

MWPS-74148

30' Pole Machine Shed

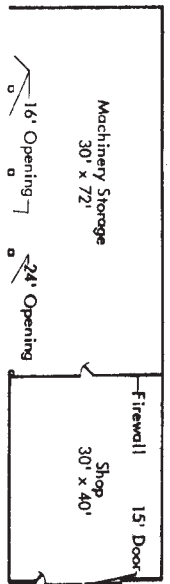
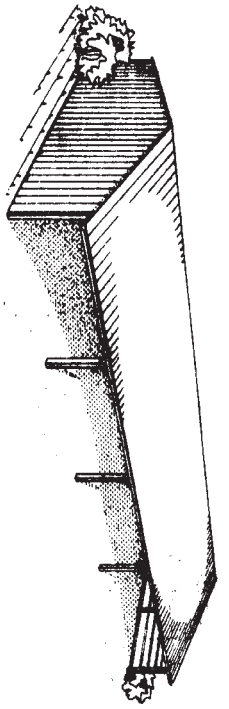
CAUTION!

Additional professional services will be required to tailor this plan to your situation, including but not limited to: assurance of compliance with codes and regulations; review of specifications for materials and equipment; supervision of site selection, bid letting and construction; and provision for utilities, waste management, roads or other access. **Furthermore, any deviation from the given specifications may result in structural failure, property damage, and personal injury including loss of life.**

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MIDWEST PLAN SERVICE
Cooperative Extension Work in Agriculture and Home Economics and Agricultural Experiment Stations of North Central Region - USDA Cooperating
30' Pole Machine Shed
Title Page
MIDWEST PLAN NO. 74148



REFERRED LUMBER SPECIFICATIONS

- Roof Purlins and Wall Girts: 2x4 Construction Grade (Doug Fir or Southern Yellow Pine)
- 2x6 No. 2 (Doug Fir or Southern Yellow Pine)
- Trusses and Headers: No. 1 or 1500r machine rated (Doug Fir or Southern Yellow Pine)
- Posts and Spliceboards: Pressure Preservative Treated (Southern Yellow Pine or equivalent) cross-section—10 pcf, Penite—0.50 pcf, AOA or CCA (Type A or B)—0.40 pcf

*For alternate member sizes using Hem-Fir and round poles, see page 2 and Truss Page

Use 30' glue-nailed trusses, 8'-0" o.c.; alternate every other pair of trusses to opposite side of posts to install 16' & 18' long roof purlins with staggered joints. Locate truss on far side of sliding door opening for knee brace installation.

71'-9" (or extend length in 8'-0" increments)

7 Bays @ 8'-0" = 56'-0"

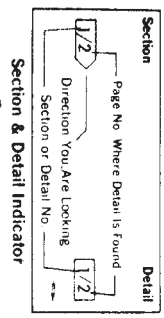
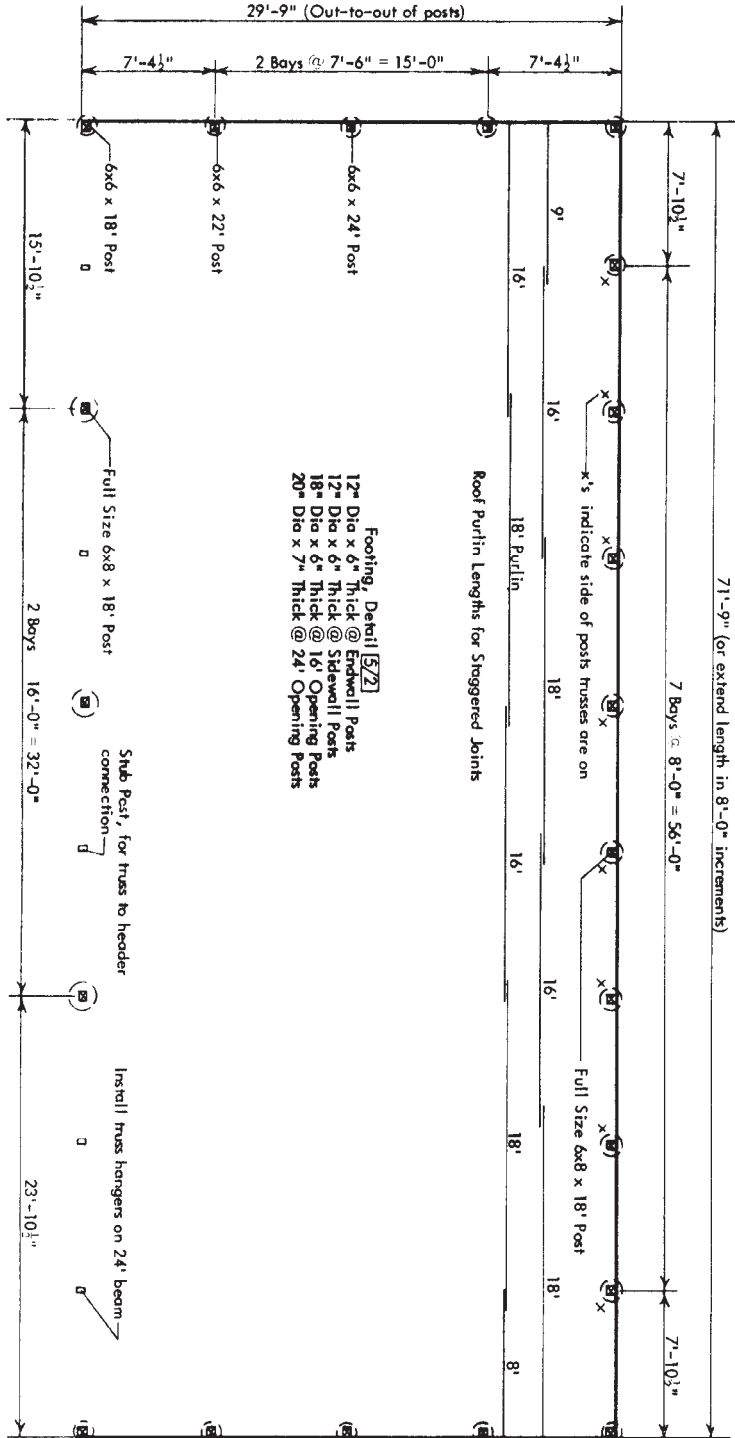


