

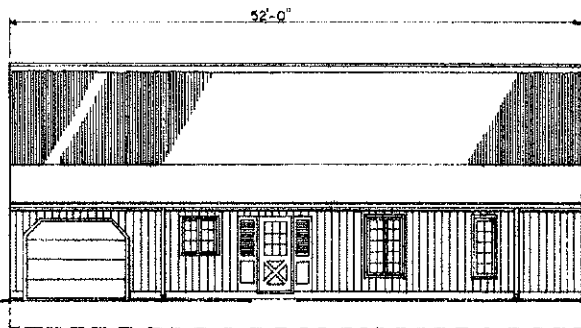
PERSPECTIVE SHOWING FRONT & LEFT SIDE VIEWS

KITCHEN MILLWORK SCHEDULE		DOOR SCHEDULE			
MARK	DESCRIPTION	MARK	SIZE	DESCRIPTION	QUANTITY
1	36" WIDE x 30" HIGH WALL CABINET W/ 2 DOORS AND ADJUSTABLE SHELVES	①	3'-0" x 6'-8"	FLUSH WOOD SOLID CORE ( EXTERIOR)	2
2	33" WIDE x 15" HIGH WALL CABINET W/2 DOORS	②	3'-0" x 6'-8"	FLUSH WOOD HOLLOW CORE	1
3	18" WIDE BASE CABINET W/ DRAWER, 1 DOOR & 1 SHELF	③	2'-6" x 6'-8"	FLUSH WOOD SOLID CORE	1
4	18" WIDE ALL PURPOSE BASE CABINET W/ CUTTING BD, 2 INTERIOR DRAWERS & CUTLERY TRAY	④	2'-6" x 6'-8"	FLUSH WOOD HOLLOW CORE	3
5	48" WIDE x 24" HIGH WALL CABINET W/3 DOORS AND ADJUSTABLE SHELF	⑤	2'-6" x 6'-8"	FLUSH WOOD HOLLOW CORE	1
6	48" WIDE x 30" HIGH WALL CABINET W/3 DOORS AND 2 ADJUSTABLE SHELVES	⑥	2'-0" x 6'-8"	FLUSH WOOD HOLLOW CORE	1
7	15" WIDE x 30" HIGH WALL CABINET W/1 DOOR & 2 ADJUSTABLE SHELVES	⑦	1'-6" x 6'-8"	FLUSH WOOD HOLLOW CORE	1
8	30" WIDE x 18" HIGH WALL CABINET W/ 2 DOORS & 1 ADJUSTABLE SHELF	⑧	4'-0" x 6'-8"	LOUVERED BI-FOLD	1
9	36" WIDE x 30" HIGH BLIND CORNER WALL CABINET W/2 DRAWERS & 2 ADJUSTABLE SHELVES	⑨	3'-0" x 6'-8"	WOOD STORM DOOR	1
10	15" WIDE BASE CABINET W/4 DRAWERS	⑩	8'-0" x 7'-0"	GARAGE DOOR	1
11	36" ROTATING BASE CORNER CABINET (LAZY-SUSAN)	⑪	5'-0" x 6'-8"	WOOD SLIDING INSUL.GL. DOORS	1
12	21" WIDE x 30" HIGH WALL CABINET W/ 1 DOOR & 2 ADJUSTABLE SHELVES	<b>WINDOW SCHEDULE</b>			
13	48" WIDE x 30" HIGH BLIND CORNER WALL CABINET W/2 DOORS & 2 ADJUSTABLE SHELVES	MARK	SASH OPG.	DESCRIPTION	QUANTITY
14	27" WIDE x 30" HIGH WALL CABINET W/2 DOORS AND 2 ADJUSTABLE SHELVES	(A)	1-10 1/2 x 5-2 3/4	WOOD CASEMENT W/ WELDED GLASS	6
15	36" WIDE x SINK BASE CABINET W/2 DOORS	(B)	1-10 1/2 x 6-3	WOOD CASEMENT W/ WELDED GLASS	1
16	42" WIDE BLIND CORNER BASE CABINET W/1 DRAWER & 1 DOOR	(C)	1-6" x 3-2 1/4	WOOD CASEMENT W/ WELDED GLASS	1
<b>BATH AND LAUNDRY MILLWORK SCHEDULE</b>		(D)	3-1 3/4 x 5-2 3/4	WOOD CASEMENT W/ WELDED GLASS	1
17	21" WIDE x 21" DEEP x 29 3/4" HIGH VANITY LAVATORY CABINET W/ DOOR	(E)	3-1 3/4 x 3-2 1/4	WOOD CASEMENT W/ WELDED GLASS	1
18	15" WIDE x 27" DEEP x 29 3/4" HIGH VANITY CABINET W/1 DRAWER & DOOR (1 LEFT & 1 RIGHT)	<b>RESEARCH BY-RHRU ARS USDA --- CLEMSON, S. CAROLINA</b>			
19	33" WIDE x 24" HIGH WALL CABINET W/2 DOORS & 1 ADJUSTABLE SHELF				
20	15" WIDE x 24" HIGH WALL CABINET W/1 DOOR & 1 ADJUSTABLE SHELF (1 LEFT & 1 RIGHT)				

