GRACE COVENANT

LAKE CITY, FLORIDA

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FIRE RESISTANCE OF STRUCTURAL ELEMENTS IN HOURS

FIRE WALLS & PARTY WALLS	4
INTERIOR BEARING WALLS	0
INTERIOR NONBEARING PARTITIONS	0
COLUMNS	0
BEAMS, GIRDERS, TRUSSES, & ARCHES	0
FLOORS & FLOOR/CEILING CONST.	0
ROOF & ROOF/CEILING CONST.	0
EXTERIOR BEARING WALLS & ROOF END GABLES (ALL OVER 30ft SEPERATION)	0
EXTERIOR NONBEARING WALLS & ROOF END GABLES (ALL OVER 30ft SEPERATION)	0
EXIT SHAFT ENCLOSURES (NONE IN PROJECT)	1
FIRE WALLS (NONE IN THIS PROJECT)	2
EXIT ACCESS CORRIDORS	1

OCCUPANT LOADS

WORSHIP BLDG.

WORSHIP	252
PLATFORM	24
CHAIRS	1
JANITOR	1
SOUND BOOTH	2
TOTAL OCCUPANT LOAD	280 (1190 EXIT CAPACITY)

FELLOWSHIP BLDG.

FELLOWSHIP	142
OFFICE	13
ELECTRICAL	1
CLASSROOMS	34
TOTAL OCCUPANT LOAD	190 (1020 EXIT CAPACITY)

EXIT CAPACITY PROVIDED

WORSHIP / FUTURE KITCHEN	1190
FELLOWSHIP	510
CORRIDORS	510
TOTAL EXIT CAPACITY	2210

CODE CLASSIFICATION

NEW WORSHIP CENTER & EDCATION SPACE

2004 FLORIDA BUILDING CODE — "A-3" (CHURCH)
NFPA-101 OCCUPANCY GROUP — SMALL ASSEMBLY-1 STORY
CONSTRUCTION TYPE — TYPE V-B / V (000)
UNSPRINKLERED

PORTABLE FIRE EXTINGUISHERS SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 10.

SQUARE FOOTAGE:

ALLOWABLE PER FLOOR - FBC 506 (6,000 SQ FT + (6,000 x .75) =)	10,500 SQ FT
MAX AREA (FELLOWSHIP BLDG.)	6,301 SQ FT
WORSHIP BLDG. AREA	3,939 SQ FT
TOTAL PROJECT AREA	10,240 SQ. FT.

BUILDING HEIGHT:

ALLOWABLE - FBC 502/504: 75' - 3 STORIES
PROPOSED: 23' 6-1/4" - 1 STORY

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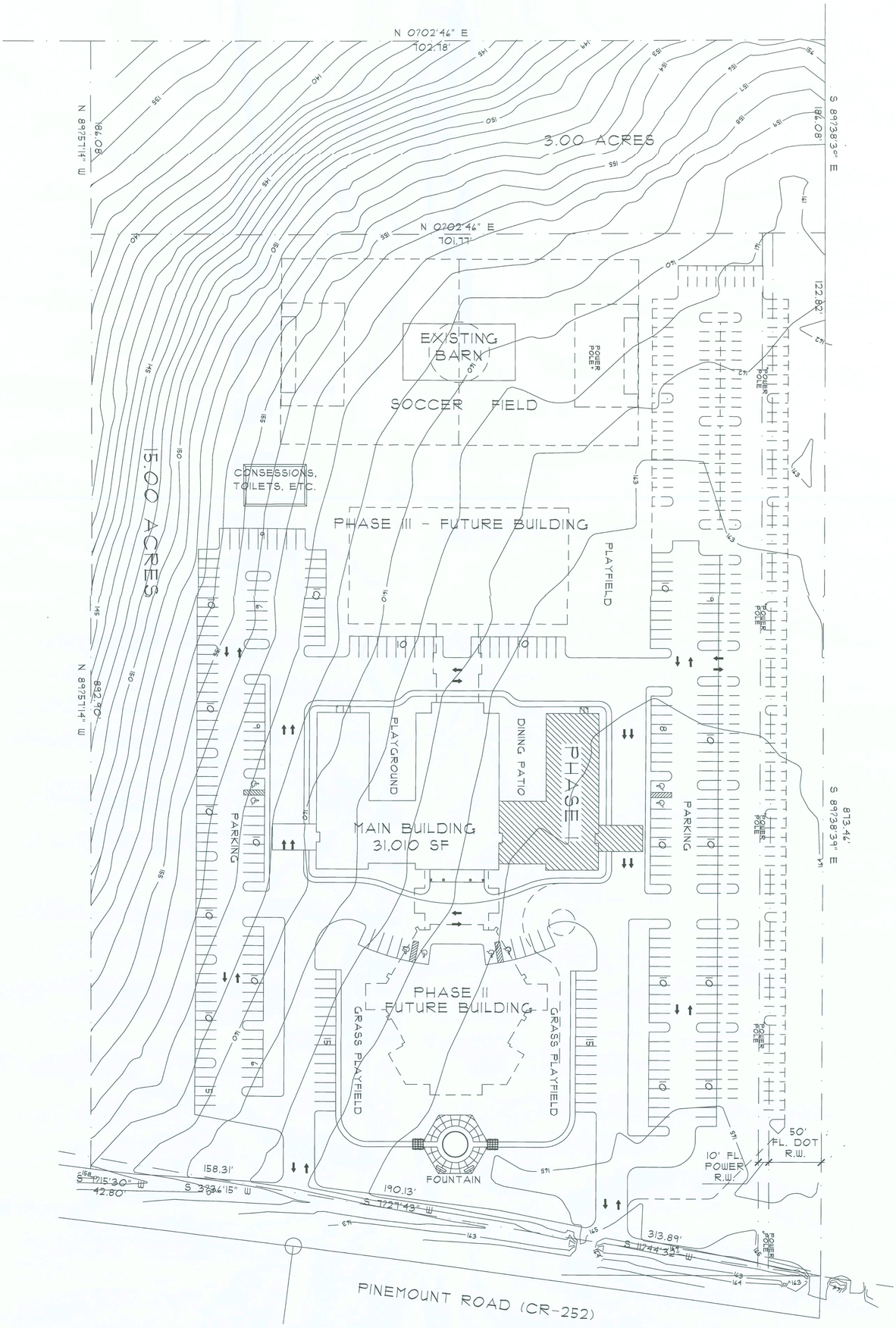

1 MASTER PLAN
A1.0 SCALE 1"=50'

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A1.0

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REQUIRED EXIT CAPACITY — 470

EXIT CAPACITY PROVIDED — 2210

PLUMBING FIXTURE COUNT FOR 1759 PERSONS	REQUIRED	PROVIDED
W/C/UR MEN	2	4
W/C WOMEN	4	4
LAVATORIES	3	7
DRINKING FOUNTAINS	1	2
SERVICE SINKS	1	1

EXIT ACCESS TRAVEL DISTANCE - 1015.1

MAXIMUM TRAVEL DISTANCE ALLOWED - 200'
MAXIMUM TRAVEL DISTANCE- 84'

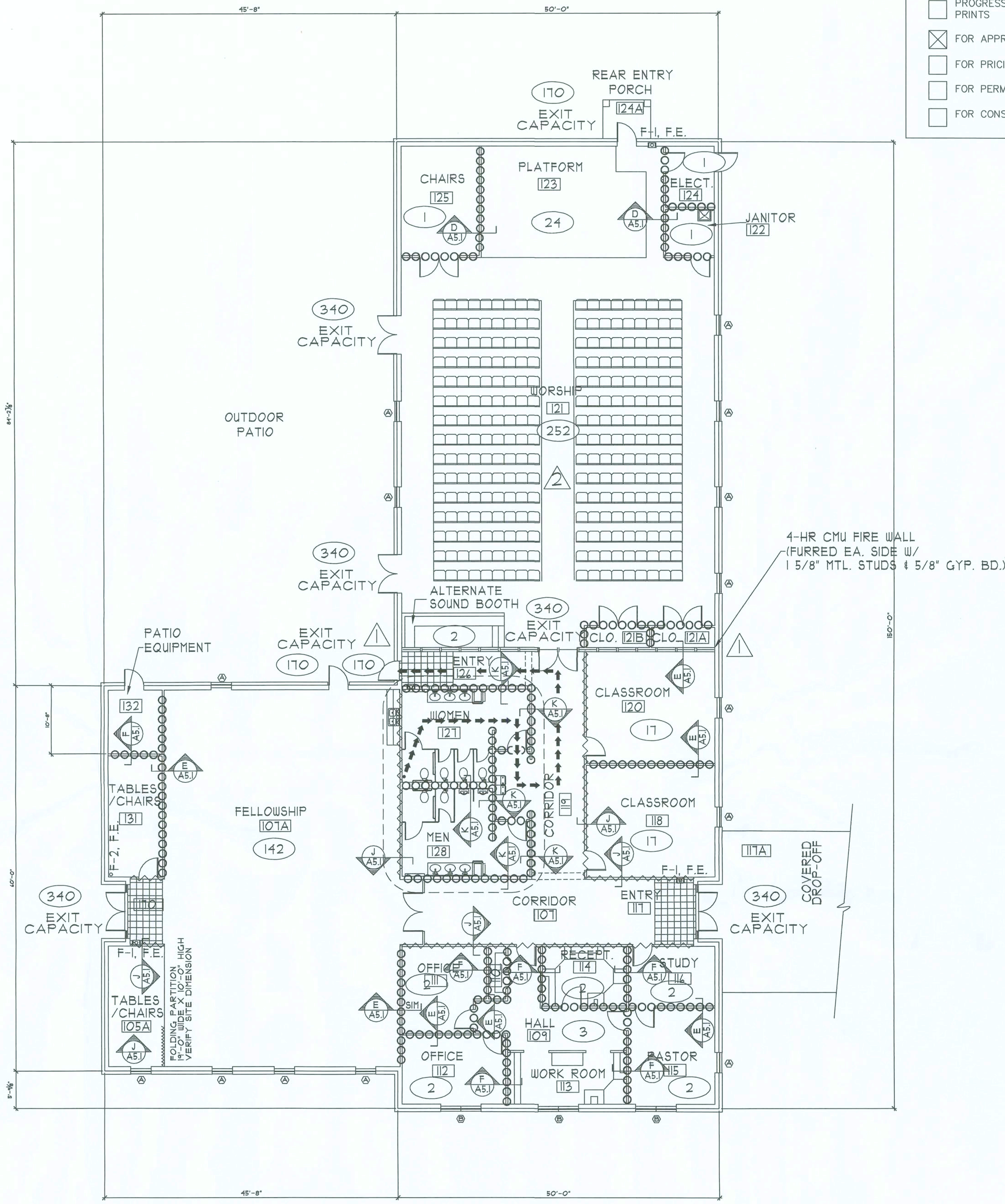
BUILDING OCCUPANCY BASED ON THE FOLLOWING ALLOWANCES OR THE DESIGNED OCCUPANT LOAD WHICHEVER IS GREATER - PER 1004.1.2

OFFICE AREAS - 100 SQ.FT./PERSON GROSS
CLASSROOM AREAS - 20 SQ.FT./PERSON NET
FELLOWSHIP AREA - 15 SQ.FT./PERSON NET
CHOIR - 7 SQ.FT./PERSON NET
ASSEMBLY AREAS - ACTUAL FIXED SEAT COUNT
KITCHEN - 200 SQ.FT./PERSON GROSS
STORAGE/MECHANICAL/ELECT. - 300 SQ.FT. PERSON GROSS
LIBRARY - 100 SQ.FT./PERSON GROSS
FOYER - 5 SQ.FT./PERSON NET

EGRESS WIDTH BASED ON 1005.1 - W/ SPRINKLER SYSTEM
STAIRWAYS - 0.3 IN. PER OCCUPANT (NONE IN THIS PROJECT)
OTHER COMPONENTS - 0.20 IN. PER OCCUPANT

36" DOOR - 170 PERSONS, 42" DOOR - 200 PERSONS

4- HR CMU FIRE WALL (UL-U901OR EQ.) TO DECK & EXTERIOR WALL FINISH
1 - HR WOOD STUD SOUND PARTITION TO BOTTOM OF JOIST
1 - HR WOOD STUD SOUND PARTITION TO RATED CEILING
NON-RATED WOOD STUD SOUND PARTITION TO 1'-0" MINIMUM AB. CLG (SEE CROSS SECTIONS)
1 - HR METAL STUD SOUND PARTITION TO DECK
E.I.F.S ON METAL STUDS



1 A2.0 WALL DESIGNATION & EXIT CAPACITY PLAN

SCALE: 3/32"=1'-0"

1 NOTE: EXTERIOR WALLS 4' EACH SIDE OF FIRE WALL TO BE 1 HR RATED W/ 3/4 HR. OPENING IF APPLICALE- PER FBC 705.5.1
ROOF DECK 4' EACH SIDE OF FIRE WALL TO BE FIRE RETARDENT TREATED WOOD W/ A CLASS B COVERING & SHALL HAVE NO OPENINGS- PER FBC 705.6.4
ROOF OVERHANG/ EAVE TO BE PROTECTED- PER 705.5.2.3

2 NOTE: CHAIR SEATING TO BE BOLTED TO FLOOR AS NEEDED TO PREVENT REMOVAL

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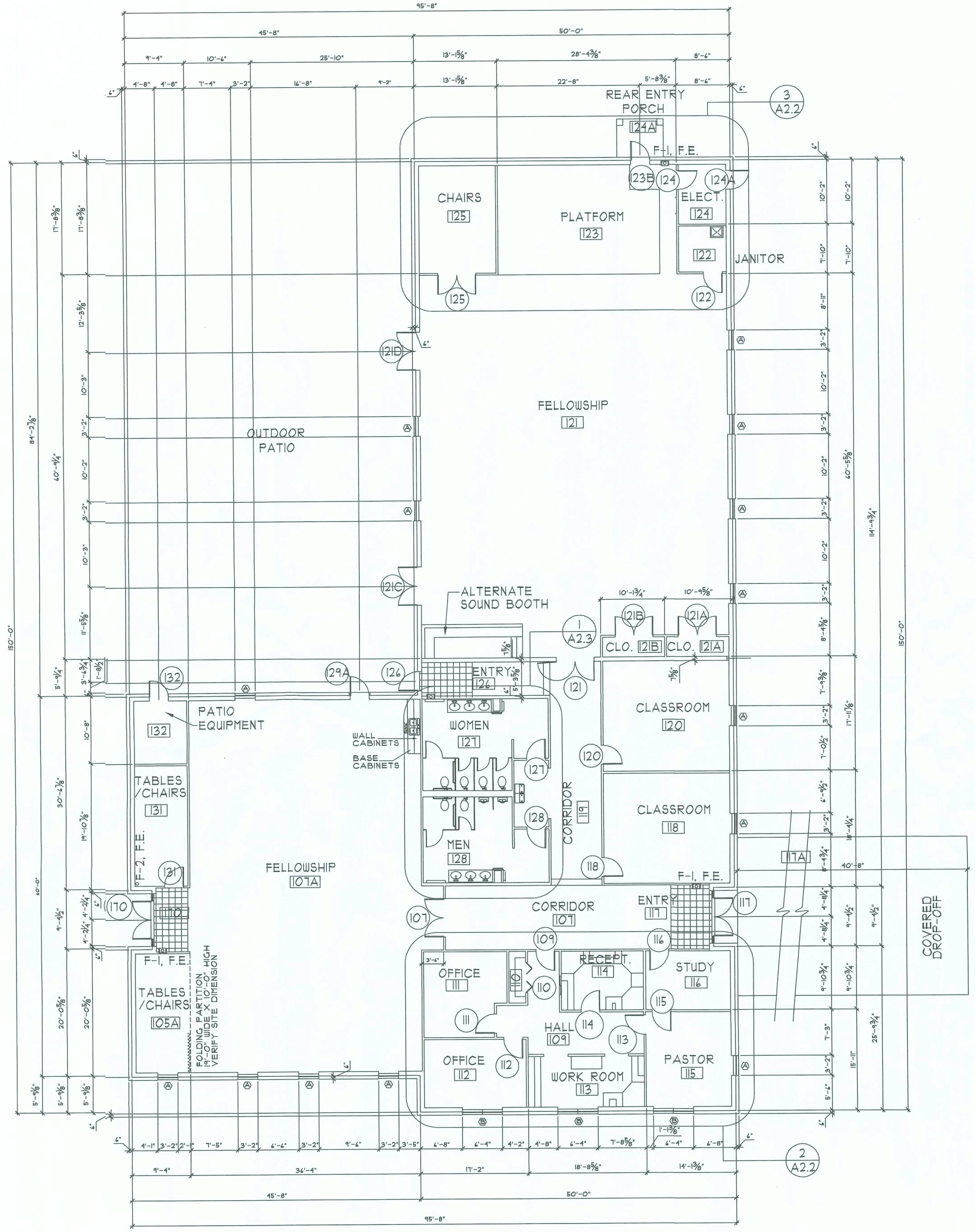

1 A2.1 FLOOR PLAN
SCALE: 3/32"=1'-0"

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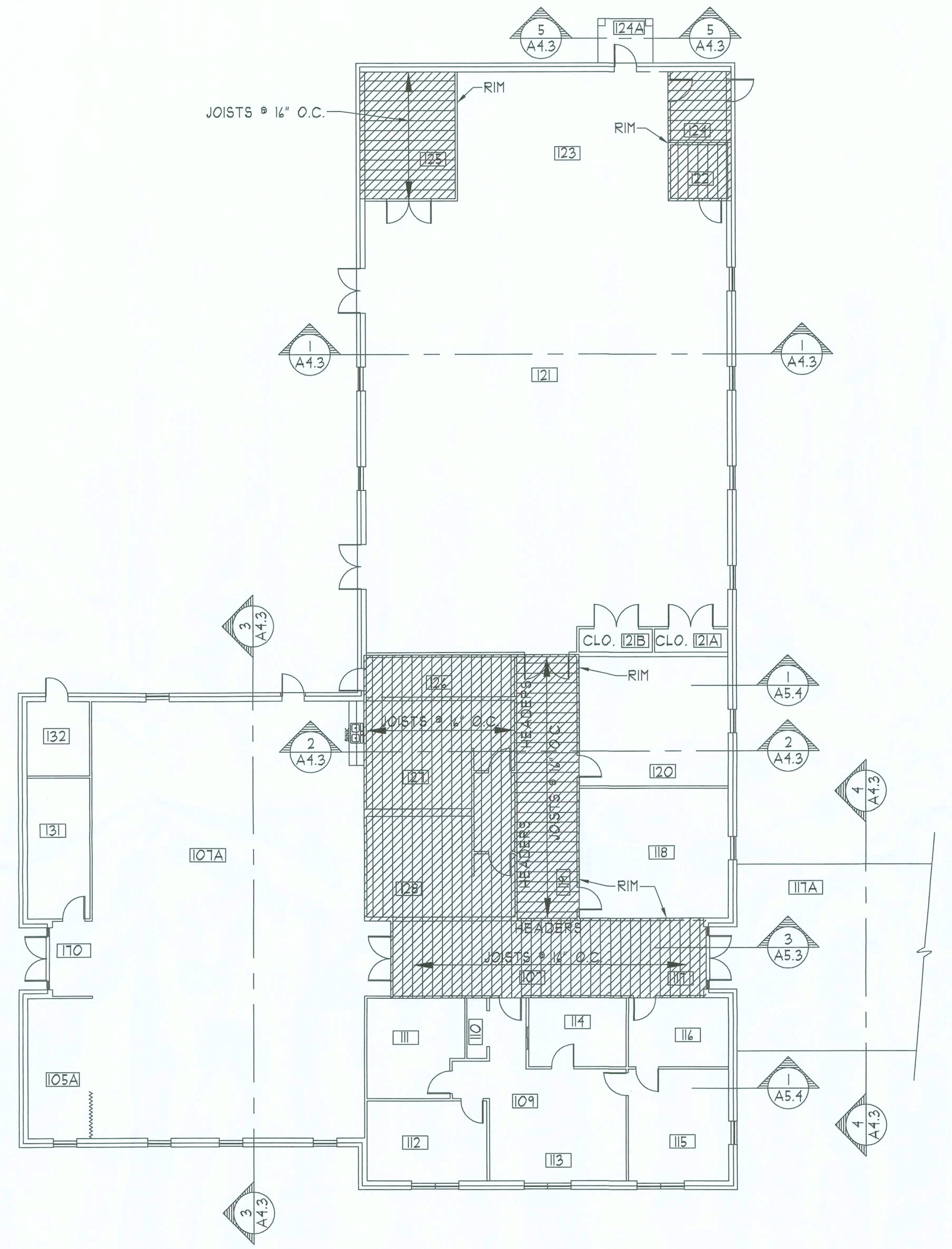

LEGEND	
RIMS	= 8" LIGHT GA GALV. STEEL TRACK
JOIST	= 8" LIGHT GA GALV. STEEL TRACK
HEADERS	= 8" LIGHT GA GALV. STEEL TRACK

NOTE:
FLOORING [hatched] TO BE 5/8" CDX PLYWOOD SHEATHING ON 2X8 WOOD JOIST @ 16" O.C.

1/A2.2 FIRE RATED CEILINGS & MECHANICAL EQUIPMENT FLOOR FRAMING PLAN

SCALE: 3/32"=1'-0"

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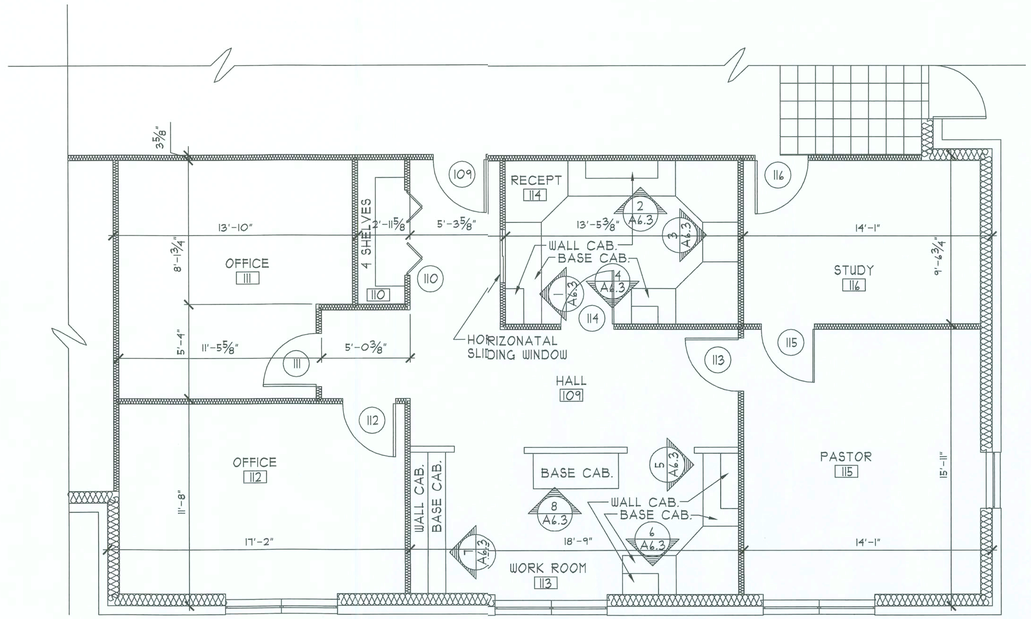
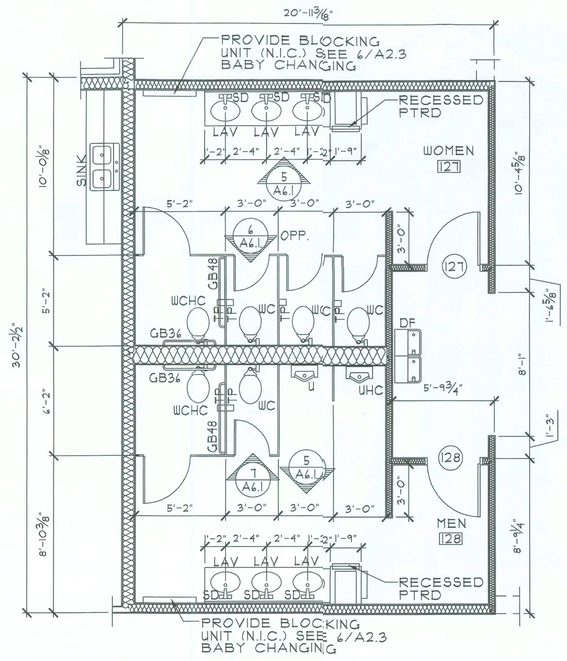
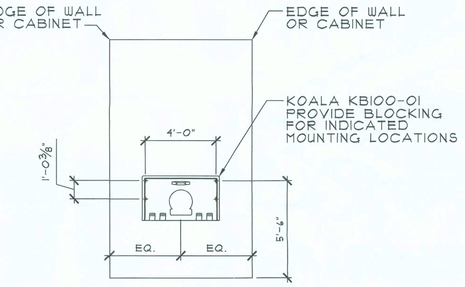


2 / A2.2 ENLARGED PLAN @ OFFICES
SCALE: 1/4"=1'-0"



1 / A2.3 ENLARGED PLAN @ TOILETS
SCALE: 1/4"=1'-0"



6 / A2.3 BABY CHANGING STATION
SCALE: 1/4"=1'-0"

FIXTURE SCHEDULE

MARK	DESCRIPTION	MTG. HEIGHT A.F.F.
LAV	LAVATORY	34" TO RIM U.N.O.
WC	WATER CLOSET	
THC	H.C. WATER CLOSET	17" - 19"
U	URINAL	
UHC	H.C. URINAL	17" - 19"
MI & M2	MIRROR (SEE ELEVATION)	40" MAX A.F.F.
SD	SOAP DISPENSER	COUNTER MTD.
TP	TOILET PAPER DISPENSER	20"
GB24	24" GRAB BAR	
GB36	36" GRAB BAR	34" @ CENTER
GB36	42" GRAB BAR	
GB48	48" GRAB BAR	34" @ CENTER
PT	PAPER TOWEL DISPENSER	BASIC 44"
* PTD	PAPER TOWEL DISPOSAL	TOP 33"
* NTV	NAPKIN/TAMPON VENDOR	TOP 62 1/8"
SND	SANITARY NAPKIN DISPOSAL	TOP 30"
DF	DRINKING FOUNTAIN	H.C. OR HI-LO
WB	WASTE BASKET	
*	OWNER / ARCHITECT VERIFY	

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1/19/07

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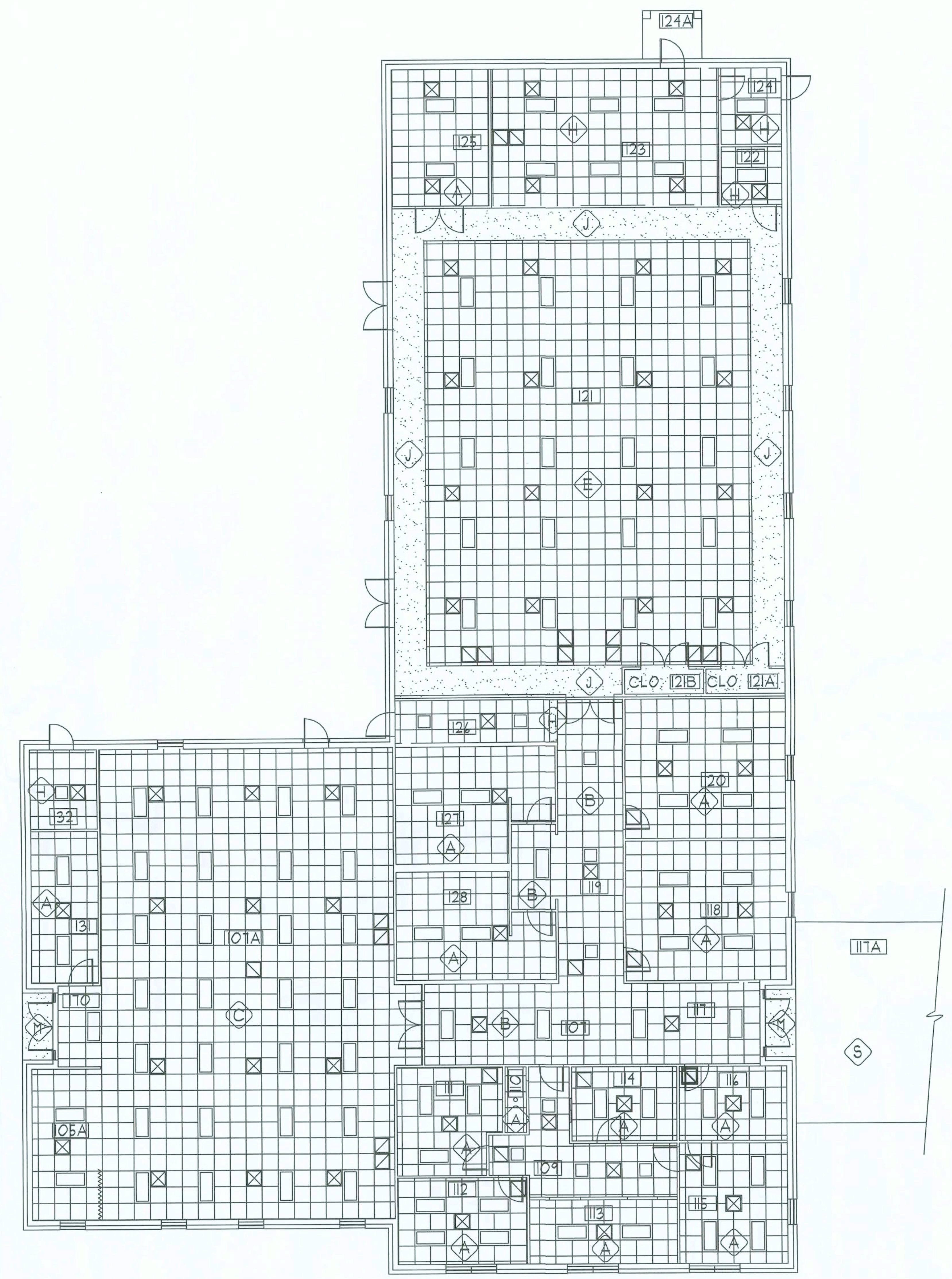
CEILING FIXTURE LEGEND

2' X 4' RECESSED FLUORESCENT LIGHT FIXTURE	CHANDELIER (BY OWNER)
2' X 2' RECESSED FLUORESCENT LIGHT FIXTURE	DOWN LIGHT (RECESSED)
1' X 4' SURFACE MOUNTED FLUORESCENT LIGHT FIXTURE	THEATRICAL LIGHTING
3" X 4' FLUORESCENT LIGHT	HVAC RETURN
	HVAC SUPPLY

CEILING HEIGHT/ MATERIAL LEGEND

(A) 2x2 ACT. 9'-0" CEILING HEIGHT A.F.F.	(J) 10'-0" CEILING PAINTED GYP. BD.
(B) 2x2 ACT. 9'-6" CEILING HEIGHT A.F.F.	(K) CEILING PAINTED GYP. BD. (VARIES, SEE 1/A4.1)
(C) 2x2 ACT. 10'-0"" CEILING HEIGHT A.F.F.	(L) 11'-0" CEILING PAINTED GYP. BD.
(D) 2x2 ACT. 11'-0"" CEILING HEIGHT A.F.F.	(M) 10'-0" CEILING E.I.F.S ON OSB & STYROFOAM
(E) 2x2 ACT. 12'-0"" CEILING HEIGHT A.F.F.	(N) 10'-8 1/2" CEILING E.I.F.S. ON OSB & STYROFOAM
(F) 2x2 ACT. 22'-0" CEILING HEIGHT A.F.F.	(O) 12'-0" CEILING E.I.F.S. ON OSB & STYROFOAM
(G) 2x2 ACT. SLOPED	(P) E.I.F.S. SLOPED ON OSB & STYROFOAM
(H) 9'-0" CEILING VINYL COATED GYP. BD.	(R) 9'-0" FURRED DOWN GYP. BD.
	(S) 14'-7" +/- CEILING E.I.F.S. ON OSB & STYROFOAM



1/A2.4 REFLECTED CEILING PLAN
SCALE: 3/32"=1'-0"

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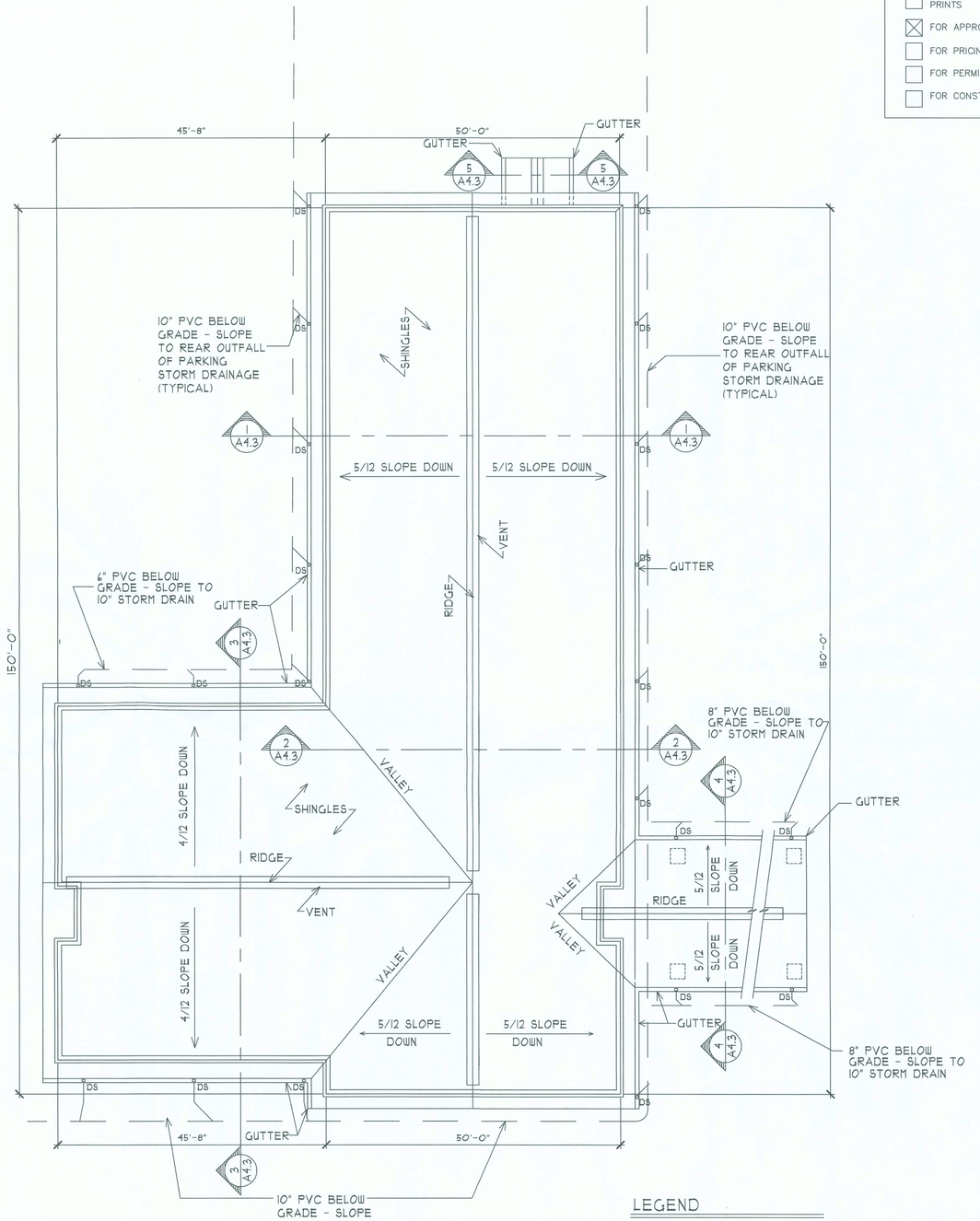

LEGEND

□ DS = DOWNSPOUT

NOTE

ALL VERTICAL LEADERS TO BE TIED TO 10" PVC BELOW GRADE AND RUN TO REAR OUTFALL OF SURFACE STORM DRAINAGE.

