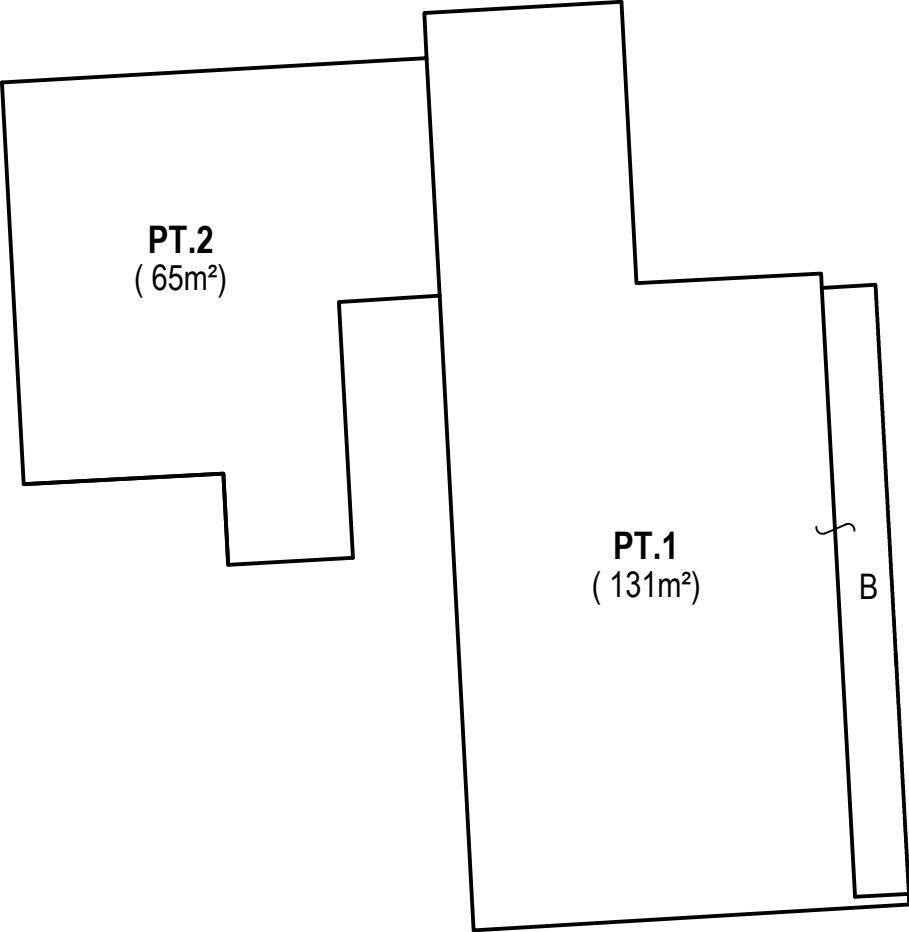


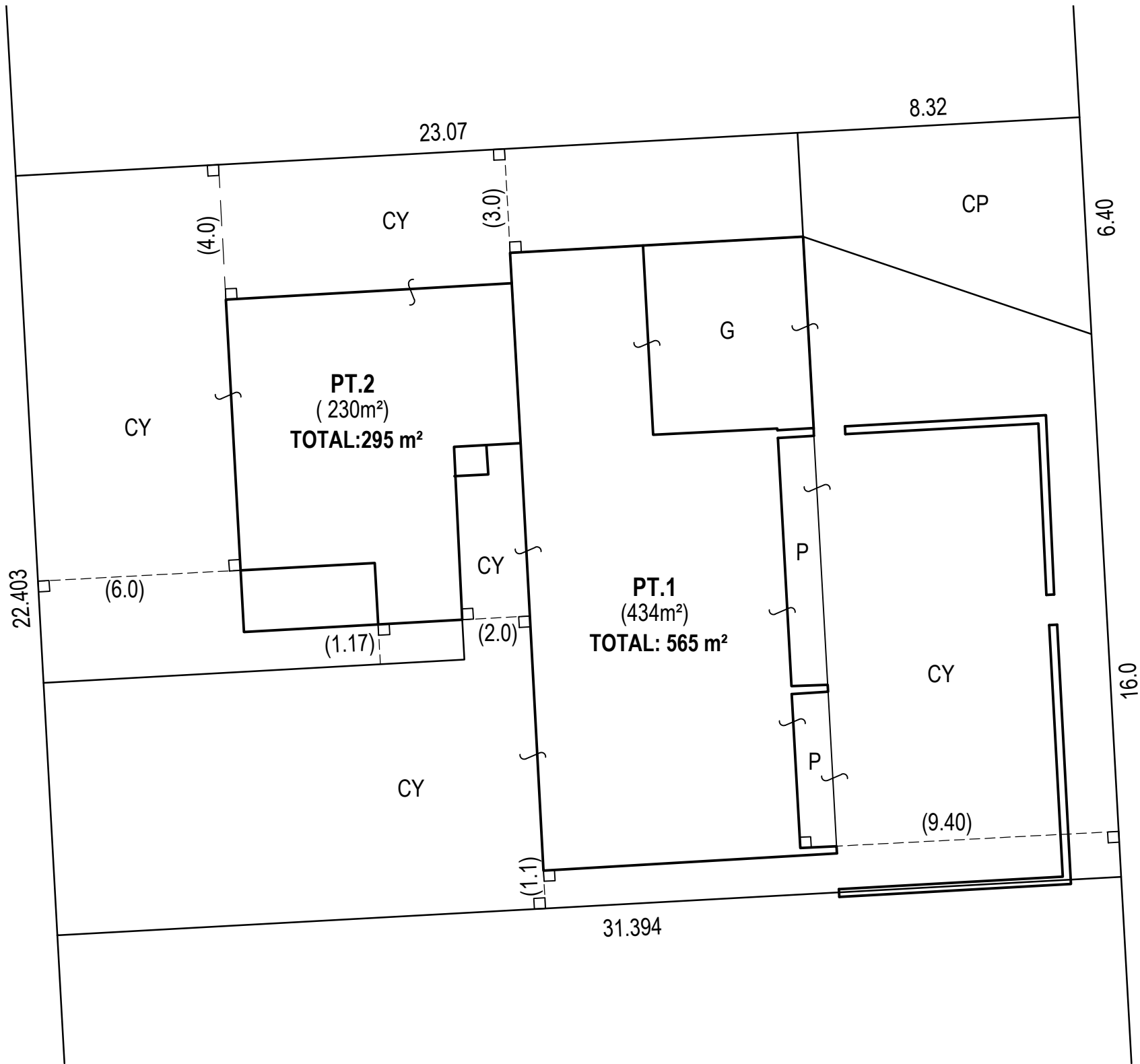


NOTES:

B – DENOTES BALCONY,HAVING A CONCRETE FLOOR AND LIMITED IN HEIGHT TO 3M ABOVE THE UPPER SURFACE OF THEIR RESPECTIVE FLOOR, EXCEPT WHERE COVERED WITHIN THIS LIMIT.

FIRST FLOOR PLAN

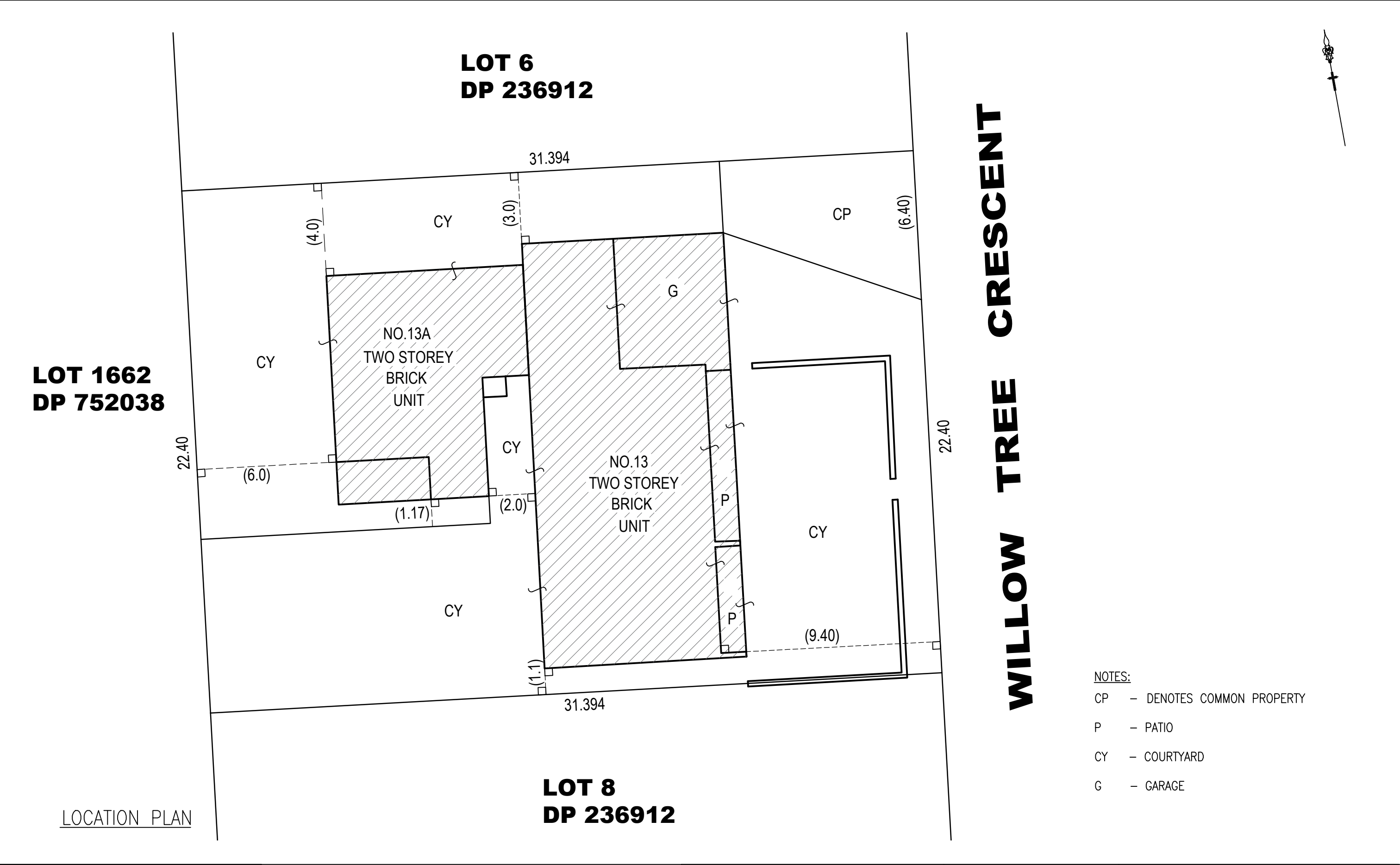
Surveyor Name : GEOFFREY FRANCIS GALLEN Date : 20/01/2021 Reference : 20/2774 SP	PLAN OF SUBDIVISION OF LOT 7 DP236912	L.G.A.: NORTHERN BEACHES Locality: BELROSE Reduction Ratio:1:150 Lengths are in metres.	REGISTERED DRAFT–ISSUE–2	SP
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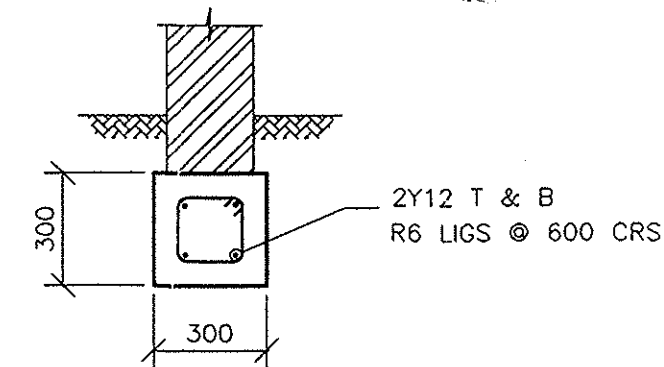
GROUND FLOOR PLAN

- NOTES:
- CY - DENOTES COURTYARD, LIMITED IN HEIGHT 2.5M BELOW TO 3M ABOVE THE UPPER SURFACE OF THE GROUND FLOOR OF THE RESPECTIVE DWELLING, EXCEPT WHERE COVERED WITHIN THIS LIMIT.
 - P - DENOTES PORCH, HAVING A CONCRETE FLOOR AND LIMITED IN HEIGHT TO 3M ABOVE THE UPPER SURFACE OF THEIR CONCRETE FLOOR, EXCEPT WHERE COVERED WITHIN THIS LIMIT.

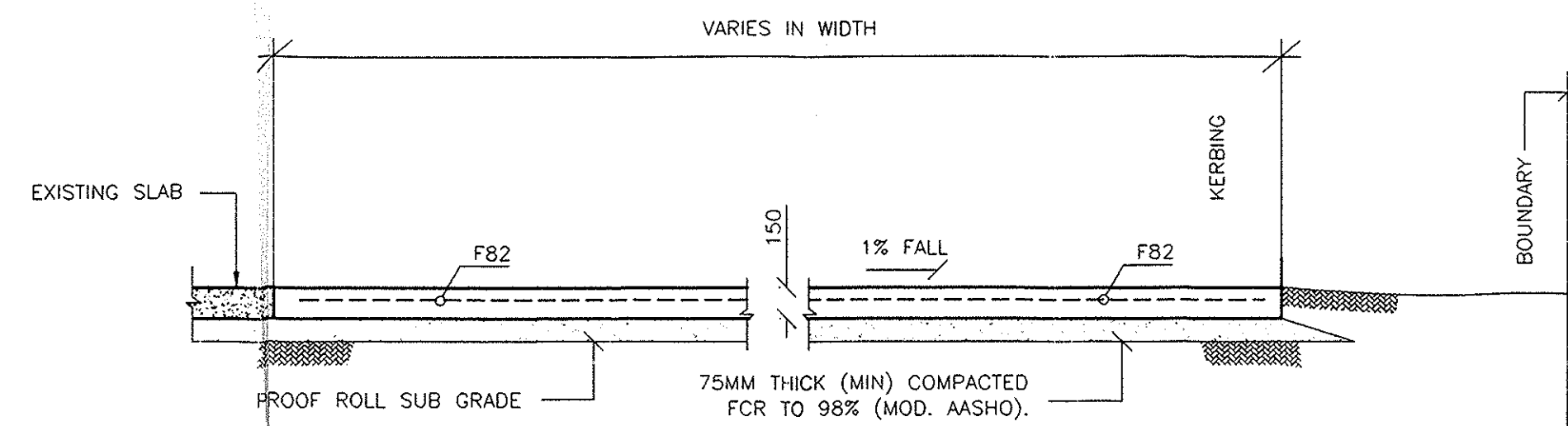
Surveyor Name : GEOFFREY FRANCIS GALLEN Date : 20/01/2021 Reference : 20/2774 SP	PLAN OF SUBDIVISION OF LOT 7 DP236912	L.G.A.: NORTHERN BEACHES Locality: BELROSE Reduction Ratio: 1:150 Lengths are in metres.	REGISTERED DRAFT-ISSUE-2	SP
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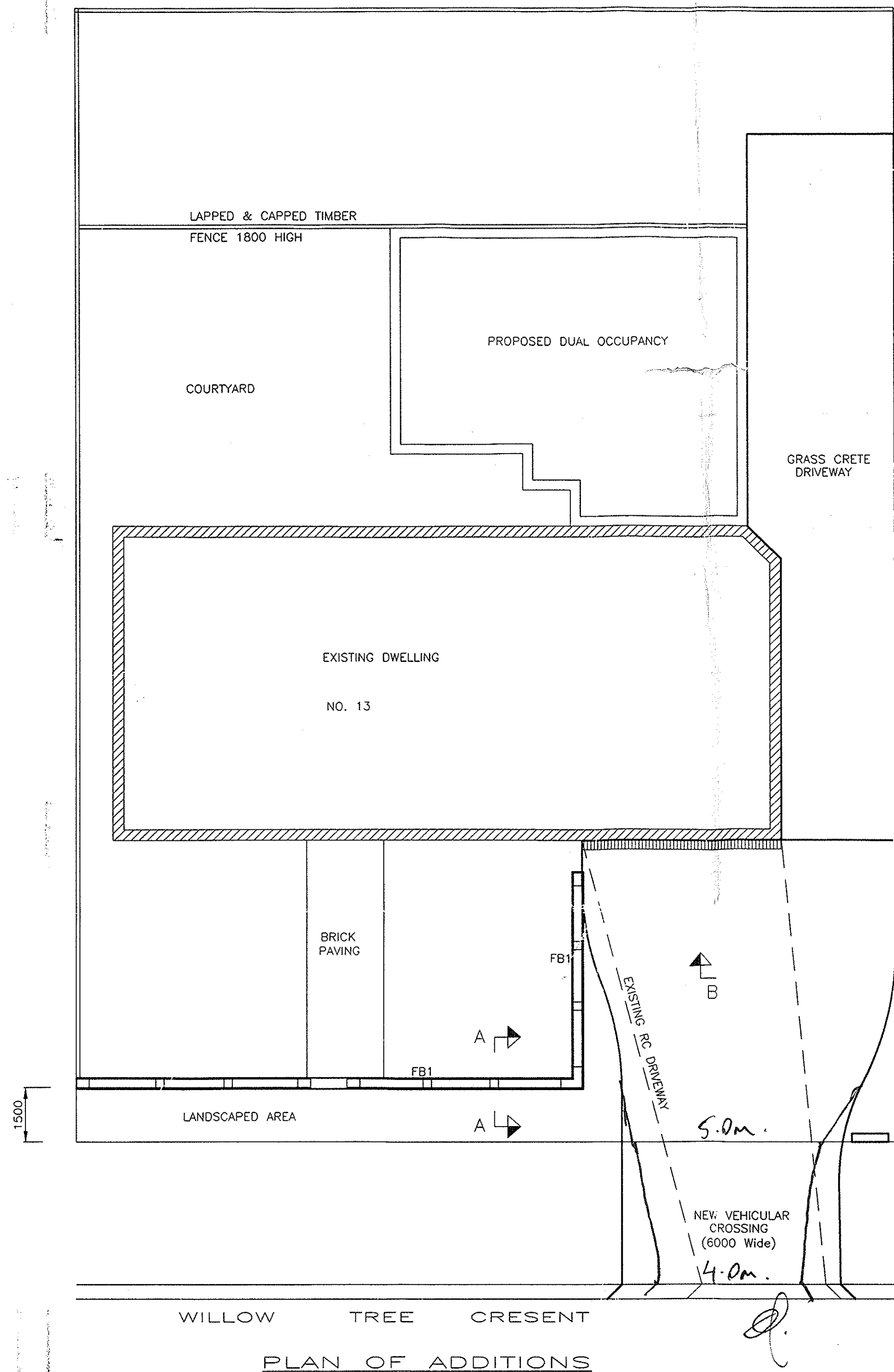
Surveyor Name : GEOFFREY FRANCIS GALLEN Date : 20/01/2021 Reference : 20/2774 SP	PLAN OF SUBDIVISION OF LOT 7 DP236912	L.G.A.: NORTHERN BEACHES Locality: BELROSE Reduction Ratio:1:150 Lengths are in metres.	REGISTERED DRAFT-ISSUE-2	SP
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SECTION A-A
1 : 20



