FSP 1146

FIRE-RESISTANCE TEST ON FIRE COLLARS RETRO-FITTED TO A REINFORCED CONCRETE SLAB

In confidence to
TRUSS HOLDINGS PTY LTD

19 AUGUST 2005

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CSIRO – Manufacturing and Infrastructure Technology
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NATA

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FIRE-RESISTANCE TEST ON FIRE COLLARS RETRO-FITTED TO A REINFORCED CONCRETE SLAB

SPONSORED INVESTIGATION No. FSP 1146

IDENTIFICATION OF SPECIMEN: The sponsor identified the specimens as FireShield Series 2 collars retrofitted to a reinforced concrete slab, protecting floor waste penetrations.

SPONSOR: Truss Holdings Pty Ltd
161 Railway Parade
THORNSIDE QLD

MANUFACTURER: Fire Protection Solutions Pty Ltd
161 Railway Parade
THORNSIDE QLD

TEST STANDARDS: Australian Standard 1530, Methods for fire tests on building materials, components and structures,
Part 4: Fire-resistance tests of elements of building construction -1997;

Australian Standard 4072, Components for the protection of openings in fire-resistant separating elements,
Part 1: Service penetrations and control joints -1992.

TEST NUMBER: FS 3747/2799

TESTED: The fire-resistance test was conducted on 3 May 2005.

DESCRIPTION OF SPECIMEN: GENERAL
The specimen comprised a 1150-mm x 1150-mm x 150-mm thick reinforced concrete slab penetrated by four HDPE pipes, protected by retro-fitted Fireshield collars.

Penetration A – 40/50-mm Series 2 Retro-fit FireShield Collar FS2S – 50HFW (50-mm HDPE Geberit PE80 pipe with a trap fitting and a plastic floor grate)

The Series 2 Retro-fit FireShield Collar consisted of a 1.2-mm thick steel case, 85-mm in diameter and 60-mm in height.
The collar incorporated 3 springs, these were pivoted at the top of the spring metal casings and restrained by a nylon fusible link with a melting temperature of 75 degrees Celsius.
A soft intumescent wrap lined the internal circumference of the collar. The wrap was 4-mm thick x 57-mm wide, and weighed approximately 75 grams. The wrap was covered on the outside by a 0.35-mm thick x 57-mm wide stainless steel sleeve.
The collar was fixed to the underside of the concrete slab using three 5-mm diameter and 40-mm long stainless steel masonry "knock-ins" that passed through the collar's 2-mm thick metal angle brackets. The interface between the steel surface of the collar and the surface of the concrete slab was sealed with a fire resistant sealant. The same sealant was used to seal the gap between the pipe and the cut-out hole on the unexposed side of the concrete slab.

A nominal 50-mm ID HDPE Geberit PE80 pipe, was fitted through the collar's sleeve. The pipe projected vertically, approximately flush with the top of the concrete slab. On the exposed side of the slab, a HDPE trap fitting filled with water was inserted into the collar that projected approximately 150-mm into the furnace chamber. The pipe was capped at the top with a standard 50-mm diameter plastic floor grate. On the exposed side of the slab, the pipe was capped with a standard HDPE cap fitting.

Penetration B – 40/50-mm Series 2 Retro-fit FireShield Collar FS2S – 50HFW (50-mm HDPE Geberit Silent pipe with a trap fitting and a plastic floor grate)

The Series 2 Retro-fit FireShield Collar consisted of a 1.2-mm thick steel case, 85-mm in diameter and 60-mm in height.
The collar incorporated 3 springs, these were pivoted at the top of the spring metal casings and restrained by a nylon fusible link with a melting temperature of 75 degrees Celsius.
A soft intumescent wrap lined the internal circumference of the collar. The wrap was 4-mm thick x 57-mm wide, and weighed approximately 75 grams. The wrap was covered on the outside by a 0.35-mm thick x 57-mm wide stainless steel sleeve.
The collar was fixed to the underside of the concrete slab using three 5-mm diameter and 40-mm long stainless steel masonry "knock-ins" that passed through the collar's 2-mm thick metal angle brackets. The interface between the steel surface of the collar and the surface of the concrete slab was sealed with a fire resistant sealant. The same sealant was used to seal the gap between the pipe and the cut-out hole on the unexposed side of the concrete slab.

A nominal 50-mm ID HDPE Geberit Silent pipe, with 3.2-mm wall thickness was fitted through the collar's sleeve. The pipe projected vertically, approximately flush with the top of the concrete slab. On the exposed side of the slab, a HDPE trap fitting filled with water was inserted into the collar that projected approximately 150-mm into the furnace chamber. The pipe was capped at the top with a standard 50-mm diameter plastic floor grate. On the exposed side of the slab, the pipe was capped with a standard HDPE cap fitting.

Penetration C – 65/80/90/100-mm Series 2 Retro-fit FireShield Collar FS2S – 100HFW - Z (100-mm HDPE Silent pipe with a trap fitting and a plastic floor grate)

The Series 2 Retro-fit FireShield Collar consisted of a 1.2-mm thick steel case, 140-mm in diam[illegible]nd 85-mm in height.
The collar inc[illegible]springs, these were pivoted at the top of the spring metal casing[illegible]by a nylon fusible link with a melting temperature of 75 degre[illegible]
A soft int[illegible]nal circumference of the collar. The wrap was 6-m[illegible]d approximately 300 grams. The wrap v[illegible]thick x 85-mm wide stainless steel s[illegible]
The colla[illegible]lab using three 5-mm diameter and [illegible]s" that passed through the collar's 2-mm [illegible]face between the steel surface of the co[illegible]ealed with a fire resistant sealant. The[illegible]een the pipe and the cut-out hole o[illegible]

A nominal 100-mm ID HDPE Geberit Si[illegible]all thickness, was fitted through the collar's sle[illegible]rtically, approximately flush with the top of the concrete [illegible]d side of the slab, a HDPE trap fitting filled with water was ins[illegible]ollar that projected approximately 150-mm into the furnace chamb[illegible]pipe was capped at the top with a standard 100-mm diameter plastic f[illegible]r grate. On the exposed side of the slab, the pipe was capped with a standard plastic cap fitting.

Penetration D – 65/80/90/100-mm Series 2 Retro-fit FireShield Collar FS2S – 100HFW - Z (100-mm HDPE Geberit PE80 pipe with a trap fitting and a plastic floor grate)

The Serie[illegible]Collar consisted of a 1.2-mm thick steel case, 140-mm i[illegible]
The colla[illegible]the top of the spring metal ca[illegible]mperature of 75 de[illegible]
A soft i[illegible]ap was 6-[illegible]
wrap w[illegible]s steel sleeve.

The collar was fixed to the underside of the concrete slab using three 5-mm diameter and 40-mm long stainless steel masonry "knock-ins" that passed through the collar's 2-mm thick metal angle brackets. The interface between the steel surface of the collar and the surface of the concrete slab was sealed with a fire resistant sealant. The same sealant was used to seal the gap between the pipe and the cut-out hole on the unexposed side of the concrete slab.

A nominal 100-mm ID HDPE Geberit PE80 pipe, with 4.3-mm wall thickness, was fitted through the collar's sleeve. The pipe projected vertically, approximately flush with the top of the concrete slab. On the exposed side of the slab, a HDPE trap fitting filled with water was inserted into the collar that projected approximately 150-mm into the furnace chamber. The pipe was capped at the top with a standard 100-mm diameter plastic floor grate. On the exposed side of the slab, the pipe was capped with a standard plastic cap fitting.

DIMENSIONS
The specimen's overall dimension was 1150-mm x 1150-mm to suit the opening in the specimen frame.

ORIENTATION
The reinforced concrete slab was placed horizontally on top of the furnace chamber.

DOCUMENTATION: The following documents were supplied by the sponsor as a complete description of the specimen and should be read in conjunction with this report:

Specification, dated 1 June 2005, by Fireball International Pty Ltd

Drawings file Nos. FSTD80, FSTD80A, FSTD80B, FSTD80C and FSTD80D, undated by Fireball Collars Pty Ltd.

Confidential information about the test specimen has been submitted and is retained at the Division of Manufacturing and Infrastructure Technology.

EQUIPMENT:

FURNACE
The furnace had a nominal opening of 1000-mm x 1000-mm for attachment of vertical or horizontal specimens.

The furnace was lined with refractory bricks and materials with the thermal properties as specified in AS 1530.4-1997 and was heated by combustion of a mixture of natural gas and air.

TEMPERATURE
The temperature in the furnace chamber was measured by four type K, 3-mm diameter, 310 stainless steel Mineral Insulated Metal Sheathed (MIMS) thermocouples. Each thermocouple was housed in high-nickel steel tubes opened at the exposed end.

The temperature in the furnace chamber was also measured by two plate thermometer assemblies as specified in ISO 834.1 – 1999.

The temperatures of the specimen were measured by glass-fibre insulated and sheathed K-type thermocouples with a wire diameter of 0.5-mm.

MEASUREMENT SYSTEM
The primary measurement system comprised a multiple-channel datalogger scanning at one-minute intervals during the test.

AMBIENT TEMPERATURE: The temperature of the furnace chamber was 22°C at the commencement of the test.

DEPARTURE FROM TEST STANDARDS: There were no departures from the requirements of AS 1530.4-1997 and AS 4072.1-1992.

TERMINATION OF TEST: The test was terminated at 182 minutes by agreement with the sponsor.

TEST RESULTS: CRITICAL OBSERVATIONS
The following observations were made during the fire-resistance test:

2 minutes -	Smoke is fluing from penetration A, its grate is starting to deform.
3 minutes -	Smoke is fluing from penetration B, its grate is starting to deform.
4 minutes -	Smoke is fluing from penetration D.
5 minutes -	Smoke is fluing from penetration C. Grate of penetration D is starting to deform.
6 minutes -	Insulation Failure of Penetration D – Maximum temperature rise limit of 180 K is exceeded on top of the grate.
7 minutes -	Insulation Failure of Penetration C – Maximum temperature rise limit of 180 K is exceeded on top of the grate. Grate of penetration C is starting to deform.
10 minutes -	Smoke quantity of all penetrations has decreased.
60 minutes -	No apparent change to the specimens.
110 minutes -	Smoke has started to flue from penetrations B & C.
145 minutes -	Smoke continues to flue from penetrations B & C.
182 minutes -	Test terminated.

