FILE DISCUSSED AT COUNCIL/COMMITTEE MEETING

FILE REF: 9/A/1082

MEETING	COMMENTS	NOTED IN DEV. CONTROL	NOTED BY
Belgard 24/9/91.	Cllr Cmelgath see	perm be granted	

BYE LAW APPLICATION FEES

REF. NO.: 91A/1082 CERTIFICATE NO.: 15608B

PROPOSAL: Office & Workshop (Extension)

LOCATION: National Medical Care, J.D.A. Industrial Estate, Cavehill

APPLICANT: Industrial Development Authority

	1	2	3	4	5	6	7
CLASS	DWELLINGS/AREA LENGTH/STRUCTURE	RATE	AMT. OF FEE REQUIRED	AMT. LODGED	BALANCE DUE	RED. FEE APPL.	AMT. OF RED. FEE
A	Dwelling (Houses/Flats)	@ £55					
B	Domestic Ext. (Improvement/ Alts.)	@ £30					
C	Building for office or other comm. purpose 265 M²	@ £3.50 per M² or £70	£929	£929			
D	Building or other structure for purposes of agriculture	@ £1.00 per M² in excess of 300 M² Min. £70					
E	Petrol Filling Station	@ £200					
F	Dev. of prop. not coming within any of the forgoing classes	£70 or £9 per .1 hect. whichever is the greater					

Column 1 Certified: Signed: [signature] Grade: DAO Date: 5/7/91

Column 1 Endorsed: Signed: [signature] Grade: _____ Date: _____

Columns 2,3,4,5,6 & 7 Certified: Signed: [signature] Grade: EO Date: 4/7/91

Columns 2,3,4,5,6 & 7 Endorsed: Signed: _____ Grade: _____ Date: _____

PLANNING APPLICATION FEES

Reg. Ref. 91A/1082 Cert. No. 25884

PROPOSAL: Office & Warehouse extension to factory

LOCATION: National Medical Care, I.D.A. Industrial Estate, Cloverhill

APPLICANT: Industrial Development Authority

CLASS	DWELLINGS/AREA LENGTH/STRUCT.	RATE	AMT. OF FEE REC.	AMOUNT LODGED	BALANCE DUE	BALANCE PAID
1	Dwellings	@£32				
2	Domestic,	@£16				
3	Agriculture	@50p per m2 in excess of 300m2. Min. £40				
4	Metres 2656m²	@£1.75 per m2 or £40	£4648	£4648	—	
5	x .1 hect.	@£25 per .1 hect. or £250				
6	x .1 hect.	@£25 per .1 hect. or £40				
7	x .1 hect.	@£25 per .1 hect. or £100				
8		@£100				
9	x metres	@£10 per m2 or £40				
10	x 1,000m	@£25 per £1000m or £40				
11	x .1 hect.	@£5 per .1 hect. or £40				

Column 1 Certified: Signed: J. [illegible] Grade: D.H.E. Date: 5/7/91

Column 1 Endorsed: Signed: ..... Grade: ..... Date: .....

Columns 2,3,4,5,6 & 7 Certified: Signed: [illegible] Grade: S.O. Date: 4/7/91

Columns 2,3,4,5,6 & 7 Endorsed: Signed: ..... Grade: ..... Date: .....

LOCATION GOVERNMENT (PLANNING AND DEVELOPMENT) ACTS, 1963 TO 1982

ASSESSMENT OF FINANCIAL CONTRIBUTION

REG. REF.: 91A/1082

CONT. REG.:

SERVICES INVOLVED: WATER/FOUL SEWER/SURFACE WATER

AREA OF SITE:

FLOOR AREA OF PRESENT PROPOSAL: 28590 FT

MEASURED BY: J.G. 5/7/91.

CHECKED BY:

METHOD OF ASSESSMENT:

TOTAL ASSESSMENT

MANAGER'S ORDER NO: P/ /
DATED

ENTERED IN CONTRIBUTIONS REGISTER:

(i) Standard
ml
band in full
acreage bases

(ii) Roads
13,000 [illegible]

[illegible] 17/10/91

DEVELOPMENT CONTROL ASSISTANT GRADE

South Dublin

Order No. P/2294/92

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Office extension, warehouse extension and toilets, plant rooms extensions employee entrance, additional car parking at Cloverhill Industrial Estate, Clondalkin for National Medical Care.

Traynor O'Toole Partnership,
40 Lr. Leeson Street,
Dublin 2.

Reg. Ref. 91A/1082
COMP. REC'D: 19.02.92

Report of the Dublin Planning Officer, dated 27 April 1992.

This is a submission for **COMPLIANCE** with Condition No. 7 of decision to Grant Permission by Order No. P/4759/91, dated, 21st October, 1991, in connection with the above.

Condition No. 7 stated:-

> "That additional off-street car parking and parking for trucks be provided for the proposed extension in accordance with Development Plan standards".

As stated in the Planning Officer's report on this application a total of 80 spaces would be required to meet Development Plan Standards for the extension. (A total of 214 would be required for the overall development).

The current submission has been lodged following consultation with the Planning Authority.

The applicants now propose to provide 52 no. new spaces to the front of the building. Areas are reserved on site to provide for additional parking to Development Plan Standards. According to the submission this area is to be landscaped. A compliance submission under condition 8 will be required in this regard.

The appliant should be advised that the current proposals are considered satisfactory.

(MG/BB)

Endorsed:- _____ for Principal Officer

_____ For Dublin Planning Officer

Order:- Applicant to be informed as set out in the above report.

Dated: 19th ~~April~~ May, 1992.

_____ Assistant County Manager

to whom the appropriate powers have been delegated by Order of the Dublin City and County Manager, dated 10/2/92

DUBLIN COUNTY COUNCIL
1 0 SEP 1991

Register Reference : 91A/1082 Date : 5th July 1991

Development : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

LOCATION : Cloverhill Industrial Estate, Clondalkin

Applicant : Industrial Development Authority

App. Type : PERMISSION/BUILDING BYE-LAW APPROVAL

Planning Officer : M.GALVIN

Date Recd. : 28th June 1991

Attached is a copy of the application for the above development .Your report would be appreciated within the next 28 days.

Yours faithfully,

Paul Dolan

for PRINCIPAL OFFICER

The proposal is acceptable subject to
(1) Compliance with Office Premises Act 1958.
(2) Compliance with Health, Safety & Welfare at Work Act 1989
(3) Provision of suitable ventilation in the sanitary accommodation and lobbies leading thereto.

for Declan
John O'Reilly
SUPER.ENVIRON. HEALTH OFFICER,
33 GARDINER PLACE,
DUBLIN 1.

13/9/91.

PLANNING DEPT.
DEVELOPMENT CONTROL SECT
Date: 25.10.91
Time: 4.10

Register Reference : 91A/1082 Date : 9th September 1991

Development : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

LOCATION : Cloverhill Industrial Estate, Clondalkin

Applicant : Industrial Development Authority

App. Type : Additional Information

Planning Officer : M.GALVIN

Date Recd. : 2nd September 1991

Attached is a copy of the application for the above development .Your report would be appreciated within the next 28 days.

Yours faithfully,

.....

for PRINCIPAL OFFICER

The proposal is acceptable
See previous report attached
13/9/91.

for Ita Devine
John O Reilly
SUPER.ENVIRON. HEALTH OFFICER,
33 GARDINER PLACE,
DUBLIN 1.

24/10/91

SS + ors.

Register Reference : 91A/1082 Date : 9th September 1991

Development : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

LOCATION : Cloverhill Industrial Estate, Clondalkin

Applicant : Industrial Development Authority

App. Type : Additional Information

Planning Officer : M.GALVIN

Date Recd. : 2nd September 1991

Attached is a copy of the application for the above development .Your report would be appreciated within the next 28 days.

Yours faithfully,

DUBLIN Co. COUNCIL
SANITARY SERVICES
for PRINCIPAL OFFICER
17 OCT 1991
Returned

DUBLIN Co. COUNCIL
12 SEP 1991
SAN SERVICES

Date received in Sanitary Services ..12.SEP.1991..

FOUL SEWER

Available to existing system.

The applicant must ~~(illegible)~~ re apply for a licence under the Provision of the Water Pollution Act.

SURFACE WATER

Available to existing system.

Surface Water run off is subject to the provision of the Water Pollution Act.

SENIOR ENGINEER,
SANITARY SERVICES DEPARTMENT,
46/49 UPPER O'CONNELL STREET,
DUBLIN 1

PLANNING DEPT.
DEVELOPMENT CONTROL SECT
Date 18.10.91
Time 10.00
10.10.91

J.F.
14/10/91

Filed.

Register Reference : 91A/1082 Date : 9th September 1991

.....

ENDORSED _____ DATE _____

WATER SUPPLY... Existing metered supply (See previous Report 13/8/91) 2/10/91

P J Howell 7/10/91

.....

ENDORSED _____ DATE 15/10/91

PLANNING DEPT.
DEVELOPMENT CONTROL SECT
Date 18.10.91
Time 12.00

P/4759/91

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Register Reference : 91A/1082 Date Received : 2nd September 1991

Correspondence Name and Address : Industrial Development Authority, Wilton Park House, Wilton Place, Dublin 2.

Development : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

Location : Cloverhill Industrial Estate, Clondalkin

Applicant : Industrial Development Authority

App. Type : Permission

Zoning : E

Floor Area : 2650 Sq.metres

CONTRIBUTION:
Standard: Nil paid in full
~~Roads:~~ on account
S. Sers:
Open Space:
~~Other: 13000~~ Under ck
SECURITY:
Bond / C.I.F.:
Cash:

(MG/CM)

Report of the Dublin Planning Officer, dated 9th September, 1991.

This is an application for Permission for (a) office extension, (b) warehouse extension incorporating laboratories and toilets, (c) plant rooms extensions, (d) employee entrance and (e) additional car parking at its Cloverhill Industrial Estate, Clondalkin, Dublin 22, for National Medical Care.

The proposed site which has a stated area of 2300sq. metres (2.3 hectares) is located to the east of the Cloverhill Industrial Estate in an area zoned 'E' "to provide for industry and related uses." It adjoins the railway line to the south and Western Parkway Motorway reservation to the east and north-east.

Reg. Ref. No. TA/562 refers to the original grant of permission for a factory at this site.

Reg. Ref. No. 85A/505 refers to a grant of permission for an extension to rear of existing factory at Cloverhill Industrial Park.

Reg. Ref. No. 89A/~~4~~50 refers to grant of permission for a security fence at this site.

Reg. Ref. No. 90A/0734 refers to a grant of permission for the retention of new plant room to roof of existing factory at Cloverhill Industrial Park.

The existing building has a floor area of 4500sq. m. (stated) and comprise a large factory area, 2-storey offices to the front and associated plant room and storage compounds. Existing buildings have a dark brown brick and cladding and

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Reg.Ref: 91A/1082

Page No: 0002

Location: Cloverhill Industrial Estate, Clondalkin

are occupied by the National Medical Care.

The current application provides for the construction of extensions totalling 2656sq. m. This is to comprise:
(a) a 2-storey office extension adjoining existing offices to the front of the building,
(b) an extension to the rear of the existing premises. Lodged plans identify this as comprising a warehouse area, laboratories, toilets, etc.
(c) an extension to plant room area to accommodate a new chiller room and extended switch and transformer rooms,
(d) new employee entrance to existing offices,
(e) an area of car parking to the front of existing building comprising 20 spaces.

The proposed extensions to the existing building are to be finished in metal cladding and brick, with aluminium windows, to match existing finishes. Lodged plans provide for a new plant room to roof of the extensions to match existing. This will be located to the rear of the existing structure and so will be more or less hidden when viewed from the industrial estate access road to the north. This plant room will be visible from the adjoining motorway. However, it should not be obtrusive given the location of the building at a lower level than this adjoining road.

The proposed development provides for largescale additions to the existing premises and will increase the floor area by some 60%. It involves a level of site coverage of the order of c.40%. However, it is noted that much of the remaining open areas of the site are used as compounds, service roads and banked areas.

The proposed development provides for an additional 20 no. car spaces to the front of the existing building. There is an existing car parking area comprising some 50 no. spaces to the west of the existing building.

This is substantially less than the 214 spaces required to meet current Development Plan Standards, (3 per 100sq. metres) for the existing and proposed developments. From site inspections, it was noted that proportions of the existing car park to the side and rear remains unused although considerable car parking takes place on the Industrial Estate access road. Some 80 car parking spaces are required to serve the proposed new development.

It is considered that the Development Plan standards may be excessive in this instance - however, this cannot be ascertained as information regarding the nature of the existing business, numbers employed or details of the expected increase in employment arising out of the proposed extensions have not been submitted

In addition it is noted that an ESB pylon is located to the west of the site

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Reg.Ref: 91A/1082

Page No: 0003

Location: Cloverhill Industrial Estate, Clondalkin

and that a 110 or possibly 220kw. power lines traverses the site. These power lines are not identified on drawings lodged. It is noted that the proposed buildings will be located under and close to the lines for a short distance.

The proposed development to extend this existing factory is considered acceptable in principle. The level of site coverage outlined in the County Development Plan is not exceeded, (i.e. 45%). However, the level of car parking proposed does not comply with Development Plan Standards for a development of this size. The applicants were requested to submit further details of numbers employed/likely increase in employment in order to ascertain whether a lesser number of car parking spaces would be satisfactory in this instance, as follows:

1. Lodged plans provide for extensions to the existing premises totalling 2656sq. metres. Existing buildings on site are stated to have a floor area of 4500sq. metres.

It is estimated that c.214 car parking spaces are required to meet Development Plan Standards for a development of this size (3 spaces per 100sq. metres manufacturing/warehousing, offices regarded as ancillary). The current application provides for c.20 car parking spaces in addition to the c.510 no. currently marked out and available on site.

The applicants are requested to submit any proposals they may have to increase the number of car parking spaces.

2. The applicants are requested to submit full details of:

(a) numbers employed,
(b) expected increase in employment as a result of the proposed extension,
(c) current and proposed work practices, i.e. hours of operation, shift-work etc.

These details may determine whether a lesser amount of on site car parking is satisfactory.

3. The applicants are requested to submit revised drawings identifying the existing ESB power lines which traverse the site. The applicant is requested to confirm whether they have consulted with the ESB with regard to constructing the proposed building under or close to these power lines.

Additional Information was submitted on 2nd September, 1991. This included a revised site plan indicating existing and future car parking areas. 254 spaces are identified in all. This includes the existing 50 spaces, the proposed 20 spaces to the front of the building and additional car parking spaces to the

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Reg.Ref: 91A/1082

Page No: 0004

Location: Cloverhill Industrial Estate, Clondalkin

rear and side (east) of the existing building.

Detailed information was submitted regarding the numbers employed at the existing premises and the expected increase in employment as a result of the extension. This noted that 140 persons are currently employed on shift basis. This is expected to increase to c.200. ~~A 24 hour shift operation will be utilised (although~~ certain shifts will overlap).

Given the employment data it is considered that 80 no. car parking spaces should be provided in addition to the 50 existing. This (80 no.) meets Development Plan standards for the proposed extension. Roads Department have been contacted. They consider this satisfactory. The revised site location map shows that there is adequate open spaces on site to provide this additional car parking.

The revised layout also indicates the ESB line which traverses the site. According to documentation submitted, the applicants have ongoing liaison with the ESB with regard to construction in proximity to this line.

The proposed development is considered acceptable.

I recommend that a decision to Grant Permission be made under the Local Government (Planning and Development) Acts, 1963-1990, subject to the following conditions:-

C O N D I T I O N S / R E A S O N S

01 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. amended by and additional information lodged on 2/9/91
REASON: To ensure that the development shall be in accordance with the permission and that effective control be maintained.

02 That before development commences, approval under the Building Bye-Laws be obtained and all conditions of that approval be observed in the development.
REASON: In order to comply with the Sanitary Services Act, 1878-1964.

03 That the requirements of the Chief Fire Officer be ascertained and strictly adhered to in the development.
REASON: In the interest of safety and the avoidance of fire hazard.

04 That the requirements of the Supervising Environmental Health Officer be ascertained and strictly adhered to in the development.

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Reg. Ref.: 91A/1082

Page No.: 0005

Location: Cloverhill Industrial Estate, Clondalkin.

Reason: In the interest of health.

05 That the water supply and drainage arrangements, including the disposal of surface water, be in accordance with the requirements of the Council.

Reason: In order to comply with the Sanitary Services Acts, 1978 - 1964.

06 That no industrial effluent be permitted without prior approval from Planning Authority

Reason: In the interest of health.

07 That additional off-street car parking and parking for trucks be provided for the proposed extension in accordance with Development Plan Standards.

Reason: In the interest of the proper planning and development of the area.

08 That details of landscaping and boundary treatment be submitted to and approved in writing by Planning Authority and work thereon completed prior to occupation of units.

Reason: In the interest of amenity.

09 That no advertising sign or structure be erected, except those which are exempted development, without prior approval of the Planning Authority.

Reason: In the interest of the proper planning and development of the area.

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Reg.Ref: 91A/1082

Page No: 0006

Location: Cloverhill Industrial Estate, Clondalkin

Endorsed:-.....
for Principal Officer

.....
for ~~Dublin~~ Planning Officer

Order: A decision pursuant to Section 26(1) of the Local Government (Planning and Development) Acts, 1963-1990 to GRANT PERMISSION for the above proposal subject to the (9) conditions set out above is hereby made.

Dated : 21 OCTOBER 1991

.....
~~ASSISTANT CITY AND COUNTY MANAGER~~ APPROVED OFFICER

to whom the appropriate powers have been delegated by order of the Dublin City and County Manager dated ~~10th~~ 21st October 1991.

DUBLIN COUNTY COUNCIL

REG. REF: 91A/1082.

DEVELOPMENT: (a) office ext. (b) warehouse extension incorporating laboratories and toilets, plant rooms and additional car parking.

LOCATION: Cloverhill Industrial Estate, Clondalkin.

APPLICANT: Industrial Development Authority.

DATE LODGED: 2.9.91.

This submission is additional information with respect to the provision of off-street car parking. We refer to our previous report dated 12.7.91.

The applicant states that existing parking is satisfactory for present demand and that the recent overflow is due to a temporary security problem. Based on the enclosed National Medical Care letter the Roads Department would require a minimum additional car parking provision 25 spaces. In addition to this the applicant has shown 'proposed future car parking as required' of 194 spaces. It is, therefore, apparent that the Development Plan requirements could be met on this site if there was a future change of use or ownership.

If permission is being granted it should be subject to:-

1. An additional 25 off-street car parking spaces to be provided prior to the opening for use of the proposed development.

2. A reserve car parking area to be maintained free of development to ensure that 214 car parking spaces can be provided in the future to fully cater to Development Plan standards.

3. All or part of the reserve car park to be developed for parking at the applicant's expense if requested by Dublin County Council.

4. Car parking to be marked out on site.

5. A financial contribution, in the sum of money equivalent to the value of £13,000 as on 1st January, 1991, updated in accordance with the Wholesale Price Index-Building and Construction (Capital Goods) as published by the Central Statistics Office to the value pertaining at the time of

payment shall be paid by the developer to Dublin County Council towards the cost of road improvements and Traffic Management proposals in the area serving this site.

PLANNING DEPT.
DEVELOPMENT CONTROL SECT
Date 17.10.91
Time 3.00

GC/BMcC
14.10.91.

SIGNED: Garrett Cuna
DATE: 14/10/91

ENDORSED: [illegible]
DATE: 14/10/91

Register Reference : 91A/1082 Date : 5th July 1991

Development : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

LOCATION : Cloverhill Industrial Estate, Clondalkin

Applicant : Industrial Development Authority

App. Type : PERMISSION/BUILDING BYE-LAW APPROVAL

Planning Officer : M.GALVIN

Date Recd. : 28th June 1991

Attached is a copy of the application for the above development .Your report would be appreciated within the next 28 days.

Yours faithfully,

"Paul Dobin

for PRINCIPAL OFFICER

The proposal is acceptable subject to

(1) Compliance with Office Premises Act 1958.

(2) Compliance with Health, Safety & Welfare at Work Act 1989

(3) Provision of suitable ventilation in the sanitary accommodation and lobbies leading thereto.

for Ita Devine
John O'Reilly
SUPER.ENVIRON. HEALTH OFFICER,
33 GARDINER PLACE,
DUBLIN 1.

13/9/91.

SS + CMO.

Mary g.

Register Reference : 91A/1082 Date : 5th July 1991

Development : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

LOCATION : Cloverhill Industrial Estate, Clondalkin

Applicant : Industrial Development Authority

App. Type : PERMISSION/BUILDING BYE-LAW APPROVAL

Planning Officer : M.GALVIN

Date Recd. : 28th June 1991

PLANNING DEPT.
DEVELOPMENT CONTROL SEC
Date ...11:09:91.....
Time.....10:00.....

Attached is a copy of the application for the above development .Your report would be appreciated within the next 28 days.

Yours faithfully,

Paul Dolan

for PRINCIPAL OFFICER

DUBLIN Co. COUNCIL
-8 AUG 1991
SAN SERVICES

DUBLIN CO. COUNCIL
SANITARY SERVICES
-9 SEP 1991
Returned

Date received in Sanitary Services .....

FOUL SEWER

Insufficient Information;

1) The applicants must indicated the quality and quantity of the existing effluent from the process areas, and what ~~increase~~ change of effluent is likely

2) The applicants must indicate the ~~quality~~ type and quantity of chemicals stored.

3) The applicants are to indicate the condition of the drains serving the existing chemical laboratories.

SURFACE WATER

Available to existing system.

The rock pit serving the loading bay is to meet the requirements of the B.B.L. department.

SENIOR ENGINEER,
SANITARY SERVICES DEPARTMENT,
46/49 UPPER O'CONNELL STREET,
DUBLIN 1

5.9.91

4/25/7.

Register Reference : 91A/1082 Date : 5th July 1991

.....

ENDORSED_____ DATE_____

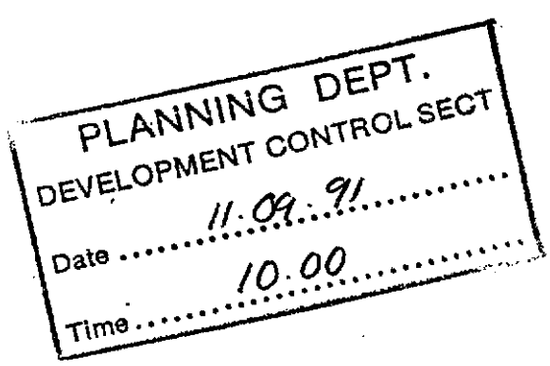
WATER SUPPLY....Existing mains supply.....

9/8/91

13/8/91

.....

ENDORSED_____ DATE 6/9/91



May.

DUBLIN COUNTY COUNCIL

REG. REF: 91A/1082.

DEVELOPMENT: (a) office extn. (b) warehouse ext. incorporating laboratories and toilets (c) plant rooms extns. (d) employee entrance and (e) additional car parking.

LOCATION: Cloverhill Ind. Estate, Clondalkin.

APPLICANT: Industrial Development Authority.

DATE LODGED: 28.6.91.

---

1) The existing facility has 61 car parking spaces. Despite this, cars are parking on the road side and turning bay fronting the existing building. The applicant shows and addition of 20 spaces for the extension. By Dublin County Council Development Standards an additional 63 spaces are required. Applicant to be conditioned to provide these spaces to Dublin County Council Development Standards.

2) A financial contribution, in the sum of money equivalent to the value of £13.000.00 as on 1st January, 1991, updated in accordance with the Wholesale Price Index-Building and Construction (Capital Goods) as published by the Central Statistics Office to the value pertaining at the time of payment shall be paid by the developer to Dublin County Council towards the cost of road improvements and Traffic Management proposals in the area serving this site.

PLANNING DEPT.
DEVELOPMENT CONTROL SECT
Date ....24:07:91.....
Time.....9:50.....

TB/BMcC
12.7.91.

SIGNED: 4. Burke **ENDORSED:** _____

DATE: 15/7/91 **DATE:** _____

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Proposed (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking at it's Cloverhill Industrial Estate, Clondalkin, Dublin 22 for ~~National Medical Care.~~ National Medicalcare.

Industrial Development Authority,
Wilton Park House,
Wilton Place,
Dublin 2.

Reg. Ref. 91A/1082
App. Recd: 28.06.91
Floor Area: 2656 sq.m.
Site Area: 23000 sq.m.
Zoning:

Report of the Dublin Planning Officer, dated 19 August 1991

This is an application for **PERMISSION** for (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking at it's Cloverhill Industrial Estate, Clondalkin, Dublin 22 for National Medical Care.

The proposed site which has a stated area of 23000 sq.m. (2.3 hectares) is located to the east of the Cloverhill Industrial Estate in an area zoned 'E' "to provide for industry and related uses". It adjoins the railway line to the south and the Western Parkway Motorway reservation to the east and north-east.

Reg. Ref. No. TA.562 refers to the original grant of permission for a factory at this site.

Reg. Ref. No. 85A/505 refers to a grant of permission for an extension to rear of existing factory at Cloverhill Industrial Park.

Reg. Ref. No. 89A/150 refers to grant of permission for a security fence at this site.

Reg. Ref. No. 90A/0734 refers to a grant of permission for the retention of new plant room to roof of existing factory at Cloverhill Industrial Park.

The existing building has a floor area of 4500 sq.m. (stated) and comprise a large factory area, 2-storey offices to the front and associated plant room and storage compounds. Existing buildings have a dark brown brick and cladding and are occupied by the National Medical Care.

The current application provides for the construction of extensions totally 2656 sq.m. This is to comprise:

(a) a 2-storey office extension adjoining existing offices to the front of the building,

Over .....

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Proposed (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking at it's Cloverhill Industrial Estate, Clondalkin, Dublin 22 for National Medical Care.

(b) ~~a factory~~ extension to the rear of the existing premises. Lodged plans identify this as comprising a warehouse area, laboratories, toilets etc.

(c) an extension to plant room area to accommodate a new chiller room and extended switch and transformer rooms.

(d) new employee entrance to existing offices.

(e) an area of car parking to the front of existing building comprising 20 spaces.

The proposed extensions to the existing building are to be finished in metal cladding, brick, with aluminium windows, to match existing finishes. Lodged plans provide for a new plant room to roof of the extensions to match existing. This will be located to the rear of the existing structure and so will be more or less hidden when viewed from the industrial estate access road to the north. This plant room will be visible from the adjoining motorway. However, it should not be obtrusive given the location of the building at a lower level than the adjoining road.

The proposed development provides for largescale additions to the existing premises and will increase the floor area by some 60%. It involves a level of site coverage of the order of 40% ~~only~~. However it is noted that much of the remaining open areas of the site are used as compounds, service roads and banked areas. A large section of the open part of the site to the east slopes ~~quite steeply~~ to the Western Parkway Motorway.

