91A/2033

Niall Phelan,
Keane Murphy Duff,
4 Prince's Street South,
City Quay,
Dublin 2.

24 February 1992

RE: Change of house type from previously approved 4 bed semi-detached houses to 3 bed semi-detached houses at 9-18 inclusive, and garage extension to side of house no. 20, Willsbrook Drive, (Road 2), Willsbrook Park, Ballydowd, for Lark Developments Ltd.

Dear Sir,

I refer to the decision to grant permission issued on the 18th February, 1992, (Reg. Ref. 91A/2033), relating to changes of house type and a garage extension at Willsbrook, in Ballydowd.

This decision referred, inter alia, to a garage extension to the side of No. 20, Willsbrook Drive. However, the planning application was in respect of an extension to No. 19 Willsbrook Drive and the decision issued accordingly should be read as relating to a garage extension to No. 19 Willsbrook Drive (and not No. 20 as specified).

Yours faithfully,

for Principal Officer.

DUBLIN COUNTY COUNCIL

Tel. 724755 (ext. 262/264)

PLANNING DEPARTMENT,
BLOCK 2,
IRISH LIFE CENTRE,
LR. ABBEY STREET,
DUBLIN 1.

Notification of Decision to Grant Permission/[redacted]

Local Government (Planning and Development) Acts, 1963-1983

To Keane Murphy Duff,
4, Princes Street South,
City Quay,
Dublin 2.

Decision Order Number and Date P/706/92 - 18.02.1992
Register Reference No. 91A-2033
Planning Control No.
Application Received on 20.12.1991

Applicant Lark Developments Ltd.

In pursuance of its functions under the above-mentioned Acts, the Dublin County Council, being the Planning Authority for the County Health District of Dublin, did by Order dated as above make a decision to grant Permission/[redacted] for:-

change of house type from previously approved 4 bed semi detached houses to 3 bed semi detached houses at 9-18 incl. and garage extension to side of house no. 20, Willsbrook Drive (Road 2), Willsbrook Park, Ballydowd.

SUBJECT TO THE FOLLOWING CONDITIONS

CONDITIONS	REASONS FOR CONDITIONS
1. The development to be carried out in its entirety in accordance with the plans, particulars and specifications lodged with the application, save as may be required by the other conditions attached hereto.	1. To ensure that the development shall be in accordance with the permission and that effective control be maintained.
2. That before development commences, approval under the Building Bye-Laws be obtained, and all conditions of that approval be observed in the development.	2. In order to comply with the Sanitary Services Acts, 1878-1964.
3. That each proposed house be used as a single dwelling unit.	3. To prevent unauthorised development.
4. That arrangements made for the payment of the financial contribution in the sum of £121,560 in respect of the overall development required by condition no. 4 of planning permission granted under Reg. Ref. 89A-1687 be strictly adhered to in respect of the above proposal.	4. In the interest of the proper planning and development of the area.
(Continued)	

Signed on behalf of the Dublin County Council .....
For Principal Officer

Date 18.02.1992

IMPORTANT: Turn overleaf for further information

(Continued) CONDITIONS	REASONS FOR CONDITIONS
5. That the arrangements made for the lodgement of security in the form of an approved Insurance Company Bond or Letter of Guarantee in the sum of £250,000 or a cash lodgement of £150,000 in respect of the overall development, required by condition no. 5 of planning permission granted under Reg. Ref. 89A-1687 be strictly adhered to in respect of the above proposal.	5. In the interest of the proper planning and development of the area.
6. The development shall be carried out in conformity with Conditions Nos. 6-24 of the decision to grant permission by Order No. P/4937/89, dated 16.01.1989, Reg. Ref. 89A-1687, save as amended to conform with the revisions indicated in the plans lodged with Dublin County Council in connection with this application.	6. In the interest of the proper planning and development of the area.
7. Heating to be provided by the use of either oil, gas, electricity or by smokeless fuels in fireplaces or appliances suitable only for burning solid smokeless fuels.	7. In the interest of reducing air pollution.
8. Bedroom sizes to conform to the minimum standards laid down by the Department of Local Government as applied in providing Local Authority dwellings.	8. In the interest of the proper planning and development of the area.

NOTE:

If there is no appeal to An Bord Pleanala against this decision PERMISSION/APPROVAL will be granted by the Council as soon as may be after the expiration of the period for the taking of such appeal. If every appeal made in accordance with the Acts has been withdrawn, the Council will grant the PERMISSION/APPROVAL after the withdrawal.

An appeal against the decision may be made to An Bord Pleanala. The applicant may appeal within one month from the date of receipt by him of this notification. ANY OTHER PERSON may appeal within twenty-one days beginning on the date of the decision.

An appeal shall be in writing and shall state the subject matter and grounds of the appeal. It should be addressed to:—

An Bord Pleanala, Blocks 6 and 7, Irish Life Centre, Lower Abbey Street, Dublin 1.

(1) An appeal lodged by an applicant or his agent with An Bord Pleanala will be invalid unless accompanied by a fee of £36 (Thirty-six Pounds). (2) A party to an appeal making a request to An Bord Pleanala for an Oral Hearing of an appeal must, *in addition* to (1) above, pay to An Bord Pleanala a fee of £36 (Thirty-six Pounds). (3) A person who is not a party to an appeal must pay a fee of £10 (Ten Pounds) to An Bord Pleanala when making submissions or observations to An Bord Pleanala in relation to an appeal.

Approval of the Council under Building Bye-Laws must be obtained and the terms of the approval must be complied with in the carrying out of the work before any development which may be permitted is commenced.

FUTURE PRINT LTD.

KEANE MURPHY DUFF
Chartered Architects, Designers & Project Managers

4 Prince's Street South, City Quay, Dublin 2 Telephone: 770077 Facsimile: 771186

6th February 1992.

10 FEB 92

Dublin County Council,
Planning Department,
Irish Life Centre,
Lower Abbey Street,
Dublin 1.

Attn. Ms. Mary Galvin.

Re: Change of House Type at Residential Development at Willsbrook Park, Ballydowd, Lucan - Plan Reg. Ref. No. 91A/2033.

Dear Sirs,

Further to our planning application on the 20th December 1991 for a change of house type from previously approved 4 bed semi detached houses to 3 bed semi detached houses at 9 to 18 inclusive and garage to the side of house No. 19 at Willsbrook Drive, Willsbrook Park, Ballydowd, Lucan, we have been instructed by our client Lark Developments Ltd to request an extension of the appropriate period as provided for under Section 26 (4A) of the Local Government (Planning and Development Act 1963) until the 4th March 1992. This is to allow for a revised newspaper advertisement to be submitted.

Trusting this is to your satisfaction.

Yours sincerely,

662

Niall Phelan
KEANE MURPHY DUFF

KMD

BAILE ÁTHA CLIATH 7 II 92

éire POSTAS IOCTHA 32 NP1341

Attn: Ms. Mary Galvin.
Dublin County Council,
Planning Department,
Irish Life Centre,
Lower Abbey Street,
Dublin 1.

KEANE MURPHY DUFF
Chartered Architects, Designers & Project Managers

4 Prince's Street South, City Quay, Dublin 2 Telephone: 770077 Facsimile: 771186

Ref: NP/MQ

10th February, 1992.

Dublin County Council,
Planning Department,
Irish Life Centre,
Lr. Abbey Street,
Dublin 1.

Att: Ms. Mary Galvin

Re: Change Of House Type At Residential Development, Willsbrook Park, Ballydowd, Lucan, Co. Dublin, Plan Reg. Ref. No. 91A/2033.

Dear Sirs,

Further to our application on 20th December 1991 for a change of house type from previously approved four bedroomed semi-detached houses to three bedroomed semi-detached houses at 9 - 18 inclusive and Garage to the side of house no. 19, Willsbrook Drive, Willsbrook Park, Ballydowd, Lucan, and our subsequent letter to yourselves dated 6th February 1992, regarding an extension of time for making a decision on the application, we now wish to enclose for your attention a revised newspaper advertisement dated the 7th February 1992.

Trusting that this is to your satisfaction.

Yours faithfully,

Niall Phelan,
KEANE MURPHY DUFF.

Encls.

DUBLIN COUNTY COUNCIL
Planning permission is being sought for a change of house type from previously approved 4 bed semi detached houses to 3 bed semi detached houses at 9-18 incl. and garage extension to the side of house no. 19 all at Willsbrook Drive (Road 2), Willsbrook Park, Ballydowd, Lucan for Lark Developments Ltd.

12 FEB 92

7/2/92

Unsat AF
1-0-0.

KMD

Dublin County Council Comhairle Chontae Atha Cliath **Planning Department**

Building Control Department,
Liffey House,
Tara Street,
Dublin 1.
Telephone:773066

Bloc 2, Ionad Bheatha na hEireann,
Bloc 2, Irish Life Centre,
Sraid na Mainistreach Iacht,
Lower Abbey Street,
Baile Atha Cliath 1.
Dublin 1.
Telephone (01) 724755
Fax (01) 724896

Register Reference : 91A/2033

Date : 23rd December 1991

LOCAL GOVERNMENT (PLANNING AND DEVELOPMENT) ACTS, 1963 TO 1990

Dear Sir/Madam,

DEVELOPMENT : Change of house type from previously approved 4 bed semi detached houses to 3 bed semi detached houses at 9-18 incl. and garage extension to side of house no. 20

LOCATION : Willsbrook Drive (Road 2) Willsbrook Park, Ballydowd

APPLICANT : Lark Developments Ltd

APP. TYPE : PERMISSION/BUILDING BYE-LAW APPROVAL.

With reference to the above, I acknowledge receipt of your application received on 20th December 1991.

Yours faithfully,

.....

for PRINCIPAL OFFICER

Keane Murphy Duff,
4 Princes Street South,
City Quay,
Dublin 2.

If there is any query with regard to the information contained in this newspaper notice we would be glad if you could advise us immediately to this effect.

It is the practice of this office to take account of the Draft Building Regulations as issued by the Minister for the Environment in the design of buildings, but this is not to be interpreted as a guarantee that the provisions of the Draft Building Regulations have been implemented in full or in any particular respect in this proposal.

Dublin County Council
Comhairle Chontae Atha Cliath

Planning Application Form/ Bye - Law Application Form

PLEASE READ INSTRUCTIONS AT BACK BEFORE COMPLETING FORM. ALL QUESTIONS MUST BE ANSWERED.

1. Application for Permission [X] Outline Permission [ ] Approval [ ] Place ✓ in appropriate box.
Approval should be sought only where an outline permission was previously granted. Outline permission may not be sought for the retention of structures or continuances of uses.

2. Postal address of site or building 9-19 Willsbrook Drive (Road 2),
(If none, give description sufficient to identify) Willsbrook Park, Ballydowd, Lucan, Co. Dublin.

3. Name of applicant (Principal not Agent) Lark Developments Ltd
Address 8 Hermitage Park Road, Ballydowd, Lucan, Co. Dublin. Tel. No 6261748

4. Name and address of person or firm responsible for preparation of drawings Keane Murphy Duff, 4 Princes Street South, City Quay, Dublin 2. Tel. No 770077

5. Name and address to which notifications should be sent Keane Murphy Duff, 4 Princes Street South, City Quay, Dublin 2.

6. Brief description of proposed development Change of house type from previously approved houses.

7. Method of drainage Main sewer 8. Source of Water Supply Mains water supply

9. In the case of any building or buildings to be retained on site, please state:-
(a) Present use of each floor or use when last used. N/A
(b) Proposed use of each floor N/A

DUBLIN COUNTY COUNCIL
Planning permission is being sought for a change of house type from previously approved 4 bed. semi detached houses to 3 bed. semi detached houses at 9-18 incl. and garage extension to side of house no. 20 all at Willsbrook Drive (Road 2), Willsbrook Park, Ballydowd, Lucan for Lark Developments Ltd

Dust Pres 18/12/91

10 Does the proposal involve demolition, partial demolition or change of use of any habitable house or part thereof? No

11.(a) Area of Site 2400m² Sq. m.
(b) Floor area of proposed development 3 bed semi = 97m² Sq. m.
(c) Floor area of buildings proposed to be retained within site N/A Sq. m.

12. State applicant's legal interest or estate in site (i.e. freehold, leasehold, etc.) Freehold

13. Are you now applying also for an approval under the Building Bye Laws?
Yes [X] No [ ] Place ✓ in appropriate box.

14. Please state the extent to which the Draft Building Regulations have been taken in account in your proposal:
See standard statement.

15. List of documents enclosed with application. 4 copies of drawing nos. 8432/11, 26, 28B, 33, 34, 35 and 36. Specification completed application form, Newspaper Advertisement Covering letter, cheque for £693.00 & 2 COPIES STRUCTURAL CALCULATIONS.

16. Gross floor space of proposed development (See back) As 11(b) above Sq. m.
No of dwellings proposed (if any) 11 no. Class(es) of Development Class 1
Fee Payable £ 693 Basis of Calculation 11 x £8 = 88 + 11 x 55 = 605
If a reduced fee is tendered details of previous relevant payment should be given
Full planning fee already paid for previous application, Plan Reg. Ref. 90A/1116 dated 26th September, 1990.

Signature of Applicant (or his Agent) KMD Date 17th December, 1991

Application Type P/B
Register Reference 91A/2033
Amount Received £
Receipt No
Date 17/1 89A/1687

FOR OFFICE USE ONLY
2.32.4.4

RECEIVED
20 DEC 1991
REG. SEC.

LOCAL GOVERNMENT (PLANNING & DEVELOPMENT) REGULATIONS 1977 to 1984.

Outline of requirements for applications for permission or Approval under the Local Government (Planning & Development) Ac 1963 to 1983. The Planning Acts and Regulations made thereunder may be purchased from the Government Publications Sales Office, Sun Alliance House, Molesworth Street, Dublin 2.

1. Name and Address of applicant.

2. Particulars of the interest held in the land or structure, i.e. whether freehold, leasehold, etc.

3. The page of a newspaper, circulating in the area in which the land or structure is situate, containing the required statutory notice. The newspaper advertisement should state after the heading Co. Dublin.

   (a) The address of the structure or the location of the land.
   (b) The nature and extent of the development proposed. If retention of development is involved, the notice should be worded accordingly. Any demolition of habitable accommodation should be indicated.
   (c) The name of the applicant.

