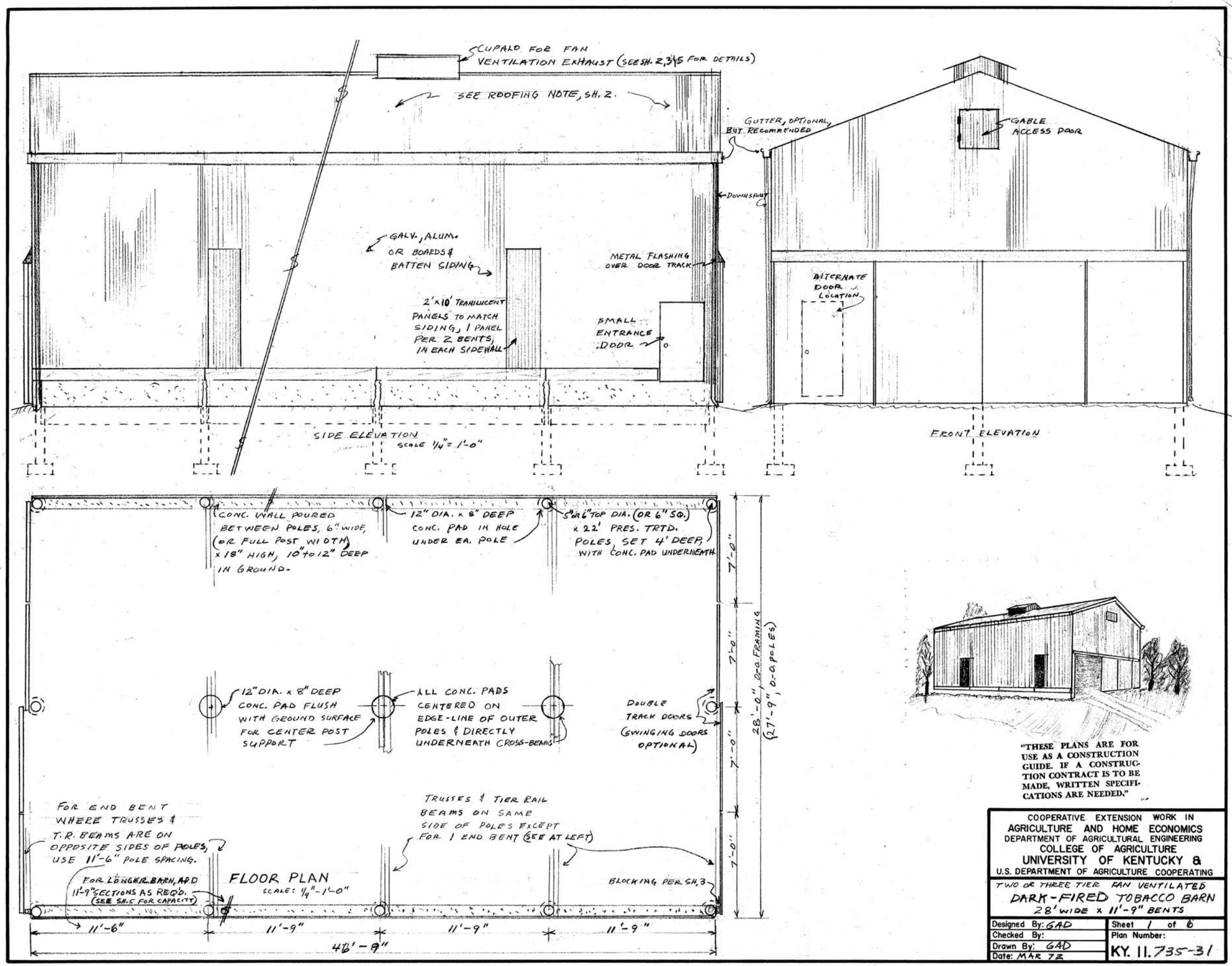

"THESE PLANS ARE FOR USE AS A CONSTRUCTION GUIDE. IF A CONSTRUCTION CONTRACT IS TO BE MADE, WRITTEN SPECIFICATIONS ARE NEEDED."

