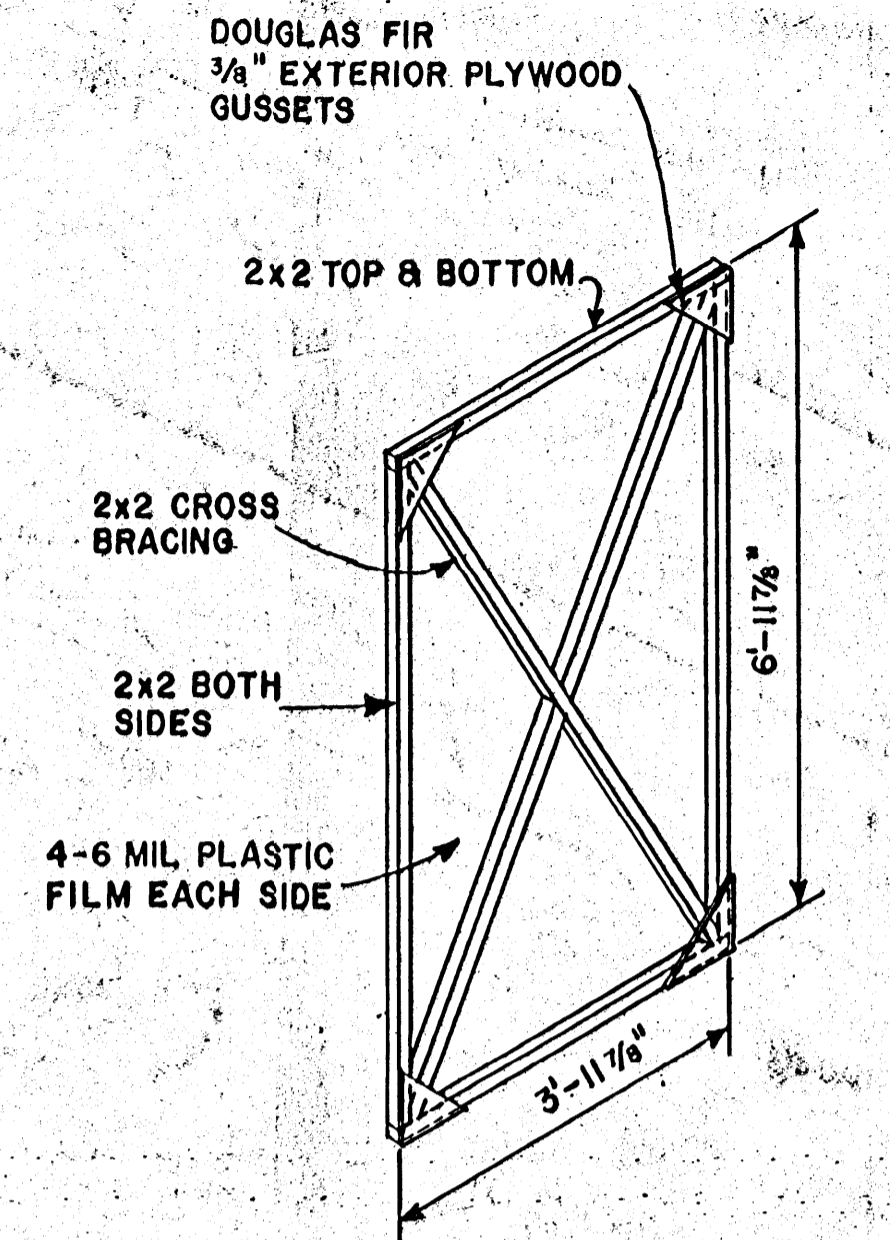
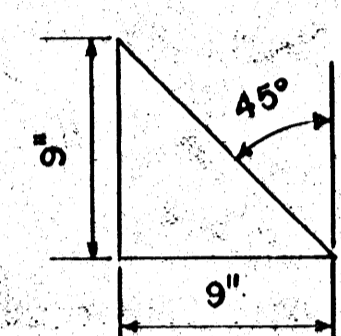


PLAN VIEW
SCALE: 3/16"=1'-0"

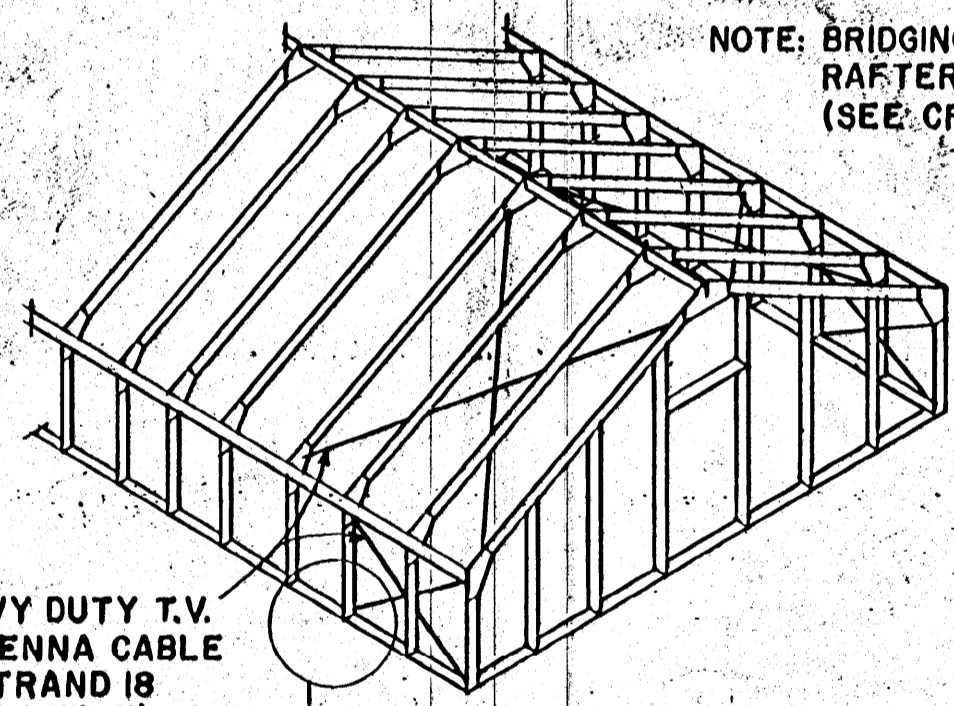
NOTE: GAS & WATER LINES TO BE PLACED A MINIMUM OF 2'-0" UNDER GROUND AND BELOW FROST LINE

DOOR GUSSET DETAIL

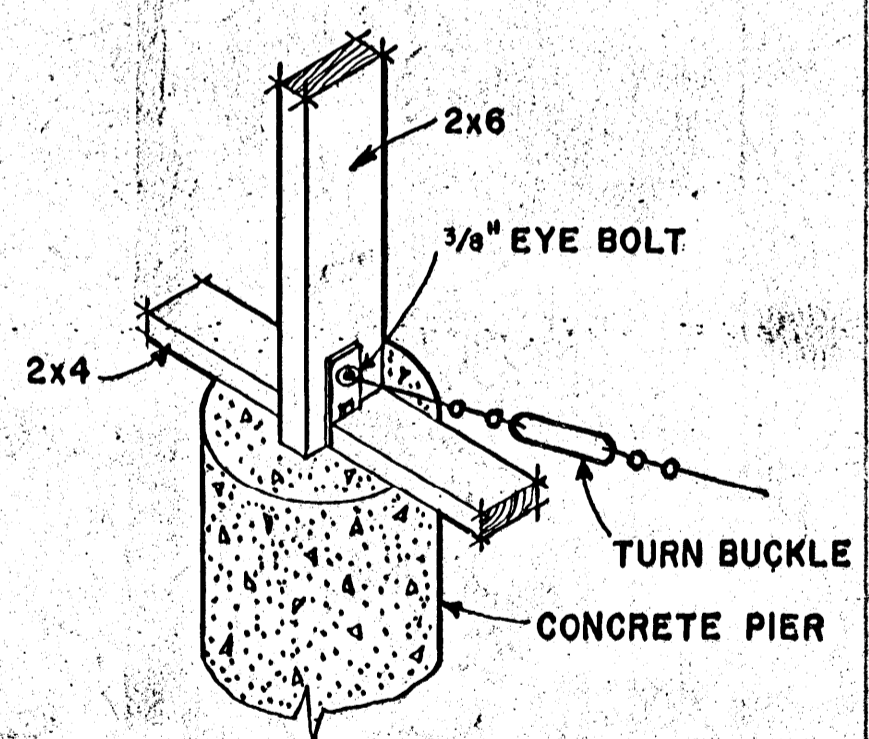


DOOR DETAIL
SCALE: 1/2"=1'-0"

