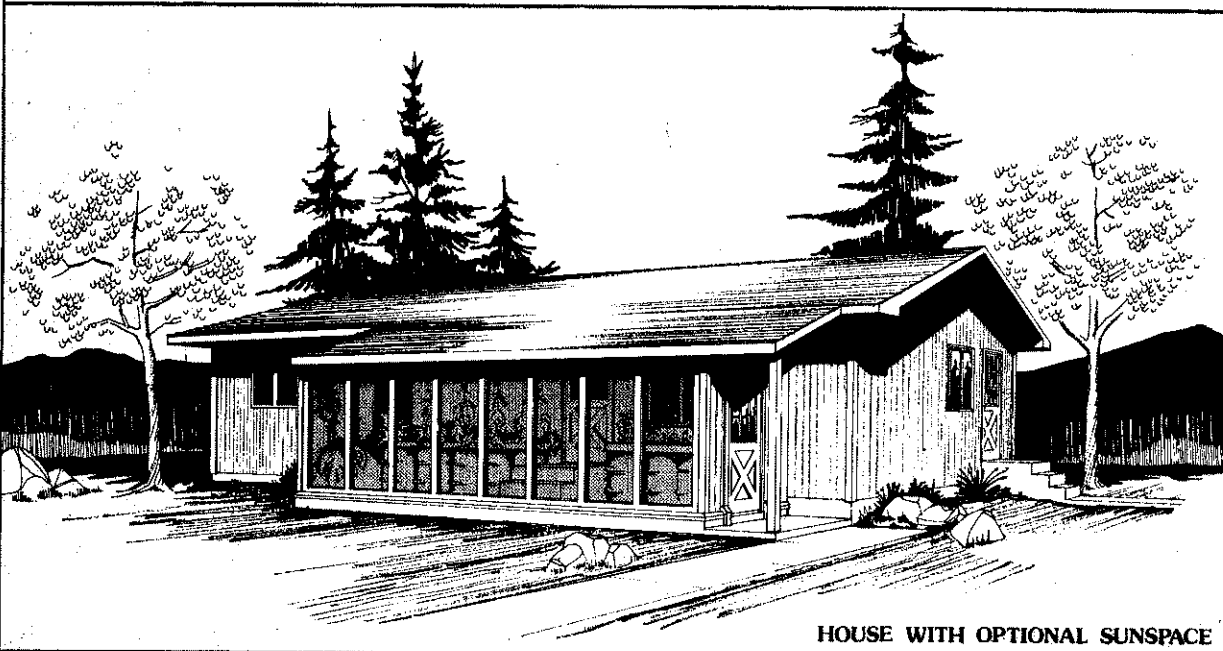


VIEW FROM SOUTHEAST



HOUSE WITH OPTIONAL SUNSPACE

A Low Cost Three Bedroom Two Bath Superinsulated House For Cold Climates

INDEX

- 1 Cover Sheet With Perspective Views
- 2 Alternative Site Layouts
- 3 Main Floor Plan and Schedules
- 4 Basement Floor Plan and Schedules
- 5 Foundation Plan and Details
- 6 Wall Sections
- 7 Stair Section and Miscellaneous Details
- 8 Window and Glazing Details
- 9 Kitchen and Bath Elevations and Schedules
- 10 Exterior Elevations
- 11 Main Floor Electrical and Heating Plan
- 12 Basement Electrical and Heating Plan
- 13 Air-to-Air Heat Exchanger System and Details
- 14 Double Wall Construction Sequence

This drawing is not a contract. It is a representation of the design of the house. The actual construction of the house is subject to the terms and conditions of the contract. The owner is responsible for obtaining all necessary permits and for the accuracy of the information provided. The architect is not responsible for the accuracy of the information provided. The architect is not responsible for the accuracy of the information provided.

DRAWN BY: J. CORBETT
CHECKED BY: J. CORBETT
DATE: JULY 4, 1982
REVISED:

Superinsulated House
NCCAT
RESOURCES: VICTORIA, B. C.

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PO Box 3033, Victoria, BC V8W 2G7
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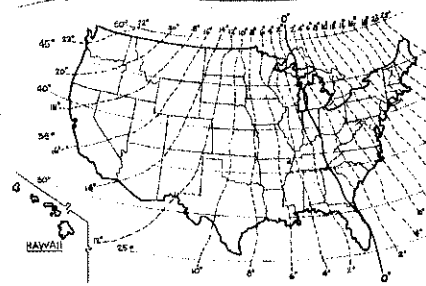
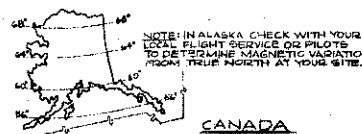
SITING AND LANDSCAPING NOTES

NOTE:

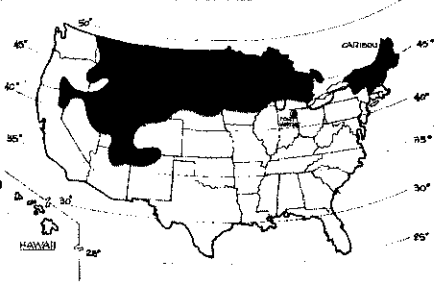
1. PLAN MAY BE REVERSED ALONG THE EAST-WEST AXIS, BUT SHOULD NOT BE REVERSED ALONG THE NORTH-SOUTH AXIS.
2. DEVIATION OF 10 TO 30 DEGREES FROM TRUE SOUTH SHOULD NOT SIGNIFICANTLY AFFECT PERFORMANCE. IF POSSIBLE, AN EASTERLY DEVIATION MAY BE MORE ADVANTAGEOUS THAN A WESTERLY ONE, SINCE THAT EARLY MORNING SOLAR GAIN IS MORE DESIRABLE THAN AFTERNOON SOLAR GAIN.
3. IF LOCATING TRUE SOUTH WITH A COMPASS, BE SURE TO CORRECT FOR LOCAL MAGNETIC VARIATION (SEE MAP OF CORRECTION FACTORS ON THIS SHEET).
4. ALL SITE PLANS ON THIS SHEET ARE SHOWN FOR PURPOSES OF ILLUSTRATION ON AN ASSUMED LOT SIZE OF 12,000 SQUARE FEET (60' X 160'). PLACEMENT OF THE HOUSE ON SMALLER LOTS IS POSSIBLE PROVIDED ZONING AND SETBACK REQUIREMENTS ARE MET, AND DEPENDING ON THE SIZE AND PLACEMENT OF THE GARAGE.
5. VERIFY ALL SETBACK AND ZONING REQUIREMENTS WITH LOCAL AUTHORITIES. SETBACKS SHOWN ON THIS SHEET ARE ASSUMED TO BE 10' ON REAR, 8' ON SIDES, AND 24' ON FRONT YARD.
6. PEAK LOAD ANALYSIS OF THIS DESIGN IS ONLY PRESENTED HEREIN FOR GREAT FALLS, MONTANA (7550 DEGREE DAYS, 5642' ABOVE SEA LEVEL, AND 147 DEGREE 50 MINUTES NORTH LATITUDE). THE DESIGN SHOULD PERFORM REASONABLY IN MOST NORTHERN GREAT PLAINS REGIONS OF SIMILAR CLIMATE, BUT BECAUSE MICRO-CLIMATE CONDITIONS MAY VARY, THE BUILDER IS ADVISED TO CHECK WITH LOCAL ENGINEERS OR ARCHITECTS BEFORE CONSTRUCTION. (SEE ALSO PROJECTIONS OF ANNUAL HEATING COST FOR FIVE NORTHERN CITIES - THIS SHEET.)

7. EVERGREEN PLANTINGS SHOULD BE UTILIZED AS WINDBREAKS TO THE NORTH AND NORTHWEST, OR SUCH AS TO SHIELD THE HOUSE FROM THE SITE'S PREVAILING WINDS.

8. DECIDUOUS PLANTINGS MAY BE UTILIZED TO THE WEST, SOUTHWEST, AND SOUTHEAST TO BLOCK UNWANTED SOLAR GAIN IN SUMMER, YET ADMIT SOLAR GAIN IN WINTER.



U.S. MAP SHOWING VARIATION OF MAGNETIC NORTH FROM TRUE NORTH



U.S. MAP SHOWING AREAS OF 7000 DEGREE DAYS AND COLDER

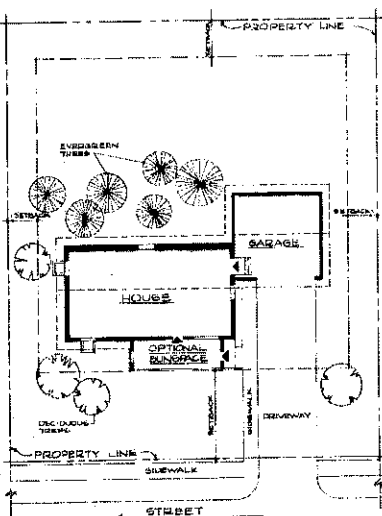
HOW TO DETERMINE TRUE SOUTH FROM MAGNETIC NORTH USING A COMPASS

1. DETERMINE MAGNETIC NORTH USING A COMPASS.
2. LOCATE YOUR POSITION ON THE MAP SHOWN ABOVE TO DETERMINE THE MAGNETIC VARIATION FROM TRUE NORTH.
3. IF YOUR LOCATION IS WEST OF THE 0° DEGREE MAGNETIC VARIATION LINE, THE READINGS ON THE MAP INDICATE HOW FAR TRUE NORTH LIES TO THE WEST OF MAGNETIC NORTH, AND YOUR ADJUSTMENT WILL BE THAT MANY DEGREES TO THE WEST FOR TRUE NORTH.
4. IF YOUR LOCATION IS EAST OF THE 0° DEGREE MAGNETIC VARIATION LINE, THE READINGS ON THE MAP INDICATE HOW FAR TRUE NORTH LIES TO THE EAST OF MAGNETIC NORTH, AND YOUR ADJUSTMENT WILL BE THAT MANY DEGREES TO THE EAST FOR TRUE NORTH.
5. ADDING 180° TO YOUR TRUE NORTH HEADING WILL GIVE YOU TRUE SOUTH.

