

### TRUSS GENERAL NOTES

1. ALL TRUSS MANUFACTURERS BUILT TO MEET THE REQUIREMENTS OF LOCAL CODES, CLIMATIC CONDITIONS, AND AGENCIES INVOLVED.
2. LUMBER ALL LUMBER SHALL BE STRESS GRADED AND LOADS SAFELY ACCORDING TO SOUND ENGINEERING PRACTICE.
3. CONNECTIONS: SAFE WORKING LOAD SHALL BE DETERMINED BY TRUSS MANUFACTURER.
4. DESIGN: MANUFACTURER SHALL PROVIDE A TRUSS IN WHICH THE ALLOWABLE STRESSING HAS BEEN INCREASED 33% FOR SHORT TERM LOADING CONDITIONS.
5. CONNECTION PLATES: SHALL BE 90 GA. (MIN.) GALVANIZED STEEL OF SUCH DESIGN AND SIZE AS TO PROVIDE A POSITIVE JOINT CONNECTION BETWEEN TWO OR MORE TRUSS MEMBERS AND TO SAFELY CARRY ANY LOADS IMPOSED AT JOINTS ON BOTH SIDES OF JOINT.
6. FABRICATION: ALL JOINTS SHALL BE ACCURATELY CUT, ALL JOINT BEAMS AND HELD FIRMS IN PLACE IN WOOD (WOOD WITH KNOTS THAT WOULD REDUCE DESIGN CAPACITY WILL NOT BE USED FOR TRUSS MEMBERS). TOP AND BOTTOM CHORD SHALL BE TWIST OR WARP TOP AND BOTTOM CHORD SPLICES, WHEN REQUIRED, SHALL BE DESIGNED TO CARRY ALL LOADS IMPOSED AT SPLICE, TOP AND BOTTOM CHORD SPLICES SHALL NOT OCCUR IN THE SAME PANEL.
7. NAILS: WHEN USED SHALL BE 1 1/2" X 11 GA. "SCOTCH" NAILS OR EQUAL.

### CONSTRUCTION CHECK LIST

- 1) SHEATH WITH 1/2" PLYWOOD OR HIGH DENSITY FIBERBOARD
- 2) USE EXTERIOR GRADE PLYWOOD WHEREVER IT MAY BE WETTED DURING OR AFTER CONSTRUCTION
- 3) PRESSURE TREAT ALL WOOD WITH GROUND CONTACT AND PROVIDE OTHER NEEDED TERMITE CONTROL
- 4) PROVIDE 1 SQ FT. OF ATTIC VENT OPENINGS FOR EACH 150 SQ FT. OF CEILING
- 5) INSULATION R VALUES DEPEND ON LOCAL CLIMATES AND FUEL COST

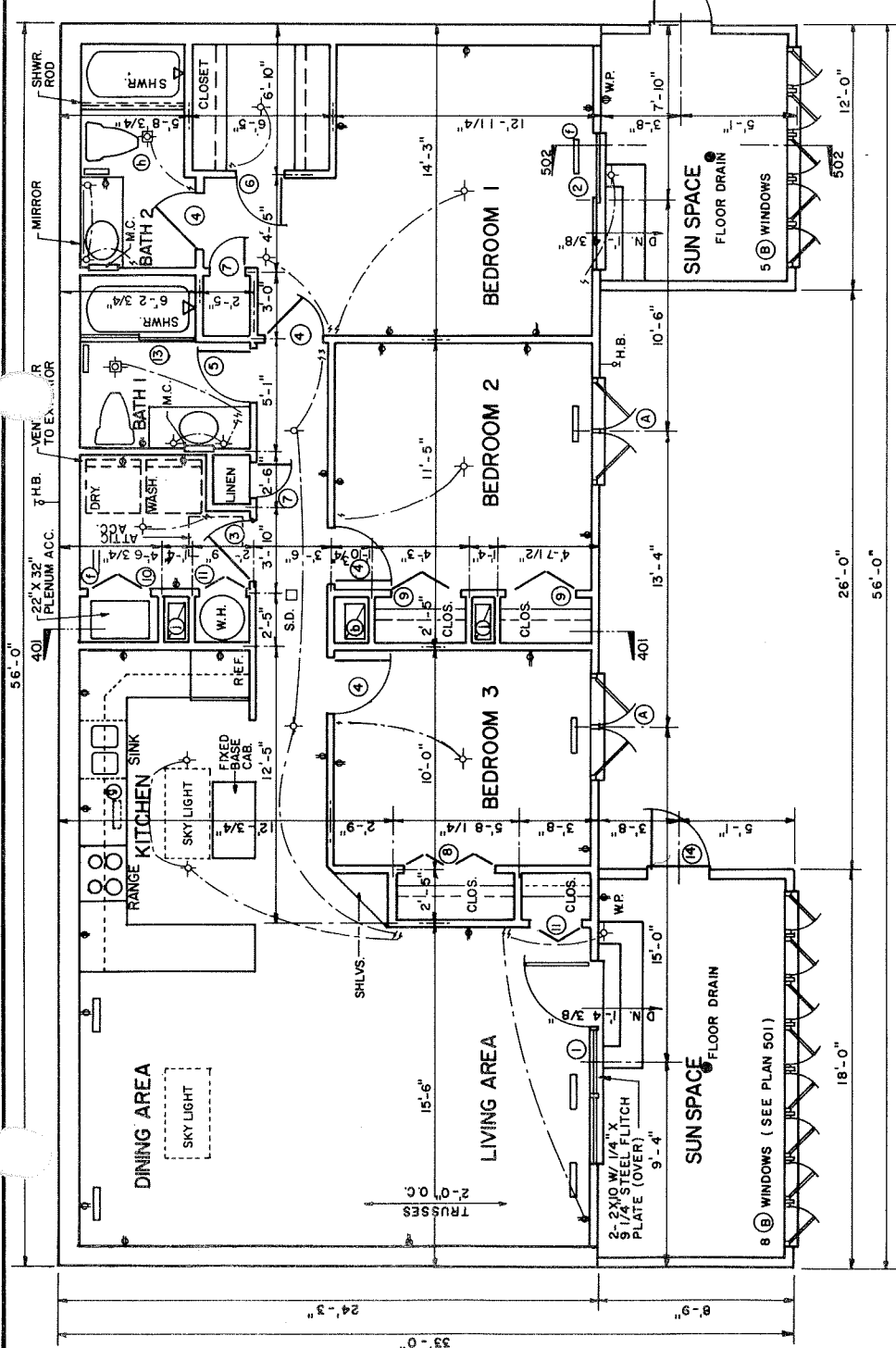
LOADS  
TOP CHORD DEAD LOAD + LIVE LOAD = 45 P.S.F.  
BOTTOM CHORD DEAD LOAD = 20 P.S.F.  
TOTAL LOAD = 65 P.S.F.

