	IDENTIFICATION WSSPEC LIGO-E950097-C1-B			
TITLE WELD SHELTER SPECIFICATION	REFERENCE NO. 930212		SHT 1 OF 27	
	OFFICE RSE		REVISION 1	
PRODUCT LIGO BEAM TUBE MODULES CALIFORNIA INSTITUTE OF TECHNOLOGY	MADE BY SDH	CHKD BY MLT	MADE BY SDH	CHKD BY MLT
	DATE 07/10/95	DATE 08/02/95	DATE 11/10/95	DATE 11/10/95

1.0 SCOPE:

1.1 Weld Shelter Concept: A two piece movable building constructed from steel plate, angle and channel with cleanable interior surfaces. The shelter is constructed of two halves to be bolted together in the field. The room will be unbolted, shipped to another job location, and re-bolted during the construction cycle, therefore the maximum building halves must be within a shippable size of 8' x 20' maximum for each half. The building moves shelter mounted Vee Groove wheels along a temporary angle rail system. An opening thru the building allows the shelter to pass over the LIGO beam tube during construction and therefore must remain a clear passageway. The building is separated into three compartments that are sealed from the outside and the elements during the fit-up and welding process. This is done with the use of fabric bellows with draw string or Velcro® closures. The floor has a removable floor in the fit-up room which is a drop-in type design that allows fit-up and welding in a controlled atmosphere. The outer rooms(Ante Rooms) are used for pre-cleaning the tube ends before moving the tube to the fitting.welding room. The shelter is equipped with a filtered, conditioned air supply system that provides both heating and cooling to the shelter. The shelter is fitted with appendages that allow the storage of cleaning, welding, and testing equipment. These appendages fit to the walls of the shelter to allow maximum working space inside. An outside wall of the shelter is designed to hold purge and test gas bottles. The man doors on the shelter must be lockable from the inside to discourage entry during fit and welding processes and should provide a positive seal.

1.2 The term Contractor identifies the party purchasing the Clean Room. The term Weld Shelter Fabricator identifies the vendor responsible for constructing, testing and delivering the weld shelter.

APPROVED

M. Fallelein 11/10/95

11/10/95

1.3 This specification provides the requirements for the fabrication and delivery of the LIGO weld shelter. The Weld Shelter(s) consist of a 8ft wide x 16ft long x 9' high custom, metal fabricated building.

1.3.1 The weld Shelter(s) will consist of two assemblies bolted together for transport. The joint shall be an exterior gasket or caulked detail to assure weather protection when assembled.

1.3.2 The Weld Shelter Fabricator will fit out the building with insulated walls, doors, HVAC system, and appendages.

1.3.2 The Weld Shelter Fabricator shall provide specified equipment including cabinets, lockers, and trash receptacles. These will be either installed or shipped packaged inside the shelter halves.

1.3.3 The Weld Shelter Fabricator shall provide all electrical equipment and installation to the National Electrical Code(NEC) as detailed in the attached sketches.

1.3.5 The Weld Shelter Fabricator shall paint the shelter(s) as detailed in the attached specification.

1.3.6 The Weld Shelter Fabricator will prepare the Weld Shelter(s) for shipment per the requirements of this specification.

1.4 The LIGO Project requires two(2) Weld Shelter assemblies to be delivered to the LIGO Hanford, Washington site at the scheduled time agreed upon by the Contractor and the Weld Shelter Fabricator.

1.5 Definition of clean: Surfaces which are visibility clean to the unaided eye and will not display any visual signs of dust when wiped with a clean, unbleached cloth. This condition will be described as "Conference Room Clean."

1.6 The terms "submit" an "approval" relates to the sharing of information from the Weld Shelter Fabricator and subsequent approval by the Contractor. This may be performed by mail, Fax or telephone conversation as long as the discussions are documented and distributed to both parties.

2.0 REFERENCES:

The Weld Shelter is deisgned to meet the requirements of LIGO based on the following references. All changes or revisions to this specificaiton must be consistant with and meet the requirements of these procedures.

2.1 The construction and operation of the Weld Shelter(s) is based on the following references:

2.1.1 Summary of concepts and Reference Design for a Laser Gravitational-Wave Observatory, CAL TECH; Feb-92.
2.1.2 Chicago Bridge & Iron Safety Manual for L.I.G.O. Project.
2.1.3 CBI Cleaning Procedure CL3N.
2.1.4 CBI Contamination Control Procedure CCP-1.
2.1.5 CBI Procedure for Clean Room Transporation, Storage, and Maintenance; CRTSM-1.

3.0 OUTLINE DRAWINGS

The following is a listing of Weld Shelter Outline drawings.

Sketch R1 General Views and Dimensions
Sketch R2 Equipment Plan View and Listing
Sketch R3 Bulkhead Elevations
Sketch R4 Electrical Power Plan
Sketch R5 Operating and Emergency Equip Elect Plan
Sketch R6 Electrical Lighting Plan
Sketch R7 Electrical Receptacle Plan
Sketch R8 Rolling Plan
Sketch R9 VEE Grove Wheel Detail
Sketch R10 Floor Plan and Insert
Sketch R11 Penetration Details
Sketch R12 HVAC Balancing Details
Sketch R13 Fabric Bellows/Seal Details
Sketch R14 Appendages

4.0 EQUIPMENT:

Fabrication of the Weld Shelter(s) shall include the following as a minimum for materials and equipment purchased, provided and/or installed by the Weld Shelter Fabricator.

4.1 Weld Shelter shall consist of a steel fabricated building meeting the following:

4.1.1 Steel shall be 1/8" minimum thickness and all steel surfaces shall be blasted and painted per this specification.Corrigated steel material may be subsituted provided all areas are sealed and structural intregrity is maintained.

4.1.2 Maximum allowable floor deflection of 1/4" for 4 lbs/sq.in. The Contractor will assist in determining floor framing plan.

4.1.3 All efforts should be made by the Weld Shelter Fabricator to decrease the weight when ever possible without detriment of strength.

4.1.4 Alternate designs for the use of MDO, PVC or other alternate materials in lieu of steel plate may be submitted to the Contractor for approval after review.

4.1.5 The use of other framing materials as alternate to steel angle, beam or channel is not allowed.

4.2 Weld Shelter Safety Equipment shall be provided as noted on the table **Table 4.0** and these specifications. Substitutions of equipment shall be identical to that listed or an approved equal. All substitutions shall be pre-approved in writing before purchase.

4.3 Weld Shelter Electrical Equipment shall be provided as noted on the table **Table 4.0** and these specifications. Substitutions of equipment shall be identical to that listed or an approved equal. All substitutions shall be pre-approved in writing before purchase.

4.4 Weld Shelter Construction Materials shall meet the following standards listed.

4.4.1 Insulation Materials shall be sheet foam with aluminized backing and a minimum of 1" total thickness(laminating multiple pieces is acceptable).Blanket type insulation is not acceptable. All insulation material shall meet or exceeding UL®, Factory Mutual, and NFPA requirements

4.4.3 Walls and ceilings shall be covered with MARLITE® board. This is a ceramic coated Masonite® type material with the color white. Substitutions are allowable per requirements noted below.

4.4.3.1 Fasteners shall be white and as suggested by the panel manufacturer.

4.4.3.2 Panel Joint and corner assembly strips shall be as suggested by panel manufacturer.

4.4.4 Fasteners used for Weld Shelter fabrication and construction shall conform to the following:

4.4.4.1 Interior fasteners used for framing and structural work shall be drive screw type fasteners properly sized and coated for corrosion resistance.

4.4.4.2 Exterior fasteners used for attaching framing to Weld Shelter walls shall be 18-8 stainless steel button head screws, nuts and washers. All exterior fasteners shall be sealed to prevent leakage and painted to match the surface where screw head is visible.

4.4.4.1 Fasteners used for molding shall meet the paneling manufacturer's recommendations.

4.4.5 Doors shall be sized as noted on the attached sketches and meet the following requirements:

4.4.5.1 Four man doors shall be made with structurally supported steel plate.

4.4.5.2 Hinges may be bolted or welded to the door and wall at the description of the Weld Shelter Fabricator.

4.4.5.3 A gasket shall be installed between the door and the opening to prevent leakage into the rooms. This gasket shall be replaceable without damage to the door, wall or their surface coatings.

4.4.5.4 Door latches shall be as listed on the Table 4.0 and mounted with manual locking trigger to the inside and keyed on the outside of the door.

4.4.5.5 Inside surfaces of doors shall be insulated and outside surfaces shall be painted to match the mating surface paint.

4.4.5.6 All Doors shall be fitted with windows fabricated from clear cast acrylic or wire reinforced glass. Window details shall conform to the following.

4.4.5.2 Windows shall be sized to fit per the details noted on sketch Window detail.

4.4.6 Flooring shall be blue in color with smooth finish. Material shall be applied to Weld Shelter floor with adhesive as suggested by flooring manufacturer. floor surface shall be "wax free" finish and resistant to alcohol and detergent. Flooring material shall be pre-approved by the Contractor prior to purchasing. The Clean Room Fabricator shall provide a sample of a minimum size of 6"x6" to the Contractor for approval.

Substitutions of equipment may be permitted. All suggested, alternate materials shall be identical to that listed or an approved equal. All substitutions shall be pre-approved in writing before purchase.

4.5 Weld Shelter Safety Equipment shall be provided as noted on the table **Listing 4.0**. Substitutions of equipment shall be identical to that listed or an approved equal. All substitutions shall be pre-approved in writing before purchase.

5.0 *EXECUTION*:

Fabrication of the Weld Shelter(s) shall include the following as a minimum for workmanship and quality of installation. The Contractor reserves the right to inspect the fabrication and constructions during the Weld Shelter construction.

5.1 Framing shall be performed using materials specified and installed in a craftsmanship like manner.

5.1.1 Any framing installed shall be attached to the Weld Shelter flooring in a manner which will not be detrimental to the floor strength. All fasteners penetrating the Weld Shelter walls or flooring shall be sealed with caulking before the joint is covered.

5.1.2 Fastening which requires roof attachment shall be made by epoxy adhesive conforming to the specifications or gasketed and/or sealed stainless steel fasteners .

5.1.3 Open

5.1.4 Electrical wiring required within the walls of the container shall be installed before any insulation and paneling is installed.

5.1.5 Equipment installation(HVAC Unit, registers, and duct, Floor Insert, lighting and electrical equipment) must be installed prior to wall and ceiling

paneling. The Contractor reserves the right to inspect the framing and equipment installation prior to installation of the paneling.

5.1.6 Wall Paneling shall be installed per the paneling manufacturers recommendations. Materials shall conform to the specifications. Damage, including cracks, chips, and mismatched panels shall be repaired by means of replacement or patching based on the discretion of the Contractor.

5.1.7 Flooring is installed after wall & ceiling panels and equipment is installed. Flooring shall be applied by adhesive and floor molding shall be installed around all walls. Caulk with clear caulk between molding at the wall and the floor.

5.3 Electrical installation shall conform to NEC and the local building code for the Weld Shelter Fabricator. All work shall be performed in a quality workmanship manner.

