

# IAN C. SMITH CONSULTANTS

CIVIL STRUCTURAL AND EARTHQUAKE ENGINEERS

1st FLOOR  
BRAEMAR  
32 THE TERRACE  
P.O. BOX 10153  
TELEPHONE: 739-175  
WELLINGTON N.Z.

The City Engineer,  
Wellington City Corporation,  
P.O. Box 2199,  
WELLINGTON

1004

10 October, 1979

Attention: Mr K.S. Mulholland

Dear Sir,

WELLINGTON WORKINGMEN'S CLUB & LITERARY INSTITUTE  
CUBA STREET, WELLINGTON  
STRENGTHENING & UPGRADING - YOUR REF. KSM:hdn 6/2087

We refer to letters from Brickell, Moss, Rankine & Hill dated 2 February, 1978 and 7 March, 1978 and your replies dated 28 February, 1978 and 30 March, 1978.

Planning has now been completed for upgrading of the above building in two stages which comprise:

Stage I                      north building upgrading  
Stage II                     south building upgrading

Plans have been submitted to the Town Planning branch of your office and approval obtained to the planning arrangements in principle.

We write now enclosing outline drawings of our updated proposal for strengthening the north building - Stage I, seeking your confirmation that the upgrading in the form now illustrated meets with the general principles you had previously accepted.

We are now proceeding with documentation of working drawings for Stage I and will be depositing these for permit purposes in the first week in November. In the meantime we enclose a preliminary copy of the calculations for your perusal. These can be updated at the time of the permit application.

Yours faithfully,

Ian C. Smith

ICS:amh

Encl:

Drainage Plan No. 8170Sheet No. P28**BUILDING APPLICATION FORM**

WELLINGTON

Date 30<sup>th</sup> Oct 19 79To the City Engineer,  
Wellington

Sir,

I hereby apply for permission to ~~Convert~~

Reinstate

~~Demolish~~at 117 Cuba St for(House No. 117 Street)

WELLINGTON

(Owner's Address)

(Owner)

according to Plans

and Specifications deposited herewith.

Particulars of Land Lot No. 1. CT 605/212Town Acre 15298  
or D/PFrontage 50.41 m by Depth of 28.66Area 1375.8 m<sup>2</sup>Particulars of Building — Foundations Concrete Pile Walls Concrete Block Roof TimberArea of Ground Floor As existing

Estimated Value of Work:

Number of Storeys 3 Building \$ \$37,600Area of Outbuildings — Drainage \$ \$4,000 NANumber of Occupants As previously advised Plumbing \$ \$20,000 NAWater Fee \* A/P Mechanical Services \$ —

Plumbing

TOTAL \$ \$376,000-00TOTAL \$ \$400,000Signed by Applicant IAN C SMITH

IAN C SMITH CONSULTANTS

Full Name of Building Company to be advised

(Please Print)

Full Postal Address of Building Company

Telephone No. of Building Company 739175

C.E.354



R.W. McFarlane P.P. H.E. McFarlane  
Building Superintendent

Date 14 - 1 - 80.

Dear Sirs

Expiry date: ...../...../197.....

The Economic Stabilisation (Building Registration and Construction)  
Regulations 1974

Registration  
number

8|0|0|1|0|4|6

Pursuant to these regulations the issue of a building permit has been considered and is authorised immediately/deferred to allow construction to commence in .....(month) .....(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,

\* ~~ESTIMATED~~ VALUE \$400,000

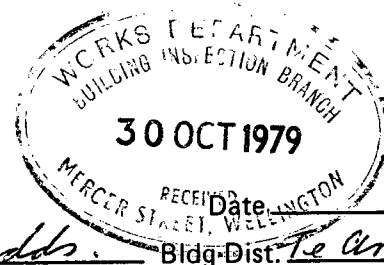
STAGE 1

P.G. Walker  
Building Projects Authority

\* VALUE OF  
PERMIT. } \$376,000 ✓

P.W. 753A (Rev. 11/74)

WORKS DEPARTMENT  
BUILDING BRANCH



Locality 101-117 Cuba St. Wellington

Owner Wellington Working Mens Club Application for Club building add.

Date 30 OCT 1979 Bldg Dist. Le Ave

Revision of C.E. 604

	Checked By		Date
	Receiving Inspt.	Senior Inspt.	
1. Building Permit Application fully completed. <input checked="" type="checkbox"/>			
2. Documents Received: Plan Sets <input checked="" type="checkbox"/> Specifications <input checked="" type="checkbox"/> Calcs <input checked="" type="checkbox"/> Water form <input type="checkbox"/> Govt Clearance <input checked="" type="checkbox"/> <u>CHECK FOR GVT. CTS.</u>			
3. Plans Show: Elevations <input checked="" type="checkbox"/> Sections <input checked="" type="checkbox"/> Construction <input checked="" type="checkbox"/> Architect's Signature <input checked="" type="checkbox"/>	X	<u>[Signature]</u>	<u>31/10/79</u>
4. Fully dimensioned site plan & Road frontage <input checked="" type="checkbox"/>			
5. Drainage Plan <input checked="" type="checkbox"/> Parking Area <input checked="" type="checkbox"/>			
6. Contour Plans including Longitudinal Section through vehicle access from kerb <input checked="" type="checkbox"/> <u>FLAT ACCESS</u>			
ACTION TAKEN ON ABOVE: 1-6 <u>proceeding with previous permit application</u>			
	Dist. Inspt.		
7. Excavation <input checked="" type="checkbox"/> Retaining <input type="checkbox"/> Disposal of Spoil <input checked="" type="checkbox"/>			
8. Ground Conditions: Fill <input type="checkbox"/> Natural <input checked="" type="checkbox"/>			
9. Demolitions <input checked="" type="checkbox"/> Hoardings <input type="checkbox"/> Gantry <input checked="" type="checkbox"/>			
10. Special Licences etc. Refer to -			
11. Encroachments <input type="checkbox"/> Building Line Restriction <input type="checkbox"/>			
12. Egress Refer to - <u>Mr Cross &amp; A Philhellen St.</u>			
MISCELLANEOUS NOTES: <u>* RESERVE CONTRIBUTIONS \$1880.00</u>			
13. Water Board			
14. Town Planning Dept.	<u>[Signature]</u>	<u>[Signature]</u>	<u>13/11/79</u>
15. Plumbing & Drainage Branch	<u>[Signature]</u>	<u>[Signature]</u>	<u>22/11-79</u>
16. Streetworks Design Branch		<u>[Signature]</u>	<u>21/11/79</u>
17. Dist. Engineer: Deposit \$			
18. Other Departments:			

19. Unit Titles, etc.

HEALTH

\* DISTRICT ENGINEERS???

STRUCTURAL 2/11/79

15 No plumbing or drainage authorised under this permit.  
Any Plumbing or drainage work required during this stage to be carried out by licensed tradesmen under a separate permit & fees paid.

Inspector:

House No.

Lot

Sec.

D.P.

Road  
Street

Description:

Occupier:

Owner and Address:

Inspection Dates

Approved by Health.

John Anderson.

3/11/79.

All works to comply with Health Branch  
Requirements

**WORKS DEPARTMENT**  
**CHECKING & COMMENTS FORM**  
**Structural Branch to Building Branch**

Code

3

**Nº 3716**

CE 1061

NATURE OF WORK <i>new Building</i>		Dates when Plans Deposited	1 <i>10/10/79</i> 2 3
NAME OF OWNER <i>Wellington Workington Club &amp; Literary Institute</i>		Dates received Structural Office	1 <i>NOVEMBER 5</i> 2 3
ADDRESS OF NEW WORK <i>St. James Street</i>		Date Calculations Received in Structural Office	1 <i>NOVEMBER 5</i> 2 3
CONSULTING ENGINEER <i>San. C. Smith</i>		Date of Inspection Time	<div style="display: flex; justify-content: space-between;"> <span>A.M.</span> <span>P.M.</span> </div>
ARCHITECT <i>K. Wilson</i>		Dates Returned to Building Branch	1 <i>8/11/79</i> 2 3
BUILDER		Date Letter Sent File	1 2
PROPOSAL		Signature	Referred Action required
	REFERRED BACK		
	ACCEPTED	<i>DKambers</i> <i>8/11/79</i>	

ACCEPTANCE SUBJECT TO FOLLOWING CONDITIONS:-

1. Engineer to supply further structural steel fixing details.
2. All concrete block walls MUST have reinforcing steel in both directions i.e. vertically and horizontally.
3. All columns having 8 or more vertical bars must have extra internal ties.
4. Proprietary flooring system yet to be decided. Contractor to submit design and detailed drawings to N.C.C. for approval.
5. Engineer to supervise.

Building Branch,  
Works Department,  
WELLINGTON CITY COUNCIL.

10 December, 1979

A D D E N D A      S H E E T

WELLINGTON WORKINGMEN'S CLUB AND LITERARY  
INSTITUTE : STAGE I : STRENGTHENING AND  
ALTERATIONS : CUBA STREET PREMISES:

1. 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.
2. 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.
3. 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.
4. Notify Building Inspector before pouring any concrete and prior to fixing internal linings.
5. An amended party wall agreement between the building owners and shall be recorded in a form and manner to the approval of the City Engineer.
6. No building work is to encroach on to public property (doors from Cuba Mall to new stair appear to encroach over site boundaries when opened.
7. All doors to stair enclosures and smoke stop lobbies are to be Type "A" smoke stop doors fitted with approved self-closers. Walls forming the stair enclosures shall comply with the requirements of NZSS 1900 Chapter 5, Clause 5.22.4.2.
8. Glazing to stair enclosures and smoke stop doors is to be 6mm Georgian wired glass in sizes not exceeding 1.1m<sup>2</sup>.
9. Handrails to stairs to be provided to comply with the requirements of NZSS 1900, Chapter 5, Clauses 5.43 and 5.44.
10. The restriction of the roof space and suspended ceilings areas shall be in accordance with the requirements of NZSS 1900, Chapter 5, Clause 5.23.5 and 5.24.
11. Exit and directional signs illuminated by both the mains and emergency

power supplies are to be provided to all exitways. All fire exit doors are to be opened without the use of keys and to open in the direction of exit travel.

12. The emergency lighting system is to be extended to cover all newly formed areas.
13. The existing fire alarm system is to be extended to give complete coverage to all areas of the building, and the thermal detection system is to be amended accordingly.
14. Fire hose reels are to be provided on each level; the fire hoses are to be of sufficient length to cover all floor areas with a maximum length of 25 metres per hose reel.
15. Provide a 3.18 kg C.O.<sub>2</sub> fire extinguisher, or its equivalent in BCF, in an accessible position 900mm from floor level in the kitchen.
16. An asbestos blanket is to be provided and positioned in an accessible site adjacent to any deep frying unit.
17. The surface finish to walls and ceilings is to comply with the requirements of NZSS 1900, Chapter 5, Clause 5.67.
18. Floors and floor coverings are to comply with the requirements of NZSS 1900, Chapter 5, Clause 5.68.
19. Any drapes or curtains are to be either made from non-combustible material or to be suitably treated with an approved fire retardent solution.
20. All other requirements as outlined in the letter of the Chief Fire Officer are to be fully complied with.

21. PLUMBING AND DRAINAGE REQUIREMENTS:

No plumbing and drainage authorised under this permit. Any plumbing and drainage work required during this stage to be carried out by licensed tradesmen under a separate permit and fees paid.

22. STRUCTURAL BRANCH REQUIREMENTS:

- 1) Engineer to supply further structural steel fixing details.
- 2) All concrete blockwalls MUST have reinforcing steel in both directions, i.e. vertically and horizontally.
- 3) All columns having eight or more vertical bars must have extra internal ties.
- 4) Proprietary flooring system yet to be decided. Contractor to submit design and detailed drawings to Wellington City Council for approval.
- 5) Engineer to supervise.

23. HEALTH BRANCH REQUIREMENTS:

All works to comply with Health Branch Requirements.

BUILDING CONTRACTOR'S FULL NAME: UNIT CONSTRUCTION COMPANY LIMITED

UPLIFTED BY:

DATE:

16/1/80

WELLINGTON CITY COUNCIL  
WORKS DEPARTMENT BUILDING BRANCH  
PAYMENT ADVICE (PLEASE FORWARD WITH YOUR PAYMENT)

TO Department of Administration & Finance

(Postal Address: — The Town Clerk, P.O. Box 2199, Wellington) N<sup>o</sup> 4017

Received From: Mr Tait Unit Construction Ltd  
of (Postal Address) P.O. Box 2462, Motuea

By Cash/Cheque Being Building Permit For: Wellington Workmen's Club  
At: 101-117 Cuba Str (stage 1)

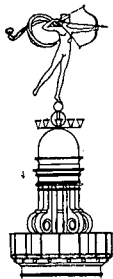
Account	Item	Activity	Payments	
Deposit No.			Access Guarantee Deposit	\$ _____
225	971	E09.042	Light Duty Crossing	\$ _____
225	972	E09.044	Builders Road Fee	\$ _____
225	970	E09.040	Heavy Duty Crossing	\$ _____
Permit Fees				
294	902	E04.058	Water	\$ _____
065	955		Inspection of Works/ Documents	\$ <u>751-90</u>
263	902	E05.042	Drainage	\$ _____
263	902	E05.042	Plumbing	\$ _____
263	902	E05.042	Mechanical Services Plumbing	\$ _____
704	902		Building Research Levy	\$ <u>376-00</u>
Miscellaneous Payments				
Deposit No.			Road & Footpath Deposit	\$ _____
263	940	E05.050	Sewer & Stormwater Disconnection	\$ _____
294	940	E04.191	Water Disconnection	\$ _____
<u>768</u>	<u>909</u>		<u>Reserve Contribution</u>	<u>\$ 1880-00</u>
				\$ _____
				\$ _____

TOTAL \$ 3007-90

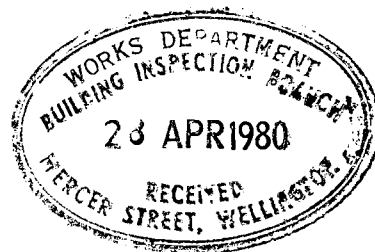
Rates Office Machine Receipt No. 01-233-768909

Signed [Signature] Date 10/1/90





KEITH WILSON  
ARCHITECT  
BOX 12321  
WELLINGTON  
PH. 735-633



*For George Skinning.*

*Wellington Workingmens Club*

*Additional Details for  
Building, plumbing, Heater.*

*Thankyou.*

*Keith Wilson*

5 June 1980

Plumbing & Drainage Addenda Sheet,  
Alterations to Wellington Working Mens Club  
& Literary Institute,  
101-117 Cuba Street,  
WELLINGTON, 1.

- (1) Prefabricated metal grease trap to conform to Wellington City Council requirements. Both hot and cold water to be provided adjacent to grease trap 75 mm vent required from above water line of grease trap to above roof.
- (2) Floor outlet pipes from kitchen area's to discharge to Tandish connected to inlet side of grease trap top of tandish to be not less than 150 mm above level of grating on inlet side of grease trap.
- (3) Combined floor outlet pipes to be extended above roof level as a vent.
- (4) An approved strainer is to be fitted to the potatoe peeler.
- (5) Owners to make application for a double check valve assembly back flow preventer to be connected before spray dish rinse fitting.
- (6) Drain pipes from pressure relief valves on mains pressure hot water cylinders to discharge to an approved position outside building.
- (7) All ventilating ducting to conform to N.S.S. 1900 5:70.
- (8) Lobby to womens toilet area, second floor to be ventilated or alternatively door from passage to be deleted.
- (9) All work to conform to Drainage and Plumbing Regulations 1978 and Wellington City Council Bylaws.

*All this work carried out under separate  
Plumbing permit  
J.C. Blanchard.*

Enc

SPECIFICATION

of



WORKS TO BE EXECUTED AND MATERIALS TO BE USED

in the

ERECTION AND COMPLETION

of the

STRENGTHENING AND UPGRADING, CUBA STREET, WELLINGTON

for the

WELLINGTON WORKINGMEN'S CLUB & LITERARY INSTITUTE

ENGINEER:

IAN C. SMITH CONSULTANTS  
P.O. Box 10153  
The Terrace,  
WELLINGTON

ARCHITECT:

K. WILSON  
92 Cecil Road  
Wadestown,  
WELLINGTON 1

QUANTITY SURVEYOR

HALLAM-EAMES & PARTNERS  
P.O. Box 2496  
WELLINGTON

NOVEMBER, 1979

# INDEX TO TRADES

	<u>Page Nos</u>
B. DEMOLITION	25
D. CONCRETOR	27
E. STRUCTURAL STEELWORK	42
F. BLOCKLAYER	47
G. PLASTERER	52
H. CARPENTER	
J. JOINER	
K. ROOFER	
L. PLUMBER	
P. ELECTRICIAN	
R. GLAZIER	
S. PAINTER	

CONTRACT FOR STRENGTHENING AND UPGRADING OF PREMISES AT  
107 CUBA STREET, WELLINGTON

INSTRUCTIONS TO TENDERERS

1. Tenders close at 4.00 p.m. on 27 November, 1979 at the office of the Engineer, Ian C. Smith Consultants (1st Floor, Braemar, 32 The Terrace, Wellington).
2. Tenders shall be enclosed in a sealed envelope marked "Strengthening and Upgrading Contract, 107 Cuba St. Wellington" and shall comprise the following:
  - (a) a completed and signed Form of Tender and Appendix in triplicate.
  - (b) a deposit of \$500 in accordance with the General Conditions of Contract, NZS 623:1964 (Part II). (The cheque shall be made payable to 'Ian C. Smith Consultants Trust Account').
3. The Principal is not bound to accept the lowest or any tender.
4. The Contractor's special attention is drawn to the "Remeasured Schedule" nature of the contract as outlined in section A1.04 of this Specification.
5. The Tenderer's special attention is drawn to Insurance provisions, Clause A1.09 et seq in the documents. Tenderers will be required to offer proof of satisfactory insurance arrangements before acceptance of their tender.

FORM OF TENDER

TO: The Wellington Workingmen's Club & Literary Institute  
C/- Ian C. Smith Consultants  
Braemar,  
32 The Terrace,  
WELLINGTON P.O. Box 10153

I/WE \_\_\_\_\_

of \_\_\_\_\_

hereby tender for the construction of the works detailed on the contract drawings and specification labelled "Strengthening and Upgrading, Stage I", Contract 1004 and in accordance with the appended copies of the Conditions of Contract, NZS 623:1964 for:

\$ \_\_\_\_\_

(in words) \_\_\_\_\_  
\_\_\_\_\_ )

We have inspected the site, examined the contract documents and prepared our tender in accordance with them. If our tender is accepted we undertake to complete the works within \_\_\_\_\_ weeks from date of authorisation to proceed.

We undertake to complete the work within the retail areas within the number of weeks for each area as below.

Fuller Fultons Delicatessan (stages 1-4)	... weeks	Stage 5	... weeks
London Bag Store (stages 1 & 2)	... weeks		
Eatox Butchery (stages 2, 3 & 4)	... weeks		
Pearl River Restaurant (stages 3 & 4)	... weeks		

Rates are given for all items of work given in the "Schedule of Quantities".

My/Our Surety will be \_\_\_\_\_

Signed \_\_\_\_\_

Name of Tenderer \_\_\_\_\_

Date \_\_\_\_\_

Address for Serving of Notices \_\_\_\_\_

A. SPECIAL CONDITIONS OF CONTRACT

Al.0 GENERAL INSTRUCTIONS

Al.01 TENDERS

Tenderers are notified that tenders are being invited for the structural strengthening and upgrading of premises at 107 Cuba St., Wellington.

The works are as illustrated, detailed and described in the accompanying drawings and subsequent sections of this specification.

Al.01.01 Submission

Tenders shall be submitted in triplicate on the Tender Forms supplied, together with a deposit of \$500 in accordance with the General Conditions, Clause 2.3.1. They shall be in sealed envelopes clearly endorsed:

"Strengthening and Upgrading Contract, 107 Cuba St. Wellington"

and shall be delivered by hand to the office of the Consulting Engineer, Ian C. Smith Consultants, 1st floor, Braemar, 32 The Terrace, Wellington, not later than 4.00 pm on Tuesday, 27 November, 1979. Tenders submitted after the stated time of submission, or after any extensions authorised by the Engineer, will not be considered.

Each tenderer shall provide all facilities for the Principal and his Consultant to analyse his tender, and shall supply any additional information requested by the Engineer and/or Quantity Surveyor during the analysis. Should any tenderer fail to sign a contract within (7) days of receipt of written notice to do so from the Engineer, his tender may be cancelled.

Submission of a tender shall be construed as indicating that the Tenderer has made himself familiar with the tender documents and with their intent and has clarified to his complete satisfaction anything appearing to be incomplete or ambiguous arising therefrom.

Tenderers are strongly advised to inspect the site and surroundings as it will be assumed that they will have become fully informed as to the extent and nature of the work and to the access and the security arrangements which exist.

Prior to the submission of tenders the Engineer will be available by appointment to conduct tenderers through the building to indicate the nature of the existing building. The provision of this service by the Engineer will in no way relieve the tenderer of his responsibility to fully acquaint himself with the requirements of the contract.

The successful tenderer will be required to enter into an agreement under bond with the Principal to carry out this contract as defined by the contract documents. The amount of the bond shall be forty thousand dollars (\$40,000). One approved surety, being a

Al.01.1 Cont'd

bank, insurance company or bonding company, will be required.

Al.02 TIME

The date for completion of the whole works shall be as nominated on the tender form.

Tenderers are advised that the lower floor (ground floor) of the premises are occupied by tenants and that provision has been made in the tenancy leases for the tenants to co-operate with the Contractor for specified periods of time when the Contractor will need access to carry out strengthening works. It is essential that the Contractor carry out his work in the retailing areas after the completion of the Christmas rush period and preferably as early as practicable in the New Year. Tenderers are also advised that the work in the retail areas shall be carried out in stages occupying the limited areas for the stages as shown on the drawings. It is essential that the strengthening work required to be carried out in the retail tenancies be completed as quickly and as expeditiously as possible, and with the minimum of disruption to the tenants. The Contractor shall nominate in his Form of Tender the time required in each retail tenancy.

The liquidated damages as defined in Clause 11.6.1 shall be for:

- (a) the non-completion of the retail tenancies in the time specified, the amount of \$            per week for each tenancy uncompleted.
- (b) the non-completion of the total contract, the amount of \$            per week.

No bonus for early completion of any part of the contract will be paid.

Al.02.1 Time Schedules & Programming of the Work

Tenderers attention is drawn to the need to maintain a reasonable customer and tenant flow pattern to all areas of the retail tenancies during the progress of the works. The retailing interests of the tenants are to be protected at all times. To assist with these requirements, the Engineer has prepared work area sequence drawings for the various tenancies within the building (refer drawing 7915/A

The Contractor shall conform to the specific work areas and broad construction sequence as indicated on the drawing.

Each tenderer shall submit with his tender a time schedule based on defining all critical trades and in sufficient detail to illustrate his appreciation of the order of the works necessary to complete the works within the nominated time frames. The above schedule shall also include details of the proposed storage, craneage, access to various levels in the building,



Al.02.1 Cont'd

and give a nominated overall contract period.

Within two weeks of being awarded the Contract, the Contractor shall submit to the Engineer a detailed bar chart construction schedule prepared in one of the recognised systems of critical path scheduling, showing each and every trade associated with the work and to a presentation standard acceptable to the Engineer.

In preparing his construction programme, the Contractor is advised to consult with the Engineer before the final copy of the construction programme is submitted. The Contractor's construction programme shall be agreed by the Principal and his Consultants as it is essential that this construction programme for the retail tenancies and the Club premises conform to the broad outline of construction areas shown on the drawings.

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.

Al.02.2 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 instructions in connection with the work as shall be reasonably necessary and shall have been applied for in writing by the Contractor.

Al.02.2 Cont'd

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 required 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.

Al.03 CONTRACT DOCUMENTS

The Contract Documents shall mean the following:

- (a) The Conditions of Contract NZS 623:1964
- (b) The Specification
- (c) The Provisional Contract Drawings
- (d) The Provisional Schedule of Quantities
- (e) The Contractor's tender
- (f) The Bond
- (g) 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 30 November, 1979.

Al.04 NATURE OF CONTRACT

The nature of the contract is a Schedule of Quantities contract which is formulated in the following manner.

The tender shall consist of a provisional lump sum figure based on provisional drawings and schedules of provisional quantities for preliminaries, dayworks, demolition, concretor, blocklayer, precast flooring, reinforcing steelworker, structural steelworker, and carpenter, and provisional lump sum figures prepared by the Employer's consultants for all other trades.

On acceptance of a tender it is envisaged that an order to commence work on site would be given on 4 December, 1979. Final documents for the trades nominated above would be substantially completed at that date to enable the work to proceed.

A1.04 Cont'd

Documentation for sub-contracted trades other than those listed above would be completed progressively in time to enable the Contractor to call tenders for these trades. Tenders shall be called by the General Contractor from an agreed list of sub-contractors and to be closed at the office of the Engineer. The calling of these sub-trade tenders shall be to an agreed timetable and with this in mind the Contractor shall nominate in his programme the latest times at which sub-trade tenders may be called in order that the overall construction time can be met.

At the completion of the final drawings, the Schedule of Quantities will be re-measured and the tender adjusted on the final quantities based on the rates supplied with the Schedule of Provisional Quantities.

A1.05 DEFINITIONS

The Principal is:

The Wellington Workingmen's Club & Literary Institute,  
P.O. Box 6354,  
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.

Sub-contractor 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 Ian C. Smith Consultants, P.O. Box 10153, Wellington.

The words "Quantity Surveyor" shall mean Hallam Eames & Partners, P.O. Box 2496, 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 or 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.

A1.06 SCHEDULE OF QUANTITIES

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

Within 10 working days of the acceptance of the Contract and subsequently sub-contract trade section the Contractor shall deposit with the Engineer a copy of the relevant Schedule of Quantities fully priced, extended and added to agree with the amount of the tender.

After completion of all trades the Contractor shall provide the Engineer with three copies of the priced Schedule of Quantities.

A1.07 SITE

The site is situated at 107-109 Cuba St. Wellington.

Tenderers are advised to inspect the site and surroundings as it will be assumed that they will have become fully informed as to the extent and nature of the work and to access and security arrangements existing.

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.

The Contractor shall be aware of the special requirements for sequencing of the work in the retail tenancy areas at ground floor as defined in section A1.02 of the specification.

The Contractor's attention is drawn to the need to co-operate with the contractor for the construction on the building site to the north of the Club premises for the construction of the boundary wall which is to be constructed above first floor level. The construction of this boundary wall is wholly within this contract but arrangements have been made for reasonable access to enable its construction providing reasonable notice is given to the adjoining owner and his contractor.

It is assumed that access means access for workmen and does not carry the right for erection of scaffolding on the adjoining owner's site. The Contractor shall be responsible for all arrangements with the adjoining owner or his Contractor.

Rear access to the construction area is available from the right-of-way connecting to Leeds St. Construction equipment or vehicles may not however be left parked in the accessway unless prior agreement has been obtained from Hannah's, the owners of the site immediately to the east of the Club premises. The Contractor shall be responsible for arrangements regarding access on Hannah's land.

A1.08 EXTENT OF WORK

The work included in this contract comprises, but is not necessarily restricted to, the following.

Al.08 Cont'd

- (a) provision of earthquake strengthening in walls, floors and roof.
- (b) incidental breaking out and final trimming of demolished areas to enable both strengthening and construction of new work to be carried out.
- (c) the construction of new concrete floors and roof over and including perimeter concrete framed infill block walls forming the extensions.
- (d) internal refurbishment.

Al.09 INSURANCE AND INDEMNITY

Contract drawings and specifications will be supplied to the Contractor when policies of insurance in accordance with the following clauses are produced to the Engineer by the Principal of his Insurance brokers, and the Contractor before any site work is commenced, and proof of the continuance of the insurance may be required to be produced to the Engineer before any progress payment is authorised.

Al.09.1 Insurance

Without in any way reducing the extent or effect of the indemnification contained in 9.1 of the General Conditions of Contract, Part 9.3, 9.4.1, 9.4.2, 9.5.1, 9.5.2, 9.6 and 9.7 are deleted and replaced by the following:

- 9.3 The Contractor shall effect and maintain accident compensation insurance in accordance with the Accident Compensation Act.
- 9.4.1 On execution of the contract, the Principal shall insure by means of a policy of insurance of the kind known as a Public Liability Policy (in the joint names of the Principal and the Contractor and any sub-contractor as agreed within the terms of Part 7 of the General Conditions of the Contract for their respective rights and interests) against legal liability for any damage, loss or injury in respect of which he is required by clause 9.1 to indemnify the Principal insofar as it is insurable. Such insurance shall not limit the Contractor's obligations and responsibilities under Clause 9.1. Such insurance shall be maintained throughout the contract including the period of maintenance.
- 9.4.2 Such public liability insurance shall be effected for an amount of not less than \$500,000 in respect of any one accident or series of accidents arising out of the same occurrence, the amount being unlimited in the period of insurance. The Principal shall supply to the Contractor a copy of the policy or policies of insurance together with certification of payment of the required premium.

Al.09.1 Cont'd

The said policy arranged by the Principal shall be extended to include liability arising from the following special risks:

1. Goods/products installed.
2. Vibration removal or weakening of support of land or buildings which shall be subject to a deductible excess at the contractor's risk of \$1,000 each and every accident arising from one event.
3. Cranes, lifts, hoisting equipment and other plant machinery including trailers and vehicles whilst being used as contract machinery otherwise insured for public liability.

The policy shall also be extended to include the following clauses:

- (i) Cross Liability Clause - to provide indemnify to all parties insured as if separate policies had been issued.
- (ii) Breach of Policy Warranties.
- (iii) Local Authorities Clause.
- (iv) An excess of \$250 (each loss) applies to this Public Liability insurance which shall be the responsibility of the Contractor.

9.5.2 These sections of the general conditions of contract are deleted.

9.6 The Principal shall insure the existing structure and the works together with the Principal's stock in trade and all fixtures and fittings and plant contained within the building in the joint names of the Principal and the Contractor and any sub-contractor as agreed within the terms of part 7 of the general terms of contract for the equivalent of "Contract Works" Insurance as commonly in use in New Zealand. The Principal and the Contractor and the sub-contractors shall be covered for their respective rights and interests during the period of construction of the works and during the period of maintenance for loss or damage arising from a cause occurring prior to the commencement of the period of maintenance and for any loss or damage occasioned by the Contractor or the sub-contractor in the course of any operations carried out for the purpose of complying with the obligations under part 12 of the General Conditions of the Contract.

A1.09.1 Cont'd

The amount of the insurance shall be full replacement value of the existing structure and the works, the Principal's stock, fixtures and fittings and plant plus the costs of demolition and clearing of the site as required after the occurrence of loss or damage plus the amount of professional fees which may be incurred in the course of reinstatement.

The said policy will be made subject to the following special extensions, conditions and clauses:

- A. An excess of:
  - (i) \$250 - Contract Works, Removal of Debris and Fees:
  - (ii) \$500 - Damage to Existing Structure

(each loss) excluding loss or damage occasioned by fire, lightning or explosion (which shall be the responsibility of the Contractor).
- B. The protection of the policy to apply to materials to be used or incorporated in the works whilst stored off site and whilst in transit to the site.
- C. Damage or Costs resulting from earthquake for which indemnification is not provided within the terms of the Earthquake & War Damage Commission Act, 1944.
- D. Increased cost of working following operation of an Insured Peril including express air freight and over-time charges.
- E. Damage arising from defective design but excluding that part of the works which proves defective.
- F. 72 hour time occurrence clause.
- G. Temporary removal.
- H. Automatic Reinstatement of Sum Insured following a loss.
- J. Loss or damage arising during cessation of work.
- K. Breach of Warranty.
- L. Riot and Civil Commotion
- M. Leading Underwriter Clause
- N. Claim Settling Authority.
- O. All Other Contents Clause
- P. Other Insurance

A1.09.1 Cont'd

- Q. Repair of Reinstatement Costs Clause
- R. Payment on Account
- S. Transit Includes General Average (payable in full and salvage charges payable according to Foreign Statement of York Antwerp Rules).

In addition to the contract works insurance policy described in the proceeding paragraphs the Principal shall also insure in the joint names of the Principal and the Contractor and any sub-contractor as agreed within the terms of Part 7 of the general conditions of the contract against loss of rents, increased cost of working, payment of Principal's employees salaries or wages following an occurrence for which indemnification is provided within the terms of the contract works policy described in the proceeding paragraphs.

This policy in a similar manner to the contract works policy shall be effected at the commencement of the works and shall be maintained until the Contractor becomes entitled to a final certificate of payment inclusive of the maintenance period.

This policy shall be subject to an excess or deductible in accordance with those deductibles detailed under the Contractor's All Risks Insurance (each loss excluding fire, lightning or explosion) which shall be the responsibility of the Contractor.

- 9.7 If the Principal shall fail to effect and keep in force any of the foregoing insurances then the Contractor may after notifying the Principal in writing effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose from time to time charge the amount so paid to the Principal.

Should the Contractor or sub-contractors consider that further insurance protection is required by them then although they may effect such insurance that they consider necessary any premium charge in this respect shall not form part of the contract price and will not be reimbursed by the Principal to the Contractor.

A1.10 MAINTENANCE

Maintain the works included in this Contract including preventative maintenance as required by this specification for a period of 90 days from the date of completion in accordance with Parts 12 and 17 of the General Conditions of Contract.



Al.10 Cont'd

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.

Al.11 SUB-CONTRACTS

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

Before issuing documents to sub-contractors for pricing, the Contractor shall submit a list showing trades to be sub-let and the names of the firms to whom he proposes such work to be sub-let. The approval or rejection of any of these firms will be made in writing by the Engineer to the Contractor and an agreement will be made as to the firms chosen. The list will then be attached to, and form part of, the contract. For the protection of the contractor, this list will be confidential.

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.

Sub-contractors 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.

The Contractor will be responsible for advising them of his programme and for seeing that they conform to it. The Contractor shall let all sub-contracts to suit his programme for the Works, and shall hold sub-contractors responsible for delays caused by their failure to carry out their programme.

Each sub-contractor shall keep a competent foreman upon the sub-contract works during such time as the said works are in progress.

Al.12 RESPONSIBILITY

The Contractor shall be held responsible for all works, materials, equipment and fittings comprised in the Contract, and for their care, maintenance and protection, this shall also include the work of all sub-contractors and nominated sub-contractors. He will take full responsibility for the proper execution of such work for the full period of his legal responsibility in connection with his Contract, and shall be responsible for ensuring that all work and materials executed or supplied is in accordance with the requirements and is executed or delivered to suit the building programme.

A1.12 Cont'd

The Contractor will be held responsible for the continued water-tightness of the premises in those areas affected by the works involved in this contract. The Contractor's particular attention is drawn to the fact that temporary weathering has been installed to protect the retail shopping areas in the ground floor. This temporary weatherproofing shall be maintained by the Contractor and kept in good condition until the new roof and walls of the new structure above are made weathertight. In order that this requirement can be achieved it will be necessary to pay particular care when the temporary roofing is penetrated for column construction to trim around openings and weatherproof around columns progressively as the work proceeds.

Necessary work on the part of any trade to make possible the work of other trades is to be done as part of this contract without additional expense to the Principal and to the satisfaction of the Engineer.

A1.13 MANAGEMENT AND EMPLOYEES

The Contractor shall keep upon the works the following experienced staff, whose sole purpose during working hours will be the management and execution of the Contract.

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

When tendering, tenderers may submit for consideration an alternative management organisation to that indicated above.

The Contractor shall be fully responsible to ensure all sub-contractors appoint experienced and competent foremen to perform their sub-contract works.

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

A1.14 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.

The following guarantees are required under this specification.

<u>ITEM</u>	<u>GUARANTEES</u>
Precast floor systems	10 years
Metal roofing	2 years
Roof coverings (non-metal)	10 years
Suspended ceilings	10 years
Vinyl sheet flooring and wall cladding	5 years
Plumbing	1 year
Applied paint finishes	5 years

A1.15 COMPLETIONA1.15.1 Maintenance Certificate

Before the issue of a Maintenance Certificate in accordance with Part 17 of the General Conditions of Contract, NZS 623:1964, 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 approvals and having jurisdiction over the Works

Al.15.1 Cont'd

- (d) Contractor's Completion Certificate as noted in Clause Al.15.2.

Al.15.2 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 Contractor's 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.

Al.16 SITE MEETINGS

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

The Principal will provide a room within the building, for the purpose of holding site meetings only. Refer schedule of provided accommodation as noted in Clause A2.03.

Al.17 DRAWINGS

The following drawings are complementary to and form part of this specification.

1004/E1	Standard Details
/E2	Plan, Ground & Level 1
/E3	Plan, Level 2 & Roof
/E4	Frame line 4 & details
/E5	Wall line G
/E6	Wall line L
7915A1	Site Plan & Dimensions
A2	Existing Ground Floor
A3	Existing First Floor
A4	Existing Second Floor
A5	Revised Overall Ground & Mezzanine Floor Plans
A6	Revised Overall First Floor Plan & Intermediate Phase
A7	Revised Second Floor Plan
A8	Ground Floor Plan - North Egress Stair
A9	Revised First & Second Floor Plan
A10	First & Second Floor Reflected Ceiling Plans
A11	Roof & Roof Edge Details
A12	Elevations/Windows

Al.17      Cont'd

Owing to the nature of the work and intent of the contract, additional detail drawings may be issued during the progress of the work to clarify particular situations which are uncovered when the internal wall linings and ceilings and partitions are stripped away from the base structure.

Al.18      SECURITY

The Contractor is advised that the existing Club security will be active during the contract period. The Contractor and all sub-contractors shall comply with all additional arrangements imposed by the Principal.

These may include:

- .            identification of all personnel
- .            supervision by the Club security officers
- .            search of employees personal belongings
- .            restricted access through the Club premises and/or special provisions for out of hours work.

Al.19      PAYMENT

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 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 623:1964 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 of 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.

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.

- (i)            the Statement of Claim separately designates such materials, with values, for which payment is sought,
- (ii)           the Contractor shall provide evidence that he has paid for such materials,
- (iii)           the materials are stored in a location and under

Al.19 Cont'd

conditions approved by the Engineer, are readily identifiable and are stored in a manner ensuring that same will not be used for any purpose other than fulfilling said Contract,

- (iv) access to these materials, for the purposes of inspection, shall be available to the Employer 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.
- (v) the materials are adequately insured.

In consideration of the payment by the Employer 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.

Al.20 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 Contractors 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.

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

Al.21 COST FLUCTUATIONS

The provisions of Appendix A to NZS 623 shall apply to this Contract, except that the allowance in Clause A22.1.2 shall be 18%.

Al.22 PROVISIONAL & CONTINGENCY SUMS

The amount of the Provisional and Contingency Sums shown in the Monetary Allowances section of the Schedule of Quantities shall be included in the Tender Sum.



A1.23      REPORTS & PHOTOGRAPHS

At weekly intervals the Contractor shall agree with the Engineer the number of men employed in each trade.

Obtain three progress photographs of the Works each month from commencement of the Contract as directed by the Engineer.

At each period take photographs from view points as directed and submit 5 glossy 250mm x 200mm prints of each, dated and captioned.

## A2.0 WORKING INSTRUCTIONS

### A2.01 PROTECTION OF EXISTING PROPERTY

#### A2.01.1 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 sub-contract operations.

The interests of the Employer 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.

#### A2.01.2 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, subject to the limitations laid down in Clause A1.10.

#### A2.01.3 Roofing

The Contractor shall provide all necessary planking to prevent damage or overstress to the existing roofing, skylights, guttering and flashings.

### A2.02 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 fence and 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.

It is considered that suitable heavy fabric screens which will prevent the circulation of dust, absorb welding flashes, and present a token physical barrier will be adequate for the work areas within the retail tenancies at ground floor.

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



#### A2.03      TEMPORARY BUILDINGS

The Contractor shall provide suitable office accommodation for his foreman and other site staff complete with telephone and pay all charges. He shall also provide offices as required for sub-contractors.

The Contractor's particular attention is drawn to the Principal's requirement that access to Contractor's workmen and sub-contractor's workmen through the Club premises shall be kept to the essential minimum. Nevertheless there are toilets located at ground level at the rear of the existing premises which may be used by the Contractor's workmen.

Provide accommodation for workers in accordance with appropriate regulations and awards.

Completely remove all temporary buildings from the site upon completion of work.

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

- (a)            One (1) Dry Chemical Type Extinguisher having a net chemical content of not less than 7kg 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 at least 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 authorized 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.

#### A2.04      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 switchboards. He shall make available to all sub-contractors 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.

Remove all temporary services and make good on completion of work.

#### A2.05 TOOLS AND PLANT

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

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

#### A2.06 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 and/or B.S.I. 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, 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.

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 substitution 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,

A2.06 Cont'd

decals, trade names and signs of manufacturer's 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 the cost of removal from moneys due to the Contractor.

A2.07 ATTENDANCE

The Contractor shall allow for providing the following facilities or services without charge to all sub-contractors. 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 sub-contractors and for his own sub-contractors and being responsible for seeing that all work carried out and materials supplied by the nominated sub-contractors and his own sub-contractors is in accordance with the sub-contracts and is delivered and erected to suit the building programme.

Allowing the sub-contractors to use scaffolding, ladders and other facilities upon the site.

Taking delivery and hoisting the sub-contractors' materials and equipment.

Providing suitable lockable storage space for the sub-contractor's use.

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

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

Removal of rubbish as it accumulates and cleaning up after the sub-contractors have left the site.

A2.06      Cont'd

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

A2.08      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 Employer.

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

A2.09      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 sub-contractors 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.

#### A2.10      NUISANCE

The work shall be carried out in such a manner as to cause the least inconvenience to the Employer and the public 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 exceeding 85 dB on 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 of minimising exhaust fumes. Work outside normal hours shall only be done with the Engineer's approval. 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 Employer of any claims arising therefrom.

#### A2.11      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.

#### A2.12      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.

#### A2.13      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.

A2.14 PROPRIETARY PRODUCTS

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

A2.15 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.

A2.16 SURVEY AND SETTING OUT

In addition to the certificates required under the Conditions of Contract furnish a Registered Surveyor's Certificate verifying that the periphery of the construction is within the parameters established.

## B. DEMOLITION

### B1.0 SCOPE

The work in this section comprises the demolition and removal of the remaining part of the east facade wall and safe at second floor level together with the minor demolition work associated with the strengthening and upgrading of the premises.

### B2.0 EAST FACADE, CONCRETE WALL SAFE AND PARAPET

Demolish and remove the remaining section of the east facade and the concrete wall safe at second floor as required to enable the construction of the new concrete extension all as shown on the drawings. Allow for erection of special scaffold to protect the skylight below from falling debris.

Remove existing parapet on line G as indicated on the drawings.

### B3.0 INTERNAL PARTITIONS

Demolish and remove timber framed walls as required for the installation of internal strengthening.

### B4.0 BREAKING OUT

Break out existing concrete floor locally for the construction of new reinforced concrete columns and for construction of the new stairway. This work to be carried out progressively to suit the sequence of work and allow the maintenance of temporary roofing.

Break out existing brick walls locally for new concrete columns where shown. Walls shall be saw-cut to sufficient depth to allow a clean break of the bricks at the surface before breaking out for columns.

### B5.0 TRIMMING

After completion of the roofing of the new extensions, and the removal of temporary roofing, allow to trim back the remnants of brick walls at first floor level.

### B6.0 TEMPORARY WALLING AND ROOFING

After completion of the roof and exterior walls of the extensions remove the temporary walling and roofing.

### B7.0 CLEANING

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

B8.0            MAKING GOOD

In areas where demolition has been carried out and where no new works are to be constructed, make good any damage to the surrounding areas.



D. CONCRETORD1.0 GENERALD1.01 SCOPE

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

D1.02 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.

D1.03 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 1900, Chapter 9.3A.

No concrete pouring 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.

D1.04 STANDARDS

Unless noted to the contrary in this specification materials for and the construction of reinforced concrete shall be in accordance with NZS 1900, Chapter 9.3A (metric version) including all current amendments; a copy of this standard shall be kept on site.

The Related Documents listed on page 7 of NZS 1900, Chapter 9.3A (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 NZS 1900, Chapter 9.3A the former shall take precedence.

D1.05 ORDER OF WORK

The order of carrying out the Concretor's work shall be agreed with

D1.05 Cont'd

the Engineer and shall conform to the agreed programme for the work as a whole and the Contractor shall adhere to this schedule.

D1.06 DRAWINGS

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

D1.07 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.

D1.08 WORK FOR SUB-CONTRACTORS

Build in fillets, cast in fastenings, bolts and sleeves, and form all holes, recesses and chases as required by all sub-contractors and as described in this Specification or indicated on the drawings.

D1.09 PROTECTION

Refer to Clause A2.01 for protection generally. In particular protect all fairface concrete blockwork 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 columns and other structures near penetrations through the existing first floor concrete slab take special measures as necessary to prevent the leakage of grout or water into the ground floor tenancy areas.

D2.0 MATERIALSD2.01 AGGREGATES

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

D2.02 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 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.

D2.03 WATER

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

D2.04 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:	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.

D2.04      Cont'd

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 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.

D2.05      STORAGE AND HANDLING

Storage and handling of materials shall be to the requirements of 9.3A, 11.

D2.06      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.

D3. CONCRETED3.01 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 9.3A in respect to design, placing and testing, except where modified by this specification.

Unless otherwise specifically stated slump values shall not vary from the values given in Table 7 of 9.3A by more than  $\pm 25\text{mm}$ .

D3.02 SAMPLING AND TESTING OF INSITU AND PRECAST CONCRETE.021 Concrete Testing

Compression tests and slump tests shall be carried out during the progress of the work generally to the requirements of 9.3A, 24 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. The Contractor shall provide at his own cost sufficient standard moulds for concrete specimens 100mm diam. x 200mm 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.

.022 Certificates

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

D3.03 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

D3.03 Cont'd

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.

D3.04 PLACING REINFORCEMENT

Placing of reinforcement shall comply with the requirements of NZS 1900, Chapter 9.3A and as follows:

Bars intended to be in contact at passing points shall be securely wired together at all such points with 1.6mm 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 shall be lapped, jointed or spliced only at the points described. Splices and the like found to be necessary elsewhere shall be formed only if and as approved.

Welded splices shall only be made with the written approval of the Engineer.

Reinforcement projecting from work being concreted, or already concreted, shall not be bent 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 in flat sheets.

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

D3.05 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 450mm before compaction. Provide adequate labour to ensure that the concrete is compacted to these requirements.

D3.05 Cont'd

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 in correct alignment, level and rigidly held in such a manner that it will not be displaced during placement of concrete.

Before placing is commenced, form all holes, recesses and chases and position all fillets, fastenings, bolts, sleeves, pipes and items specified to be formed or built-in.

Beams shall be poured to the full height of each unit. Vertical and horizontal construction joints shall be permitted in pre-determined 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.

D3.06 VIBRATING

All concrete shall be vibrated sufficiently to produce dense concrete of a uniform texture. Concrete in vertical sections shall be placed in layers not exceeding 500mm 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 complete.

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 reinforcement.

D3.07 CURING AND PROTECTION

All concrete is to be cured.

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

D3.07      Cont'd

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.

D3.08      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 sub-contractors and set out the positions of such penetrations accurately in conjunction with the specialists concerned.

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.



D4. JOINTSD4.01 MATERIALSSealants

All joints, construction joints and transverse joints in exterior framing shall be sealed with "Uraflex F" or equivalent to the approval of the Engineer.

The sealing compound shall be poured after the concrete has been cured. Joint surfaces must be dry and thoroughly cleaned to the satisfaction of the Engineer.

Prime joint surfaces as recommended by the sealant manufacturer and apply sealant strictly in accordance with the manufacturer's printed recommendations. The pointing at the joints will be cut off level with the floor slab top surface and will not overrun the width of the joints.

D4.02 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 pre-determined construction joints or levels.

Wherever 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.

## D6. FORMWORK AND FALSEWORK

### D6.01 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 for 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.

#### .012 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.

#### .013 Extent

All concrete work shall be boxed unless the Engineer approves to the contrary in particular cases.

#### .014 Tightness and Rigidity of Forms

Joints between 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 1/300th of the span between joints or other supports and in any case shall not exceed 5mm. 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.

#### .015 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.

.016 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 20mm x 20mm 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 25mm grout checks shall be used to ensure clean, sharp, joint lines.

.017 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 50mm 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 as described in Clause D. 7 all joints and bolts shall be positioned to a regular pattern which has been approved by the Engineer.

.018 Wire Ties

The use of wire ties for formwork is prohibited.

.019 Re-use of Forms

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

.0110 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.

.0111 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 D6.0112.

.0112 Inspection 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.



### .0113      Bulging

If during a pour, undue 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.

### D6.02      SURFACE FINISH

Concrete surfaces shall be finished as follows:

<u>Location</u>	<u>Surface finish type</u>
Floor slabs	U4
Exposed columns and beams	F2
Covered surfaces	F1 or U1 as applicable

Surface finish types shall be as defined in "Finishing of Concrete Surfaces" (NZPCA Bulletin AC4) a copy of which will be available for inspection at the Engineer's office.

### D6.03      STRIPPING AND REMOVAL

Under special circumstances the Engineer may allow earlier or require later stripping of formwork than those given in Table 9 NZS 1900, 9.3A.

### D6.04      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.

### D6.05      TOLERANCES

Tolerances shall be as specified in NZS 1900, Chapter 9.3A.

D9. STRUCTURAL FRAMINGD9.01 BEAMS AND COLUMNS

Where blockwork abuts beams and columns, provide reinforcement starter bars for blockwork reinforcement all as detailed on the drawings.

D14. FLOORSD14.01 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 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 D3.07.

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 WU4 as noted on the drawings.

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

D14.02 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.

D14.03 PROPRIETARY FLOORING

The drawings indicate the area of the floor to be covered with precast flooring units. The suppliers shall submit designs and detailed shop drawings for the supply of these units which shall be capable of carrying the Dead and Live loads designated on the drawings without exceeding the permissible stresses for the materials used. Either Ultimate Strength or Working Strength design methods may be used.

D14.03 Cont'd

The designs and shop drawings submitted shall include the negative and edge reinforcing steel required which shall not be less than that shown on the structural drawings.

The precast units can be prestressed if required, but it is necessary to provide a 2 hour fire rating in the floor construction which will determine the cover required to the prestressing wires.

The structural screed shall have a minimum compressive strength of 25 MPa at 28 days.

The structural screed may be considered in the design as forming a composite construction provided adequate shear connection is provided between the precast units and the screed. 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.

No services are to be routed horizontally through the structural screed.

The ends of all precast units are to be blanked off before pouring the structural screed.

Form all holes in the precast units for the passage of services as indicated.

Where any flooring unit ribs 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.

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 the site.

E. STRUCTURAL STEELWORKE1.0 GENERALE1.01 SCOPE

The work specified in this section comprises the supply, fabrication and erection of all steelwork.

E1.02 QUALITY OF MATERIALS

The quality of materials used in the execution of this contract shall comply with the requirements of NZS 3404:1977 and all related documents.

E1.03 DRAWINGS

All work shall be carried out in accordance with the structural drawings and future details. The Engineer shall be notified in advance of the commencement of work in the shop in order that materials and workmanship can be inspected. If in the execution of the work the steel fabricator finds discrepancies in the information supplied he shall refer such discrepancies to the Engineer before proceeding further with work which would be affected.

E1.04 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, and the normal progress of the work shall not be delayed because of such substitutions. The Engineer must have approved all substitutions before work is put in hand. All members indicated on the drawings shall be in one length without splicing. If splicing is found to be necessary the Engineer shall approve the positions and types of splice before the work is put in hand.

E1.05 TESTS

The Engineer may direct tests to be made in a selected testing laboratory.



E2. FABRICATIONE2.01 GENERAL

All fabrication shall be done in accordance with the requirements of NZS 3404:1977.

E2.02 WELDING

All welding shall be in accordance with BS 5135 for mild steel.

All surfaces to be welded shall be cleaned of loose scale, slag, rust, grease, paint and any other foreign matter by vigorous wire brushing.

All sections to be fillet welded should be in close contact. In no case shall separation be greater than 1.5mm. Sections to be butt welded shall not be out of alignment by more than 3mm. Work is to be positioned for flat welding wherever 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 in accordance with AWS D1.1.76.

### E3.0 WELDING INSPECTION

#### E3.01 GENERAL

An independent, qualified welding inspector may be appointed who will carry out visual, radiographic and other methods of testing as may be considered necessary by the inspector.

The Contractor shall comply with all reasonable demands of the welding inspector to cut out in search of defects and shall supply the plant necessary for this purpose. "Reasonable" shall mean the cutting out of not more than 10mm per metre 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.

#### E3.02 UNACCEPTABLE DEFECTS

The following defects discovered by visual, radiographic or other means shall not be acceptable.

- (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 sq.mm of radiograph is greater than either 2% on the radiograph of plate of up to 12mm thickness or 3% on the radiograph 12mm and over in thickness except that where any other defect which is acceptable under the provisions of this specification occurs with porosity, the allowable limit for porosity shall be reduced by 1%.
- (c) inclusions or 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 6mm shall be acceptable for all plate thicknesses and that the maximum length of any such defect shall be 20mm for all plate thicknesses; or:
  - (ii) the depth on the weld of any such defect 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 a weld length  $12T$  or, where length of weld is less than  $12T$  the sum of the largest dimensions exceeding  $1/12$  the

E3.02 Cont'd

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.

E3.03 REPAIR OF DEFECTS

- (a) If in the opinion of the Engineer, the total amount of repair required in any one welded seam is excessive, the whole of that seam shall be cut out and rewelded.
- (b) In the case of a crack at least 50mm 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 effective.

Defects shall be cut out by flame gouging. The gouging head shall be the smallest necessary to satisfactorily cut out the defect.

The Engineer will 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 Steelwork sub-contractor.

E4.0 SHOP PAINTING

All steelwork shall be thoroughly cleaned in accordance with the requirements of the Painter Section of this Specification.

Apply paint only to dry surfaces. Lack of complete coverage and/or uniform texture will be cause for rejection.

All steelwork including all bolts, washers, nuts and fittings shall be shop painted by brush and/or roller with one coat of 'Dulux HD 441 Primer' or similar approved applied in accordance with the manufacturer's instructions. Surfaces not accessible after fabrication shall be treated before assembly.

All painting damaged during erection shall be made good by the Steelwork contractor.

E5.0 DELIVERY TO SITE

All steelwork shall be delivered to the site and shall be protected from damage in transit. The Contractor shall arrange for the delivery of all long lengths of steelwork at times to avoid peak-traffic periods and shall make arrangements with traffic authorities regarding transport of same.

E6.0 STORAGE

The Contractor shall secure the approval of the Engineer as to the location of space for the storage of materials at the site.

All steelwork shall be placed upon substantial shores or blocking, of sufficient strength and size to prevent any metalwork touching the ground after stacking. Each piece shall be placed so that water cannot stand thereon, and in such a manner that bending under its own or superimposed weights or any other cause will not damage 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 damage are due to his negligence. The acceptance of damaged material which has been improperly piled, stacked or stored will be entirely at the discretion of the Engineer.

E7.0 ERECTION

The Contractor shall give at least 48 hours notice of the time when he proposes to start erection in order that proper inspection can be provided.

The Contractor shall satisfy himself that bases are at the proper level and truly flat and ready to receive steelwork. He shall verify the location and level of all anchor bolts in the concrete. Bases and bearing plates which require to be grouted shall be supported exactly to the established lines and levels. Adequate temporary bracing and guying shall be provided to maintain the structure true to plumb line and level during erection. The temporary guying and bracing should be adequate to resist all wind and earthquake forces on the structure during the erection period.

E8.0 INSPECTION

The Contractor shall give access to the Engineer or his representatives at all reasonable times for the inspection of the work at all stages during fabrication and erection.

F. BLOCKLAYER

F1.0 GENERAL INSTRUCTIONS

F1.01 SCOPE

The work specified in this section covers the supply and erection of all blockwork.

All articles and fittings which are specified or required to be built into blockwork will be found under the appropriate trades or on the detail drawings.

F1.02 DRAWINGS

The whole of the work shall be carried out in accordance with the drawings and details.

F1.03 STANDARD SPECIFICATIONS

All blockwork shall comply with the appropriate clauses of NZS 1900, Chapters 6.2 and 9.2:1964 and current amendments.

F1.04 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 wherever, 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 the specimen 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.

Minimum Mortar and Grout Strengths (MPa)

	<u>7 days</u>	<u>28 days</u>
Mortar	6.20	12.4
Grout	8.30	17.3

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.



## F2. MATERIALS

### F2.01 CONCRETE BLOCKS

Concrete blocks shall be modular concrete masonry units nominally 390mm long, 190mm high and either 150mm or 190mm 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 thoroughly cured. Blocks shall be manufactured in accordance with NZS 3102P 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.

### F2.02 MORTAR FOR BLOCKWORK

Cement, sand, water and waterproofing compounds shall conform to Section D. 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.

### F2.03 TIES AND REINFORCEMENT

Starter rods for securing block walls to concrete work and existing work are shown on the drawings.

Reinforce all concrete block walls as shown on the structural drawings.

Reinforcement shall be as specified in Section D.

#### F2.04 GROUT FOR FILLING BLOCKWORK CAVITIES

The whole of the work to be in accordance with NZS 1900, Chapter 9.2. All cavities containing reinforcement 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 12.5mm to 5mm aggregate. The water cement ratio shall not exceed 0.7.

When the cells of the hollow masonry exceed 100mm in least dimensions, concrete of maximum size aggregate of 10mm may be used. The mix shall have a minimum compressive strength of 17.5 MPa at 28 days. See Clause F1.04.

### F3. WORKMANSHIP

#### F3.01 LOCATION

Construct all concrete block walls as shown on the drawings.

#### F3.02 STANDARDS

All masonry work shall be laid in accordance with NZS 1900, Chapter 9.2.

#### F3.04 BLOCK 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 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 rises.

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 75mm x 50mm and the cross webs of these cells shall be fully bedded in mortar.

The maximum height of pour i.e. the distance through which grout is required to drop shall be 400mm for 150mm and 190mm blocks, 400mm at reinforcement laps and 1.2 metres elsewhere. All grout must be fully compacted by "rodding". 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.

#### F3.07 PIPES AND CONDUITS

Pipes except rigid electric conduits shall not be embedded in any masonry without prior approval of the Engineer.

#### F3.08 BOLTS AND FIXINGS

Bolts or fixings shall be secured in place prior to placing of grout. Timbers not bolted to wall shall be fixed by means of masonry spikes or other approved means. Setting of grounds in joints is not permitted except for fixing joinery finishings.

#### F3.09 BUILDING IN

Build in all necessary plugs, bolts, ties, metal clamps, metal



F3.09 Cont'd

flashings, dowels, fastenings and fixings required by this and other trades.

F3.10 BLOCKWORK TO BE REINFORCED

Where indicated in the drawings, block walls are to be reinforced with vertical and horizontal steel. The reinforcement shall be of the spacing and diameter shown on the structural drawings. All horizontal and vertical cores containing reinforcement shall be grouted solid with concrete. All reinforcement shall be tied to the starter reinforcing bars.

F3.11 JOINTS

All bed joints shall be flushed up solid and all perpendics well filled. See Clause F3.04.

F3.12 GAUGE

The gauge rod for concrete blockwork shall be 800mm to four courses of full height blocks.

F3.14 CHASES AND RECESSES

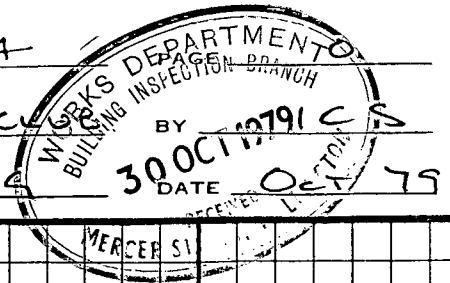
Chases and recesses shall be formed only where shown on the drawings.

F3.15 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 other trades have completed their work. Cut all chases necessary for metal flashings.

F3.16 CLEANING DOWN

Clean down concrete blocks with stiff wire brushes and water only. Acid shall not be used. Grout and mortar runs on to blockwork are to be washed off as they occur and finished work maintained in a clean condition.



## INDEX

## PAGE

DESCRIPTION	1
UPGRADING PROPOSAL	3
ASSUMPTIONS	4
STAGE 1 STRUCTURE	6
SEISMIC ANALYSIS - FLOOR WEIGHTS	7
- SEISMIC COEFF & SHEAR	12
- GEOMETRY & COING	13
- DEAD LOAD / LIVELOADS	14
- GEN FRAME ANALYSIS	15-36
DESIGN FRAME LINE 4	37
DESIGN FRAME LINE 9	40
- COLUMNS	41-44
- BEAMS	45-46
- UPLIFT	47
LEVEL 2 FLOOR NEW BLDG	48
ROOF " "	49
LEVEL 2 EXTG BLDG	51
- EXTG FLOOR JOISTS	52
- SUPPORT BEAM	54
- STRUTS	54
- TIES	55
- STEEL COLUMNS OUTER WALL	56
- DIAG BRACES UNDER FLOORS	57
- PERIMETER ANGLE	58
EXISTING STRUCTURE - CHECK WEIGHTS	59
- TOTAL WEIGHT ON PILE GROUPS	66
NEW STRUCTURE	68
- LOAD ON PILE GROUPS	68
WALLS - DISTRIBUTION OF LOAD	75
- ALTERNATIVE IF PANELS SEPARATE	76
- WALL MOMENTS	77
- SHEAR PANELS BELOW LEVEL 1	83
WALL LINE 9 - CHECK DIAGS	85
PILES - CHECK EXTG	86



WELLINGTON CITY  
CORPORATION  
CITY ENGINEER  
A.D. MARTIN  
F.I.C.E. F.N.Z.I.E  
M.R.S.M. A.N.Z.I.M.

# WORKS DEPARTMENT

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

Reply to City Engineer

Attention Mr K.S. Mulholland.....

Telephone No. 724-599 Ext. ....778.....

IN REPLY PLEASE QUOTE

KSM:hdn 6/2087

30th March 1978

Messrs Brickell Moss Rankine & Hill,  
Consulting Engineers,  
P.O. Box 10349,  
WELLINGTON.

Attention: Mr W.D. Champion

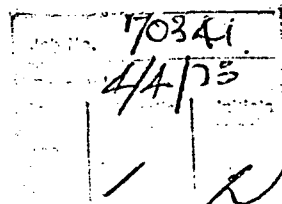
Dear Sir,

WELLINGTON WORKINGMEN'S CLUB  
CUBA STREET

In reply to your letter dated 7th March 1978, I have to confirm that the above building will be reclassified as Class C in terms of earthquake resistance once the proposed alterations to the structure have been completed. The seismic coefficient to be used in design calculations shall not be less than two-thirds of that required by NZS1900 Chapter 8.

Yours faithfully,

DIVISIONAL ENGINEER (BLDGS)  
FOR CITY ENGINEER



HM / BH

Copy - BH Funnell.

FILE COPY

The Wellington City Corporation,  
P.O. Box 2199,  
WELLINGTON

70341

7 March, 1978

Attention: Mr K.S. Mulholland

Dear Sir,

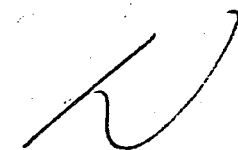
WELLINGTON WORKINGMEN'S CLUB  
CUBA ST.

Thank you for your letter of 28 February 1978 under reference KSM:VB 6/2087 concerning the above.

Referring to the subsequent discussion we confirm that the building will be classified as Grade C on completion of the alterations provided the seismic coefficient is 2/3rds that given in NZS 1900, Chapter 8; such a coefficient has been used.

In respect to Item 2 of your letter it is our understanding that this requirement refers to improving vehicular access only and does not imply major requirements in respect to the building.

Yours faithfully,  
p.p. BRICKELL, MOSS, RANKINE & HILL



W. D. Champion

WDC:amh

cc: B. Funnell



CITY ENGINEER  
G.J. Macdonald  
M.N.Z.I.E.

WELLINGTON CITY CORPORATION

# WORKS DEPARTMENT

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

Reply to City Engineer

Attention:

Mr K.S. MULHOLLAND

Telephone: 724-599

Extension: 778

Please Quote:

KSD:GMD 50/574

6/2087

6 March 1979

The Trustees,  
Wellington Workingmen's Club,  
P.O. Box 6354,  
Te Aro,  
WELLINGTON.

Dear Sir,

PREMISES AT 101-107 CUBA STREET

During August 1973 the owners of the building at the above address were notified of Council's power in respect of earthquake risk buildings, given under Section 301A of the Municipal Corporations Act.

At the same time they were advised that their building was considered to be an earthquake risk in terms of the Act, and that at sometime in the future Council would require that the building be either:-

- (a) Demolished, or
- (b) Strengthened to an extent that will enable it to meet two-thirds of the seismic requirements for new buildings.

The owners were also advised that they would not be permitted to make major alterations to their buildings without strengthening them.

The City Council has reviewed the position and has resolved:-

- (a) To re-affirm its policy in respect of earthquake risk buildings by way of discouraging owners from prolonging the lives of such buildings by refusing permits for extensive alterations unless structural upgrading to two-thirds bylaw requirements is carried out concurrently with such alterations.
- (b) To make an exception to (a) above when an owner gives an undertaking to demolish or strengthen the building in a time to be specified by the Council, but in no case shall the time specified by the Council exceed the programmed time for earthquake risk buildings in a generally similar category.
- (c) To notify the owners of earthquake risk buildings in the main retail areas, Lambton Quay, Willis Street (from Stewart Dawsons to the St. George Hotel), Manners Street, Cuba Street (from Wakefield Street to Vivian Street) and Courtenay Place, that formal notice in terms of Section 301A of the Municipal Corporations Act will be served in 1983 and that the maximum period given for compliance with the notice

will be five years and as a consequence no permits for alterations except those which include strengthening to two-thirds bylaw requirements, will be issued in respect of these buildings after 1982.

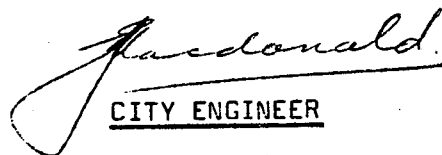
- (d) That no action be taken at this stage on earthquake risk buildings in other areas as natural removal and replacement is proceeding satisfactorily under existing arrangements.

This notification is being sent in accordance with Clause (c) above and is to advise you to expect formal notice in 1983 requiring the demolition or strengthening of your building. A specific period for complying with the requirements of the notice will be given at that time but in no case shall the period given exceed five years.

Permits for major alterations sought prior to 1982 must comply with the general requirements of resolutions (a) and (b) above.

Any enquiries in respect of this matter may be directed to Mr K.S. Mulholland, Divisional Engineer (Buildings), telephone 724-599 Extension 778.

Yours faithfully,

  
CITY ENGINEER



Municipal Office Building, Mercer Street, P.O. Box 2199, Wellington, 1. New Zealand  
Reply to City Engineer  
Attention Mr **K.S. MULHOLLAND**  
Telephone No. 724-599 Ext. **778**

IN REPLY PLEASE QUOTE

KSM:VB 6/2087

28 February 1978

Messrs. Brickell Moss Rankine & Hill,  
Consulting Engineers,  
P.O. Box 10349,  
WELLINGTON.

Attention : Mr. W.D. Champion

**Dear Sir,**

**WELLINGTON WORKINGMEN'S CLUB : CUBA STREET**

In reply to your letter dated 2 February 1978 I have to advise that the proposed alterations to the Wellington Workingmen's Club as shown on your drawings numbered 70341/P1 to P6 inclusive are approved in principle and subject to the following conditions.

1. The existing timber floors are not considered adequate for diaphragm action without some form of additional strengthening.
2. Provision at this stage may be required for the future servicing of the building from the proposed service lane at the rear. This matter should be discussed with the Planning Department prior to working drawings being commenced.

No work is to be undertaken until the required building permits and plumbing and drainage permits have been uplifted.

Yours faithfully,

H Marshall and

Divisional Engineer (Bldgs)  
for City Engineer

Doc No.	7034
Date	2/3/78
✓	

ORIGINAL GIVEN TO  
B. FUNNEN 3/3/78

The City Engineer,  
Wellington City Corporation,  
P.O. Box 2199,  
WELLINGTON

70341

2 February, 1978

Attention: Mr K.S. Mulholland

Dear Sir,

WELLINGTON WORKINGMENS' CLUB - CUBA STREET

Subsequent to the various discussions held between Messrs Champion and Morgan of this office and your Messrs Mulholland, Skimmings and Rex on 31 January, 1978 regarding the seismic strengthening and fire egress upgrading of the above premises, we enclose scheme drawings 70341/P1-P6 inclusive of our proposals. We understand from your officers that these proposals are acceptable to your Council. We would be grateful for confirmation in writing of your acceptance in principle of these proposals (including town planning aspects) so that we may advise our client before proceeding to the detailed design phase.

