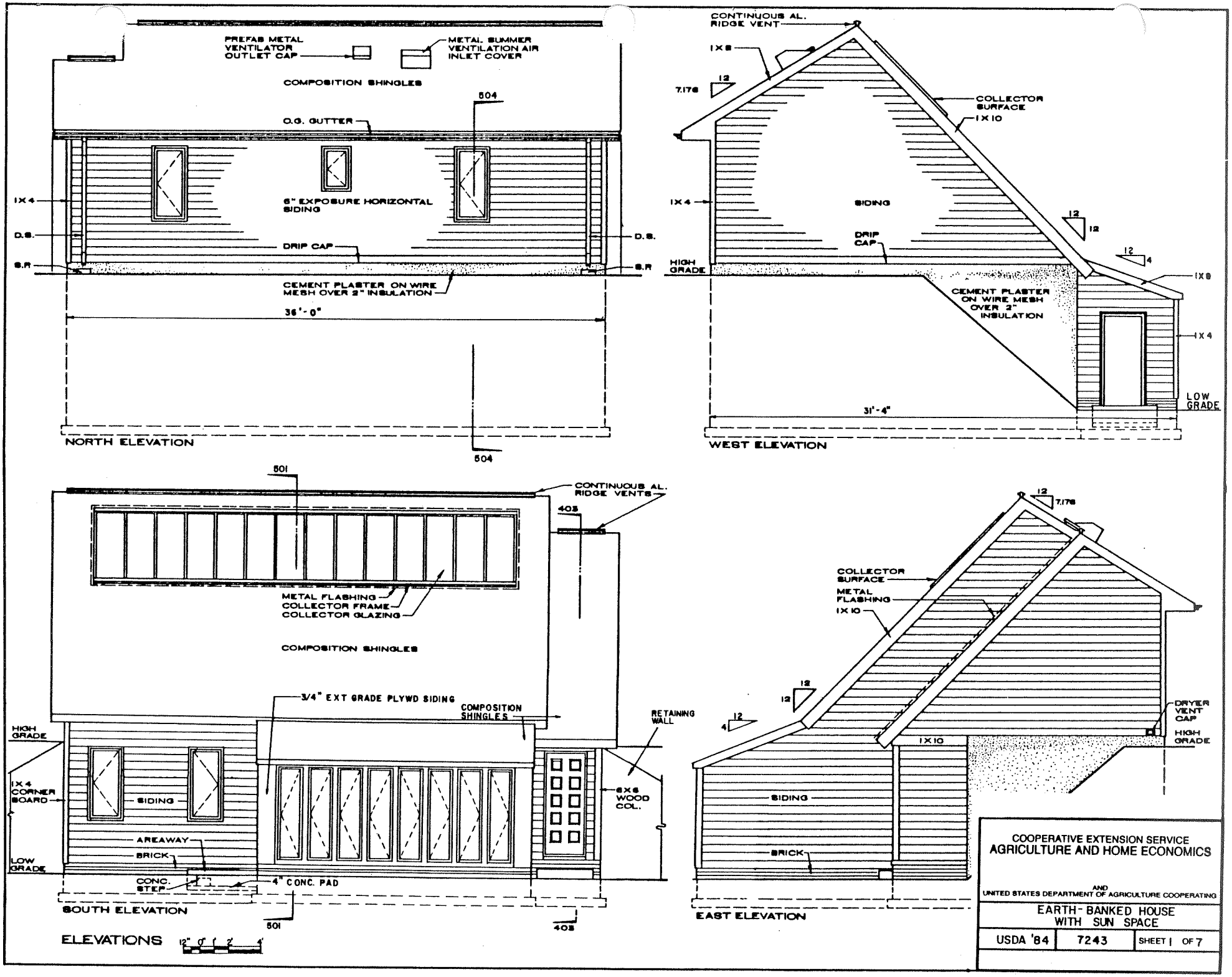
PREFAB METAL VENTILATOR OUTLET CAP
METAL SUMMER VENTILATION AIR INLET COVER
COMPOSITION SHINGLES
504
O.G. GUTTER
1X4
6" EXPOSURE HORIZONTAL SIDING
D.S.
DRIP CAP
S.R
CEMENT PLASTER ON WIRE MESH OVER 2" INSULATION
36'-0"
NORTH ELEVATION
CONTINUOUS AL. RIDGE VENT
1X8
7.17
12
COLLECTOR SURFACE
1X10
SIDING
DRIP CAP
HIGH GRADE
12
4
CEMENT PLASTER ON WIRE MESH OVER 2" INSULATION
31'-4"
LOW GRADE
WEST ELEVATION
501
CONTINUOUS AL. RIDGE VENTS
405
METAL FLASHING
COLLECTOR FRAME
COLLECTOR GLAZING
COMPOSITION SHINGLES
3/4" EXT GRADE PLYWD SIDING
COMPOSITION SHINGLES
RETAINING WALL
HIGH GRADE
1X4 CORNER BOARD
SIDING
6X6 WOOD COL.
AREAWAY
BRICK
LOW GRADE
CONC. STEP
4" CONC. PAD
SOUTH ELEVATION
501
405
ELEVATIONS
12" 0' 1' 2' 4'
COLLECTOR SURFACE
METAL FLASHING
1X10
DRYER VENT CAP
HIGH GRADE
SIDING
BRICK
EAST ELEVATION
COOPERATIVE EXTENSION SERVICE
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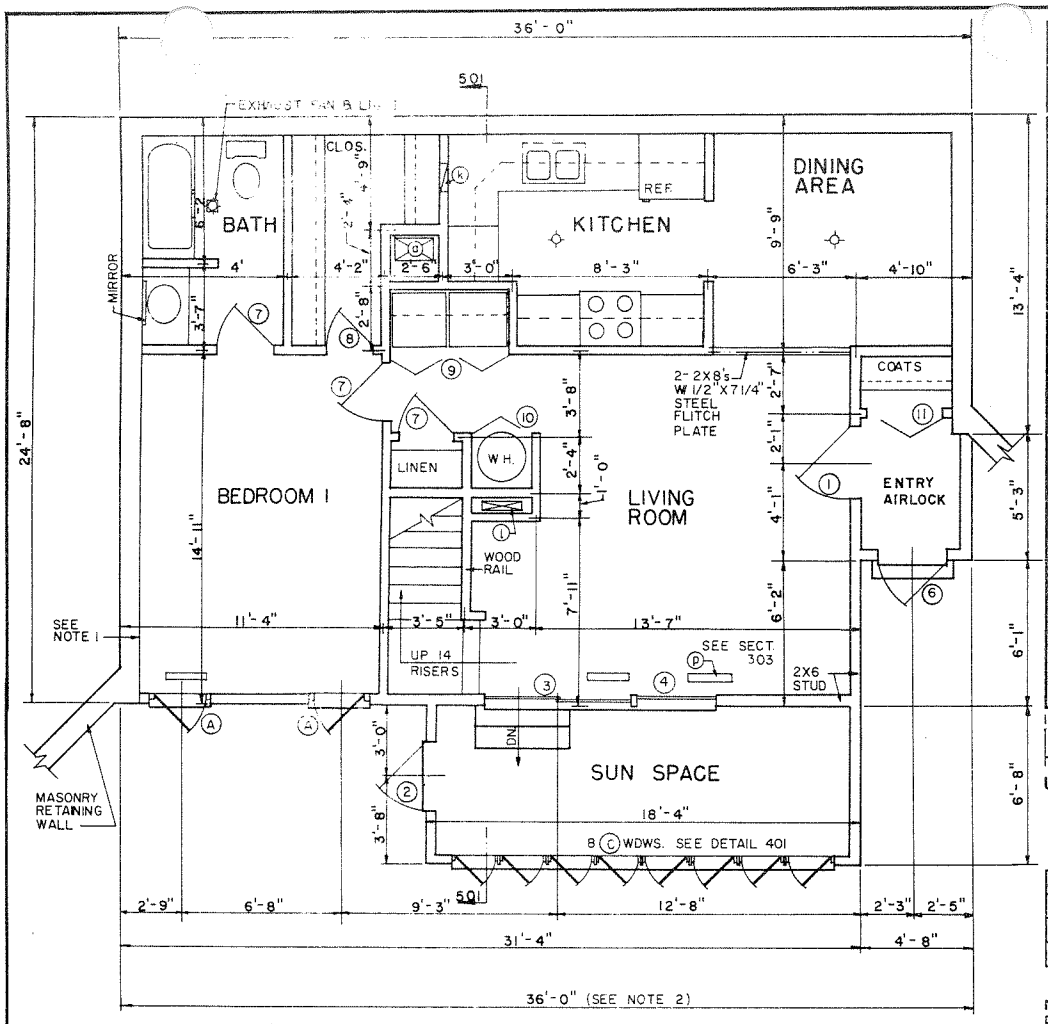
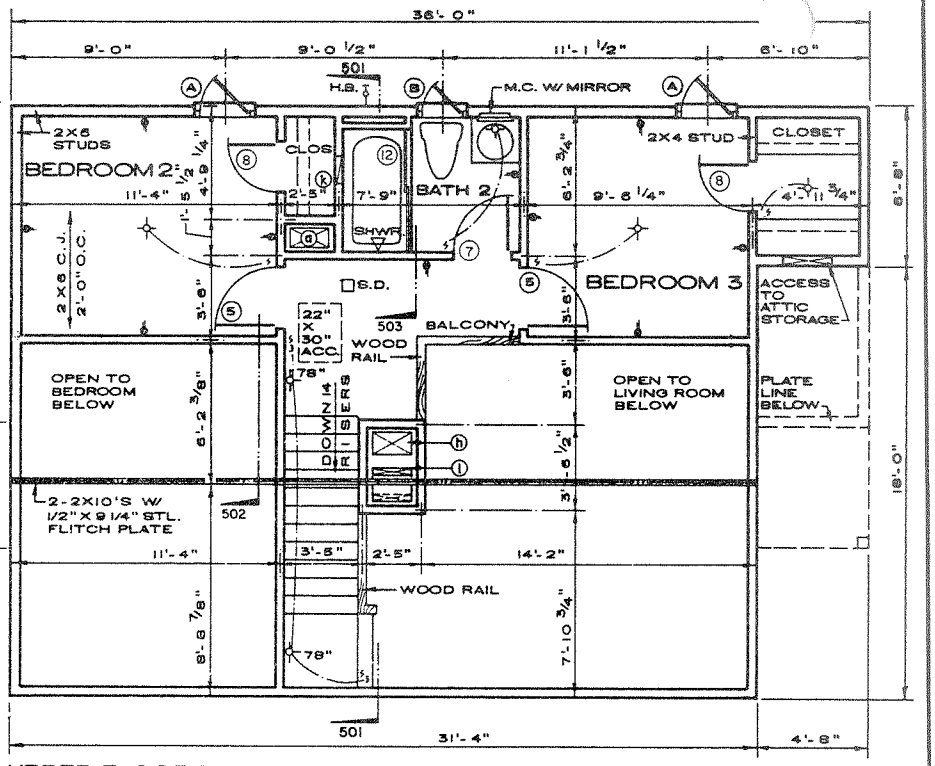
USDA '84
7243
SHEET 1 OF 7



