

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK CITY OF PORTLAND

BUILDING INSPECTION PERMIT

Permit Number: 031083

Please Read
Application And
Notes, If Any,
Attached

This is to certify that Portland Housing Authority/ Heating and Ventilating
has permission to Install Kitchen Ventillation, Exhaust and
AT 17 Riverton Dr 327 B012001

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statutes of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of buildings and structures, and of the application on file in this department.

Apply to Public Works for street line and grade if nature of work requires such information.

Notification of inspection must be given and when permission is procured before this building or part thereof is occupied or service is used-in.
HOURS NOT REQUIRED.

A certificate of occupancy must be procured by owner before this building or part thereof is occupied.

OTHER REQUIRED APPROVALS

Fire Dept. ARM
Health Dept. _____
Appeal Board _____
Other _____
Department Name _____

[Signature]
Director - Building & Inspection Services

PENALTY FOR REMOVING THIS CARD

City of Portland, Maine - Building or Use Permit Application
 389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 03-1083	Issue Date:	CBL: 327 B012001
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Location of Construction: 17 Riverton Dr	Owner Name: Portland Housing Authority	Owner Address: 14 Baxter Blvd	Phone: 797-4231
Business Name:	Contractor Name: Aero Heating and Ventilating	Contractor Address: 378 Presumpscot Portland	Phone: 2077612092
Lessee/Buyer's Name	Phone:	Permit Type: Fire Suppression System	Zone: R5

Fast Use: Daycare Center/Commercial	Proposed Use: Daycare Center/Commercial	Permit Fee: \$120.00	Cost of Work: \$10,003.00	CEO District: 1
		FIRE DEPT: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied	INSPECTION: Use Group: Type:	

Proposed Project Description: Install Kitchen Ventillation, Exhaust and Fire Systems	Signature: <i>[Signature]</i>	Signature:
PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)		
Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied		
Signature:	Date:	

Permit Taken By: gad	Date Applied For: 09/04/2003	Zoning Approval	
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1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules. 2. Building permits do not include plumbing, septic or electrical work. 3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..	Special Zone or Reviews <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetland <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input type="checkbox"/> Date: <i>[Signature]</i> 9/10/03	Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date:	Historic Preservation <input checked="" type="checkbox"/> Not in District or Landmark <input type="checkbox"/> Does Not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date: <i>[Signature]</i>
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CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

03-1083



Commercial Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

Location/Address of Construction: Riverton/102-104 Riverton Drive, Portland, ME		
Total Square Footage of Proposed Structure Existing		Square Footage of Lot Existing
Tax Assessor's Chart, Block & Lot Chart# 327 Block# B Lot# 012	Owner: Portland Housing Authority	Telephone: Prop Contact: Theresa Lee 797-4281
Lessee/Buyer's Name (If Applicable) PROP Program Attn: Linda Lajoie	Applicant name, address & telephone: Aero Heating & Ventilating 378 Presumpscot Street Portland, ME 04103 (207) 761-2092	Cost Of Work: \$ 10,003.00 Fee: \$ 120.00
Current Specific use: <u>Daycare Center</u>		
Proposed Specific use: <u>Same</u>		
Project description: Providing Kitchen ventilation and exhaust systems with Fire Protection system.		
Contractor's name, address & telephone: Who should we contact when the permit is ready: <u>Pete Collard</u> Mailing address: Aero Heating & Ventilating, Inc. 378 Presumpscot Street Portland, ME 04103 Phone: (207) 761-2092		

Please submit all of the information outlined in the Residential Application Checklist. Failure to do so will result in the automatic denial of your permit.

At the discretion of the Planning and Development Department, additional information may be required prior to permit approval. For further information stop by the Building Inspections office, room 315 City Hall or call 874-8703.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature of applicant: <u>Peter L. Collard</u>	Date: <u>09/03/03</u>
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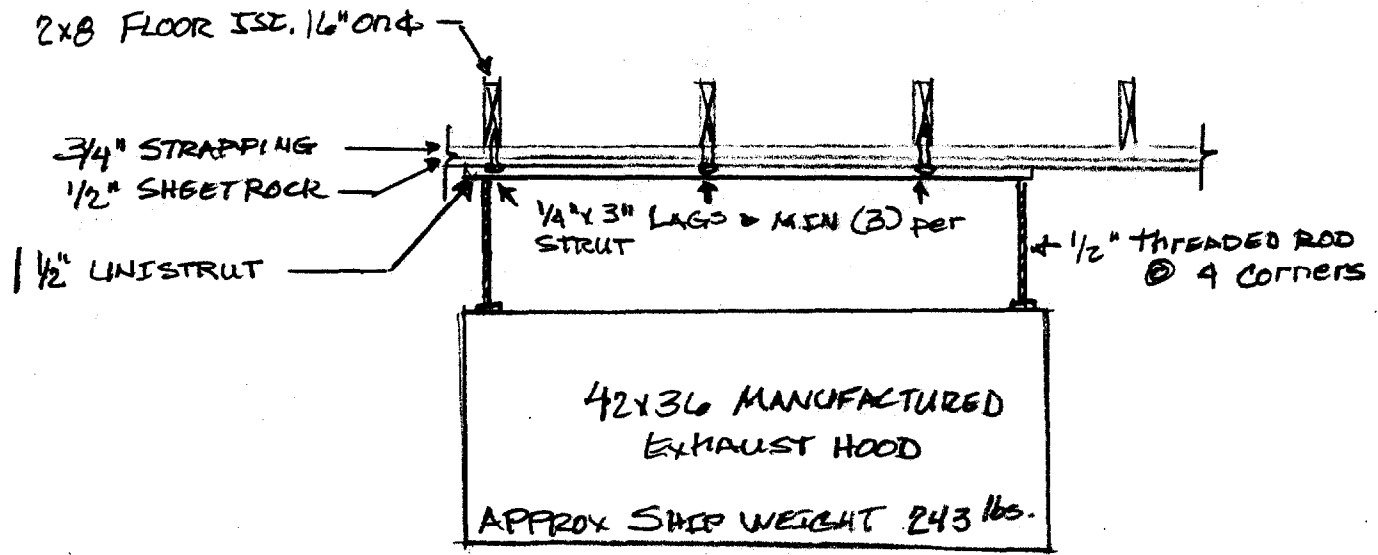
Permit Fee: \$30.00 for the first \$1000.00 Construction Cost, \$9.00 per additional \$1000.00 cost

This is not a Permit; you may not commence any work until the Permit is issued.