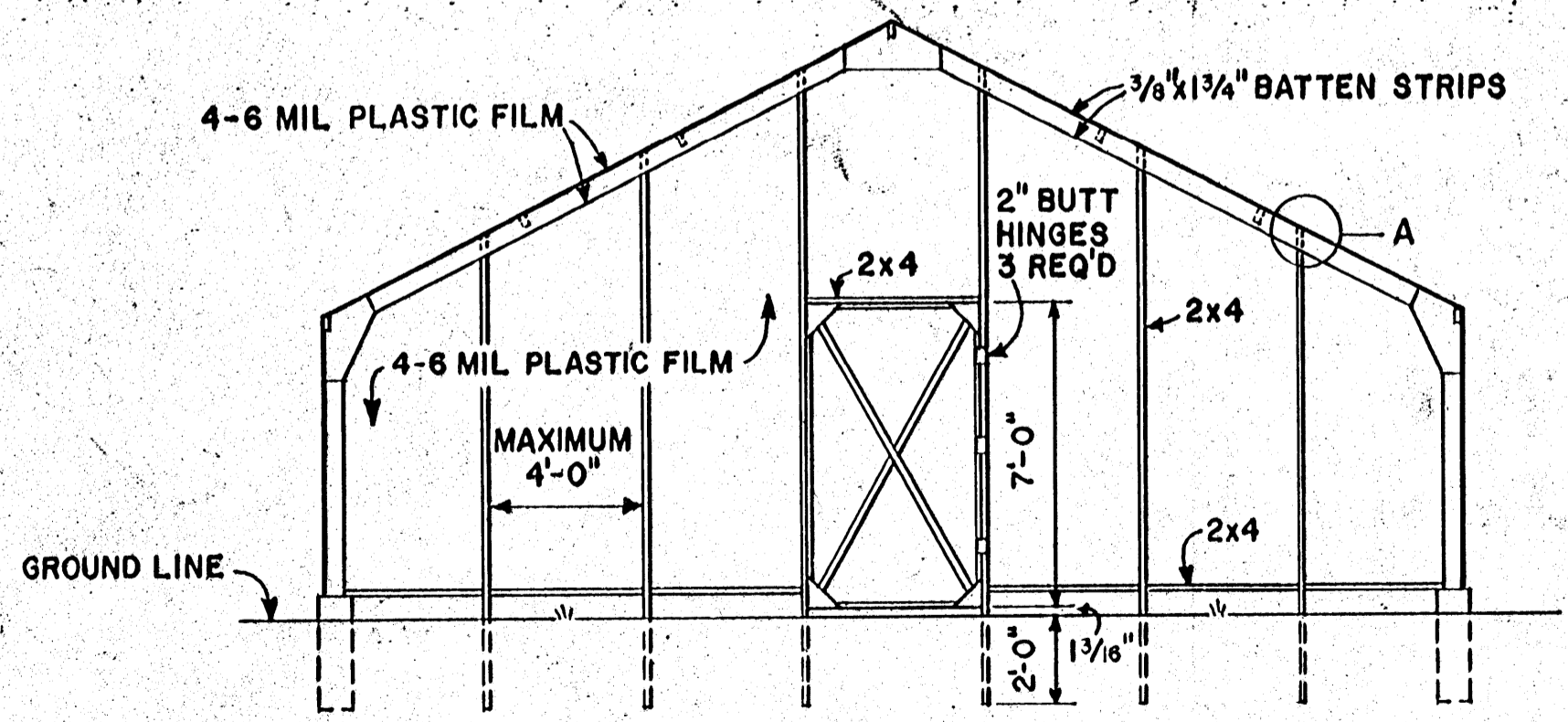
NOTE: BRIDGING BETWEEN RAFTERS NOT SHOWN. (SEE CROSS SECTION)



WIRE BRACING DETAIL
(BOTH ENDS OF HOUSE)

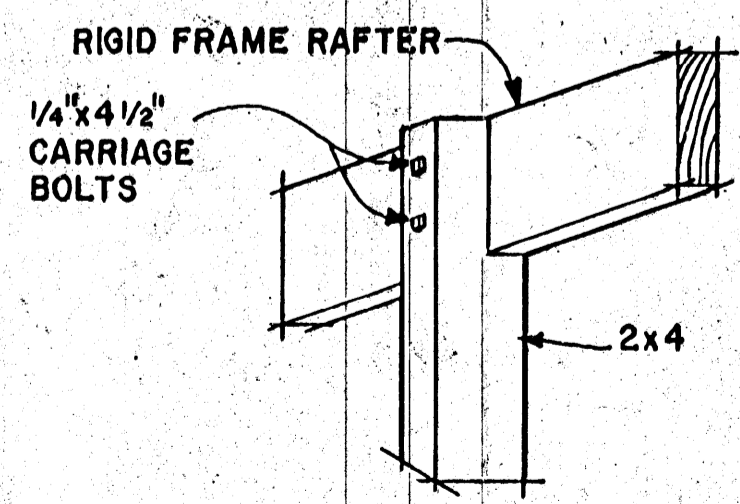


DETAIL "B"



VIEW A
SCALE: 1/4"=1'-0"

NOTE: ALL LUMBER IN CONTACT WITH THE GROUND TO BE DIPPED 24 HOURS IN PENTACHLOROPHENOL. EXTEND FOOTINGS BELOW FROST LINE.



DETAIL "A"
SCALE: 1 1/2"=1'-0"

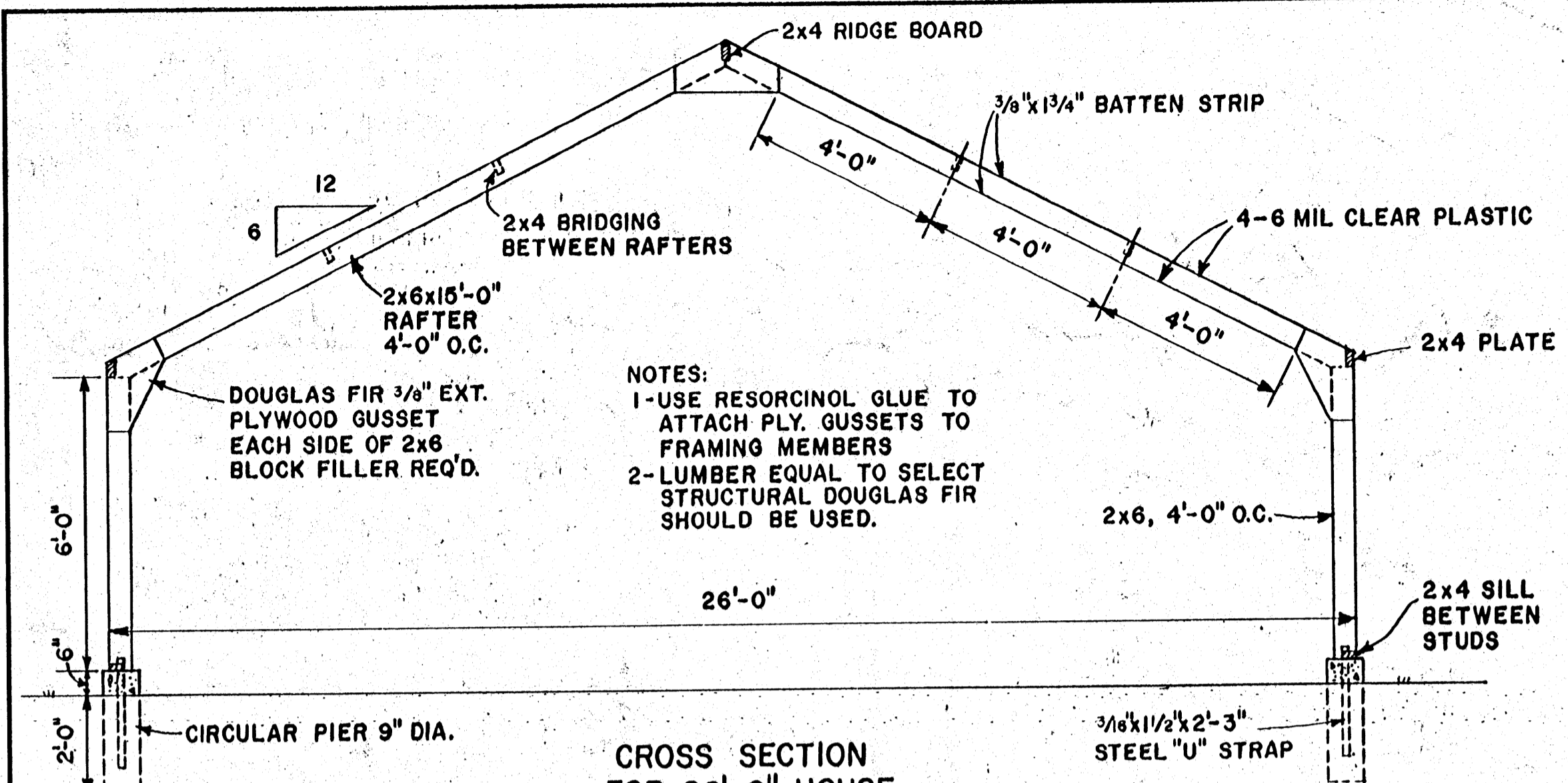
NOTE: ADAPT TO LOCAL CONDITIONS AND CONFORM WITH LEGAL REGULATIONS

BASED ON UNIV. OF KY. PLANS NO. 11,771-2, 11,811-1, 11,811-4 AND 11,811-5

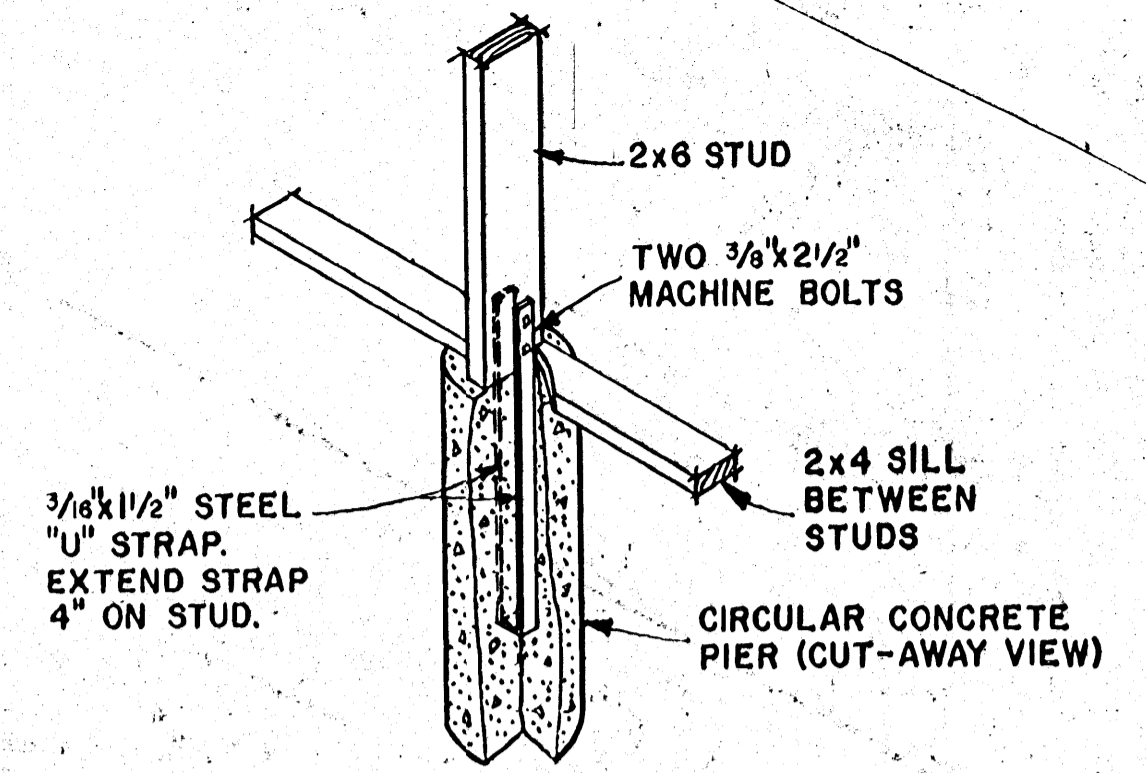
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STATE OF MISSISSIPPI
MISSISSIPPI STATE UNIVERSITY
AND
UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