LOWER FLOOR PLAN

12" 0" 1' 2' 4'

NOTE 1:
ANY WALL FINISHES ATTACHED DIRECTLY TO EXTERIOR MASONRY WALLS SHALL BE ATTACHED WITH APPROVED ADHESIVE. DO NOT USE FURRING STRIPS.



UPPER FLOOR PLAN

12" 0" 1' 2' 4'

* WINDOW SCHEDULE	
A	2'-4 3/8" X 4'-11 7/8" CX15 CASEMENT
B	2'-0 1/8" X 2'-11 15/16" C13 CASEMENT
C	1'-11 1/4" X 4'-7 1/4" 1N4 CASEMENT

* ANDERSEN WINDOWS

NOTE:2:
DIMENSIONS TO EXTERIOR WALLS ARE TO FACE OF STUD OR FACE OF MASONRY UNLESS OTHERWISE NOTED.
PROVIDE DOUBLE JOIST UNDER ALL LOAD BEARING PARTITIONS PARALLEL TO JOIST DIRECTION.

DOOR SCHEDULE			
1	3⁰X6⁸X1 3/8" INTERIOR	7	2⁴X6⁸X1 3/8" INTERIOR
2	2⁸X6⁹AL. STORM DOOR	8	2⁰X6⁸X1 3/8" INTERIOR
3	6⁰X6¹⁰SLIDING GLASS	9	5⁰X6⁸X1 3/8" INT. BIFOLD
4	3⁰X6¹⁰SIDE LITE	10	2⁶X6⁸X1 3/8" INT. BIFOLD
5	2⁶X6⁸X1 3/8" INTERIOR	11	3⁴X6⁸X1 3/8" INT. BIFOLD
6	3⁰X6⁹X1 3/8" EXTERIOR	12	TEMP. GLASS SHWR. DOOR