COOPERATIVE EXTENSION SERVICE  
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UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

EARTH BANKED SOLAR HOUSE  
WITH SUNSPACE

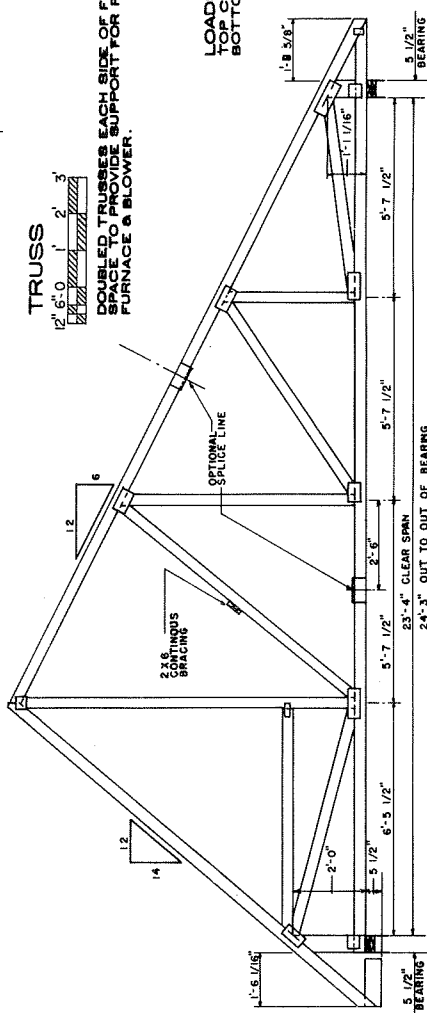
RHRU-USDA 11/83 7232 SHEET 2 OF 7



### TRUSS

12'-6'-0" 1' 2' 3'

DOUBLED TRUSSES EACH SIDE OF FURNACE SPACE TO PROVIDE SUPPORT FOR PLATFORM, FURNACE & BLOWER.

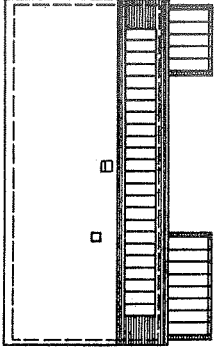


FLOOR PLAN 12'-0" 1' 2' 3'  
NOTE: DIMENSIONS TO EXTERIOR WALLS ARE TO FACE OF STUD OR FACE OF MASONRY UNLESS OTHERWISE NOTED.  
NOTE: FINISHES ATTACHED DIRECTLY TO EXTERIOR MASONRY WALLS SHALL BE ATTACHED WITH APPROVED ADHESIVE. DO NOT USE FURRING STRIPS.

WINDOW SCHEDULE	
A	4'-8 1/2" X 5'-11 3/4" 80-75 CASEMENT *
B	1'-11 5/8" X 4'-7 3/8" 40-14 CASEMENT *
*	CRESTLINE WDWNS.

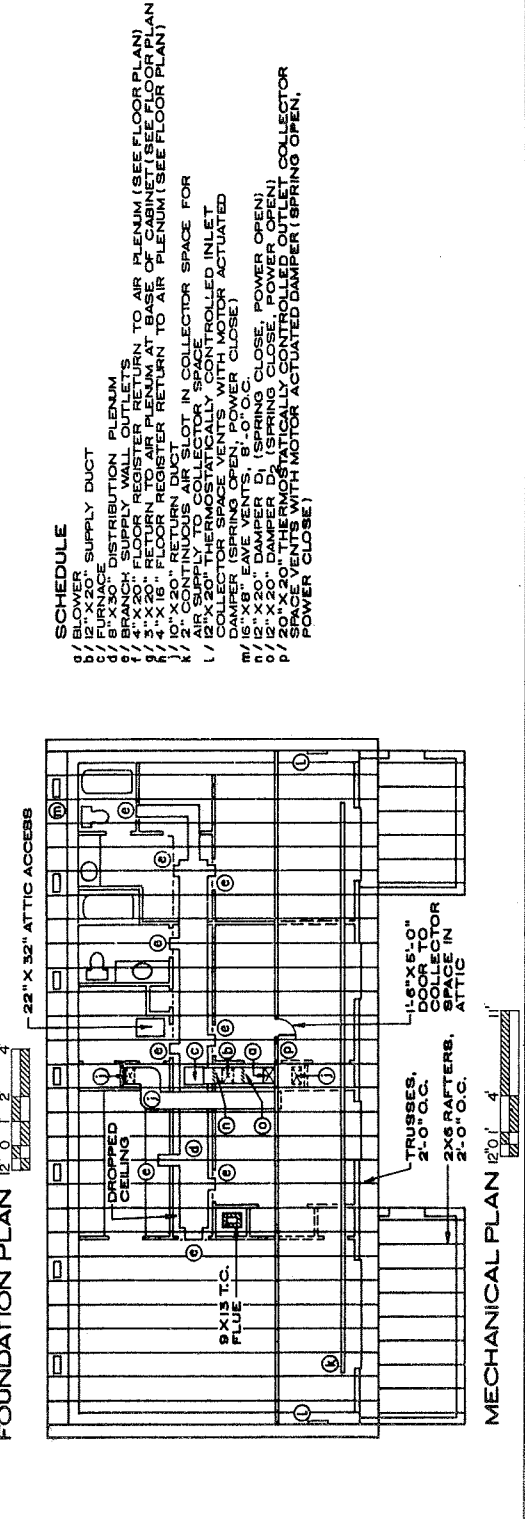
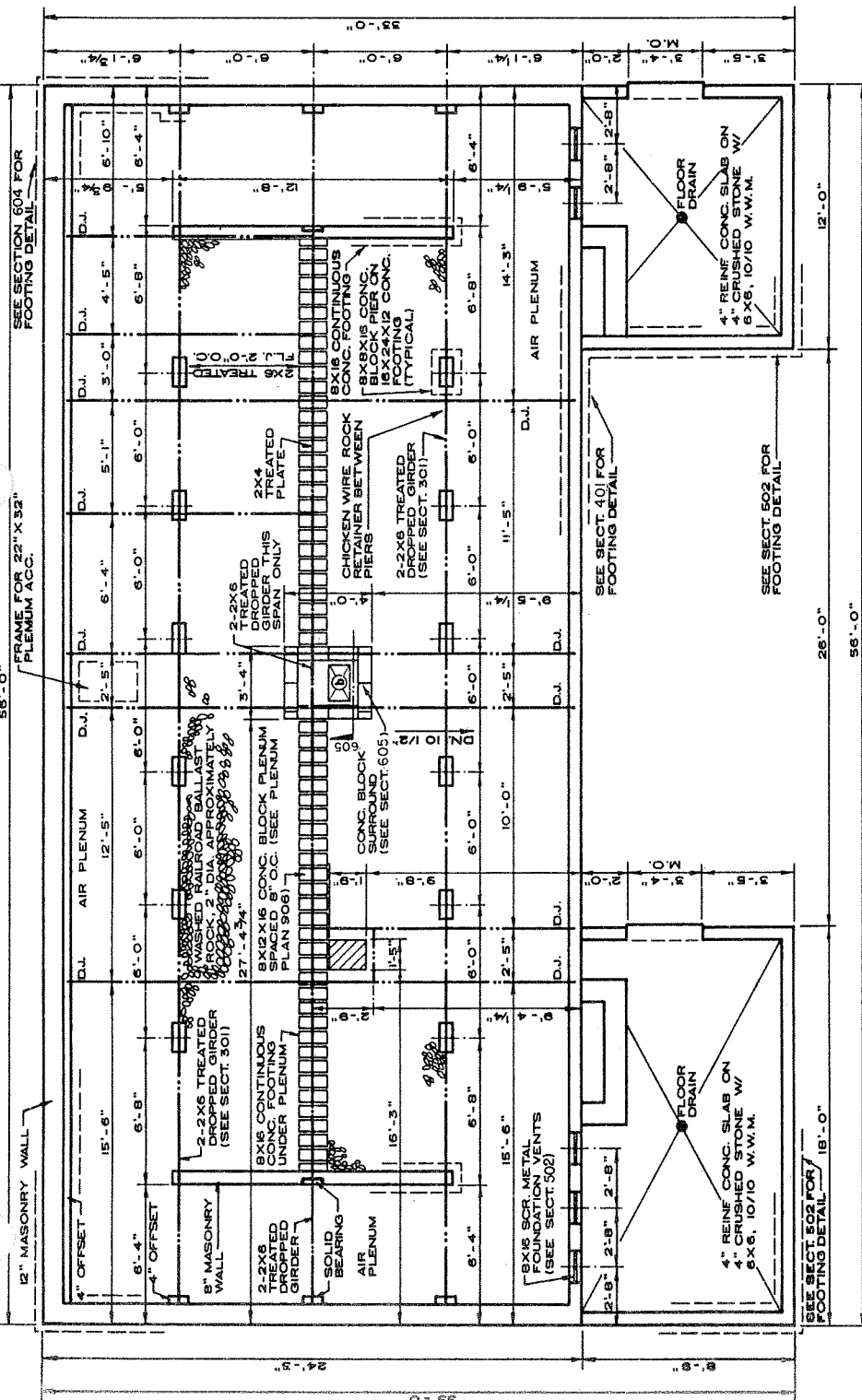
DOOR SCHEDULE	
1	9'-0" X 6'-8" SWING SET PATIO *
2	6'-0" X 6'-8" SLIDING GLASS
3	2'-5" X 6'-8" INTERIOR
4	2'-6" X 6'-8" X 1'-3/8" INTERIOR
5	2'-4" X 6'-8" X 1'-3/8" INTERIOR
6	2'-0" X 6'-8" X 1'-3/8" INTERIOR
7	1'-6" X 6'-8" X 1'-3/8" INTERIOR
8	4'-0" X 6'-8" X 1'-3/8" INT. BIFOLD
9	2'-6" X 6'-8" X 1'-3/8" INT. BIFOLD
10	2'-6" X 6'-8" X 1'-3/8" INT. BIFOLD
11	2'-6" X 6'-8" X 1'-3/8" INT. DOUBLE
12	2'-6" X 6'-8" X 1'-3/8" INT. DOUBLE
13	TEMPERED GLASS SHWR. DR.
14	3'-0" X 6'-8" AL. STORM DOOR
*	MORGAN DOORS