   NB. Applications must be received within 2 weeks from date of publication of the notice.

4. Four (4) sets of drawings to a stated scale must be submitted. Each set to include a layout or block plan, proposed and existing services to be shown on this drawing, location map, and drawings of relevant floor plans, elevations, sections, details of type and location of septic tank (if applicable) and such other particulars as are necessary to identify the land and to describe the works or structure to which the application relates (new work to be coloured or otherwise distinguished from any retained structures). Buildings, roads, boundaries and other features bounding the structure or other land to which the application relates shall be shown on site plans or layout plans. The location map should be of scale not less than 1: 2500 and should indicate the north point. The site of the proposed development must be outlined in red. Plans and drawings should indicate the name and address of the person by whom they were prepared. Any adjoining lands in which the applicant has an interest must be outlined in blue.

5. In the case of a proposed change of use of any structure or land, requirements in addition to 1, 2, & 3 are:
   (a) a statement of the existing use and the proposed use, or, where appropriate, the former use and the use proposed.

   (b) (i) Four (4) sets of the drawings to a stated scale must be submitted. Each set to consist of a plan or location map (marked or coloured in red so as to identify the structure or land to which the application relates) to a scale of not less than 1:2500 and to indicate the North point. Any adjoining lands in which the application has an interest must be outlined in blue.

   (ii) A layout and a survey plan of each floor of any structure to which the application relates.

   (c) Plans and drawings should indicate the name and address of the person by whom they were prepared.

6. Applications should be addressed to: Dublin County Council, Planning Department, Irish Life Centre, Lr. Abbey Street, Dublin 1, Tel. 724755.

SEPTIC TANK DRAINAGE: Where drainage by means of a septic tank is proposed, before a planning application is considered, the applicant may be required to arrange for a trial hole to be inspected and declared suitable for the satisfactory percolation of septic tank effluent. The trial hole to be dug seven feet deep at or about the site of the septic tank. Septic tanks are to be in accordance with I.I.R.S. S.R. 6:75.

INDUSTRIAL DEVELOPMENT:
The proposed use of an industrial premises should, where possible, be stated together with the estimated number of employees, (male and female). Details of trade effluents, if any, should be submitted.

Applicants to comply in full with the requirements of the Local Government (Water Pollution) Act, 1977 in particular the licencing provisions of Sections 4 and 16.

PLANNING APPLICATIONS

CLASS NO.	DESCRIPTION	FEE
1.	Provision of dwelling — House/Flat.	£32.00 each
2.	Domestic extensions/other improvements.	£16.00
3.	Provision of agricultural buildings (See Regs.)	£40.00 minimum
4.	Other buildings (i.e. offices, commercial, etc.)	£1.75 per sq. metre (Min. £40.00)
5.	Use of land (Mining, deposit or waste)	£25.00 per 0.1 ha (Min £250.00)
6.	Use of land (Camping, parking, storage)	£25.00 per 0.1 ha (Min. £40.00)
7.	Provision of plant/machinery/tank or other structure for storage purposes.	£25.00 per 0.1 ha (Min. £100.00)
8.	Petrol Filling Station.	£100.00
9.	Advertising Structures.	£10.00 per m² (min £40.00)
10.	Electricity transmission lines.	£25.00 per 1,000m (Min. £40.00)
11.	Any other development.	£5.00 per 0.1 ha (Min. £40.00)

BUILDING BYE-LAW APPLICATIONS

CLASS NO.	DESCRIPTION	FEE
A	Dwelling (House/Flat)	£55.00 each
B	Domestic Extension (improvement/alteration)	£30.00 each
C	Building — Office/ Commercial Purposes	£3.50 per m² (min. £70.00)
D	Agricultural Buildings/Structures	£1.00 per m² in excess of 300 sq. metres (min. - £70.00) (Max. - £300.00)
E	Petrol Filling Station	£200.00
F	Development or Proposals not coming within any of the foregoing classes.	£9.00 per 0.1 ha (£70.00 min.) Min. Fee £30.00 Max. Fee £20,000

Cheques etc. should be made payable to: Dublin County Council.
Gross Floor space is to be taken as the total floor space on each floor measured from the inside of the external walls.
For full details of Fees and Exemptions see Local Government (Planning and Development) (Fees) Regulations 1984.

RECEIPT CODE

COMHAIRLE CHONTAE ÁTHA CLIATH

PAID BY —

CASH

CHEQUE ✓

M.O.

B.L.

I.T.

DUBLIN COUNTY COUNCIL
46/49 UPPER O'CONNELL STREET
DUBLIN 1.

Issue of this receipt is not an acknowledgement that the sum tendered is the prescribed application fee.

N 54193

£88.00

Received this 20th day of December 1991

from Lark Davs. Ltd.,
8 Hermitage Park Rd.,
Lucan

the sum of eighty eight ——— Pounds
——— Pence, being Fee for
planning application at 9-19 Willsbrook Dr.

Noelle Deane Cashier

S. CAREY Class 1 x 11
Principal Officer

COMHAIRLE CHONTAE ÁTHA CLIATH

DUBLIN COUNTY COUNCIL
46/49 UPPER O'CONNELL STREET
DUBLIN 1.

RECEIPT CODE

PAID BY —
CASH
CHEQUE ✓
M.O.
B.L.
I.T.

BYE LAW APPLICATION

REC. No. N 54429

£ 605.00

Received this 20th day of December 19 91

from Lark Devs - HO.,
8 Hermitage Park Rd,
Lucan

the sum of six hundred and five Pounds

Pence, being fee for bye-law application at 9-19 Willsbrook Dr.

Noeleen Deane Cashier

S. CAREY
Principal Officer

Class A x 11

RECEIPT CODE

COMHAIRLE CHONTAE ÁTHA CLIATH

PAID BY — **DUBLIN COUNTY COUNCIL**

46/49 UPPER O'CONNELL STREET
DUBLIN 1.

BYE LAW APPLICATION

REC. No. N 54429

CASH ●
CHEQUE ✓
M.O.
B.L.
I.T.

£ 605.00

Received this 20th day of December 19 91

from Lark Dev. Ltd.,
8 Hermitage Park Rd.,
Lucan

the sum of six hundred and five ——— Pounds

——— Pence, being fee for

bye-law application at 9-19 Willsbrook Dr.

Noeleen Deane Cashier

S. CAREY
Principal Officer

Cass M.x11

COMHAIRLE CHONTAE ÁTHA CLIATH

DUBLIN COUNTY COUNCIL

46/49 UPPER O'CONNELL STREET
DUBLIN 1.

RECEIPT CODE

PAID BY —
CASH
CHEQUE ✓
M.O.
B.L.
I.T.

Copy of this receipt to be an acknowledgement that the fee tendered is the N[illegible]541[illegible]93 application fee.

£88.00

Received this 20th day of December 19 91

from Lark Davs. Ltd.,
8 Hermitage Park Rd.,
Lucan

the sum of Eighty Eight Pounds

Pence, being for fee

planning application at 9-19 Willsbrook Dr.

Noelan Doane Cashier

S. CAREY Class 1 x 11
Principal Officer

KEANE MURPHY DUFF
Chartered Architects, Designers & Project Managers

4 Prince's Street South, City Quay, Dublin 2 Telephone: 770077 Facsimile: 771186

Ref: NP/MQ

18th December, 1991.

Dublin County Council,
Planning Department,
Block 2,
Irish Life Centre,
Lr. Abbey Street,
Dublin 1.

Re: Residential Development At Willsbrook Park, Ballydowd, Lucan / Lark Developments Ltd.

Dear Sirs,

On behalf of our Client, Lark Developments Ltd., we wish to apply for both Planning Permission and Bye-Law Approval for a change of house type from previously approved houses at 9 - 19 inclusive Willsbrook Drive (Road 2), Willsbrook Park, Ballydowd, Lucan.

There have been two previous Grant of Planning Permission and Bye-Law Approval obtained from the Dublin County Council for the overall development, Plan Reg. Ref. Nos. 89A/1687, dated 21st February 1990, and 90A/1116 dated 26th September 1990 and the Bye-Law references, BBL/1563/90 and BBL/4074/90.

The change of house type consists of three bedroomed semi-detached houses for site nos. 9 - 18 inclusive in lieu of the previously approved four bedroomed semi-detached houses, and a garage to the side of house no. 19, all on Willsbrook Drive (Road 2).

We are enclosing a cheque for £693 made payable to the Dublin County Council as application fee for Planning Permission and Bye-Law Approval.

We trust that sufficient information has been provided to enable you to assess this application and look forward to receiving from yourselves an early favourable decision.

Yours sincerely,

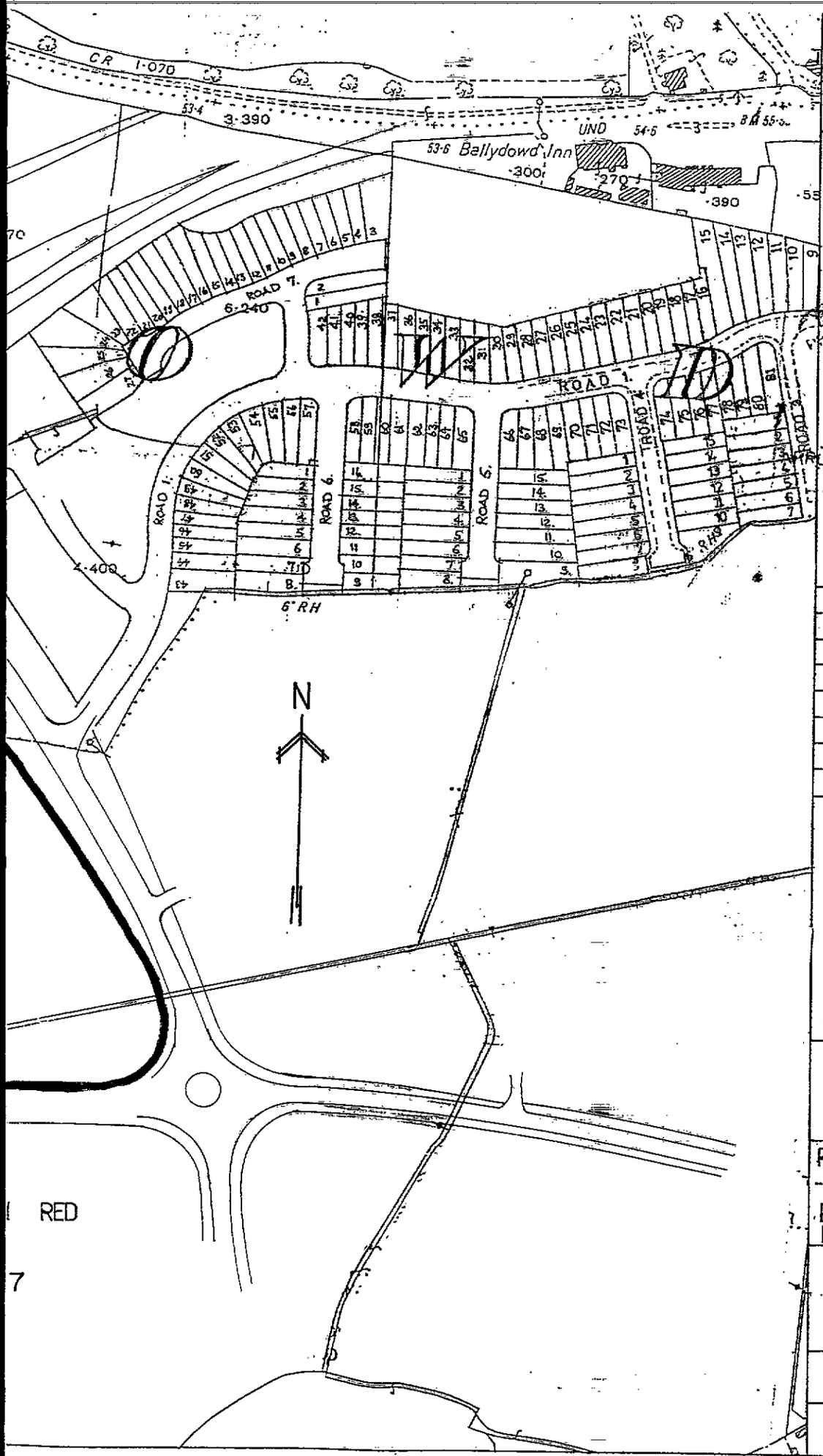
Niall Phelan.

Niall Phelan,
KEANE MURPHY DUFF.

C.C. Lark Developments Ltd

KMD

Encls.



