



FyreWrap® Cable Insulation System

APPLICATION PROCEDURE



Document: UFX/CSINST/001, Rev 01

July 2009

Introduction

The information in this manual should be followed with care to ensure that the Unifrax FyreWrap® Cable Insulation system is installed in a manner which will ensure optimum performance of the system..

Installer/end users should ensure before installation begins that the materials supplied to site are of the correct type and grade. It is recommended that records are kept of the brand designation and any batch/ lot numbers for future reference.

A generalised cross section of the system and longitudinal layout are shown in Fig. 1 below and it is essential that components are installed in the correct order. The certified system uses the grades and thicknesses etc of the materials which are indicated in this guide. Under some circumstances it may be possible to substitute alternative grades of material (e.g. a greater thickness of FyreWrap® Cable Insulation, a greater thickness or width of stainless steel banding) with no detrimental effect on the performance of the system but any such deviations should be approved prior to installation by the appropriate Notified Body or Authority giving approval to the project. Under no circumstances should thinner or lower density materials or reduced numbers of fastenings be used as the system performance will be compromised.

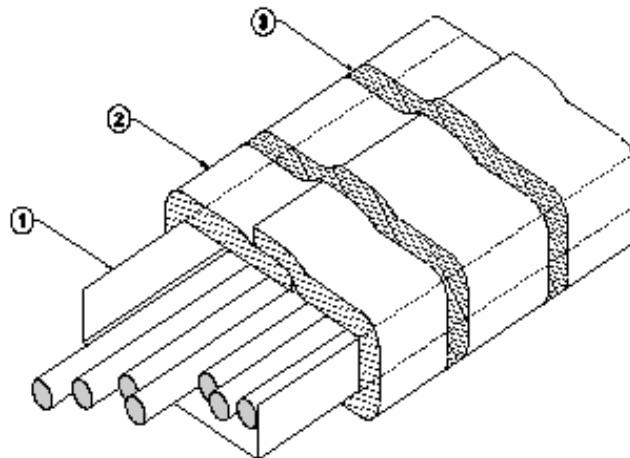


Fig. 1. Longitudinal system layout.

- 1- Cable Tray
- 2- FyreWrap Cable Insulation
- 3- Stainless steel banding

The table below summarises the testing and the relevant system constructions.

ASTM E-1529 Circuit Integrity (Hydrocarbon Fire Curve, Loaded Trays)					As per FM Global Listing
Tray	Cable Loading	Product Version	Blanket	No. of Layers	ASTM E-1529 Rating
305mm	39% actual fill, 100% visual fill	FyreWrap 1.5 Cable Insulation	38mm	One	30 min.
305mm	39% actual fill, 100% visual fill	FyreWrap 2.0 Cable Insulation	50mm	One	60 min.
914mm	39% actual fill, 100% visual fill	2.0 Cable Insulation	50mm	One	45 min.

ASTM E-1725 (ASTM E1529 Hydrocarbon Fire Curve, max 121°C temp rise)					
Tray	Cable Loading	Product Version	Blanket	No. of Layers	ASTM E-1725 Rating
305mm	Empty	FyreWrap 1.5 Cable Insulation	38mm	Two	45min.
305mm	Empty	FyreWrap 2.0 Cable Insulation	50mm	One	30 min.
305mm	39% actual fill, 100% visual fill	FyreWrap 2.0 Cable Insulation	50mm	One	30 min.
914mm	Empty	FyreWrap 2.0 Cable Insulation	50mm	One	15 min
914mm	39% actual fill, 100% visual fill	FyreWrap 2.0 Cable Insulation	50mm	One	15 min

Section 1. Tools

Sharp knife

Scissors

Measuring Tape

Larger Pliers

Large Wire Cutters

Banding Ratchet Tightening Tool

Band Clip Crimping Tool

Section 2. Internal Support installation

Materials

Stainless steel grade AISI 302 (minimum) banding of 0.5mm (.015") minimum thickness and 13mm (0.5") minimum width and AISI 302 grade (minimum) clips of the crimp closing type.

Method

Install stainless steel bands at approximately 265 mm centres around the cable trays to support the flexible FyreWrap Cable Insulation as shown in Figure 2 below. These bands prevent the wrap from sagging into the cable trays.

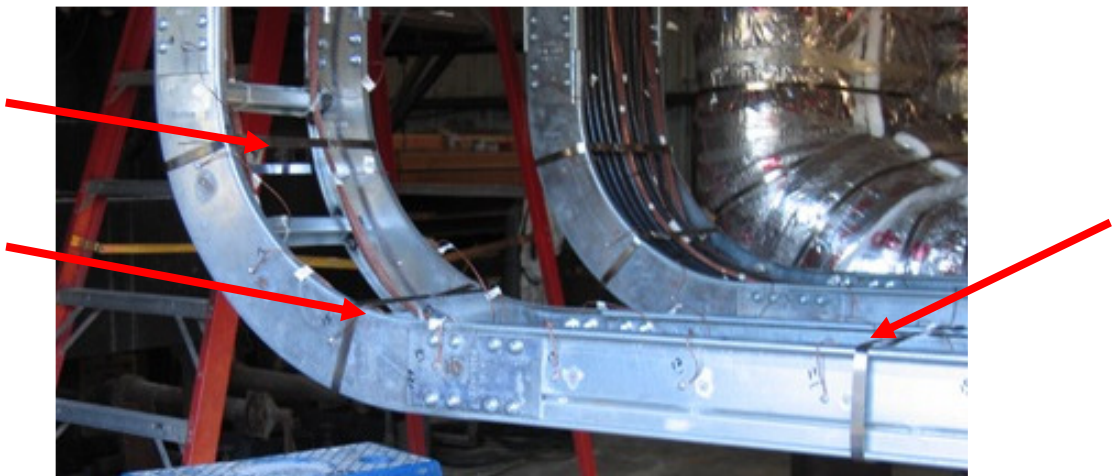


Figure 2. Support Banding

An alternative method of supporting the wrap sections is the use of wire mesh or a cable tray cover.