5.3.1 All wireways shall be rigid conduit and carry a #14 ground wire to the Weld Shelter Ground at the breaker panel.

5.3.2 All interior boxes shall be metal with conduit compression connectors used for junctions of conduit.

5.3.3 All Flexible conduit shall be liquid-tight with box connections being liquid-tight.

5.3.4 All pull cover plates and boxes, switch boxes and receptacle boxes shall be rated NEMA 4X

5.3.5 Conductors shall be THHN stranded building wire color and sized per NEC requirements.

5.3.6 Receptacles shall be sized per sketch detail. They shall be ground fault unless respective breaker in the electrical breaker panel is designated ground fault.

5.3.7 Electrical panel shall be mounted as noted in the details and be rated a minimum of NEMA 12.

5.3.8 HVAC Equipment wiring shall be the requirements of the manufacturer.

5.3.9 Power wiring to the remote source shall conform the the details on the attached sketches. Equipment for this installation shall be provided by the Weld Shelter Fabricator and installed per details. FOR THIS DETAIL, NO SUBSTITUTIONS ARE ALLOWED.

5.3.10 Exterior receptacles and equipment shall be installed per the detailed sketch.

5.4 Painting of surfaces shall be performed in a professional manner with attention to sealing and caulking areas exposing the container interior to the outside environment. This spec does not apply to factory painted equipment unless noted.

5.4.1 All Exterior Weld Shelter metal surfaces shall be sandblasted to a SSP-SP3 finish. Immediately coat the Weld Shelter surfaces with an epoxy primer, color gray. Final paint surfaces using a two part blue epoxy paint. Provide a sample of the paint color for approval prior to final coat. Paint thickness shall meet the paint manufacturers recommendations.

5.4.2 Interior Weld Shelter metal surfaces shall be sandblasted to a SSP-SP3 finish. All surfaces shall be painted with an oil based primer and two coats of white, high gloss oil base enamel or epoxy paint pre-approved by the Contractor. Paint thickness shall meet the paint manufacturers recommendations.

5.4.3 Interior wood surfaces requiring painting shall be coated with high gloss, white, oil base enamel paint pre-approved by the Contractor. A minimum of a sealing primer and two coats of enamel is required. The sealing coat may consist of a oil based sanding sealer or oil based gray primer.

5.4.4 Caulking is required for all areas where sealing is needed and/or surfaces join causing a corner which can accumulate dust and debris. All caulking shall be of a white or clear, Latex-Based siliconized acrylic caulk and applied in a quality workmanship manner. The caulk bead shall be concave and a radius which is tangent with the intersecting surfaces. Caulking used to cover or seal openings shall be applied in a manner to smooth and seal the opening. Caulking shall be applied before painting to allow proper cure time. White caulking shall be painted with the surface paint.

5.5 HVAC Installation, start-up and balancing shall be performed in a professional, craftsman manner. The following details specific minimum requirements.

5.5.1 The Weld Shelter Fabricator shall install the HVAC system including the Unit, Exhaust fan, return air register/damper as detailed in the applicable specifications. The following is determined to be required:

5.5.1.1 HVAC Unit includes fan, condenser, evaporator, electric heating coil, pre-filter and HEPA filter. The unit shall be sized as noted below:

- 460 Volt AC/60hz 3Ø
- 30 amp Maximum Unit Total Current
- Adjustable and/or Variable Fan Speed
- 2000cfm Minimum of Filtered, Conditioned Air
- 36,000 BTU/hr Cooling Capacity(minimum)
- 35,900 BTU/hr Heating Capacity(minimum)
- Pre-Filter: Bag type Fiber Glass Unit
- Final HEPA Filter 0.3 Micron Unit
- 24VAC Thermostat and Control Voltage
- Compressor Short Cycle Protection
- Voltage and Over-current protection
- Sheet Metal Cabinet with Factory Finish

The unit shall be secured to the Weld Shelter roof curb with the filters acceptable from ground level as detailed on the applicable sketch. Power and control wiring shall be installed based on specifications and the manufacturers recommendations.

5.5.1.2 HVAC duct shall be insulated and installed in conjunction with the Weld Shelter construction and be equipped with required registers and dampers. Hangers and supports shall be supported from the Weld Shelter surfaces.

5.5.1.3 The exhaust fan shall be installed to the curb penetration and meet the following requirements:

- 120 volts/60hz TEFC 1/4 hp Motor
- 1,200cfm @ 1/4" Static Pressure minimum flow
- Curb sized by Clean Room Fabricator
- Control Switch mounted to Weld Shelter wall above fan register/damper.
- positive motorized closing damper which closes when fan is turned off.

5.5.1.4 The filter system including the bag filters and the HEPA filter elements shall be attached or integrated into the HVAC Unit. Access to inspect, remove and replace shall be permitted. Changing filters shall be demonstrated by the Weld Shelter Fabricator. A positive motorized damper assembly shall be up-stream of filters to close when unit is shut off.

5.5.2 The Weld Shelter Fabricator will operate and demonstrate the ability to balance the system using gauges noted in Table 4.0 and with the assistance of the Contractor. These gauges will consist of three manometers for the purpose to adjust air flow while exhausting through the fit-up room. This demonstration is to assure adequate conditioned air is available for Weld Shelter operation. See applicable sketch for test set-up.

6.0 ACCEPTANCE:

Prior to shipping, the Weld Shelter(s) shall be inspected by the Contractor. This inspection may be preformed during the HVAC demonstration.

6.1 The inspection will include a demonstration of the operation of the systems including the lighting, emergency lighting, HVAC, inventory of equipment/condition and cleanliness.

6.2 At the time of acceptance by the Contractor, the Weld Shelter Fabricator shall provide two(2) sets of keys for each Weld Shelter(s). These keys shall be given to the On-Site Contractor's representative.

7.0 SHIPPING:

The Weld Shelter Fabricator shall prepare the Weld Shelter(s) for shipment by performing the following as a minimum:

7.1 Dis-assemble the Weld Shelter and prepare for shipping by covering the open faces with a 4 mil poly sheet. Secure a 3/4" exterior grade plywood cover to the face of each Weld Shelter half and secure using the actual clean room attachment bolts(note that twice the number of fasteners are required, these are included in the Table 4.0 listing).

7.2 Wipe clean all surfaces of the clean room using a 30:1 mixture of **Mirachem 500®** detergent and water. The mixture will be applied by spray bottle and wiped down with clean wiping cloths. Assure all safety precautions are followed.

7.2 Remove outside lighting from hangers, package and store light inside clean room for shipping.

7.3 Remove exhaust fan, package and secure inside Weld Shelter. Cover fan curb with 4 mil poly sheet and 3/4" exterior plywood cover.

7.5 Secure all Weld Shelter equipment to avoid movement during shipment.

7.6 Disconnect power cord and coil the cord inside the a Weld Shelter half. Store receptacle and cover for generator in the same location.

7.8 Lock all doors and padlock with CBI provided lock.

7.9 Load the Weld Shelter halves on a commercial flat bed truck and ship to the Hanford Site.

	IDENTIFICATION WSSPEC			
TITLE WELD SHELTER SPECIFICATION	REFERENCE NO. 930212		SHT 12 OF 27	
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PRODUCT LIGO BEAM TUBE MODULES CALIFORNIA INSTITUTE OF TECHNOLOGY	MADE BY SDH	CHKD BY MLT	MADE BY SDH	CHKD BY MLT
	DATE 07/10/95	DATE 08/02/95	DATE 11/10/95	DATE 11/10/95

TABLE 4.0

ITEM No.	Quantity	Description	Distrubuter	Catalog No.
1	1	Weld Shelter Assembly	Per Specifications	
2	2	Clean Room Stool 30" x 13"Ø	McMaster-Carr	5096T53
3	2	Stainless Gas Hose Bin 18"w x 12"d x 18"h	CRS-1-GBH	
4	1	Aluminum Floor Insert 60" x 72" x 4"	R10	
5	4	Purge Manifold System	Open	
6	1	Gas Bottle Rack Assembly	R8	
7	1	HVAC/FILTER Unit, outlet registers and adjsutable dampers	Per Specifications	
8	1	1,200cfm Exhaust Fan	McMaster-Carr	2011K14
9	1	Exhaust Fan Roof Curb	McMaster-Carr	2330K78
10	5	Adjustable Filtered Air Register/Damper 14"x10"	McMaster-Carr	2039K1
11	4	Flire Resistant Trash Container 20"Ø x 31"h	McMaster-Carr	4388T4
12	2	Fabric Bellows Assembly	R13	
13	2	Secondary Fabric Seal System	R13	
14	1	Open		
15	1	First Aid Kit 18"w x 24"h	Masuen	53500M
16	1	Trolly for 4" I beam	McMaster-Carr	3189T2
17	3	Single Lighted EXIT Sign	McMaster-Carr	1577K11
18	2	S.S. Dispensing Plunger Can(OSHA/FM)	McMaster-Carr	40075T51
19	2	Type 2 Flammable Liquid Container 2 gal.	McMaster-Carr	4289T7
20	3	Emergency Lighting with Exit Light	WW Grainger	4V324
21	1	100 Amp Breaker Panel with 18 min Slots	WW Grainger	4A562
22	1	100 Amp Receptacle for Marine Connection	Hubbell	4100B12R
23	1	100 Amp Plug for Marine Connection	Hubbell	4100R12
24	2	15° Box for Marine Plug/Recpt	Hubbell	BB1001W
25	2	Box Spacer for Maring Application	Hubbell	FW60/100
26	1	100 A Marine Cord with Plug/Receptacle- 75'	Hubbell	4100CS75
27	1	15 Amp Breaker(one Spare Included)	WW Grainger	4A585