Yours faithfully,  
p.p. BRICKELL, MOSS, RANKINE & HILL

Encl:  
NJM:WDC:amh

  
W. D. Champion

cc: B. Funnell



## DESCRIPTIONS

The extg structure consists of a ground, first & second floor with roof over built in two sections. The original section to the south 21600 x 15400 on plan has perimeter walls of unreinforced brick masonry. All floors of this building are of timber construction supported on steel framing & internal brick walls at lower levels.

The north section build subsequently utilized existing boundary walls at the north & south sides. The front & rear walls (west & east) were constructed in solid brick masonry reinforced at floor levels by substantial bands of concrete & steel.

The ground floor structure consists of two 18" thick transverse unreinforced brick walls with intermediate rows of concrete encased structural steel columns. The first floor slab over consists of a 9" thick concrete slab reinforced with steel railway rails spaced at 900 approx cts.

The second floor is of timber construction supported on timber load bearing walls which in turn seat on the first floor concrete slabs. The roof over is of timber trussed construction with corrugated iron over timber sarking.

At the time of its construction the south building + an adjacent building (the Masonic Hotel) were existing and the new building (north structure) was merely constructed between boundary walls. The western wall comprising the Cuba St frontage was built of unreinforced brick masonry with concrete bands. Additionally some steel framing is provided at the eastern wall ground level to provide the larger openings for shop fronts. At the rear east facade a series of three wings projected behind the main body of the building on the upper two floors.

All foundation walls & columns are supported on 14" dia concrete piles

## UPGRADING PROPOSAL

It is proposed that the premises be strengthened by constructing new extensions to the rear (East) at both the north and south ends. These extensions will be given sufficient inherent strength to stabilise the existing building to which they are attached.

The upgrading includes:

- (i) demolition of the rear wings above first floor together with the upper portion of a party wall at the northern boundary. N.B. At the time of writing this demolition has been completed under a stage permit.
- (ii) new extensions at the north end on floors 1 and 2 including a new party wall on the north boundary and strengthening works as required from ground to first floor below. NB This work constitutes stage I and is the scope of the work for which a permit is currently required.

(iii) Also included in stage I are strengthening of the existing structure of the north building + tying back to the new extensions at the north end.

(iv) Stage II will comprise the construction of extensions at the rear of the south building. This work will include the bracing of the extg south structure + is likely to be carried out in about 2 yrs time when funds become available.

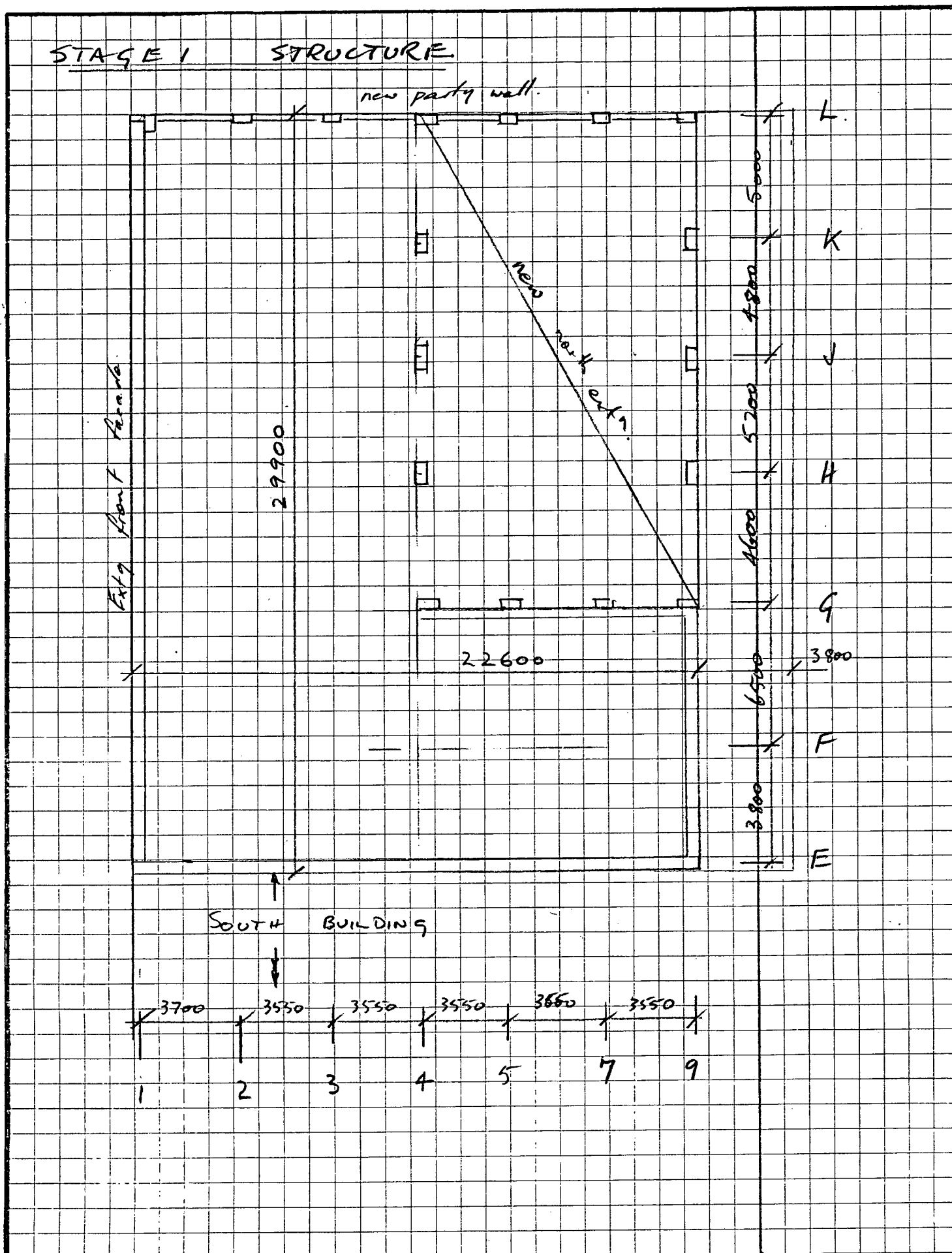
Alternatively the south building may be demolished to be replaced entirely by new construction.

## ASSUMPTIONS

- 1/ Design the north extensions with sufficient strength to provide a level of earthquake resistance equivalent to  $\frac{2}{3}$  code level forces at 1965 values for the north building and extensions
- 2/ Provide strength in the southern extensions to bring the total overall strength when completed to

the combined requirement for both buildings

3, Provide a reasonable level of ductility reinforcement in the new construction, while it is recognised that the initial requirement means only compatibility with the existing structure it is possible that in 30 to 40 yrs time when the premises may again be altered or reconstructed compatibility with possible future new construction would be desirable



JOB WWMC - Stage 1BY DDSNew Structure - seismicDATE 26/7/79FLOOR WEIGHTS FOR SEISMIC ANALYSIS

665 93

1st Floor  $98 \times (73 + 13.5) = 788.5 \text{ m}^2 - (41) + 13 = 761 \text{ m}^2$

9" concrete slabs throughout.

Allow 10" as before.  $\therefore 5.7 \text{ kPa}$  (ie incl partitions)

$$\text{Total D} = \underline{4340 \text{ kN}}$$

Live Load Table 2.2  $L_v = 3.0 \text{ kPa}$

$\therefore$  Seismic live load  $\Rightarrow S_L = 1.0 \text{ kPa} \times 665 \text{ m}^2$

$$\underline{S_L = 760 \text{ kN}}$$

$\frac{1}{2}$  walls above (Assume includes column & beams)  
- no openings allowed for

(i) 200 block work  $(87' + 64' + 36') \times 6' = 1122' \text{ } 13'$

$$\therefore \text{wt} = 1122 / 10.75 \times 4.5 = \underline{469 \text{ kN}}$$

(ii) 14" brick above (existing - P)  $\Rightarrow \frac{1}{2} \times 267 = \underline{133 \text{ kN}}$

(iii) walls (e, c' & d) (existing)  $\frac{1}{2} (446 + 443 + 87) = \underline{488 \text{ kN}}$

(iv) front wall (existing)  $\frac{1}{2} \times 1370 = \underline{685 \text{ kN}}$

$$\underline{\underline{\text{Total above} = 1775 \text{ kN}}}$$

JOB WWM C - StageBY DDSNew Struct. - seismicDATE 26/7/79 $\frac{1}{2}$  walls below ( $\frac{1}{2} \times 18' = 9'$ )

(i) 9' walls (5.3 kPa)

$$(10' + 10' + 7' + 53') \times 9' = 720 \text{ sq'}$$

$$\therefore \text{Wt} = \underline{355 \text{ kN}}$$

(ii) 14' walls (8.2 kPa)

$$(114' + 98') \times 9' = 1908 \text{ sq'}$$

$$\therefore \text{Wt} = \underline{1455 \text{ kN}}$$

(iii) 19' walls (11.1 kPa)

$$(72' + 36' + 36' + 72') \times 9' = 1944 \text{ sq'}$$

$$\therefore \text{Wt} = \underline{2010 \text{ kN}}$$

(iv) Front wall 5 kPa

$$98' \times 9' = 882 \text{ sq'}$$

$$\therefore \text{Wt} = \underline{410 \text{ kN}}$$

$$(v) \text{ Wall (d)} = \frac{1}{2} \times 44 = \underline{86 \text{ kN}}$$

$$\text{Total wt below} = \underline{4296 \text{ kN}}$$

Total wt of "1st floor"

$$D_1 = \underline{10411 \text{ kN}}$$

$$S_1 = \underline{760}$$

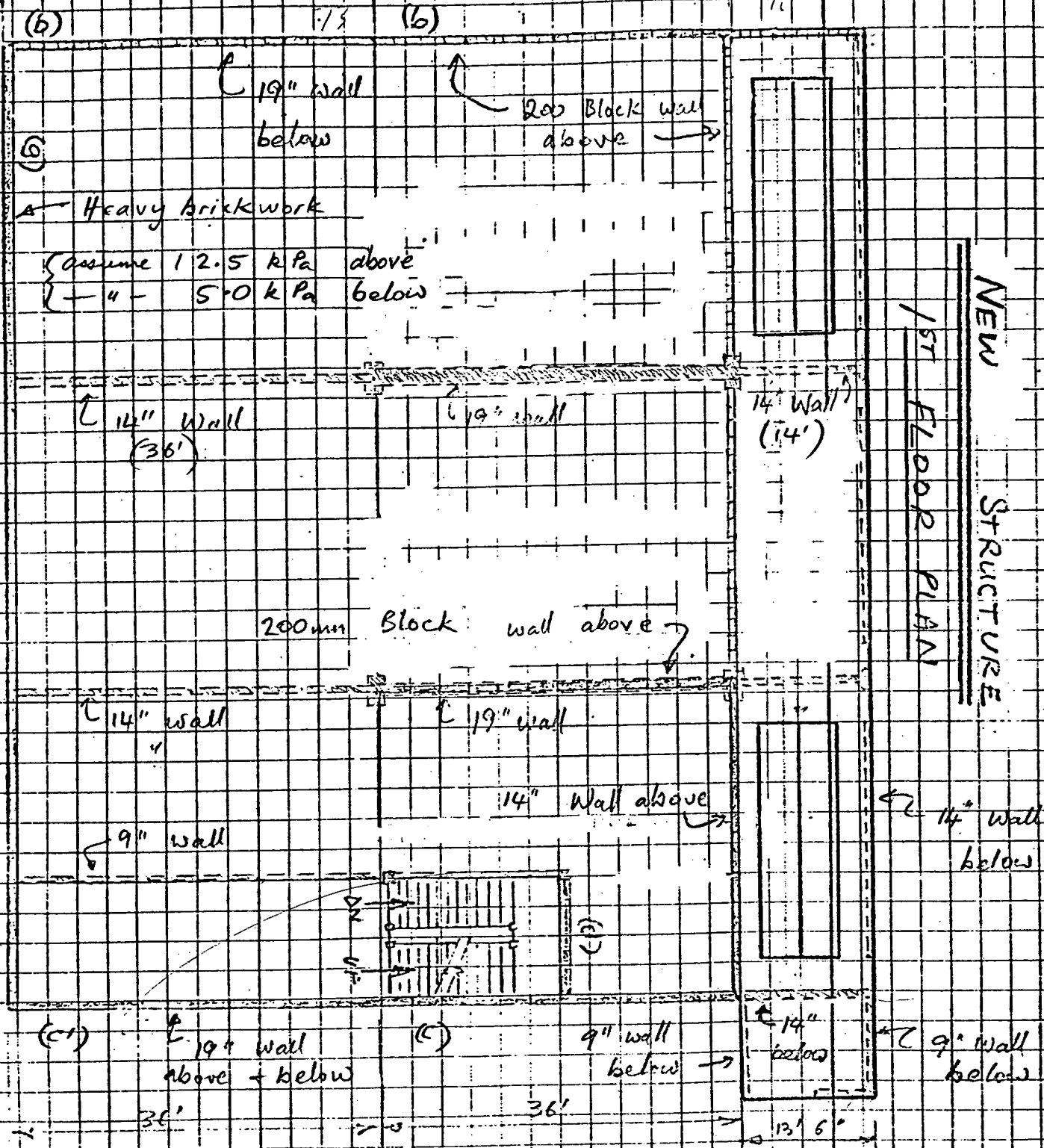
$$\underline{11171}$$



Suba St

NEW STRUCTURE

1st FLOOR PLAN



Note

(1) Not all partitions shown

(2) Openings not shown

(3) Brickwork shown in heavy lines

NTS

JOB WLWMC - Stage 1BY DDSNew Struct - SeismicDATE 26/7/76(I) 2nd FloorFloor loads

(i) New conc floor

$$W_D = 3.5 \text{ kPa} \times 36' \times 64'$$

$$= \underline{750 \text{ kN}}$$

(ii) Wood floor 1.2 kPa

$$W_D = 1.2 (36' \times 64' + 32' \times 72') / 10.75$$

$$= 1.2 \times (2304 \times 2) / 10.75$$

$$= \underline{515 \text{ kN}}$$

(iii) Walls = 2 x "above" value for 1st floor

$$\therefore W_T = \underline{3550 \text{ kN}}$$

(iv) internal cols 4 x 41.5 = 166 kN  
(seismic)(v) seismic beam 4 x 31 = 124 kNTotal "2nd floor" D = 5105 kN

Seismic live = 1.0 \* 98 \* 73 / 10.75

$$S_L = \underline{667 \text{ kN}}$$

$$\text{Total D+S} = \underline{5772 \text{ kN}}$$

JOB WWM C

BY \_\_\_\_\_

SessmieDATE 26/7/79Roof

$$(i) \text{ roof } 1.5 \text{ kPa} \times 98 \times 73 / 1.075$$

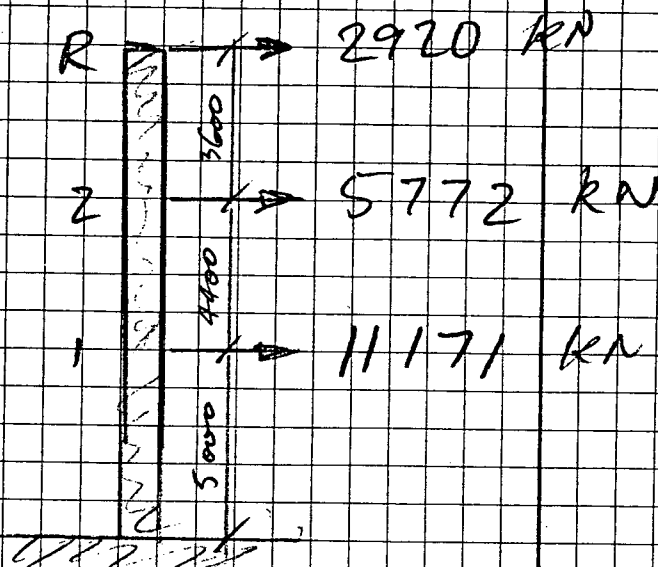
$$\therefore \underline{\text{wt} = 1000 \text{ kN}}$$

$$(ii) \text{ walls } \underline{\text{wt} = 1775 \text{ kN}} \quad \checkmark$$

$$(iii) \text{ cols } \underline{\text{wt} = 83 \text{ kN}}$$

$$(iv) \text{ beams } \underline{\text{wt} = 62 \text{ kN}}$$

$$\therefore \underline{\text{Total "D" = 2920 kN}}$$

loads are

Total seismic load

$$= 2920 + 5772 + 11171 = 19863$$

say 20000

### SEISMIC COEFFICIENT & SHEARS

1965 value for zone A = 0.08

Load Factor = 1.25

total base shear

$$= 0.08 \times 1.25 \times 20000$$

$$= 2000 \text{ kN.}$$

Level.	$h_x$	$W_x$	$W_x h_x$	$\frac{W_x h_x}{\sum W_x h_x}$	$P_x$	$V_{16}$
3	13.	2920	37960	0.256	512.7	513
2	9.4	5772	54257	0.366	732.8	733
1	5.0	11171	55855	0.377	754.4	754
		$\sum W = 19863$	148072		1999.9	

$$V = 2000 \text{ as above}$$

OK

From preliminary analysis the approximate split between frames on lines 4 & 9 are 40% & 70% respectively. Analyse two frame cases (a) full lateral seismic load on frame free to sway at level 1 (b) same load but with sway prevented at 1. Thus to simulate case when shear wall provided on outside East wall

## CHECK SEISMIC LOADS

Level 1 say 200 p/sf = 9.58 kPa

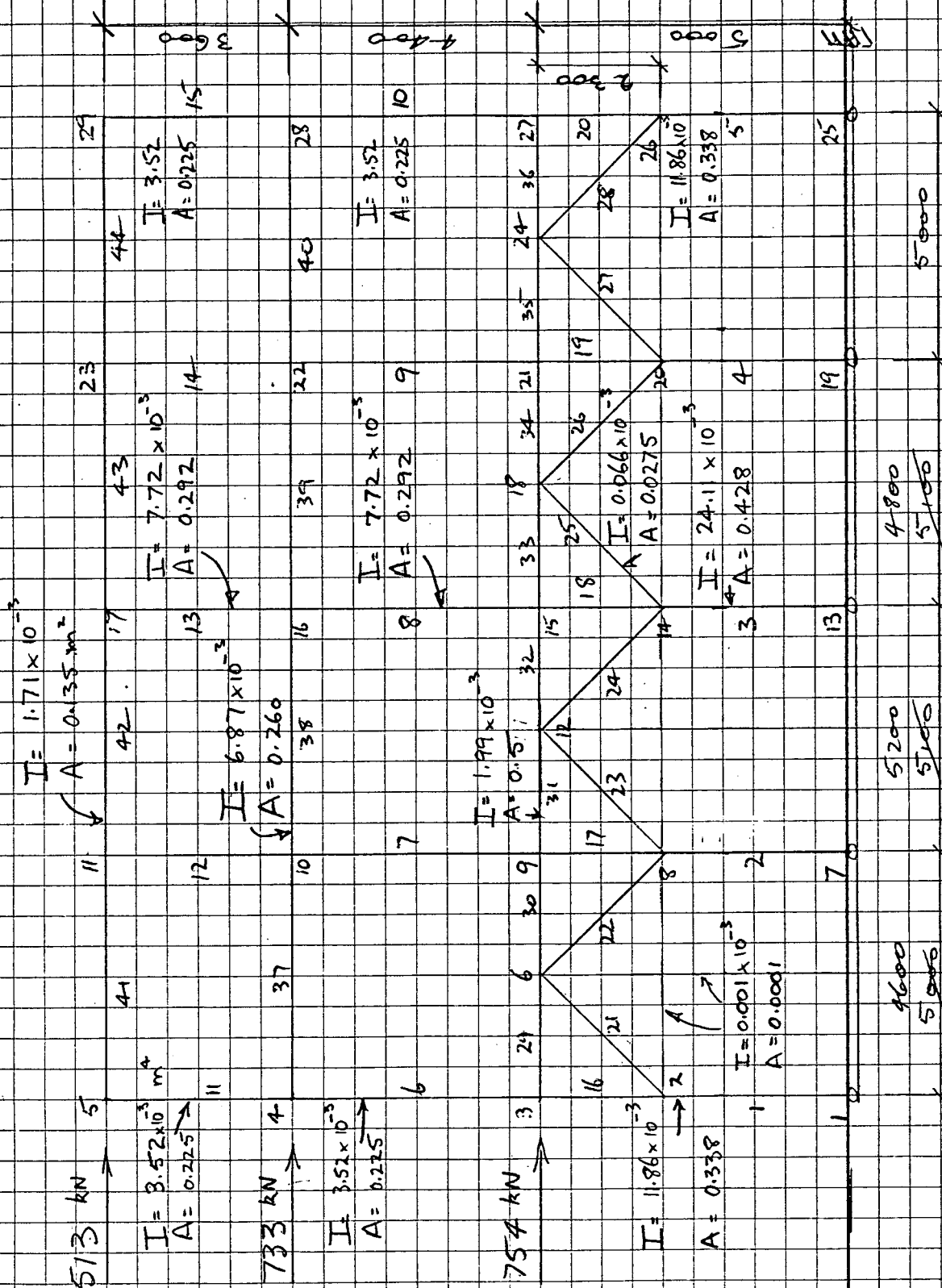
Level 2 say 160 p/sf 7.66

Roof say 105 5.03

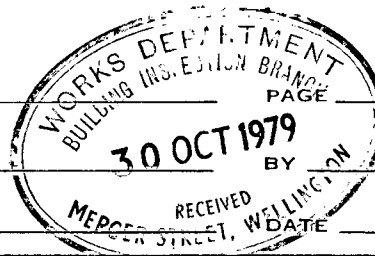
Level	Area	Load/sf	Total	c.f.
1	789.9	9.6	7578	11171
2	675.7	7.7	5203	5772
3	"	5	3379	2920
			<u>16160</u>	<u>19863</u>

ie seismic loads actually  
allowed appear generous.

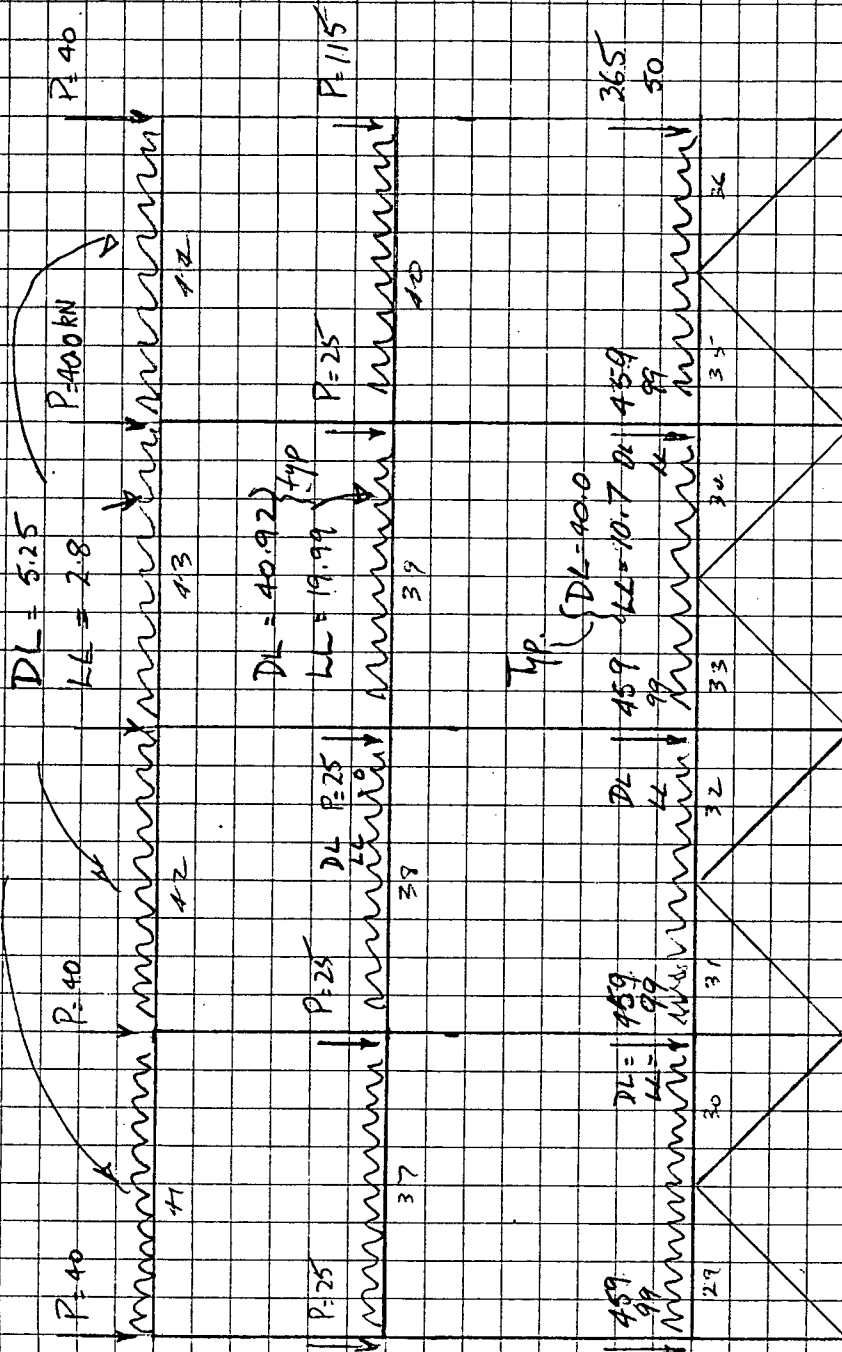
# GEOMETRY & CODING



Note: Where steel members occur  $I \neq A$  factored  $\times n = 9$   
 2. Concrete members assumed 0.75 unfactored section.  
 3.  $I \neq A$  in units



# DEAD LOAD - LIVE LOADS



DL factored by 1.4  
RL " " 1.7

$$1.4 DL + RLL \times 1.7$$

## GENERAL FRAME ANALYSIS

15

WMMC 8.10.79

UNITS FOR GEOMETRY

M

NODE	X-COORD	Z-COORD
1	0.000	0.000
2	0.000	2.700
3	0.000	5.000
4	0.000	9.400
5	0.000	13.000
6	2.300	5.000
7	4.600	0.000
8	4.600	2.700
9	4.600	5.000
10	4.600	9.400
11	4.600	13.000
12	7.200	5.000
13	9.800	0.000
14	9.800	2.700
15	9.800	5.000
16	9.800	9.400
17	9.800	13.000
18	12.200	5.000
19	14.600	0.000
20	14.600	2.700
21	14.600	5.000
22	14.600	9.400
23	14.600	13.000
24	17.100	5.000
25	19.600	0.000
26	19.600	2.700
27	19.600	5.000
28	19.600	9.400
29	19.600	13.000

FRAME LINE 4



## NODE      RESTRAINTS

1      LX LZ

7      LX LZ

13      LX LZ

19      LX LZ

25      LX LZ

## IAN C. SMITH CONSULTANTS

MEMBER	NODE A	NODE B	LENGTH
1	1	2	2.70
2	7	8	2.70
3	13	14	2.70
4	19	20	2.70
5	25	26	2.70
6	3	4	4.40
7	9	10	4.40
8	15	16	4.40
9	21	22	4.40
10	27	28	4.40
11	4	5	3.60
12	10	11	3.60
13	16	17	3.60
14	22	23	3.60
15	28	29	3.60
16	2	3	2.30
17	8	9	2.30
18	14	15	2.30
19	20	21	2.30
20	26	27	2.30
21	2	6	3.25
22	6	8	3.25

IAN C. SMITH CONSULTANTS

23	8	12	3.47
24	12	14	3.47
25	14	18	3.32
26	18	20	3.32
27	20	24	3.40
28	24	26	3.40
29	3	6	2.30
30	6	9	2.30
31	9	12	2.60
32	12	15	2.60
33	15	18	2.40
34	18	21	2.40
35	21	24	2.50
36	24	27	2.50
37	4	10	4.60
38	10	16	5.20
39	16	22	4.80
40	22	28	5.00
41	5	11	4.60
42	11	17	5.20
43	17	23	4.80
44	23	29	5.00

## IAN C. SMITH CONSULTANTS

UNITS FOR YOUNGS MODULUS KN CM

YOUNGS MODULUS 2650

LENGTH UNITS FOR MEMBER PROPERTIES CM

PROPERTY  
TYPE

KAA

KAB

KBB

INERTIA

AREA

1	4.00	2.00	4.00	351999.74	2250.00
2	4.00	2.00	4.00	1185998.50	3379.99
3	4.00	2.00	4.00	771998.93	2920.00
4	4.00	2.00	4.00	2409999.23	4280.00
5	4.00	2.00	4.00	6599.98	275.00
6	4.00	2.00	4.00	198999.76	5000.00
7	4.00	2.00	4.00	686999.63	2600.00
8	4.00	2.00	4.00	170999.64	1350.00

## IAN C. SMITH CONSULTANTS

MEMBER	PROPERTY TYPE
--------	------------------

1	2
2	4
3	4
4	4
5	2
6	1
7	3
8	3
9	3
10	1
11	1
12	3
13	3
14	3
15	1
16	2
17	4
18	4
19	4
20	2
21	5
22	5

23	5
24	5
25	5
26	5
27	5
28	5
29	6
30	6
31	6
32	6
33	6
34	6
35	6
36	6
37	7
38	7
39	7
40	7
41	8
42	8
43	8
44	8

UNITS FOR FORCES AND MOMENTS KN M

LOAD CASE 1

EARTHQUAKE

NODE	HORIZONTAL	VERTICAL	MOMENT
3	94.00	0.00	0.00
9	189.00	0.00	0.00
15	189.00	0.00	0.00
21	189.00	0.00	0.00
27	94.00	0.00	0.00
4	92.00	0.00	0.00
10	183.00	0.00	0.00
16	183.00	0.00	0.00
22	183.00	0.00	0.00
28	92.00	0.00	0.00
5	64.00	0.00	0.00
11	128.00	0.00	0.00
17	128.00	0.00	0.00
23	128.00	0.00	0.00
29	64.00	0.00	0.00

## LOAD CASE 2

## DEAD LOAD \* 1.4

MEMBER	41	VERTICAL	UDL	-5.25
MEMBER	42	VERTICAL	UDL	-5.25
MEMBER	43	VERTICAL	UDL	-5.25
MEMBER	44	VERTICAL	UDL	-5.25
MEMBER	37	VERTICAL	UDL	-40.92
MEMBER	38	VERTICAL	UDL	-40.92
MEMBER	39	VERTICAL	UDL	-40.92
MEMBER	40	VERTICAL	UDL	-40.92
MEMBER	29	VERTICAL	UDL	-40.00
MEMBER	30	VERTICAL	UDL	-40.00
MEMBER	31	VERTICAL	UDL	-40.00
MEMBER	32	VERTICAL	UDL	-40.00
MEMBER	33	VERTICAL	UDL	-40.00
MEMBER	34	VERTICAL	UDL	-40.00
MEMBER	35	VERTICAL	UDL	-40.00
MEMBER	36	VERTICAL	UDL	-40.00



LOAD CASE 3

LIVE LOAD \*1.7

MEMBER	41	VERTICAL	UDL	-2.80
MEMBER	42	VERTICAL	UDL	-2.80
MEMBER	43	VERTICAL	UDL	-2.80
MEMBER	44	VERTICAL	UDL	-2.80
MEMBER	37	VERTICAL	UDL	-20.00
MEMBER	38	VERTICAL	UDL	-20.00
MEMBER	39	VERTICAL	UDL	-20.00
MEMBER	40	VERTICAL	UDL	-20.00
MEMBER	29	VERTICAL	UDL	-10.70
MEMBER	30	VERTICAL	UDL	-10.70
MEMBER	31	VERTICAL	UDL	-10.70
MEMBER	32	VERTICAL	UDL	-10.70
MEMBER	33	VERTICAL	UDL	-10.70
MEMBER	34	VERTICAL	UDL	-10.70
MEMBER	35	VERTICAL	UDL	-10.70
MEMBER	36	VERTICAL	UDL	-10.70

NODE	HORIZONTAL	VERTICAL	MOMENT
3	0.00	-99.00	0.00
9	0.00	-99.00	0.00
15	0.00	-99.00	0.00
21	0.00	-99.00	0.00
27	0.00	-50.00	0.00

IAN C. SMITH CONSULTANTS

UNITS FOR DEFLECTIONS MM

OUTPUT UNITS FOR FORCES KN

OUTPUT LENGTH UNITS FOR MOMENTS M

LOAD CASE 1

NODE	X-DEFLECTION	Z-DEFLECTION	ROTATION
1	0.000	0.000	0.00673820
2	15.620	0.280	0.00387938
3	21.351	0.361	0.00213856
4	41.880	0.547	0.00199633
5	52.044	0.578	0.00210662
6	21.244	0.154	-0.00093298
7	0.000	0.000	0.00673780
8	15.610	-0.018	0.00386849
9	21.351	-0.028	0.00218288
10	41.874	-0.047	0.00216024
11	52.047	-0.051	0.00214297
12	21.221	-0.035	-0.00108041
13	0.000	0.000	0.00678011
14	15.679	0.017	0.00386028
15	21.349	0.025	0.00215082
16	41.871	0.044	0.00213775
17	52.049	0.047	0.00214447
18	21.234	0.035	-0.00104909
19	0.000	0.000	0.00673417
20	15.603	-0.015	0.00386784
21	21.349	-0.023	0.00218836
22	41.873	-0.040	0.00214929
23	52.052	-0.043	0.00214715
24	21.228	-0.210	-0.00096157
25	0.000	0.000	0.00680042
26	15.719	-0.259	0.00386465
27	21.346	-0.329	0.00209719
28	41.877	-0.493	0.00208676
29	52.055	-0.520	0.00212780

## IAN C. SMITH CONSULTANTS

26

MEMBER	NODE	MOMENT	SHEAR	AXIAL
1	1	-0.04	246.53	-929.80
	2	-665.59	-246.53	929.80
2	7	-0.04	502.77	76.44
	8	-1357.42	-502.77	-76.44
3	13	-0.03	511.61	-70.06
	14	-1381.32	-511.61	70.06
4	19	-0.03	502.24	64.75
	20	-1356.00	-502.24	-64.75
5	25	-0.04	253.16	858.73
	26	-683.50	-253.16	-858.73
6	3	-327.48	150.23	-252.35
	4	-333.52	-150.23	252.35
7	9	-694.41	316.12	33.80
	10	-696.52	-316.12	-33.80
8	15	-702.37	319.54	-33.27
	16	-703.59	-319.54	33.27
9	21	-694.44	316.48	30.21
	22	-698.08	-316.48	-30.21
10	27	-327.22	148.84	221.69
	28	-327.67	-148.84	-221.69
11	4	-122.86	66.67	-51.11
	5	-117.14	-66.67	51.11
12	10	-228.88	127.70	7.61
	11	-230.85	-127.70	-7.61
13	16	-234.28	129.94	-6.72
	17	-233.51	-129.94	6.72
14	22	-231.52	128.69	5.79
	23	-231.77	-128.69	-5.79
15	28	-112.99	62.18	44.42
	29	-110.86	-62.18	-44.42
16	2	662.22	-368.99	-313.69
	3	186.46	368.99	313.69
17	8	1350.43	-767.32	47.75
	9	414.40	767.32	-47.75

## IAN C. SMITH CONSULTANTS

18	14	1374.36	-782.35	-41.98
	15	425.04	782.35	41.98
19	20	1349.16	-767.69	35.62
	21	416.52	767.69	-35.62
20	26	679.85	-381.16	274.36
	27	196.82	381.16	-274.36
21	2	3.31	-0.44	-870.91
	6	-1.87	0.44	870.91
22	6	-1.92	-0.41	865.33
	8	3.24	0.41	-865.33
23	8	3.46	-0.56	-880.01
	12	-1.53	0.56	880.01
24	12	-1.45	-0.60	878.58
	14	3.53	0.60	-878.58
25	14	3.38	-0.48	-882.04
	18	-1.78	0.48	882.04
26	18	-1.87	-0.43	883.59
	20	3.30	0.43	-883.59
27	20	3.38	-0.53	-859.83
	24	-1.59	0.53	859.83
28	24	-1.43	-0.62	862.50
	26	3.54	0.62	-862.50
29	3	140.97	-61.34	612.72
	6	0.12	61.34	-612.72
30	6	3.66	-65.31	-612.90
	9	146.54	65.31	612.90
31	9	132.96	-51.36	660.38
	12	0.58	51.36	-660.38
32	12	2.39	-52.25	-654.11
	15	133.46	52.25	654.11
33	15	143.48	-60.97	638.00
	18	2.86	60.97	-638.00
34	18	0.79	-59.94	-634.43
	21	143.06	59.94	634.43
35	21	134.61	-54.53	640.22

## IAN C. SMITH CONSULTANTS

	24	1.72	54.50	-640.22
36	24	1.28	-52.64	-625.09
	27	130.33	52.64	625.09
37	4	456.35	-201.23	8.18
	10	469.33	201.23	-8.18
38	10	455.89	-175.04	3.56
	16	454.32	175.04	-3.56
39	16	483.38	-201.59	-2.12
	22	484.25	201.59	2.12
40	22	445.19	-177.17	-6.35
	28	440.64	177.17	6.35
41	5	117.15	-51.09	-2.59
	11	117.87	51.09	2.59
42	11	113.06	-43.49	-1.43
	17	113.08	43.49	1.43
43	17	120.46	-50.20	-2.31
	23	120.51	50.20	2.31
44	23	111.22	-44.42	-2.04
	29	110.87	44.42	2.04



## LOAD CASE 2

NODE	X-DEFLECTION	Z-DEFLECTION	ROTATION
1	0.000	0.000	0.00074953
2	0.891	-0.041	-0.00050868
3	-0.023	-0.077	0.00089818
4	-0.422	-0.147	0.02074000
5	-0.871	-0.155	-0.00125018
6	-0.022	0.920	-0.00051313
7	0.000	0.000	-0.00111602
8	-1.943	-0.125	0.00007294
9	-0.004	-0.193	0.00138067
10	-0.420	-0.328	0.00036515
11	-0.882	-0.340	0.00064744
12	0.017	-3.319	0.00003451
13	0.000	0.000	0.00163680
14	2.756	-0.083	-0.00021175
15	0.021	-0.150	-0.00158003
16	-0.419	-0.281	-0.00230147
17	-0.896	-0.293	0.00018998
18	0.024	2.702	-0.00001823
19	0.000	0.000	-0.00214137
20	-3.507	-0.124	0.00038669
21	0.042	-0.192	0.00171582
22	-0.417	-0.327	0.00376596
23	-0.907	-0.339	-0.00142160
24	0.064	-4.992	0.00053054
25	0.000	0.000	0.00250935
26	4.595	-0.048	0.00008644
27	0.065	-0.088	-0.00404195
28	-0.415	-0.166	-0.02625150
29	-0.921	-0.174	0.00192150

## IAN C. SMITH CONSULTANTS

LINE	NODE	MOMENT	SHEAR	AXIAL
1	1	-0.00	1.08	135.38
	2	-2.93	-1.08	-135.38
2	7	0.00	-2.08	524.35
	8	5.62	2.08	-524.35
3	13	-0.00	3.24	349.39
	14	-8.75	-3.24	-349.39
4	19	0.00	-4.43	521.96
	20	11.96	4.43	-521.96
5	25	-0.00	2.09	157.85
	26	-5.64	-2.09	-157.85
6	3	9.67	-6.31	95.43
	4	18.08	6.31	-95.43
7	9	3.17	-1.23	237.70
	10	2.23	1.23	-237.70
8	15	-4.80	2.33	229.64
	16	-5.47	-2.33	-229.64
9	21	6.98	-3.61	236.52
	22	8.89	3.61	-236.52
10	27	-14.42	8.69	105.72
	28	-23.84	-8.69	-105.72
11	4	21.04	-8.52	12.16
	5	9.65	8.52	-12.16
12	10	2.00	-1.20	25.58
	11	2.32	1.20	-25.58
13	16	-4.56	1.75	26.50
	17	-1.73	-1.75	-26.50
14	22	7.41	-2.48	25.54
	23	1.51	2.48	-25.54
15	28	-25.99	10.39	13.19
	29	-11.39	-10.39	-13.19
16	2	2.93	-4.22	140.69
	3	6.78	4.22	-140.69
17	8	-5.57	1.69	336.10
	9	1.69	-1.69	-336.10

30

18	14	0.68	-4.24	329.62
	15	1.08	4.24	-329.62
19	20	-11.88	7.12	334.93
	21	-4.50	-7.12	-334.93
20	26	5.57	0.06	155.94
	27	-5.71	-0.06	-155.94
21	2	-0.00	0.00	-7.50
	6	-0.00	-0.00	7.50
22	6	-0.03	0.02	138.76
	8	-0.02	-0.02	-138.76
23	8	-0.03	0.02	136.05
	12	-0.03	-0.02	-136.05
24	12	0.04	-0.02	19.53
	14	0.03	0.02	-19.53
25	14	0.03	-0.02	9.87
	18	0.03	0.02	-9.87
26	18	-0.04	0.02	130.10
	20	-0.03	-0.02	-130.10
27	20	-0.04	0.02	143.36
	24	-0.04	-0.02	-143.36
28	24	0.07	-0.04	2.77
	26	0.07	0.04	-2.77
29	3	-16.45	45.25	-2.09
	6	18.17	46.75	2.09
30	6	-18.14	46.06	-105.53
	9	18.00	45.94	105.53
31	9	-22.86	52.46	-108.44
	12	21.66	51.54	108.44
32	12	-21.66	51.58	-21.15
	15	22.75	52.42	21.15



## IAN C. SMITH CONSULTANTS

33	15	-19.03	47.57	-14.59
	18	20.06	48.43	14.59
34	18	-20.05	48.39	-101.39
	21	19.11	47.61	101.39
35	21	-21.59	50.81	-112.10
	24	19.57	49.19	112.10
36	24	-19.61	49.79	-8.63
	27	20.13	50.21	8.63
37	4	-39.13	83.26	-2.21
	10	89.06	104.97	2.21
38	10	-93.29	107.17	-2.21
	16	89.26	105.62	2.21
39	16	-79.22	97.52	-2.80
	22	82.51	98.89	2.80
40	22	-98.81	112.10	-1.69
	28	49.83	92.50	1.69
41	5	-9.65	12.16	8.52
	11	9.24	11.99	-8.52
42	11	-11.57	13.56	9.71
	17	12.01	13.74	-9.71
43	17	-10.28	12.75	7.93
	23	9.57	12.45	-7.93
44	23	-11.09	13.06	10.39
	29	11.39	13.19	-10.39

## LOAD CASE 3

NODE	X-DEFLECTION	Z-DEFLECTION	ROTATION
1	0.000	0.000	0.00011193
2	0.165	-0.048	-0.00004031
3	-0.036	-0.088	-0.00005239
4	-0.283	-0.123	0.01013280
5	-0.525	-0.127	-0.00032953
6	-0.035	0.157	-0.00005426
7	0.000	0.000	-0.00027677
8	-0.485	-0.069	0.00001438
9	-0.030	-0.118	0.00031866
10	-0.282	-0.185	0.00022530
11	-0.530	-0.192	0.00031067
12	-0.025	-0.840	0.00000166
13	0.000	0.000	0.00037790
14	0.622	-0.059	-0.00006414
15	-0.023	-0.107	-0.00034003
16	-0.281	-0.172	-0.00120213
17	-0.537	-0.178	0.00008955
18	-0.022	0.584	0.00000566
19	0.000	0.000	-0.00053110
20	-0.857	-0.069	0.00011001
21	-0.017	-0.118	0.00033238
22	-0.280	-0.185	0.00192460
23	-0.543	-0.191	-0.00070351
24	-0.012	-1.241	0.00005280
25	0.000	0.000	0.00064901
26	1.085	-0.035	-0.00009257
27	-0.011	-0.065	-0.00061702
28	-0.279	-0.104	-0.01298100
29	-0.550	-0.108	0.00063982

MEMBER	NODE	MOMENT	SHEAR	AXIAL
1	1	-0.00	0.13	157.94
	2	-0.35	-0.13	-157.94
2	7	0.00	-0.51	290.87
	8	1.38	0.51	-290.87
3	13	-0.00	0.77	246.75
	14	-2.09	-0.77	-246.75
4	19	0.00	-1.12	289.90
	20	3.03	1.12	-289.90
5	25	-0.00	0.64	117.16
	26	-1.73	-0.64	-117.16
6	3	4.32	-2.95	47.12
	4	8.64	2.95	-47.12
7	9	0.96	-0.42	117.42
	10	0.87	0.42	-117.42
8	15	-1.59	0.90	113.40
	16	-2.39	-0.90	-113.40
9	21	2.57	-1.51	116.82
	22	4.05	1.51	-116.82
10	27	-5.95	3.90	52.20
	28	-11.19	-3.90	-52.20
11	4	10.44	-4.29	6.45
	5	5.01	4.29	-6.45
12	10	1.10	-0.64	13.68
	11	1.20	0.64	-13.68
13	16	-2.39	0.92	14.12
	17	-0.92	-0.92	-14.12
14	22	3.82	-1.30	13.66
	23	0.84	1.30	-13.66
15	28	-13.01	5.26	7.00
	29	-5.95	-5.26	-7.00
16	2	0.35	-0.29	158.37
	3	0.32	0.29	-158.37
17	8	-1.36	0.45	242.75
	9	0.32	-0.45	-242.75

18	14	2.08	-1.14	239.12
	15	0.54	1.14	-239.12
19	20	-3.01	2.08	242.15
	21	-1.78	-2.08	-242.15
20	26	1.71	-0.87	115.77
	27	0.28	0.87	-115.77
21	2	0.00	-0.00	-0.60
	6	0.00	0.00	0.60
22	6	-0.01	0.00	35.48
	8	-0.01	-0.00	-35.48
23	8	-0.01	0.00	34.78
	12	-0.01	-0.00	-34.78
24	12	0.01	-0.00	6.87
	14	0.01	0.00	-6.87
25	14	0.01	-0.00	4.47
	18	0.01	0.00	-4.47
26	18	-0.01	0.00	33.04
	20	-0.01	-0.00	-33.04
27	20	-0.01	0.01	36.78
	24	-0.01	-0.01	-36.78
28	24	0.01	-0.01	2.05
	26	0.01	0.01	-2.05
29	3	-4.64	12.24	-2.65
	6	4.79	12.37	2.65
30	6	-4.79	12.29	-28.16
	9	4.82	12.32	28.16

## IAN C. SMITH CONSULTANTS

31	9	-6.11	14.02	-29.04
	12	5.82	13.80	29.04
32	12	-5.82	13.80	-8.14
	15	6.10	14.02	8.14
33	15	-5.05	12.71	-6.10
	18	5.37	12.97	6.10
34	18	-5.37	12.98	-26.73
	21	5.04	12.70	26.73
35	21	-5.84	13.63	-30.32
	24	5.19	13.12	30.32
36	24	-5.19	13.18	-4.76
	27	5.67	13.57	4.76
37	4	-19.08	40.67	-1.34
	10	43.61	51.33	1.34
38	10	-45.59	52.39	-1.57
	16	43.55	51.61	1.57
39	16	-38.77	47.66	-1.57
	22	40.40	48.34	1.57
40	22	-48.28	54.82	-1.36
	28	24.20	45.18	1.36
41	5	-5.01	6.45	4.29
	11	4.99	6.43	-4.29
42	11	-6.18	7.24	4.92
	17	6.40	7.32	-4.92
43	17	-5.48	6.79	3.99
	23	5.13	6.65	-3.99
44	23	-5.96	7.00	5.27
	29	5.95	7.00	-5.27

LOAD SHARING

$$\frac{\text{Frame line 4}}{\text{Frame line 9}} = \frac{0.518}{1}$$

$$\text{Frame line 9} = 1$$

$$\therefore \text{Load to Frame 4} = \frac{0.518}{1.518} = 0.341$$

$$\text{Load to Frame 9} = 0.659$$

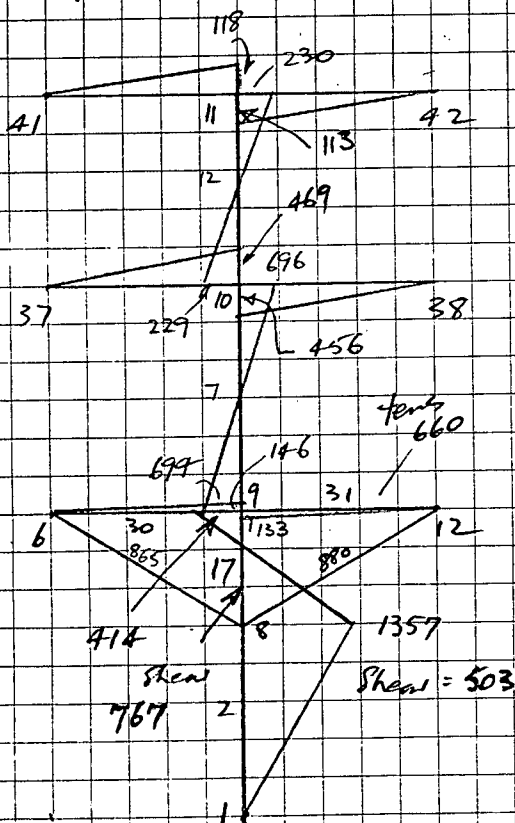
Therefore design frame 9 for say 70%  
design frame 4 for 40%

This allows a margin for  
increased loading due to torsion.

DESIGN FRAME LINE 4

Take computer output for full  
earthquake and factor by 0.4

SUBSEQUENTLY  
INCREASE TO  
0.5 SINCE FRAMES  
IDENTICAL



Design moment

for ground level

$$\begin{aligned} \text{columns} &= 0.4 \times 1357 \\ &= 543 \end{aligned}$$

for first floor

$$\begin{aligned} \text{columns} &= 0.4 \times 696 \\ &= 278 \end{aligned}$$

for upper columns

$$\begin{aligned} &= 0.4 \times 230 \\ &= 92 \end{aligned}$$

## DESIGN COLUMN

Tty 900 x 450.

$$M_u = 1218 \text{ kNm}$$

since  $P_u$  is negligible design as

$$R_u = \frac{54.3 \times 10^6}{0.9 \times 450 \times 825^2} = 1.97$$

$$A_s = 0.0055 \times 450 \times 825 = 2042 \text{ each face}$$

Use 3 HD 32 each face

USE GRADE  
380 reo.

900 x 450 OK

6 HD 32

## CHECK DIAGONAL STRUTS

INCREASE BY 25%  
USE 8 HD 32

$$\text{Compression} = 0.4 \times 880 = 352$$

$$DL + \frac{1}{3} LL = \frac{139}{1.4} + \frac{1}{3} \times \frac{75}{1.7} = 104$$

458 kN

or at working stress

$$\text{Effective load} = 0.8 \times 458 = 367$$


$$\text{length} = 3.7 \text{ m}$$

Use 2 equal angles toe to toe

127 x 127 x 8

dim 132 x 132

to give overall

This conveniently fits with  entry beam.INCREASE x 1.25  
USE 127 x 127 x 12

## BEAM AT LEVEL 1

CHECK conn.

Moments at intermediate columns of entry level are only nominal. When columns are constructed and beams are opened up check contributing steel moment capacity & ensure tie capacity is developed

$$\text{Max tension} = 660 \times 0.4 \text{ kN}$$

$$A_s = \frac{264 \times 10^3}{275} = 960 \text{ mm}^2$$

Use

## EXISTING STEEL GIRDER

Sections show 2 - I sections

However Drawings refer to 14" x 6" x 57 p

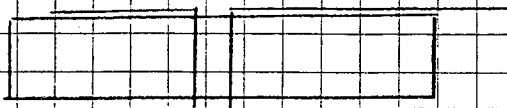
Tensile capacity Area = 16.78 s.i.

= 2980 kN

$$M_u = 1.25 \times 762 \times 254 \times 165^3$$

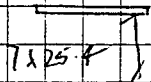
$$= 258 \text{ kNm}$$

Need to provide web &amp; top flange plates

Top plate say  
130 wide  
x 12 thick

Area = 1560 mm<sup>2</sup>

$$M_u \text{ required} = 0.4 \times 146 = 58 \text{ kNm}$$



$$Z_{\text{reqd}} = \frac{58 \times 10^6}{1.25 \times 165 \times 10^3} \text{ mm}^3$$

$$= 50 \times 10^6$$

$$\text{width of 25 thickness reqd}$$

$$= \frac{50}{1.76} = 28 \text{ mm}$$

100 x 12 mm  
plates OK

## COLUMN AND BEAMS ABOVE LEVEL 1

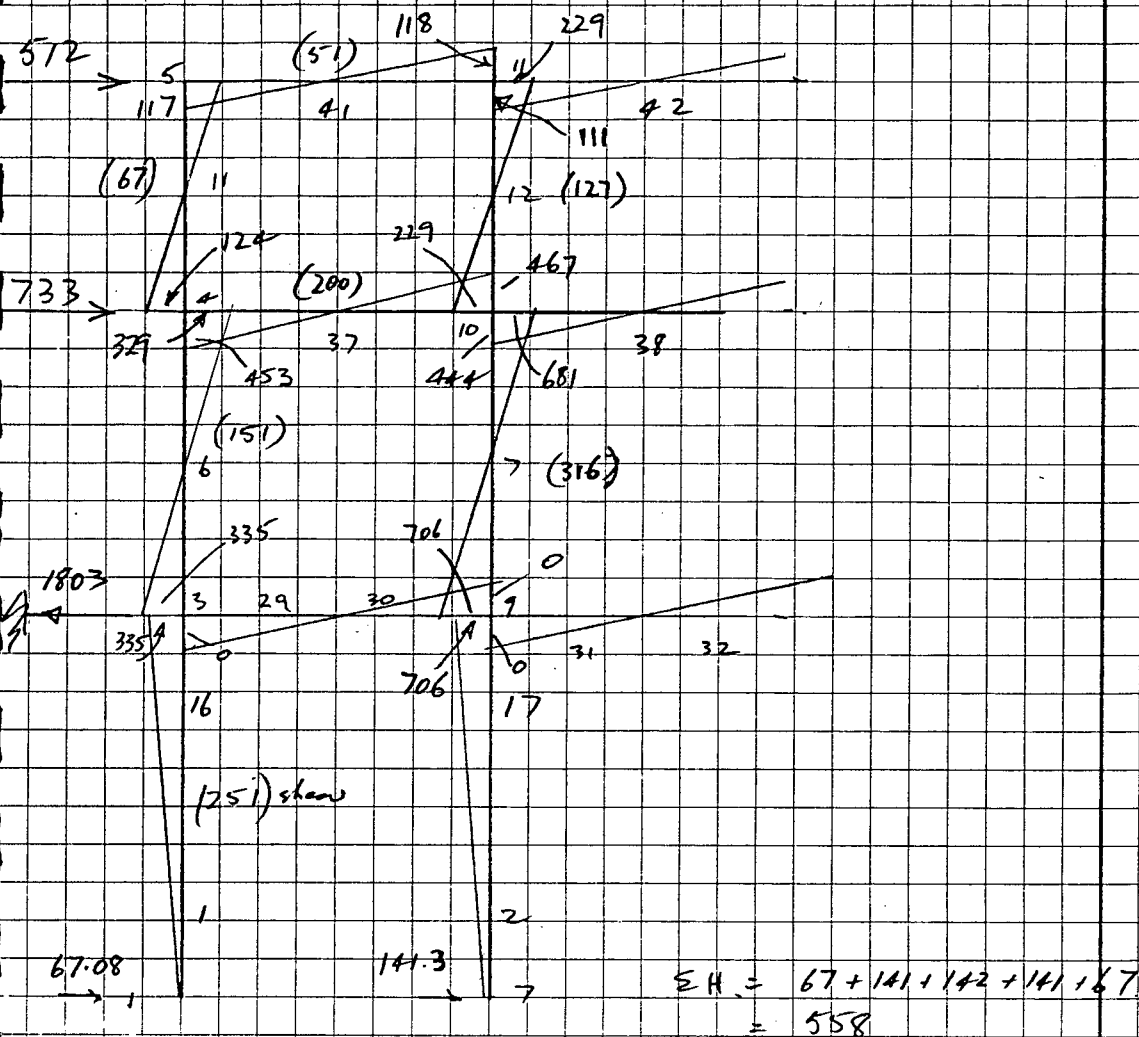
Since this frame takes 40% of  
seismic loading but slightly more  
gravity Design frame on line 9

Now TO TAKE  
50%

First - Use same dimensions for

concrete sections + modify reinforcement  
where appropriate for reduced load.



DESIGN FRAME LINE 9.

Take 0.7 x applied moment  
above

SINCE FRAMES ARE  
NOW IDENTICAL DESIGN  
FOR 0.7 IS CONSERVATIVE

# END COLUMN

Level 1 to 2

$$M_u = 0.7 \times (335 - 0.3 \times 151)$$

$$= 203 \text{ kNm.}$$

Try column 450 x 450

Design as a beam

$$R_u = \frac{203 \times 10^6}{0.9 \times 450 \times 375^2} = 3.56$$

$$A_s = 0.0102 \times 450 \times 375 \text{ c.f.} \quad 450 \times 450 \text{ OK}$$

$$= 1720 \text{ mm}^2 \text{ c.f.}$$

$$\text{I.E.} \quad 3 \text{ HD } 28 \text{ c.f.}$$

Use 6 HD 28.

Level 2-3

$$M_u = 0.7 (124 - 0.225 \times 67)$$

$$= 76$$

$$R_u = \frac{76}{203} \times 3.56 = 1.33$$

$$A_s = 0.0038 \times 450 \times 375$$

$$= 641$$

$$2 \text{ HD } 28 \text{ c.f.}$$

4 HD 28.

Level 9 to 1

$$M_u = 0.7 \times 335 \quad \text{or} \quad 0.4 \times 166$$

$$= 234 \quad \text{or} \quad 266$$

Try 600 x 450

$$R_u = \frac{266 \times 10^6}{0.9 \times 450 \times 535^2} = 2.29$$

$$A_s = 0.0065 \times 450 \times 535 = 1565$$

Use 6 HD 28.

INTERMEDIATE COLUMNSLevel 1 to 2

$$M_u = 0.7 \times (706 - 0.3 \times 316)$$

$$= 428$$

Try 600 x 450 col.

Design as a beam

$$R_u = \frac{428 \times 10^6}{0.9 \times 450 \times 525^2} = 3.83$$

$$A_s = 0.0111 \times 450 \times 535$$

$$= 2672$$

2-HD 32 + 2 HD 28 e.f.

4 HD 32  
4 HD 28Level 2 to 3

$$M_u = 0.7 (229 - 0.3 \times 127)$$

$$= 134$$

$$R_u = \frac{134 \times 10^6}{0.9 \times 450 \times 535^2} = 1.16$$

$$A_s = 0.0035 \times 450 \times 535$$

$$= 842$$

4-HD 28

Could reduce column to

450 x 450

Use 450 x 450

$$R_u = \frac{1.16 \times 535^2}{375^2} = 2.36$$

$$A_s = 0.0067 \times 450 \times 375 = 1130$$

4-HD 28

OK

## SHEAR ON COLUMNS

Concrete strength 25 MPa

$$\text{Allowable shear stress} = 0.33 \sqrt{f'_c}$$

$$= 1.65$$

## END COLUMN

Shear level 1 to 2 = 151 kN

$$v = \frac{151 \times 1000}{450 \times 450} = 0.75$$

$$v_c = 0.17 \sqrt{f'_c} = 0.85$$

Use nominal rebar  $\phi 12 @ 300$ 

Shear level 2 to roof = 67

Use nominal rebar

## INTERMEDIATE COLUMN

Shear level 1 to 2 = 316

$$v = \frac{0.7 \times 316 \times 1000}{0.85 \times 600 \times 450} = 0.96$$

$$v_s = 1.17 - 0.85 = 0.32$$

$$\phi 12 @ 300 \quad v_s = \frac{2 \times 113 \times 275}{300 \times 450} = 0.46$$

 $\phi 12 @ 300$  OK

By inspection level 2-3

 $\phi 12 @ 300$  OK $\phi 12 @ 300$

## CHECK COLUMNS FRAME 4 ABOVE LEVEL 2

Since there is only a partial diaphragm provided through gang nail trusses, design 600 x 450 columns above level 2 as cantilevers to distribute earthquake force in transverse direction

$$V \text{ at roof} = 513 \quad (\text{refer p 12})$$

divide load to 4 columns

cantilever moment above level 2

$$= \frac{513}{4} \times 3.3 = 423 \text{ kNm}$$

$$R_n = \frac{423 \times 10^6}{0.9 \times 600 \times 400^2} = 4.89$$

$$A_s = 0.0148 \times 600 \times 400 = 3552$$

Use 2-HD28 + 3 HD 32

$$\text{Shear: } 513 \div 4 = 128$$

Use  $\phi 12 @ 300$

## BEAMS LEVEL 2

Assume DL + LL is taken care  
of in redistribution of moments

$M_u$  at column face

$$= 0.7(467 - 0.3 \times 200)$$

$$= 285$$

$$1.4 DL + 1.7 LL = 93 + 45 = 138 - \frac{0.3 \times 60.9 \times 5.1}{2}$$

$$= 91.4$$

$$\text{Span moment} = \frac{60.9 \times 5.1^2}{8} - 91.4$$

$$= 106.6$$

Try  $600 \times 300$

$$R_u = \frac{285 \times 10^3}{0.9 \times 300 \times 525^2} = 3.83$$

$$A_s = 0.0112 \times 300 \times 525$$

$$= 1764$$

Use 3 HD 28

3 HD 28  
bars at supports

Span reinforcement

try 2 - HD 28

$$a = \frac{A_s f_y}{0.85 f_c' b} = \frac{1232 \times 380}{0.85 \times 25 \times (300 + 6 \times 50)}$$

$$= 37 \text{ mm}$$

$$l_a = 600 - 65 - 18 = 517$$

$$M_u = 1232 \times 380 \times 517$$

$$= 242$$

2 HD 28 more than  
ample

BEAMS LEVEL 3 $M_u$  at column face

$$= 0.7 (118 - 0.3 \times 51)$$

$$= 72$$

Try 450 x 250 beam

450 x 250 beam

$$R_u = \frac{72 \times 10^6}{0.9 \times 250 \times 375^2} = 2.27$$

$$A_s = 0.0063 \times 250 \times 375$$

$$= 591$$

Use 2 HD 24

2 HD 24

SHEAR ON BEAMSSHEAR600 x 300 beam max<sup>n</sup> shear = 200 x 0.7

600 x 300 beam

$$v = \frac{140 \times 1000}{0.85 \times 600 \times 300} = 0.915$$

Use nominal shear req

φ 10 @ 300

φ 10 @ 300

450 x 250 beam max<sup>n</sup> shear = 0.7 x 51

450 x 250 beam

$$v = \frac{36 \times 1000}{0.85 \times 450 \times 250} = 0.38$$

Use nominal shear req

φ 10 @ 300

φ 10 @ 300

CHECK UPLIFT ON END COLUMN.

Internal column at 94 is the  
worst case

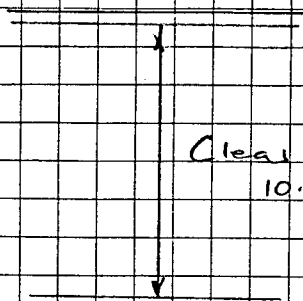
$$\begin{aligned}\text{Uplift} &= 0.4 \times 930 \\ &= 372 \text{ kN}\end{aligned}$$

$$\text{DL} + \text{RL} \text{ from p} = 806 \text{ kN}$$

This OK. Also load  
can be carried around the corner  
on to shear wall



SECOND FLOOR NEW BLOCK



$$LL = 3.0 \text{ kPa}$$

$$V_{\text{max}} 900 \text{ Tt } 300$$

$$DL = 3.3 \text{ kPa}$$

LOAD ON END BEAMS

$$\begin{aligned} \text{CONTRIBUTORY AREA} &= 10.8 \times 5 \\ &= 44 \text{ m}^2 \end{aligned}$$

$$R = 0.3 + \frac{3.0}{44} = 0.368$$

$$\therefore L_R = 0.368 \times 3 = 1.1 \text{ kPa}$$

Beams  $650 \times 400$  Length = 5000

$$D/W = 0.65 \times 0.4 \times 23.5 \times 1.4 = 6.11 \times 1.4 = 8.55$$

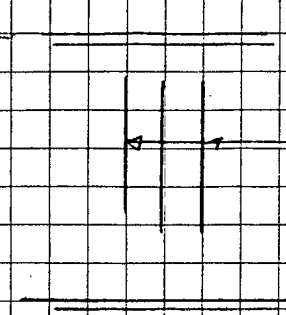
$$DL \text{ Floor} = 3.3 \times 5.4 \times 1.4 = 24.95$$

$$+ 1.0 \times 5.3 \times 1.4 = 7.42$$

$$LL = 0.368 \times 3 \left( \frac{10.8 + 10.5}{2} \right) \times 1.7 = 19.99$$

$$60.91$$

ROOF


 Pryda Trusses @ 2170 c/c

Loads	Insulation	50
	Metall. Diagonal	44.3
	Partials	32
	Trusses	60
	Ceiling g/b bd	235
	Ceiling joists	50
		<hr/> 471

live load

$$\text{Area support } 10.8 \times 2.17 = 23.4$$

$$\text{live load } 250$$

$$\text{Total } 721$$

Pryda I 503 has capacity

$$2.5 \times 574 = 1437 \text{ N/m}$$

$$\text{Actual required } = \frac{721}{2.5} \times 2.17$$

$$= 1564$$

$$\text{Close centre to } \frac{1437}{1564} \times 2.17$$

$$= 199$$

Add a further truss 9 truss plus

2 end frames i.e. 10 spaces @ 19380

$$\text{i.e. Spacing } = 1938 \text{ ! OK @ } 1940 \text{ c/c}$$

$$\text{i.e. Use } 9 \text{ trusses @ } 1940 \text{ c/c}$$

## PURLINS

Space @ 900 c/c. Span 1940.

$$\text{Load } 50 + 44 + 32 + 250 = 376$$

$$M = \frac{0.9 \times 376 \times 1.94^2}{8} = 159 \text{ Nm}$$

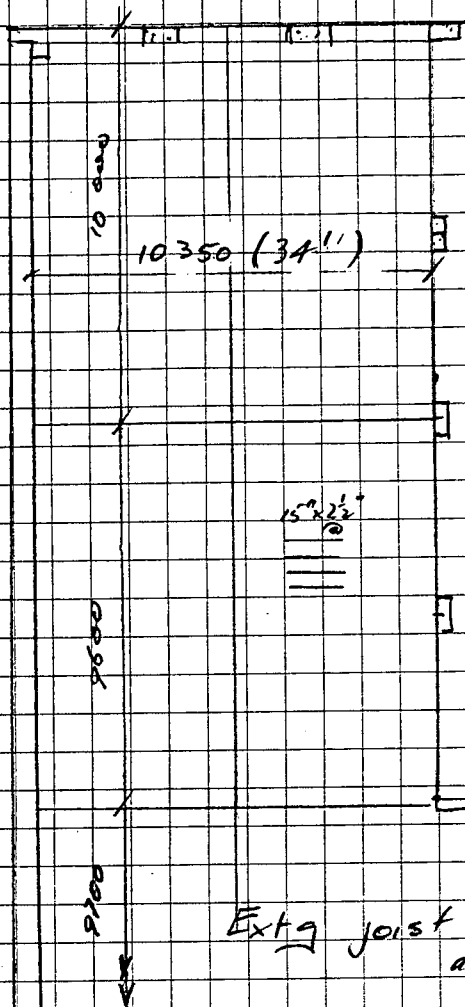
$$I_{yy} = 100 \times 50$$

$$Z = \frac{50 \times 100^2}{6} = 83.3 \times 10^3$$

$$f = \frac{159 \times 1000}{83.3 \times 10^3} = 1.91 \text{ N/mm}^2$$

$$\text{Allowable @ } 7 \text{ N/mm}^2 \therefore \text{OK}$$

## CONSIDER SECOND FLOOR



Provide fire rating on top  
by 1 layer Gyrostop plus 1/4 boarding  
Provide fire rating below  
with 2 layers Gyrostop.

Extg joist are 15" x 2 1/2" @ 16" c/s  
assumed to be Oregon

Floor to Floor height = 13'2"

LOADING

Flooring 1 1/2" @ 40 p/sf	=	4
Ceiling 2 layers Gyrostop	=	
161 kg/m <sup>2</sup>	=	12.5
Surfacing 6 + 4	=	10
Joists 15" x 2 1/2" @ 16" c/s	=	8
		34.5 p/sf

Pl dance Floor 100 p/sf

Total = 134.5 p/sf.  
= 6.44 kPa.

## EXISTING FLOOR JOISTS

15" x 2 1/2" @ 16" c/c  
 ie 380 x 64 @ 400 c/c.

