

MWPS-74146

48' 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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Cooperative Extension Work in Agriculture and Home Economics and Agricultural Experiment Stations of North Central Region - USDA Cooperating
48' Pole Machine Shed
Title Page
MIDWEST PLAN NO. 74146

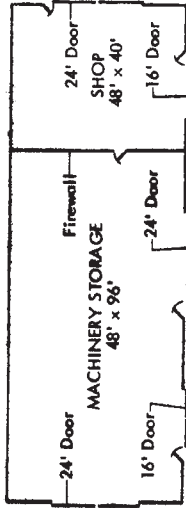
***PREFERRED LUMBER SPECIFICATIONS**
 Roof Purlins and Wall Girts
 S&K Construction Grade (Doug Fir or Southern Yellow Pine).
 2x6 No. 2 (Doug Fir or Southern Yellow Pine).

Trusses and Headers
 No. 1 or 15001 machine rated (Doug Fir or Southern Yellow Pine).

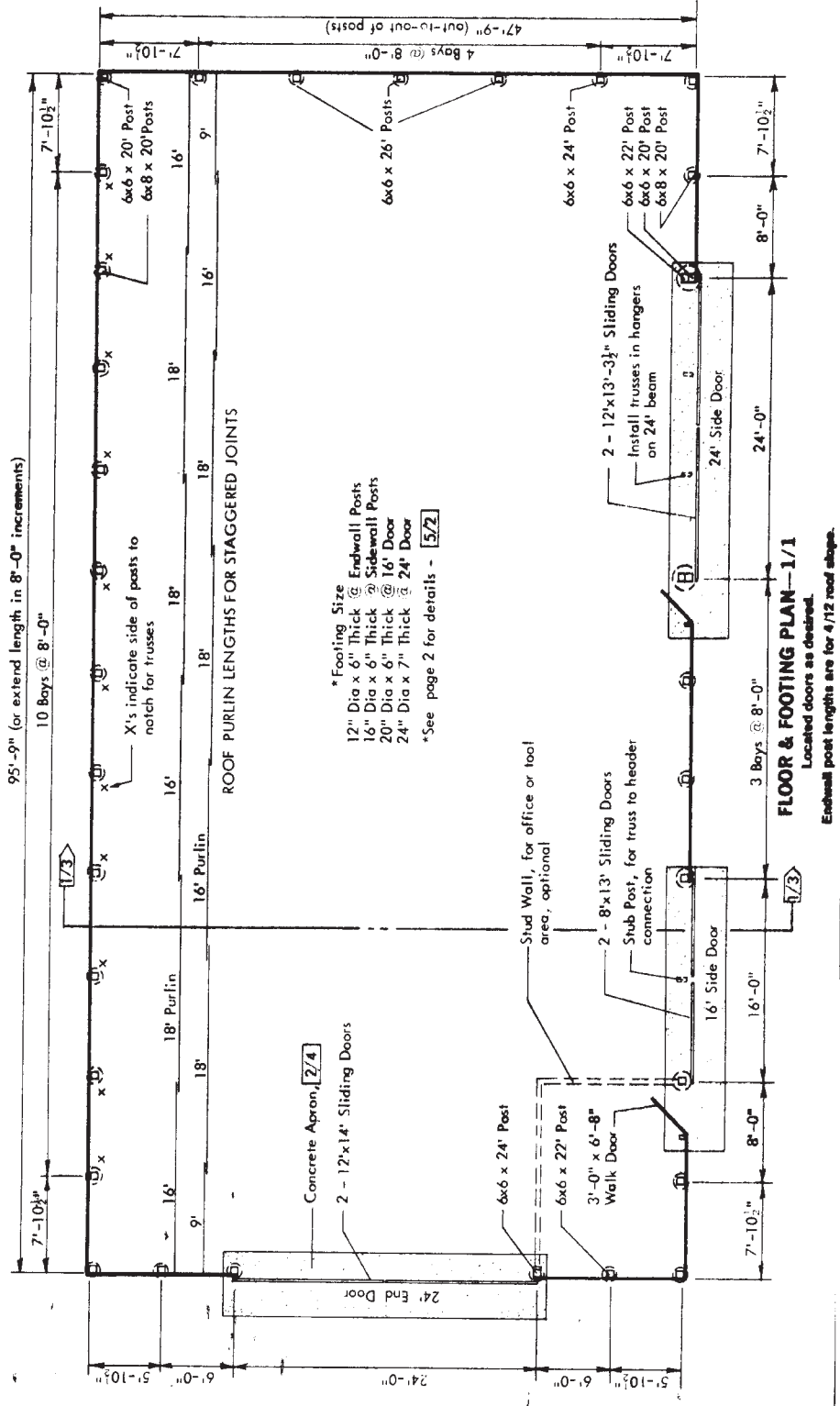
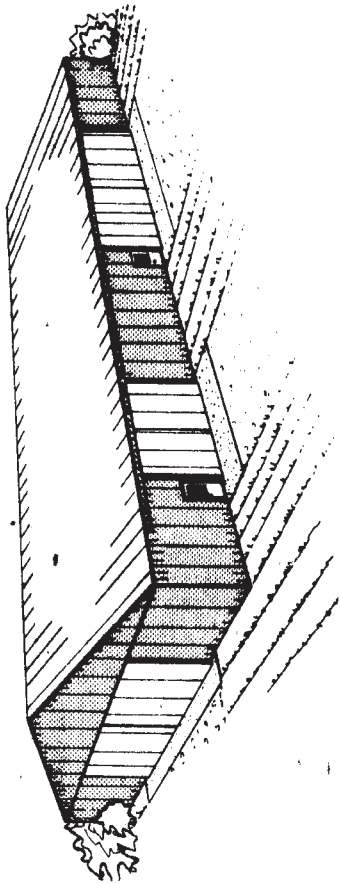
Posts and Splashboards
 Pressure Preservative Treated (Southern Yellow Pine or equivalent) creosote-10 pct. Penta-0.50 pct, ACA or CCA (Type A or B)-0.40 pct.

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

Use 48' glue-nailed trusses, 8'-0" o.c., alternate every other pair of trusses to opposite side of posts. Posts 18' & 18' long roof purlins with staggered joints. Locate truss on far side of sliding door opening for knee brace installation.

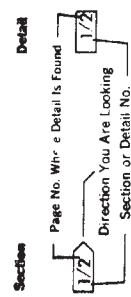


Machine Shed plus Shop
 See pages 9 & 10 for details.



*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
 *See page 2 for details - 5/2

FLOOR & FOOTING PLAN-1/1
 Located doors as desired.
 Endwall post lengths are for 4/12 roof slope.