Section 3. FyreWrap Cable Insulation installation

Materials

FyreWrap Cable Insulation of either 38mm or 50mm thickness
Filament reinforced adhesive tape.

Self adhesive aluminium tape 50 microns thickness - 75mm minimum width for the 38mm Cable Insulation and 100mm minimum width for the 50mm Cable Insulation.

Method

- a) The wraps of FyreWrap Cable Insulation should be cut to size with a large sharp knife. It is recommended that to do this the wrap should be unrolled onto a clean and flat surface such as flattened cardboard packaging. Allow where necessary at least 75mm for joint overlaps. Care should be taken to ensure that the aluminium foil covering is not pierced away from the cut edges.
- b) Seal all cut edges with the self adhesive aluminium tape and ensure that the tape is well pressed into contact with the foil and that there are no holes in the sealing at corners.
- c) Wrap the first length of FyreWrap Cable Insulation around the cable installation as shown in Figure 3 and temporarily secure with the filament tape.

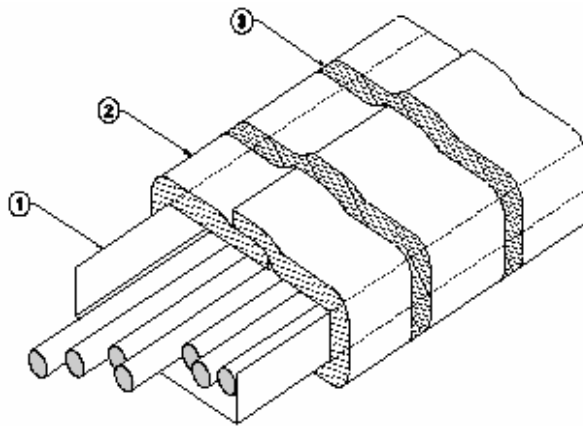


Figure 3. Longitudinal system layout.

1- Cable Tray, 2- FyreWrap Cable Insulation, 3- Filament tape

- d) Install the next lengths of wrap in the same manner. For single layer systems each subsequent length should overlap the previous one at the circumferential joint by 75mm as shown in the drawings in Figures 4-8.

For two layer systems all circumferential joints should be butt joints as shown in the drawing in Figure 9.