ABBREVIATIONS AND SYMBOLS

ACC.	ACCESS	O.C.	ON CENTER
AL.	ALUMINUM	PLYWD.	PLYWOOD
CAB.	CABINET	POLY.	POLYETHYLENE
C.O.	CASED OPENING	P.S.	PULL SWITCH
C.J.	CEILING JOIST	REF.	REFRIGERATOR
COL.	COLUMN	REINF.	REINFORCED
COMP.	COMPOSITION	S.D.	SMOKE DETECTOR
CONC.	CONCRETE	SCR.	SCREENED
CONST.	CONSTRUCTION	SECT.	SECTION
DET.	DETAIL	SHWR.	SHOWER
DIA.	DIAMETER	SID.	SIDING
D.W.	DISHWASHER	S.P.	SPLASH PAD
D.H.	DOUBLE HUNG	STL.	STEEL
D.J.	DOUBLE JOIST	SUSP.	SUSPENDED
D.S.	DOWN SPOUT	SHELVS.	SHELVES
DN.	DOWN	THRU	THROUGH
ELEV.	ELEVATION	W.H.	WATER HEATER
EXT.	EXTERIOR	W.P.	WATERPROOF
FIN.	FINISHED	WDW.	WINDOW
FL.	FLOOR	W.W.M.	WELDED WIRE MESH
F.J.	FLOOR JOIST		LIGHT FIXTURE
HT.	HEIGHT		CONVENIENCE OUTLET
H.B.	HOSE BIB		SWITCH
INSUL.	INSULATION		3- WAY SWITCH
INT.	INTERIOR	78"	LIGHT FIXTURE 78" ABOVE FLOOR
M.O.	MASONRY OPENING		
MAX.	MAXIMUM		
M.C.	MEDICINE CABINET		
MIN.	MINIMUM		

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EARTH-BANKED HOUSE WITH SUN SPACE

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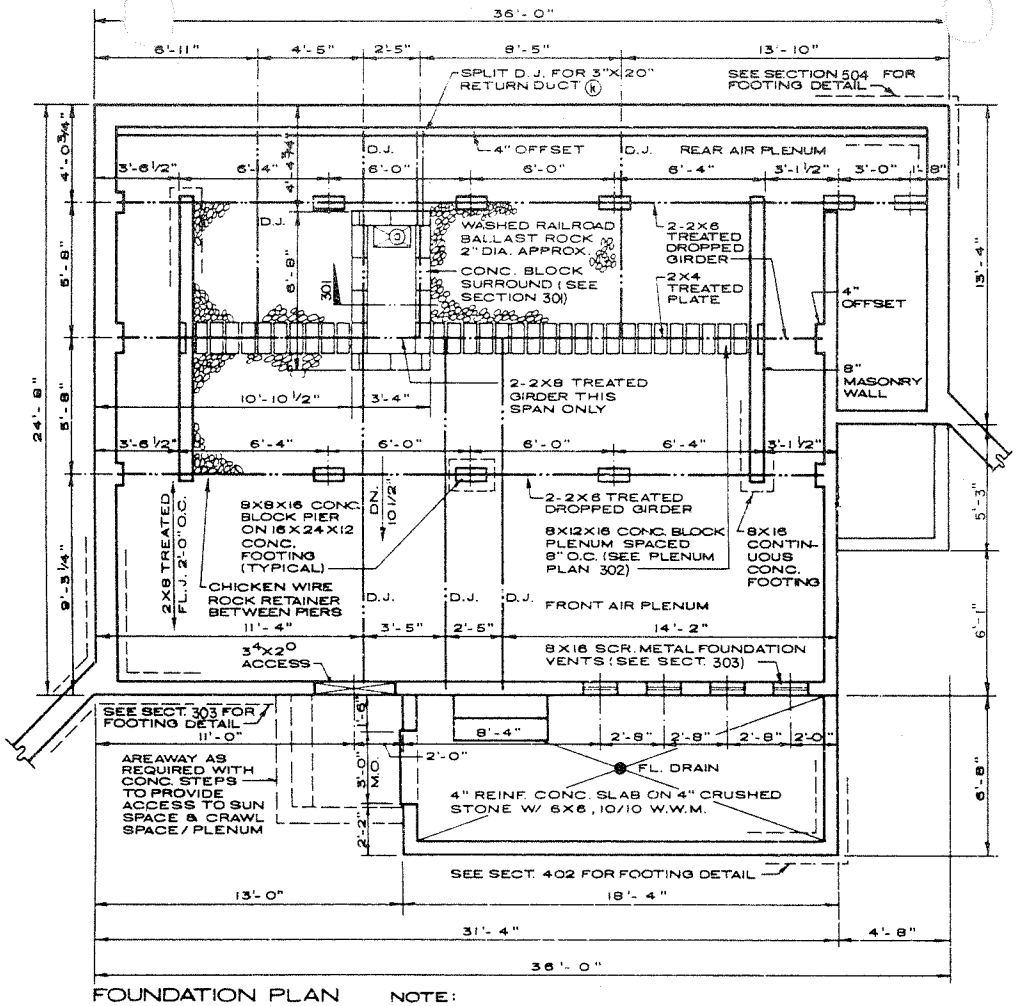


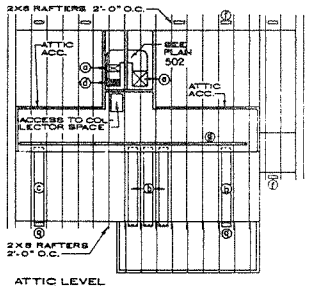
FOUNDATION PLAN

NOTE:
AIR PLENUM/ CRAWL SPACE IS EXCAVATED 10 1/2" DEEPER THAN ROCK STORAGE AREA. SEE SECT. 501 & 504

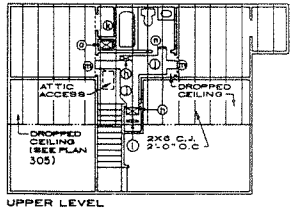
12" 0" 1' 2' 4'

SCHEDULE

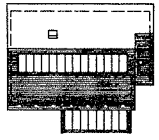
a/ 12"X20" SUPPLY DUCT TO ROCK STORAGE
b/ 3"X20" RETURN DUCT FROM SUN SPACE
c/ 3"X20" VENTILATION DUCT CONNECTING EAVE VENT TO COLLECTOR SPACE
d/ BLOWER
e/ FURNACE
f/ 16"X8" SCREENED EAVE VENT, 6'-0" O.C. TYPICAL
g/ 2" CONTINUOUS AIR SLOT IN COLLECTOR SPACE FOR AIR SUPPLY TO COLLECTOR SPACE
h/ 8" X 20" FURNACE PLENUM
j/ 8"X 30" FURNACE PLENUM
k/ 3" X 20" RETURN DUCT FROM REAR AIR PLENUM
l/ 4" X 20" RETURN DUCT FROM FRONT AIR PLENUM
m/ BRANCH SUPPLY WALL OUTLETS
n/ BRANCH SUPPLY CEILING OUTLET
o/ BRANCH SUPPLY AT COUNTER BASE
p/ 4" X 20" FLOOR REGISTER RETURN TO AIR PLENUMS
q/ 8"X20" THERMOSTATICALLY CONTROLLED COLLECTOR SPACE OR EAVE VENTS WITH MOTOR ACTUATED DAMPER (SPRING OPEN, POWER CLOSE)