Design  $\therefore$  Allowable = 11 MPa

Design using NZS 1900 Chap 9.1

$$K = 0.8 \frac{(15^2 + 14^2)}{(15^2 + 88)} = 0.9406$$

$$Z = \frac{64 \times 380^2}{6} \times \frac{1}{0.4} / m = 3.85 \times 10^6 \text{ mm}^3$$

$$M = K F Z = 0.9406 \times 11 \times 3.85 \times 10^6 \times 10^6 \text{ RNm}$$

$$= 39.8 \text{ RNm}$$

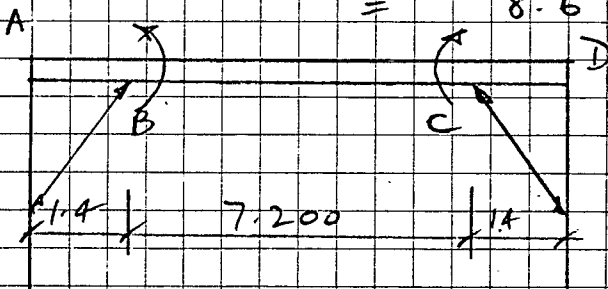
If continuous over knee braces  
 & therefore effectively encastre

$$M = \frac{w l^2}{12} \text{ at support}$$

$\therefore$  max. clear span =  $l_c$

$$= \sqrt{\frac{12 \times 39.8 \times 10^3}{6.44 \times 10^3}}$$

$$= 8.6 \text{ m}$$



$$M_B = M_C = \frac{6.44 \times 7.2^2}{12} = 27.82 \text{ RNm}$$

$$\therefore \text{Stress in timber} = \frac{27.82 \times 10^3 \times 10^9}{3.85 \times 10^6 \times 10^6}$$

$$= 7.22 \text{ MPa}$$

or 1050 p.s.i.

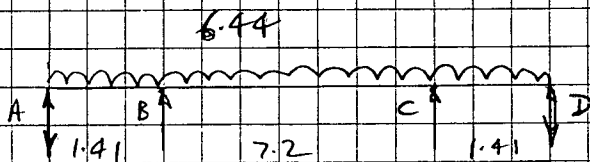
$\therefore$  OK

$$\begin{array}{r}
 \frac{7.20}{2} \times 1.41 \\
 0.207 \quad 0.793 \\
 27.82 - 1.60 \\
 - 5.43 - 20.79 \\
 22.39 - 22.39
 \end{array}$$

MOMENT DISTN

By distribution therefore actual  $M = 22.39$ 

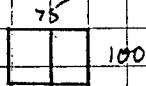
$$\therefore \text{shear} = \frac{22.39}{27.82} \times 7.22 = 5.81 \quad (845 \text{ p.s.i.})$$



$$R_A = R_D = \left( \frac{M_B}{2} - \frac{1.41^2 \times 6.44}{2} \right) \times \frac{1}{1.41} = 11.34 \text{ kN.}$$

$$\text{Pullout on dia 12 bolt} = \frac{5691 \times 9.81}{3} =$$

$$\text{Provide dia 12 @ } \frac{18.6}{11.34} \quad 1600 \text{ cm.}$$

Tie down member say  $100 \times 75$ 

$$Z = \frac{75 \times 100^2}{6} = 125 \times 10^3 \text{ mm}^3$$

$$\text{UDL} = 11.34 \text{ kN/m.}$$

$$\text{Continuous } \therefore M = \frac{W l_c^2}{12} \quad f_c = 7 \text{ MPa}$$

where  $l_c$  = distance between bolts

$$\therefore M = FZ = 7 \times 10^6 \text{ N/m}^2 \times 125 \times 10^3 \times 10^{-9} = 875 \text{ N m.}$$

$$\therefore l_c = \sqrt{\frac{12 \times 875}{11340}} = 960$$

i.e. Use dia 12 bolts @ 900 cm.

Check coach screws  $\frac{1}{0.4}$  dia 10 screws/m.

$$\begin{aligned}
 \text{Tie down} &= 2.5 \text{ bolts} \quad \therefore \text{load per bolt} \\
 &= 4.54 \text{ kN} \quad @ \quad (1020 \text{ p.s.i.})
 \end{aligned}$$

Coach screws to be checked for pullout to 460 kg.

BEAM AT B + C

Supported 1500 or approx

$$\begin{aligned} \text{UDL} &= \frac{6.44 \times 10.02}{2} + 11.34 \\ &= 43.6 \text{ kN/m} \end{aligned}$$

$$M = \frac{43.6 \times 1.5^2}{12} = 8.17 \text{ kNm}$$

$$f_{\text{allowable}} = \frac{1000}{145} = 7 \text{ MPa}$$

$$\begin{aligned} Z_{\text{reqd}} &= \frac{8.17 \times 10^3 \times 10^9}{7 \times 10^6} \text{ mm}^3 \\ &= 1.18 \times 10^6 \text{ mm}^3 \end{aligned}$$

$$\text{Try } b = 100$$

$$\therefore d = \sqrt{\frac{6 \times 1.18 \times 10^6}{100}} = 266$$

$$\text{ie. } 100 \times 300$$

$$\text{Try } b = 150$$

$$d = 150 \times 217$$

Use 2- 75 x 200

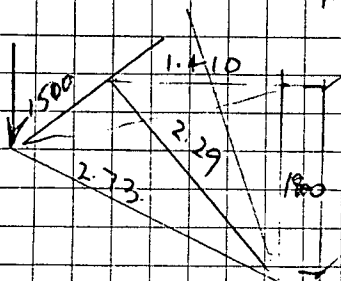
$$\begin{aligned} \therefore \text{Stress} &= \frac{8.17 \times 10^3 \times 6 \times 10^3}{150 \times 200^2} \text{ MPa} \\ &= 8.17 \end{aligned}$$

$$\begin{aligned} \text{Laminated effectively so that} \\ \text{allowable stress} &= \frac{1.23 \times 1000}{145} = 8.48 \\ &= \text{OK} \end{aligned}$$

STRUTS

$$\text{Load / m} = 43.6$$

$$\text{Load / strut} = 43.6 \times 1.5 = 65.4 \text{ kN}$$



$$\begin{aligned} &\text{as down slop.} \\ &\frac{2.73}{1.8} \times 65.4 \\ &= 99.2 \text{ kN} \end{aligned}$$

$$C' = \frac{P}{A} = \frac{0.3 E}{(L/d)^2}$$

$$\begin{aligned} \text{Try } 150 \\ \frac{L}{d} &= \frac{2.73}{0.15} = 18.2 \quad C' = \frac{1180}{145} = 8.14 \end{aligned}$$

Try 150 x 150

$$\text{Stress} = \frac{99.2 \times 10^3}{150^2} = 4.40$$

$$\text{Reduce size} = \frac{\sqrt{4.4}}{8.14} \times 150 = 110$$

Try 120 sq.

$$\frac{L}{d} = 22.7 \quad C = \frac{700}{145} = 4.83$$

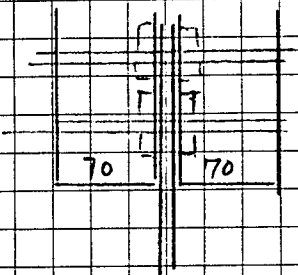
$$\text{Stress} = \frac{99.2 \times 10^3}{120^2} = 6.89$$

USE 150 sq  
timber  
ALTERNATIVELYBOLTS

Try 2 - dia 20 in double shear

$$\text{Allowable shear} = 4 \times 1.415 \times 4.448$$

$$= 25.2 \text{ kN}$$

USE  
76 x 76 x 4.0 mm  
RHS.

∴ Need 8 bolts

Alternatively use  
laminated timber 2-150 x 75  
+ shear plates. 65 dia.

$$\text{Allowable load} = 3.15 \times 4.448 = 14 \text{ kN/bolt}$$

WITH STEEL  
USE 4-M20  
Bolts or  
174 mm 6mm  
fillet

$$\text{No of plates} = 7$$

ie 4 bolts 2 each.

TIES

$$\text{tie force} = 51.23 \text{ kN}$$

$$\text{Allowable stress} = 140 \text{ MPa}$$

$$\therefore A = \frac{51.23 \times 10^3}{140} = 366 \text{ mm}^2$$

Use 20 dia.

Alternatively use 24 dia Duplex anchor

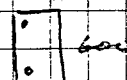
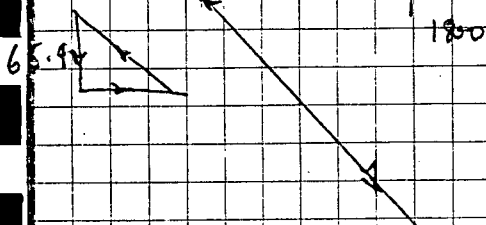
CHECK

Bending on concrete beam

$$M_u = 1.5 \times 51.2 \times 1.5 \times \frac{8}{12} \quad \text{for cantilever}$$

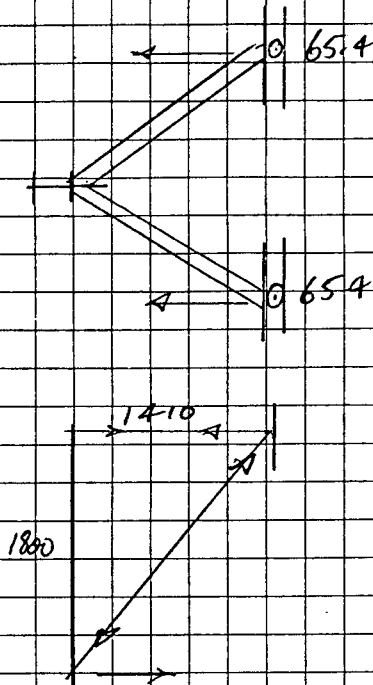
$$= 76.8 \text{ kN m}$$

$$R = \frac{76.8 \times 10^3}{0.9 \times 600 \times 250^2} = 2.27$$

(in any case load goes into  
stationary pile. OK)



## STRUCTURAL STEEL COLUMNS - OUTER WALL



Thrust on column

$$= 2 \times 51.23 = 102.46$$

Design columns to be clear of external wall.

$$M = \frac{Pab}{L}$$

$$= \frac{102.46 \times 1.8 \times 1.7}{3.5}$$

$$= 89.6 \text{ kNm}$$

equivalent UDL

$$\frac{WL}{8} = 89.6$$

$$W = \frac{8 \times 89.6}{3.5} = 205$$

200 UC 60 would suffice.

## SHEAR AT BASE

$$V = \frac{M}{1.7} = \frac{89.6}{1.7} = 52.7$$

Try dia 20 bolts.

$$\text{Allowable shear} = 1.45 \times 9.81 \text{ kN/bolt}$$

$$= 14.2$$

Use 4 - dia 20 bolts.

## LOAD ON COLUMNS IF WALL FAILS

$$30 \times 0.04788 \times 3 \times 5 = 21 \text{ kN}$$

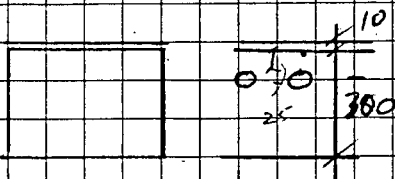
Which is small relative to capacity of 200 UC 60 at 900 kN.

## ALTERNATIVELY

TRY

CONC 450 x 300

CONC



$$d = 260$$

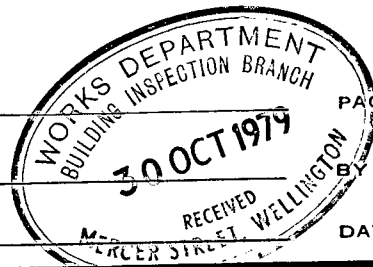
$$R_n = \frac{1.5 \times 89.6 \times 10^6}{0.9 \times 450 \times 260^2}$$

$$= 4.91$$

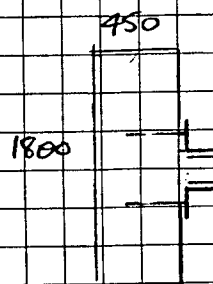
$$450 \times 300$$

$$3 - \text{HD 28}$$

$$A_s = 0.0147 \times 450 \times 260 = 1720$$



## COLUMNS AT U/S OF ROOF TRUSSES



Extg brick pier 1800x450

Height 3.4 m

$$W = 1.8 \times 0.45 \times 3.4 \times 17.2$$

$$= 47.4 \text{ kN}$$

$$\text{Take } C_d = 2 \times 0.67 \times 0.12$$

$$= 0.16$$

UDL on column

$$= 0.16 \times 47.4 = 7.6 \text{ kN}$$

USE

2- 102x102x8 angles

capacity as beams

$$= 2 \times 4.8 = 9.6 \text{ kN} \therefore \text{OK}$$

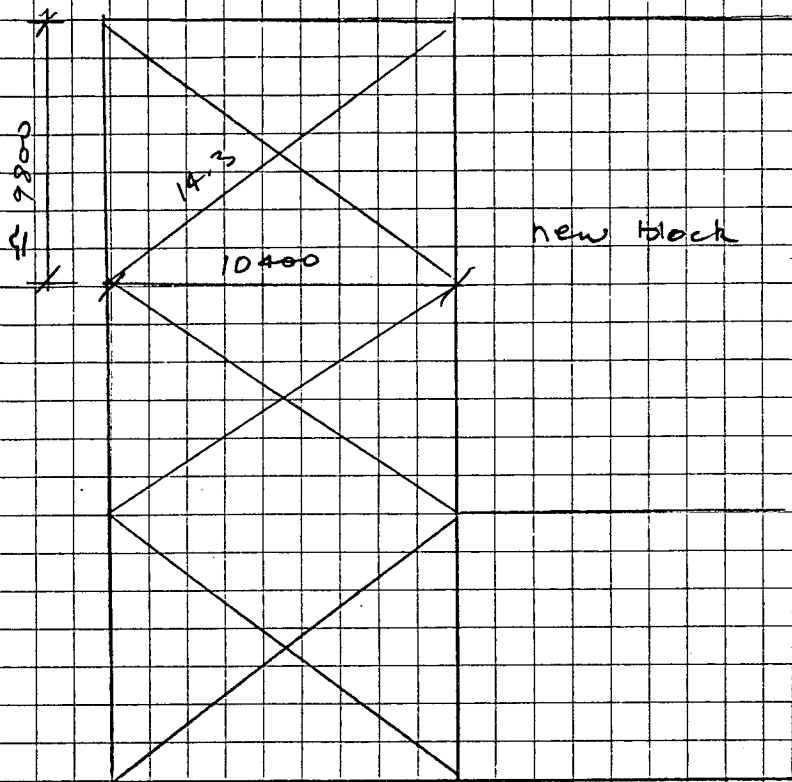
102x102x8 angles as struts

$$\text{will carry } 2 \times 48 \text{ kN} = 96 \text{ kN}$$

c.f. actual if pier collapses = 21 kN.

(as p 56)

## DIAGONAL BRACES UNDER FLOORS



Floor shear at level 2 = 733 kN

By inspection assume 0.5 times has to be distributed through floor bracing

Allow load in tension only

$\therefore$  Load to 3 diags

$$= \frac{366}{3} \times \frac{14.3}{9.8} = 178 \text{ kN}$$

$$A_s = \frac{178000}{275} = 647 \text{ mm}^2$$

Use 65 x 10 straps

Be conservative + use 100 x 10.

NOTE TOO THAT FLOOR WILL HELP TO DISTRIBUTE DIAPHRAGM LOADS

Use 100 x 10 straps under level 2 floor

Use 76 x 76 x 8 angles under roof framing

## PERIMETER L

By inspection use 150 x 150 L  
bolted into exist concrete band, 150  
dimension gives sufficient dim for coach bolts  
Bolt @ 900 cts

∴ Assumed load per bolt

$$= 366 \div \left( \frac{29600}{900} + 1 \right) = 10.8 \text{ kN.}$$

Allowable shear on

φ 16 is 17.8 kN ∴ φ 16 OK

use φ 16  
bolts @  
900.

From Ramset catalogue

5/8" Dynabolts in concrete shear = 8000

Take safe load = 4000 lbs

$$= 4 \times 4.448 \text{ kN}$$

$$= 17.8 \text{ kN.}$$

## COACH BOLT OVER ALTERNATE JOISTS

TOTAL NUMBER BOLTS =

$$\frac{3 \times 9800}{400 \times 2} = 36$$

$$\text{Load per bolt} = \frac{366}{36} = 10 \text{ kN}$$

$$\phi 10 \text{ coach bolt worth } 1.33 \times 275 \times 1.41 \times 4.448 = 2.3 \text{ kN.}$$

Need to fix over each joist and  
pick up ends of each joist at  
outside edge as well.

In fact this later is required to tie  
ends of joist down against uplift  
from knee bracing.

Total available force

$$36 \times 2 \times 2 \times 2.3 \text{ kN} = 331 \text{ kN}$$

This is OK since end fixings have  
better than side grain load capacity

Fix each  
timber joist  
both to diag  
straps and  
to edge angle

# EXISTING STRUCTURE

IAN C. SMITH CONSULTANTS

CONSULTING ENGINEERS

JOB No. \_\_\_\_\_

PAGE

59

JOB

WWMC - Stage 1

BY DOS

Wts of Existing Structure.

DATE 25/7/19

CURRENT WEIGHTS

These wts are only for comparison with new structure. Therefore will ignore partitions etc in both cases.

1st Storey

(a) 4 walls 14" brick (8.2 kPa)

36' x 12' with 4 off 7' x 3'-3" windows

$$\text{Area} = 432 - 88 = 344 \text{ m}^2 = 32 \text{ m}^2$$

$$\text{Wt of each wall} = \underline{263 \text{ kN}}$$

(b) 1 end wall - 14" brick

36' x 12' no openings  $\Rightarrow$  area = 40.2 m<sup>2</sup>

$$\text{Wt} = \underline{330 \text{ kN}}$$

(c) 1 end wall 12' high

$$30' \text{ at } 19'' (11.1 \text{ kPa}) - 50 \text{ sq ft window} = 320 \text{ kN}$$

$$6' \text{ at } 28'' (16.4 \text{ kPa}) = \underline{113 \text{ kN}}$$

$$(c') \text{ total of wall } 36' - 12' \times 19'' = \underline{446 \text{ kN}} \quad \approx \underline{443 \text{ kN}}$$

(d) 1 int. brick wall

$$7' \times 12' \times 19'' (11.1 \text{ kPa}) = \underline{87 \text{ kN}}$$

Long<sup>th</sup> walls

e) 4 walls approx  $17' \times 12' \times 14''$  — 45 sq ft openings  
 $= 204 - 45 = 160 \text{ sq ft} = 14.9 \text{ m}^2$

wt of each wall = 122 kN

f) 1 wall  $35' \times 12' \times 14''$  — 70 sq ft openings  
 $= 420 - 70 = 350 \text{ sq ft} = 32.5 \text{ m}^2$

wt of wall = 267 kN

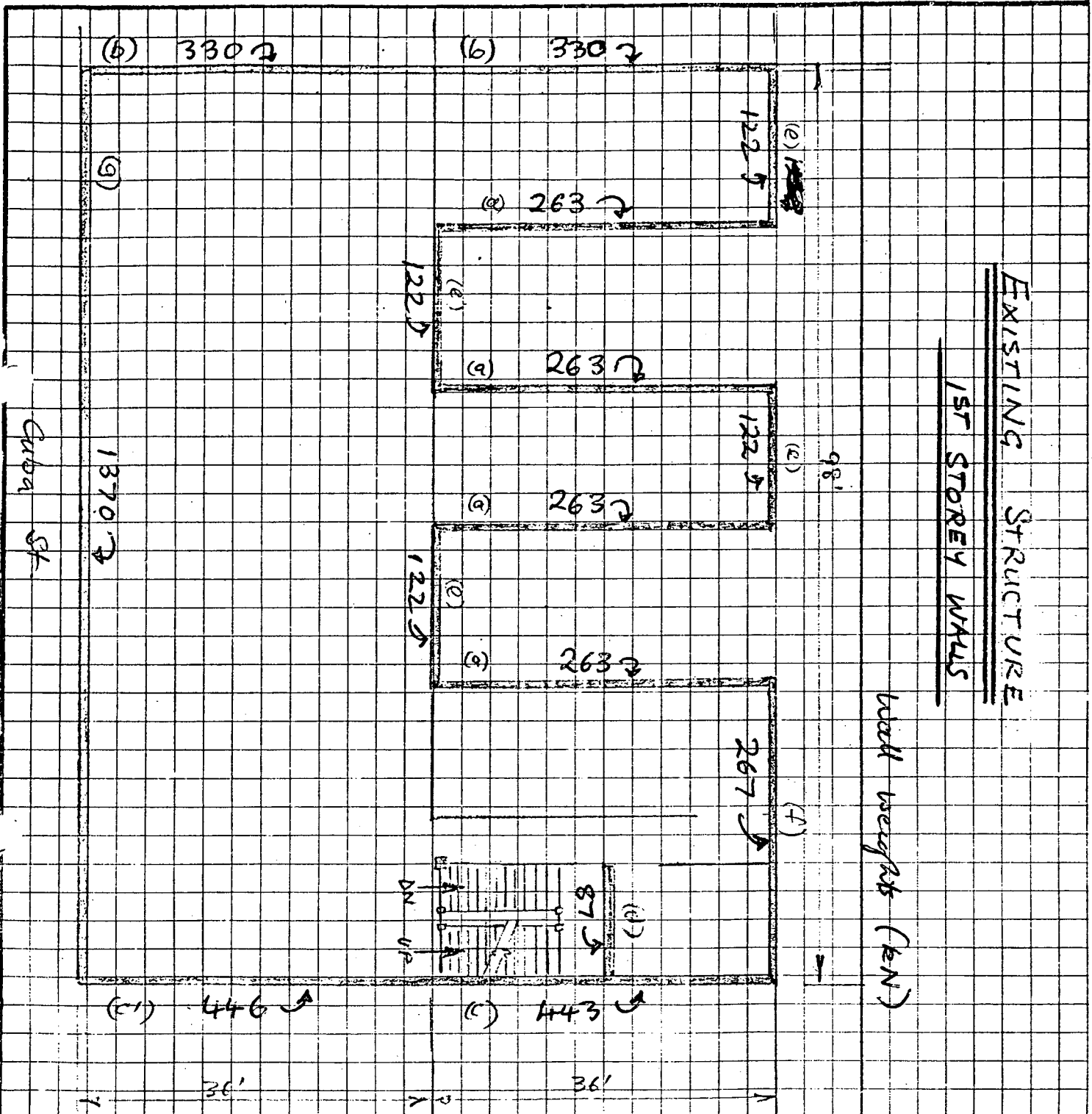
g) Front wall assume 12.5 kPa over gross area

$98' \times 12' = 1176 \text{ sq ft} = 109.5 \text{ m}^2$

wt of wall = 1370 kN

h) Stairs

(not significantly altered)



NTS

- Note
- (1) Not all partitions shown
  - (2) openings not shown
  - (3) Brickwork shown in heavy lines

JOB WWM

Stage 1

BY DOSWts of existing structure.DATE 26/7/79II 2nd Storey

a), (b), (d), (e), (f), (g) &amp; (h) as for 1st Storey

$$(c) (23.5' \times 12' - 490') \times 14'$$

$$= 21.67 m^2 \times 8.2 kPa$$

$$= 178 kN$$

$$12.5' \times 12' = 19'$$

$$= 155 kN$$

$$\underline{\underline{333 kN}}$$

$$(c') (36' \times 12' - 720') \times 19' = \underline{\underline{372 kN}}$$

III 1st Floor - Consider only Wts of tributary  
(See next page) areas on critical pile groups.

9" Thick concrete.

assume 10" thick, to allow for ceiling, flooring  
railway work etc

$$\therefore .254 m \text{ cover} = \underline{\underline{5.7 kPa}}$$

$$\text{Area (A)} \quad 21' \times 16' - 13.5 \times 4' = 336 - 54 = 2820'$$

$$\therefore \text{Wt} = \underline{\underline{150 kN}}$$

$$\text{Area (B)} \quad 36' \times 16' - 540' = 5220'$$

$$\therefore \text{Wt} = \underline{\underline{306 kN}}$$



JOB

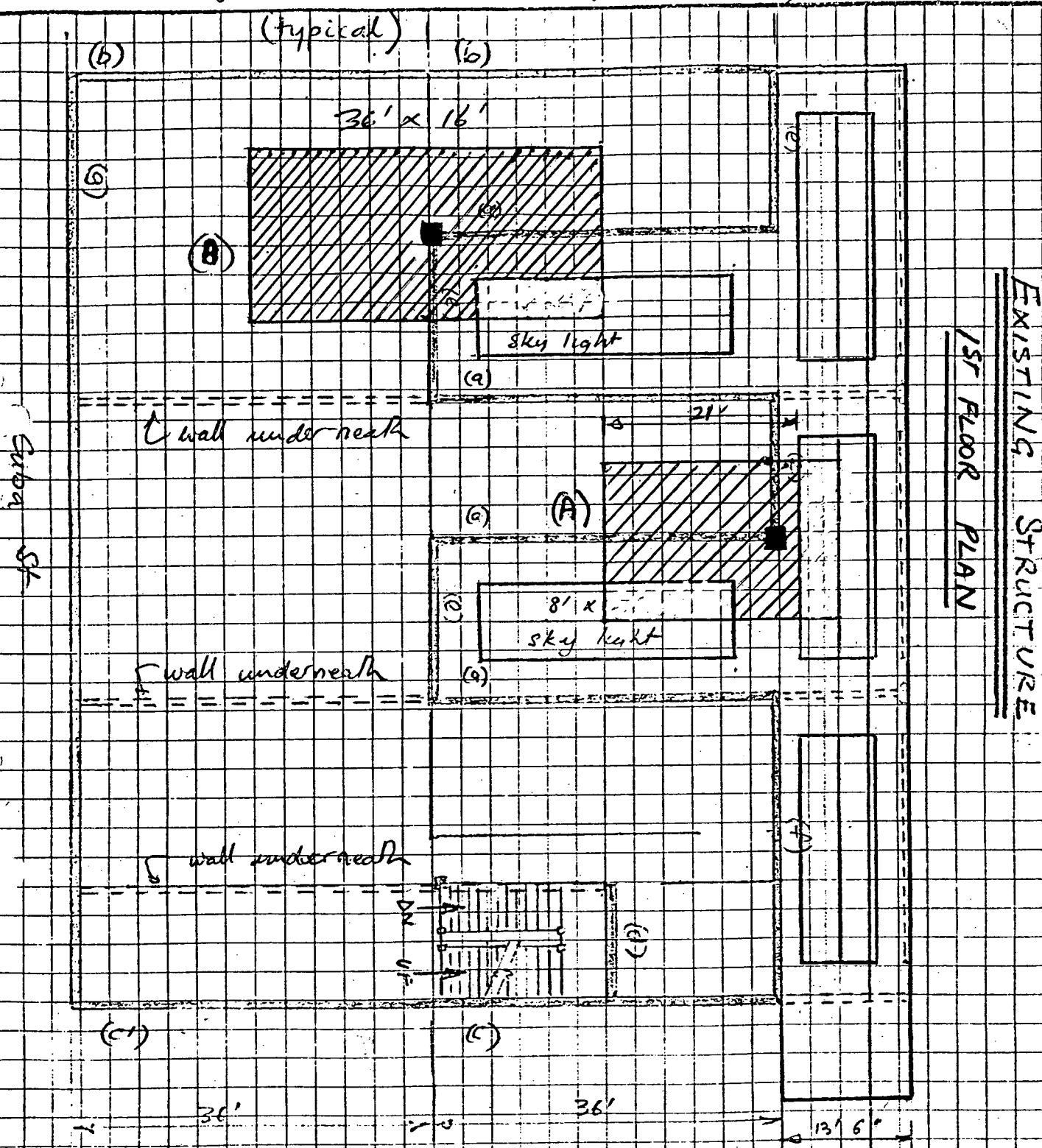
W W M C - Stage 1

BY \_\_\_\_\_

Tributary areas for critical pile groups (gravity)

DATE

25/7/79



- (1) Not all partitions shown
- (2) openings not shown
- (3) Brickwork shown in heavy lines

N.T.S.

JOB WWMC Stage 1BY DDSWts of Existing structureDATE 26/7/79IV 2<sup>ND</sup> Floor - (See next page)Timber Floor -  $25 \text{ lb/ft}^2 = 1.2 \text{ kPa}$ 

- assume cat walker for fire escape at same wt.

$$\text{Area (A)} \quad 10' \times 20' + 5' \times 6' = 230 \text{ ft}^2$$

$$\therefore \text{WT} = 25.7 \text{ kN}$$

$$\text{Area (B)} \quad \overset{576}{36' \times 16'} - \overset{90}{15' \times 6'} = 486 \text{ ft}^2$$

$$\therefore \text{WT} = 54.2 \text{ kN}$$

V Roof - 1.5 kPa

$$\text{Area (A)} \quad 8' \times 18' = 144 \text{ ft}^2$$

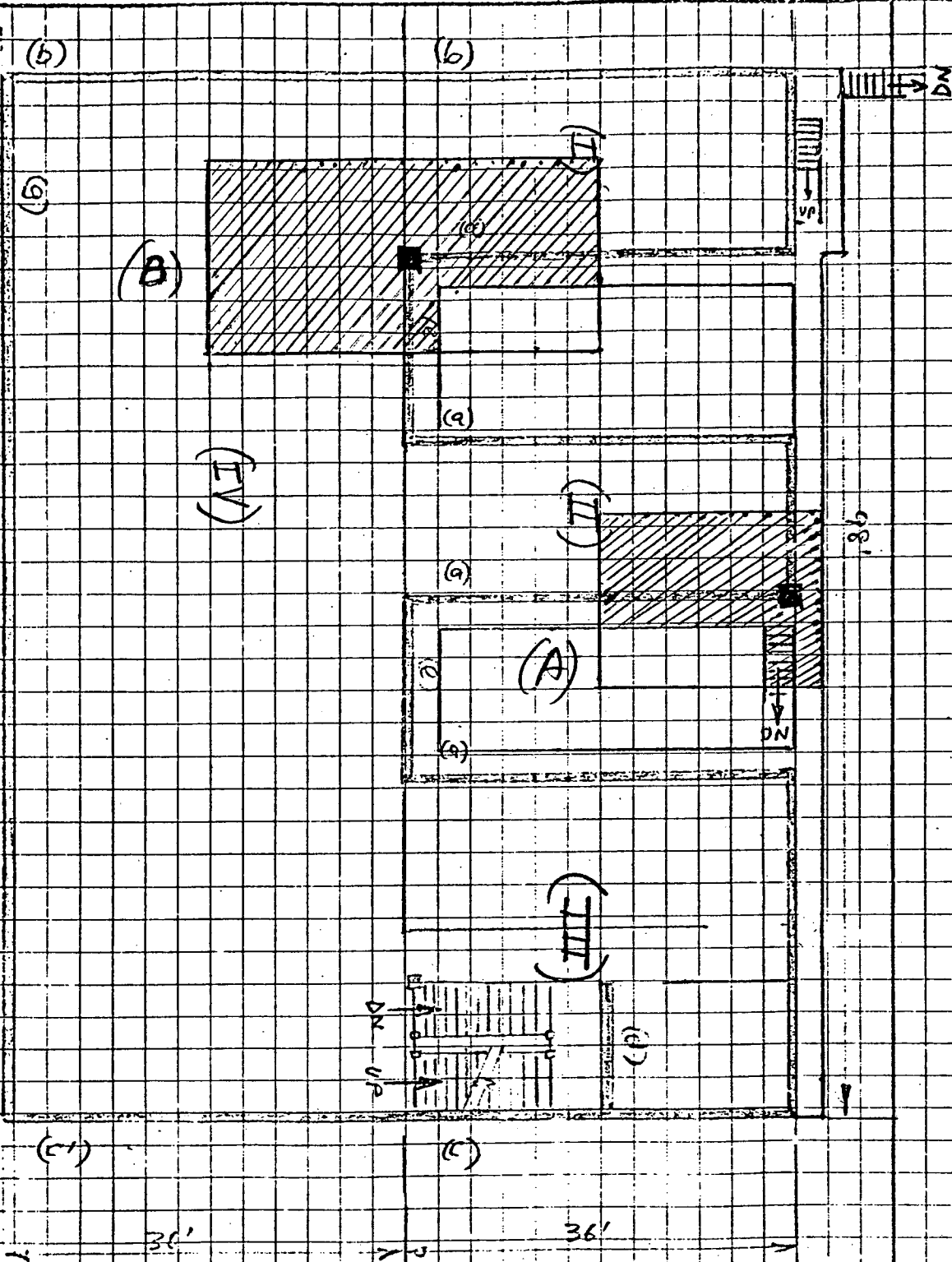
$$\therefore \text{WT} = 20.1 \text{ kN}$$

$$\text{Area (B)} \quad 36' \times 16' - 18' \times 8' = 432 \text{ ft}^2$$

$$\therefore \text{WT} = 60.3 \text{ kN}$$

3000 St

EXISTING STRUCTURE  
2ND FLOOR PLAN



NTS

- Note
- (1) Not all partitions shown
  - (2) openings not shown
  - (3) Brickwork shown in heavy lines

JOB WWM C Stage 1BY DDSWts of Existing StructureDATE 26/7/79TOTAL WEIGHT ON PILE GROUPS A & B

Note: (1) Loads considered are the same for all pile groups of similar type to A & B. However, in cases where there is also a load bearing wall at ground floor level, the loads on the piles will be less critical.

(2) Only loads above the ground floor columns considered.

(3) Dead loads only considered.

Pile Group A

$$\text{Wall loads, 1-2} \quad \frac{1}{2} \times (263 + 122) = 193$$

$$2-R \quad \frac{1}{2} \times (263 + 122) = 193$$

$$\text{Floor loads 1st} \quad = 150$$

$$2ND \quad = 26$$

$$R \quad = 20$$

$$\text{Total load} \quad \underline{\underline{582 \text{ kN.}}}$$

$$\left( \text{Pile area} = 3.97 \times 10^5 \text{ mm}^2 \right)$$

$$\therefore \text{concrete stress} = 1.47 \text{ MPa}$$

JOB WMC Stage 1BY DSSlots of Existing StructureDATE 26/7/19Pile Group B

Wall loads 1-2 193

2-R 193

Floor loads 1st 306

2nd 54

R 60

---

Total load 806 kN

(Concrete stress in piles = 2.05 MPa.)

JOB WW MC - Stage 1BY DOSNew Structure - wtsDATE 26/7/79DEAD LOADS ON PILE GROUPS A & B1<sup>st</sup> Floor - 5.7 kPaAs for existing structure, but with  
sky lights filled in.

Area (A)  $25 \times 16 = 400 \text{ m}^2$

$\therefore \text{WT} = 212 \text{ kN}$

Area (B)  $36 \times 16 = 576 \text{ m}^2$

$\therefore \text{WT} = 306 \text{ kN}$

2<sup>nd</sup> Floor (see next page)

95 conc slab over 75 Hibond (changed to Stahlbau)

End reactions computed for steel beams  
- see p.

Existing Timber Floor  $= 25 \text{ lb/ft}^2 = 1.2 \text{ kPa}$

Area (A)  $R_D = 101 \text{ kN}$  <sup>96</sup>

Area (B)  $R_D \text{ (conc slab)} = 101 \text{ kN}$  <sup>96</sup>

Extg Timber Floor  $18' \times 16' \times 1.2 \text{ kPa} = 32 \text{ kN}$

Conc. beam - allow  $0.8 \text{ m} \times 0.4 \text{ m} \times 4.3 \text{ m} \Rightarrow 31 \text{ kN}$

$\therefore \text{Total WT (B)} = 164 \text{ kN}$

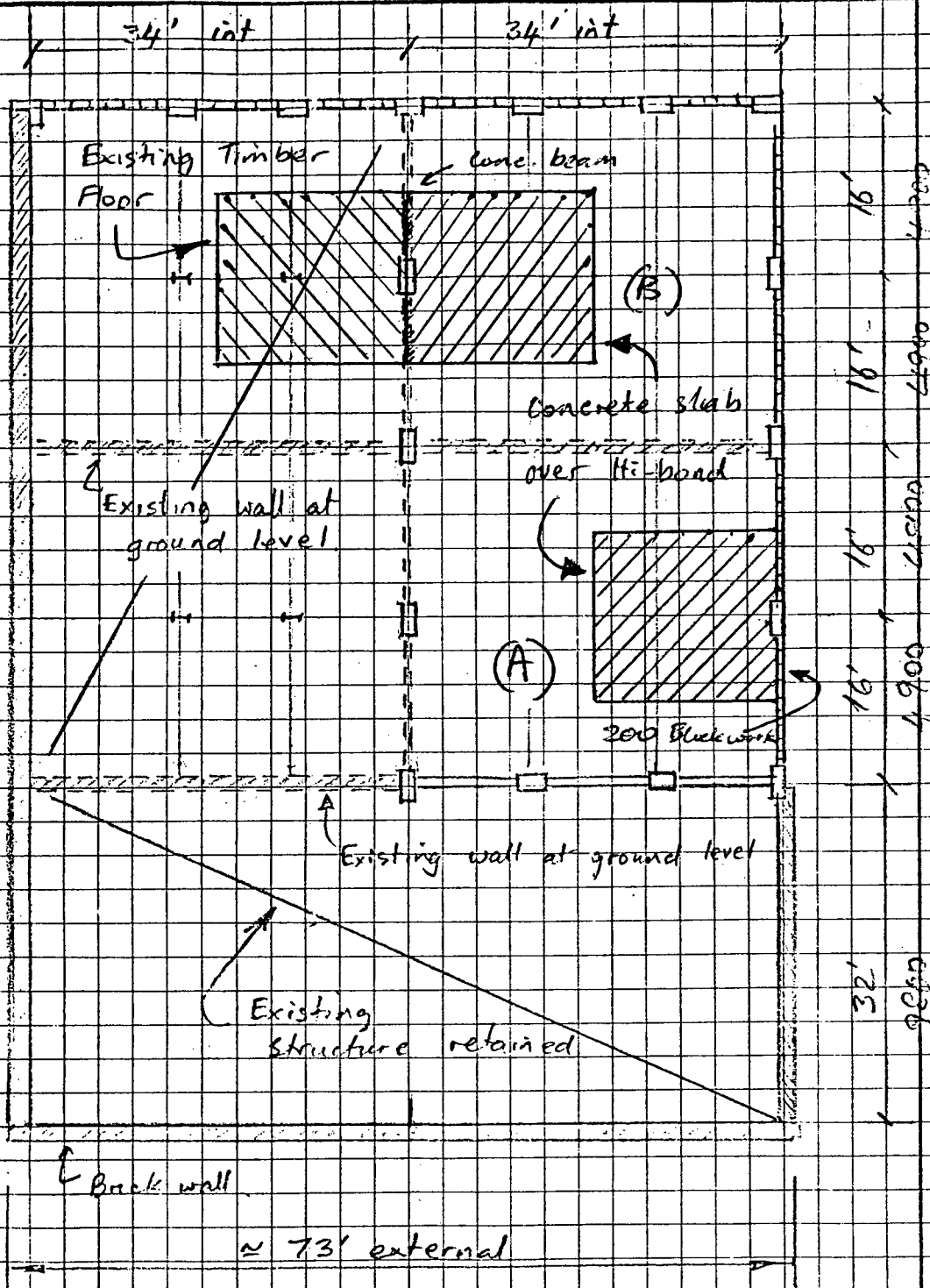
160

JOB WWMC - Stage 1

BY DDS

Tributary areas at 2nd Floor.

DATE 26/7/79



Dimensions approx. only

NEW STRUCTURE - 2ND FLOOR

Roof - 1.5 kPa throughout.

$$\text{Area (A)} = 18' \times 16' \times 1.5 \text{ kPa} = \underline{40 \text{ kN}}$$

$$\text{Area (B)} = 36' \times 16' \times 1.5 \text{ kPa} = \underline{80 \text{ kN}}$$

Columns 1-2 + 2-R

At (A) - include as part of the block wall

$$\text{At (B)} \text{ allow } 1\text{m} \times 0.5\text{m} \times 3.7\text{m} \Rightarrow \underline{41.5 \text{ kN}} \text{ each}$$

Wall 1-2 + 2-R

$$\text{At (A) only } 4.9\text{m} \times 3.7\text{m} \times 0.2\text{m} \Rightarrow \underline{81.5 \text{ kN}} \text{ each}$$

### TOTAL DEAD LOAD ON PILE GROUPS AT B

Since only for comparison with loads from existing structure, wt of partitions, furniture etc not included. Nor are any loads below the 1st floor. These remain constant.

### Pile Group A

$$\text{Wall loads 1-2-R } 2 \times 81.5 = 163 \text{ kN}$$

$$\text{Floor loads 1st} = 212 \text{ kN}$$

$$2\text{nd} = 96 \text{ kN}$$

$$\text{R} = 40 \text{ kN}$$

$$\text{Total Load (A)} = \underline{\underline{511 \text{ kN}}}$$



Existing load on A group = 582 kN

OK

A group  
piles OK

### Pile Group B

Column loads  $2 \times 41.5 = 83 \text{ kN}$

Floor loads 1st = 306 kN

2nd = 164 kN

150

R = 80 kN

Total load (B) = 633 kN

629

cf 806 kN on existing structure

OK

B group  
piles OK

### NOTE:

Since calculations for

P 68 to 71 carried out

1st floor of new structure changed

to slab on. dw 3.3 kPa

cf 3.8 kPa assumed

as safe side

GRAVITY LOADS ON END WALLRoof

$$\text{Tributary area} = 72' \times 8' = 576 \text{ ft}^2 \\ = 53.6 \text{ m}^2$$

$$\therefore \text{load} = 1.5 \text{ kPa} \times 53.6 \text{ m}^2 = \underline{80.4 \text{ kN}} \quad (D)$$

$$\text{2nd storey wall } 12' \times 72' = 864 \text{ ft}^2 = 80.4 \text{ m}^2$$

$$200 \text{ block work } \therefore \text{Wt of wall} = \underline{361.8 \text{ kN}} \quad (D)$$

2nd Floor

$$\text{Tributary area} = 26.8 \text{ m}^2 \text{ wood floor} \\ + 26.8 \text{ m}^2 \text{ concrete}$$

Dead loads

$$\left. \begin{array}{l} \text{Wt of Wood } 26.8 \times 1.2 \\ \text{Wt of Concrete } 26.8 \times 3.25 \end{array} \right\} = \underline{119.3 \text{ kN}} \quad (D)$$

$$\text{Seismic live load } 1.0 \text{ kPa} = \underline{53.6 \text{ kN}} \quad (S)$$

$$\text{1st Storey wall wt} = \underline{361.8 \text{ kN}} \quad (D)$$

$$\text{1st Floor Tributary area} = 53.6 + 4.5 = 58.1 \text{ m}^2$$

$$9" \text{ conc slab } \therefore \text{Wt} = 58.1 \times 0.229 \times 22.5 = \underline{298.9 \text{ kN}} \quad (D)$$

$$\text{Seismic live load } 1.0 \text{ kPa} = \underline{58.1 \text{ kN}} \quad (S)$$

1st Storey wall, 19" brickwork (11.1 kPa)

$$86' \times 17' = 136 \text{ m}^2$$

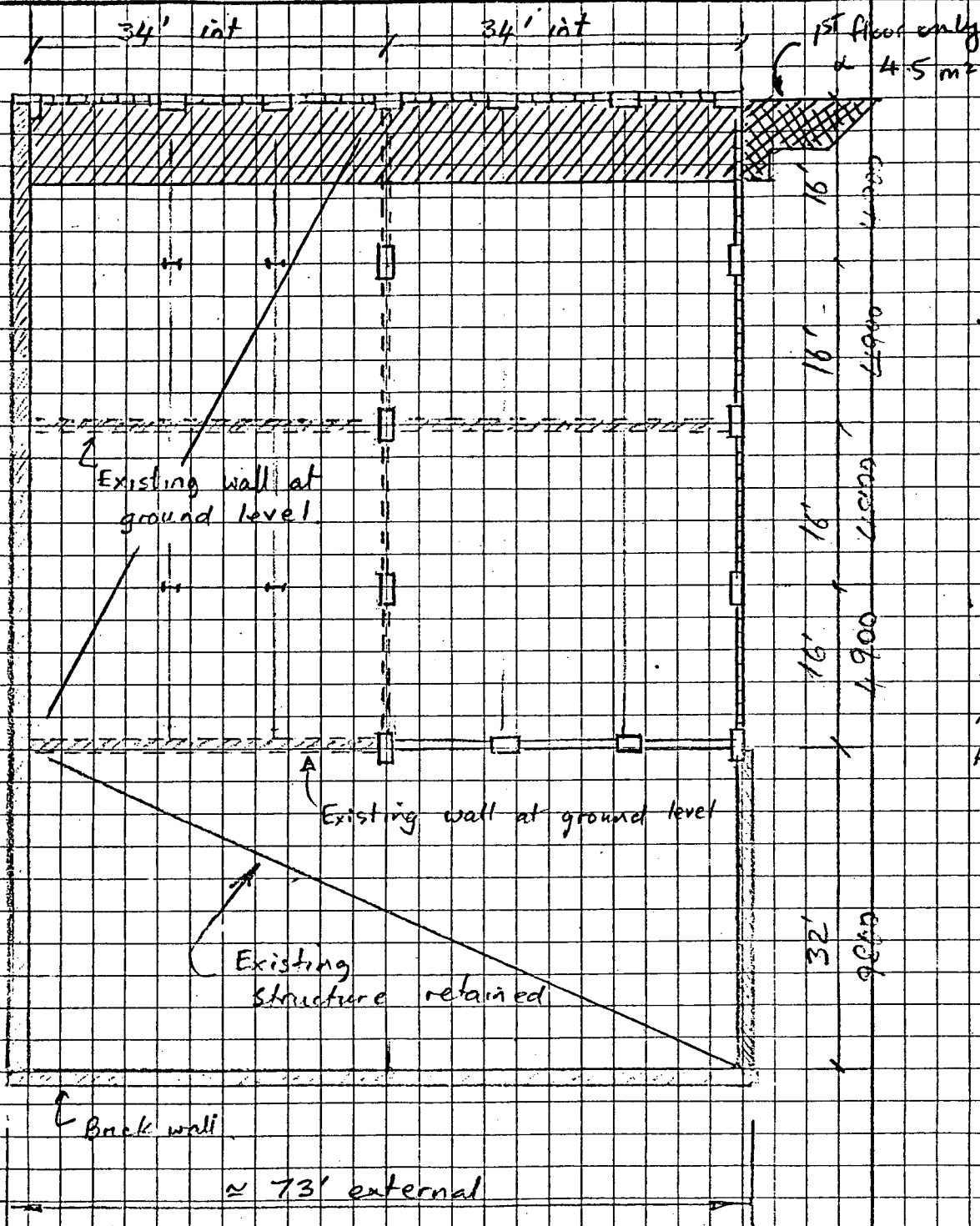
$$\therefore \text{Wt} = \underline{1510 \text{ kN}} \quad (D)$$

JOB WWMC - Stage 1

BY DDS

DATE

31/7/79



Dimensions approx. only

NEW STRUCTURE - 2ND FLOOR

Tributary area for load on 1st + 2nd storey walls

Since  $\frac{1}{2}$  wall above + below added to seismic wts of each floor; take section at  $\frac{1}{2}$  wall height, i.e.

(A) gravity load on 2nd storey wall

$$= \text{wt of Roof} = 80.4 \text{ kN}$$

$$+ \frac{1}{2} \text{ wt of 2nd storey wall} = 180.9 \text{ kN}$$

$$\text{Total wt at } \frac{1}{2} \text{ wall height} = \underline{261 \text{ kN}} \quad (D)$$

(B) Gravity load on 1st Storey wall

$$\text{Roof} = 80.4$$

$$\text{2nd storey wall} = 361.8$$

$$\text{2nd floor (D)} = 119.3$$

$$\frac{1}{2} \text{ 1st storey wall} = 180.9$$

$$\text{Total DL at } \frac{1}{2} \text{ wall ht.} = \underline{742.4 \text{ kN}} \quad (D)$$

$$\text{Seismic live load} = \underline{53.6 \text{ kN}} \quad (S_1)$$

(C) Gravity load on Ground Floor wall

$$\text{DL above 2nd storey} = 742.4$$

$$\frac{1}{2} \text{ 1st storey wall} = 180.9$$

$$\text{1st floor} = 298.9$$

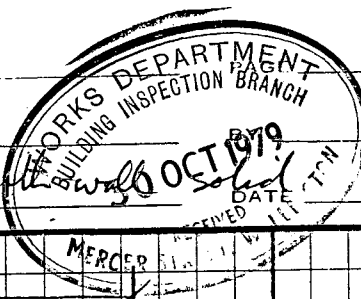
$$\frac{1}{2} \text{ ground floor wall} = 755$$

$$\text{Total wt at } \frac{1}{2} \text{ height} = \underline{1977 \text{ kN}} \quad (D)$$

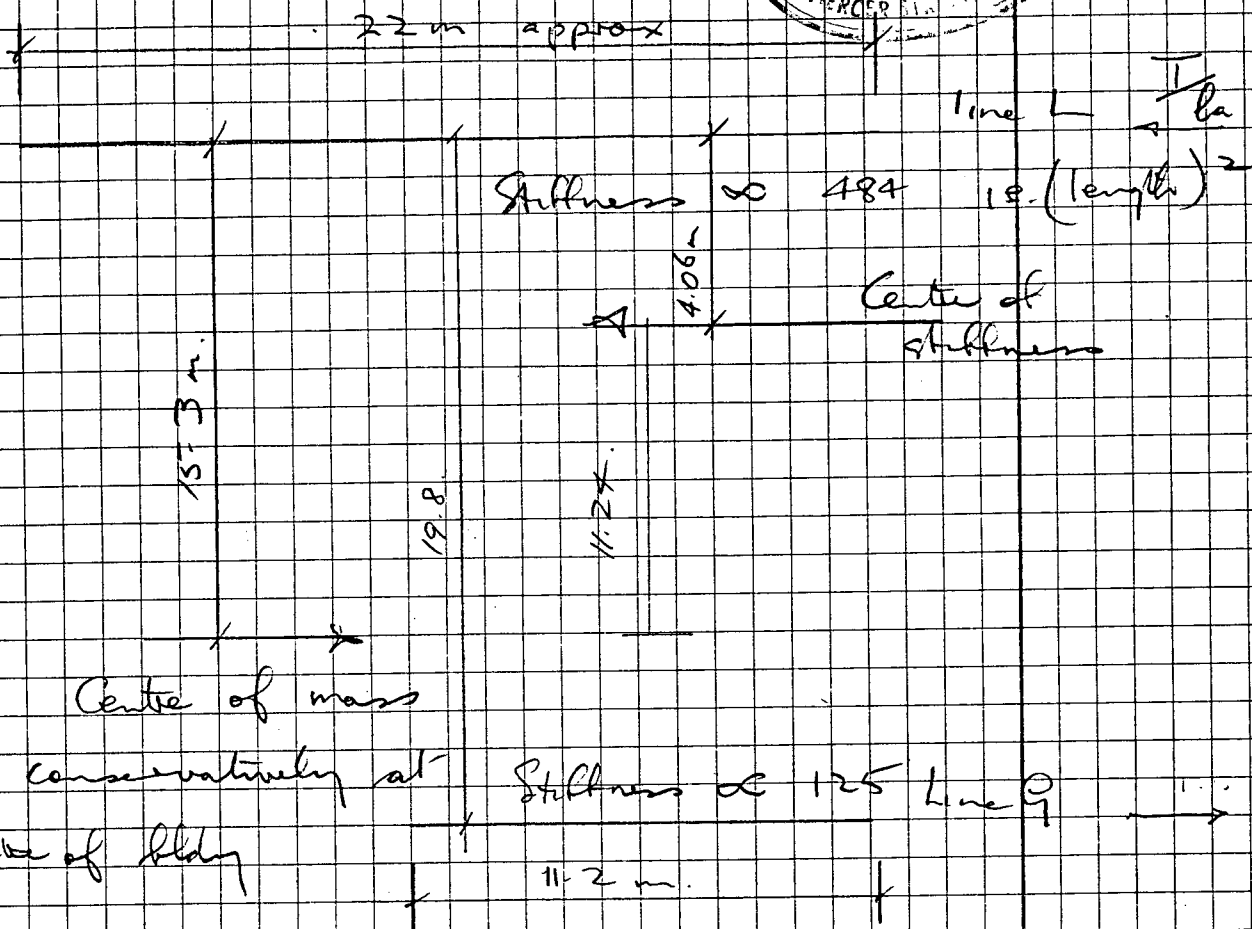
$$\text{seismic live load} = 112 \text{ kN} \quad (S_1)$$

Seismic loads on Walls - Assume North Wall

North Wall



75



Load to wall on line L

$$= \frac{484}{609} V - \frac{11.24}{19.8} V = 0.23 V$$

Load to wall on line G =

$$\frac{125}{609} V + \frac{11.24}{19.8} V = 0.77 V$$

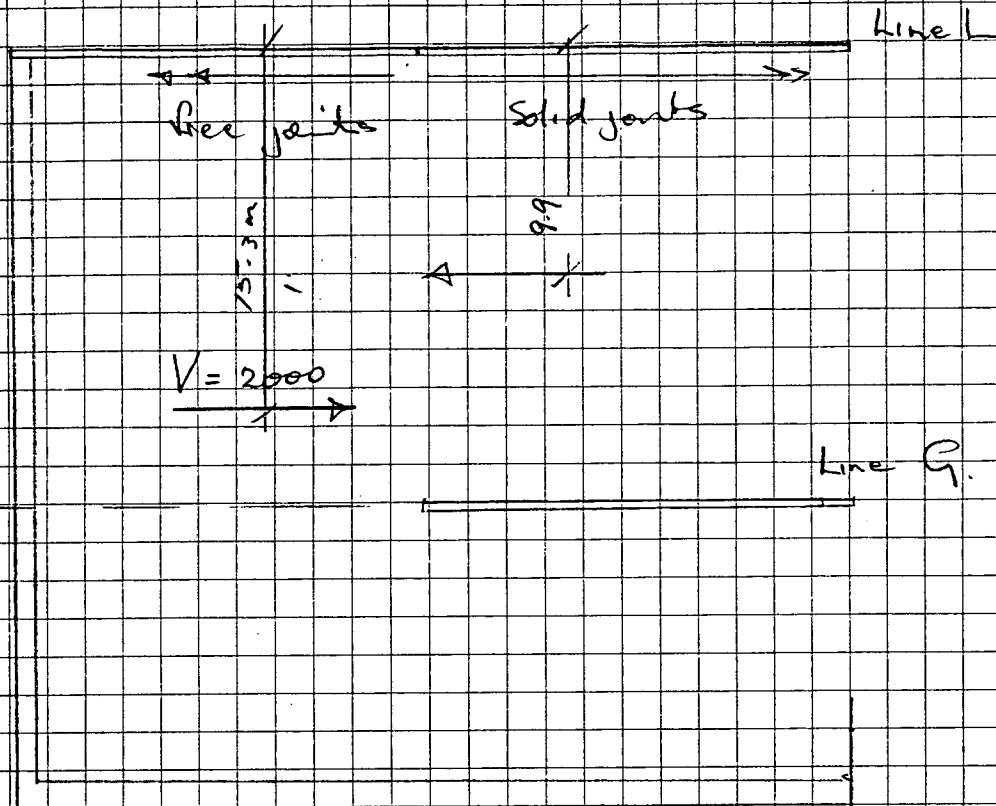
Wall on line L takes 25%

Wall on line G takes 75%

Design for 0.5 & 0.75 respectively

CHERK 11- BLOCK PANELS - Separated

Total transverse base shear = 2000 kN.



Assume rigidity of walls on lines G & L are similar. Ensure this by making panels over front half of wall on line L are separated from the frame. Need to seal & use asbestos rope at 6 joints

$$Torsion = 5.4 \times V$$

$$\text{Load on wall G} = \frac{V}{2} + \frac{5.4V}{19.8}$$

$$= 0.77 V.$$

$$\text{Load on wall L} = 0.23 V$$

$$\text{Design end wall L as } 0.5 V$$

$$\text{Wall on line G as } 0.75 V.$$

} Same as before

CONSULTING ENGINEERS

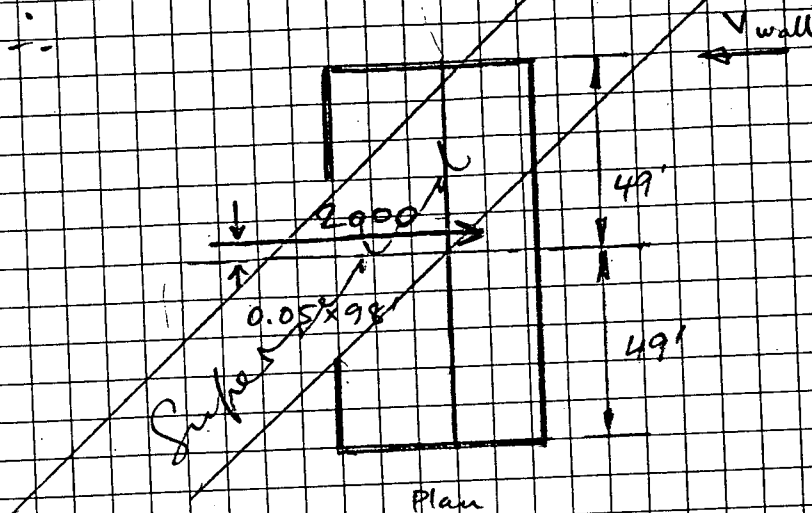
JOB No. \_\_\_\_\_

BY DISJOB WWMCDATE 31/1/79Seismic loads on walls

Total transverse base shear = 2000 kN.

Assume  $\frac{1}{2}$  shear carried by each end wall.

Allow 5% eccentricity

 $\therefore$  Max base shear on end wall = 1100 kN

Distribution of lateral force (NZSS 1900: 8.36.3)

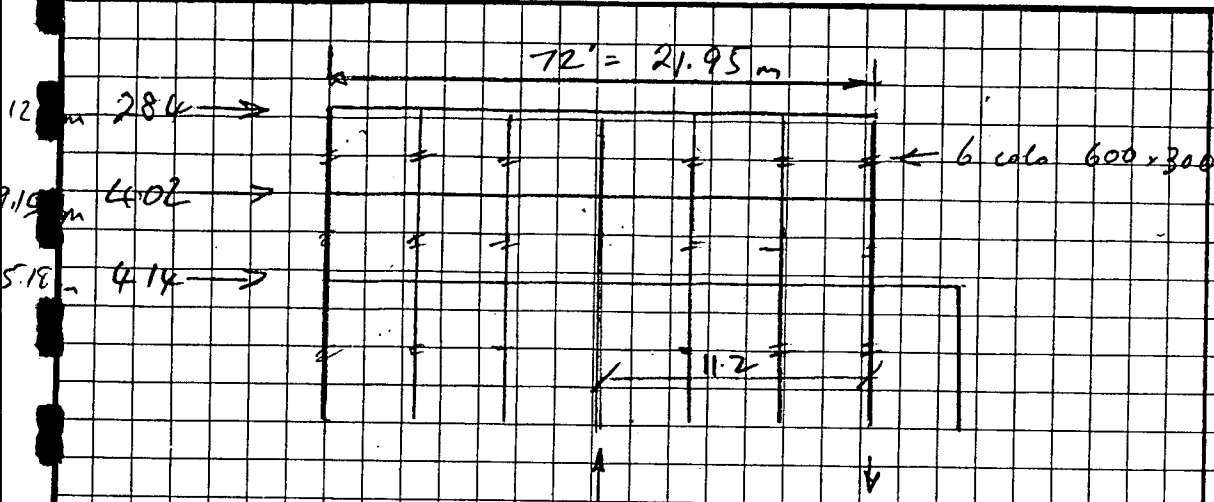
$F_x$			Cumulative shear	
62	284 $\rightarrow$	R	$\leftarrow$ 284 kN	0.9 D
				235 kN $\downarrow$
30	402 $\rightarrow$	2	$\leftarrow$ 686 kN	668 kN $\downarrow$
	414 $\rightarrow$	1	$\leftarrow$ 1100 kN	1779 kN $\downarrow$
			$\frac{1100}{0.9 \times 1779} = 0.618$	

Block work walls 1-2 + 2-R - act as shear walls

Nominal reinforcing in columns, beams and block work

WALL MOMENTS

Design as infill cantilever SW. - ignore

Walls

Max over turning moment at base  
 $= 9460 \text{ kNm}$

For nominal steel in columns

$$P = 0.01$$

$$\therefore A_s = 0.01 \times 600 \times 300 = 1800 \text{ mm}^2$$

$$\therefore f_y A_s = 495 \text{ kN per column. } (f_y = 275 \text{ MPa})$$

$$\text{assume } l_a = 11.2 \text{ m}$$

Capacity of wall Even considering  
 only steel in two outside columns

$$\begin{aligned} \text{Then } M_u &= 0.9 \times (11.2 \times 495) \\ &= 4990 \text{ kNm} > 9460 \text{ kNm} \end{aligned}$$

nominal steel throughout more than  
enough to resist moments on the walls



JOB WWMC

BY

DAS

walls

DATE

1/8/79

Shear stresses in Reinforced Block work walls2-R

Design walls to withstand equate shear  
at working stress

Max shear in wall 2-R

$$V_u = 284 \text{ kN} + 63.8 \text{ kips}$$

$$N_u = 63.8 / (72 \times 12 \times 7.87)$$

$$= 18.7 \text{ psi}$$

Check max allowable stresses

from NEB 1900.9 2.27.1 (Table 4), 3, & 8 (table 6)

$$\text{Max allowable shear stress} = 60 \times \frac{1}{3} \times 1.0$$

(unsupervised construction)

$$= 80 \text{ psi} > 18.7 \text{ psi}$$

∴ Sewer shear stresses OK at working  
stress

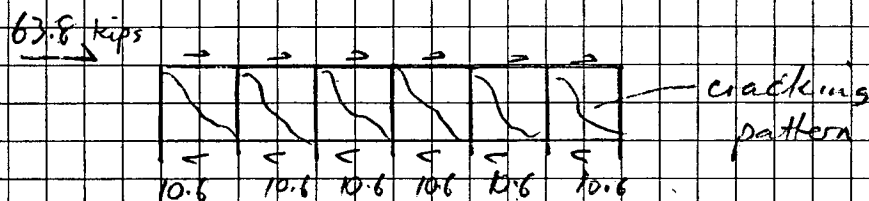
(in fill panels  $3.66 \times 3.66$  restrained all edges)

JOB NWMCBY DDSWALLSDATE 1/8/79Horizontal Reinforcement

Reinforcement to carry total seismic shear at working stress of 20000 psi

$$V = 63.8 \text{ kips.}$$

Assume total shear equally distributed between each bay of the wall ie



$$t = 7.87' \approx 200 \text{ mm}$$

$$h = 120''$$

$$A_v/s = \frac{10.6 \text{ kip}}{20 \text{ ksi} \times 120}$$

$$= 0.0044 \text{ sq in / in}$$

$$= 112.6 \text{ mm}^2/\text{m}$$

$$\text{min reinforcement} = \frac{1}{3} \times 0.0025 \times 200$$

$$= 167 \text{ mm}^2/\text{m} > 112.6$$

but must use total of  $0.0025 \times 200$  two ways  
since square panel,

$$\text{use } \frac{1}{2} \times 0.0025 \times 200 \text{ each way}$$

$$= 750 \text{ mm}^2/\text{m}$$

$$\text{use } \phi 12 @ 400 \text{ each way } (283 \text{ mm}^2/\text{m})$$

Bond beam  
@ 600 2-#12  
323 mm<sup>2</sup>/m  
Use #12/600  
OK

JOB WWMC

BY

DDS

Walls 1-2 & 2-R

DATE

1/8/79

Shear 1-2

$$V_u = 686 \text{ kN} = 154.2 \text{ kips}$$

$$\therefore v_u = 154.2 / (72 \times 12 \times 787) = 22.7 \text{ psi} < 80 \text{ psi}$$

OK

$$\text{require } A_s/s = 154.2 / (6 \times 120 \times 20)$$

$$= 0.0107 \text{ sq in/in}$$

$$= 272 \text{ mm}^2/\text{m} > 250$$

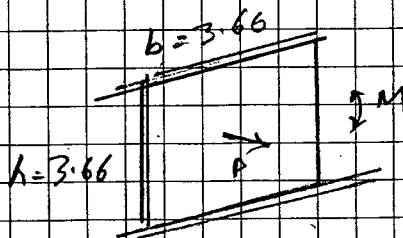
$$\text{D12 @ 400 mm } (283 \text{ mm}^2/\text{m}) \text{ OK} \checkmark$$

Check Earthquake normal to wall

lateral load on wall

= 4 x basic seismic

coeff.



$$P = 4.5 \text{ kPa} \times 4 \times 0.08 \times 1.25$$

$$= 1.8 \text{ kPa}$$

$$M = P h^2 b / 10 = 8.83 \text{ kNm}$$

Assume nominal D12 @ 400

$$F_{bc} = 400 \text{ psi} \times 1.33$$

$$= 532 \text{ psi} = 3.668 \text{ MPa}$$

$$k = \sqrt{p_A \rho_A - p_A}$$

$$\alpha = 95$$

$$\rho = 0.00298$$

$$n = 200 / 10.5 = 19$$

$$\rho_A = 0.0567$$

$$k = 0.2849$$

$$k d = 27.06$$

$$27.06$$

$$67.94$$

$$j d = 85.98$$

$F_{bc}$  will govern

$$M = \frac{3.668}{2} \times 27.06 \times 85.98 \times 3.66 \times 10^{-3}$$

$$= 15.7 \text{ kNm} > 8.83 \text{ kNm}$$

OK

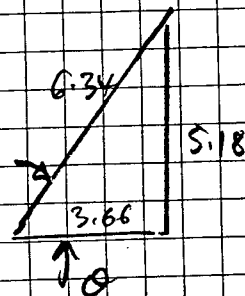
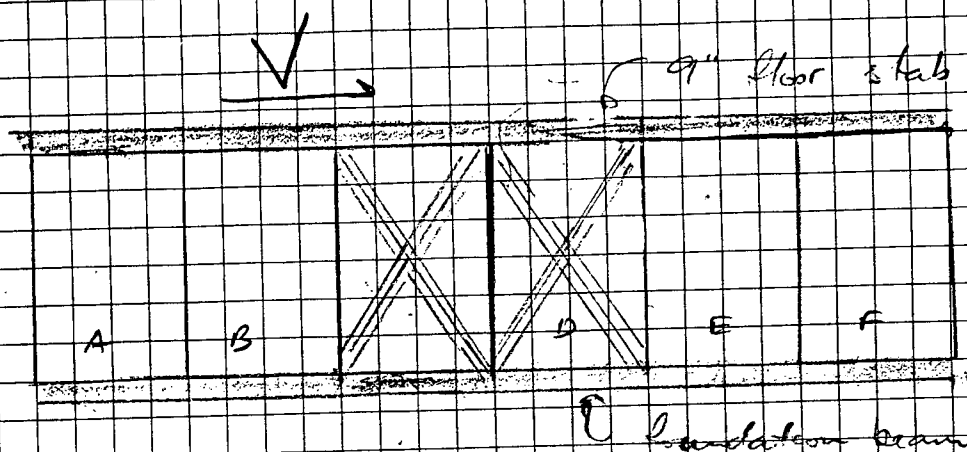
For both 1-2 and 2-R walls

use 200 blockwork reinforced

with D12 @ 400 c/c both ways

$$= 30 \text{ kg/m}^3$$

## SHEAR PANELS BELOW LEVEL 1.



Diagonally reinforce panels C & D,  
cover with mesh and spray concrete  
to 150 mm thick.

Assume all shear carried by  
Re diagonal reinforcement

$$V = 1100 \text{ kN}$$

$A_s$  = total area of  
diagonal steel

$$A_s f_y \cos \theta = 1100 \text{ kN}$$

$$A_s = \frac{1100 \times 6.34}{3.66 f_y} = \frac{1905}{f_y}$$

for  $f_y = 380 \text{ MPa}$

$$A_s = 5014 \text{ mm}^2$$

(for  $f_y = 275$ )

$$A_s = 6929 \text{ mm}^2$$

→ Area of steel reqd per bar

$$\text{group} = 5016 \text{ mm}^2 / 4 = 1254 \text{ mm}^2$$

→ 4 - D20 bars give  $A_s = 1257$

$$\text{Section} = 3660 \times 150$$

$$\rightarrow \rho_s = 0.0021$$

Have this steel two ways

$$\rightarrow \text{total steel content} = 0.0042$$

$$\text{Min steel content} = 0.0025 < 0.0042$$

$$\rightarrow \underline{1254 \text{ mm}^2 \text{ of Grade 380 steel}}$$

is sufficient for each bar group.

In addition to hold sprayed  
concrete, will require 2 layers

of 335 mesh placed with 20 mm  
cover. Steel straps to be welded to  
mesh and ranset to back walls  
at 900 cts. (see R.L. Williams).

