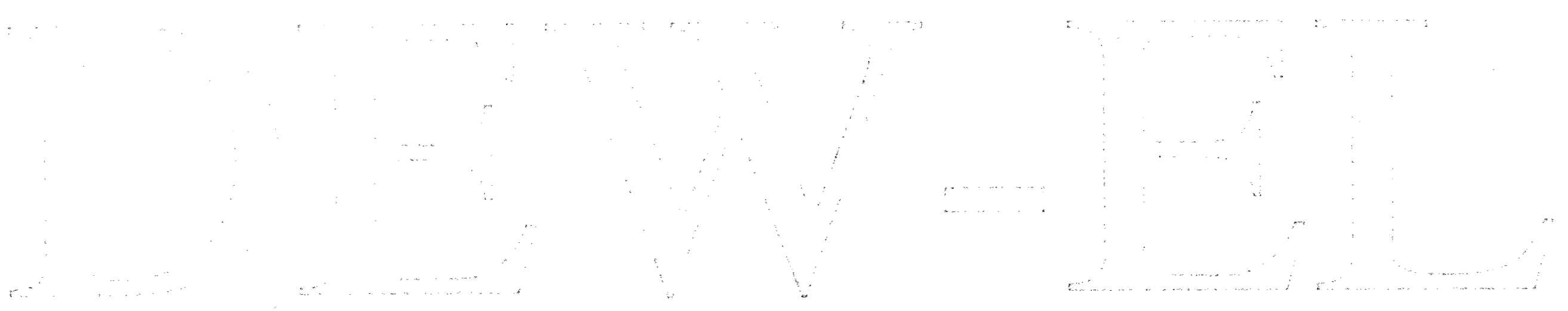


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SHEET INDEX	
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1	COVER SHEET
2	SITE PLAN
3	FOUNDATION PLAN
4A	FLOOR & ELECTRICAL PLAN
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10A	END WALL MOUNT ELECTRICAL PLAN
10B	NATURAL GAS HEAT PLAN
11	COMBINED THERMAL TRANSMITTANCE U-VALUE FIGURES

DEW-EL PORTABLES

400 VETERAN DRIVE
 HOLLAND MICHIGAN 49422

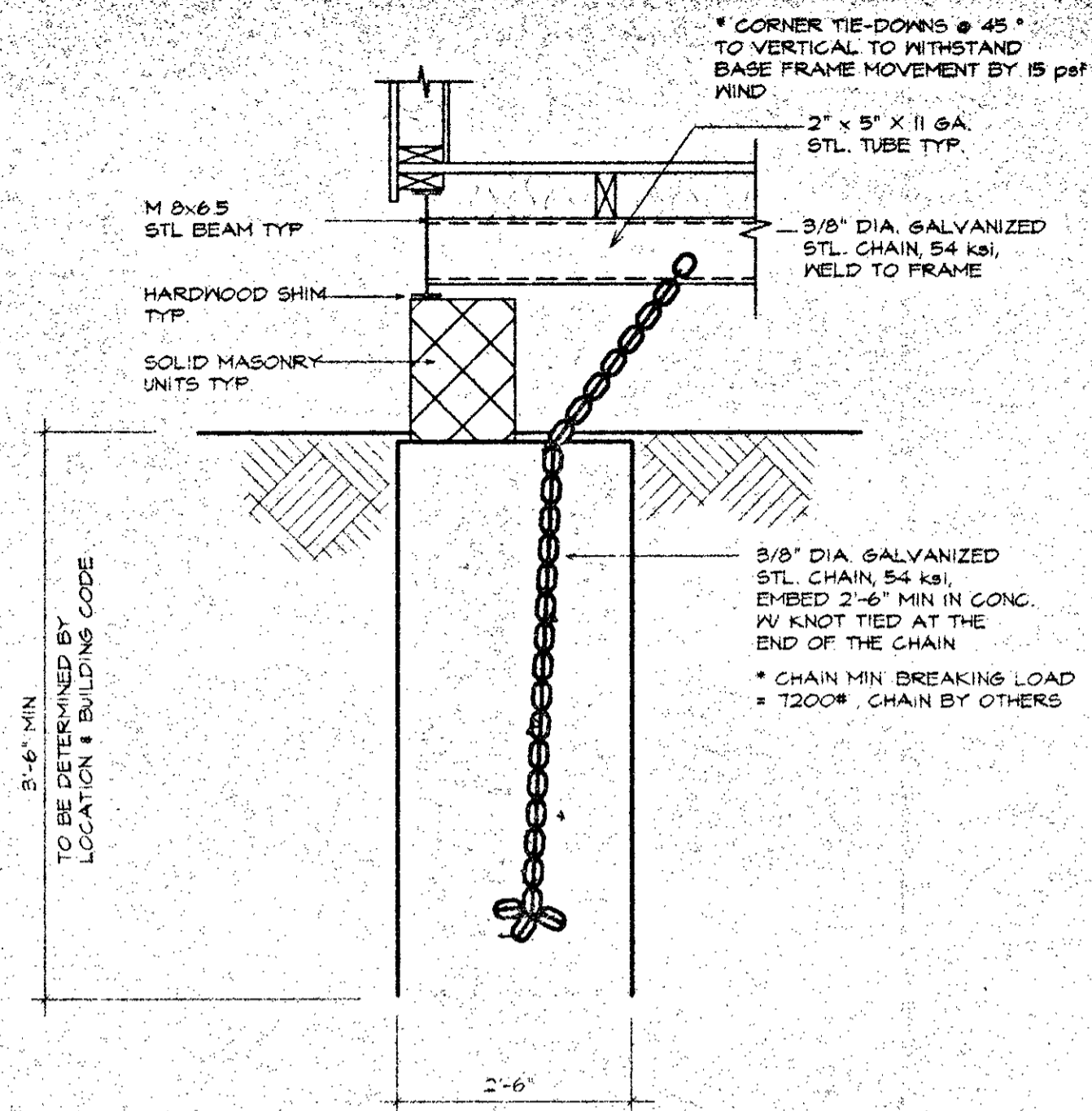
TEMPORARY RELOCATABLE CLASSROOMS

24' X 36' & 40' STANDARD CLASSROOMS

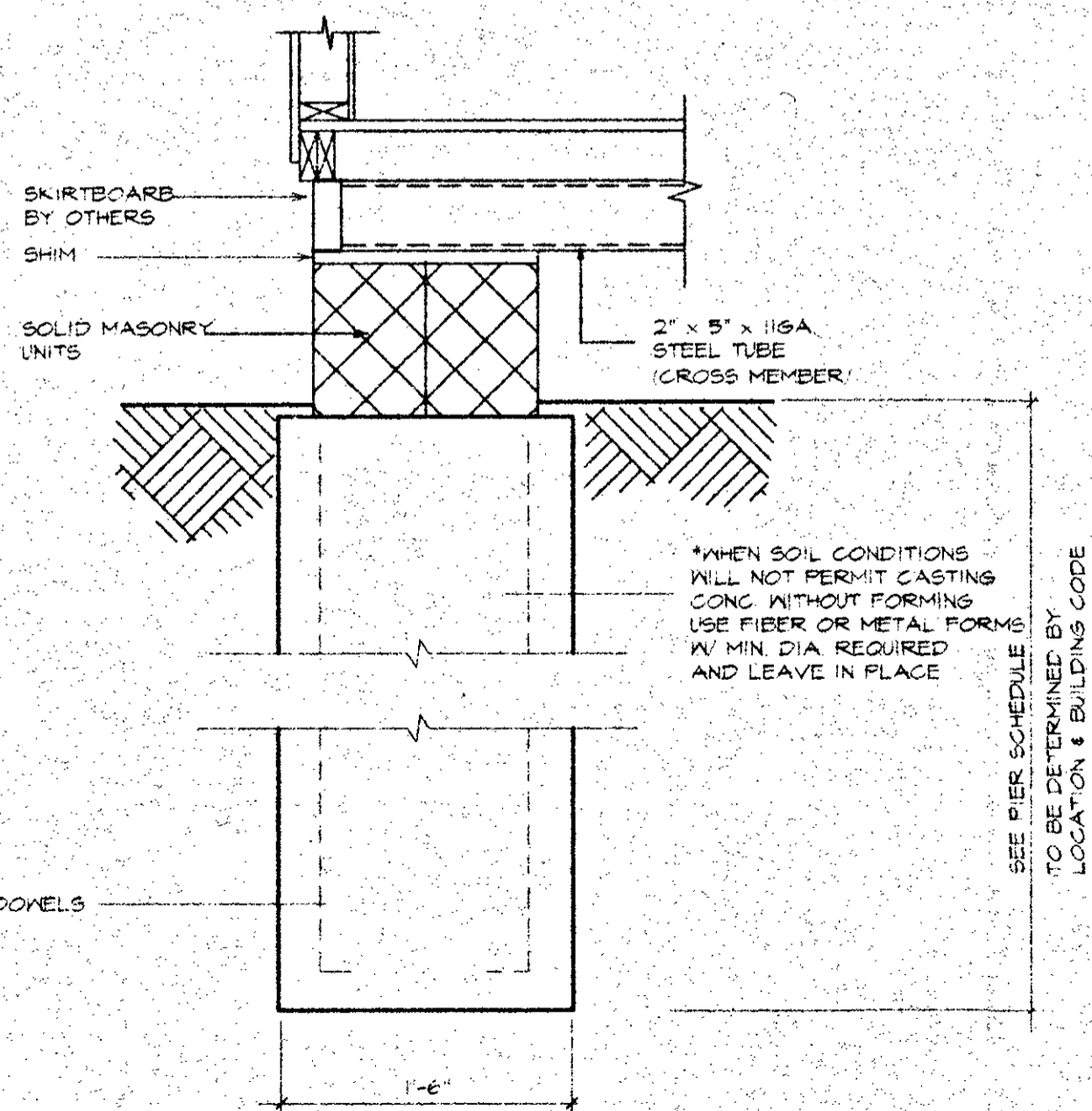
MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING
 BELDING INC. BELDING, MICHIGAN

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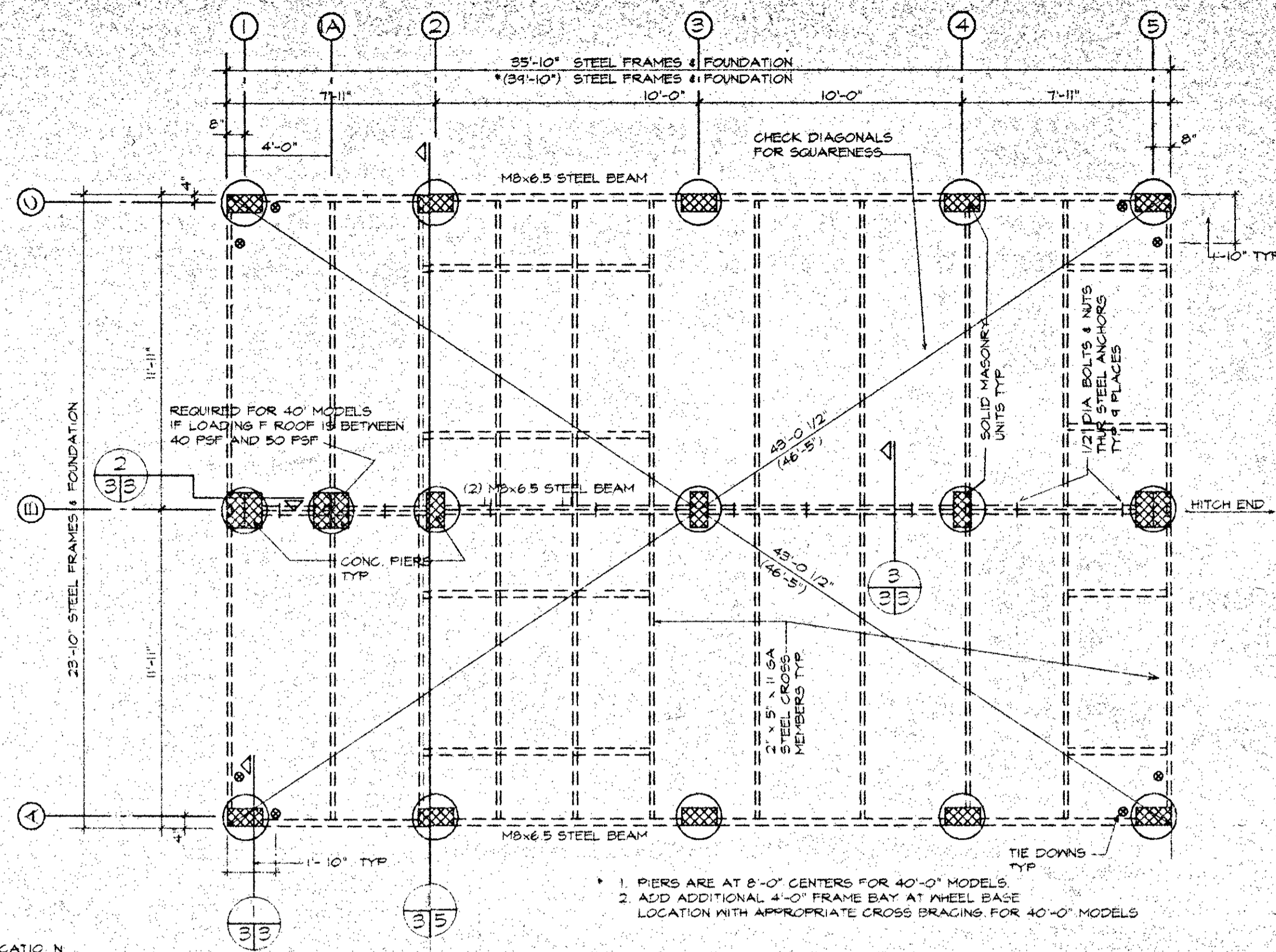
	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 101 REED ROAD BELDING MICHIGAN 48804 PHONE 616-794-8455	COVER SHEET RELOCATABLE CLASSROOMS 24'X36' & 40' STANDARD CLASSROOM THOMAS CONSTRUCTION, INC. TEMPORARY CLASSROOM	ALL PERRY ASSOCIATES, LTD. ARCHITECTURE ENGINEERING 840 LEONARD AVE GRAND RAPIDS MICHIGAN 49504 PHONE 616-454-4740	DATE 12/12/99	SHEET NO. 98-076 1-00
	SERIAL NO.				



1 TYP. SECTION @ CORNER PIER
SCALE 1/2" = 1'-0"



2 TYP. SECTION @ PERIMETER PIER
SCALE 1" = 1'-0"

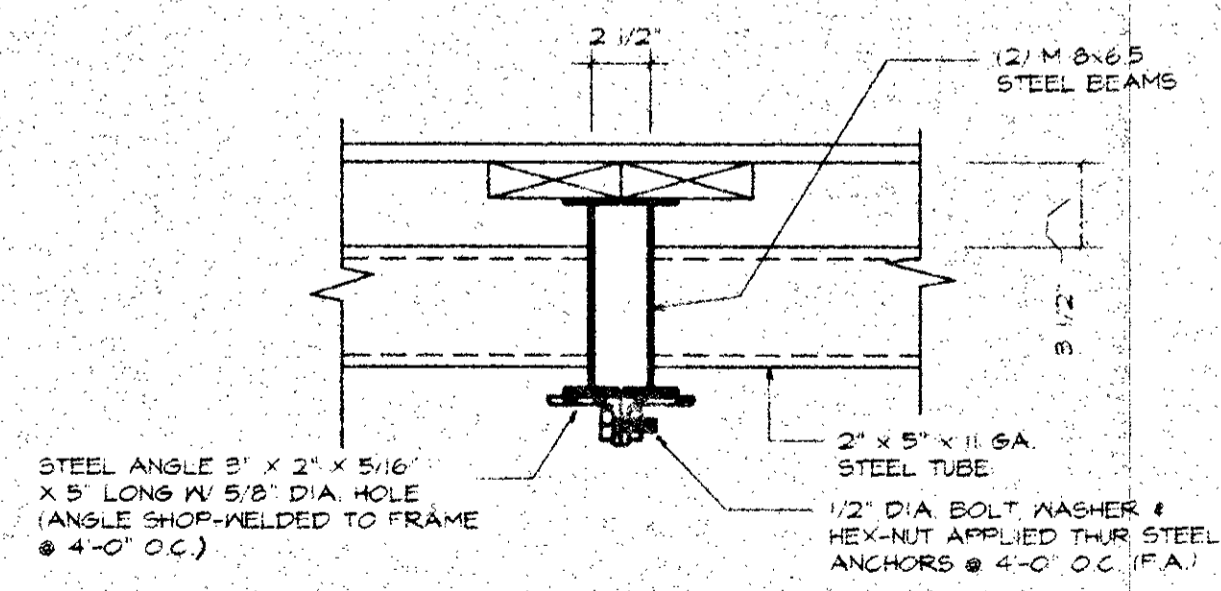


NOTES:

- 1. Ⓢ INDICATES TIE DOWN LOCATION
- 2. PIER LOADINGS ARE CALCULATED FOR 50 psf LIVE LOAD ROOF DESIGN TO psf OPT.
- 3. PLUMBING ENTRANCE LOCATIONS TO BE DETERMINED ON A PER JOB BASIS

FOUNDATION PLAN

SCALE 1/4" = 1'-0"



3 TYP. SECTION BETWEEN INTERIOR PIERS
SCALE 1/2" = 1'-0"

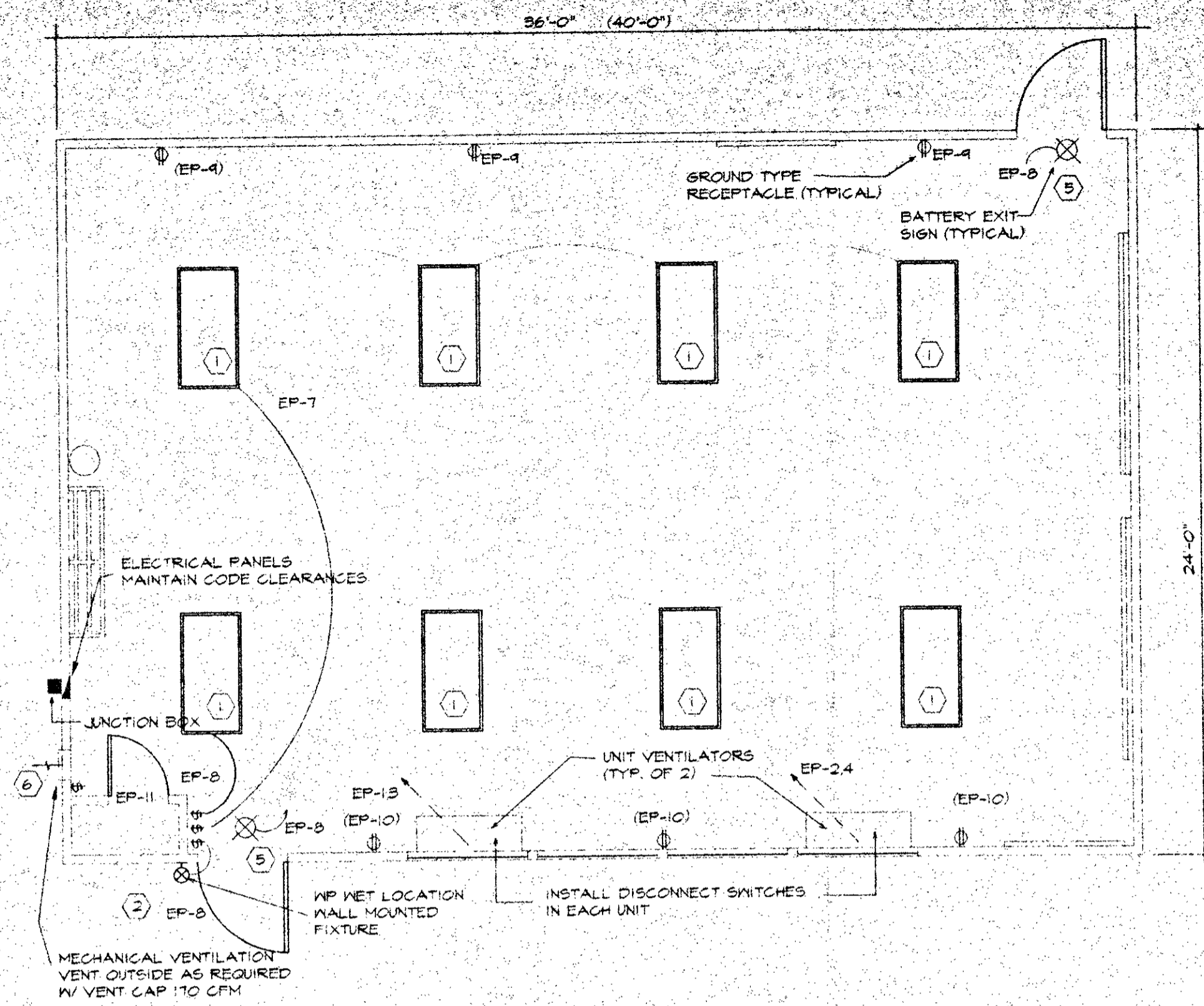
PIER SCHEDULE			
MARK	KIPS	DIA.	DEPTH
C-1A-1	3.2	1'-6"	3'-6" MIN.
C-2A-2	6.6	1'-6"	3'-6" MIN.
C-3A-3	7.3	1'-6"	3'-6" MIN.
B-1B-5 B-1A	14.7	1'-6"	6'-0"
B-2B-4	7.6	1'-6"	3'-6" MIN.
B-3	8.5	1'-6"	3'-6" MIN.