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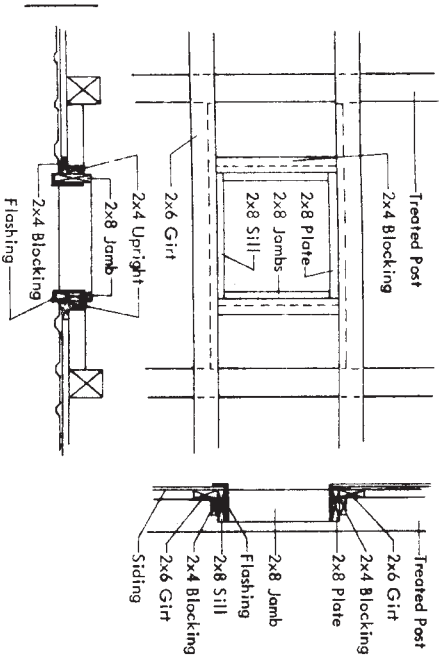
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30' POLE MACHINE SHED

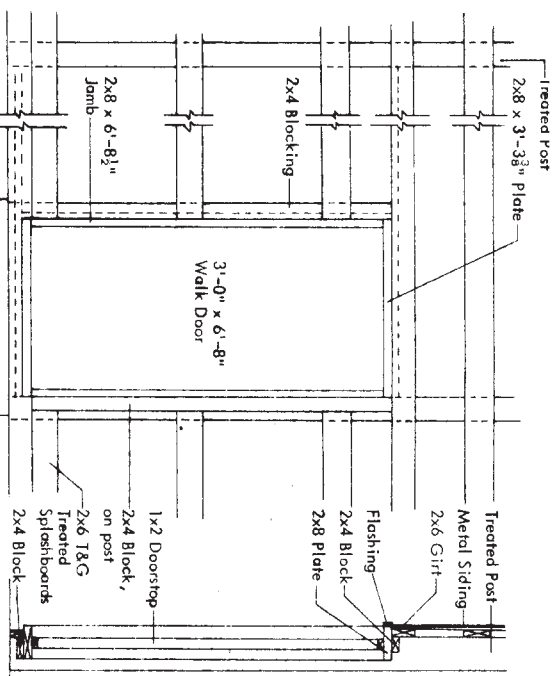
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FRAMED OPENING DETAIL—1/2

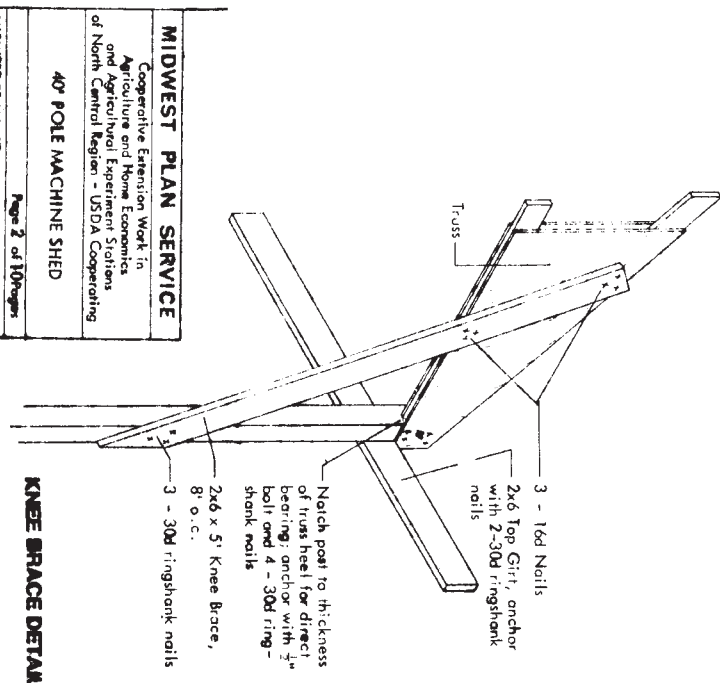
For windows, sills and small vent doors, for a building with an interior lining, extend the jambs, plate and sill to be flush with the inside edges of the posts.

- Alternate Lumber Specifications, Spacing and Sizes.**
- 2x4 Purline (Construction Grade Hem-Fir) Max Spacing: Snow Zone 1: 28" o.c., Snow Zone 2: 24" o.c., Snow Zone 3: 18" o.c.
 - 2x6 Girt (No. 2 Hem-Fir) Max Spacing: 24" o.c.
 - Headers (No. 1 Hem-Fir)
 - 16 Door
 - Snow Zone 1: 3'-2x12
 - Snow Zone 2: 4'-2x12
 - Snow Zone 3: 5'-2x12
 - 24 Door (All Zones 5'-7" x 24")
 - Posts (Round vs Square)
 - 6x6 = ASA or ASAE Class 5, 6.0" Top Diameter
 - 6x6 = ASA or ASAE Class 7, 4.8" Top Diameter
 - Trusses (No. 1 Hem-Fir)
 - See Truss Page

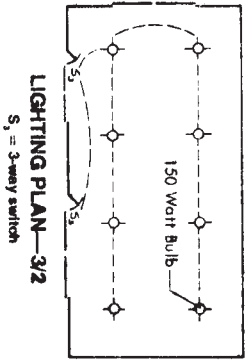


WALK DOOR FRAMING—4/2

For a building with an interior lining, extend the jambs, plate and sill to be flush with the inside edges of the posts.



