	SERVICE PENETRATION SYSTEM CERTIFICATE NO.	HIL2 Version 1.0
	WARNING: This certificate may only be reproduced in full	
	SYSTEM NAME: CP660 FLEXIBLE FIRESTOP FOAM	DATE ISSUED: 31 March 2008 EXPIRY DATE: 31 March 2009
PO Box 6825 St Kilda Road Central VIC 8008 Tel: +61 3 9865 8644 Fax: +61 3 9865 8615 www.certifire.com.au info@certifire.com.au	SUPPLIER: HILTI (AUST) PTY LTD Level 5 / 1G Homebush Bay Drive, Rhodes, NSW 2138 Tel: +61 2 8748 1111 Fax: +61 2 8748 1190	

1. SCOPE

The service penetration fire protection system described below has been appraised against Certifire schedules [CA001](#), [CA002](#), and [CA021](#). These schedules require that the FRLs of the system have been established in accordance with the BCA provisions and that the products are manufactured/supplied under an independently audited quality management system.

2. FIELD OF APPLICATION

This certificate relates to the fire resistance performance of walls and floors penetrated by electrical cables on cable trays and metal pipes protected by HILTI CP660 flexible PU based firestop foam tested in accordance with AS1530.4-2005 and assessed in accordance with AS4072.1-2005.

The materials and components that form the fire protection system for through penetration systems is a two-part gun applied flexible fire resistant foam. The two parts are combined as they are dispensed with the use of a specially-designed applicator.

The applicability of this Certificate relates to cables that have been tested and listed in tables 1-8.

2.1 Floor Penetrations

The assessment forming part of this Certificate comprised an assembly of aerated concrete floor construction of overall nominal dimensions 3000mm wide x 4000mm long x 150mm deep and a density of 670 kg/m³. The floor was provided with nine 400mm long x 400mm wide apertures to accommodate the following cables and metal pipes which penetrated the floor element that were sealed using "Hilti CP 660" firestop foam to a depth of 150mm. Floor Services A, B, D & G are referenced in this certificate.

Table 1: Performance for Service A Penetrating Floor

Item	Description	FRL
9	<p>Upper Cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method : Fixed to Hilti MQ41/3 unistrut support system at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/120/90
3	<p>Electric Cable Cable Markings : 2006 + Protadur NYY-J, 3x185 SM/95, SM 0.6/1 KV, VDE 0276. Overall size : 50mm diameter (colour, black) Core material : Copper segments Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	-/120/90
4	<p>Electric Cable Cable Markings : FACAB 60102 N2XSY, 1x150 RM/25 10KV, VDE 0276 2005. Overall size : 32mm diameter (colour, red) Core material : Copper Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	-/120/90
5	<p>Pipes Material : Mild steel Overall size : 16mm diameter x 1.5mm thick wall Length : Pipe extended 500mm from both faces of penetration Quantity : 3 no. pipes Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	-/120/90
9	<p>Lower Cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method : Fixed to Hilti MQ41/3 unistrut support system at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/120/120
3	<p>Electric Cable Cable Markings : 2006 + Protadur NYY-J, 3x185 SM/95, SM 0.6/1 KV, VDE 0276. Overall size : 50mm diameter (colour, black) Core material : Copper segments Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	-/120/90
7	<p>Electric Cable Cable Markings : FACAB 60102 M2XSEY, 3x185 RM/25 Overall size : 70mm diameter (colour, red) Core material : Copper Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	-/120/90
8	<p>Electric Cable Cable Markings : 4x185 SE, 0.6/1 KV, VDE 0276, BAYKA 2001 Overall size : 50mm diameter (colour, black) Core material : Aluminium segments Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	-/120/90

Table 2: Performance for Service B Penetrating Floor

Item	Description	FRL
13	<p>Upper cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method: Fixed to Hilti MQ41/3 unistrut support system at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/180/120
10	<p>Bundle of Electric cables Cable Markings : None Overall size : 13mm diameter approximate (colour, black) Core material : Copper Length : Cables extended 500mm from both faces of penetration. Quantity : 15 no. cables Fixing method: Wire cable ties to cable tray (item 13) at both sides of penetration.</p>	-/180/90
11	<p>Bundle of communications cables Cable Markings : None Overall size : 12mm diameter approximate (colour, white) Length : Cables extended 500mm from both faces of penetration. Quantity : 30 no. cables Fixing method: Wire cable ties to cable tray (item 13) at both sides of penetration.</p>	
13	<p>Lower cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method: Fixed to Hilti MQ41/3 unistrut support system at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/180/120
12	<p>Bundle of Electric cables Cable Markings : 2005 + Protadur NYY-0, 4x10 RE, 0.6/1 KV, VDE 0276 Overall size : 12mm diameter approximate (colour, black) Core material : Copper Length : Cable extended 500mm from both faces of penetration. Quantity : 15 no. cables Fixing method: Wire cable ties to cable tray (item 13) at both sides of penetration.</p>	-/180/90

Table 3: Performance for Service D Penetrating Floor

Item	Description	FRL
23	<p>Cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method : Fixed to Hilti MQ41/3 unistrut support system at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/180/120
20	<p>Electric cable Cable Markings : 2006 + Protadur NYY-J, 3x185 SM/95, SM 0.6/1 KV, VDE 0276. Overall size : 50mm diameter (colour, black) Core material : Copper segments Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 23) at both sides of penetration.</p>	-/180/120
21	<p>Electric cable Cable Markings : FACAB 60102 N2XSY, 1x150 RM/25 10KV, VDE 0276 2005. Overall size : 32mm diameter (colour, red) Core material : Copper Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 23) at both sides of penetration.</p>	
22	<p>Electric cable Cable Markings : FACAB 60102 M2XSEY, 3x185 RM/25 Overall size : 70mm diameter (colour, red) Core material : Copper Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 23) at both sides of penetration.</p>	
26	<p>Pipe Material : Mild steel Overall size : 114.3mm diameter x4.5mm thick wall Length : Pipe extended 850mm from both faces of penetration. Quantity : 1 no. pipe Fixing method : Fixed to Hilti MQ41/3 unistrut support system using Hilti MPN-S 110mm pipe clamps at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/180/180
27	<p>Pipe insulation Material : Mineral wool with aluminium foil face Density of insulation : Not stated Thickness : 40mm Length : Insulation extended 500mm from both faces penetration.</p>	