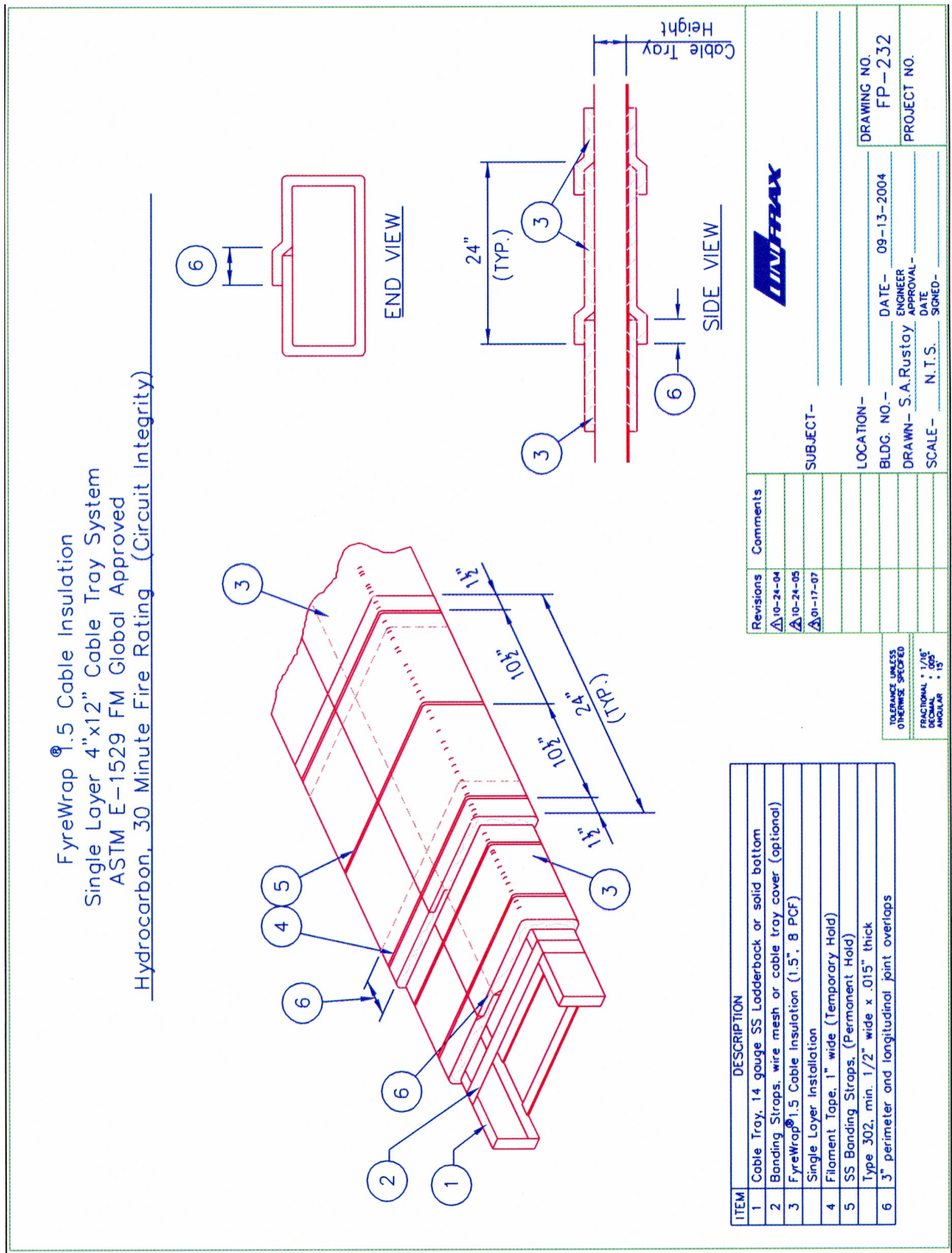


Figure 4. ASTM E-1529 30 Minute System

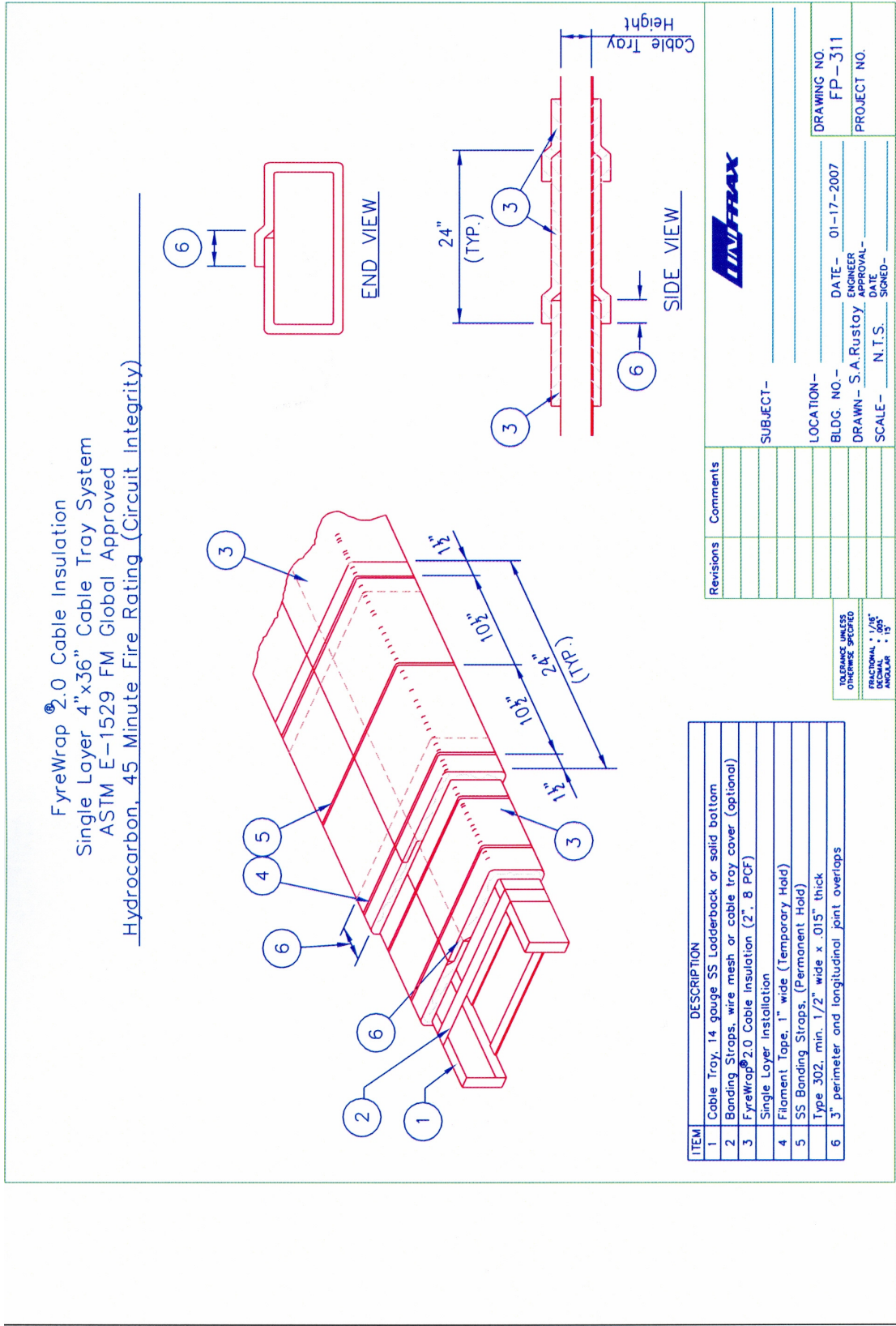


Figure 5. ASTM E-1529 45 Minute System

Hydrocarbon, 60 Minute Fire Rating (Circuit Integrity)