**NOTES:**

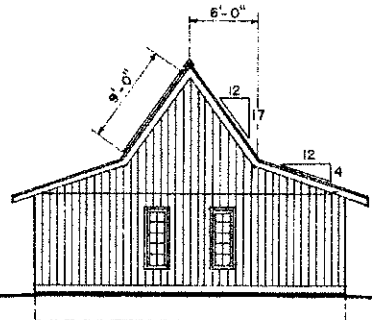
- COUNTERTOPS & SPLASHBOARDS FOR KITCHEN BASES & BATH VANITY SHALL BE PLASTIC. LAMINATE OVER 3/4" WOOD PARTICLE BOARD.
- PROVIDE 5- 3/4" PLYWOOD ADJUSTABLE SHELVES W/ WOOD TAPED EDGES FOR PANTRY.
- AS AN ALTERNATE TO KITCHEN STOCK-SIZE WALL CABINETS, SOFFIT MAY BE OMITTED ALLOWING CUSTOM-MADE HIGHER WALL CABINETS TO EXTEND TO CEILING IF MORE STORAGE IS NECESSARY.

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS STATE OF NORTH DAKOTA NORTH DAKOTA STATE UNIVERSITY OF AGRICULTURE AND APPLIED SCIENCE AND UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING		
<b>SOLAR HOUSE          EXPERIMENTAL</b>		
USDA '77	7220	SHEET 1 OF 7

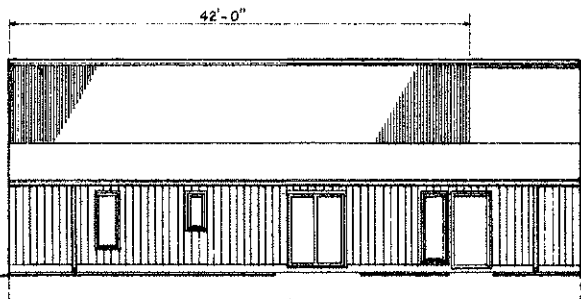


**ZONE - 1**

**FRONT ELEVATION W/COLLECTOR FACING SOUTH**

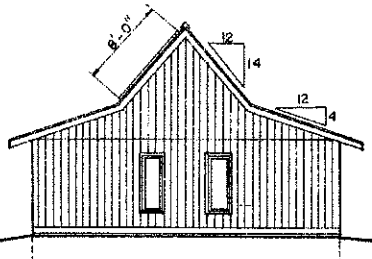


**SIDE ELEVATION**

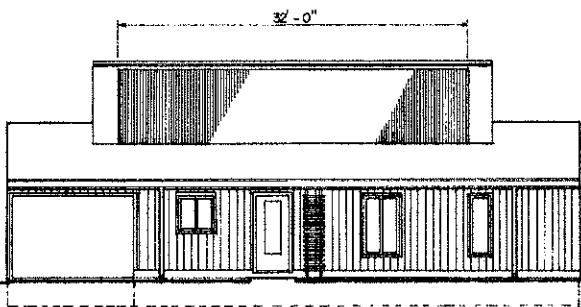


**ZONE - 2**

**REAR ELEVATION W/COLLECTOR FACING SOUTH**

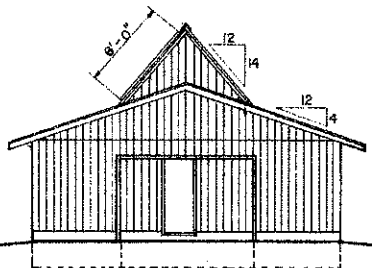


**SIDE ELEVATION**



**ZONE - 3**

**FRONT ELEVATION W/ COLLECTOR FACING SOUTH**

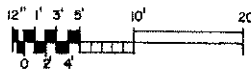


**CARPORT SIDE ELEVATION**

**EXTERIOR ELEVATION VARIATIONS**

SCALE: 1/8" = 1'-0"