COOPERATIVE EXTENSION WORK IN
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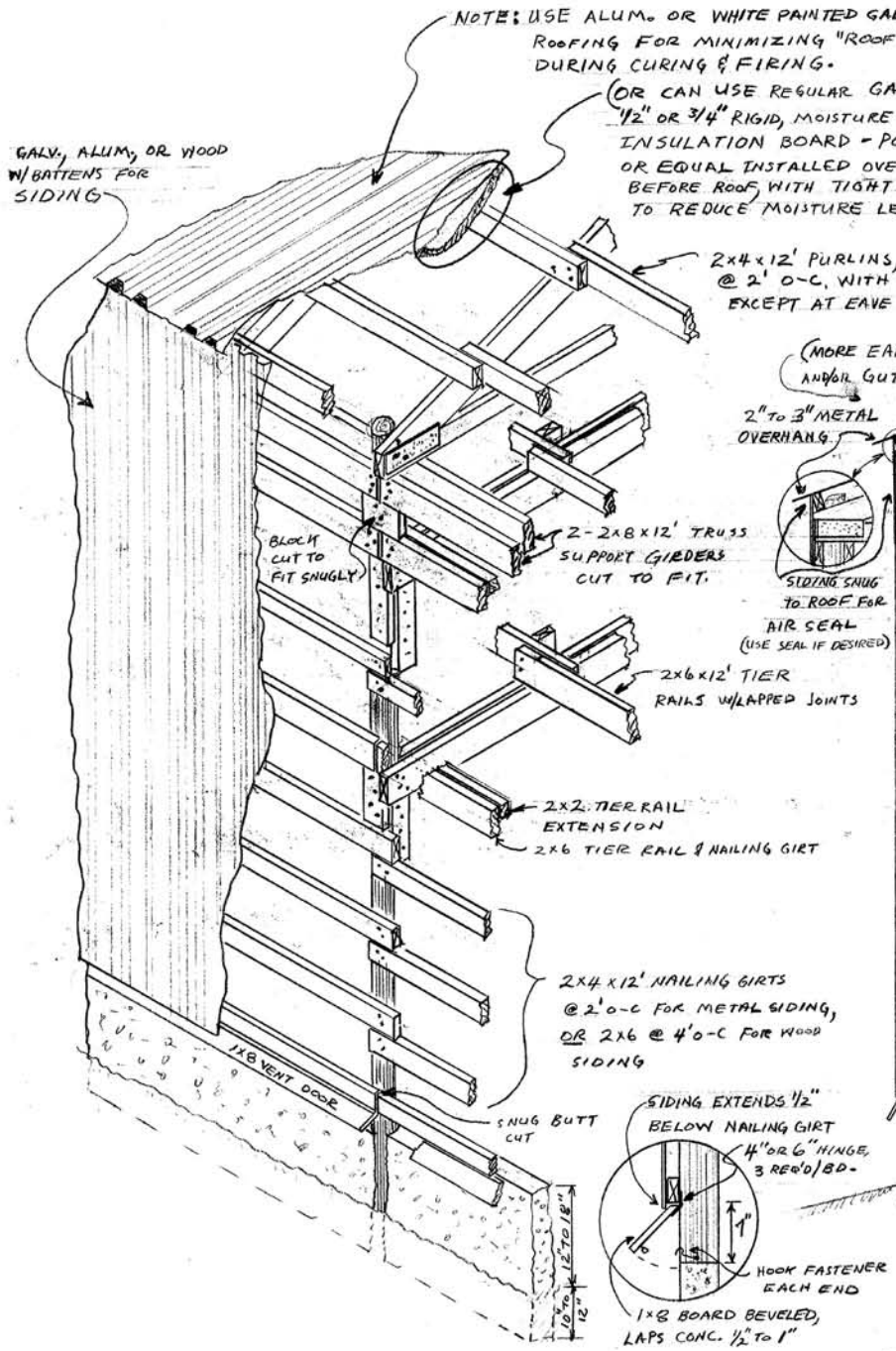
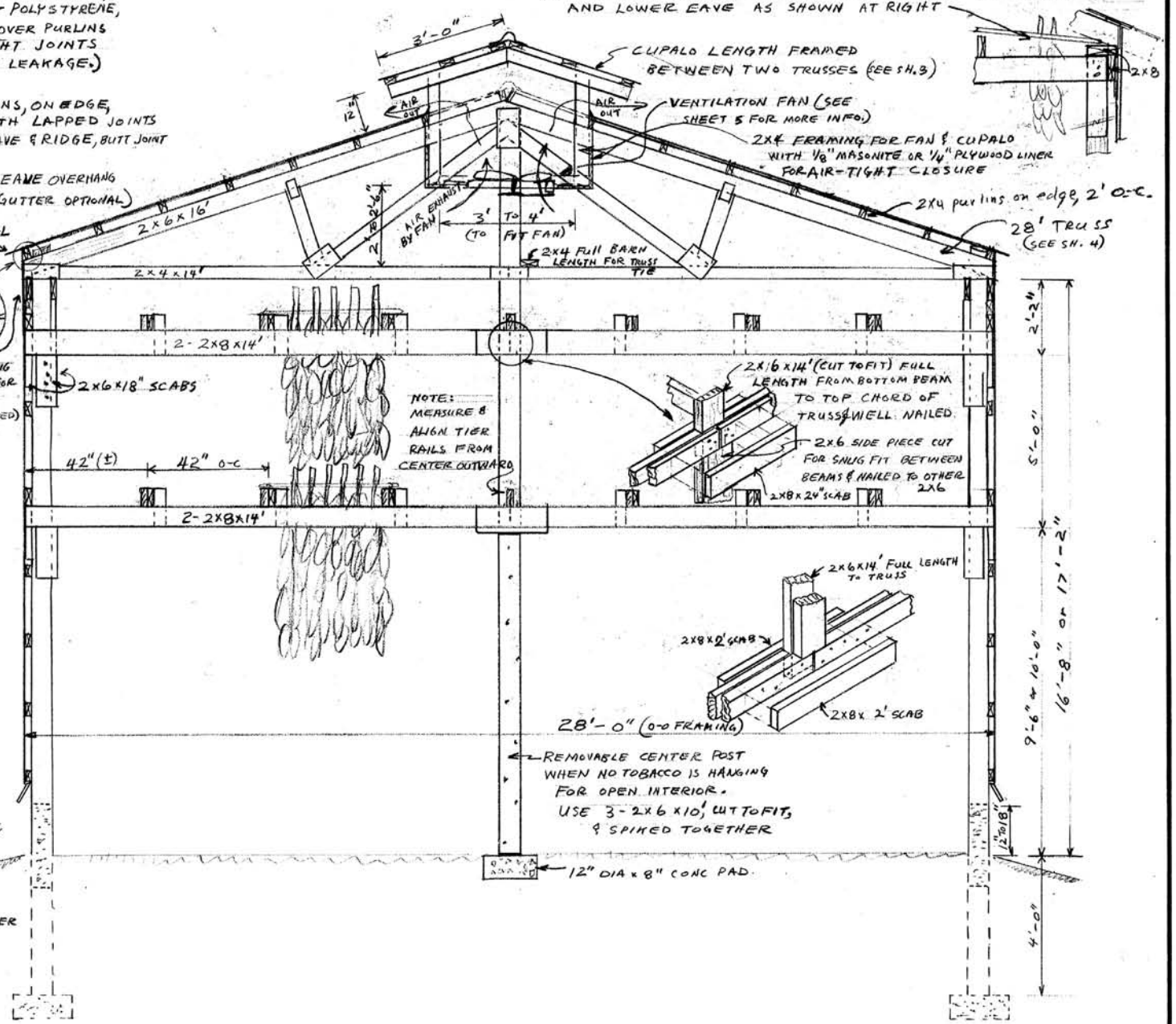
TWO OR THREE TIER FAN VENTILATED
DARK-FIRED TOBACCO BARN
28' WIDE x 11'-9" BENTS

Designed By: GAD	Sheet 1 of 6
Checked By:	Plan Number:
Drawn By: GAD	KY. 11.735-31
Date: MAR 72	



SIDEWALL CONSTRUCTION DETAILS
(NO SCALE)