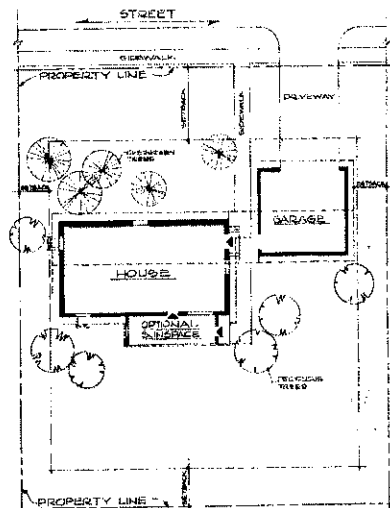
PROJECTION OF ANNUAL HEATING COST FOR FIVE NORTHERN CITIES

LOCATION	HOUSE ONLY				HOUSE WITH ADD'D SUBSPACE			
	1980 COST PER YEAR (\$)	1980 COST PER YEAR (\$)	1980 COST PER YEAR (\$)	1980 COST PER YEAR (\$)	1980 COST PER YEAR (\$)	1980 COST PER YEAR (\$)	1980 COST PER YEAR (\$)	% AS PERCENT OF HOUSE ONLY
SPRINGMOUNT	3602	1076	1524	2158	26	1472	1528	191
MINNEAPOLIS	3054	2000	1024	1077	24	1028	1028	250
WEST WYOMING	5209	1282	370	2524	14	1251	261	500%
MINNEAPOLIS MN	3310	1382	542	1839	17	5243	170	451%
Caribou ME	3215	1634	1264	2899	21	1487	1079	514

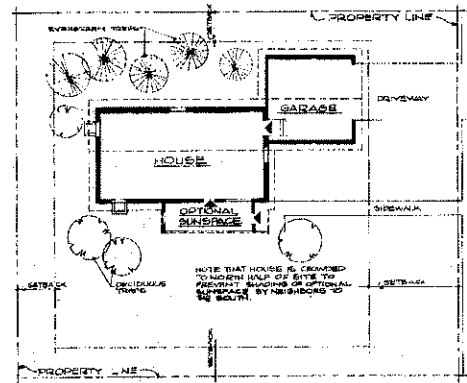
OPERATING COSTS FOR HEAT ONLY FOR THE HOUSES WITH AND WITHOUT THE OPTIONAL SUBSPACE ARE PRESENTED ABOVE FOR FIVE NORTHERN CITIES BASED ON COMPLETE DATA FURNISHED BY INTERACTIVE RESOURCES INC. POINT RICHMOND CALIFORNIA USING THE GARAGE & COMPOSITE DESIGN DEVELOPED BY THE BUREAU OF SOLAR ENERGY RESEARCH. THE DESIGN WAS REFINED TO BE OPTIMAL FOR GREAT FALLS ALBERTA WHERE IN THE SUBSPACE A MINIMUM TEMPERATURE OF 10°F WAS USED AND MAINTAINED WITH PORTABLE ELECTRIC HEATERS. THE USE OF THE SUBSPACE HEATMENT WAS ASSUMED TO BE UNLIMITED. THE USE OF THE SUBSPACE HEATERS ON THE HOUSE WINDOWS AND INTERNAL CURTAIN IN THE SUBSPACE (OR SUBSTITUTION OF 600W IS IN WINTER) WILL NOT REDUCE HEATING COSTS EVEN IN MONTANA AND MINNEAPOLIS WITH HOURS OF CHILLING WIND. BUILT WITH MILLION LEVELS OF INSULATION AND HEATERS, THE COSTS FOR HEATING ABOVE SHOULD BE VIEWED AS CONSERVATIVE. (ACTUAL ANNUAL COSTS FOR HEATING MAY BE SIGNIFICANTLY LOWER THAN THOSE SHOWN) HOWEVER, THE LIFE-TIME, ASB, AND NUMBER OF THOSE LIVING IN THE HOUSE CAN HAVE A SIGNIFICANT EFFECT ON THE ANNUAL HEATING REQUIREMENT AND COULD RESULT IN ANNUAL HEATING COSTS GREATER THAN THOSE SHOWN ABOVE.



ACCESS FROM SOUTH WITH ATTACHED GARAGE
SCALE 1/4" = 1'-0"



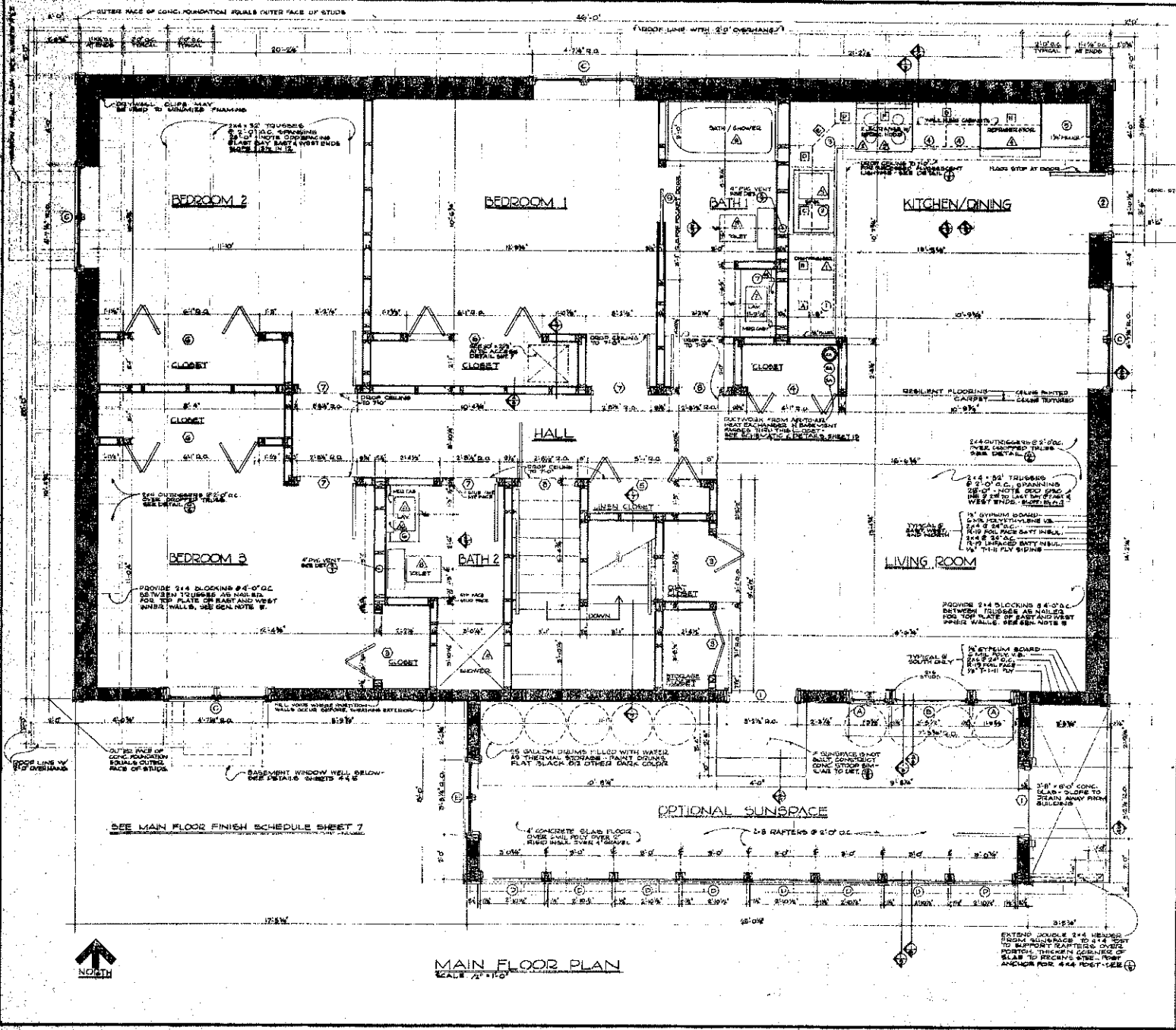
ACCESS FROM NORTH WITH DETACHED GARAGE
SCALE 1/4" = 1'-0"



ACCESS FROM EAST WITH ATTACHED GARAGE (REVERSE PLAN FOR ACCESS FROM WEST)
SCALE 1/4" = 1'-0"

LOT LAYOUT FOR SITES WITH VARYING ACCESS TO THE STREET

DRAWN BY: G. COBBETT
 CHECKED BY: [Signature]
 DATE: JULY 21, 1982
 PROJECT: [Project Name]
 SCALE: 1/4" = 1'-0"
 SHEET: 2 OF 14
 THE NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY
 PO Box 3000, Butte, Montana 59721



- ### GENERAL NOTES
1. ALL FRAMING DIMENSIONS RUN FROM STUD FACE TO STUD FACE UNLESS OTHERWISE INDICATED.
 2. ALL EXTERIOR CORNERS REQUIRE PROPER DIAGONAL BRACING AND SHOULD BE CHECKED BY BUILDING INSPECTOR BEFORE STARTING CONSTRUCTION.
 3. ONE OF THE PRIME FACTORS AFFECTING THE THERMAL PERFORMANCE OF THIS HOUSE IS THE CONSTRUCTION OF THE WALLS. THE INSULATION VARIOUS BARRIERS EXTRA CARE SHOULD BE TAKEN TO BE SURE THAT THE BARRIERS DO NOT INTERFERE. A GOOD METHOD OF CHECKING THE CONSTRUCTION OF THE WALLS IS TO OBTAIN A COPY OF THE FOUNDATION AND WALL SHEET IS FOR STEP-BY-STEP CONSTRUCTION REQUIREMENTS.
 4. FILL ALL SHIM SPACES AND CRACKS AT DOOR AND WINDOW THRESHOLS WITH A CLOSET DOOR AND WINDOW WITH LEAKS.
 5. PROVIDE #14 BLOCKING BETWEEN TRUSSES WHERE REQUIRED FOR NAILING TOP PLATE OF ALL PARTITION WALLS AS WELL AS TO PROVIDE A POINT OF ATTACHMENT FOR SHEET WALL. (NOTE THAT THIS BLOCKING IS NOT SHOWN ON THIS SHEET.)
 6. WINDOWS IN THIS HOUSE, EVEN THOUGH TRIPLE GLAZED, WILL BE NEARLY 75% OF THE TOTAL HEAT LOSS AT PEAK HEATING LOADS. THE HOUSE BUILT TO THIS STANDARD HAS BEEN DESIGNED TO COMPENSATE FOR THIS LOSS. THE DESIGNER HAS ADVISED TO CONSIDER SOME FORM OF WINDOW COATING OR WINDOW FILM. HOWEVER, THE DESIGNER IS NOT RESPONSIBLE FOR THE SELECTION OF ANY WINDOW FILM OR WINDOW COATING. THE SELECTION OF ANY WINDOW FILM OR WINDOW COATING IS THE RESPONSIBILITY OF THE OWNER. THE DESIGNER HAS ADVISED TO CONSIDER SOME FORM OF WINDOW COATING OR WINDOW FILM. HOWEVER, THE DESIGNER IS NOT RESPONSIBLE FOR THE SELECTION OF ANY WINDOW FILM OR WINDOW COATING. THE SELECTION OF ANY WINDOW FILM OR WINDOW COATING IS THE RESPONSIBILITY OF THE OWNER.
 7. IF OPTIONAL SUNSPACE IS TO BE BUILT SELECT GOOD QUALITY STAINLESS STEEL FOR THE GLAZING MATERIALS. RATCH DOOR GLAZING PANELS SQUARE AND TRUSS AND AN INSULATED WINDOW ON THE GLAZING PANELS ARE EXACT DIMENSIONS AND WILL NOT FIT RIGHT UNLESS THE FRAMING IS ACCURATE.
 8. OTHER EXTERIOR FINISH MATERIALS MAY BE SUBSTITUTED IF THEY PROVIDE EQUIVALENT DURABILITY, WEATHER RESISTANCE, AND ECONOMIC VALUE.
 9. DOOR BLOCKING REQUIREMENTS IN CLOSETS AND OTHER PLACES WHERE CLEARANCES ARE LIMITED ARE SHOWN WITH DIMENSIONS AND NOTES ON THIS SHEET.
 10. IF THE BUILDER elects TO APPLY DOOR WALL GLAZING, HOLES SHOULD BE DRILLED BETWEEN STUDS FOR NAILING EDGE OF DOOR THRESHOLDS.
 11. IF OPTIONAL SUNSPACE IS NOT BUILT A RAIN SUTTER SHOULD BE PROVIDED OVER THE MAIN ENTRY.
 12. ALL DOOR THRESHOLS SHOULD BE SELECTED FROM AN ENERGY EFFICIENT MANUFACTURER. DOOR THRESHOLS IN COMMERCIAL DRIPPING.
 13. ALL SLIDING WINDOWS SHOULD BE FITTED WITH FLOW METER DETECTORS FOR WATER CONSTRUCTION.
 14. SETTING THE THERMOSTAT BACK AN INCH DURING THE WINTER MONTHS WILL RESULT IN A SIGNIFICANT ADDITIONAL DECREASE IN HEATING ENERGY USAGE.
 15. WHERE LOCAL WINDITIONS HAVE A KNOWN TENDENCY TO DAMAGE FOUNDATIONS (E.G. IN AREAS WHERE SOILS HAVE A HIGH WATER TABLE) OR WHERE THERE IS A KNOWN TENDENCY TO SUBJECT TO EXPANSION IN THE WINTER, FOUNDATION WALLS SHOULD BE REINFORCED WITH STEEL OR GRANULAR FILL WITH GRADE OR GRANULAR FILL.
 16. IF THE FOUNDATION IS TO BE FINISHED RELATIVELY EARLY AFTER THE CONCRETE FOUNDATION IS PLACED, THE FOUNDATION WALLS SHOULD BE PROTECTED FROM DAMAGE BY THE SOIL. THE FOUNDATION WALLS SHOULD BE PROTECTED FROM DAMAGE BY THE SOIL. THE FOUNDATION WALLS SHOULD BE PROTECTED FROM DAMAGE BY THE SOIL.
 17. DOOR THRESHOLS MUST BE REINFORCED FOR LOCAL LOADS. CONSULT WITH THE ARCHITECT FOR THE BEST USE OF THE THRESHOLDS.
 18. VERIFY CONCRETE REINFORCEMENT AND DEPTH OF FOOTINGS WITH LOCAL BUILDING REGULATORY OFFICIALS OR WITH A COMPETENT ARCHITECT OR ENGINEER AS REQUIRED IN YOUR STATE.