PLASTIC COVERED GREENHOUSE

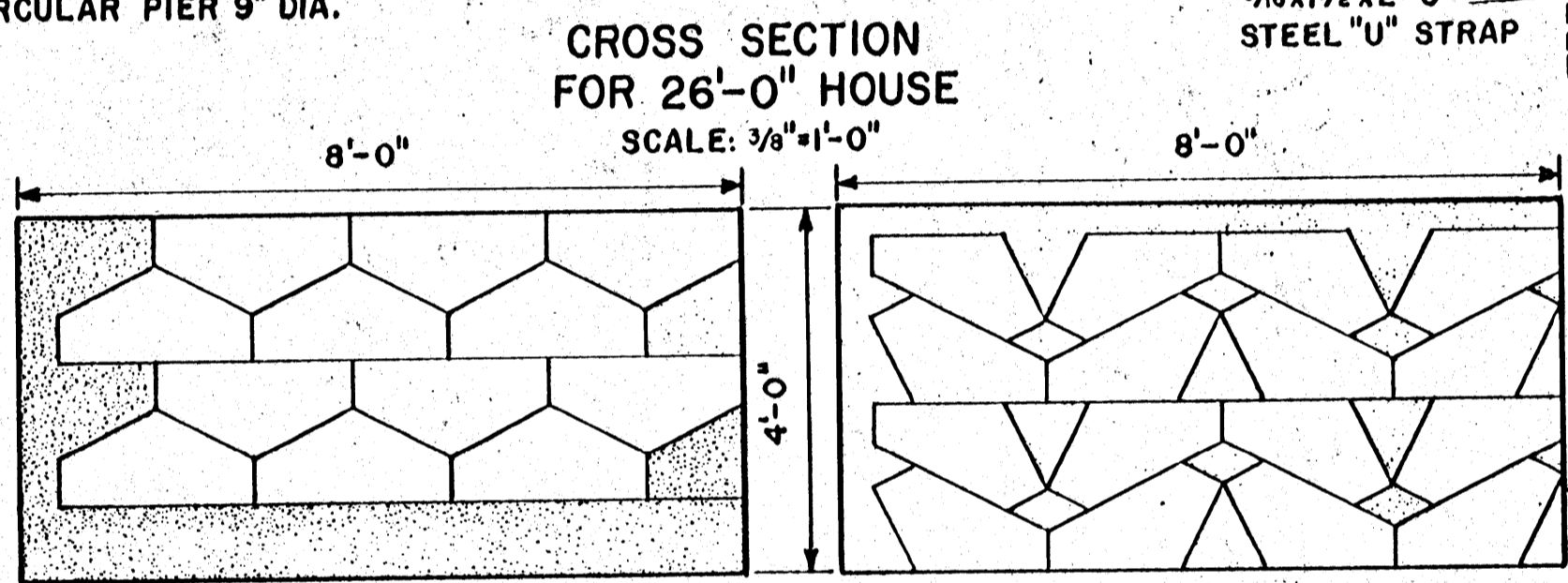
KY.	'70	6094	SHEET 1 OF 4
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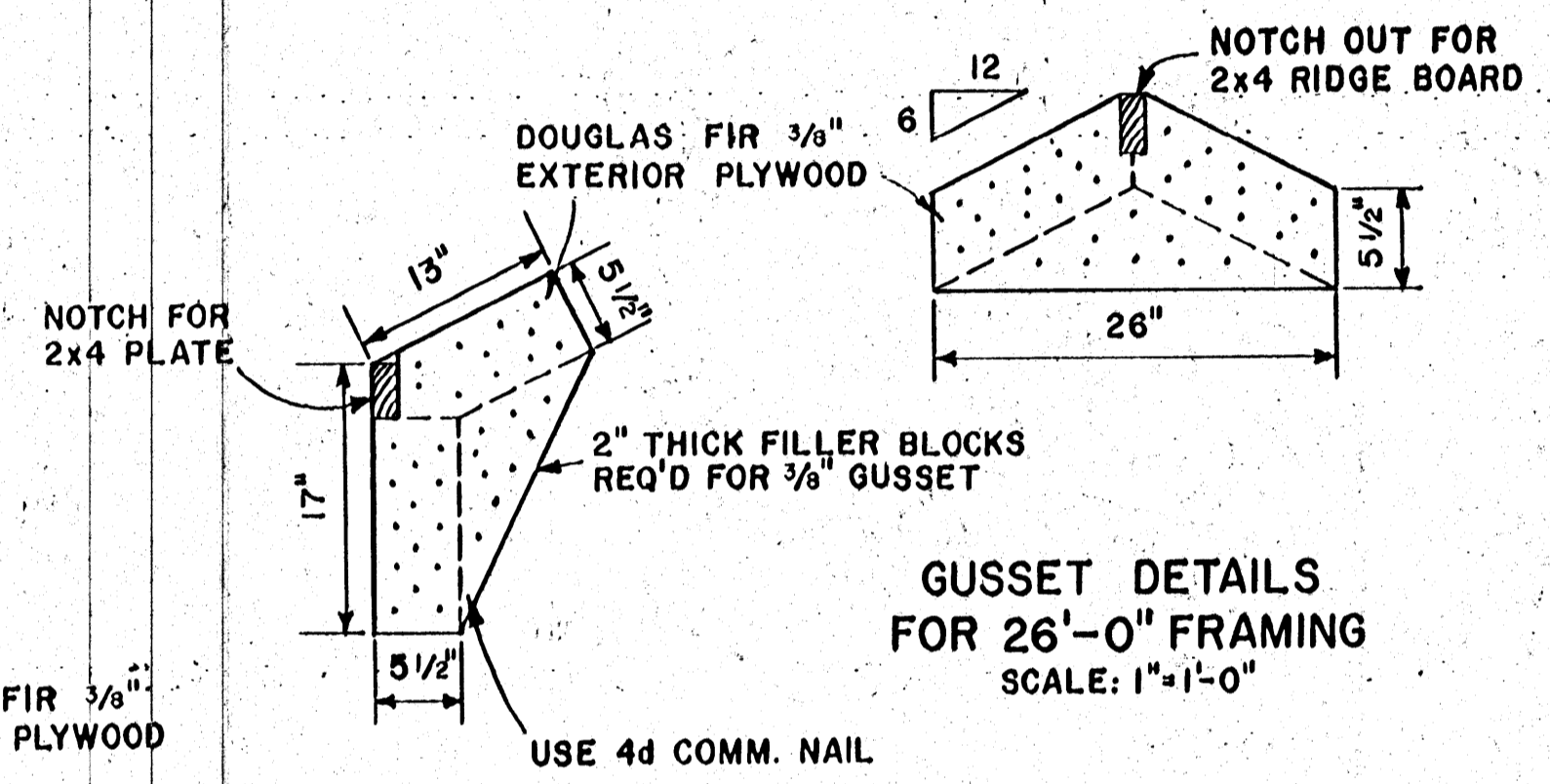
NOTES:
 1-USE RESORCINOL GLUE TO ATTACH PLY. GUSSETS TO FRAMING MEMBERS
 2-LUMBER EQUAL TO SELECT STRUCTURAL DOUGLAS FIR SHOULD BE USED.