NOTE: AIR PLENUM / CRAWL SPACE AREA IS EXPOSED TO ROCK STORAGE AREA. (SEE SECTION 401.)



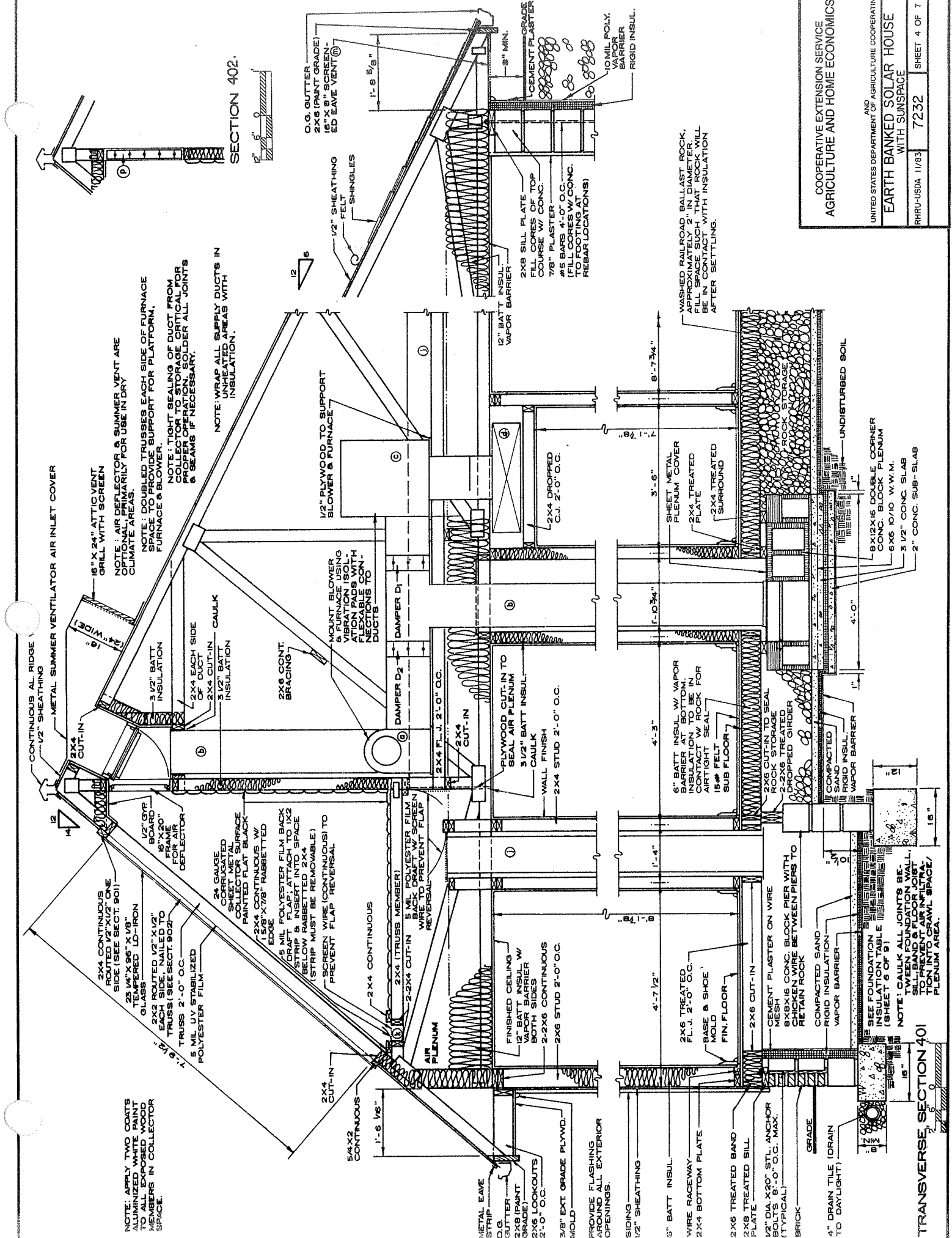
**ABBREVIATIONS AND SYMBOLS**

- ACC. ACCESS
- AL. ALUMINUM
- C.B. CASE
- C.O. CEILING OPENING
- C.J. CEILING JOIST
- COOL. COOLING
- C.C. COLUMN
- CONC. CONCRETE
- CONSTR. CONSTRUCTION
- DET. DETAIL
- DIA. DIAMETER
- DR. DRAIN
- D.H. DOUBLE HUNG
- D.J. DOWN JOIST
- D.S. DOWN SPOUT
- D.S. DOUBLE HUNG
- ELEV. ELEVATION
- EXT. EXTERIOR
- FIN. FINISH (ED)
- F.L. FLOOR
- F.L. FLOOR JOIST
- H.T. HEIGHT
- H.B. HOSE BIB
- INSUL. INSULATION
- M.D. MASONRY
- M.O. MASONRY OPENING
- MAX. MAXIMUM
- M.C. MEDICINE CABINET
- M.M. MEDICINE
- O.C. ON CENTER
- P.W.D. PLYWOOD
- POLY. POLYETHYLENE
- R.H. REFRIGERATOR
- REF. REFRIGERATOR
- REIN. REINFORCED
- S.D. SMOKE DETECTOR
- SECT. SECTION
- SHWR. SHOWER
- SID. SIDING
- S.P. S.P.
- SP. STEEL
- SUSP. SUSPENDED
- SHLV. SHELVES
- THRU. THROUGH
- W.H. WATER HEATER
- W.D. WINDOW
- W.W.M. W.W.M.
- W.W.M. WELDED WIRE MESH
- ⊕ LIGHT FIXTURE
- ⊖ CONVENIENCE OUTLET
- ⚡ SWITCH
- ⚡ 3 WAY SWITCH
- ⚡ EXHAUST FAN W/ LIGHT



**SCHEDULE**

- 16" X 20" SUPPLY DUCT
- 16" X 20" DISTRIBUTION PLENUM
- 16" X 20" SUPPLY WALL OUTLETS
- 16" X 20" FLOOR REGISTER RETURN TO AIR PLENUM (SEE FLOOR PLAN)
- 16" X 20" RETURN TO AIR PLENUM AT BASE OF CABINET (SEE FLOOR PLAN)
- 16" X 16" FLOOR REGISTER RETURN TO AIR PLENUM (SEE FLOOR PLAN)
- 16" CONTINUOUS AIR SLOT IN COLLECTOR SPACE FOR AIR SUPPLY TO COLLECTOR SPACE
- 16" X 20" THERMOSTATICALLY CONTROLLED INLET DAMPER (SPRING OPEN, POWER CLOSE)
- 16" X 8" EAVE VENTS, 8'-0" O.C.
- 16" X 20" DAMPER DI (SPRING CLOSE, POWER OPEN)
- 16" X 20" DAMPER DI (SPRING CLOSE, POWER OPEN)
- SPACE VENTS WITH MOTOR ACTUATED DAMPER (SPRING OPEN, POWER CLOSE)



NOTE: APPLY TWO COATS ALUMINIZED WHITE PAINT TO ALL EXPOSED WOOD MEMBERS IN COLLECTOR SPACE.

2x4 CONTINUOUS ROUTED 1/2" X 1/2" ONE SIDE (SEE SECT. 901)

2x4 W/ 96" X 1/8" GLASS

2x2 ROUTED 1/2" X 1/2" EACH SIDE, NAILED TO TRUSS (SEE SECT. 902)

TRUSS 2'-0" O.C.

5 MIL UV STABILIZED POLYESTER FILM

24 GAUGE CORRUGATED SHEET METAL COLLECTOR SURFACE PAINTED FLAT BLACK