FURNACE TEMPERATURE
Figure 1 shows the standard curves of temperature versus time for heating the furnace chamber and the actual curves of average and maximum temperature versus time recorded during the heating period.

SPECIMEN TEMPERATURE
Figure 2 shows the curve of maximum temperature versus time associated with Penetration A.

Figure 3 shows the curve of maximum temperature versus time associated with Penetration B.

Figure 4 shows the curve of maximum temperature versus time associated with Penetration C.

Figure 5 shows the curve of maximum temperature versus time associated with Penetration D.

PERFORMANCE
Performance observed in respect of the following heating conditions and general AS 1530.4-1997 criteria:

Penetration A – 40/50-mm Series 2 Retro-fit FireShield Collar FS2S – 50HFW (50-mm HDPE Geberit PE80 pipe with a trap fitting and a plastic floor grate)

Structural adequacy	-	not applicable
Integrity	-	no failure at 182 minutes
Insulation	-	no failure at 182 minutes

Penetration B – 40/50-mm Series 2 Retro-fit FireShield Collar FS2S – 50HFW (50-mm HDPE Geberit Silent pipe with a trap fitting and a plastic floor grate)

Structural adequacy	-	not applicable
Integrity	-	no failure at 182 minutes
Insulation	-	no failure at 182 minutes

Penetration C – 65/80/90/100-mm Series 2 Retro-fit FireShield Colla FS2S – 100HFW - Z (100-mm HDPE Silent pipe with a trap fitting and a plastic floor grate)

Structural ad		
Integrity		
Insulation		

Z Type – Research & Development Prototype

NOT For Use or Certification Under Any Circumstances

Penetration D – 65/80/90/100-mm Series 2 Retro-fit FireShield Collar FS2S – 100HFW - Z (100-mm HDPE Geberit PE80 pipe with a trap fitting and a plastic floor grate)

Structural adequacy

Integrity

Insulation

Z Type – Research & Development Prototype

NOT For Use or Certification Under Any Circumstances

For the purposes of AS 1530.4 –1997, the results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use, nor do they reflect the actual behaviour in fires.

FIRE-RESISTANCE LEVEL:

For the purpose of building regulations in Australia, the fire-resistance levels (FRL) of the test specimens are as follows:

Penetration A	-/180/180
Penetration B	-/180/180
Penetration C	-/180/0
Penetration D	-/180/0

The fire-resistance level is applicable for exposure to fire from the same side as tested.

APPENDICES:

APPENDIX 1

APPENDIX 2

APPENDIX 3

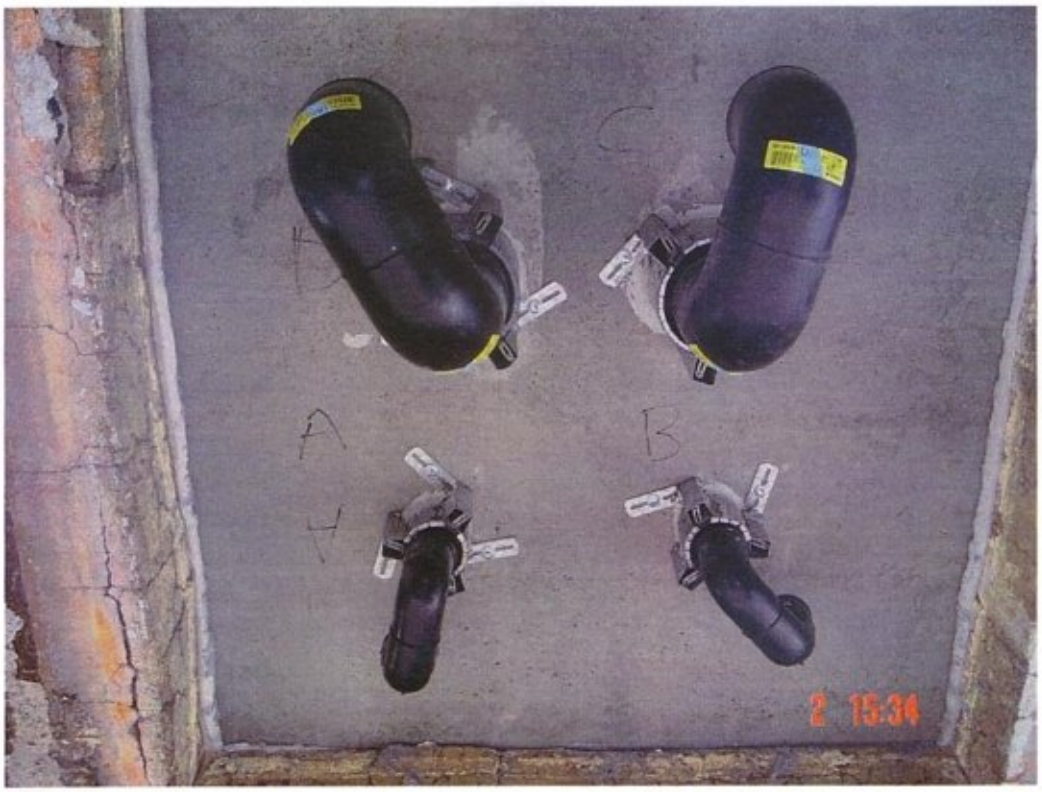
APPENDIX 4

TESTED BY:

Chris Wojcik
Testing Officer

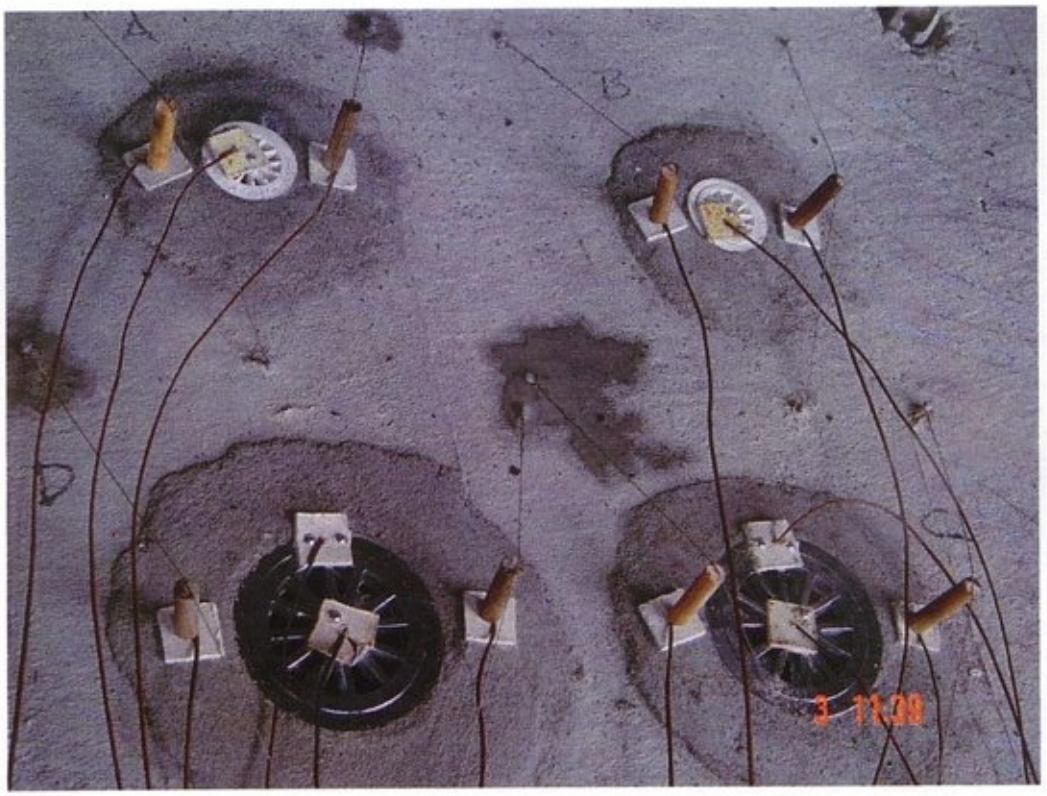
Garry Collins
Manager, Fire Testing and Assessment

19 AUGUST 2005

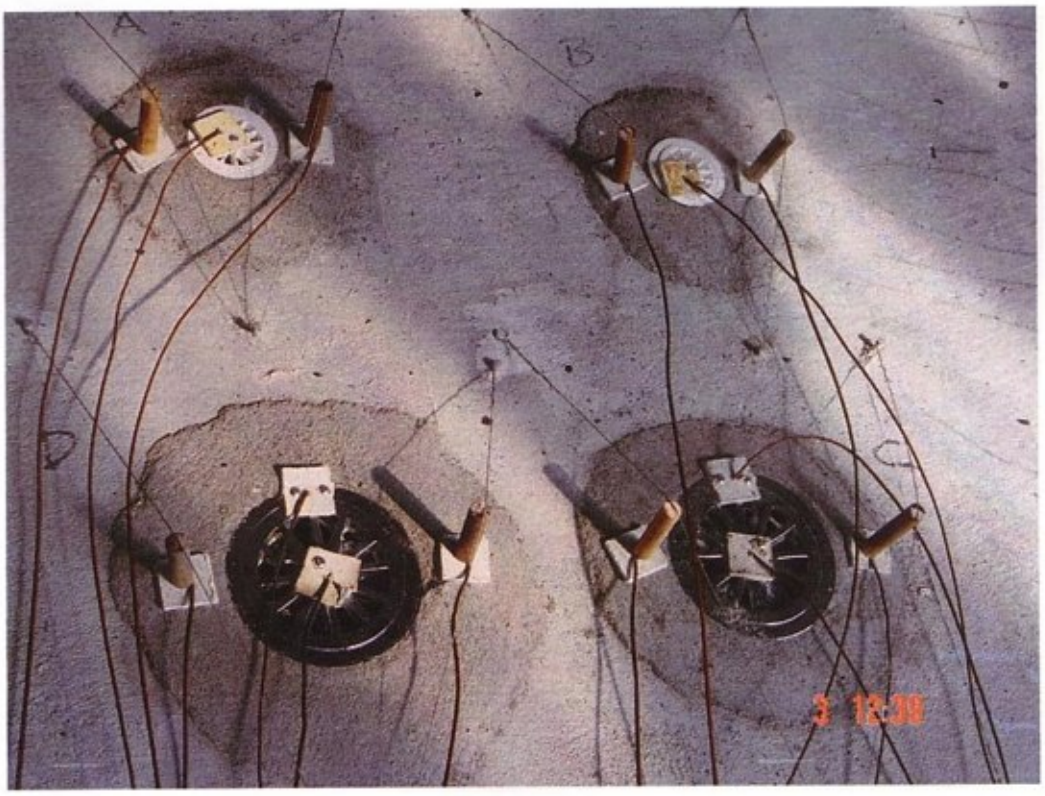


Photograph 1 - Specimens (exposed side) prior to testing.