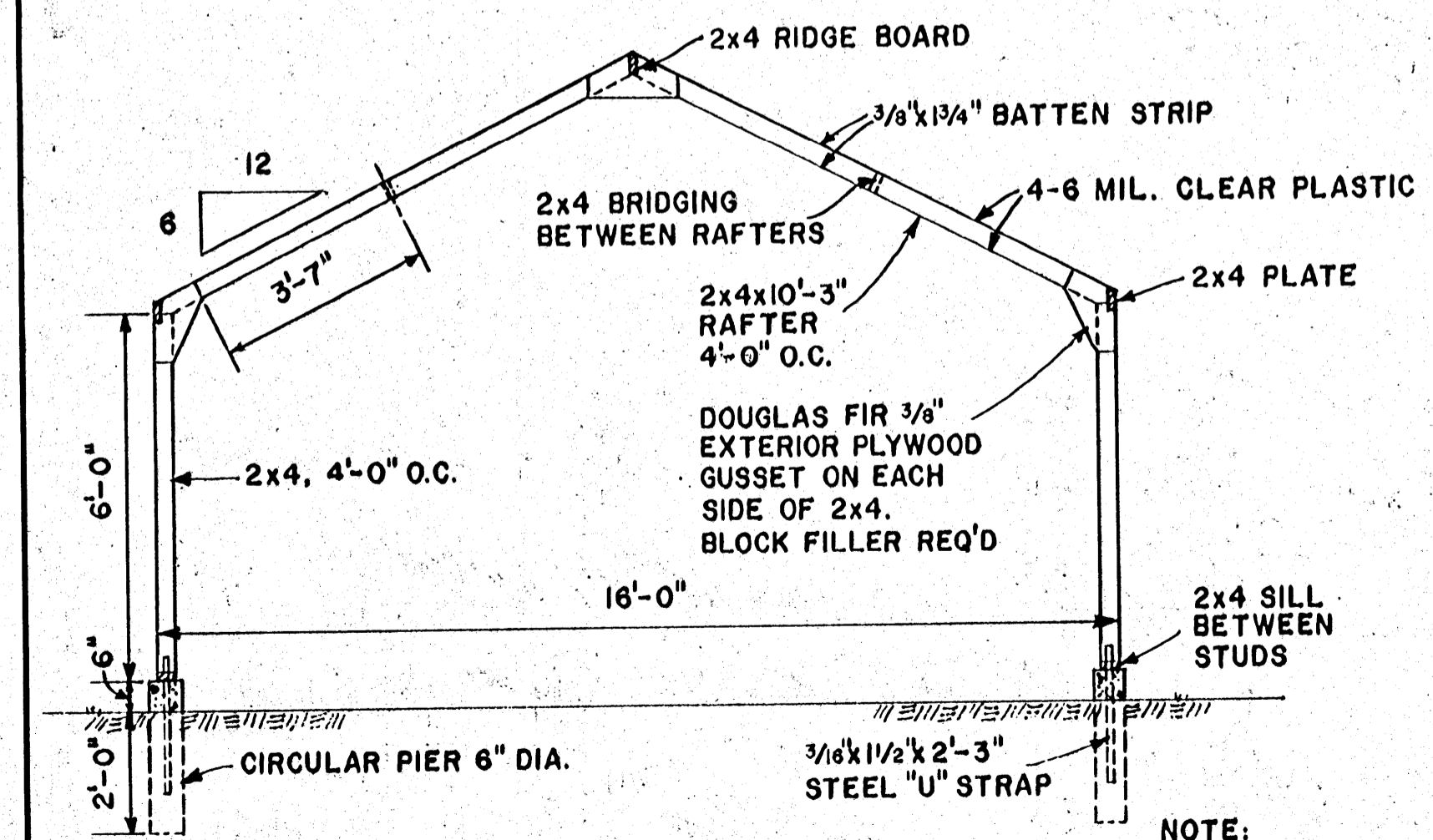
PIER AND "L" STRAP DETAIL
 SCALE: 3/4"=1'-0"



GUSSET CUTTING DIAGRAMS FOR 26' HOUSE SCALE: 1/2"=1'-0"

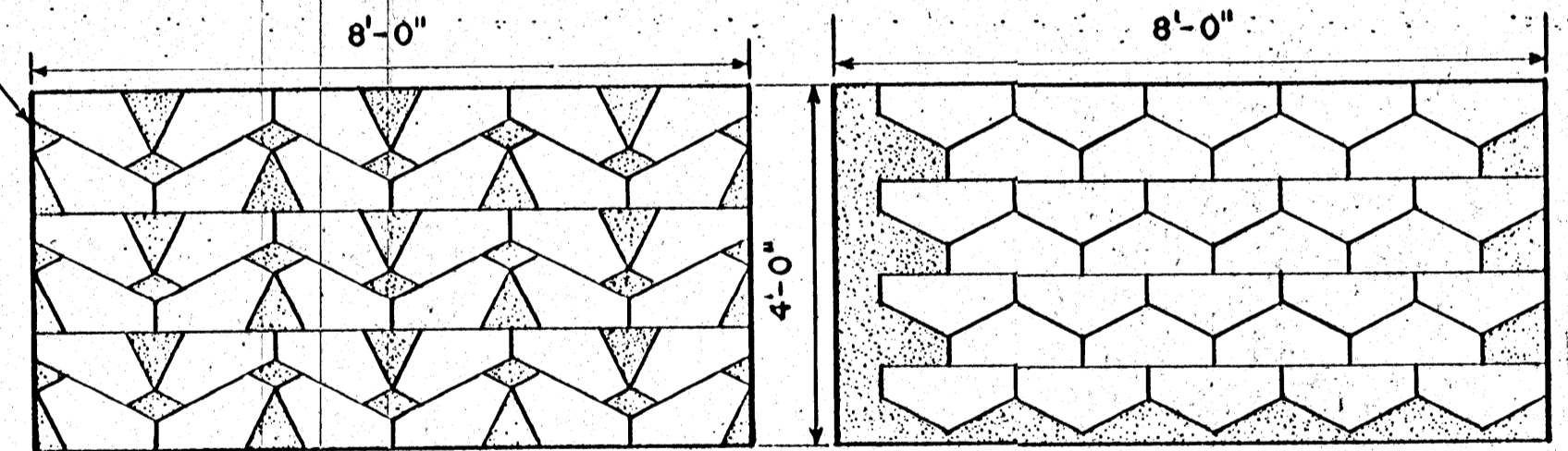


GUSSET DETAILS FOR 26'-0" FRAMING
 SCALE: 1"=1'-0"

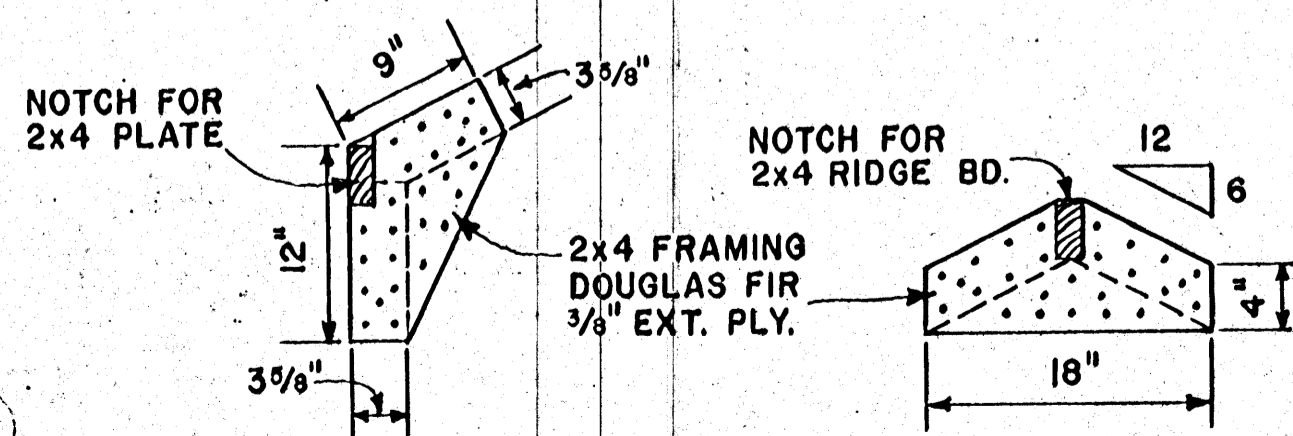


CROSS SECTION FOR 16'-0" HOUSE
 SCALE: 3/8"=1'-0"

NOTE:
 LUMBER SHOULD BE SELECTED WHICH IS FREE OF KNOTS OR OTHER DEFECTS. MINOR DEFECTS SHOULD BE LOCATED IN UPPER 2/3 OF RAFTER OR LOWER 1/2 OF STUD



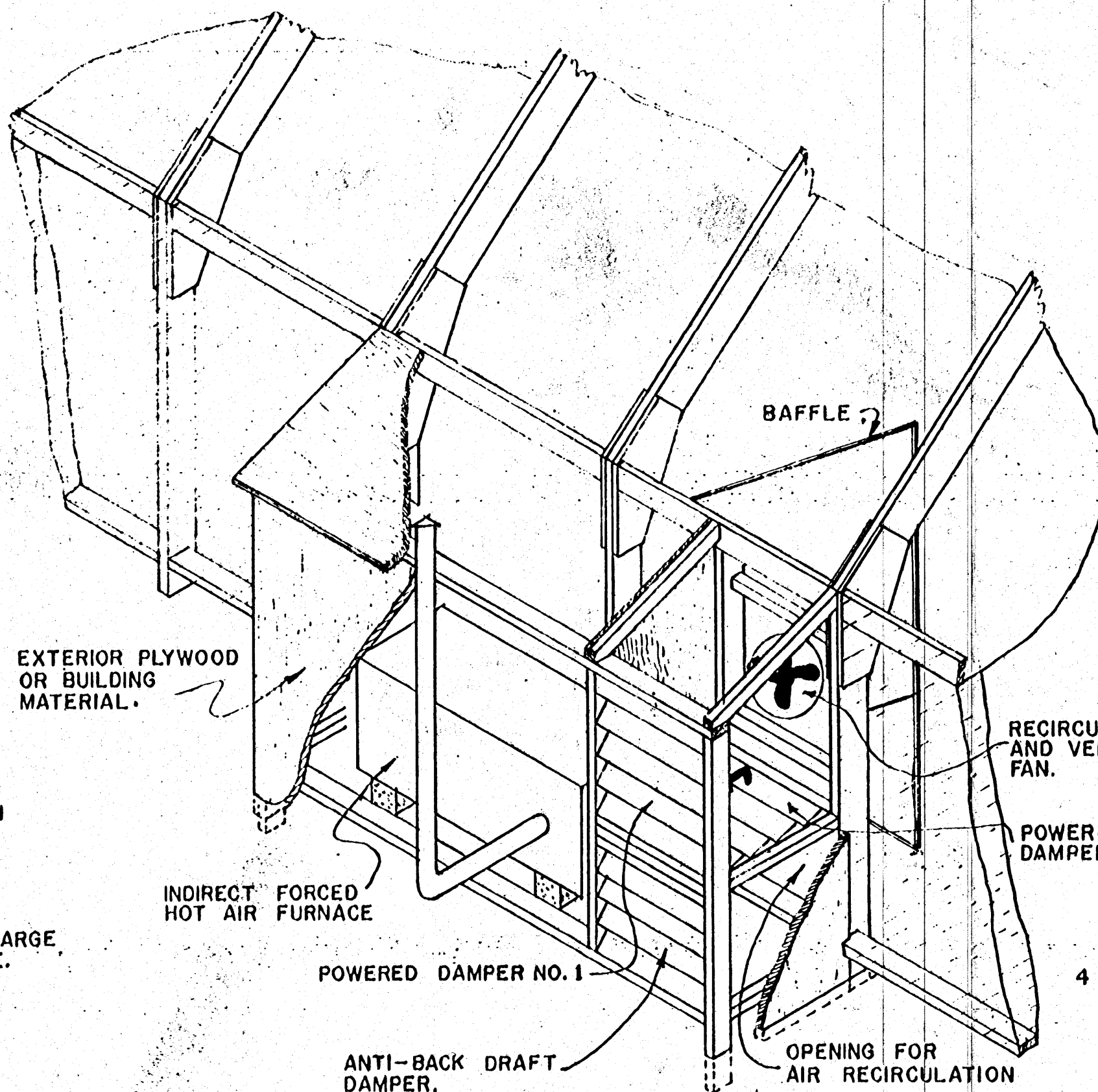
GUSSET CUTTING DIAGRAMS FOR 16' HOUSE
 SCALE: 1/2"=1'-0"