Section & Detail Indicator

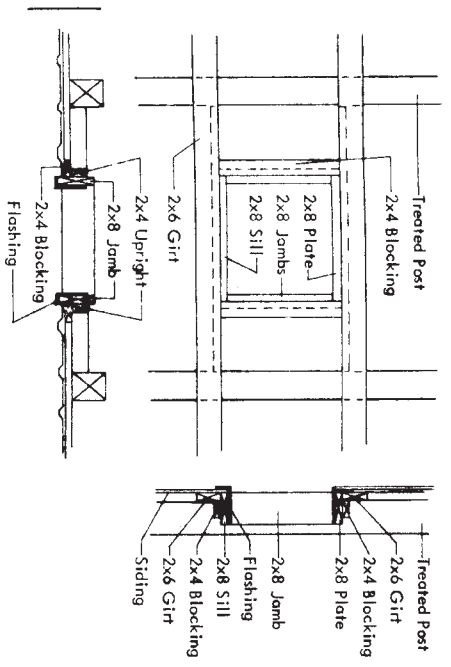
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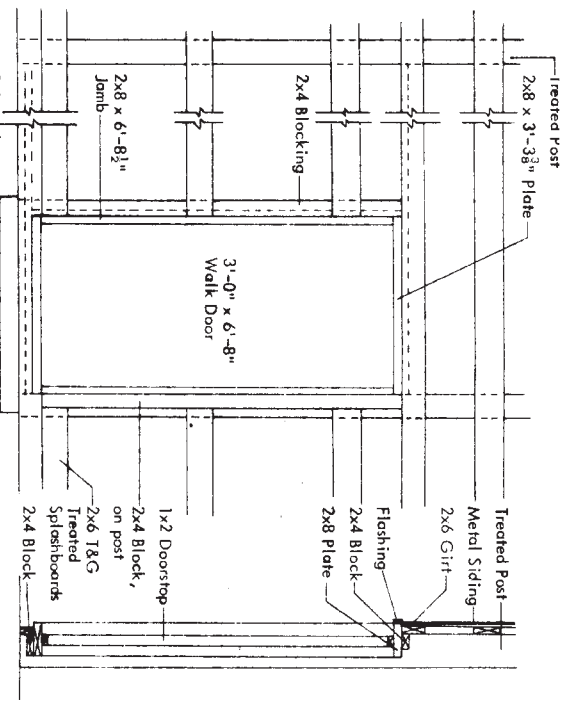
48' POLE MACHINE SHED

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FRAMED OPENING DETAIL—1/2
 For windows, fans and small vent doors.
 For a building with an interior lining, extend the jamba, plate and sill to be flush with the inside edges of the posts.

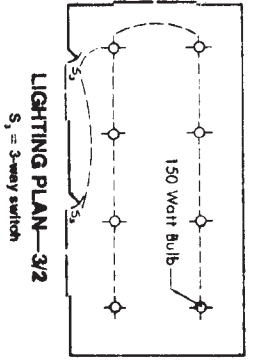
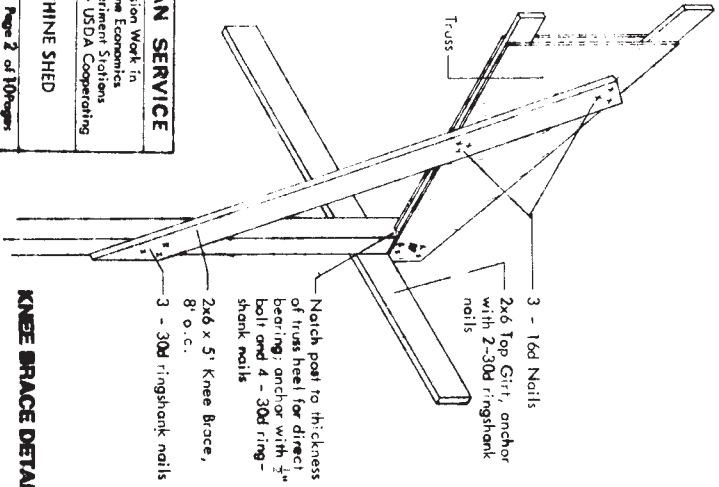
- Alternate Lumber Specifications, Spacing and Sizes.**
- 2x4 Purina (Construction Grade Hem-Fir) Max Spacing
 - Snow Zone 1: 28" o.c.
 - Snow Zone 2: 24" o.c.
 - Snow Zone 3: 18" o.c.
 - 2x6 Girts (No. 2 Hem-Fir)
 - Max Spacing: 24" o.c.
 - Headers (No. 1 Hem-Fir)
 - 16" Door
 - Snow Zone 1: 3"-2x12
 - Snow Zone 2: 4"-2x12
 - Snow Zone 3: 5"-2x12
 - 24" Door
 - All Zones: 5 1/2" x 24"
 - Posts (Round vs Sawn)
 - 6x6 = ASA or ASAE Class 5, 60" Top Diameter
 - 6x6 = ASA or ASAE Class 7, 48" Top Diameter
- Trusses (No. 1 Hem-Fir)
 See Truss Page



WALK DOOR FRAMING—4/2
 For a building with an interior lining, extend the jamba, plate and sill to be flush with the inside edges of the posts.

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40' POLE MACHINE SHED
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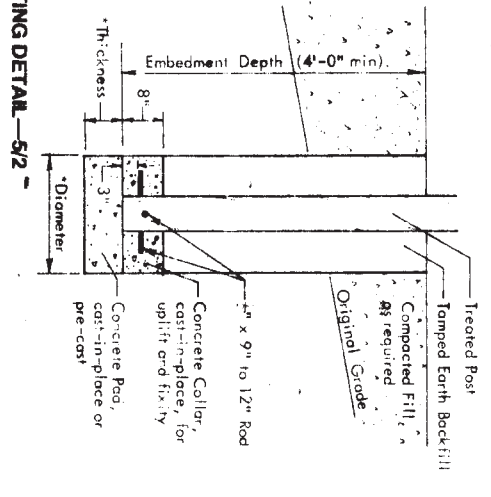
KNEE BRACE DETAIL—2/2

