

EO 40-1-13

ROYAL CANADIAN AIR FORCE



BATTERY CHARGING - ROOMS  
ELECTRICAL - GENERAL

**"REVISION"**  
NOTICE

LATEST REVISED PAGES  
SUPERSEDE THE SAME  
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Insert revised pages into basic  
publication. Destroy superseded pages.

ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF

16 MAY 55

Revised 7 Feb 62

# LIST OF RCAF REVISIONS

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## INTRODUCTION

This EO is published to enumerate requirements for RCAF battery charging rooms (also refer EO 175-140-11).

Lead-acid batteries charged in RCAF battery charging rooms are to be charged in accordance with EO 40-5A-2.

Nickel-Cadmium batteries charged in RCAF battery charging rooms are to be charged in accordance with EO 40-5EA-2.

Personnel Safety Precautions: For safety precautions, protective clothing, and first aid equipment and treatment, refer to:

EO 00-80-4/13  
EO 40-5A-2  
EO 40-5EA-2

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## BATTERY CHARGING ROOMS

### GENERAL

1 The details as outlined in this EO are for an ideal battery charging room. It is realized that it may not be possible to comply with these requirements in all cases; however, the degree of necessity regarding each item is indicated and action is to be taken accordingly.

### FIREPROOFING REQUIREMENTS

2 The following requirements are established in an effort to eliminate fire or explosions and to minimize the effect should one of these occur:

#### Location

(a) Discretion must be used when deciding on the location of the battery charging room. It must not be located adjacent to shops, such as dope shops, etc., where inflammable fumes are prevalent. A separate workshop is a definite requirement for battery repair, storage and testing.

#### Floors

(b) Floors are to be made of concrete or other fireproof substance which is not affected by acid and which provides good footing. The following is a proposal to facilitate the dumping of heavy batteries in battery rooms, thereby minimizing the hazards of battery maintenance.

(1) Construction:- All materials required for the floor sump and drain are procured locally. The sump is made up of concrete, lead lined, 9" above the floor which is approximately the height of the wheeled dollies which are used for transporting the batteries.

(2) The grating fitted to the sump is made of maple wood and coated with anti-sulphuric acid resistant paint.

(3) In conjunction with the floor sump a gravel soak away pit is required outside the building. The soak away pit should be at least 5 or 6 feet away from the building, approximately 3' x 3' x 5' deep with a 2" diameter lead drainpipe connecting the pit with the sump.

(4) See Figure 7 for a sketch of the floor sump and drain for battery rooms.

#### Walls

(c) Walls are to be fireproof, or lined with fireproof material, and are to be coated with acid resisting paint to a height of at least five feet above the floor.

#### Ceiling

(d) The Ceiling is to be fireproof or lined with fireproof material.

#### Doors

(e) Doors are to open outwards. If a door must open into another adjoining room, it must be of fireproof construction. The door should be located as far from the charging benches as possible. Whenever possible, the door should open to the outside of the building.

#### Ventilation

(f) An exhaust fan is to be provided to carry off the explosive fumes and should be located over the battery charging benches as close to the ceiling as possible. The fan should be of sufficient size to give a complete change of air in the room six times an hour. An air intake, located relatively close to the floor, is to be provided in order that fresh air, preferably outside air, can be drawn into the room.

#### Electrical Equipment, Fittings and Wiring

(g) All electrical equipment and fittings in

the battery room should be vapour proof. This will include all lamps, switches and motors for ventilating fans. This will include battery chargers when the vapour proof type is made available. All wiring must be in lead conduit or as an alternative, in rigid galvanized steel conduit coated with acid resisting paint.

#### GENERAL REQUIREMENT

3 The following sub-paragraphs detail the

internal outfitting of the room:

#### Layout

(a) The disposition of equipment in the room should be such that in case of explosion, easy access to the exit door is available.