KMD

DUBLIN CO... COUNCIL
Planning Dept Registry Section
APPLICATION RECEIVED
20 DEC 1991
REG No 91A/2035
APPLICATION TYPE O/P/A/BB
NO L C

KEANE MURPHY DUFF

Chartered Architects

36 FENIAN STREET
DUBLIN 2
PHONE 611711

RESIDENTIAL DEVELO-PMENT, WILLSBROOK PK, BALLYDOWD LUCAN, LARK HOMES

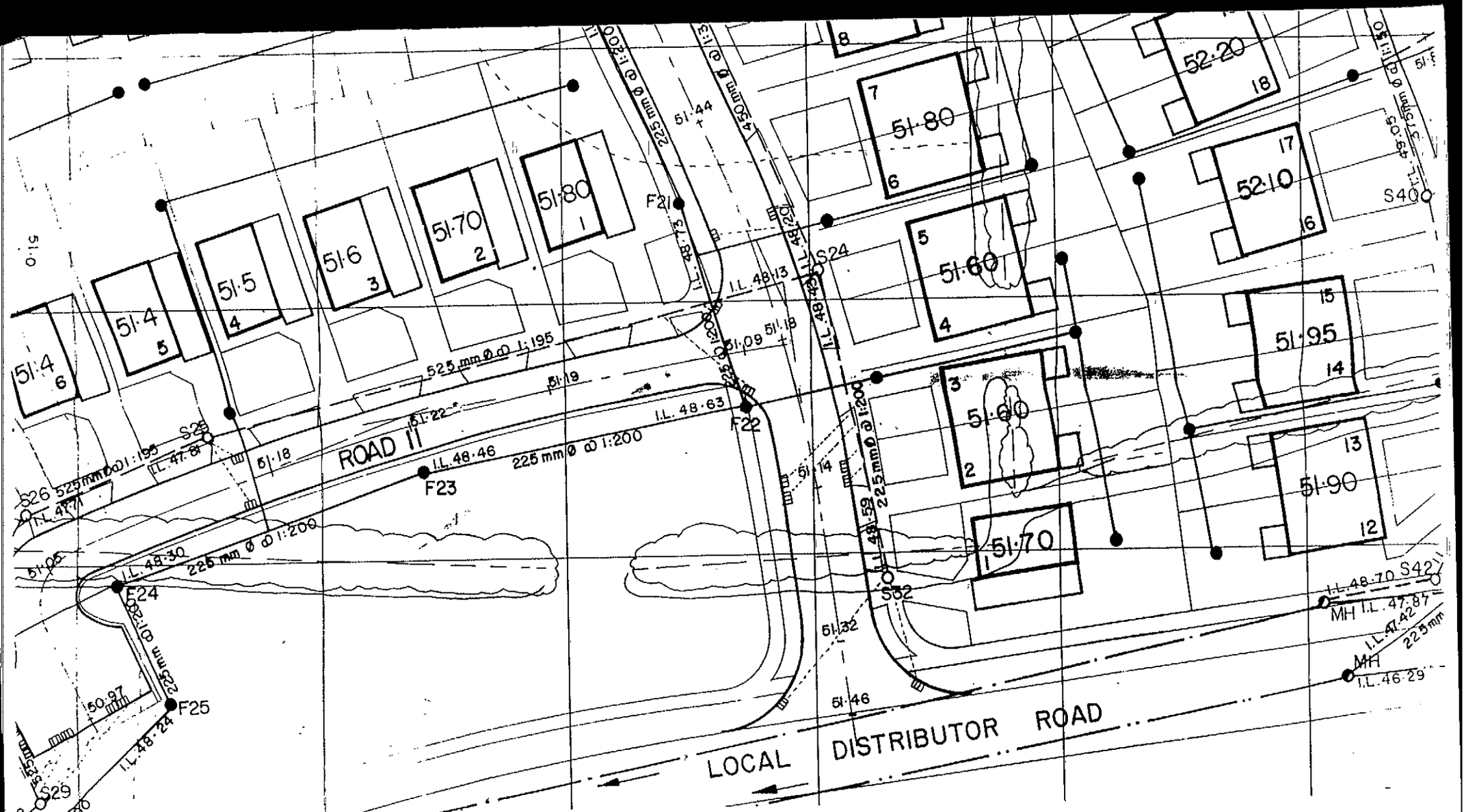
SITE LOCATION MAP

scale	date
1: 2500	SEPT 89,

ML	8932	11


3·010
38kv
1·360
4·440
·880
38kv
·320
·250
·450
Palmville
9·730
·300
·250
3·6
·110
6·600
6"RH
6"RH
·010
6"RH
C R
·360
1·700
1·430
·550
·290
·330
·940
Tank
·170
SH
Wills Brook House
6·510
OVERALL SITE OUTLINED IN
SITE MAP TAKEN FROM
O.S. MAP REF DUBLIN 17-

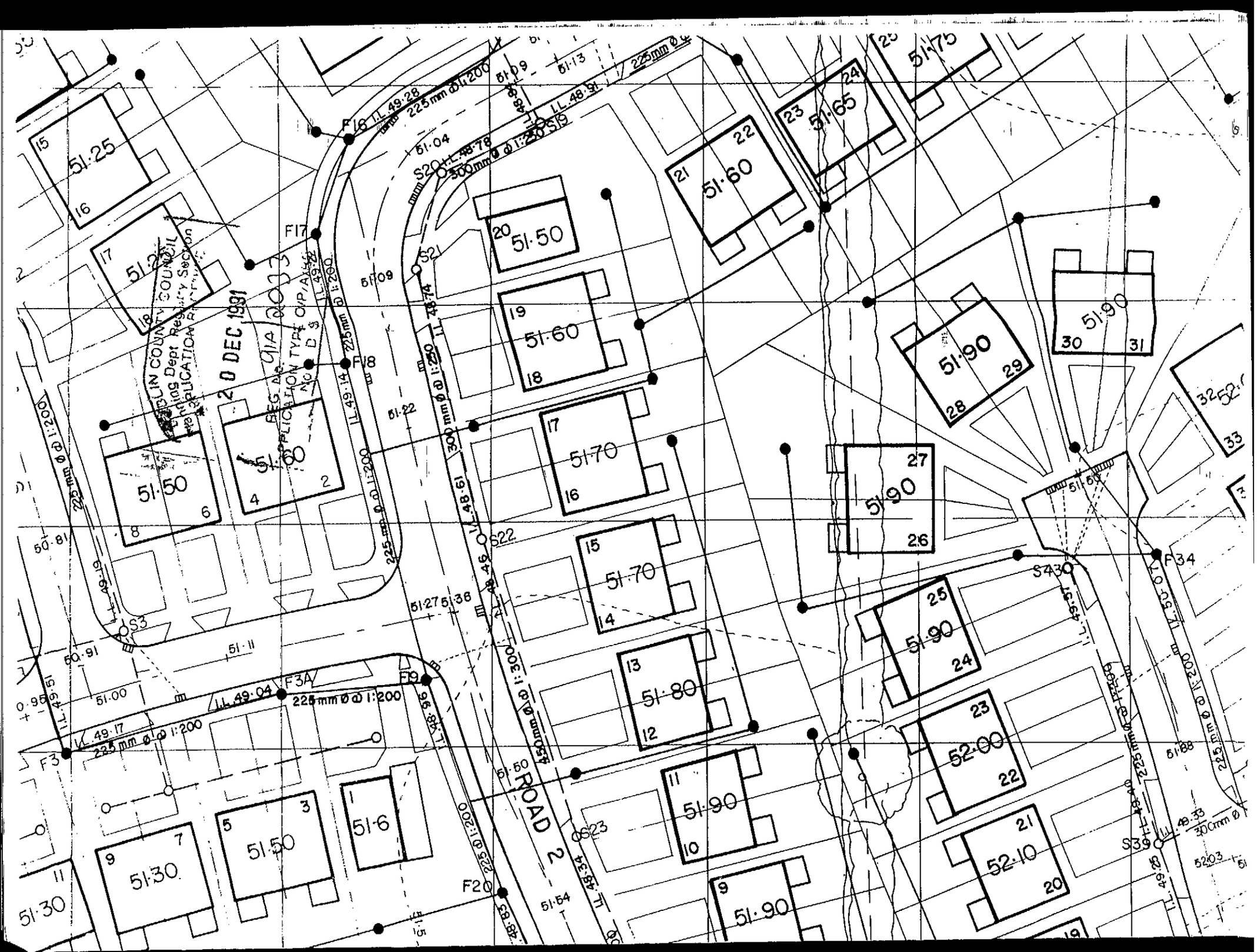
JDH12637



NOTE: THIS IS PART OF A PREVIOUSLY LODGED CIARAN FAHY+ASSOC DRG. NO. 9211/2b. REG 90A/1116, BBL/4074/90

THIS DRAWING IS FOR DRAINAGE DETAILS ONLY.

READ IN CONJUNCTION WITH RELEVANT ARCHS. DRAWINGS.


DUBLIN COUNTY COUNCIL
Planning Dept Registry Section
Map APPLICATION
20 DEC 1991
REG. No. 91A/0033
APPLICATION TYPE O/P/A
A/D
D.S.
ROAD 2
51·25
51·60
51·50
51·70
51·90
51·80
51·30
52·00
52·10
F1
F2
F3
F8
F9
F17
F34
S2
S3
S22
S23
S30
S39
225mm Ø @ 1:200
300mm Ø @ 1:200
450mm Ø @ 1:300

STRUCTURAL CALCULATIONS

FOR

HOUSING DEVELOPMENT AT WILLSBROOK PARK

FOR

LARK DEVELOPMENTS LIMITED

CIARAN FAHY + ASSOCIATES
Consulting Engineers
Lincoln House
Lincoln Lane
Smithfield
DUBLIN 7

September 1990

FAHY FITZPATRICK *Consulting Engineers* Lincoln House, Lincoln Lane Smithfield, Dublin 7	STRUCTURAL CALCULATIONS			
	JOB NO :		JOB Willsbrook Park	
	SHEET NO 1	DATE Sept. 90	CALC YMcD	CHEC.

Scope

There are 3 types of buildings included in this design at Willsbrook Park, Lucan Co. Kildare, comprising -

- a steel support over the Kitchen
- a steel support over the first floor bay window
- a timber frame forming the ground and first floor bay windows.

Codes of Practice

The design will be carried out in accordance with the following British and Irish Codes of Practice:

CP3 : Chapter V : Parts 1 and 2 : 1972 : Loading for the design of Buildings

BS 5268 : Part 2 : 1988 : Structural Use of Timber

BS 5950 : Part 1 : 1985 : Structural Use of Steelwork in Buildings

The Institution of Structural Engineers "Manual for the design of Steelwork Building Structures"

Materials

Blockwork to have compressive strength not less than 5.0 MPa.

Structural Steel to be grade 43A

Timber to be European Whitewood, GS grade and Strength Class SC2

Concrete to be grade 35A/20mm.

FAHY FITZPATRICK
Consulting Engineers
Lincoln House, Lincoln Lane
Smithfield, Dublin 7

STRUCTURAL CALCULATIONS

JOB NO : | JOB

SHEET NO	DATE	CALC	CHEC.
2	Sept 90	FitzPa	

Loadings.

		kN/sq.m
Roof :	Tiles	0.50
	Felt + battens	0.10
	Rafters	0.15
		0.75 kN/sq.m on slope of 30°
	=	0.75 / Cos 30 = 0.87 kN/sq.m on plan
	Ceiling joists	0.15
	Insulation	0.05
	Plaster slab	0.15
		0.35 kN/sq.m on plan
	Roof Imposed	0.75
	Ceiling Imposed	0.25

Total Load = 2.22 kN/sq.m

Ultimate Load = 1.4 x 1.22 + 1.6 x 1.0 = 3.31 kN/sq.m

Stepped Wall :-

Tiles	0.50
Felt + battens	0.10
Slates	0.5
Insulation	0.05
Plaster	0.15
	0.95 kN/sq.m

Wind Load :-

b_r = 8.0 m
width = 9.5 m
length = 8.0 m
roof pitch = 30°

V_c = 46 m/s
$S_1 = S_2$ = 1.0
S_3 = 0.70
$\Rightarrow V_s$ = 32.2 m/s
$q = KV_s^2$ = 0.64 kN/sq.m

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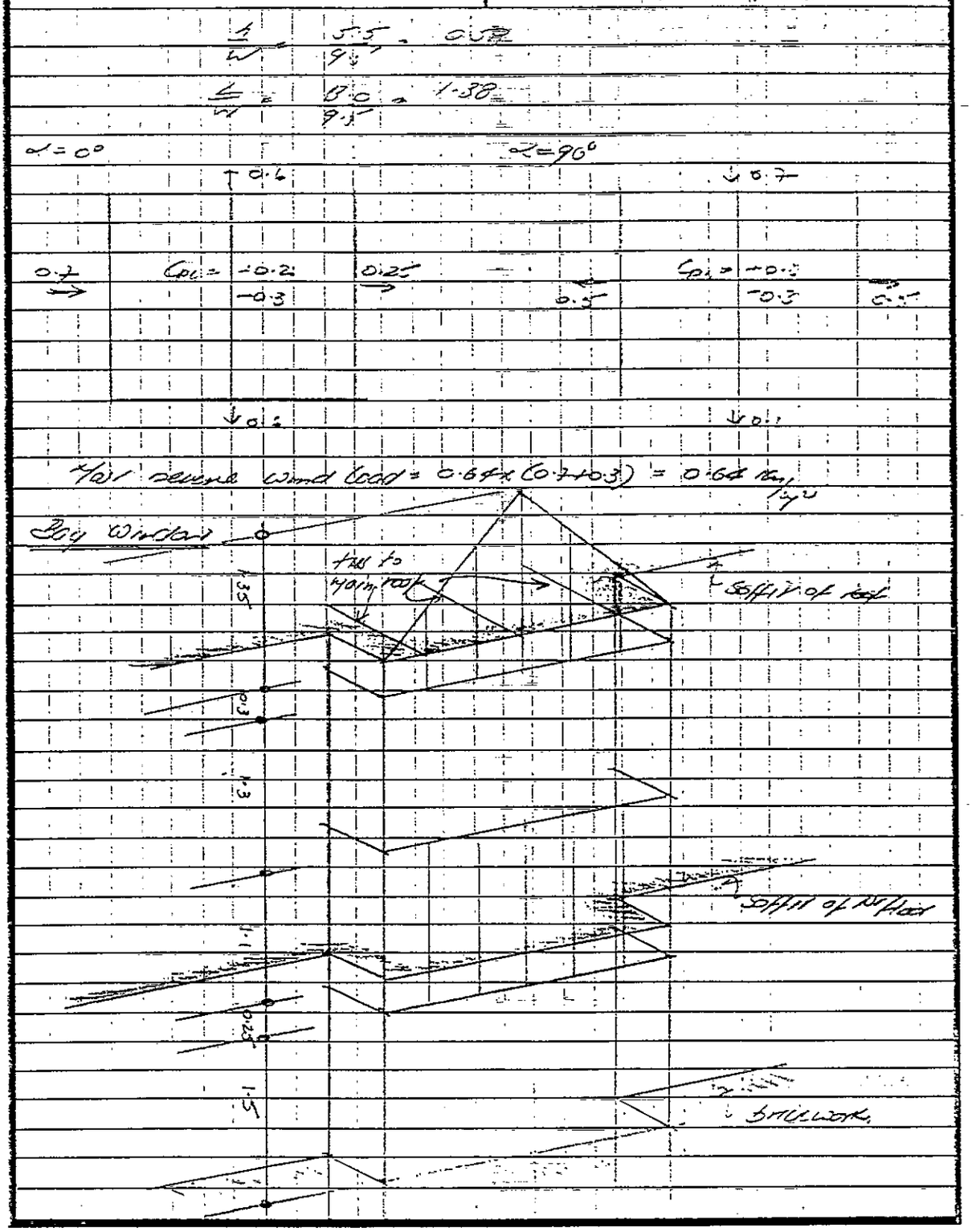
STRUCTURAL CALCULATIONS

JOB NO :		JOB	
SHEET NO 3	DATE Sept. 90	CALC MOBB	CHEC.