Table 4: Performance for Service G Penetrating Floor

Item	Description	FRL
34	<p>Pipe Material : Mild steel Overall size : 114.3mm diameter x 12.5mm thick wall Length : Pipe extended approximately 1000mm from both faces of penetration. Quantity : 1 no. pipe Fixing method : Fixed to Hilti MQ41/3 unistrut support system using Hilti MPN-S 110mm pipe clamps at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/120/120
35	<p>Pipe Material : Mild steel Overall size : 114.3mm diameter x 2.5mm thick wall Length : Pipe extended approximately 1000mm from both faces of penetration. Quantity : 1 no. pipe Fixing method : Fixed to Hilti MQ41/3 unistrut support system using Hilti MPN-S 110mm pipe clamps at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/120/120
36	<p>Pipe Material : Mild steel Overall size : 32mm diameter x 2.5mm thick wall Length : Pipe extended approximately 650mm from both faces of penetration. Quantity : 1 no. pipe Fixing method : Fixed to Hilti MQ41/3 unistrut support system using Hilti MPN-S 1 ½" pipe clamps at approximately 250mm and 400mm from unexposed face of penetration.</p>	-/120/120
37	<p>Pipe insulation (for all pipes) Material : Mineral wool with aluminium foil face Density of insulation : Not stated Thickness : 40mm Length : Insulation extended 500mm from both faces of penetration.</p>	-/120/120

Figure 1: Floor Service A (Item 6 not within the scope of certificate) - Plan view

