

REPORT INTO A FIRE AT RA WOOD ADHESIVE TAPES CANNOCK ON 5 NOVEMBER 2009

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for:
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THE INDEPENDENT FIRE SAFETY ENGINEERING CONSULTANTS

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Contents:

1 Introduction 4

2 Brief description of the building 5

3 The Fire 8

4 The site investigation 9

5 Conclusions 14

1 Introduction

1.1 A fire occurred within RA Wood Adhesive Tapes, Wedges Mills, Cannock 5th November 2009.

1.2 Kingspan Ltd instructed Tenos Ltd to examine the building to determine the behaviour of any Kingspan products in the structure during the fire.

1.3 M Bullock and A Addinsell of Tenos Ltd and M Harris of Kingspan Ltd visited the building on 16th November 2009 in the company of I Bullock of Bullock Design (architect).

2 Brief description of the building

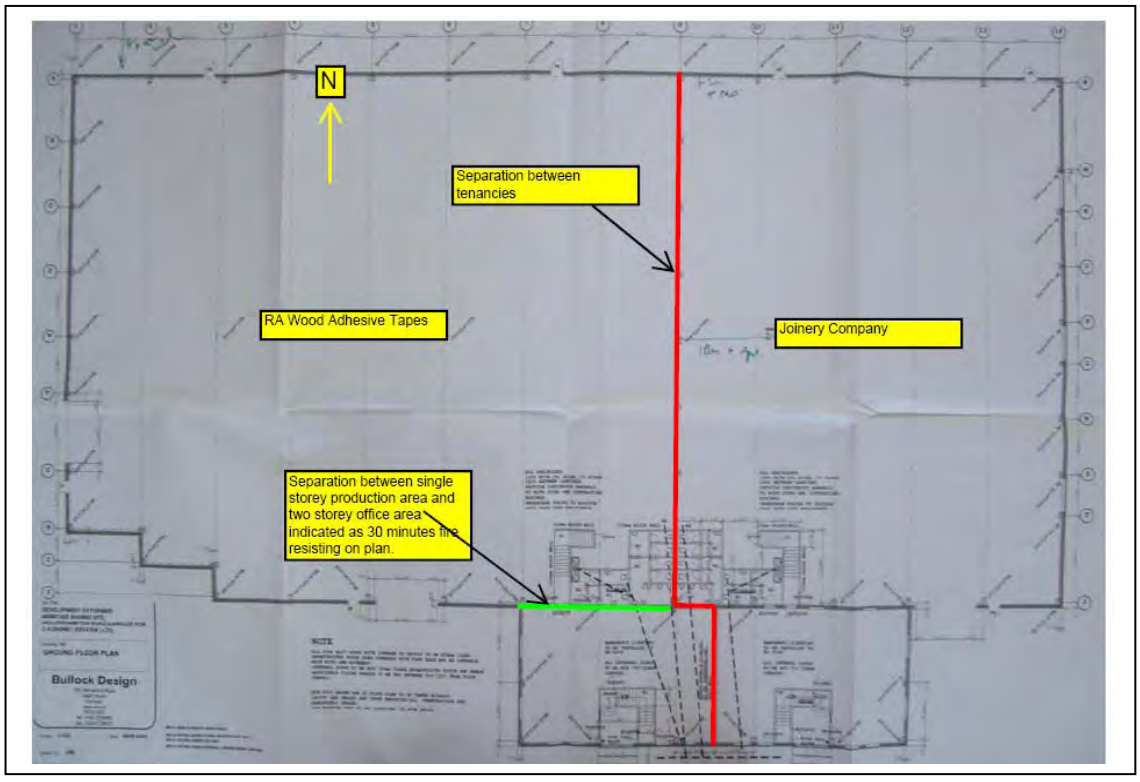
2.1 The building is located on the Wedges Mills industrial estate in Cannock, Staffordshire. It is understood that the building was constructed in 2003.

