

EMERGENCY & VENTILATION FANS
OPERATION, MAINTENANCE AND INSTALLATION MANUAL

SECTION SEVEN

DAMPERS

- RUSKIN TECHNICAL DATA
- DAMPER DRAWINGS

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PHILIPS
INDUSTRIES INC.

Air Distribution Group
Ruskin Division

Manufacturing Quality Components for Better Building

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OPERATION, MAINTENANCE AND INSTRUCTION MANUAL

FOR

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT

METRO RAIL PROJECT

CONTRACT A740

CONTRACTOR: FLACK

HVAC CONTROL DAMPERS

RUSKIN DIVISION

PHILIPS INDUSTRIAL COMPONENTS, INC

MANUAL NO. 0562-MI

AUGUST 8, 1989

INTRODUCTION

Thank you for selecting equipment engineered and manufactured by Ruskin Manufacturing.

This technical manual is provided to help you receive the safest operation, longest life, and the optimum performance available from your damper machinery.

Thoroughly review this manual and familiarize yourself with the equipment and components you have received.

If you have any questions, require spare parts, or need factory assistance, please call Ruskin Manufacturing, Division of Philips Industries, Inc., at (816) 761-7476.

RUSKIN DIVISION
OPERATION, MAINTENANCE AND INSTRUCTION MANUAL

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EQUIPMENT DESCRIPTION

1. Control Dampers

The function of a control damper is to control the air flow thru the duct. Automatic damper is operated by an electric powered spring return rotary actuator.

The damper configuration and actuator arrangement are detailed on project drawing No's. 0562-001 thru 0562-028.

PROCEDURE E-515 - SITE STORAGE AND HANDLING OF
DAMPER UNITS

RUSKIN Manufacturing Company
RUSKIN® *air handling specialties*

ENGINEERING
PROCEDURE NO. E-515

Rev. No. 0

Date: August 19, 1982

SITE STORAGE AND HANDLING OF DAMPER UNITS
(Excluding Fire Damper Units)

Page 1 of 2

1.0 Damper Units should be inspected upon receipt.

Damaged discovered at installation and not previously reported shall be considered the buyers responsibility to be repaired at the buyers sole expense.

2.0 Damper Units shall be stored in such a way as to be protected from the weather and physical damage.

2.1 Storage Classification Level

2.1.1 Damper Unit Only - ANSI N45.2.2 - Level C

2.1.2 Damper Unit W/Electric Actuator - ANSI N45.2.2 Level B

2.1.3 Damper W/Actuator (other than electric) -
ANSI N45.2.2 Level C.

2.1.4 Damper Unit W/other accessories - ANSI N45.2.2 Level B.

2.2 Damper units shall be stored in a manner to avoid possible physical damage such as impacts with other objects.

2.2.1 Storage facilities shall protect damper units from direct contact with dirt, dust, moisture, chemicals, and contaminants, including moisture.

2.2.2 Damper units shall not be stacked or have objects of excessive weight placed upon them where units on the bottom might be subject to crushing or deformation of any kind.

B-2

Written By: Ted Lasher

Approved by: Bob Van Becelaere

Date: 8/19/82

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2.3 Storage and storage facilities shall be subject to Ruskin Manufacturing Company's approval and are also subject to inspection by Ruskin for the purpose of verifying that the appropriate type and level of storage is being provided.

3.0 Damper Units shall be handled in such a way as to avoid dirt, dust, moisture, detrimental contaminations, or physical damage. No special handling procedures or processes are required. However, it should be pointed out that damper units with actuators and/or accessory equipment should be handled with due care necessary to avoid damage to accessory components of the damper unit assembly.

4.0 Damper Units require no special preparation before installation, however, the unit should be checked for any damage to blades, axles, linkage, and accessory equipment to assure that there is no damage causing any binding of the actuation train.

The following instruction regarding handling, extended storage prior to operation, and extended idle periods after the equipment has been in operation are provided.

<u>Equipment</u>	<u>Extended Storage Prior to Operation</u>	<u>Extended Idle Period, After Installation</u>
Control Damper w/ Electrical Components	ANSI N4.5.2.2 Level B	Cycle Minimum 10 Cycles per unit each 90 days
Control Damper w/ Actuators other than electric & no accessory equipment	ANSI 4.5.2.2 Level C	Cycle Minimum 10 Cycles per unit each 90 days
Damper Units Only	ANSI N45.2.2 Level C	Cycle Annually

For additional storage and handling information, see Produced E-515.

Maintenance shall be per maintenance schedules.

In addition to the cycling required during an extended idle period - the following actuator manufacturers recommend their equipment be cycled as follows:

ITT

SPRING RETURN ACTUATORS

Operate actuators at 15 day intervals, a minimum of 5 cycles.

PROCEDURE E-517 - INSTALLATION INSTRUCTIONS DAMPER UNITS

RUSKIN Manufacturing Company
RUSKIN® air handling specialties

ENGINEERING
PROCEDURE NO. E-517

Rev. No. 1

Date: Oct. 21, 1986

INSTALLATION INSTRUCTIONS FOR RUSKIN STANDARD DAMPERS
(EXCLUDING FIRE DAMPERS)

Page 1 of 2

1.0 PRIOR TO INSTALLATION

- 1.1 Carefully remove damper from shipping container and inspect it for damage, obstruction, rust or corrosion.
- 1.2 Care must be taken in handling damper.
 - 1.2.1 Handle damper by the frame. Use the lifting lugs, if provided. Do not lift dampers by the blade, linkage, axle or any other delicate parts.
 - 1.2.2 Do not drop, drag, crush or apply excessive force on damper.
 - 1.2.3 If damper will not be installed immediately after receiving, it must be stored and protected from dirt, dust and moisture. Damper units must not be stacked or have heavy object placed on them which may deform the frame and other parts.
- 1.3 Inspect ductwork and opening where damper will be installed for any obstructions and irregularities which may hinder installation and eventually interfere with damper operation.

2.0 INSTALLATION

- 2.1 Installation of dampers must be in accordance with standard trade practices of good workmanship.
- 2.2 Dampers must be installed with frame straight (without twisting or bending), square and free of obstructions.
- 2.3 Unless specifically designed for vertical blade application, damper must be mounted with the blade axis horizontal.
- 2.4 Use appropriate shims between damper frame and duct opening to prevent distorting the frame when the fasteners securing damper in place are tightened.
- 2.5 Damper blades, axles and linkage must operate without binding. Damper must be cycled after installation to assure proper operation.
- 2.6 Low-leakage dampers must be caulked with good-grade caulking material to prevent leakage between the damper frame and duct.
- 2.7 Backdraft dampers require the counterbalance arm set screws torqued to 100 inch-pounds after adjustment and correct positioning of counterweight.

Written by:

J. M. Bullan
10-21-86

Reviewed by:

Connie Schubert
10/22/86

Approved by:

[Signature]

Date:

10/22/86

RUSKIN Manufacturing Company
RUSKIN® *air handling specialties*

ENGINEERING
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Rev. No. 1

Date: Oct. 21, 1986

INSTALLATION INSTRUCTIONS FOR RUSKIN STANDARD DAMPERS
(EXCLUDING FIRE DAMPERS)

Page 2 of 2

2.8 Provide sufficient clearance to allow access to damper parts for maintenance and adjustments.

2.9 Multiple-section damper assemblies must have appropriate bracing at every horizontal mullion and vertical bracing every 8 feet of damper width (minimum) for strength. Higher system pressures may require more bracing.

3.0 INSTRUCTIONS FOR SPECIFIC PROJECTS

3.1 Any "approved drawings, instructions or procedures" issued by RUSKIN, the Utility (owner), or the Engineer describing installation for a specific project that may differ from the above instructions for standard dampers must be followed.

C-3

Written by:

Reviewed by:

Approved by:

Date:

PROCEDURE E-516 - OPERATION AND MAINTENANCE DAMPER UNITS

RUSKIN Manufacturing Company
RUSKIN® *air handling specialties*

ENGINEERING
PROCEDURE NO. E-516

Rev. No. 0

Date: August 19, 1982

OPERATION AND MAINTENANCE DAMPER UNITS
(Excluding Fire Damper Units).

Page 1 of 4

1.0 Control damper operation is to be in accordance with the "approved drawings, the engineer's plans and specifications, or special instructions" issued for the specific project by the Engineer or owner.

1.1 Damper operation is verified to be in accordance with the "approved drawings and the Engineer's (Owner's) plans and specifications" by Ruskin Manufacturing Company prior to shipment of the damper unit.

1.2 Damper unit operation should be checked at the time of installation prior to system on line service.

1.3 Damper unit "accessory equipment", operators, solenoids, limit switches, etc., should function in accordance with that manufacturers specifications for operation and in accordance with the "approved drawings, plans and specifications of the Engineer (Owner)".

1.3.1 Maintenance should be performed on Damper Units in accordance with the preventative maintenance schedules as determined and prescribed by the Engineer (owner).

D-2

Written By: Ted Lasher

Approved by: Bob Van Becelaere

Date: 8/19/82

RUSKIN Manufacturing Company
RUSKIN® *air handling specialties*

ENGINEERING
PROCEDURE NO. E-516

Rev. No. 0

Date: August 19, 1982

OPERATION AND MAINTENANCE DAMPER UNITS
(Excluding Fire Damper Units)

Page 2 of 4

1.3.2 Damper unit maintenance should be performed on,
but not limited to the following items:

- A. Blade Seals: Elastomeric materials
- B. Bearings
- C. Linkage Trains
- D. Accessory Equipment

1.3.3 Elastomeric blade seals should be maintained in
accordance with the following schedule:

- A. Two years from the date of manufacture, elastomeric seals must be inspected for evidence of wear and/or deterioration.
- B. After two years from the date of manufacture, elastomeric seals are to be inspected annually for evidence of wear and/or deterioration.
- C. Five years after date of manufacture, it is recommended that elastomeric seals be replaced whether or not wear and/or deterioration is evident.

1.3.4 Bearing Maintenance should be performed in accordance
with the following at minimum of a yearly interval.

All bearings must be kept clean; free of dirt,
dust, or foreign material accumulations.

D-3

Written by: Ted Lasher

Approved by: Bob Van Becelaere

Date: 8/19/82

RUSKIN Manufacturing Company
RUSKIN® air handling specialties

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OPERATION AND MAINTENANCE DAMPER UNITS
(Excluding Fire Damper Units)

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- A. Synthetic material bearings such as Rulon etc. should require no maintenance other than inspection for any undue wear. DO NOT OIL.
- B. Stainless steel and Bronzoil Type sleeve bearings should be inspected for any evidence of undue wear, and oiled with a light machine oil.
- C. Bearings with grease fittings should be inspected for evidence of undue wear; the plug removed; greased until new grease is evidenced emitting from the plug hole; plug replaced.

CAUTION: DO NOT OVER-GREASE BEARINGS.

- D. Bearings with packing glands should be inspected for any evidence of undue wear, maintained in accordance with the type of bearings, and the packing should be inspected for deterioration.

1.3.5 Linkage trains should be inspected for secureness, smooth operation of damper unit, and for evidence of any undue wear or deterioration. Linkage components are to be oiled with a light machine oil at pivot points. Linkage trains must be kept clean from dirt and dust accumulation.

RUSKIN Manufacturing Company
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OPERATION AND MAINTENANCE DAMPER UNITS
(Excluding Fire Damper Units)

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1.3.6 Accessory equipment such as operators, limit switches, solenoids, air sets, etc., are to be maintained in accordance with the individual manufacturers recommended maintenance schedules and/or in accordance with the Engineer's (owner's) preventative maintenance schedules.

MAINTENANCE SCHEDULES

MAINTENANCE SCHEDULE

CD-50 TUNNEL DAMPERS

ITEM	MAINTENANCE INTERVAL	REPLACEMENT INTERVAL (MAX)	REQUIRED MAINTENANCE	REPLACEMENT PARTS
Tie-Bar Linkage	Annually	N/A	Lubricate with Preservative oil	N/A
Bearings	Annually	N/A	Lubricate with Preservative oil	N/A
Fasteners	Annually	N/A	Check for Tightness of Fasteners	N/A

NOTE:

1. When dampers are installed where they will be exposed to heavy dust laden air, occasional flushing of bearings with water is recommended for extended bearing life.
2. When equipped with pneumatic or electric actuator the manufacturers recommend maintenance procedure should be observed.

RECOMMENDED SPARE PARTS LIST

RECOMMENDED SPARE PARTS LIST FOR:

MODEL SPECIAL CD-50

PART DESCRIPTION	DRAWING NUMBER	IBM NUMBER	RECOMMENDED 1 YEAR	QUANTITIES 5 YEAR
Shoulder Bolt 3/8" Dia X5/8" LG S.S.	N/A	N/A	5 each	10 each
3/8" Dia X1" LG S.S.	N/A	N/A	5 each	10 each
Truarc Ring	N/A	N/A	75 each	375 each

Recommended quantities listed are for all dampers in this category. Items listed above may be purchased as required from Ruskin. Prices are available upon request.

OPERATOR REMOVAL AND REPLACEMENT PROCEDURE

- I. For dampers with direct coupled operators:
 - A. Refer to Dwgs. 0562-001 thru 0562-011 for details:
 1. Disconnect the power from the operator.
 2. Drive groove pins from couplings and slide coupling back off of operator stems.
 3. Remove (8) bolts attaching operator to the operator bracket. (3/8 - 16 X 1 1/4 LG Bolt)
Pull operator towards you from operator bracket.
 4. To replace operator, reverse steps 1 thru 3.
- II. Tools required:
 - A. For groove pins:
 1. Hammer
 2. 3/16" diameter punch.
 - B. For bolts holding operator to bracket:
 1. 9/16" box end wrench or crescent wrench.

DAMPER REMOVAL AND REPLACEMENT PROCEDURE

1. Remove operator per operator removal instructions (if req'd).

2. Remove jackshaft and jackshaft linkage.

3. Unbolt and remove one section at a time.

(NOTE: Individual damper sections cannot be disassembled)

5. To replace dampers, follow the steps 1 thru 4 in reverse order.

6. Tools required:

A. For jackshaft.

1. Set screw in collars: small crescent wrench.

2. Groove pins: hammer and 3/16" dia. punch.

3. Shoulder bolts: 7/16" box end wrench or small crescent wrench and 3/16" hex allen wrench.

B. For damper section/companion flanges.

1. 3/4" box end or crescent wrench.

1. Motor Operated Outside Air Damper Schedule

Air Handling Unit Served	Station Served	Station I.D. Number	Flow Rate (CFM)	Damper Size (In.) W x H	Min. Torque Requirement (in Lbs.)
<u>CC A147</u>					
AHU-021	Civic Center	MD-3	37,500	138 x 66	1850
AHU-022		MD-4	37,500	138 x 66	1850
AHU-023		MD-22	37,500	138 x 66	1850
AHU-024		MD-23	37,500	138 x 66	1850
<u>CC A157</u>					
AHU-031	5th & Hill	MD-7	37,500	138 x 66	1850
AHU-032		MD-8	37,500	138 x 66	1850
AHU-033		MD-22	37,500	138 x 66	1850
AHU-034		MD-15	37,500	138 x 66	1850
<u>CC A167</u>					
AHU-041	7th & Flower	MD-1	37,500	138 x 66	1850
AHU-042		MD-2	37,500	138 x 66	1850
AHU-043		MD-3	37,500	138 x 66	1850
AHU-044		MD-4	37,500	138 x 66	1850
<u>CC A187</u>					
AHU-051	Wilshire/Alvarado	MD-7	37,500	138 x 66	1850
AHU-052		MD-8	37,500	138 x 66	1850
AHU-061	Optional equipment for	---	37,500	138 x 66	1850
AHU-062	future station beyond	---	37,500	138 x 66	1850
AHU-063	MOS-1	---	37,500	138 x 66	1850
AHU-064		---	37,500	138 x 66	1850
AHU-071	Optional equipment for	---	37,500	138 x 66	1850
AHU-072	future station beyond	---	37,500	138 x 66	1850
AHU-073	MOS-1	---	37,500	138 x 66	1850
AHU-074		---	37,500	138 x 66	1850
AHU-081	Optional equipment for	---	37,500	138 x 66	1850
AHU-082	future station beyond	---	37,500	138 x 66	1850
AHU-083	MOS-1	---	37,500	138 x 66	1850
AHU-084		---	37,500	138 x 66	1850

Note: CC = Construction Contract.

2. Motor Operated Combination Fire/Smoke Outside Air Damper Schedule

Air Handling Unit Served	Station Served	Station I.D. Number	Flow Rate (CFM)	Damper Size (In.) W x H	Min. Torque Requirement (in Lbs.)
<u>CC A136</u>					
AHU-011	Union Station	FSD-014	37,500	138 x 66	1850
AHU-012		FSD-015	37,500	138 x 66	1850
AHU-013		FSD-016	37,500	138 x 66	1850
AHU-014		FSD-017	37,500	138 x 66	1850
<u>CC A187</u>					
AHU-053	Wilshire/Alvarado	MD-9	37,500	120 x 92	1850
AHU-054		MD-10	37,500	120 x 92	1850

3. Traction Power Substation Motor Operated Outlet Damper Schedule

Air Handling Unit Served	Station Served	Station I.D. Number	Flow Rate (CFM)	Damper Size (In.) W x H	Min. Torque Requirement (in Lbs.)
<u>CC A130</u>					
SSF-011	South East of Union Station	MD-9	35,000	44 x 56	600
SSF-012		MD-10	35,000	44 x 56	600
<u>CC A147</u>					
SSF-021	Civic Center	MD-19	35,000	76 x 60	600
SSF-022		MD-20	35,000	76 x 60	600
<u>CC A157</u>					
SSF-031	5th & Hill	MD-28	18,200	52 x 38	600
SSF-032		MD-29	18,200	52 x 38	600
<u>CC A167</u>					
SSF-041	7th & Flower	MD-5	35,000	96 x 48	600
SSF-042		MD-6	35,000	96 x 48	600
<u>CC A187</u>					
SSF-051	Wilshire/Alvarado	MD-1	35,000	52 x 60	600
SSF-052		MD-2	35,000	52 x 60	600
SSF-061	Optional equipment for future station beyond MOS-1	---	35,000	76 x 60	600
SSF-062		---	35,000	76 x 60	600
SSF-071	Optional equipment for future station beyond MOS-1	---	35,000	76 x 60	600
SSF-072		---	35,000	76 x 60	600
SSF-081	Optional equipment for future station beyond MOS-1	---	35,000	76 x 60	600
SSF-082		---	35,000	76 x 60	600

EHR 202/220 Electrohydraulic Rotary Actuators

Self-contained EHR 202-220 Rotary Actuators provide a positive, hard-positioning, 1/4-turn (90°) power stroke to operate valves, dampers, and other rotary devices requiring 200 to 2,000 lb-in. torque.

Upon power interruption, encased fail-safe springs return the output shaft to its de-energized position, or the actuator can be equipped to "lock" in its last position.

The direction of rotation is easily changed by simply inverting the actuator. Each unit is factory equipped with a position indicator (1° rotation) and an adjustable auxiliary switch. The pump/motor unit is completely immersed in oil to minimize maintenance.

Options: *Electronic Position Controller, Manual Override, Adjustable Rotation Speed, Auxiliary Switches* (maximum 2). *Enclosures:* watertight (NEMA 4), explosion-proof/watertight (NEMA 4 & 7 — Class 1, Group D), and epoxy finish.

OPERATION

A twin cylinder pump/motor unit supplies high pressure hydraulic fluid to drive the piston. The connecting rod transmits linear piston displacement to rotate the output shaft. The degree of rotation may be adjusted by the travel limit switch. Rotation is mechanically controlled by adjustable travel limit stops.

Power interruption causes the standard, *normally open* solenoid dump valve to open, relieving hydraulic pressure and allowing automatic spring return. A *normally closed* dump valve option locks the actuator shaft in its last position at the moment of power interruption.

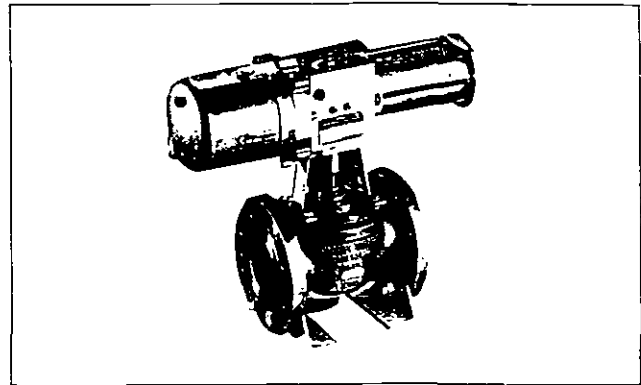


Figure 1. EHR Rotary Actuator with valve (EHR 205 shown)

EHR MODEL	TORQUE* (lb-in.)		STROKE TIME** (SECONDS)		WATTS
	RATED	PEAK	POWER	RETURN	
202	200	370	22	7	240
203	350	645	22	7	240
205	500	925	22	7	240
206	600	1110	22	7	240
208	800	1480	22	7	270
213	1300	2400	22	7	270
220	2000	3700	22	7	270

*The actuator will provide the rated torque at the ends of the spring return and hydraulic power strokes. The torque at the beginning of each stroke may be up to 50% greater than the rated torque. The peak torque may be up to 85% greater than the rated torque. The actual net output torque in the hydraulic power stroke direction will be equal to the resistive torque of the device being operated by the actuator.

**Power stroke times shown are approximate for 60 Hz operation against the rated torque. For 50 Hz operation, increase power stroke times by up to 20%.

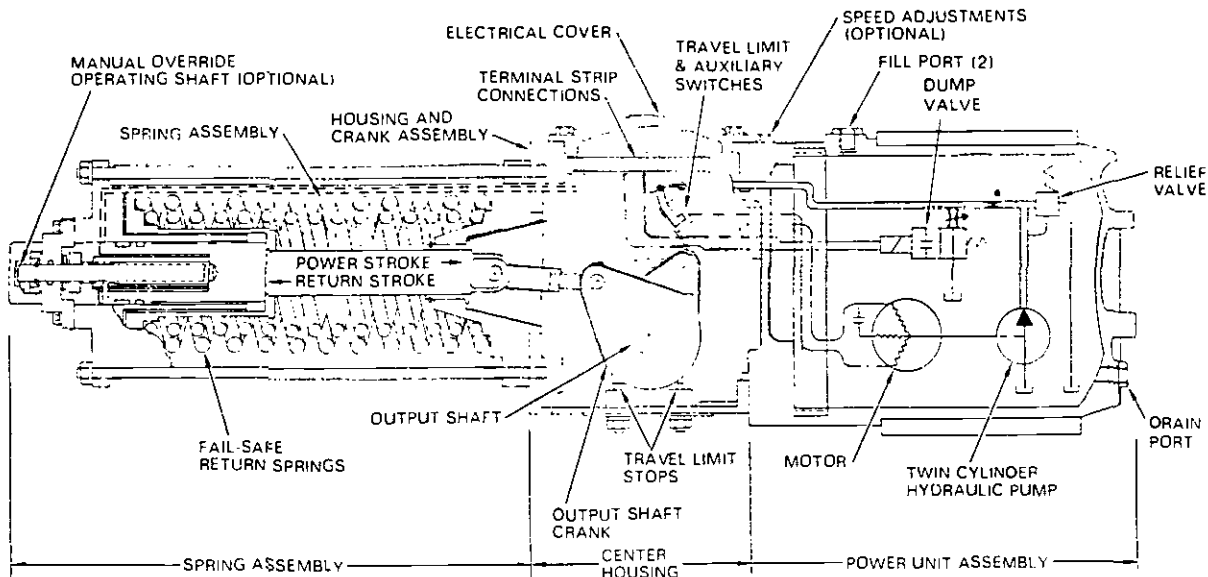


Figure 2. EHR Cross Section

⚠ WARNING ⚠

Hazardous voltage/hydraulic power/preloaded springs. To prevent personal injury, death, and/or property damage:

Turn off electrical power before installing or servicing actuator.

Actuator should only be installed or serviced by a trained and experienced technician.

Do not attempt to disassemble the return spring cannister. Spring assembly is not field serviceable. Contact factory for replacement.

ACTUATORS USED IN AREAS WHERE DUST AND CORROSIVE OR EXPLOSIVE ELEMENTS ARE PRESENT MUST BE EQUIPPED WITH APPROPRIATE ENCLOSURES.

CHECK ACTUATOR NAMEPLATE AND VERIFY THAT UNIT IS CORRECT FOR THE APPLICATION.

INSTALL ONLY WHERE AMBIENT TEMPERATURES REMAIN BETWEEN -40 AND 150 °F (-40 TO 66 °C).

INSTALLATION

Weight: EHR 202-206 52 lb.
EHR 208-220 89 lb.

The actuator must be properly oriented to provide hydraulic oil at the pump inlet (Figure 3).

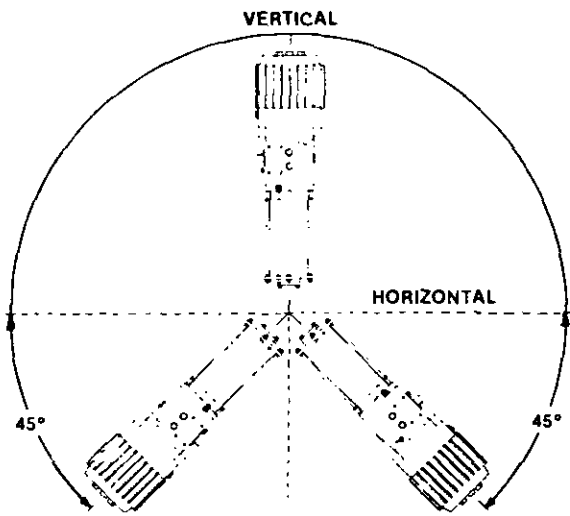


Figure 3. Mounting Positions

(Unit may be rotated around its longitudinal axis.)

EHR actuators have two output shafts. To reverse the direction of rotation, simply invert the EHR unit and remount the position indicator and electronic position controller.

Secure actuator to valve or other device. Couple actuator shaft to valve with appropriate mounting hardware, referring to manufacturer's instructions and Figure 6. Torque 4 mounting bolts to 14 lb-ft.

WIRING

ELECTRICAL WIRING MUST COMPLY WITH ALL NATIONAL AND LOCAL REGULATIONS GOVERNING THE EQUIPMENT AND APPLICATION.

IF ACTUATOR IS EQUIPPED WITH A POSITIONER, REFER TO "SDI POSITIONER" FOR WIRING INSTRUCTIONS.

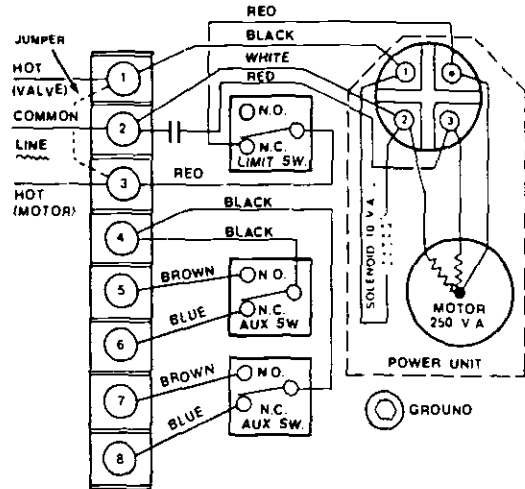


Figure 4. Wiring --EHR 202-206 Without Positioner

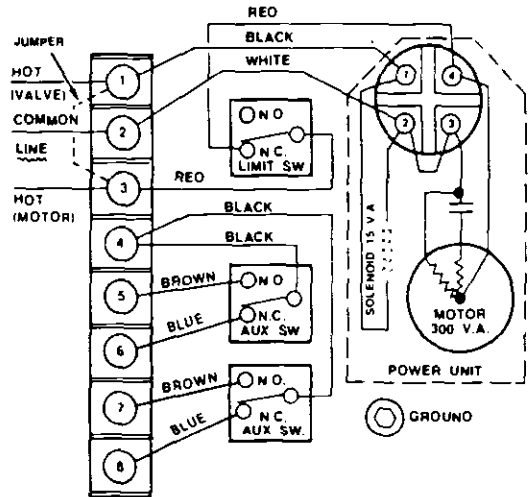


Figure 5. Wiring -- EHR 208-220 Without Positioner

1. Turn off power supplies to actuator. Remove the electrical cover and O-ring to gain access to the terminal strip (Figure 2). Note wiring diagram inside cover.
2. Install appropriate fittings and route external power and control wiring through the 3/4" NPT conduit opening (Figure 6).
3. Connect ground wire to green terminal.

LIMIT CONTROLS MUST CONFORM TO ACTUATOR RATING (VOLTAGE, CYCLES, VA). WIRE LIMIT CONTROLS INTO THE HOT SIDE OF THE CIRCUIT.

INSURE THAT ALL WIRING CONNECTIONS ARE CLEAN AND TIGHT, AND THAT WIRING IS ROUTED PROPERLY.

4. Connect the power wiring to terminals 3 (HOT) and 2 (COMMON) (Figure 4 or 5).
5. On standard models a jumper between terminals 1 and 3 provides a common power supply to both motor and dump valve, allowing spring return upon power interruption.
Lock-in-last-position models only: Connect the independent, external power lead controlling the return stroke dump valve to terminals 1 (HOT) and 2 (COMMON). Note that lock-in-last versions have no jumper.
6. Connect the external auxiliary switch HOT wire to terminal 4. To provide normally open (N.O.) auxiliary circuit(s) use terminals 5 and/or 7. For normally closed (N.C.) circuits, use terminals 6 and/or 8.

Each auxiliary switch is rated to 15 amps @ 125 VAC. Total connected load to the power unit and auxiliary switches must not exceed 2000 VA.

7. Replace the electrical cover with O-ring, and secure with four screws.
8. Operate system through 5 complete cycles to purge hydraulic circuits to purge hydraulic circuits of air and to verify proper operation. Test all functions.

Travel Limit and Auxiliary Switch(es)

A travel limit switch interrupts power to stop rotation. The travel limit and auxiliary switch(es) are independently field adjustable.

1. De-energize all power supplies. Remove electrical cover (Figure 2).
2. Loosen each switch setscrew and slide the switch along its bracket to the desired position. Tighten setscrew to 1-1/2 lb-in.
3. Cycle the actuator to check calibration and repeat step 2 as required. Verify that the travel limit switch interrupts the motor circuit to stop rotation before the output shaft crank reaches the travel limit stop. Replace electrical cover.

Travel Limit Stops

The two travel limit stops are factory set at 0° and 90°, but can each be field adjusted up to 5° above or below these settings.

1. Power the actuator or use the manual override to move the output shaft crank away from the travel limit stop to be adjusted (Figure 2).
2. Remove the threaded cap and turn the adjustment screw no more than one turn at a time, clockwise to decrease or counter-clockwise to increase the stroke.
3. Power the actuator or use the manual override to move the output shaft crank back until it touches the adjusted

travel limit stop. Check the output shaft position. Repeat steps 1 and 2 as required to complete the adjustment.

4. Readjust the travel limit switch as required. Be sure the switch actuates to *interrupt the motor circuit before the actuator reaches the travel limit stop*

Power and Return Stroke Speed

Two field adjustable needle valves are available as an option or kit to control the power and return stroke speeds (Figure 2). The valves are factory-set to provide the fastest possible stroke.

1. Install and wire the actuator as instructed above. Apply the normal operating load to the valve or PCD. Operate actuator to check timing.
2. Remove the threaded seal plugs and O-rings to expose the power and return stroke needle valves (Figure 2).
3. Turn the needle valve clockwise to decrease or counter-clockwise to increase stroke speed.
4. Cycle the actuator to check stroke speed and readjust as required. If hydraulic oil leaks past the needle valve, turn the valve clockwise several turns, then readjust.
5. Re-install seal plugs with O-rings.

MANUAL OVERRIDE

The optional manual override (Figure 2) is factory set to the de-energized (zero) position. To manually position the output shaft, remove the manual override cover and use a 3/8" wrench to rotate the operating shaft counter-clockwise. Turn the shaft clockwise to return the output shaft to its original position. Adjust the manual override fully clockwise before operating the actuator.

SERVICE

EHR actuators are durable and require little maintenance. However, regular maintenance inspections are recommended, based upon the environment and frequency of use. Maintenance procedures are detailed in the EHR manual (M-EHR).

ORDERING INFORMATION

To order replacement or spare parts, specify:

- Kit number and name (Figure 2), and
- Actuator catalog and serial numbers (shown on actuator nameplate)

The following kits are available for field repair or retrofit. (The specific kit variation will be determined by your actuator catalog number.)

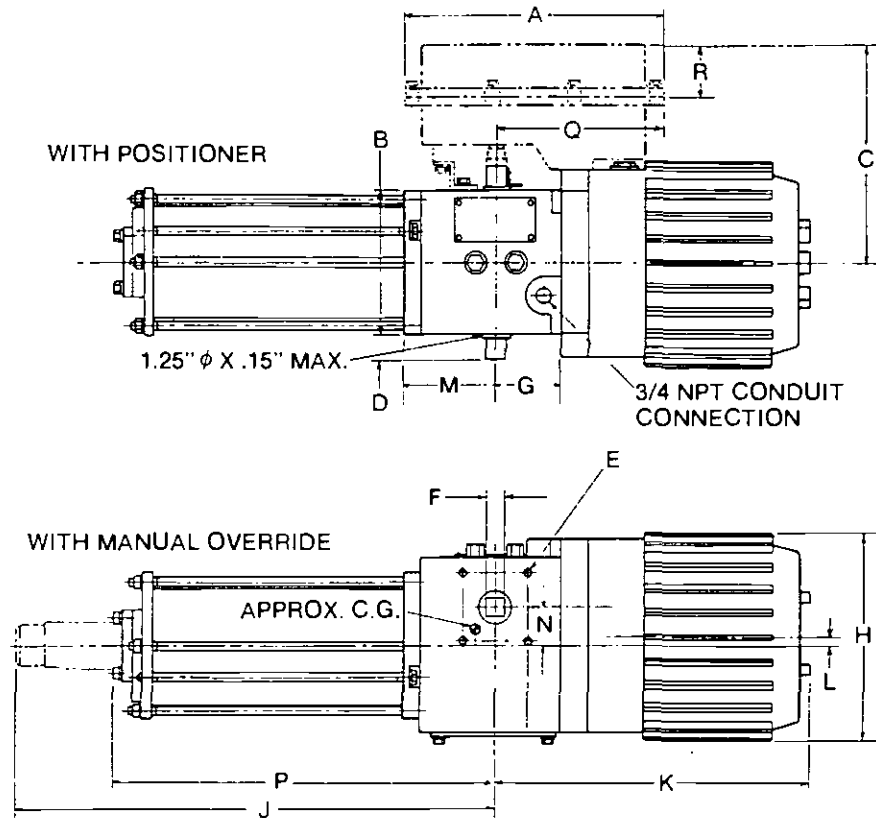
Manual Override	S109712
Electronic Positioner	S109824
Adjustable Speed	S109717A
Auxiliary Switch	S109728
Power Unit	S109716
Actuator Mechanism	S109715
Oil Kit	S156202A
Seals	S109731

OTHER AVAILABLE DOCUMENTS

TDS EHR 202-220: Specifications and performance data for single cylinder units providing 200 to 2,000 in.-lb. torque. TDS EHR 228-240: Specifications and performance data for double cylinder units providing 2,800 to 4,000

in.-lb. torque. SDI EHR P: Installation, calibration and operation of optional electronic position controller. M EHR: Maintenance manual — repair, modification and troubleshooting.

NOMINAL DIMENSIONS



Inches (millimeters)

Model	A	B	C	D ②	E	F ②	G	H
202-206	11.37 (289)	6.23 (158)	10.63 (270)	1.00 (25)	①	.62 (16)	3.00 (76)	7.25 (184)
208-220	11.37 (289)	6.50 (165)	10.88 (276)	1.03 (26)		.87 (22)	3.00 (76)	9.00 (229)

J	K	L	M	N	P	Q	R
15.79 (401)	12.32 (313)	.75 (19)	3.75 (95)	1.50 (38)	14.55 (370)	5.80 (147)	3.50 (89)
21.38 (543)	14.00 (356)	0	4.40 (112)	1.75 (44)	17.63 (448)	5.80 (147)	3.50 (89)

① Dimension "E" — 4 tapped holes (both top and bottom)
Unit may be mounted either way, depending on desired rotation direction.

EHR 202-206 5/16-18 UNC-3B x .63 deep, on a 2.25" (57mm) square.

EHR 208-220 3/8-16 UNC-3B x .76 deep, on a 3.00" (76mm) square.

② Square, ± .005", shaft dimensions identical, both ends.