ENGINEERING DATA			
ALLOWABLE SOIL BEARING PRESSURE			4000 PSF
LATERAL SOIL PRESSURE			300 PSF
ALLOWABLE STRESSES			3000 PSI
CONCRETE		FC	
CONCRETE REINFORCING			
NO. 3 REBAR AND SMALLER	FY		40,000 PSI
NO. 4 REBAR AND LARGER	FY		60,000 PSI
WELDED WIRE FABRIC	FY		60,000 PSI
STRUCTURAL STEEL	FY		36,000 PSI
LIVE LOADS			
WIND			20 PSF
GROUND SNOW AS PER BOCA CODE PG.			50 PSF 1C
FLOORS			60 PSF

24' X 36', 40' TEMPORARY STANDARD CLASSROOM

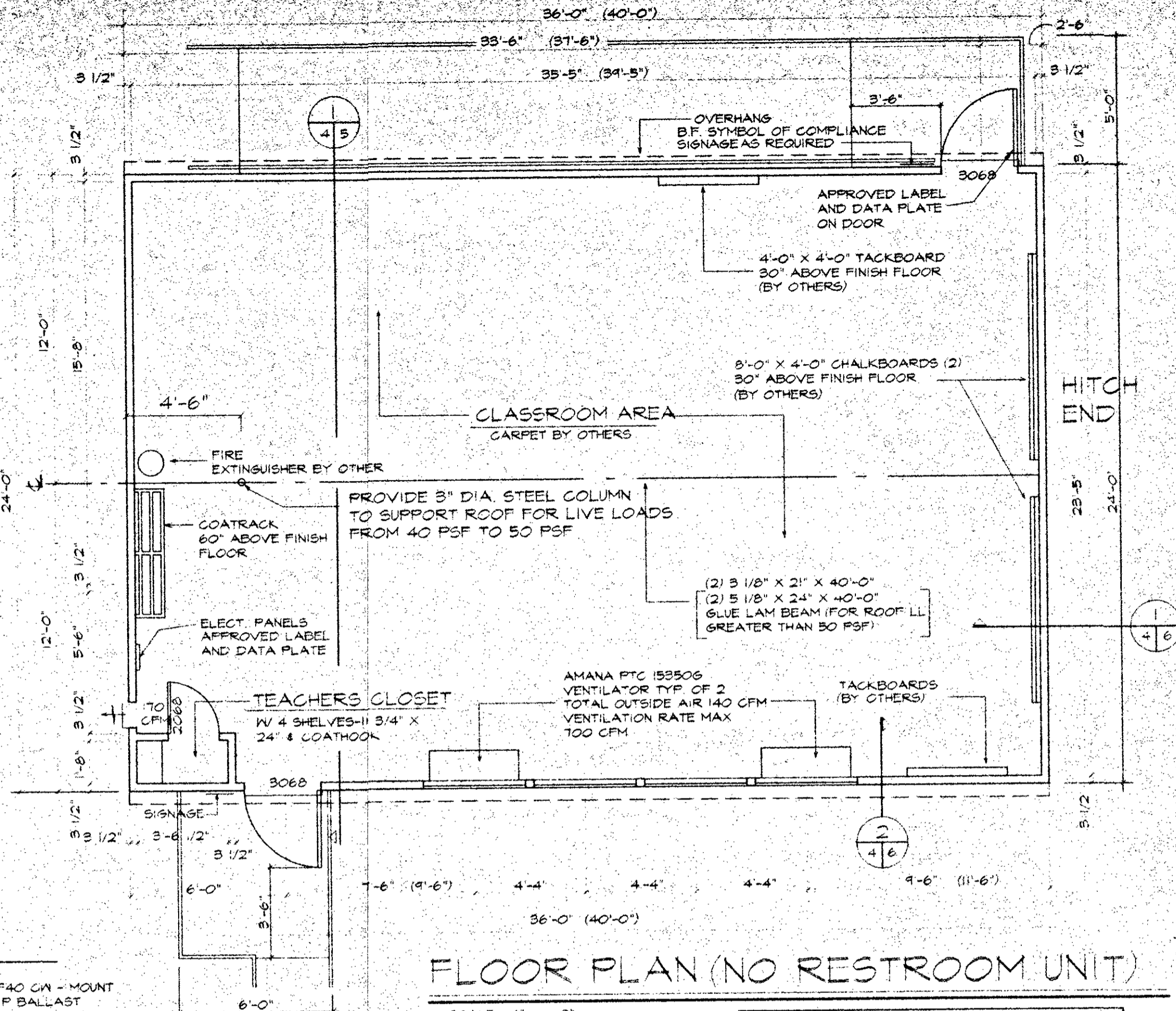
MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

 NO. 44-	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING, MICHIGAN 48809 PHONE 616-794-3455	FOUNDATION PLAN & DETAILS RELOCATABLE CLASSROOMS 24' X 36', 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W.L. PERRY ASSOCIATES, LTD. ARCHITECTURE ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS, MICHIGAN 49504 PHONE 616-454-1740	DATE 3/24/98	SHEET NO 3
	48-076				



ELECTRICAL PLAN (NO RESTROOM UNIT)

SCALE 1/4" = 1'-0"



FLOOR PLAN (NO RESTROOM UNIT)

SCALE 1/4" = 1'-0"

FIXTURE SCHEDULE

- ① - LITHONIA #26-440-A12 W/ 4-48-#F40 CW - MOUNT IN CEILING GRID SYSTEM W/ TYPE P BALLAST
- ② - HALO #H24H (60W) - WALL MOUNTED
- ④ - HALO #H-71CT/TFP COVER (60W) - RECESS IN CEILING
- ⑤ - LITHONIA - FESIR-120 ELN - SURFACE MOUNT ON CEILING
- ⑥ - NUTONE #B:70 OR EQUAL

LINTEL SCHEDULE

ALL DOORS (TYP) 2 - 2 X 6 #2 SYP MIN
ALL WINDOWS (TYP) 2 - 2 X 6 #2 SYP MIN

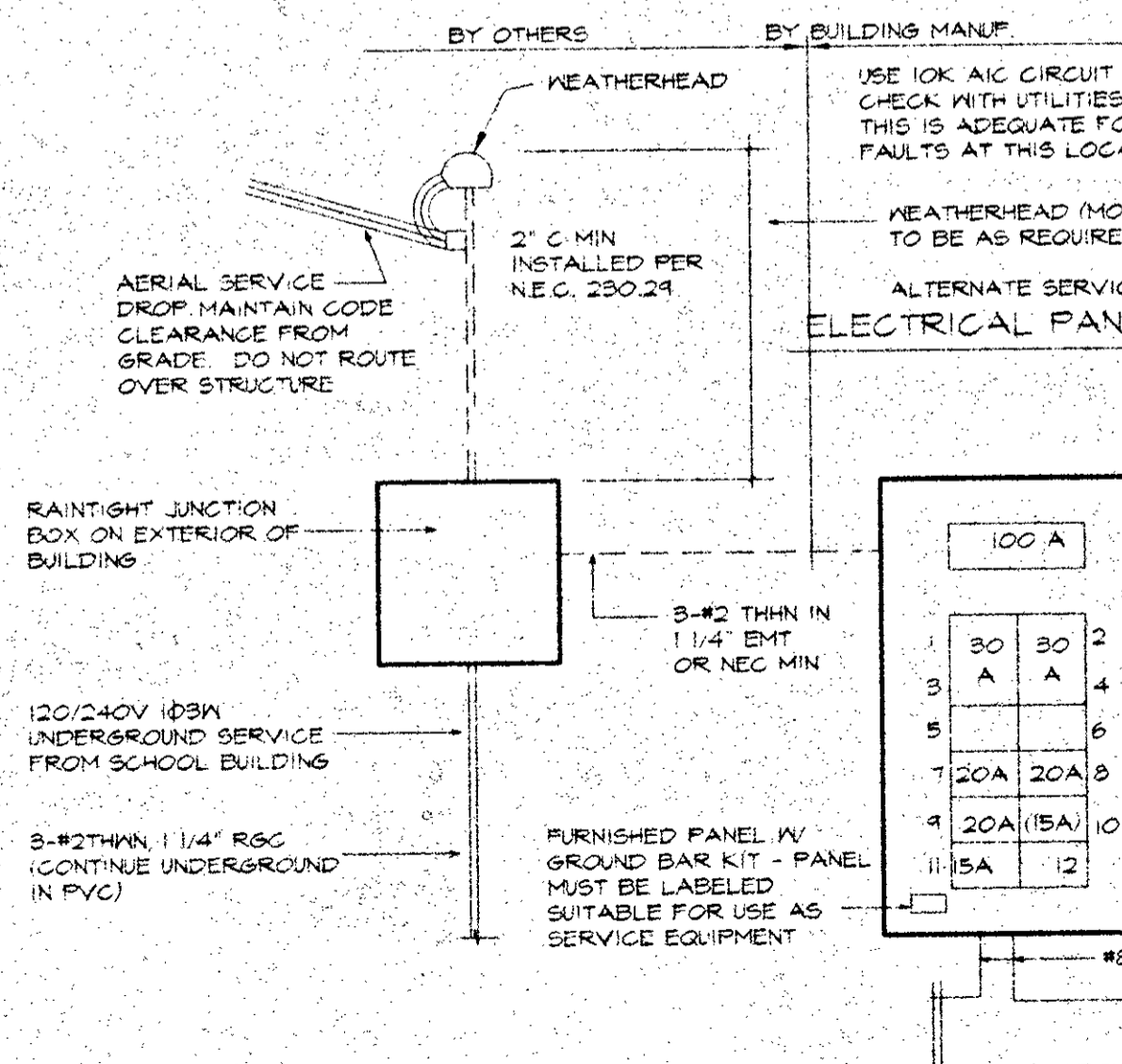
36'		40'	
UNIT VENTILATOR	5670	13 - UNIT VENTILATOR	5670
24 - UNIT VENTILATOR	5670	24 - UNIT VENTILATOR	5670
7 - LIGHTING	2542 TOTAL	7 - LIGHTING	2880 TOTAL
EP - LIGHTING	(PER NEC)	8 - LIGHTING	(PER NEC)
9 - RECEPTACLES	540	9 - RECEPTACLES	540
10 - RECEPTACLES	540	10 - RECEPTACLES	540
11 - EXHAUST FAN	80	11 - EXHAUST FAN	80
	15,042 VA		15,380 VA
	EST. LOAD = 15.1 KVA		EST. LOAD = 15.3 KVA
	72 AMPS @ 90% PF		73 AMPS @ 90% PF

ELECTRICAL NOTES

1. MIN WIRE SIZE UNIT VENTILATORS TO BE #10 THIN MIN WIRE SIZE OTHER CIRCUITS TO BE #12 THIN (THERMOSTAT WIRE #18 THIN OR EQUAL)
2. ELECTRICAL SWITCHES AND THERMOSTATS TO BE MOUNTED +48" FROM FLOOR - RECEPTACLES TO BE MOUNTED +8" FROM FLOOR
3. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "NATIONAL ELECTRIC CODE" ALL WIRING SHALL CONSIST OF COPPER CONDUCTORS INSTALLED IN METAL RACEWAY PER NEC (ROMEX ALLOWED IN INDIVIDUAL UNITS)
4. ALL RECESSED FIXTURES SHALL BE PROVIDED WITH ADEQUATE CLEARANCES. THIS INCLUDES COMBINATION FAN/LIGHT UNITS
5. ALL RECESSED INCANDESCENT FIXTURES SHALL HAVE THERMAL PROTECTION AND BE SO IDENTIFIED. THIS INCLUDES COMBINATION FAN LIGHT UNITS.
6. NOTES & DIMENSIONS IN PARENTHESIS () ARE IN REFERENCE TO 40'-0" UNIT ONLY
7. DOES NOT APPLY TO NON-RESTROOM MODELS
8. ALL WIRING (ELECTRICAL, TELEPHONE, COMMUNICATIONS, FIRE ALARM, ETC.) IN DUCTS, PLENUMS, OR OTHER SPACE USED FOR ENVIRONMENTAL AIR SHALL BE INSTALLED IN PROPER RACEWAYS, OR BY CABLES SPECIFICALLY LISTED FOR THE USE
9. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANCE RATED WALLS, PARTITIONS FLOORS OR CEILINGS SHALL BE FIRESTOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE RESISTANCE RATING
10. BOXES USED AT LIGHTING FIXTURE OUTLETS SHALL BE DESIGNED FOR THE PURPOSE. DEVICE BOXES SHALL NOT BE USED TO SUPPORT FIXTURES.
11. OUTLET BOXES SHALL NOT BE THE SOLE SUPPORT FOR CEILING FANS.
12. THE DISCONNECTING MEANS FOR MOTORS SHALL BE MOTOR-CIRCUIT SWITCH RATED IN HORSEPOWER, A CIRCUIT BREAKER OR A MOLDED CASE SWITCH (NONAUTOMATIC CIRCUIT INTERRUPTER) AND FOR A CORD PLUG-CONNECTED MOTOR, A HORSEPOWER RATED ATTACHMENT PLUG AND RECEPTACLE.

DIMENSIONS AND NOTES IN PARENTHESIS () ARE IN REFERENCE TO THE 40' UNIT ONLY

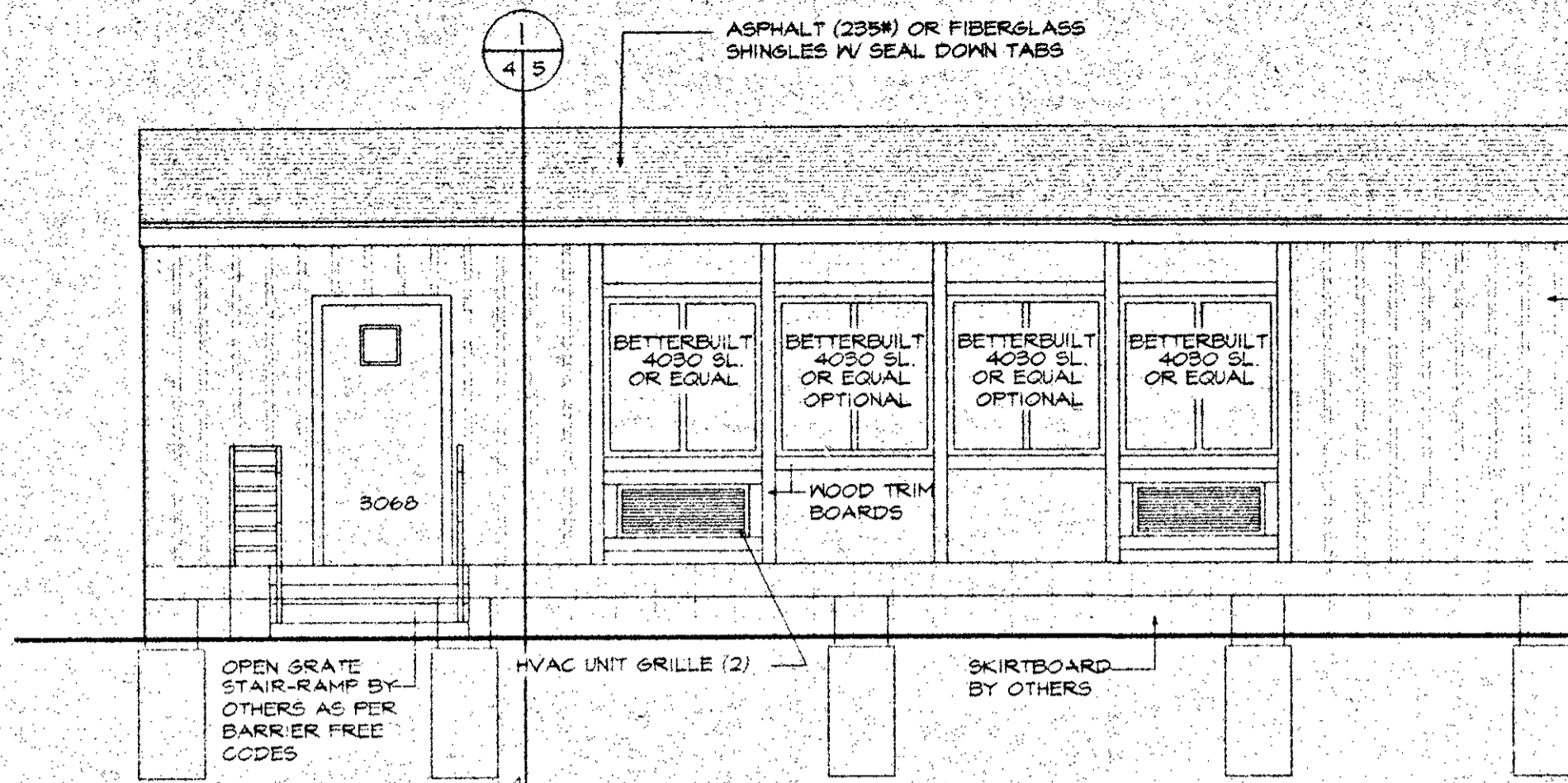
- NOTES:
1. ELEVATIONS HAVE OPTIONAL 8'-6" SIDEWALLS W/ 1/2" ROOF SLOPE AND 9'-0" SIDEWALLS W/ 1/2" ROOF SLOPE
 2. 16" x 12" EAVE OVERHANGS ARE OPTIONAL
 3. RAMP & STEPS FURNISHED & INSTALLED PER CODE (BY OTHERS)
 4. BUILDING & FACILITIES MEETING BARRIER FREE DESIGN SHALL BE CLEARLY IDENTIFIED W/ SYMBOL OF COMPLIANCE.
 5. ALL SIGNAGE PROVIDING EMERGENCY INFORMATION, ROOM IDENTIFICATION & CIRCULATION SHALL MEET SECTION 4.28 OF BARRIER FREE DESIGN REQUIREMENTS
 6. ALL DOORS SHALL HAVE HANDLES, PULLS, LATCHES, AND OTHER TYPES OF OPERATING DEVICES WHICH DO NOT REQUIRE TIGHT GRASPING, TIGHT PINCHING, OR TWISTING OF THE WRIST TO OPERATE. ALL DOOR HARDWARE SHALL BE NO HIGHER THAN 48"
 7. AN EXTERIOR RESIDENTIAL SLIDING DOOR THRESHOLD SHALL BE NO HIGHER THAN 3/4"
- NOTES:
1. DIMENSIONING TAKEN TO STUD LINE UNLESS NOTED OTHERWISE
 2. STUDS ARE 3 1/2" UNLESS NOTED OTHERWISE.
 3. AMANA HEATING AND AC
 4. OSB INTERSEAL EXT. & PAINTED TAN TONE BEIGE DEVICE
 5. ACOUSTIC TILE CEILING ON INTL. SUSPENSION SYSTEM
 6. RESTROOM - BARRIER FREE DESIGN WITH TILE IN RESTROOM AREA TO INCLUDE: VA TILE GRAB BARS, TOILET PAPER HOLDER, PAPER HOLDER, PAPER TOWEL DISPENSOR AS STANDARD EQUIPMENT (BY OTHERS)
 7. (2) CHALKBOARDS
 8. (2) TACKBOARDS
 9. COAT RACK
 10. TEACHERS CLOSET