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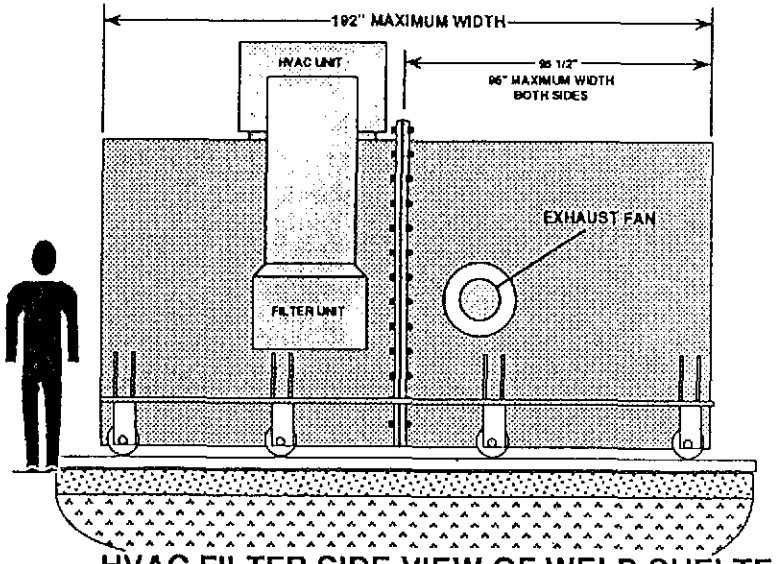
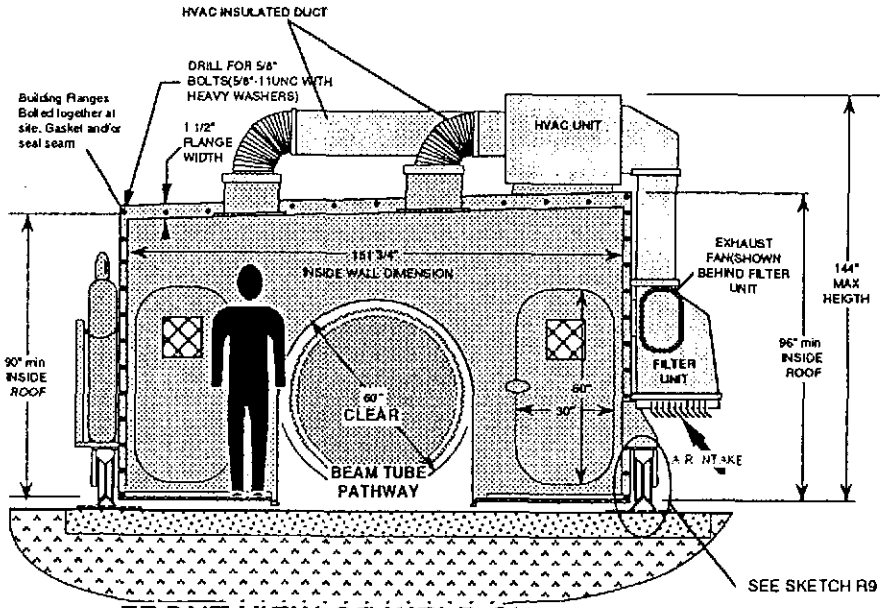
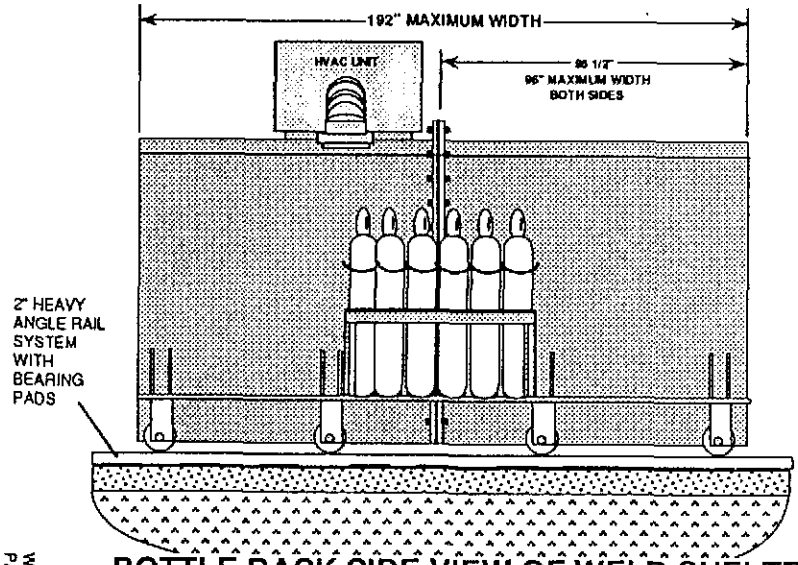
ITEM No.	Quantity	Description	Distrubuter	Catalog No.
28	3	15 Amp GFI Breaker	WW Grainger	4A583
29	1	30 Amp, 2 Pole Breaker	WW Grainger	4A588
30		Open		
31	8	Fluorescent Vapor Proof Light Fixture	WW Grainger	3V424
32	12	Fluorescent Tubes F40, Philips "U" Bent	WW Grainger	4V300
33	2	Incandescent Vapor Resistant Fixture	WW Grainger	2V565
34	2	Incandescent 60w "Bug Away" Bulb	WW Grainger	2V290
35	10	Duplex Receptacle 5-15R, 15 amp	WW Grainger	3A378
36	10	Duplex Covers Rated NEMA 4X	WW Grainger	2V705
42	1	Wall Mounted Switch for Exhaust Fan	R5	
45	1 Lot	Insulation for Walls	Per Specifications	
46	1 Lot	Conduit	Per Specifications	
47	1 Lot	Electrical Wire	Per Specifications	
48	1 Lot	Electrical Boxes, Fittings, Etc	Per Specifications	
49	1 Lot	Fasteners	Per Specifications	
50	1 Lot	Wall Board	Per Specifications	
52	1 Lot	Paint	Per Specifications	
53	4	30" x 60" Steel Man Doors with window cutout	Per Specifications	
54	4	Door Window .020 Wire Glass insert 12" x 12"	McMaster-Carr	8481K12
55	4	Door Window Unit Frames	Per Specifications	
56	1 Lot	Caulking and Sealing Materials	Per Specifications	
57	8	Floor Mats	McMaster-Carr	62675T82
58	3	Dial Manometers	McMaster-Carr	4021K15
		All Items listed in this table may be subsituted based on documented pre-approval.		



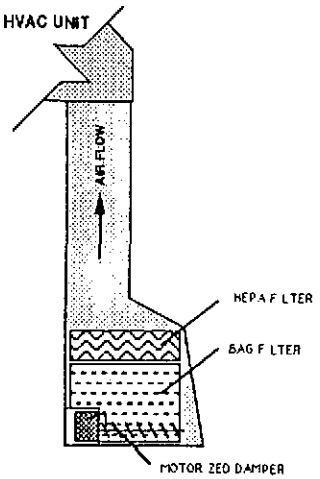
HVAC FILTER SIDE VIEW OF WELD SHELTER



FRONT VIEW OF WELD SHELTER



BOTTLE RACK SIDE VIEW OF WELD SHELTER



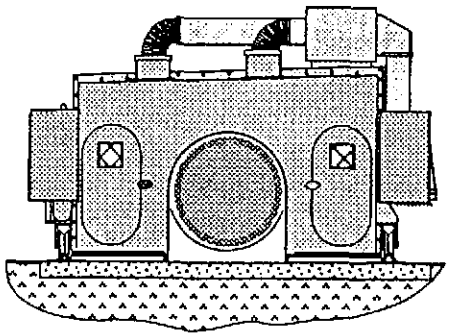
FILTER DUCT AND UNIT ELEVATION SECTION

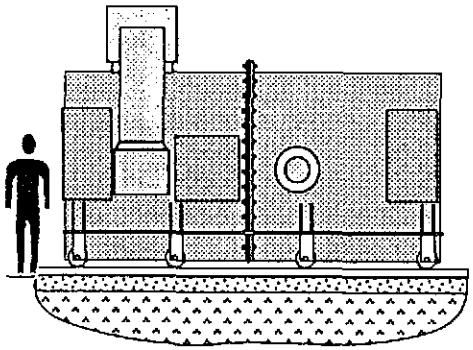
NOTES:

1) ALL STEEL MATERIAL SHALL BE A36 CARBON STEEL UNLESS OTHERWISE NOTED.
2) HVAC UNIT SHALL BE OVERSIZED FOR OPERATION.
3) DOORS SHALL HAVE WINDOWS FOR SAFETY ACCESS.
4) APPENDAGES REMOVED FOR CALIRITY.

CBI
LIGO WELD SHELTER
11/6/95

▶ INDICATES CHANGE FROM PREVIOUS ISSUE

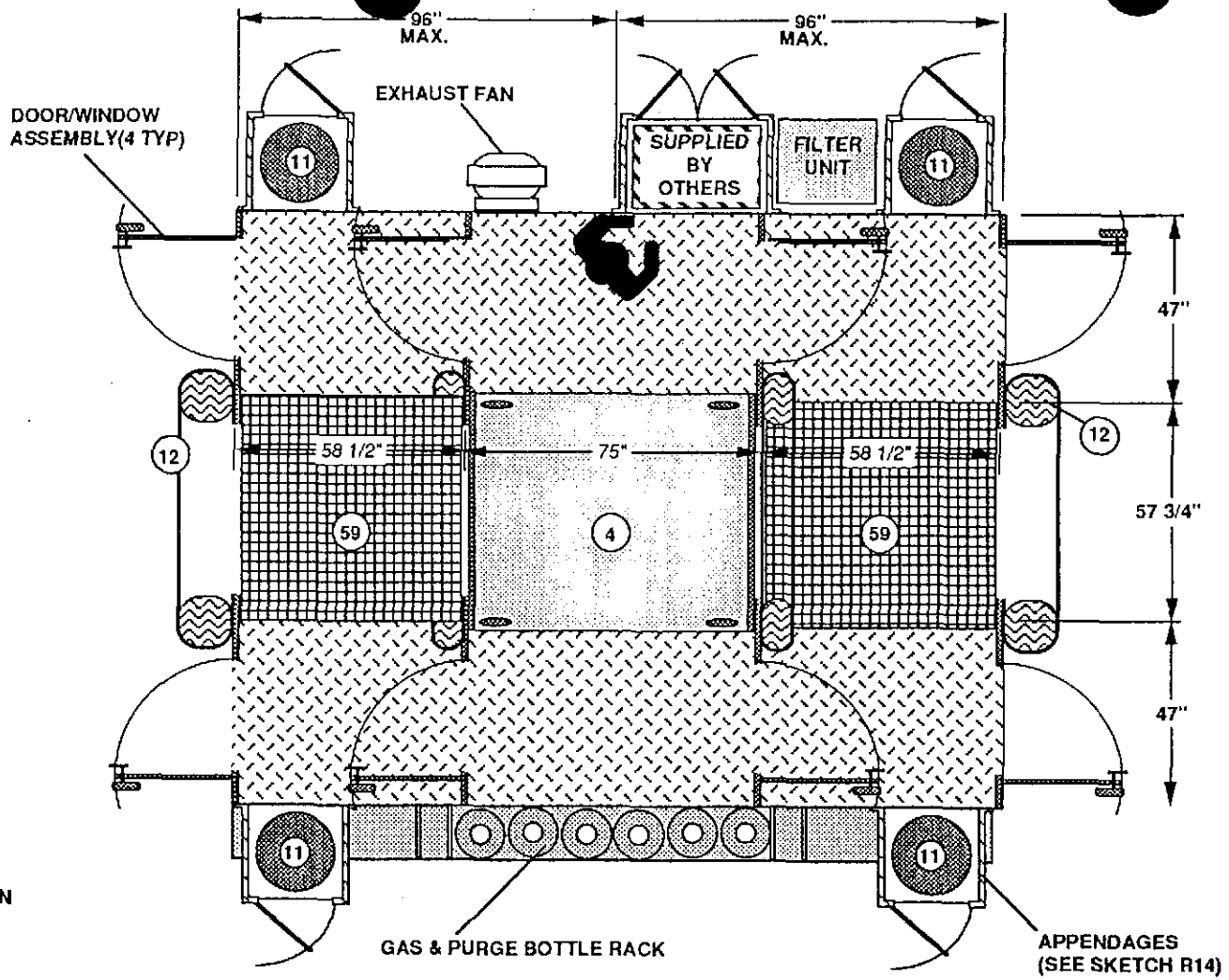




WELD SHELTER

NOTES:

1) ALL STEEL MATERIAL SHALL BE A36 CARBON STEEL UNLESS OTHERWISE NOTED.
2) ALL FLOOR PLATE SHALL BE 1/2" ALUMINUM CHECKER PLATE UNLESS OTHERWISE NOTED.
3) DOORS SHALL HAVE WINDOWS FOR SAFETY ACCESS AND LOCKS KEYED FROM OUTSIDE, OPENABLE FROM INSIDE WITHOUT KEY.
4) SEE TABLE 4.0 FOR EQUIPMENT DESCRIPTION.