NOTE: TRUSSED ROOF BARN SHOWN FOR CLEAR-SPAN USE DURING NON-TOBACCO SEASON OR FOR VERSATILITY IN FUTURE CHANGES.
IF RAFTER ROOF IS TO BE USED, USE 26' CENTER POLE IN GND.
4' AND 2x6 x 16' RAFTERS @ 2' SPACING AND 1x4 SHEATHING @ 24" O-C
OR 2x10 x 16' RAFTERS @ 5'-10" SPACING AND 2x4 PURLINS ON EDGE @ 24" O-C
AND LOWER EAVE AS SHOWN AT RIGHT



CROSS-SECTION
3/8" = 1'-0"

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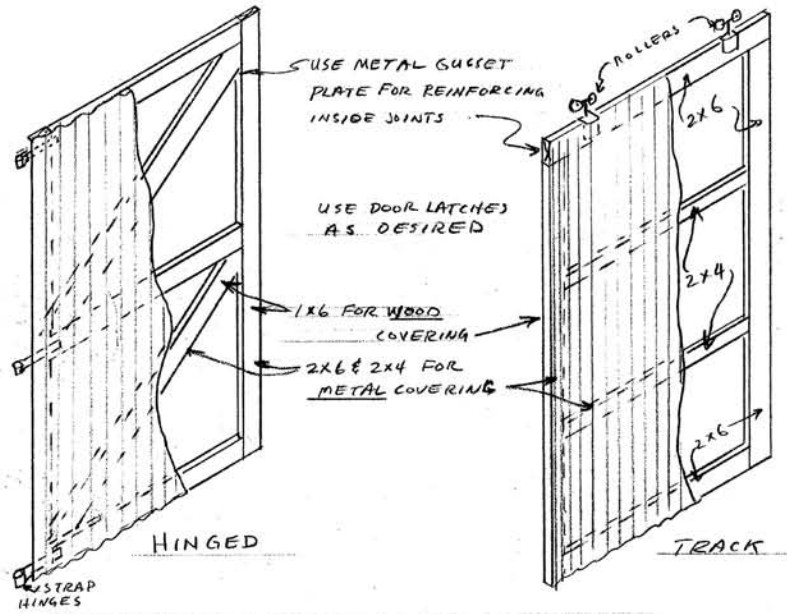
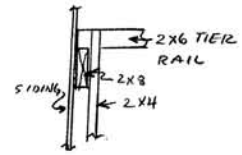
TWO OR THREE TIER FAN VENTILATED
DARK-FIRED TOBACCO BARN
28' WIDE

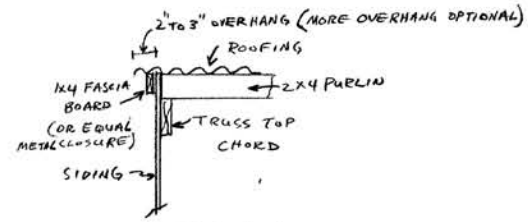
Designed By: GAD	Sheet 2 of 6
Checked By:	Plan Number:
Drawn By: GAD	KY. 11. 735-31
Date: 3-72	



