ARCHITECTURAL TECHNOLGY

Fire and Safety 1

Dissertation

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Fire Safety Report for

the Quad Building at

UCC

For

XXXXX

Prepared by Aidan Walsh

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Fire Safety Report

Introduction:

This report is submitted with the relevant drawings and other documentation in support of a Fire Safety certificate for the East and North Wing of the Quad building located on the main UCC campus, under Part B of The Technical Guidance Document 1997 and Part B of the Building Regulations 2006. It also complies with any changes or alterations that have been made to the regulations since.

The purpose of this report and the drawings that follow is to correct any errors that may appear on the building and bring them up to the current standards. In doing this we will ensure that the building is in complete compliance when it comes to doing the fire certificate.

This is a very old building and is protected under the conservation act. This in turn means that no major changes can be made to the building or its overall appearance. The building had a fire report and cert done as recently as April 2002 and therefore there are not many alterations that need to be made in order to bring it up to the current standards.

I am going to complete this report by looking at each section of Part B fire and stating what needs to be altered or fixed in order for the building to perform to the current standards. I will start with B1 and work my way down to B5.

B1: Means of escape in case of a fire:

The Quad building is made up mainly of offices and meeting rooms. There or not many changes or room alterations that need to be made in order to make the building comply with its current use. One noticeable alteration is the changing of the aula maxima, from an area of assembly to a canteen area. however this will still fall in order the same regulations and therefore it is in compliance with the regulations.

All travel distances were checked back in 2002 to ensure the building was in compliance and as they have not changed since it means that the building is still in compliance with the current regulations.

The emergency lighting and exit signs were also looked at and upgraded back in 2002 and are still sufficient to satisfy the current regulations.

The current fire detection and alarm system is sufficient an complies with the current standards set in the technical guidance documents.

The one major error I have found during my examination of the building is the fact that some doors that are located along emergency exit routes are opening in the wrong way and could impede someone's ability to exit the building in the case of an emergency. These doors have been highlighted in the drawings that follow. All doors were upgraded in2002 to fire doors that comply with Appendix B of the technical guidance documents. this means that although the swing of the door will have to change, the doors themselves can remain the same.

B2: Internal fire spread (linings):

On inspection of the building i found that there was damage to plaster in patches around the building. This will have to be dealt with appropriately in order for it to comply with the current regulations. I also noted there were certain amounts of internal damage to the roof around the building which also must be dealt with before a fire cert is approved for the building.

B3: Internal fire spread (Structure):

The existing structural elements of the building are not being altered by the proposed new use of the building.

The compartments that already exist in the building are sufficient and the only area where a new compartment is required is in the courtyard where the boiler room has been installed. this boiler room is going to be a compartment in itself and will be completely separate to the rest of the building. All openings for services and joints are to be fully fire stopped in accordance with section 3.4 of

the technical guidance document. This will ensure that the fire resistance of the building is not impaired. All services penetrating such barriers will be stopped using in tumescent mastic, gypsum plaster or sand/cement mortar.

B4:External fire spread:

The requirements in relation to space separation are considered to be met due to the fact that there is no increase in floor area. the only alteration being made to the structure is the installation of a boiler room in the courtyard. This will form a separate compartment on its own and will not increase the overall floor area of the building.

B5:Access and facilities for the fire service:

The requirements of B5 of Part B- Fire are already met in this building through the existing fire access and fire facilities. Therefore there is no need to make any alterations in terms of access and facilities for the fire service.

Fire Safety Certificate for

the Quad Building at

UCC

For

XXXXX

Prepared by Aidan Walsh

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Fire Safety Certificate

Introduction:

This certificate is submitted with the relevant drawings and other documentation in support of a Fire Safety certificate for the East and North Wing of the Quad building located on the main UCC campus, under Part B of The Technical Guidance Document 1997 and Part B of the Building Regulations 2006. It also complies with any changes or alterations that have been made to the regulations since.

The certificate and drawings that follow include all appropriate and required changes in order to make the building safe. All of the figures and drawings are in compliance with Part B (fire) of the building regulations.