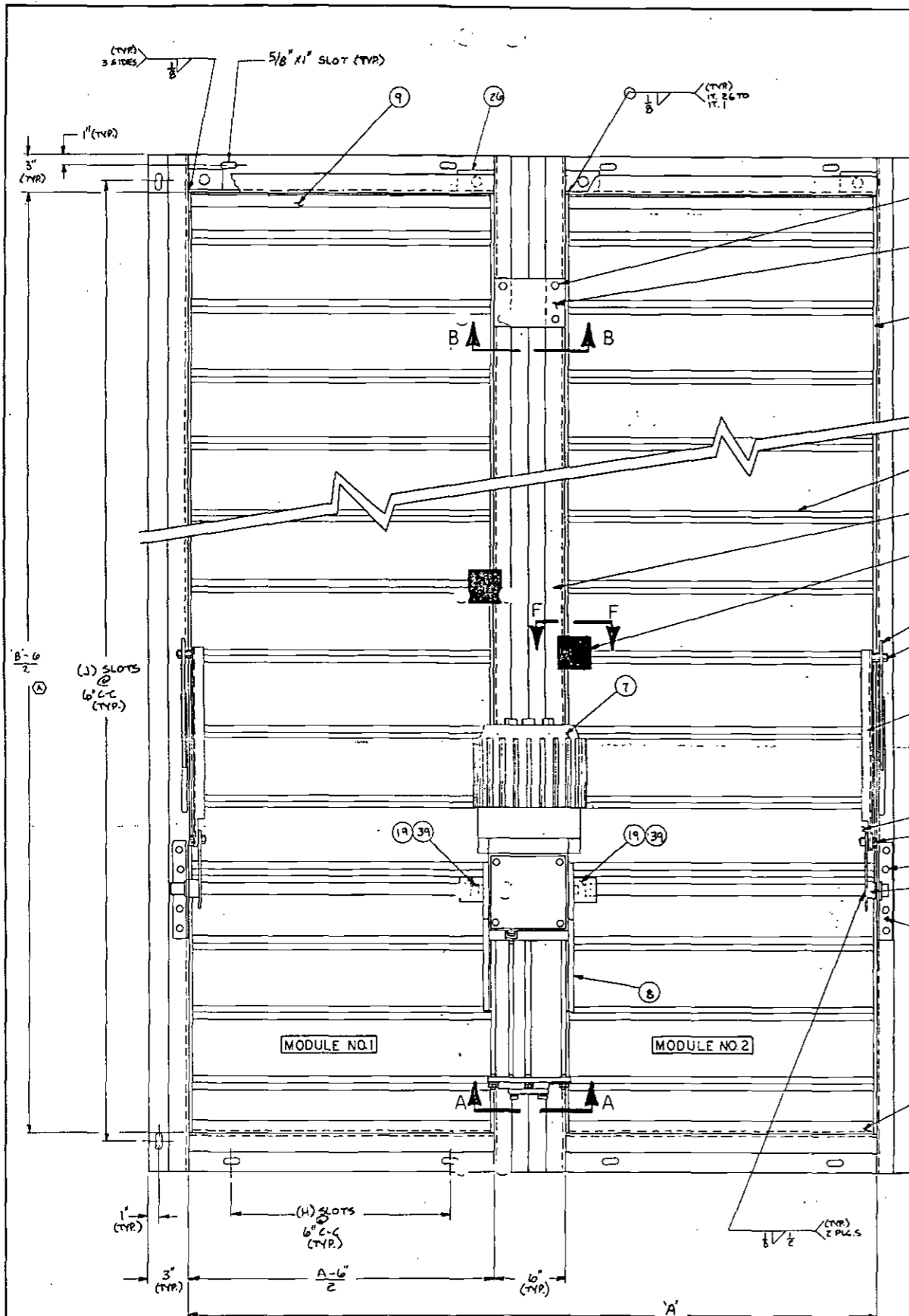
Figure 6. Dimensions



Barton

ITT Fluid Technology Corporation

900 S. Turnbull Canyon Road
City of Industry, CA 91749-1882
Tele. (818) 961-2547 Telex: 67-7475

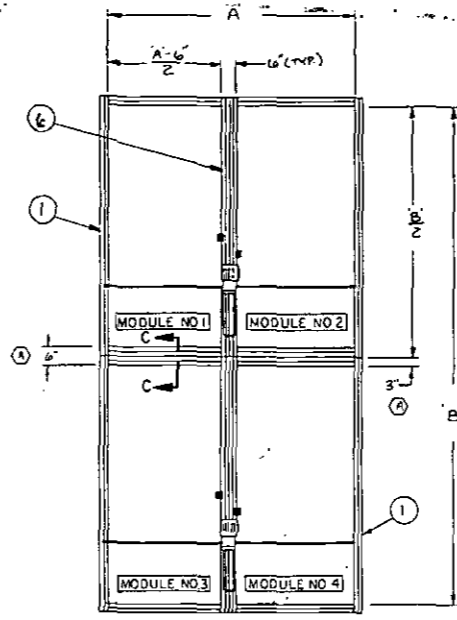


FACE VIEW
 SHOW IN FAIL OPEN FOR FAIL CLOSED OPERATION
 ROTATE OPERATOR 180° ABOUT ITS VERTICAL AXIS.
CONFIGURATION 2x1

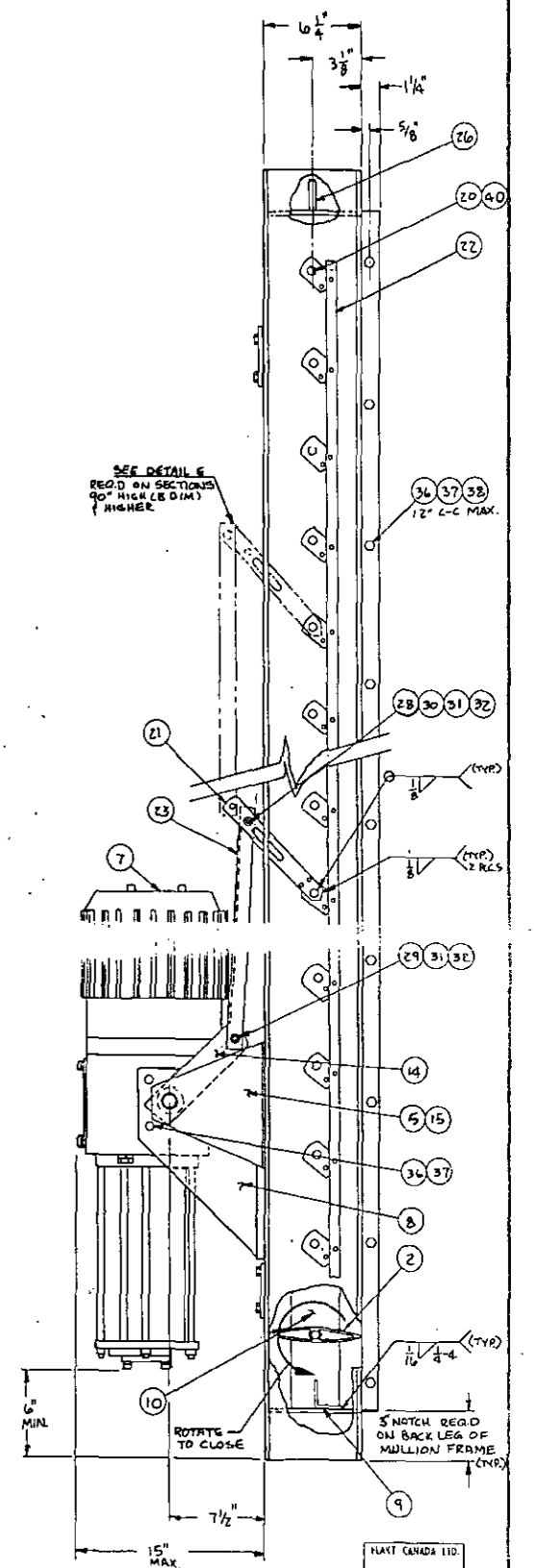
NOTES:

1. SEE DWG. 0562-009 FOR BILL OF MATERIALS & SECTIONS AND DETAILS.
2. SEE DWG. 0562-011 FOR DAMPER SCHEDULE.
3. EACH SECTION TO BE MARKED WITH STENCILS ON JAMB & MULLION FRAMES FOR IDENTIFICATION IN FIELD.
4. MODULES 1 & 3 TO HAVE LINKAGE ON LEFT SIDE, MODULES 2 & 4 TO HAVE LINKAGE ON RIGHT SIDE.

UNLESS OTHERWISE SPECIFIED USE
 STANDARD ENGINEERING TOLERANCES



CONFIGURATION 2x2



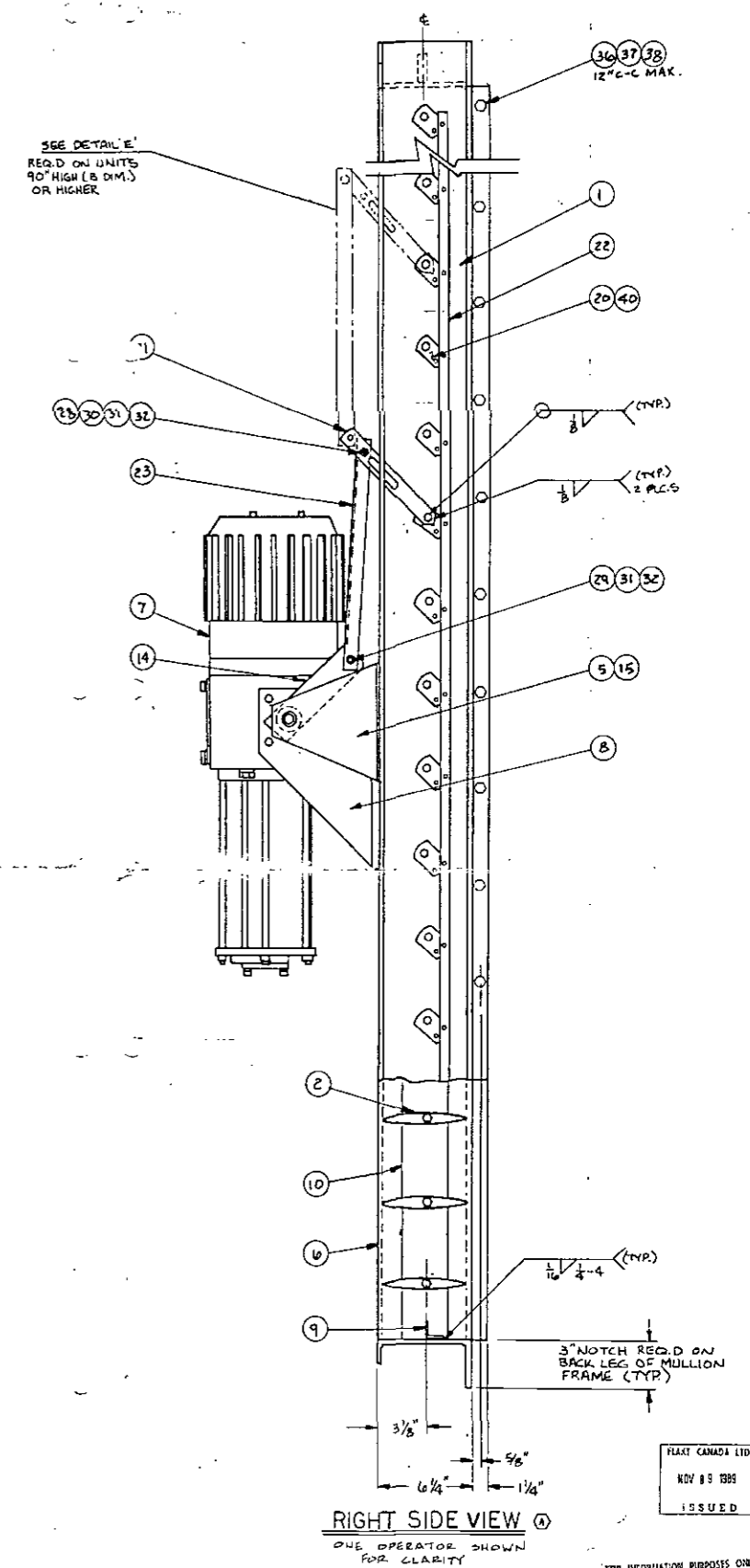
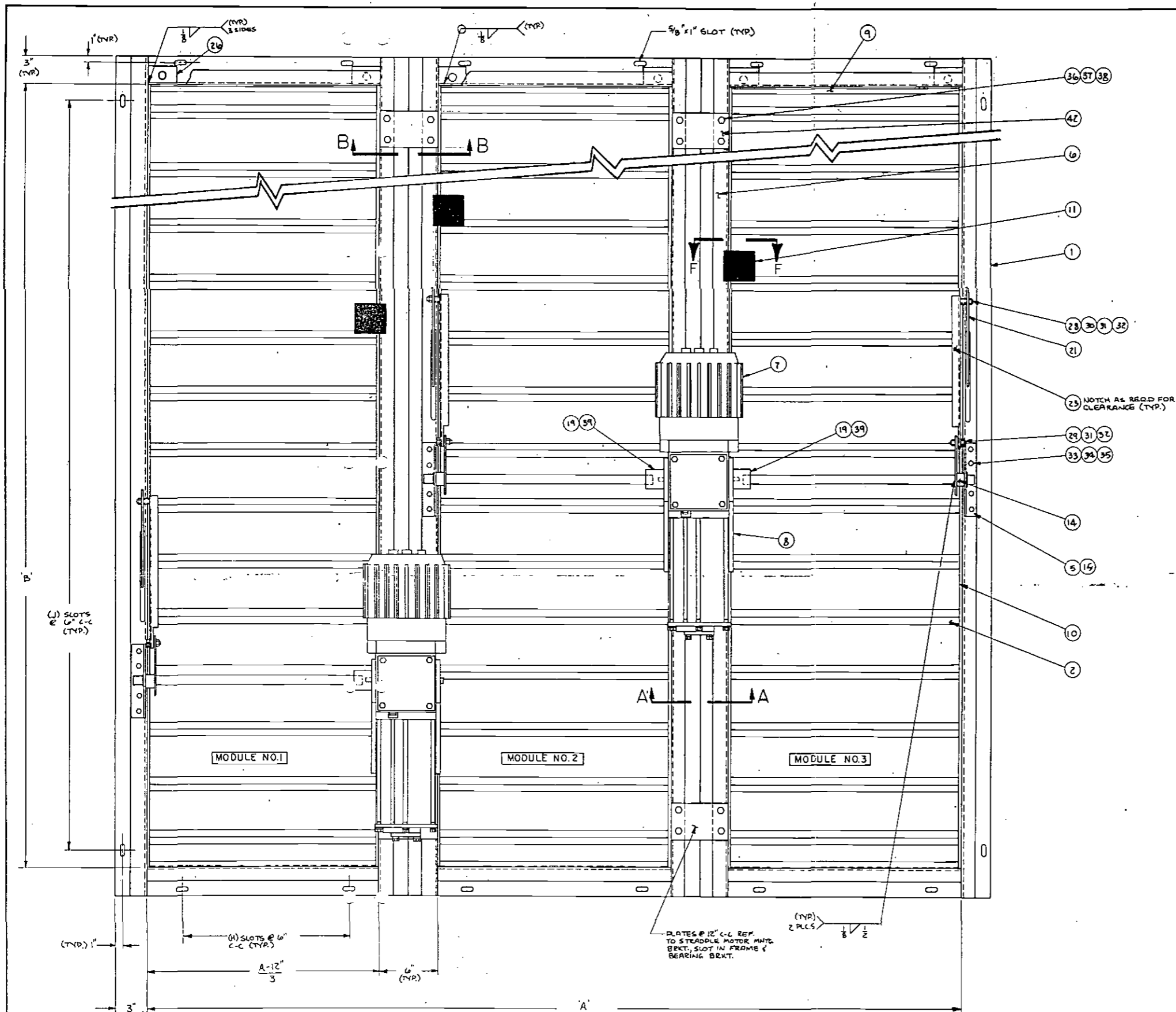
RIGHT SIDE VIEW

FOR INFORMATION PURPOSES ONLY
 SEE IT TO BE USED FOR CONSTRUCTION

CHANGE LETTER	REVISION DESCRIPTION	OWN BY	APP'D.	DATE
(A)	RWD PER CUSTOMER COMMENTS			

DATE	DRW BY	CHKD BY	APP'D BY	DATE	DATE	DATE	DATE	DATE
3-23-89				4-6-89	4-4-89			

RUSKIN <small>DIVISION OF HALL'S INDUSTRIES, CORPORATION</small> <small>PO BOX 129 GRANDVIEW, MO 64030</small>	SCALE NONE	ISSUE NONE
TITLE VERTICAL SUBWAY DAMPER	DWG NO. 0562-001	



- FACE VIEW**
 SHOWN FAIL-OPEN FOR FAIL-CLOSED OPERATION
 ROTATE OPERATOR 180° ABOUT ITS VERTICAL AXIS.
- CONFIGURATION 3x1**
- NOTES:**
- SEE DWG. 0562-009 FOR BILL OF MAT'L'S & SECTIONS & DETAILS. SEE DWG. 0562-011 FOR DAMPER SCHEDULE.
 - EACH SECTION TO BE MARKED WITH STENCILS ON JAMB & MULLION FRAME FOR IDENTIFICATION IN FIELD.
 - MODULE NO. 1 TO HAVE LINKAGE ON LEFT SIDE. MODULES NO. 2 & 3 TO HAVE LINKAGE ON RIGHT SIDE.

SEE DETAIL 'E'
 REQ'D ON UNITS
 90" HIGH (B. DIM.)
 OR HIGHER.

PLATES @ 12" C-C REF.
 TO STEADY MOTOR MNTD.
 BRKT. SLOT IN FRAME &
 BEARING BRKT.

3" NOTCH REQ'D ON
 BACK LEG OF MULLION
 FRAME (TYP.)

RIGHT SIDE VIEW (A)
 ONE OPERATOR SHOWN
 FOR CLARITY

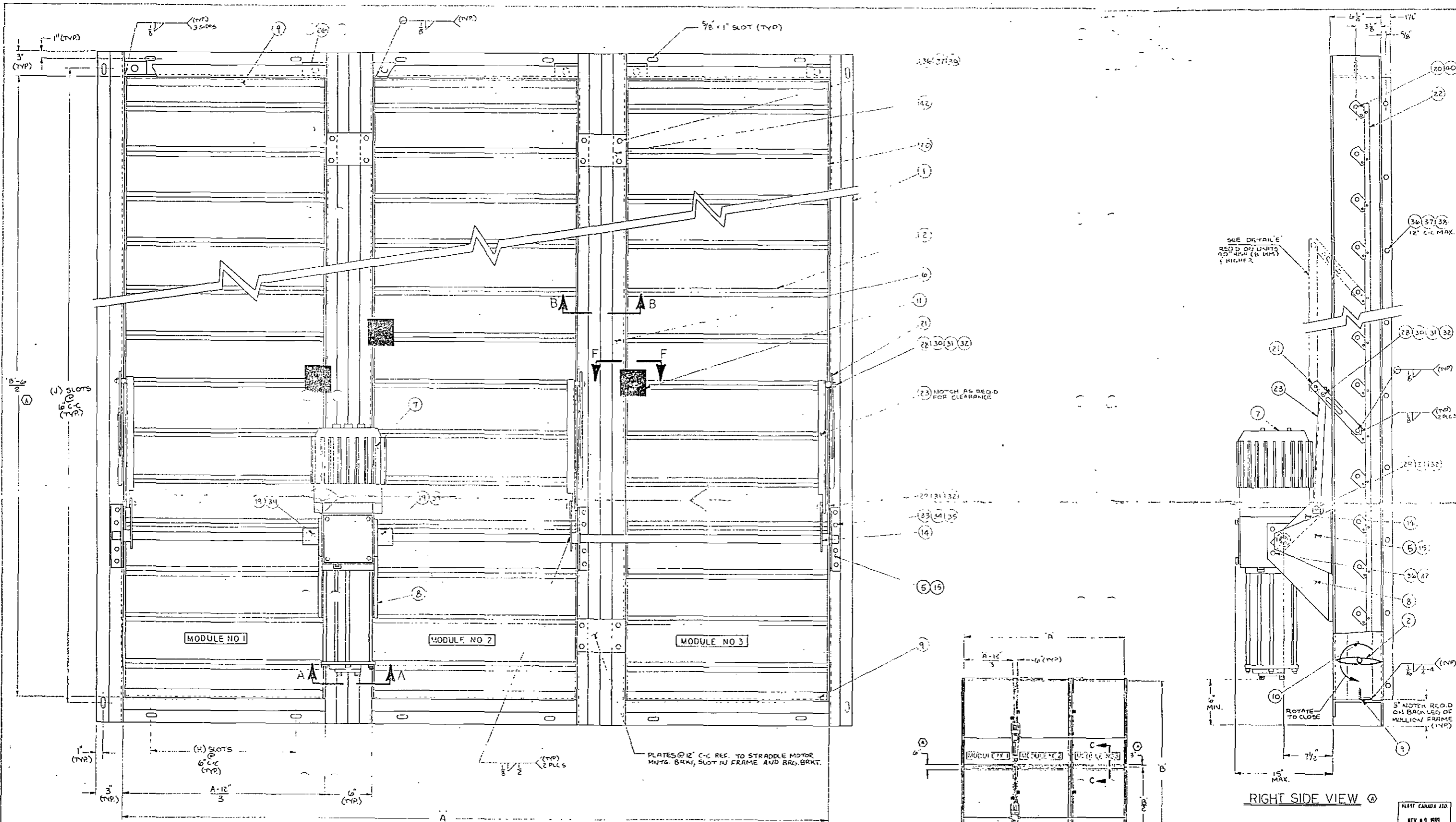
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UNLESS OTHERWISE SPECIFIED USE
 STANDARD ENGINEERING TOLERANCES

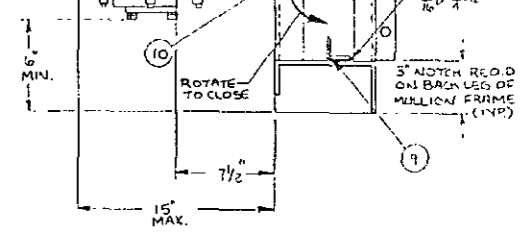
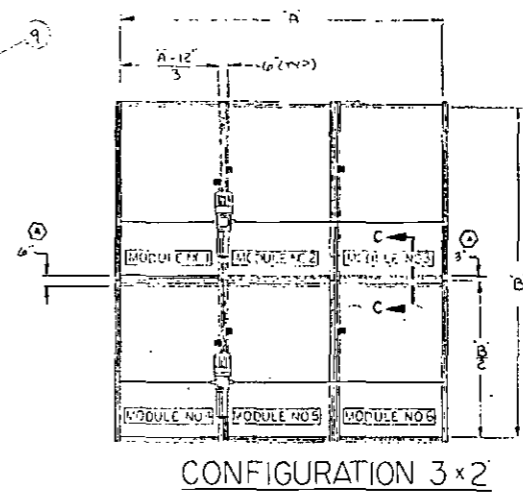
CHANGE LETTER	REVISION DESCRIPTION	OWN BY	APP'D BY	DATE
(A)	REMOVED BLADE SEALS PER CUSTOMER REQUEST	DDH	[Signature]	11/10/88

DWG. NO. 0562-002 DATE 3-23-88 L.A. SUBWAY CONTRACT SPEC. NO. A740 RUSKIN PROJ. NO. 0562	CKD BY: PTL DATE: 4-4-88 APPROV'D BY: [Signature] DATE: 4-4-88	RUSKIN DIVISION OF HALLS MARKS & COMPANY INC. P.O. BOX 129 GRANDVIEW, MO 64530	SCALE: NONE ISSUE: 0562-002
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FACE VIEW
 SHOWN FAIL-OPEN FOR FAIL-CLOSED POSITION
 ROTATE OPERATOR 180° ABOUT ITS VERTICAL AXIS

- NOTES:**
1. USE DWG. 0562-009 FOR ALL OF MAT'L & SECTIONS AND DETAILS.
 2. SEE DWG. 0562-011 FOR DAMPER SCHEDULE.
 3. EACH SECTION TO BE MARKED WITH STENCILS ON JAMB & MULLION FRAMES FOR IDENTIFICATION IN FIELD.
 4. MODULES 1 & 4 TO HAVE LINKAGE ON LEFT SIDE.
 MODULES 2, 3, 5, 6 TO HAVE LINKAGE ON RIGHT SIDE.



RIGHT SIDE VIEW

UNLESS OTHERWISE SPECIFIED USE
 STANDARD ENGINEERING TOLERANCES

DATE	BY	DATE	BY	DATE	BY
3-23-88	PTB	4-4-88	PTB	4-4-88	PTB

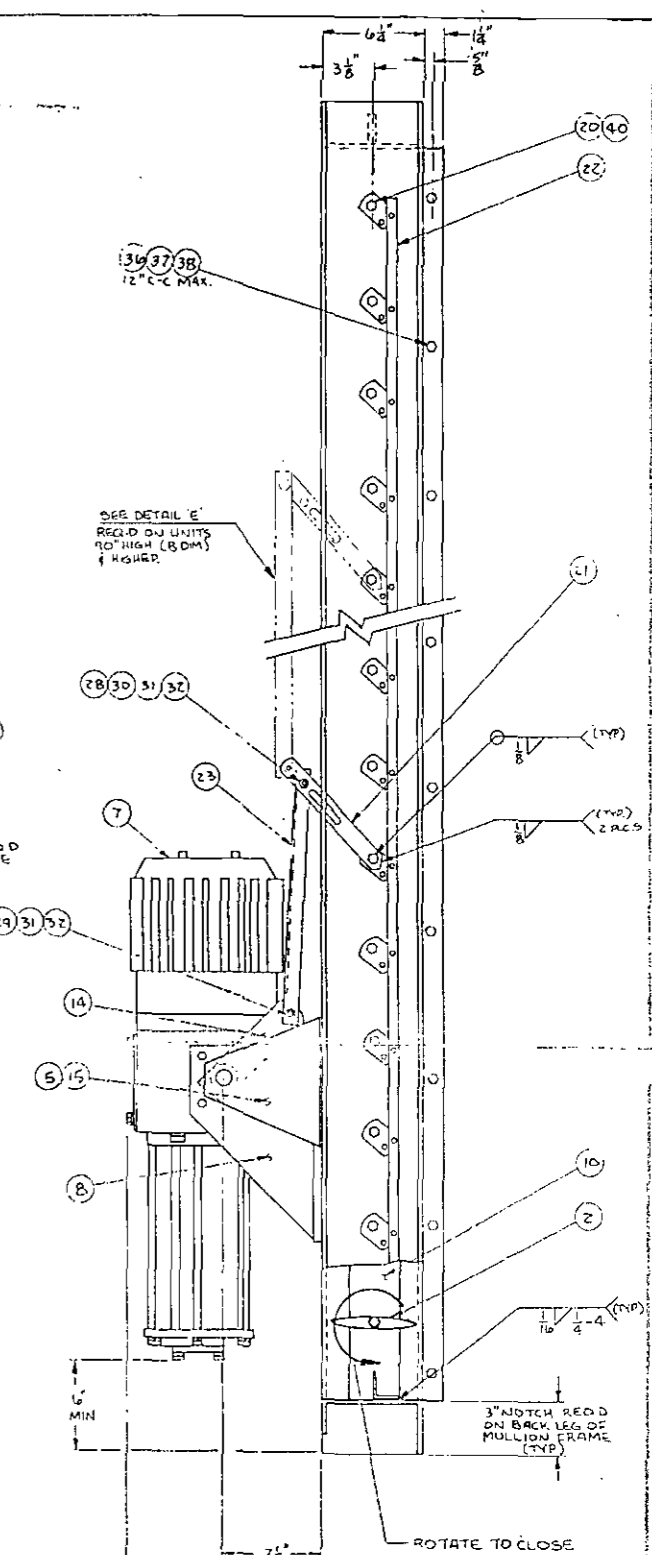
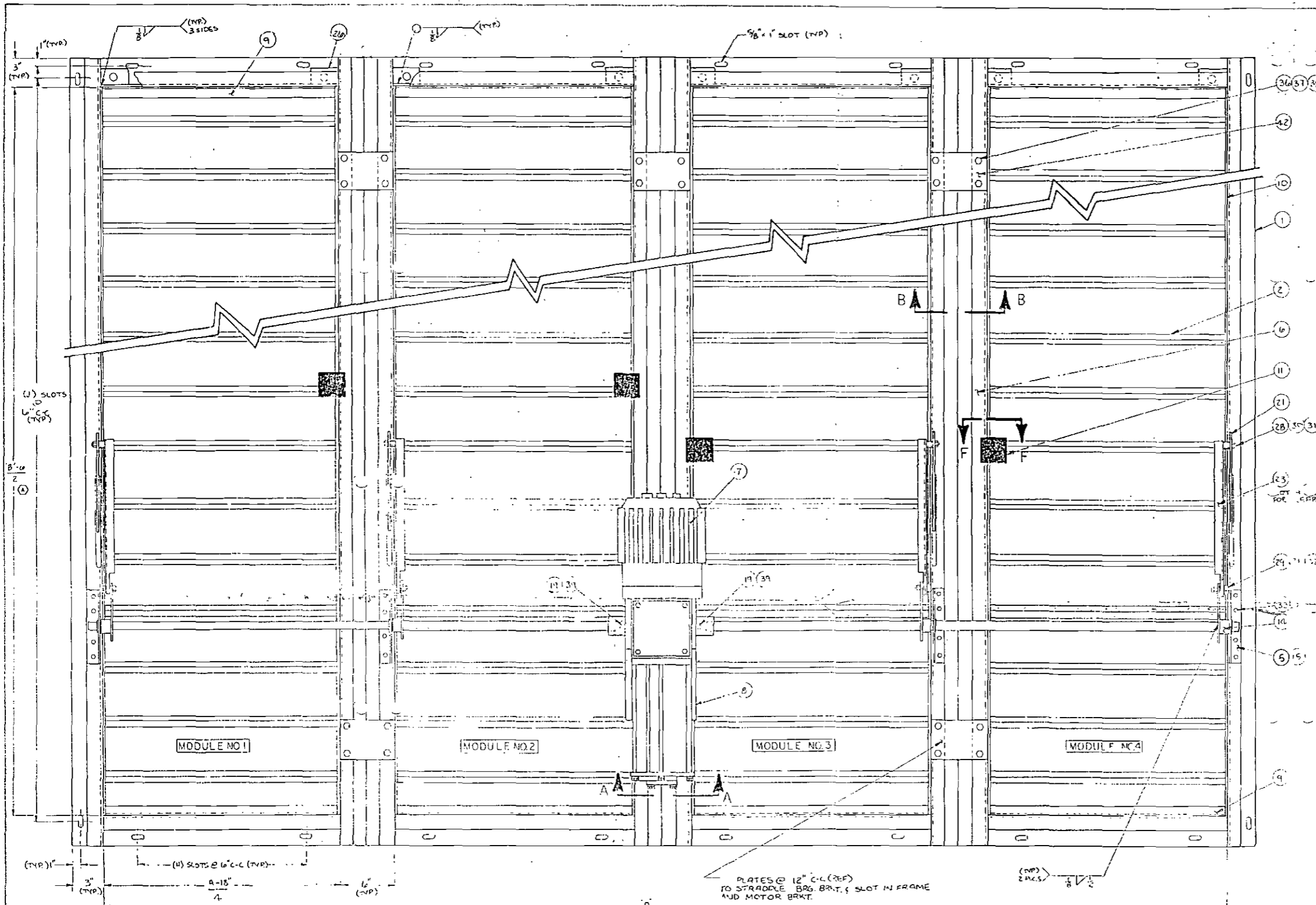
CHANGE LETTER	REVISION DESCRIPTION	DATE	BY	APP'D	DATE
A	REMOVED BLADE SEALS PER CUSTOMER REQUEST. REV'D DIMS.				

RUSKIN
 VERTICAL SPECIAL CD-50 SUBWAY DAMPER

SCALE: NONE
 ISSUE NO: 0562-003

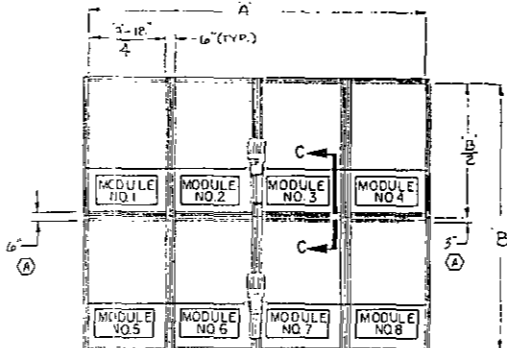
ISSUED
 NOV 9 1988

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- NOTES:**
- SEE DWG. 0562-009 FOR BILL OF MAT'L. & SECTIONS & DETAILS.
 - SEE DWG. 0562-011 FOR DAMPER SCHEDULE.
 - EACH MODULE TO BE MARKED WITH STENCILS ON JAMB & MULLION FRAMES FOR IDENTIFICATION IN FIELD.
 - MODULES 1, 2, 5, 6 TO HAVE LINKAGE ON LEFT SIDE. MODULES 3, 4, 7, 8 TO HAVE LINKAGE ON RIGHT SIDE.

FACE VIEW
 SHOWN FAIL-OPEN: FOR FAIL-CLOSED POSITION, ROTATE OPERATOR 180° ABOUT ITS VERTICAL AXIS.



