



Figure - 2.1



Figure - 2.2

STEP 10 - EXHAUST DISH HAS TO BE FIXED

- Polycarbonate with exhaust fan has to be handled with care during installation. (exhaust fan is pre-assembled)
- exhaust dish has to be fixed on top of exhaust fan, As shown in figure 2.4



Exhaust fan - Figure 2.3



Exhaust Dish - Figure 2.4

STEP 11 - DOOR LOCK

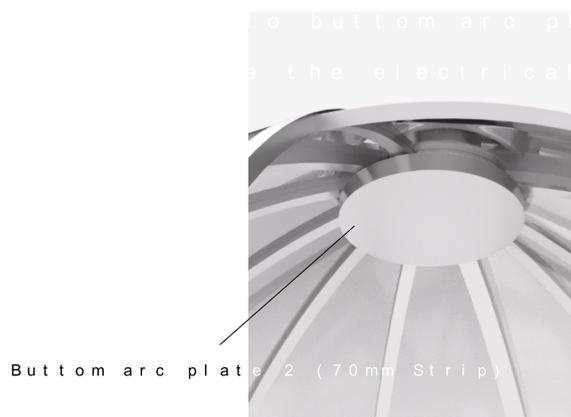
- make sure that polycarbonate is fixed properly with given key slot in polycarbonate matches the door lock
- door lock will be pre-assembled in door side profile.
- make sure that after assembly door lock is fixed as shown in figure 2.5



Lock - Figure 2.5

STEP 12 - INSTALL ELECTRICAL

- Electrical Management strip has to
- All electrical cables has to be enc



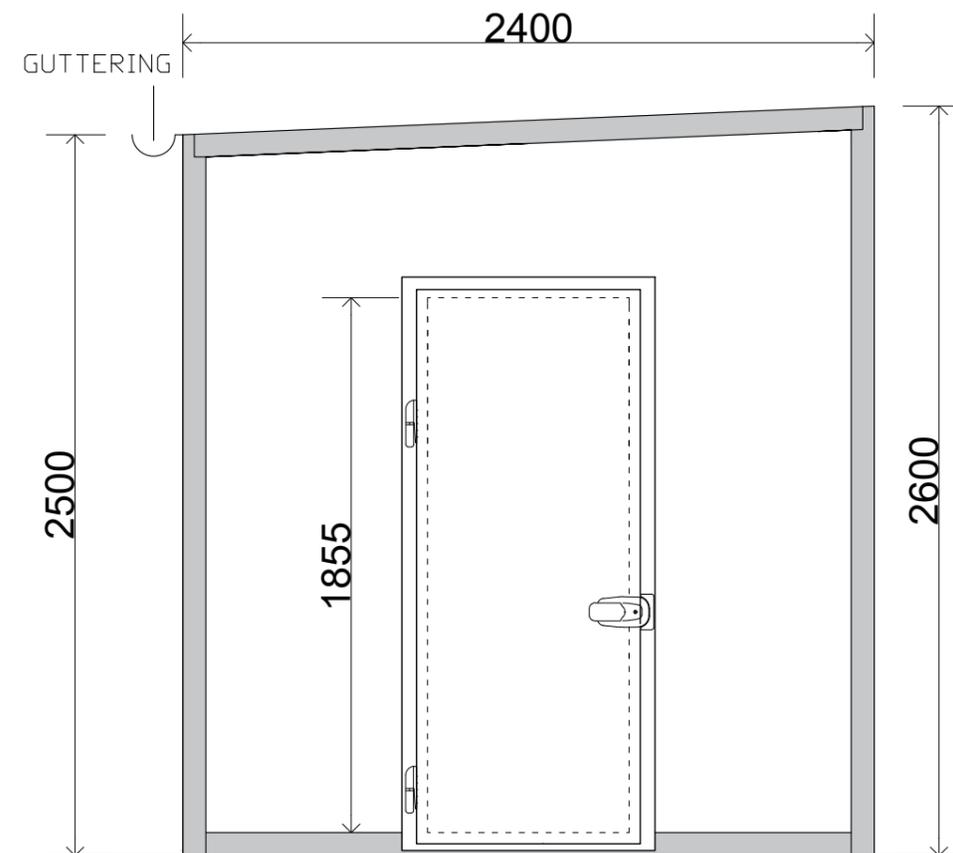
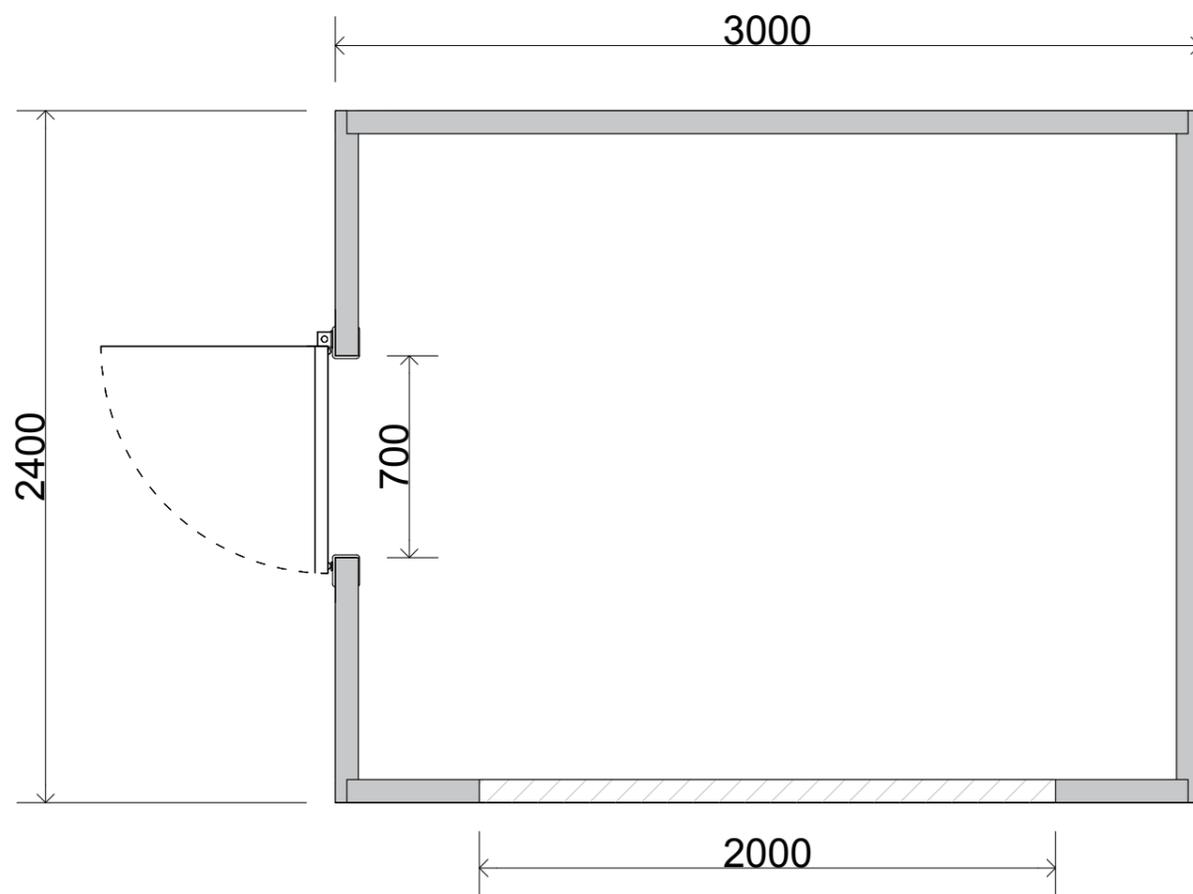
Electrical management - figure 2.6

