APPENDIX C

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Timothy Aitchison
King Sturge LLP
One Piccadilly Gardens
Manchester
M1 1RG

20 June 2008

Our Ref: 31977/111

Dear Tim

Subject: Triangle - External works - Main entrance canopy

With reference to the email of 6th March 2008 (enclosed) from Richard Llewellyn (Manchester City Council), in reply to an email from Naomi Kellett (King Sturge) on 20th February 2008 (also enclosed) in regard to design and fixings of canopies and signage at the Triangle, the principle of the main entrance cantilever canopy was accepted. Our comments, as structural engineers on the project, regarding this design are as follows:

Please find enclosed structural calculations and sketches for the proposed cantilevered main entrance canopy which support our comments.

Basic Description of Cantilevered Canopy:

The canopy design, as proposed in the email from Manchester City Council, assumes full cantilever support from the face of the building. The plan area is approximately 9m wide by 4m deep at 5.3m above pavement level. The canopy is to be of glass panelling with a steel support frame. The thickness of glass required to counteract wind uplift is 17.5mm laminated. The glass could be thinner, however the 8 upper tie rods would need to be significantly increased in size as they would need to be designed as struts.

Comments:

It is our calculated view that due to the weight of glass, the snow and wind loading and the position at which the tie rods can be connected back to the building, the forces in the tie rods are unworkable. We are concerned that the structure is overly heavy and excessive and that there are problems providing the necessary support back to the building.

In our view, the raking tie bar supports, where they attach to the canopy from the main elevation of the building, are too close to the building even with 8 tie rods. The central connection of the tie bar to the stone pier is also looking quite big at 350mm in length and width (0.1225sq.m).

We have investigated the design of the main connection back to the existing first floor level compound steel beams. (Refer to the penultimate design sheet No. 20). This is the only structural zone available for connection other than taking support at the second floor level. The perimeter

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floor beam at second floor level would need to be exposed to establish the necessary steel to steel connection.

The tie bar forces need to be transferred, via some tenuous bracketry, to the rear of the stonework, back to the triple compound steel beam section at first floor level. Access to the back of the stone is severely restricted by the roller shutter door mechanism and the tubular steel brace between masonry piers which cannot be removed. (Refer to attached photo's).

We are also unsure as to how the triple beam sections physically connect to the side and central columns. The significant torsion moments induced in the triple beams, from the canopy, will need to be transferred into and resisted by the building side columns which are currently embedded in masonry.

Conclusion:

In order to progress this design philosophy it will be necessary to remove the masonry from around the triple beam/column connection for inspection. It is our considered opinion that the original beam/column connection design did not allow for any torsion at this joint. The beams were not designed to provide support to the canopy structure that is proposed. Thus, it is likely that we may expose the connection at the expense of disturbing the façade stonework only to find that we cannot achieve the desired support.

It is strongly recommended that alternative means of support be investigated to eliminate the need for the raking tie rods which induce the cantilever moment and torsion in the first floor level beams. This could be achieved by providing a pair of front posts thus eliminating the cantilever requirements at the building face. This is being investigated further.

Finally, we have been asked to consider by how much we would need to reduce the canopy plan area such that we could cantilever from the building. It is our opinion that no matter what size of canopy was adopted, we would still need to get access to the back of the stonework so as to deal with the raking tie forces and we would still need to verify the beam/column connection capacity, which, as detailed above, we consider could still be inadequate.

Yours sincerely

Steve Seddon
Associate Director
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E Steve.Seddon@fabermaunsell.com

APPENDIX D

Naomi Kellett

From: Pauline Patton [P.Patton1@manchester.gov.uk]
Sent: 26 August 2008 13:56
To: Naomi Kellett
Cc: Tina Mullen
Subject: Triangle

Naomi,

Having seen the pictures of the proposed changes to the entrance of the Triangle, I have no objections in principle. However as discussed, we would like bins with cigarette disposal units incorporated near to the entrance, and would like to have a say in the choice, this way keeping uniformity within the Public Realm.

Many thanks

Pauline Patton
Public Realm Manager
Neighbourhood Services
PO Box 585
Town Hall
Manchester
M60 3NZ
e-mail - p.patton1@manchester.gov.uk
Direct line 0161 234 4293 / int 800 4293 / mob 07717788553

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Manchester City Council supports Smokefree England

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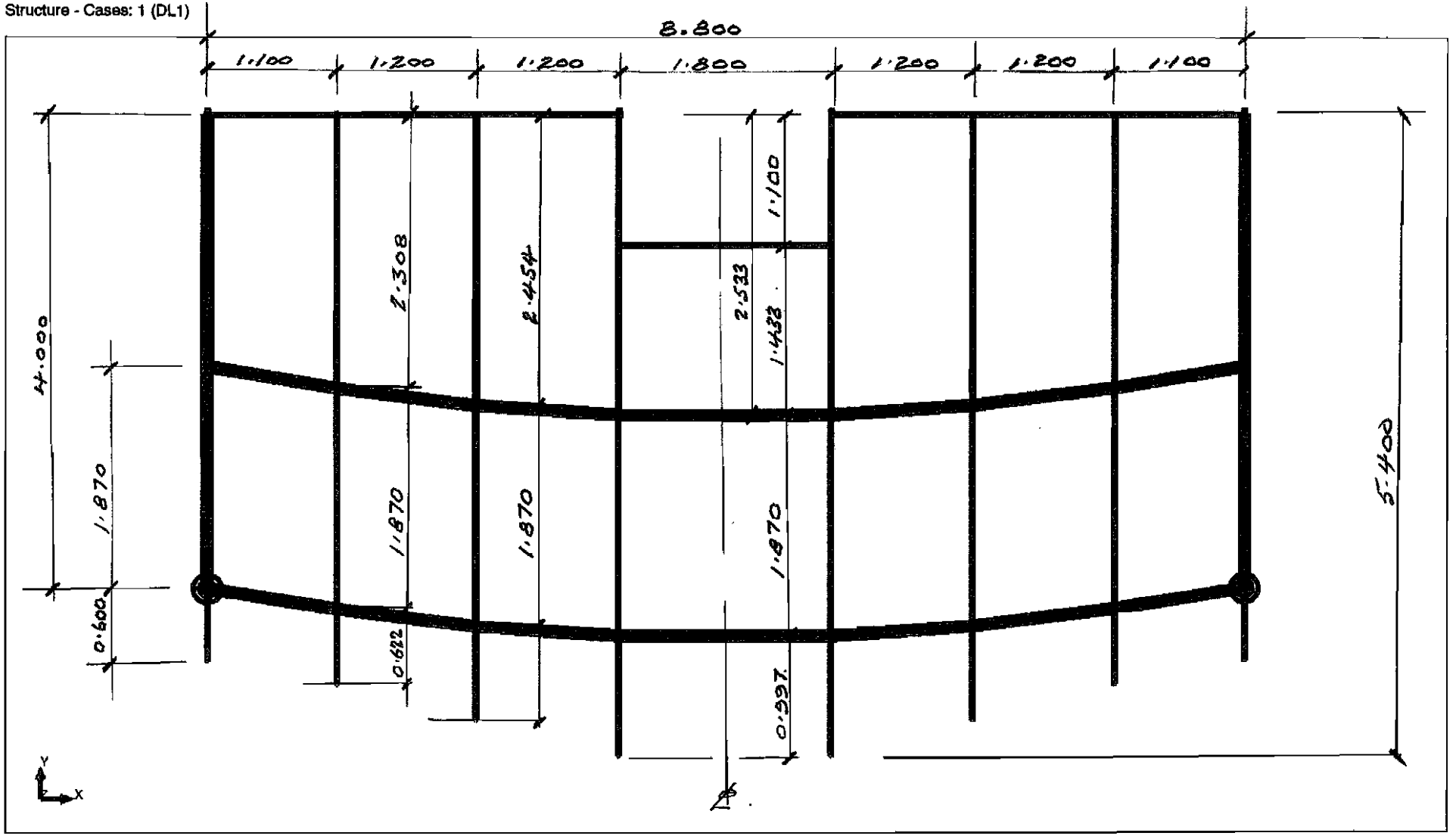
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APPENDIX E

ROBOT v 20.1.5
Author: SPS
Address: Faber Maunsell

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File: **main canopy 5.rtd**
Project: main canopy 5

Structure - Cases: 1 (DL1)