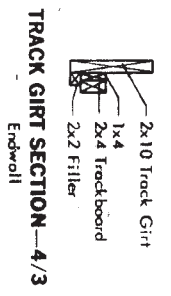
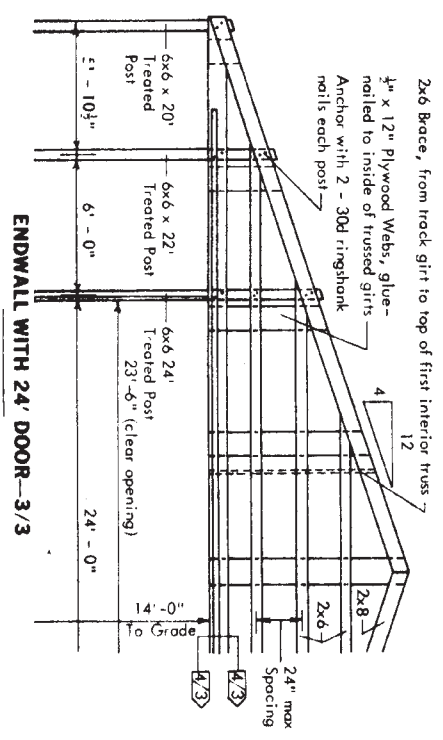
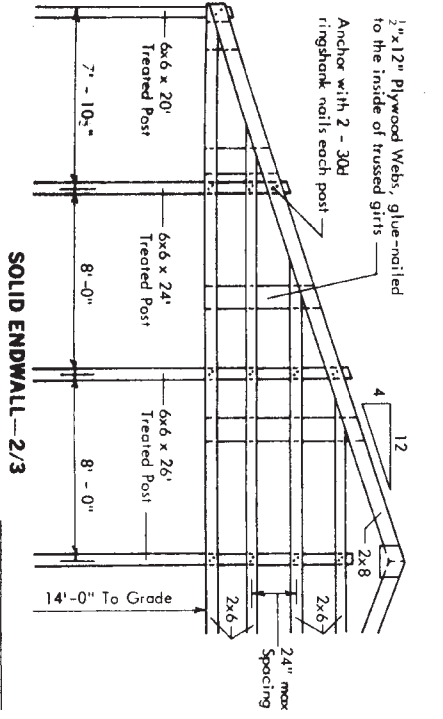
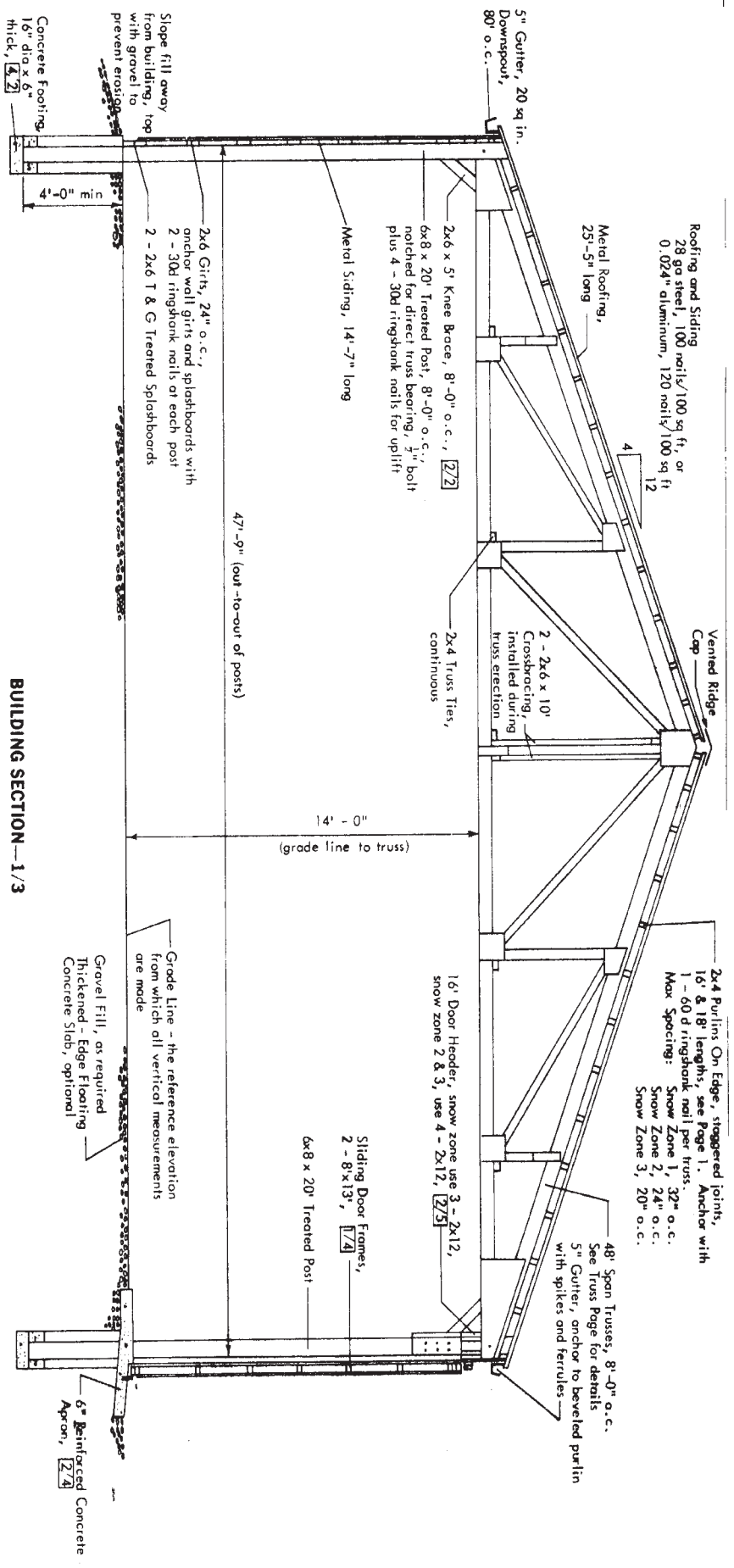


LIGHTING PLAN—3/2
 S₁ = 3-way switch

- *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 larger diameter footings, use smaller diameter auger and flare the bottom of the hole with Lineman's spoon.

POST FOOTING DETAIL—5/2

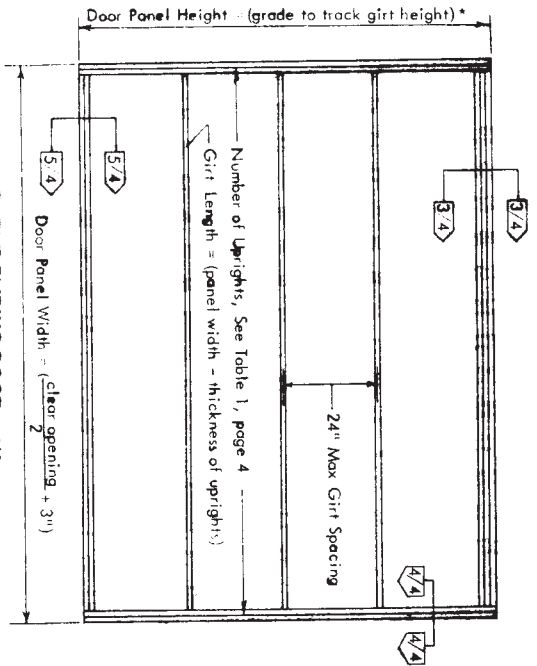




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DOUBLE SLIDING DOOR—1/4

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.



"U"-Shaped Door Guide

Locate 3/4" dia x 20" "U"-shaped door guide at center of door opening. Break at center to force closing door against apron lip. Taper from 4 1/2" end to 3" center clearance.