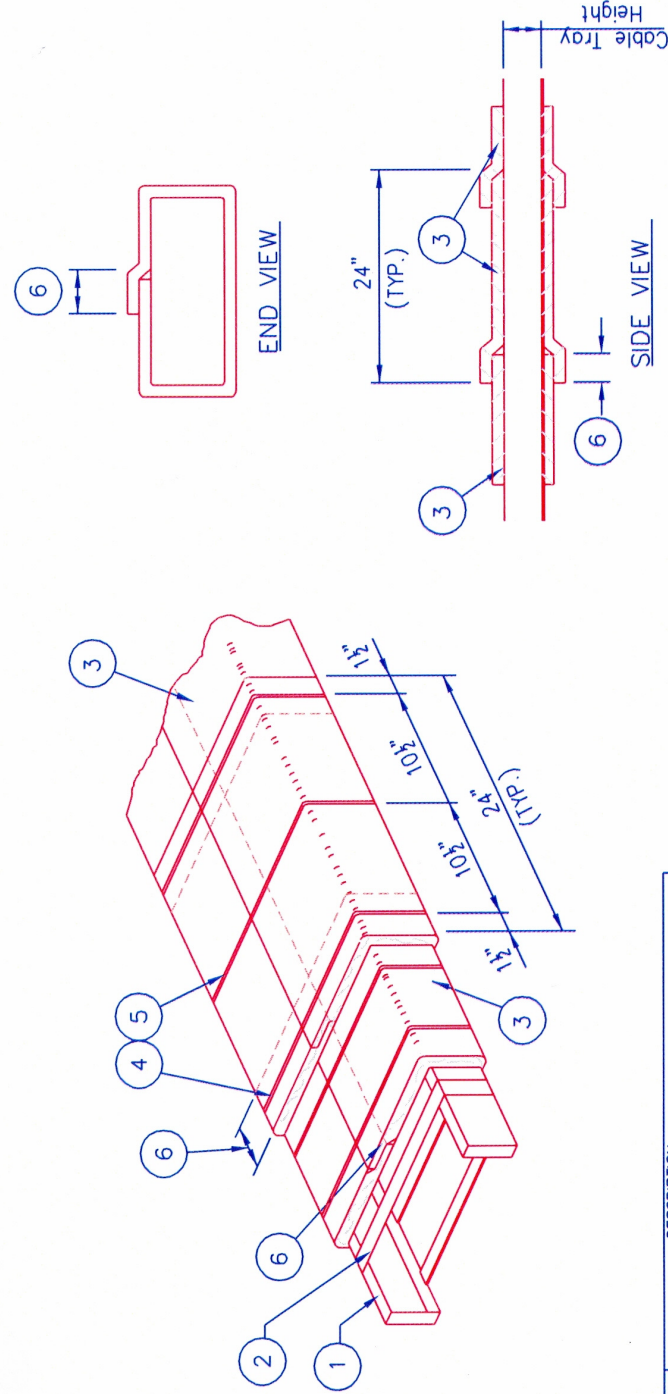


TOLERANCE UNLESS
OTHERWISE SPECIFIED

ENGINEER
APPROVAL - _____

8

FyreWrap® 2.0 Cable Insulation
 Single Layer 4"x36" Cable Tray System
 ASTM E-1725 Intertek Tested
 Hydrocarbon, 15 Minute Fire Rating



ITEM	DESCRIPTION
1	Cable Tray, 14 gauge SS Ladderback or solid bottom empty to full cable loading
2	Banding Straps, wire mesh or cable tray cover (optional)
3	FyreWrap® 2.0 Cable Insulation (2", 8 PCF)
4	Single Layer Installation Filament Tape, 1" wide (Temporary Hold)
5	SS Bonding Straps. (Permanent Hold)
6	Type 302, min. 1/2" wide x .015" thick 3" perimeter and longitudinal joint overlaps

Revisions	Comments



SUBJECT-

LOCATION-

BLDG. NO.-

DRAWN- S.A. Rustay

SCALE- N.T.S.

DATE- 03-07-2007

ENGINEER

APPROVAL-

DRAWING NO. FP-318

PROJECT NO.