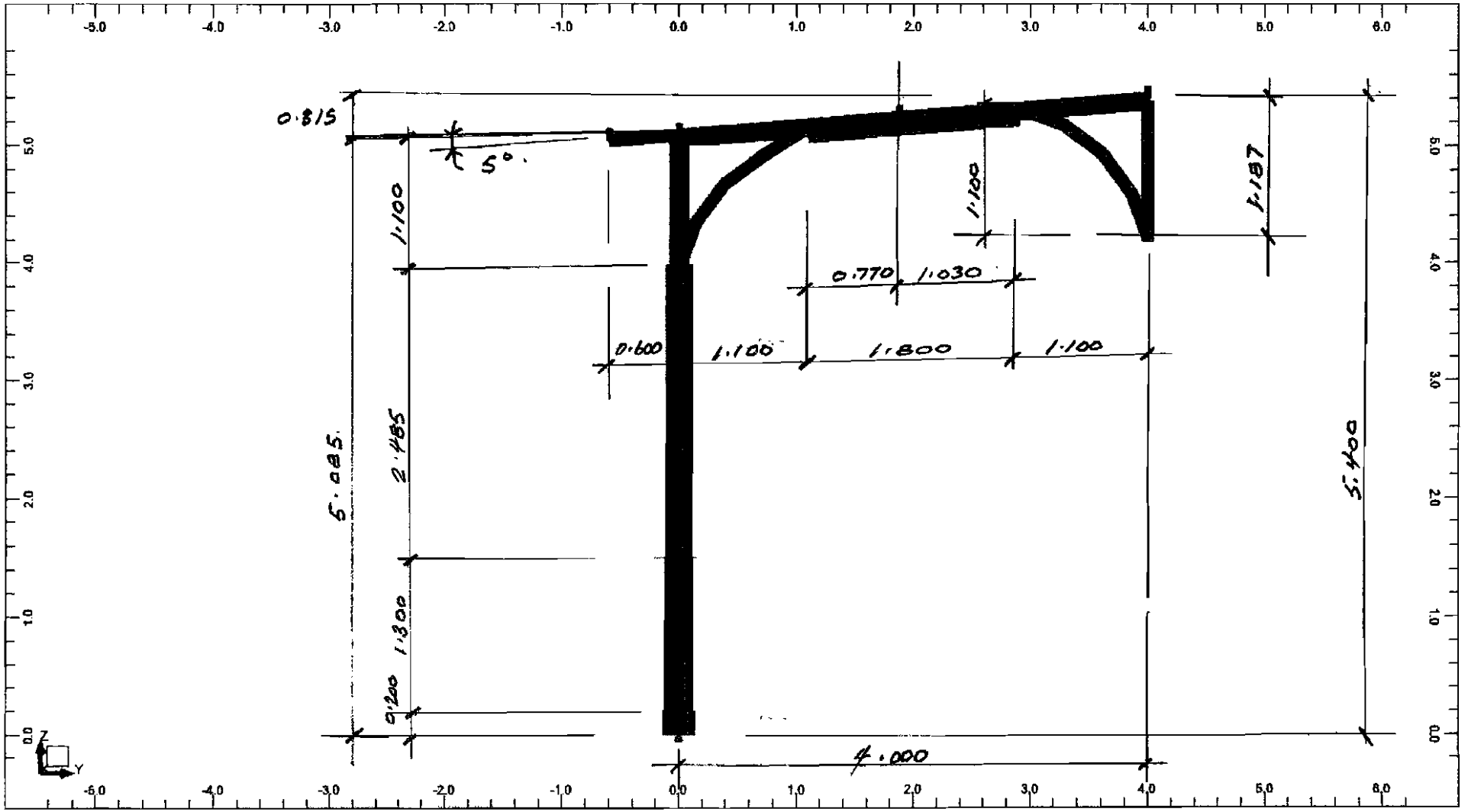


BASIC. APPROX DIMENSIONS.

ROBOT v 20.1.5
Author: SPS
Address: Faber Maunsell

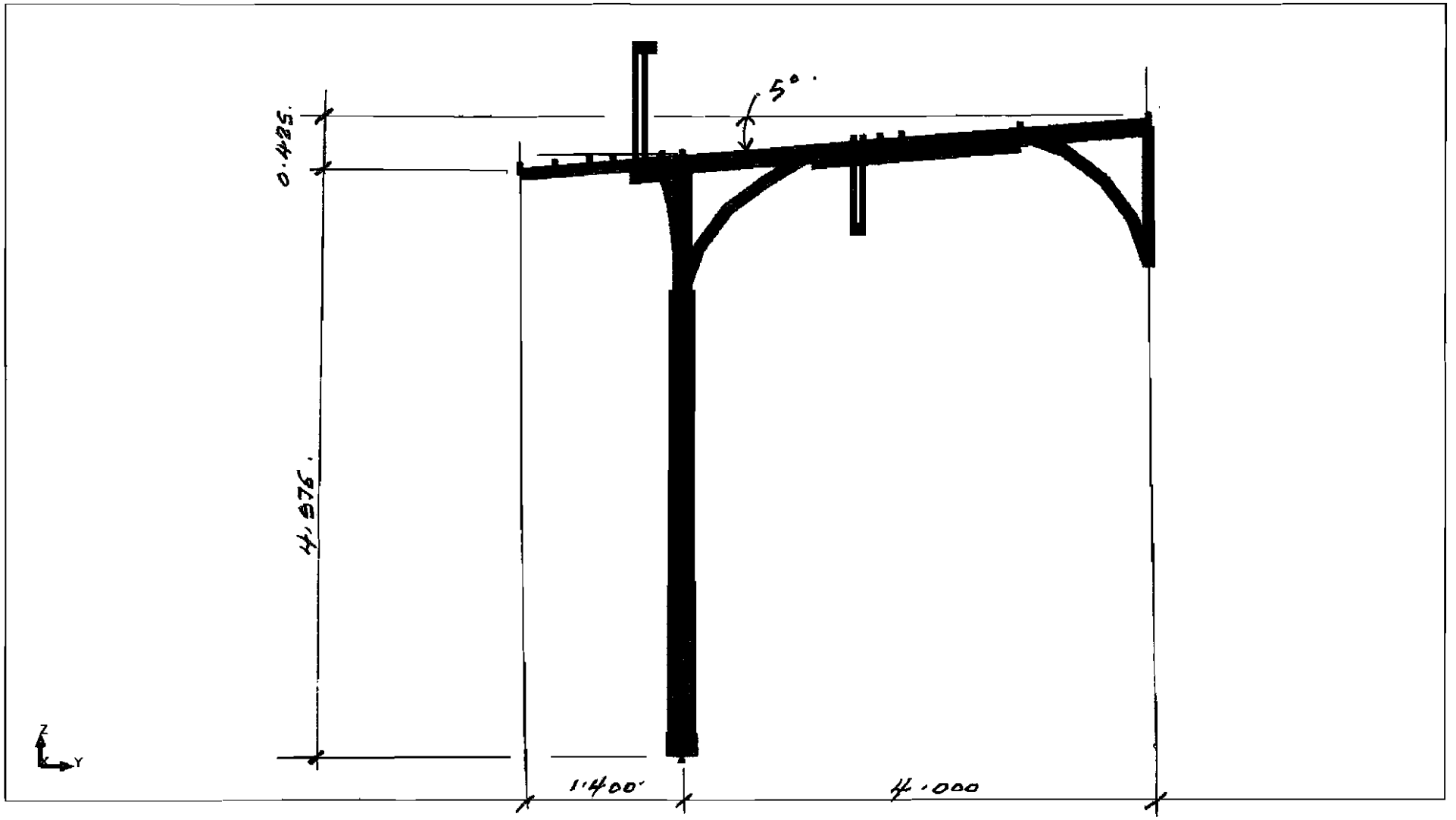
© Robobat 1996-2007
File: **main canopy 5.rtd**
Project: main canopy 5

Structure - Cases: 1 (DL1)



Basic Approx Dimensions.

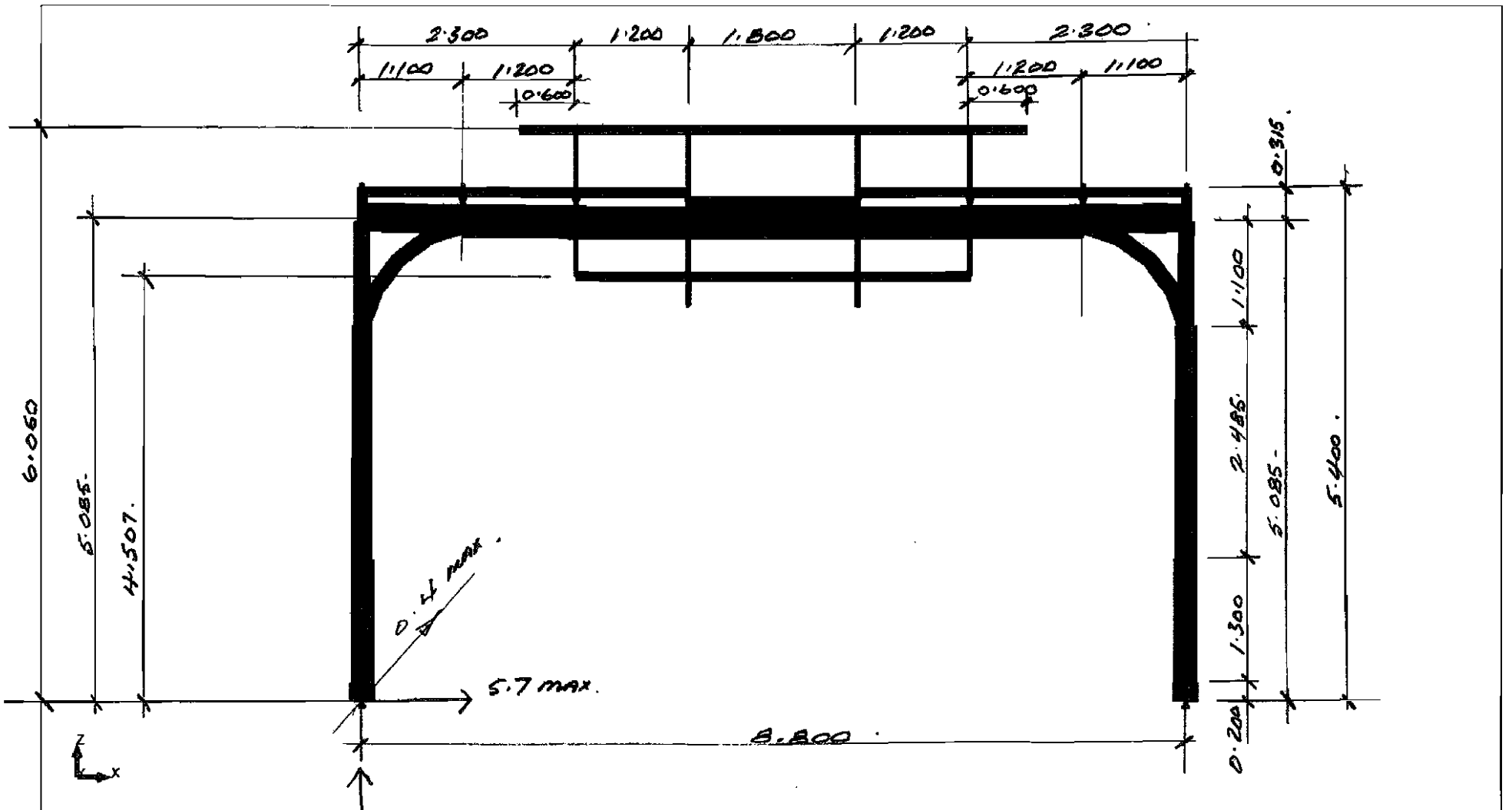
Structure - Cases: 1 (DL1)