2.2 On plan the building measures approximately 78m (from west to east) by 46m (from north to south) with a height to eaves of approximately 6.5m and height to roof apex of approximately 10m.

2.3 The building is occupied by two tenants, RA Wood Adhesive Tapes (to the west) and a joinery Company (to the east). An imperforate full height blockwork wall in the plane of the main portal frame structure separates both tenancies. The area occupied by RA Wood Adhesives Tapes measures approximately 1840m^2 in plan.

2.4 Figure 1 shows a plan of the building (this is a photograph of an A1 drawing as an electronic drawing file was not available).

Figure 1 - Plan drawing of building



2.5 The frontage of the tenancies along the south elevation is provided with office and welfare accommodation on two storeys.

2.6 The main building consists of a steel frame with the lower part of the external walls and interior walls constructed of blockwork.

2.7 To the western extremity of the building, it is understood that a covered storage area abutted the main building and had been constructed using lightweight structure and cladding. This was completely destroyed by the fire and had been demolished by the time of the site inspection on 16 November.

2.8 Figure 2 shows an aerial view of the site taken from Google Maps. The image has been marked up to indicate the location of the covered storage area and the wall dividing the two tenancies.

Figure 2 - Aerial view of site before fire



2.9 The production area of both tenancies is single storey and occupies the majority of the plan area of the building.

2.10 The production area of the RA Wood Adhesive Tapes tenancy was separated from the two storey office and welfare facilities accommodation by nominally 30 minute fire resisting construction.

2.11 The upper parts of the external walls and roof comprised Kingspan insulated panels (KS1000 RW) with a core of PIR (Polyisocyanurate).

2.12 The portal frame stanchions to the north elevation of the building were clad with a proprietary fire protection board. It is understood that this was due to the proximity of the site boundary to that elevation requiring the limitation of unprotected area in that façade to comply with Building Regulations (Regulation B4).

2.13 It is understood that the compartment party wall separating the two tenancies was provided in two leaves of 200mm blockwork, encapsulating the vertical portal frame stanchions for the full height of the building.

2.14 The head of the wall was fire stopped to the underside of the KS1000 RW profiled roof cladding composite panels over-sailing the wall using sand cement mortar.

2.15 It is understood that the KS1000 RW roof panels did not incorporate a band of limited combustibility material providing a break in the PIR core of the panel at the point where the panels over-sailed the party compartment wall. At the time that the building was constructed, this was a recommendation in clause 9.29 of Approved Document B (2000 edition) and in the current 2006 edition of Approved Document B the recommendation (now in clause 8.30) refers to the width of this band being 300mm.

3 The Fire

3.1 From statements made by I Bullock during the site visit on 16 November, it is understood that the fire started whilst persons were still within the premises in the late evening of 5 November and that suspected ignition event involved a high level light fitting towards the northeast corner of the production area in the RA Wood Adhesives Tapes demise.

3.2 We understand that all persons safely evacuated the building without injury.

3.3 Press reports posted on the web on 6 November 2009 (Express and Star) reported a very significant fire event requiring attendance by 60 fire service personnel.

3.4 Figure 3 (an image provided in the web press report) gives an idea of the intensity of the fire, resulting in penetration of fire through the roof and flaming well above the height of the building.

Figure 3- photograph of fire in Express and Star web report



3.5 The web press report states that the Fire Service took the decision to allow the fire to burn out and to carry out appropriate procedures to prevent spread of fire to adjacent buildings.

3.6 It is understood that the fire burned through into the morning of 6 November before reducing to an intensity at which fire-fighters were able to extinguish the fire.

4 The site investigation

4.1 It was clear from the site inspection that the fire load density within the RA Wood Adhesives Building had been significant with the resulting fire being sufficiently intense to result in complete destruction of the covered storage building and the part of the main building occupied by RA Wood Adhesive Tapes.

