



10/5/91

APPENDIX III
TO THERMAL SCIENCE, INC.'S RESPONSE TO THE
UNITED STATES NUCLEAR REGULATORY COMMISSION'S
LETTER DATED 10 SEPTEMBER 1991

Enclosure 16

TSI Technical Note 11266

Installation Procedures For The "Ready Access
Designs" Of The THERMO-LAG 330-1 Subliming
Fire Barrier Systems

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TSI TECHNICAL NOTE 11266

INSTALLATION PROCEDURES FOR THE

"READY ACCESS DESIGNS"

OF THE

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS

DATE OF ISSUE:

26 January 1983

FIRST REVISION:

14 May 1983



TSI TECHNICAL NOTE 11266

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OF THE

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS

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14 May 1983

TSI TECHNICAL NOTE 11266

INSTALLATION PROCEDURES FOR THE

"READY ACCESS DESIGNS"

OF THE

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS

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26 JANUARY 1983

FIRST REVISION:

14 MAY 1983

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THERMO-LAG 330-1 SUBLIMING FIRE BARRIER
PREFABRICATED PANEL
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THERMO-LAG 330-1 SUBLIMING FIRE BARRIER
PREFABRICATED PANEL
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TSI TECHNICAL NOTE 11266

INSTALLATION PROCEDURES FOR THE

"READY ACCESS DESIGNS"

OF THE

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS

1.0 INTRODUCTION

This procedure sets forth sequential steps involved in installing THERMO-LAG 330-1 Subliming Fire Barrier System to cable trays in conformance with the prerequisites of "Ready Access Designs" and to conduits.

The THERMO-LAG 330-1 Subliming Fire Barrier System consists of THERMO-LAG 330-1 Subliming Materials and THERMO-LAG Stress Skin Type 330-69, and as an option or when required by specific design, THERMO-LAG 350 Two Part Spill Resistant Topcoat.

2.0 PRE-APPLICATION PRACTICES

2.1 Qualification of Contractor

The application shall be preformed by a qualified contractor who has had prior training in applying the materials and who has the equipment required to perform the application.

2.2 Safety Precautions

The contractor shall follow standard industrial safety practices established for the handling of chemical coatings and shall conform to applicable OSHA and owner safety rules in all respects.

2.3 Delivery

The coating materials shall be delivered to the jobsite in original containers which show the product name, color, name of the manufacturer, and the expiration date.

2.4 Storage

The coating materials shall be stored off the ground when not in use in totally enclosed and weather protected areas provided for that purpose.

The Prefabricated Panels do not require any temperature protection. The Bulk Materials such as THERMO-LAG 330-1 Subliming Coating, THERMO-LAG 330-1 Trowelable Grade Material or THERMO-LAG 350-2 Part Water Based Topcoat shall be protected against freezing and from temperatures above 100°F.

3.0 FABRICATION OF FIRE BARRIER ENVELOPE

3.1 Cable Trays

- 3.1.1 Cut a piece of material large enough to form the bottom section from a Prefabricated Panel. The width of the bottom section shall be equal to the sum of the base (W) and both sides (H) of the cable tray, plus 2½ inches as shown in Figure 1.0.1. The length of the bottom section shall not exceed 6½ feet since longer sections are unwieldy and more difficult to install.
- 3.1.2 Cut a square 1½ inch piece from each corner at the bottom section of the Stress Skin.
- 3.1.3 Score along dotted lines which are located at each end of the (W) plus 1/2 inch dimension lines as shown in Figure 1.0.1. Form a rectangular shape section by making two (2) 90° bends along the scored lines and form a box section.
- 3.1.4 Form a 1½ inch flange on each side of the bottom section by making a score along the dotted lines as shown in Figure 1.0.1, followed by making a 90° bend along the dotted lines.
- 3.1.5 Cut a piece of material large enough to form the top section from a Prefabricated Panel. The width of the top section shall be equal to the base (W) of the cable tray plus 2½ inches, as shown in Figure 1.0.1.
- 3.1.6 Mount the bottom box shape fire barrier section on the cable tray by the use of approved stainless steel tie wires as shown in Figure 1.0.2. The application of the tie wires, while the fire barrier section is supported to the bottom section of the cable tray, is accomplished by firmly tying the tie wires to an interior rung of the cable tray, draping it over the Prefabricated Box Section following along the one side, the bottom, the opposite side of the cable tray, until the opposite end of the rung is reached and the tie wire is securely fastened. The recommended maximum spacing between tie wire fasteners shall not exceed 6 inches.