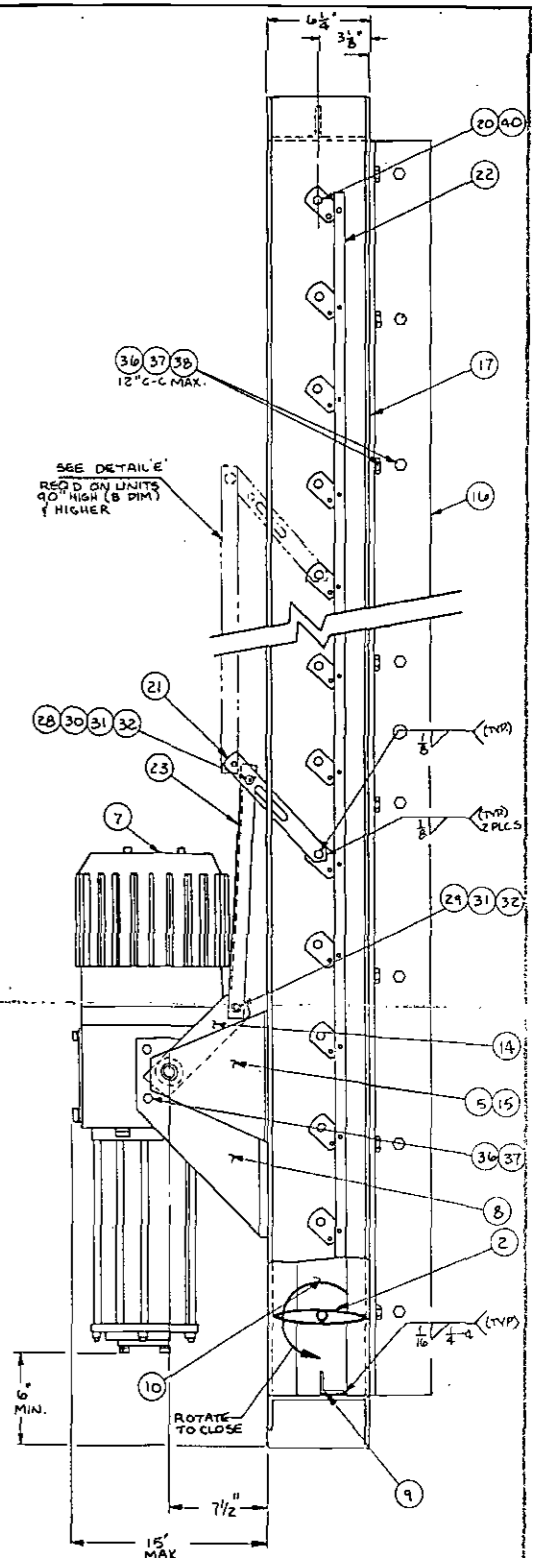
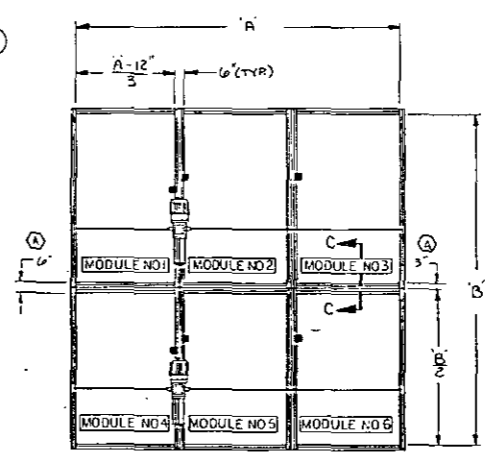
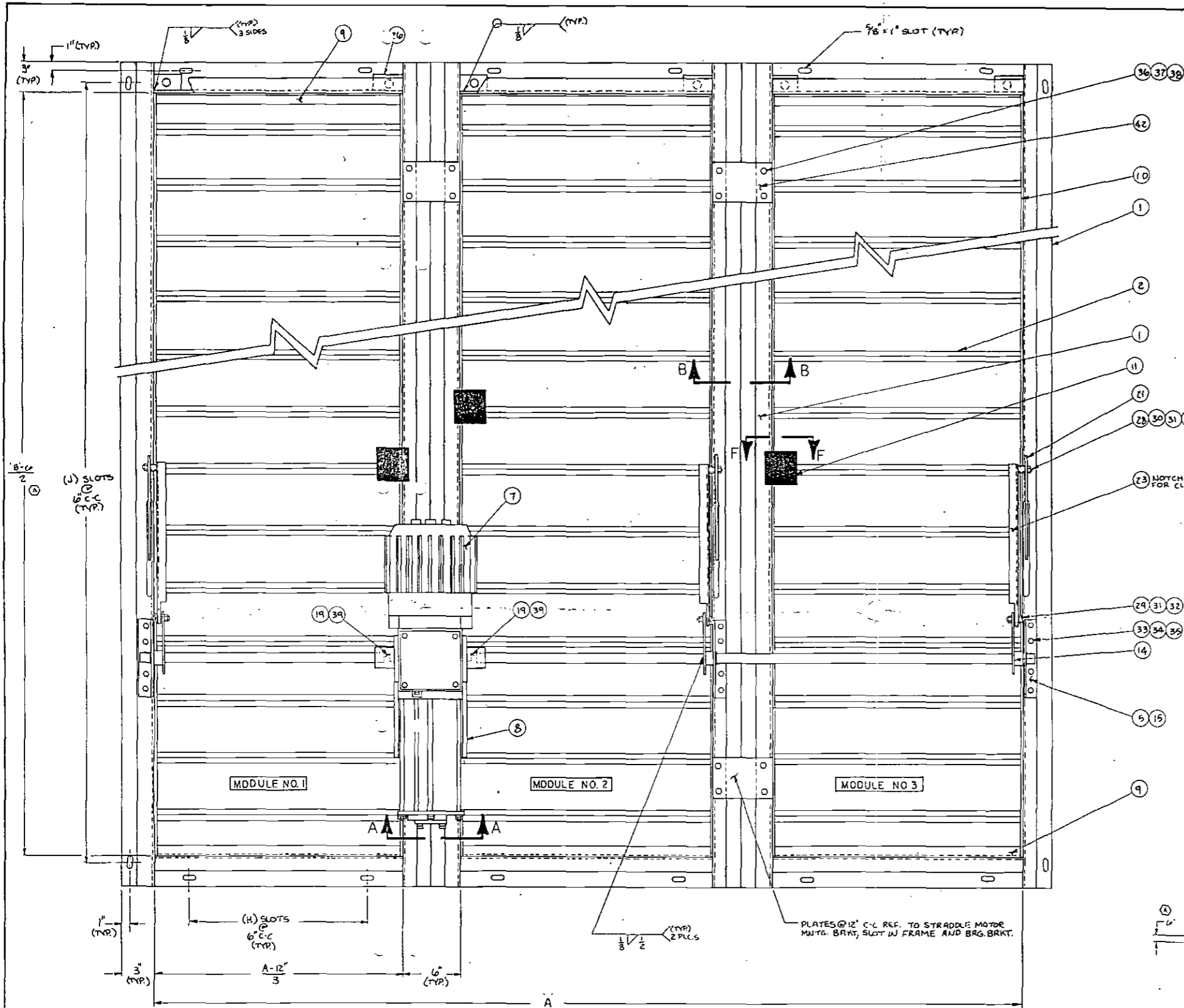
CONFIGURATION 4 x 2

UNLESS OTHERWISE SPECIFIED USE STANDARD ENGINEERING PRACTICES

RIGHT SIDE VIEW (A)

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REVISED BY	DATE	REVISION DESCRIPTION	APP'D BY	DATE
(A)		REMOVED BLADE SEALS PER CUSTOMER REQUEST. REVISED DIMS.		
RUSKIN				
SPECIAL CO-50 SUBWAY DAMPER VERTICAL			0562-004	



FACE VIEW
 SHOWN FAIL-OPEN; FOR FAIL-CLOSED POSITION
 ROTATE OPERATOR 180° ABOUT ITS VERTICAL AXIS

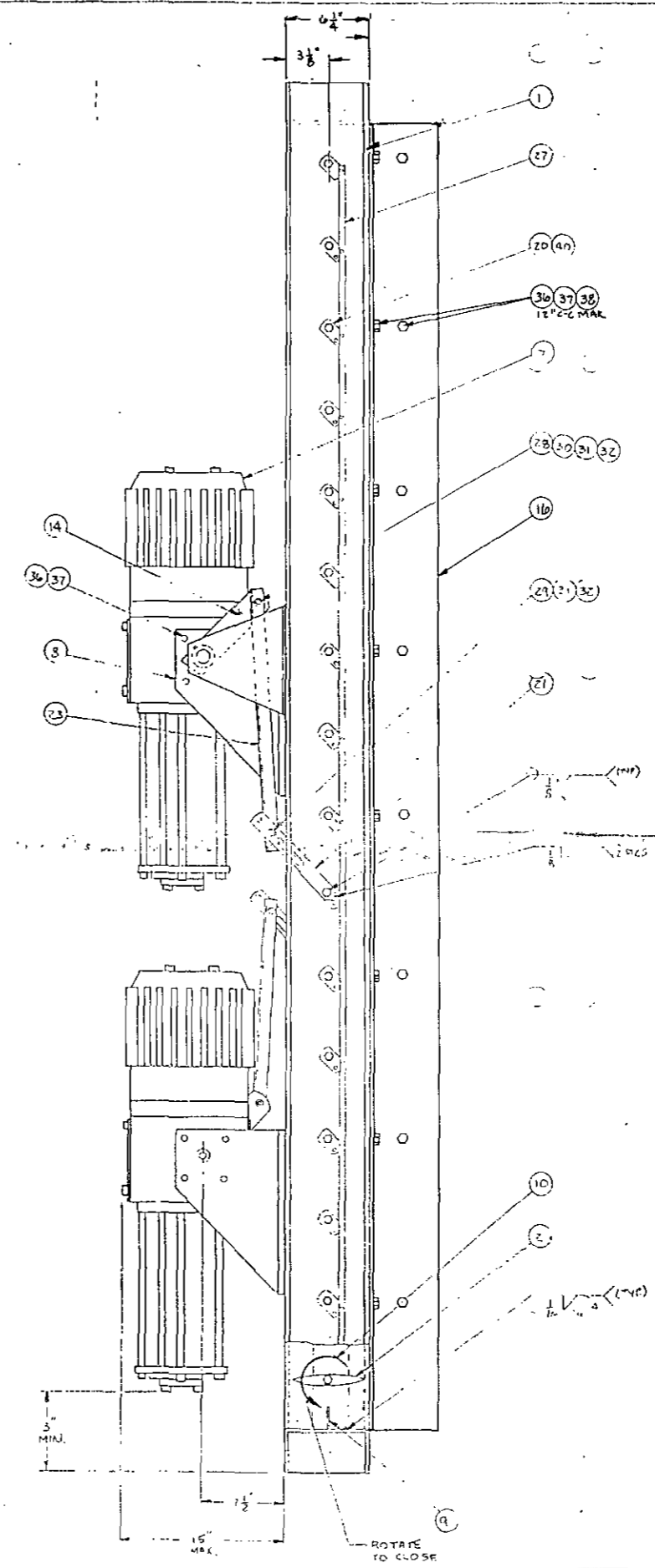
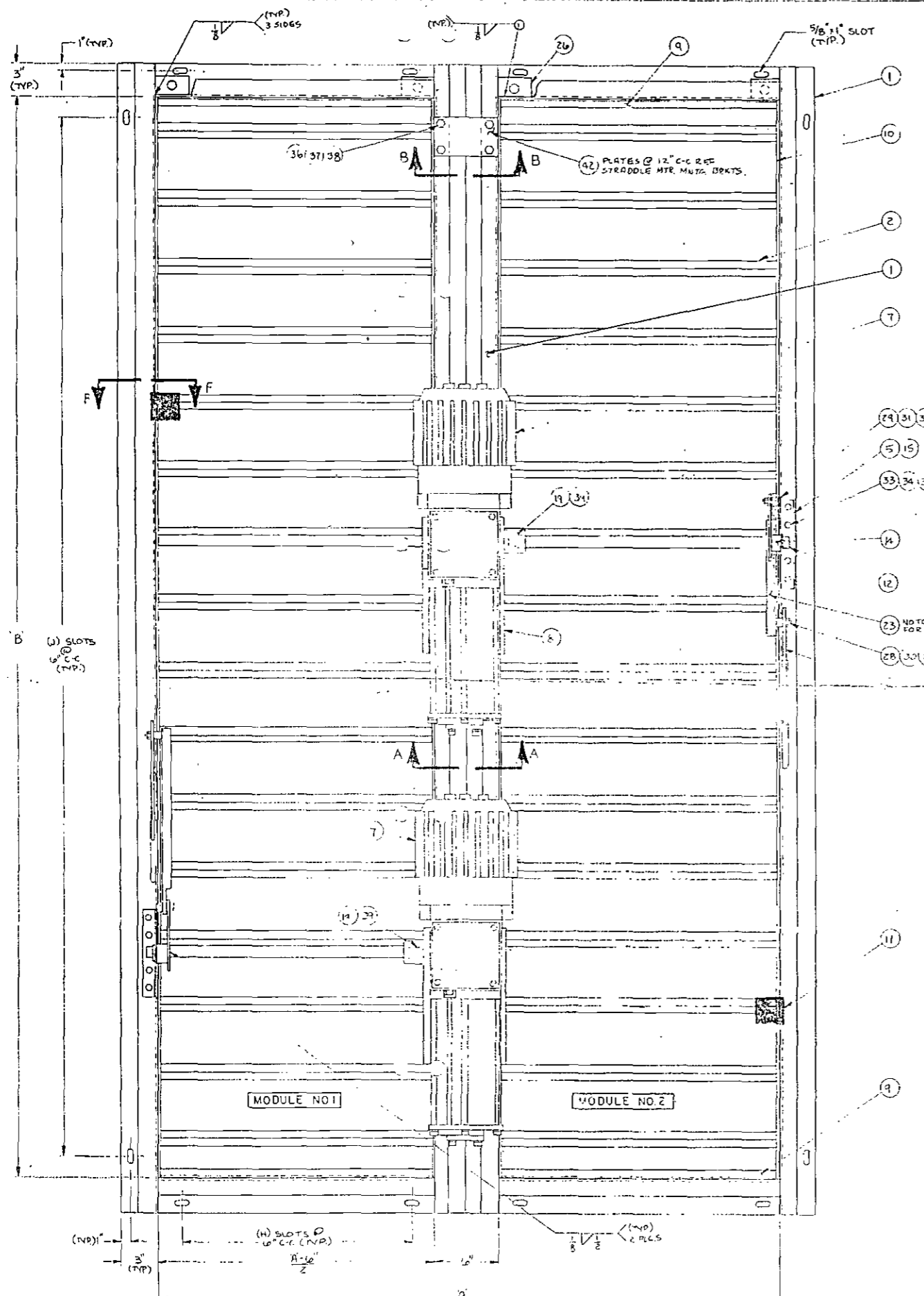
- NOTES:**
1. SEE DWG. 0562-010 FOR BILL OF MATERI. & SECTIONS AND DETAILS.
 2. SEE DWG. 0562-011 FOR DAMPER SCHEDULE.
 3. EACH SECTION TO BE MARKED WITH STENCILS ON JAMS & MULLION FRAMES FOR IDENTIFICATION IN FIELD.
 4. MODULES 1 & 4 TO HAVE LINKAGE ON LEFT SIDE.
 MODULES 2, 3, 5, & 6 TO HAVE LINKAGE ON RIGHT SIDE.

UNLESS OTHERWISE SPECIFIED USE
 STANDARD ENGINEERING TOLERANCES

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DATE	DATE	DATE	DATE	DATE	DATE
3-23-88	4-4-88	4-4-88	4-4-88	4-4-88	4-4-88
DESIGNED BY	CHECKED BY	APP'D BY	DATE	SCALE	ISSUE
				NONE	
RUSKIN HORIZONTAL SPECIAL CD-50 SUBWAY DAMPER				DWG. NO.	0562-005



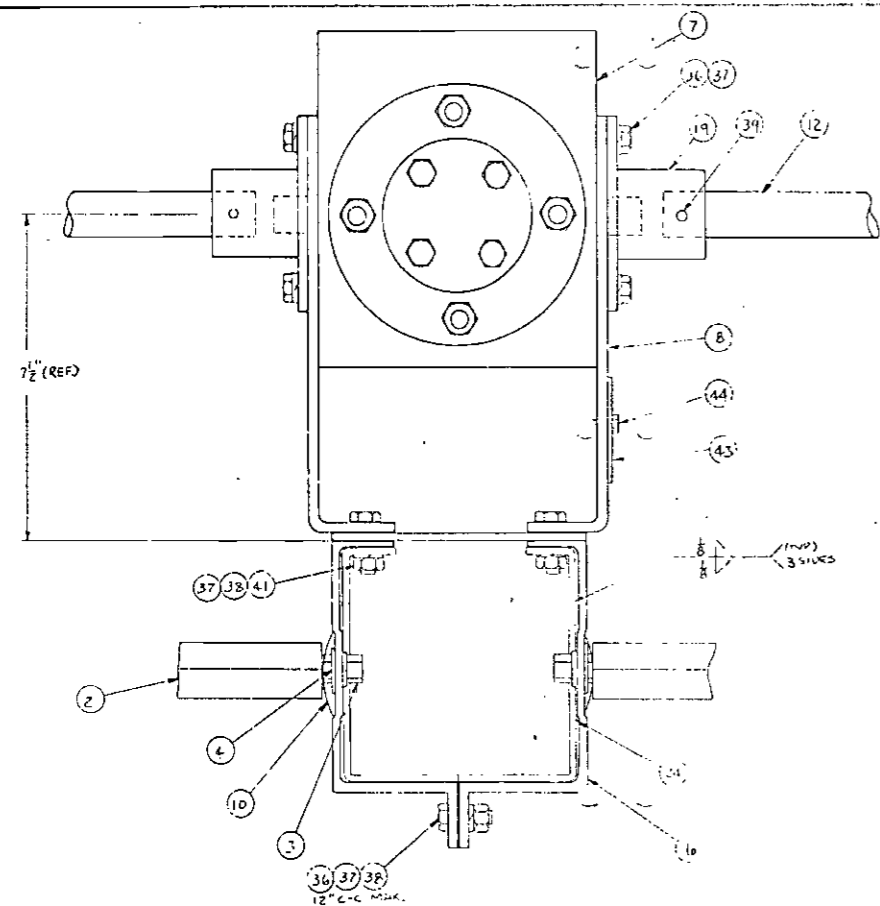
- NOTES:**
- SEE DWG. 0562-010 FOR BILL OF MAT'L'S, SECTIONS & DETAILS.
 - SEE DWG. 0562-011 FOR DAMPER SCHEDULE.
 - EACH MODULE TO BE MARKED WITH STENCILS ON MULLION & JAMB FRAME FOR FIELD IDENTIFICATION.
 - MODULE NO. 1 TO HAVE LINKAGE ON LEFT SIDE. MODULE NO. 2 TO HAVE LINKAGE ON RIGHT SIDE.

FACE VIEW
 ENCL. FAIL-OPEN: IN CLOSED POSITION ROTATE OPERATOR 180° ABOUT ITS VERTICAL AXIS.
CONFIGURATION 2x1

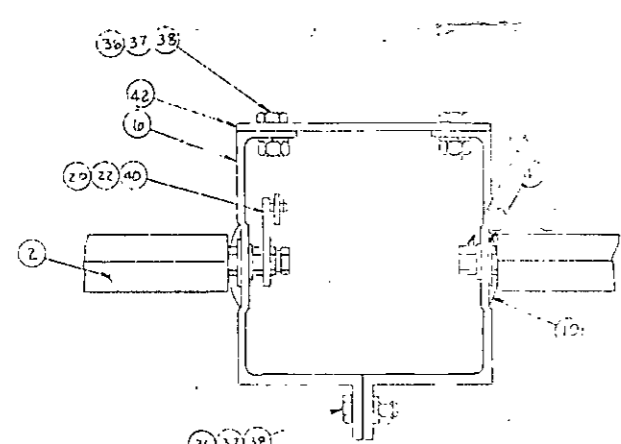
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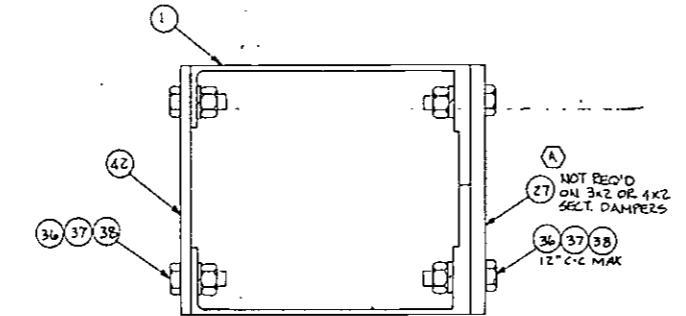
DC	4/88	4/88	4/88	4/88	4/88	4/88	4/88	4/88	4/88
RUSKIN A SUBWAY CONTRACT SPEC. NO. A740 RUSKIN PROJ. NO. 0562									
SPECIAL CD-50 SUBWAY DAMPER HORIZONTAL									
0562-007									



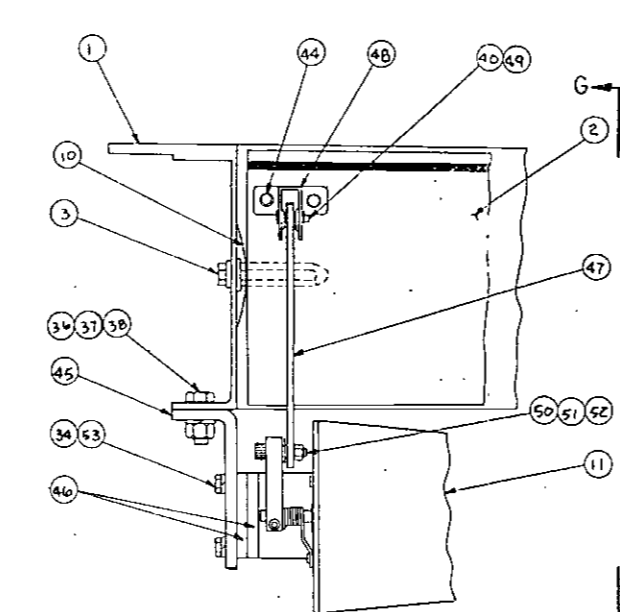
SECTION A-A



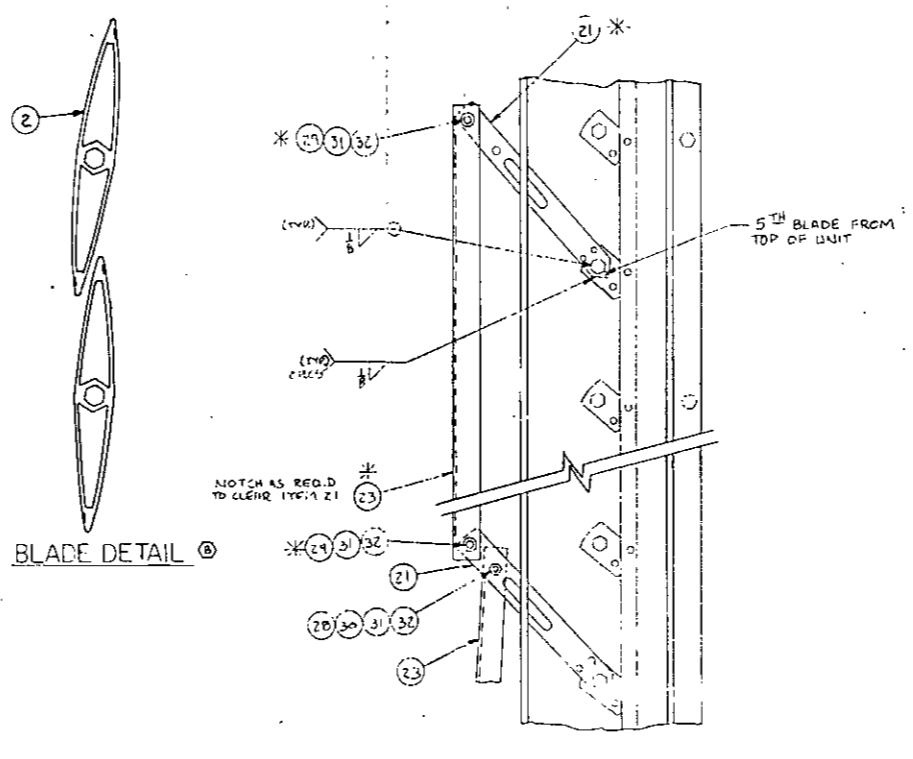
SECTION B-B



SECTION C-C



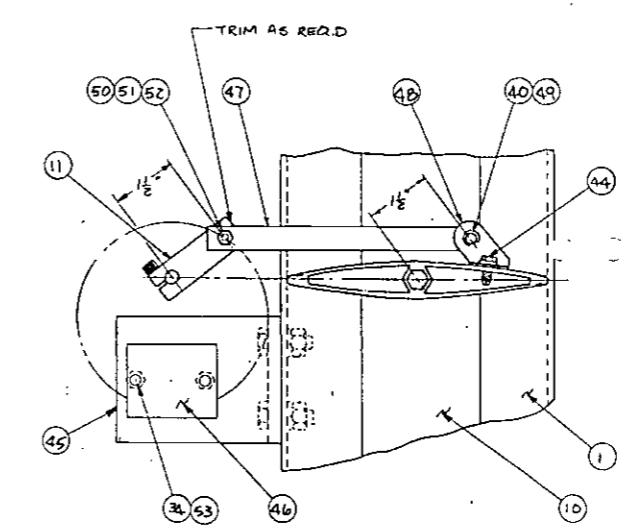
SECTION F-F



BLADE DETAIL

DETAIL E

* ITEMS INDICATED, REQ'D ON UNITS 90" HIGH (8 DIM.) AND OVER



VIEW G-G

NOTE 7

ITEM	PART	DESCRIPTION	INVT.	AS TM
1.	B101	FRAME: 1/8" 6061-T6 EXTRUDED ALUM.		B-308
2.		BLADE: .008 THK. EXTRUDED ALUM. AIRFOIL 6061-T6		B-308
3.	Z30Z	AXLE: 1/2" HEX AXLE S.S.		
4.	ZD8Z	BEARING: 1/2" I.D. S.S.	O1840	
5.	B18D	BEARING: 1" S.S. FLANGE		
6.	M659	MULLION FRAME: 6061-T6 EXTRUDED ALUM.		B-308
7.		OPERATOR: ITT EHR-R20		
8.	14229	OPERATOR MNTG. BRKT. ASSY.: 1/4" S.S.		A-240
9.		BLADE STOP: D63 THK. FORMED ANGLE 6061-T6		B-308
10.		JAMB SEAL: .007 THK x 2 1/4" WIDE 301 F.H. S.S.		
11.		LIMIT SWITCH ASSY.: (2 SPDT MICRO SWITCHES) PROXIMITY 42TL0		
12.		JACK SHAFT: 1" DIA. BAR (SOLID) 304 S.S.		A-276
13.		NOT ASSIGNED		
14.	15669	JACKSHAFT CONTROL ARM: 1" I.D. 316 S.S.		A-240
15.	14230	JACKSHAFT BEARING BRKT.: 316 S.S.		A-240
16.		NOT ASSIGNED		
17.		OASKET: 1/4" THK. x 3" WIDE SILICONE		
18.		NOT ASSIGNED		
19.	Z3Z	COUPLER: 1" I.D. TO 7/8" FLAT 304 S.S.		A-276
20.	15660	LINKAGE ARM ASSY.: 316 S.S.		
21.	15661	LINKAGE CONTROL ARM: 316 S.S.		
22.		LINKAGE TIE BAR: 1/4" x 1/2" 316 S.S.		A-276
23.		ANGLE TIE BAR: 1" x 1" x 10 GA 316 S.S.		A-240
24.		FRAME STIFFENER CHAN.: 1/8" x 2 1/2" L6 FORMED ALUM.		
25.		NOT ASSIGNED		
26.	9126	LIFTING LUG: 3/8" THK. ALUM.		
27.		SECTION ASSY. STRIP: 1/2" WIDE x BLADE LENGTH x 1/8" THK ALUM.		
28.		SPACER: 7/16" I.D. x 3/16" O.D. x 1/2" LG 301 S.S. TUBING		A-276
29.		SHOULDER BOLT: 3/8" DIA x 5/8" LG. S.S.		
30.		SHOULDER BOLT: 3/8" DIA x 1" LG. S.S.		
31.		LOCK NUT: 5/16-18 S.S. DIST. THRD.		
32.		FLAT WASHER: 3/8" S.S.		
33.		HEX HD BOLT: 1/4-20 x 3/4" S.S.	05500	
34.		LOCKWASHER: 1/4" S.S.	05604	
35.		HEX NUT: 1/4-20 S.S.	05410	
36.		HEX HD. BOLT: 3/8-16 x 1 1/4" S.S.	05716	
37.		LOCKWASHER: 3/8" S.S.	05330	
38.		HEX NUT: 3/8-16 S.S.	04896	
39.		GROOVE PIN: 1/4" DIA x 1 1/2" S.S.		
40.		REPAIRING RING: TEVARC # 5133-25H	05066	
41.		HEX HD. BOLT: 3/8-16 x 1 1/2" S.S.	05369	
42.	132 S	MULLION PLATE STRIP: 4" x 6" x 1/8" ALUM.		
43.	326	NAMEPLATE: 3 3/4" x 2 1/2" S.S.		
44.		TS. SCREEN: #10 x 3/16" LG. S.S.		
45.	1996	LIMIT SWITCH BRKT: 1/2" S.S.		A-240
46.	1556	LIMIT SWITCH SPACER: 2" x 1/2" x 1/4" THK ALUM.		A-240
47.		LIMIT SWITCH TIEBAR: 1/2" x 10 GA. 316 S.S.		A-240
48.	M-58-2	LIMIT SWITCH BLADE BRKT: S.S.		
49.	M-51-5	CLEVIS PIN: S.S.		
50.		SHOULDER BOLT: 1/4" DIA. x 1/2" LG. S.S.		
51.		FLAT WASHER: 1/4" S.S.		
52.		LOCK NUT: NO. 10 (DIST THRD.) S.S.		
53.		HEX HD. BOLT: 1/4-20 x 1 1/4" S.S.		

- NOTES
1. STIFFENER CHANNEL (ITEM 24) TO EXTEND 6" BEYOND TOP (BOTTOM OF OPERATOR MNTG. BRKT. ASSY (ITEM 8)).
 2. (2) LIFTING LUGS REQ'D PER DAMPER MODULE.
 3. DEDUCT 3/16" OFF BLADE LENGTH.
 4. MOTOR TO BE CAPABLE OF WITHSTANDING TEMP UP TO 300°F FOR A MIN OF 1 HOUR.
 5. ALUM. PARTS TO HAVE A CLEAR ANODIZED FINISH WITH A MIN. COATING THICKNESS OF .0008 INCH AND A MIN. WEIGHT OF 27 MILLIGRAMS PER SQUARE INCH.
 6. ALL ANODIZED AREAS DESTROYED BY WELDING TO BE CLEANED AND PAINTED WITH 2 COATS OF Z.R.C.
 7. USE BLADE #B552 ON SECTION SIZES UP TO 36" AND USE BLADE #14658 ON SECTION SIZES ABOVE 36" THRU 46".

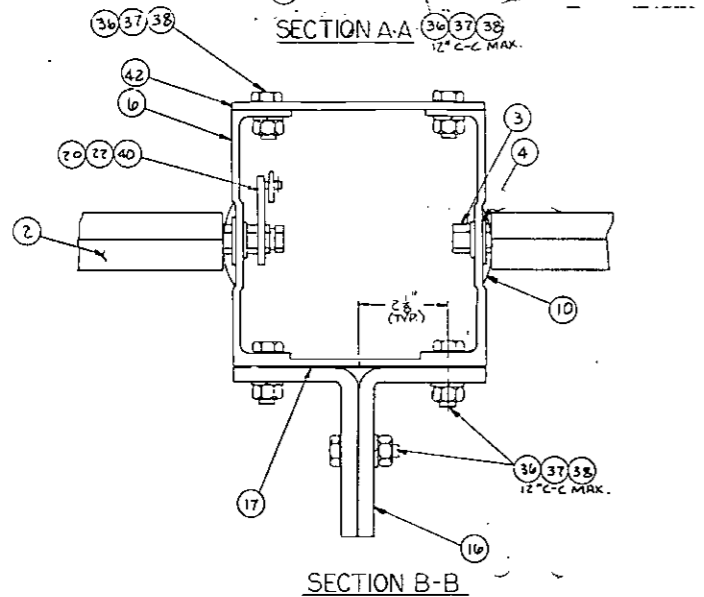
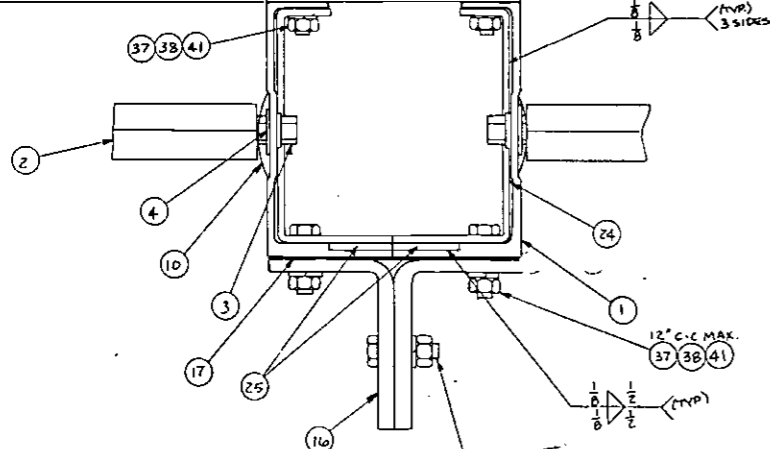
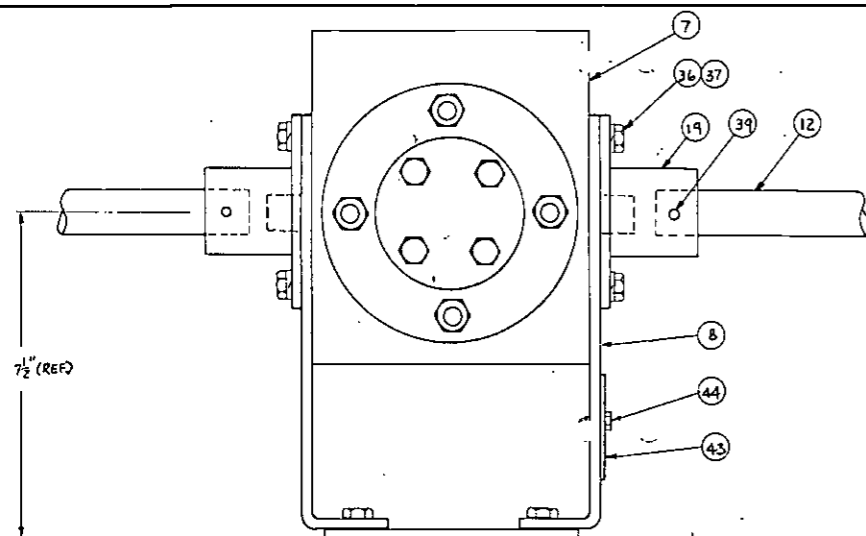
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REV ED TO BE USED FOR CONSTRUCTION

REV	DATE	BY	CHKD	DESCRIPTION
1	11/8/89	KM	4/1/91	304 S.S. WAS 316 S.S. ITEM 19
2	11/8/89	KM	4/1/91	REV PART NO. ITEM 8
3	11/8/89	KM	4/1/91	ADDED NOTE # 7, REV'D ITEM # 2
4	11/8/89	DDH	4/1/91	REV'D FOR CUSTOMER COMMENTS REMOVE BLADE KEALS
5	11/8/89	DDH	4/1/91	ADDED TO SECTION C-C - ITEM # 27 NOT REQ'D ON 3x2 OR 4x2 SECT.

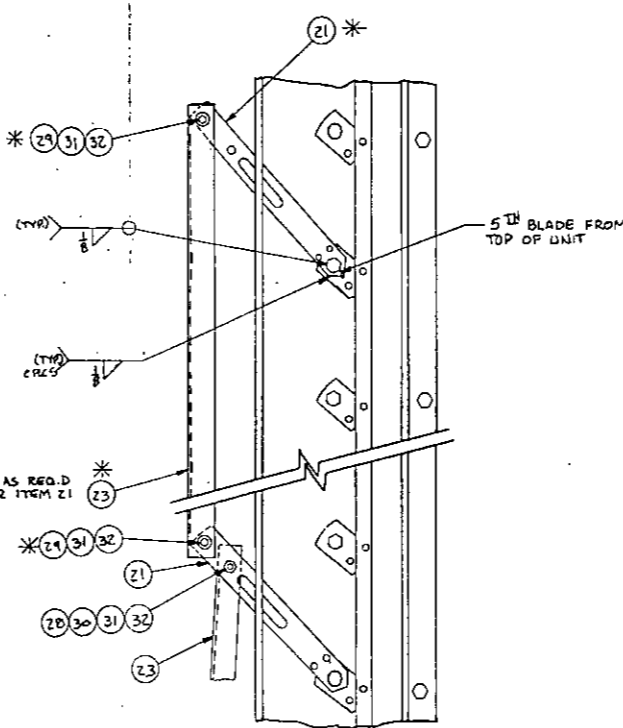
UNLESS OTHERWISE SPECIFIED, USE STANDARD ENGLISH UNITS TOLERANCES
RUSKIN
3-25-BB
L.A. SUBWAY
CONTRACT SPEC. NO. A740
RUSKIN PROJ. NO. 0562

RUSKIN
VERTICAL DAMPER
BILL OF MATERIAL
SECTIONS & DETAILS
Nov
0562-009

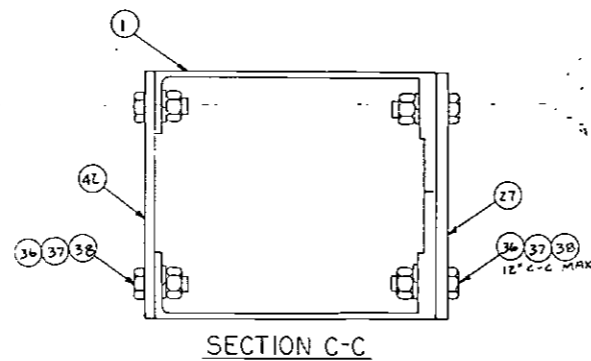


BLADE DETAIL ②

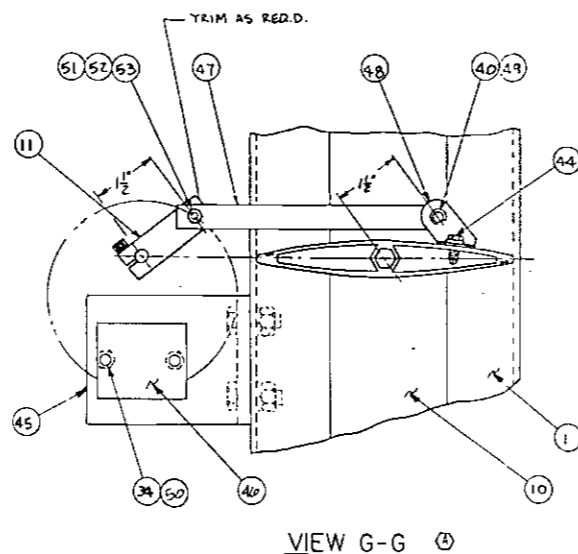
NOTCH AS REQ'D TO CLEAR ITEM 21



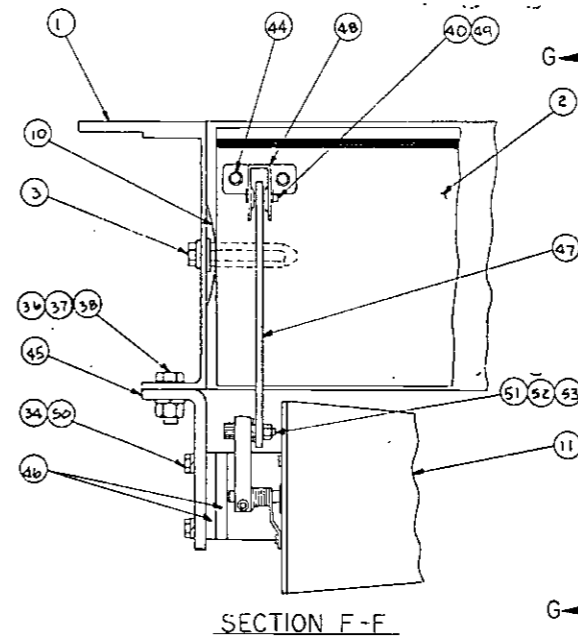
DETAIL E
* ITEMS INDICATED REQ'D ON UNITS 90" HIGH (B DIM) AND OVER



SECTION C-C



VIEW G-G ③



SECTION F-F

⑦ NOTE 7

ITEM	PART	DESCRIPTION	INVT.	ASTM
1.	0101	FRAME: 1/8" 6061-T6 EXTRUDED ALUM.		B-308
2.		BLADE: 0.80 THK. EXTRUDED ALUM. AIRFOIL 6061-T6		B-308
3.	2302	AXLE: 1/2" HEX AXLE S.S.		
4.	2002	BEARING: 1/2" I.D. S.S.	01840	
5.	8180	BEARING: 1" S.S. FLANGE		
6.	14659	MULLION FRAME: 6061-T6 EXTRUDED ALUM.		B-308
7.		OPERATOR: ITT ENR-220		
8.	14229	OPERATOR MNTG. BRKT. ASSY.: 1/4" S.S.		A-240
9.		BLADE STOP: .063 THK. FORMED ANGLE 6061-T6		B-308
10.		JAMB SEAL: .007 THK X 2 1/4" WIDE 301 F.H. S.S.		
11.		LIMIT SWITCH ASSY.: (2 SPDT MICRO SWITCHES) PROXIMITY 42TLO		
12.		JACK SHAFT: 1" DIA. BAR (SOLID) 304 S.S.		A-276
13.		NOT ASSIGNED		
14.	10869	JACKSHAFT CONTROL ARM: 1" I.D. 316 S.S.		
15.	14230	JACKSHAFT BEARING BRKT.: 316 S.S.		A-240
16.		MULLION SUPPORT ANGLE: 3/8" X 3/8" X 1/8" DIM'L6. GALV. STL.		
17.		GASKET: 1/4" THK X 3" WIDE SILICONE		
18.		NOT ASSIGNED		
19.	132	COUPLER: 1" I.D. TO 7/8" FLAT 304 S.S.		A-276
20.	15500	LINKAGE ARM ASSY.: 316 S.S.		
21.	15501	LINKAGE CONTROL ARM: 316 S.S.		
22.		LINKAGE TIE BAR: 1/4" X 1/2" 316 S.S.		A-276
23.		ANGLE TIE BAR: 1" X 1" X 10 GA 316 S.S.		A-240
24.		FRAME STIFFENER CHAN: 1/8" X 24" LG FORMED ALUM.		
25.		STIFFENER BAR: 1 1/2" X 24 1/2" LG. X 1/8" THK. ALUM.		
26.	9126	LIFTING LUG: 3/8" THK. ALUM.		
27.		SECTION ASSY. STRIP: 1" WIDE X BLADE LENGTH X 1/4" THK. ALUM.		
28.		SPACER: 7/16" I.D. X 3/4" O.D. X 1/2" LG. 304 S.S.		A-276
29.		SHOULDER BOLT: 3/8" DIA X 5/8" LG. S.S.		
30.		SHOULDER BOLT: 3/8" DIA X 1" LG. S.S.		
31.		LOCK NUT: 5/16-18 S.S. DIST. THRD.		
32.		FLAT WASHER: 3/8" S.S.		
33.		HEX HD. BOLT: 1/4-20 X 3/4" S.S.	05500	
34.		LOCKWASHER: 1/4" S.S.	05604	
35.		HEX NUT: 1/4-20 S.S.	05420	
36.		HEX HD. BOLT: 3/8-16 X 1 1/4" S.S.	05716	
37.		LOCKWASHER: 3/8" S.S.	05330	
38.		HEX NUT: 3/8-16 S.S.	04896	
39.		GROOVE PIN: 1/4" DIA X 1 1/2" S.S.		
40.		RETAINING RING: TEVARC # 5133-25H	05026	
41.		HEX HD. BOLT: 3/8-16 X 1 1/2" S.S.	05369	
42.	1329	MULLION PLATE STRIP: 4" X 6" X 1/8" ALUM.		
43.	4263	NAMEPLATE: 3 3/4" X 2 1/2" S.S.		
44.		TEX SCREW: #10 X 1 1/2" LG. S.S.		
45.	15502	LIMIT SWITCH BRKT.: 316 S.S.		A-240
46.	15503	LIMIT SWITCH SPACER: 2" X 1 3/8" X 1/8" THK. ALUM.		A-240
47.		LIMIT SWITCH TIE BAR: 1/2" X 10 GA. 316 S.S.		A-240
48.	M-580	LIMIT SWITCH BLADE BRKT.: S.S.		
49.	M-565	CLEVIS PIN: S.S.		
50.		HEX HD. BOLT: 1/4-20 X 1 1/4" S.S.		
51.		SHOULDER BOLT: 1/4" DIA X 1/2" LG. S.S.		
52.		FLAT WASHER: 1/4" S.S.		
53.		LOCK NUT: NO. 10 (DIST. THRD.) S.S.		