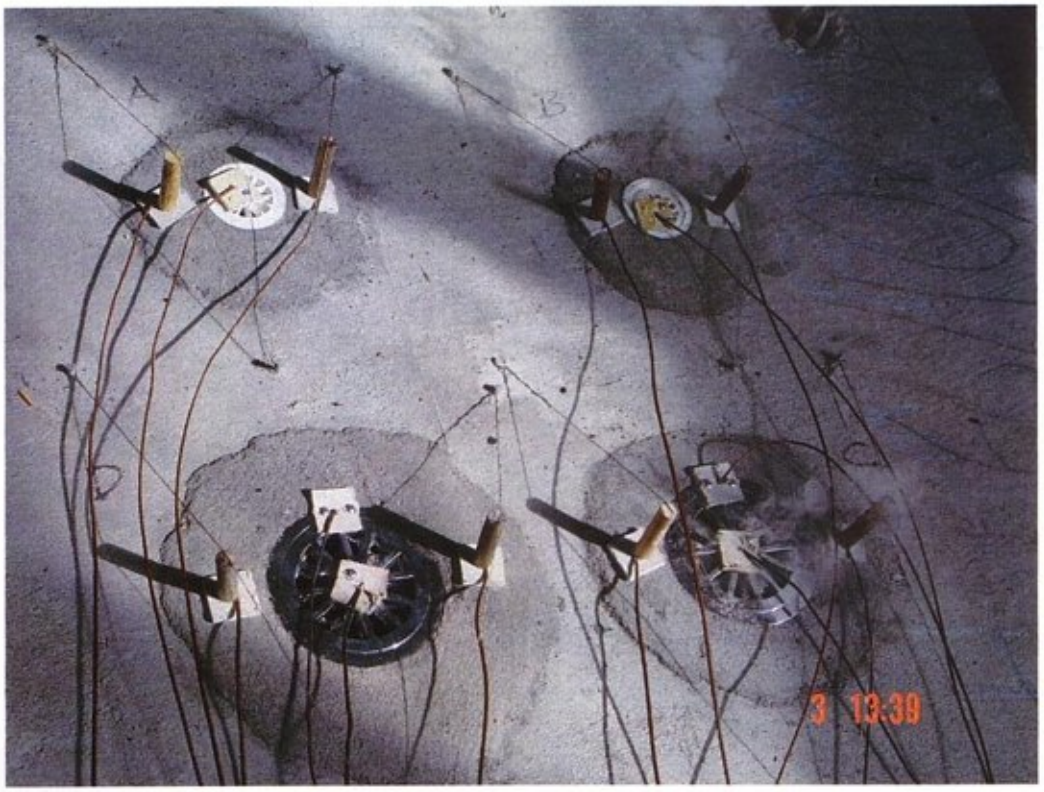
Photograph 2 – Specimens (unexposed side) prior to testing.



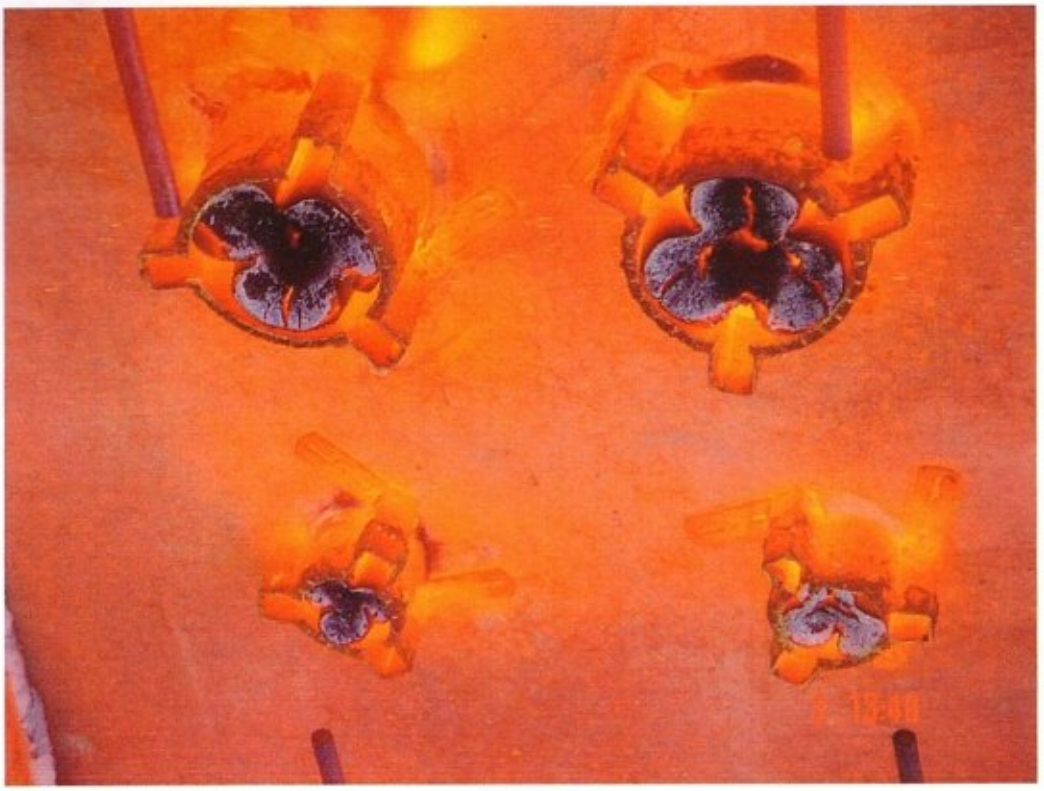
Photograph 3 – Specimens at 61 minutes into the test.



Photograph 4 – Specimens at 121 minutes into the test.



Photograph 5 – Specimens at 181 minutes into the test.



Photograph 6 – Specimens (exposed side) after the completion of testing.