The proposed development provides for an additional 20 no. car spaces to the front of the existing building. There is an existing car parking area comprising some 50 no. spaces to the west of the existing building.

This is substantially less than the 214 car spaces required to meet current Development Plan Standards (3 spaces per 100 sq.m.). However, on site inspection it was noted that the existing car parking area to the side of the existing building remains unused, although several cars were parked on the industrial estate access road. While it is noted that these ~~at~~ inspection ~~were~~ carried out during the holiday season, it is considered that the Development Plan standards may be excessive in this instance.

However no details have been submitted regarding the nature of the existing business and the numbers employed therein. Neither have any details been supplied regarding the likely increase in employment arising out of the proposed extensions. These matters should be clarified.

Over .....

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Proposed (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking at it's Cloverhill Industrial Estate, Clondalkin, Dublin 22 for National Medical Care.

In addition it is noted that an ESB pylon is located to the west of the site and that ~~a~~ 220 kw. power lines traverse the site. These power lines are not identified on drawings lodged. It is noted that the proposed buildings will be located under and close to them for a short distance.

The proposed development to extend this existing factory is considered acceptable in principle. The level of site coverage outlined in the County Development Plan is not exceeded (i.e. 45%). However the level of car parking proposed does not comply with Development Plan Standards for a development of this size. It is recommended that the applicants be requested to submit further details of numbers employed/likely increase in employment in order to ascertain whether a lesser number of car parking spaces would be satisfactory in this instance.

I recommend that **ADDITIONAL INFORMATION** be requested from the applicant with regard to the following:-

1. Lodged plans provide for extensions to the existing premises totalling 2696 sq.m. Existing buildings on site are stated to have a floor area of 4500 sq.m.

   It is estimated that c. 214 car parking spaces are required to meet Development Plan Standards for a development of this size (3 spaces per 100 sq.m. manufacturing/warehousing, offices regarded as ancillary). The current application provides for c. 20 car parking spaces in addition to the c. 520 no. currently marked out and available on site.

   The applicants are requested to submit any proposals they may have to ~~improve this situation~~ increase the number of car parking spaces.

2. The applicants are requested to submit full details of:

   (a) numbers employed,
   (b) expected increase in employment as a result of the proposed extension,
   (c) current and proposed work practices i.e. hours of operation, shift-work etc.

   These details may determine whether a lesser amount of car parking on site is satisfactory.

Over .....

COMHAIRLE CHONTAE ÁTHA CLIATH

Record of Executive Business and Manager's Orders

Proposed (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking at it's Cloverhill Industrial Estate, Clondalkin, Dublin 22 for National Medical Care.

3. The applicants are requested to submit revised drawings identifying the existing [redacted] ESB power lines which traverse the site. The applicant is requested to confirm whether they have consulted with the ESB with regard to constructing the proposed building under or close to these power lines.

(MG/AC)

Endorsed:- _____ for Principal Officer

_____ For Dublin Planning Officer

Order:- I direct that ADDITIONAL INFORMATION be requested from the applicant for planning permission as set out in the above report and that notice thereof be served on the applicant.

Dated: 21 August, 1991.

_____ APPROVED OFFICER

to whom the appropriate powers have been delegated by Order of the Dublin City and County Manager, dated 16 August, 1991.

DUBLIN COUNTY COUNCIL

REG. REF: 91A/1082.

DEVELOPMENT: (a) office extn. (b) warehouse ext. incorporating laboratories and toilets (c) plant rooms extns. (d) employee entrance and (e) additional car parking.

LOCATION: Cloverhill Ind. Estate, Clondalkin.

APPLICANT: Industrial Development Authority.

DATE LODGED: 28.6.91.

---

1) The existing facility has 61 car parking spaces. Despite this, cars are parking on the road side and turning bay fronting the existing building. The applicant shows and addition of 20 spaces for the extension. By Dublin County Council Development Standards an additional 63 spaces are required. Applicant to be conditioned to provide these spaces to Dublin County Council Development Standards.

2) A financial contribution, in the sum of money equivalent to the value of £13.000.00 as on 1st January, 1991, updated in accordance with the Wholesale Price Index-Building and Construction (Capital Goods) as published by the Central Statistics Office to the value pertaining at the time of payment shall be paid by the developer to Dublin County Council towards the cost of road improvements and Traffic Management proposals in the area serving this site.

PLANNING DEPT.
DEVELOPMENT CONTROL SECT
Date 16.07.91
Time 12.30

TB/BMcC
12.7.91.

SIGNED: _____ **ENDORSED:** _____

DATE: 15/7/91 **DATE:** _____

JF/BMcC
12.7.91.

SIGNED: J. Fitzsimons

DATE: 13-07-91

ENDORSED: [signature]

DATE: 16/7/91

Traynor O'Toole Partnership,
40 Lr. Leeson Street,
Dublin 2.

91A/1082

19 May 1992

RE: Office extension, warehouse extension and toilets, plant rooms extensions employee entrance, additional car parking at Cloverhill Industrial Estate, Clondalkin for National Medical Care.

Dear Sir/Madam,

I refer to your submission received on 19th Feb. 92, to comply with Condition No. 7, of decision to grant permission by Order No. P/4759/91, dated, 21st Oct. 91, in connection with the above.

In this regard, I wish to inform you that the current proposals are considered satisfactory.

Yours faithfully,

for Principal Officer.

CONHAIRLE CHONTAE ATHA CLIATH

DUBLIN COUNTY COUNCIL

Building Control Department,
Liffey House,
Tara Street,
Dublin 1.

Telephone: 773066

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

Telephone: 724755
Extension: 231/234

12/3/92

LOCAL GOVERNMENT (PLANNING AND DEVELOPMENT) ACTS, 1963 TO 1982

LOCATION: Cloverhill Ind. Est., Clondalkin.

PROPOSED DEVELOPMENT: Office ext., warehouse ext. & toilets, plant rooms exts. employee entrance, add. carparking.

APPLICANT: National Medical Care.

PLANNING REG.REF.: 91A/1082

DATE OF RECEIPT OF SUBMISSION: 19/2/92

A Chara,

With reference to above, I acknowledge receipt of application for:

Compliance with conditions.

Mise, le meas

A. Smith

PRINCIPAL OFFICER

Traynor O'Toole Partnership,
40 Lr. Leeson Street,
Dublin 2.

traynor o toole partnership
architecture project management interior design
40 lr. leeson street dublin 2 ph:~ 618085/6 fax:~ 610551

18th February, 1992

91A/1082
I.I. o
Lond

Mary Galvan,
Planning Officer,
Dublin County Council,
Irish Life Centre,
Lower Abbey Street,
Dublin 1.

RE: **OFFICE AND WAREHOUSE EXTENSION AT NATIONAL MEDICAL CARE, I.D.A. INDUSTRIAL EST. CLOVERHILL, CLONDALKIN, DUBLIN 22 FOR INDUSTRIAL DEVELOPMENT AUTHORITY GRANT ORDER NO. P/5863/91**

Dear Ms. Galvan,

Further to our telephone conversation yesterday afternoon we enclose herewith for your information copy of our drawing no. 19-91-11b showing existing parking outlined in Blue (52 spaces) and proposed carparking outlined in Red (51 spaces).

We would confirm that areas will be reserved on site to accommodate future carparking when and if required.

We would also confirm that suitable landscaping will be carried out around new carparking area.

Should you require further information please do not hesitate to contact this office.

Thanking you.

Yours sincerely,

Brian Traynor

BYE LAW APPLICATION
REC. No. 19. FEB 92

BRIAN TRAYNOR
Traynor O'Toole Partnership

traynor otoole partnership
architecture project management interior design

40 lr. leeson street dublin 2 ph:- 618085/6 fax:- 610551

91A/1082
1.6.2
A.I. for BBL

17th December, 1991

Principal Officer,
Building Control Section,
Dublin County Council,
Block 2,
Irish Life Centre,
Lower Abbey Street,
Dublin 1.

17 DEC

RE: **TIME EXTENSION/ADDITIONAL INFORMATION FOR B.B.L. REG. REF. NO. 91A/1082 NATIONAL MEDICAL CARE, CLOVERHILL INDUSTRIAL ESTATE, CLONDALKIN, DUBLIN 22**

Dear Sir/Madam,

With reference to your letter dated 4th October, 1991 and our letter dated 15th October, 1991 in connection with the above we enclose herewith for your attention the following documentation;

(1) Two copies of Eolas Confidential Report,

(2) Two copies of drawing no. 19-91-09B incorporating additional notes underlined in **red**,

(3) Two copies of drawing no. 19-91-09 showing effluent drains marked **red**, foul drains marked **green**, and suface water drains marked **blue**,

(4) Two copies of drawing no. 19-91-11B incorporating additional notes underlined in **red**, and surface water drainage to hard surfaces marked **blue**,

We would like to point out that in compiling this additional information Dr. Kyran Vallom of Eolas and Mr. Paul Martin of National Medical Care had discussions with Mr. Barry Morris of Dublin County Council Drainage Department. On Tuesday 10th December, Dr. Vallom and Mr. Martin met with Mr. Morris at Dublin County Council offices for a review of this additional information prior to submission.

brian traynor fi arch s patrick o toole b arch mriai riba gerard o toole b arch mriai riba

We should be pleased if you could give this matter your early consideration to enable us to commence on site as soon as possible.

If we can be of further assistance, please do not hesitate to contact this office.

Thanking you.

Yours sincerely,

Brian Traynor

BRIAN TRAYNOR
Traynor O'Toole Partnership

EOLAS

THE IRISH SCIENCE AND TECHNOLOGY AGENCY.

CONFIDENTIAL REPORT

[redacted]

EFFLUENT AND STORAGE ASPECTS OF
NATIONAL MEDICAL CARE'S FACILITY
AT CLONDALKIN

DECEMBER 1991.

[redacted]

GROUP TECHNICAL AND CONSULTANCY

DEPT. ENVIRONMENTAL SERVICES

Sheet no. 1 of 10 sheets

EOLAS

THE IRISH SCIENCE AND TECHNOLOGY AGENCY.

Glasnevin, Dublin 9, Ireland. Telephone 01-370101.
Fax 01-379620. Telex 32501.

CONFIDENTIAL REPORT

Client

National Medical Care,
Cloverhill,
Clondalkin.

Title

Effluent and Storage Aspects of
National Medical Care's Facility
at Clondalkin.

Report ref. :

Order no. :

File no. : R.6./0951B

Report by. : Dr. Kyran Vallom.

Kyran Vallom

Date recd. :

Approved by : Dr. L.O. Hopkins.

Copies to :

Date : 4th December, 1991.

CONTENTS

Introduction

National Medical Care (NMC) commenced the manufacture of artificial kidneys (dialysers) at its Clondalkin facility in 1980. In 1986 it commenced the manufacture of a hemoperfusion devise in a custom built extension to the facility. This product is a carbon filled plastic cartridge which is used for the removal of specific toxins from the blood stream. The company in conjunction with its parent company, W.R. Grace, is currently developing a process to manufacture a fully synthetic membrane to replace the existing cellusloe membrane used at present in he dialysers. A pilot plant was built in the existing factory in 1990 to develop the process.

Because of continuous business growth it has become necessary to provide additional office, laboratory and warehouse accommodation. A planning application has been submitted for this extension.

EOLAS were requested by the company to prepare an environmental report covering the existing effluent discharged from the facility and the consequent changes brought about by the present planning application. It was also requested to indicate the type and quantity of chemicals stored on site.

Process

Artificial Kidney (Dialysers)

These are the main products manufactured. A dialyser consists of a large number of hollow cellulose fibre membranes which are encased in a plastic housing such that when the patients blood passes through the fibre it is filtered as the waste material passes across the membrane into an external waste collection unit.

The raw materials are all bought in. The casing (plastic housing) is electrically treated to aid the adhesion of the polyurethane. Temporary potting end caps are attached to the casing and the required cellulose fibre bundle is put into the casing via a hole in the cap. The unit is washed in Freon 113 and dried using a closed loop system. The holes in the cap are plugged and the unit is placed into a centrifuge machine and polyurethane (a mixture of Polycin and Vorite) is injected to seal the end of the fibres in the casing. Excess polyurethane is removed using chloroethane or methylene chloride. The solvents are recovered and exported to the U.K. The potting end caps are removed and the ends of the unit are cut to open up the fibres. A small quantity of isopropyl myristat is used as a lubricant in the cutting opertion. The fibres are leak tested using air and the end caps are electronically welded on to the casing. The unit is washed in isopropyl alcohol using a closed loop system. The unit is again leak tested using air, labelled, sterilised using ethylene oxide and packaged.

Hemoperfusion Devise

The activated carbon is washed in isopropyl alcohol (IPA) using a closed loop system and residual IPA is vacuumed off. The carbon is washed in reverse osmosis filtered water and the residual water is vacuumed off. The carbon is placed into dishes and dried in an oven. A mixture of Collodion, ether and ethanol is added to the cooled dried carbon and it is put into the required cartridge. The cartridge unit is aspirated using air to remove any residual ether. A cap is welded onto the cartridge and it is leak tested using air prior to labelling and packaging.

Synthetic Membrane

The polymers polysulphone and polyethyleneglycol 600 are blended in the organic solvent n-methylpyrrolidone. The mixture is drawn through an extrusion head to form hollow fibres which are washed in two counter current water baths, soaked in a glycerine solution and dried in a tunnel oven prior to collection into bundles for dialyser manufacture. Some of the vessels and pipework in this area are cleaned using n-methylpyrrolidone. The solvent is recovered and exported to the U.K.

Effluent

Dialyser Manufacture

No industrial effluent is discharged from this operation. No effluent is generated by the ethylene oxide sterilisation unit. The production area is dry cleaned.

Hemoperfusion Manufacture

Industrial effluent consisting of reverse osmosis filtered water contaminated with isopropyl alcohol is collected into a $5.2m^3$ holding tank outside the building. This tank is prefilled with $3.9m^3$ of mains water to dilute the $1.3m^3$ of industrial effluent produced per manufacturing cycle. At peak production the manufacturing cycle would be completed 3 times per week. The holding tank is discharged over a two day period. Thus at peak production $2.6m^3/d$ of effluent would be discharged. In the last year one tank ($5.2m^3$) per month was discharged. An analysis (carried out by the company) of the effluent discharged from this process on the 18th of October 1991 is presented below.

pH	7.2
BOD (mg/l)	693
COD (mg/l)	5740
Suspended Solids (mg/l)	23
Oil/Fat/Grease (mg/l)	13
MBAS (mg/l)	<1
Volume (m^3/d)	2.6

Membrane Manufacture

The wash waters from the counter current baths are discharged to the foul sewer. The volume discharged has increased from $20m^3/d$ to $46m^3/d$ ($1.9m^3/h$) over the last three months. The effluent is discharged Monday to Friday. Analysis (carried out by the company) of the effluent discharged on the 18th October 1991 is presented below.

pH	7.0
BOD (mg/l)	11
COD (mg/l)	648
Suspended Solids (mg/l)	1
Oil/Fat/Grease (mg/l)	<1
MBAS (mg/l)	<1
Volume (m^3/d)	46

Other Effluent

Although the majority of the facility is dry cleaned, some areas are wet cleaned using a water wash vacuum system. The effluent from the container (20 l/d) is poured into the foul sewer. Small quantities of wash water are also discharged from the two laboratories, boiler blow down and the de-ionisers and reverse osmosis equipment. This on average amounts to $4m^3/d$.

Present Discharge

The present effluent discharge is present below along with the effluent licence limits:

	Effluent Licence	Present Discharge
pH	6 - 10	7 - 7.3
Temperature (°C)	43	<43
BOD (mg/l	2500	<693
COD (mg/l)	5000	<5740
Suspended Solids (mg/l)	500	<23
Oil/Fat/Grease (mg/l)	100	<13
MBAS (mg/l)	100	<1
N-methylpyrrolidone (mg/l)	-	<200
Polyethyleneglycol (mg/l)	-	<170
Volume (m^3/d)	25	<52

Present Planning Application

The present proposed planning application expansion will result in an increase in the quantity and quality of the effluent discharged. A simulated future effluent of the combined effluents was made up in the company's laboratory and it's analysis is presented below along with the anticipated volume.

pH	7 - 7.3
Temperature (°C)	<43
BOD (mg/l)	66
COD (mg/l)	8020
Suspended Solids (mg/l)	1
Oil/Fat/Grease (mg/l)	0.1
MBAS (mg/l)	<0.1
N-methylpyrrolidone (%)	0.25
Polyethyleneglycol (%)	0.2
Volume (m^3/d)	91

The company are in the process of collecting all the relevant data so that an application for a review of the effluent licence can be made to fully regularise the present discharge. This application should be made within the next four months.

Presented in drawing number 19-91-09 is a layout of the facility's (existing and future) associated effluent, foul sewer (domestic) and surface water drainage.

Future

In the future the warehouse may be converted to a production facility. However, this will be the subject of a new planning application. This expansion will result in an increase in the effluent discharged and will require a further review of their licence.

Storage

The type and quantity of chemicals stored on site is presented below:

Chemical	Form	Storage Container	Average Storage on site for 1992 (kg)
Polysulphone	Solid	25kg bag	7147
Carbon	Solid	5kg bag	1000
Collodion	Liquid	500ml bottle	100
N-methylpyrrolidone	Liquid	200l drum	6270
Polyethyleneglycol	Liquid	200l drum	2050
Glycerin	Liquid	200l drum	2500
Freon 113	Liquid	200l drum/bulk(1)	17528
Di-ethyl ether	Liquid	200l drum	615
Chloroethane	Liquid	200l drum	600
Isopropyl myristat	Liquid	25kg key	125
Isopropyl alcohol	Liquid	200l drum/bulk (2)	32000
Polycin 1864	Liquid	200l drum/bulk (3)	11400
Polycin 1859	Liquid	200l drum/bulk (4)	4300
Vorite 1745	Liquid	200l drum/bulk (5)	8626
Vorite 1754	Liquid	200l drum/bulk (6)	4300
Methylene Chloride	Liquid	200l drum	1080
Ethylene Oxide	Gas	170kg cylinder	1360
Acetylene, Oxygen Nitrogen, Hydrogen Helium	Gas	Cylinders	
Water Treatment Chemicals		Small Quntities	
Laboratory Chemicals		Small Quantities	
Waste (IPA/water or chlorinated solvent or N-methylpyrrolidone)	Liquid	200l drums	16000

(1) 16,000kg are stored in a bulk tank as part of the Freon wash closed loop system.

(2) 3600l is stored in two 1.8m^3 storage tanks associated with the IPA washing system.

(3) 500kg is stored in two 250kg tanks associted with the production machines.

(4) 250kg is stored in a 250kg tanks associated with the production machines.

(5) 500kg is stored in two 250 tanks associated with the production machines.

(6) 250kg is stored in a 250 tank associated with the production machines.

All the chemicals are stored in adequately bunded areas. The locations of storage are shown in drawing 19-91-09A and 19-91-11A.

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

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

NOTIFICATION OF DECISION TO GRANT PERMISSION
LOCAL GOVERNMENT (PLANNING AND DEVELOPMENT)ACTS 1963-1990.

Decision Order Number : P/ 4759 /91 Date of Decision : 21st October 1991

Register Reference : 91A/1082 Date Received : 2nd September 1991

Applicant : Industrial Development Authority

Development : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

Location : Cloverhill Industrial Estate, Clondalkin

Floor Area : Sq.Metres

Time Extension(s) up to and including :

Additional Information Requested/Received :260891//020991

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 in respect of the above proposal.

Industrial Development Authority,
Wilton Park House,
Wilton Place,
Dublin 2.

NOTES

1. 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 this decision.

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

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

3.An appeal lodged by an applicant or his agent with An Bord Pleanala will be invalid unless accompanied by the prescribed fee.

(a) An appeal against a decision relating to commercial development by the person by whom the application was made must be accompanied by a fee of £100 (one hundred Pounds).

"Commercial Development" means development for the purposes of any professional, commercial or industrial undertaking, development in connection with the provision for reward of services to persons or undertakings, or development consisting of the provision of two or more dwellings, but does not include developmemt for the purposes of agriculture.

(b) An appeal other then an appeal mentioned at (a) above, including third party appeal must be accompanied by a fee of £50 (fifty pounds)

(c) A party to an appeal making a request to An Bord Pleanala for an Oral Hearing of an appeal must, in addition to the prescribed fee, pay to An Bord Pleanala a fee of £50 (fifty pounds).

(d) A person who is not a party to an appeal must pay a fee of £15 (fifteen pounds) to An Bord Pleanala when making submissions or observations to An Bord Pleanala in relation to an appeal.

4.If the Council makes a decision to grant permission/approval and 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 an appeal. If every appeal made in accordance with the Acts has been withdrawn, the Council will grant the PERMISSION/APPROVAL after the withdrawal.

5. Approval of the Council under the 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.

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

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

Reg.Ref. 91A/1082
Decision Order No. P/ 4759 /91
Page No: 0002

Subject to the Conditions on the attached Numbered Pages.

NUMBER OF CONDITIONS:- 9 ATTACHED.

Signed on behalf of the Dublin County Council.....
for Principal officer

Date: 22/10/91

NOTES

1. 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 this decision.

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

An Bord Pleanala,
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Irish Life Centre,
Lower Abbey Street,
Dublin 1.

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(d) A person who is not a party to an appeal must pay a fee of £15 (fifteen pounds) to An Bord Pleanala when making submissions or observations to An Bord Pleanala in relation to an appeal.

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5. Approval of the Council under the 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.

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

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

Reg.Ref. 91A/1082
Decision Order No. P/ 4759 /91
Page No: 0003

C O N D I T I O N S / R E A S O N S

01 The development to be carried out in its entirety in accordance with the plans, particulars and specifications lodged with the application, as amended by additional information received on 2nd September 1991 save as may be required by the other conditions attached hereto.
REASON: To ensure that the development shall be in accordance with the permission and that effective control be maintained.

02 That before development commences, approval under the Building Bye-Laws be obtained and all conditions of that approval be observed in the development.
REASON: In order to comply with the Sanitary Services Act, 1878-1964.

03 That the requirements of the Chief Fire Officer be ascertained and strictly adhered to in the development.
REASON: In the interest of safety and the avoidance of fire hazard.

04 That the requirements of the Supervising Environmental Health Officer be ascertained and strictly adhered to in the development.
REASON: In the interest of health.

05 That the water supply and drainage arrangements, including the disposal of surface water, be in accordance with the requirements of the County Council.
REASON: In order to comply with the Sanitary Services Acts, 1978 - 1964.

06 That no industrial effluent be permitted without prior approval from Planning Authority.
REASON: In the interest of health.

07 That additional off-street car parking and parking for trucks be provided for the proposed extension in accordance with Development Plan standards.

07 REASON: In the interest of the proper planning and development of the area.

08 That details of landscaping and boundary treatment be submitted to and approved in writing by Planning Authority and work thereon completed prior to occupation of unit.
REASON: In the interest of amenity.

09 That no advertising sign or structure be erected except those which are exempted development, without prior approval of Planning Authority.
REASON: In the interest of the proper planning and development of the area.

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,
Block 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/1082 Date : 3rd September 1991

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

Dear Sir/Madam,

DEVELOPMENT : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

LOCATION : Cloverhill Industrial Estate, Clondalkin

APPLICANT : Industrial Development Authority

APP. TYPE : Additional Information

With reference to the above, I acknowledge receipt of additional information received on 2nd September 1991.

Yours faithfully,

.....

for PRINCIPAL OFFICER

68'6633
Burns.

Industrial Development Authority,
Wilton Park House,
Wilton Place,
Dublin 2.

traynor otoole partnership
architecture project management interior design
40 lr.leeson street dublin 2 ph:~ 618085/6 fax:~ 610551

2nd September, 1991

Principal Officer,
Planning Department,
Dublin County Council,
Block 2,
Irish Life Centre,
Lower Abbey Street,
Dublin 1.

RE: **ADDITIONAL INFORMATION - REG. REF. NO. 91A/1082**
PROPOSED (A) OFFICE EXTENSION (B) WAREHOUSE EXTENSION INCORPORATING LABORATORIES AND TOILETS (C) PLANT ROOMS EXTENSIONS (D) EMPLOYEE ENTRANCE (E) ADDITIONAL CARPARKING AT CLOVERHILL INDUSTRIAL ESTATE, CLONDALKIN, DUBLIN 22 FOR **NATIONAL MEDICAL CARE**

91A/1082
3.4.0
A.1.

DUBLIN COUNTY COUNCIL
Planning Dept. Registry Section
APPLICATION RECEIVED
02 SEP 1991
REG No. 91A/1082

Dear Sir/Madam,

We refer to your letter to the Industrial Development Authority dated 26th August, 1991 in connection with the above and we enclose herewith additional information as requested in quadruplicate.

1. Drawings no. 19-91-11a showing existing, proposed and future carparking as required.

2. Copyof letter from National Medical Care giving a breakdown of numbers employed.

3. Copy of letter from Seamus Homan & Associates confirming their consultantions with E.S.B.I. regarding overhead High Tension Power lines where indicated on drawing no. 19-91-11a.

We should be pleased if you could advise us in due course, the number of on-site carparking spaces required based on the contents of National Medical Care letter.

If we can be of further assistance please do not hesitate to contact the undersigned.

Yours faithfully,

Brian Traynor

BRIAN TRAYNOR
Traynor O'Toole Partnership

brian traynor fi arch s patrick o toole b arch mriai riba gerard o toole b arch mriai riba

ASSOCIATES
CONSULTING ENGINEERS
5 MARINE TERRACE, DUN LAOGHAIRE, CO. DUBLIN
Telephone: 2805666/2805649. Telex: Dublin 90329
Fax: 2842617

DJ/HL/9129

29th August, 1991.

Traynor O'Toole Partnership,
Architects,
40, Lower Leeson Street,
DUBLIN, 2.

Attention: Mr. Brian Traynor

Dear Sirs,

Extension to National Medical Care,
Cloverhill, Clondalkin, Dublin, 22

We wish to confirm that we have been liaising with E.S.B.I. on an ongoing basis in connection with the existing 220 kV overhead lines crossing the location of the extension.

E.S.B.I. have confirmed to us that the extension per se does not create any problems. The method of construction is, however, of interest to E.S.B.I. Each individual construction site and its particular conditions was examined in detail by E.S.B.I. in conjunction with the building contractor after he is appointed. The methods of construction and machinery to be used are jointly agreed. In the event of suitable construction methods not being practical it is then necessary to consider a planned shut down of the line which is the province of a separate E.S.B. department. A planned outage of the line particularly in winter months, creates problems for E.S.B. and is difficult to obtain. Therefore every effort should be made by the building contractor to agree procedures with E.S.B.I. before considering a planned outage.