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STRUCTURAL CALCULATIONS

JOB NO : | JOB

SHEET NO	DATE	CALC	CHEC.
6	Sept 90	YMJO	

Floor :- kN/m²

25 boards	0.10
Joists	0.13
timber	0.05
plaster	0.17
	0.55 kN/m²
Imposed	1.50 kN/m²

Side Elevation :-

0.5y span.

Load (roof level) : roof = $\frac{2.22 \times 2.4}{2}$ = 2.7 kN/m

gable = $\frac{0.5 \times 1.3 \times 0.3}{3.0}$ = 0.3 kN/m

Load (1st floor level) : window = 0.25 × 1.3 = 0.33 kN/m *

floor = $\frac{2.05 \times 2.4}{2}$ = 2.5 kN/m

slated wall = 0.85 × 1.1 = 1.05 kN/m

* window carried by side elevation at this level

→ Max load on beam = 2.5 + 1.05 = 3.55 kN/m

$V = \frac{3.55 \times 0.54}{8}$ = 0.11 kN/m

$V = \frac{3.55 \times 0.5}{2}$ = 0.9 kN

Elevation wall wood :-

gable studs $P_{bc} = 5.3 \times \left(\frac{350}{100}\right)^{-0.11}$ = 6.0 N/mm².

P_y = 0.92 N/mm² ÷

75 × 100 → Z = 125000 mm³

$f_{bc} = \frac{0.1126}{Z}$ = 0.8 N/mm² ✓

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STRUCTURAL CALCULATIONS

JOB NO : JOB

SHEET NO	DATE	CALC	CHEC.
5			

$f_y = \frac{z}{2} \times \frac{0.9E3}{75 \times 150} = 0.18 \text{ N/mm}^2$ ✓

$d = \frac{5}{384} \times \frac{0.35 \times 3500^4}{6000 \times 6.25E6} = 0.1 \text{ mm}$ ✓

Use 75 x 100 section

Front beam

Span = 2.4 m

Roof level load: $0.95 \times \frac{2.4}{2.4} = 0.95 \text{ kN/m}$

First floor level load: $0.95 \times 1.35 = 1.28 \text{ kN/m}$

$0.25 \times 1.8 = 0.33 \text{ kN/m}$

1.60 kN/m

$M = \frac{1.60 \times 2.4^2}{8} = 1.15 \text{ kNm}$

$V = \frac{1.60 \times 2.4}{2} = 1.9 \text{ kN}$

Allow. stress. $P_{bc} = 5.3 \times \left(\frac{300}{175}\right)^{0.11} = 5.6 \text{ N/mm}^2$

$P_v = 0.82 \text{ N/mm}^2$

$E = 6000 \text{ N/mm}^2$

75 x 150 section $\Rightarrow Z = 281.25 \text{ mm}^3$

$f_{bc} = \frac{1.15E6}{Z} = 4.1 \text{ N/mm}^2$ ✓

$f_v = \frac{z}{2} \times \frac{1.9E3}{75 \times 150} = 0.25 \text{ N/mm}^2$ ✓

$\delta = \frac{5}{384} \times \frac{1.60 \times 2400^4}{6000 \times 2.11E7} = 5.5 \text{ mm} < \frac{L}{360} = 6.7 \text{ mm}$

Use 75 x 150 section

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STRUCTURAL CALCULATIONS

JOB NO : | JOB

SHEET NO	DATE	CALC	CHEC.
6	Sept 96	YMcA	

Wind on front beam -

Wind area = $0.25 \times 2.4 \times \frac{1}{2}\left(2.4 + \frac{2.4}{2}\right) \times 0.75 = 1.5\ kN$

Note - Most of the wind load will be transferred to the floor beams by means of the steel partitions.

$\Rightarrow$ Load = $\frac{0.6 \times 1.5}{2.4} = 0.4\ kN/m$

$M = \frac{0.4 \times 2.4^2}{8} = 0.29\ kNm$

$V = 0.4 \times 1.2 = 0.49\ kN$

75 x 150 section - $Z_y = 1.41E3\ mm^3$.

$f_{by} = \frac{M_y}{Z_y} = \frac{0.29E6}{1.41E3} = 2.1\ N/mm^2$

Total $f_{bc} = 4.1 + 2.1 = 6.2\ N/mm^2$.

$P_{bc} = 5.6 \times 1.25 = 7.0\ N/mm^2$ ✓

$f_v = \frac{3}{2} \times \frac{0.49E3}{75 \times 150} = 0.09\ N/mm^2$.

Total $f_v = 0.25 + 0.09 = 0.34\ N/mm^2$ ✓

$\delta_y = \frac{5}{384} \times \frac{0.4 \times 2400^4}{6.2E3 \times 5.29E6} = 5.6mm < \frac{L}{360}$ ✓

$\Rightarrow$ 75 x 150 section is adequate.

Note use same size section for rear beam which is also heavily stressed

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STRUCTURAL CALCULATIONS

JOB NO :

JOB

SHEET NO 7 | DATE 6/4/90 | CALC TJ&S | CHEC.

1st floor SHF bay

Subject to wind load only

Area = $\frac{1.1 \times 1.4}{2} + (1.1 + 2.2) \times 0.65 = 2.46$ sq.m.

Load = $\frac{0.64 \times 2.46}{2.4} = 0.65$ kN/m

Span = 2.4m

M = $\frac{0.65 \times 2.4^2}{8} = 0.47$ kNm

V = $0.65 \times 1.2 = 0.78$ kN

D/Load. allowable = $P_d + 5.3 \times \left(\frac{300}{100}\right)^{0.11} \times 1.25 = 7.5$ N/mm²

$P_d = 0.82 \times 1.25 = 1.03$ N/mm²

Try 100 x 100 SHS $Z = 1.67E5$ mm³

$f_{bc} = \frac{0.47E6}{Z} = 2.82$ N/mm² ✓

$f_v = \frac{2 \times 0.78E3}{2 \times 100^2} = 0.12$ N/mm² ✓

$\delta = \frac{5}{384} \times \frac{0.65 \times 2400^4}{200 \times 8.33E6} = 5.6$ mm

$\frac{L}{366} = 6.7$ mm

Use 100 x 100 SHS

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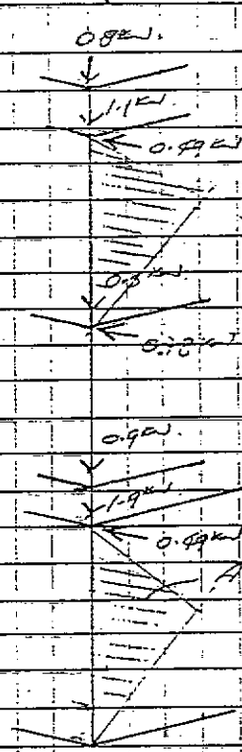
STRUCTURAL CALCULATIONS

JOB NO :		JOB	
SHEET NO	DATE	CALC	CHEC.
8	Sept-12	MBO	

Vertical Leg



Wind load ~

Area = 0.536m²

W = 0.6 × 0.536 = 0.32kN.

DL = 0.36 / 1.5 = 0.24kN/m

Vertical load = 0.8 + 1.1 + 0.5 + 0.3 + 1.9 = 5.2kN.

Leg restrained at NW floor and roof level by floor boards and ceiling joists respectively

Also restrained by side and front cross beams

Max moment due to wind = 0.24 × 1.5² / 8 = 0.06kNm

Effective length = 1500mm

by 100x100 section

allow stresses P_c = 6.8N/mm²

P_{bc} = 5.2 × (200/100)^0.11 = 6.0N/mm²

E = 6000N/mm²

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STRUCTURAL CALCULATIONS

JOB NO : | JOB

SHEET NO	DATE	CALC	CHEC.
9	Sept 96	Hdg	

$\frac{E}{f_{cu}} = \frac{6000}{5.8} = 862$

$\frac{L_e}{b} = \frac{500}{100} = 5$

Table 20 of BS 5268 → $K_1 = 0.98$

$\therefore$ allow $P_c = 6.8 \times 0.98^2 = 6.3 N/mm^2$

$f_c = \frac{5263}{100^2} = 0.52 N/mm^2$

$f_{cc} = \frac{0.06 E_c}{1.6 \gamma_{mc}} = 0.4 N/mm^2$

$P_E = \frac{\pi^2 6000}{(52)^2} = 21.94 N/mm^2$ where $\gamma_y = 52.0$

$K_{eq} = \frac{0.40}{6.0\left(1 - \frac{1.5 \times 0.52}{21.9} \times 0.98\right)} + \frac{0.52}{6.3} = 0.15$

→ 100 x 100 section adequate

Connections

All side and front beams shall be welded into the vertical legs

The inner leg shall be bolted to the blockwork using M10 anchor bolts spaced at 600mm c/c.

The base of all legs shall be set into recess in the 100 x 100 timber sill.

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STRUCTURAL CALCULATIONS

JOB NO : | JOB

SHEET NO 10 | DATE Sept 90 | CALC 7ddg. | CHEC.

Kitchen Beam

Loading from roof : Dead = $\frac{1.22 \times 9.8}{2}$ = 6.0 Kn/m

Imposed = $\frac{1.00 \times 9.8}{2}$ = 4.9 Kn/m

Structural : Dead = 0.25 × 2.0 × 2.45 = 12.25 Kn/m

Kitchen roof : Dead = $\frac{1.22 \times 2.3}{2}$ = 1.40 Kn/m

Live = 1.0 × 1.15 = 1.15 Kn/m

Floor : Dead = $\frac{0.55 \times 3.5}{2}$ = 1.0 Kn/m

Live = 1.50 × 1.75 = 0.6 Kn/m

Beam self wt (uniform) = 0.30 × 0.25 × 24 = 1.80 Kn/m

Total Dead Load = 22.5 Kn/m

Total Live Load = 8.65 Kn/m

Design Load = 1.4 × 22.5 + 1.6 × 8.65 = 45.3 Kn/m

Beam span = 5.4m

$M = \frac{45.3 \times 5.4^2}{8}$ = 65.5 Kn/m

$V = \frac{45.3 \times 5.4}{2}$ = 77.0 Kn.

Assume beam not fully restrained since in some cases the joists don't span onto the beam at first floor level.

Try 203 × 133 × 30 UB -

$I = 2880$ cm⁴

$S_x = 312.6$ cm³

$L_E = 0.85 \times 3400 = 2890$ mm

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STRUCTURAL CALCULATIONS

JOB NO : | JOB

SHEET NO 11 | DATE Sept 98 | CALC Yebo. | CHEC.

$\lambda = \left(\frac{L_e}{r}\right)\sqrt{\frac{p_y}{275}}$

$= \left(\frac{2890}{30.5}\right)^{0.92} = 72$

$p_y = 275 N/mm^2$ $\quad \frac{x}{T} = \frac{9}{T} = 29.5$

$\therefore p_b = 218 N/mm^2$

$M_b = \frac{218 \times 312.6 E3}{1E6} = 68 kNm$ ✓

Deflection $\delta = \frac{1.5}{384} \times \frac{31.5 \times 3400^4}{210000 \times 2780E4} = 9.0mm$

$< \frac{L}{360} = 9.4mm$ ✓

Shear :- $P_v = 0.6 P_y A_v$

$= 0.6 \times 275 \times 63 \times 806.8 / 1E3$

$= 214 kN.$

$0.6 P_y = 129 kN > F_v$ ✓

203 x 133 x 30 UB

Bearing :-

Bearing on bottom flange (50mm)

Factored load = 77.0 kN.

or bearing - local design strength = $1.25 \frac{P_y t_f}{\gamma_m}$

$= \frac{1.25 \times 4.8}{3.5} = 1.7 N/mm^2$

$\therefore$ area req'd $= \frac{77000}{1.0} = 77000 mm^2$

UC 254 x 89 bearing good $A = 9675 mm^2$ ✓

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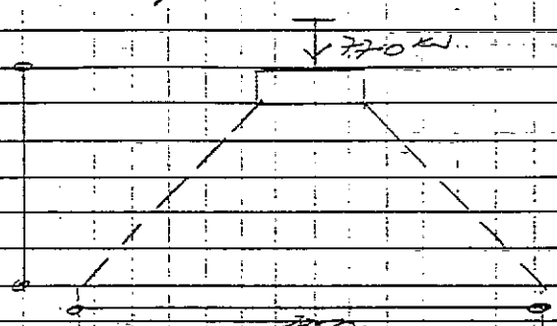
STRUCTURAL CALCULATIONS

JOB NO :

JOB

SHEET NO	DATE	CALC	CHEC.
12	Sept 90	HMB	

Oak below Bearing



Load on Wall : Roof = 10.9 x 1.487 = 16.2 kN/m

Self wt = 0.25 x 20 x 3.4 x 1.4 = 23.9 kN/m

Kitchen roof = 2.58 x 1.487 = 3.8 kN/m

Floor = 3.6 x 1.5 = 5.4 kN/m

Contrib. per Load = $\frac{77.0}{2.35}$ = 32.8 kN/m

→ Total = 66.1 kN/m

Effective Thickness t = 25mm

$\frac{h}{t}$ h = 2800mm

$\frac{h}{t} = \frac{2800}{25} = 11.2$

→ Capacity reduction factor β = 0.95

Allowable Load = $\frac{0.95 \times 25 \times 2.8}{3.5}$

= 16.8 kN/m ✓

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STRUCTURAL CALCULATIONS

JOB NO : | JOB

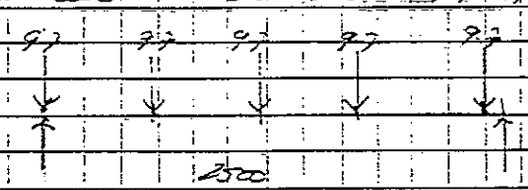
SHEET NO	DATE	CALC	CHEC.
8	Sept 20	YMG	

Roof Loads

Roof Load = 10.9 x 1.48 = 16.2 kN/m²

Joist spacing = 0.6 m

∴ Joist Load = 16.2 x 0.6 = 9.7 kN/m

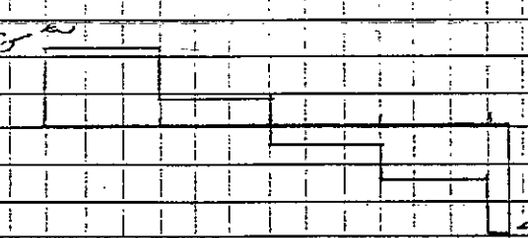


$V_A + V_B = 9.7 \times 5 = 48.5$ kN

$2.5 V_B = 2 \times 9.7 + 1.8 \times 9.7 + 1.2 \times 9.7 + 0.5 \times 9.7$

$\Rightarrow V_B = 23.2$ kN

$V_A = 48.5 - 23.2 = 25.3$ kN



$V_{max} = 25.3 \times 1.2 - 9.7 \times 1.2 - 9.7 \times 0.6 = 12.6$ kN/m

$V_{max} = 23.2$ kN.