VERIFY DIRECTION WITH SITE PLAN.

1/A2.5 ROOF PLAN
SCALE: 3/32" = 1'-0"

REVISIONS	BY

Thomas L. Hagan 11/19/07

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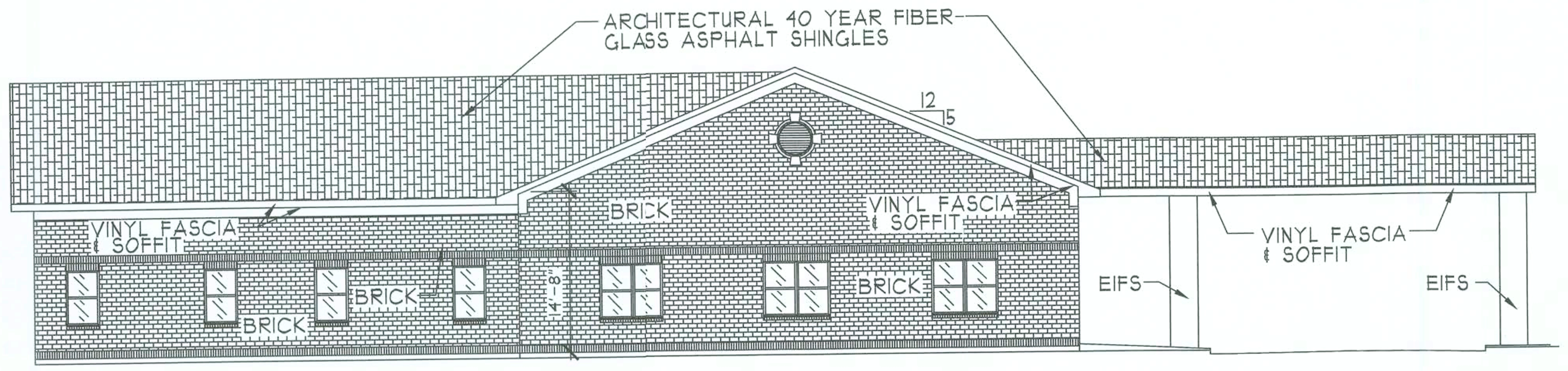
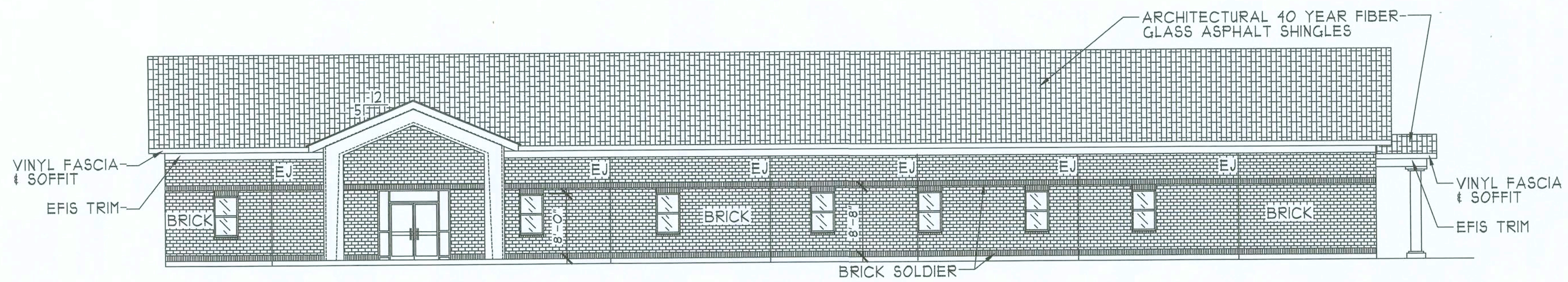
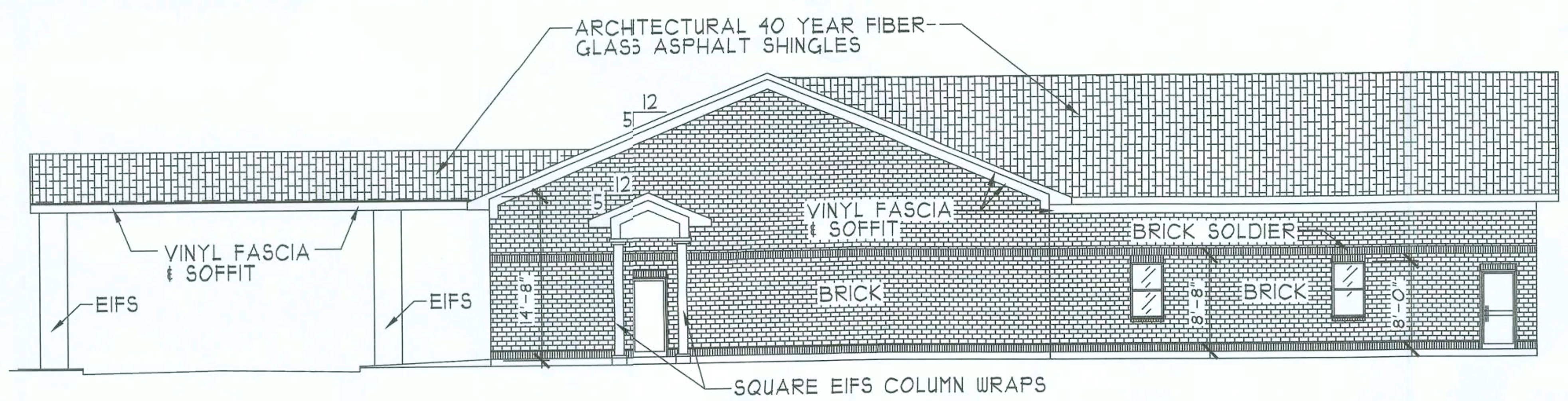


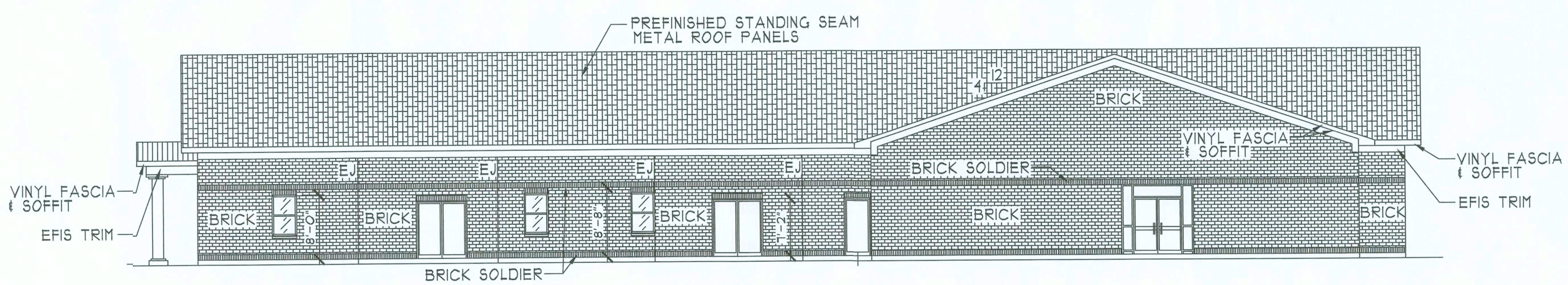
1 A3.1 FRONT ELEVATION
SCALE: 3/32" = 1'-0"



3 A3.1 RIGHT ELEVATION
SCALE: 3/32" = 1'-0"



2 A3.1 REAR ELEVATION
SCALE: 3/32" = 1'-0"



4 A3.1 LEFT ELEVATION
SCALE: 3/32" = 1'-0"

NOTES:
1) SEE ROOF PLANS FOR GUTTER (DOWNSPOUT
2) BRICK EXPANSION JOINTS @ 20'-0" O.C. (TYP. VERIFY LOCATIONS)

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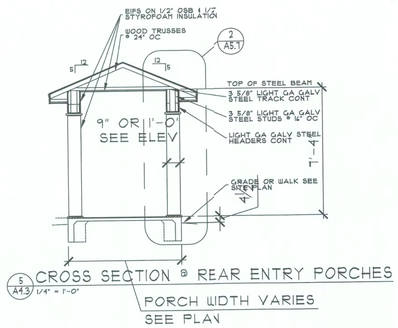
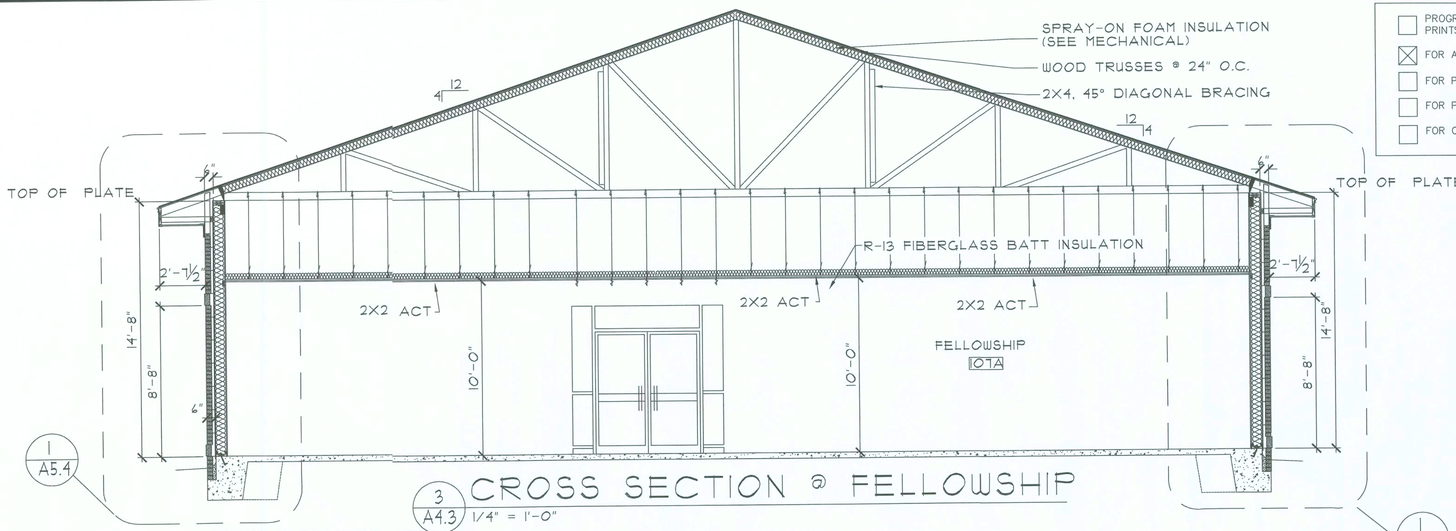


5 / A4.3 1/4" = 1'-0"

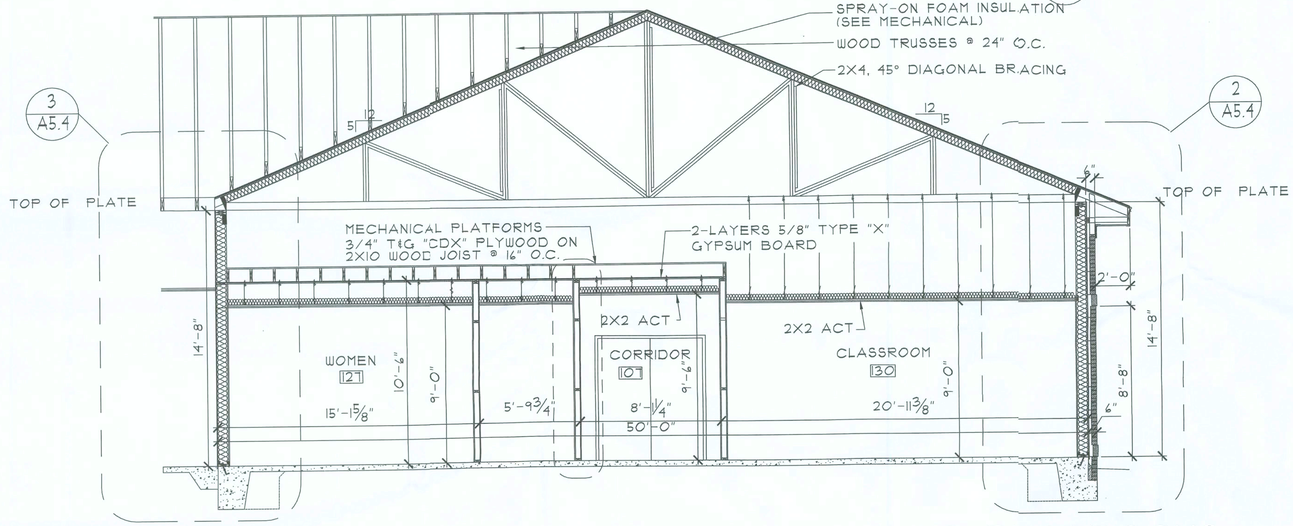
CROSS SECTION @ REAR ENTRY PORCHES

PORCH WIDTH VARIES
SEE PLAN



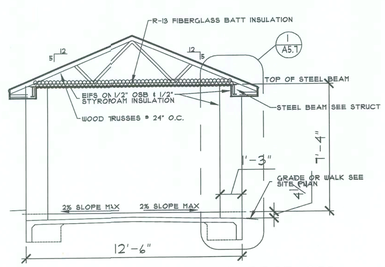
3 / A4.3 1/4" = 1'-0"

CROSS SECTION @ FELLOWSHIP



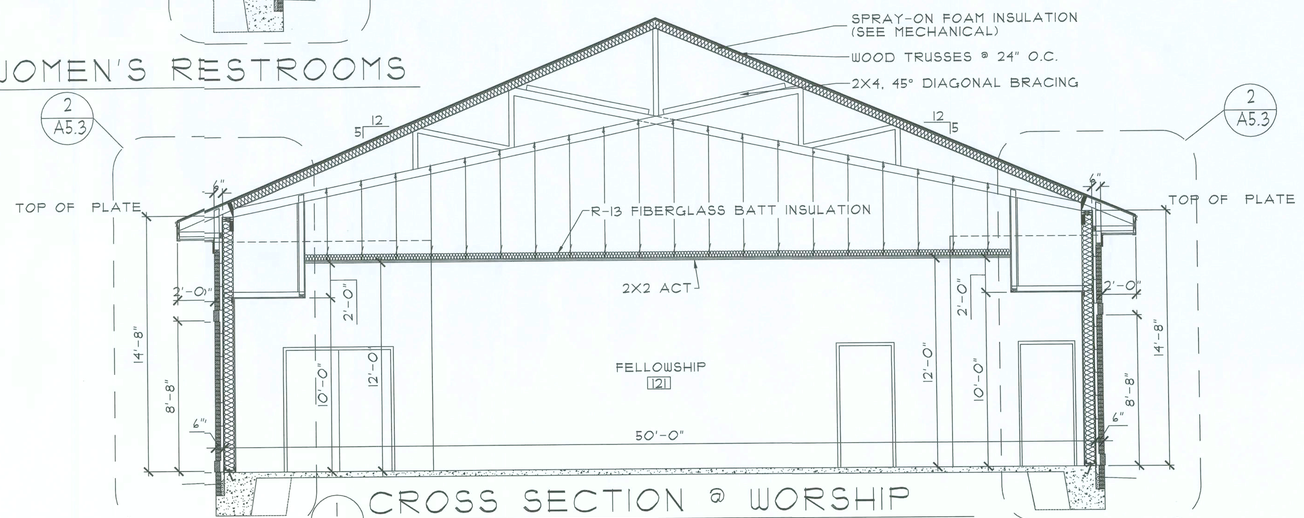
2 / A4.3 1/4" = 1'-0"

CROSS SECTION @ EDUCATION & WOMEN'S RESTROOMS



4 / A4.3 1/4" = 1'-0"

CROSS SECTION @ COVERED DROP-OFF



1 / A4.3 1/4" = 1'-0"

CROSS SECTION @ WORSHIP

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- ☐ PROGRESS PRINTS
- ☒ FOR APPROVAL
- ☐ FOR PRICING
- ☐ FOR PERMIT
- ☐ FOR CONSTRUCTION

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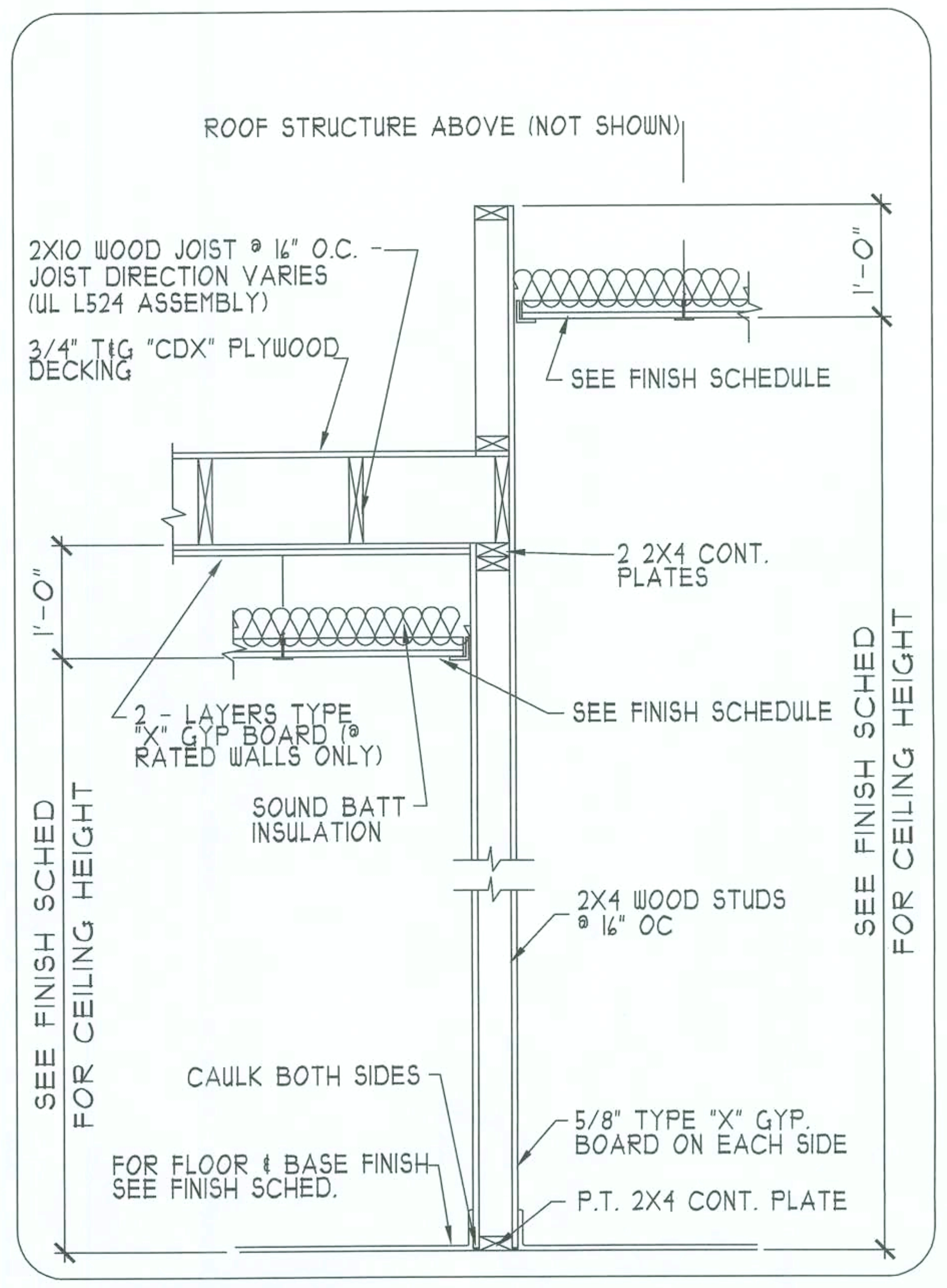
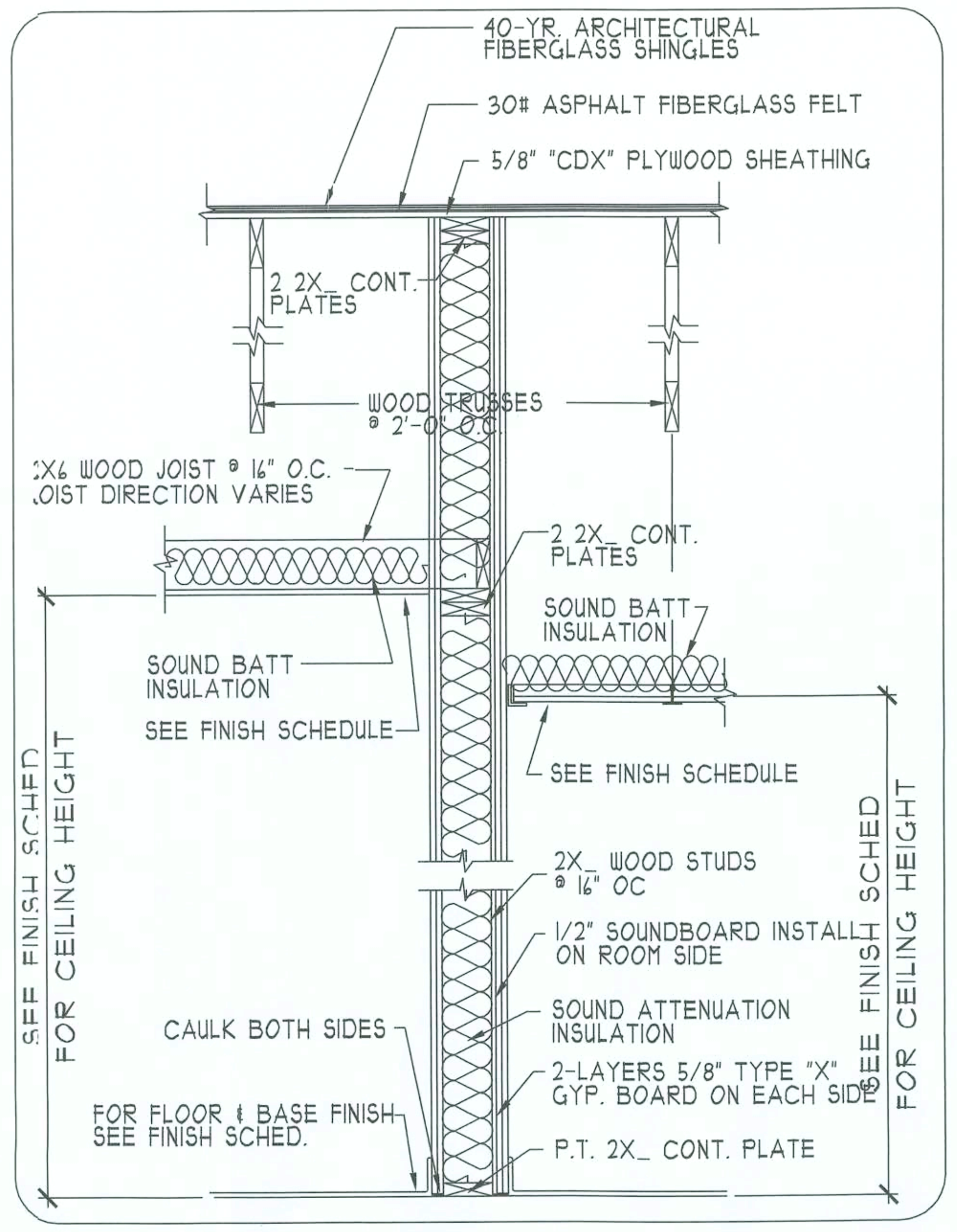
JOB NO	04-816
SHEET	A4.3L