ELECTRICAL RISER DIAGRAM

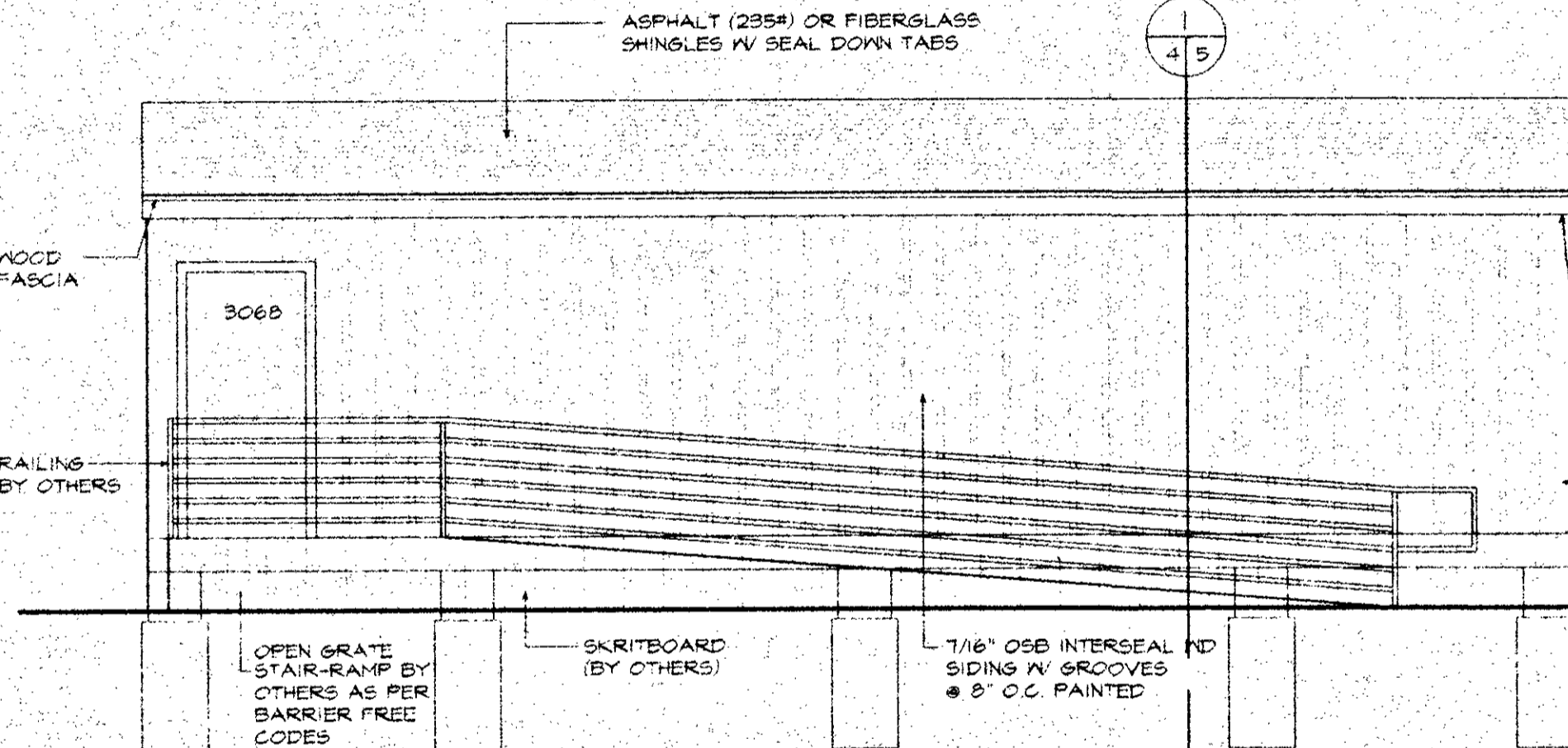
24' X 36' 40' TEMPORARY STANDARD CLASSROOM
MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC BELDING, MICHIGAN

 NO. 94-	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING, MICHIGAN 48809 PHONE 616-794-3455	FLOOR PLAN & ELEVATIONS RELOCATABLE CLASSROOMS 24'X36' & 40' STANDARD CLASSRM THOMAS CONSTRUCTION INC (TEMPORARY CLASSROOM)	W/L PERRY ASSOCIATES, LTD. ARCHITECTURE ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS MICHIGAN 49504 PHONE 616-454-1740	DATE: 3/21/96 REVISED: 3/24/96	SHEET NO 98-076 4A



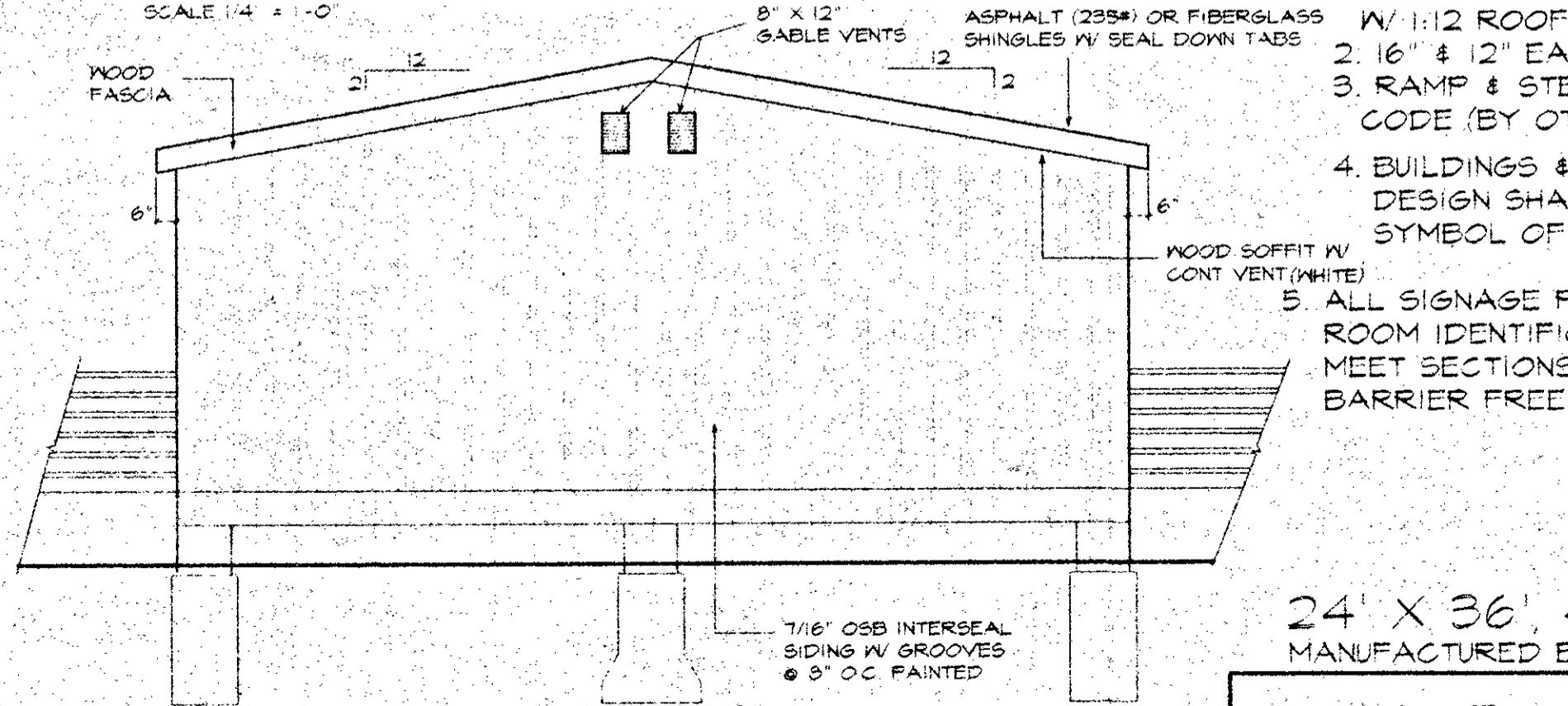
FRONT ELEVATION (40' SIMILAR)

SCALE 1/4" = 1'-0"



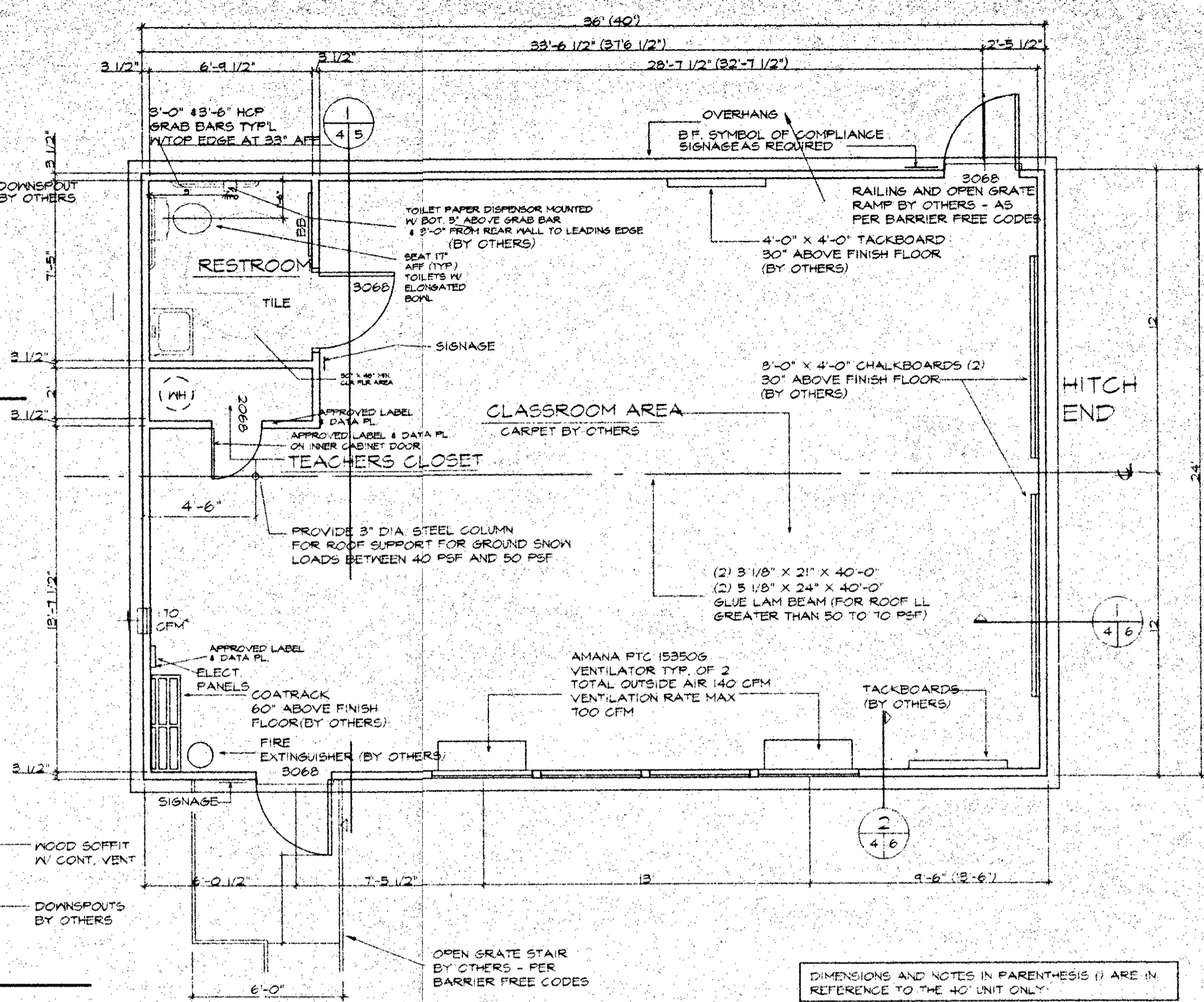
BACK ELEVATION (40' SIMILAR)

SCALE 1/4" = 1'-0"



SIDE ELEVATION (LEFT & RIGHT SIMILAR)

SCALE 1/4" = 1'-0"



FLOOR PLAN (REFER TO FLOOR PLAN ON SHIT 4A FOR NON-RESTROOM UNITS)

SCALE 1/4" = 1'-0"

NOTES:

- ELEVATIONS HAVE OPTIONAL 8'-6" SIDEWALLS W/ 1 1/2" ROOF SLOPE AND 9'-0" SIDEWALLS W/ 1:12 ROOF SLOPE
- 16" & 12" EAVE OVERHANGS ARE OPTIONAL
- RAMP & STEPS FURNISHED & INSTALLED PER CODE (BY OTHERS)
- BUILDINGS & FACILITIES MEETING BARRIER FREE DESIGN SHALL BE CLEARLY IDENTIFIED W/ SYMBOL OF COMPLIANCE.
- ALL SIGNAGE PROVIDING EMERGENCY INFORMATION, ROOM IDENTIFICATION & CIRCULATION SHALL MEET SECTIONS 4.28 OF BARRIER FREE DESIGN REQUIREMENTS

NOTES:

- DIMENSIONING TAKEN TO STUD LINE UNLESS NOTED OTHERWISE
- STUDS ARE 3 1/2" UNLESS NOTED OTHERWISE
- SEE HEATING & AC
- OSB INTERSEAL EXT. & PAINTED - TAN TONE BEIGE - DEVOE
- ACOUSTIC TILE CEILING ON MTL SUSPENSION SYSTEM
- RESTROOM - BARRIER FREE DESIGN WITH TILE IN RESTROOM AREA TO INCLUDE VA TILE, GRAB BARS, TOILET PAPER HOLDER, PAPER TOWEL DISPENSOR AS STANDARD EQUIPMENT (BY OTHERS)
- (2) CHALKBOARDS
- (2) TACKBOARDS
- COAT RACKS
- TEACHERS CLOSET
- WATER CLOSET GRAB BARS SHALL BE MOUNTED WITH THE TOP EDGE AT 33" TO 36" ABOVE THE FLOOR. SECTION 4.24.2.2.
- FLUSH CONTROL FOR BARRIER FREE WATER CLOSET SHALL BE MOUNTED AT NO HIGHER THAN 44" SECTION 4.17.5
- ALL DOORS SHALL HAVE HANDLES, PULLS, LATCHES AND OPERATING DEVICES WHICH DO NOT REQUIRE TIGHT GRASPINGS, TIGHT PINCHING, OR TWISTING OF THE WRIST TO OPERATE. TYPICAL DOOR KNOBS ARE INCAPABLE OF COMPLYING WITH THESE PROVISIONS. SECTION 4.13.4
- PRIMARY LOCKING AND LATCHING DEVICES ON A DOOR SHALL BE MOUNTED NO HIGHER THAN 48" AND SECONDARY LOCKING DEVICES NO HIGHER THAN 48" SECTION 4.2.4.2.
- AN EXTERIOR RESIDENTIAL SLIDING DOOR THRESHOLD SHALL BE NO HIGHER THAN 3/4"