FIGURE 1.0.1

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL

TYPICAL LAYOUT FOR CABLE TRAY SECTIONS

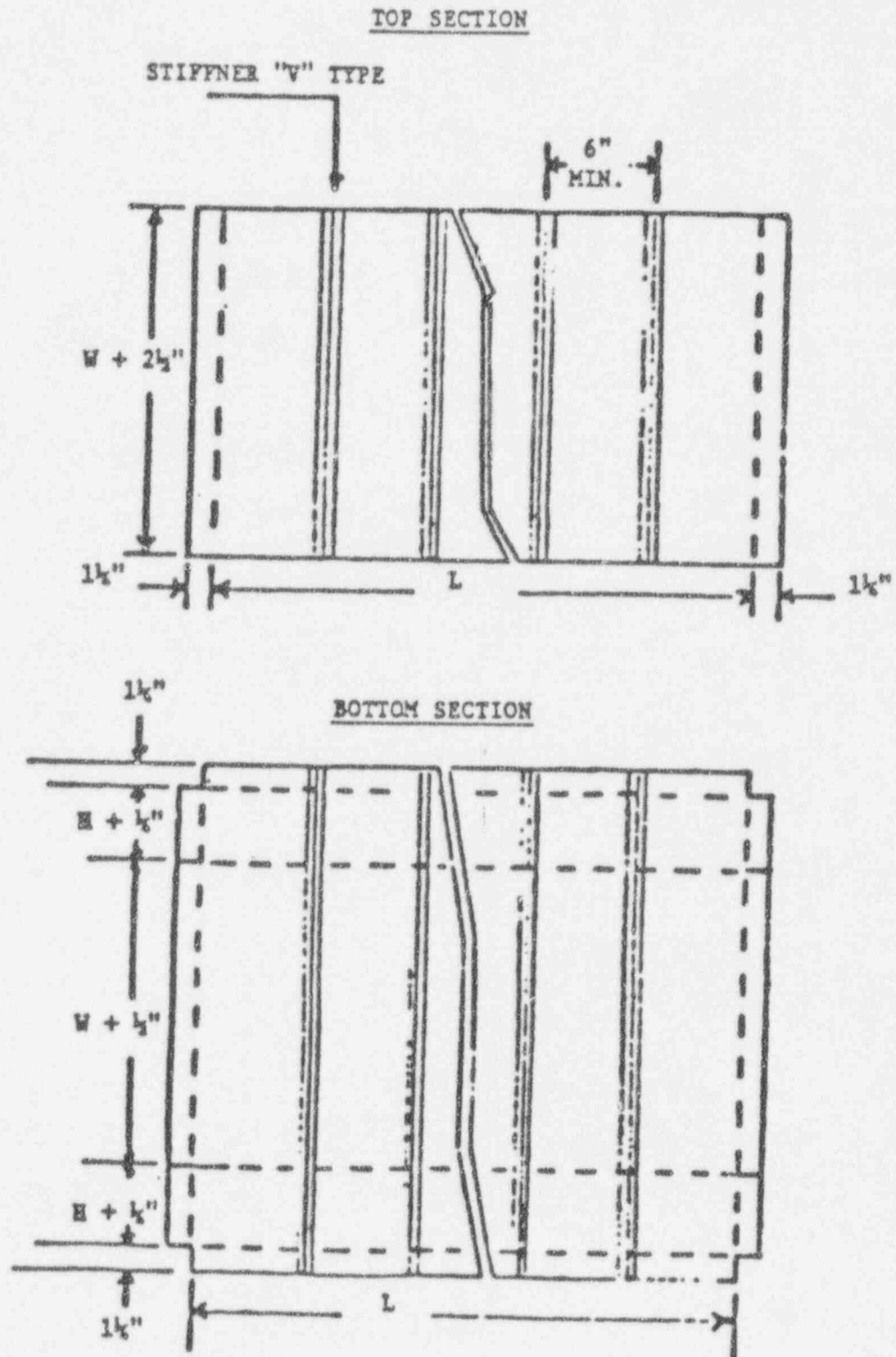
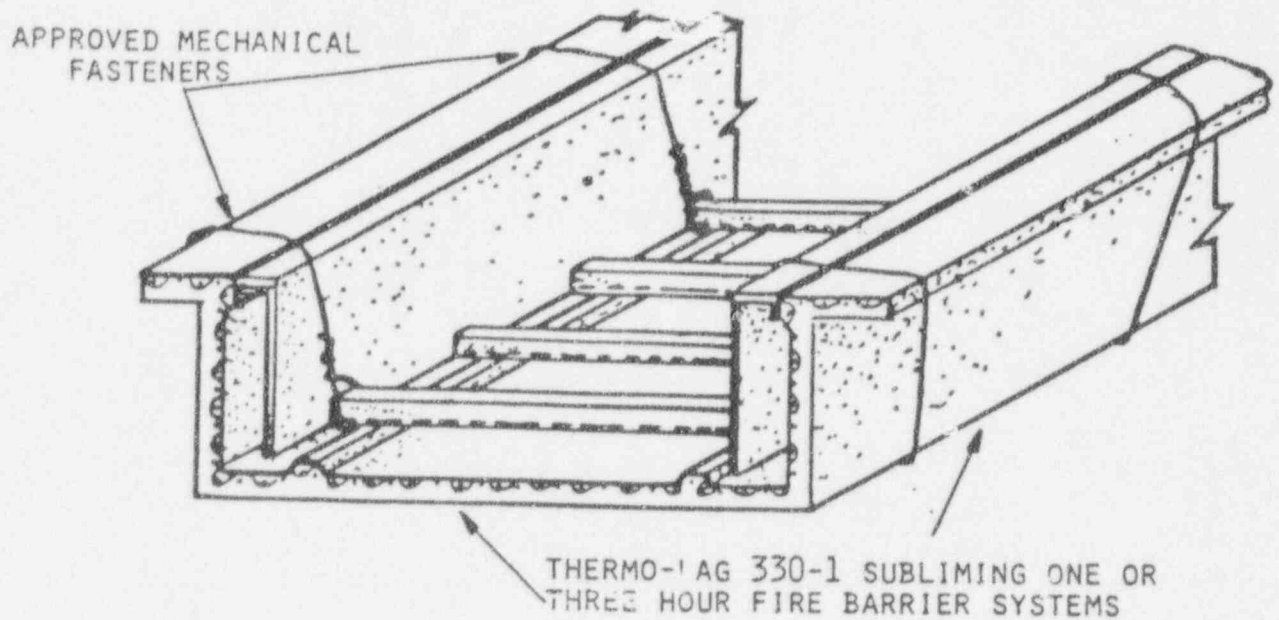


FIGURE 1.0.2

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL
BOTTOM "BOX ASSEMBLY"



TST, INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
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DATE: 12-14-1982		REVISED
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN		
4		DRAWING NUMBER FIGURE 1.0.2

- 3.1.7 Attach the flat top section of the fire barrier material as shown in Figure 1.0.3 to the balance of the assembly, making sure that the entire system is flush, using complete wraps of tie wires, at spacing not to exceed 6 inches.
- 3.1.8 The assembly is completed by filling in the scored areas by troweling or caulking the THERMO-LAG 330-1 Subliming Coating - Trowelable Grade Material formed by the operations delineated in Sections 3.1.1 and 3.1.3. A minimum dry film thickness of 0.5 inches of THERMO-LAG 330-1 Subliming Coating must be present at all cross-sections of the system.