Classification of building by purpose group:

Use: Office

Purpose group: 3

Purpose for which the building is being used: Premises used for the purpose of administration, clerical work (including writing, book keeping, sorting papers, filing, typing, duplicating, machine calculating, drawing and the editorial preparation of matter for publication, handling money (including banking and building society work), telephone system operation).

B1: Means of escape in case of a fire:

B1.2 Design for horizontal escape.

B1.2.2 Number of escape routes and exits.

B1.2.2.1 Number of occupants:

Room no.	Room type	Occupant Factor	Area (sqm)	No. occupants
G.17	Office	5.0	22	4
G.18	Office	5.0	27	6
G.20	Reception	7.0	28	4
G.29	Meeting room	1.0	118	118
G.31	Office	5.0	40	8
G.32	Canteen	1.0	303	303
G.33	Office	5.0	52	10
G.34	Kitchen	7.0	48	7
G.37	Office	7.0	7	1
G.38	Office	7.0	8	1
G.40	Office	7.0	10	1
G.43	Office	7.0	7	1
G.44	Office	5.0	41	8
G.47	Office	5.0	38	8
G.48	Waiting area	1.0	45	45
G.49	Office	7.0	24	3
G.50	Office	5.0	40	8
G.57	Office	7.0	20	3
G.58	Office	5.0	40	8
G.59	Office	7.0	23	3
1.19	Meeting room	1.0	105	105

1.20	Office	5.0	44	9
1.23	Office	5.0	94	19
1.25	Office	5.0	240	48
1.28	Office	7.0	20	3
1.29	Office	7.0	14	2
1.30	Canteen	5.0	37	7
1.31	Office	5.0	35	7
1.32	Office	5.0	31	6
1.33	Office	7.0	10	1
1.34	Office	5.0	25	5
1.35	Office	7.0	20	3
1.36	Office	7.0	10	1
1.37	Office	5.0	28	6
1.38	Office	7.0	10	1
1.40	Office	5.0	29	6

Table 1.1: Maximum occupancy levels

Note: All other rooms on drawings are rooms that are not occupied full time (toilets, store rooms, etc....). and therefore do not require an occupancy load fact.

B1.2.2.2 Travel distances:

Room no.	**Room type**	**Travel distance in one direction (M)**	**Travel distance in two directions (M)**
G.17	Office	8.6	-
G.18	Office	14.7	-
G.20	Reception	13	-
G.29	Meeting room	-	32.7/42.7
G.31	Office	-	31.3/32.5

G.32	Canteen	-	27.3/33.6
G.33	Office	-	23/22.9
G.34	Kitchen	-	19.6/14.7
G.37	Office	16	
G.38	Office	12.3	
G.40	Office	15.8	
G.43	Office	12.4	
G.44	Office	-	14.8/16.9
G.47	Office	-	16.5/24.8
G.48	Waiting room	-	24.85/21.4
G.49	Office	-	31.15/17.2
G.50	Office	14.3	-
G.57	Office	8.5	-
G.58	Office	15.1	-
G.59	Office	5.5	-
1.19	Meeting room	-	17.7/13.9
1.20	Office	8.7	-
1.23	Office	16.8	-
1.25	Office	-	16.9/25.8
1.27	Office	15.9	-
1.29	Office	-	37.5/21
1.30	Canteen	-	23.9/31.7
1.31	Office	-	30.7/34.1
1.32	Office	-	21.5/39.8
1.33	Office	17.7	-
1.34	Office	15.23	-
1.35	Office	6	-

1.36	Office	4.6	-
1.37	Office	7.5	-
1.38	Office	4.6	-
1.40	Office	8.44	-

Table 1.2: Travel distances (worst case).

Note: All other rooms on drawings are rooms that are not occupied full time (toilets, store room, etc....). and therefore do not require a calculated travel distance. However all rooms throughout the building are in fact in sufficient range of an exit or protected stairs in accordance with the building regulations.

B1.2.2.4 Minimum number of escape routes

The maximum number of occupants for the first floor is 230 and therefore it requires a minimum of two escape routes. There are more than two escape routes provided and this in turn means it is in compliance with the building regulations (Ref Table 1.3).