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	14	2	2	2	2	3	3	3	4
8	1	1	1	1	1	2	2	2									
9	1	1	1	2	2	2	2	2									
10	1	2	2	2	2	2	2	2									
11	2	2	2	2	2	2	2	3									
12	2	2	2	2	3	3	3	3									
13	2	2	2	2	3	3	3	4									
14	2	2	2	2	3	3	3	4									

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

MIDWEST PLAN SERVICE

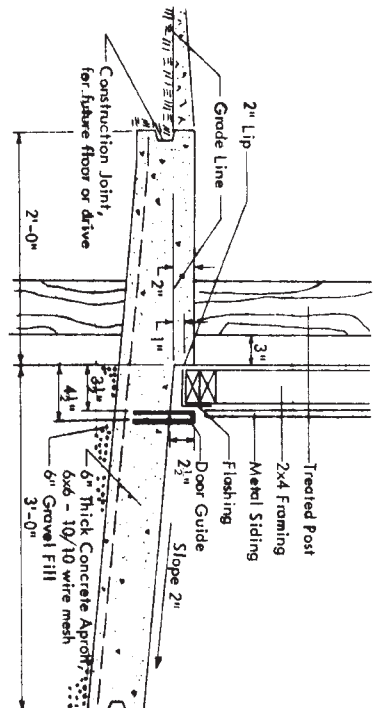
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40' POLE MACHINE SHED

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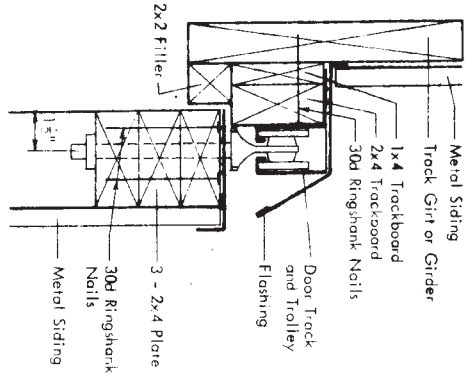
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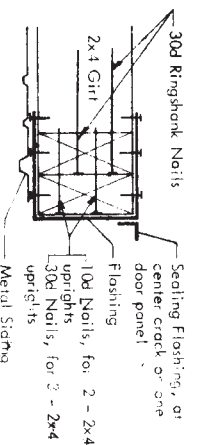


SLIDING DOOR APRON—2/4

Set adjustable roller guides in the concrete apron at door jams. Use door stops as required.

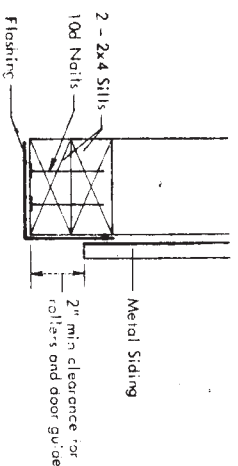


DOOR TRACK ASSEMBLY—3/4



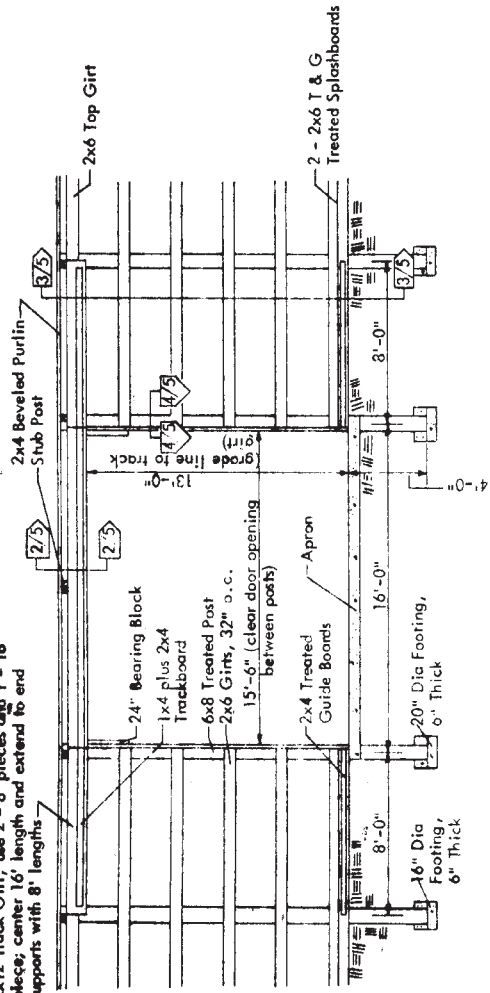
UPRIGHT SECTION—4/4

Extend flashing around uprights and nail to girts and uprights.



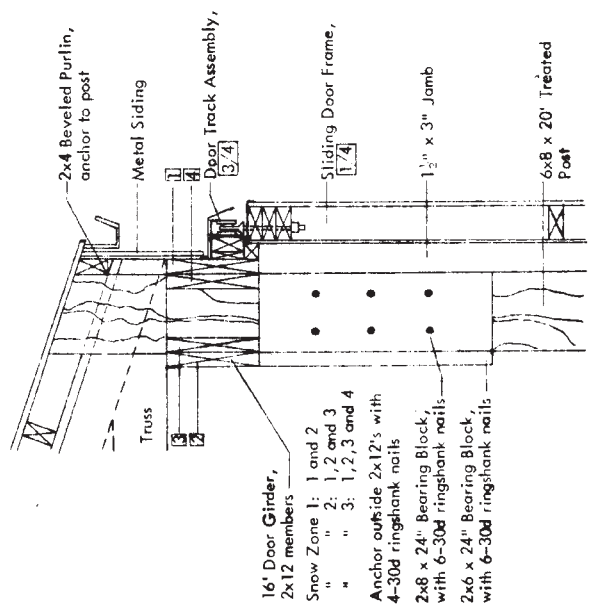
SILL SECTION—5/4

2x12 Track Girt, use 2 - 8' pieces and 1 - 16' piece; center 16' length and extend to end supports with 8' lengths

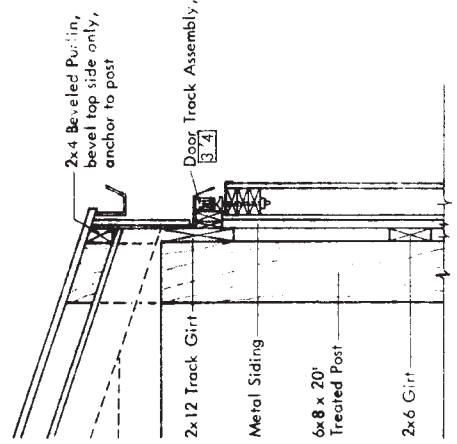


16' DOOR—1/5

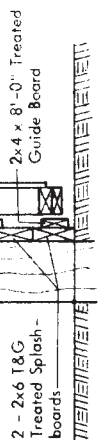
Use stub post for intermediate truss to girder connection, notch post to fit girder opening.