SECTION B-B
1 : 20



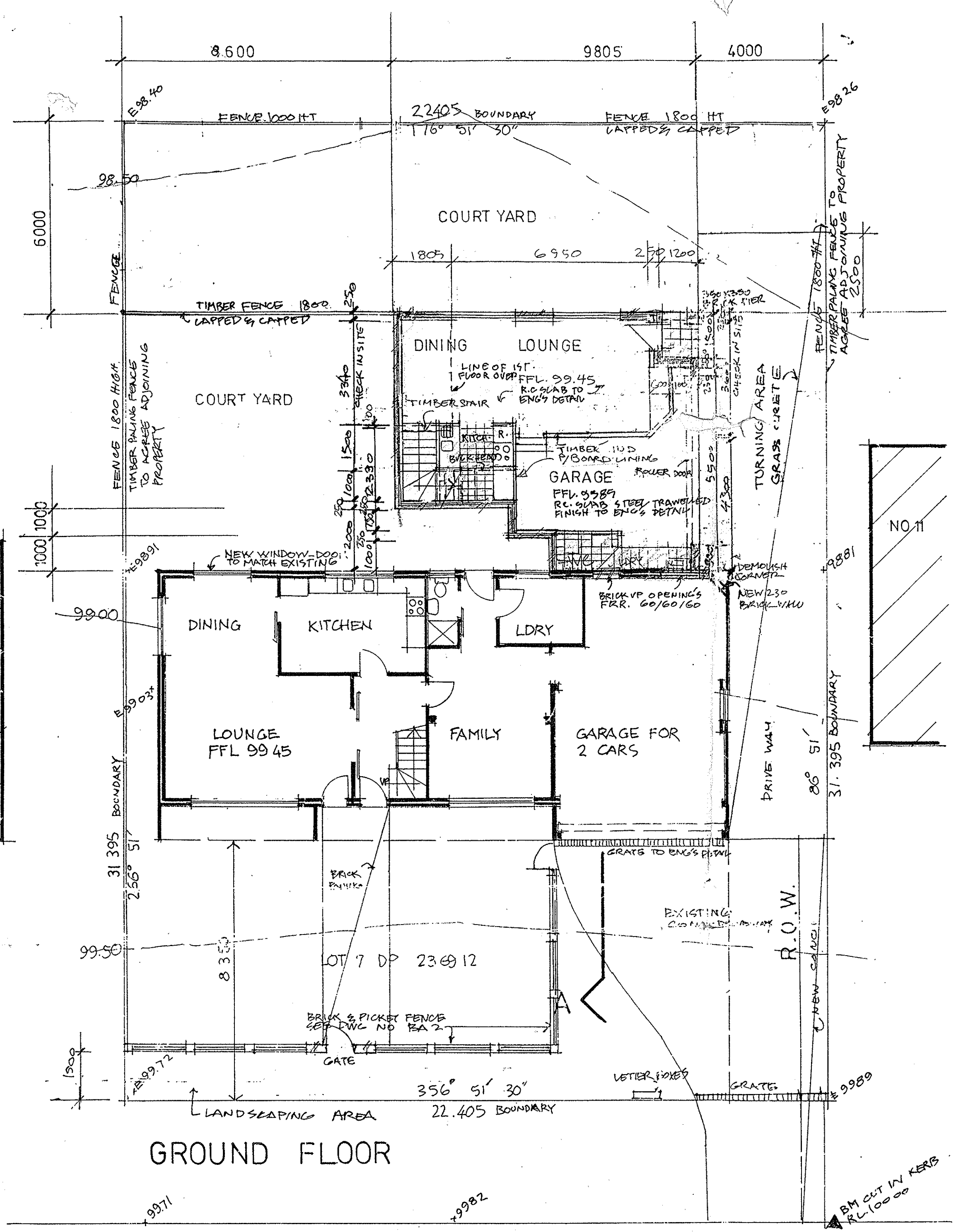
PLAN OF ADDITIONS
1:100

Registered Professional Engineer 19823+
Mr Edward A. Bennett
MIEAust CPEng
NPER
Signature: *[Signature]* Date: 18.9.98
Registered on the NPER in the Category of
Civil/Environmental/Structural/Geotechnical
National Professional Engineers Register

CIVIL & STRUCTURAL ENGINEERING
DESIGN SERVICES PTY. LTD. A.C.N. 051 307 852
CONSULTING STRUCTURAL, CIVIL, GEOTECHNICAL & ENVIRONMENTAL ENGINEERS
PH/FAX 61-02 9975 3899
MOBILE 04-14 75 3899
EMAIL hited@infonet.net.au

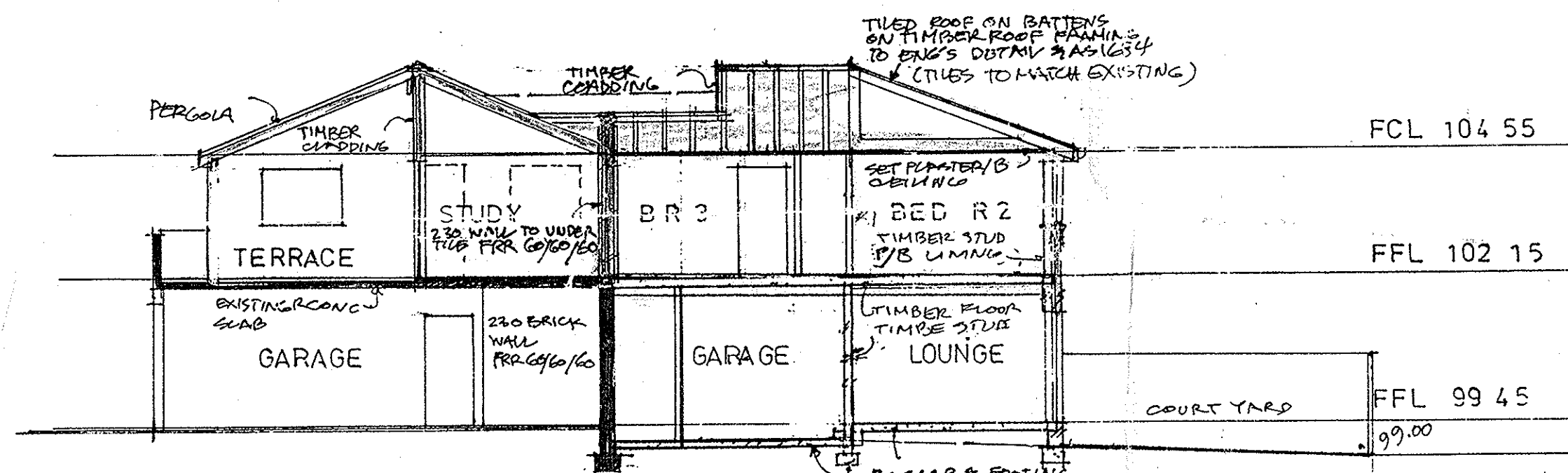
CLIENT: MR. & MRS. SHIRVANIAN
PROJECT: STRUCTURAL DETAILS AT
13 WILLOW TREE CRES BELROSE 2085

Drawn By: W.J. WALBURN	Scale: AS SHOWN
Checked By: E.A. BENNETT M.I.E. Aust.	Drawing No.: S-98-11209
Date: 17/9/98	

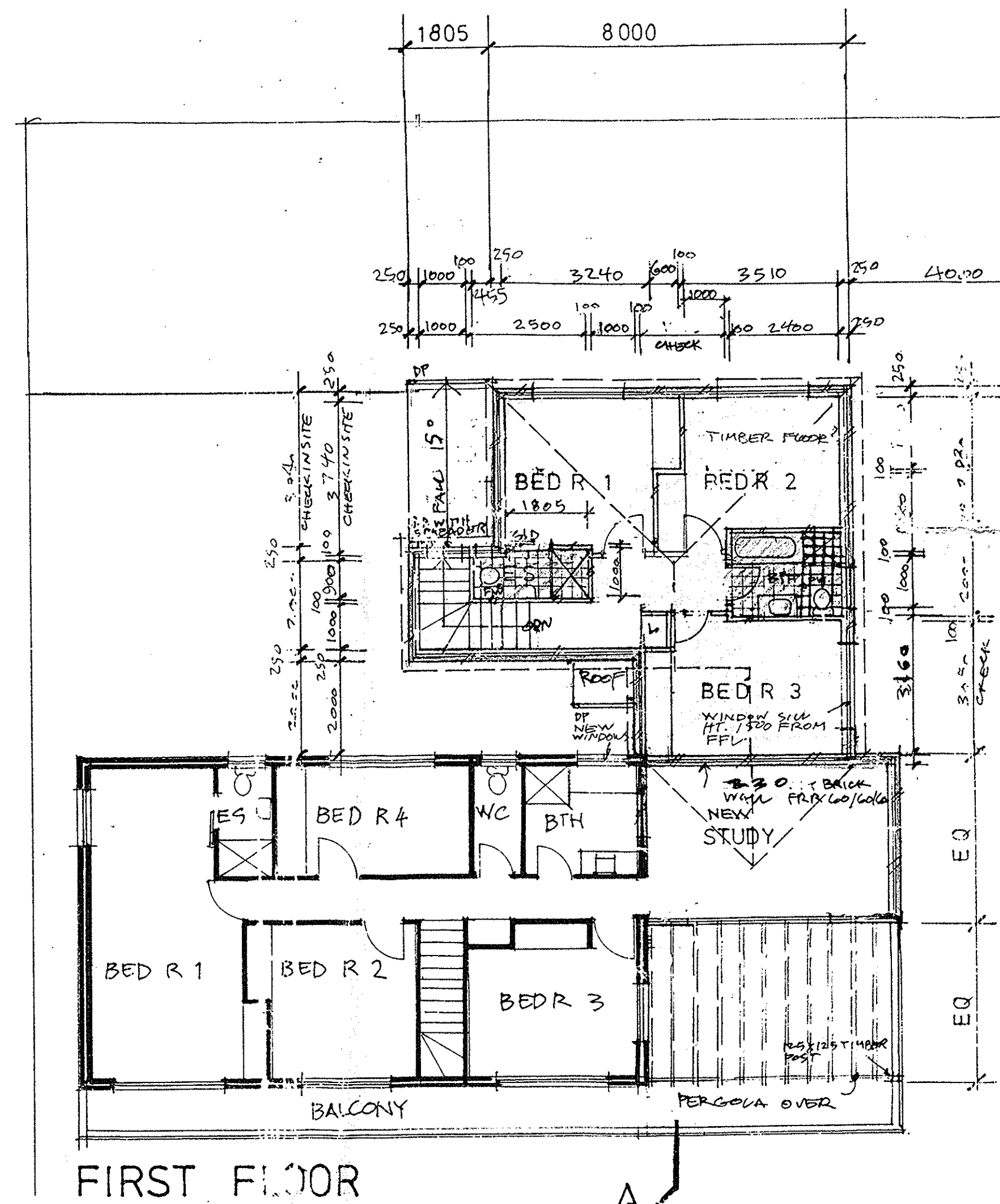


GROUND FLOOR

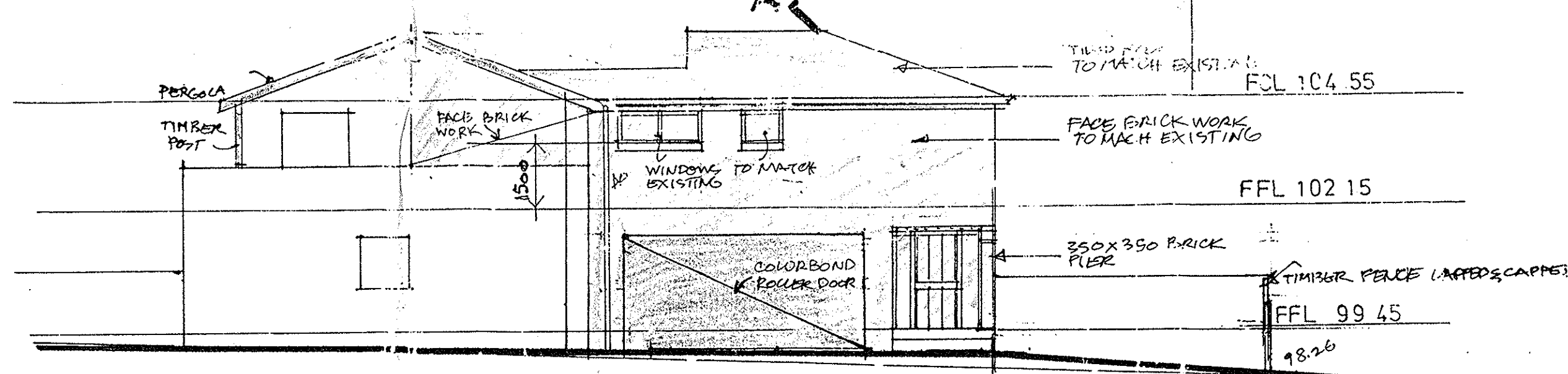
WILLOW TREE CR.