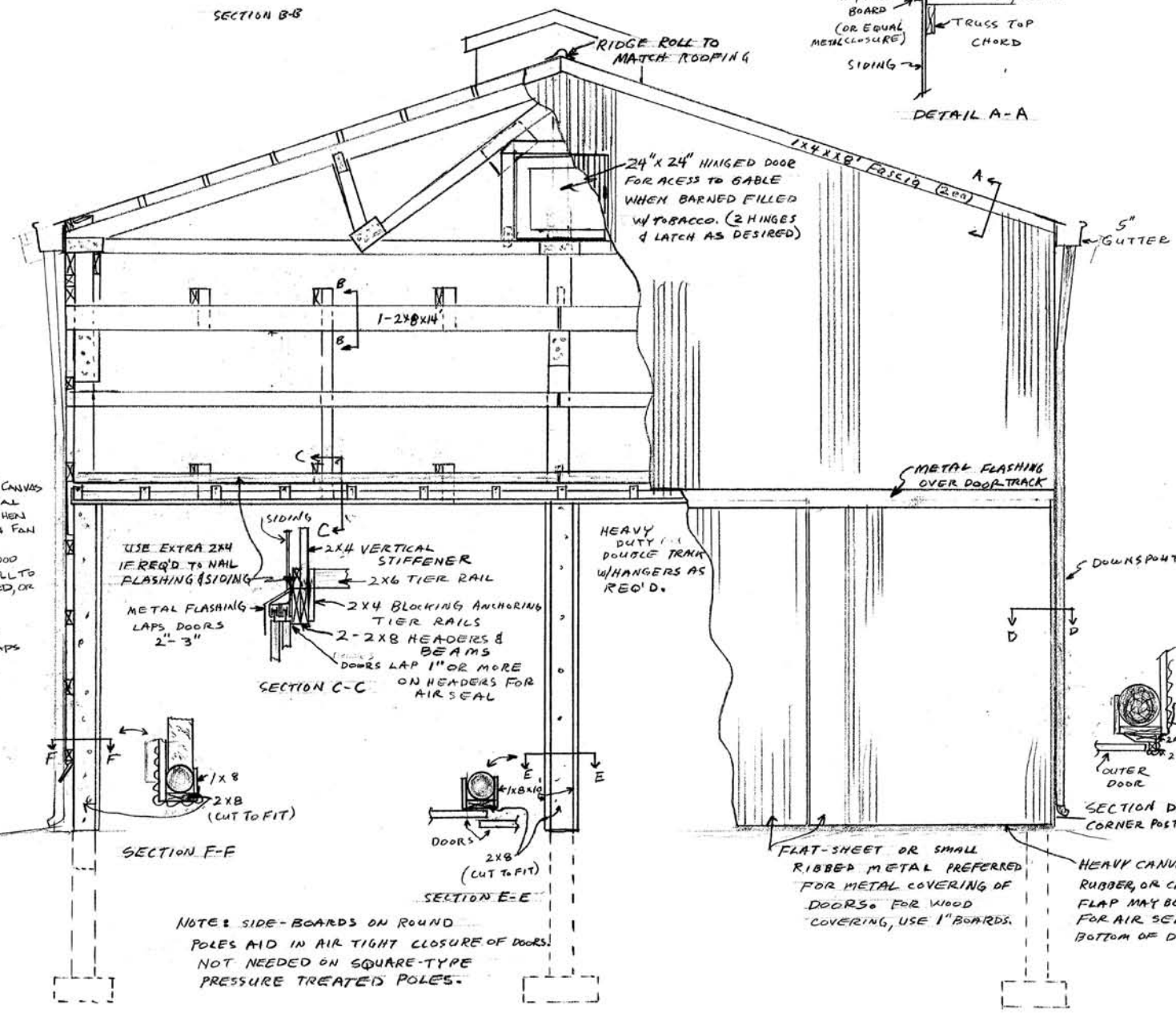
END ENTRANCE DOORS



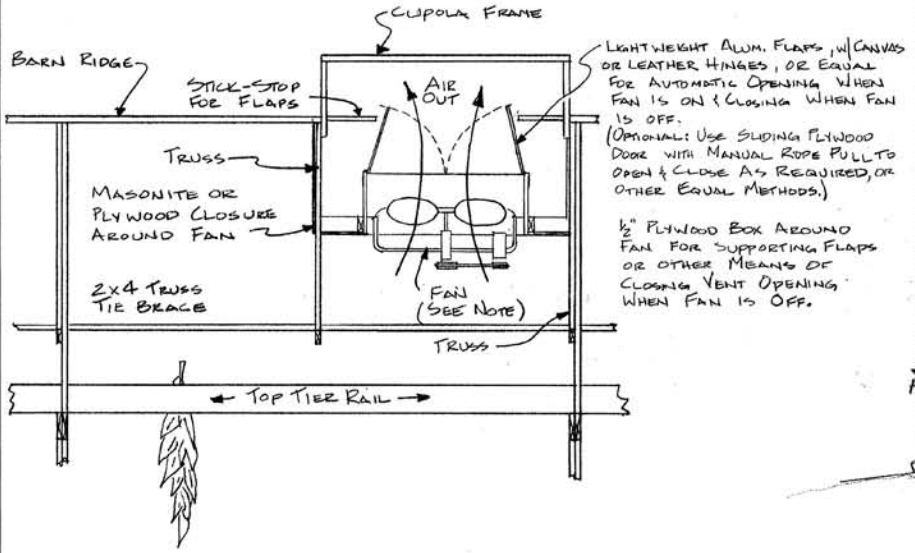
SECTION B-B



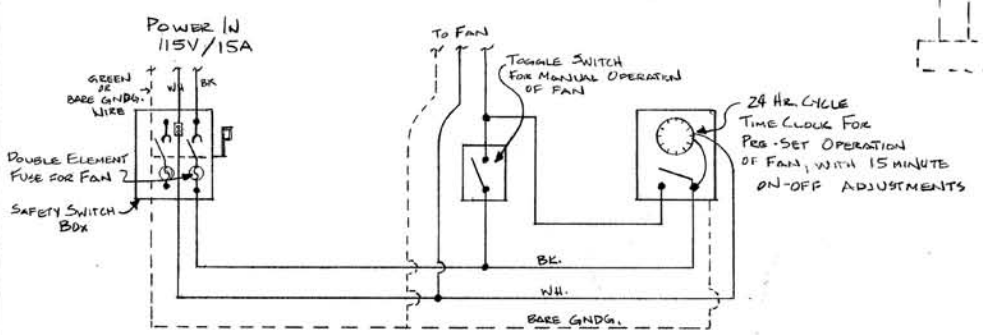
DETAIL A-A



NOTE: SIDE-BOARDS ON ROUND POLES AID IN AIR TIGHT CLOSURE OF DOORS. NOT NEEDED ON SQUARE-TYPE PRESSURE TREATED POLES.



SIDE SECTION VIEW - FAN INSTALLATION



WIRING FOR FAN & CONTROLS

COOPERATIVE EXTENSION WORK IN
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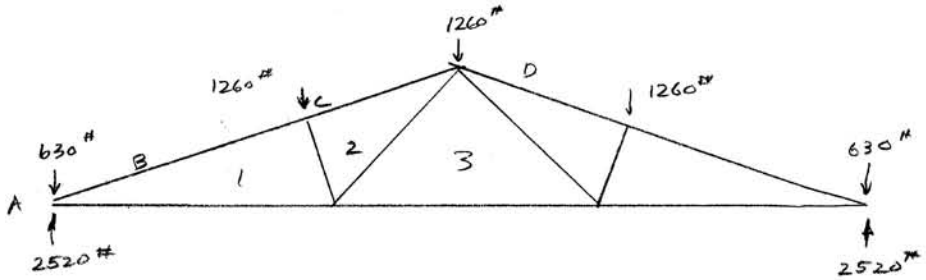
TWO OR THREE TIER FAN VENTILATED
DARK-FIRED TOBACCO BARN
28' WIDE x 11'-9" BENTS

Designed By:	Sheet 3 of 6
Checked By:	Plan Number:
Drawn By:	KY. 11.735-31
Date:	