#### Benches

(b) Charging benches should be located so

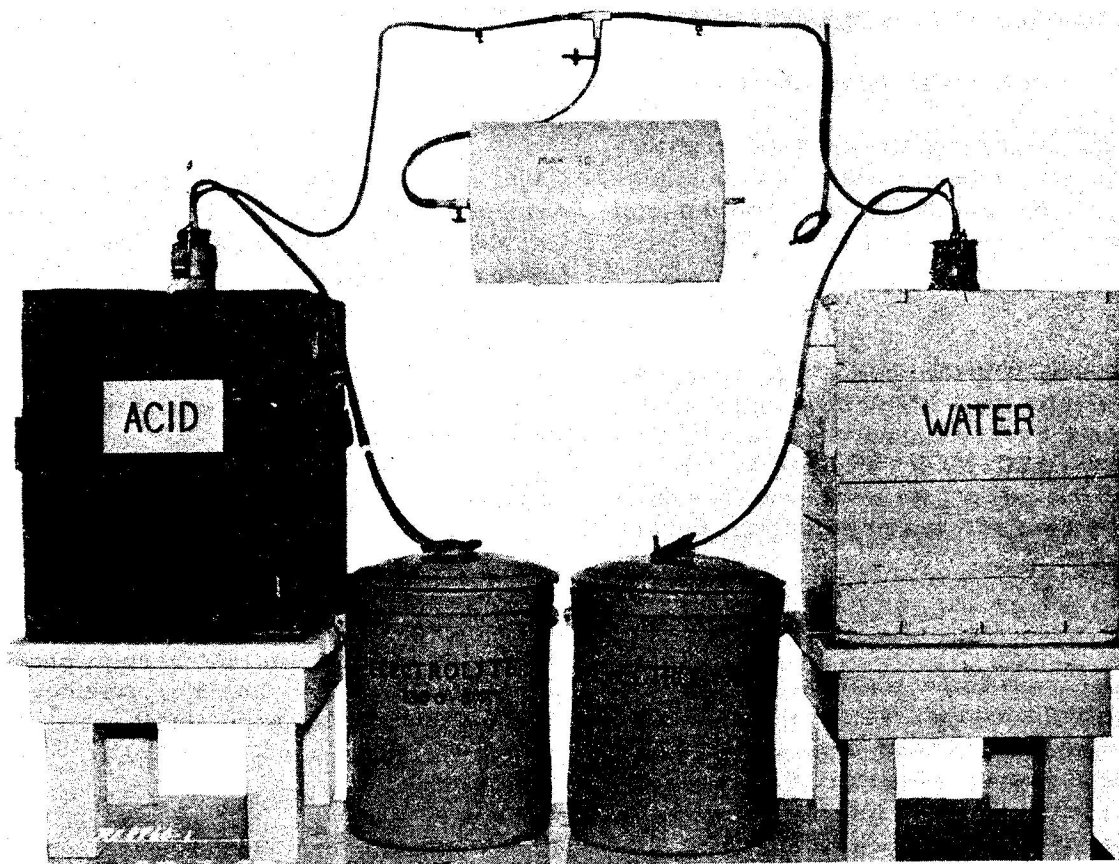


Figure 1

- |                              |   |
|------------------------------|---|
| 1 Air Line Pinchcock (Acid)  | 8 Copper Tubing                                       |
| 2 Air Line Pinchcock (Water) | 9 Stopper Lock (Acid)                                 |
| 3 Acid Line Pinchcock        | 10 Stopper Lock (Air)                                 |
| 4 Air Control Valve          | 11 Rubber Line From "Still"                           |
| 5 Air Filler Valve           | 12 Water Line   |
| 6 Air Tank                   | 13 Acid Line  |
| 7 Glass Tubing               | 14 Control Valve - Opened to Atmosphere for Syphoning |