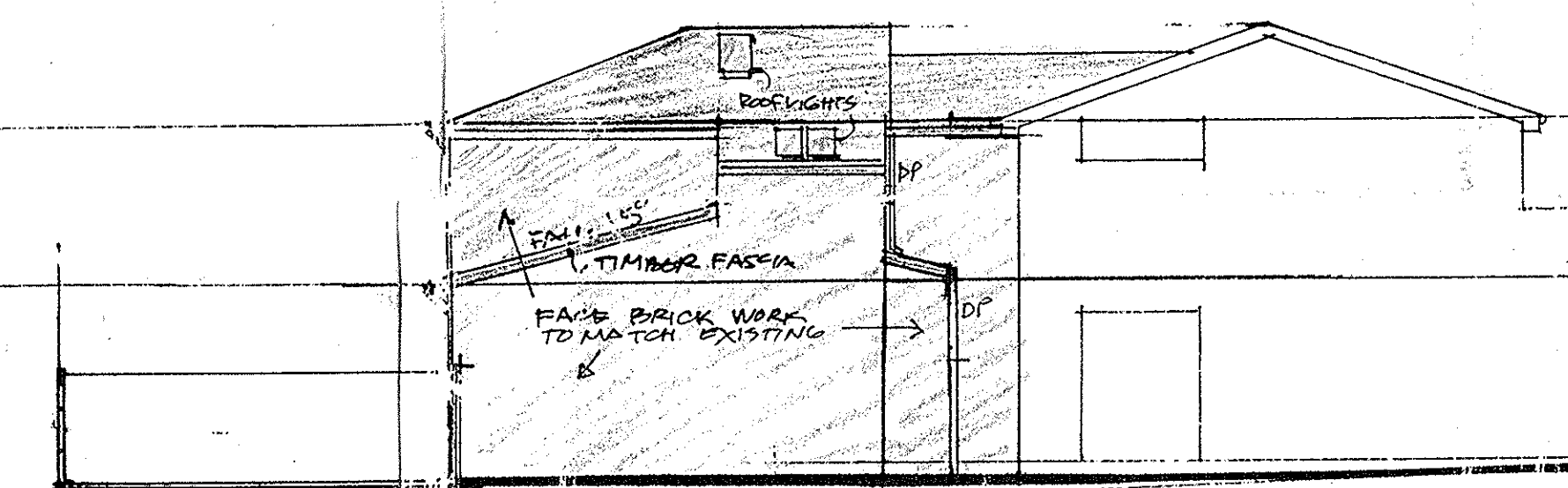
SECTION A



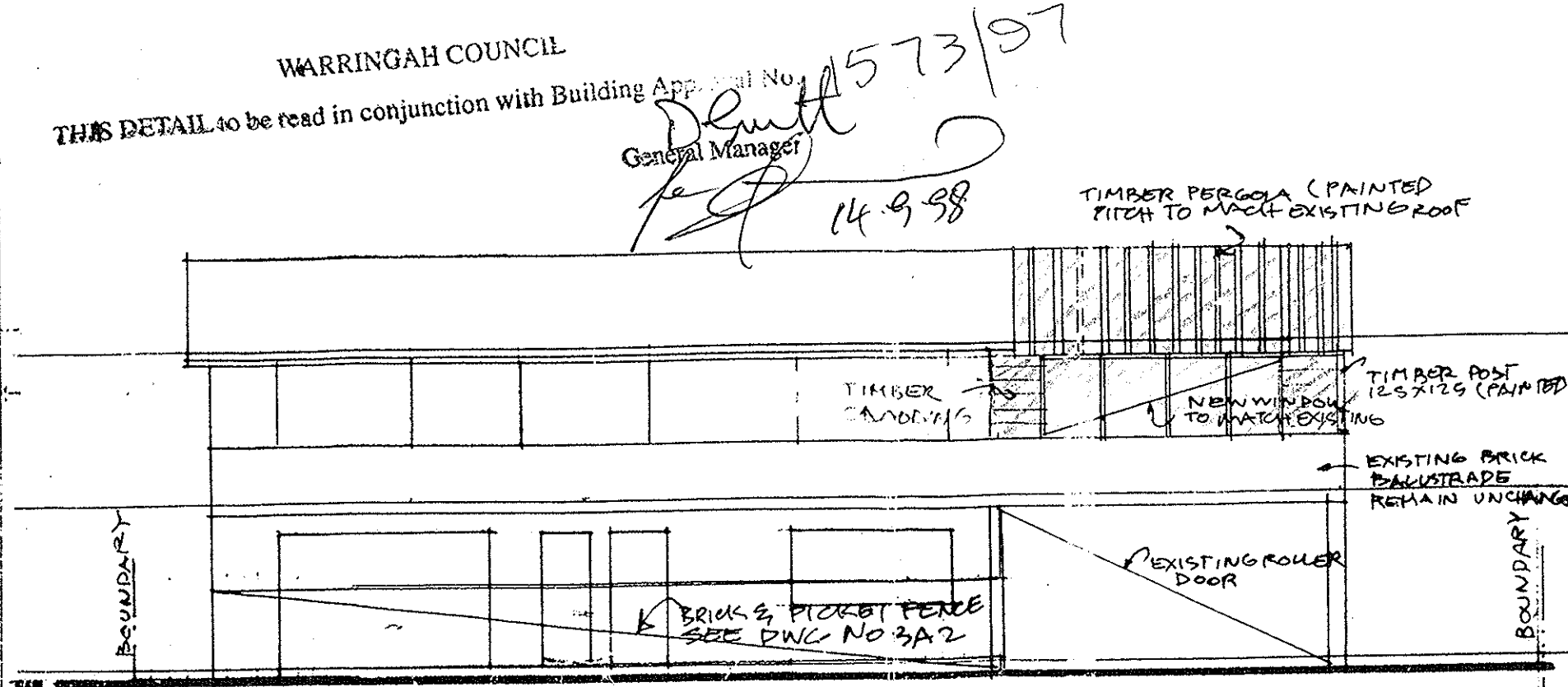
FIRST FLOOR



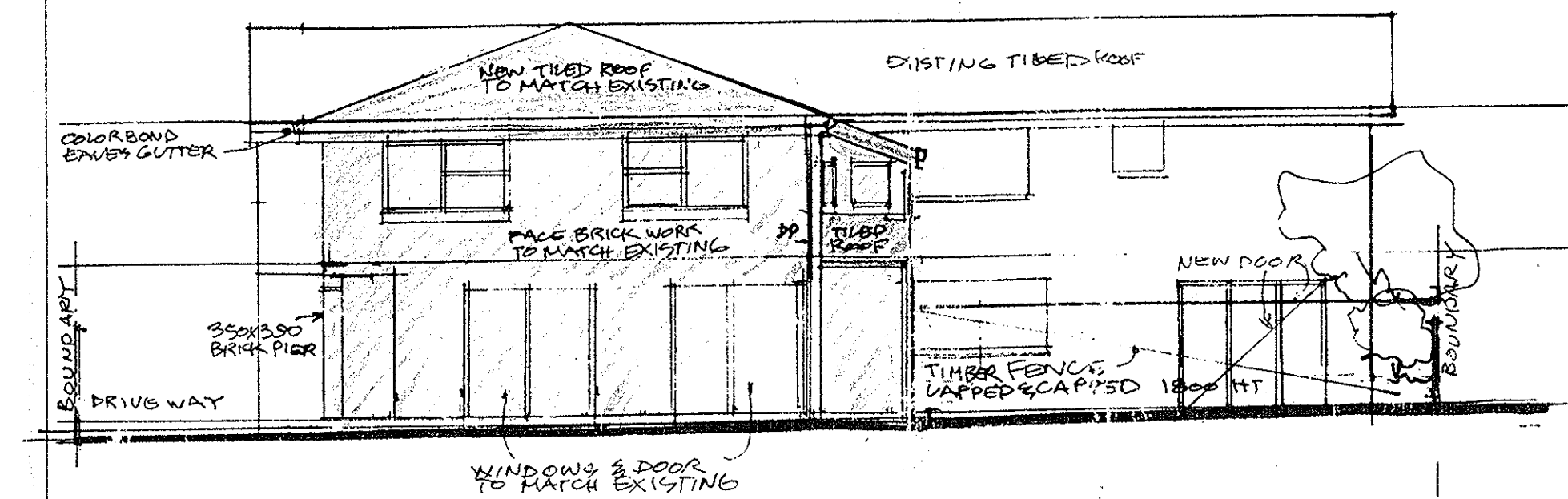
NORTH ELEVATION



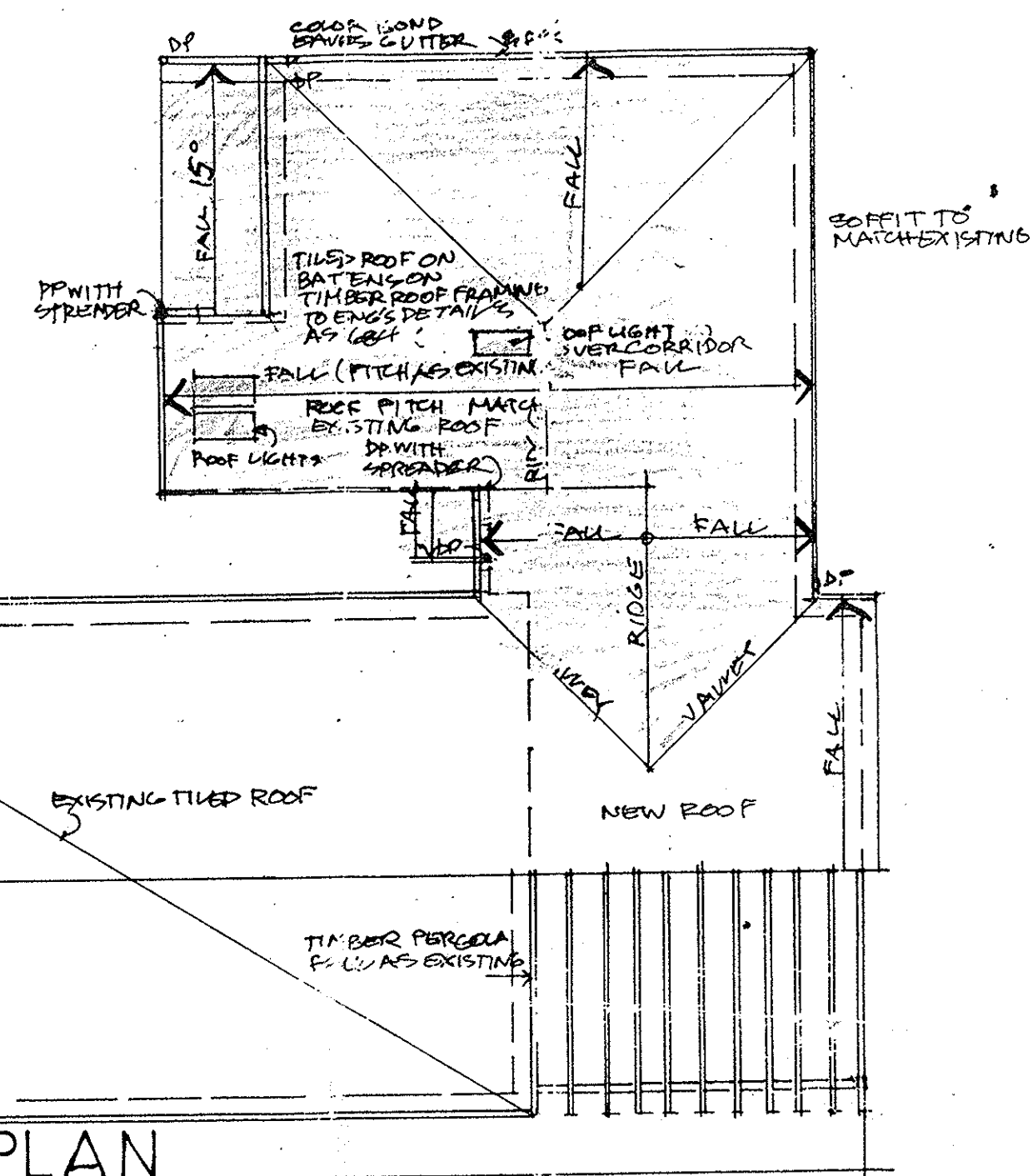
SOUTH ELEVATION



EAST ELEVATION



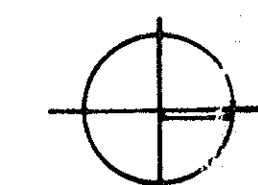
WEST ELEVATION



ROOF PLAN

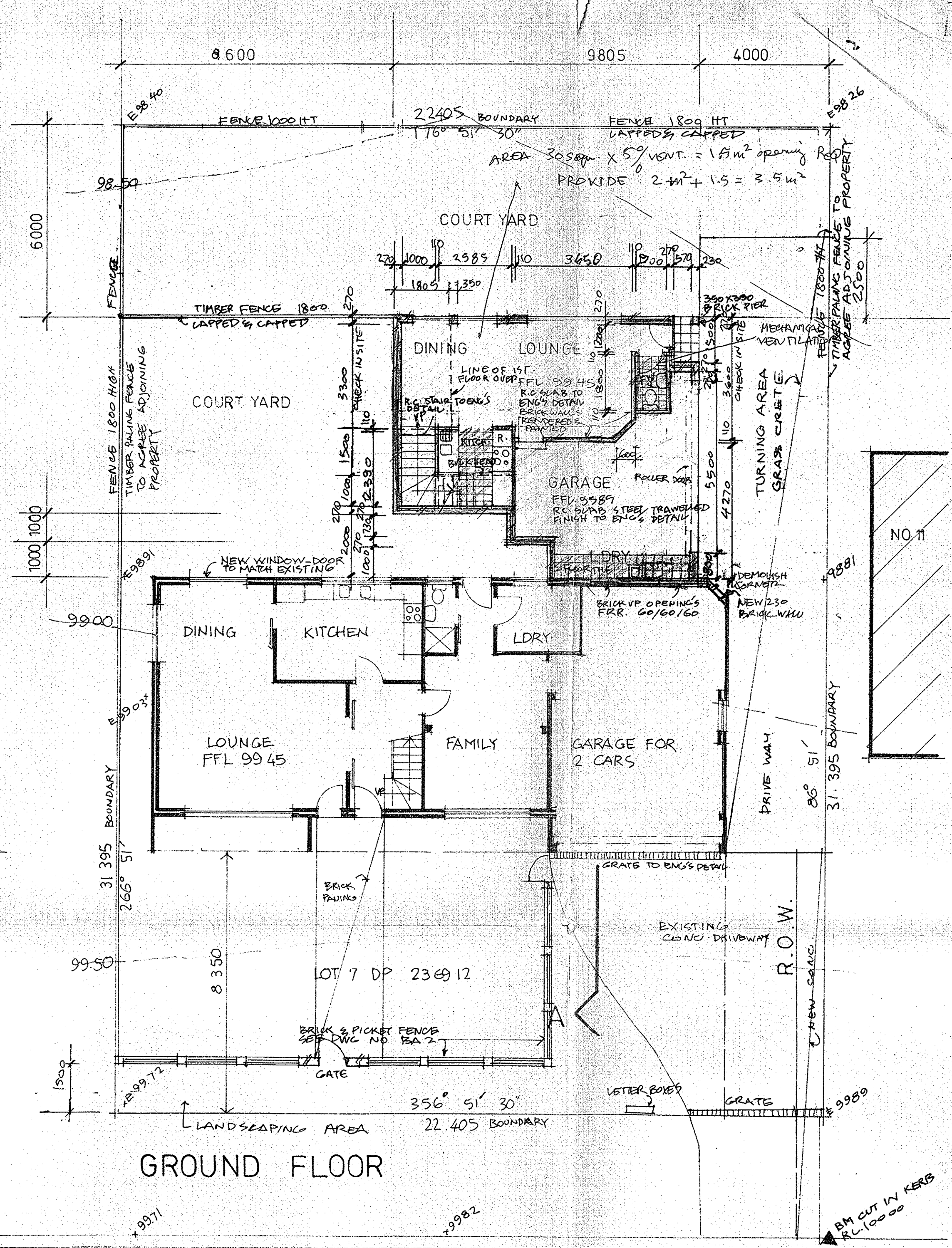
PROPOSED DUAL OCCUPANCY
AT NO 13 WILLOW TREE CR.
BELROSE

BA-1A

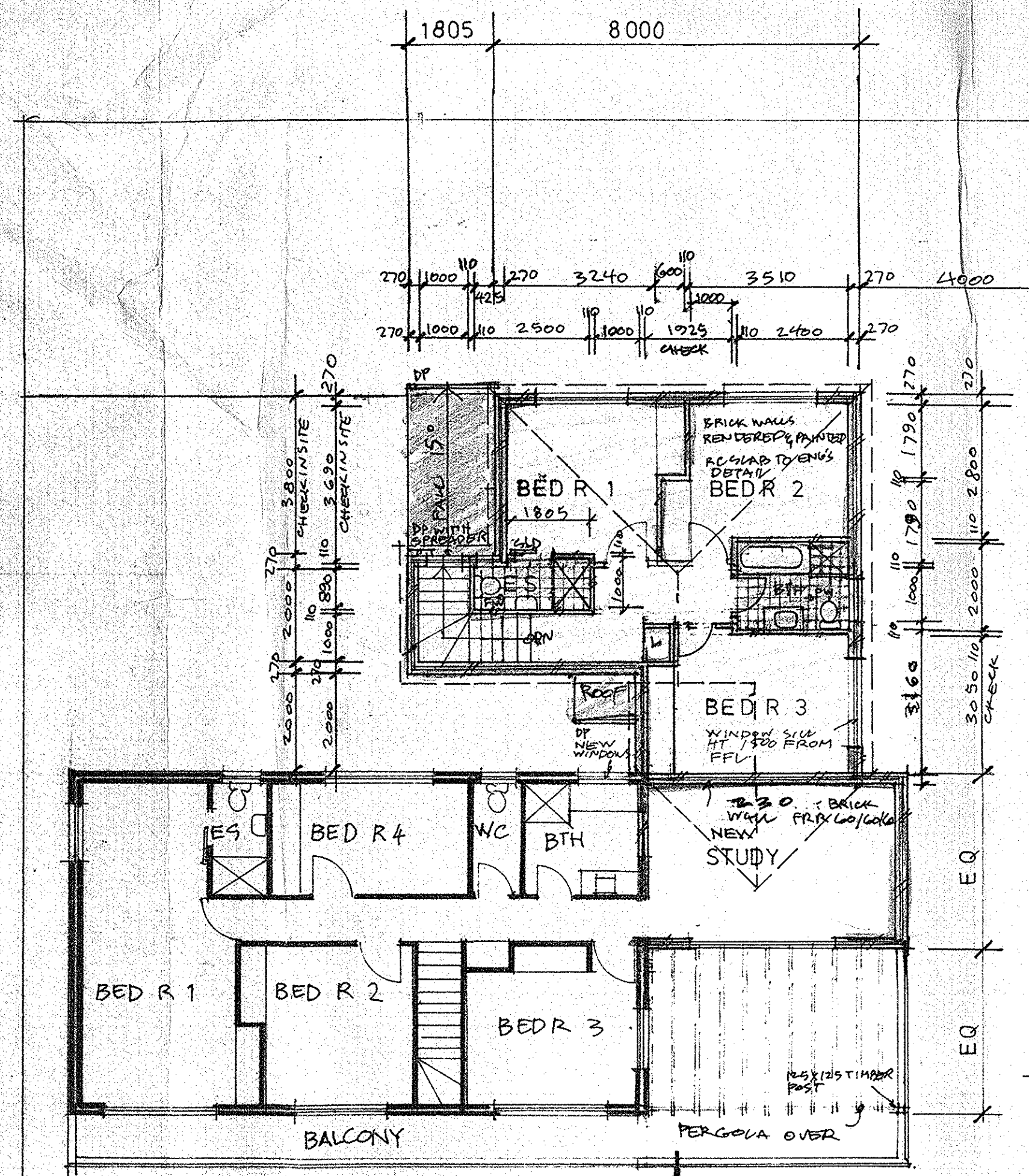


VAHAN PTY. LTD.
26 B HILMER ST.
FRENCH'S FOREST
TEL 014 622 051
DATE MARCH 97
SCALE 1:100

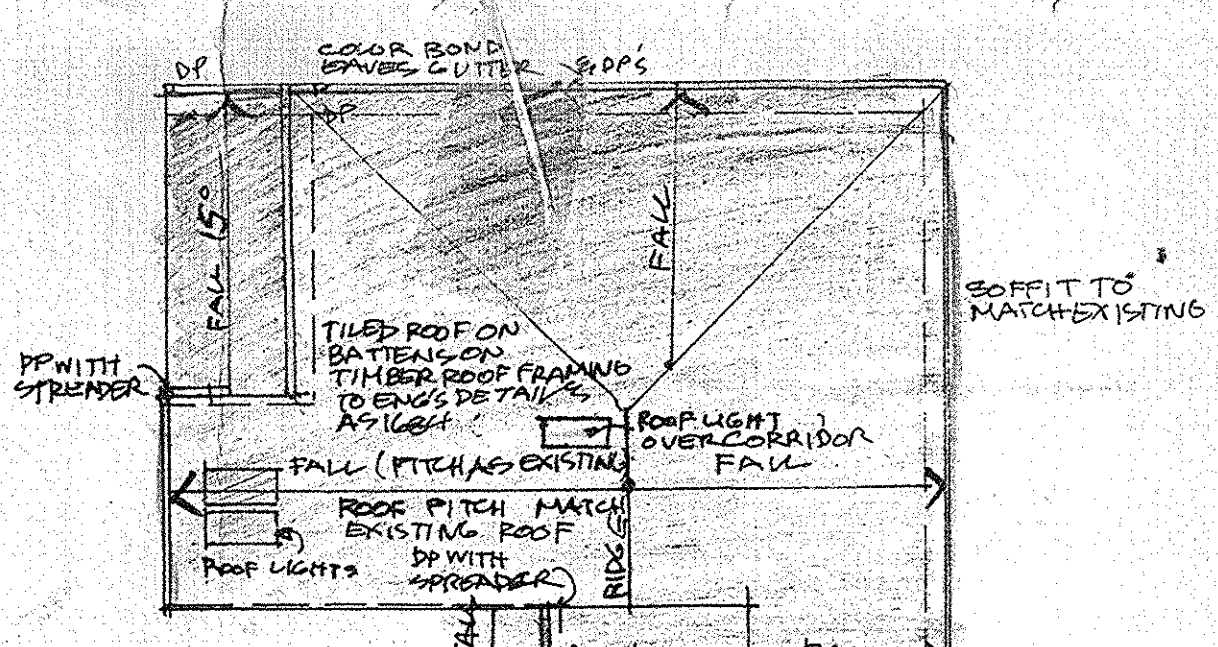
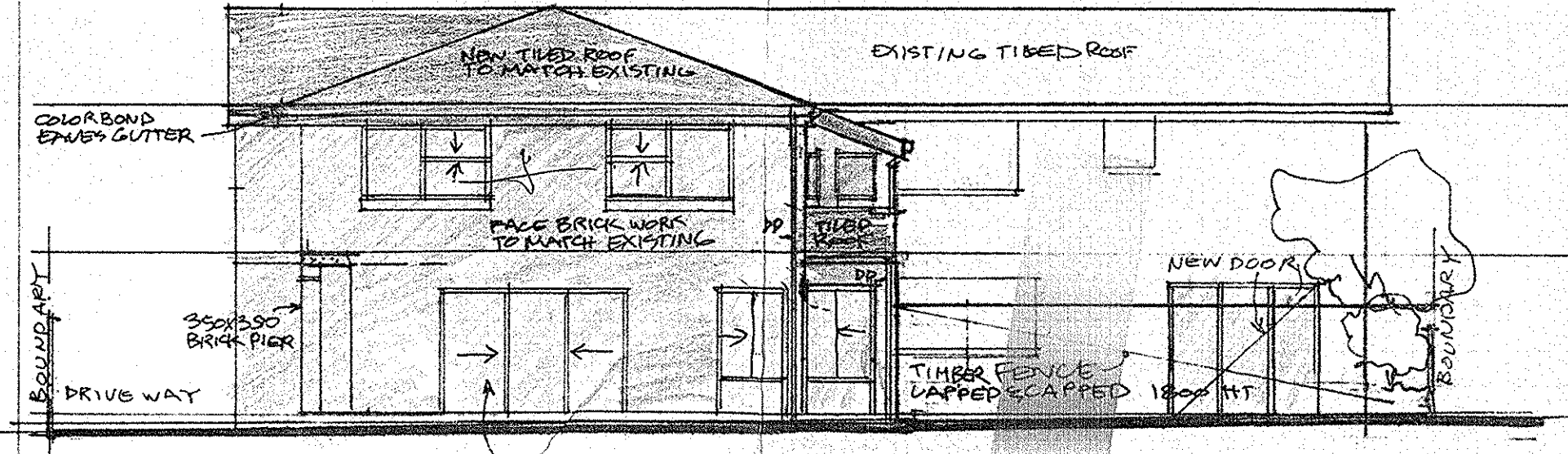
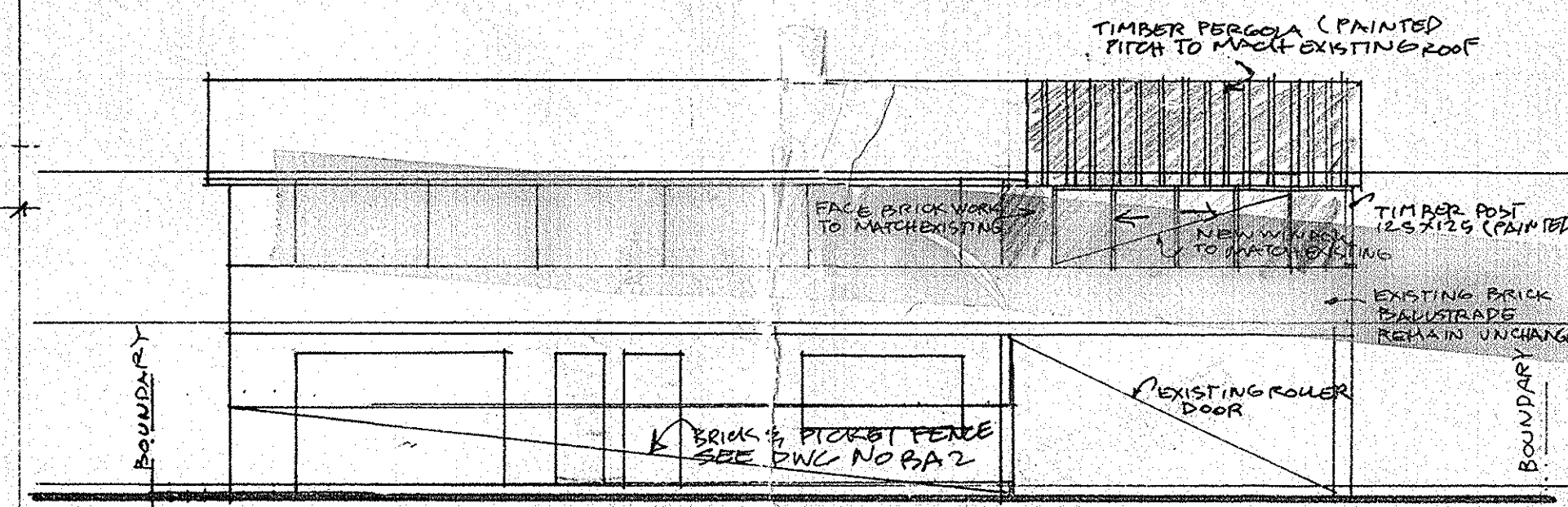
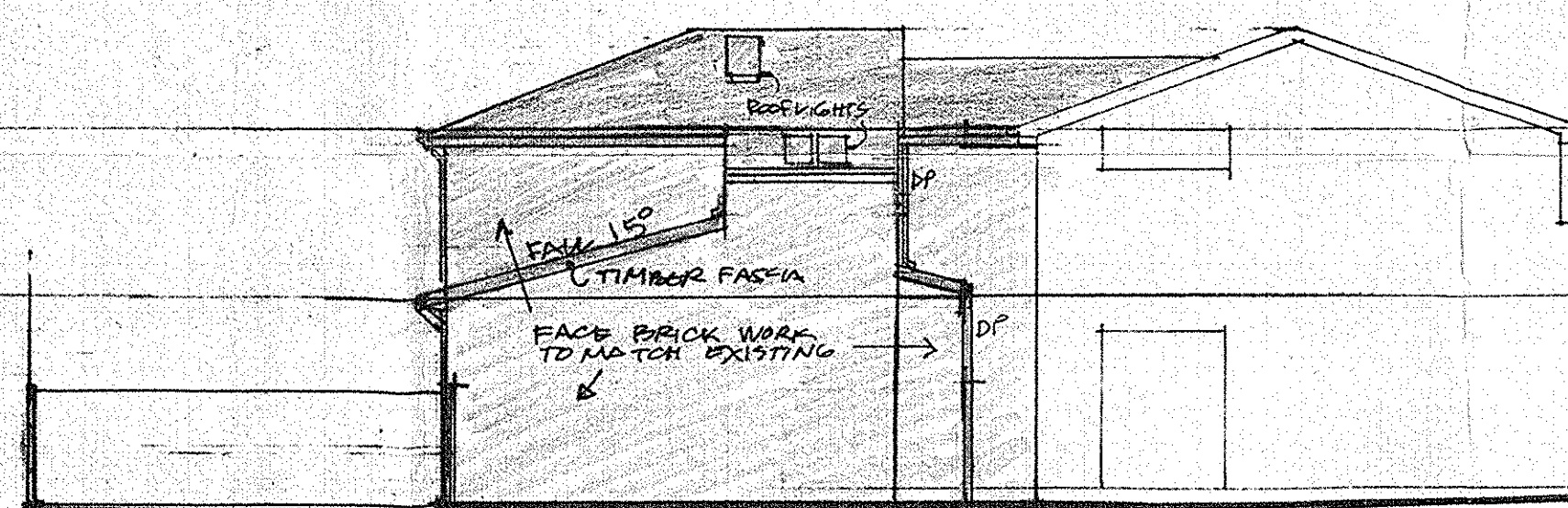
A BUILDING CHANGED TO BRICK VENTILATION
GROUND FLOOR TOILET DELETED
D.M.S. AUTOREL



SECTION A

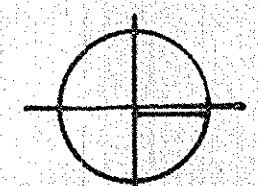


NORTH ELEVATION



PROPOSED DUAL OCCUPANCY
AT NO 13 WILLOW TREE CR.
BELROSE

BA_1



VAHAN PTY. LTD.
26 B HILMER ST.
FRENCH'S FOREST
TEL 014 622051
DATE MARCH 97
SCALE 1:100

THE COUNCIL OF WARRINGAH AS THE LOCAL AUTHORITY UNDER THE LOCAL GOVERNMENT ACT 1993, AS AMENDED, HEREBY APPROVES PLAN NO: 1573/97 FOR: New Building ON LOT: 7, DP: 236912, STREET: 13 WILLOW TREE CRESCENT, LOCALITY: BELROSE NSW, SUBJECT TO THE FOLLOWING CONDITIONS:

1. Street Levels in relation to driveways, fences, garages, etc, being obtained from Council before construction commences.
2. Closest Accommodation in accordance with C1.36 of the Regulations being provided during building operations.
3. Builder's Refuse being removed from the site to an approved waste disposal centre.
4. Notice in writing being given on completion of building before occupation.
N.B. - The current penalty for occupation without approval is \$5,000 for individuals and \$10,000 in the case of a Corporation.
5. Plant and building materials shall not be placed or stored within the public road reserve and shall be stored within the boundaries of the site during building works.
Failure to comply with this condition may result in Council taking action to remove the offending items from the public reserve, and all costs incurred by Council will be deducted from any deposit monies held in relation to the subject property.
6. Sydney Water By-Laws relative to all sanitary plumbing and drainage being complied with and Special Inspection Certificates from such authority being produced before occupation of building. Plans should be submitted to the Building Plans Section of Sydney Water prior to commencement of building - failure may lead to penalty and demolition of work.
7. Prior to the commencement of any excavation of Council's roadway or reserve, the builder, or his contractor, shall obtain a Road Opening Permit and pay all associated restoration charges to Council. A copy of such permit shall be kept on-site during the works.
Failure to comply with this requirement will result in Council taking action to recover all of its costs in accordance with the provisions under Section 94 of the Roads Act 1993.
8. The provision of an on-site stormwater detention facility to control the rate of stormwater runoff from the site in accordance with Council's "Specification for On-site Detention System Design". (R3)
9. Restoration and maintenance to approved levels and safe condition of the footway reserve/s adjoining the site *** to Council's reasonable satisfaction. (S4)
10. The public footways and roadways adjacent to the site shall be maintained at all times during the course of the work in a safe condition to the satisfaction of Council. (S7)
11. Prior to finalising detailed designs of the proposed development, the applicant should check all existing public service facilities adjacent to the site and ensure that where necessary appropriate arrangements are made for the relocation and/or adjustment of any services at the applicant's expense. (U4)
12. The requirements of condition R3 ending in code 8 shall be designed and supervised during the works by an Engineering with qualifications and expertise recognised by the Institution of Engineers Australia as being adequate for the purpose. The Engineer shall certify to Council's satisfaction prior to occupation, the issue of a certificate of classification or release of Linen Plan of Subdivision that the works are sound, stable and durable. (U6)
13. All fences, letterboxes and any other structures erected on the street alignment to conform to the approved back of footpath levels. (V2)
14. The footpath is to be protected from surface water by the construction of a graded drain across the driveway within the boundary connected to the drainage system. (V3)

15. All vehicle access for the construction period shall be confined to a stabilised entry/exit/crossing and driveway 4 metres wide installed and maintained to Council's satisfaction. (V10)
16. Building waste containers or "skips" and the like are not to be placed within the public road reserve unless prior approval from Council has been obtained and appropriate fees paid. (V6)
17. Submission to Council of details prior to the commencement of work from a practising Structural Engineer covering fence footing and structural steel/timber beams.
18. Submission to Council of a certificate from a practising Structural Engineer certifying the adequacy of the existing structure to support the additional loads prior to commencement of work.