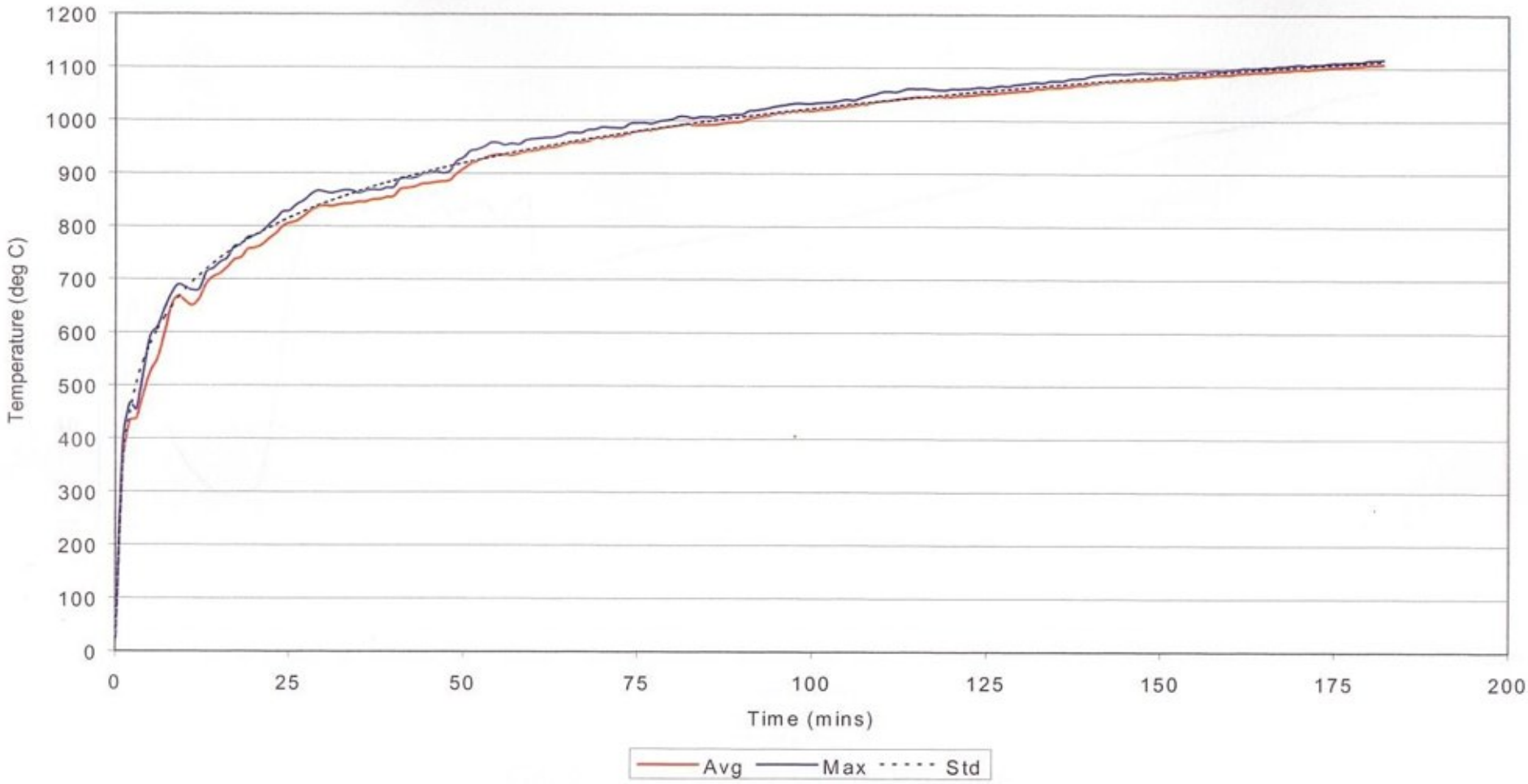


Fig. 1 – FURNACE TEMPERATURE

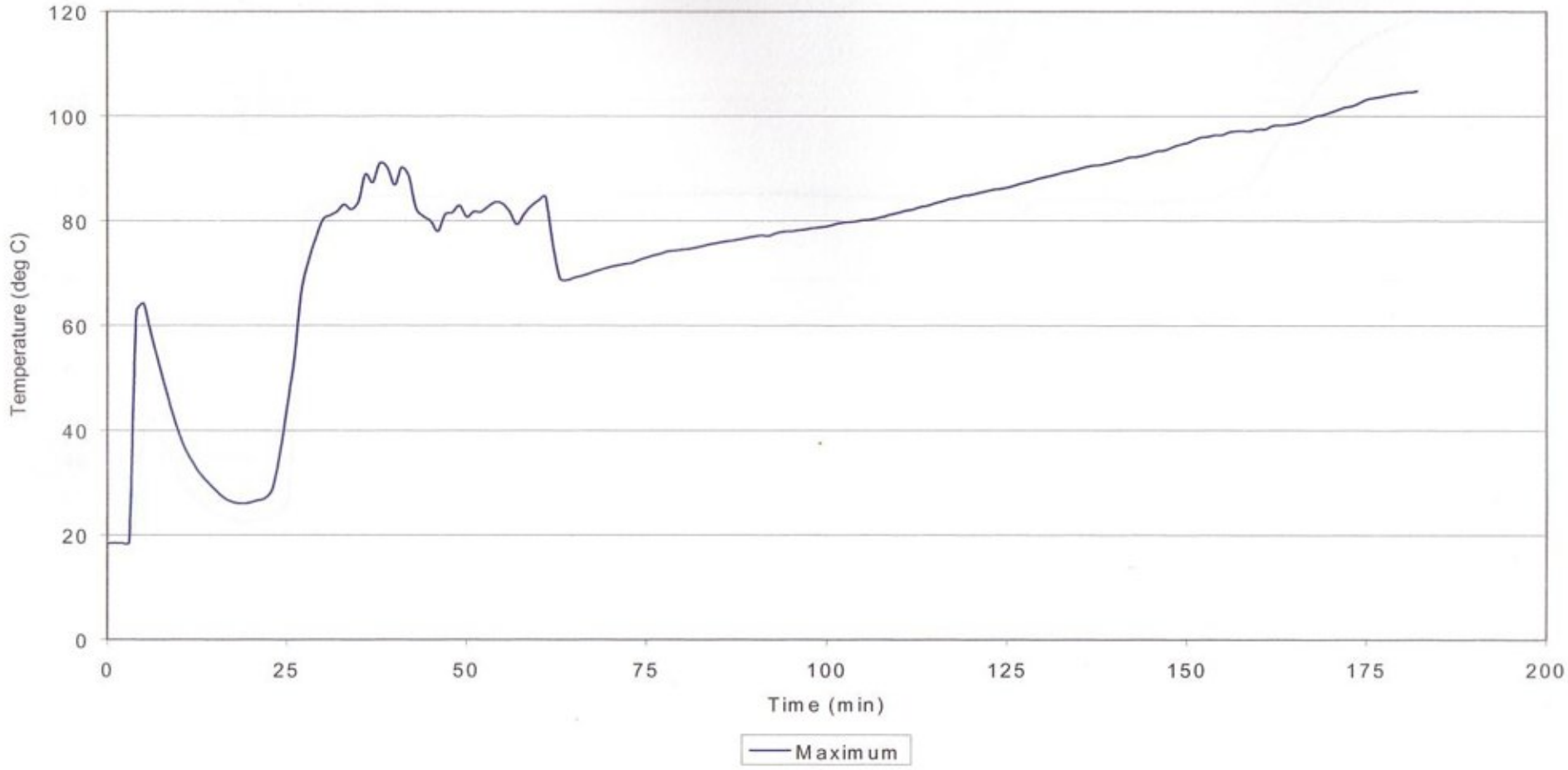


Fig. 2 – SPECIMEN TEMPERATURE
Maximum temperature associated with Penetration A.

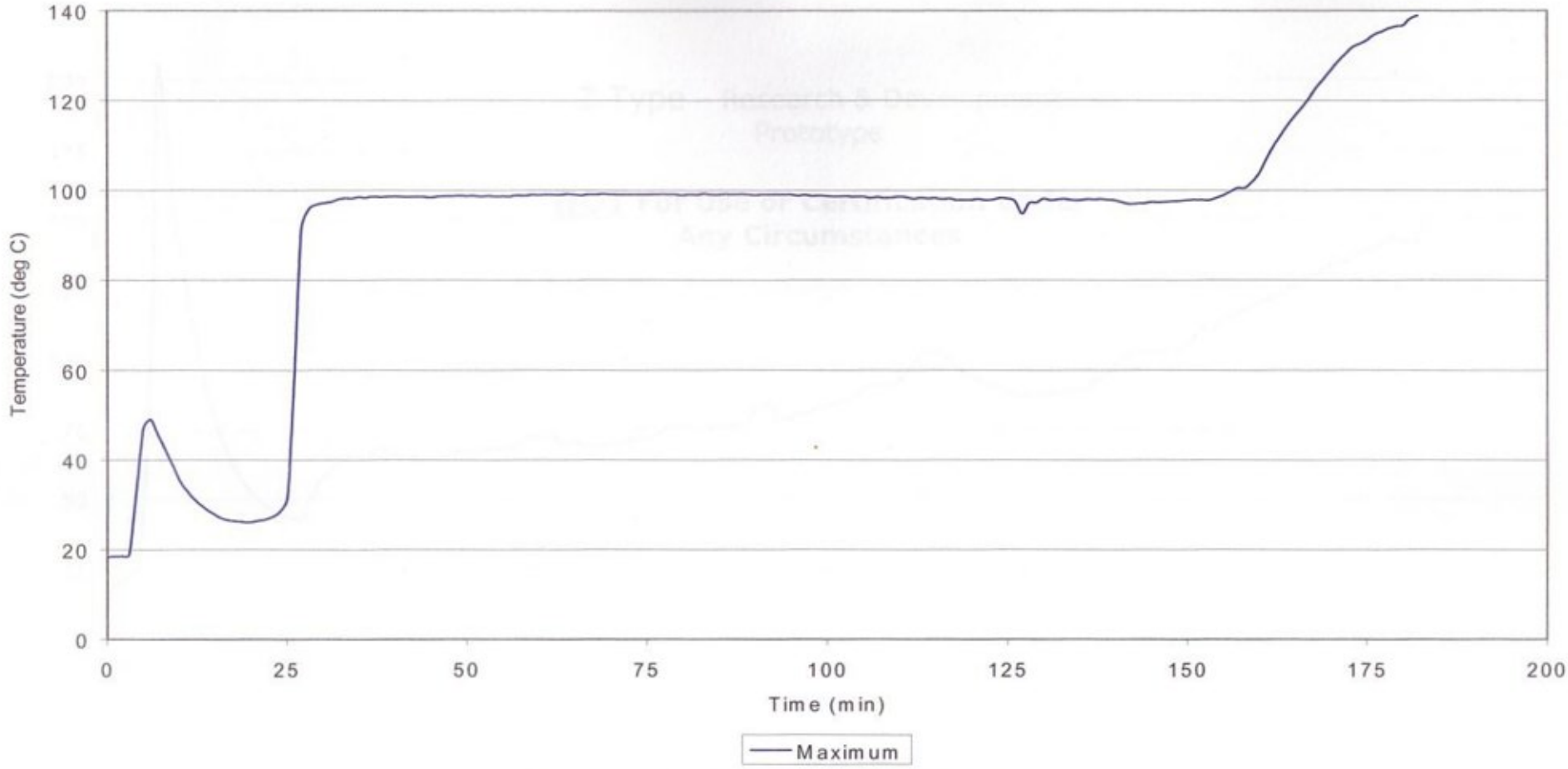


Fig. 3 – SPECIMEN TEMPERATURE
Maximum temperature associated with Penetration B.