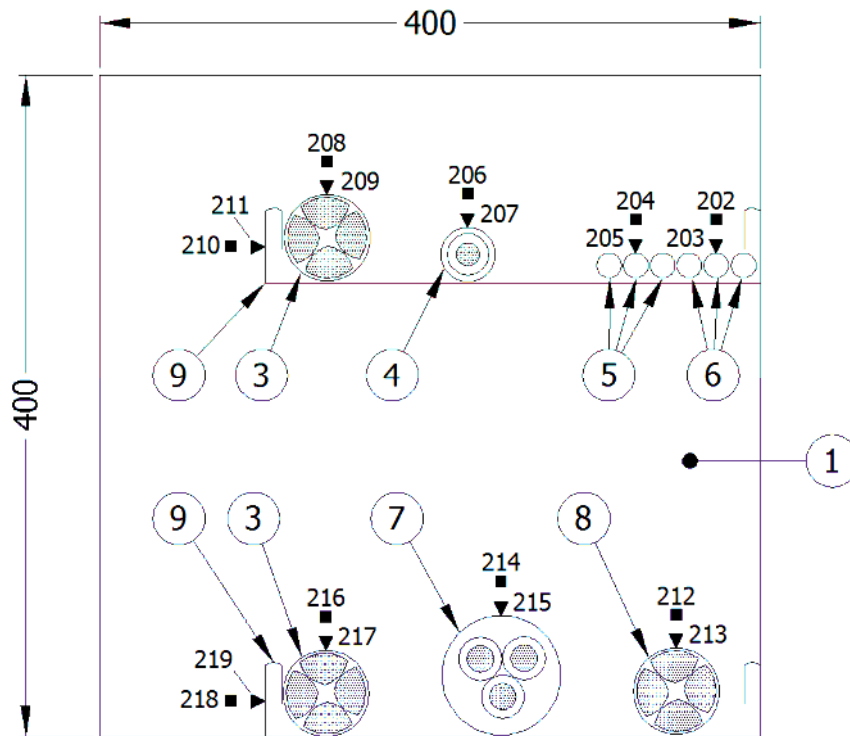


Figure 2: Floor Service A - Section view

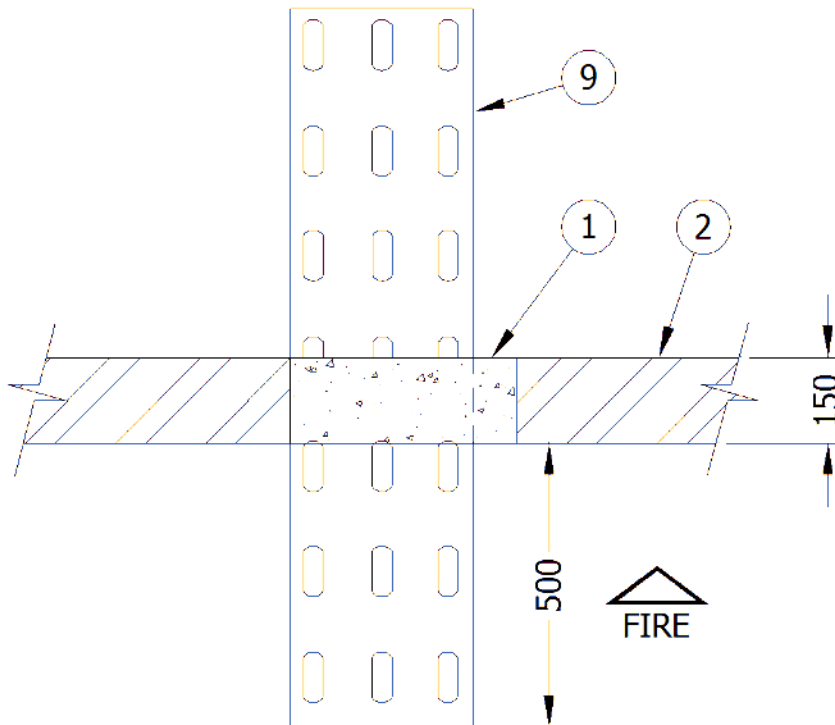


Figure 3: Floor Service B - Plan view

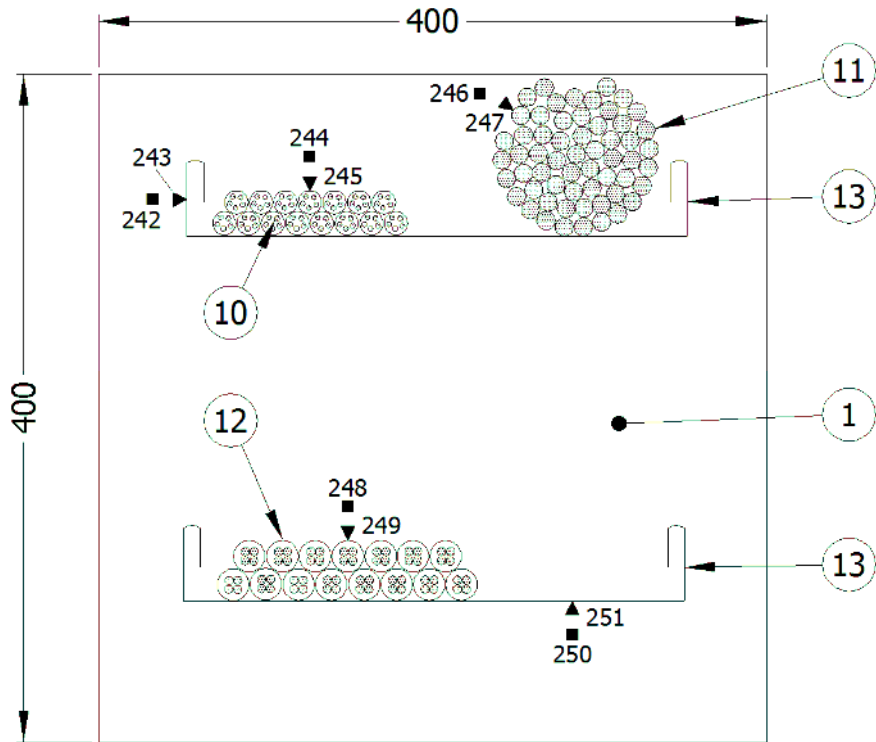


Figure 4: Floor Service B - Section view

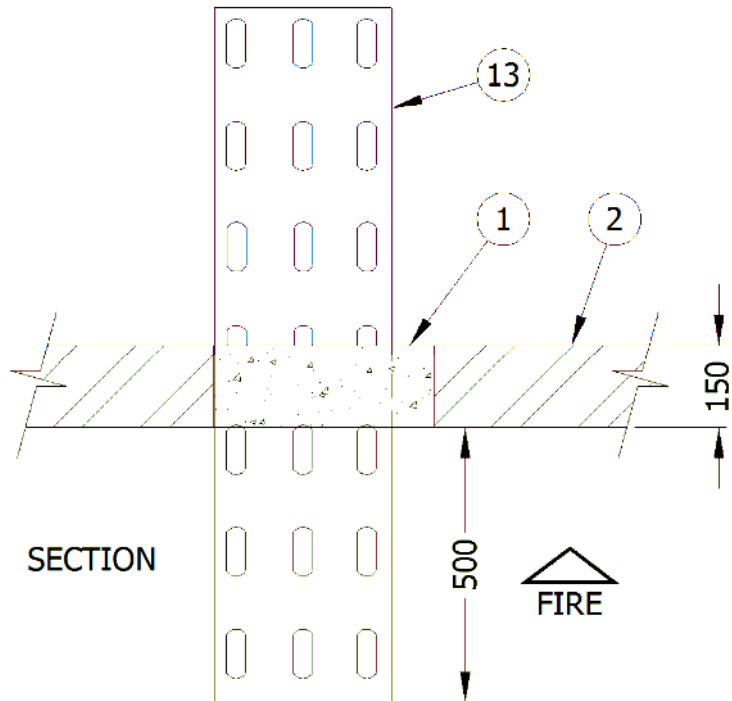


Figure 5: Floor Service D (Item 24/25 not included in certificate) - Plan view

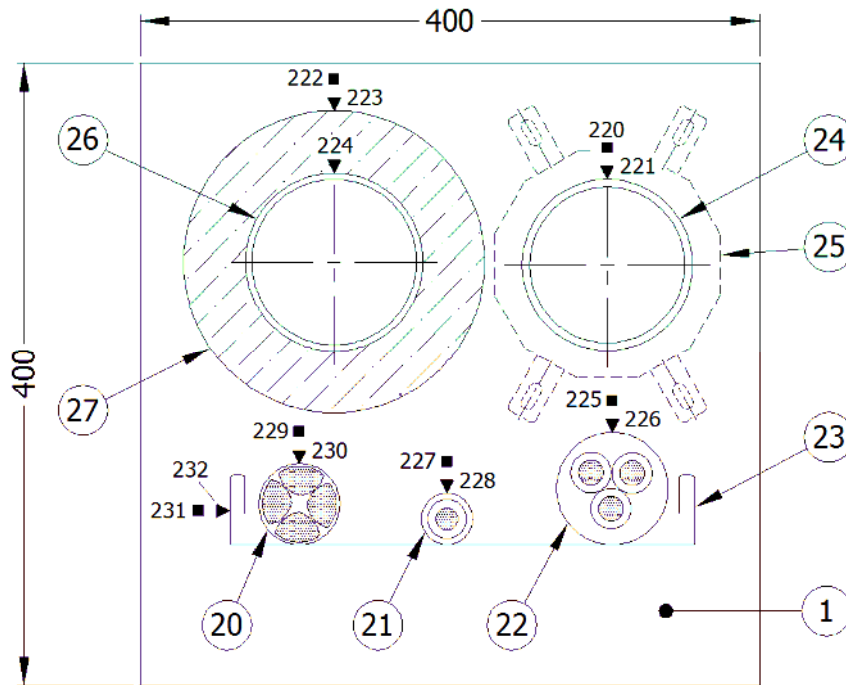


Figure 6: Floor Service D (Item 24/25 not included in certificate) - Section view