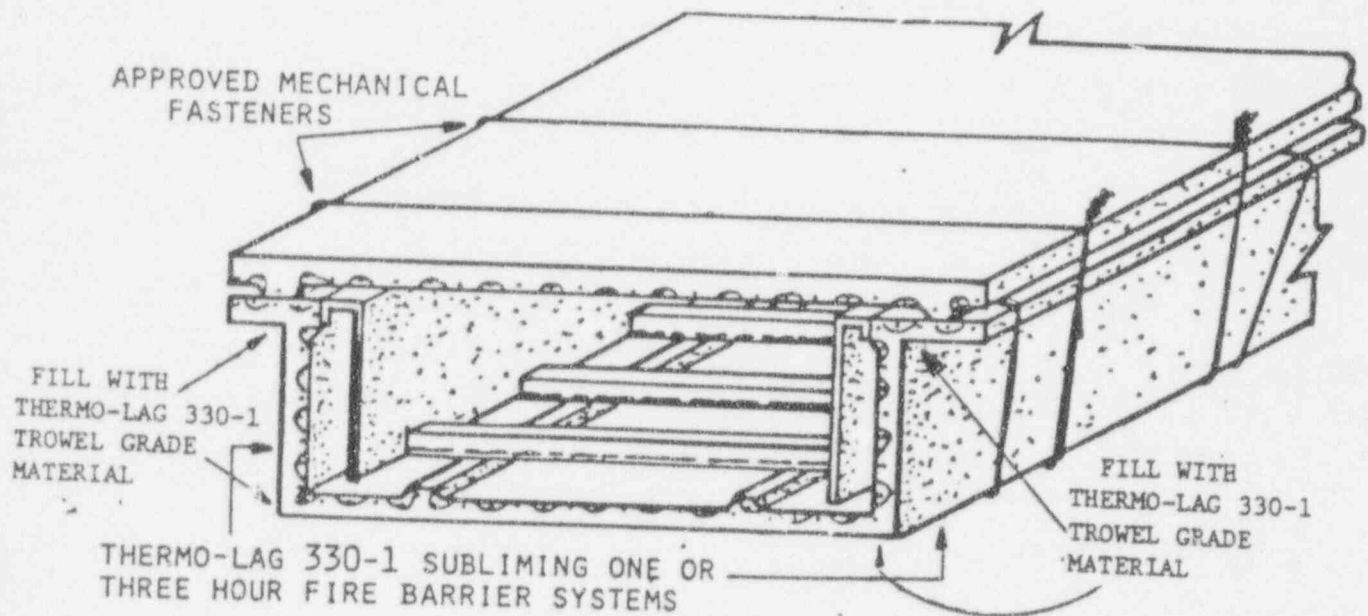
AS AN OPTION

- 3.1.9 Drill holes, having a maximum diameter of 0.25", in the cable tray shell along the upper horizontal lip as shown in Figure 1.0.4. Only tools and procedures approved by the owner may be employed. The maximum distance between each hole shall not exceed 8 inches.
- 3.1.10 Mount the bottom rectangularly shaped bottom section to the cable tray fabricated per Section 3.1.1, 3.1.2, 3.1.3 and 3.1.4. While in place, firmly affix the tie wires to the pre-drilled holes on the cable tray. Drape the tie wire along the two sides of the tray and the bottom and fasten securely through the pre-drilled holes on the opposite side of the cable tray as shown in Figure 1.0.4.
- 3.1.11 Cut a piece of material large enough to form the top section from a Prefabricated Panel. The width of the top shall be equal to the base (W) of the cable tray plus 2½ inches, as shown in Figure 1.0.1 (Top Section).
- 3.1.12 Attach the flat top section of the fire barrier materials as shown in Figure 1.0.5 to the balance of the assembly, making sure that the entire system is flush, using complete wraps of tie wires, at spacing not to exceed 6 inches.
- 3.1.13 The assembly is completed by filling in the scored areas by troweling or caulking the THERMO-LAG 330-1 Subliming Coating - Trowelable Grade Material formed by the operations delineated in Sections 3.1.1 and 3.1.3.

FIGURE 1.0.3

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL

TOTAL ASSEMBLY

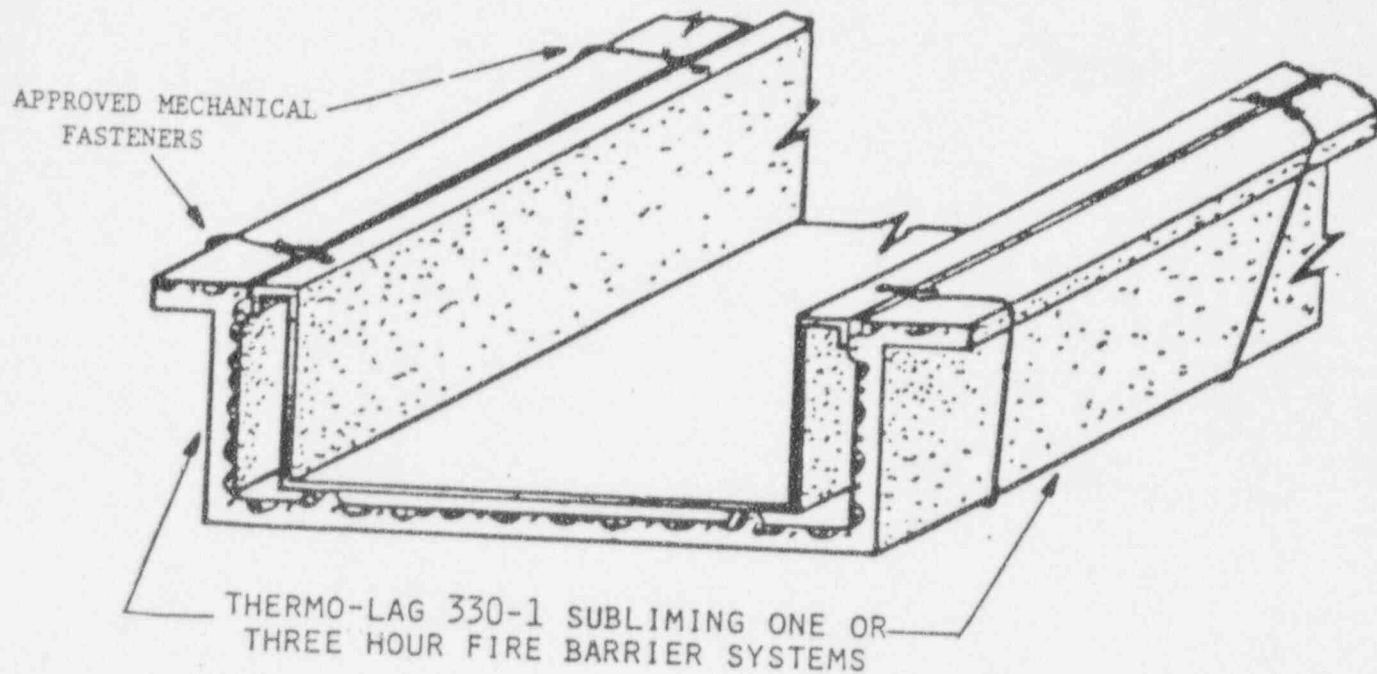


TST, INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE	APPROVED BY: <i>R. D. Johnson</i>	DRAWN BY J. DUMPIE
DATE: 12-14-1982		REVISED
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN		
- 6 -		DRAWING NUMBER FIGURE 1.0.3

FIGURE 1.0.4

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL

ALTERNATE BOTTOM "BOX" ASSEMBLY



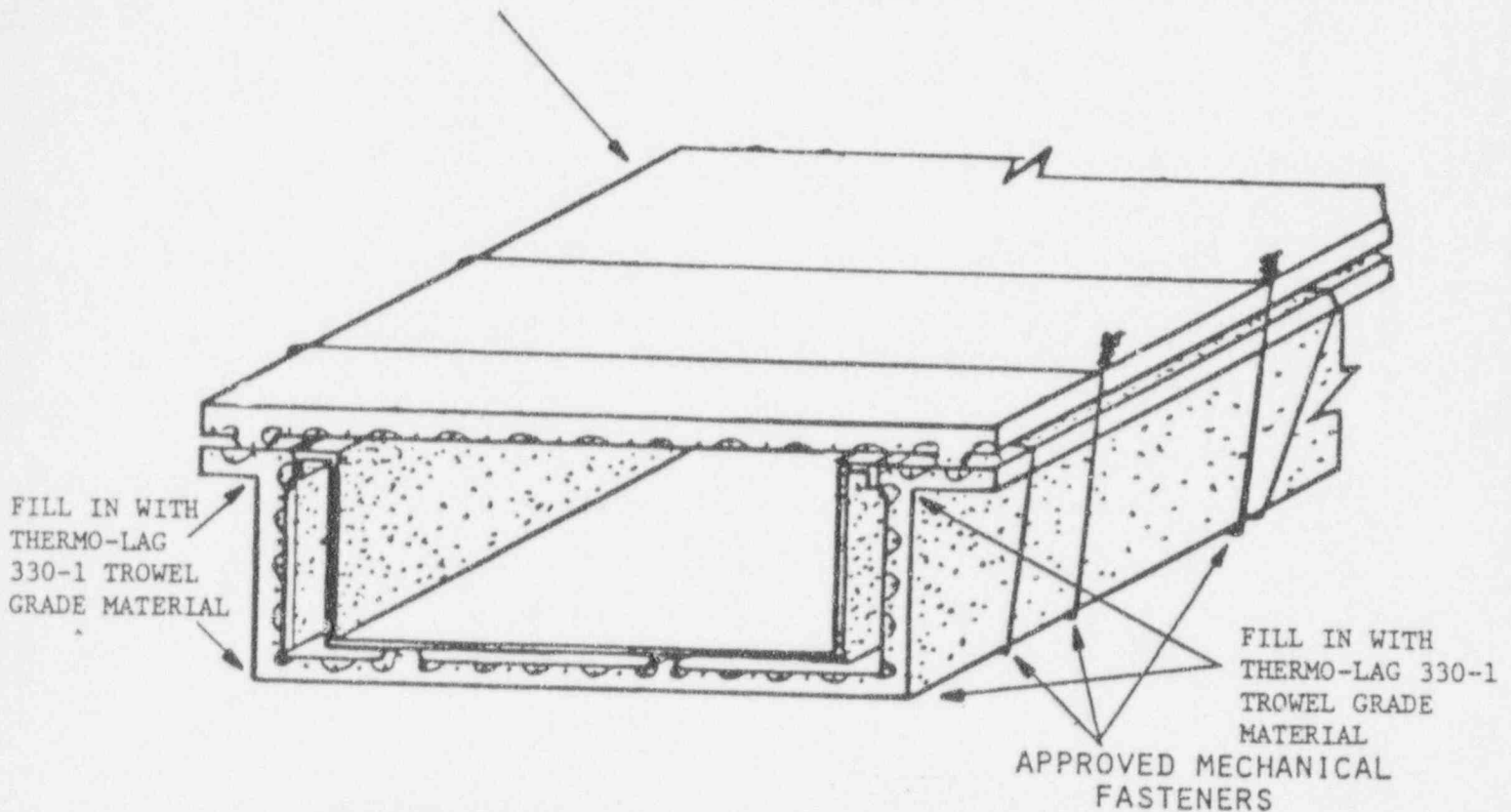
TST, INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE	APPROVED BY: <i>L. D. Schuman</i>	DRAWN BY J. DUMPIE
DATE: 12-14-1982	REVISED	
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN		
- 7 -		DRAWING NUMBER FIGURE 1.0.4