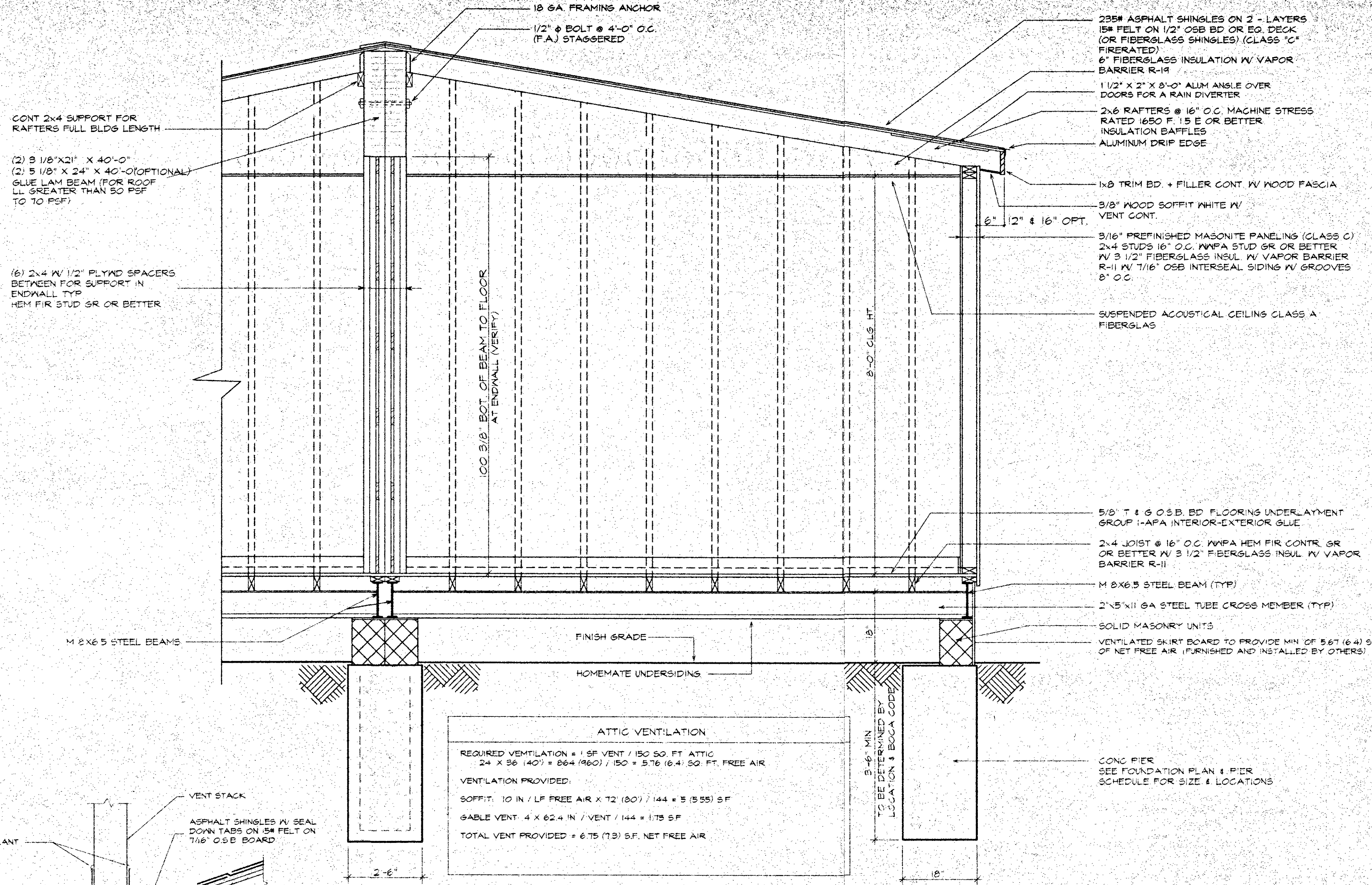
LINTEL SCHEDULE

ALL DOORS TYP 2 - 2X6 #2 SYP MIN
ALL WINDOWS TYP 2 - 2X6 #2 SYP MIN

24' X 36', 40' TEMPORARY STANDARD CLASSROOM

MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

No. 95- SERIAL NUMBER:	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING MICHIGAN 48809 PHONE 616-794-3455	FLOOR PLAN & ELEVATIONS RELOCATABLE CLASSROOMS 24' x 36' 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W.L. PERRY ASSOCIATES, LTD. ARCHITECTURE ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS, MICHIGAN 49504 PHONE 616-454-1740	DATE: 09/21/96 REVISED 3/24/98	98-076	SHEET NO 4B
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ATTIC VENTILATION

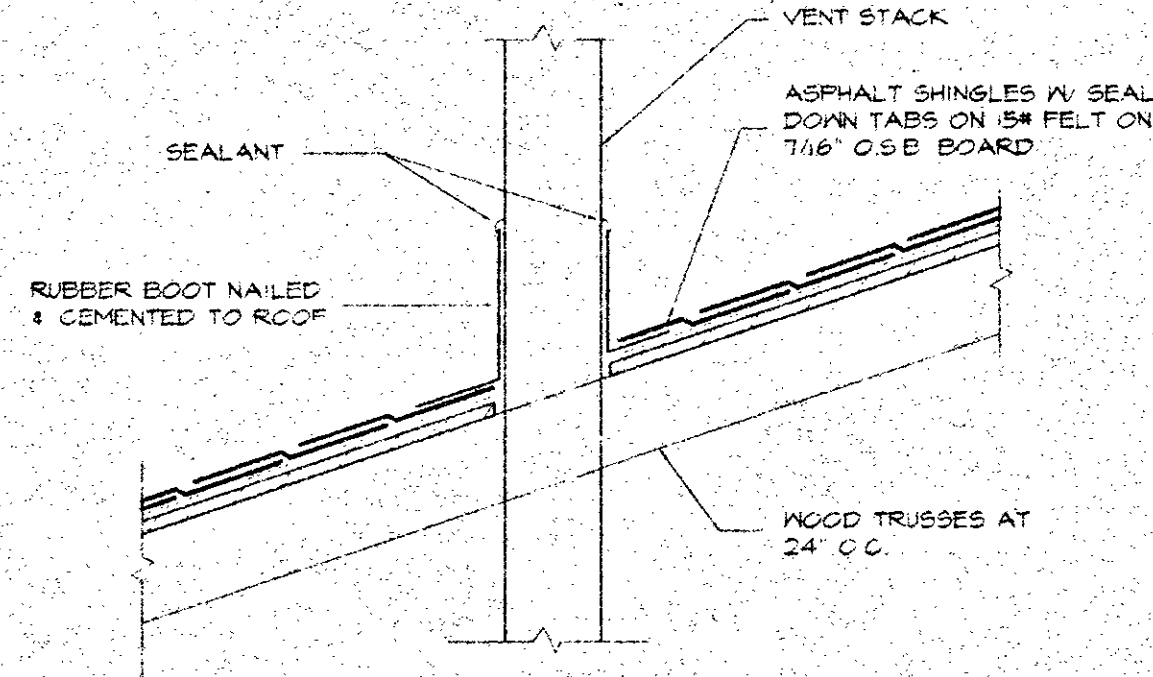
REQUIRED VENTILATION = 1 SF VENT / 150 SQ. FT. ATTIC
 24 X 36 (40') = 864 (960) / 150 = 5.76 (6.4) SQ. FT. FREE AIR

VENTILATION PROVIDED:

SOFFIT: 10 IN / LF FREE AIR X 72 (80) / 144 = 5 (5.55) SF

GABLE VENT: 4 X 62.4 IN / VENT / 144 = 1.75 SF

TOTAL VENT PROVIDED = 6.75 (7.3) S.F. NET FREE AIR

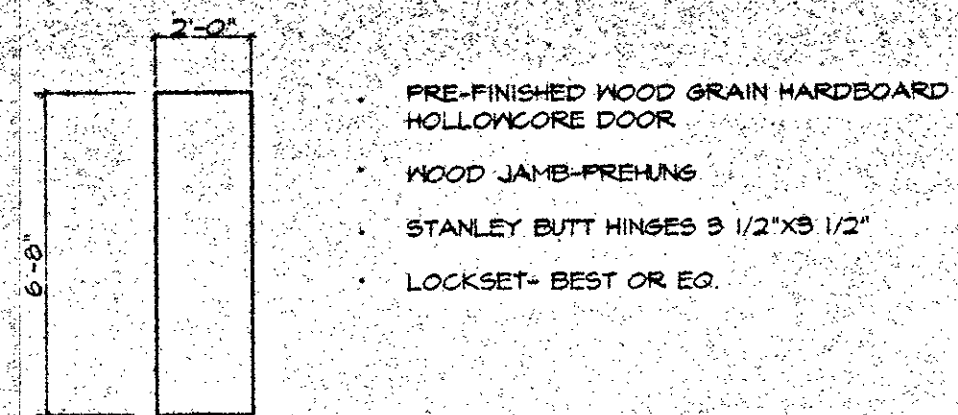
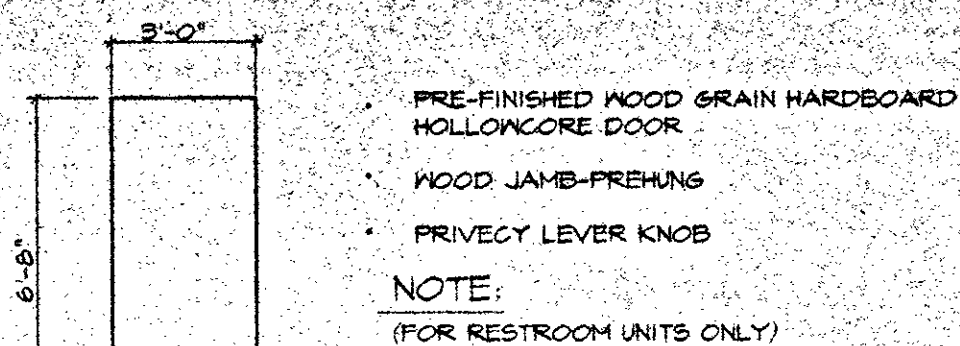
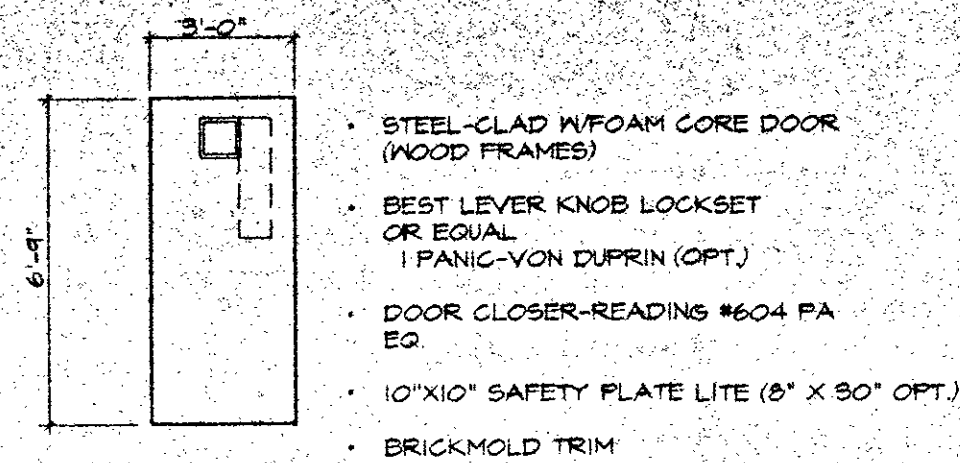


CROSS SECTION
 SCALE 3/4" = 1'-0"

24' X 36', 40' TEMPORARY STANDARD CLASSROOM
 MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

DETAIL OF PENETRATION THRU ROOF
 SCALE 1/2" = 1'-0"

 NO. 94-	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING, MICHIGAN 48809 PHONE 616-744-3455	CROSS SECTION RELOCATABLE CLASSROOMS 24' X 36' 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W.L. PERRY ASSOCIATES LTD. ARCHITECTURE ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS, MICHIGAN 49504 PHONE 616-454-1740	DATE: 3/21/96 REVISED 3/24/98	SHEET NO. 98-076 5
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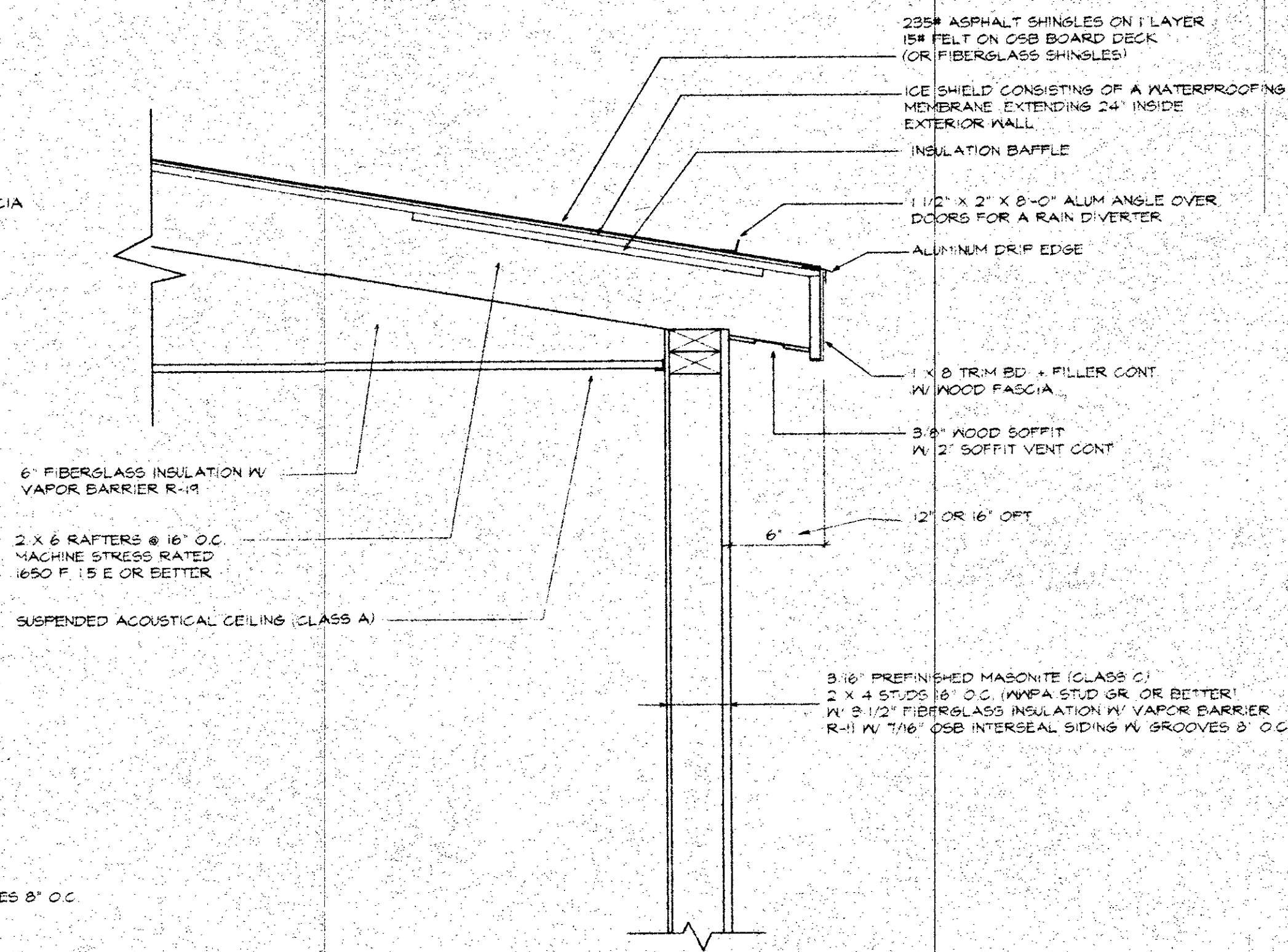
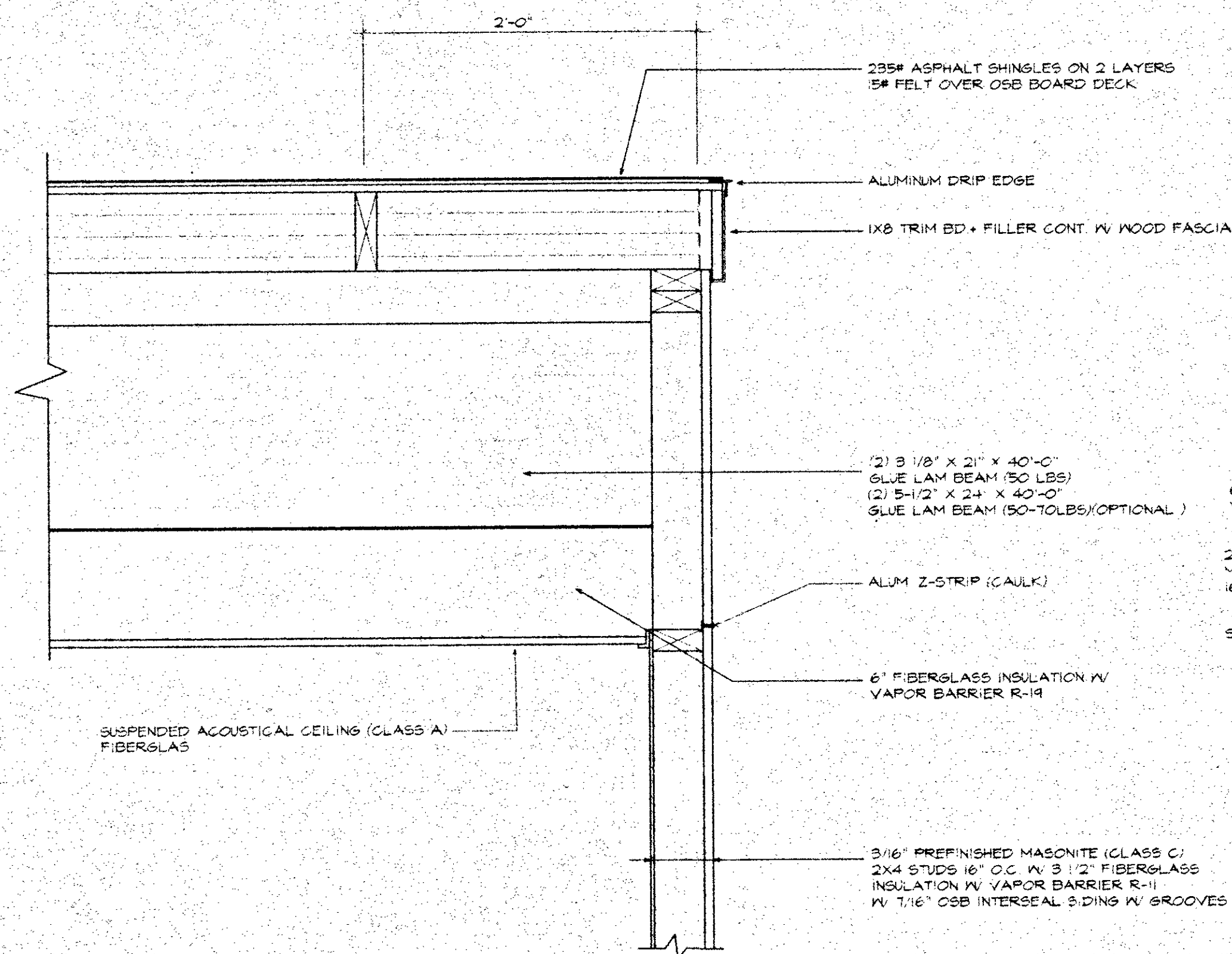


(A) ENTRANCE DOOR 1/4"=1'-0"

(B) EXIT DOOR REST ROOM DOOR (RESTROOM UNITS ONLY) 1/4"=1'-0"

(C) CLOSET DOOR 1/4"=1'-0"

DOOR TYPES



(1) WALL DETAIL 1/2"=1'-0"

(2) WALL DETAIL 1/2"=1'-0"

24' X 36' 40' TEMPORARY STANDARD CLASSROOM
 MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING, MICHIGAN 48805 PHONE: 616-794-3455	WALL DETAIL RELOCATABLE CLASSROOM 24' X 36' 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W. L. PERRY ASSOCIATES ARCHITECTURE ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS, MICHIGAN 49504 PHONE: 616-454-1740	DATE 3/24/98	SHEET NO. 48-076 6

SPECIFICATIONS FOR:

24'x36'40' RELOCATABLE CLASSROOM
THOMAS CONSTRUCTION LTD.

PROJECT # 96-057

STANDARDS

ALL WORK SHALL BE DONE AND CARRIED ON IN ACCORDANCE WITH ALL GOVERNING (FEDERAL, COUNTY, TOWNSHIP, CITY, ETC.) AND ACCREDITED AUTHORITATIVE AGENCIES AS LISTED IN THE APPENDICES OF BUILDING OFFICIALS AND CODE ADMINISTRATORS INTERNATIONAL, INC. (BOCA) CODE, LATEST EDITION.