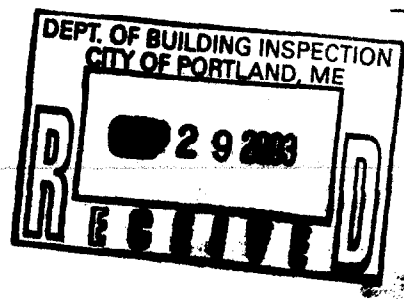
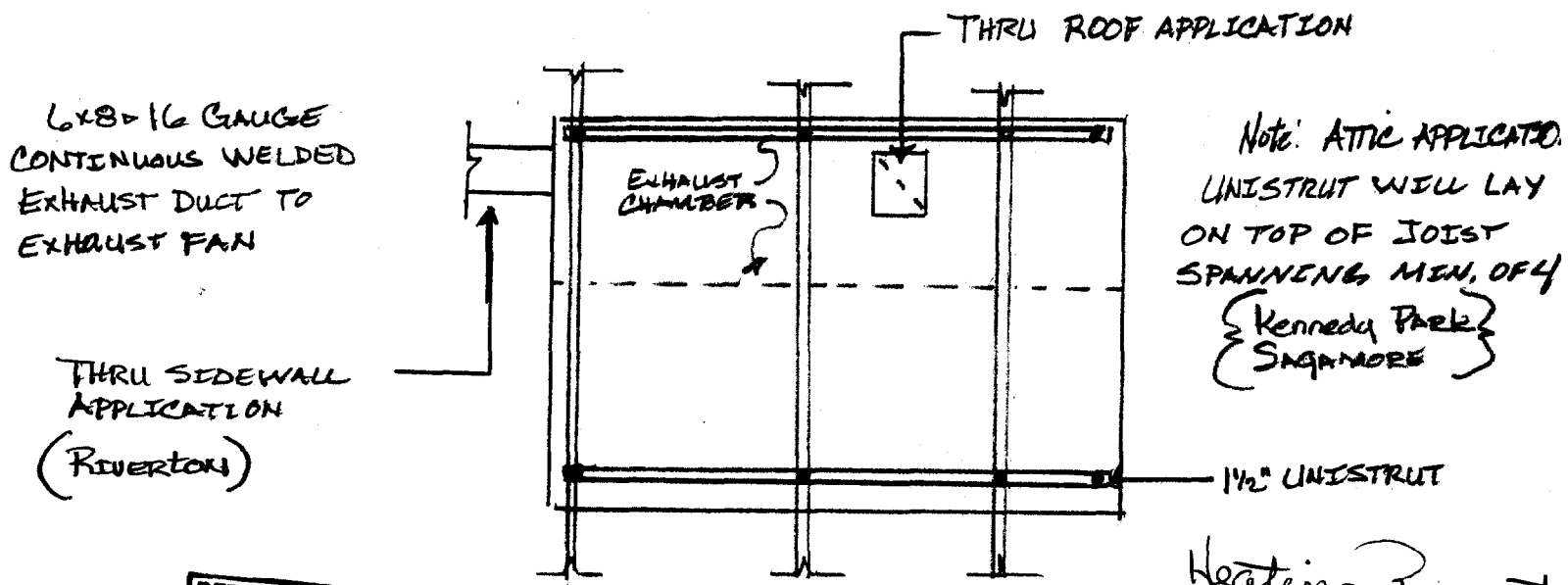
Proposal AERO HEATING & VENTILATING 378 PRESUMPCOT STREET PORTLAND, ME 04103 (207) 761-2092		Proposal No. 1 R Sheet No. 1 Date: 6.19.03
Proposal Submitted To		Work To Be Performed At
<i>Name</i> : Prop—Attn: Linda Lajoie		<i>Street</i> Riverton Park
<i>Street</i> : 510 Cumberland Ave.		<i>City - State</i> Portland, ME
<i>City</i> : Portland		<i>Date of Plans</i>
<i>State</i> : ME 04101		<i>Architect</i>
<i>Telephone Number</i> : 1-800-698-4959		New Construction
<i>We hereby propose to furnish all materials and perform all labor necessary for the completion of:</i>		
<i>work is to be completed with in 60 days of acceptance</i>		
Kitchen exhaust system with Fire Protection system.		
<i>All material is guaranteed to be as specified, and the above work to be performed in accordance with the drawings and specifications submitted for above work and completed in a substantial workman like manner for the sum of Dollars (\$ 10,003.00) Ten thousand three dollars and no cents.</i>		
<i>With payments to be made as follows: 50% deposit / 50% net 30 days after completion</i>		
<i>Any alteration or deviation from above specifications involving extra costs, will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strike~, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance upon above work. Workmen's Compensation and Public Liability Insurance on above work to be taken out by:</i>		
<i>Respectfully submitted:</i> <u> Pete Collard </u> <i>Per:</i> <u> Aero Heating & Ventilating, Inc. </u>		
<i>Note - This proposal may be withdrawn by us if not accepted within 30 days</i>		
ACCEPTANCE OF PROPOSAL		
<i>The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.</i>		
<i>Accepted</i>		
<i>Signature-</i>		<i>Date-</i>

PROP PROGRAM

ELEVATION



PLAN VIEW



RE: 21 Pomphan
Kennedy Park
102 RIVERTON



Thermal Ceramics

FIREMASTER™

Fire Protection Systems

Duct Wrap Duct Wrap+ Commercial Kitchen Grease Duct Air Ventilation Duct

Prop

Product Data & Installation Guide



NFPA 96
MEA
IMC

1. Product Description

Thermal Ceramics FireMaster® Duct Wrap and FireMaster Duct Wrap+ products are foil-encapsulated, non-combustible, high temperature, inorganic flexible fireproofing wrap materials specifically tested to provide a 1 or 2 hour fire rated enclosure for commercial kitchen grease and air ventilation ducts. The difference between the two wrap systems is the core material basic chemistries. FireMaster Duct Wrap is a high temperature ceramic fiber insulating blanket composed primarily of alumina and silica and FireMaster Duct Wrap+ is a low biopersistence alkaline-earth silicate wool. Both chemistries are free of binders and lubricants. FireMaster Duct Wrap and Duct Wrap+ products are classified by Underwriters Laboratories Listing and Follow-up Service Program to ensure uniform thickness and density specifications, thus providing consistency in end physical properties for required fire ratings based on the number of wraps applied. FireMaster Duct Wrap and Duct Wrap+ systems are proven performance alternatives through extensive testing to 1 or 2-hour fire-resistance rated shaft enclosures for commercial kitchen grease and air ventilation duct systems. With its excellent insulating capability of withstanding fire temperatures up to 2000°F (1093°C), it protects combustible constructions at zero clearance throughout the entire cocoon wrap enclosure for commercial kitchen grease ducts in tight congested areas. When the commercial kitchen grease or air ventilation duct penetrates fire rated walls and floors, Fire Barrier 2000+, 1000 N/S or 1003 S/L Silicone Sealant used in combination with FireMaster Duct Wrap and Duct Wrap+ provides an alternate means of protection to rigid shafts by maintaining the integrity of the 1 or 2 hour floor or wall assembly.

Product Features

- Completely inorganic
- Low biopersistence with FireMaster Duct Wrap+
- Alternate to rigid shaft enclosures
- Zero clearance to combustibles protection
- Wide range of proven performance testing for complex duct jobs
- Wide variety of through-penetration systems
- Compact wrap design saves space
- Lightweight flexible system requires minimum labor and resists cracking
- Problem solver for tight, congested areas
- Totally foil encapsulated system protects against material degradation and potential fire hazards
- Massive fire proof material does not lose fire fighting capabilities with age
- Product markings on foil ensure proper material identification for easy inspections

2. Applications

- 1 or 2 Hour Commercial Kitchen Grease Ducts
- 1 or 2 Hour Air Ventilation Ducts

3. Physical Characteristics

FireMaster Product	Unit	Size	Units Ctn.	Wt./Ctn.
Duct Wrap or Duct Wrap+	Roll	1 1/2" x 24" x 25' (37.5mm x 60cm x 7.5m)	1	43 lbs. (19.5kg)
Duct Wrap or Duct Wrap+	Roll	1 1/2" x 48" x 25' (37.5mm x 120cm x 7.5m)	1	86 lbs. (39kg)
Color		White filler blanket with silver foil encapsulation		

4. Specifications

This specification guide covers the application of FireMaster Duct Wrap, FireMaster Duct Wrap+ and Fire Barrier 2000+, 1000 N/S, or 1003 S/L Silicone Sealants.