MAIN FLOOR DOOR SCHEDULE

UNLESS OTHERWISE SPECIFIED, ALL DOORS SHALL BE:

NO.	SIZE	TYPE	FINISH
1	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
2	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
3	3'0" x 6'6"	LOWEVED WOOD SH-POLO DOOR	INTERIOR: WHITE PAINTE
4	3'0" x 6'6"	LOWEVED WOOD SH-POLO DOOR	INTERIOR: WHITE PAINTE
5	3'0" x 6'6"	LOWEVED WOOD SH-POLO DOOR	INTERIOR: WHITE PAINTE
6	3'0" x 6'6"	LOWEVED WOOD SH-POLO DOOR	INTERIOR: WHITE PAINTE
7	3'0" x 6'6"	LOWEVED WOOD SH-POLO DOOR	INTERIOR: WHITE PAINTE
8	3'0" x 6'6"	LOWEVED WOOD SH-POLO DOOR	INTERIOR: WHITE PAINTE
9	3'0" x 6'6"	LOWEVED WOOD SH-POLO DOOR	INTERIOR: WHITE PAINTE

MAIN FLOOR WINDOW SCHEDULE

UNLESS OTHERWISE SPECIFIED, ALL WINDOWS SHALL BE:

NO.	SIZE	TYPE	FINISH
1	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
2	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
3	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
4	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
5	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
6	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
7	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
8	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE
9	3'0" x 6'6"	INSULATED METAL DOOR (R15 MIN)	INTERIOR: WHITE PAINTE

- ### SEE SHEET 4 FOR BASEMENT WINDOW SCHEDULE
- WINDOW NOTES:
1. TWO UNITS (2) ARE UNIT (2) ARE COMBINED IN LIVING ROOM WITH A LEAD BEARING STUD SUPPORT UNIT. OVERALL WIDTH OF ROUGH OPENING IS 7'3 1/2". CONTINUOUS DOUBLE 2x6 HEADERS SHALL BE PROVIDED ON BOTH SIDES OF STUDS OR BETWEEN WINDOW UNITS PLACED AS DIMENSIONED.
 2. EXTERIOR FINISHES SHALL BE PROVIDED WHERE MANUFACTURED WINDOWS ARE USED IN THE WALLS. (SEE SHEET 4 FOR FINISHES AND VEST WALLS IF OPTION.)
 3. ROUGH OPENINGS FOR SUNSPACE SOUTH WALL MUST BE CONSTRUCTED WITH CARE - SEE GENERAL NOTE 7 ABOVE.
 4. IF OPTIONAL SUNSPACE IS BUILT, DOUBLE GLAZING ON UNITS (2) & (3).
 5. ALL ROUGH OPENINGS FOR MANUFACTURED WINDOWS ARE TO BE PROVIDED BY THE MANUFACTURER. THE MANUFACTURER SHALL BE RESPONSIBLE FOR THE WINDOW, TUBER AND CHASE FRAMING ACCORDINGLY.
 6. CONSULT WINDOW MANUFACTURER REGARDING USE OF APPROVED INSULATING GLASS UNITS ABOVE GOOD ELEVATION.

3

OF 14

DATE: JULY 4, 1992

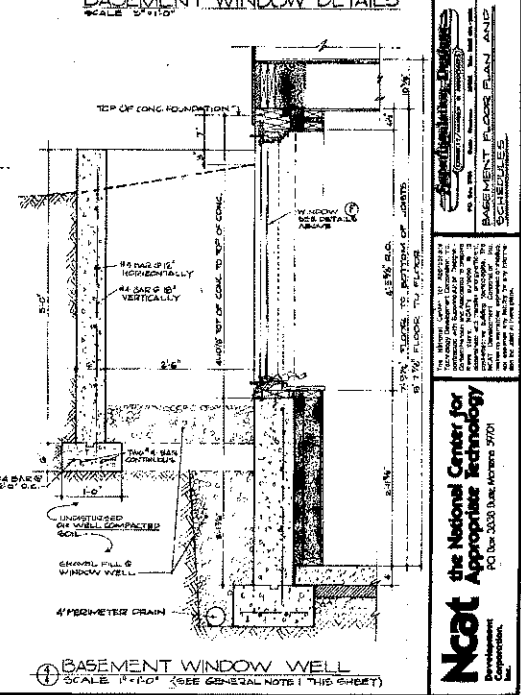
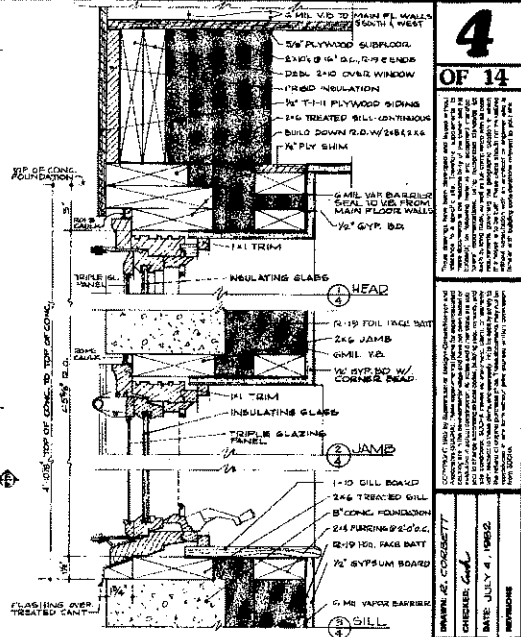
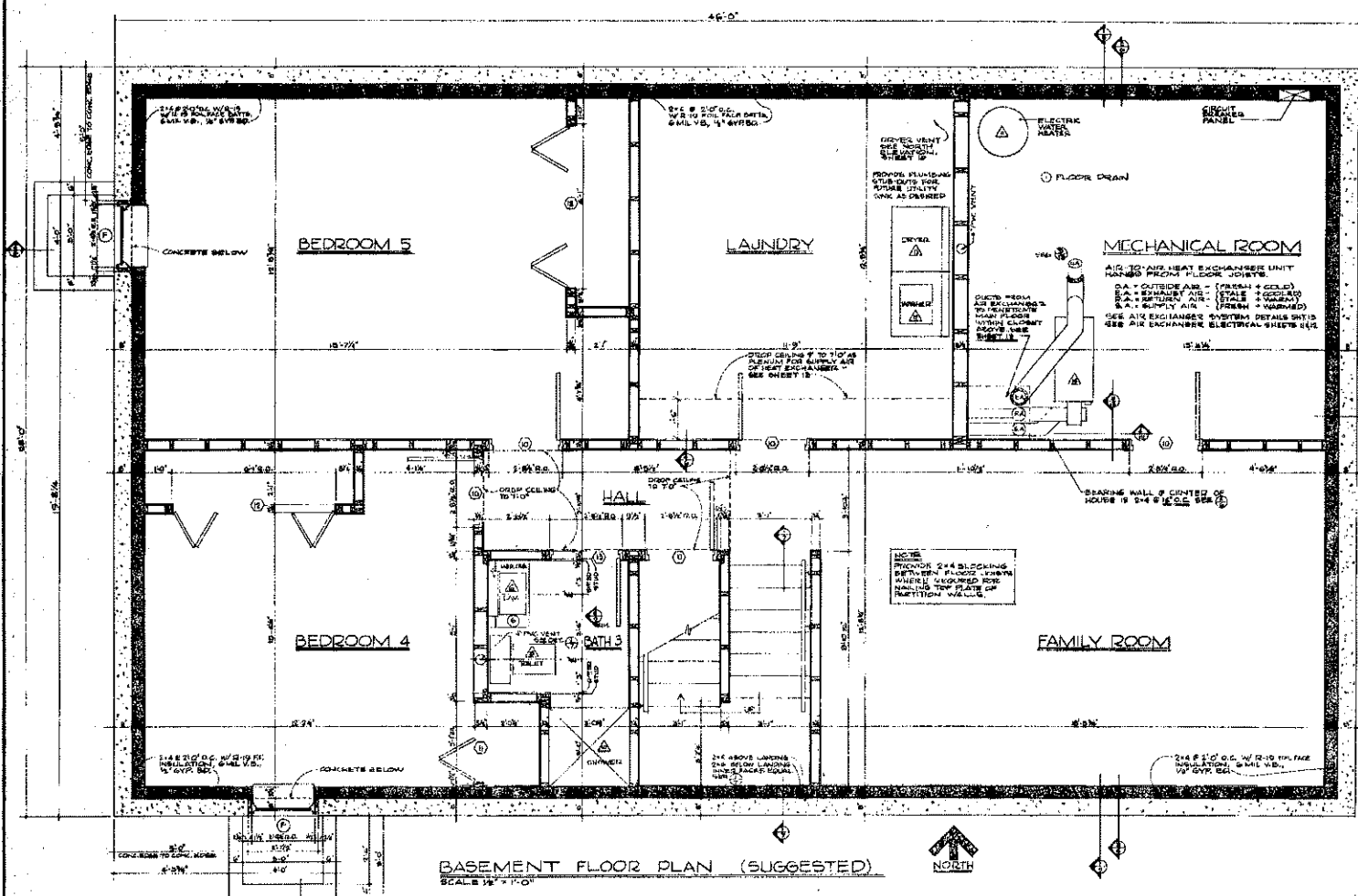
PROJECT: MAIN FLOOR PLAN & SCHEDULES