KNEE BRACE DETAIL—2/2

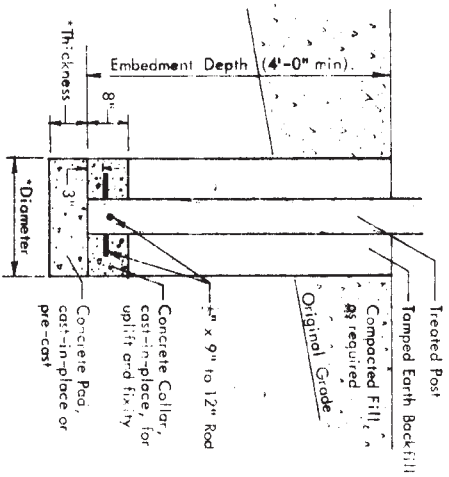


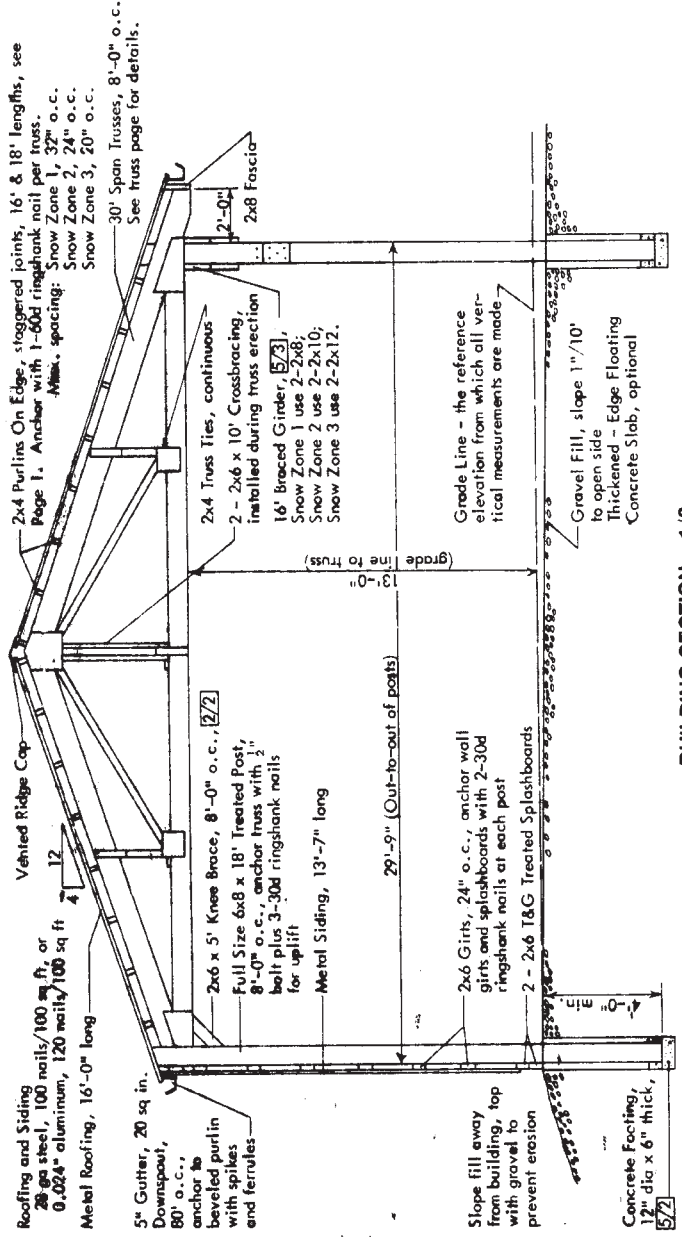
LIGHTING PLAN—3/2

S₁ = 3-way switch

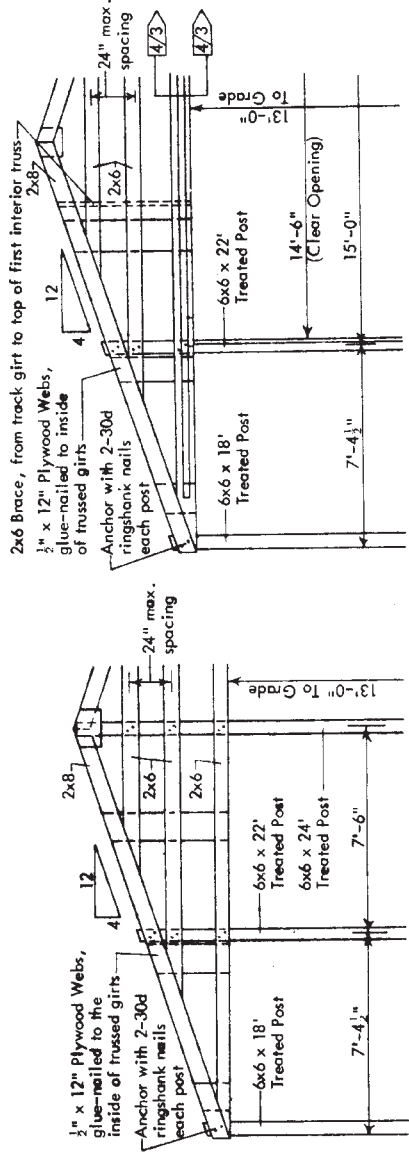
- *Footing Size
 - 12" Dia x 6" Thick @ Endwall Posts
 - 16" Dia x 6" Thick @ Sidewall Posts
 - 20" Dia x 6" Thick @ 16" Door
 - 24" Dia x 7" Thick @ 24" Door
- Extend embedment depth as required to place footing on undisturbed soil. For large diameter footings, use smaller diameter auger and flare the bottom of the hole with Lineman's spoon.

POST FOOTING DETAIL—5/2



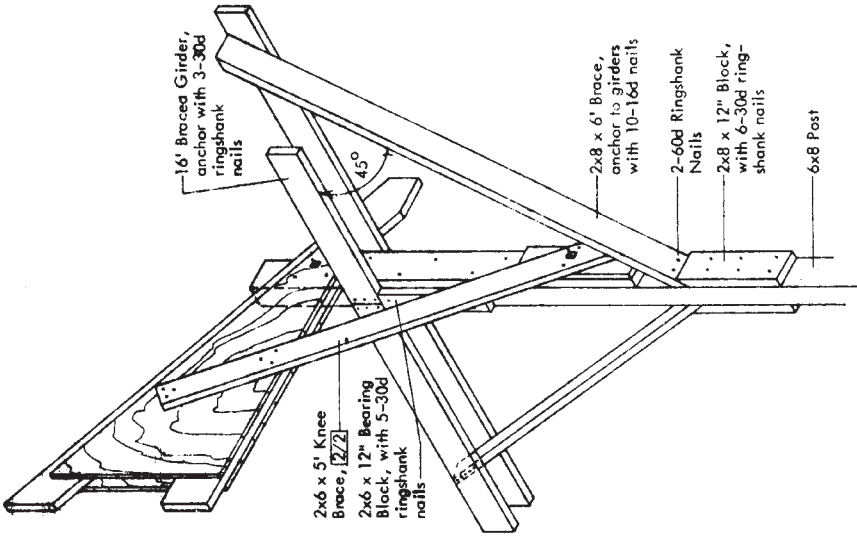


BUILDING SECTION—1/3

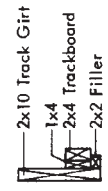


SOLID ENDWALL—2/3

ENDWALL WITH 15' DOOR—3/3



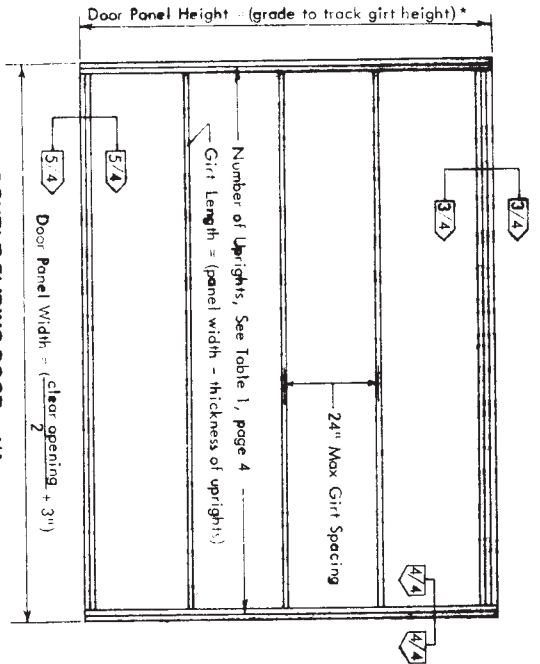
16' GIRDER BRACE DETAIL—5/3



TRACK GIRT SECTION—4/3

Endwall

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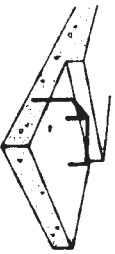


DOUBLE SLIDING DOOR—1/4
 2x4 Framing
 *If sliding door apron 2/4 is not installed, reduce door panel height by 2".
 Use clear opening dimensions from Detail 1/5 or 2/7.