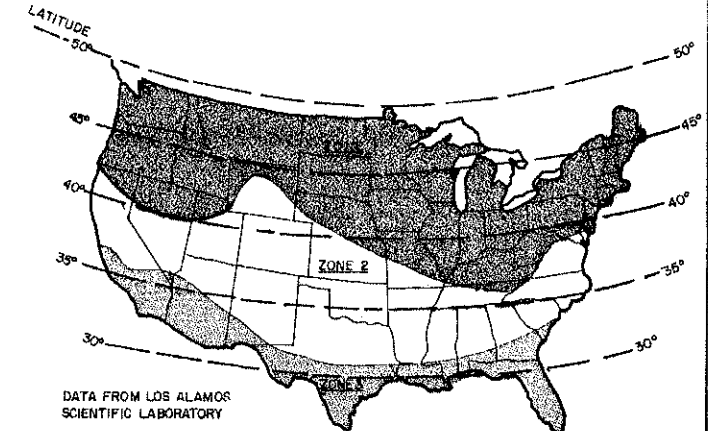
1/8" = 1'-0"



**SITE PLANNING:**

ORIENTATE HOUSE WITH COLLECTOR FACING SOUTH FOR OPTIMUM SOLAR ENERGY ABSORPTION MAKING SURE NO OBSTRUCTIONS SUCH AS, HIGH TREES OR BUILDINGS WILL BE BLOCKING THE SUN'S RAYS, MAKE MAXIMUM USE OF EXISTING ASSETS SUCH AS NATURAL SHADE, GOOD DRAINAGE AWAY FROM HOUSE, OPEN EXPOSURE TO SUMMER BREEZES, AND SHELTER FROM COLD WINTER WINDS.

IF HIGH WATER TABLE EXISTS, MAKE SURE ADEQUATE DRAINAGE IS POSITIVE TO PREVENT WATER SATURATION IN THE AIR PLENUMS AND ROCK STORAGE UNDER FLOOR, OTHERWISE HIGH DEGREE OF HUMIDITY DISCOMFORT WILL RESULT WITHIN THE DWELLING.



**SOLAR COLLECTOR FOR SUPPLYING 75% OF HEATING**

SOLAR HEAT PERCENTAGE FOR AVERAGE HEATING SEASON IS BASED ON 40% COLLECTION EFFICIENCY AND ALLOWS FOR CLOUD COVERAGE. IF SOLAR WATER HEATER IS INSTALLED IN ATTIC INCREASE PANEL AREA AMOUNT EQUAL TO THE WATER COLLECTOR OR ABSORBER.

ELECTRICAL SYMBOLS	
MARK	TYPE
S	SINGLE POLE SWITCH
SS	THREE WAY SWITCH
⊕	DUPLEX CONVENIENCE OUTLET
⊕c	DUPLEX CONVENIENCE OUTLET ABOVE COUNTER
⊕DW	DISHWASHER OUTLET
⊕WP	WEATHER PROOF DUPLEX OUTLET
⊕R	RANGE OUTLET
⊕WH	WATER HEATER OUTLET
⊕	CEILING LIGHT OUTLET
⊕	SIDE WALL OUTLET WITH PULL CORD
⊕	FLUORESCENT FIXTURE
⊕	CEILING FAN OUTLET

**CAUTION**

FIBERGLASS IS FLAMMABLE IN HIGH FIRE HAZARD AREAS AND SHOULD BE SUBSTITUTED WITH DS TEMPERED GLASS FOR COLLECTOR SURFACE.

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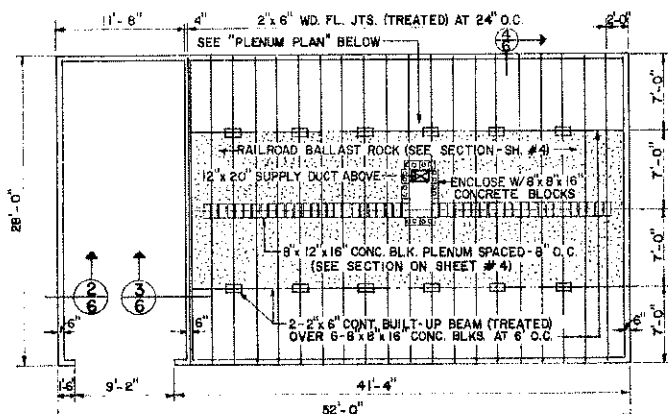
**SOLAR HOUSE  
 EXPERIMENTAL**