ARCHITECT: NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY

PO Box 3033, Fort Collins, CO 80522

PHONE: (970) 226-1100

FAX: (970) 226-1101



BASEMENT FLOOR PLAN (SUGGESTED)
SCALE 1/8" = 1'-0"

BASEMENT FINISH SCHEDULE - (SUGGESTED IF BASEMENT IS TO BE FINISHED)

ROOMS	FLOORS		WALLS					CEILING		REMARKS
	WALLS	CEILING	EXPOSED	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	INTERIOR	EXTERIOR	
FAMILY ROOM	•	•	•	•	•	•	•	•		
BEDROOM 4	•	•	•	•	•	•	•	•		
BEDROOM 5	•	•	•	•	•	•	•	•		
BATH 3	•	•	•	•	•	•	•	•		
LAUNDRY	•	•	•	•	•	•	•	•		
MECHANICAL RM.	•	•	•	•	•	•	•	•		
HALL	•	•	•	•	•	•	•	•		

• SEE MAIN FLOOR FINISH SCHEDULE SHEET 7
• SEE SCHEDULE OF BASEMENT CABINETS, APPLIANCES & FIXTURES SHEET 9

BASEMENT DOOR SCHEDULE

NO.	SIZE	DESCRIPTION AND REMARKS
(1)	2'-0" x 6'-6" W/	HOLLOW DOOR W/DOOR INSULATION UNDERCUT 1" SEE 3
(2)	1'-0" x 6'-6" W/	LOUVERED WOOD SH-FOLD DOOR
(3)	2'-0" x 6'-6" W/	LOUVERED WOOD SH-FOLD DOOR
(4)	1'-0" x 6'-6" W/	(SAME AS (3) BUT NOT UNDERCUT)

SEE MAIN FLOOR DOOR SCHEDULE SHEET 5

BASEMENT WINDOW SCHEDULE

NO.	SIZE	DESCRIPTION
(1)	2'-0" x 6'-6" W/	DOUBLE GLAZED WINDOW WITH 1/2" AIR GAP
(2)	2'-0" x 6'-6" W/	DOUBLE GLAZED WINDOW WITH 1/2" AIR GAP

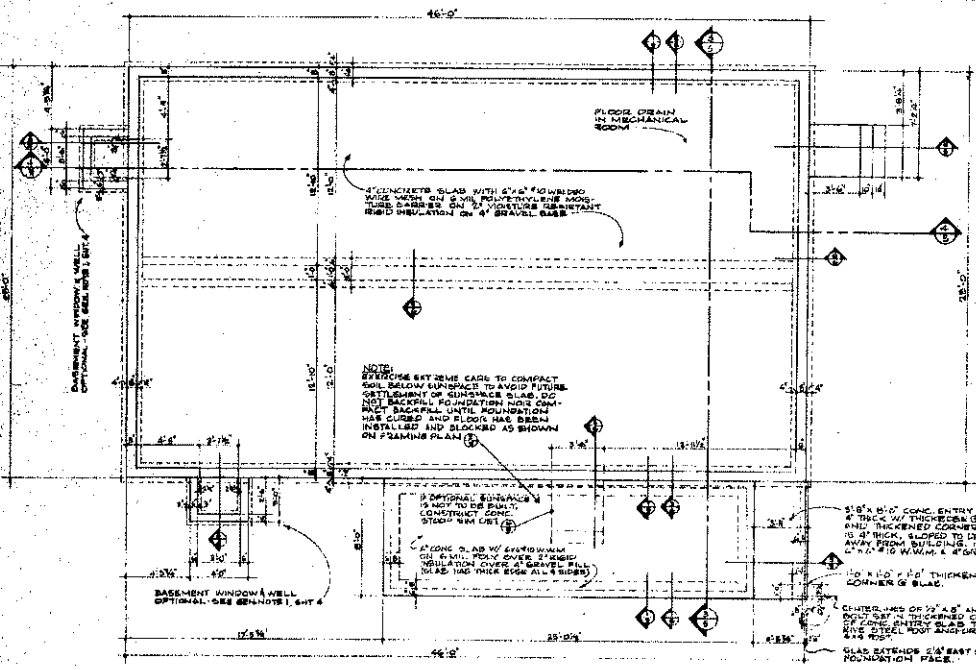
NOTE:
1. SEE GENERAL NOTE 1 THIS SHEET
2. SEE DETAILS 100 AND WINDOW WELL DETAIL 1
3. SEE NOTES 2 & 4 OF MAIN FLOOR WINDOW SCHEDULE SHEET 3
4. SEE MAIN FLOOR WINDOW SCHEDULE SHEET 3

- GENERAL NOTES**
1. LODGE REQUIRE THAT BEDROOMS LOCATED IN FINISHED ARE TO BE PROVIDED WITH EGRESS WINDOWS. THIS SUGGESTED PLAN MEETS OR EXCEEDS EGRESS CODE REQUIREMENTS. EGRESS WINDOWS ARE DESIGNATED IN BASEMENT IF THE OWNER INTENDS TO HAVE EGRESS LIGHT WINDOWS AND WINDOW WELLS MAY BE OMITTED.
 2. IF EGRESS IS TO HAVE NO BEDROOMS AND NO FINISHED ARE, THE ROOMS OF THE BASEMENT SHALL BE FINISHED AND ILLUMINATED AS NECESSARY TO MAINTAIN THE INTEGRITY OF THE BUILDING.
 3. OF THE PARTITION WALLS SHOWN ON THE SUBMITTED BASEMENT PLAN ABOVE, THE ONLY ONE REQUIRED FOR STRUCTURAL PURPOSES, SEE THE SEATING POSITION AT THE CENTERLINE 8'-0" W/ AND THE STAIRWELL ENCLOSURE. THE TWO 2'-0" PLUMBING WALLS THOUGHT NOT REQUIRED SHALL BE REMOVED. OTHER WALLS MAY BE LOCATED AS LONG AS PROVIDED A SUFFICIENT MEANS TO MAINTAIN THE 2'-0" CLEARANCE DISTRIBUTION IS PROVIDED.
 4. IF BASEMENT WALLS ARE NOT TO BE FINISHED AND ILLUMINATED, INSTALL AN EGRESS LIGHTING MAIN FLOOR TAKE PRECAUTIONS TO PREVENT FIREHOLD ENHANCED FROM A FINISHED FLOOR.
 5. IF BASEMENT IS TO BE COMPLETELY FINISHED AS SUBMITTED ABOVE, PROVIDE A MEANS TO MAINTAIN THE 2'-0" CLEARANCE DISTRIBUTION. SEE CONSTRUCTION REQUIREMENTS SHEET 13.

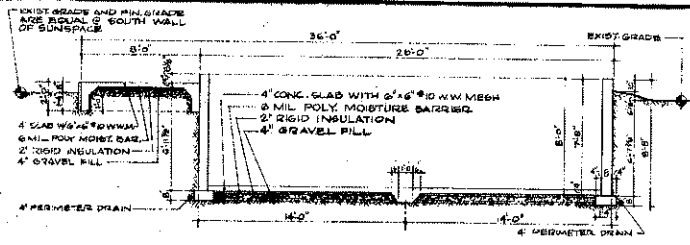
DESIGNED BY: COGGRETT
CHECKED BY: [Signature]
DATE: JULY 4, 1980

PROJECT: [Project Name]
SHEET: 4 OF 14

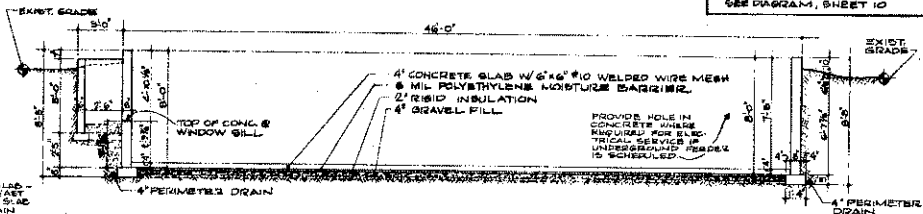
THE NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY
PO Box 33000, Tucson, Arizona 85721



1 FOUNDATION PLAN
SCALE 1/4" = 1'-0"

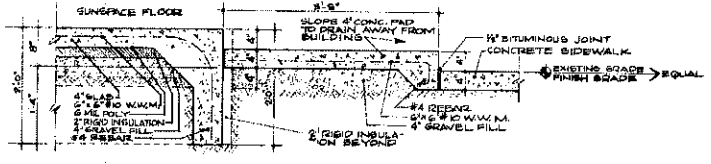


2 FOUNDATION SECTION
SCALE 1/2" = 1'-0"

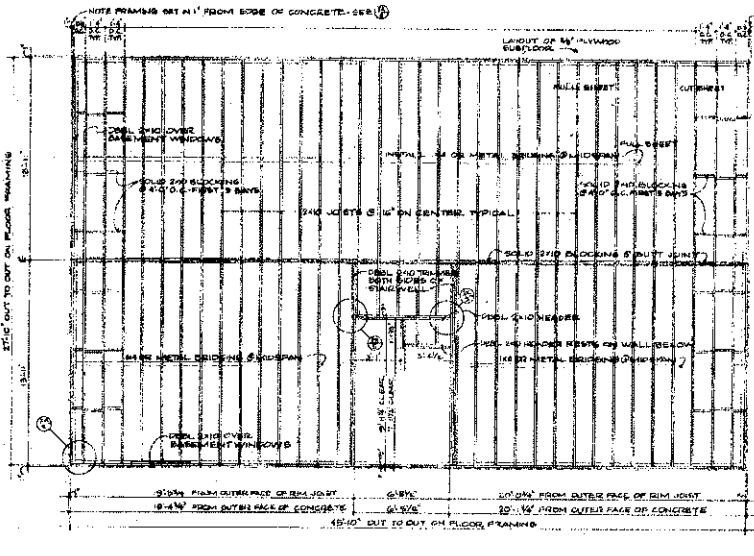


3 FOUNDATION SECTION
SCALE 1/2" = 1'-0"

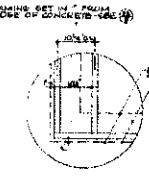
IMPORTANT CONCRETE NOTE:
 1. CHECK LOCAL CODE REQUIREMENTS FOR FOUNDATION FOOTING DEPTHS TO SEE IF FOOTINGS ARE BELOW THE FROST LEVEL.
 2. CHECK LOCAL CODES FOR CONCRETE REINFORCEMENT REQUIREMENTS AS THEY APPLY TO YOUR SPECIFIC SITE'S SOIL CONDITIONS AND SEISMIC ACTIVITY. SEE WALL SECTIONS SHEET G.