ROBOT v 20.1.5
Author: SPS
Address: Faber Maunsell

© Robobat 1996-2007
File: main canopy 5.rtd
Project: main canopy 5

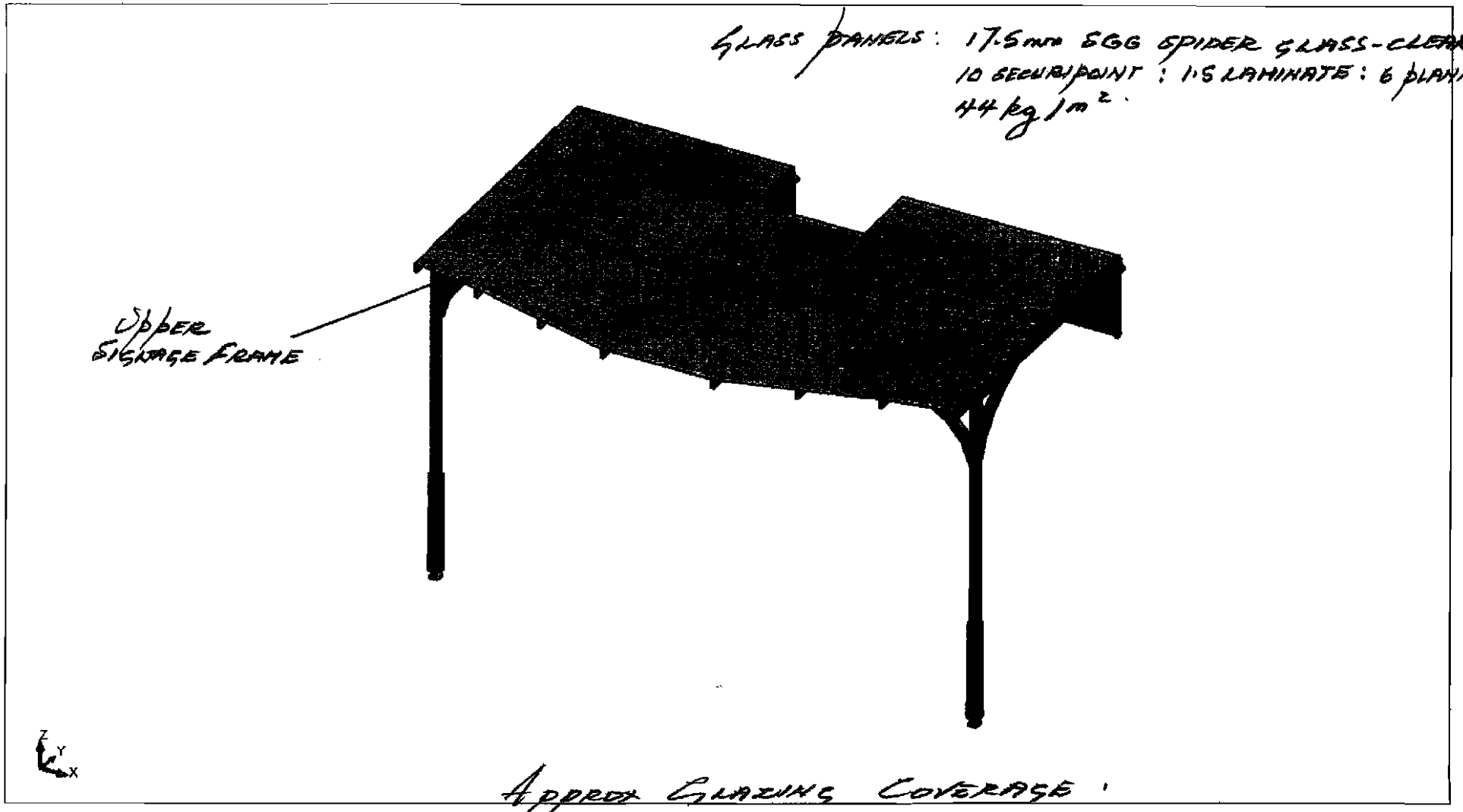
Structure - Cases: 1 (DL1)



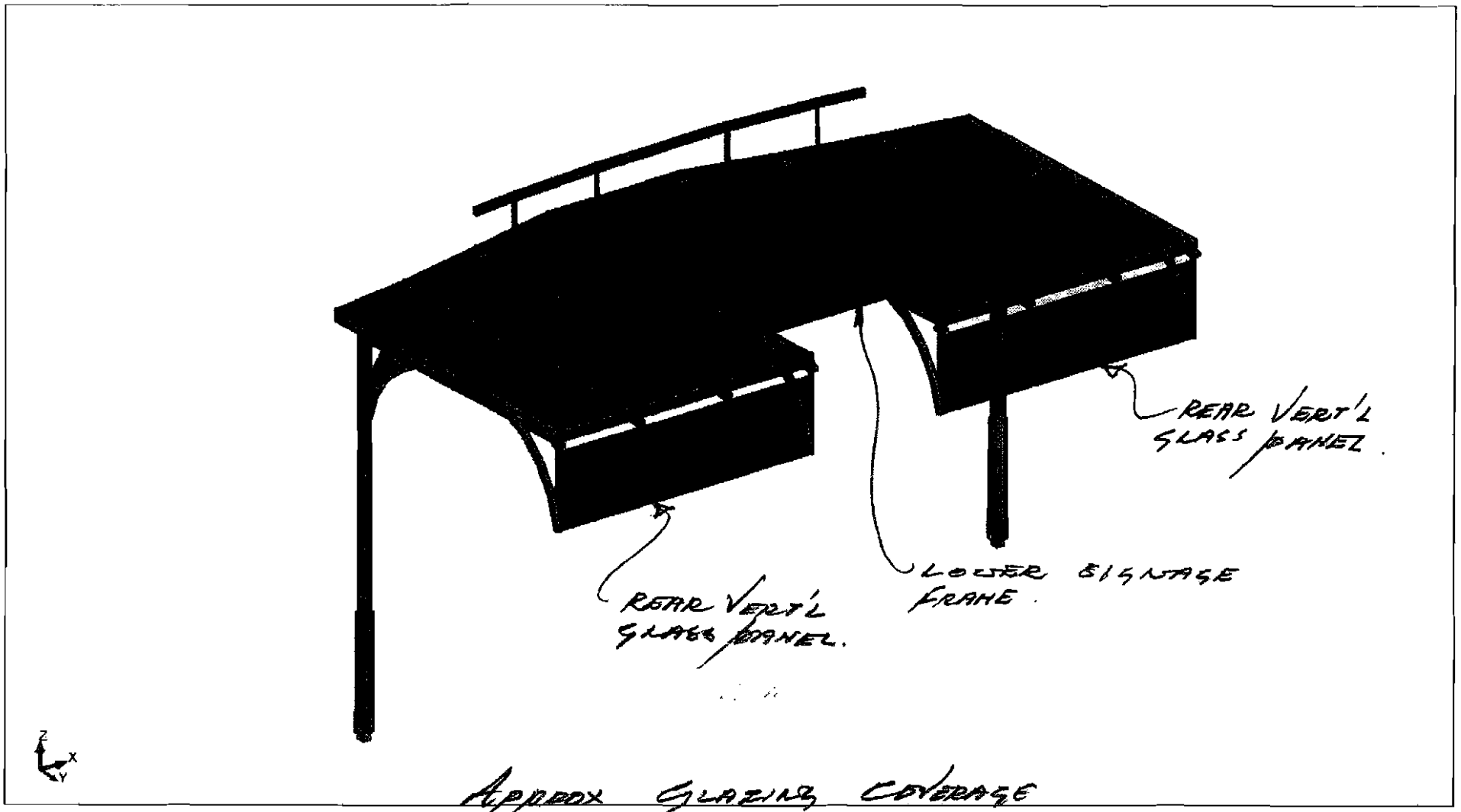
BASIC APPROX DIMENSIONS.

31.6 kN (ULS)
MAX
21.4 kN (SLS).