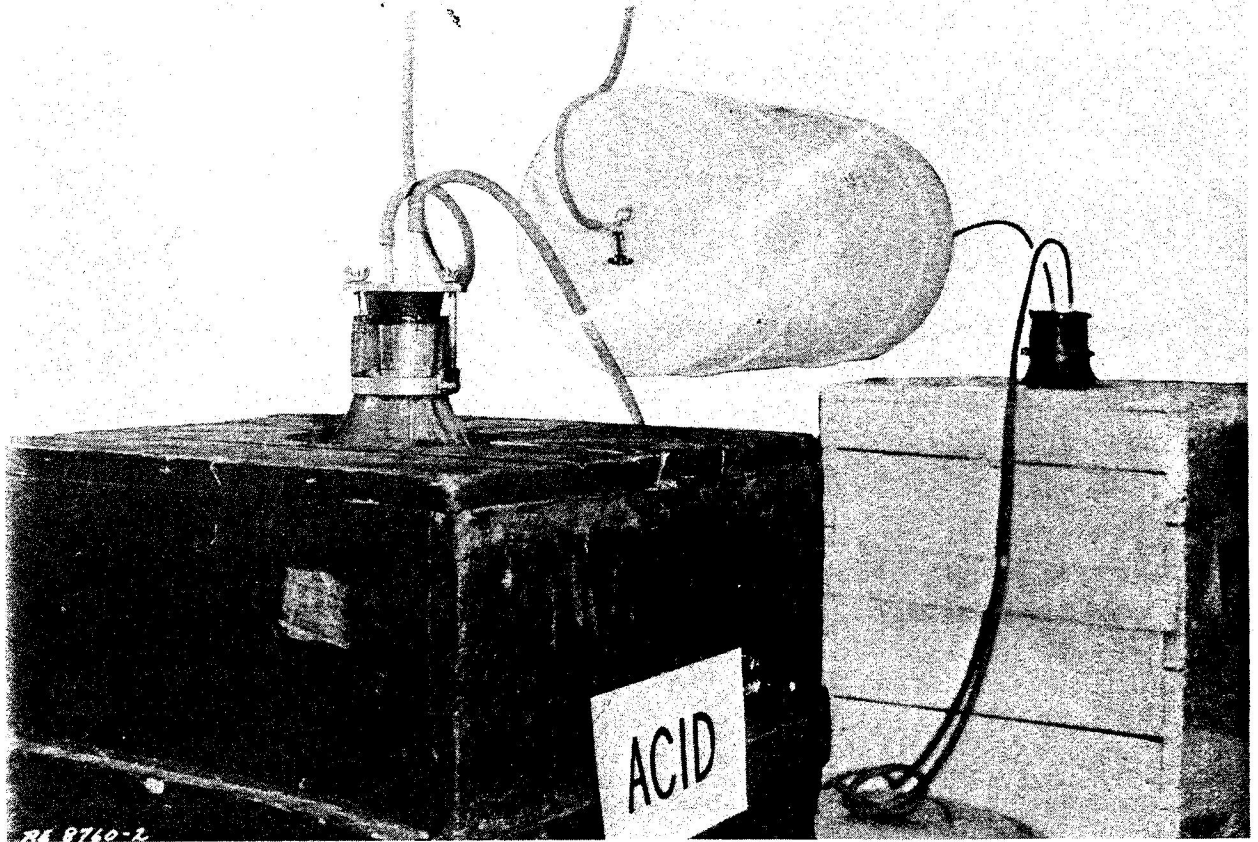


Figure 2 Acid Carboy and Hose Connections

that they are out of line of direct sunlight. They are to be approximately thirty inches high and should have suitable wooden racks on which to set batteries. The tops are to be covered with #14 gauge sheet lead lining and the whole top is to be watertight. The lining is to be brought over the wood trim at the rear, front and sides to the under part of the benchtop. Any exposed wood, wooden racks, etc., and other benches, such as those used for storage of batteries, must be coated with acid resisting paint or acid and alkaline resistant paint if applicable.

#### Sink

(c) A sink is to be provided of porcelain enamelled iron, lead lined or stainless steel construction with an acid resisting strainer and coupling. The waste is to have a trap with cleaning cap and drain is to extend at least three feet outside the building. Hot and cold running water should be provided.

#### Acid and Electrolyte Containers

(d) Non-metallic containers are to be provided for mixing and storing electrolyte. A suitable stand is to be provided to facilitate the pouring of acid.