Application	Fire Resistive Rating	Enclosure System	Through-Penetration System
Grease Ducts	1 or 2 hours	2 layers FireMaster Duct Wrap or FireMaster Duct Wrap+ UL YYET 3" (75mm) perimeter and longitudinal overlap	UL C-AJ 7014 UL C-AJ 7021 ULC-FRD-4
Air Ventilation Duct Systems	1 hour	1 layer FireMaster Duct Wrap or FireMaster Duct Wrap+ V-1, V-3, 3" (75mm) perimeter and longitudinal overlap or optional butt joint plus collar wrap method	UL C-AJ 7012 UL C-AJ 7019 UL WL-7041 ULC-FRD-3
Air Ventilation Duct Systems	2 hours	2 layers FireMaster Duct Wrap or FireMaster Duct Wrap+ UL V-2, V-4, 3" (75mm) perimeter and longitudinal overlap or optional butt joint plus collar wrap method	UL C-AJ 7014 UL C-AJ 7021 UL WL-7041 ULC-FRD-3

5. Performance

A. FireMaster Duct Wrap & FireMaster Duct Wrap+ Flammability (ASTM # 84/UL 723)

Foil:	Flame spread	5
	Smoke developed	5
Blanket:	Flame spread	0
	Smoke developed	0

Thermal Resistance

R value per ASTM C 518

4.15 per inch at 70°F (21°C)

B. Fire Stop Sealant

3M™ Fire Barrier Sealant	2000+	1000 N/S	1003 S/L
Color	Light Gray	Light Gray	Light Gray
Working Time (min.)	10 - 20	5 - 10	20 - 40
Cure Time at 77°F (25°C), 50% R.H.	14 - 21 days	14 - 21 days	14 - 21 days
Flow, Sag, or Slump	Nil	Nil	Self Leveling
Elongation at Break	600%	600%	600%

6. Listings

Agency	Reference Standard/ File Number
Underwriters Laboratories Inc.	Grease Duct Enclosures (YYET): R14229; Fire Resistance Ventilation Duct Assemblies (HNIJ): V-1, V-2, V-3, V-4 Batts and Blankets (BKNV): R8418; Through-Penetration Firestop Systems (XHEZ): C-AJ-7012, C-AJ-7019, C-AJ- 7014, C-AJ 7021, WL-7041 Research Report 9424D
SBCCI	
BOCA	Research Report 21.51
NFPA	Complies with NFPA 96, 1998 Edition
California State Fire Marshall	Listing Nos. 2440-1361:100 4485-1361:101
New York City	MEA # 417-92-M (grease ducts) 417-92-M Vol II (air ventilation ducts)
North Carolina Mechanical Code	Sections 308.4.7, 308.4.10 Volume III
International Mechanical Code	Section 506 Commercial Kitchen Grease Ducts and Exhaust Equipment, Section 507 Commercial Kitchen Hoods

7. Installation

The FireMaster Duct Wrap and Duct Wrap+ systems shall be installed by a qualified contractor in accordance with the manufacturer's instructions and the referenced standards.

Materials and Equipment

- FireMaster Duct Wrap and Duct Wrap+ blanket, 1½" (38mm) thick, 24" (610mm) or 48" (120cm) wide, 6 pcf density, 25' (7.5m) long rolls, 48" (120cm) wide blanket helps to minimize waste
- Aluminum foil tape
- Minimum ¾" (19mm) wide filament tape
- Carbon steel or stainless steel banding material, minimum ½" (12.5mm) wide, minimum 0.015" (0.38mm) thick, with steel banding clips.
- Hand banding tensioner and crimping tool

- Minimum 12 gage copper-coated steel insulation pins, 4" to 5" long (102 - 127mm); galvanized steel speed clips, minimum 1 ½" (38mm) x 1 ½" (38mm) square or 1 ½" dia. (38mm), or equivalent sized cup-head pins; capacitor discharge stud gun
- Access door hardware: four galvanized steel threaded rods, ¼" diameter (6.35mm) by 4 ½" to 5" long (114 to 127mm) with ½" (6.35 mm) wing nuts and ¼" (6.35mm) washers; 4" (102mm) l steel tubing to fit threaded rods
- Fire Barrier 2000+, 1000 N/S or 1003 S/L silicone sealant

Storage:

The FireMaster Duct Wrap, Duct Wrap+, and Fire Barrier Silicone Sealant must be stored in a dry warehouse environment on pallets. Pallets should not be stacked.

Preparatory Work:

FireMaster Duct Wrap and Duct Wrap+ are installed with common tools, such as knives, banders and capacitor discharge guns for applying insulation pins. In order to install the duct fire stop system, the surfaces of all openings and penetrating items need to be clean, dry, frost free, and free of dust.

Installation techniques for Thermal Ceramics FireMaster Duct Wrap and Duct Wrap+ (Figure 1):

- 3" (75mm) Overlap Wrap Telescope - Each blanket overlaps one adjacent blanket a minimum of 3" (75mm), and each blanket has one edge exposed and one edge covered by the next blanket as shown in Figure 1. The visible edges of the longitudinal overlaps all point in the same direction.

- Butt joint & Collar System - The adjacent blankets of both interic exterior layers are firmly butted together with the exterior joints located 12" (30cm) away from the interior joints. An 8" (20cm) wide collar made from FireMaster Duct Wrap or Duct Wrap+ is centered over each exterior joint, overlapping each blanket by 4" (101mm) as shown in Figure 1. The collar overlaps itself with a 3" (75mm) perimeter overlap.

- 2 & 3 Sided Wrap System - When space does not allow for a full wrap enclosure on all four sides of the duct, the FireMaster Duct Wrap or Duct Wrap+ may be installed on 2 or 3 sides of the duct and mechanically attached to a concrete or CMU assembly on the unexposed side of the duct.

General:

Applies to all FireMaster Duct Wrap & FireMaster Duct Wrap+ Installation Methods

To minimize waste, FireMaster material should be rolled out tautly before measuring. Cut edges of the blanket shall be taped with aluminum foil tape to prevent exposed edges of the insulation from wicking moisture from condensation or grease from a compromised leaking duct joint into the material and causing degradation of the fire barrier. The FireMaster material may be installed with either a mechanical banding system or insulation pins and clips (see Mechanical Attachment Methods below and figures 1 and 2). When using the banding technique, caution shall be taken to ensure that the bands are not fitted too snug as which could result in cutting into the blanket. To prevent blanket sag on ducts with dimensions greater than or to 24" (600mm), insulation pins, long enough to extend through the of blanket insulation, are welded to the duct in columns spaced 12" (305mm) apart, between 6" and 12" (152 and 305mm) from each edge and 10-1/2" (267mm) on center along the bottom horizontal and outside vertical duct runs as shown in Figure 3. Insulation pins that extend beyond the blanket wrap shall be tuned down to eliminate sharp points.

or FireMaster Duct Wrap+ material, the FireMaster enclosure may terminate above and below the floor/ceiling or wall assembly as shown in figure 5 - 7 by mechanically attaching the FireMaster to the termination point above and below the termination area with bands or pins.