We trust that this is the information which you required, however, if you have any further query please do not hesitate to contact us.

Yours faithfully,

D. Jacobs

David Jacobs

NATIONAL MEDICAL CARE
Medical Products Division
Cloverhill, Clondalkin,
Dublin 22, IRELAND.
Tel: 573354 Tlx: 32884
Fax: 572623

T E L E F A X M E S S A G E

H E A D E R S H E E T

DATE : 02/09/91

TO : Traynor O'Toole FROM : Joe Watson

ATTENTION OF : Brian Traynor

COPY TO :

NUMBER OF PAGES INCLUDING THIS PAGE : 1

RE: PROJECTED INCREASE IN STAFF NUMBERS

Following are details of the current and projected employment levels at our facility in Clondalkin.

Current employment level is 140. A number of shift arrangements exist as follows:

Day Shift	(08.00 - 16.30)	= 100
Morning Shift	(07.00 - 15.00)	= 20
Evening Shift	(15.00 - 23.00)	= 20

Current on-site parking is adequate at all times to meet the requirements of the existing workforce. In the recent past, it has been necessary to allow parking on the roadside in front of the office block. This is due to a short term security problem at tho rear of the site and not due to a shortage of available parking spaces.

It is expected that employment will increase to 200 upon completion of the factory extension. At this time 24 hour operation will be utilised and the following shift arrangements will apply.

Day Shift	(08.00 - 16.30)	= 110
Morning Shift	(07.00 - 15.00)	= 35
Evening Shift	(15.00 - 23.00)	= 35
Night Shift	(23.00 - 07.00)	= 20

Should you require any further information please contact me.

Regards,

JOE WATSON

Industrial Development Authority,
Wilton Park House,
Wilton Place,
Dublin 2.

Reg. Ref. No. 91A/1082

26 August 1991

Re: Proposed (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking at its Cloverhill Industrial Estate, Clondalkin, Dublin 22 for National Medical Care.

Dear Sir/Madam,

With reference to your planning application, received here on 28 June 1991, in connection with the above, I wish to inform you, that before the application can be considered under the Local Government (Planning and Development) Acts, 1963-1990, the following additional information must be submitted in quadruplicate:-

1. Lodged plans provide for extensions to the existing premises totalling 2656 sq.m. Existing buildings on site are stated to have a floor area of 4500 sq.m.

   It is estimated that c. 214 car parking spaces are required to meet Development Plan Standards for a development of this size (3 spaces per 100 sq.m. manufacturing/warehousing, offices regarded as ancillary). The current application provides for c. 20 car parking spaces in addition to the c. 50 no. currently marked out and available on site.

   The applicants are requested to submit any proposals they may have to increase the number of car parking spaces.

2. The applicants are requested to submit full details of:

   (a) numbers employed,
   (b) expected increase in employment as a result of the proposed extension,
   (c) current and proposed work practices i.e. hours of operation, shift-work etc.

   These details may determine whether a lesser amount of on-site car parking is satisfactory.

Over .....

3. The applicants are requested to submit revised drawings identifying the existing ESB power lines which traverse the site. The applicant is requested to confirm whether they have consulted with the ESB with regard to constructing the proposed building under or close to these power lines.

Please mark your reply "**ADDITIONAL INFORMATION**" and quote the Reg. Ref. No. given above.

Yours faithfully,

for Principal Officer.

traynor o toole partnership
architecture project management interior design
40 lr. leeson street dublin 2 ph:~ 618085/6 fax:~ 610551

22nd July, 1991

91A/1082
1.4.0
Mark A.I.

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

22 JUL 91

RE: **OFFICE AND WAREHOUSE EXTENSION AT**
NATIONAL MEDICAL CARE
I.D.A. INDUSTRIAL ESTATE
CLOVERHILL CLONDALKIN DUBLIN 22
FOR THE INDUSTRIAL DEVELOPMENT AUTHORITY
REG. REF. NO. 91A/1082

Dear Sir/Madam,

Further to our letter dated 28th June, 1991 we enclose herewith for your information 4 copies of our drawing no. 19-91-15.

This drawing was inadvertently omitted from our submission documentation for Permission/Building Bye-Law Approval in connection with the above.

We do apologize for any inconvenience this may cause.

Thanking you.

Yours sincerely,

Brian Traynor

BRIAN TRAYNOR
Traynor O'Toole Partnership

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

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

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

Register Reference : 91A/1082

Date : 1st July 1991

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

Dear Sir/Madam,

DEVELOPMENT : (a) office extension (b) warehouse extension incorporating laboratories and toilets (c) plant rooms extensions (d) employee entrance and (e) additional car parking

LOCATION : Cloverhill Industrial Estate, Clondalkin

APPLICANT : Industrial Development Authority

APP. TYPE : PERMISSION/BUILDING BYE-LAW APPROVAL

With reference to above, I acknowledge receipt of your application received on 28th June 1991.

Yours faithfully,

.....

for PRINCIPAL OFFICER

Industrial Development Authority,
Wilton Park House,
Wilton Place,
Dublin 2.

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 [/] 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 NATIONAL MEDICAL CARE I.D.A. INDUSTRIAL ESTATE
(If none, give description sufficient to identify) CLOVERHILL, CLONDALKIN, DUBLIN 22.

3. Name of applicant (Principal not Agent) INDUSTRIAL DEVELOPMENT AUTHORITY
Address WILTON PARK HOUSE, WILTON PLACE, DUBLIN 2. Tel. No. 686633

4. Name and address of person or firm responsible for preparation of drawings TRAYNOR O'TOOLE PARTNERSHIP
40, LOWER LEESON STREET, DUBLIN 2 Tel. No 618085/6

5. Name and address to which notifications should be sent INDUSTRIAL DEVELOPMENT AUTHORITY
WILTON PARK HOUSE, WILTON PLACE, DUBLIN 2.

BYE 9296 N41978

6. Brief description of proposed development
OFFICE EXTENSION AND WAREHOUSE EXTENSION TO EXISTING FACTORY.

7. Method of drainage PUBLIC 8. Source of Water Supply PUBLIC

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. PRODUCTION AREA - WAREHOUSE AREA - ADMINSTRATION OFFICES.
(b) Proposed use of each floor AS AT 'A'

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

4648 1/7 N44020

11.(a) Area of Site 23000 Sq. m.
(b) Floor area of proposed development 2656 Sq. m.
(c) Floor area of buildings proposed to be retained within site 4500 Sq. m.

Test Jovel 26.6.91

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 [/] No [ ] Place ✓ in appropriate box.

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

28 JUN 91

DUBLIN COUNTY COUNCIL
Notice is hereby given by the Industrial Development Authority of it's intention to apply to Dublin County Council for planning permission and by-law approval for (a) office extension, (b) warehouse extension incorporating laboratories and toilets, (c) plant rooms extensions, (d) employee entrance and (e) additional car parking at it's Cloverhill Industrial Estate, Clondalkin, Dublin 22 for National Medical Care.

15.List of d applicat
PLICATION FORM AND OUTLINE SPECIFICATION
WSPAPER ADVERTISEMENT - IRISH INDEPENDENT 26TH JUNE, 1991
EQUE IN THE SUM OF £13,944-00
RUCTURAL DRAWINGS D596-02,03,04.
CHITECTS DRAWINGS 19-91-10,11,12,13,14

16.Gross fl ient (See back) 2656 Sq. m.
No of dwellings proposed (if any) NE Class(es) of Development

Fee Payable £13,944-00 Basis of Calculation 2656M² X £1-75 (PLANNING FEE) 2656M² X £3-50 (BYE-LAW)
If a reduced fee is tendered details of previous relevant payment should be given

Signature of Applicant (or his Agent) Traynor O'Toole Date 28TH JUNE, 1991

Application Type P. BYE. 9117/105
Register Reference
Amount Received £
Receipt No 17/12
Date

FOR OFFICE USE ONLY

2.32.8.

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

Outline of requirements for applications for permission or Approval under the Local Government (Planning & Development) Acts 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 accordence 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

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

PAID BY
CASH
CHEQUE ✓
M.O.
P.C.
I.T.

Issue of ... tendered is No N 41020 fee.

£4648.00

Received this 1st day of July 19 91

from I.D.A.
Wilton Park House,
D.2

the sum of four thousand six hundred & forty eight Pounds
Pence, being fee for
planning application at Clarehills
Clondalkin
Naas Road

S. CAREY Cash
Principal Officer
Cashier

RECEIPT CODE

COMHAIRLE CHONTAE ÁTHA CLIATH

DUBLIN COUNTY COUNCIL

46/49 UPPER O'CONNELL STREET,
DUBLIN 1.

PAID BY

CASH

CHEQUE ✓

M.O.

B.L.

I.T.

BYE LAW APPLICATION.

REC. No N 41778

£9296.00

Received this 1st day of July 19 91

from I.D.A.,
Wilton Park House
D: 2

the sum of nine thousand two hundred & ninety six Pounds

Pence, being Noe for

bye-law application at Cloverhill,
Clondalkin
Nolan Deane

Cashier

S. CAREY Class C
Principal Officer

traynor o'toole partnership
architecture project management interior design
40 lr. leeson street dublin 2 ph:~ 618085/6 fax:~ 610551

28th June, 1991

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

RE: **OFFICE AND WAREHOUSE EXTENSION AT NATIONAL MEDICAL CARE I.D.A. INDUSTRIAL ESTATE, CLOVERHILL, CLONDALKIN, DUBLIN 22 FOR THE INDUSTRIAL DEVELOPMENT AUTHORITY**

Dear Sir/Madam,

On behalf of the Industrial Development Authority we enclose herewith for your attention the following documentation in connection with the above.

(1) Application form duly completed.

(2) Newspaper advertisement (Irish Independent 26th June, 1991).

(3) Cheque in the sum of £13,944-00 to cover Planning and Bye-Law fees.

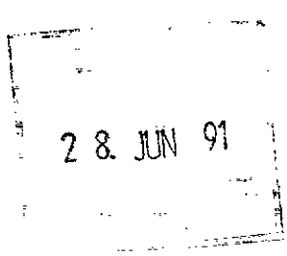
(4) 4 copies of Structural Engineers drawings Nos. D596-02,03,04 and calculations.

(5) 4 copies of Architects drawings Nos. 19-91-10,11,12,13,14 and Outline Specification.

If in any way we can be of Assistance, please do not hesitate to contact this office.

Thanking you,

Yours sincerely,



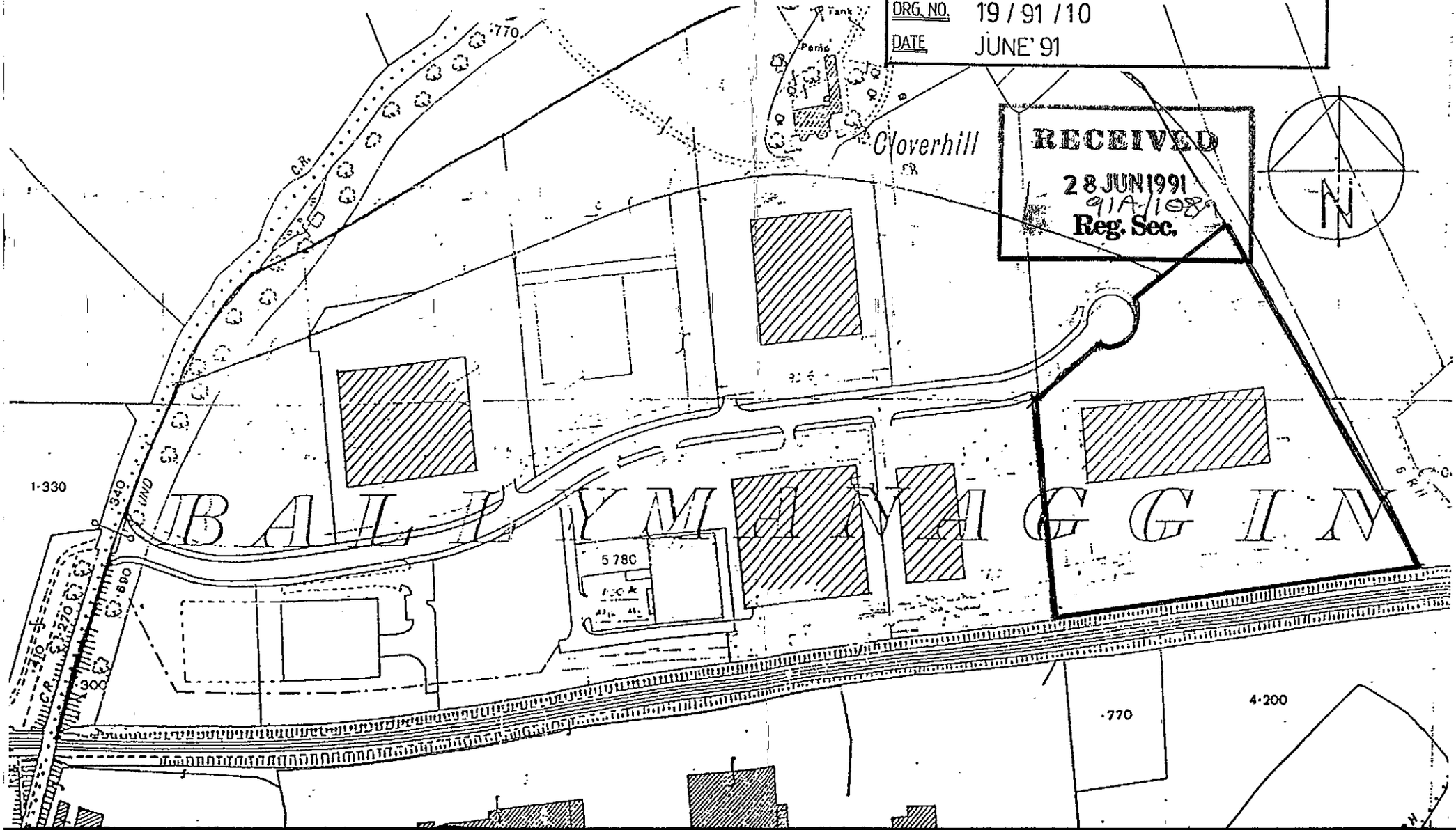
Brian Traynor

BRIAN TRAYNOR
Traynor O'Toole Partnership

traynor o'toole partnership
architecture project management interior design
40 lr. leeson street dublin 2 ph:- 618085/6 fax:- 610551

project
OFFICE/WAREHOUSE/PLANT ROOM
EXTENSIONS AT NATIONAL MEDICAL CARE
I.D.A. INDUSTRIAL ESTATE CLOVERHILL
CLONDALKIN DUBLIN 22
FOR INDUSTRIAL DEVELOPMENT AUTHORITY

DRAWING LOCATION MAP
SCALE 1:2500
DRG. NO. 19/91/10
DATE JUNE '91



PROPOSED EXTENSION

AT

NATIONAL MEDICAL CARE

CLOVERHILL

DUBLIN 22.

STRUCTURAL CALCULATIONS

FOR

BUILDING BYE LAW

SUBMISSION

Muir Associates
Consulting Engineers
17 Fitzwilliam Place
Dublin 2.

June 1991

Muir Associates
Consulting Engineers

17 Fitzwilliam Place, Dublin 2, Ireland
Tel. 1-762788, 1-785127, Telex: 30583 MWI EI,
Fax. 1-686912

Job Name . . NATIONAL MEDICAL CARE . .
Portion . . . . . /INDEX . . . . . .

Page . . . . . .
Job No. . . . . .
Date . . . . . .
Eng. . . . . .

Item	Calculations	Output	Ch.

Muir Associates
Consulting Engineers

17 Fitzwilliam Place, Dublin 2, Ireland
Tel. 1-762788, 1-785127, Telex 30583 MWI EI,
Fax. 1-686912

Job Name . . NATIONAL MEDICAL CARE
Portion . . . . . STRUCTURAL SUMMARY

Page 1
Job No. . D.596
Date . . . . June 1991
Eng. . . . . JS

Item	Calculations	Output	Ch.

CODES OF PRACTICE USED.

BS 6399 : "DESIGN LOADING FOR BUILDINGS"

CP3. ch 5 pt 2 : "WIND LOADING"

BS 5950 : "THE STRUCTURAL USE OF STEELWORK IN BUILDING"

BS 8110 : "THE STRUCTURAL USE OF CONCRETE"

BS 5628 : "THE STRUCTURAL USE OF MASONRY."

MATERIALS USED

CONCRETE : MODERATE EXPOSURE : GRADE 35
MILD EXPOSURE : GRADE 30.

REINFORCEMENT : HIGH YIELD f_y = 460 N/mm²

STEELWORK : GRADE 43

BLOCKWORK : SOLID : 5N

HOLLOW : 3N

ASSUMED ALLOWABLE BEARING CAPACITY = 150 KN/m²

Muir Associates
Consulting Engineers

17 Fitzwilliam Place, Dublin 2, Ireland
Tel 1-762788, 1-785127, Telex 30583 MWI EI,
Fax: 1-686912

Job Name NATIONAL MEDICAL CARE

Portion STRUCTURAL SUMMARY

Job No. D596

Date June 1991

Eng. [illegible]

Item	Calculations	Output	Ch.

IT IS PROPOSED TO CONSTRUCT AN EXTENSION TO THE NATIONAL MEDICAL CARE FACILITY AT CLOVERHILL INDUSTRIAL ESTATE CLONDALKIN. THE WORK COMPRISES

(a) A SINGLE STOREY WAREHOUSE EXTENSION TO THE EXISTING FACILITY
(b) A TWO STOREY EXTENSION TO THE EXISTING OFFICES AT THE FRONT OF THE BUILDING
(c) A SINGLE STOREY EXTENSION TO EXISTING PLANT/SUB STATION ROOMS
(d) AN EXTENSION TO THE EXISTING PLANTROOM AT ROOF LEVEL OVER THE PROPOSED NEW WAREHOUSE AREA IN (a) ABOVE.

(a) THE SINGLE STOREY WAREHOUSE EXTENSION WILL BE OF STEEL FRAMED CONSTRUCTION. THE TRAPAZOIDAL ROOF SHEETING WILL ACT AS A DIAPHRAGM AND WILL BE SUPPORTED ON LATTICE STEEL TRUSSES. THE LATTICE TRUSSES IN CONJUNCTION WITH THE COLUMNS ON THE MAIN GRID LINES WILL ACT AS STEEL FRAMES TO GIVE STABILITY TO THE BUILDING. THE WALLS WILL BE CLAD WITH STEEL SHEETING WITH A 2m HIGH BLOCKWORK WALL AT LOW LEVEL. FOUNDATIONS FOR THE STEEL FRAME WILL GENERALLY BE THE R.C. PAD TYPE, WITH AN EXTENSION TO THE EXISTING PADS ADJACENT TO THE EXISTING BUILDING.

(b) THE TWO STOREY OFFICE EXTENSION WILL BE CONSTRUCTED USING PRECAST PRESTRESSED FLOOR AND ROOF SLABS RESTING ON BLOCKWORK WALLS. STABILITY WILL BE PROVIDED BY THE P.S. FLOOR AND ROOF ACTING AS A DIAPHRAGM TRANSFERRING THE HORIZONTAL LOADS TO THE GABLE SHEAR WALLS. FOUNDATIONS ARE GENERALLY THE STRIP FOUNDATION TYPE EXCEPT AT THE NEW 215 S/B WALL ADJOINING THE EXISTING BUILDING. HERE AN ECCENTRIC GROUND BEAM HAS BEEN USED WITH RESTRAINING GROUND BEAMS.

(c) THE CONSTRUCTION OF THE PROPOSED NEW GROUND LEVEL PLANTROOM IS SIMILAR TO THAT EXISTING, I.E. P.C. ROOF SLAB RESTING ON LOADBEARING BLOCKWORK WALLS.

Muir Associates
Consulting Engineers

17 Fitzwilliam Place, Dublin 2, Ireland
Tel 1-762788, 1-785127, Telex. 30583 MWI EI,
Fax. 1-686912

Job Name NATIONAL MEDICARE
Portion STRUCTURAL SUMMARY

Page 2A
Job No. DS96
Date June 1991
Eng. B

Item	Calculations	Output	Ch.

(d) THE PLANTROOM AT ROOF LEVEL WILL BE USED TO HOUSE AIR HANDLING PLANT, AND WILL BE DESIGNED FOR THIS PURPOSE. IT IS PROPOSED TO BUILD THIS NEW PLANTROOM OVER THE PROPOSED WAREHOUSE ROOF (SIMILAR TO THE EXISTING PLANTROOM). THE PLANTROOM IS OF STEEL FRAMED CONSTRUCTION WITH METAL DECK CLADDING.

Muir Associates
Consulting Engineers

17 Fitzwilliam Place, Dublin 2, Ireland
Tel: 1-762788, 1-785127, Telex: 30583 MWI EI,
Fax: 1-686912

Job Name . NATIONAL MEDICAL CARE.
Portion . LOADING.

Page . 3.
Job No. . D596.
Date . June 1991.
Eng. . .

Item	Calculations	Output	Ch.

LOADING

OFFICES

Roof : G_k : asphalt : 0.5 kN/m²
screed : 1.8 "
p.c. slabs : 3.6 "
ceiling : 0.25 "
services : 0.25 "
6.4 "

Q_k : live : 1.5 "
7.9 kN/m².

$n = 11.36$ kN/m²

Floor : G_k : finishes : 0.1 kN/m²
screed : 1.8 "
p.c. slabs : 3.6 "
ceiling : 0.25 "
services : 0.25 "
6.0 "

Q_k : live : 3.5 "
partitions : 1.0 "
10.5 kN/m².

$n = 15.6$ kN/m²

WALLS
215 S/B : 4.5 kN/m².
plaster : 0.5 "
5.0 kN/m² $n = 7.0$ kN/m²

100 brick : 2.2 kN/m²
215 S/B : 4.5 "
plaster : 0.3 "
7.0 kN/m² $n = 9.8$ kN/m²

Muir Associates
Consulting Engineers

17 Fitzwilliam Place, Dublin 2, Ireland
Tel. 1-762788, 1-785127, Telex. 30583 MWI EI,
Fax: 1-686912

Job Name . . NATIONAL MEDICAL CARE . .
Portion . . . . . LOADING .

Job No. . D.596 . .
Date . . . June 1991 .
Eng. . . . . B . . . .

Item	Calculations	Output	Ch.

WAREHOUSE

ROOF G_k :

FELT	:	0.05	kN/m²
insulation	:	0.05	"
metal deck	:	0.1	"
s.w. steel	:	0.15	"
ceiling + services	:	0.5	"
		0.85	"
Q_k		0.75	"
		1.6	kN/m²

WALLS 215 S/B : 4.5 kN/m²

215 H/B : 2.2 kN/m²

WIND LOADING

$V = 46$ m/s

$S_1 = 1.0$

S_2 : ground roughness 2 class C $h = 7.5$m.

$= 0.76$

$S_3 = 1.0$

$V_s = 34.96$ m/s

$\Rightarrow q = 0.75$ kN/m²

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Item	Calculations	Output	Ch.

ROOF

USE 200 deep precast prestressed roof slab.
(see attached copy from brochure)

1st FLOOR

Use 200 deep precast prestressed floor slab
(see attached copy from brochure)

WALLS

NEW 215 S/B WALL AGAINST EX BUILDING

loading:

roof :	11.36 . 4.3	=	49.0
1st floor wall:	7. 2.7	=	19.0
1st floor slab:	15.6 . 4.3	=	67.0
grnd floor wall :	7. 3.0	=	21.0
			156.0 kN/m ult

$N_u = \frac{\beta t f_k}{\gamma_m} = 0.725 . 215 . \frac{3.6}{3.5}$

$= 160$ kN/m OK.

β : $\frac{h_{eff}}{t} = 0.875 \frac{3000}{215}$

$= 12.2$

$f_k = 3.6$ (SH block laid flat)

$\gamma_m = 3.5$.

$e = 0.167\,t$

Use 215 (S/B SH) laid flat
mortar 1:1:6.

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Item	Calculations	Output	Ch.

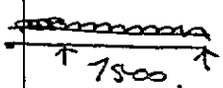
R.C BEAM SUPPORTING ROOF SLAB OVER WINDOWS

loading:

slab : 11.4.4.3 = 5.0

S.W : = 5.0

55 kN/m.



Bm = 55.7.5²/8 = 387 kN m.

f_{cu} = 35
f_y = 460

Mu core = 660.3. kNm — Z = 664
A_s = 1456 mm². 2T32 (1608).

V = 55.7.5/2 = 206kN

$v = \frac{206 \times 10^3}{215.750} = 1.28$ N/mm²

100As/bd =
⇒ v_c = 0.48
⇒ v − v_c = 0.8 N/mm²

Using 1T10 link S_v = 366 Use 1T10 @ 300 c/c

deflection. basic l/d = 26

mod factor f_m = 0.99

allow l/d = 25.8

actual l/d = 10.0 OK

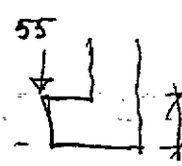
check torsion + rib

BM = 55. 0.15 = 8.3 kNm.

Mu core = 157.8 kNm Z = 162 ⇒ A_s = 121 mm² — use 1T10 @ 200 c/c

V = 55 kN.

v = 0.32 v_c = 0.35 OK



T = 55. 0.2 = 11 kNm.

$V_t = \frac{2 \times 11 \times 10^6}{215^2 (800 - \frac{215}{3})} = 0.65$

$\Rightarrow \frac{A_{sv}}{S_v} = \frac{11 \times 10^6}{0.8.400.700.0.87.460} = 0.49$ use 1T10 @ 300 c/c

A_{sv} = 0.49 (100+700) = 420 mm
use 8T12

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Item	Calculations	Output	Ch.

R.C BEAM SUPPORTING 1ST FLOOR SLAB OVER WINDOWS

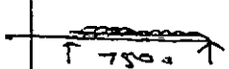
Loading: spandrel blk: 9·8·0·95 = 9 kN/m

slab : 15·6·4·3 = 67

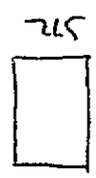
S.W beam : = 5

81 kN/m

$BM = 81 \cdot 7.5^2/8 = 570$ kNm.



$\Rightarrow M_{ult\ one} = 423$ kNm $\quad Z = 466$ $\quad f_{cu} = 35$, $f_y = 460$



$\Rightarrow A_s' = 670\ mm^2$ 2T25 (982)

$\Rightarrow A_s = 2935\ mm^2$ 4T32 (3217).

$V = 81 \cdot 3.75 = 304$ kN.

