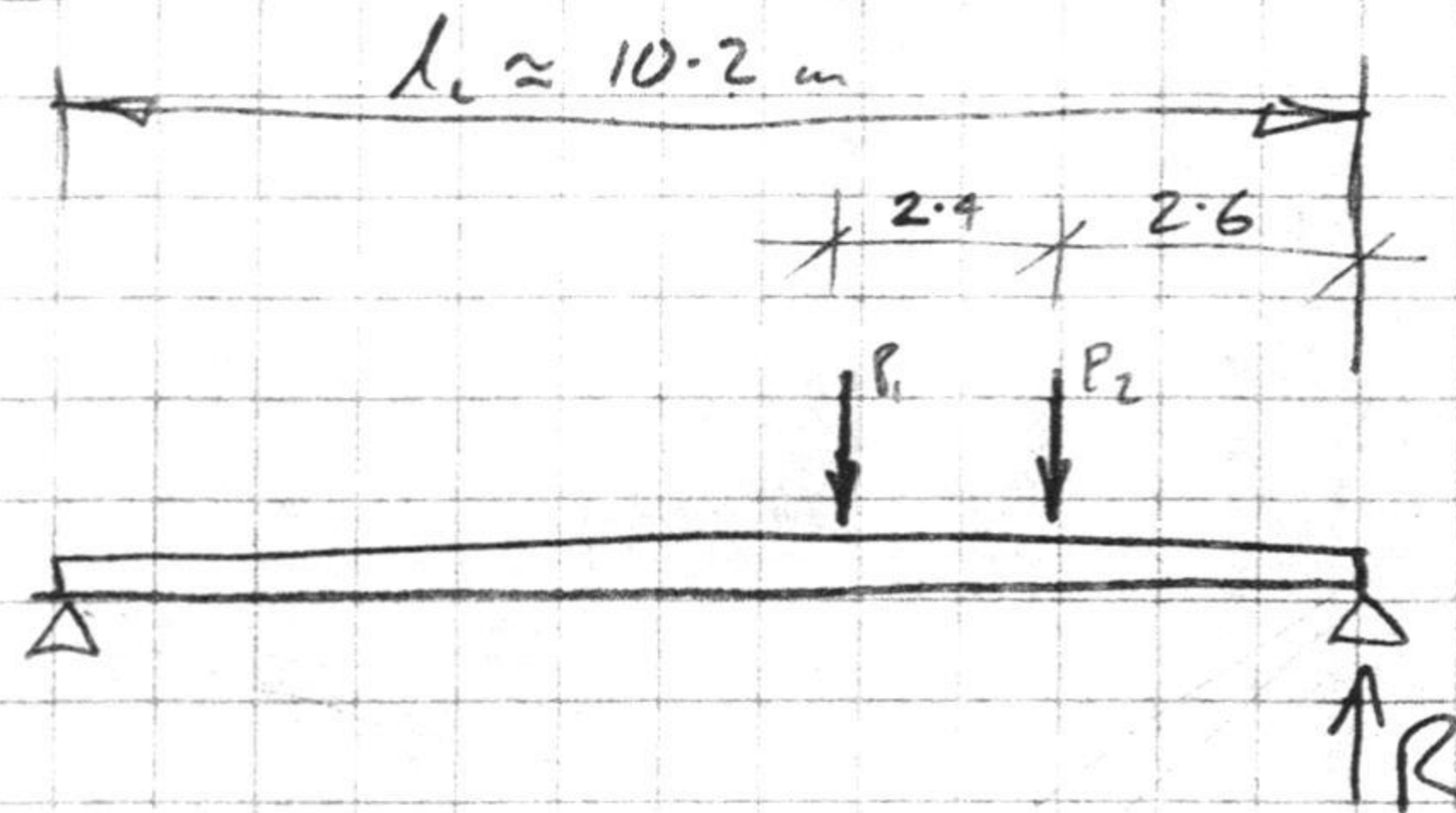
OR Can rely on the woodwork noggling.

To ensure stability is given to Column members.
at level 2 - Members will be clated to timbers
within thickness of flooring. Details will be produced once
flooring is opened up to determine exact location of
structural members.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

[illegible]

1. *Journal of the American Medical Association*, 2000; 283: 2689-2693.



NB dimensions approximate.

LOADS

- 1/ Lifting beam : P_1 or $P_2 = 20 \text{ kN}$
or $P_1 + P_2 = 20 \text{ kN}$
- 2/ Safety gear : $P_1 = P_2 = 14 \text{ kN}$
- 3/ Seismic : Not critical
- 4/ Wind :

dim 2 $P_1 = -P_2 = 32 \text{ kN}$
dim 1 $P_1 = 31$ or $P_2 = 89 \text{ kN}$
 $P_2 = 89$ or $P_1 = 31 \text{ kN}$

NOT USED
(posts to ground)

critical case

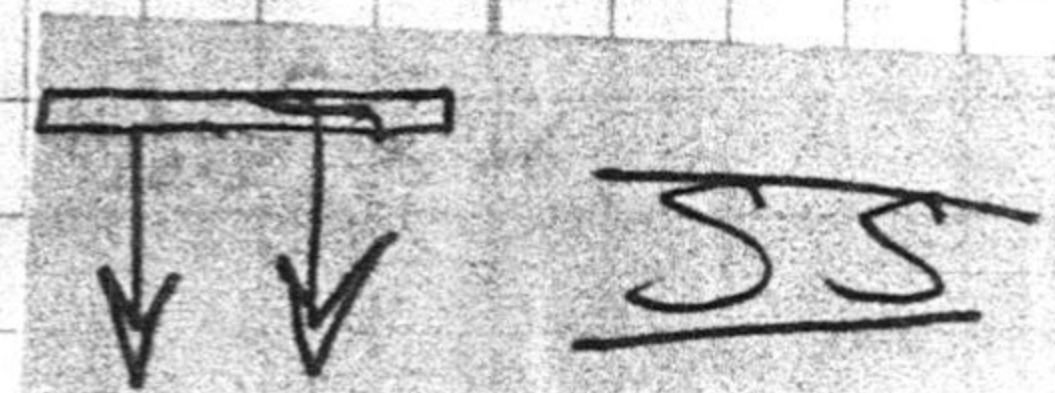
add 5 kN to each of these loads as an allowance for dead weight of the tower.
∴ Use

$P_1 = 36$
 $P_2 = 94$

LOAD EFFECTS

Reaction

$R = \frac{10.2 - 2.6}{10.2} \times 94 +$
 $= 88 \text{ kN}$



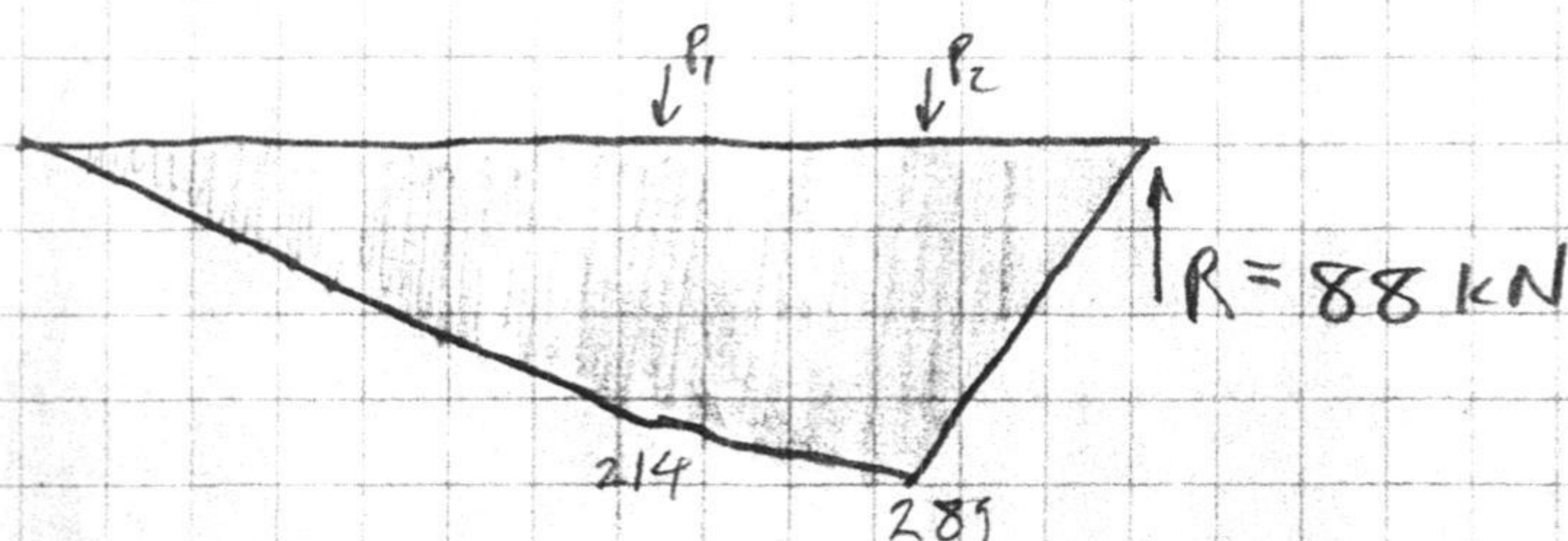
@ P2

$M_{(2)} = 88 \times 2.6$
 $= 229 \text{ kN-m}$

@ P1

$M_{(1)} = 88 \times 5.0 - 94 \times 2$
 $= 214 \text{ kN-m}$

BMD



1. Introduction	2. Methodology	3. Results	4. Conclusion
5. Discussion	6. References	7. Appendix	8. Bibliography
9. Summary	10. Acknowledgements	11. Contact Information	12. Disclaimer
13. Glossary	14. Index	15. Table of Contents	16. Executive Summary
17. Abstract	18. Introduction	19. Methodology	20. Results
21. Discussion	22. Conclusion	23. References	24. Appendix

estimate section $Z \approx M/F_s$
 $= 289 \times 10^6 / 0.6 \times 250$
 $= 1927 \times 10^3 \text{ mm}^3$

\Rightarrow 530 UB 92

$P_{self} = 9.81 \times 92 \text{ N/m}$
 $= 0.9 \text{ kN/m}$
 $M_{self} = 0.9 \times 10^2 \text{ m}^2 / 8$
 $= 12 \text{ kNm}$

Not used.

Combine

$M = 289 + (3/4 \times 12)$
 $= 298 \text{ kNm}$

$f_b = 298 \times 10^6 / 2080 \times 10^3$
 $= 143$
 $= 0.57 F_y$

$Z_x = 2080 \times 10^3 \text{ mm}^3$

$F_y = 258 \text{ MPa}$

can be used to support
 lateral flexural torsional buckling,
 therefore ignore C15.4
 bending OK!

check shear

$f_v = 88 \times 10^3 / 533 \times 10^{-2}$
 $= 16 \text{ MPa}$
 $= 0.065 F_y \ll 0.37 F_y$

\therefore Shear OK!

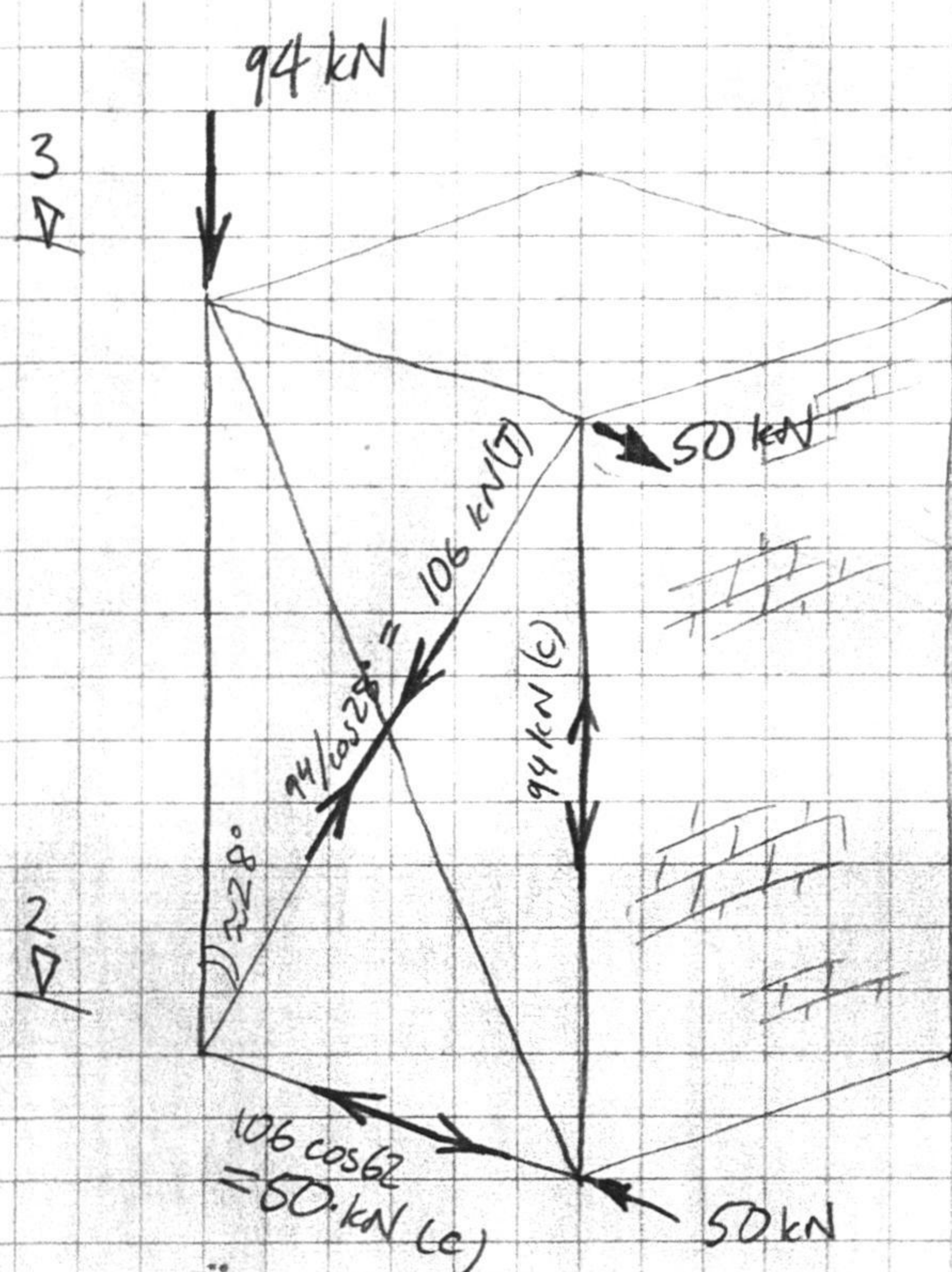
Support beam

530 UB 92

CHECK DEFLECTION

Corbel detail
 at ends needs
 designing.

<p>1. <i>...</i></p> <p>2. <i>...</i></p>	<p>3. <i>...</i></p> <p>4. <i>...</i></p>	<p>5. <i>...</i></p> <p>6. <i>...</i></p>
<p>7. <i>...</i></p> <p>8. <i>...</i></p>	<p>9. <i>...</i></p> <p>10. <i>...</i></p>	<p>11. <i>...</i></p> <p>12. <i>...</i></p>
<p>13. <i>...</i></p> <p>14. <i>...</i></p>	<p>15. <i>...</i></p> <p>16. <i>...</i></p>	<p>17. <i>...</i></p> <p>18. <i>...</i></p>
<p>19. <i>...</i></p> <p>20. <i>...</i></p>	<p>21. <i>...</i></p> <p>22. <i>...</i></p>	<p>23. <i>...</i></p> <p>24. <i>...</i></p>
<p>25. <i>...</i></p> <p>26. <i>...</i></p>	<p>27. <i>...</i></p> <p>28. <i>...</i></p>	<p>29. <i>...</i></p> <p>30. <i>...</i></p>
<p>31. <i>...</i></p> <p>32. <i>...</i></p>	<p>33. <i>...</i></p> <p>34. <i>...</i></p>	<p>35. <i>...</i></p> <p>36. <i>...</i></p>
<p>37. <i>...</i></p> <p>38. <i>...</i></p>	<p>39. <i>...</i></p> <p>40. <i>...</i></p>	<p>41. <i>...</i></p> <p>42. <i>...</i></p>
<p>43. <i>...</i></p> <p>44. <i>...</i></p>	<p>45. <i>...</i></p> <p>46. <i>...</i></p>	<p>47. <i>...</i></p> <p>48. <i>...</i></p>
<p>49. <i>...</i></p> <p>50. <i>...</i></p>	<p>51. <i>...</i></p> <p>52. <i>...</i></p>	<p>53. <i>...</i></p> <p>54. <i>...</i></p>



NOT
USED
(posts to ground)

Tension diagonal:

$$A_s = 106 / 0.6 \times 0.25 = 707 \text{ mm}^2$$

DIAGONALS
60x12 FE

Horizontal strut:

Compressive force $C = 50 \text{ kN}$
 $l \approx 2000$

Try 50x50x8 L

$$r_v = 9.85$$

$$L/r_v = 203 \text{ MPa}$$

$$F_{ac} = 23 \text{ MPa}$$

T6.1.1 \Rightarrow

$$f_{ac} = 50000 / 739$$

$$= 68 \text{ MPa} > 23 \therefore \text{NG!}$$

Try 76x76x8L

76-1.1 \Rightarrow

$$\lambda/r = 2050/14.9$$

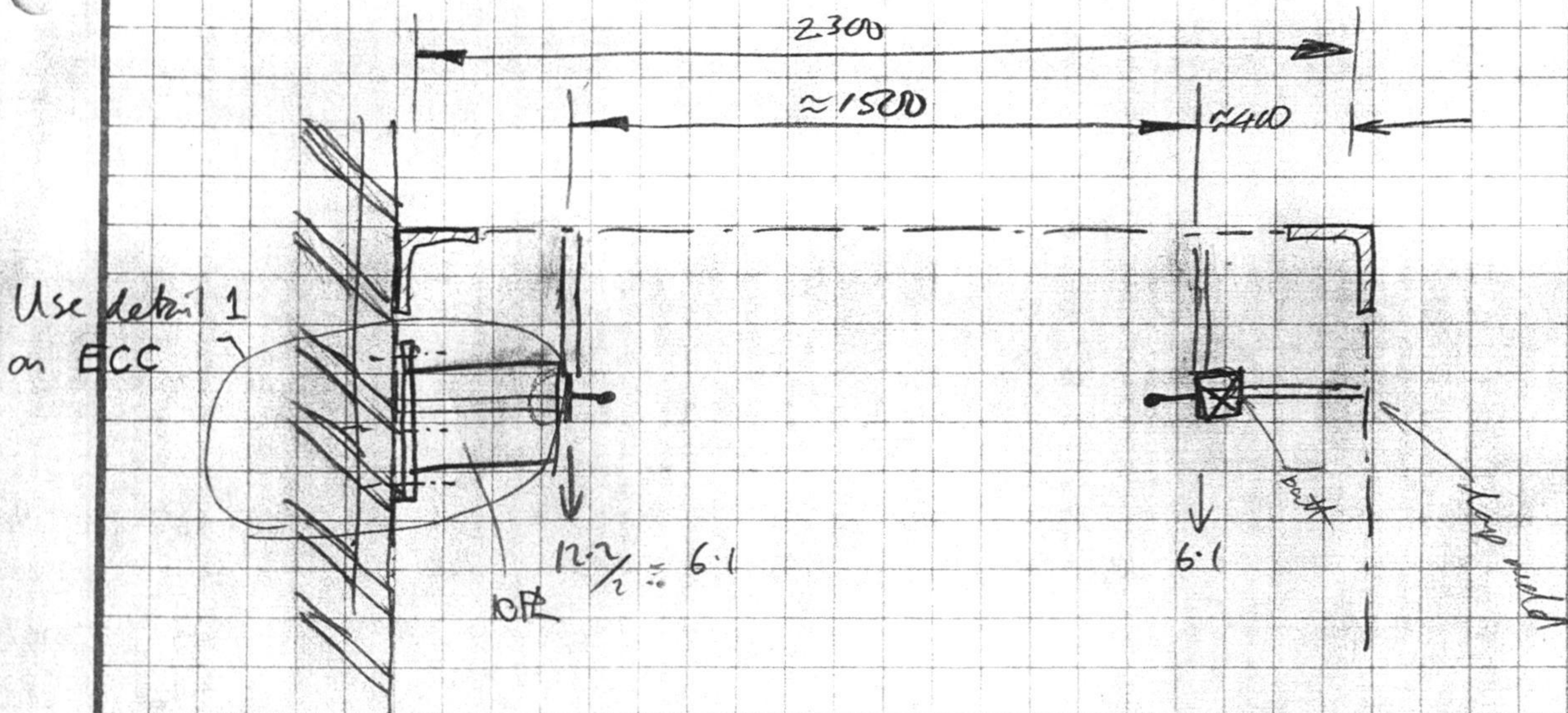
$$= 134$$

$$F_{ac} = 48 \text{ MPa}$$

$$f_{ac} = 50 \times 10^3 / 1140$$

$$= 44 \text{ MPa} < 48 \therefore \text{OK!}$$

CHECK HORIZONTAL STIFF FOR LOADS FROM RHS



Load onto RHS
 \rightarrow FEM

$$M^F = 6.1 \text{ kN}$$

$$= 6.1 \times 0.4 \times 1.9/2.3$$

$$= 2.0 \text{ kN-m}$$

for "safety gear" load case

distribution factors

$$d_1 \approx 0.4$$

$$d_2 \approx 0.6$$

assumes that L-section has low torsional stiffness.

2.0		FEM
- 0.8	-1.2	load
1.2	-1.2	total

Try 76x76x8L

$$f_L = 1.2 \times 10^6 / 11.2 \times 10^3$$

$$= 107 \text{ MPa}$$

$$= 0.43 F_y \rightarrow \text{OK!}$$

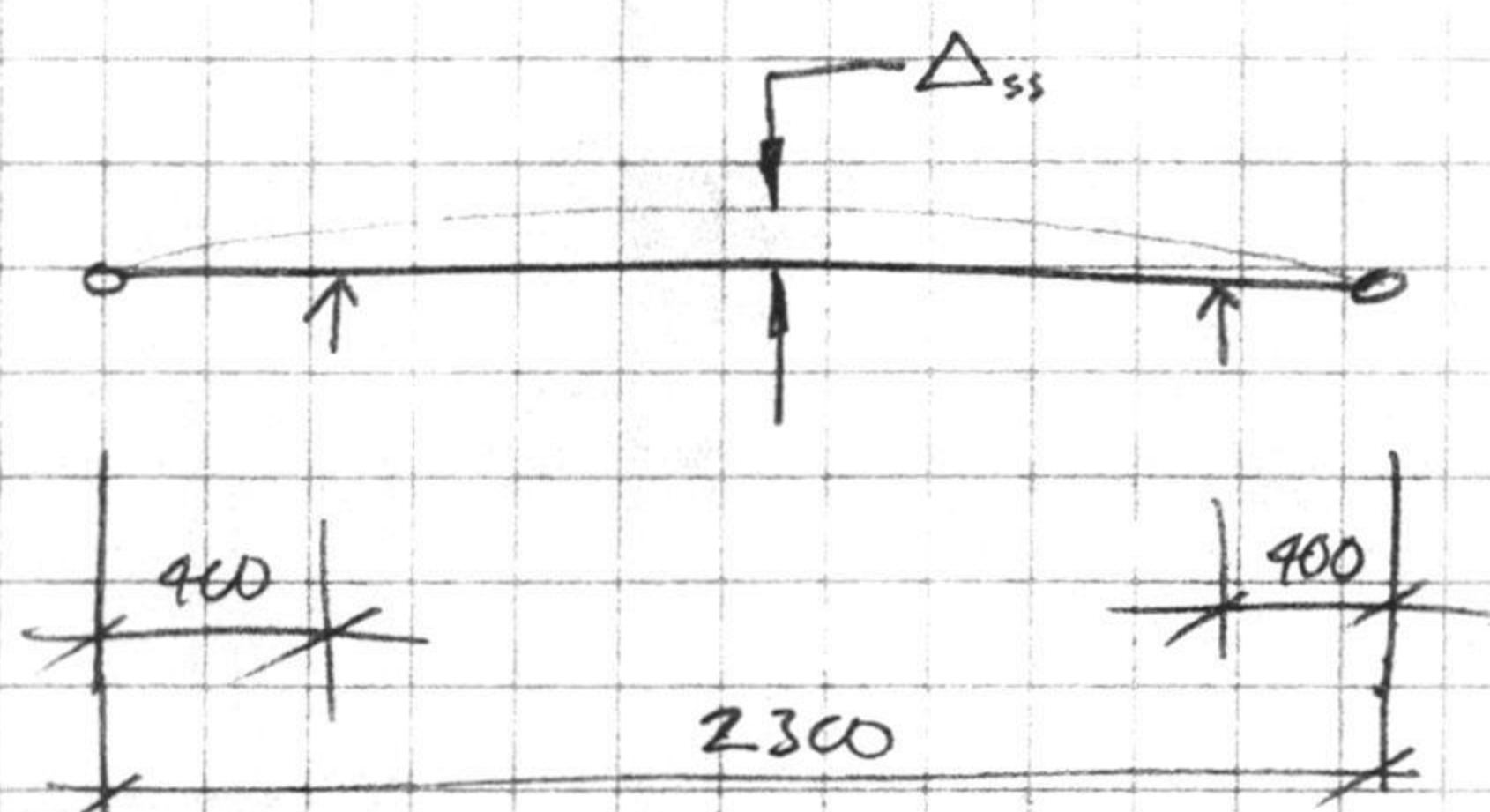
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JOB WPMC - LIFT TOWER

BY RP

DATE 9 / 12 / 87

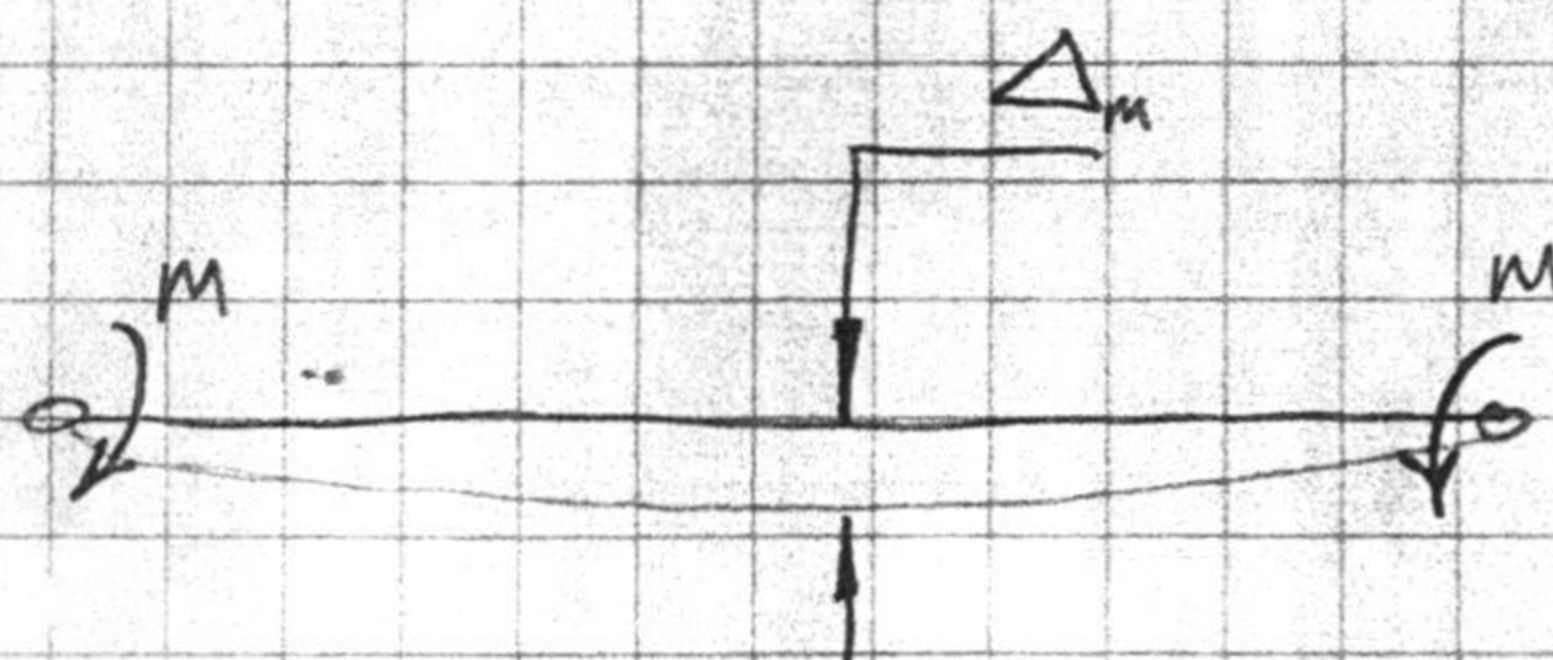
CHECK DEFLECTION



$$\frac{a}{L} = \frac{400}{2300} = 0.17$$

$$P = 6100 \text{ N}$$

$$\begin{aligned} \Delta_{ss} &= \frac{PL^3}{6EI} \left[\frac{3}{4} \frac{a}{L} - \left(\frac{a}{L} \right)^3 \right] \\ &= \frac{6100 \times 2300^3}{6 \times 200 \times 10^3 \times 0.609 \times 10^6} \left[\frac{3}{4} \times 0.17 + 0.17^3 \right] \text{ mm} \\ &= 13.7 \text{ mm} \end{aligned}$$



$$\begin{aligned} \Delta_m &= -\frac{ML^2}{8EI} \\ &= -\frac{12 \times 10^6 \times 2300^2}{8 \times 200 \times 10^3 \times 0.609 \times 10^6} \\ &= -6.5 \text{ mm} \end{aligned}$$

$$\begin{aligned} \text{Total } \Delta &= \Delta_{ss} + \Delta_m \\ &= 13.7 - 6.5 \\ &= 7.2 \text{ mm} \end{aligned}$$

3.0

NG

required by Lift Power Rules.

$$\begin{aligned} \text{required } I &= \frac{7.2}{3.0} \times 0.609 \times 10^6 \\ &= 1.46 \times 10^6 \text{ mm}^4 \end{aligned}$$

$$\begin{aligned} \text{Use } I &= 100 \times 100 \times 8 \text{ L} \\ &= 1.50 \times 10^6 \text{ mm}^4 \end{aligned}$$

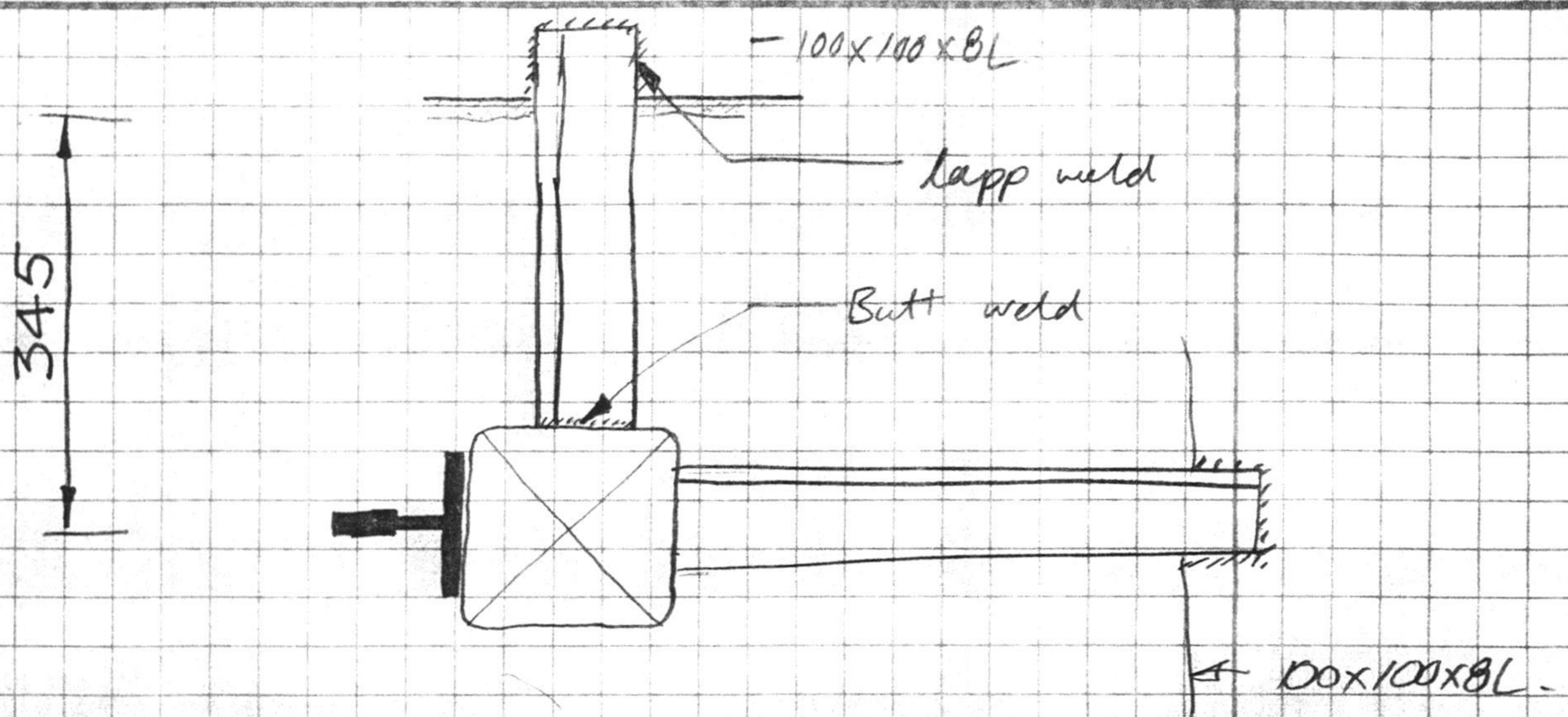
USE 100x100x8L

JOB WWMC - LIFT TOWER

BY RP

CONNECTION; Guide rail RHS to horizontal braces

DATE 10/12/87



Maximum axial load input in RHS
 $= 80127 \text{ kN}$ (safety gear application)

Try $25 \times 25 \times 6.3 \text{ L}$
 $l_{rv} = 345 / 4.88$
 $= 71$

T6.1.1 \Rightarrow $F_{ac} = 116 \text{ MPa}$

$f_{ac} = 80127 / 284$

$= 29 \text{ MPa}$

$29 < 116 \therefore \text{OK}$



CONNECTION OF 60 x 12 FE TO 100 x 100 x 8 L

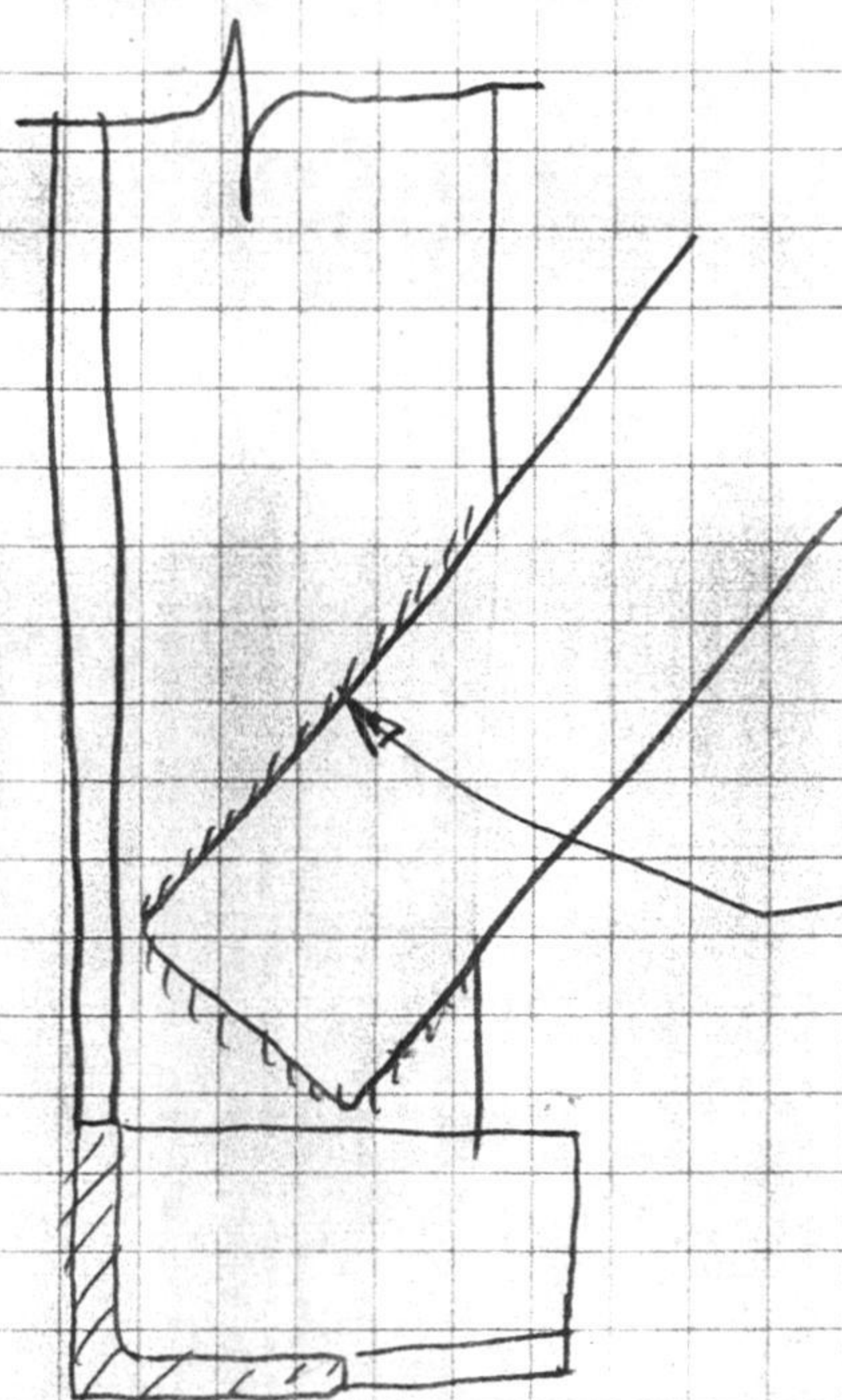
$$\text{Tension force to transmit} = 106 \text{ kN}$$

Try 6 mm Fillet

BCSA, "Handbook on Structural Steelwork", 1971, P252

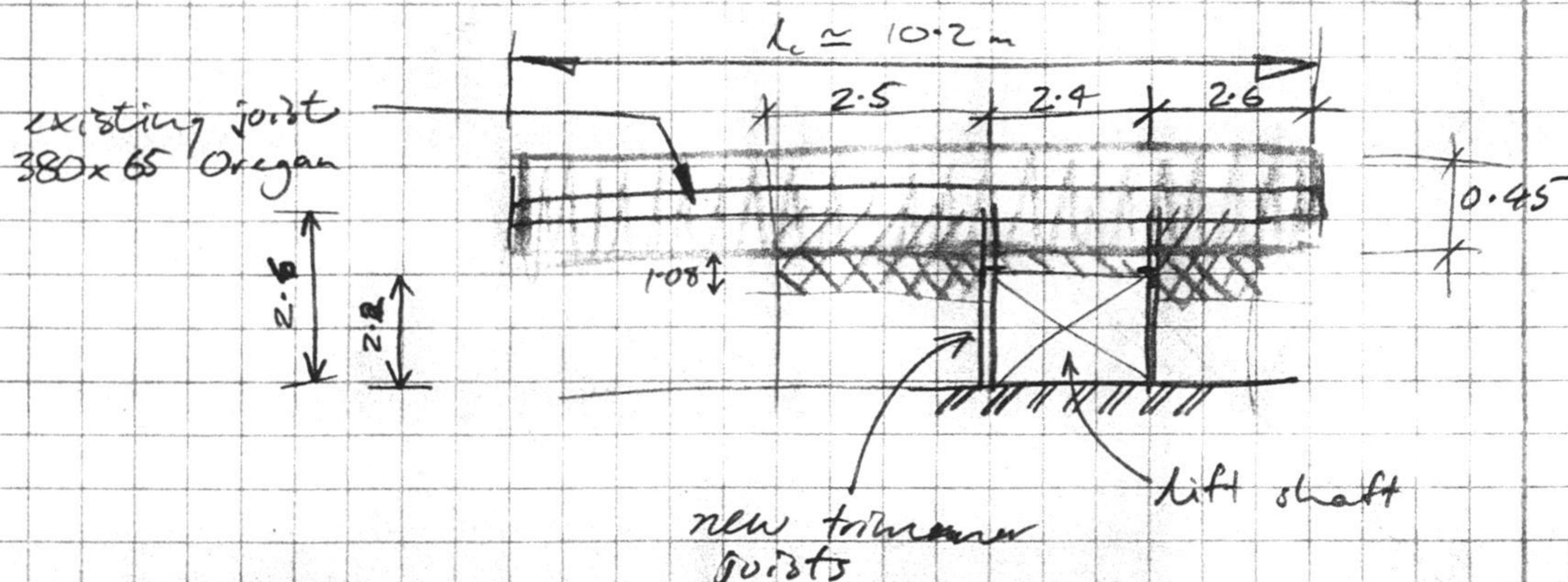
$$\Rightarrow \text{permissible load} = 0.67 \text{ kN/mm run}$$

$$\therefore \text{required lap length} = 106 / 0.67$$
$$= 158 \text{ mm} \quad \text{use } 200$$



6 mm Fillet
at least 200
mm length.

CHECK EXISTING JOIST



LOADS

Self: $= 0.38 \times 0.065 \times 800 \times 9.81 \times 10^{-3} \text{ kN/m}$
 $= 0.2 \text{ kN/m}$

Floors D = 0.12 kPa.

SDL. " SDL = 0.25 kPa.

D = 0.37 kPa.

Live LL = 3.0 kPa

Use distributed load

D+L = 3.5 kPa. and ignore joist self weight

total $W = 3.5 [(10.2 \times 0.45) + (1.08 \times (2.5 + 2.6)) + (0.18 \times 2.4)]$
 $= 37 \text{ kN}$

$M \approx WL/8$
 $= 37 \times 10.2 / 8$
 $= 47 \text{ kN.m}$

380 x 65 section $\Rightarrow Z = \frac{1}{6} \times 65 \times 380^2$
 $= 1.56 \times 10^6$

$f_b = \frac{47 \times 10^3}{1.56 \times 10^6}$
 $= 30 \text{ MPa}$

This is too high

—————→ NG

Hence, instead of relying upon the joist these loads must be carried down using posts.

1875

1875

1875

1875

1875

1875

1875

1875

1875

1875

1875

1875

1875

Assume that each of the 2 posts takes $\frac{1}{2}$ of the load that would have been taken by the joint. i.e. $P_{\text{floor}} = 18 \text{ kN}$

add to this the axial load in the column above L2

$$P = 18 + 94 = 112 \text{ kN.}$$

Try $100 \times 100 \times 8 \text{ L}$

$$f_{ac} = 112 \times 10^3 / 1540 = 73 \text{ MPa.}$$

T6.1.1 \Rightarrow that R_v
 \Rightarrow then
 \Rightarrow max

$$f_{ac} = 73$$

$$l/r_v = 105 \quad r_v = 20$$

$$l = 105 \times 20 = 2100 \text{ mm.}$$

$\therefore 100 \times 100 \times 8 \text{ L}$ OK only if laterally supported at 2 m intervals.

OK.
provide bracing within stud line

If unsupported between LG & L1 then $l = 4725 \text{ mm}$

Try 2 - $89 \times 89 \times 6.3 \text{ RHS}$

$$r = 33.2 \text{ mm}$$

$$l/r = 4725 / 33.2 = 142$$

T6.1.1 \Rightarrow

$$f_{ac} = 44 \text{ MPa}$$

$$f_{ac} = 112 \times 10^3 / 2 \times 1990 = 28 \text{ MPa.}$$

$$28 < 44.$$

$\rightarrow 2 - 89 \times 89 \times 6.3 \text{ RHS}$
OK!

(not needed)

THE UNIVERSITY OF CHICAGO

PHILOSOPHY DEPARTMENT

PHILOSOPHY 101

LECTURE NOTES

PROF. J. L. GORDON

SPRING 2001

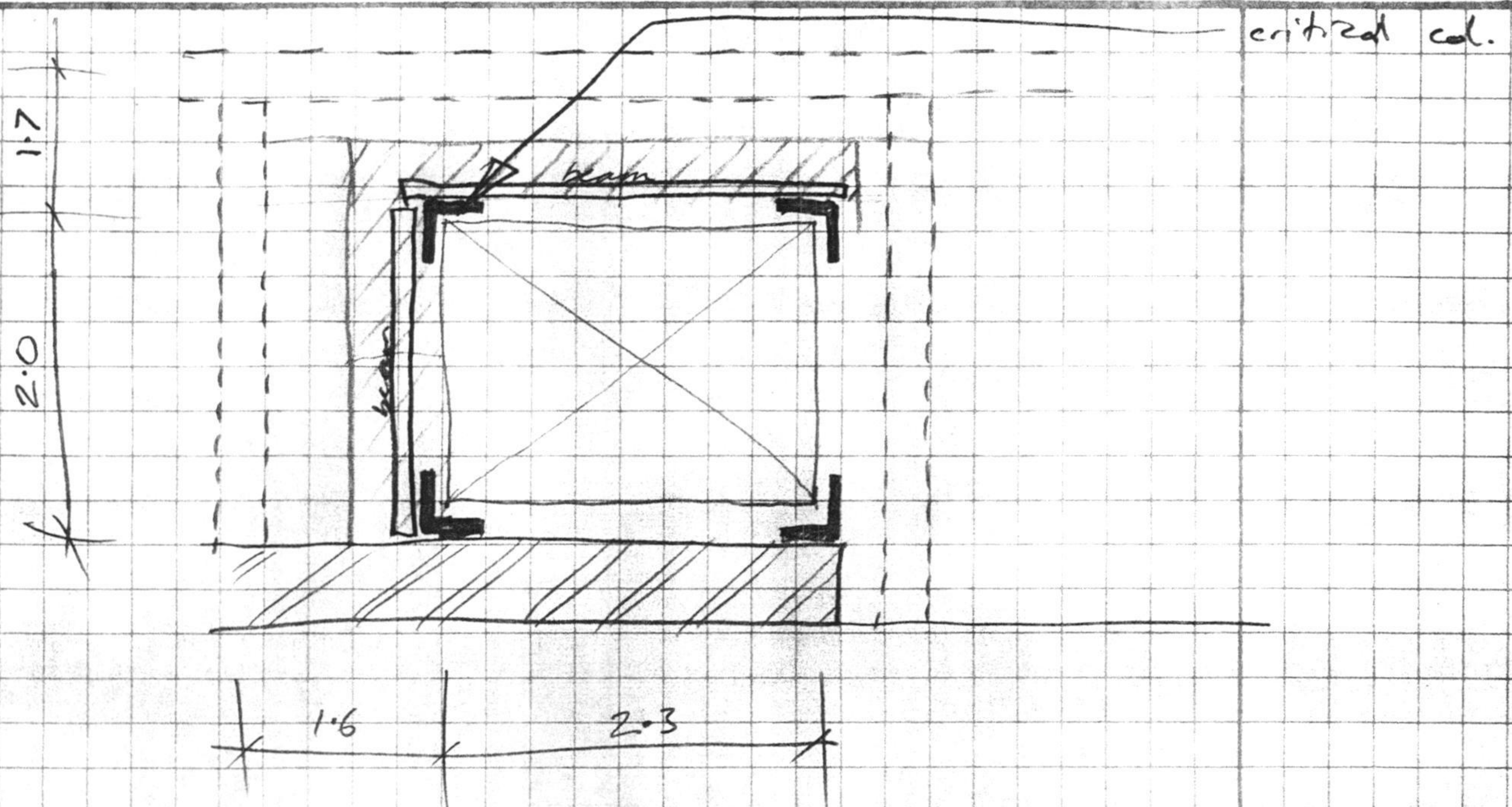
LECTURE 1

THE PHILOSOPHY OF

SCIENCE

LECTURE 2

THE PHILOSOPHY OF

LOADS

Assume 250 thick existing conc. slab

$$D_{slab} = 0.25 \times 24$$

$$= 6.0 \text{ kPa}$$

$$SDC = 0.25 \text{ kPa}$$

$$LL = 3.0 \text{ kPa}$$

Use distributed load $D+L = 9.25 \text{ kPa}$ LOAD EFFECTS

Tributary area onto critical col.

$$A = [0.8 \times (1.0 + \frac{1.7}{2})] + [\frac{1.7}{2} \times \frac{2.3}{2}]$$

$$= 2.46 \text{ m}^2$$

$$P_{DL} = 9.25 \times 2.46 \text{ kN}$$

$$= 23 \text{ kN}$$

1000

1000

1000	1000	1000	1000	1000
1000	1000	1000	1000	1000
1000	1000	1000	1000	1000
1000	1000	1000	1000	1000
1000	1000	1000	1000	1000
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1000	1000	1000	1000	1000
1000	1000	1000	1000	1000
1000	1000	1000	1000	1000
1000	1000	1000	1000	1000

Axial load above level 1 ;
 $P = 112 \text{ kN}$

below level 1 ; $P = 112 + 23$
 $= 135 \text{ kN}$

Try 102 x 102

RHS

$$r_v \leq 37.4$$

$$L/r_v \leq 4725/37.4$$

$$= 126$$

T6.1.1 \Rightarrow
 \therefore required

$$F_{ac} = 54 \text{ MPa.}$$

$$A_s = 135 \times 10^3 / 54$$

$$= 2500 \text{ mm}^2$$

$\Rightarrow 102 \times 102 \times 9.5 \text{ RHS}$

$$A_s = 3460 \text{ mm}^2$$

If unbraced
between LG & L1
we can use
102 x 102 x 9.5 RHS

Design if braced at mid-height.

try 89 x 89 RHS

$$r_v \leq 33.2$$

$$L/r_v \leq 4725/2 \times 33.2$$

$$= 71$$

T6.1.1 \Rightarrow
required

$$F_{ac} = 116 \text{ MPa}$$

$$A_s = 135 \times 10^3 / 116$$

$$= 1164 \text{ mm}^2$$

$\Rightarrow 89 \times 89 \times 3.6 \text{ RHS OK! } (A_s = 1210 \text{ mm}^2)$

Try 76 x 76 RHS

$$r_v \leq 28 \text{ mm}$$

$$L/r_v = 89$$

T6.1.1 \Rightarrow
reqd

$$F_{ac} = 98 \text{ MPa.}$$

$$A_s = 135 \times 10^3 / 98$$

$$= 1378 \text{ mm}^2$$

$\therefore 76 \times 76 \times 6.3 \text{ NG}$

If braced at
midheight of
LG - L1 then
can use
89 x 89 x 3.6 RHS
or larger.

Try 2-89 x 89 x 6.3 RHS
UNBRACED

T6.1.1 \Rightarrow

$$L/r_v = 4725/33.2 = 142$$

$$F_{ac} = 44 \text{ MPa.}$$

$$F_{ac} = 135 \times 10^3 / 2 \times 1990$$

$$= 34$$

$$F_{ac} < F_{ac} \text{ OK!}$$

USE 2-89 x 89 x 6.3 RHS (bracing not needed)

Try 127x64 RHS

$$\lambda_{ry} = 4725/25.3$$

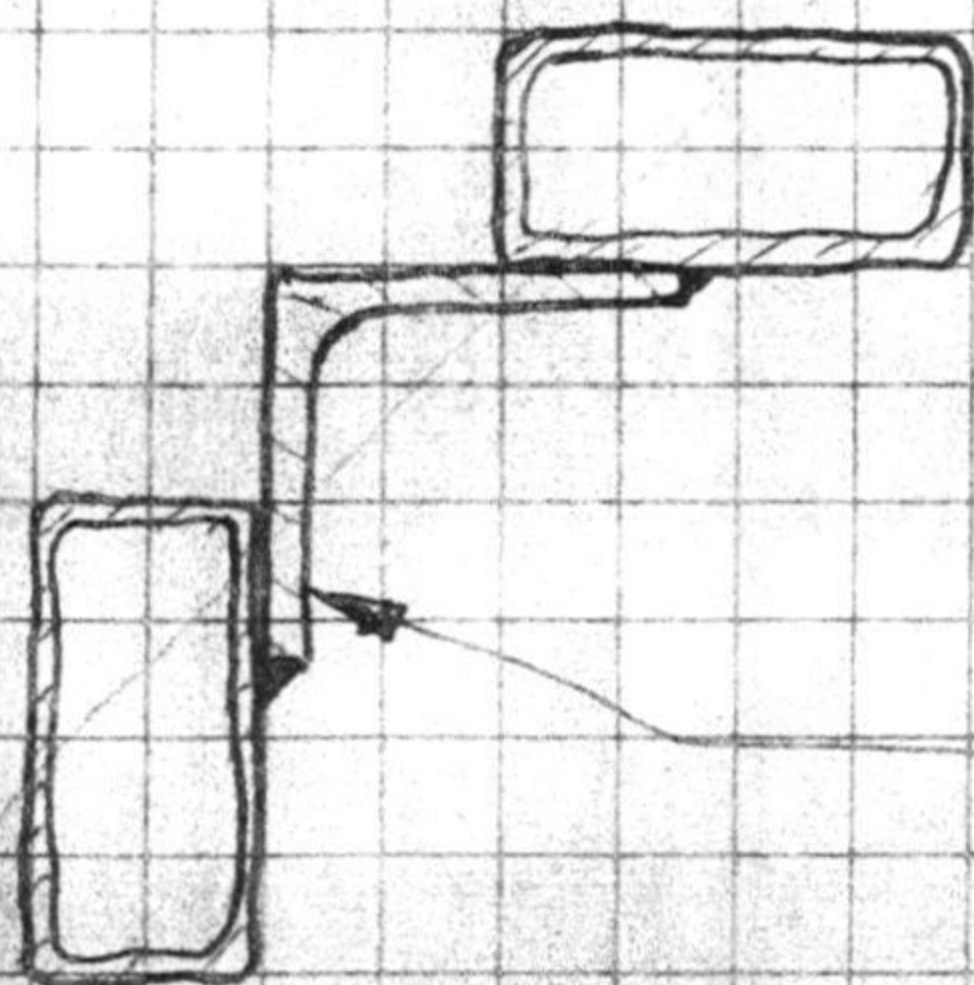
$$= 187$$

T6.11 \rightarrow $F_{ac} = 27 \text{ MPa}$

\rightarrow reqd. $A = \frac{135 \times 10^3}{27}$ $P = 135 \text{ kN}$

$$= 5000 \text{ mm}^2 = 2500 \text{ mm}^2/\text{RHS}$$

too high, therefore require bracing



Connector 100 long, 100 x 100 x 8 L
@ 800 c/s.

Using 127x64x6.3 RHS

$$A = 2240$$

which is marginally less than the 2500 required if the sections are unbraced. Since the connectors will markedly increase the strength of the struts, the 10% shortfall in section area is considered OK!

CONNECTION BETWEEN RHS and ANGLE ABOVE (at level 2)

$$P = 112 \text{ kN}$$

$$= 66 \text{ kN/RHS}$$

Safe load of 6mm fillet $= 0.57 \text{ kN/mm}$

ref. AISC
safe load tables
1976, p 219

\therefore required weld length $L = \frac{66}{0.57}$

$$= 116 \text{ mm}$$

Use

\rightarrow Use
150 long
6 mm fillet.