19. The new building being inspected by Council's Building Surveyor at the following construction stages. (Forty-eight (48) hours notice is to be given to enable inspection).
(a) Lower upper floor slab reinforcement (x 2)
(b) Structural frame and roof members.
(c) Wetroom flashing.
(d) Completion.
20. Payment of \$250.00 building inspection fee.
21. The construction of all timber members being in accordance with AS 1684-1992 "National Timber Framing Code".
22. Safety glass as defined in AS 2208-1978 being provided in all locations subject to human impact as required by AS 1288-1994 "Glass in Buildings - Selection and Installation".
23. Internal stair having a minimum head height of 2000mm and a minimum width of 800mm.
24. Stairways to comply with the requirements of D2.13 of the Building Code of Australia.
25. (i) Provision of a continuous balustrade to any stairway, ramp or balcony which is more than 1 metre above the floor or ground surface beneath. Balustrades to be a minimum height of 1000mm (or 865mm above stair nosings) with openings not exceeding 125mm. Ref. D2.16 of the Building Code of Australia.
26. The installation of a smoke alarm system complying with AS 3786-1993 "Smoke Alarms" connected to the mains electrical power and having a standby power supply. Alarms being installed and located in accordance with Clause 3.7.2.3 of the Building Code of Australia (Housing Provisions). Submission of a certificate from the electrical contractor certifying compliance.
27. All rooms in the building being ventilated in accordance with the provisions of Part 74 of the Building Code of Australia.
28. Walls immediately adjoining or behind the bath/s or of the shower compartment/s shall be finished to a height of not less than 1800mm above the floor with cement render, ceramic tiles or other approved impervious finish and to comply with AS 3740-1994 "Waterproofing of Wet Areas in Residential Buildings".
29. Wet room floors being finished in an impervious material with a grade to a suitable floor waste outlet. Finishes, flashings and wall/floor junctions to comply with AS 3740-1994 "Waterproofing of Wet Areas in Residential Buildings".
30. Top of slab being a minimum of 200mm above the adjacent finished ground level with a 75mm step to enable suitable flashing and drainage.
31. Moisture from the ground beneath the concrete floor slabs shall be prevented from reaching the upper surfaces of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870.1-1989 "Residential Slabs and Footings Construction".

32. The terms and conditions of Development Consent No 95/542, dated 16.10.1995 being strictly complied with.
33. No building, demolition, excavation or material of any nature is to be placed on the public reserve without the prior consent of Council.
34. No excavation or construction work to commence on site until all silt/sediment control measures are in place to Council's satisfaction.
35. Street number being affixed to building prior to occupation.
36. Hours of construction being limited to Monday to Friday 7.00am-5.00pm, Saturday 7.00am-1.00pm if inaudible on residential premises. No construction work to take place on Sundays or Public Holidays.
37. Provision of 7.5m of clothes line or one heat operated drying cabinet or appliance per occupancy.
38. Termite control measures being installed in accordance with AS3660.1-1995 "Protection of Buildings from Subterranean Termites. Part 1: New Buildings". Details being submitted prior to commencement of work.
39. A durable notice is to be permanently fixed to the building in a prominent location, such as the meter box or the like, indicating: the method of termite protection; date of installation; life expectancy of chemical barrier (if used); and installer's or manufacturer's recommendations for the scope and frequency of future inspections for termite activity.
40. Submission of a certificate of installation of the termite control measures being installed prior to the building works progressing beyond the respective stage the certificate covers.
41. Warringah Council
(a) The applicable requirements of "Part 6 of the Home Building Act 1989" in relation to:-
- Building Contractor, or
- Developer or other person
(DELETE NOT APPLICABLE) have been satisfied.
OR (alternatively)
(b) In relation to "Part 6 of the Home Building Act 1989" approval is released on the basis that the work is to be carried out by the owner under owner-builder's licence No:

(DELETE NOT APPLICABLE)

Authorised Council Officer

per P. Jones GENERAL MANAGER
[Signature] BUILDING SURVEYOR

DATE OF APPROVAL 29/10/1997

Notice is Hereby Given That:-

- (a) Plans should be submitted to the Building Plans Section of Sydney Water prior to commencement of building - failure may lead to penalty and demolition of work.
- (b) This approval shall be void if building work is not substantially physically commenced on the land within (5) years after the date of approval, unless otherwise specified above.

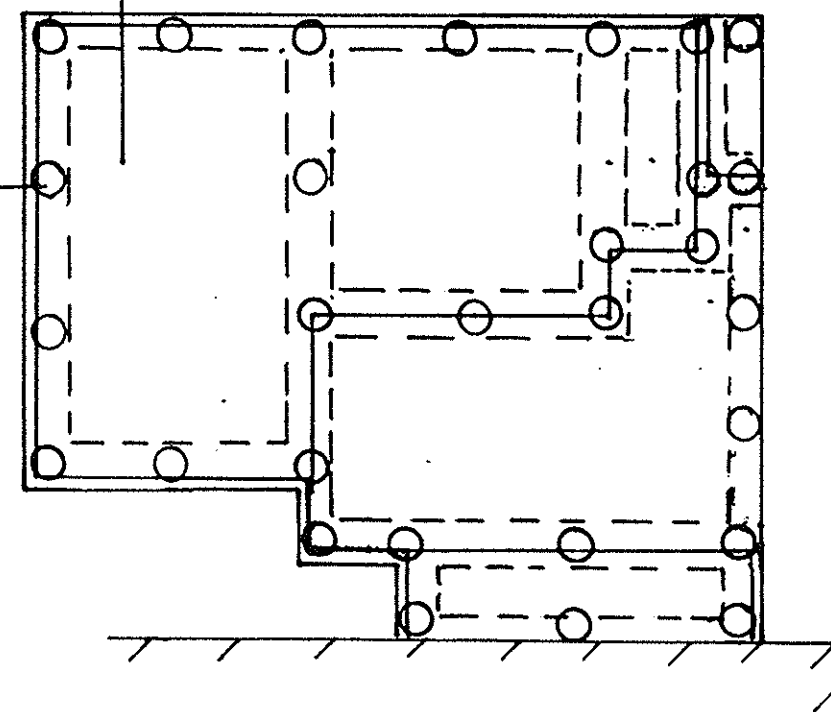
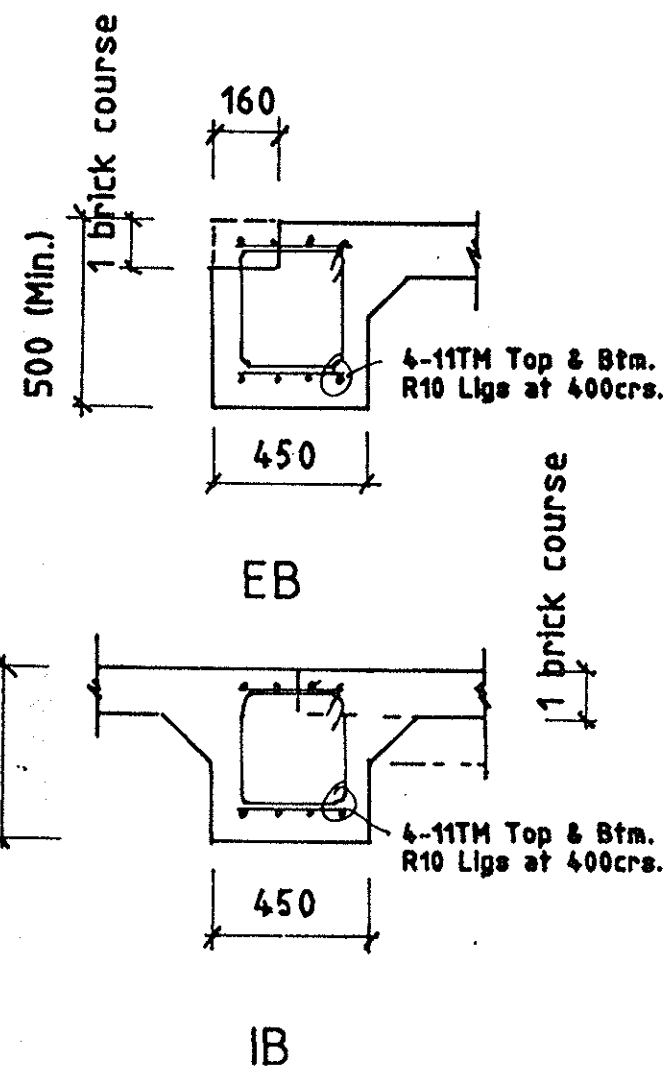
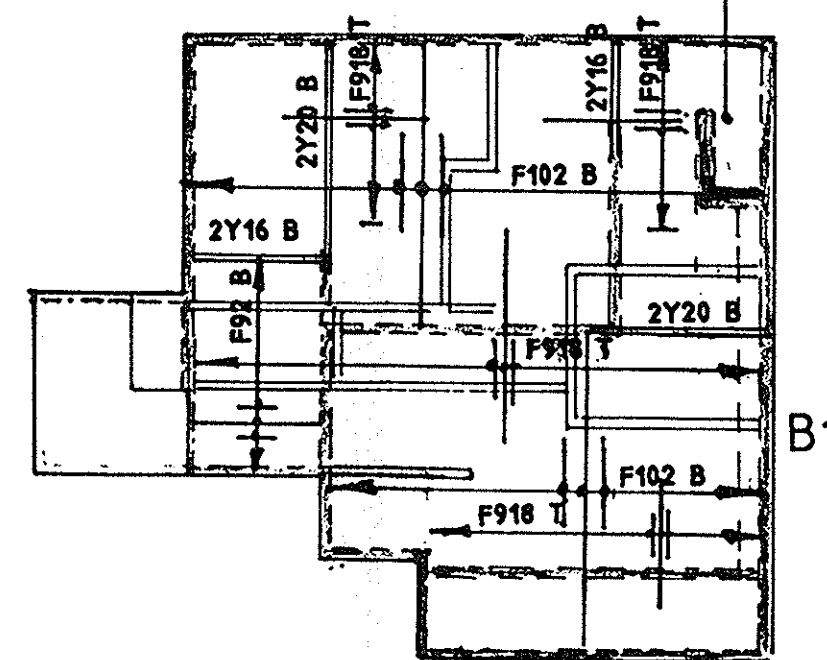
NB - Builder's Kerb/Road Damage Deposit will not be refunded until all works associated with this approval (including driveways, pathways etc) have been completed to Council's satisfaction.