WELD SHELTER FLOOR PLAN

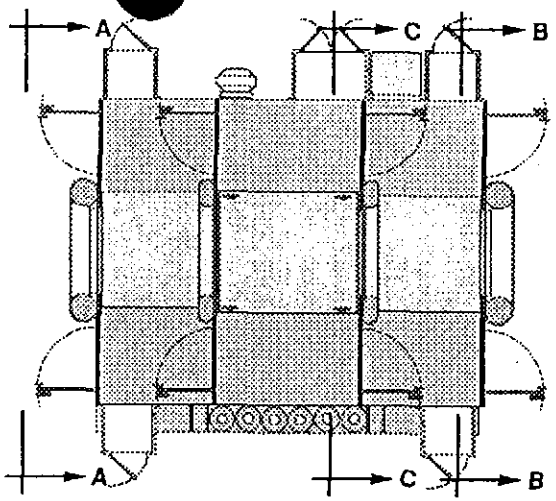
Supplier's/Purchaser's No. _____

CBI

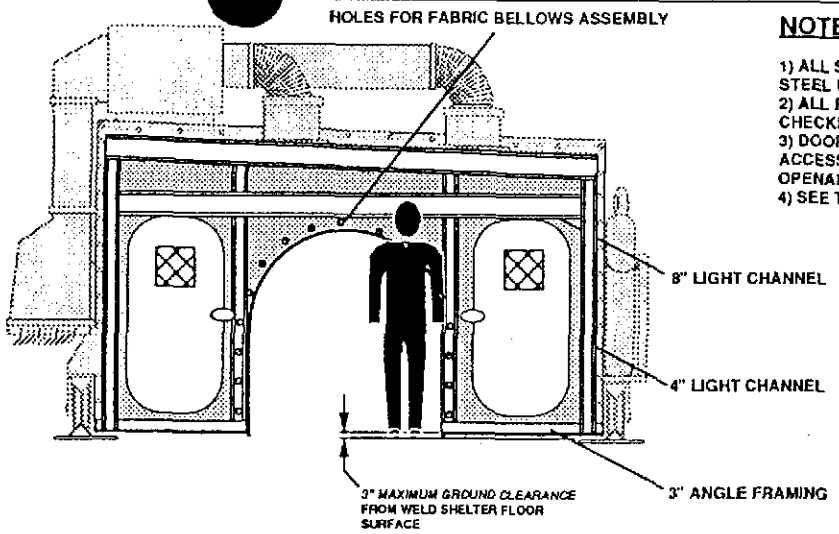
LIGO WELD SHELTER EQUIPMENT PLAN

▶ INDICATES CHANGE FROM PREVIOUS ISSUE

THIS DRAWING HAS BEEN PREPARED FOR AND IS THE PROPERTY OF CBI AND IS TO BE USED ONLY IN CONNECTION WITH PERFORMANCE OF CBI CONTRACT TO WHOLE OR IN PART FOR ANY OTHER PURPOSE IS EXPRESSLY FORBIDDEN



WELD SHELTER FLOOR PLAN



OUTSIDE ELEVATION VIEW AA

NOTES:

1) ALL STEEL MATERIAL SHALL BE A36 CARBON STEEL UNLESS OTHERWISE NOTED.
2) ALL FLOOR PLATE SHALL BE 1/2" ALUMINUM CHECKER PLATE UNLESS OTHERWISE NOTED.
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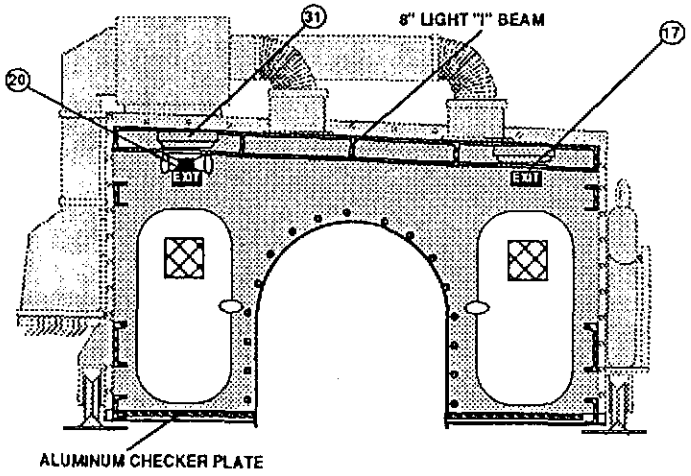
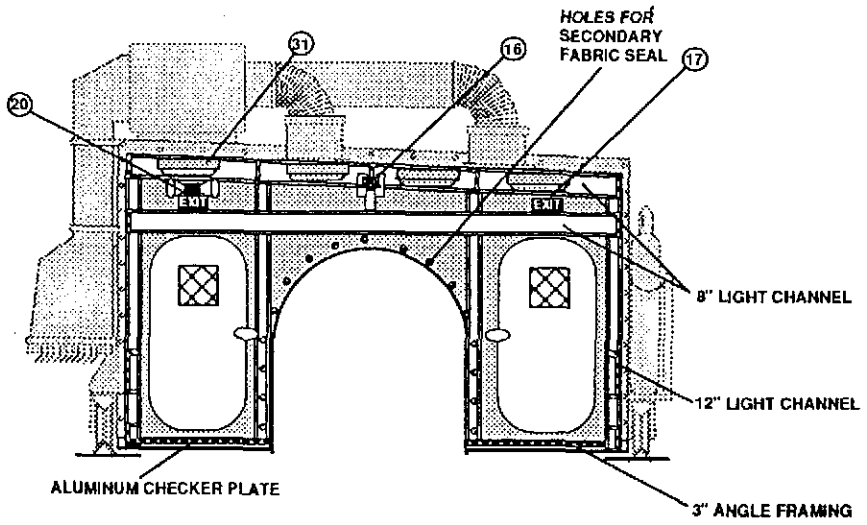


INSIDE WALL ELEVATION VIEW BB



INSIDE BULKHEAD ELEVATION VIEW CC

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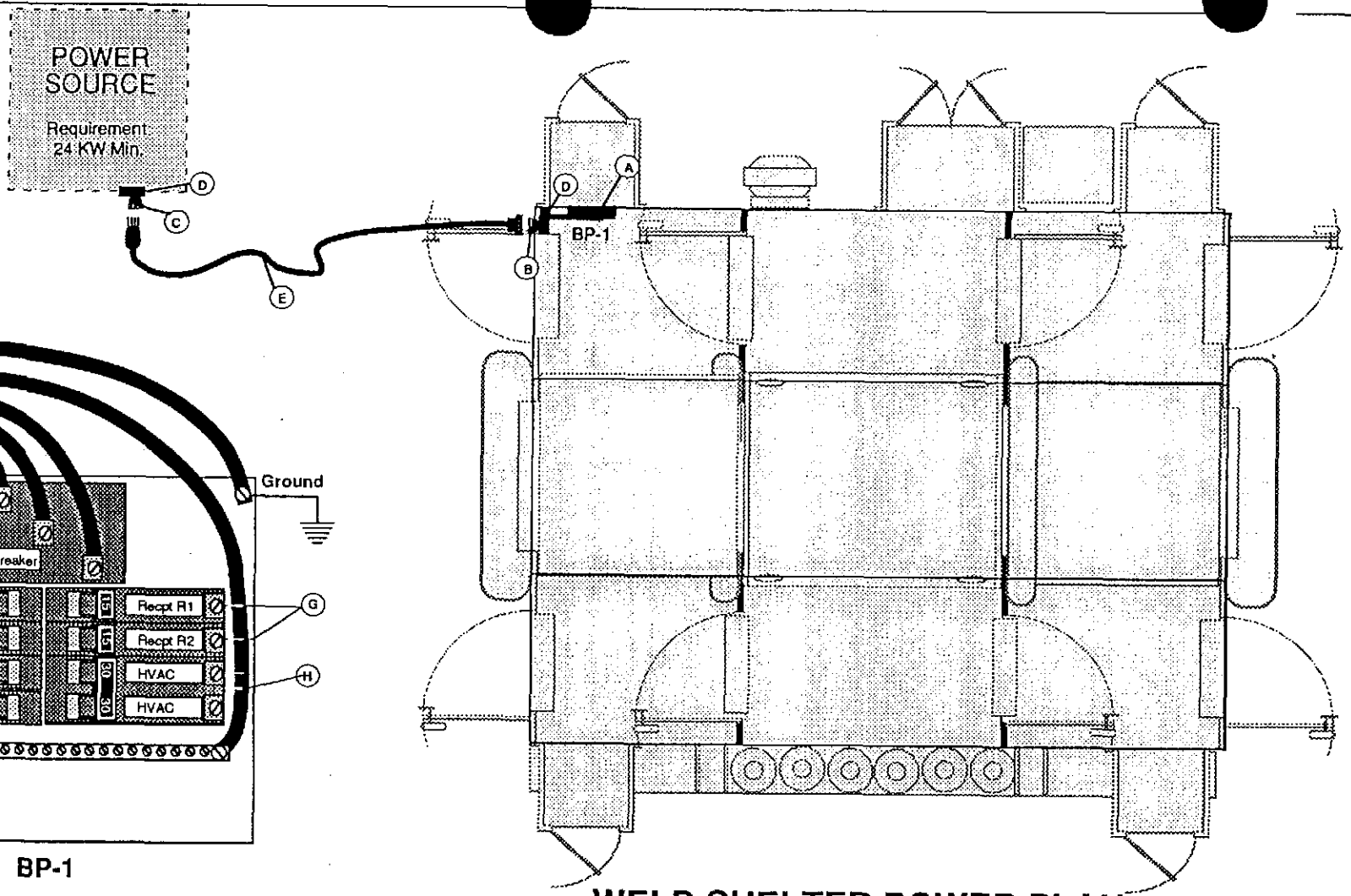
SKETCH R3