- The steel banding should be placed around the material and tensioned so as to firmly hold the FireMaster Duct Wrap or Duct Wrap+ in place without cutting into the blanket causing violation of the fire barrier

8. Maintenance

No maintenance is required when installed in accordance with the manufacturer's installation instructions. Once installed, if any section of the FireMaster Duct Wrap or FireMaster Duct Wrap+ is damaged, the following procedures will apply:

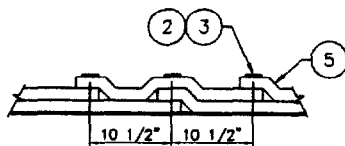
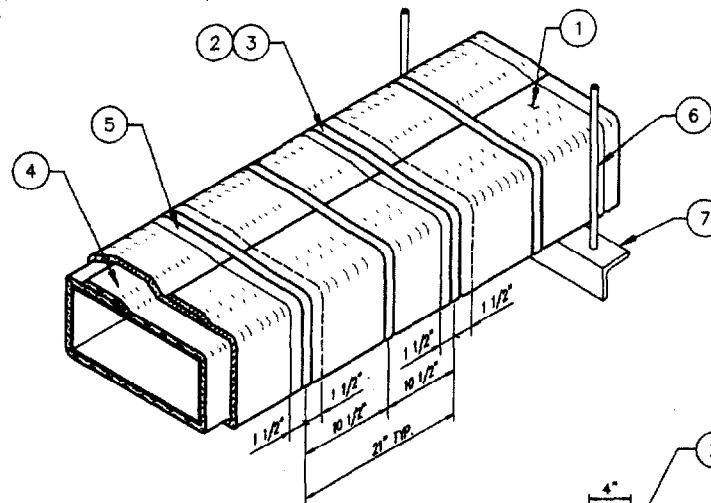
- The damaged section should be removed by cutting the steel bands and removing the anchor clips holding it in place
- A new section of the same dimension should be cut from a roll of Duct Wrap or FireMaster Duct Wrap+, either 24" (610mm) or 48" (120cm) wide. Cut edges of the blanket shall be taped to prevent exposed edges of the insulation from wicking moisture or grease into the material and degradation of the fire barrier
- The new section should be placed per manufacturer's installation instructions ensuring the same overlap and installation method that existed previously

9. Limitations

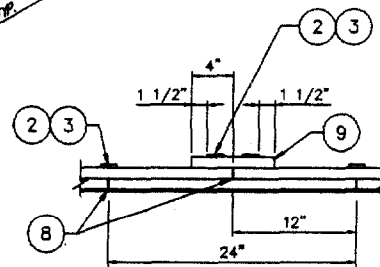
- FireMaster Duct Wrap and FireMaster Duct Wrap+ shall be installed in accordance with Thermal Ceramics manufacturer's installation instructions
- Multiple steel ducts in a single Duct Wrap or Duct Wrap+ enclosure are not permitted
- Minimum 3/8" (10mm) diameter all thread steel rods and minimum 1 1/2" x 1 1/2" x 1/8" (38 x 38 x 3.2mm) steel support angle do not have to be wrapped
- The size of the steel duct shall not be limited
- The use of transitional duct sizes shall not be limited
- The use of transition to gypsum wallboard shaft shall not be limited
- The integrity of FireMaster Duct Wrap and Duct Wrap+ systems is limited to the quality of the installation

*For personal protective equipment recommendations see the MSDS.

Thermal Ceramics FireMaster Duct Wrap or Duct Wrap+ Commercial Kitchen Grease Duct System 1 or 2 Hour Shaft Alternative Zero Clearance to Combustibles (Overlap Wrap Technique)



3" OVERLAP ON ALL LAYERS



BUTT-JOINT/COLLAR

OPTIONAL INSTALLATION METHODS

FireMaster Duct Wrap or Duct Wrap+ Figure 1 Drawing# RB0100501	
1	Two layers FireMaster Duct Wrap or Duct Wrap+
2	Filament tape
3	Banding
4	3" minimum perimeter overlap
5	3" minimum longitudinal overlap
6	3/8" minimum diameter hanger rod
7	1 1/2" x 1 1/2" x 1/8" angle
8	Firmly butted joint
9	8" wide Duct Wrap or Duct Wrap+ collar

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

Support hanger systems do not need to be wrapped provided that the steel hanger rods are at least a minimum of 3/8" (9.5 mm) diameter and the steel angle is a minimum of 1 1/2" x 1 1/2" x 1/8" (38mm x 38mm x 3.2mm). Horizontal trapeze support system may be incorporated into the wrap enclosure.

Overlap Wrap Telescope Installation

FireMaster Duct Wrap and Duct Wrap+ commercial kitchen grease duct and air ventilation duct 2 hour enclosure includes a two-layer wrap construction for 1 or 2 hour grease ducts and 2 hour air ventilation ducts, or a one-layer wrap for 1 hour air ventilation ducts applied directly to all surfaces of the duct (see figure 1 and 2). The first or interior layer of FireMaster Duct Wrap or Duct Wrap+ blanket is wrapped around the perimeter of the duct and is cut to a length with enough excess to overlap itself not less than 3" (75mm). Adjacent blankets are placed to overlap the previous blanket not less than 3" (75mm). The overlap made by adjacent blankets forms the "longitudinal" overlap. The overlap a blanket makes with itself is called the "perimeter" overlap. The first layer is held in place with filament tape 1 1/2" (38mm) from each blanket edge and in the center of the blanket. The second layer is wrapped around the perimeter of the first layer with the longitudinal overlaps of the exterior layer spaced 10 1/2" (26cm) away from those of the interior layer and held in place with filament tape 1 1/2" (38mm) from each blanket edge and in the center of the blanket until banding is in place or the pinning attachment is fully secured

B. Butt Joint / Collar Installation

FireMaster Duct Wrap or Duct Wrap+ is installed in two layers with a tight butt joint construction. The first layer of FireMaster Duct Wrap or Duct Wrap+ is applied directly to the duct with each adjacent blanket tightly butted to the next. The blankets of the first layer are held in place with filament tape 1 1/2" (38 mm) from each blanket edge and in the center of the blanket. The second layer of FireMaster Duct Wrap or Duct Wrap+ is wrapped around the perimeter of the first layer with a tight butt joint construction with the joints of the exterior wrap located 12" (305mm) away from the butted joints of the interior layer blankets. The second layer of FireMaster Duct Wrap or Duct Wrap+ is held in place with filament tape as a temporary hold until the mechanical attachment system is installed. An 8" (203mm) wide FireMaster Duct Wrap or Duct Wrap+ Collar is centered over the joints of the exterior layer and wrapped around the perimeter of the duct and cut to a length so that it overlaps itself not less than 3" (75mm). The collar is held in place with filament tape placed 1 1/2" (38mm) from each edge of the collar until the mechanical banding or pinning and clip attachment method is in fully secured.

C. 2 & 3 Sided Wrap System

When space does not allow for a complete wrap applied to the duct on all four sides, the FireMaster Duct Wrap or Duct Wrap+ can be installed on 2 or 3 sides of the exposed duct in one of the installation methods described above and mechanically attached to a concrete or CMU assembly, thus enclosing the duct on all accessible sides. The FireMaster Duct Wrap or Duct Wrap+ is installed on the duct as described in the two installation methods described above with the starting edge of the blanket attached to the concrete or CMU assembly and then wrapped around the duct until the other end can be affixed to the other concrete or CMU assembly, thus encapsulating the duct with insulation around all accessible sides. The blanket is to flange out onto the concrete or CMU assembly. It shall be secured to the adjoining assembly with min 3/16" (5mm) diameter, 4" (100mm) long concrete anchors, footed to a minimum 1 1/2" (38mm) wide x 3/16" (5mm) thick steel strip/strap with pre-drilled holes spaced a maximum 10" (25cm) on center. The FireMaster Duct Wrap or Duct Wrap+ insulation wrap is secured to the duct with banding. The ends of the banding are to loop into the steel strips/straps that

foot the blanket to the concrete floor or wall, and tightened down.

Mechanical Attachment Methods for Insulation Wrap:

1. **Banding** - 1/2" (12.7mm) wide carbon steel or stainless steel banding, 0.015" (0.38mm) thick, is placed around the entire perimeter of the insulated duct with maximum 10 1/2" (267mm) spacing centers and 1 1/2" (38mm) from each blanket edge or 1 1/2" (38mm) from each collar edge when using the butt joint and collar method. When banding, filament tape can be used to temporarily hold the blanket in place until the banding is applied. The banding is placed around the material and tightened so as to firmly hold the FireMaster Duct Wrap or Duct Wrap+ in place against the duct, but not cause any cutting or damage to the blanket.