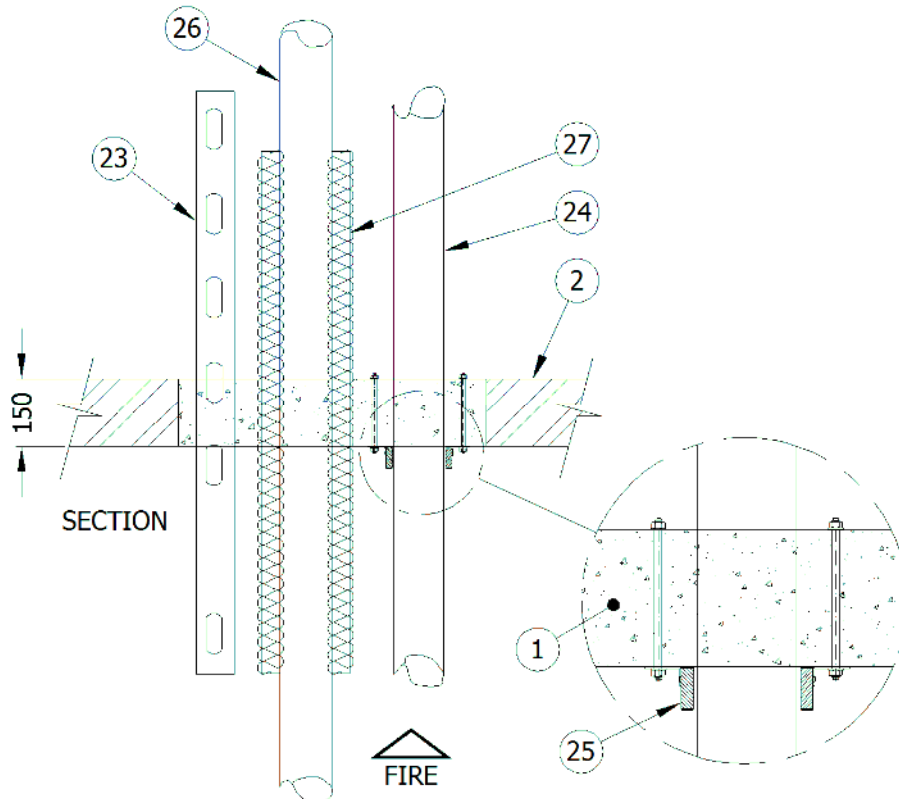


Figure 7: Floor Service G - Plan view

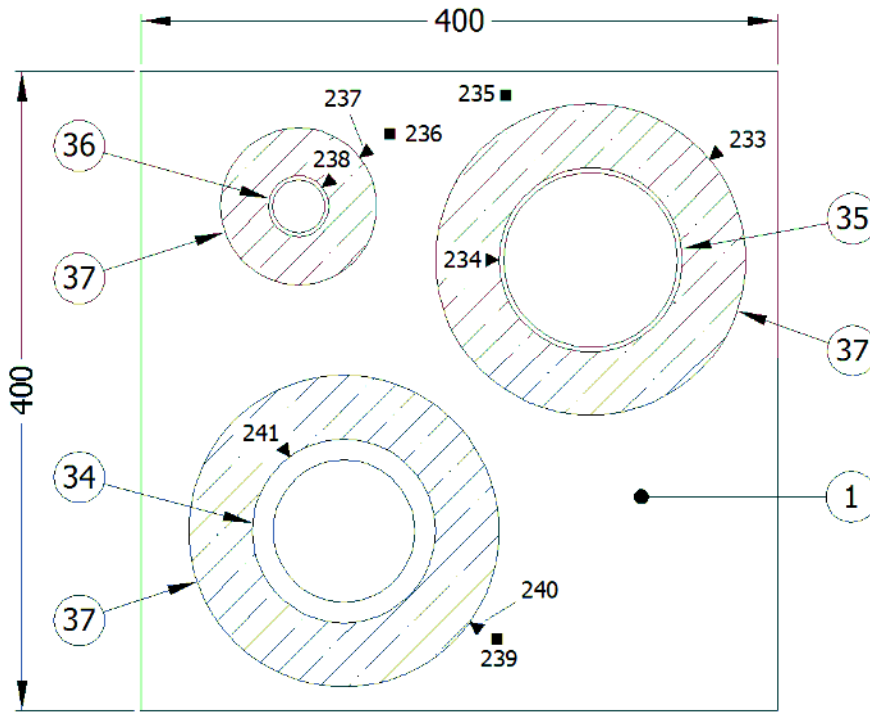
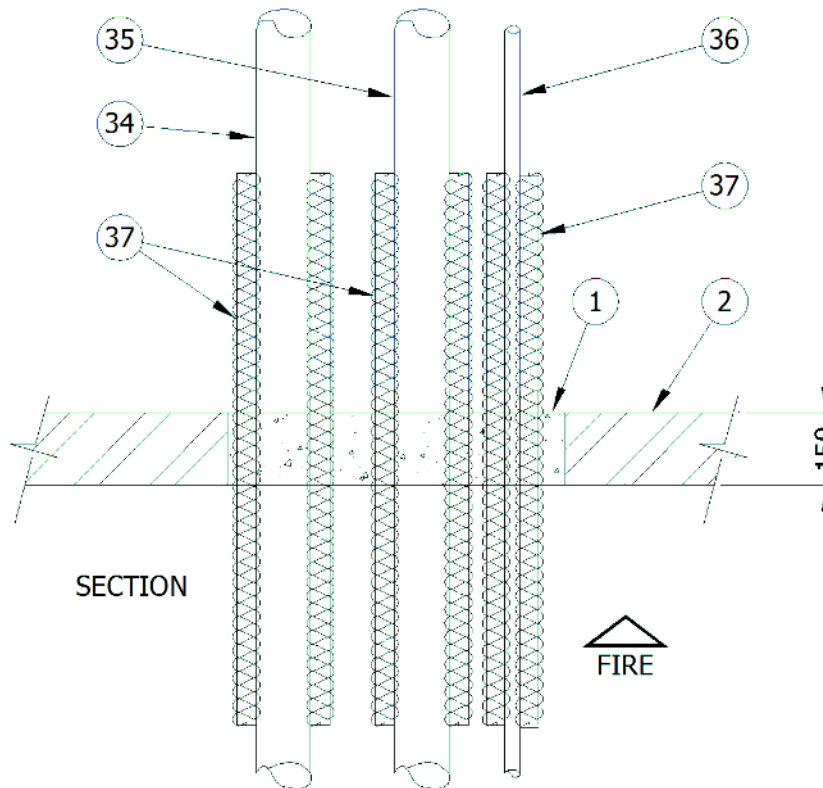


Figure 8: Floor Service G - Section view



2.2 Lightweight Wall Penetrations

The assessment forming part of this Certificate comprised an assembly of drywall construction of 120mm thick with framing of 70mm wide galvanised steel studs, at maximum 600mm centres, friction fitted into galvanised steel 'U-section' head and base channels. Each side of the stud frame was faced with two layers of 12.5mm thick fire grade plasterboard. The wall was provided with eight 400mm high × 400mm wide apertures to accommodate the "CP 660" seals, each positioned in its upper half. The drywall construction incorporated one free edge. Wall Services A, B, E & G will be referenced in this assessment.

The following cables and metal pipes penetrated the wall element and were sealed with "Hilti CP 660" firestop foam to a depth of 120mm.

Table 5: Performance for Service A Penetrating Wall

Item	Description	FRL
9	<p>Upper cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method : Fixed to Hilti MQ41/3 unistrut support system at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/90
3	<p>Electric Cable Cable Markings : 2006 + Protadur NYY-J, 3x185 SM/95, SM 0.6/1 KV, VDE 0276. Overall size : 50mm diameter (colour, black) Core material : Copper segments Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	-/120/90
4	<p>Electric Cable Cable Markings : FACAB 60102 N2XSY, 1x150 RM/25 10KV, VDE 0276 2005. Overall size : 32mm diameter (colour, red) Core material : Copper Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	
5	<p>Pipes Material : Mild steel Overall size : 16mm diameter x 1.5mm thick wall Length : Pipe extended 500mm from both faces of penetration Quantity : 3 no. pipes Fixing method : Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	
9	<p>Lower cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method : Fixed to Hilti MQ41/3 unistrut support system at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/90
3	<p>Electric Cable Cable Markings: 2006 + Protadur NYY-J, 3x185 SM/95, SM 0.6/1 KV, VDE 0276. Overall size : 50mm diameter (colour, black) Core material : Copper segments Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method: Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	-/120/60
7	<p>Electric Cable Cable Markings : FACAB 60102 M2XSEY, 3x185 RM/25 Overall size : 70mm diameter (colour, red) Core material : Copper Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method: Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	
8	<p>Electric Cable Cable Markings : 4x185 SE, 0.6/1 KV, VDE 0276, BAYKA 2001 Overall size : 50mm diameter (colour, black) Core material : Aluminium segments Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method: Wire cable ties to cable tray (item 9) at both sides of penetration.</p>	