Try 150 x 89 RSJ

Assume uniform loading between supports.

$L = 0.85 \times 2500 = 2125$ mm

$\lambda = \left(\frac{2125}{19.9}\right) 0.92 = 81$

$\chi = 18.4$

$\therefore P_b = 240$ N/mm²

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STRUCTURAL CALCULATIONS

JOB NO : | JOB

SHEET NO	DATE	CALC	CHEC.
14	Sept 90	TGD	

S_x = 621 cm³

M_b = $\frac{20 \times 6.1 E3}{1.5}$ = 23.5 kNm ✓

Deflection δ = $\frac{19}{384} \times \frac{9.7E3 \times 2500^3}{20000 \times 6.1E4}$ = 4.1 mm

$< \frac{L}{360}$ = 6.9 mm ✓

Shear

P_t = $\frac{0.6 \times 20 \times 4.9 \times 0.74}{1000}$ = 9 kN

$0.6 P_t$ = 56.4 kN > F_v ✓

Use 42 x 89 est.

Bearings

V = 23.2 kN.

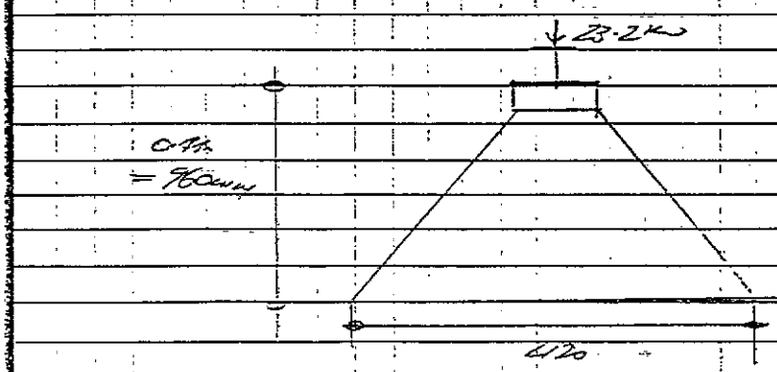
Available bearing stress = $\frac{1.25 \times 4.4}{3.5}$ = 1.57 N/mm²

Note - 5.0 N/mm² solid block assumed → F_c = 9.4 N/mm²

Bearing area req'd = $\frac{23.2E3}{1.5}$ = 14764 mm²

Bearing pad = 100 x 100 → A = 20000 mm² ✓

Allow 0.4 kN clear bearings.



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STRUCTURAL CALCULATIONS

JOB NO : | JOB

SHEET NO	DATE	CALC	CHEC.
15	Sept. 90	MDA	

Load on wall :-

Roof = 10.9 x 1.484 = 16.2 kN/m

wall self wt = 0.96 x 20 x 0.141 x 4 = 23 kN/m

Distributed ult. load = $\frac{23.2}{2.12}$ = 10.9 kN/m

Total load = 39.8 kN/m

Effective Height $h = \frac{2}{3}(150+100) = 133$ mm

Height h = 2400 mm

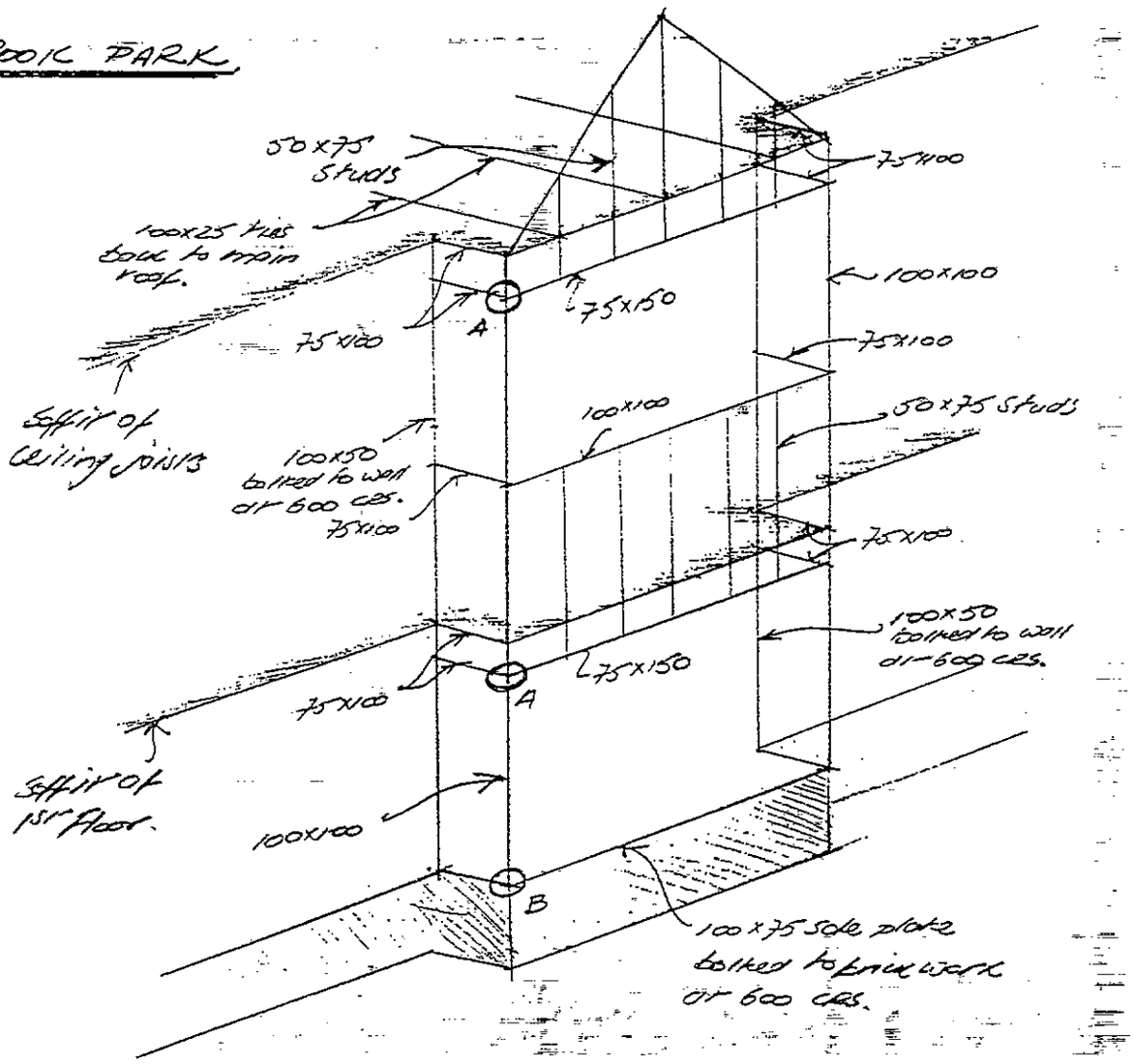
$\frac{h}{t} = \frac{2400}{133} = 18$

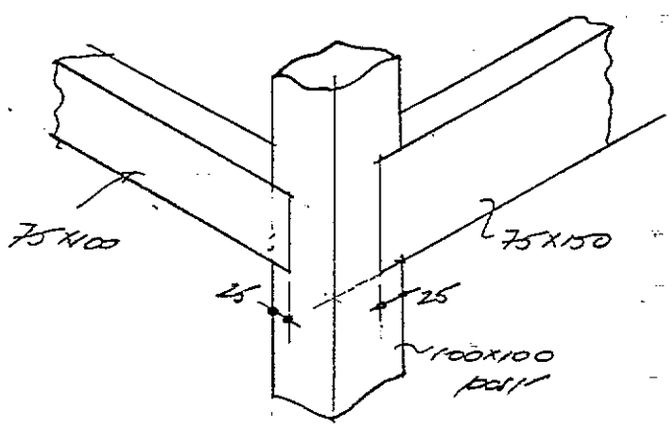
→ Capacity reduction factor β = 0.77

Allowable load = $\frac{0.77 \times 100 \times 4.4}{3.5}$ = 96.8 kN/m ✓

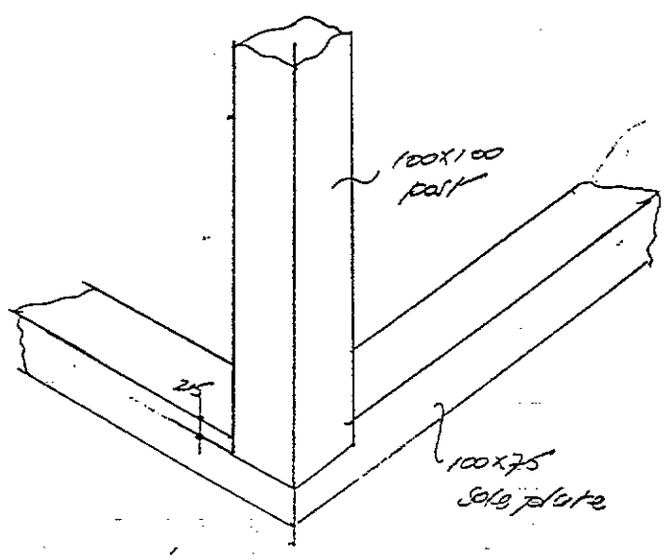
∴ Sizing and thickness adequate.

WILLSBROOK PARK



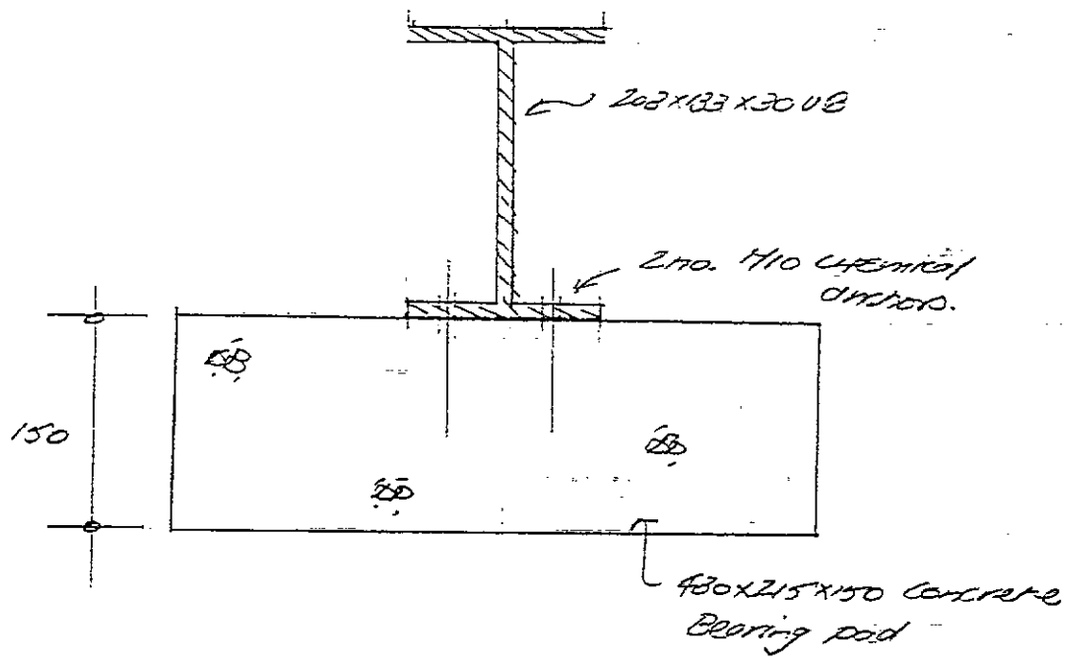


DETAIL A

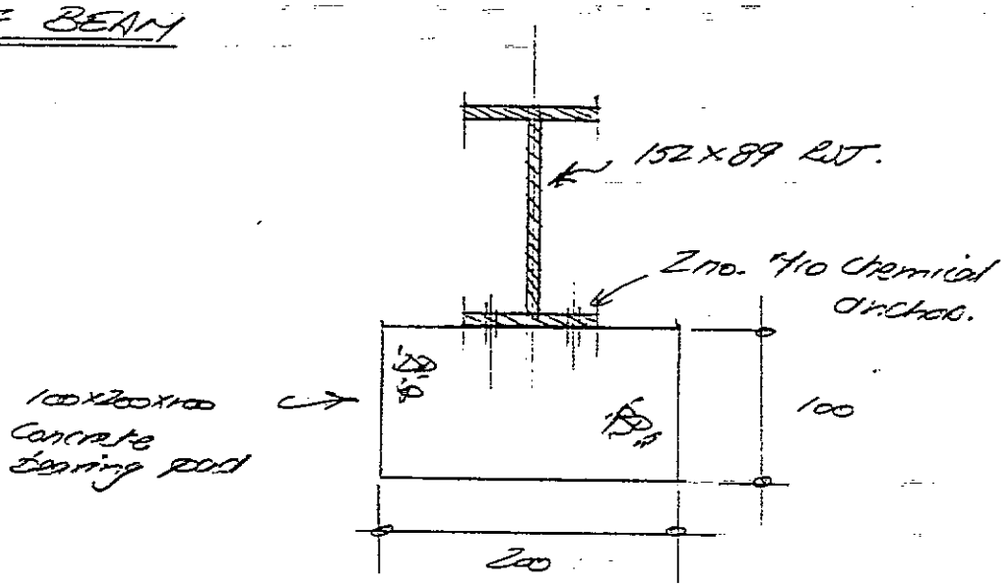


DETAIL B

KITCHEN BEAM



ROOF BEAM



SPECIFICATION for works to be carried out in the construction of 209 houses on lands south of the Lucan Bye-Pass and west of the Outer Ring Road adjacent to Hermitage Park, Ballydowd, Lucan, Co. Dublin for Lark Developments Ltd.