Use

groups of

4 - D20

bars, Grade

380 steel

ON WALL

LINE &

INCREASE

DIAG REQ IN

RATIO 0.75

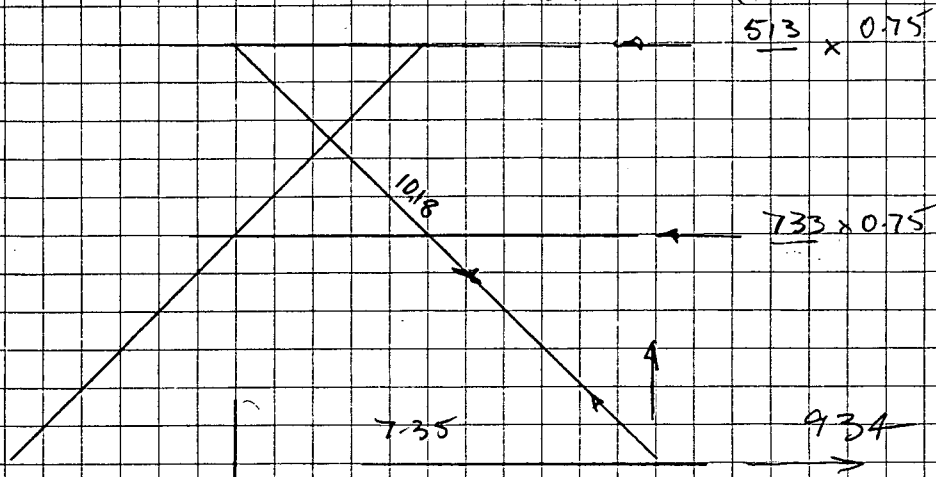
0.5

I.E. USE

6 - D20 each

Diag

# CHECK DIAGONAL BRACES ON WALL LINE C



$$\text{Tension in diagonal} = \frac{434 \times 10.18}{7.35} = 1187$$

$$A_s = \frac{1187000}{275} = 4316 \text{ mm}^2$$

Use  $152 \times 152 \times 16$  L  $A = 4600$

## UPLIFT

Since load can be distributed along the internal braced wall at ground level and along the frames in the North-South direction worst case is uplift on outer face of new block (i.e. line 9 frame <sup>conservatively</sup> after total).

$$\text{Area} \times l_a = 11.2 \text{ m.}$$

$$\text{Uplift} = \frac{754 \times 5.4 + 733 \times 9.8 + 513 \times 13.4}{11.2} = 1618 \text{ kN.}$$

weight of new blocks + substructure

$$\text{From p 77} \rightarrow \text{at least } 4 \times 511 = 2044$$

$\therefore$  uplift OK.

CONSULTING ENGINEERS

JOB No. \_\_\_\_\_

PAGE

86

JOB WWM C

BY

ODS

PilesDATE 1/8/79EXISTING PILES.SHEAR FORCES ON PILES.

Pile should be capable of withstanding any shear force developed in the bottom columns.

max shear for internal columns

$$- V_u = 1.25 \times 400 = 500 \text{ kN.}$$

From original 1908 building specification

P.5 - Piling

28, & 29 under each column

4 x 14" piles

30 - Concrete pile moulded in a steel cylinder driven to approved solid.

Ram wt = 10 cwt. Driving continued till the piles do not sink more than 3" to twelve successive blows of the ram falling eight feet.

32. The head of the piles to be incorporated 12" in with the depth of the concrete footings. (0.3 m)



From Drawings.

pile caps appear to be approx

$$1 \text{ m} \times 1 \text{ m} \times 0.5 \text{ m}$$

— approx 0.83 m into ground.

— no mention is made of reinforcement in the pile caps.

Area of Piles  $\Gamma = 7^2 = 178 \text{ mm}^2$

$$— A_p = 9.93 \times 10^4 \text{ mm}^2$$

$$— \text{Area of 4 piles} = 3.97 \times 10^5 \text{ mm}^2$$

$$— \text{nominal shear stress in piles} = \underline{1.48 \text{ MPa}}$$

$$\underline{\text{Assume } f_c = 20 \text{ MPa} \quad N_u = 0.33 \sqrt{f_c}}$$

$$\text{Dead load on pile} = 629 \text{ kN} = 1.58 \text{ MPa}$$

$$N_d = 0.17 (1 + 0.073 \times 0.9 \times 1.58) \sqrt{f_c}$$

$$= 0.188 \sqrt{f_c}$$

$$— V_s = 0.142 \sqrt{f_c}$$

Since piles are encased in a steel cylinder, they are probably capable of carrying this shear.

However, the shear forces on these internal piles are fairly high. Both

JOB NWMCBY DDSPilesDATE 1/E/79

From the point of view of the shear in the piles and the ground bearing pressures, it may be necessary to tie in the piles either side of those under the seismic frame.

- possibly put down a strip of concrete flooring.

### Piles under "exterior" columns

$N_u = \frac{1}{2} N_c$  for interior columns.

$$\leq 0.74 MPa = 0.65 \sqrt{f_c} < N_c$$

Allow in contract to excavate for group of piles & to break out & inspect for reinforcement.

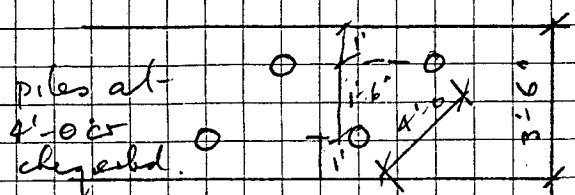
### NOTE in TRANSVERSE DIRECTIONS

Load is shared through transverse walls in transverse directions the ground timber floor acts in compression. May therefore be install tie rod to take tension. Decision can be taken later.

Shear on internal pile  
on line of frames 4 & 9

Total number of pile

$$= 4 \times 4 + 2 \left\{ \frac{15 \times 3.28}{3.5} \right\} = 44$$



Say 1 / 3' 6" length.

2 walls @ 15 m each

$$\therefore \frac{2 \times 15 \times 3.28}{3.5}$$

$$\text{Total base shear} = 2000 \text{ kN}$$

$$\therefore \text{shear per pile} = 45 \text{ kN/pile}$$

$$\text{Area} = \frac{\pi \times 1.17^2}{4 \times 3.28^2} = 0.1 \text{ m}^2/\text{pile}$$

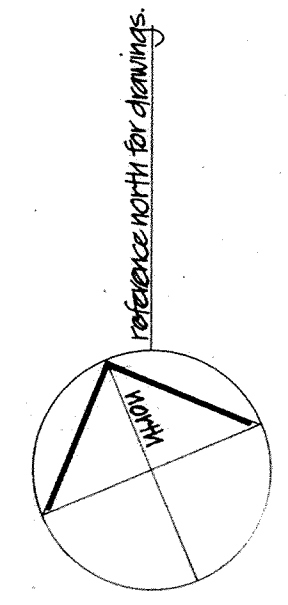
$$\therefore \text{Shear stress on piles} = \frac{45000}{10^6 \times 0.1} \text{ MPa}$$

$$= 0.45 \text{ MPa}$$

$$(65 \text{ p.s.i.})$$



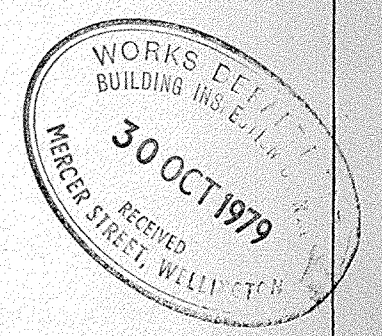
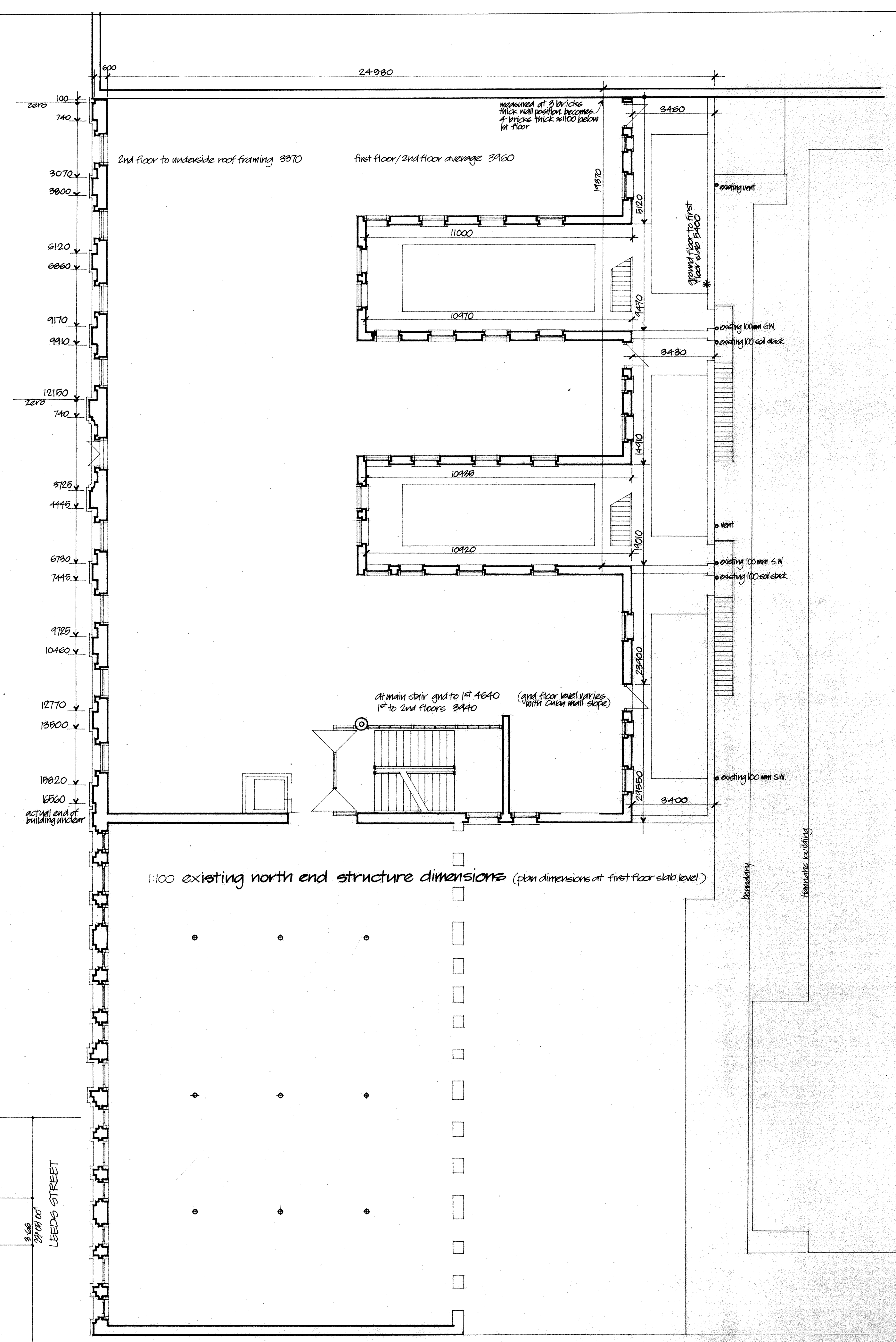
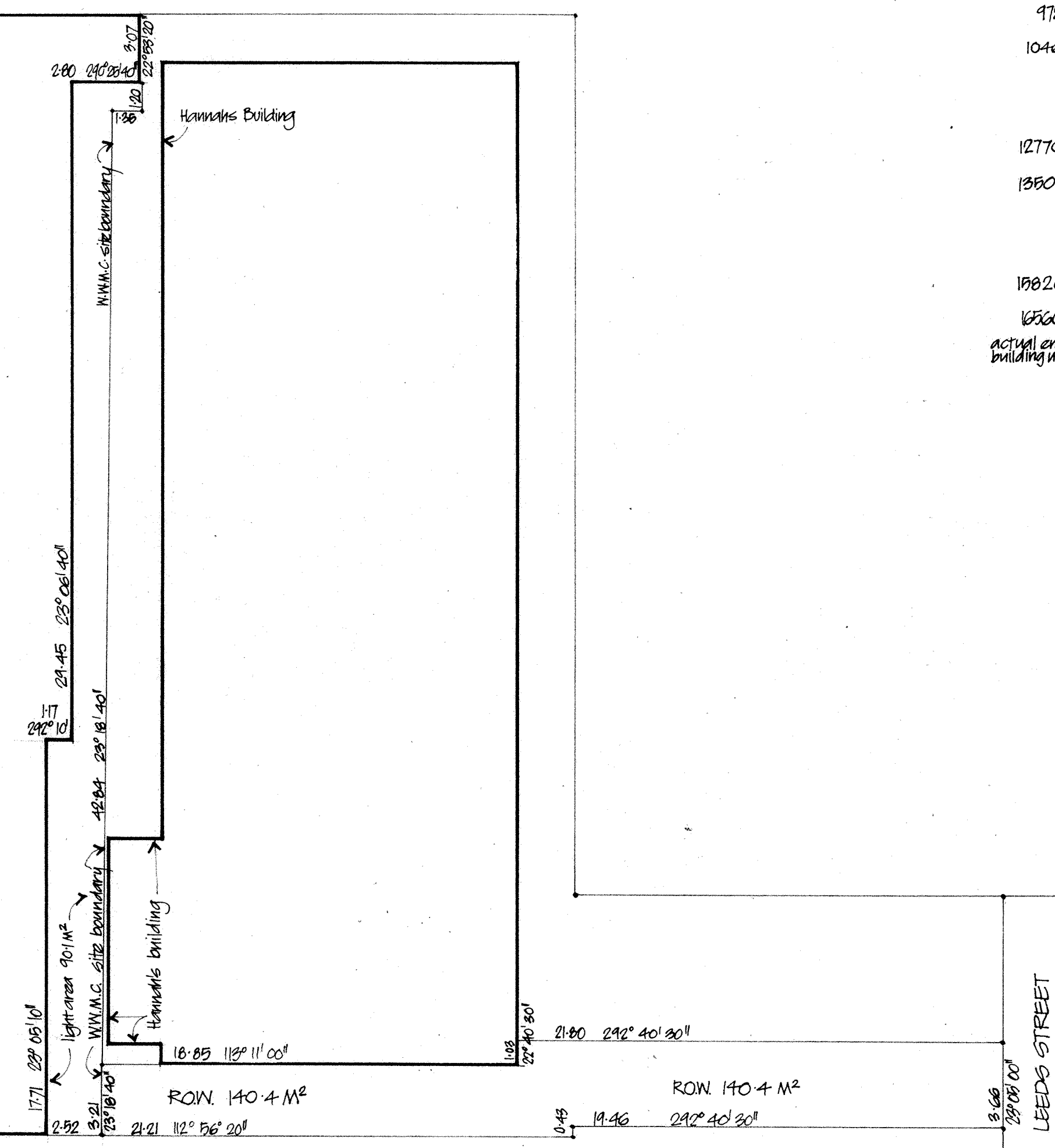
CUBA STREET  
50.41 22° 40' 20"



DP 15298 Lot 1 1285.7 M<sup>2</sup>  
light area 90.1 M<sup>2</sup>  
total area 1375.8 M<sup>2</sup>  
C.T. 605/212  
Nos 101 to 117 Cuba Street.

Nee Hardware Limited.

1:200 site plan



WELLS  
WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
STRENGTHENING AND ALTERATIONS - CUBA ST. PREMISES

IAN C. SMITH CONSULTANTS  
ENGINEERS - WELLINGTON

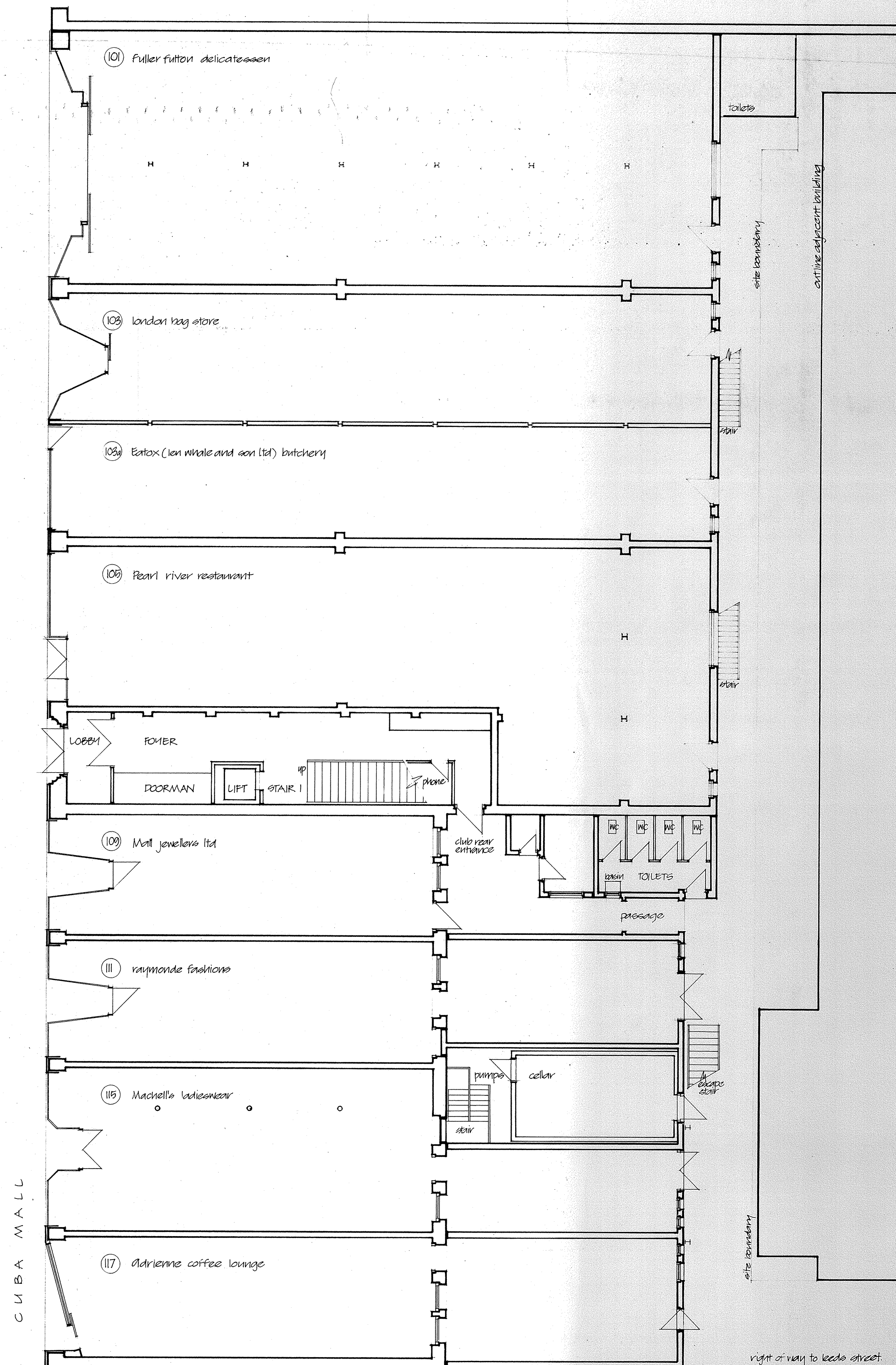
Keith Wilson  
architect  
wellington

box 12321 wellington  
phone 735693

BASIC SITE DIMENSIONS

7915A1





1:100 existing ground floor plan



WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
**WWMCI**  
 STRENGTHENING AND ALTERATIONS • CUBA ST PREMISES

BRICKELL MOSS RANKINE & HILL  
 CONSULTING ENGINEERS • WGN

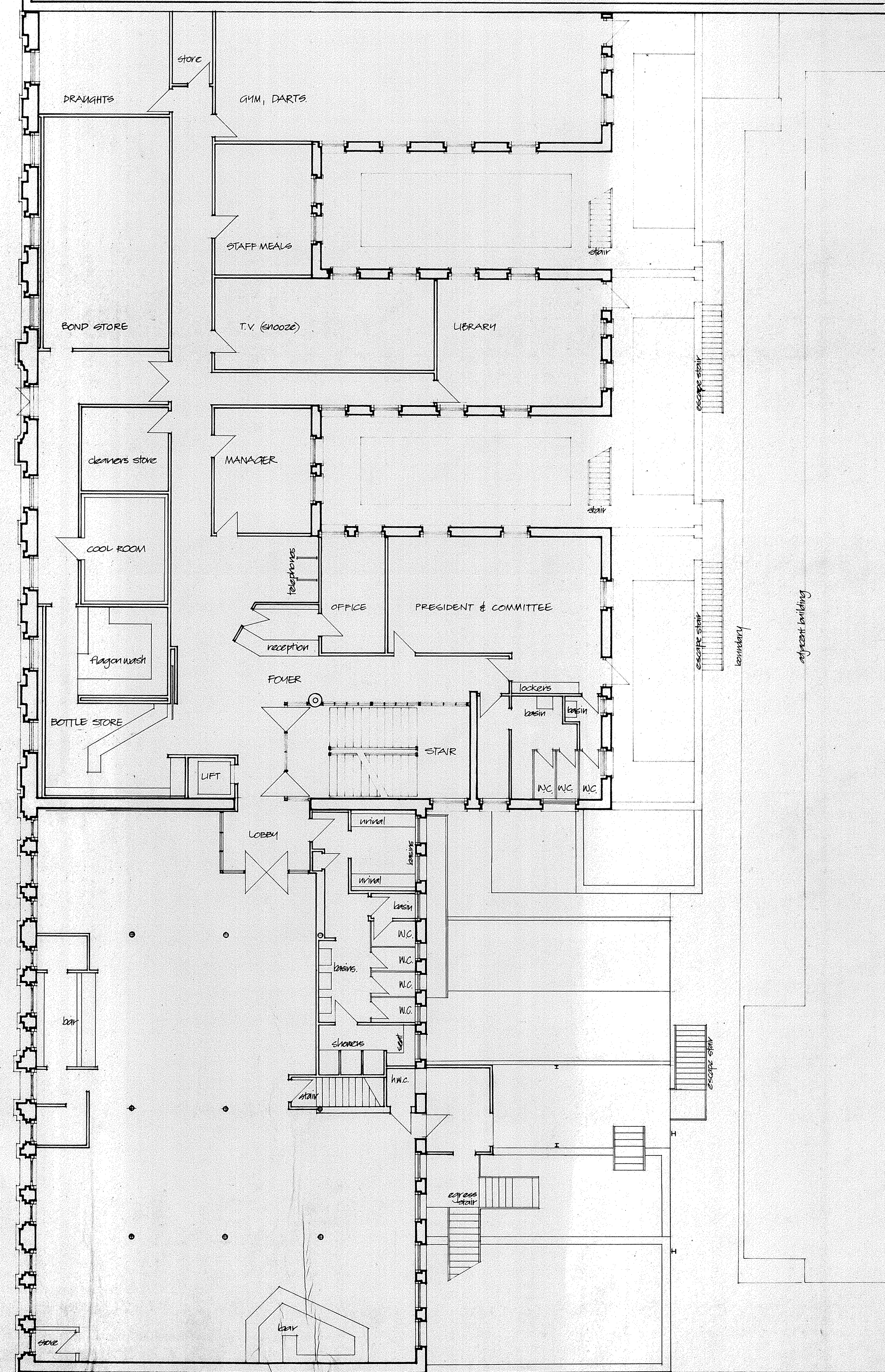
keith wilson  
 architect  
 wellington

box 12321 wellington  
 phone 739633

EXISTING GROUND FLOOR

7915A2





1:100 existing first floor plan



WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
STRENGTHENING AND ALTERATIONS • CUBA ST. PREMISES

BRICKELL MOSS RANKINE & HILL  
CONSULTING ENGINEERS • NGTN

keith wilson  
architect  
wellington

box 12321 wellington  
phone 739683

EXISTING FIRST FLOOR

7915A3





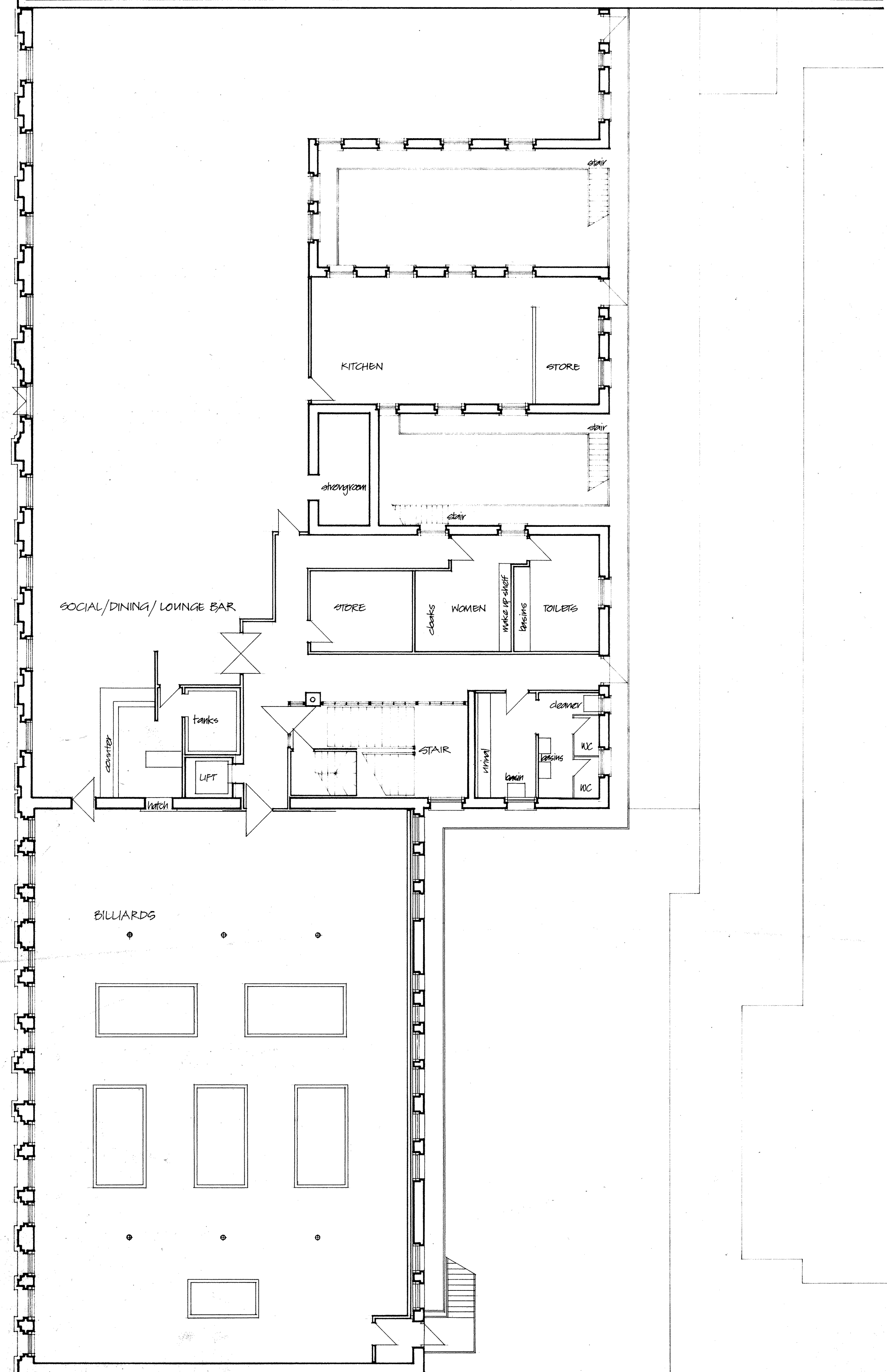
WELINGTON WORKINGMEN'S CLUBS AND LITERARY INSTITUTE  
**WWMCI**  
STRENGTHENING AND ALTERATIONS • CUBA ST. PREMISES

BRICKELL MOSS RANKINE & HILL  
CONSULTING ENGINEERS • WATN

keith wilson  
architect  
wellington

box 12321 wellington  
phone 733 633

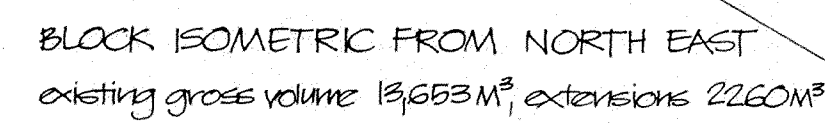
EXISTING SECOND FLOOR



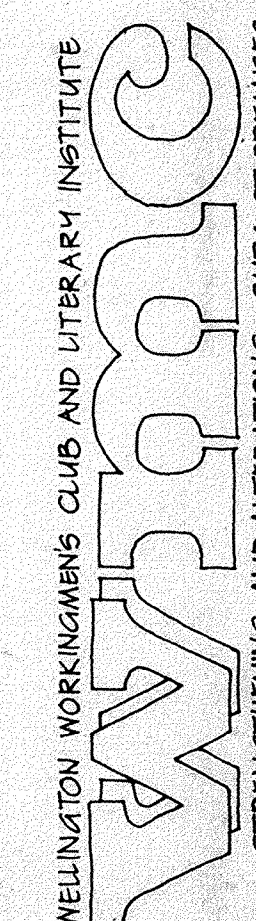
1:100 existing second floor plan

7915A4





SHOWING FULL STRENGTHENING/ALTERATIONS SCHEME.  
FOR STAGE 1 / NORTH BUILDING / CURRENT WORKS  
EXTENT DEFINITION SEE DWG 7915AG, A9 & DETAILS.



BRICKELL MOSS RANKINE & HILL  
CONSULTING ENGINEERS • WGTN

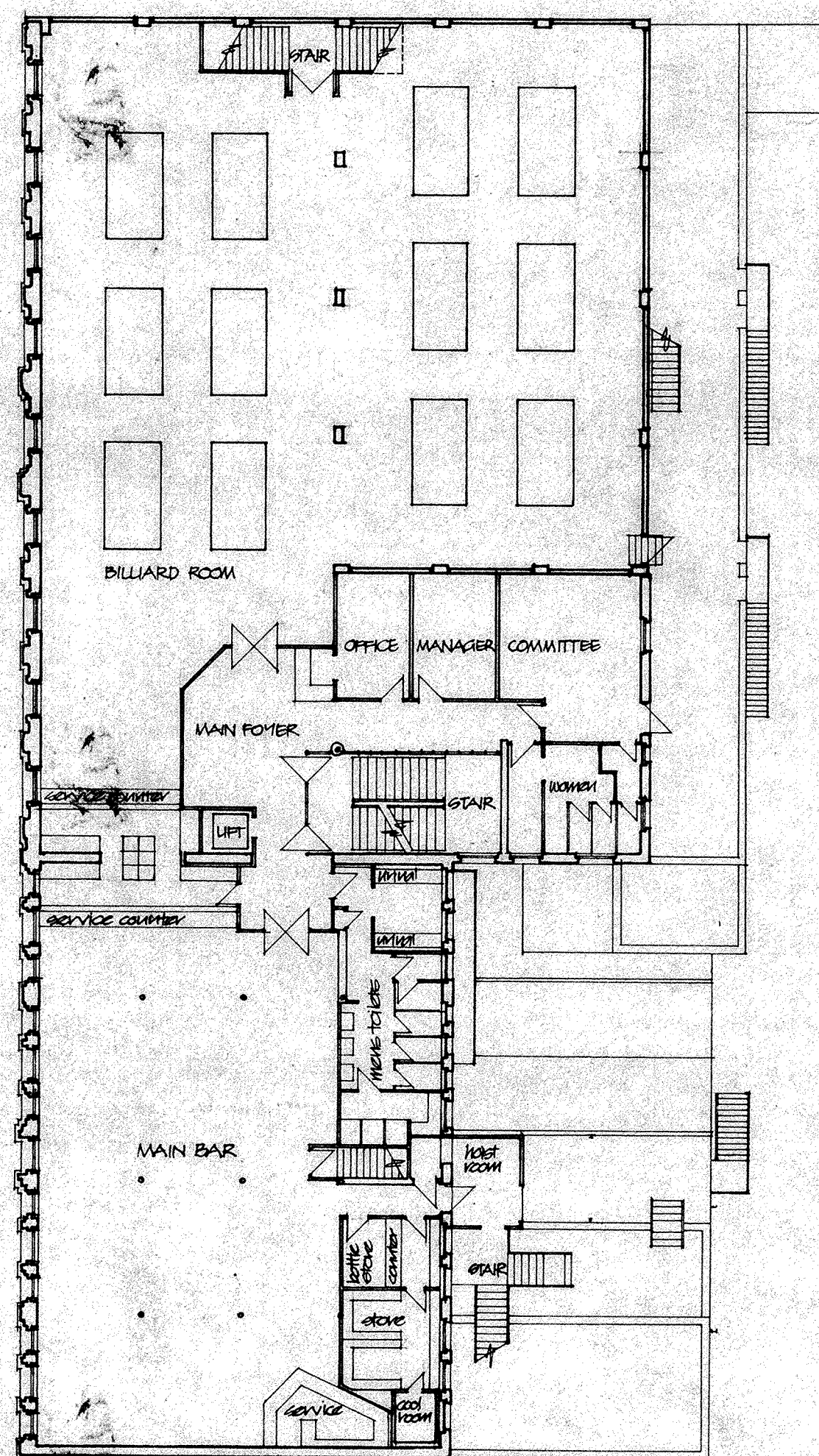
keith wilson  
architect  
wellington

box 12321 wellington  
phone 735633

OVERALL SCHEME  
MEZZANINE AND  
GROUND PLANS.

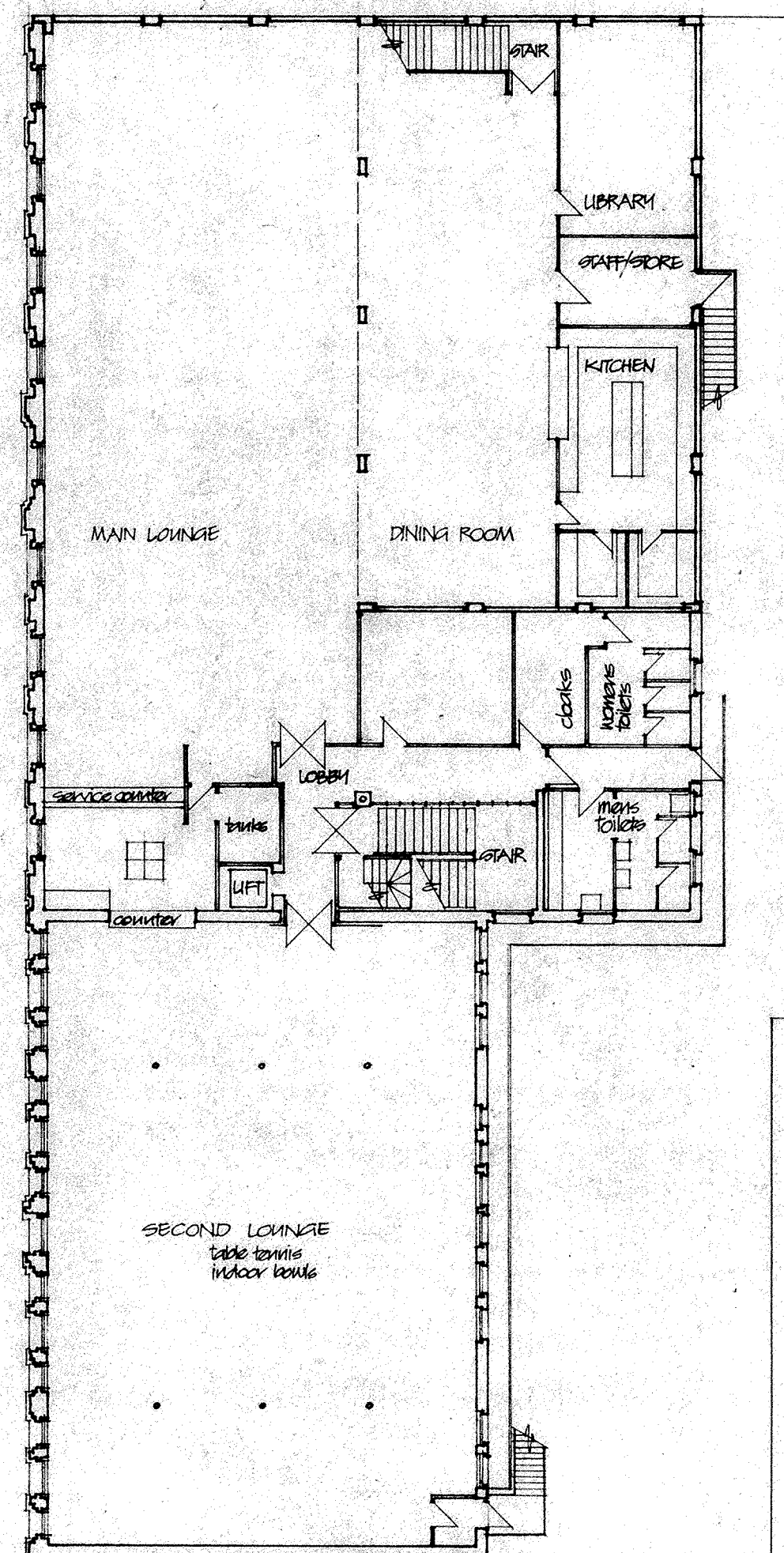
7915A5





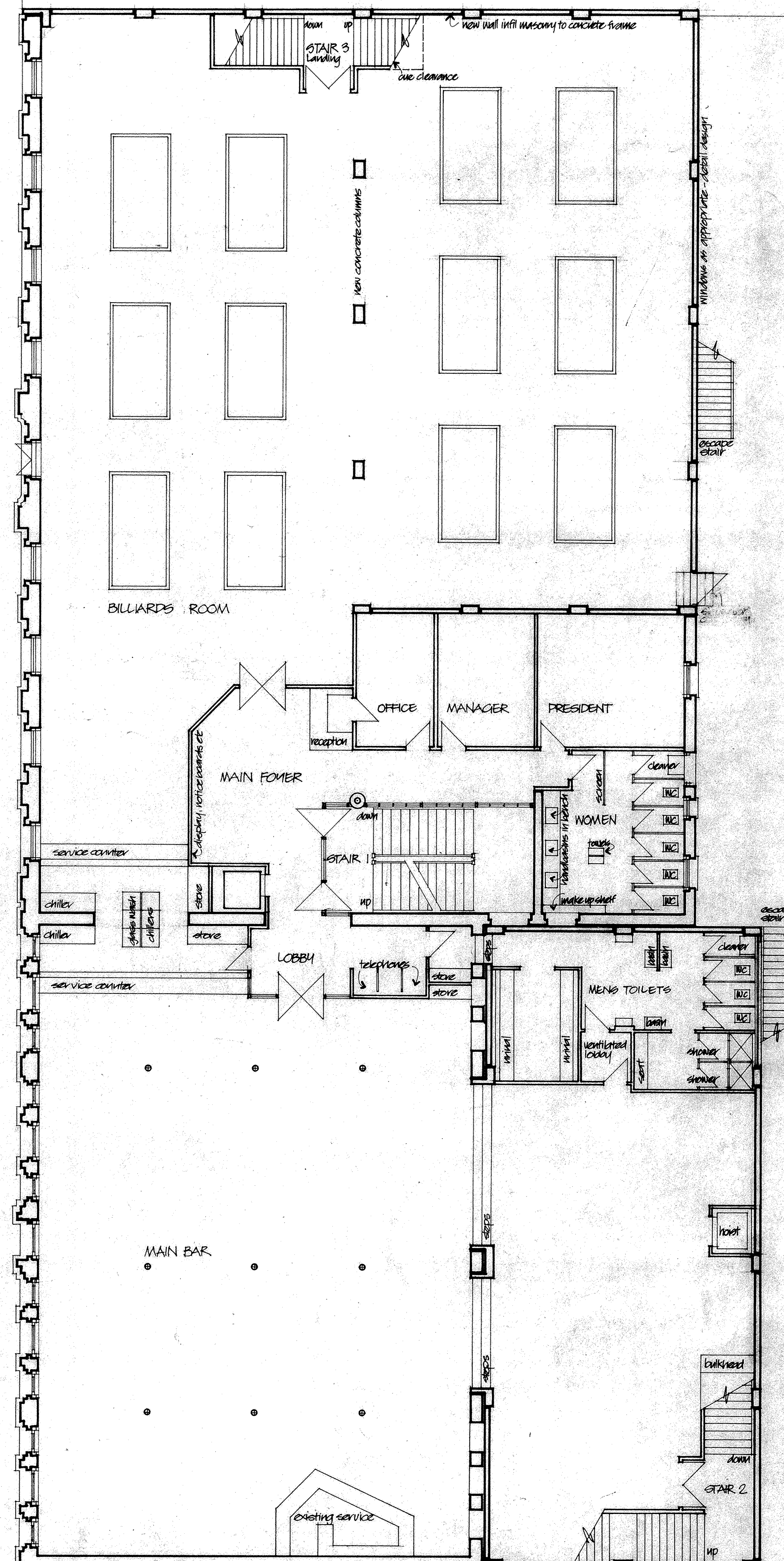
1:200 First floor

plans showing intermediate phase between stage one and stage two.



1:200 second floor

ie. changes from existing show extent of stage 1



1:100 revised first floor plan

showing full strengthening/alterations scheme for stage 1/north building/current works extent definition see 1:200 plans at left, DNG 7115A1 & DETAILS



WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
STRENGTHENING AND ALTERATIONS - CHINA ST PREMISES

BRICKELL MOSE RANKINE & HILL  
CONSULTING ENGINEERS - NGTN

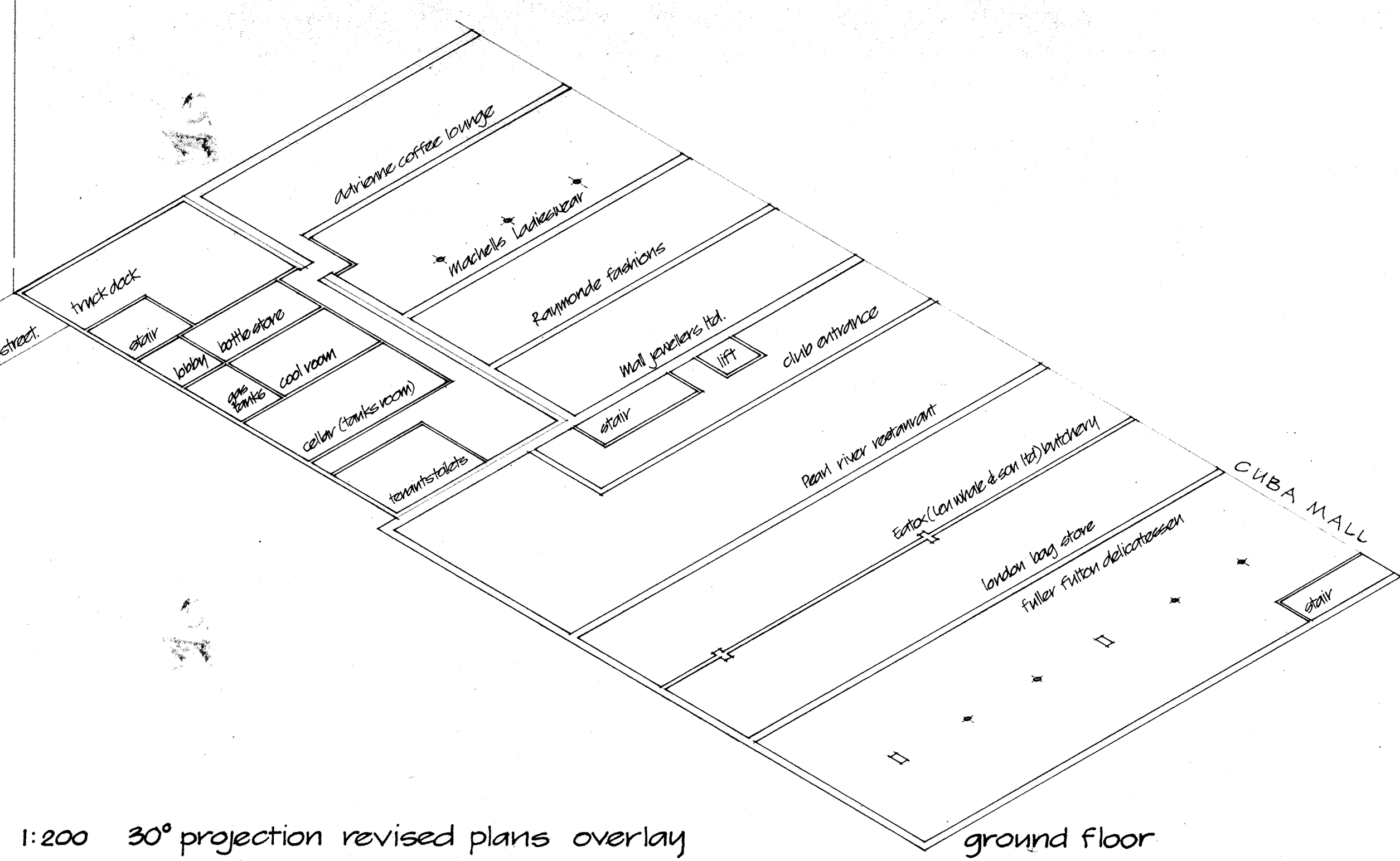
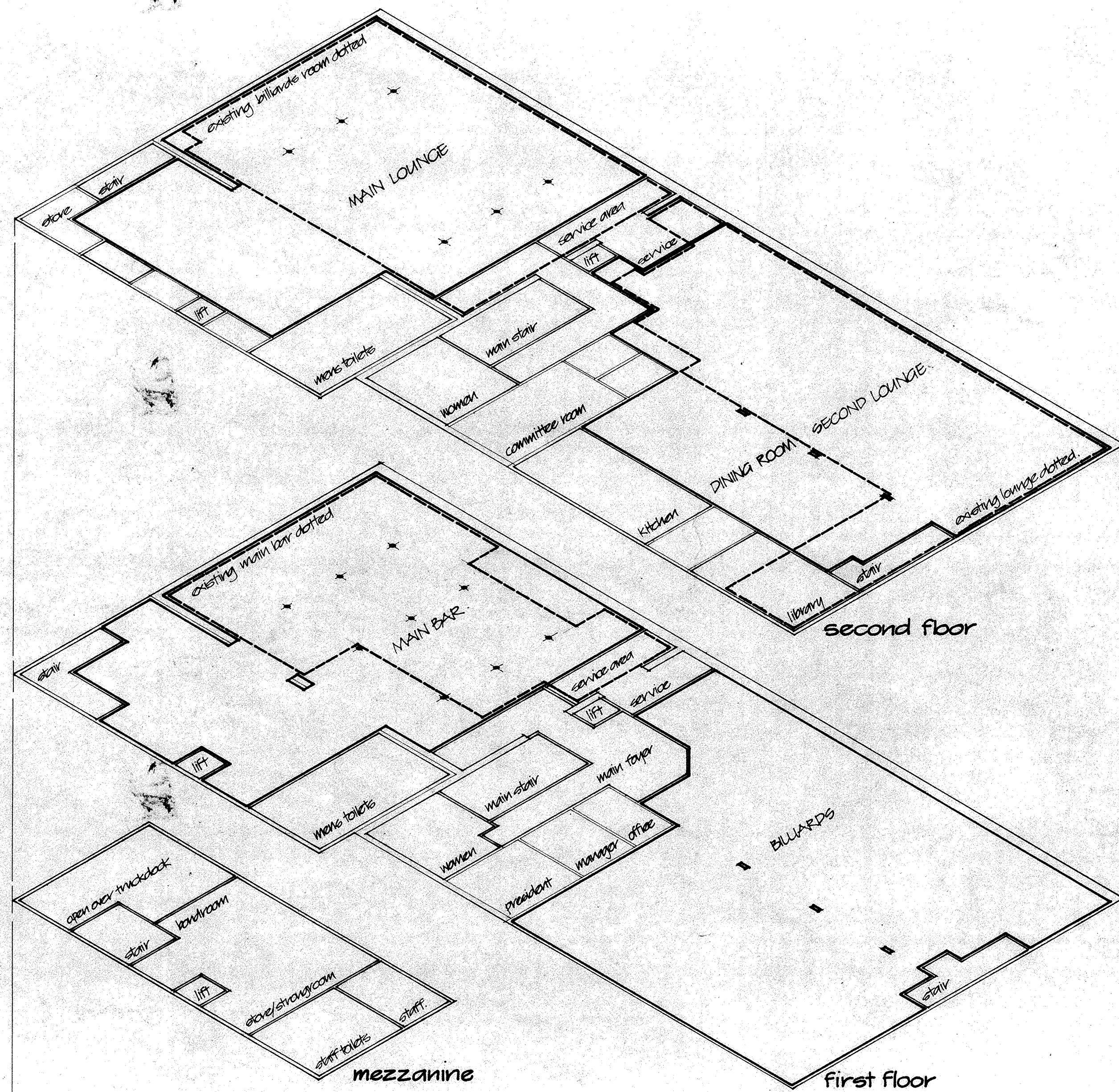
Keith Wilson  
architect  
Wellington

box 12321 Wellington  
phone 735653

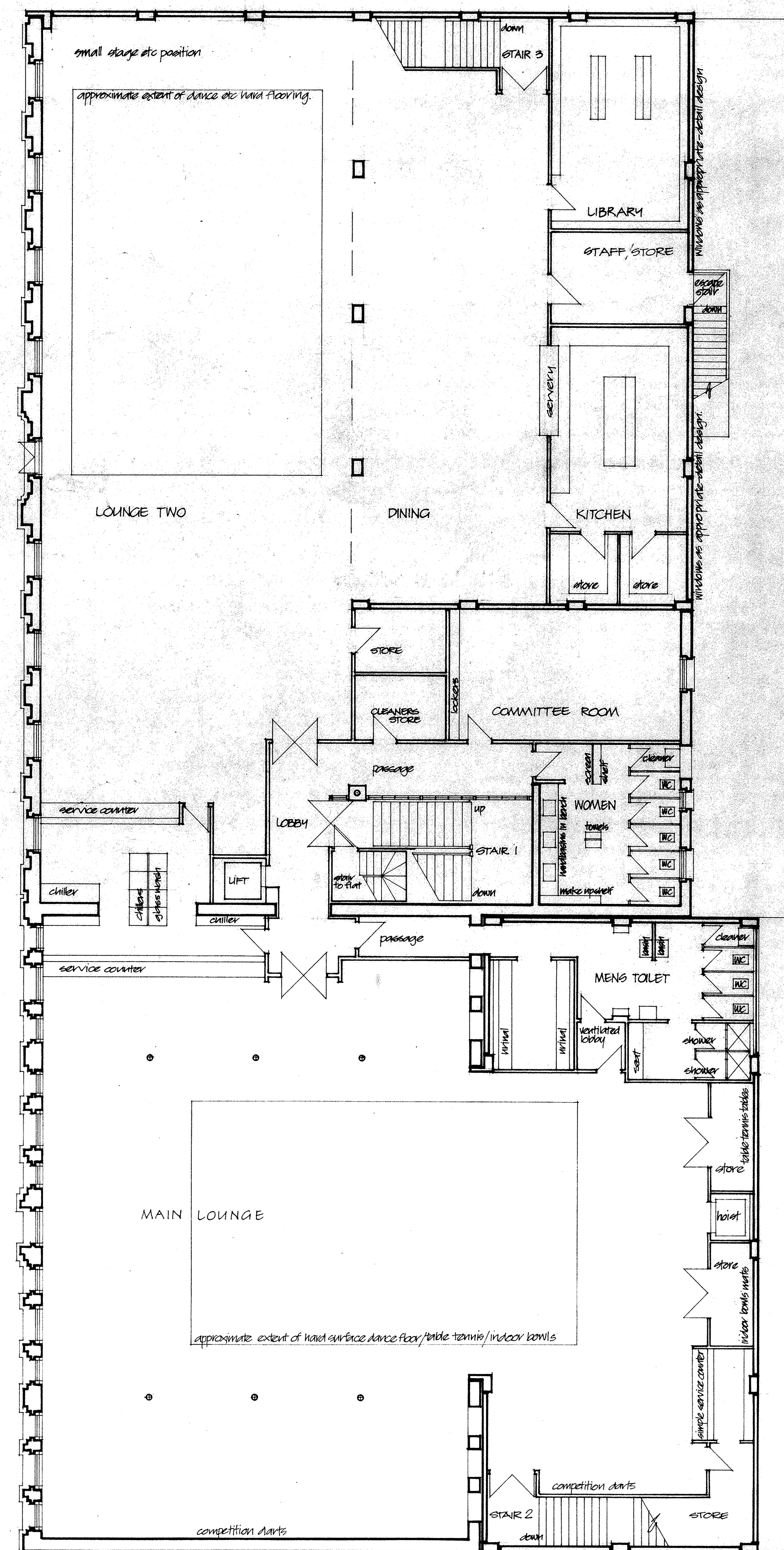
OVERALL SCHEME  
FIRST FLOOR PLAN.  
INTERMEDIATE PHASE  
OVERALL PLANS.

7915A6





1:200 30° projection revised plans overlay



1:100 revised second floor plan

SHOWING FULL STRENGTHENING/ALTERATIONS SCHEME FOR STAGE 1/NORTH BUILDING/CURRENT WORKS EXTENT DEFINITION SEE DRAWINGS 7411BAG, A4 AND DETAILS.



WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
**W.M.C.**  
STRENGTHENING AND ALTERATIONS • CUBA ST PREMISES

BRICKELL MOSS RANKINE & HILL  
CONSULTING ENGINEERS • WATY

keith wilson  
architect  
wellington  
box 12321 wellington  
phone 785 633

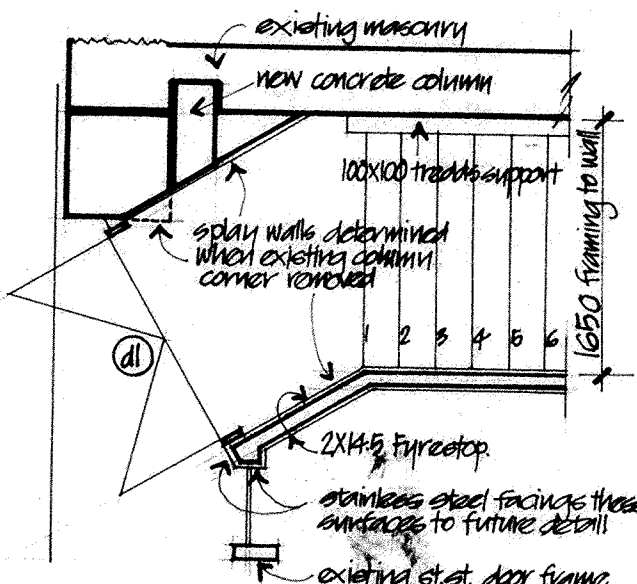
OVERALL SCHEME  
SECOND FLOOR PLAN

7915A7

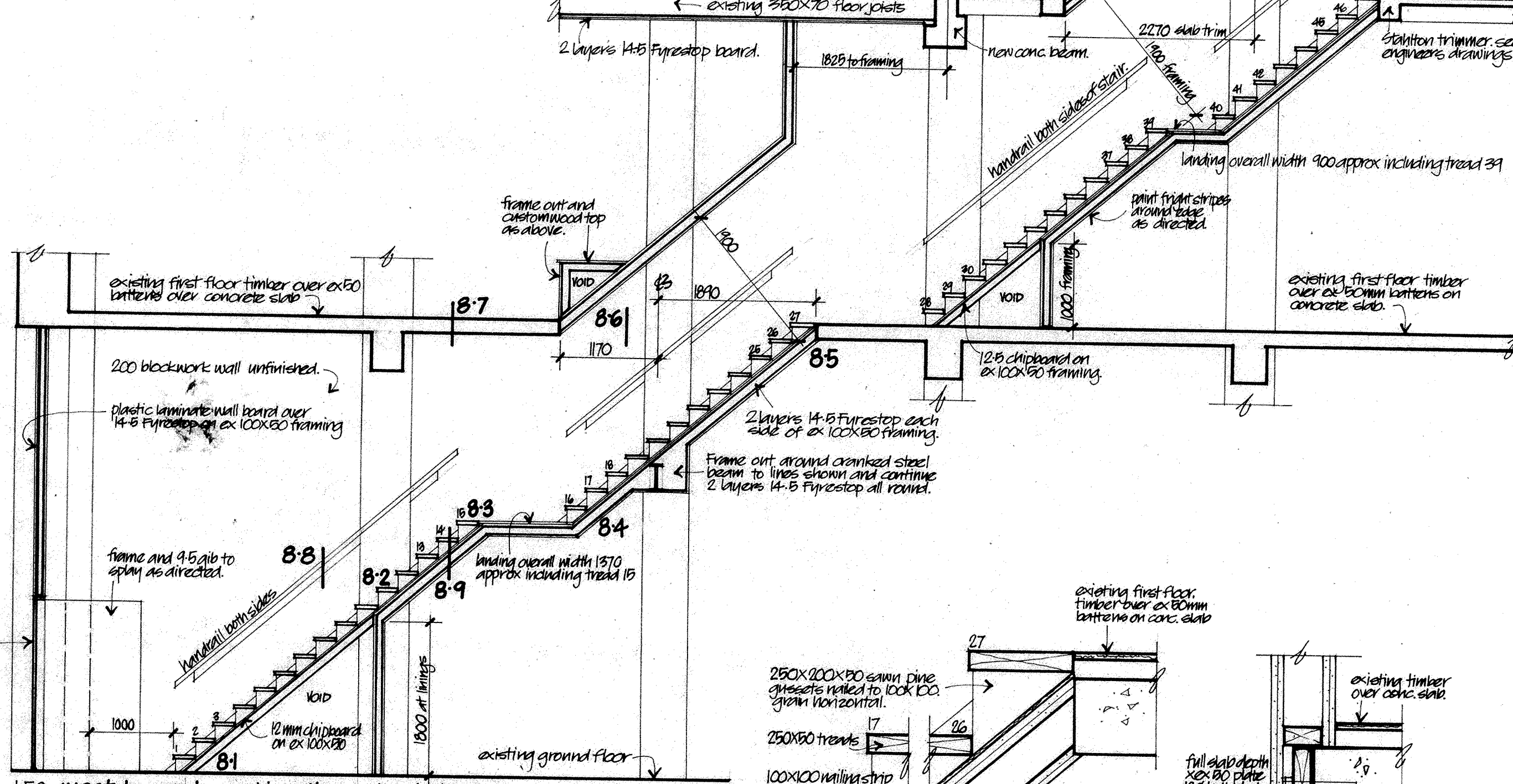


# stair construction

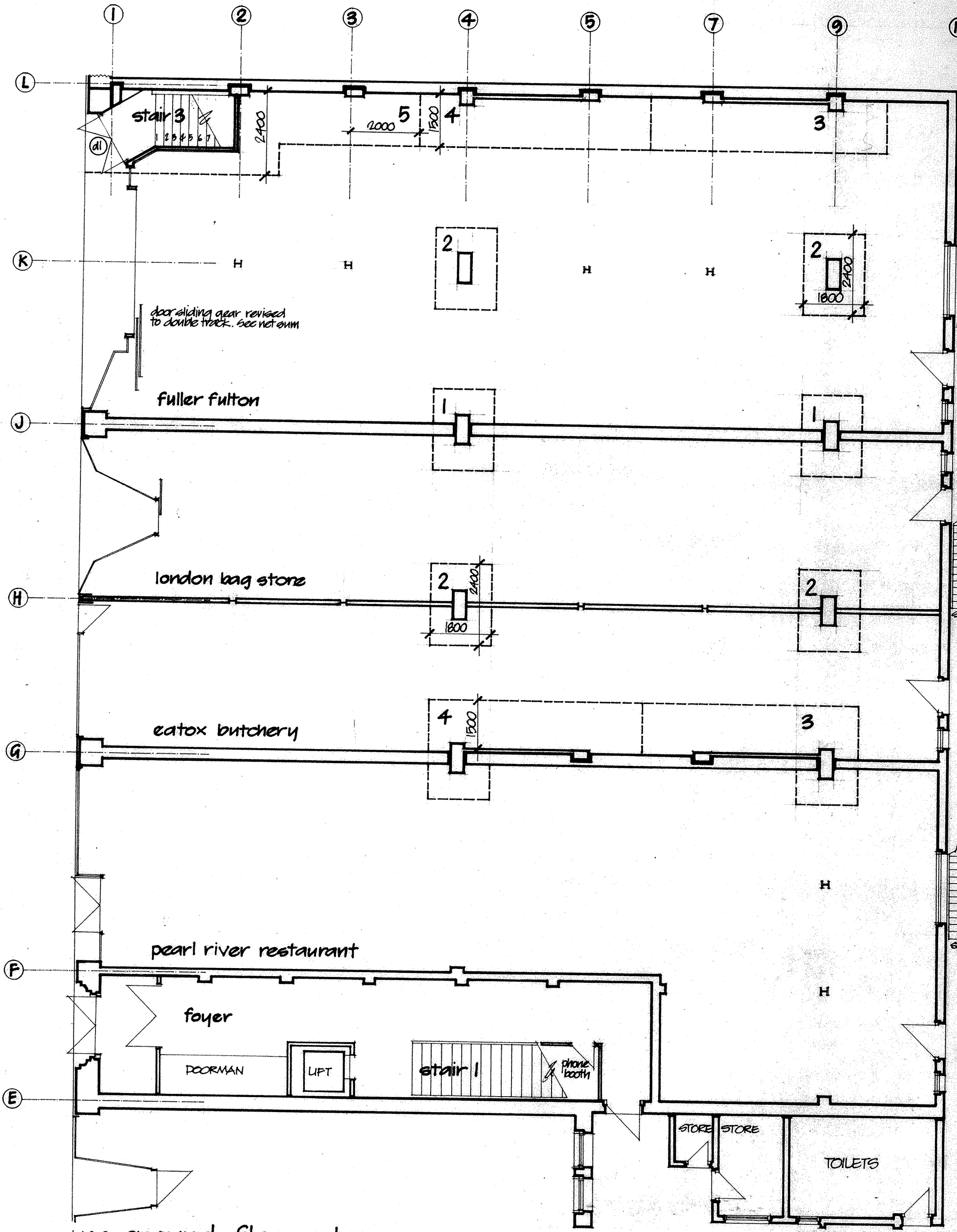
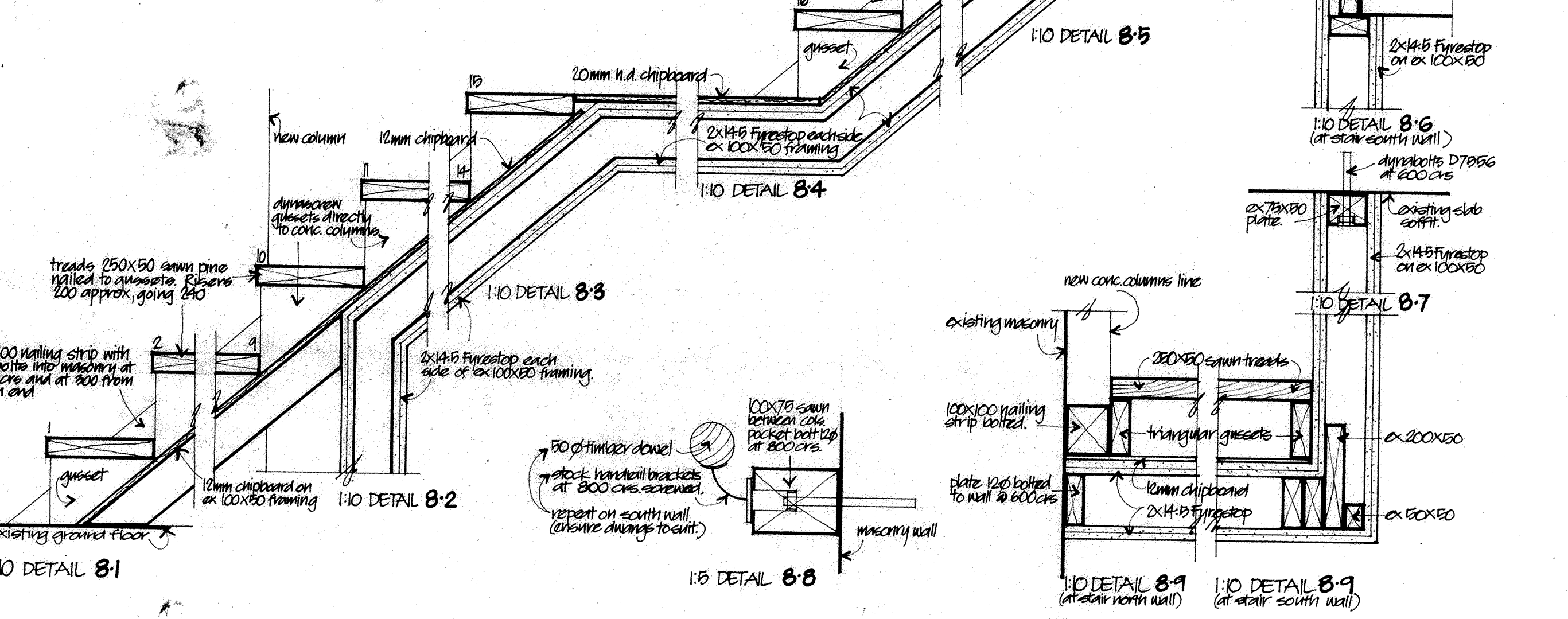
- Stair fire enclosure ex 100x80 and as noted framed, with galvanized steel strip nailing, etc. as required or directed. Framing must be completed and approved before commencing lining.
- Fix 2 layers 14.5 mm Ninestones Firestop in accordance with specification GBL7 all over both surfaces. Firestop work must be approved before proceeding.
- Frame out infill pieces, fix 12 mm medium density particle board over stair entrance, 20 mm h.d. chipboard over intermediate landings and build stair in place as detailed.



1:50 plan at foot of stair



1:50 west to east section through stair 3



1:100 ground floor plan

## work areas marked thus 2

- Contractor shall stage work in the shops to minimize disruption to tenants in sequence as numbered.
- Complete work in each stage before moving to the next area.
- On lines 4 and 9 where overhead steel braces intersect at centre span between allotted areas allow to suspend braces and tack weld under existing first floor beams. Weld overhead either from a working scaffold or by accessing in the ceiling space only.
- Complete stages 1 to 4 in sequence as soon as possible after commencement on site and in parallel with work going on above level 1.
- Allow to return to Fuller Fultons tenancy to work on penetration through the existing first floor slab and construct stair in area 5 when the boundary wall on the north side of the building is constructed and the roof over has been weatherproofed.



WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
STRENGTHENING AND ALTERATIONS • CHURCH ST. PREMISES

IAN G. SMITH CONSULTANTS  
ENGINEERS • WELLINGTON

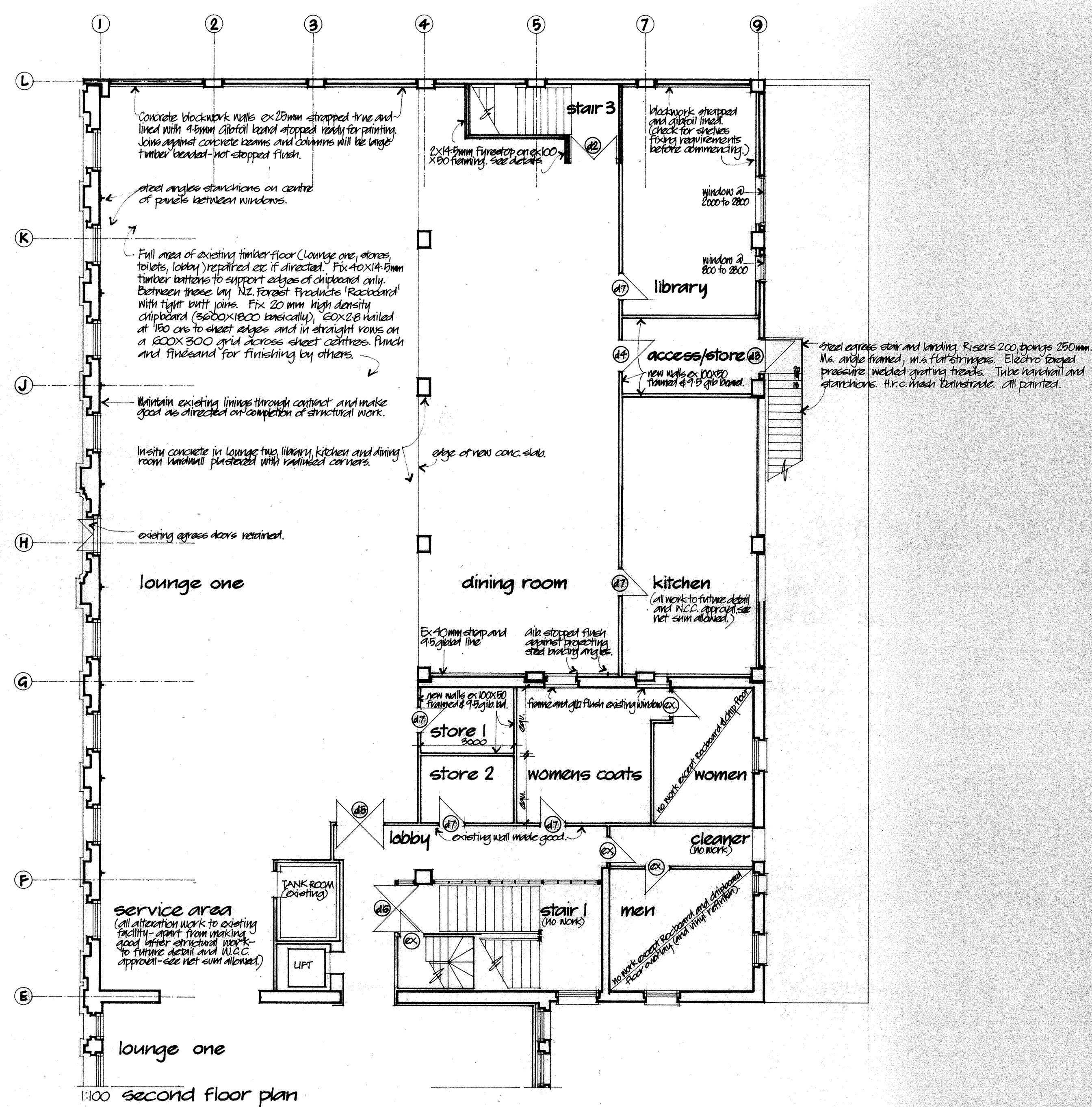
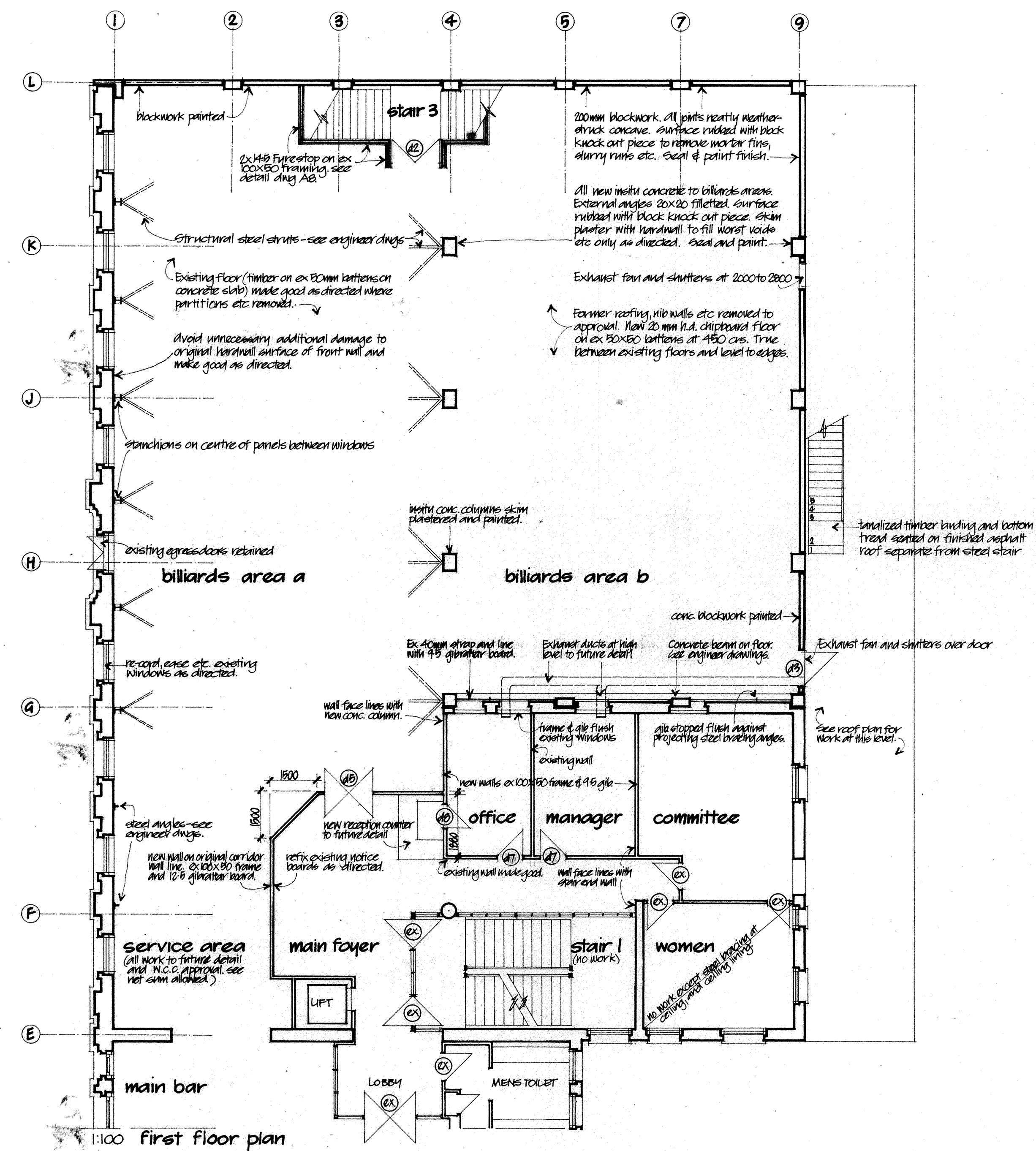
keith wilson  
architect  
wellington

box 12321 wellington  
phone 735633

GROUND FLOOR PLAN,  
STAIR THREE DETAILS

7915A8





# doors schedule

All doors 1980 high by widths given.  
 'ex' indicates existing retained.  
 d1. (stair 3 to street). Ex 720 solid core flush exterior paint quality.  
 d2. 2X760 solid core flush interior ht. rimu varnish quality.  
 d3. 1150 solid core flush exterior paint quality.  
 d4. 1150 hollow core flush interior ht. rimu varnish quality.  
 d5. 2X760 ht. rimu framed, 6mm Georgian wired pp. glazed to detail.  
 d6. existing adjacent pair of aluminium doors revised.  
 d7. existing 810 varnished flush doors (and frames) carefully salvaged and reused as directed.  
 d8. 710 hollow core flush interior ht. rimu varnish quality.



WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
**WORKS**  
 STRENGTHENING AND ALTERATIONS - CUBA ST. PREMISES

IAN G. SMITH CONSULTANTS  
 ENGINEERS - WELLINGTON

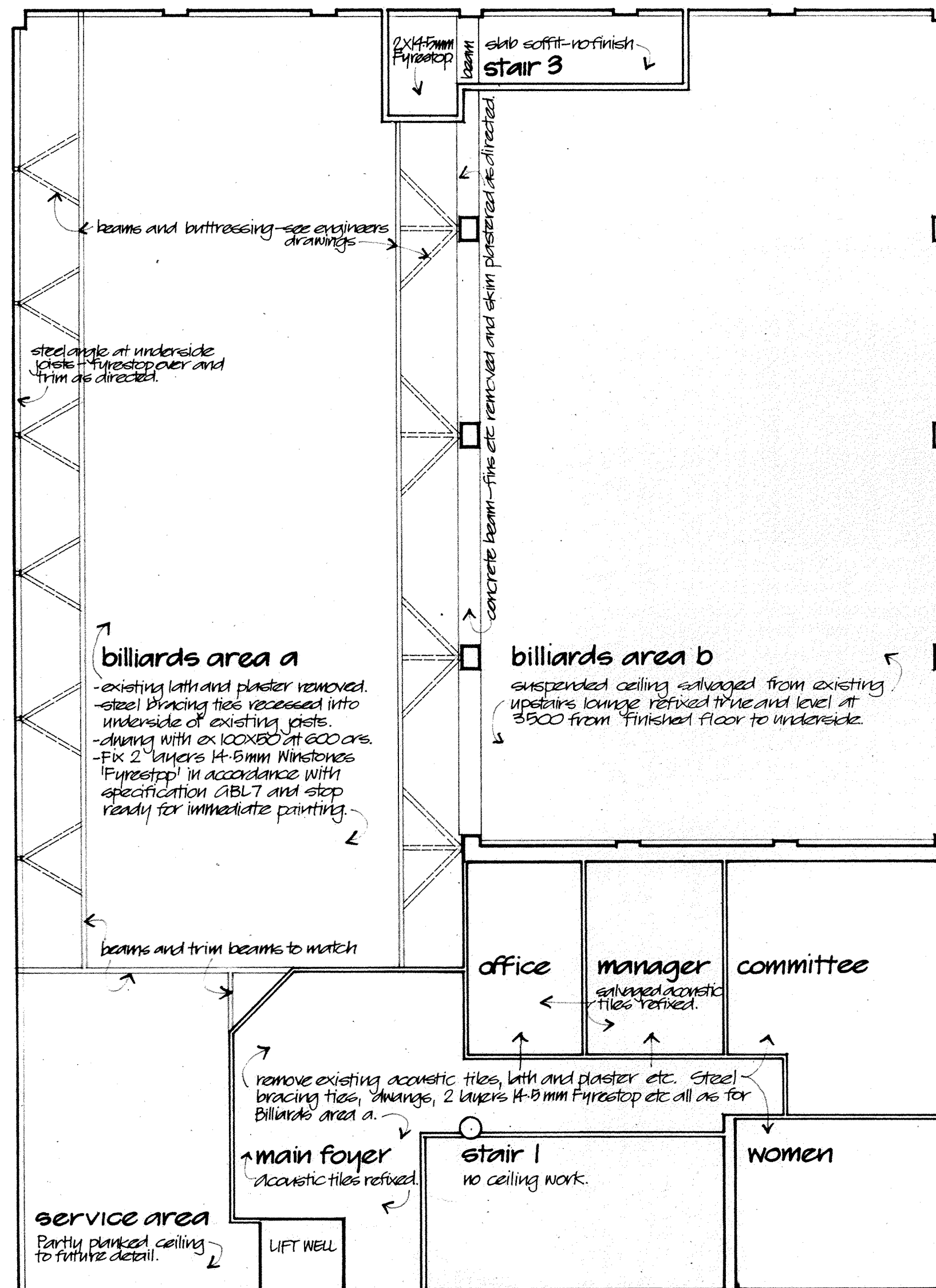
keith wilson  
 architect  
 wellington

box 12821 wellington  
 phone 756633

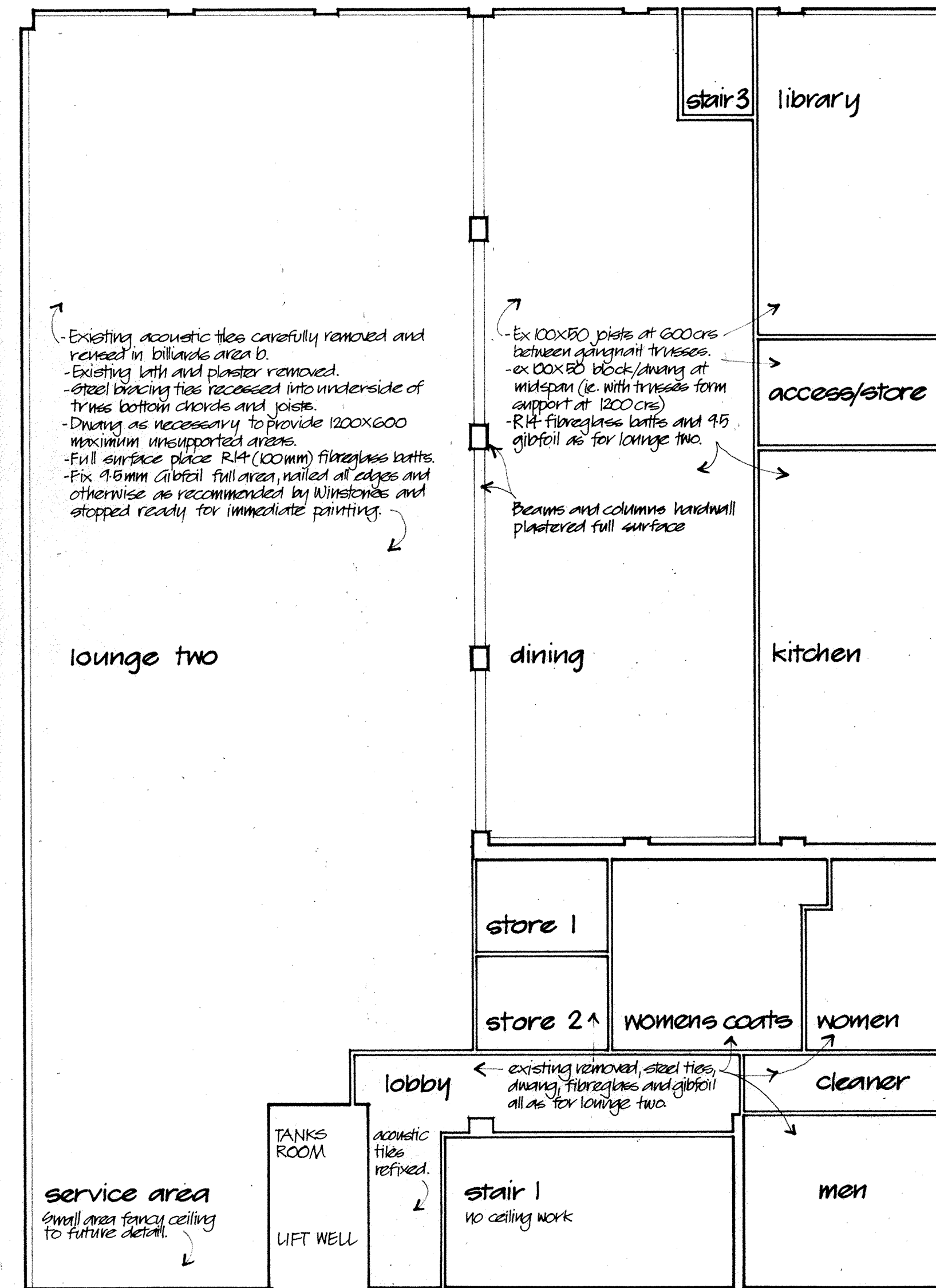
FIRST & SECOND FLOORS.  
 DOORS SCHEDULE.

7915A9





1:100 first floor reflected ceiling plan



1:100 second floor reflected ceiling plan



WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
**WMC**  
 STRENGTHENING AND ALTERATIONS - CUBA ST PREMISES

IAN G. SMITH CONSULTANTS  
 ENGINEERS • WELLINGTON

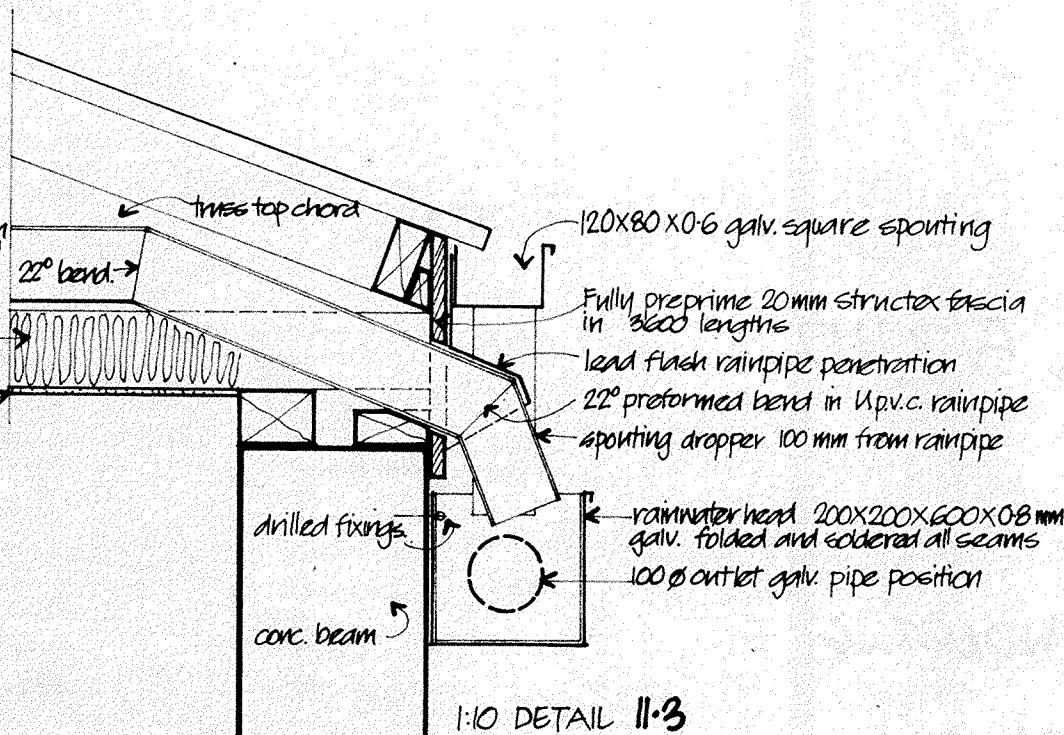
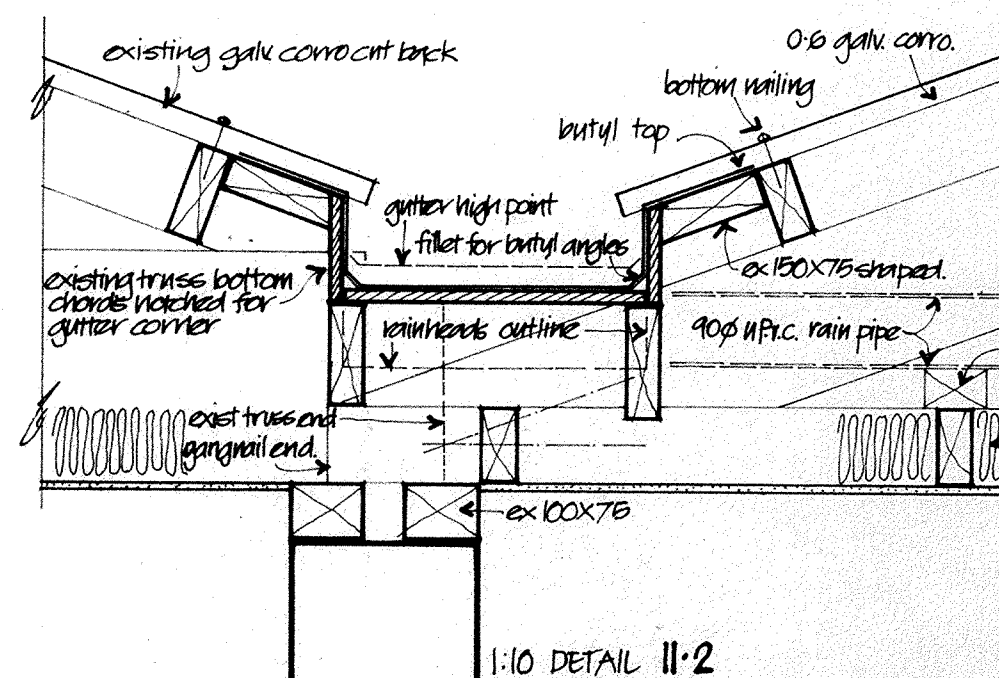
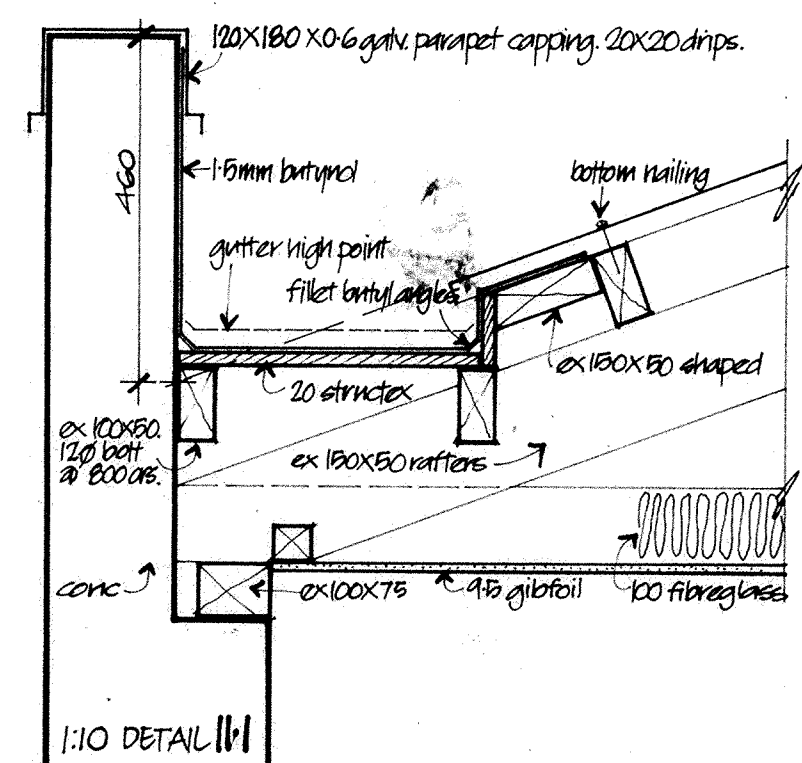
keith wilson  
 architect  
 wellington

box 12821 wellington  
 phone 766233

FIRST AND SECOND  
 FLOORS REFLECTED  
 CEILING PLANS

7915A10





notes / spec.

Purlins ex 100x50 at 900 cns on edge, skew nailed and one Pryde Zed nail at each purlin/truss contact.

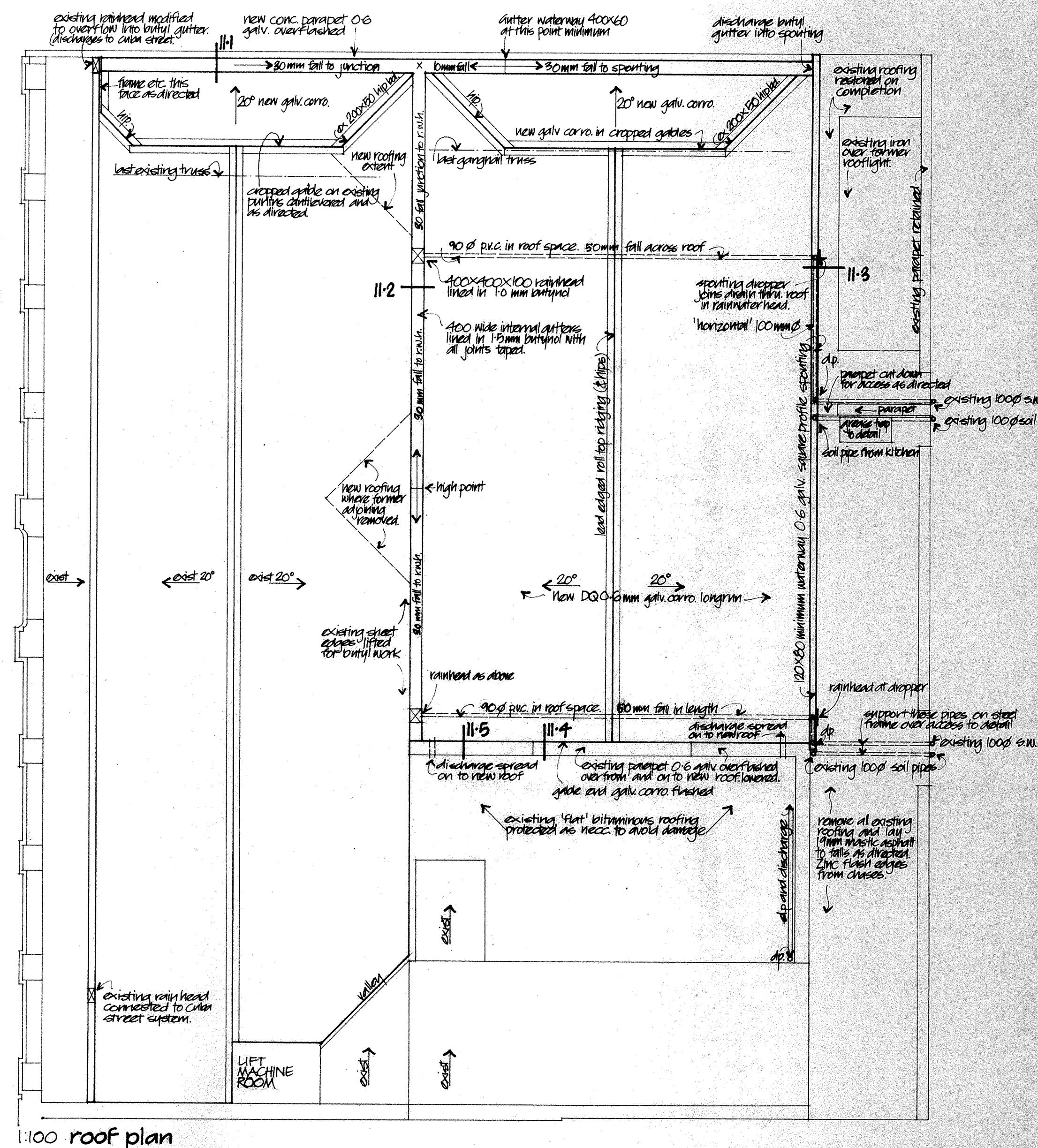
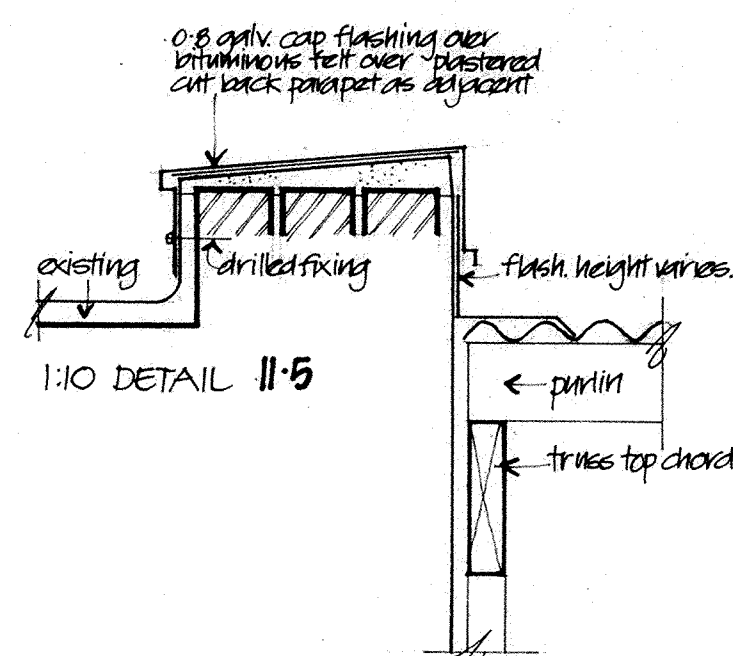
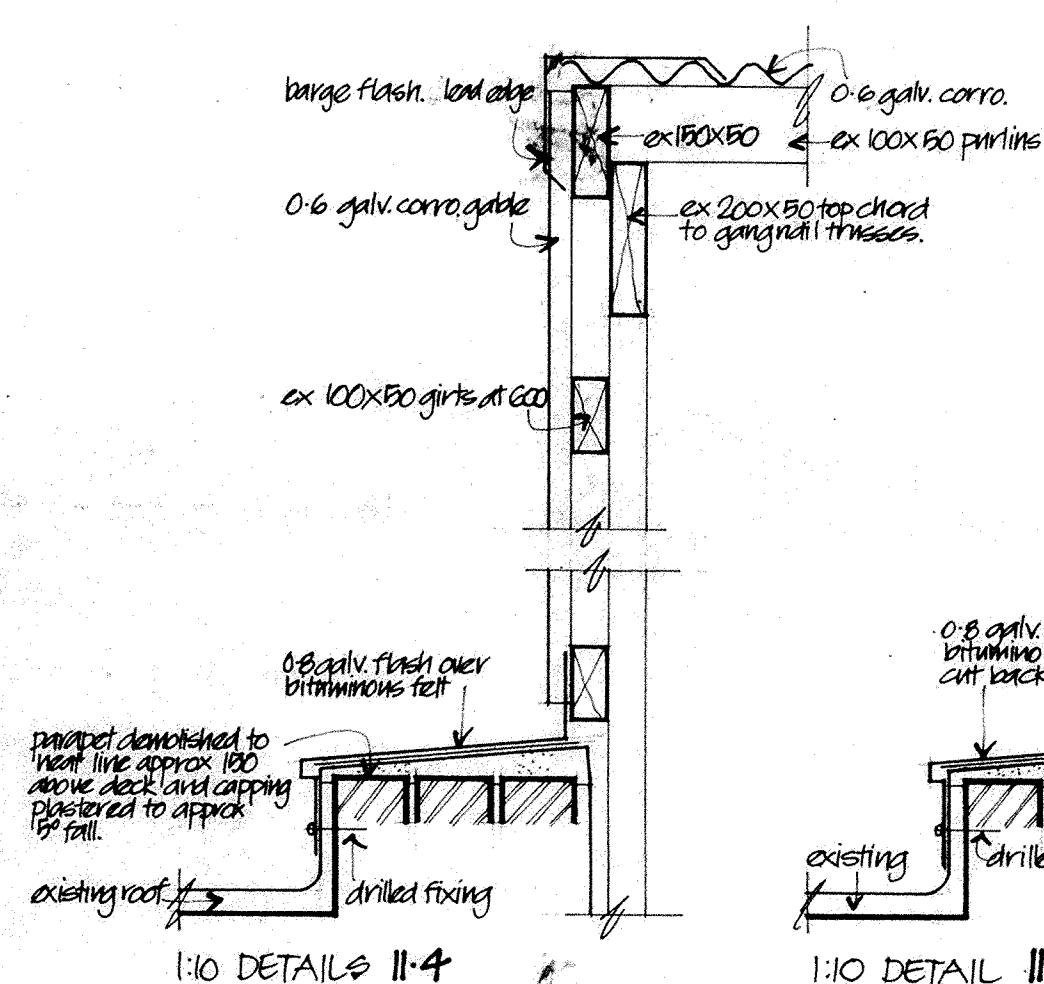
Purlin joins over truss and with 400 long ex 100x50 on flat flitch well nailed.

Roofing D30-0.6mm galvanized corrugated in full length ridge to eaves pieces, primed at bottom over butyl and top under ridging, fixed with 60mm spiral shank spring head nails at each second corr. Side laps 1/2 corrugations. Roofing over twisted tau 30x12mm galvanized wire mesh over heavyweight building paper fixed weatherstrip.

Burial substrate shall be 20mm structure, preprepared especially all cut edges, fixed to achieve even falls as noted. Internal angles neatly 20mm filletted. Burial fixing only on calm days with surrounding surfaces clean and substrates completely clean and dry.

Butyrol fixed in full width strips full length between rainheads, junctions etc. 15mm thick in gutters, 1mm to rainheads. All joints taped/butyl adhesive and all work by experienced men exactly to manufacturers recommendations to leave neat and tidy finished job.

Flashings 0.6 or 0.8 as noted galv. sheet, lead edged as necessary, all machine folded, all securely fixed.



WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE

IAN C. SMITH CONSULTANTS  
ENGINEERS • WELLINGTON

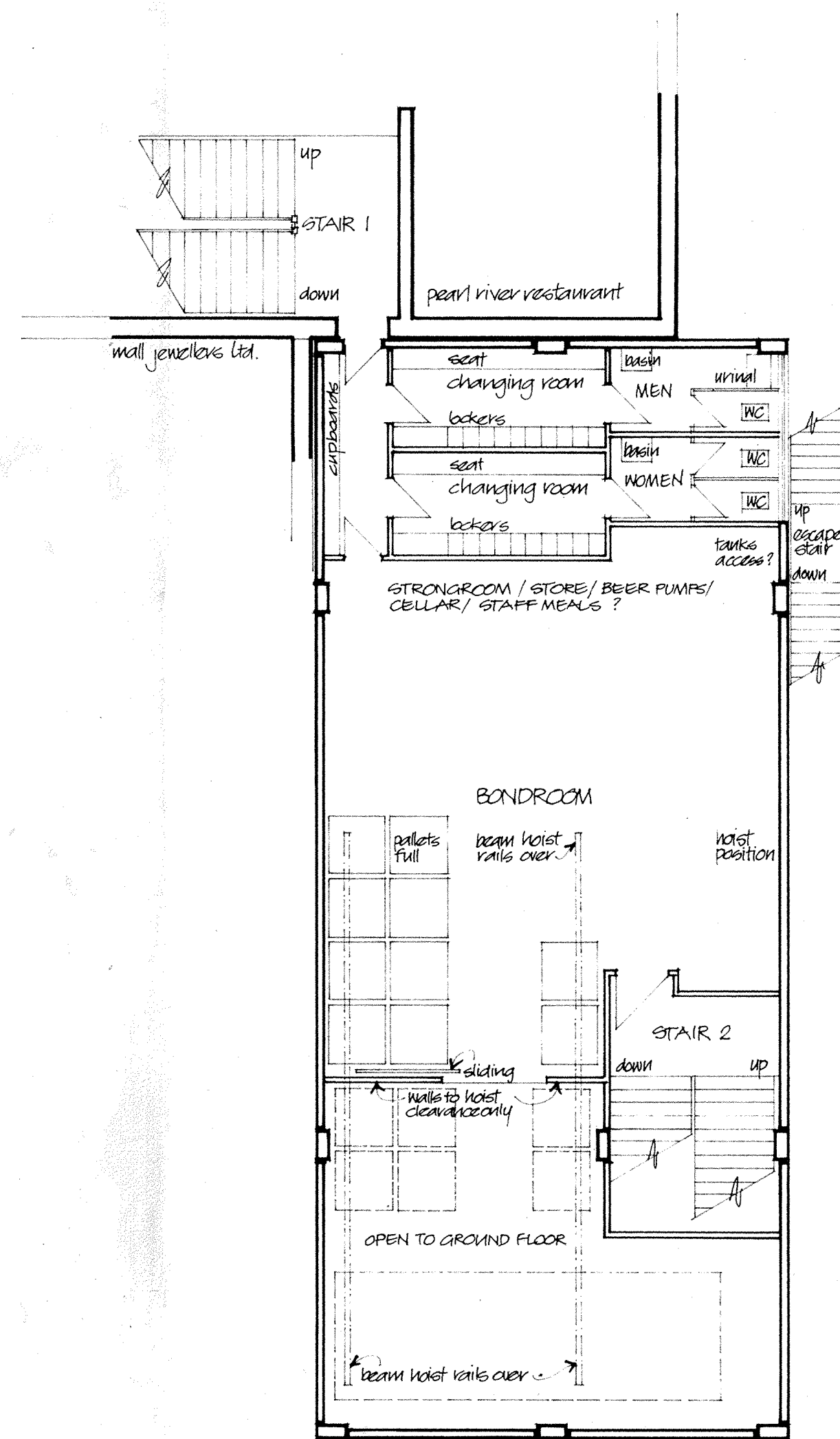
keith wilson  
architect  
wellington

box 12321 wellington  
phone 735 633

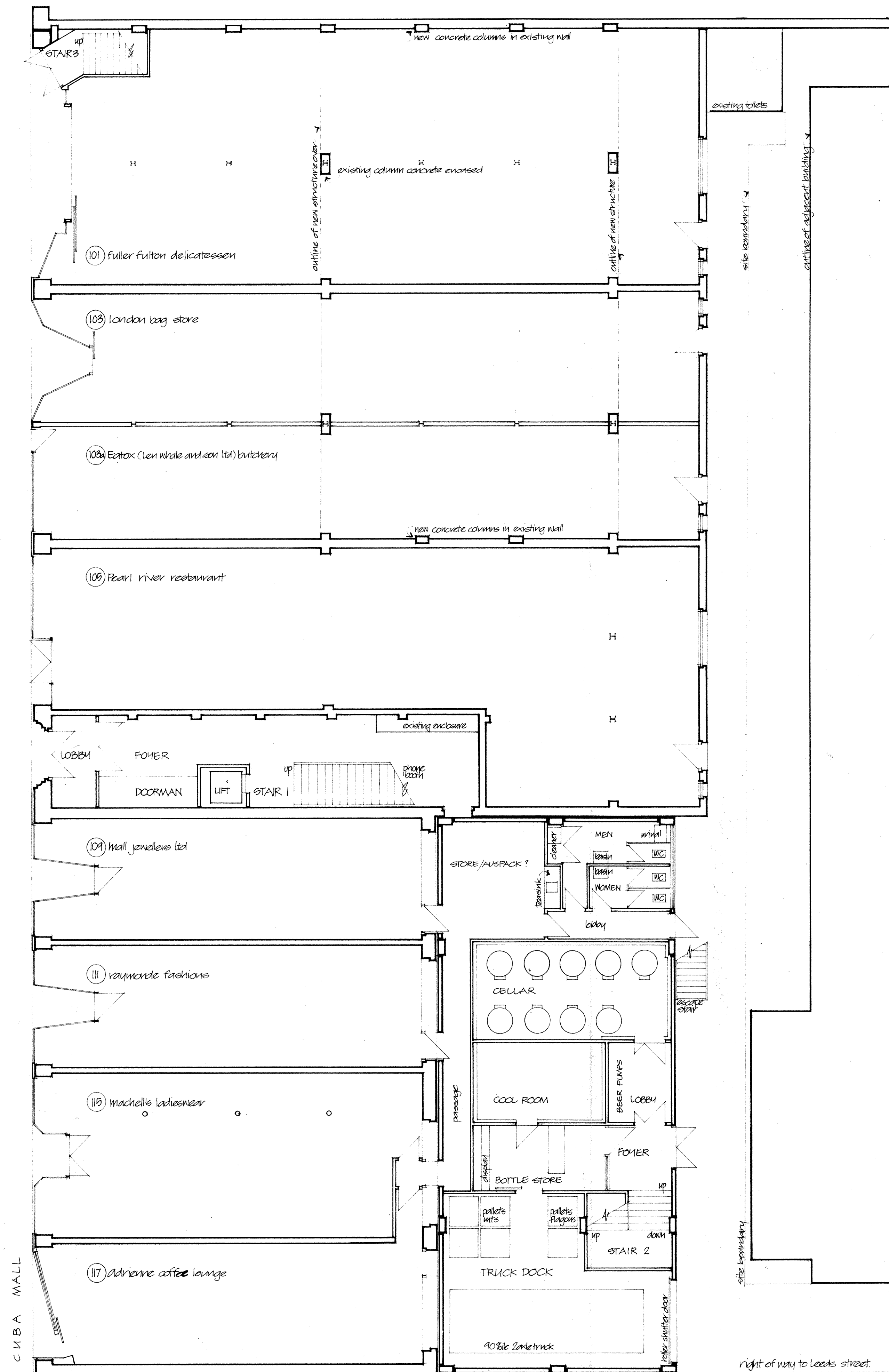
## ROOF PLAN AND DETAILS

7915A11



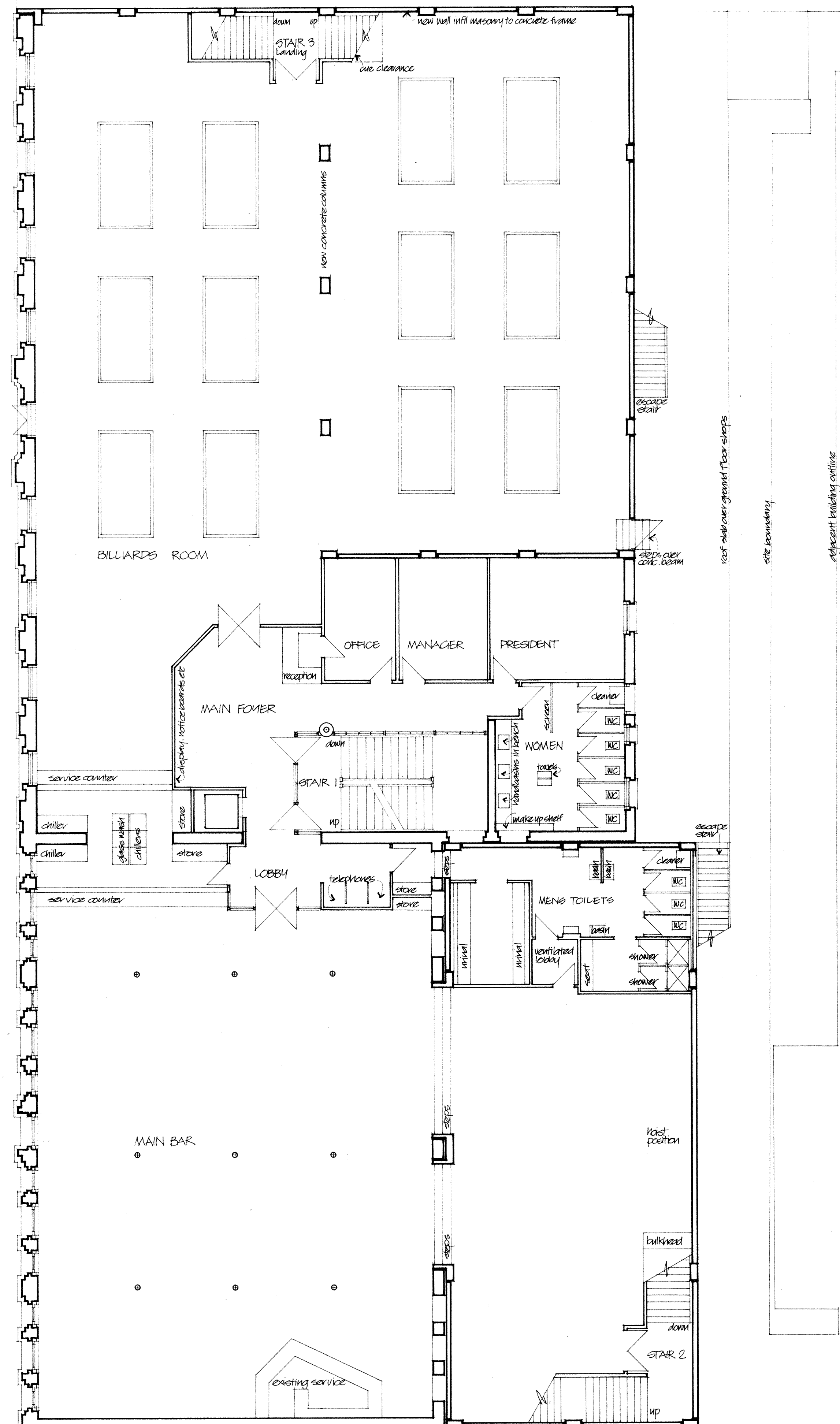


1100 mezzanine floor plan



1100 revised ground floor plan





1100 revised first floor plan

Concrete slab full floor area

WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
**W.M.C.L.I.**  
 STRENGTHENING AND ALTERATIONS • CURBA ST PREMISES

BRICKELL MOSS RANKINE & HILL  
 CONSULTING ENGINEERS • NGATN

keith wilson  
 architect  
 wellington

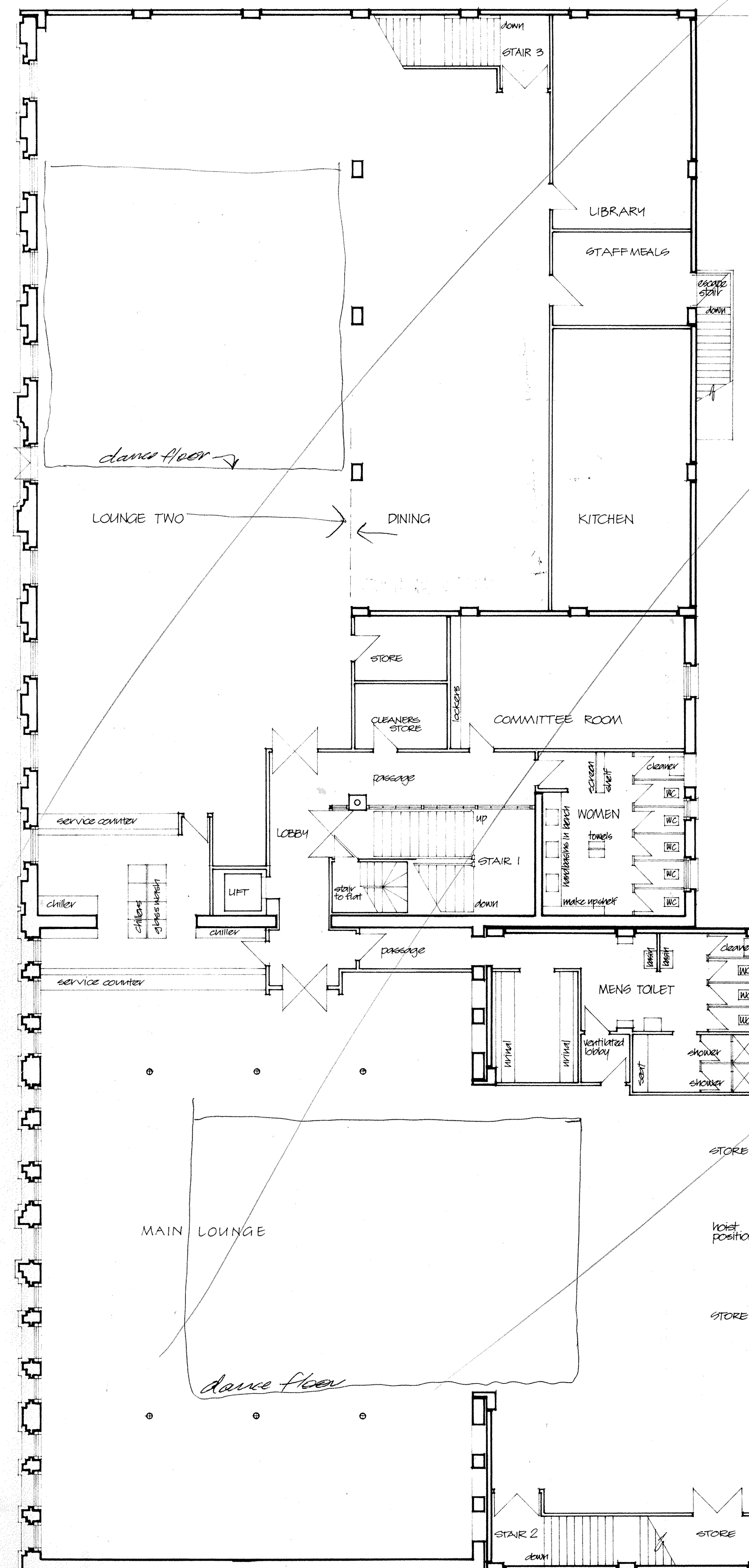
box 12321 wellington  
 phone 735633

7915P11









1100 revised second floor plan

WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
**WWMCI**  
 STRENGTHENING AND ALTERATIONS • CUBA ST PREMISES

BRICKELL MOSS RANKINE & HILL  
 CONSULTING ENGINEERS • WWTN

keith wilson  
 architect  
 wellington

box 12321 wellington  
 phone 735633

7915P12



GENERAL NOTES

GENERAL

- A1 These drawings to be read in conjunction with the Architectural Drawings and the Specification. Attention is drawn to the notes on this sheet. Any variation or discrepancy must be confirmed.
- A2 All workmanship and materials must be in accordance with the Wellington City Council By-Laws.
- A3 For falls to slabs, architectural features, bolts, downpipes, conduits, rebates and holes, reference must be made to the relevant Architectural and Building Services drawings. Any holes through columns, beams, slabs and walls that are not shown on the structural drawings must be confirmed.
- A4 Sizes shown on these drawings are minimum structural sizes and are not necessarily the finished sizes. For finished sizes refer to the Architectural drawings.
- A5 During construction the structure shall be maintained in a stable condition by means of temporary bracing and guying, and no part shall be overstressed.
- A6 The contractor must allow in his programme sufficient time to obtain all building permits.

STEELWORK

- B1 All structural steel to be mild steel complying with BS 4360.
- B2 Bolted connections are to be made with black bolts in 2mm clearance holes.
- B3 All welding is to be arc welding in accordance with N.Z.S. 1646. Welds are to be 6mm continuous fillet unless otherwise noted.
- B4 All gusset plates and cleats to be 10mm thick unless otherwise noted.
- B5 All bolts to be 20mm diameter unless otherwise noted.
- B6 When shop splices are necessary in members the position is to the approval of the Engineer.
- B7 Before fabrication is commenced two copies of all workshop drawings are to be submitted for checking and two copies of the final corrected drawings shall also be supplied.

CONCRETE

- C1 Materials and Workmanship are to be in accordance with the Wellington City Council By-Laws and N.Z.S. 1900 Chapter 9.3.A.
- C2 Construction joints in slabs and beams are to be within the middle third of the span. No horizontal joints will be permitted in slabs or beams.
- C3 P.V.C. Waterslops must be incorporated in all construction joints below Ground Level.
- C4 Minimum cover to reinforcing is to be in accordance with N.Z.S. 3101 P. Clause 1.2.8.2 Table 2.
- C5 Where beam sizes are shown the depth is written first and includes the slab thickness.
- C6 No holes or chases shall be made in concrete members other than those shown on the drawings without prior approval of the Engineer.
- C7 Concrete Grades: All structural concrete shall be Special Grade with a minimum compressive strength at 28 days of 20 MPa unless shown otherwise. All blinding concrete and filling to over-excavated areas shall be Low Grade with a minimum compressive strength at 28 days of 10 MPa.

REINFORCEMENT

- D1 Reinforcing steel grades shall be shown on detail drawings using the following notation:  
R - Plain mild steel bars to N.Z.S. 3402 P: 1973  
D - Deformed mild steel bars to N.Z.S. 3402 P: 1973  
HR - Plain high yield to N.Z.S. 3402 P: 1973  
HD - Deformed high yield to N.Z.S. 3402 P: 1973.
- D2 Reinforcement is represented diagrammatically, it is not necessarily shown in true projection.
- D3 Splices in reinforcement shall be made only in the positions shown. Where lap length is not shown, it shall be taken as 32 dia. for deformed steel and 66 dia. for plain round rods unless shown otherwise.
- D4 Welding of reinforcement will not be permitted, unless shown on the structural drawings.

CONCRETE BLOCKWORK

- E1 All blockwork shall be constructed in accordance with N.Z.S. 1900; Chapter 9.2 so that it shall comply with the requirements of reinforced concrete masonry construction.

DRAWING INDEX

ENGINEERING

- E0A General Notes  
E1 Standard Details Sheet 1  
Dwgs E2-EG superseded.  
E7A Ground & First Floor Plans & Sections.  
E8A Second & Roof Floor Plans & Structural Steel details.  
E9A Wall Elevation on Grid (L) & Sections.  
E10A Wall Elevation on Grid (G) & Sections.  
E11A Wall Elevation on Grid (9) & Sections & Structural Steel details.  
E12A Wall Elevation on Grid (4) & Sections & Structural Steel details.

ARCHITECTURAL

- A1 Basic Site Dimensions  
A2 Existing Ground Floor  
A3 Existing First Floor  
A4 Existing Second Floor  
A5 Overall Scheme Mezzanine And Ground Plans  
A6 Overall Scheme First Floor Plan Intermediate Phase Overall Plans  
A7 Overall Scheme Second Floor Plan  
A8 Ground Floor Plan Stair Three Details  
A9 First & Second Floors Doors Schedule  
A10 First And Second Floors Reflected Ceiling Plans  
A11 Roof Plan And Details

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
A	Dwg Index updated	AK	Jan 80

1	WCC, KW, HE & P, WMC, Record	8/1/80
4	Unit Construction	8/1/80
1	Contract set	6.11.79
2	WCC	31.10.79
COPIES	ISSUED TO	DATE

ARCHITECT  
KEITH WILSON

IAN C. SMITH  
CONSULTANTS  
CIVIL STRUCTURAL  
AND EARTHQUAKE  
ENGINEERS

BRAEMAR  
32 THE TERRACE  
PH. 739-175  
WELLINGTON NZ

JOB TITLE  
WELLINGTON WORKINGMENS  
CLUB & LITERARY INSTITUTE  
STRENGTHENING AND  
UPGRADING CUBA ST PREMISES

DWG TITLE  
GENERAL NOTES

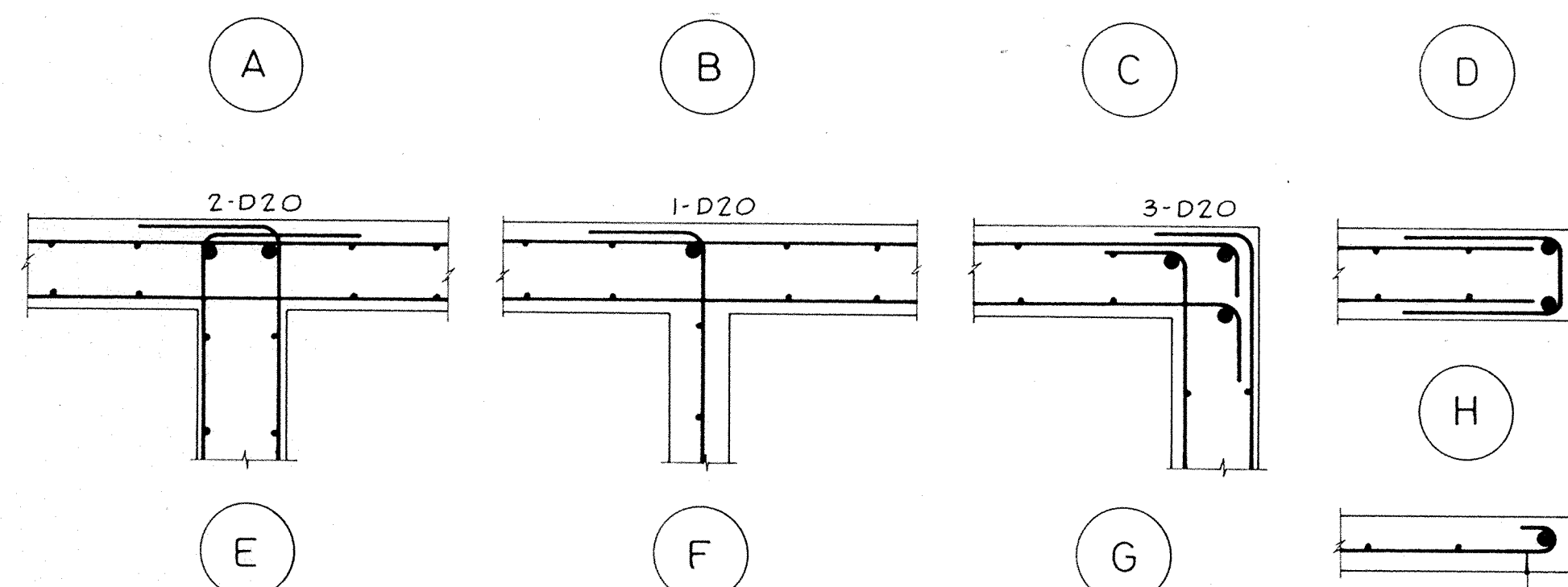
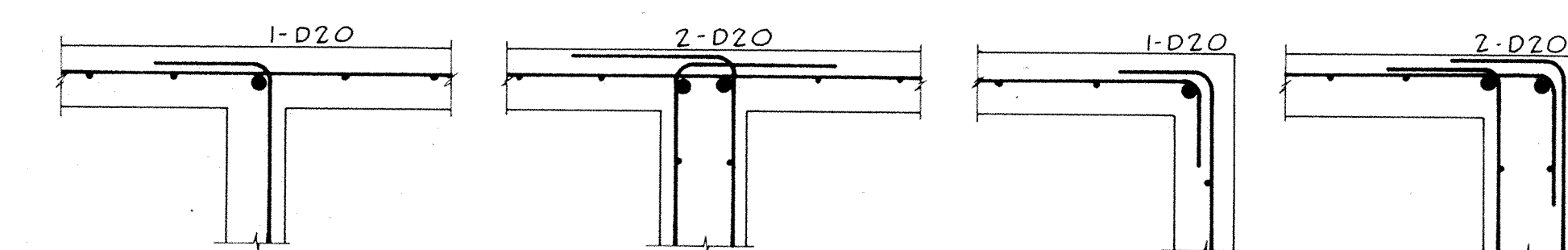
DRAWN	AK	SCALES
CHECKED	EB	
APP'D	EB	DWG NO
DATE Oct 1979		1004 / E0 A



WALL THICKNESS	TRIMMING BARS & PARAPETS	MINIMUM REINF EW	
100	1-D20	D10 at 300	665
110	1-D20	D10 at 250	664
125	1-D20	D10 at 225	663
150	1-D24	D12 at 300	662
175	2-D16	D10 at 300 EF	665 EF
200	2-D20	D10 at 300 EF	665 EF
225	2-D20	D10 at 250 EF	664 EF
250	2-D20	D10 at 225 EF	663 EF
300	2-D24	D12 at 300	662 EF

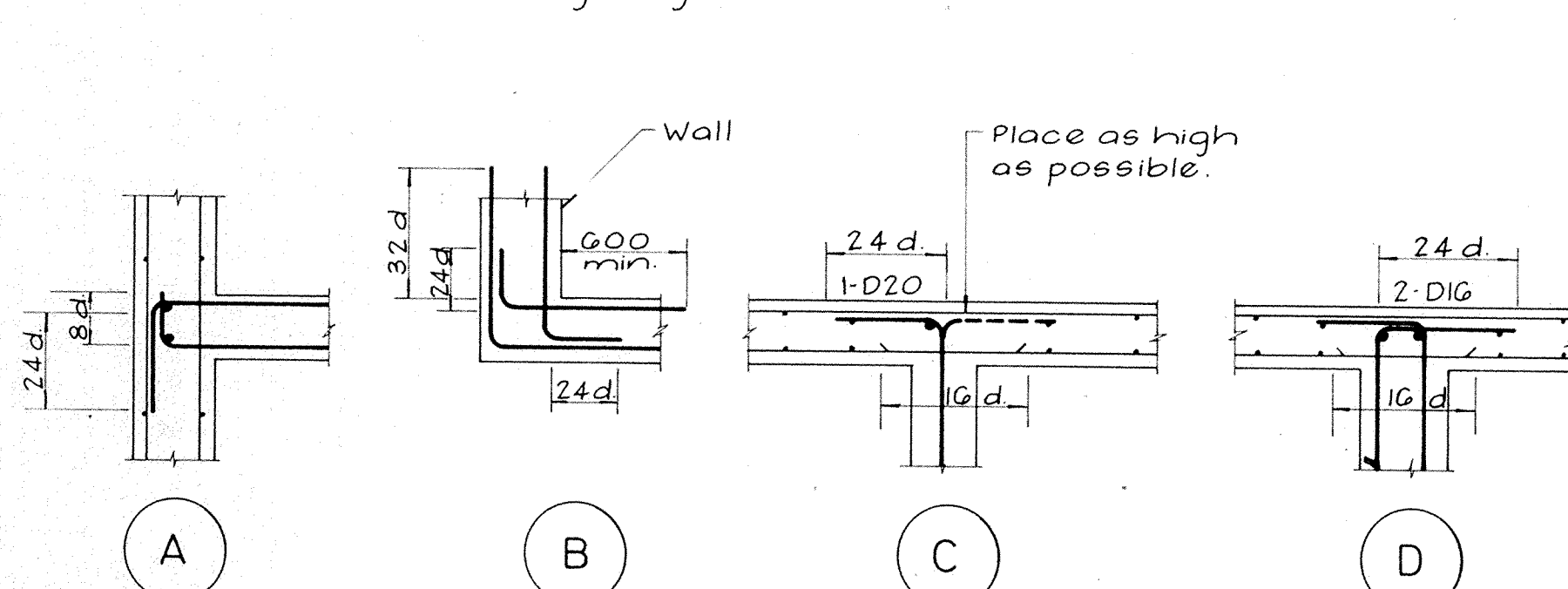
TABLE 1

MINIMUM WALL REINFORCEMENT & TRIMMING TO OPENINGS



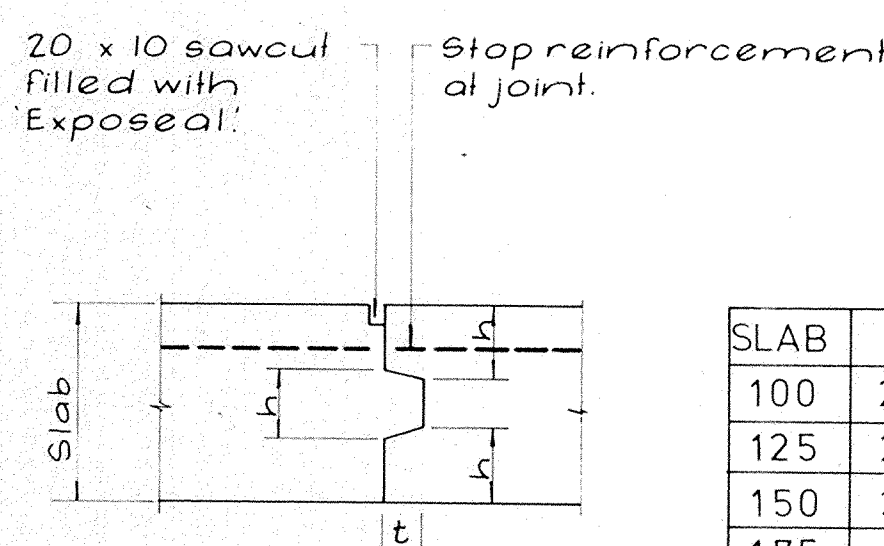
WALL JUNCTIONS

Notes: 1. Concrete block wall junctions similar where applicable.  
2. All bar leg lengths 24d, unless otherwise shown.



WALL & SLAB JUNCTIONS

Junction reinforcing to line with corresponding wall or slab reinforcing.

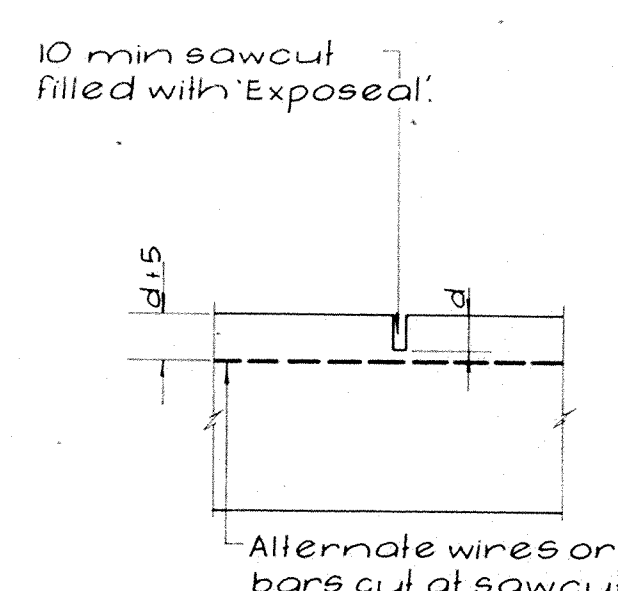


CONSTRUCTION JOINT

Note: Construction Joint not to deviate more than 5 from 3.000 straightedge placed along the joint.

SLAB	t	h
100	25	40
125	25	50
150	30	60
175	40	65
200	40	75

TABLE 5



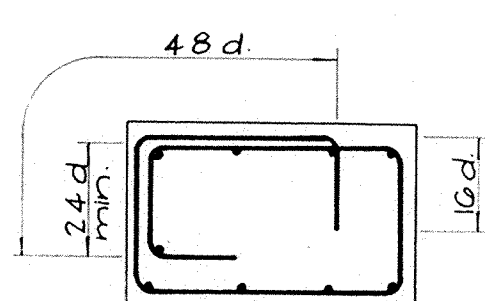
CONTRACTION JOINT

SLAB ON GRADE

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.

SLAB	d
100	20
125	25
150	30
175	40
200	45

TABLE 6

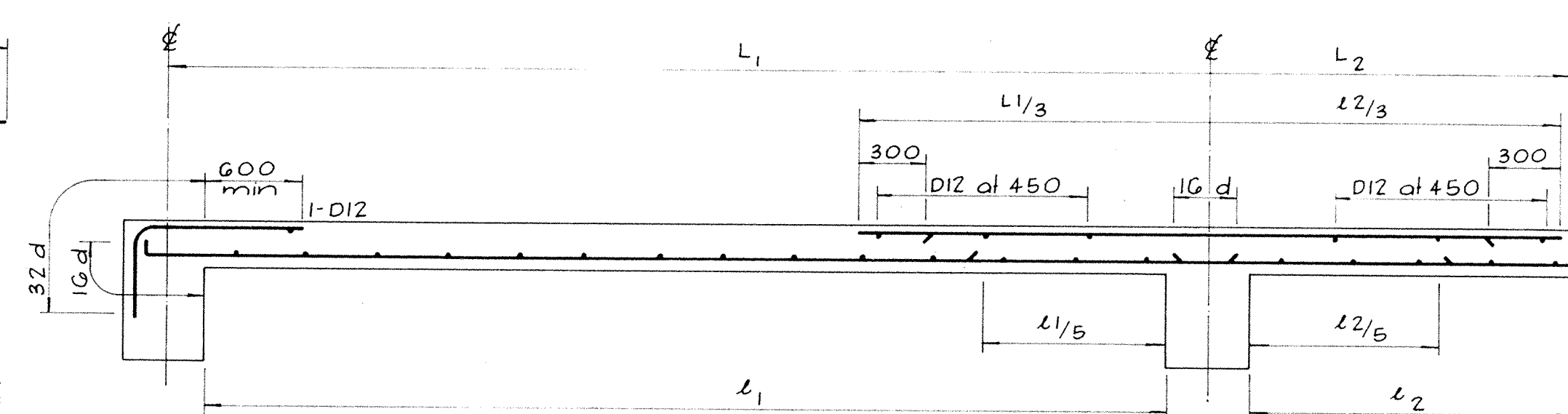


RECTANGULAR SPIRAL LAPS

BAR SIZE	$\ell_c$	$\ell_t$	$\ell_a(\text{min})$
D 16	550	750	550
D 20	800	1000	800
D 24	1000	1200	1000
D 28	1300	1400	1300
D 32	1600	1700	1600

TABLE 7

SUSPENDED SLAB



MINIMUM RADIUS OF BENDS OTHER THAN STIRRUPS & TIES					
BAR SIZE					R
D10	D12	D16	D20	D24	3D
D28	D32				4D

TABLE 3

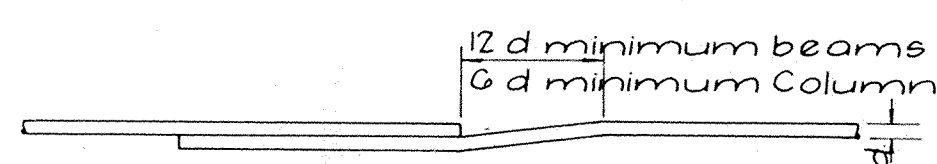
LAP WELDING OF BARS		
BAR DIAMETER	MINIMUM WELD SIZE	MINIMUM WELD LENGTH
D 10	5	100
D 12	5	100
D 16	5	125
D 20	6	125
D 24	8	150
D 28	8	175
D 32	10	175

TABLE 4

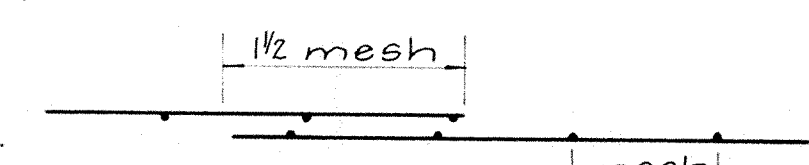
STIRRUP & TIE ANCHORAGES

Note: Radii of bends (inside face) equal to radius of enclosed bar but not less than d except for ties larger than R20 the minimum radius shall be 2d.

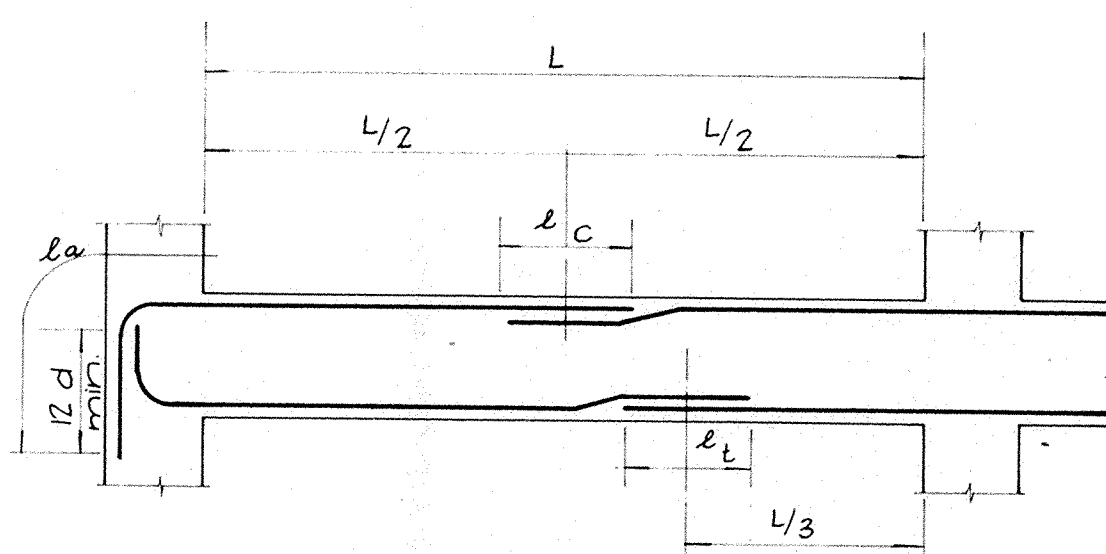
CRANKING OF BARS



LAPPING OF HRC MESH



TYPICAL BEAM REINF LAYOUT



MINIMUM REINFORCEMENT COVERS (NZS 3101P TABLE 2)

MEMBER	BELOW GROUND LEVEL		ABOVE GROUND LEVEL		
	Against natural ground	Against approved boxing & backfill or similar construction.	Exposed to weather and unplastered	Exposed to weather and plastered	Not exposed to weather
Foundations	75	50	-	-	-
Beams & Columns	75	50	50	40	40
a Principal Reinf b Secondary Reinf (stirrups etc.)	60	40	40	25	25
Slabs	50	30	30	20	20
Walls	50	40	40	25	25

Notes:  
1. Cover to be increased by 12 where D20 bars or larger are used.  
2. Above covers to be used unless otherwise shown on drawings.