JOB WWML

- LIFT TOWER

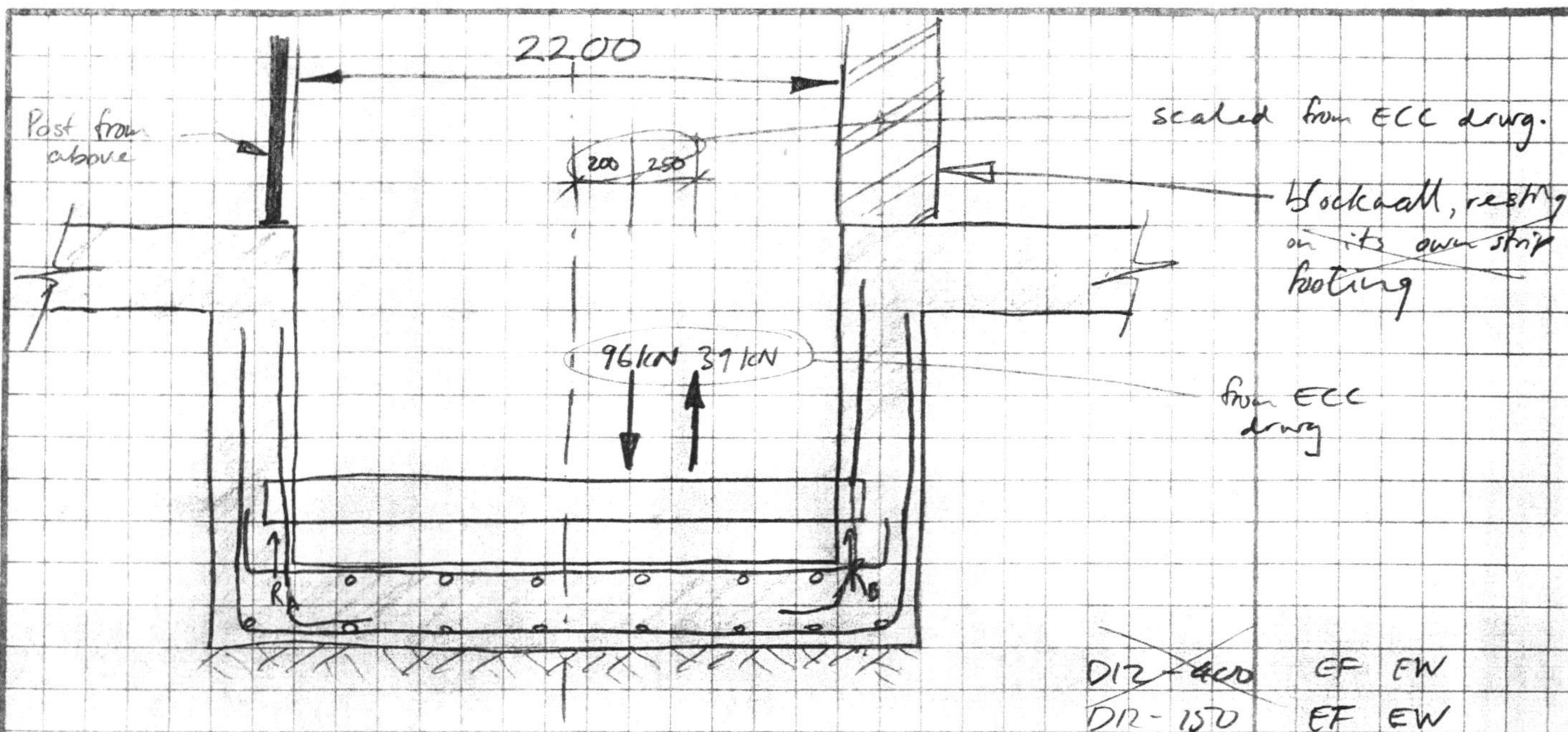
BY

RP

LIFT PIT.

DATE

9/12/87



Load from lifting gear etc.:

$$\begin{aligned}
 R_b &= \frac{22}{22} [(96 \times 130) - (39 \times 155)] \\
 &= 29 \text{ kN} \\
 R_n &= 96 - 39 - 29 \\
 &= 28 \text{ kN}
 \end{aligned}$$

Load from posts above:

$$\begin{aligned}
 P_1 + P_2 &= 36 + 94 \\
 &= 130 \text{ kN}
 \end{aligned}$$

from superceded LL2 beam calc.

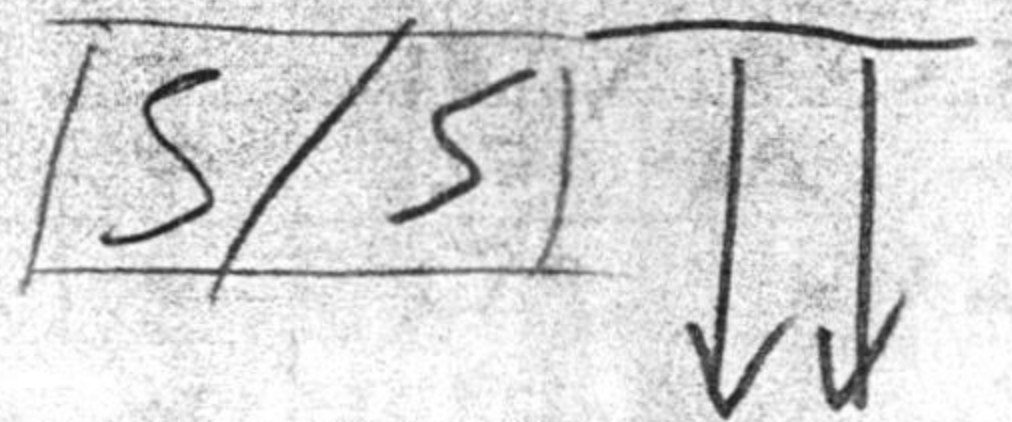
∴ Total soil press to be resisted by underside of pit floor;

$$\begin{aligned}
 W &= 130 + 29 + 28 \\
 &= 187 \text{ kN}
 \end{aligned}$$

$$l_x/h_y \approx 10 \Rightarrow$$

wind

N



3
/m
T11.1 /
m

(Simply supported edges)

200 slab

$$\begin{aligned}
 A_{smin} &= \dots \times 10000 \\
 &= 400 \text{ mm}^2/\text{m}
 \end{aligned}$$

divide by 2 for steel on both sides

$$A_{smin} = 200 \text{ mm}^2/\text{m}$$

Try D12 @ 400 c/s

$$\begin{aligned}
 A_s &= 283 \text{ mm}^2/\text{m} \\
 a &= 283 \times 225 / (0.85 \times 25 \times 1000) \\
 &= 4 \text{ mm}
 \end{aligned}$$

$$M_u = 0.9 \times A_s f_y \times (200 - 35 - 6 - 2) = 12 \text{ kN}\cdot\text{m}/\text{m}$$

 $P_c = 25 \text{ MPa}$

35 cover.

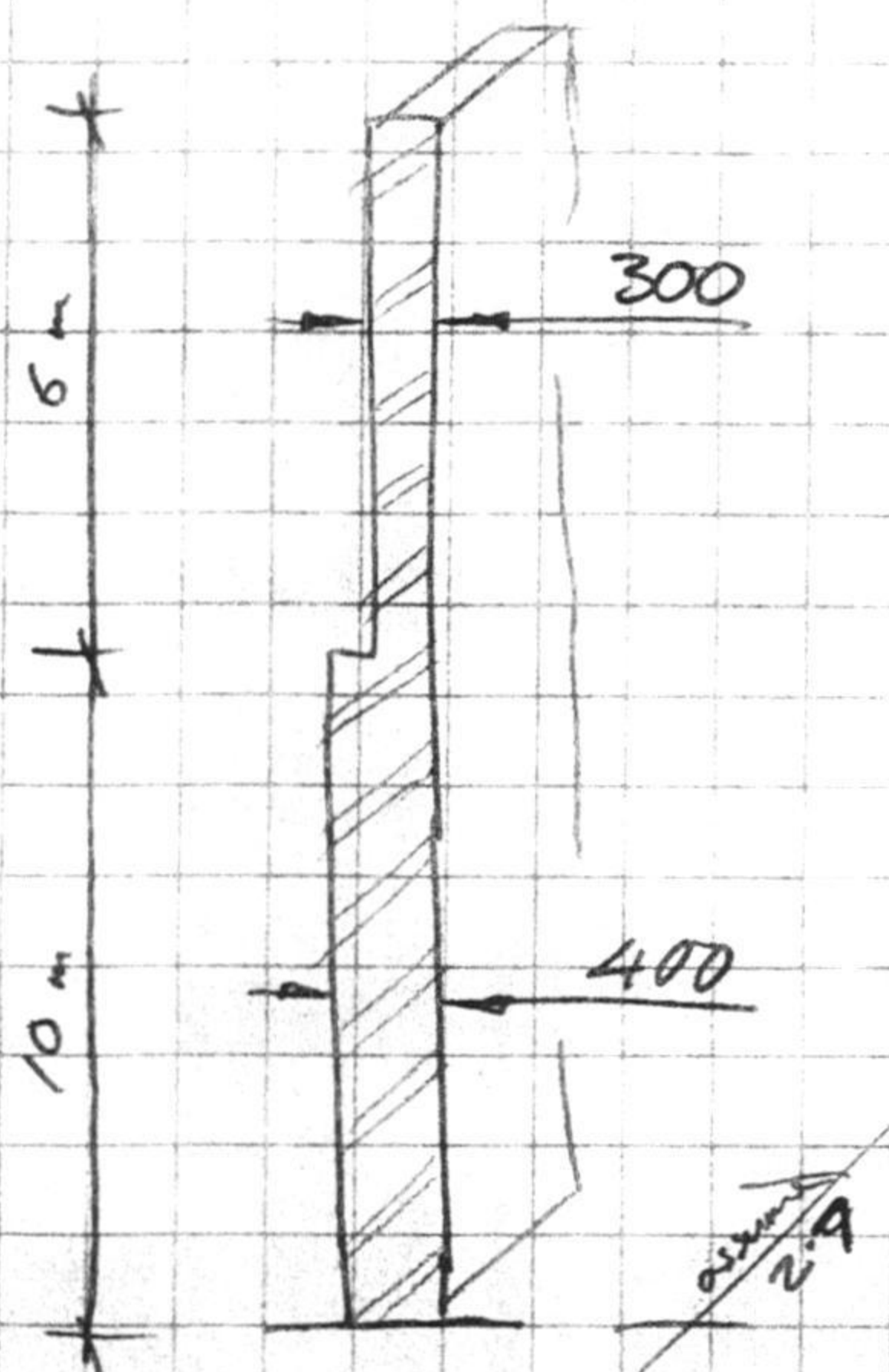
OK!

1870

Date	Description	Debit	Credit
Jan 1	Balance		100.00
Jan 5	To Cash	50.00	
Jan 10	By Cash		25.00

Date	Description	Debit	Credit
Jan 15	To Cash	75.00	
Jan 20	By Cash		30.00
Jan 25	To Cash	40.00	
Jan 30	By Cash		15.00
Feb 5	To Cash	60.00	
Feb 10	By Cash		20.00
Feb 15	To Cash	35.00	
Feb 20	By Cash		10.00
Feb 25	To Cash	20.00	

LIFT PIT - REVISE FOR BLOCKWORK WEIGHT DATE 2/12/87



$$\begin{aligned} \text{weight of blockwork} &= 24 \times 27 [(10 \times 0.4) + (6 \times 0.3)] \\ &= 376 \text{ kN} \end{aligned}$$

Total load on top blockwork floor:

$$W = 187 + 376$$

$$= 563 \text{ kN}$$

$$M = \frac{563}{1.87} \times 10$$

$$= 30.1 \text{ kNm}$$

Try D12 - 150 c/s (200 thick slab)

$$A_s = 754$$

$$a = \frac{A_s f_y}{0.85 \times 25 \times 1000}$$

$$= 10 \text{ mm}$$

35 mm cover

$$M_u = 0.9 \times A_s f_y \times (200 - 35 - 6 - 5)$$

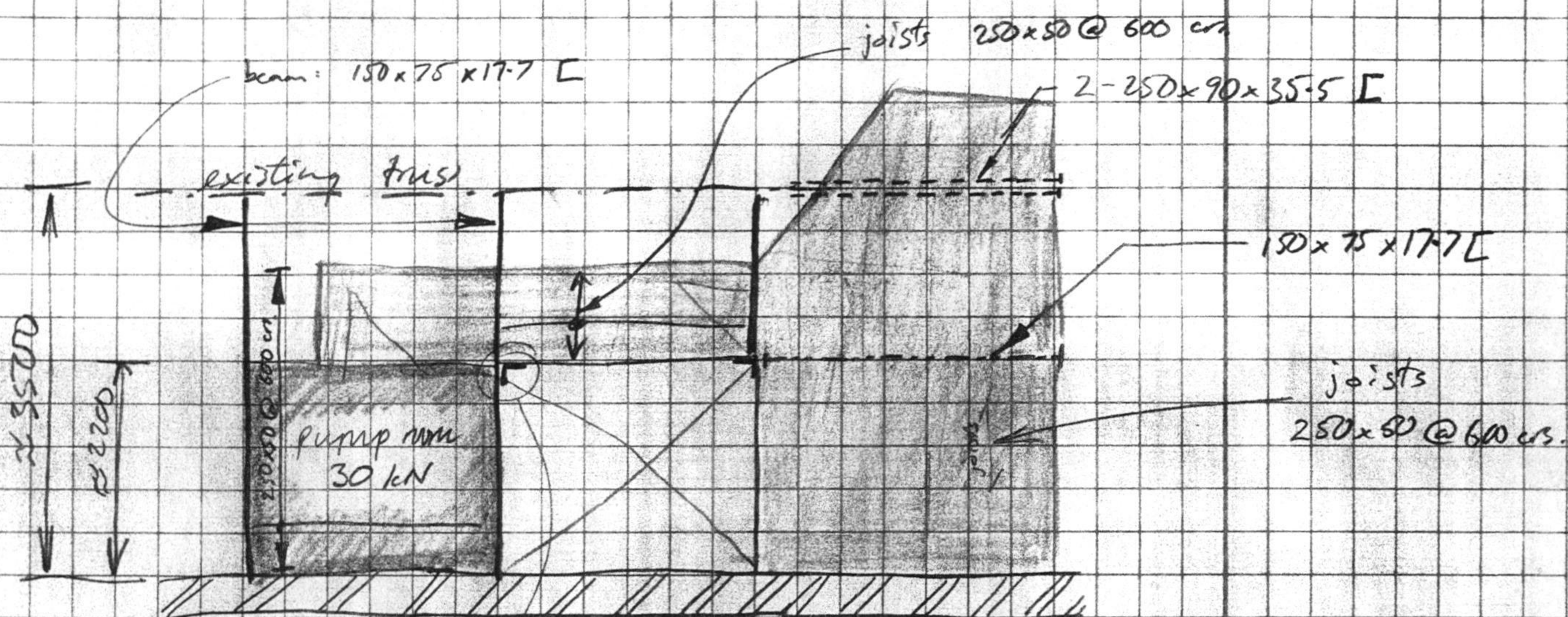
$$= 30.8 \text{ kNm/m}$$

<p>1. Introduction</p> <p>The purpose of this study is to investigate the effects of various factors on the performance of the system. The study is organized as follows: Section 2 describes the system architecture, Section 3 presents the experimental setup, Section 4 shows the results, and Section 5 concludes the study.</p>	
<p>2. System Architecture</p> <p>The system architecture is shown in Figure 1. It consists of a client and a server. The client is responsible for sending requests to the server, and the server is responsible for processing these requests and returning the results to the client.</p>	
<p>3. Experimental Setup</p> <p>The experimental setup is described in Table 1. It shows the parameters used in the experiments, such as the number of clients, the number of servers, and the size of the data set.</p>	

Pump room internal size = 2400×2000
= 4.8 MPa

Assume $L = 5.0$ kPa
 $D+L \approx 6.2$ kPa

\therefore total weight: $W_{RL} = 6.2 \times 4.8$ kN
= 30 kN



NB: No connection between post and channel.

Pump room floor

Try $250 \times 50 @ 400$ c/c

$$\sum = 466.4 \times 10^3 \text{ mm}^3$$

$$W_{DL} = 0.4 \times 6.2 = 2.5 \text{ kN/m}$$

$$M = 2.5 \times 2.4^2 / 8$$

$$= 1.8 \text{ kN}\cdot\text{m}$$

$$f_b = 1.8 \times 10^6 / 466.4 \times 10^3$$

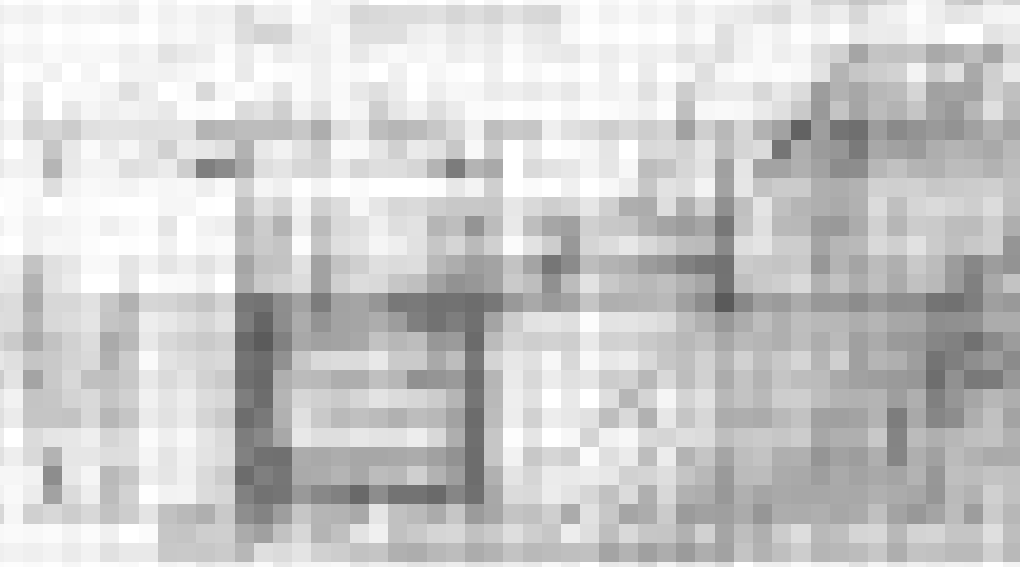
$$= 3.82 \text{ MPa}$$

$$D/B = 5 \quad L/B = 2400/50 = 48 \quad \therefore K_8 = 0.66$$

$$F_b = 0.66 \times 6.0 = 4.0 > 3.82 \therefore \text{OK!}$$

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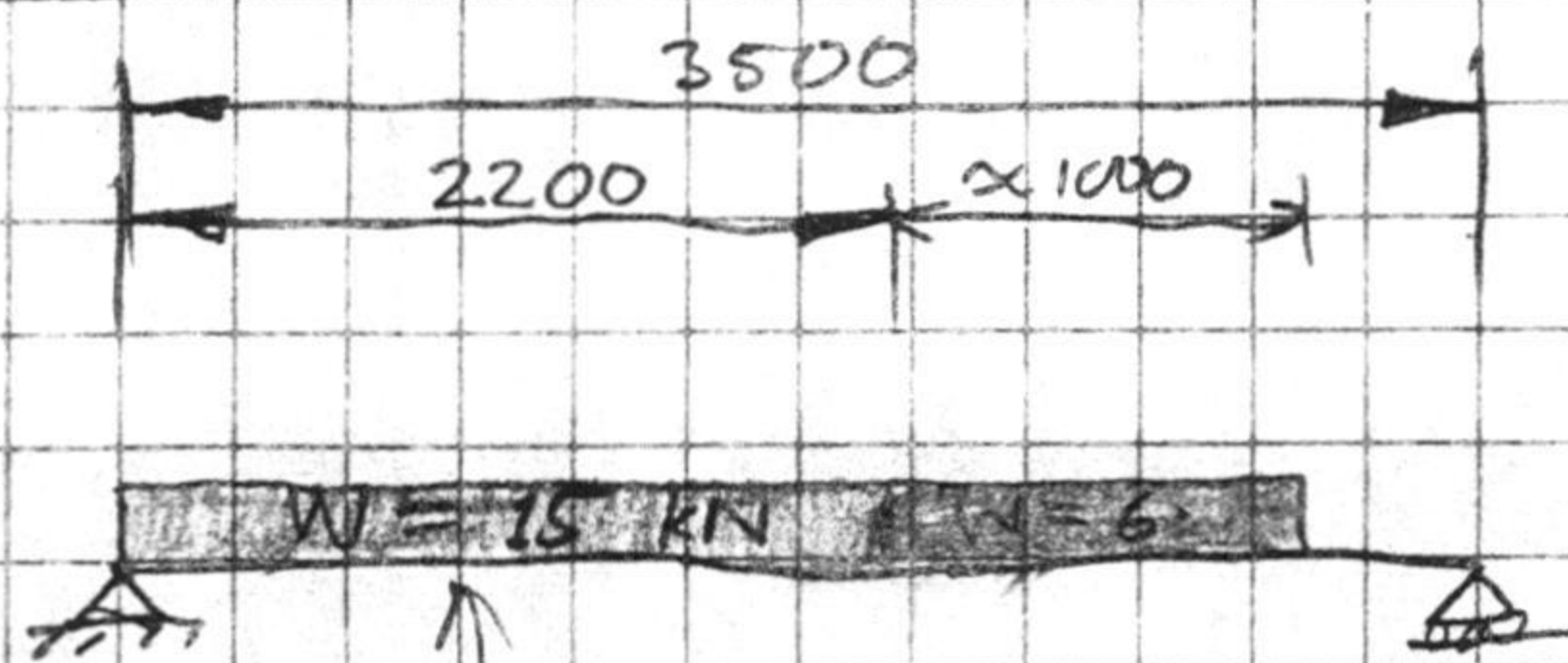
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JOB W W M C - L I F T T O W E R

BY RP

PUMP - ROOM FLOOR SUPPORT BEAMS

DATE 12 / 1 / 88



$$w = 15 / 22 = 6.8 \text{ kN/m}$$

$$M \approx \frac{35}{22} \times 15 \times 3.5 / 8$$

$$= 10.1 \text{ kN}\cdot\text{m}$$

$$Z \approx \frac{10.1 \times 10^6}{0.6 \times 250}$$

$$= 66.7 \times 10^3 \text{ mm}^3$$

Try 150 x 75 x 17.7 C

$$f_b = \frac{10.1 \times 10^6}{111 \times 10^3}$$

$$= 90 \text{ MPa}$$

$$= 0.36 F_y$$

$$L_{ky} = 3500 / 23.7$$

$$= 146$$

$$\frac{L_{ky}}{r_y} = \frac{21.8}{2.0} < 85 \quad \left. \begin{array}{l} \frac{L_{ky}}{r_y} < 2.0 \\ \frac{L_{ky}}{r_y} < 2.0 \end{array} \right\} \Rightarrow \text{FS-4-1(3)}$$

$$+ 5.4-1(3) \Rightarrow F_b = 128 \text{ MPa}$$

OK! in bending.

CHECK DEFLECTION:

$$\Delta/L = \frac{5}{384} \times \frac{w L^4}{EI}$$

$$= \frac{5}{384} \times 6.8 \times (3.5 \times 10^3)^4 / (200 \times 10^9 \times 8.39 \times 10^8)$$

$$= 0.0023 < 0.003 \therefore \text{OK!}$$

100

1000

Figure 1

(continued)

[illegible]

Abstract

LOADS INTO EXISTING TRUSS

Self weight:

bottom chord,	vol.	$V = 0.300 \times 100 \times 10.3$	$= 0.31 \text{ m}^3$
top chord		$V = 0.175 \times 0.1 \times 11.9$	$= 0.21$
braces		$V = 1 \times 0.075 \times 6.0$	$= 0.05$
			<u>0.57 m</u>

$$W_{\text{wood}} = 5 \text{ kN}$$

Roofing: guess purlins, cladding etc weigh 0.4 kPa on plan area.

$$W_{\text{roofing}} = 0.4 \times 10.3 \times 3.3 = 14 \text{ kN}$$

Wind:

$$V_s = 1.0 \times 0.78 \times 50 = 39 \text{ kN}$$

$$Z = 0.93 \text{ kPa}$$

$$C_{pi} = \pm 0.3$$

$$C_{pe} = -0.9$$

$$p = 1.0 \times 0.93$$

$$= 1.0 \text{ kPa uplift.}$$

$$F_{\text{wind}} = 1.0 \times 10.3 \times 3.3$$

$$= 34 \text{ kPa} \uparrow \text{ uplift.}$$

Pump room:

pump room weight = 30 kN.
∴ load onto truss = 15 kN

Pump room access walkway:

Area	$A = 5 \text{ m}^2$
assume	$D+L = 1.2 + 1.5$
	$= 2.7 \text{ kPa}$
	$W_{\text{atl}} = 14 \text{ kN}$

Walkway wall

$$A = 5 \times 4 = 20 \text{ m}^2$$

Assume wall frame, cladding and lining etc weigh

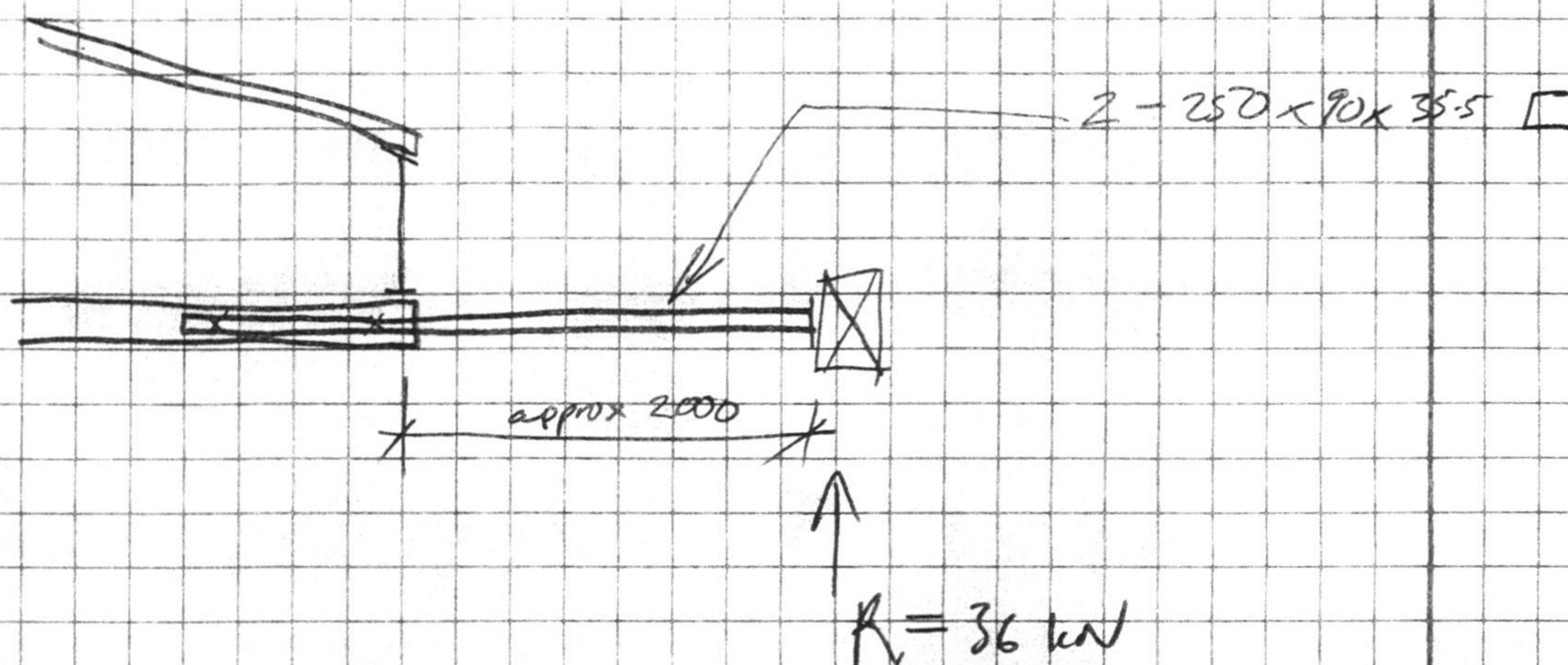
$$W = 0.5 \text{ kPa}$$

$$W_{\text{wall}} = 10 \text{ kN}$$

Reaction, D+L

$$R = \frac{1}{2} [5 + 14] + \frac{2}{3} [15 + 14 + 10] = 36 \text{ kN}$$

[illegible]



$$M = 36 \times 2$$

$$= 72 \text{ kN}\cdot\text{m}$$

$$Z \approx \frac{72 \times 10^3}{0.6 \times 250}$$

$$= 480 \times 10^3 \text{ mm}^3$$

Try 2-250 x 90 x 35.5

$$Z = 2 \times 361 \times 10^3$$

$$= 722 \times 10^3 \text{ mm}^3$$

$$f_b = \frac{72 \times 10^3}{722 \times 10^3}$$

$$= 100 \text{ MPa}$$

$$= 0.40 F_y \quad (F_y = 250 \text{ MPa})$$

$$T/E = \frac{15}{8} < 2.0$$

$$d/A = 27.5 < 85$$

$$L/r_y = 2000/28.4$$

$$= 70$$

∴ TS-4.1(3)

$$TS-4.1(3) \Rightarrow F_b = 165 \text{ MPa}$$

Hence section OK for bending

1874

No.		Date		Description		Amount	
1		Jan 1		Balance		100.00	
2		Jan 15		Received from A. B.		50.00	
3		Jan 20		Received from C. D.		25.00	
4		Jan 25		Received from E. F.		75.00	
5		Jan 30		Received from G. H.		100.00	
6		Feb 5		Received from I. J.		150.00	
7		Feb 10		Received from K. L.		200.00	
8		Feb 15		Received from M. N.		250.00	
9		Feb 20		Received from O. P.		300.00	
10		Feb 25		Received from Q. R.		350.00	
11		Feb 30		Received from S. T.		400.00	
12		Mar 5		Received from U. V.		450.00	
13		Mar 10		Received from W. X.		500.00	
14		Mar 15		Received from Y. Z.		550.00	
15		Mar 20		Received from A. B.		600.00	
16		Mar 25		Received from C. D.		650.00	
17		Mar 30		Received from E. F.		700.00	
18		Apr 5		Received from G. H.		750.00	
19		Apr 10		Received from I. J.		800.00	
20		Apr 15		Received from K. L.		850.00	
21		Apr 20		Received from M. N.		900.00	
22		Apr 25		Received from O. P.		950.00	
23		Apr 30		Received from Q. R.		1000.00	
24		May 5		Received from S. T.		1050.00	
25		May 10		Received from U. V.		1100.00	
26		May 15		Received from W. X.		1150.00	
27		May 20		Received from Y. Z.		1200.00	
28		May 25		Received from A. B.		1250.00	
29		May 30		Received from C. D.		1300.00	
30		Jun 5		Received from E. F.		1350.00	
31		Jun 10		Received from G. H.		1400.00	
32		Jun 15		Received from I. J.		1450.00	
33		Jun 20		Received from K. L.		1500.00	
34		Jun 25		Received from M. N.		1550.00	
35		Jun 30		Received from O. P.		1600.00	
36		Jul 5		Received from Q. R.		1650.00	
37		Jul 10		Received from S. T.		1700.00	
38		Jul 15		Received from U. V.		1750.00	
39		Jul 20		Received from W. X.		1800.00	
40		Jul 25		Received from Y. Z.		1850.00	
41		Jul 30		Received from A. B.		1900.00	
42		Aug 5		Received from C. D.		1950.00	
43		Aug 10		Received from E. F.		2000.00	
44		Aug 15		Received from G. H.		2050.00	
45		Aug 20		Received from I. J.		2100.00	
46		Aug 25		Received from K. L.		2150.00	
47		Aug 30		Received from M. N.		2200.00	
48		Sep 5		Received from O. P.		2250.00	
49		Sep 10		Received from Q. R.		2300.00	
50		Sep 15		Received from S. T.		2350.00	
51		Sep 20		Received from U. V.		2400.00	
52		Sep 25		Received from W. X.		2450.00	
53		Sep 30		Received from Y. Z.		2500.00	
54		Oct 5		Received from A. B.		2550.00	
55		Oct 10		Received from C. D.		2600.00	
56		Oct 15		Received from E. F.		2650.00	
57		Oct 20		Received from G. H.		2700.00	
58		Oct 25		Received from I. J.		2750.00	
59		Oct 30		Received from K. L.		2800.00	
60		Nov 5		Received from M. N.		2850.00	
61		Nov 10		Received from O. P.		2900.00	
62		Nov 15		Received from Q. R.		2950.00	
63		Nov 20		Received from S. T.		3000.00	
64		Nov 25		Received from U. V.		3050.00	
65		Nov 30		Received from W. X.		3100.00	
66		Dec 5		Received from Y. Z.		3150.00	
67		Dec 10		Received from A. B.		3200.00	
68		Dec 15		Received from C. D.		3250.00	
69		Dec 20		Received from E. F.		3300.00	
70		Dec 25		Received from G. H.		3350.00	
71		Dec 30		Received from I. J.		3400.00	
72		Jan 5		Received from K. L.		3450.00	
73		Jan 10		Received from M. N.		3500.00	
74		Jan 15		Received from O. P.		3550.00	
75		Jan 20		Received from Q. R.		3600.00	
76		Jan 25		Received from S. T.		3650.00	
77		Jan 30		Received from U. V.		3700.00	
78		Feb 5		Received from W. X.		3750.00	
79		Feb 10		Received from Y. Z.		3800.00	
80		Feb 15		Received from A. B.		3850.00	
81		Feb 20		Received from C. D.		3900.00	
82		Feb 25		Received from E. F.		3950.00	
83		Feb 30		Received from G. H.		4000.00	
84		Mar 5		Received from I. J.		4050.00	
85		Mar 10		Received from K. L.		4100.00	
86		Mar 15		Received from M. N.		4150.00	
87		Mar 20		Received from O. P.		4200.00	
88		Mar 25		Received from Q. R.		4250.00	
89		Mar 30		Received from S. T.		4300.00	
90		Apr 5		Received from U. V.		4350.00	
91		Apr 10		Received from W. X.		4400.00	
92		Apr 15		Received from Y. Z.		4450.00	
93		Apr 20		Received from A. B.		4500.00	
94		Apr 25		Received from C. D.		4550.00	
95		Apr 30		Received from E. F.		4600.00	
96		May 5		Received from G. H.		4650.00	
97		May 10		Received from I. J.		4700.00	
98		May 15		Received from K. L.		4750.00	
99		May 20		Received from M. N.		4800.00	
100		May 25		Received from O. P.		4850.00	
101		May 30		Received from Q. R.		4900.00	
102		Jun 5		Received from S. T.		4950.00	
103		Jun 10		Received from U. V.		5000.00	
104		Jun 15		Received from W. X.		5050.00	
105		Jun 20		Received from Y. Z.		5100.00	
106		Jun 25		Received from A. B.		5150.00	
107		Jun 30		Received from C. D.		5200.00	
108		Jul 5		Received from E. F.		5250.00	
109		Jul 10		Received from G. H.		5300.00	
110		Jul 15		Received from I. J.		5350.00	
111		Jul 20		Received from K. L.		5400.00	
112		Jul 25		Received from M. N.		5450.00	
113		Jul 30		Received from O. P.		5500.00	
114		Aug 5		Received from Q. R.		5550.00	
115		Aug 10		Received from S. T.		5600.00	
116		Aug 15		Received from U. V.		5650.00	
117		Aug 20		Received from W. X.		5700.00	
118		Aug 25		Received from Y. Z.		5750.00	
119		Aug 30		Received from A. B.		5800.00	
120		Sep 5		Received from C. D.		5850.00	
121		Sep 10		Received from E. F.		5900.00	
122		Sep 15		Received from G. H.		5950.00	
123		Sep 20		Received from I. J.		6000.00	
124		Sep 25		Received from K. L.		6050.00	
125		Sep 30		Received from M. N.		6100.00	
126		Oct 5		Received from O. P.		6150.00	
127		Oct 10		Received from Q. R.		6200.00	
128		Oct 15		Received from S. T.		6250.00	
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131		Oct 30		Received from Y. Z.		6400.00	
132		Nov 5		Received from A. B.		6450.00	
133		Nov 10		Received from C. D.		6500.00	
134		Nov 15		Received from E. F.		6550.00	
135		Nov 20		Received from G. H.		6600.00	
136		Nov 25		Received from I. J.		6650.00	
137		Nov 30		Received from K. L.		6700.00	
138		Dec 5		Received from M. N.		6750.00	
139		Dec 10		Received from O. P.		6800.00	
140		Dec 15		Received from Q. R.		6850.00	
141		Dec 20		Received from S. T.		6900.00	
142		Dec 25		Received from U. V.		6950.00	
143		Dec 30		Received from W. X.		7000.00	
144		Jan 5		Received from Y. Z.		7050.00	
145		Jan 10		Received from A. B.		7100.00	
146		Jan 15		Received from C. D.		7150.00	
147		Jan 20		Received from E. F.		7200.00	
148		Jan 25		Received from G. H.		7250.00	
149		Jan 30		Received from I. J.		7300.00	
150		Feb 5		Received from K. L.		7350.00	
151		Feb 10		Received from M. N.		7400.00	
152		Feb 15		Received from O. P.		7450.00	
153		Feb 20		Received from Q. R.		7500.00	
154		Feb 25		Received from S. T.		7550.00	
155		Feb 30		Received from U. V.		7600.00	
156		Mar 5		Received from W. X.		7650.00	
157		Mar 10		Received from Y. Z.		7700.00	
158		Mar 15		Received from A. B.		7750.00	
159		Mar 20		Received from C. D.		7800.00	
160		Mar 25		Received from E. F.		7850.00	
161		Mar 30		Received from G. H.		7900.00	
162		Apr 5		Received from I. J.		7950.00	
163		Apr 10		Received from K. L.		8000.00	
164		Apr 15		Received from M. N.		8050.00	
165		Apr 20		Received from O. P.		8100.00	
166		Apr 25		Received from Q. R.		8150.00	
167		Apr 30		Received from S. T.		8200.00	
168		May 5		Received from U. V.		8250.00	
169		May 10		Received from W. X.		8300.00	
170		May 15		Received from Y. Z.		8350.00	
171		May 20		Received from A. B.		8400.00	
172		May 25		Received from C. D.		8450.00	
173		May 30		Received from E. F.		8500.00	
174		Jun 5		Received from G. H.		8550.00	
175		Jun 10		Received from I. J.		8600.00	
176		Jun 15		Received from K. L.		8650.00	
177		Jun 20		Received from M. N.		8700.00	
178		Jun 25		Received from O. P.		8750.00	
179		Jun 30		Received from Q. R.		8800.00	
180		Jul 5		Received from S. T.		8850.00	
181		Jul 10		Received from U. V.		8900.00	
182		Jul 15		Received from W. X.		8950.00	
183		Jul 20		Received from Y. Z.		9000.00	
184		Jul 25		Received from A. B.		9050.00	
185		Jul 30		Received from C. D.		9100.00	
186		Aug 5		Received from E. F.		9150.00	
187		Aug 10		Received from G. H.		9200.00	
188		Aug 15		Received from I. J.		9250.00	
189		Aug 20		Received from K. L.		9300.00	
190		Aug 25		Received from M. N.		9350.00	
191		Aug 30		Received from O. P.		9400.00	
192		Sep 5		Received from Q. R.		9450.00	
193		Sep 10		Received from S. T.		9500.00	
194		Sep 15		Received from U. V.		9550.00	
195		Sep 20		Received from W. X.		9600.00	
196		Sep 25		Received from Y. Z.		9650.00	
197		Sep 30		Received from A. B.		9700.00	
198		Oct 5		Received from C. D.		9750.00	
199		Oct 10		Received from E. F.		9800.00	
200		Oct 15		Received from G. H.		9850.00	
201		Oct 20		Received from I. J.		9900.00	
202		Oct 25		Received from K. L.		9950.00	
203		Oct 30		Received from M. N.		10000.00	
204		Nov 5		Received from O. P.		10050.00	
205		Nov 10		Received from Q. R.		10100.00	
206		Nov 15		Received from S. T.		10150.00	
207		Nov 20		Received from U. V.		10200.00	
208		Nov 25		Received from W. X.		10250.00	
209		Nov 30		Received from Y. Z.		10300.00	
210		Dec 5		Received from A. B.		10350.00	

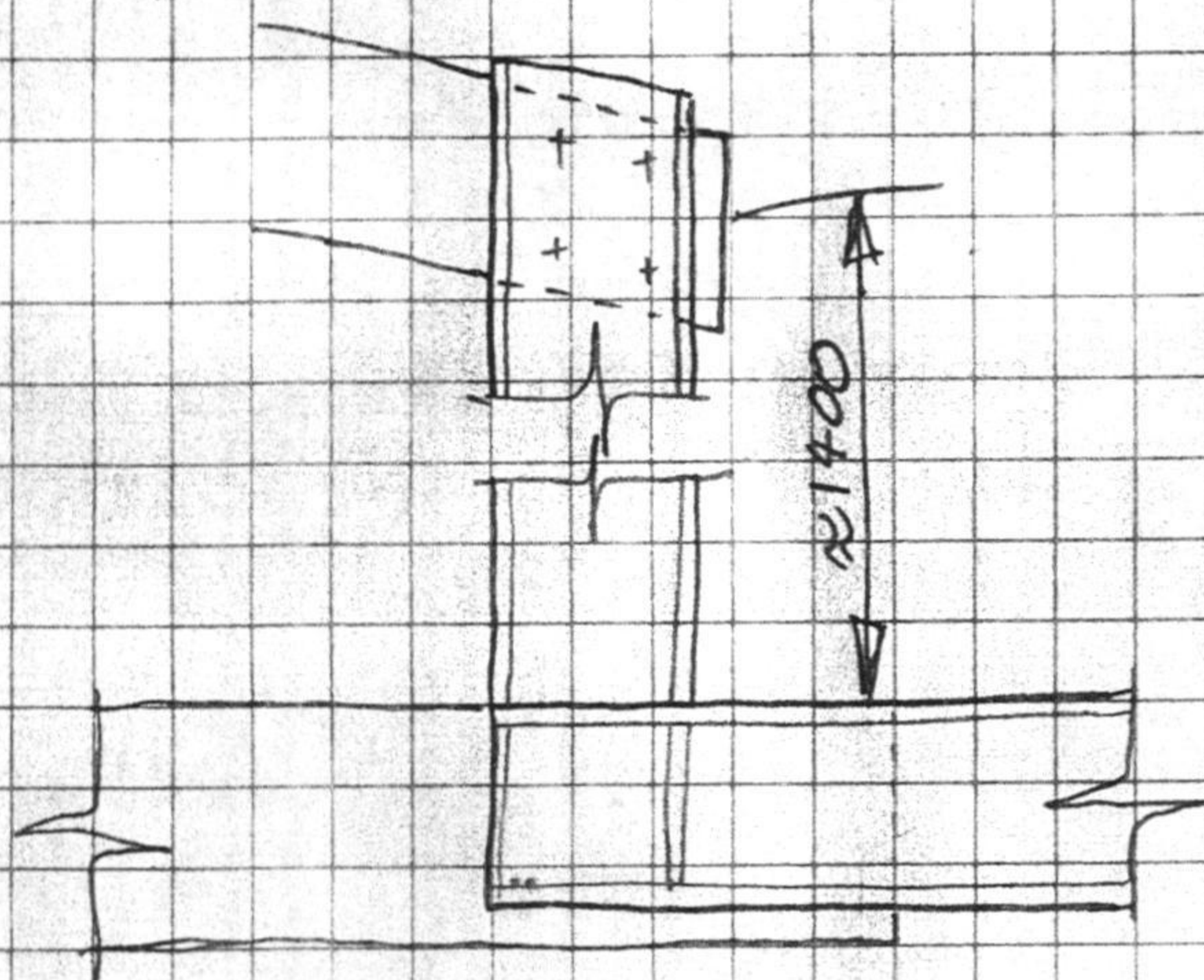
CHECK BENDING IN BOTTOM CHORD

$$\begin{aligned} 12" \times 4" &= 300 \times 100 \text{ mm} \\ Z &= \frac{1}{2} \times 100 \times 300^2 \text{ mm}^3 \\ &= 1.5 \times 10^6 \text{ mm}^3 \end{aligned}$$

$$\begin{aligned} f_b &= \frac{M}{Z} \\ &= \frac{72 \times 10^6}{1.5 \times 10^6} \\ &= 48 \text{ MPa.} \end{aligned}$$

too high.

Use a post to connect the channels to the top chord.

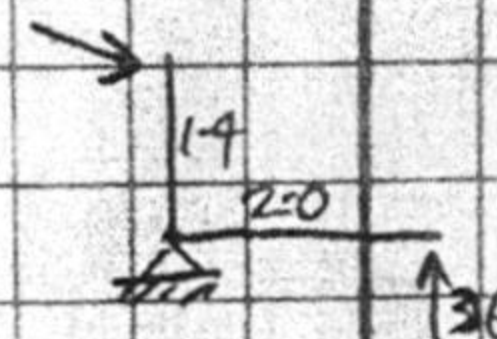


Axial compression induced into top chord

$$\begin{aligned} &\approx 2.0 \times 36 / 1.4 \\ &= 51 \text{ kN} \end{aligned}$$

7" x 4"

$$\begin{aligned} f_a &= \frac{51 \times 10^3}{175 \times 100} \\ &= 2.9 \text{ MPa.} \end{aligned}$$

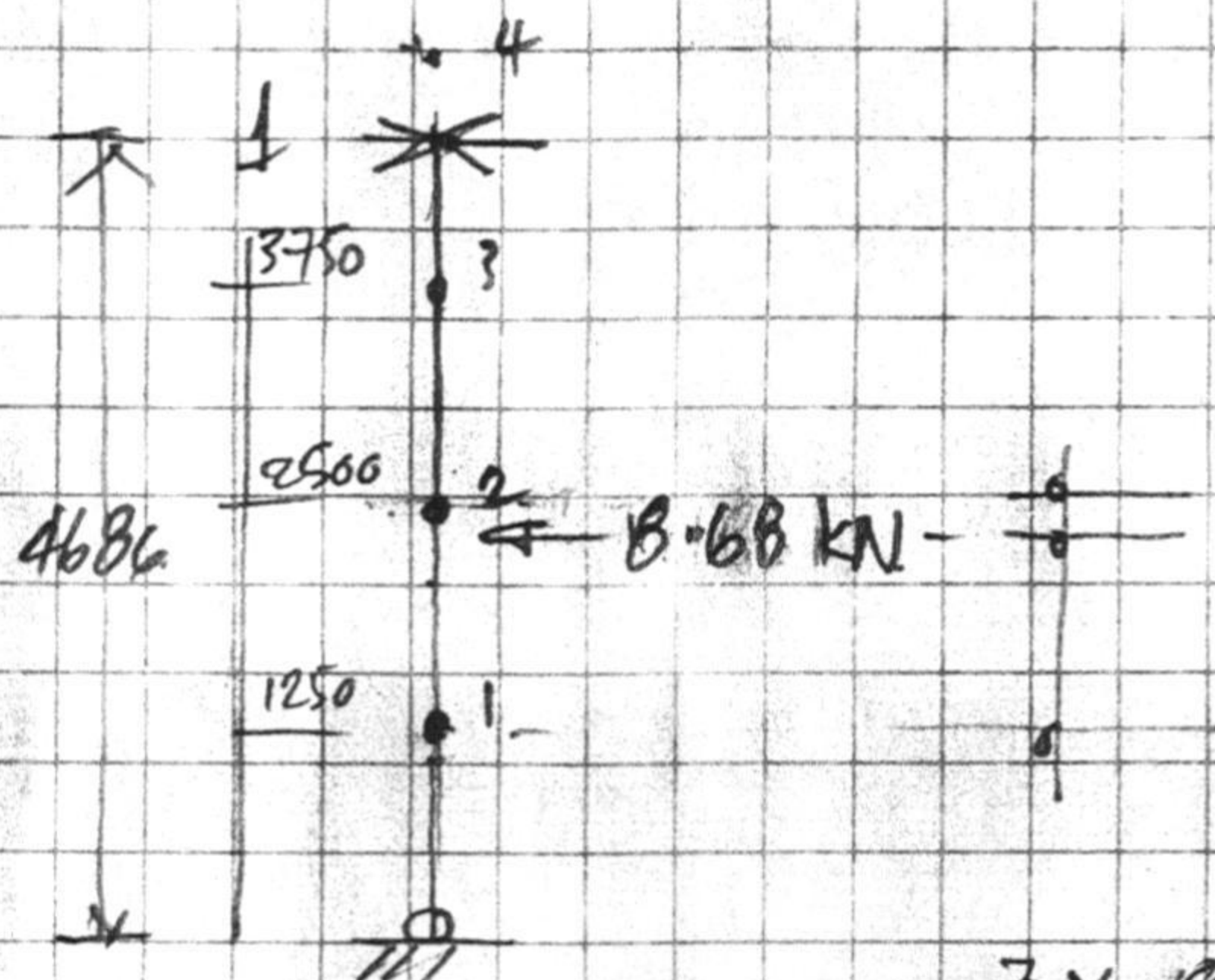


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Date	Description	Amount	Total
1890	Jan 1	100.00	100.00
1891	Feb 1	200.00	300.00
1892	Mar 1	300.00	600.00
1893	Apr 1	400.00	1000.00
1894	May 1	500.00	1500.00
1895	Jun 1	600.00	2100.00
1896	Jul 1	700.00	2800.00
1897	Aug 1	800.00	3600.00
1898	Sep 1	900.00	4500.00
1899	Oct 1	1000.00	5500.00
1900	Nov 1	1100.00	6600.00
1901	Dec 1	1200.00	7800.00
1902	Jan 1	1300.00	9100.00
1903	Feb 1	1400.00	10500.00
1904	Mar 1	1500.00	12000.00
1905	Apr 1	1600.00	13600.00
1906	May 1	1700.00	15300.00
1907	Jun 1	1800.00	17100.00
1908	Jul 1	1900.00	19000.00
1909	Aug 1	2000.00	21000.00
1910	Sep 1	2100.00	23100.00
1911	Oct 1	2200.00	25300.00
1912	Nov 1	2300.00	27600.00
1913	Dec 1	2400.00	30000.00
1914	Jan 1	2500.00	32500.00
1915	Feb 1	2600.00	35100.00
1916	Mar 1	2700.00	37800.00

⇒ Approx $\delta_{eff} \leq 3mm$ at Point of Support ⇒ (Differential deflection)

ie if total $\delta_{eff} \leq 6mm$ at mid span then OK



Place 14 kN load at Conn 2.

$$\Delta = \frac{7 \times 8.68 \times 10^3 \times 4686^3}{768 \times 210,000 \times I}$$

$$I_{reqd} \geq \frac{7 \times 8.68 \times 10^3 \times 4686^3}{6 \times 768 \times 210,000} \quad \text{mm}^4$$


$$= 16.46 \times 10^6 \text{ mm}^4$$

114 x 114 x 915 RHS
MIN.

Support NW rail off 152 x 152 x 63 RHS
connected into flooring at LVL 6 (Side of Pit)
LVL 1 (Point Concrete Flr)
LVL 2 (Diagonally braced Flr)

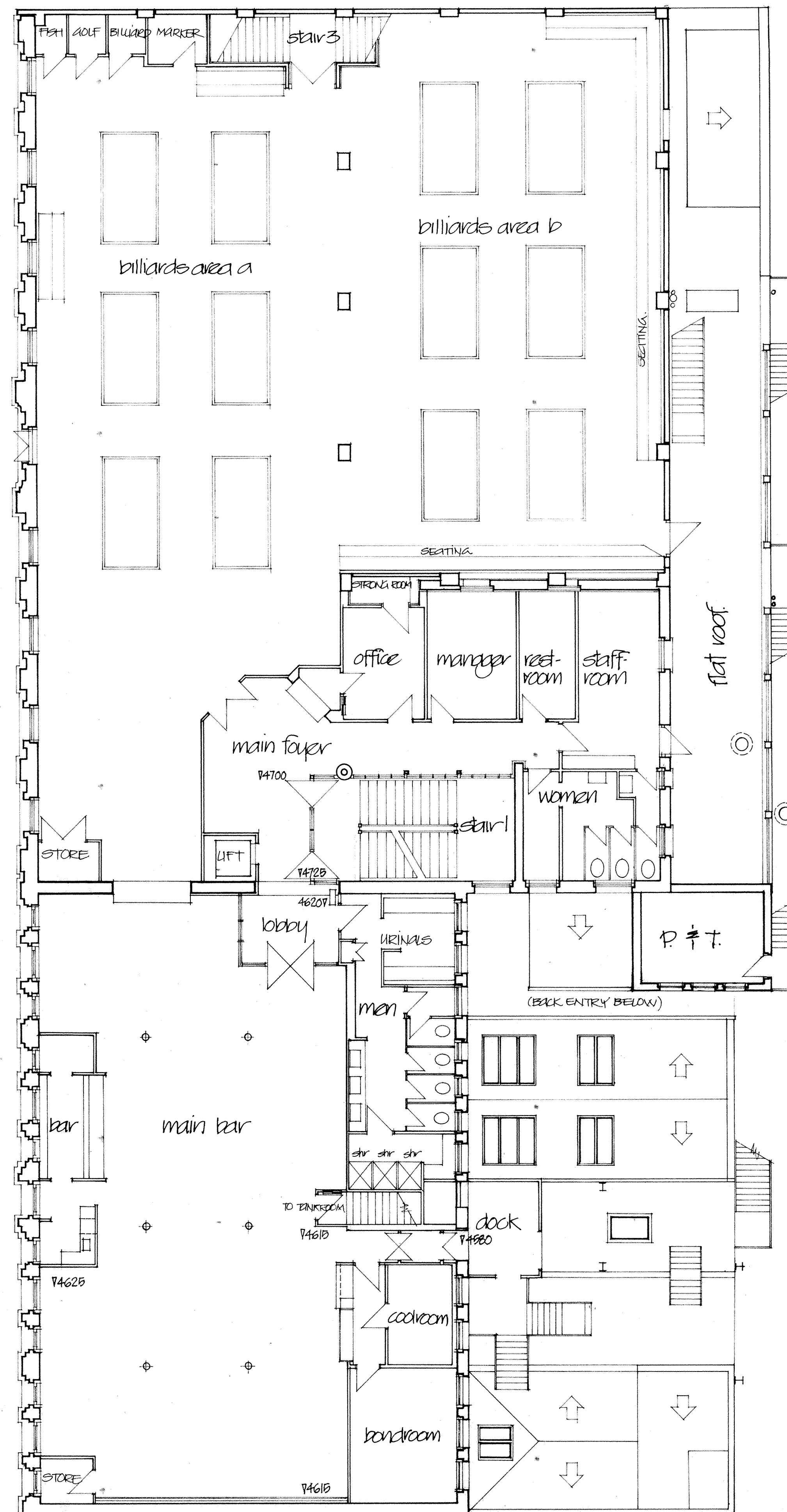
Abstract—The purpose of this study was to determine if there were differences in the prevalence of musculoskeletal disorders among different types of workers. The subjects included all employees of a large manufacturing company who had been employed at least one year. A questionnaire was sent to each employee asking about symptoms of musculoskeletal disorders. The results showed that the prevalence of musculoskeletal disorders was higher among workers in the production department than among workers in the administrative department. The results also showed that the prevalence of musculoskeletal disorders was higher among workers who had been employed for more than five years than among workers who had been employed for less than five years.