#### Charging Warning Light

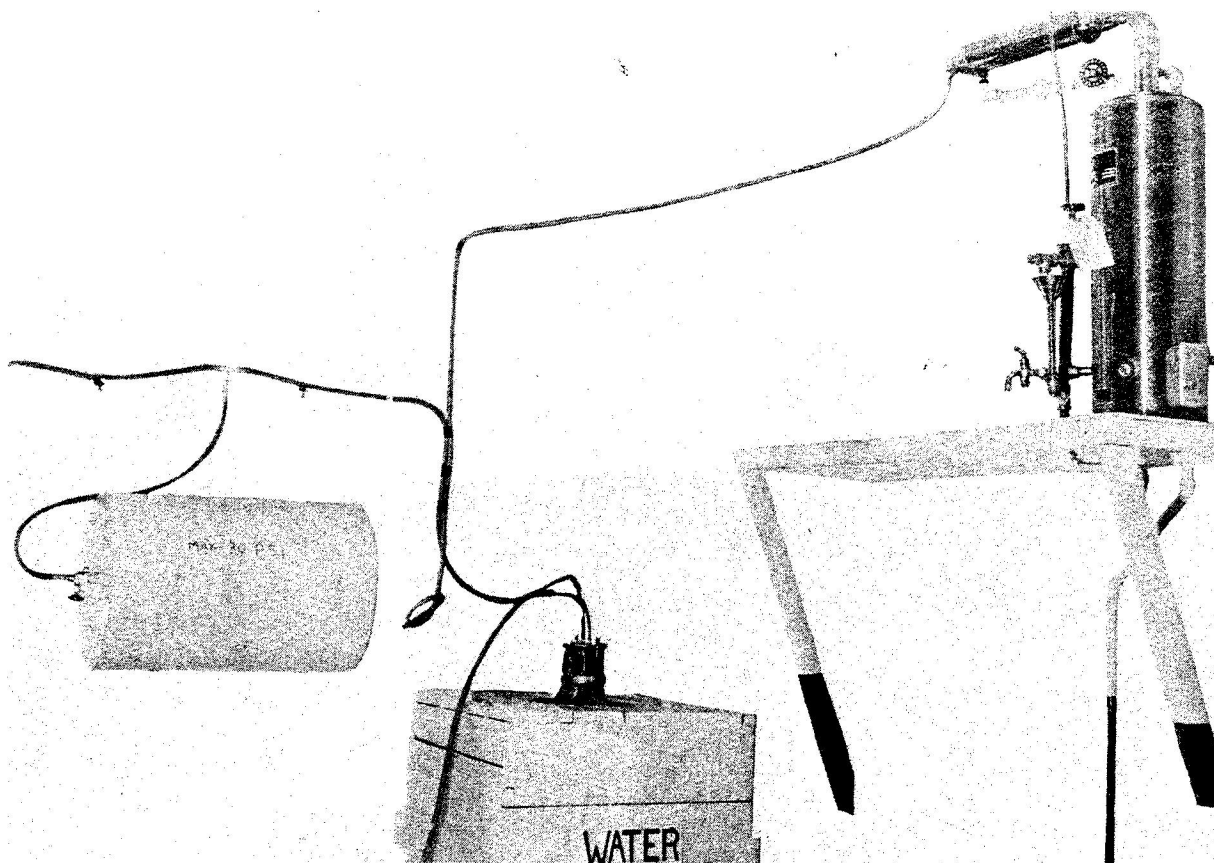
(e) A red light is to be provided in a conspicuous location. This light will be so wired that it will be illuminated when batteries are being charged.

#### Warning Signs

(f) "NO SMOKING" signs must be prominently displayed in adequate numbers.

#### Charging Room Equipment

(g) For charging room equipment not al-



When the pneumatic system is not in use, the water line (12) is replaced by the rubber line from the "still" (11), the "still" is turned on and the distilled water supply is replenished.

Figure 3

ready detailed, refer to the appropriate Scale of Issue.

#### PERSONNEL SAFETY PRECAUTIONS

4 Reference should be made to EO 00-25-13 for first aid treatment to be provided, first aid treatment, protective clothing and safety precautions.

#### MIXING OF ELECTROLYTE

5 The following is a suggested method to facilitate the mixing of electrolyte for battery shop use, and to minimize the danger to the personnel while so doing.

#### Construction and Operation

6 All materials required for this instal-

lation are procured locally. Into each carboy is placed two tubes; one to the bottom of the liquid and the other above the surface of the liquid; this forces the liquid up the long tube; out the rubber hose and into the earthenware jug. To mix a quantity of electrolyte, the following steps are taken. Reference may be made to Figures 1, 2, 3 and 4; details for air tank in Figure 5, and details for stopper in Figure 6:

- (a) Fill air tank (6) to 30 psi.
- (b) Place end of water line (12) in earthenware jug.
- (c) Ensure air line pinchcock for the acid (1) is closed.
- (d) Ensure air line pinchcock for the water (2) is open.