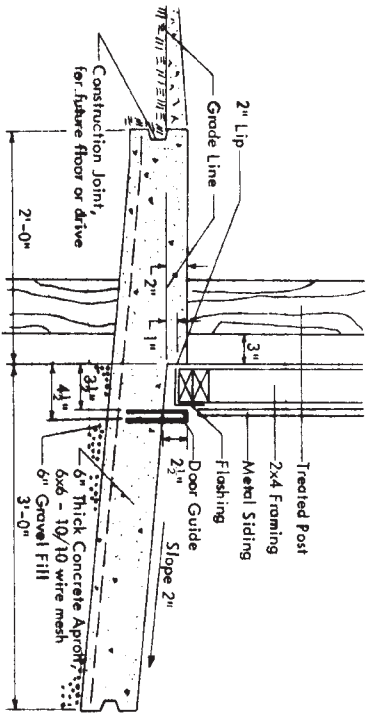
Table 1. Number of 2x4 uprights, each side of door panel.

Door Panel Height, ft	Door Panel Width, ft													
6	7	8	9	10	11	12	13	8	1	1	1	1	2	2
7	1	1	1	1	2	2	2	9	1	1	1	2	2	2
8	1	1	1	2	2	2	2	10	1	2	2	2	2	2
9	1	1	2	2	2	2	2	11	2	2	2	2	2	3
10	1	2	2	2	2	2	2	12	2	2	2	3	3	3
11	2	2	2	2	2	2	2	13	2	2	2	3	3	3
12	2	2	2	2	3	3	3	14	2	2	2	3	3	4
13	2	2	2	2	3	3	3	14	2	2	2	3	3	4
14	2	2	2	2	3	3	3	14	2	2	2	3	3	4

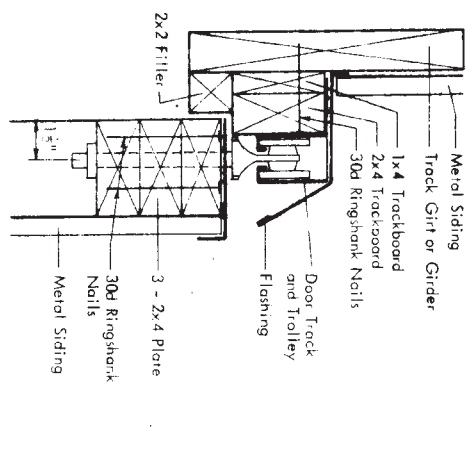
Door Sliding Sheet Length approx. 2" shorter than upright length.



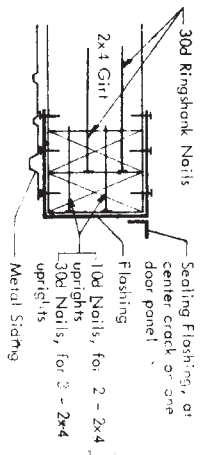
"U"-Shaped Door Guide
 Locate 3/4" dia x 28" "U"-shaped door guide at center of door opening. Break at center to force closing door against apron lip. Taper from 1/2" end to 3/4" center clearance.



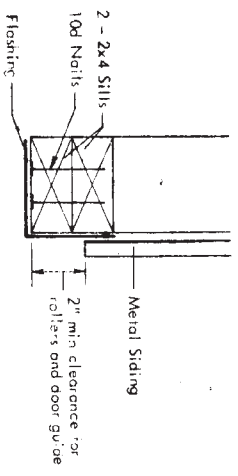
SLIDING DOOR APRON—2/4
 Set adjustable roller guides in the concrete apron at door jams. Use door slope as required.



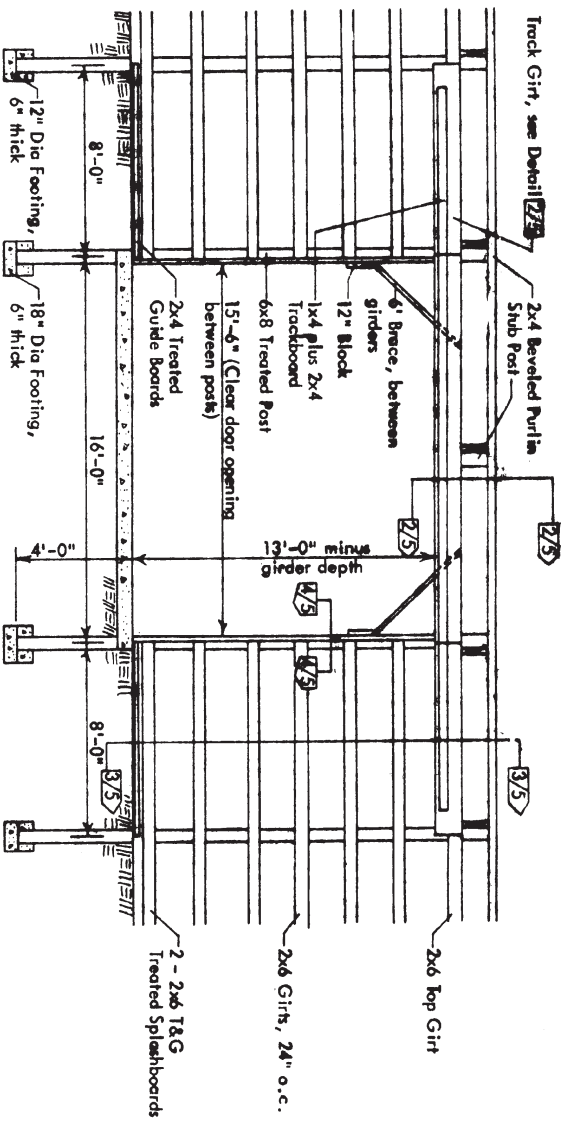
DOOR TRACK ASSEMBLY—3/4



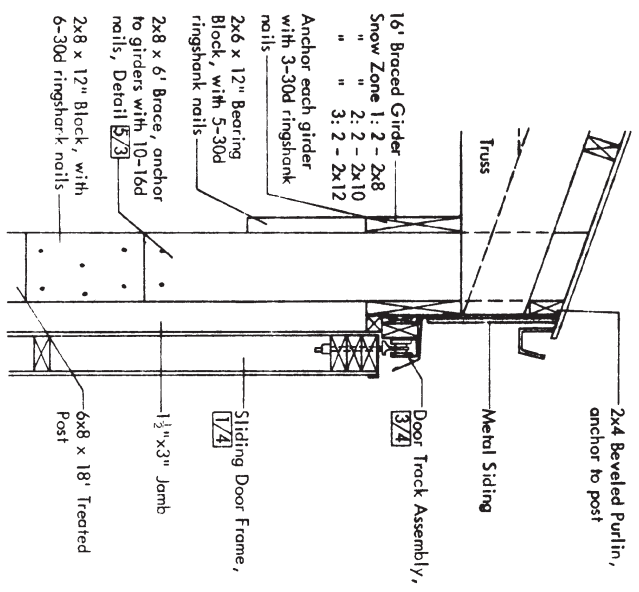
UPRIGHT SECTION—4/4
 Extend flashing around uprights and nail to girts and uprights.