12x4 CONTINUOUS W/ 1/2" X 7/8" RABBETTED EDGE

5 MIL POLYESTER FILM BACK DRAFT FLAP, ATTACH TO 1x2 STRIP & INSERT INTO SPACE BELOW RABBETTED 2x4 (STRIP MUST BE REMOVABLE)

SCREEN WIRE (CONTINUOUS) TO PREVENT FLAP REVERSAL

2x4 CONTINUOUS W/ 1/2" GYP BOARD 16" X 20" FOR AIR DEFLECTOR

2x4 CUT-IN

3 1/2" BATT INSULATION

2x4 CUT-IN CAULK

3 1/2" BATT INSULATION

2x4 CONT. BRACING

CONTINUOUS AL RIDGE 1/2" SHEATHING

METAL SUMMER VENTILATOR AIR INLET COVER

6" X 24" ATTIC VENT GRILL WITH SCREEN

NOTE: AIR DEFLECTOR & SUMMER VENT ARE OPTIONAL, PRIMARILY FOR USE IN DRY CLIMATE AREAS.

NOTE: DOUBLED TRUSSES EACH SIDE OF FURNACE SPACE TO PROVIDE SUPPORT FOR PLATFORM, FURNACE & BLOWER.

NOTE: TIGHT SEALING OF DUCT FROM PROPER OPERATION. SOLDER ALL JOINTS & SEAMS IF NECESSARY.

NOTE: WRAP ALL SUPPLY DUCTS IN UNHEATED AREAS WITH INSULATION.

1/2" PLYWOOD TO SUPPORT BLOWER & FURNACE

12" BATT INSUL.

12" VAPOR BARRIER

2x8 SILL PLATE

FILL CORES OF TOP COURSE W/ CONC.

7/8" PLASTER

#5 BARS 4'-0" O.C. (FILL CORES W/ CONC. TO FOOTING AT REBAR LOCATIONS)

8" MIN.

CEMENT PLASTER

10 MIL POLY. VAPOR BARRIER

RIGID INSUL.

SECTION 402

METAL EAVE STRIP

O.G. GUTTER

2x8 (PAINT GRADE) JOCKOUTS 2'-0" O.C.

3/8" EXT. GRADE PLYWD. MOLD

PROVIDE FLASHING AROUND ALL EXTERIOR OPENINGS.

SIDING

1/2" SHEATHING

6" BATT INSUL.

WIRE RACEWAY

2x4 BOTTOM PLATE

2x6 TREATED BAND PLATE

2x6 TREATED SILL

1/2" DIA. X 20" STL. ANCHOR BOLTS 8'-0" O.C. MAX. (TYPICAL)

BRICK

GRADE

4" DRAIN TILE (DRAIN TO DAYLIGHT)

FINISHED CEILING

12" BATT INSUL W/ VAPOR BARRIER BOTH SIDES

2-2x6 CONTINUOUS

2x6 STUD 2'-0" O.C.

2x4 CUT-IN

2x4 (TRUSS MEMBER)

2-2x4 CUT-IN

5 MIL POLYESTER FILM BACK DRAFT W/ SCREEN WIRE TO PREVENT FLAP REVERSAL

DAMPER D<sub>1</sub>

DAMPER D<sub>2</sub>

2x4 FL. J. 2'-0" O.C.

2x4 CUT-IN

PLYWOOD CUT-IN TO SEAL AIR PLENUM

3 1/2" BATT INSUL.

CAULK

WALL FINISH

2x4 STUD 2'-0" O.C.

6" BATT INSUL W/ VAPOR BARRIER AT BOTTOM. INSULATION TO BE IN CONTACT WITH ROCK FOR AIR TIGHT SEAL

18# FELT

SUB FLOOR

ROCK STORAGE

2-2x6 TREATED DROPPED GIRDER

COMPACTED SAND

RIGID INSUL.