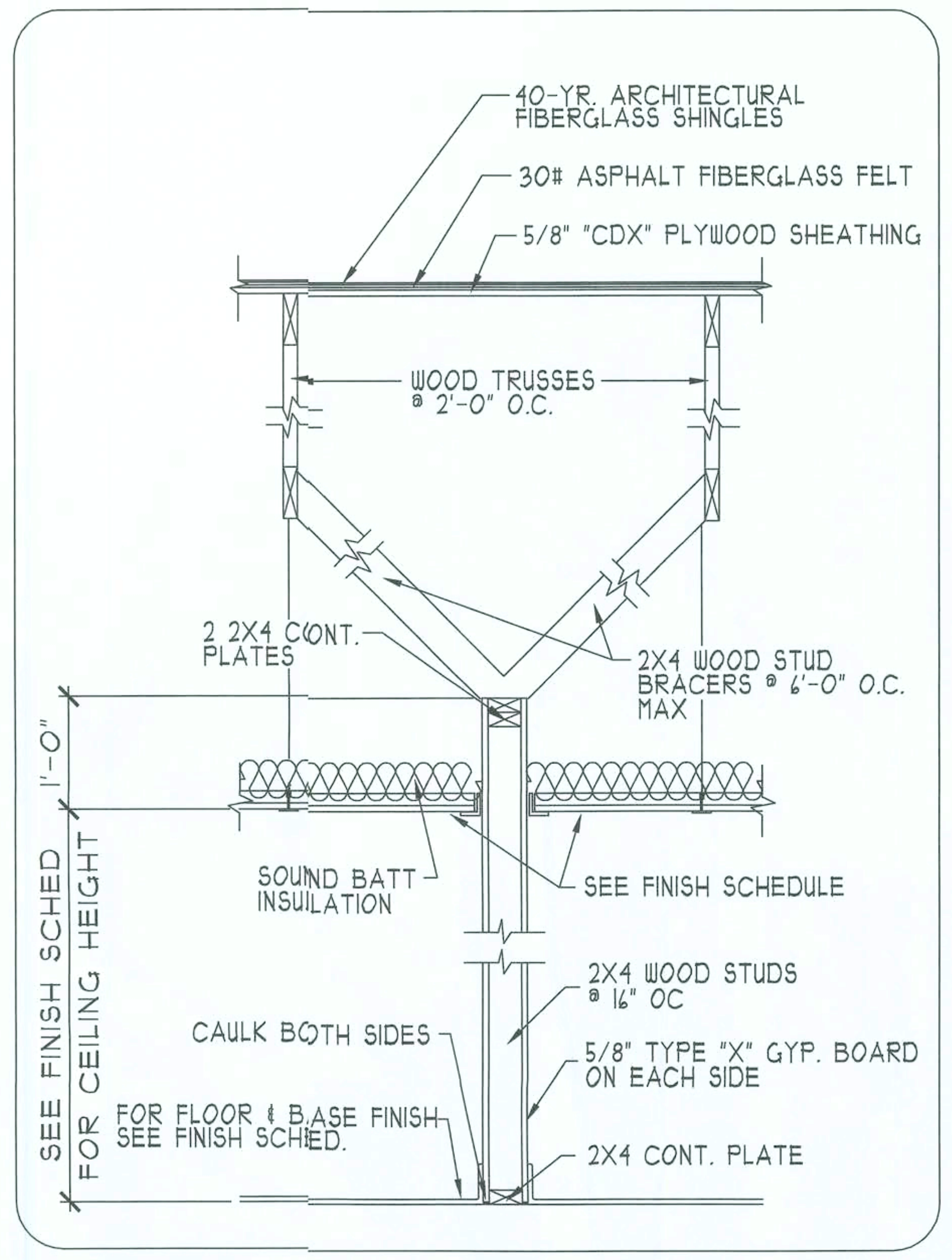


A / A5.1 PARTITION CONST
3/4" = 1'-0" @ 1-HR RATED PARTITION

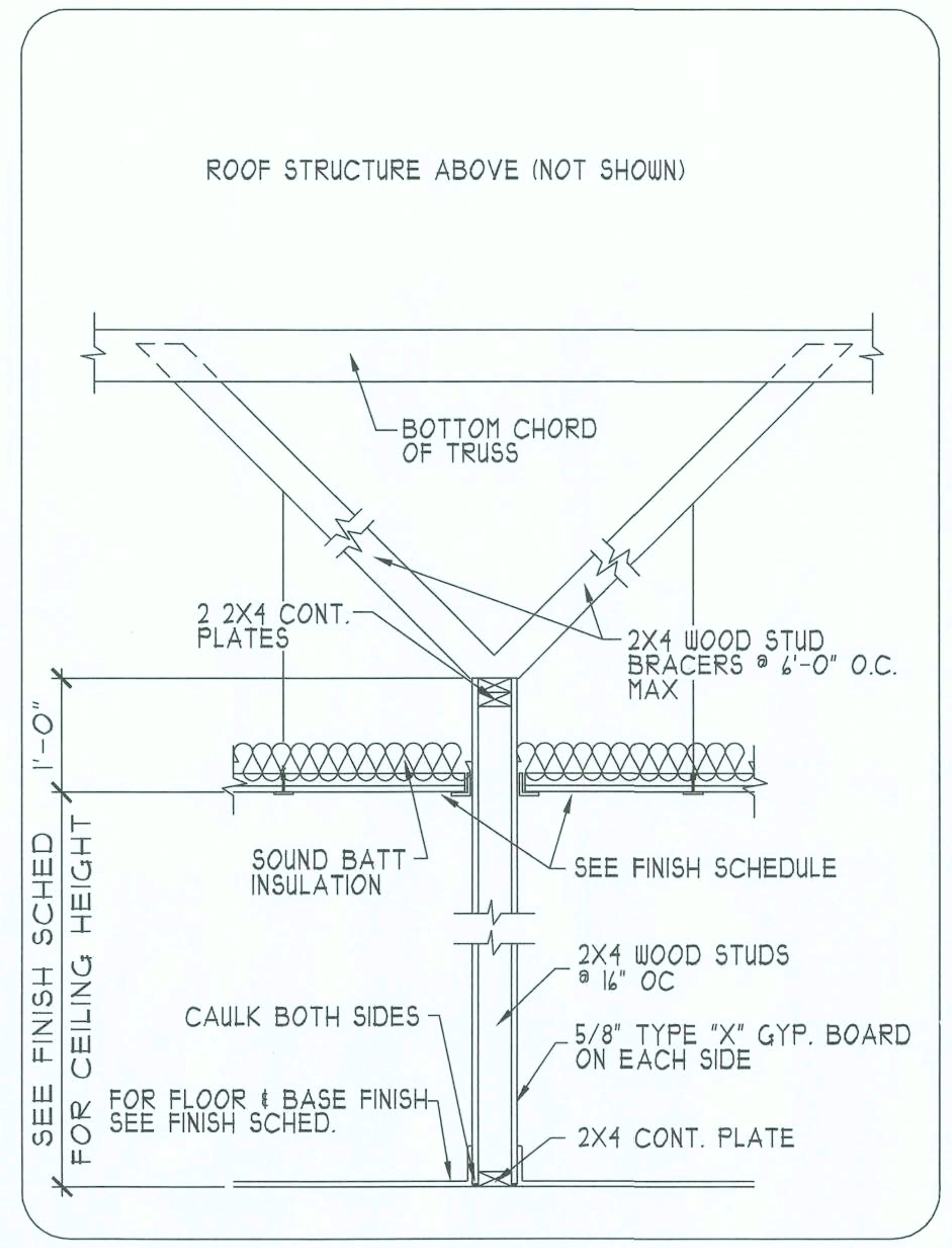
L / A5.1 PARTITION CONST
3/4" = 1'-0"



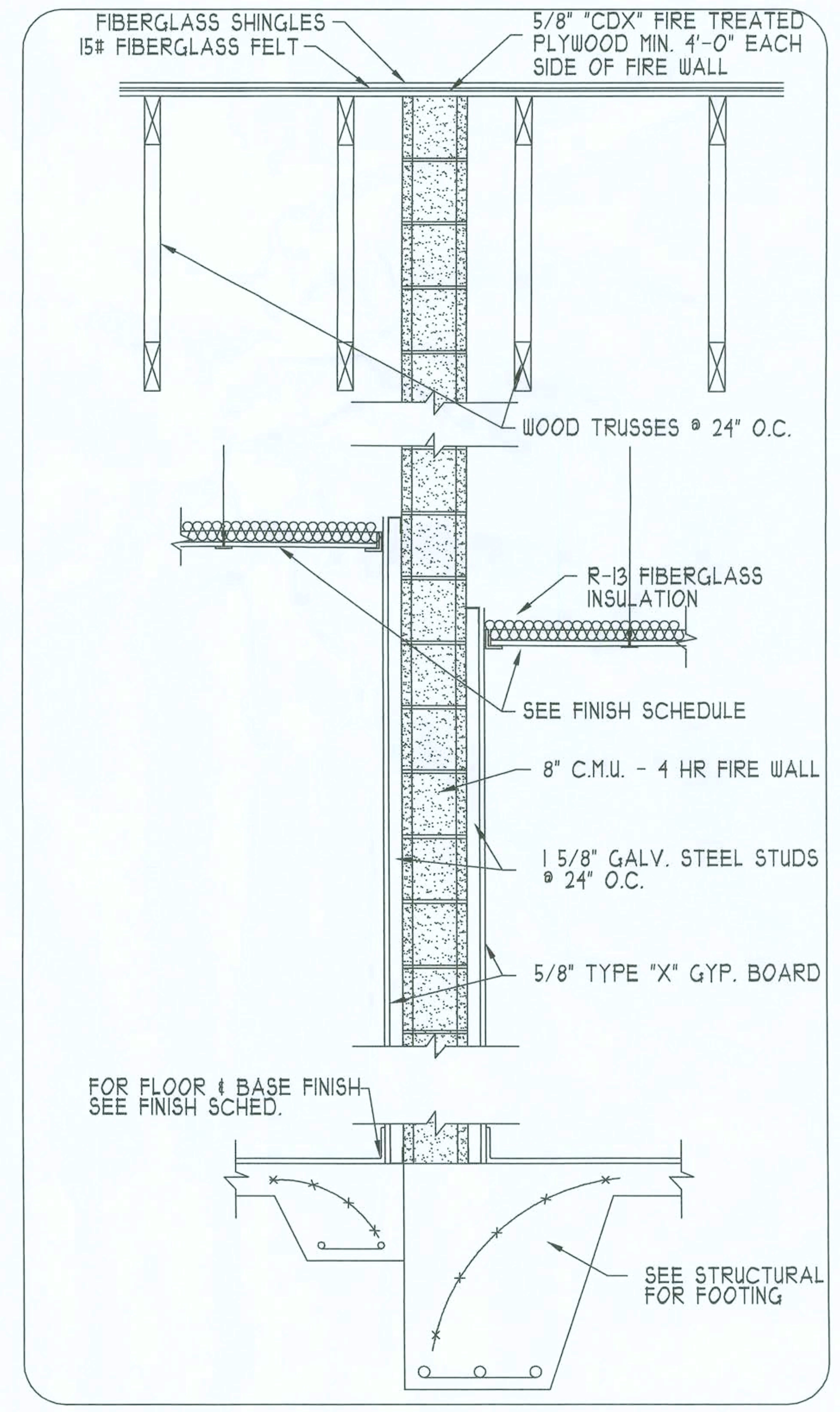
B / A5.1 2X4 WOOD STUD
3/4" = 1'-0" @ 2-HR SOUND PARTITION

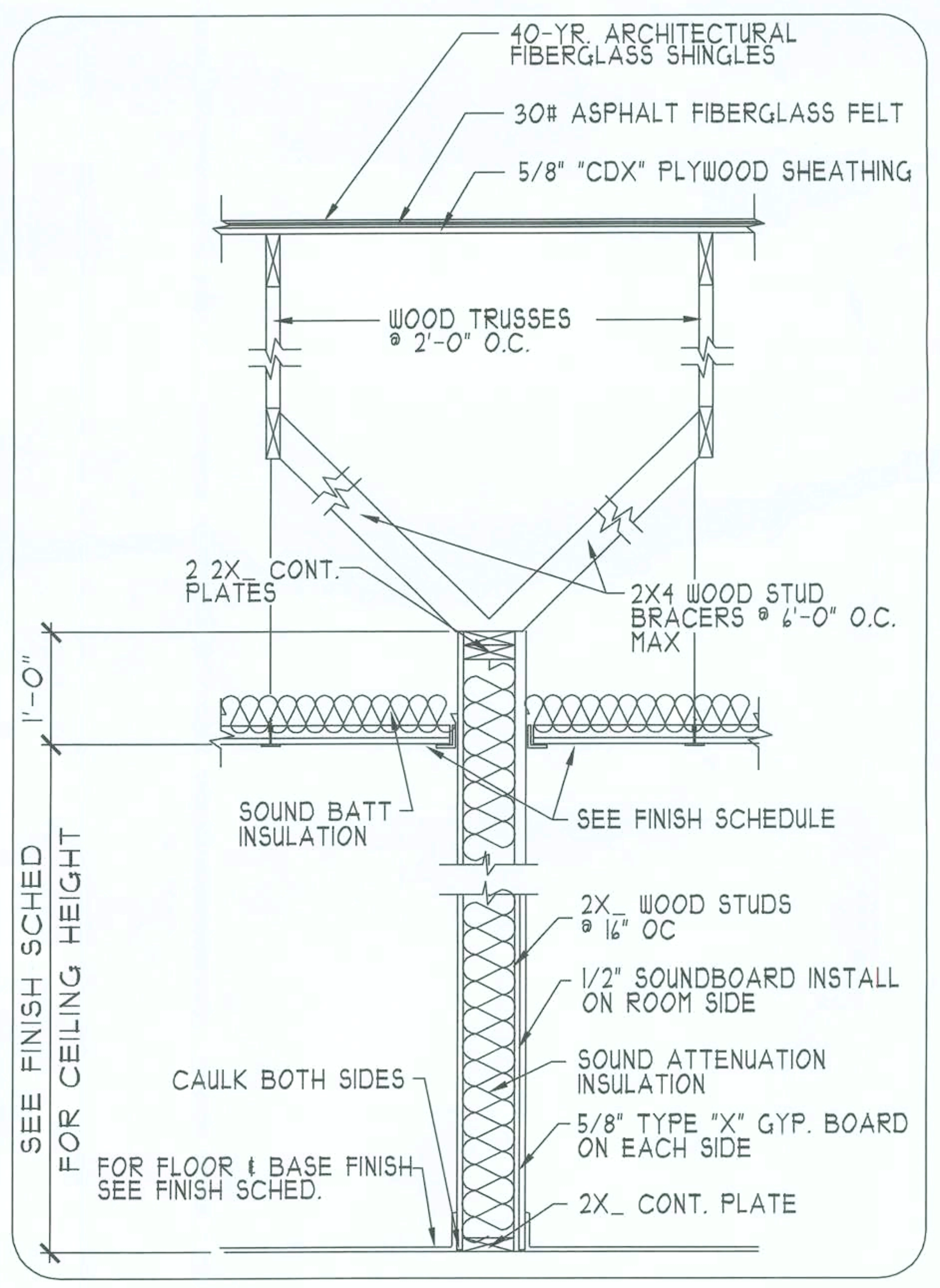


C / A5.1 PARTITION CONST
3/4" = 1'-0"



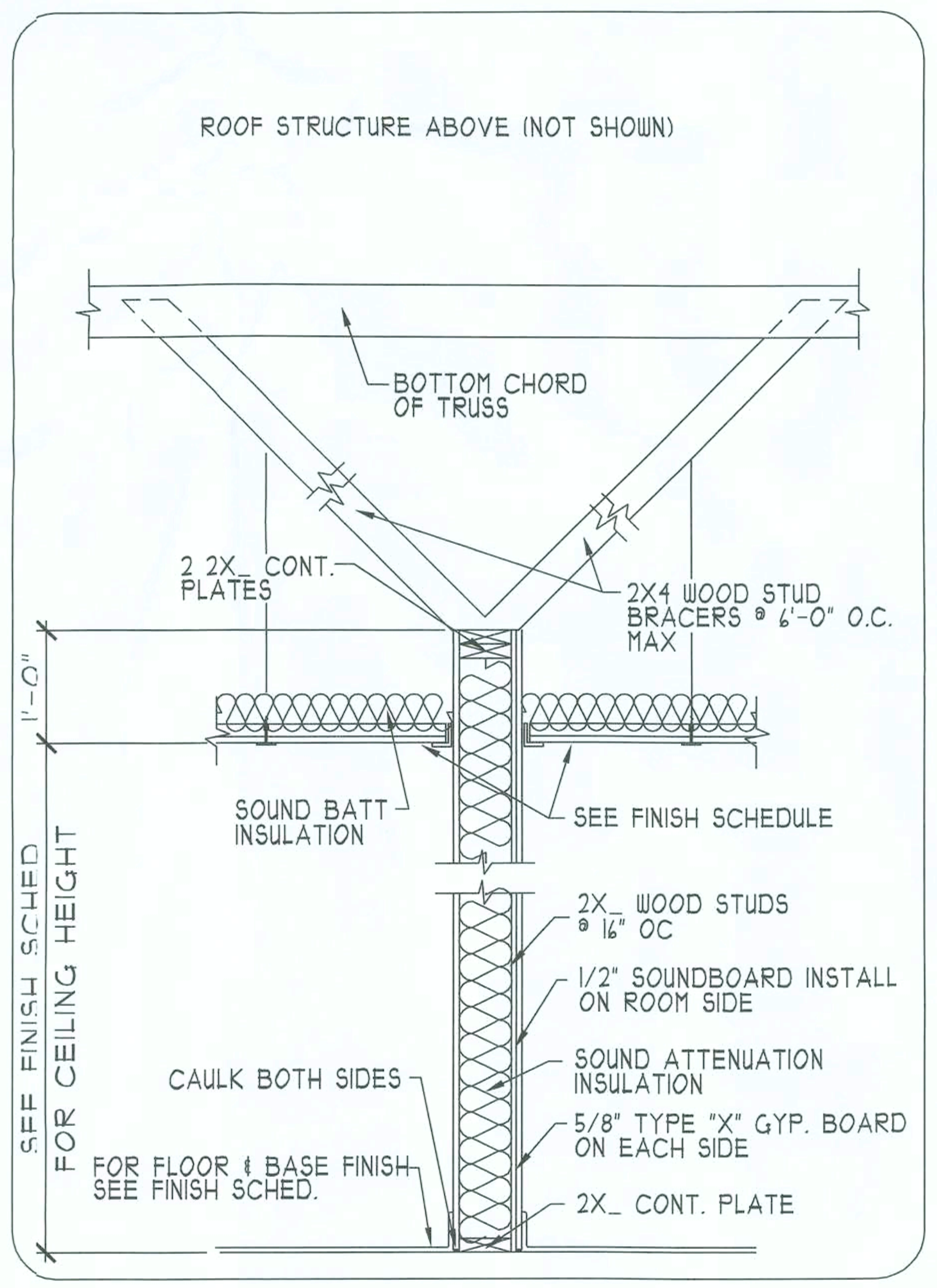
D / A5.1 PARTITION CONST
3/4" = 1'-0"





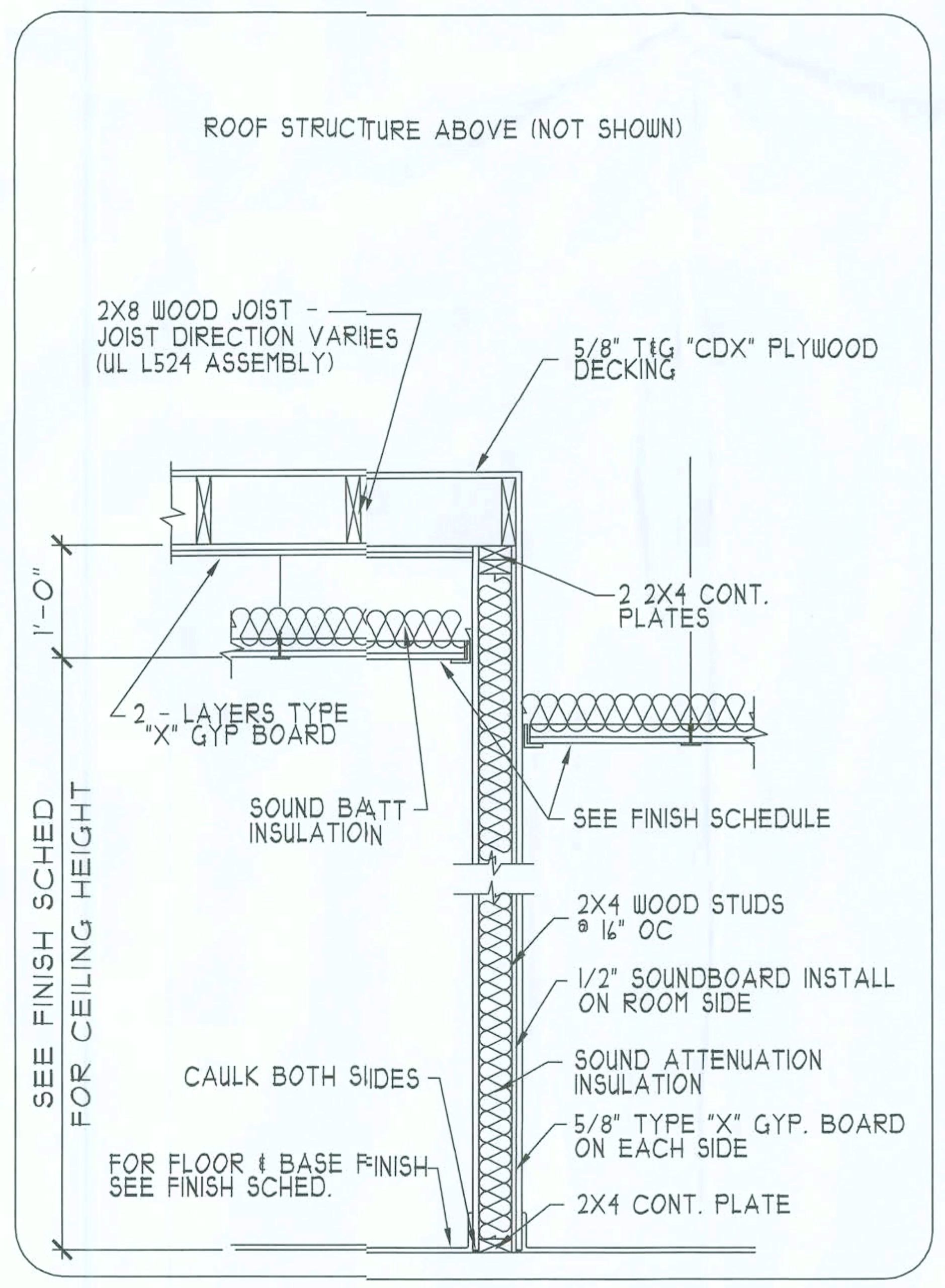
E / A5.1 2X4 WOOD STUD
3/4" = 1'-0" SOUND PARTITION

G / A5.1 2X6 WOOD STUD
3/4" = 1'-0" @ 1 HR SOUND PARTITION

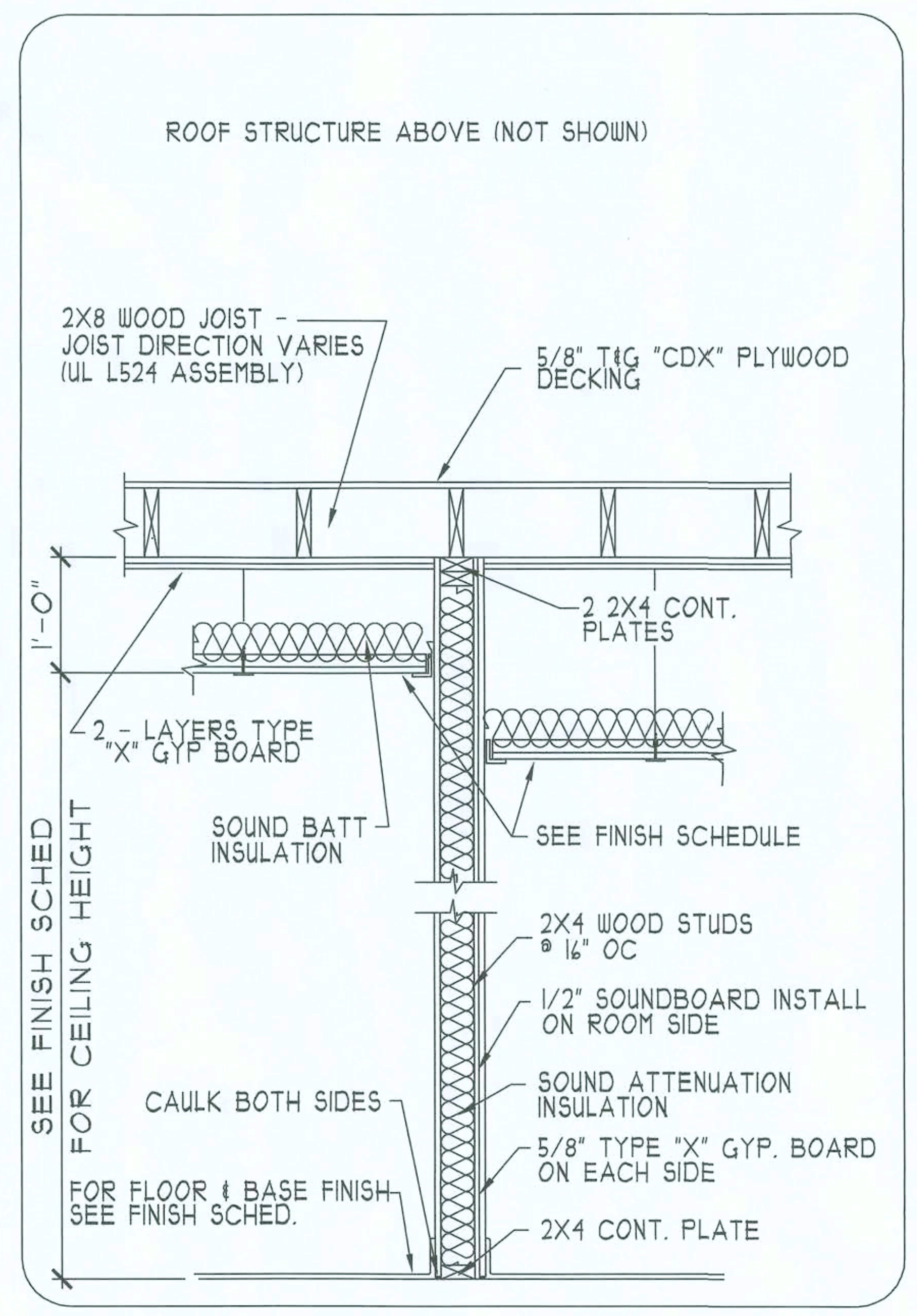


F / A5.1 2X4 WOOD STUD
3/4" = 1'-0" SOUND PARTITION

H / A5.1 2X6 WOOD STUD
3/4" = 1'-0" @ 1 HR SOUND PARTITION



J / A5.1 PARTITION CONST
3/4" = 1'-0" SOUND PARTITION



K / A5.1 PARTITION CONST
3/4" = 1'-0" SOUND PARTITION

M / A5.1 SECTION @ 4-HOUR FIRE WALL
3/4" = 1'-0"

- [ ] PROGRESS PRINTS
- [x] FOR APPROVAL
- [ ] FOR PRICING
- [ ] FOR PERMIT
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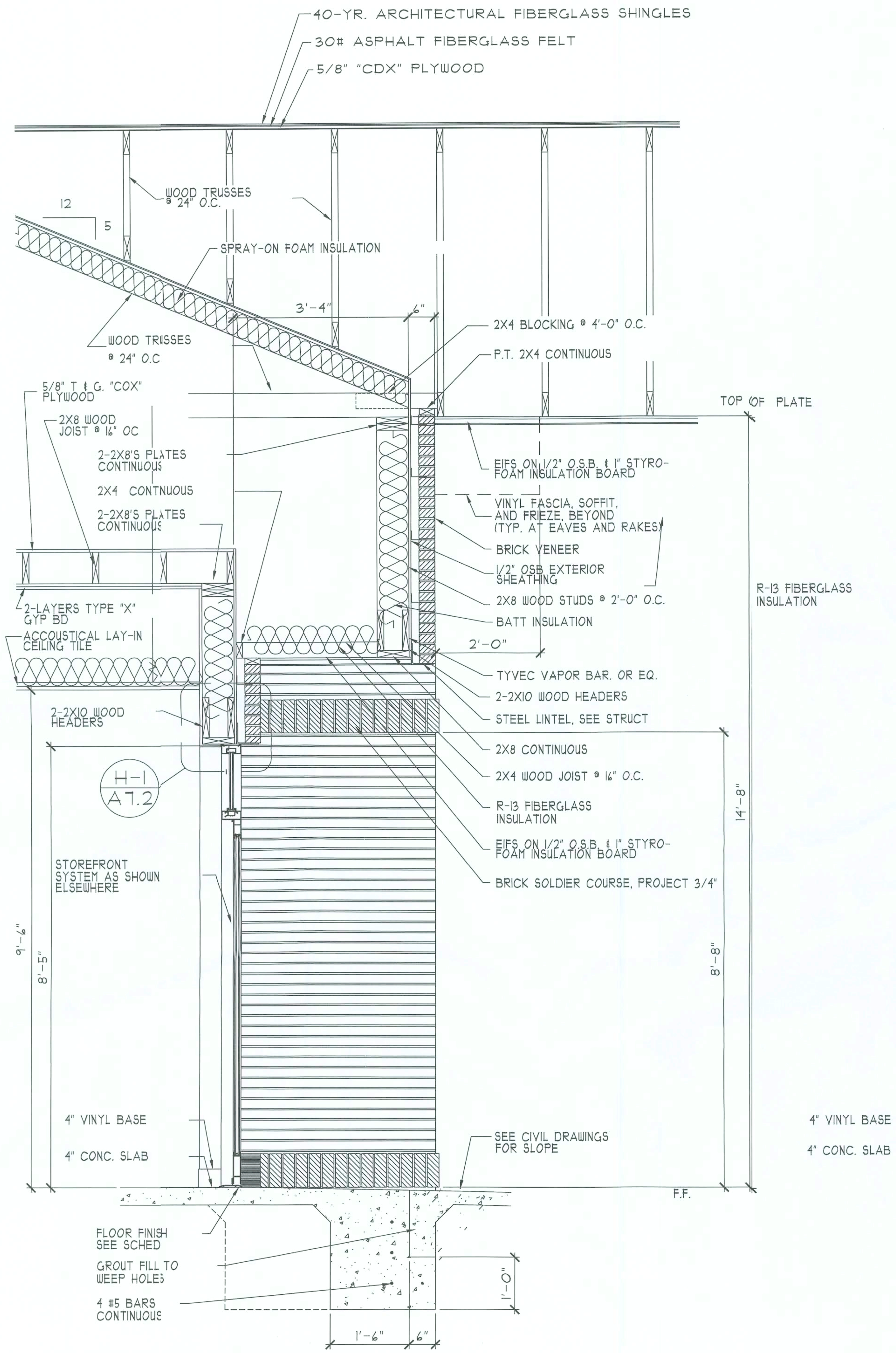
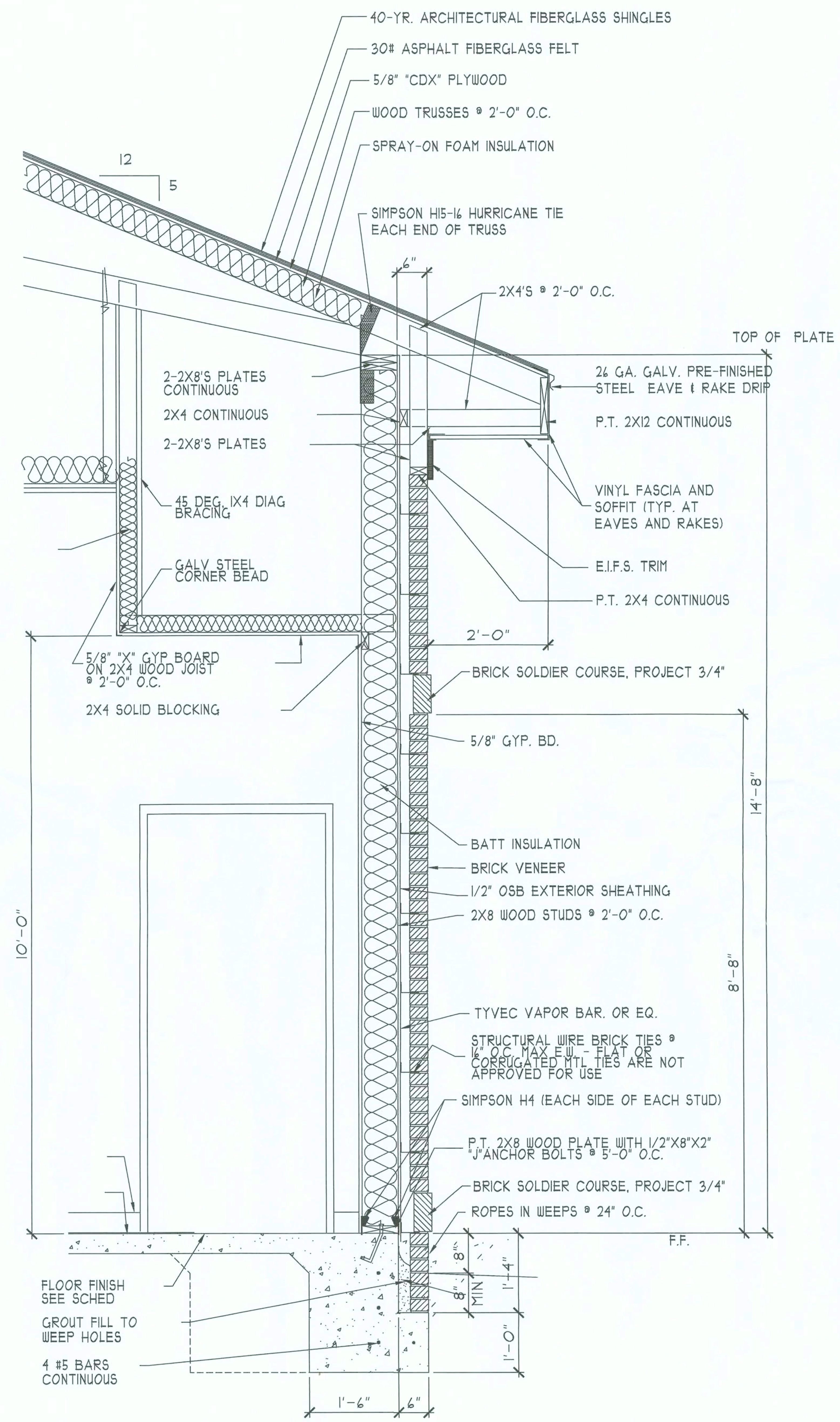