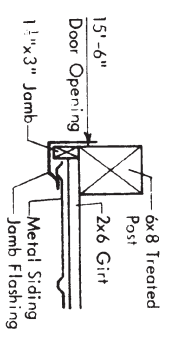
SILL SECTION—5/4



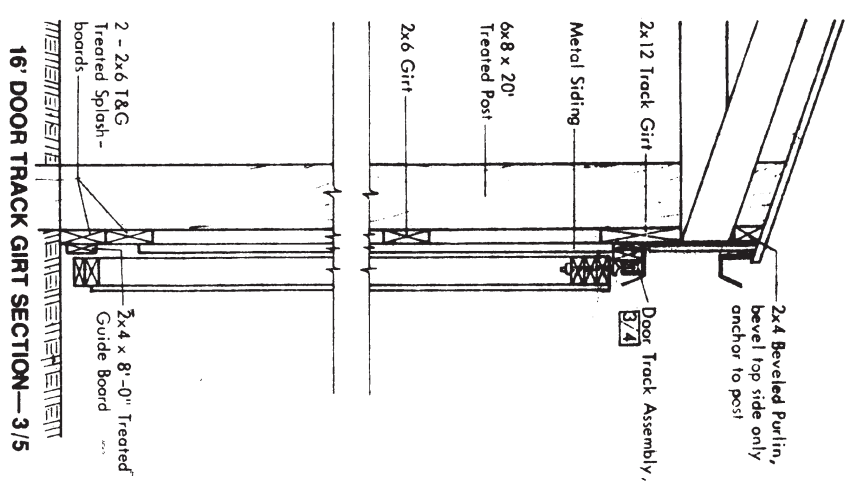
16' SIDE DOOR—1/5
Use stub post for intermediate truss to girder connection.