The maximum number of occupants for the ground floor is 780, including the first floor and therefore it requires a minimum of three escape routes. There are more than three escape routes provided and this in turn means it is in compliance with the building regulations (Ref Table 1.3).

B1.2.2.4 Single escape route

All rooms with single escape routes are in compliance with the building regulations. The occupancy of these rooms does not exceed 50 and the distance to the nearest exit does not exceed the maximum distance allowed (Ref Table 1.2).

B1.2.3 Planning of escape routes and exits

B1.2.3.1 Inner rooms

The office room G31, G49 and toilet G22 are inner rooms in the building. They both have less than 20 occupants and there will be a vision panels provided on all doors of each room. The access rooms are also being fitted with appropriate heat detector systems to alert the people in the inner rooms. All inner rooms will comply with the building regulations.

B1.2.3.2 Open connections between floors

There are no open connections between floors and therefore this is not an issue with this building.

B1.2.3.3 Planning of exits in a central core

This is not an issue with this building as there is no central core in this building.

B1.2.3.4 Access to storey exits

All escape stairways are planned in such a way that it is not necessary to leave the protected shaft and stairway in order to exit the building.

B1.2.3.5 Separation of circulation routes from stairways

None of the escape stairways form part of a primary circulation route between different parts of the building at the same level. All doors opening onto escape stairways will be provided with 60 minute fire doors and self closers.

B1.2.3.6 Storeys divided into different occupancies

The existing building is all being used as the one office space. therefore there will not be separate occupancies and this means that this will not be an issue with this building.

B1.2.4 Width of escape routes and exits

Room no.	Room type	Max No. of occupants	Required width of escape	Minimum Provided width of escape
G.15	Lobby	446	5mm pp	3000
G.17	Office	4	750	890
G.18	Office	6	750	950
G.19	Lobby	124	5mm pp	860
G.20	Reception	4	750	1615
G.21	Lobby	181	5mm pp	1220
G.29	Meeting room	118	950	1030

G.31	Office	8	750	1200
G.32	Canteen	303	5mm pp	1105
G.33	Office	10	750	940
G.34	Kitchen	7	750	780
G.37	Office	1	750	820
G.38	Office	1	750	900
G.39	Lobby		5mm pp	860
G.40	Office	1	750	910
G.43	Office	1	750	890
G.44	Office	8	750	980
G.46	Lobby		5mm pp	1315
G.47	Office	8	750	970
G.48	Waiting area	45	750	970
G.49	Office	3	750	970
G.50	Lobby		5mm pp	950
G.50A	Office	8	750	960
G.51	Lobby		5mm pp	950
G.57	Office	3	750	970
G.58	Office	8	750	770
G.59	Office	3	750	910
1.19	Meeting room	105	950	980
1.20	Office	9	750	800
1.23	Office	19	750	780
1.25	Office	48	750	1250
1.27	Office	3	750	900
1.29	Office	2	750	900
1.30	Canteen	7	750	900

1.31	Office	7	750	840
1.32	Office	6	750	780
1.33	Office	1	750	900
1.34	Office	5	750	900
1.35	Office	3	750	880
1.36	Office	1	750	800
1.37	Office	6	750	780
1.38	Office	1	750	780
1.39	Lobby		5mm pp	1440
1.40	Office	6	750	800
Stairs 3	Stairs	172	5mm pp	3400
Stairs 4	Stairs		5mm pp	925
Stairs 5	Stairs		5mm pp	1000
Stairs 6	Stairs		5mm pp	1100

Note: All other rooms on drawings are rooms that are not occupied full time (toilets, store room, etc....). They do however have sufficient door widths and escape routes, in accordance with the building regulations.

B1.2.5 Corridors

B1.2.5.1 Protected corridors

Corridors G.15, G.19, G.21,G.39,G.46, G.50,G.51,G.61, 1.39, 1.42 and 1.43 are all protected corridors. These corridors will achieve a half hour fire protection at the least.