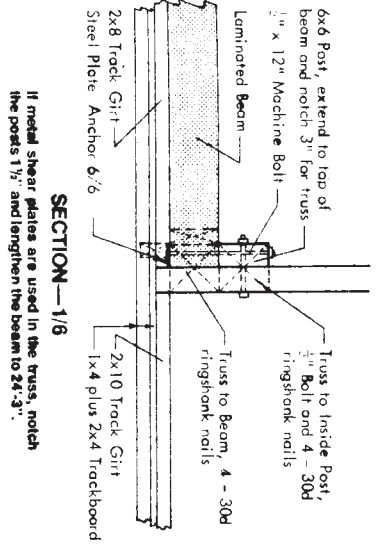
16' DOOR GIRDER SECTION—2/5



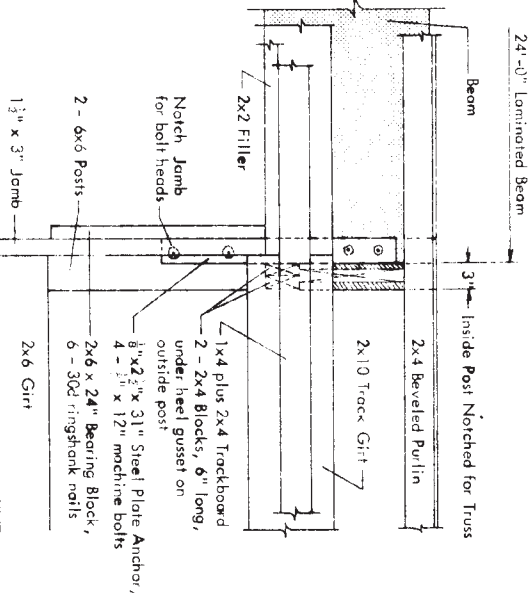
16' DOOR TRACK GIRT SECTION—3/5



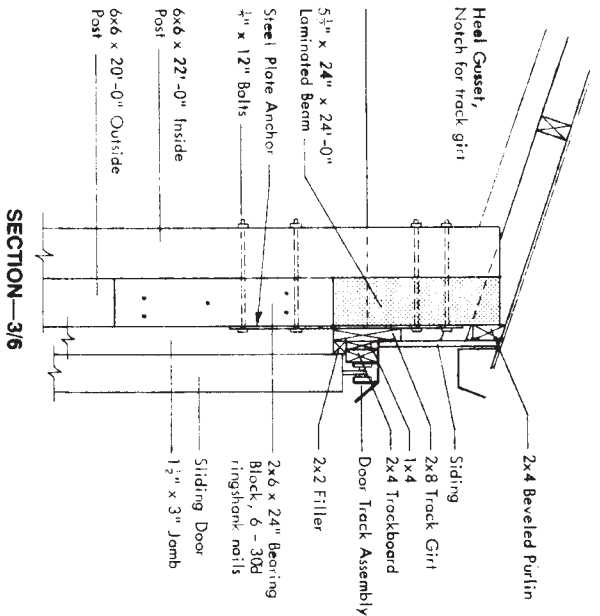
JAMB SECTION—4/5



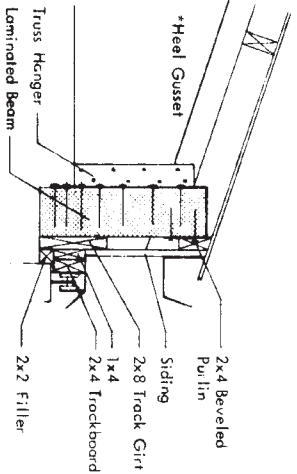
SECTION - 1/6
If metal shear plates are used in the truss, notch the posts 1 1/2" and lengthen the beam to 24'-3".



BEAM TO COLUMN CONNECTION - 2/6



SECTION - 3/6

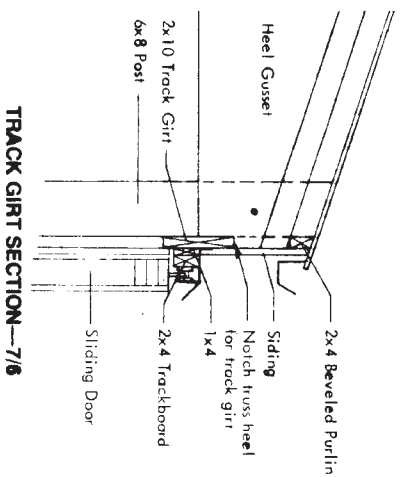


JAMB SECTION - 4/6

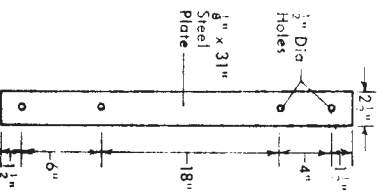


TRUSS TO BEAM - 5/6

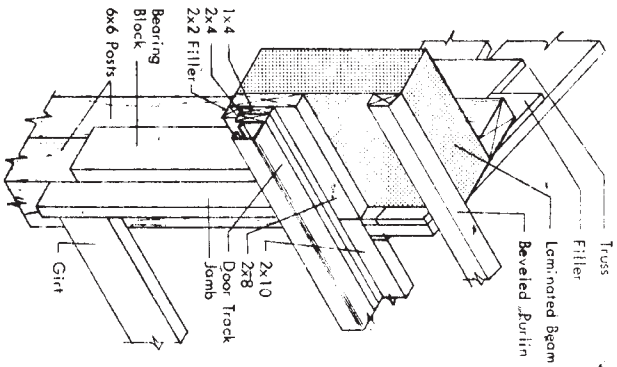
* 40' Truss with 7' cut off the heel. Extend gussets 7" to the left so they are not shortened.



TRACK GIRT SECTION - 7/6



STEEL PLATE ANCHOR - 6/6



JOINT ASSEMBLY - 8/6

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40' POLE MACHINE SHED

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24' BEAM — for 24' wide sidewall door

MATERIALS

Lumber

This beam is designed for use of Douglas Fir-Larch (No. 1, MC19) or Southern Yellow Pine (No. 1, NC19).

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

Plywood

Use 5/8" C-C Ext. ("Identification Index" = 42/20)

Glue

Casein (MM-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 + 2x6). Spread glue on the plywood (Layer #1). Nail plywood to Layer #2 with 6d 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.

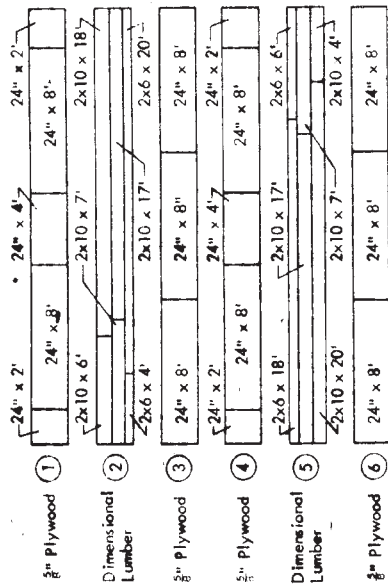
a. Clamping method.