1 A5.3 WALL SECTION @ ENTRY 117 & 170
3/4" = 1'-0"



2 A5.3 WALL SECTION
3/4" = 1'-0"

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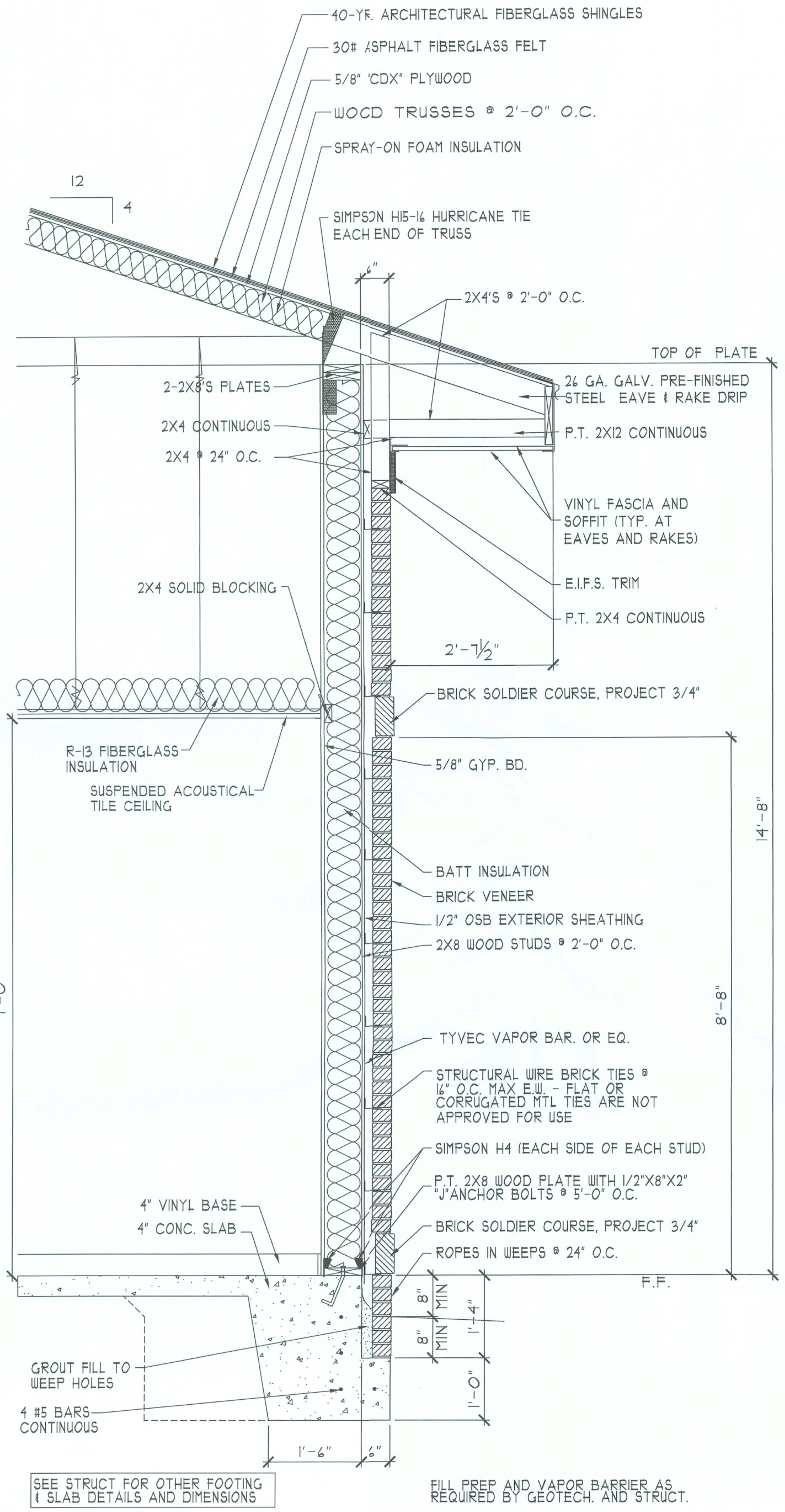
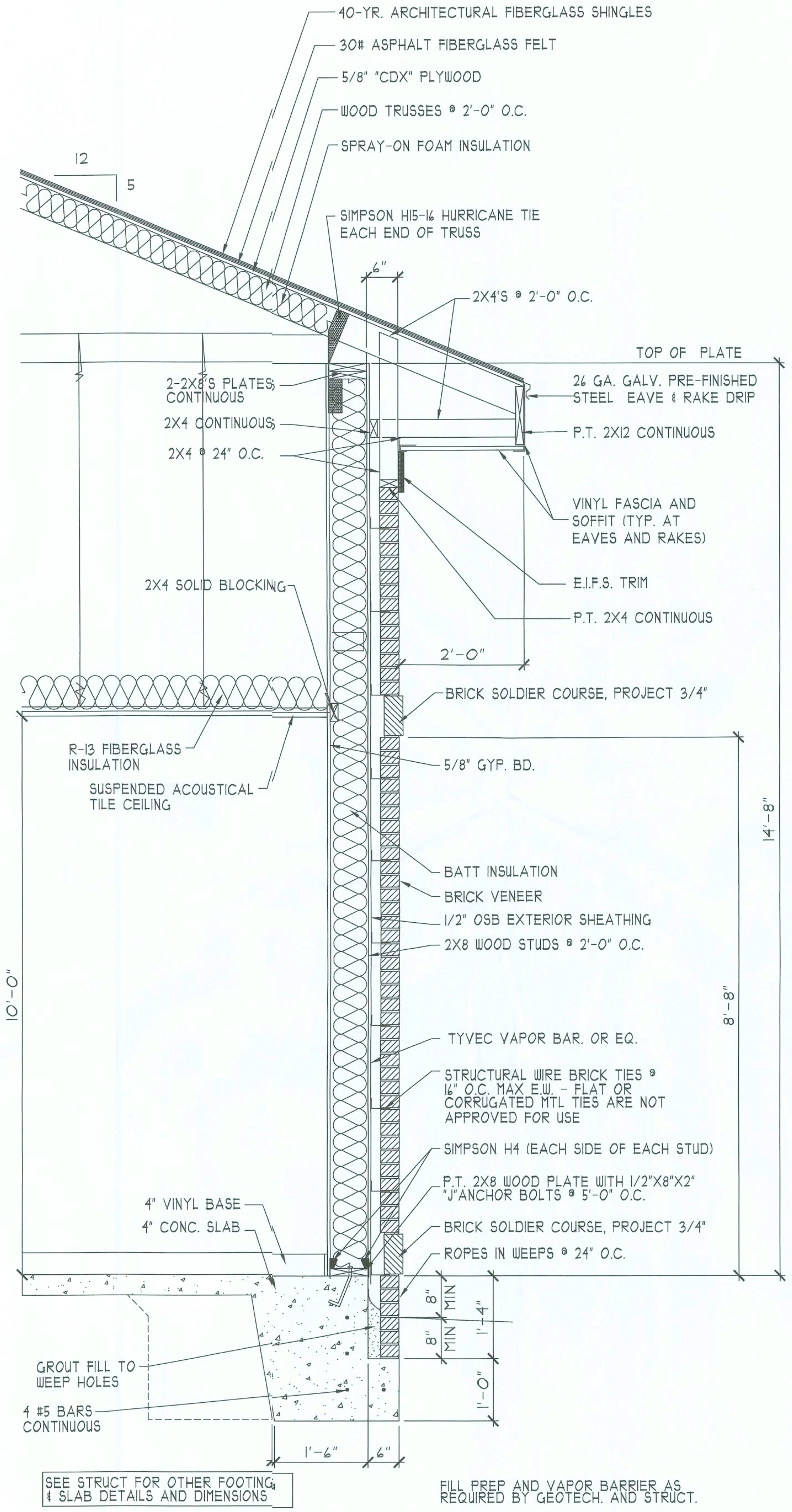
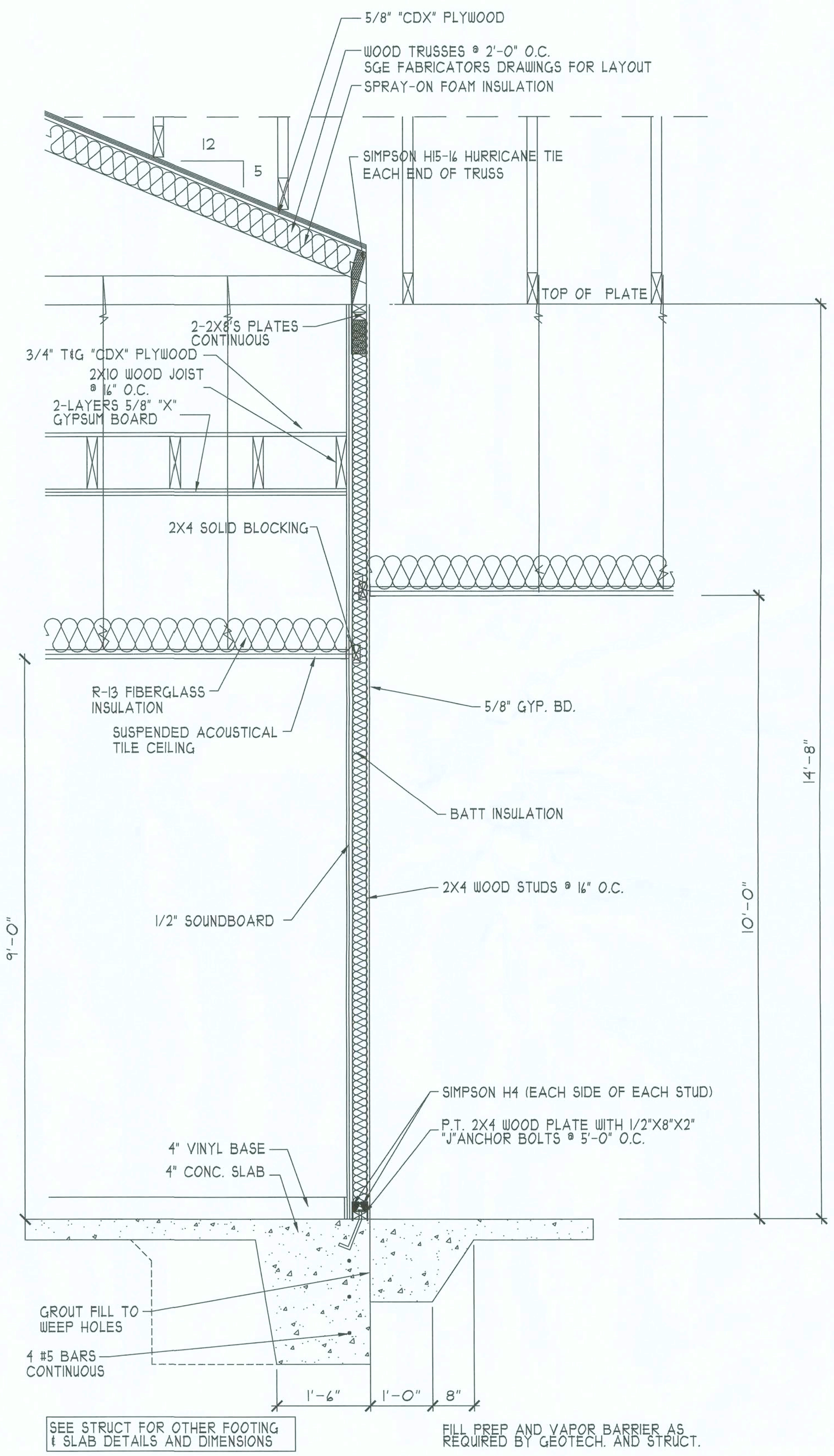


1 / A5.4 WALL SECTION 3/4" = 1'-0"



2 / A5.4 WALL SECTION 3/4" = 1'-0"



3 / A5.4 WALL SECTION 3/4" = 1'-0"

- [ ] PROGRESS PRINTS
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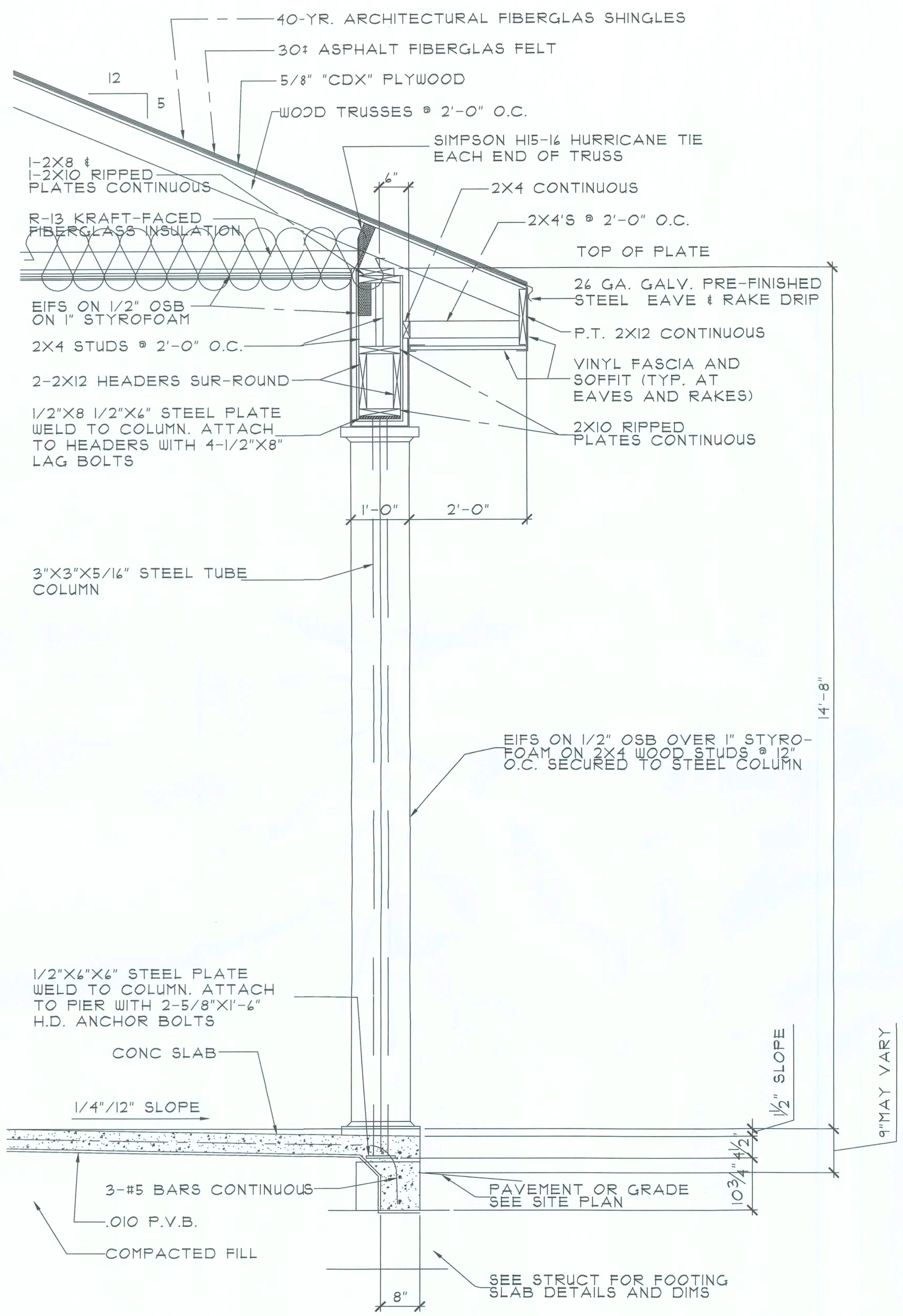
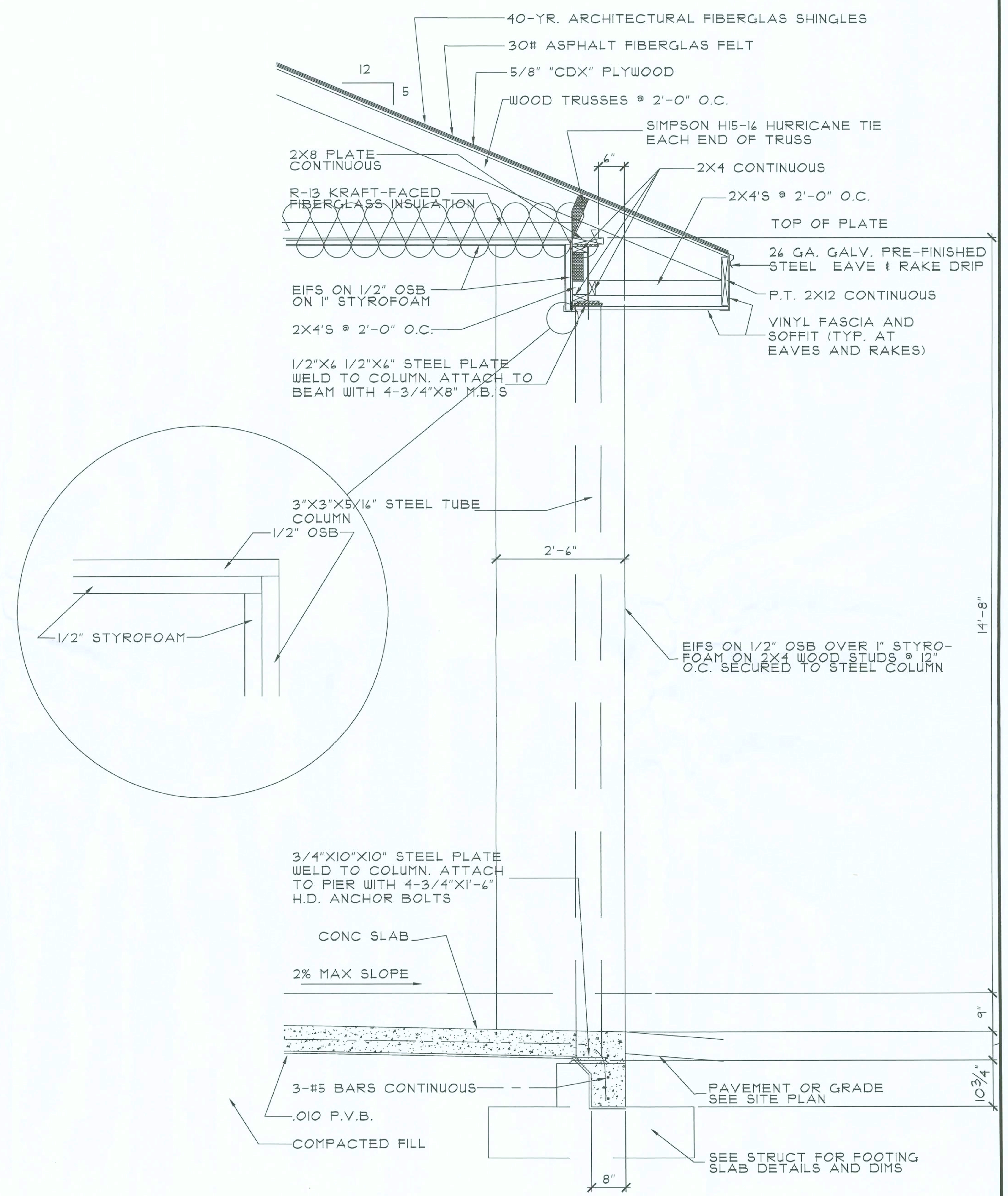


FILL PREP AND VAPOR BARRIER AS REQUIRED BY GEOTECH AND STRUCT ENGINEER

2 / A5.7 WALL SECTION
3/4" = 1'-0"



FILL PREP AND VAPOR BARRIER AS REQUIRED BY GEOTECH AND STRUCT ENGINEER

1 / A5.7 WALL SECTION
3/4" = 1'-0"

- [ ] PROGRESS PRINTS
- [x] FOR APPROVAL
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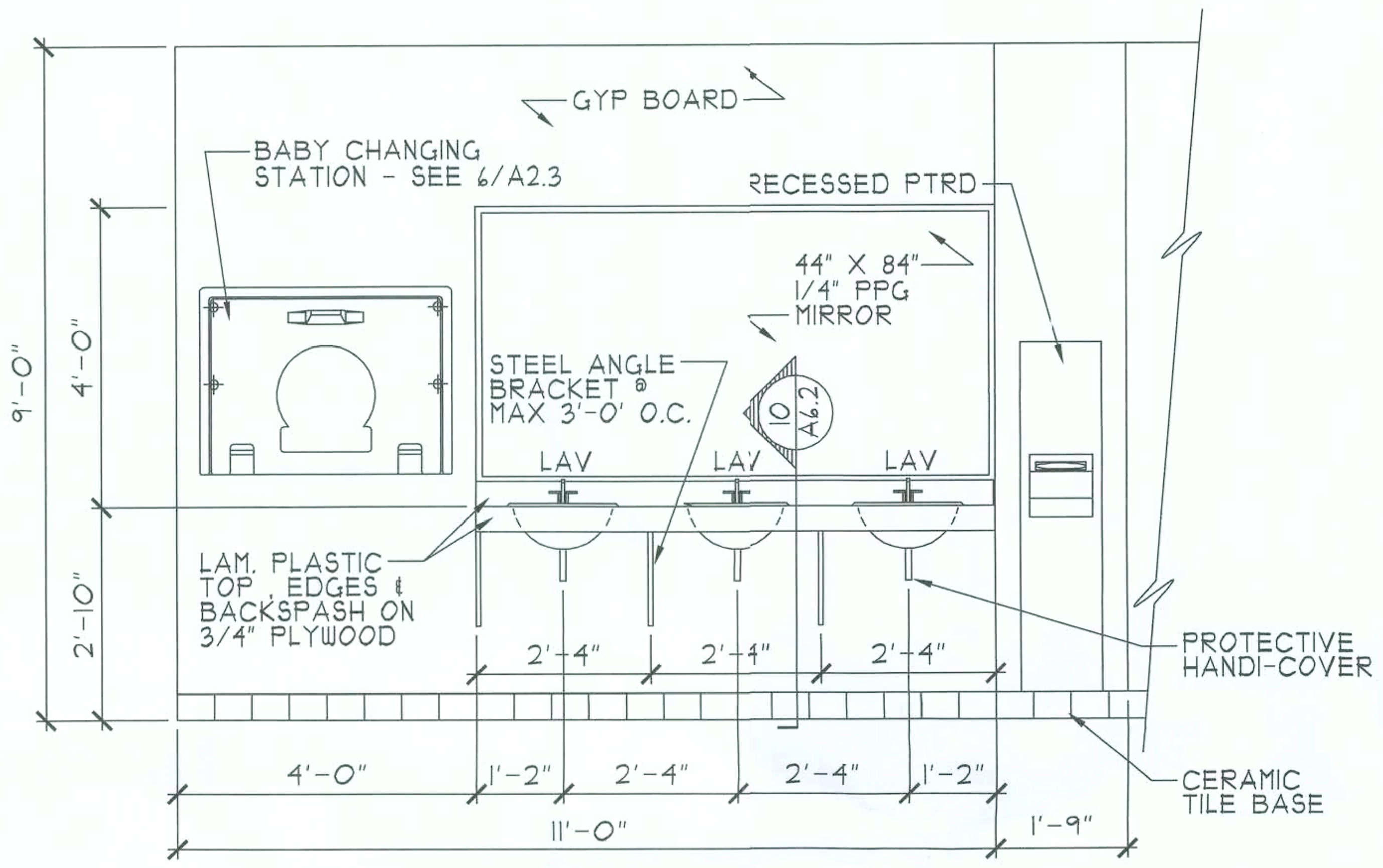
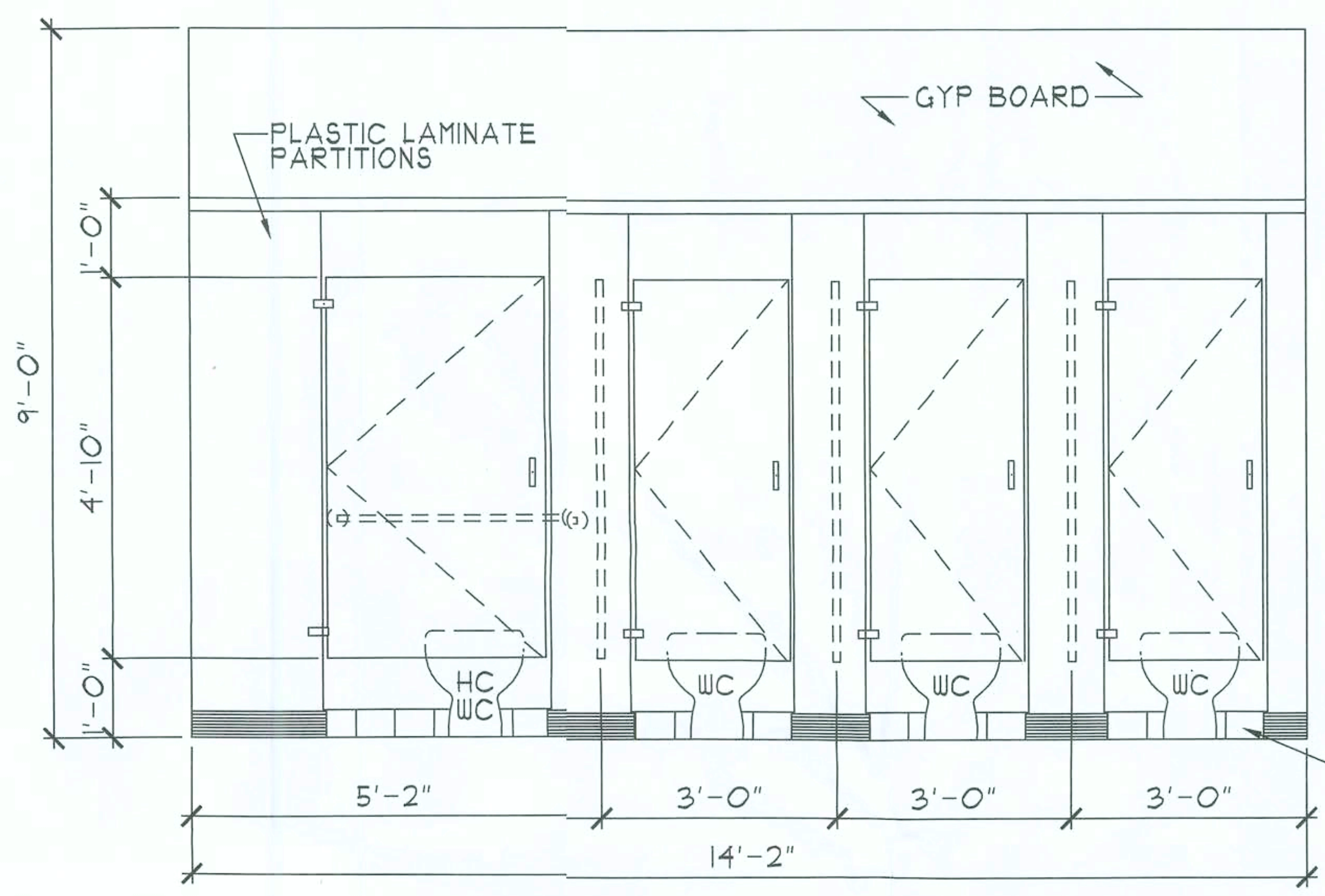


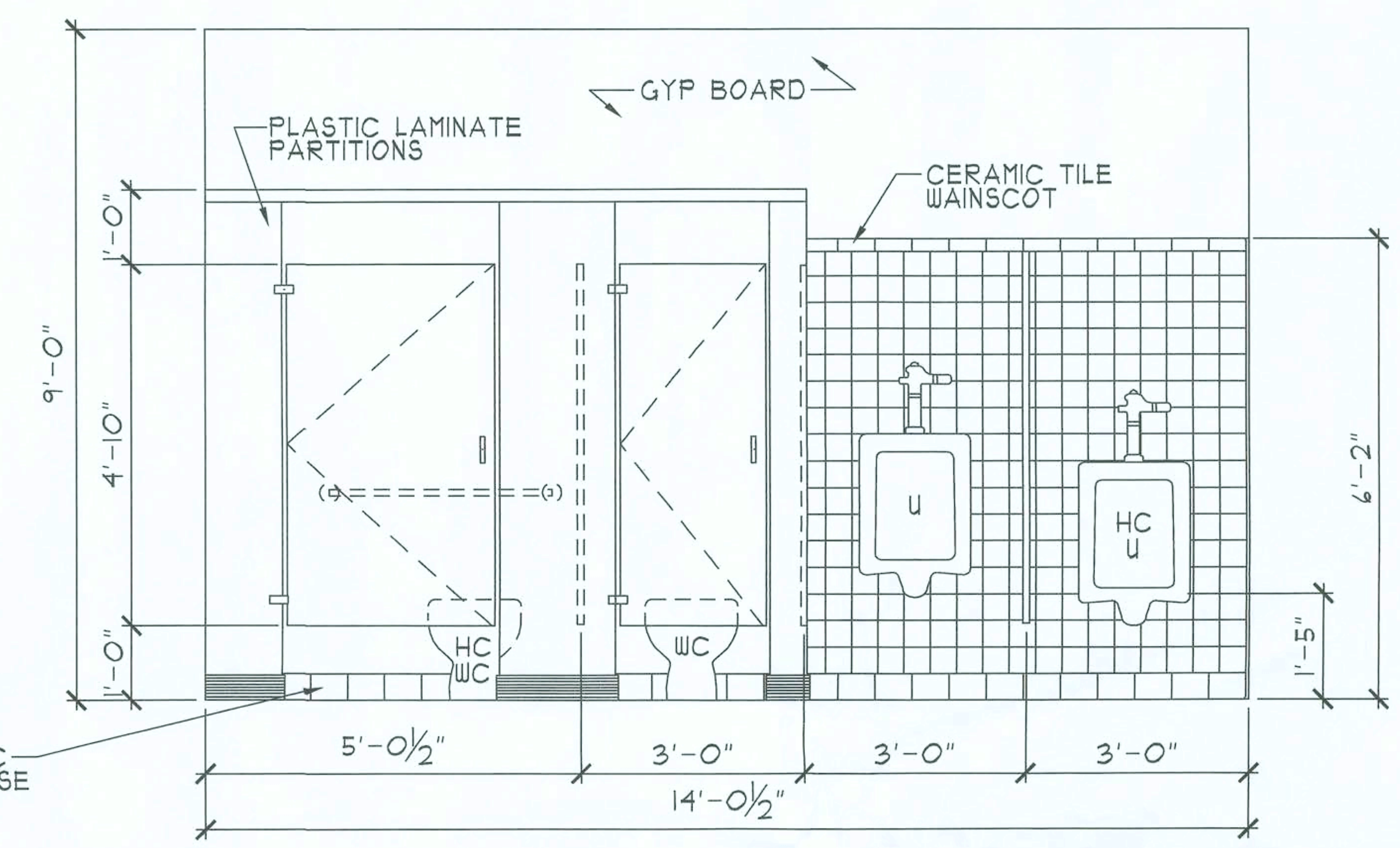
5 / A6.1 ELEV. @ WOMEN'S 121

SCALE: 1/2" = 1'-0" MEN 128 OPP. HAND



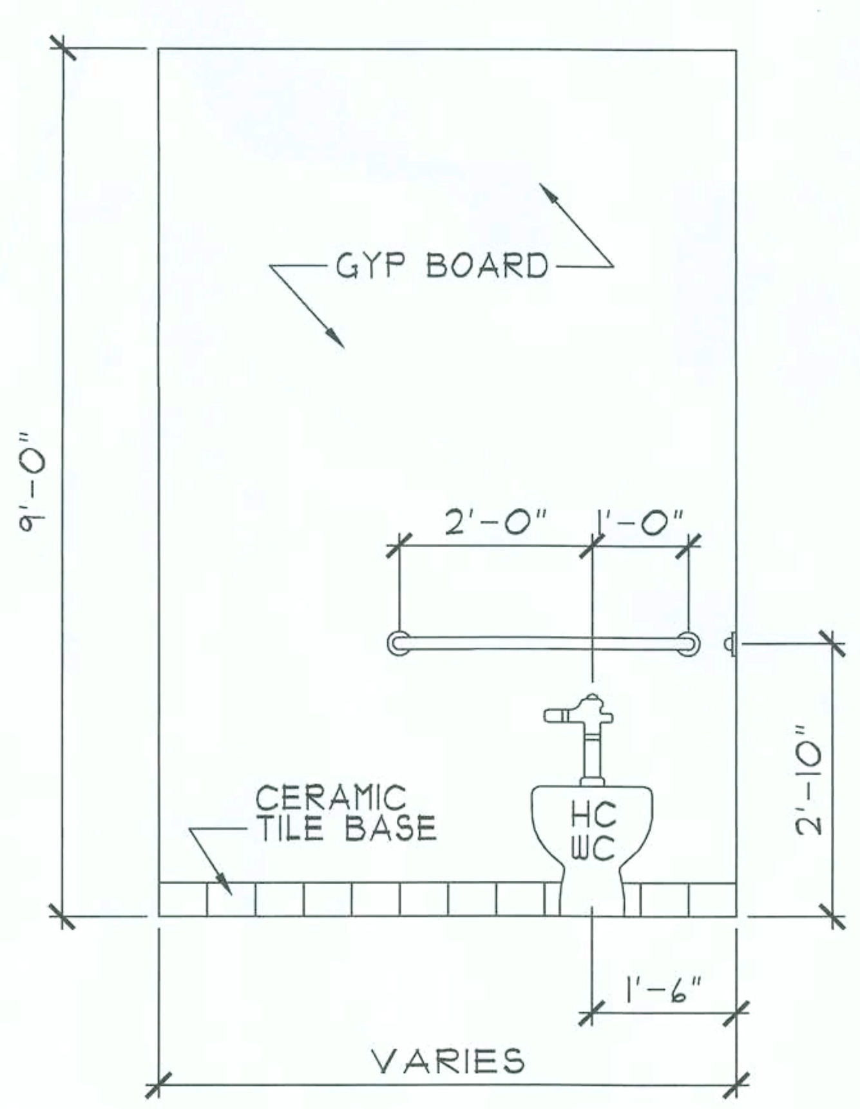
6 / A6.1 ELEV. @ WOMEN'S 121

SCALE: 1/2" = 1'-0"