STEP 13 - SPL

- Fix the polycarbonate in the prov
- After that EPDM's has to be fixed Garden pearl.



Splash gaurd- figure 2.7



Notes:

Drawn by:

H.H

Project:

Insulated Room

Date:

11.07.22

Scale @ A3:

N/A

Revision:

A

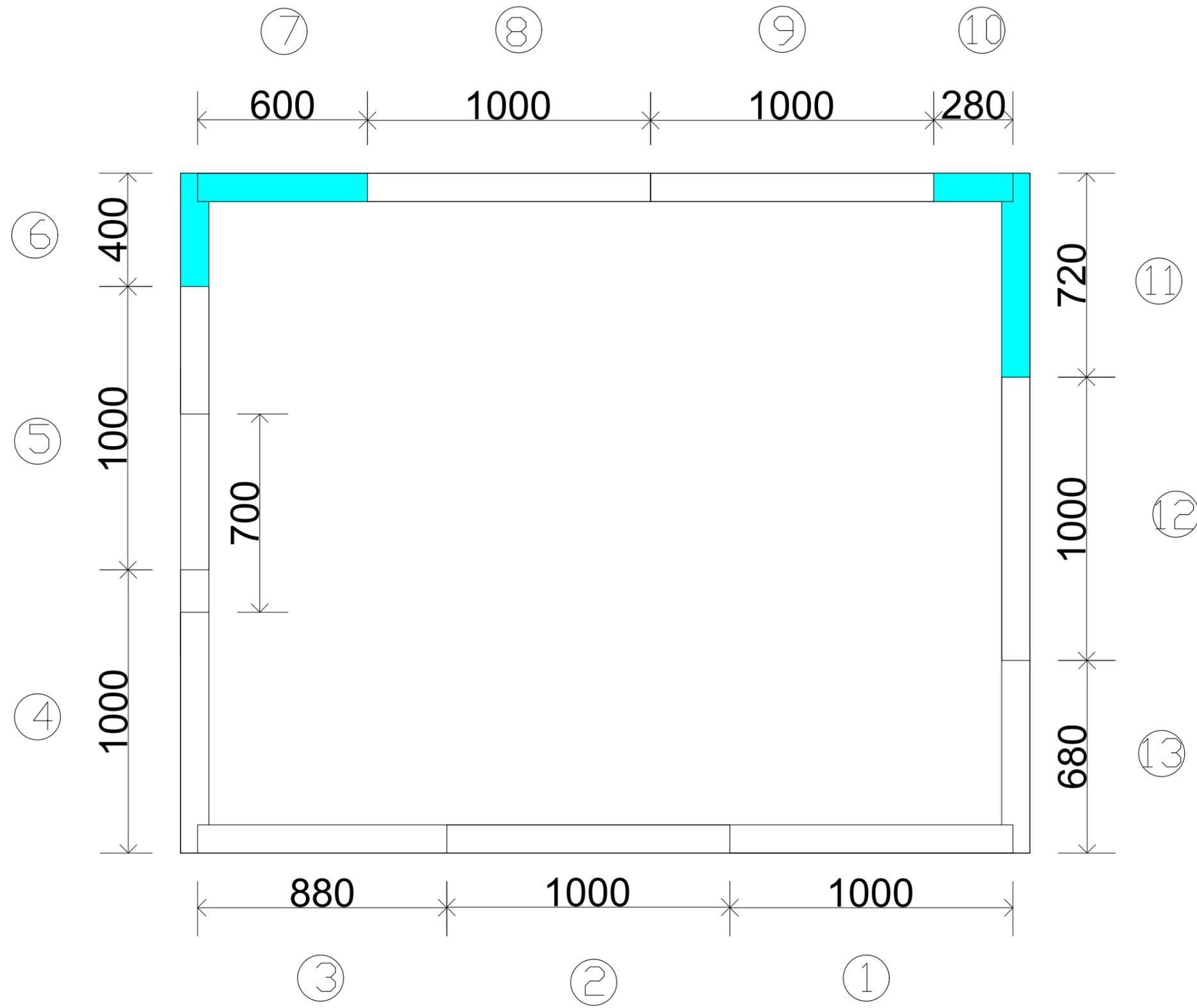
Client:

Keasim Events Ltd

Drawing Title:

22.199.02





Notes:

Drawn by:
H.H

Client:
Keasim Events Ltd

Project:
Insulated Room
Layout

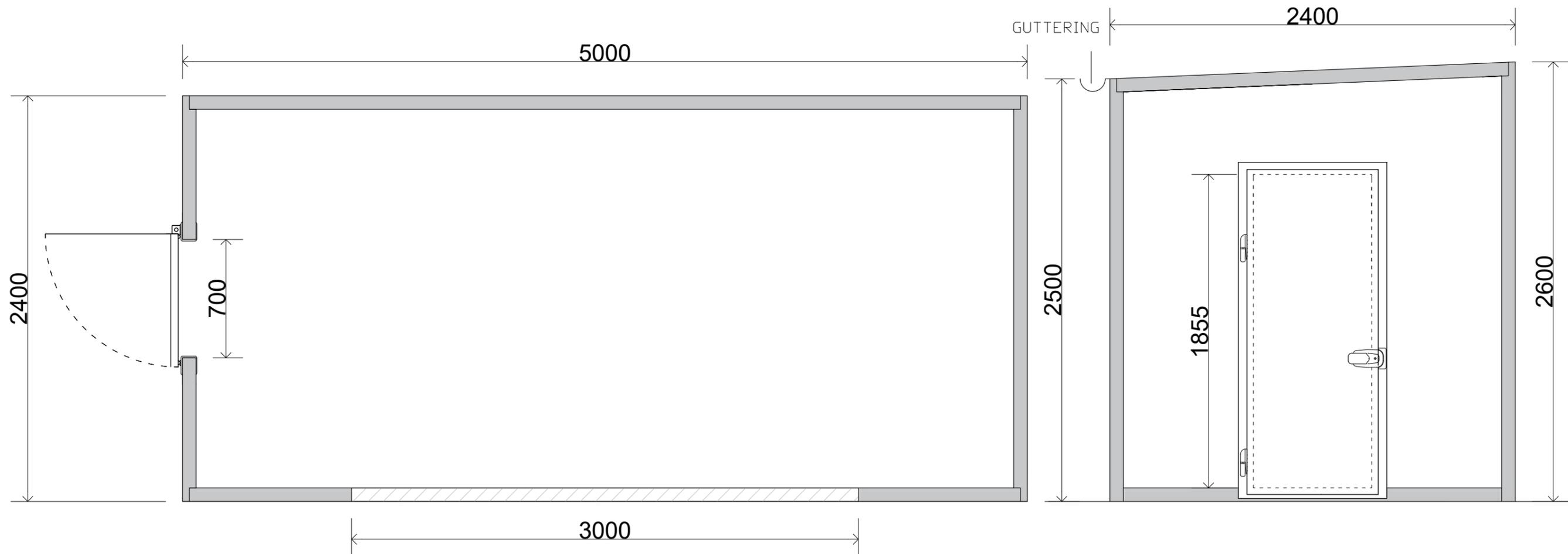
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22.199.02B

Date:
11.07.22

Scale @ A3:
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Revision:
A





Notes:

Drawn by:
H.H

Project:
Insulated Room

Date:
11.07.22

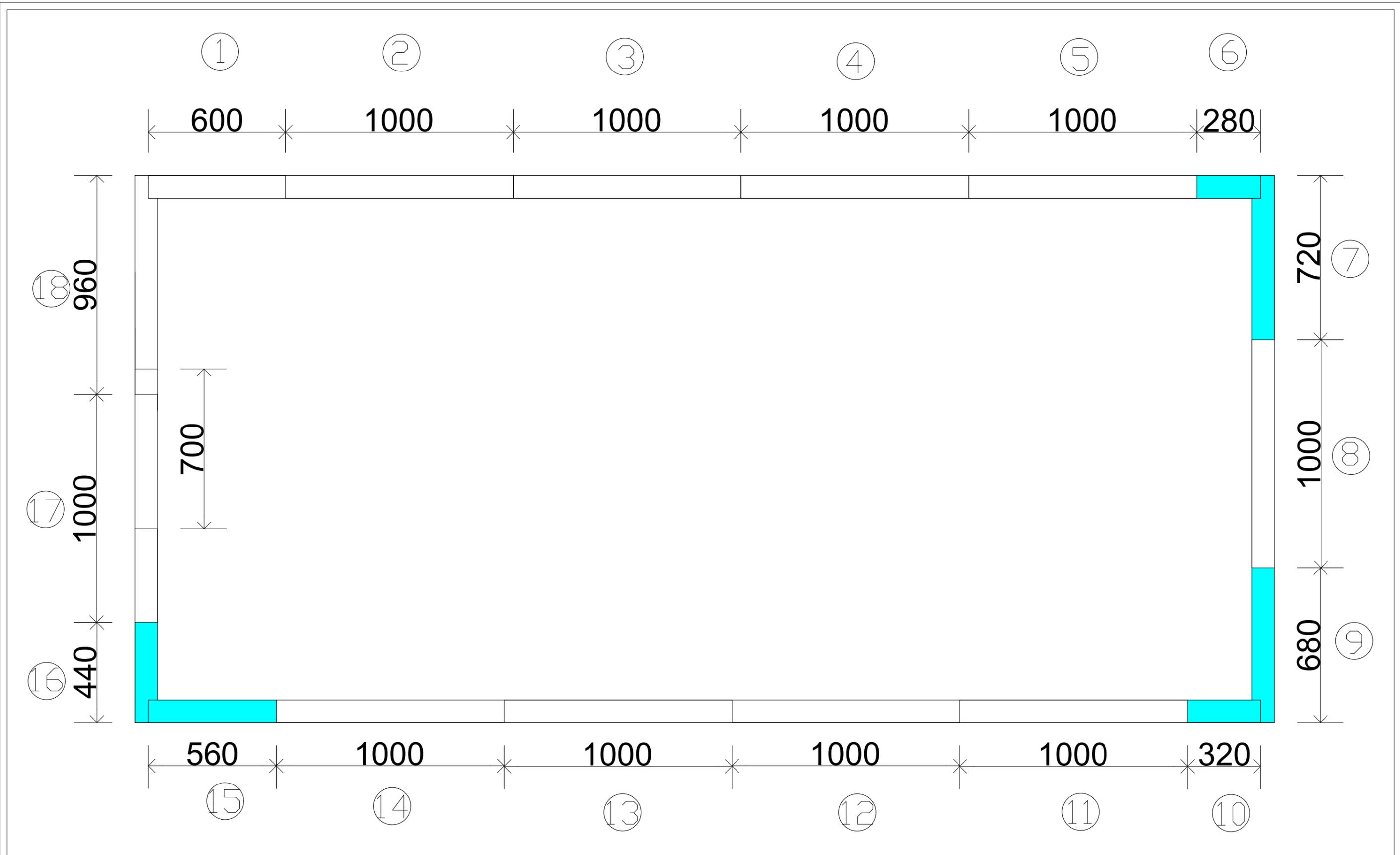
Client:
Keasim Events Ltd

Drawing Title:
22.199.01

Scale @ A3:
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Revision:
A





Notes:

Drawn by:
H.H

Client:
Keasim Events Ltd

Project:
Insulated Room
Layout

Drawing Title:
22.199.01B

Date:
11.07.22

Scale @ A3:
N/A

Revision:
A



APPENDIX 3 WAVERLEY MALL – PLAZA ROOF LOAD ASSESSMENT

Job No. E10622

Client: Waverley Mall

**Waverley Mall
Plaza Roof Load Assessment**

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Date: 28th June 2017



**Waverley Mall
Plaza Roof Load Assessment**

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- **Appendix C** Approximate Density of Occupation Guide
- **Appendix D** Loading Code Extracts
- **Appendix D** Charles Darley Report

Waverley Mall Plaza Roof Load Assessment

1.0 Executive Summary

Will Rudd Davidson have undertaken an investigation of the existing reinforced concrete roof slabs for Costa Coffee and Tourist Information on the upper roof plaza for the proposed enhancement of their current use. Currently the 3 no. roof areas are inaccessible other than for maintenance purposes. It is proposed to convert the use of the space to provide access for bar/restaurant seating.

Intrusive investigations were carried out by Charles Darley and Associates Ltd. Reinforcement was exposed at four locations (2 no. on downstand beams & 2 no. on midspan of slab). Using the reinforcement details recorded, in tandem with the original design codes for the construction period we have adopted slab and beam arrangements which allow us carry out analysis of the slab.

The slabs did not pass the modern imposed loading criteria for assembly areas with fixed seating of 4.0 kN/m^2 (400kg/m^2), but were estimated to have a capacity to carry 2.0kN/m^2 (200kg/m^2). Similarly, the beam analysis confirms a capacity to carry 2.0 kN/m^2 (200kg/m^2).

The proposed seating arrangement as per drawing included in Appendix A, could be accommodated within the 2.0kN/m^2 capacity of the slab provided the relevant fixed furniture and crowd control measures were adopted.

Waverley Mall Plaza Roof Load Assessment

2.0 Introduction

Will Rudd Davidson have undertaken an investigation of the existing reinforced concrete roof slabs for Costa Coffee and Tourist Information on the upper roof plaza for the proposed reconfiguration of the upper plaza area. Currently the 3no roof areas are inaccessible other than for maintenance purposes.

It is understood that it is proposed to convert the use of the space to provide access for a temporary terrace from June – September for bar/restaurant usage. The proposed alterations would increase the loading criteria as follows:-

- Roof access for maintenance only: 0.6kN/m² (60kg/m²)
- Assembly area with fixed seating: 4.0kN/m² (400kg/m²)

We have undertaken a review of the available drawings from Waverley Mall's record drawings and those available within Edinburgh City council archives. The available drawings confirmed the general arrangement of columns and beams along with the slab thickness and concrete grade but did not contain any details for reinforcement within the slab.

Intrusive investigations were carried out by Charles Darley and Associates Ltd. Access for testing was provided to the fire escape of Costa Coffee as well as the rear offices for Tourist Scotland. No access was available for carrying out intrusive investigations to the soffit of the slab for Tourist Scotland. Please refer to the attached plans confirming testing locations (Appendix B).

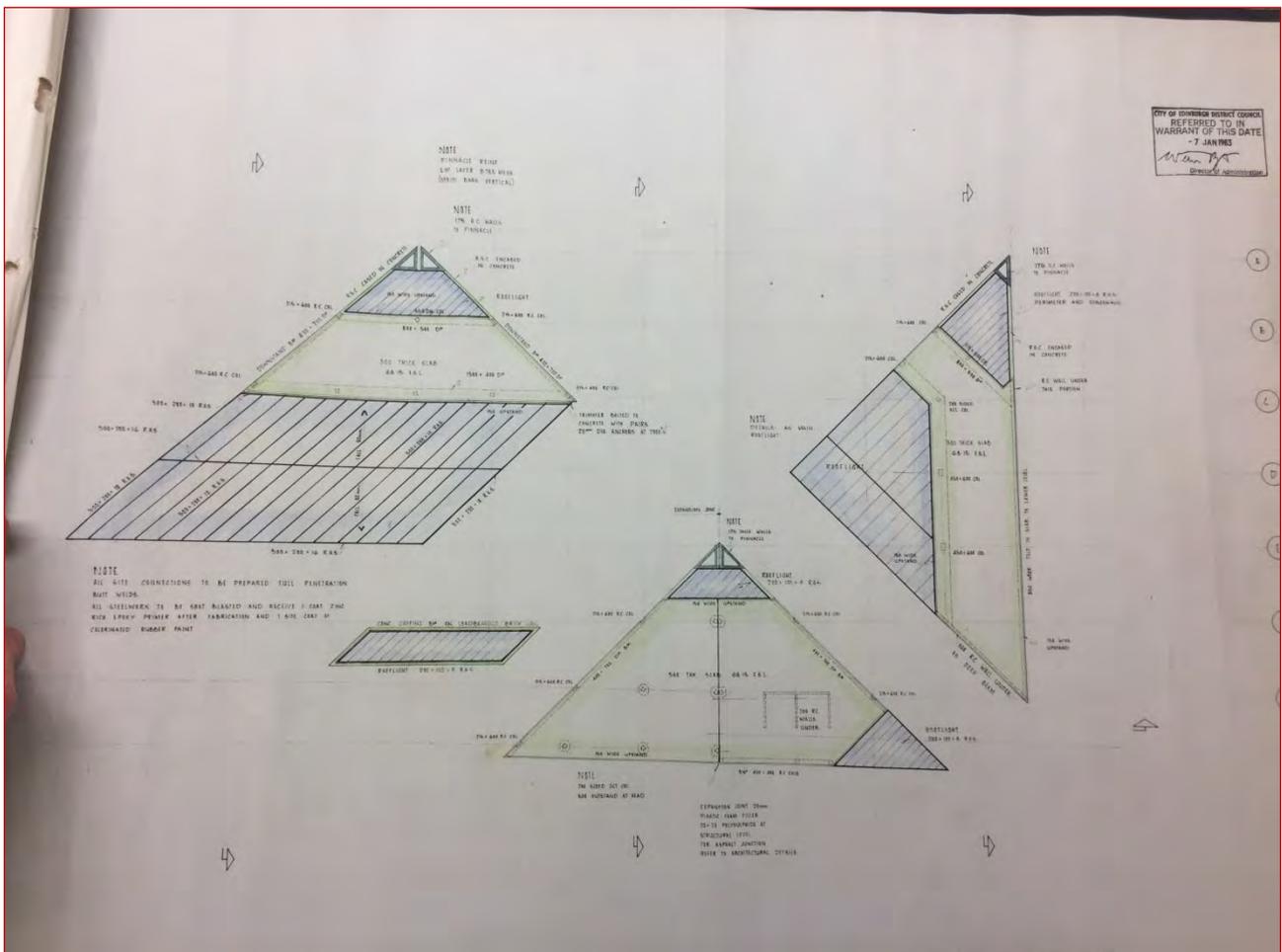
Reinforcement was exposed at four locations (2 no. on downstand beams & 2 no. on midspan of slab). A cover meter was then used to supplement the intrusive works and measure the spacing between bars. As we were working in confined spaces, the extents of the survey are restricted.