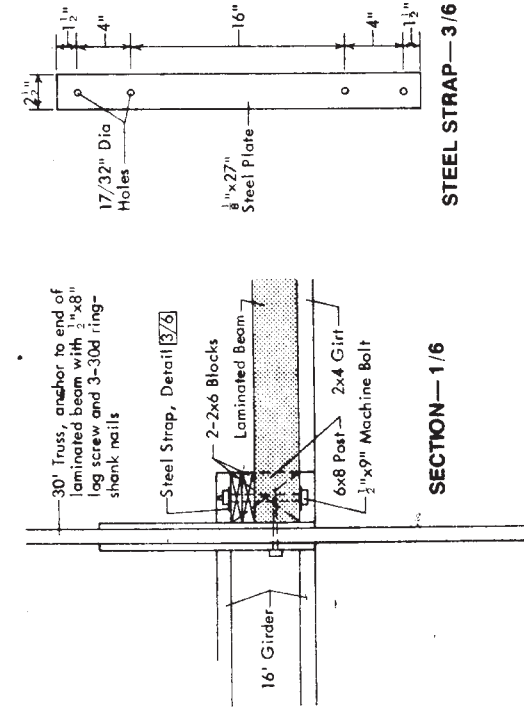
16' DOOR GIRDER SECTION—2/5



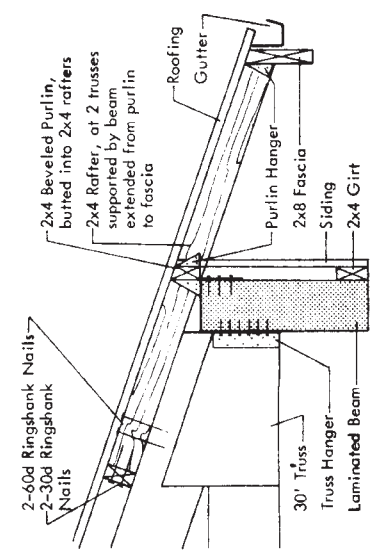
JAMB SECTION—4/5



16' DOOR TRACK GIRR SECTION—3/5

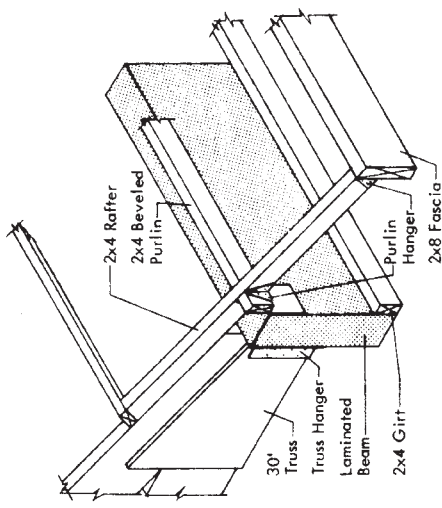


SECTION — 1 / 6

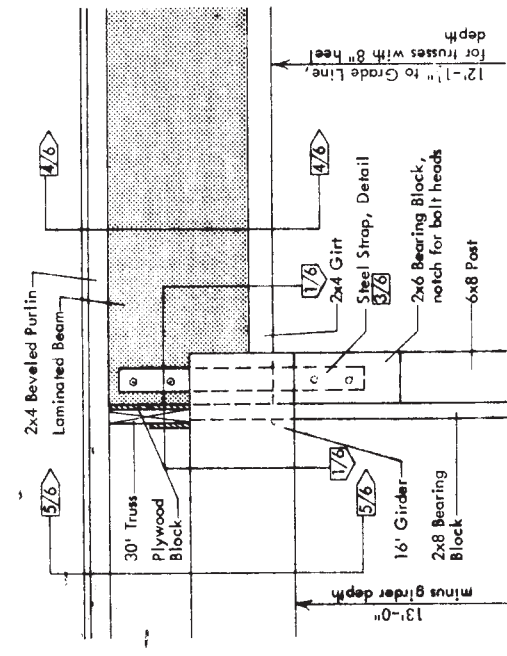


SECTION — 4 / 6

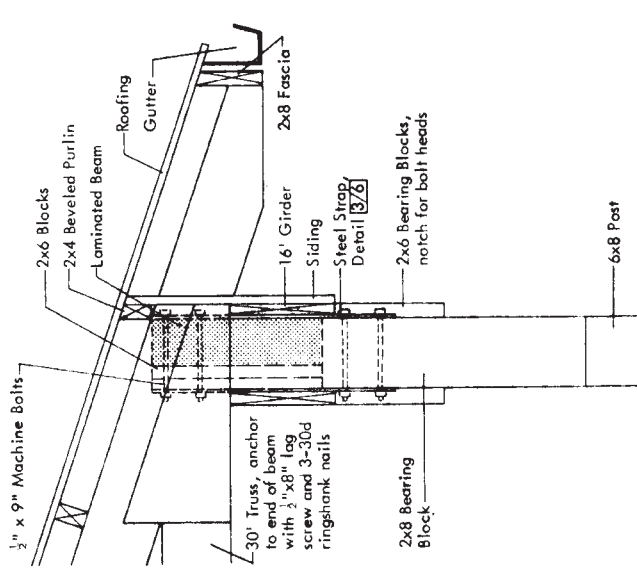
30' truss with 6 1/2" cut off heel. Extend gussets 6 1/2" to the left so they are not shortened.



OVERHANG RAFTER DETAIL — 6 / 6

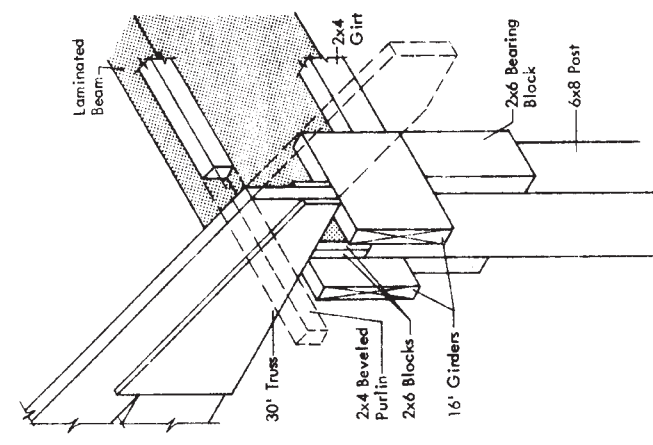


BEAM TO POST CONNECTION — 2 / 6
16' Girder Brace and Truss Knee Brace not shown.



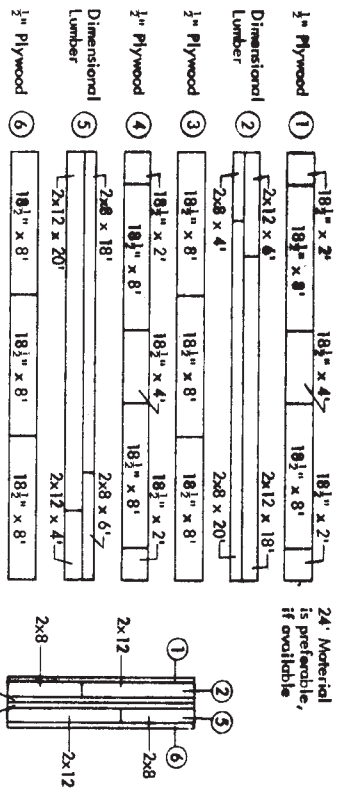
SECTION — 5 / 6

16' Girder Brace and Truss Knee Brace not shown. See Detail 5/3 for fasteners in 16' Girders and its supports.



JOINT ASSEMBLY — 7 / 6

2x6 bearing block under truss not shown.



24' LAMINATED BEAM ASSEMBLY—1/7
 For the opening width shown in Detail 1/7 and framing in Detail 2/8, add 4 1/2" to one end of the beam for a total length of 24'-4 1/2".

See Detail 2/7 of 48' Machine Shed, Plan #74148, for framing of 24' opening with a sliding door and no overhang.

24' BEAM—for 34' wide sidewall door.

MATERIALS

Lumber

This beam is designed for use of Douglas Fir-Larch (No. 1, MC19) or South Yellow Pine (No. 1, MC19).

Use clean and smooth lumber. Do not use cupped or twisted lumber.

Plywood

Use 1/2" G-C Ext. ("Identification Index" = 32/16)

Glue

Casein (MNN-125A, type II, mold resistant) is not waterproof, but is highly water resistant. Resorcinol resin glue is waterproof and should be used if the beam is to be exposed to unusual moisture conditions.

Follow the manufacturer's specifications for mixing, pot life, temperature during use, etc.

BEAM CONSTRUCTION

1. Assemble the beam in two pieces, layers 1, 2, and 3 and layers 4, 5, and 6. Clamp the narrow faces of the dimensional lumber together (layer #2 = 2x6 + 2x10 + 2x10 = 2x26). Spread glue on the plywood (layer #1). Nail plywood to layer #2 and add box nails preferably galvanized or cement coated, 4" o.c., both ways. (Glue should squeeze out from the edges of the beam. Remove the clamps; glue and nail layer #3 plywood to the other side of the dimension lumber in a similar manner. Then assemble layers #4, #5, and #6.

2. Final Assembly - use method a, or b.

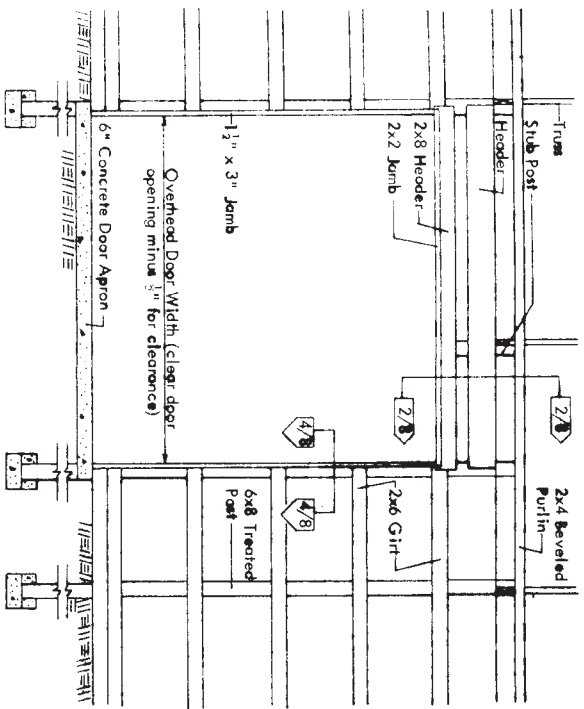
a. Clamping method.

When both halves of the beam have been assembled, apply glue to the two remaining inside surfaces. Place clamps about 2' apart on the fully assembled beam and leave on the 24 hours.