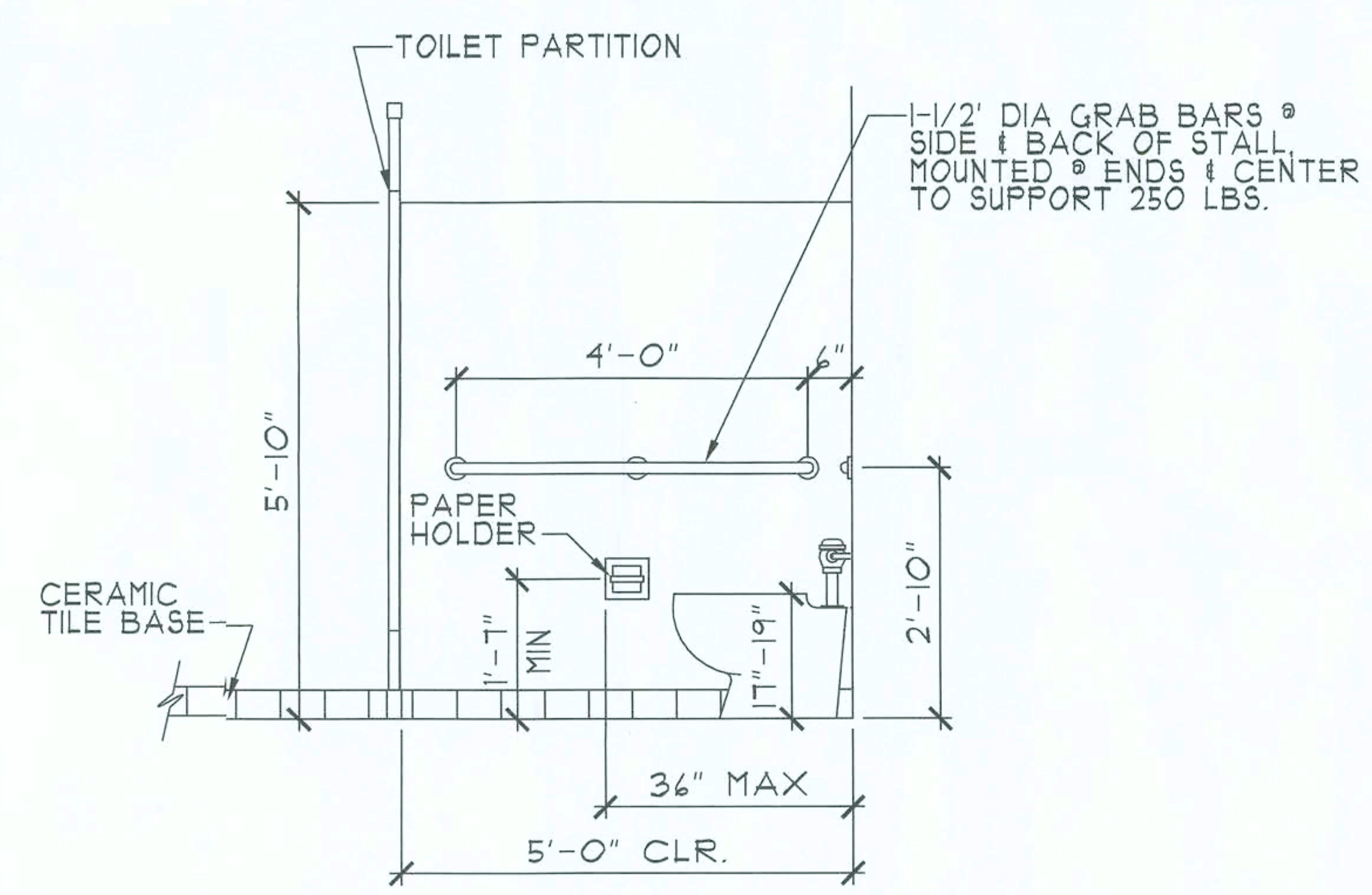
7 / A6.1 ELEV. @ MEN'S 128

SCALE: 1/2" = 1'-0"



4 / A6.1 TYP. FRONT ELEV. @ HC TOILET

SCALE: 1/2" = 1'-0"



8 / A6.1 TYP. SIDE ELEV. @ HC TOILET

SCALE: 1/2" = 1'-0"

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- [ ] PROGRESS PRINTS
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- [ ] FOR PRICING
- [ ] FOR PERMIT
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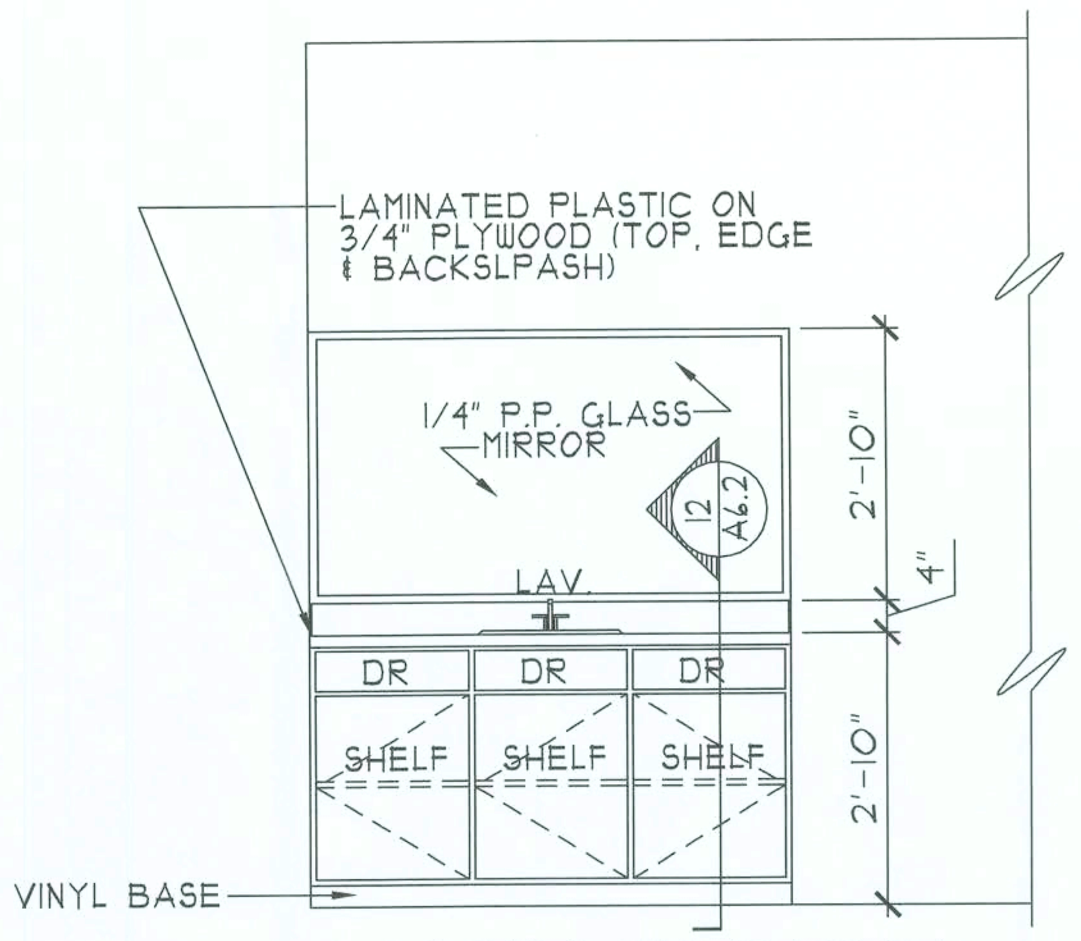
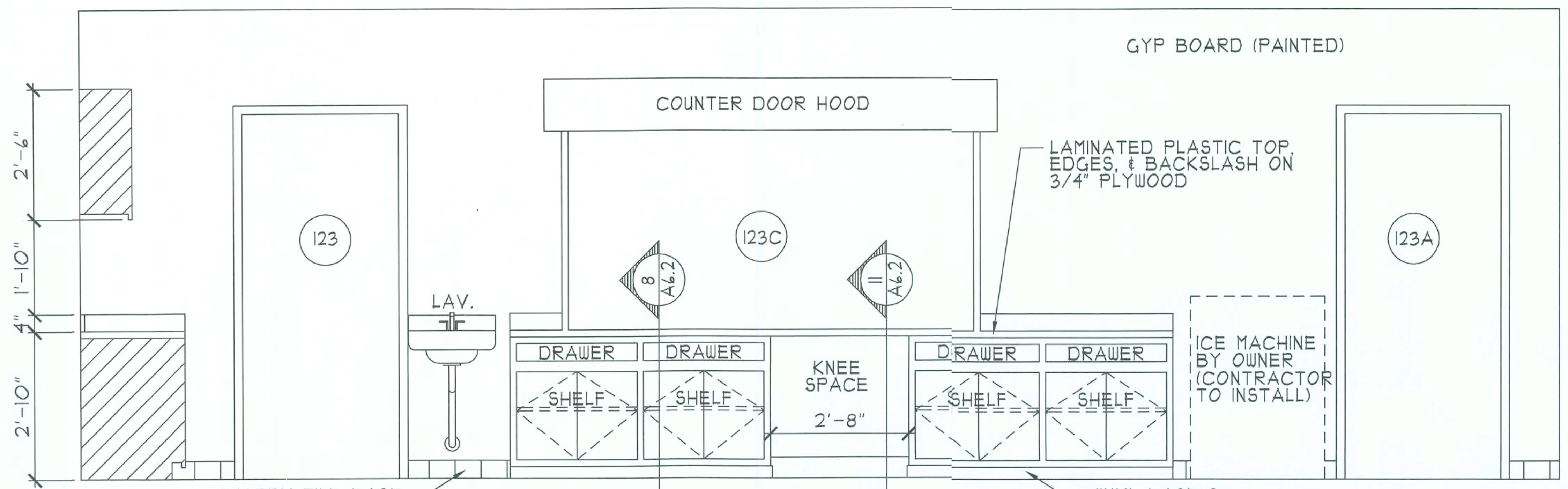
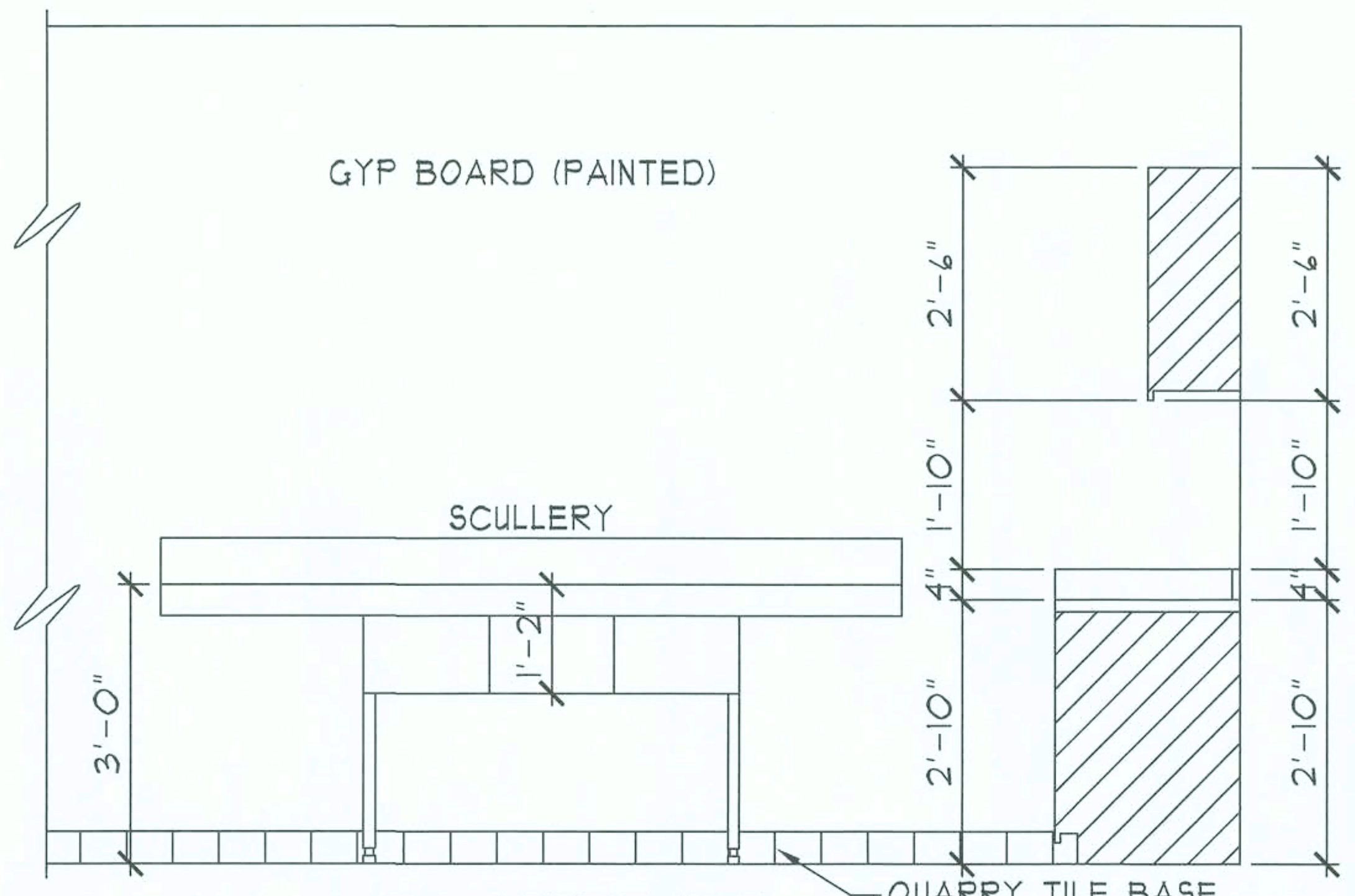


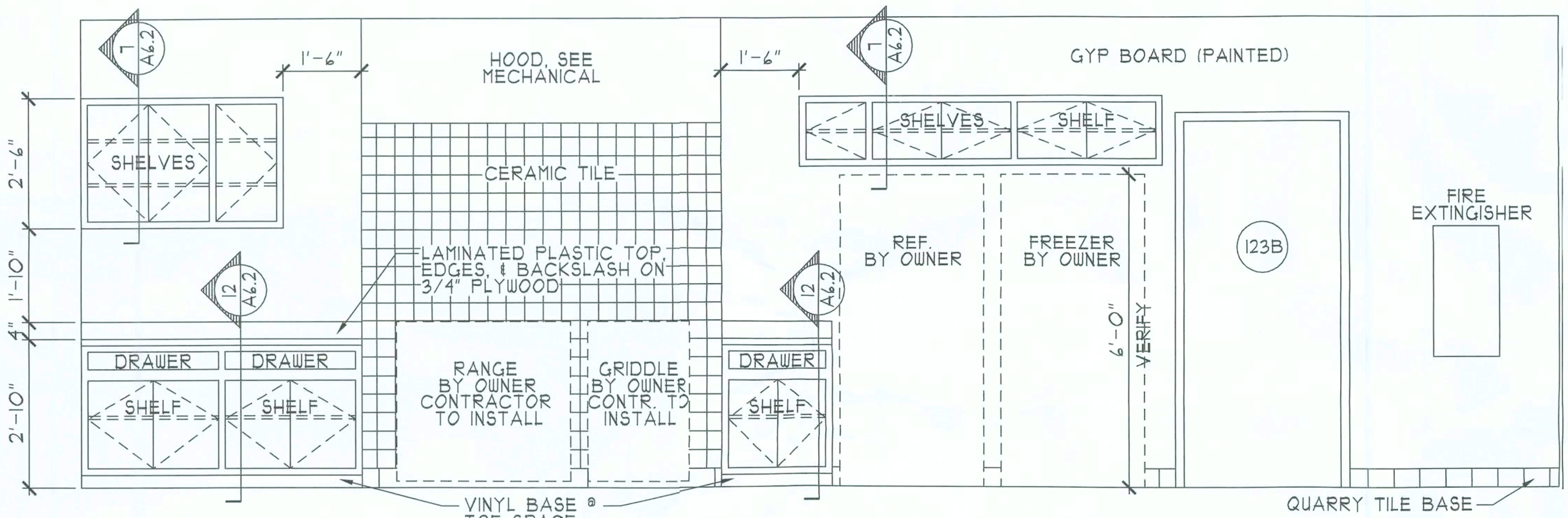
3 A6.2 CLASSROOM/BRIDE 105
SCALE 1/2"=1'-0"