86 x 9 3 8 10 8 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

5/5113-C
2/5

THIS DETAIL to be read in conjunction with Building Approval No. 1573/97

General Manager

150mm thick RC Slab UNO
F72 Fabric 30mm top cover UNO400 ϕ PIERS AT 2000C/C
TO SOUND SOLID ROCKPLAN OF SLAB-ON-GROUND
1 : 100FOOTING DETAILS
1 : 20175mm thick RC Slab UNO
F82 Fabric 30mm top cover UNOPLAN OF SUSPENDED SLAB
1 : 100

GENERAL

- G1. All workmanship and materials to be in accordance with the requirements of current SAA codes, by-laws and ordinances laid down by the relevant Building Authority. This design will need to be approved by the relevant Building Authority.
- G2. Do not scale from the drawing. All dimensions shall be checked and verified by on site measurements. Any discrepancies greater than 1% shall be brought to the attention of the Engineer immediately.
- G3. All work shall be carried out by a competent, licensed Contractor or Sub-Contractor who will have been experienced in this field of construction.

FOUNDATIONS

- F1. The Foundation material shall be uniform throughout and shall be classified in accordance with AS 2870 - 1998. "SOIL CLASSIFICATION" ASSUMED: **SOUND SOLID ROCK**
Minimum Safe Bearing Capacity: **600 KPA**
- F2. Any variation in foundation Conditions or materials from that assumed shall be referred to the Engineer immediately.
- F3. Any excavation within 2m of any existing structure shall be referred to the Engineer prior to commencing. Upon the Engineer's inspection, the Engineer will make recommendations for Underpinning or shoring or otherwise proceeding without the necessity to underpin or shore up, but under no circumstances is the Contractor to proceed without giving due and proper notice.

REINFORCED CONCRETE:

- C1. All workmanship and materials shall be in accordance with AS 1480 current edition with amendments, except where varied by the contract documents.

Elements	Slump mm	Max Size Agg mm	Cement Type	F _c at 28 days MPa	Admixture
All	80	20	Normal Portland Cement	25	pump mix

- C3. Minimum clear concrete cover to reinforcement including ties and stirrups shall be as follows unless otherwise shown.

Element	Cast against forms complying with current SAA Code		No form-work mm
	In sheltered location mm	Exposed to ground or weather mm	
Pad footing	-	65	75
Slab footings	-	50	65
Columns	40	50	75
Walls	20	30	65
Beams	25	40	65
Slabs	20	30	65

- C4. Cover to reinforcement shall be obtained by the use of approved bar chairs. All chairs to be spaced at 750 c/c maximum.
- C5. All concrete shall be mechanically vibrated. Vibrators shall not be used to spread concrete.
- C6. Sizes of concrete elements do not include thickness of applied finishes.
- C7. Beam depths are given first and include slab thickness.
- C8. No holes or chases other than those shown on the structural drawings shall be made in concrete members without the prior approval of the engineer.
- C9. Construction joints where not shown shall be located to the approval of the engineer. All construction joints shall be scaffolded over the whole face and any unsound material removed.
- C10. Reinforcement is represented diagrammatically; it is not necessarily shown in true projection.
- C11. Splices in reinforcement shall be made only in the positions shown unless the approval of the engineer is obtained for any other splice.
- C12. Welding of reinforcement will not be permitted unless shown on the structural drawings.
- C13. Pipes or conduits shall not be placed within the concrete cover to reinforcement without the approval of the engineer. Plumbing penetrations permitted.
- C14. Reinforcement symbols:
S Denotes Grade 200S hot rolled deformed bars to AS 1302.
C Denotes Grade 410C cold worked deformed bars to AS 1302.
R Denotes Grade 230R hot rolled plain bars to AS 1302.
Y Denotes Grade 410Y high yield strength deformed bars to AS 1302.
The number preceding the above symbols denotes the number of bars in the group.
The number following the above symbols denotes the number of millimetres in the bar diameter.
F Denotes hard-drawn wire reinforcing fabric to AS 1304.
W Denotes hard-drawn plain wire to AS 1303.

- C15. All reinforcing fabric shall comply with AS 1304 and AS 1303 and shall be supplied in flat sheets.
- C16. All fabric for slabs poured on ground must be in place before concreting commences and shall be supported on bar chairs in accordance with note C4 above, seated on in feds.

BRICKWORK:

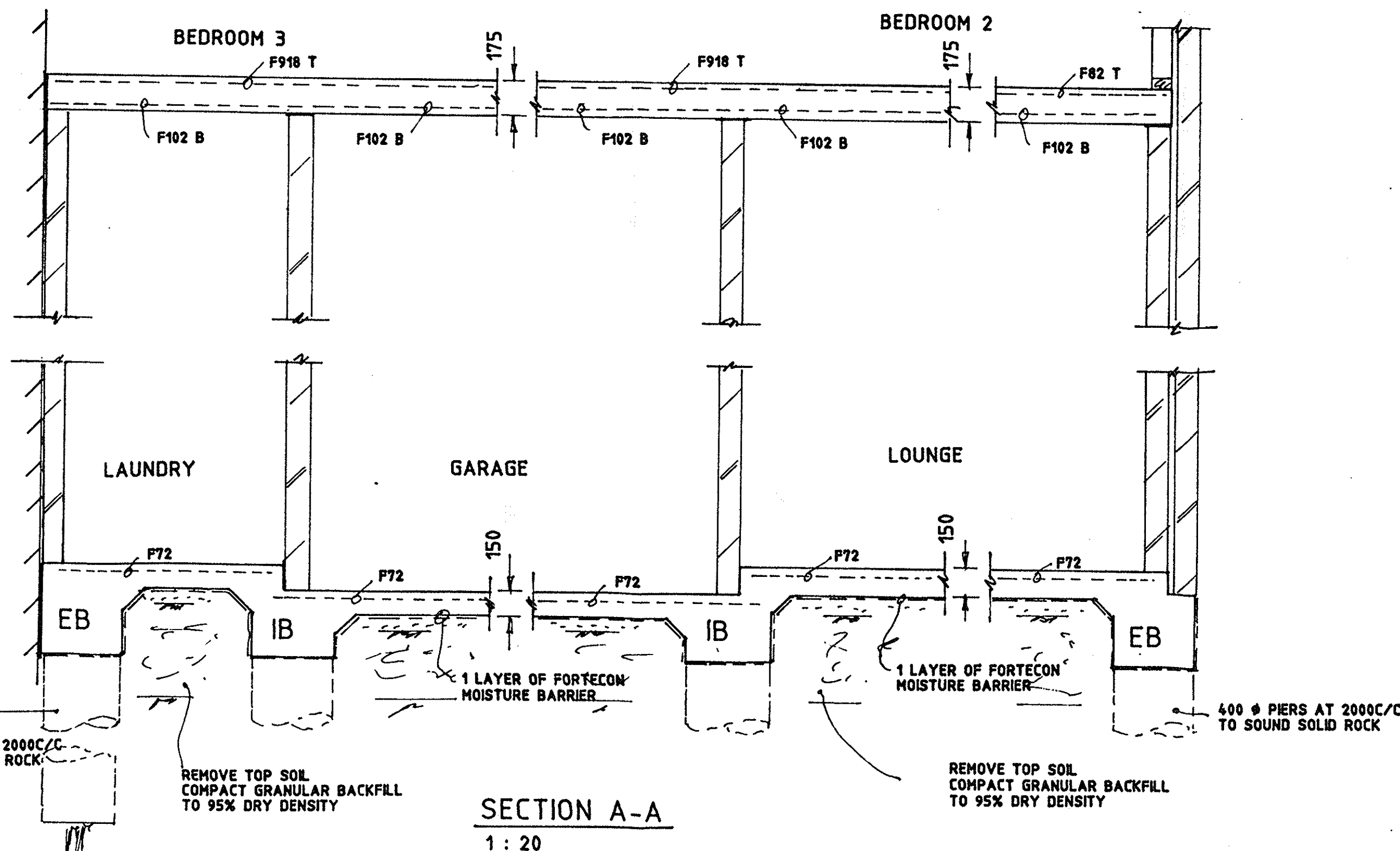
- B1. All bricks shall conform to the requirements of AS 421 and department of local government (NSW) standard specification No. 13.
- B2. All brickwork shall be constructed in accordance with the current relevant SAA code.
- B3. The design strength of brickwork shall be:

Element	Brick Compressive Strength	Mortar Mix		
		Cement Lime Sand	F _c MPa	Admixture
load-bearing	25mpa	1 : 0.25 : 3	4.0	NIL

- B4. Where brickwork supports concrete slabs the top course shall be laid frogs down and covered with 2 layers of Akor or equal unless otherwise shown.
- B5. Where walls are not load-bearing, they shall be separated from the concrete above by 20mm of Cooke or equal.
- B6. All brickwork built on slabs shall bear on 1 layer Akor or equal.
- B7. All steelwork to be hot dipped galvanized with 150 mm minimum bearing at each end.

CLIENT: MR. J. SHIRVANIAN

TED BENNETT & ASSOCIATES CONSULTING STRUCTURAL & CIVIL ENGINEERS 3 WANN T1 ROAD, BELROSE 2085		Mobile: (018) 278 738 Phone: 975 3899
STRUCTURAL DETAILS - DUAL OCCUPANCY 13 WILLOW TREE CRESCENT BELROSE		
SCALES	As shown	DRAWING NUMBER
DRAWN	EAB	S-97-10122
CHECKED	Robert HIEVISH	
DATE	11-8-97	

SECTION A-A
1 : 20

Design Data:

Total site Area
Predevelopment

Paved Area 162
Roof Drive 39
Grassed Area 201 m²
Predevelopment Discharge (1 in 5 year storm) 502 m³
Peak Discharge 23 l/sec

Postdevelopment:

Paved Area 334 m²
Roof & Drive 369 m²
Grassed Area 27 l/sec
Q_S - Peak Discharge

Site Absorption Rate = 6×10^{-4} cm/sec.

Limit Discharge for 1:5 year storm to predevelopment level

Required Absorption rate = $27.0 - 23.0 = 4.6$ l/sec

Absorption Area = $4/0.006 = 666$ m² (Insufficient Area Available)

Limit discharge to I_S (Predevelopment)

ie 23 l/sec

Provide 2 basins each to discharge 11.5 l/sec.

Max head 'H' = 550 mm

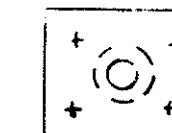
Outlet Orifice Diam. = 86 mm for Discharge of 11.5 l/sec

THE ONSITE DETENTION AND ASSOCIATED STORMWATER DRAINAGE SYSTEMS HAS BEEN CHECKED BY THE TECHNICAL SERVICES DIVISION AND IS:

☐ SATISFACTORY

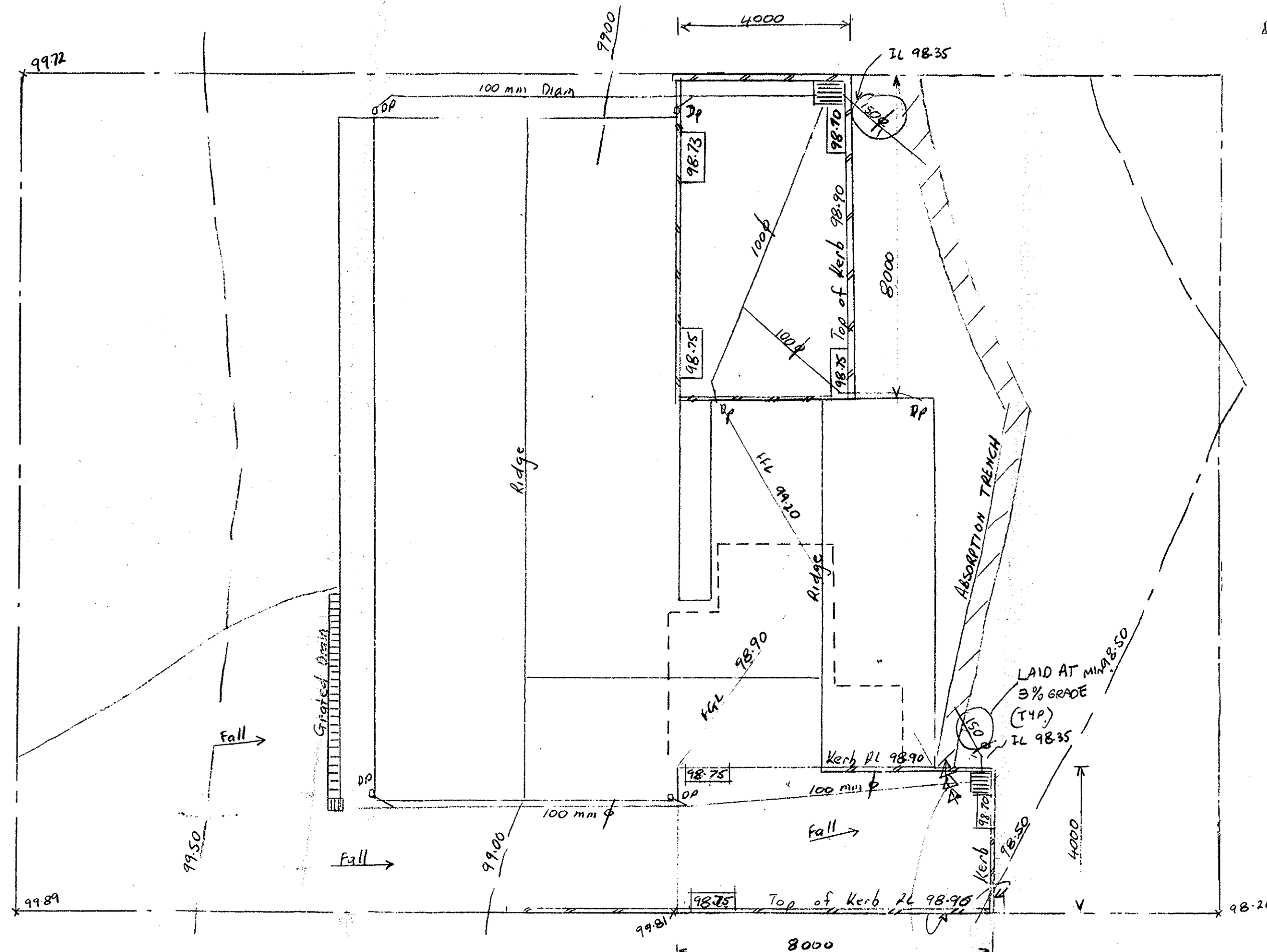
☐ NOT SATISFACTORY

☒ SATISFACTORY WITH AMENDMENTS SHOWN ON DRAWINGS. 20/6/97



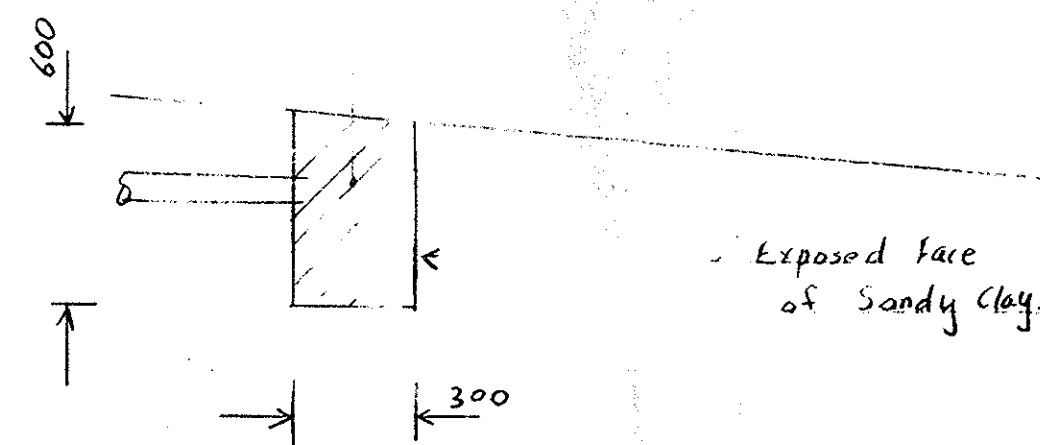
6 mm Stainless Steel Plate
L - 10 mm Diam Masonry Anchors
86 mm Diam Orifice