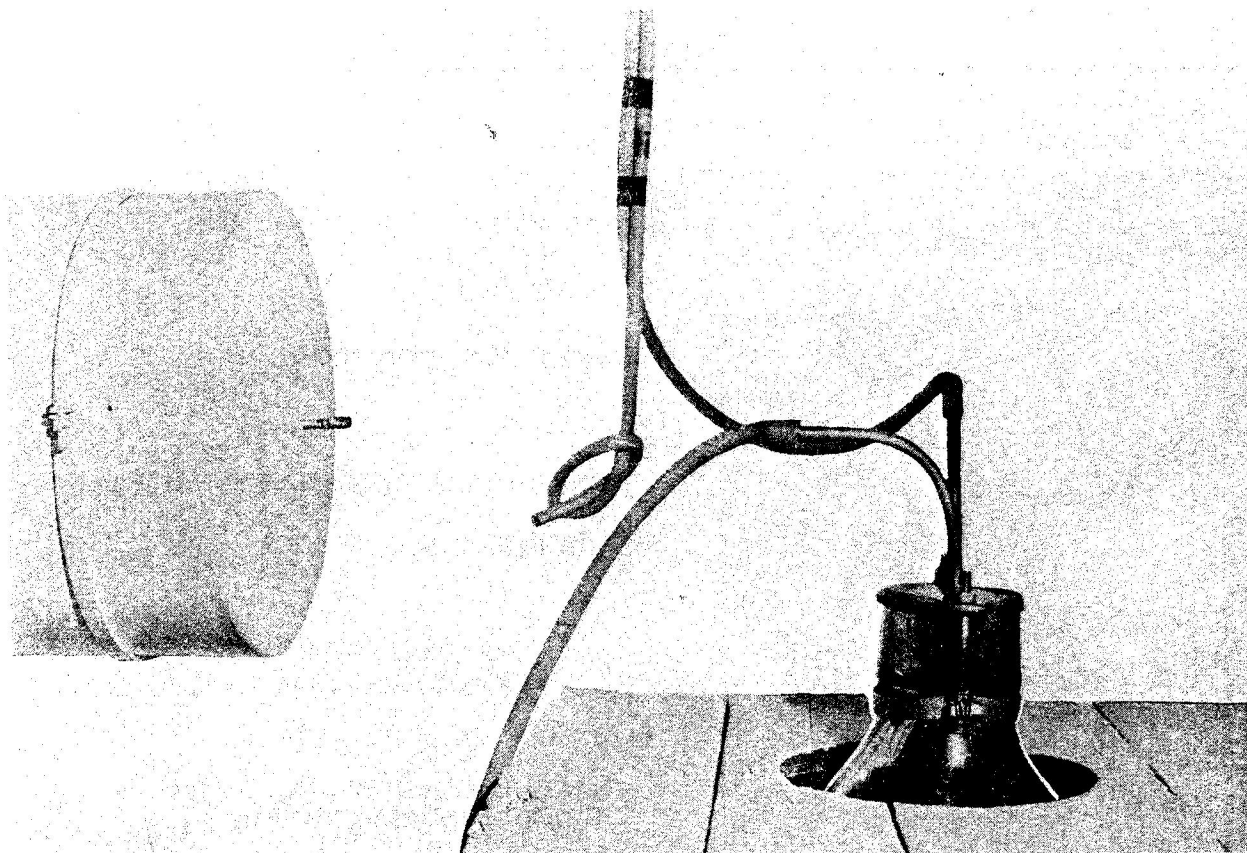


Figure 4 Water Carboy and Hose Connections

- (e) Open air control valve (4).
- (f) When sufficient water has run, shut off air control valve (4) and pinch off water line (12).
- (g) Put acid line (13) into earthenware jug with water.
- (h) Open air line pinchcock (1) for acid.
- (j) Close air line pinchcock (2) for water.
- (k) Open air control valve (4).
- (l) Gently stir electrolyte as acid flows into water.

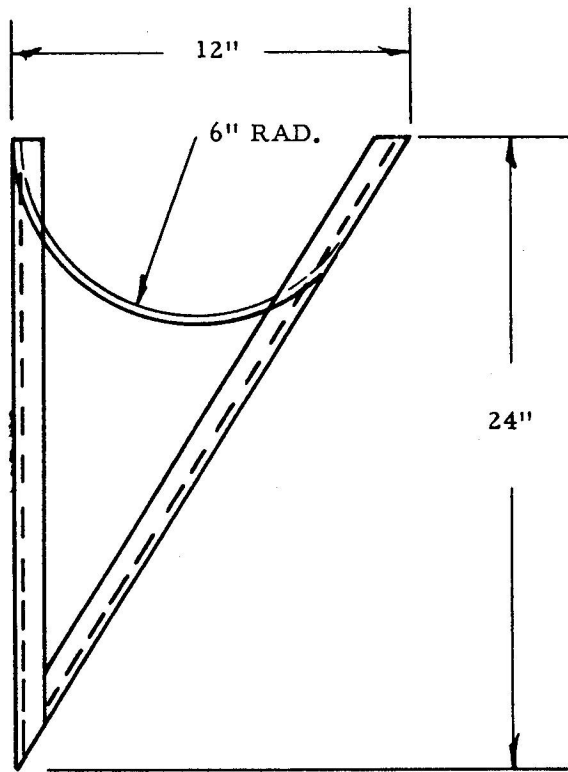
- |     |                        |       |                                    |
|-----|------------------------|-------|------------------------------------|
| (b) | Pinchcocks             | 3     |                                    |
| (c) | Stopper, rubber 2 1/4" | 1     |                                    |
| (d) | Air control valve      | 1     |                                    |
| (e) | Air filler valve       | 1     |                                    |
| (f) | Air tank 18" x 12"     | 1     | Manufactured locally, see Figure 5 |
| (g) | Locks stopper          | 2     | Manufactured locally, see Figure 6 |
| (h) | Tubing glass 1/4"      | 4 ft. |                                    |