RESPONSIBILITIES

1. THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL EXISTING CONDITIONS AT THE PLACE OF BUILDING, PRIOR TO BEGINNING WORK AND SHALL BE RESPONSIBLE FOR THE SAME.
2. THE GENERAL CONTRACTOR IS TO NOTIFY ENGINEER IMMEDIATELY IN WRITING IF EXISTING CONDITIONS INVALIDATE THE DRAWINGS OR WHEN QUESTIONS ARISE REGARDING THE INTENT OF THE DRAWINGS.
3. THE GENERAL CONTRACTOR IS TO SECURE ALL NECESSARY PERMITS AND CERTIFICATES OF INSPECTION IN CONNECTION WITH THE WORK.
4. ANY DEVIATIONS FROM THESE DRAWINGS WITHOUT THE ENGINEER'S WRITTEN PERMISSION SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND/OR THOSE SO DIRECTING HIM.
5. GENERAL CONTRACTOR IS TO NOTIFY ENGINEER IMMEDIATELY, IN WRITING WHEN REQUESTED, AND PRIOR TO PERFORMING THE WORK OF ANY ERRORS OR OMISSIONS FOUND IN THE ENGINEER'S DOCUMENTS.
6. ALL SUBCONTRACTORS SHALL GIVE A ONE (1) YEAR WRITTEN GUARANTEE OF MATERIALS AND WORKMANSHIP.
7. OWNER/GENERAL CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR SOILS TESTING TO INSURE THAT SOIL HAS THE DESIGN BEARING CAPACITY AS SHOWN ON PLANS. IF SOIL CAPACITY IS FOUND TO BE LESS THAN THE DESIGN CAPACITY USED OWNER/CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER BEFORE PROCEEDING WITH FOUNDATION WORK.

CONSTRUCTION DIVISIONS

EXCAVATION AND CONCRETE WORK

1. FOOTINGS ARE TO BE CARRIED TO SOLID BEARING REGARDLESS OF ELEVATIONS SHOWN.
2. FILL WITHIN AND ADJACENT TO AND UNDER BUILDING AREA SHALL BE COMPACTED TO 95% MINIMUM MODIFIED PROCTOR DENSITY AT OPTIMUM MOISTURE. BACKFILL SHALL BE COARSE SAND.
3. CONCRETE SPECIFICATION IN ACCORDANCE WITH ACI 318-83. ALL APPLICABLE SPECIFICATIONS OF THE AMERICAN CONCRETE INSTITUTE SHALL APPLY TO THIS CONSTRUCTION.
4. REINFORCING BARS TO BE ASTM A-15 NEW BILLET GRADE 60. BARS #3 AND LARGER SHALL HAVE DEFORMATIONS CONFORMING TO ASTM A-305.
5. CONCRETE SHALL HAVE 3,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
6. PORTLAND CEMENT USED SHALL BE TYPE IA FOR EXTERIOR USE.
7. CONCRETE SHALL HAVE A MAXIMUM 3" AND MINIMUM 1" SLUMP.

MASONRY

1. EXTERIOR MASONRY UNITS SHALL BE OF REGULAR WEIGHT AGGREGATE, SOLID TYPE GRADE "A" ASTM C-90.
2. ALL MASONRY UNITS SHALL BE LAID UP IN TYPE "N" MORTAR.
3. REINFORCE EVERY OTHER HORIZONTAL BLOCK COURSE WITH STANDARD "DUR-O-WALL" REINFORCING.
4. CONSULT ALL OTHER TRADES IN ADVANCE, AND MAKE PROVISIONS FOR BUILT IN WORK AS REQUIRED.

STRUCTURAL STEEL

1. THE STRUCTURAL STEEL SHALL BE FURNISHED, FABRICATED AND ERECTED IN ACCORDANCE WITH AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
2. ALL STEEL BEAMS, CHANNELS AND COLUMNS SHALL CONFORM TO ASTM SPECIFICATIONS A-36.
3. ALL BOLTS SHALL CONFORM TO ASTM SPECIFICATIONS A-325.
4. ALL STRUCTURAL STEEL SHALL BE OF NEW MATERIALS AND SHOP PAINTED PRIOR TO SHIPPING.
5. ALL FIELD WELDING SHALL BE COMPLETED WITH CERTIFIED WELDERS.

MISCELLANEOUS STEEL

1. ALL LINTELS, ANGLES, BEAMS AND BEARING PLATES SHALL BE AS SIZED ON PLANS.
2. ALL LINTELS, ANGLES, BEAMS AND PLATES USED ON THIS PROJECT SHALL BE OF NEW MATERIALS, SHOP PAINTED, AND FABRICATED AS PER SHOP DRAWINGS.

CARPENTRY WORK

1. LUMBER SHOWN ON PLANS SHALL BE SPF STUD GRADE OR BETTER.
2. ROOF JOIST LUMBER SHALL BE MACHINE STRESS GRADED 1650 PSI, 15E.
3. ALL ROOF JOISTS SHALL BE SIZED AND STAMPED GRADED AS SHOWN ON PLANS.
4. GRADING - LUMBER, WESTERN WOOD PRODUCTS ASSOCIATION.
5. ALL LUMBER IN CONTACT WITH CONCRETE MASONRY AND MORTAR SHALL BE PRESERVATIVE TREATED LUMBER (WOLMANIZED).
6. ALL LUMBER AND PLYWOOD SHALL BE GRADE STAMPED. FRAMING LUMBER: S4S CONSTRUCTION GRADE. PLYWOOD: CD EXTERIOR GRADE DOUGLAS FIR, PLYSCORE.
7. INSULATION, BATT TYPE - INDICATED ON DRAWINGS. RIGID TYPE - STYROFOAM THICKNESS TO BE AS SHOWN ON DRAWINGS.
8. CAULKING FOR INTERIOR JOINTS, BUTYL, ELASTOMERIC, OR POLYSULFIDE.
9. FIBERGLASS OR ASPHALT SHINGLES SHALL BE 3 IN 1 235# ON 2 LAYERS, 15# FELT. COLOR SELECTION BY OWNER.

LAMINATED WOOD BEAMS

1. ALL STRUCTURAL LAMINATED WOOD BEAMS SHALL BE FURNISHED AS SHOWN DETAILED ON THE PLANS AND SPECIFIED HEREIN.
2. LAMINATING COMBINATIONS SHALL MEET THE REQUIREMENTS OF PRODUCT STANDARD PS 56-75 "STRUCTURAL GLUED LAMINATED TIMBER" AND SHALL PROVIDE ALLOWABLE STRESS VALUES OF 2400 PSI IN BENDING (FB).
3. THE FABRICATOR SHALL HAVE AITC LICENSES AND LAMINATED WOOD BEAMS SHALL BE MARKED WITH AITC STAMP.

HOLLOW METAL DOORS

- A. HOLLOW METAL DOORS:
 1. TYPE: 1 3/4" THICK FULL FLUSH TYPE WITHOUT PANELS OR FACE JOINTS. SIZES AS CALLED FOR IN SCHEDULE.
 2. GAUGES:
 - a. FACE PANELS, ROLLED LEVELED STEEL SHEETS - 18 GA.
 - b. TOP AND BOTTOM EDGES - 16 GAUGE STEEL CHANNELS.
 - c. VERTICAL REINFORCING 22 GAUGE, MAXIMUM 6" O.C.
 3. SPOT WELD INNER VERTICAL REINFORCING TO EACH INSIDE FACE OF EACH DOOR CONTINUOUS INNER REINFORCING AT ALL CORNERS. EDGE JOINTS TO BE WELDED CONTINUOUSLY, FILLED WITH METALLIC FILLER AND GROUND SMOOTH. NO LOCK SEAMS PERMITTED. PROVIDE ASTRAGALS ON ALL PAIRS OF DOORS.
 4. REINFORCE AND MORTISE DOORS FOR HARDWARE AS SPECIFIED IN SECTION 0870. HINGE REINFORCING - 7 GAUGE, LOCKS, CLOSURES, ETC., 12 GAUGE.
 5. PROVIDE STYROFOAM INSULATION IN ALL DOORS.
 6. LABEL DOORS INSULATED AS REQUIRED BY UNDERWRITERS' LABORATORIES. PROVIDE UL LABELS.

(2)

DESIGN OF ROOF RAFTERS

ROOF SNOW LOAD = 10 PSF x 7 = 49 PSF
 MAXIMUM LOADING ROOF TRUSS D.L. = 11 PSF
TOTAL LOAD = 60 PSF

SPAN OF ROOF JOIST = 11'-8"

$$\Delta M = \frac{(0.060 \times 133)(11.67)^2}{8} = 136 \text{ FT-KIPS/JOIST}$$

REG. SECTION MODULUS = $\frac{136 \times 12}{115(115) \times 1.65} = 7.47 \text{ IN.}^3$ 2 X 6 RAFTER S = $\frac{15 \times 55(55)}{6} = 156 \text{ IN.}^3$

ACOUSTICAL CEILINGS


1. 2x4 CEILING SHALL BE CLASS "A" 24x48x5/8 FISSED DESIGN MINABOARD LAY-IN PANELS BY ARMSTRONG OR APPROVED EQUAL.
2. METAL GRID SYSTEM SHALL BE BAKED ENAMEL (WHITE) STEEL TEE RAILS.
3. INSTALLATION:
 - A. SUSPENSION SYSTEM:
 1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 2. LAYOUT WORK TO FINISHED EXACTLY WITH PRELOCATED LIGHT GRILLES, ETC., AS INDICATED ON DRAWINGS TO BE INSTALLED OR SUSPENDED FROM THE CEILINGS. REINFORCE AS REQUIRED TO SUPPORT EXTRA WEIGHT.
 3. PROVIDE RIGID SYSTEM OF METAL FURRING FOR ALL CEILINGS WITH SPACING NOT EXCEEDING THOSE LISTED BELOW WITH MAIN RUNNERS AND TEES LEVEL WITHIN 1/8" IN 12'-0".
 - a. HANGER WIRES, 4'-0" O.C. IN DIRECTION OF RUNNING CHANNELS AND MAIN TEE BEAMS.
 - b. EXPOSED T BARS: MAIN TEES 4'-0" O.C. GROSS TEES: 2'-0" O.C. TO FORM 24x48 GRID.
 4. INSTALL MOLDINGS AT PERIMETER OF ALL CEILING PANELS AND/OR ROOMS WHERE CEILINGS MEET WALLS AND PARTITIONS.
 - B. LAY-IN CEILINGS: INSTALL PANELS IN GRID SYSTEM WITH PATTERN RUNNING IN ONE DIRECTION.
 1. CLEANING & MAINTENANCE
 - a. REPLACE WITH NEW MATERIAL OR REPAIR TO LIKE NEW CONDITION ANY TILE WHICH IS DISCOLORED, BROKEN OR DAMAGED.
 - b. UPON COMPLETION OF WORK, CLEAN ALL TILE SURFACES AND REMOVE FOREIGN MATTER AND DEBRIS CAUSED BY WORK OR THIS CONTRACTOR.
 - c. PROTECTION: PROTECT WORK OF THE OTHERS FROM DAMAGE DUE TO INSTALLATION OF CEILING.

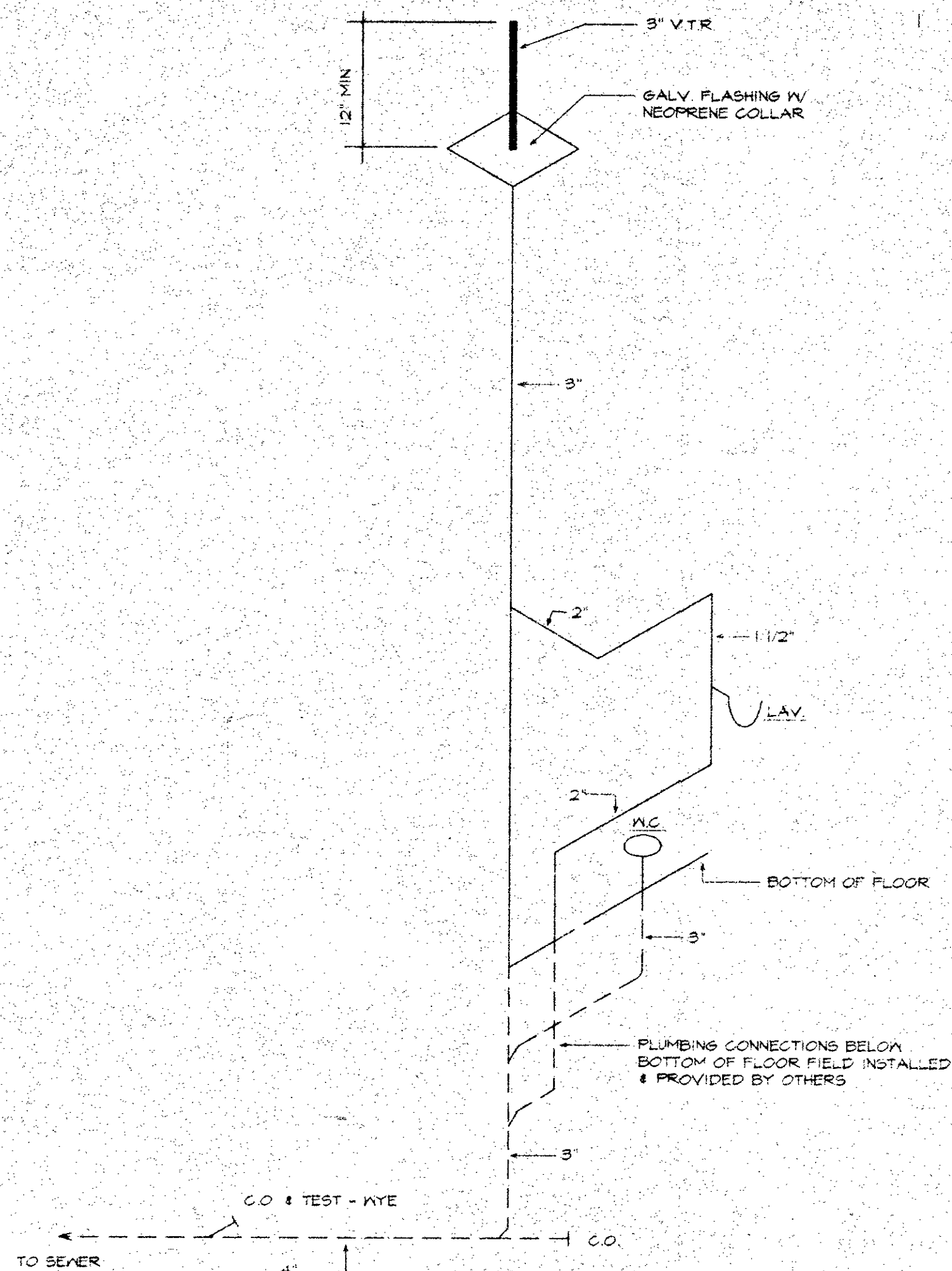
(3)

BUILDING ELEMENT	RECOMMENDED FASTENING SCHEDULE	NAIL SIZE AND TYPE
STUD TO SOLE PLATE	16D COMMON
STUD TO CAP PLATE	16D COMMON
DOUBLE STUDS	16D COMMON
CORNER STUDS	16D COMMON
SOLE PLATE TO JOIST OF BLOCKING	16D COMMON
DOUBLE CAP PLATE	16D COMMON
CAP PLATE LAPS	10D COMMON
FLOOR JOISTS TO SILL OF GRIDER	2D COMMON
LEDGER STRIP	16D COMMON
CEILING JOISTS TO PLATE	16D COMMON
CEILING JOISTS (LAPS OVER PARTITION)	10D COMMON
CEILING JOISTS (PARALLEL TO RAFTER)	10D COMMON
COLLAR BEAM	10D COMMON
BRIDGING TO JOISTS	2D COMMON
DIAGONAL BRACE (TO STUD AND PLATE)	2D COMMON
PLYWOOD ROOF AND WALL SHEATHING (1/2" OR LESS)	16D COMMON
(5/8" OR GREATER)	2D COMMON
(5/16" 3/8" OR 1/2")	16 GAGE GALVANIZED WIRE STAPLES 3/8" MINIMUM CROWN LENGTH OF 1" PLUS PLYWOOD THICKNESS
PLYWOOD ROOFING (1/2")	6" O.C DIRECT EDGES AND 10" O.C INTERMEDIATE
(5/8" 3/4")	6" O.C DIRECT EDGES AND 10" O.C INTERMEDIATE
CONTINUOUS HEADER TO STUD	4 TOE NAIL
CONTINUOUS HEADER TWO PIECES	16" O.C DIRECT
1/2" FIBER BOARD SHEATHING	3" O.C EXTERIOR EDGES 6" O.C INTERMEDIATE
SYFSUM SHEATHING	12 GAGE 1-1/4" LARGE HEAD CORROSION RESISTIVE
		4" O.C ON EDGE 8" O.C INTERMEDIATE

24' X 36', 40' TEMPORARY STANDARD CLASSROOM
MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

(1)

 NO. 94-	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING MICHIGAN 48809 PH: 616-794-3455	SPECIFICATIONS RELOCATABLE CLASSROOM 24' X 36', 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	A. L. PERRY ASSOCIATES LTD. ARCHITECTURE/ ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS, MICHIGAN 49504 PH: 616-454-1740	DATE: 3/24/98	JOB NO. 98-076	SHEET NO. 7
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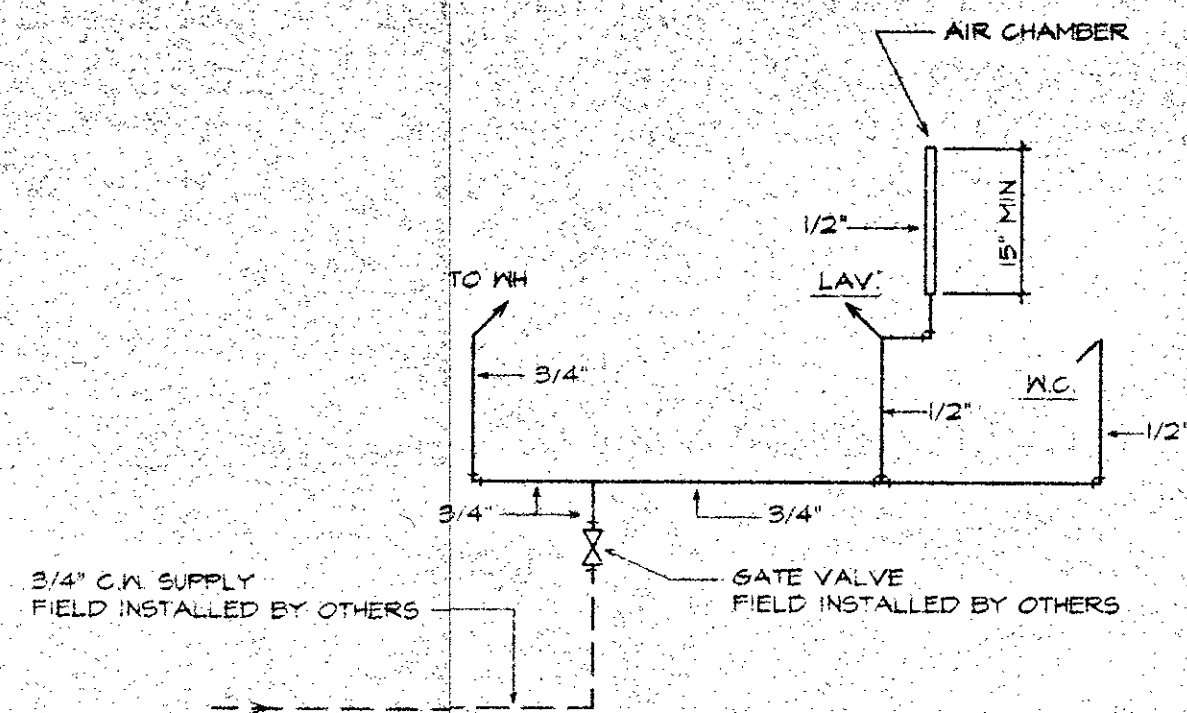