$v = \frac{304 \cdot 10^3}{215 \cdot 600} = 2.35\ N/mm^2$. $\quad v_c = 0.69$

$\Rightarrow$ link =

using 1PO link $s_v = 175$ c/c.

deflection: basic s/d = 26

mod factor (ten) = 0.77

~ (comp) = 1.2

$\Rightarrow$ allow s/d = 24

actual s/d = 12.5 Ok.

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Item	Calculations	Output	Ch.

FOUNDATION UNDER FRONT WALL

Loading

roof : 7·9. 4·3 = 34 kN/m

floor : 10·5. 4·3 = 45

wall : 7. 6·5 = 46

S.W : 7

132 kN/m. (service)

⇒ width reqd = $\frac{132}{150}$ = 0·88 use 900×300 strip.

use T12@300 EW Bottom.

PAD FOUNDATION UNDER 450×215 COL.

Loading : N = 132. 7·5/2 = 495

⇒ Area reqd = $\frac{495}{150}$ = 3·3 m² use 1800×1800×400 pad

use T16-200 EW Bottom

PAD FOUNDATION UNDER 1275×215 COL (CENTRAL)

Loading : N = 132. 7·5 = 990 kN

⇒ Area reqd = $\frac{990}{150}$ = 6·6 m²

use 2500×2500×400 pad T16-200 EW Bottom.

PAD FOUNDATION UNDER 1275×215 COL. (LHS).

Loading : N = 132. 3·2 = 422 kN

⇒ Area reqd = $\frac{422}{150}$ = 2·8 m²

use. 1800×1800×400 pad use T16-200 EW Bottom.

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Item	Calculations	Output	Ch.

FOUNDATIONS UNDER BOILERHOUSE WALLS

loading. roof : 7.9, 3.6 = 28 kN/m

floor : 10.5. 3.6 = 38

walls : 5. 6 = 30

96 kN/m

WIDTH REQD = $\frac{96}{150} = 0.64$

use 150 × 300 STUP
T12 @ 300 EW BOTTOM

FOUNDATION UNDER 215 S/B WALL BESIDE EX BLDG

from previous page N/m = 132 kN/m.

USE 900 × 400 GROUND BEAM

TRANSVERSE BENDING: M = 1.5.150. 0.45²/2 = 22.8 kNm.

M/bd² = 0.18 use 0.13 %, bd = 455 mm²/m. T12-225 c/c. (502)

LONG. BENDING : M = 1.5.150. 5²/10 = 563 kNm

Min use = 602 kNm.
Z = 279
A = 5047 4T32. (5630).

fcu = 35
fy = 460

V = 1.5.150. 2.5 = 563 kN

v = 1.79 vc = 0.89 ⇒ v − vc = 0.9 N/mm²

using 2 leg links Sv = 155 use 2T10 @ 150 c/c.

deflection : basic s/d = 26

mod factor ten = 0.85

mod factor comp = 1.08
⇒ allow s/d = 23.95

actual s/d = 14.3 ok

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Job Name NATIONAL MEDICARE
Portion OFFICES FOUNDATIONS

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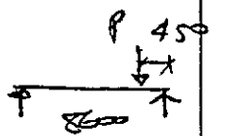
Item	Calculations	Output	Ch.

RESTRAINING GROUND BEAM (750×500).

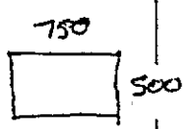
$P = 1.5 \cdot 150 \cdot .5 = 1125\ kN.$

$BM = Pab/L = 1125 \cdot \frac{8 \cdot 15 \cdot 0.45}{8.6} = 480\ kNm$



$M_{uncr} = 829 \quad Z = 399 \quad f_{cu} = 35$

$A_s = 3005 \quad (4732\ 3217). \quad f_y = 460$



$V = 1125\ kN.$

$\Rightarrow v = 3.33\ N/mm^2 \quad v_c = 0.54 \quad \Rightarrow v - v_c = 2.79.$

$A_{sv} = 157.$ use 3T20 @ 90 c/c.

deflection: basic $s/d = 20$

Mod factor (ten) = 0.98

Mod factor (comp) = 1.07

$\Rightarrow$ allow $s/d = 20.99$

actual $s/d = 19.1.$ OK.

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Job Name NATIONAL MEDICARE
Portion DESIGN FRAMES ON NUMBERED GRIDS

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Item	Calculations	Output	Ch.

DL ON ROOF = 0.85 kN/m²
IL = 0.75 kN/m²

UDL ON FRAME

DL = 0.85 × 3 = 2.55
0.75 × 3 = 2.25

W_u = 2.55 × 1.4 + 2.25 × 1.6 = 7.17

MEMBER DESIGN
(SEE COMPUTER PRINTOUT).

TOP CHORD (MEM 4 = 96 x 4)

Max Comp = Mem no 74.3 kN.

l_e = 1.1 m.

TRY 2(60 × 30 × 5)

LOCAL BENDING

M_1 = $7.17 \times 1.1^2 / 10$ = 0.87 kN m

$\lambda = l_e / r_{xx}$ = 1100/19 = 57.9

T6Z5 → 167 C) f_c = 205 N/mm²

M_{cx} = 8100 × 275 × 10^{-6} = 2.23 kN m

LOCAL CAPACITY

$\frac{F}{A_g f_c} + \frac{M_x}{M_{cx}} \leq 1.0$

Item	Calculations	Output	Ch.

$$\frac{71.3 \times 10^3}{858 \times 275} + \frac{0.87}{2.73} = 0.705 < 1.0$$

OVERALL BUCKLING

$$\frac{F}{A_g P_c} + \frac{m M_n}{M_b} \leq 1.0$$

$$\frac{71.3 \times 10^3}{858 \times 205} + \frac{0.87}{2.73} = 0.812 < 1.0 \therefore ok$$

USE 2 No. 75 × 50 × 6 RSA ⊤

$F_T = 307$ kN $\therefore$ ok

BOTTOM CHORD.

$F_{c\,max} = 104.74$ kN Mem #6

LONGITUDINAL BRACING @ NODE 21

$\therefore l_{eq} = 2.7$ m

PROVIDE 75 × 50 × 6 RSA's ⊥

$F_{cn} = 112.6$ kN

INTERNAL MEMBERS (DIAGONAL)

$F_T = -59.17$ kN Mem #7

$F_c = 3.0$ kN.

$l_e = 1653$ mm.

PROVIDE 50 × 50 × 5 RSA

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Job Name NATIONAL MEDICARE

Portion DESIGN FRAMES

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Job No. DS96

Date 6/91

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Item	Calculations	Output	Ch.

INTERNAL MEMBERS (VERTICAL)

F_c = 46.3 kN.

l_e = 1750 kN.

PROVIDE 50 × 50 × 5 RSA

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ATIONAL MEDICARE CLOVERHILL DUBLIN 22
ECONDARY TRUSS

EN102: PLANE FRAME ANALYSIS V2.7 (c) ENCAD SYSTEMS LTD. 1987
nits: S.I. METRIC (Steel) Data File : d5960isb

Basic Case Identifiers

ENTRY	CASE NO.	TITLE
1	B1	DEAD LOAD
2	B2	LIVE LOAD
3	B3	WIND LOAD

asic Load Case B1 : DEAD LOAD
oad Groups

PLANE FRAME LOAD TYPES	VALUE 1	VALUE 2	VALUE 3	VALUE 4
JF=Joint Forces	FX	FZ		
JM=Joint Moments	MY			
P?=Point Load	P?	L		
U?=Uniformly Distributed	U?			
T?=Triangularly Distrib. Load	T?			
V?=Variably Distributed Load	V?1	L1	V?2	L2
t =Temperature Elevation	t			
g =Gravitational Loading	gX	gZ		

N.B. 1. ? is one of X,Z (global directions) or x,z (member directions).
2. VALUES are load intensities except that:-
L,L1,L2 are distances along the member from END1 joint.
t is the temperature elevation of the group of members in degrees.
gX,gZ are 'g' factors; gZ=-1 for normal gravity loading.
3. JOINT/MEMBER LIST '9,26,2-6*2,40-30*5' means '9,26,2,4,6,40,35,30'

TYPE	MEMBER/JOINT LIST	VALUE 1	VALUE 2	VALUE 3	VALUE 4
1	UZ 4-96*4	-2.5500			

asic Load Case B2 : LIVE LOAD
oad Groups

PLANE FRAME LOAD TYPES	VALUE 1	VALUE 2	VALUE 3	VALUE 4
JF=Joint Forces	FX	FZ		
JM=Joint Moments	MY			
P?=Point Load	P?	L		
U?=Uniformly Distributed	U?			
T?=Triangularly Distrib. Load	T?			
V?=Variably Distributed Load	V?1	L1	V?2	L2
t =Temperature Elevation	t			
g =Gravitational Loading	gX	gZ		

N.B. 1. ? is one of X,Z (global directions) or x,z (member directions).
2. VALUES are load intensities except that:-
L,L1,L2 are distances along the member from END1 joint.
t is the temperature elevation of the group of members in degrees.
gX,gZ are 'g' factors; gZ=-1 for normal gravity loading.
3. JOINT/MEMBER LIST '9,26,2-6*2,40-30*5' means '9,26,2,4,6,40,35,30'

TYPE	MEMBER/JOINT LIST	VALUE 1	VALUE 2	VALUE 3	VALUE 4
1	UZ 4-96*4	-2.2500			

ombination Cases

ENTRY	CASE NO.	DETAILS
1	C1	1.4*B1+1.6*B2
2	C2	1.0*B1+1.4*B3
3	C3	1.2*B1+1.2*B2+1.2*B3

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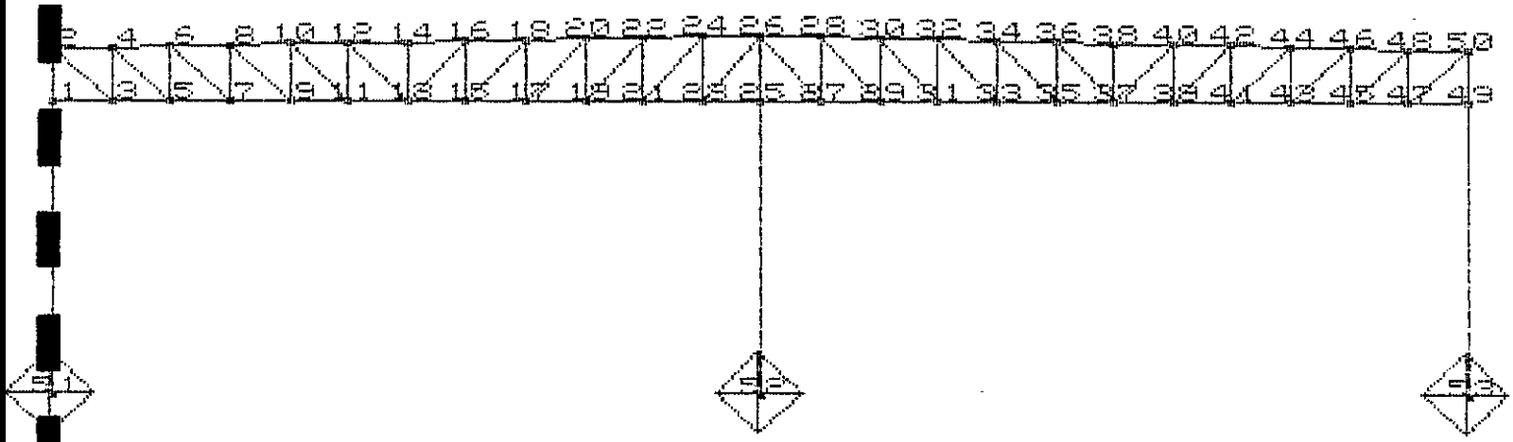
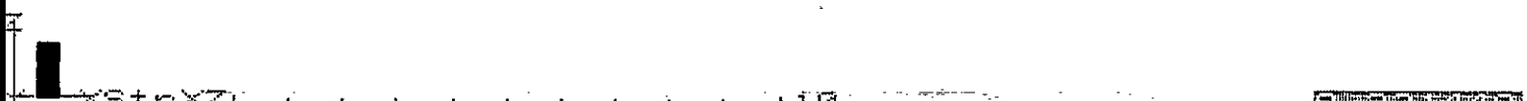
Units: S.I. METRIC (Steel) Data File : d59601sb





NATIONAL MEDICARE CLOVERHILL DUBLIN 22

Joint Co-ordinates

JOINT	X (m)	Z (m)
1	.000	.000
2	.000	1.000
3	1.083	.000
4	1.083	1.021
5	2.167	.000
6	2.167	1.042
7	3.250	.000
8	3.250	1.063
9	4.333	.000
10	4.333	1.083
11	5.417	.000
12	5.417	1.104
13	6.500	.000
14	6.500	1.125
15	7.583	.000
16	7.583	1.146
17	8.667	.000
18	8.667	1.167
19	9.750	.000
20	9.750	1.188
21	10.833	.000
22	10.833	1.208
23	11.917	.000
24	11.917	1.229
25	13.000	.000
26	13.000	1.250

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NATIONAL MEDICARE CLOVERHILL DUBLIN 22
SECONDARY TRUSS

EN102: PLANE FRAME ANALYSIS V2.7
Units: S.I. METRIC (Steel)

(c) ENCAD SYSTEMS LTD. 1987
Data File : d59601sb

Joint Co-ordinates

JOINT	X (m)	Z (m)
27	14.083	.000
28	14.083	1.229
29	15.167	.000
30	15.167	1.208
31	16.250	.000
32	16.250	1.188
33	17.333	.000
34	17.333	1.167
35	18.417	.000
36	18.417	1.146
37	19.500	.000
38	19.500	1.125
39	20.583	.000
40	20.583	1.104
41	21.667	.000
42	21.667	1.083
43	22.750	.000
44	22.750	1.063
45	23.833	.000
46	23.833	1.042
47	24.917	.000
48	24.917	1.021
49	26.000	.000
50	26.000	1.000
51	.000	-5.600
52	13.000	-5.600
53	26.000	-5.600

Member Incidences

MEMBER NO.	START NODE	END NODE	LENGTH (m)
1	1	2	1.000
2	1	27	1.083
3	27	2	1.474
4	2	28	1.083
5	28	4	1.021
6	28	5	1.084
7	4	5	1.489
8	4	6	1.084
9	5	6	1.042
10	5	7	1.083
11	6	7	1.503
12	6	8	1.083
13	7	8	1.063
14	7	9	1.083
15	8	9	1.517
16	8	10	1.083
17	9	10	1.083
18	9	11	1.084
19	10	11	1.533
20	10	12	1.084
21	11	12	1.104
22	11	13	1.083
23	12	13	1.547
24	12	14	1.083
25	13	14	1.125
26	13	15	1.083
27	13	16	1.577
28	14	16	1.083
29	15	16	1.146
30	15	17	1.084
31	15	18	1.593

Member Incidences

MEMBER NO.	START NODE	END NODE	LENGTH (m)
32	16	18	1.084
33	17	18	1.167
34	17	19	1.083
35	17	20	1.608
36	18	20	1.083
37	19	20	1.188
38	19	21	1.083
39	19	22	1.622
40	20	22	1.083
41	21	22	1.208
42	21	23	1.084
43	21	24	1.639
44	22	24	1.084
45	23	24	1.229
46	23	25	1.083
47	23	26	1.654
48	24	26	1.083
49	25	26	1.250
50	25	27	1.083
51	26	27	1.654
52	26	28	1.083
53	27	28	1.229
54	27	29	1.084
55	28	29	1.639
56	28	30	1.084
57	29	30	1.208
58	29	31	1.083
59	30	31	1.622
60	30	32	1.083
61	31	32	1.188
62	31	33	1.083
63	32	33	1.608
64	32	34	1.083
65	33	34	1.167
66	34	35	1.084
67	34	35	1.593
68	34	36	1.084
69	35	36	1.146
70	35	37	1.083
71	36	37	1.577
72	36	38	1.083
73	37	38	1.125
74	37	39	1.083
75	37	40	1.547
76	38	40	1.083
77	39	40	1.104
78	39	41	1.084
79	39	42	1.532
80	40	42	1.084
81	41	42	1.083
82	41	43	1.083
83	41	44	1.518
84	42	44	1.083
85	43	44	1.063
86	43	45	1.083
87	43	46	1.503
88	44	46	1.083
89	45	46	1.042
90	45	47	1.084
91	45	48	1.489
92	46	48	1.084
93	47	48	1.021
94	47	49	1.083
95	47	50	1.474
96	48	50	1.083
97	49	50	1.000
98	51	1	5.600

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Units: S.I. METRIC (Steel) Data File : d59601sb

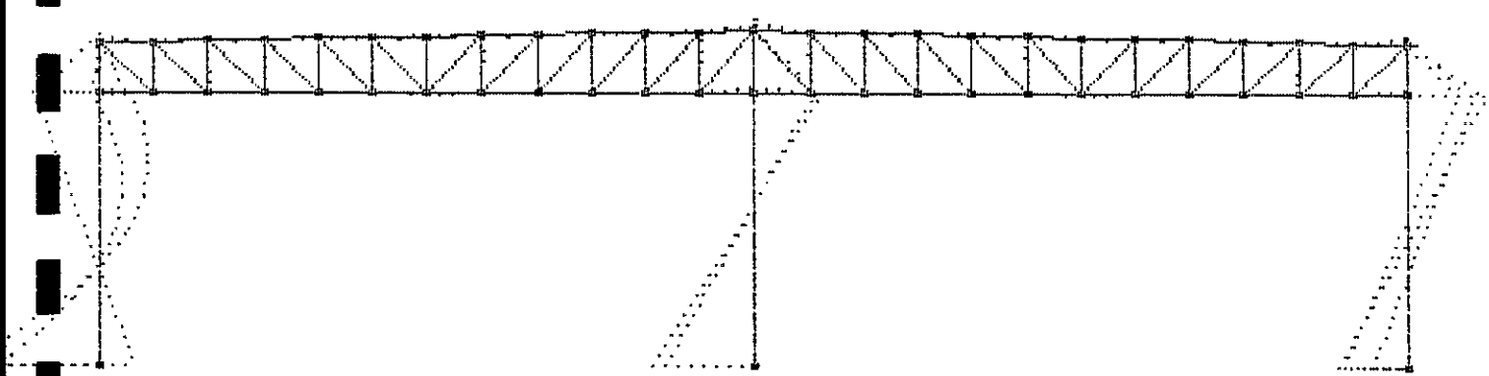
Member Incidences

MEMBER NO.	START NODE	END NODE	LENGTH (m)
99	52	25	5.600
100	53	49	5.600

Support Stiffnesses

N.B. If the specified support settlements and stiffnesses conflict, then the settlements override the stiffnesses.

JOINT	KLX (kN/mm)	KLZ (kN/mm)	KRY (kNm/rad)
51	R	R	R
52	R	R	R
53	R	R	R



E1 : C1,C2,C3

My XZ 50.

XStrXZ 10.

NATIONAL MEDICARE CLOVERHILL DUBLIN 22

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
1	1	-4.3884 C2	-4.1012 C2	-17.6389 C1
1	1	35.9285 C1	15.0717 C1	7.5048 C2
1	2	-4.3884 C2	-10.4012 C2	-2.5672 C1
1	2	35.9285 C1	15.0717 C1	.2536 C2
2	1	4.9267 C2	-.4471 C2	-1.9484 C1
2	1	20.3654 C1	2.1939 C1	.4010 C2
2	3	4.9267 C2	-.4471 C2	-.0831 C2
2	3	20.3654 C1	2.1939 C1	.4276 C1

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
3	2	-43.3512 C1	-.0206 C1	-.0044 C1
3	2	5.8171 C2	.0067 C2	-.0024 C2
3	3	-43.3512 C1	-.0206 C1	-.0347 C1
3	3	5.8171 C2	.0067 C2	.0076 C2
4	2	6.1130 C2	-.5656 C2	-2.5629 C1
4	2	16.9159 C1	6.2077 C1	.2560 C2
4	4	6.0595 C2	-1.5575 C1	-.0443 C1
4	4	16.7653 C1	.0848 C2	-.0044 C2
5	3	-4.4126 C2	-.3484 C1	-.0234 C2
5	3	31.5216 C1	.0450 C2	.1761 C1
5	4	-4.4126 C2	-.3484 C1	-.1796 C1
5	4	31.5216 C1	.0450 C2	.0226 C2
6	3	-11.8471 C1	.0242 C2	-.0522 C2
6	3	9.2501 C2	.0663 C1	.2167 C1
6	5	-11.8471 C1	.0242 C2	-.0259 C2
6	5	9.2501 C2	.0663 C1	.2886 C1
7	4	-37.5424 C1	-.0837 C1	-.0095 C2
7	4	5.7279 C2	.0114 C2	.0721 C1
7	5	-37.5424 C1	-.0837 C1	-.0525 C1
7	5	5.7279 C2	.0114 C2	.0074 C2
8	4	1.8283 C2	-.3268 C2	-.2960 C1
8	4	44.6079 C1	3.7466 C1	.0277 C2
8	6	1.7747 C2	-4.0257 C1	-.4473 C1
8	6	44.4573 C1	.3242 C2	.0263 C2
9	5	-3.8569 C2	-.2042 C1	-.0145 C2
9	5	25.5439 C1	.0277 C2	.1085 C1
9	6	-3.8569 C2	-.2042 C1	-.1043 C1
9	6	25.5439 C1	.0277 C2	.0144 C2

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
10	5	-39.4374 C1	-.0379 C2	-.0040 C2
10	5	13.4553 C2	.2020 C1	.1276 C1
10	7	-39.4374 C1	-.0379 C2	-.0451 C2
10	7	13.4553 C2	.2020 C1	.3463 C1
11	6	-24.7033 C1	-.0478 C1	-.0073 C2
11	6	4.5004 C2	.0087 C2	.0424 C1
11	7	-24.7033 C1	-.0478 C1	-.0294 C1
11	7	4.5004 C2	.0087 C2	.0057 C2
12	6	-1.5157 C2	-.3557 C2	-.5940 C1
12	6	62.6546 C1	4.1018 C1	.0480 C2
12	8	-1.5680 C2	-3.6633 C1	-.3564 C1
12	8	62.5076 C1	.2947 C2	.0150 C2
13	7	-3.1363 C2	-.1341 C1	-.0118 C2
13	7	17.2204 C1	.0219 C2	.0728 C1
13	8	-3.1363 C2	-.1341 C1	-.0697 C1
13	8	17.2204 C1	.0219 C2	.0114 C2
14	7	-57.4062 C1	-.0156 C2	-.0276 C2
14	7	16.7262 C2	.0747 C1	.2442 C1
14	9	-57.4062 C1	-.0156 C2	-.0445 C2
14	9	16.7262 C2	.0747 C1	.3251 C1
15	8	-13.4176 C1	-.0298 C1	-.0063 C2
15	8	3.5062 C2	.0069 C2	.0310 C1
15	9	-13.4176 C1	-.0298 C1	-.0141 C1
15	9	3.5062 C2	.0069 C2	.0042 C2
16	8	-4.1102 C2	-.3419 C2	-.4572 C1
16	8	72.3883 C1	3.9761 C1	.0328 C2
16	10	-4.1632 C2	-3.7890 C1	-.3558 C1
16	10	72.2392 C1	.3085 C2	.0147 C2

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Units: S.I. METRIC (Steel) Data File : d5960isb

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
17	9	-2.4507 C2	-.0560 C1	-.0082 C2
17	9	9.4438 C1	.0149 C2	.0323 C1
17	10	-2.4507 C2	-.0560 C1	-.0283 C1
17	10	9.4438 C1	.0149 C2	.0080 C2
18	9	-67.0609 C1	-.0155 C2	-.0321 C2
18	9	19.2489 C2	.0063 C1	.2787 C1
18	11	-67.0609 C1	-.0155 C2	-.0489 C2
18	11	19.2489 C2	.0063 C1	.2855 C1
19	10	-2.6079 C1	-.0085 C1	-.0051 C2
19	10	2.4974 C2	.0051 C2	.0145 C1
19	11	-2.6079 C1	-.0085 C1	.0014 C1
19	11	2.4974 C2	.0051 C2	.0030 C3
20	10	-5.9611 C2	-.3467 C2	-.3986 C1
20	10	74.2911 C1	3.7875 C1	.0278 C2
20	12	-6.0139 C2	-3.9848 C1	-.5055 C1
20	12	74.1427 C1	.3044 C2	.0048 C2
21	11	-1.7864 C2	-.0017 C1	-.0046 C2
21	11	1.7636 C1	.0079 C2	.0014 C1
21	12	-1.7864 C2	-.0017 C1	-.0005 C1
21	12	1.7636 C1	.0079 C2	.0042 C2
22	11	-68.9133 C1	.0092 C2	-.0417 C2
22	11	21.0269 C2	.0801 C1	.2856 C1
22	13	-68.9133 C1	.0092 C2	-.0318 C2
22	13	21.0269 C2	.0801 C1	.3724 C1
23	12	1.6149 C2	.0036 C2	-.0039 C2
23	12	8.6270 C1	.0113 C1	.0017 C1
23	13	1.6149 C2	.0036 C2	.0018 C2
23	13	8.6270 C1	.0113 C1	.0192 C1

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
24	12	-7.1673 C2	-.3077 C2	-.5077 C1
24	12	68.2483 C1	4.0234 C1	.0129 C2
24	14	-7.2209 C2	-3.7417 C1	-.3552 C1
24	14	68.0977 C1	.3427 C2	.0318 C2
25	13	-.6843 C2	.0053 C2	-.0402 C1
25	13	7.4871 C1	.0675 C1	-.0032 C2
25	14	-.6843 C2	.0053 C2	.0028 C2
25	14	7.4871 C1	.0675 C1	.0357 C1
26	13	-50.1811 C1	-.2570 C1	-.0256 C2
26	13	22.5761 C2	-.0225 C2	.4497 C1
26	15	-50.1811 C1	-.2570 C1	-.0500 C2
26	15	22.5761 C2	-.0225 C2	.1714 C1
27	13	-18.3316 C1	.0000 C2	-.0179 C1
27	13	-.5976 C2	.0332 C1	-.0012 C2
27	16	-18.3316 C1	.0000 C2	-.0012 C2
27	16	-.5976 C2	.0332 C1	.0345 C1
28	14	-7.2394 C2	-.3414 C2	-.3195 C1
28	14	68.1754 C1	3.7453 C1	.0346 C2
28	16	-7.2929 C2	-4.0198 C1	-.4681 C1
28	16	68.0248 C1	.3090 C2	.0170 C2
29	15	-.2108 C2	.0039 C2	-.0858 C1
29	15	20.7489 C1	.1456 C1	-.0022 C2
29	16	-.2108 C2	.0039 C2	.0023 C2
29	16	20.7489 C1	.1456 C1	.0811 C1
30	15	-30.5846 C1	-.1520 C1	-.0470 C2
30	15	22.4071 C2	.0033 C2	.2981 C1
30	17	-30.5846 C1	-.1520 C1	-.0435 C2
30	17	22.4071 C2	.0033 C2	.1334 C1