Table 6: Performance for Service B Penetrating Wall

Item	Description	FRL
13	<p>Upper cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method : Fixed to Hilti MQ41/3 unistrut support system at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/120
10	<p>Bundle of Electric cables Cable Markings : None Overall size : 13mm diameter approximate (colour, black) Core material : Copper Length : Cables extended 500mm from both faces of penetration. Quantity : 15 no. cables Fixing method : Wire cable ties to cable tray (item 13) at both sides of penetration.</p>	-/120/90
11	<p>Bundle of communications cables Cable Markings : None Overall size : 12mm diameter approximate (colour, white) Length : Cables extended 500mm from both faces of penetration. Quantity : 30 no. cables Fixing method : Wire cable ties to cable tray (item 13) at both sides of penetration.</p>	
13	<p>Lower cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method : Fixed to Hilti MQ41/3 unistrut support system at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/90
12	<p>Bundle of Electric cables Cable Markings : 2005 + Protadur NYY-0, 4x10 RE, 0.6/1 KV, VDE 0276 Overall size : 12mm diameter approximate (colour, black) Core material : Copper Length : Cable extended 500mm from both faces of penetration. Quantity : 15 no. cables Fixing method : Wire cable ties to cable tray (item 13) at both sides of penetration.</p>	-/120/90

Table 7: Performance for Service E Penetrating Wall

Item	Description	FRL
27	<p>Cable tray Material : Perforated mild steel Thickness : 1.5mm Overall size : 300mm wide Length : Extended 500mm from both faces of penetration Fixing method : Fixed to Hilti MQ41/3 unistrut support system at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/90
24	<p>Electric cable Cable Markings : 2006 + Protadur NYY-J, 3x185 SM/95, SM 0.6/1 KV, VDE 0276. Overall size : 50mm diameter (colour, black) Core material : Copper segments Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 27) at both sides of penetration.</p>	-/120/60
25	<p>Electric cable Cable Markings : FACAB 60102 N2XSY, 1x150 RM/25 10KV, VDE 0276 2005. Overall size : 32mm diameter (colour, red) Core material : Copper Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 27) at both sides of penetration.</p>	
26	<p>Electric cable Cable Markings : FACAB 60102 M2XSEY, 3x185 RM/25 Overall size : 70mm diameter (colour, red) Core material : Copper Length : Cable extended 500mm from both faces of penetration Quantity : 1 no. cable Fixing method : Wire cable ties to cable tray (item 27) at both sides of penetration.</p>	
30	<p>Pipe Material : Mild steel Overall size : 114.3mm diameter x 4.5mm thick wall Length : Pipe extended 850mm from both faces of penetration. Quantity : 1 no. pipe Fixing method : Fixed to Hilti MQ41/3 unistrut support system using Hilti MPN-S 110mm pipe clamps at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/120
31	<p>Pipe insulation Manufacturer : Rockwool Material : Mineral wool with aluminium foil face Density of insulation : Not stated Thickness : 40mm Length : Insulation extended 500mm from both faces penetration.</p>	

Table 8: Performance for Service G Penetrating Wall

Item	Description	FRL
38	<p>Pipe Material : Mild steel Overall size : 114.3mm diameter x 12.5mm thick wall Length : Pipe extended approximately 1000mm from both faces of penetration. Quantity : 1 no. pipe Fixing method : Fixed to Hilti MQ41/3 unistrut support system using Hilti MPN-S 110mm pipe clamps at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/120
39	<p>Pipe Material : Mild steel Overall size : 114.3mm diameter x 2.5mm thick wall Length : Pipe extended approximately 1000mm from both faces of penetration. Quantity : 1 no. pipe Fixing method : Fixed to Hilti MQ41/3 unistrut support system using Hilti MPN-S 110mm pipe clamps at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/120
40	<p>Pipe Material : Mild steel Overall size : 32mm diameter x 2.5mm thick wall Length : Pipe extended approximately 650mm from both faces of penetration. Quantity : 1 no. pipe Fixing method : Fixed to Hilti MQ41/3 unistrut support system using Hilti MPN-S 1 ½" pipe clamps at approximately 300mm and 500mm from unexposed face of penetration and at 400mm from the exposed face.</p>	-/120/120
41	<p>Pipe insulation (for all pipes) Manufacturer : Rockwool Material : Mineral wool with aluminium foil face Density of insulation : Not stated Thickness : 40mm Length : Insulation extended 500 mm from both faces of penetration.</p>	-/120/120