Waverley Mall Plaza Roof Load Assessment

3.0 Observations

Archive Drawing Retrieval and Review

Archive drawings were retrieved for viewing from the Council plan store & from within the sites record drawings, and photographic reference taken. The original building was built circa 1982. From a review of the available archive drawing information, we were able to determine the engineering design philosophy and thus coordinate intrusive investigations.



Upper Roof Plan

It is noted that similar forms of construction have been used to the Costa coffee and Tourist Information office roof structures.

The roof make up for the Tourist Information Centre is more typical of the upper and lower mall levels with flat slab construction and splayed column head to the underside of the slab. The slab thickness for Tourist information Centre roof slab is 300mm thick while the lower levels are 350mm thick.

Waverley Mall Plaza Roof Load Assessment

Review of the Current Codes with Regards Floor Loading Criteria

Superimposed floor loadings vary with different types of property, and different categories of occupancy.

These are based on a maximum worst case characteristic loading below which, there is an extremely low risk of structural failure.

Imposed Floor Loadings according to the British Standard BS6399 for examples of different occupancy are as follows:-

- | | | | |
|--|---|-----------------------|-------------------------|
| • Domestic and Residential | - | 1.5 kN/m ² | (150kg/m ²) |
| • Restaurants | - | 2.0 kN/m ² | (200kg/m ²) |
| • Assembly areas with fixed seating | - | 4.0 kN/m ² | (400kg/m ²) |
| • Assembly areas without fixed seating | - | 5.0 kN/m ² | (500kg/m ²) |

Appendix C gives an approximation of the density of occupancy for different imposed loadings for ease of reference.

Waverley Mall Plaza Roof Load Assessment

Structural Analysis of Reinforced Slab and Beams

Numerical calculation of the performance of structures is important, in relation to new buildings and conversion of existing buildings, where proof of structural safety and compliance is concerned.

Modern codes of practice provide imposed loading criteria for different building use, and require that factors of safety be applied to these loadings to ensure structural safety in design. Furthermore, material design properties in design codes are presented based on standard deviations providing a further safety margin, whereby conservative solutions result.

Some theoretical beam analyses have been carried out, and results established:-

- The capacity of the reinforced slabs for both Costa Coffee and Tourist information Scotland is 2.0kN/m^2 (200kg/m^2). This coincides with the capacity of the downstand beam analysis on Costa Coffee.
- The downstand beam on the external north elevation of Costa was also investigated. The reinforcement identified was not consistent with the reinforcement exposed elsewhere and is considered that the main beam reinforcement was not exposed but rather reinforcement which were tying into the adjoining boundary wall on the east elevation.

Waverley Mall Plaza Roof Load Assessment

4.0 Conclusions

Using the reinforcement details recorded, in tandem with the original design codes for the construction period we have adopted slab and beam arrangements which allow us carry out analysis of the slab and beams.

The slabs did not pass the modern imposed loading criteria for assembly areas with fixed seating of 4.0 kN/m² (400kg/m²), but were estimated to have a capacity to carry 2.0kN/m² (200kg/m²). Similarly, the beam analysis confirms a capacity to carry 2.0 kN/m² (200kg/m²).

The proposed seating arrangement as per drawing included in Appendix A, could be accommodated within the 2.0kN/m² capacity of the slab provided the relevant fixed furniture and crowd control measures were adopted. The imposed loading achieve is as per BS6399 Table 1 - Category C1 "*Public Institutional & Communal dining room & lounges, cafes & Restaurants*" Refer to relevant extract in Appendix D.

No access for intrusive investigation was available for Tourist Information Centre. The construction of this roof space differs to that of the office area & Costa Coffee. While we do not have any details of the reinforcement in the slab, we would anticipate that similar design intent was carried out across all roofs and therefore it would be considered likely similar load capacities for this space would be achievable.

It is considered that the existing plaza level would have been designed to have an imposed load capacity equal to (or likely greater than) those of the above noted roof structures. Furthermore, this space has previously occupied to the required loading classification as per BS6399 Table 1 - Category C1 "*Public Institutional & Communal dining room & lounges, cafes & Restaurants*".

5.0 Recommendations

We would recommend that the proposed furniture arrangements are coordinated to ensure they are within the allowable limits of the slab. Sufficient security control measures will be required to control the occupancy of the roof area.

For the proposed areas to become occupied, suitable hand railing will need to be provided to meet the current standards of that it does not allow the passage of a 99mm sphere and is suitable for the proposed occupancy crowd loadings. Refer to appended minimum imposed loading extracts from the relevant loading codes.