DRAIN, WASTE & VENT DIAGRAM

FACTORY INSTALLED PLUMBING TO BE PVC SCHEDULE - 40
 FIELD INSTALLED PLUMBING TO MEET STATE AND LOCAL CODES
 (NOTE: W.C. LOCATIONS & HOOKUPS FOR RESTROOM UNITS ONLY)

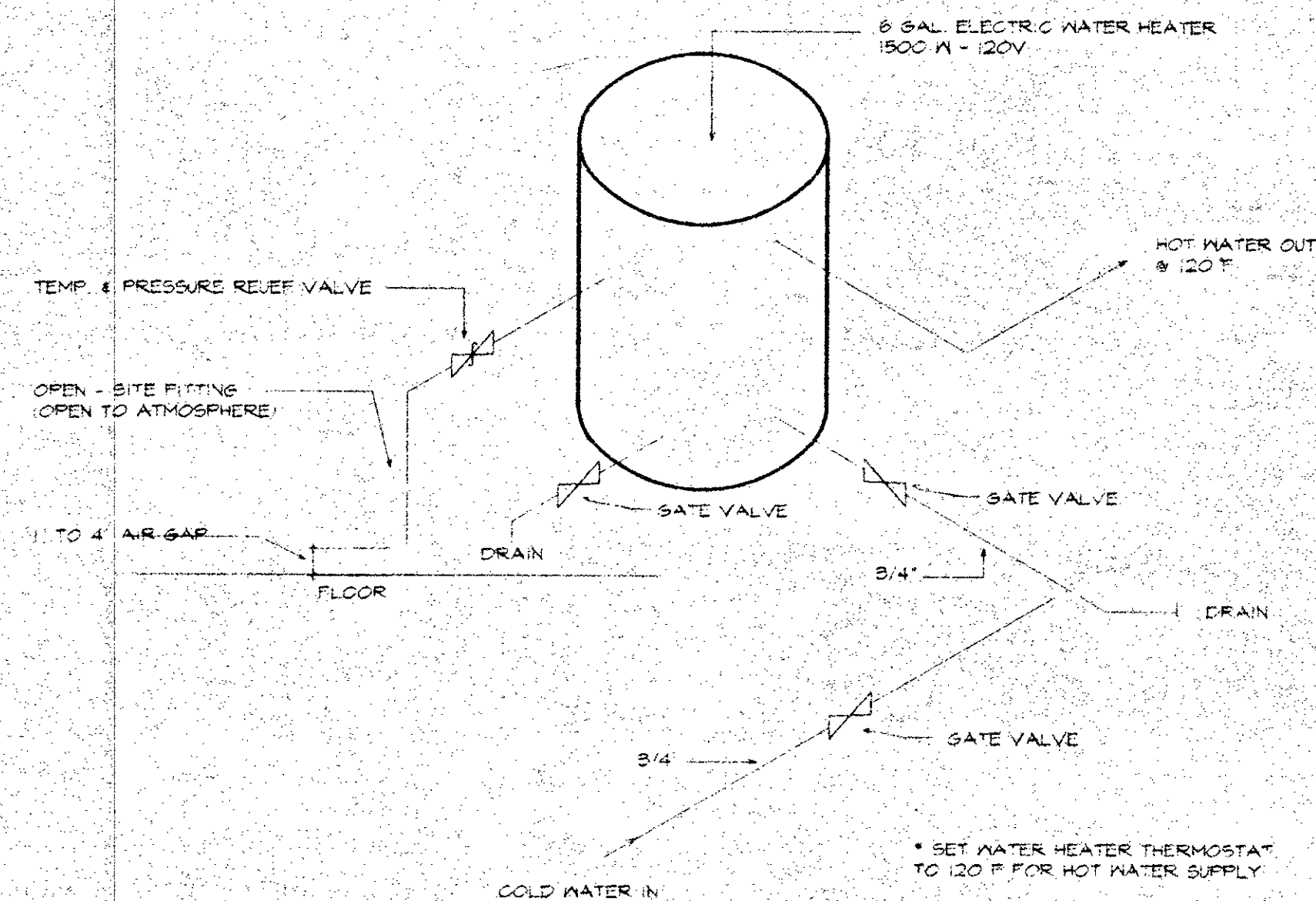
NOTES:

- HANGERS, ANCHORS & SUPPORTS SHALL BE OF METAL OR OTHER MATERIALS OF SUFFICIENT STRENGTH TO SUPPORT THE PIPING AND ITS CONTENTS. HANGERS & ANCHORS SHALL BE SECURELY ATTACHED TO THE BUILDING CONSTRUCTION IN COMPLIANCE W/ THE "PLUMBING CODE"
- HORIZONTAL DRAINAGE PIPING SHALL BE INSTALLED IN UNIFORM ALIGNMENT & SLOPE IN COMPLIANCE W/ THE PLUMBING CODE
- DOES NOT APPLY TO NON - RESTROOM MODELS



COLD WATER DIAGRAM

TYPE "L" COPPER



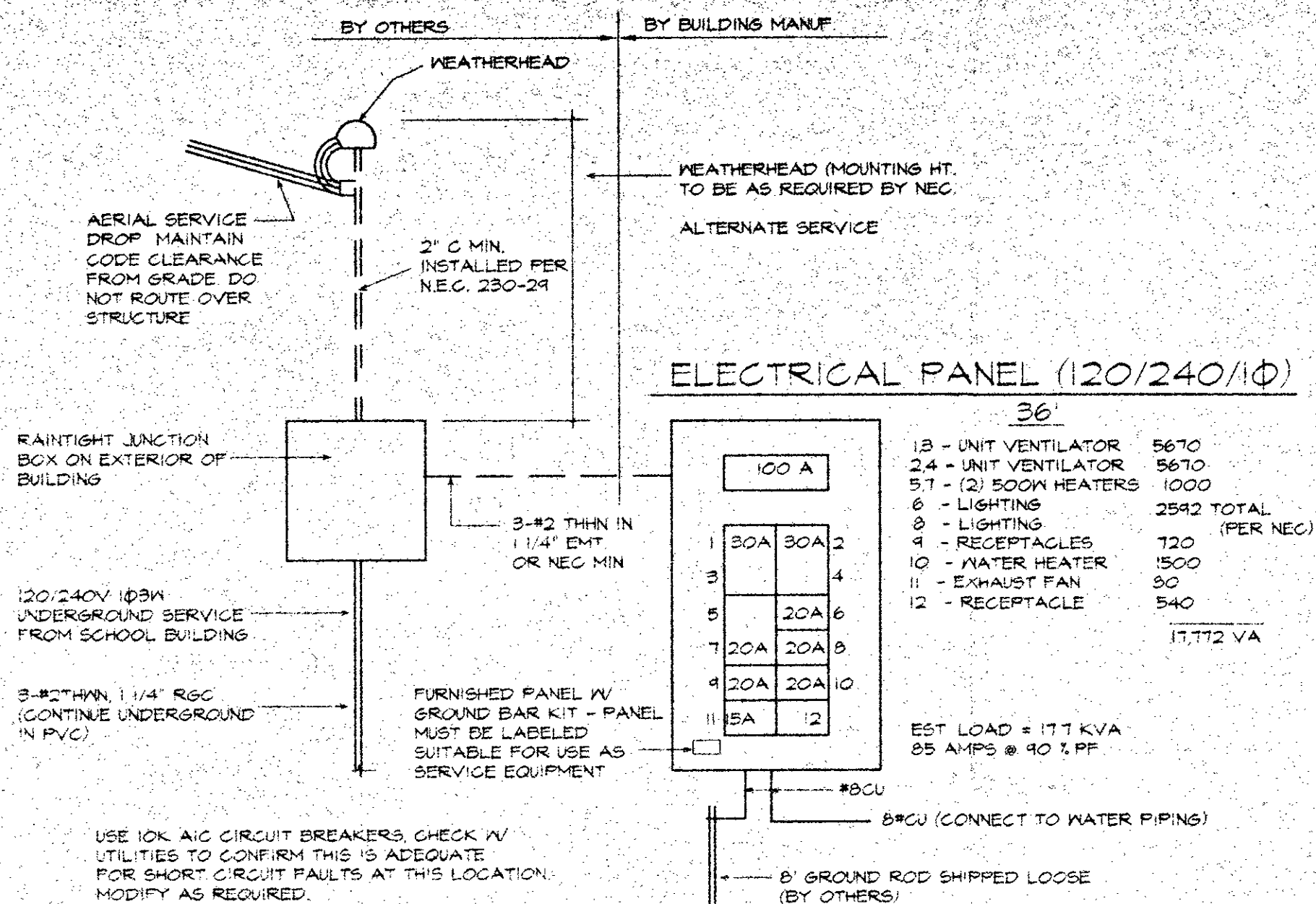
HOT WATER DIAGRAM

TYPE "L" COPPER

* SET WATER HEATER THERMOSTAT TO 120°F FOR HOT WATER SUPPLY

24' X 36' 40' TEMPORARY STANDARD CLASSROOM
 MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

 NO. 96-	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING, MICHIGAN 48809 PH: 616-794-3455	PLUMBING DIAGRAMS RELOCATABLE CLASSROOM 24' X 36' 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W. L. PERRY ASSOCIATES LTD. ARCHITECTURE/ ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS, MICHIGAN 49504 PH: 616-454-1740	DATE: 3/24/98	JOB NO.: 98-076	SHEET NO. 9



ELECTRICAL RISER DIAGRAM

40'			
13 - UNIT VENTILATOR	5670	EST. LOAD = 18.4 KVA 89 AMPS @ 90 % PF	
24 - UNIT VENTILATOR	5670		
57 - BASEBOARD HTS	1000		
6.8 - LIGHTING	2880 TOTAL (PER NEC)		
9 - RECEPTACLES	900		
10 - WATER HEATER	1500		
11 - EXHAUST FAN	80		
12 - RECEPTACLE	720		
			18,420 VA

NOTES

- MIN. WIRE SIZE UNIT-VENTILATORS, TO BE #10 THHN
- MIN. WIRE SIZE OTHER CIRCUITS TO BE #12 THHN (THERMOSTAT WIRE #18 THIN OR EQUAL)
- ELECTRICAL SWITCHES AND THERMOSTATS TO BE MOUNTED +48" FROM FLOOR - RECEPTACLES TO BE MOUNTED +18" FROM FLOOR
- ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "NATIONAL ELECTRIC CODE"
- ALL WIRING SHALL CONSIST OF COPPER CONDUCTORS INSTALLED IN METAL RACEWAY PER NEC ROMEX ALLOWED FOR SINGLE UNITS
- ALL RECESSED FIXTURES SHALL BE PROVIDED WITH ADEQUATE CLEARANCES. THIS INCLUDES COMBINATION FAN/LIGHT UNITS. NEC 410-65 (a) AND (b) AND 410-66
- ALL RECESSED INCANDESCENT FIXTURES SHALL HAVE THERMAL PROTECTION AND BE SO IDENTIFIED. THIS INCLUDES COMBINATION FAN LIGHT UNITS. NEC 410-65(c)
- NOTES & DIMENSIONS IN PARENTHESIS () ARE IN REFERENCE TO 40'-0" UNIT ONLY
- DOES NOT APPLY TO NON-RESTROOM MODELS
- ALL WIRING (ELECTRICAL, TELEPHONE COMMUNICATIONS, FIRE ALARM, ETC.) IN DUCTS, PLENUMS, OR OTHER SPACE USED FOR ENVIRONMENTAL AIR SHALL BE INSTALLED IN PROPER RACEWAYS, OR BY CABLES SPECIFICALLY LISTED FOR THE USE
- OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANCE RATED WALLS, PARTITIONS, FLOORS, OR CEILINGS SHALL BE FIRESTOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE RESISTANCE RATING
- BOXES USED AT LIGHTING FIXTURE OUTLETS SHALL BE DESIGNED FOR THE PURPOSE. DEVICE BOXES SHALL NOT BE USED TO SUPPORT FIXTURES
- OUTLET BOXES SHALL NOT BE THE SOLE SUPPORT FOR CEILING FANS
- THE DISCONNECTING MEANS FOR MOTORS SHALL BE MOTOR-CIRCUIT SWITCH RATED IN HORSEPOWER, A CIRCUIT BREAKER, OR A MOLDED CASE SWITCH (NON-AUTOMATIC CIRCUIT INTERRUPTER); AND FOR A CORD PLUG-CONNECTED MOTOR, A HORSEPOWER RATED ATTACHMENT PLUG AND RECEPTACLE
- MEANS OF EGRESS LIGHTING SHALL BE PROVIDED AT AN EXIT DISCHARGE AND SHALL BE CONNECTED TO AN EMERGENCY ELECTRICAL SYSTEM IN ACCORDANCE WITH THE CODE

FIRE PROTECTION SIGNALING SYSTEM

PROVIDE A SINGLE GANG BOX WITH A BLANK PLATE FOR EACH FIRE ALARM DEVICE. INSTALL 3/4" CONDUIT FROM EACH BOX AND THE FIRE ALARM PANEL LOCATION THROUGH THE CEILING CAVITY AREA. WIRING AND HOOKUP TO BE FIELD INSTALLED BY OWNER.

THE FIRE PROTECTION SIGNALING SYSTEM SHALL BE APPROVED TYPE AND SHALL BE INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 917.0 AND NFPA 72A.

THE AUTOMATIC FIRE DETECTION SYSTEM SHALL BE OF AN APPROVED TYPE AND SHALL BE INSTALLED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 917.0 AND NFPA 72E.

FIRE ALARM SYSTEM SHALL BE AN ELECTRICALLY SUPERVISED TYPE WITH TROUBLE BELL OR ALARM SIGNAL.

FIRE ALARM SYSTEM WIRING SHALL BE INSTALLED IN SEPARATE ENCLOSURES, CABLES, RACEWAYS, ETC.

PROPER INSULATION AND TYPE (SOLID OR BUNCH TINED-BONDED-STRANDED COPPER) SHALL BE REQUIRED FOR FIRE ALARM SYSTEM CONDUCTORS.

ALL AUTOMATIC FIRE ALARM SYSTEMS SHALL HAVE AUDIBLE AND VISUAL ALARM INDICATING APPLIANCES.

PROVIDE VISUAL INDICATING DEVICES IN ALL OCCUPIED ROOMS.

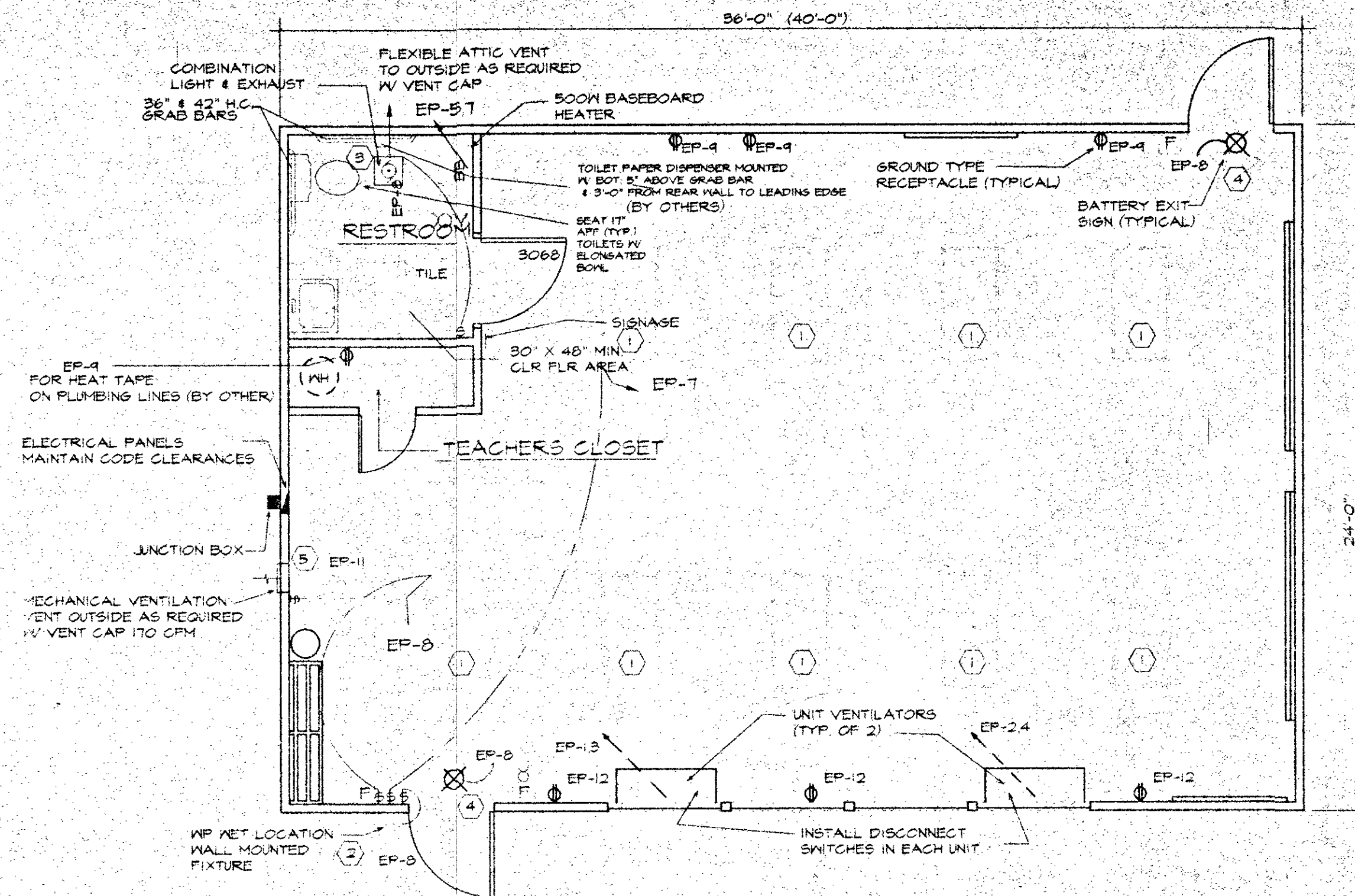
FIRE ALARM SYSTEMS SHALL BE FED FROM THREE SOURCES OF ELECTRICAL POWER: A PRIMARY SUPPLY, A SECONDARY SUPPLY WHICH SHALL BE EITHER A BATTERY OR A GENERATOR AND A TROUBLE SUPPLY WHICH MAY BE FED FROM THE SECONDARY SUPPLY. CONNECTIONS TO THE NORMAL BUILDING LIGHT AND POWER SERVICE SHALL BE ON A DEDICATED (BREAKER LOCK) BRANCH CIRCUIT ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL AND PROPERLY IDENTIFIED.