GUSSET DETAILS FOR 16'-0" FRAMING
 SCALE: 1"=1'-0"

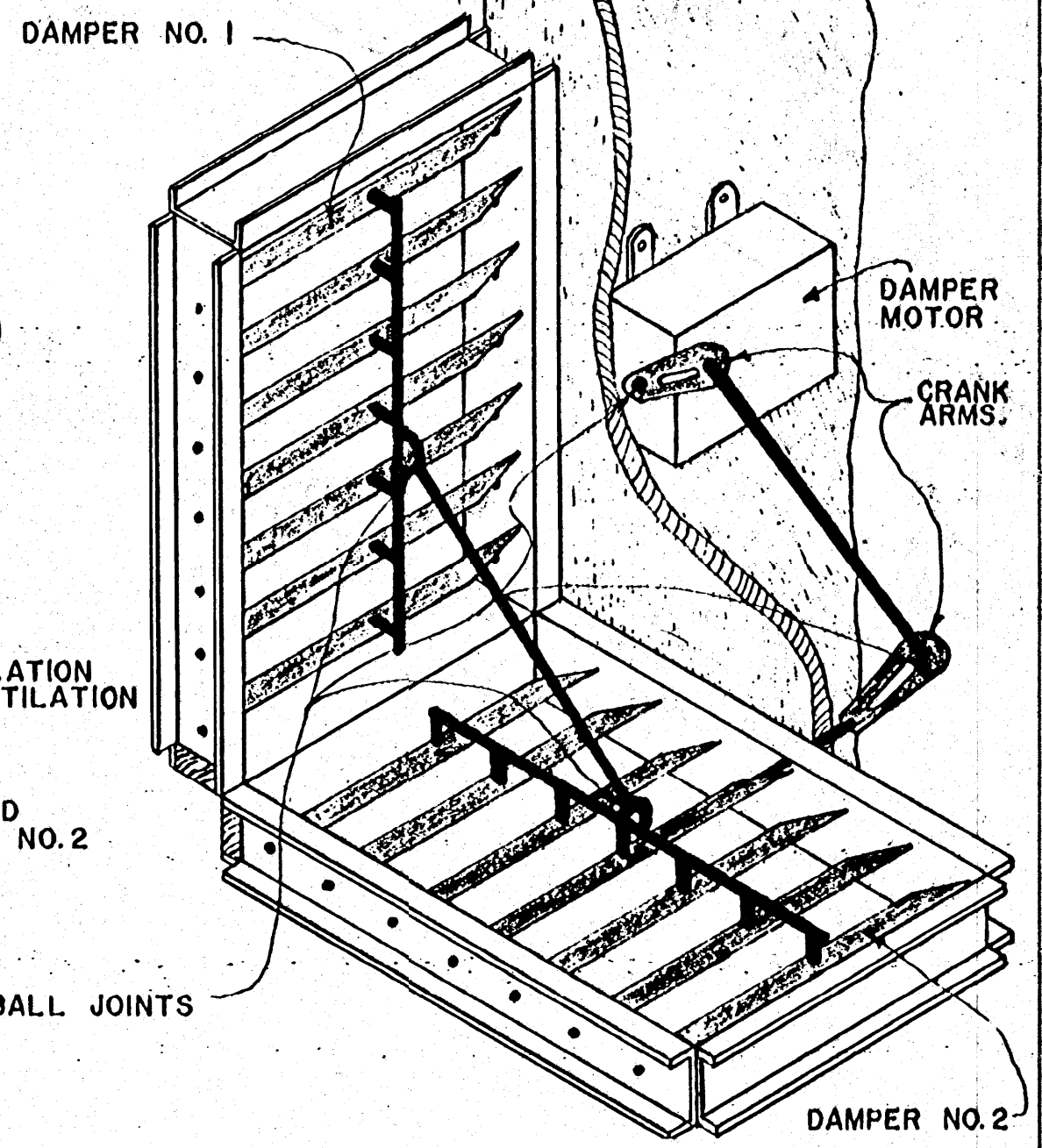
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STATE OF MISSISSIPPI		
MISSISSIPPI STATE UNIVERSITY		
AND UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING		
PLASTIC COVERED GREENHOUSE		
KY. '70	6094	SHEET 2 OF 4

- ① FAN CAPABLE OF DELIVERING 1 C.F.M. AT 1/8" H₂O FOR EACH CU.-FT. OF VOLUME IN HOUSE.
- ② FORCED HOT AIR FURNACE HEATING CAPACITY BASED ON SIZE OF GREEN HOUSE.
- ③ DAY-NIGHT FURNACE THERMOSTAT.
- ④ MINNEAPOLIS HONEYWELL MODULATING THERMOSTAT MODEL NO T-921-A RANGE 56°-84°F, DIFFERENTIAL 3°F. (OR EQUAL)
- ⑤ POWERED DAMPERS CONTROLLED BY NO.4, 1 SQ. FT. AREA PER 1000 C.F.M. OF AIR MOVED BY FAN.
- ⑥ DAMPER MOTOR TO POWER NO.5 MINNEAPOLIS HONEYWELL INTEGRAL SPRING RETURN DAMPER MOTOR MODEL NO M.905 E OR EQUAL TWO PUSH RODS 24" FOUR BALL JOINTS, TWO CRANK ARMS.
- ⑦ ANTI-BACK DRAFT GRAVITY DAMPER 1 SQ. FT. OF AREA PER 1000 C.F.M. OF AIR MOVED BY FAN, AIR CONDITIONING PRODUCTS COMPANY BACK DRAFT DAMPER MODEL 702 BLACK FRAMES, TWO CRANK ARMS.
- ⑧ METAL ASBESTOS VENT PIPE FOR FURNACE



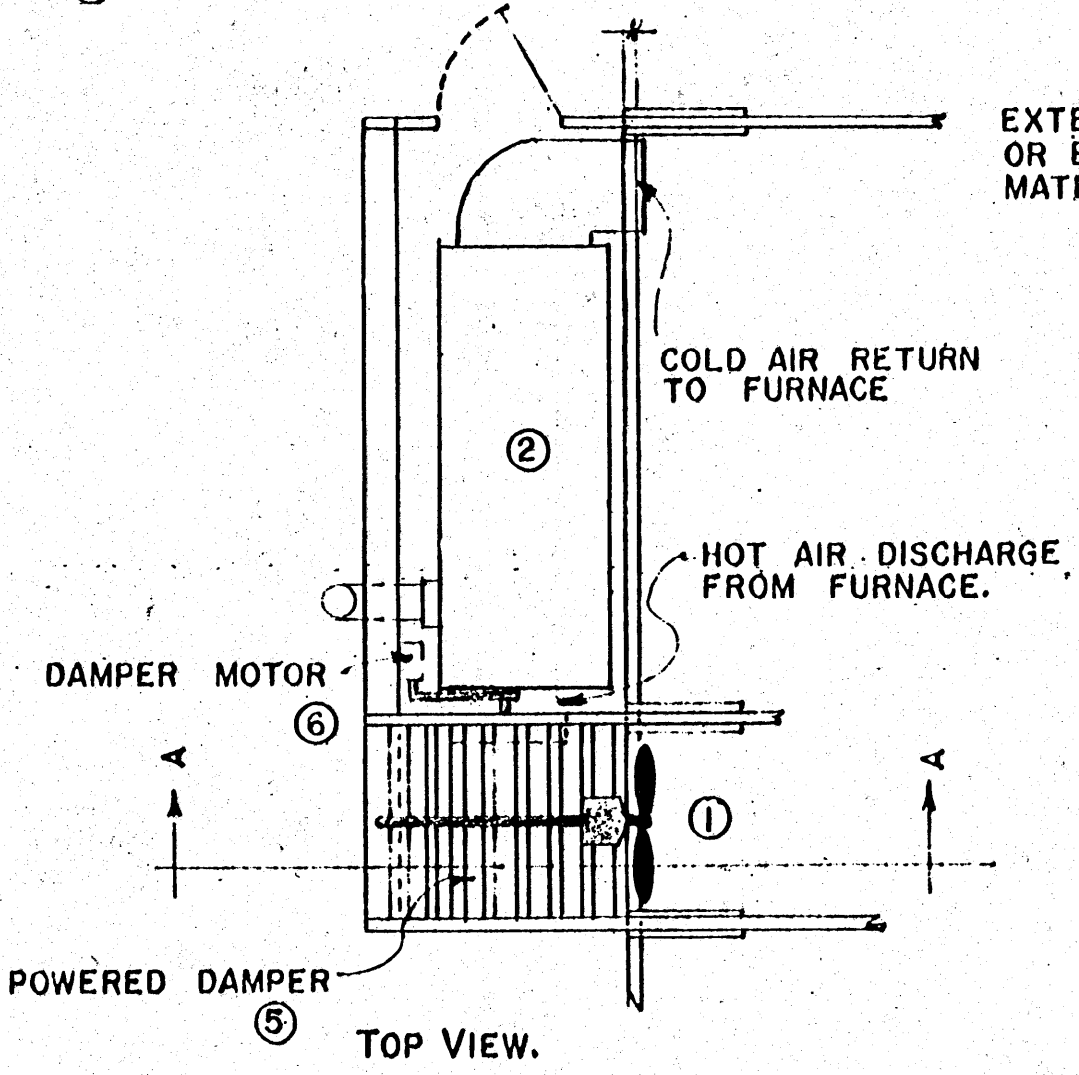
ISOMETRIC VIEW.