11. *Journal of the American Medical Association*, 277, 1996, 1033-1034.



1. *Journal of the American Medical Association*, 2000; 284: 2689-2695.





1100 first floor plan

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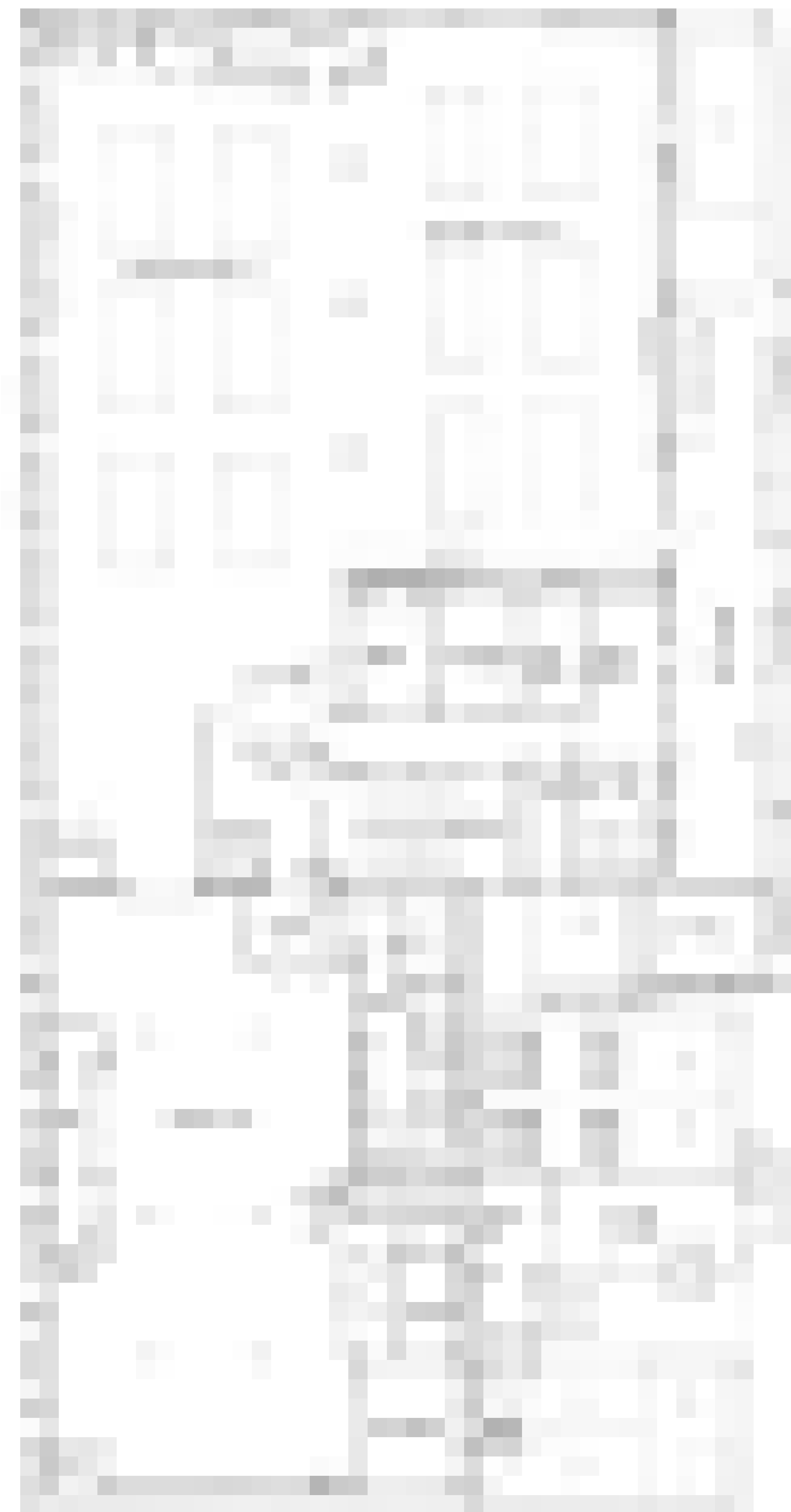
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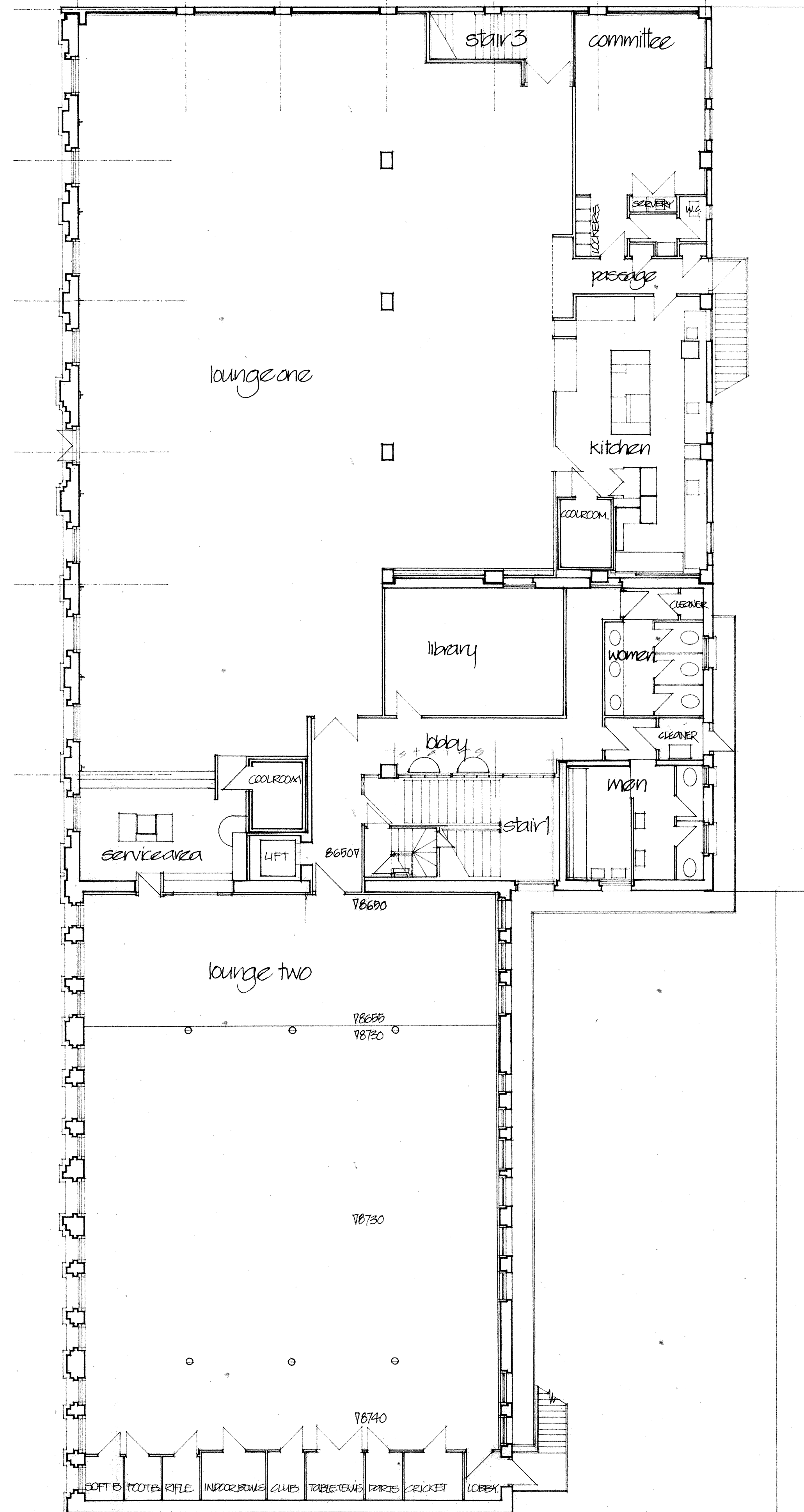
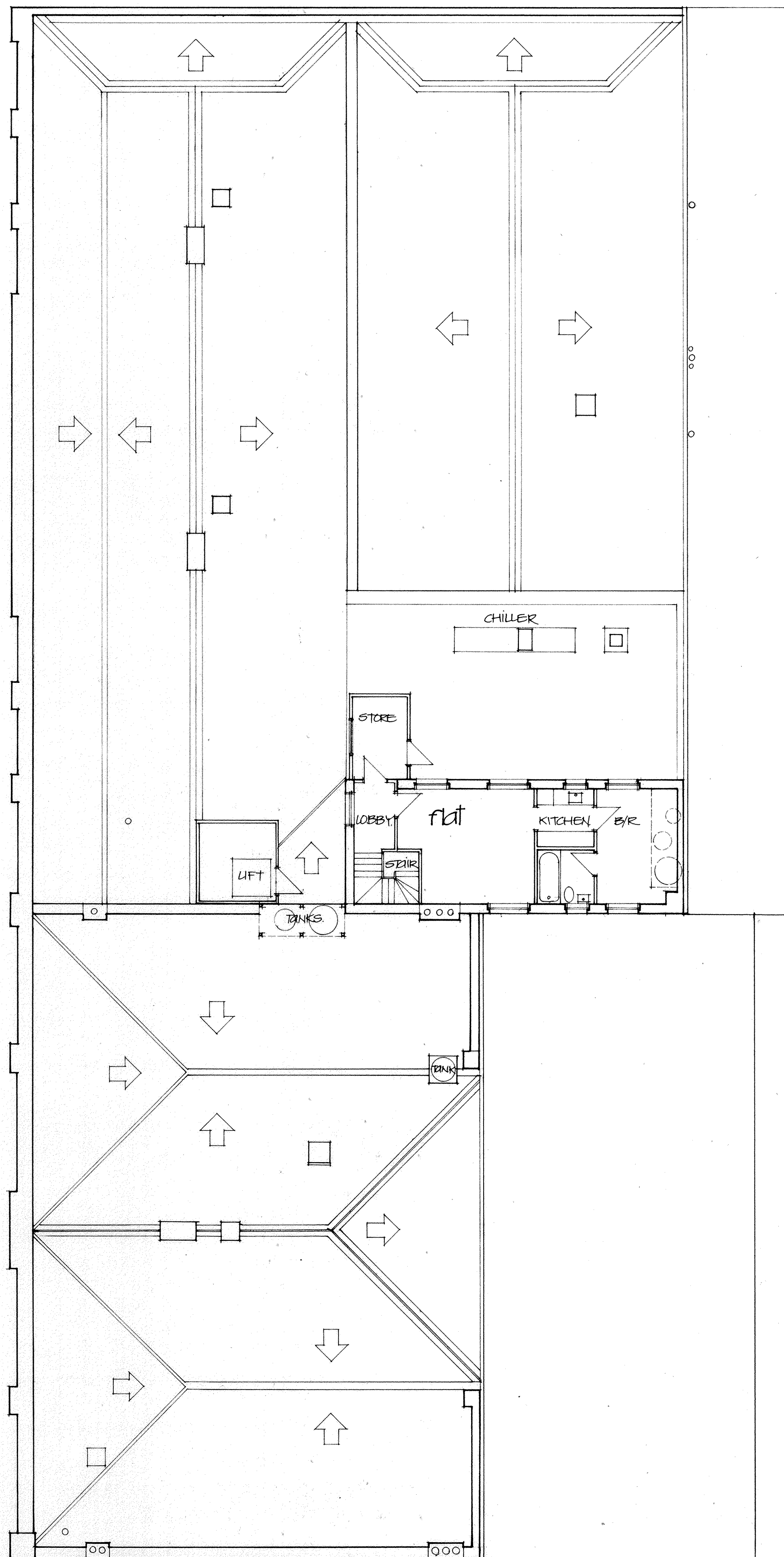
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first floor plan,
existing

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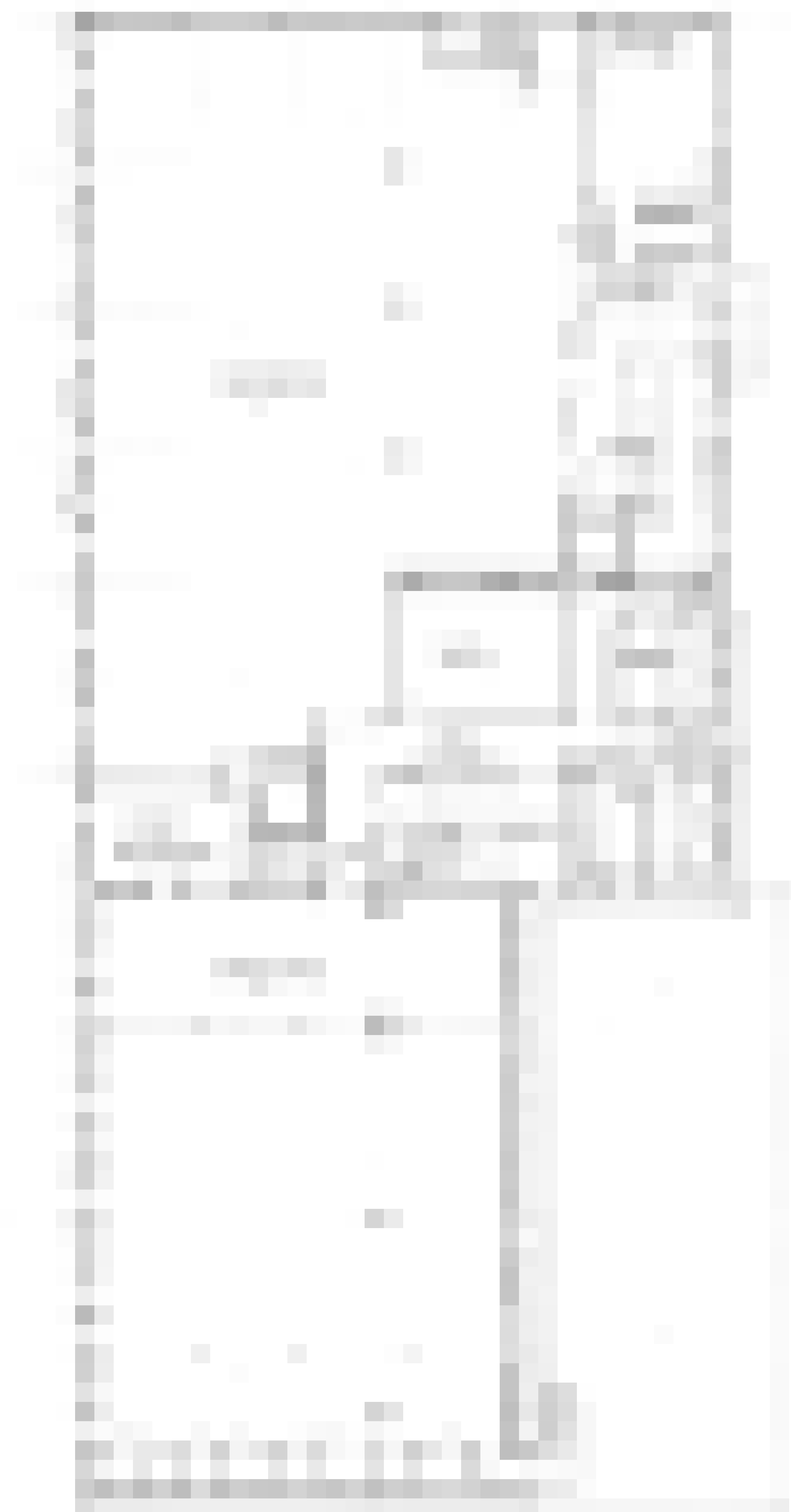
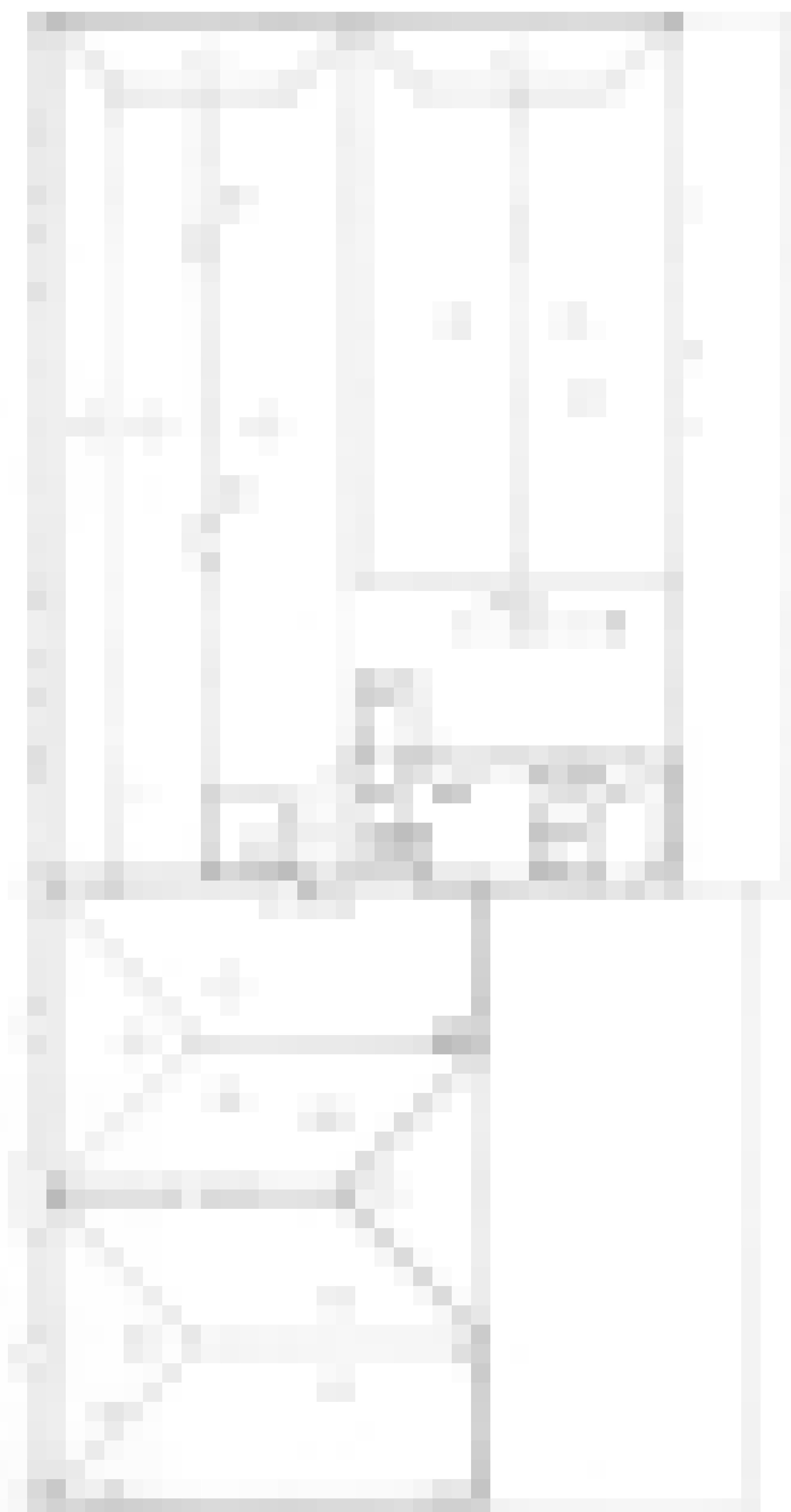
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roof-existing
second floor,
existing.

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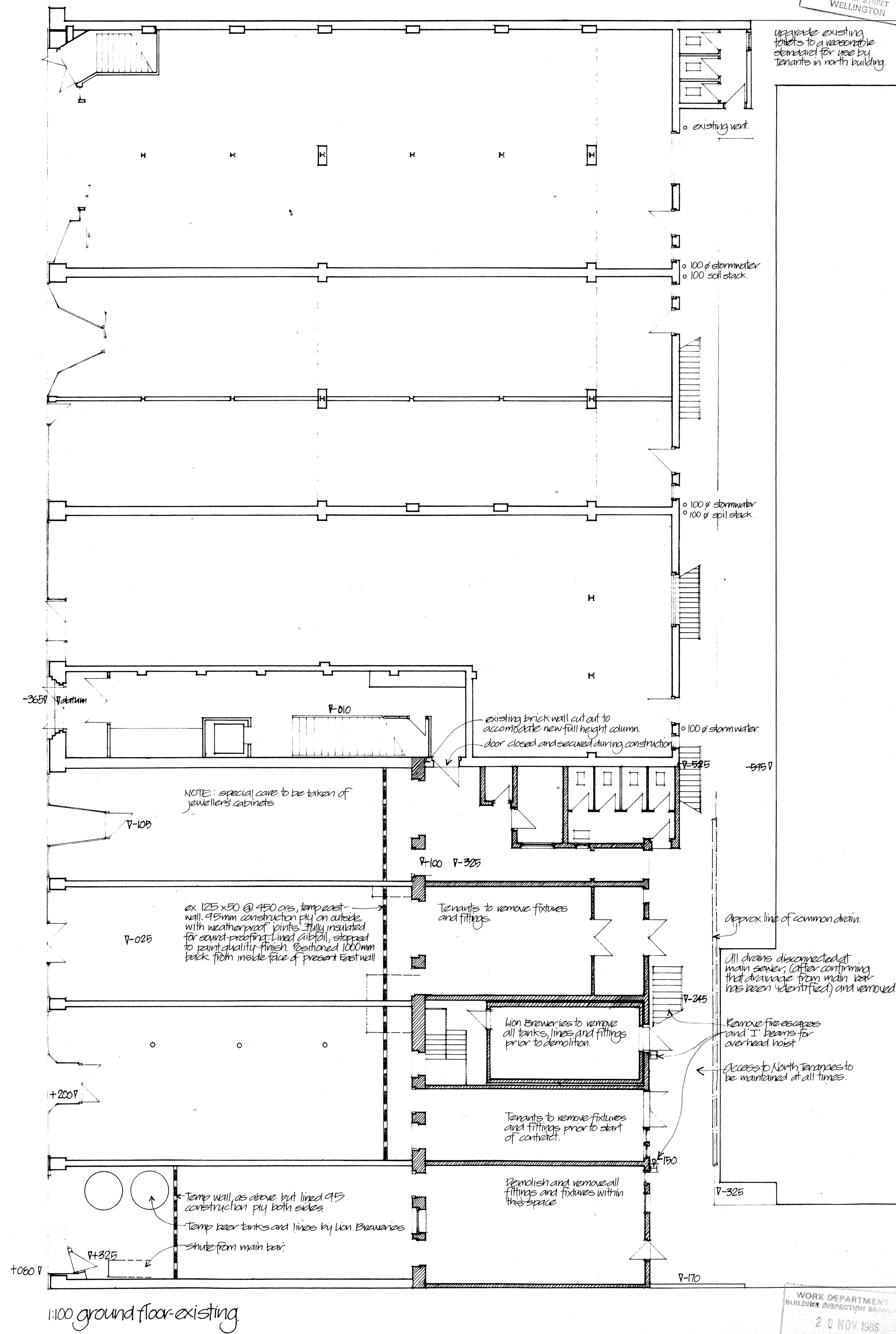


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demolition and
temporary works
ground floor

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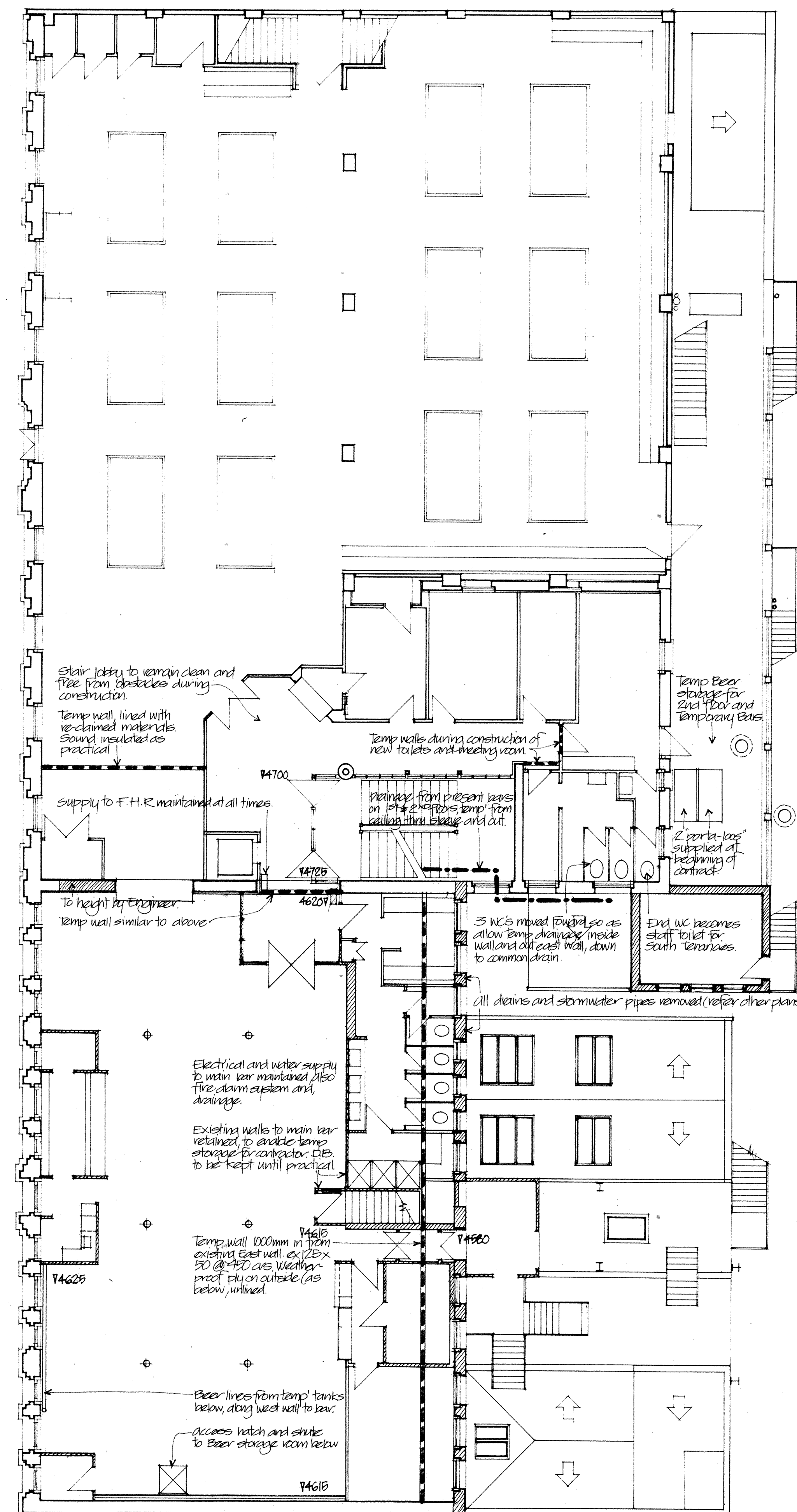
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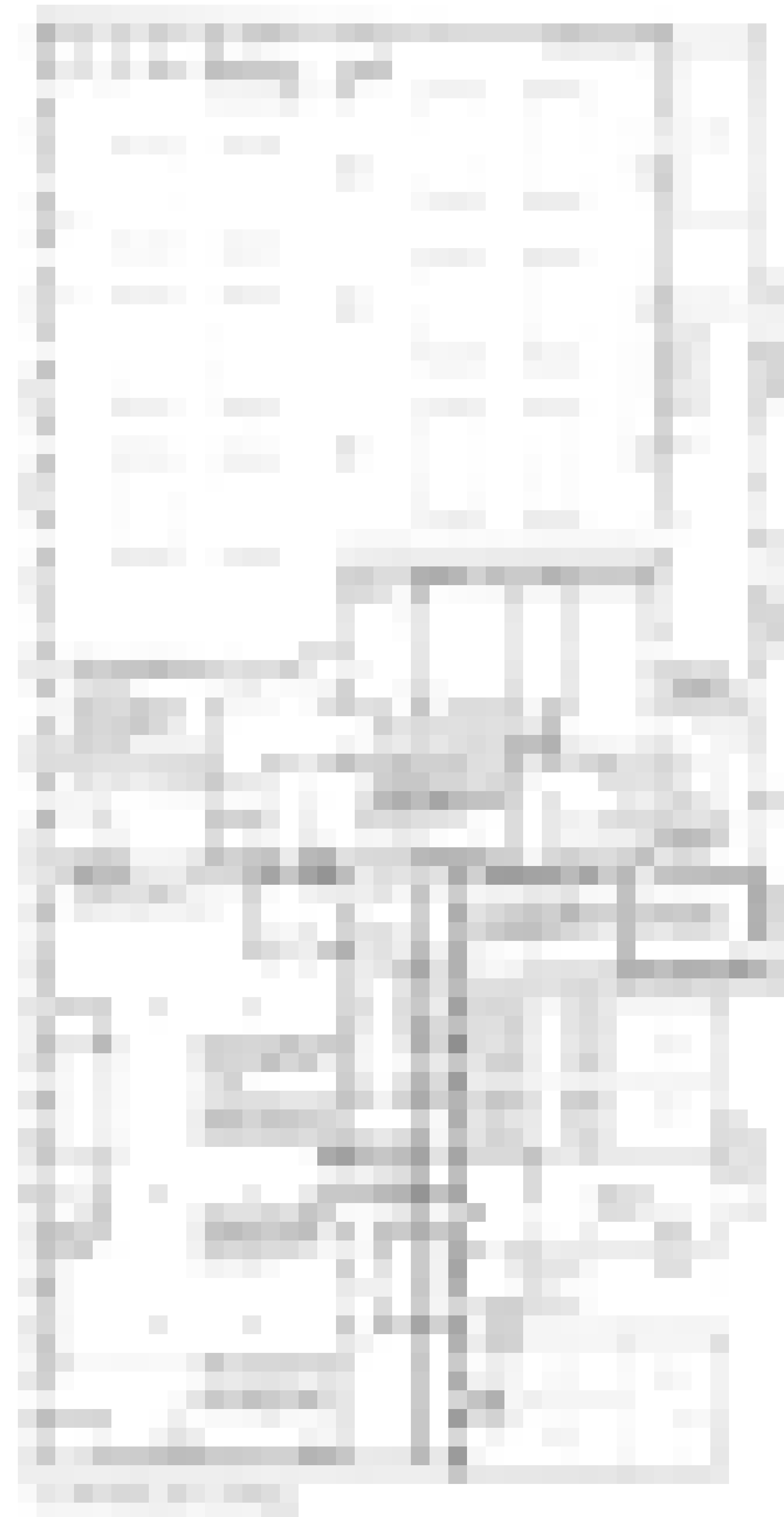
demolition and
temporary works
first floor

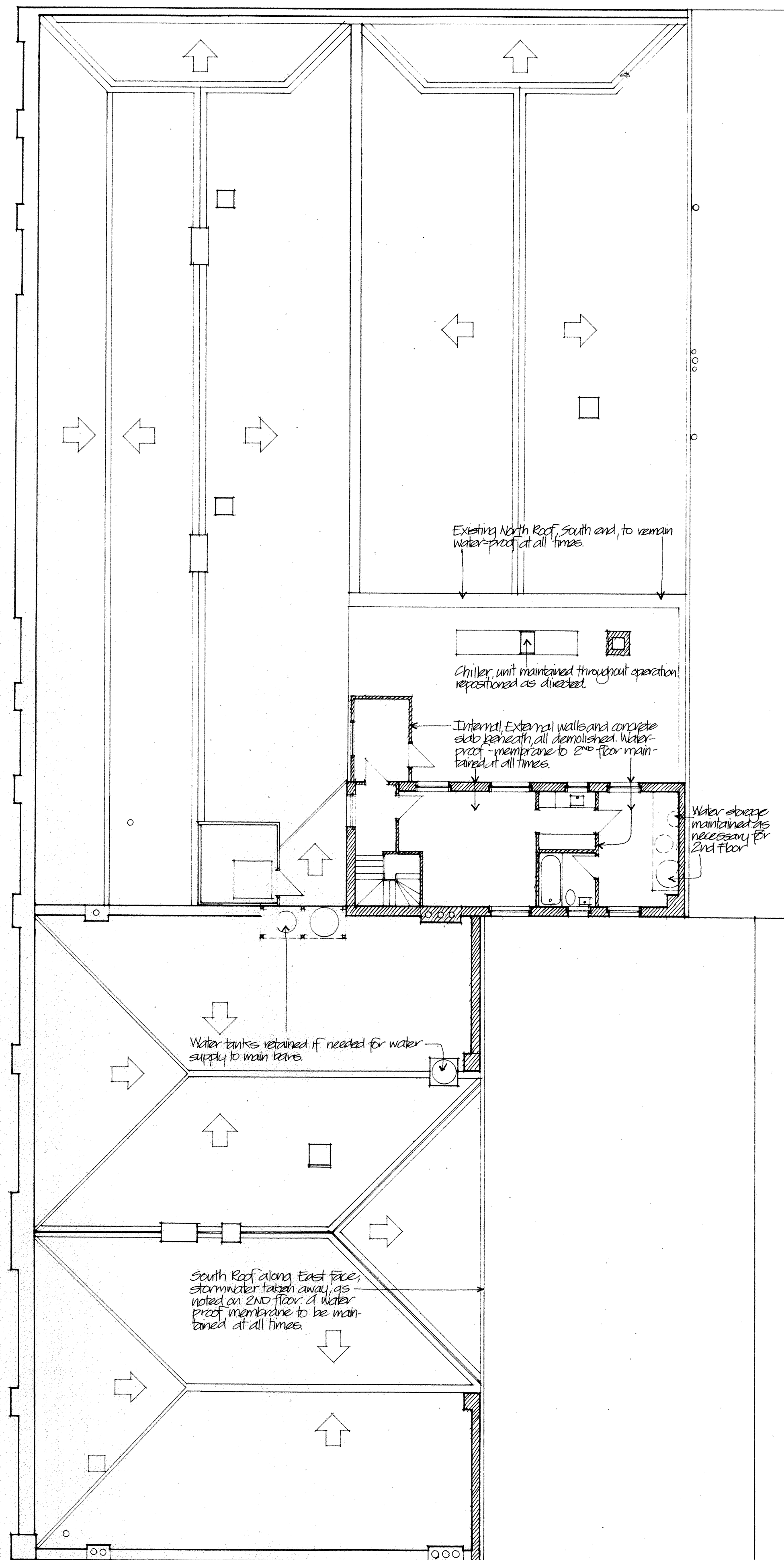
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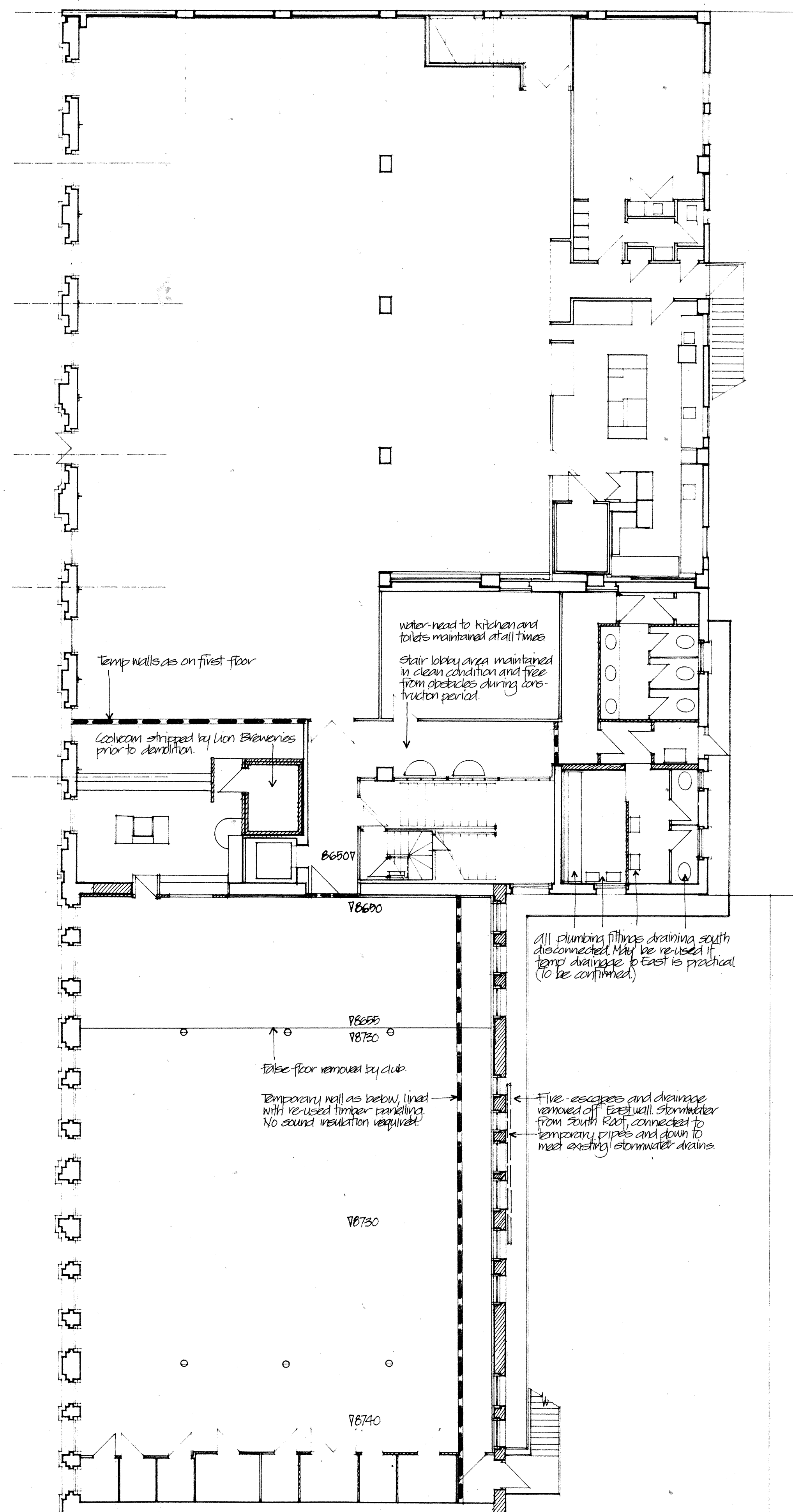
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1:100 roof plan - existing



1:100 second floor plan - existing.



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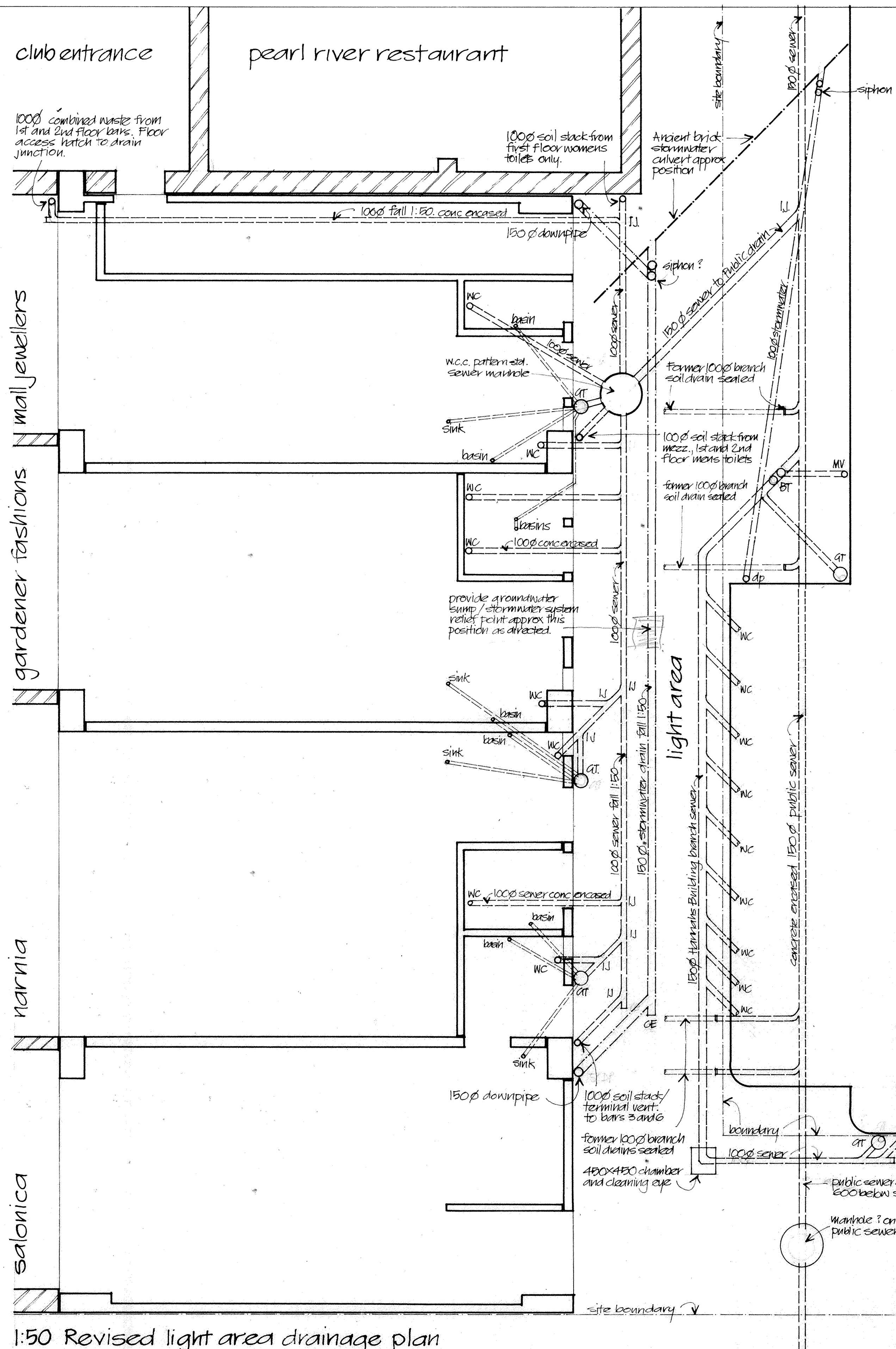
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demolition and
temporary works
second floor,
roof

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1:50 Revised light area drainage plan

Note: position of all existing drains are shown as accurately as confused records allow. Position of all new drains and associated items will be confirmed when existing situations are clarified. Contractor shall keep accurate records to enable an 'as built' drawing to be done.

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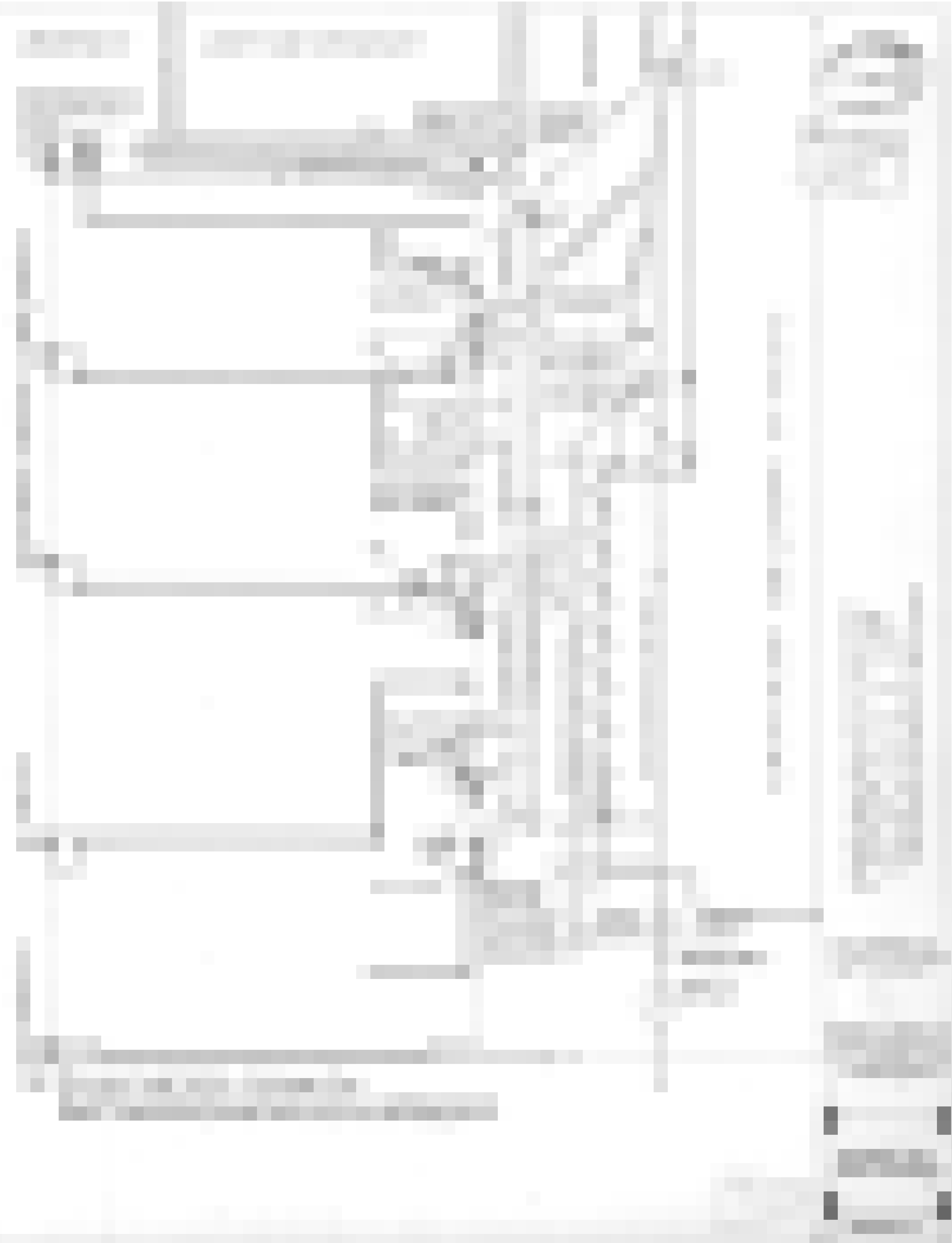
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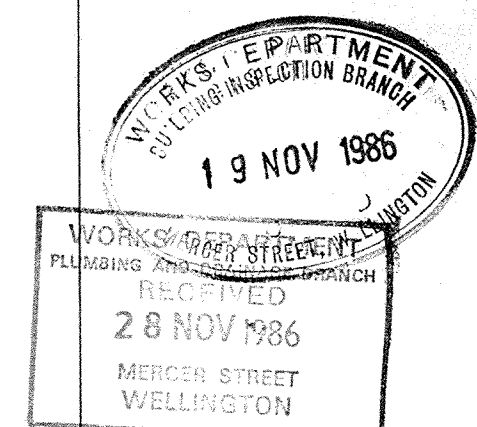
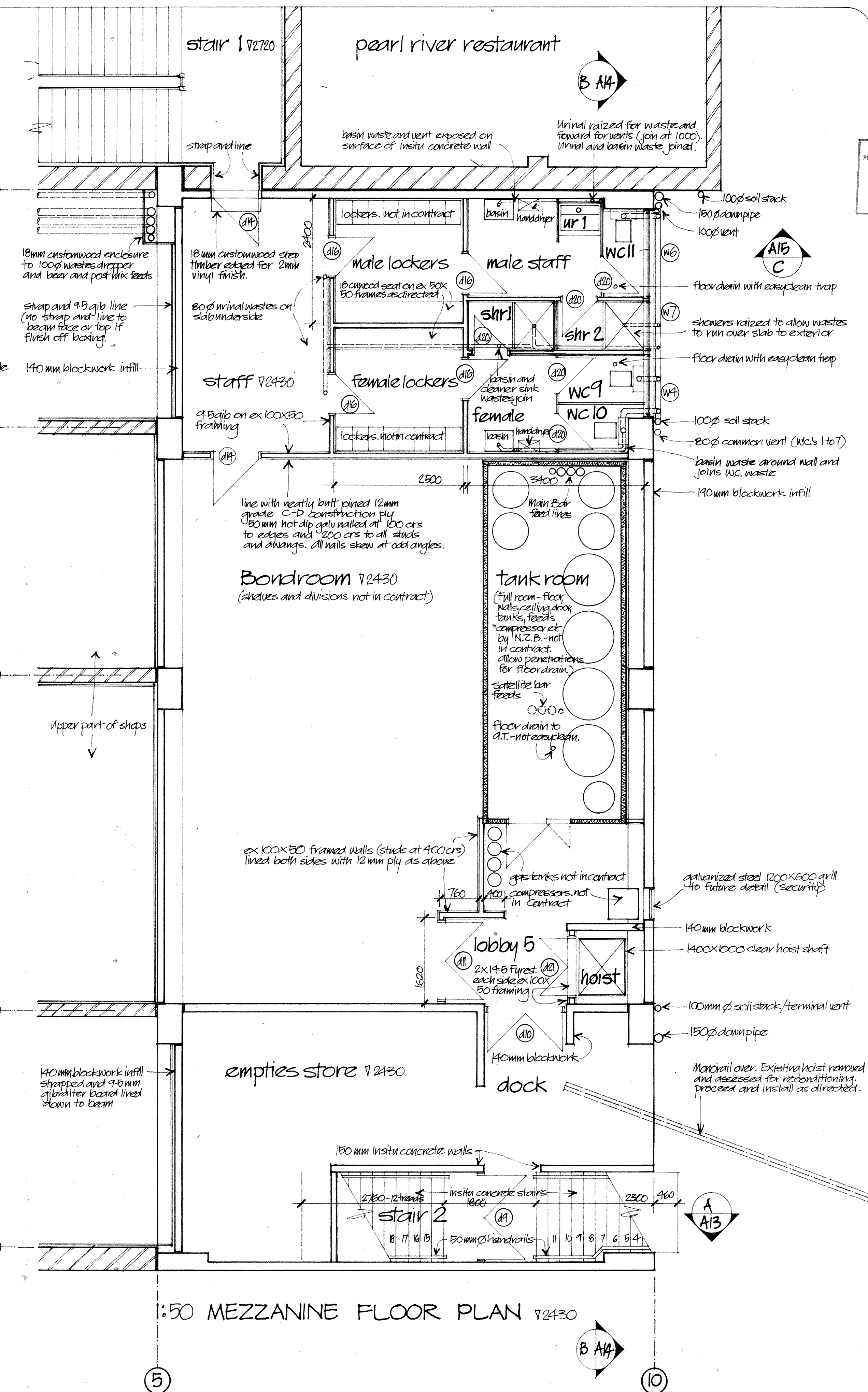
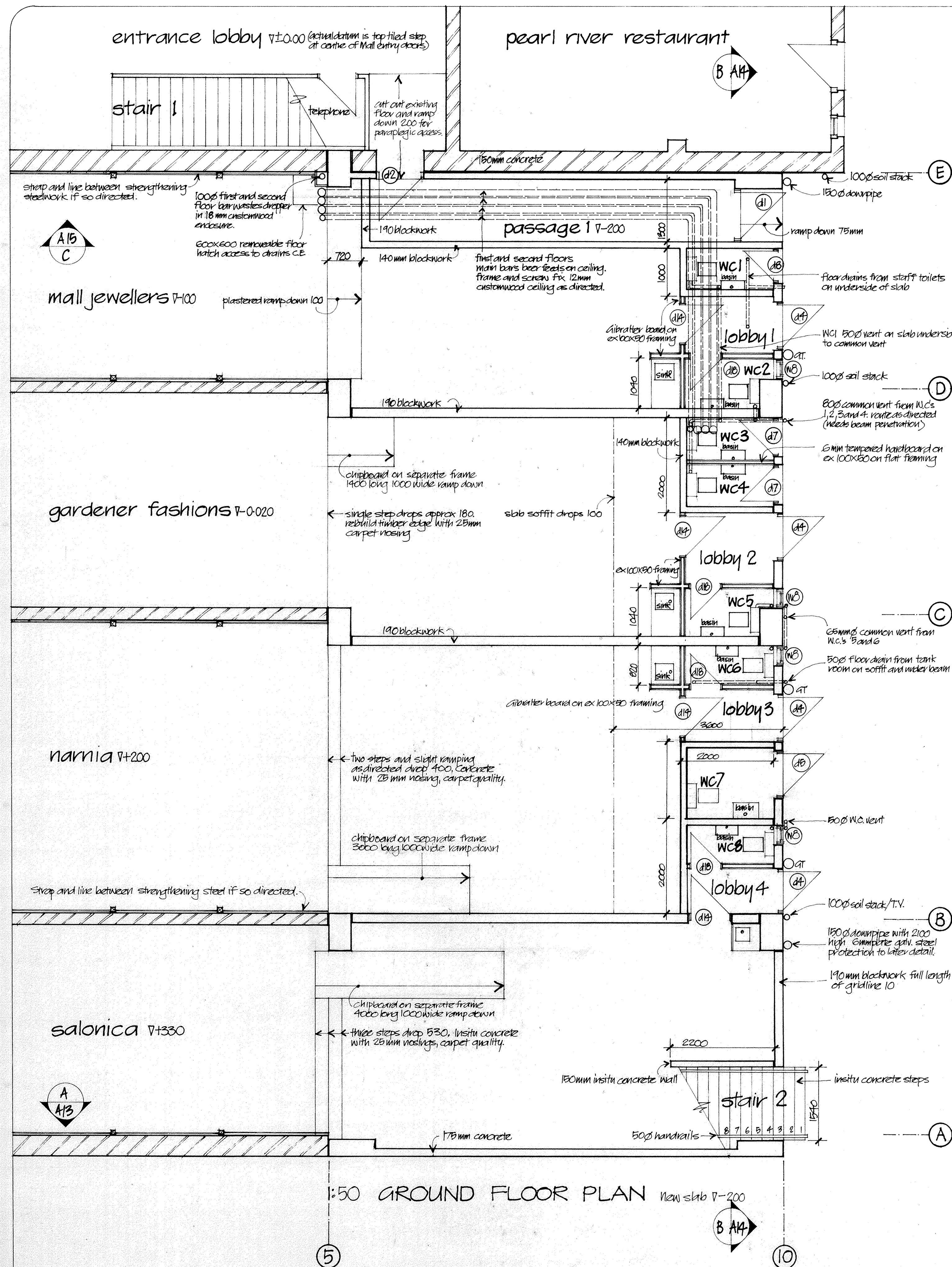
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revised light
area drainage