NOTES:

1. STIFFENER CHANNEL (ITEM 24) TO EXTEND 6" BEYOND TOP & BOTTOM OF OPERATOR MNTG. BRKT. ASSY (ITEM 8).
2. (2) LIFTING LUGS REQ'D PER DAMPER MODULE.
3. DEDUCT 3/16" OFF BLADE LENGTH.
4. MOTOR TO BE CAPABLE OF WITHSTANDING TEMP. UP TO 300°F FOR A MIN. OF 1 HOUR.
5. ALUM. PARTS TO HAVE A CLEAR ANODIZED FINISH WITH A MIN. COATING THICKNESS OF .0008 INCH AND A MIN. WEIGHT OF 27 MILLIGRAMS PER SQUARE INCH.
6. ALL ANODIZED AREAS DESTROYED BY WELDING TO BE CLEANED AND PAINTED WITH 2 COATS OF Z.R.C.
- ⑦ 7. USE BLADE #B552 ON SECTION SIZES UP TO 38", AND USE BLADE #14658 ON SECTION SIZES ABOVE 38" THRU 46".

FLAT CANADA LTD
NOV 09 1988
ISSUED

FOR INFORMATION PURPOSES ONLY
NOT TO BE USED FOR CONSTRUCTION

CHANGE LETTER	REVISION DESCRIPTION	OWN BY	APP'D BY	DATE
(C)	304 S.S. WAS 316 S.S. ITEM # 19	KIM		11/02/88
(D)	REV'D. ITEM # 2	KIM		11/09/88
(E)	ADDED NOTE # 7	KIM		11/09/88
(A)	REV'D PER CUSTOMER COMMENTS REMOVED BLADE DETAIL	DDM		11/01/89

OWN BY	CD BY	APP'D BY	SCALE	ISSUE
LS-BB	11/88	11/88	None	0562-010

UNLESS OTHERWISE SPECIFIED USE STANDARD ENGINEERING TOLERANCES

RUSKIN
L A SUBWAY
CONTRACT SPEC. NO. A740
RUSKIN PROJ. NO. 0562

HORIZONTAL DAMPER
BILL OF MATERIAL & SECTIONS & DETAILS

DAMPERS TAG NO.	FLANGE TYPE	A	B	H	J	MNTG POS.	CONFIG.	SCREEN	SCREEN	DWG. NO. 0562-	COMMENTS	FAIL POS.
								RECD.	LOCATION			
A130-EDO11	B	120	120	6	21	VERT.	3 x 1	YES	ATTEN.	002		OPEN
A130-EDO12	B											
A130-EDO13	B											
A136-EDO21	B	96	144	8	13	VERT.	2 x 2	YES	ATTEN.	001		OPEN
A136-EDO22	B											
A136-EDO23	B											
A147-EDO31	A	98	146	8	13	VERT.	2 x 2	YES	DMPR.	001		OPEN
A147-EDO32	A											
A147-EDO41	A											
A147-EDO42	A											
A157-EDO51	B	96	114	8	20	VERT.	2 x 1	YES	DMPR.	008		OPEN
A157-EDO52	B											
A157-EDO61	B											
A157-EDO62	B											
A167-FD71	A	90	120	7	21	VERT.	2 x 1	YES	ATTEN.	008		OPEN
A167-FD72	A											
A167-FD81	A											
A167-FD82	A											
A167-FD1L	B	120	120	6	21	VERT.	3 x 1	YES	DMPR.	002		OPEN
A167-FD2L	B											
A167-FD4L	A	96	156	8	14	VERT.	2 x 2	YES	DMPR.	001	(2) REQ'D	OPEN
A167-FD6L	B	120	120	6	21	VERT.	3 x 1	YES	DMPR.	002		OPEN
A187-EDO91	B											
A187-EDO92	B											
A187-EDO93	B	90	120	7	21	VERT.	2 x 1	YES	DMPR.	008		OPEN
A187-ED101	B											
A187-ED102	B											
A167-FD3L	B	120	120	6	21	VERT.	3 x 1	YES	DMPR.	002		OPEN
A167-FD5L	B											
A136-UDO11	C	78	84	6	15	VERT.	2 x 1	NO		008		OPEN
A136-UDO12	B							YES	DMPR.			
A147-UDO21	P	60	96	5	17	VERT.	2 x 1	NO		008		OPEN
A147-UDO22	B											
A157-UDO31	B	96	60	8	11	VERT.	2 x 1	NO		008	OPERATOR MAY EXTEND PAST TOP FRAME 7 3/4" MAX.	OPEN
A157-UDO32	B											
A167-ED41	C	72	72	6	13	VERT.	2 x 1	NO		008		OPEN
A167-ED42	A	66	72	5	13	HORIZ.	2 x 1	NO		007		OPEN
A187-UD051	B	80	72	6	13	HORIZ.	2 x 1	NO		007		OPEN
A187-UD052	B	80	72	6	13	VERT.	2 x 1	NO		008		OPEN
A167-OD1L	C	60	60	5	11	HORIZ.	2 x 1	NO		007	OPERATOR MAY EXTEND PAST TOP FRAME 7 3/4" MAX.	OPEN
A167-OD2L	C											
A167-BD1L	A	168	144	6	13	HORIZ.	4 x 2	YES	DMPR.	006		CLOSE
A167-BD2L	A											
A167-BD81	A	150	192	8	17	VERT.	3 x 2	YES	DMPR.	003		CLOSE
A167-BD82	A											
A167-BD3L	A	96	156	8	14	VERT.	2 x 2	YES	DMPR.	001	(2) REQ'D EACH	CLOSE
A167-BD4L	A											
A187-BDO91	A	192	150	7	13	HORIZ.	4 x 2	YES	DMPR.	006		CLOSE
A187-BDO92	A											
A187-BD101	A	180	139	7	13	VERT.	4 x 2	YES	DMPR.	004		CLOSE
A187-BD102	A											
A136-TDO21	B	192	138	7	12	VERT.	4 x 2	YES	DMPR.	004		OPEN
A136-TDO22	B											
A147-TDO31	A	141	174.5	7	15	VERT.	3 x 2	YES	DMPR.	003		OPEN
A147-TDO32	A											
A147-TDO41	A											
A147-TDO42	A											

TAG NO.	FLANGE TYPE	A	B	H	J	MNTG. POS.	CONFIG.	SCREEN	SCREEN	DWG. NO. 0562-	COMMENTS	FAIL POS.
								RECD.	LOCATION			
A157-TDO51	A	164	132	6	12	VERT.	4 x 2	YES	DMPR.	004		OPEN
A157-TDO52	A											
A157-TDO61	A	152	184	8	16	VERT.	4 x 2	YES	DMPR.	004		OPEN
A157-TDO62	A											
A167-TD71	A	120	180	6	16	VERT.	3 x 2	YES	DMPR.	003		OPEN
A167-TD72	A											
A167-TD81	A	120	180	6	16	VERT.	3 x 2	YES	DMPR.	003		OPEN
A167-TD82	A											
A187-TDO91	B	144	150	8	13	VERT.	3 x 2	YES	DMPR.	003		OPEN
A187-TDO92	B											
A187-TD101	A											
A187-TD102	A											
A130-BDO11	A	156	192	8	17	HORIZ.	4 x 2	YES	DMPR.	006		CLOSE
A130-BDO12	A											
A136-BDO21	A	180	162	7	14	HORIZ.	4 x 2	YES	DMPR.	006		CLOSE
A136-BDO22	A											
A147-BDO31	A	170	156	7	14	VERT.	4 x 2	YES	DMPR.	004		CLOSE
A147-BDO32	A											
A147-BDO41	A											
A147-BDO42	A											
A157-BDO51	A	195	132	8	12	VERT.	4 x 2	YES	DMPR.	004		CLOSE
A157-BDO52	A											
A157-BDO61	A	150	172	8	15	VERT.	3 x 2	YES	DMPR.	003		CLOSE
A157-BDO62	A											
A167-BD71	A	150	192	8	17	VERT.	3 x 2	YES	DMPR.	003		CLOSE
A167-BD72	A											
A167-BD5L	A	96	156	8	14	VERT.	2 x 2	YES	DMPR.	001	(2) REQ'D EACH	CLOSE

SUBWAY STATION NAME	STAGE I CONTRACT NO.	STAGE II CONTRACT NO.
YARDS (PART OF UNION STATION)	A130	A130
UNION STATION	A135	A136
CIVIC CENTER	A141	A147
5 TH + HILL	A145	A157
7 TH + FLOWER	A165	A167
WILSHIRE / ALVARADO	A175	A187

FLANGE TYPE	DESCRIPTION
A	3 x 3 x 3/8 steel angle supplied by A740 and installed by Stage I Contractor.
B	Threaded steel studs or bolts supplied by A740 for use by Stage I or Stage II Contractor. Steel channel frame or steel tube supplied and installed by Stage I or Stage II Contractor.
C	Flange not required (metal frame is part of A740 equipment).
D	6 x 4 x 3/8 steel angle supplied by A740 and installed by Stage I or Stage II Contractor.

- NOTES:
- ALL FLANGES TYPE 'A' ARE DELIVERED TO THE STAGE I CONTRACTORS. ALL NUTS, LOCKWASHERS, ALL THRD., & GASKET TO BE SUPPLIED W/ THE DAMPERS, NOT THE COMPANION ANGLES. SEE COMPANION ANGLE DWGS. FOR QTY.
 - ALL DAMPERS & GASKETS, HARDWARE FOR TYPE 'B' FLANGES AND ALL FLANGES TYPE 'D' ARE DELIVERED TO THE STAGE II CONTRACTORS.
 - TAG NO.: A187 - 1281 (STATION CONTRACT NUMBER) / A187 - 1281 (DAMPERS OR FLANGE NUMBER)
 - A PRINT OF THIS SUMMARY SCHEDULE IS INCLUDED IN THE SHOP DRAWING PACKAGE FOR EACH SHIPMENT DESTINATION.
 - SEE DWG. 0562-029 FOR BIRDSCREEN MOUNTING DETAIL. SCREEN LOCATION: ATTEN. (SOUND ATTENUATOR) TO SHIP LOOSE FOR FIELD MOUNTING TO SOUND ATTENUATORS. DMPR. (DAMPERS) TO BE MOUNTED AND SHIPPED ATTACHED TO DAMPERS.

REV. NO.	REV. DESCRIPTION	DATE	BY	CHKD. BY	DATE
1	REV'D NOTE # 5. REV'D SCREEN REQUIREMENTS. APPROV. SCREEN LOCATIONS.	10/11/89	...	...	...
2	ADDED BIRDSCREEN.	10/11/89	...	...	...
3	ADDED FLANGE TYPE PER CUSTOMER.	10/11/89	...	...	...
4	BDO61 & BDO62 'A' DIM WAS 144"	10/11/89	...	...	...
5	ADDED UNIT # 4 PER CUSTOMER. REV. DIMS. & TAG NO.	10/11/89	...	...	...
6	PER CUSTOMER. REV. DIMS. & TAG NO.	10/11/89	...	...	...
7	REV. TAG. NO. 3 REV. DWG. NO. 3 REV. CONFIGURATIONS	10/11/89	...	...	...

DWG. NO. 0562-011
 DATE 4-1-88
 SCALE 1/8" = 1'-0"
 RUSKIN
 L.A. SUBWAY
 CONTRACT SPEC. NO. A740
 RUSKIN PROJ. NO. 0562
 DAMPER SCHEDULE
 0562-011




EMERGENCY & VENTILATION FANS
OPERATION, MAINTENANCE AND INSTALLATION MANUAL

SECTION EIGHT

SOUND ATTENUATORS

- DELIVERY LIST
- SOUND ATTENUATOR DRAWINGS


DELIVERY LIST

	CUSTOMER	DRAWN	DWG. NO.	SUB. NO.
	S.C.R.T.D. - METRO RAIL PROJECT A740	B.B.	CO-A-13214	014
CONTRACT NO.	PRODUCT	CHECKED	SHEET 2 OF 5	REV. NO.
C-118-324-0773	VENTILATION FANS	<i>R.J.L.</i>	ASSEMBLY DWG.	
	TITLE	APPROVED	CO-D-12804	DATE
	FAN SILENCERS			JUN 26/89

DELY. ITEM	QTY.	DESCRIPTION	DWG. No. OR DIM. AND MAT'L SPECS.	REV.	DELY. CODE	ESTIMATED WEIGHT	LINE NO.
004	18	SILENCER (7'-6" x 10'-0" x 7'-0" LG.)	EACH UNIT CONSISTING OF :-			74,600	1
	6	SIDE PANELS	CO-D-12803 DETAIL *7				2
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL *7				3
	4	FULL BAFFLES	CO-C-11465 DETAIL *8				4
	2	HALF BAFFLES	CO-C-11465 DETAIL *8				5
	2	SUPPORT LEGS L.H.	CO-D-12803 DETAIL *12				6
	2	SUPPORT LEGS R.H.	CO-D-12803 DETAIL *13				7
005	4	SILENCER (5'-0" x 5'-0" x 5'-0" LG.)	EACH UNIT CONSISTING OF :-			5,640	9
	4	SIDE PANELS	CO-D-12803 DETAIL *2				10
	4	TOP & BOTTOM PANELS	CO-D-12803 DETAIL *2				11
	2	FULL BAFFLES	CO-C-11465 DETAIL *1				12
	2	HALF BAFFLES	CO-C-11465 DETAIL *1				13
006	1	SILENCER (4'-10" x 7'-0" x 8'-0" LG.)	CONSISTING OF :-			2,780	15
	6	SIDE PANELS	CO-D-12803 DETAIL *1				16
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL *1				17
	2	FULL BAFFLES	CO-C-11465 DETAIL *10				18
	2	HALF BAFFLES	CO-C-11465 DETAIL *10				19
	2	SUPPORT LEGS L.H.	CO-D-12803 DETAIL *12				20
	2	SUPPORT LEGS R.H.	CO-D-12803 DETAIL *13				21
							22
							23
							24
							25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS					TOTAL ESTIMATED WEIGHT	
MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'s AND SUB. NO.'s CLEARLY MARKED					LBS.	KG.
CRATING					ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.	
NOTE:						
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> FLAKT CANADA LTD. NOV 13 1989 ISSUED </div>						
					'S' - FLAKT STOCK SENT TO FIELD	
					'Sd' - FLAKT STOCK SENT TO SHOP	
					'R' - FLAKT PURCHASE SENT TO FIELD	
					'Rd' - FLAKT PURCHASE SENT TO SHOP	
SYM.	REVISION	DATE	BY	CHK'D		

DELIVERY LIST

	CUSTOMER	DRAWN	DWG. NO.	SUB. NO.
	S.C.R.T.D. - METRO RAIL PROJECT A740	B.B.	CO-A-13214	014
CONTRACT NO.	PRODUCT	CHECKED	SHEET 3 OF 5	REV. NO.
C-118-324-0773	VENTILATION FANS	RJR.	ASSEMBLY DWG.	
	TITLE	APPROVED	CO-D-12804	DATE
	FAN SILENCERS			JUN 26/89

DELY. ITEM	QTY.	DESCRIPTION	DWG. No. OR DIM. AND MAT'L SPECS.	REV.	DELY. CODE	ESTIMATED WEIGHT	LINE NO.
007	3	SILENCER (6'-6" x 7'-0" x 7'-0" LG.)	EACH UNIT CONSISTING OF :-			8,920	1
	6	SIDE PANELS	CO-D-12803 DETAIL #5				2
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL #5				3
	3	FULL BAFFLES	CO-C-11465 DETAIL #5				4
	2	HALF BAFFLES	CO-C-11465 DETAIL #5				5
	2	SUPPORT LEGS L.H.	CO-D-12803 DETAIL #12				6
	2	SUPPORT LEGS R.H.	CO-D-12803 DETAIL #13				7
							8
008	4	SILENCER (5'-0" x 8'-0" x 7'-0" LG.)	EACH UNIT CONSISTING OF :-			11,030	9
	6	SIDE PANELS	CO-D-12803 DETAIL #3				10
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL #3				11
	2	FULL BAFFLES	CO-C-11465 DETAIL #6				12
	2	HALF BAFFLES	CO-C-11465 DETAIL #6				13
	2	SUPPORT LEGS L.H.	CO-D-12803 DETAIL #12				14
	2	SUPPORT LEGS R.H.	CO-D-12803 DETAIL #13				15
							16
009	4	SILENCER (8'-0" x 5'-0" x 7'-0" LG.)	EACH UNIT CONSISTING OF :-			10,990	17
	6	SIDE PANELS	CO-D-12803 DETAIL #8				18
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL #8				19
	4	FULL BAFFLES	CO-C-11465 DETAIL #2				20
	2	HALF BAFFLES	CO-C-11465 DETAIL #2				21
	2	SUPPORT LEGS L.H.	CO-D-12803 DETAIL #12				22
	2	SUPPORT LEGS R.H.	CO-D-12803 DETAIL #13				23
							24
							25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

TOTAL LBS.
ESTIMATED WEIGHT KG.

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'s AND SUB. NO.'s CLEARLY MARKED.


CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.

FLAKT CANADA LTD.
NOV 13 1989
ISSUED

NOTE

- 'S' - FLAKT STOCK SENT TO FIELD
- 'Sd' - FLAKT STOCK SENT TO SHOP
- 'R' - FLAKT PURCHASE SENT TO FIELD
- 'Rd' - FLAKT PURCHASE SENT TO SHOP

DELIVERY LIST

	CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13214	SUB. NO. 014
	PRODUCT VENTILATION FANS	CHECKED <i>RJL</i>	SHEET 4 OF 5 ASSEMBLY DWG.		REV. NO.
CONTRACT NO. 18-324-0773	TITLE FAN SILENCERS	APPROVED	CO-D-12804	DATE JUNE 26/89

DEL. ITEM	QTY.	DESCRIPTION	DWG. No. OR DIM. AND MAT'L SPECS.	REV.	DEL. CODE	ESTIMATED WEIGHT	LINE NO.
010	2	SILENCER (6'-0" x 6'-0" x 7'-0" LG.)	EACH UNIT CONSISTING OF :-			4,980	1
	6	SIDE PANELS	CO-D-12803 DETAIL #4				2
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL #4				3
	3	FULL BAFFLES	CO-C-11465 DETAIL #3				4
	2	HALF BAFFLES	CO-C-11465 DETAIL #3				5
011	1	SILENCER (6'-0" x 6'-0" x 7'-0" LG.)	CONSISTING OF :-			2,780	7
	6	SIDE PANELS	CO-D-12803 DETAIL #4				8
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL #4				9
	3	FULL BAFFLES	CO-C-11465 DETAIL #3				10
	2	HALF BAFFLES	CO-C-11465 DETAIL #3				11
	6	SUPPORT BRACKETS	CO-D-12803 DETAIL #14				12
012	1	SILENCER (6'-0" x 6'-0" x 7'-0" LG.)	CONSISTING OF :-			2,500	14
	6	SIDE PANELS	CO-D-12803 DETAIL #4				15
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL #4				16
	3	FULL BAFFLES	CO-C-11465 DETAIL #3				17
	2	HALF BAFFLES	CO-C-11465 DETAIL #3				18
	2	SUPPORT LEGS L.H.	CO-D-12803 DETAIL #12				19
	2	SUPPORT LEGS R.H.	CO-D-12803 DETAIL #13				20
							21
							22
							23
							24
							25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'S AND SUB. NO.'S CLEARLY MARKED.

TOTAL ESTIMATED WEIGHT LBS. / KG.

FLAKT CANADA LTD.
 NOV 13 1989
 ISSUED

CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.

NOTE:

'S' - FLAKT STOCK SENT TO FIELD


'Sd' - FLAKT STOCK SENT TO SHOP

'R' - FLAKT PURCHASE SENT TO FIELD

'Rd' - FLAKT PURCHASE SENT TO SHOP

SYM. REVISION DATE BY CHK'D

DELIVERY LIST

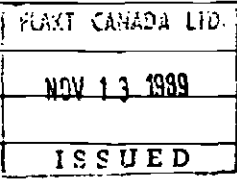
	CUSTOMER S. C. R. T. D. - METRO RAIL PROJECT A 740	DRAWN B.B.	DWG. NO. CO-A-13214	SUB. NO. 014
	PRODUCT VENTILATION FANS	CHECKED R.J.L.	SHEET 5 OF 5 ASSEMBLY DWG.	REV. NO.
CONTRACT NO. 118-324-0773	TITLE FAN SILENCERS	APPROVED	CO-D-12804	DATE JUN 26/89

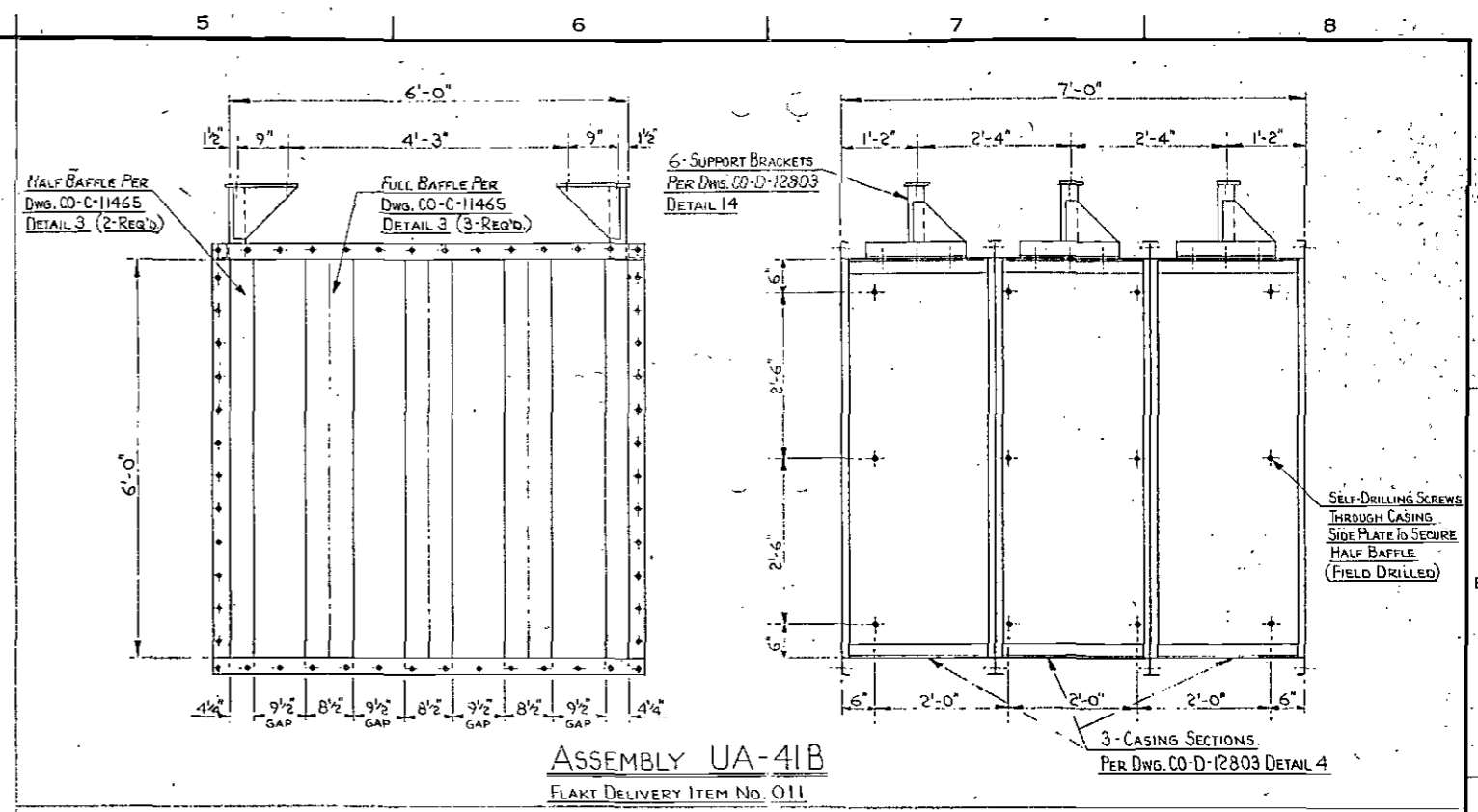
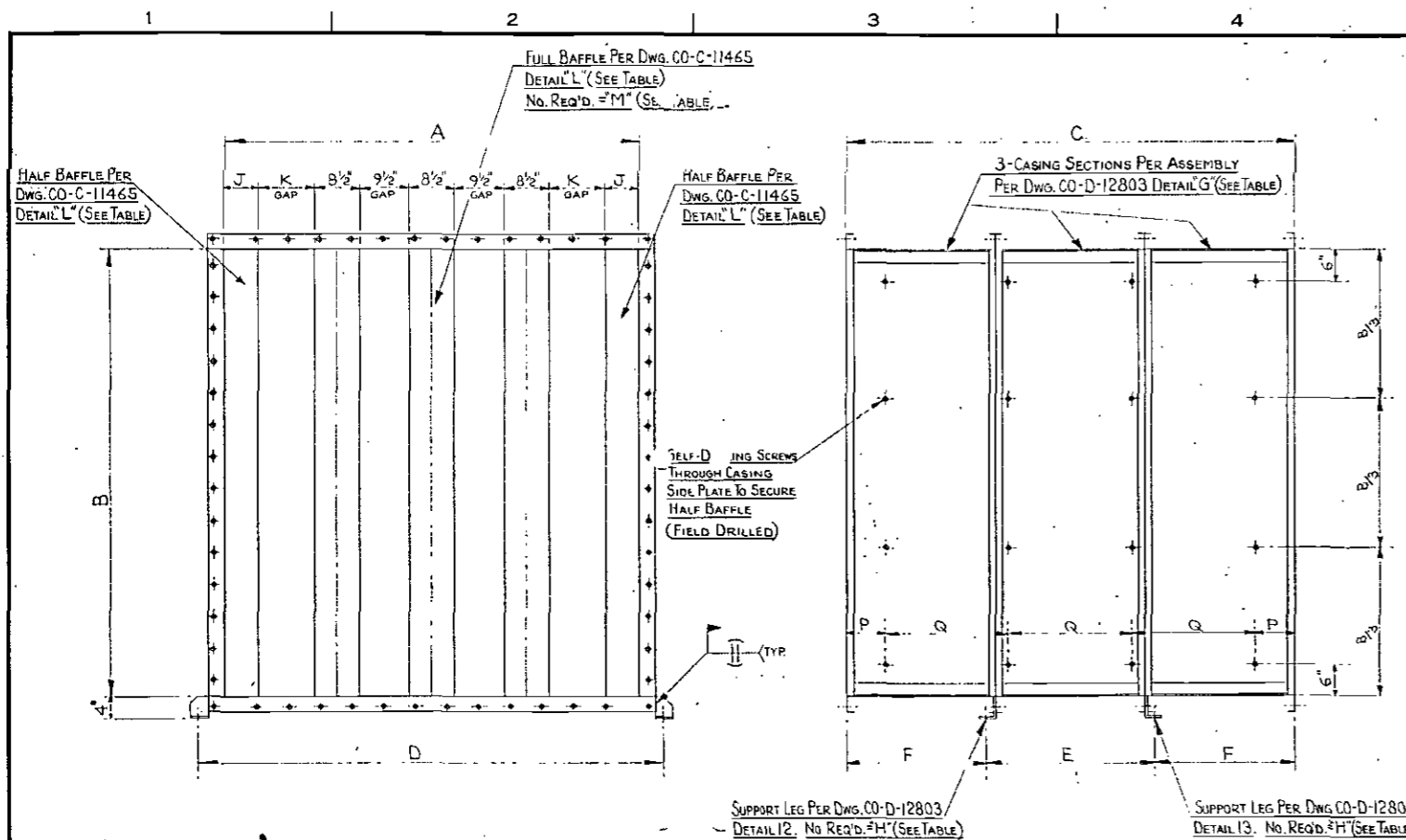
DEL. ITEM	QTY.	DESCRIPTION	DWG. No. OR DIM. AND MAT'L SPECS.	REV.	DEL. CODE	ESTIMATED WEIGHT	LINE NO.
013	1	SILENCER (6'-8" x 6'-0" x 7'-0" LG.)	CONSISTING OF :-			2,890	1
	6	SIDE PANELS	CO-D-12803 DETAIL *6				2
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL *6				3
	3	FULL BAFFLES	CO-C-11465 DETAIL *4				4
	2	HALF BAFFLES	CO-C-11465 DETAIL *4				5
014	3	SILENCER (6'-8" x 6'-0" x 7'-0" LG.)	EACH UNIT CONSISTING OF :-			8,680	7
	6	SIDE PANELS	CO-D-12803 DETAIL *6				8
	6	TOP & BOTTOM PANELS	CO-D-12803 DETAIL *6				9
	3	FULL BAFFLES	CO-C-11465 DETAIL *4				10
	2	HALF BAFFLES	CO-C-11465 DETAIL *4				11
	2	SUPPORT LEGS L.H.	CO-D-12803 DETAIL *12				12
	2	SUPPORT LEGS R.H.	CO-D-12803 DETAIL *13				13
		<u>FIELD MATERIAL</u>					14-17
015	650	CLEATS (10GA. BENT PL.)	1 1/2" x 1 1/2" x 3" LG. (DWG. CO-D-12804)			210	18
016	16,280	HEX. HD. BOLT	1/2" UNC. x 1" LG.			1,500	19
017	16,280	HEX. NUT	1/2" UNC.			610	20
018	16,280	FLAT WASHER	1/2" DIA.			300	21
019	6,650	SELF-DRILLING SCREWS	TEKS 12-14 x 3/4" HEX. WASHER HEAD TEKS/3			70	22
							23
							24
							25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

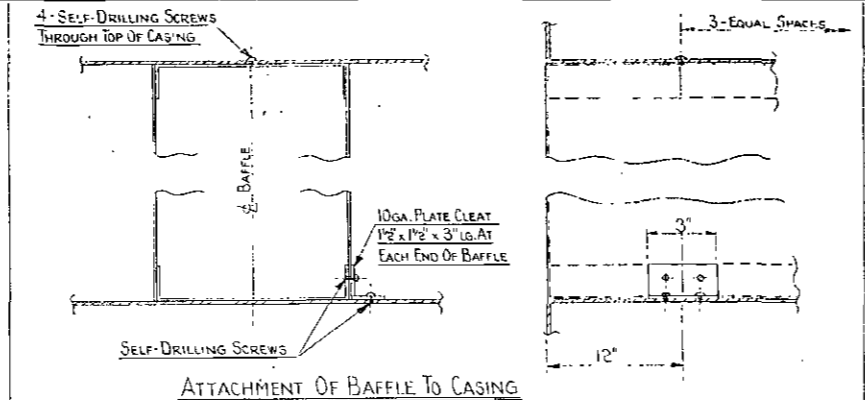
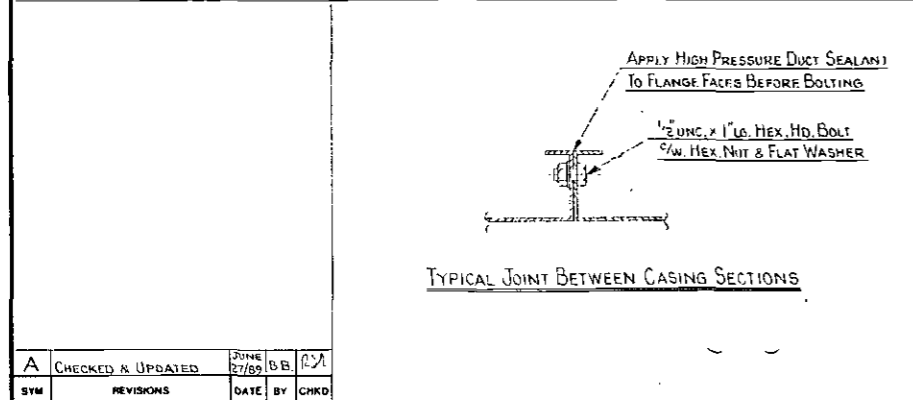
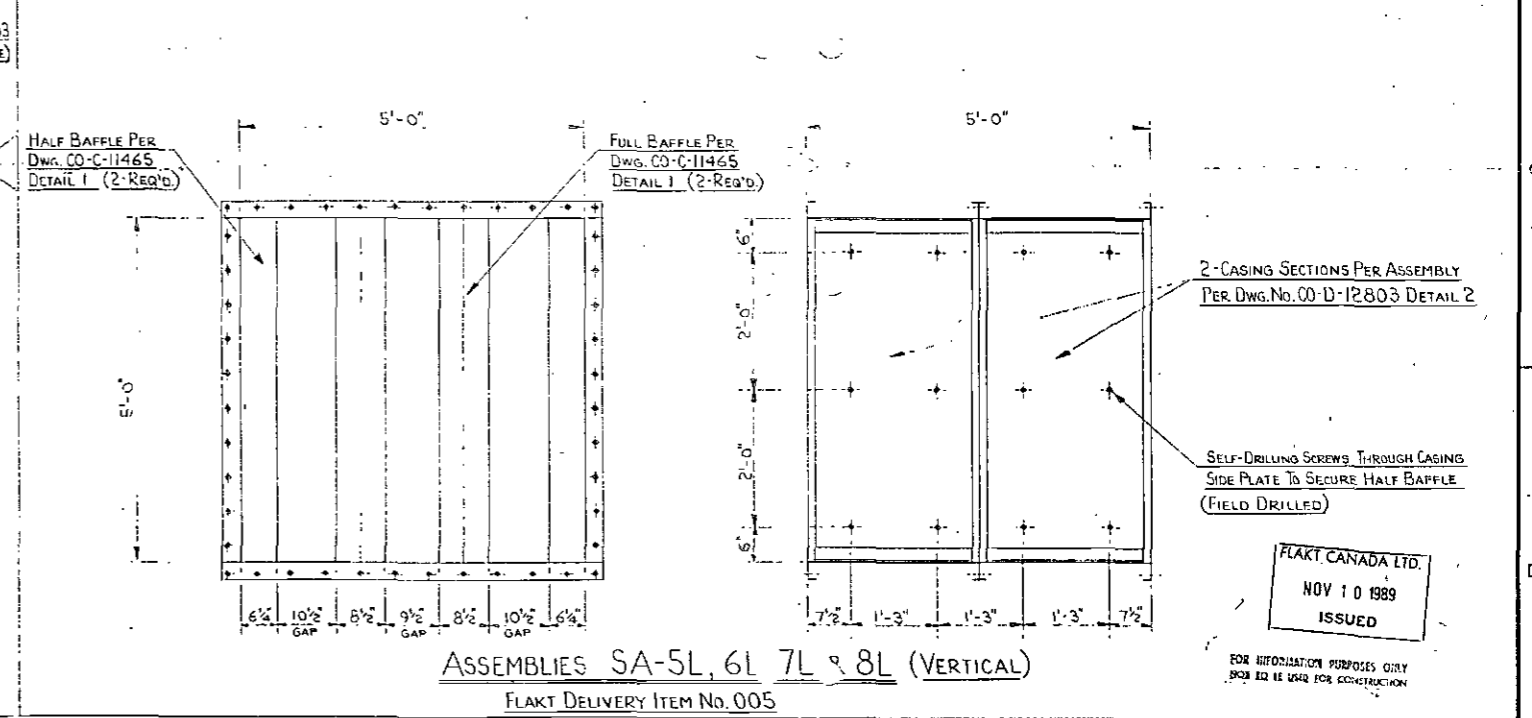
MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'S AND SUB. NO.'S CLEARLY MARKED.