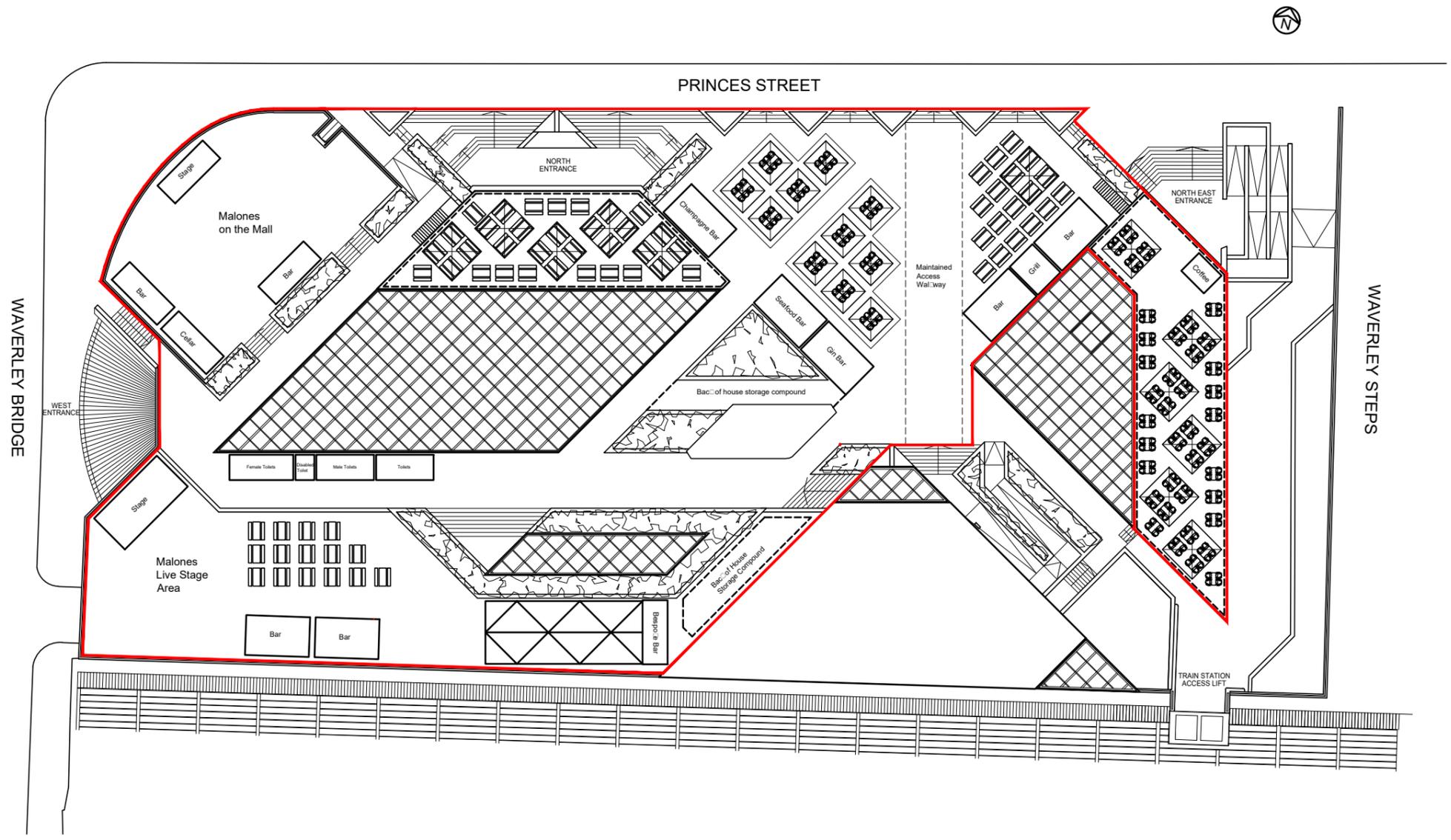
Should the roof space of the Tourist Information Centre wish to be utilised, further intrusive investigations would be required. The investigations would require access to both the underside and top side of the slab which would penetrate any waterproof details.

Should the plaza space require confirmation of a load capacity in excess of the noted 2.0kN/m² for Public Institutional lounges, cafes & restaurants then further intrusive investigations should be carried out to verify its capacity.

**Waverley Mall
Plaza Roof Load Assessment**

Appendix A - Proposed Seating Arrangement





Plan a Roof Plan Layout

**Waverley Mall
Plaza Roof Load Assessment**

Appendix B - Testing Locations



NOTE
 PINNACLE REINF
 1st LAYER B785 MESH
 (MAIN BARS VERTICAL)