Figure 9: Wall Service A (Item 6 not in certificate) - Elevation view

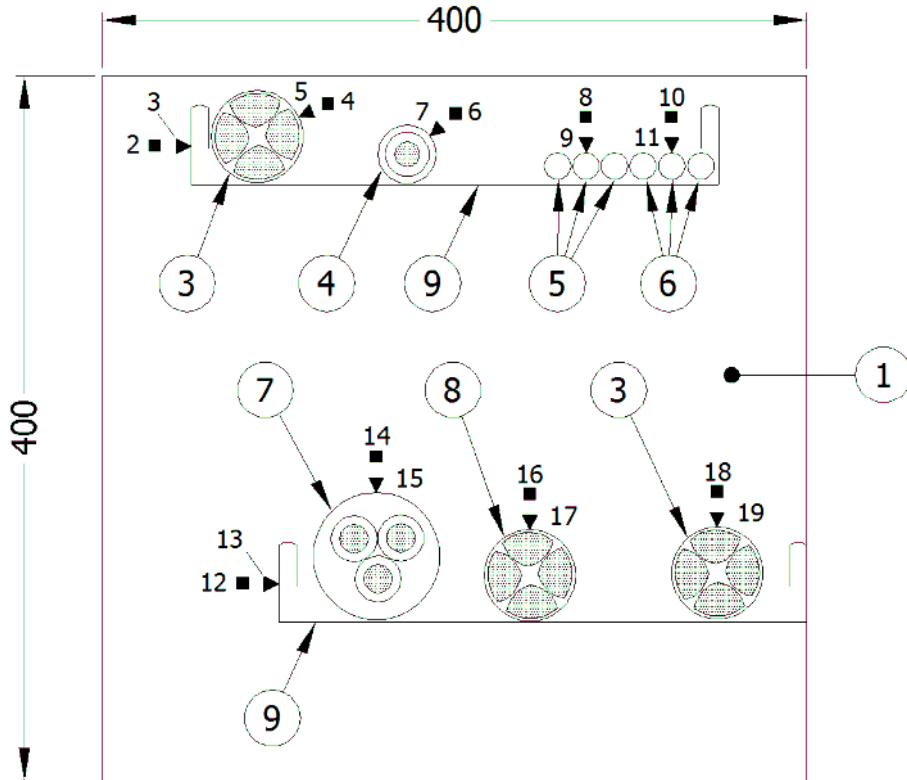


Figure 10: Wall Service A - Section view

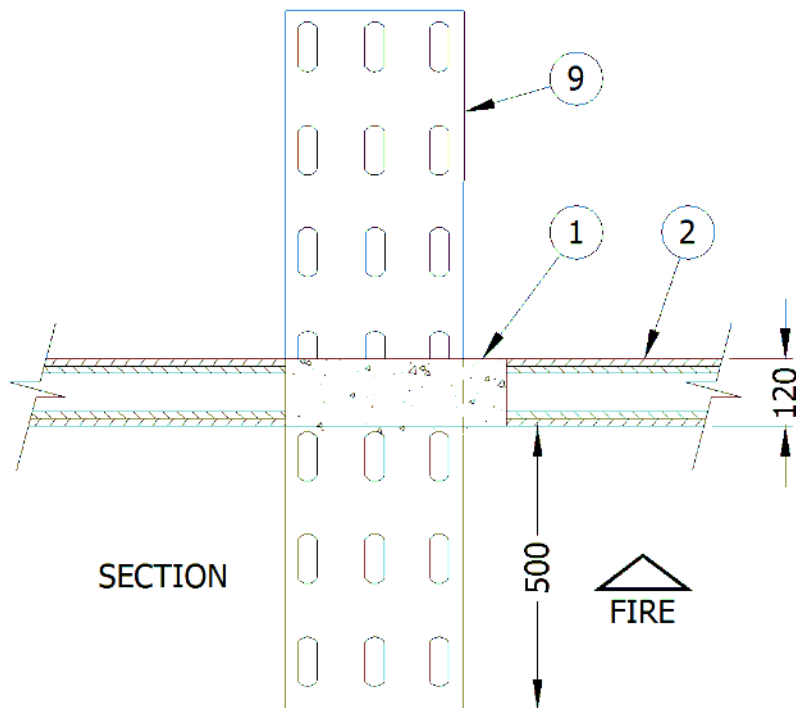


Figure 11: Wall Service B - Elevation view

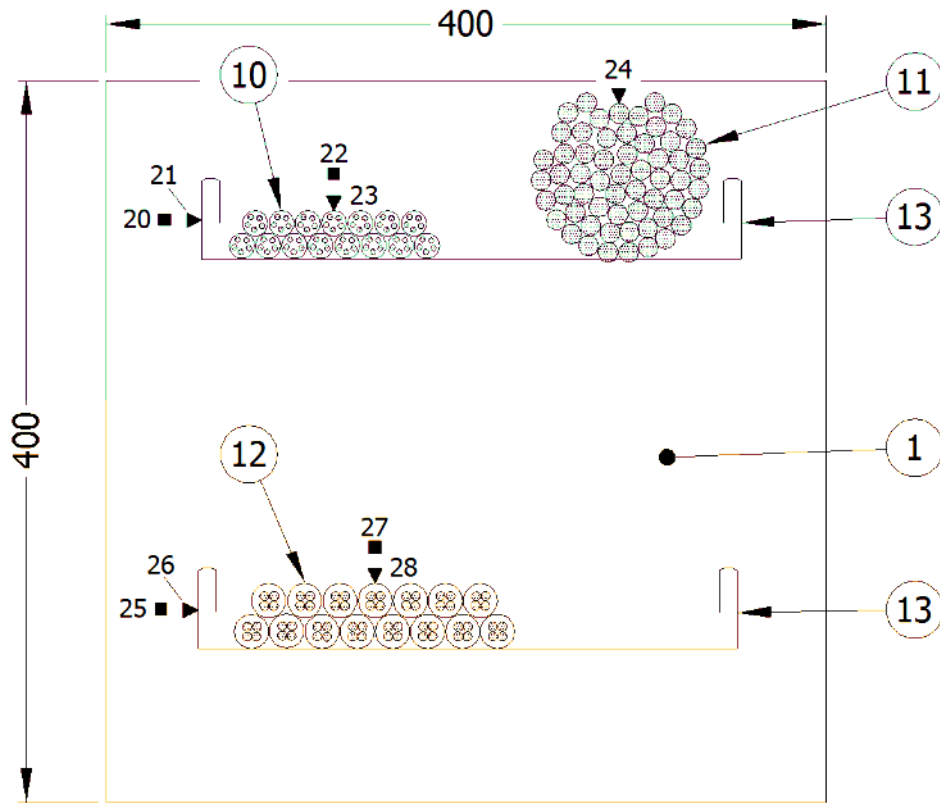


Figure 12: Wall Service B - Section view

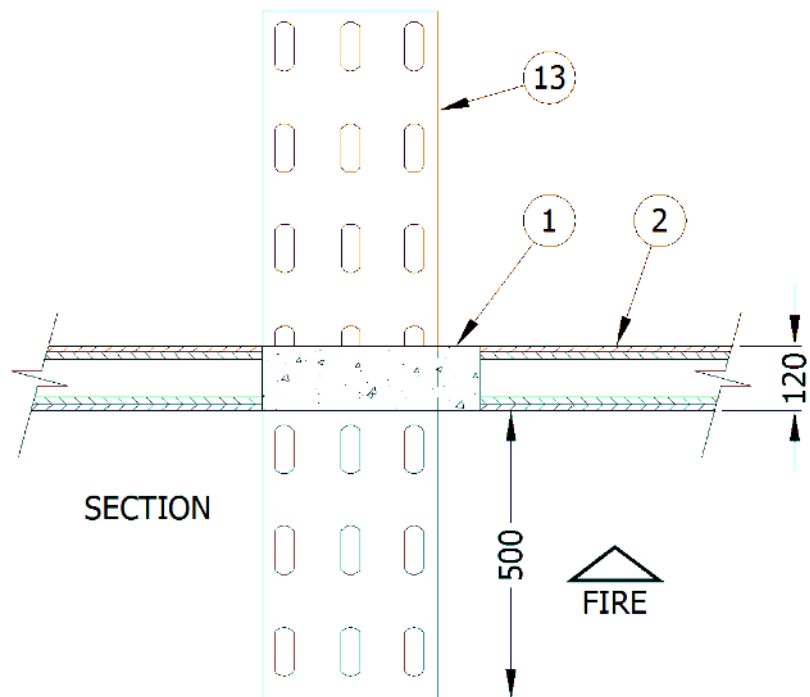


Figure 13: Wall Service E (Item 28 and 29 not within scope of certificate) – Elevation view