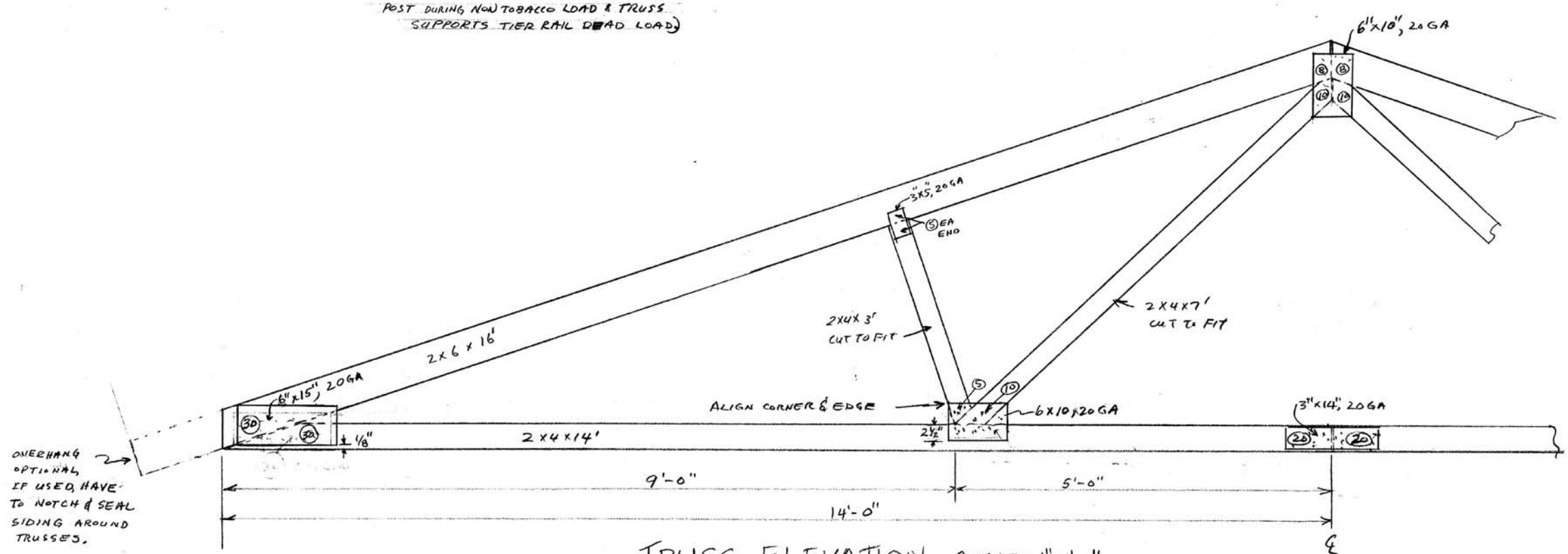
NOTE: CAN USE HOME BUILT TRUSSES OR BUY COMMERCIAL PRE-FAB. PER THESE LOAD SPECIFICATIONS.



LOADING DIAGRAM
SCALE: 1/4" = 1'-0"

DESIGN LOAD

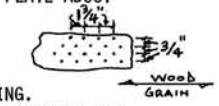
1. TRUSS DESIGNED FOR 30 P.S.F. ROOF, SNOW, AND WIND LOAD RATING AT 6' SPACING
(THIS LOAD RATING PERMITS REMOVAL OF CENTER POST DURING NON TOBACCO LOAD & TRUSS SUPPORTS TIER RAIL DEAD LOAD)



TRUSS ELEVATION SCALE: 1" = 1'-0"

SPECIFICATIONS FOR NAIL-ON METAL-GUSSET-PLATE TRUSS CONSTRUCTION:

1. LUMBER SHALL BE DRESSED, KILN DRY, STANDARD OR CONSTRUCTION GRADE DOUG. FIR, NO. 1 OR 2 SOUTHERN YELLOW PINE, OR EQUIVALENT.
2. GUSSET PLATES SHALL BE GALVANIZED STEEL, 18 or 20 GAUGE AS SPECIFIED, ONE ON BOTH SIDES OF EACH JOINT. PLATES MAY BE PRE-PUNCHED OR BLANK (DRIVE NAILS RIGHT THROUGH BLANK PLATE).
3. NAILS SHALL BE 1-1/2", 11 GAUGE, SCREW-SHANK, HARDENED, PALLET-TYPE NAIL.
4. NUMBER OF NAILS DRIVEN THROUGH GUSSET PLATE INTO EACH SIDE OF EACH MEMBER IS SHOWN BY NUMERALS IN CIRCLE AT EACH JOINT. DRIVE ALL NAILS SNUG AGAINST THE METAL PLATE.
5. ALIGN GUSSET PLATE OVER JOINT AS SHOWN ON TRUSS DIAGRAM. BEGIN NAILING IN CENTER OF GUSSET PLATE AND PROGRESS OUTWARDS TO ELIMINATE WRINKLES.
6. SPACE NAILS EVENLY OVER GUSSET PLATE ABOUT 1-1/2" APART ALONG GRAIN OF WOOD AND 3/4" APART ACROSS GRAIN IN STAGGERED PATTERN AS SHOWN AT THE RIGHT FOR MAXIMUM STRENGTH AND NO SPLITTING.



7. USE A JIG TO KEEP TRUSS MEMBERS ALIGNED AND PROVIDE FIRM SUPPORT UNDERNEATH FOR NAILING. BUTT ALL JOINTS TOGETHER TIGHTLY. A FEW NAILS IN EACH JOINT SHOULD COME WITHIN 3/8 TO 1/2 INCH OF JOINT BUTT-ENDS AND EDGES TO HOLD METAL PLATE FLAT.
8. DO NOT FABRICATE ANY JOINT HAVING A KNOT OR OTHER WOOD IMPERFECTION UNDER OR ADJACENT TO GUSSET PLATE.
9. HANDLE TRUSS WITH CARE WHEN ROTATING TO ATTACH OPPOSITE-SIDE GUSSET PLATES.

BILL OF MATERIALS

ITEM	NO.	SIZE	QUANTITY
Top Chord	2	2x6x16'	32 bd. ft. } 64 1/3 bd. ft.
Lower Chord	2	2x4x14'	19 " "
Diagonals	2	2x4x10'	13 1/3 "
Metal Plts.	4	6"x15"-20 GA. } (30"x30"-20 GA)	
	6	6"x10" "	
	2	3"x14" "	
	14	3"x5" "	
	2		
Nails	532	1 1/2", 11 GA, SC. Shank, 3 lb.	