Orifice Outlet Plate

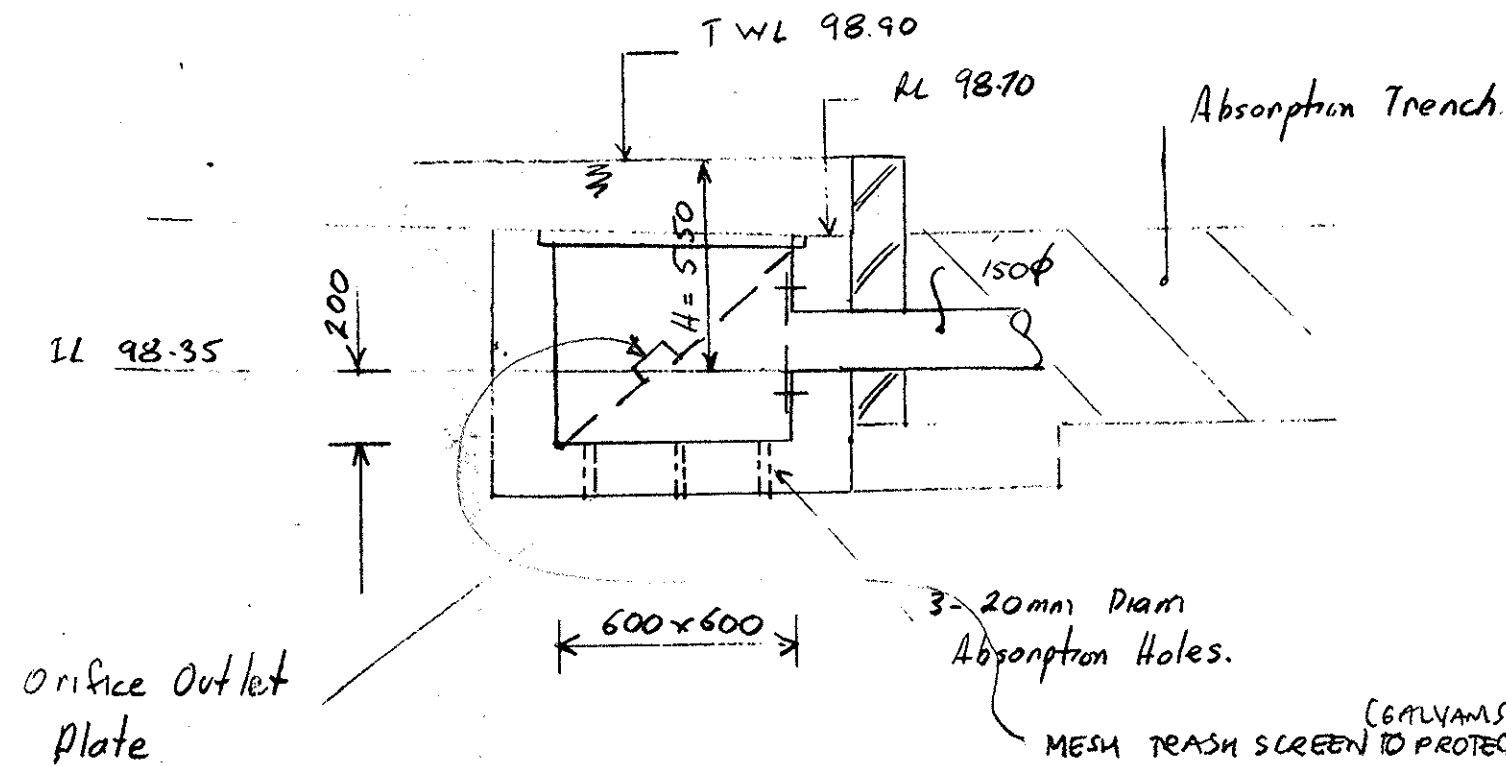


Absorption Trench follows Ground Contours. (Gravel fill)

PROVIDE OVERFLOW WEIR SUCH THAT ANY RUNOFF FROM THE BASIN IS DIRECTED TO THE ABSORPTION TRENCH



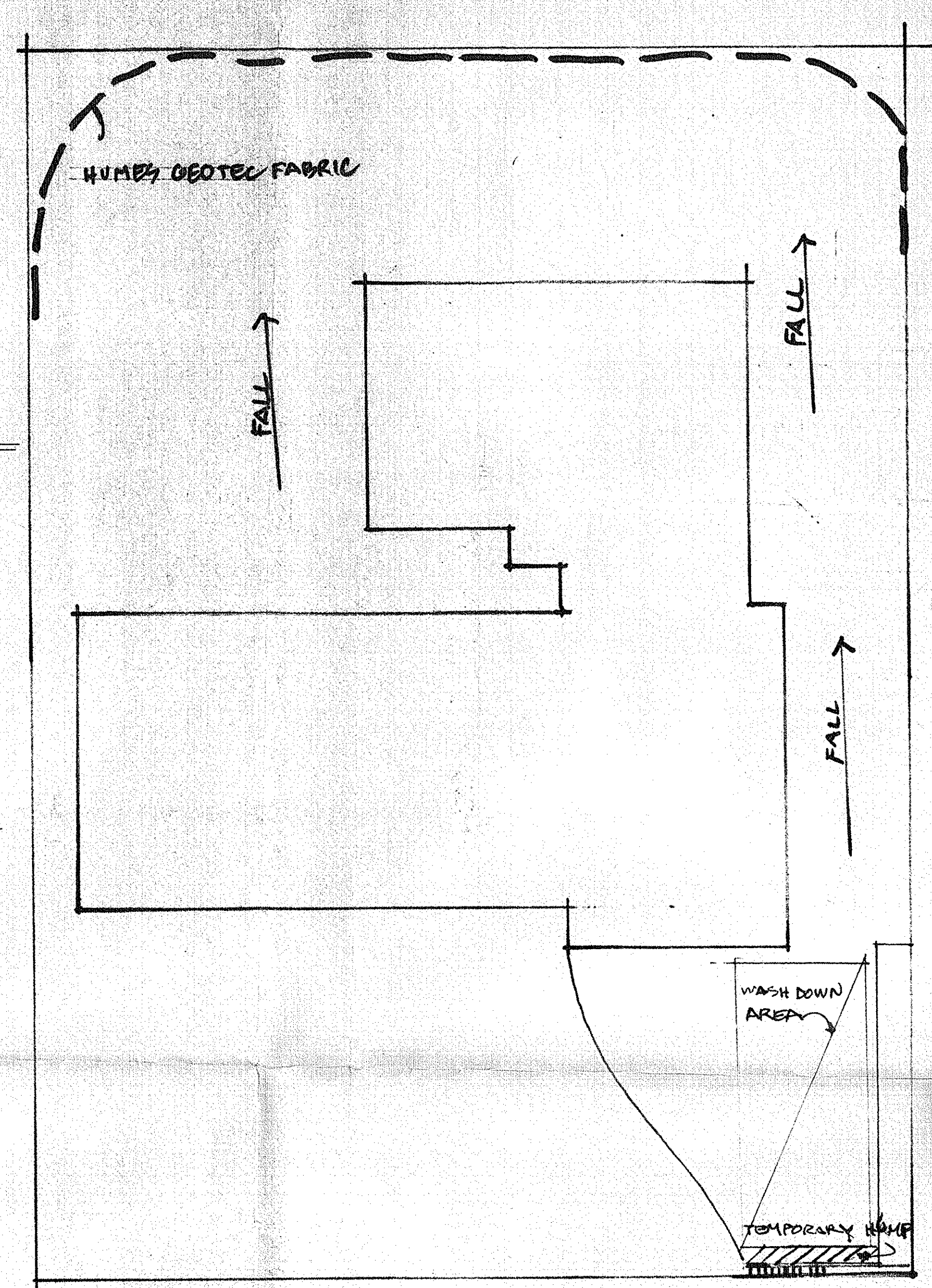
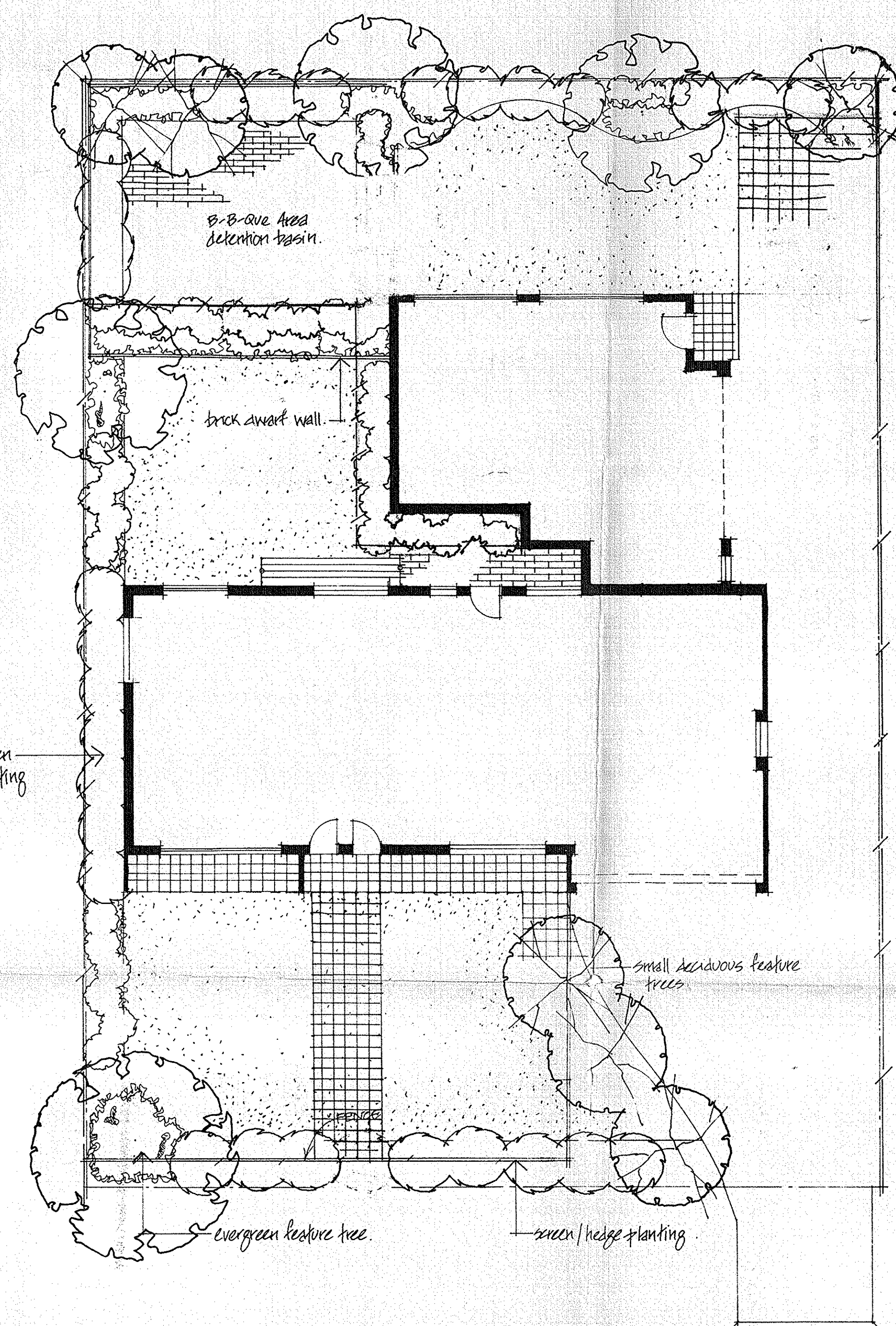
Section Thru' Absorption Pit



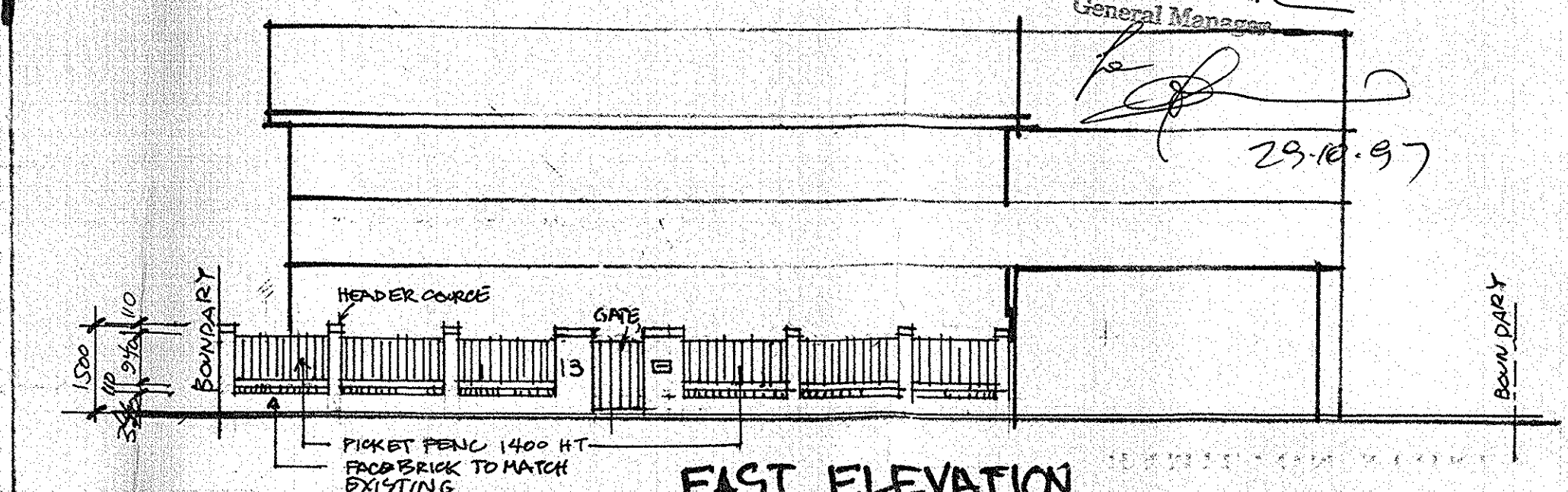
3 - 20 mm Diam Absorption Holes.
MESH TRASH SCREEN TO PROTECT ORIFICE REQUIRED. INSTALL HANDLE TO MESH.

Project 13 Willowtree Crescent Belrose		
Drawing Stormwater Details.		
Geoff Hopkins & Associates Consulting Structural & Civil Engineers 7 Latona Street West Pymble N.S.W. 2073 Tel: 488 8635 Fax: 488 8635		
Scale 1:100	Designed G.H.	Drp.No. 92094-C2
Date April 95	Drawn G.H.	
Approved M.H.	B.E., M.I.E., C.P. eng.	

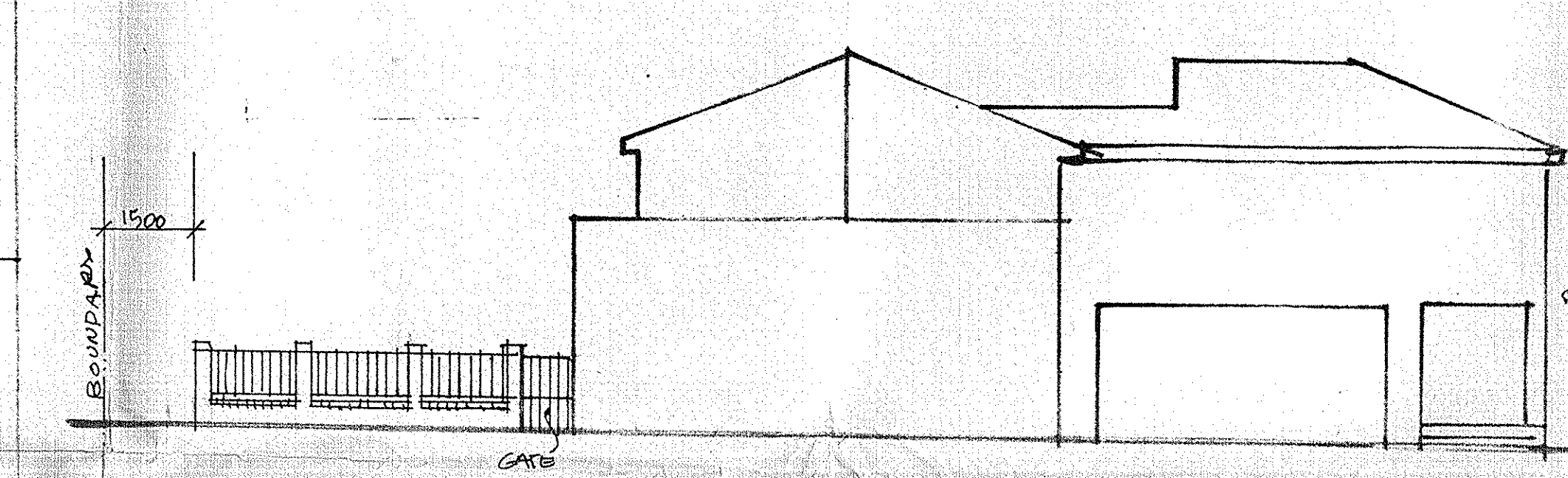
WARRINGAH COUNCIL
 THIS DETAIL to be read in conjunction with Building Approval No. 1573/97
 General Manager
 29.10.97



EROSION & SEDIMENT CONTROL PLAN

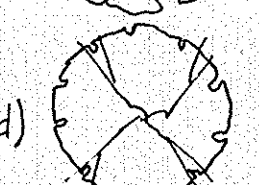
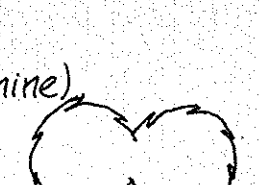
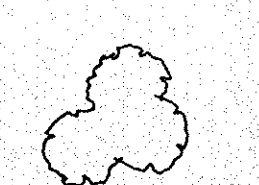
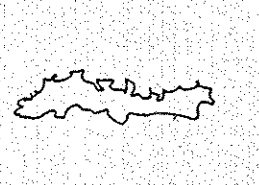