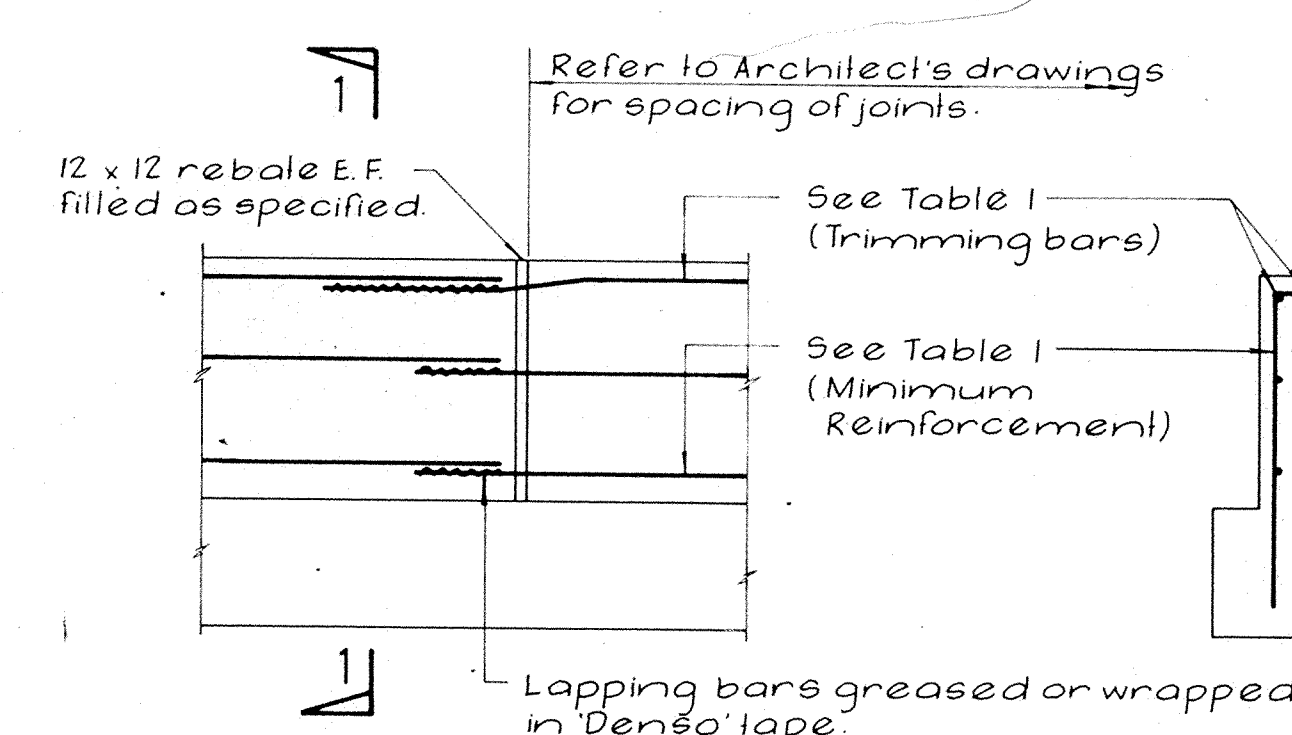
TABLE 2

ABBREVIATIONS

R	Plain round mild steel reinforcement (dia in mm) eg. R10 at 150	L.F.	Laid first
HR	Plain round high yield reinforcement (dia in mm) eg. HR12 at 100	L.L.	Laid last
D	Deformed mild steel reinforcement (dia in mm) eg. D20 at 225	T.	Top
HD	Deformed high yield reinforcement (dia in mm) eg. HD20 at 300 at 150 At 150 centres D12 at 150	B.	Bottom
sps	Stirrups	H.	Horizontal
sp.	Spiral	V.	Vertical
I.F.	Inside Face	C.T.	Confinement tie
O.F.	Outside Face	N.C.T.	Non-Confinement tie
N.F.	Near Face	J.T.	Joint-tie
F.F.	Far Face	N.T.S.	Not to Scale
E.F.	Each Face		
E.W.	Each Way		
c.j.	Construction Joint		
d.	diameter		

3 Denotes Section 3 detailed on same drawing.

2/5 Denotes Section 2 detailed on drawing N° 5.



PARAPET CRACK CONTROL JOINT

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

These notes and details shall apply unless otherwise specified or detailed on the drawings, but inclusion of this sheet in the Contract Set does not imply that all details shown occur in this contract.

1	WCC, KW, HE&P, WMC, Record	8-1-80
4	Unit Construction	8-1-80
1	Contract set	6-11-79
2	WCC	31-10-79

ARCHITECT  
KEITH WILSON

IAN C. SMITH  
CONSULTANTS  
CIVIL STRUCTURAL  
AND EARTHQUAKE  
ENGINEERS

BRAEMAR  
32 THE TERRACE  
PH. 739-175  
WELLINGTON, NZ

JOB TITLE  
WELLINGTON WORKINGMENS  
CLUB & LITERARY INSTITUTE  
STRENGTHENING AND  
UPGRADING CUBA ST PREMISES

DWG TITLE

STANDARD DETAILS -  
SHEET 1

DRAWN PW/AK

CHECKED

APP'D

DATE Oct 1979

SCALES

N.T.S.

DWG NO

1004 / E1



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



2	WCC	31.10.79
COPIES	ISSUED TO	DATE

ARCHITECT:  
KEITH WILSON

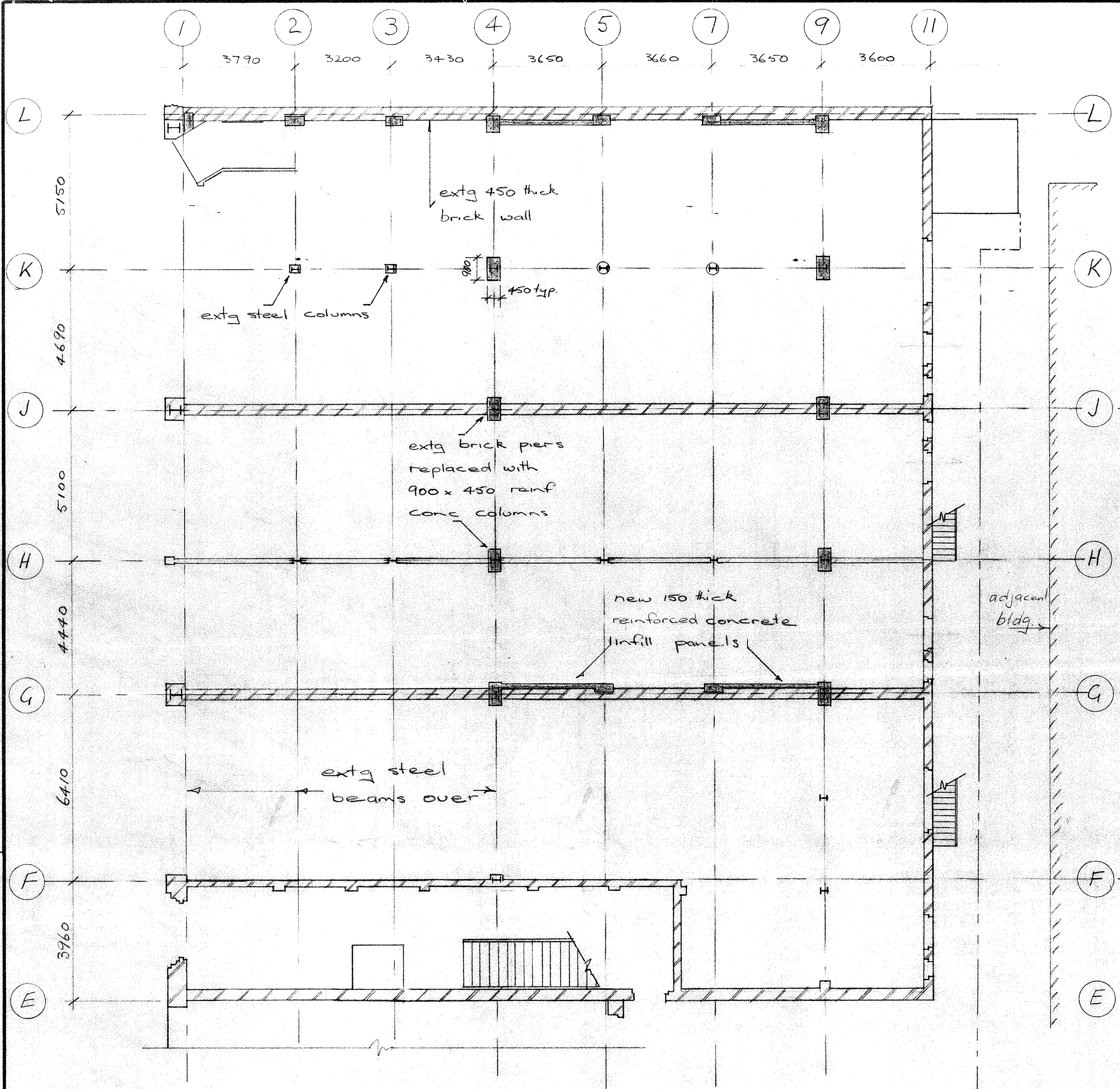
IAN C SMITH  
CONSULTANTS

CIVIL STRUCTURAL AND  
EARTHQUAKE ENGINEERS  
BRAEMAR  
32 THE TERRACE WELLINGTON.

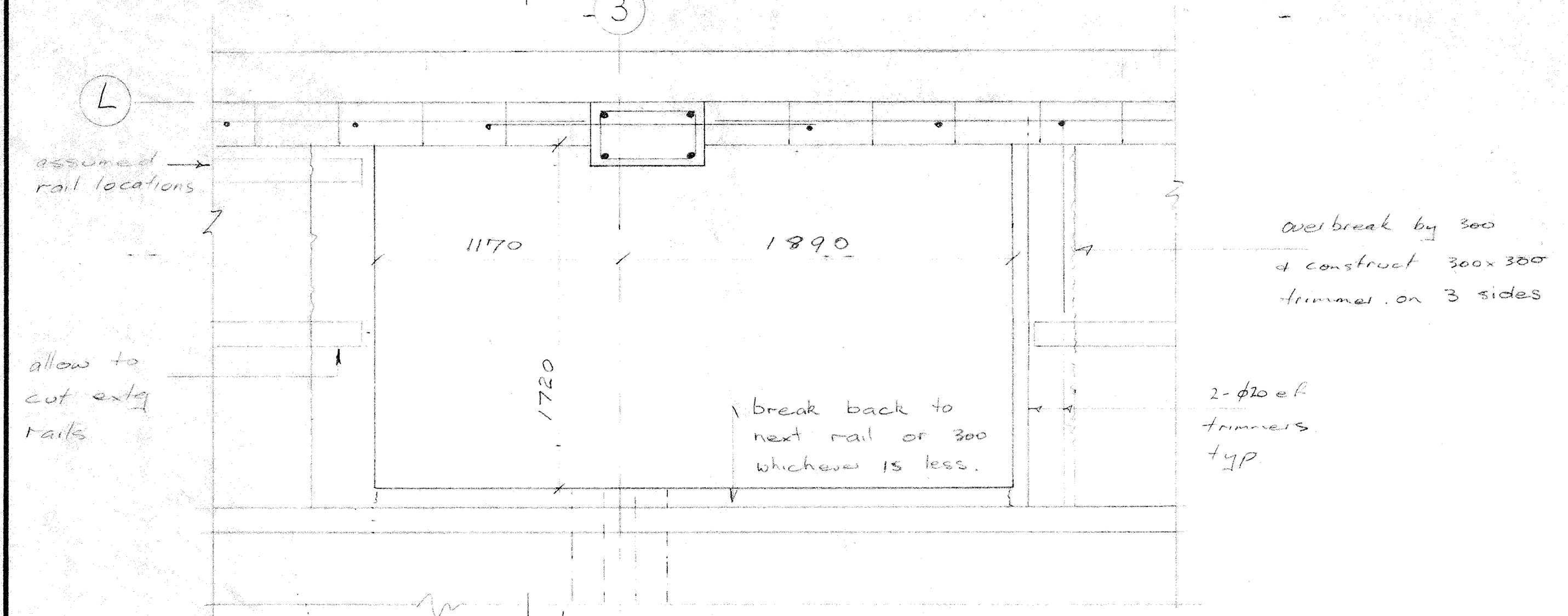
JOB TITLE  
WELLINGTON WORKINGMENS  
CLUB AND LITERARY INSTITUTE  
STRENGTHENING AND UPGRADING  
CUBA ST PREMISES

DWG TITLE  
PLANS  
LEVELS G & I

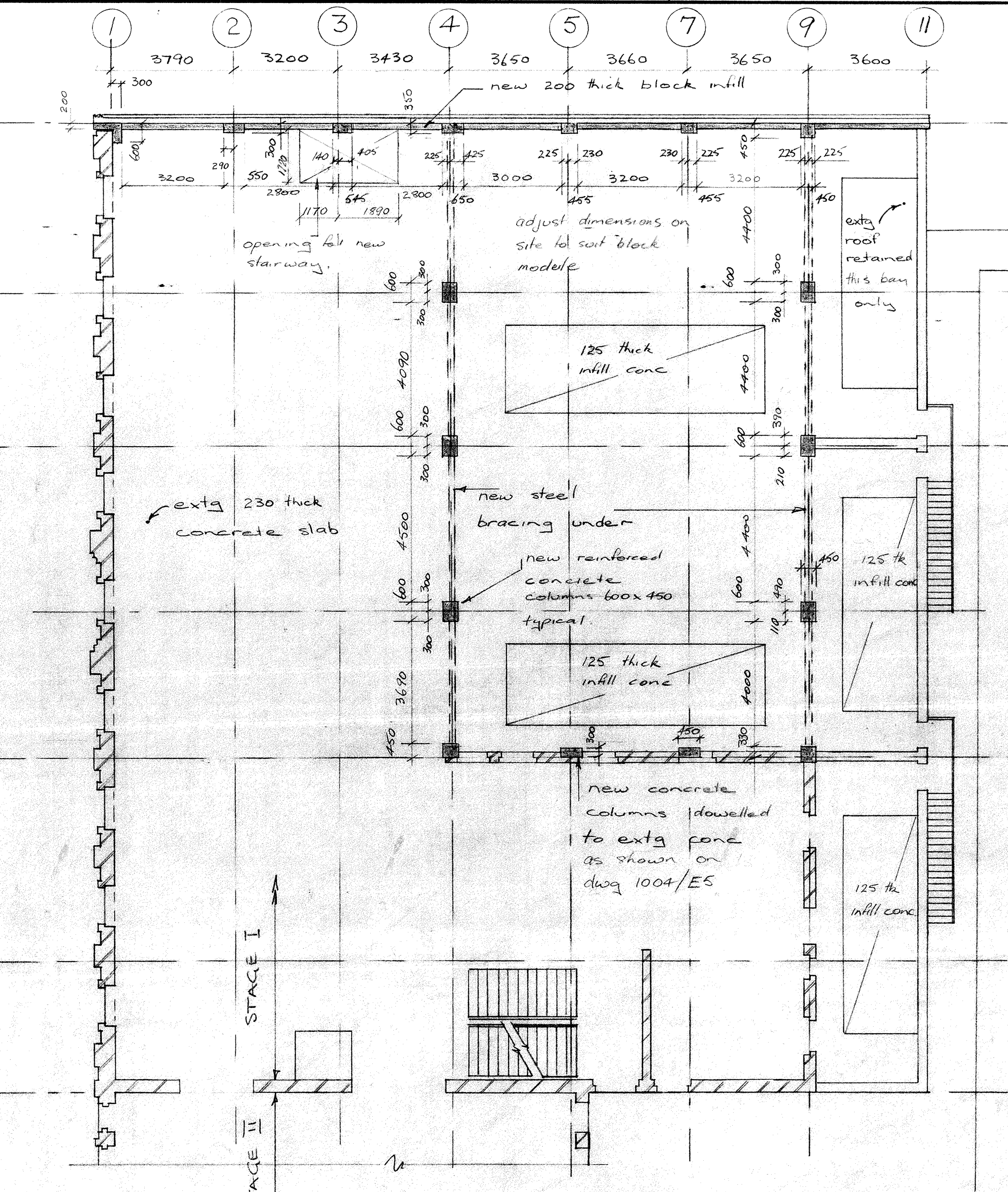
DRAWN ICS.	SCALES
CHECKED	1:100
APP'D	DWG NR
DATE Oct 79	1004 / E2



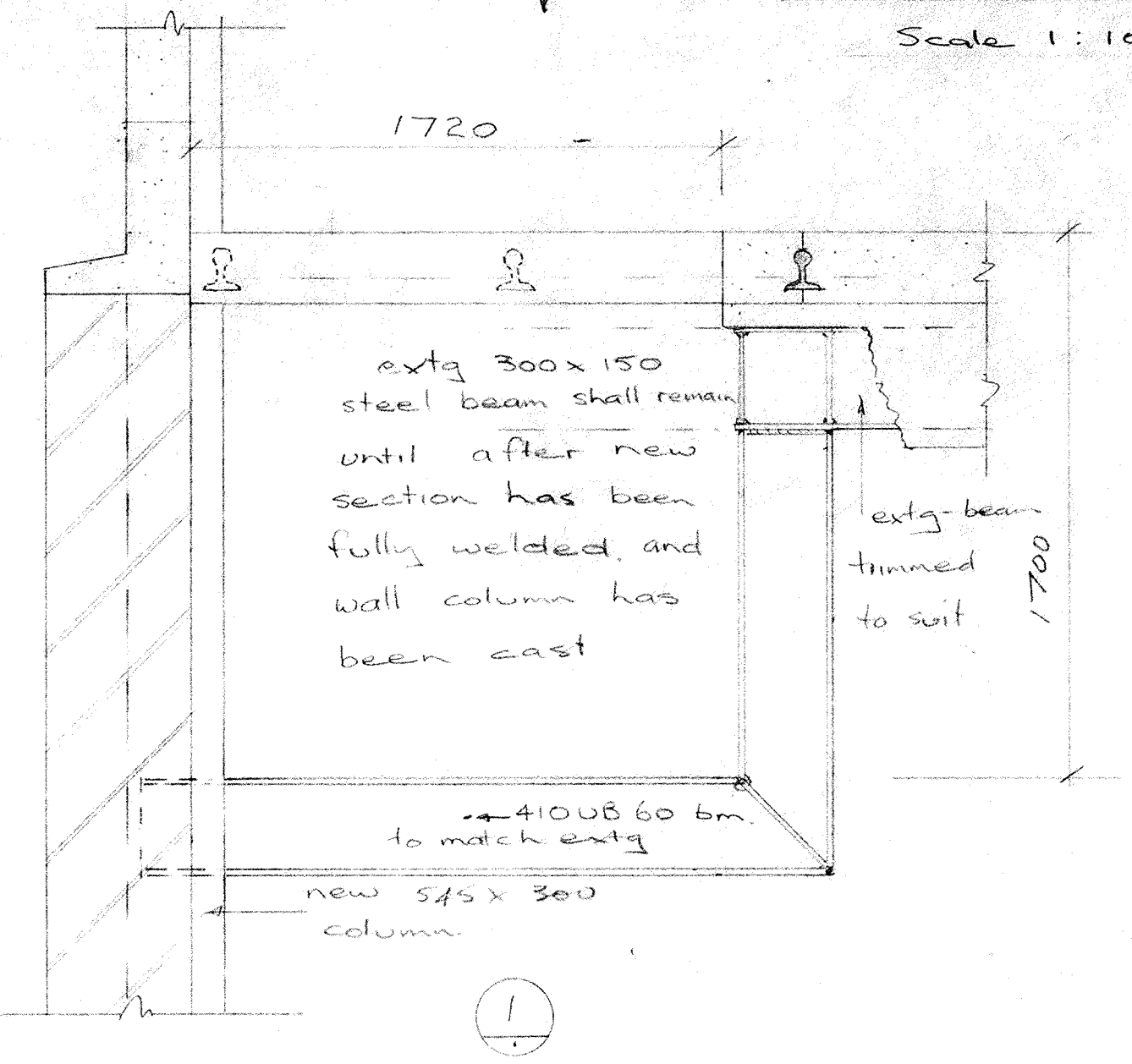
PLAN LEVEL G  
Scale 1:100



PLAN AT STAIR OPENING



PLAN LEVEL I  
Scale 1:100



### SUGGESTED SEQUENCE

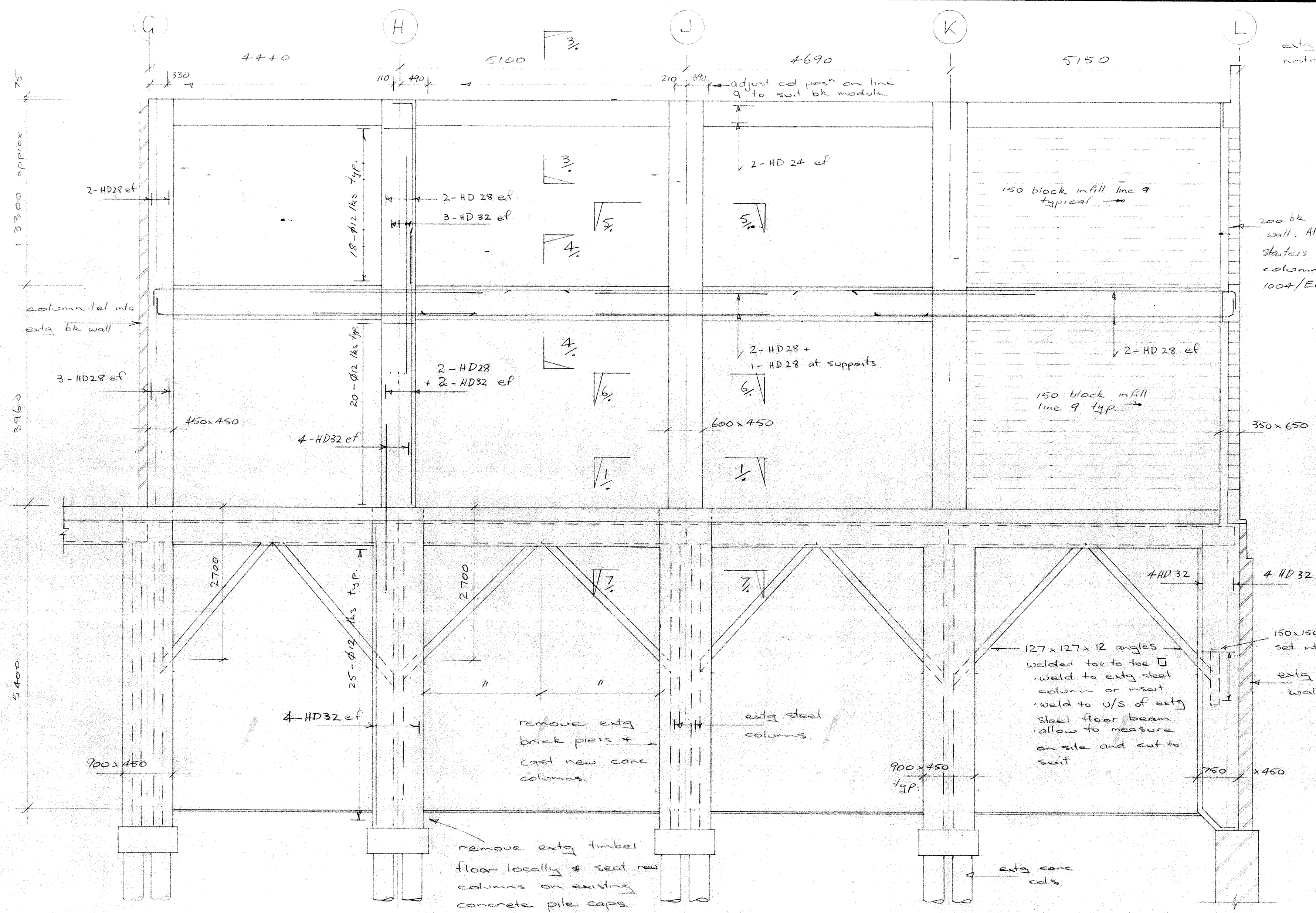
It is assumed that wall beam and block wall on line L will proceed ahead of work on the stair

1. Break out concrete for opening leaving steel rails & extg steel beams intact.
2. Depending on position of rails overbreak by up to 300 in each direction.
3. Providing temporary hangers to the end of extg 300 x 150 bm have been embedded in new conc wall bm proceed to saw cut brick wall for column & remove 200 depth approximately.
4. Measure & fabricate new 300 x 150 bent steel section & erect in position under extg bm. Weld at junction with extg steel bm & fit gussets.
5. Preload projecting end of steel bm by means of Acro process or similar and cast end of beam into concrete column.
6. Cut away section of extg steel bm.





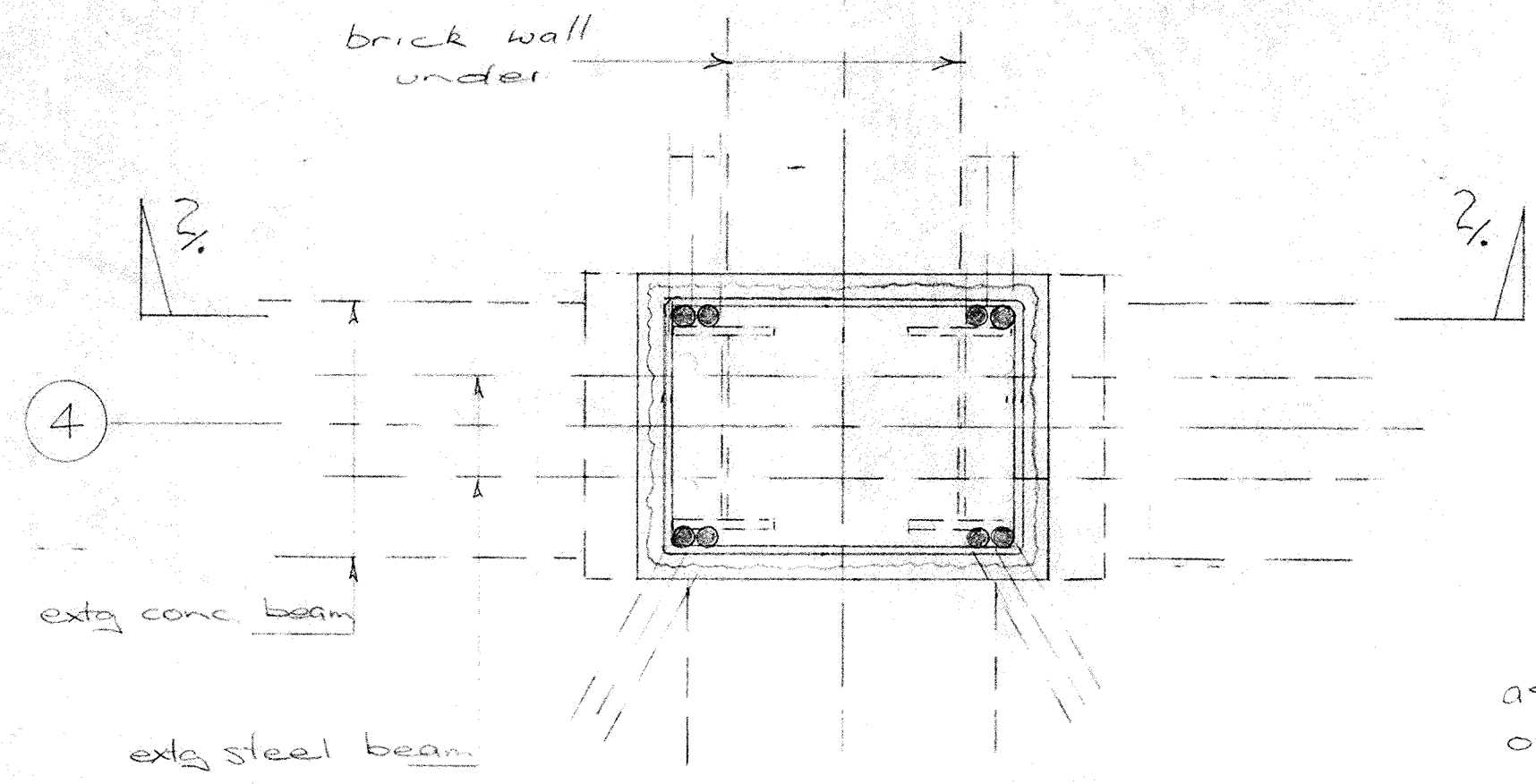




FRAME ON LINE 4.

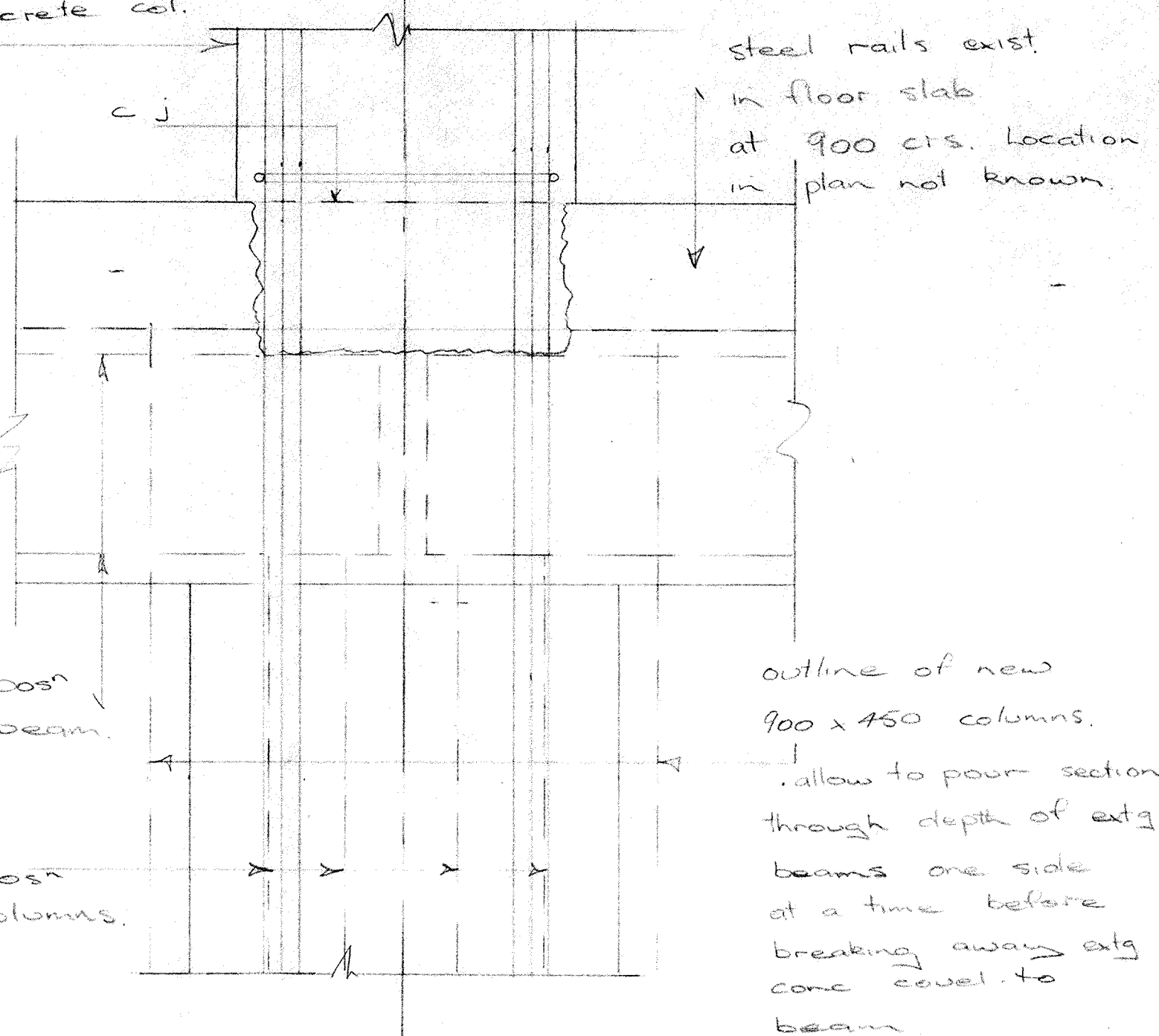
frame on line 9 similar.

new concrete col.

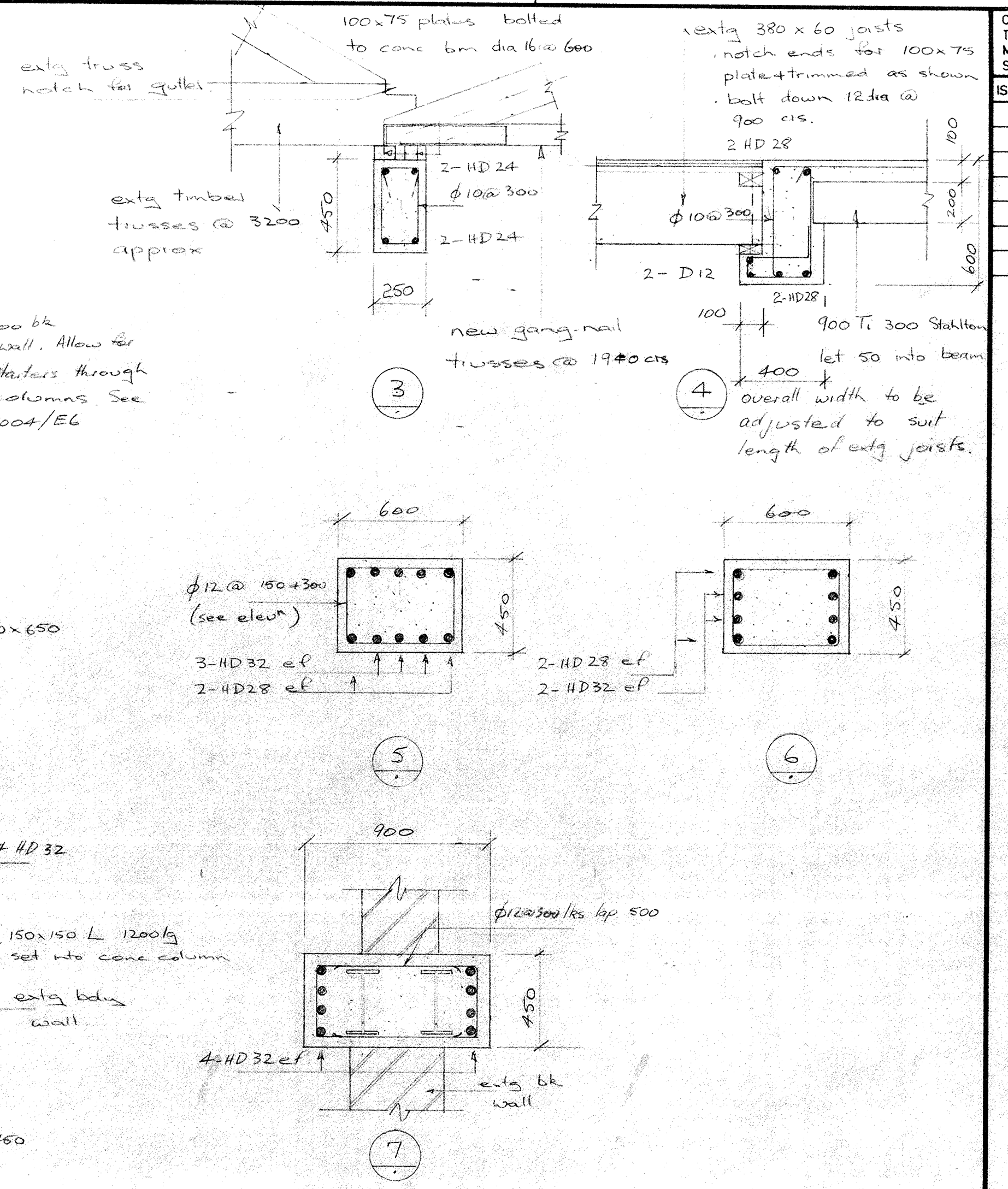


assumed pos of steel beam.

assumed pos of steel columns.



outline of new 900x450 columns. allow to pour section through depth of extg beams one side at a time before breaking away extg concrete to beam



## SUGGESTED SEQUENCE

To enable column construction to start above level 1 before breaking out existing brick piers in the retail tenancy's below the following sequence is suggested -

1. Remove temporary roof locally & break into 225 slab & locate extg floor beams & steel rails
2. Break out to 550 x 400 for column to level of top of extg steel floor beam as shown
3. If extg steel beam is discontinuous allow to weld top flange plate 130 x 12 lapping 100 mm onto each end of beams and weld all round 10 mm fillet.
4. Position 32 dia starters 3500 lg bent to avoid extg walls & pier below as shown.
5. Cast concrete to slab surface level and proceed to construct columns & beams over
6. Reinstate temporary roof by flashing against new concrete columns.

NOTE During operations 1 to 6 allow to cover exposed areas by tarpaulin or similar when left overnight or during wet weather.

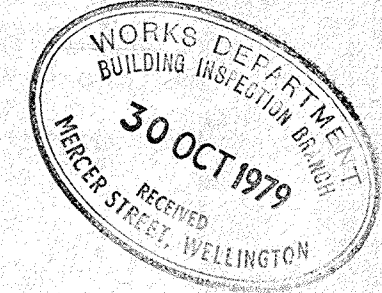
7. Remove extg brick piers in sequence and cast new 900x450 concrete columns with connecting steel angle braces in stages to suit ground floor tenancy layouts. For welding of steel braces extg concrete cover to beams may be broken out locally only.
8. Allow to dry pack top 100 of ground floor c/s.

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. Frame on line 9 similar. Allow to infill with 150 nominal thickness reinforced block wall. Provide kickers to heights to suit block courses as wall on line 9.
2. Provide 12 mm gap at side & top of block infill panels on line 9 only. Allow to seal with Thoflex 600 or similar.
3. Windows to details provided on Arch's dsgs.
4. Allow to remove extg timber floor under column G4 & excavate to expose extg concrete piles. Break into typical pile to determine reinf content. Allow to reinstate.



2	WCC	31/10/99
COPIES	ISSUED TO	DATE

ARCHITECT

KEITH WILSON

IAN C SMITH  
CONSULTANTS

CIVIL STRUCTURAL AND  
EARTHQUAKE ENGINEERS  
BRAEMAR  
32 THE TERRACE WELLINGTON

JOB TITLE  
WELLINGTON WORKINGMENS  
CLUB AND LITERARY INSTITUTE  
STRENGTHENING AND UPGRADING  
CUBA ST PREMISES

DWG TITLE  
FRAME LINE 4  
ELEVATION & DETAILS.

DRAWN	ICS	SCALES	1:50, 20, 10
CHECKED			
APP'D		DWG NR	1004/E4
DATE	OCT 99		

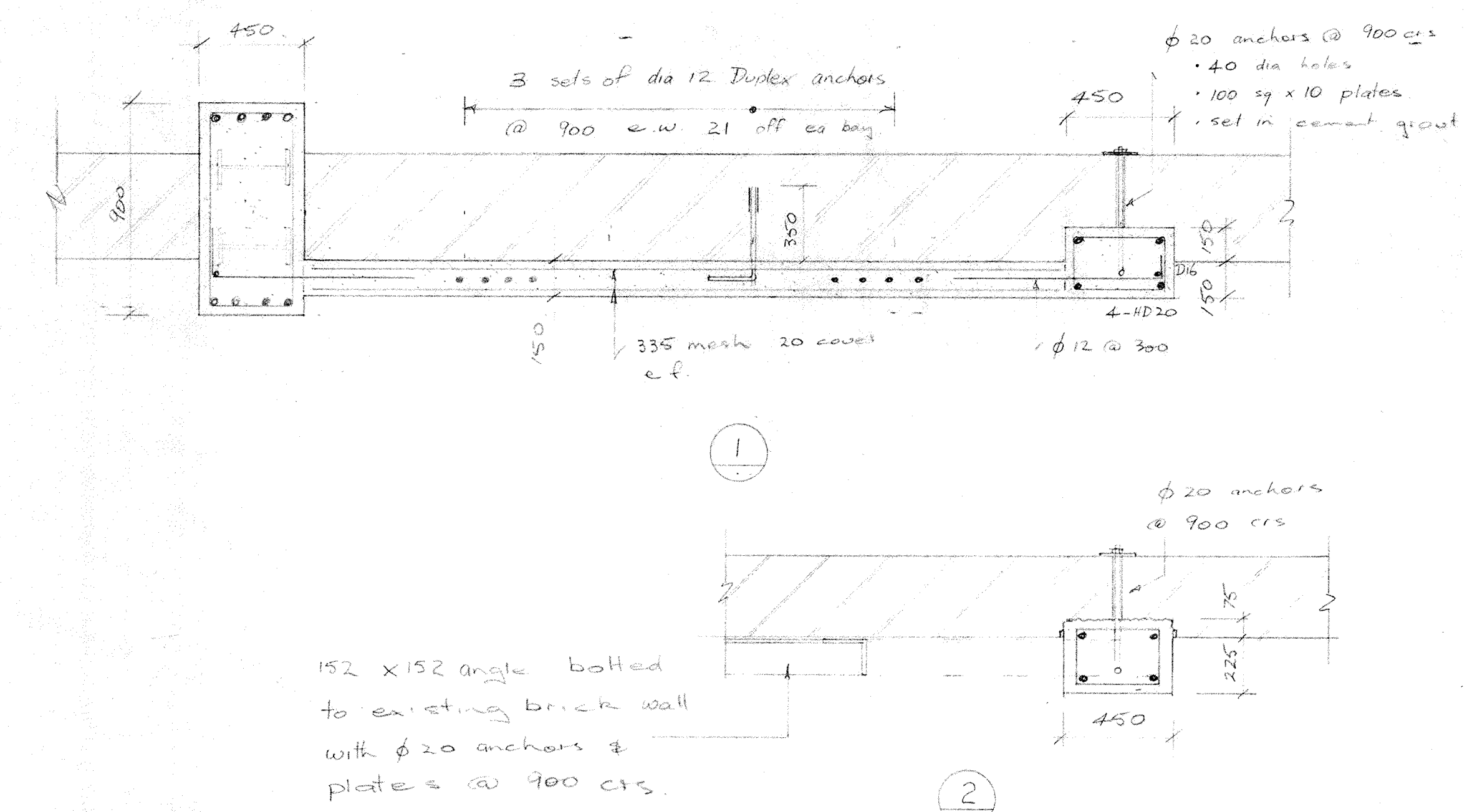
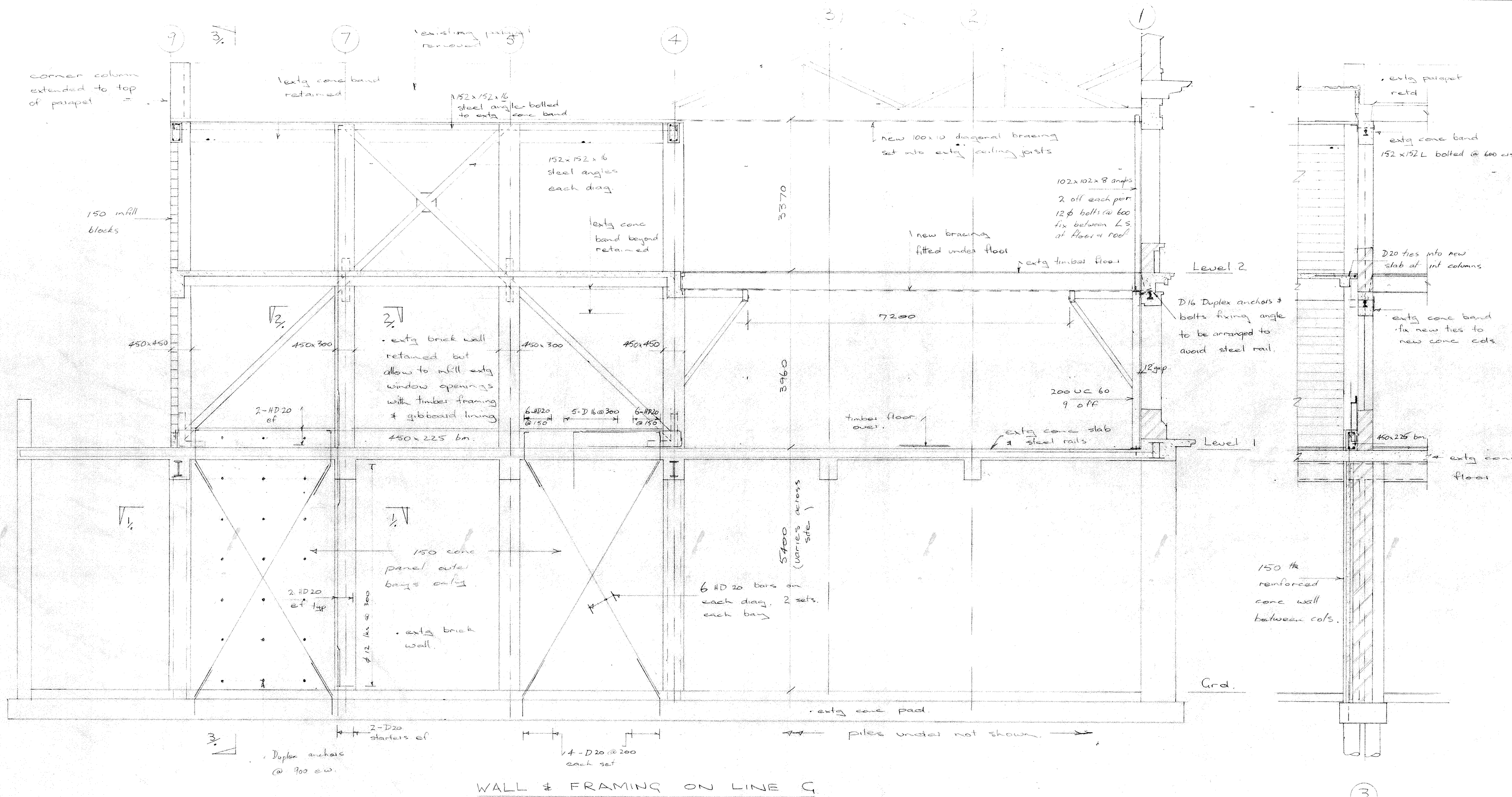


CONTRACTORS MUST VERIFY ALL DIMENSIONS AT THE JOB BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED BEFORE MANUFACTURE.

ISSUE	AMENDMENT	BY	DATE

#### NOTES

- Saw cut extg brick walls to 25 depth before breaking out for new concrete columns.



#### SUGGESTED SEQUENCE

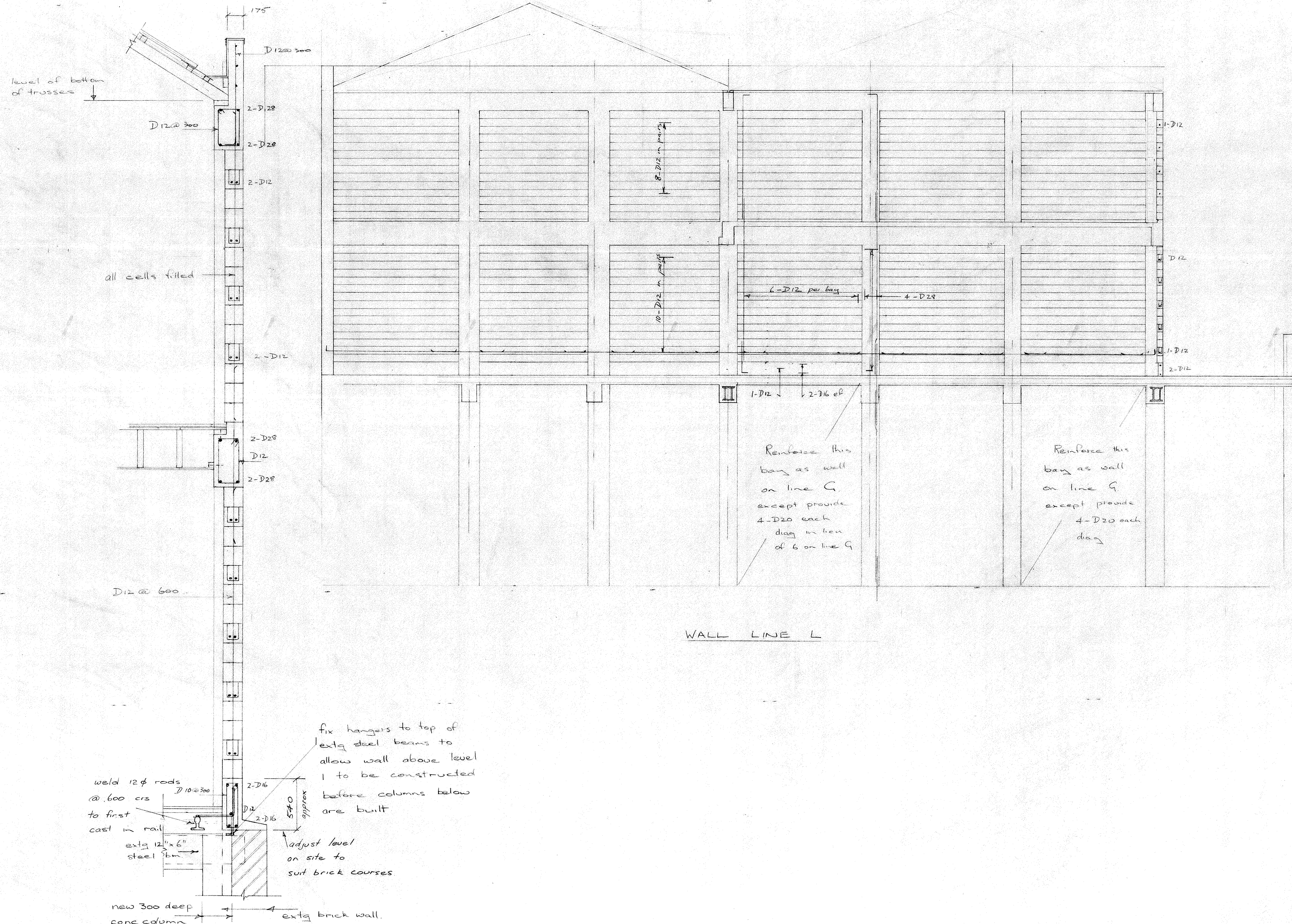
- Drill & place #20 & D16 starters through extg 225 slab at level 1.
- Saw cut vertically for columns above level 1 and break away extg brick to 75 mm depth.
- Fabricate steel angle braces & bolt to extg wall above level 1.
- Construct columns and superstructure above level 1.
- Enter ground floor tenancies in stages as arranged with tenants & build columns ground to 0/s level 1.
- Fit duplex anchors and rent. & spray on concrete mill panels between lines 7#5 and 7#9.

ARCHITECT	KEITH WILSON
IAN C SMITH	CONSULTANTS
CIVIL STRUCTURAL AND EARTHQUAKE ENGINEERS	BRAEMAR
32 THE TERRACE	WELLINGTON
JOB TITLE	WELLINGTON WORKINGMENS CLUB AND LITERARY INSTITUTE STRENGTHENING AND UPGRADING CUBA ST PREMISES
DWG TITLE	WALL & FRAME LINE C
DRAWN	ICS
CHECKED	
APP'D	
DATE	OCT 79
SCALES	1:50, 20
DWG NO	1004/E5



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



2	WCC	31/10/79
COPIES	ISSUED TO	DATE

ARCHITECT  
KEITH WILSON

IAN C SMITH  
CONSULTANTS

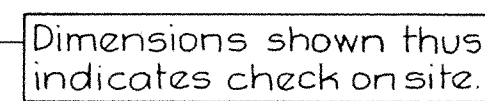
CIVIL STRUCTURAL AND  
EARTHQUAKE ENGINEERS  
BRAEMAR  
32 THE TERRACE WELLINGTON

JOB TITLE  
WELLINGTON WORKINGMENS  
CLUB AND LITERARY INSTITUTE  
STRENGTHENING AND UPGRADING  
CUBA ST PREMISES

DWG TITLE  
WALL LINE L  
ELEVATION & DETAILS

DRAWN ICS	SCALES 1:50, 1:20
CHECKED	
APP'D	DWG NO 1004/E6
DATE Oct 79	





NOTES:-

1: Preload new 310 U.B.4G stair trim to take up 10 mm deflection either end, to Engineers instructions.

2: All welds to be 6mm fillet welds unless noted otherwise.

3. This is a redraw of E2 which drawing is hereby superseded.

1.	WCC, KW, HE & P, Record, WMC	8/1/80
4	Unit. Construction	8/1/80
1.	Unit. Constr. Prelim. Copy	10/12/79
COPIES	ISSUED TO	DATE

ARCHITECT  
KEITH WILSON

**IAN C. SMITH  
CONSULTANTS  
CIVIL STRUCTURAL  
AND EARTHQUAKE  
ENGINEERS**

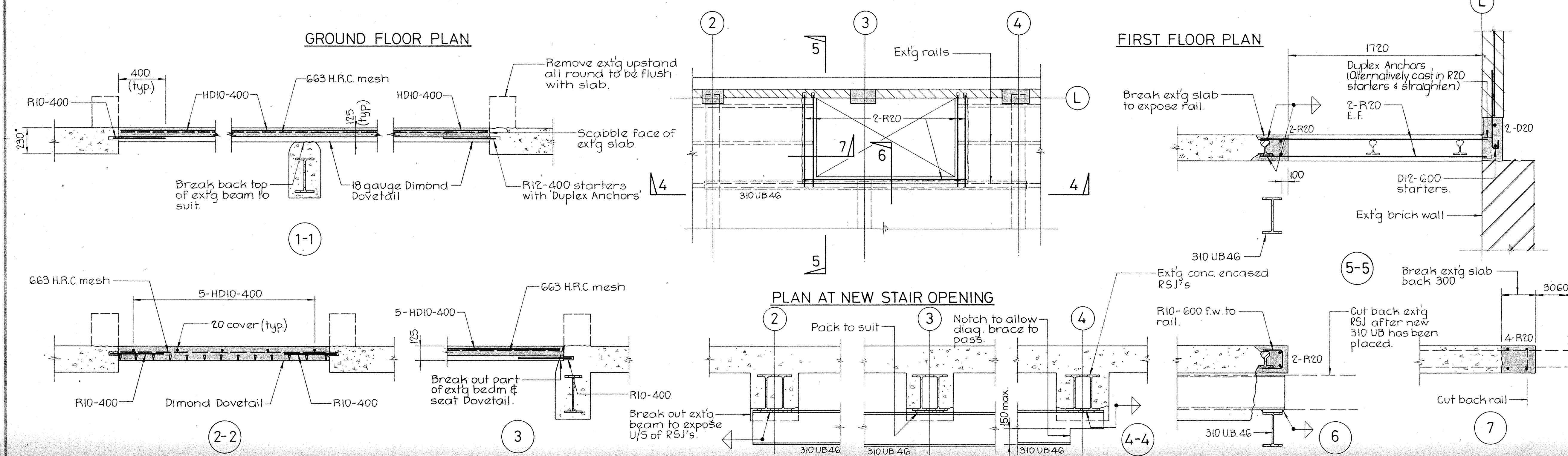
**BRAEMAR**  
32 THE TERRACE  
PH. 739-175  
WELLINGTON N.Z.

**JOB TITLE**  
WELLINGTON WORKINGMENS  
CLUB & LITERARY INSTITUTE  
STRENGTHENING AND  
UPGRADING CUBA ST. PREMISES

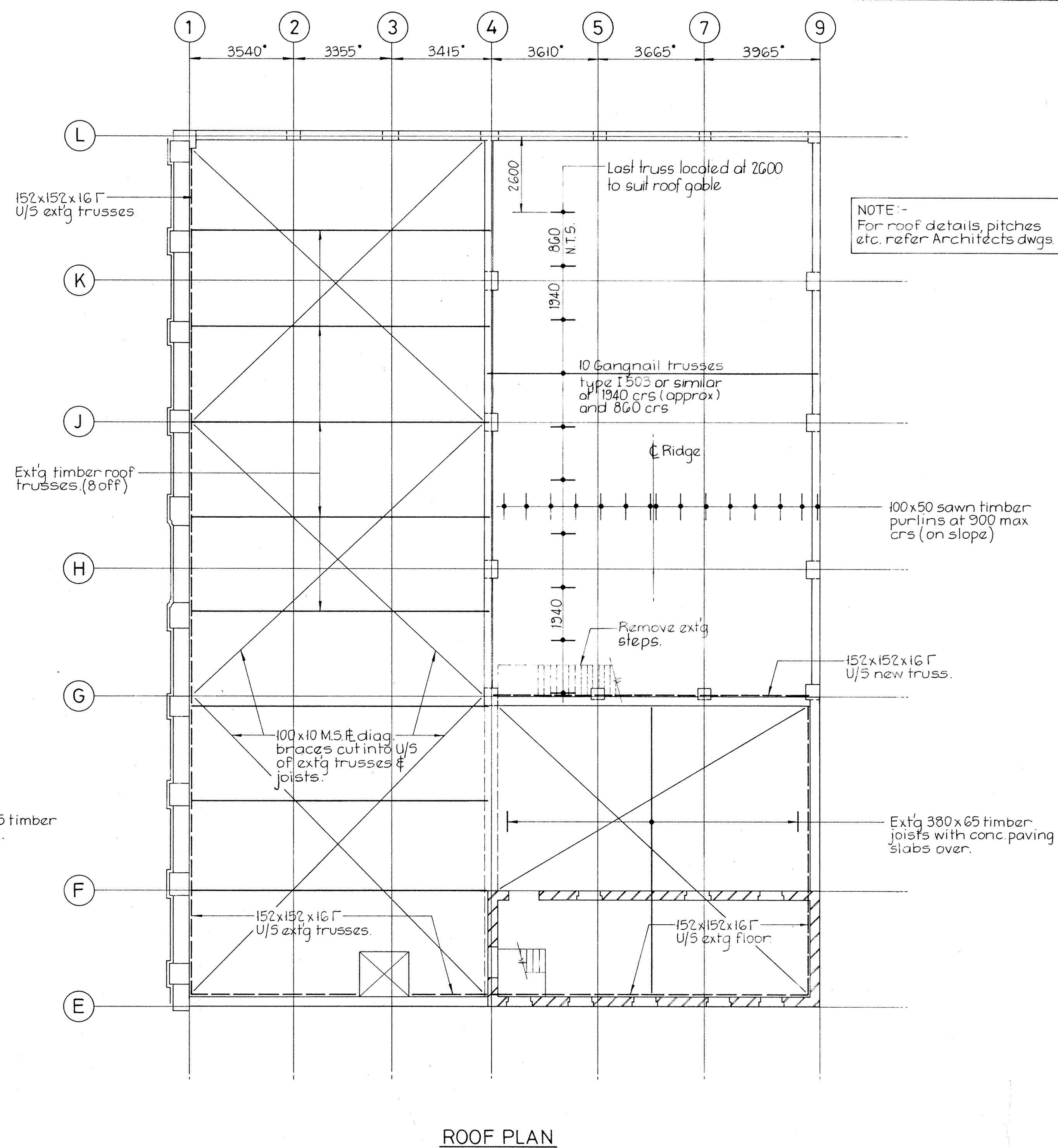
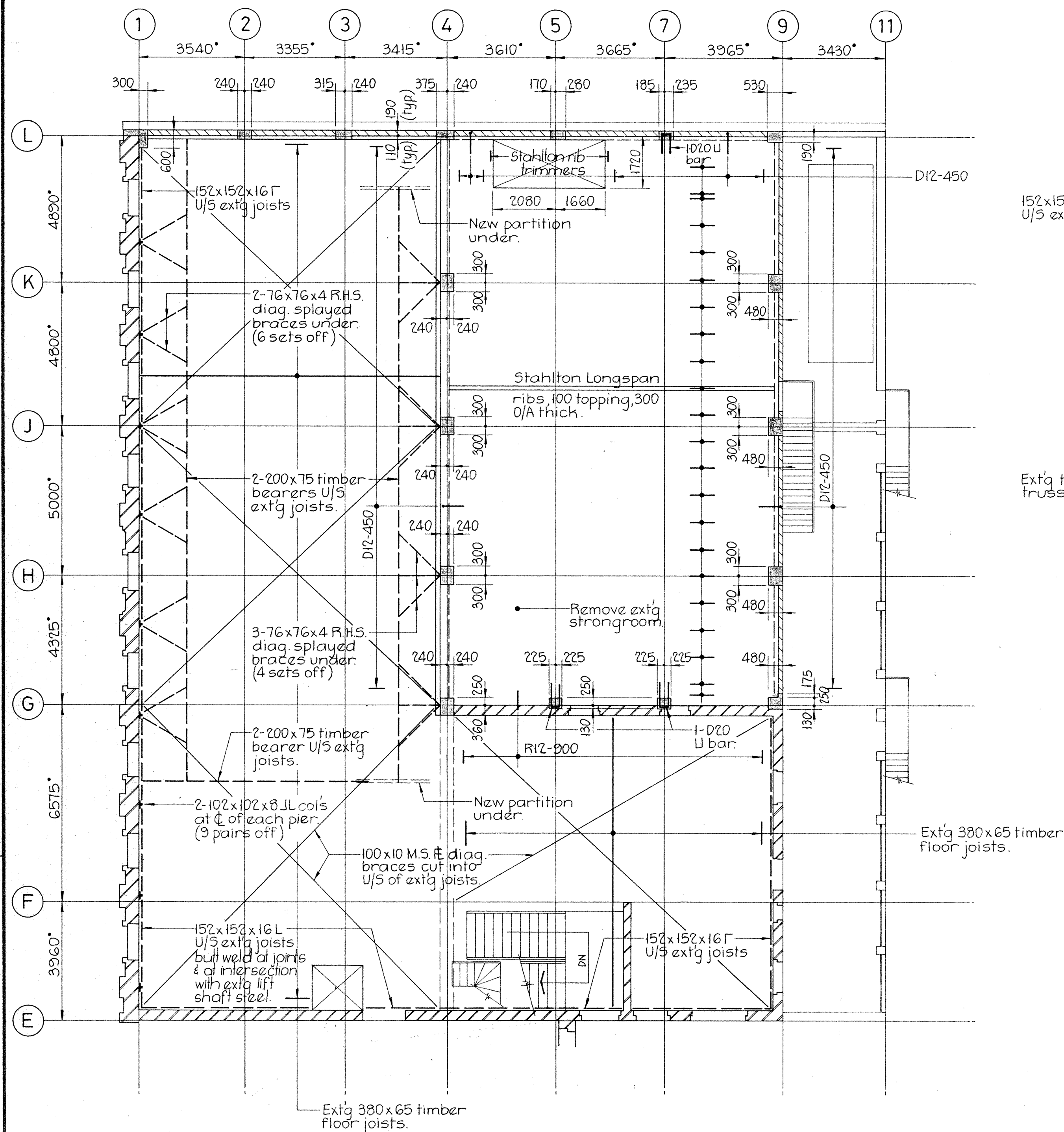
DWG TITLE

GROUND & FIRST FLOOR  
PLANS & SECTIONS

DRAWN	D.J.H.	SCALES 1:100, 1:50, 1:20 DWG NO 1004 / E7.A
CHECKED	<i>[Signature]</i>	
APP'D	<i>[Signature]</i>	
DATE	DEC 1979	







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
A	Dimensional check	I.C.S.	10/10/80

#### NOTES

1. This is a redraw of E3 which drawing is hereby superseded.
2. Level 2 Floor has been detailed to suit Stahlton Longspan flooring but alternatives may be accepted.
3. Floor design criteria
  - min. fire rating shall be 2 hrs.
  - floor loads shall be dead  $\pm 3.3 \text{ kPa}$  Live  $4.3 \text{ kPa}$
4. Roof truss capacity required:
  - dead load plus live load =  $1400 \text{ N/m}$ .

1.	WCC, KW, HE & P, WMC, Record	8/11/80
4.	Unit Construction.	8/11/80
1.	Unit Constr. Prelim. Copy	10/12/79
COPIES	ISSUED TO	DATE

ARCHITECT  
KEITH WILSON

**IAN C. SMITH**  
**CONSULTANTS**  
**CIVIL STRUCTURAL**  
**AND EARTHQUAKE**  
**ENGINEERS**

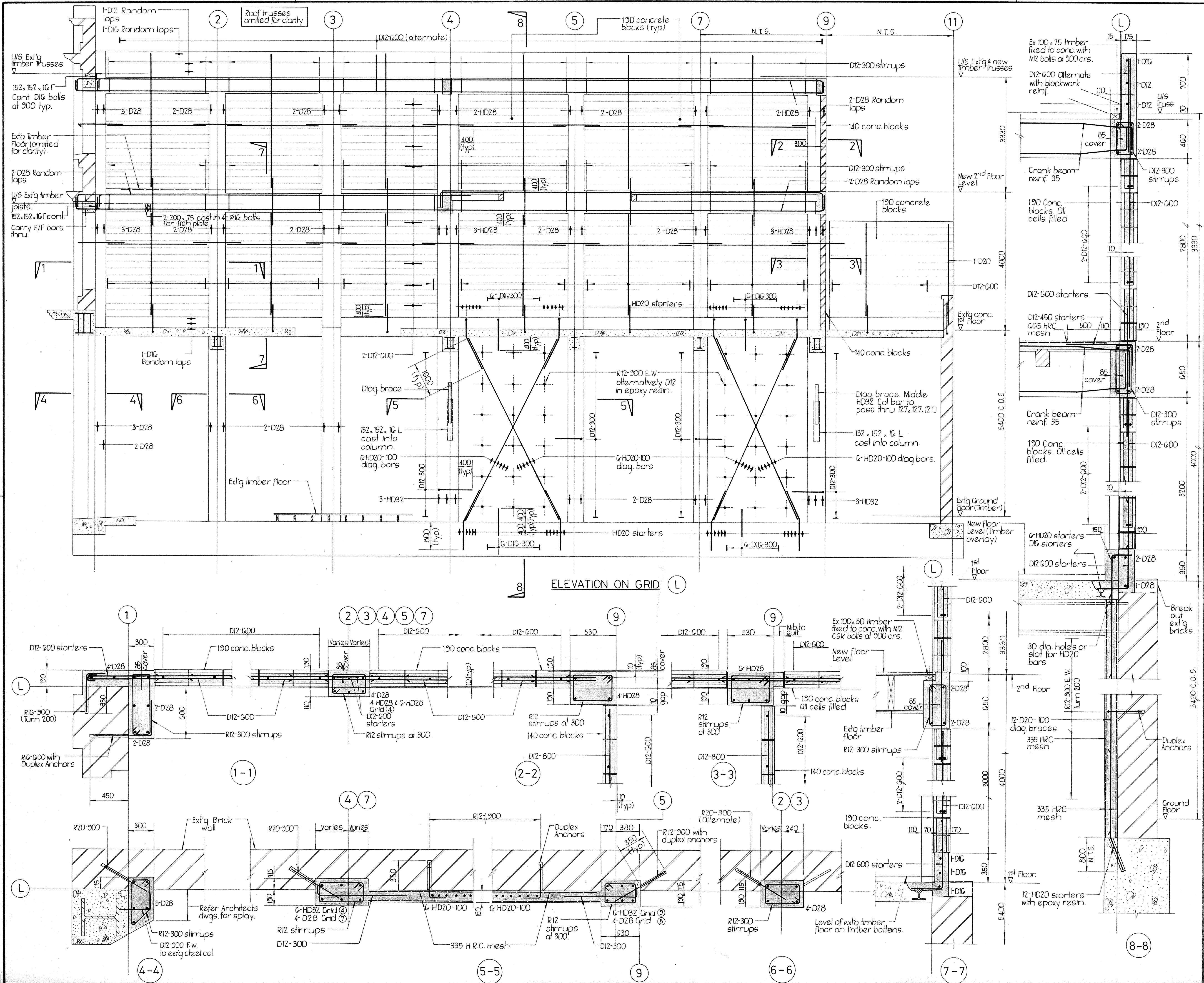
BRAEMAR  
32 THE TERRACE  
PH. 739-175  
WELLINGTON, N.Z.