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
31	15	-28.5170 C1	-.0007 C2	-.0410 C1
31	15	.2533 C2	.0588 C1	-.0007 C2
31	18	-28.5170 C1	-.0007 C2	-.0019 C2
31	18	.2533 C2	.0588 C1	.0526 C1
32	16	-7.7197 C2	-.3281 C2	-.3525 C1
32	16	55.4108 C1	3.6754 C1	.0181 C2
32	18	-7.7733 C2	-4.0969 C1	-.5810 C1
32	18	55.2602 C1	.3230 C2	.0153 C2
33	17	-.8259 C2	-.0011 C2	-.1161 C1
33	17	28.2600 C1	.1965 C1	.0008 C2
33	18	-.8259 C2	-.0011 C2	-.0005 C2
33	18	28.2600 C1	.1965 C1	.1132 C1
34	17	-4.5975 C1	-.2347 C1	-.0452 C2
34	17	21.6538 C2	.0081 C2	.3064 C1
34	19	-4.5975 C1	-.2347 C1	-.0364 C2
34	19	21.6538 C2	.0081 C2	.0523 C1
35	17	-38.1982 C1	-.0026 C2	-.0570 C1
35	17	1.1135 C2	.0766 C1	.0009 C2
35	20	-38.1982 C1	-.0026 C2	-.0034 C2
35	20	1.1135 C2	.0766 C1	.0663 C1
36	18	-7.6117 C2	-.3210 C2	-.4151 C1
36	18	35.7599 C1	3.6878 C1	.0129 C2
36	20	-7.6652 C2	-4.0773 C1	-.6261 C1
36	20	35.6093 C1	.3295 C2	.0175 C2
37	19	-1.4322 C2	-.0057 C2	-.1467 C1
37	19	35.2303 C1	.2447 C1	.0035 C2
37	20	-1.4322 C2	-.0057 C2	-.0034 C2
37	20	35.2303 C1	.2447 C1	.1440 C1

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
38	19	20.3446 C2	-.2970 C1	-.0417 C2
38	19	31.0463 C3	-.0084 C2	.2711 C1
38	21	20.3446 C2	-.2970 C1	-.0687 C3
38	21	31.0463 C3	-.0084 C2	-.0505 C1
39	19	-47.3131 C1	-.0036 C2	-.0721 C1
39	19	1.9488 C2	.0905 C1	.0018 C2
39	22	-47.3131 C1	-.0036 C2	-.0040 C2
39	22	1.9488 C2	.0905 C1	.0746 C1
40	20	-6.9191 C2	-.3026 C2	-.4158 C1
40	20	9.7125 C1	3.4881 C1	.0108 C2
40	22	-6.9701 C2	-4.2770 C1	-.8431 C1
40	22	9.5691 C1	.3478 C2	.0353 C2
41	21	-2.1362 C2	-.0106 C2	-.1708 C1
41	21	42.9954 C1	.2779 C1	.0069 C2
41	22	-2.1362 C2	-.0106 C2	-.0059 C2
41	22	42.9954 C1	.2779 C1	.1649 C1
42	21	18.5443 C2	-.3608 C1	-.0627 C2
42	21	65.6147 C1	.1103 C2	.2210 C1
42	23	18.5443 C2	-.3608 C1	-.1702 C1
42	23	65.6147 C1	.1103 C2	.0569 C2
43	21	-57.3592 C1	-.0077 C2	-.1007 C1
43	21	2.6970 C2	.1295 C1	.0050 C2
43	24	-57.3592 C1	-.0077 C2	-.0075 C2
43	24	2.6970 C2	.1295 C1	.1116 C1
44	22	-22.2056 C1	-.3588 C2	-.6035 C1
44	22	-5.6692 C2	4.1587 C1	.0254 C2
44	24	-22.3561 C1	-3.6135 C1	-.3080 C1
44	24	-5.7228 C2	.2922 C2	-.0107 C2

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
45	23	-2.3900 C2	-.0109 C2	-.2117 C1
45	23	46.2897 C1	.3545 C1	.0052 C2
45	24	-2.3900 C2	-.0109 C2	-.0082 C2
45	24	46.2897 C1	.3545 C1	.2241 C1
46	23	16.0850 C2	-1.9505 C1	.0532 C2
46	23	104.7393 C1	-.3279 C2	.0971 C1
46	25	16.0850 C2	-1.9505 C1	-2.0154 C1
46	25	104.7393 C1	-.3279 C2	-.3019 C2
47	23	-59.1710 C1	.0015 C2	-.0556 C1
47	23	3.7407 C2	.0317 C1	-.0015 C2
47	26	-59.1710 C1	.0015 C2	-.0032 C1
47	26	3.7407 C2	.0317 C1	.0010 C2
48	24	-60.6775 C1	-.1150 C2	-.0264 C2
48	24	-3.9297 C2	.4886 C1	-.0276 C1
48	26	-60.8281 C1	-7.2765 C1	-3.6486 C1
48	26	-3.9833 C2	.5355 C2	.2013 C2
49	25	-1.2543 C2	-15.8386 C2	.0004 C1
49	25	106.3088 C1	-.0003 C1	19.4173 C2
49	26	-1.2543 C2	-15.8386 C2	-.3809 C2
49	26	106.3088 C1	-.0003 C1	.0000 C1
50	25	-8.7884 C2	-.3301 C2	-2.0153 C1
50	25	104.7388 C1	1.9505 C1	.3139 C2
50	27	-8.7884 C2	-.3301 C2	-.0436 C2
50	27	104.7388 C1	1.9505 C1	.0971 C1
51	26	-59.1711 C1	-.0317 C1	-.0033 C3
51	26	-2.3817 C2	.0032 C2	-.0020 C2
51	27	-59.1711 C1	-.0317 C1	-.0556 C1
51	27	-2.3817 C2	.0032 C2	.0032 C2

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
52	26	-60.8278 C1	.5372 C2	-3.6486 C1
52	26	15.8437 C2	7.2765 C1	-.1765 C2
52	28	-60.6772 C1	-.4886 C1	.0185 C2
52	28	15.8973 C2	-.1772 C2	.0296 C3
53	27	1.3741 C2	-.3545 C1	.0034 C2
53	27	46.2898 C1	-.0077 C2	.2117 C1
53	28	1.3741 C2	-.3545 C1	-.2241 C1
53	28	46.2898 C1	-.0077 C2	-.0061 C2
54	27	-10.3533 C2	.0979 C2	-.1702 C1
54	27	65.6142 C1	.3608 C1	-.0438 C2
54	29	-10.3533 C2	.0979 C2	.0623 C2
54	29	65.6142 C1	.3608 C1	.2210 C1
55	28	-57.3593 C1	-.1295 C1	.0051 C2
55	28	-1.1878 C2	-.0046 C2	.1116 C1
55	29	-57.3593 C1	-.1295 C1	-.1007 C1
55	29	-1.1878 C2	-.0046 C2	-.0025 C2
56	28	-22.3557 C1	.3242 C2	-.3080 C1
56	28	16.6846 C2	3.6135 C1	.0073 C2
56	30	-22.2052 C1	-4.1587 C1	-.6035 C1
56	30	16.7382 C2	-.3908 C2	-.0288 C2
57	29	.9998 C2	-.2779 C1	.0045 C2
57	29	42.9955 C1	-.0066 C2	.1708 C1
57	30	.9998 C2	-.2779 C1	-.1649 C1
57	30	42.9955 C1	-.0066 C2	-.0035 C2
58	29	-11.1491 C2	-.0142 C2	-.0505 C1
58	29	27.2971 C1	.2970 C1	.0554 C2
58	31	-11.1491 C2	-.0142 C2	.0401 C2
58	31	27.2971 C1	.2970 C1	.2711 C1

Data File : d5960isb

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
59	30	-47.3132 C1	-.0905 C1	.0016 C2
59	30	-.3057 C2	-.0005 C2	.0746 C1
59	31	-47.3132 C1	-.0905 C1	-.0721 C1
59	31	-.3057 C2	-.0005 C2	.0007 C2
60	30	9.5695 C1	.3703 C2	-.8431 C1
60	30	19.2858 C3	4.2770 C1	-.0339 C2
60	32	9.7129 C1	-3.4881 C1	-.4158 C1
60	32	19.4010 C3	-.3441 C2	-.0197 C2
61	31	.2120 C2	-.2447 C1	.0007 C2
61	31	35.2304 C1	-.0012 C2	.1467 C1
61	32	.2120 C2	-.2447 C1	-.1440 C1
61	32	35.2304 C1	-.0012 C2	-.0006 C2
62	31	-12.0248 C3	.0011 C2	.0401 C2
62	31	-4.5981 C1	.2347 C1	.0604 C3
62	33	-12.0248 C3	.0011 C2	.0413 C2
62	33	-4.5981 C1	.2347 C1	.3064 C1
63	32	-38.1983 C1	-.0766 C1	.0007 C2
63	32	.6551 C2	.0007 C2	.0663 C1
63	33	-38.1983 C1	-.0766 C1	-.0570 C1
63	33	.6551 C2	.0007 C2	.0018 C2
64	32	16.5318 C2	.3586 C2	-.6261 C1
64	32	35.6098 C1	4.0773 C1	-.0210 C2
64	34	16.5853 C2	-3.6878 C1	-.4151 C1
64	34	35.7604 C1	-.3558 C2	-.0195 C2
65	33	-.4724 C2	-.1965 C1	-.0024 C2
65	33	28.2600 C1	.0045 C2	.1161 C1
65	34	-.4724 C2	-.1965 C1	-.1132 C1
65	34	28.2600 C1	.0045 C2	.0028 C2

Data File : d59601sb

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
66	33	-30.5852 C1	-.0101 C2	.0455 C2
66	33	-10.9084 C2	.1520 C1	.1334 C1
66	35	-30.5852 C1	-.0101 C2	.0345 C2
66	35	-10.9084 C2	.1520 C1	.2982 C1
67	34	-28.5171 C1	-.0588 C1	-.0011 C2
67	34	1.6097 C2	.0028 C2	.0526 C1
67	35	-28.5171 C1	-.0588 C1	-.0410 C1
67	35	1.6097 C2	.0028 C2	.0033 C2
68	34	15.4699 C2	.3275 C2	-.5810 C1
68	34	55.2607 C1	4.0968 C1	-.0156 C2
68	36	15.5234 C2	-3.6755 C1	-.3526 C1
68	36	55.4113 C1	-.3875 C2	-.0482 C2
69	35	-1.1916 C2	-.1456 C1	-.0049 C2
69	35	20.7491 C1	.0084 C2	.0858 C1
69	36	-1.1916 C2	-.1456 C1	-.0811 C1
69	36	20.7491 C1	.0084 C2	.0047 C2
70	35	-50.1819 C1	-.0039 C2	.0427 C2
70	35	-9.8025 C2	.2569 C1	.1714 C1
70	37	-50.1819 C1	-.0039 C2	.0470 C2
70	37	-9.8025 C2	.2569 C1	.4496 C1
71	36	-18.3316 C1	-.0332 C1	-.0019 C2
71	36	2.7500 C2	.0044 C2	.0345 C1
71	37	-18.3316 C1	-.0332 C1	-.0179 C1
71	37	2.7500 C2	.0044 C2	.0050 C2
72	36	13.6078 C2	.3798 C2	-.4682 C1
72	36	68.0253 C1	4.0200 C1	-.0415 C2
72	38	13.6614 C2	-3.7451 C1	-.3192 C1
72	38	68.1759 C1	-.3346 C2	-.0170 C2

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
73	37	.6718 C2	-.0675 C1	-.0093 C2
73	37	7.4857 C1	.0156 C2	.0402 C1
73	38	.6718 C2	-.0675 C1	-.0357 C1
73	38	7.4857 C1	.0156 C2	.0082 C2
74	37	-68.9152 C1	-.0801 C1	.0650 C2
74	37	-5.3172 C2	-.0445 C2	.3722 C1
74	39	-68.9152 C1	-.0801 C1	.0167 C2
74	39	-5.3172 C2	-.0445 C2	.2855 C1
75	37	-3.6746 C2	-.0113 C1	-.0036 C2
75	37	8.6288 C1	.0061 C2	.0192 C1
75	40	-3.6746 C2	-.0113 C1	.0017 C1
75	40	8.6288 C1	.0061 C2	.0058 C3
76	38	13.6327 C2	.3367 C2	-.3550 C1
76	38	68.0983 C1	3.7405 C1	-.0088 C2
76	40	13.6863 C2	-4.0246 C1	-.5088 C1
76	40	68.2488 C1	-.3776 C2	-.0310 C2
77	39	1.7468 C1	.0016 C1	-.0154 C2
77	39	3.7535 C3	.0272 C2	-.0013 C1
77	40	1.7468 C1	.0016 C1	.0004 C1
77	40	3.7535 C3	.0272 C2	.0147 C2
78	39	-67.0779 C1	-.0255 C2	.0388 C2
78	39	-1.8911 C2	-.0049 C1	.2854 C1
78	41	-67.0779 C1	-.0255 C2	.0111 C2
78	41	-1.8911 C2	-.0049 C1	.2801 C1
79	39	-5.3993 C3	.0086 C1	-.0066 C2
79	39	-2.5865 C1	.0125 C3	.0014 C1
79	42	-5.3993 C3	.0086 C1	.0081 C2
79	42	-2.5865 C1	.0125 C3	.0145 C1

EN102: PLANE FRAME ANALYSIS V2.7 (c) ENCAD SYSTEMS LTD. 1987
Units: S.I. METRIC (Steel) Data File : d5960isb

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
80	40	11.0675 C2	.3158 C2	-.5067 C1
80	40	74.1438 C1	3.9885 C1	-.0105 C2
80	42	11.1210 C2	-3.7838 C1	-.3957 C1
80	42	74.2944 C1	-.3993 C2	-.0558 C2
81	41	4.1787 C2	.0358 C2	-.0329 C3
81	41	9.4924 C1	.0587 C3	-.0195 C2
81	42	4.1787 C2	.0358 C2	.0193 C2
81	42	9.4924 C1	.0587 C3	.0307 C3
82	41	-57.3826 C1	-.0780 C1	.0386 C2
82	41	2.4098 C2	-.0338 C2	.3266 C1
82	43	-57.3826 C1	-.0780 C1	.0021 C2
82	43	2.4098 C2	-.0338 C2	.2421 C1
83	41	-13.4771 C1	.0113 C2	-.0141 C1
83	41	-5.9652 C2	-.0297 C1	-.0081 C2
83	44	-13.4771 C1	.0113 C2	.0091 C2
83	44	-5.9652 C2	.0297 C1	.0310 C1
84	42	7.6718 C2	.3236 C2	-.3527 C1
84	42	72.2576 C1	3.7832 C1	-.0284 C2
84	44	7.7228 C2	-3.9819 C1	-.4604 C1
84	44	72.4010 C1	-.3909 C2	-.0649 C2
85	43	4.9433 C2	.0449 C2	-.0728 C1
85	43	17.1930 C1	.1341 C1	-.0241 C2
85	44	4.9433 C2	.0449 C2	.0237 C2
85	44	17.1930 C1	.1341 C1	.0697 C1
86	43	-39.4362 C1	-.1992 C1	.0363 C2
86	43	7.5746 C2	-.0697 C2	.3443 C1
86	45	-39.4362 C1	-.1992 C1	-.0392 C2
86	45	7.5746 C2	-.0697 C2	.1285 C1

EN102: PLANE FRAME ANALYSIS V2.7 (c) ENCAD SYSTEMS LTD. 1987
Units: S.I. METRIC (Steel) Data File : d59601sb

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
87	43	-24.6723 C1	.0134 C2	-.0294 C1
87	43	-7.0919 C2	.0478 C1	-.0101 C2
87	46	-24.6723 C1	.0134 C2	.0101 C2
87	46	-7.0919 C2	.0478 C1	.0424 C1
88	44	3.3990 C2	.3054 C2	-.3597 C1
88	44	62.4827 C1	3.6676 C1	-.0321 C2
88	46	3.4526 C2	-4.0975 C1	-.5925 C1
88	46	62.6333 C1	-.4090 C2	-.0882 C2
89	45	5.7749 C2	.0514 C2	-.1084 C1
89	45	25.5451 C1	.2040 C1	-.0267 C2
89	46	5.7749 C2	.0514 C2	.0268 C2
89	46	25.5451 C1	.2040 C1	.1041 C1
90	45	-11.8487 C1	-.0672 C1	-.0005 C2
90	45	13.9176 C2	.0583 C2	.2894 C1
90	47	-11.8487 C1	-.0672 C1	.0627 C2
90	47	13.9176 C2	.0583 C2	.2166 C1
91	45	-37.5389 C1	.0168 C2	-.0525 C1
91	45	-8.6272 C2	.0837 C1	-.0120 C2
91	48	-37.5389 C1	.0168 C2	.0130 C2
91	48	-8.6272 C2	.0837 C1	.0721 C1
92	46	-1.7345 C2	.3582 C2	-.4460 C1
92	46	44.4561 C1	4.0242 C1	-.0513 C2
92	48	-1.6809 C2	-3.7481 C1	-.2963 C1
92	48	44.6067 C1	-.3569 C2	-.0506 C2
93	47	6.3273 C2	.0790 C2	-.1762 C1
93	47	31.5210 C1	.3485 C1	-.0411 C2
93	48	6.3273 C2	.0790 C2	.0395 C2
93	48	31.5210 C1	.3485 C1	.1796 C1

Envelope Case E1 : C1,C2,C3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
94	47	19.9366 C2	-2.1937 C1	.1158 C2
94	47	27.2402 C3	-.7953 C2	.4275 C1
94	49	19.9366 C2	-2.1937 C1	-1.9483 C1
94	49	27.2402 C3	-.7953 C2	-.7455 C2
95	47	-43.3519 C1	.0081 C2	-.0347 C1
95	47	-8.0774 C2	.0206 C1	-.0120 C2
95	50	-43.3519 C1	.0081 C2	-.0044 C1
95	50	-8.0774 C2	.0206 C1	.0000 C2
96	48	-8.0586 C2	-.0561 C2	-.0446 C1
96	48	16.7667 C1	1.5578 C1	.0020 C2
96	50	-8.0051 C2	-6.2073 C1	-2.5627 C1
96	50	16.9173 C1	-.7705 C2	-.4457 C2
97	49	6.0888 C2	-19.4773 C3	14.4041 C2
97	49	35.9286 C1	-13.9585 C2	-21.1390 C3
97	50	6.0888 C2	-19.4773 C3	.4457 C2
97	50	35.9286 C1	-13.9585 C2	2.5671 C1
98	51	-4.8354 C2	-5.2937 C1	-40.3215 C2
98	51	38.1223 C1	26.2520 C2	10.0572 C1
98	1	-4.8354 C2	-10.3772 C3	-19.5873 C1
98	1	38.1223 C1	-5.2937 C1	7.9059 C2
99	52	-1.2565 C2	.0002 C1	-30.5621 C2
99	52	110.2099 C1	9.0349 C2	-.0006 C1
99	25	-1.2565 C2	.0002 C1	.0004 C1
99	25	110.2099 C1	9.0349 C2	20.0331 C2
100	53	6.8841 C2	5.2935 C1	-20.7231 C3
100	53	38.1223 C1	7.7629 C3	-10.0572 C1
100	49	6.8841 C2	5.2935 C1	15.1496 C2
100	49	38.1223 C1	7.7629 C3	22.7493 C3

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AUTHOR SB
DATE 21/5/91

NATIONAL MEDICARE CLOVERHILL DUBLIN 22
SECONDARY TRUSS

EN102: PLANE FRAME ANALYSIS V2.7
Units: S.I. METRIC (Steel)

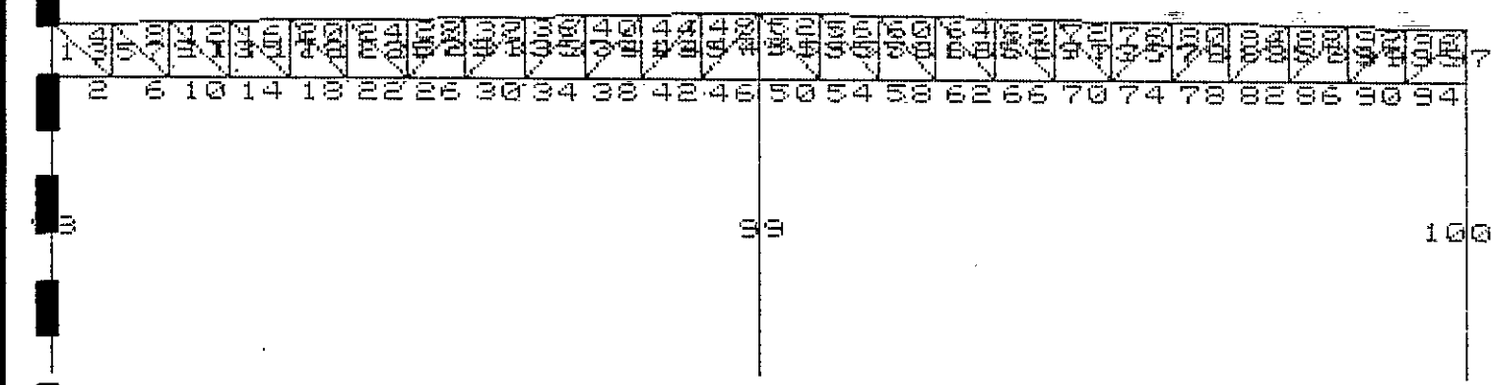
Data File : d59601sb

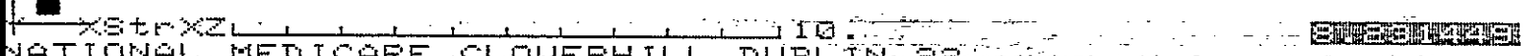
Envelope Case E1 : C1,C2,C3
Support Reactions

JOINT	X FORCE (kN)	Z FORCE (kN)	Y MOMENT (kNm)
51	-26.2520 C2	-4.8354 C2	-40.3215 C2
51	5.2937 C1	38.1223 C1	10.0572 C1
52	-9.0349 C2	-1.2565 C2	-30.5621 C2
52	-.0002 C1	110.2099 C1	-.0006 C1
53	-7.7629 C3	6.8841 C2	-20.7231 C3
53	-5.2935 C1	38.1223 C1	-10.0572 C1

EN102: PLANE FRAME ANALYSIS V2.7
Units: S.I. METRIC (Steel)

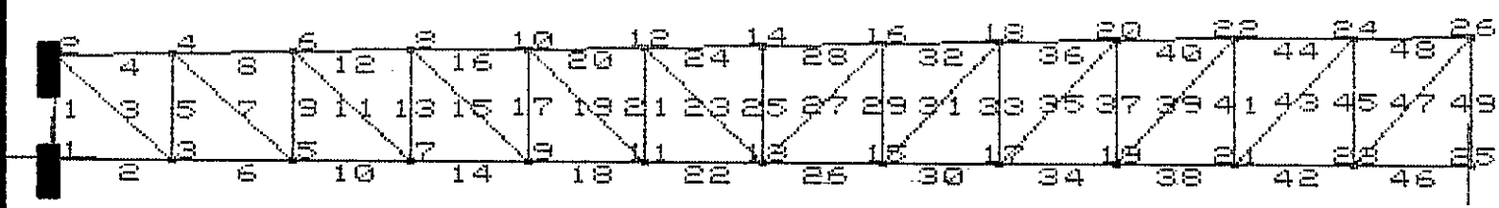
Data File : d59601sb





N102: PLANE FRAME ANALYSIS V2.7
Units: S.I. METRIC (Steel)

Data File : d59603sb



Joint Co-ordinates

JOINT	X (m)	Z (m)
1	.000	.000
2	.000	1.000
3	1.083	.000
4	1.083	1.021
5	2.167	.000
6	2.167	1.042
7	3.250	.000
8	3.250	1.063
9	4.333	.000
10	4.333	1.083
11	5.417	.000
12	5.417	1.104
13	6.500	.000
14	6.500	1.125
15	7.583	.000
16	7.583	1.146
17	8.667	.000
18	8.667	1.167
19	9.750	.000
20	9.750	1.188
21	10.833	.000
22	10.833	1.208
23	11.917	.000
24	11.917	1.229
25	13.000	.000

26 13.000 1.250

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NATIONAL MEDICARE CLOVERHILL DUBLIN 22
SECONDARY TRUSS

EN102: PLANE FRAME ANALYSIS V2.7
Units: S.I. METRIC (Steel)

(c) ENCAD SYSTEMS LTD. 1987
Data File : d59603sb

Member Incidences

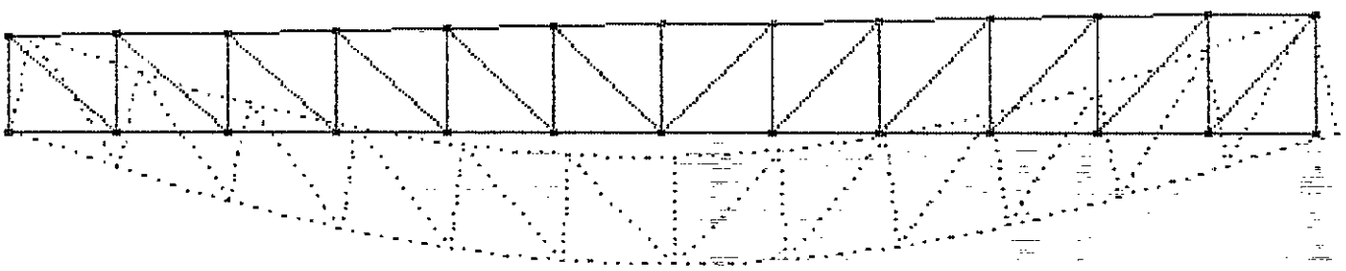
MEMBER NO.	START NODE	END NODE	LENGTH (m)
1	1	2	1.000
2	1	3	1.083
3	2	3	1.474
4	2	4	1.083
5	3	4	1.021
6	3	5	1.084
7	4	5	1.489
8	4	6	1.084
9	5	6	1.042
10	5	7	1.083
11	6	7	1.503
12	6	8	1.083
13	7	8	1.063
14	7	9	1.083
15	8	9	1.517
16	8	10	1.083
17	9	10	1.083
18	9	11	1.084
19	10	11	1.533
20	10	12	1.084
21	11	12	1.104
22	11	13	1.083
23	12	13	1.547
24	12	14	1.083
25	13	14	1.125
26	13	15	1.083
27	13	16	1.577
28	14	16	1.083
29	15	16	1.146
30	15	17	1.084
31	15	18	1.593
32	16	18	1.084
33	17	18	1.167
34	17	19	1.083
35	17	20	1.608
36	18	20	1.083
37	19	20	1.188
38	19	21	1.083
39	19	22	1.622
40	20	22	1.083
41	21	22	1.208
42	21	23	1.084
43	21	24	1.639
44	22	24	1.084
45	23	24	1.229
46	23	25	1.083
47	23	26	1.654
48	24	26	1.083
49	25	26	1.250

Support Stiffnesses

N.B. If the specified support settlements and stiffnesses conflict, then the settlements override the stiffnesses.