NOTE: LUMBER EQUAL TO SELECT STRUCTURAL DOUGLAS FIR SHOULD BE USED.



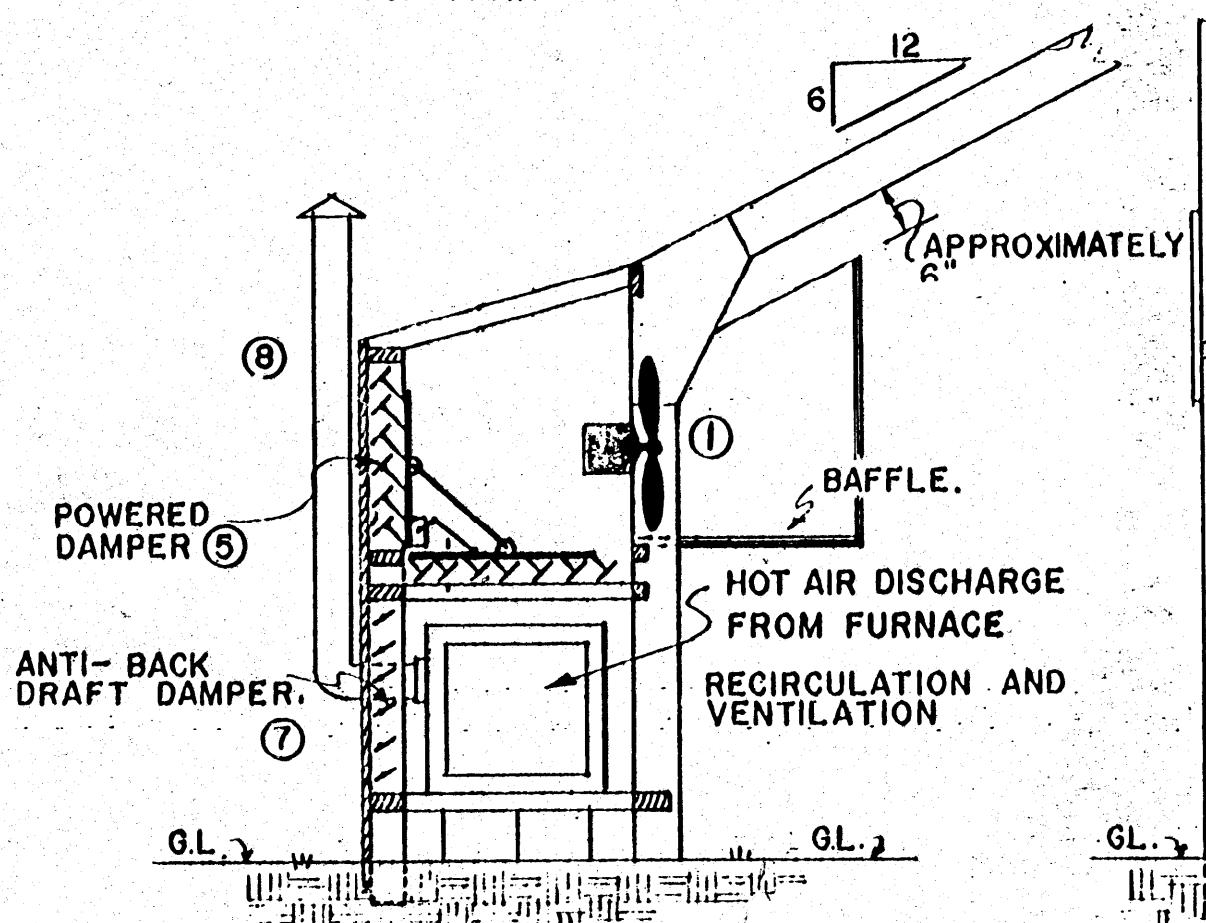
ISOMETRIC VIEW (DAMPER MOTOR AND DAMPERS)

NOTE: 1-DAMPER NO. 2 OPEN WHEN DAMPER NO. 1 IS CLOSED AND NO. 2 CLOSED WHEN NO. 1 IS OPEN
 2-DAMPERS SHOULD HAVE 1 SQ. FT. OF AREA PER 1000 C.F.M. OF AIR MOVED BY FAN.
 3-FAN SHOULD MOVE 1 C.F.M. OF AIR AGAINST 1/8" STATIC PRESSURE FOR EVERY CU. FT. OF VOLUME IN HOUSE.

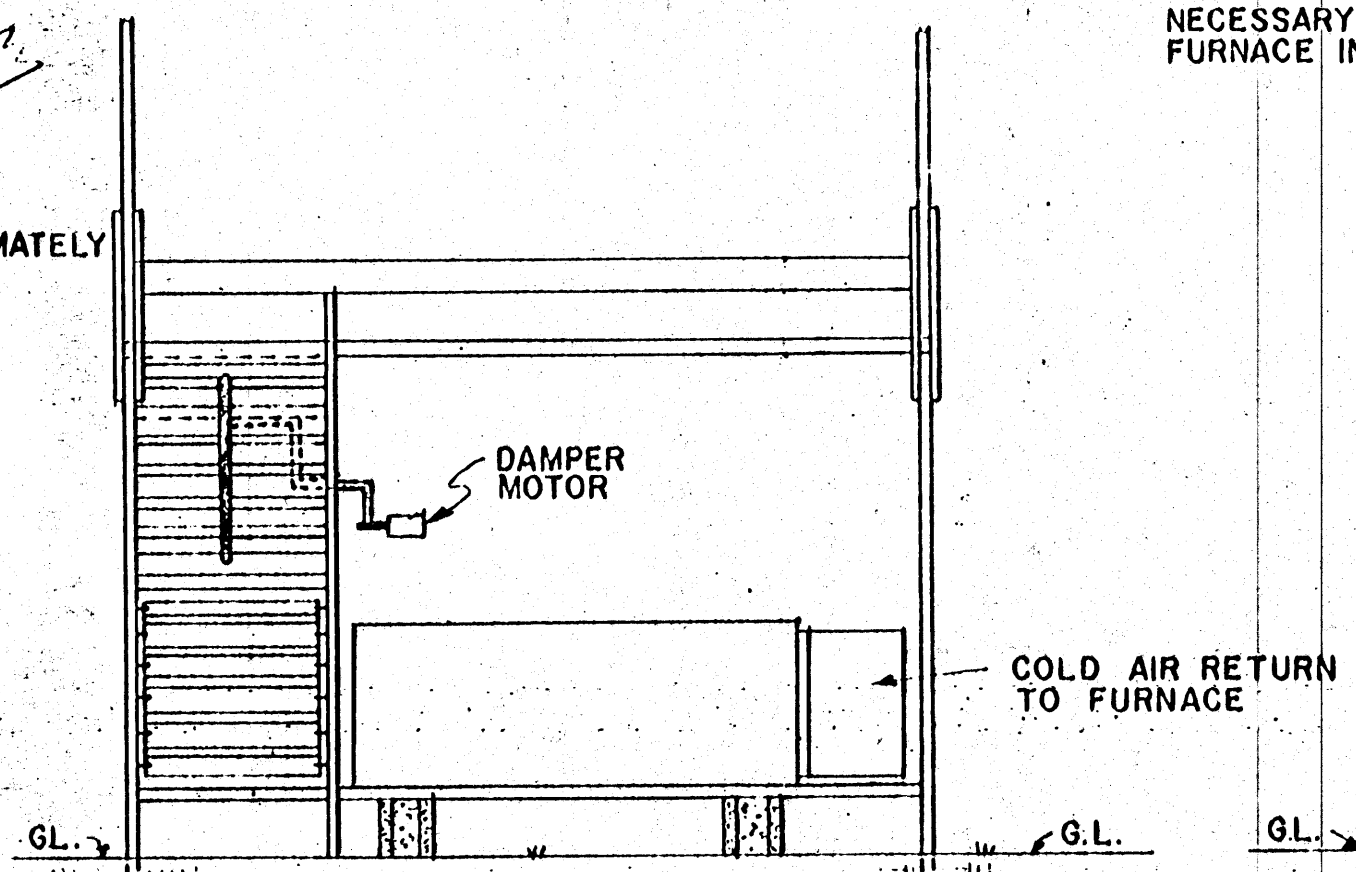


TOP VIEW.

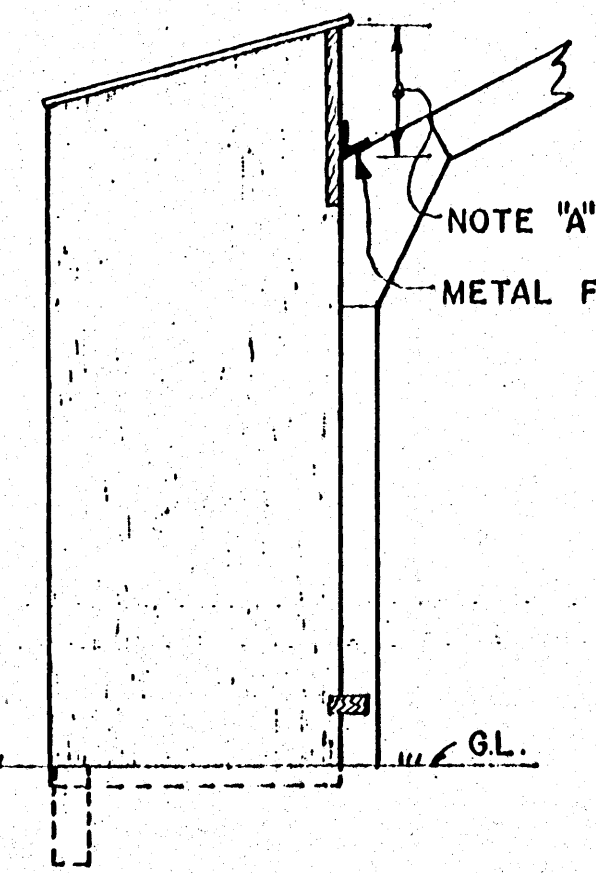
NOTE: "A" INCREASE HEIGHT AS NECESSARY TO PERMIT FURNACE INSTALLATION.