TOLERANCE UNLESS OTHERWISE SPECIFIED
 FRACTIONAL: 1/16"
 DECIMAL: .005"
 ANGULAR: 15°

Figure 7. ASTM E-1725 15 Minute System

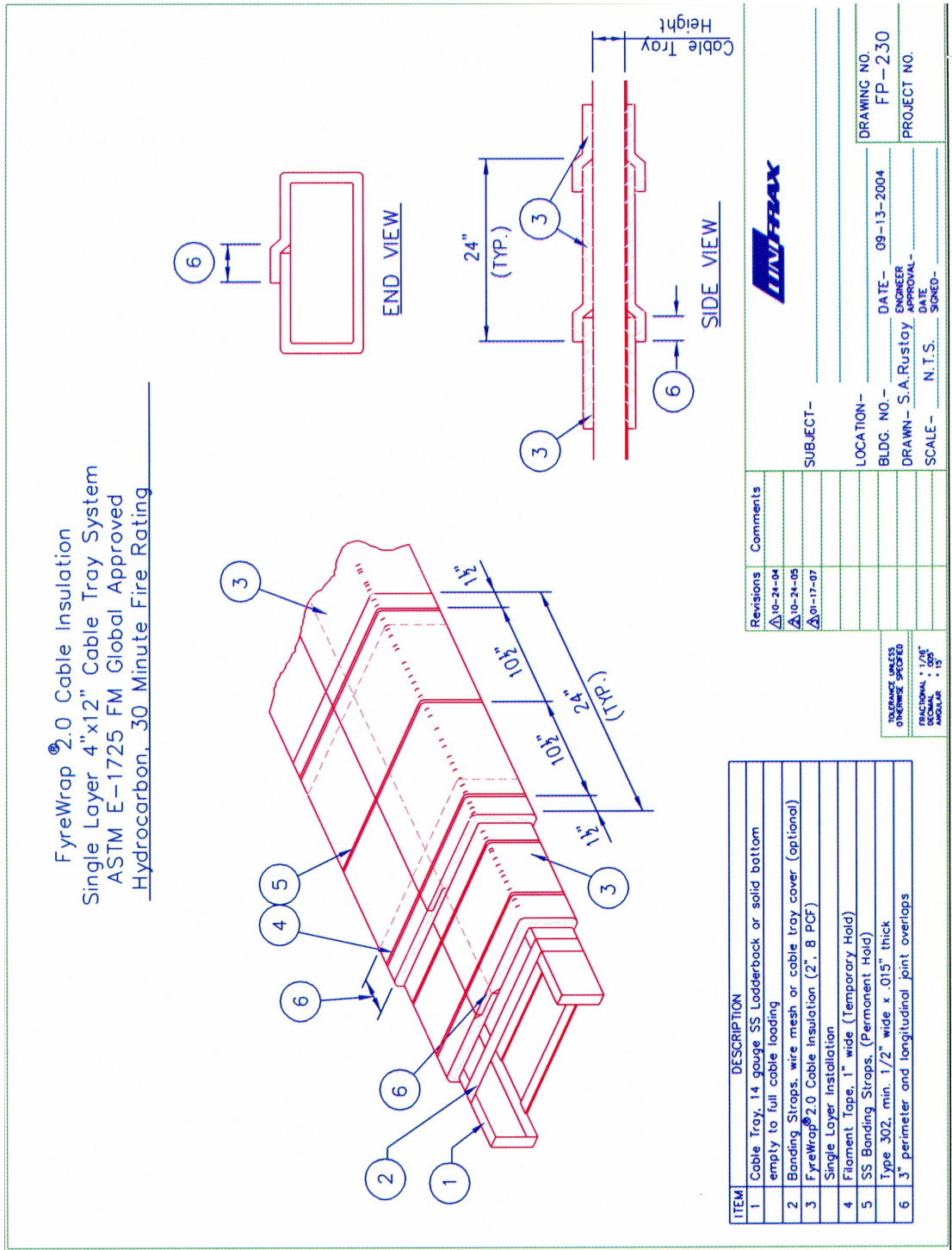
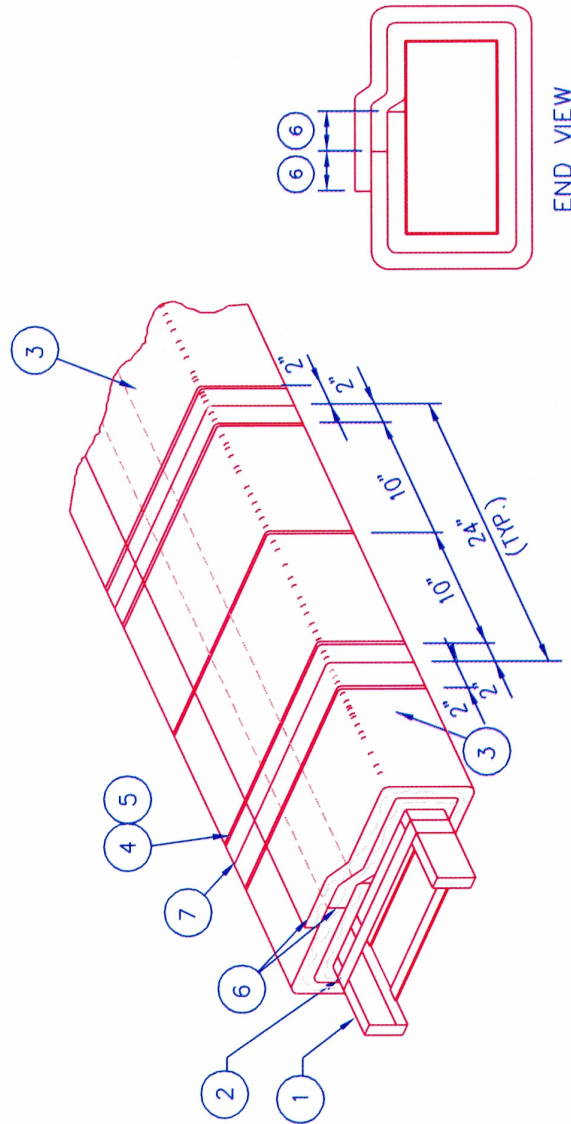


Figure 8. ASTM E-1725 30 Minute System

FyreWrap® 1.5 Cable Insulation
Two Layer 4"x12" Cable Tray System
ASTM E-1725 FM Global Approved
Hydrocarbon, 45 Minute Fire Rating



ITEM	DESCRIPTION
1	Cable Tray, 14 gauge SS Ladderback or solid bottom empty to full cable loading
2	Banding Straps, wire mesh or cable tray cover (optional)
3	FyreWrap® 1.5 Cable Insulation (1.5", 8 pcf) Two-Layer Installation
4	Filament Tape, 1" wide (Temporary Hold)
5	SS Banding Straps, (Permanent Hold)
6	Type 302, min. 1/2" wide x .015" thick
7	Circumferential butt joints

Revisions	Comments
Δ 10-24-04	
Δ 01-17-07	



SUBJECT-

LOCATION-

BLDG. NO.-

DRAWN- S.A. Rustay

SCALE- N.T.S.

DRAWING NO.
FP-231

PROJECT NO.

DATE- 09-20-2004

ENGINEER

APPROVAL-
DATE
SIGNED-

TOLERANCE UNLESS
OTHERWISE SPECIFIED
FRACTIONAL : 1/16"
DECIMAL : .005"
ANGULAR : 15°

Figure 9. ASTM E-1725 45 Minute System

Vertical Installations

For vertical system runs installation should start at the lower end and work upwards with overlaps aligned downwards as shown in Fig. 10. This will facilitate rainwater run off.

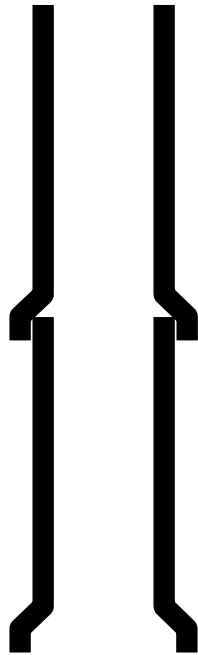


Figure 10. Vertical Overlap Alignment

Section 4. Stainless Steel Banding Application

Materials

Stainless steel grade AISI 302 (minimum) banding of 0.5mm (.015") minimum thickness and 13mm (0.5") minimum width and AISI 302 grade (minimum).