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 for 24 hours.

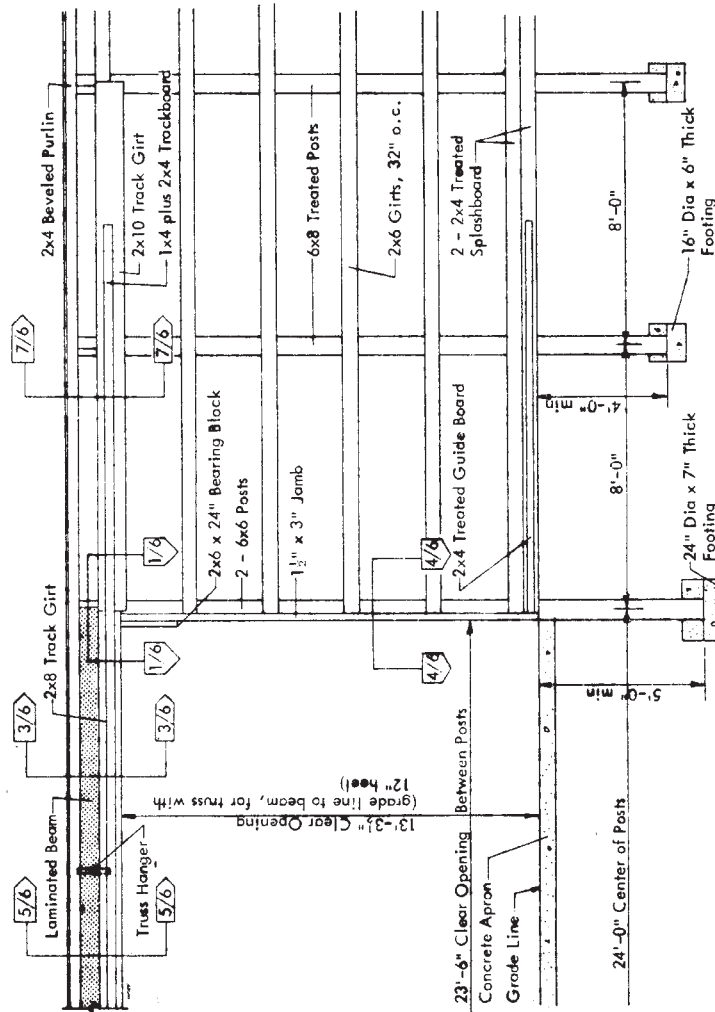
b. Weighting method.

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.

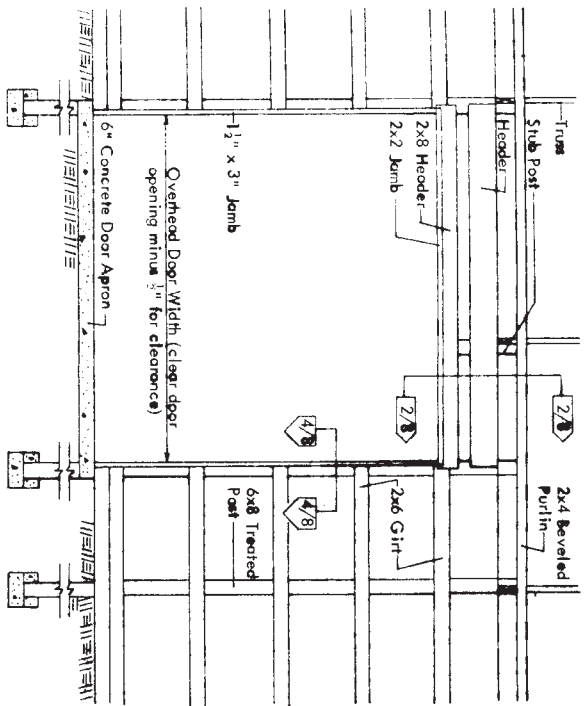
24' Material is preferable, if available



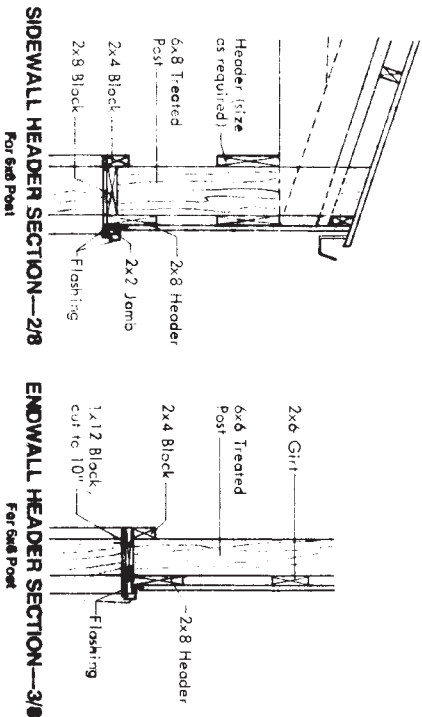
24' LAMINATED BEAM ASSEMBLY—1/7



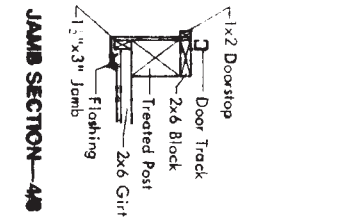
24' DOOR FRAMING—2/7



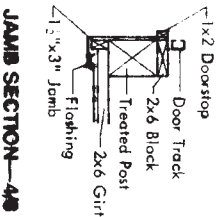
OVERHEAD DOOR FRAMING—1/8



SIDEWALL HEADER SECTION—2/8
For 6x8 Post

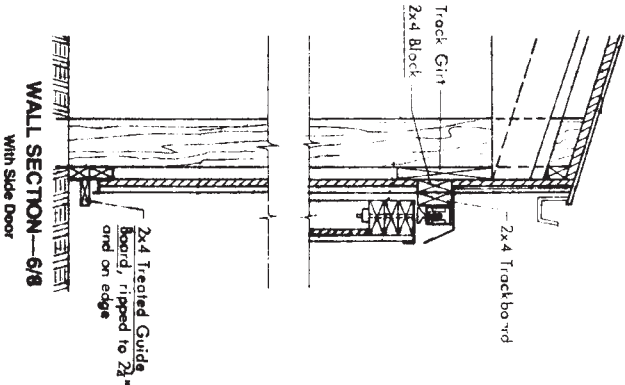
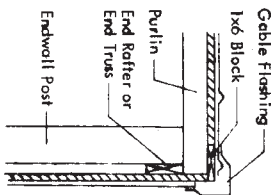