GENERAL: The work described in this specification consists in the supplying of all labour, materials, etc. necessary in the erection of the houses and shall include all items reasonable and obviously to be inferred as necessary though not described in the drawing or specification as the contract is for completely finished works, fully adapted for their purpose. The timber throughout shall be of the approved quality of its respective and various kinds, and native grown where possible, especially where carcasing timbers are concerned. Other materials throughout shall be of Irish manufacture where possible and if available. The entire works shall comply and be completed to the satisfaction of the Local Authority.

INSURANCES: The contractor and sub-contractors are to insure fully their men under the National Health, Workmen's Compensation, Employer's Liability and other Insurance Acts.

SERVING OF NOTICE; ETC., Serve all notices on adjoining owners, etc., and pay fees in connection with work or otherwise due, also serve all notices on the Local Authority when starting work and when foundations are ready for inspection.

EXCAVATOR

FOUNDATIONS: Excavate for foundations to depths and widths as shown on drawings or as may be directed by the Architects to ensure a good solid foundation. Trench bottoms to be properly levelled off in horizontal benches to suit gradient of ground.

DRAINS: Excavate to the required depth, all necessary cuttings for drains, manholes, Armstrong junctions etc., Pipes to be laid to correct falls.

GENERAL EXCAVATION : Excavate over surface of site of buildings, and paved areas to depth of 150mm and remove surface soil.

FOUNDATION EXCAVATION : Excavate to the dimensions, levels, lines, and profiles shown on the drawings, or as directed by the Architect.

BEARING STRATUM : If, in the Contractor's opinion, a bearing stratum is obtained at a lesser depth than that shown on the drawings, he shall inform the Architect.

EXCAVATION BOTTOMS, EARTH : Level and consolidate the bottoms of excavations in earth.

EXCAVATION BOTTOMS, ROCK : Trim bottoms of excavations in rock.

FORMATION : Excavate the last 75mm of earth above formation level immediately before overlying construction is commenced.

TIERING : Tier surface of sloping ground as directed.

REINSTATEMENT OF EXCAVATIONS : Reinstate to formation level with approved filling surfaces of excavations which have been rendered unsuitable during the progress of the Works.

ADDITIONAL EXCAVATION: Any additional excavation required to accommodate the temporary support of sides of excavations shall be provided and backfilled at the Contractor's expense.

UNAUTHORISED EXCAVATION : Backfill unauthorised or excess excavations with approved filling at no expense to the Employer.

BLASTING : The use of explosives is not permitted without the written permission of the Architect.

FREE FROM WATER : All trenches and excavations shall be kept free from water at all times.

INSPECTION : The Contractor shall notify the Architect when the trenches and other excavations are ready for inspection. On no account shall any concrete be put in until the Architect has expressed himself satisfied with the bottom of the trenches, in writing.

CONCRETOR.

CONCRETE : Designed concrete mixes shall be in accordance with the following schedule :

Mix Type	10 N 20	20 N 20
Reference	A	B
28 day Cube strength N/mm^2	10	20
Nominal Maximum Aggregate Size	20 mm	20 mm
Minimum Cement Content Kg / m^3	250	290
Maximum Cement Content Kg/m^3	550	550
Maximum Slump mm.	75	50

FINE AND COARSE AGGREGATE : Fine and Coarse aggregate shall comply with I.S. 5 1974.

CEMENT : Use only Normal Portland Cement to I.S. 1.

WATER : The water to be used in the concrete and morter shall be clean and free from harmful matter.

RECORDS : Record the time and date of all concrete cast and retain on site for inspection.

TEMPERATURE RECORDS : Install a maximum / minimum thermometer in an approved position on site to record air shade temperatures. Record :

1. The maximum and minimum overnight air temperatures each night.
2. The air shade temperature at three approved times each day.

Retain records of temperature on site for inspection.

WALL TILES :

Metal ties for cavity wall construction shall be galvanised mild steel or stainless steel wall ties

LINTELS :

Prestressed concrete lintels shall be "Spanlite" type lintels manufactured by Spanlite Limited, Malahide, Co. Dublin or similar equal and approved.

CONCRETE BLOCKS :

Concrete blocks shall comply with I.S. 20.

LAYING BLOCKS :

Ensure the stability of blockwork and brickwork during erection.

Do not lay blocks or bricks while the air temperature is below 2°C on a rising thermometer or below 5°C on a falling thermometer.

Build walling in level lifts. Where walling is racked back no part shall rise more than 1.2m above the general level. In facing work complete the lift in one operation and leave no work racked back at the end of each day.

MORTAR BEDS :

Lay solid blocks and bricks on a full bed of mortar and with bed and vertical joints fully filled to a consistent thickness.

Lay blocks and bricks with cross joints in any course not less than one quarter of the length of the unit from those in the course below. Bats shall be used only where required to obtain bond.

Leave toothing to provide for the bonding of future work. Weather tops of projections with mortar.

DUCTS, CHANNELS AND OPENINGS :

Form ducts, channels and openings in walling as the work proceeds.

CONCRETE : Designed concrete mixes shall be in accordance with the following schedule :

Mix	Type	10 N 20	20 N 20
	Reference	A	B
28 day Cube strength N/mm^2		10	20
Nominal Maximum Aggregate Size		20 mm	20 mm
Minimum Cement Content Kg / m^3		250	290
Maximum Cement Content Kg/m^3		550	550
Maximum Slump mm		75	50

FINE AND COARSE AGGREGATE : Fine and Coarse aggregate shall comply with I.S. 5 1974.

CEMENT : Use only Normal Portland Cement to I.S. 1.

WATER : The water to be used in the concrete and morter shall be clean and free from harmful matter.

RECORDS : Record the time and date of all concrete cast and retain on site for inspection.

TEMPERATURE RECORDS : Install a maximum / minimum thermometer in an approved position on site to record air shade temperatures. Record :

1. The maximum and minimum overnight air temperatures each night.
2. The air shade temperature at three approved times each day.

Retain records of temperature on site for inspection.

MINIMUM CASTING TEMPERATURE : Do not cast concrete while the air temperature is below 2°C on a rising thermometer or below 5°C on a falling thermometer.

FROZEN SURFACES : Do not place concrete against frozen or frost covered surfaces.

MAXIMUM CONCRETE TEMPERATURE : Do not place concrete which has a temperature in excess of 30°C without approval.

QUALITY CONTROL : Take samples of all concrete used on site as directed by the Architect and test for (i) compressive strength at seven days and twenty-eight days and (ii) slump.

TRANSPORTING AND DISCHARGING : The discharge of ready mixed concrete transported in a truck mixer or agitating truck shall be completed within two hours from the first introduction of the mixing water to the cement and aggregates or the introduction of cement to the aggregates, unless otherwise approved. The discharge of ready mixed concrete transported in non-agitating equipment shall be completed within one hour from the first introduction of the mixing water to the cement and aggregate or the introduction of cement to the aggregates, unless otherwise approved.

PLACING AND COMPACTING : Formwork and excavations shall be clean and free from water at the time of placing concrete.

Complete each unit of construction or each section of work between construction joints in one operation. Discharge concrete into formwork and excavation in such a way as to prevent segregation or loss of ingredients. Discharge all concrete as close as possible to its final position. Partially hardened concrete or concrete adversely affected by delay or weather shall not be used.

Thoroughly compact all concrete using a method appropriate to the workability of the concrete and the nature of the work. Concrete shall be compacted as soon as practicable after placing. Do not damage adjacent partially hardened concrete.

Mechanical compaction shall be carried out with approved vibration equipment.

Manual compaction shall be carried out with approved tools and may be used in all unreinforced work and elsewhere with approval.

CURING : Maintain the temperature of the concrete at not less than 5°C for at least forty-eight hours

MINIMUM CASTING TEMPERATURE : Do not cast concrete while the air temperature is below 2°C on a rising thermometer or below 5°C on a falling thermometer.

FROZEN SURFACES : Do not place concrete against frozen or frost covered surfaces.

MAXIMUM CONCRETE TEMPERATURE : Do not place concrete which has a temperature in excess of 30°C without approval.

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Thoroughly compact all concrete using a method appropriate to the workability of the concrete and the nature of the work. Concrete shall be compacted as soon as practicable after placing. Do not damage adjacent partially hardened concrete.

Mechanical compaction shall be carried out with approved vibration equipment.

Manual compaction shall be carried out with approved tools and may be used in all unreinforced work and elsewhere with approval.

CURING : Maintain the temperature of the concrete at not less than 5°C for at least forty-eight hours

WALL TILES :

Metal ties for cavity wall construction shall be galvanised mild steel or stainless steel wall ties

LINTELS :

Prestressed concrete lintels shall be "Spanlite" type lintels manufactured by Spanlite Limited, Malahide, Co. Dublin or similar equal and approved.

CONCRETE BLOCKS :

Concrete blocks shall comply with I.S. 20.

LAYING BLOCKS :

Ensure the stability of blockwork and brickwork during erection.

Do not lay blocks or bricks while the air temperature is below 2°C on a rising thermometer or below 5° on a falling thermometer.

Build walling in level lifts. Where walling is racked back no part shall rise more than 1.2m above the general level. In facing work complete the lift in one operation and leave no work racked back at the end of each day.

MORTAR BEDS :

Lay solid blocks and bricks on a full bed of mortar and with bed and vertical joints fully filled to a consistent thickness.

Lay blocks and bricks with cross joints in any course not less than one quarter of the length of the unit from those in the course below. Bats shall be used only where required to obtain bond.

Leave toothing to provide for the bonding of future work. Weather tops of projections with mortar.

DUCTS, CHANNELS AND OPENINGS :

Form ducts, channels and openings in walling as the work proceeds.

CAVITY WALLS:

Keep cavities and ties free from mortar and debris.

Form weep holes at intervals not exceeding 900mm in vertical joints at the base of the cavity.

Set wall ties in mortar joints to a depth not less than 50mm in each leaf.

Space wall ties in cavity walls at 750mm horizontally and 450mm vertically.

Bed ends only of sills and point horizontal joint for full length of sill with mortar to a depth of 20 mm.

MORTAR :

The proportions of constituents of mortar mixes shall be in accordance with the following schedule. Measure constituents by volume using clean gauge boxes of an appropriate size. The proportions of sand are based on the use of dry sand. Adjust the proportion of sand for bulking due to moisture content. If admixtures are used, the proportions should be further adjusted in accordance with the manufacture's written instructions.

Mortar Mix	Cement	1
	Lime	2
	Sand	9

Cement shall be ordinary Portland Cement to I.S.I.

Lime shall be Hydrated Lime to I.S.8

Sand shall be to B.S. 1200.

DAMP PROOF COURSES :

Slate D.P.C.s and cavity closures shall comply with B.S. 743. or,
Bitumen D.P.C.s with hession base shall comply with I.S. 57

LAYING D.P.C. :

Lay two courses of slates breaking joint, as a damp proof course for the full width of the wall or for the full width of each leaf of a cavity wall. Lay each course on a full bed of mortar.

Lay flexible damp proof course in a continuous strip on a full bed of mortar for the full width of the wall or for the full width of each leaf in a cavity wall. Lap 150 mm at joinings and the full width at angles and junctions.

Provide a damp proof course at the base of external walls not less than 150 mm above the adjacent finished level of external ground or paving.

Provide a flexible damp proof course under sills for the full width of the sill bed and turn up at back and ends of the sills to the full depth.

Provide a damp proof course under copings and cappings.

Provide a damp proof course at the base of parapet walls not less than 150 mm above junction with horizontal and sloping surfaces.

Provide a flexible damp proof course in one piece spanning the cavity over the openings in cavity walls and extending not less than 100 mm beyond the ends of the lintel. Slope the damp proof course downwards to the exterior and carry it through to the outer face of the external leaf.

Provide a flexible damp proof course in a continuous strip set vertically in jambs of openings in cavity wall construction.

Provide a stepped flexible damp proof course in chimney stacks 150 mm above the highest point of intersection with roof

Provide a damp proof course at base of chimneys, level with the damp proof course in the adjoining walls.

FLUES : Clay flue liners shall be 225 mm and socket flue liners to comply with I.S. 51.

FILLING : Fill around flue liners with lime mortar and suitable broken concrete blocks or bricks.

FLUE TERMINALS : Set flue terminals vertically in mortar and in true alingment with the flue and embed to a depth of 150 mm minimum, excluding the thickness of the flaunching or one quarter the length of the terminal, whichever is the greater. Project flue terminals 50 mm above highest point of flanching.

LIABILITY The Contractor shall take all responsibility for smoke being satisfactorily drawn by the flue.

DRAIN-LAYERS

DRAINAGE:

The plans indicate the extent of drainage required in the contract. All drains shall be laid at the beginning of the contract, and shall be left open for inspection by the Architect and until they have been properly tested and finally approved. Each pile shall be properly bored in so that the invert is to a true and even gradient and special care shall be taken that any extra excess cement, etc. is neatly cleaned off while each joint is being made.

EXCAVATION & BEDDING:

Excavate for drain trenches to the widths and depths required to even and regular falls and well ram bottoms to receive concrete beds. Lay 100mm thick concrete beds three times the width of the drain pipes and flaunch up to half the height of the pipes each side after testing. Increase size of concrete beds or encasings and properly pack around all gulley traps and rising pieces, etc. Cut or leave holes through walls for passage of drainpipes as required and make good.

DRAINS:

All pipes, gullies etc., for soil drains shall be an approved pvc.

Pipes and accessories laid on gravel, all in strict accordance with manufacturer's instructions.

RAINWATER GULLIES:

Rainwater gullies and gratings shall be of an approved pvc.