#### MATERIALS REQUIRED

7 The following materials are required:

- (a) Rubber hose 1/4" 30 ft.

8 This installation may be made more complete by the addition of a system pressure gauge and a safety valve on the tank, also a control valve open to atmosphere in the main air line so that siphoning can take place after the liquid has started to flow.



1" x 1" x  $\frac{1}{8}$ " ANGLE IRON

1" x  $\frac{1}{8}$ " BAR STEEL FLAT

WELDED CONSTRUCTION

REQUIRE EACH 2. ONE LEFT-HAND

ONE RIGHT-HAND

STANDARD AM PIPE

$\frac{1}{2}$ " x 14 TPI TYP.

MATERIAL MILD STEEL .125"  
WELDED CONSTRUCTION

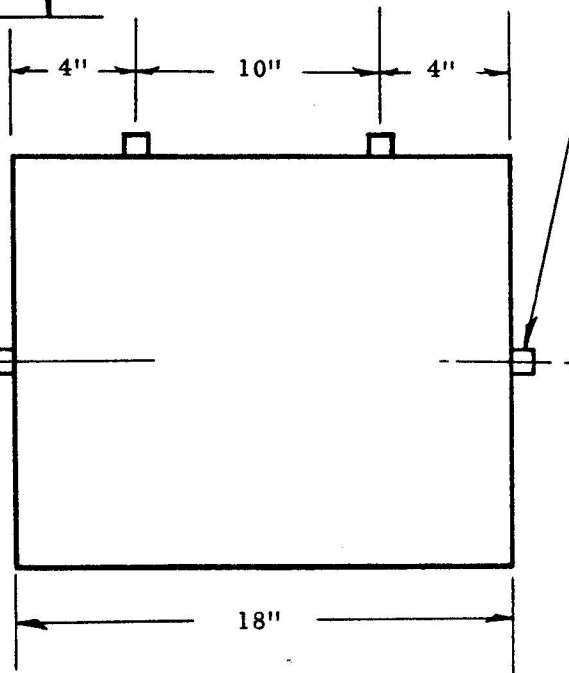
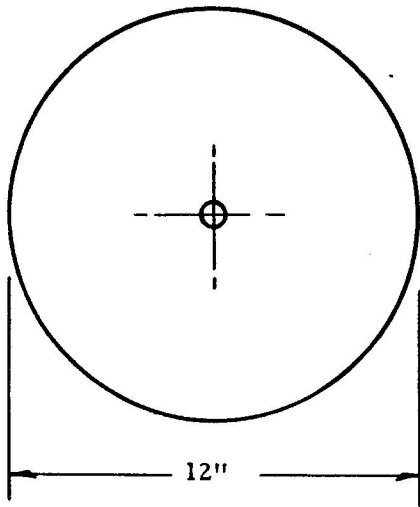