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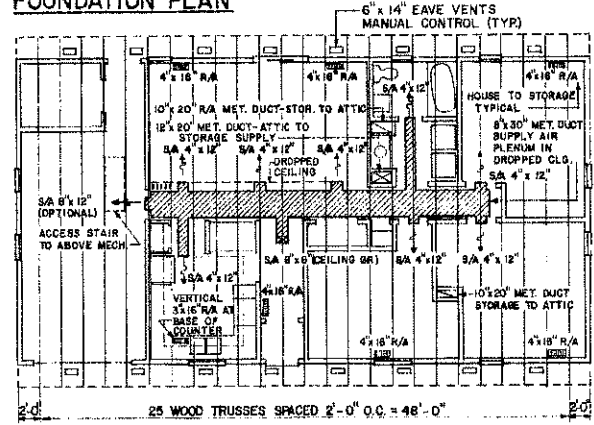
*Harold 89*



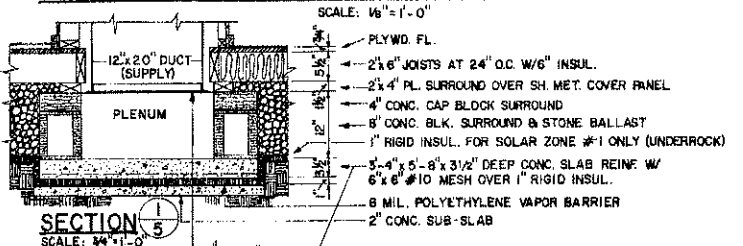




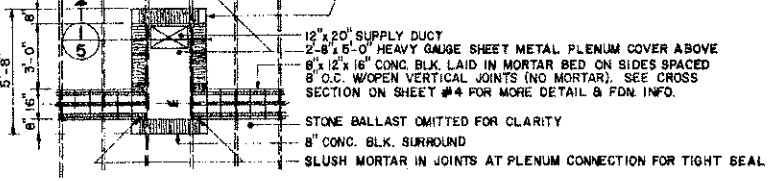
**FOUNDATION PLAN**



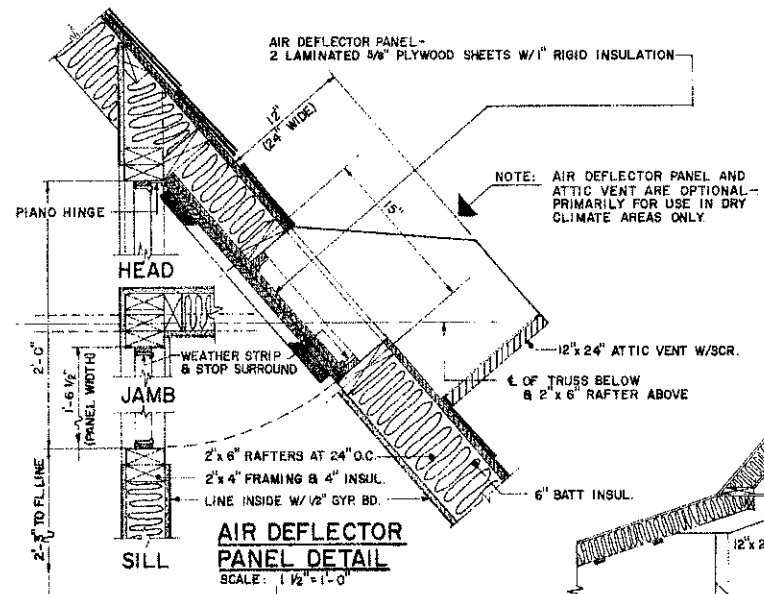
**MECHANICAL & TRUSS FRAMING PLAN**



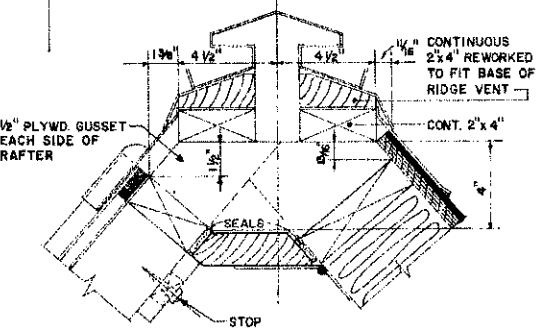
**SECTION 5**



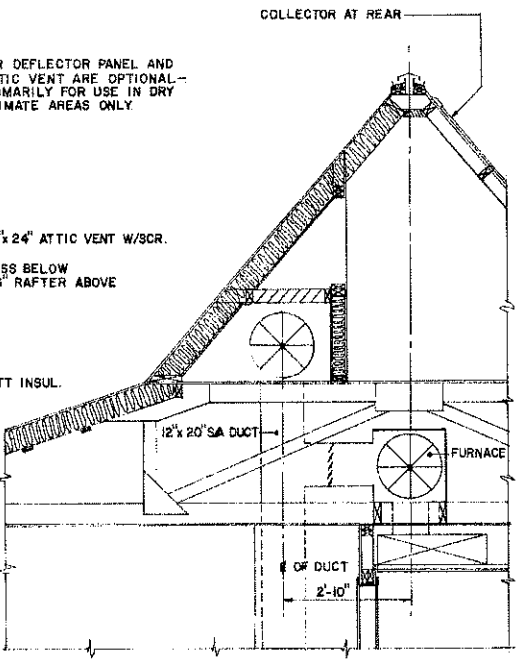
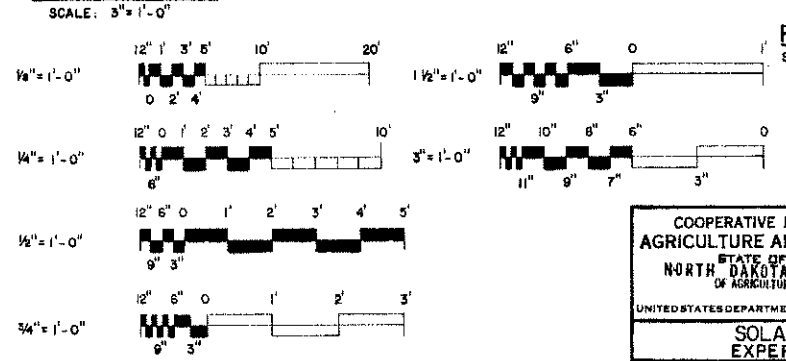
**PLENUM PLAN**