ENDWALL HEADER SECTION—3/8
For 6x6 Post

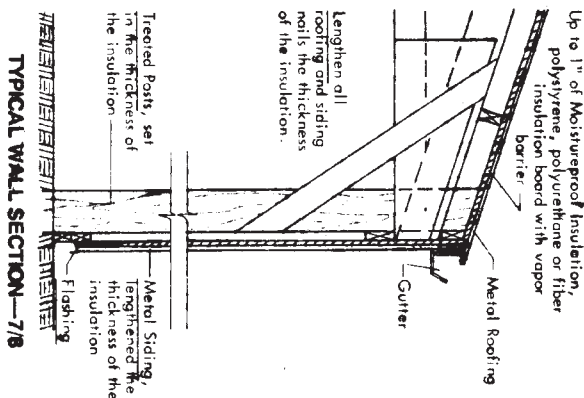


JAMB SECTION—4/8

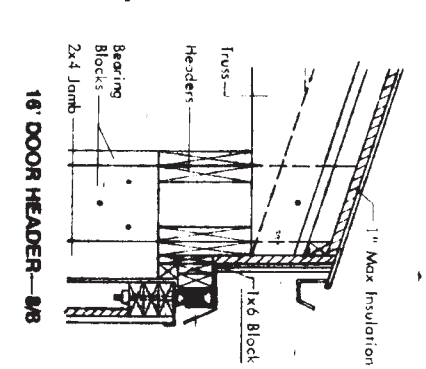
TYPICAL GABLE END SECTION—5/8



WALL SECTION—6/8
With Side Door



TYPICAL WALL SECTION—7/8



16' DOOR HEADER—8/8

INSULATION DETAILS

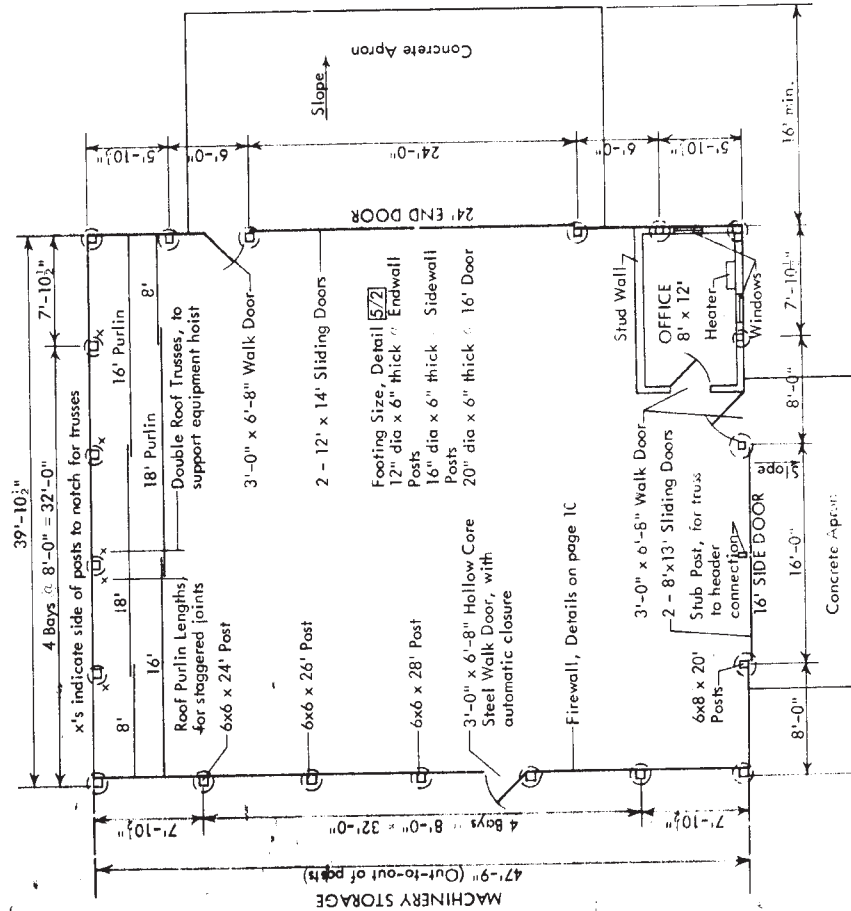
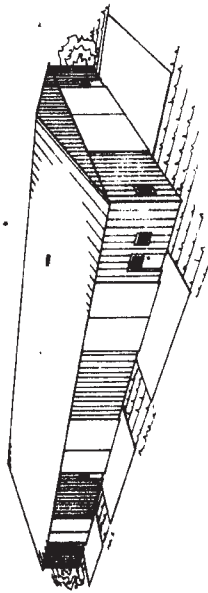
Underlines show materials that change when insulation is added.

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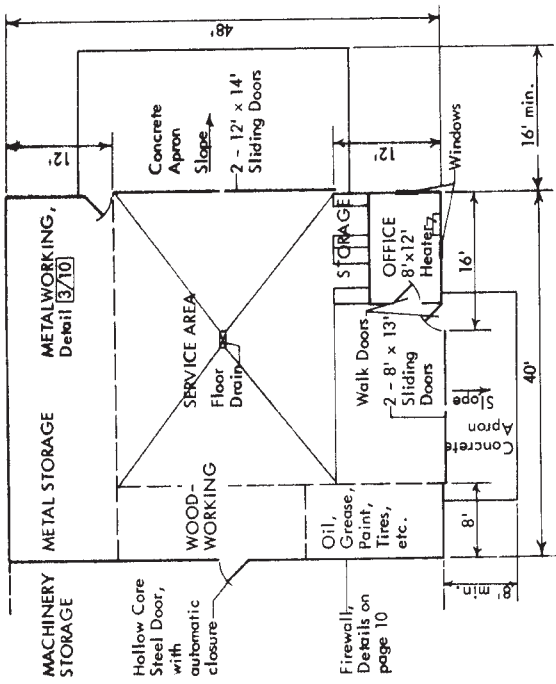
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HEATING SPECIFICATIONS

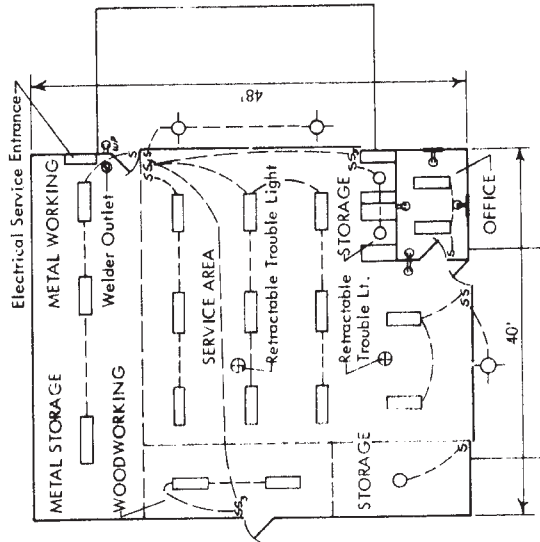
Office Electric: baseboard or wall unit, best size is 2,000-4,000 watts.
 Gas: wall unit, 10,000 Btu/hr. over-Size Area
 Underfloor: install 4" wide U-shaped strip around the floor drain, open end toward door, 2' away from floor drain.
 Electric: 15 watts/ft², easy installation, potential failure due to floor cracks.
 Hot water: 50 Btu/ft², high installation cost, durable.
 Space hot air: 50,000 Btu/hr in highly 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 WALL AND FOOTING PLAN—1/9



SHOP FLOOR PLAN—2/9



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.