ARMSTRONG JUNCTIONS:

To be of an approved pvc.

MANHOLES:

Excavate for and build manholes of 225mm concrete sides, 150mm bottom and 150mm r.c. tops to the dimensions shown on the drawings. Provide and set all channels, bends, etc., in first quality glazed stonewear or pvc properly or neatly cut to fit and render and float inside faces of walls and benching with cement compo. 3 to 1 mixed with an approved waterproofer. For cleaning and rodding purposes no manhole shall be more than 90 mm apart.

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ROAD GULLIES : Where shown on drawings fit precast concrete road gullies complying with B.S. 556 or a chamber of 100mm solid concrete blockwork with internal dimensions of 450mm x 300mm x 750mm deep and having a 150mm insitu concrete floor. The outlet of the gully shall be 150mm diameter set a minimum of 375mm above the floor of the chamber. Gully gratings shall comply with B.S. 497, Grade E.

COVERS & FRAMES : Provide and set in position to all manholes galvanized manhole covers and frames to B.S. 497 : 1952, grade A, B, or C as specified on the drawings.

TESTING : Contractor shall supply all labour and appliances and shall carry out all tests when required to do so by the Architect, and in any case the drain shall be tested by water tests to the satisfaction of the Architect before being covered in and again afterwards. All pipes are to be subjected not less that 5 foot head of water at the highest point of the section under test. All defective parts of work are to be taken up and relaid.

CLEANING : At completion of the works the Contractor shall ensure to the satisfaction of the Architect, that all sewers and drains within the site are clean and free from obstructions.

TIMBER FOR CARPENTRY :

Stress graded softwood shall be graded in accordance with B.S. 4978, and its species shall comply with C.P. 112 and be as follows :

Use	Species	Origin	Stress Grade
Trussed Rafters Floor Joists	Whitewood	Imported European	G.S.

The species group and stress grade shall be marked on the timber.

All other timber for carpentry shall be home grown Norway Spruce on Sitka Spruce Grade : N.S.

Timber shall be free from major defects and such other defects as are likely to impair its intended use.

TIMBER FOR JOINERY :

Softwood for joinery shall comply with B.S. 1186 Part 1, Appendix A;
Species : European Redwood for external joinery.
European Whitewood for internal joinery.

ANCHOR STRAPS :

Anchor straps to roof joists shall be galvanised mild steel, 25mm wide X 3mm thick X 450 long, twisted and drilled with 6 no 6m diameter holes for nailing.

MOISTURE CONTENT :

The maximum moisture content of timber at time of fabrication and installation shall be:

Use	Moisture Content
All carpentry	22%
External joinery	17%
Internal joinery	15%

TIMBER SIZES :

Timber dimensions in general, which are shown on the drawings or referred to elsewhere, shall be basic sawn sizes, unless otherwise indicated. Timber dimensions for joinery items or components shown on the drawings or referred to elsewhere shall be finished sizes, unless otherwise indicated.

GENERAL TOLERANCES :

The permissible dimensional deviations for timber work generally shall be as follows :

Level : for any nominally horizontal surface when measured from the nearest reference level : ± 10 mm.

Position on plan : for the position of any nominally vertical surface, at the lower edge, when measured horizontally from the nearest reference line : ± 10 mm.

Plumbness : for plumb of upper to lower edges of any nominally vertical surface : ± 2 mm in any 1 m but not more than 10 mm overall.

CROSS SECTION, BASIC SIZES :

The permissible dimensional deviation from the basic cross-sectional sizes of sawn softwood timber, measured at 20% moisture content, shall be as follows :

Thickness and widths not exceeding 100mm: 1 mm ÷ 3 mm.

Thickness and widths exceeding 100mm : - 2mm, ÷ 6 mm.

Minus deviations shall not be permissible in more than 10% of the pieces.

DISTORTION :

Distortion in timber due to bow, spring, twist and cup shall be measured in accordance with B.S. 4978 and shall not exceed limits :

BOW	SPRING	TWIST	CUP
Half the thickness in any 3m length	15mm in any 3m length	1mm per 25mm of width in any 3m length.	1/25th the widt

FLOOR LEVELS :

The permissible deviation in the level of the finished surface of any floor at any point under

a 3m straight edge placed level in any direction shall be 5mm.

FLATNESS : The permissible deviation in flatness of a finished surface at any point under a 1m straight edge placed on the surface in any direction shall be 2mm without any abrupt changes.

FINISHED SIZES : The permissible deviation from the finished sizes of timber shown shall be ± 0.5 mm.

JOINERY SURFACES : All surfaces of joinery items or components shall be wrought unless otherwise indicated

WORKMANSHIP / PREPARATION / STORAGE GENERALLY : Store timber and timber products protected from the weather, clear of the ground and supported to prevent distortion. If stored in the open or in damp air conditions enclose completly with a suitable covering to prevent deterioration and provide for air circulation and ventilation.

VACUUM PRESSURE TREATMENT : Timber shall be vacuum pressure treated with copper / chrome/ arsenic water-borne preservative to comply with I.S. 131 to give a net dry salt retention of not less than 4.0 kg/m^3. Treatment shall be carried out by an approved specialist firm.

DOUBLE VACUUM TREATMENT : Timber shall be double vacuum treated with an organic solvent preservative to comply with B.S. 5268 : Part 5 for the proposed use and the durability of the timber. Treatment shall be carried out by an approved specialist firm.

RE- DRYING : Before fabrication or installation, redry to the specified moisture content, timber which has been impregnated with copper/chrome/arsenic by vacuum pressure treatment.

TREATMENT CERTIFICATE : Provide a certificate from the processor with each consignment of the timber stating :

1. The preservation treatment carried out.
2. The moisture content of the timber prior to treatment.

WORK AFTER TREATMENT : Liberally brush pre-treated timber with two coats of a compatible preservative supplied by the manufacturer or processor on any fresh surfaces exposed by drilling or cross cutting after treatment. Treated timber subsequently rip-sawn and timber for use in ground contact which has been drilled or cut, shall be re-treated by th specified process.

METAL FITTINGS : Do not apply any metal fittings to timber treated with copper/chrome/arsenic within seven days of treatment.

SCHEDULE OF PRESERVATION TREATMENT : Preservation treatment of timber shall be in accordance with the following schedule :

Timber location or Use	Treatment
Roof timbers, wall plates, floor joists, slating battens. Soffits and fascias. Fences, gates, and gateposts.	Vacuum pressure treatment.
External door Joinery	Double vacuum treatment.

CONTINUOUS LENGTHS : Install timber members in continuous lengths without splices where possible, unless otherwise shown or approved.

BEARING SURFACES : Ensure full contact of surfaces over the area of joints and over the area of other bearing surfaces.

WALL PLATES : Install wall plates level with joints halved and lapped where in one thickness, and sufficiently lapped where in two thicknesses. Set in a full bed of cement mortar over masonry or concrete bearing walls.

WALL PLATE ANCHORS : Secure wall plates to walls with tie-down anchors fixed at not more than 900mm centres.

JOISTS GENERALLY : Space joists at least 50mm clear of flanking masonry or concrete walls. Lay joists with crown or convex side of any camber upwards.

JOISTS : Fix joists at 400mm centres, unless otherwise indicated. Skew nail each end to wall plates with two 100mm, 4.5mm diameter round plain head nails.

BUILT-IN MEMBERS : Allow a clear space of at least 10mm at sides and ends of joists, beams and other members where built into masonry or concrete supporting structure, and provide a minimum bearing of 75mm at supports, unless otherwise indicated.

TRUSSED RAFTERS :

Where shown on drawings fit timber trussed rafters to I.S. 193P (amended).

Trussed rafters shall be manufactured by a fabricator approved by the Architect. Fix trussed rafters to wall plates by means of approved galvanized steel straps.

HOLES IN JOISTS :

Drill holes where required in joists, centred at half the depth only and with diameter limited to one-third of the joist depth, and a minimum distance of 150mm from edge of hole to end of joists, unless otherwise indicated.

NAILS AND SCREWS :

Unless otherwise indicated, the length of nails used shall be not less than twice, and screws not less than 1 ½ times, the thickness of the member through which they are driven, but they shall not be longer than the combined thickness of the sections being joined, less 5mm.

FIXING GENERALLY :

Do not insert nails or screws in any end split. Where nailing may cause splitting, pre-bore holes. Drill pilot holes for non-ferrous nails in hardwood. Bore lead for all screws.

TRIM WORK :

Install trims and skirtings where possible in unjointed lengths between angles or in straight runs. Mitre exposed angle joints. Scribe timber sections to adjoining uneven surfaces.

NAIL & SCREW HEADS :

Punch nail heads below surfaces of timber sections to be painted on requiring a smooth surface. Countersink screw heads not less than 2mm below surfaces of timber sections in trim work to allow for stopping.

JOINERY ASSEMBLY :

The quality of workmanship in joinery shall comply with B.S. 1186 Part 2 for requirement as to fit, precision of joints and the use of adhesives, unless otherwise indicated. Construct joinery as shown on the drawings unless otherwise approved.

The drawings show the final appearance of the work in outline rather than the complete construction. Obtain approval of proposed construction details before starting fabrication.

ARRISES : Slightly round sharp arrises on exposed and semi-concealed surfaces.

ANGLE JOINTS : Mitre exposed angle joints unless otherwise indicated.

SCREW FIXING : Provide matching clearance holes in addition to lead holes for screws.

PROTECTION : Provide temporary protective covering for joinery during the construction period.

ADHESIVES : Apply adhesive in accordance with the manufacturer's written instructions, and within any stated shelf life. Maintain mating surfaces in intimate contact to ensure adhesion within the setting time.

DOWELS : Use dowels of hardwood other than beech, grooved for adhesive and sized for a driving fit.

PLASTERING AND RENDERING

SAND : Sand for rendering shall comply with B.S. 1 199.

LIME : Hydrated lime shall comply with I.S. 8.

CEMENT : Normal Portland Cement shall comply with I.S. 1.

GYPSUM PLASTERS : Use the following lightweight plasters to comply with I.S. 27 part 2.

Undercoating plaster 11mm thick to all internal block walls.

Bonding plaster 11mm thick to concrete ring beam.

Finishing plaster 2mm thick to gypsum plaster undercoats.

Board finishing plaster skim finish to plasterboards.

Use bonding agents for internal work as recommended by gypsum plaster manufacturer.

COLD WEATHER : Do not work while the air shade temperature is below 2°C on a rising thermometer or below 5°C on a falling thermometer. Ensure that the temperature of coatings remains above 4°C for at least 24 hours before setting.

EXTERNAL RENDERING : Render all external walls with cement : lime : Sand mixed in the properties shown

3 - 5mm Scud Coat	1:0:2
13mm Undercoat	2:1:8
10mm Final Coat	1:1:6

The final coat shall be finished to a Kwapp finish to match an approved sampl

WORKMANSHIP : Keep plant and tools clean and free from contamination by previous mixes.

Do not commence internal plastering in any area until it is protected at all times from the adverse effects of weather.

Avoid premature or localized drying of coatings.

EMBEDDED METAL : Ensure that all metal items to be embedded in plaster and cement rendering are non-corrosive.

TOLERANCES :

The permissible deviation under a 2m straight-edge from the flatness of the finished plaster at any point shall not be more than 3mm.

THICKNESS OF PLASTERWORK AND RENDERING :

The permissible deviation for the thickness of plasterwork and rendering, exclusive of dubbing out coats, shall be as follows :

TYPE	NOMINAL THICKNESS (mm)	PERMISSIBLE DEVIATION (mm)
Undercoats (Gypsum)	11	± 2
Finish (Gypsum)	2	+ 1, -0
Scud Coat (External)	3 - 5	± 1
undercoat (External)	15	± 2
Final Coat (External)	- 10	± 2

PREPARATION OF BACKGROUNDS :

Expose the sub-surface of the background area by hacking or other mechanical means to an even depth of approximately 3mm. Wash and brush after exposure.

Remove all unwanted projections from background surfaces.

Sprinkle very dry surfaces of concrete or brick-work with water and allow to soak in before coating.

DUBBING OUT :

Dub out, where necessary, in separate coats each of not more than 10mm in thickness and in same mix as the first specified coat. Scratch surface of each coat immediately after it has set.

SCUDDING :

Ensure that surfaces are clean and damp before scudding with a mix of one part cement to two parts of coarse sand of a consistency of thick slurry. Dash on the mix to give a coating with a rough uneven finish. Keep the mixture well stirred during the operation. Allow the coating to dry out slowly and harden before the application of undercoat.

FIXING METAL LATHING GENERALLY :

Fix metal lathing with the long way of the mesh

running from support to support. Fix ribbed lath with the ribs towards and accross the supports. On timber bearers fix with 38 mm long galvanised nails or staples at 100 mm centres. Lap ends not less than 50mm. Sheets shall be lapped and securley tied together with tying wire. Side laps shall not be less than 25mm and wired together at 150 mm centres. The lath shall be as taut as possible. Bend cut ends of fastening wire away from plaster face.

NGLE BEADS : Use metal angle beads at all external corners of internal plastering.

IXING BEADS AND STOPS : Fix beads and stops, plumb square and level, unless otherwise indicated. Secure with plaster dabs, 38mm long clout nails, masonry nails or trying wire as required by background, at not more than 600 mm centres. Fix angles by pairing fastenings at each side of angle.

XPANSION BEADS : Fix expansion beads centred over background expansion joints with plaster dabs or galvanised 38 mm clout nails at not more than 600 mm centres on each side in accordance with the manufacturer' instructions.

ISSIMILAR BACKGROUNDS : At junction between dissimilar backgrounds in the same plane and to receive the same coating, fix metal lathing over building paper with suitable fastenings for each background. At single junctions lathing shall not be less than 30 mm wide, fixed each edge at 100 mm centres.

STORAGE GENERALLY: Store hydrated lime under dry ventilated conditions, protected from the weather, on a raised floor or in suitable silos.

Store admixtures and pigments in accordance with the manufacturer's written instructions.

Store different aggregates separately on hard self-draining areas or in suitable hoppers or containers.

Store ready mixed sand-lime on a clean impermeable surface under weatherproof conditions. Avoid prolonged storage before use.