2. **Pinning** - To prevent blanket sag on duct spans 24" (610mm) or larger, min. 12 gage, 5" long (127mm) copper coated steel insulation pins are welded to the duct in columns spaced 12" (305mm) apart, 6" - 12" (152 - 305mm) from each edge and on 10 1/2" (267mm) centers along bottom horizontal and outside vertical runs (see fig 3). Pins are also required 1" (25mm) from the end of a duct and 1" (25mm) from any edge near a 90° bend, spaced on 6" (152mm) centers. Pins are locked into place with 1 1/2" (38mm) diameter round or square, galvanized steel, speed clips or cup head pins. Pins that extend beyond outer blanket wrap layer shall be turned down to eliminate sharp edges or the excess length cut off.

Grease Duct Access Door Installation (See Figure #4)

Four galvanized steel threaded rods, 1/4" diameter (6.35mm) by 4 1/2" to 5" long (114 to 127mm) are welded to the duct at the corners of the door opening. 4" (100mm) long steel tubes fit over the threaded rods and protect the blanket material when the door is fastened. Four 5" (125mm), long 12 gage insulation pins are welded to the door panel for installation of the blanket. Three layers of FireMaster Duct Wrap or Duct Wrap+ are impaled over the 12 gage insulation pins on the door panel. The first layer is cut and impaled on the door panel insulation pins with no less than 1" (25mm) overlap. The second layer is cut to overlap the first layer by no less than 1" (25mm), and the third layer is cut to overlap the second by no less than 1" (25mm). It is essential that these layers fit tightly against the wrap surrounding the access door opening with no through openings. The three layers are impaled over the pins and are locked in place with speed clips. Pins that extend beyond the outer layer of FireMaster wrap shall be turned down to avoid sharp points on the door.

The insulated door panel is placed over the threaded rods covered by the steel tubes and held in place with washers and wing nuts. The details are shown in Figure 4.

Through-Penetration Firestop System

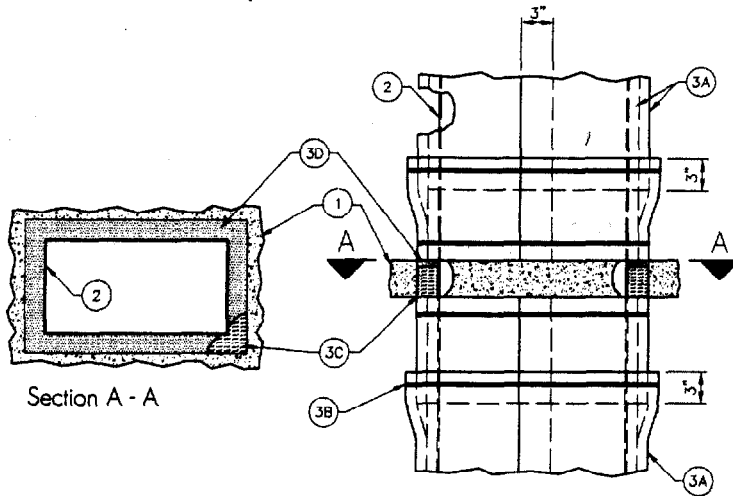
When the duct penetrates a concrete or dry-wall fire rated wall, ceiling, or floor, an approved fire stop system must be employed. The through penetration systems listed under Specifications in Paragraph 4 above, and shown in Figures 5 through 8, are approved for FireMaster Duct Wrap and Duct Wrap+.

To fire stop the through penetration void area of the wrapped duct, fill the annular space between the wrapped duct and periphery of the opening with 4 1/4" (107mm) thickness of scrap FireMaster Duct Wrap or Duct Wrap+, firmly packed into the opening and recessed 1/4" (6.25mm), below the top of the opening. Apply 1/4" (6.25mm) minimum Fire Barrier 2000+, 1000 N/S or 1003 S/L Silicone Sealant over the packing material within the annulus, flush with top surface of floor or both surfaces of wall.

Alternatively, when there is no room in the remaining annular space to wrap the duct with 1 or 2 layers of the FireMaster Duct Wrap

Thermal Ceramics

FireMaster Duct Wrap or Duct Wrap+
Through Penetration System
1 or 2 Hour Grease Duct
UL System No. C-AJ-7014

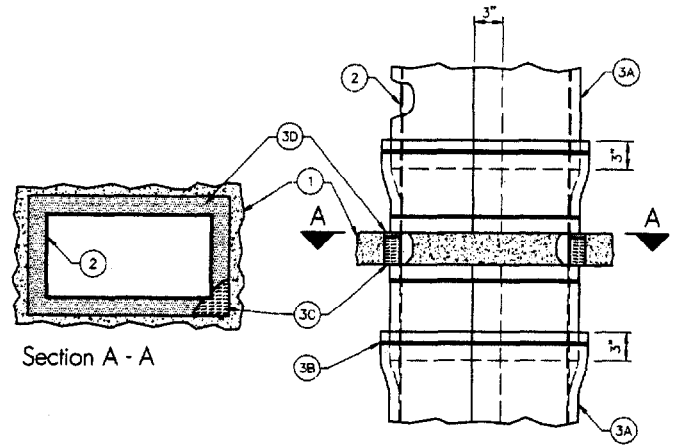


FireMaster Duct Wrap or Duct Wrap+ Figure 5 Drawing# RB0100504	
1	Floor or wall
2	Duct
3A	Two layers FireMaster Duct Wrap or Duct Wrap+
3B	Banding
3C	FireMaster Duct Wrap or Duct Wrap+ (packing material)
3D	Fire Barrier 2000+, 1000 N/S or 1003 S/L silicone sealants

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

Thermal Ceramics

FireMaster Duct Wrap or Duct Wrap+
Through Penetration System
1 Hour Air Duct
UL System No. C-AJ-7019

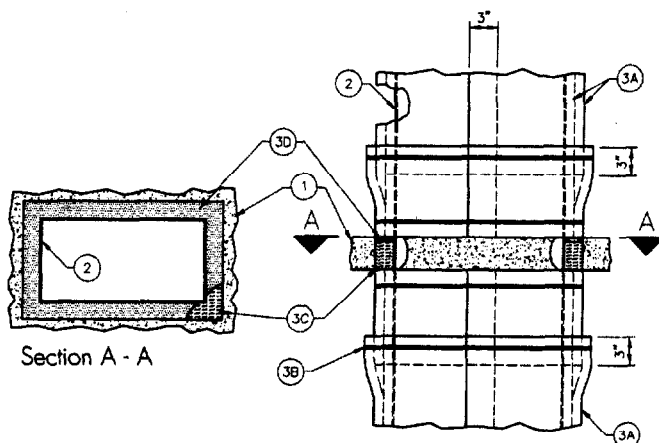


FireMaster Duct Wrap or Duct Wrap+ Figure 6 Drawing# RB0100505	
1	Floor or wall
2	Duct
3A	One layer FireMaster Duct Wrap or Duct Wrap+
3B	Banding
3C	FireMaster Duct Wrap or Duct Wrap+ (packing material)
3D	Fire Barrier 2000+, 1000 N/S or 1003 S/L silicone sealants

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

Thermal Ceramics

FireMaster Duct Wrap or Duct Wrap+
Through Penetration System
2 Hour Air Duct
UL System No. C-AJ-7021