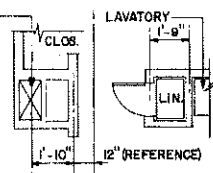
**AIR DEFLECTOR PANEL DETAIL**



**GUSSET DETAIL**



**ALTERNATE LOCATION OF SUPPLY AIR DUCT WITH COLLECTOR AT REAR SIDE**

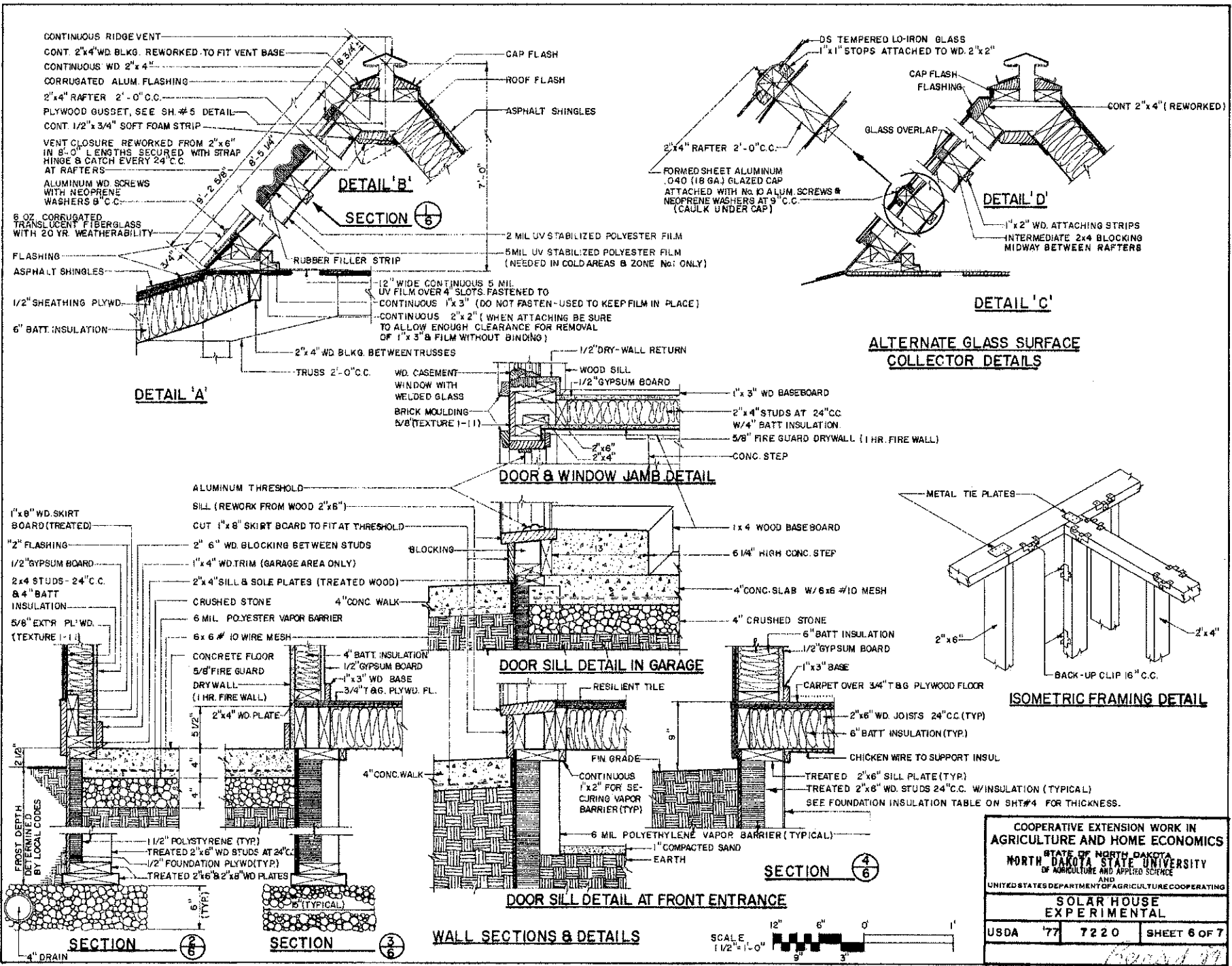


**PLAN REWORK**

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS  
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**SOLAR HOUSE EXPERIMENTAL**

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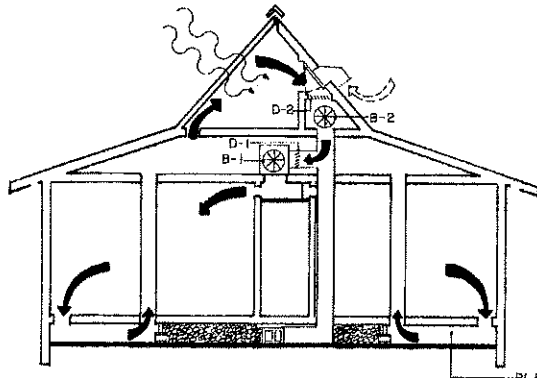


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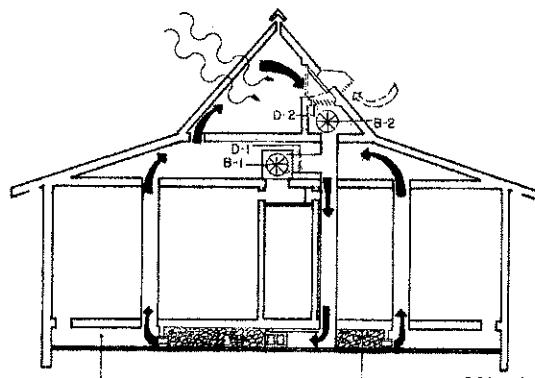