VAPOR BARRIER

4'-0"

UNDISTURBED SOIL

8x12x16 DOUBLE CORNER CONC. BLOCK PLENUM

5x6 10/10 W.W.M.

3 1/2" CONC. SLAB

2" CONC. SUB-SLAB

WASHED RAILROAD BALLAST ROCK, APPROXIMATELY 2" IN DIAMETER, MUST BE IN CONTACT WITH INSULATION AFTER SETTLING.

SHEET METAL PLENUM COVER

2x4 TREATED PLATE

2x4 TREATED SURROUND

8'-7 3/4"

3'-6"

7'-1 7/8"

1'-10 3/4"

4'-3"

1'-4"

4'-7 1/2"

2x6 TREATED FL. J. 2'-0" O.C. BASE & SHOE MOLD

2x6 CUT-IN

CEMENT PLASTER ON WIRE MESH

8x8x16 CONC. BLOCK PIER WITH WICKS BETWEEN PIERS TO RETAIN ROCK

COMPACTED SAND

RIGID INSULATION

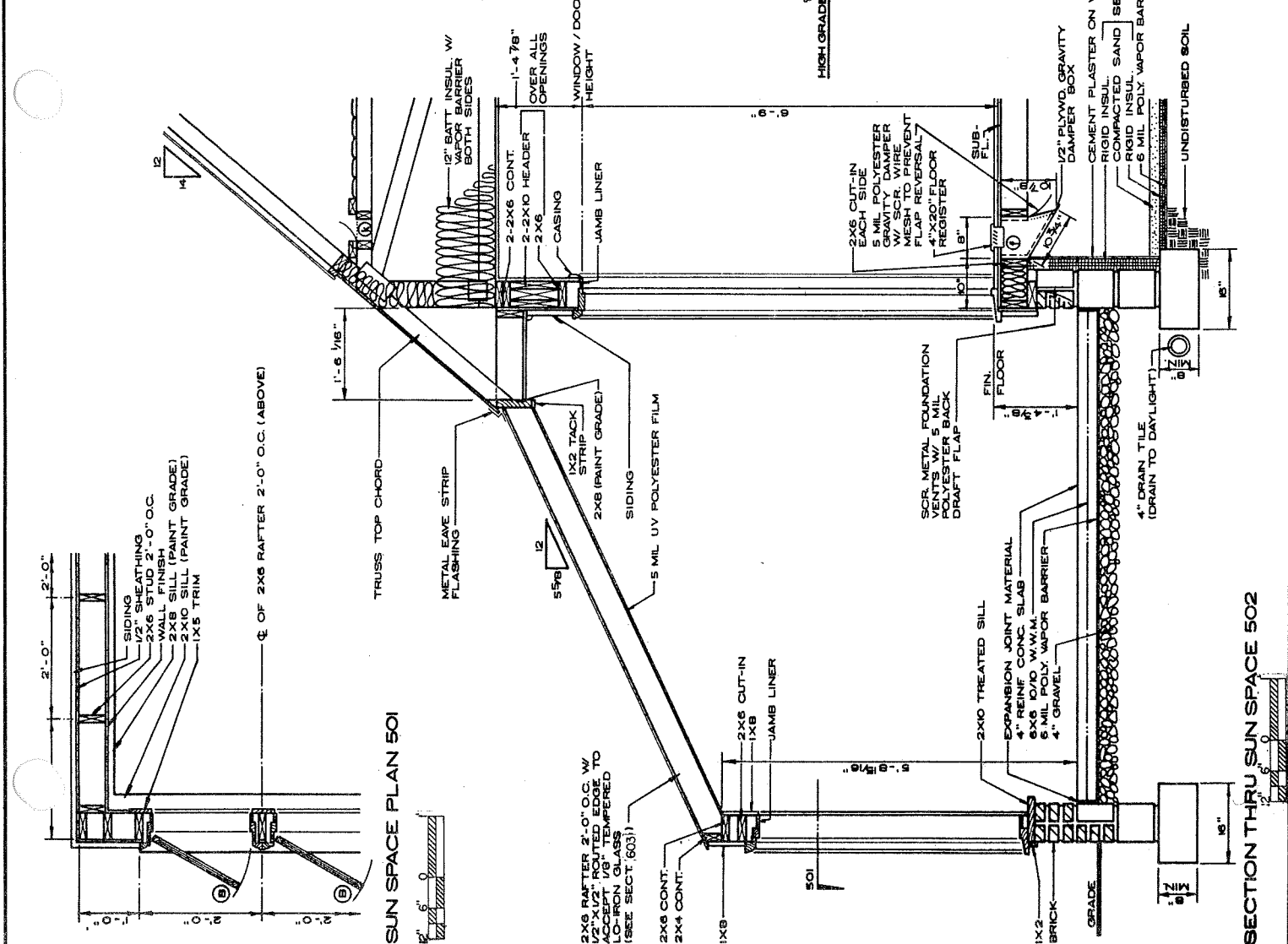
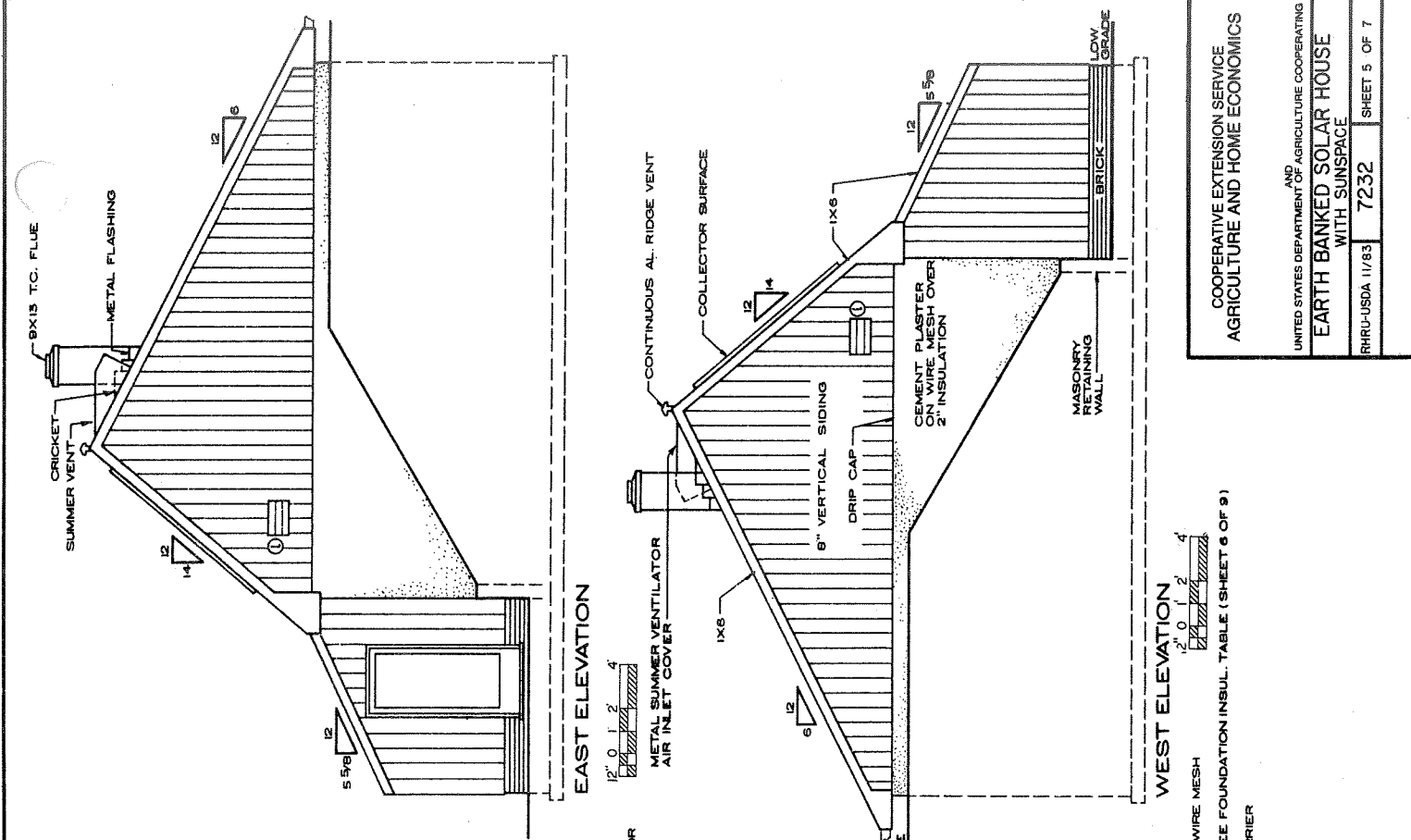
VAPOR BARRIER