FIGURE 1.0.5

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL

ALTERNATE TOTAL ASSEMBLY

THERMO-LAG 330-1 SUBLIMING ONE OR—
THREE HOUR FIRE BARRIER SYSTEMS



TST, INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
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THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN		
- 8 -		DRAWING NUMBER FIGURE 1.0.5

3.2 Conduit

3.2.1 Semi-Circular Section Fire Barrier Design

- 3.2.1.1 Cut two equal sections from Prefabricated Panel(s) large enough for enclosing the conduit. The width of each section shall be equal to $1/2$ of the circumference of the conduit plus $1/4$ inch to provide adequate tolerance in fitting the fire barrier sections on the conduit. The length shall not exceed $6\frac{1}{2}$ feet since longer sections are unwieldy and more difficult to handle.
- 3.2.1.2 Score the subliming coating side of the two precut sections along the dotted lines shown in Figure 1.0.6.
- 3.2.1.3 Form a semi-circular fire barrier section from each of the scored precut sections by bending each section, with the stress skin side down, along the conduit.
- 3.2.1.4 Mount the two semi-circular fire barrier sections on the conduit with the edges flush with each other to form a cylindrical section around the conduit and fasten the two sections together with approved stainless steel tie wires as shown in Figure 1.0.7.
- 3.2.1.5 Attach additional semi-circular formed fire barrier sections to previously installed sections by butt joining them together at their ends as shown in Figure 1.0.7.
- 3.2.1.6 The assembly is completed by filling in the scored areas by troweling or caulking the THERMO-LAG 330-1 Subliming Coating - Trowelable Grade Material formed by the operations delineated in Section 3.2.1.1, 3.2.1.2 and 3.2.1.3.

AS AN OPTION

3.2.2 Box Section Fire Barrier Design

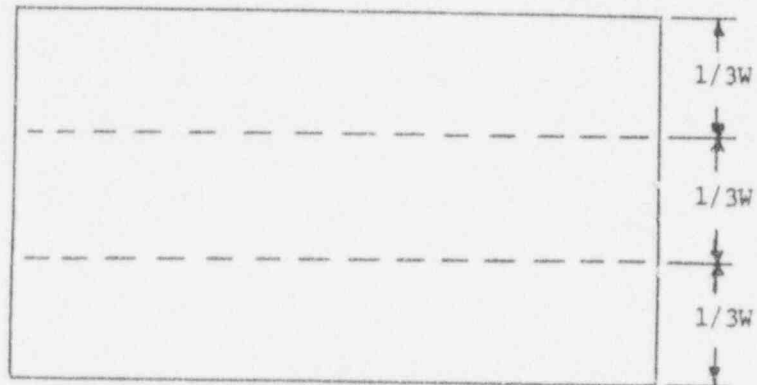
- 3.2.2.1 Cut two equal sections from Prefabricated Panel(s) large enough for enclosing the conduit. The width of each section shall be equal to two (2) times the outer diameter of the conduit plus $1\frac{1}{4}$ inches. The length shall not exceed $6\frac{1}{2}$ feet since longer sections are unwieldy and more difficult to install.
- 3.2.2.2 Score the subliming coating side of the bottom precut section and the top precut section along the dotted lines shown in Figure 1.0.8.
- 3.2.2.3 Form a two sided bottom fire barrier section with the stress skin side facing inward, from the scored bottom precut section, by making one 90° bend along the middle dotted line and then two 90° bends along the two outer dotted lines shown in Figure 1.0.8.

FIGURE 1.0.6

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL

CONDUIT

SEMI-CIRCULAR FIRE BARRIER DESIGN



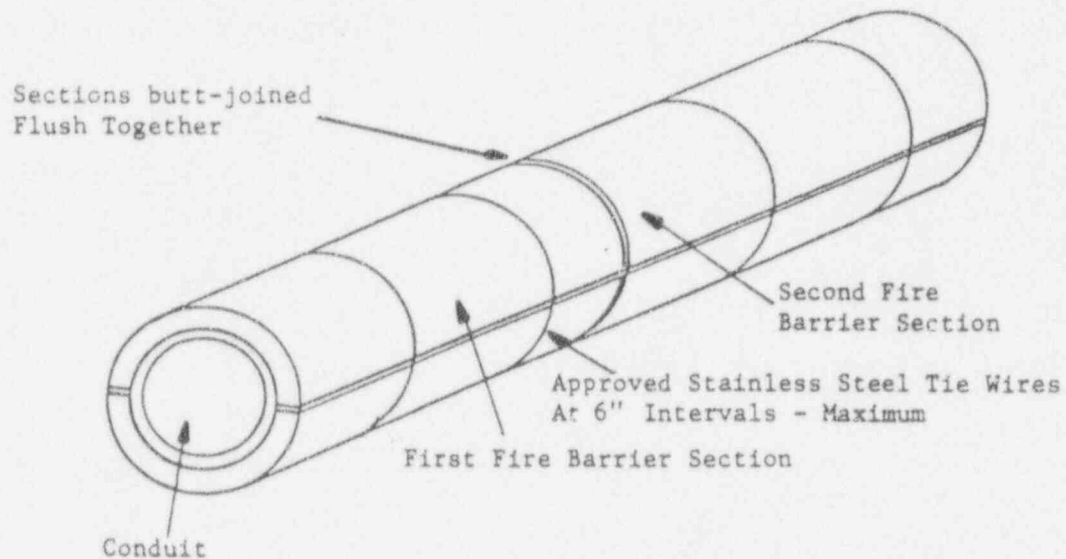
TST INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE	APPROVED BY: <i>R. D. Johnson</i>	DRAWN BY J. DUMPIE
DATE: 12-14-1982		REVISED
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN		
10		DRAWING NUMBER FIGURE 1.0.6