CBI
LIGO
WELD SHELTER BULKHEAD ELEVATIONS



WELD SHELTER POWER PLAN

MARK	QTY	DESCRIPTION	SIZE	COMMENTS	REFERENCE NO.
A	1	100 Amp Breaker Panel	18 spcs	240/1Ø	Flush WWG# 4A562
B	1	100Amp Marine Receptacle	5 wire	with Cover	Hubbell 5100B9R Watertight Receptacle
C	1	100Amp Plug for Generator	5 wire	with Cover	Hubbell 5100R9 Watertight Plug
D	1	15° Angle Back Box & Spacer	4x4"	NEMA 4X	Hubbell #BB1002W and FW60/100
E	1	100Amp Marine Cord Set	100'	Watertight	Hubbell 5100CS100
F	4	15 Amp Breaker	1"		WWG#4A585
G	2	15 Amp Breaker with GFI	1"		WWG#4A583
H	1	30 Amp Breaker	1"		WWG#4A588

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LIGO WELD SHELTER POWER PLAN

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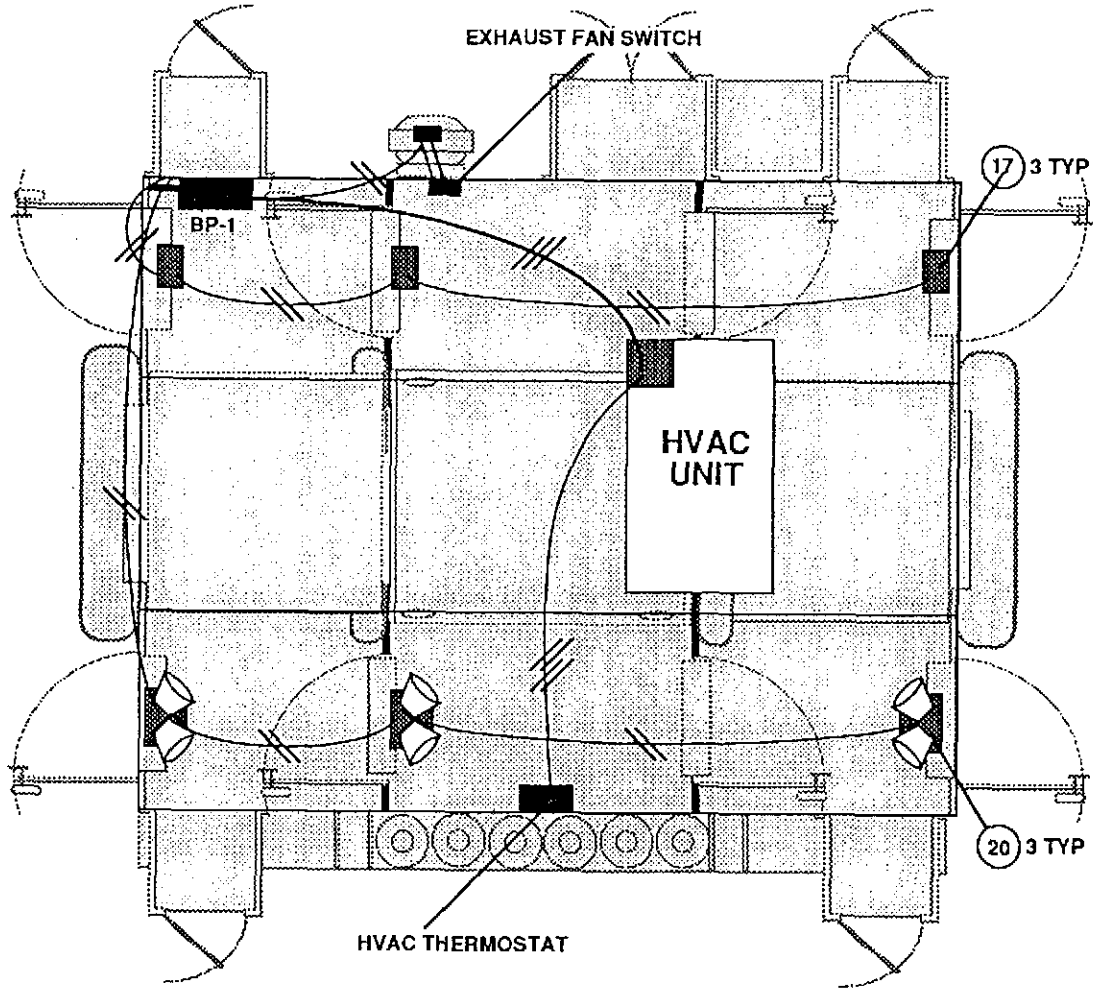

WELD SHELTER EQUIPMENT AND EMERGENCY LIGHTING PLAN

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OPERATING & EMERGENCY WIRING PLAN

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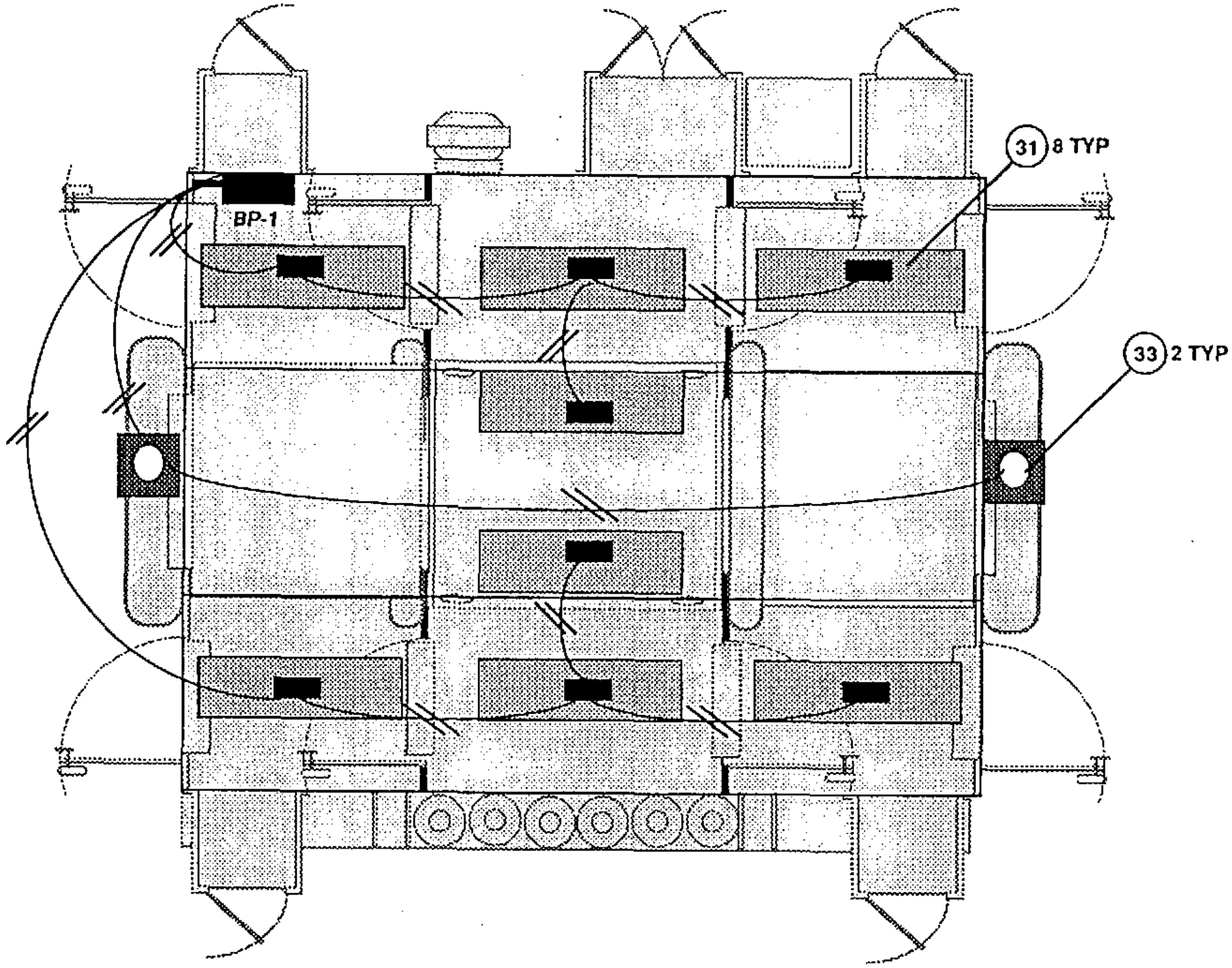

WELD SHELTER LIGHTING PLAN

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SKETCH R6

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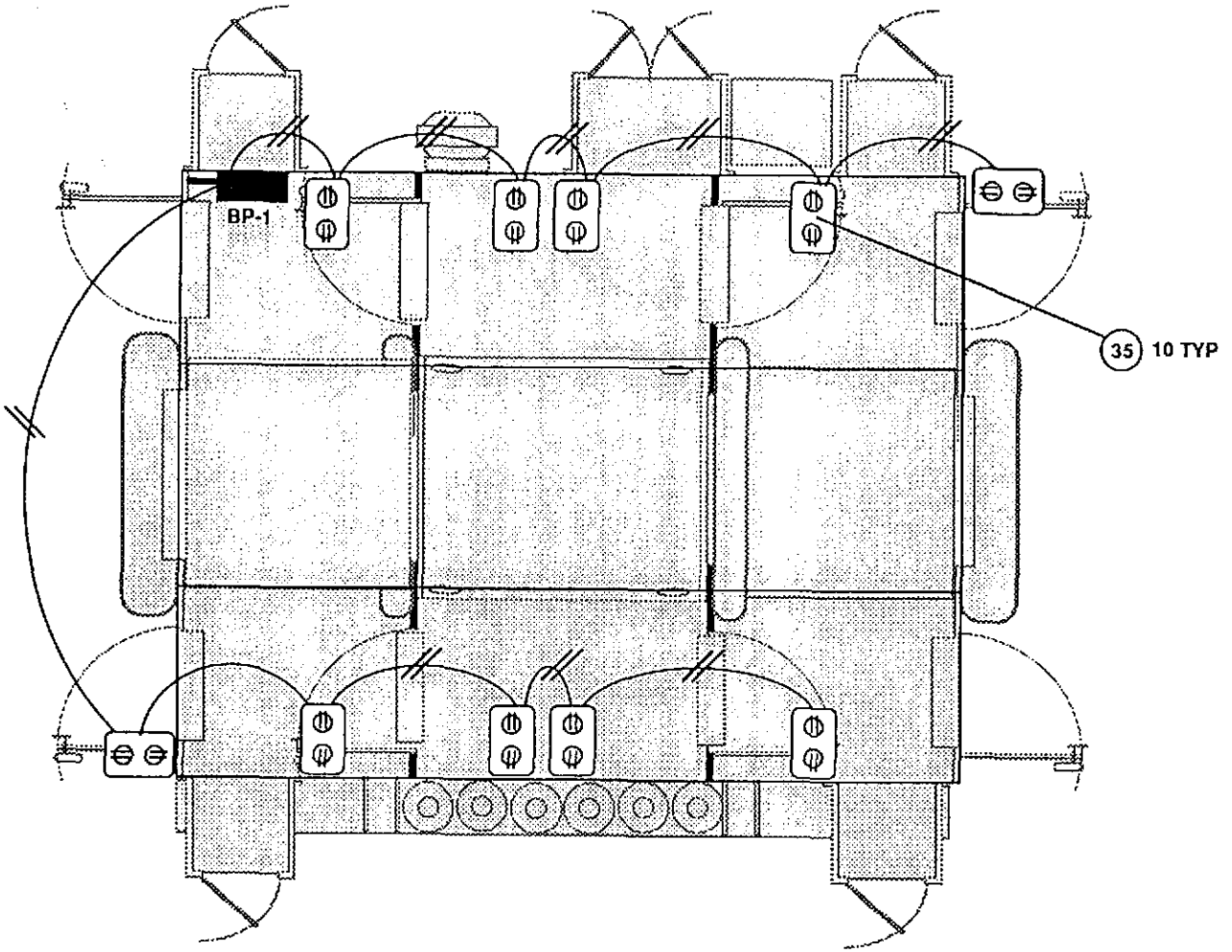
LIGO LIGHTING PLAN