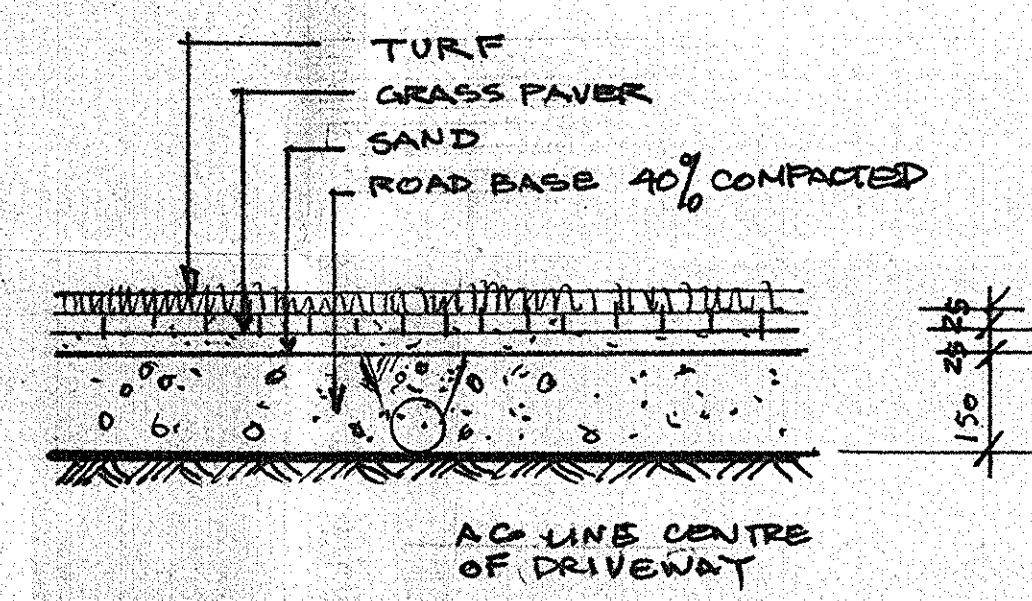
EAST ELEVATION



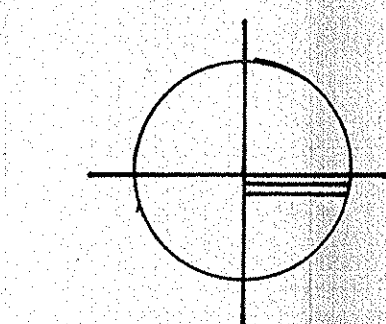
NORTH ELEVATION

PLANTING SCHEDULE

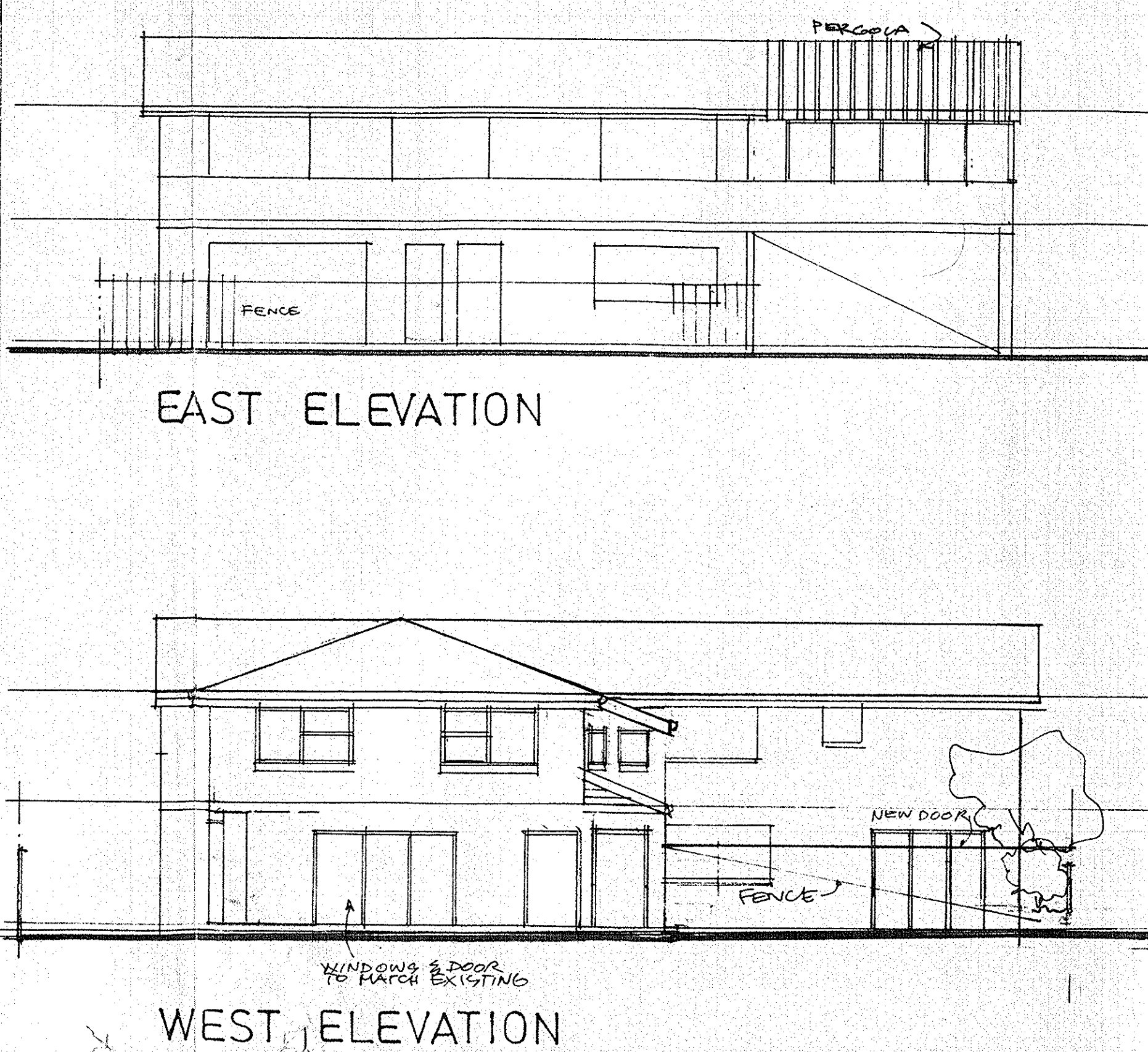
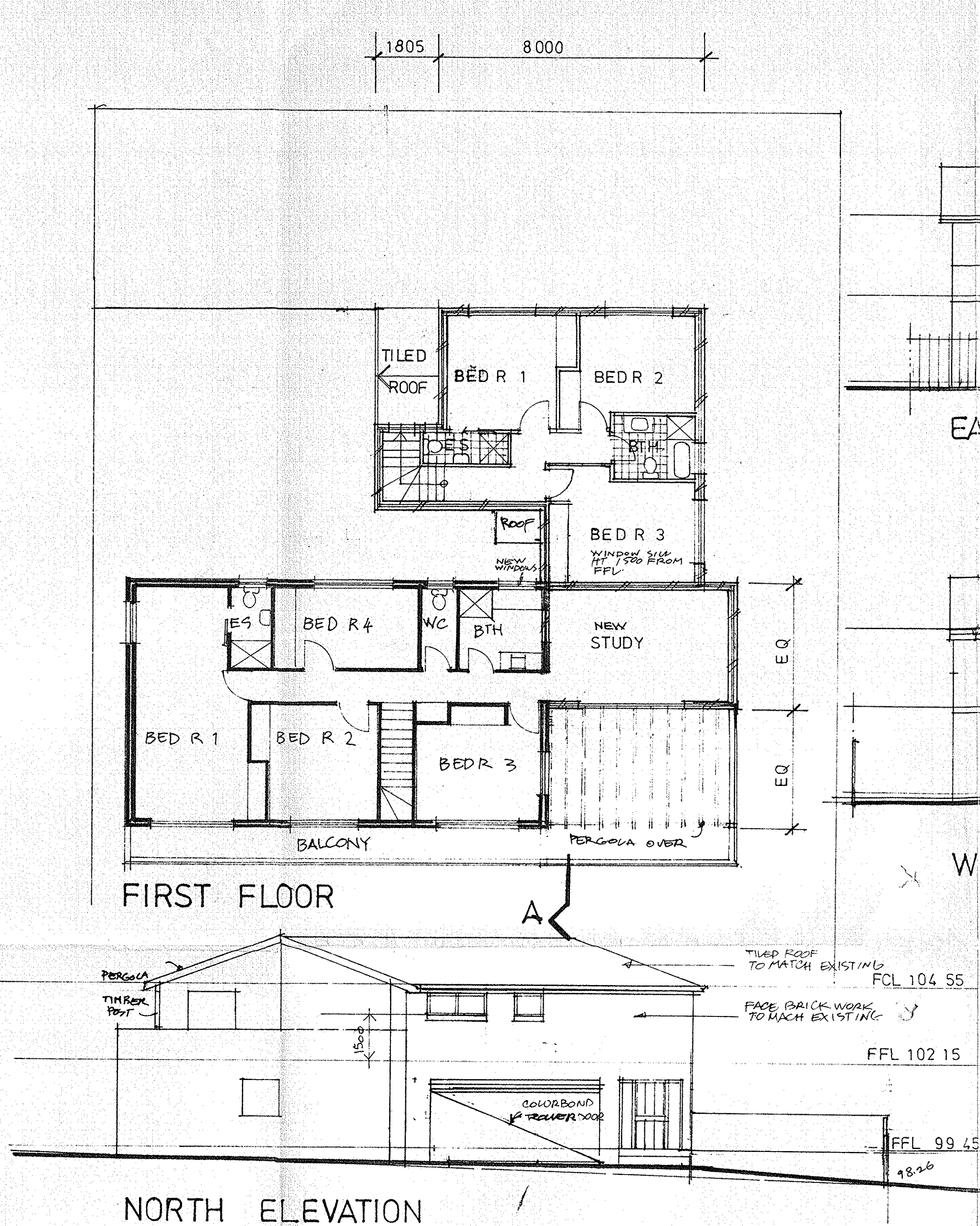
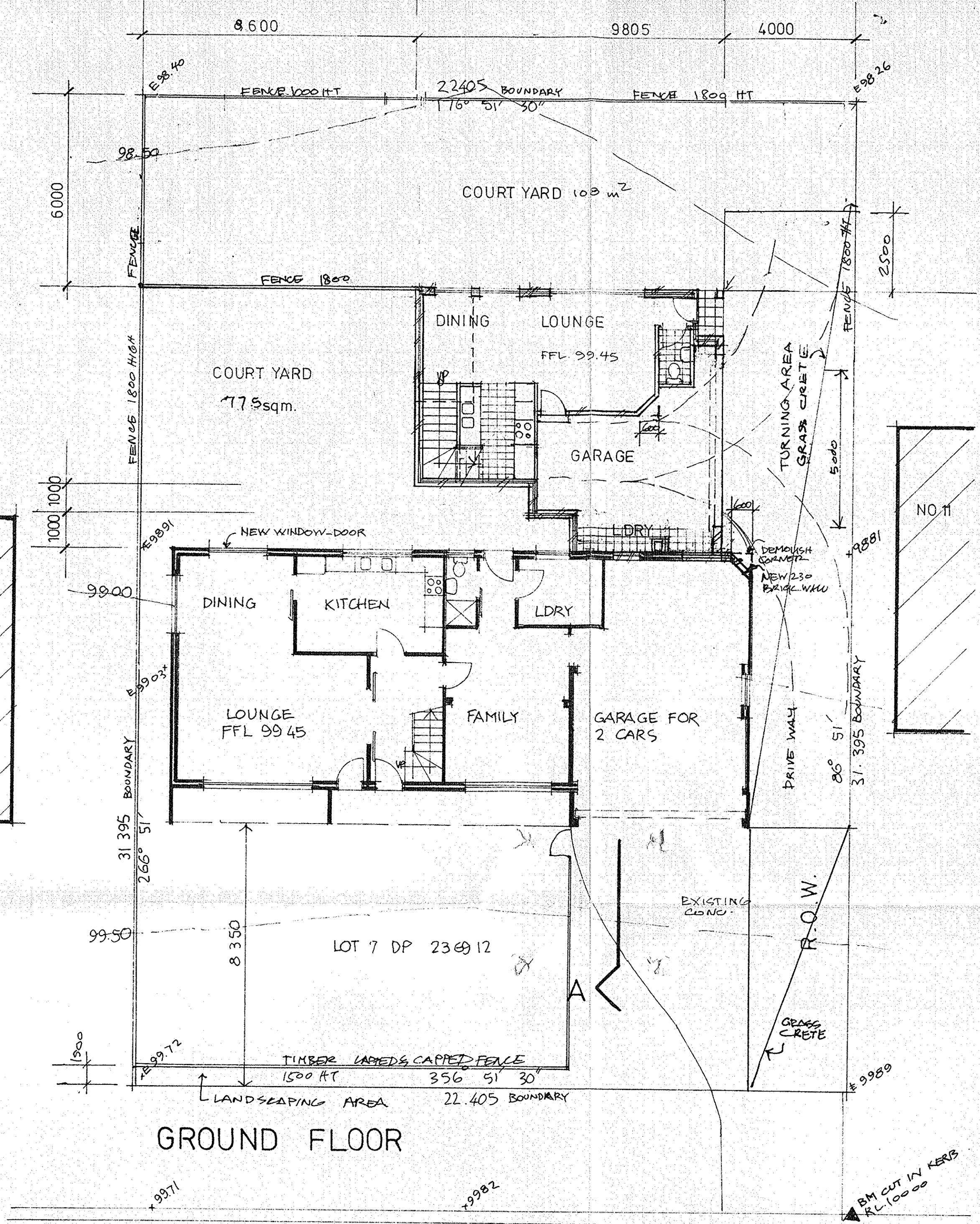
<u>Evergreen feature/shade trees</u>	
<i>Alnus 'javanica'</i> (Evergreen Alder)	
<i>Fraxinus</i> (Evergreen Ash)	
<i>Calodendrum capense</i> (Cape Chestnut)	
<u>Deciduous feature trees</u>	
<i>Ulmus parvifolia</i> (Chinese Elm)	
<i>Sapum schiferum</i> (Chinese Yellowwood)	
<i>Taxus mimosifolia</i>	
<u>Screen/hedge shrubs</u>	
<i>Murraya paniculata</i> (Orange Jessamine)	
<i>Photinia glabra</i> 'Rubens'	
<i>Viburnum tinus</i>	
<u>Medium/small shrubs</u>	
<i>Hebe franseria</i> 'Blue Gem' (Veronica)	
<i>Chardenia augusta</i> 'Florida'	
<i>Asplenium adnigrum</i>	
<i>Coleonema pulchrum</i> (Diosma)	
<i>Agapanthus orientalis</i>	
<i>Erigeron karwinskianus</i>	
<i>Bracteantha multifida</i>	
selected turf	



DETAIL OF GRASS PAVER

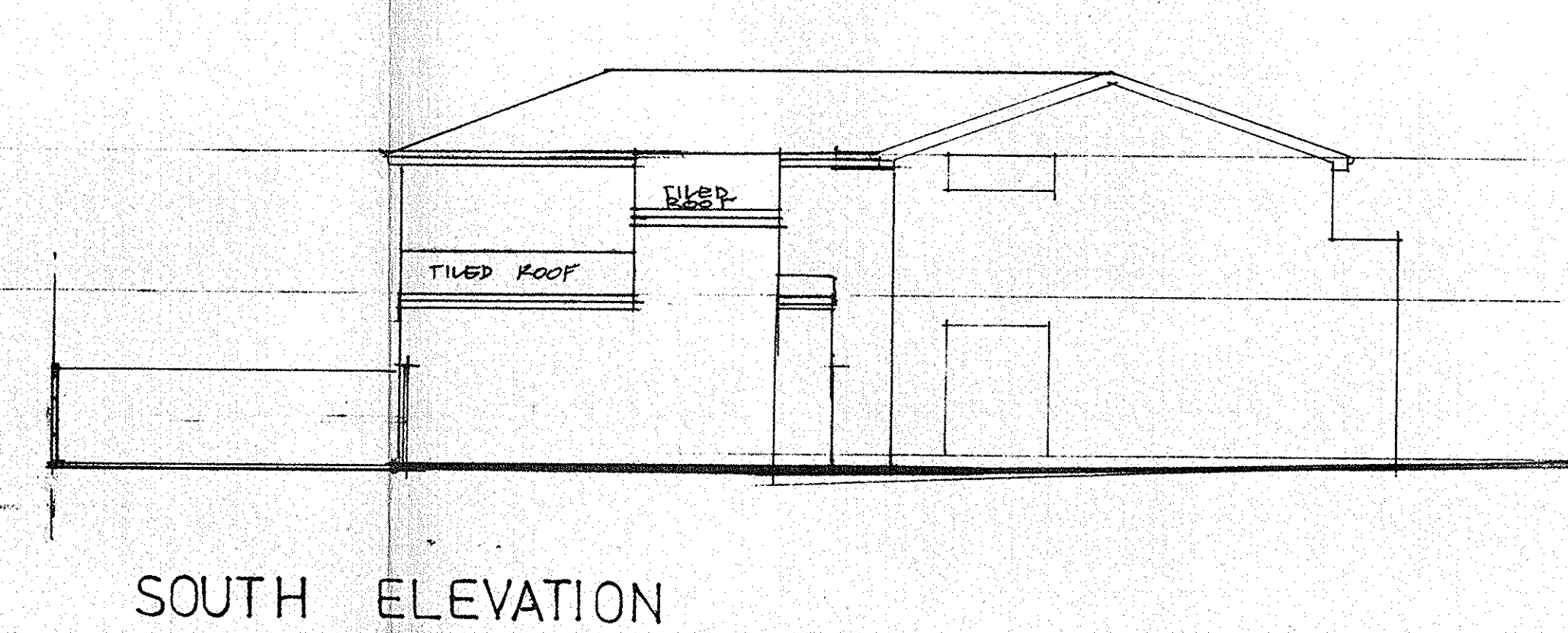
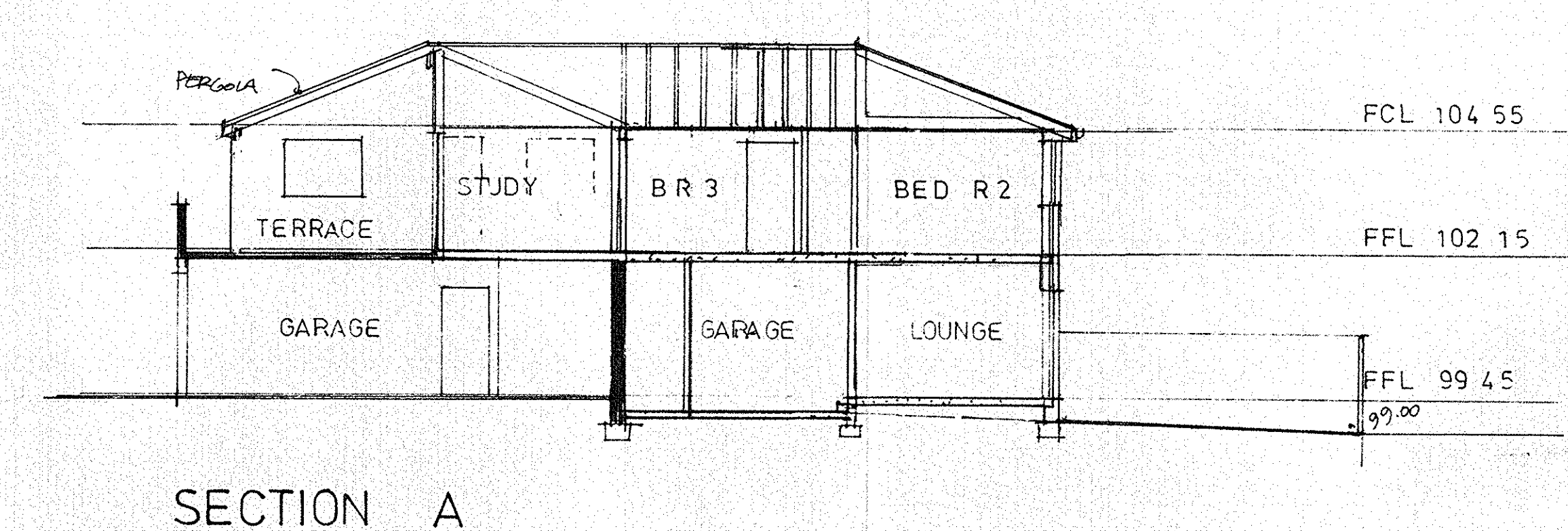