Structure - Cases: 1 (DL1)



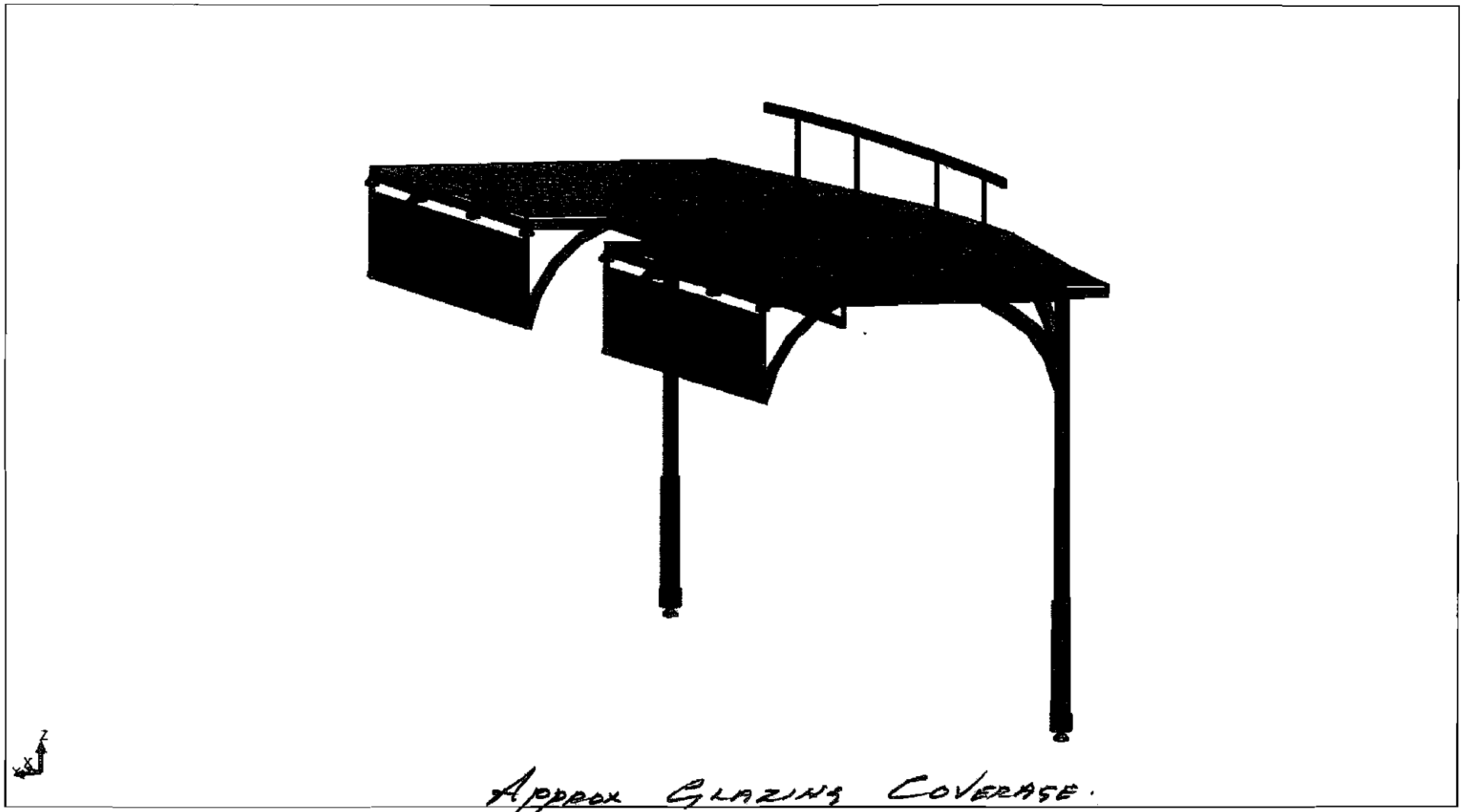
Structure - Cases: 1 (DL1)



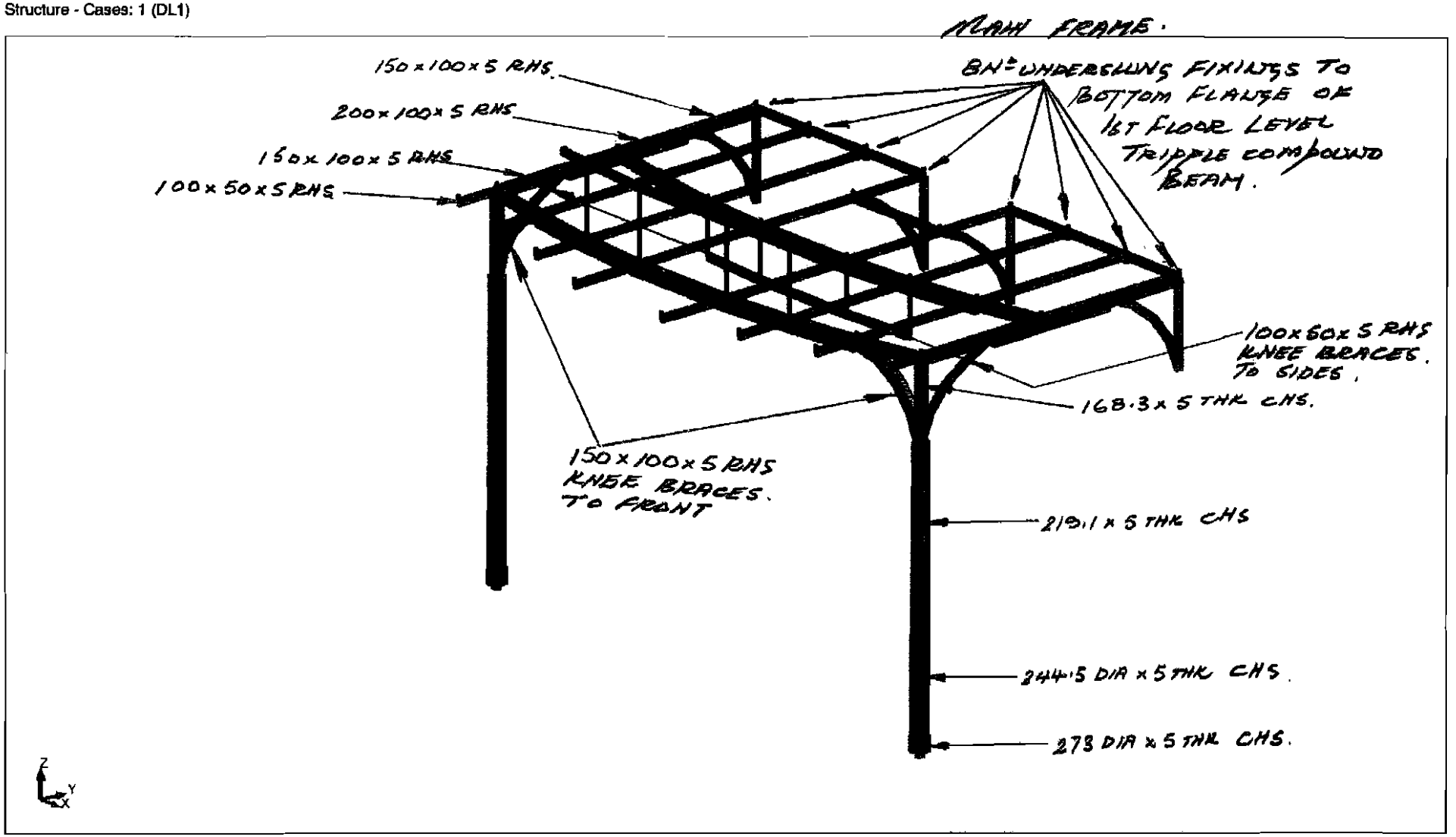
APPROX GLAZING COVERAGE

6

Structure - Cases: 1 (DL1)

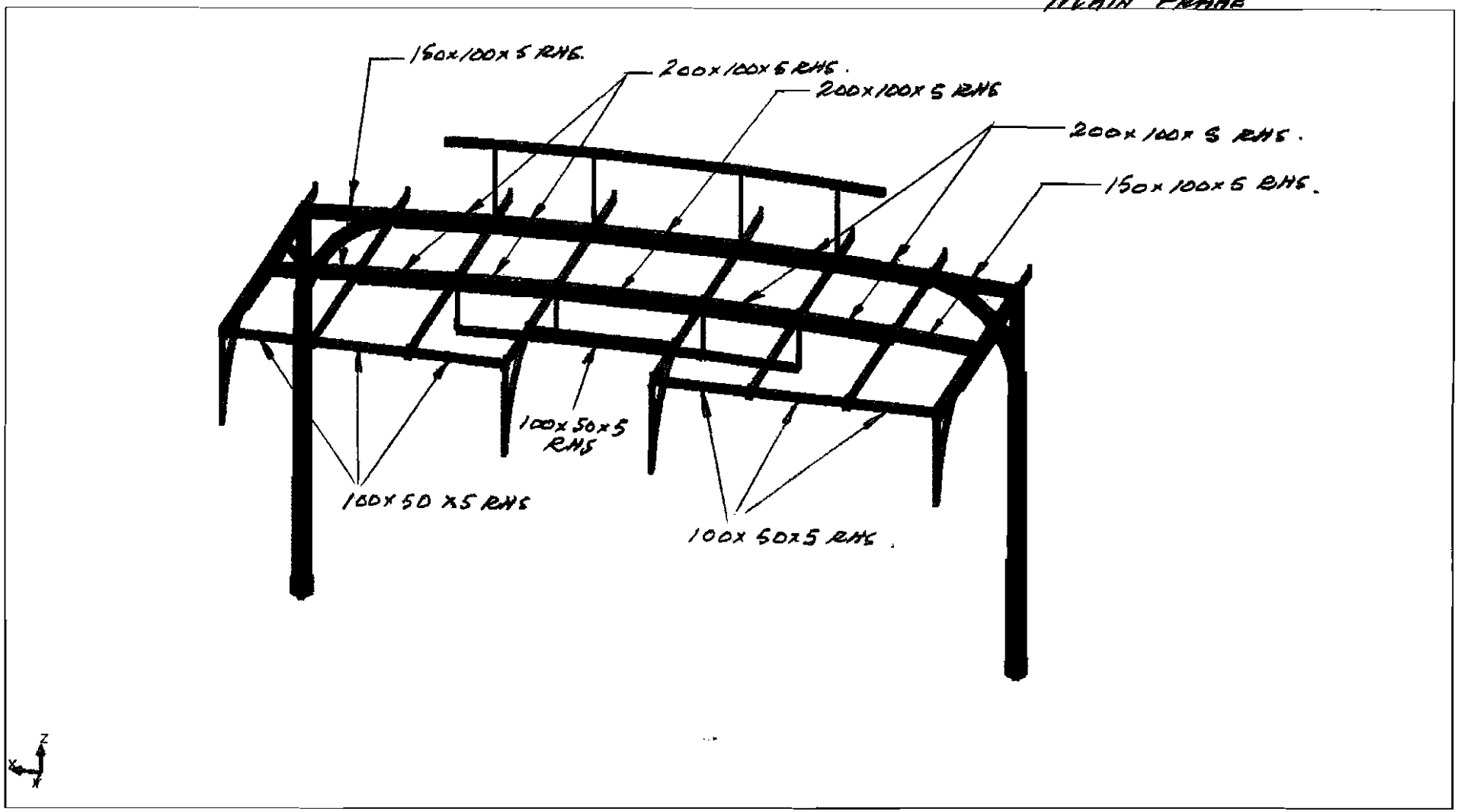


Structure - Cases: 1 (DL1)