SOLAR HOUSE  
 EXPERIMENTAL

USDA '77 7220 SHEET 6 OF 7

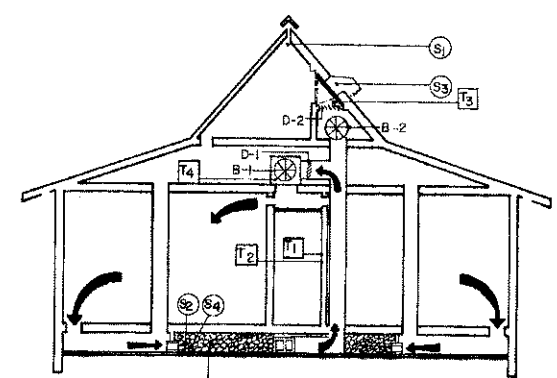
Board 77



HEATING - ATTIC TO HOUSE  
COOLING - OUTSIDE AIR TO HOUSE (OPTIONAL)



HEATING - ATTIC TO STORAGE  
COOLING - OUTSIDE AIR TO STORAGE (OPTIONAL)



HEATING - STORAGE TO HOUSE / CONVENTIONAL FORCED AIR HEATING  
COOLING - STORAGE TO HOUSE / CONVENTIONAL FORCED AIR COOLING

### AIR FLOW DIAGRAMS FOR SIX OPERATING MODES & CONTROL LOCATIONS

SCALE 3/16" = 1'-0"

T<sub>1</sub> AND T<sub>2</sub> - 24V HEATING-COOLING THERMOSTATS, HEAT-OFF-COOL SELECTION.