4"

SEE FOUNDATION TABLE (SHEET 6 OF 9)

NOTE: CAULK ALL JOINTS BETWEEN FOUNDATION WALL, SILL BAND & FLOOR JOIST TO PREVENT AIR INFILTRATION IN RAFTER SPACE/ PLENUM AREA.

TRANSVERSE SECTION 401



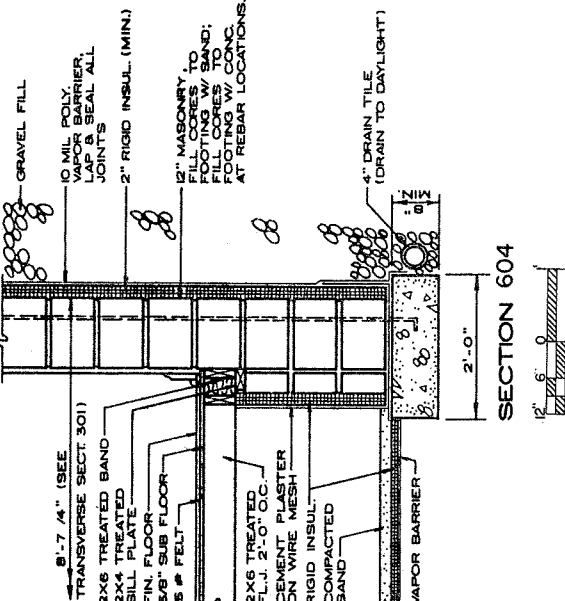
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**EARTH BANKED SOLAR HOUSE  
 WITH SUNSPACE**

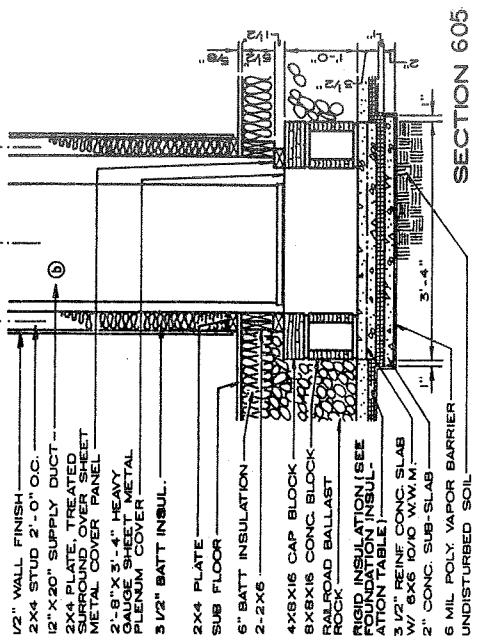
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SECTION THRU SUN SPACE 502

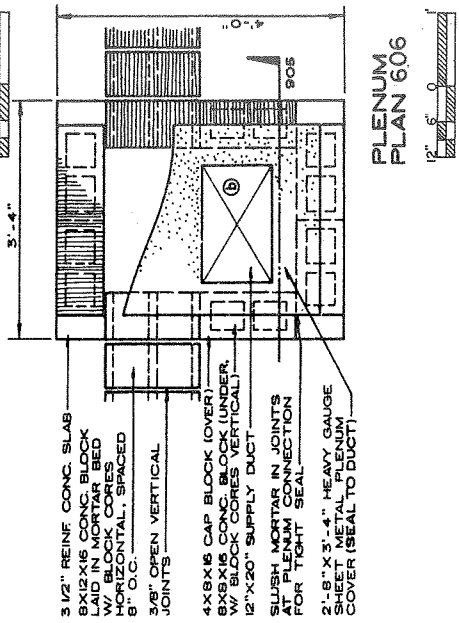
NOTE:  
ALL TREATED WOOD SHALL BE OF "GROUND PRESERVATIVE" AND BE CORROSION W/ SALT PRESERVATIVE.