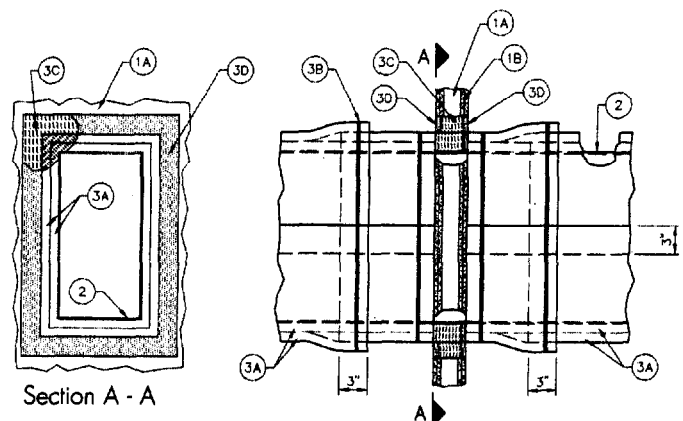


FireMaster Duct Wrap or Duct Wrap+ Figure 7 Drawing# RB0100506	
1	Floor or wall
2	Duct
3A	Two layers FireMaster Duct Wrap or Duct Wrap+
3B	Banding
3C	FireMaster Duct Wrap or Duct Wrap+ (packing material)
3D	Fire Barrier 2000+, 1000 N/S or 1003 S/L silicone sealants

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

Thermal Ceramics

FireMaster Duct Wrap or Duct Wrap+
Through Penetration System
Gypsum Wall 1 or 2 Hour
Grease or Air Ventilation Duct
UL System No. WL-7041



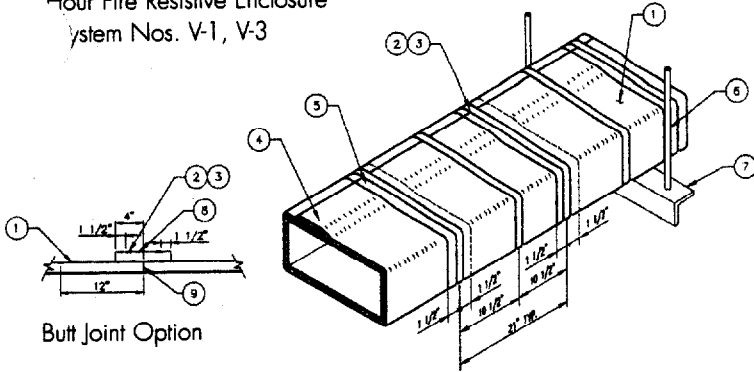
FireMaster Duct WRap or Duct Wrap+ Figure 8 Drawing# RB0100517	
1A	Wall
1B	Gypsum wallboard
2	Duct
3A	Two layers FireMaster Duct Wrap or Duct Wrap+
3B	Banding or pinning
3C	FireMaster Duct Wrap or Duct Wrap+ (packing material)
3D	FB 2000+ caulk

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

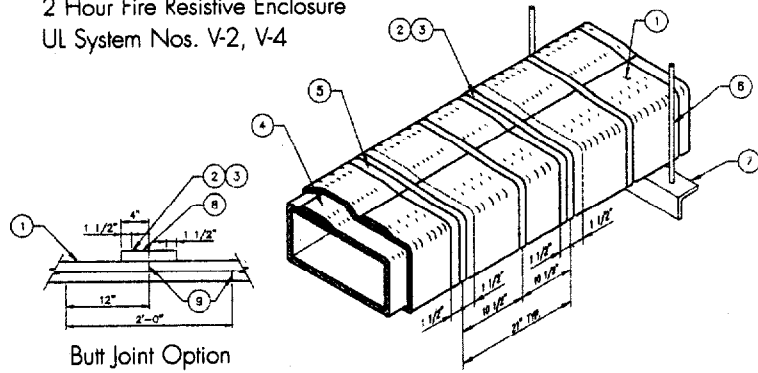
Thermal Ceramics

FireMaster Duct Wrap or Duct Wrap+ Air Ventilation Duct System (Overlap Wrap Technique)

1 Hour Fire Resistive Enclosure
System Nos. V-1, V-3



2 Hour Fire Resistive Enclosure
UL System Nos. V-2, V-4



FireMaster Duct Wrap or Duct Wrap+ Figure 2 Drawing# RB0100503

1	One layer FireMaster Duct Wrap or Duct Wrap+
2	Filament tape
3	Banding
4	3" minimum perimeter overlap
5	3" minimum longitudinal overlap
6	3/8" minimum diameter hanger rod
7	1 1/2" x 1 1/2" x 1/8" angle
8	8" wide FireMaster Duct Wrap or Duct Wrap+ collar (for Butt joint option)
9	Firmly butted joint (for Butt joint option)

FireMaster Duct Wrap or Duct Wrap+ Figure 2A Drawing# RB0100503

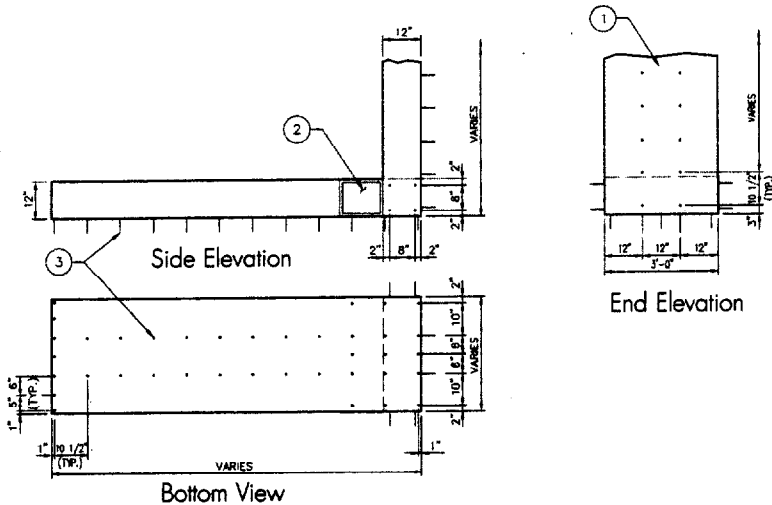
1	Two layers FireMaster Duct Wrap or Duct Wrap+
2	Filament tape
3	Banding
4	3" minimum perimeter overlap
5	3" minimum longitudinal overlap
6	3/8" minimum diameter hanger rod
7	1 1/2" x 1 1/2" x 1/8" angle
8	8" wide FireMaster Duct Wrap or Duct Wrap+ collar (for Butt joint option)
9	Firmly butted joint (for Butt joint option)

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

Thermal Ceramics

FireMaster Duct System Typical Insulation Pin Layout For Duct Spans $\geq 24"$ Wide To Prevent Blanket Sag



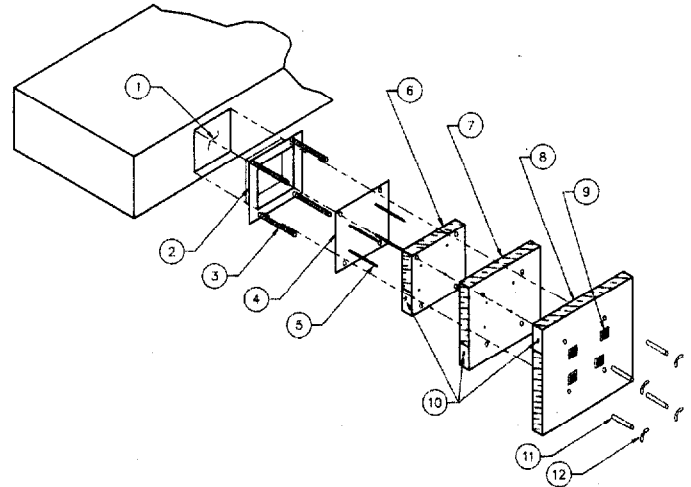
FireMaster Duct Wrap or Duct Wrap+ Figure 3 Drawing# RB0109301

1	Typical section
2	Access door
3	10 or 12 gauge copper coated steel insulation pins

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

Thermal Ceramics

FireMaster Duct Wrap or Duct Wrap+ Commercial Kitchen Grease Duct Access Door System



FireMaster Duct Wrap or Duct Wrap+ Figure 4 Drawing# RB0100502

1	Door hole
2	Access frame welded to duct
3	1/4" diameter threaded rods
4	Access cover - 16 gauge
5	Insulation pins - welded
6	One layer FireMaster Duct Wrap or Duct Wrap+
7	One layer FireMaster Duct Wrap or Duct Wrap+ 1" overlap
8	One layer FireMaster Duct Wrap or Duct Wrap+ 1" overlap
9	Speed clips
10	Aluminum tape at edges
11	Spool pieces for threaded rods
12	1/4" diameter wing nuts

Note: The integrity of FireMaster Duct Systems is limited to the quality of the installation.