FIGURE 1.0.7

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL

CONDUIT

SEMI-CIRCULAR SECTION FIRE BARRIER DESIGN



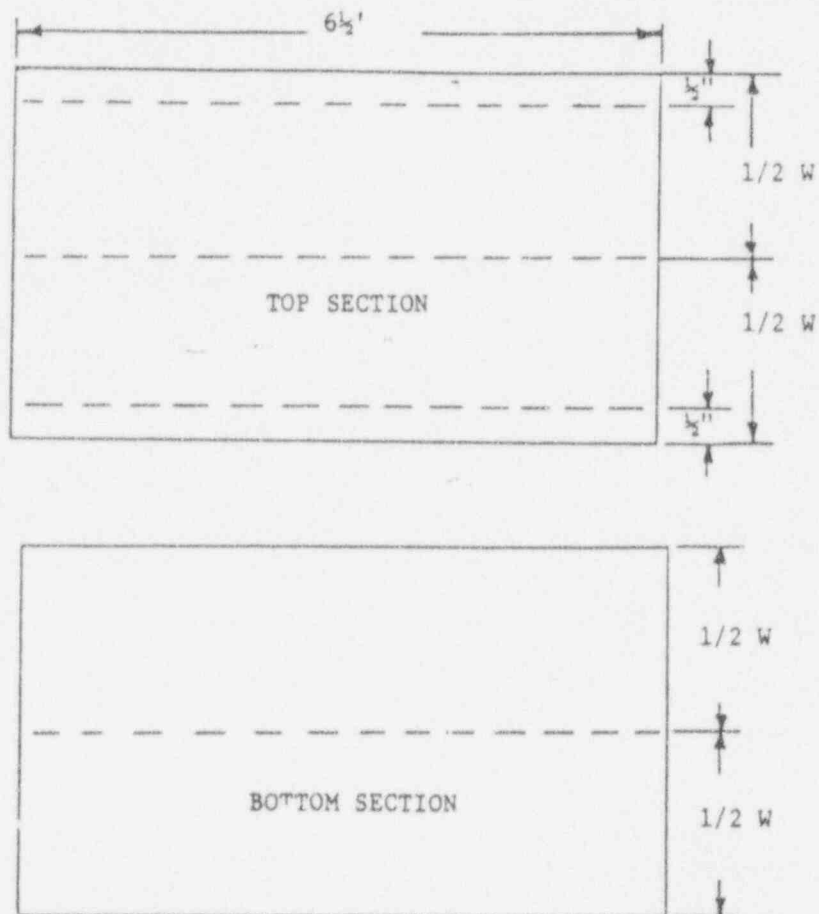
TST, INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE DATE: 12-14-1982	APPROVED BY: <i>R. A. [Signature]</i>	DRAWN BY J. DUMPIE REVISED
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN		
11		DRAWING NUMBER FIGURE 1.0.7

FIGURE 1.0.8

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL

CONDUIT

BOX FIRE BARRIER DESIGN



TST, INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE DATE: 12-14-1982	APPROVED BY: <i>R. D. Johnson</i>	DRAWN BY: J. DUMP REVISED:
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN		
12		DRAWING NUMBER FIGURE 1.0.8

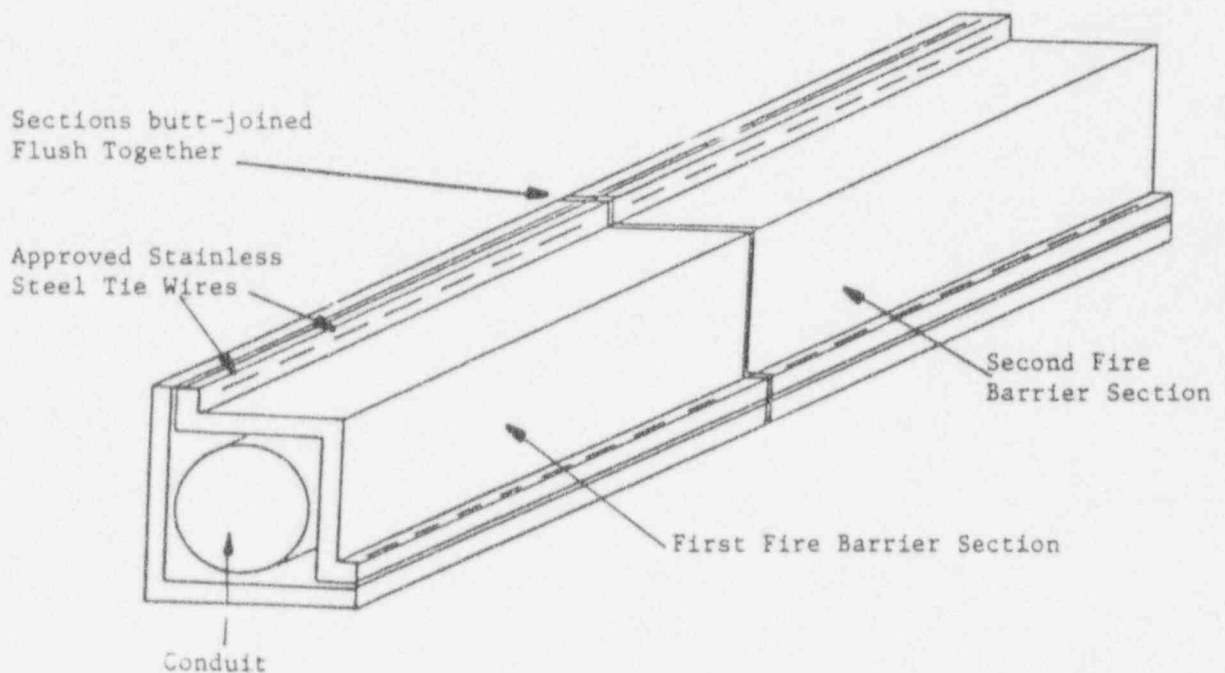
- 3.2.2.4 Mount the two fire barrier sections on the conduit to form a box design around the conduit and then lace the two sections together at the flanges using approved stainless steel tie wires as shown in Figure 1.0.9.
- 3.2.2.5 Attach additional top and bottom fire barrier sections to previously installed sections by butt joining them together at their ends as shown in Figure 1.0.9.
- 3.2.2.6 The assembly is completed by filling in the scored areas by troweling or caulking the THERMO-LAG 330-1 Subliming Coating - Trowelable Grade Material formed by the operations delineated in Section 3.2.2.1 and 3.2.2.2.