B1.2.5.2 Enclosure of corridors that are not protected corridors

The enclosures to all corridors used as means of escape (which are not protected corridors) will have all partitions carried up to the underside of the structural floor above (or to a suspended ceiling) and all openings in the corridor enclosures should be fitted with doors.

B1.2.5.3 Sub division of corridors

Anywhere where there is a sub division of corridors the relevant fire protected self closing doors are incorporated.

B1.2.5.4 Sub division of corridors

This is not an issue with this building as all corridors are in compliance with the building regulations.

B1.2.6 External escape routes

B1.2.6.1 External escape stairway

No external escape stairways are provided on this building and they are not required.

B1.2.6.2 Escape over flat roof

There are no flat roofs on this building and therefore this is not an issue with this building.

B1.2.7 Evacuation considerations

This section is not relevant for this particular fire cert.

B1.2.8 Closely seated audiences

An area where this problem may arise is the canteen area on the ground floor. however the necessary steps have been taken in accordance with Section 3, Sub-Section 8, to BS 5588: Part 6: 1991.

B1.2.9 Premises provided with a stage

There is a small stage in this building in the canteen area but this will not be an issue as there will not be many combustible materials on it.

B1.3 Design for vertical escape.

B1.3.2 Number of escape stairways

There are 4 protected stairways in this building which is more than enough and means that it is in compliance with the regulations.

B1.3.3 Single escape stairways

This is not an issue in this building as there is more than one escape stairways.

B1.3.4 Width of escape stairways

All stairways are of appropriate width to carry all the people safely from the building and are in compliance with the building regulations.

B1.3.5 Calculation of minimum stairway width

All stairways are wide enough and will be able to carry all people using them in the case of an emergency.

B1.3.6 Protection of escape stairways

All stairways and adjoining corridors are fully protected and provide 30 minute fire resistance. They are in complete compliance with the regulations and will allow all occupants to exit the building safely in the case of a fire.

B1.3.7 Basement stairways

This is not an issue with the part of the building that I am covering as there is no basement.

B1.3.8 Protected lobbies and corridors to escape stairways

All relevant lobbies leading to escape stairways are protected which can again be seen in the drawings.

B1.3.9 External escape stairways

This is not an issue with this building as there are no external escape stairways.

B1.4 General provision for means of escape.

B1.4.1 Introduction

The design of the escape routes will conform with the technical guidance documents and be in complete compliance with the building regulations, section 1.4.

B1.4.2 Protection of escape routes.

B1.4.2.1 Fire resistance of enclosures

The kitchen G.34 is an area of high risk and has been given compartmentation that will provided a minimum of 1 hour fire protection. All other rooms of high risk in the building have been provided with a minimum of a half hour fire resistance.

B1.4.2.2 Fire resistance of doors.

All fire doors are indicated clearly in the drawings and they are classified as follows, in accordance with building regulations:

B2 - All fire doors (other than those to a cupboard or service duct which are kept locked) are to be fitted with an automatic self closing device which is capable of closing the door from any angle and against any latch fitted to the door.

B3 – Where a self closing device is considered a hindrance to the normal use of the building a fusible link, electro-magnetic/mechanical device or a time delay closer maybe used.

B5 - All hinges on which fire doors are hung are made entirely from non-combustible material having a melting point of at least 800ºC.

B6 - All relevant fire doors are marked (at about eye level) with the appropriate fire safety sign complying with BS 5499 Part 1: 2000 on both sides.

B7 - All fire doors are identified by a permanently fixed small metal plate indicating the period of resistance, manufacture, year of manufacture and other pertinent details.

The limitation on uninsulated fire resisting glazing in fire doors set down in Appendix A, Table A4 and will be complied with.

B1.4.2.3 Fire resistance of glazed elements.

All glazed elements in fire resisting enclosures are in compliance with the building regulations.

B1.4.2.4 Protection of escape stairways.

This is not an issue with this building as there is no escape stairways.

B1.4.3 Doors on escape routes.

B1.4.3.2 Door fastenings.