MIXING GENERALLY : Do not mix Portland cement and gypsum plaster together.

Mix plastering and rendering materials thoroughly to incorporate all the constituents of the mix.

Wash out mixer after each batch has been discharge if the mixer is not in continuous use.

Mix materials on clean bankers or in clean mixing boxes which shall be washed out after each mixing.

COARSE STUFF : For coarse stuff (lime-sand mix), mix hydrated lime and sand dry. Add water and mix to a workable consistency. Store coarse stuff on a clean impermeable surface. Do not use for sixteen hours after adding water.

SCRATCHING : Scratch undercoats to provide key for subsequent coats. On three-coat work form a deep key coat with a wooden scratch. Use a fine wire scratch on all other undercoats.

UNDERCOATS : Remove dust and loose particles from each undercoat by brushing, and wet lightly and uniformly if surface is porous and dry before application of the following coat.

COATING PROPRIETARY LATHING : Apply coating to proprietary lathing in accordance with the manufacturer's written instructions.

COATING ON METAL LATH : Work undercoat well into interstices. Apply coating uniformly and with sufficent pressure to form a good key and allow to become firm before scratching for key. Do not apply second undercoat until the first undercoat is thoroughly dry.

IDENTIFICATION OF GROUNDS : Provide location identification of fixing grounds which may be obscured by plastering work.

GYPSUM PLASTERING - MIXING : Do not add materials other than water to premixed lightweight plasters, and mix in accordance with the manufacturer's written instructions.

SCRIMMING PLASTERBOARD : Scrim all plasterboard intended to receive gypsum plaster coating as follows:

1. At all junctions with dissimilar materials which are to be plastered.
2. At external and internal angles, except where plaster stops, beads or other accessories are fitted.
3. At all joints between boards in the same plane except in the case of gypsum lath.

Use neat gypsum board finish or lightweight bonding plaster and 100 mm jute scrim cloth. Press scrim well in, trowel smooth and allow to dry before applying first coat of plaster.

PLASTERING ON GYPSUM LATH : Fill the joints between the rounded edges of gypsum lath with neat gypsum plaster similar to

the following coat, and finish flush. Allow to set, but not dry out, before applying the following coat.

EXTERNAL WALLS: 225mm hollow concrete block walls

WINDOWS: Purpose made timber windows of Irish manufacture, all windows to be carefully set in position before plaster jamb linings are fixed and pointed around with 3 : 1 cement / sand . Hardwood windows to front , soft wood to rear and sides.

DOORS: Selected hardwood front entrance door and aluminium double sliding doors at rear. Softwood side door.

INTERNAL DOORS: All internal doors to principle rooms to be 50mm nominal flush (and in accordance with ISS. 48/55 stamped as such) hung on specially prepared frames . All doors to be hung on one pair of 4" butt hinges.

GENERALLY :

The work described in this specification shall include all jointing material, copper nails, oak and lead wedges, wall hooks, tacks, lead collars, felt underlays, etc., necessary to make the construction perfect and complete.

LEAD :

The sheet lead shall be uniform thickness free from all defects and neatly dressed without injury to the surfaces. Solder shall not be used on roof work and all nailing shall be done with copper nails.

CHIMNEY GUTTERS ETC :

Gutters behind chimney shall be 150mm wide at narrowest part, of 5lbs lead, dressed over tilting fillet and turned up 150mm against vertical face dressed 100mm around returns of chimney and covered with 7lbs lead flashing as before. The apron in front of the chimney shall be of 5lbs lead 300mm width and the upper edge dressed at right angles and secured into joint in brickwork and lower neatly dressed on top of slates for about 150mm and dressed 75mm around returns of chimney.

SANITARY FITTINGS :

Sanitary fittings shall be as follows:

(a). Wash - hand basins:

550mm X 400mm white V/china wash hand basins (Avon or similar) with pedestals, 13mm c.p. hot and cold pillar taps 35mm c.p. plug waste, chain and stay.

(b). W.C.'s :

11 litre white V/china (Stylus or similar low level W.C. cisterns with internal overflow flush bend and flush pipe connector, white V/china S trap closets (Nisa or similar) and single black bakelite seats and covers.

(c). Baths :

1 650mm White P.E. Cast Iron Rectangular bath (Richmond or similar) with 18mm c.p. hot and cold pillar taps, 30mm c.p. overflow, 40mm c.p. plug waste and chain and 40mm bath P trap,

(d).

13mm c.p. hot and cold high necked pillar taps together with all necessary waste and connector pipes, etc., for kitchen sink units.

All connectors, pipes, waste, etc., for the above to be provided and fixed to Architect's approval. Samples of any of the above items to be made available to the Architect on request for his approval.

TESTING :

The whole of this plumbing and heating work shall be tested to the Architect's satisfaction and left in perfect order. The Contractor shall demonstrate by testing the boiler, indirect cylinder, radiators and to show that the installation is functioning efficiently in each house.

INSULATION :

Lag all pipes, including overflow and expansion pipes, in roof space with an approved pipe insulation. Lag all water storage cisterns with approved insulation material and fit a fibreglass lagging jacket to the hot water cylinder.

WATER MAINS.

WATERMAIN PIPES : Lay the water mains where shown on drawings in 110mm Polyethylene pipe 710 type to I.S. 135: 1975 or 100mm Unplasticised PVC to I.S. 123:1964.

SERVICE PIPES : Lay 12mm internal diameter service pipes to each house in one of the following :

Annealed Copper complying with B.S. 2871 Part 1, Table Y.

Polyethylene pipe 425 type complying with I.S. 134: 1965, Heavy Gauge.

Polyethylene pipe 710 type complying with I.S. 135: 1975.

COVER TO PIPES : Watermain pipes shall have a mimimum cover of 900mm Service pipes shall have a mimimum cover of 600mm.

PIPE LAYING : Maximum trench width shall be the pipe diameter plus 600mm. Pipes shall be laid on a 50mm bed of fine grained material consisting of sand gravel or soil passing a 9.5mm sieve. Similar material shall be placed around and over the pipe for a cover of 100mm. Selected fill free from stones greater than 25mm in size, rubbish, tree roots, vegetable matter and lumps of clay greater than 75mm in size shall be used to fill the next 300mm.

PIPE JOINING : Joints shall be formed by an approved method recommended by the pipe manufacturers. Rubber sealing rings, where used, shall comply with B.S. 2494, Part 1.

PIPE ANCHORAGE : Concrete anchor blocks shall be provided on watermains at dead ends, tees, bends of greater curvature than 22 1/2 and at both sides of a sluice valve chamber. Anchor blocks shall encase the pipe in concrete to a minimum thickness of 150mm all round and shall be a minimum length of 600mm.

SLUICE VALVES : Sluice valves shall comply with B.S. 1218. The depth of the sluice valve spindle below finished ground level shall not exceed 300mm. S.V. identification plates shall be provided on concrete markings posts to I.S. 162 : 1968.

HYDRANTS : Hydrants shall comply with B.S. 750 screw down type The depth of the hydrant outlet shall not exceed 200mm below finished ground level. Hydrant indentification plates shall be provided on concrete post to I.S. 162 : 1963.

STOPCOCKS :

A stopcock shall be provided on each service pipe in the footpath immediately outside the boundary of each house. Stopcocks shall comply with B.S. 1010. The depth of the stopcock spindle shall not exceed 200mm below finished ground level.

CHAMBERS FOR STOPCOCKS :

Chambers for stopcocks shall comply with B.S. 1185.

CHAMBERS FOR SLUICE VALVES :

Chambers for sluice valves and hydrants shall be constructed in 225 solid concrete blockwork on a 100mm thick concrete floor.

SURFACE BOXES:

Hydrant, sluice valve, and stopcock chambers shall be provided with cast iron surface boxes. Surface boxes for sluice valve and stopcock chambers shall comply with B.S. 1426 and 3461, Type M.

ELECTRICAL

GENERAL : The electrical installation must be carried out to the satisfaction of the Architects. The electrical installation is to form part of the general building contract and the responsibility for carrying out the work to a satisfactory conclusion is borne by the building contractors. The contractor shall supply all materials and labour necessary for the complete electrical installation as herein specified.

SUB-CONTRACTORS : Where it is proposed to sub-let the contract for the electrical installation, only electrical contractors of good standing will be permitted to undertake the work. Before the installation is commenced it will be necessary to obtain the Architect's approval of the electrical sub-contractor. The Architect may also require information about the arrangements and work schedule for completion of the works.

STANDARDS : All electrical works must comply with the latest edition of the "National Rules for Electrical Installations" published by the Electro Technical Council of Ireland, Ballymun Road, Dublin 9, and available from the Secretary of that body.

MAINS : The electricity supply mains will be erected by the Electricity Supply Board and do not form part of this contract. Single phase current is required.

POSITIONS OF POINTS : The approximate positions of lights, switches and socket outlets are given in the relevant drawings. These positions may be altered on site, with the approval of the Architect.

WIRING ROUTES : Mains and wiring routes are to be ascertained by the contractor at an early stage so that, where possible, ways and chases in masonry walls are to be left to receive them to save unnecessary cutting away.

NOTICE TO E.S.B. : The contractor and, where applicable, the electrical sub-contractor shall consult at an early stage with the local Group Engineer of the E.S.B. to arrange for service and meter position. A meter cabinet to E.S.B. specification shall be provided.

INSPECTION OF WORKS & MATERIALS DURING PROGRESS : All materials to be used on this contract shall comply with the relevant standard specification (Irish British or equivalent harmonised standard published by the appropiate authority of a member

State of the European Communities) for electrical materials and be available for examination by the Architect or his specified representative at any time during the progress of the contract. If requested samples of materials must be forwarded to the Architect before commencing work. Any departure from the specification or the approved samples without written confirmation from the Architect may also cause certification of the installation to be refused.

EXAMINATION ON COMPLETION OF WORK :

The Architect shall be notified when the electrical installation has been completed. No house will be taken over unless the electrical installation has been certified by the Architect or his authorised representative and, a Completion Certificate as approved by the Electro Technical Council of Ireland shall be submitted for each installation. Sight of the certificate shall be required by the E.S.B. before supply is connected.

CABLES :

All cables are to be stranded or solid core cables, and to conform to BS 6004 or an equivalent harmonised standard published by the appropiate authority of a member State of the European Communities and the sizes of the cables to be installed are as follows :

Lighting Circuits	$1.5m^2$ PVC/PVC Cable.
Socket Outlets do	$2.5m^2$ twin core flat PVC/PVC cable with ECC
Cooker Circuits	$6\ mm^2$ twin core flat PVC/PVC cable with ECC
Immersion Group Circuit	$2.5mm^2$ twin core flat PVC/PVC cable with ECC
Earthing and Neutralizing leads	$6mm^2$ PVC insulated (gaeen)
Tails to E.S.B. meter and service fuse	$10mm^2$ PVC/PVC

The minimum size flexiblecable permitted is $0.75mm^2$.

Junctions in wiring shall only be made in suitable ceiling roses, switch boxes or approved junction boxes "Dry" or soldered joints will not be permitted. Slack cable shall be left at the back of ceiling roses switches and fuseboards to facilitate inspection, testing and maintenance. Sufficien slack cable should be left behind the fuseboards to

permit any circuit to be transferred to another fuse.

WIRING :

The wiring of each final sub-circuit shall be electrically separate from that of every other final sub-circuit. The wiring for the lighting and sockett outlets will be effected in cable concealed under the floorboards or in the attic. Joists may not be grooved, except where specifically authorised by the Architect, the holes must normally be bored through the centre of the joists. Holes through joists shall be bored horizontally and before joists are erected. Boards for access to electrical wiring should be screwed, the tongues having been first removed. In solid walls all switches and socket outlet drops shall be enclosed in approved plastic conduit fully recessed in walls. Where necessary cables to be fixed with buckle clips spaced 250mm apart horizontally or 400mm apart vertically.

The contractor and where applicable the sub-contractor shall provide all chases for conduit and recesses for switch boxes and socket outlet boxes.

Access shall be provided to all junction boxes where used.

CONDUIT :

In solid walls oval approved plastic conduit shall be sunk in the wall for each switch drop and socket outlet.

EARTHING :

Earthing shall be in accordance with the "National Rules for Electrical Installations" published by the Electro Technical Council of Ireland. Requirements for bathrooms, earthing systems, etc are covered in this publication. A separate 2.5mm earth wire shall be run directly to earth the bath and the metallic hot, cold and waste pipes shall be bonded thereto. Where there is a gas service pipe it shall be bonded at its entry points by means of a stranded 4mm^2 insulated conductor bonding the main earth terminal of the electrical installation.

FUSEBOARDS :

The fuseboard shall be a bakelite DZ pattern mounted on an incombustable surface, e.g. asbestos faced and incorporating the following :

a. consumers main fuse	50 amp
b. main isolating switch or circuit breaker (single pole)	60 amp minimum
Cooker circuit	35 amp

BOUNDARIES:

Low rendered concrete blockwall with brick coping to front boundary wall. Concrete bollards with chains and hedging separating front gardens. Timber fence to rear.

VENTS:

Permanent vents to be formed in walls of all habitable rooms. 6,500 mm^2 gross sectional area.

PORCHES:

Concrete roof tiles on timber battens on felt on timber supports on brick screen porch walls with timber ornamental posts.

UTILITY SERVICES:

All site services to be provided underground in 1.5 M wide zone in footpath area.

LANDSCAPING:

Extensive programme of new tree planting as noted on site layout.

SITE:

Every effort shall be made to ensure that the plot selected and as shown on the lease map will conform absolutely to the shape and dimensions shown on the drawing. However, it is not possible to guarantee this.

ALTERNATIVE MATERIALS:

The Builder reserves the right at his absolute discretion to substitute alternative materials or methods of construction of a similar nature and cost as approved by the Architect responsible for the scheme to those described in the drawings or this specification and to alter the plans or elevations if made necessary by such change of materials or method or by legislative enactments or in order to conform with Local Authority or Department of Local Government Requirements.

INTERPRETATION OF SPECIFICATION:

The Show House on the development shall be the detailed interpretation of this specification since this specification is of an outline nature.

DISPUTES:

Any dispute arising between the contracted purchaser and builder shall be settled by the Architect for the development whose decision shall be final and binding on both parties.