JOINT	KLX (kN/mm)	KLZ (kN/mm)	KRY (kNm/rad)
1	R	R	0.
25	0.	R	0.

Data File : d59603sb



C1 : 1.4*B1+1.6*B2

DefXZ 20.

StrXZ 8.

NATIONAL MEDICARE CLOVERHILL DUBLIN 22

Combination Case C1 : 1.4*B1+1.6*B2

Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
1	1	44.7450	-4.5927	1.6231
1	2	44.7450	-4.5927	-2.9696
2	1	-4.5927	1.8687	-1.6231
2	3	-4.5927	1.8687	.4007
3	2	-54.7156	-.0180	-.0073
3	3	-54.7156	-.0180	-.0339
4	2	44.9442	6.7695	-2.9623
4	4	44.7936	-.9956	.1648
5	3	38.7194	-.4219	.2104
5	4	38.7194	-.4219	-.2203
6	3	-45.2264	.2547	.1564
6	5	-45.2264	.2547	.4324
7	4	-48.7208	-.1091	.0946
7	5	-48.7208	-.1091	-.0678
8	4	80.8540	3.7017	-.1501
8	6	80.7034	-4.0706	-.3501
9	5	33.3418	-.2750	.1461
9	6	33.3418	-.2750	-.1404
10	5	-81.0421	.2383	.2185
10	7	-81.0421	.2383	.4766
11	6	-35.5743	-.0667	.0599
11	7	-35.5743	-.0667	-.0404
12	6	106.8223	4.1973	-.5504
12	8	106.6753	-3.5678	-.2095

Combination Case C1 : 1.4*B1+1.6*B2
Member End Forces

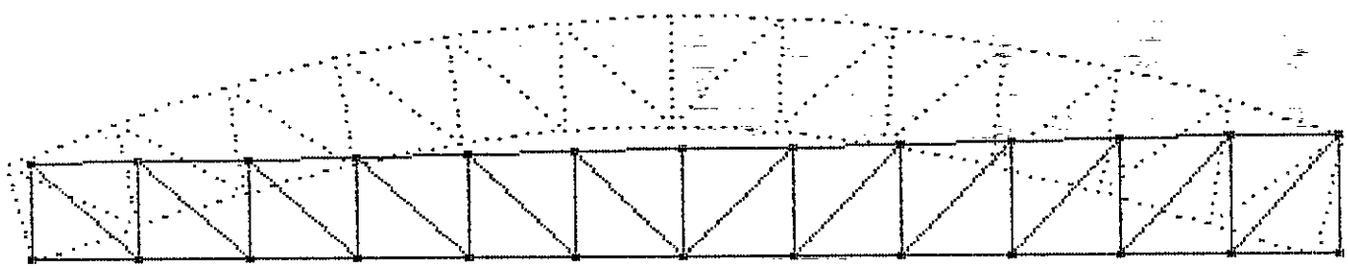
MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
13	7	24.7176	-.2006	.1081
13	8	24.7176	-.2006	-.1050
14	7	-106.9243	.1375	.3281
14	9	-106.9243	.1375	.4771
15	8	-23.9889	-.0494	.0498
15	9	-23.9889	-.0494	-.0251
16	8	124.1830	4.0208	-.3644
16	10	124.0338	-3.7443	-.2146
17	9	16.8457	-.1192	.0665
17	10	16.8457	-.1192	-.0627
18	9	-124.2021	.0564	.3855
18	11	-124.2021	.0564	.4466
19	10	-12.8005	-.0280	.0339
19	11	-12.8005	-.0280	-.0090
20	10	133.3751	3.9096	-.3112
20	12	133.2267	-3.8627	-.2857
21	11	8.9587	-.0564	.0324
21	12	8.9587	-.0564	-.0298
22	11	-133.3325	.1263	.4051
22	13	-133.3325	.1263	.5419
23	12	-1.4440	-.0055	.0188
23	13	-1.4440	-.0055	.0104
24	12	134.4505	4.0075	-.3344
24	14	134.3000	-3.7576	-.1990
25	13	7.5081	.0192	-.0113
25	14	7.5081	.0192	.0103
26	13	-128.4696	-.1808	.5635
26	15	-128.4696	-.1808	.3678
27	13	-8.5114	.0175	.0000
27	16	-8.5114	.0175	.0276
28	14	134.4263	3.7495	-.1887
28	16	134.2758	-4.0157	-.3329
29	15	13.8506	.0926	-.0546
29	16	13.8506	.0926	.0514
30	15	-115.3820	-.1009	.4435
30	17	-115.3820	-.1009	.3341
31	15	-19.0506	.0406	-.0211
31	18	-19.0506	.0406	.0436
32	16	128.4743	3.7771	-.2538
32	18	128.3237	-3.9952	-.3721
33	17	21.3911	.1427	-.0848
33	18	21.3911	.1427	.0817
34	17	-95.7295	-.1788	.4562
34	19	-95.7295	-.1788	.2626
35	17	-28.8944	.0593	-.0373
35	20	-28.8944	.0593	.0580
36	18	115.3330	3.7165	-.2468
36	20	115.1824	-4.0486	-.4266
37	19	28.4475	.1937	-.1163
37	20	28.4475	.1937	.1137
38	19	-69.9805	-.2319	.4314
38	21	-69.9805	-.2319	.1802
39	19	-38.2009	.0738	-.0525
39	22	-38.2009	.0738	.0673
40	20	95.6178	3.5545	-.2548
40	22	95.4744	-4.2106	-.6102
41	21	36.3094	.2311	-.1424
41	22	36.3094	.2311	.1367
42	21	-37.6717	-.3400	.4024
42	23	-37.6717	-.3400	.0338
43	21	-48.3684	.1107	-.0797
43	24	-48.3684	.1107	.1016
44	22	69.8422	4.1160	-.4062
44	24	69.6917	-3.6563	-.1569
45	23	40.1856	.3029	-.1805

45	24	40.1856	.3029	.1917

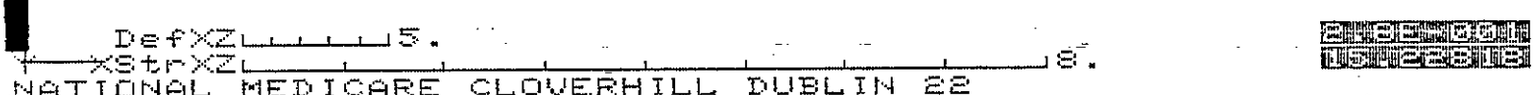
Combination Case C1 : 1.4*B1+1.6*B2

Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
46	23	-3.6280	-1.6247	.2563
46	25	-3.6280	-1.6247	-1.5032
47	23	-51.4949	.0280	-.0420
47	26	-51.4949	.0280	.0044
48	24	37.3943	.9538	.1363
48	26	37.2438	-6.8113	-3.0360
49	25	44.9889	3.6280	-1.5032
49	26	44.9889	3.6280	3.0317



C2 : 1.0*B1+1.4*B3



NATIONAL MEDICARE CLOVERHILL DUBLIN 22

Combination Case C2 : 1.0*B1+1.4*B3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
1	1	-12.3838	1.2649	-.4454
1	2	-12.3838	1.2649	.8194
2	1	2.4024	-.5147	.4454
2	3	2.4024	-.5147	-.1120
3	3	15.1343	.0051	.0019
3	2	15.1343	.0051	.0093
4	2	-12.4262	-1.8799	.8176
4	4	-12.4798	.2870	-.0452
5	3	-10.7074	.1161	-.0579
5	4	-10.7074	.1161	.0607
6	3	13.6411	-.0706	-.0448
6	5	13.6411	-.0706	-.1213
7	4	13.4423	.0301	-.0262
7	5	13.4423	.0301	.0187
8	4	-22.4292	-1.0335	.0416
8	6	-22.4828	1.1354	.0969
9	5	-9.1999	.0755	-.0401
9	6	-9.1999	.0755	.0385
10	5	23.5224	-.0654	-.0625
10	7	23.5224	-.0654	-.1334
11	6	9.7819	.0184	-.0165
11	7	9.7819	.0184	.0110
12	6	-29.6652	-1.1700	.1519

12 8 -27.7173 .7985 .0361

MUIR ASSOCIATES

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JOB NO. D596
RUN NO. 1
AUTHOR SB
DATE 21/5/91

NATIONAL MEDICARE CLOVERHILL DUBLIN 22
SECONDARY TRUSS

EN102: PLANE FRAME ANALYSIS V2.7 (c) ENCAD SYSTEMS LTD. 1987
Units: S.I. METRIC (Steel) Data File : d5960Jsb

Combination Case C2 : 1.0*B1+1.4*B3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
13	7	-6.7968	.0548	-.0295
13	8	-6.7968	.0548	.0287
14	7	30.6389	-.0374	-.0928
14	9	30.6389	-.0374	-.1334
15	8	6.5522	.0135	-.0137
15	9	6.5522	.0135	.0068
16	8	-34.5003	-1.1214	.1005
16	10	-34.5533	1.0456	.0595
17	9	-4.6013	.0322	-.0180
17	10	-4.6013	.0322	.0169
18	9	35.3577	-.0151	-.1086
18	11	35.3577	-.0151	-.1250
19	10	3.4345	.0075	-.0093
19	11	3.4345	.0075	.0023
20	10	-37.0615	-1.0896	.0856
20	12	-37.1142	1.0793	.0801
21	11	-2.4041	.0147	-.0085
21	12	-2.4041	.0147	.0078
22	11	37.8071	-.0335	-.1142
22	13	37.8071	-.0335	-.1504
23	12	.2702	.0013	-.0051
23	13	.2702	.0013	-.0031
24	12	-37.3617	-1.1175	.0930
24	14	-37.4152	1.0494	.0561
25	13	-2.0972	-.0060	.0036
25	14	-2.0972	-.0060	-.0032
26	13	36.2627	.0501	-.1572
26	15	36.2627	.0501	-.1029
27	13	2.5112	-.0051	.0002
27	16	2.5112	-.0051	-.0079
28	14	-37.4499	-1.0475	.0529
28	16	-37.5034	1.1194	.0918
29	15	-3.9593	-.0264	.0156
29	16	-3.9593	-.0264	-.0147
30	15	32.5231	.0289	-.1246
30	17	32.5231	.0289	-.0933
31	15	5.4436	-.0116	.0061
31	18	5.4436	-.0116	-.0124
32	16	-35.7902	-1.0525	.0693
32	18	-35.8437	1.1165	.1040
33	17	-6.0620	-.0405	.0240
33	18	-6.0620	-.0405	-.0232
34	17	26.9533	.0505	-.1279
34	19	26.9533	.0505	-.0733
35	17	8.1890	-.0168	.0106
35	20	8.1890	-.0168	-.0164
36	18	-32.1311	-1.0368	.0684
36	20	-32.1846	1.1302	.1190
37	19	-8.0292	-.0547	.0328
37	20	-8.0292	-.0547	-.0321
38	19	19.6857	.0653	-.1209
38	21	19.6857	.0653	-.0502
39	19	10.7822	-.0208	.0148
39	22	10.7822	-.0208	-.0190
40	20	-26.6394	-.9910	.0705
40	22	-26.6904	1.1758	.1706
41	21	-10.2227	-.0651	.0401
41	22	-10.2227	-.0651	-.0385
42	21	10.5891	.0955	-.1127
42	23	10.5891	.0955	-.0092
43	21	13.6182	-.0311	.0225
43	24	13.6182	-.0311	-.0286
44	22	-19.4554	-1.1490	.1131
44	24	-19.5090	1.0199	.0431

45	23	-11.2969	-.0852	.0508
45	24	-11.2969	-.0852	-.0539

MUIR ASSOCIATES

PAGE 41
JOB NO. D596
RUN NO. 1
AUTHOR SB
DATE 21/5/91

NATIONAL MEDICARE CLOVERHILL DUBLIN 22
SECONDARY TRUSS

EN102: PLANE FRAME ANALYSIS V2.7 (c) ENCAD SYSTEMS LTD. 1987
Units: S.I. METRIC (Steel) Data File : d59603sb

Combination Case C2 : 1.0*B1+1.4*B3
Member End Forces

MBR	JOINT	AXIAL Nx (kN)	SHEAR Sz (kN)	MOMENT My (kNm)
46	23	1.0185	.4564	-.0718
46	25	1.0185	.4564	.4225
47	23	14.4766	-.0079	.0118
47	26	14.4766	-.0079	-.0012
48	24	-10.4154	-.2607	-.0394
48	26	-10.4690	1.9063	-.8519
49	25	-12.6390	-1.0185	.4225
49	26	-12.6390	-1.0185	-.8507

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Job Name NATIONAL MEDICARE....
Portion TRUSSES BETWEEN GRIDS

Page 42
Job No. 6597
Date 6/91
Eng. [illegible]

Item	Calculations	Output	Ch.

LOADING AS PREVIOUS TRUSS.

TOP CHORD

$F_{c\,max}$ = 134.5 kN Mem 24.

l_e = 1100 mm. × 0.85 = 935 mm.

TRY 2L 75×50×6 BSA

$\lambda_n = 935/23.7 = 39.5$

7.6.2.7c) $P_c = 238$ N/mm²

LOCAL BENDING

$M = 7.17 \times 1.1^2/10 = 0.87$ kN m

OVERALL BUCKLING.

$\frac{134.5 \times 10^3}{1110 \times 238} + \frac{0.87}{4.4} = 0.71 < 1.0 \therefore$ ok

PROVIDE

2L 75×50×6 BSA T

BOTTOM CHORD.

$F_{T\,max}$ = 133.3 kN

$F_{c\,max}$ = 36.3 kN.

TRY 2L 75×50×6 BSAs LL

BRACING AT NODES 21 + 13

l_e = 6500 ; $\lambda = 6500/37 = 175.7$

7.6.2.7c) $P_c = 52$ N/mm²

$P_c = 52 \times 1110 \times 10^{-3} = 57.72$ kN > 36.3 ∴ ok

PROVIDE

2L 75×50×6 LL

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Job Name NATIONAL MEDICARE
Portion TRUSSES BETWEEN GRIDS

Job No. 0586
Date 6/91
Eng. [illegible]

Item	Calculations	Output	Ch.

INTERNAL MEMBERS. (DIAGONAL)

F_T = 57.5 kN Mem 47.

F_c = 14.5 kN

l_e = 1.651 × 0.85 = 1.806 m.

$\lambda = 1806/9.73 = 184.5$ ∴ P_c = 72 N/mm²

$P_c = 72 \times 480 \times 10^{-3} = 34.56$ kN > 14.5 ∴ ok

$P_T = 275 \times 0.48 = 132$ kN > 57.5 ∴ ok

PROVIDE 50×50×5 RSA.

INTERNAL MEMBERS (VERTICAL)

F_c = 45 kN Mem 49.

l_e = 1250 × 0.85 = 1063.

PROVIDE 50×50×5 RSA

50×50×5 RSA.

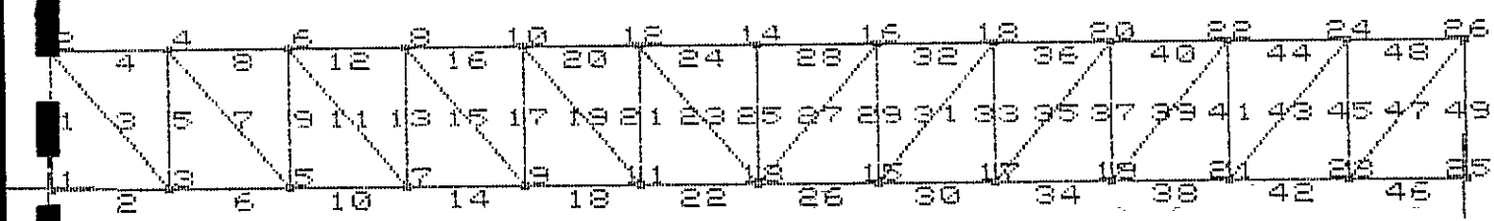
MUIR ASSOCIATES

PAGE 44
JOB NO. D596
RUN NO. 1
AUTHOR SB
DATE JUNE 91

ATIONAL MEDICARE CLOVERHILL DUBLIN 22
AIN SPINE TRUSS ON GRID E

EN101: PLANE TRUSS ANALYSIS V2.7
nits: S.I. METRIC (Steel)

Data File : D59604SB



Joint Co-ordinates

JOINT	X (m)	Z (m)
1	.000	.000
2	.000	1.250
3	1.000	.000
4	1.000	1.250
5	2.000	.000
6	2.000	1.250
7	3.000	.000
8	3.000	1.250
9	4.000	.000
10	4.000	1.250
11	5.000	.000
12	5.000	1.250
13	6.000	.000
14	6.000	1.250
15	7.000	.000
16	7.000	1.250
17	8.000	.000
18	8.000	1.250
19	9.000	.000
20	9.000	1.250
21	10.000	.000
22	10.000	1.250
23	11.000	.000
24	11.000	1.250
25	12.000	.000
26	12.000	1.250

NATIONAL MEDICARE CLOVERHILL DUBLIN 22
MAIN SPINE TRUSS ON GRID E

EN101: PLANE TRUSS ANALYSIS V2.7
Units: S.I. METRIC (Steel)

Data File : D59604SB

Section Properties

SECTION NO.	TABLE REF./ DESCRIPTION	AREA Ax (cm2)
1	2No.150*75*12 EA	5.140E+03
2	80*80*6 EA	9.350E+00

Member Incidences

MEMBER NO.	START NODE	END NODE	LENGTH (m)
1	1	2	1.250
2	1	3	1.000
3	2	3	1.601
4	3	4	1.000
5	3	4	1.250
6	3	5	1.000
7	4	5	1.601
8	4	6	1.000
9	5	6	1.250
10	5	7	1.000
11	6	7	1.601
12	6	8	1.000
13	7	8	1.250
14	7	9	1.000
15	8	9	1.601
16	8	10	1.000
17	9	10	1.250
18	9	11	1.000
19	10	11	1.601
20	10	12	1.000
21	11	12	1.250
22	11	13	1.000
23	12	13	1.601
24	12	14	1.000
25	13	14	1.250
26	13	15	1.000
27	13	16	1.601
28	14	16	1.000
29	15	16	1.250
30	15	17	1.000
31	15	18	1.601
32	16	18	1.000
33	17	18	1.250
34	17	19	1.000
35	17	20	1.601
36	18	20	1.000
37	19	20	1.250
38	19	21	1.000
39	19	22	1.601
40	20	22	1.000
41	21	22	1.250
42	21	23	1.000
43	21	24	1.601
44	22	24	1.000
45	23	24	1.250
46	23	25	1.000
47	23	26	1.601
48	24	26	1.000
49	25	26	1.250

NATIONAL MEDICARE CLOVERHILL DUBLIN 22
MAIN SPINE TRUSS ON GRID E

EN101: PLANE TRUSS ANALYSIS V2.7
Units: S.I. METRIC (Steel)

Data File : D59604SB

Member Details

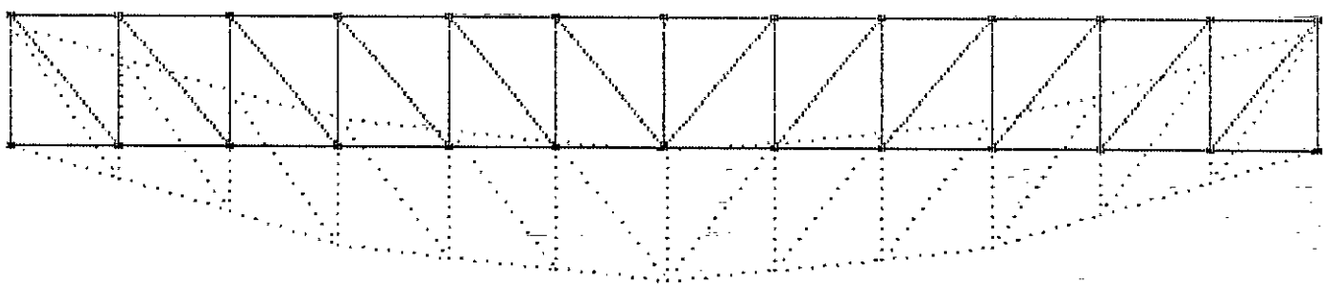
MEMBER NO.	SECTION GROUP	MATERIAL GROUP
1	2	1
2	1	1
3	2	1
4	1	1
5	2	1
6	1	1
7	2	1
8	1	1
9	2	1
10	1	1
11	2	1
12	1	1
13	2	1
14	1	1
15	2	1
16	1	1
17	2	1
18	1	1
19	2	1
20	1	1
21	2	1
22	1	1
23	2	1
24	1	1
25	2	1
26	1	1
27	2	1
28	1	1
29	2	1
30	1	1
31	2	1
32	1	1
33	2	1
34	1	1
35	2	1
36	1	1
37	2	1
38	1	1
39	2	1
40	1	1
41	2	1
42	1	1
43	2	1
44	1	1
45	2	1
46	1	1
47	2	1
48	1	1
49	2	1

Support Stiffnesses
N.B. If the specified support settlements and stiffnesses conflict, then the settlements override the stiffnesses.

JOINT	KLX (kN/mm)	KLZ (kN/mm)
1	R	R
25	0.	R

EN101: PLANE TRUSS ANALYSIS V2.7
Units: S.I. METRIC (Steel)

Data File : D59604SB



Combination Case C1 : 1.4*B1+1.6*B2
Member End Forces

MBR	JOINT	AXIAL Nx (kN)
1	1	419.4450
1	2	419.4450
2	1	.0000
2	3	.0000
3	2	-537.1517
3	4	-537.1517
4	2	335.5560
4	4	335.5560
5	3	419.4450
5	4	419.4450
6	4	-335.5560
6	5	-335.5560
7	4	-537.1517
7	5	-537.1517
8	4	671.1121
8	6	671.1121
9	5	419.4450
9	6	419.4450
10	5	-671.1121
10	7	-671.1121
11	6	-537.1517
11	7	-537.1517
12	6	1006.6680
12	8	1006.6680

EN101: PLANE TRUSS ANALYSIS V2.7
Units: S.I. METRIC (Steel)

Data File : D59604SB

Combination Case C1 : 1.4*B1+1.6*B2
Member End Forces

MBR	JOINT	AXIAL Nx (kN)
13	7	139.8150
13	8	139.8150
14	7	-1006.6680
14	9	-1006.6680
15	8	-179.0506
15	9	-179.0506
16	8	1118.5200
16	10	1118.5200
17	9	139.8150
17	10	139.8150
18	9	-1118.5200
18	11	-1118.5200
19	10	-179.0506
19	11	-179.0506
20	10	1230.3720
20	12	1230.3720
21	11	139.8150
21	12	139.8150
22	11	-1230.3720
22	13	-1230.3720
23	12	-179.0506
23	13	-179.0506
24	12	1342.2240
24	14	1342.2240
25	13	.0000
25	14	.0000
26	13	-1230.3720
26	15	-1230.3720
27	13	-179.0506
27	16	-179.0506
28	14	1342.2240
28	16	1342.2240
29	15	139.8150
29	16	139.8150
30	15	-1118.5200
30	17	-1118.5200
31	15	-179.0506
31	18	-179.0506
32	16	1230.3720
32	18	1230.3720
33	17	139.8150
33	18	139.8150
34	17	-1006.6680
34	19	-1006.6680
35	17	-179.0506
35	20	-179.0506
36	18	1118.5200
36	20	1118.5200
37	19	139.8150
37	20	139.8150
38	19	-671.1121
38	21	-671.1121
39	19	-537.1517
39	22	-537.1517
40	20	1006.6680
40	22	1006.6680
41	21	419.4450
41	22	419.4450
42	21	-335.5560
42	23	-335.5560
43	21	-537.1517
43	24	-537.1517
44	22	671.1121
44	24	671.1121
45	23	419.4450
45	24	419.4450

NATIONAL MEDICARE CLOVERHILL DUBLIN 22
MAIN SPINE TRUSS ON GRID E

EN101: PLANE TRUSS ANALYSIS V2.7
Units: S.I. METRIC (Steel)

Data File : D59604SB

Combination Case C1 : 1.4*B1+1.6*B2
Member End Forces

MBR	JOINT	AXIAL Nx (kN)
46	23	.0000
46	25	.0000
47	23	-537.1517
47	26	-537.1517
48	24	335.5560
48	26	335.5560
49	25	419.4450
49	26	419.4450

Combination Case C1 : 1.4*B1+1.6*B2
Support Reactions

JOINT	X FORCE (kN)	Z FORCE (kN)
1	.0000	419.4450
25	.0000	419.4450

Combination Case C1 : 1.4*B1+1.6*B2
Load Balance

ENTRY	X LINEAR (kN)	Z LINEAR (kN)
1 EXTERNAL LOADS SUM	.0000	-838.8900
2 REACTIONS SUM	.0000	838.8900

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Job Name NATIONAL MEDICARE
Portion SPIKE TRUSS GRID E

Page 50
Job No. 0597
Date JUNE 91
Eng. [illegible]

Item	Calculations	Output	Ch.

LOADING.

DL = $2.55 \times 26/2 \times 3$ = 99.45 kN

IL = $2.75 \times 26/2 \times 3$ = 87.75

WIND $0.75 \times 13/2 \times 3$ +

$0.75 \times 13/2 \times 3 \times 0.6$ = -23.4 kN.

TOP CHORD (SEE COMPUTER PRINTOUT)

F_c = 1342.2 kN Mem 28

l_e = 1000×0.85 = 850

TRY 2 No $150 \times 90 \times 12$ ESA ⊤

λ = $850/47.7$ = 17.8 p_c = 273 N/mm²

P_c = 273×5.5 = 1501.5 > 1342.2 ∴ ok.

BOTTOM CHORD

F_T = -1230.4 kN.

PROVIDE 2 No $150 \times 90 \times 12$ ⊥

INTERNAL MEMBERS.

F_c = 419.5 kN

l_e = 1.6×0.85 = 1.36m.