All doors on escape routes are fitted with simple fastenings that can be readily operated in the direction of escape without the use of a key. Any escape door that is designed to accommodate more than 50 people is to be provided with a panic bolt.

B1.4.3.3 Direction of opening.

All doors that are required to open out in the direction of escape. No doors hinder or interfere with the minimum width required for any escape.

B1.4.3.4 Amount of opening and effect on associated escape routes.

All doors on escape routes are hung to open not less than 90deg and with a swing that is clear of any change of floor level.

B1.4.3.5 Vision panels.

Vision panels will be installed where doors on escape routes subdivide corridors and where doors are hung to swing both ways.

B1.4.3.6 Revolving and automatic doors.

This is not an issue with this building as there are no revolving or automatic doors in this building.

B1.4.4 Construction of escape stairways.

B1.4.4.1 General.

All escape stairways are constructed in accordance with the building regulations and they will have a 60 minute fire rating.

B1.4.4.2 Helical, spiral stairways and fixed ladders.

This is not an issue with this building as there are no helical, spiral stairways or fixed ladders.

B1.4.5 Height of escape routes.

All escape rotes willl have a clear headroom of 2m or more.

B1.4.6 Floors of escape routes.

All floors within escape routes will have an even non slip surface.

B1.4.7 Final exits.

All final exits are in accordance with the building regulations and will provide all occupants with a safe exit from the building.

B1.4.8 Lighting of escape routes.

Adequate artificial lighting will be provided to all internal and external escape routes. An emergency lighting system shall be provided throughout the building. This shall operate automatically on failure of the normal supply. It shall be designed, installed, commissioned and serviced in accordance with I.S. 3217: 2008: Code of Practice for Emergency Lighting.

B1.4.9 Lighting of escape routes.

This is not an issue in this building as it does not contain a lift.

B1.4.10 Electrical installation and protected circuits.

The electrical installation shall comply with the National rules for Electrical Installations, ET 101: issued by the Electro Technical Council of Ireland.

B1.4.11 Ventilation systems.

B1.4.11.1 Natural ventilation.

The natural ventilation will comply with' BS5925:1991, code of practice for ventilation principles and designing for natural ventilation'.

B1.4.11.2 Mechanical ventilation and air conditioning systems.

All mechanical and air conditioning systems will comply with 'BS: 5588: Part 9 Code of practice for ventilation and air-conditioning ductwork in terms of its operation under fire conditions'.

B1.4.12 Refuse chutes and storage.

All refuse will be stored in a compound away from the building.

B1.4.13 Fire safety signs.

Door signage, Illuminated Exit signs and markings will be provided in accordance with' BS 5499 Pt.5 :2002, and S.I No. 299, 2007 Safety, health and Welfare at Work.(signs) Regulations'.

B1.4.14 Fire detection and alarm system.

A Fire alarm system is to be provided in compliance with the building regulations. There will be an L3 system, tested and commissioned in accordance with I.S. 3218, 2009, code of practice for fire detection and alarm systems for buildings or CEN TS 54: part 14, 2004, fire planning, design, installation, commissioning use and maintenance.

B1.4.15 Provision for people with disabilities.

Where access is provided for disabled people, means of escape is provided in accordance with BS5588 Part 8: 1988.

B1.4.16 First-aid fire-fighting equipment.

Portable fire extinguishers shall be incorporate in accordance with I.S.291 in compliance with Fire Services Act 1981 and 2003 and the safety, Health and Welfare Act, 2005. Hose reel will also be installed into the building.

B1.4.17 Heat producing appliances.

The boiler room is located in the courtyard area of the ground floor, and will have a full 60min fire rated enclosure, with external access only. It will be appropriately ventilated and designed in accordance with Part J of the technical guidance documents. All other appliances are in compliance with the building regulations.

B1.5 Dwelling house.

This hole section does not apply to this building and therefore is not relavant as it is an office building and not a dwelling house.

B2:Internal fire spread(Linings):

B2.1 General provisions.

Classification	Designation required	Classification/Linings provided
Toilets	Class 3	Class O
Rooms exceeding 30 square m	Class 0	Class O

B2.2 Variations and special provisions

B2.2.1 Walls

This is not an issue for this building as there are no requirements for variations and special provisions.