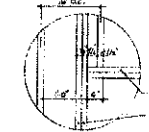
4 ENTRY SLAB AT OPTIONAL SUNSPACE
SCALE 1/2" = 1'-0"



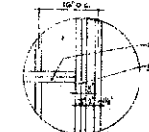
5 FLOOR FRAMING PLAN
SCALE 1/4" = 1'-0"



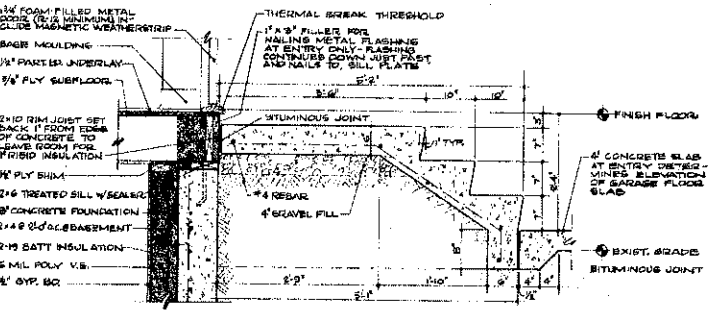
6 FRAMING



7 FRAMING



8 FRAMING



9 CONCRETE STOOP AT EAST ENTRY
SCALE 1/2" = 1'-0"

FOR CONCRETE WORK:
 ELEVATIONS AT TOP OF:

HOUSE FOOTINGS	28'-4 1/4"
FOUNDATION	28'-4 1/4"
BASEMENT SLAB	28'-0 1/2"
WINDOW WELLS	28'-0 1/2"
FOOTINGS	28'-0 1/2"
WELL WALLS	28'-0 1/2"
SUNSPACE	28'-0 1/2"
SLAB FLOOR	100'-0"
ENTRY SLAB	100'-0"
SIDEWALK	100'-0"
EAST ENTRY STOOP	100'-0"
SIDEWALK FIRST STEP	100'-0"
SECOND STEP	100'-0"
TOP OF STOOP	100'-0"
FINISHED GRADE AT FOUNDATION	100'-0"
AT TOP OF SLOPE	100'-0"
AT SOUTH OF SLOPE	100'-0"
EXISTING GRADE (ASSUMED)	100'-0"

NOTE:
 *SLOPE TO DRAIN AWAY FROM BUILDING
 SEE DIAGRAM, SHEET 10

5 OF 14

DATE: JULY 4, 1982

DRIVER: ZC COSEFF

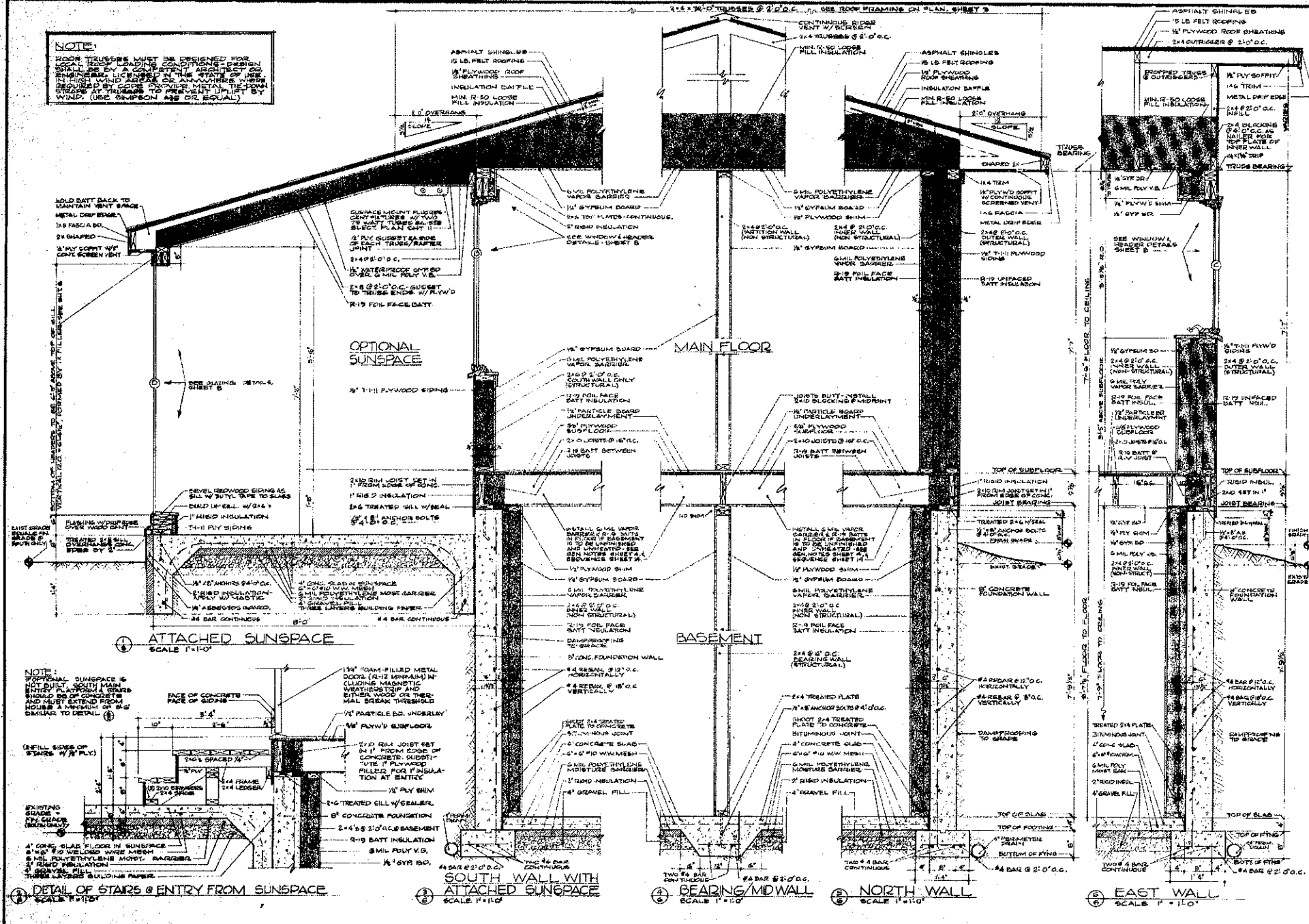
DRAWN: ZC

PROJECT: [illegible]

FOUNDATION PLAN & DETAILS

Ncat the National Center for Appropriate Technology
 PO Box 3003 Lamoni, MO 64601

NOTE:
DOOR TRUSSES MUST BE DESIGNED FOR LOCAL WIND BY A REGISTERED DESIGN ENGINEER LICENSED IN THE STATE OF ILLINOIS. WIND LOADS TO BE APPLIED TO TRUSS JOINTS AT CORNERS PROVIDED METAL TIE-DOWN RODS AT TRUSSES TO PREVENT BY WIND. (SEE SIMPSON ANCH OR EQUAL)



AWARD & CREDIT
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: JULY 9, 1982
 WALL SECTION 6
 THE NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY
 P.O. Box 3000, Duane, Missouri 63010

SCHEDULE OF CABINETS, APPLIANCES AND FIXTURES (MAIN FLOOR ONLY)

KITCHEN & BATH (S) - BASE CABINETS

NO.	DESCRIPTION	DIMENSIONS
1	30" - 2 DOOR / 2 DRAWER BASE UNIT	30" W x 34 1/2" H x 24" D
2	36" - GINK BASE UNIT	36" W x 34 1/2" H x 24" D
3	36" - REVOLVING CORNER BASE UNIT	36" W x 34 1/2" H x 24" D
4	2 18" - 4 DRAWER CORNER BASE UNIT	18" W x 34 1/2" H x 24" D
5	24" - UTILITY CABINET	24" W x 34 1/2" H x 24" D
6	30" - 2 DOOR VANITY BASE UNIT	27 1/2" W x 29 3/8" H x 17 1/2" D
7	30" - 2 DOOR VANITY BASE UNIT	34 1/2" W x 29 3/8" H x 17 1/2" D

KITCHEN WALL CABINETS

NO.	DESCRIPTION	DIMENSIONS
1	30" - 2 DOOR WALL UNIT	30" W x 30" H x 12" D
2	24" - 2 DOOR WALL UNIT	24" W x 30" H x 12" D
3	36" - 2 DOOR WALL UNIT	36" W x 18" H x 12" D
4	2 12" - 1 DOOR WALL UNIT	12" W x 30" H x 12" D
5	48" ANGLE CORNER 2 WALL UNIT	24" W x 30" H x 12" D
6	30" - 2 DOOR WALL UNIT	30" W x 18" H x 12" D
7	30" - 2 DOOR WALL UNIT	30" W x 30" H x 12" D
8	36" - 2 DOOR WALL UNIT	36" W x 18" H x 12" D

KITCHEN & BATH (S) - APPLIANCES & FIXTURES

NO.	DESCRIPTION	DIMENSIONS
1	DISHWASHER - UNDERCOUNTER TYPE	24" W x 24" H x 24" D
2	RANGE HOOD - DUCTLESS W/ SINK LIGHT	30" W x 6" H x 27" D
3	RANGE - ELECTRIC	30" W x 24" H x 27" D
4	REFRIGERATOR	36" W x 68" H x 29" D
5	KITCHEN SINK	33" W x 6 3/8" H x 24" D
6	BATHRM LAV. 2" SPLASH FAUCETS #40C	30" W x 4 1/2" H x 18 3/4" D
7	TOILET	18 1/2" W x 28 1/2" H x 27 1/2" D
8	BATHRM SHOWER COMBO	36" W x 74" H x 34" D
9	SHOWER STALL	36" W x 74" H x 36" D
10	MIRROR DOOR MEDICINE CABINET	24" W x 30" H x 5" D
11	MIRROR DOOR MEDICINE CABINET	30" W x 24" H x 5" D

NOTE: SEE SIMILAR SCHEDULE FOR FINISHED BASEMENT ONLY BELOW

SCHEDULE OF CABINETS, APPLIANCES AND FIXTURES (FIN. BASEMENT ONLY)