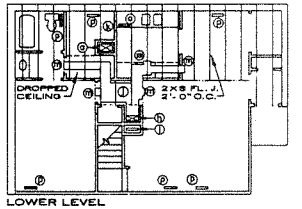
ATTIC LEVEL



UPPER LEVEL

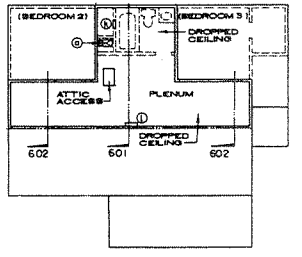


ROOF PLAN

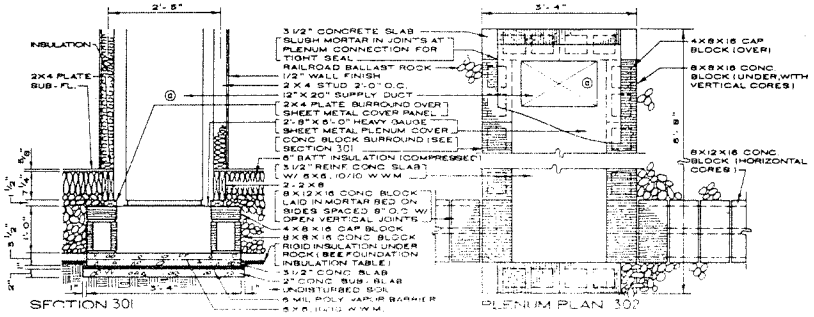


LOWER LEVEL

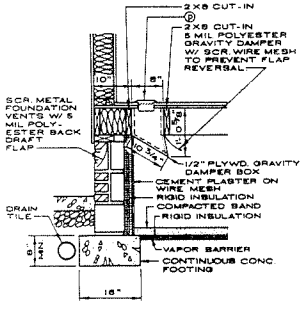
MECHANICAL PLANS



LOWER ATTIC PLENUM PLAN 305



SECTION 301 PLENUM PLAN 302



SECTION 303

COOPERATIVE EXTENSION SERVICE
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EARTH-BANKED HOUSE WITH SUN SPACE

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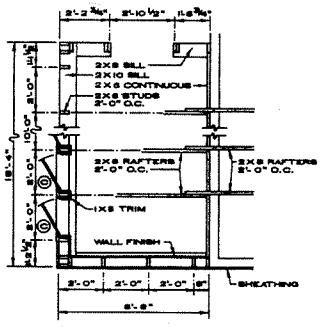
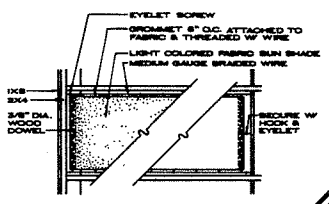


SUN SPACE PLAN 401



(OPTIONAL) FOR SOUTHERN LATITUDES OF THE U.S, GLASS PANELS FOR THE SUN ROOM ROOF WOULD BE ADVANTAGEOUS

(OPTIONAL) 2X2, ROUTED 1/2"X 1/2" EACH SIDE, NAILED TO 2X4 RAFTER, 2'-0" O.C.

1/2" SHEATHING

2X6 CONT.

1X4

1X6

8'-0"

6" BATT INSULATION

2X6 STUD 2'-0" O.C.

1/2" SHEATHING

SIDING

INSULATION CONTINUES FULL HEIGTH OF WALL

FLASHING

12

4

2X6 CONT

8'-2"

WOOD RAIL

WALL FIN.

2'-9 1/2"

9" TREADS W/ 1 1/8" NOSING

1/2" SHEATHING

1" POLYSTYRENE INSULATION

2X8 RAFTER 2'-0" O.C.

2X4 RAFTER PLATED TO 2X8 RAFTER 2'-0" O.C.

6" BATT INSULATION WITH VAPOR BARRIER ON INSIDE

FINISHED CIELING

INSULATION CONT. FROM PLATE TO RIDGE

3 1/2" SEAT CUT

WIRE RACEWAY

2X4 BOTTOM PLATE

FIN. FL.

2X8 TREATED BAND

FINISHED FLOOR

5/8" SUB-FLOOR

2X6 TREATED FL. J. 2'-0" O.C.

2X10 SILL

EXPANSION JOINT MATERIAL

4" REINF. CONC. SLAB

6X6, 10/10 W.W.M.

6 MIL POLY. VAPOR BARRIER

4" GRAVEL

FL. DRAIN

1X2

BRICK

GRADE

2'-0"

RIGID INSULATION (SEE FOUNDATION INSULATION TABLE, SHEET 8 OF 8)

2X6 TREATED SILL

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

CEMENT PLASTER OVER WIRE MESH FOR FIRE PROTECTION

COMPACTED SAND

RIGID INSULATION } SEE FOUNDATION INSULATION TABLE, SHEET 8 OF 8)

VAPOR BARRIER

UNDISTURBED SOIL

8" MIN.

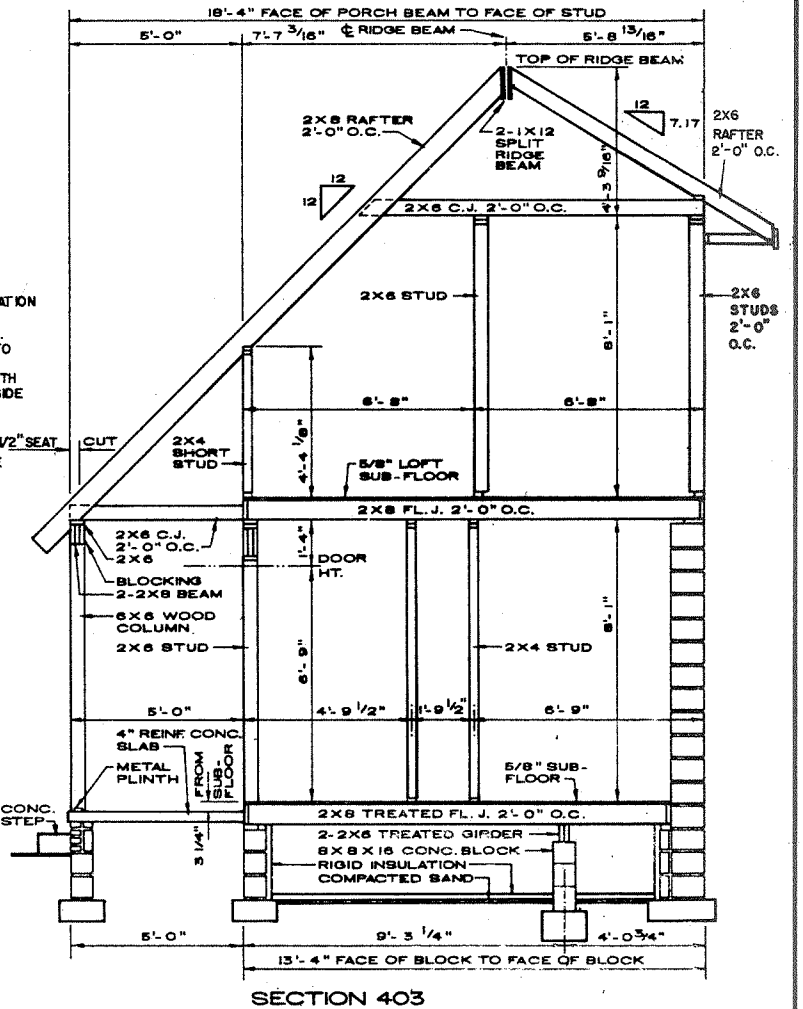
16" MIN.