WELD SHELTER ELECTRICAL RECEPTACLE PLAN

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LIGO ELECTRICAL RECEPTACLE PLAN

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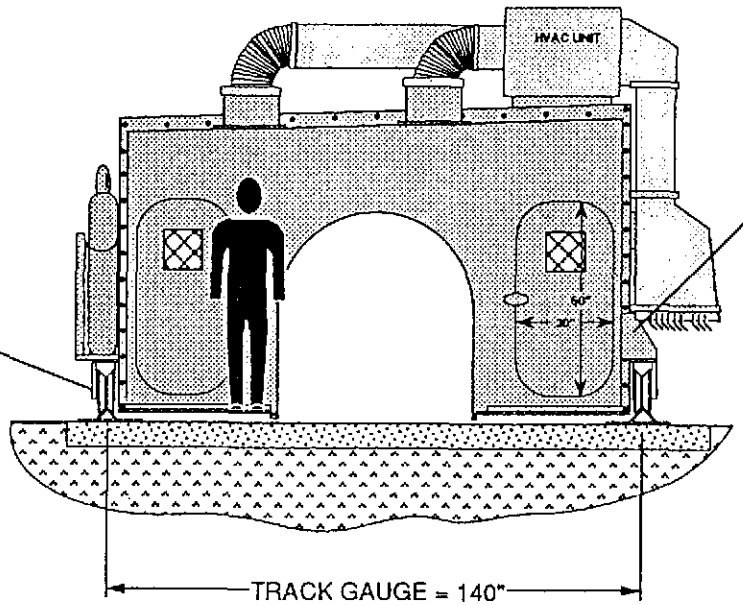
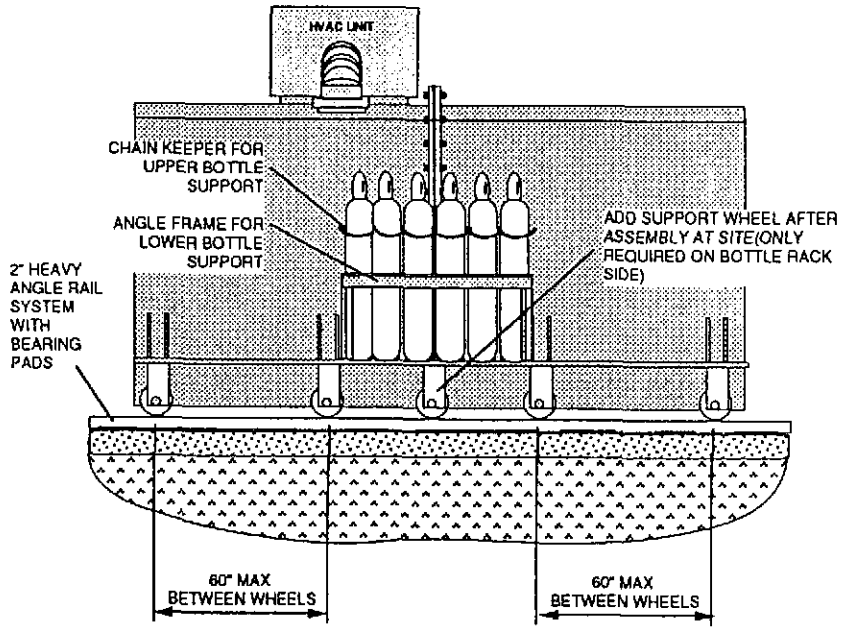


FRONT VIEW OF WELD SHELTER



BOTTLE RACK SIDE VIEW OF WELD SHELTER

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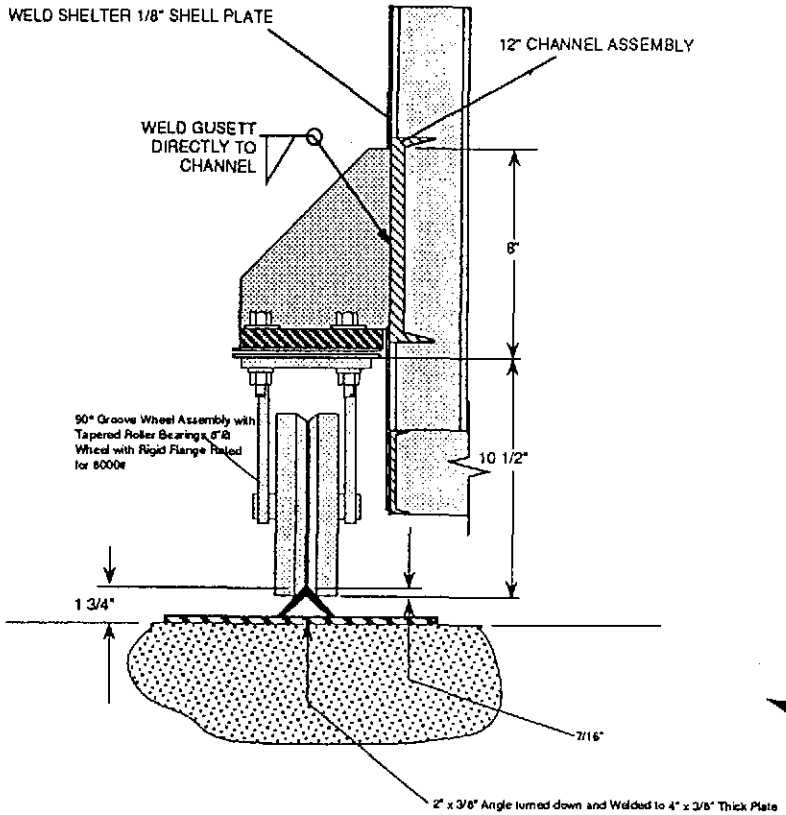
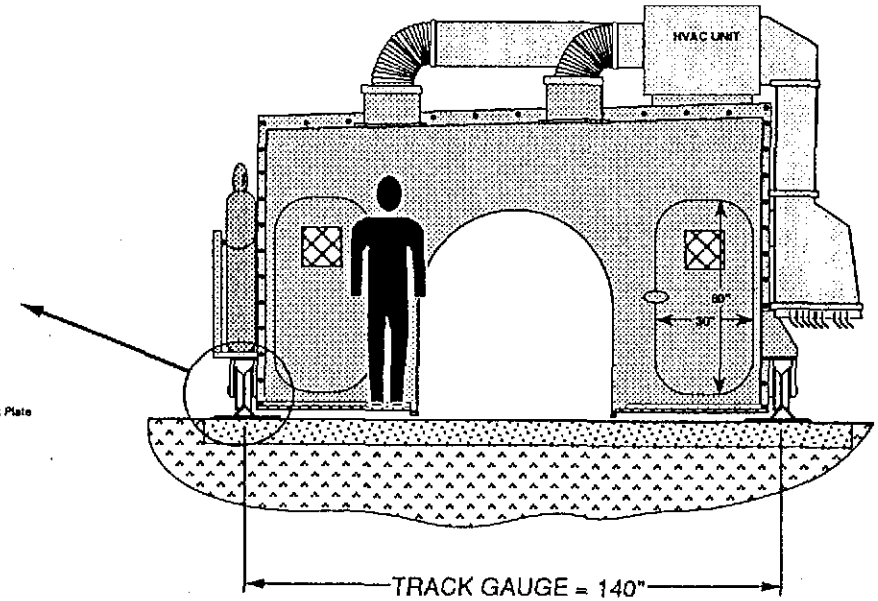
SKETCH R8

INDICATES CHANGE FROM PREVIOUS ISSUE

CBI

LIGO ROLLING DETAIL





NOTES:

1) ALL STEEL IS A36.
2) TRACK SUPPLIED BY OTHERS.

FRONT VIEW OF WELD SHELTER

▶ INDICATES CHANGE FROM PREVIOUS ISSUE

CBI

LIGO

VEE GROOVE DETAIL

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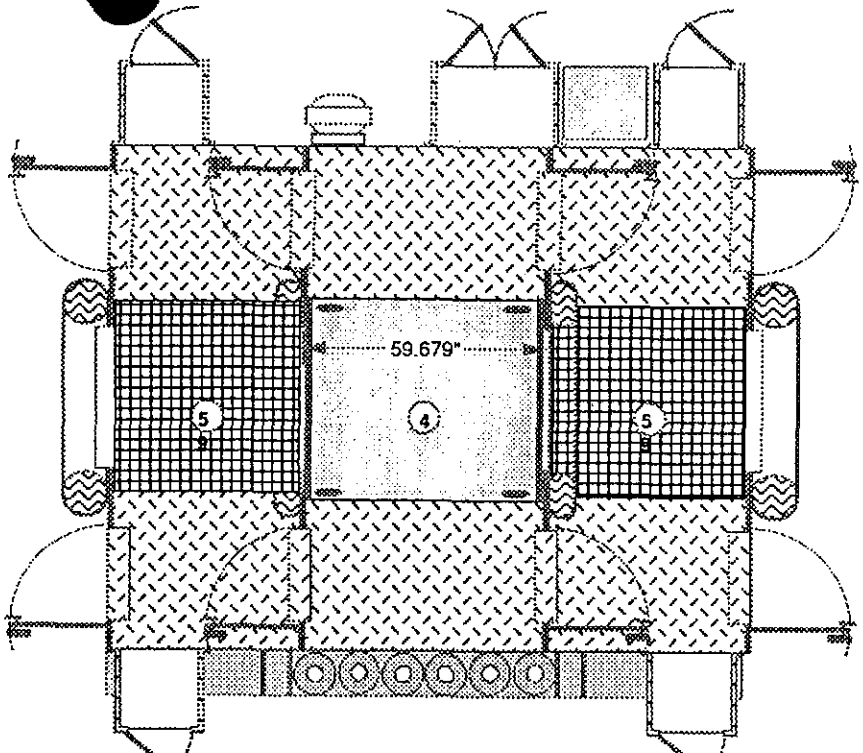
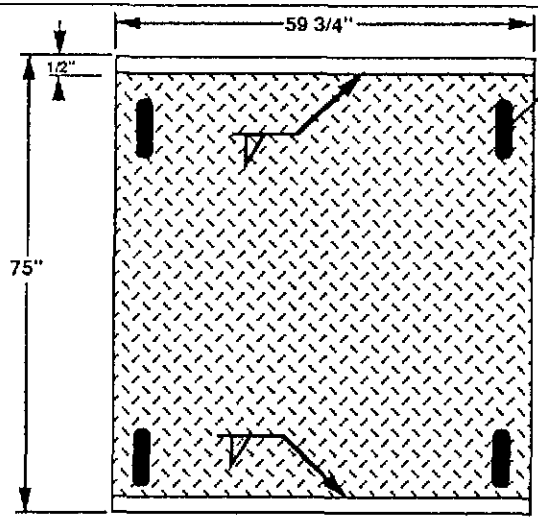
SKETCH R9