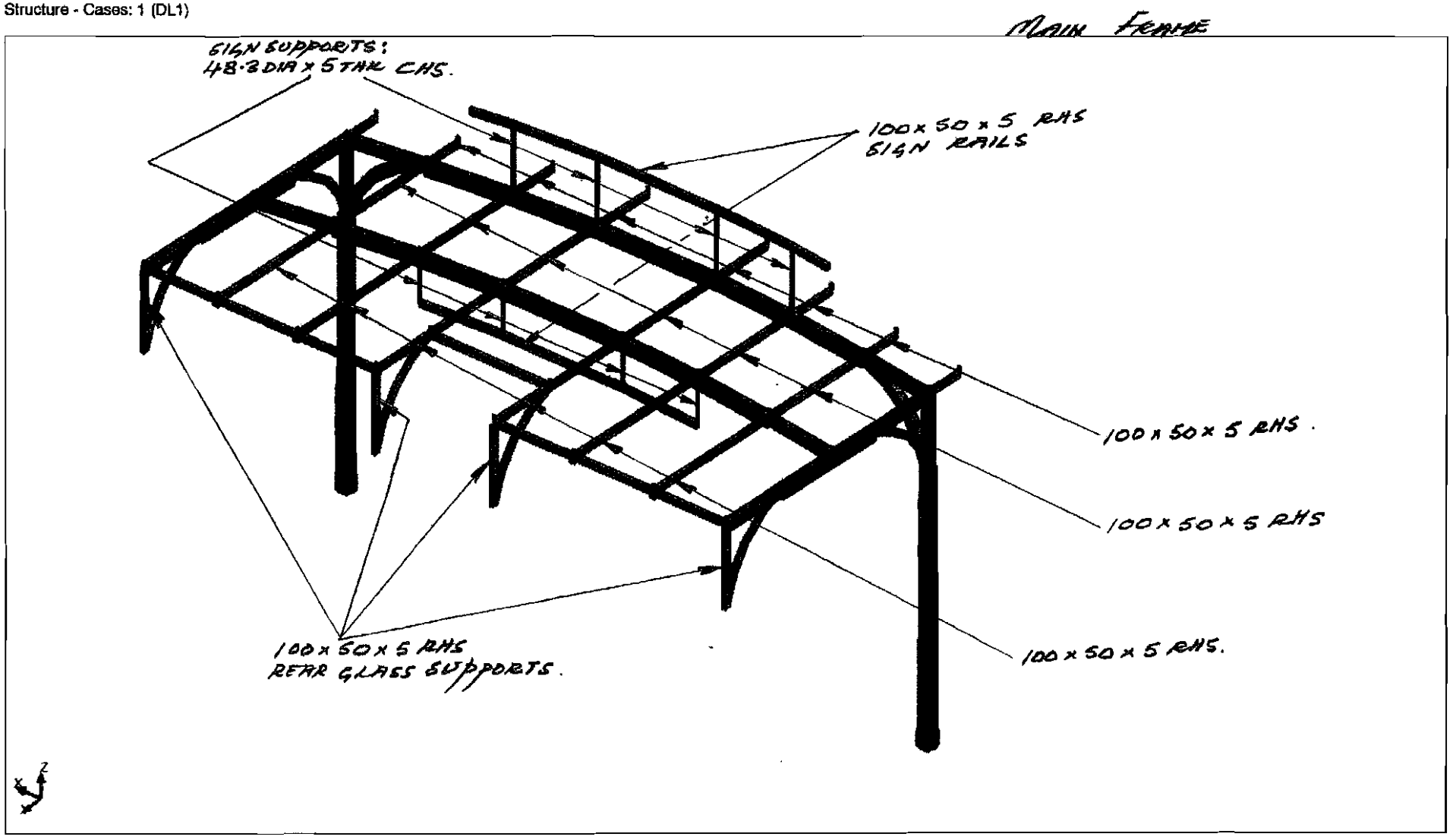


Structure - Cases: 1 (DL1)