FIGURE 1.0.9

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER PREFABRICATED PANEL

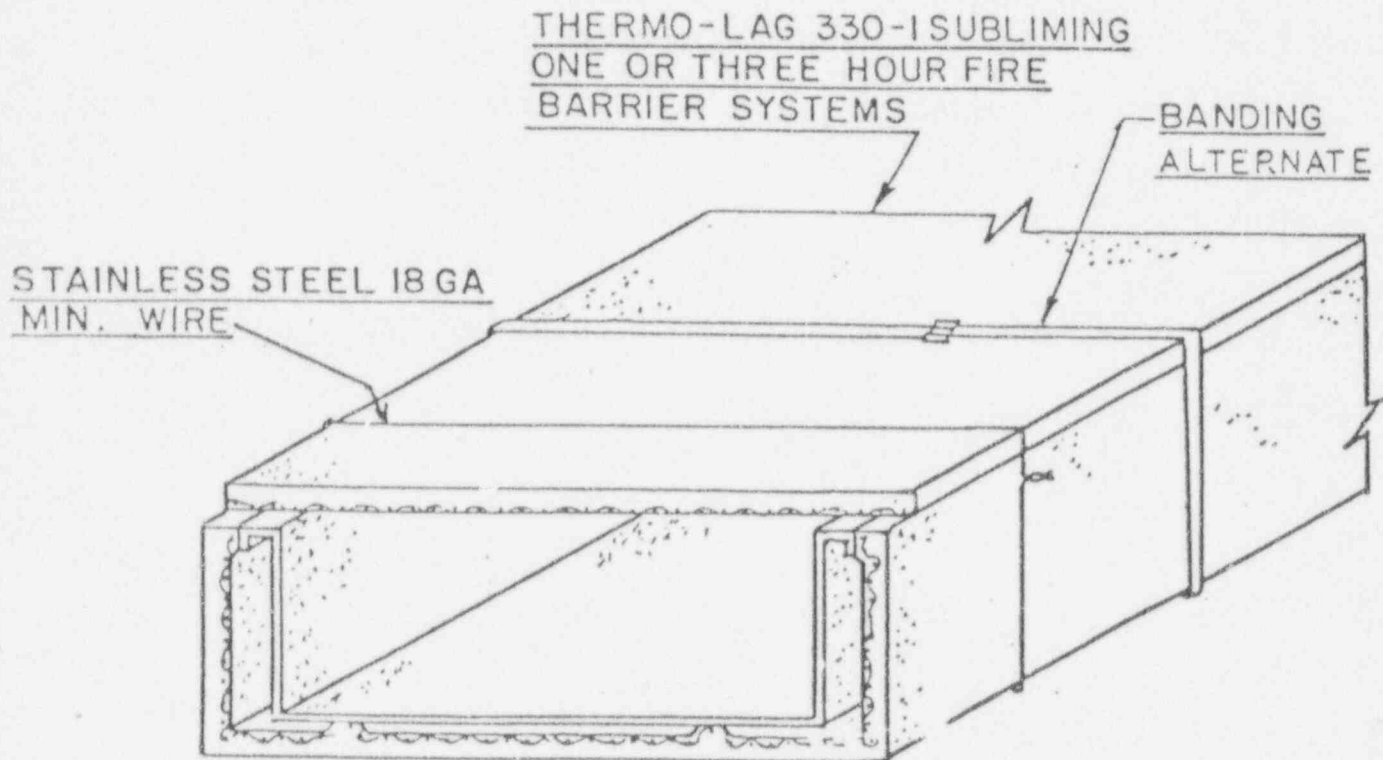
CONDUIT

BOX SECTION FIRE BARRIER DESIGN



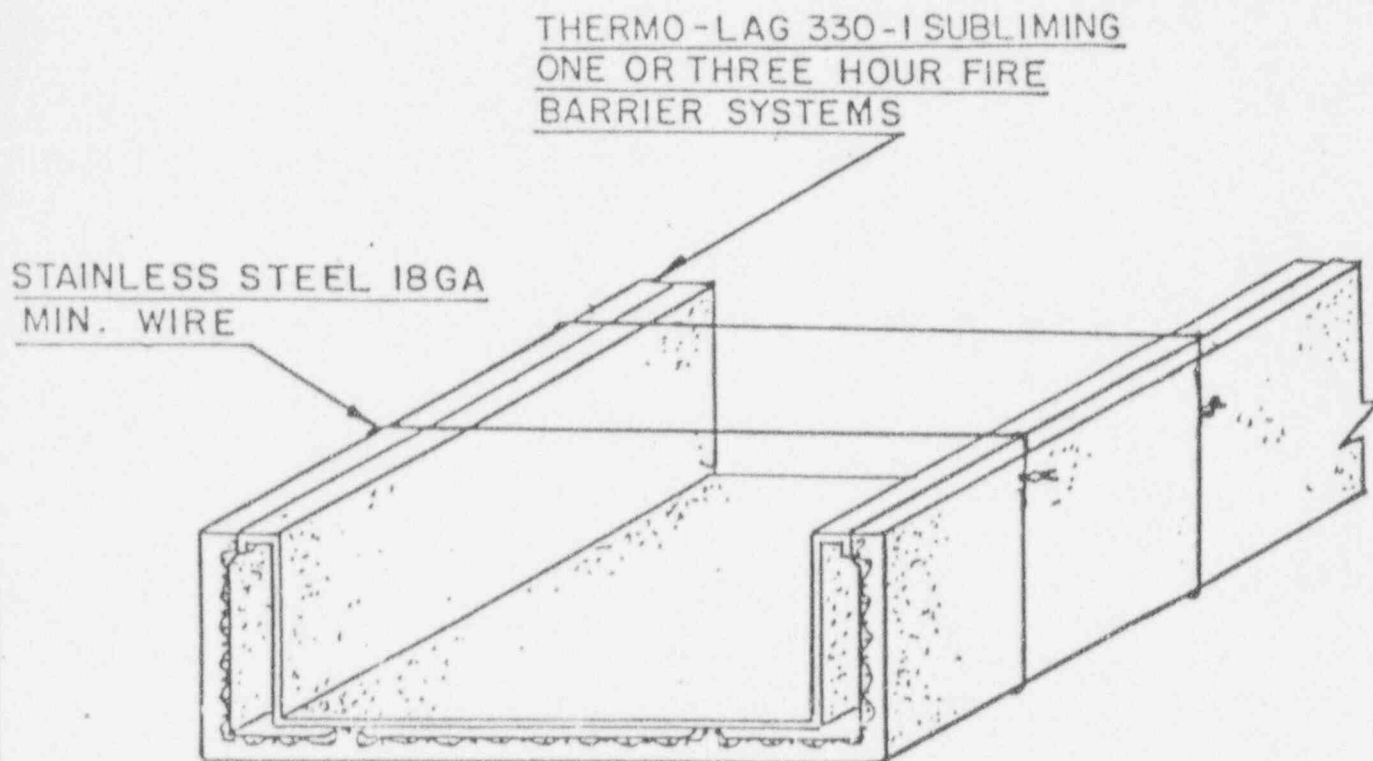
TST, INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE	APPROVED BY:	DRAWN BY J. DUMPIB
DATE: 12-14-1982	<i>R. D. Johnson</i>	REVISED
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN		
14		DRAWING NUMBER FIGURE 1.0.9

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER
PREFABRICATED PANEL. ALTERNATE TOTAL
ASSEMBLY.