CONNECT TO SUMP OR POSITIVE OUTFALL

4" DRAIN TILE; CONNECT TO SUMP OR POSITIVE OUTFALL

SECTION THRU SUN SPACE 402

12" 6" 0 1'



SECTION 403

12" 6" 0 1' 2' 3'

COOPERATIVE EXTENSION SERVICE
AGRICULTURE AND HOME ECONOMICS

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UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

EARTH - BANKED HOUSE WITH SUN SPACE

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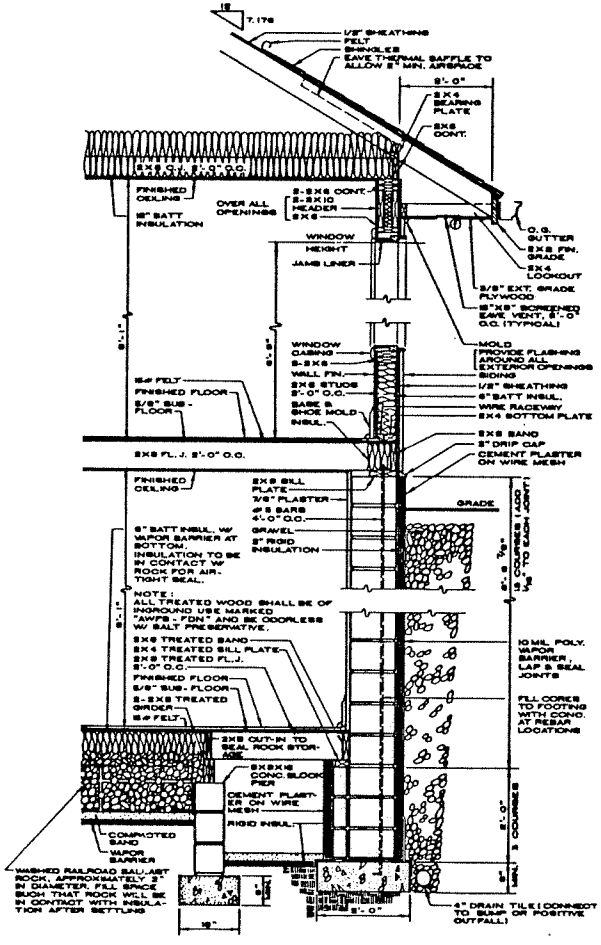
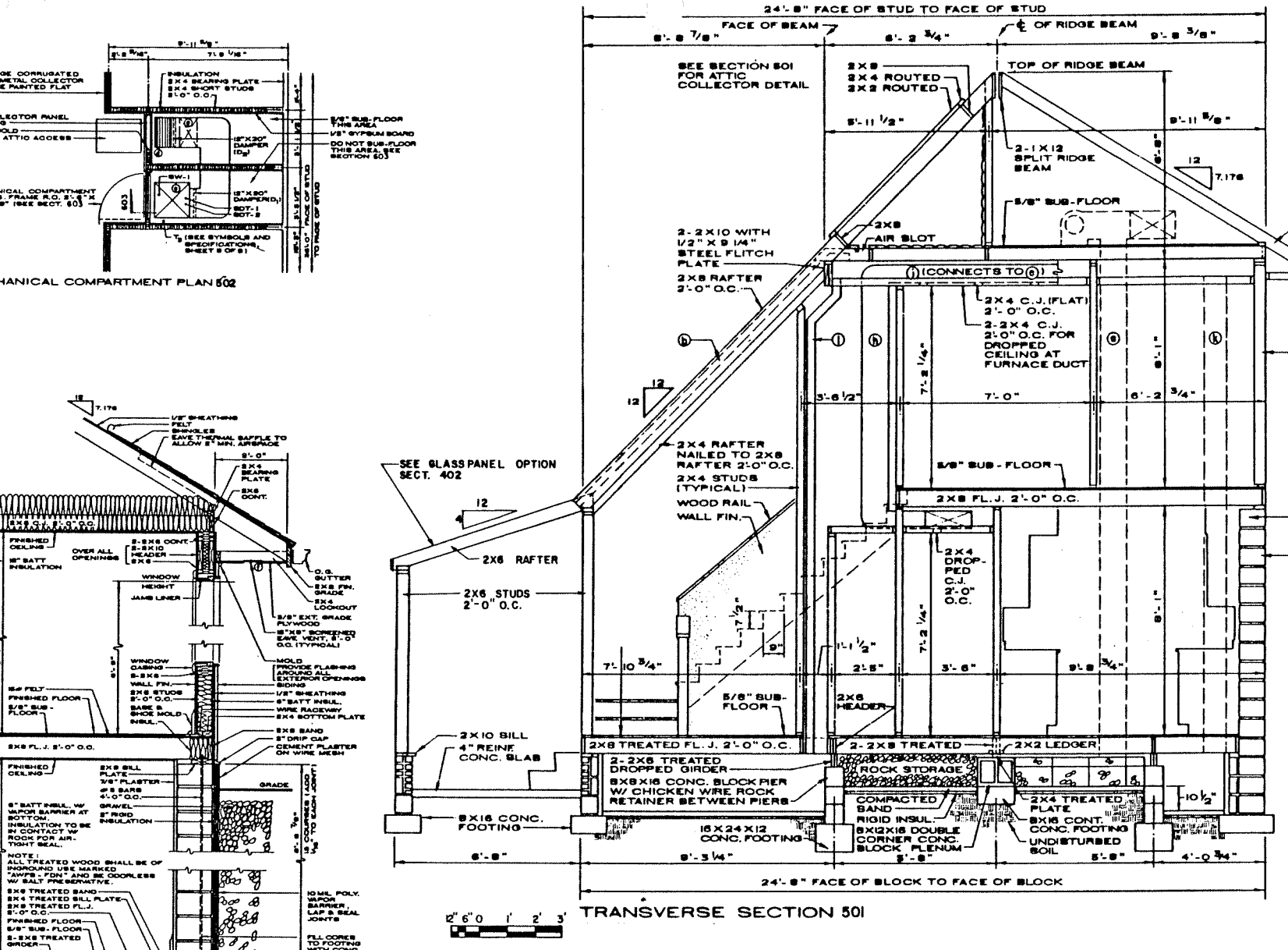
MECHANICAL COMPARTMENT PLAN 502