SECTION "A-A" VIEW.



VIEW FROM INSIDE HOUSE.



END VIEW (OPTIONAL FRAMING)

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 STATE OF MISSISSIPPI
 MISSISSIPPI STATE UNIVERSITY
 AND
 UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

PLASTIC COVERED GREENHOUSE

KY. '70	6094	SHEET 3 OF 4
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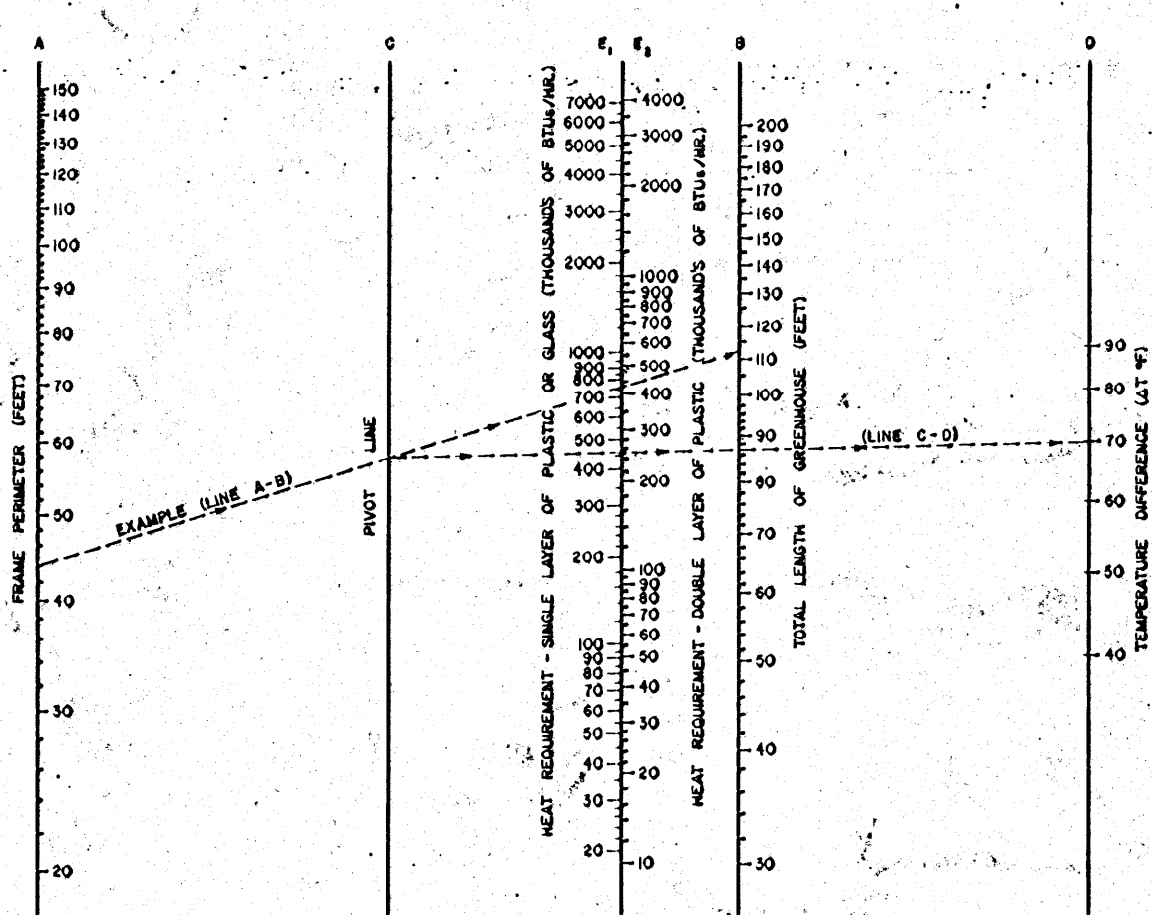
TABLE I - FRAME PERIMETER (FEET)

WIDTH (W) (FEET)	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100
12	28	36	44	52	60	68	76	84	92	100	108	116	124	132	140	148	156	164	172	180	188	196	204

TABLE II - EQUIVALENT LENGTH FOR END WALLS (FEET) (ADD TO LENGTH OF HOUSE)

WIDTH (W) (FEET)	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100
12	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52

GRAPH X - HEAT REQUIREMENT FOR GREENHOUSES



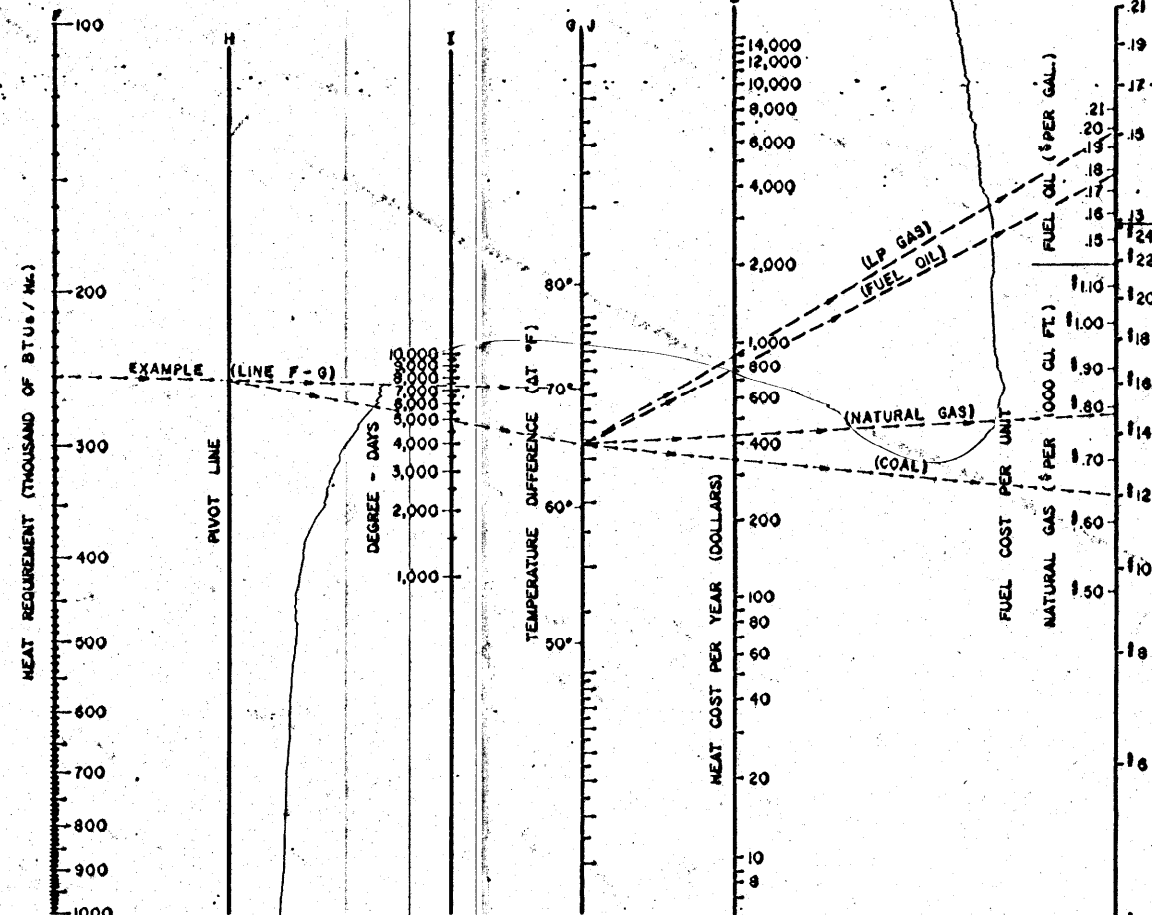
HOW TO USE THE GRAPH AND DETERMINE HEAT REQUIREMENT

- FROM TABLE I, FIND FRAME PERIMETER OF HOUSE. LOOK UNDER SHAPE OF HOUSE AND WIDTH, MARK FRAME PERIMETER ON LINE A OF THE GRAPH.
- FROM TABLE II, FIND EQUIVALENT LENGTH OF HOUSE TO BE ADDED FOR END WALLS. ADD THIS TO THE ACTUAL LENGTH OF THE HOUSE. MARK THE TOTAL LENGTH ON LINE B.
- DRAW A STRAIGHT LINE FROM THE POINT MARKED ON LINE A TO THE POINT MARKED ON LINE B.
- DETERMINE DIFFERENCE IN OUTSIDE AND INSIDE TEMPERATURE AND MARK ON LINE D. SEE TABLE III FOR NORMAL WINTER DESIGN TEMPERATURE.
- FROM THE POINT WHERE LINE A-B CROSSES LINE C, DRAW A STRAIGHT LINE TO POINT ON LINE D, LINE C-D.
- READ HEAT REQUIREMENT ON LINE E, OR E₂ WHERE LINE C-D CROSSES.

EXAMPLE:

- GREENHOUSE (GABLE TYPE) 28 FEET BY 100 FEET. OUTSIDE DESIGN TEMPERATURE 0° INSIDE DESIGN TEMPERATURE 70°.
- FRAME PERIMETER - 44 FEET. (TABLE I)
- EQUIVALENT LENGTH 12 FEET. TOTAL LENGTH 112 FEET. (TABLE II)
- TEMPERATURE DIFFERENCE 70° (70° - 0°)
- FOR SINGLE LAYER OF PLASTIC OR GLASS, HEAT REQUIREMENT - 490,000 BTU/HR. FOR DOUBLE LAYER OF PLASTIC, HEAT REQUIREMENT - 250,000 BTU/HR.