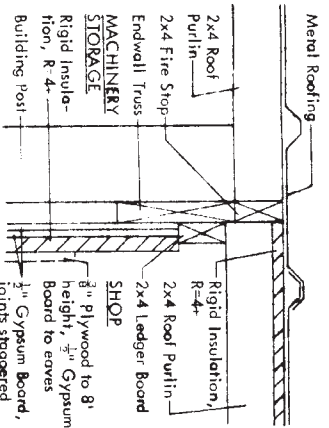
KEY:

- S Single Pole Switch
- S₃ 3-Way Switch
- S₄ 4-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

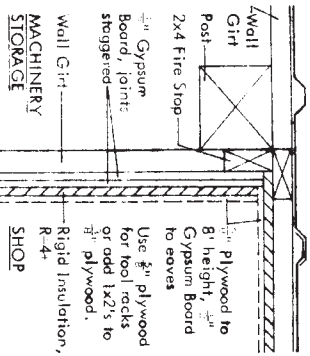
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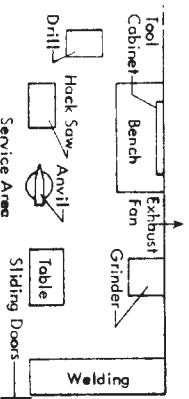
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LIGHTLY INSULATED FIREWALL ROOFLINE—1/10



LIGHTLY INSULATED FIREWALL WALL LINE—2/10



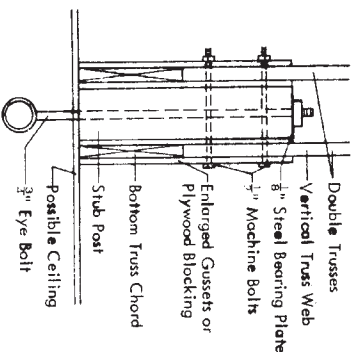
METALWORKING EQUIPMENT LAYOUT—3/10

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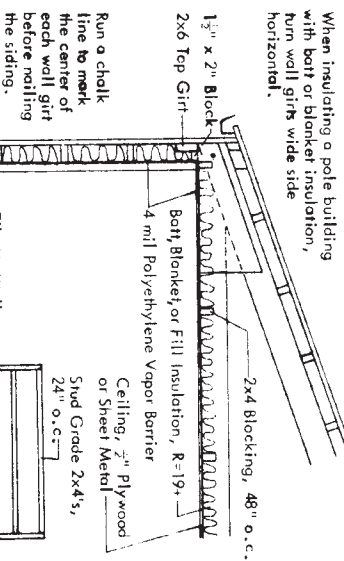
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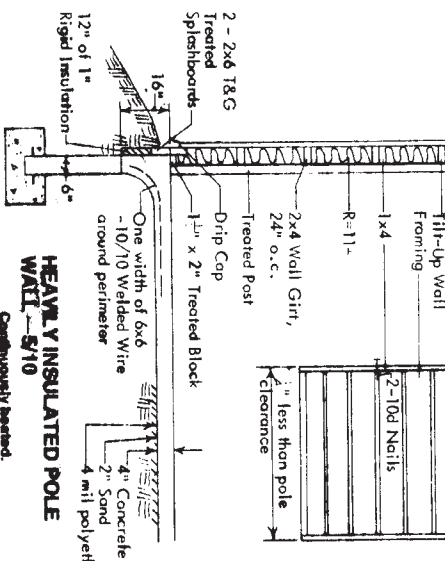
1 1/2 TON HOIST TO TRUSS CONNECTION

See Table 7 in MWSP-9, Designs for Glued Trusses, for enlarged gusset sizes. Locate at any bottom chord panel point.



When insulating a pole building with batt or blanket insulation, burn wall girth joints wide side horizontal.

Run a chalk line to mark the center of each wall girth before nailing the siding.



HEAVY INSULATED POLE WALL—6/10
 Continuously Insulated.

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 5' 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.

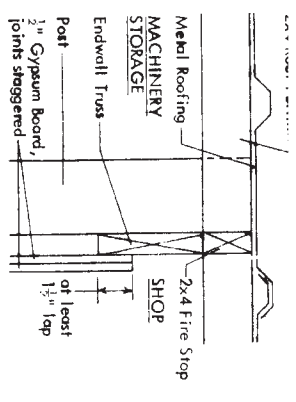
Position outlets about 4' above floor.
 Install all exposed wiring on the walls in electrical metal or PVC tubing.

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.

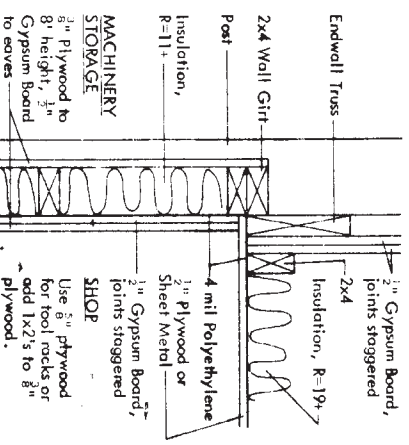
Circuits
 Lighting and duplex outlets:
 Provide a 120-volt 20-amp circuit of 12-ga wire for each 1500 watts of lighting; 10 duplex outlets; or motors under 1/2 hp.
 Provide a 120-volt 15-amp circuit of 14-ga wire for each 1100 watts of lighting or 7 duplex outlets.

Special circuits
 Provide a 240-volt 50-amp individual circuit of 6-ga wire for a welder.
 Provide 240-volt circuits for heating loads 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.

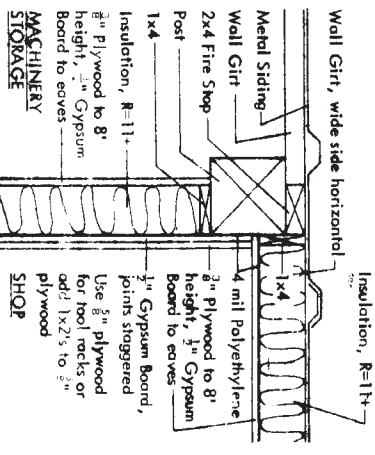
Locate the service entrance by the welder outlet.
 Surface mount it at least height.



HEAVY INSULATED FIREWALL ROOFLINE—6/10



HEAVY INSULATED FIREWALL WALL LINE—7/10



HEAVY INSULATED FIREWALL WALL LINE—8/10