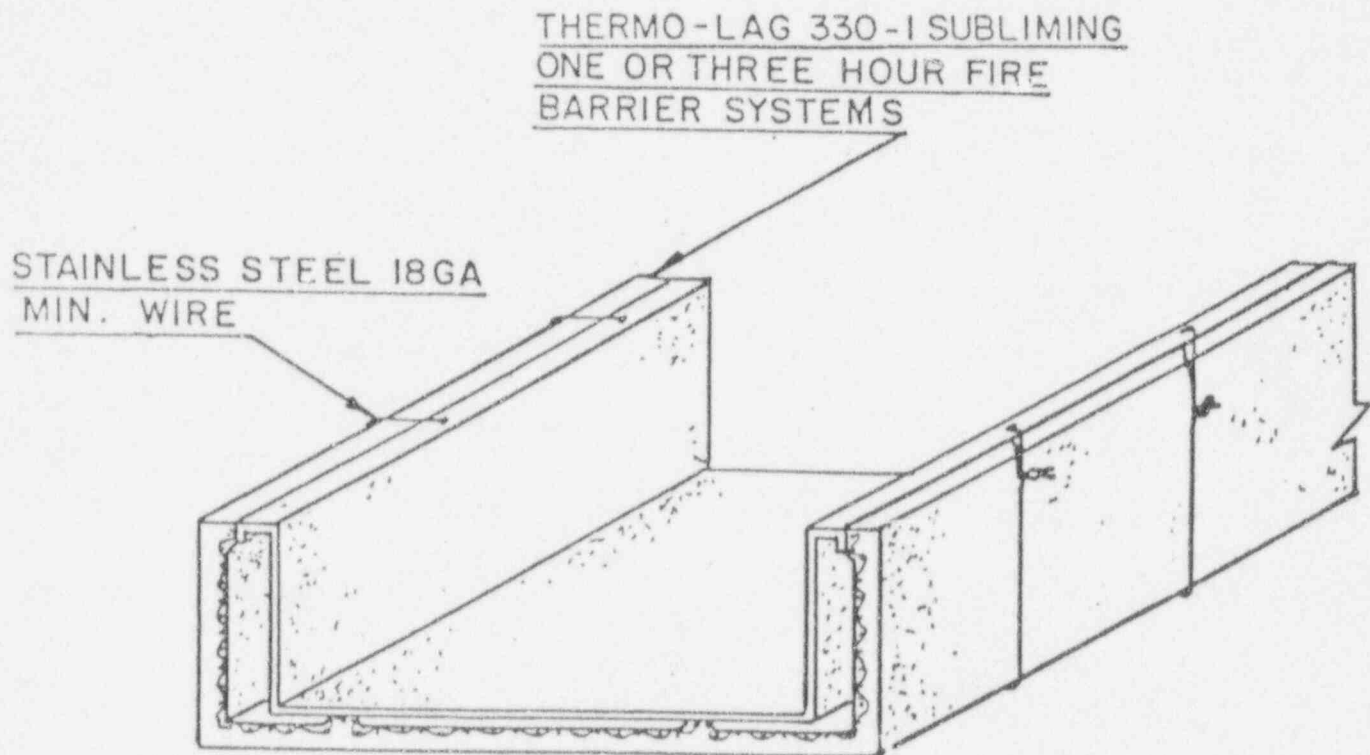
ISI INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE	DATE: 5-14-1983	DRAWN BY: J. DUMPLIS
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN.		REVISIONS
		1.0.10

THERMO-LAG 330-I SUBLIMING FIRE BARRIER
PREFABRICATED PANEL, ALTERNATE BOTTOM
"BOX" ASSEMBLY.



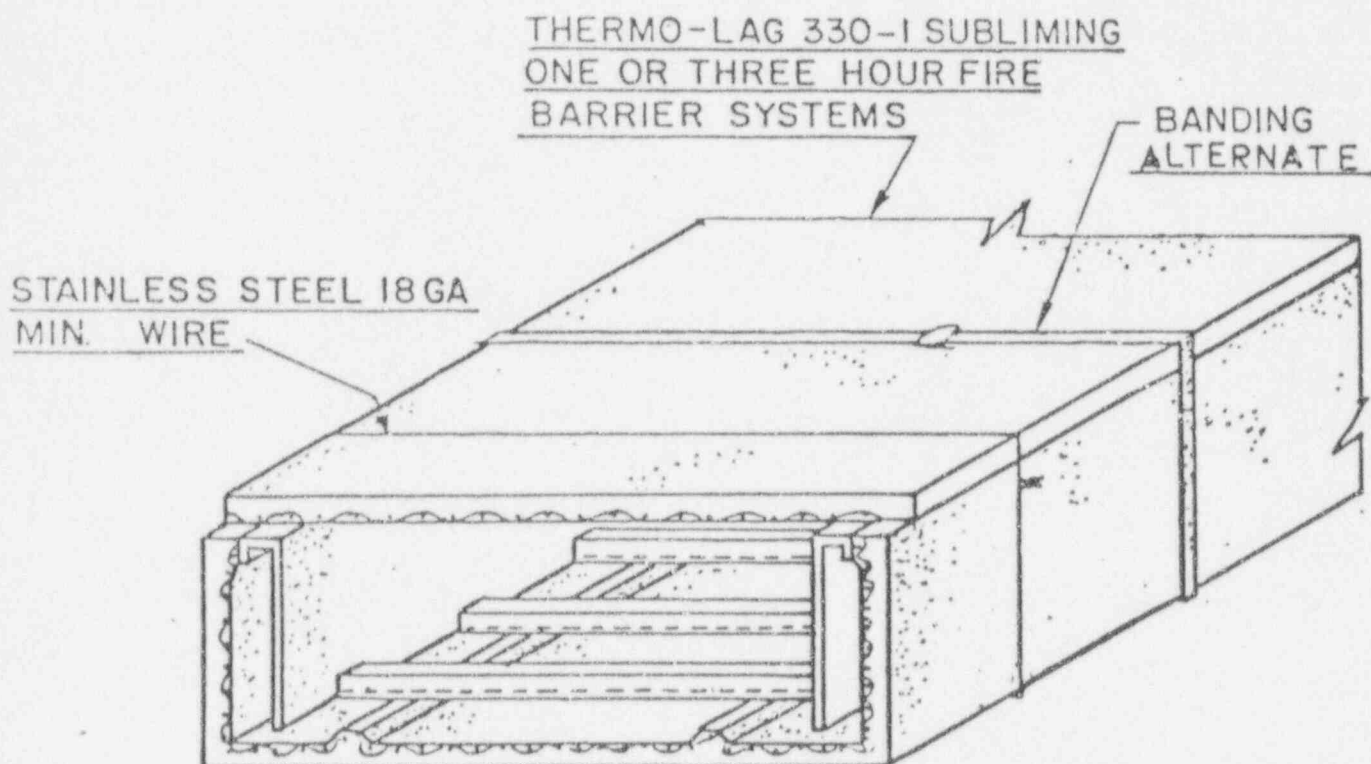
TSL INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE	APPROVED BY: <i>P.A. Holman</i>	DRAWN BY: J.DUMPS
DATE: 5-14-1983	CHECKED BY:	DESIGNED BY:
THERMO-LAG 330-I SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN.		
DRAWING NUMBER		1.0.11

THERMO-LAG 330-I SUBLIMING FIRE BARRIER
PREFABRICATED PANEL. ALTERNATE BOTTOM
"BOX" ASSEMBLY.