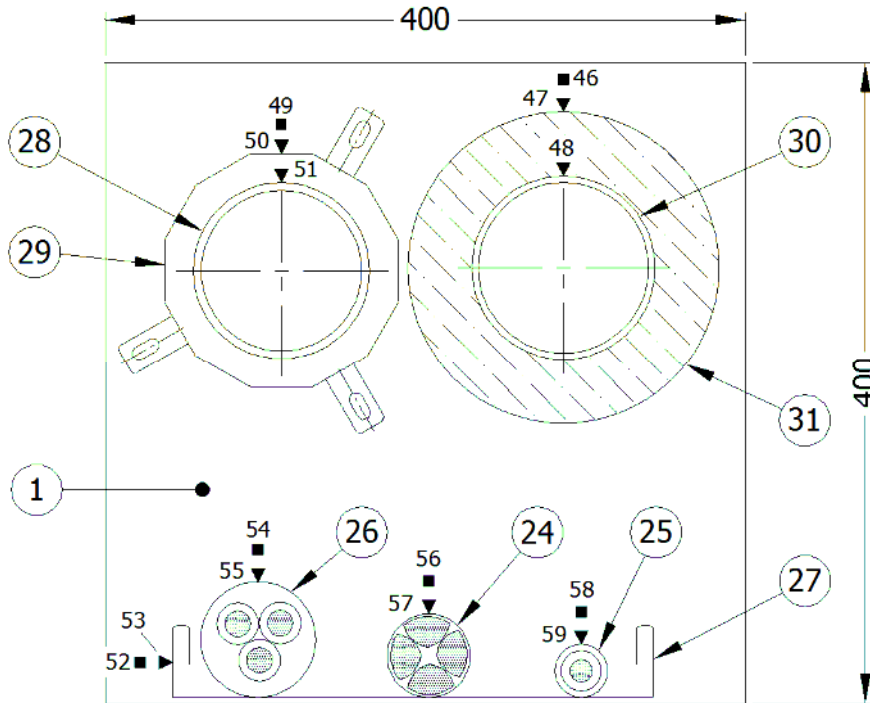


Figure 14: Wall Service E (Item 28 and 29 not within scope of certificate) - Section view