JOB TITLE  
WELLINGTON WORKINGMENS  
CLUB & LITERARY INSTITUTE  
STRENGTHENING AND  
UPGRADING CUBA ST PREMISES

DWG TITLE  
SECOND & ROOF FLOOR  
PLANS & STRUCTURAL  
STEEL DETAILS

DRAWN D.J.H.	SCALES
CHECKED <i>[Signature]</i>	1:100
APP'D <i>[Signature]</i>	DWG NO.
DATE DEC 1979	1004/E8 A





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
A	Dimensional check	ICS	Jan 80

**NOTES**

- All covers to main reinforcement in columns & beams to be 50mm unless noted otherwise.
- All welds 6mm fillet welds unless otherwise noted.
- This dwg supersedes dwg. EG.
- All drilled & dowelled rods to be fitted with Duplex Anchors. Alternatively use D bars & set in epoxy resin to Manufacturers specification.

NO.	DESCRIPTION	DATE
1.	WCC, K.W. HE&P, WMC, Record	8/1/80
4.	Unit Construction	8/1/80
1.	Unit Constr. Prelim. Copy	10/12/79

**COPIES ISSUED TO**

**ARCHITECT**  
KEITH WILSON

**IAN C. SMITH CONSULTANTS**  
CIVIL STRUCTURAL AND EARTHQUAKE ENGINEERS

**BRAEMAR**  
32 THE TERRACE  
PH. 739-175  
WELLINGTON N.Z.

**JOB TITLE**  
WELLINGTON WORKMENS CLUB & LITERARY INSTITUTE STRENGTHENING AND UPGRADING CUBA ST. PREMISES.

**DWG TITLE**  
WALL ELEVATION ON GRID L & SECTIONS

DRAWN	SCALE
D.J.H.	1:50 & 1:20

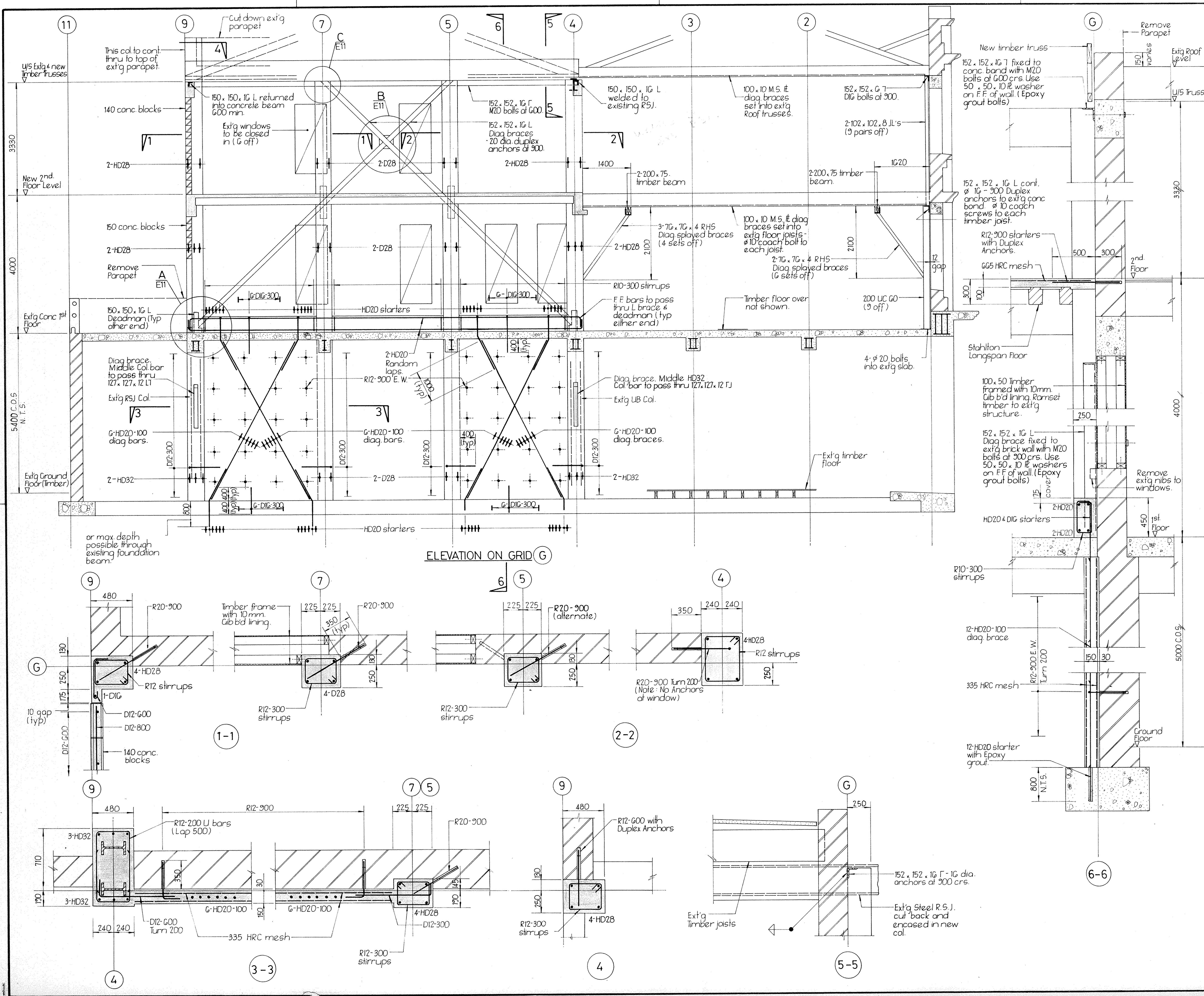
**CHECKED** [Signature]

**APP'D** [Signature]

**DATE** DEC. 1979

**DWG NO**  
1004/E9A





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
A	Dimensional check	I.C.S.	Jan 80

**NOTES**

- All cover to main reinf. in Cols & beams to be 50mm. unless noted otherwise.
- This is a redraw of E5 which dwg is hereby superseded.
- Duplex anchors may be substituted by epoxy bonded anchors of equivalent capacity.

1.	WCC, KW, HE & P. WMC, Record	8/1/80
4.	Unit Construction.	8/1/80
1.	Unit Constr. Prelim. Copy	10/12/79
COPIES	ISSUED TO	DATE

**ARCHITECT**  
KEITH WILSON

**IAN C. SMITH  
CONSULTANTS  
CIVIL STRUCTURAL  
AND EARTHQUAKE  
ENGINEERS**

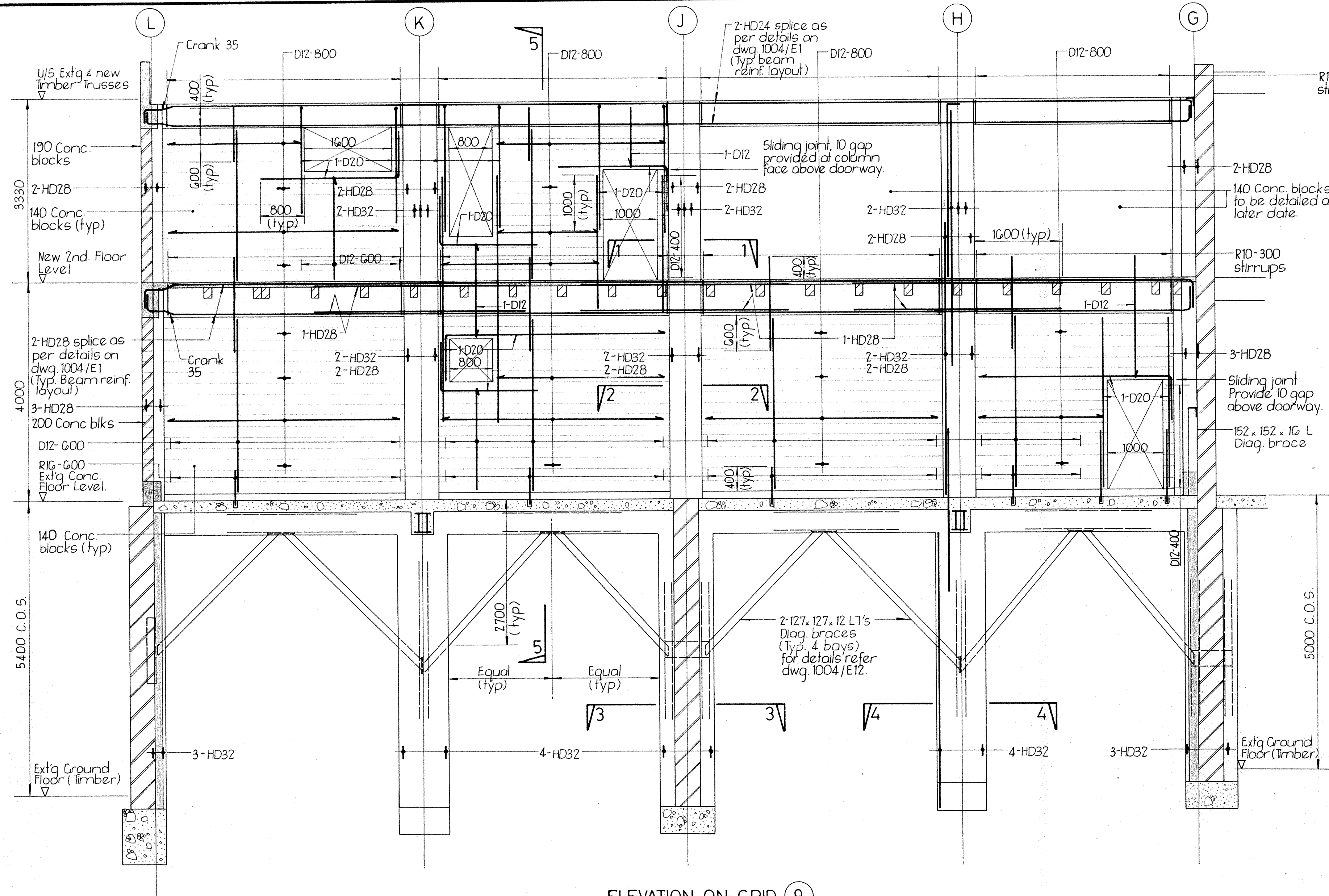
BRAEMAR  
32 THE TERRACE  
PH. 739-175  
WELLINGTON N.Z.

**JOB TITLE**  
WELLINGTON WORKINGMENS  
CLUB & LITERARY INSTITUTE  
STRENGTHENING AND  
UPGRADING CUBA ST PREMISES

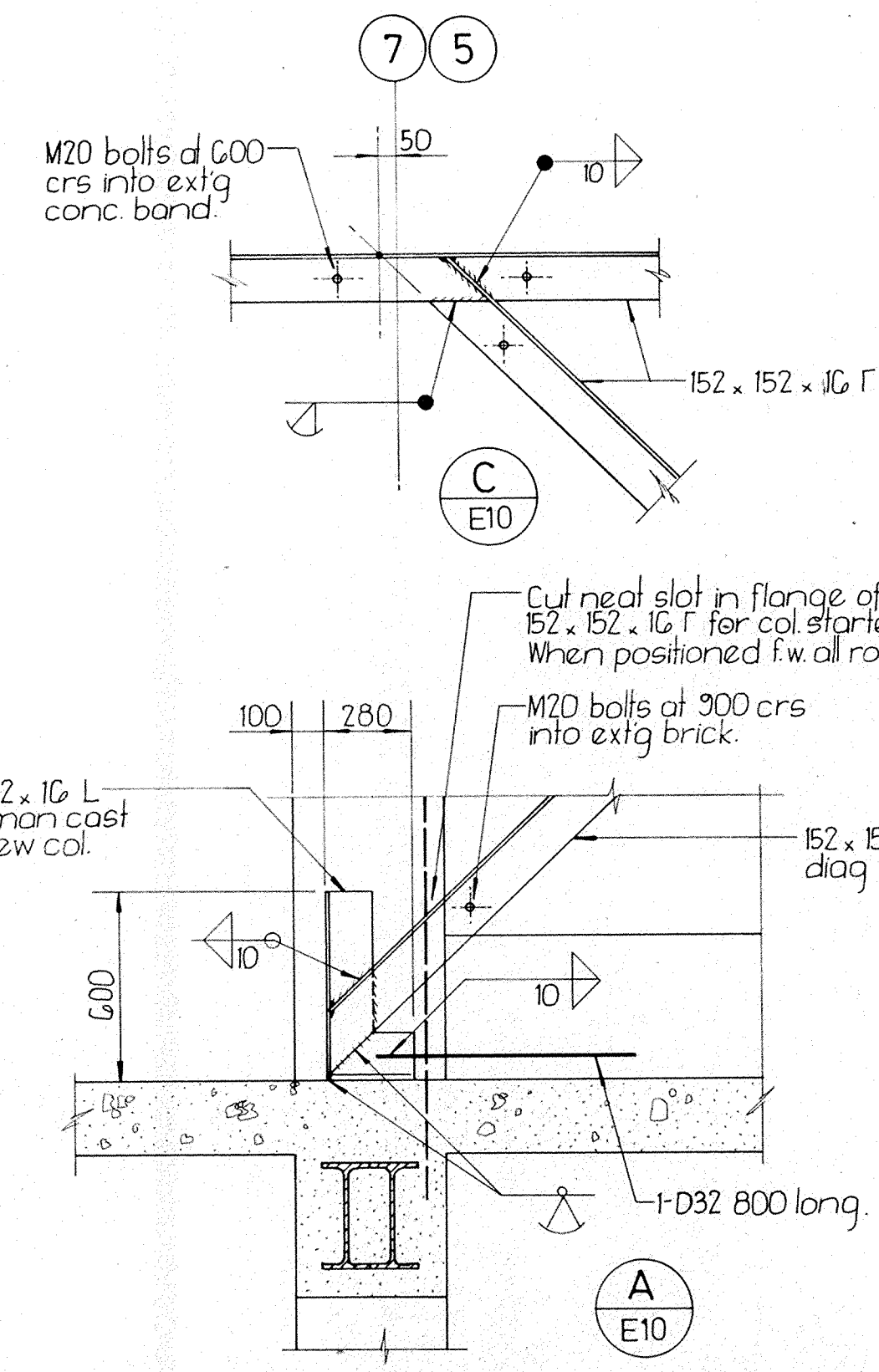
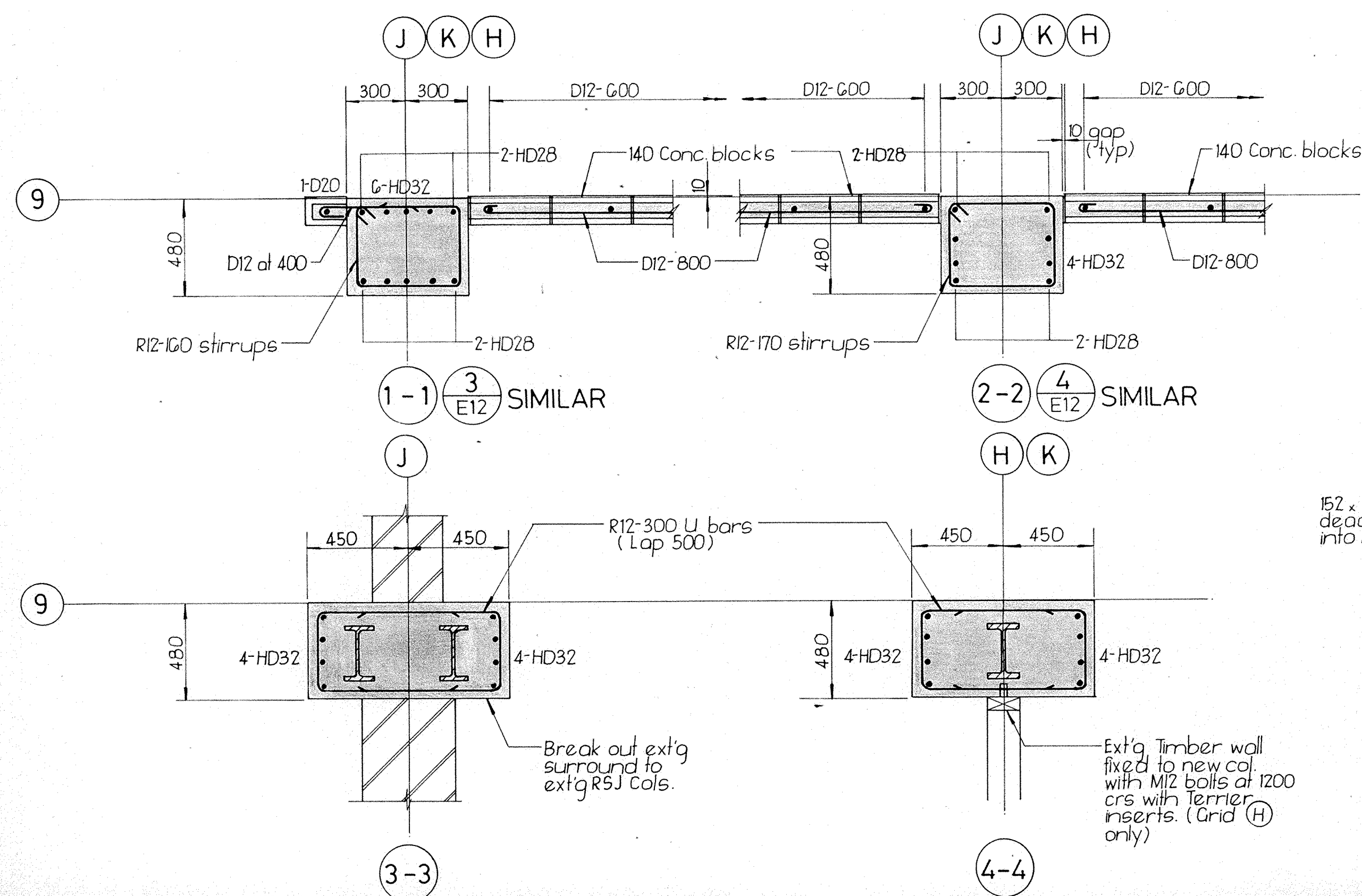
**DWG TITLE**  
WALL ELEVATIONS ON  
GRID G AND SECTIONS

<b>DRAWN</b> D.J.H.	<b>SCALES</b>
<b>CHECKED</b> <i>[Signature]</i>	1:50 & 1:20
<b>APP'D</b> <i>[Signature]</i>	<b>DWG No</b>
<b>DATE</b> Dec 1979	1004 / E10 A





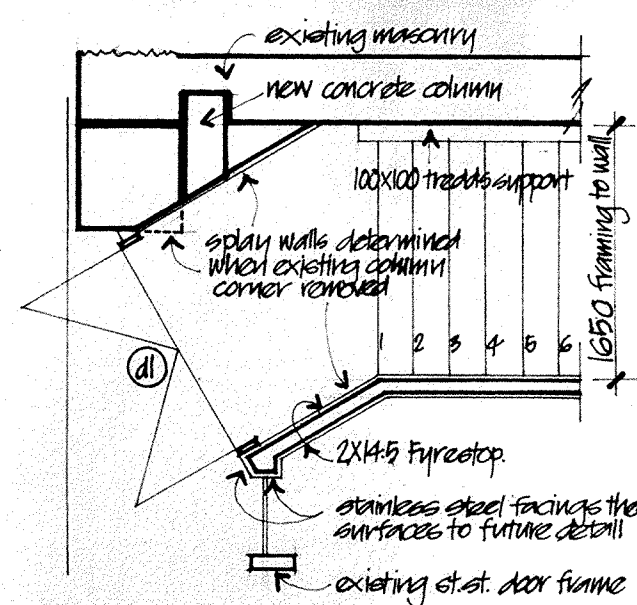
ELEVATION ON GRID 9







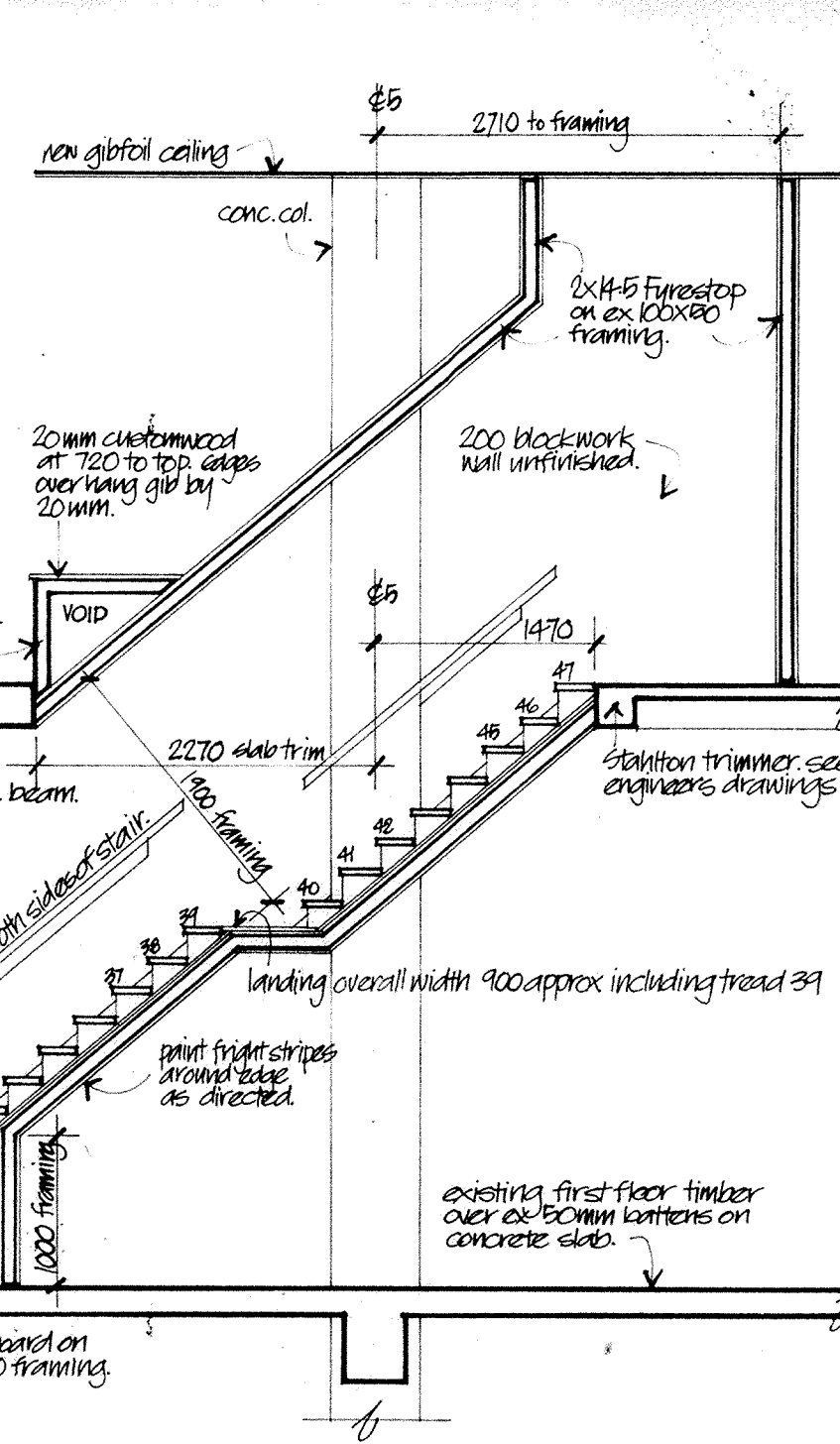




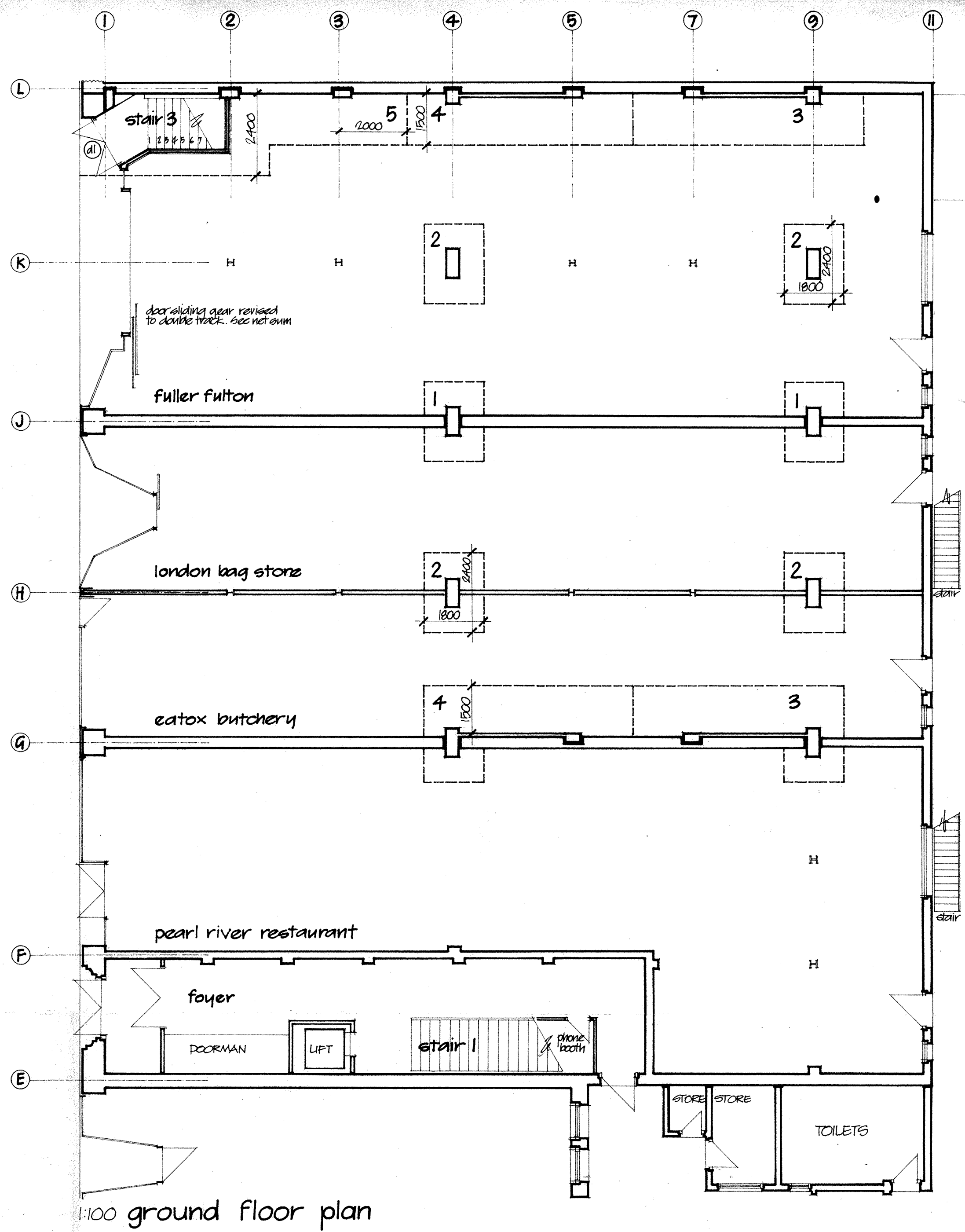
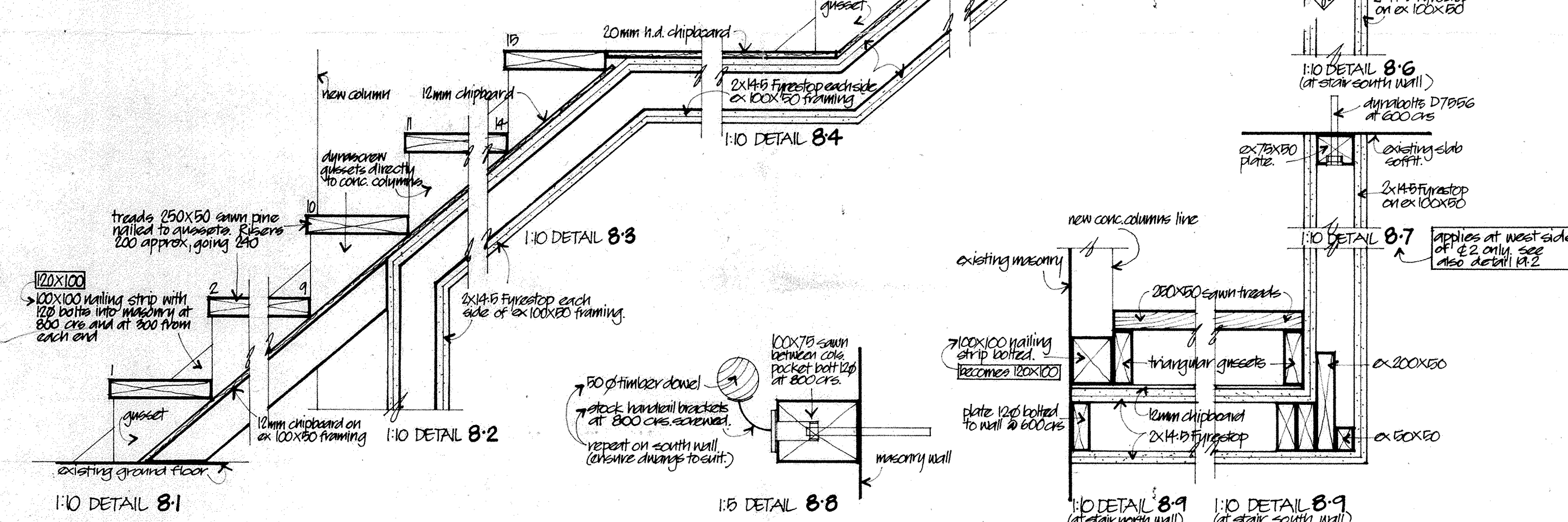
1:50 plan at foot of stair  
Delete. Entirely to future detail

# stair construction

- Stair fire enclosure ex 100x50 and as noted framed, with galvanized steel strip lining/risers etc as required or directed. Framing must be completed and approved before commencing lining.
- Fix 2 layers 14.5 mm Ninetones Firestop in accordance with specification ABL7 all over both surfaces. Firestop work must be approved before proceeding.
- Frame out infill pieces, fix 12 mm medium density particle board over stair surface, 20 mm n.d. chipboard over intermediate landings and build stair in place as detailed.



1:50 west to east section through stair 3  
Redrawn adjusting dimensions and subtrim on 7/10/84. Surfaces etc notes still apply.

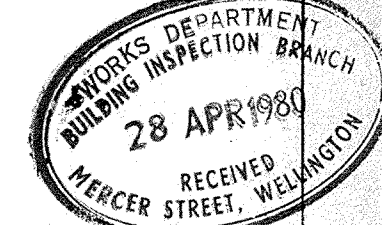


1:100 ground floor plan



## work areas marked thus 2

- Contractor shall stage work in the shops to minimize disruption to tenants in sequence as indicated.
- Complete work in each stage before moving to the next area.
- On lines 4 and 9 where overhead steel braces intersect at centre span between allotted areas allow to suspend braces and lock weld under existing first floor beams. Weld overhead either from a movable scaffold or by accessing in the ceiling space only.
- Complete stages 1 to 4 in sequence as soon as possible after commencement on site and in parallel with work going on above level 1.
- Allow to return to Fuller Fulton tenancy to work on penetration through the existing first floor slab and construct stair in area 5 when the boundary wall on the north side of the building is constructed and the roof over has been weatherproofed.



Notes boxed thus are revisions added between 30.10.1979 and 14.4.1980

WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
**W.M.C.I.**  
STRENGTHENING AND ALTERATIONS • CUBA ST. PREMISES

IAN G. SMITH CONSULTANTS  
ENGINEERS • WELLINGTON

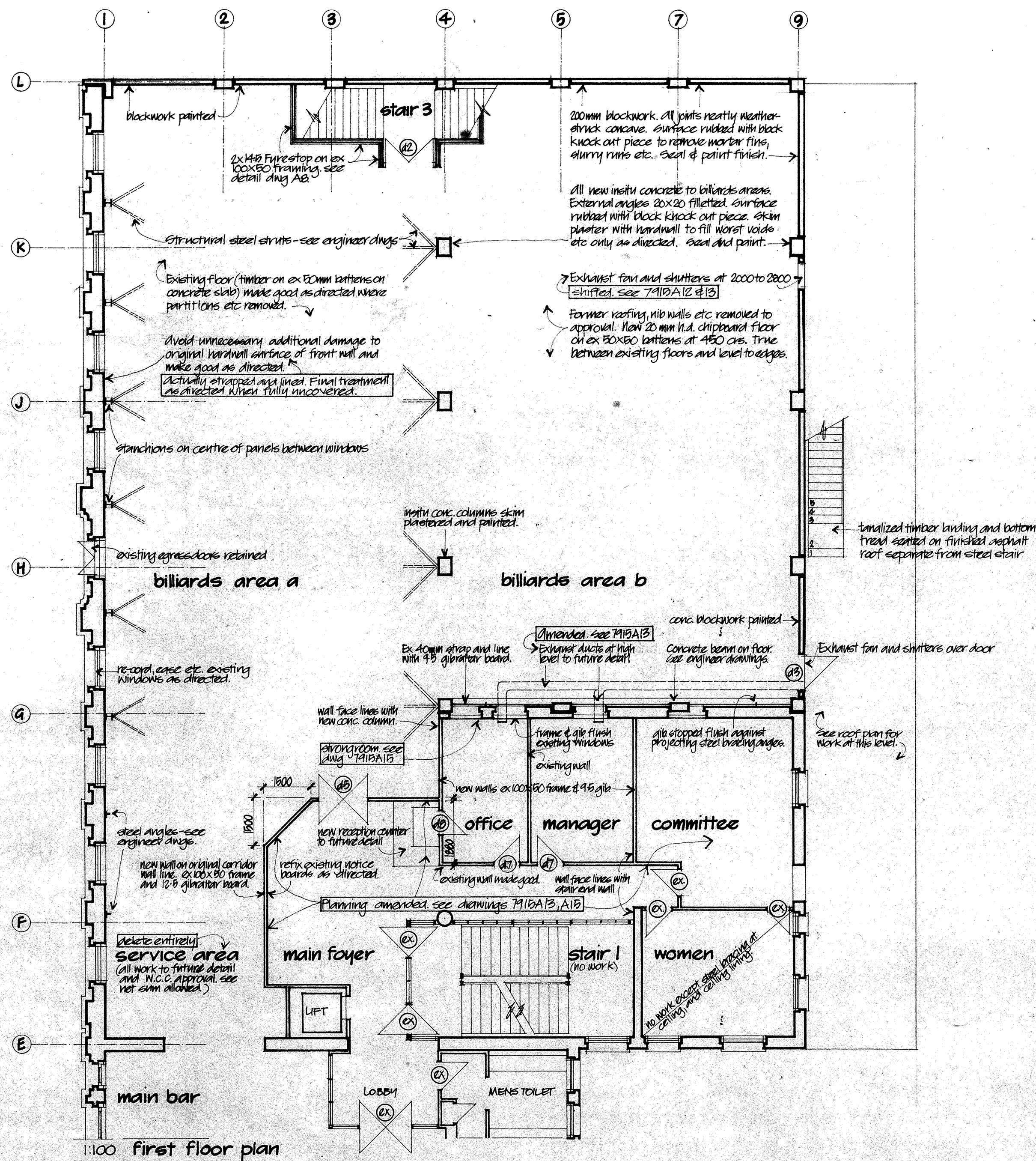
keith wilson  
architect  
wellington

box 12321 wellington  
phone 735633

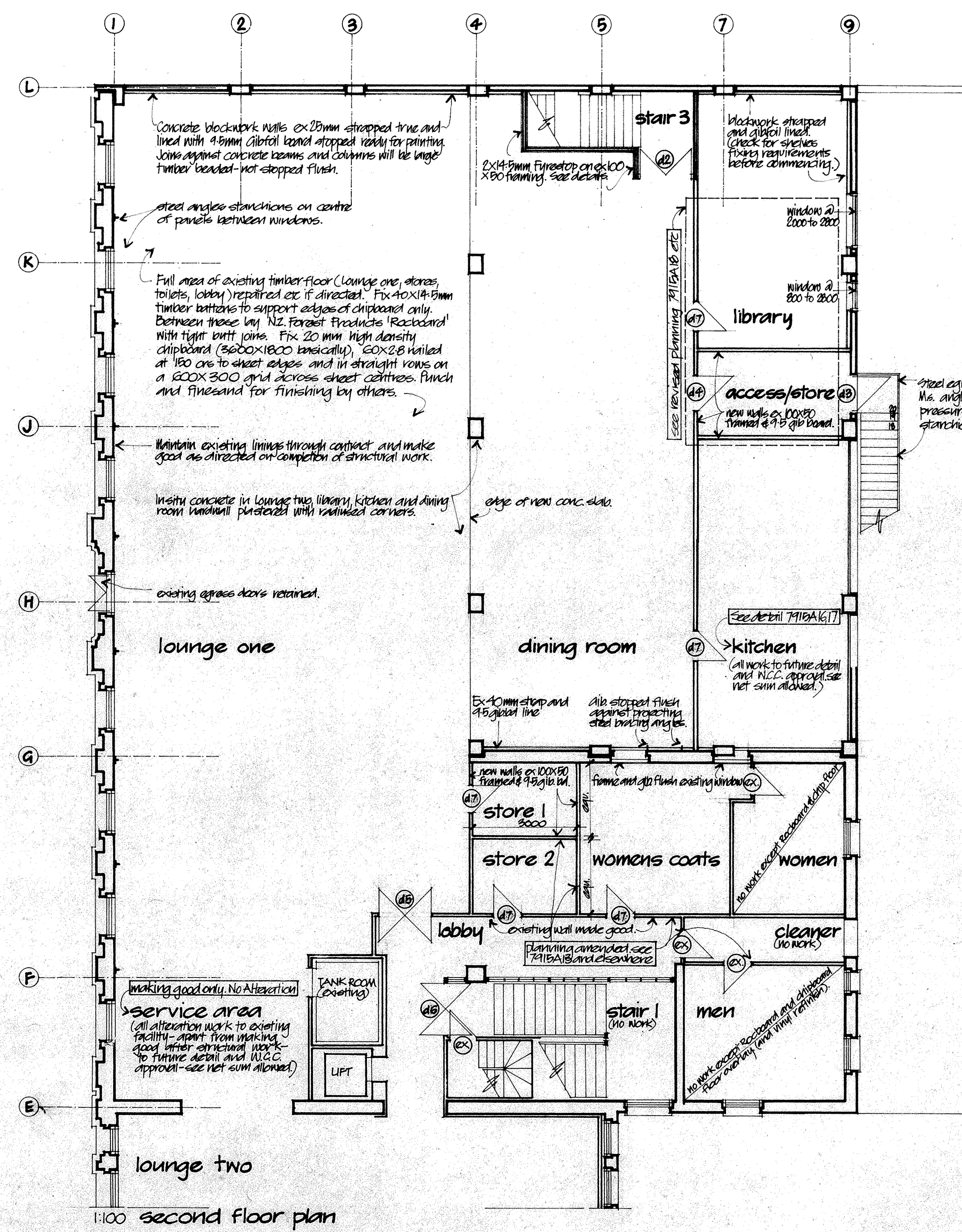
GROUND FLOOR PLAN.  
STAIR THREE DETAILS

7915A8a





1:100 first floor plan



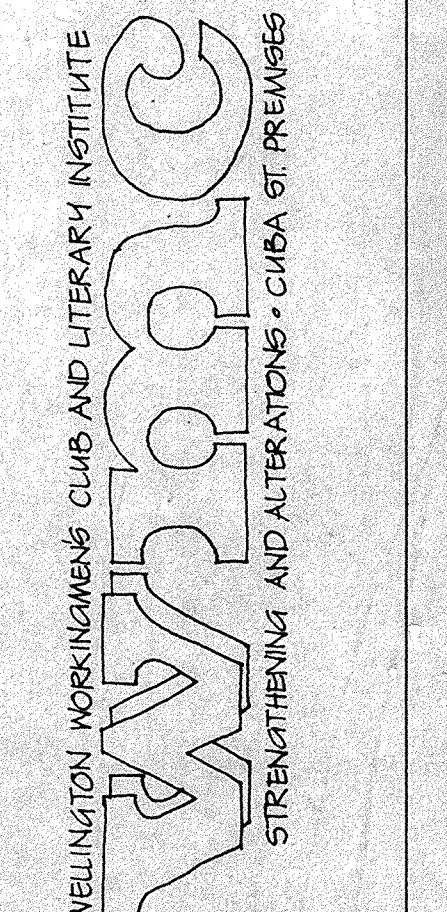
1:100 second floor plan

# doors schedule

- All doors 1800 high by 900 wide, given.  
 ext indicates existing, lined.  
 d1. (stair 3 to street) 18720 solid core finish exterior, int quality.  
 d2. 2X760 solid core finish interior int. rimu varnish quality.  
 d3. 1130 solid core finish exterior paint quality.  
 d4. 1150 hollow core finish interior int. rimu varnish quality.  
 d5. 2X760 rimu framed, 6mm glass, steel pp. glazed to detail.  
 d6. existing adjacent pair of aluminium doors revised.  
 d7. existing 810 varnished finish door (and frames) carefully ref. and resealed as directed.  
 d8. hollow core finish interior int. rimu varnish quality.



Notes boxed items are revisions of original drawings 20/10/79 and 14-4-1980



IAN G SMITH CONSULTANTS ENGINEERS - WELLINGTON

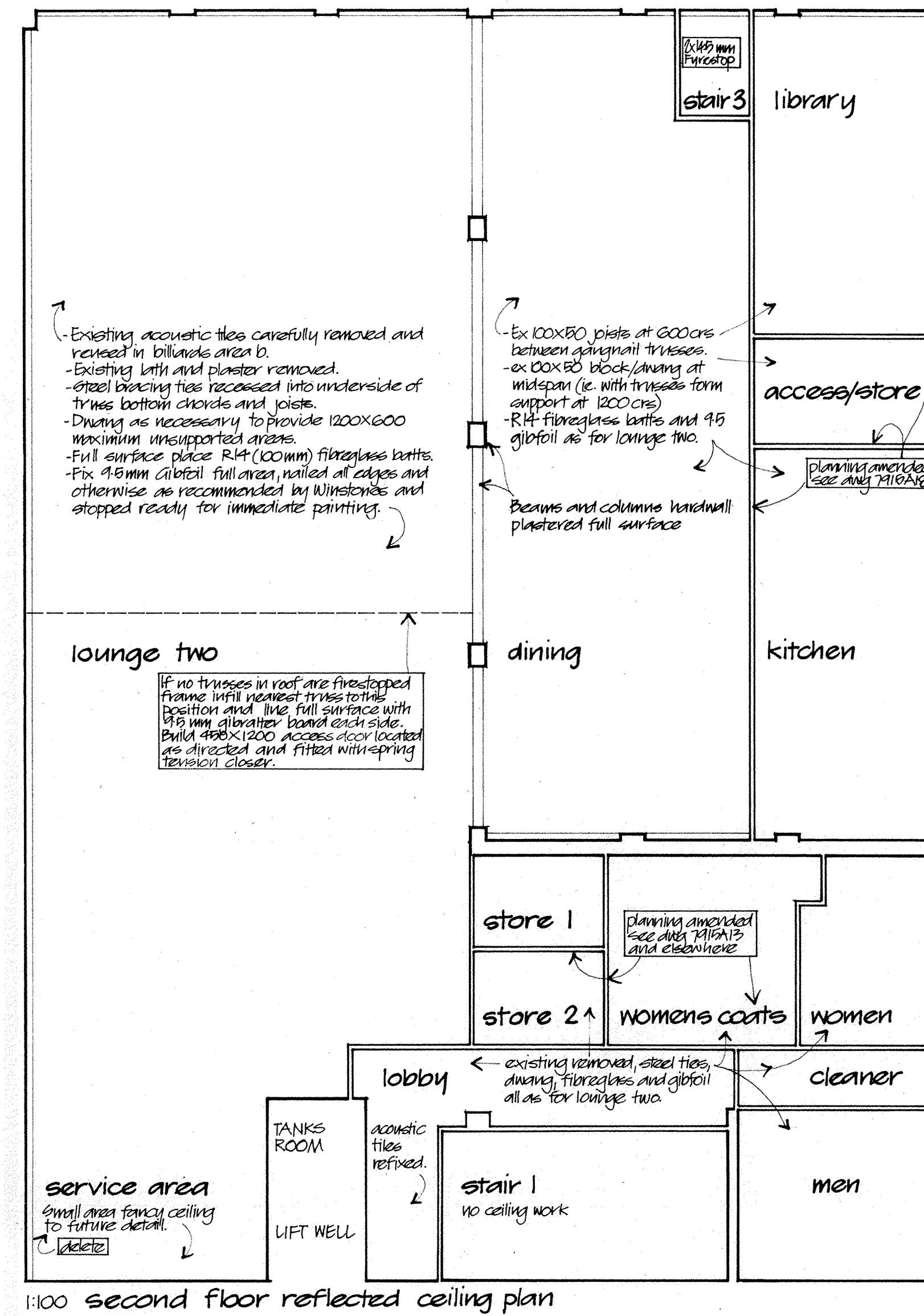
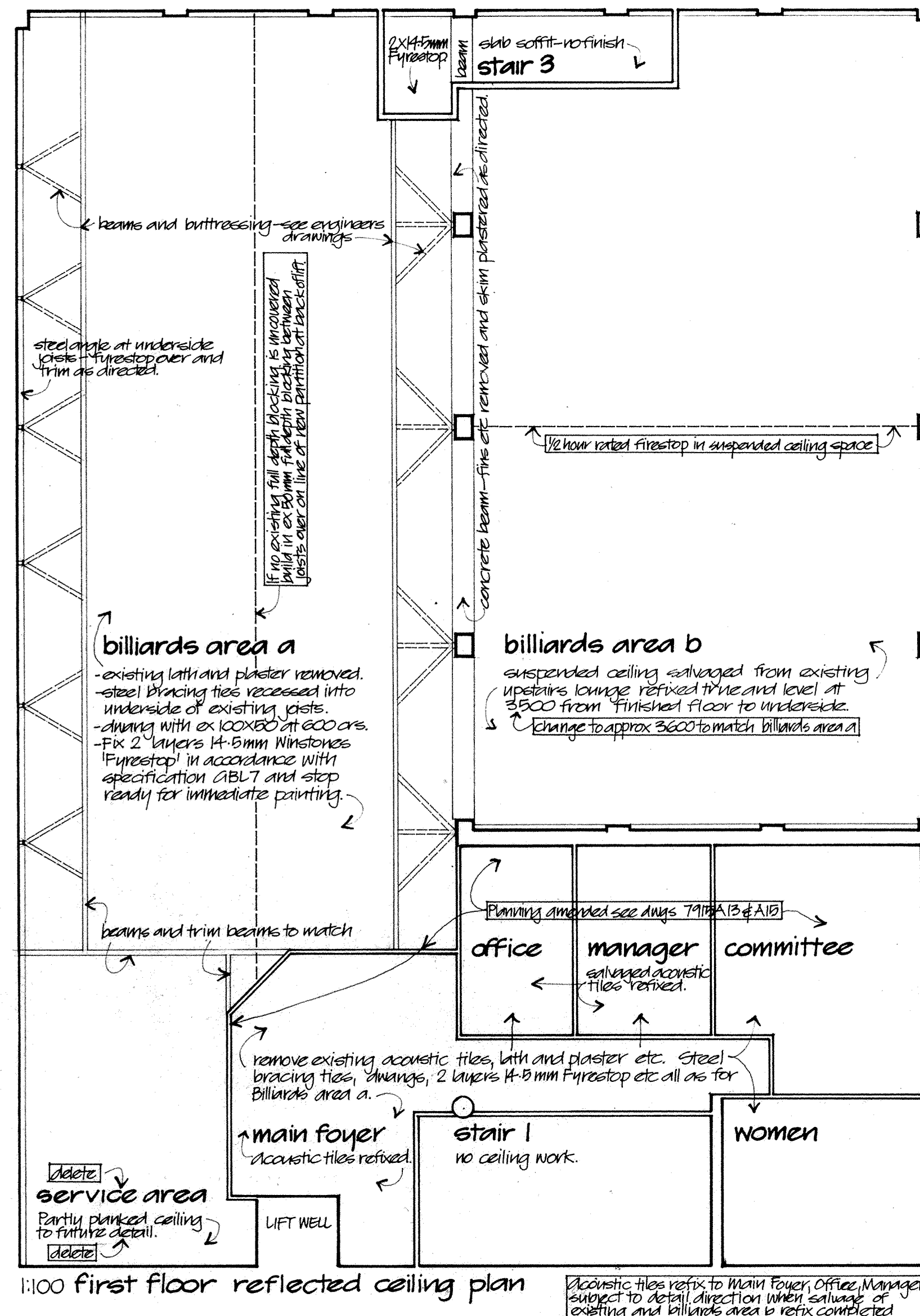
keith wilson architect wellington

box 12321 wellington phone 735633

FIRST & SECOND FLOORS. DOORS SCHEDULE.

7915A9a





Notes boxed items are Revisions  
A added between 30.10.79 and 14.4.1980

WELINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
**W.M.C.**  
STRENGTHENING AND ALTERATIONS - C.M.B.A. ST PREMISES

IAN G. SMITH CONSULTANTS  
ENGINEERS • WELLINGTON

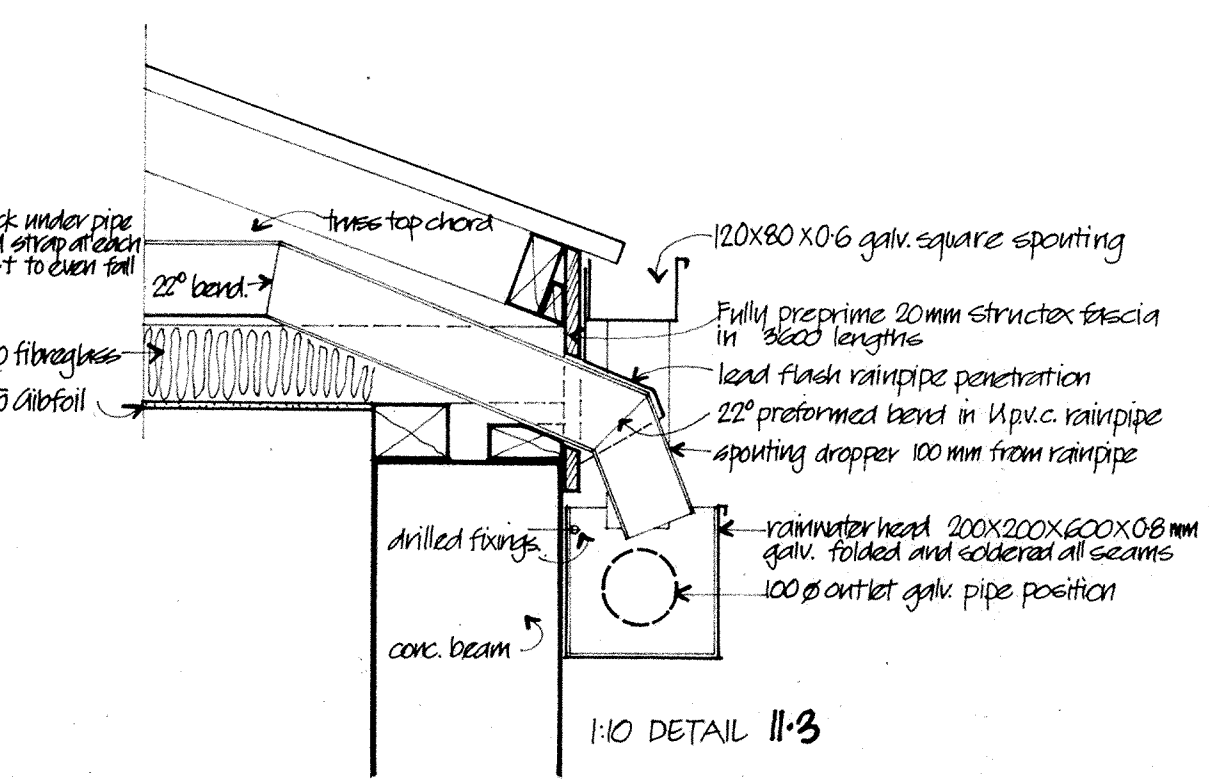
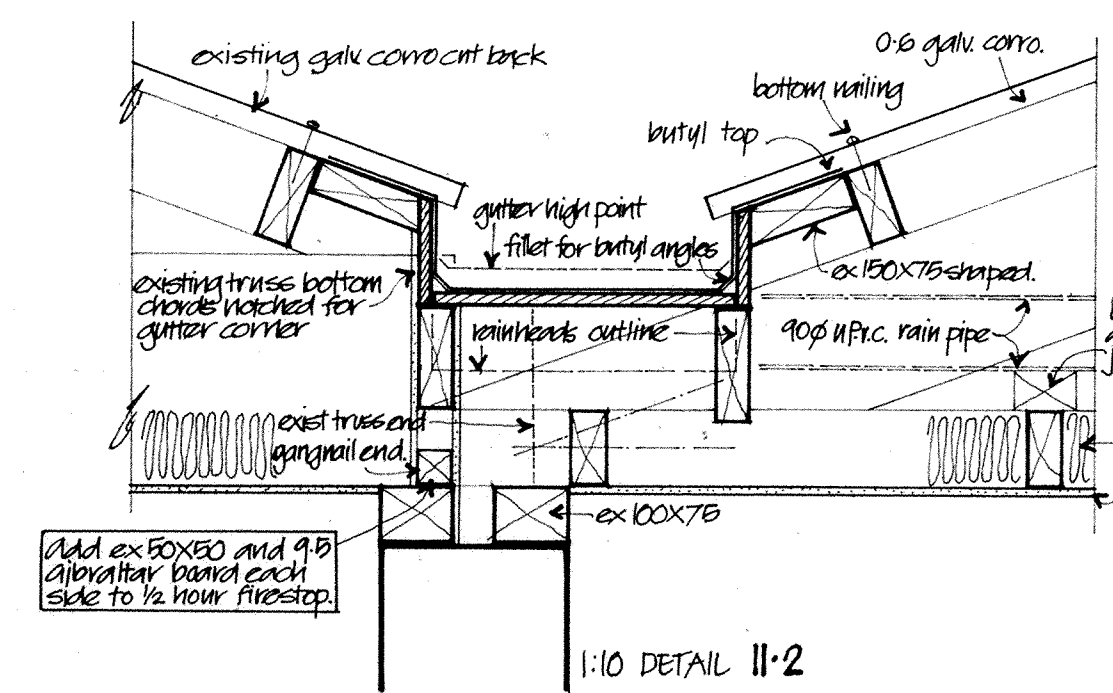
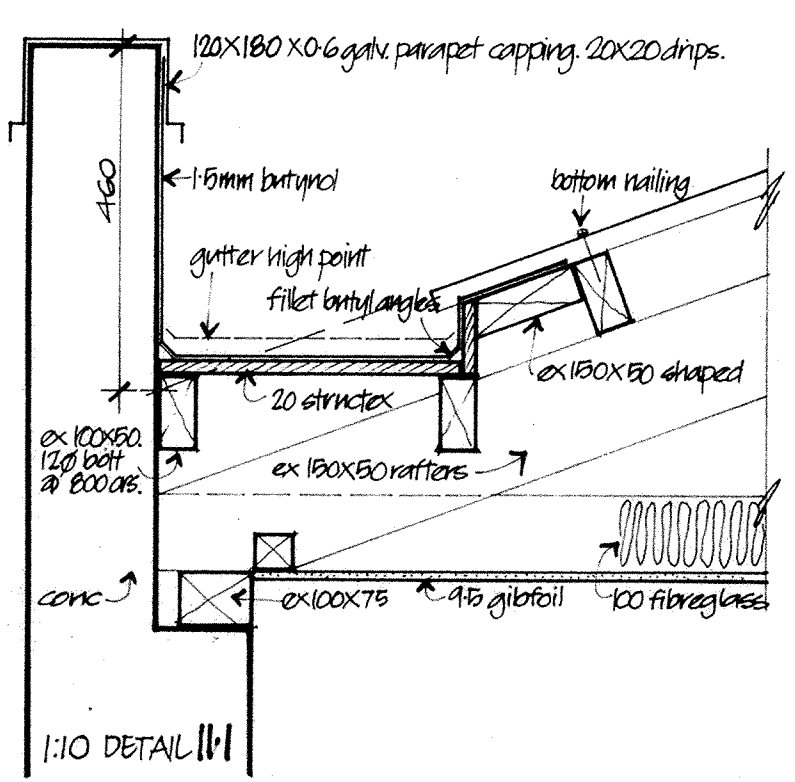
keith wilson  
architect  
wellington

box 12821 wellington  
phone 755633

FIRST AND SECOND  
FLOORS REFLECTED  
CEILING PLANS

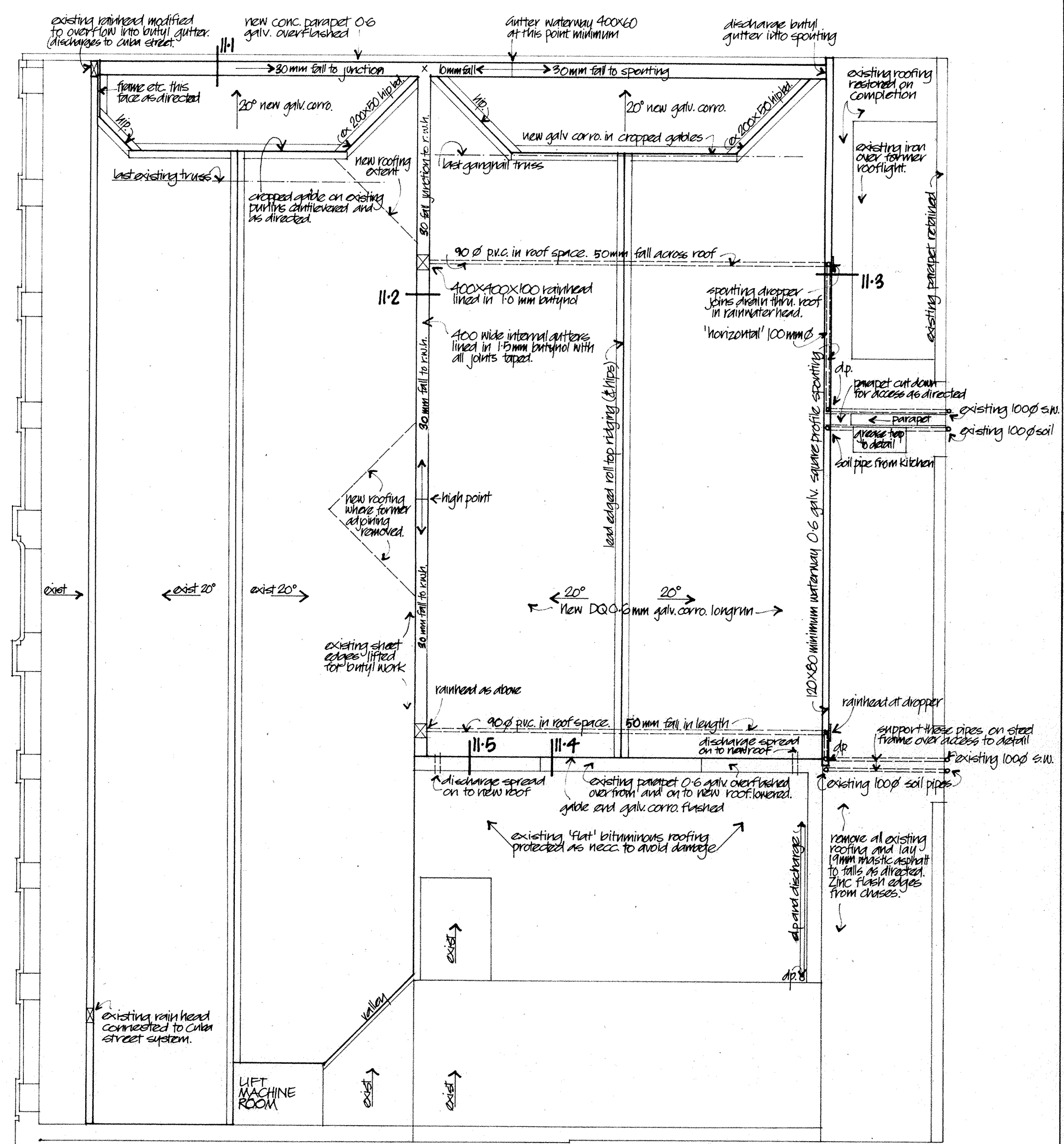
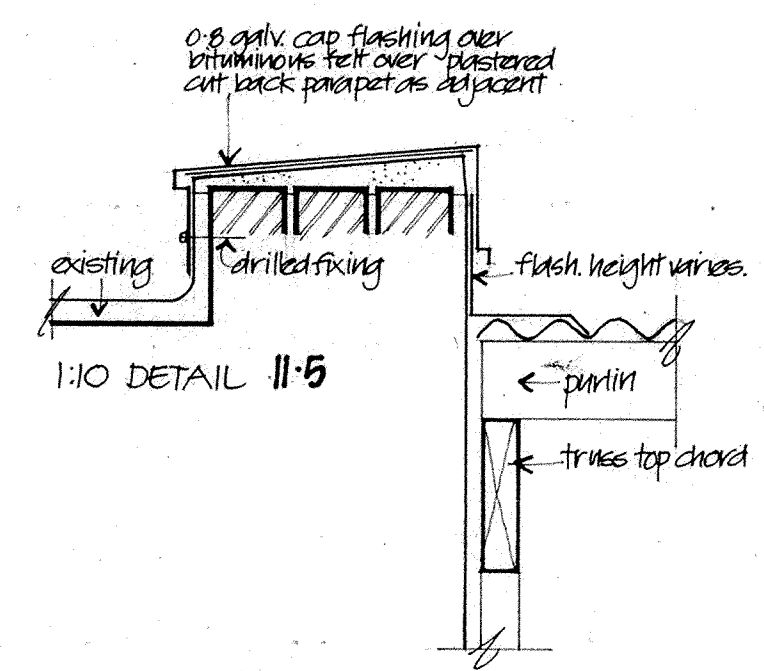
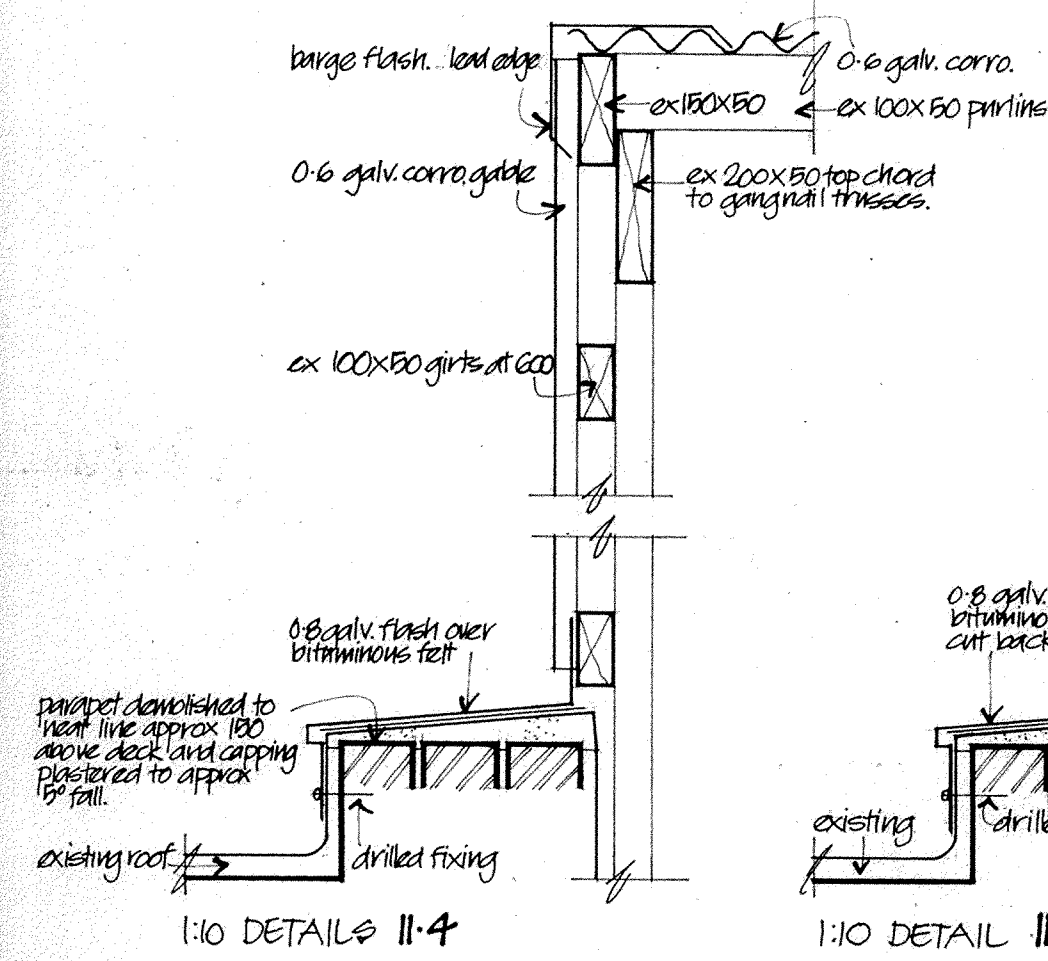
7915A10a





notes / spec.

Parline ex 100x80 at 900 c/s on edge, skew nailed and one Pryde Zed nail, at each purlin/truss contact.  
Purlin joins over truss and with 400 long ex 100x80 on flat flitch well nailed.  
Roofing D&O 6mm galvanized corrugated in full length ridge to eaves pieces, primed at bottom over butyl and top under rickging, fixed with 60mm spiral shank spring head nails at each second corro. Side laps 1 1/2 corrugations. Roofing over twisted taut 150 x 12mm galvanized wire mesh over heavyweight building paper fixed weatherlapped.  
Butyl substrate shall be 20mm structex, preprimed especially all cut edges, fixed to achieve even falls as noted. Internal angles neatly 20mm filletted.  
Butyl fixed only on calm days with surrounding surfaces clean and substrate completely clean and dry.  
Butyl fixed in full width strips full length between rainheads, junctions etc. 15mm thick in gutters. 1mm to rainheads. All joints taped/butyl adhesive and all work by experienced men exactly to manufacturer's recommendations to leave neat and tidy finished job.  
Flashings 0.6 or 0.8 as noted galv. sheet, lead edged as necessary, all machine folded, all securely fixed.