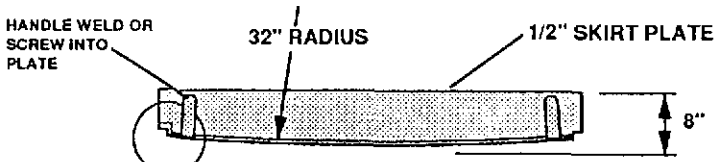


WELD SHELTER FLOOR PLAN

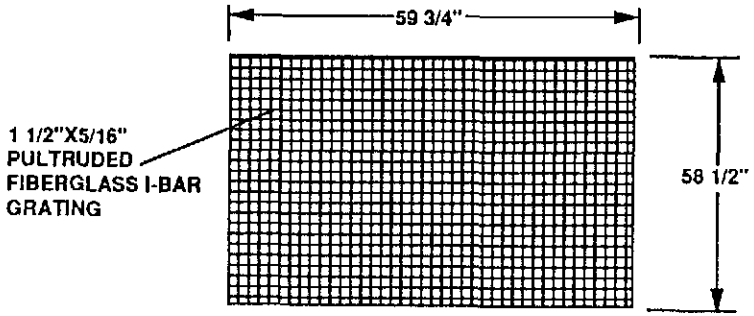


4

PLAN VIEW OF FLOOR INSERT



ELEVATION VIEW OF FLOOR INSERT



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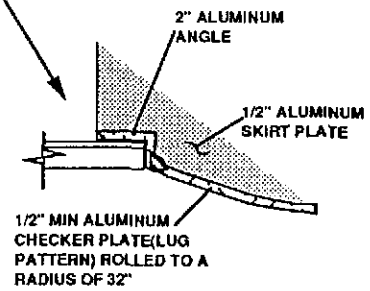

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SKETCH R10

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LIGO

FLOOR PAN & INSERT

SIZE B | LD195

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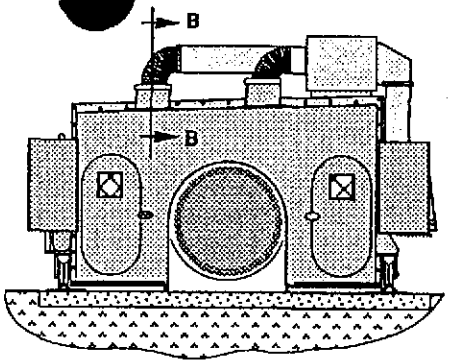
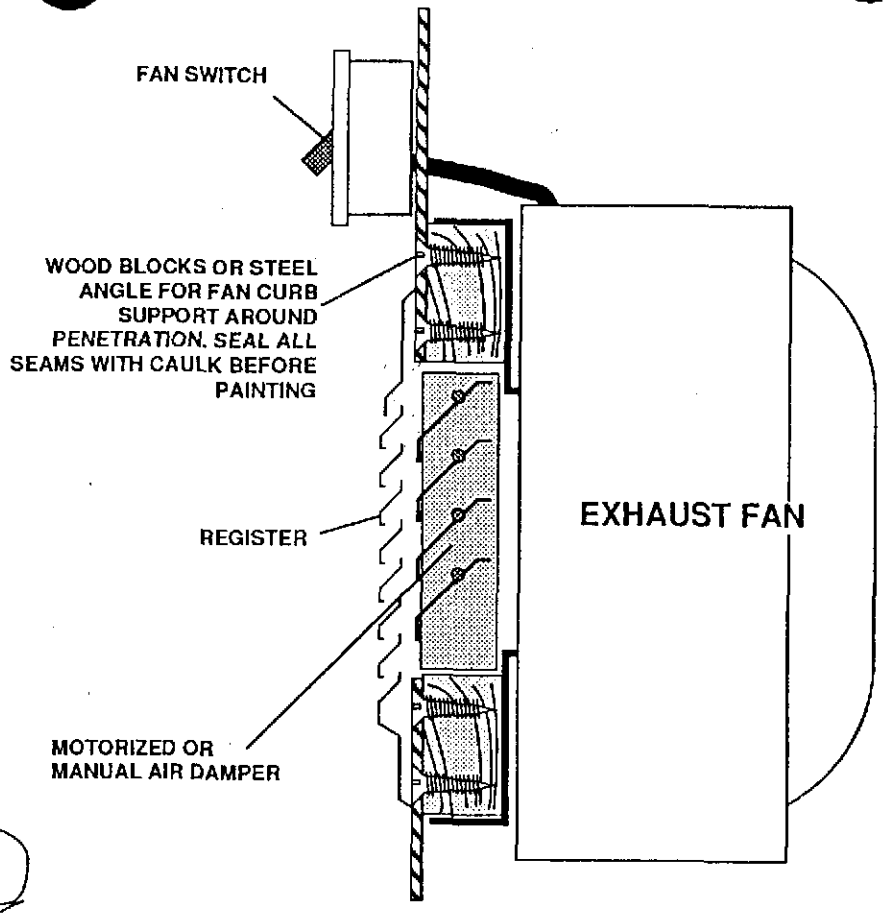
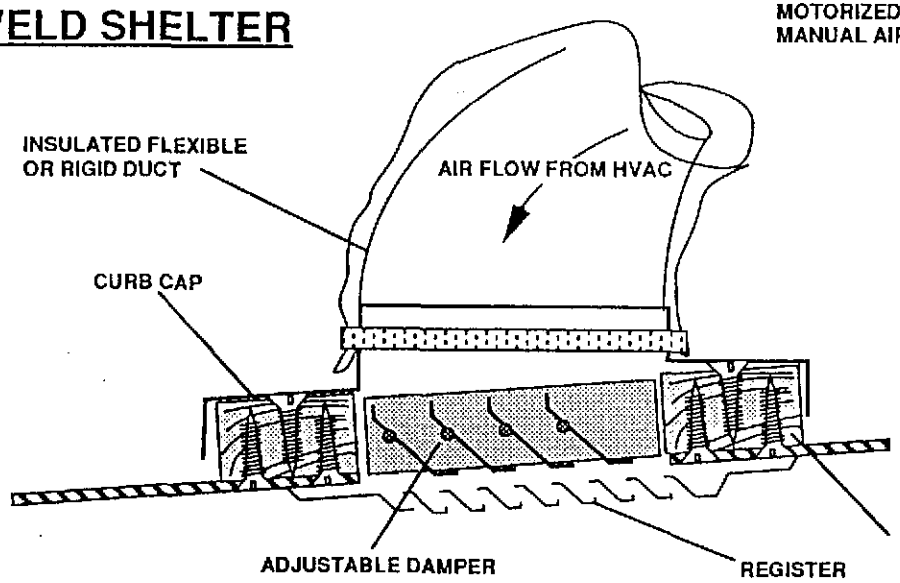


WELD SHELTER



SECTION AA FAN CURB



SECTION BB HVAC DUCT CURB

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SKETCH R11

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LIGO CURBE DETIALS

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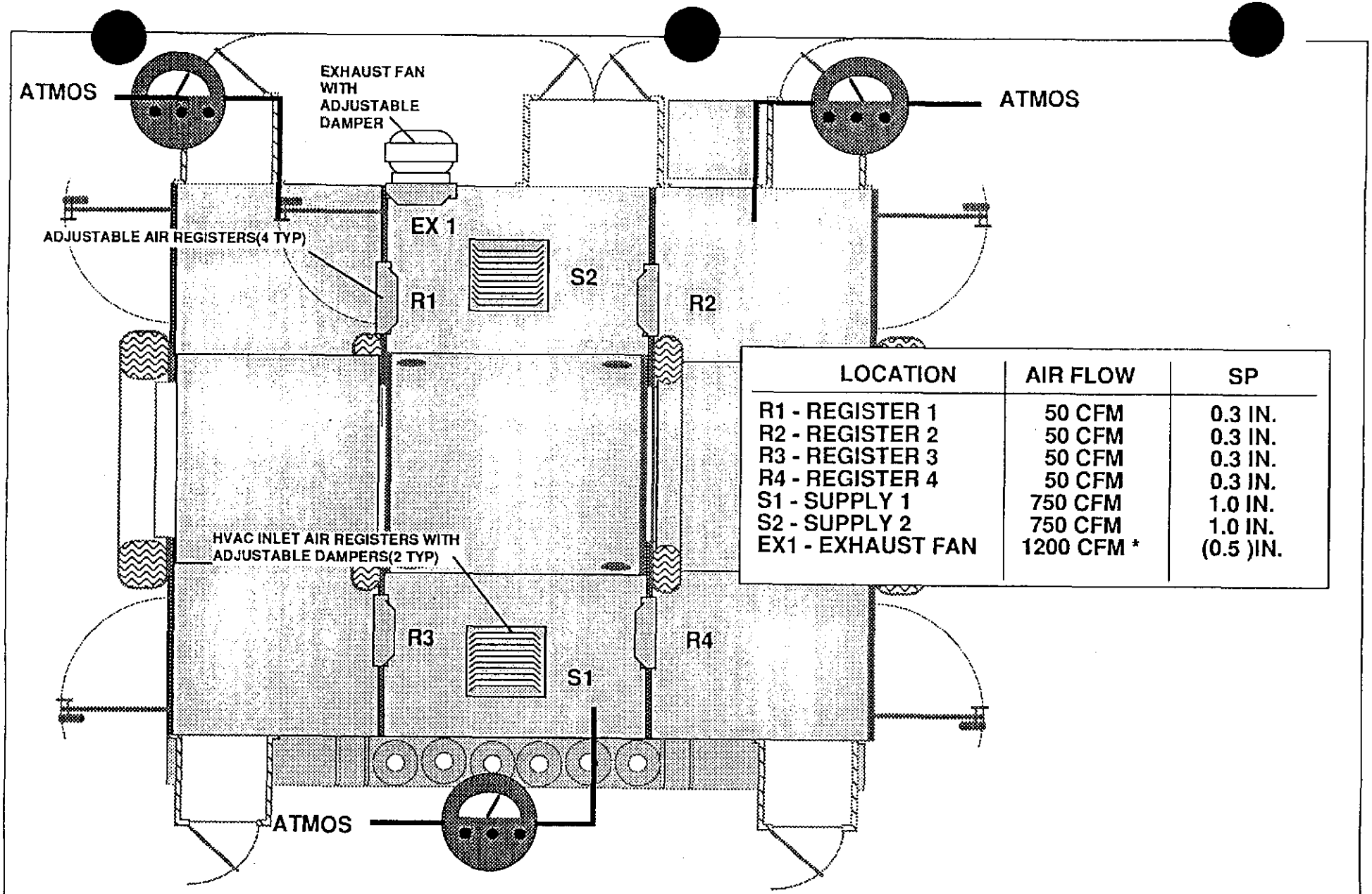

LOCATION	AIR FLOW	SP
R1 - REGISTER 1	50 CFM	0.3 IN.
R2 - REGISTER 2	50 CFM	0.3 IN.
R3 - REGISTER 3	50 CFM	0.3 IN.
R4 - REGISTER 4	50 CFM	0.3 IN.
S1 - SUPPLY 1	750 CFM	1.0 IN.
S2 - SUPPLY 2	750 CFM	1.0 IN.
EX1 - EXHAUST FAN	1200 CFM *	(0.5)IN.