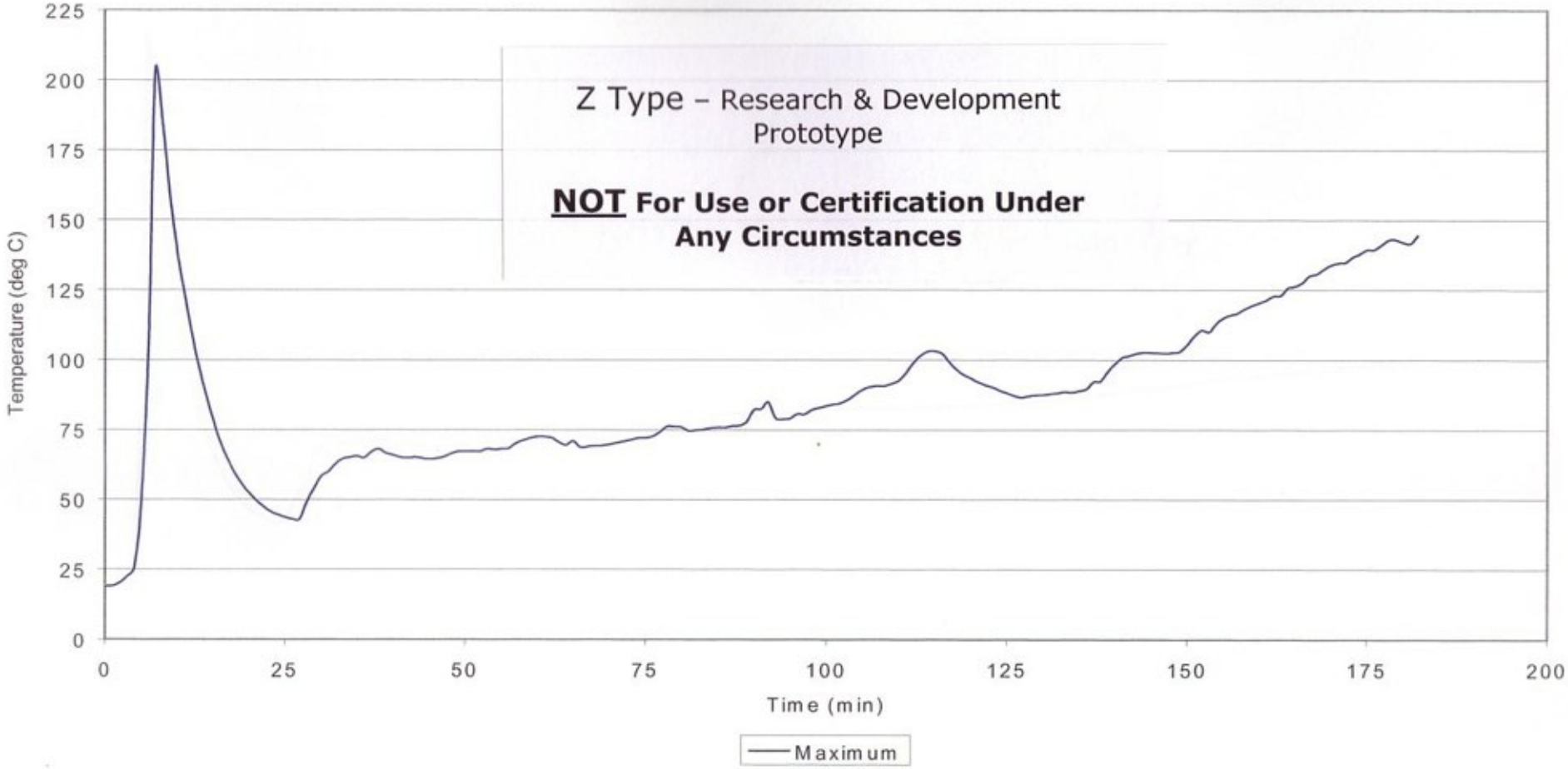


Fig. 4 – SPECIMEN TEMPERATURE
Maximum temperature associated with Penetration C.

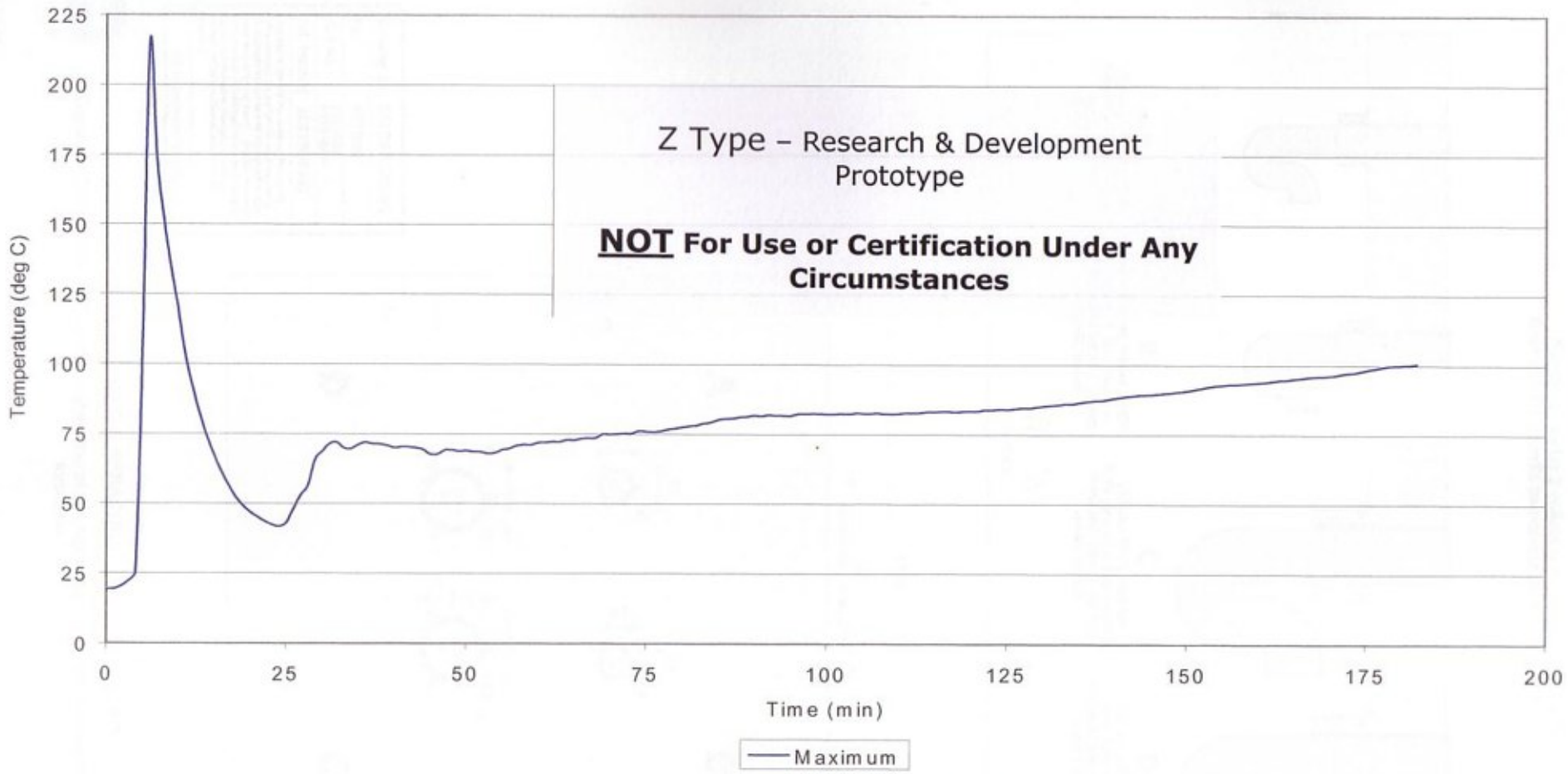
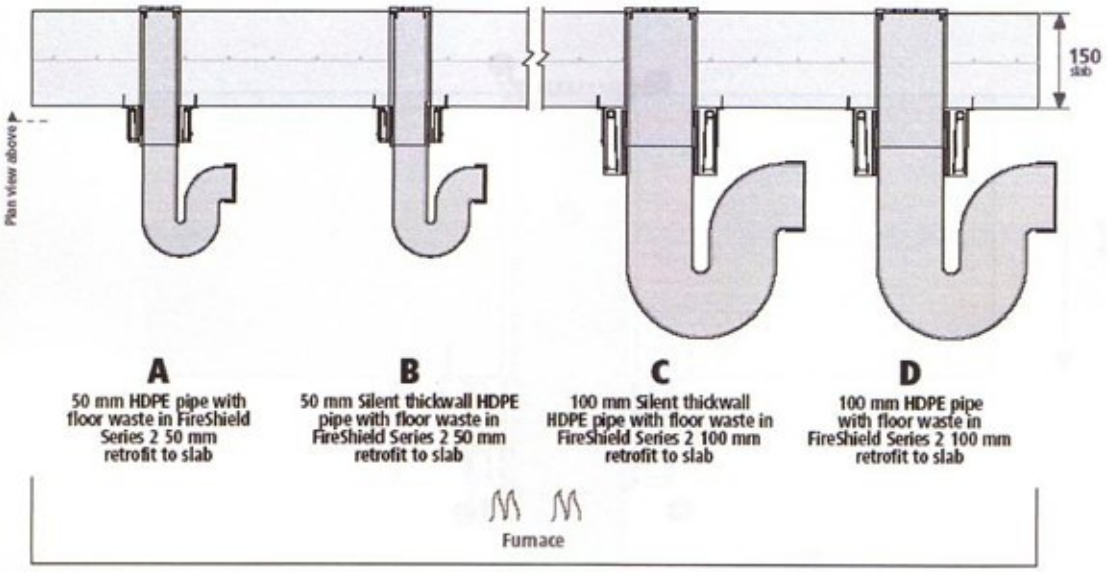
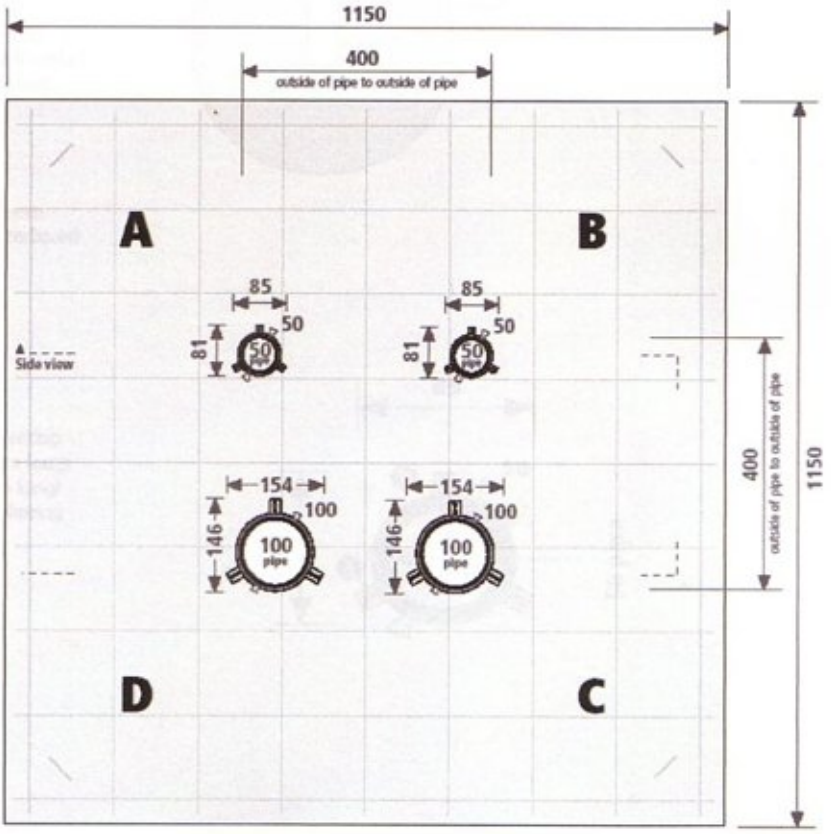


Fig. 5 – SPECIMEN TEMPERATURE
Maximum temperature associated with Penetration D.