B2.2.2 Fire-protecting suspended ceilings.

All suspended ceilings meet the requirements set out in paragraph A5 and diagram A3. this in turn means they comply with the building regulations.

B2.2.3 Fire-resisting ceilings.

All fire resisting ceilings will have a fire rating of at least 30nminutes and a class 0 surface

B2.2.4 Special applications.

Any flexible membrane covering a structure will comply with the recommendations given in 'Appendix A of BS 7157:1989 Method of test for ignitability of fabrics used in the construction of large tented structures'.

B2.3 Thermoplastic materials.

B2.3.2 Windows.

All windows are to be glazed with glass and no other material. All exit doors containing glass will use laminated glass.

B2.3.3 Roof lights.

All roof lights are to be glazed with glass and no other material.

B2.3.4 Lighting diffusers.

There are no light diffusers used in this building and therefore it is not an issue.

B3:Internal fire spread (Structure):

B3.1 Load bearing elements of structure.

Structure Under section 3.1.4, any part of the structure which only supports the roof and does not form part of a fire rated enclosure, is not required to be classified as an element of structure. In accordance with Table A1 and A2 of the appendix, a 60min fire rating is to be achieved for the following elements of structure: Load bearing block work walls and precast concrete floors. Any additional structural elements, frames, beams, columns, load bearing walls or floor structures will have the fire resistance required under Appendix A, Table A1.

B3.2 Compartmentation.

In order for this building to comply with Table A2 of Appendix A of the technical guidance documents Purpose Group 3 – office use. It is not more 20 metres in height and has no fire sprinkler system and therefore it requires a minimum of 60 minute for fire compartments. The kitchen and protected lift shafts and corridors will be compartmented and all with a minimum of 60 min fire resistance. The building does not require any further compartmentation as its areas and cubic capacity do not exceed the restrictions of the size limit 4,600m2 and 28,000m3 for a non sprinkled building in purpose group 3. All compartment walls are in compliance with the building regulations.

B3.3 Concealed spaces (cavities).

All spaces and cavities have been sealed using cavity barriers and following the guide lines set out in the building regulations. There are not many issues with cavity barriers in this building as it is a solid structure with little or no cavities.

B3.4 Protection of openings and fire-stopping.

All openings, joints are sealed in accordance with section 3.4 of the technical guidance documents part b. this is in order to ensure that the fire resistance of the

barrier is not affected. All pipes and wiring that pass through compartment walls do not exceed the dimensions stated in the technical guidance documents section 3.4. 160mm for non-combustible materials or 40mm diameter for PVC pipes. Service pipes less than 40mm will be fire stopped with in tumescent mastic, gypsum plaster or sand/cement mortar at their junction with the surrounding construction.

B3.5 Special provisions.

This is not an issue with this building as there are no special provisions provided or required.

B4:External fire spread:

B4.1 Construction of external walls.

B4.1.1 Introduction.

The external wall is constructed completely of limestone , concrete and lime plaster and is a solid wall with no cavities. it achieves a class O rating and therefore it does not require fire resistance.

B4.1.2 Fire resistance standard.

The external walls of the building have the appropriate fire resistance that is set out in Appendix A, Table A1.they are in complete compliance with the building regulations.

B4.1.3 Portal frames.

This is not an issue with this building as there are no portal frames.

B4.1.4 External surfaces.

As the building is more than 1m away from any boundary and it is under 18m, it does not require any provisions for external surfaces. this is in accordance with the ' Table 4.1'.

B4.1.5 External wall construction.

The external wall is constructed of a solid, rigid material that is limestone. there is no cavity in the external wall construction and therefore it is in accordance with 'Table 4.1' of the technical guidance documents.

B4.2 Space separation.

B4.2.2 Boundaries.

This building is located on a site with lots of other buildings however its boundary is not within 1m of any surrounding building.

B4.2.3 National boundaries.

There are buildings located within close proximity of the quad. Using the national boundary method in Diagram 26 we can see that the building does comply.