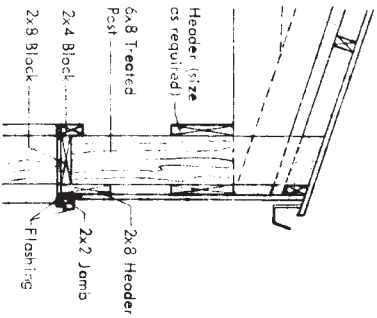
b. Weighting method.

When both halves of the beam have been assembled, apply glue to the two remaining inside surfaces. Lay the beam on a level surface. Place sufficient weight on the fully assembled beam to squeeze glue out from the edges of the beam. Leave on for 24 hours.

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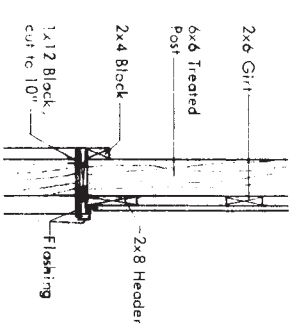


OVERHEAD DOOR FRAMING--1/8



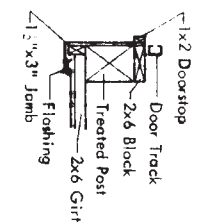
SIDEWALL HEADER SECTION--2/8

For 6x8 Post



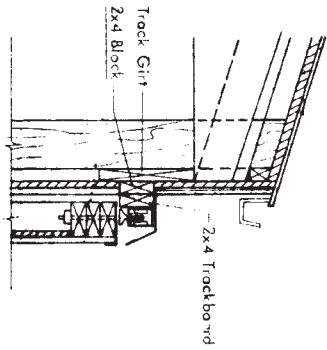
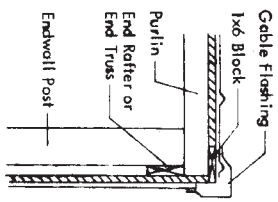
ENDWALL HEADER SECTION--3/8

For 6x8 Post



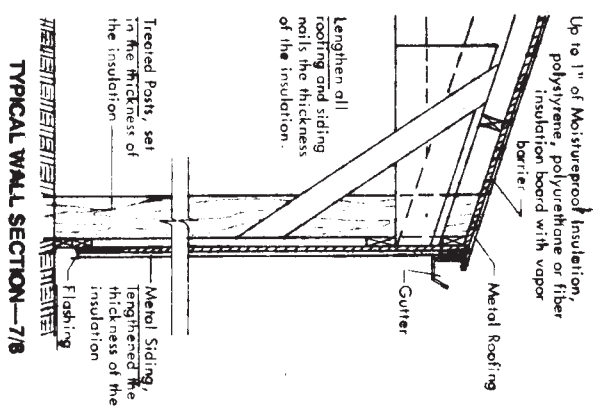
JAMB SECTION--4/8

TYPICAL GABLE END SECTION--5/8



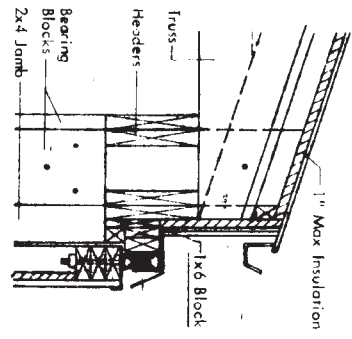
WALL SECTION--6/8

With Side Door



TYPICAL WALL SECTION--7/8

16' DOOR HEADER--8/8



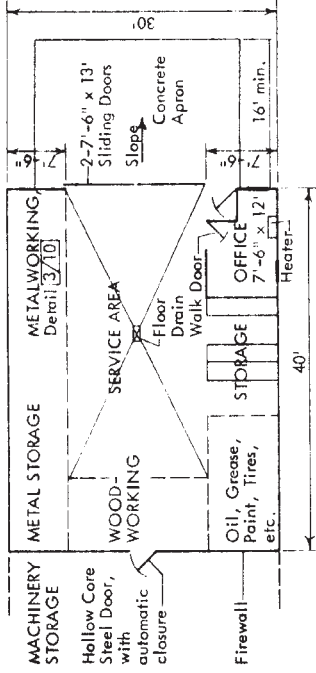
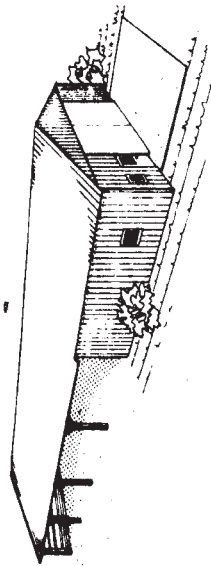
INSULATION DETAILS

Underlines show materials that change when insulation is added.

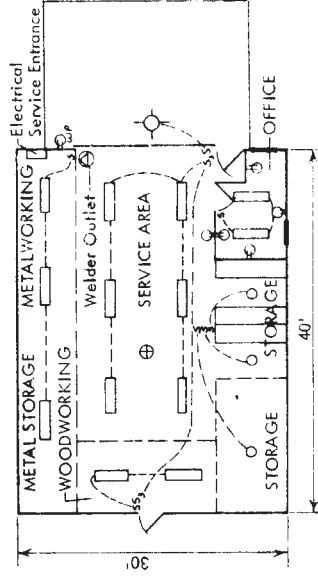
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HEATING SPECIFICATIONS

- Office**
 Electric baseboard or wall unit, best size is 2,000-4,000 watts.
 Gas wall unit 10,000 Btu/hr. over 5,250
- Service Area**
 Underfloor, install 4" wide U-shaped strip around the floor drain, open end toward door, 2" away from floor drain.
 Electric, 15 watts ft², easy installation, potential failure due to floor cracks.
 Hot water, 50 Btu ft², high installation, cost durable.
 Space, hot air, 50,000 Btu/hr in lightly insulated shop, 25,000 Btu/hr in heavily insulated shop, ceiling or wall mounted or pot belly stove.
 Radiant, electric or gas over work area.