TOTAL ESTIMATED WEIGHT LBS. 341,450

CRATING		ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.	
NOTE			
			
'S'	- FLAKT STOCK SENT TO FIELD		
'Sd'	- FLAKT STOCK SENT TO SHOP		
'R'	- FLAKT PURCHASE SENT TO FIELD		
'Rd'	- FLAKT PURCHASE SENT TO SHOP		
SYM.	REVISION	DATE	BY CHK'D



FLAKT DELIVERY ITEM No.	CUSTOMER DESIGNATION & EQUIPMENT No.	WIDTH A	HEIGHT B	LENGTH C	D	E	F	DETAIL G	H	J	K	DETAIL L	M	P	Q
001	EA-011 ^{A/B} , EA-012 ^{A/B} , EA-013 ^{A/B} , EA-073 ^{A/B} , EA-074 ^{A/B} , EA-083 ^{A/B} , EA-084 ^{A/B} , SA-3L, SA-4L, SA-9L, SA-10L	10'-0"	10'-0"	7'-0"	10'-9 1/2"	2'-7 1/2"	2'-2 1/4"	11	2	2 1/4"	8 1/2"	8	6	4"	2'-1 1/2"
002	EA-021 ^{A/B} , EA-022 ^{A/B} , EA-023 ^{A/B} , EA-031 ^{A/B} , EA-032 ^{A/B} , EA-041 ^{A/B} , EA-042 ^{A/B}	8'-0"	12'-0"	7'-0"	8'-9 1/2"	2'-7 1/2"	2'-2 1/4"	10	2	6 1/4"	10 1/2"	9	4	7 1/2"	1'-11"
003	EA-051 ^{A/B} , EA-052 ^{A/B} , EA-061 ^{A/B} , EA-062 ^{A/B}	8'-0"	9'-0"	7'-0"	8'-9 1/2"	2'-7 1/2"	2'-2 1/4"	9	2	6 1/4"	10 1/2"	7	4	7 1/2"	1'-11"
004	EA-071 ^{A/B} , EA-072 ^{A/B} , EA-081 ^{A/B} , EA-082 ^{A/B} , EA-091 ^{A/B} , EA-092 ^{A/B} , EA-093 ^{A/B} , EA-101 ^{A/B} , EA-102 ^{A/B}	7'-6"	10'-0"	7'-0"	8'-3 1/2"	2'-7 1/2"	2'-2 1/4"	7	2	4 1/2"	9 1/2"	8	4	5 1/2"	2'-0 3/8"
006	UA-011A	4'-10"	7'-0"	8'-0"	5'-7 1/2"	2'-11 1/2"	2'-6 1/4"	1	2	6 1/4"	9 1/2"	10	2	7 1/2"	2'-3"
007	UA-011B, UA-012 ^{A/B}	6'-6"	7'-0"	7'-0"	7'-3 1/2"	2'-7 1/2"	2'-2 1/4"	5	2	6 1/4"	10 1/2"	5	3	7 1/2"	1'-11"
008	UA-021 ^{A/B} , UA-022 ^{A/B}	5'-0"	8'-0"	7'-0"	5'-9 1/2"	2'-7 1/2"	2'-2 1/4"	3	2	6 1/4"	10 1/2"	6	2	7 1/2"	1'-11"
009	UA-031 ^{A/B} , UA-032 ^{A/B}	8'-0"	5'-0"	7'-0"	8'-9 1/2"	2'-7 1/2"	2'-2 1/4"	8	2	6 1/4"	10 1/2"	2	4	7 1/2"	1'-11"
010	UA-041A, UA-042B (VERTICAL)	6'-0"	6'-0"	7'-0"	—	—	—	4	—	4 1/4"	7 1/2"	3	3	5 1/2"	2'-0 3/8"
012	UA-042A	6'-0"	6'-0"	7'-0"	6'-9 1/2"	2'-7 1/2"	2'-2 1/4"	4	2	4 1/4"	9 1/2"	3	3	5 1/2"	2'-0 3/8"
013	UA-051A (VERTICAL)	6'-8"	6'-0"	7'-0"	—	—	—	6	—	6 1/4"	11 1/2"	4	3	7 1/2"	1'-11"
014	UA-051B, UA-052 ^{A/B}	6'-8"	6'-0"	7'-0"	7'-5 1/2"	2'-7 1/2"	2'-2 1/4"	6	2	6 1/4"	11 1/2"	4	3	7 1/2"	1'-11"



TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS) MACHINING .010" - STRUCTURAL GALV. ALL 1/16" - ALL OTHERS 1/32" NON-ACCUMULATIVE

NOTE
ALL SELF-DRILLING SCREWS TO BE TEKS 12-14 x 3/4 HEX. WASHER HEAD TEKS/3

QUANTITY	ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT

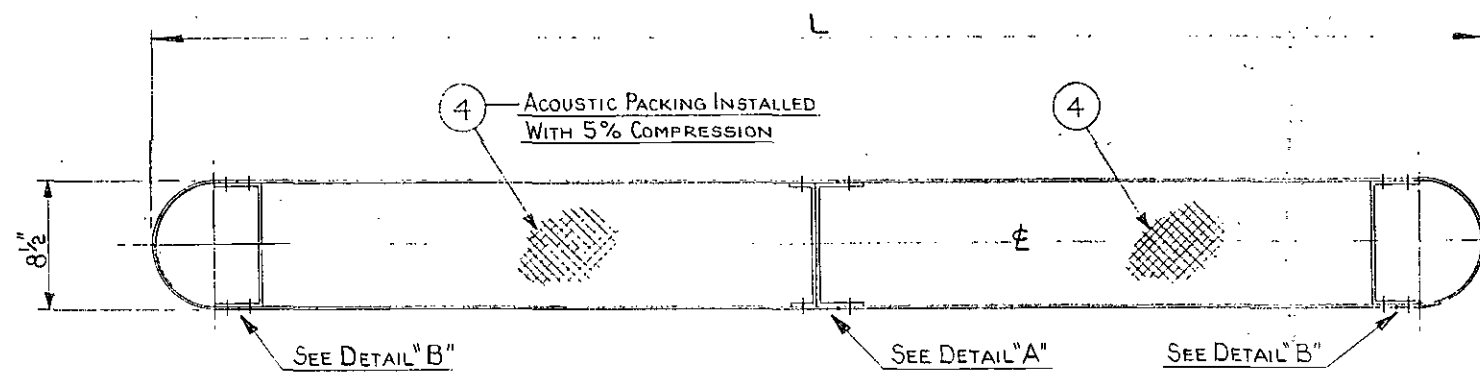
Flakt **FLAKT CANADA LTD.**

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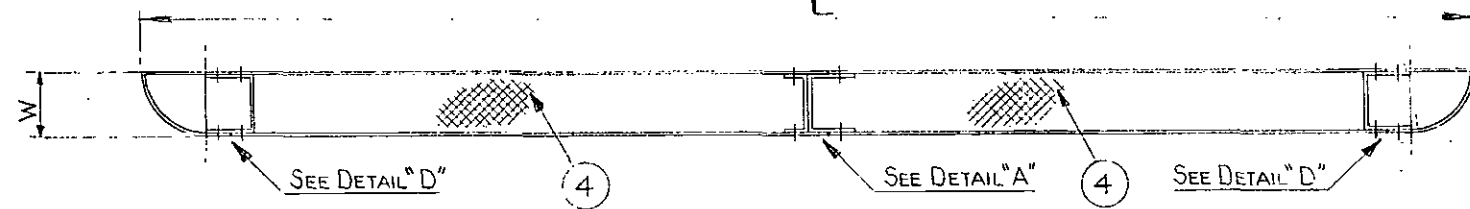
CONTRACT NO. C-118-324-0773 QUOTATION NO. SFC REG NO. NEXT ASSY. REF. DWG. DRAWN: B.B. DATE: 19 MAY 89 SUB NO: 014

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT A740
FIELD ASSEMBLY OF FAN SILENCERS

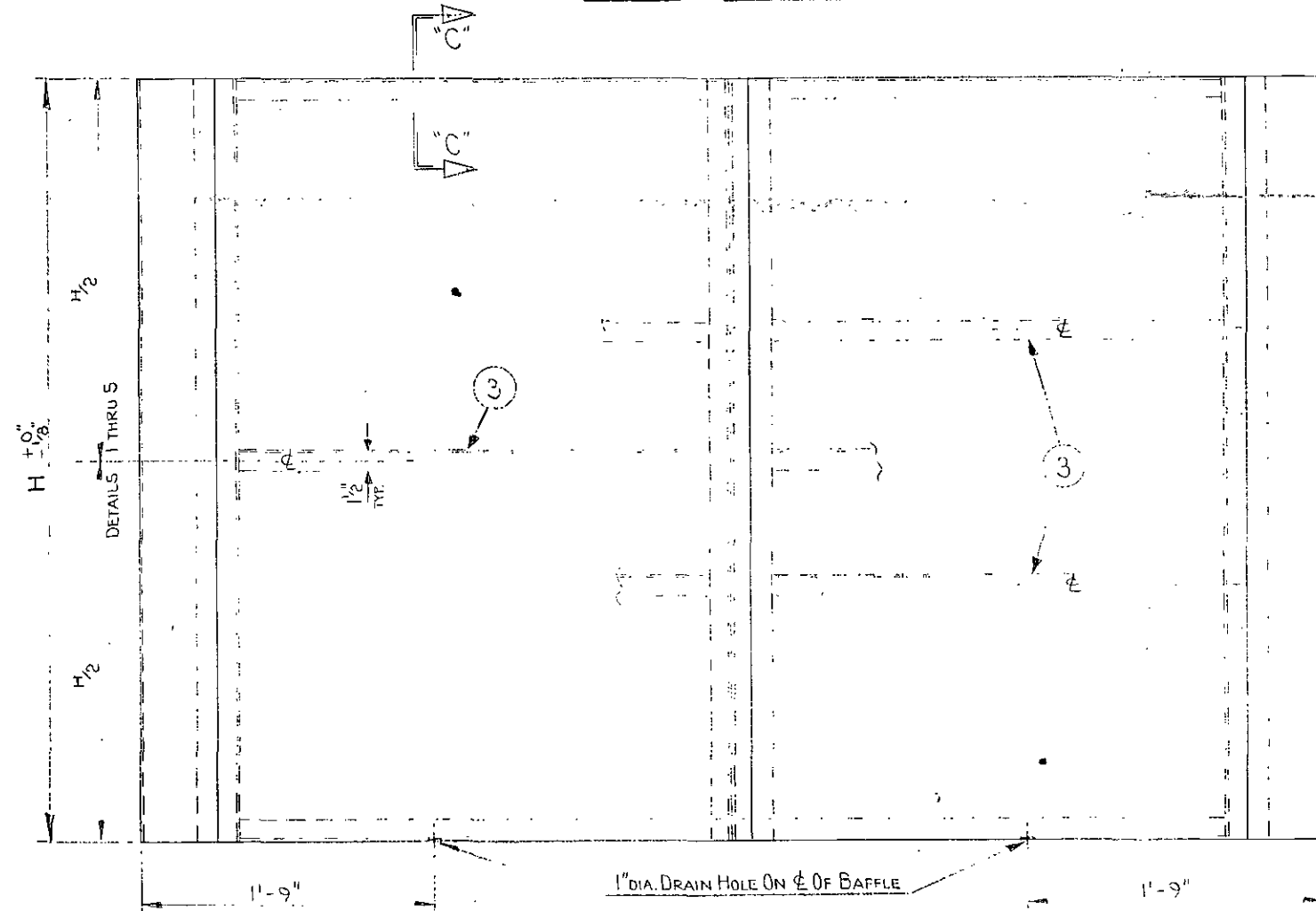
SCALE: 1/2" = 1'-0" CUSTOMERS REF. DWG NO. CO-D-12804 REV A



PLAN - FULL BAFFLE



PLAN - HALF BAFFLE

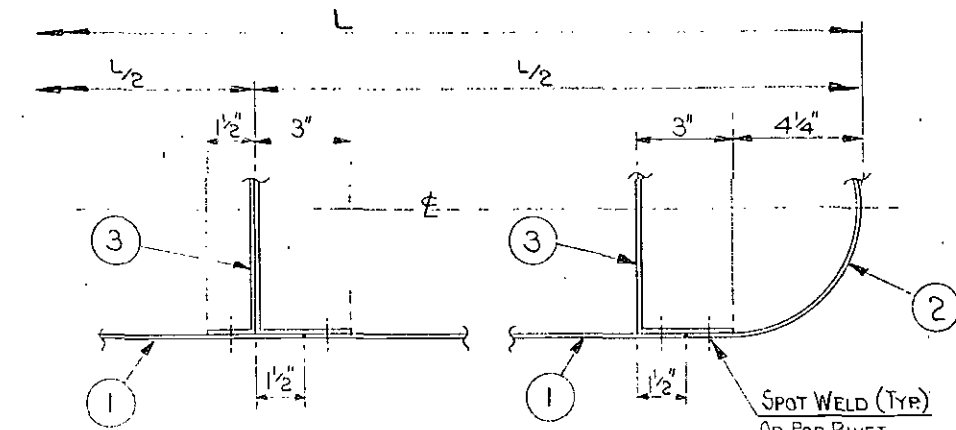


ELEVATION - ALL BAFFLES

NOTE
AFTER FABRICATION, PERFORATED SIDES OF BAFFLES TO BE COVERED WITH WATERPROOF PAPER BEFORE SHIPMENT.

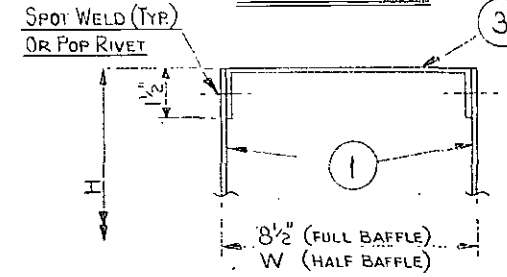
SYM.	REVISIONS	DATE	BY	CHKD
C	ADDED ITEM 5.	JULY 20/89	B.B.	
B	DELETED ACOUSTIC PACKING & TOP & BTM. CHAN. FROM NOSE SECT.	JULY 7/89	B.B.	
A	CHECKED & UPDATED	JUNE 27/89	B.B.	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

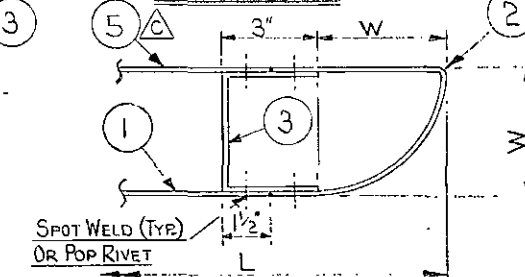


DETAIL "A"

DETAIL "B"



SECTION "C-C"



DETAIL "D"

TYPICAL AT TOP & BOTTOM OF BAFFLES

FOR INFORMATION PURPOSES ONLY
NOT TO BE USED FOR CONSTRUCTION

FLAKT CANADA LTD.
NOV 13 1989
ISSUED

FLAKT DELIVERY ITEM NO.	DETAIL NO.	ALL BAFFLES			WEIGHT (LB.)	
		L	H	W	FULL BAFFLE	HALF BAFFLE
005	1	5'-0"	5'-0"	6 1/4"	161	116
009	2	7'-0"	5'-0"	6 1/4"	226	162
010/011/012	3	7'-0"	6'-0"	4 1/4"	271	132
013/014	4	7'-0"	6'-0"	6 1/4"	271	194
007	5	7'-0"	7'-0"	6 1/4"	316	227
008	6	7'-0"	8'-0"	6 1/4"	361	259
003	7	7'-0"	9'-6"	6 1/4"	429	308
001/004	8	7'-0"	10'-0"	2 1/4"	452	175
002	9	7'-0"	12'-0"	6 1/4"	542	389
006	10	8'-0"	7'-0"	6 1/4"	361	259

QUANTITY	ITEM	DESCRIPTION	DWG. NO. OR DIM.	MATERIAL	WEIGHT
	5	PLAIN SHEET	24 GA.	GALVANISED STEEL	
	4	ACOUSTIC PACKING	1 LB./FT ³ FIBREGLASS	JOHN-SHANNVILLE MICROLIGHT UNBONDED R.S.O. (SEE REV. 5)	
	3	INTERNAL STIFFENERS	18 GA. FORMED CHANNEL	GALVANISED STEEL	
	2	PLAIN SHEET	20 GA.	GALVANISED STEEL	
	1	PERFORATED SHEET	24 GA. 34% OPEN 3/16" HOLES	GALVANISED STEEL	



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CONTRACT NO. C-118-324-0773 QUOTATION NO. SFC REG. NO. NEXT ASSY. REF. DWG. DRAWN B.B. DATE 17 MAY 89 SUB. NO. 014

SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT A740
BAFFLE DETAIL - FAN SILENCERS


SCALE 1 1/2" & 3" = 1'-0"
DWG. NO. CO-C-11465
REV C

EMERGENCY & VENTILATION FANS
OPERATION, MAINTENANCE AND INSTALLATION MANUAL

SECTION NINE

- FLEXIBLE CONNECTIONS
- SCREEN GUARDS
- TRANSITIONS

DELIVERY LIST

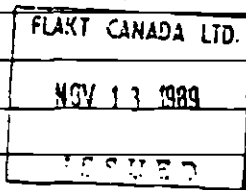
	CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13001	SUB. NO. 012
	PRODUCT VENTILATION FANS	CHECKED	SHEET 1 OF 1 ASSEMBLY DWG.	REV. NO.
CONTRACT NO. 18-324-0773	TITLE FLEXIBLE CONNECTIONS	APPROVED	DATE OCT. 31/88	LINE NO.

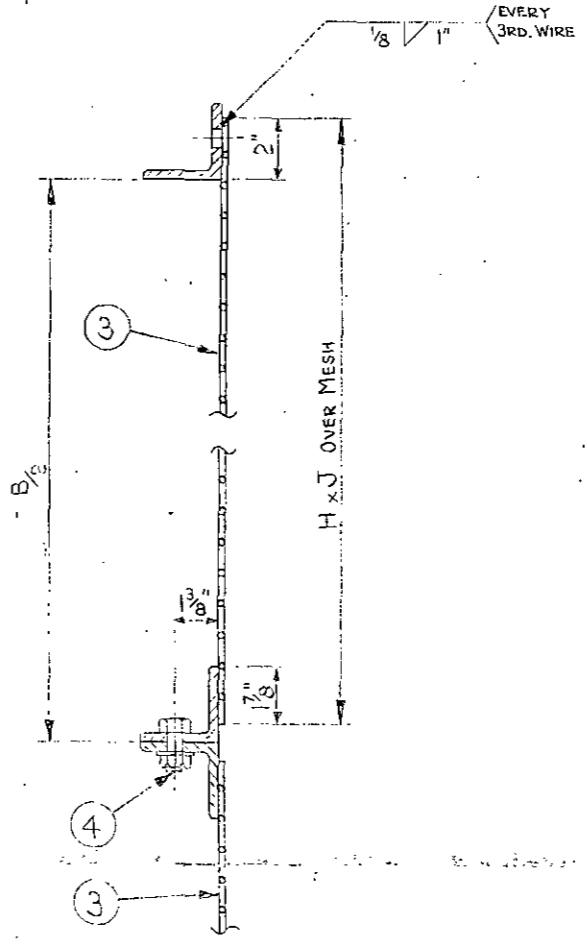
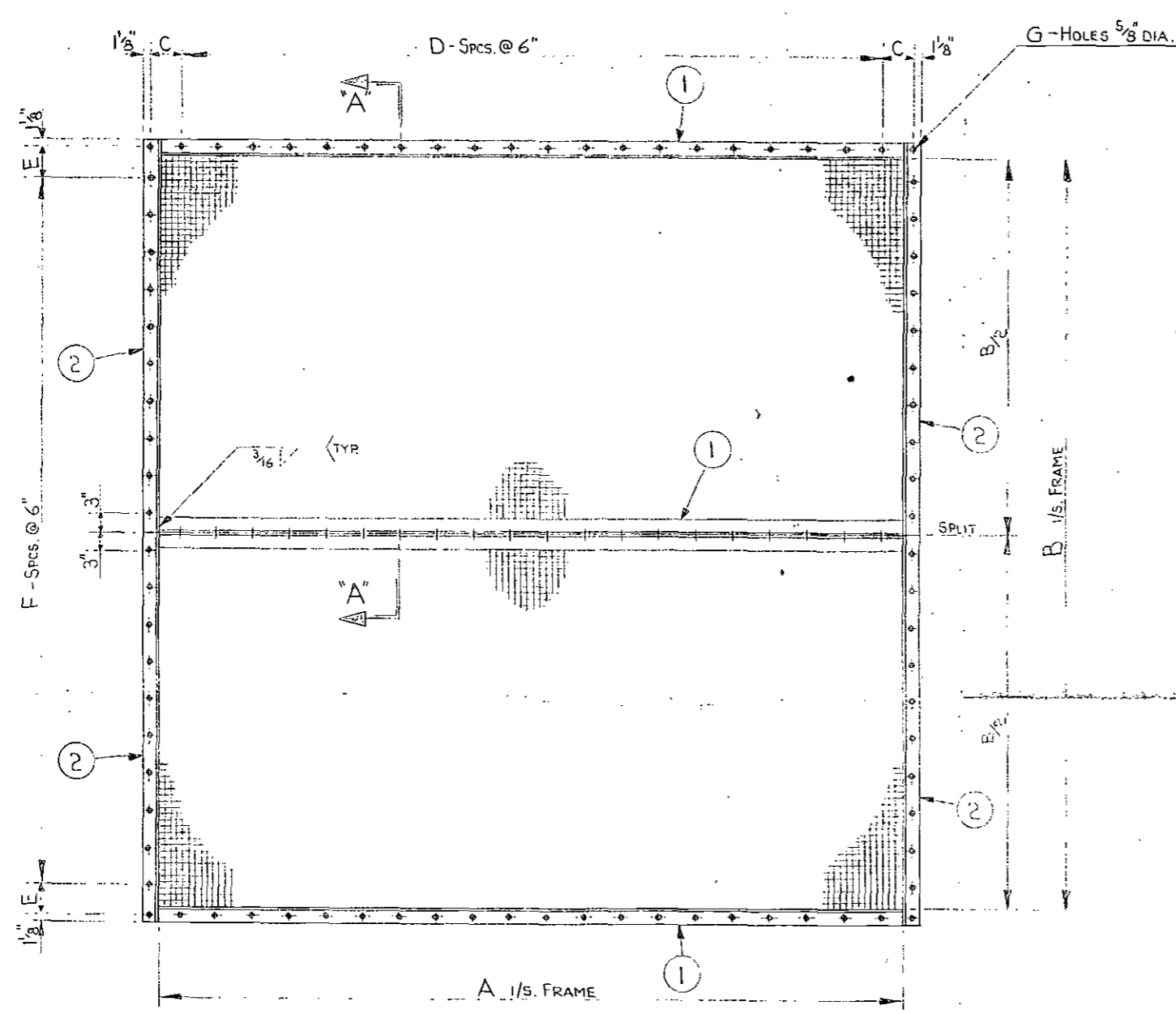
DELY. ITEM	QTY.	DESCRIPTION	DWG. No. OR DIM.	AND	MAT'L SPECS.	REV.	DELY. CODE	ESTIMATED WEIGHT	LINE NO.
		FAN ASSEMBLY EF	CO-D-12541						1
		FAN ASSEMBLY UF	CO-D-12542						2
		FAN ASSEMBLY UF-041	CO-D-12543						3
		FAN ASSEMBLY OTE	CO-D-12544						4
		FAN ASSEMBLY SVF	CO-D-12545						5
									6
									7
001	24	FLEXIBLE CONNECTION	CO-C-11151					5,640	8
									9
002	58	FLEXIBLE CONNECTION	CO-C-11152					18,850	10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO's AND SUB. NO's CLEARLY MARKED

TOTAL ESTIMATED WEIGHT LBS. 24,490

					CRATING	ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.
					NOTE	
					'S'	- FLAKT STOCK SENT TO FIELD
					'Sd'	- FLAKT STOCK SENT TO SHOP
					'R'	- FLAKT PURCHASE SENT TO FIELD
SYM.	REVISION	DATE	BY	CHK'D	'Rd'	- FLAKT PURCHASE SENT TO SHOP



SECTION "A-A"

NOTE
AFTER FABRICATION, ALL WELDS TO BE TOUCHED UP WITH ZINC RICH PAINT.

FLAKT CANADA LTD.
NOV 13 1989
ISSUED

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TOTAL WEIGHT = W I.B.

DETAIL NO.	A	B	C	D	E	F	G	H	J	K	N	W	NO. REQ'D.	FOR SILENCERS NOS.
1	4'-11 1/4"	7'-1 1/4"	4"	9"	5"	13	52	3'-8"	5'-3"	3'-9 1/2"	10	225	1	UA-011A
2	5'-1 1/4"	8'-1 1/4"	5"	9"	5"	15	56	4'-2"	5'-5"	4'-3 3/8"	10	245	2	UA-021B, UA-022A
3	7'-7 1/4"	10'-1 1/4"	8"	13	5"	19	72	5'-2"	7'-11"	5'-3 3/8"	14	360	2	EA-101B, EA-102B
4	8'-1 1/4"	9'-7 1/4"	5"	15	8"	17	72	4'-11"	8'-5"	5'-0 1/8"	16	370	4	EA-051B, EA-052B EA-061A, EA-062A
5	8'-1 1/4"	12'-1 1/4"	5"	15	5"	23	84	6'-2"	8'-5"	6'-3 3/8"	16	420	5	EA-031A, EA-032A EA-041B, EA-042B
6	10'-1 1/4"	10'-1 1/4"	5"	19	5"	19	84	5'-2"	10'-5"	5'-3 3/8"	20	445	3	EA-073B, EA-074B SA-4L

QUANTITY	ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT
4	N	HEX. HD. BOLT ^{C/W. HEX. NUT & FLAT WASHER}	1/2" UNC. x 1 1/4" LG.	S.S. 316	
3	2	WIRE MESH (10GA. x 1" SQ. MESH)	H x J	GALVANISED STEEL WIRE	
2	3	FRAME	L 2 1/2" x 2 1/2" x 5/16" K LG.	GALV. STEEL	
4	1	FRAME	L 2 1/2" x 2 1/2" x 5/16" A LG.	GALV. STEEL	



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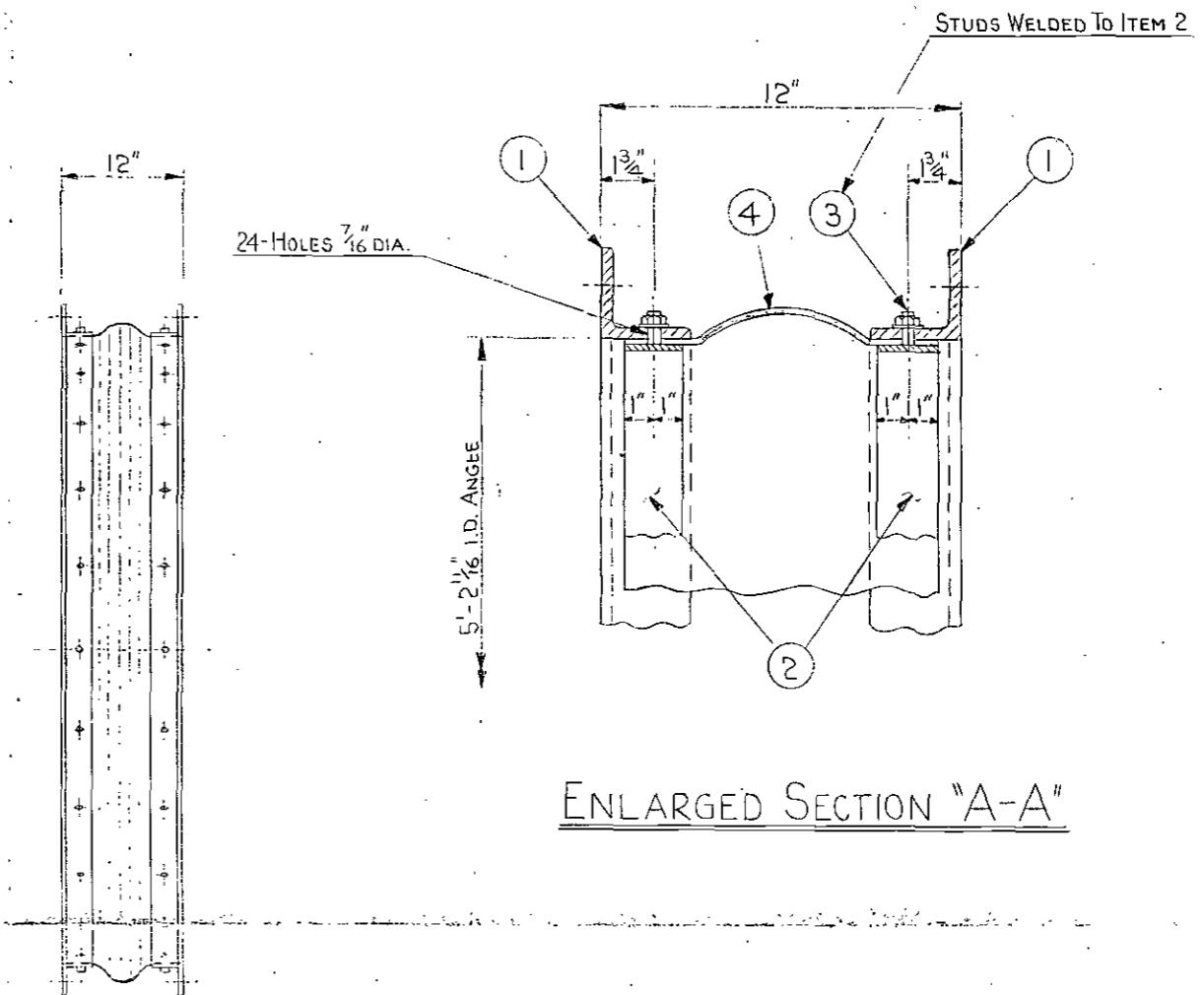
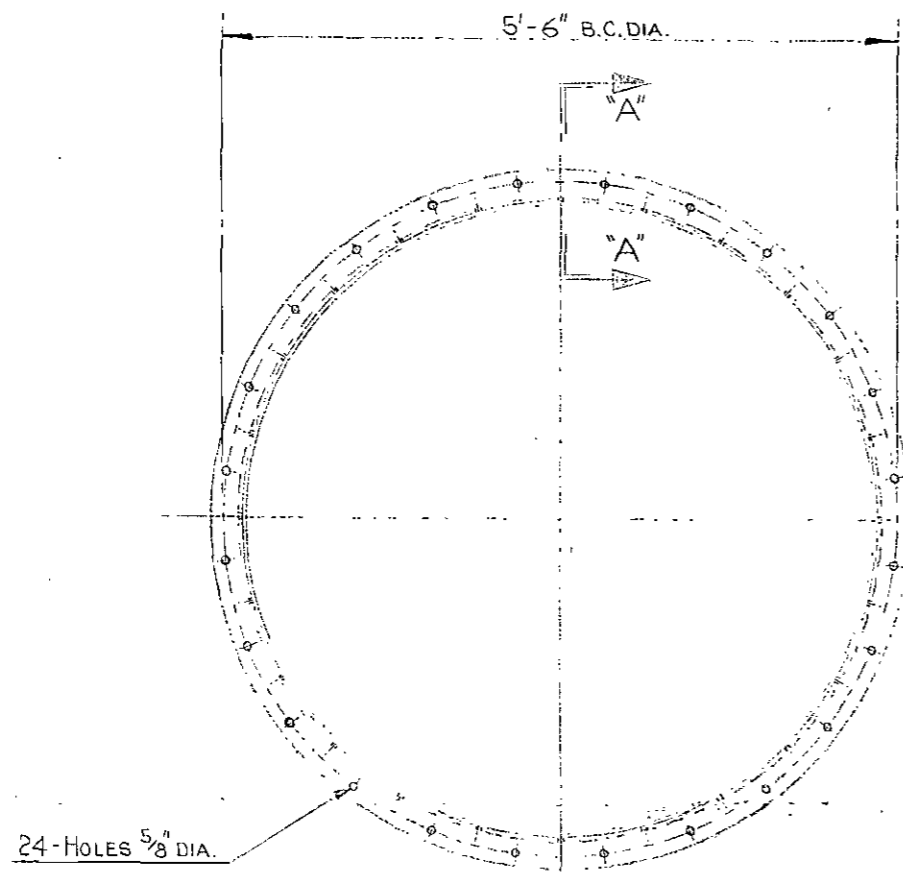
CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN B.B.	DATE 18 APR. 89	SUB. NO.
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT				CHKD.	APPROVED	DWG TYPE	

METRO RAIL PROJECT - A740
VENTILATION FANS
SCREEN GUARD DETAILS

SCALE 3/4" & 3" = 1'-0"	CUSTOMERS REF
DWG. NO. CO-C-11450	REV A

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

A	ADDED TABLE & ADDITIONAL SCREENS (DETAILS 1 THRU 5)	OCT 3/89	B.B.	
SYM.	REVISIONS	DATE	BY	CHKD



TOTAL WEIGHT = 235 LB.