Figure 5

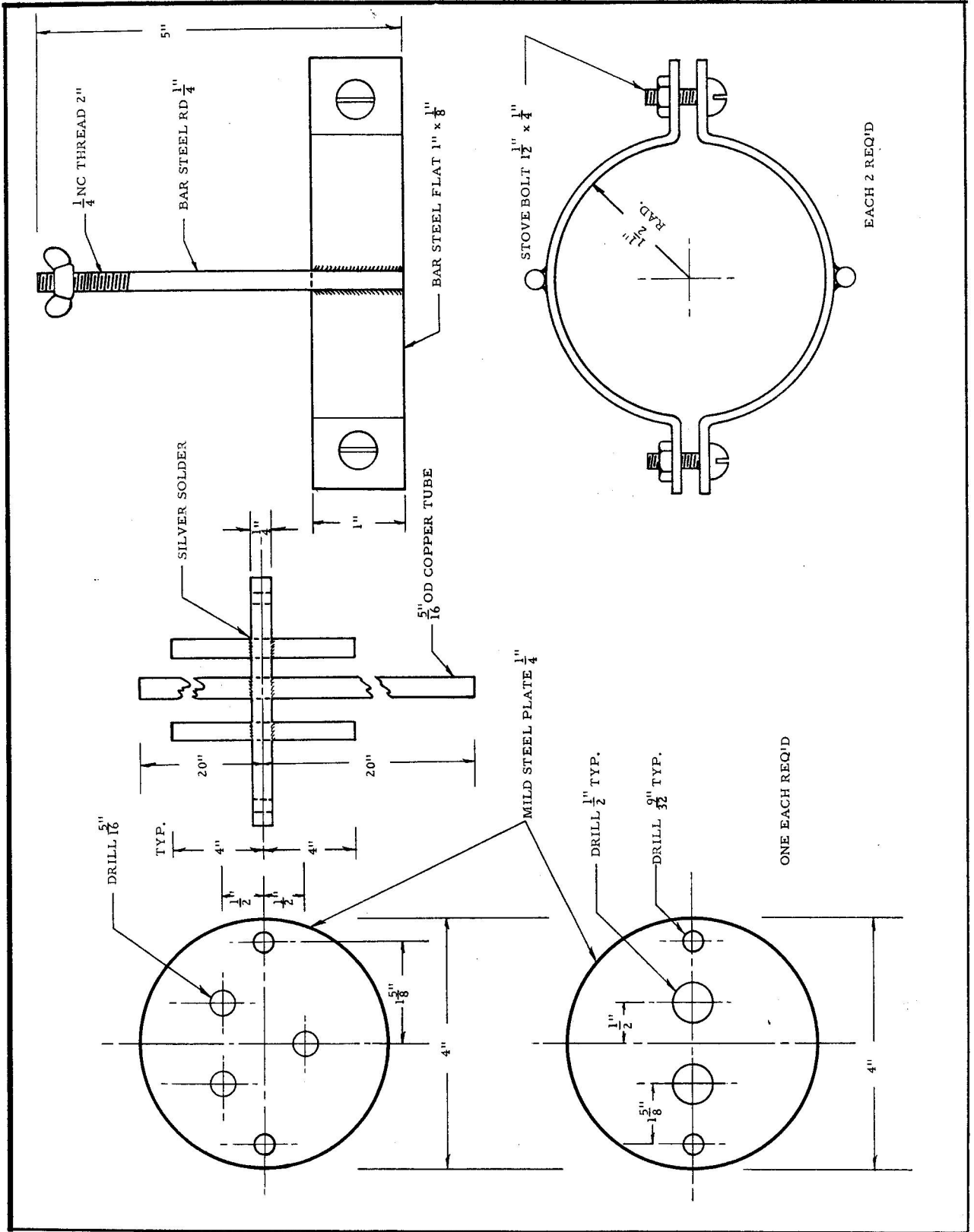


Figure 6