CAPTIVE-AIRE HOODS/ NON-INTC HAS OPTIMAL CLEARANCE REDUCTION SYSTEM AVAILABLE AS FOLLOWS:

MATERIAL	CLEARANCE REDUCTION SYSTEM
NON-CONDUCTIBLE	NONE REQUIRED
INSULATED-CONDUCTIBLE	3" INSULATED SHROOF
CONDUCTIBLE	3" INSULATED SHROOF

TABLE 1

CAPTIVE-AIRE HOODS ARE BUILT IN COMPLIANCE WITH:

- NFPA 99
- NF
- BRAC 70-16
- LCB 84113
- NIOSH MS & CS NO 1017
- U.S. MESH 2000104

LISTED

UL MF-112106

NSE

NFPA

BUILDING CODES

1. ALL ELECTRICAL "TYPE" CONNECTIONS AND RELATED IMPLEMENTATIONS BY ELECTRICAL CONTRACTORS.
2. ALL PLUMBING "TYPE" CONNECTIONS AND RELATED IMPLEMENTATIONS BY PLUMBING CONTRACTORS.
3. ALL APPROVED HYDRAULIC SYSTEMS BY MECHANICAL CONTRACTORS.
4. 6" LIGHT FIXTURE LIGHTS AND TUBES HANGING DIRECTLY IN SPACES OF PLUMBING.
5. ALL CONNECTIONS FROM CAPTIVE-AIRE HOOD FOR THE PLUMBING CONTRACTORS.
6. ALL LIGHTS MUST BE SHOWN BY CAPTIVE-AIRE, AND PLUMBING CONTRACTORS FOR THE PLUMBING CONTRACTORS. INTERFERENCES BETWEEN HOODS ARE TO BE SHOWN BY ELECTRICAL CONTRACTORS.
7. LEADS FOR LIGHT SHOWN BY MECHANICAL CONTRACTORS.
8. PERIODIC INSURANCE AND PERFORMANCE OF MECHANICAL CONTRACTORS.
9. MECHANICAL CONTRACTORS MUST ALL RELATED IMPLEMENTATIONS FOR THE PROVISIONS OF MECHANICAL CONTRACTORS. THIS CONTRACTOR HAS BEEN DOCUMENTED FOR ELECTRICAL CONTRACTORS, AND MECHANICAL CONTRACTORS. ALL MECHANICAL CONTRACTORS MUST BE NOTIFIED BY THE FACTORY PRIOR TO COMMENCEMENT OF WORK.
10. HOODS AND "APPARENT" COPIES OF THIS DOCUMENT MUST BE KEPT BY THE FACTORY PRIOR TO COMMENCEMENT OF WORK.
11. MAINTAIN YOUR BUSINESS AS SHOWN ON CHANGES.

GENERAL NOTES

CUSTOMER APPROVAL TO MANUFACTURE:

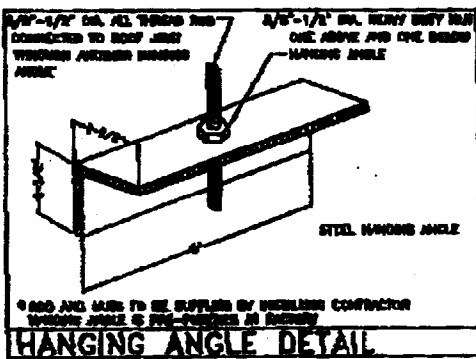
Approved as Noted

Approved with NO Exception Taken

Revised and Resubmit

SIGNATURE *[Signature]*

Your Title _____ Date *8/20/03*



CALCULATIONS UTILIZED

EXHAUST CAPACITY OF HOOD X CAPACITY (LOAD)

SUPPLY CAPACITY OF X PERFORMANCE REQUIRED

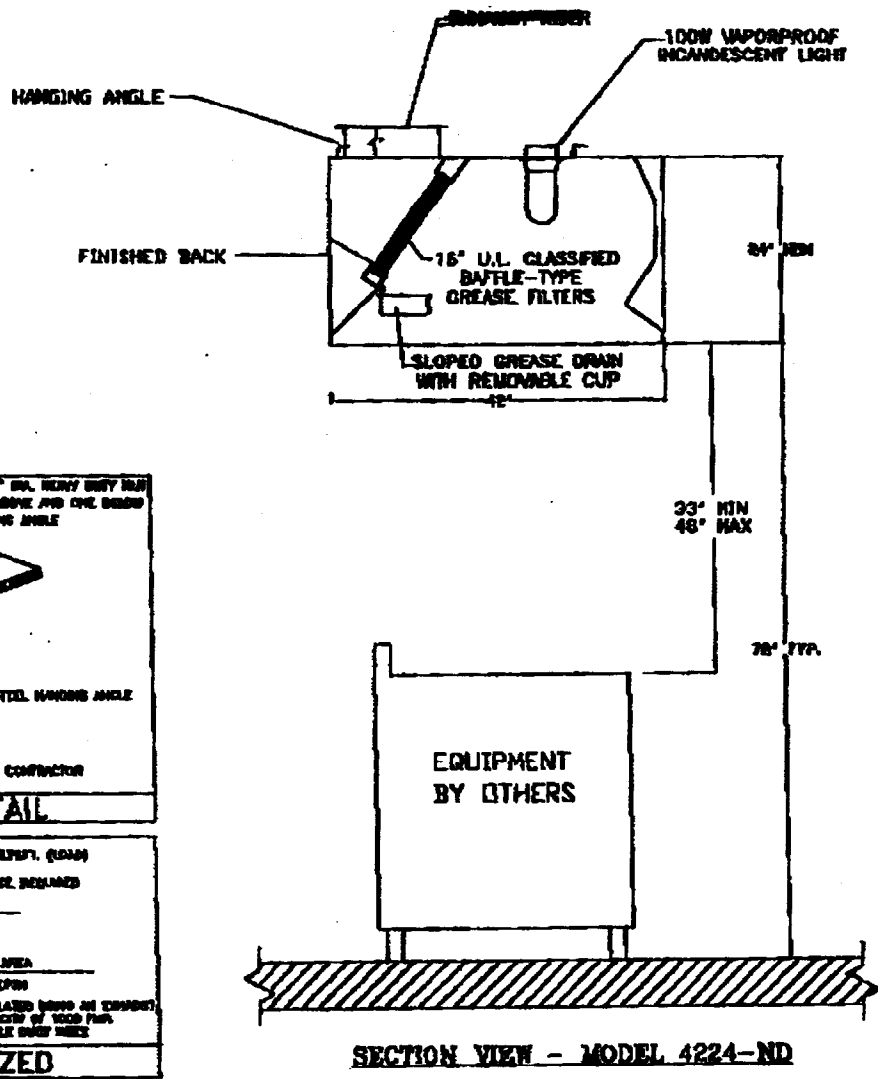
TOTAL DUCT AREA = 144 X

DUCT LENGTH =

DUCT DUCT AREA

DUCT DUCT AREA

CAPTIVE-AIRE MECHANICAL HOODS ARE CALCULATED BASED ON EXHAUST VELOCITY OF 1000-1200 FPM AND A SUPPLY VELOCITY OF 1000 FPM. PLEASE CONSULT FACTORY FOR VARIATIONS AND/OR OTHER NEEDS.