TRY $150 \times 150 \times 10$ ESA.

λ = 1360/29.7 = 45.8

p_c = 228 N/mm²

P_c = $228 \times 2983 \times 10^{-3}$ = 680 > 419.5 ∴ ok.

PROVIDE $150 \times 150 \times 10$

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Job Name NATIONAL MEDICARE
Portion INTERNAL COLS

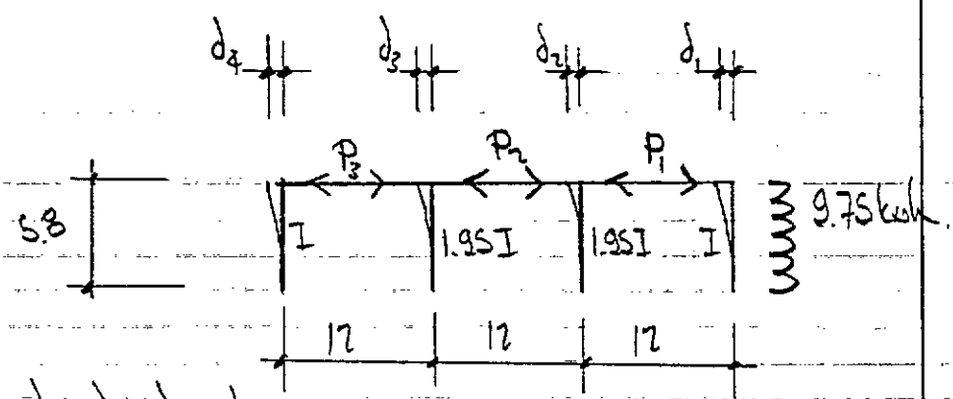
Page 51
Job No. 0597
Date JUNE 91
Eng. [illegible]

Item	Calculations	Output	Ch.

These cols are designed to resist the wind load from the gable end by cantilevering off their pads.

Wind Load.

$0.75 \times 13 = 9.75$ kN/m.



$\delta_1 = \delta_2 = \delta_3 = \delta_4$

$$\delta_4 = \frac{P_3 5.8^3}{3EI} = \delta_3 = \frac{(P_2 - P_3) 5.8^3}{3E \times 1.95I}$$

$$P_3 = \frac{P_2}{1.95} - \frac{P_3}{1.95}$$

$$2.95 P_3 = P_2$$

$$\delta_3 = \frac{1.95 P_3 \times 5.8^3}{3 \times 1.95 EI} = \delta_2 = \frac{(P_1 - 2.95 P_3) 5.8^3}{3 \times 1.95 EI}$$

$$4.95 P_3 = P_1$$

$$\delta_1 = \frac{56.55 \times 5.8^3}{8EI} - \frac{4.95 P_3 \times 5.8^3}{3EI} = \frac{P_3 5.8^3}{1EI}$$

Item	Calculations	Output	Ch.

$1379.2 = 386.97 P_3$

$\therefore P_3 = 3.564$ kN.

$P_2 = 10.514$ kN

$P_1 = 17.642$ kN.

DESIGN COLS FOR $1.4DL + 1.6IL$.

$N = 419.5 \times 2 + 110.21 = 949.21$ kN.

TRY 305UC97

$\lambda = 5800/76.8 = 75.5$

T6 27c) $p_c = 169$ N/mm^2.

$P_c = 169 \times 12300 \times 10^{-3} = 7078.7$ kN < 949.2

CASE II $1.2(DL + IL + WL)$

$N = 949.21 \times 1.2/1.5 = 759.4$ kN.

$M_{yy} = 30.6 \times 1.2/1.4 = 26.23$ kNm (PAGE 31 Mem 99)

$\lambda = 75.5 \therefore p_c = 169$ N/mm^2.

305UC97

OVERALL BUCKLING.

$\frac{F}{A_g p_c} + \frac{m M_y}{p_y z_y} \leq 1.0$; $b = \frac{20}{-30} = -0.67$

$\therefore m = 0.43$

$\frac{759.4 \times 10^3}{12300 \times 169} + \frac{0.43 \times 26.23}{275 \times 0.477} = 0.45 < 1.0 \therefore$ ok

305UC97 ok.

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Job Name NATIONAL MEDICARE
Portion EXTERNAL COLUMN DESIGN

Page 53
Job No. 0596
Date JULIE 90.
Eng. KJB

Item	Calculations	Output	Ch.

COLUMNS ON NUMBERED GRIDS.

CASE I $1.4DL + 1.6IL$.

$N = 38.7$ kN ; $M = 19.6$ kN m. (PAGE 31 Mem 98).

$l_e = 5800$ TRY 254 UC 73

$\lambda = 5800/64.6 = 89.8$ $p_c = 142$ N/mm^2.

$b = {}^{10}/_{19.6} = -0.51$ $m = 0.43$.

$x = 17.3$ $\therefore$ $p_b = 193$ N/mm^2.

$M_b = 193 \times 0.989 = 190.88$ kN m.

OVERALL BUCKLING.

$$\frac{38.7 \times 10^3}{142 \times 9790} + \frac{19.6 \times 0.43}{190.88} = 0.1 < 1.0 \therefore \text{OK}$$

USE 254 UC 73 COLS.

Muir Associates
Consulting Engineers

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Fax 1-686912

Job Name NATIONAL MEDICAL CARE
Portion WAREHOUSE FOUNDATIONS

Item	Calculations	Output	Ch.

CENTRAL FOUNDATIONS

Loading:

Roof: 1·6. 13.12 = 250 kN.
SW: 50
300 kN.

⇒ Area reqd = $\frac{300}{150}$ = 2 m²
use 1500x1500x400 deep
use T16-200 EW BOTTOM

EXTERNAL FOUNDATIONS

Loading

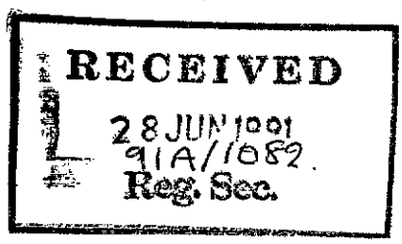
Roof. 1·6. 12. $\frac{13}{2}$ = 125 kN.
SW: 50
175 kN.

⇒ Area reqd = $\frac{175}{150}$ = 1·2 m²
use 1500x1500x400 pad
use T16-200 EW. BOTTOM

USE 750x300 STRIP FOUNDATION UNDER EXTERNAL WALLS.

OUTLINE SPECIFICATION

Relating to:



OFFICE AND WAREHOUSE EXTENSIONS

At:

NATIONAL MEDICAL CARE
I.D.A. INDUSTRIAL ESTATE
CLOVERHILL
CLONDALKIN
DUBLIN 22

For:

THE INDUSTRIAL DEVELOPMENT AUTHORITY

ARCHITECTS:

Traynor O'Toole Partnership
40, Lower Leeson Street
Dublin 2

Ph. 618085/6 Fax 610551

June, 1991

DESCRIPTION OF DEVELOPMENT

The development consists of a two storey office extension and a warehouse extension at I.D.A. Industrial Estate, Cloverhill, Clondalkin.

The offices are constructed in red brick to match existing. There is a 50 cavity and 215 block internal leaf throughout. Ground floor is in-situ concrete on D.P.M. and upper floor and roof are pre-cast concrete slabs. Roof finish is asphalt on screed to falls on insulation.

The warehouse is finished with insulated metal cladding to match existing. The structure is steel roof trusses (2° pitch) on steel stanchions. The roof is built-up insulated metal roof deck and torch-on felt finished.

The entire floor slab is 200 thick on D.P.M. with a power float finish.

Windows will be double glazed aluminium to match existing.

Additional carparking will be provided to the front of the building and the site will be suitably landscaped.

EXCAVATIONS AND EARTHWORKS

DEFINITIONS

A. Surface Level

The term "surface level" means the ground level after topsoil or turf has been removed.

The term "reduced level" means the ground level after subsoil has been excavated.

The term "formation level" means the finished level at the top of the hardcore.

B. Site Inspection Nature of Ground

The Contractor is to inspect the site and shall be deemed to have satisfied himself as to the nature of the soil.

C. Surplus Excavations

Surplus excavation to be removed from site to tip provided by Contractor.

D. Rock

Rock, if encountered, must be removed by compressed air or such special apparatus as may be necessary. Blasting will not be permitted.

E. Oversite Hardcore

Beds of hardcore to be consolidated to the thickness shown on drawings, be properly graded and free from all harmful chemicals. The top layer to be blinded with fine sand and finished to receive concrete floors.

F. Bottom Excavations

The bottom surface of all excavations to be inspected by the Architect and Local Authority prior to concreting foundations. Care to be taken to prevent surface of trenches from deterioration due to inclement weather or ground water. Surface of all excavation to be levelled and well rammed prior to pouring concrete in footings and beds.

G. Dewatering and Pumping

The Contractor to keep excavation free from all water by whatever means necessary.

The Contractor shall provide all pumping equipment and other works necessary to keep the direct access of water from the formation.

A. Dimensions and Levels

Excavations shall be in accordance with the Architect's dimensions and levels as shown on drawings.

B. Propping and Shoring

The Contractor will be held entirely responsible for the strength, adequacy and stability of any necessary shoring, needling, propping, strutting and the like and shall be responsible for making good any loss or damage resulting from any failure in this respect.

C. Earthwork Supports

The Contractor to allow for supports to all vertical faces of excavation and removing prior to backfilling.

D. Hardcore

Hardcore shall be 75mm down crushed rock.

All material shall be frost resistant as defined by the test described in the Transport and Road Research Laboratory Report LR 90.

The material shall be well graded and lie within the following grading envelope:

B.S Sieve Sizes	Range of Grading Percentage by mass passing.
75 mm	100
37.5mm	85 - 100
10 mm	40 - 70
5 mm	25 - 45
600 mi	8 - 22
75 mi	0 - 10

The particle size shall be determined by Test 7A of BS 1377 except for well burnt non-plastic shale for which Test 7B will be an acceptable alternative.

The material passing the 425 mi BS sieve when tested in accordance with BS 1377 shall have a plasticity index of less than 6.

With exception of well burnt non-plastic shale, the material shall have a ten percent fines value of 50 KN or more when tested in accordance with BS 812.

All material will be continously tested on site for grading and compaction. Any material which does not conform to the specification shall be removed at the contractor's expense.

A. Excavation of Soft Areas

Where soft areas are in the opinion of the Architect unsuitable for bearing of the overlying construction such areas shall be dealt with as directed by the Architect to suit the materials and conditions.

Before any further work is carried out on such areas the unsuitable materials occuring on the site shall be removed to such depths and widths as are directed by the Architect and carted to an approved tip.

The cost of removing and carting away such soft areas shall be paid for at the tender rates unless the soft areas have been caused solely in the opinion of the Architect by the unnecessary operations of the Contractor in which case the Contractor shall meet the said costs entirely at his own expense.

B Protecting Existing Trees

Existing trees to be retained shall be protected from damage both below ground and above during the course of the works. The Contractor shall be responsible for the provision and removal of adequete barriers and restrictions in order to achieve this protection.

CONCRETE WORK

A. General

The materials, labour and workmanship in and connected with the execution of the concrete work shall be the best of their kind without regard to any trade terms and the Contractor shall employ a duly qualified person experienced in reinforced concrete construction to supervise the work. The quality of materials and the standard of workmanship for the reinforced concrete shall comply with the relevant clauses of C.P. 110; Part 1 and B.S. Code of Practice 2007 in regard to all requirements not otherwise described in these preambles.

The amount of water shall be measured by volume or by weight. Any solid admixtures to be added shall be measured by weight only, but liquid or paste admixtures shall be measured by volume or weight.

The batch weights of aggregates shall be adjusted for the moisture content of the aggregates being used. The quanity of water contained in the aggregates shall be determined by the Contractor in accordance with a method approved by the Architect.

The accuracy of all measuring equipment shall be within 3% of the quantity of cement, water or total aggregates being measured and with 5% of the quantity of any admixture being used. All measurement equipment shall be maintained by the Contractor in a clean, serviceable condition.

The mixer shall comply with the requirements of B.S. 1305 or B.S. 4251 where applicable. The mixing time shall not be less than two minutes or the time necessary to ensure compliance with the required strength. When the mixer complies with B.S. 4251 no water shall be added at the batching plant or in transit to site.

B. Transporting & Pumping Concrete

The concrete shall be transported from the mixer to the formwork or place of deposit as rapidly as practicable by method which shall prevent the segregation or loss of any of the ingredients and shall maintain the required workability.

A. Placing & Compaction of Concrete

The concrete shall be evenly placed in its final position and shall not be worked or allowed to flow in a horizontal direction. The concrete shall be deposited in layers to a compacted depth not exceeding 450 mm where internal vibrators are used or 300 mm in all other cases. The concrete required for one construction unit shall be placed in one continuous operation. The concrete shall not be dropped from a height exceeding 1800 mm unless approved by the Architect. The concrete shall be thoroughly compacted and worked around the reinforcement and embedded fixtures, and into corners of the formwork to form a solid dense mass, free from voids , and which shall have the required surface finish when the formwork is removed. Unless otherwise approved by the Architect compaction shall be achieved using vibrators.

The number and method of use of vibrators shall be such as to ensure uniform compaction. The heads of immersion vibrators shall be sufficiently small to pass freely between the reinforcing bars. Vibrators shall not be applied via reinforcement or embedded fixtures. External vibrators shall be used in such a manner as to ensure efficient compaction without surface blemishes, hollows or bulges. The concrete shall not be vibrated after setting has commenced and shall not be subsequently disturbed.

B. Power Floating

After placing and compacting the concrete, the timing of the finishing operation is critical and arrangements must be made to float when the concrete is in optimum condition for the purpose.

The degree of smoothness must be acceptable for the application of thin floor finishes. The Contractor is responsible for any damage from any source, caused to the floor during pouring operations.

After the surface finish is formed, adequete protection must be provided to protect it from the many heavy and dirty trades to follow. The Contractor will be responsible for making good the floor to the Architect's satisfaction.

C. Construction Joints

Construction joints shall be located in the positions shown on the drawings and the position and detail of any construction joints not described in the contract shall be subject to the approval of the Architect.

Longitudinal joints shall be provided by means of steel roar forms braced in true vertical alignment, with provision made for the dowels between pours.

In no case shall concrete be formed or run to a feather edge.

A. Concreting in Cold Weather

All concreting shall be entirely suspended when the temperature in the shade is below 2 degrees C, and concrete shall not be mixed when the temperature in the shade is below 4 degrees C.

The Contractor shall provide a maximum and minimum thermometer of approved design for the purpose of measuring the shade temperature of the outside air.

The temperature of concrete measured at the surface at the most unfavourable position shall not be less than 5 degrees C at the time of placing. Any batch of concrete whose temperature as measured above falls below 5 degrees C shall be removed from the site.

Subsequent to or during cold weather the water and aggregates used in the mix shall be free from snow, ice and frost. Formwork, reinforcement and any other surfaces against which fresh concrete is to be poured shall be free from snow, ice and frost and have a temperature within 2 degrees C of the temperature of the fresh concrete.

Concrete placed in cold weather shall be protected from damage by frost with a covering of suitable insulation material.

All concrete damaged by frost or other weather conditions shall be cut out and replaced with fresh concrete at the Contractor's expense.

B. Concrete in Hot Weather

During hot weather the Contractor shall ensure that the constituent materials are sufficiently cool to prevent the concrete from stiffening prematurely. The temperature of the mixing water shall be less than 60 degrees C.

When placed, the concrete shall not have a temperature greater than 32 degrees C. Any batch of concrete whose temperature on the most unfavourable position is greater than 32 degrees C shall be removed from the site and replaced by fresh concrete at the Contractor's expense.

C. Concrete Placed under Water

The methods and proceedures to be used in placing concrete under water shall be subject to the approval of the Architect.

A. Protection of Concrete Foundations

Reinforced concrete foundations, up to a thickness of 300 mm shall not require formwork, the concrete being cast against the side of the excavations. The Contractor shall ensure that the footings be kept clear of loose material from the sides of the excavations. Particular care shall be taken to keep footings clean during the operation of fixing reinforcement and pouring concrete. Subject to the approval of the Architect reinforced concrete foundations of thickness greater than 300 mm shall not require formwork.

B. Curing

The method and duration of curing shall be such that the concrete has satisfactory durability and strength and the member suffers a minimum of distortion, is free of excessive efflorescence and does not cause, by its shrinkage cracking in the structures.

Similar components shall be cured under the same conditions.

The concrete during the curing period shall be protected to prevent rapid changes in temperatures at the surface, sudden temperature variations across the section, and excessive loss of water by evaporation due to drying winds or sunshine.

The method of curing and protection shall be approved by the Architect.

The use of accelerating or retarding curing agents or compounds shall be with the written consent of the Architect only.

C. Loading

Concrete shall at no time be subjected to loading, including its own weight which will induce a compressive stress in it greater than one-third of the charactaristic strength. The assessment of the strength of the concrete and the stresses produced by the load shall be subject to the agreement of the Architect.

D. Openings In

No tampering with the concrete whether by cutting holes or otherwise by other trades shall be allowed without the written consent of the Architect.

All pipes passing through the concrete shall be provided with an approved fibre tube and shall be concreted in position during the course of the work.

A. Designed Mix

The Contractor shall be responsible for selecting the mix proportions to achieve the specific strength, workability and durability.

Before commencing concreting the Contractor shall produce at his own expense, evidence for each grade of concrete showing that the mix proportions and manufacturing method produce concrete of the specific quality.

The following information shall be submitted to the Architect before any mix is supplied or used:

1. Nature and sourse of each material.

2. Either:

   (a) Appropriate existing data as evidence of satisfactory previous performances for target mean strength, current margin, workability and water/cement ratio.

   (b) Full details of tests on trial mixes carried out to conform to CP 110 section 6.5.3.

3. Proposed quantities of each ingredient per cubic metre of fully compacted concrete.

The Contractor shall notify the Architect in writing of any change in source of materials and any change in cement content which results in a difference greater than 20kg/m3 from the cement content previously used.

B. Strength of Concrete

The grades of concrete shall be as follows:

Grade	Chartaristic Crushing Strength Works Test Cubes	
	7 Days	28 Days
	N/mm2	N/mm2
C 15	10	15
C 20	15	20
C 30	20	30

Compliance with the specified characteristic strength shall be judged by tests made on cubes at 7 days and at 28 days.

The rate of sampling shall be one sample from a randomly selected batch representing an average volume of not more than 20 m3 or 20 batches whichever is smaller for suspended slabs, beams and exposed architectural concrete: the lesser of 50 m3 or 50 batches for walls and floating slabs. Higher rates of sampling and testing shall be carried out on the Architects instructions.

Each cube shall be made from a single sample taken from a randomly selected batch of concrete.

Compliance with the specified characteristic strength shall be assumed only if:

(1) The average strength determined from any group of four consecutive test cubes exceeds the specified characteristic strength by not less than 0.5 times the current margin, and

(2) Each individual test result is greater than 85% of the specified characteristic strength.

The current margin shall be taken as 15N/mm2 unless a smaller margin has been established (under 6.7.6.2 of C.P. 110 Part 1: 1972) to the satisfaction of the Architect.

In the event of cube results failing to satisfy the foregoing criteria then further examination of the structure will be carried out based on the following interpretation of B.S. 6084 "Guide to Assessment of Concrete Strength in Existing Structures".

a) The core test and the estimated in-situ cube strength estimation in accordance with B.S. 1981: Part 120: 1983 is the approved method of non-destructive testing.

b) Ultrasonic, Schmidt Hammer or other tests can be used to define the location of weakest concrete (6.5.2).

c) The core test should be taken from the area of weakest concrete and within this the most highly stressed section, as specified by the Architect. The cores will then be presumed to lie within the distribution curve, below the mean of which no more than 5% all values will lie.

d) These core values will then be considered acceptable if they are not less than 1.2 times the design strength.

e) If the cores are taken from the member at locations chosen for convenience or intuitively, (i.e. without establishing objectively where the weakest concrete is), then the results will be considered to be around the mean of all strengths.

f) In such cases the results will be subject to the same criteria as works cube strengths i.e. that the in-situ cube strength should exceed the value (design strength x 1.2) by 50% of the current margin.

g) If core testing fails this test the Contractor has the option of going back to identify the area of least strength (2 above) and coming from there, or load testing.

A. Test Cubes

The strength of the concrete shall be verified by means of 150 mm test cubes, made under the supervision of the Architect.

The cubes shall be made, compacted by hand and stored in the manner specified in B.S. Code of Practice 110. The concrete sample for the making of the test cube shall be obtained at the place of deposition of the concrete. The cubes shall be given an identification mark and an accurate register of the location and dates of each cube sample shall be kept on site, so that the location of the concrete from which the cube was made may be ascertained at any time.

The Contractor shall provide a sufficient number of machined steel or cast iron cube moulds to carry out the sampling required by the specified method of quality control.

B. Formwork:

All formwork whether of wood, metal or glass reinforced plastic shall in every respect be adapted to the structure and to the surface finish of the concrete. All formwork shall be fixed in perfect alignment and be securely braced to withstand without displacement, deflection or movement of any kind, the weight of forces exerted by the wet concrete, the movement of persons, material or plant and the effects of mechanical vibrators. Notwithstanding approval by the Architect the strength and adequacy of the shuttering shall remain the responsibility of the Contractor.

Formwork defined as wrought shall be lined with an approved smooth non-absorbent lining, or rendered non-absorbent by means of polyurethane based paint or varnish.

All pipes, angles and inserts of any kind shall be firmly fixed to the formwork which shall be neatly and accurately cut around them.

A. Joints in Formwork:

All joints shall be sufficiently close and tight to prevent the leakage of grout.

Joints in forms shall be horizontal or vertical, and perfect alignment of joint pattern shall be maintained consistent with the first pour of concrete. Where concrete is vibrated all joints are to be tongued and grooved, or the boards shall have straight parallel edges planed perpendicularly to the boards edge. If necessary joints are to be caulked or sealed with approved compound or material.

Where steel or glass reinforced plastic formwork is used all joints and holes in the formwork shall be sealed with tape and approved adhesive.

B. Reinforcement:

Reinforcement shall comply with the requirements of B.S. 4449, B.S. 4461, B.S. 4432 and B.S. 4483.

Before commencement of the Contract the Contractor shall produce at his own expense test results from an independent approved laboratory as evidence that the reinforcement used complies with the appropriate British Standard.

Tying wire shall be 16 guage soft annealed iron wire.

C. Placing Bending Reinforcement:

All bar reinforcement shall be bent and cut in accordance with B.S. 4466. Particular care shall be taken to ensure that the radius of bend of reinforcement which is not less than that specified in B.S. 4466.

Bars shall not be re-shaped or re-bent without the written permission of the Architect.

Reinforcement shall be accurately placed as shown on the drawings and secured against displacement by tying wire and shall be supported on an adequate number of small precast concrete blocks with tying wire cast in, or metal spacers, or plactic spacers, or metal hangers.

All joints in round mild steel bar reinforcement shall have overlaps of at least 50 diameters of the smallest of the overlapping bars and in deformed high tensile bar reinforcement overlaps of at least 40 diameters of the smaller of the overlapping bars.

Laps in fabric reinforcement shall be as follows:- Oblong mesh: 450 mm along longitudinal wires and 75 mm along transverse wire.

Square mesh: 300 mm both ways.

Reinforcement shall not be surrounded by concrete unless it is free from mud, oil, paint, retarders, loose rust, loose mill scale, snow, ice, grease or any other substance which will affect adversely the steel or concrete chemically, or reduce the bond between steel and concrete.

All reinforcement shall be bent cold and no heating or welding will be permitted. When the temperature of the steel is less than 5 degrees C, the speed of bending shall be reduced.

A. Concrete Cover Reinforcement:

The nominal cover is that dimension used in design and reinforcement shall be placed to provide the cover shown on the drawings.

B. Precast Concrete

Precast concrete shall be made in properly constructed wrought and oiled timber moulds. The core shall be Grade 30/20 concrete as before described. All exposed surfaces shall be finished fine at least 19 mm thick homogeneous with core with 1 part cement and 2 parts washed sand. All arrises shall be perfect. Rates are to include for all hoisting, bedding, and pointing in cement mortar and necessary moulds.

The work shall be cast as soon as the Contract is signed and shall be well matured as directed and shall not be fixed until approved by the Architect.

C. Cast in Items and Holes:

Anchor bolts for roof trusses and holding down bolts for portal frames shall be set accurately and templated and held firmly in position. During the placing of concrete the positions of all embedded shall be fully checked by an approved means to ensure them correct location. Holding down bolts in foundation shall be set with sleeves in accordance with the drawings to allow for minor adjustments.

All sleeves for pipes or other materials that pass through concrete shall be accurately set and securely held in position. Reinforcement shall not be relocated or cut. If reinforcement is found to clash with the position of any hole or sleeve the Architect shall be consulted. Sleeves shall be adequately blocked or filled with sand to prevent concrete from entering. No sleeve, pipe or chase shall intercept a structural member unless the member has been specifically designed therefore.

BRICKWORK & BLOCKWORK

Definitions

A. Making good

The description of the labours stated in SMM Clause G52 are deemed to include making good brickwork & blockwork.

B. Half-brick

The size denoted by the term "half-brick is the width of the bricks described irrespective of their length.

C. Materials

Materials to comply with the following specification:

Concrete Blocks	IS 20:1974
Facing Bricks	IS 91
Cement	IS 1 & BS 12
Sand	IS 5 & BS 1200
Lime	IS 8 & BS 890
Wall Ties	BS 1243
Damp Proof Course	IS 57: BS 743
Polythene	BS 3012
Brickforce Reinforcement	BS 4482:1969

D. Concrete Blocks

Concrete blocks shall be steam cured machine made blocks obtained from approved specialist manufacturers. The blocks shall be true in shape, free from all defects and have straight and undamaged arrises.

Where described as finishing fair the blocks shall be 'masonry block' texture obtained from approved specialist manufacturers. The blocks shall be manufactured with all faces of a consistantly fine-texture nature, free from course aggregate, true in shape, free from all defects and have straight and undamaged arrises. Materials shall be obtained from a single sourse and shall exhibit a uniform colour and texture. Cavity at openings to be sealed with special 'L' shaped closers.

E. Facing Bricks

First quality facing bricks to be used. Brick samples to be approved by Architect before work commences on site. A Prime Cost Sum has been included for the supply of bricks in the relevant items.

Clay bricks to be 215 x 102.5 x 65mm unless otherwise stated.