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28' NAIL-METAL-PLATE TRUSS FOR 2 OR 3 TIER DARK-FIRED TOBACCO BARN

Designed By: GAD	Sheet 4 of 6
Checked By:	Plan Number:
Drawn By: GAD	KY. 11.735-31
Date: 3-72	

BILL OF MATERIALS

28' WIDE DARK-FIRED TOBACCO BARN (TWO-TIER FAN-VENTILATED DESIGN)

ITEM	SIZE	QUANTITY
ENDWALLS:	(Quantity is for both ends)	
P.T. Poles	22', (Use 6"x6" Sq. to eliminate need for seal around doors.)	6 ea.
Framing		
Cross Beams	2 x 8 x 14'	12 ea.
Nail Girts	2 x 4 x 14'	4 ea.
Vert. Stiffner	2 x 4 x 12' (Cut to approx. 5'-6")	1
Doors (Use Hinged Door per Sheet 3		
Vert. pcs	2 x 6 x 10'	16 ea.
Hor. pcs.	2 x 6 x 14'	12 ea.
Diog. Brcs	2 x 4 x 10'	16 ea.
Air seal	1 x 4 x 14'	4 ea.
Framing-Gable door	2 x 4 x 10	4 ea.
Siding (Metal, Galv.)		
Doors	10' long, x 2' wide	28 pcs.
Gable	9' long x 2' wide	4 pcs.
	10' long x 2' wide	8 pcs.
	11' long x 2' wide	4 pcs.
	12' long x 2' wide	8 pcs.
	13' long x 2' wide	4 pcs.
Fascia	Metal type to cover & seal metal ends	64 lin.ft. or 1x4-64'
Hardware	16" strap hinges 2/screw anchor	24 ea.
	Latches (as desired)	
	4" strap hinges for gable door	4 ea.
	Latch for gable door	2 ea.
Concrete Pads under poles	Concrete	6 cu.ft.

SIDEWALLS: (NOTE: Quantity is for each bent of length. Multiply by total No. of bents for total quantity per barn.)

ITEM	SIZE	QUANTITY/BENT	TOTAL QUANT./BARN
P.T. Poles	22', 5" Dia. Top (Rnd), or 4"x6", or 6"x6"	2 ea.	
Concrete Pads	Concrete	2 cu.ft.	
Framing			
Vent. Door	1x8x12' (Oak or P.Trtd.)!	2 ea.	
Nail. Girts	2x4x12'	10 ea.	
Tier Rails	2x6x12'	18 ea.	
Outer T.R. Pc.	2x4x12' (Rip to 2x2)	1 ea.	
Spt. Beams	2x8x14'	8 ea.	
Beam Scabs	2x8x14'	1 ea.	
Spt. Girders	2x8x12'	4 ea.	
Purlins	2x4x12'	16 ea.	
Truss Tie	2x4x12'	1 ea.	
Cupalo Frame	2x4x12'	2 ea.	
Cntr. Posts	2x6x10'	3 ea.	
Cntr. Tier Rail Spt.	2x6x14'	1 ea.	
Tier Rail Blocks	2x4x12' (Cut to 13" pcs.)	1 1/2 ea.	
Spt. Scabs	2x6x12' (Cut to 18" ±)	2 ea.	
Conc. Curbing	5" w (±), 2.5' total Ht. x 94' (118 cu.ft.)	1 1/4 yds.	
+ Cntr. Post Pads	Approx. (5 cu.ft.)		
Siding	Metal, Galv., 16' long x 2' wide, or equal (Cut to length to fit sidewall, or use 2-8' pcs. & lap.)	12 pcs.	
Roofing	Metal, Alum., white ptd. Galv., or Galv. w/insul. (or wood sheathing 2/asphalt shingles) 15' long for no overhang, 16' for 12" overhang	12 pcs., 2' wide or (8 pcs. 3' wide) or (6 pcs. 4' wide) or (3.6 sq. shingles)	
Cupalo Roof	Metal, same as roofing above	48 sq. ft.	
Cupalo Ends	(Use extra pcs. from roof cut at opening)		

ITEM	SIZE	QUANTITY/BENT	TOTAL QUANT/BENT
Plywood for Fan Encl.	1/4"- 4'x8'	2 shts.	
Hardware			
Strap Hinge-Vent Panels	4" long	6 ea.	
Hooks-Vent Panels	(4" + or -)	4 ea.	
Guttering	Gutter, w/nails	24 ft.	
	Downspout (3x4)	70 ft.	per barn
	Elbows	4 ea.	
Trusses:	(28' span, 4:12 slope, Rated 30 p.s.f. @ 6' spacing) pre-fab, or buy materials below and build.	2 Req'd/bent, plus 1 more for total barn	
Top Chord	2x6x16'	18 ea.	
Bottom Ch.	2x4x14'	18 ea.	
Diagonals	2x4x10'	18 ea.	
Metal plates	20 gauge, (see Blueprint for exact sizes)		
Nails	1 1/2", 11g. (see Blueprint)	30 Lbs.	

NOTE: If optional rafter-roof construction is used, omit above trusses, 2x4x12' purlins, and 2x6x10' removable center posts, and add extra 26' center poles, rafter, and sheathing materials per page 2 of blueprint.

Nails:	40d R.S. (Pole Barn)	50 Lbs.
	16d (or 12d) R.S.	100 Lbs.
	Roofing, 1 3/4" S.S. Lead-under-head or Neop. washer	50 Lbs. (+ or -)

ELECTRICAL AND ENVIRONMENTAL:

ITEM	SIZE	QUANTITY	REMARKS
Fan	Rated Cfm @ 0.1" Static Pressure. (other specs. per blueprint.)	1 ea.	1 fan per 3-5 bents
Safety Sw.Bx.1	pole (or 2 pole), 20 A Capacity, with plug fuse holder for proper fusing of fan circuit	1 ea.	
Time Clock	24 hour, (Specs. per blueprint)	1 ea.	
Wire	12-2 w/gnd.	75' (±)	
Toggle Switch	for controlling fan	1 ea.	
Entrance Wire	6/3 "outdoor" type	Approx. 20'	
Entrance "Weatherhead"		1 ea.	
Service wire from distr. line to barn, "Triplex" or equal, sized for 60 or 100 Amp. capacity at 2% voltage drop for distance Req'd.			
El. PANEL WITH CKT BREAKERS IN BARN, 60A.			

Capacity main BKR, at least 8 pole capacity, with 1-20A, 115v, BKR for duplex outlet(s), and 1-20A, 115v BKR for Fan Vent. System.

NOTE: All lumber to be standard grade Douglas Fir, or No. 2 Southern Pine, or equivalent grade sawmill oak or pine, or better.

GENERAL NOTES

1. This plan shows a pole-frame trussed-roof barn with two-tier housing and fan ventilation for housing and partial curing of DARK-FIRED tobacco. Normal firing methods are to be used for the final curing finish.