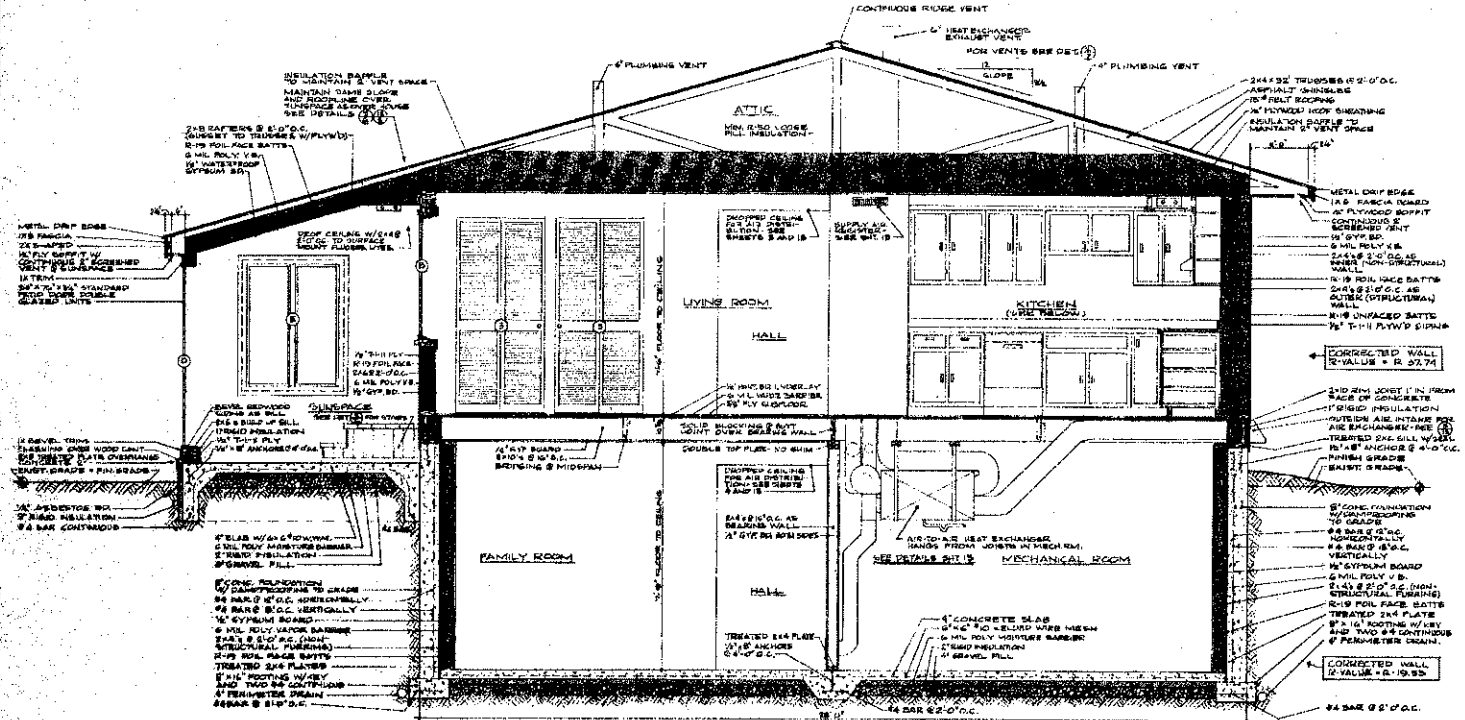
BATHROOM BASE CABINET

NO.	DESCRIPTION	DIMENSION
1	30" - 2 DOOR VANITY BASE UNIT	27 1/2" W x 29 3/8" H x 17 1/2" D

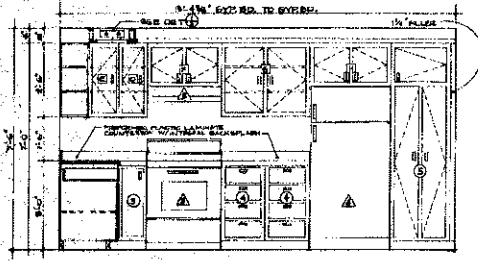
BASEMENT APPLIANCES AND FIXTURES

NO.	DESCRIPTION	DIMENSION
1	BATHROOM LAV. 2" SPLASH FAUCETS #40C	30" W x 4 1/2" H x 18 3/4" D
2	TOILET	18 1/2" W x 28 1/2" H x 27 1/2" D
3	SHOWER STALL	36" W x 72" H x 36" D
4	HOT WATER HEATER - ELECTRIC	36" GAL GALV. FOR 500 GPM
5	CLOTHES WASHER	AS REQUIRED
6	CLOTHES DRYER - ELECTRIC	AS REQUIRED
7	AIR-TO-AIR HEAT EXCHANGER	SEE SCHEDULE SHEET 13
8	MIRROR DOOR MEDICINE CABINET	20" W x 24" H x 5" D

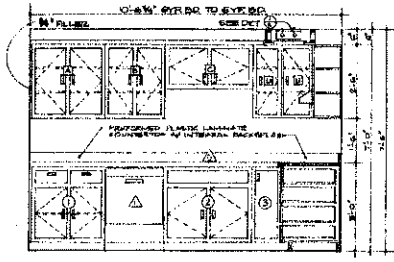
NOTE: THIS WORK IS TO BE INSTALLED EVEN IF BASEMENT IS TO BE UNFINISHED. IF WASHER AND DRYER ARE TO BE INSTALLED AT A LATER DATE, PLUMBING AND WIRING FOR SAME SHOULD BE STIPULATED OUT DURING CONSTRUCTION.



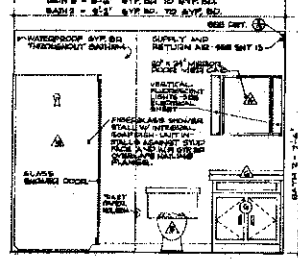
5 TRANSVERSE SECTION
SCALE 1/4" = 1'-0"



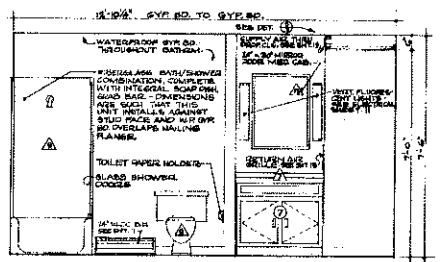
4 KITCHEN - NORTH ELEVATION
SCALE 1/4" = 1'-0"



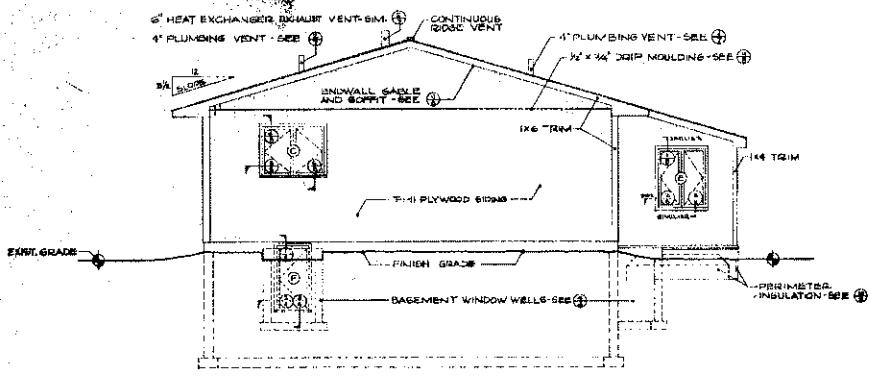
3 KITCHEN - WEST ELEVATION
SCALE 1/4" = 1'-0"



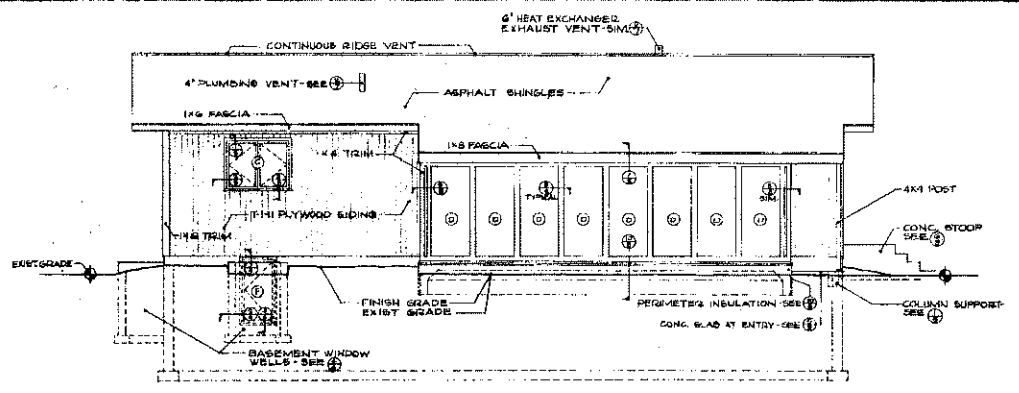
2 BATH 2 - WEST ELEVATION
SCALE 1/4" = 1'-0"
(BATH 3 IN BASEMENT SIMILAR EXCEPT FOR DIMENSIONS AS NOTED)



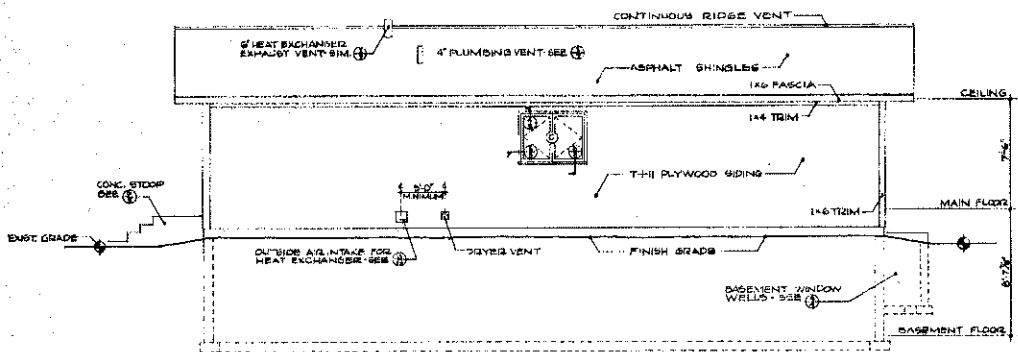
1 BATH 1 - EAST ELEVATION
SCALE 1/4" = 1'-0"



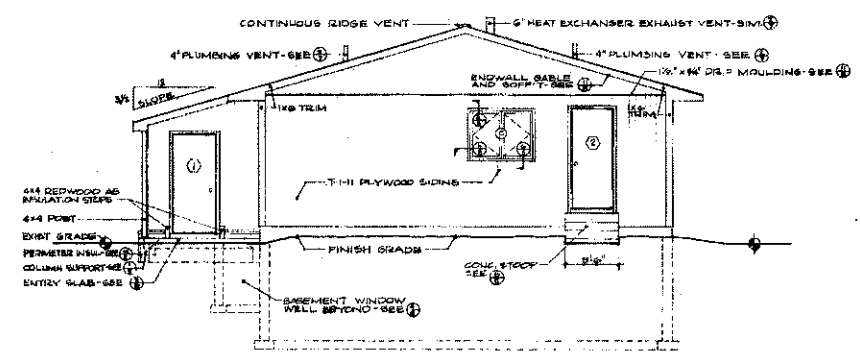
WEST ELEVATION
(SHOWN WITH OPTIONAL SUNSPACE)
SCALE 1/4" = 1'-0"