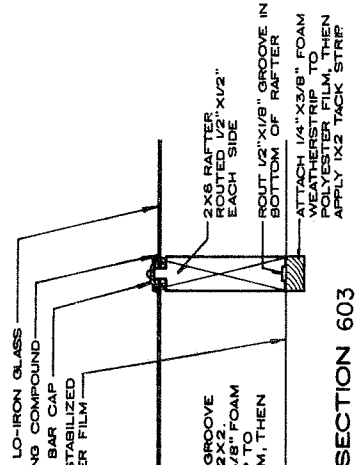
SECTION 604



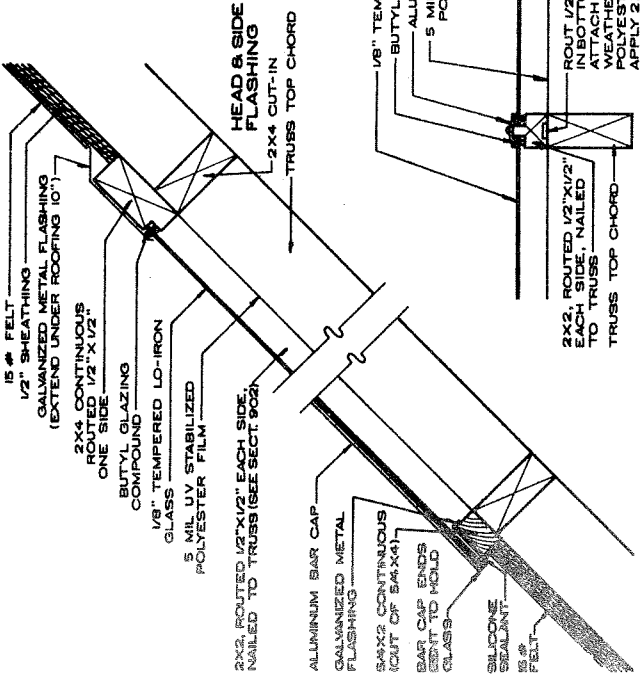
SECTION 605



PLENUM PLAN 606



SECTION 603



COLLECTOR FLASHING DETAIL 601

SECTION 602

SECTION 603

**SYMBOLS AND NOTATIONS**

- T<sub>1</sub>, T<sub>2</sub>: 24V CONTROL THERMOSTATS, HEAT-OFF, COOL SELECTION.
- DAYTON, 2E086 AND 2E161 SUBBASE
- DAYTON, 2E086 AND 2E161 SUBBASE
- WHITE ROGERS - IF 36-910 AND 920-1 SUBBASE
- T<sub>3</sub>: TWO SPEED BLOWER THERMOSTAT, SPOT LINE VOLTAGE, RATED TEMPERATURE RANGE, 0° TO 180° F.
- PENN. CONTROLS - A18AC-1
- DAYTON, 2E206
- HONEYWELL - T63C1103A
- T<sub>4</sub>: FAN AND LIMIT CONTROL SUPPLIED WITH FURNACE. USE FURNACE MANUFACTURER'S SUGGESTED SETTINGS.
- DM-1: SPRING RETURN DAMPER MOTOR, TWO POSITION, OPEN-CLOSE.
- DM-2: POWER OPEN, SPRING RETURN, 115V CONTROL VOLTAGE.
- DM-3: POWER OPEN, SPRING RETURN, 115V CONTROL VOLTAGE.
- DM-5: POWER OPEN, SPRING RETURN, 115V CONTROL VOLTAGE.
- HONEYWELL MA3M111
- HONEYWELL MA3M111
- PENN. CONTROLS - M81ACB-1 AND 24V TRANSFORMER
- DAMPERS (SEE AIR FLOW DIAGRAMS) LOW LEAK QUALITY. SPECIFY END AND BLOW SEALS, FULL OPEN AND FULL CLOSED USE.
- AMERICAN WARNING AND VENTILATING - DAA-P-10
- LOWERS AND DAMPERS, INCORPORATION
- SOLAR CONTROL CORPORATION
- HONEYWELL
- JOHNSON SERVICE CO. - D-1900
- RHD SIGMA
- HELO & ROPE GENERAL
- DEKO LABS
- SOLAR ENERGY RESEARCH CORPORATION

- SDT-1: DIFFERENTIAL THERMOSTAT AND SENSORS FOR WINTER SOLAR HEATING. SPECIFY 15°F TURN-ON DIFFERENTIAL AND 52°F TURN-OFF DIFFERENTIAL, RATED 1/2 HP 115 V.
- SDT-2: DIFFERENTIAL THERMOSTAT AND SENSORS FOR SUMMER NOCTURNAL COOLING OF ROCK STORAGE. SPECIFY 25°F TURN-ON DIFFERENTIAL AND 115 V (OPTIONAL, PRIMARILY FOR DRY CLIMATE AREAS).
- SDT-3: DIFFERENTIAL THERMOSTAT AND SENSORS FOR COOLING OF ROCK STORAGE. SPECIFY 25°F TURN-ON DIFFERENTIAL AND 115 V (OPTIONAL, PRIMARILY FOR DRY CLIMATE AREAS).
- SDT-4: DIFFERENTIAL THERMOSTAT AND SENSORS FOR COOLING OF ROCK STORAGE. SPECIFY 25°F TURN-ON DIFFERENTIAL AND 115 V (OPTIONAL, PRIMARILY FOR DRY CLIMATE AREAS).
- SD-2: SOLAR CONTROL CORPORATION
- HELO & ROPE GENERAL
- DEKO LABS
- SOLAR ENERGY RESEARCH CORPORATION
- RHD SIGMA
- HELO & ROPE GENERAL
- DEKO LABS
- SOLAR CONTROL CORPORATION

- B-1: FURNACE BLOWER - 115 V 60 CYCLE, ONE CFM/FT.<sup>2</sup> OF FLOOR AREA AT 1/2 INCHES WATER COLUMN AT 100° F AIR TEMPERATURE. SUGGEST PERMANENT SPLIT CAPACITOR MOTOR.
- SW-1: SWITCH SPST SWITCH, 1/2 HP AT 115 V.
- SW-2: HEAT-COOL SWITCH, DPDT RATED 1/2 HP AT 115 V.
- SW-3: SWITCH SPST 24 VOLT FOR CONTROL CIRCUIT.
- TR-1: 24V TRANSFORMER.

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

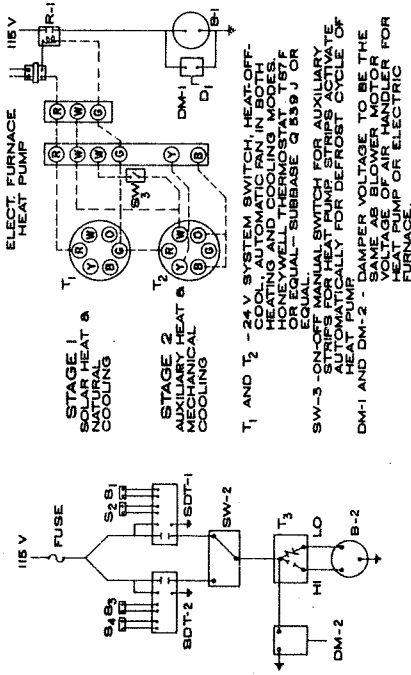
**OPERATIONS**

1. TWO STANDARD HEAT-COOL THERMOSTATS LOCATED IN HALLWAY CONTROL ELECTRIC FURNACE OR HEAT PUMP.
2. DAMPER MOTOR DM-1 IS ENERGIZED WHEN B-1 IS ON AND IS CONTROLLED BY THE DISTRIBUTION CONTROL SYSTEM HEATING OR COOLING THE HOUSE.
3. DAMPER MOTOR DM-2 IS ENERGIZED WHEN B-2 IS ENERGIZED AND IS CONTROLLED BY THE COLLECTION CONTROL SYSTEM.