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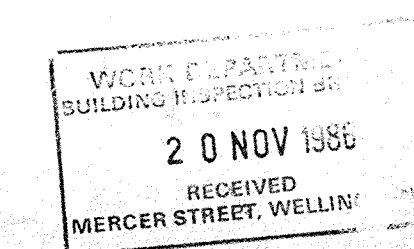
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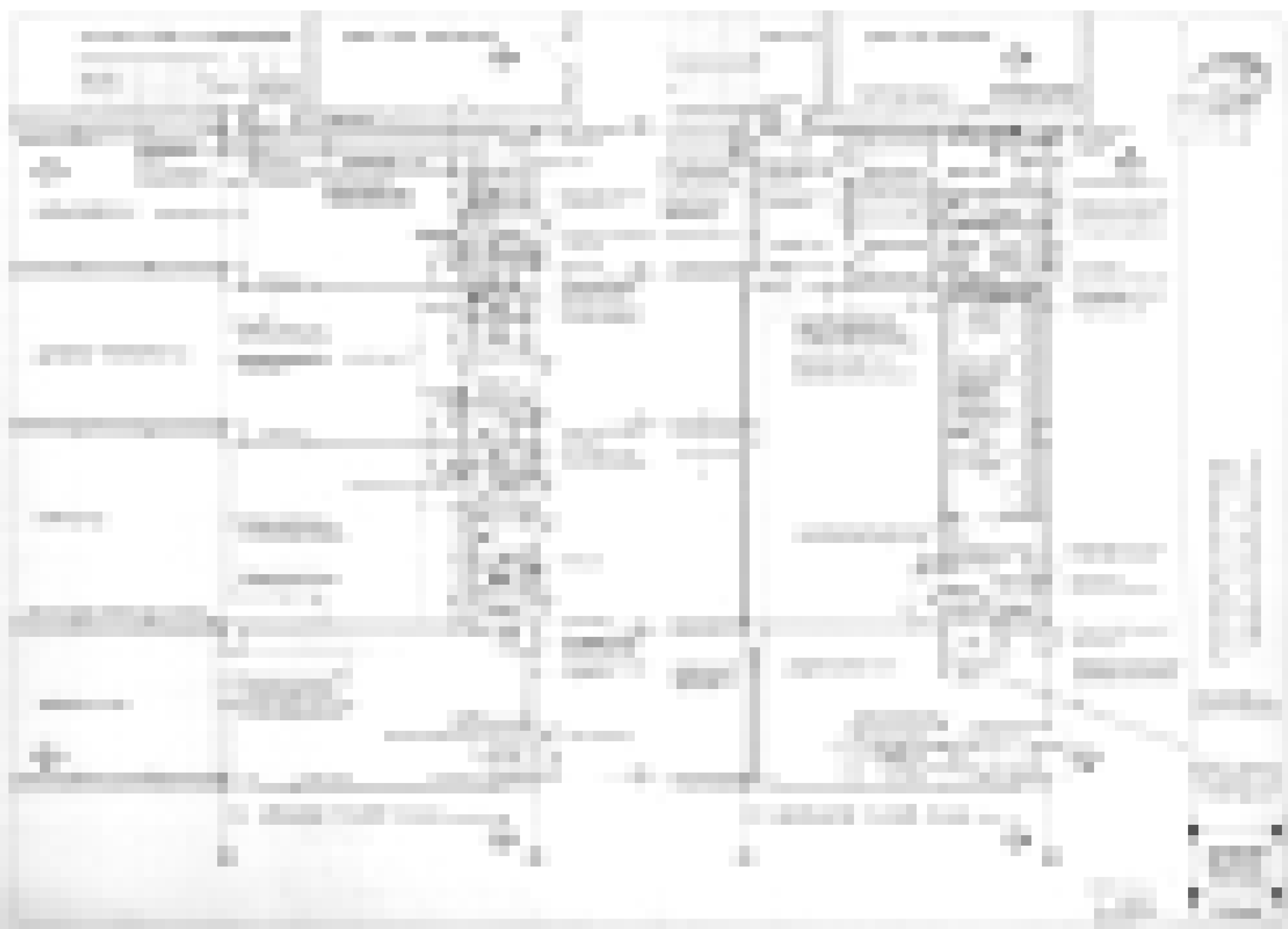
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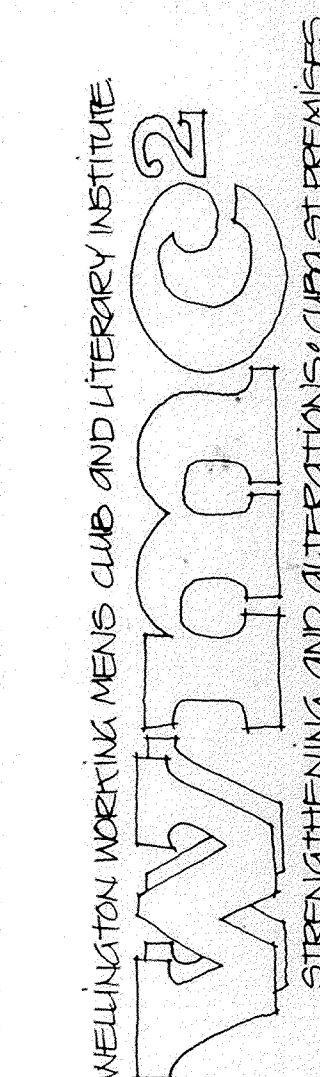
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ground and
mezzanine
floor plans

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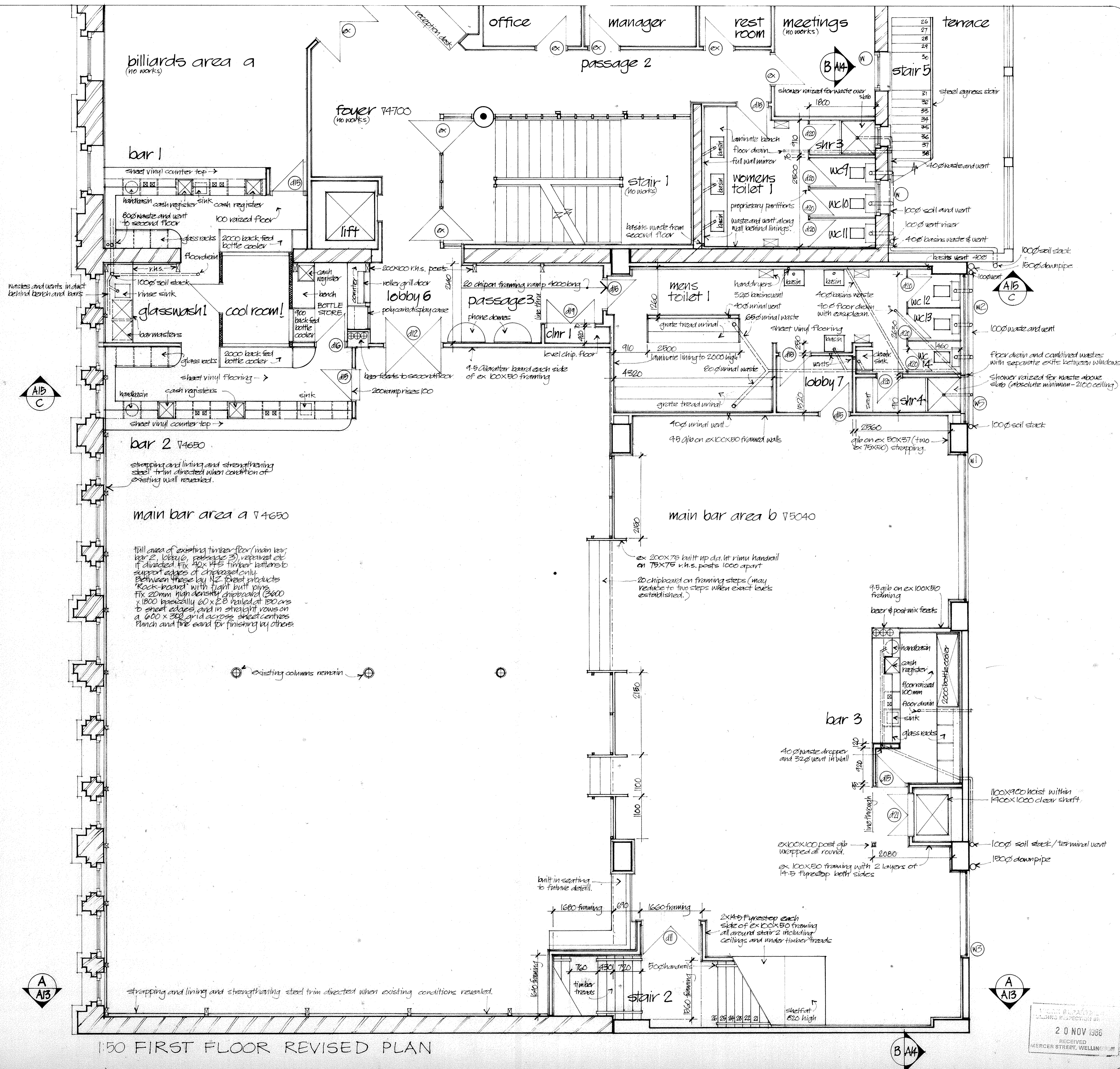




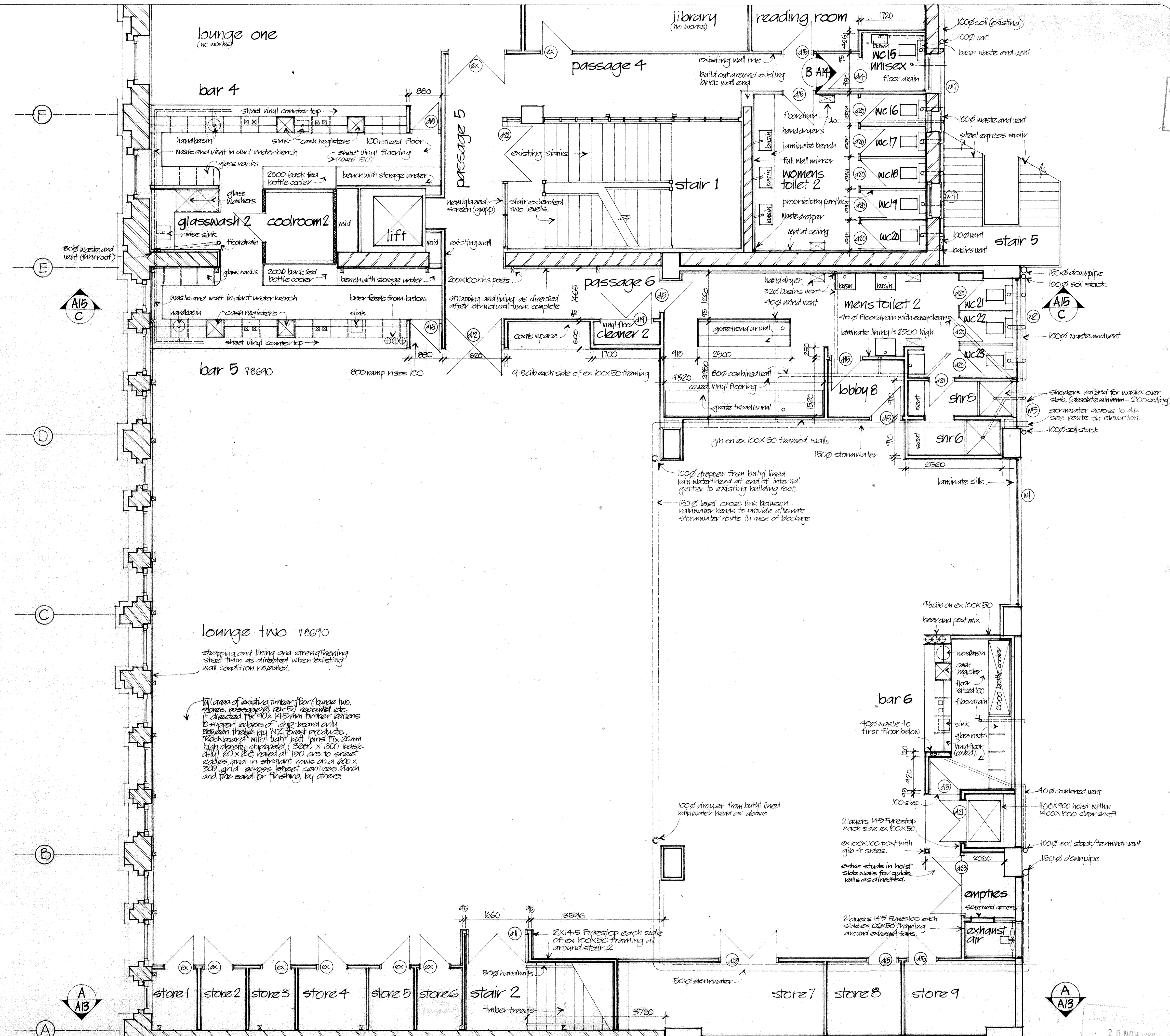


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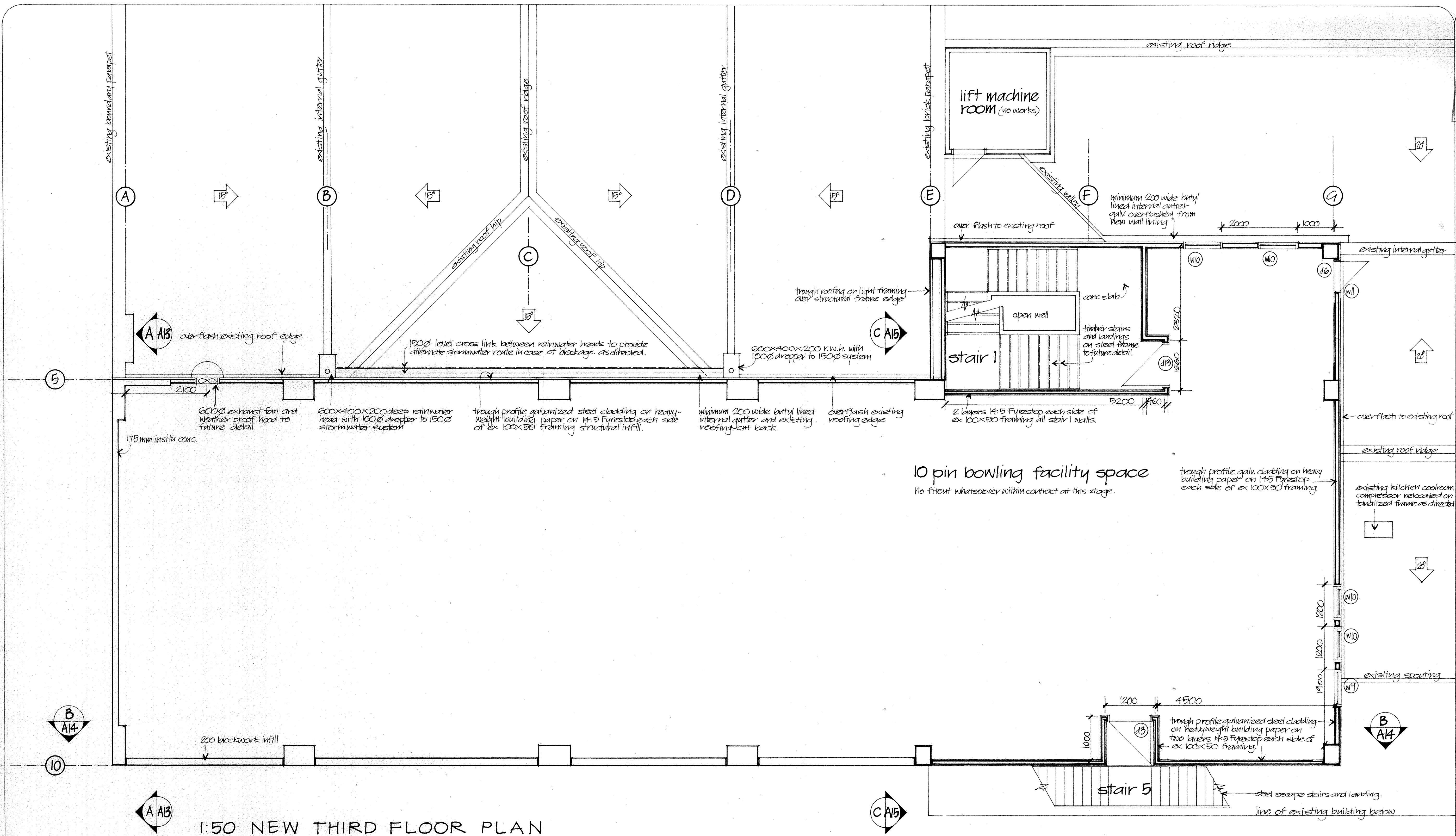
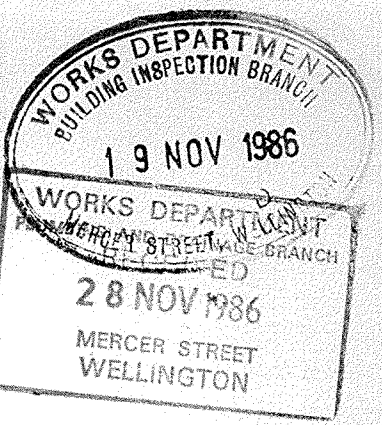
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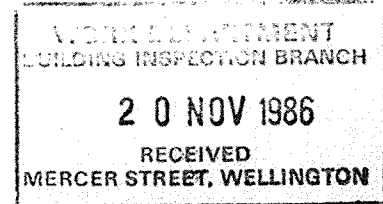
1:50 NEW THIRD FLOOR PLAN

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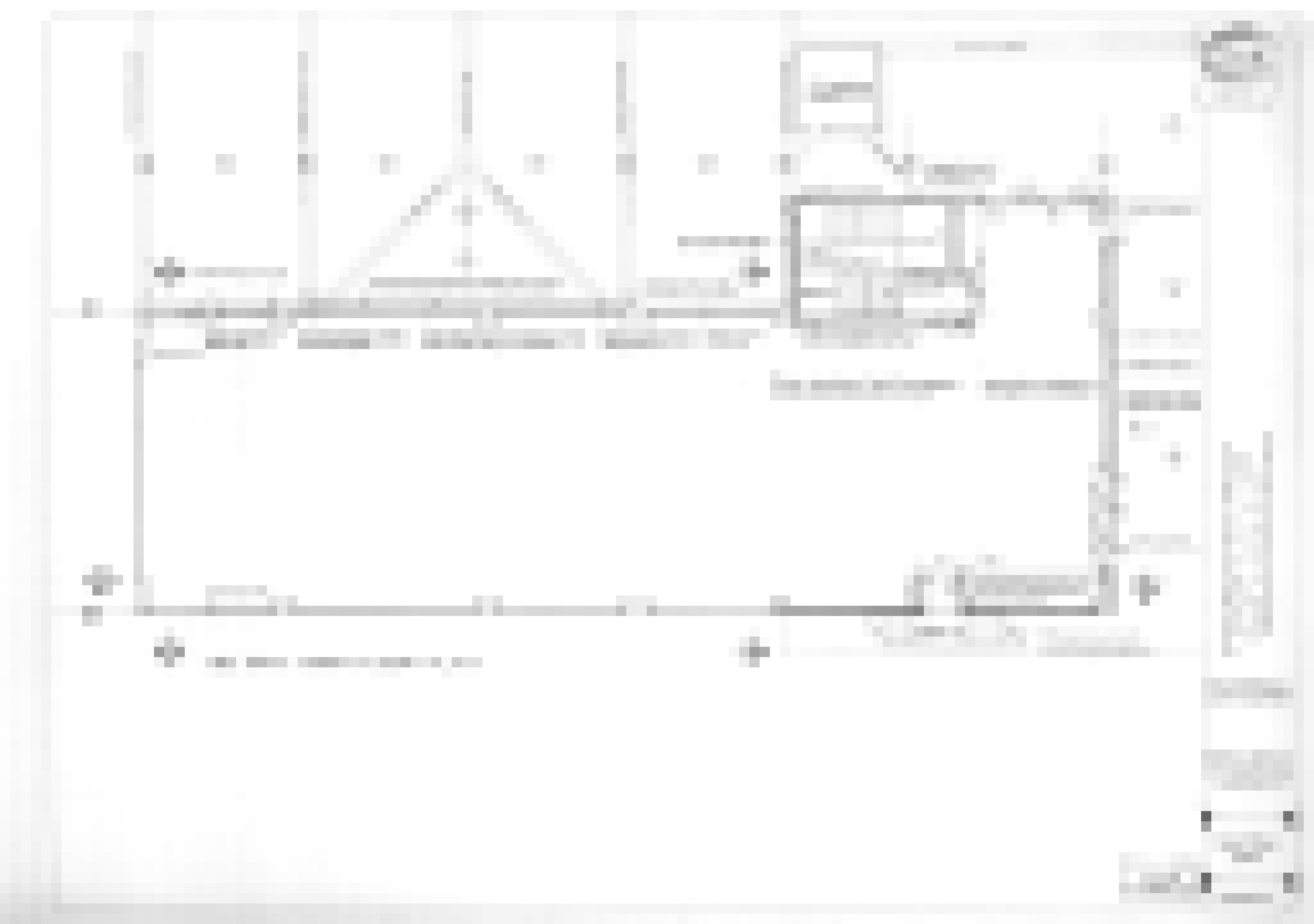
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third floor
plan

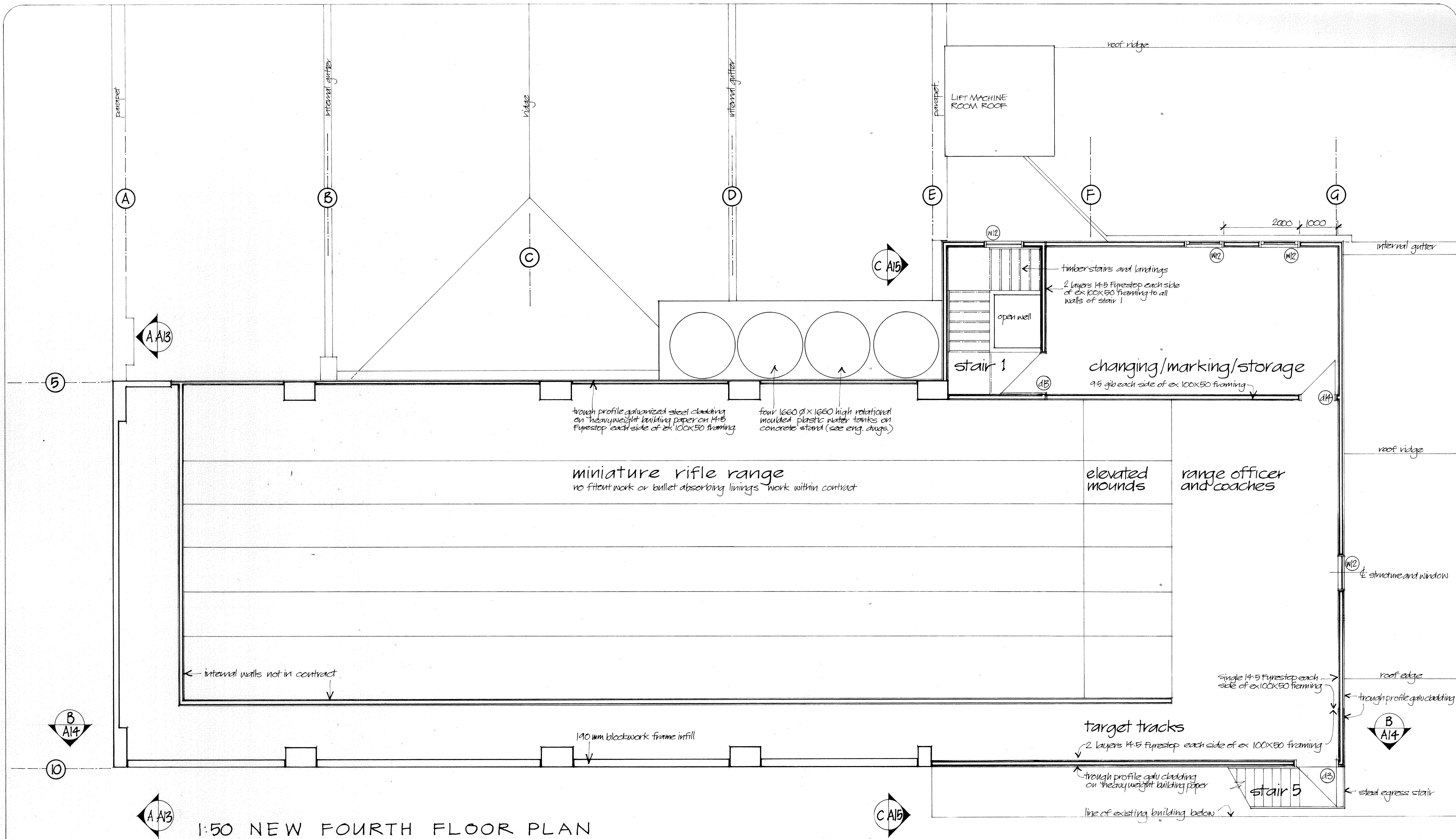


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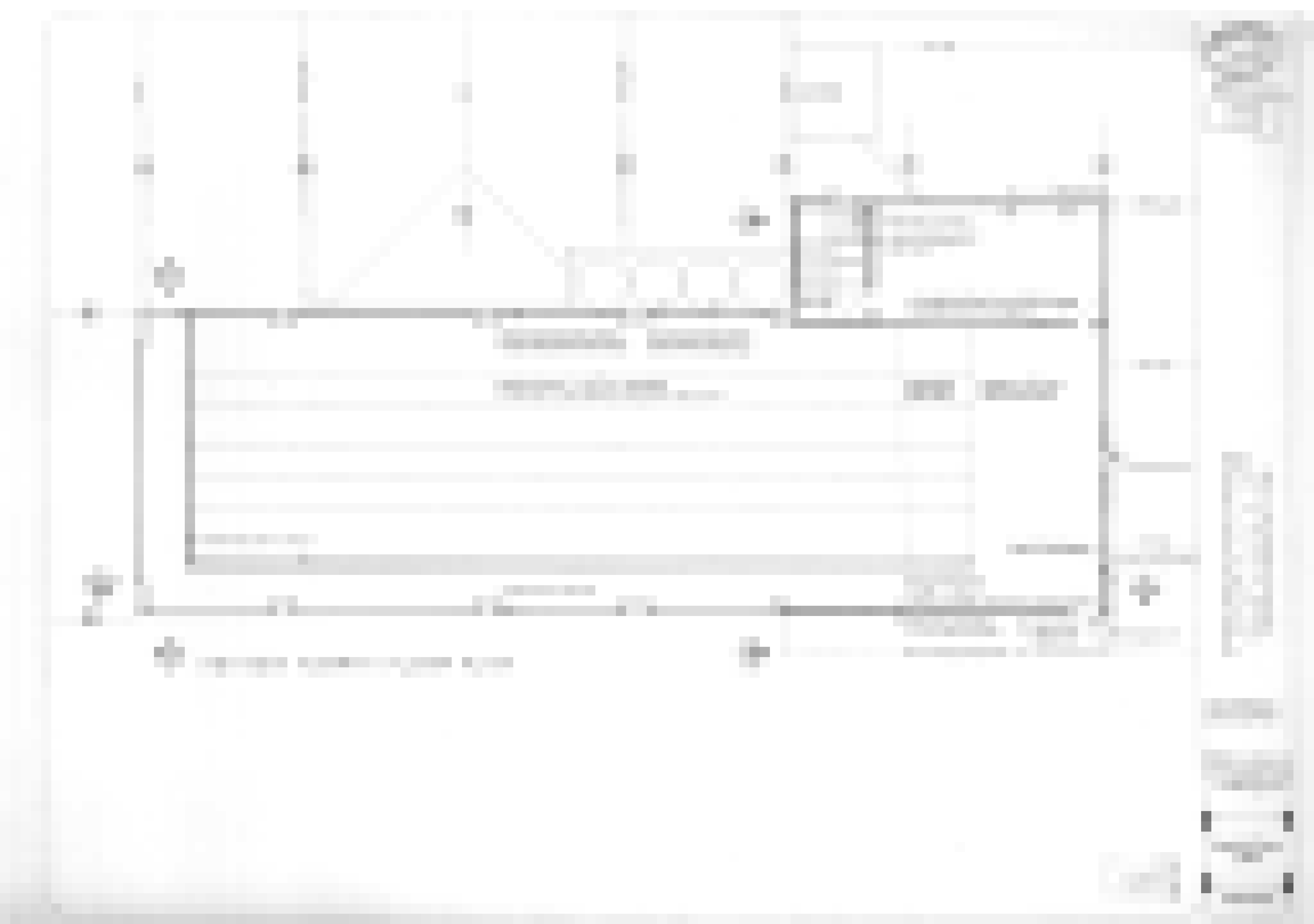
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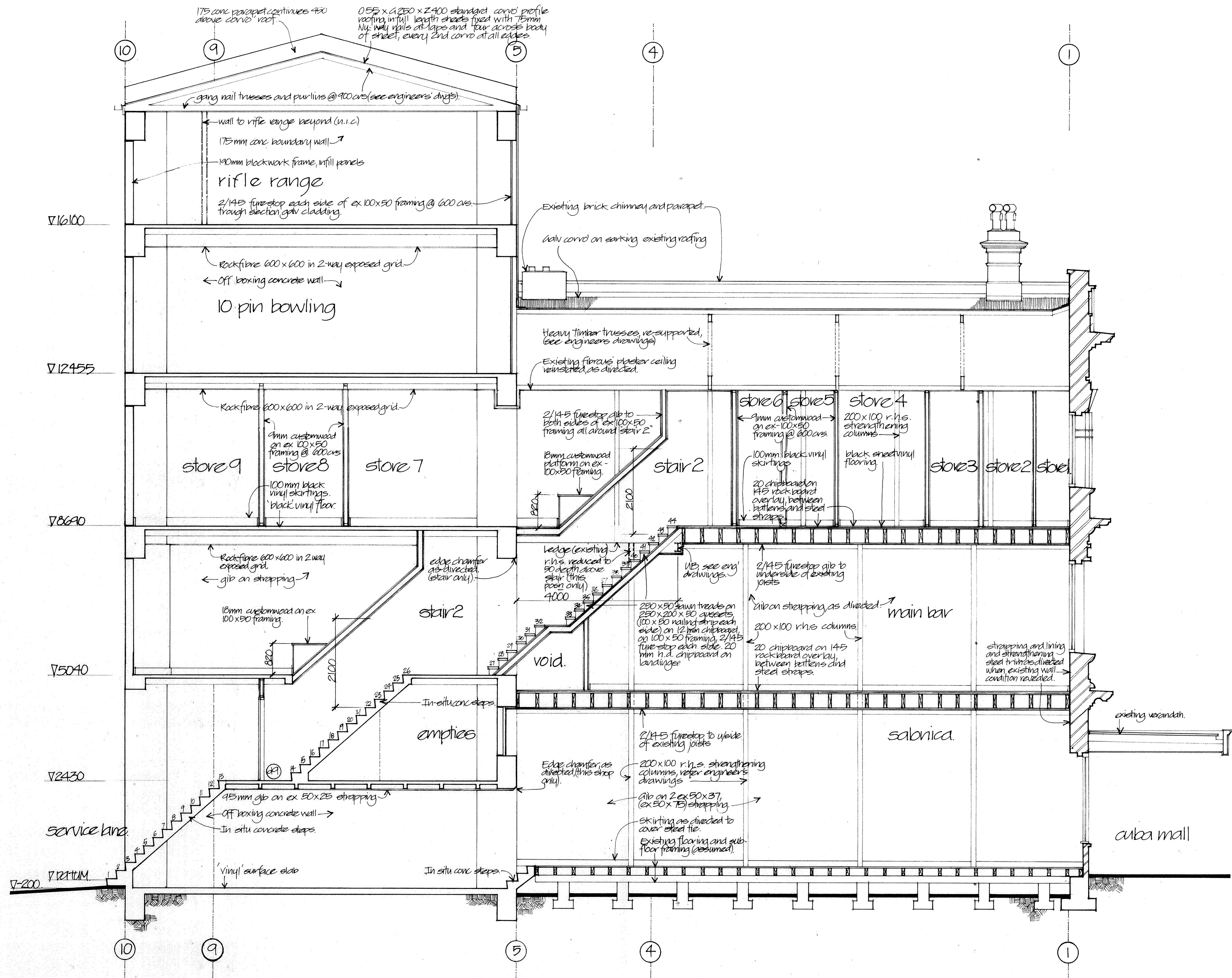
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fourth floor
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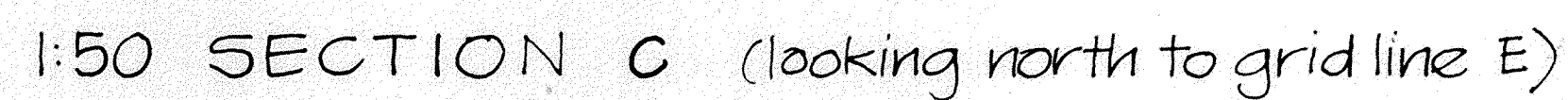
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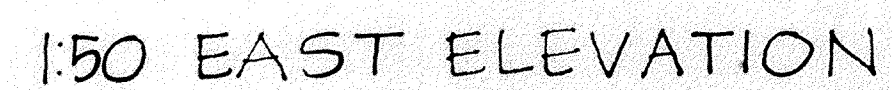


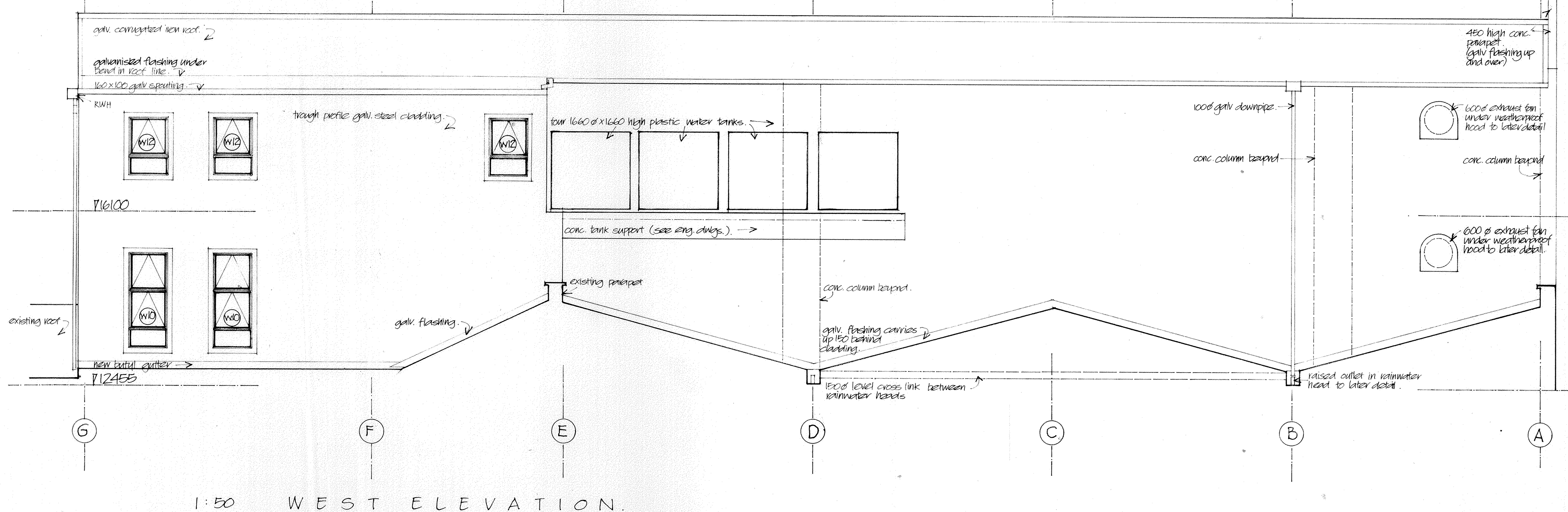
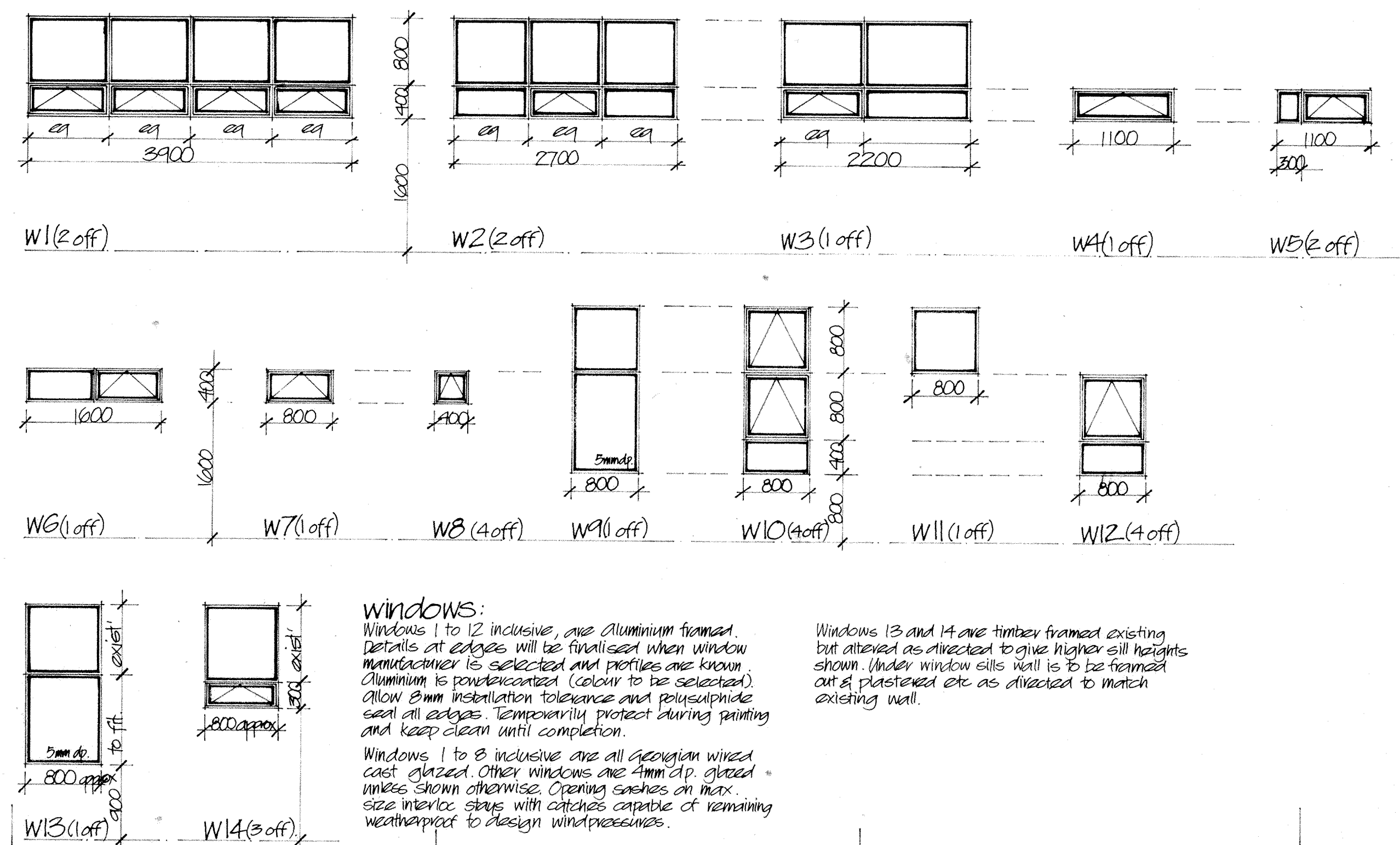
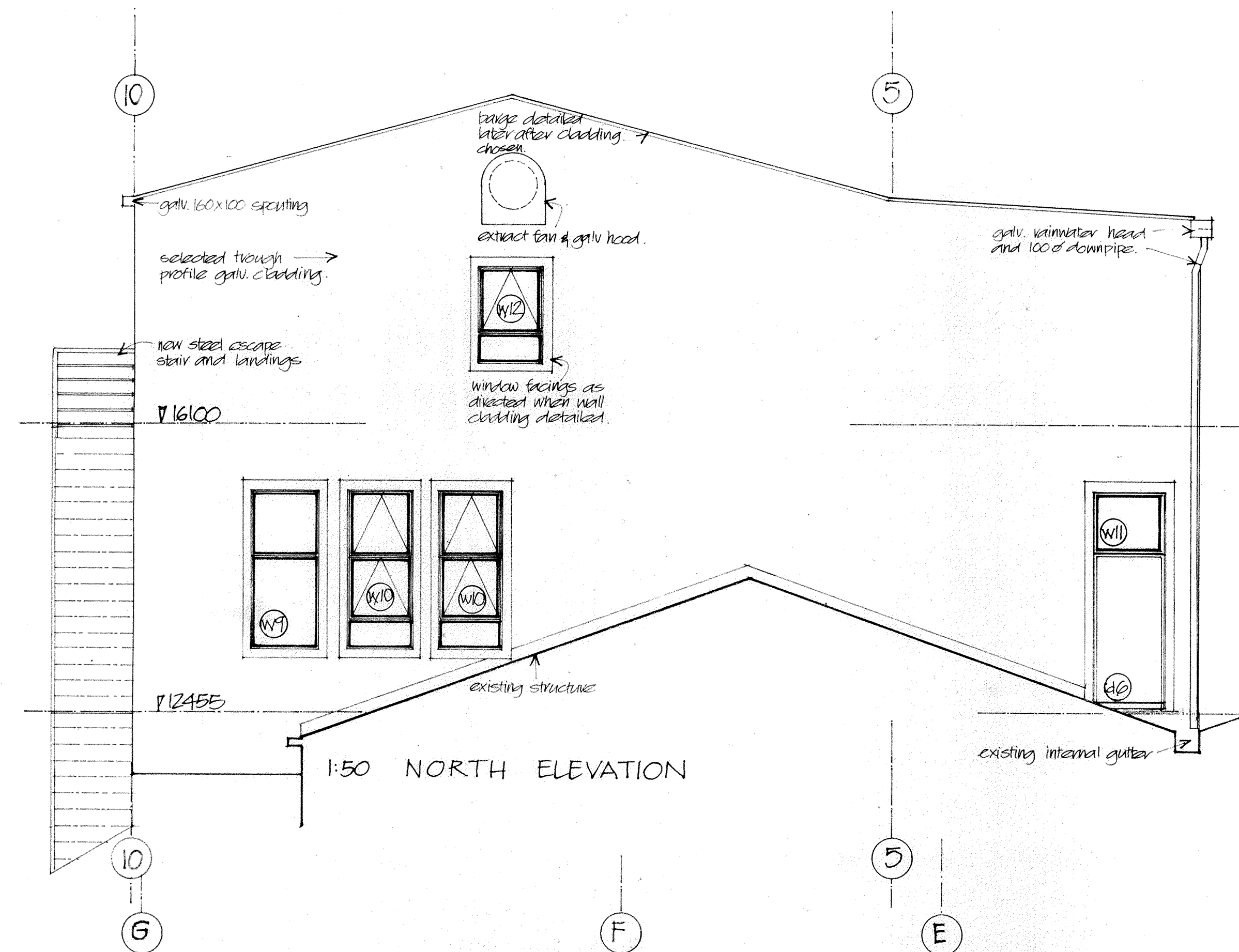
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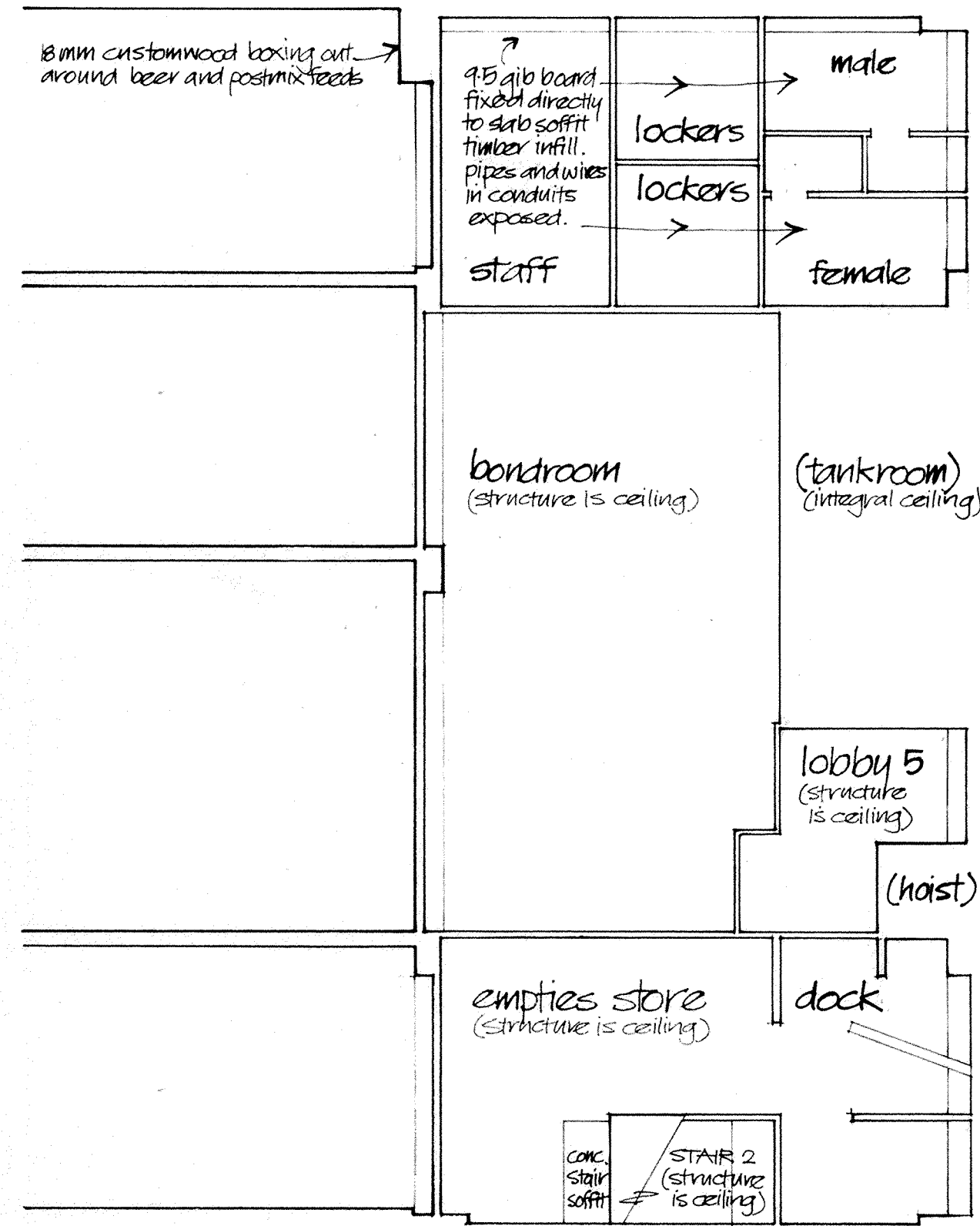
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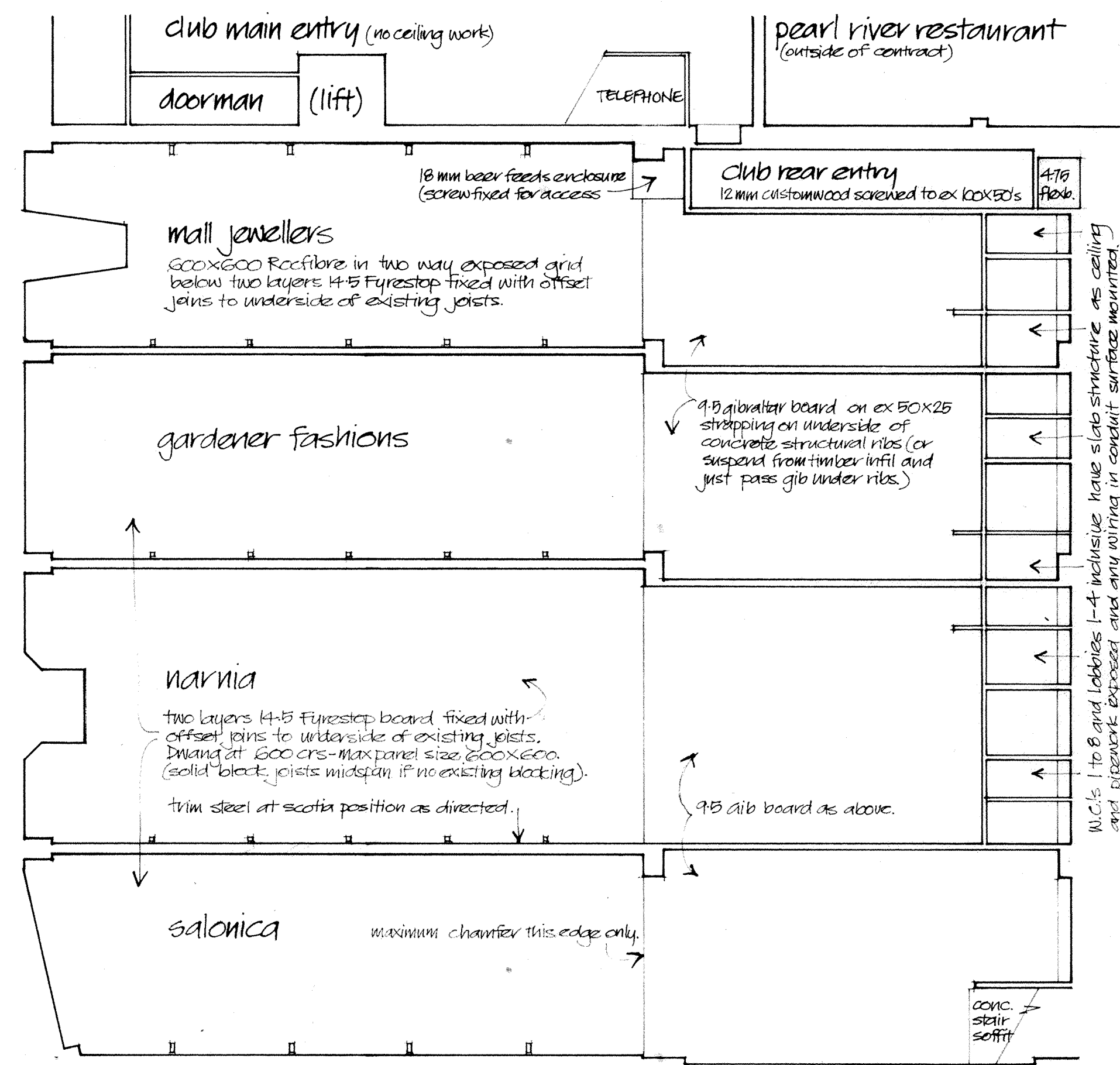
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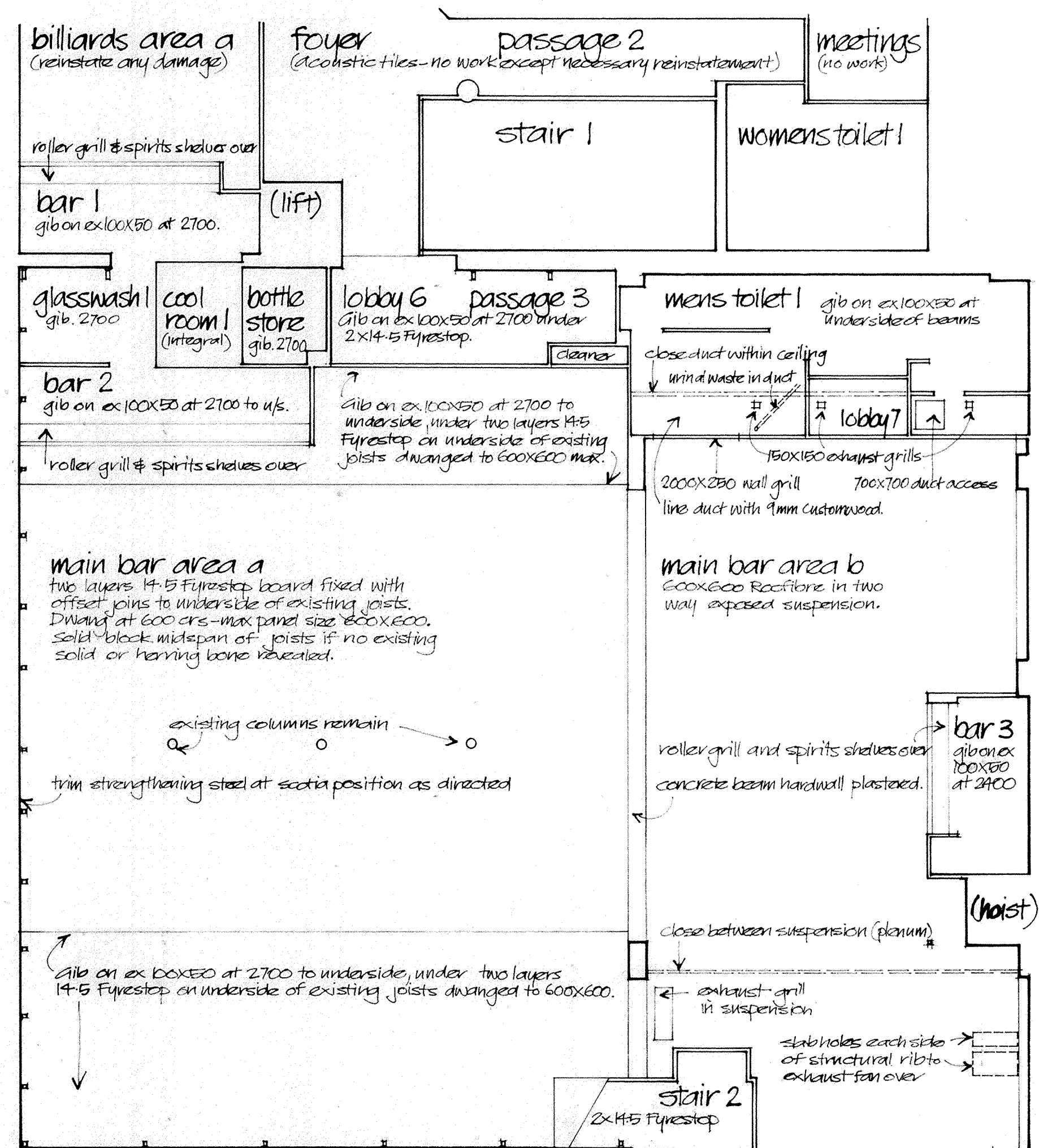
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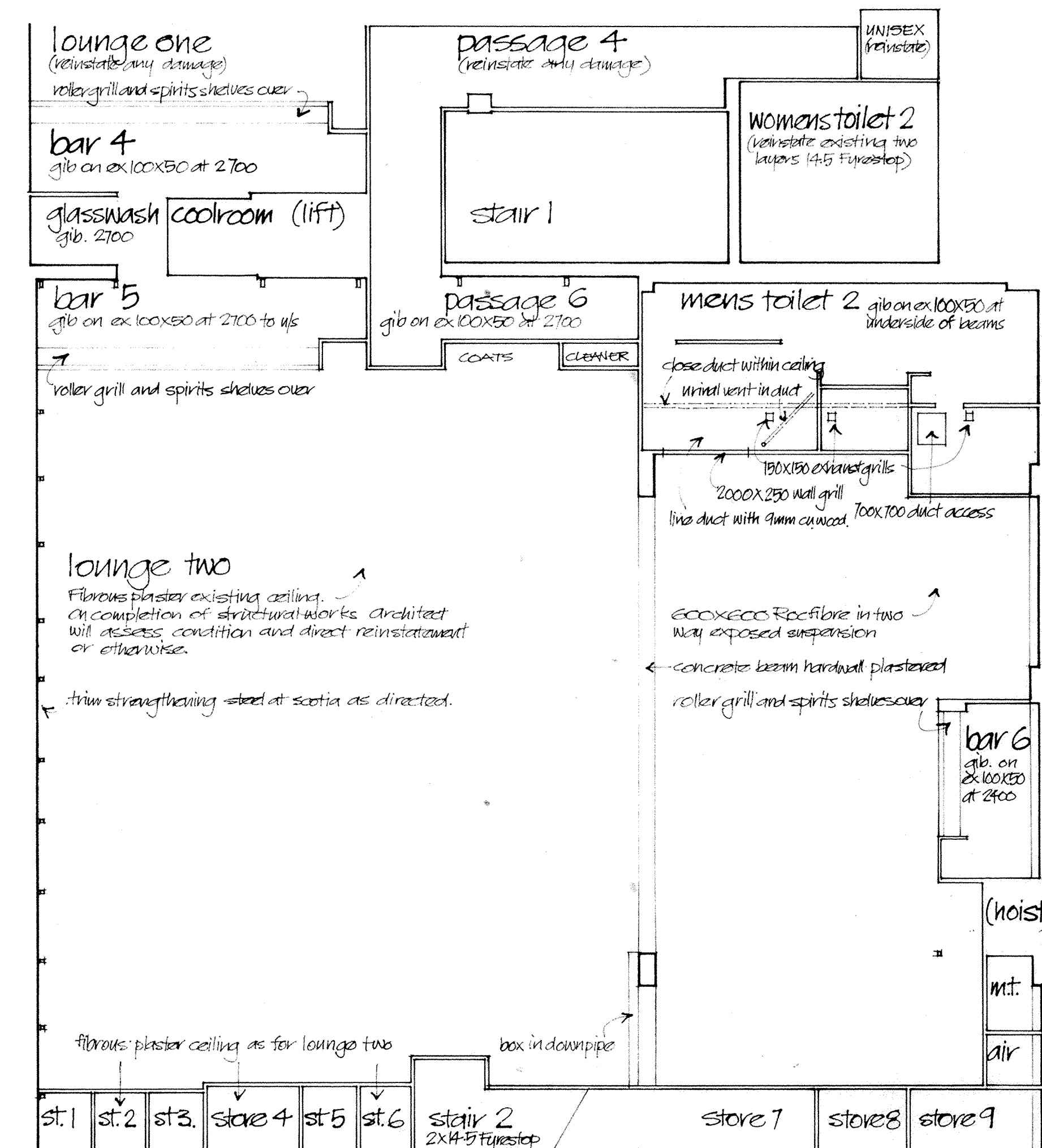
mezzanine reflected ceiling