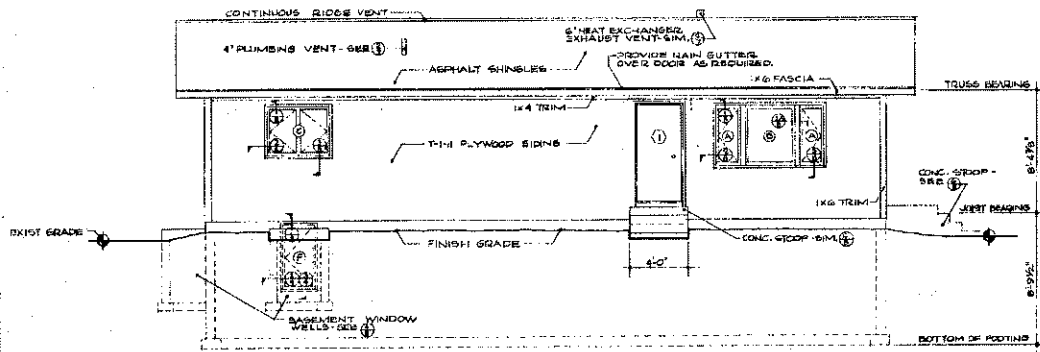
SOUTH ELEVATION
(SHOWN WITH OPTIONAL SUNSPACE)
SCALE 1/4" = 1'-0"



NORTH ELEVATION
SCALE 1/4" = 1'-0"



EAST ELEVATION
(SHOWN WITH OPTIONAL SUNSPACE)
SCALE 1/4" = 1'-0"



SOUTH ELEVATION
(SHOWN WITHOUT OPTIONAL SUNSPACE)
SCALE 1/4" = 1'-0"

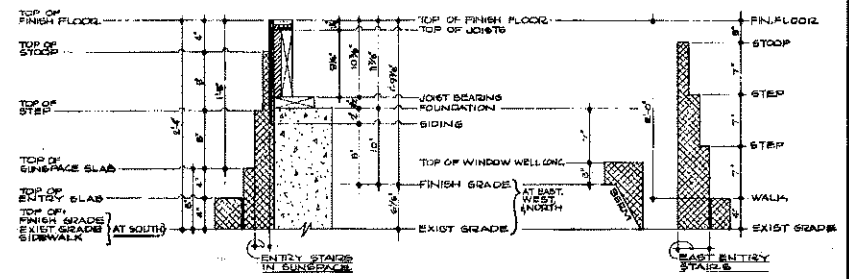
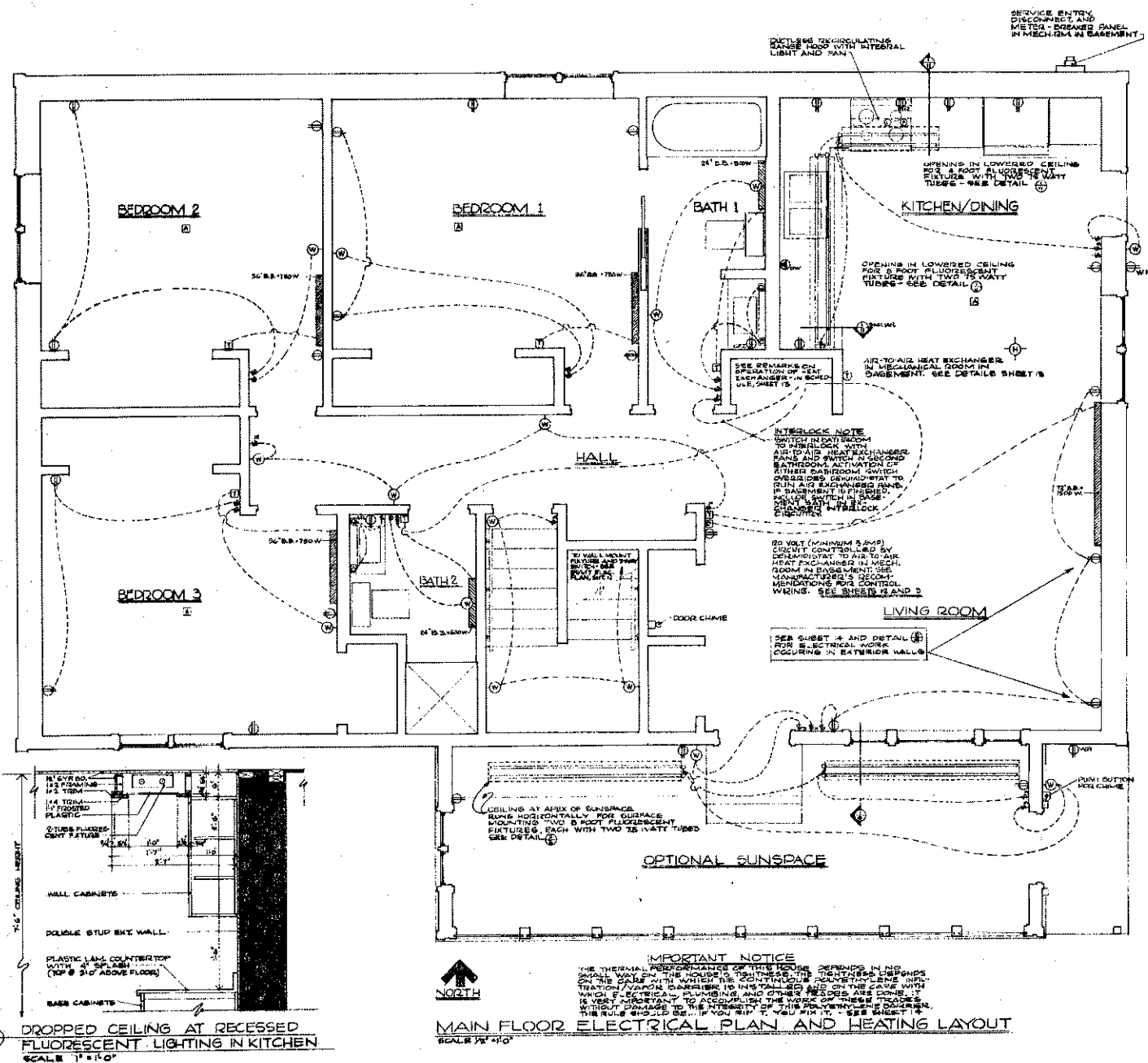


DIAGRAM OF VARIOUS VERTICAL DIMENSIONS BETWEEN EXISTING GRADE AND FINISH FLOOR AT MAIN FLOOR
VERTICAL SCALE ONLY - 1/2" = 1'-0"

DRAWING BY COSGROVE
DESIGNED BY
DATE: JULY 4, 1982
BY: [Signature]

EXTERIOR ELEVATIONS

Ncat
The National Center for
Appropriate Technology
P.O. Box 3300 Durango, Colorado 81302



MAIN FLOOR ELECTRICAL SCHEDULE

SYMBOL	QUANTITY	DESCRIPTION	REMARKS
2B	2	DUPLEX CONVENIENCE OUTLET	NEAREST OFF VENTS PROVIDE GROUNDING ALLY INTERRUPTION
2	2	WEATHERPROOF DUPLEX OUTLET	
1	1	ELECTRIC RANGE OUTLET	240 VOLT
14	1	SINGLE POLE SWITCH	NOTATION IS MEANS PROVIDE THREE SWITCH (TWO EXCHANGERS)
3	2	THREE WAY SWITCH	
14	14	WALL MOUNTED LIGHT FIXTURES	TO SWITCHED DUPLEX OUTLET
14	14	FLOORESCENT FIXTURES	TWO IN EACH ROOM EXCEPT ONE IN EACH BATHROOM USE 4" X 12" TUBES IN KIT
4	4	VERT. FLOURESCENT FIXTURES	QUANTITY IN BATHROOMS
4	4	SMOKE ALARM	BATTERY POWERED.
14	14	THERMOSTAT	
1	1	DEHUMIDISTAT	SEE INTERLOCK NOTE ON SHEET 12
14	14	ELECTRIC BASEBOARD HEAT	SEE SIGN ANALYSIS BELOW
1	1	TELEPHONE	WALL MOUNT
1	1	DISHWASHER	MOUNT BELOW COUNTER
1	1	DOOR CHIME	
1	1	PUSHBUTTON FOR CHIME	LOCATE IN VENTS ENTRY IN SUNSPACE IS NOT BUILT.

SEE BASEMENT ELECTRICAL SHEET 12.

MAIN FLOOR DESIGN HEATING LOAD FOR GREAT FALLS, MONTANA (7550 DEGREE DAYS)

NOTE: THIS ANALYSIS IS FOR THE MAIN FLOOR ONLY AND ASSUMES THAT THE BASEMENT IS UNHEATED AND INSULATED UNOCCUPIED AND UNHEATED, AND THAT IT MAINTAINS A TEMPERATURE CLOSE TO THAT OF THE SURROUNDING GROUND. SEE SHEET 12 FOR A SIMILAR ANALYSIS OF THE BASEMENT. THIS ANALYSIS ASSUMES THAT THE DESIGN IS AS REPRESENTED, COMPLETE AND AS NOTED. IT SHOULD BE RECALCULATED WITH 2-22 BATHS AS PER GENERAL NOTE 4 ON SHEET 4.