Stainless Steel grade AISI 302 (minimum) clips of the crimp closing type.

Method

Bands should be positioned at a distance of 38mm (1.5") from the end of each insulation section and also at centres of 267mm (10.5") along the length of the insulation as shown in the drawings in Figures 4 – 9.

Tighten the bands with the ratchet tool and crimp the band seals tight. Take care that the insulation wrap is clamped securely but not over compressed. Cut off excess banding.

At the corners of the insulation wrap reinforcement pads of aluminium sheet 0.5 x 50 x 50mm can be used to minimise the risk of the encapsulation being punctured when the bands are tightened. This can be seen in Fig. 11.

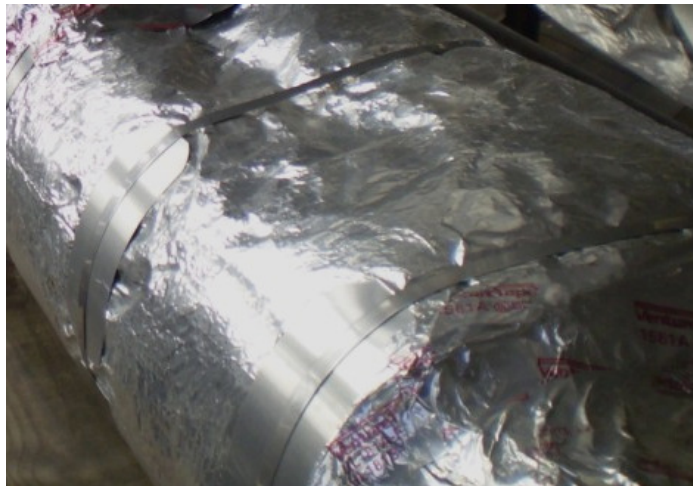


Figure 11 – Corner Protection Pads

Section 5. Joint Sealing

Materials

100mm wide (4inch) 50 micron thickness self adhesive aluminium tape

Method

All the overlapping longitudinal joints on both horizontal and vertical installation runs should be sealed with 100mm wide self adhesive aluminium foil tape as shown in Fig. 12.

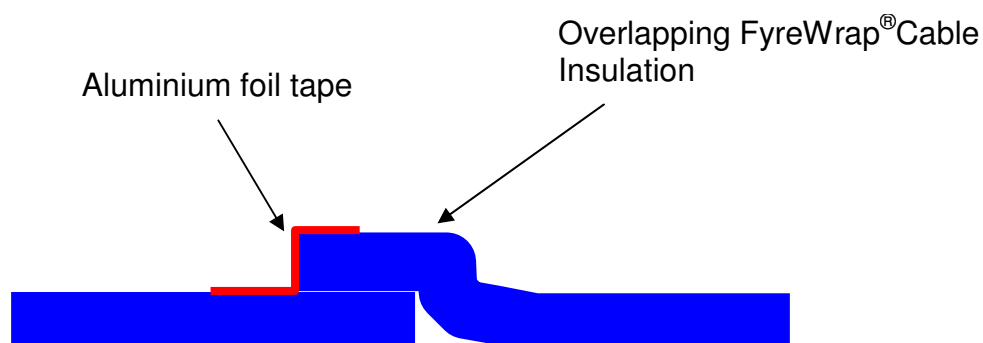


Figure 12. Joint sealing

On horizontal installation runs all circumferential joints should be taped in the same manner.

On vertical installation runs the final (top) circumferential joint should be taped if the system has been installed with downward aligned overlaps.

Section 6. Hanger Insulation

Materials

FyreWrap 1.5 or 2.0 to match the cable tray system being used.
Stainless steel grade AISI 302 (minimum) banding of 0.5mm (.015") minimum thickness and 13mm (0.5") minimum width and AISI 302 grade (minimum) clips of the overlapping type for two layer systems.
Stainless steel wire, minimum 18vgauge (1.219 mm) thickness for single layer systems

It is recommended that hanger systems are protected with the same insulation system (thickness, density and number of layers) as the cable trays.

Single Layer Systems

Suggested hanger insulation detail for single layer systems is detailed in Fig. 13. Note that the drawing shows the use of FyreWrap 2.0 Cable Insulation but this same installation technique can be used for single layer systems of FyreWrap 1.5 Cable Insulation.

Two Layer Systems

Suggested hanger system insulation detail for two layer systems is detailed in Fig's. 14a &14b. Note that the drawings show the use of FyreWrap 2.0 Cable Insulation but this same installation technique can be used for single layer systems of FyreWrap 1.5 Cable Insulation.