HONEYWELL - T87F AND Q539A SUBBASE  
DAYTON - 2E206 AND 2E151 SUBBASE  
PENN. CONTROLS - T-51CG-1 AND Y 51CG-1 SUBBASE  
WHITE ROGERS - 1F 36-910 AND 92-1 SUBBASE

T<sub>3</sub> - TWO SPEED BLOWER THERMOSTAT, SPDT LINE VOLTAGE, 1/2 HP RATED, SET FOR 100°F, 2° TO 7°F DIFFERENTIAL AMBIENT TEMPERATURE RANGE 0° TO 150°F.

PENN. CONTROLS - A19BAC-1  
DAYTON - 2 E208  
HONEYWELL - T631C1103A

T<sub>4</sub> - FAN AND LIMIT CONTROL SUPPLIED WITH FURNACE, USE FURNACE MANUFACTURERS SUGGESTED SETTINGS.

DM-1 AND DM-2 - SPRING RETURN DAMPER MOTOR, 2-POSITION (OPEN-CLOSE) POWER OPEN, SPRING RETURN, 115V CONTROL VOLTAGE.

BARBER COLMAN - MA - 405  
HONEYWELL - M436A116  
PENN. CONTROLS - M811ACB-1 & 24V TRANSFORMER

D<sub>1</sub> AND D<sub>2</sub> DAMPERS - 12" x 20" SPECIFY END AND BLADE SEALS, FULL OPEN & FULL CLOSED USE.

JOHNSON SERVICE CO. D-1300  
AMERICAN WARMING & VENTILATING - DAA-P-10  
LOUVERS & DAMPERS, INC. - CD - 500  
SOLAR CONTROL CORP.

SDT-1 - DIFFERENTIAL THERMOSTAT AND SENSORS FOR WINTER SOLAR HEATING. SPECIFY 5 ± 1°F TURN ON DIFFERENTIAL AND 5 ± 1°F TURN OFF DIFFERENTIAL, RATED 1/2 HP 115V SOLAR CONTROL CORP.

RHO SIGMA  
HELIO & ROPE GENERAL  
DEKO LABS  
SOLAR ENERGY RESEARCH CORP.

SDT-2 - DIFFERENTIAL THERMOSTAT AND SENSORS FOR SUMMER NOCTURNAL COOLING OF ROCK STORAGE. SPECIFY 5 ± 1°F TURN ON DIFFERENTIAL AND 3 ± 1°F TURN OFF DIFFERENTIAL, RATED 1/2 HP 115V. (OPTIONAL - PRIMARILY FOR DRY CLIMATE AREAS) SOLAR ENERGY RESEARCH CORP.  
RHO SIGMA  
HELIO & ROPE GENERAL  
DEKO LABS  
SOLAR CONTROL CORP.

B-2 - COLLECTION BLOWER: 115V 60 CYCLE MULTI OR TWO SPEED, PERMANENT SPLIT CAPACITOR TYPE, THESE ARE 40% TO 50% MORE EFFICIENT THAN SHADED POLE MOTORS. LOW SPEED BLOWER OUTPUT 2 TO 3 CFM/FT<sup>2</sup> OF COLLECTOR SURFACE AT 3/8" INCHES WATER COLUMN. HIGH SPEED OUTPUT SHOULD BE 4 TO 5 CFM/FT<sup>2</sup> OF COLLECTOR SURFACE AT 3/8" INCHES WATER COLUMN. SIMILAR TO DAYTON 4 C058.

B-1 - FURNACE BLOWER: 115V 60 CYCLE, ONE CFM/FT<sup>2</sup> OF FLOOR AREA, 1/2" WATER COLUMN. SUGGEST PERMANENT SPLIT CAPACITOR MOTOR.