NOTE
 175 RC WALLS
 TO FINNACLE

NOTE
 175 RC WALLS
 TO FINNACLE

NOTE
 ROOFLIGHT 200x100x8 R.R.B.
 PERIMETER AND DIAGONALS

NOTE
 R.C. ENCASED
 IN CONCRETE

NOTE
 R.C. WALL UNDER
 THIS PORTION

NOTE
 MIDSPAN OF SLAB

NOTE
 DOWNSTAND BEAM

NOTE
 MIDSPAN OF SLAB

NOTE
 DOWNSTAND BEAM

NOTE
 TRIMMER BALLED TO
 CONCRETE WITH PAIRS
 20mm DIA ANCHORS AT 200mm

NOTE
 DETAILS AS MAIN
 ROOFLIGHT

NOTE
 175 THICK WALLS
 TO FINNACLE

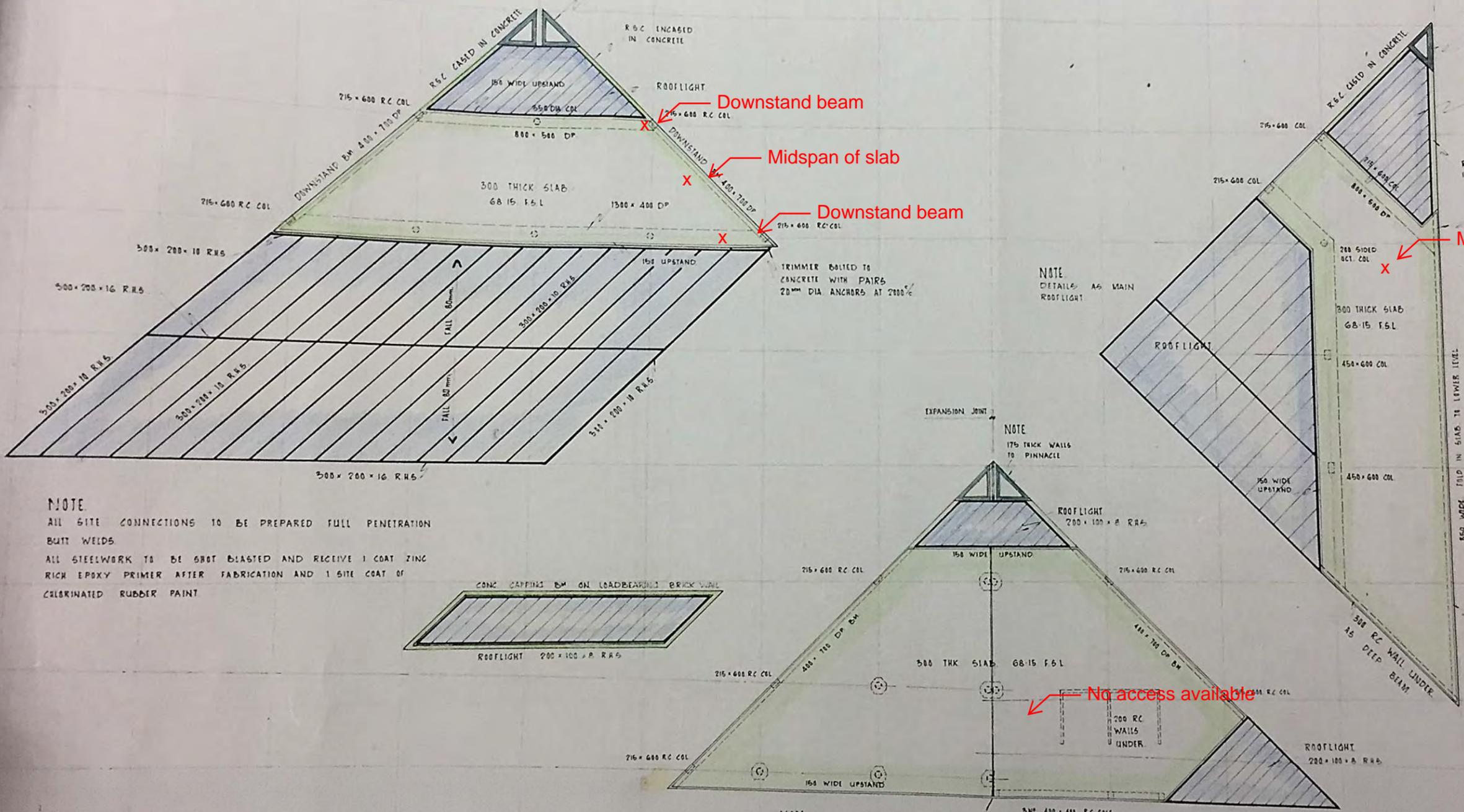
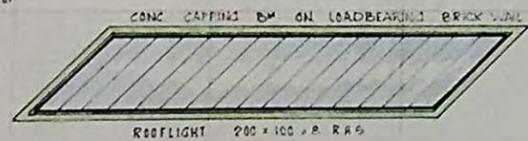
NOTE
 ROOFLIGHT
 200x100x8 R.R.B.

NOTE
 NO ACCESS AVAILABLE

NOTE
 200 SIDED OCT. COL
 500 OUTSTAND AT HEAD

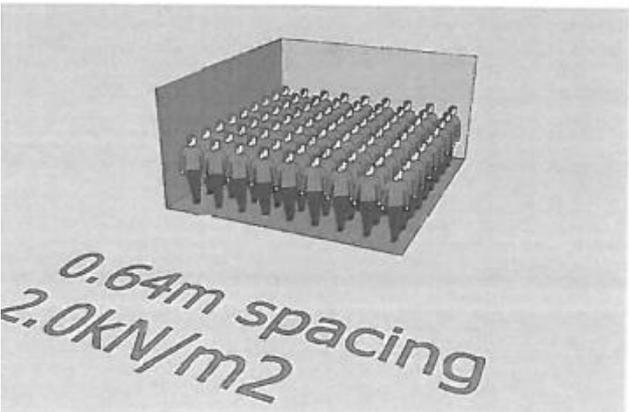
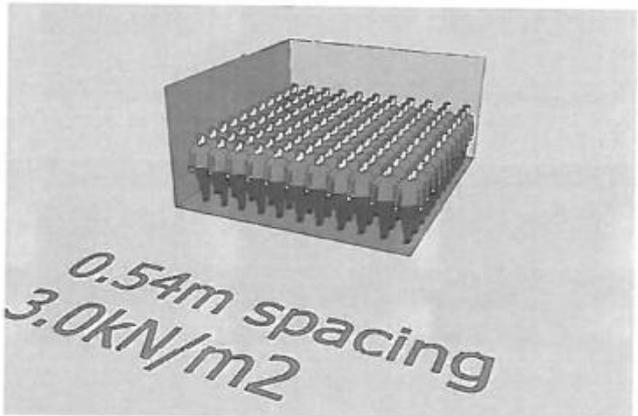
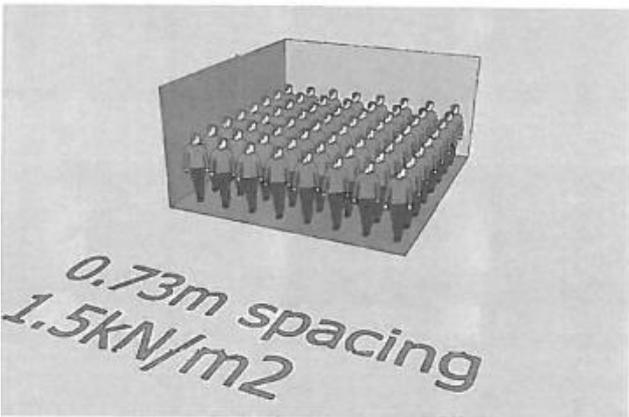
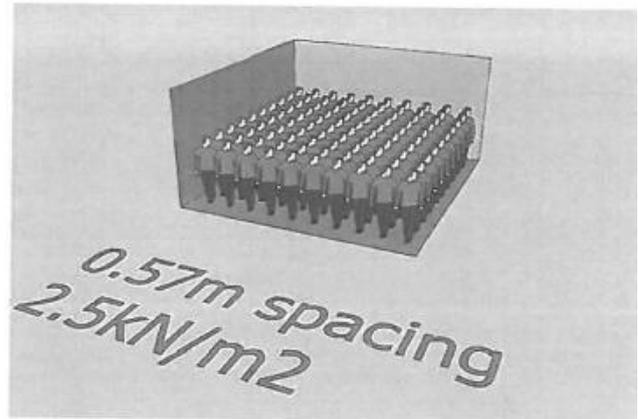
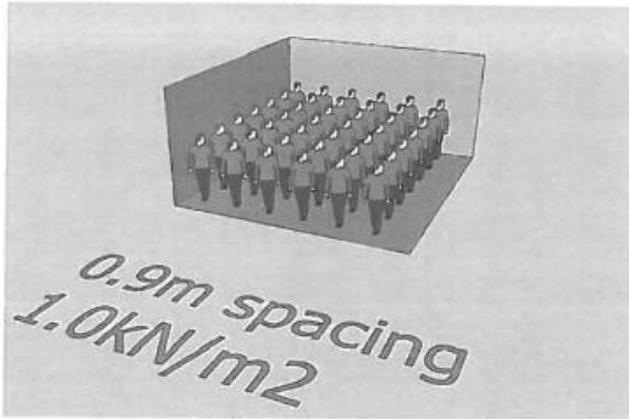
EXPANSION JOINT 20mm
 PLASTIC FOAM FILLER
 20x20 POLYSULPHIDE AT
 STRUCTURAL LEVEL
 FOR ASPHALT JUNCTION
 REFER TO ARCHITECTURAL DETAILS