FireShield Series 2 collars with floor wastes retrofit toconcrete slab

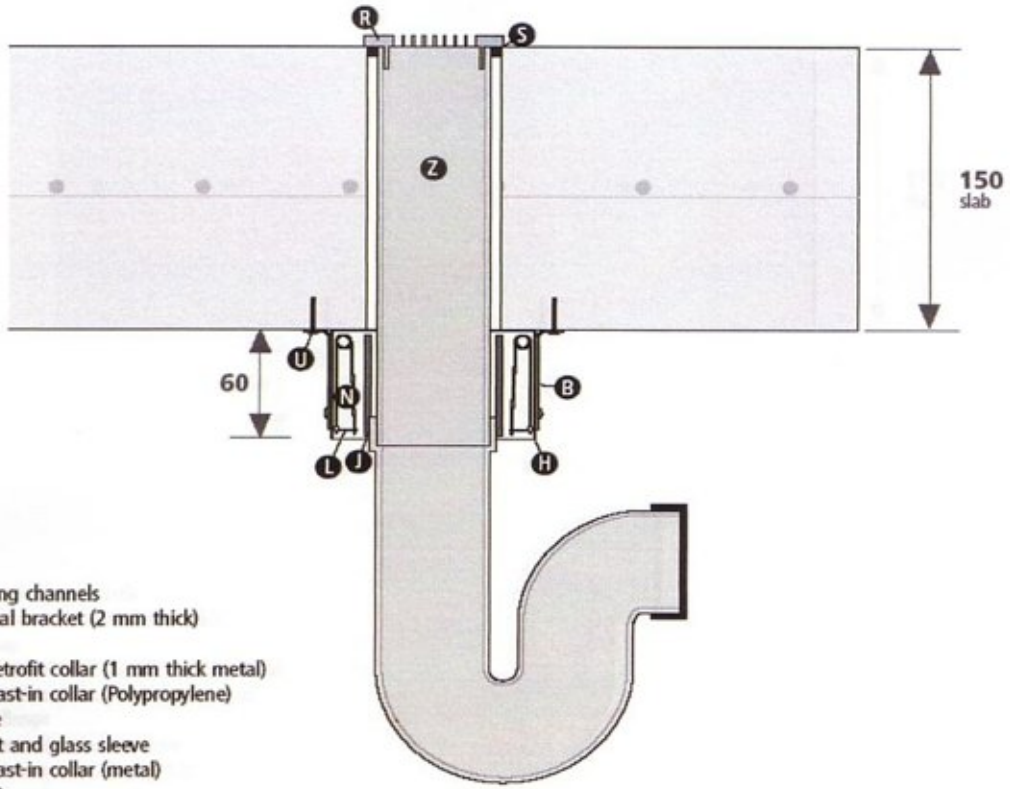




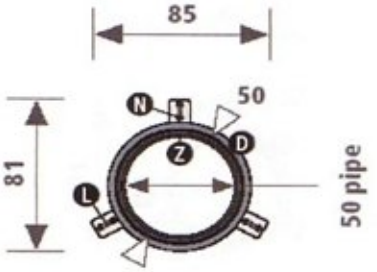
Drawing No.	FSTD80120505
File	FSTD80
Part No.	FS2550H FS25100H
Pat. Pending	2003900592

All dimensions in mm.

Detail drawing A
50 mm HDPE pipe with floor waste in
FireShield Series 2 50 mm retrofit to slab



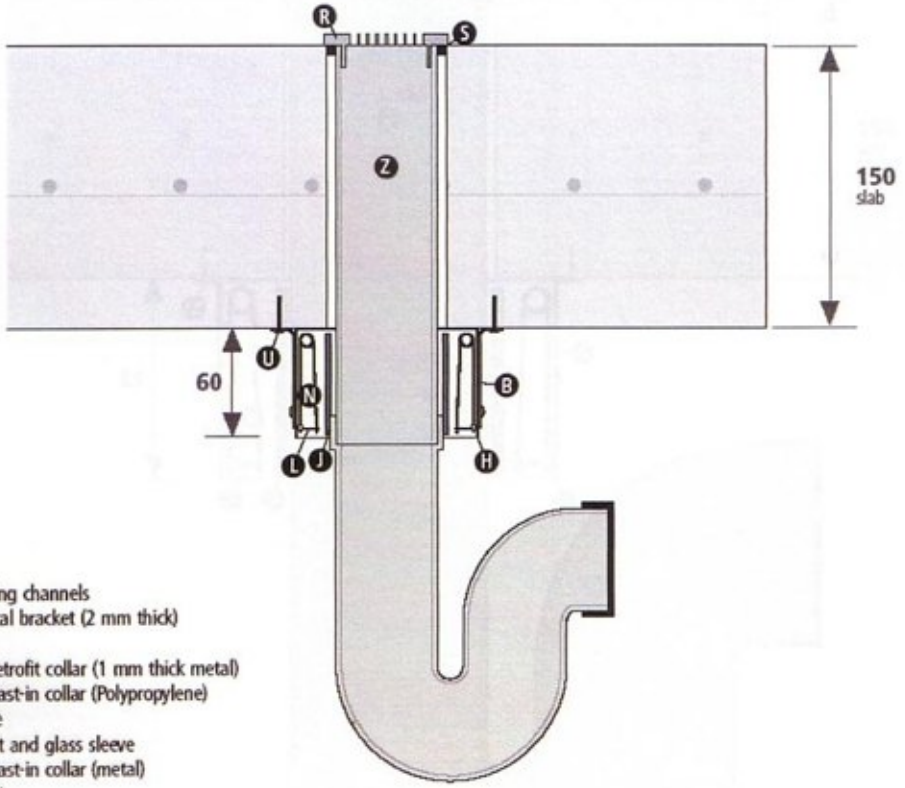
- A Rondo furring channels
- B Angled metal bracket (2 mm thick)
- C End cap
- D FireShield retrofit collar (1 mm thick metal)
- E FireShield cast-in collar (Polypropylene)
- F Floor flange
- G Intumescent and glass sleeve
- H FireShield cast-in collar (metal)
- I Intumescent
- J Intumescent and stainless steel sleeve
- K 3 sheets of 16 mm Fyrchek® plasterboard
- L Fusible link
- M Cement mortar
- N Spring for closing fire collar
- O Ceiling frame at 600 mm centres
- P Metal plate (1 mm thick)
- R Floor grate
- S Fire-rated sealant
- T Steel angles fixed to surface of sheeting
- U Stainless steel knock-in (5 x 40 mm long)
- V Screw into wall frame (5 x 40 mm long)
- W Screw into steel angles or Rondo furring channels (5 x 20 mm long)
- X Fibreglass liner
- Z 50 mm HDPE pipe



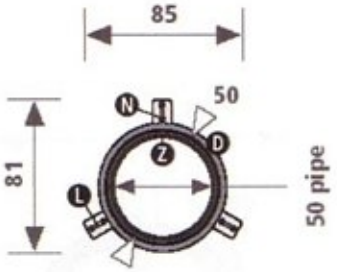
Drawing No.	**FSTD80A**
File	**FSTD80A**
Part No.	**FS2S50H**
Pat. Pending	**2003900592**

All dimensions in mm.

Detail drawing B
50 mm Silent thickwall HDPE pipe with floor waste
in FireShield Series 2 50 mm retrofit to slab



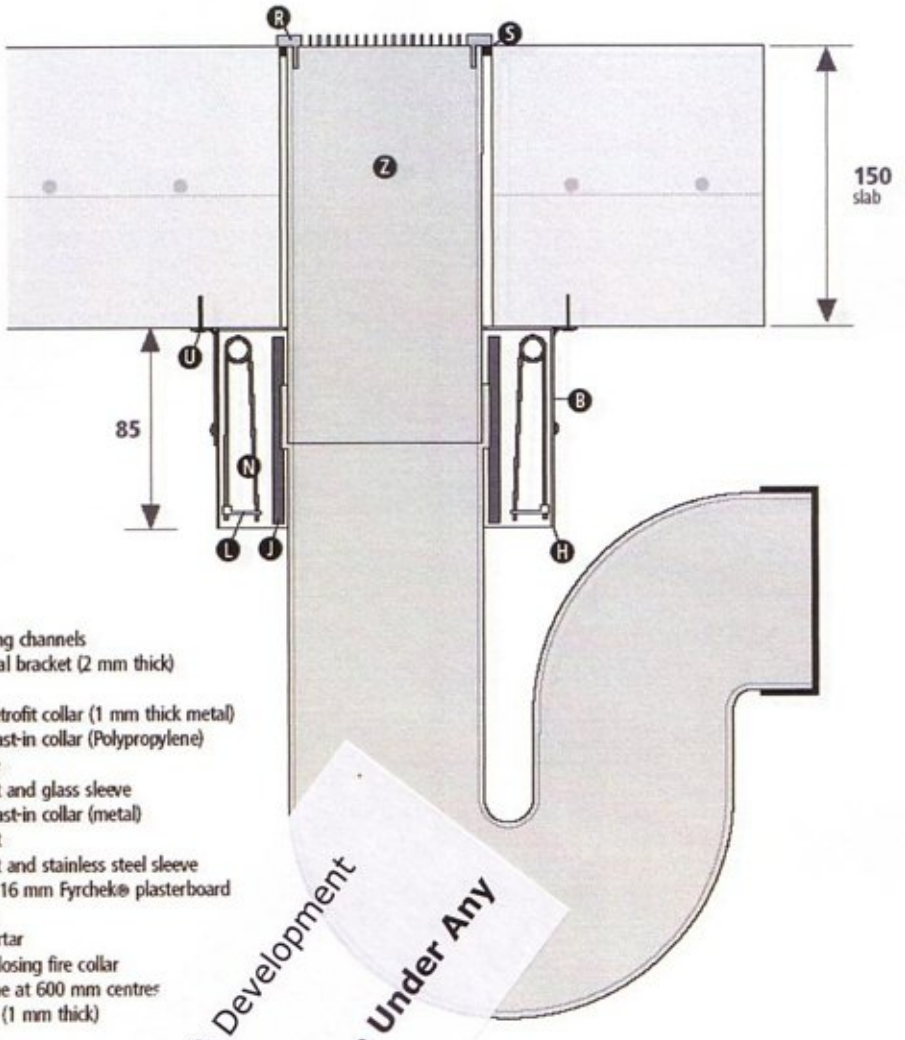
- A Rondo furring channels
- B Angled metal bracket (2 mm thick)
- C End cap
- D FireShield retrofit collar (1 mm thick metal)
- E FireShield cast-in collar (Polypropylene)
- F Floor flange
- G Intumescent and glass sleeve
- H FireShield cast-in collar (metal)
- I Intumescent
- J Intumescent and stainless steel sleeve
- K 3 sheets of 16 mm Fyrchek® plasterboard
- L Fusible link
- M Cement mortar
- N Spring for closing fire collar
- O Ceiling frame at 600 mm centres
- P Metal plate (1 mm thick)
- R Floor grate
- S Fire-rated sealant
- T Steel angles fixed to surface of sheeting
- U Stainless steel knock-in (5 x 40 mm long)
- V Screw into wall frame (5 x 40 mm long)
- W Screw into steel angles or Rondo furring channels (5 x 20 mm long)
- X Fibreglass liner
- Z 50 mm Silent thickwall HDPE pipe