A. Certificates	A manufacturer's certificate of the quality of the blocks and bricks shall be produced for all batches delivered to site.
B. Water for Mortar	Water for mortar shall be clean and free from all harmfull matter. Approval of sourse of supply shall be obtained if supply is not obtained from mains. Water shall be tested to BS.3148 if required.
C. Cavity Wall Insulation	50mm thick polystyrene boards, obtained from an approved specialist manufacturer. The insulation shall be stored, protected and fixed within 100mm wide external wall cavities in accordance with the manufacturer's recommendations.
D. Wall Ties	Wall ties shall comply with BS.1243 type 'A' Stainless steel 25 x 3 x 250mm long, fish tail ends, with 2 x 50mm diameter locking plate to support cavity insulation.
E. Damp Proof Course	Hyload pitch polymer damp-proof course 1.2 mm nominal thickness to be used throughout at d.p.c. level, at jambs, under cills, and have 150 mm (minimum) laps and bonded.
F. Storage of Materials	Contractor is to ensure that all bricks and blocks are stacked in a clean dry place and adequately covered during adverse weather conditions. Precast units and concrete blocks shall be open stacked to permit ventilation and protected from saturation by rising damp. Cement and lime shall be stored off the ground under cover and away from damp; in such a manner as to enable them to be used in rotation in order of delivery. Sand shall be stored separately according to type, on clean dry hard standings and protected from contamination. Sands for pointing shall be obtained in sufficient quantity at one time to enable material of the approved colour to be used for the whole of the work
G. Cement Mortar	To be composed of one part cement to four parts of sand as described.
H Gauged Mortar	Mortar for blockwork to consist of six parts of sand, one part hydrated lime and one part cement by volume. Mortar for brickwork to consist of nine parts of sand, two parts hydrated lime and one part cement by volume.

A. Waterproofed Mortar

Where waterproofed mortar is specified the mixes as described above shall be modified by the addition of a suitable approved integral waterproofing agent used in strict accordance with the manufacturer's instructions.

B. Mixing Mortar

All mortar to be well mixed on clean floor or platform or mechanical mixer, mixed in quantities sufficient only for immediate use. Retempering mortar will not be permitted. Mortar containing cement shall be used within two hours of the addition of the cement.

C. Laying Blocks

Blocks to be laid in a dry condition on a uniform bed of mortar 10 mm thick for horizontal joints, 10 mm thick for vertical joints exclusive of key on the jointing surfaces, joints to be solidly filled and blocks and bricks properly bonded.

No portion of blockwork shall be allowed to rise above another by one metre as the building proceeds.

Work is not to be executed when the temperature is likely to fall below 3 degrees celcius.

No mortar or other staining of wall surfaces will be permitted and extra care to be taken when laying of facing blocks.

Before the mortar sets, fair faced blockwork shall have the joints ponted by rubbing with a round bar.

Blocks for fair face work to be selected to the satisfaction of the Architect.

D. Laying Bricks

Bricks to be laid in accordance with the Code of Practice for Walling CP 121: Part 1: 1973 or latest up to date code.

Mortar pointing profile to be recessed by rubbing with a round bar.

E. Cavity Walls

Both leaves to be tied together with stainless steel wall ties, spaced 400 mm horizontally, 400 mm vertically and staggered.
The spacing of wall ties at reveals and openings shall not exceed 200 mm.

A close fitting lath to be drawn along and up the cavity as work progresses. Suitable openings to be left to allow the cavities to be cleaned on completion.

Ties to be carefully fixed not to fall towards inner leaf, the cavity to be kept clean of mortar droppings by lifting battens. Weep holes to be formed in vertical joints over cavity gutters and at base of walls.

Both leaves to be built in a uniform manner and no leaf shall exceed the height of another by more than 900 mm. All facing work to show uniform colour. Blocks & bricks must be selected from a number of pallets and deliveries to maintain consistency. Form 100mm cavity space between both leaves.

A. Inclement Weather & Frost

No blockwork or brickwork shall be laid during rain, frost or snow unless sufficiently protected. During inclement weather and overnight the work shall be covered with polythene or felt. If the work continues during cold weather the work shall be protected from freezing during the first week after laying by suitable coverings. None of the materials shall be at temperatures below freezing point and the sand and lime shall be free from frozen lumps of ice. If necessary the water shall be warmed. Proprietary anti-freeze admixtures in the mortar may be used with the Architect's written permission to allow work to continue under frosty conditions and must be used in strict accordance with manufacturer's instructions.

Any brickwork or blockwork damaged by frost shall be taken down and made good at the contractor's expense.

B. Keeping the Work Clean

Mortar boards should have two adjacent vertical sides about 150mm high, one of which should face the wall being built to minimise splashing. Scaffolding planks should be kept at least 225mm from the face of the brickwork and blockwork and should be turned back at night and in rain to prevent splashing. Tops of all walls should be protected with felt or polythene on the completion of the day's work and during inclement weather. Where cast in-situ concrete has to be executed adjacent to fair face work, it is imperative that the brickwork/blockwork should be covered down with felt or polythene.

WOODWORK

A. Materials

Materials to comply with the following specification;

Timber nomenclature	BS 881/589
Moisture content	IS 96
Plywood	BS 1455 & 1203
Blockboard	BS 3444
Chipboard	BS 2604
Flush doors	IS 48 & BS.459
Joinery, timber and workmanship	BS 1186: Parts 1 & 2
Glue	BS 1204: 1444
Screws	BS 1210
Nails	BS 1202

B. Timber

Timber to be of the best quality of the kind specified, sound, properly seasoned, free from all defects and finished to the sizes specified on the drawings.

The moisture content of softwood when joinery is manufactured shall be between 10 and 15%.

C. Red Deal

Red deal shall be from Northern Sweeden or Canada.

D. Iroka

Iroka shall be of African origin

E. Doors

All door to be in accordance with BS. 459

Part 1. : Panelled and glazed wood doors

Part 2. : Flush doors

Part 3 : Fire check flush doors; wood and metal frames.

Part 4. : Matchboard doors

F. Preservative Timber

All timber shall where possible be pressure impregnated with approved preservative dry salt net retention 4 kg/m3 or brush applied treatment.

A. Workmanship

Workmanship generally shall be in accordance with BS 1186 Part 2; 1971. The whole of the carpentry and joinery work is to be carried out in the best manner. Plates, ceiling joists, etc. shall be in one length where possible. All joints shall be made directly over supports and these shall be scarfed and spiked where required.

Work is not to commence until the Architect has approved the Contractor's full size setting out drawings. Suggestions which the Contractor may wish to make for modifying the construction of joinery units as shown on Architect's drawings will only considered when the shop drawings are examined. No deviation is to be made from the Architect's details without his written approval.

Facilities are to be given to the Architect to inspect all work in progress both in the shop and on the site.

B. Defective Work

Should any shrinkage and/or warping occur or any other defect appear in the woodwork before the end of the defects liability period, such defective work is to be taken down and renewed to the Architect's satisfaction and any work disturbed in consequence must be made good at the Contractor's expense.

C. Storage

Timber shall be delivered as early as possible to the site and shall be stored under cover clear of the ground and protected from dampness.

D. Ironmongery

All ironmongery used to be the best available of its kind and be fixed with matching screws.

Where ironmongery is fixed to hardwood it shall be with nonferrous screws.

STRUCTURAL STEELWORK

A. General

The steelwork shall be carried out by a subcontactor specialising in structural steelwork approved by the Architect.

B. Special Detail

If the Contractor considers that sufficient information is not available on the drawings concerning a particular detail and that such a detail would materially affect his price he shall submit to the Architect his interpretation of such a detail at the time of tendering.

C. Site Connections

Any site connections which the Contractor may require to facilitate erection which are not indicated on the Architects drawings shall be deemed to have been allowed for in his tender. The position and details of such additional connections must be approved by the Architect.

D. Site Measurements

The Contractor must take all site measurements necessary for the preparation of the shop drawings.

E. Weld Details

The Architect will require complete details of all joint preparation, size and sequence of individual runs of weld and of welding jigs, temporary erection cleats, erection holes, etc. to be sent for his approval either with or on the Contractor's shop drawings.

Note:

Butt welding of members shall not be undertaken by the Contractor except with the express written permission of the Architect and all non-destructive tests or other tests shall be at the sole cost of the Contractor.

F. Distortion

The Contractor shall arrange his welding sequence, jigging etc. so as to eliminate distortion. The Contractor shall draw the Architect's attention to any excessive distortion which despite his precautions may occur.

G. Down Hand Welding

The Contractor shall so organise his fabrication in order that welding in the downhand position is kept to a minimum.

A. Faulty Work

Where a weld is, in the opinion of the Architect faulty, it shall be cut out in such a way as not to impair the subsequent strength of the structure and replaced with sound weld to the requirements of the drawings and specification.

B. Quality of Steelwork

The quality of the materials, fabrication and erection of the steelwork in this contract shall comply entirely with the requirements set out in the following British Standard and all other standards therein referred to, except for all clauses dealing with the training and certification of welders. The date of issue of each standard shall be the most recent date of issue. All amendments to the standards shall be deemed to be part of the relevant Standards:

BS 449	Use of Structural Steel in Building.
BS 4360	Welding Structural Steel.
BS 968	High Yield Stress Steel.
BS 1775	Steel Tubes for Structural Engineering Purposes.
BS 4 (Part 1)	Structural Sections.
BS 4 (Part 2)	Ditto.
BS 2708	Unified Black Square and Hexagon Bolts and Nuts.
BS 1768	Unified Precision Hexagon Bolts and Nuts.
BS 3139	High Strength Friction Grip Bolts.
BS 3410	Metal Washers
BS 3294	Use of High Strength Friction Grip Bolts.
BS 1719	Classification of Covered Electrodes.
BS 639	Covered Electrodes
BS 938	Metal Arc Welding of Tubes.
BS 1856	Metal Arc Welding of Mild Steel.
BS 2642	Metal Arc Welding of Steel to BS 968.

The Contractor shall keep a copy of each of the above standards in his shop for reference.

A. Test Pieces and Testing

The Contractor shall supply such test pieces as may be required by ordering such extra lengths as may be directed by the Architect. All test pieces shall be cut from material as delivered on site or to Contractor's works. Copies of certificates from rolling mills for each rolling from which consignments are sent shall be sent to the Architect on request and the lengths from each rolling identified to the Architect's satisfaction. Standard tensile test specimens for butt welds and for fillet welds shall be made and tested in accordance with BS 1856 and such other test specimens as may be directed shall be made up and tested prior to the commencement of the fabrication and during the progress of the work as may be directed by the Architect.

B. Site Welding

No site welding may be carried out except at such locations of the work as are indicated on the drawings provided for the contract, or at such other locations as may be approved by the Architect. Touch up all damaged paint surfaces after site welding.

C. Drifting

The holes in the various parts of the steelwork to be connected shall be sufficiently concentric that no drifting is necessary to insert the bolts connecting the parts together. No drifting or rereaming of holes during the erection of the steelwork will be allowed except by the permission of the Architect.

D. Tightening of Bolts

All bolts shall be fully tightened by the use of standard spanner of good fit and patterns appropriate to the part of the work for which they are to be used. Special spanners of appropriate kinds shall be used where high tensile bolts are specified, the patterns of special spanners depending on the type of indicating device used to determine the correct tightness of the bolts.

A. Rolling Margins Etc.

The unit weight of each rolled section specified on the steelwork drawings is that listed in Bs 4 for the appropriate section. No allowance may be made for rolling margin or waste. For the purpose of computing quantities for omissions or additions, the lengths of rolled sections shall be measured overall, and gussets shall be measured nett.

B. Bolts

All shop and site bolts with the exception of anchor bolts and H.S.F.G. bolts shall be sheradised or spun galvanised.

C. Tolerances

Structural members consisting primarly of a single rolled shape shall be straight within the appropriate tolerances allowed by ASTM Specification A6.

D. Erection Tolerances

1. Position of first erected column + or - 10mm

2. Linear Dimensions

up to 8m	+ or - 10mm
from 8m to 15m	+ or - 15mm
from 15m to 25m	+ or - 20mm
over 25m	+ or - 25mm

Protection of Steelwork

E. Shot-Blasting

All steelwork shall be shot blasted to Swedish SA 2.5 standard in accordance with CP 2008 and the requirements of BS 4232 to 2nd quality.

F. Cleaning

After blasting, remove all accumulated grit, shot and dust. Leave the surfaces of all steel dry and free of all mill scale, rust and other forms of contamination.

G. Painting

All painting to steelwork shall be carried out as requested and in accordance with the manufacturers recommendations.

The primer shall be applied as quickly as possible after completion of the surface preparation.

DEFINITIONS

A. Holes for attachments

When lugs and other subsidary members are given in the description of main members of plates, bars, sections or tubes, holes required for screws, bolts or rivets by which the subsidary members are attached to the main members are deemed to be included.

B. Materials

Mild Steel	- BS 15: Grade 1
	- BS 4
Wrought Iron	- BS 51: Grade C
Cast iron	- BS 1452 Grade 10
Galvanised iron and steel	- BS 729 Part 1
(after fabrication)	- BS 3190
Bolts and nuts	- BS 1494: 916
	BS 84

C. Workmanship

Workmanship shall be in accordance with the relevant Code of Practice.

QUALIFICATIONS OF THE RULES OF SMM

DEFINITIONS

A.	Faced Timber	The term "faced timber" means any or all of the backgrounds described in SMM Clause R3/6c.
B.	Backgrounds requiring plugging	The term "backgrounds requiring plugging" means any or all of the backgrounds described in SMM Clause R.3/6.d and is deemed to include the associated plugging.
C.	Extra over	Labours, ornamental joints, isolated joints and fittings are deemed given as extra over the gutters, pipes or ducts in which they occur, except where ducts are given in kilogrammes.
D.	Surface finishes	In the absence of specific requirements the treatment and finish of standard gutter brackets and of pipe fittings shall be appropriate to the finish of gutters and pipes with which they are associated.
E.	Painting	The preparation of surfaces is deemed to be included with the description for painting. Specific requirements relating to the preparation of surfaces are given in the WORKMANSHIP section of this preamble. In the absence of specific requirements surfaces shall be prepared in the manner reccommended by the manufacturer of the paint being used.
F.	Welding	In the absence of specific requirements the techniques and materials employed in welding shall be selected with due regard to the character of the work and the metals being connected.
G.	Bedding and pointing	The information required by SMM Clause R40.3 is given in the description of equipment, ancillaries and the like.

Supply and fix sanitary fittings as indicated on drawings and as described in the Bill of Quantities.

Include for all necessary temporary fixing, disconnecting, setting aside and refixing of sanitary fittings for the convenience of other trades.

All connections of hot and cold service pipes to fittings etc. shall be under the subcontract for Mechanical Services.

A. Rainwater Goods

Rainwater goods shall be in pressed aluminium to B.S. 2997 and shall be installed by approved specialist firm.

B. Soils and Wastes

Soils and waste pipes shall be in UPVC as manufactured by an approved firm and shall comply with the following:-

Pipes - BS 3506
Rings - BS 2752 and BS 2494
The installation of the system shall be in accordance with manufacturer's "Fixing Instructions".

C. Hot & Cold Supply etc.

Ventilation, hot and cold supply, and fire fighting shall be under the subcontract for mechanical services.

DEFINITIONS

A.	Faced timber	The term "faced timber" means any or all of the backgrounds described in SMM Clause S3.6.c.
B.	Backgrounds Requiring Plugging	The term "backgrounds requiring plugging" means any or all of the backgrounds described in SMM Clause S3.6.d. and is deemed to include the associated plugging.
C.	Extra over	Special conduit boxes etc. measured in accordance with S11.2 and labours with fittings measured in accordance with S12.2. S14.3 and S22 are deemed given as extra over the conduit, trunking or tray in which they occur.
D.	Surface Finishes	In the absence of specific requirements the treatment and finish of conduit, trunking and tray fittings shall be appropriate to the finish of the conduits, trunking or tray with which they are associated.
E.	Painting	The preparation of the surfaces is deemed to be included with the descriptions for painting. Specific requirements relating to the preparation of the surfaces are given in the WORKMANSHIP section of this preamble. In the absence of specific requirements surfaces shall be prepared in the manner recommended by the manufacturer of the paint being used.
F.	Welding	In the absence of specific requirements the techniques and materials employed in welding shall be selected with due regard to the character of the work and the metal being connected.
G.	Bedding and pointing	The information required by SMM clause S27.4 is given in the description of equipment, ancillaries and the like.
H.	Electrical Installation	The electrical installation will be carried out by a nominated sub-contractor and a Prime Cost Sum has been included for this work.

DEFINITIONS

A.	Preamble to other sections	Preamble to other sections are deemed to apply to this section where appropriate.
B.	Plant and Protection	The prices set against items of plant and protection elsewhere in these Bills Of Quantities are deemed to include the cost of any such requirements in this section

QUALIFICATION OF THE RULES OF THE SMM

A. Inserts

Inserts are given in accordance with the provisions of SMM clause T12 and not T7.4.

DEFINITIONS

B. Selected

The term 'selected' is deemed to include keeping the material so described clean for transparent or similar finish.

C. Labours on existing work

The descriptions of labours on existing work are deemed to include making good the existing finishings described.

D. Material

Materials to comply with the following specifications:-

Sand	- BS 1198 and 1199
Cement	- IS 1 and BS 12
Lime	- IS 8
Gypsum Plaster	- BS 1191 and IS 27
Gypsum Plaster Lath	- BS 1230
Vinyl Asbestos Tiles	- BS 3260
Clay Quarry Tiles	- BS 1286
Linolium Sheet	- BS 810

E. Water

Water shall be obtained from the mains or from an approved sourse.

F. Storage of Materials

All cement and plaster shall be stored in a weatherproof, dry, well ventilated shed, used exclusively for this purpose, with a wooden floor not less than 150mm clear above the earth.

Different types of plaster shall be kept seperate and used in order of delivery. No gypsum plasters shall be used after three months from the date of manufacture unless tested and proved to be in good condition to the Architect's satisfaction.

All sands shall be stored separately, according to type, on clean, hard, dry standings and shall be protected from contamination.

G. Workmanship

The whole of the work is to comply with the following Codes of Practice:-

Internal Plastering	-	BSCP 211
External Plastering	-	BSCP 221

All mixing to be carried out on a clean platform or mechanical mixer, properly gauged and using clean drinking water for mixing.

All joints of surfaces to be plastered should be raked out and surfaces to be saturated with water.

Surfaces to receive plastering shall have all mould oil, loose ans flaky matter and unintentional projections removed and plastering shall be deferred until the incidence and causes of efflorences have been eliminated.

Plaster lath boards shall be fixed with the long edges at right angles to the supporting members. Fixing shall be by the recommended rustproof nails with clout heads driven flush with slab surface.

All finished plastering shall exhibit a truly plane surface of uniform colour, hardness and texture, free from blowholes and other imperfections and projections. All shall be fully bonded to the backing surface and free from hollow spots and bolstering.

A. Adverse Conditions

Plastering shall not be executed when the air temperature is below 3 deg. C unless adequate protection is given to prevent the work from falling below that temperature until hydration is complete. Completed plaster work shall be protected from frost and extremes of humidity.

B. Tiling

It will be the Contractors responsibility to achieve a surface which is acceptable for the laying of tiles: any additional costs incurred in providing this finish shall be at the Contractors own expense.

C. Carpet, Tiling Etc.

Carpet, tiling and sheet finishes shall be of an approved manufacture and be laid strictly in accordance with manufacturer's instructions.

D. Deviding Strips

Dividing strips shall be used between different types of floor coverings. They shall be set into concrete.

E. Battens

All battens are to be pressure impregnated before fixing and shall be shot-fixed to brickwork, blockwork or concrete.

GLAZING

Materials

A. Glass

Glass to be full thickness stated, free from bubbles, smoke veins, scratches, air holes and other defects and in accordance with BS 952.

The wires in wired glass shall extend to the edges and be free of rust. The wires of georgian wired shall be parallel to the framing and align with adjoining panes.

B. Putty

Putty for glazing to normal woods shall be linseed oil putty to comply with BS 544.

Putty for glazing to hardwoods shall be metal window putty or other approved glazing compound suitable for non-porous timber, coloured to match wood.

Sealing strips shall be best quality P.V.C

C. Workmanship

Workmanship to be in accordance with BSCP 973 and BSCP 152.

Sizes to be accurately cut to fit easily into the rebates.

All glass surfaces shall be kept dry during transit and storage. Glass becoming moist from condensation or other causes shall be thoroughly dried and aired before fixing and surfaces in contact with putty thoroughly cleaned.

All glass shall have clean cut edges.

The provision of glazing compounds, putties, springs, gaskets, clips, spacer blocks and other sundry fixings shall be deemed to be included in the rates submitted.

Glazing fixed with beads shall have back applied putty and the putty neatly trimmed.

Rebates to be primed before receiving glass.

PAINTING AND DECORATING

A. Materials

Materials to comply with the following specifications:

Oil Paints	IS 15, 32 and 115
Emulsion Paint	IS 129
Knotting	IS 16 and BS 1336
Primer	IS 18, 33 and 110
Varnishes	IS 10, 103 and 104
Linseed Oil	IS 14, 93 and 94
White Spirit	BS 245
Turpentine	BS 3416 Type 1 or type 2

B. Containers

All paint, varnishes and coatings shall be freshly manufactured and delivered in sound and sealed containers, labelled clearly by the manufacturers to state:

1. the type of product
2. the brand name, if any
3. the manufacturer's brand number.

All except water based paints and bituminous paint shall be delivered in containers not exceeding 5 litre capacity, unless the extent of the work warrants larger sizes and the Architect's permission for their use is obtained.

C. Storage

All materials shall be kept in a clean, dry store and protected from frost.

D. Samples

Samples shall be submitted to the Architect and sample work painted for his approval on request.

E. Workmanship

Workmanship to comply with the following Code of Practice:

Painting BSCP 231

F. Colour Scheme

A schedule of decoration colours is to be obtained from the Architect.

G. Woodwork

Woodwork in contact with blockwork or brickwork to be primed at abutting surface. Exposed surfaces to be rubbed down before painting.

A.	Steelwork and Metalwork	External All Steel shall be shot blasted to Swedish Standard SA 2.5 and shall be given a blast primer of zinc rich epoxy reference No. A5214 to a D.F.T. of 30 microns. Following fabrication all areas damaged by welding or otherwise shall be restored to the original standard by preparing the damaged surfaces and touching up with zinc rich epoxy reference A5214, after overnight drying a further coat of zinc rich epoxy reference A5214 shall be applied to a D.F.T. of 45 microns. Final coat shall consist of one coat of high build acrylated rubber micaceous iron oxide reference 799-5132 to a D.F.T. of 75 microns.
B.	Concrete and Blockwork Surfaces.	Seal and two coats emulsion as directed by Architect.
C.	Surfaces of Ceilings	Exposed concrete surfaces to receive one coat sealer and two coats emulsion.

DRAINAGE

DEFINITIONS

A.	Extra over	Fittings are deemed given as extra over the pipes in which they occur.
B.	Materials and Workmanship	The preamble clauses to all work sections shall be deemed to apply to this work sections insofar as they are consistent with the following and workmanship to be in accordance with BSCP 301.
C.	UPVC Pipes Fittings	These are to comply with BS 4660: 1971 and IS 123.
D.	Concrete Pipes	These are to comply with I.S. 6: 1965
E.	Cast Iron Pipes Fittings	These are to comply with BS 437. (Pipes) and BS 1130 (Fittings)
F.	Step Irons	These are to comply with BS 1247.
G.	Manhole Covers	These are to comply with BS 497.
H.	Concrete and Granular Pipe Protection.	For specification for concrete and granular protection to pipes see concrete and excavation preambles respectively.
I.	Manufacture	All pipes and fittings of whatever category shall be of approved manufacture and origin
J.	Storage of Materials	uP.V.C. pipes shall be stored on site so that:

1. the pipes have an even bearing throughout their entire barrel length.
2. the storage surface is free from stones or other sharp objects.
3. pipes of equal diameter are stored in tapered stacks not more than 1m high.
4. pipes of different diameters shall not be stacked together or nested one within the other.

uP.V.C fittings, rubber rings, etc., shall be stored so as to avoid damage of any kind and to avoid contamination by oils, petrol or greases. All rubber items shall be stored in a cool, dry and dark location.

A. Excavations:

Excavation for drainage trenches to be in straight lines to the correct depths and gradients to be in accordance with BSCP 301: 1950.

Any unfirm ground below invert levels to be taken out as directed by the Architect until a firm base is reached and levels to be made up with concrete.

B. Levels of Existing Drains

The Contractor shall check the invert levels of existing drains, sewers and manholes before laying new drains and shall notify the Architect immediately if the declared invert levels are found to be inaccurate or unsuitable.

C. Backfilling

Extreme care to be taken when backfilling trenches.

D. Lay and Joint

(a) Pipes to be laid with sockets facing slope and rest on the foundation for the full length of the barrel.

(b) UPVC pipes to be laid in accordance with the recommendations of the manufacturers.

(c) Cast iron pipes to be jointed with molten lead and asbestos rope well caulked in and lead finished flush with rim.

(d) Concrete pipes shall be ogee jointed, pointed in cement mortar and laid in accordance with manufacturers recommendations.

E. Bedding and Surrounding

All pipes inside building and under paved areas shall be bedded on and surrounded with concrete.

All P.V.C pipes in grassed areas shall be bedded on a granular bed.

F. Notices and Notifications

The Contractor to give all necessary notices to the local Sanitary Authority and shall also notify the Consultants when drains are ready for testing.

A. Manholes

Manholes to be constructed to dimensions and levels as shown on drawings.

B. Testing

The Contractor to provide all necessary equipment for carrying out water test to drain runs and smoke test to vent pipes.

C. Testing Drain Lines

When the joints are fully set, each length of sewer shall be subject to a water test in suitable lengths or from manhole to manhole. The head of water at the summit of each section under test shall be not be less than 915mm and at the lower end not less than 1.5m or greater than 2.4m, measured from the crown of the pipe. During the test the surface of water in the 100mm diameter stand pipe should show no appreciable diminution in level after 15 minutes and should be kept under observation for one hour. Any pipes showing sweating or joints leaking should be removed or made good, and again tested to the satisfaction of the Architect.

On completion the entire system shall be tested to the satisfaction of the Architect.

SITEWORKS

A. Generally

The preambles to the various sections and trades shall equally apply to this section.

Materials shall comply with the following specification:

Precast concrete kerbs	-	BS 340
Bituminous macadam	-	BS 1621
Fencing	-	BS 1722

B. Site

Remove selected trees, hedges, bushes, scrub undergrowth or the like, including grubbing up roots which may interfere with construction works.

C. Existing Services

The Contractor is responsible for locating existing services. Wherever new construction work crosses the path of existing services, then the Contractor shall take all necessary precautions and where necessary surround these services with concrete.