SHOP FLOOR PLAN — 2/9



SHOP WALL & FOOTING PLAN — 1/9

- KEY:**
- S Single Pole Switch
 - S₃ 3-Way Switch
 - ⊖ 2 - 40 Watt Fluorescent Light
 - 100 Watt Light Bulb
 - ⊕ Retractable Trouble Light
 - ⊖ 120 Volt Outlet
 - ⊖ 150 Watt Weather Proof Flood Light
 - ⊖ 240 Volt Outlet
 - w.p. Weather Proof

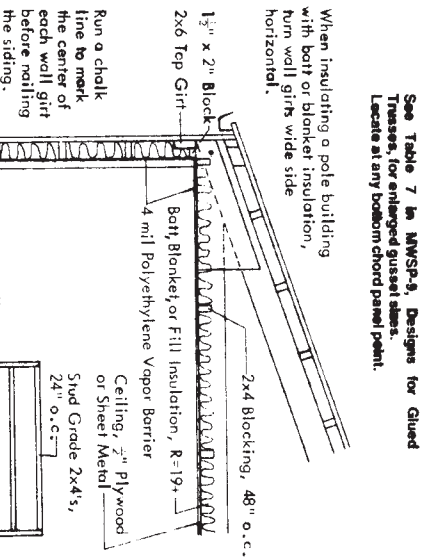
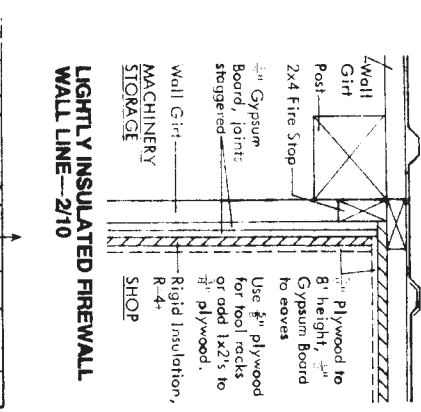
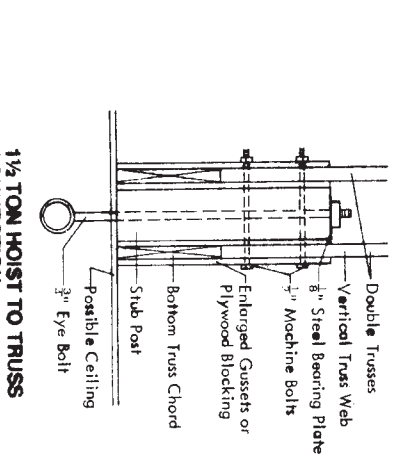
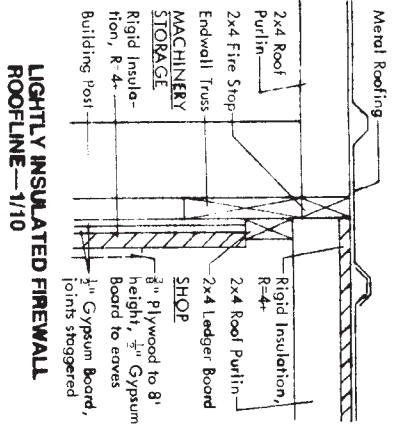
GENERAL LIGHTING PLAN — 3/9

See page 10 for general electrical specifications and this page for heating specifications.
 Fluorescent lights may have difficulty starting at temperatures less than 32 F. Use 150 watt bulbs with reflectors in unheated shops.

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FARM SHOP ELECTRICAL SPECIFICATIONS

Use general lighting as shown on plan

Special Lighting
Place two 150-watt bulbs with reflectors or one 4' fluorescent fixture over each 10' of work bench, positioned 4' above the front 1/2 of bench.

Place special lighting outlets over each stationary power tool

Convenience Outlets
Provide one 20-amp duplex outlet for every 3' of bench

Provide a 240-volt 50-amp outlet for an electric welder located close to an outside door so large machinery can be repaired outside.

Locate an outlet on the ceiling for a retractable trouble light in the service area.

Position outlets about 4' above floor

Install all exposed wiring on the walls in electrical metallic or PVC tubing.

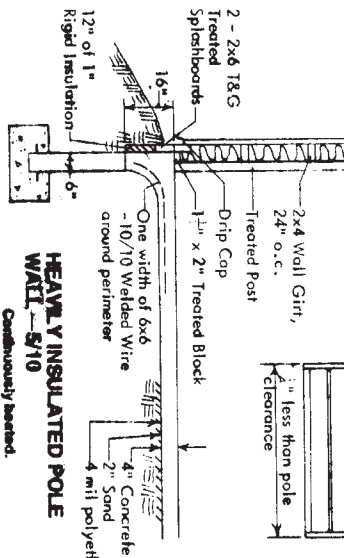
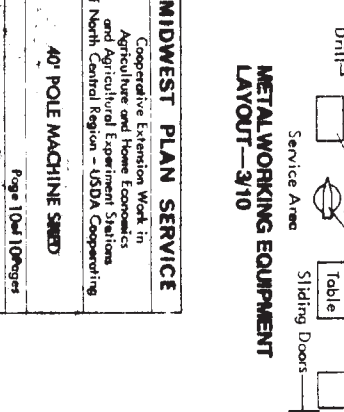
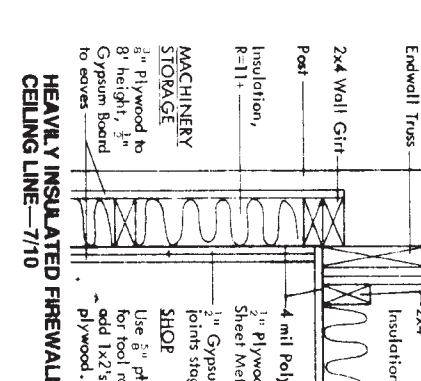
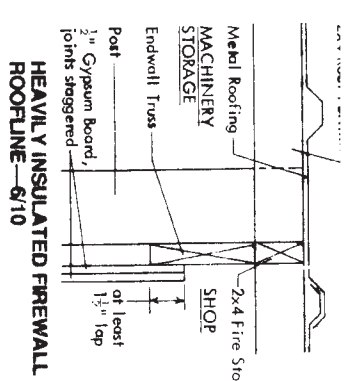
Special Purpose Outlets
Provide single-phase 120-volt 20-amp outlets for small motors. If 3-phase electrical service is available, wire all permanent motor locations greater than 1/2 hp to 3 phase, unless you already have single-phase motors.

Circuits
Lighting and duplex outlets:
Provide a 120-volt 20-amp circuit of 12-ga wire for each 1500 watts of lighting, 10 duplex outlets, or motors under 1/2 hp.
Provide a 120-volt 15-amp circuit of 14-ga wire for each 1100 watts of lighting or 7 duplex outlets.

Special circuits
Provide a 240-volt 50-amp individual circuit of 6-ga wire for a welder.
Provide 240-volt circuits for heating units over 1,000 watts and motors over 1/2 hp.
Use 8-ga wire for 40-amp circuits and 10-ga wire for 30-amp circuits.
Use wire one size larger if aluminum is used instead of copper.

Service entrance
Locate the service entrance by the welder outlet

Surface mount at face height.



HEAVILY INSULATED FIREWALL WALL LINE—8/110

This diagram shows a cross-section of a wall with a fire-rated exterior. The exterior side features Wall Girt, wide side horizontal, Metal Siding, Wall Girt, 2x4 Fire Stop, Post, 2x4 Plywood to 8' height, 3/4" Gypsum Board, R-4+, with joints staggered. The interior side shows a SHOP area with 3/4" Plywood to 8' height, 3/4" Gypsum Board, R-4+, and Rigid Insulation, R-11+.