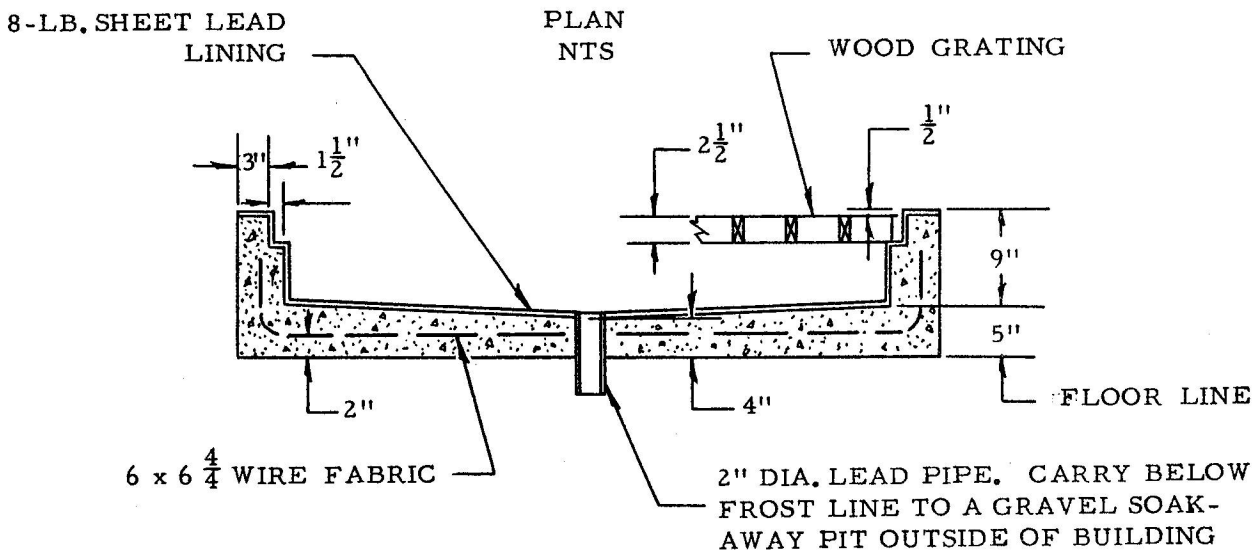
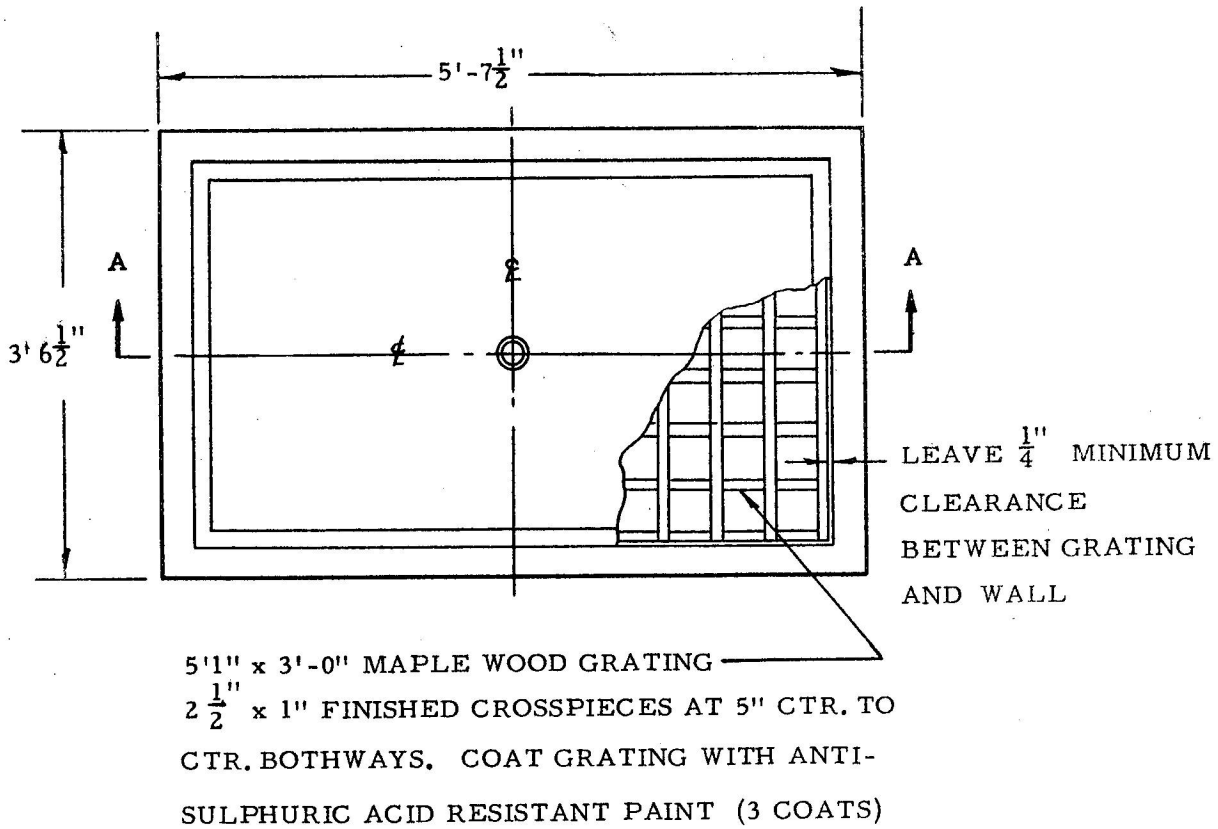


Figure 7