SECTION THRU REAR WALL 504



TRANSVERSE SECTION 501

NOTE:
CAULK ALL JOINTS BETWEEN FOUNDATION WALL, SILL, SAND & FLOOR JOIST TO PREVENT AIR INFILTRATION INTO CRAWL SPACE / PLENUM AREA.

COOPERATIVE EXTENSION SERVICE
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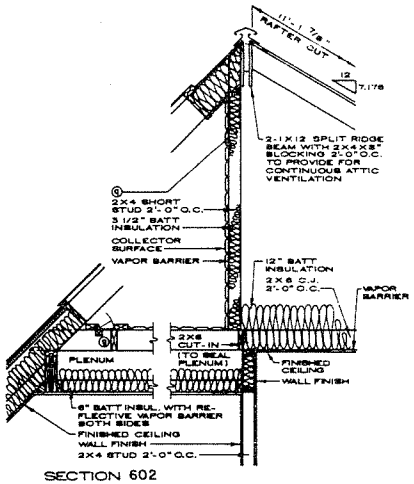
EARTH-BANKED HOUSE WITH SUN SPACE

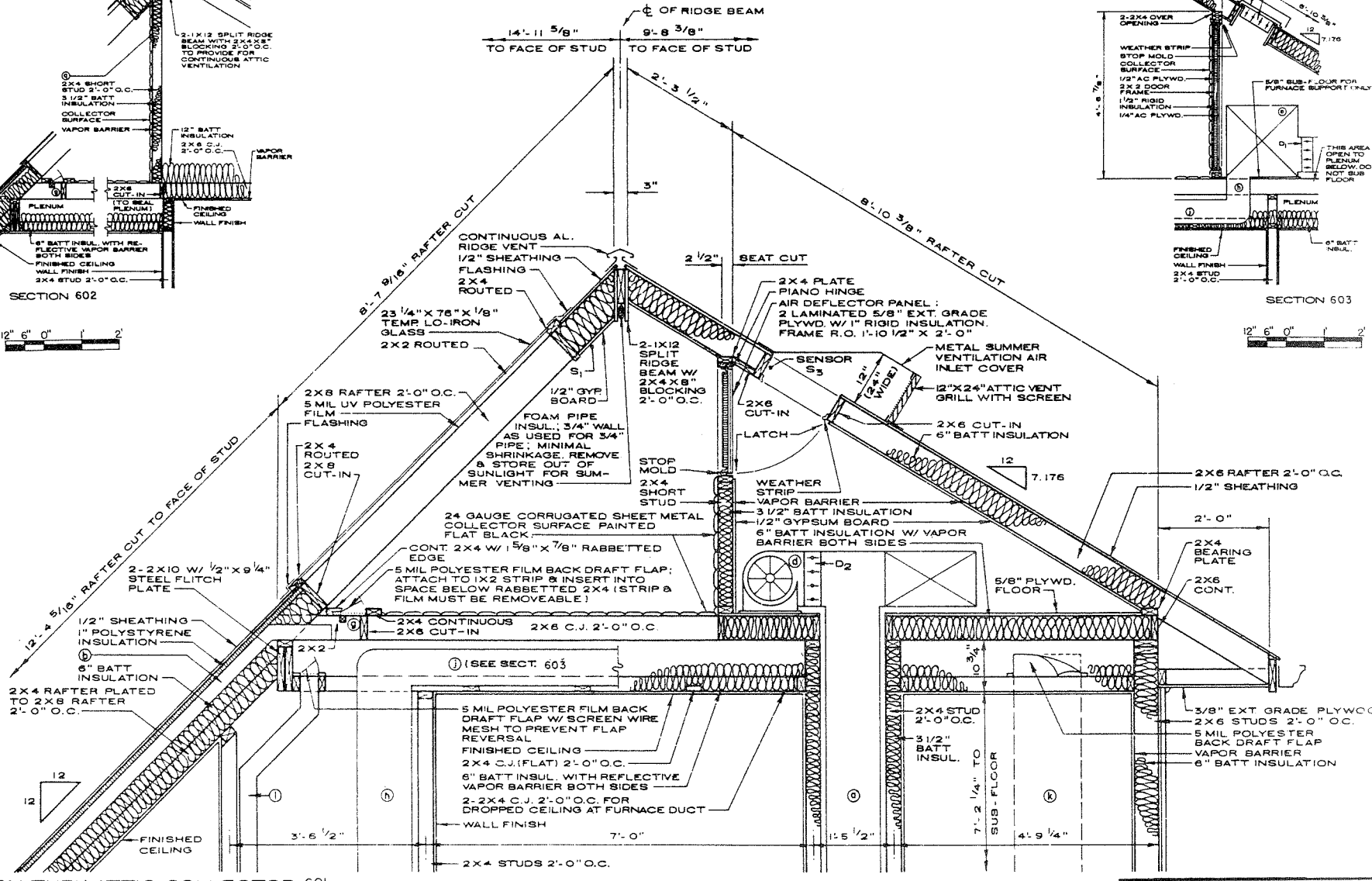
USDA '84	7243	SHEET 5 OF 7

NOTE : APPLY 2 COATS ALUMINIZED WHITE PAINT TO ALL EXPOSED WOOD MEMBERS IN COLLECTOR SPACE.



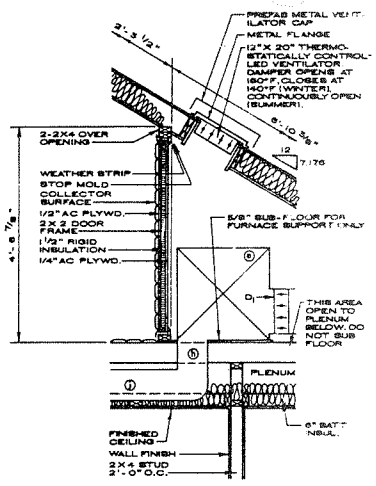
SECTION 602

12" 6" 0" 1' 2'



SECTION THRU ATTIC COLLECTOR 601

12" 6" 0 1'



SECTION 603

12" 6" 0" 1' 2'

COOPERATIVE EXTENSION SERVICE
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EARTH-BANKED HOUSE WITH SUN SPACE

USDA '84	7243	SHEET 6 OF 7

SYMBOLS AND SPECIFICATIONS

T_1 & T_2 : 24 V HEATING AND COOLING THERMOSTATS, HEAT- OFF- COOL SELECTION.