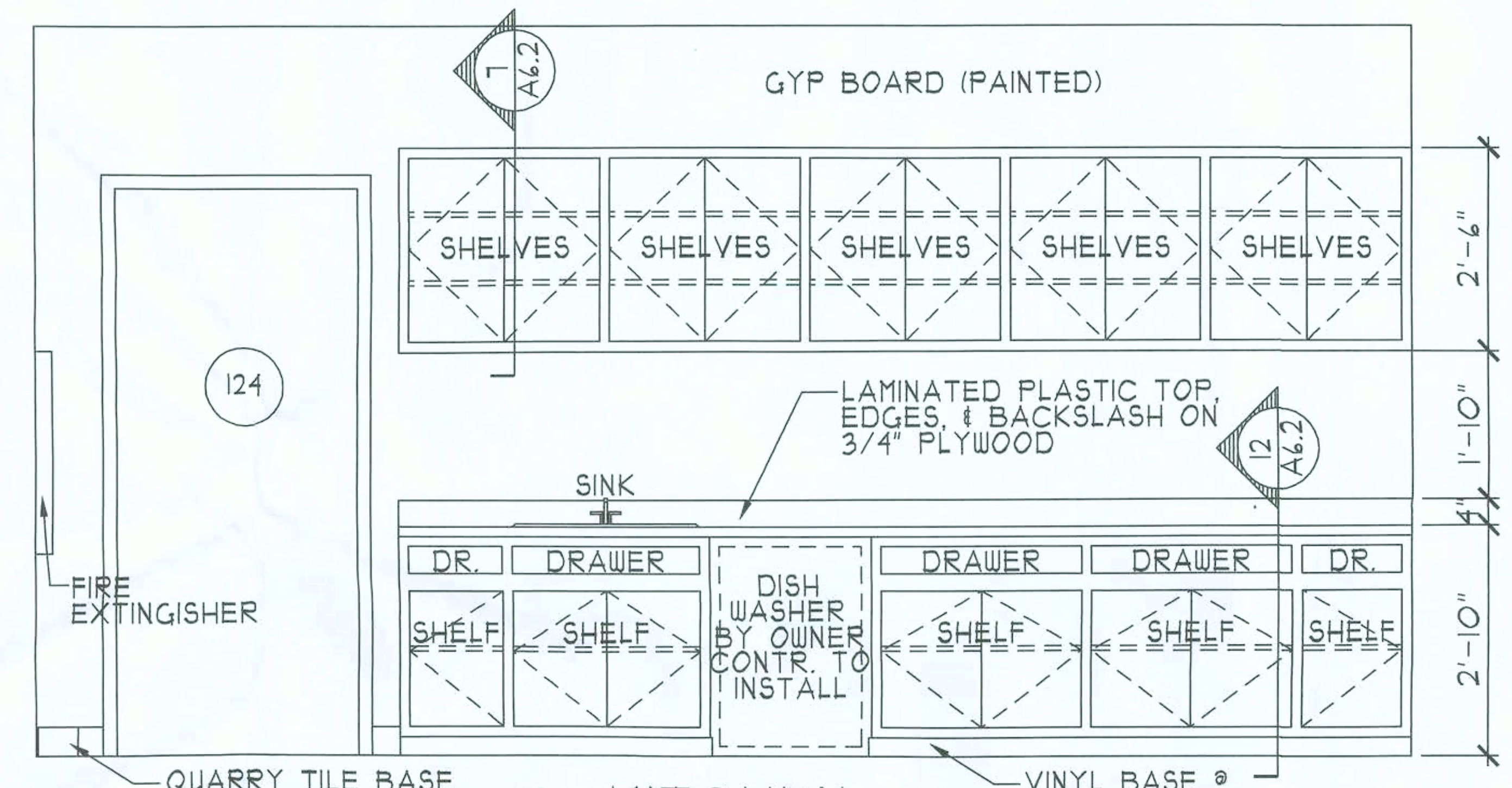
4 A6.2 KITCHEN
SCALE 1/2"=1'-0" 123



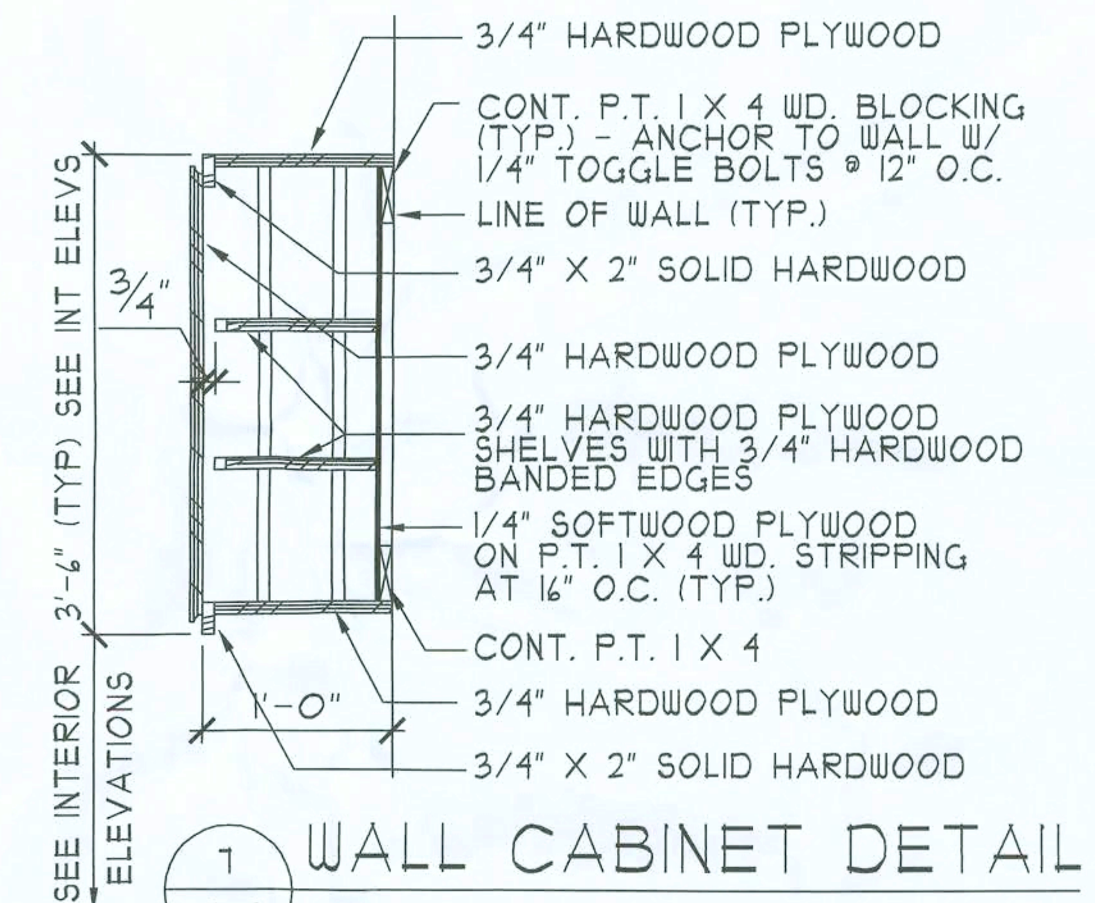
5 A6.2 KITCHEN
SCALE 1/2"=1'-0" 123



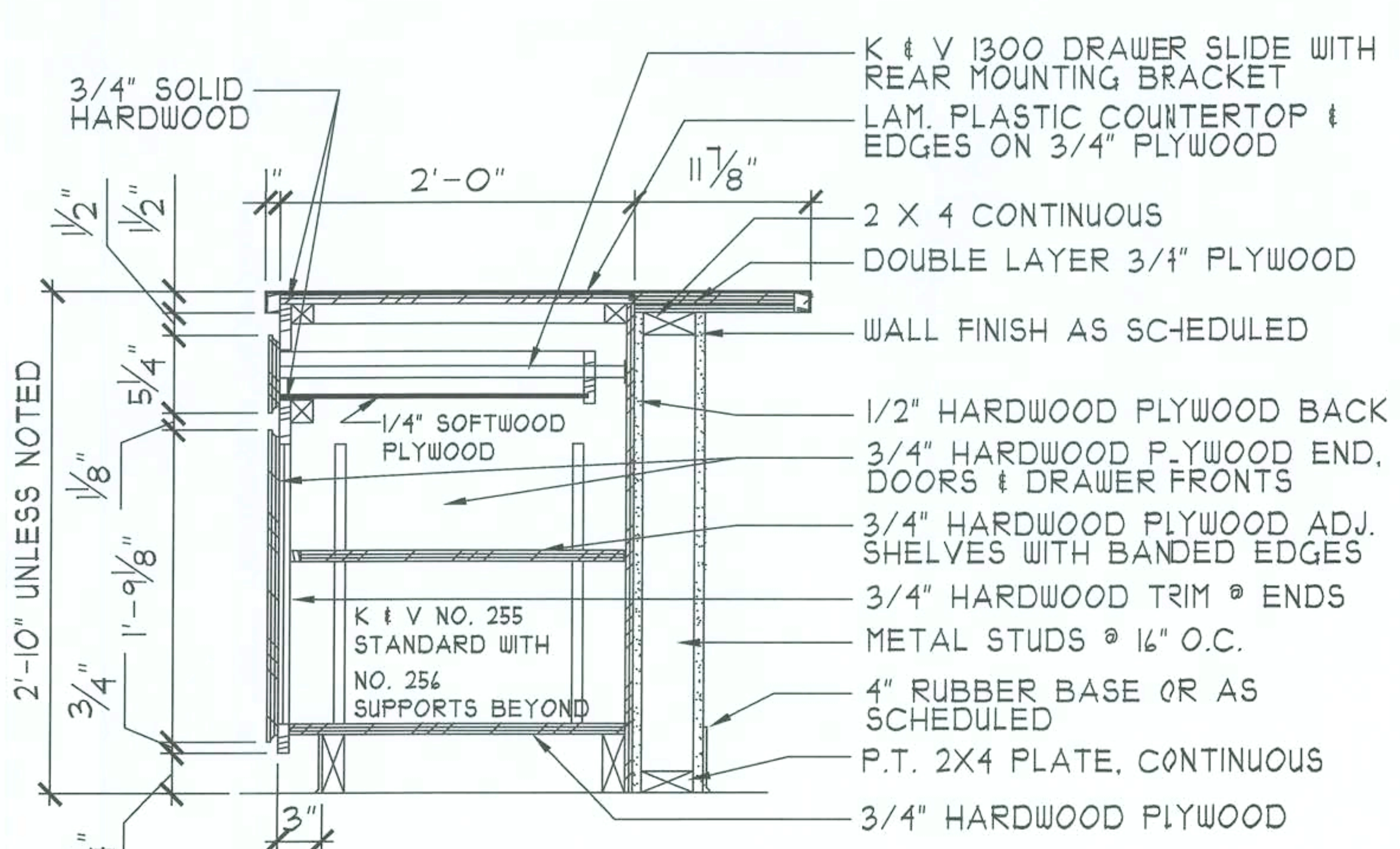
6 A6.2 KITCHEN
SCALE 1/2"=1'-0" 123



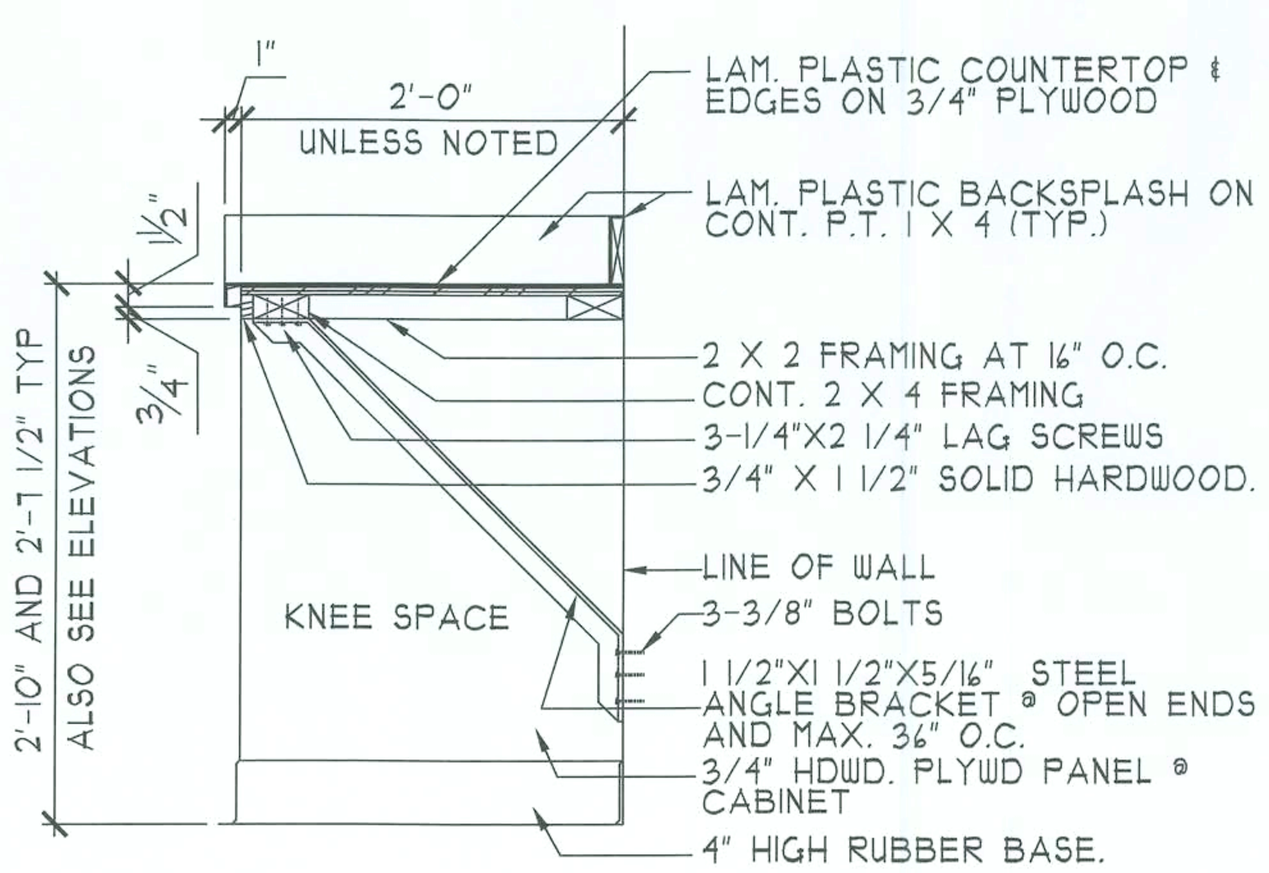
13 A6.2 KITCHEN
SCALE 1/2"=1'-0" 123



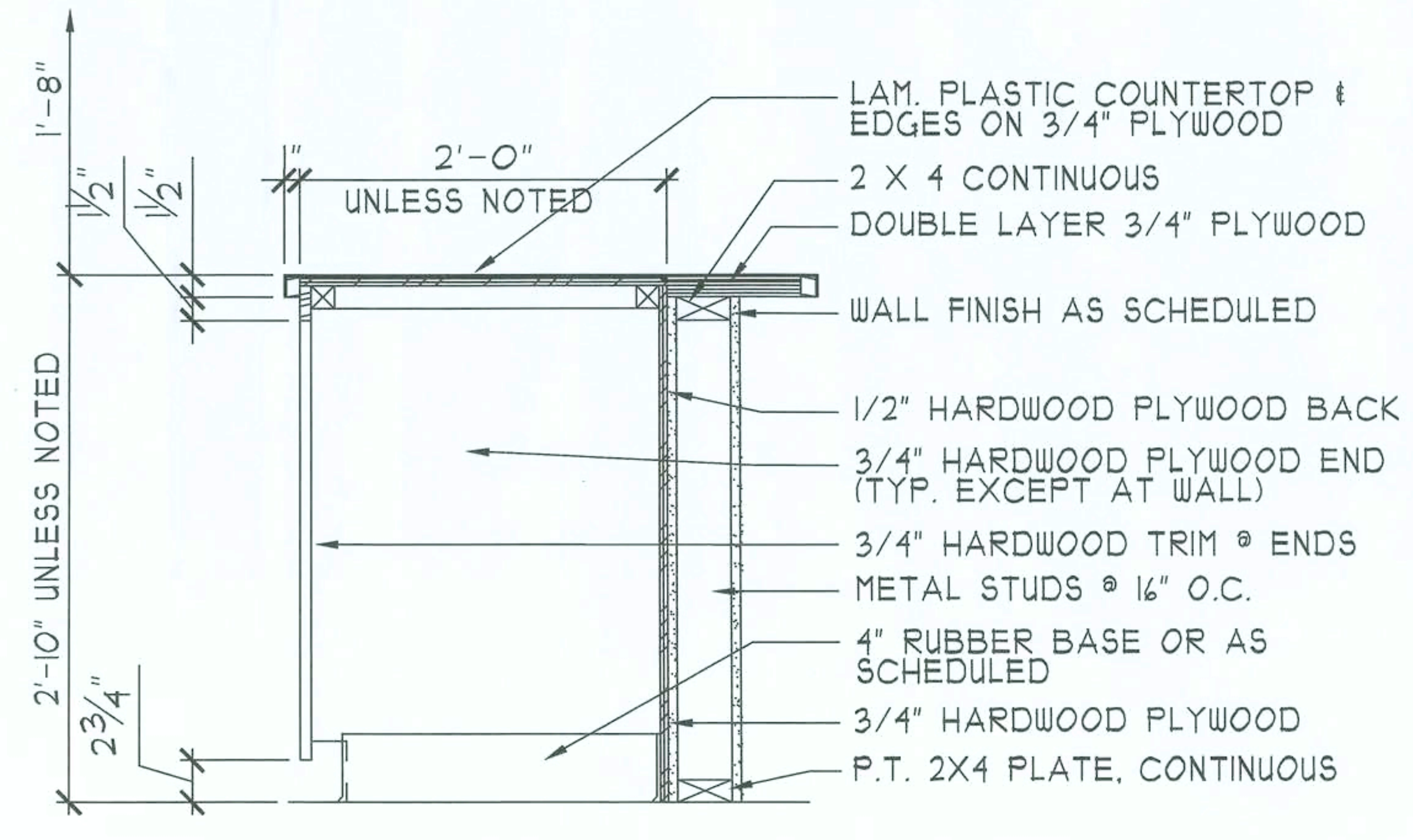
7 A6.2 WALL CABINET DETAIL
SCALE 1"=1'-0" MIL64008



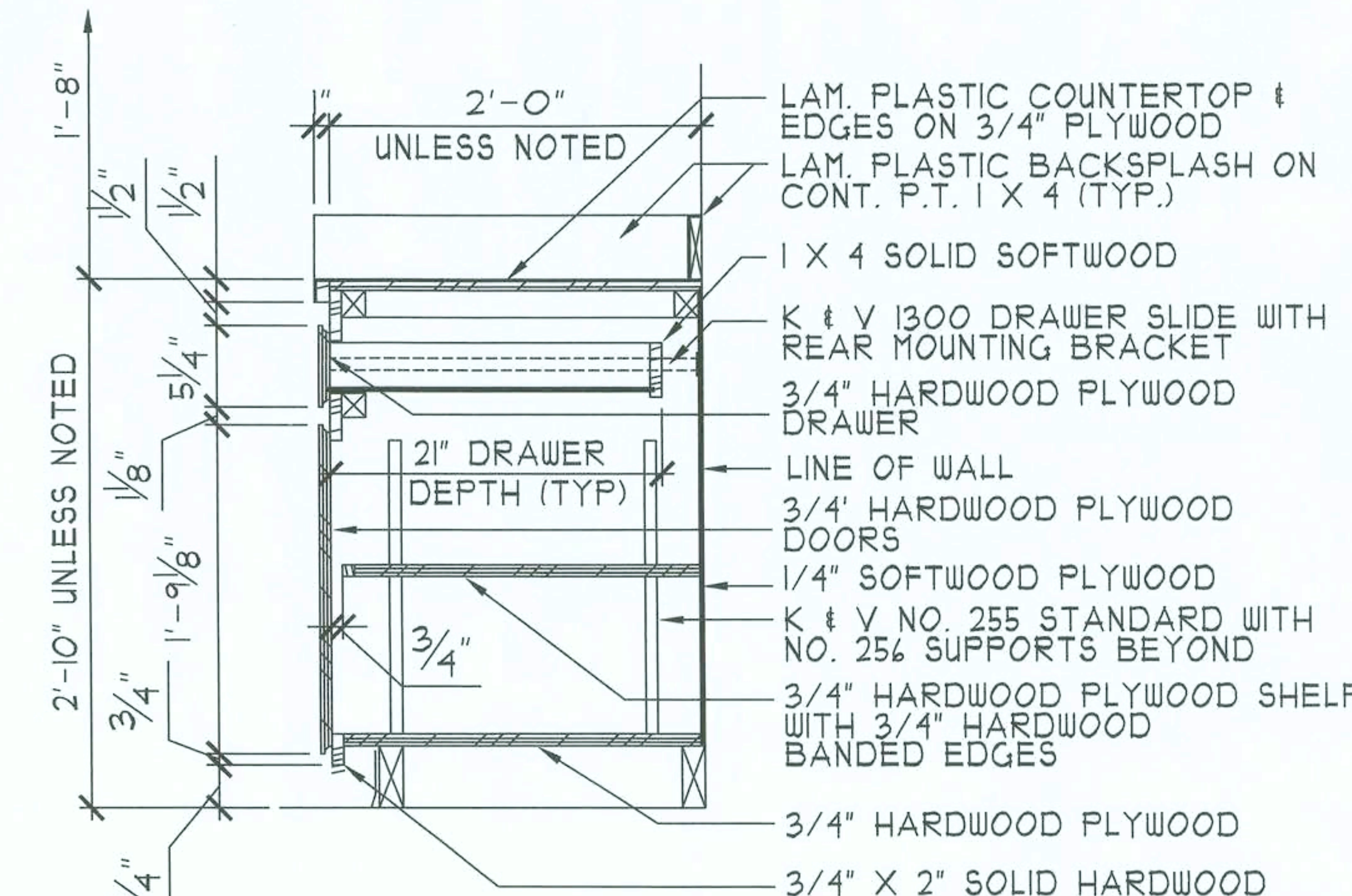
8 A6.2 BASE CABINET DETAIL
SCALE 1"=1'-0" MIL64029A



10 A6.2 OPEN BASE COUNTER
SCALE 1"=1'-0" MIL64006



11 A6.2 BASE CABINET DETAIL
SCALE 1"=1'-0" MIL64029



12 A6.2 BASE CABINET DETAIL
SCALE 1"=1'-0" MIL64002

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Thomas [signature] 11/19/07

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CONSTRUCTION MANAGEMENT AIA/APA

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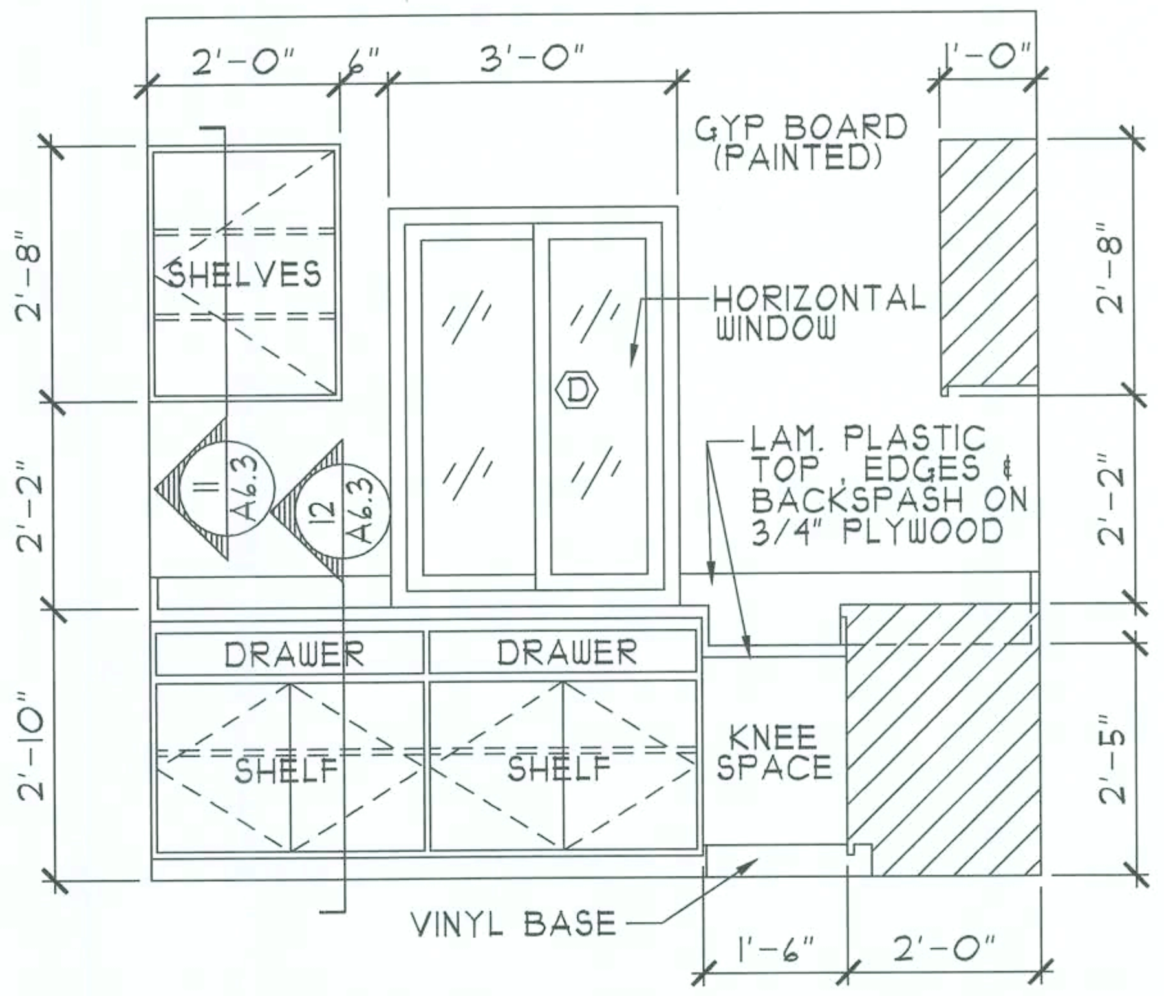
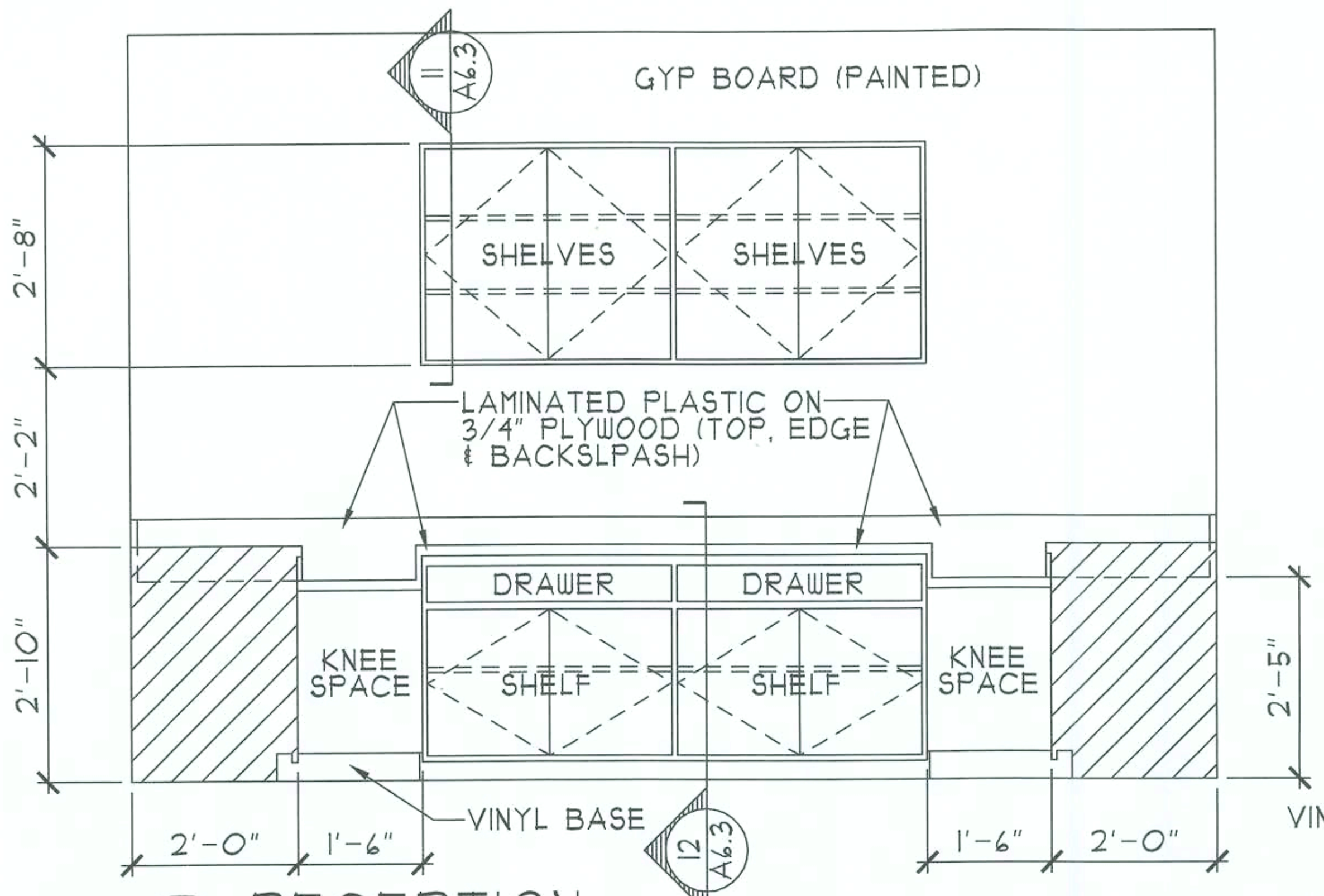
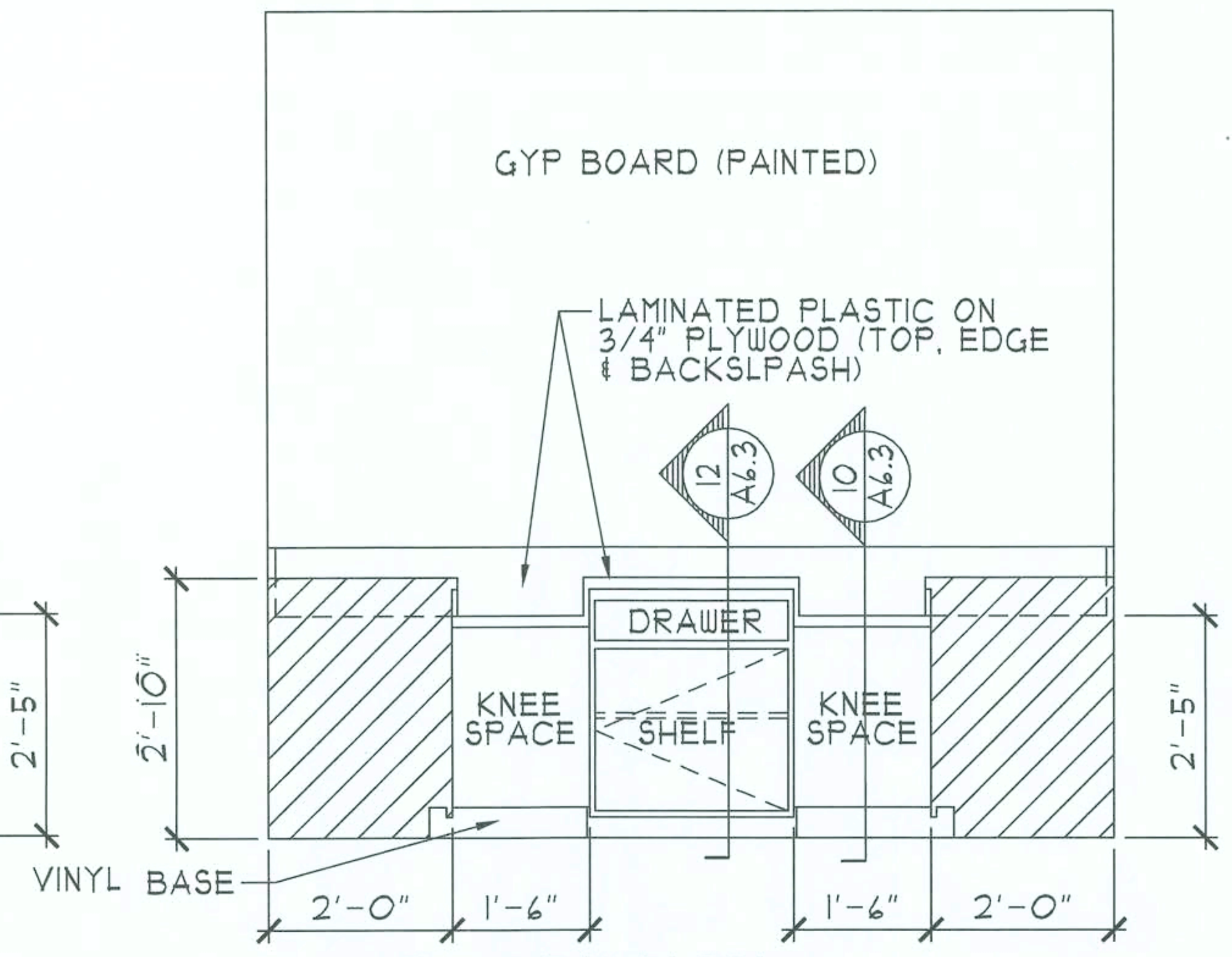