4.2 Figure 4 shows a view from the western most extremity of the building towards the compartment wall (still standing) to the adjacent joinery business demise. The picture illustrates the complete destruction of all roof supporting structure over the production area compartment in the RA Wood Adhesive Tapes demise.

Figure 4 - view from western extremity of the building towards the adjacent demise line



4.3 Figure 5 shows a photograph taken from an aerial platform position to the south side of the building and looking along the line of the compartment wall separating the RA Wood Adhesive Tapes demise (to the west) and Joinery company (to the east). The photograph illustrates how the fire has completely destroyed the roof structure to the left whilst the roof over the joinery company demise is still in place.

Figure 5 - photograph from high level looking northwards along tenancy separation line



4.4 The complete collapse of steel supporting structure shown in Figures 4 and 5, and the presence of melted aluminium from door controls indicates that global temperatures attained in the production area compartment were significantly in excess of 650^{o}C.

4.5 The 30 minute fire door and fire rated glazed screen (provided with Georgian Wired Glass) between ground level office accommodation and the production area appeared to have maintained effective separation for a period but eventually lost their integrity.

4.6 Figure 6 shows the remnants of the fire resisting glazed screen. The georgian wired glass has fallen from the frame which has been eroded by the fire.

Figure 6 - Effects on fire resisting glazed screen between office and production area



4.7 The evidence illustrated in these photographs indicates that the severity of the fire was substantially in excess of that to which 30 minute fire resisting elements of construction would be subjected under standard fire resistance testing procedures to BS476 or BSEN1363.

4.8 The decision taken by the Fire Service to let the fire burn itself out is indicative of a very high fire loading in the building which comprised of combustible raw materials and completed product.

4.9 The reported fire duration and evidence of the temperatures achieved indicate that that the overall fire exposure of the wall separating the production areas of the two tenancies was at least equivalent to a 60 minute fire resistance test.

4.10 Figure 7 shows a photograph taken along the head of the blockwork party wall between the tenancies and shows a close-up of the charred PIR core of the roof cladding. The PIR core remained in place to the centre of the blockwork leaf on the RA Wood Adhesive Tapes side of the party wall.

Figure 7 - photograph of head of party wall between tenancies



4.11 Figure 8 shows a photograph taken from inside the adjacent joinery company demise looking up at the underside of the roof cladding along the party wall line.

Figure 8 - photograph of underside of roof in Joinery Company demise



4.12 It is understood from talking to staff in the joinery company that there was smoke leakage into their demise and this was also evidenced by the striations of smoke staining on the roof soffit and local loss of the PVC coating to the steel skin close to the apex. However, it was clear from the inspection that there was no loss of fire compartmentation provided by the party wall and the fire did not spread to the adjacent demise.

4.13 The roof cladding over the joinery company demise remained sufficiently intact to provide continued weather protection to the demise and to allow that business to resume operations shortly after the fire was extinguished by the fire service.

5 Conclusions

5.1 The following conclusions can be drawn from the site inspection:

- The fire was sufficiently intense to have subjected the party wall between the adjacent tenancies to a level of exposure equivalent to at least 60 minutes in a standard fire resistance test.
- The fire compartmentation provided by the party wall prevented fire spread from the demise of origin to the adjacent demise.
- The charring exhibited by the PIR core material indicated the formation of a sufficiently stable char within the panel to provide an effective fire stop between the steel skins of the cladding at the head of the compartment party wall.
- The omission of a band of material of limited combustibility in the composite roof panel at the point of intersection with the head of the party wall (as recommended by Approved Document B guidance) did not result in a break-down of fire compartmentation.
- The findings of the site inspection provide evidence that the PIR core of the Kingspan KS1000 RW panel can provide sufficient resistance to fire propagation and erosion such that the functional requirement of the Building Regulations (Regulation B3) can be satisfied without providing a 300mm wide band of limited combustibility material to replace the PIR core where the KS1000 RW panel passes over a compartment wall (i.e. it is not necessary to adopt the recommendation of clause 8.30 of Approved Document B).

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