TWO STANDARD HEAT-COOL THERMOSTATS LOCATED IN HALLWAY CONTROL ELECTRIC FURNACE OR HEATPUMP. T<sub>1</sub> - CONTROLLING BLOWER (B-1) IS SET AT 65°F WINTER & 75°F SUMMER. T<sub>2</sub> - CONTROLLING AUX. HEAT OR COOL IS SET AT 65°F WINTER & 78°F SUMMER.

DAMPER MOTOR DM-1 IS ENERGIZED WHEN BLOWER (B-1) IS ON & OPENS DAMPER (D-1). BLOWER (B-1) IS TURNED OFF WHEN DAMPER MOTOR (DM-2) IS ENERGIZED. WHEN BOTH DAMPERS ARE OPEN COLLECTION BLOWER HEATS OR COOLS HOUSE.

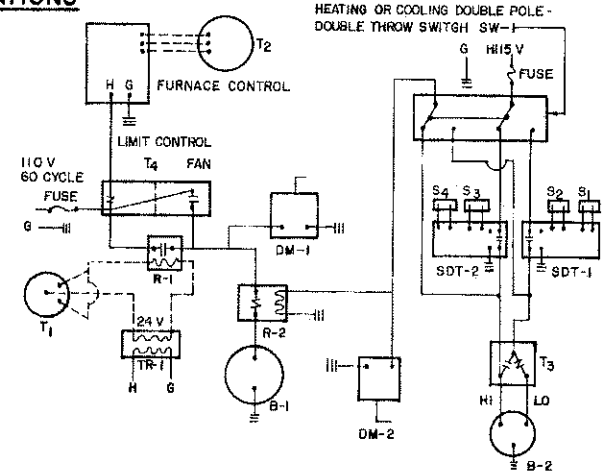
TWO DIFFERENTIAL THERMOSTATS CONTROL COLLECTION BLOWER (B-2) SDT-1 CONTROLS BLOWER DURING SOLAR HEAT CYCLE. SENSOR (S<sub>1</sub>) IS LOCATED IN ATTIC NEAR RIDGE & SHADED. SENSOR (S<sub>2</sub>) IS CENTERED IN ROCK ONE FOOT IN ON COOL SIDE. WHEN S<sub>1</sub> IS 15°F HOTTER THAN S<sub>2</sub> BLOWER STARTS AT LOW SPEED. BLOWER 2-SPEED THERMOSTAT (T<sub>3</sub>) SET AT 100°F FOR HIGH SPEED BLOWER OPERATION. SDT-2 CONTROLS BLOWER (B-2) DURING COOLING. SENSOR (S<sub>3</sub>) IS LOCATED WITHIN ATTIC INTAKE VENT & (S<sub>4</sub>) IS LOCATED NEAR (S<sub>2</sub>) IN ROCK. WHEN S<sub>3</sub> IS 7°F COOLER THAN S<sub>4</sub> COLLECTION BLOWER (B<sub>2</sub>) CIRCULATES COOL AIR THROUGH ROCK OR HOUSE. BOTH DIFFERENTIAL THERMOSTATS AND HEAT-COOL SWITCH ARE LOCATED ON OR IN HOUSING FOR COLLECTION BLOWER.

MANUAL CHANGE-OVER FROM SOLAR HEAT TO COOLING.

- (1) OPEN RIDGE VENT.
- (2) OPEN ROOF VENT TO BLOWER (B<sub>2</sub>) & CLOSE OFF ATTIC TO BLOWER.
- (3) SWITCH TO COOLING THERMOSTAT (SDT-2) WITH SWITCH SW-1.
- (4) CHANGE BOTH HOUSE THERMOSTATS TO COOL.
- (5) OPEN ALL SOFFIT VENTS.

TO CHANGE FROM COOLING TO SOLAR HEAT REVERSE ABOVE CHANGE-OVER.

NOTE: AUXILIARY FURNACE OR HEAT PUMP SHOULD BE SIZED BY LOCAL SUPPLIER.



SW-1 - ON-OFF SWITCH, DPDT, RATED 1/2 HP AT 115V.

R-1 - SPDT RELAY, 24V COIL, RATED 1/2 HP AT 115V.

R-2 - SPDT RELAY, 115V COIL, RATED 1/2 HP AT 115V.

TR-1 - 24V TRANSFORMER

**NOTE**

MENTION OF PROPRIETARY ITEMS DOES NOT IMPLY USDA GUARANTEE OR WARRANTY AND IS NOT INTENDED TO EXCLUDE OTHER SUITABLE PRODUCTS.

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SOLAR HOUSE  
EXPERIMENTAL

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