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SKETCH R12

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HVAC BALANCING DETAIL

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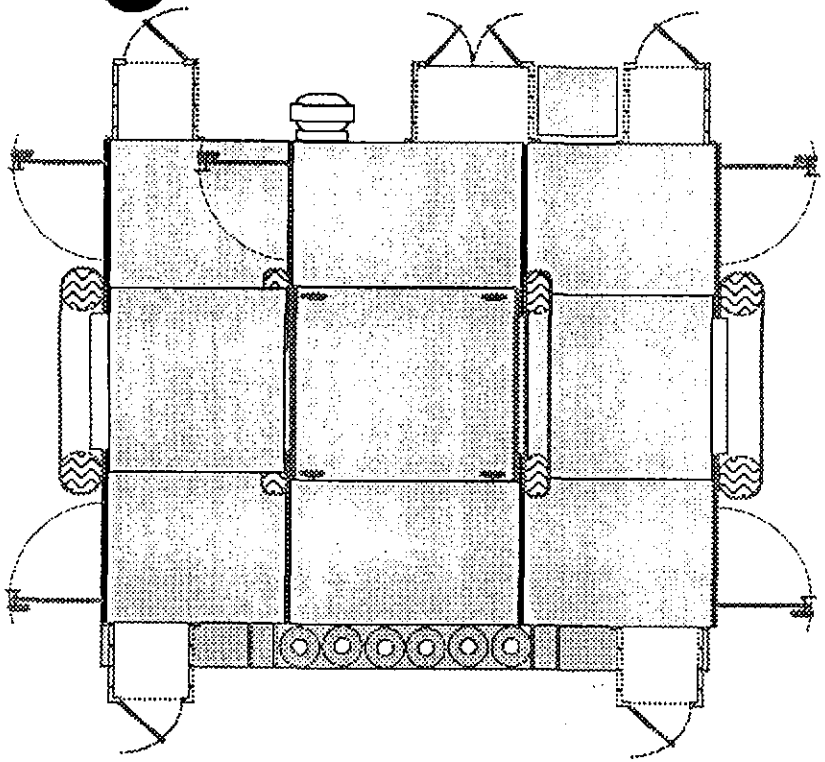
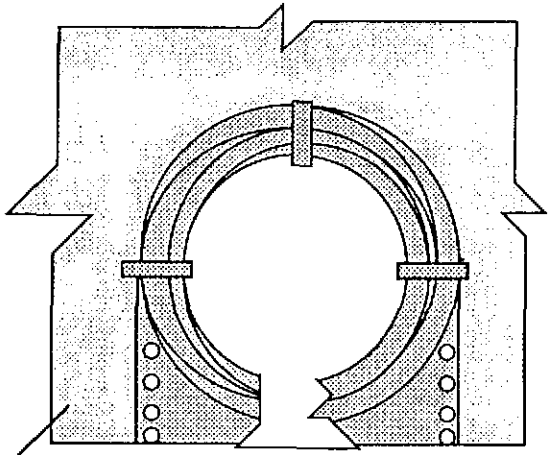
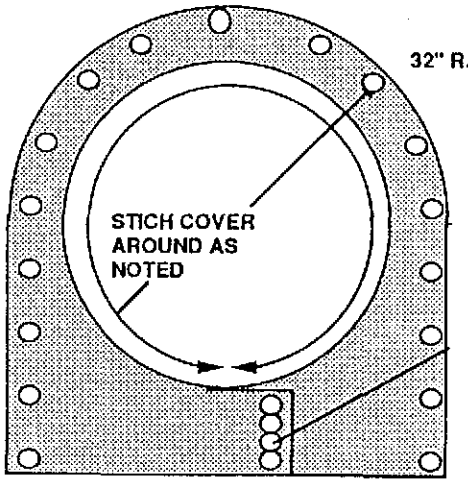


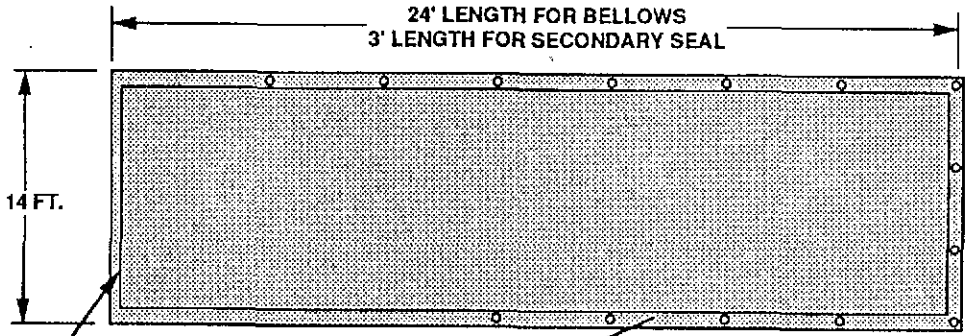


FABRIC BELLOWS(2 REQUIRED)

FABRIC BELLOWS FOLDED AND SECURED TO WELD SHELTER WITH STRAPS. ATTACHMENT TO WELD SHELTER BY HOLES CLIPS.



STICH DETAIL



STICH END TO DETAIL NOTED

HEM DEGES WITH GROMMENTS LOCATED EACH 4 FOOT

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FABRIC SEAL DETAILS

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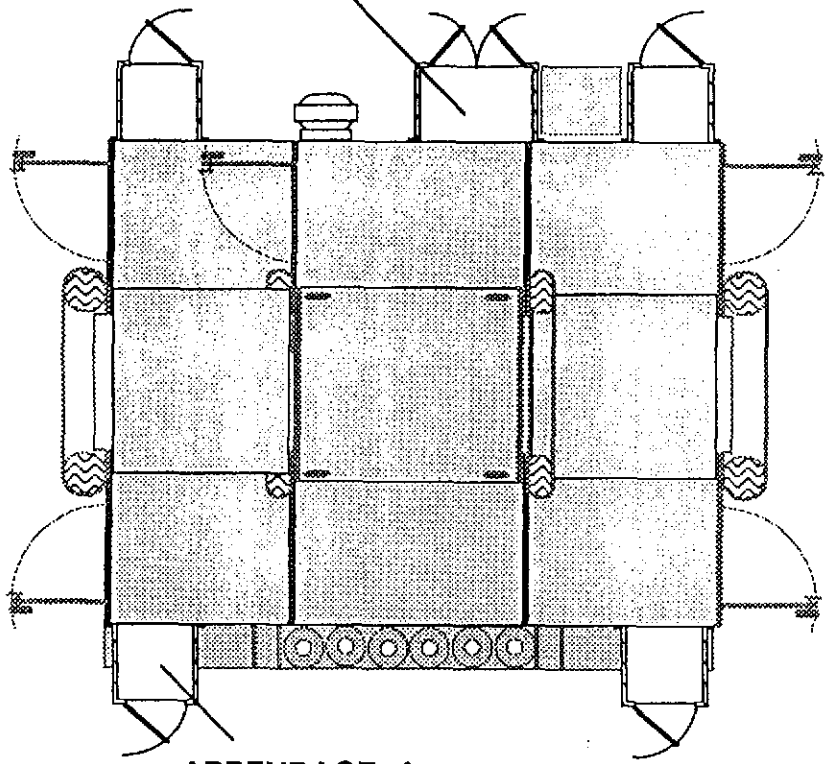
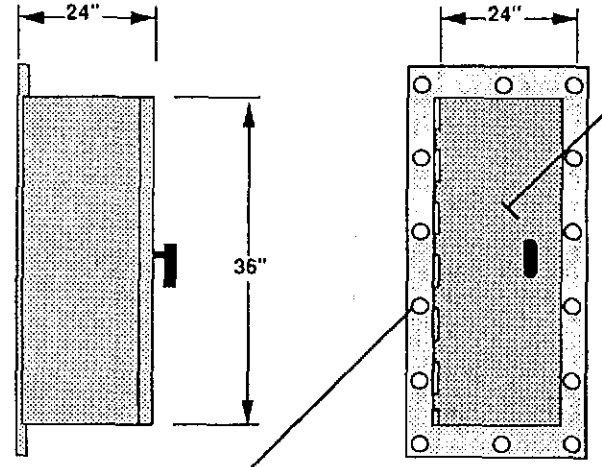
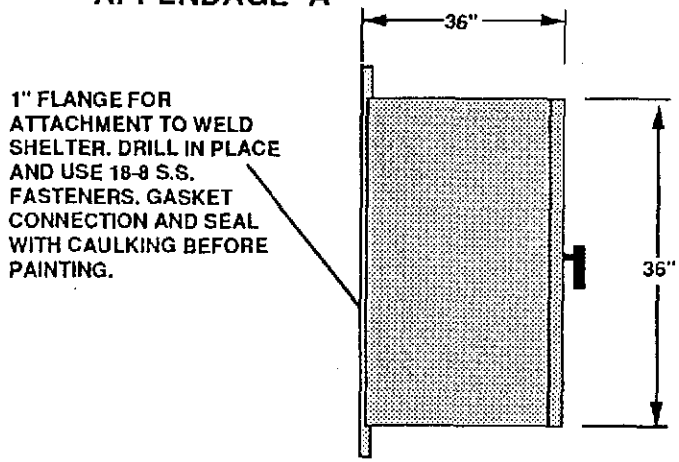
APPENDAGE -B-

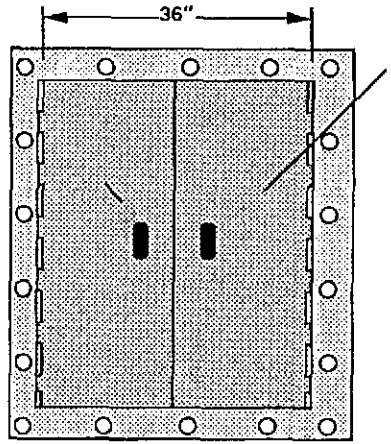


APPENDAGE -A-



APPENDAGE -A-
(4 REQUIRED)





APPENDAGE -B-
(4 REQUIRED)

WSSPEC
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SKETCH R14

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APPENDAGE DETAIL

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