FOR INFORMATION PURPOSES ONLY
NOT TO BE USED FOR CONSTRUCTION

FLAKT CANADA LTD.
NOV 13 1989
ISSUED

QUANTITY	ITEM	DESCRIPTION	DWG. NO. OR DIM.	MATERIAL	WEIGHT
1	4	FABRIC SLEEVE	FLOW FLEX STYLE NP-12		
48	3	WELD STUD ^{HEX. NUT & W. FLAT WASHER}	3/8" UNC. x 1 1/4" LG.	S.S. 316	8
2	2	CLAMPING BAR	F.B. 2" x 1/4" x 16'-4 1/2" LG.	S.S. 304	56
2	1	FLANGE	L 3" x 3" x 1/4" x 17'-3 1/2" LG.	A-36	170

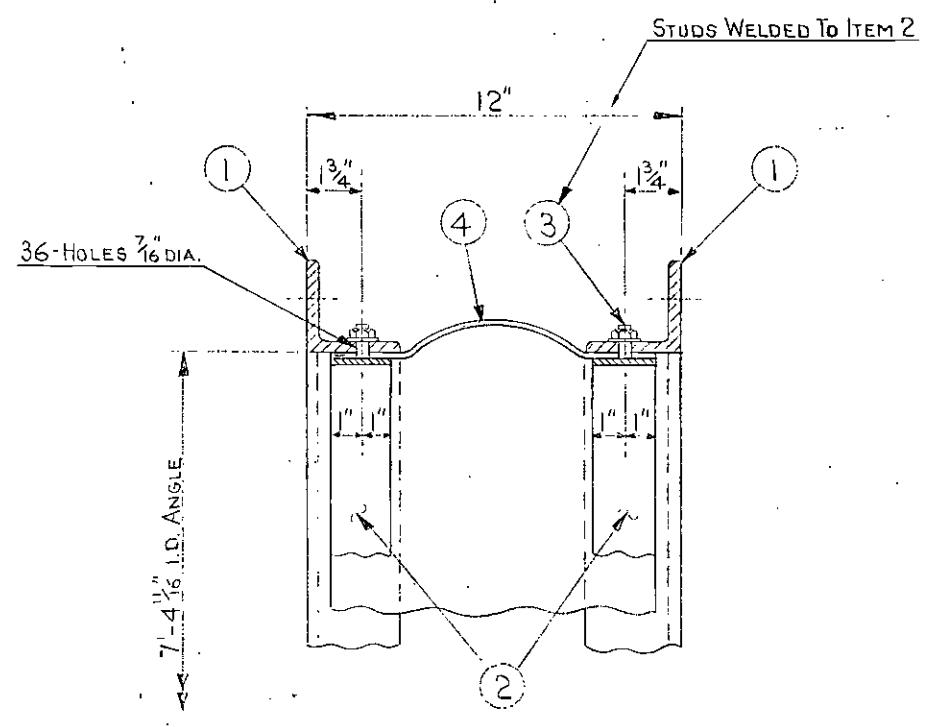
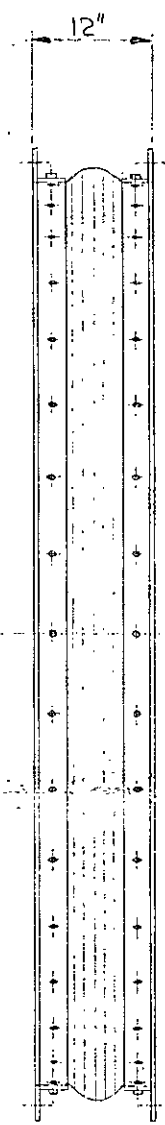
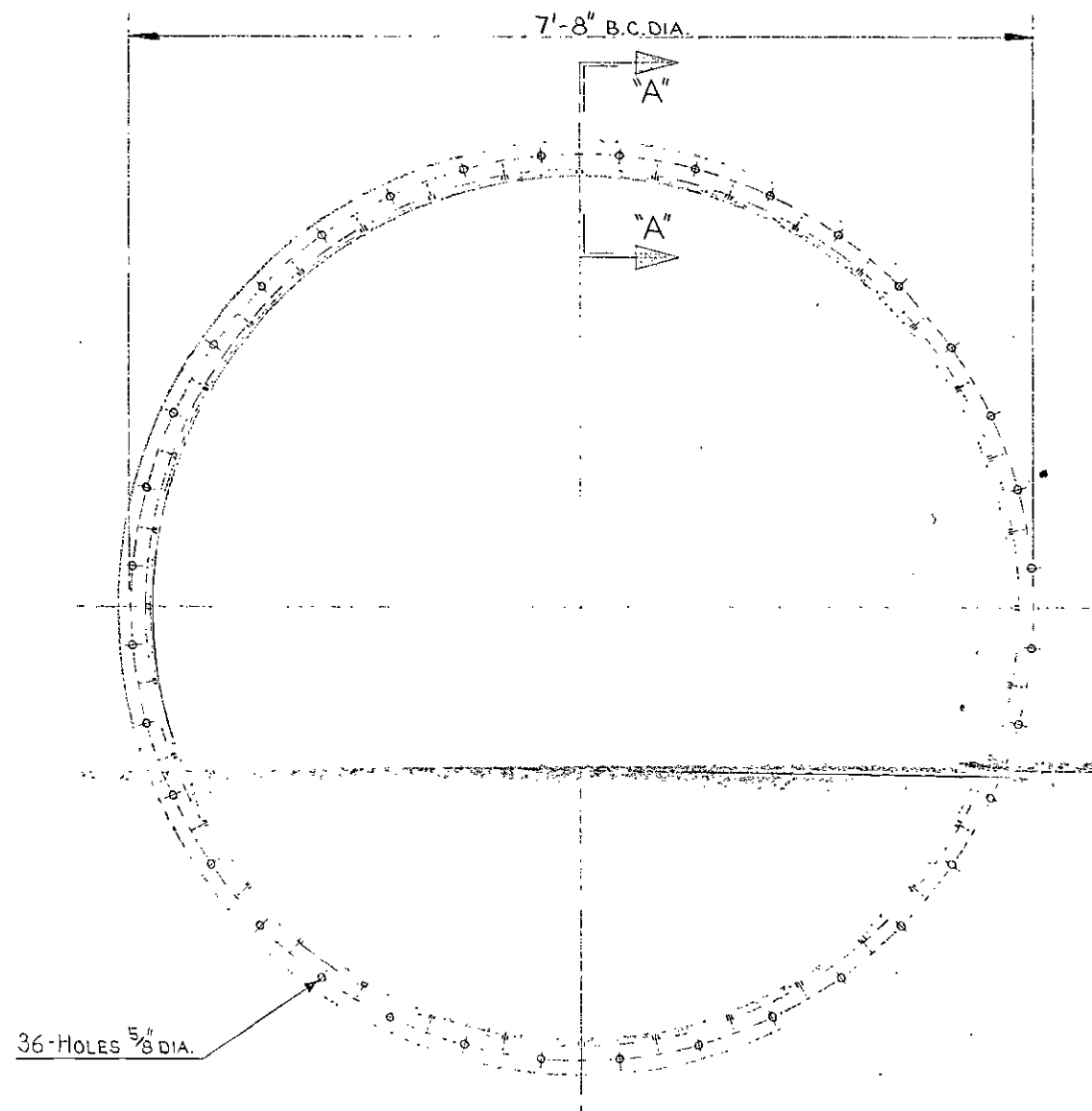


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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN B.B.	DATE 20 MAY 89
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT				CHKD.	APPROVED	SUB. NO.
METRO RAIL PROJECT - A740				SCALE 1" & 3" = 1'-0"	CUSTOMERS REF.	
FLEXIBLE CONNECTION - FANS UF & OTE				DWG. NO. CO-C-11151	REV A	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

A	FABRIC SLEEVE MATERIAL WAS TEXCOAT 300	JULY 21/89	B.B.	
SYM.	REVISIONS	DATE	BY	CHKD



ENLARGED SECTION "A-A"

TOTAL WEIGHT = 325 LB.

FOR INFORMATION PURPOSES ONLY
BOX TO BE USED FOR CONSTRUCTION

FLAKT CANADA LTD.
NOV 13 1988
ISSUED

QUANTITY	ITEM	DESCRIPTION	DWG. NO. OR DIM.	MATERIAL	WEIGHT
1	4	FABRIC SLEEVE	FLOW FLEX STYLE NP-12		
72	3	WELD STUD ^{HEX. NUT & W. FLAT WASHER}	^{3/8" UNC. x 1 1/4" LG.}	S.S. 316	11
2	2	CLAMPING BAR	F.B. 2" x 1/4" x 23'-1" LG.	S.S. 304	78
2	1	FLANGE	L 3' x 3' x 1/4" x 24'-1" LG.	A-36	236



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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY	REF. DWG.	DRAWN B.B.	DATE 24 MAY 88	SUB. NO.
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT				METRO RAIL PROJECT - A740		SCALE 1" & 3" = 1'-0"	
FLEXIBLE CONNECTION - FANS EF & SVF				CUSTOMERS REF. CO-C-11152		REV A	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

A	FABRIC SLEEVE MATERIAL WAS TEXCOAT 300	JULY 21/89	B.B.	
SYM.	REVISIONS	DATE	BY	CHKD

DELIVERY LIST

	CUSTOMER	S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN	B.B.	DWG. NO.	CO-A-13058	SUB NO.	006
	PRODUCT	VENTILATION FANS	CHECKED		SHEET 1 OF 11	ASSEMBLY DWG.	REV. NO.	
CONTRACT NO.	C-118-324-0773	TITLE	TRANSITION SECTIONS		APPROVED		DATE	DEC. 22/88

DELY ITEM	QTY.	DESCRIPTION	DWG No. OR DIM.	AND	MAT'L SPECS.	REV.	DELY. CODE	ESTIMATED WEIGHT	LINE NO
001	1	TRANSITION UT-011A (IN 2-SECTIONS)	CO-C-11332					1570	1
									2
									3
002	1	TRANSITION UT-011B (IN 2-SECTIONS)	CO-C-11333					1510	4
									5
									6
003	1	TRANSITION UT-012A (IN 2-SECTIONS)	CO-C-11332					1440	7
									8
									9
004	1	TRANSITION UT-012B (IN 2-SECTIONS)	CO-C-11332					1440	10
									11
									12
005	1	TRANSITION UT-021A (IN 2-SECTIONS)	CO-C-11334					1560	13
									14
									15
006	1	TRANSITION UT-021B (IN 2-SECTIONS)	CO-C-11334					1560	16
									17
									18
007	1	TRANSITION UT-022A (IN 2-SECTIONS)	CO-C-11334					1490	19
									20
									21
008	1	TRANSITION UT-022B (IN 2-SECTIONS)	CO-C-11334					1490	22
									23
									24
									25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'s AND SUB. NO.'s CLEARLY MARKED.

TOTAL ESTIMATED WEIGHT LBS. KG.

CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.

FLAKT CANADA LTD.
NOV 13 1989
ISSUED

NOTE

'S' - FLAKT STOCK SENT TO FIELD

'sd' - FLAKT STOCK SENT TO SHOP

'R' - FLAKT PURCHASE SENT TO FIELD

'rd' - FLAKT PURCHASE SENT TO SHOP

SYM REVISION DATE BY CHK'D

DELIVERY LIST



CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13058	SUB. NO. 006
PRODUCT VENTILATION FANS	CHECKED	SHEET 2 of 11	REV. NO.
CONTRACT NO. 118-324-0773	TITLE TRANSITION SECTIONS	ASSEMBLY DWG.	DATE DEC. 22/88

DELY ITEM	QTY.	DESCRIPTION	DWG No OR DIM.	AND	MAT'L SPECS.	REV.	DELY CODE	ESTIMATED WEIGHT	LINE NO
009	1	TRANSITION UT-031A (IN 2-SECTIONS)	CO-C-11335					1520	1
010	1	TRANSITION UT-031B (IN 2-SECTIONS)	CO-C-11335					1520	4
011	1	TRANSITION UT-032A (IN 2-SECTIONS)	CO-C-11335					1490	7
012	1	TRANSITION UT-032B (IN 2-SECTIONS)	CO-C-11335					1490	10
013	1	TRANSITION UT-041A (IN 2-SECTIONS)	CO-C-11336					600	13
014	1	TRANSITION UT-041B (IN 2-SECTIONS)	CO-C-11336					600	16
015	1	TRANSITION UT-042A (IN 2-SECTIONS)	CO-C-11337					930	19
016	1	TRANSITION UT-042B (IN 2-SECTIONS)	CO-C-11337					930	22

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'S AND SUB. NO.'S CLEARLY MARKED

TOTAL LBS
ESTIMATED WEIGHT KG.

CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES

NOTE

FLAKT CANADA LTD.
NOV 13 1989
ISSUED

- S - FLAKT STOCK SENT TO FIELD
- Sd - FLAKT STOCK SENT TO SHOP
- R - FLAKT PURCHASE SENT TO FIELD
- Rd - FLAKT PURCHASE SENT TO SHOP

SYM REVISION DATE BY CHK'D

DELIVERY LIST



CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13058	SUB NO. 006
PRODUCT VENTILATION FANS	CHECKED	SHEET 3 of 11	REV. NO.
TITLE TRANSITION SECTIONS	APPROVED	ASSEMBLY DWG.	DATE DEC. 22/88

CONTRACT NO.
C-118-324-0773

DELV ITEM	QTY.	DESCRIPTION	DWG No OR DIM.	AND	MAT'L SPECS.	REV.	DELV CODE	ESTIMATED WEIGHT	LINE NO
017	1	TRANSITION UT-051A (IN 2-SECTIONS)	CO-C-11338					1420	1
018	1	TRANSITION UT-051B (IN 2-SECTIONS)	CO-C-11338					1420	4
019	1	TRANSITION UT-052A (IN 2-SECTIONS)	CO-C-11338					920	7
020	1	TRANSITION UT-052B (IN 2-SECTIONS)	CO-C-11338					920	10
021	1	TRANSITION OT-1LA (IN 2-SECTIONS)	CO-C-11339					870	13
022	1	TRANSITION OT-1LB (IN 2-SECTIONS)	CO-C-11339					870	16
023	1	TRANSITION OT-2LA (IN 2-SECTIONS)	CO-C-11339					810	19
024	1	TRANSITION OT-2LB (IN 2-SECTIONS)	CO-C-11339					810	22

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

TOTAL ESTIMATED WEIGHT LBS. / KG.

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'S AND SUB NO.'S CLEARLY MARKED.

CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES

FLAKT CANADA LTD.
NOV 13 1988
ISSUED

'S' - FLAKT STOCK SENT TO FIELD

'So' - FLAKT STOCK SENT TO SHOP

'R' - FLAKT PURCHASE SENT TO FIELD

'Rd' - FLAKT PURCHASE SENT TO SHOP

SYM. REVISION DATE BY CHK'D

DELIVERY LIST



CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13058	SUB NO. 006
PRODUCT VENTILATION FANS	CHECKED	SHEET 4 OF 11	REV. NO.
CONTRACT NO. C-118-324-0773	TITLE TRANSITION SECTIONS	APPROVED	DATE DEC. 22/88

DELY. ITEM	QTY.	DESCRIPTION	DWG No OR DIM.	AND	MAT'L SPECS.	REV.	DELY. CODE	ESTIMATED WEIGHT	LINE NO
025	1	TRANSITION ET-011A (IN 4-SECTIONS)	CO-C-11340					2050	1
026	1	TRANSITION ET-011B (IN 4-SECTIONS)	CO-C-11340					2050	4
027	1	TRANSITION ET-012A (IN 4-SECTIONS)	CO-C-11340					2050	7
028	1	TRANSITION ET-012B (IN 4-SECTIONS)	CO-C-11340					2050	10
029	1	TRANSITION ET-013A (IN 4-SECTIONS)	CO-C-11340					2050	13
030	1	TRANSITION ET-013B (IN 4-SECTIONS)	CO-C-11340					2050	16
031	1	TRANSITION ET-021A (IN 4-SECTIONS)	CO-C-11341					2670	19
032	1	TRANSITION ET-021B (IN 4-SECTIONS)	CO-C-11341					2670	22

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'S AND SUB NO.'S CLEARLY MARKED

TOTAL ESTIMATED WEIGHT LBS. KG.

CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.

NOTE:

S - FLAKT STOCK SENT TO FIELD

Sd - FLAKT STOCK SENT TO SHOP

R - FLAKT PURCHASE SENT TO FIELD

Rd - FLAKT PURCHASE SENT TO SHOP

FLAKT CANADA LTD.
NOV 13 1988
ISSUED

DELIVERY LIST



CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13058	SUB NO. 006
PRODUCT VENTILATION FANS	CHECKED	SHEET 5 OF 11	REV. NO.
TITLE TRANSITION SECTIONS	APPROVED	ASSEMBLY DWG.	DATE DEC. 22/88

CONTRACT NO.
C-118-324-0773

DELY ITEM	QTY.	DESCRIPTION	DWG No OR DIM.	AND	MAT'L SPECS.	REV.	DELY CODE	ESTIMATED WEIGHT	LINE NO
033	1	TRANSITION ET-022A (IN 4-SECTIONS)	CO-C-11341					2670	1
									2
									3
034	1	TRANSITION ET-022B (IN 4-SECTIONS)	CO-C-11341					2670	4
									5
									6
035	1	TRANSITION ET-023A (IN 4-SECTIONS)	CO-C-11341					2670	7
									8
									9
036	1	TRANSITION ET-023B (IN 4-SECTIONS)	CO-C-11341					2670	10
									11
									12
037	1	TRANSITION ET-031A (IN 4-SECTIONS)	CO-C-11341					2450	13
									14
									15
038	1	TRANSITION ET-031B (IN 4-SECTIONS)	CO-C-11341					2450	16
									17
									18
039	1	TRANSITION ET-032A (IN 4-SECTIONS)	CO-C-11341					2450	19
									20
									21
040	1	TRANSITION ET-032B (IN 4-SECTIONS)	CO-C-11341					2450	22
									23
									24
									25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'s AND SUB NO.'s CLEARLY MARKED.

TOTAL ESTIMATED WEIGHT LBS
KG

CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES

FLAKT CANADA LTD.
NOV 13 1988
ISSUED

NOTE

S - FLAKT STOCK SENT TO FIELD

Sd - FLAKT STOCK SENT TO SHOP

R - FLAKT PURCHASE SENT TO FIELD

Rd - FLAKT PURCHASE SENT TO SHOP

SYM REVISION DATE BY CHK'D

DELIVERY LIST



CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13058	SUB. NO. 006
PRODUCT VENTILATION FANS	CHECKED	SHEET 6 OF 11	REV. NO.
CONTRACT NO. 0-118-324-0773	TITLE TRANSITION SECTIONS	APPROVED	DATE DEC. 22/88

DELY ITEM	QTY.	DESCRIPTION	DWG No OR DIM.	AND	MAT'L SPECS.	REV.	DELY CODE	ESTIMATED WEIGHT	LINE NO
041	1	TRANSITION ET-041A (IN 4-SECTIONS)	CO-C-11341					2450	1
									2
									3
042	1	TRANSITION ET-041B (IN 4-SECTIONS)	CO-C-11341					2450	4
									5
									6
043	1	TRANSITION ET-042A (IN 4-SECTIONS)	CO-C-11341					2450	7
									8
									9
044	1	TRANSITION ET-042B (IN 4-SECTIONS)	CO-C-11341					2450	10
									11
									12
045	1	TRANSITION ET-051A (IN 4-SECTIONS)	CO-C-11342					1870	13
									14
									15
046	1	TRANSITION ET-051B (IN 4-SECTIONS)	CO-C-11342					1870	16
									17
									18
047	1	TRANSITION ET-052A (IN 4-SECTIONS)	CO-C-11342					1870	19
									20
									21
048	1	TRANSITION ET-052B (IN 4-SECTIONS)	CO-C-11342					1870	22
									23
									24
									25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

TOTAL LBS.
ESTIMATED WEIGHT, KG.

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO'S AND SUB NO'S CLEARLY MARKED

FLAKT CANADA LTD.
NOV 13 1988
ISSUED


CRATING - ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.

NOTE

- S - FLAKT STOCK SENT TO FIELD
- Sd - FLAKT STOCK SENT TO SHOP
- R - FLAKT PURCHASE SENT TO FIELD
- Rd - FLAKT PURCHASE SENT TO SHOP

SYM	REVISION	DATE	BY	CHK'D
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DELIVERY LIST

	CUSTOMER	S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN	B.B.	DWG. NO.	CO-A-13058	SUB NO.	006
	PRODUCT	VENTILATION FANS	CHECKED		SHEET 8 of 11	ASSEMBLY DWG.	REV. NO.	
CONTRACT NO.	118-324-0773	TITLE	TRANSITION SECTIONS	APPROVED			DATE	DEC. 22/88

DELY ITEM	QTY	DESCRIPTION	DWG No OR DIM.	AND	MAT'L SPECS.	REV.	DELY. CODE	ESTIMATED WEIGHT	LINE NO
057	1	TRANSITION ET-073A (IN 4-SECTIONS)	CO-C-11340					1980	1
									2
									3
058	1	TRANSITION ET-073B (IN 4-SECTIONS)	CO-C-11340					1980	4
									5
									6
059	1	TRANSITION ET-074A (IN 4-SECTIONS)	CO-C-11340					1980	7
									8
									9
060	1	TRANSITION ET-074B (IN 4-SECTIONS)	CO-C-11340					1980	10
									11
									12
061	1	TRANSITION ET-081A (IN 4-SECTIONS)	CO-C-11343					1900	13
									14
									15
062	1	TRANSITION ET-081B (IN 4-SECTIONS)	CO-C-11343					1900	16
									17
									18
063	1	TRANSITION ET-082A (IN 4-SECTIONS)	CO-C-11343					1900	19
									20
									21
064	1	TRANSITION ET-082B (IN 4-SECTIONS)	CO-C-11343					1900	22
									23
									24
									25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO'S AND SUB NO'S CLEARLY MARKED

TOTAL ESTIMATED WEIGHT LBS. KG.

FLAKT CANADA LTD.
NOV 13 1989
ISSUED


CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.

NOTE

- S - FLAKT STOCK SENT TO FIELD
- Sd - FLAKT STOCK SENT TO SHOP
- R - FLAKT PURCHASE SENT TO FIELD
- Rd - FLAKT PURCHASE SENT TO SHOP

SYM. REVISION DATE BY CHK'D

DELIVERY LIST

	CUSTOMER	S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN	B.B.	DWG. NO.	CO-A-13058	SUB. NO.	006
	PRODUCT	VENTILATION FANS	CHECKED		SHEET	9 OF 11	REV. NO.	
CONTRACT NO.	-118-324-0773	TITLE	TRANSITION SECTIONS	APPROVED	ASSEMBLY DWG.		DATE	DEC. 22/88

DELY. ITEM	QTY.	DESCRIPTION	DWG No OR DIM.	AND	MAT'L SPECS.	REV.	DELY. CODE	ESTIMATED WEIGHT	LINE NO
065	1	TRANSITION ET-083A (IN 4-SECTIONS)	CO-C-11340					1980	1
									2
									3
066	1	TRANSITION ET-083B (IN 4-SECTIONS)	CO-C-11340					1980	4
									5
									6
067	1	TRANSITION ET-084A (IN 4-SECTIONS)	CO-C-11340					1980	7
									8
									9
068	1	TRANSITION ET-084B (IN 4-SECTIONS)	CO-C-11340					1980	10
									11
									12
069	1	TRANSITION ET-091A (IN 4-SECTIONS)	CO-C-11343					1870	13
									14
									15
070	1	TRANSITION ET-091B (IN 4-SECTIONS)	CO-C-11343					1870	16
									17
									18
071	1	TRANSITION ET-092A (IN 4-SECTIONS)	CO-C-11343					1870	19
									20
									21
072	1	TRANSITION ET-092B (IN 4-SECTIONS)	CO-C-11343					1870	22
									23
									24
									25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS					TOTAL ESTIMATED WEIGHT		LBS
MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO.'S AND SUB NO.'S CLEARLY MARKED.					WEIGHT		KG.
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> FLAKT CANADA LTD. NOV 13 1989 ISSUED </div>			CRATING		ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES		
			NOTE				
			S		- FLAKT STOCK SENT TO FIELD		
			Sd		- FLAKT STOCK SENT TO SHOP		
			R		- FLAKT PURCHASE SENT TO FIELD		
SYM			REVISION		DATE BY CHK'D		
			Rd		- FLAKT PURCHASE SENT TO SHOP		

DELIVERY LIST



CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13058	SUB. NO. 006
PRODUCT VENTILATION FANS	CHECKED	SHEET 10 of 11 ASSEMBLY DWG.	
TITLE TRANSITION SECTIONS	APPROVED	DATE DEC. 22/88	

CONTRACT NO
C-118-324-0773

DELY. ITEM	QTY.	DESCRIPTION	DWG No OR DIM. AND MAT'L SPECS.	REV.	DELY. CODE	ESTIMATED WEIGHT	LINE NO
073	1	TRANSITION ET-093A (IN 4-SECTIONS)	CO-C-11343			1870	1
							2
							3
074	1	TRANSITION ET-093B (IN 4-SECTIONS)	CO-C-11343			1870	4
							5
							6
075	1	TRANSITION ET-101A (IN 4-SECTIONS)	CO-C-11343			1870	7
							8
							9
076	1	TRANSITION ET-101B (IN 4-SECTIONS)	CO-C-11343			1870	10
							11
							12
077	1	TRANSITION ET-102A (IN 4-SECTIONS)	CO-C-11343			1870	13
							14
							15
078	1	TRANSITION ET-102B (IN 4-SECTIONS)	CO-C-11343			1870	16
							17
							18
079	1	TRANSITION ST-1LA (IN 4-SECTIONS)	CO-C-11340			1800	19
							20
							21
080	1	TRANSITION ST-1LB (IN 4-SECTIONS)	CO-C-11340			1800	22
							23
							24
							25

NOTE - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO'S AND SUB NO'S CLEARLY MARKED.

TOTAL ESTIMATED WEIGHT LBS. KG.

CRATING ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES.

FLAKT CANADA LTD.

NOV 13 1989

ISSUED

S - FLAKT STOCK SENT TO FIELD

Sd - FLAKT STOCK SENT TO SHOP

R - FLAKT PURCHASE SENT TO FIELD

Rd - FLAKT PURCHASE SENT TO SHOP

SYM. REVISION DATE BY CHK'D

DELIVERY LIST



CUSTOMER S.C.R.T.D. - METRO RAIL PROJECT A740	DRAWN B.B.	DWG. NO. CO-A-13058	SUB. NO. 006
PRODUCT VENTILATION FANS	CHECKED	SHEET 11 OF 11	REV. NO.
TITLE TRANSITION SECTIONS	APPROVED	ASSEMBLY DWG.	DATE DEC 22/88

CONTRACT NO.
-118-324-0773

DELY ITEM	QTY	DESCRIPTION	DWG No OR DIM.	AND	MAT'L SPECS.	REV.	DELY CODE	ESTIMATED WEIGHT	LINE NO
081	1	TRANSITION ST-2LA (IN 4-SECTIONS)	CO-C-11340					1850	1
									2
									3
082	1	TRANSITION ST-2LB (IN 4-SECTIONS)	CO-C-11340					1850	4
									5
									6
									7
									8
									9
		FLANGE DETAILS	CO-C-11344						10
		SHOP FABRICATION DETAILS	CO-C-11345						11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25

NOTE: - REFER TO ASSEMBLY DRAWINGS FOR LOCATION OF ITEMS

MARKING: ALL SHIPPING ITEMS TO HAVE DELIVERY ITEM NO'S AND SUB NO'S CLEARLY MARKED

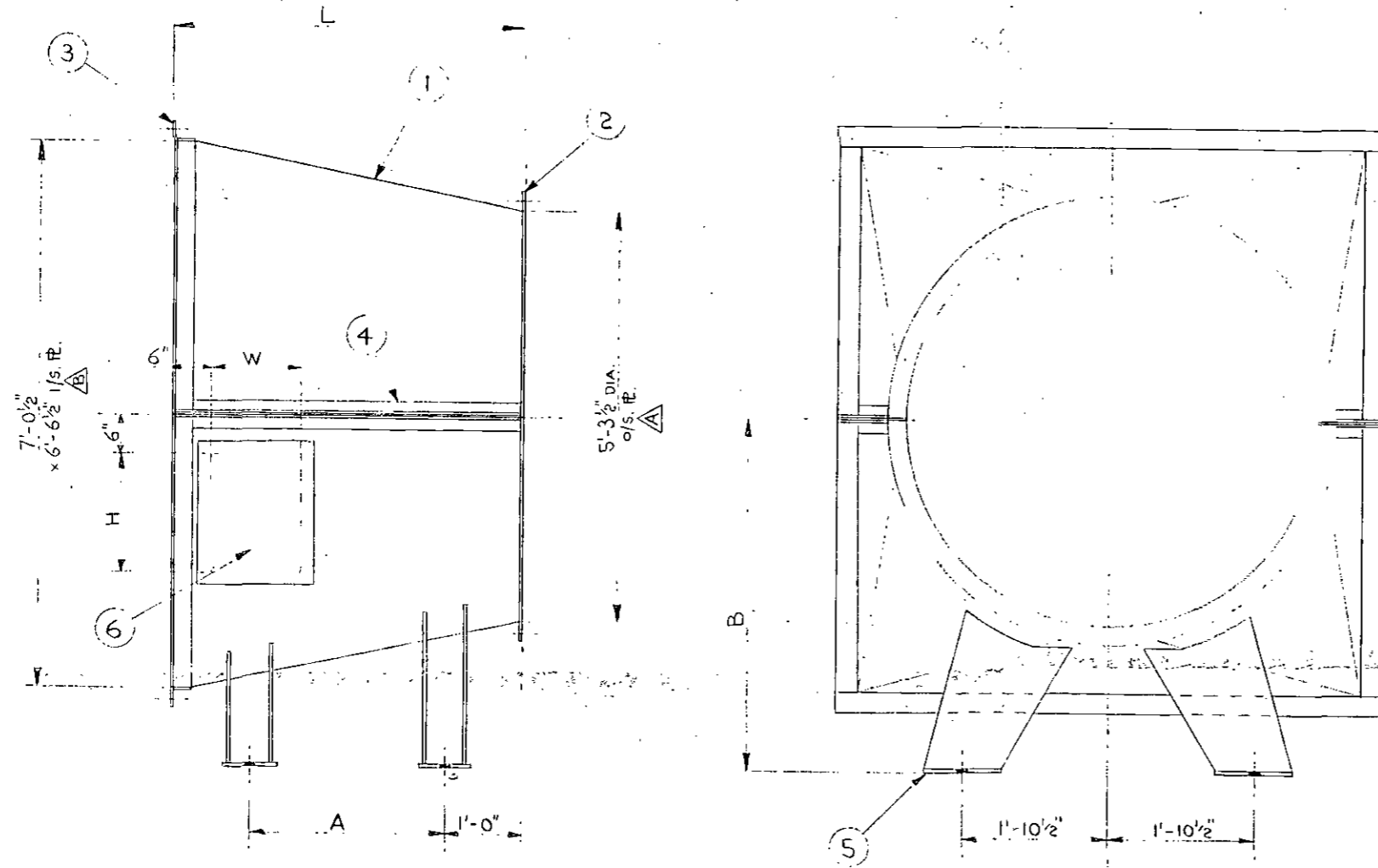
TOTAL ESTIMATED WEIGHT **148,540** LBS

FLAKT CANADA LTD.
NOV 13 1989
ISSUED

CRATING - ALL SMALL LOOSE ITEMS TO BE SHIPPED IN MARKED CRATES

- NOTE:
- S - FLAKT STOCK SENT TO FIELD
 - So - FLAKT STOCK SENT TO SHOP
 - R - FLAKT PURCHASE SENT TO FIELD
 - Rd - FLAKT PURCHASE SENT TO SHOP

SYM	REVISION	DATE	BY	CHK'D
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FOR SHOP FABRICATION DETAILS, SEE DRAWING No. CO-C-11345

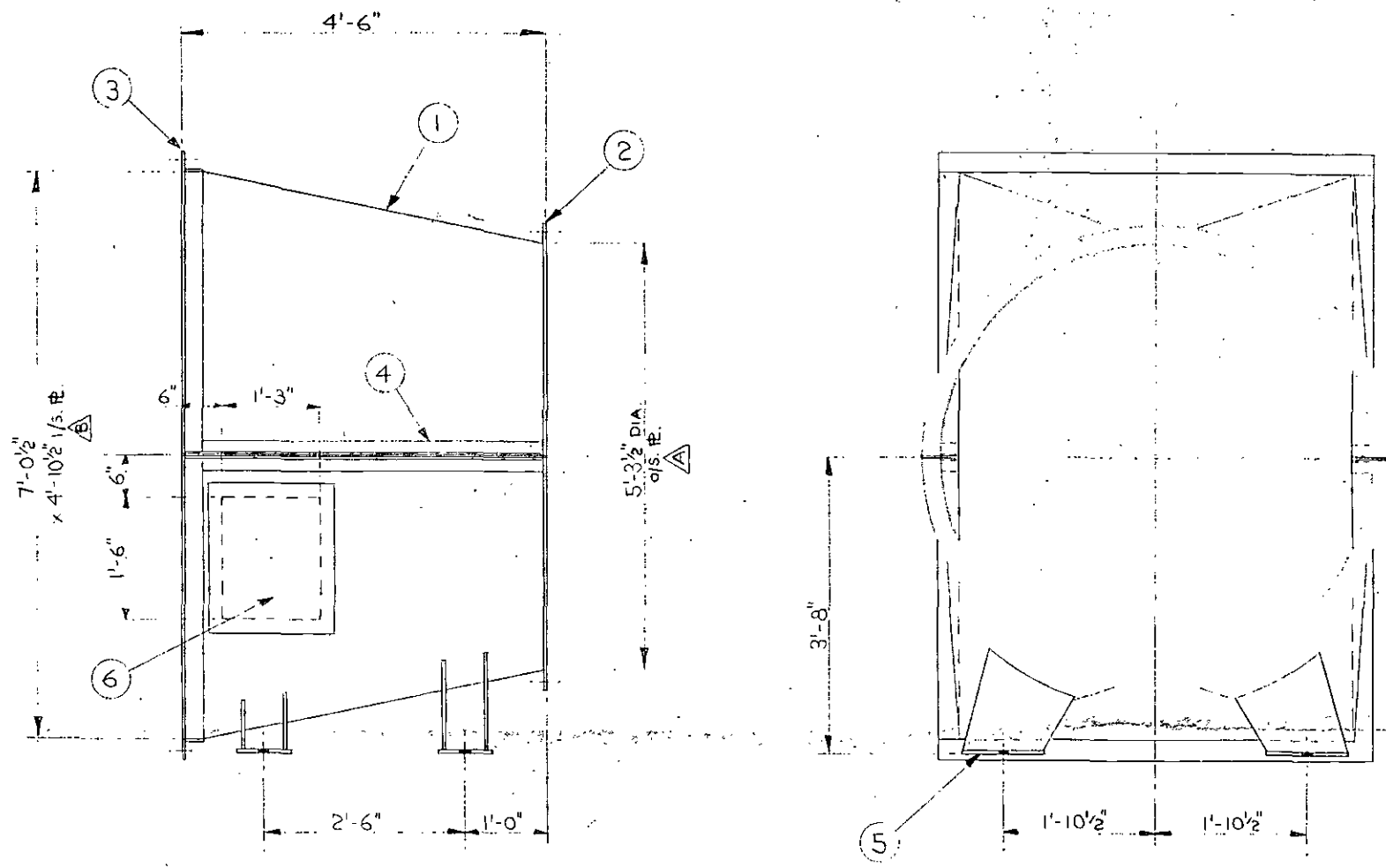
Mk. No.	L	A	B	W	H	HANDING	WEIGHT
UT-011 A	4'-6"	2'-6"	3'-8"	1'-3"	1'-6"	OPP. HAND	1570
UT-012 A	3'-6"	1'-6"	4'-6"	1'-0"	1'-3"	AS DRAWN	1440
UT-012 B	3'-6"	1'-6"	4'-6"	1'-0"	1'-3"	OPP. HAND	1440

6	ACCESS DOOR	CO-C-11345 DETAIL "E"		
5	SUPPORT LEG	CO-C-11345 DETAIL "D"		
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 6		
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 12		
1	TRANSITION	10 GA. PL.		GALV. STEEL

QUANTITY	ITEM	DESCRIPTION	DWG. NO. OR DIM.	MATERIAL	WEIGHT
VARIANT		FLAKT CANADA LTD. Flakt Canada Ltd.			
<small>THIS DRAWING AND ALL INFORMATION THEREON IS THE PROPERTY OF FLAKT CANADA LTD. AND IS SUBJECT TO RETURN UPON REQUEST. IT IS CONFIDENTIAL AND SUBJECT TO COPYRIGHT PROTECTION AND MUST NOT BE MADE PUBLIC NOR COPIED NOR USED DIRECTLY NOR INDIRECTLY IN ANY WAY DETRIMENTAL TO THEIR INTEREST.</small>					
CONTRACT NO.	QUOTATION NO.	REG. NO.	NEXT ASSY	REF. DWG.	DRAWN
C-118-324-0773	SFC				BSA
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT			DATE	SUB. NO.	
METRO RAIL PROJECT A740			DEC. 10/88	006	
VENTILATION FANS			CHKD.	APPROVED	DWG. TYPE
TRANSITION SECTION			AC	[Signature]	
SCALE				CUSTOMERS REF.	
NONE					
DWG. NO.					REV
CO-C-11332					B

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

B	DIM. 7'-0 1/2" x 6'-6 1/2" WAS O/S. PL.	MAY 29/89	B.B.	
A	OUTSIDE PL. DIA. WAS 5'-2 1/2"	MAY 12/89	B.B.	
SYM.	REVISIONS	DATE	BY	CHKD.



Mk. No. UT-011B

FOR SHOP FABRICATION DETAILS, SEE DRAWING No. CO-C-11345

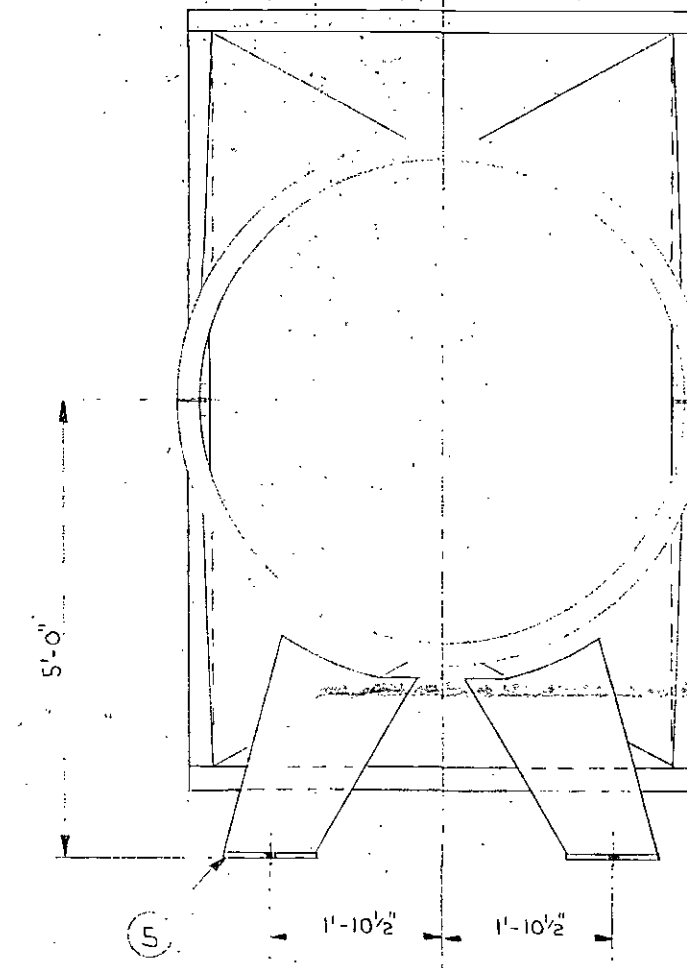
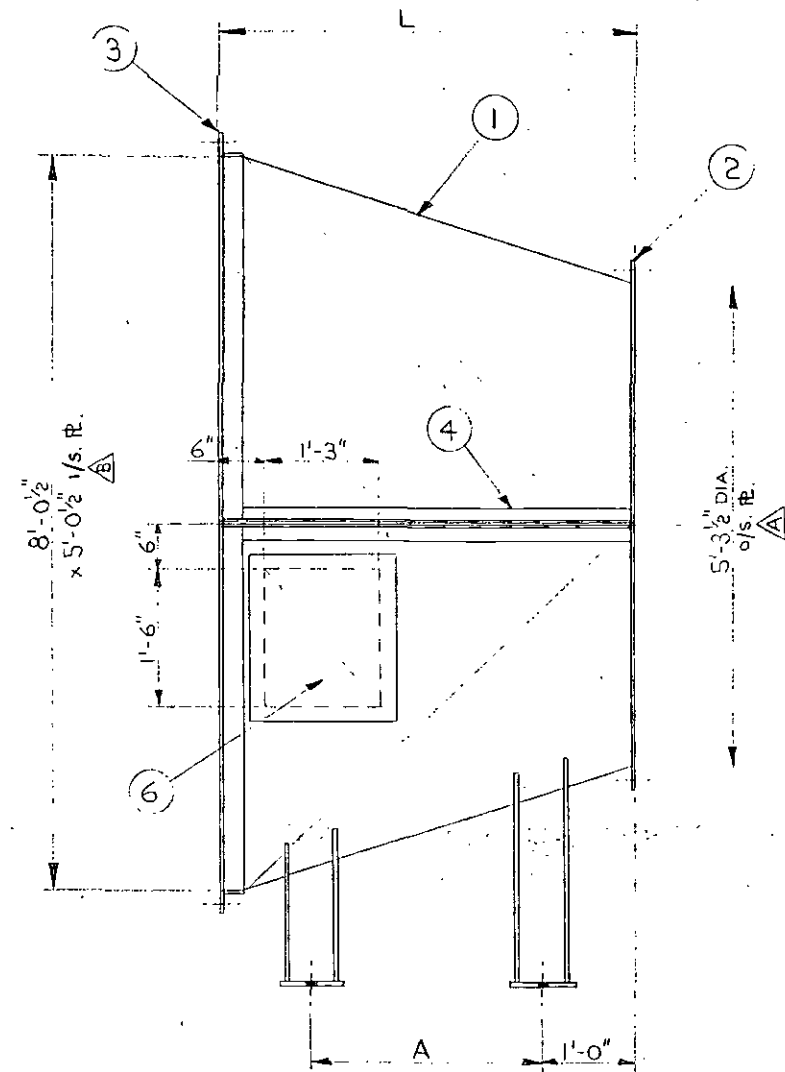
TOTAL WEIGHT = 1510 LB.