HONEYWELL - T87F AND Q539A SUBBASE
DAYTON - 2E096 AND 2E151 SUBBASE
PENN. CONTROLS - T-5IACG-1 AND Y-5ICG-1 SUBBASE
WHITE ROGERS - IF 36-910 AND S20-1 SUBBASE

T_3 : TWO- SPEED BLOWER THERMOSTAT, SPDT LINE VOLTAGE, RATED 1/2 HP. SET FOR 100° F. 2° TO 7° DIFFERENTIAL. AMBIENT TEMPERATURE RANGE, 0° TO 150° F.

PENN. CONTROLS - A19BAC-1
DAYTON - 2 E206
HONEYWELL - T631C1103A

T_4 : FAN AND LIMIT CONTROL SUPPLIED WITH FURNACE. USE FURNACE MANFACTURER'S SUGGESTED SETTINGS.

DM-1 : SPRING RETURN DAMPER MOTOR, TWO POSITION, OPEN- CLOSE.
DM-2 POWER OPEN, SPRING RETURN. 115 V CONTROL VOLTAGE.
DM-3
DM-4 BARBER COLMAN - MA-405
DM-5 HONEYWELL - M436A1116
PENN. CONTROLS - M611ACB-1 AND 24 V TRANSFORMER

D_1 : DAMPERS (SEE AIR FLOW DIAGRAMS) LOW LEAK QUALITY
D_2 SPECIFY END AND BLADE SEALS, FULL OPEN AND FULL CLOSED USE.
D_3
D_4 AMERICAN WARMING AND VENTILATING - DAA-P-10
D_5 LOUVERS AND DAMPERS, INC. - CD-500
DOSRIN ENGINEERING CORPORATION
SOLAR CONTROL CORPORATION
HONEYWELL
JOHNSON SERVICE CO. - D-1300

SDT-1 : DIFFERENTIAL THERMOSTAT AND SENSORS FOR WINTER SOLAR
S_1 HEATING. SPECIFY 15 ± 1° F TURN-ON DIFFERENTIAL AND 5 ± 1° F
S_2 TURN- OFF DIFFERENTIAL, RATED 1/2 HP 115 V.

SOLAR CONTROL CORPORATION
RHO SIGMA
HELIO & ROPE GENERAL
DEKO LABS
SOLAR ENERGY RESEARCH CORPORATION

SDT-2 : DIFFERENTIAL THERMOSTAT AND SENSORS FOR SUMMER NOCTURNAL
S_3 COOLING OF ROCK STORAGE. SPECIFY 5 ± 1° F TURN- ON
S_4 DIFFERENTIAL AND 3 ± 1° F. TURN- OFF DIFFERENTIAL, RATED 1/2 HP 115 V. (OPTIONAL, PRIMARILY FOR DRY CLIMATE AREAS.)

SOLAR ENERGY RESEARCH CORPORATION
RHO SIGMA
HELIO & ROPE GENERAL
DEKO LABS
SOLAR CONTROL CORPORATION

B-2 : COLLECTION BLOWER — 115 V 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 SHOULD BE 2 TO 3 CFM/FT.^{2} OF COLLECTOR SURFACE AT 3/8 INCHES WATER COLUMN & AT 110° F. AIR TEMPERATURE. HIGH SPEED BLOWER OUTPUT SHOULD BE 4 TO 5 CFM/FT.^{2} OF COLLECTOR SURFACE AT 3/8 INCHES WATER COLUMN & AT 110° F. AIR TEMPERATURE.

SIMILAR TO DAYTON 4 C058

B-1 : FURNACE BLOWER — 115 V 60 CYCLE, ONE CFM/FT.^{2} OF FLOOR AREA AT 1/2 INCHES WATER COLUMN AT 100° F AIR TEMPERATURE. SUGGEST PERMANENT SPLIT CAPACITOR MOTOR.

SW-1 : SWITCH SPST RATED 1/2 HP AT 115 V.
SW-2 : HEAT- COOL SWITCH, DPDT, RATED 1/2 HP AT 115 V.
SW-3 : SWITCH SPST 24 V FOR CONTROL CIRCUIT.
R-1 : SPDT RELAY, 24 VOLT COIL, RATED 1/2 HP AT 115 V.
TR-1 : 24 V TRANSFORMER.

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

OPERATIONS

A. TWO STANDARD HEAT- COOL THERMOSTATS LOCATED IN HALLWAY CONTROL ELECTRIC FURNACE OR HEAT PUMP.
1. T_1 - CONTROLS BLOWER B-1 AND IS SET AT 68° F WINTER AND 75° F SUMMER.
2. T_2 - CONTROLS AUXILIARY HEAT OR COOL AND IS SET AT 65° F WINTER AND 78° F SUMMER.

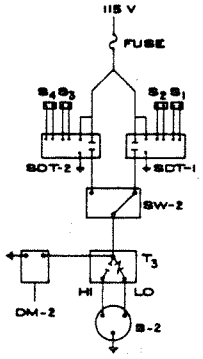
NOTE : AUXILIARY FURNACE OR HEAT PUMP SHOULD BE SIZED BY LOCAL SUPPLIER.

B. DAMPER OPERATION
1. DAMPER MOTOR DM-1 IS ENERGIZED WHEN BLOWER B-1 IS ON AND IS CONTROLLED BY THE DISTRIBUTION CONTROL SYSTEM HEATING OR COOLING THE HOUSE.
2. DAMPER MOTOR DM-2 IS ENERGIZED WHEN B-2 IS ENERGIZED AND IS CONTROLLED BY THE COLLECTION CONTROL SYSTEM.