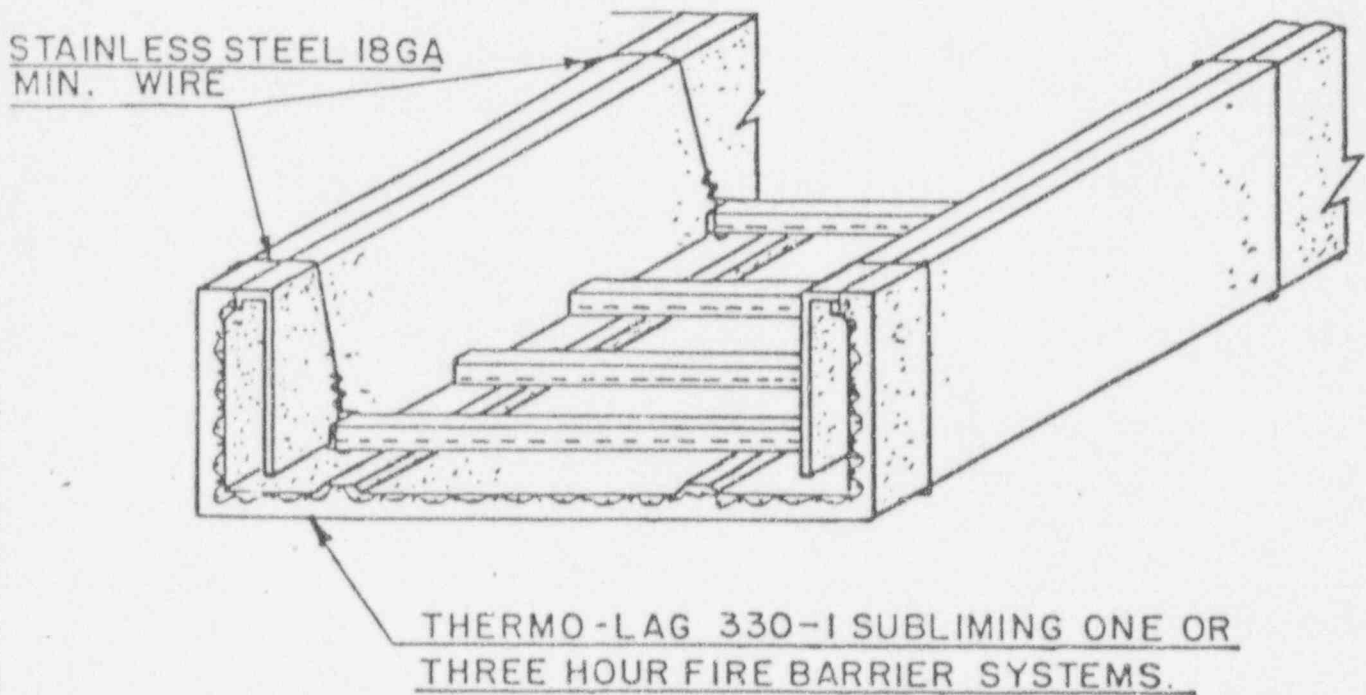
TST, INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE	APPROVED BY: <i>J. P. Holman</i>	DRAWN BY: J. DUMPS
DATE: 5-14-1983		REVISED
THERMO-LAG 330-I SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN.		
		DRAWING NUMBER 1.0.12

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER
PREFABRICATED PANEL . TOTAL ASSEMBLY.



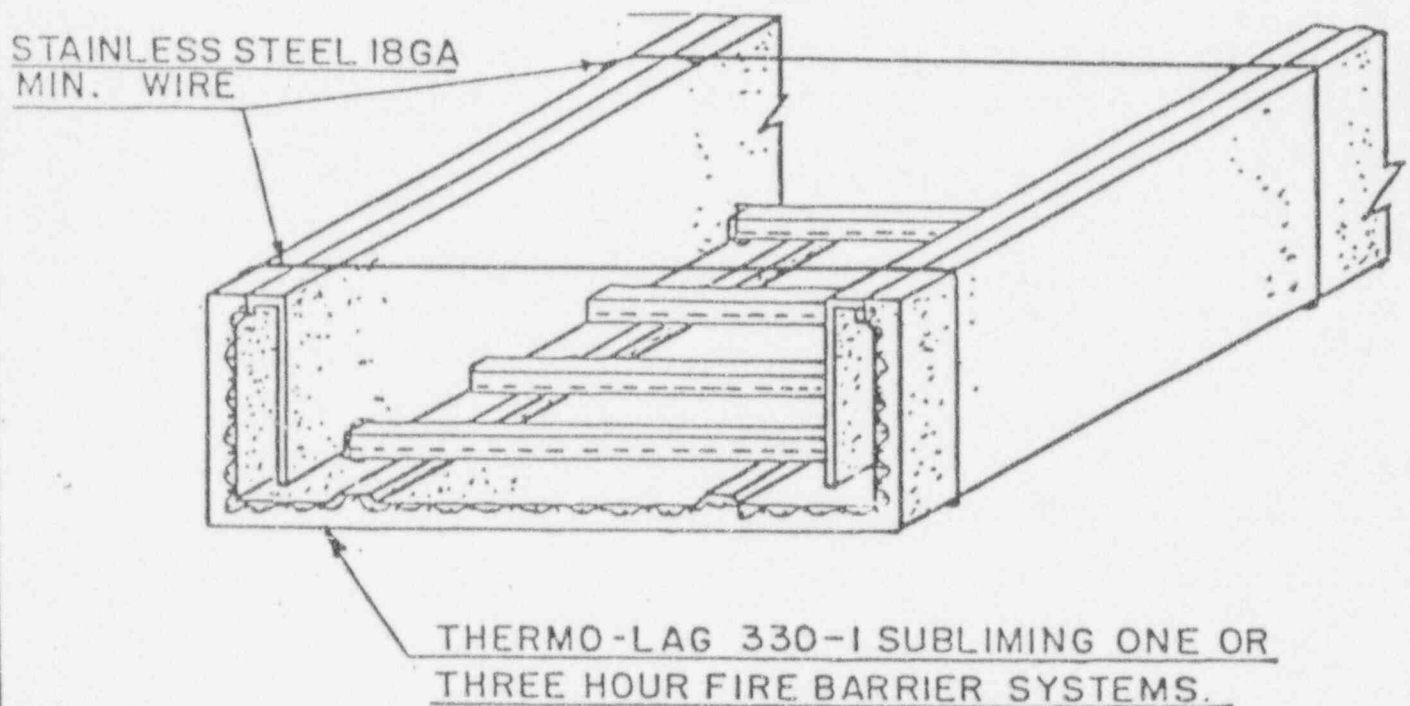
TSL INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
SCALE: NONE	APPROVED BY: <i>R. D. Johnson</i>	DRAWN BY: J. DUMPS
DATE: 5-14-1983	CHECKED BY:	REVIEWED BY:
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN.		
REVISION NUMBER		1.0.13

THERMO-LAG 330-1 SUBLIMING FIRE BARRIER
PREFABRICATED PANEL BOTTOM "BOX" ASSEMBLY.



TST. INC. 3260 BRANNON ST. LOUIS, MO. 63139.		
DESIGN: NONE	APPROVED BY: <i>P. A. Holman</i>	DRAWN BY: J DUMPS
DATE: 5-14-1983		REVISED:
THERMO-LAG 330-1 SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN.		
		DRAWING NUMBER 1.0.14

THERMO-LAG 330-I SUBLIMING FIRE BARRIER
PREFABRICATED PANEL. BOTTOM "BOX" ASSEMBLY.



TST. INC. 3260 BRANNON ST. LOUIS, MO. 63139		
DATE: NONE	APPROVED BY: <i>P. P. Lohman</i>	DATE: J. DUMPI
REV. 5-14-1983		
THERMO-LAG 330-I SUBLIMING FIRE BARRIER SYSTEMS READY ACCESS DESIGN.		
		1.0.15.