ground floor reflected ceiling



first floor reflected ceiling



second floor reflected ceiling

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ceiling plans

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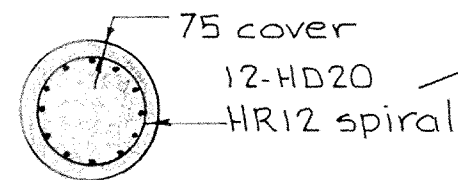
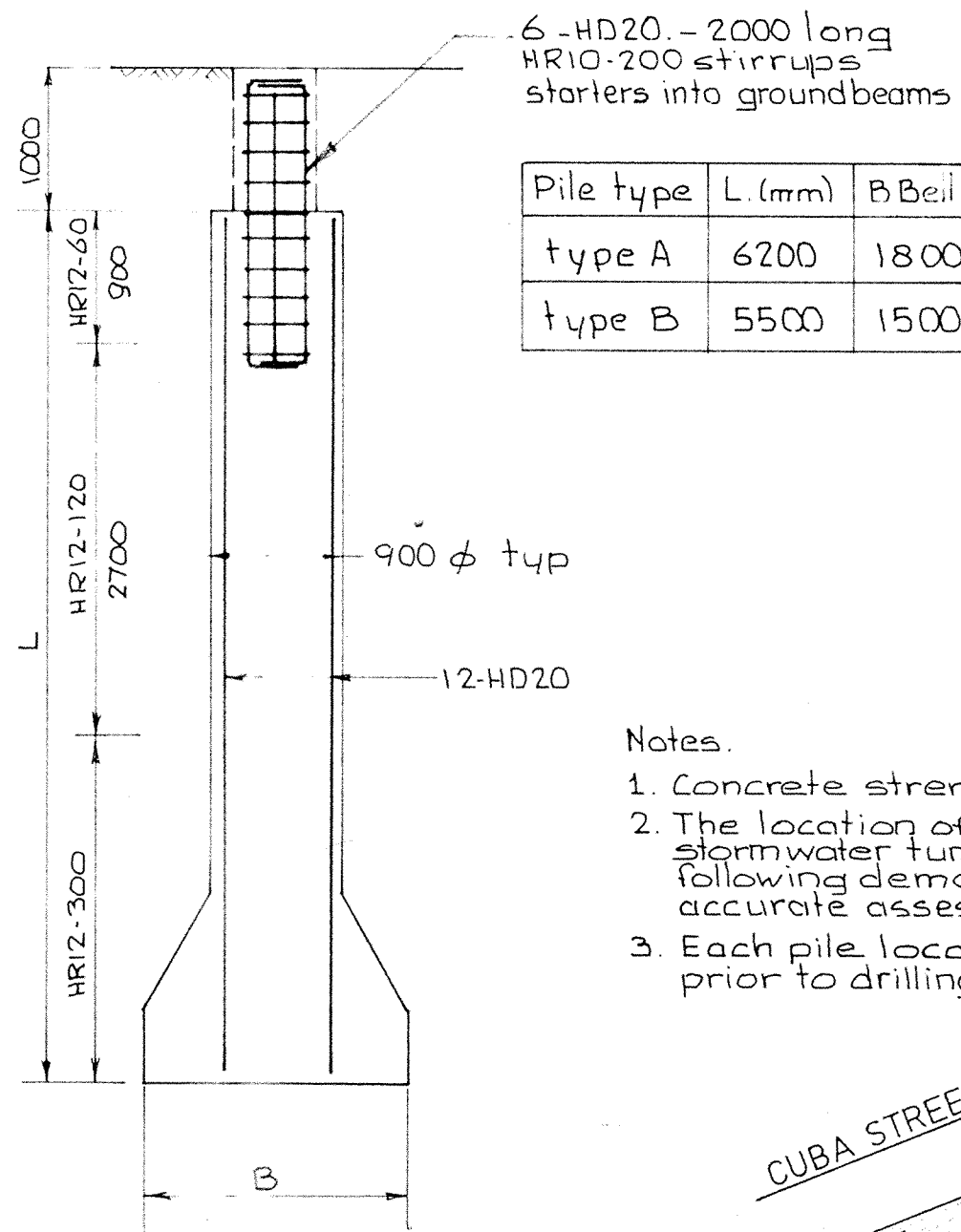
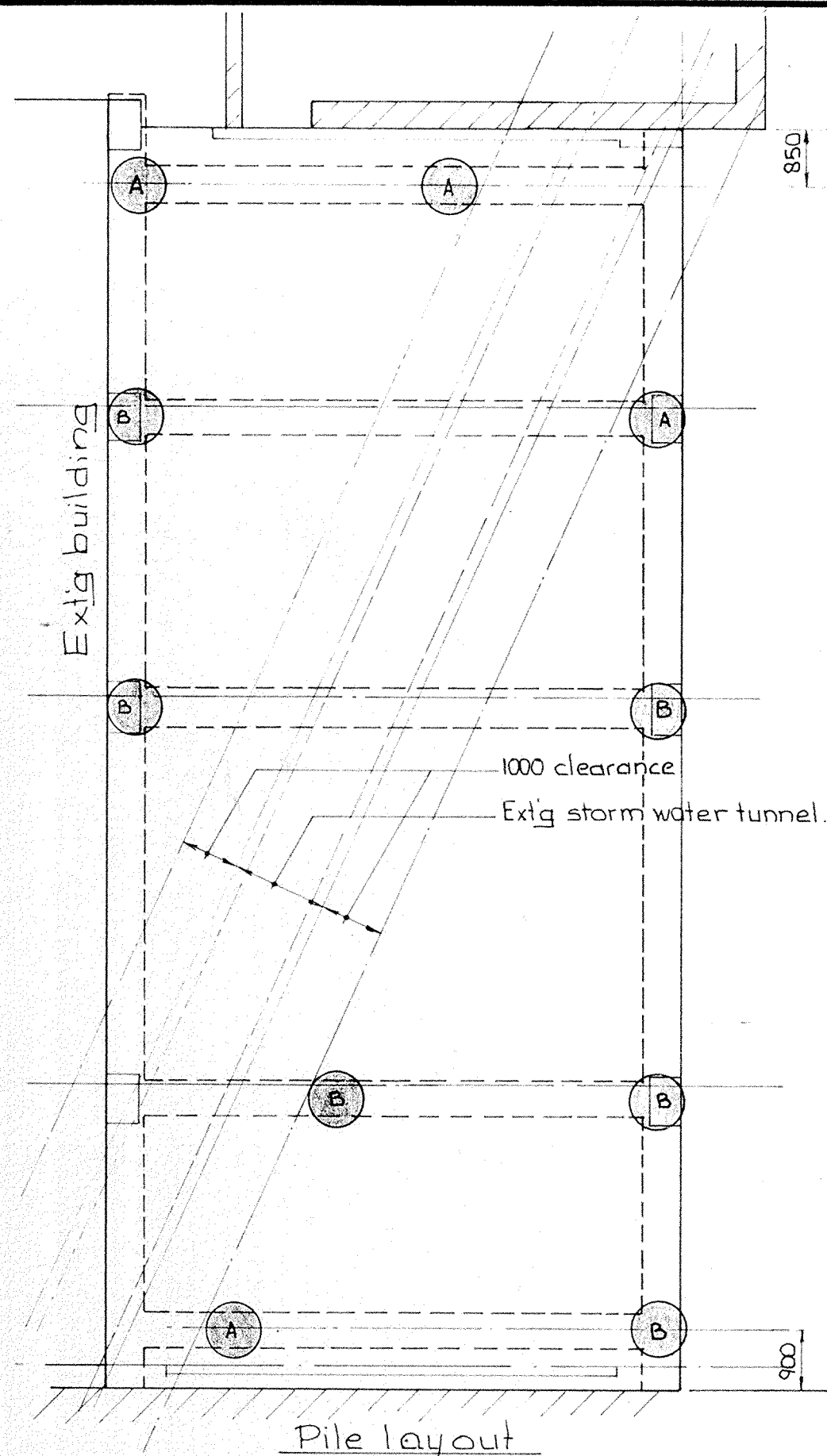
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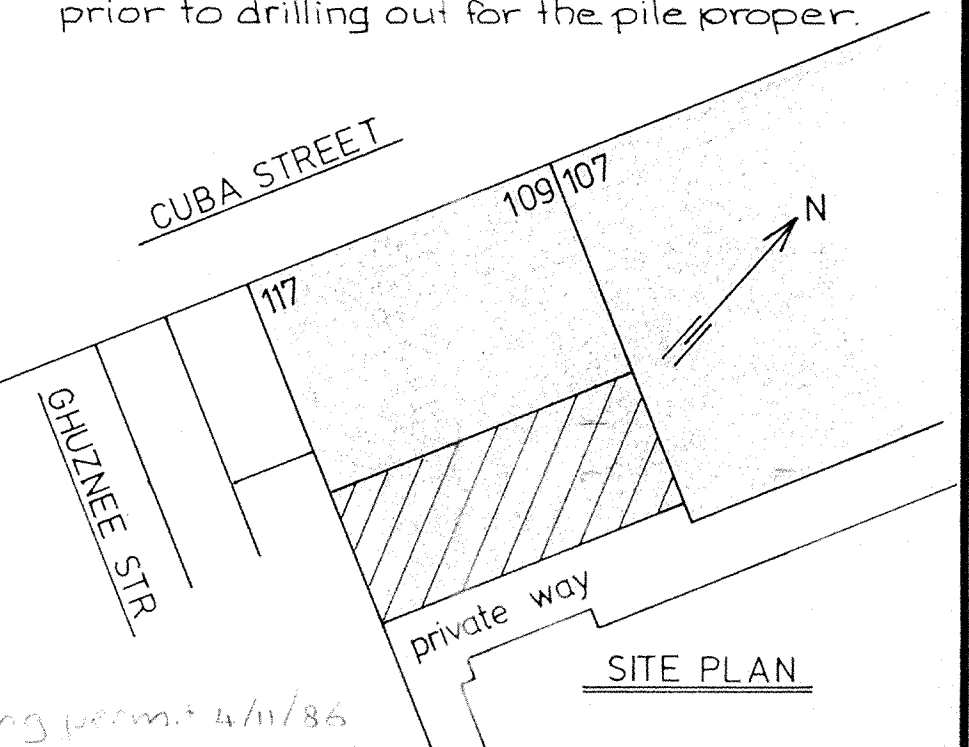
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Typ pile section
All piles 900 ϕ

Notes.

1. Concrete strength to be 25 MPa @ 28 days
2. The location of the piles adjacent to the stormwater tunnel may be adjusted following demolition and a more accurate assessment of the tunnel position.
3. Each pile location is to be proof drilled prior to drilling out for the pile proper.



CONTRACTORS MUST VERIFY ALL DIMENSIONS AT THE JOB BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED BEFORE MANUFACTURE

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Provisional piling

SCALE 1:100 1 50

DATE Oct '86

DRAWN JL

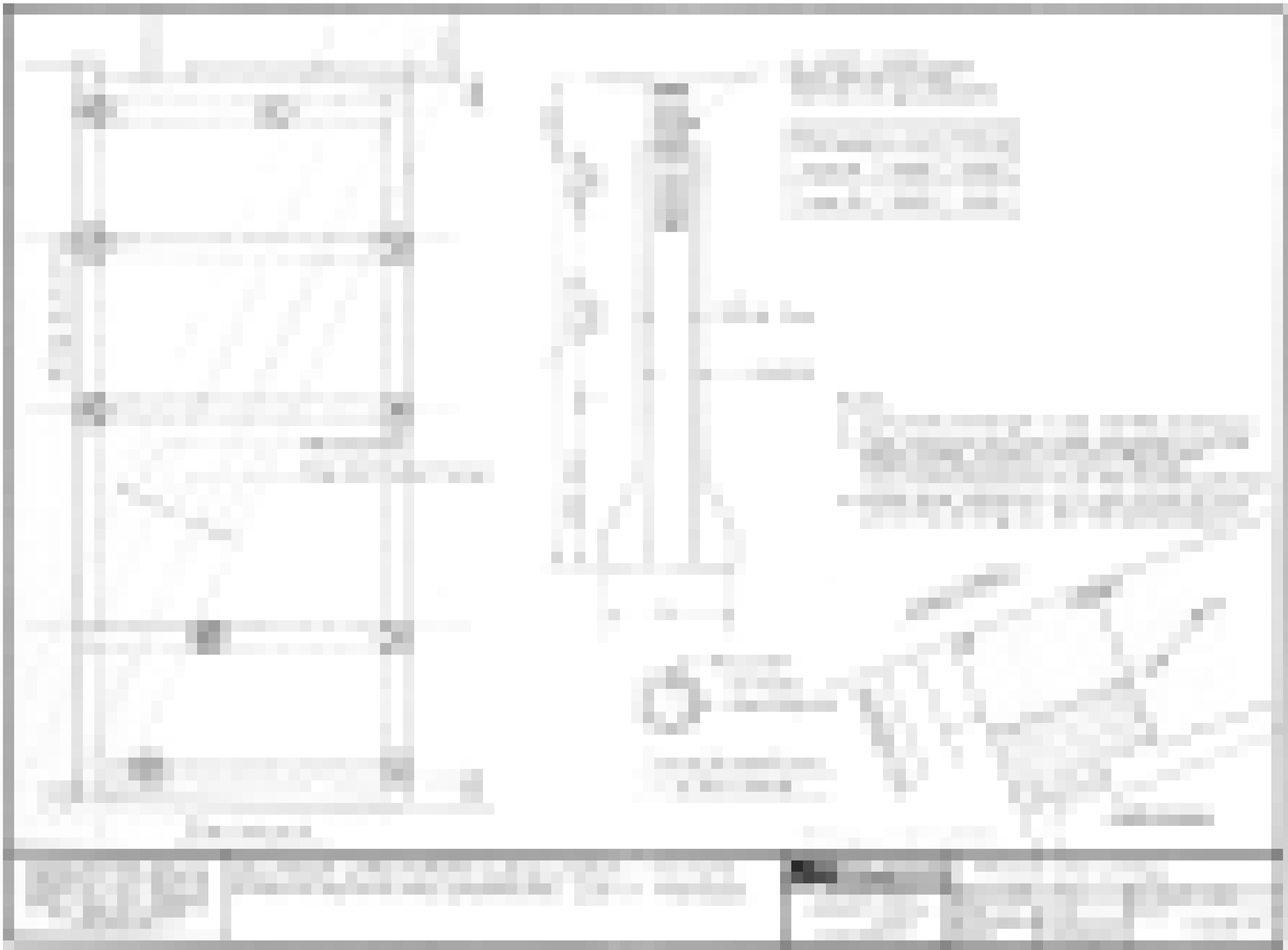
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DWG No

CHECKED

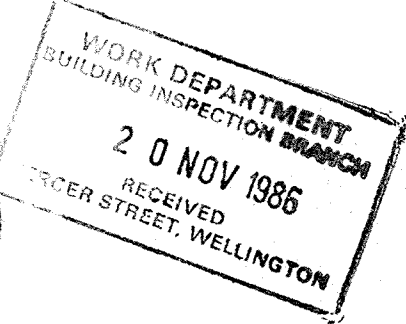
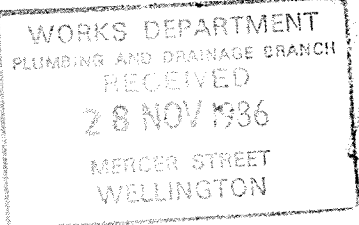
APPROVED *MLD*

1868/P1

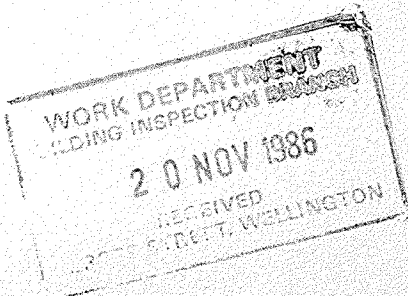


WELLINGTON WORKINGMEN'S CLUB & LITERARY INSTITUTE
STRENGTHENING & UPGRADING
STAGE 2

ENGINEERS: SMITH LEUCHARS
ARCHITECT: KEITH WILSON.



DWG N°	TITLE
1868/ST 1	STANDARD DETAILS REINFORCED CONCRETE
ST 2	STANDARD DETAILS MASONRY.
/ 1	PILE PLAN
/ 2	GROUND, MEZZANINE & FIRST FLOOR PLANS
/ 3	SECOND & THIRD FLOOR PLANS
/ 4	FOURTH & ROOF LEVEL PLANS
/ 5	WALL ELEVATION ON GRID E
/ 6	WALL ELEVATION ON GRIDS B,C & D BELOW 1 ST FLOOR.
/ 7	WALL ELEVATION ON GRID A
/ 8	" " " " 1
/ 9	" " " " 5
/ 10	" " " " 10
/ 11	SECTION ON GRIDS B & D
/ 12	CONCRETE STAIR ON GRID A
/ 13	TYPICAL STEEL CONSTRUCTION. SHEET 1
/ 14	" " " " 2



1. The first part of the document discusses the importance of maintaining accurate records of all transactions.

2. The second part of the document discusses the importance of maintaining accurate records of all transactions.

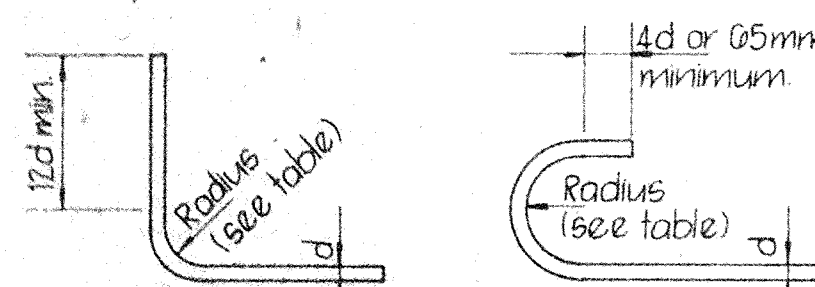
Transaction Details	
Date	1/1/2020
Description	Initial deposit
Amount	1000.00
Balance	1000.00
Transaction Details	
Date	1/15/2020
Description	Withdrawal
Amount	500.00
Balance	500.00
Transaction Details	
Date	2/1/2020
Description	Deposit
Amount	250.00
Balance	750.00
Transaction Details	
Date	2/15/2020
Description	Withdrawal
Amount	100.00
Balance	650.00
Transaction Details	
Date	3/1/2020
Description	Deposit
Amount	150.00
Balance	800.00
Transaction Details	
Date	3/15/2020
Description	Withdrawal
Amount	75.00
Balance	725.00

BENDS AND ANCHORAGE

BAR SIZE	D BARS	HD BARS	BEAM AND COLUMN TIES (PLAIN ROUND)
D10, D12, D16	2½ d	4d	Equal to radius of enclosed bar but not less than d except that for ties larger than 20mm dia the minimum radius shall be 2d.
D20, D24	3d	5d	
D28, D32	4d	5d	
D40	5d		
Max for std hook	6d	6d	

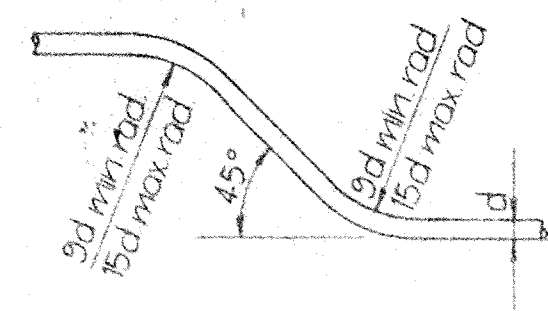
RADI OF BENDS (INSIDE FACE)

Note: d = Diameter of bar being bent.



90 Bend (equiv. std. hook) Standard Hook

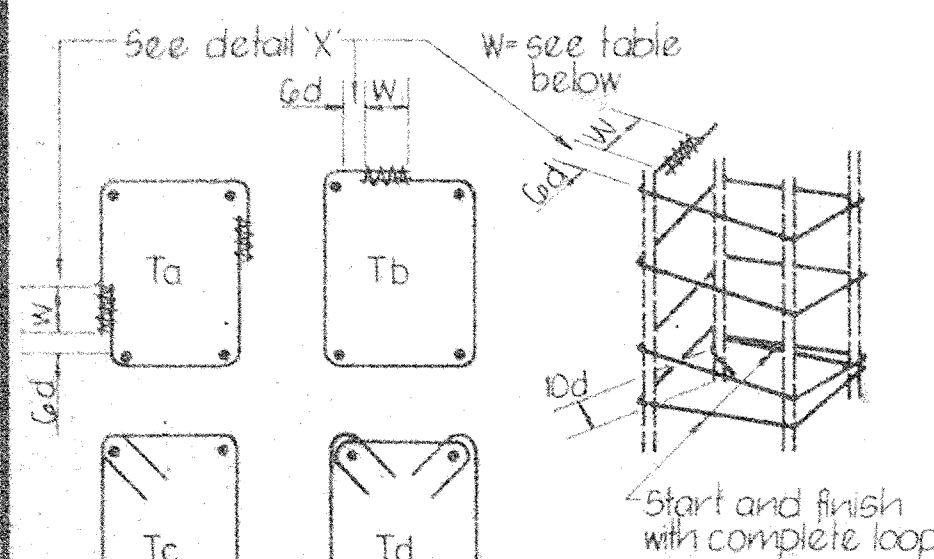
STANDARD END ANCHORAGE



45° CRANK

TIES FOR BEAMS AND COLUMNS

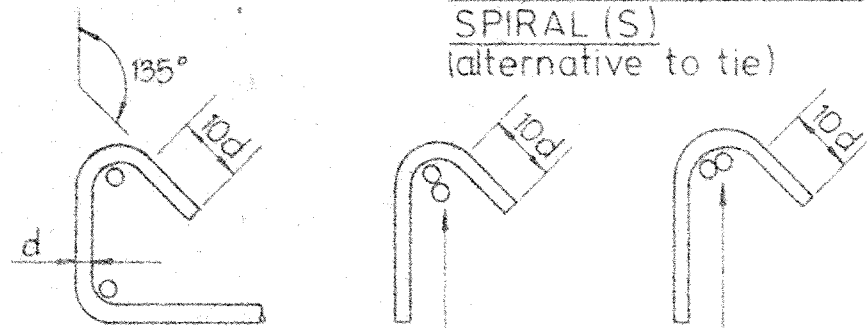
Note: 1. First beam tie positioned flush with column face.
2. All ties to be plain round bars.
3. All non welded beam ties to close in top of beams, unless shown otherwise on the drawing.



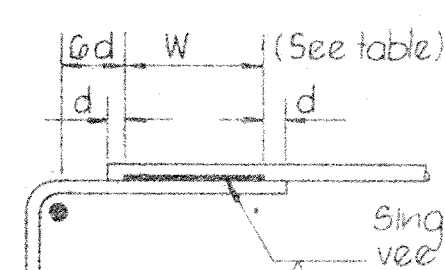
Beams only

TIES (T)

Alternative Spiral Joint (S) (alternative to tie)



TIE ANCHORAGE



DETAIL 'X'

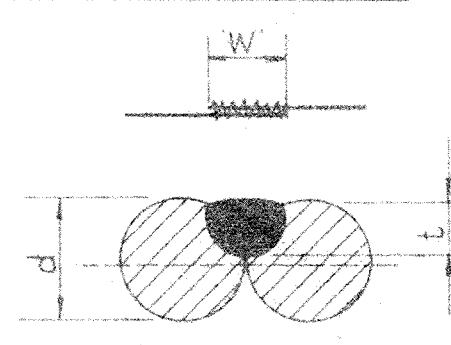
SINGLE FLARE VEE GROOVE WELD

(for grade 275 steel only)

d	w min	t min
10	50	5
12	75	6
16	105	6.5
20	130	7.5

WELD SIZE (mm)

WELD DETAIL



Note: Alternatively Butt Weld

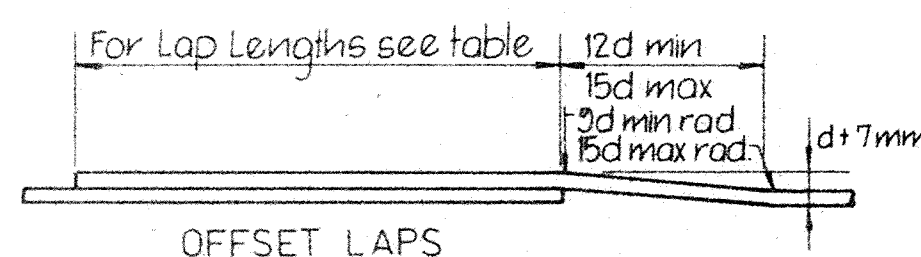
LAP LENGTHS

275 GRADE STEEL

BAR SIZE	Anchorage	MINIMUM LAP LENGTHS CONCRETE 25 MPa to 30 MPa		
		BEAMS TOP STEEL	STANDARD	COLUMNS & WALLS
10	300	300	300	300
12	300	370	300	340
16	300	480	340	450
20	330	610	430	570
24	480	890	630	820
28	650	1190	850	1110
32	840	1540	1100	1430
40	1320	2410	1720	2250

380 GRADE STEEL

BAR SIZE	300	410	300	380
10	300	410	300	380
12	300	510	360	460
16	360	660	470	620
20	460	840	600	790
24	660	1210	860	1130
28	890	1630	1160	1520
32	1170	2150	1530	1990



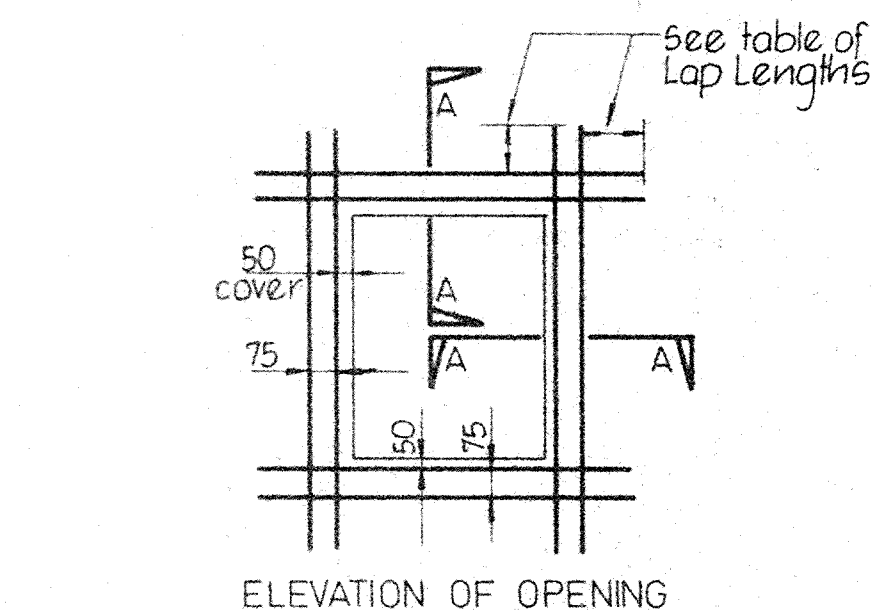
OFFSET LAPS

MINIMUM REINFORCEMENT FOR WALLS 200mm THICK OR LESS

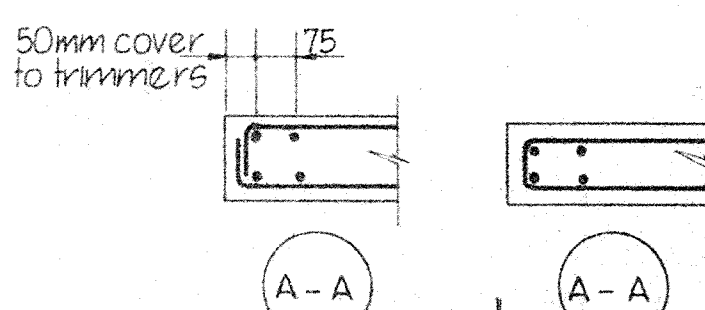
(ALL DIMENSIONS IN MM)

WALL THICKNESS	TRIMMING BARS TO OPENINGS	MIN WALL REINFORCEMENT
200	2-D12-75 E.F.	D10-300 E.F.
175	2-D10-75 C.	D12-250 C.
150	2-D10-75 C.	D12-300 C or D10-200 C.
100-125	2-D12-75 C.	D10-225 C.

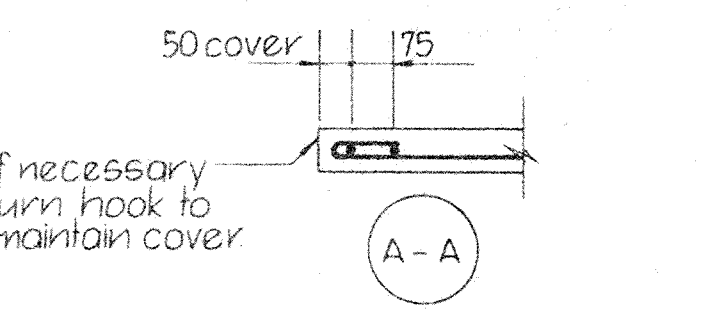
No trimmer bars at sides of openings 300mm or less in length.



ELEVATION OF OPENING

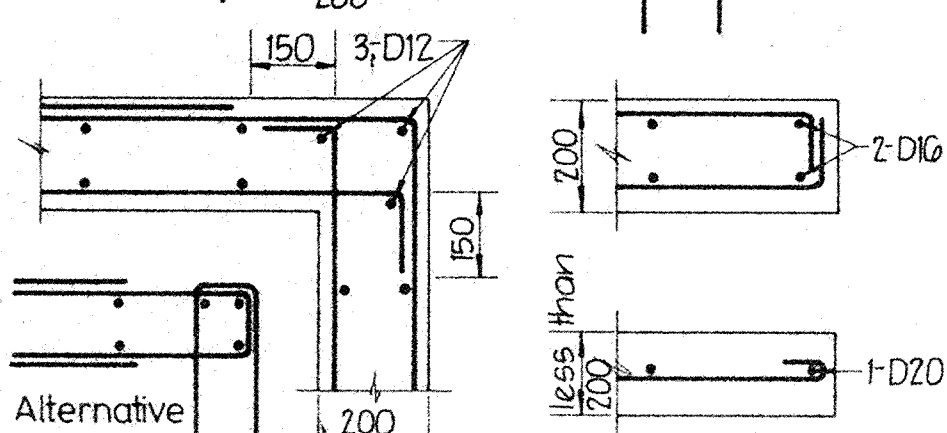
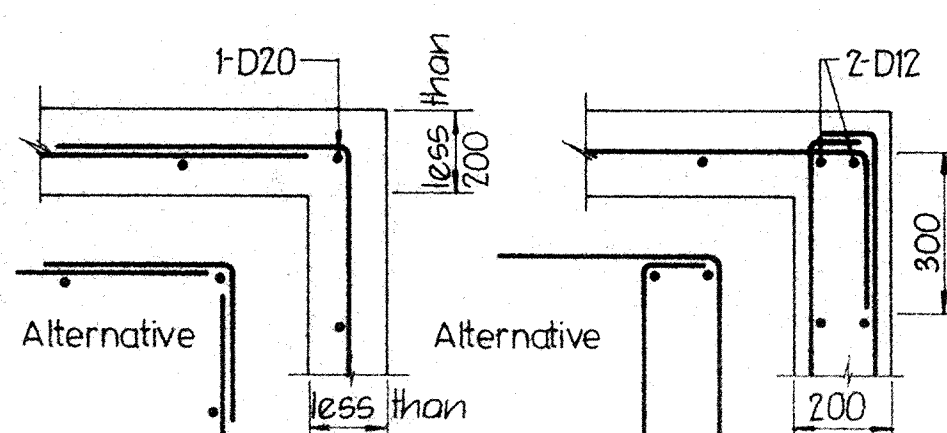
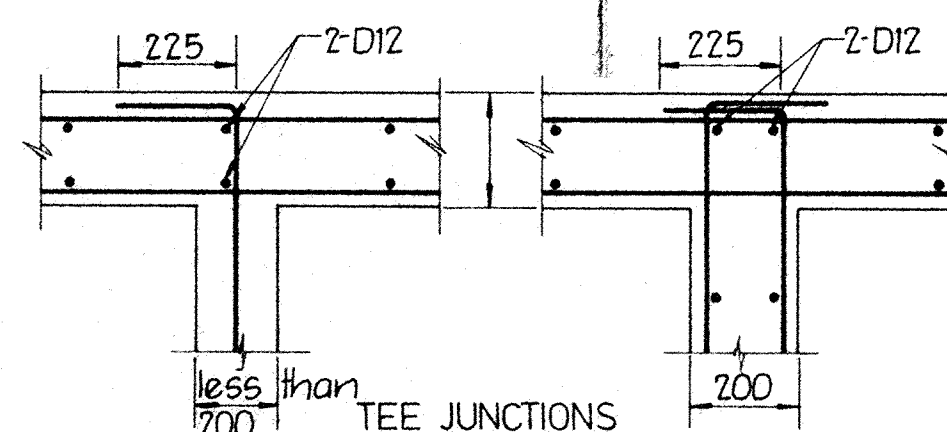
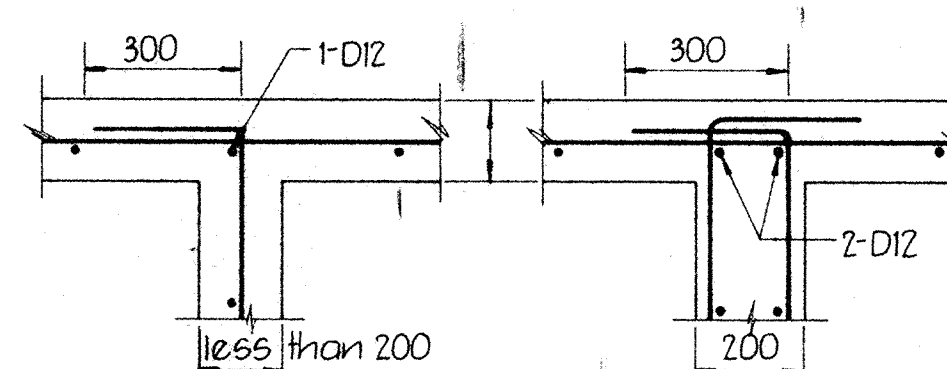


ALTERNATIVES FOR 200mm THICK WALL

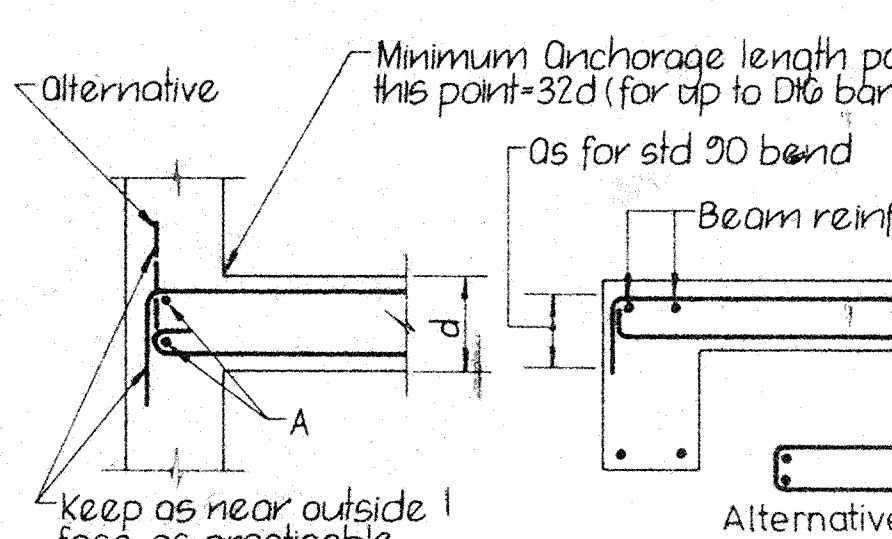
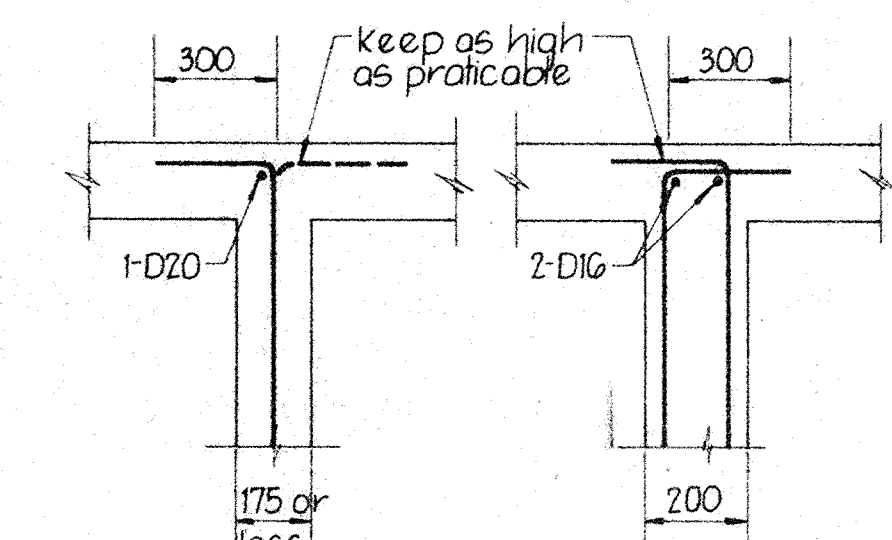


WALLS LESS THAN 200mm

JUNCTIONS & ENDINGS OF WALLS 200mm & LESS WITH MINIMUM REINFORCEMENT



SLAB JUNCTIONS WITH EDGE BEAMS & WALLS 200mm THICK OR LESS.



DEPTH OF SLAB 'd'	A
Less than 150	2-D12
150-175	2-D10

COVERS

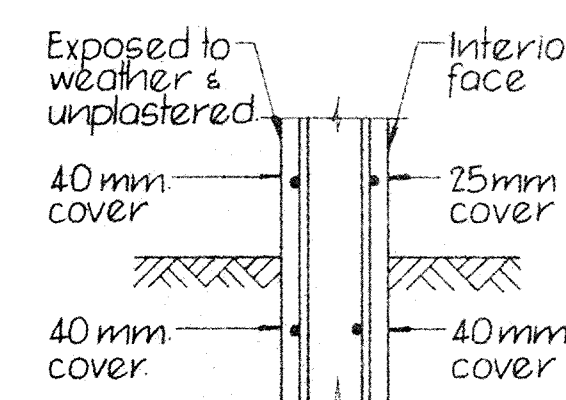
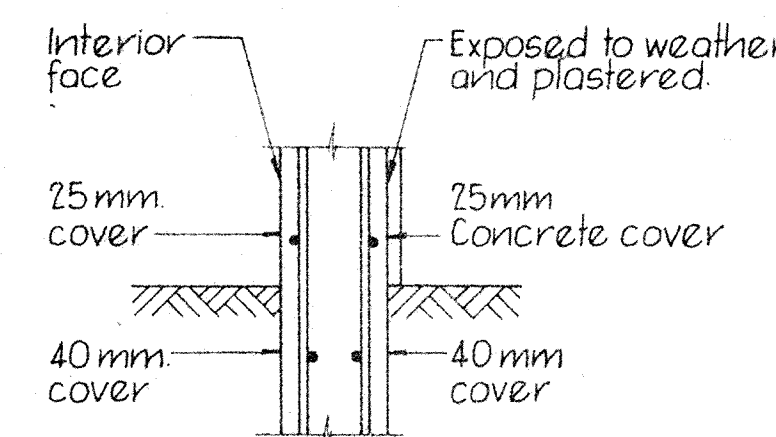
1. Fire Rating may necessitate greater cover than shown.
2. For reinforcement tolerances see specification.
3. ** Increase by 15mm where D20 bars or larger are used.

MEMBER	BELOW GROUND LEVEL	
	Cast against Ground	Against apvd skin or piling
Footings	75	50
Beam and Column (A) Principal reinf. (B) Secondary reinf. **	75	50
Slabs	50	35
Walls **	50	40

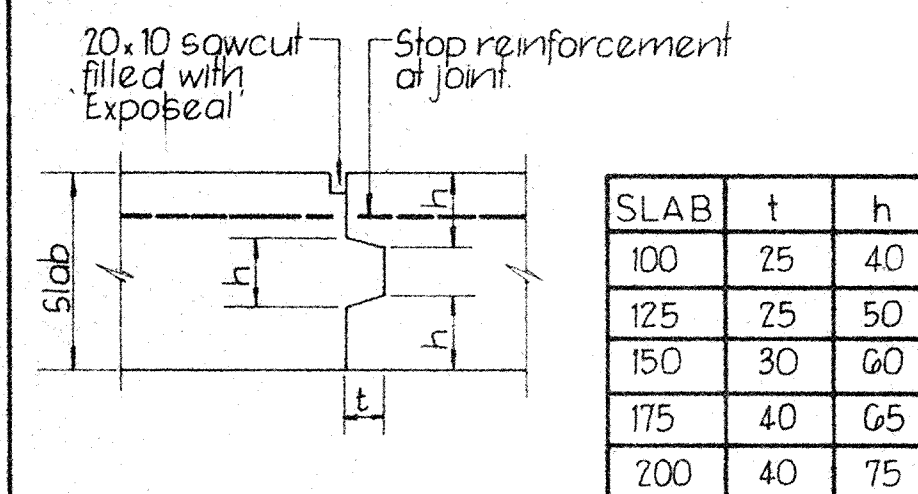
MEMBER	ABOVE GROUND LEVEL		
	Exposed to weather & unplastered	Exposed to weather & plastered	Not exposed to weather
Beam and Column (A) Principal reinf. (B) Secondary reinf. **	50	40	40
Slabs	35	20	20
Walls **	40	25	25

DOUBLE REINFORCED WALL AT GROUND LEVEL

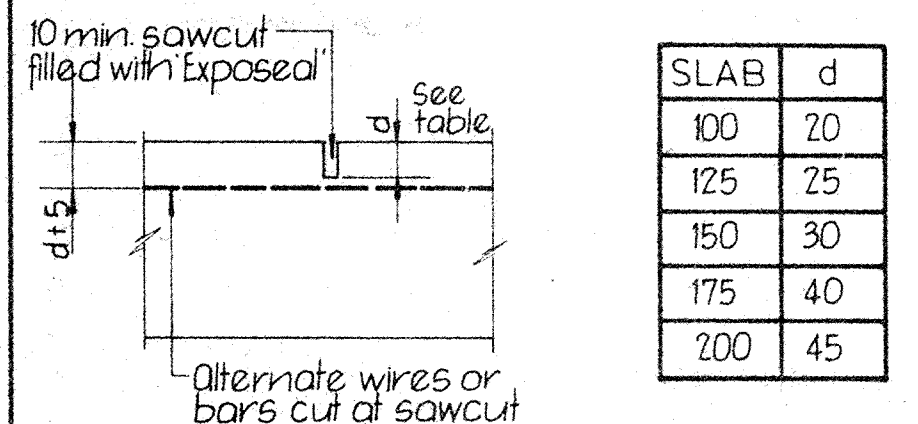
Showing re-arrangement of horizontal bars to obtain extra cover.



CONSTRUCTION JOINT (C.J.)

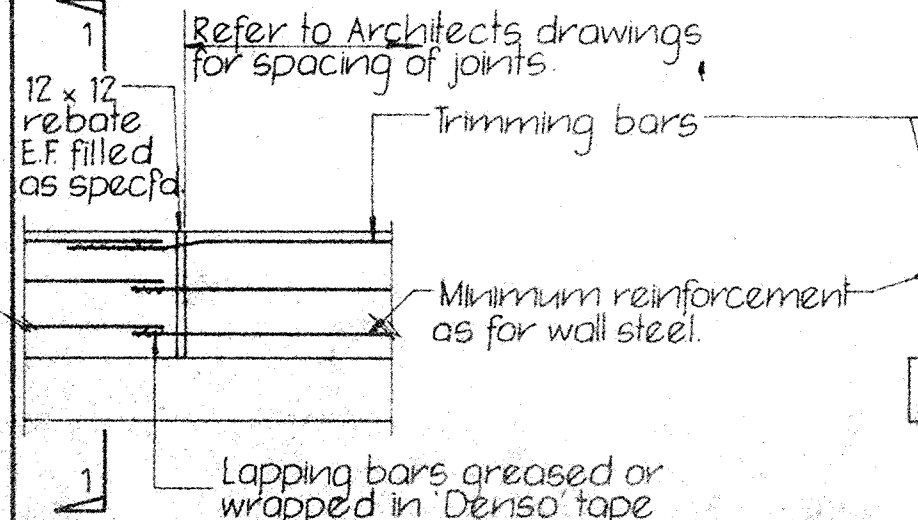


CONTRACTION JOINT (S.J.)



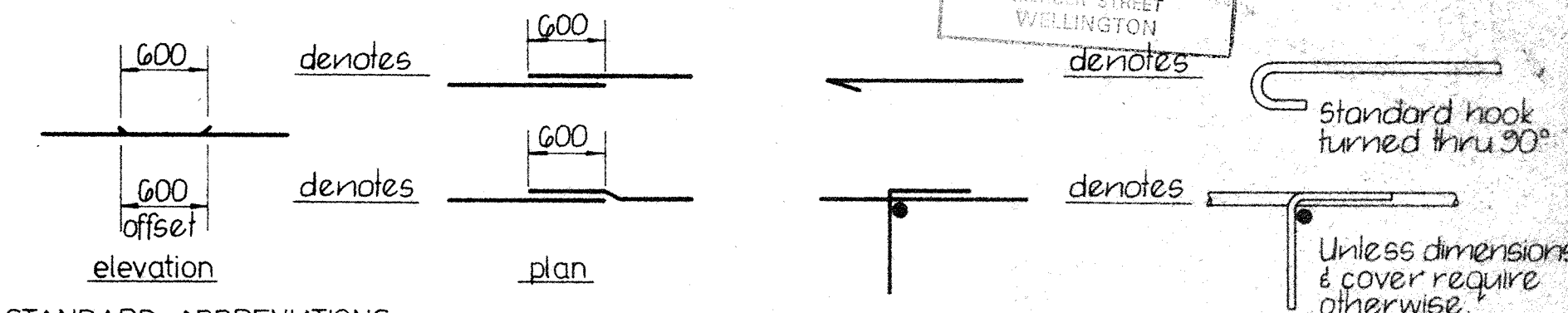
Note: Sawcutting for contraction joint to be commenced as soon as possible after concrete has hardened sufficiently to prevent ragged edges with a minimum of 24 hours and a maximum of 3 days after pouring.

PARAPET CRACK CONTROL JOINT



NOTES

1. PICTORIAL REPRESENTATION OF REINFORCING BARS ON DRAWINGS
(A) PARALLEL AND OFFSET LAPS (B) HOOKS AND BENDS



STANDARD ABBREVIATIONS

ALT Alternate EF Each Face R Plain Round bars
B Bottom EW Each Way SFL Structural Floor Level
C Central FF Far Face STA Starter
CJ Construction Joint FFL Finish Floor Level T Top
d Nominal bar dia in mm LAR Lap at Random TRM Trimmer
D Deformed bars NF Near Face VL Varying Lengths
DPC Damp Proof Course NL No Laps SJ Contraction Joint
NB All abbreviations (except 'd') should be shown in upper case printing.

REINFORCEMENT NOTATIONS

30-D12-250 denotes 30-12mm dia deformed bars at 250mm centres.
30-R12-250 denotes 30-12mm dia plain round bars at 250mm centres.
30-HD12-250 denotes 30-12mm dia high tensile grade 380 deformed bars at 250 centres.

CONCRETE MIX NOTATIONS

20mm C30 denotes 20mm Maximum aggregate size.
C Insitu concrete
30 28 day compression strength MPa
12mm P35 denotes 12mm Maximum aggregate size.
P Precast concrete
35 28 day compression strength MPa

IN GROUND SUPPORTED SLABS

welded wire mesh reinforcement to be lapped as shown above

SLABS ON GROUND

Shall be poured in alternate panels not exceeding 25sqm or 7m on any side with 14 days between adjacent panels. Alternatively sawcut to an approved pattern (see construction & contraction joint details on this sheet).

SLABS

Top reinforcement shall be supported by high chairs or other approved methods. Top reinforcement not to be supported on precast blocks.

MESH REINFORCEMENT

Is designated on the drawings by the pitches of wire in inches followed by respective size of wires e.g. 6x6 5" Mesh
Pitch of wire in inches = Size of Wires (S.W.G.)
N.B. Mesh Sizes are designated in imperial units because metric sizes are not available.

LAPS

Where laps are not shown on the drawings reinforcement in walls and slabs may, if approved be lapped at random in a staggered pattern, bars longer than 3m where length is critical for accurate placing should incorporate the lap.

TIMBER GROUNDS

are not to be used without approval where used they are to be at least 20mm clear of any reinforcing.

ANCHOR BOLTS

For stud wall plates etc. to be 12mm diameter minimum embedment 75mm excluding upstand if used. Shot fired fixings only to be used if approved.

DEFORMED BARS

The diameters given for deformed bars are nominal only. The actual diameter over deformations is approximately 10% greater than these.

WELDS

To be not closer than 6d to bends in reinforcing bars.

GENERAL

- Check all dimensions on site.
- Where alternatives are shown on this sheet the Contractor must obtain approval for use of one of these, and shall not change from this without further approval.
- Current versions of standard specifications to be used.
- Where applicable this sheet to be read in conjunction with:
Reinforced masonry
Structural Steel and timber.
- Metric dimensioning throughout this set of drawings the following rules apply. A. On dimension lines all lengths of under one metre are given in millimetres. e.g. 420. B. On dimension lines lengths of one metre and over are 12420. Given in metres decimalised to three places.
C. On dimension lines no length symbols will be shown except 1. Where whole metres are shown. e.g. 65m.
2. Where decimals of a millimetre are shown e.g. 24.5mm.
D. Descriptions with single measurements have symbols e.g. 250mm centres. E. Descriptions with two or more measurements have no symbols e.g. 300x350 beam.
6. Structural drawings to be read in conjunction with the drawings of other specialists (e.g. Architects, Mechanical, Building Services, Electrical etc.) The Architect must be notified of any discrepancy between structural and other drawings.

NB: Unless otherwise specified or detailed on the drawings these notes & details shall apply but inclusion of this sheet in this contract set does not imply that all details occur in this contract.

Copies Issued to Date

SL SMITH LEUCHARS CONSULTANTS
CIVIL STRUCTURAL & EARTHQUAKE ENGINEERS

Telephone: 739-175, P.O. Box 10-153
Braemar, 32 The Terrace, Wellington.