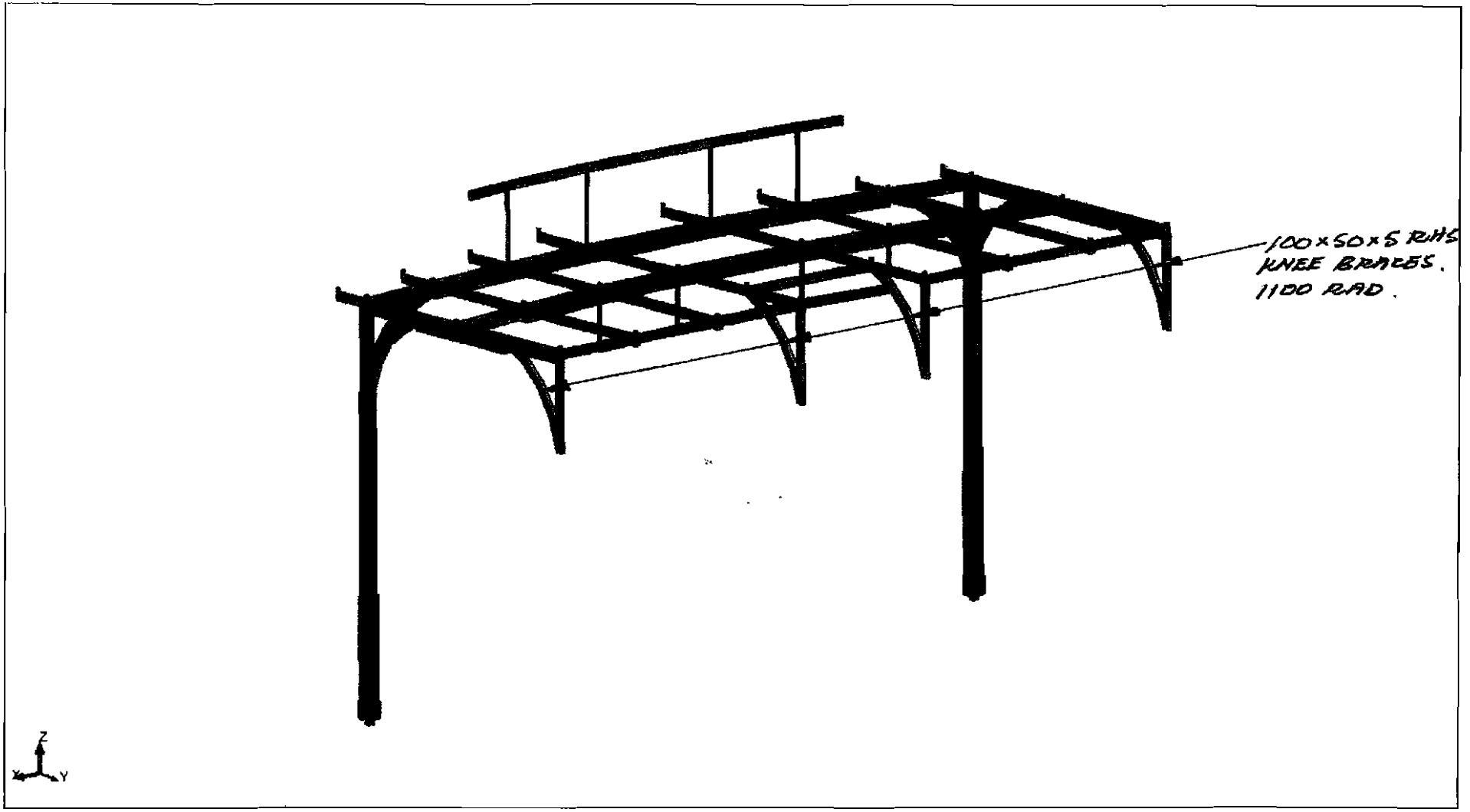
MAIN FRAME



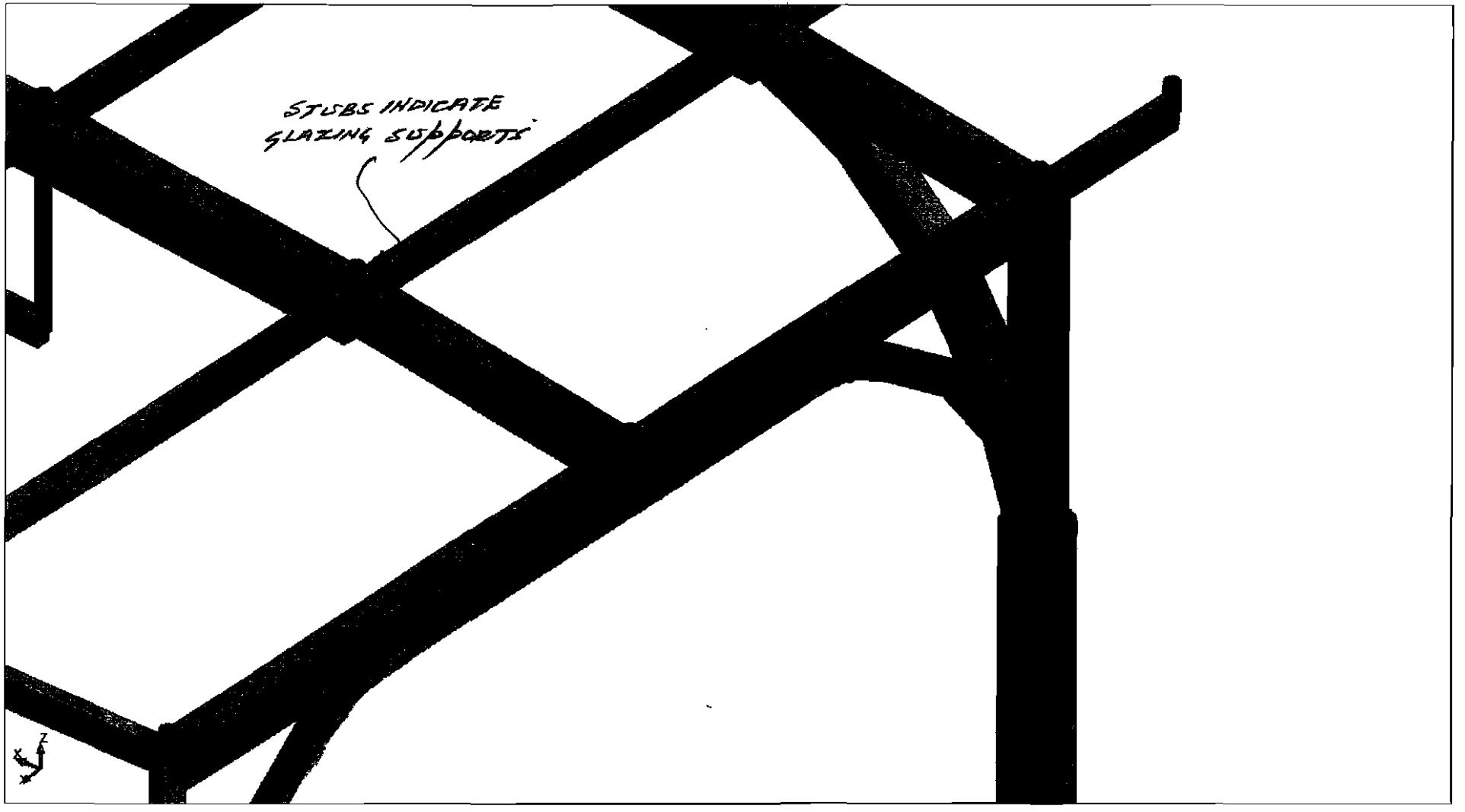
Structure - Cases: 1 (DL1)



Structure - Cases: 1 (DL1)

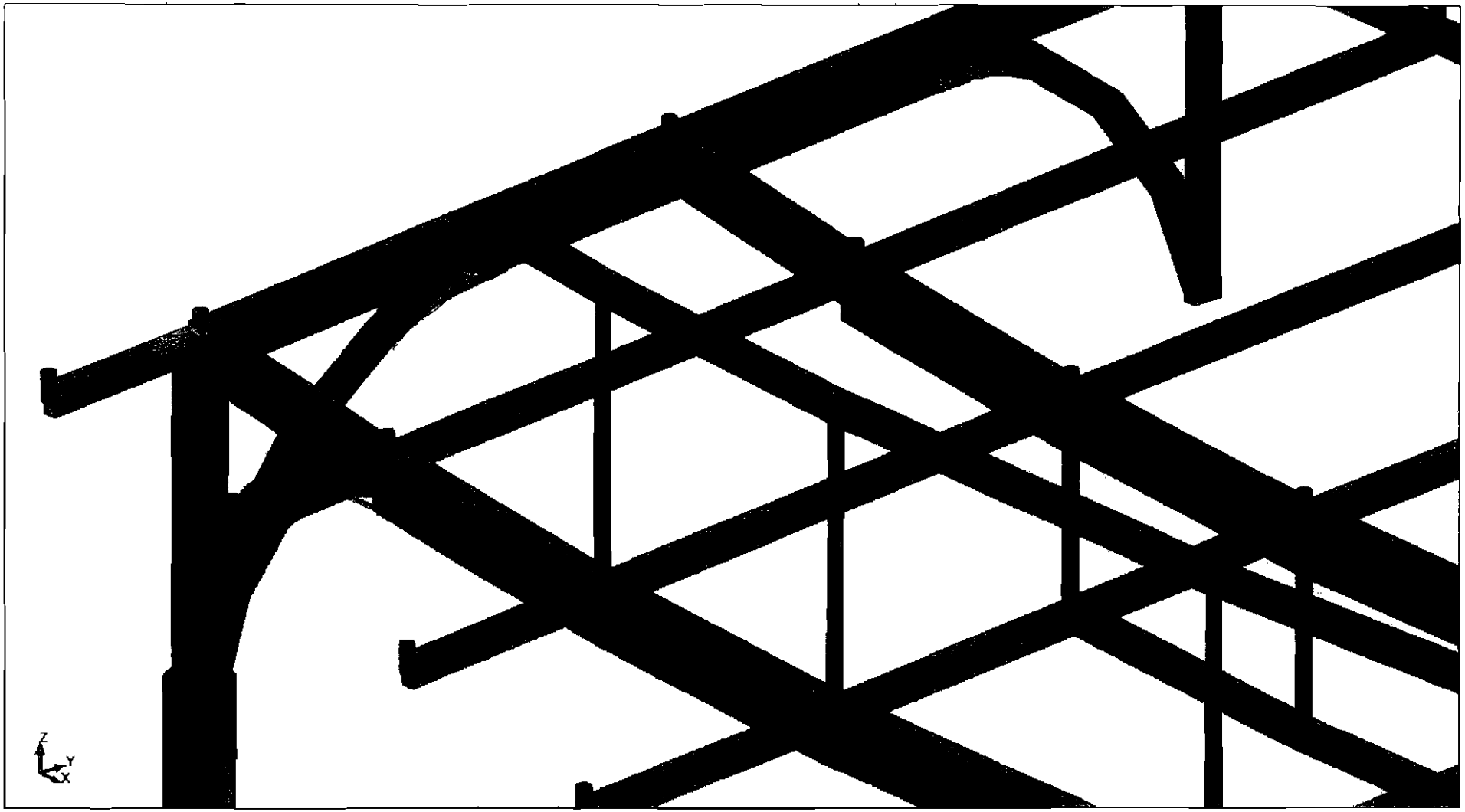


Structure - Cases: 1 (DL1)



12

Structure - Cases: 1 (DL1)

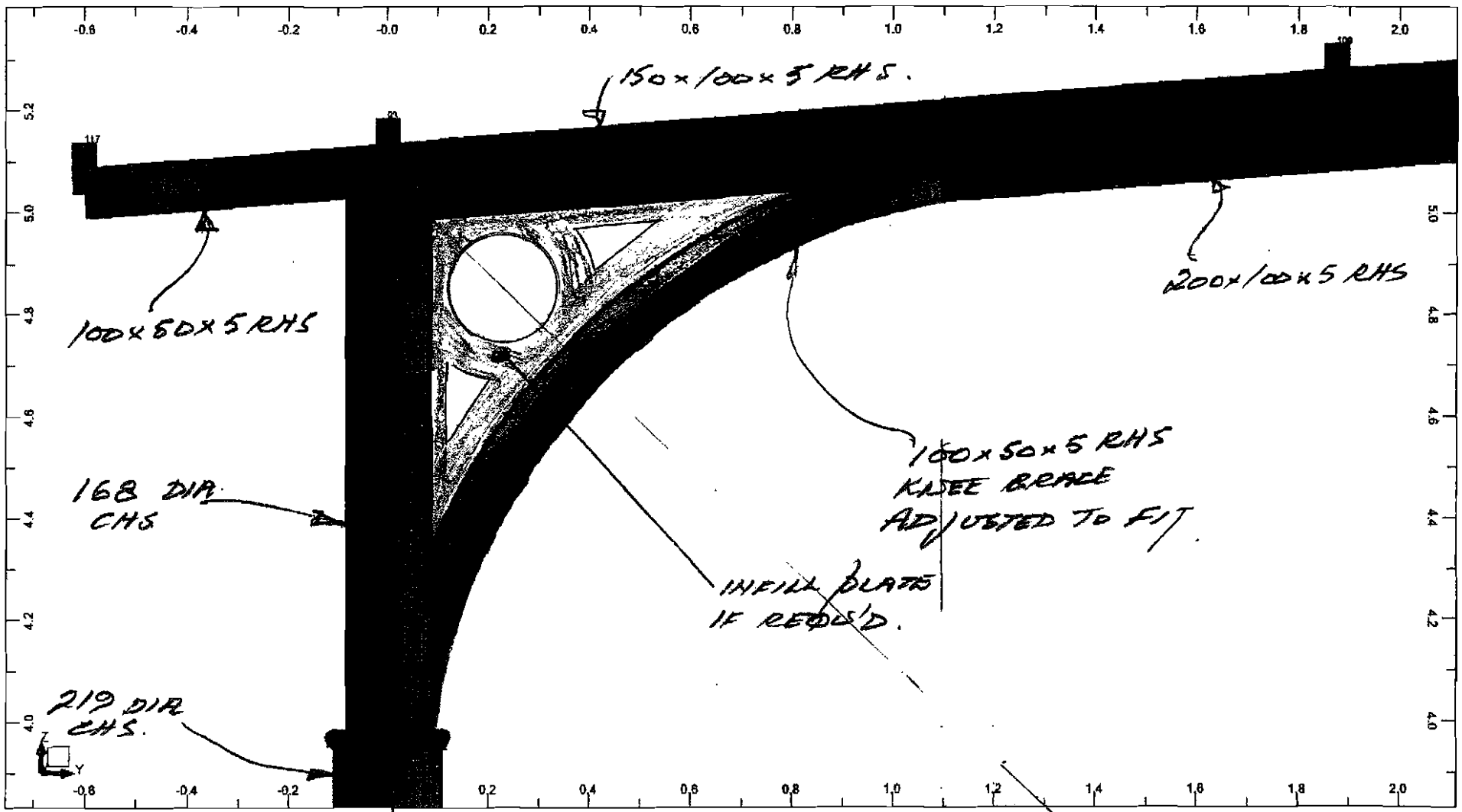


13

ROBOT v 20.1.5
Author: SPS
Address: Faber Maunsell

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File: **main canopy 5.rtd**
Project: main canopy 5