GRAPH Y - ESTIMATING ANNUAL HEAT COST FOR GREENHOUSES



HOW TO USE THE GRAPH AND ESTIMATE ANNUAL HEAT COST

- USE HEAT REQUIREMENT ON LINE F AS FOUND FROM GRAPH X, LINE E, OR E₂. DIVIDE OR MULTIPLY BY 10, IF NECESSARY TO FIT SCALE.
- MARK TEMPERATURE DIFFERENCE ON LINE G - SAME AS LINE D.
- DRAW A STRAIGHT LINE FROM F TO G (LINE F-G) INTERSECTING LINE H.
- FROM TABLE III SELECT THE NUMBER OF DEGREE DAYS AND MARK ON LINE I.
- DRAW A STRAIGHT LINE FROM INTERSECTION OF LINES H AND F-G THROUGH POINT ON LINE I TO LINE J. MARK POINT ON LINE J.
- MARK LOCAL PRICES OF FUEL ON LINE K.
- DRAW STRAIGHT LINES FROM POINT ON J TO POINTS ON K.
- READ ESTIMATED ANNUAL COST ON LINE L. IF LINE F WAS DIVIDED BY 10, MULTIPLY LINE L BY 10; IF LINE F WAS MULTIPLIED BY 10, DIVIDE LINE L BY 10.

EXAMPLE:

- GRAPH X, LINE E₂ HEAT REQUIREMENT - 250,000 BTU/HR.
- LOCATION - LEXINGTON, KENTUCKY - 5000 DEGREE DAY @ 70° (TABLE III)
- MARK 250,000 BTU/HR. ON LINE F AND 70° DIFFERENCE ON LINE G.
- DRAW LINE F-G.
- MARK 5000 DEGREE DAYS ON LINE I AND DRAW LINE H-J.
- PRICE OF FUELS - LEXINGTON, KENTUCKY, JAN. 1963. COAL - \$12.00/TON; LP GAS - \$1.15/GAL; NATURAL GAS - \$.79/1000 CU. FT.; FUEL OIL - \$1.79/GAL.
- MARK PRICES ON LINE K AND DRAW LINES FROM POINT ON J.
- READ ESTIMATED ANNUAL HEAT COST ON LINE L.

TABLE III - WINTER DESIGN TEMPERATURE AND APPROXIMATE DEGREE DAYS

STATE	AREA	CITY	NORMAL OUTSIDE DESIGN TEMP FOR WINTER (°F)	APPROX. DEGREE DAYS	INSIDE TEMPERATURE (°F)
ALABAMA	BIRMINGHAM		10	2800	65°
ARIZONA	PHOENIX		15	2150	65°
ARIZONA	TUCSON		15	3000	65°
CALIFORNIA	LOS ANGELES		40	2000	65°
CALIFORNIA	SAN FRANCISCO		35	2400	65°
COLORADO	DENVER		-10	4100	65°
FLORIDA	JACKSONVILLE		25	1250	65°
GEORGIA	ATLANTA		10	2850	65°
GEORGIA	SAVANNAH		20	1700	65°
ILLINOIS	CHICAGO		-10	4750	65°
INDIANA	INDIANAPOLIS		-10	5600	65°
KANSAS	TOPEKA		-10	5200	65°
KENTUCKY	LEXINGTON		0	5000	65°
LOUISIANA	NEW ORLEANS		25	1300	65°
MASSACHUSETTS	BOSTON		0	5800	65°
MARYLAND	BALTIMORE		0	4800	65°
MICHIGAN	LANSING		-10	7000	65°
MISSISSIPPI	MEMPHIS		15	2350	65°
MISSOURI	COLUMBIA		-10	5100	65°
NEVADA	RENO		0	6000	65°
NEW JERSEY	TRENTON		0	5050	65°
NEW YORK	ITHACA		-5	7000	65°
NEW YORK	NEW YORK CITY		5	5050	65°
NORTH CAROLINA	RALEIGH		10	3100	65°
OHIO	CLEVELAND		-5	6000	65°
OREGON	PORTLAND		10	4650	65°
PENNSYLVANIA	PITTSBURGH		-5	6000	65°
SOUTH CAROLINA	COLUMBIA		20	2450	65°
TENNESSEE	MEMPHIS		5	3150	65°
TEXAS	AMARILLO		5	4350	65°
TEXAS	DALLAS		5	2300	65°
TEXAS	HOUSTON		20	1400	65°
VIRGINIA	NORFOLK		15	3500	65°
WASHINGTON	SEATTLE		-5	5100	65°
WEST VIRGINIA	PARKERSBURG		-5	4750	65°
WISCONSIN	MADISON		-20	7400	65°
CANADA					
ONTARIO	LONDON		0	7400	65°

NOTE:

IN DEVELOPING THE CHART THE FOLLOWING FUEL HEAT CAPACITIES AND BURNING EFFICIENCIES WERE ASSUMED.

FUEL	HEAT CAPACITY	BURNING EFFICIENCY
COAL	13,000 BTU/LB.	60%
NATURAL GAS	1,000 BTU/CU. FT.	80%
LP-GAS	92,000 BTU/GAL.	80%
FUEL OIL	138,000 BTU/GAL.	70%

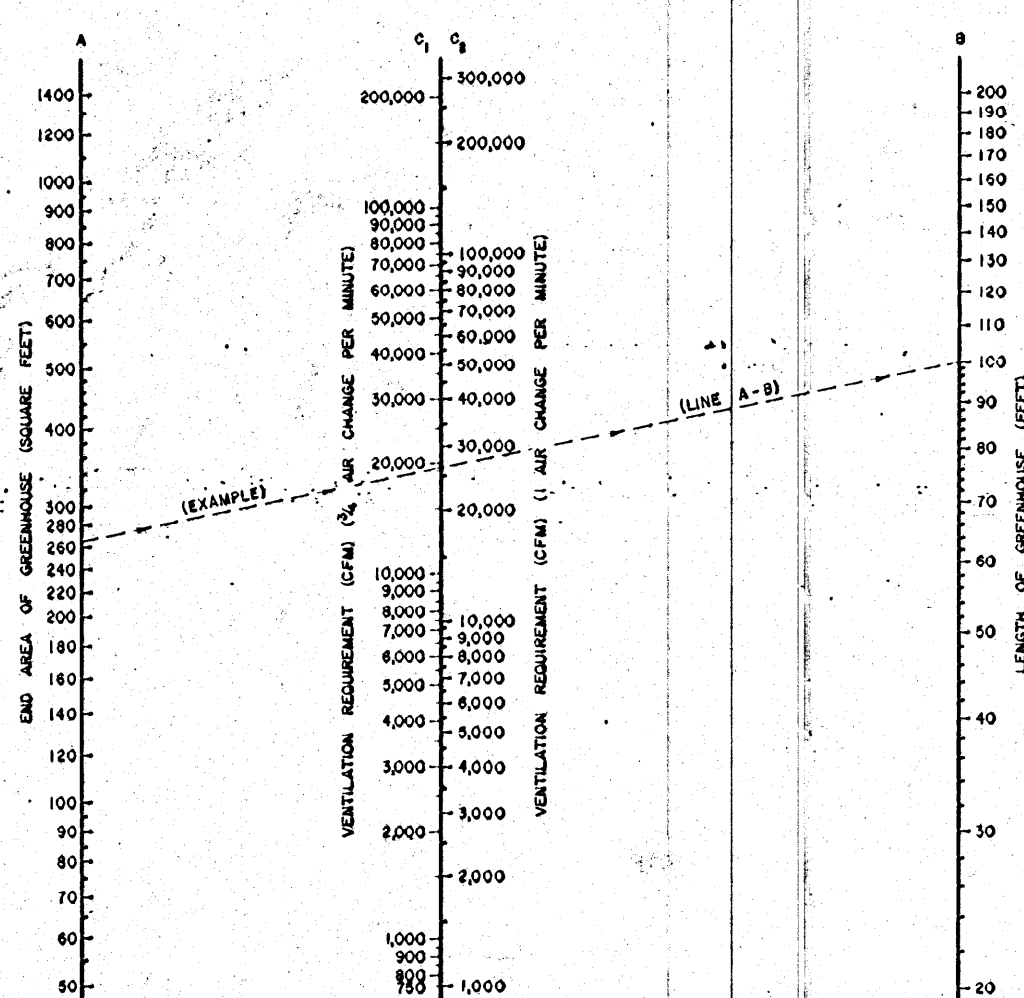
TABLE IV - END AREA OF GREENHOUSE (SQUARE FEET)

WIDTH (W) (FEET)	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	
12	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510	540	570	600	630	660	690	720	750	780

NOTES:

- FOR MAXIMUM CONTROL OF TEMPERATURE, USE 1 AIR CHANGE PER MINUTE. (READ LINE C₁)
- WHERE A SLIGHTLY HIGHER TEMPERATURE MAY BE TOLERATED, SUCH AS BEDDING PLANT OR SPRING FLOWER PRODUCTION, 3/4 AIR CHANGE PER MINUTE MAY BE USED. (READ LINE C₂)

GRAPH III - VENTILATION REQUIREMENT FOR CONTROL OF SOLAR HEAT IN GREENHOUSES



HOW TO USE THE GRAPH AND DETERMINE VENTILATION REQUIREMENT

- FROM TABLE IV, FIND END AREA OF HOUSE. LOOK UNDER SHAPE OF HOUSE AND WIDTH.
- MARK END AREA ON LINE A.
- MARK LENGTH OF HOUSE ON LINE B.
- DRAW A STRAIGHT LINE FROM THE POINT MARKED ON LINE A TO THE POINT MARKED ON LINE B. (LINE A-B).
- READ VENTILATION REQUIREMENT ON LINE C₁ OR LINE C₂ WHEN LINE A-B CROSSES.

EXAMPLE:

- GREENHOUSE (GABLE TYPE) 28 FEET BY 100 FEET.
- END AREA = 268 SQUARE FEET. (TABLE IV)
- LENGTH = 100 FEET.
- VENTILATION REQUIREMENT:
 - AT 3/4 AIR CHANGE PER MINUTE (LINE C₂) = 19,000 CFM.
 - AT 1 AIR CHANGE PER MINUTE (LINE C₁) = 28,000 CFM.

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