2. This housing and curing facility has labor saving and improved curing control features with costs competitive with conventional barns.

3. Stick spacing of approximately 6 inches is used, with 5 or 6 plants per stick. Uniform stick and plant spacing during housing promotes good curing results.

4. Capacity per bent (based on 28' barn, 11'-9" long bents, 16 rails per bent, 5,000 plants per acre):

	Stick Spacing (Sticks/Rail)			
Pl/Stk	7" (21)	6 1/2" (23)	6" (25)	5 1/2" (28)
6	.41	.45	.48	.54
5	.34	.37	.40	.45

5. Operation and management are comparable to conventional barns (See U.K. Extension Circular 555), except the fan is used during yellowing and curing as required for ventilation and moisture removal. Proper selection and installation of the fan is important for dependable and successful operation. Sawdust firing is done as in normal barns.

6. Recommended fan size and specifications:

Barn Length No. Bents	Fan Size, C.F.M. air delivery at 0.1 inch static pressure, A.M.C.A. rated
3	6,000
4	8,000
5	10,000
6	Use 2 fans as for two 3-bent units
7, and larger	Use combination of fans and units as above.

Other fan specifications:

Motors to be totally enclosed, ball-bearing, and thermally protected or with proper dual-element fusing,
Direct-drive fans with narrow blades would not collect as much smoke precipate and operate better overall than wide, slow turning blades.
(NOTE: Fan should be cleaned every year or two to remove smoke deposits that would affect air flow and motor cooling efficiency.

7. Use of aluminum or insulated steel roofing is recommended to minimize roof drip during curing.

8. The tier rail framework may be altered or completely removed in the future if desired to provide a versatile clear-span structure for other uses.

For further information on construction, operation, and/or management, contact George Everette, Extension Tobacco Specialist, Princeton Substation, or George Duncan, Extension Agricultural Engineer, University of Kentucky, Lexington.

NOTE: This plan not recommended for a BURLEY barn. See plan 735-32.

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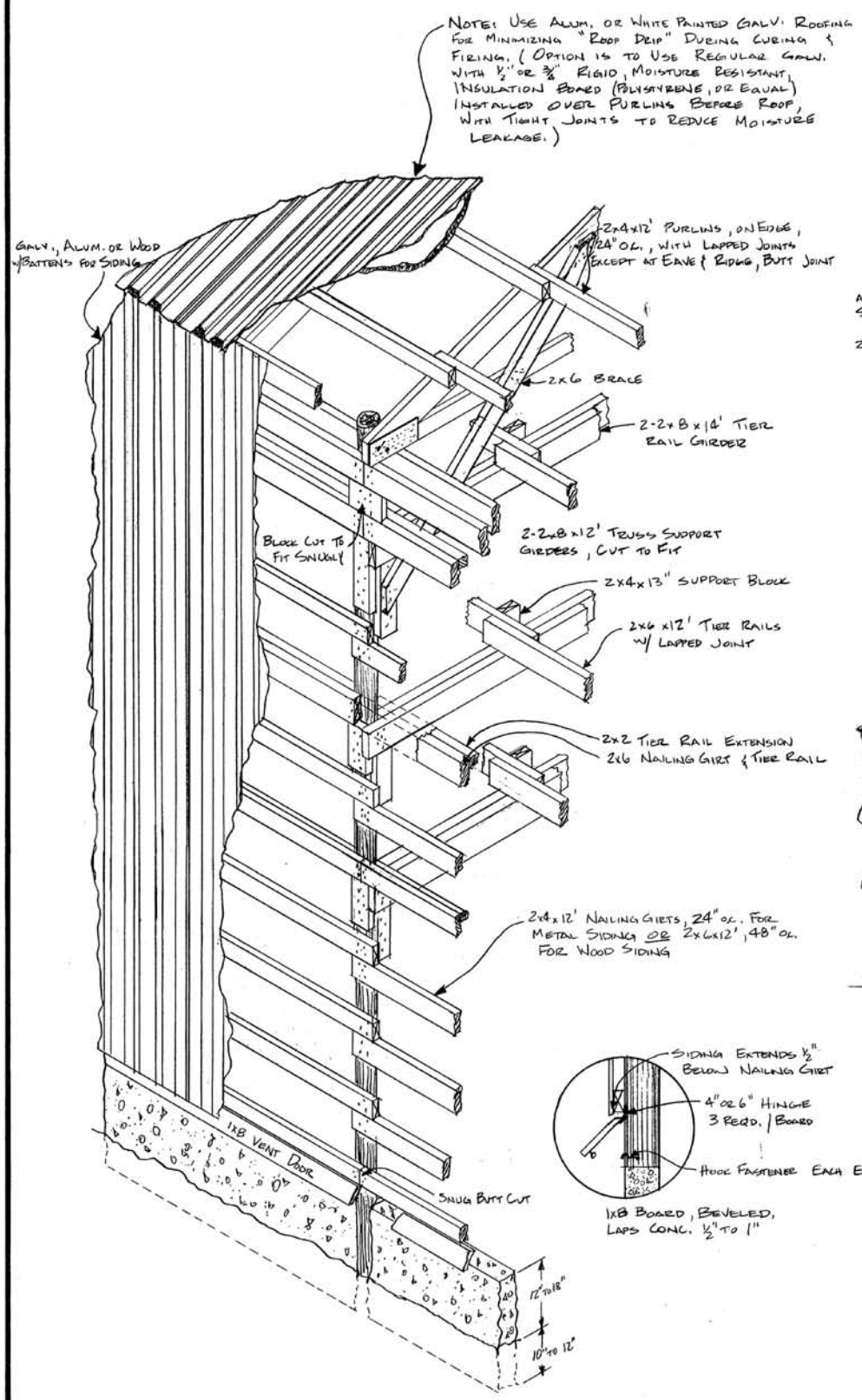
TWO OR THREE TIER FAN VENTILATED DARK-FIRED TOBACCO BARN 28' WIDE