CAPTIVE-AIRE

JOB Prop	
LOCATION	
DATE 08/20/2003	JOB # 0
DWG # Prop	DRAWN BY SAC
REV. 1.00	SCALE 8.5" x 11"

BRIDGTON

HOOD INFORMATION

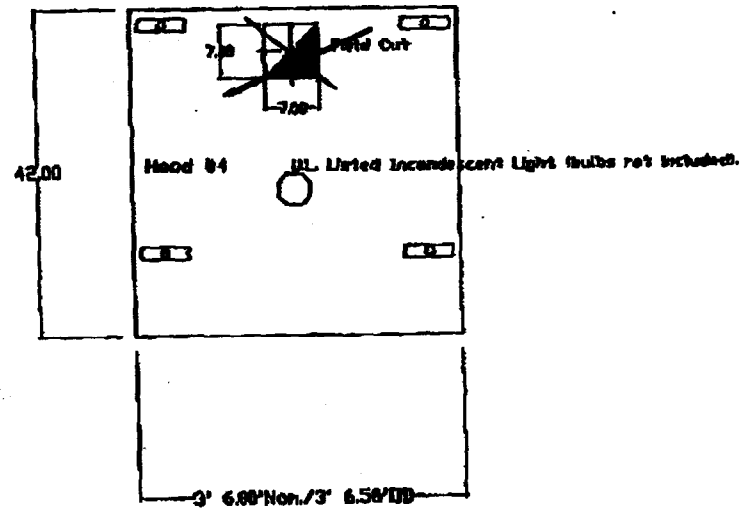
HOOD NO.	MODEL	LENGTH	MAX. COOKING TEMP.	EXHAUST PLENUM					SUPPLY PLENUM					HOOD CONSTRUCTION	HOOD CONFIG.		
				TOTAL EXH. CFM	WIDTH	LENG.	DIA.	CFM	S.P.	TOTAL SUP. CFM	WIDTH	LENG.	DIA.		CFM	S.P.	END TO END
4	4224 HD	3' 6.00" Non. 3' 6.58" DB	450 Deg.	613	7'	7'		613	-8226'	0					384 SS 1800'		

HOOD INFORMATION

HOOD NO.	FILTER(S)			LIGHT(S)			UTILITY CABINET(S)				FIRE SYSTEM PIPING	HOOD WEIGHT		
	TYPE	QTY	HEIGHT	LENGTH	QTY	TYPE	TYPE	LOCATION	SIZE	ELECTRICAL MODEL #			QUANTITY	LOCATION
4	Alum. Baffle w/ Handles	2	16"	24"		Incandescent Light bulbs not included.							NO	223 LBS.

HOOD OPTIONS

HOOD NO.	OPTION
4	FINISHED BACK 42.00' Long



PLAN VIEW - 3' 6.00' LONG 4224ND

CUSTOMER APPROVAL TO MANUFACTURE

Approved as Noted

Approved with NO Exception Taken

Revise and Resubmit

SIGNATURE _____

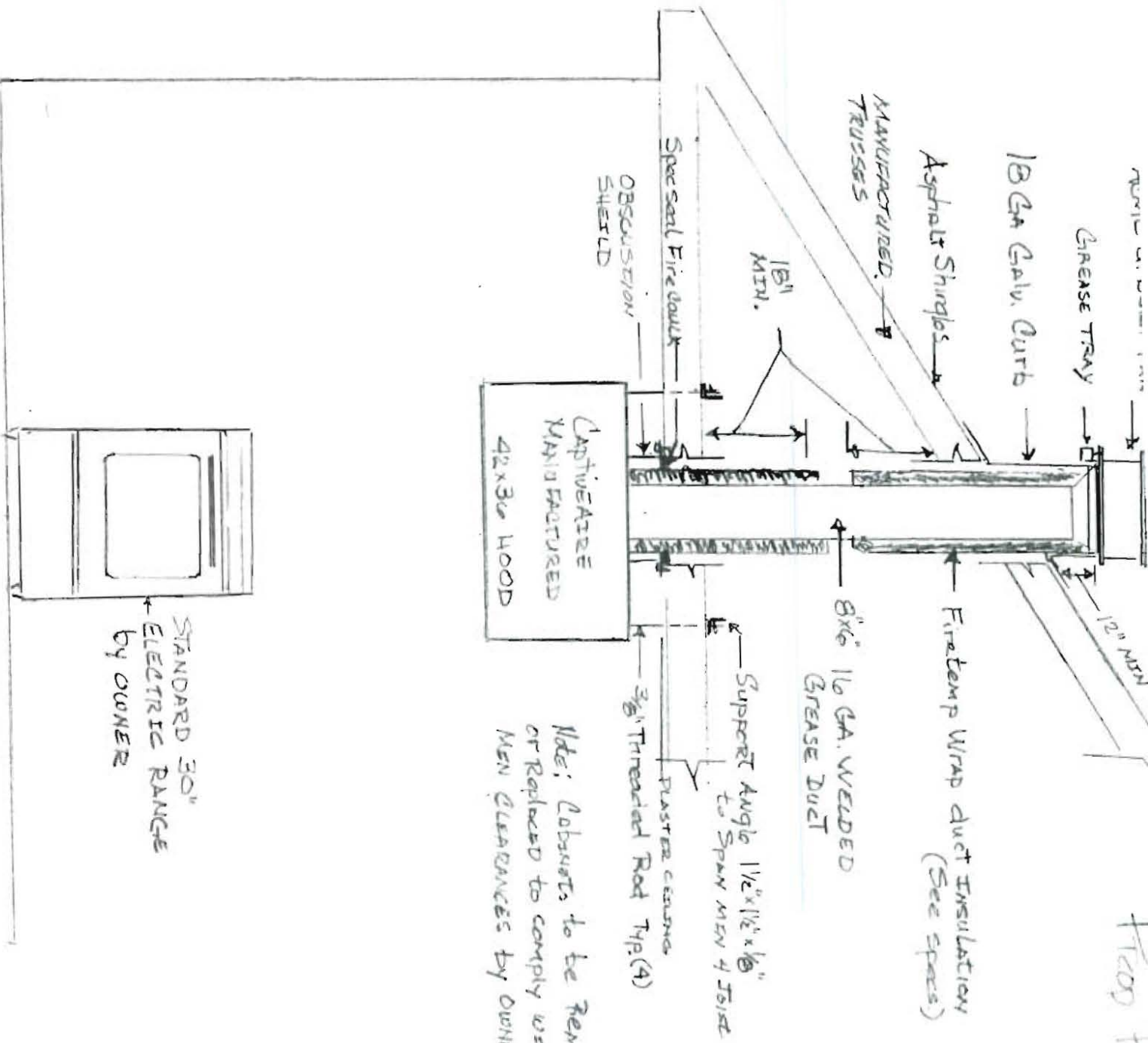
Your Title _____ Date _____



JOB	Prop	
LOCATION		
DATE	08/20/2003	JOB # 0
DWG #	Prop	DRAWN BY SAC
REV.	1.00	SCALE 8.5' x 11'

AUG-21-2003 12:27

RODGERS AEROTECH



Note: Obstructions to be Removed or Replaced to comply with MEN CLEARANCES by OWNER

STANDARD 30" ELECTRIC RANGE by OWNER

TRAP PROGRAM KILGORE - 5-1-15

G

Simple

R

E

C

Johns

EL

Box