COMPONENT	AREA (SQ. FT.)	U-VALUE (BTU/HR/SQ. FT./IN)	ΔT (°F)	Q _{LOSS} (BTU/HR)
NORTH WALL	319.20	0.274	0.265	8.46
EAST WALL	155.24	0.274	0.265	4.11
SOUTH WALL	272.52	0.265	15.25	85
WEST WALL	175.96	0.274	0.265	5.88
CEILING	1055.49	0.020	21.67	85
FLOORS	1055.49	0.020	21.67	85
DOORS	32.74	1.2	0.33	3.15
WINDOWS	173.90	2.50	1.90	22.93
TOTAL				229.13

INFLTRATION HEAT LOSS $Q_{INF} = VCA_{INF} \Delta T$

VOLUME (CUBIC FEET)	HEAT CAPACITY (BTU/DEGREE F)	AIR CHANGING PER HOUR	ΔT (°F)	Q _{INF} (BTU/HR)
8126.15	0.01875	275	85	2991.70

TOTAL DESIGN HEATING LOAD $Q_{DES} = Q_{INF} + Q_{CONV}$
= 12,291.0 BTU/H

NOTE:
TO PROPERLY ESTIMATE THE AMOUNT OF BASEBOARD ELECTRIC HEATING REQUIRED, CONSULT A HEATING ENGINEER, ARCHITECT, OR CONTRACTOR IN YOUR AREA WHO IS FAMILIAR WITH THE CLIMATE IN WHICH YOU INTEND TO BUILD. FOR GREAT FALLS, MONTANA (7550 DEGREE DAYS, 47.30° NORTH LATITUDE, 5600' ABOVE SEA LEVEL), THE ANALYSIS ABOVE TRANSLATES TO THE AMOUNT OF ELECTRIC BASEBOARD HEATING REQUIRED AS FOLLOWS:

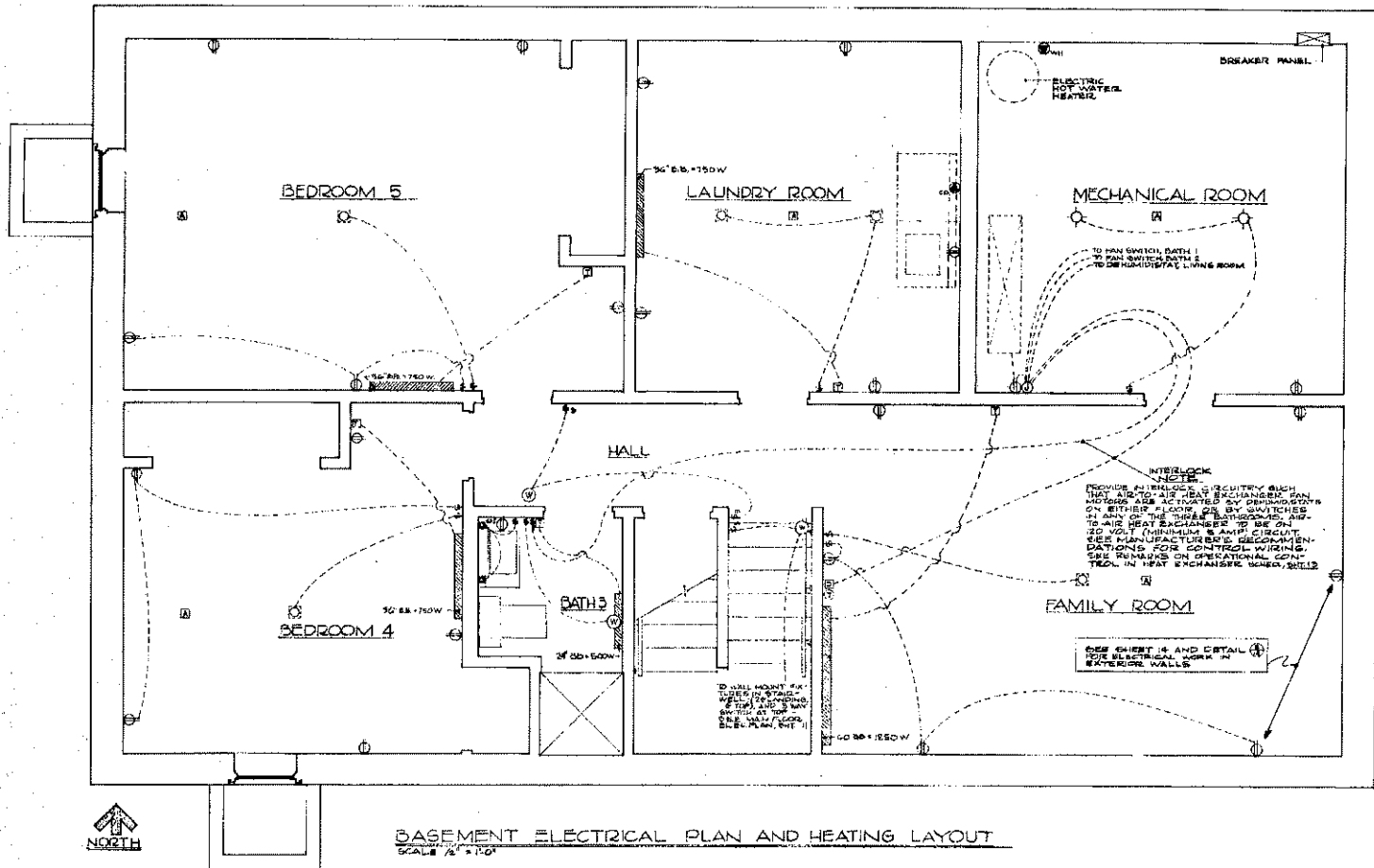
ASSUMPTIONS:
 • BASEBOARD HEATING RATED @ 250 WATTS PER FOOT
 • 1 KW = 1000 WATTS = 3413 BTU
 TOTAL DESIGN HEATING LOAD DIVIDED BY 3413 EQUALS TOTAL KW REQUIRED CAPACITY:
 OR: $12,291 / 3413 = 3.60 \text{ KW} = 3600 \text{ WATTS}$
 TOTAL WATTS REQUIRED DIVIDED BY 250 EQUALS LINEAL FEET OF BASEBOARD REQUIRED:
 OR: $3600 / 250 = 14.4 \text{ LINEAL FEET}$

* THESE PLANS SHOW 19 LINEAL FEET INSTALLED TO PROVIDE A RESERVE UNDER WINTER CONDITIONS THAN DESIGN TEMPERATURE.

DRINK & COBBETT
CHECKED: [Signature]
DATE: JULY 4, 1982
REVISION:

MADE ELECTRICAL PLAN
MADE HEATING PLAN

THE NATIONAL CENTER FOR THE APPROPRIATE TECHNOLOGY
PO Box 4039 Bozeman, Montana 59701



BASEMENT ELECTRICAL PLAN AND HEATING LAYOUT
SCALE: 1/4" = 1'-0"

IMPORTANT NOTICE
THE THERMAL PERFORMANCE OF THIS HOUSE DEPENDS IN NO SMALL WAY ON THE HOUSE'S TIGHTNESS. THE TIGHTNESS DEPENDS ON THE CARE WITH WHICH THE CONTINUOUS POLYETHYLENE INSULATION/VAPOR BARRING IS INSTALLED AND ON THE CARE WITH WHICH ELECTRICAL WORK, PLUMBING AND OTHER TRADES ARE DONE. IT IS VERY IMPORTANT TO ACCOMPLISH THE WORK OF THESE TRADES WITHOUT DAMAGE TO THE INTEGRITY OF THE POLYETHYLENE BARRIER. IF DOUBT SHOULD OCCUR IN YOUR MIND, YOU MUST SEE SHEET 15.

MK. QUAN.	DESCRIPTION	REMARKS
1	DUPLICATION OUTLET	EXPOSED TO BE MADE PROVIDE SECOND PULL INTERLOCK
1	WATER HEATER	
1	CLOTHES DRYER	
1	JUNCTION BOX	
1	SINGLE POLE SWITCH	NOTATION 8, PLEASE PROVIDE TRIPPER SWITCH (AS REQUIRED)
3	THREE WAY SWITCH	
5	RECESSED CEIL. FIXTURE	
2	PORCELAIN LAMP BASE	
2	VERT. FLUORESCENT FIXTURE	SPANITY IN BATHROOMS
3	WALL MOUNTED FIXTURE	
5	SMOKE ALARM	BATTERY POWERED
5	THERMOSTAT	
1	DEHUMIDIF. UNIT	SEE INTERLOCK NOTION ON PLAN, AND SEE SHEET 15
1	ELECTRIC BASEBOARD HEAT	SEE SIZING ANALYSIS BELOW
1	TELEPHONE	WALL MOUNT

(BASEMENT ONLY)

DESIGN HEATING LOAD FOR GREAT FALLS, MONTANA (7590 ELEV.)

NOTE: THIS ANALYSIS IS FOR THE BASEMENT ONLY AND IS BASED ON THE ASSUMPTIONS THAT BOTH THE BASEMENT AND THE MAIN FLOOR ARE FINISHED, OCCUPIED AND HEATED. FOR THIS ANALYSIS NO INSULATION USED IN THE MAIN FLOOR STRUCTURE BECAUSE BOTH FLOORS ARE HEATED.

COMPONENT	AREA (SQ. FT.)	R VALUE (INSULATION)	U VALUE (BTU/HR/FT ²)	Q _{INFIL} (BTU/HR)	Q _{COND} (BTU/HR)	Q _{TOTAL} (BTU/HR)
NORTH WALL	338.87	19.58	.0512	17.52	45.1	701.13
EAST WALL	198.87	19.58	.0512	0.18	45.1	459.12
SOUTH WALL	330.77	19.58	.0512	16.84	45.1	763.99
WEST WALL	191.27	19.58	.0512	5.79	45.1	441.63
FLOOR	1120.92	6.00	1.250	140.04	45.1	6316.80
WINDOWS	15.2	2.56	.390	5.93	85	304.05
TOTAL 9245.62						

INFILTRATION HEAT LOSS Q_{INFIL} = VCAΔT

VOLUME	C	ΔT	Q _{INFIL}
(213-CU FEET)	(.0187 BTU/HR/FT ³)	(125 °F AND 70 °F)	3140 BTU/HR
6662.4	x .0187	x 125	x .85 = 1452.95

NOTE: (* ASSUMING LITTLE OR NO NATURAL INFILTRATION OCCURS BELOW GRADE, BUT THAT THE AIR TO AIR HEAT EXCHANGER IS USED TO MAINTAIN INDOOR AIR QUALITY SUCH THAT THE EFFECTIVE AIR CHANGE RATE (PER HOUR) EQUALS .125

TOTAL DESIGN HEATING LOAD Q_{DT} = Q_E + Q_{INFIL}
= 10719 BTU/HR

NOTE:
TO PROPERLY ESTIMATE THE AMOUNT OF BASEBOARD ELECTRIC HEATING REQUIRED, CONSULT A HEATING ENGINEER, ARCHITECT, OR CONTRACTOR IN YOUR AREA WHO IS FAMILIAR WITH THE CLIMATE IN WHICH YOU INTEND TO BUILD. FOR GREAT FALLS, MONTANA (7590 DEGREE DAYS, 67° 30' NORTH LATITUDE, 5662' ABOVE SEA LEVEL), THE ANALYSIS ABOVE TRANSLATED TO THE AMOUNT OF ELECTRIC BASEBOARD HEATING REQUIRED AS FOLLOWS:

ASSUMPTIONS:
 - BASEBOARD HEATING RATED @ 250 WATTS/FT.
 - 1 KW = 1000 WATTS = 3413 BTU
 - TOTAL DESIGN HEATING LOAD DIVIDED BY 3413 EQUALS TOTAL KW REQUIRED CAPACITY!
 OR: 10719 / 3413 = 3.14 KW = 3140 WATTS
 - TOTAL WATTS REQUIRED DIVIDED BY 250 EQUALS LINEAL FEET OF BASEBOARD REQUIRED!
 OR: 3140 / 250 = 12.6 LINEAL FEET*

* THESE PLANS SHOW 16 LINEAL FEET INSTALLED TO PROVIDE A "CUSHION" AGAINST COLDER CONDITIONS THAN DESIGN TEMPERATURE.

Not the National Center for the National Appropriate Technology
 Development
 P.O. Box 3009 Blue Ridge, VA 22834