Structure - Cases: 8 (DL+Snow)



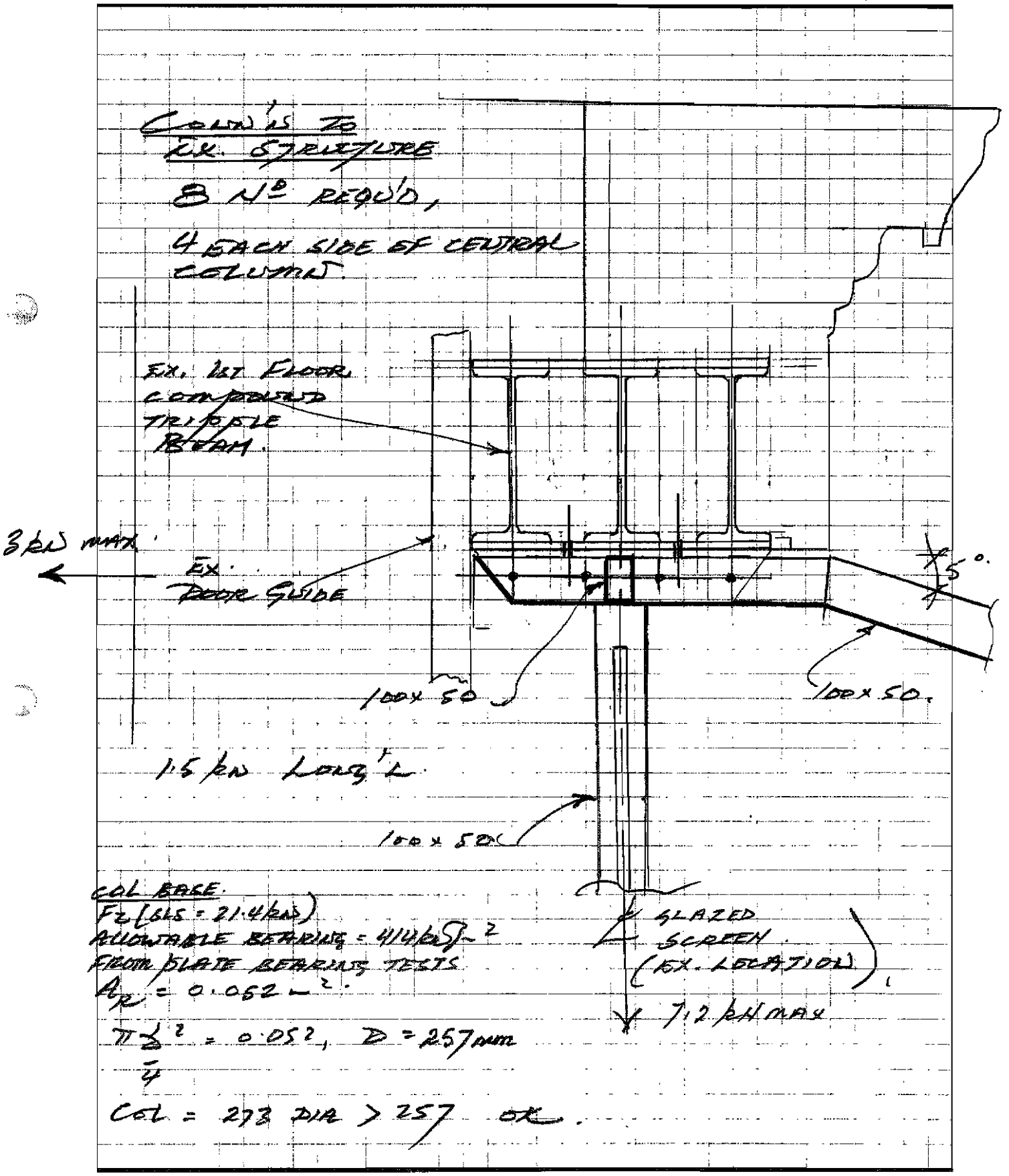
14

Project: Ref:

Section: Job No:

Date:

Made by: Checked by: Sheet No: 15 of



APPENDIX F

King Sturge

083391/LO/2007/C1

RETROSPECTIVE - LISTED BUILDING CONSENT - for the installation of new entrance doors, signage and associated internal fit out.

Approved

083216/FO/2007/C1

RETROSPECTIVE - Installation of new shop front

Approved

077895/LO/2005/C1

LISTED BUILDING CONSENT installation of 1 no. externally illuminated projecting sign

Approved

077894/AO/2005/C1

Installation of 1 no. externally illuminated projecting sign

Approved

074042/LO/2004/C1

RETROSPECTIVE LISTED BUILDING CONSENT for two illuminated signs to Exchange Square elevation

Approved

074042/LO/2004/C1

High level illuminated banners, individually lettered name signs and centre logo signs to hanging ditch, cathedral st and fennel st elevations

Approved

070473/AOH/2003/C1

High level illuminated banners, individually lettered name signs and centre logo signs to hanging ditch, cathedral st and fennel st elevations

Approved

070472/LO/2003/C1

LISTED BUILDING CONSENT high level illuminated banners, individually lettered name signs, and centre logo signs to hanging ditch, cathedral st and fennel st elevations

Approved

069392/LO/2003/C1
LISTED BUILDING CONSENT alterations to elevations and interior, erection of external sculptures and new entrance
Approved

069391/FO/2003/C1
Alterations to elevations and interior, erection of external sculptures and new entrance
Approved

069315/LO/2003/C1
Listed building consent retrospective application for internal fit out works for retail unit
Approved

067983/LO/2003/C1
LISTED BUILDING CONSENT construction of new steel framed licenced 'Sky Bar' within the former trading hall

067982/FO/2003/C1
Construction of new steel framed licensed 'Sky Bar' within the former trading hall
Approved

065947/AOH/CITY1/02
A provisional panel fixed to the building by small ringbolts and located above the main entrance
Approved

063293/LO/CITY1/01
LISTED BUILDING CONSENT installation of a satellite dish on roof
Approved

063291/FO/CITY1/01
Installation of a 2.1m diameter satellite dish on roof
Approved

062476/AO/CITY1/01
Signs to proposed canopies and attached to the existing building, including flags and high level signage
Approved
062474/LO/CITY1/01
LISTED BUILDING CONSENT Proposed canopies, signage and lighting

Approved

062473/FO/CITY1/01

Proposed canopies, lighting to Fennel Street, Cathedral Street and Hanging Ditch

Approved

061432/LO/CITY01

LISTED BUILDING CONSENT Installation of new shop front and internal alterations

Approved

054722/LL/CITY1/98

LISTED BUILDING CONSENT Refurbishment and internal and external alterations to Corn Exchange

Approved

054721/FO/CITY1/98

Refurbishment and external alterations to corn exchange in association with the re-use of the building to provide a mix of food and drink, retail and night-club uses (basement, ground and first floors) and office use on the upper floors.