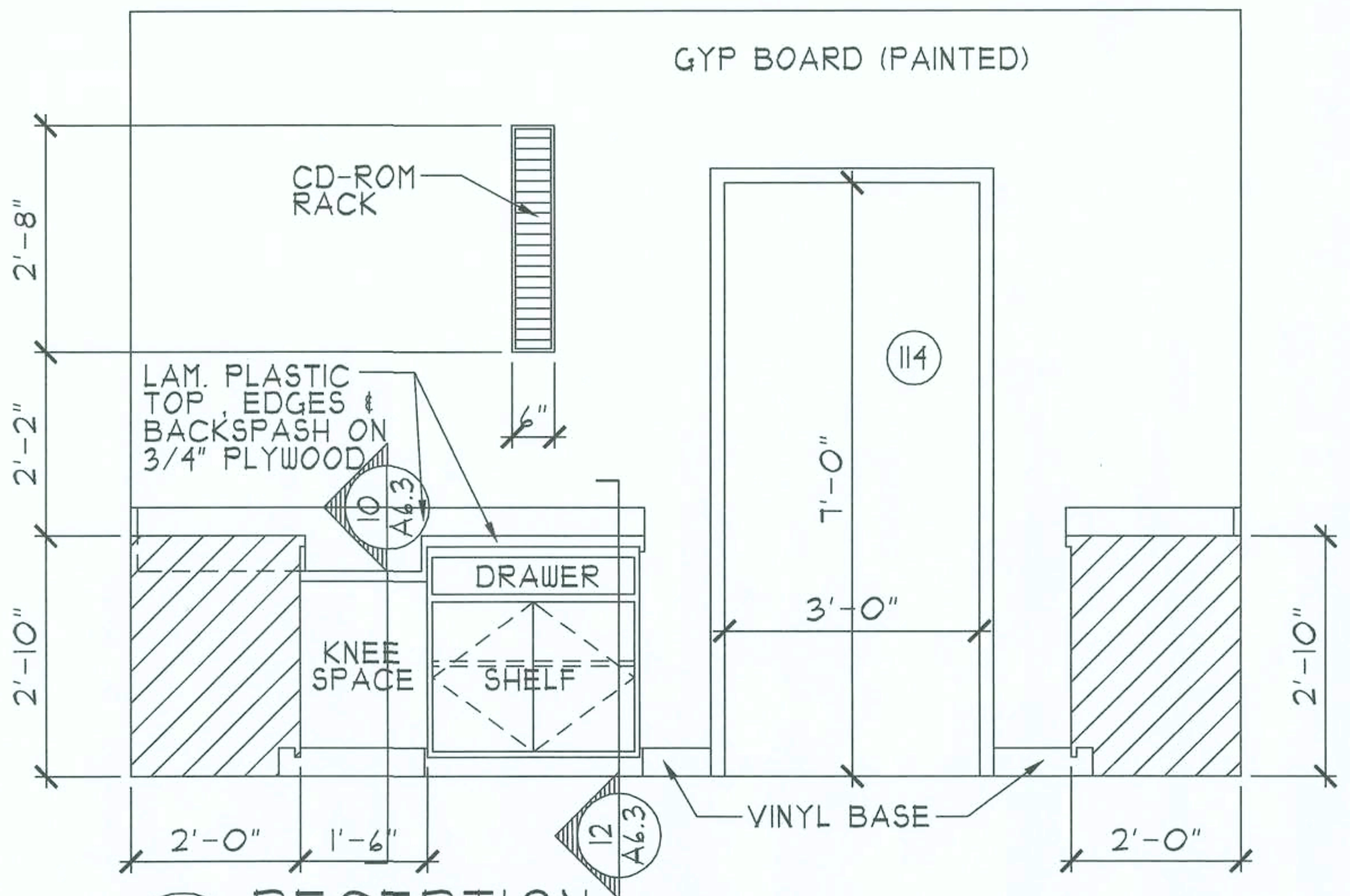
1 RECEPTION
A6.3 SCALE 1/2"=1'-0" 114



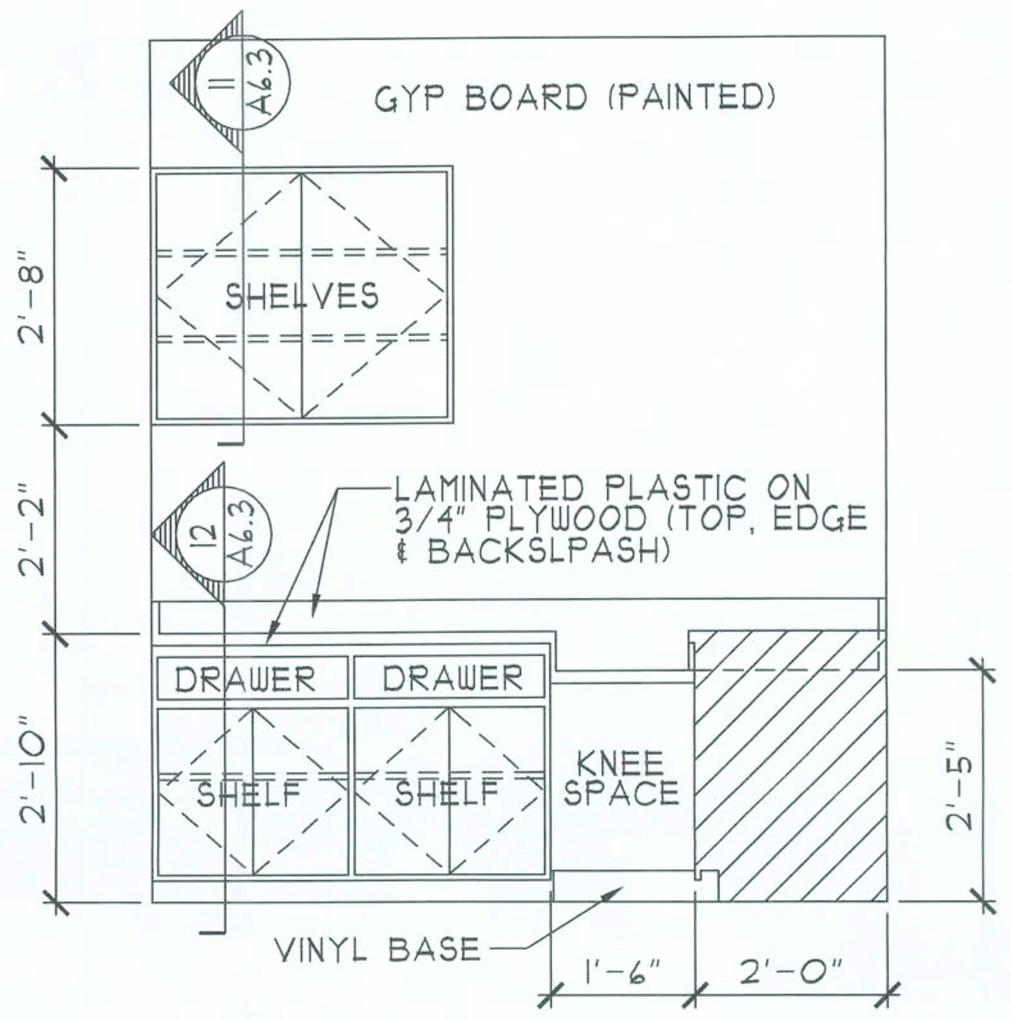
2 RECEPTION
A6.3 SCALE 1/2"=1'-0" 114



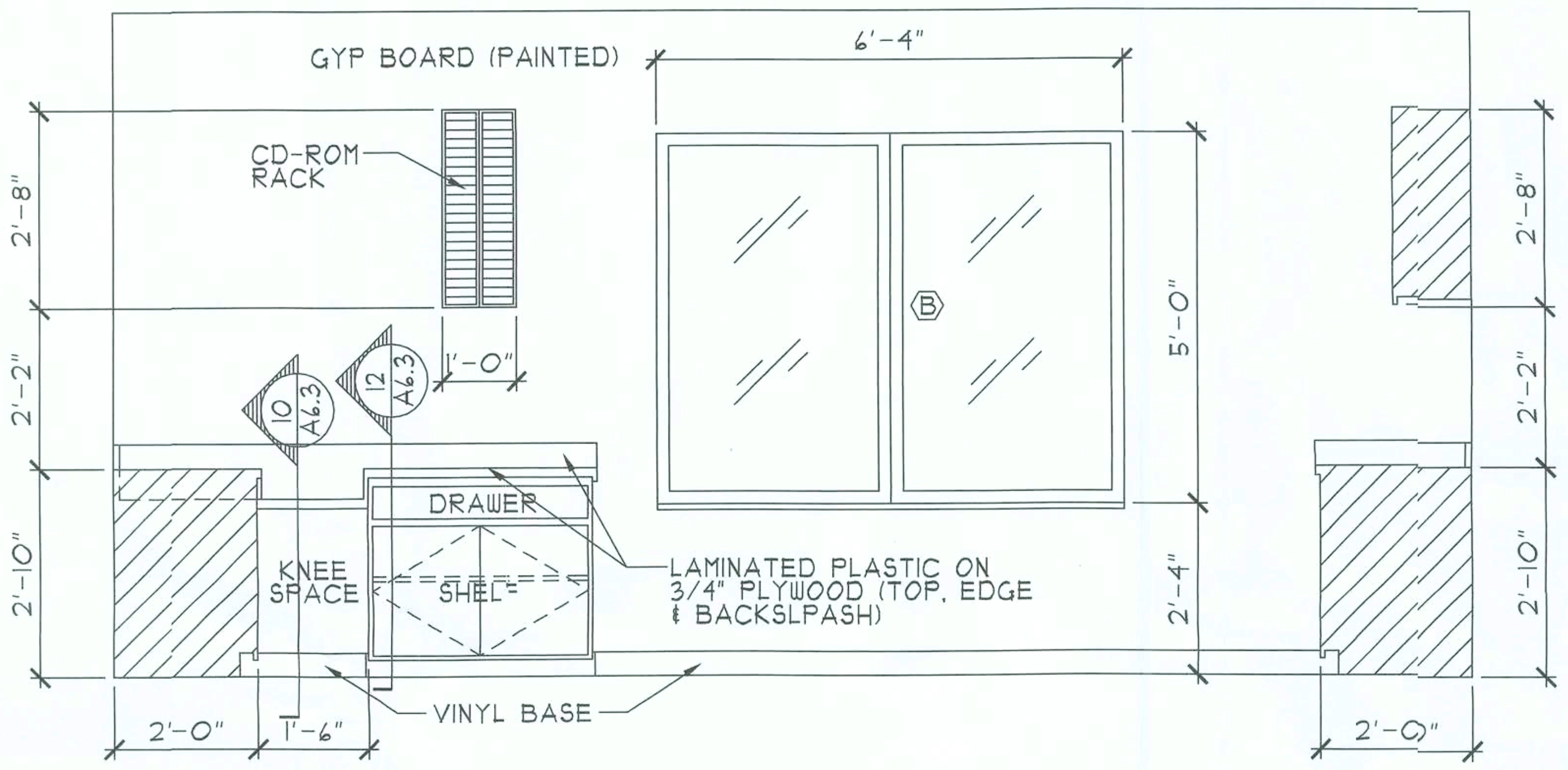
3 RECEPTION
A6.3 SCALE 1/2"=1'-0" 114



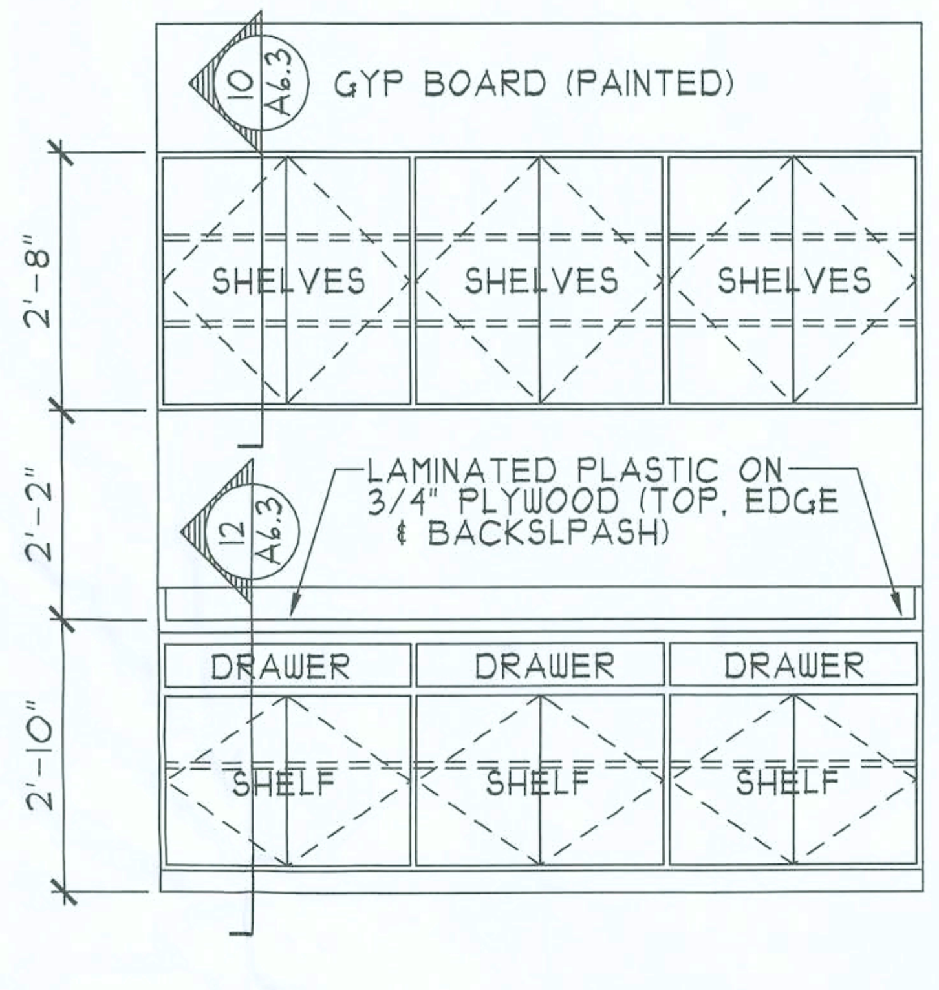
4 RECEPTION
A6.3 SCALE 1/2"=1'-0" 114



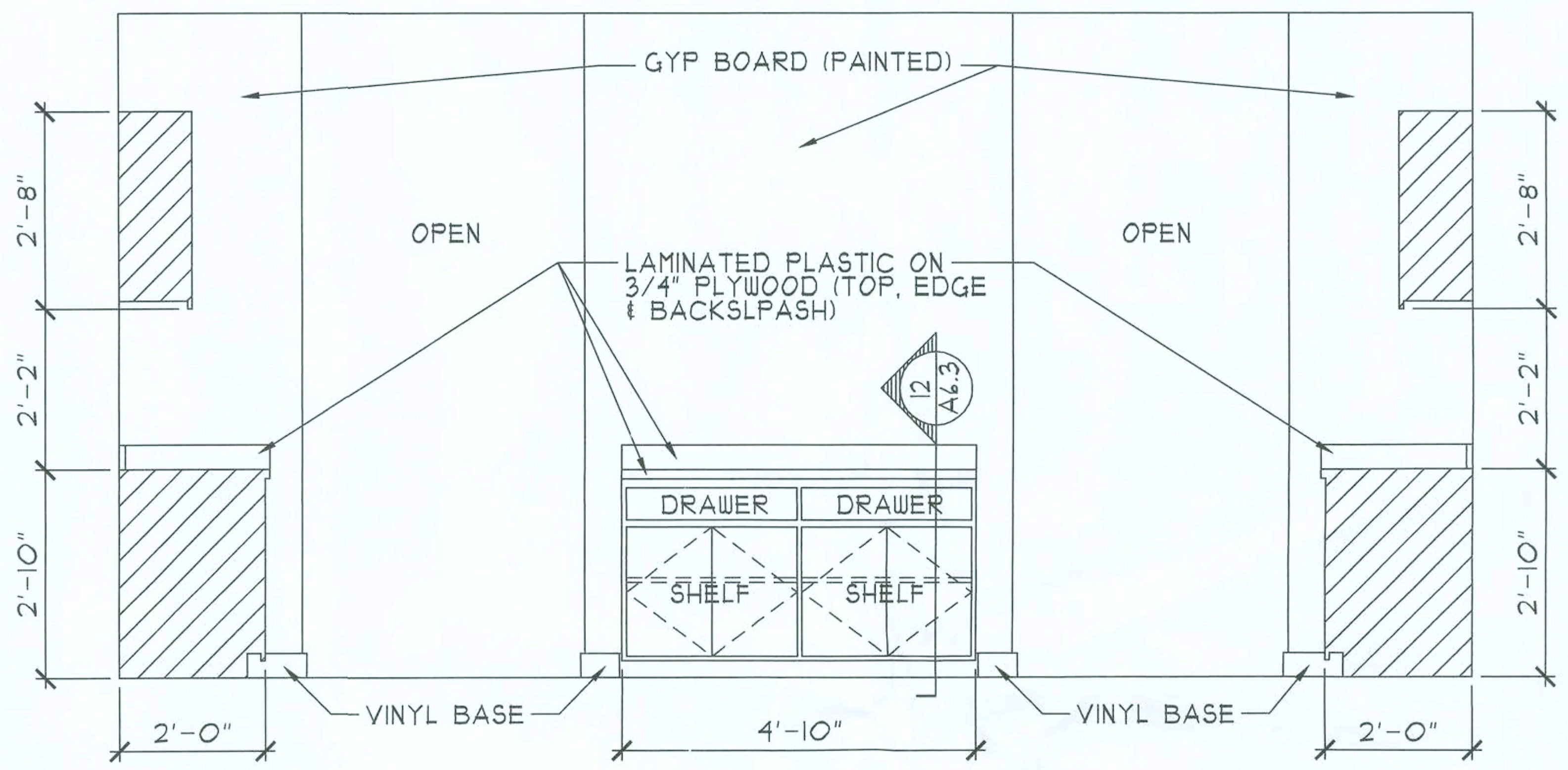
5 WORK ROOM
A6.3 SCALE 1/2"=1'-0" 113



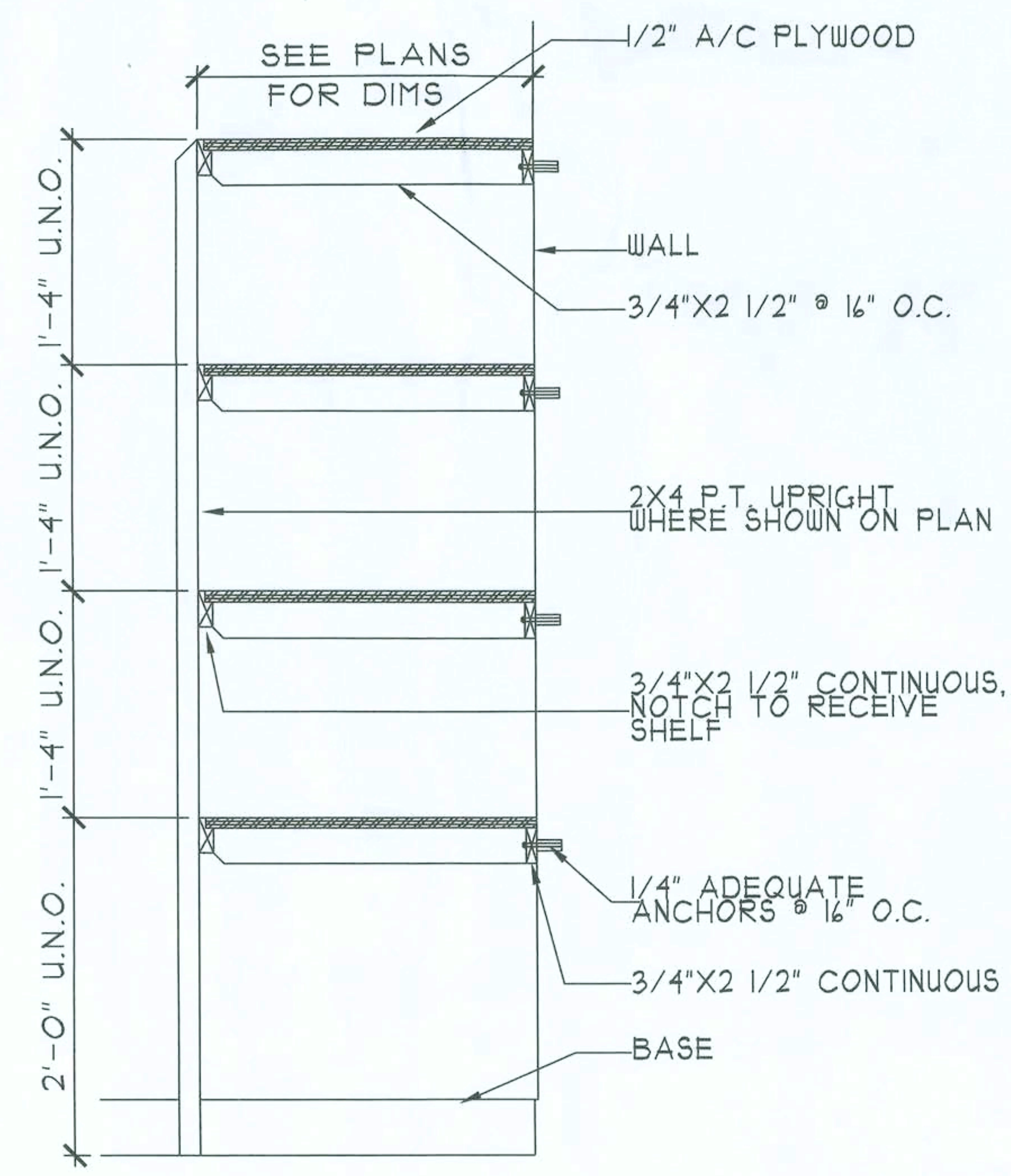
6 WORK ROOM
A6.3 SCALE 1/2"=1'-0" 113

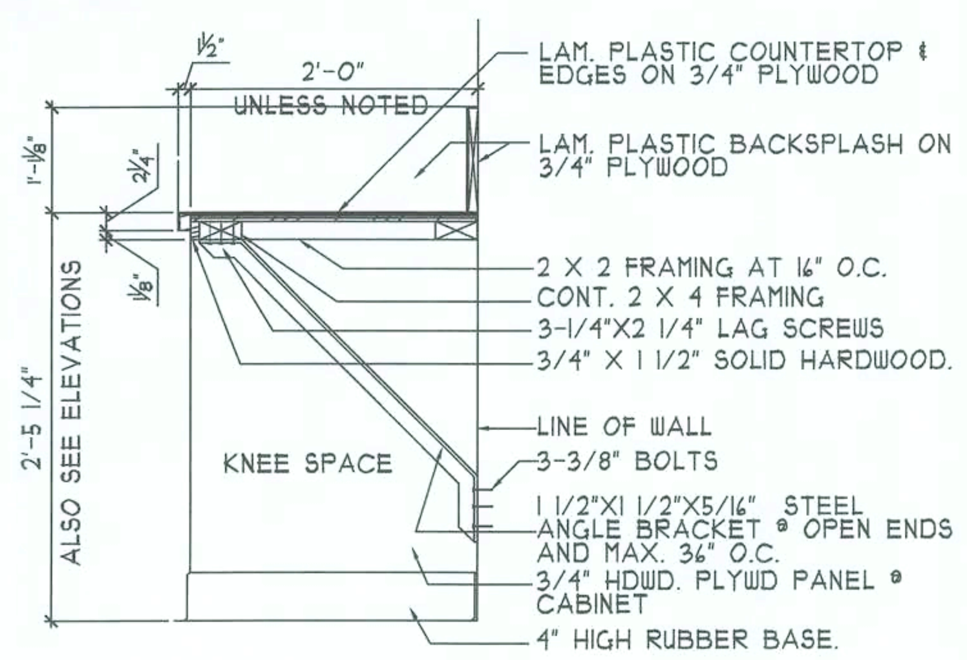


7 WORK ROOM
A6.3 SCALE 1/2"=1'-0" 113

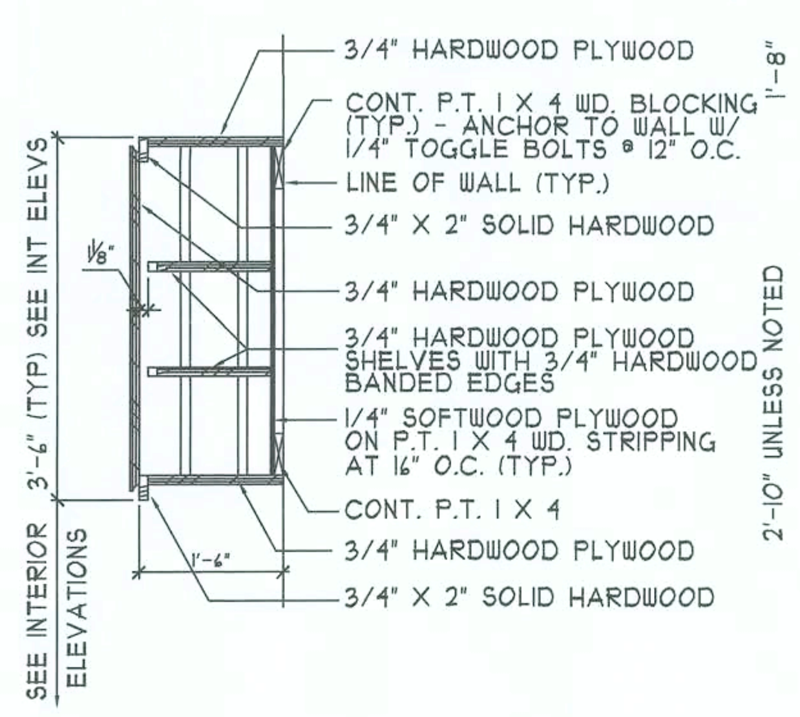


8 WORK ROOM
A6.3 SCALE 1/2"=1'-0" 113

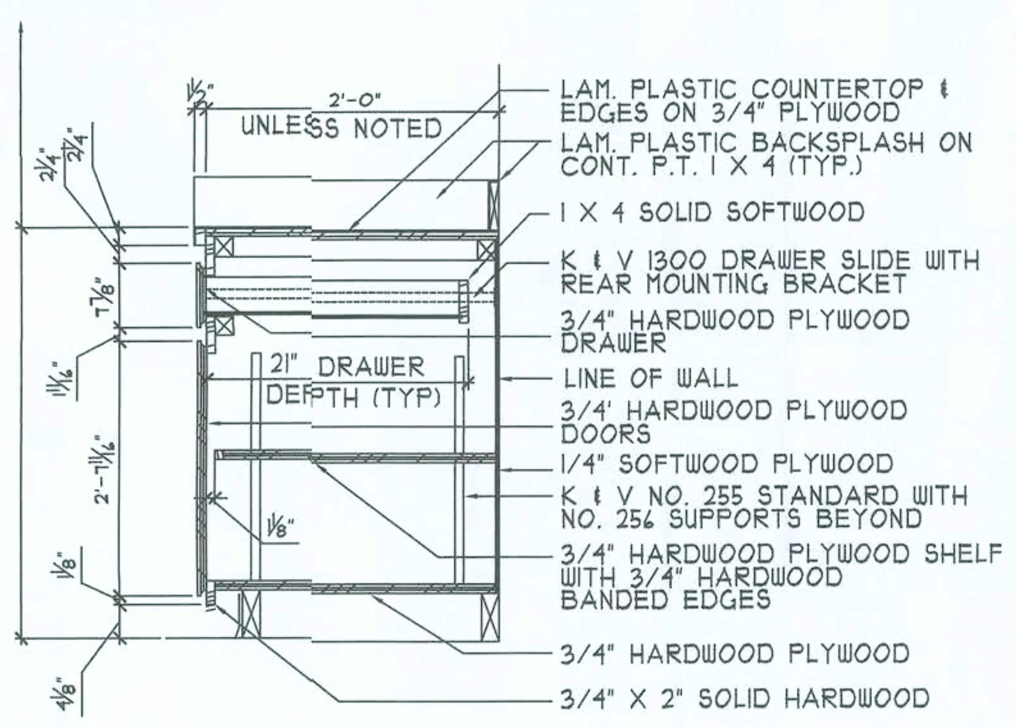




10 OPEN BASE COUNTER
A6.3 SCALE 1 1/2"=1'-0" MIL64006



11 WALL CABINET DETAIL
A6.3 SCALE 1 1/2"=1'-0" MIL64008



12 BASE CABINET DETAIL
A6.3 SCALE 1 1/2"=1'-0" MIL64002

9 STORAGE SHELVING DETAIL
A6.3 SCALE 1"=1'-0" MIL64021

- [ ] PROGRESS PRINTS
- [x] FOR APPROVAL
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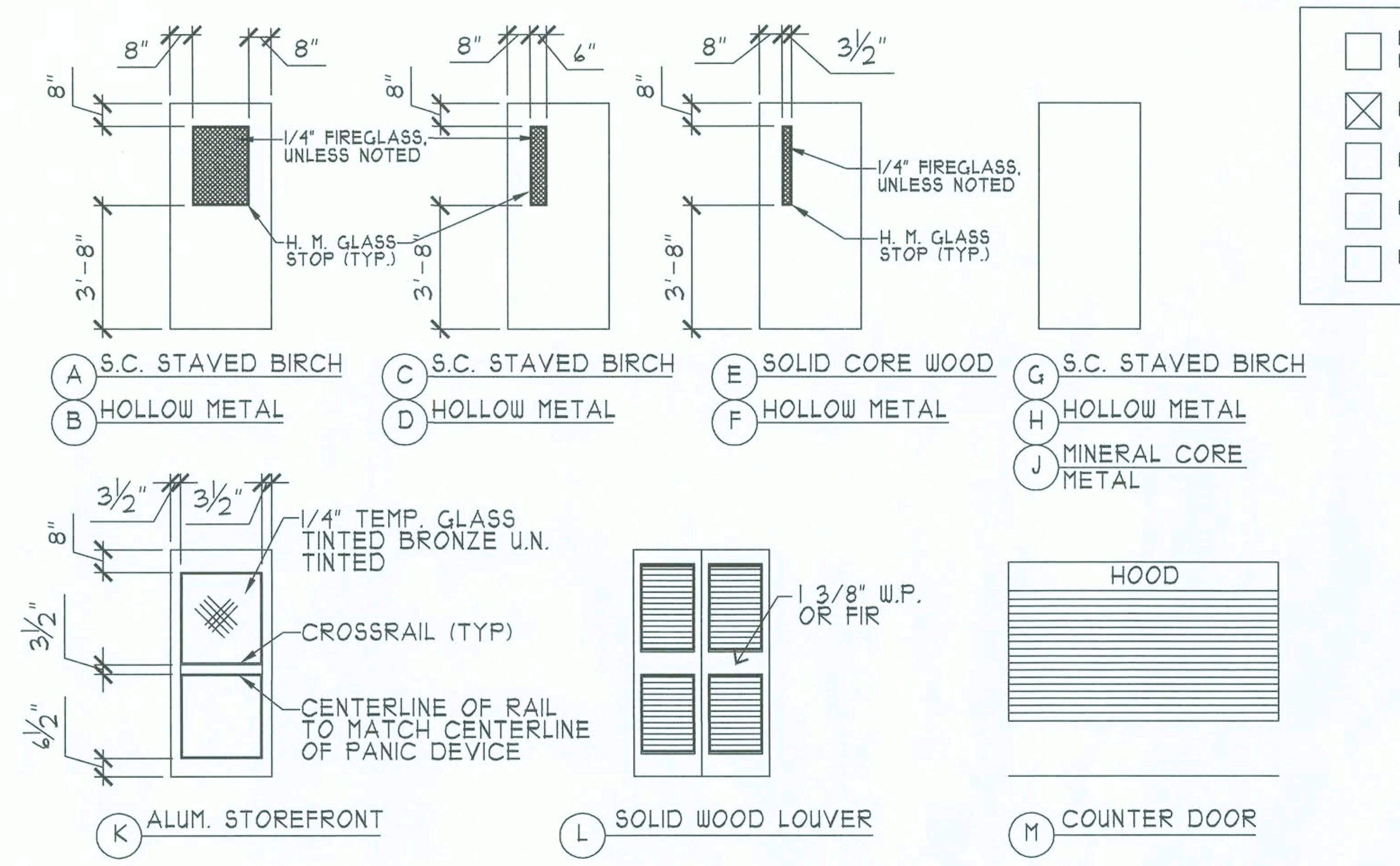
SHEET A6.3L

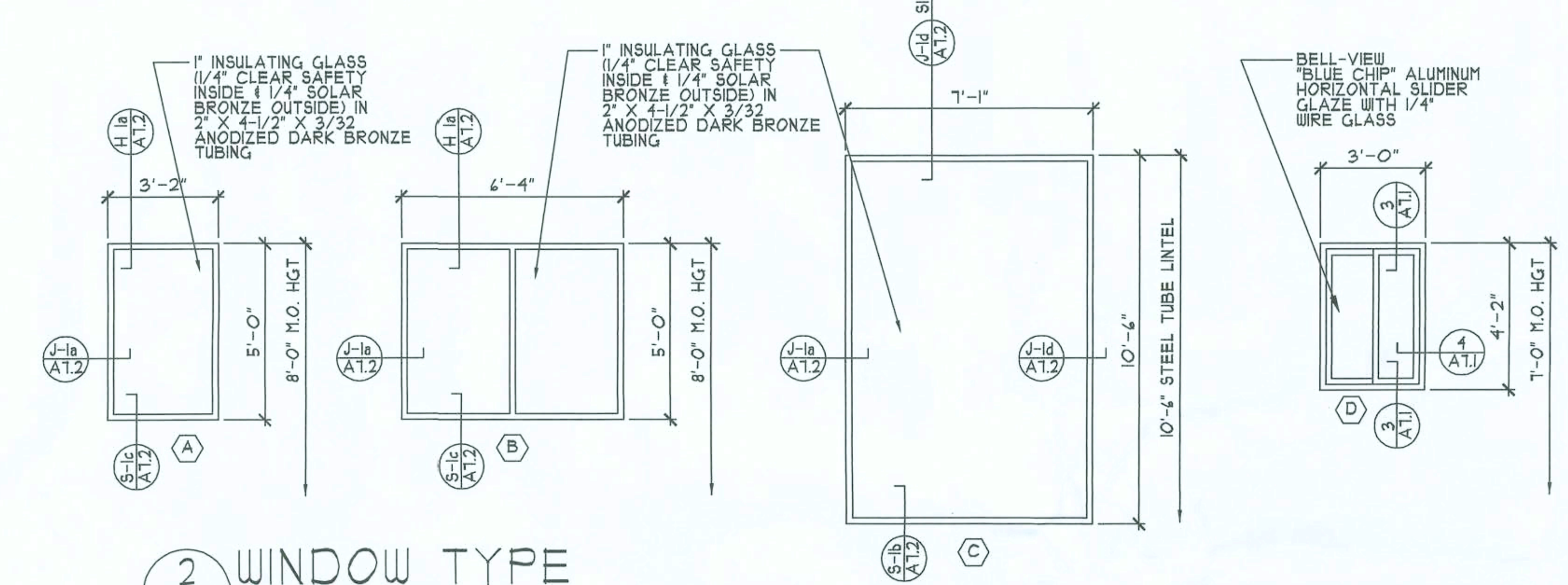
DOOR SCHEDULE (HARDWARE PER DOOR)

DOOR NUMBER	DOOR TYPE	DOOR SIZE: WIDTH	DOOR SIZE: HEIGHT	DOOR SIZE: THICKNESS	SINGLE	PAIR	INTERIOR	EXTERIOR	CLOSER	SMOKE HOLDER	OVERH'D H'LDR STOP	ASTRAGAL	REMOVABLE MULL.	WEATHERSTRIP	THRESHOLD	PANIC HARDWARE	DOOR GRILL SIZE (verify w/ mech.)	FIRE LABEL REQUIRED, DOOR AND FRAME	HEAD	JAMB	SILL	HARDWARE SET	DOOR FRAME ELEV.	KICKPLATE	MOPPLATE	3-SILENCERS	FIRE EXIT DEVICES	PAIRS BUTTS	PUSH	PULL	OUTSIDE CYLINDER	O.S. CYL. & LATCH	PASSAGE	STORAGE ROOM	OFFICE	PRIVACY	O.S. LATCH	FOOT & HEAD BOLTS (1- LEAF ONLY)	INSIDE CYLINDER	DEAD BOLT	REMARKS	DOOR NUMBER
107	E	3-0	7-0	1 3/4		●	●		●		●							20 Min	H-3	J-3	S-7			●	●	●	●	1 1/2		●						●	●					107
109	C	3-0	7-0	1 3/4	●		●		●		●							20 Min	H-2	J-2	S-4			●	●	●		1 1/2							●							109
110	L	2-6	7-0	1 3/4		●													H-3	J-3	S-4																				SEE NOTE #5	110
111	C	3-0	7-0	1 3/4	●		●												H-2	J-2	S-4			●	●	●		1 1/2							●							111
112	C	3-0	7-0	1 3/4	●		●												H-2	J-2	S-4			●	●	●		1 1/2							●							112
113	C	3-0	7-0	1 3/4	●		●												H-2	J-2	S-4			●	●	●		1 1/2							●							113
114	C	3-0	7-0	1 3/4	●		●												H-2	J-2	S-4			●	●	●		1 1/2							●							114
115	C	3-0	7-0	1 3/4	●		●												H-2	J-2	S-4			●	●	●		1 1/2							●							115
116	C	3-0	7-0	1 3/4	●		●		●		●							20 Min	H-2	J-2	S-4			●	●	●		1 1/2							●							116
117	K	3-0	7-0	1 3/4		●		●	●		●			●	●	●			H-1, T-1	J-1b,c(SIM)	S-1a							2		●		●									SEE NOTE #2 & #3	117
118	C	3-0	7-0	1 3/4	●		●		●		●							20 Min	H-2	J-2	S-4			●	●	●		1 1/2					●									118
120	C	3-0	7-0	1 3/4	●		●		●		●							20 Min	H-2	J-2	S-4			●	●	●		1 1/2					●									120
121	J	3-0	7-0	1 3/4		●	●		●		●							180 Min	H-2	J-2	S-4			●	●	●	●	1 1/2				●									SEE NOTE #6	121
121A	G	3-0	7-0	1 3/4		●	●												H-3	J-3	S-4				●	●		1 1/2					●					●				121A
121B	G	3-0	7-0	1 3/4		●	●												H-3	J-3	S-4				●	●		1 1/2					●					●				121B
121C	H	3-0	7-0	1 3/4		●		●	●		●	●		●	●	●			H-4	J-4	S-6			●		●		1 1/2				●										121C
121D	H	3-0	7-0	1 3/4		●		●	●		●	●		●	●	●			H-4	J-4	S-6			●		●		1 1/2				●										121D
122	C	3-0	7-0	1 3/4	●		●												H-3	J-3	S-5				●	●		1 1/2							●							122
123B	H	3-0	7-0	1 3/4	●			●	●		●			●	●	●			H-4	J-4	S-6			●		●		1 1/2				●										123B
124	C	3-0	7-0	1 3/4	●		●												H-3	J-3	S-3				●	●		1 1/2							●							124
125	C	3-0	7-0	1 3/4	●			●											H-3	J-3	S-3				●	●		1 1/2							●							125
126	H	3-0	7-0	1 3/4	●			●	●		●			●	●	●		45 Min	H-4	J-4	S-6			●		●		1 1/2				●										126
127	G	3-0	7-0	1 3/4	●		●		●		●				●				H-2	J-2	S-2			●	●	●		1 1/2	●	●	●									●	SEE NOTE #4	127
128	G	3-0	7-0	1 3/4	●		●		●		●				●				H-2	J-2	S-2			●	●	●		1 1/2	●	●	●									●	SEE NOTE #4	128
129A	H	3-0	7-0	1 3/4	●			●	●		●			●	●	●			H-4	J-4	S-6			●		●		1 1/2		●		●										129A
130	C	3-0	7-0	1 3/4	●		●		●		●							20 Min	H-2	J-2	S-4			●	●	●		1 1/2					●									130
131	C	3-0	7-0	1 3/4	●		●		●		●							20 Min	H-2	J-2	S-8			●	●	●		1 1/2						●								131
132	H	3-0	7-0	1 3/4	●			●	●		●			●	●				H-4	J-4	S-6			●		●		1 1/2				●										132
170	K	3-0	7-0	1 3/4		●		●	●		●			●	●	●			H-1, T-1	J-1b,c(SIM)	S-1a							2		●		●									SEE NOTE #2 & #3	170