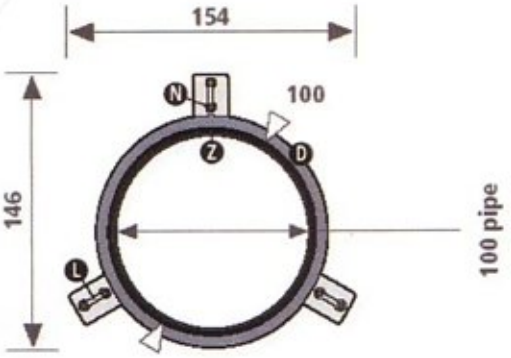
Drawing No.	**FSTD80B120505**
File	**FSTD80B**
Part No.	**FS2S50H**
Pat. Pending	**2003900592**

All dimensions in mm.

Detail drawing C
100 mm Silent thickwall HDPE pipe with floor waste in FireShield Series 2 100 mm retrofit to slab

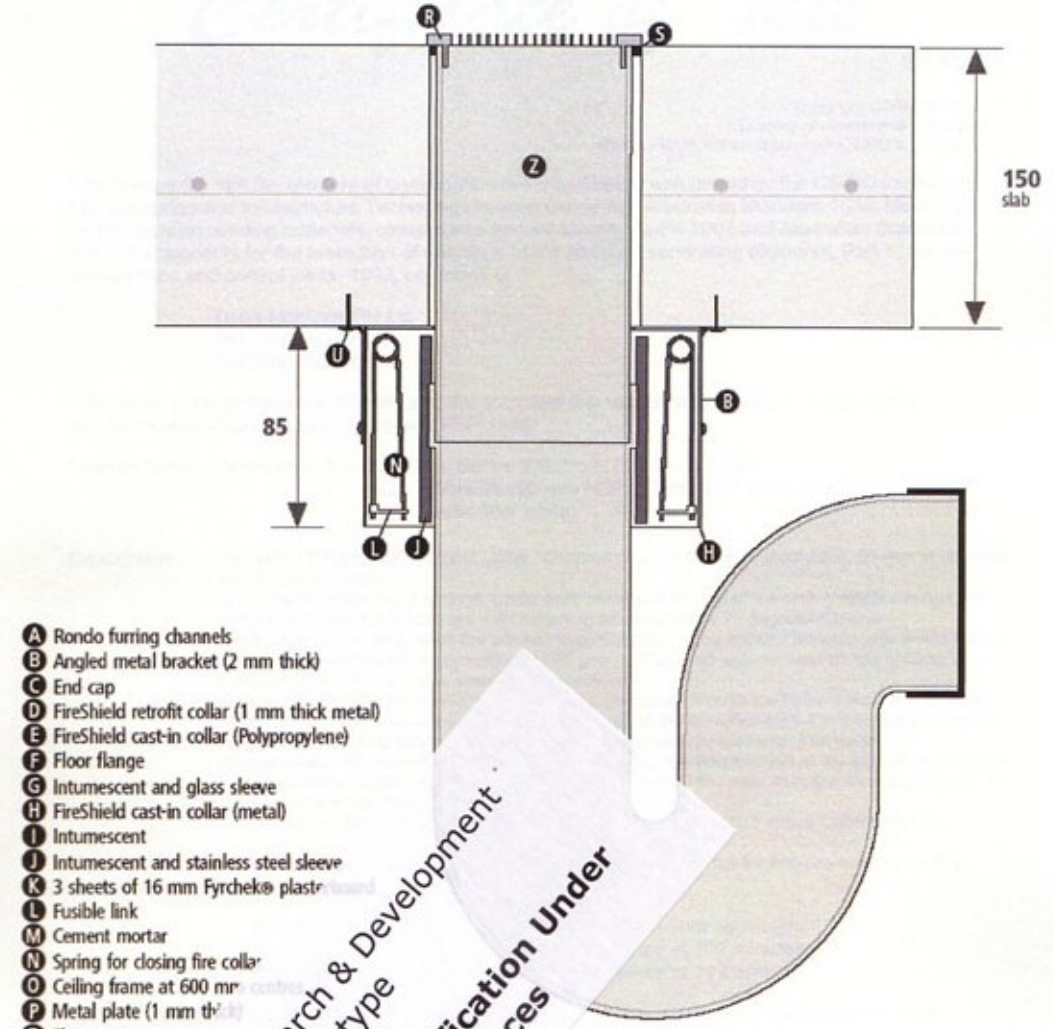


- A Rondo furring channels
- B Angled metal bracket (2 mm thick)
- C End cap
- D FireShield retrofit collar (1 mm thick metal)
- E FireShield cast-in collar (Polypropylene)
- F Floor flange
- G Intumescent and glass sleeve
- H FireShield cast-in collar (metal)
- I Intumescent
- J Intumescent and stainless steel sleeve
- K 3 sheets of 16 mm Fyrchek® plasterboard
- L Fusible link
- M Cement mortar
- N Spring for closing fire collar
- O Ceiling frame at 600 mm centres
- P Metal plate (1 mm thick)
- R Floor grate
- S Fire-rated sealant
- T Steel angles fixed to su
- U Stainless steel knock
- V Screw into wall fr
- W Screw into steel channels (5 x
- X Fibreglass
- Z 100 mm

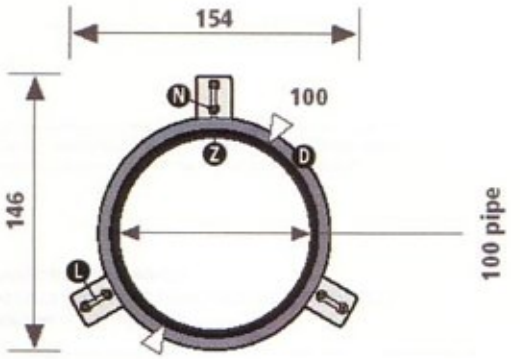


Drawing
File
P
All dimensions in m

Detail drawing D
100 mm HDPE pipe with floor waste
in FireShield Series 2 100 mm retrofit to slab



- A Rondo furring channels
- B Angled metal bracket (2 mm thick)
- C End cap
- D FireShield retrofit collar (1 mm thick metal)
- E FireShield cast-in collar (Polypropylene)
- F Floor flange
- G Intumescent and glass sleeve
- H FireShield cast-in collar (metal)
- I Intumescent
- J Intumescent and stainless steel sleeve
- K 3 sheets of 16 mm Fyrchek® plaste
- L Fusible link
- M Cement mortar
- N Spring for closing fire colla
- O Ceiling frame at 600 mm
- P Metal plate (1 mm th
- R Floor grate
- S Fire-rated sealan
- T Steel angles f
- U Stainless s
- V Screw i
- W Screw ch
- X
- Z 100 mm PVC pipe



Dr	
File	
Part No.	
Pat. Pending 20	

All dimensions in mm.

Certificate of Test

No. 1925

This is to certify that the element of construction described below was tested by the CSIRO Division of Manufacturing and Infrastructure Technology in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-1997 and Australian Standard 4072, Components for the protection of openings in fire-resistant separating elements, Part 1: Service penetrations and control joints -1992, on behalf of

Truss Holdings Pty Ltd
161 Railway Parade
THORNSIDE QLD

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSP 1146.

Product Name: Penetration A – 40/50-mm Series 2 Retro-fit FireShield Collar
FS2S – 50HFW (50-mm HDPE Geberit PE80 pipe with a trap fitting and a plastic floor grate)

Description: The Series 2 Retro-fit FireShield Collar consisted of a 1.2-mm thick steel case, 85-mm in diameter and 60-mm in height.
The collar incorporated 3 springs, these were pivoted at the top of the spring metal casings and restrained by a nylon fusible link with a melting temperature of 75 degrees Celsius.
A soft intumescent wrap lined the internal circumference of the collar. The wrap was 4-mm thick x 57-mm wide, and weighed approximately 75 grams. The wrap was covered on the outside by a 0.35-mm thick x 57-mm wide stainless steel sleeve.
A nominal 50-mm ID HDPE Geberit PE80 pipe, was fitted through the collar's sleeve. The pipe projected vertically, approximately flush with the top of the concrete slab. On the exposed side of the slab, a HDPE trap fitting filled with water was inserted into the collar that projected approximately 150-mm into the furnace chamber. The pipe was capped at the top with a standard 50-mm diameter plastic floor grate. On the exposed side of the slab, the pipe was capped with a standard HDPE cap fitting.
Construction is detailed in drawing file No. FSTD80A, undated, by Fireball Collars Pty Ltd.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	-	not applicable
Integrity	-	no failure at 182 minutes
Insulation	-	no failure at 182 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/180. The FRL is applicable for exposure to fire from the same side as tested.