Approved

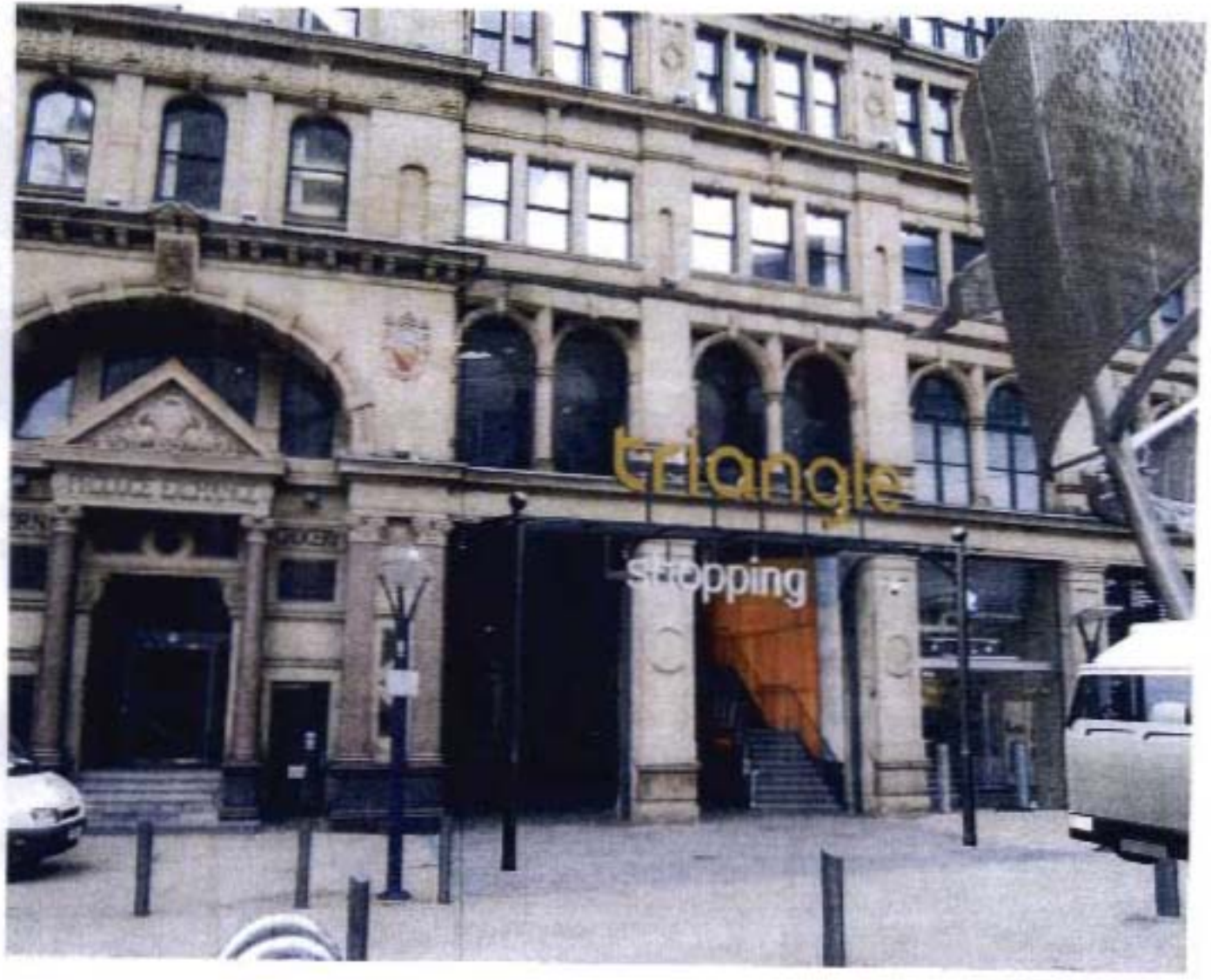
FIGURE 1

Before

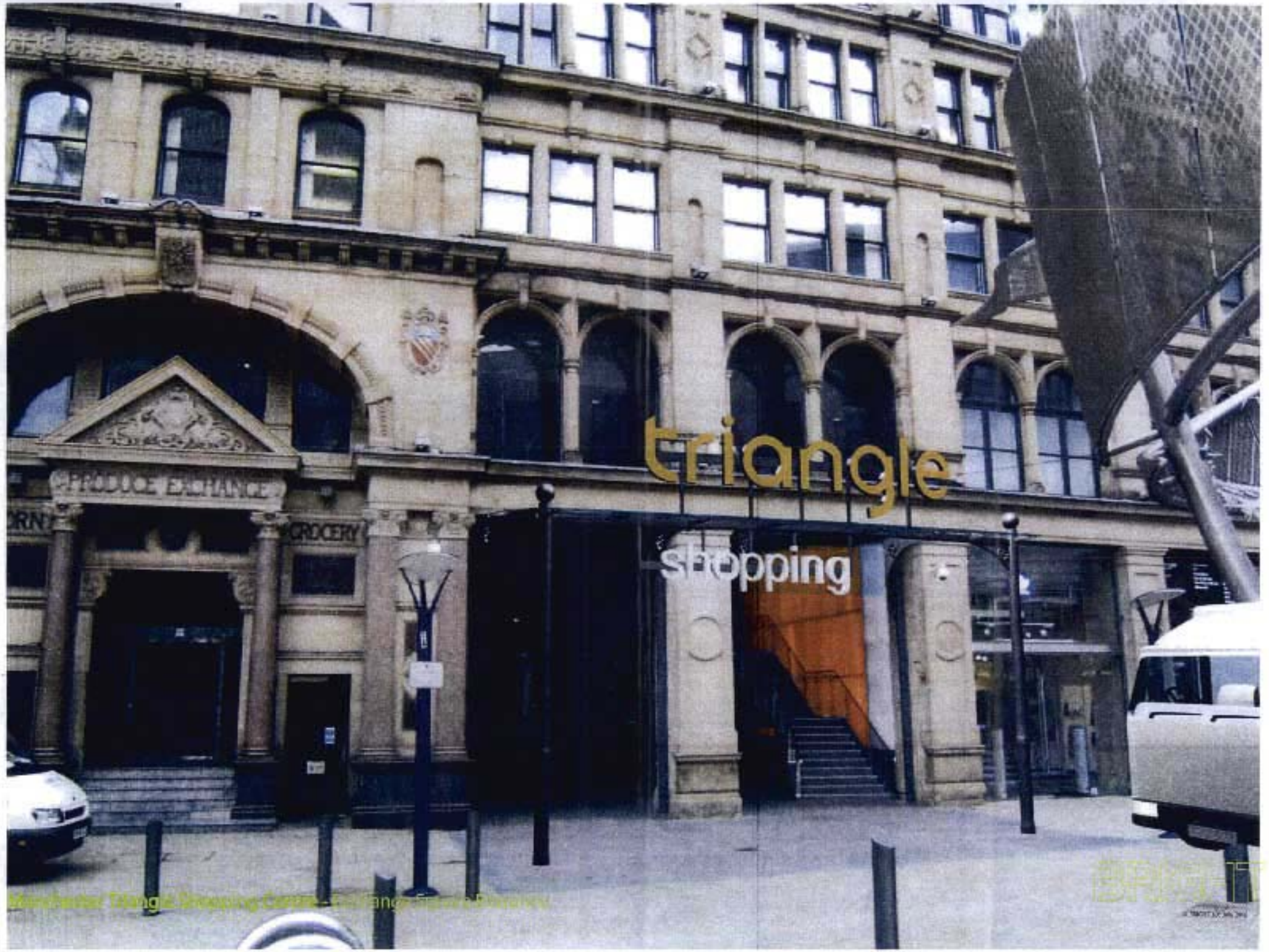




After



Manchester Triangle Shopping Centre - Exchange Square Entrance


triangle
shopping
PRODUCE EXCHANGE
GROCERY


triangle
shopping

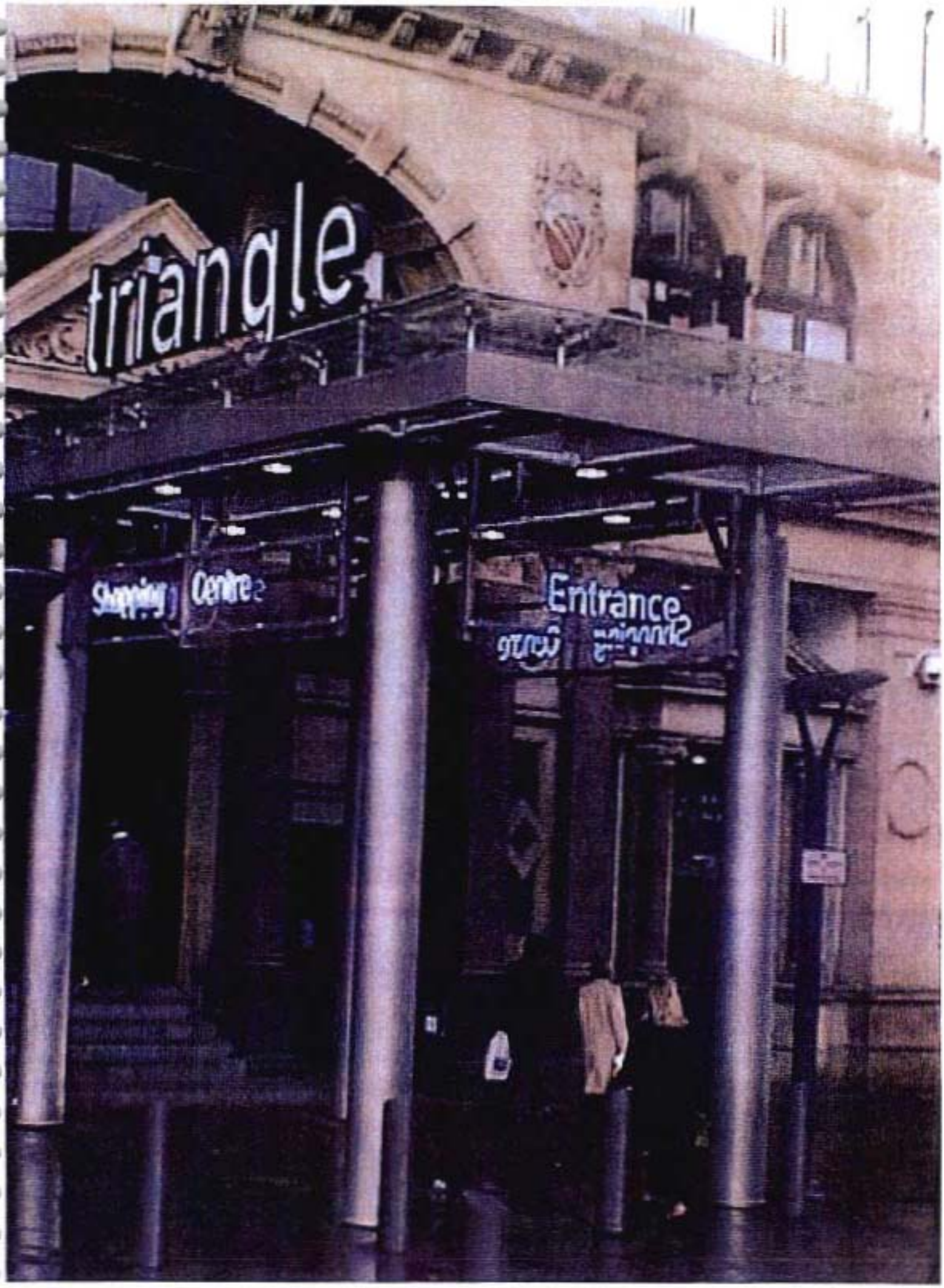


Manchester Triangle Shopping Centre - Exchange Square Entrance.


triangle
BRIGHT

FIGURE 2


triangle
Shopping Centre
Entrance


triangle
Entrance


Entrance
No skateboarding or rollerskating


triangle
Shopping Centre
BOOKS


triangle
Shopping Centre

King Sturge

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