JOB TITLE
WELLINGTON WORKINGMENS CLUB & LITERARY INSTITUTE STRENGTHENING AND UPGRADING CUBA ST PREMISES

DWG TITLE
STANDARD DETAIL REINFORCED CONCRETE

20 NOV 1986
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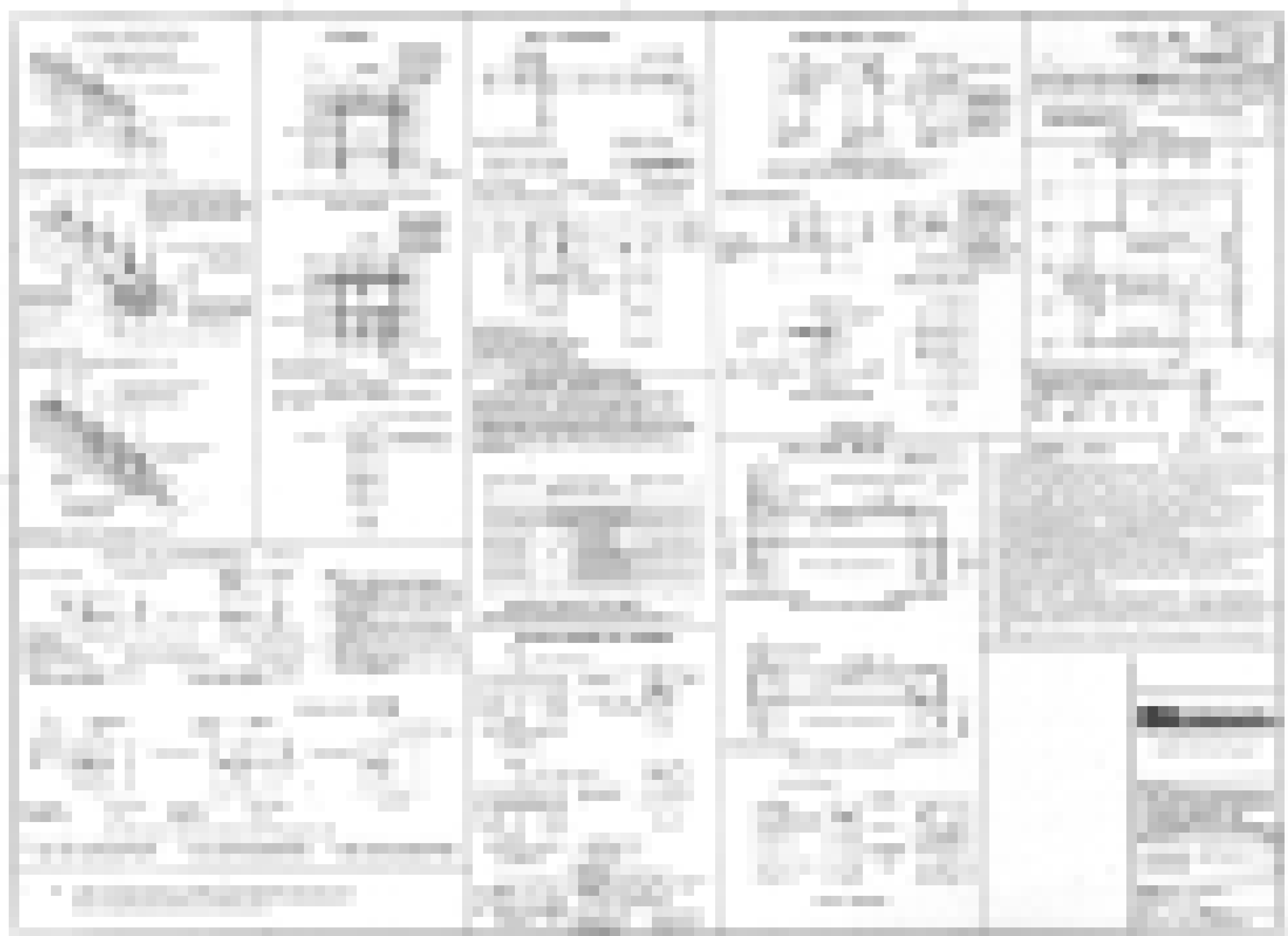
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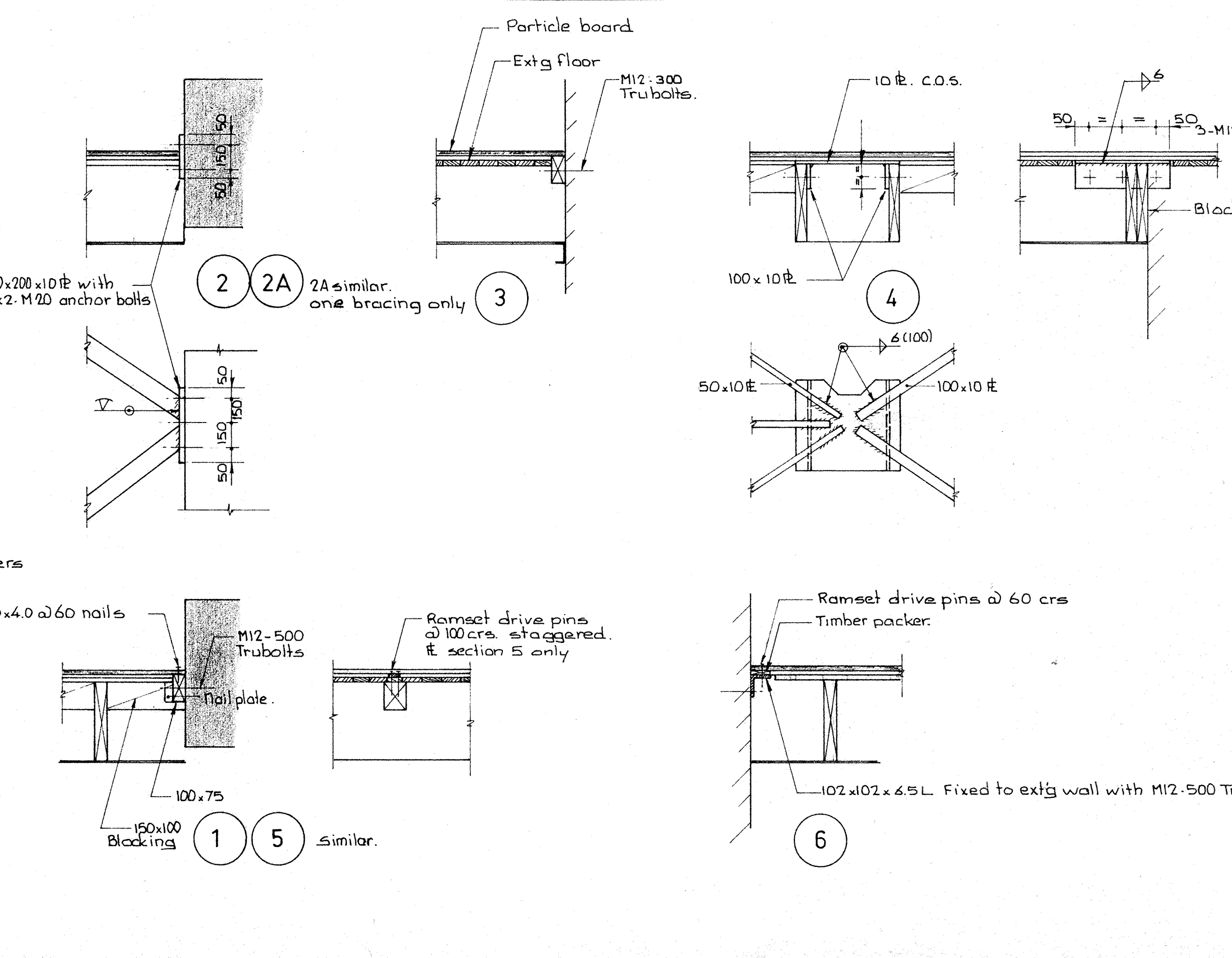
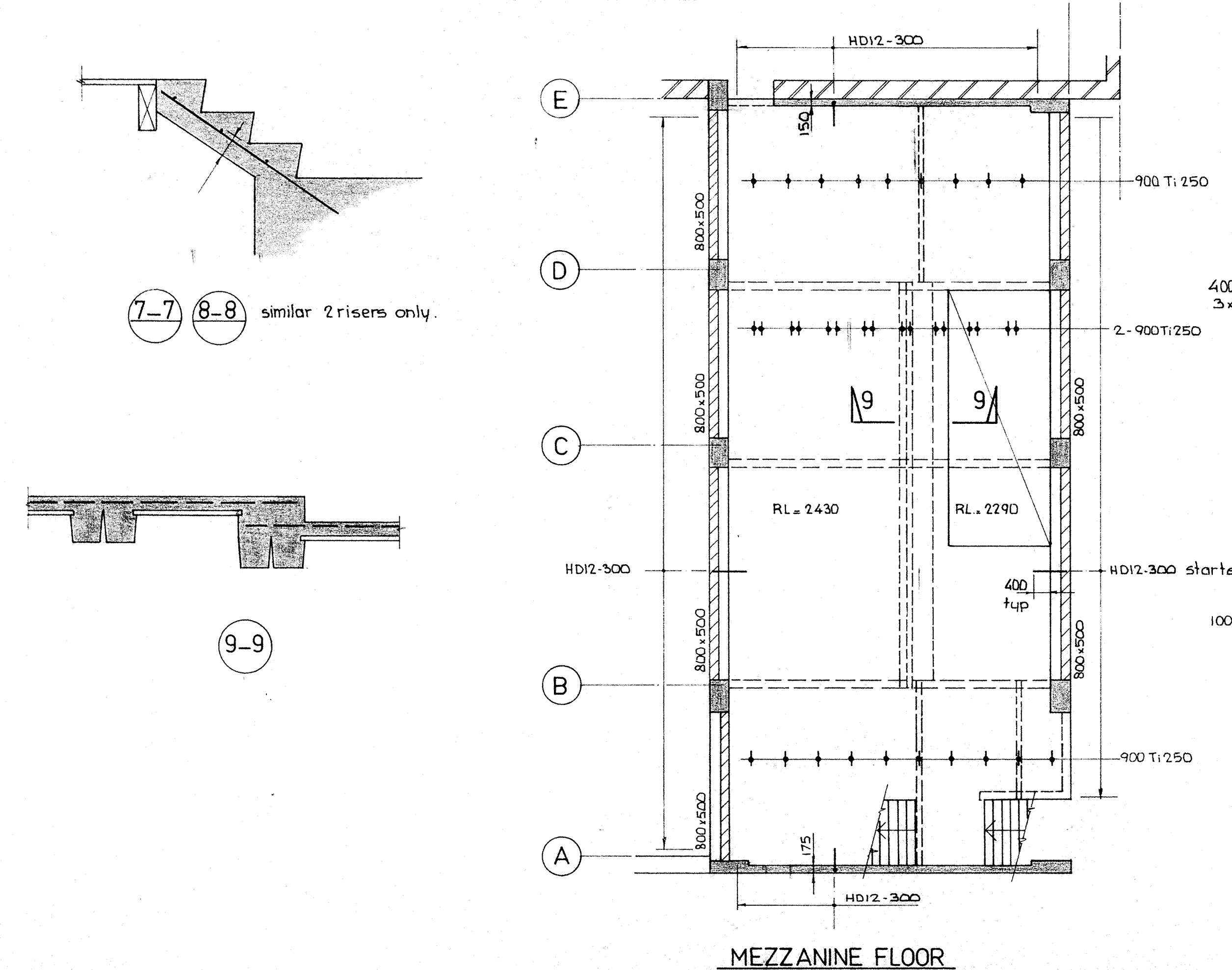
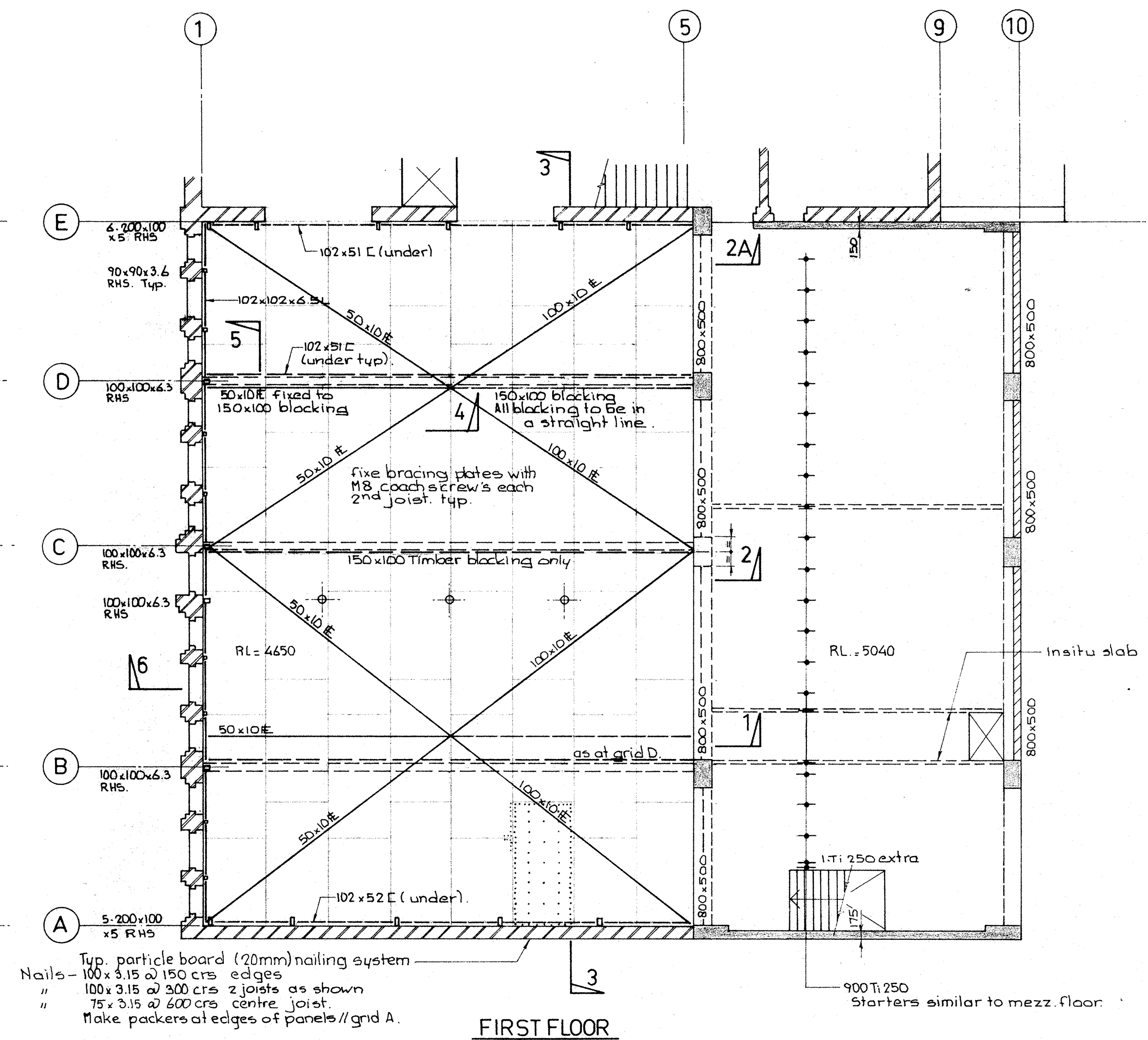
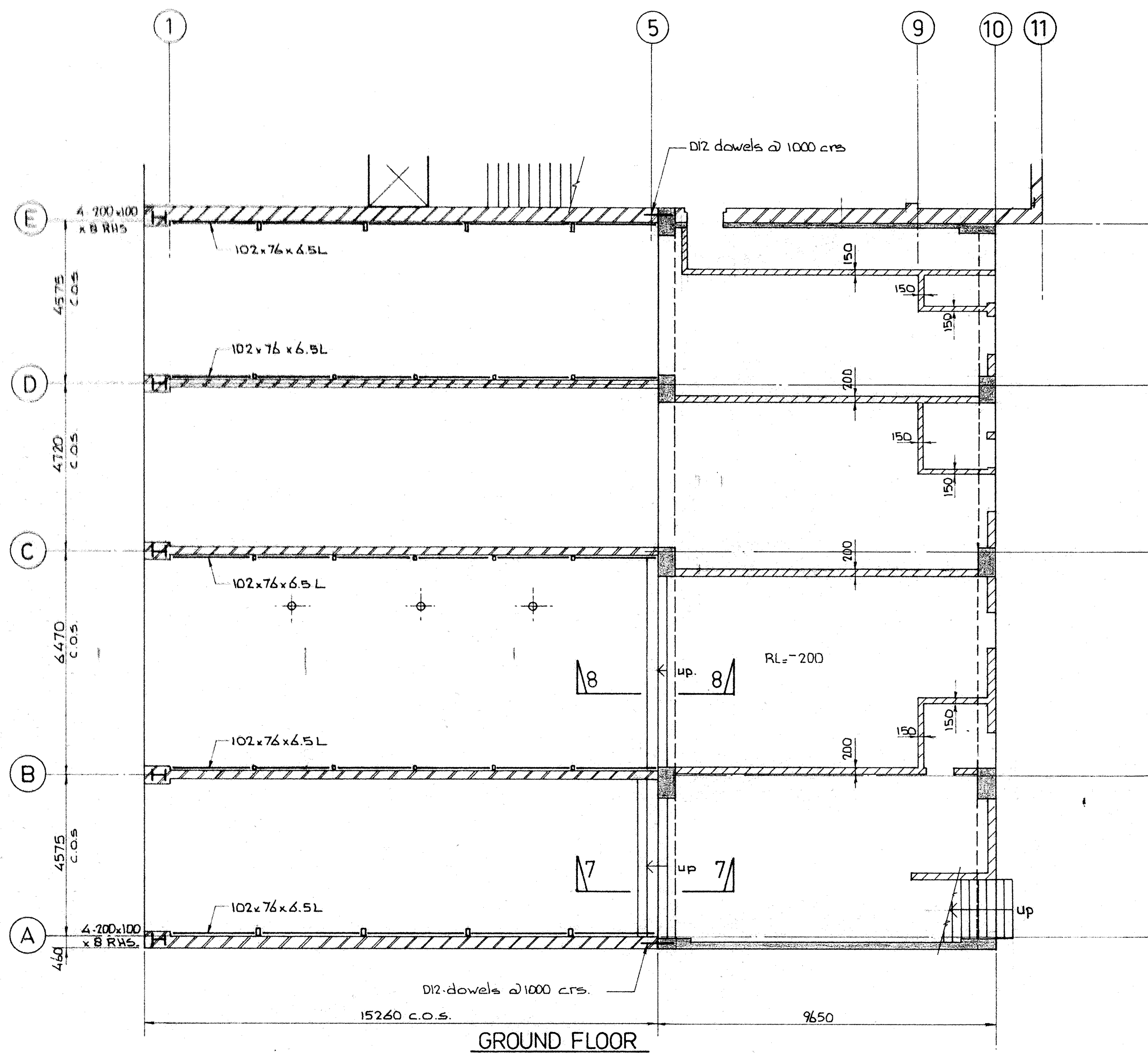
CHECKED J.M.L.

APP'D J.M.L. DWG NO

DATE Nov '86 1868/ST1

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CONTRACTORS MUST VERIFY ALL DIMENSIONS AT THE JOB BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED BEFORE MANUFACTURE.			
ISSUE	AMENDMENT	BY	DATE
1	WORKS DEPARTMENT PUMPING AND DRAINAGE BRANCH RECEIVED 28 NOV 1986 MURDER STREET WELLINGTON		

- NOTES:
- 1) Concrete strength to be 25 MPa at 28 days.
 - 2) Check all dimensions on site.
 - 3) All welds 6mm fillet welds all round unless noted otherwise.
 - 4) Welder to be in possession of an approved extinguisher at all times while site welding.

WORK DEPARTMENT
BUILDING INSPECTION BRANCH
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MURDER STREET, WELLINGTON

4	2- K460, 2- WCC	11/11/86
	Piling permit	6/11/86
COPIES	ISSUED TO	DATE

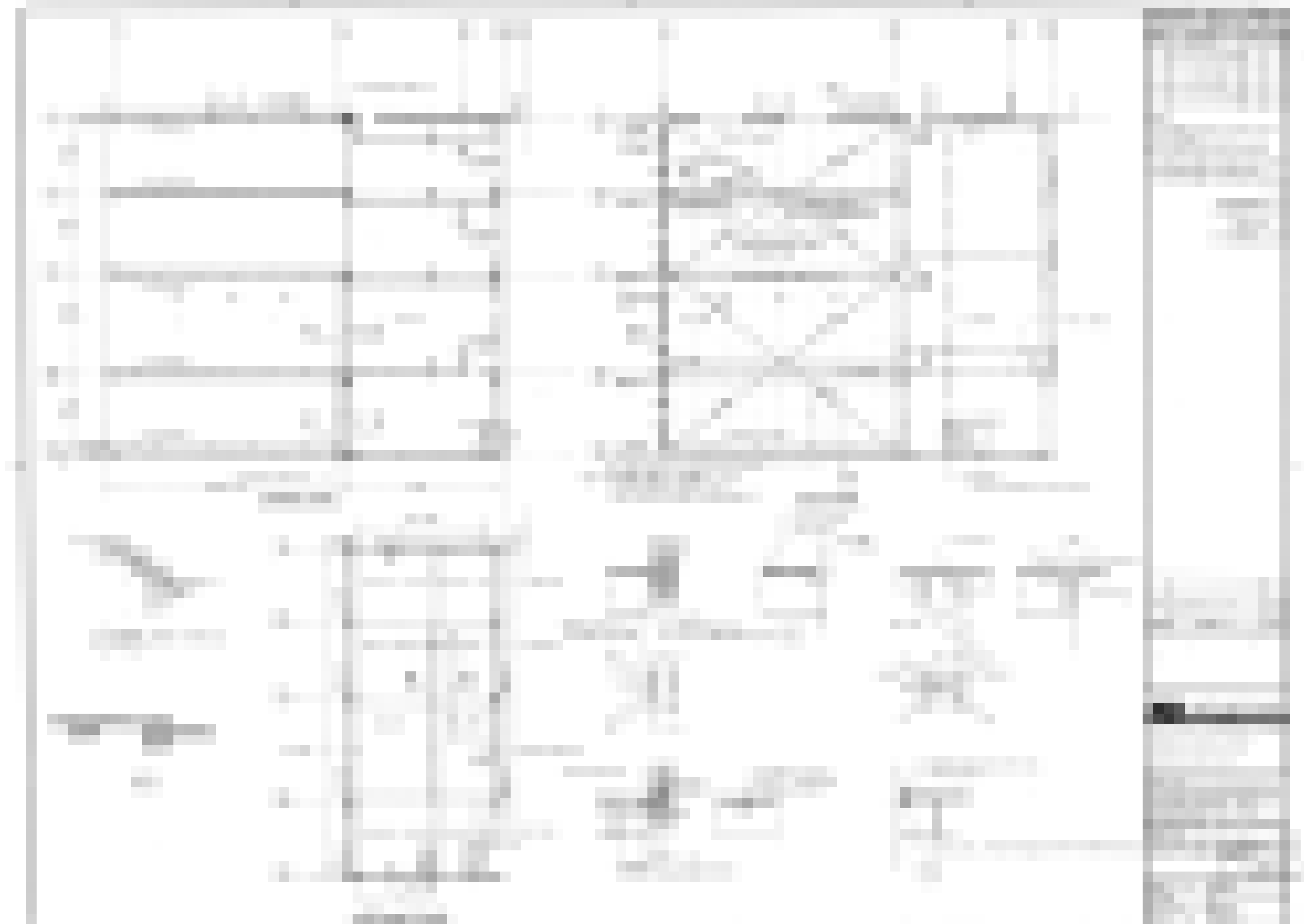
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Wellington: Ph. 857-809 P.O. Box 27349
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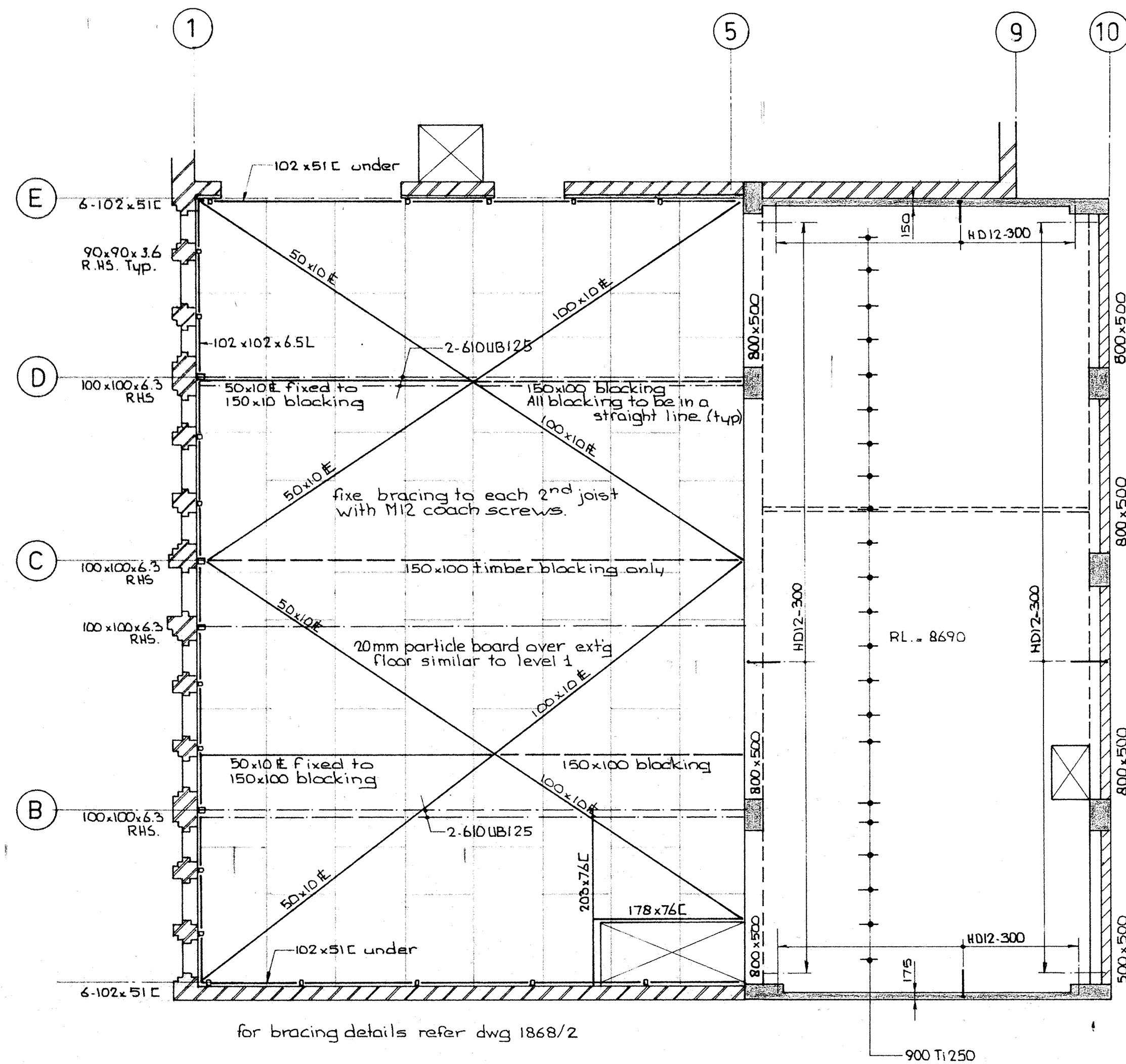
JOB TITLE
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DWG TITLE
GROUND, MEZZANINE & FIRST FLOOR PLANS

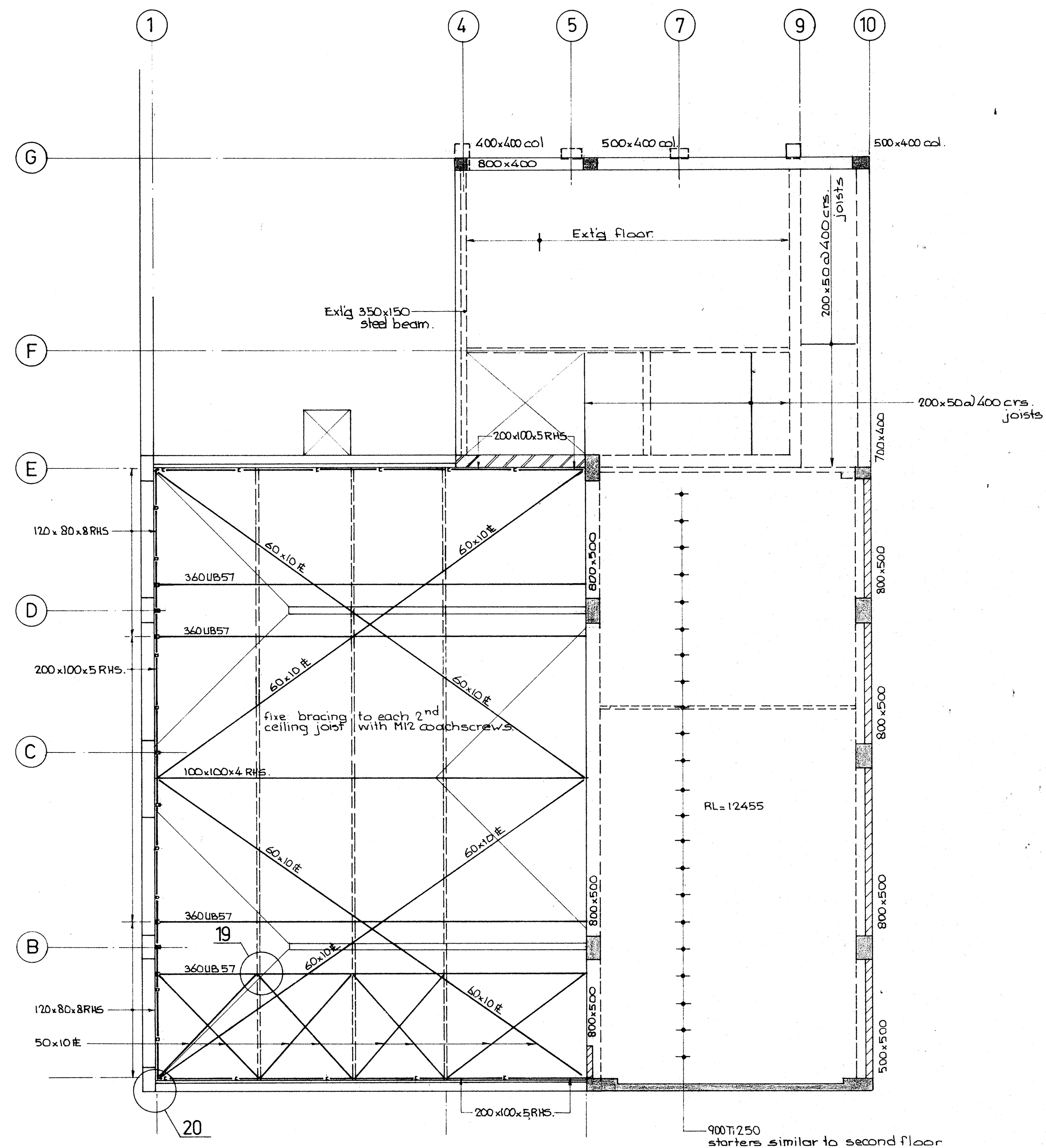
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DRAWN J.v.d.L.	SCALE 1:100
CHECKED	
APP'D	DWG NO 1868/2
DATE Nov '86	





SECOND FLOOR



THIRD FLOOR

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[illegible]

For general notes refer dwg 1868/2

WFO DEPARTMENT
BUILD SECTION GRANCH
20 NOV 1986
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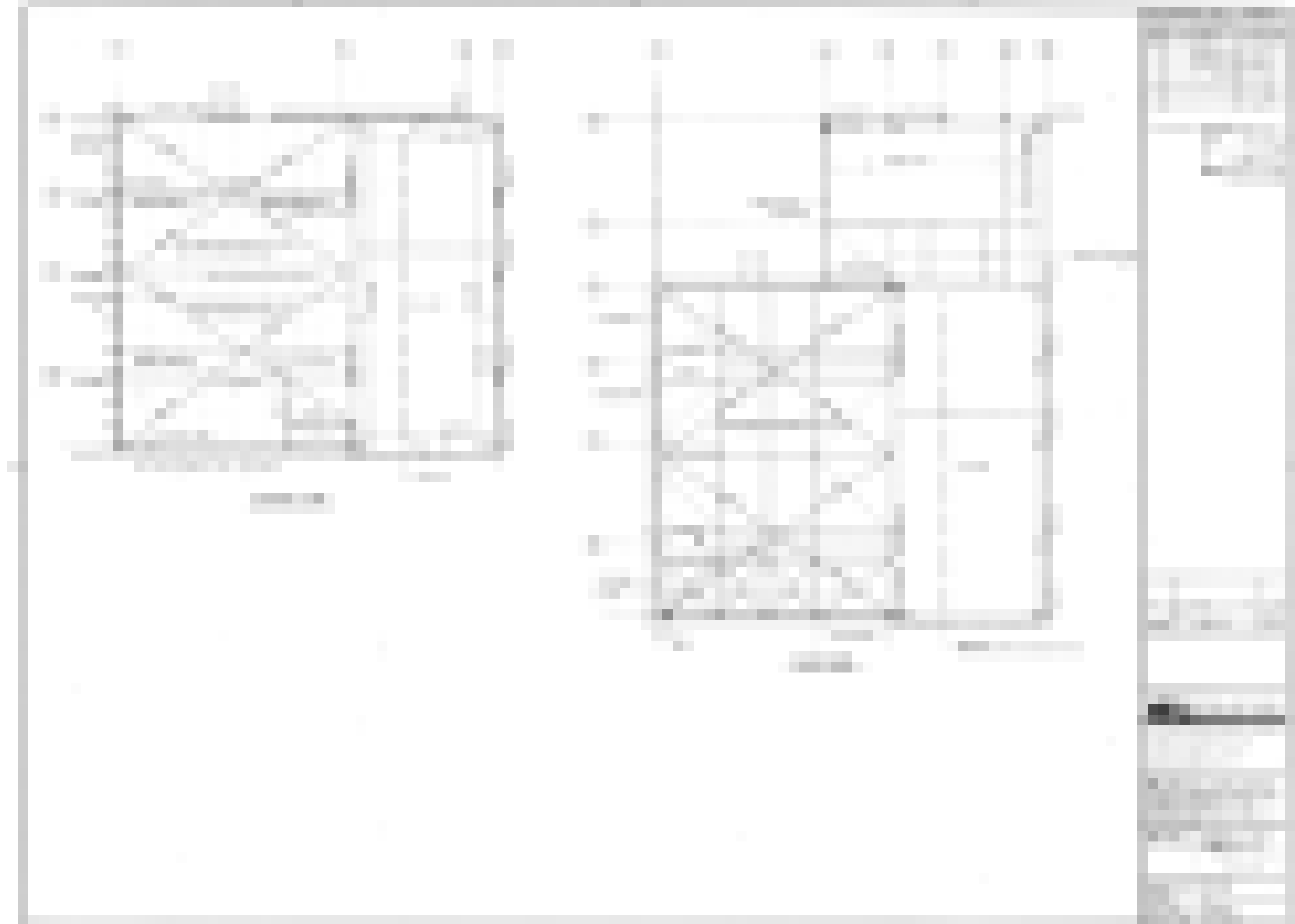
Hamilton: Ph. 82760 P.O. Box 753

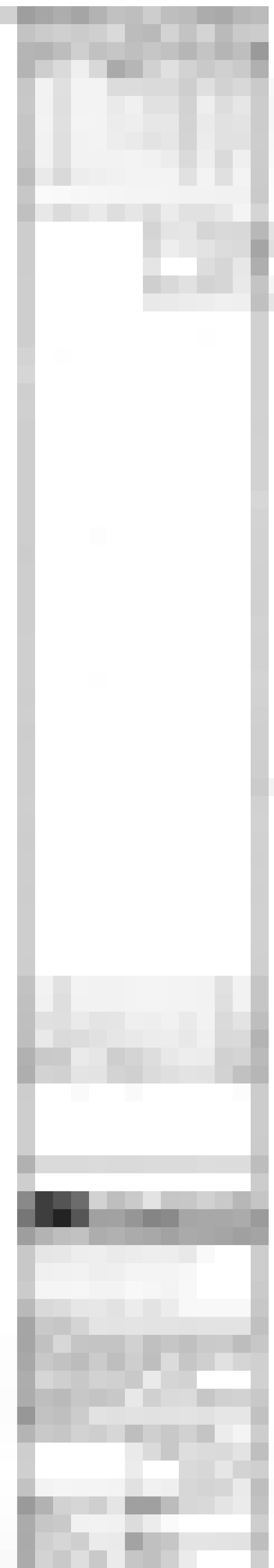
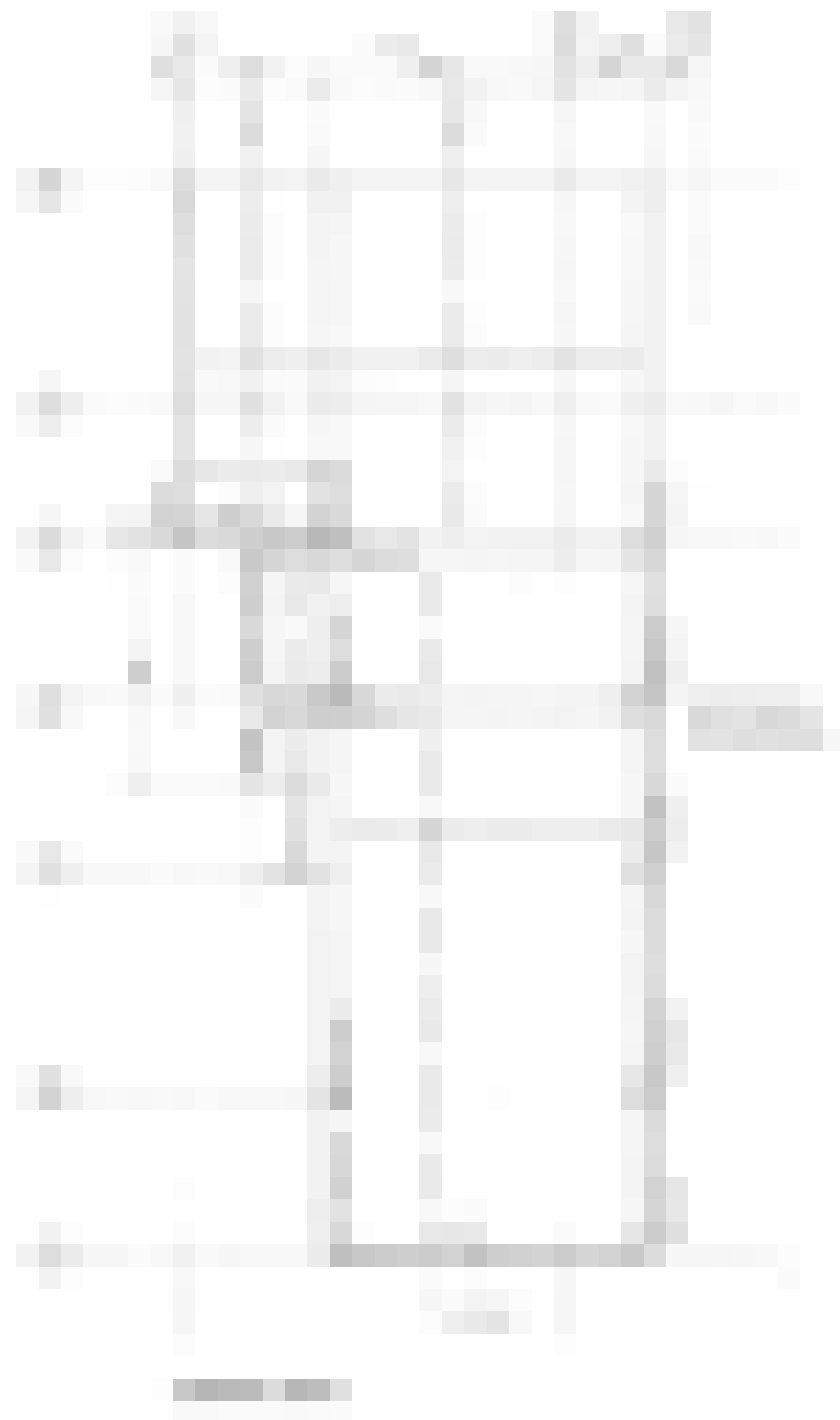
JOB TITLE
WELLINGTON WORKINGMENS
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UPGRADING CUBA ST PREMISES.

DWG TITLE
SECOND & THIRD FLOOR

20 NOV 1936

DRAWN J.v.d.L.	SCALES
CHECKED	1:100
APP'D <i>[Signature]</i>	DWG NO
DATE Nov. '86	1868/3



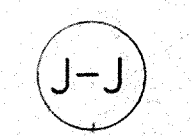




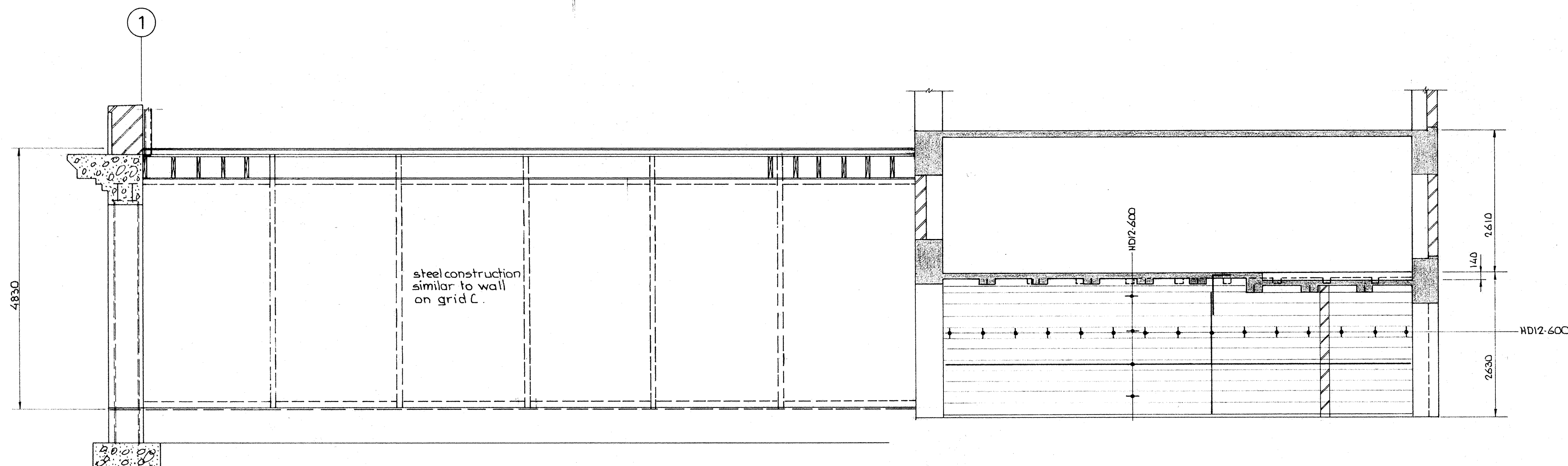
For general notes refer to page 18 of 19

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MERCER STREET, WELLINGTON

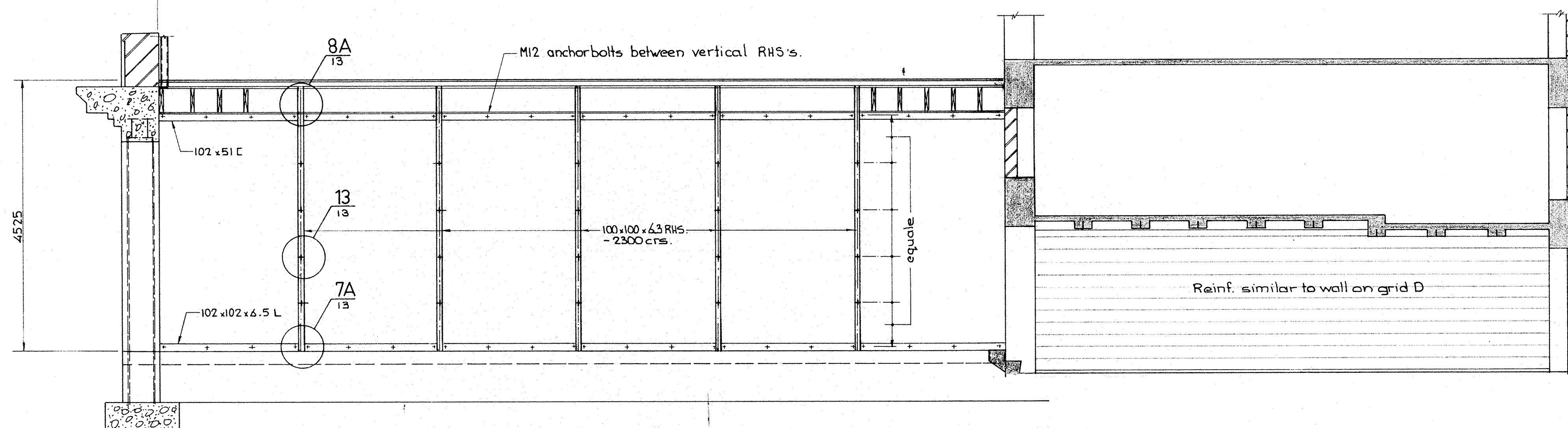
BUILDING INSPECTION BRANCH



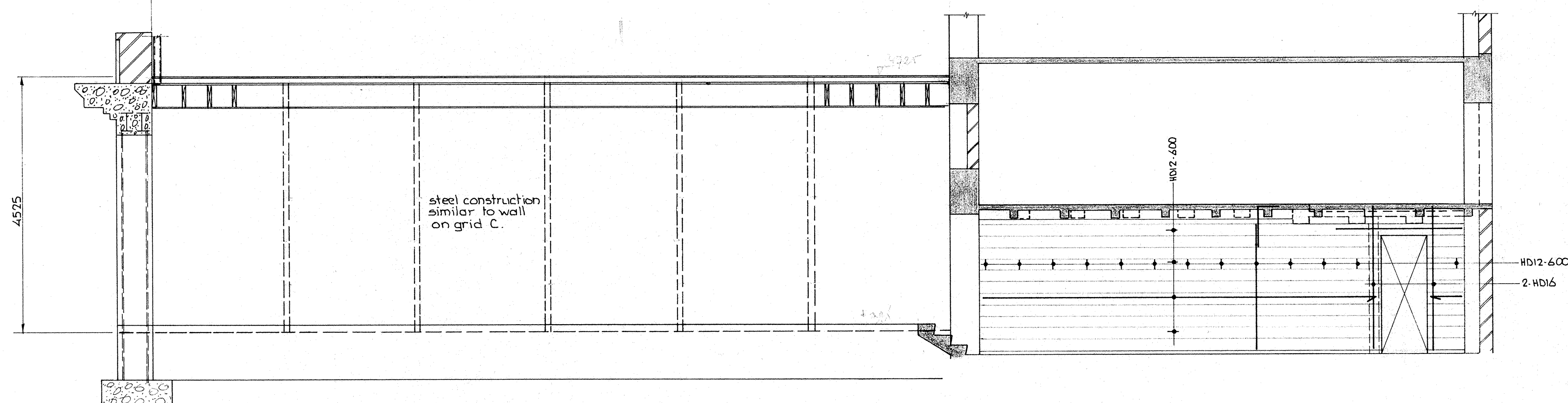
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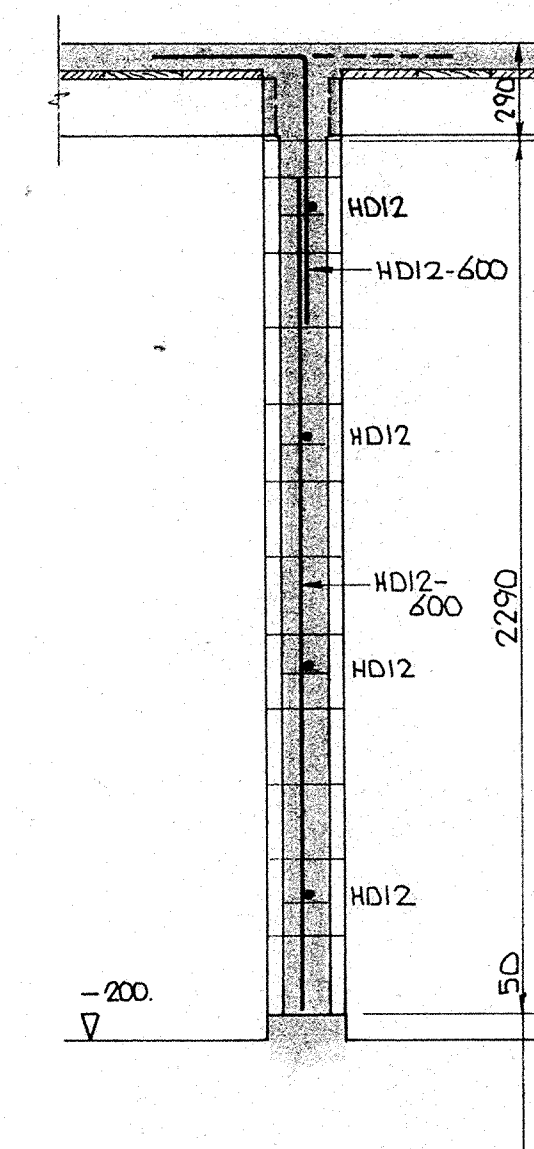
SECTION ON GRID D



SECTION ON GRID C



SECTION ON GRID B



TYP BLOCK WALL SECTION
200 BLOCKS

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for general notes refer to dwg. 1868/5
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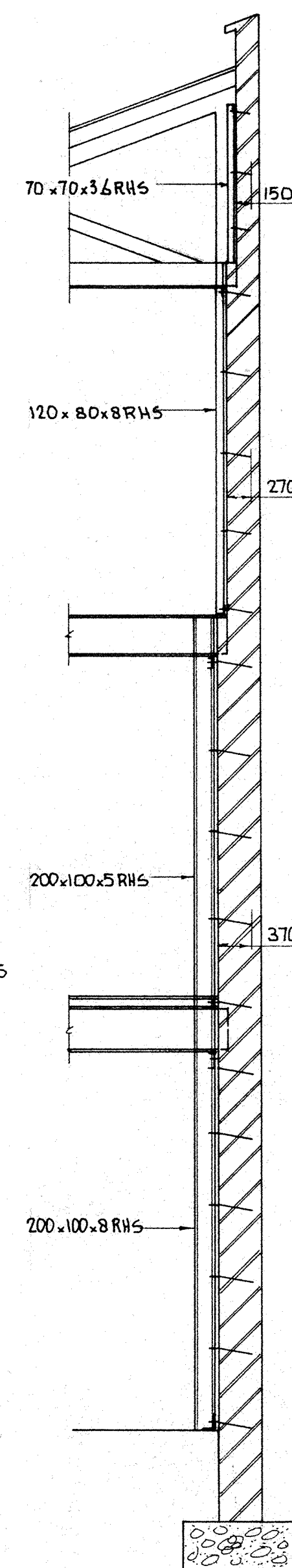
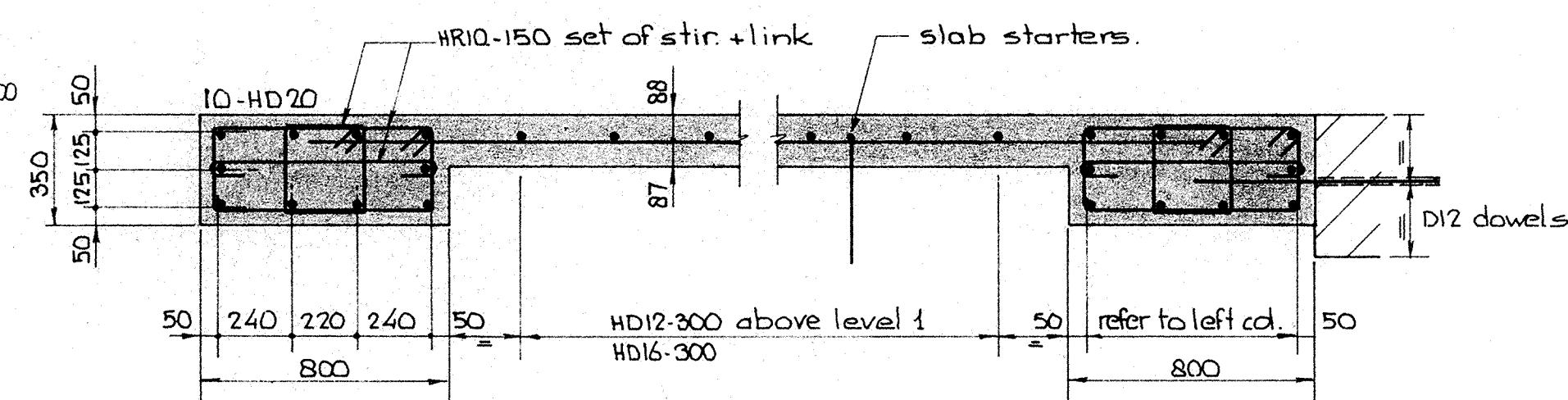
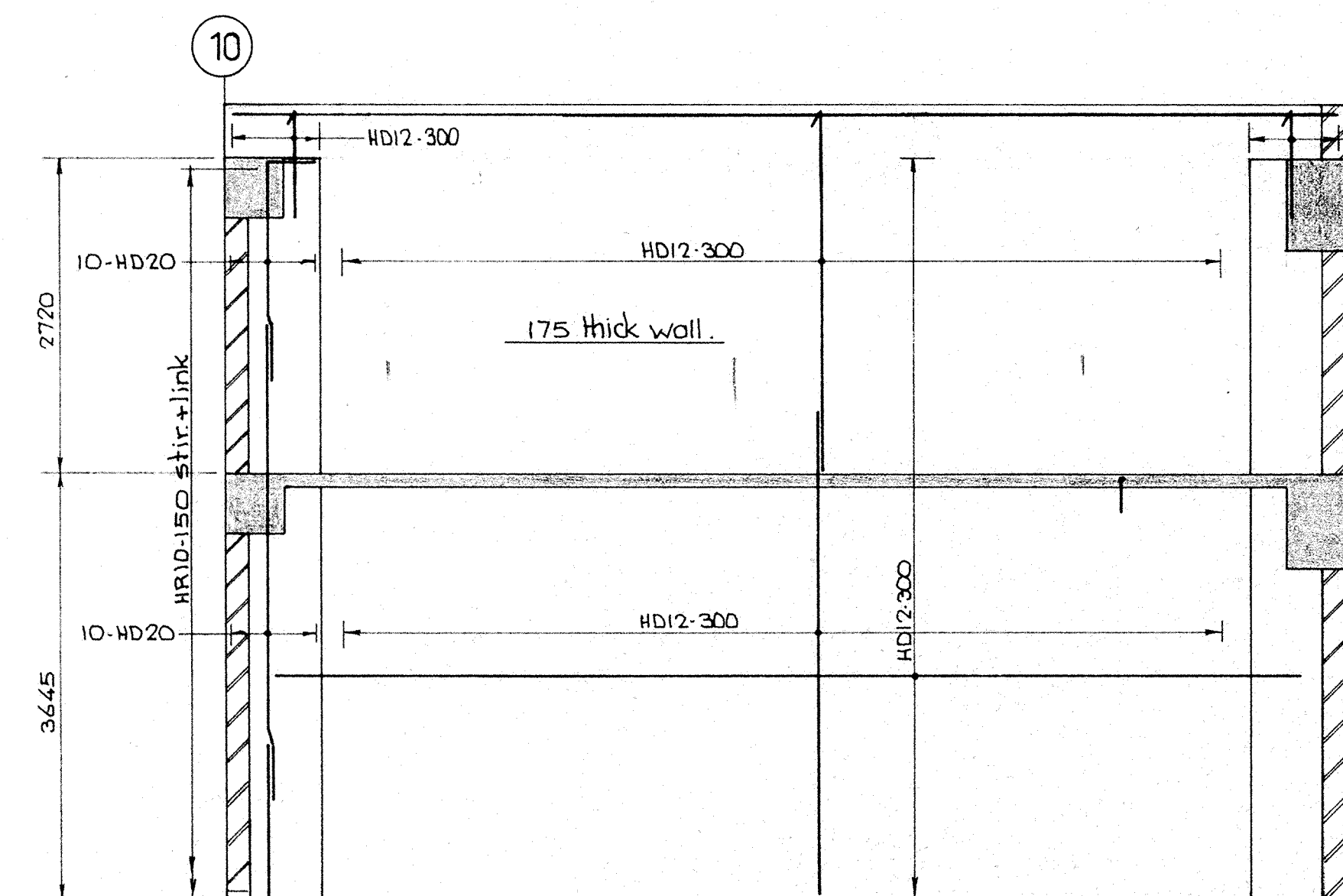
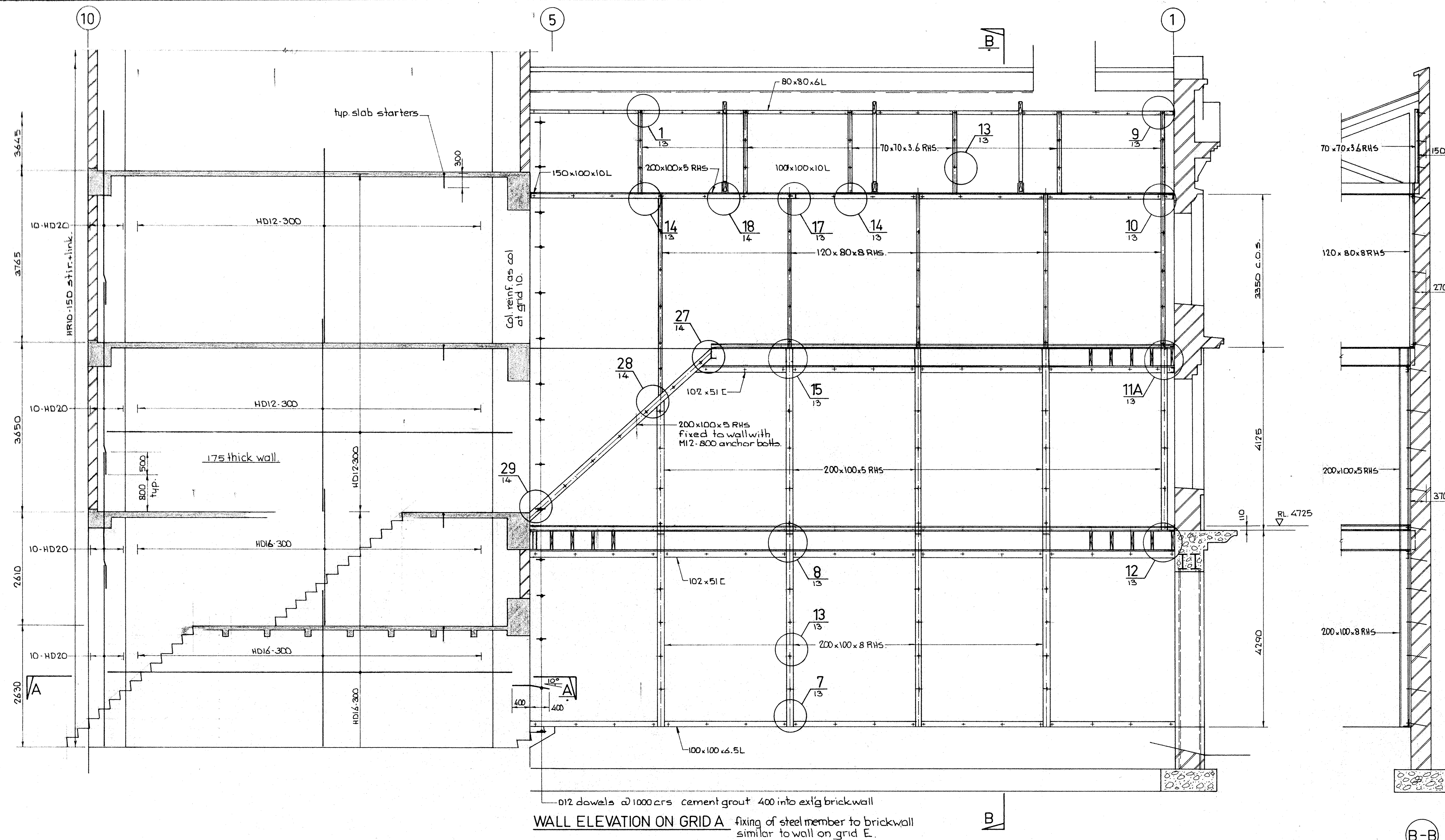
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WELLINGTON WORKINGMENS CLUB & LITERARY INSTITUTE STRENGTHENING AND UPGRADING CUBA ST PREMISES