B4.2.4 Relevant boundaries.

All relevant boundaries and boundary walls are in compliance with the technical guidance documents.

B4.2.5 Unprotected areas and fire resistance.

There are no parts of the external wall that have less fire resistance than the appropriate amount indicated in 'Table A1(5)' and 'Table A2 of appendix A and therefore it is in compliance.

B4.2.6 Status of combustible surfaces as unprotected area.

The proper steps and precautions have been taken in order to properly protect against combustible surfaces in the building. They are all in compliance with Part B of the technical guidance documents.

B4.2.7 External walls within 1m of the relevant boundary.

There are no external walls within 1m of the relevant boundary.

B4.2.8 External walls 1m or more from the relevant boundary.

All walls situated more than 1m away meet the requirements set out in the technical guidance documents as they are all fire-resisting.

B4.2.9 Material alteration of existing buildings.

There are no major material alterations to the existing building. it will be refitted with new furniture and some small repair works. this will not affect the overall fire performance of the building and therefore it is not an issue.

B4.2.10 Material change of use of existing building.

In terms of material change of use of existing building, it is not greatly change and therefore this is not an issue with this building. The space separation section of this building is in complete compliance with the building regulations.

B4.3 Roof coverings.

B4.3.3 Classification of roof.

In accordance with BS 476: part3: 2004 , Appendix A. The building is covered in natural slates and supported by timber rafters. It is therefore a designate AA Roof (national standard).

B4.3.4 Separation distances.

The permitted distance for an AA building is not restricted as per 'Table 4.4', and is in accordance with the building regulations.

B4.3.5 Plastic roof lights.

There are no plastic roof light on this building so this is not an issue.

B4.3.6 Glass roof lights.

There are no glass roof lights located on the section of the building that I am currently looking at and therefore this is not an issue.

B5:Access and facilities for the fire service:

B5.1 Fire mains.

B5.1.2 Provision of internal fire mains.

There are no internal fire mains required as the top of the top floor is less than 20 m in height.

B5.1.7/.8 Provision of hydrants/ External fire mains.

The ground floor of this building is greater than 1000m^2 and therefore it requires at least one hydrant. I have included the position of the hydrants on the site map and they are located within the restrictions set out in the technical guidance documents, which are as follows:

- The distance from the building is not less than 6m or more than 46 m.
- The distance from a hydrant to a vehicle access roadway or hard-standing area for fire appliances (see 5.2) is not more than 30 m.
- They are distributed around the perimeter of the building, having regard to the provision of access for fire appliances (see 5.2).
- The hydrants are located on the same site as the building or are provided by a sanitary authority on a public roadway adjacent to the site.

These are all complied with in this building and can be seen to do so in the drawings.

B5.2 Vehicle access.

B5.2.2 Provision of vehicle access.

The building is over 10 m in height and has a volume of less than 7,000m^3. provided vehicle access must be at a rate of 2.4 m in length for every 90m^2 of ground floor area. the type of appliance must be a high reach pump.

Ground floor area= 1165m^2

Access required-(1165 /90)2.4= 31.06m

Access provided = 50.00m

The elevation to which the vehicle access is located contains doors that allow the fire services to access the building.

B5.2.3 Existing buildings.

There are several fire mains provided in this building and they are in compliance of the building regulations. There are also several access points for the fire services around the existing building.

B5.2.4 Design of access routes and hard standings.

The access route for the vehicles in this situation is a private route and is in accordance with 'Table 5.2'. this compliance can be seen on the drawings.

B5.3 Personnel access to the building for fire fighting.

Personnel access to the building is provided via the emergency escape routes that are going to be used by the occupants. The vehicles will access the building by using the methods described in section B5.2.2. as the building is not above 20m in height, it is not necessary to provide fire fighting shafts.

B5.4 Areas requiring special consideration.

All areas requiring special consideration have been looked at carefully and designed in such a way as to provide maximum fire protection. The boiler room has been looked at and designed carefully in accordance with the building regulations. the entire building is now of the expected standard that is requested in 'Part B- Fire' of 'The Technical Guidance Documents'.