NOTE
 ALL SITE CONNECTIONS TO BE PREPARED FULL PENETRATION
 BUTT WEIDS
 ALL STEELWORK TO BE SHOT BLASTED AND RECEIVE 1 COAT ZINC
 RICH EPOXY PRIMER AFTER FABRICATION AND 1 SITE COAT OF
 CELEBRATED RUBBER PAINT



**Waverley Mall
Plaza Roof Load Assessment**

Appendix C - Approximate Density of Occupation Guide



Approximate density of occupancy to achieve various floor loadings (does not allow for furniture, fixtures or fittings).

Each person illustrated represents an 80kg (approx 12.5 stone) adult.

Waverley Mall Plaza Roof Load Assessment

Appendix D - Loading Code Extracts - BS 6399

Table 1 — Minimum imposed floor loads (continued)

Type of activity/occupancy for part of the building or structure	Examples of specific use	Uniformly distributed load kN/m ²	Concentrated load kN
C Areas where people may congregate	Public, institutional and communal dining rooms and lounges, cafes and restaurants (See note 2)	2.0	2.7
C1 Areas with tables	Reading rooms with no book storage	2.5	4.5
	Classrooms	3.0	2.7

Table 4 — Minimum horizontal imposed loads for parapets, barriers and balustrades, etc.

Type of occupancy for part of the building or structure	Examples of specific use	Horizontal uniformly distributed line load (kN/m)	A uniformly distributed load applied to the infill (kN/m ²)	A point load applied to part of the infill (kN)
A Domestic and residential activities	(i) All areas within or serving exclusively one (E) single family (E) dwelling including stairs, landings, etc. but excluding external balconies and edges of roofs (see C3 ix)	0.36	0.5	0.25
	(ii) Other residential, (but also see C)	0.74	1.0	0.5
B and E Offices and work areas not included elsewhere including storage areas	(iii) Light access stairs and gangways not more than 600 mm wide	0.22	N/A	N/A
	(iv) Light pedestrian traffic routes in industrial and storage buildings except designated escape routes	0.36	0.5	0.25
	(v) Areas not susceptible to overcrowding in office and institutional buildings also industrial and storage buildings except as given above	0.74	1.0	0.5
C Areas where people may congregate	(vi) Areas having fixed seating within 530 mm of the barrier, balustrade or parapet	1.5	1.5	1.5
C1/C2 Areas with tables or fixed seating	(vii) Restaurants and bars	1.5	1.5	1.5
C3 Areas without obstacles for moving people and not susceptible to overcrowding	(viii) Stairs, landings, corridors, ramps	0.74	1.0	0.5
	(ix) External balconies and edges of roofs. Footways and pavements within building curtilage adjacent to basement/sunken areas	0.74	1.0	0.5
C5 Areas susceptible to overcrowding	(x) Footways or pavements less than 3 m wide adjacent to sunken areas	1.5	1.5	1.5
	(xi) Theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studio. Footways or pavements greater than 3 m wide adjacent to sunken areas	3.0	1.5	1.5
	(xii) (E) Grandstands and stadia (E)	See requirements of the appropriate certifying authority		
D Retail areas	(xiii) All retail areas including public areas of banks/building societies or betting shops. For areas where overcrowding may occur, see C5	1.5	1.5	1.5
F/G Vehicular	(xiv) Pedestrian areas in car parks including stairs, landings, ramps, edges or internal floors, footways, edges of roofs	1.5	1.5	1.5
	(xv) Horizontal loads imposed by vehicles	See clause 11		
(E) Note deleted. (E)				

Waverley Mall

28th June 2017

**Waverley Mall
Plaza Roof Load Assessment**

Appendix E - Charles Darley Report



CHARLES
DARLEY
ASSOCIATES

**Report on Investigation of Slab at
Waverley Mall
Princes Street, Edinburgh**



1632

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CHARLES
DARLEY
ASSOCIATES

For the attention of Paul Nilan Esq.

**Report on Investigation of Slab at Waverley Mall
Princes Street, Edinburgh**

1. Introduction

In accordance with your e.mail instructions of 26th May, we have conducted a covermeter survey of the Waverley Mall roof slab. The work on site was done on 29th May 2017 by a team led by our Mr. A. McFarlane. This report details our findings.

Opinions and interpretations expressed herein are out with the scope of our UKAS accreditation. We confirm that in preparing this report we have exercised all reasonable skill and care.

2. Inspection and Testing

2.1 Concrete Cover to Reinforcement

Measurements were made of spacing and depth of concrete cover to reinforcement in accordance with BS1881:Part 204: 1988. The test details were as follows:-

- | | | |
|----|----------------------------------|---|
| a) | Date of test | 29th May 2017 |
| b) | Components tested | Slab soffit |
| c) | Details of concrete in test area | See Appendix 1 |
| d) | Location of test areas | See Appendix 1 |
| e) | Make of cover meter | Elcometer 331 |
| f) | Accuracy of covermeter | +/- 2mm or +/- 5%, whichever is greater.
On site +/- 5mm or +/- 15%, whichever is greater, or cover not exceeding 100mm. |
| g) | Details of calibration | Laboratory calibrated 26.8.16. |
| h) | Measured cover | See Appendix 1 |
| i) | Arrangement of reinforcement | See Appendix 1 |



For Charles Darley and Associates Ltd.

1 of 14



APPENDIX 4 TIMBER ROOF SECTION