1:100 roof plan

Note boxed title is revision  
a added between 30.10.79  
and 14.4.1980

WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
STRENGTHENING AND ALTERATIONS - CUBA ST PREMISES

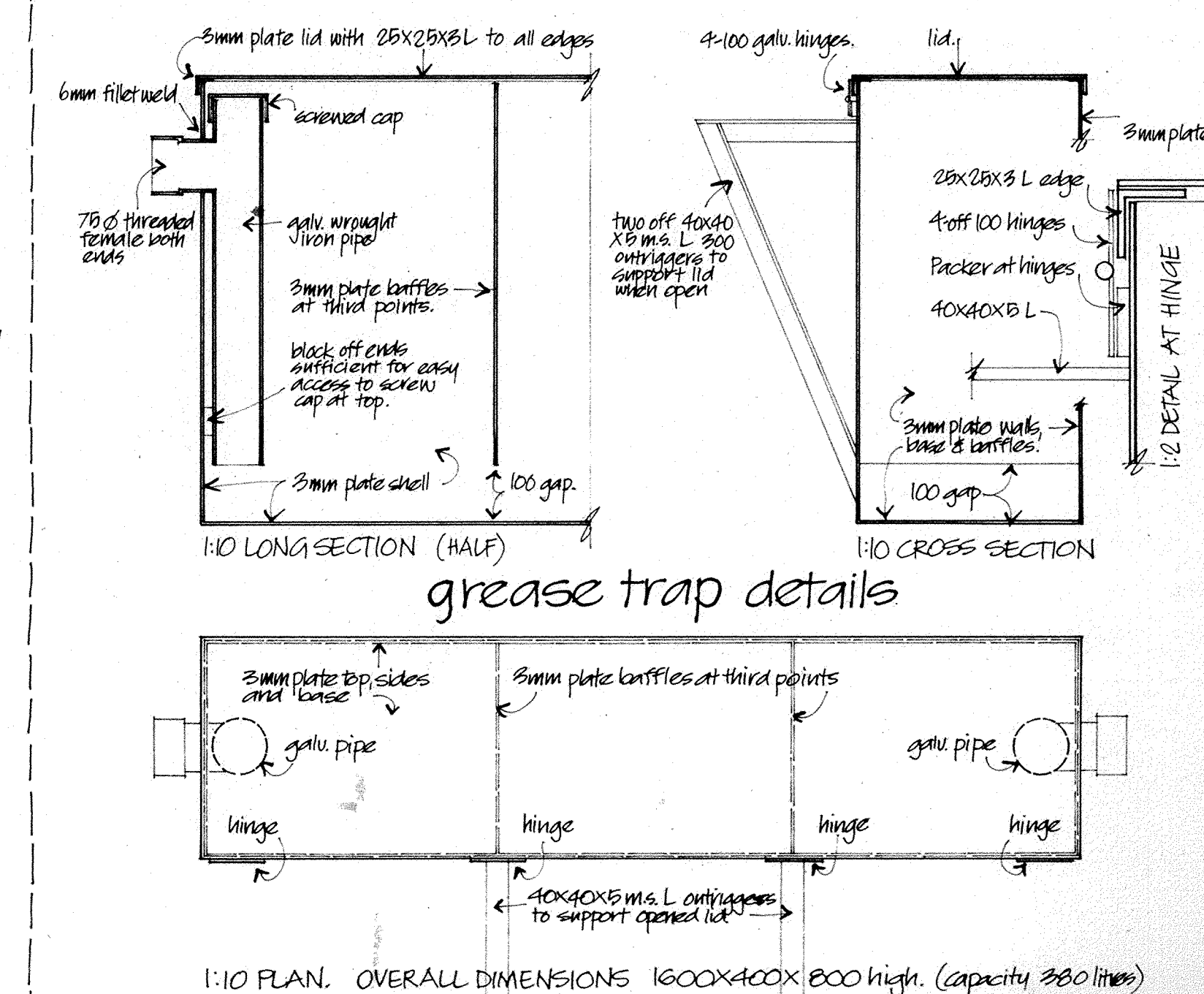
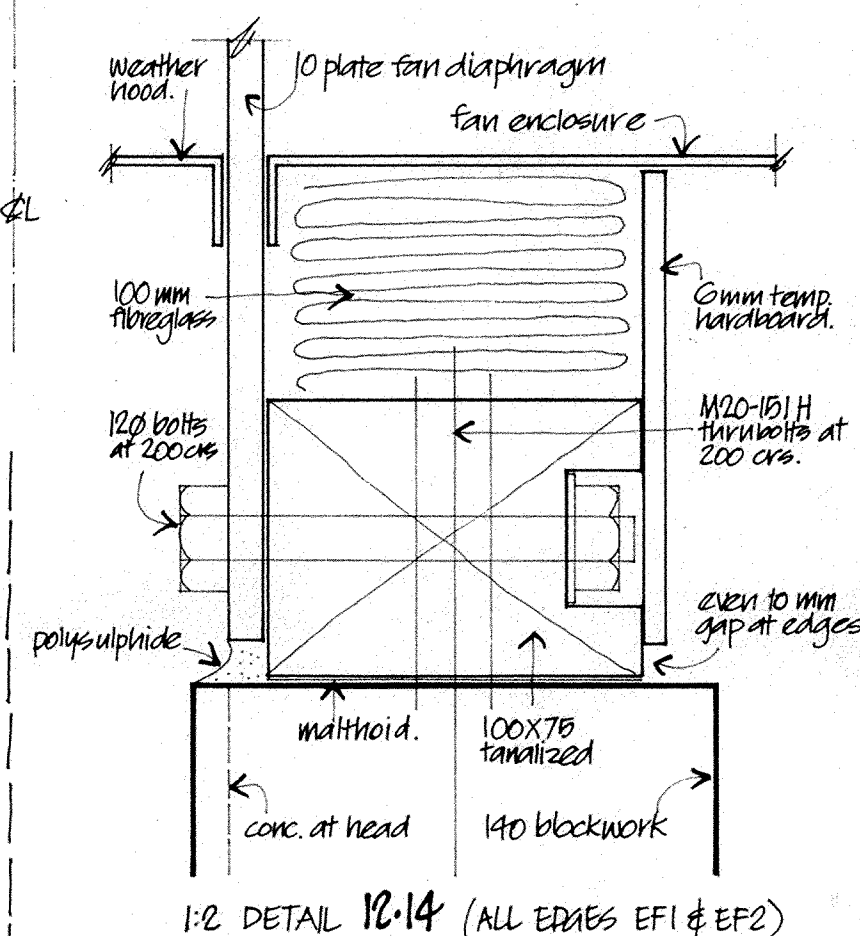
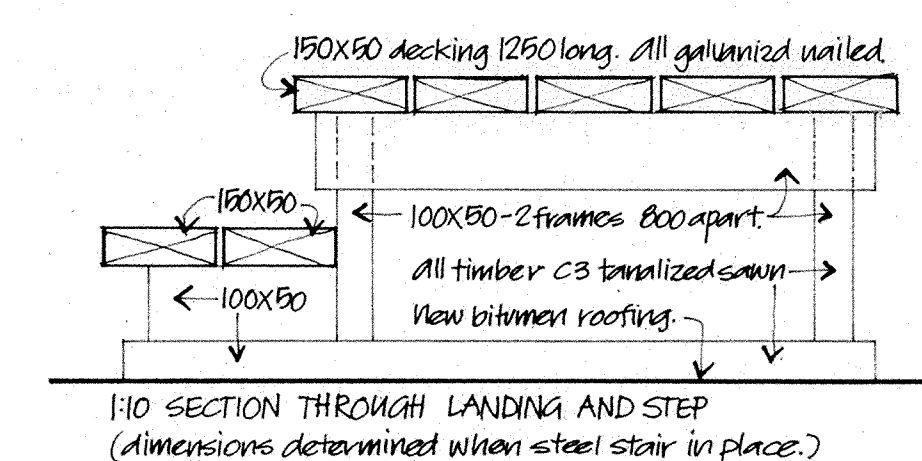
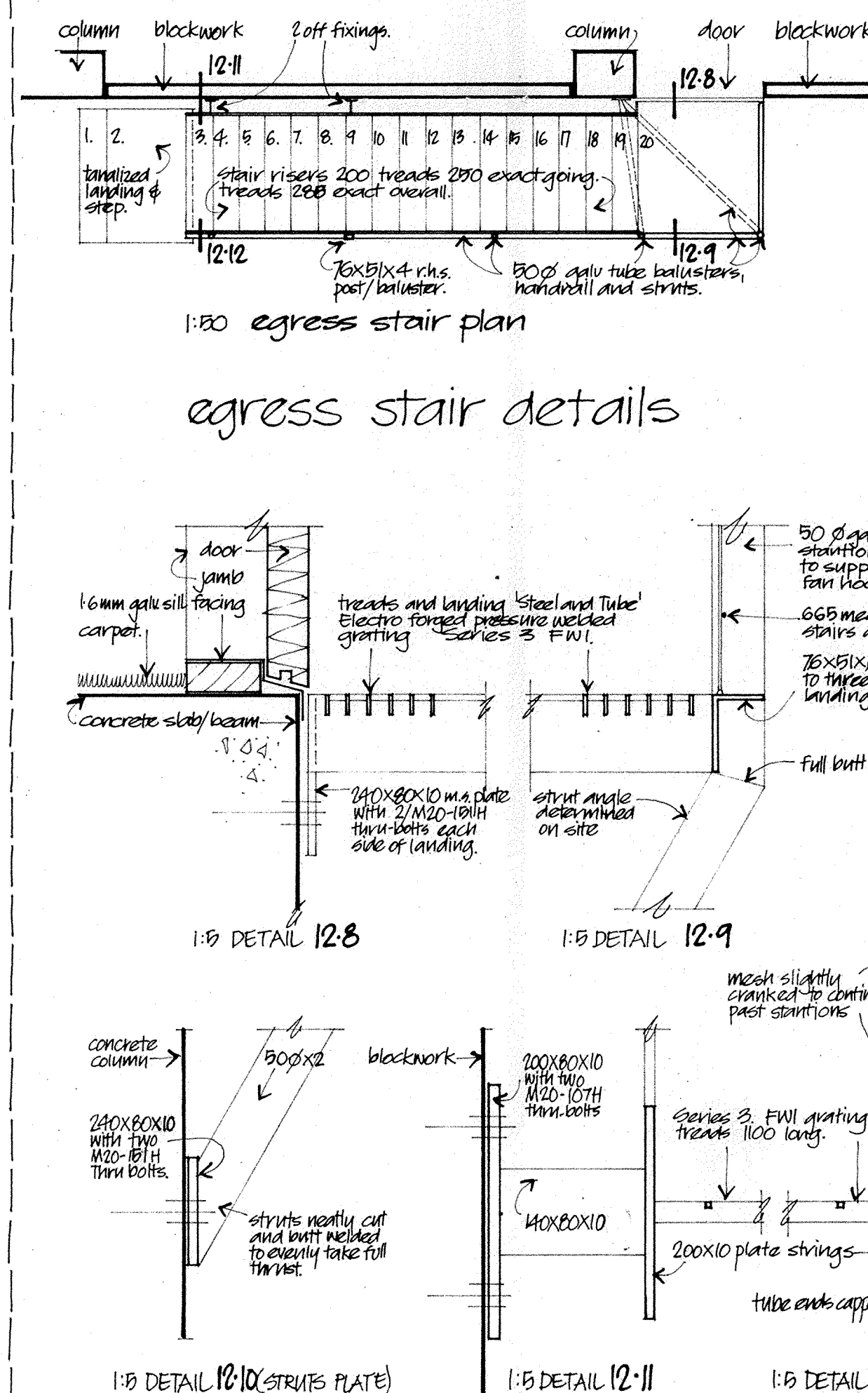
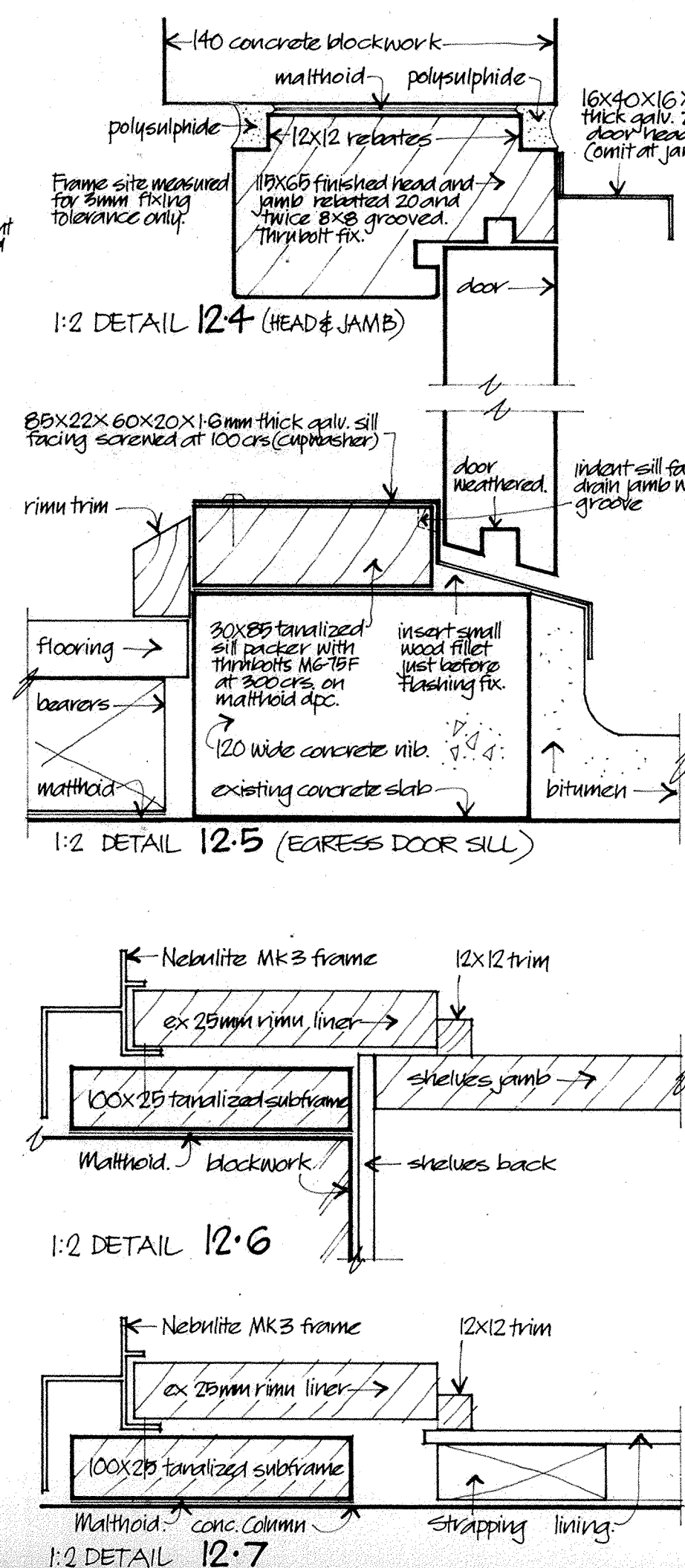
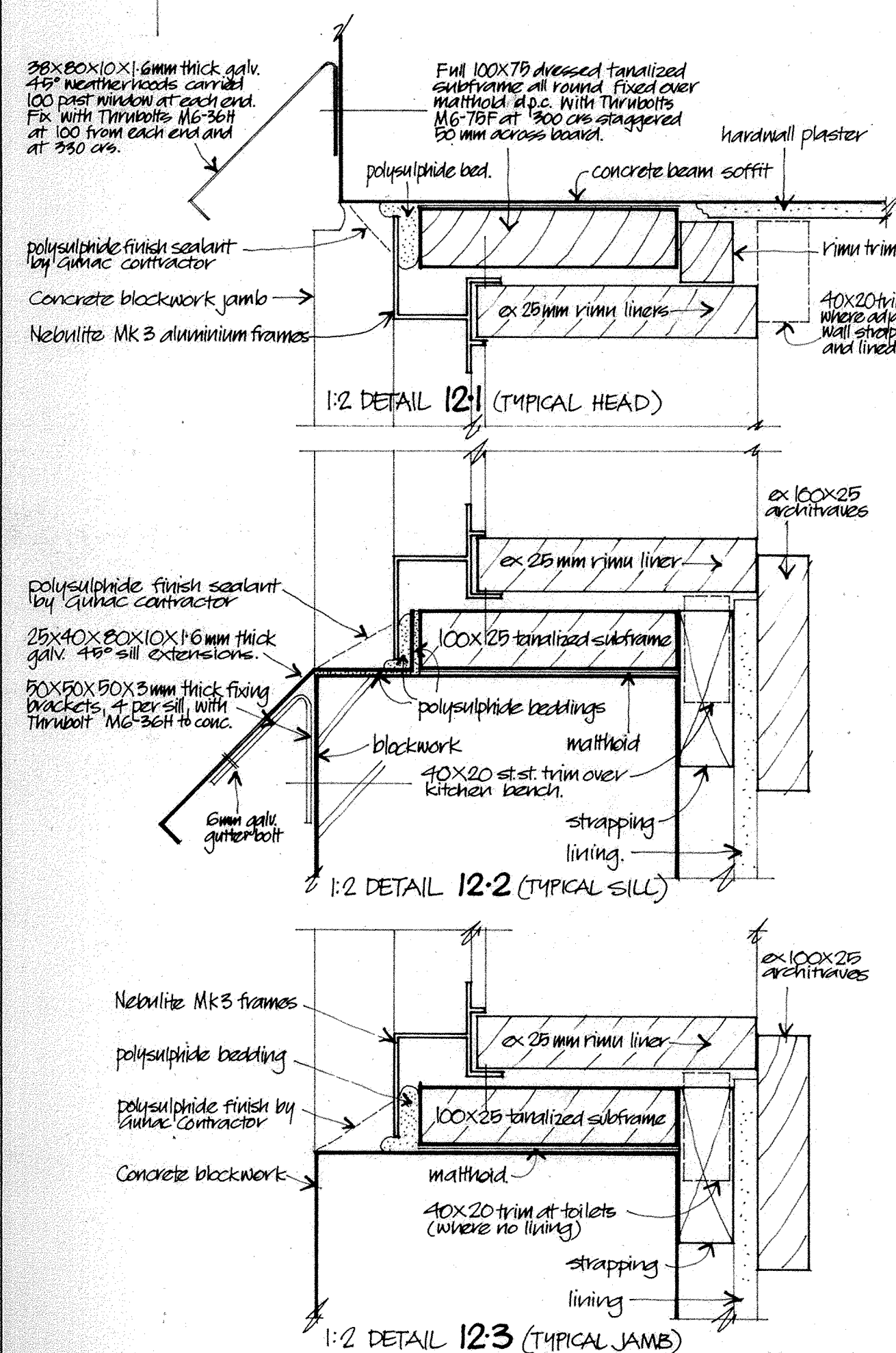
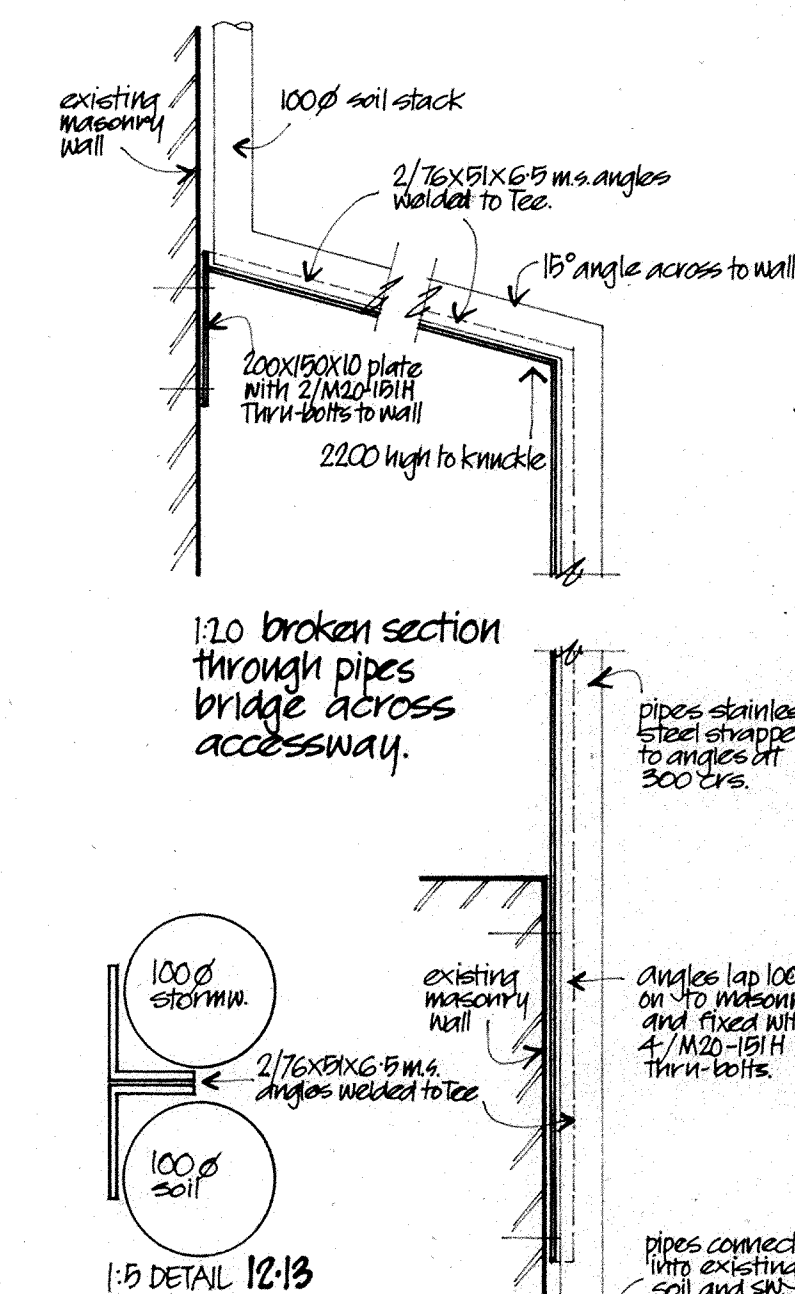
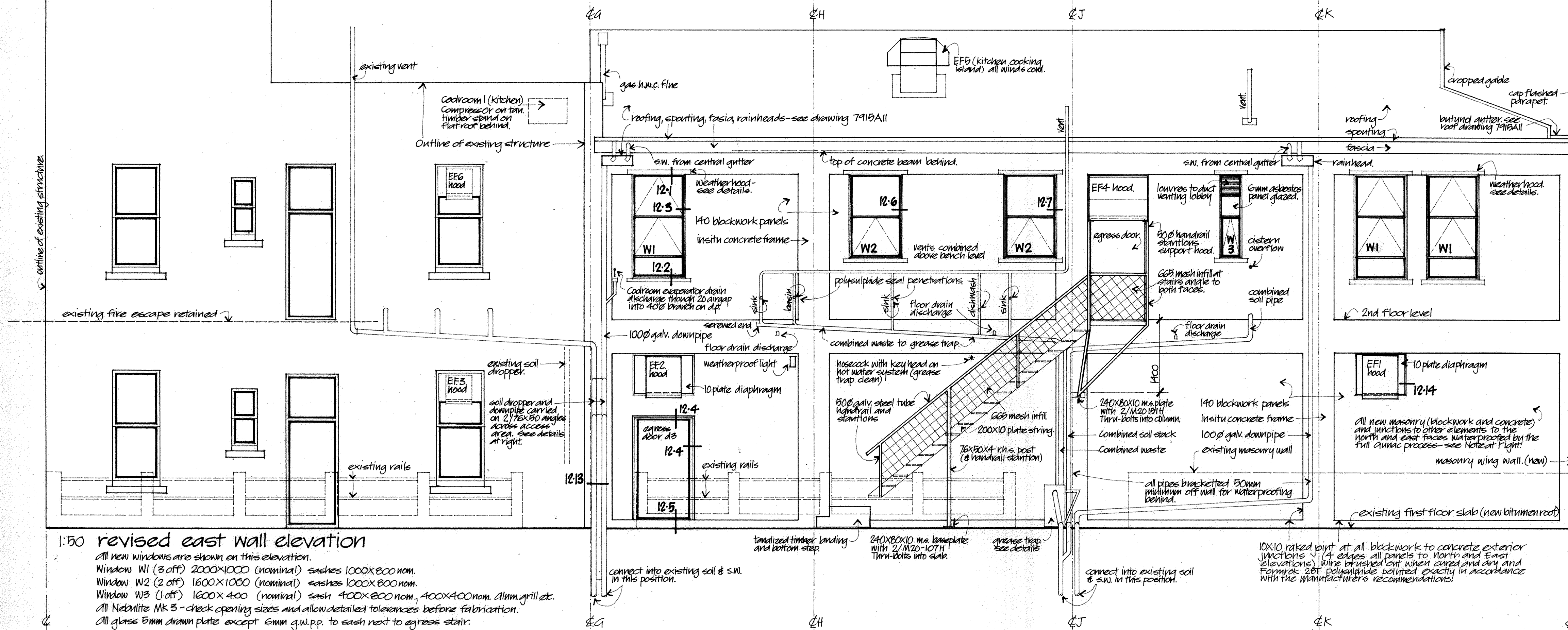
IAN O SMITH CONSULTANTS  
ENGINEERS - WELLINGTON

keith wilson  
architect  
wellington  
box 12321 wellington  
phone 795 6233

ROOF PLAN AND DETAILS

7915A11a





**Ginnac.**  
The full new concrete and  
blackwork sub-construction to this  
north wall. The elements are to be  
treated after completion of all  
sub-construction to meet  
installation in the new  
Ginnac sub-construction.  
Co-ordinating with the  
contractor and other sub-  
contractors to ensure that  
surfaces are made available in  
a fit condition for finish  
work on by the  
sub-contractor and Ginnac  
application.  
Cast the full surface with  
Ginnac, with laps to adjacent  
materials, tugless over joints,  
complementary materials  
for special situations etc.  
all as required to enable  
Ginnac sub-contractor to  
finish a 15 year full  
guarantee for the surface  
therein including joints,  
around penetrations by  
secondary elements.  
Two finish colours required,  
one for blackwork and one  
for all other elements. (cream  
/ brown probable, to later  
instruction.)  
This work includes finish  
scraping and blowdown but  
not the possible pointing of  
blackwork panel edges or  
around exhaust fans etc  
as noted elsewhere on this  
drawing.

check all  
component  
dimensions  
on site  
before  
fabrication

WELLINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE

IAN C. SMITH CONSULTANTS  
ENGINEERS • WELLINGTON

keith wilson  
architect  
wellington

box 12321 wellington  
phone 735033

EAST ELEVATION  
WINDOWS  
EGRESS STAIRS  
GREASE TRAP  
GUNNAC

7915A/2



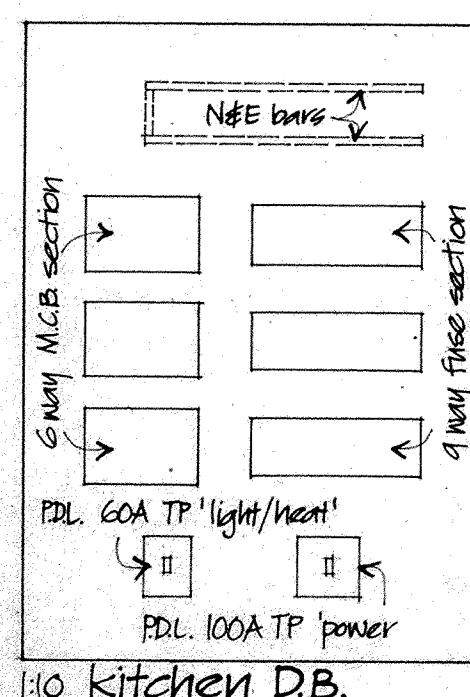
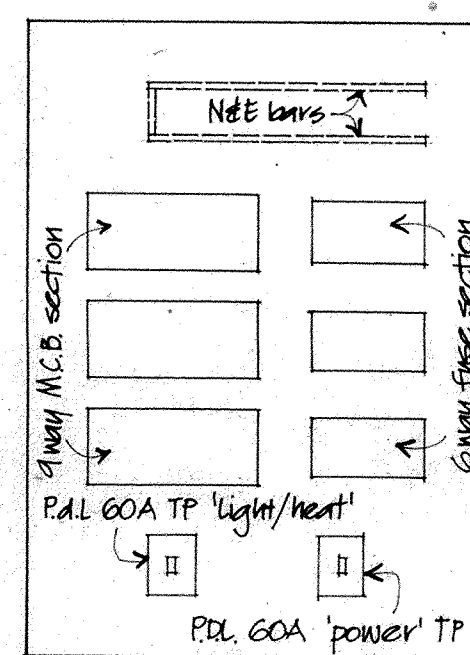
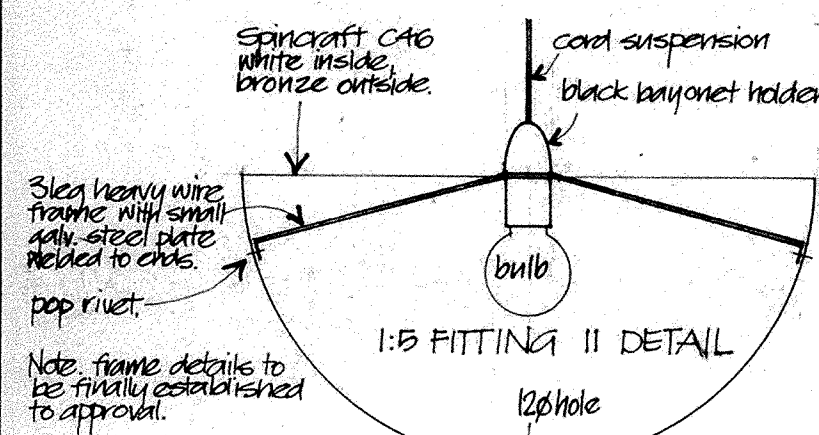




# fittings schedule

1. Special billiards table lights. Allow the net sum of \$2000.00 for supply only. Contractor to install and wire through meters supplied by W.M.U.C. 12 off.
2. Thorn pop pack HDS 20GB (twin 65W fluo.) 4 off.
3. Thorn pop pack HDS 10GB (single 65W fluo.) 6 off.
4. Thorn pop pack HDS 1040 (single 40W fluo.) 2 off.
5. Existing enclosed fluorescent in kitchen exhaust hood.
6. Thorn pop pack KAZ S20GB (twin 65W fluo.) 5 off. at 2400
7. Lumen Design LD205K (twin 65W fluo in cabinet) 17 off. ceiling
8. Lumen Design LD240K (twin 40W fluo in cabinet) 2 off. ceiling
9. Spincraft Betalight C46 3800 aluminium hemi. pendant white inside and bronze outside with incandescent mirror bulb (top hole 300 for black bayonet direct) at 2400. 20 off.
10. Spincraft Betalight C46 as 9. above but with 100W incandescent 30 off.
11. Spincraft Betalight C46 as 10. above but suspended at 3200 and 'upside down' on special bracket as detailed. 6 off.
12. White plastic chinamans hut 100W incandescent pendant at 2400. 18 off.
13. Philips NWS 108/16 Par 38 180W incandescent spotlight. 4 off.
14. Lumen Design LD4 'Exit' with dual supply. 12 off.
15. Philips NBS 808/14 Black square Par 38 150W Flood. 4 off.
16. Lumen Design LD 94 Bronze pendant aluminium cylinder 100W incand. downlight at 2400. 14 off.
17. Lumen Design LD 95 Bronze surface 100W downlight. 4 off.
18. Thorn DSR/150 par 38 Flood with bowl DVH 150. 14 off.
19. Lumen Design LD 57 200g opal glass ball with bronze metalwork 100W incandescent pendant at 2400. 10 off.
20. Lumen Design LD 82 100W incand opal glass surface button. 2 off.
21. Philips PL 2057 Copper Coolicon 3550 180W incandescent pendant at 2800. 12 off.
22. Existing opal glass cylinder pendants reused. 10 off.
23. Neeco Nandlight 60 polycarbonate brick. 1 off.
24. Ceiling roses. no fittings this stage. 4 off.
25. Provide 2 off selected desklights. Net sum \$8000.

Note: All electrical items are shown diagrammatically in their approximate positions only. Exact position of each item must be confirmed with architect on site before wiring. Items positioned in contravention of this instruction may be required to be shifted at the contractors expense.



**DISTRIBUTION BOARD NOTES**

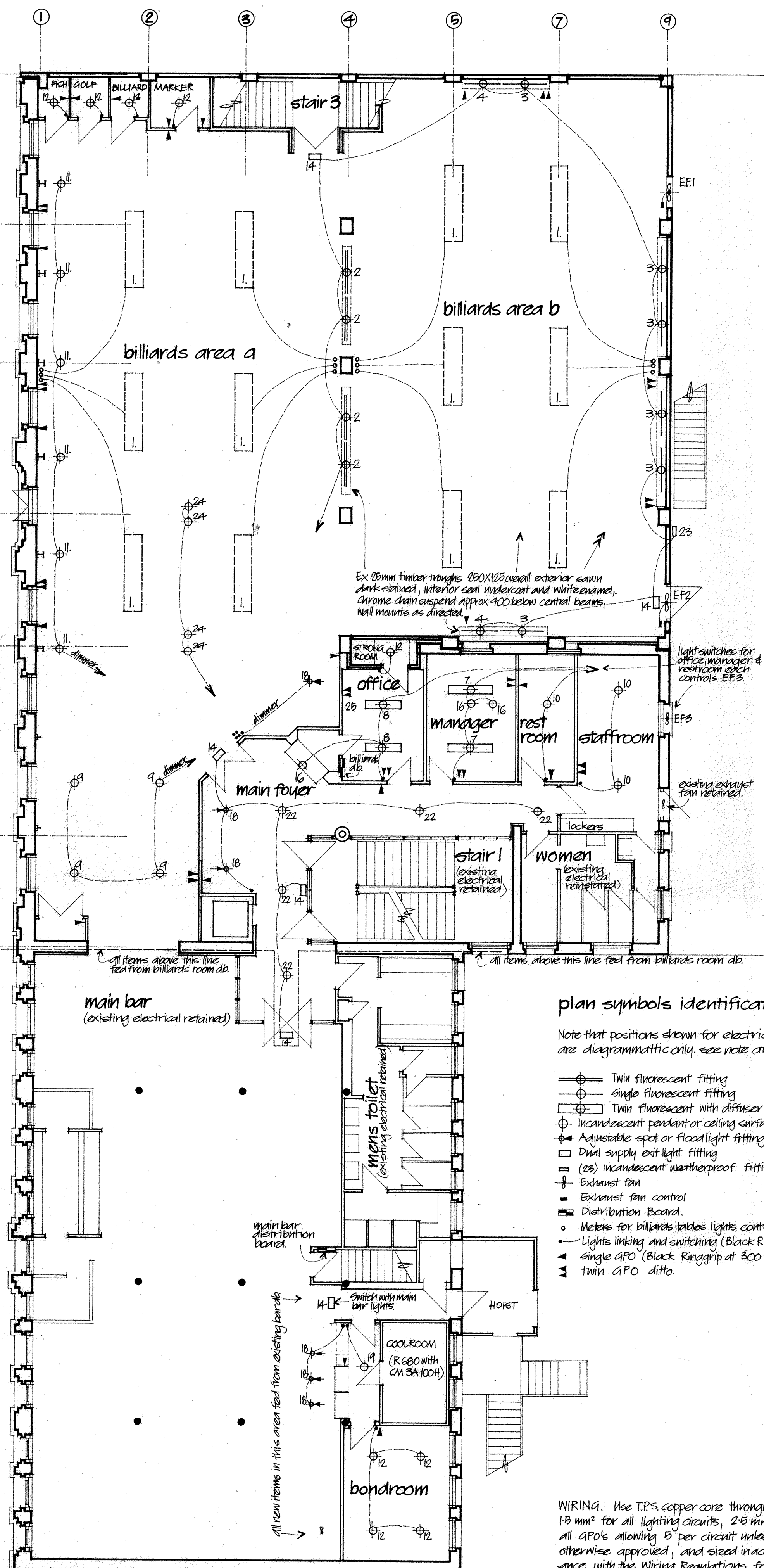
- a. DB's to be 600x840mm all hinged Formica panels in standard metal cabinets with hinged doors.
- b. Overall depth not to exceed 200mm.
- c. MCB's Lupton or Westinghouse, 10 amp for lighting, 20 amp for GPO's.
- d. Label all circuits with Dymo tape.
- e. Fuses are to be HRC English Electric, sized to suit equipment.

**MAIN SWITCHBOARD NOTES**

- a. 3 spare 60 amp fuses lighting tariff cabled in 16mm<sup>2</sup> multicore TP6 copper cables to kitchen DB.
- b. On right side fit 3x80amp HRC fuses power tariff cabled in 25 mm<sup>2</sup> TP6 single core copper cable to kitchen DB.
- c. Allow the net sum of \$350.00 to replace panel supports with full height angle iron lotted, sort out each group of submain cables, regroup them and shorten or lengthen as required so panels can be opened and closed easily, and generally tidy up and rectify any defects in the board.

**LOUNGES DB. NOTES**

On 'lighting' side remove all redundant switches and install 15 NZI MCB's to serve all lighting and GPO circuits in the lounges.



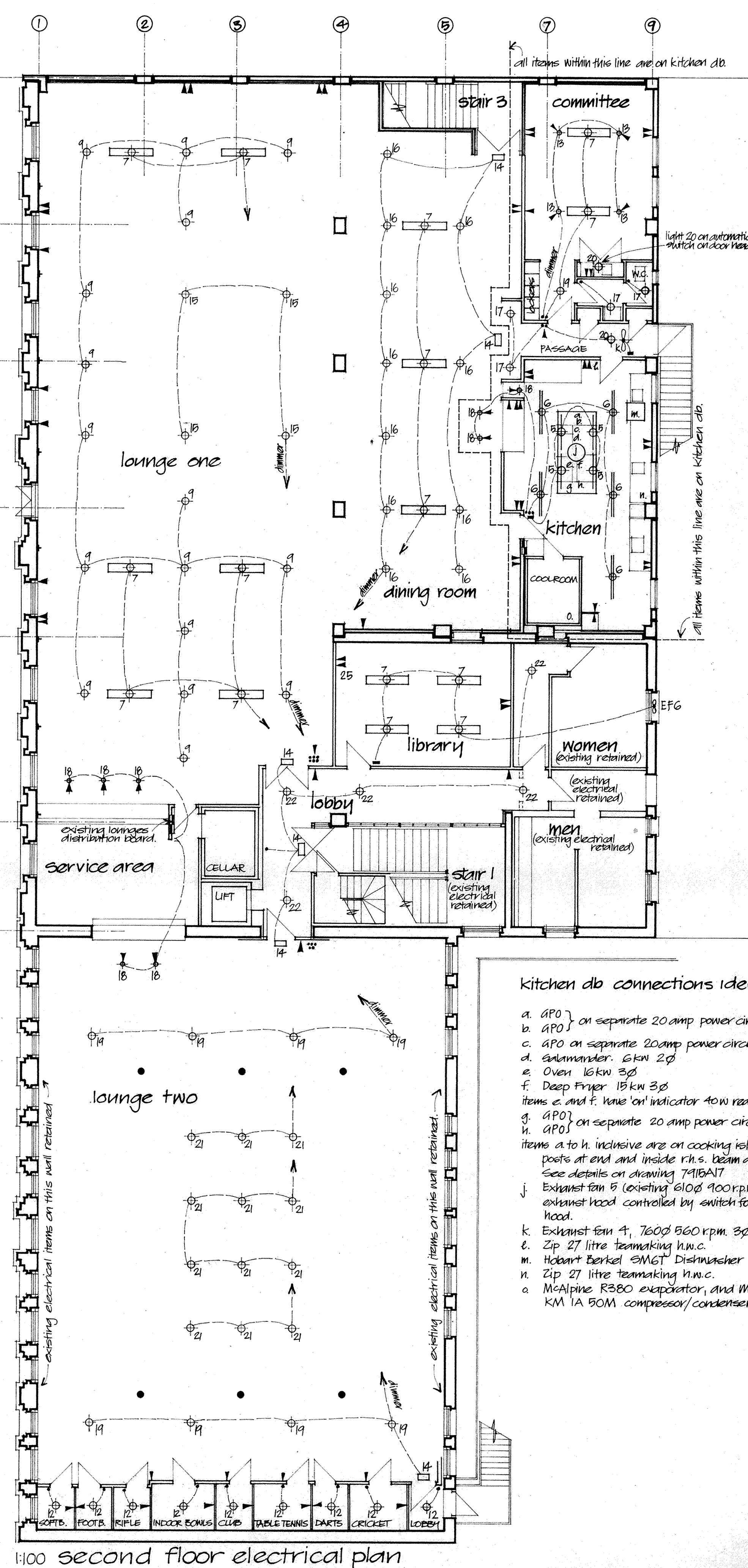
## plan symbols identification

Note that positions shown for electrical items are diagrammatic only. see note at left.

- Twin fluorescent fitting
- Single fluorescent fitting
- Twin fluorescent with diffuser fitting
- Incandescent pendant or ceiling surface fitting
- Adjustable spot or floodlight fitting
- Dual supply exit light fitting
- (ES) incandescent weatherproof fitting
- Exhaust fan
- Exhaust fan control
- Distribution Board.
- Meters for billiards tables lights control
- Lights linking and switching (Black Ringrip 21000)
- Single GPO (Black Ringrip at 300 generally)
- Twin GPO ditto.

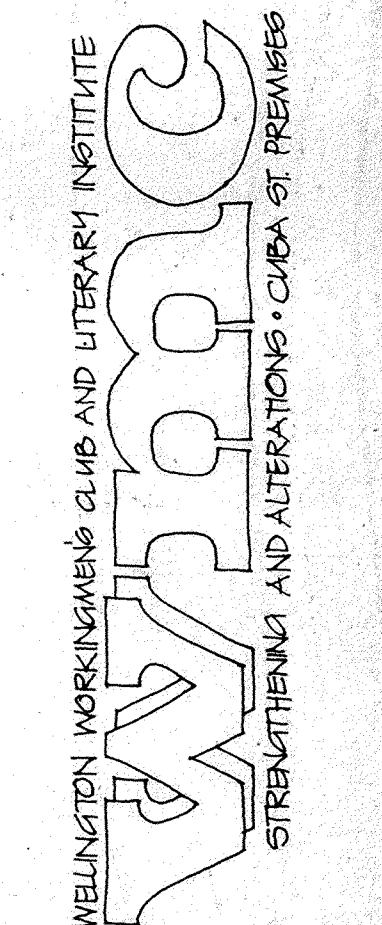
## kitchen db connections identification

- a. GPO on separate 20 amp power circuit
- b. GPO on separate 20 amp power circuit
- c. GPO on separate 20 amp power circuit
- d. Salamander. 6kw 20
- e. Oven 16kw 30
- f. Deep Fryer 15kw 30
- items e. and f. have 'on' indicator 40w rad lights on hood.
- g. GPO on separate 20 amp power circuit.
- h. GPO on separate 20 amp power circuit.
- items a to h. inclusive are on cooking island wired down posts at end and inside r.h.s. beam across centre. See details on drawing 741B/AT
- i. Exhaust fan 5 (existing 600 900r.p.m.) in duct over exhaust hood controlled by switch for lights inside hood.
- k. Exhaust fan 4, 7600 560 r.p.m. 30 in framed duct
- l. Zip 27 litre teamaking m.w.c.
- m. Hobart Berkel SMT Dishwasher
- n. Zip 27 litre teamaking m.w.c.
- a. McAlpine R380 evaporator, and McAlpine KM 1A 50M compressor/condenser on roof over.



Note: Positions shown for electrical items are diagrammatic only. See note at left.

check all component dimensions on site before fabrication



IAN G. SMITH CONSULTANTS ENGINEERS • WELLINGTON

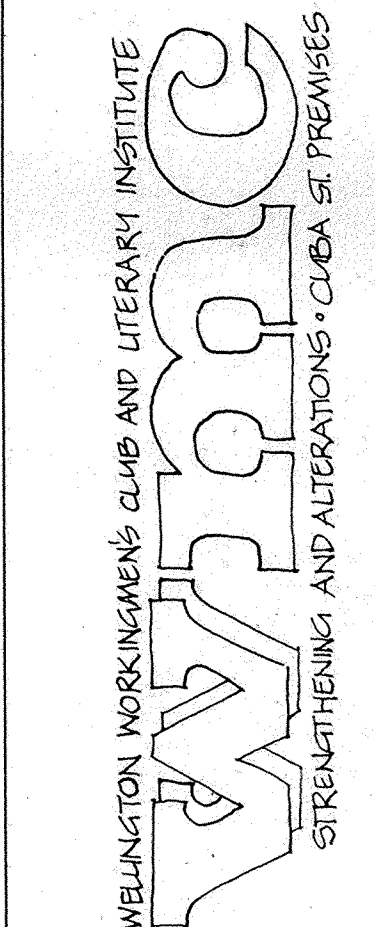
keith wilson architect wellington

box 12821 wellington phone 785628

ELECTRICS SEE ALSO DWG 7915A/3

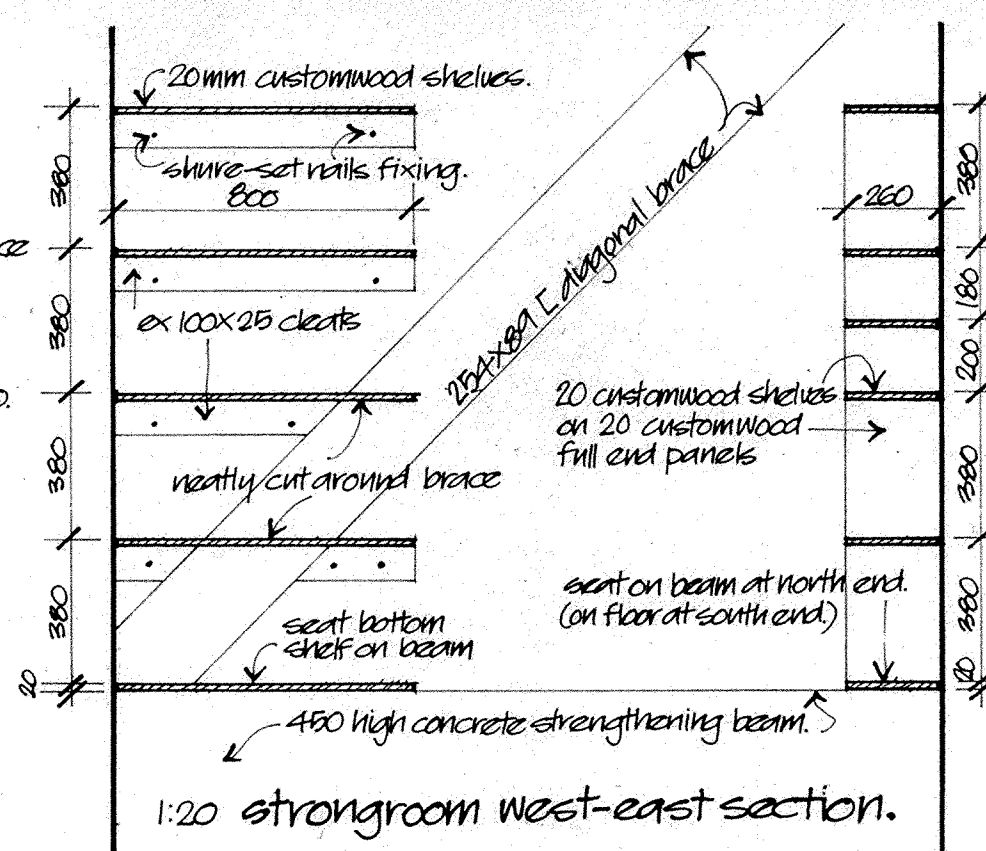
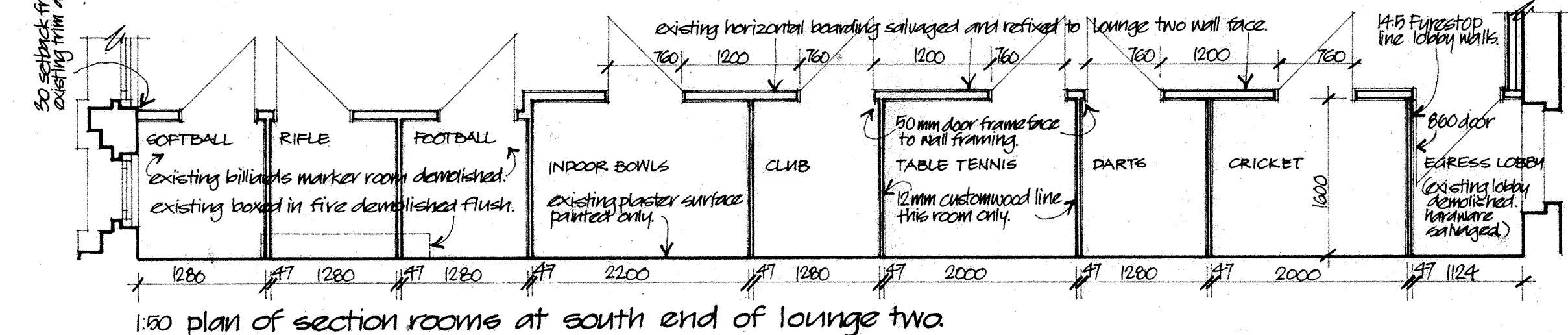
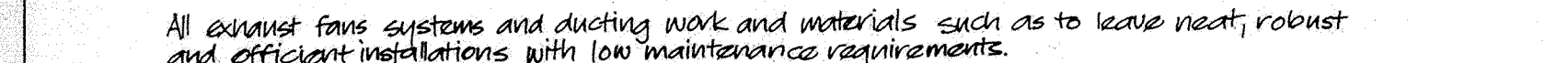
7915A/4





keith wilson  
architect  
wellington

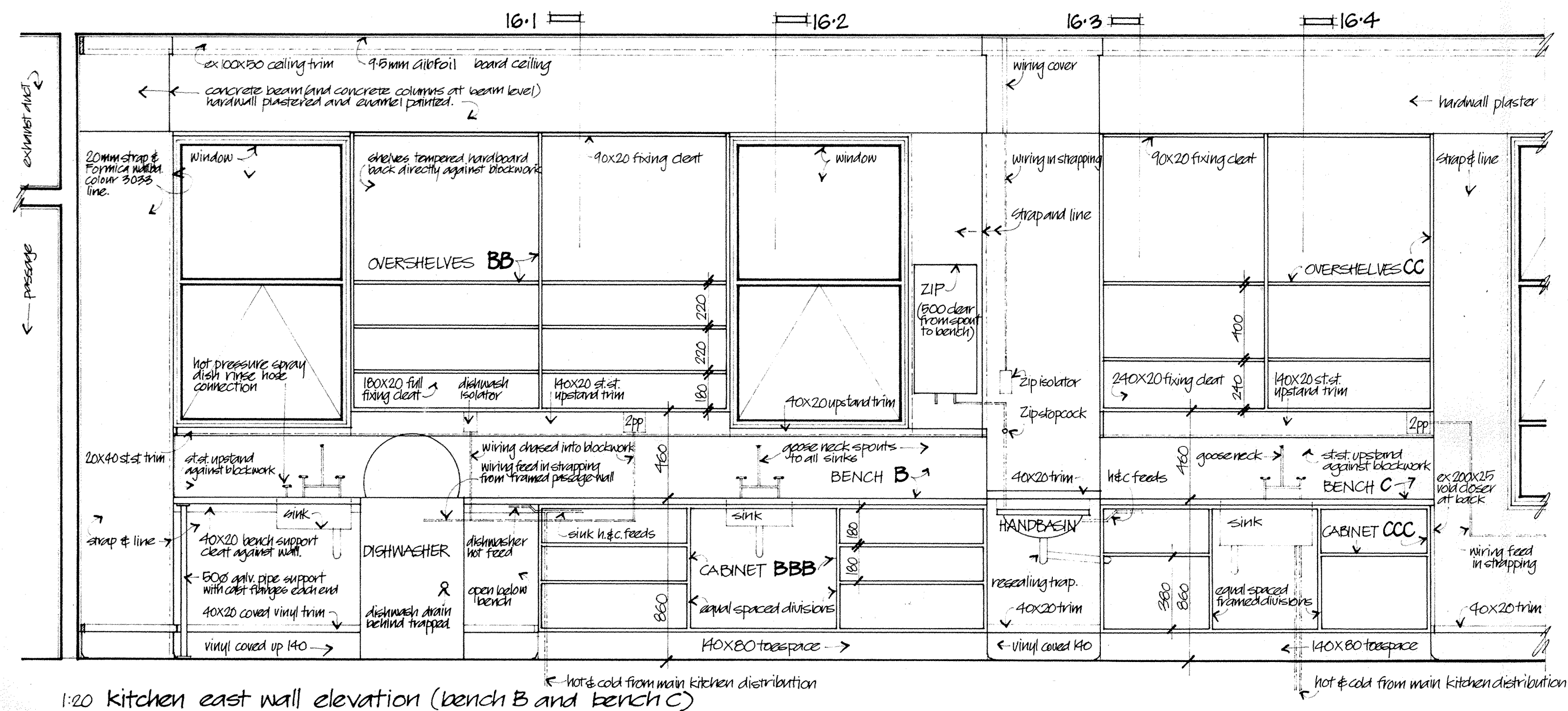
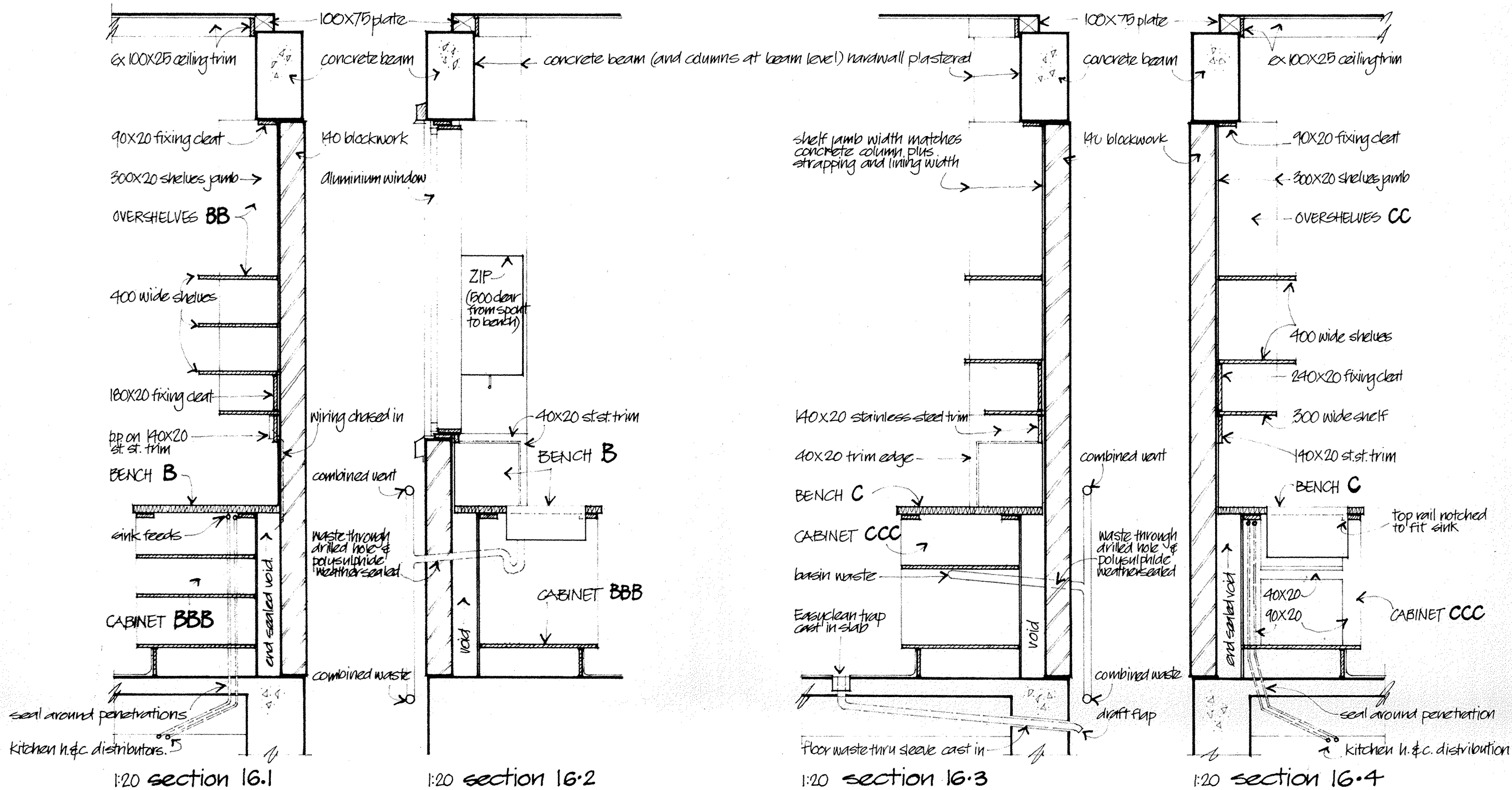
OFFICE-RECEPTION  
POST MIX CIPD  
SECTION ROOMS  
EXHAUST FANS



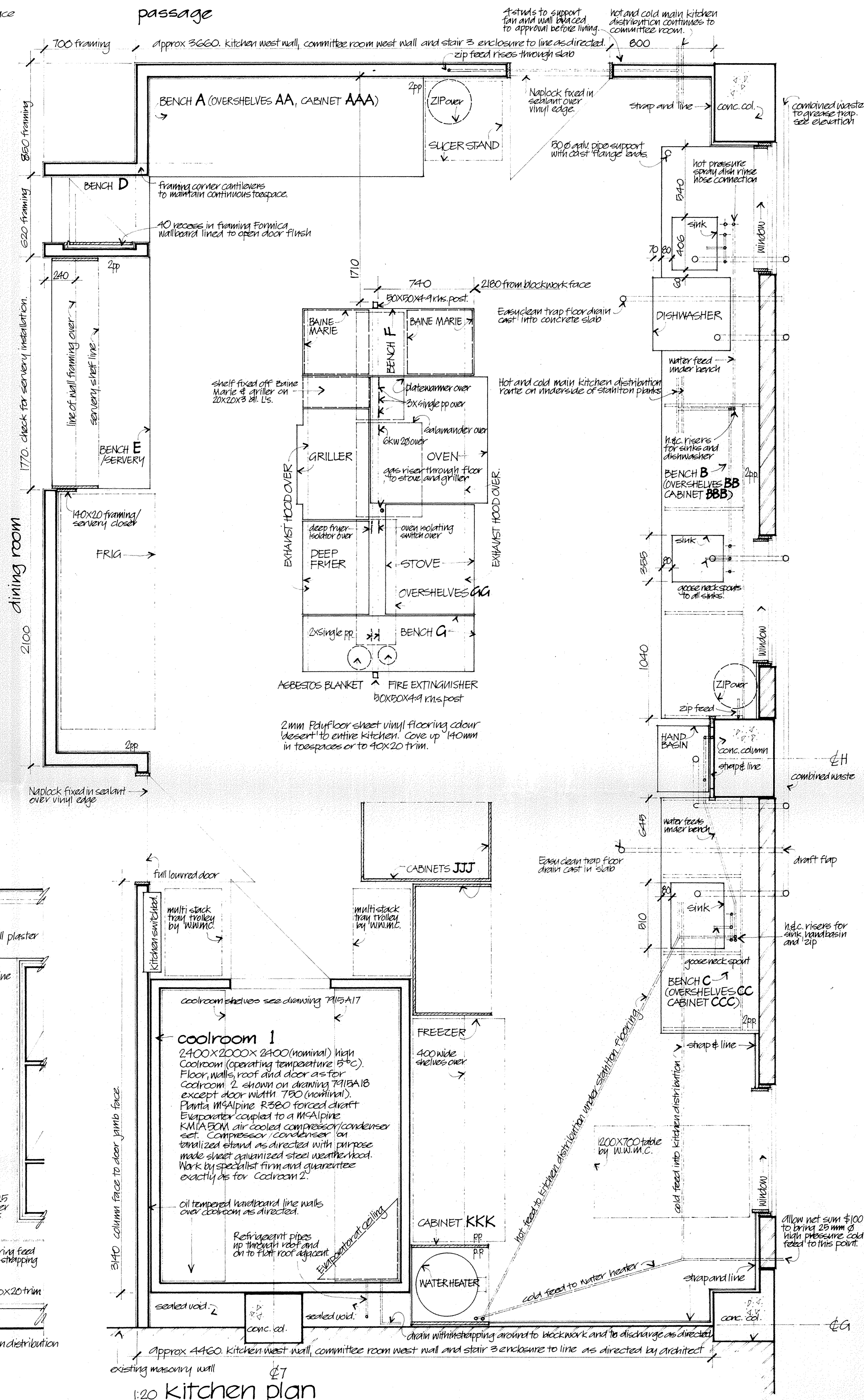


# kitchen fixtures schedule:

BENCH A stainless steel 2100X780 level full surface with domestic spillage lips to free edges.  
 BENCH B stainless steel 4360X780 with 388X406X175 hinge sink, 355X406X180 prep sink and tray guides and cutout for Hobart Bench SMT dishwasher, positioned as shown, level full surface except for localized falls to sinks. Domestic spillage lips to free edges.  
 BENCH C stainless steel 1800X780 with 510X406X255 sink central and 80 mm back from front edge. 20X20 square spillage lips and even falls to sink.  
 BENCH D 745X approx 800 Laminex 'chocolate' laminated top and two facing edges. 20 mm customwood.  
 BENCH E 745X1785 existing laminate service counter with sliding hatch, warmer lights etc to be installed complete.  
 BENCH F 800X1320 Formica 'polar white' laminated 5 surfaces top on 480X1280X580 high frame as drawn from 25.4X25.4X3.2 r.h.s black painted tube with a 500X1228 white laminated shelf at 220 to top.  
 BENCH G 420X1320 Formica 'polar white' laminated 5 surfaces top on 400X1280X880 high frame as drawn from 25.4X25.4X3.2 r.h.s black painted tube with two 420X1228 shelves at 220 and 640 high to tops.  
 All bench undersides (pinex, timber, customwood) sealed, undercoated and white enamel prefinished before fixing.  
 OVERSHELVES AA 800X2100 wide. OVERSHELVES BB 1800X approx 2040 wide. OVERSHELVES CC 1800X1800 wide.  
 Overshelves AA, BB, and CC have 400 wide shelves and 300 wide bottom shelves and jamps (excepting left end CC where jamb matches column plus strapping and lining width). From 20 mm customwood with shelf top surfaces and working edges Formica 'polar white' laminated, 6 mm tempered hardboard backs, and fixing cleats as noted.  
 OVERSHELF FF 1600X370 (for 790 length) and X810, from 20 mm customwood Formica 'polar white' laminated ALL surfaces.  
 OVERSHELVES GG 940X300X538 high with two shelves adjustable through 300 mm on Disco slotted shipping. All from 20 mm customwood Formica 'polar white' laminated tops and working edges.  
 CABINET AAA 2080 long. CABINET BBB 2400 long. CABINET CCC 1780 long.  
 CABINETS AAA, BBB, and CCC all 600 deep X 820 high including toe-space with shelf tops and working edges Formica 'polar white' laminated, 12.5 mm customwood backs. Cabinets AAA & BBB have full solid divisions, CCC has framed internal divisions as noted.  
 CABINET DDD 500 approx long X 860 deep X 940 high including toe-space with two 100 deep internal drawers, otherwise as for cabinets above.  
 Backs to all overshelves and cabinets described above shall be only lightly fixed in shop for removal for sealing, undercoating and twice enamel topcoating before tightly final fixing.  
 CABINETS JJJ 1000X600X2400 high fully formed from 20 mm customwood.  
 CABINET KKK 600X600X2400 high including toe-space fully formed from 20 mm customwood.



## passage



Note: pipe runs shown are diagrammatic only but architect must approve any significant variation from general layout shown.

check all component dimensions on site before fabrication

WELINGTON WORKINGMEN'S CLUB AND LITERARY INSTITUTE  
 STRENGTHENING AND ALTERATIONS • CHAS. ST. PRENSSES

IAN C. SMITH CONSULTANTS  
 ENGINEERS • WELLINGTON

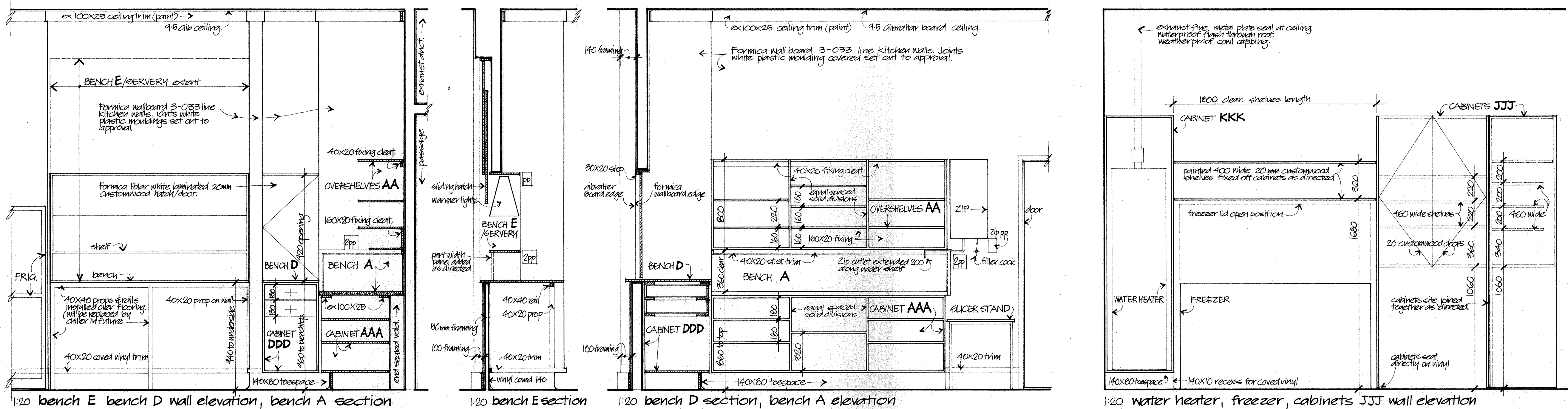
keth wilson  
 architect  
 wellington

box 12321 wellington  
 phone 735633

KITCHEN PLAN &  
 FITTINGS SCHEDULE

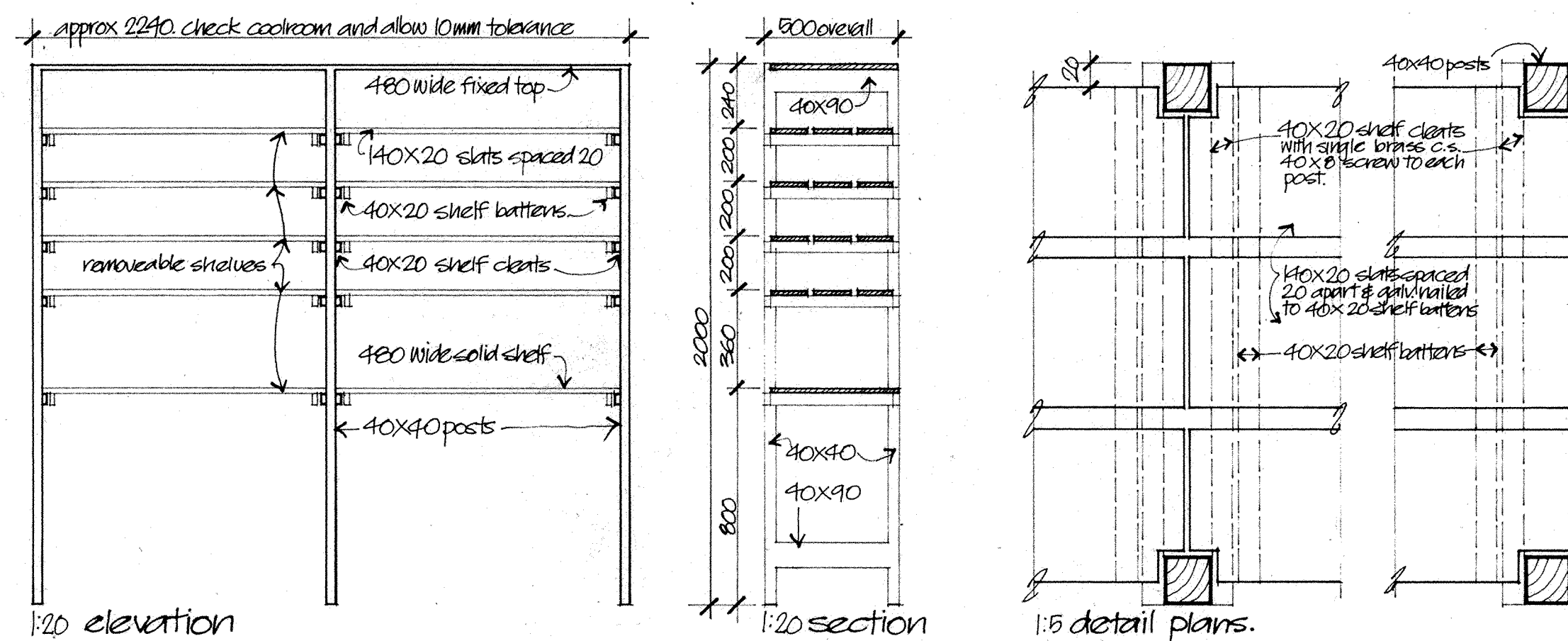
7915A16





The drawings show a kitchen island with the following details:

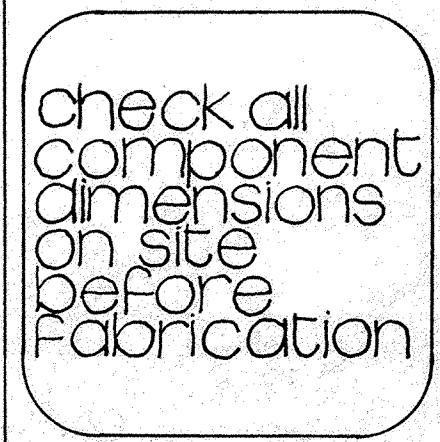
- North Elevation:** Features an exhaust hood, dishwarmer, salamander, overshelves, and a grill. Dimensions include 2160 between r.h.s. posts and 10mm fixing tolerance.
- West Elevation:** Shows the island's profile with a height of 1260. Includes a grill, deep fryer, and benches. Notes specify a wood block to deepen r.h.s. for egg cutters and a laminated custom wood shelf.
- Section at Baine Marie:** A cross-section showing the island's width and internal structure. Notes include "oven kept" and "25x25x32 r.h.s. painted black".
- Section at Fryer:** Another cross-section showing the island's width and internal structure. Notes include "wood filters, lights etc. reinstalled completely" and "top shelf 28x8 gauge p.k. screw fixed to r.h.s."
- South Elevation:** Shows the island's profile with a height of 1260. Includes a grill, deep fryer, and benches. Notes specify a wood block to deepen r.h.s. for large cutters and a laminated top & shelf.
- East Elevation:** Shows the island's profile with a height of 1260. Includes a grill, deep fryer, and benches. Notes specify a wood block to deepen r.h.s. for large cutters and a laminated top & shelf.



(Dirty dish trolleys (Steelport utility 762X457X914 high) and multi stack tray trolleys (Calverts 560X660X1826 high) all by W.W.M.C.)

7915A17





IAN C. SMITH CONSULTANTS  
ENGINEERS • WELLINGTON

box 12321 wellington  
phone 735633

7915A18