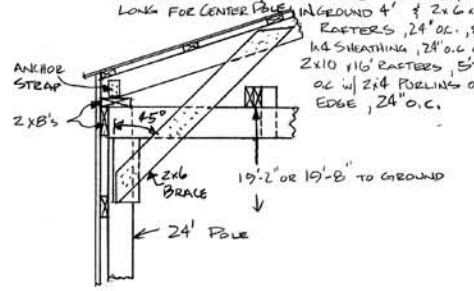
Designed By: G.A.D.	Sheet 5 of 6
Checked By: G.A.D.	Plan Number:
Drawn By: D.E. PLASTER	KY. 11.735-31
Date: SEPT. 1972	

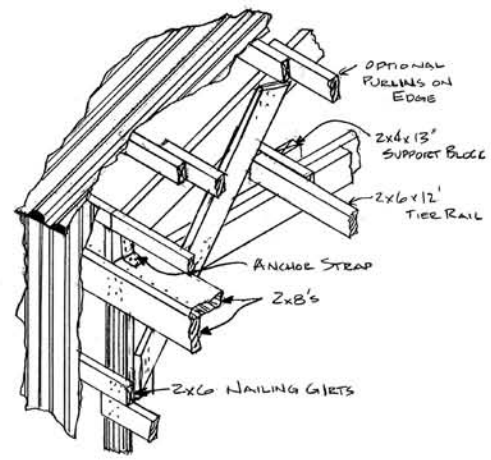


SIDEWALL CONSTRUCTION (TRUSS ROOF)
NO SCALE

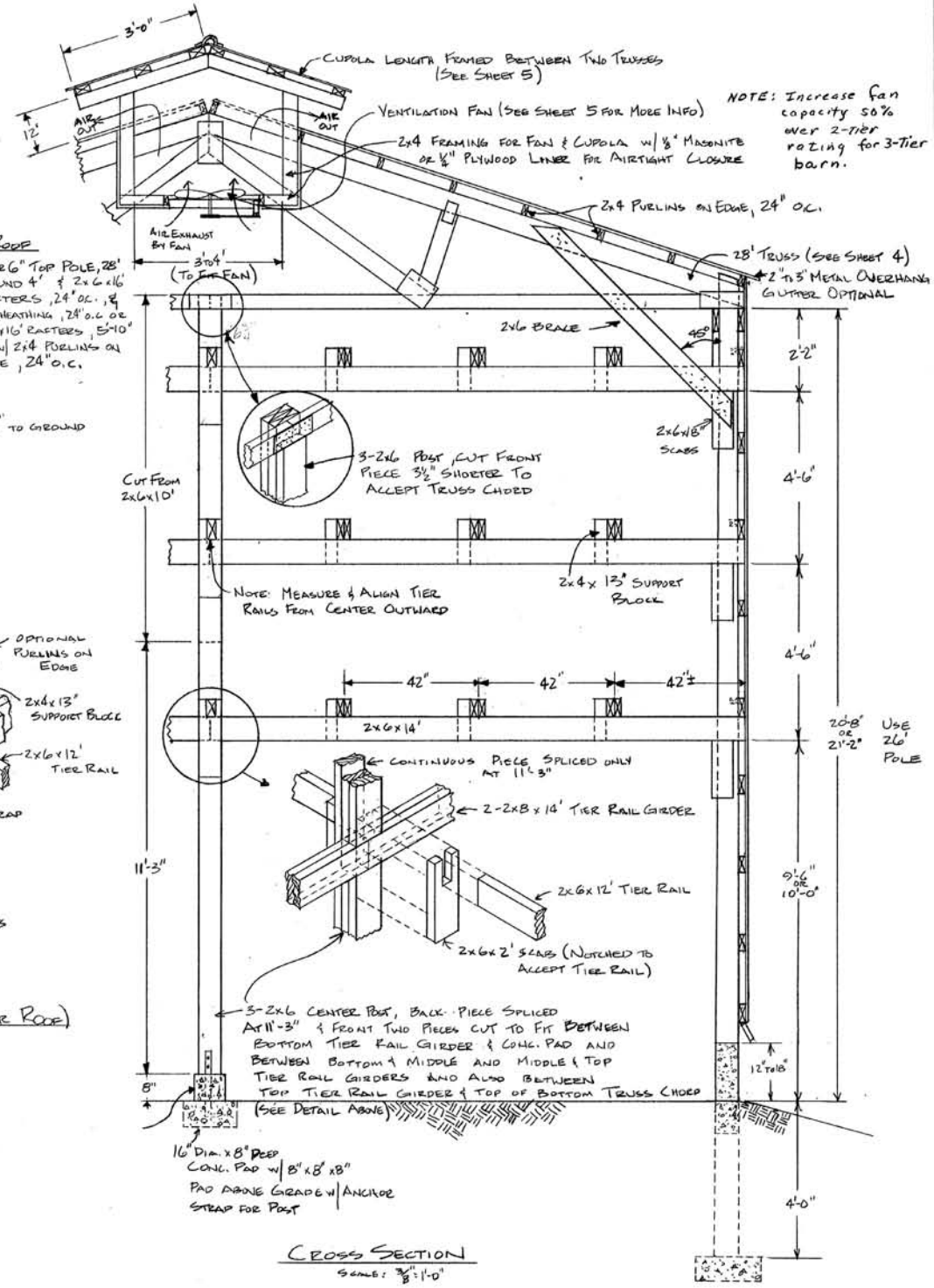
OPTIONAL RAFTER TYPE ROOF

FOR RAFTER ROOF, USE 5" OR 6" TOP POLE, 28' LONG FOR CENTER POLE, IN GROUND 4' & 2x6x16' RAFTERS, 24" O.C., & 1x4 SHEATHING, 24" O.C. OR 2x10 x 16' RAFTERS, 5'-10" O.C. W/ 2x4 PURLINS ON EDGE, 24" O.C.





SIDEWALL CONSTRUCTION (RAFTER ROOF)
NO SCALE



NOTE: Increase fan capacity 50% over 2-tier rating for 3-tier barn.

CROSS SECTION
SCALE: ⅜" = 1'-0"

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CONVERSION OF TWO-TIER FAN VENT'D. TOBACCO BARN TO THREE-TIER (28' WIDE)

Designed By: G.A. DUNCAN	Sheet 6 of 16
Checked By:	Plan Number:
Drawn By: GREG WHITE	KY. 11.735-31
Date: MAY 13, 1977 (REVISED)	