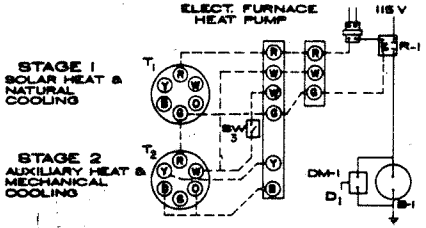
C. TWO DIFFERENTIAL THERMOSTATS CONTROL COLLECTION BLOWER B-2.
1. SDT-1 CONTROLS BLOWER B-2 DURING SOLAR HEAT CYCLE.
   a. SENSOR S_1 IS LOCATED IN ATTIC NEAR RIDGE AND SHADED ; SENSOR S_2 IS CENTERED IN ROCK, ONE FOOT IN ON COOL SIDE.
   b. WHEN S_1 IS 15° F HOTTER THAN S_2, BLOWER STARTS AT LOW SPEED.
   c. TWO SPEED BLOWER THERMOSTAT T_3 IS SET AT 100° F FOR HIGH SPEED BLOWER OPERATION WITH A 5° F. ON DIFFERENTIAL.
2. SDT-2 CONTROLS BLOWER B-2 DURING COOLING.
   a. SENSOR S_3 IS LOCATED WITHIN ATTIC INTAKE VENT; SENSOR S_4 IS LOCATED NEAR S_2 IN ROCK.
   b. WHEN S3 IS 7° F COOLER THAN S_4, COLLECTION BLOWER B-2 CIRCULATES COOL AIR THROUGH ROCK OR HOUSE.
3. FURNACE, DIFFERENTIAL THERMOSTATS SDT-1 & SDT- 2, AND HEAT- COOL SWITCHES SW-1 & SW- 2 ARE LOCATED IN OR EXPOSED TO THE COOLER ENVIRONMENT OF THE LOWER ATTIC.

WIRING DIAGRAM

COLLECTION SYSTEM



DISTRIBUTION SYSTEM

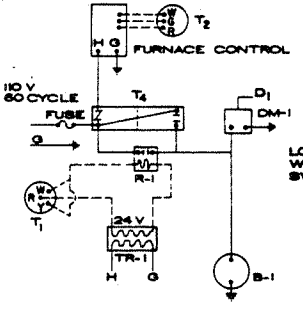


T_1 AND T_2 - 24 V SYSTEM SWITCH, HEAT-OFF-COOL, AUTOMATIC FAN IN BOTH HEATING AND COOLING MODES. HONEYWELL THERMOSTAT T87 F OR EQUAL— SUBBASE Q 539 J OR EQUAL.

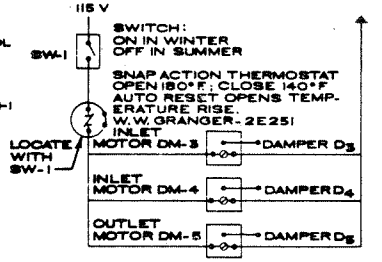
SW-3 - ON-OFF MANUAL SWITCH FOR AUXILIARY STRIPS FOR HEAT PUMP. STRIPS ACTIVATE AUTOMATICALLY FOR DEFROST CYCLE OF HEAT PUMP.

DM-1 AND DM-2 - DAMPER VOLTAGE TO BE THE SAME AS BLOWER MOTOR VOLTAGE OF AIR HANDLER FOR HEAT PUMP OR ELECTRIC FURNACE.

DISTRIBUTION SYSTEM FOR WARM AIR OIL OR GAS FURNACE



COLLECTOR SPACE VENTILATORS



ALL COLLECTOR SPACE VENTILATORS WIRED IN PARALLEL FOR SIMULTANEOUS ACTION.

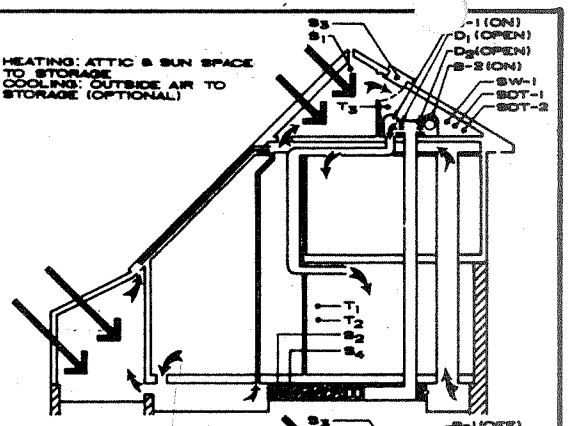
SITE PLANNING

ORIENT HOUSE WITH COLLECTOR FACING SOUTH FOR OPTIMUM SOLAR ENERGY ABSORBTION 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, OPEN EXPOSURE TO SUMMER BREEZES, SHELTER FROM COLD WINTER WINDS, AND GOOD DRAINAGE AWAY FROM HOUSE. 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.

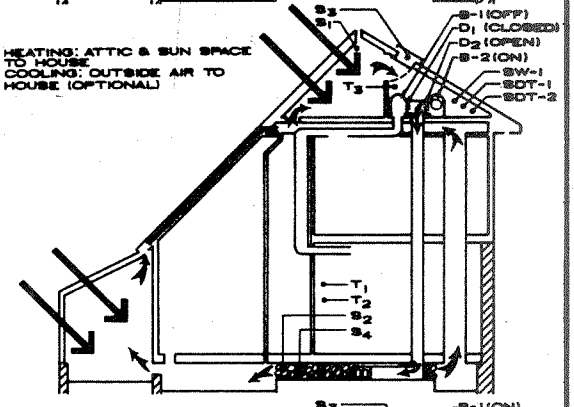
MANUAL CHANGE-OVER FROM SOLAR HEATING TO COOLING

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 BOTH HOUSE THERMOSTATS TO COOL.
E. OPEN ALL SOFFIT VENTS.

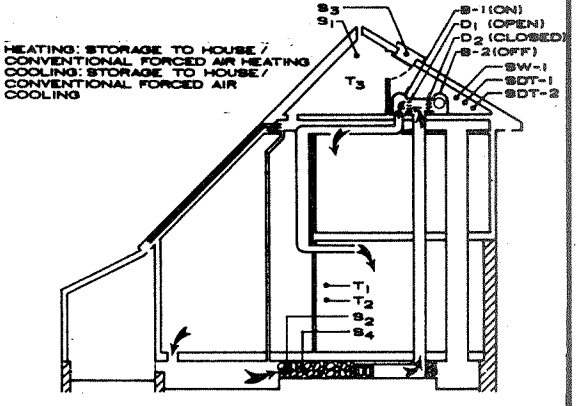
HEATING: ATTIC & SUN SPACE TO STORAGE
COOLING: OUTSIDE AIR TO STORAGE (OPTIONAL)



HEATING: ATTIC & SUN SPACE TO HOUSE
COOLING: OUTSIDE AIR TO HOUSE (OPTIONAL)



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



AIR FLOW DIAGRAMS FOR SIX OPERATING MODES AND CONTROL LOCATIONS

COOPERATIVE EXTENSION SERVICE
AGRICULTURE AND HOME ECONOMICS

AND
UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING

EARTH-BANKED HOUSE WITH SUN SPACE

USDA '84	7243	SHEET 7 OF 7