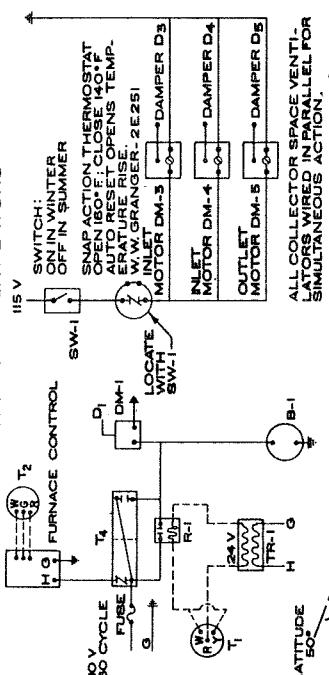
1. TWO DIFFERENTIAL THERMOSTATS CONTROL COLLECTION BLOWER B-2.
  - a. SENSOR S<sub>1</sub> IS LOCATED IN ATTIC NEAR RIDGE AND SHADED. WHEN S<sub>1</sub> IS 18°F HOTTER THAN S<sub>2</sub>, BLOWER STARTS AT LOW SPEED.
  - b. TWO SPEED BLOWER THERMOSTAT T<sub>3</sub> IS SET AT 100°F FOR HIGH SPEED.
  - c. TWO SPEED BLOWER THERMOSTAT T<sub>4</sub> IS SET AT 100°F FOR HIGH SPEED.
2. SDT-2 CONTROL BLOWER B-2 DURING SOLAR HEAT CYCLE.
  - a. SENSOR S<sub>3</sub> IS LOCATED WITHIN ATTIC INTAKE VENT; SENSOR S<sub>4</sub> IS LOCATED NEAR S<sub>2</sub> IN ROCK.
  - b. WHEN S<sub>3</sub> IS COOLER THAN S<sub>4</sub>, COLLECTION BLOWER B-2 STARTS COOL THROUGH S<sub>4</sub>.
  - c. WHEN S<sub>3</sub> IS COOLER THAN S<sub>4</sub>, COLLECTION BLOWER B-2 STARTS COOL THROUGH S<sub>4</sub>.
3. BOTH DIFFERENTIAL THERMOSTATS SDT-1 AND SDT-2, AND HEAT-COOL SWITCH SW-1 & SW-2, AND FURNACE ARE LOCATED IN OR EXP-POSED TO THE COOLER ENVIRONMENT OF THE ATTIC SPACE.

**SITE PLANNING**  
ORIENT HOUSE WITH COLLECTOR FACING SOUTH FOR OPTIMUM SOLAR ENERGY. TREES OR BUILDINGS WILL BE BLOCKING THE SUN'S RAYS. MAKE MAXIMUM USE OF EXISTING ASSETS SUCH AS NATURAL SHADE, OPEN EXPOSURE TO SUMMER BREEZES, SHELTER FROM COLD WINTER WINDS, AND GOOD 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.  
MANUAL CHANGE-OVER FROM SOLAR HEATING TO COOLING  
A. OPEN RIDGE VENT IN COLLECTOR SPACE  
B. OPEN ROOF VENT TO BLOWER B-2 AND CLOSE OFF ATTIC TO BLOWER.  
C. POSITION HEAT-COOL SWITCH SW-1 & SW-2 TO COOL.  
D. CHANGE BLOWER THERMOSTATS TO COOL.  
E. OPEN ALL SOFFIT VENTS  
F. CHANGE ALL THERMOSTATS TO HEAT.  
G. POSITION HEAT-COOL SWITCH SW-1 & SW-2 TO HEAT.  
H. CLOSE ROOF VENT TO BLOWER B-2 AND OPEN ATTIC TO BLOWER.  
I. CLOSE RIDGE VENT IN COLLECTOR SPACE.

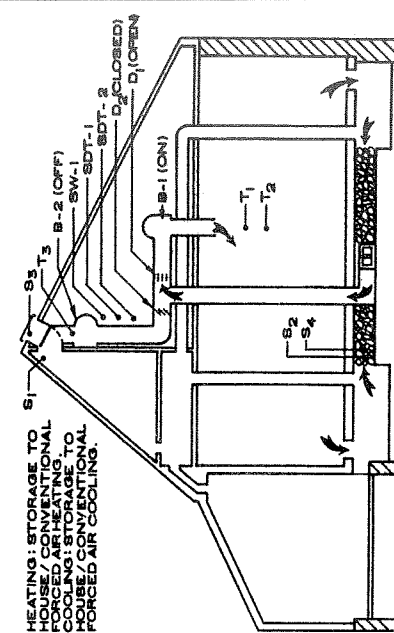
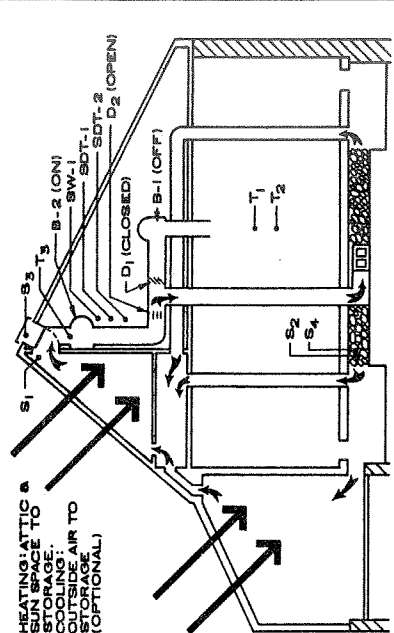
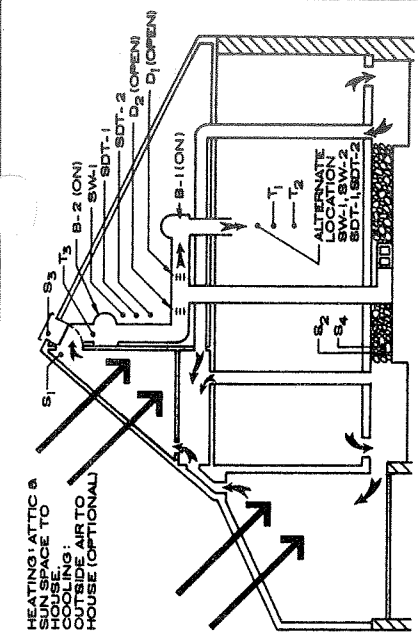
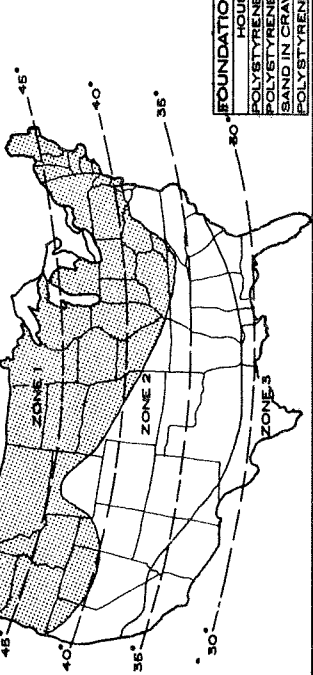
**WIRING DIAGRAM**



**DISTRIBUTION SYSTEM FOR WARM AIR OIL OR GAS FURNACE**



**COLLECTOR SPACE VENTILATORS**



**AIR FLOW FOR SIX OPERATING MODES AND CONTROL LOCATIONS**  
NO SCALE

DIAGRAMATIC REPRESENTATION OF AIR HANDLING EQUIPMENT DOES NOT INDICATE ACTUAL OPERATING LOCATION

HOUSE ZONE	1	2	3
FOUNDATION INSULATION	1 1/2"	2 1/2"	3 1/2"
POLYSTYRENE IN FOUNDATION WALL	1 1/2"	2 1/2"	3 1/2"
POLYSTYRENE BELOW ROCK	1 1/2"	2 1/2"	3 1/2"
SAND IN CRAWL SPACE	2"	2"	2"
POLYSTYRENE AT AIR PLENUM	0"	1 1/2"	2"

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RRRU-USA 11/83 7232  
SHEET 7 OF 7