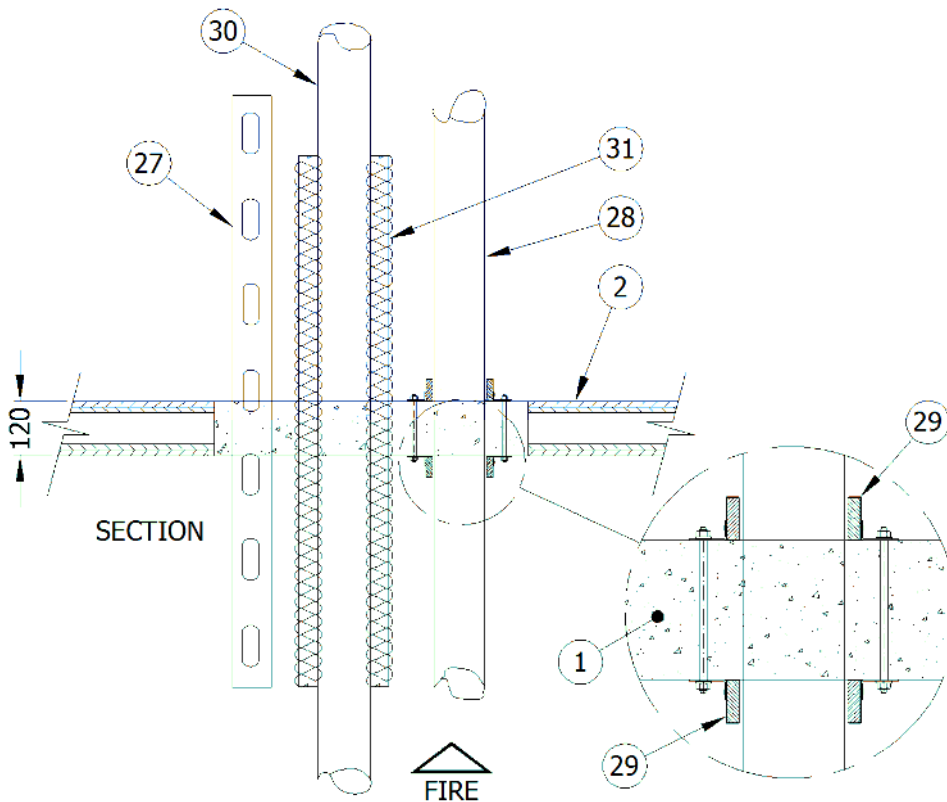


Figure 15: Wall Service G - Elevation view

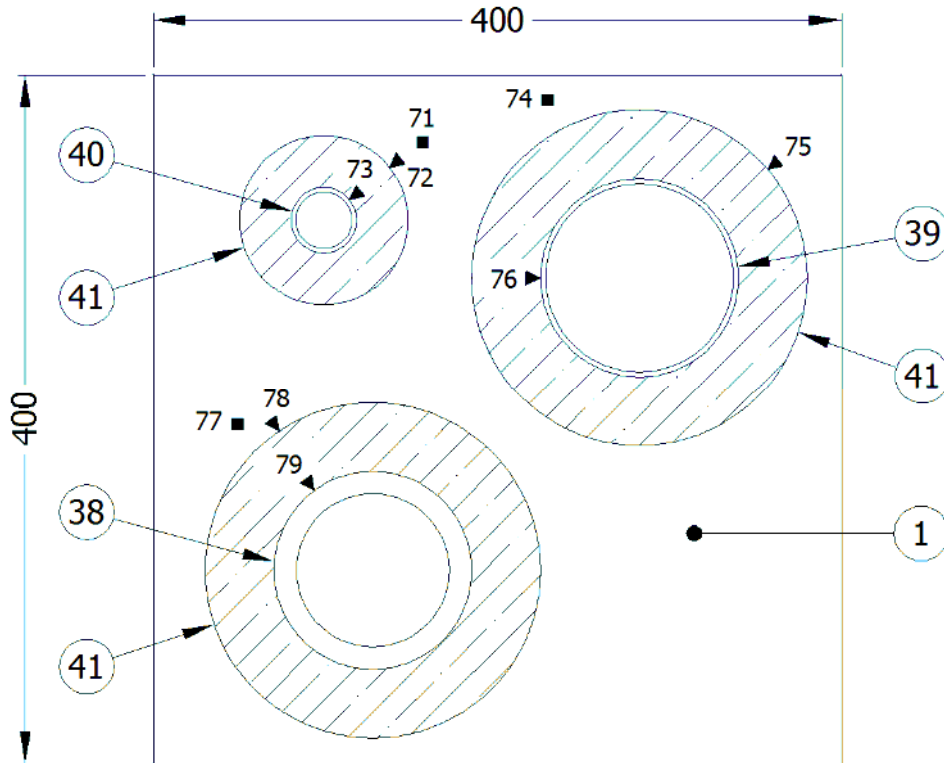
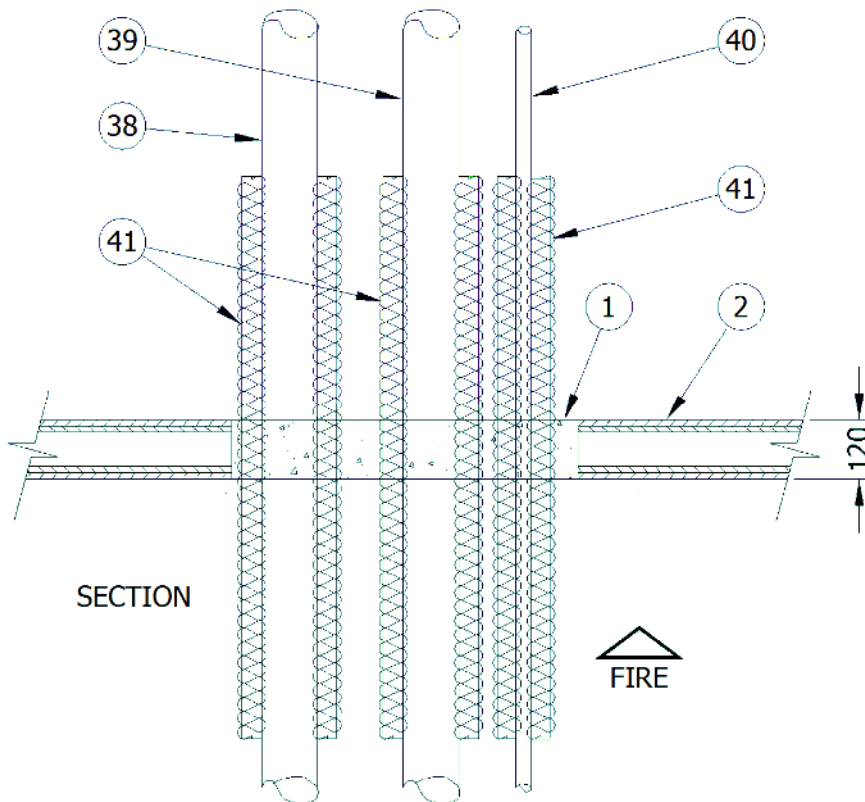


Figure 16: Wall Service G - Section view



3. DESCRIPTION OF COMPONENTS

The Certificate makes reference to various fire stopping systems incorporating HILTI CP660 firestop foam for the purpose of protecting cable and metal pipe service penetrations in light weight walls and concrete floors.

The materials and components that form the fire protection system for through penetration systems is a two-part gun applied flexible foam.

The two parts are combined as they are dispensed with the use of a specially-designed applicator.

Even mixing is achieved by a special mixing nozzle and the firestop foam begins to expand after about 30 seconds – reaching about 6 times its original volume.

The foam becomes shapeable after approximately 5 minutes and can be cut after about 10 minutes.

4. INSTALLATION SUMMARY

The supporting wall partitions or concrete floor construction shall be capable of providing effective support of the proposed construction for the required fire resistance period (FRL).

Surfaces on which the firestop foam is to be applied shall be clean and dust free.

The seal depth to width ratio listed on this certificate is maintained in order to achieve the require fire resistance levels.

The materials that form the fire protection system for through penetration systems is applied by way of the use of a specially-designed applicator. Even mixing is achieved by a special mixing nozzle and the firestop foam begins to expand after about 30 seconds – reaching about 6 times its original volume.

The firestop foam becomes shapeable after approximately 5 minutes and can be cut after about 10 minutes.

See manufacturer's installation instructions for further details regarding the installation methods.

It is recommended that the systems described in this certificate are installed by a Certifire listed Fire Protection Contractor certified in the appropriate category and that the installation be required to be labelled with a Certifire Label.

5. SERVICEABILITY DATA

Resistance to water - No data presented.

Flexibility - No data presented.

6. HEALTH AND SAFETY

Health and Safety data sheet can be obtained from the supplier.

7. SUPPORTING DATA

Assessment report no.	BWA RIR 2244100.1	Date:	21 January 2008
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8. CONTACT DETAILS

Hilti (Aust) Pty Ltd
Customer Service and Technical Advice Phone 131292

Sydney

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34/314 Hoxton Park Road Preston NSW 2170

49B Capitan Cook Drive Caringbah NSW 2229

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70-72 Orlando Road Lamberton NSW 2299

Melbourne

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Adelaide

52 Richmond Road Adelaide SA 5035

Perth

23 Belmont Avenue Belmont WA 6104

Brisbane

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Gold Coast

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Sunshine Coast

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Townsville

7/264 Woolcock Street Currajong QLD 4812

Hobart

56A Hopkins Street Moonah TAS 7009



9. INFORMATION ON CERTIFIRE

Certifire Australia is an independent, authoritative body providing a certification scheme for passive fire protection systems, suppliers and contractors.

For further information contact Certifire Australia.

Certifire Australia takes direction from the Certifire Advisory Panel which has been constituted with balanced representation from all sectors of the industry.

NOTE: This system certificate should be read in conjunction with Certifire schedules [CA001](#), [CA002](#) and [CA021](#). The BCA requires that FRL's are based on tests performed in accordance with AS1530.4-1990 or a similar/more severe test. It should be recognised that a single test method will not provide a full assessment of the performance of a system or fire hazard under all fire conditions.

Reviewed by	Approved by
 Mark Esdaile National Engineering Manager HILTI (Aust) Pty Ltd	 Glenn Evans Chief Executive Officer CERTIFIRE Pty Ltd