Testing Officer: Chris Wojcik Date of Test: 3 May 2005
Issued on the 19th day of August 2005 without alterations or additions.

Garry E Collins
Manager, Fire Testing and Assessments

This laboratory is accredited (Accreditation No. 3632) by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

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CSIRO Manufacturing & Infrastructure Technology
14 Julius Avenue, Riverside Corporate Park, North Ryde NSW 2113 AUSTRALIA
Telephone: 61 2 9490 5444 Facsimile: 61 2 9490 5555

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Certificate of Test

No. 1926

This is to certify that the element of construction described below was tested by the CSIRO Division of Manufacturing and Infrastructure Technology in accordance with Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-1997 and Australian Standard 4072, Components for the protection of openings in fire-resistant separating elements, Part 1: Service penetrations and control joints -1992, on behalf of

Truss Holdings Pty Ltd
161 Railway Parade
THORNSIDE QLD

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSP 1146.

Product Name: Penetration B – 40/50-mm Series 2 Retro-fit FireShield Collar
FS2S – 50HFW (50-mm HDPE Geberit Silent pipe with a trap fitting and a plastic floor grate)

Description: The Series 2 Retro-fit FireShield Collar consisted of a 1.2-mm thick steel case, 85-mm in diameter and 60-mm in height.
The collar incorporated 3 springs, these were pivoted at the top of the spring metal casings and restrained by a nylon fusible link with a melting temperature of 75 degrees Celsius.
A soft intumescent wrap lined the internal circumference of the collar. The wrap was 4-mm thick x 57-mm wide, and weighed approximately 75 grams. The wrap was covered on the outside by a 0.35-mm thick x 57-mm wide stainless steel sleeve.
A nominal 50-mm ID HDPE Geberit Silent pipe, with 3.2-mm wall thickness was fitted through the collar's sleeve. The pipe projected vertically, approximately flush with the top of the concrete slab. On the exposed side of the slab, a HDPE trap fitting filled with water was inserted into the collar that projected approximately 150-mm into the furnace chamber. The pipe was capped at the top with a standard 50-mm diameter plastic floor grate. On the exposed side of the slab, the pipe was capped with a standard HDPE cap fitting.
Construction is detailed in drawing file No. FSTD80B, undated, by Fireball Collars Pty Ltd.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	-	not applicable
Integrity	-	no failure at 182 minutes
Insulation	-	no failure at 182 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/180. The FRL is applicable for exposure to fire from the same side as tested.

Testing Officer: Chris Wojcik Date of Test: 3 May 2005
Issued on the 19th day of August 2005 without alterations or additions.

Garry E Collins
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Certificate of Test No. 1927

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Truss Holdings Pty Ltd
161 Railway Parade
THORNSIDE QLD

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSP 1146.

Product Name: Penetration C – 65/80/90/100-mm Series 2 Retro-fit FireShield Collar FS2S – 100HFW - Z (100-mm HDPE Silent pipe with a trap fitting and a plastic floor grate)

Description: The Series 2 FS2S-Z FireShield Collar consisted of a 1.2-mm thick steel case, 140-mm in diameter and 85-mm in height.
The collar incorporated [illegible] these were pivoted at the top of the spring metal casings and restrained by a nylon fusible link with a melting temperature of 75 degrees Celsius.
A soft intumescent wrap lined the internal circumference of the collar. The wrap was 6-mm thick x 85-mm wide and weighed approximately 300 grams. The wrap was covered on the outside by a 0.35-mm thick x 85-mm wide stainless steel sleeve.
A nominal 100-mm OD HDPE Geberit Silent [illegible] pipe, with 6.0-mm wall thickness, was fitted through the collar [illegible]. The pipe protruded vertically, approximately flush with the top of the concrete slab. On the unexposed side of the [illegible] HDPE trap fitting filled with water was inserted into the collar that [illegible] approximately 150-mm into the furnace chamber. The pipe was capped at the top with [illegible]-mm diameter plastic floor grate. On the exposed side of the slab, the pipe was capped with a [illegible] plastic cap fitting.
Construction is detailed in drawing [illegible], undated, by [illegible] Pty Ltd.

Z Type – Research & Development Prototype
NOT For Use or Certification Under Any Circumstances

The element of construction described above satisfied the [illegible] criteria for fire-resistance for the period stated.

Structural Adequacy	-	not applicable
Integrity	-	no failure at 182 minutes
Insulation	-	7 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/0. The FRL is applicable for exposure to fire from the same side as tested.

Testing Officer: Chris Wojcik Date of Test: 3 May 2005
Issued on the 19th day of August 2005 without alterations or additions.

Garry E Collins
Garry E Collins
Manager, Fire Testing and Assessments

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Certificate of Test

No. 1928

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Truss Holdings Pty Ltd
161 Railway Parade
THORNSIDE QLD

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSP 1146.

Product Name: Pe ·/80/90/100-mm Series 2 Retro-fit FireShield Collar
- 100HFW - Z (100-mm HDPE Geberit PE80 pipe with a trap
a plastic floor grate)

Description: consisted of a 1.2-mm thick steel case, 140-mm in
nivoted at the top of the spring metal casings and
mperature of 75 degrees Celsius.
ce of the collar. The wrap was 6-mm thick x
wrap was covered on the outside by a
ll thickness, was fitted through the
the top of the concrete slab.
inserted into the collar
s capped at the top
slab, the pipe was
d.

Z Type – Research & Development Prototype NOT For Use or Certification Under Any Circumstances

The element of construction described above ne
period stated.

Structural Adequacy	-	
Integrity	-	no
Insulation	-	

and therefore for the purpose of Building Regulations in Australia, achi ance level (FRL) of -/180/0. The FRL is applicable for exposure to fire from the same ted.

Testing Officer: Chris Wojcik Date of Test: 3 May 2005
Issued on the 19th day of August 2005 without alterations or additions.

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Manager, Fire Testing and Assessments

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Truss Holdings Pty Ltd
161 Railway Parade
THORNSIDE QLD

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSP 1146.

Product Name: Penetration A – 40/50-mm Series 2 Retro-fit FireShield Collar
FS2S – 50HFW (50-mm HDPE Geberit PE80 pipe with a trap fitting and a plastic floor grate)

Description: The Series 2 Retro-fit FireShield Collar consisted of a 1.2-mm thick steel case, 85-mm in diameter and 60-mm in height.
The collar incorporated 3 springs, these were pivoted at the top of the spring metal casings and restrained by a nylon fusible link with a melting temperature of 75 degrees Celsius.
A soft intumescent wrap lined the internal circumference of the collar. The wrap was 4-mm thick x 57-mm wide, and weighed approximately 75 grams. The wrap was covered on the outside by a 0.35-mm thick x 57-mm wide stainless steel sleeve.
A nominal 50-mm ID HDPE Geberit PE80 pipe, was fitted through the collar's sleeve. The pipe projected vertically, approximately flush with the top of the concrete slab. On the exposed side of the slab, a HDPE trap fitting filled with water was inserted into the collar that projected approximately 150-mm into the furnace chamber. The pipe was capped at the top with a standard 50-mm diameter plastic floor grate. On the exposed side of the slab, the pipe was capped with a standard HDPE cap fitting.
Construction is detailed in drawing file No. FSTD80A, undated, by Fireball Collars Pty Ltd.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	-	not applicable
Integrity	-	no failure at 182 minutes
Insulation	-	no failure at 182 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/180. The FRL is applicable for exposure to fire from the same side as tested.

Testing Officer: Chris Wojcik Date of Test: 3 May 2005
Issued on the 19th day of August 2005 without alterations or additions.

Garry E Collins
Manager, Fire Testing and Assessments

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Truss Holdings Pty Ltd
161 Railway Parade
THORNSIDE QLD

A full description of the test specimen and the complete test results are detailed in the Division's sponsored investigation report numbered FSP 1146.

Product Name: Penetration B – 40/50-mm Series 2 Retro-fit FireShield Collar
FS2S – 50HFW (50-mm HDPE Geberit Silent pipe with a trap fitting and a plastic floor grate)

Description: The Series 2 Retro-fit FireShield Collar consisted of a 1.2-mm thick steel case, 85-mm in diameter and 60-mm in height.
The collar incorporated 3 springs, these were pivoted at the top of the spring metal casings and restrained by a nylon fusible link with a melting temperature of 75 degrees Celsius.
A soft intumescent wrap lined the internal circumference of the collar. The wrap was 4-mm thick x 57-mm wide, and weighed approximately 75 grams. The wrap was covered on the outside by a 0.35-mm thick x 57-mm wide stainless steel sleeve.
A nominal 50-mm ID HDPE Geberit Silent pipe, with 3.2-mm wall thickness was fitted through the collar's sleeve. The pipe projected vertically, approximately flush with the top of the concrete slab. On the exposed side of the slab, a HDPE trap fitting filled with water was inserted into the collar that projected approximately 150-mm into the furnace chamber. The pipe was capped at the top with a standard 50-mm diameter plastic floor grate. On the exposed side of the slab, the pipe was capped with a standard HDPE cap fitting.
Construction is detailed in drawing file No. FSTD80B, undated, by Fireball Collars Pty Ltd.

The element of construction described above satisfied the following criteria for fire-resistance for the period stated.

Structural Adequacy	-	not applicable
Integrity	-	no failure at 182 minutes
Insulation	-	no failure at 182 minutes

and therefore for the purpose of Building Regulations in Australia, achieved a fire-resistance level (FRL) of -/180/180. The FRL is applicable for exposure to fire from the same side as tested.

Testing Officer: Chris Wojcik Date of Test: 3 May 2005
Issued on the 19th day of August 2005 without alterations or additions.

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