FIRE ALARM FULL STATIONS SHALL BE MOUNTED 48" A.F.F. FIRE ALARM AUDIO AND VISUAL SIGNALS SHALL BE 80" A.F.F.

24' X 36', 40' TEMPORARY STANDARD CLASSROOM

MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

 NO. 96-	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 101 REED ROAD BELDING, MICHIGAN 48809 PHONE 616-794-3455	ELECTRICAL PLAN RELOCATABLE CLASSROOMS 24' X 36', 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W.L. PERRY ASSOCIATES LTD. ARCHITECTURE ENGINEERING 540 LEONARD NW GRAND RAPIDS, MICHIGAN 49504 PHONE 616-454-1740	DATE: 3-21-96 REVISED 3-24-98	SHEET NO. 10
	98-076				



ELECTRICAL PLAN

SCALE 1/4" = 1'-0"

MECHANICAL NOTES:

BATH EXHAUST DUCT- FLEXIBLE DUCTS SHALL CONFORM TO THE REQUIREMENTS OF UL 181 LISTED IN APPENDIX A FOR CLASS O OR CLASS I FLEXIBLE AIR DUCTS.

FIXTURE SCHEDULE

- ① - LITHONIA #26-440-A12 W/ 4-48-#F40 CK - MOUNT IN CEILING GRID SYSTEM W/ TYPE P BALLAST
- ② - HALO #H2411 (60W) - WALL MOUNTED OR EQUAL
- ③ - NUTONE 626 (60W) COMBINATION LIGHT FIXT & EXHAUST
- ④ - LITHONIA - LHOMSWIR 120/277 N - SURFACE MOUNT ON CEILING OR EQUAL COMBINATION EXIT AND EMERGENCY LIGHT
- ⑤ - NUTONE #8:70 OR EQUAL

NOTE

VENTILATION WILL BE PROVIDED THROUGH NATURAL SOURCES BY MEANS OF OPENABLE WINDOWS AND DOORS IN EXCESS OF 4% OF THE FLOOR AREA.

NATURAL VENTILATION REQUIRED: 24' X 40' = 960 SQ. FT. X .04 = 38.4 SQ. FT.

NATURAL VENTILATION PROVIDED: 2 DOORS @ 26' X 6.6' = 34.4 SQ. FT.
4 WINDOWS @ 4.0 SQ. FT EA. = 17.52 SQ. FT.

TOTAL AVAILABLE = 51.92 SQUARE FEET

GENERAL NOTES:

1. ALL SUPPLY AIR DUCTWORK SHALL BE INSULATED.
2. VENTILATING AIR SHALL BE REQUIRED AS PER CODE RESTROOMS 75 CFM/FIXTURE EXHAUST.
3. F.D. = FIRE DAMPER
B.D. = BALANCING DAMPER

MECHANICAL SPECIFICATIONS:

1. ALL MATERIALS SHALL BE NEW AND CONFORM WITH THE STANDARDS OF THE APPLICABLE CERTIFYING AGENCY (E.G. SMACNA, UL, ADC).
2. THE INSTALLATION SHALL COMPLY WITH ALL LAWS APPLYING TO MECHANICAL TRADES. INSTALLATION IN EFFECT WITH THE 1993 BOCA MECHANICAL CODE AND STATE REVISIONS.
3. ALL WORK SHALL BE PERFORMED BY A LICENSED MECHANICAL CONTRACTOR. THE CONTRACTOR SHALL OBTAIN ALL PERMITS & PAY ALL NECESSARY FEES. THE CONTRACTOR SHALL SCHEDULE HIS WORK WITH THE OTHER TRADES.
4. AIR DISTRIBUTION.
 - a. JOINTS IN ALL DUCTWORK SHALL FORM A SMOOTH INTERIOR SURFACE AND BE PRACTICALLY AIR TIGHT.
 - b. SUPPORT DUCTWORK ON HANGERS SPACED NOT MORE THAN 4'-0" O.C.
 - c. FURNISH DAMPERS INDICATED OR REQ'D TO BALANCE DISTRIBUTION OF AIR THROUGH VARIOUS PARTS OF DUCT SYSTEMS TO OBTAIN DELIVERIES INDICATED AT ALL OUTLETS.
 - d. RECTANGULAR SUPPLY DUCT SHALL BE FIBERGLASS DUCTBOARD (EQUAL TO MANVILLE "SUPER-DUCT") MANUFACTURED FROM FIBERGLASS BONDED WITH THERMOSETTING RESIN. THE EXTERIOR SURFACE IS FACED WITH DURABLE, FIRE-RESISTANT FOIL SCRIM-KRAFT FACING. INTERIOR SURFACE IS COATED WITH THERMOSET ACRYLIC POLYMER. (MEETS OR EXCEEDS UL 181 CLASS 1 DUCT REQUIREMENTS).
 - e. FLEXIBLE DUCTWORK SHALL BE MAXIMUM 4 FEET IN LENGTH FOR EA. SUPPLY BRANCH. FLEXIBLE DUCT SHALL BE VINYL-COATED, HELICAL-WOUND W/ 1" FIBERGLASS INSULT.

HVAC EQUIPMENT SCHEDULE

TAG	MFR.	MODEL No.	DESCRIPTION
AC-1	SUN	AV42H-1-15C	VERTICAL WALL MOUNTED AIR-CONDITIONER RATED AT 3.5 TONS TOTAL COOLING CAPACITY W/ 15 KW, 2 STAGE ELECTRIC HEAT (208/230 VOLT 1 PH 60 HZ). FURNISH UNIT WITH RAIN HOOD RETURN FILTER SERVICEABLE FROM EXTERIOR, MANUALLY ADJUSTABLE OUTSIDE AIR DAMPER, AND WALL MOUNT THERMOSTAT.
EF			

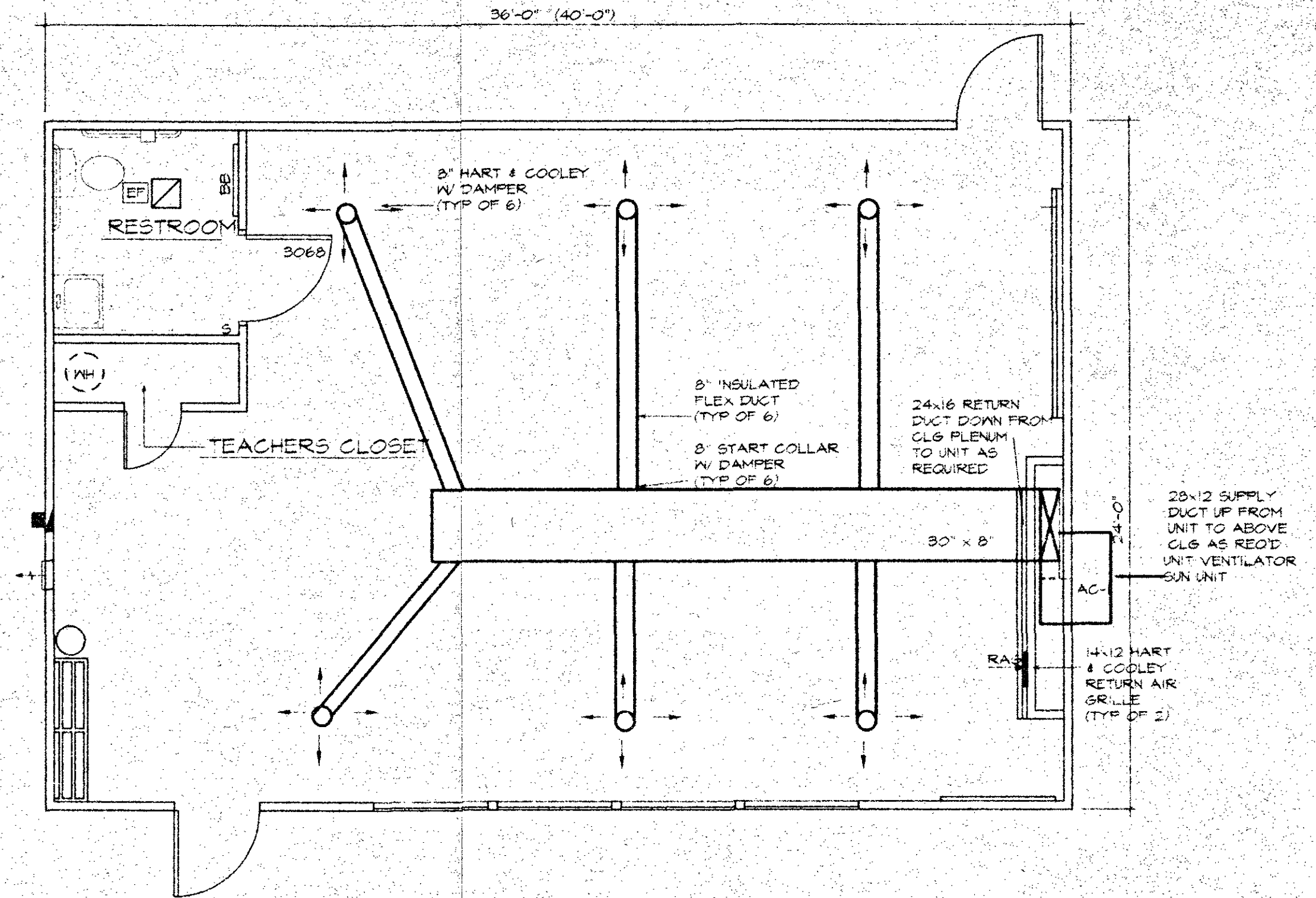
NOTE:

VENTILATION WILL BE PROVIDED THROUGH NATURAL SOURCES BY MEANS OF OPENABLE WINDOWS AND DOORS IN EXCESS OF 4% OF THE FLOOR AREA.

NATURAL VENTILATION REQUIRED: 24' x 40' = 960 SQ. FT. x .04 = 38.4 SQ. FT.

NATURAL VENTILATION PROVIDED: 2 DOORS @ 2.67' x 6.67' = 34.4 SQ. FT.
4 WINDOWS @ 4.18 SQ. FT. EA. = 17.52 SQ. FT.

TOTAL AVAILABLE = 51.92 SQUARE FEET



MECHANICAL PLAN

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

MECHANICAL NOTES:

- A. THERMOSTAT: HONEYWELL T8TF1859 W/ SUBBASE 8539
- B. DIFFUSERS AND REGISTERS: ALL DIFFUSERS SHALL BE EQUIPPED WITH DAMPERS & LOCATED WHERE INDICATED ON THE DRAWINGS & SIZED TO ALLOW ADEQUATE AIR DELIVERY TO THE ROOMS. THE DIFFUSERS SHALL BE PAINTED TO MATCH THE CLG COLOR OR AS APPROVED BY THE ARCHITECT.
- C. ALL RECTANGULAR DUCT SHALL BE CONSTRUCTED OF RIGID FIBERGLASS BOARD WITH ALUMINUM OR REINFORCED ALUMINUM FACING. THE MATERIAL SHALL BE SPECIFICALLY MANUFACTURED FOR USE AS DUCT. ALL DUCTS SHALL BE CONSTRUCTED AND INSTALLED PER SMACNA "FIBEROUS GLASS DUCT CONSTRUCTION STANDARDS 1979, TMA 1989". MINIMUM THICKNESS SHALL BE ONE (1) INCH.
- D. ALL FLEXIBLE DUCT SHALL HAVE A VINYL COATED NON-POROUS POLYMERIC LINER BONDED TO COATED, SPRING STEEL HELIX 1 1/4" THICK INSULATION, AND A FIBERGLAS OUTER JACKET REINFORCED WITH METALLIZED FILM LAMINATE. INSTALLATION SHALL BE PER "HVAC DUCT CONSTRUCTION STANDARDS" METAL AND FLEXIBLE SMACNA 1985.
- E. BALANCE DAMPERS: IN ALL DUCTWORK SYSTEMS FURNISH ALL DAMPERS FOR PROPER CONTROL AND BALANCING OF AIR DISTRIBUTION. SPLITTER OR MULTI-LEAF TYPE. DO NOT USE DAMPERS PROVIDED IN DIFFUSER OR OUTLET FOR BALANCING SYSTEM. THESE ARE TO BE USED ONLY AFTER ALL BALANCING IS COMPLETED TO CONTROL DRAFT AND VENTILATION IN INDIVIDUAL AREAS. CONCEALED DAMPERS TO HAVE CONCEALED DAMPER REGULATOR, VENTLOK #617 OR EQUAL. ALL OPERATOR GEARS OR LINKAGE REQUIRED SHALL BE INCLUDED.
- F. FIRE DAMPERS: (IF REQUIRED)
 1. DAMPER SIZE: ALL FIRE DAMPERS PROVIDED FOR DUCTS SHALL NOT INFRINGE ON DUCT FREE AREA. DAMPERS LOCATED IN TRANSFER AIR WALL OPENINGS AND IN WALLS BEHIND GRILLES SHALL NOT INFRINGE ON OPENING SIZES OR GRILLE SIZES INDICATED ON DRAWINGS.
 2. BLADE TYPE: USE FOLDING BLADE TYPE C IN MEDIUM VELOCITY DUCTS. USE FOLDING BLADE TYPE B FOR ALL OTHER LOCATIONS.
 3. FIRE LABELS: FIRE DAMPERS SHALL BEAR THE ONE HOUR UNDERWRITERS LABORATORY "UL" LABEL OR BE CONSTRUCTED ACCORDING TO ASTM E 152 TEST AND BEAR A ONE HOUR SMACNA LABEL. MANUFACTURER OF THESE DAMPERS SHALL SUBMIT AN AFFIDAVIT TO THE MICHIGAN STATE FIRE MARSHAL'S OFFICE ATTESTING THAT THE DAMPERS WERE CONSTRUCTED ACCORDING TO THE ABOVE TEST CODE.
 4. ACCESS DOORS: FURNISH FIRE DAMPERS AND ACCESS DOORS THERETO IN ALL DUCTS WHERE INDICATED ON DRAWINGS.
 5. INSTALLATION: DAMPERS SHALL BE RIGIDLY INSTALLED IN THE MASONRY WALL OR CEILING OR FLOOR SO THAT IF THE DUCT IS BURNED AWAY, THE DAMPER STAYS IN PLACE AND SEALS THE OPENING. COLLARS SHALL BE USED TO SEAL BETWEEN DAMPERS AND MASONRY OPENING. DAMPERS SHALL BE INSTALLED IN ACCORDANCE WITH UL TEST PROCEDURE.
- G. TOILET ROOM EXHAUST FANS: THE TOILET ROOM EXHAUST FANS SHALL BE LOCATED AS INDICATED ON THE PLANS. EACH FAN SHALL BE EQUIPPED WITH DUCTWORK TO THE OUTSIDE, INSECT SCREEN AND BACKDRAFT DAMPER. THE ENTIRE INSTALLATION SHALL BE AS RECOMMENDED BY THE FAN MANUFACTURER.

24' X 36', 40' TEMPORARY STANDARD CLASSROOM

MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

<p>NO. 96-</p>	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING MICHIGAN 48809 PHONE 1-616-794-3455	ELECTRICAL PLAN RELOCATABLE CLASSROOMS 24' X 36', 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W.L. PERRY ASSOCIATES, LTD. ARCHITECTURE ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS, MICHIGAN 49504 PHONE 616-454-1740	DATE: 3/24/98	79.52' 48-048	SHEET NO. 10A
	TOTAL AVAILABLE = 51.92 SQUARE FEET					

GENERAL NOTES:

1. ALL SUPPLY AIR DUCTWORK SHALL BE INSULATED.
2. VENTILATING AIR SHALL BE REQUIRED AS PER CODE
 RESTROOMS 75 CFM/FIXTURE
 CLASSROOMS 20 CFM/O.A./PERSON
 OCCUPANCY BASED ON 20 S.F./PERSON.
3. F.D. = FIRE DAMPER
 B.D. = BALANCING DAMPER

MECHANICAL SPECIFICATIONS:

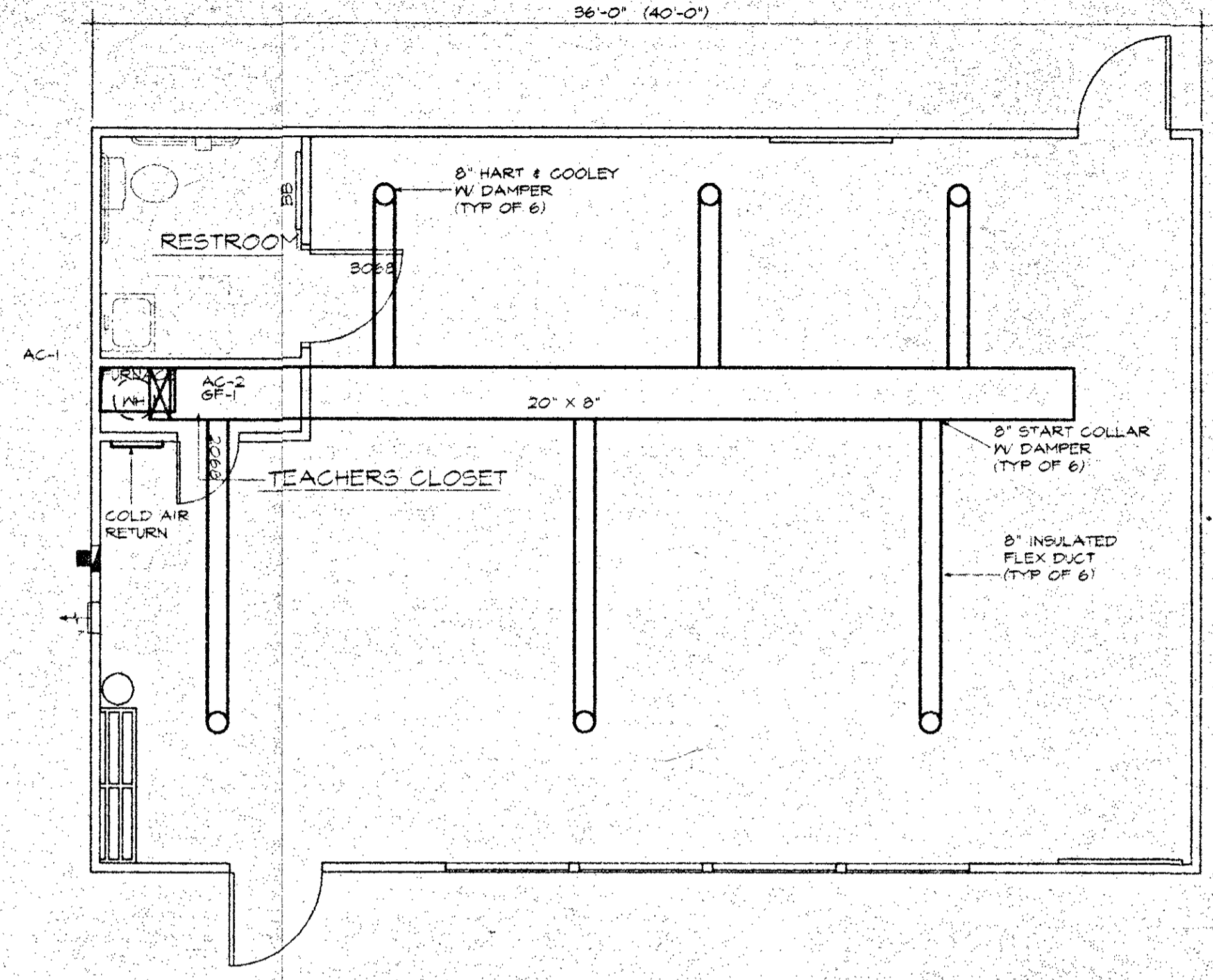
1. ALL MATERIALS SHALL BE NEW AND CONFORM WITH THE STANDARDS OF THE APPLICABLE CERTIFYING AGENCY (E.G. S.M.A.C.N.A. UL, A.S.C.).
2. THE INSTALLATION SHALL COMPLY WITH ALL LAWS APPLYING TO MECHANICAL TRADES. INSTALLATION IN EFFECT WITH THE 1998 BOCA MECHANICAL CODE AND STATE REVISIONS.
3. ALL WORK SHALL BE PERFORMED BY A LICENSED MECHANICAL CONTRACTOR. THE CONTRACTOR SHALL OBTAIN ALL PERMITS & PAY ALL NECESSARY FEES. THE CONTRACTOR SHALL SCHEDULE HIS WORK WITH THE OTHER TRADES.
4. AIR DISTRIBUTION
 - a. JOINTS IN ALL DUCTWORK SHALL FORM A SMOOTH INTERIOR SURFACE AND BE PRACTICALLY AIR TIGHT.
 - b. SUPPORT DUCTWORK ON HANGERS SPACED NOT MORE THAN 4'-0" O.C.
 - c. FURNISH DAMPERS INDICATED OR REQ'D TO BALANCE DISTRIBUTION OF AIR THROUGH VARIOUS PARTS OF DUCT SYSTEMS TO OBTAIN DELIVERIES INDICATED AT ALL OUTLETS.
 - d. RECTANGULAR SUPPLY DUCT SHALL BE FIBERGLASS DUCTBOARD (EQUAL TO MANVILLE "SUPER-DUCT") MANUFACTURED FROM FIBERGLASS BONDED WITH THERMOSETTING RESIN. THE EXTERIOR SURFACE IS FACED WITH DURABLE, FIRE-RESISTANT FOIL SCRIM-KRAFT FACING. INTERIOR SURFACE IS COATED WITH THERMOSET ACRYLIC POLYMER. (MEETS OR EXCEEDS UL 181 CLASS I DUCT REQUIREMENTS).
 - e. FLEXIBLE DUCTWORK SHALL BE MAXIMUM 4 FEET IN LENGTH FOR EA. SUPPLY BRANCH. FLEXIBLE DUCT SHALL BE VINYL-COATED HELICAL-WOUND W/ 1" FIBERGLASS INSUL.