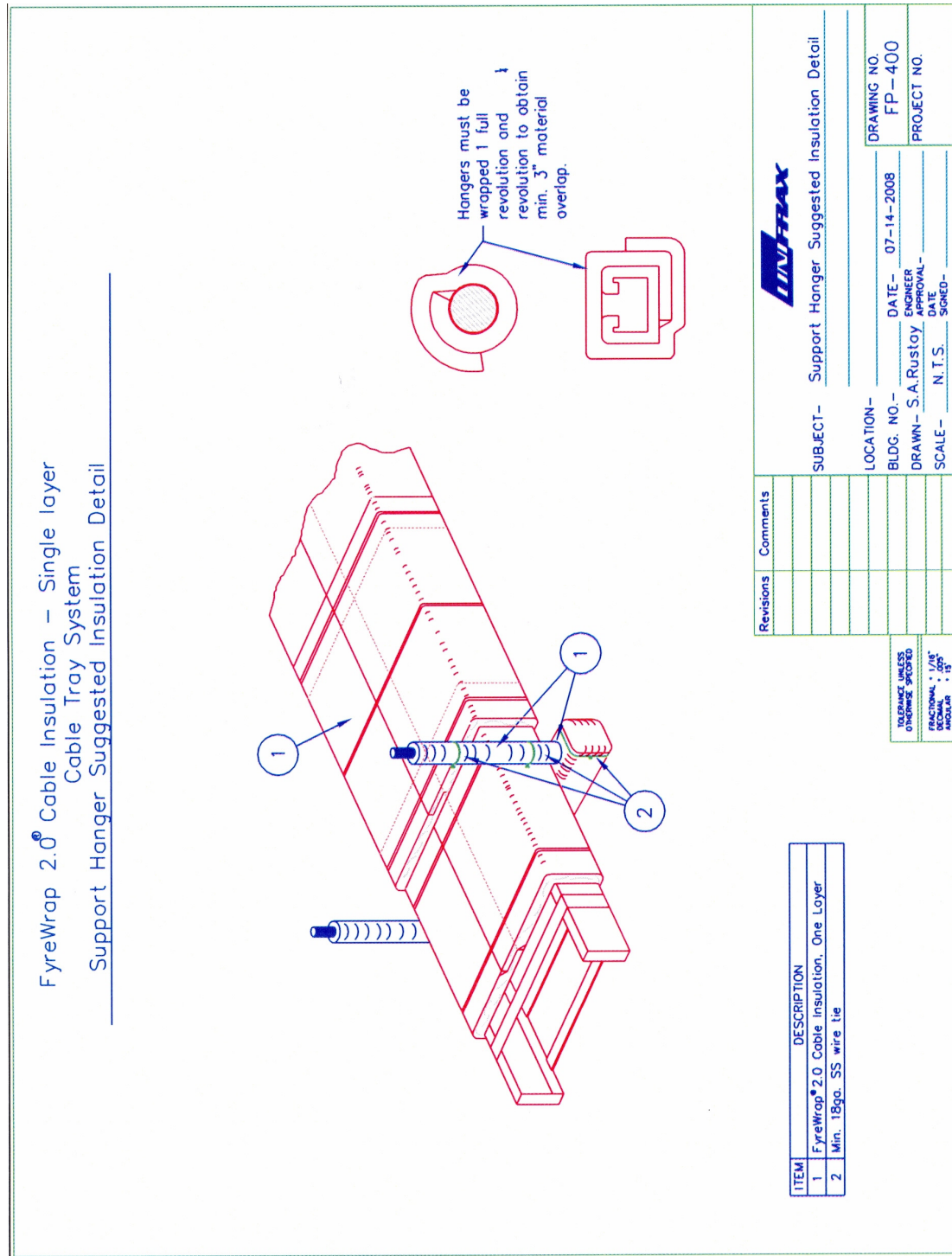


Figure 13. Hanger Insulation – Single Layer Systems

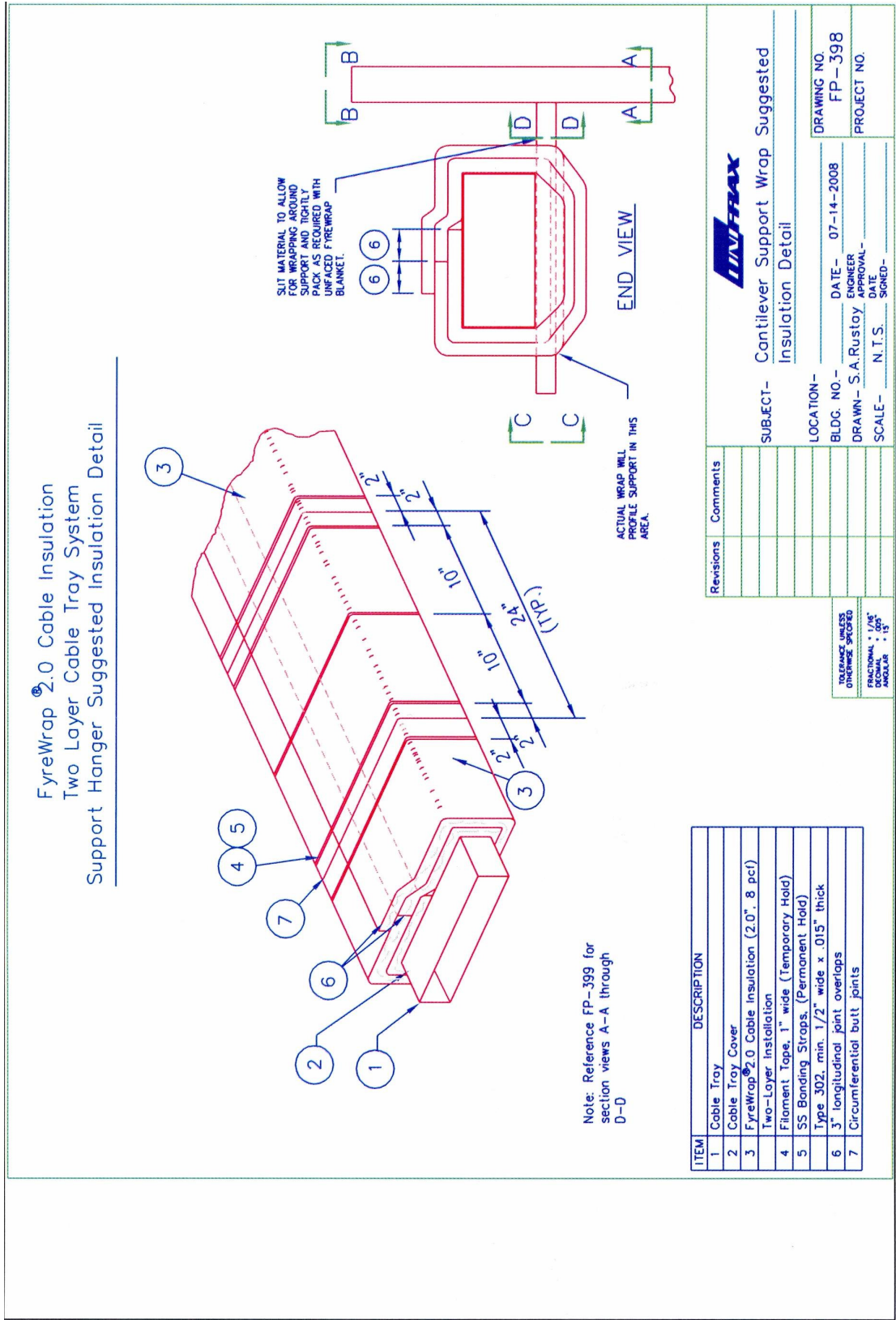
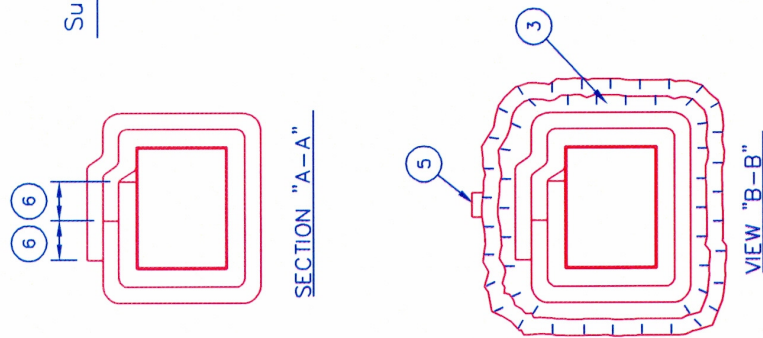
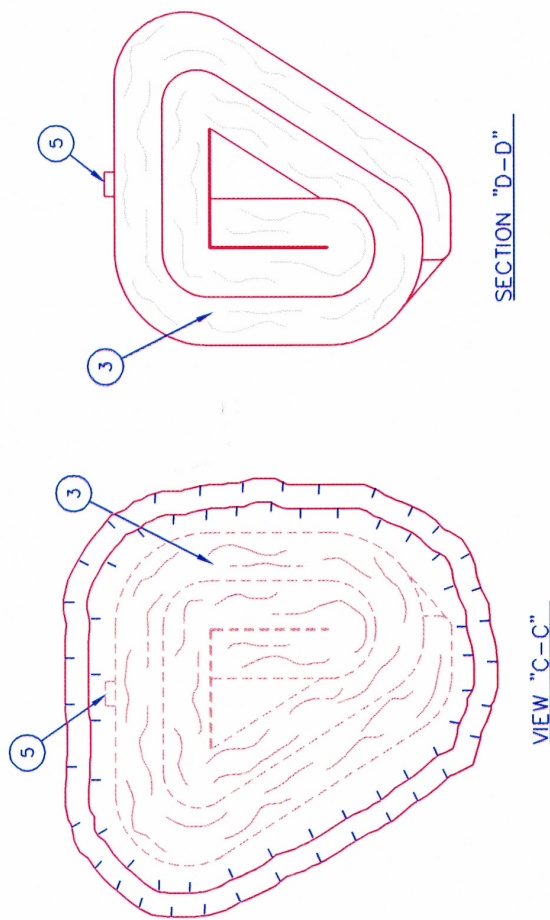


Figure 14a. Hanger Insulation- Two Layer Systems



- NOTES:**
- 1) For Views "B-B" and "C-C" use the FireWrap 2.0 Cable Insulation to create a 2-layer "end-cap" and secure with Item 5 - SS bonding strap and ensure a 3" overlap.
 - 2) When installing material in area of Section "D-D", cut material 1" wider than space between upright and tray to ensure compression fit.



Reference FP-398

[illegible]

SUBJECT -	Cantilever Support Wrap Suggested	
	Insulation Detail	
LOCATION -		
BLDG. NO. -	DATE -	07-14-2008
DRAWN - S.A.Rustoy	ENGINEER	
SCALE -	APPROVAL -	
	DATE	
	SIGNED -	
	N.T.S.	
	DRAWING NO.	FP-399
	PROJECT NO.	

Figure 14b. Hanger Insulation- Two Layer Systems

Section 7. Maintenance and Repairs & Removable Sections

It is recommended that once installations are completed the plant operator should set up a regular inspection procedure. In addition if any works have been carried out on other assemblies within close proximity of then Cable Insulation System and inspection should be made to look for mechanical damage.

Minor Damage

Minor damage such as cuts in the encapsulation which are believed to be recently made and through which there has been no water ingress can be repaired by the application of a strip of the self adhesive aluminium tape as used to seal the joints. The tape should extend well beyond each end of any cut.

Major Damage

In the case of major damage such as areas of encapsulation loss, damage to the infill insulating blanket or if it is believed that there has been water ingress into the insulation the damaged section or sections of the insulation wrap should be replaced.

The banding should be cut away and removed to allow removal of the damaged section(s). Sufficient banding from the first adjacent undamaged overlapping section should also be removed. Joint sealing tapes should be cut away taking extreme care where the damage sections are sealed to adjacent undamaged sections. The damaged sections can then be removed and new insulation wrap sections can then be installed in the normal way and the overlap with the adjacent sections made good making sure that the overlaps are at least 75mm.

Alternatively on horizontal insulation runs if only one section of wrap needs to be replaced, to make repair easier the new section can be installed with overlaps as shown in Figure 15. This method can also be used on both horizontal and vertical runs to install sections designed to be removed at a later stage for inspection or installation of additional cables. It should be noted that on vertical runs the upper joint will need to be taped and on horizontal runs both end joints require taping.



Figure 15. Alternative Overlaps for Horizontal Section Repairs