DWG TITLE
WALL ELEVATION ON GRIDS B, C & D

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CONTRACTORS MUST VERIFY ALL DIMENSIONS AT THE JOB BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED BEFORE MANUFACTURE			
ISSUE	AMENDMENT	BY	DATE

For general notes refer dwg 18.68/2

WORKS DEPARTMENT RECEIVED 28 NOV 1986 MERCER STREET WELLINGTON
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For general notes refer dwg 18.68/2

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For general notes refer dwg 18.68/2

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ISSUE	AMENDMENT	BY	DATE
	WORKS DEPARTMENT PLUMBING AND DRAINAGE BRANCH RECEIVED 28 NOV 1986 MERCER STREET WELLINGTON		

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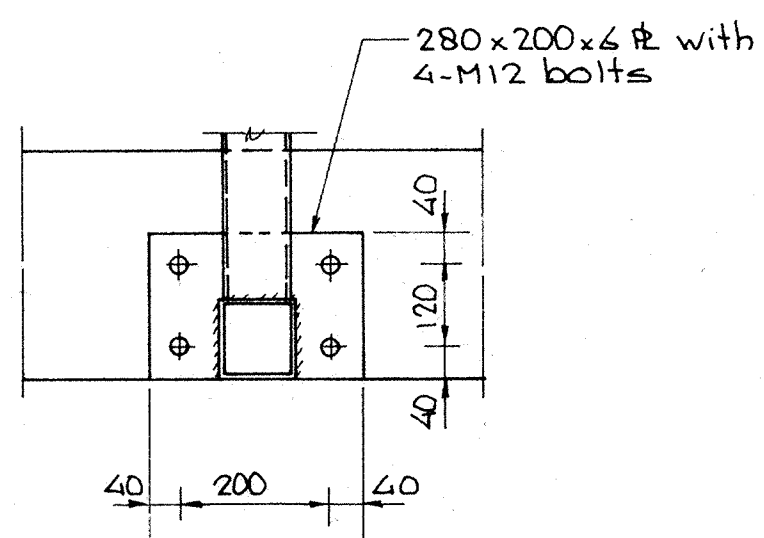
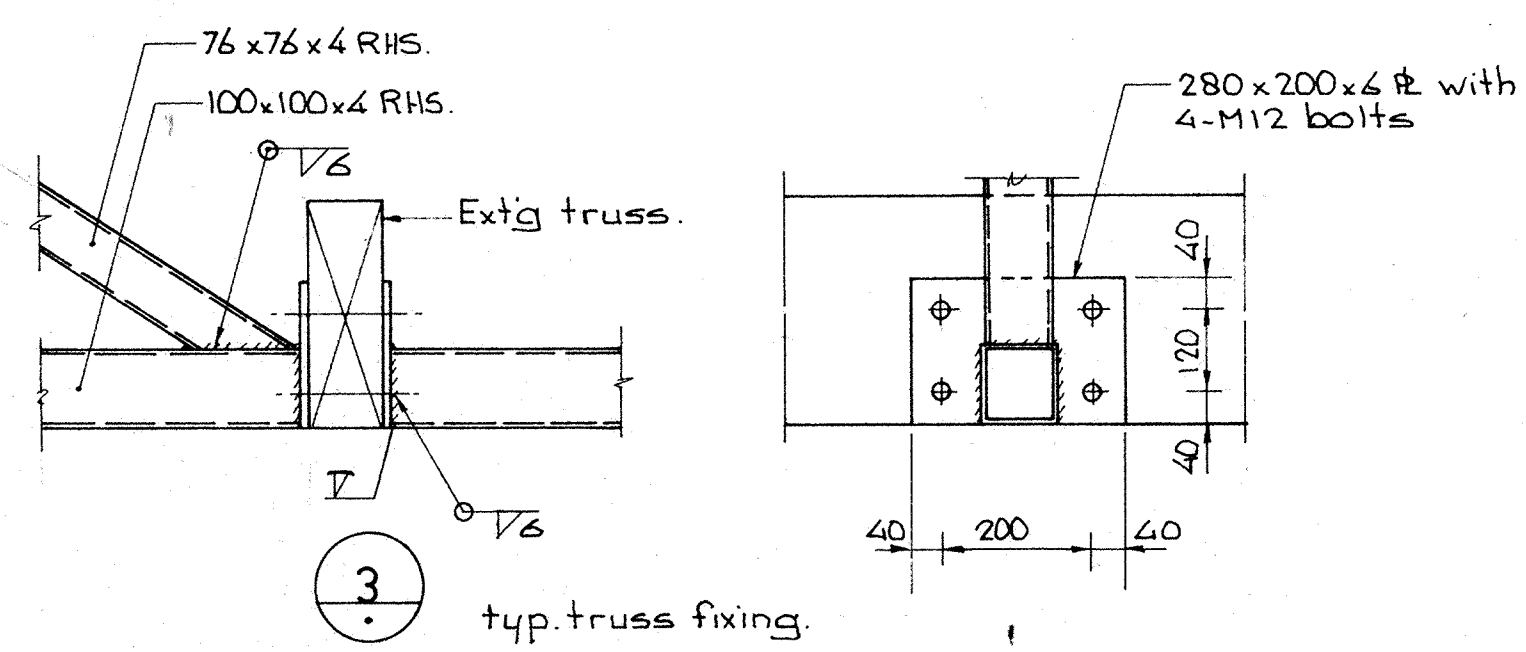
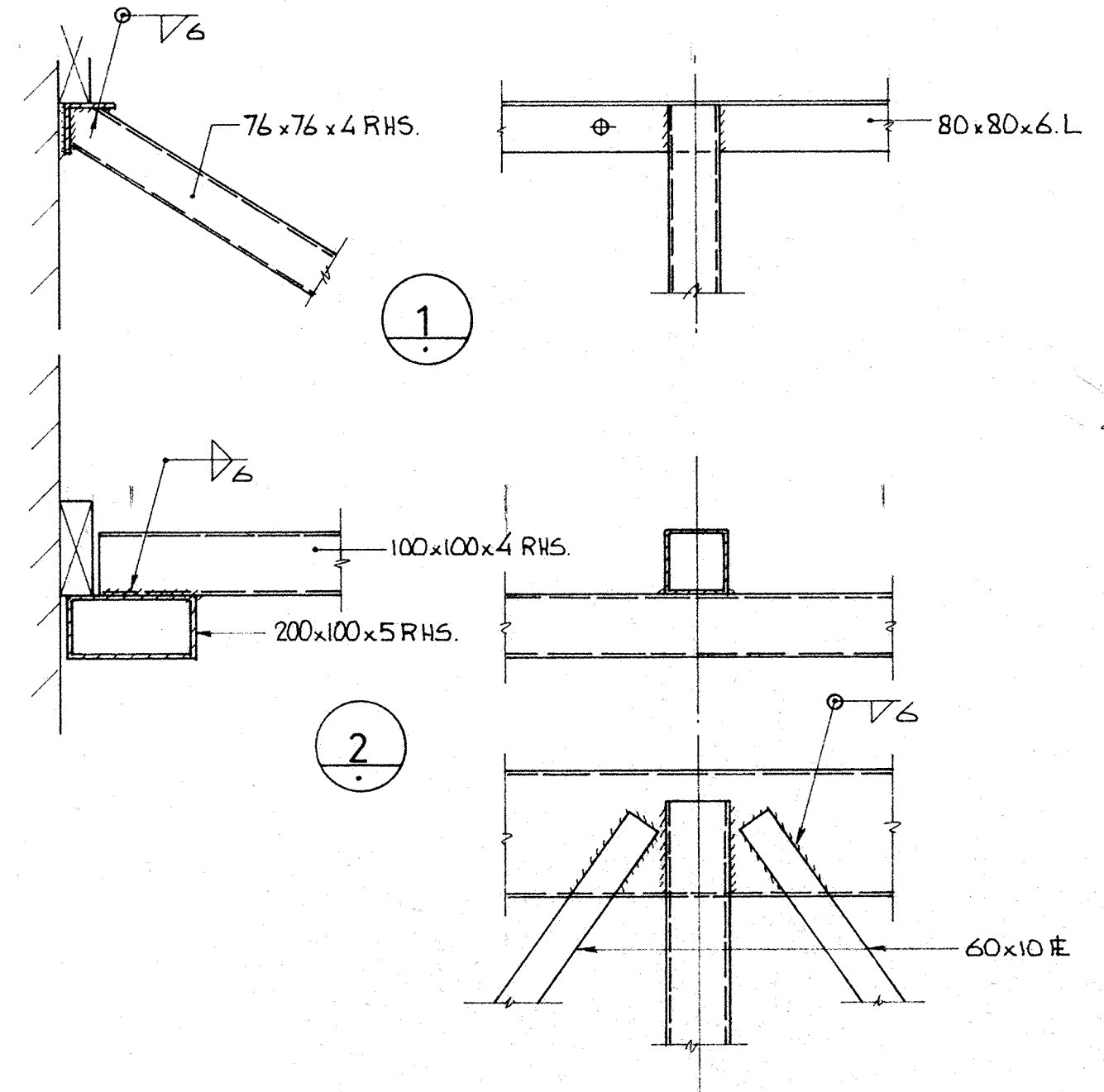
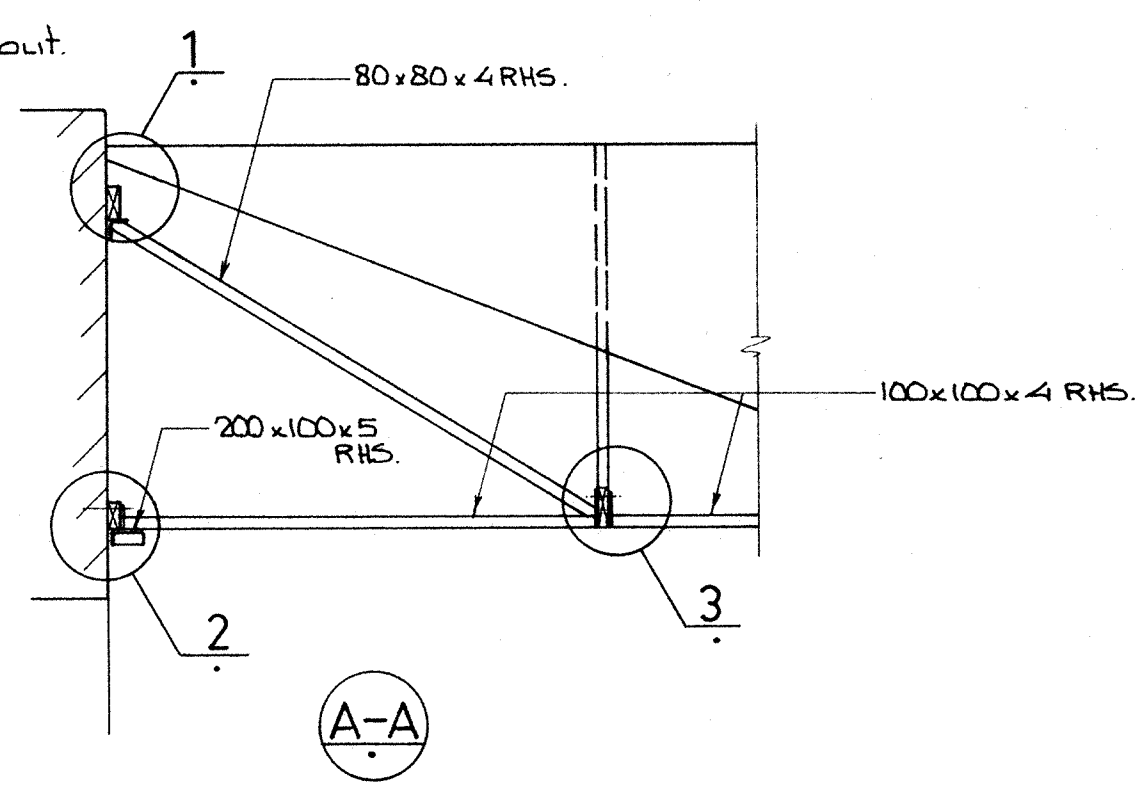
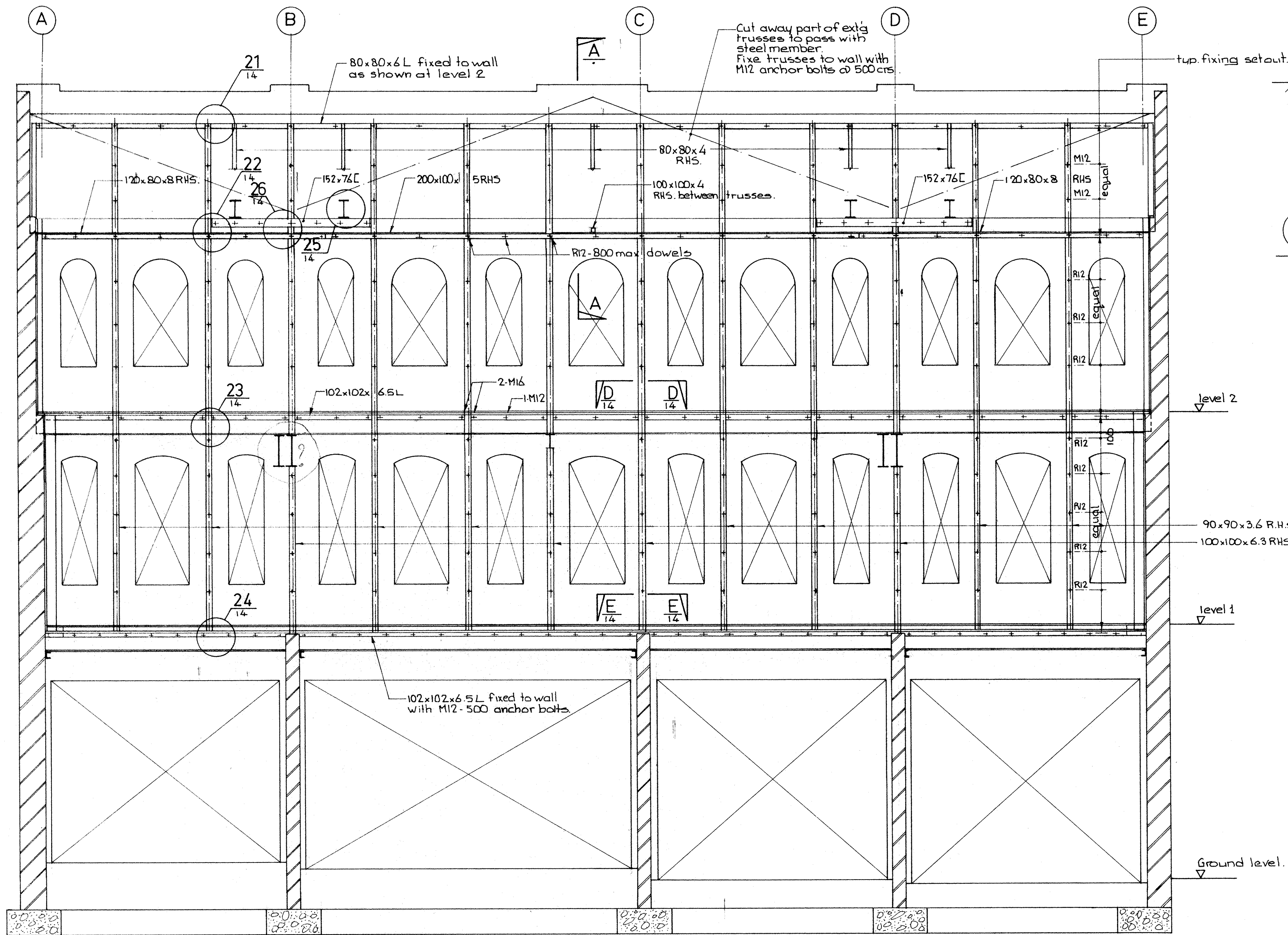
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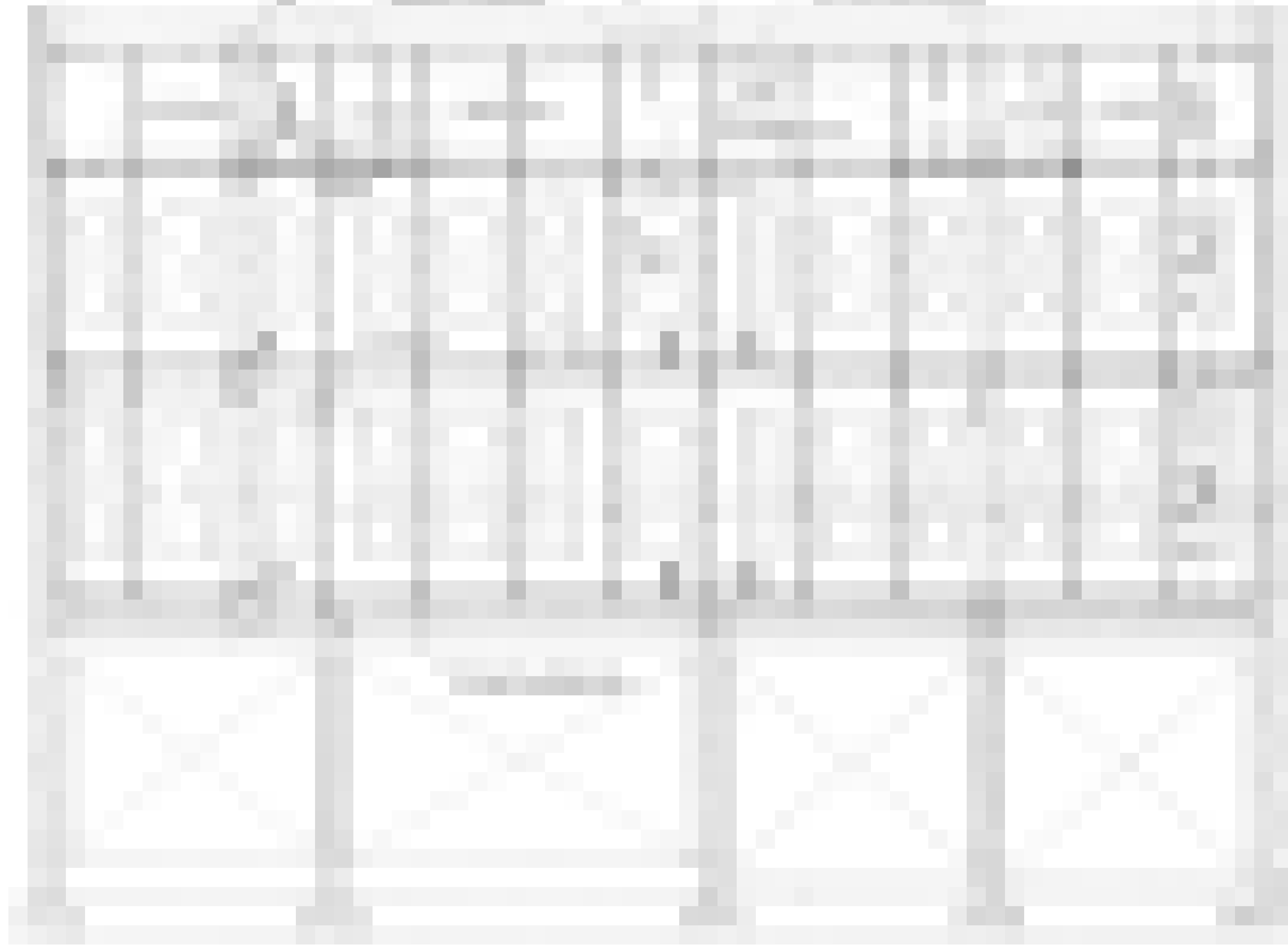
JOB TITLE
WELLINGTON WORKINGMENS CLUB & LITERARY INSTITUTE STRENGTHENING AND UPGRADING CUBA ST PREMISES

DWG TITLE
WALL ELEVATION ON GRID 1

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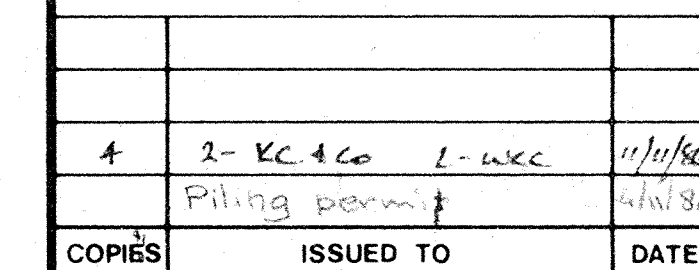




CONTRACTORS MUST BE NOTIFIED BY THE CITY ENGINEER AT THE JOB BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED BEFORE MANUFACTURE.

ISSUE	AMENDMENT	BY	DATE
	WORKS DEPARTMENT PLUMBING AND DRAINAGE BRANCH RECEIVED 28 NOV 1986 MERCER STREET WELLINGTON		
	WORKS DEPARTMENT PLUMBING AND DRAINAGE BRANCH RECEIVED 20 NOV 1986 MERCER STREET, WELLINGTON		

For general notes see



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JOB TITLE
WELLINGTON WORKINGMENS
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DWG TITLE
WALL ELEVATION ON GRID 5

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Scales

DRAWN J.V.d.L.	UNIVERSITY OF WELLINGTON SCALES
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APP'D <i>[Signature]</i>	DWG NO
DATE Nov '86	1868/9

Project Overview					Status
ID	Name	Manager	Start Date	End Date	
P001	Website Redesign	J. Doe	2023-01-15	2023-06-30	In Progress
P002	Mobile App Development	A. Smith	2023-02-01	2023-08-15	On Hold
P003	Database Migration	M. Johnson	2023-03-10	2023-05-20	Completed
P004	Security Audit	C. Lee	2023-04-01	2023-07-10	Pending Review
P005	Hardware Refresh	D. Kim	2023-05-01	2023-09-01	Not Started
P006	Cloud Migration Phase 2	E. Brown	2023-06-01	2023-10-31	Planning
P007	UX Research & Prototyping	F. Green	2023-07-01	2023-11-15	Research Phase
P008	API Integration Project	G. White	2023-08-01	2023-12-31	Design Phase
P009	Compliance Training	H. Black	2023-09-01	2023-11-30	Implementation
P010	Annual Report Generation	I. Grey	2023-10-01	2023-12-15	Final Review

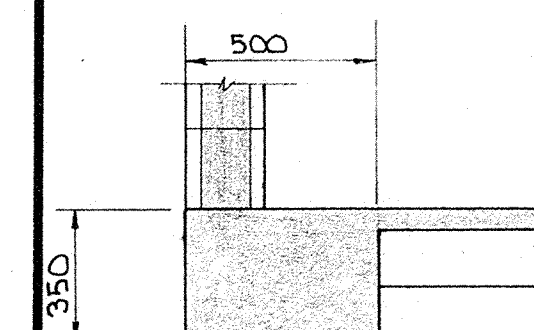
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ISSUE	AMENDMENT	BY	DATE
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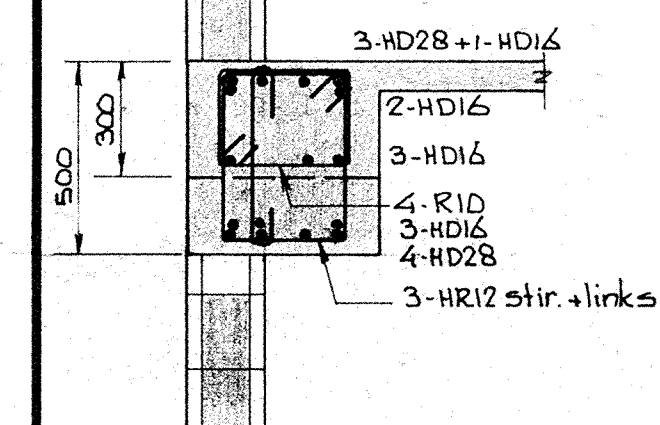
For general notes refer dwg.1868/2

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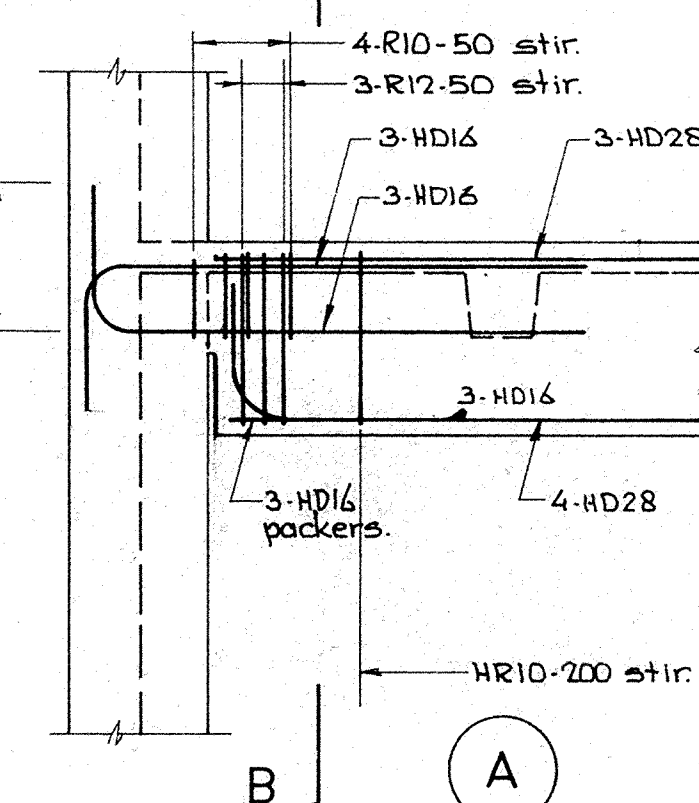


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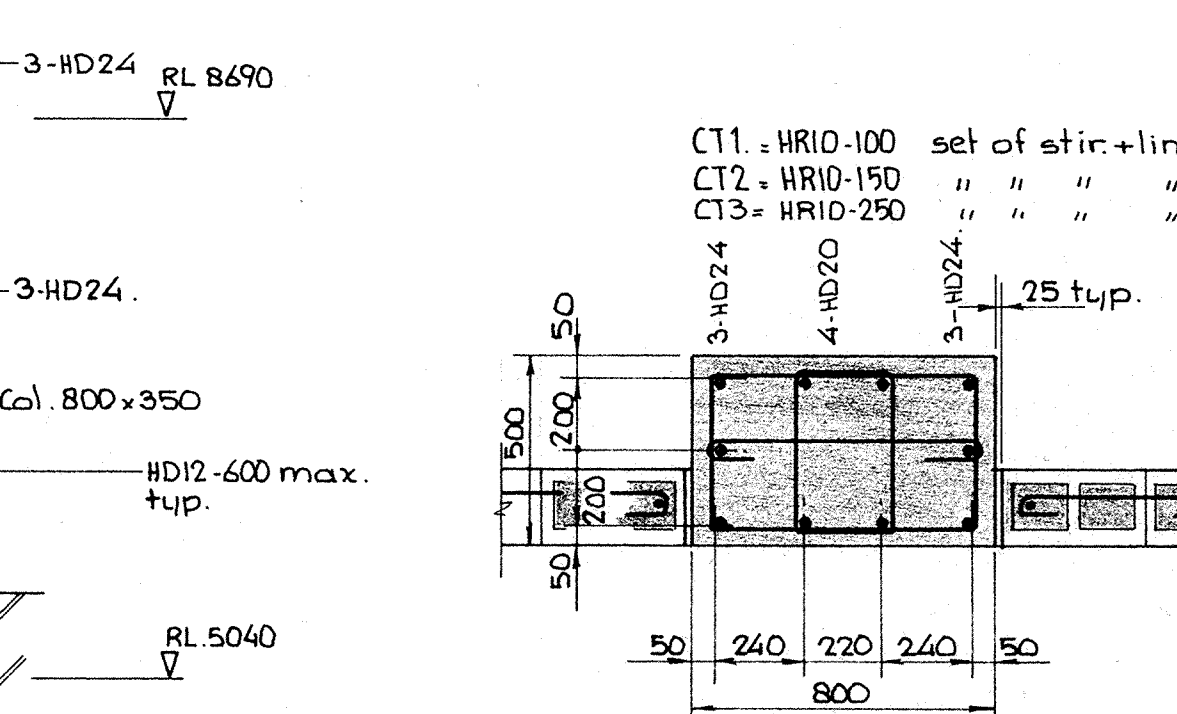
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shown at typ. section



B-B



TYP. COL. SECTION



TYP. BEAM SECTIONS

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DWG TITLE
WALL ELEVATION ON GRID 10

DRAWN J.v.d.L.

DRAWN J.V.D.L.

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APP'D *[Signature]*

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CONTRACTORS MUST VERIFY ALL DIMENSIONS AT THE JOB BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED BEFORE MANUFACTURE			
ISSUE	AMENDMENT	BY	DATE

For general notes refer dwg 1868/2

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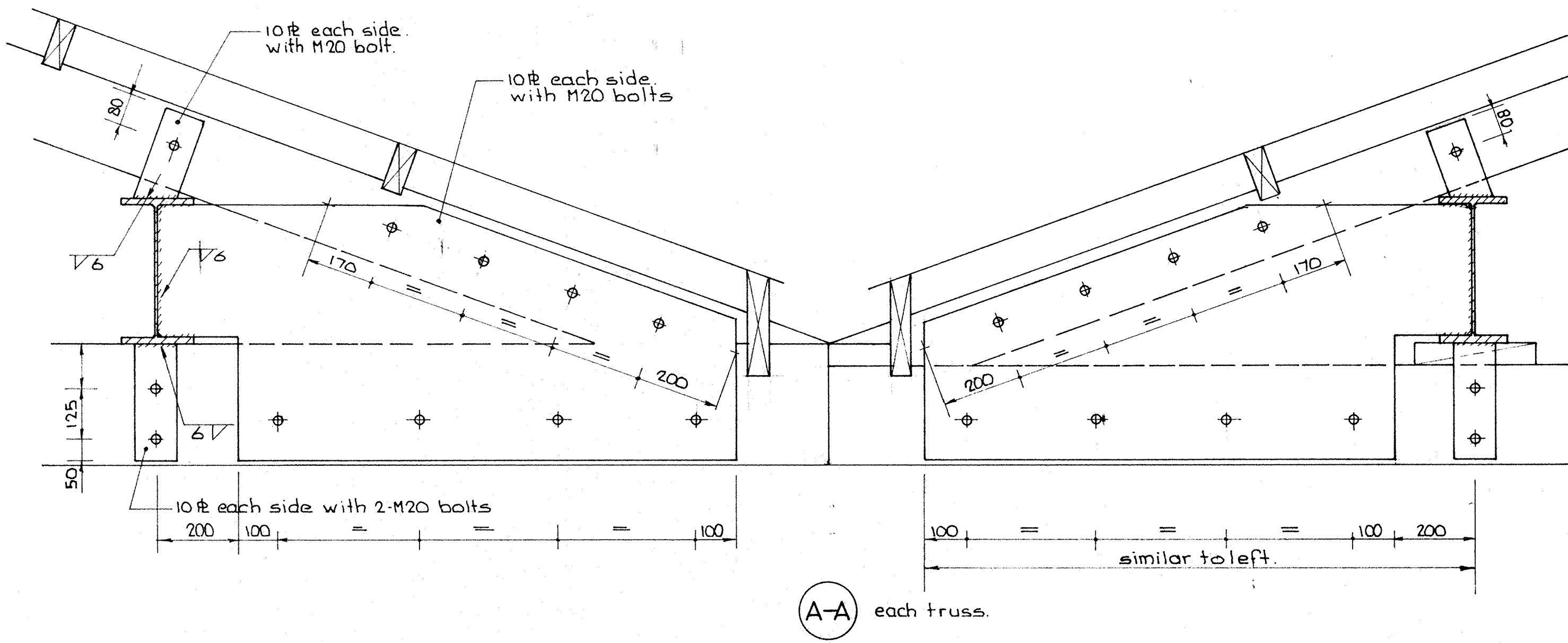
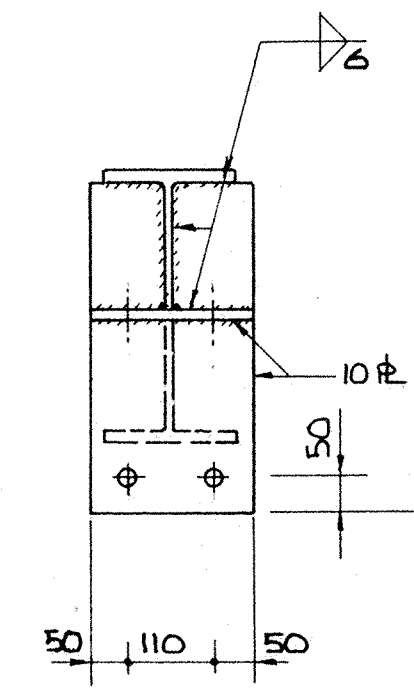
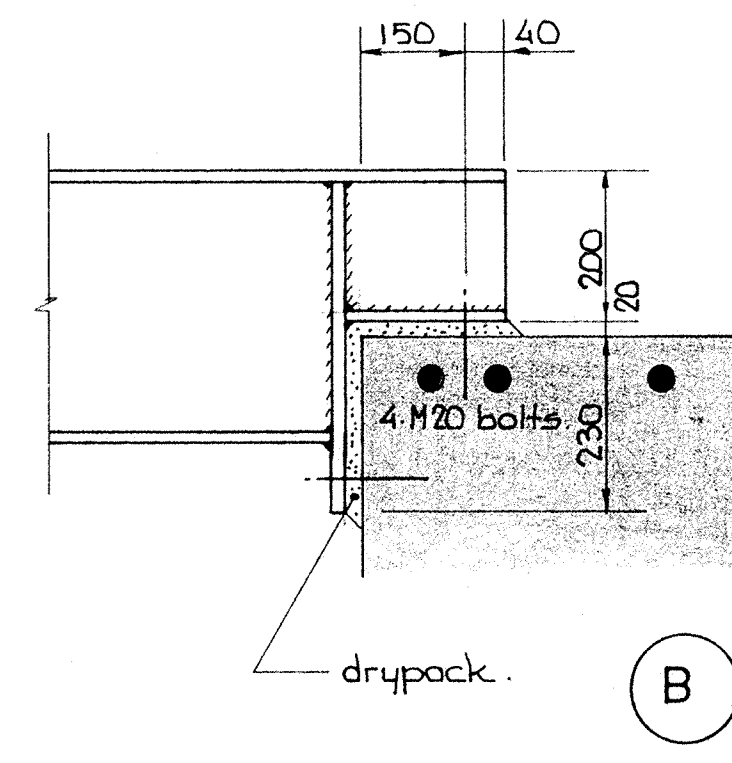
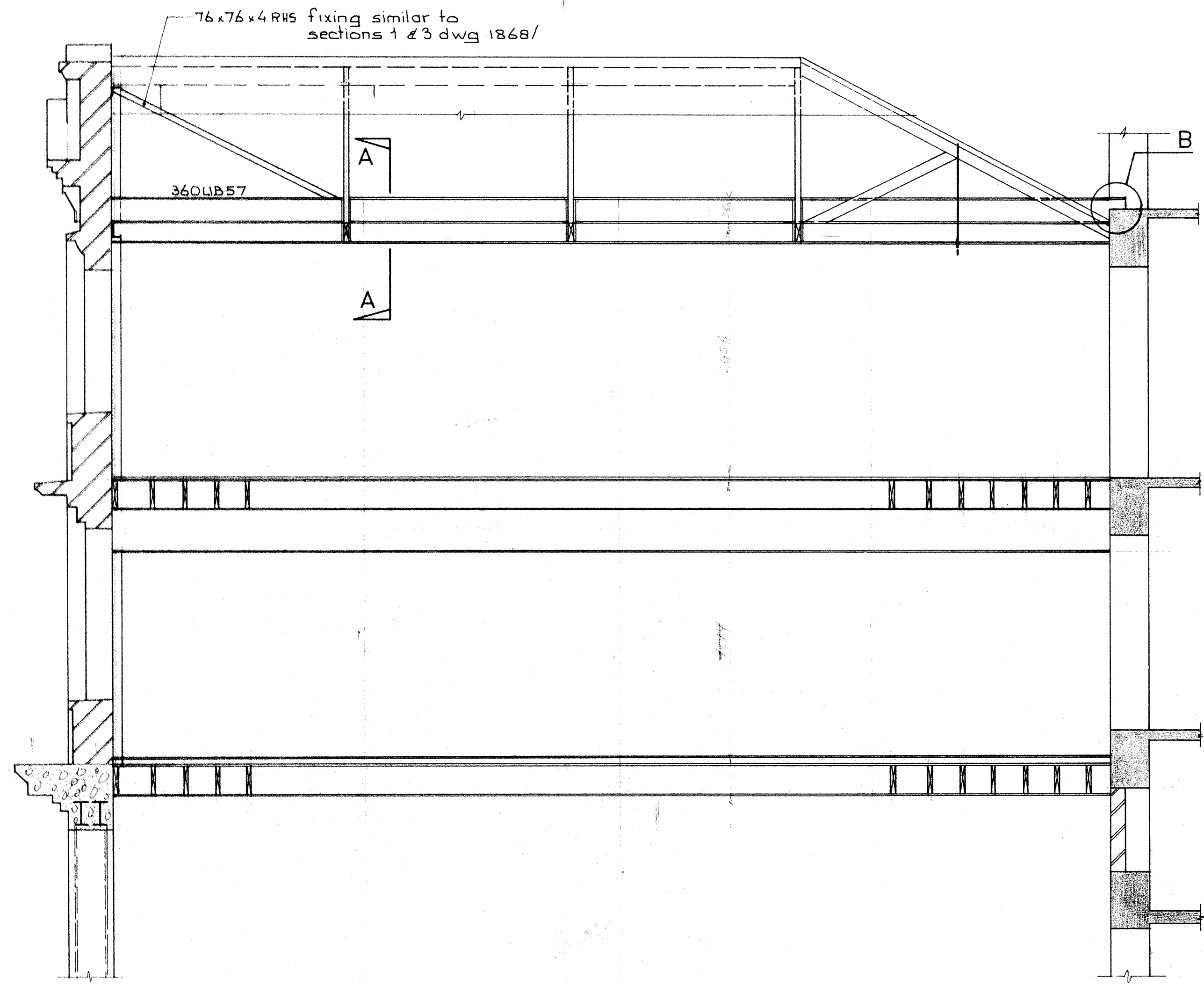
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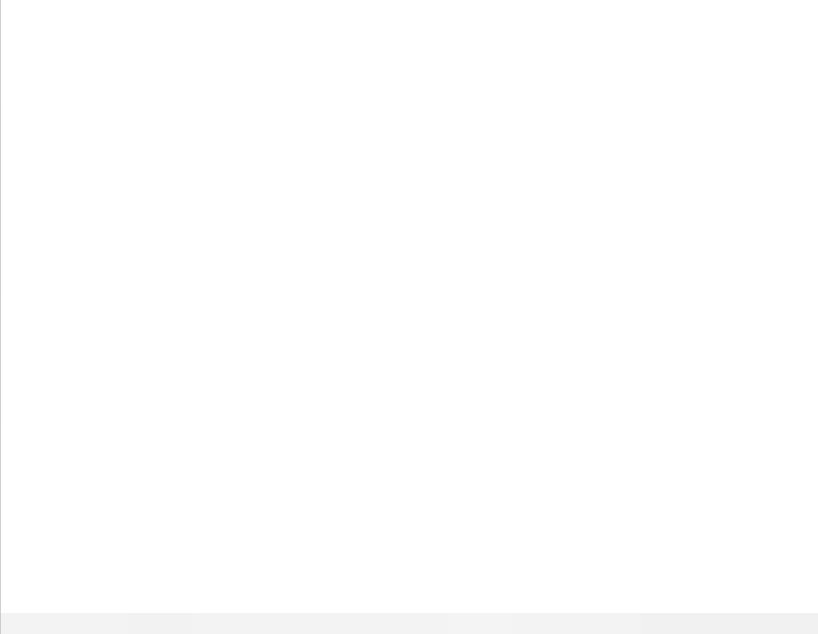
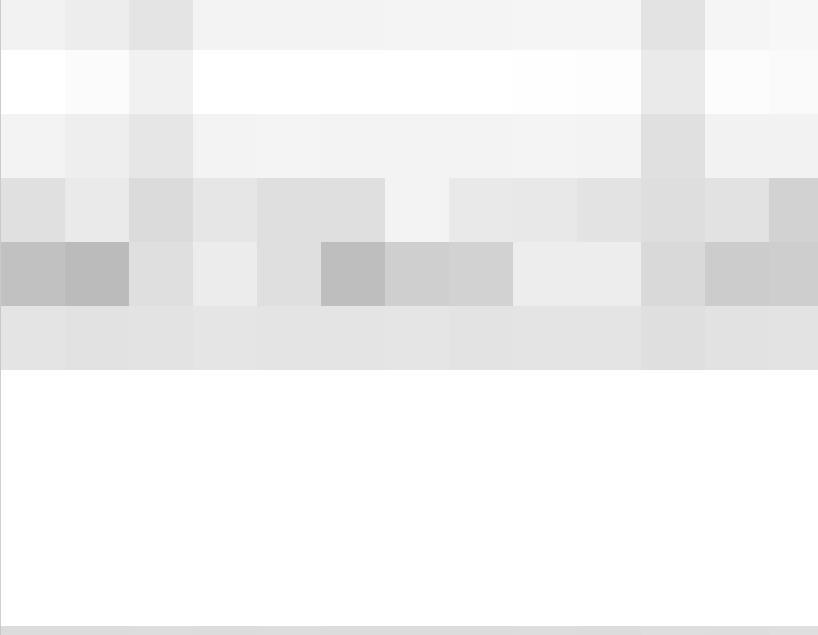


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DWG TITLE
SECTION AT GRID B & D

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DATE Nov. '86	1868/11



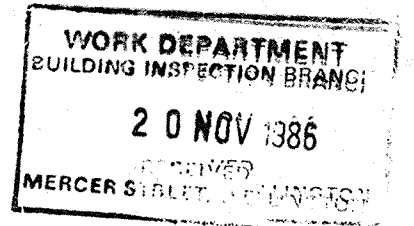
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ISSUE	AMENDMENT	BY	DATE

For general notes refer dwg 1868/2



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TYPICAL STEEL CONSTR. SECTIONS & DETAILS

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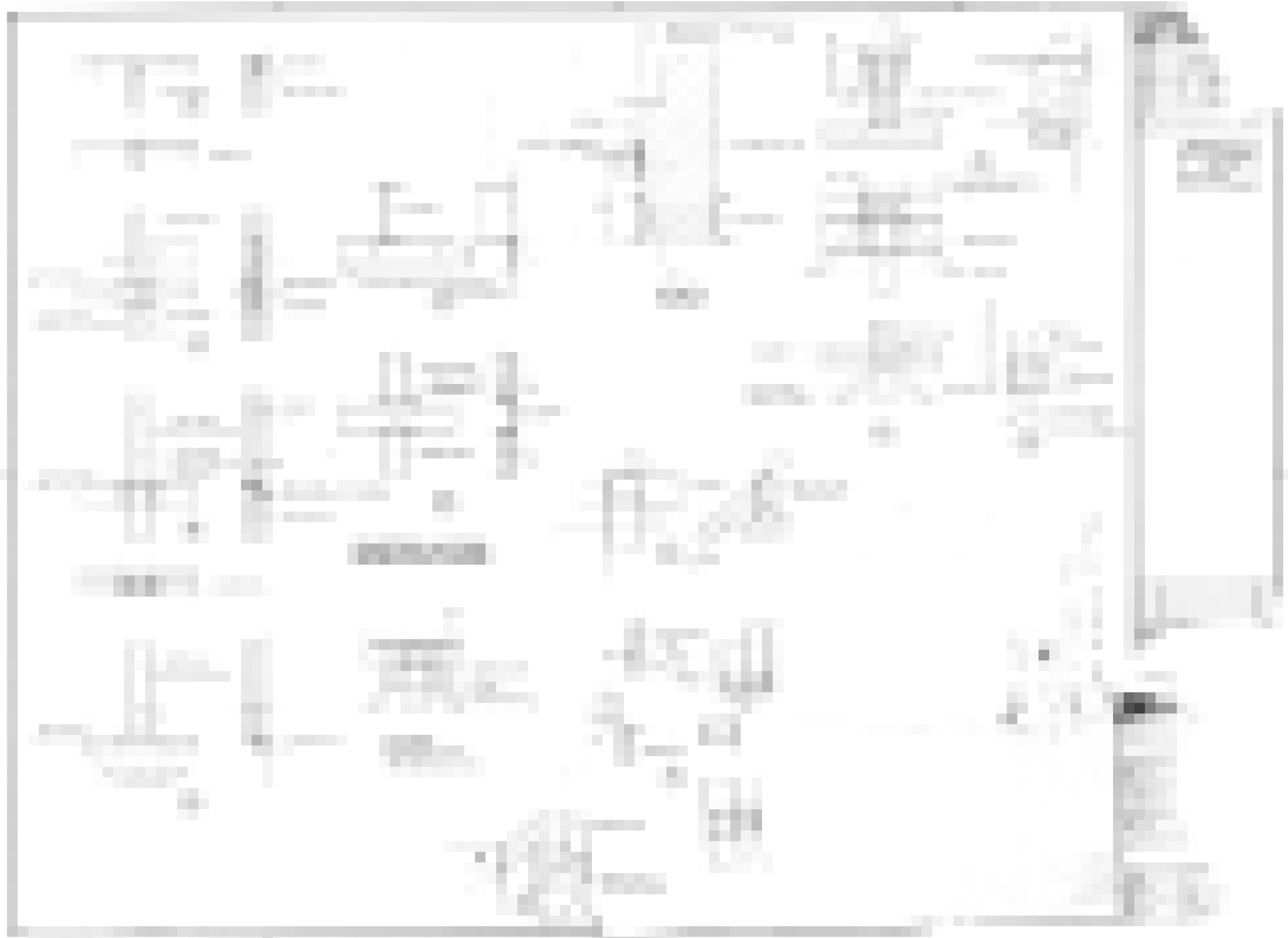
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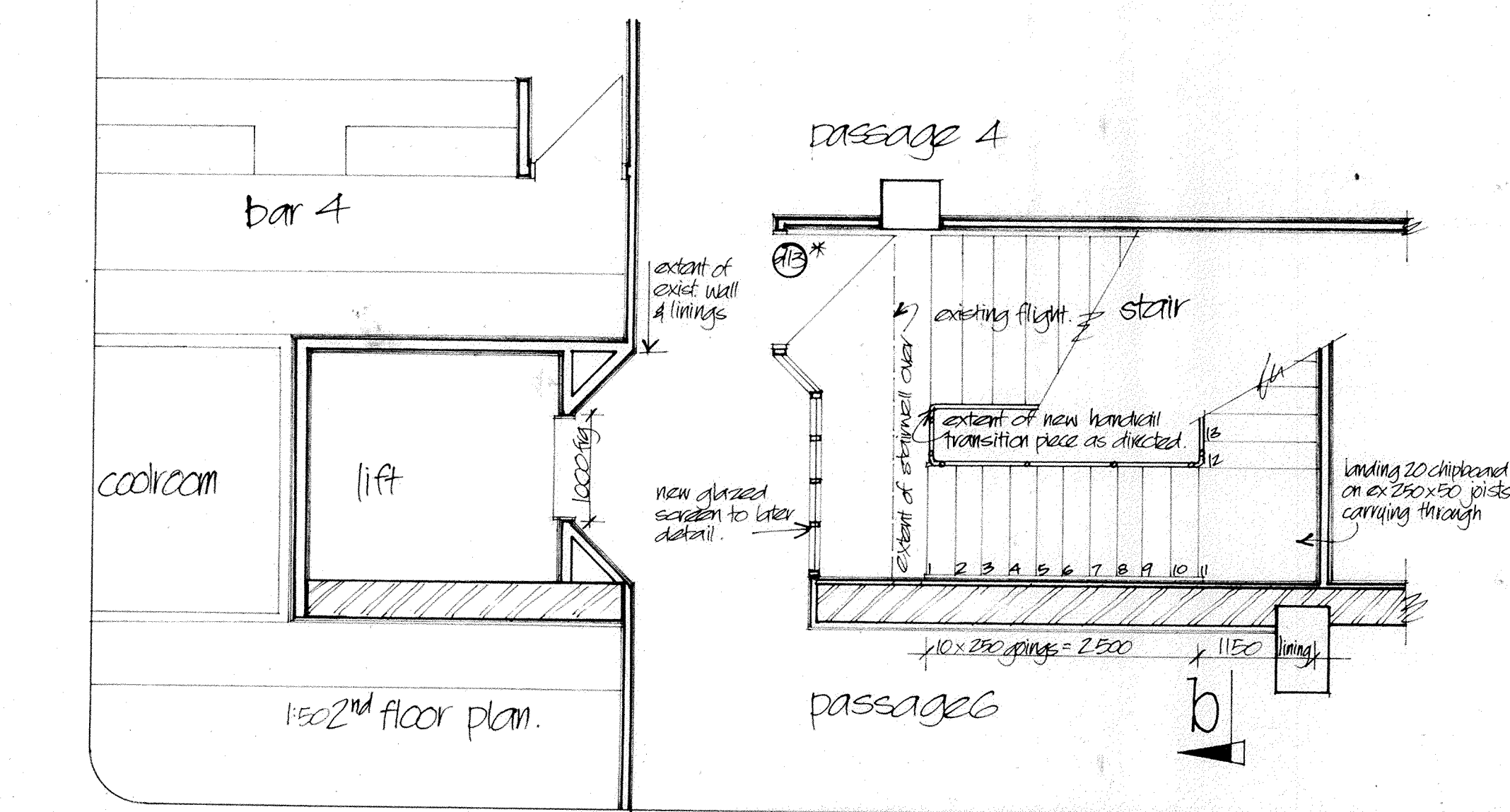
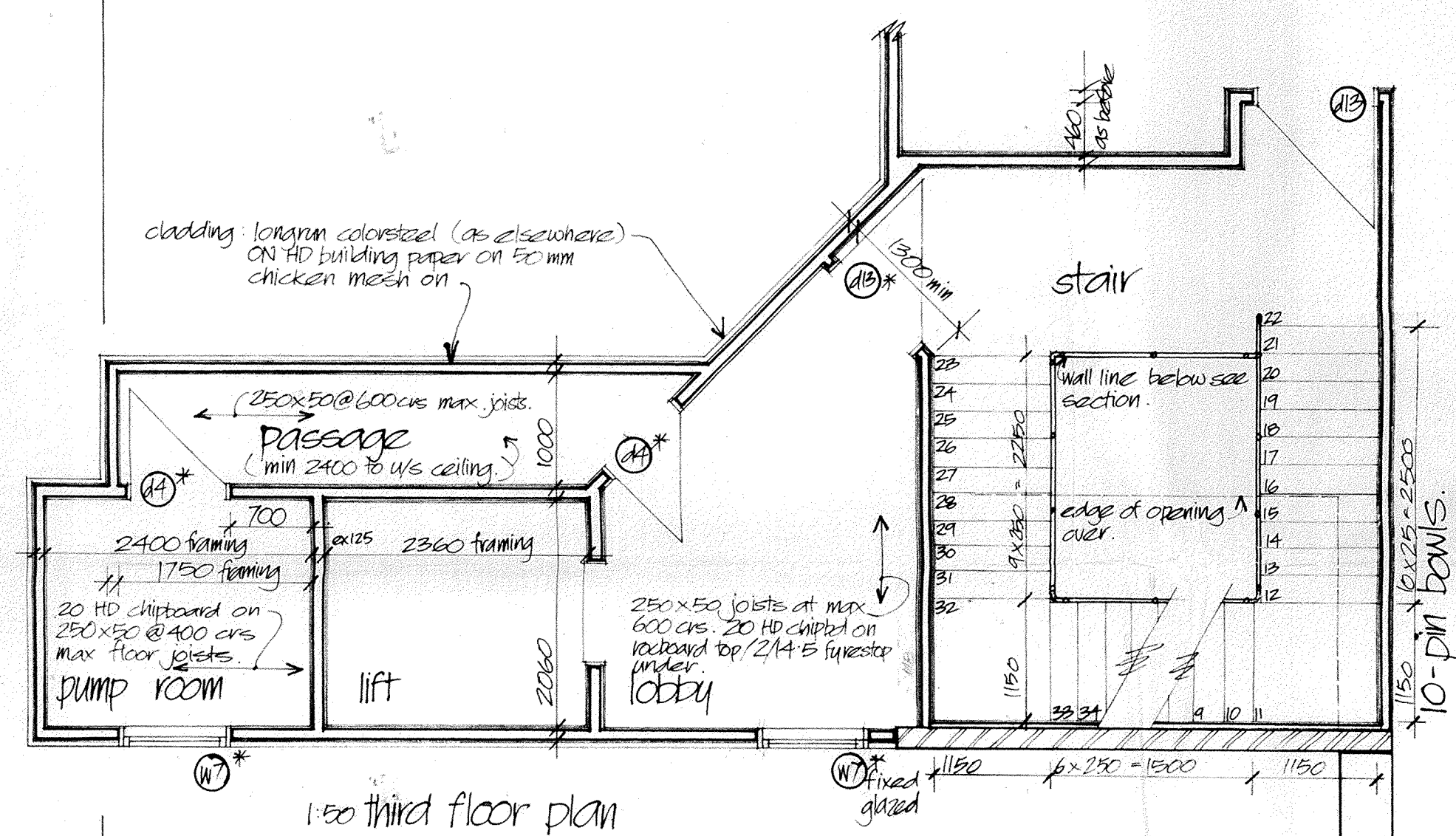
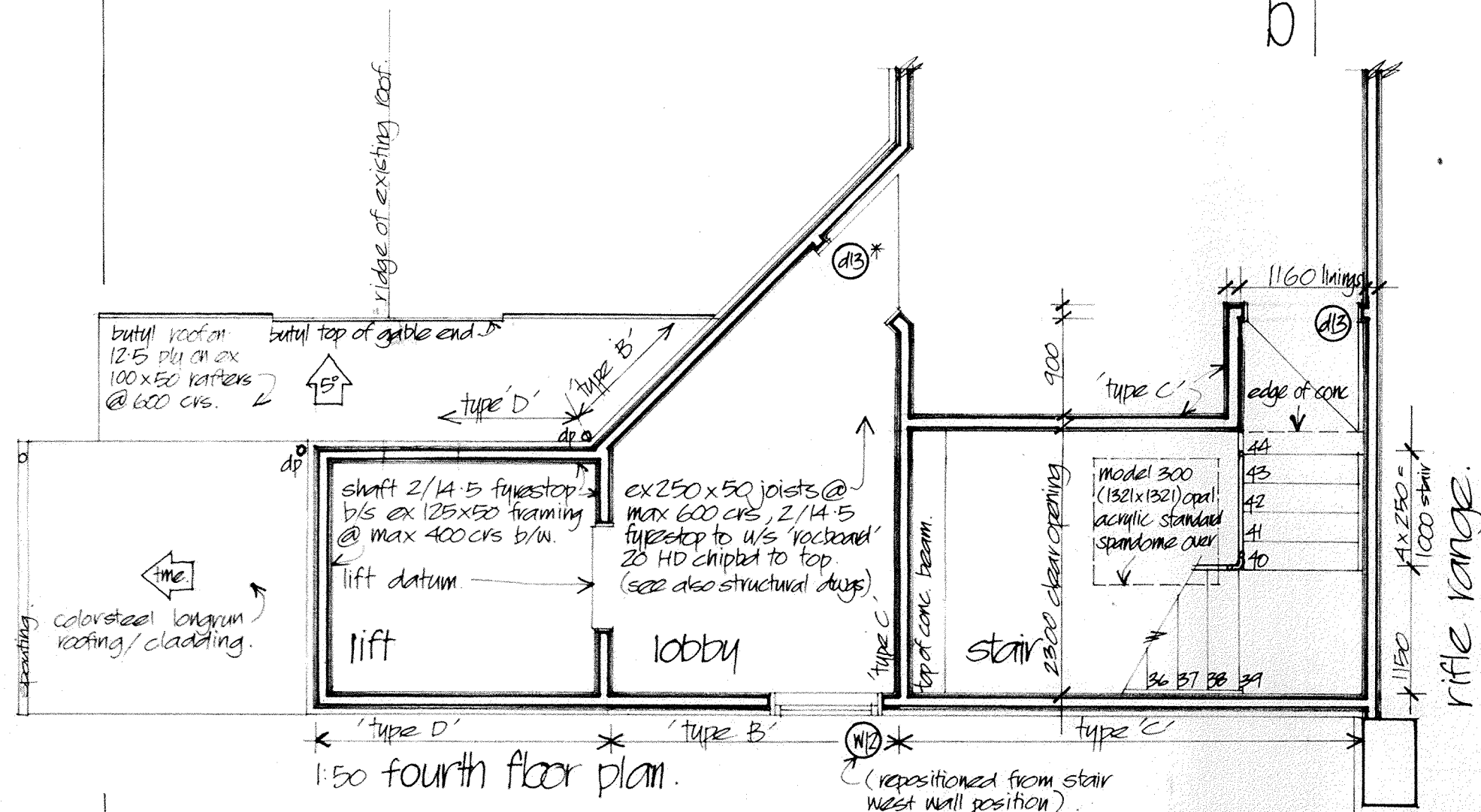
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notes:

- 1. 9.5 gibraltar beam both sides of ex 100x500
@ 400 max c/s (studs) away at max 600 c/s.
- 2. 1/4 5 finestop both sides of ex 100x50 framing
c/s as type A.
- 3. 2/14 5 finestop both sides of ex 100x50 framing
c/s as type A. (stair shaft walls).
- 4. 2/14 5 finestop both sides of ex 125x50 framing
@ 400 max c/s b/w. (lift shaft walls).