BA_2



SCHEDULE OF AREAS

<u>EXISTING</u>	
SITE AREA	451.05 sqm.
BUILDING AREA	214.16 sqm
FSR	0.47:1
CARPARK	2 CARS
OPEN SPACE	172.11 sqm.
<u>PROPOSED</u>	
SITE AREA A	250.85 sqm.
BUILDING AREA	113.70 sqm.
FSR	0.45:1
CARPARK	1 CAR
OPEN SPACE	108 sqm.
<u>TOTAL</u>	
SITE AREA	701.90 sqm.
GROSS FLOOR AREA	327.86
FSR	0.46:1



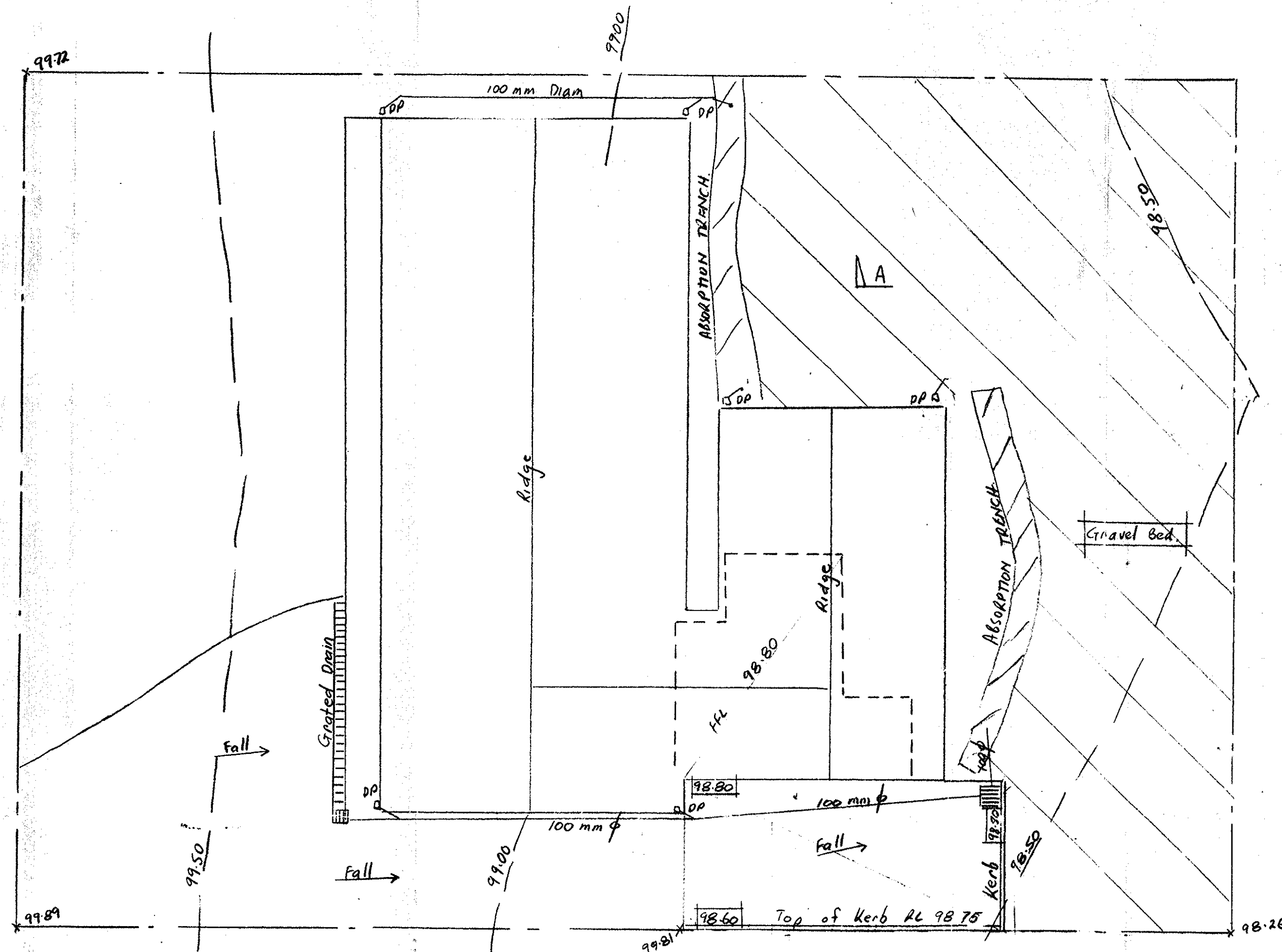
PROPOSED DUAL OCCUPANCY
AT NO 13 WILLOW TREE CR.
BELROSE

18.8.95 CORNER OF GARAGE & NEW DWELLING
LOUNGE SPAY, WALKWAY DELETED PAVING AREA
CHANGED TO GRASS CRETE
A 11.4.95 SECTION THRU COURT YARD SHOWN FENCE BETWEEN 2 DWELLINGS DELETED
GARAGE DOOR CHANGED TO 5m, PAVING AREA ADDED FOR TURNING PERGOLA 1ST FLOOR SHOWN

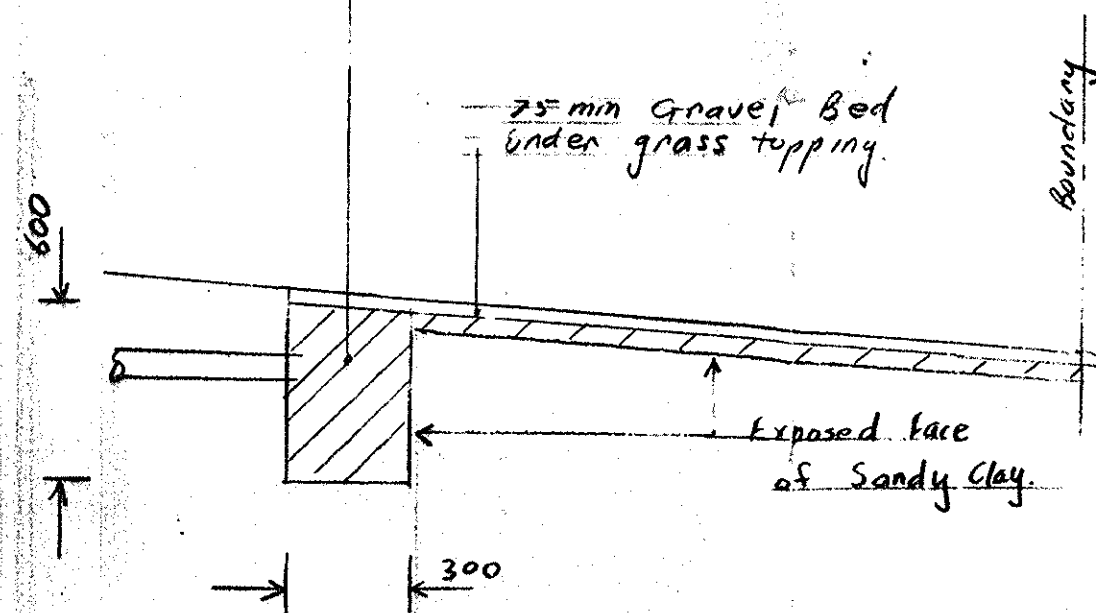
VAHAN PTY. LTD.
2 BRIERWOOD PL.
FRENCH'S FOREST
TEL 953 99 33
DATE DEC 94
SCALE 1:100

LAYOUT PLAN
FOR
DATE LAND USE CONSENT NP
16 OCT 1995 - 95/542-
WARRINGAH COUNCIL

WILLOW TREE CRESCENT



Absorption Trench follows Ground Contours. (Gravel fill)



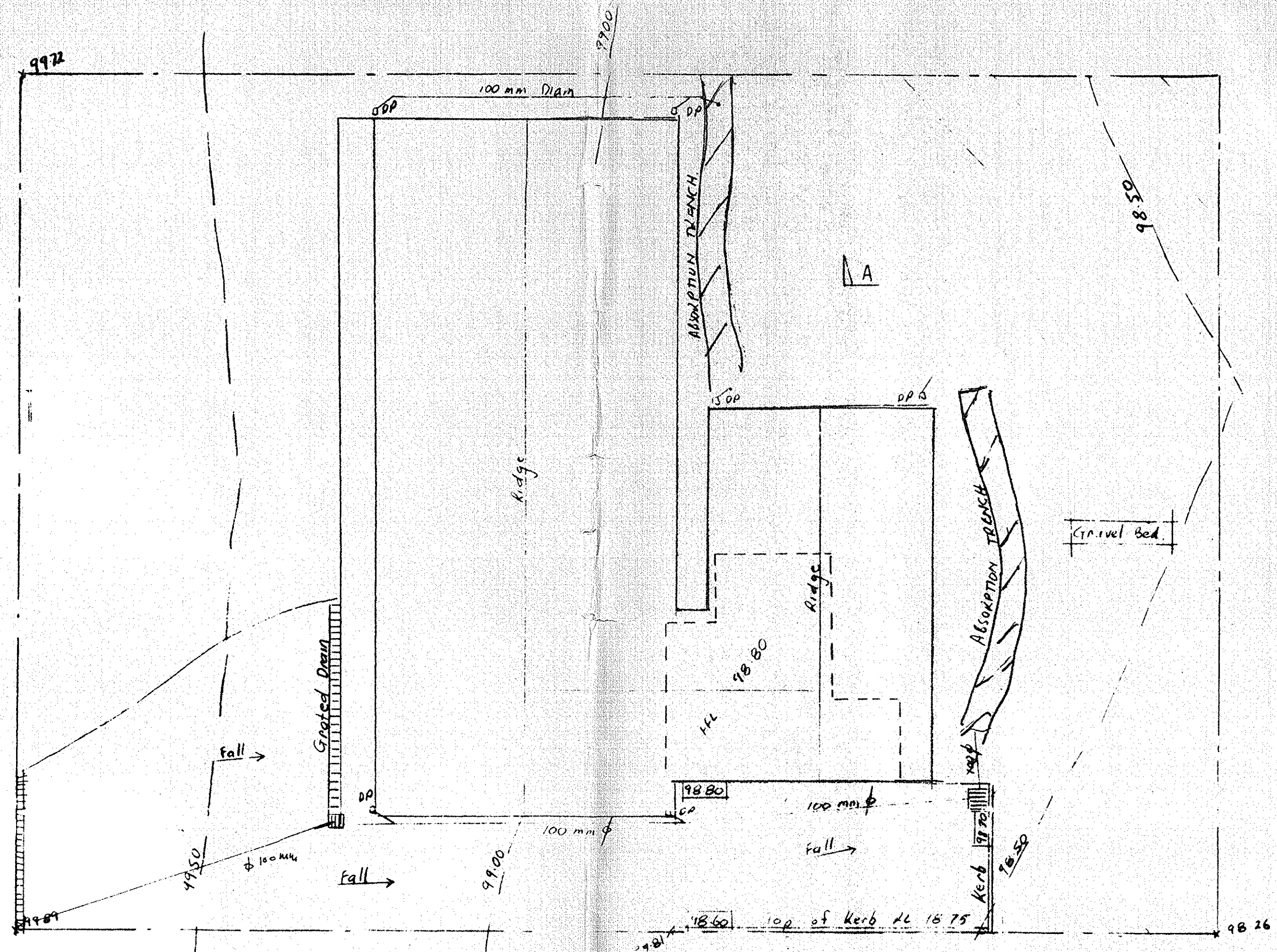
Design Data:

Total site Area	70.3 m ²
Preddevelopment	
Paved Area	162
Drive	29
Grassed Area	502 m ²
Preddevelopment Discharge (1 in 5 year storm)	
$Q_p = \frac{502 \times 0.7 \times 130}{3600} + \frac{201 \times 0.95 \times 130}{3600}$	196 l/sec
Postdevelopment	
Paved Area	240
Drive	115
Grass	348 m ²
$Q_p = \frac{240 \times 0.7 \times 130}{3600} + \frac{348 \times 0.95 \times 130}{3600}$	209 l/sec
Site Absorption Rate	$= 6 \times 10^{-4}$ cm/sec
Limit Discharge for 1:5 year storm to preddevelopment level	
Absorption rate	$= 209 - 196 = 13$ l/sec
Absorption Area	$= \frac{13}{0.006} = 216$ m ²
Absorption Area Provided	$= 224$ m ²

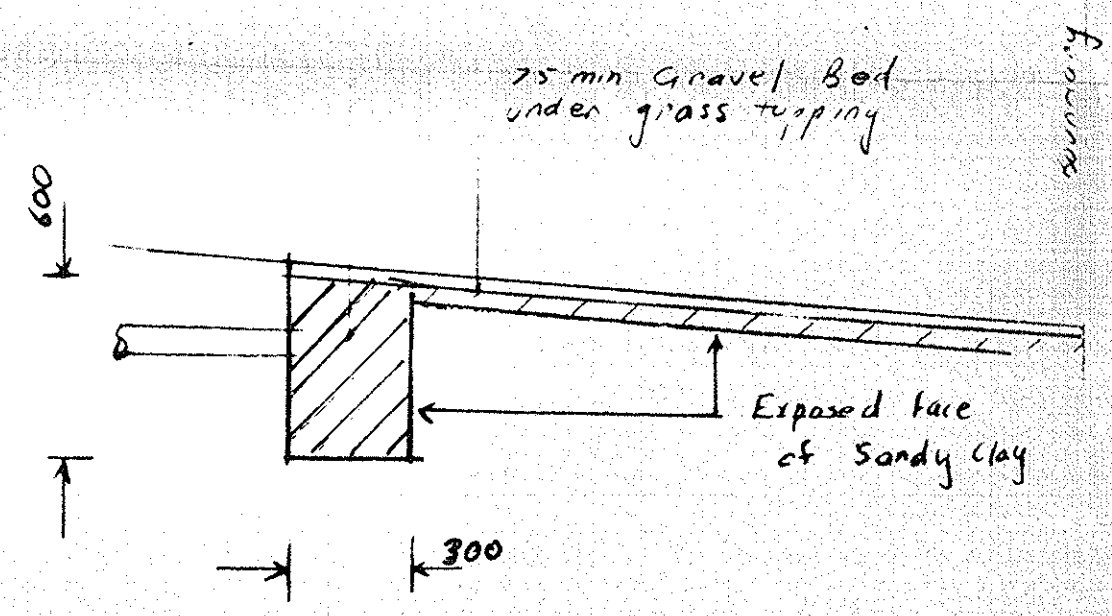
LAYOUT PLAN
FOR
DATE 16 OCT 1995 LAND USE CONSENT NO 95/542-
WARRINGAH COUNCIL

Project		
13 Willow Tree Crescent		
Belrose		
Drawing		
Stormwater Details		
Geoff Hopkins & Associates		
Consulting Structural & Civil Engineers		
7 Latona Street West Pyrmont NSW 2072		
Tel 469 8635		
Fax 469 8635		
Scale	Designed	Drawn
1:100	GAH	GAH
Date	Drawn	92094-C2
April 95	GAH	
Approved	M.L.C.	

WILLOW TREE CRESCENT



Absorption Trench follows Ground Contours. (Gravel fill)



Design Data:

Total site Area 203 m²

Predevelopment

Paved Area	Roof Drive	Grass
142	29	502 m ²

Predevelopment Discharge (1 in 5 years storm)

$$Q_p = 502 \times 0.7 \times \frac{130}{3600} + 201 \times 0.95 \times \frac{130}{3600} = 196 \text{ l/sec}$$

Postdevelopment

Paved Area	Roof Drive	Grass
240	105	328 m ²

Postdevelopment Discharge (1 in 5 years storm)

$$Q_p = 240 \times 0.7 \times \frac{130}{3600} + 328 \times 0.95 \times \frac{130}{3600} = 209 \text{ l/sec}$$

Site Absorption Rate = 6 x 10⁻⁴ cm/sec

Limit Discharge for 1:5 year storm to predevelopment level

Absorption rate = 209 - 196 = 13 l/sec

Absorption Area = $\frac{13}{0.006} = 216 \text{ m}^2$

Absorption Area Provided = 224 m²

Project		
13 Willow Tree Crescent Belrose		
Drawing		
Stormwater Details		
Geoff Hopkins & Associates Consulting Structural & Civil Engineers 7 Intona Street West Pymble NSW 2073 Tel: 488 8635 Fax: 488 8635		
Scale	Designed	Drawn
1:100	GAH	GAH
Date	Drawn	92094-62
97	GAH	
Approved		
GAH		