HVAC EQUIPMENT SCHEDULE

TAG	MFR.	MODEL NO.	DESCRIPTION
GF-1	RUUD	RUUGA04EMAES	40 PLUS HIGH EFFICIENCY DOWNFLOW GAS FURNACE. EQUIPPED WITH COOLING / HEATING RELAY AND TRANSFORMER (40VA) READY FOR AIR CONDITIONING APPLICATIONS. 115V, 60HZ, 10. GAS CONNECTION SIZE IS 1/2" 13MM N.P.T. 45,000 BTU/HR INPUT.
AC-1	RUUD	RUWAKA030JAZ	RUUD ACHIEVER 10 HI-EFFICIENCY CONDENSING UNITS 2.5 TON CONDENSER 30,000 BTU/HR (8.79 kW) ELECTRICAL DESIGNATION 208/230-1-60
AC-2	RUUD	RURCBA36656617	MULTIFLEX 2.5 TON COIL W/CASE

MECHANICAL NOTES:

- A. THERMOSTAT: HONEYWELL T87F1859 W/ SUBBASE 8539.
- B. DIFFUSERS AND REGISTERS: ALL DIFFUSERS SHALL BE EQUIPPED WITH DAMPERS & LOCATED WHERE INDICATED ON THE DRAWINGS & SIZED TO ALLOW ADEQUATE AIR DELIVERY TO THE ROOMS. THE DIFFUSERS SHALL BE PAINTED TO MATCH THE CLG. COLOR, OR AS APPROVED BY THE ARCHITECT.
- C. ALL RECTANGULAR DUCT SHALL BE CONSTRUCTED OF RIGID FIBERGLASS BOARD WITH ALUMINUM OR REINFORCED ALUMINUM FACING. THE MATERIAL SHALL BE SPECIFICALLY MANUFACTURED FOR USE AS DUCT. ALL DUCTS SHALL BE CONSTRUCTED AND INSTALLED PER SMACNA "FIBEROUS GLASS DUCT CONSTRUCTION STANDARDS 1979, TINA 1989". MINIMUM THICKNESS SHALL BE ONE (1) INCH.
- D. ALL FLEXIBLE DUCT SHALL HAVE A VINYL COATED NON-POROUS POLYMERIC LINER BONDED TO COATED SPRING STEEL HELIX 1 1/4" THICK INSULATION AND A FIBERGLAS OUTER JACKET REINFORCED WITH METALLIZED FILM. LAMINATE INSTALLATION SHALL BE PER "HVAC DUCT CONSTRUCTION STANDARDS- METAL AND FLEXIBLE, SMACNA 1985".
- E. BALANCE DAMPERS: IN ALL DUCTWORK SYSTEMS, FURNISH ALL DAMPERS FOR PROPER CONTROL AND BALANCING OF AIR DISTRIBUTION, SPLITTER OR MULTI-LEAF TYPE. DO NOT USE DAMPERS PROVIDED IN DIFFUSER OR OUTLET FOR BALANCING SYSTEM. THESE ARE TO BE USED ONLY AFTER ALL BALANCING IS COMPLETED TO CONTROL DRAFT AND VENTILATION IN INDIVIDUAL AREAS. CONCEALED DAMPERS TO HAVE CONCEALED DAMPER REGULATOR, VENTLOK #677 OR EQUAL. ALL OPERATOR GEARS OR LINKAGE REQUIRED SHALL BE INCLUDED.
- F. FIRE DAMPERS: (IF REQUIRED)
 1. DAMPER SIZE: ALL FIRE DAMPERS PROVIDED FOR DUCTS SHALL NOT INFRINGE ON DUCT FREE AREA. DAMPERS LOCATED IN TRANSFER AIR WALL OPENINGS AND IN WALLS BEHIND GRILLES SHALL NOT INFRINGE ON OPENING SIZES OR GRILLE SIZES INDICATED ON DRAWINGS.
 2. BLADE TYPE: USE FOLDING BLADE TYPE 'C' IN MEDIUM VELOCITY DUCTS. USE FOLDING BLADE TYPE 'B' FOR ALL OTHER LOCATIONS.
 3. FIRE LABELS: FIRE DAMPERS SHALL BEAR THE ONE HOUR UNDERWRITERS LABORATORY UL LABEL OR BE CONSTRUCTED ACCORDING TO ASTM E 152 TEST AND BEAR A ONE HOUR SMACNA LABEL. MANUFACTURER OF THESE DAMPERS SHALL SUBMIT AN AFFIDAVIT TO THE MICHIGAN STATE FIRE MARSHAL'S OFFICE ATTESTING THAT THE DAMPERS WERE CONSTRUCTED ACCORDING TO THE ABOVE TEST CODE.
 4. ACCESS DOORS: FURNISH FIRE DAMPERS AND ACCESS DOORS THERETO IN ALL DUCTS WHERE INDICATED ON DRAWINGS.
 5. INSTALLATION: DAMPERS SHALL BE RIGIDLY INSTALLED IN THE MASONRY WALL OR CEILING OR FLOOR SO THAT IF THE DUCT IS BURNED AWAY, THE DAMPER STAYS IN PLACE AND SEALS THE OPENING. COLLARS SHALL BE USED TO SEAL BETWEEN DAMPERS AND MASONRY OPENING. DAMPERS SHALL BE INSTALLED IN ACCORDANCE WITH UL TEST PROCEDURE.
 6. TOILET ROOM EXHAUST FANS: THE TOILET ROOM EXHAUST FANS SHALL BE LOCATED AS INDICATED ON THE PLANS. EACH FAN SHALL BE EQUIPPED WITH DUCTWORK TO THE OUTSIDE INSECT SCREEN AND BACKDRAFT DAMPER. THE ENTIRE INSTALLATION SHALL BE AS RECOMMENDED BY THE FAN MANUFACTURER.



MECHANICAL PLAN

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

24' X 36' 40' TEMPORARY STANDARD CLASSROOM
 MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN

 NO. 96-	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING MICHIGAN 48809 PHONE 794-3455	ELECTRICAL PLAN RELOCATABLE CLASSROOMS 24' X 36' 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W.L. PERRY ASSOCIATES LTD. ARCHITECTURE ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS, MICHIGAN 49504 PHONE 616-454-1740	DATE: 9/21/98	SHEET NO. 98-076	10B
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"R" VALUE CALCULATIONS

CEILING			WALL			RIM JOIST			FND. WALL			FLOOR (CARPET)			FLOOR (VINYL)		
TOP SURFACE	CAVITY R	JOIST R	OUTSIDE SURFACE	CAVITY R	JOIST R	OUTSIDE SURFACE	CAVITY R	JOIST R	OUTSIDE SURFACE	CAVITY R	JOIST R	TOP SURFACE	CAVITY R	JOIST R	TOP SURFACE	CAVITY R	JOIST R
INSULATION R-19	19.0		7/16" OSB INTERSEAL SIDING	0.78	0.78	5/8" PLYWOOD SIDING			FOUNDATION WALL			CARPET & PAD	1.23	1.23	SHEET VINYL	0.05	0.05
5 1/2" WOOD			INSULATION R-11	11.00		3" SOFT WOOD			INSIDE SURFACE			5/8" T&G PLYWOOD	0.78	0.78	5/8" T&G PLYWOOD	0.78	0.78
1/2" ACOUSTICAL TILE	1.25		STUDS, 3 1/2"		4.35	INSULATION						INSULATION R-11	11.00		INSULATION R-11	11.00	
BOTTOM SURFACE	0.60		1/4" MASONITE PANELING	0.31	0.31	INSIDE SURFACE						3 1/2" JOIST	4.35	4.35	3 1/2" JOIST	4.35	4.35
			INSIDE SURFACE	0.68	0.68							BOTTOM SURFACE	0.61	0.61	BOTTOM SURFACE	0.61	0.61
TOTAL R VALUE	20.47	11.0	TOTAL R VALUE	12.94	6.29	TOTAL R VALUE			TOTAL R VALUE			TOTAL R VALUE	14.23	1.58	TOTAL R VALUE	13.05	6.40
TOTAL U VALUE			TOTAL U VALUE	0.077	0.159	TOTAL U VALUE			TOTAL U VALUE			TOTAL U VALUE	0.070	0.132	TOTAL U VALUE	0.077	0.156
AVERAGE U VALUE @ 6.25 FRAMING			AVERAGE U VALUE @ 6.25 FRAMING									AVERAGE U VALUE @ 9.37% FRAMING			AVERAGE U VALUE @ 6.25 FRAMING		

BUILDING AREA

BUILDING PERIMETER	120
WALL HEIGHT	8
FIRST FLOOR WALL AREA	960 (1024)
RIM JOIST AREA	
FRAMING AREA @ 16%	1024 x 16 = 163.84 (-164)
WINDOW AREA	
4 4' x 3' INSULATED GLASS	48
DOOR AREAS (2) 3' x 7'	-42
NET FIRST WALL CAVITY AREA	717 (770)
BASEMENT WALL AREA	
BASEMENT WALL ABOVE GRADE	
FRAMED WALL GROSS AREA	
FRAMING AREA @ %	
WINDOW AREA	
DOOR AREAS	
NET BASEMENT WALL CAVITY	
CEILING AREAS	
GROSS CEILING AREA 24' x 36'	864 (960)
FRAMING @ %	N/A
NET CEILING CAVITY AREA	864 (960)
FLOOR AREA 24' x 36'	864 (960)
CARPET AREA	747 (843)
CARPET FRAMING AREA @ 9.37%	-70 (-79)
NET CARPET CAVITY AREA	677 (764)
VINYL AREA	106
VINYL FRAMING AREA @ 9.37%	-11
NET VINYL CAVITY AREA	95
NET FLOOR CAVITY AREA A x B	783 (870)

COMBINED GROSS WALL THERMAL TRANSMITTANCE U-CALCULATIONS

WALL COMPONENT	AREA	RESISTANCE	A/R
GLASS 1/2" INSULATED U = 58	48	1.72	27.90
GLASS			
GLASS			
DOOR POLYSTYRENE CORE U = 47	42	2.13	19.7
DOOR			
WALL	717 (770)	12.94	55.41 (59.50)
FRAMING	(164) 153	6.29	24.3 (26.07)
WALL			
FRAMING			
WALL			
FRAMING			
RIM JOIST			
EXPOSED BASEMENT WALL			
EXPOSED BASEMENT WALL			
BASEMENT GLASS SINGLE U = 1.13			
BASEMENT GLASS			
TOTALS	960		(133.17) (121.3)

$$U_{WALL} = \frac{A/R}{A} = \frac{(133.17)}{960} = 0.139 \text{ BTU/h} \cdot \text{ft}^2 \cdot \text{F}^{-1}$$

COMBINED GROSS FLOOR THERMAL TRANSMITTANCE

FLOOR COMPONENTS	AREA	RESISTANCE	A/R
CARPET	677 (764)	14.23	48 (58.61)
VINYL	106	13.05	8.12
FRAMING (CARPET)	70 (79)	1.58	9.23 (10.42)
FRAMING (VINYL)	11	6.40	1.71
TOTALS	864		(67.26) (78.86)

$$U_{FLOOR} = \frac{A/R}{A} = \frac{(67.26)}{864} = 0.078 \text{ BTU/h} \cdot \text{ft}^2 \cdot \text{F}^{-1}$$

COMBINED GROSS ROOF/CLG. THERMAL TRANSMITTANCE U-CALCULATIONS

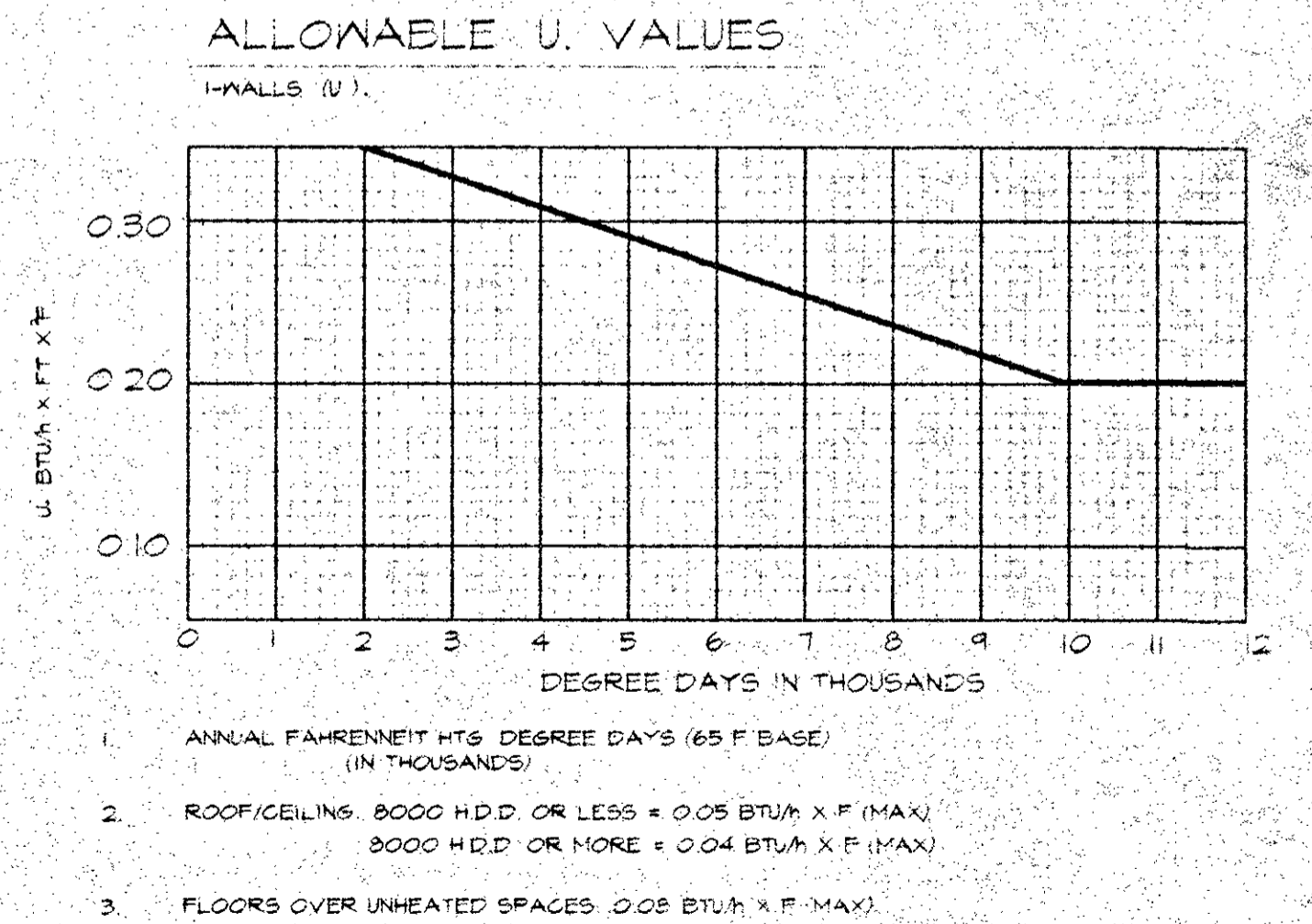
ROOF/CEILING COMPONENT	AREA	RESISTANCE	A/R
ROOF/CEILING	864 (960)	21.47	40.24 (44.71)
FRAMING			
TOTALS			

$$U_{ROOF} = \frac{A/R}{A} = \frac{(40.24)}{864} = 0.0465 \text{ BTU/h} \cdot \text{ft}^2 \cdot \text{F}^{-1}$$

NOTE:

- THIS STRUCTURE'S BUILDING ENVELOPE COMPLIES W/ ASHRAE 90A-80 FOR THE CLIMATIC CONDITION OF: 8000 WINTER DEGREE DAYS MAX.
- CONSULT W/ LOCAL AUTHORITIES FOR ACTUAL DESIGN CLIMATIC CONDITIONS.
- 1000' = 40' CLASSROOM CALCULATIONS.

24' X 36' 40' TEMPORARY STANDARD CLASSROOM
MANUFACTURED BY: THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. BELDING, MICHIGAN



T&M NO. 96-	THOMAS CONSTRUCTION & MANUFACTURING BELDING INC. 701 REED ROAD BELDING MICHIGAN 48809 PH: 616-794-3455	U-VALUE FIGURES RELOCATABLE CLASSROOM 24' X 36' 40' STANDARD CLASSROOM THOMAS CONSTRUCTION INC. (TEMPORARY CLASSROOM)	W. L. PERRY ASSOCIATES LTD ARCHITECTURE/ENGINEERING 540 LEONARD ST. NW GRAND RAPIDS MICHIGAN 49504 PH: 616-454-1740	DATE: 3/24/98	JOB NO: 98-076	SHEET NO: 11
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