QTY	ITEM	DESCRIPTION	DWG. NO. OR DIM.	MATERIAL	WEIGHT
6	ACCESS DOOR	CO-C-11345 DETAIL "E"			
5	SUPPORT LEG	CO-C-11345 DETAIL "D"			800
4	JOINT ANGLES	CO-C-11345 DETAIL "C"			57
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 5			104
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 12			44
1	TRANSITION	10 GA. R.		GALV. STEEL	503

QUANTITY		ITEM	DESCRIPTION		DWG. NO. OR DIM.	MATERIAL	WEIGHT
VARIANT		Flakt Flakt Canada Ltd.		FLAKT CANADA LTD.			
<small>THIS DRAWING AND ALL INFORMATION THEREON IS THE PROPERTY OF FLAKT CANADA LTD. AND IS SUBJECT TO RETURN UPON REQUEST. IT IS CONFIDENTIAL AND SUBJECT TO COPYRIGHT PROTECTION AND MUST NOT BE MADE PUBLIC NOR COPIED NOR USED DIRECTLY NOR INDIRECTLY IN ANY WAY DETRIMENTAL TO THEIR INTEREST.</small>							
CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA	DATE DEC.10/88	SUB. NO. 006
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT					CHKD. AC	APPROVED <i>[Signature]</i>	DWG. TYPE
METRO RAIL PROJECT A740					SCALE NONE		
VENTILATION FANS					CUSTOMERS REF.		
TRANSITION SECTIONS					DWG. NO. CO-C-11333	REV B	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
 MACHINING .010" - STRUCTURAL OVERALL 1/16"
 ALL OTHERS 1/32" NON-ACCUMULATIVE

SYM.	REVISIONS	DATE	BY	CHKD.
B	DIM. 7'-0 1/2" x 4'-10 1/2" WAS O/S. R.	MAY 29/89	B.B.	
A	OUTSIDE R. DIA. WAS 5'-2 1/2"	MAY 12/89	B.B.	



FOR SHOP FABRICATION DETAILS, SEE DRAWING NO. CO-C-11345

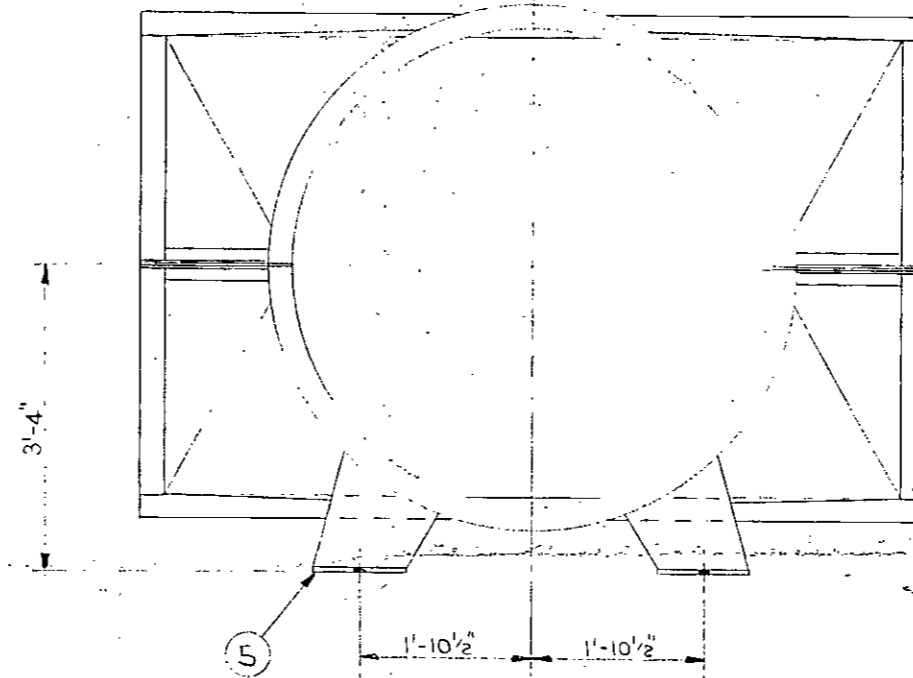
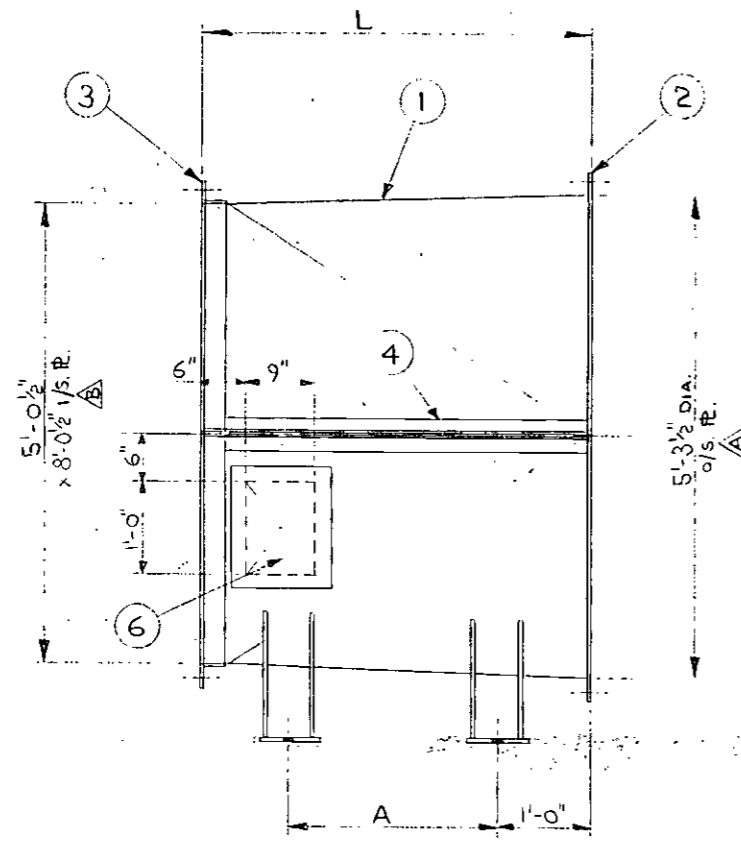
Mk. No.	L	A	HANDING	WEIGHT
UT-021A	4'-6"	2'-6"	OPP. HAND	1560
UT-021B	4'-6"	2'-6"	AS DRAWN	1560
UT-022A	4'-0"	2'-0"	AS DRAWN	1490
UT-022B	4'-0"	2'-0"	OPP. HAND	1490

6	ACCESS DOOR	CO-C-11345 DETAIL "E"		
5	SUPPORT LEG	CO-C-11345 DETAIL "D"		
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 7		
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 12		
1	TRANSITION	10 GA. PL.		GALV. STEEL

QUANTITY	ITEM	DESCRIPTION	DWG NO. OR DIM	MATERIAL	WEIGHT
FLAKT CANADA LTD. Flakt Canada Ltd.					
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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA
					DATE DEC. 10/88
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT			CHKD. AC	APPROVED <i>[Signature]</i>	SUB. NO. 006
METRO RAIL PROJECT A740			SCALE NONE	CUSTOMERS REF.	DWG. TYPE
VENTILATION FANS			DWG. NO.	REV	
TRANSITION SECTIONS			CO-C-11334	B	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
 MACHINING .010" - STRUCTURAL OVERALL 1/16"
 ALL OTHERS 1/32" NON-ACCUMULATIVE

SYM.	REVISIONS	DATE	BY	CHKD.
B	DIM. 8'-0 1/2" x 5'-0 1/2" WAS 0/S.P.	MAY 29/89	B.B.	
A	OUTSIDE R. DIA. WAS 5'-2 1/2"	MAY 12/89	B.B.	



Mk. No.	L	A	HANDING	WEIGHT
UT-031A	4'-3"	2'-3"	OPP. HAND	1520
UT-031B	4'-3"	2'-3"	AS DRAWN	1520
UT-032A	4'-0"	2'-0"	OPP. HAND	1490
UT-032B	4'-0"	2'-0"	AS DRAWN	1490

FOR SHOP FABRICATION DETAILS, SEE DRAWING NO. CO-C-11345

6	ACCESS DOOR	CO-C-11345 DETAIL "E"		
5	SUPPORT LEG	CO-C-11345 DETAIL "D"		
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 2		
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 12		
1	TRANSITION	10 GA. FL.	GALV. STEEL	

QUANTITY	ITEM	DESCRIPTION	DWG. NO. OR DIM.	MATERIAL	WEIGHT

Flakt
Flakt Canada Ltd.

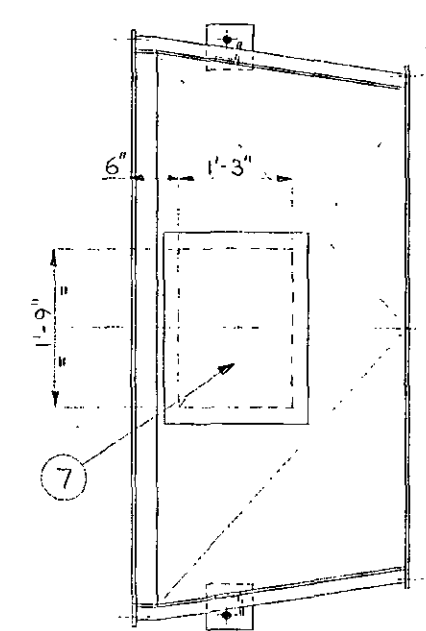
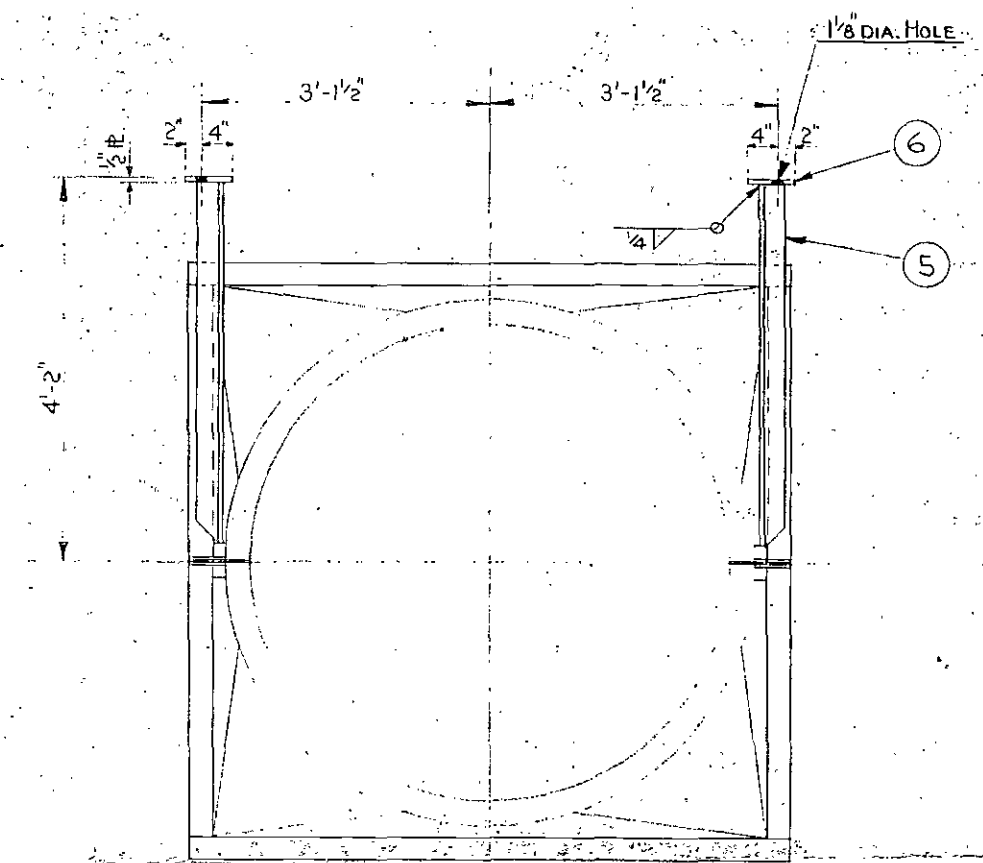
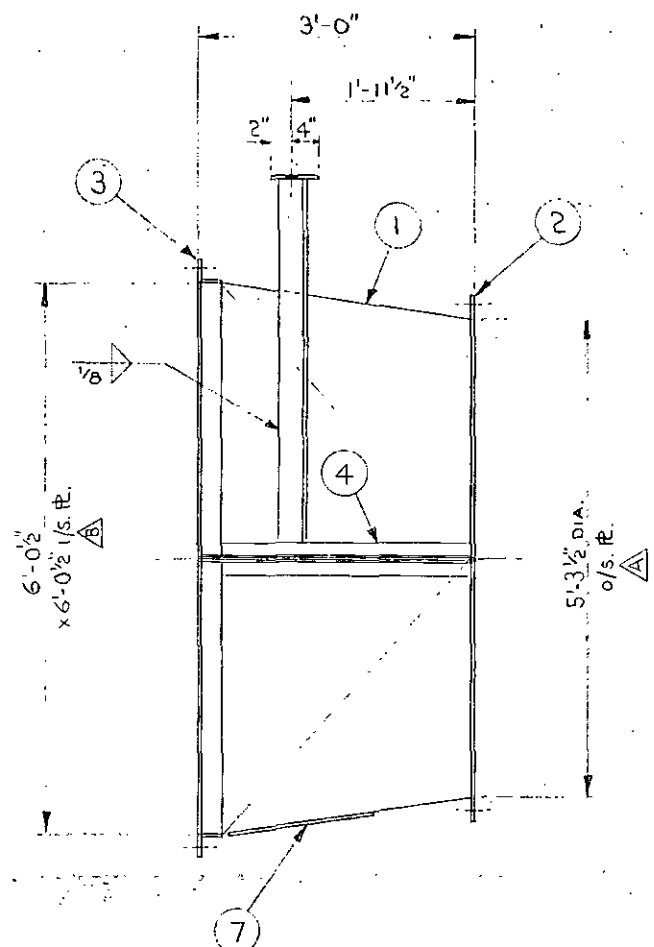
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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA	DATE DEC. 10/88	SUB. NO. 006
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT METRO RAIL PROJECT A740				CHKD AC	APPROVED	DWG TYPE	CUSTOMERS REF.
VENTILATION FANS TRANSITION SECTION				SCALE NONE	DWG. NO. CO-C-11335	REV B	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

SYM.	REVISIONS	DATE	BY	CHKD
B	DIM. 5'-0 1/2" x 8'-0 1/2" WAS O/S R.	MAY 29/89	B.B.	
A	OUTSIDE R. DIA. WAS 5'-2 1/2"	MAY 12/89	B.B.	



Mk. Nos. UT-041A & UT-041B

FOR SHOP FABRICATION DETAILS, SEE DRAWING NO. CO-C-11345

TOTAL WEIGHT = 600 LB.

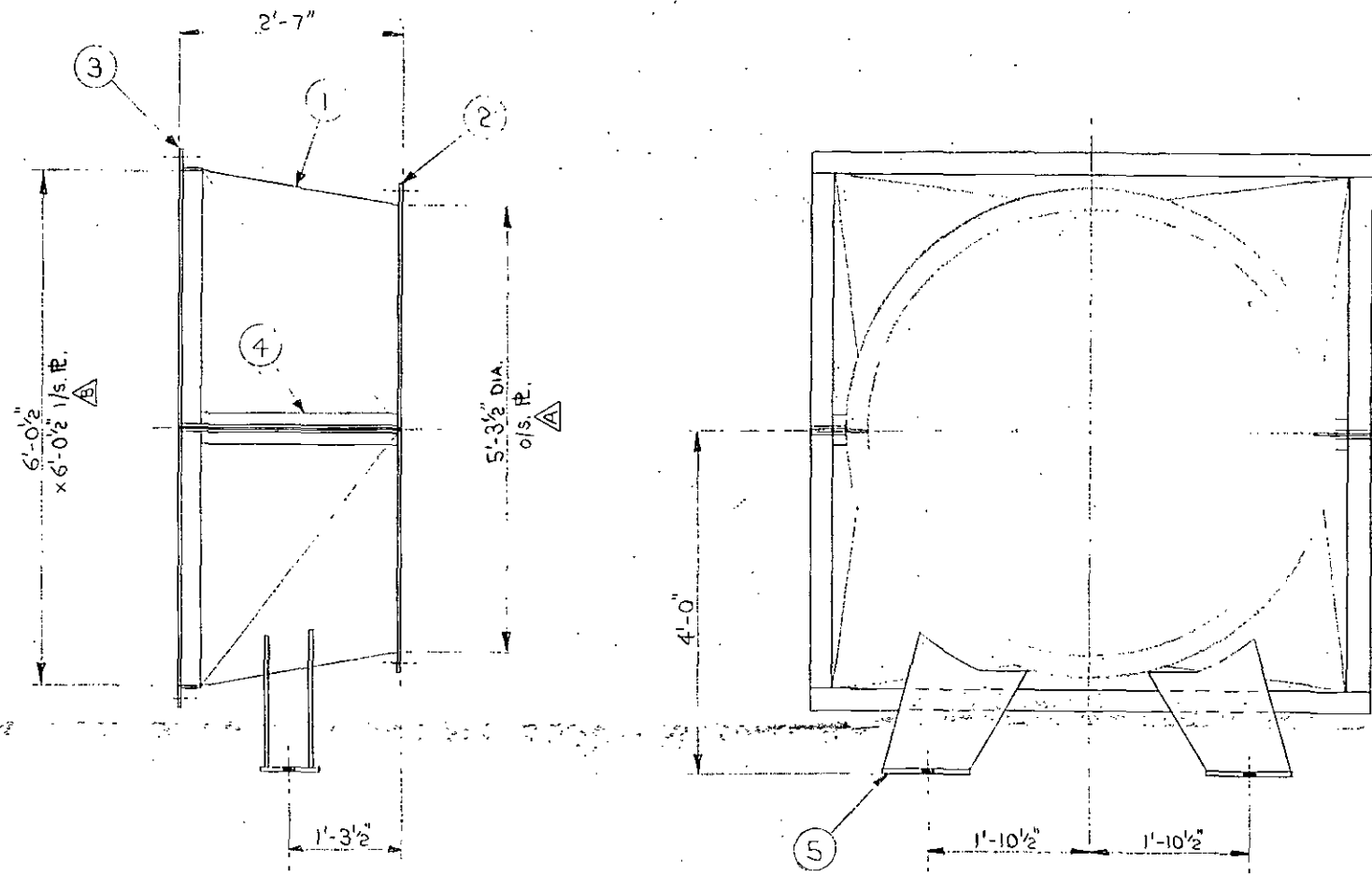
ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT
7	ACCESS DOOR	CO-C-11345 DETAIL "E"		
6	SUPPORT PLATE	1/2" PL. 6" x 6"	A-36	10
5	SUPPORT LEG	L 3" x 3" x 3/8" x 3'-11 1/2" LG.	A-36	58
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		38
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 3		105
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 12		44
1	TRANSITION	10 GA. PL.	GALV. STEEL	338

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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA	DATE DEC. 17/88	SUB NO. 006
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT					CHKD. AC	APPROVED [Signature]	DWG. TYPE
METRO RAIL PROJECT A740					SCALE NONE		
VENTILATION FANS					CUSTOMERS REF.		
TRANSITION SECTIONS					DWG. NO. CO-C-11336	REV B	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
 MACHINING .010" - STRUCTURAL OVERALL 1/16"
 ALL OTHERS 1/32" NON-ACCUMULATIVE

SYM.	REVISIONS	DATE	BY	CHKD.
B	DIM. 6'-0 1/2" x 6'-0 1/2" WAS O/S. R.	MAY 29/89	B.B.	
A	OUTSIDE R. DIA. WAS 5'-2 1/2"	MAY 12/89	B.B.	



Mk. Nos. UT-042A & UT-042B

FOR SHOP FABRICATION DETAILS, SEE DRAWING NO. CO-C-11345

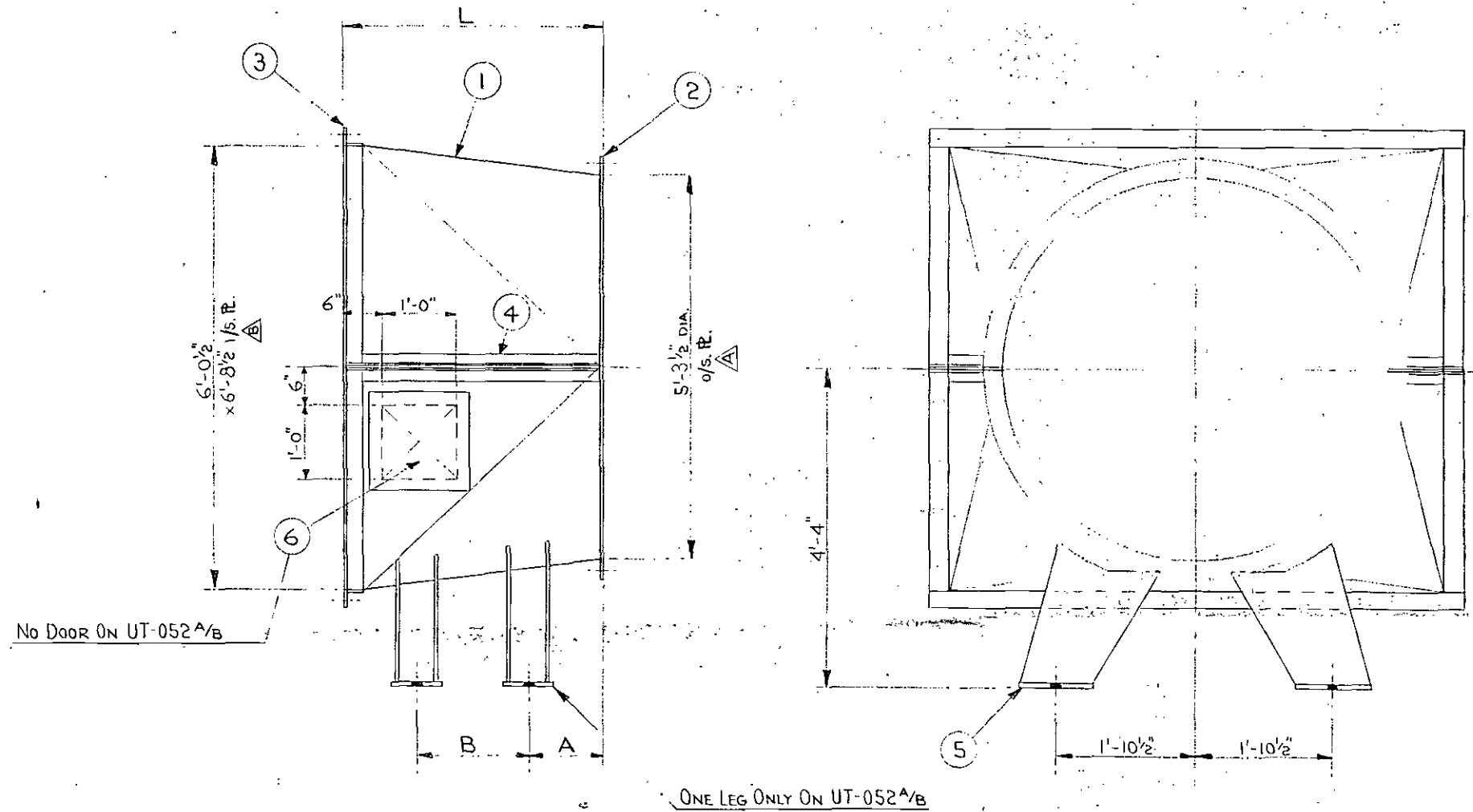
TOTAL WEIGHT = 930 LB.

ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT
5	SUPPORT LEG	CO-C-11345 DETAIL "D"		400
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		85
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 3		105
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 12		44
1	TRANSITION	10 GA. R.	GALV. STEEL	290

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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY
REF. DWG.	DRAWN BSA	DATE DEC. 17/88	SUB. NO. 006
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT METRO RAIL PROJECT A740		CHKD. AC	APPROVED <i>[Signature]</i>
VENTILATION FANS TRANSITION SECTIONS		SCALE NONE	CUSTOMERS REF.
DWG. NO. CO-C-11337		REV. B	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
 MACHINING .010" - STRUCTURAL OVERALL 1/16"
 ALL OTHERS 1/32" NON-ACCUMULATIVE

SYM.	REVISIONS	DATE	BY	CHKD.
B	Dim. 6'-0 1/2" x 6'-0 1/2" WAS O/S. R.	MAY 29/89	B.B.	
A	OUTSIDE R. DIA. WAS 5'-2 1/2"	MAY 12/89	B.B.	



FOR SHOP FABRICATION DETAILS, SEE DRAWING NO. CO-C-11345

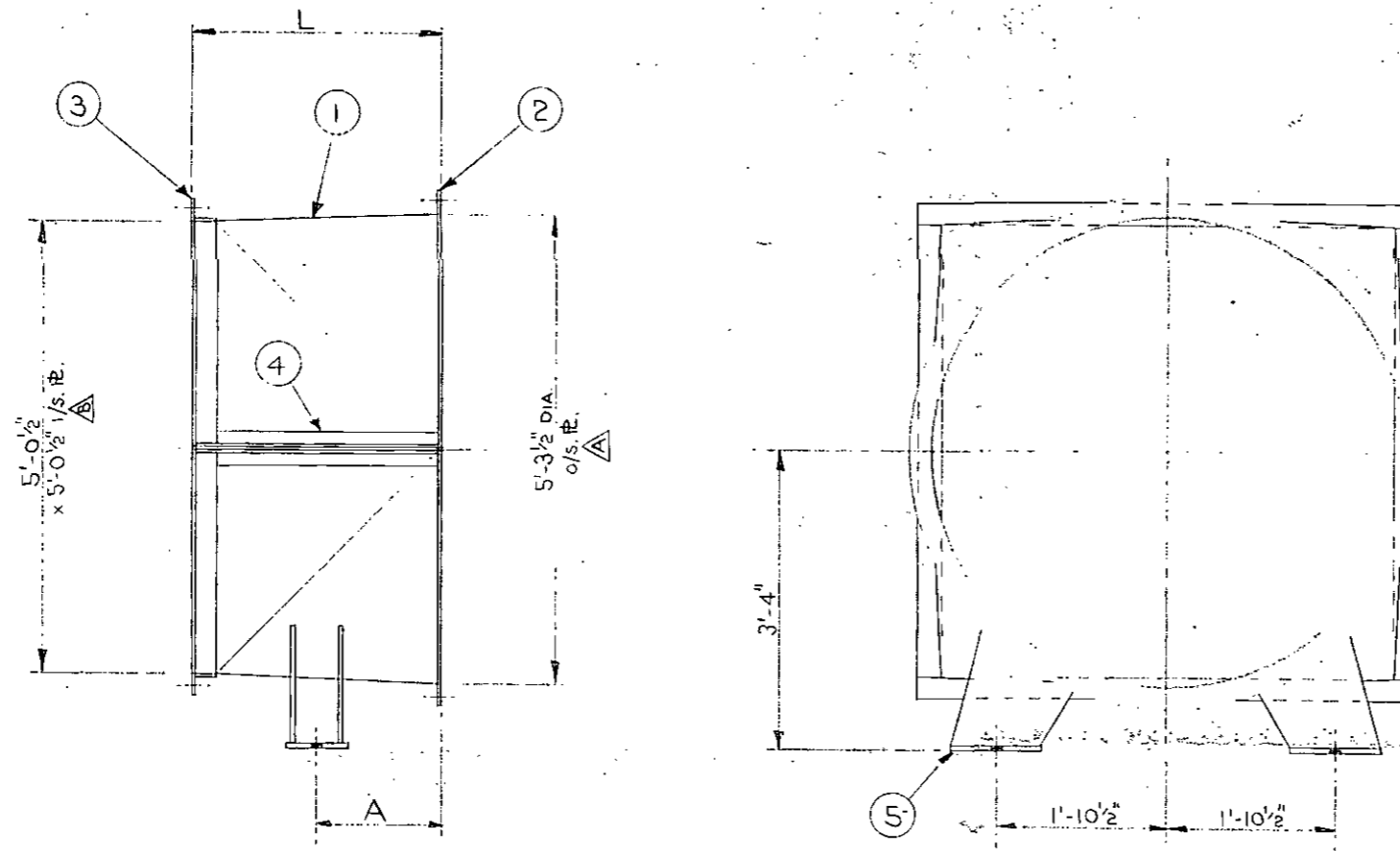
Mk. No.	L	A	B	HANDING	WEIGHT
UT-051A	3'-6"	1'-0"	1'-6"	AS DRAWN	1420
UT-051B	3'-6"	1'-0"	1'-6"	OPP. HAND	1420
UT-052A	2'-9"	1'-4 1/2"	0"	AS DRAWN	920
UT-052B	2'-9"	1'-4 1/2"	0"	AS DRAWN	920

ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT
6	ACCESS DOOR	CO-C-11345 DETAIL "E"		
5	SUPPORT LEG	CO-C-11345 DETAIL "D"		
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 4		
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 12		
1	TRANSITION	10 GA. R.F.	GALV. STEEL	

QUANTITY		ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT
FLAKT CANADA LTD. Flakt Canada Ltd.						
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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA	DATE DEC. 17/88
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT				CHKD. AC	APPROVED	SUB. NO. 006
METRO RAIL PROJECT A740				SCALE NONE		CUSTOMERS REF.
VENTILATION FANS				DWG. NO. CO-C-11338		REV B
TRANSITION SECTIONS						

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
 MACHINING .010" - STRUCTURAL OVERALL 1/16"
 ALL OTHERS 1/32" NON-ACCUMULATIVE

B	DIM. 6'-0 1/2" x 6'-8 1/2" WAS 0/S. R.F.	MAY 29/89	B.B.
A	OUTSIDE R.F. DIA. WAS 5'-2 1/2"	MAY 12/89	B.B.
SYM.	REVISIONS	DATE	BY
			CHKD



Mk. No.	L	A	WEIGHT
OT-1LA	2'-9"	1'-4 1/2"	870
OT-1LB	2'-9"	1'-4 1/2"	870
OT-2LA	2'-3"	1'-1 1/2"	810
OT-2LB	2'-3"	1'-1 1/2"	810

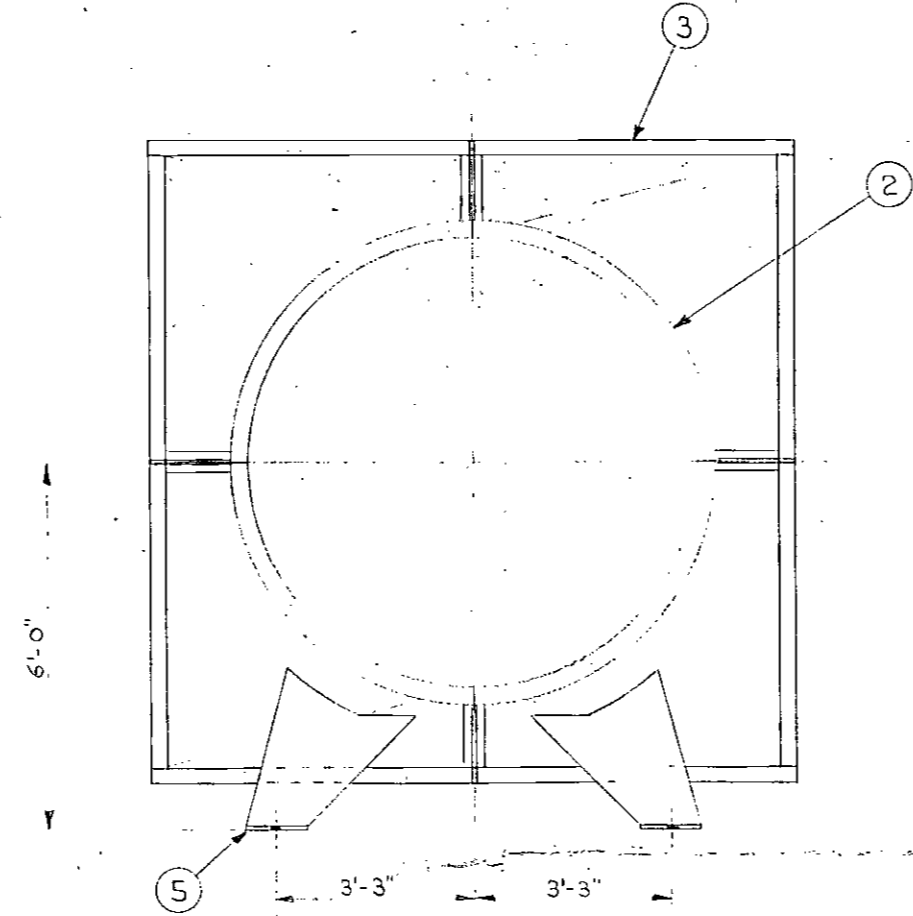
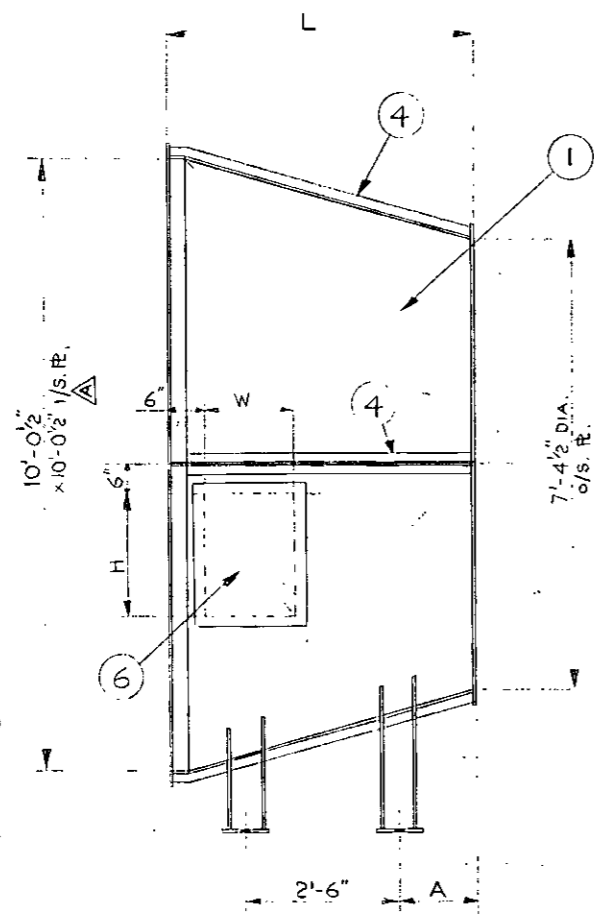
FOR SHOP FABRICATION DETAILS, SEE DRAWING No. CO-C-11345

5	SUPPORT LEG	CO-C-11345 DETAIL "D"		
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 1		
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 12		
1	TRANSITION	10 GA. B.	GALV. STEEL	

QUANTITY	ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT
VARIANT		FLAKT CANADA LTD. Flakt Canada Ltd.			
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CONTRACT NO.	QUOTATION NO.	REG. NO.	NEXT ASSY.	REF DWG	DRAWN
C-118-324-0773	SFC				BSA
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT			DATE	DEC. 17/88	SUB. NO.
METRO RAIL PROJECT A740			CHKD.	APPROVED	006
VENTILATION FANS			SCALE	NONE	CUSTOMERS REF
TRANSITION SECTIONS			OWG. NO.	CO-C-11339	REV.
					B

SYM.	REVISIONS	DATE	BY	CHKD.
B	DIM. 5'-0 1/2" x 5'-0 1/2" WAS 0/5. B.	MAY 29/89	B.B.	
A	OUTSIDE R. DIA. WAS 5'-2 1/2"	MAY 12/89	B.B.	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE



Mk. No.	L	A	W	H	HANDING	WEIGHT
ET-011A					AS DRAWN	2050
ET-012A	5'-0"	1'-3"	1'-6"	2'-0"	AS DRAWN	2050
ET-013A						
ET-011B					OPP. HAND	2050
ET-012B	5'-0"	1'-3"	1'-6"	2'-0"	OPP. HAND	2050
ET-013B						
ET-073A					AS DRAWN	1980
ET-074A	4'-8"	1'-1"	1'-6"	2'-0"	AS DRAWN	1980
ET-083A						
ET-073B					OPP. HAND	1980
ET-074B	4'-8"	1'-1"	1'-6"	2'-0"	OPP. HAND	1980
ET-083B						
ET-084A	5'-0"	1'-3"	1'-6"	2'-0"	OPP. HAND	2050
ET-084B	5'-0"	1'-3"	1'-6"	2'-0"	AS DRAWN	2050
ST-11A	3'-9"	7 1/2"	1'-3"	1'-6"	AS DRAWN	1800
ST-11B	3'-9"	7 1/2"	1'-3"	1'-6"	OPP. HAND	1800
ST-21A	4'-0"	9"	1'-3"	1'-6"	AS DRAWN	1850
ST-21B	4'-0"	9"	1'-3"	1'-6"	OPP. HAND	1850

FOR SHOP FABRICATION DETAILS, SEE DRAWING NO. CO-C-11345

QTY	ITEM	DESCRIPTION	DWG. NO. OR DIM.	MATERIAL	WEIGHT
6	ACCESS DOOR	CO-C-11345 DETAIL "E"			
5	SUPPORT LEG	CO-C-11345 DETAIL "D"			
4	JOINT ANGLES	CO-C-11345 DETAIL "C"			
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 10			
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 13			
1	TRANSITION	10 GA. 'R.		GALV. STEEL	

Flakt
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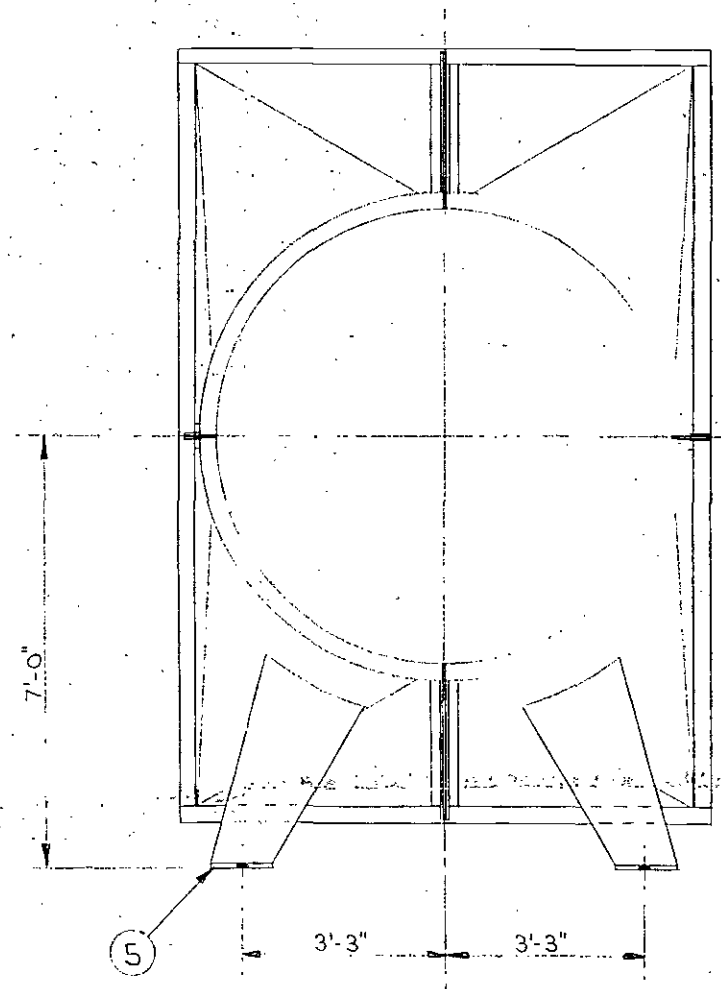
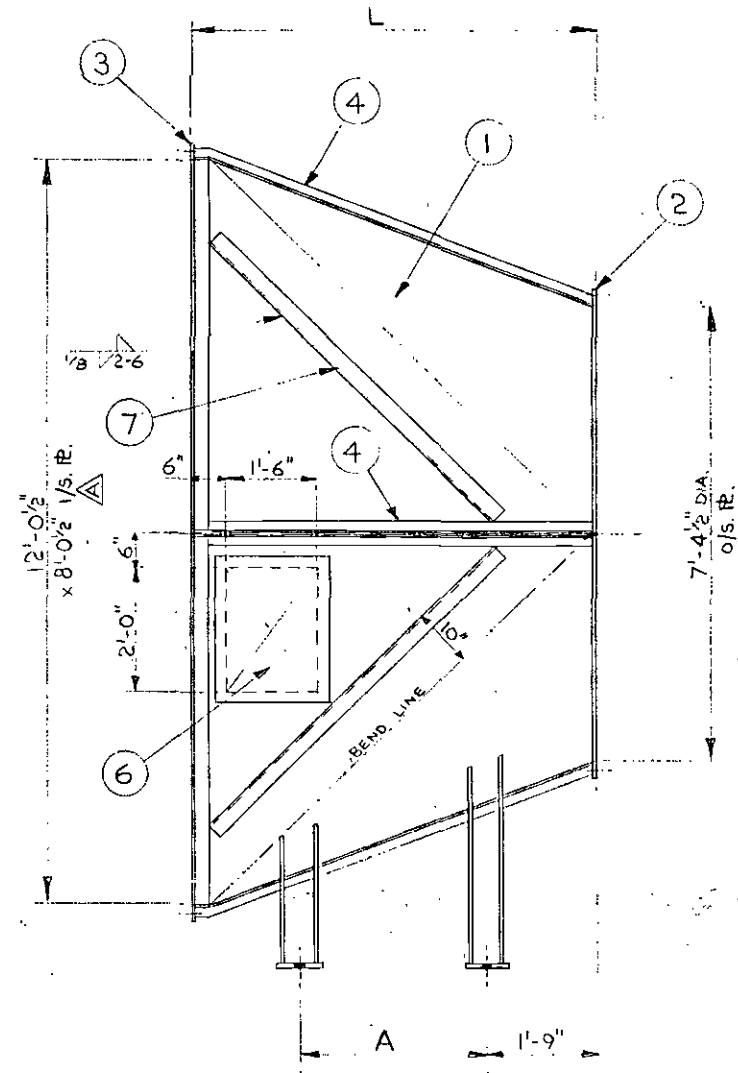
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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA	DATE DEC. 3/88	SUB. NO. 006
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT METRO RAIL PROJECT A740				CHKD. AC	APPROVED	DWG. TYPE	
VENTILATION FANS TRANSITION SECTIONS				SCALE NONE	CUSTOMERS REF.	DWG. NO. CO-C-11340	REV A

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

REV.	DATE	BY	CHKD.
A	MAY 29/89		



Mk. No.	L	A	HANDING	WEIGHT
ET-021A			As DRAWN	2670
ET-022A	7'-6"	4'-0"	As DRAWN	2670
ET-023A				
ET-021B			OPP. HAND	2670
ET-022B	7'-6"	4'-0"	OPP. HAND	2670
ET-023B				
ET-031A				
ET-032B	6'-6"	3'-0"	OPP. HAND	2450
ET-041B				
ET-042B				
ET-031B				
ET-032A	6'-6"	3'-0"	As DRAWN	2450
ET-041A				
ET-042A				

FOR SHOP FABRICATION DETAILS, SEE DRAWING NO. CO-C-11345

ITEM	DESCRIPTION	QTY	OWG. NO. OR DIM.	MATERIAL	WEIGHT
7	STIFFENING ANGLE		L 3" x 3" x 1/4"	GALV. STEEL	
6	ACCESS DOOR		CO-C-11345 DETAIL "E"		
5	SUPPORT LEG		CO-C-11345 DETAIL "D"		
4	JOINT ANGLES		CO-C-11345 DETAIL "C"		
3	RECTANGULAR FLANGE		CO-C-11344 DETAIL 11		
2	CIRCULAR FLANGE		CO-C-11344 DETAIL 13		
1	TRANSITION		10 GA. PL.	GALV. STEEL	

QUANTITY	ITEM	DESCRIPTION	OWG. NO. OR DIM.	MATERIAL	WEIGHT

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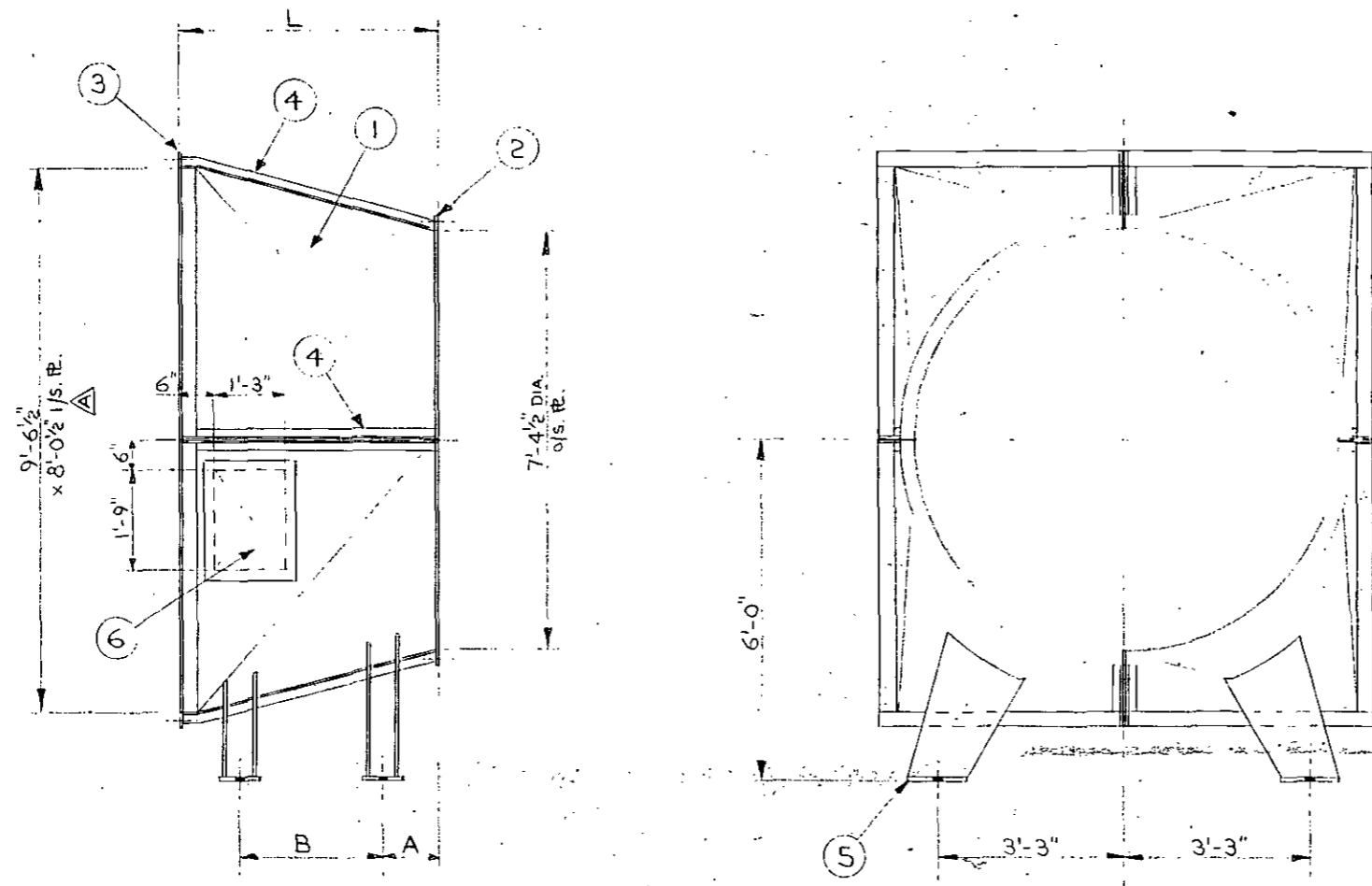
CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA	DATE DEC. 17/88	SUB. NO. 006
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SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT
METRO RAIL PROJECT A740
VENTILATION FANS
TRANSITION SECTIONS

CHKD. AC	APPROVED <i>[Signature]</i>	DWG. TYPE
SCALE NONE	CUSTOMERS REF.	
DWG. NO. CO-C-11341	REV A	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

A	Dim. 12'-0 1/2" x 8'-0 1/2" WAS O/S. PL.	MAY 29/89	B.B.
SYM.	REVISIONS	DATE	BY
			CHKD.



Mk. No.	L	A	B	HANDING	WEIGHT
ET-051A	4'-6"	1'-0"	2'-6"	AS DRAWN	1870
ET-052B					
ET-051B	4'-6"	1'-0"	2'-6"	OPP. HAND	1870
ET-052A					
ET-061A	3'-9"	10 1/2"	2'-0"	OPP. HAND	1730
ET-062B					
ET-061B	3'-9"	10 1/2"	2'-0"	AS DRAWN	1730
ET-062A					

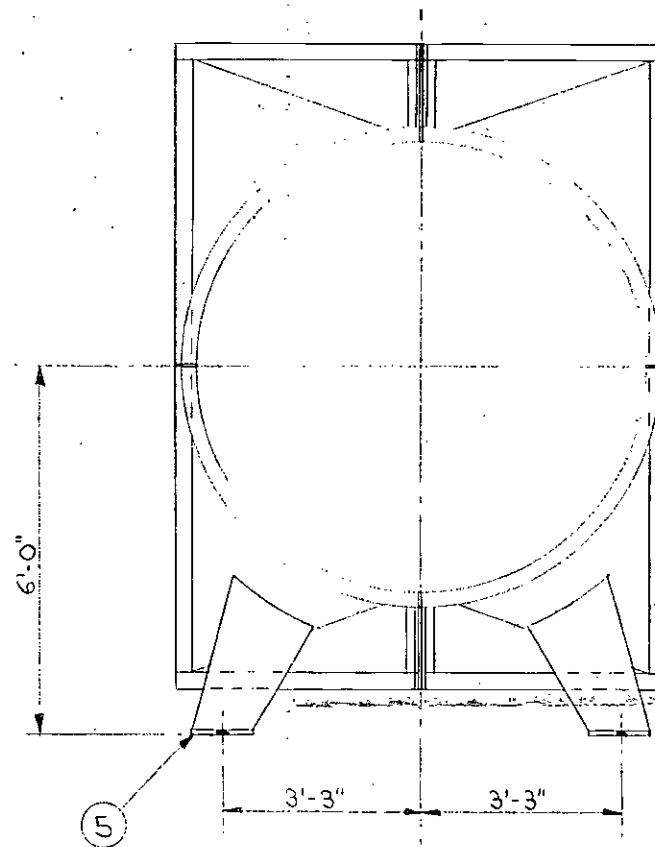
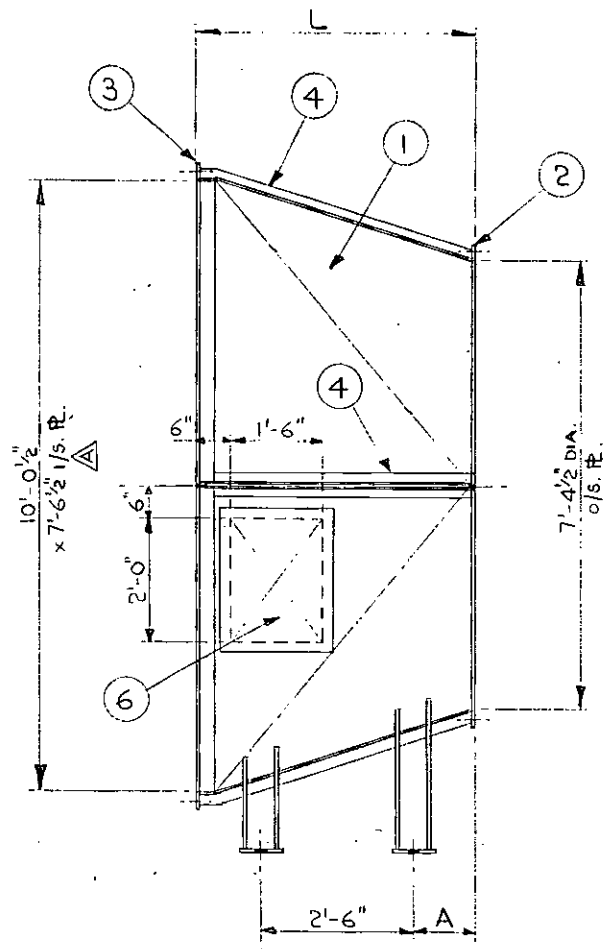
FOR SHOP FABRICATION DETAILS, SEE DRAWING NO. CO-C-11345

6	ACCESS DOOR	CO-C-11345 DETAIL "E"		
5	SUPPORT LEG	CO-C-11345 DETAIL "D"		
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL B		
2	CIRCULAR FLANGE	CO-C-11344 DETAIL I3		
1	TRANSITION	10 GA. PL.		GALV. STEEL

QUANTITY		ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT
		FLAKT CANADA LTD. Flakt Canada Ltd.				
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CONTRACT NO.	QUOTATION NO.	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN	DATE
C-118-324-0773	SFC				BSA	DEC. 17/88
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT				CHKD.	APPROVED	SUB. NO.
METRO RAIL PROJECT A740				AC	[Signature]	006
VENTILATION FANS				SCALE	CUSTOMERS REF.	REV
TRANSITION SECTIONS				NONE		
DWG. NO.					REV	
CO-C-11342					A	

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
 MACHINING .010" - STRUCTURAL OVERALL 1/16"
 ALL OTHERS 1/32" NON-ACCUMULATIVE

A	DIM. 9'-6 1/2" x 8'-0 1/2" WAS O/S. PL.	MAY 29/89	B.B.	
SYM.	REVISIONS	DATE	BY	CHKD.



Mk. No.	L	A	HANDING	WEIGHT
ET-071A				
ET-072B	4'-8"	1'-1"	OPP. HAND	1900
ET-081B				
ET-082A				
ET-071B				
ET-072A	4'-8"	1'-1"	AS DRAWN	1900
ET-081A				
ET-082B				
ET-091A				
ET-092B				
ET-093A	4'-6"	1'-0"	AS DRAWN	1870
ET-101B				
ET-102A				
ET-091B				
ET-092A				
ET-093B	4'-6"	1'-0"	OPP. HAND	1870
ET-101A				
ET-102B				

FOR SHOP FABRICATION DETAILS, SEE DRAWING No. CO-C-11345

6	ACCESS DOOR	CO-C-11345 DETAIL "E"		
5	SUPPORT LEG	CO-C-11345 DETAIL "D"		
4	JOINT ANGLES	CO-C-11345 DETAIL "C"		
3	RECTANGULAR FLANGE	CO-C-11344 DETAIL 9		
2	CIRCULAR FLANGE	CO-C-11344 DETAIL 13		
1	TRANSITION	10 GA. PL.		GALV. STEEL

QUANTITY	ITEM	DESCRIPTION	DWG NO. OR DIM.	MATERIAL	WEIGHT

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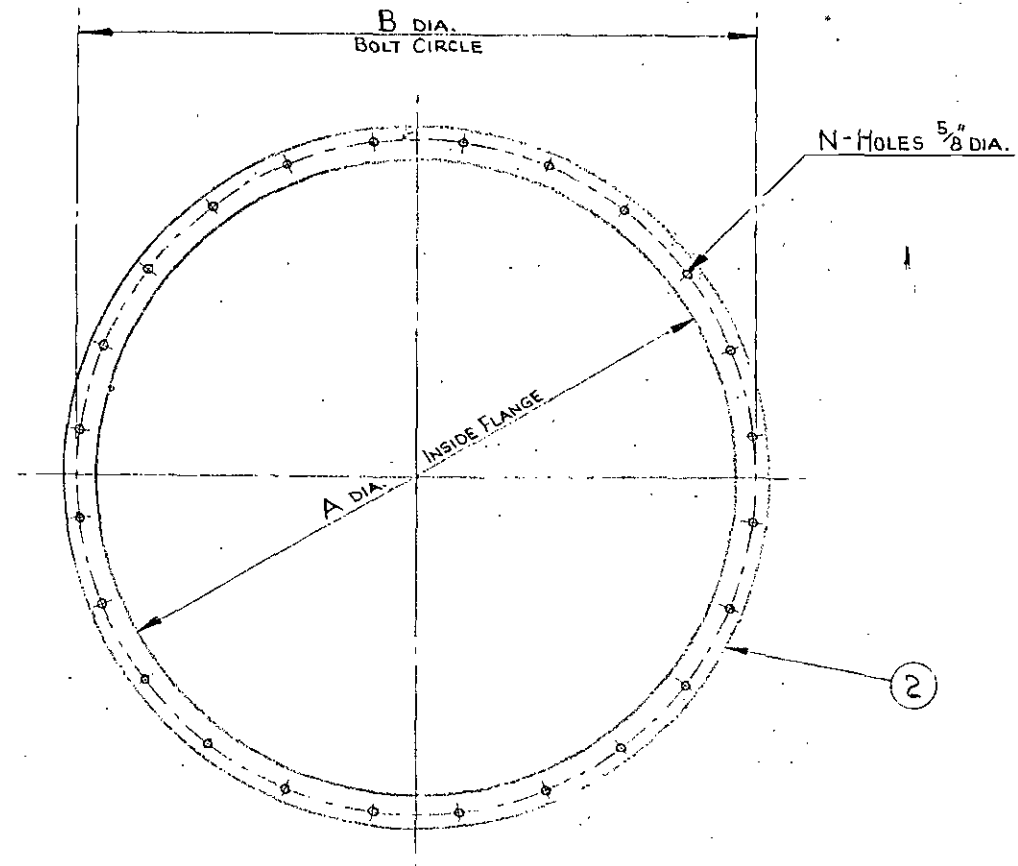
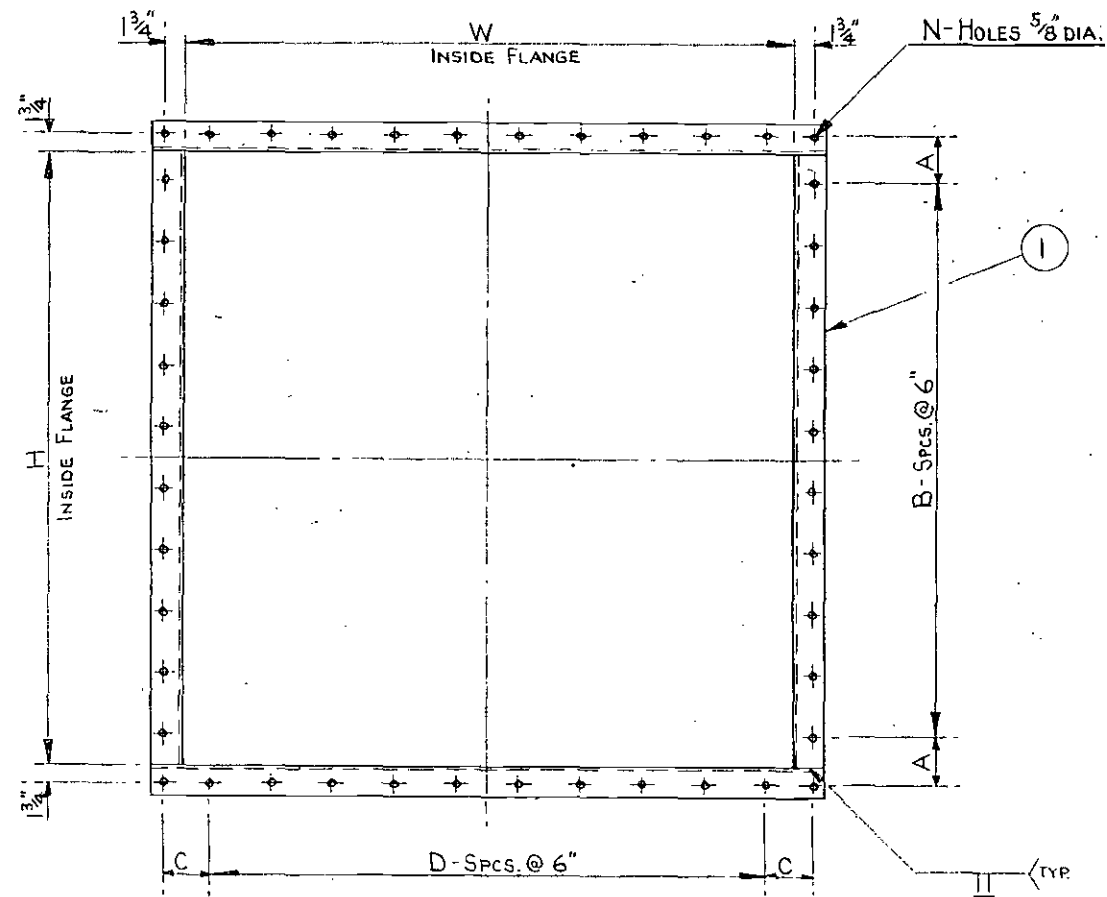
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CONTRACT NO. C-11B-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA	DATE DEC. 17/88	SUB. NO. 006
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT				CHKD AC	APPROVED	DWG TYPE	
METRO RAIL PROJECT A740				SCALE NONE	CUSTOMERS REF.		
VENTILATION FANS				DWG. NO.	REV		
TRANSITION SECTIONS				CO-C-11343	A		

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
MACHINING .010" - STRUCTURAL OVERALL 1/16"
ALL OTHERS 1/32" NON-ACCUMULATIVE

SYM.	REVISIONS	DATE	BY	CHKD
A	DIM. 10'-0 1/2" x 7'-6 1/2" WAS O/S. PL.	MAY 29/89	B.B.	



DETAIL NO.	H	W	A	B	C	D	N
1	5'-0 1/2"	5'-0 1/2"	5"	9	5"	9	44
2	5'-0 1/2"	8'-0 1/2"	5"	9	5"	15	56
3	6'-0 1/2"	6'-0 1/2"	5"	11	5"	11	52
4	6'-0 1/2"	6'-8 1/2"	5"	11	3"	13	56
5	7'-0 1/2"	4'-10 1/2"	5"	13	4"	9	52
6	7'-0 1/2"	6'-6 1/2"	5"	13	8"	11	56
7	8'-0 1/2"	5'-0 1/2"	5"	15	5"	9	56
8	9'-6 1/2"	8'-0 1/2"	8"	17	5"	15	72
9	10'-0 1/2"	7'-6 1/2"	5"	19	8"	13	72
10	10'-0 1/2"	10'-0 1/2"	5"	19	5"	19	84
11	12'-0 1/2"	8'-0 1/2"	5"	23	5"	15	84

DETAIL NO.	A	B	N
12	5'-2 1/2"	5'-6"	24
13	7'-4 1/2"	7'-8"	36

SYM.	REVISIONS	DATE	BY	CHKD

QUANTITY	ITEM	DESCRIPTION	DWG. NO. OR DIM.	MATERIAL	WEIGHT
2	FLAT BAR	3" x 1/4"		GALV. STEEL	
1	ANGLE	3" x 3" x 1/4"		GALV. STEEL	

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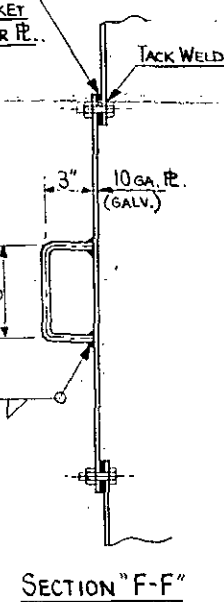
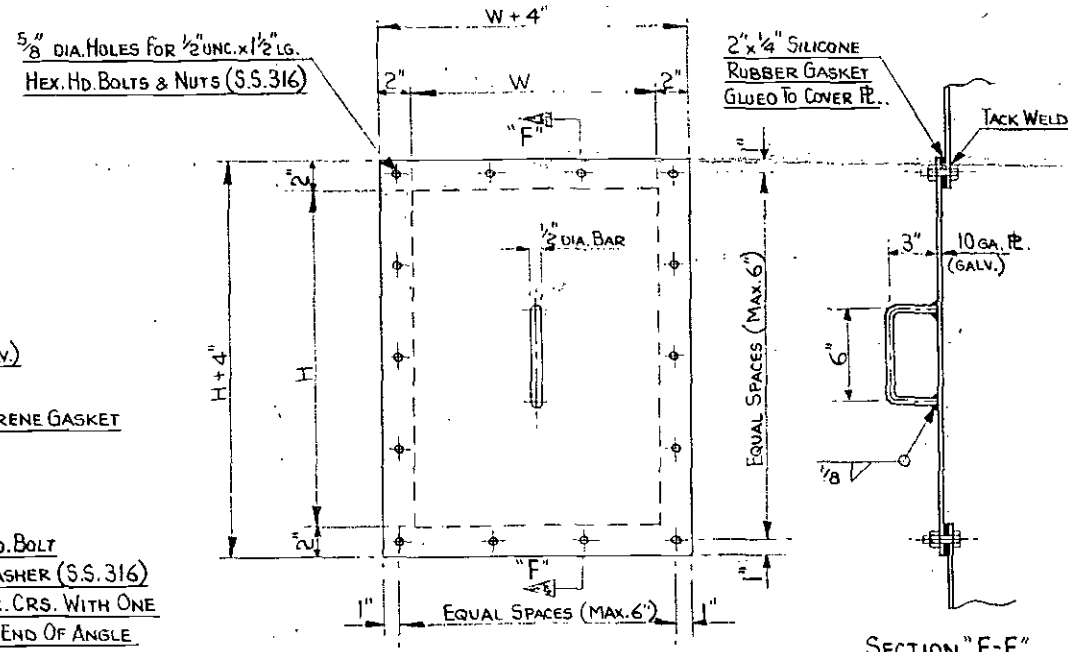
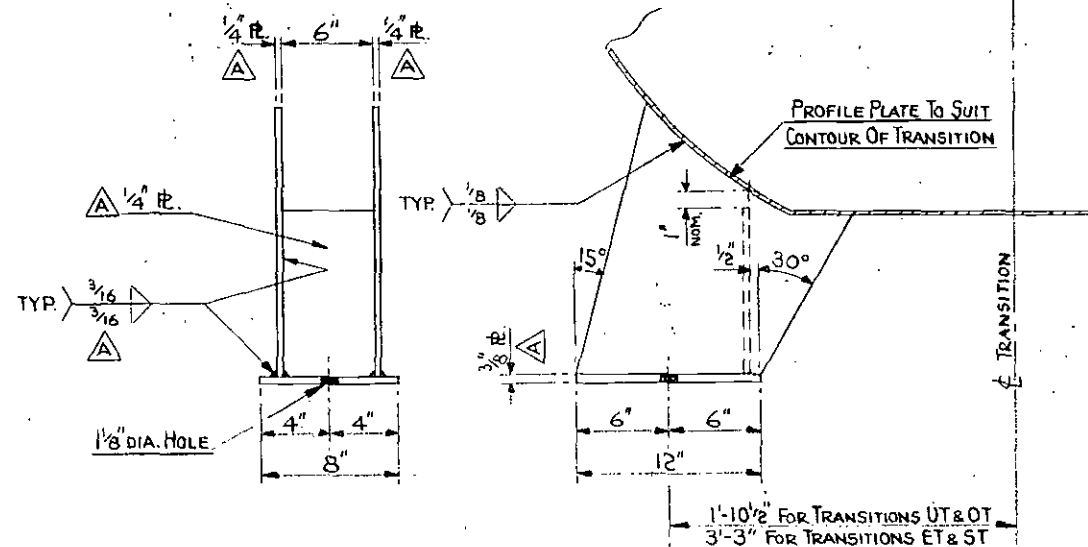
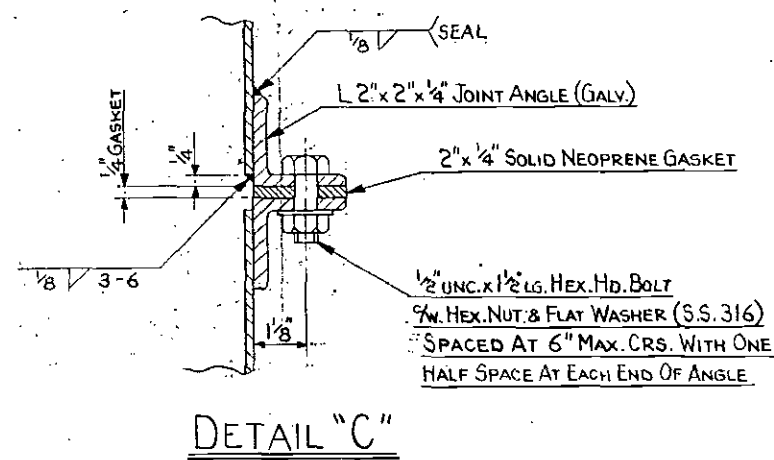
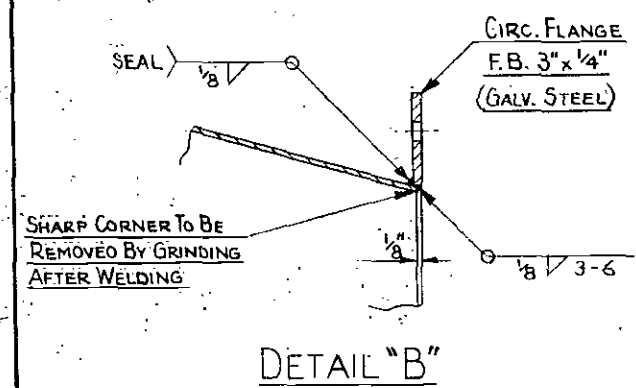
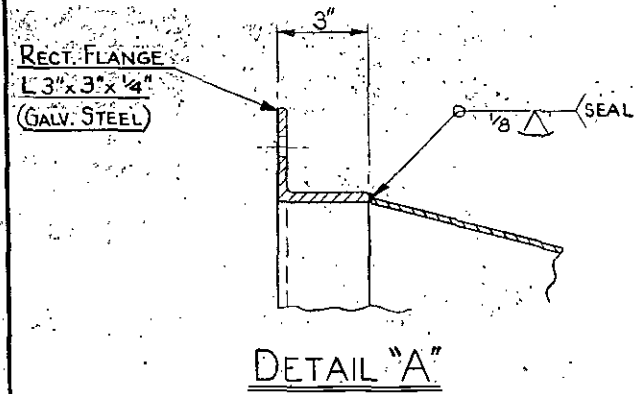
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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA	DATE DEC. 3/88	SUB. NO.
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT METRO RAIL PROJECT A740				CHKD AC	APPROVED <i>[Signature]</i>	DWG TYPE	
VENTILATION FANS				SCALE NONE	CUSTOMERS REF.		
TRANSITION SECTIONS - FLANGE DETAILS				DWG. NO. CO-C-11344	REV.		

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
 MACHINING: .010" - STRUCTURAL OVERALL 1/16"
 ALL OTHERS 1/32" NON-ACCUMULATIVE



SHOP NOTES

1. ALL TRANSITION PLATE TO BE 10 GA. GALVANISED STEEL.
2. SUPPORT LEG PLATES TO BE A-36 MATERIAL & PAINTED ONE COAT OF INORGANIC ZINC PAINT.
3. ALL WELDS TO BE DE-SCALED, WIRE BRUSHED & PAINTED ONE COAT OF INORGANIC ZINC PAINT.
4. WELDING TO BE IN ACCORDANCE WITH CSA-W59 (LATEST ISSUE).
5. ALL FLANGES TO BE MARKED FOR DRILLING USING A COMMON TEMPLATE FOR EACH SIZE OF FLANGE.
6. TRANSITION SECTIONS TO BE SHOP ASSEMBLED COMPLETE WITH GASKETS TO ENSURE HOLE ALIGNMENT & DIMENSIONAL TOLERANCES.
7. TRANSITION SECTIONS TO BE MATCH MARKED ACCORDING TO SHOP ASSEMBLY SEQUENCE, WITH SUB NUMBERS & DELIVER LIST NUMBERS, BEFORE DISMANTLING FOR SHIPMENT.
8. AFTER DISMANTLING, AFFIX ALL GASKETS TO ONE SIDE OF JOINT WITH STRONG ADHESIVE TO PREVENT LOSS IN TRANSIT.
9. ACCESS DOORS TO BE SUPPLIED COMPLETE WITH GASKETS & BOLTS AND ASSEMBLED TO TRANSITION SECTIONS BEFORE SHIPMENT.
10. ALL TRANSITION SECTIONS TO BE PROVIDED WITH ADEQUATE TEMPORARY BRACING TO PREVENT DAMAGE DURING SHIPMENT.
11. FOR DELIVERY LIST, SEE DRAWING No. CO-A-13058.

NOTE: FOR DIMENSIONS "W" & "H", REFER TO RELEVANT TRANSITION DRAWING

TOLERANCES ON DIMENSIONS UNLESS OTHERWISE NOTED ARE: (PLUS OR MINUS)
 MACHINING .010" - STRUCTURAL OVERALL 1/16"
 ALL OTHERS 1/32" NON-ACCUMULATIVE

A	DETAIL 'D': BASE PLATE WAS 1/2\"/>			
SYM.	REVISIONS	DATE	BY	CHKD

QUANTITY	ITEM	DESCRIPTION	DWG. NO. OR OIM.	MATERIAL	WEIGHT
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CONTRACT NO. C-118-324-0773	QUOTATION NO. SFC	REG. NO.	NEXT ASSY.	REF. DWG.	DRAWN BSA
SOUTHERN CALIFORNIA RAPID TRANSIT DISTRICT		DATE DEC. 3/88	SUB. NO. 006	APPROVED AC	DWG. TYPE
METRO RAIL PROJECT A740		SCALE NONE	CUSTOMERS REF.		
VENTILATION FANS		DWG. NO. CO-C-11345	REV. A		
TRANSITION SECTIONS - SHOP FAB. DETAILS					