* - indicates additional door or window to contrast to same details
as elsewhere



50x3.65 MS pipe hand-rail welded to top of stanchions.
38x38x3.2 RHS stanchions at equal c/s as shown in sections.
90x30 da hit rimu top, bottom & sides (30x30 mid uprights @ between 90 & 150 equal c/s - to suit overall panel width.

38x38x3.250 MSL welded to base of stanchion & 4 c/s screwed to stair stringer.

40x20 rebated 10x10 da hit rimu trim to edge of 100 wide gable strip.

square stop with galv. plastering L.

position of ex 100x50 framed support wall.

continuous band pipe handrail thru corners, grind smooth all welds ready for painting.

st. screw fix infill panels to RHS stanchions.

see handrail corner detail.

28x56x3.2 RHS posts. 'Treadplate' (S) aluminium stair nosing fixed to manuf. specifications.

2mm Polifloor XL vinyl.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

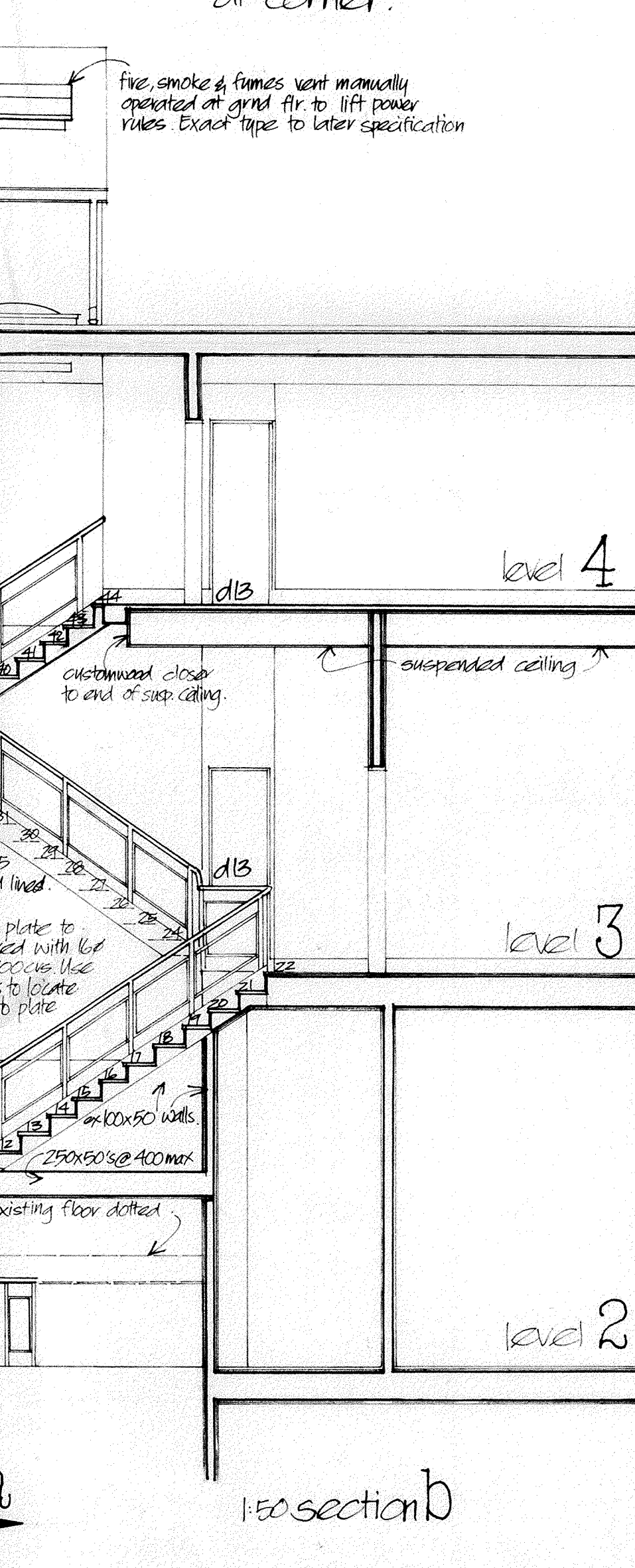
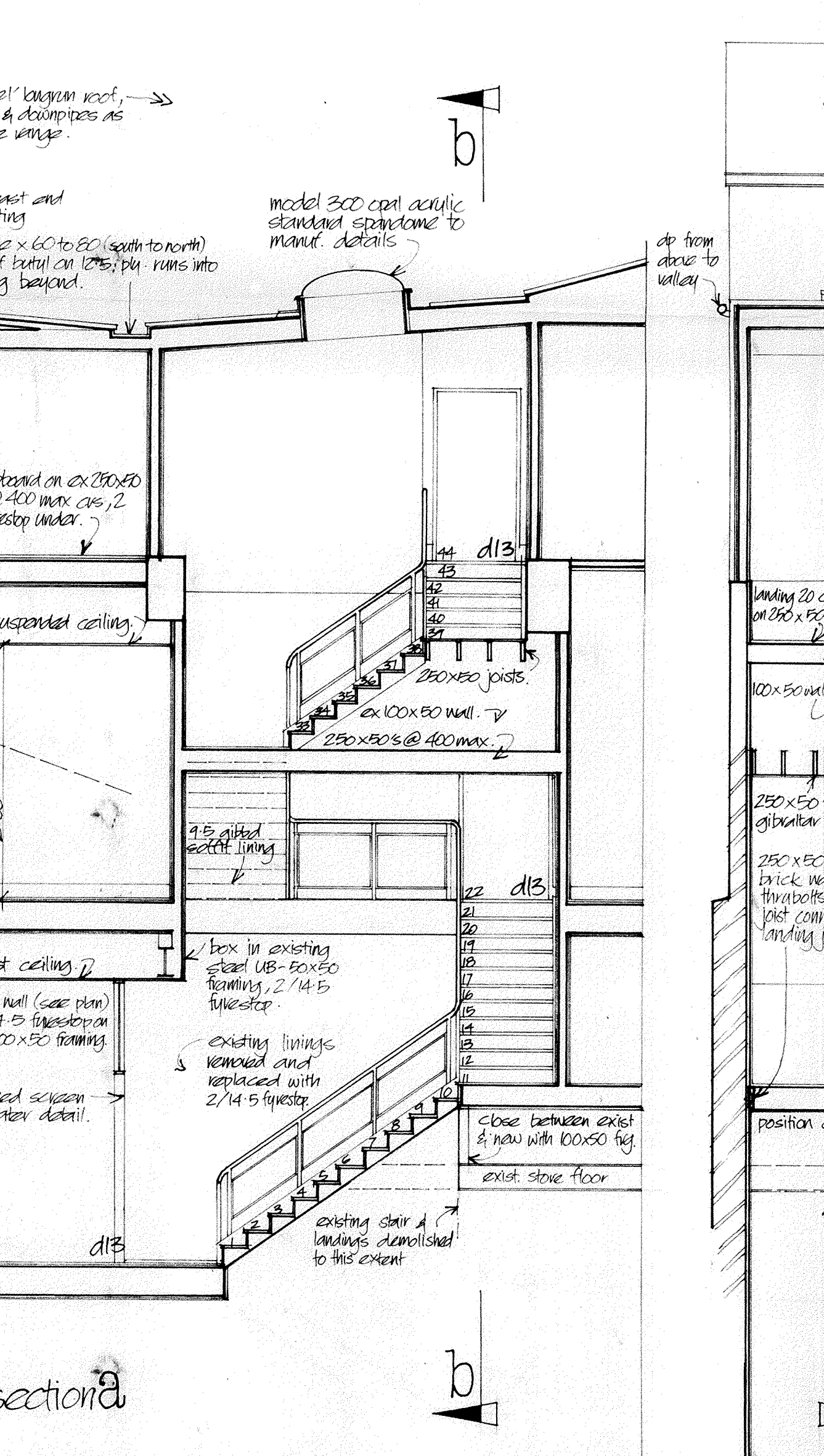
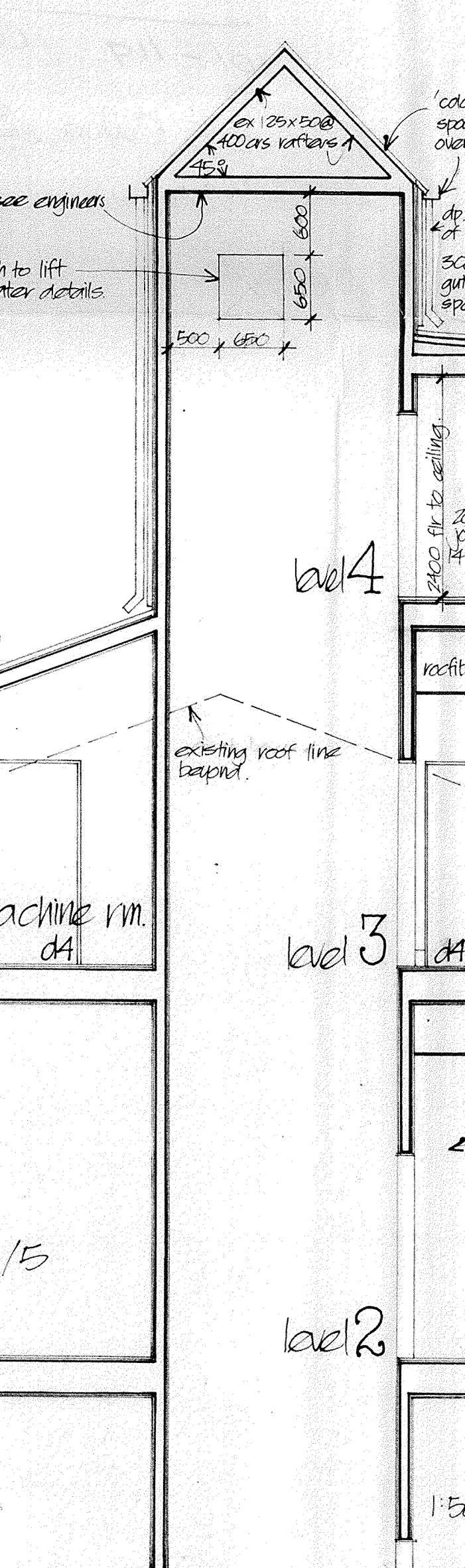
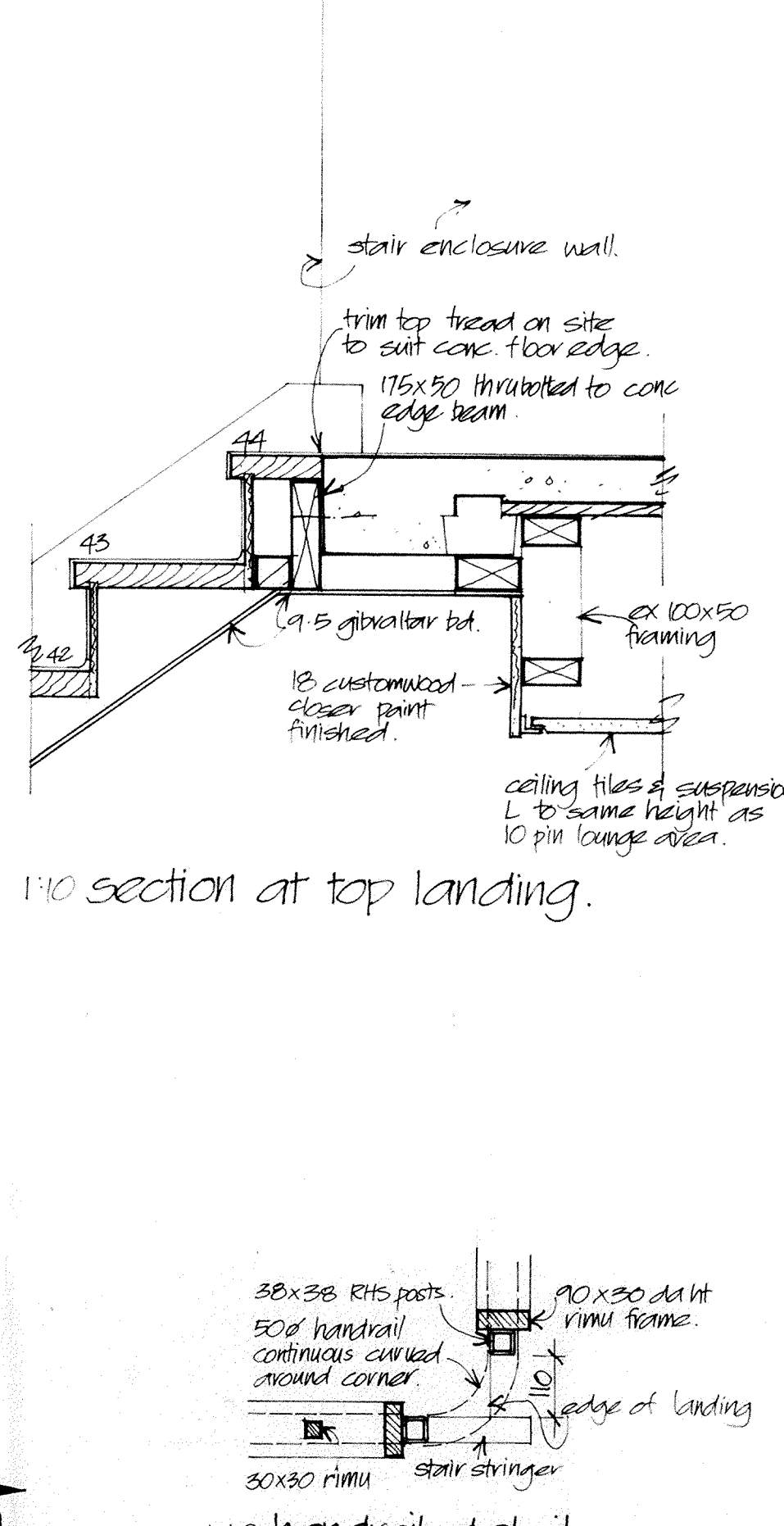
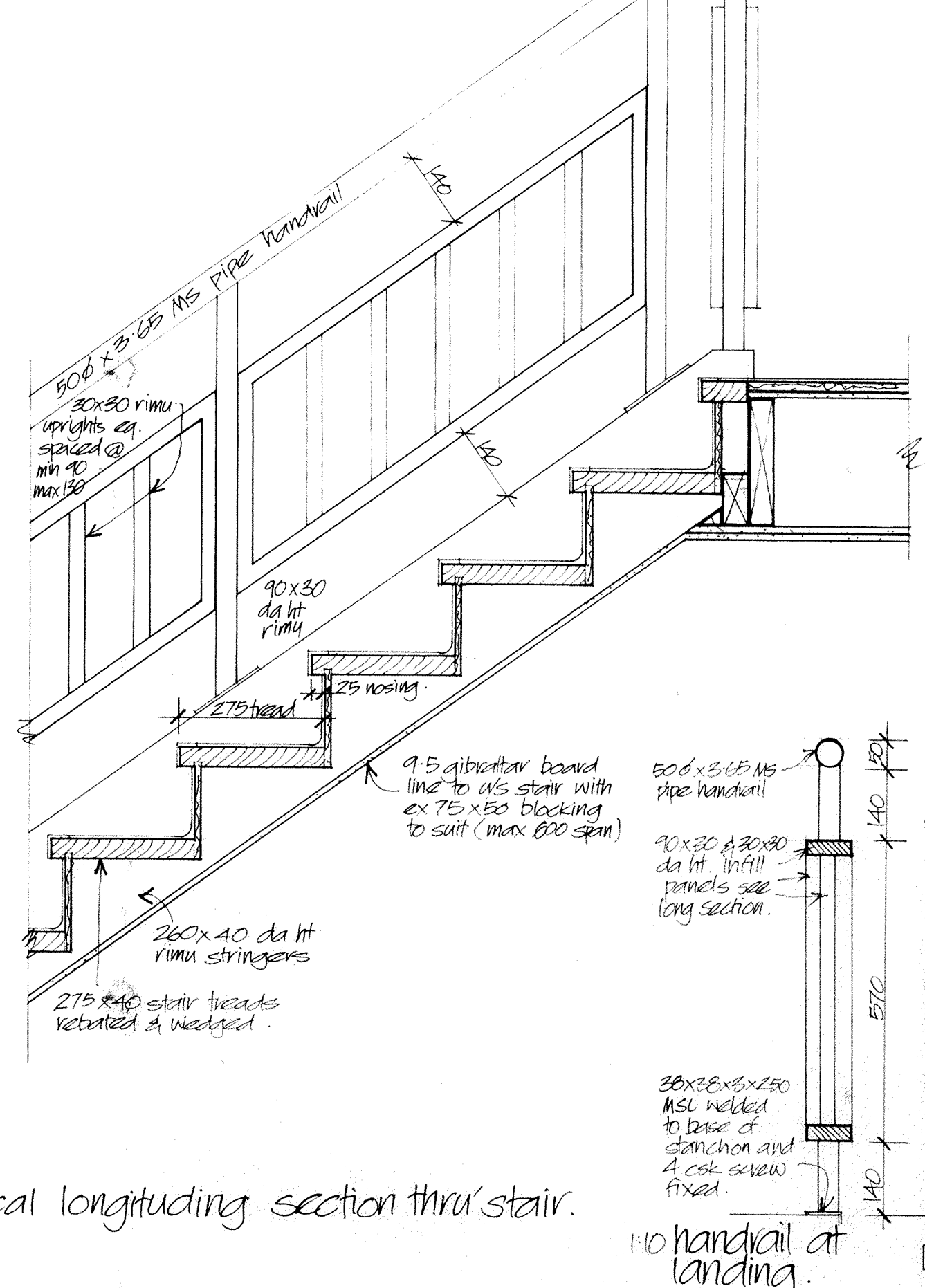
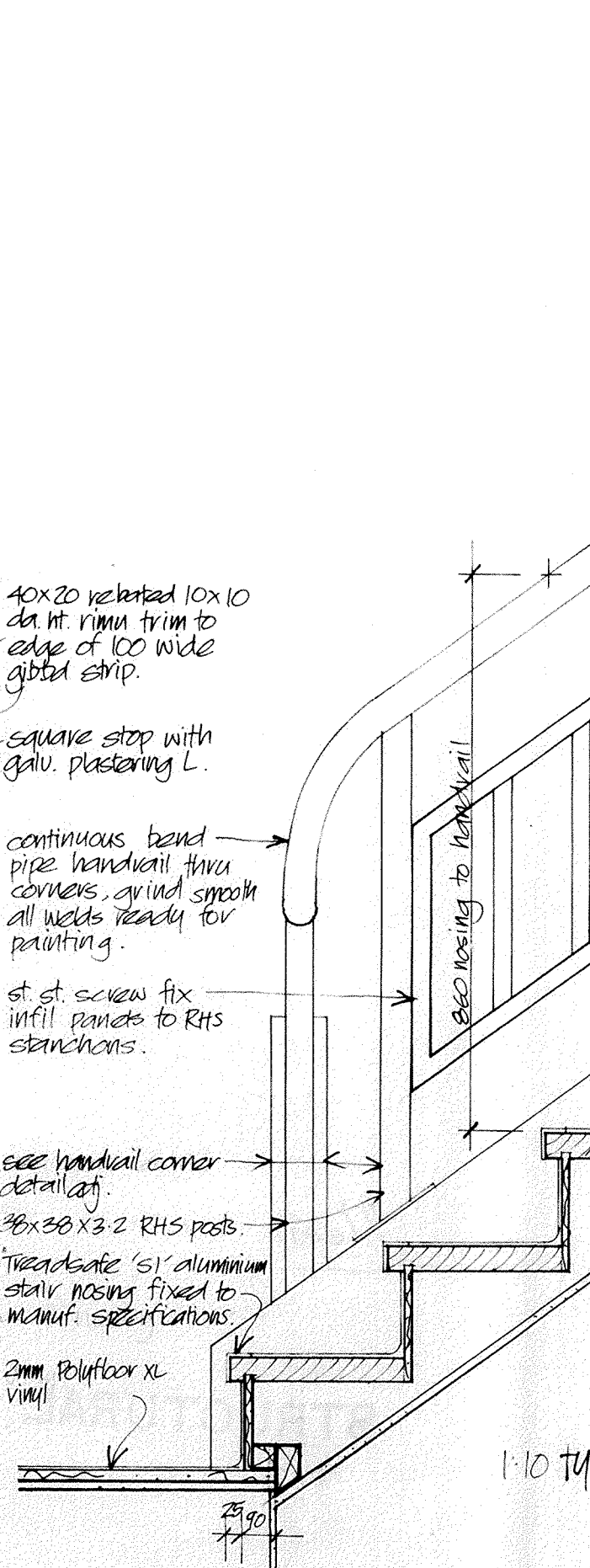
275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.

275x40 da hit rimu stringers.



revisions:
A: 4 Feb 88 general revisions

Wellington Working Mens Club and Library Institute
strengthening and alterations - 2nd & 3rd floors

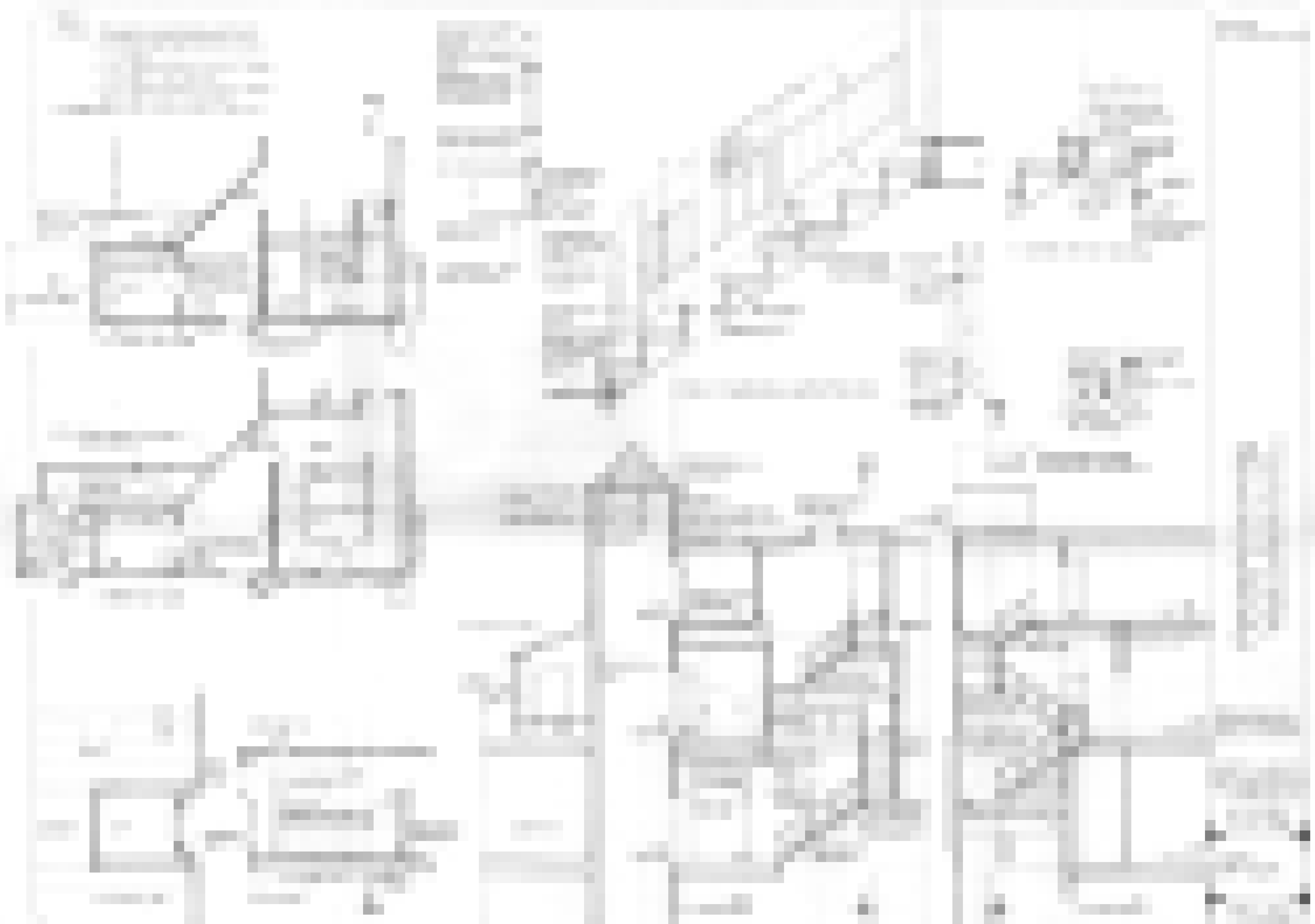
SMITH LEACHES LTD
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WELLINGTON

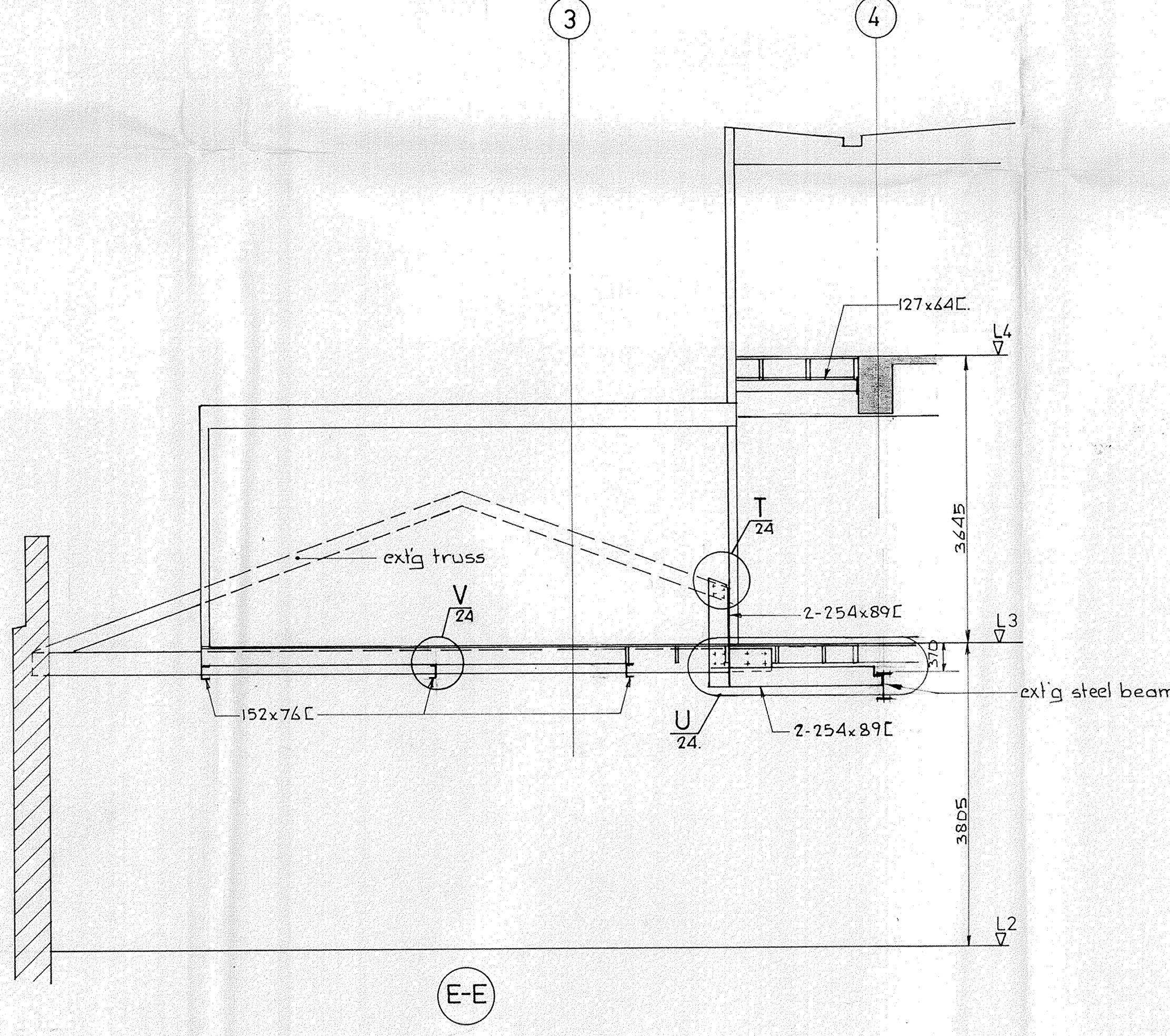
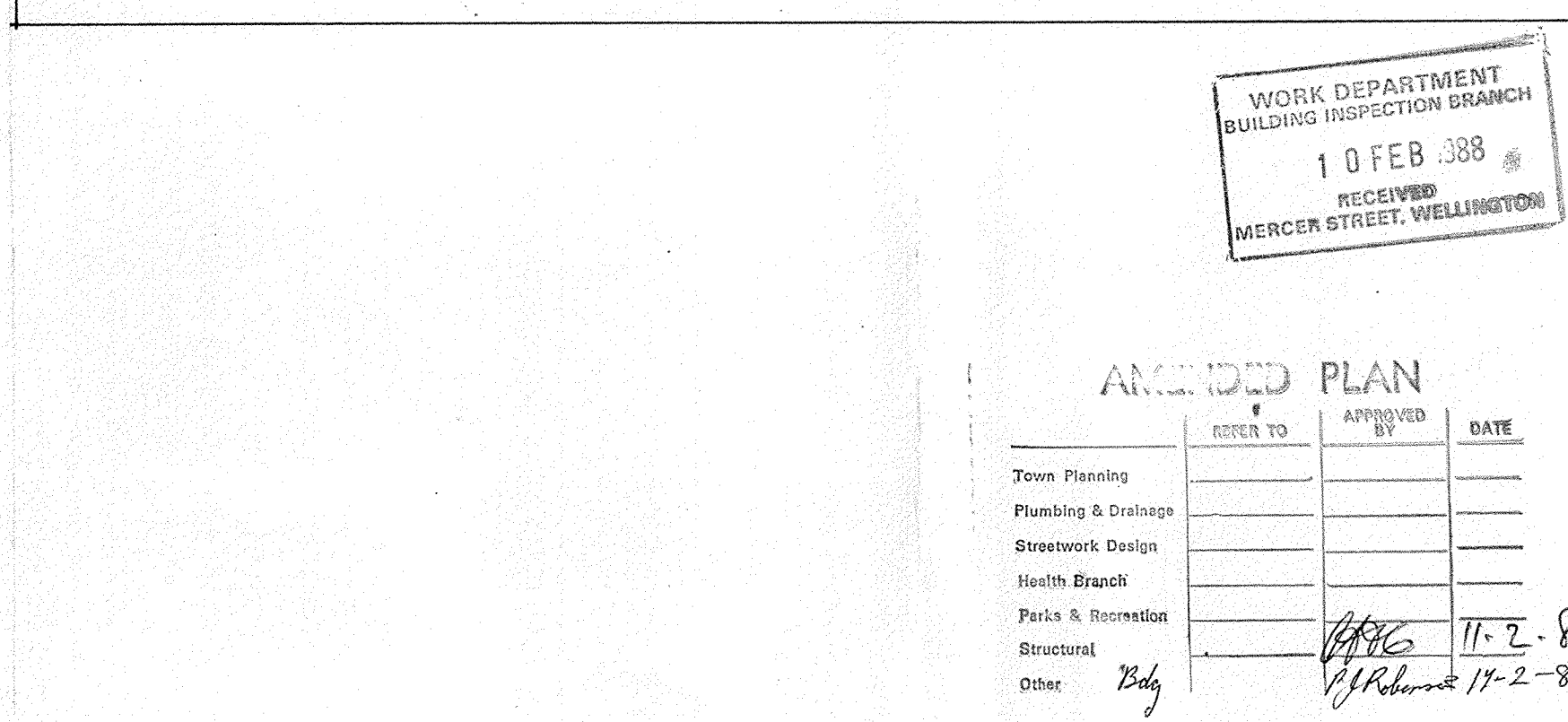
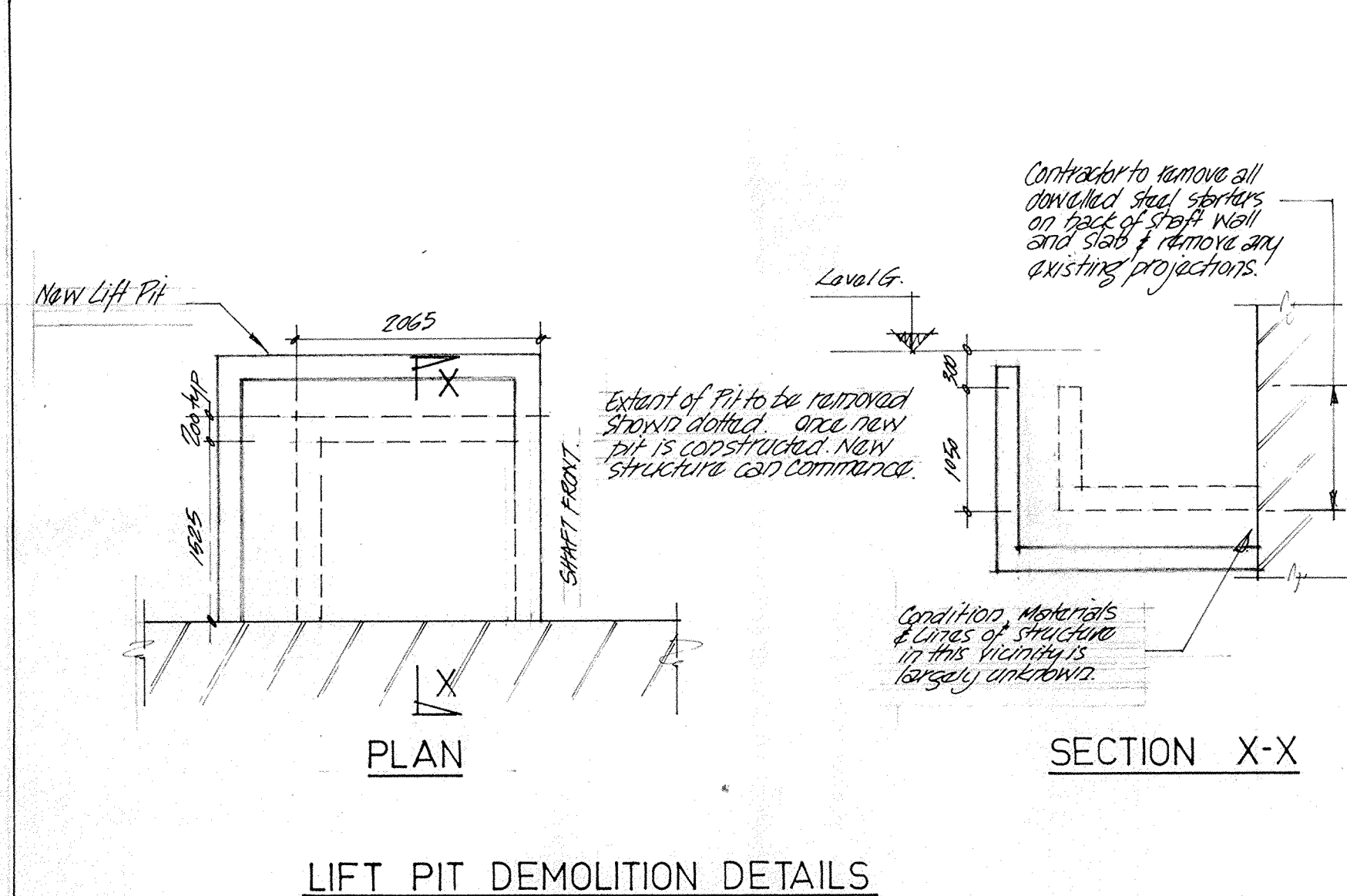
Keith Wilson
architects
Wellington

phone (04) 7308834
po. box 12361 Wellington

stair 1
lift shaft

7915a A36a





FOR CONSTRUCTION

[illegible]

1. Removal of existing shaft rails and lift motor room equipment to be carried out by others prior to access being given to contractor.
2. Contractor to erect fully dust proof screens with sealed access doors into shaft as and where required by him to enable work to proceed within the shaft without undue disruption to the plant & his members.
3. Contractor to ensure that the lift shaft remains fully water tight during all operations. Any resulting damage and removal operations consequent to inadequate protection shall be at his expense.

1	ELL	24/11
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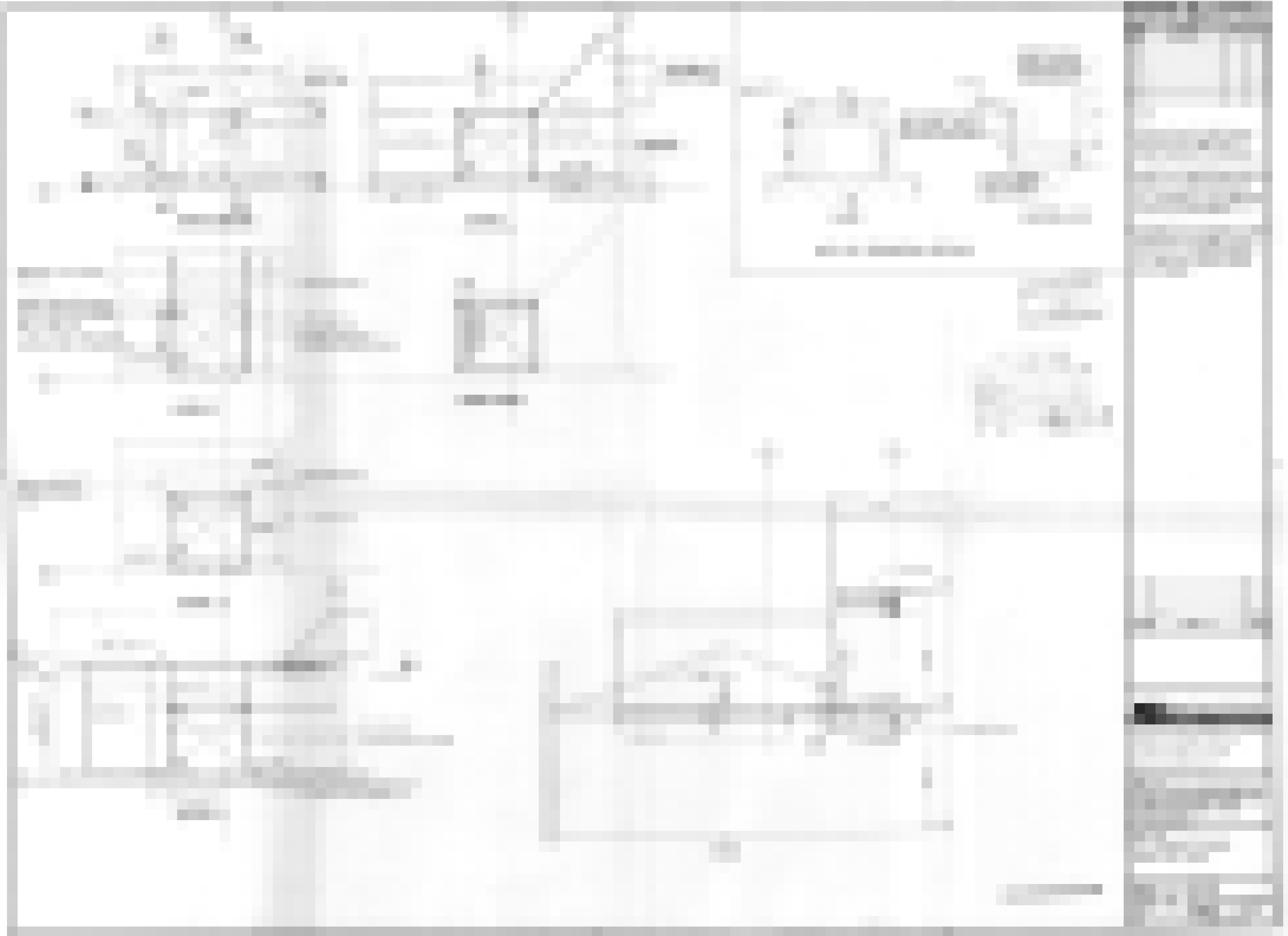
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JOB TITLE
WELLINGTON WORKINGMENS
CLUB & LITERARY INSTITUTE
STRENGTHENING AND
UPGRADING

DWG TITLE
LIFT SHAFT PLANS.
AND SECTION.

DRAWN J.v.d.L.	SCALES 1:50	
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APP'D	DWG NR 1868L/21	REV
DATE Jan '88		



[illegible]

Journal of Management Studies, 19(6), 701-718.

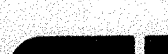
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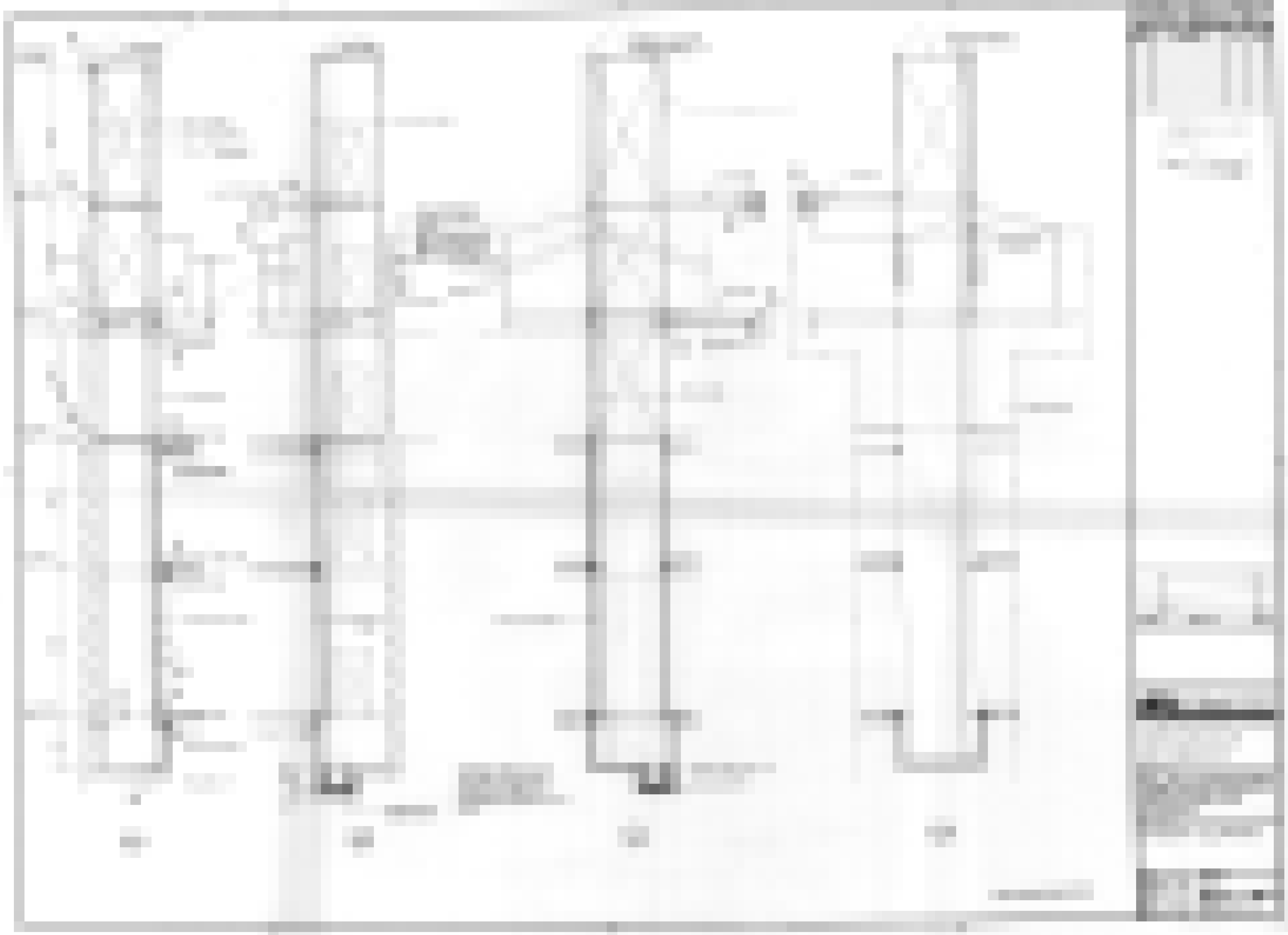
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STRENGTHENING AND
UPGRADING

DWG TITLE
LIFT SHAFT ELEVATIONS

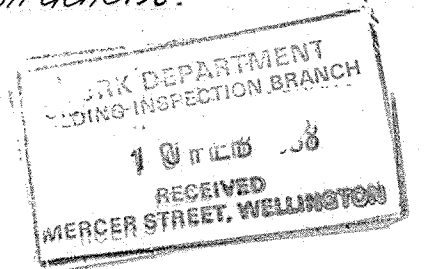
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APP'D	DWG NO	REV
DATE Jan. '88	1868L/22	





CONTRACTORS MUST VERIFY ALL DIMENSIONS AT THE JOB BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED BEFORE MANUFACTURE.			
ISSUE	AMENDMENT	BY	DATE

Notes.
 1. All welds to be 6mm F.W. unless noted otherwise.
 2. All structural steel to be painted with 2 coats red oxide primer Hb-441 or equivalent. All work to be undertaken in strict accordance with manufacturers instructions.



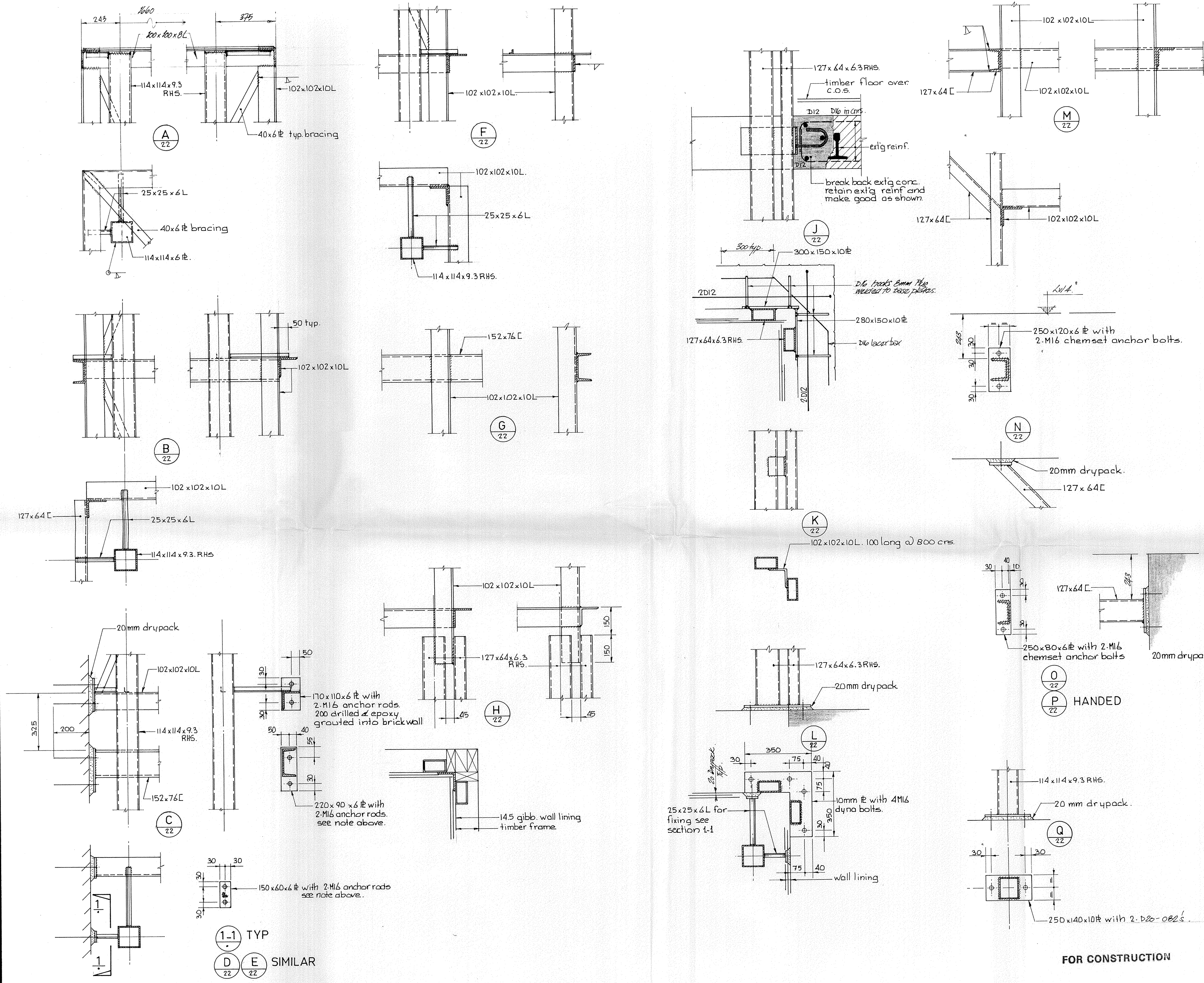
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JOB TITLE
 WELLINGTON WORKINGMENS CLUB & LITERARY INSTITUTE STRENGTHENING AND UPGRADING

DWG TITLE
 LIFT SHAFT STRUCTURAL STEEL SECTIONS.

DRAWN J.v.d.L	SCALES 1:10
CHECKED	
APP'D	DWG NO 1868L/23
DATE Jan. '88	REV



FOR CONSTRUCTION

附錄

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A black and white photograph of a large, multi-story building with a prominent central tower and many windows, likely a government or institutional building. The building has a classical architectural style with a central vertical axis and symmetrical wings. The image is somewhat grainy and has a high-contrast, almost graphic quality.