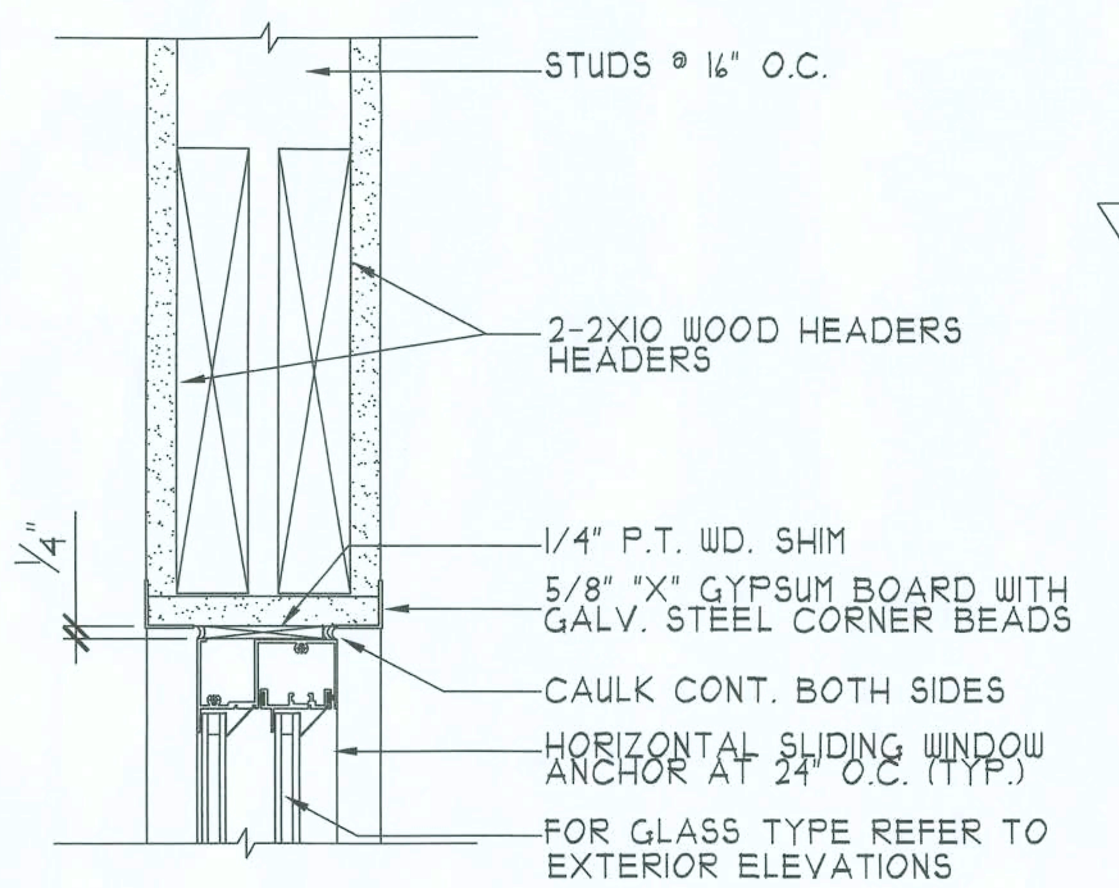


NOTE: ALL DOOR TYPES NOT NECESSARILY USED ON THIS PROJECT

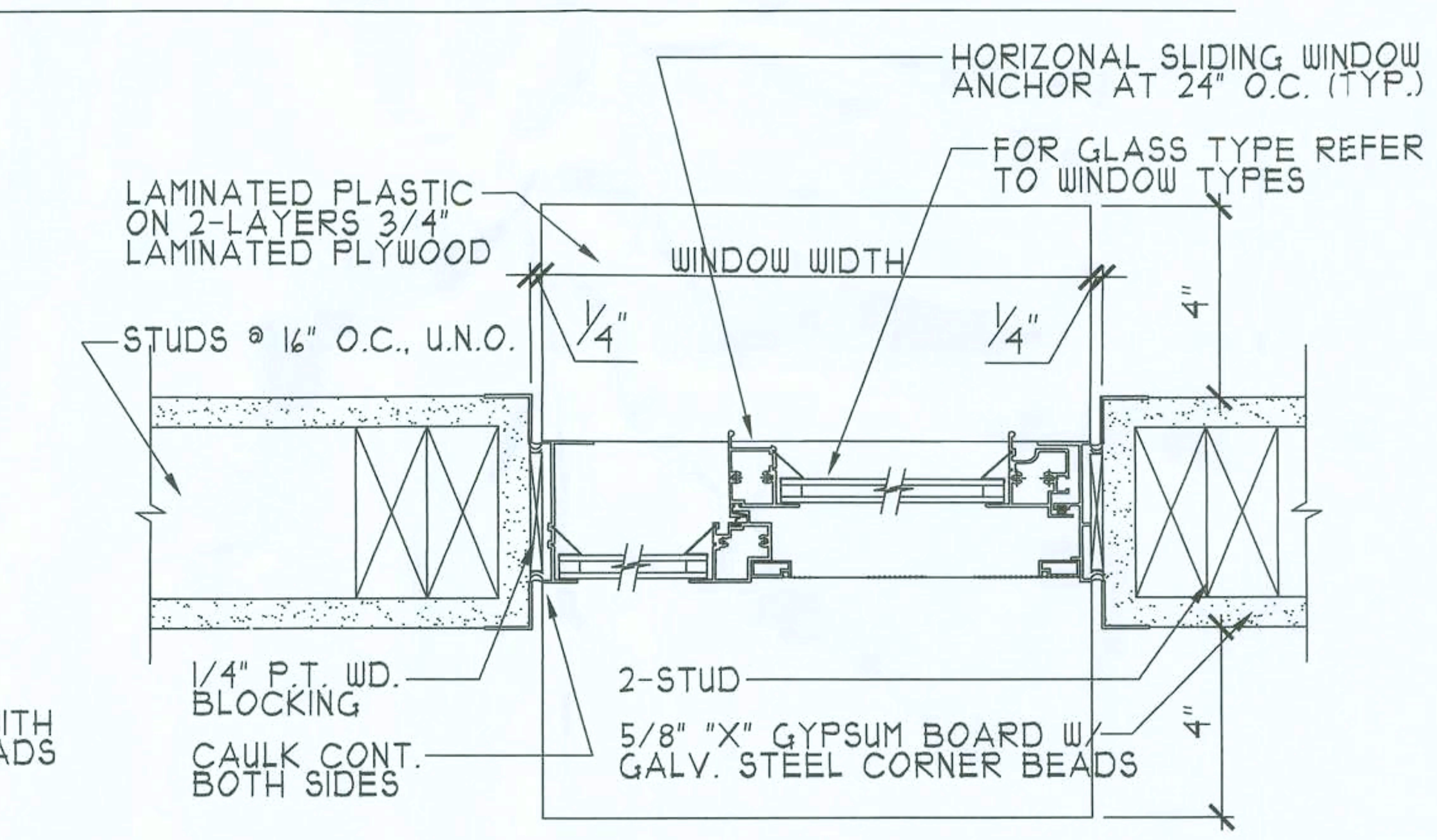
1 A7.1 DOOR TYPE
NO SCALE
FILE:--D80001



2 A7.1 WINDOW TYPE
NO SCALE

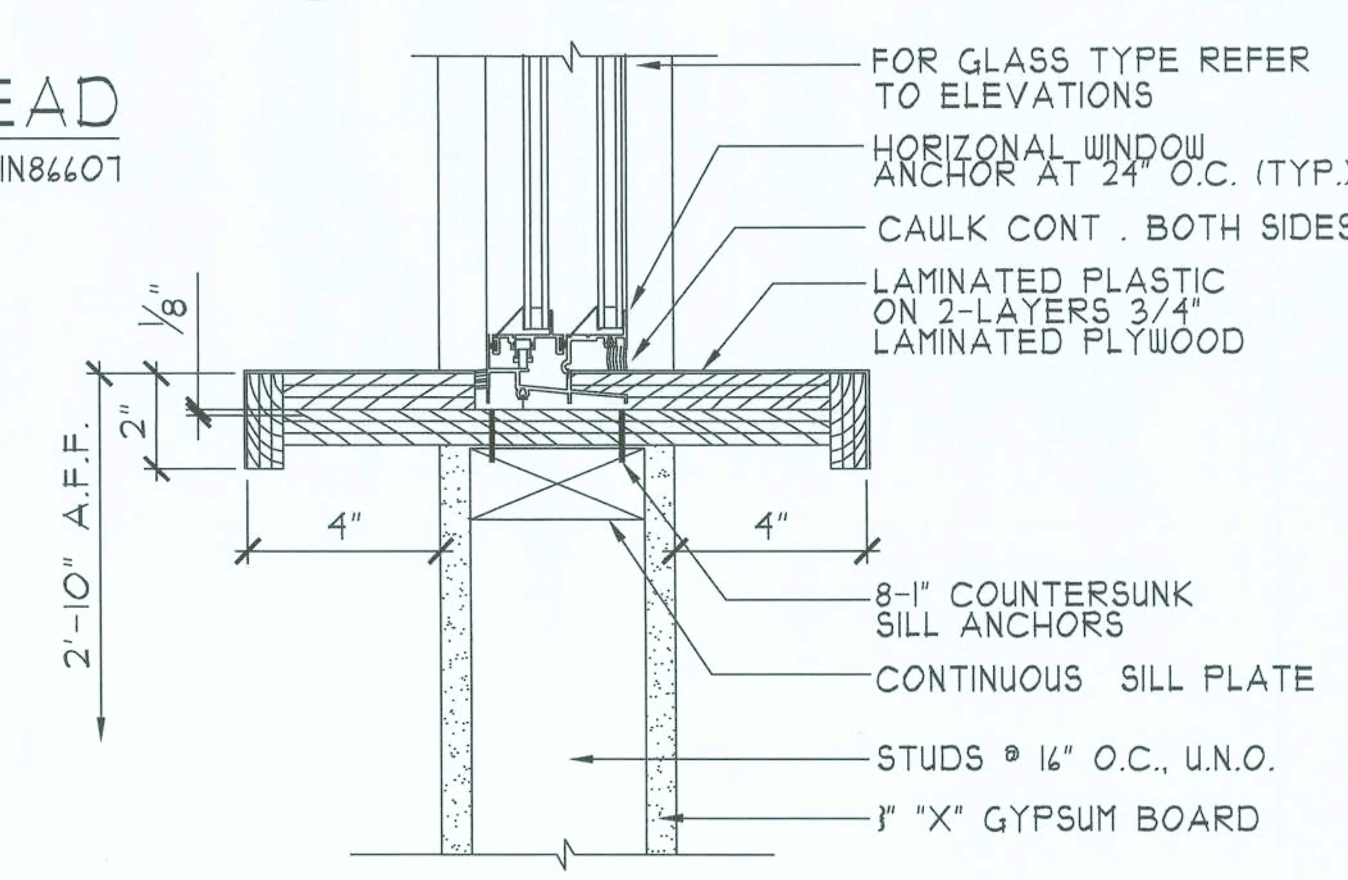


3 A7.1 HORIZONTAL WINDOW HEAD
SCALE 3"=1'-0"
FILE:--WIN86607

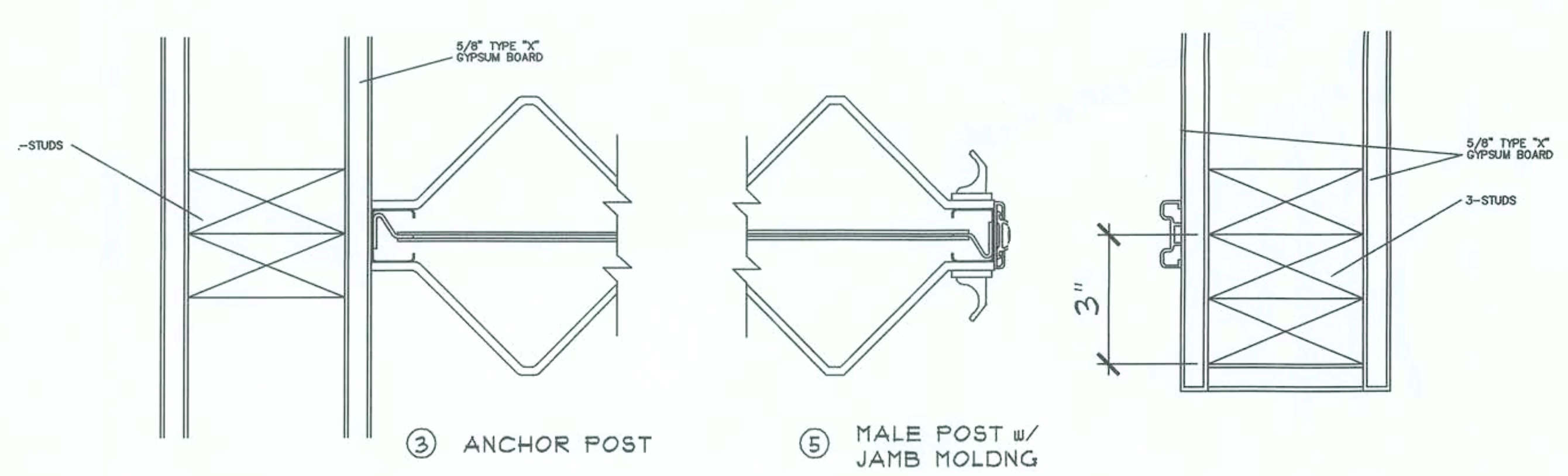


4 A7.1 HORIZONTAL WINDOW JAMB
SCALE 3"=1'-0"
FILE:--WIN86608

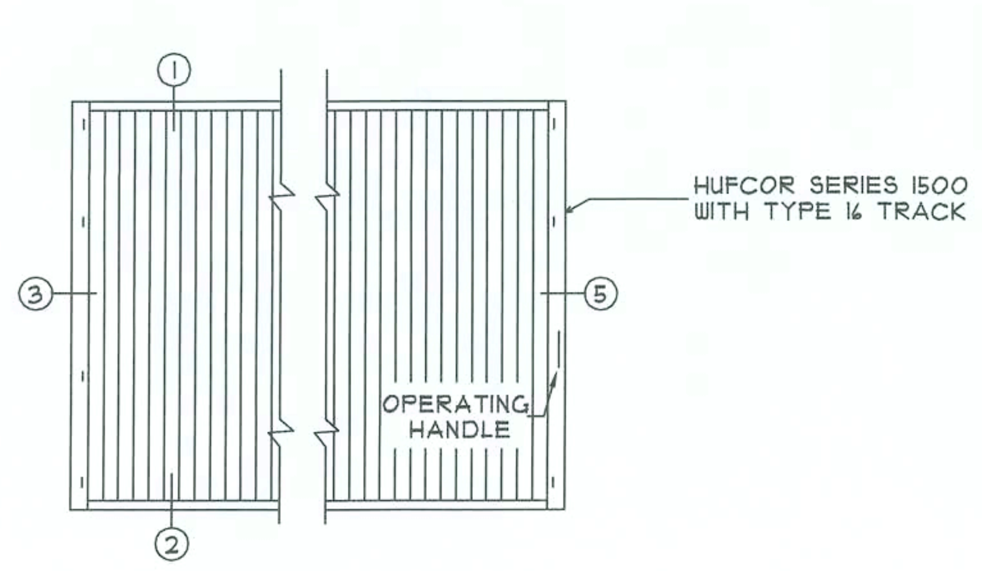
NOTES:
1. DOOR MUST REMAIN UNLOCKED AT ALL TIMES WHEN THE BUILDING IS OCCUPIED.
2. OFFSET PIVOT (TOP & BOTTOM).
3. DOG-DOWN PANIC DEVICE.
4. MARBLE THRESHOLD.
5. COMPLETE WITH MANUFACTURES HARDWARE INCLUDING TRACK.
6. PROVIDE ELETRONIC HOLD OPEN AND AUTO-MATIC CLOSE.



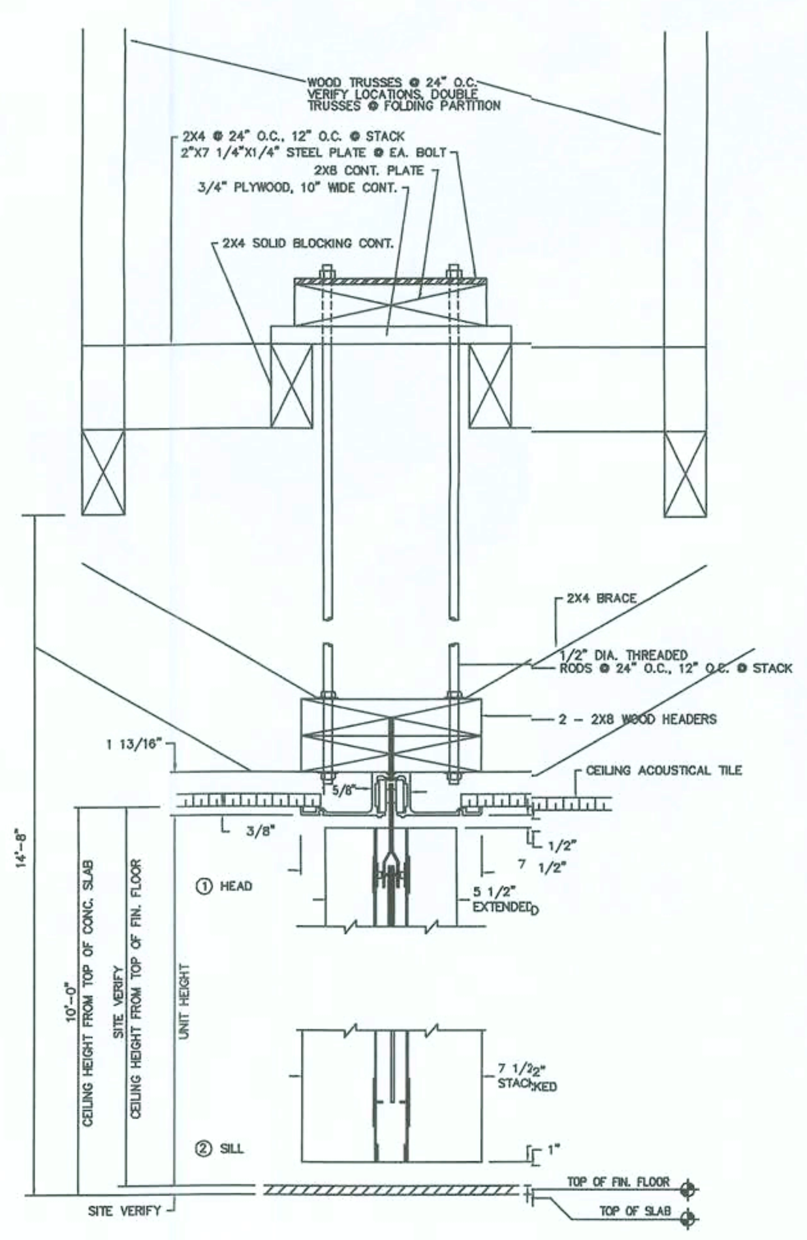
5 A7.1 HORIZONTAL WINDOW SILL
SCALE 3"=1'-0"
FILE:--WIN86609



A HORIZONTAL SECTIONS
SCALE: 3" = 1'-0"



B ELEVATION
NO SCALE



C VERTICAL SECTIONS
SCALE: 1 1/2" = 1'-0"

3 A7.1 FOLDNG PARTITIONS DETAILS
VARIES

PROGRESS PRINTS	
☐	PROGRESS PRINTS
☒	FOR APPROVAL
☐	FOR PRICING
☐	FOR PERMIT
☐	FOR CONSTRUCTION

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ARCHITECTURE/PLANNING/URBAN DESIGN/INTERIOR DESIGN/CONSTRUCTION MANAGEMENT AIA/APA
11/19/07

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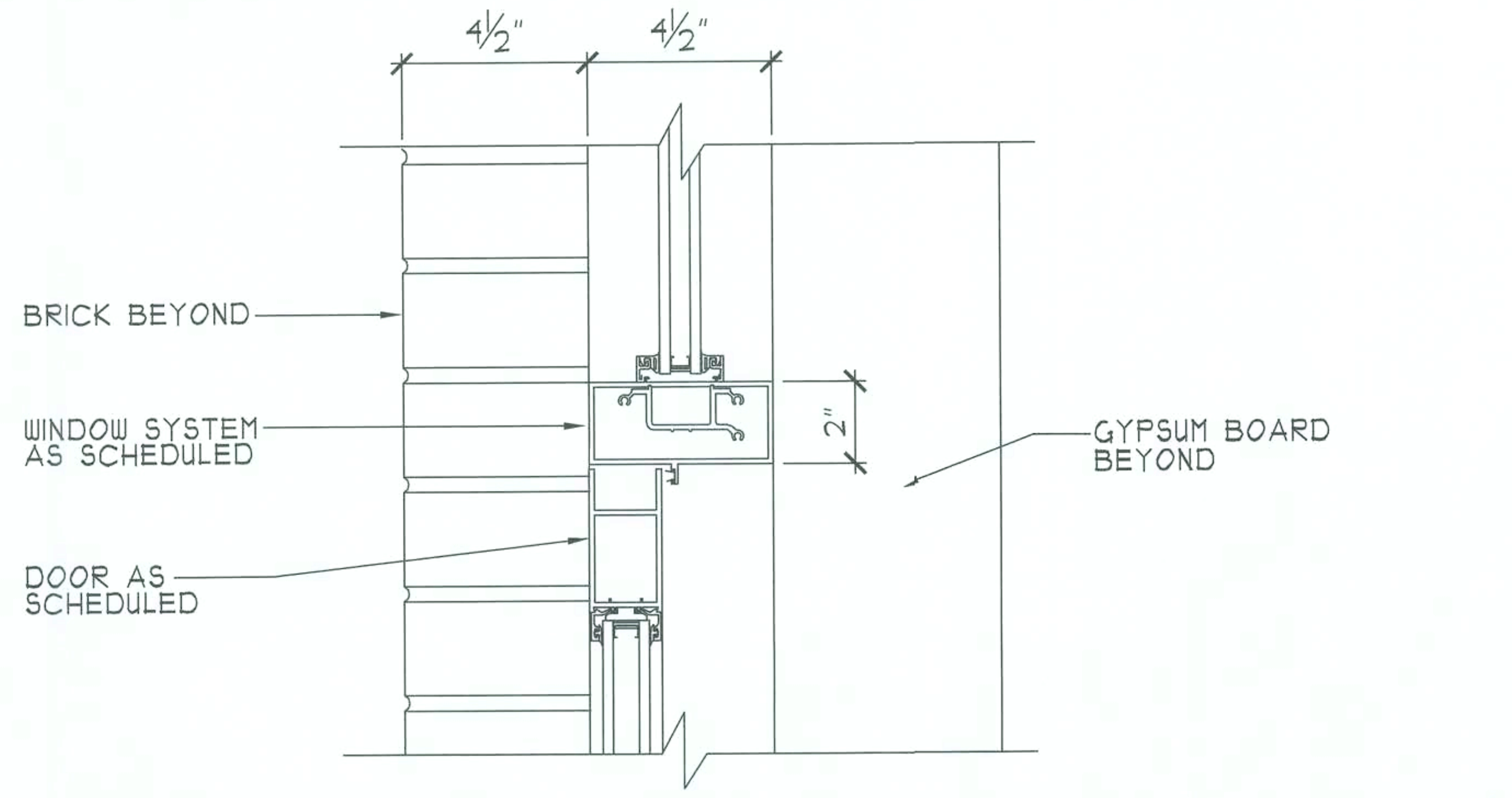
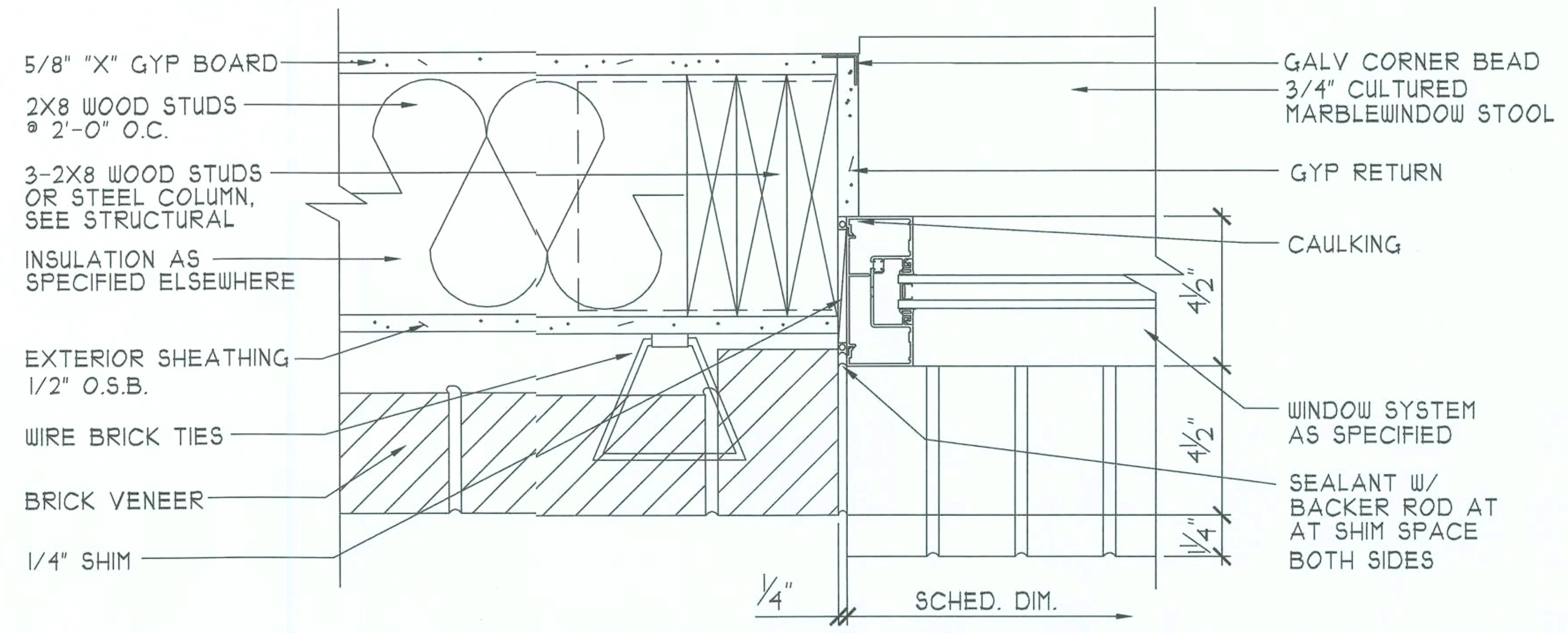
"Faith is the substance of things hoped for, the evidence of things not seen. Hebrews 11:1

GRACE COVENANT
LAKE CITY, FLORIDA

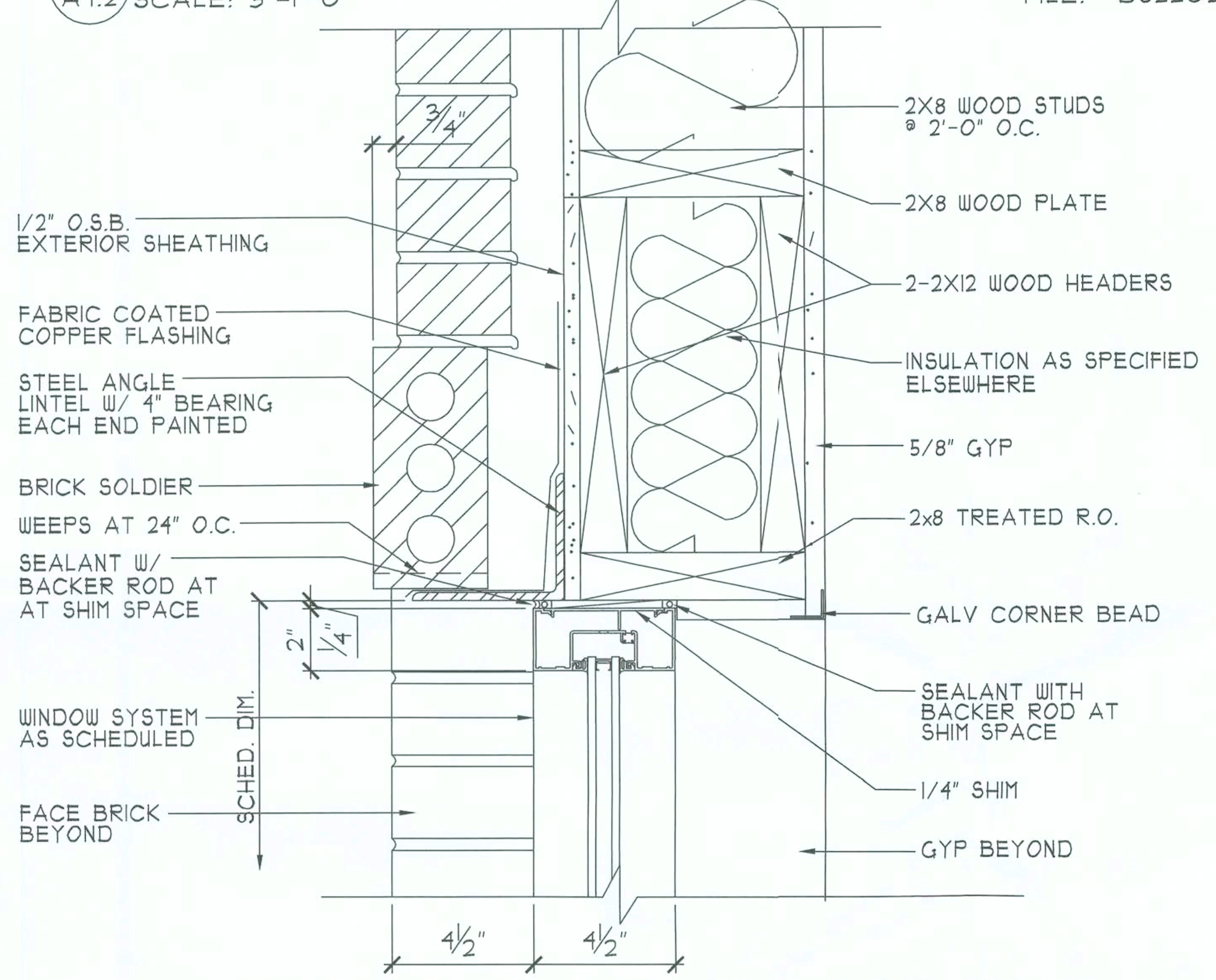
DRAWN	
CHECKED	
DATE	10/15/07
FILE NO	816A701-L
JOB NO	04-816
SHEET	A7.1L



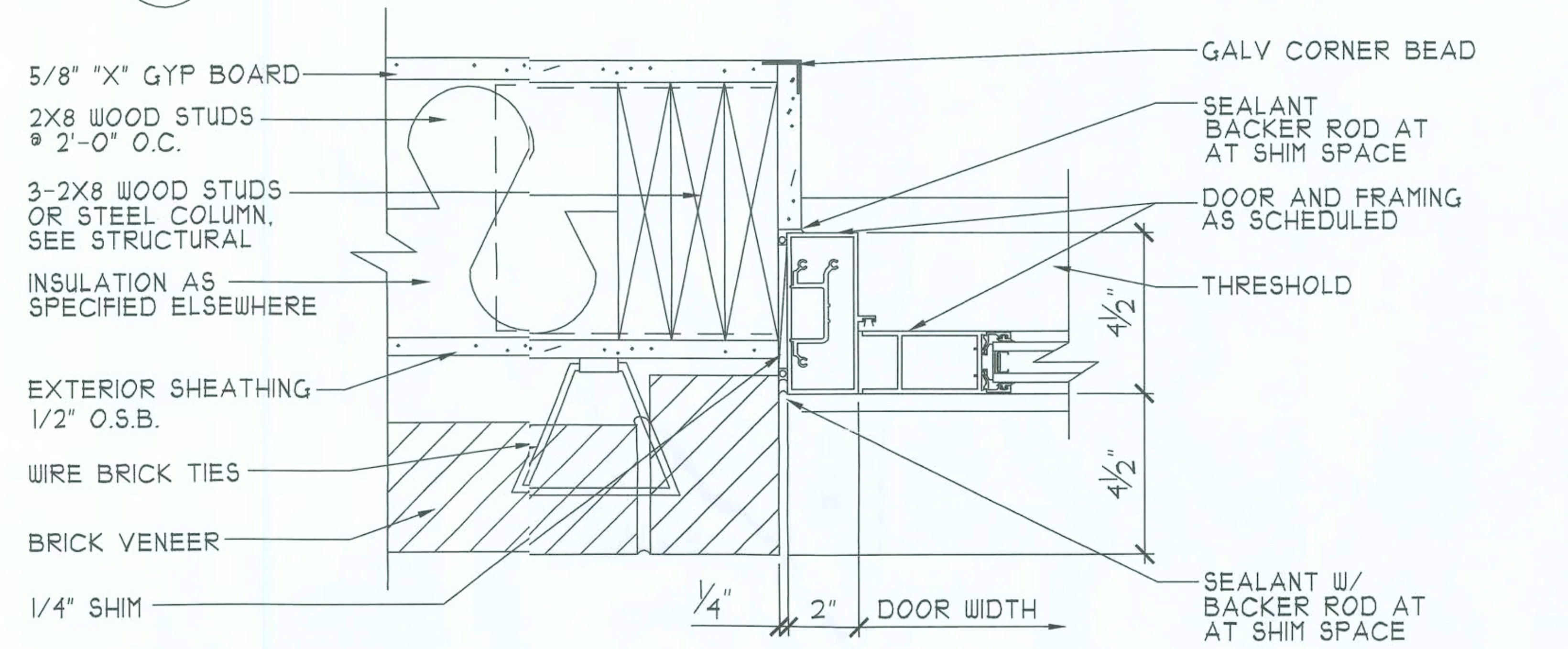
T-1 A7.2 STOREFRONT DOOR/WINDOW TRANSOM
SCALE: 3"=1'-0" FILE:--D82202



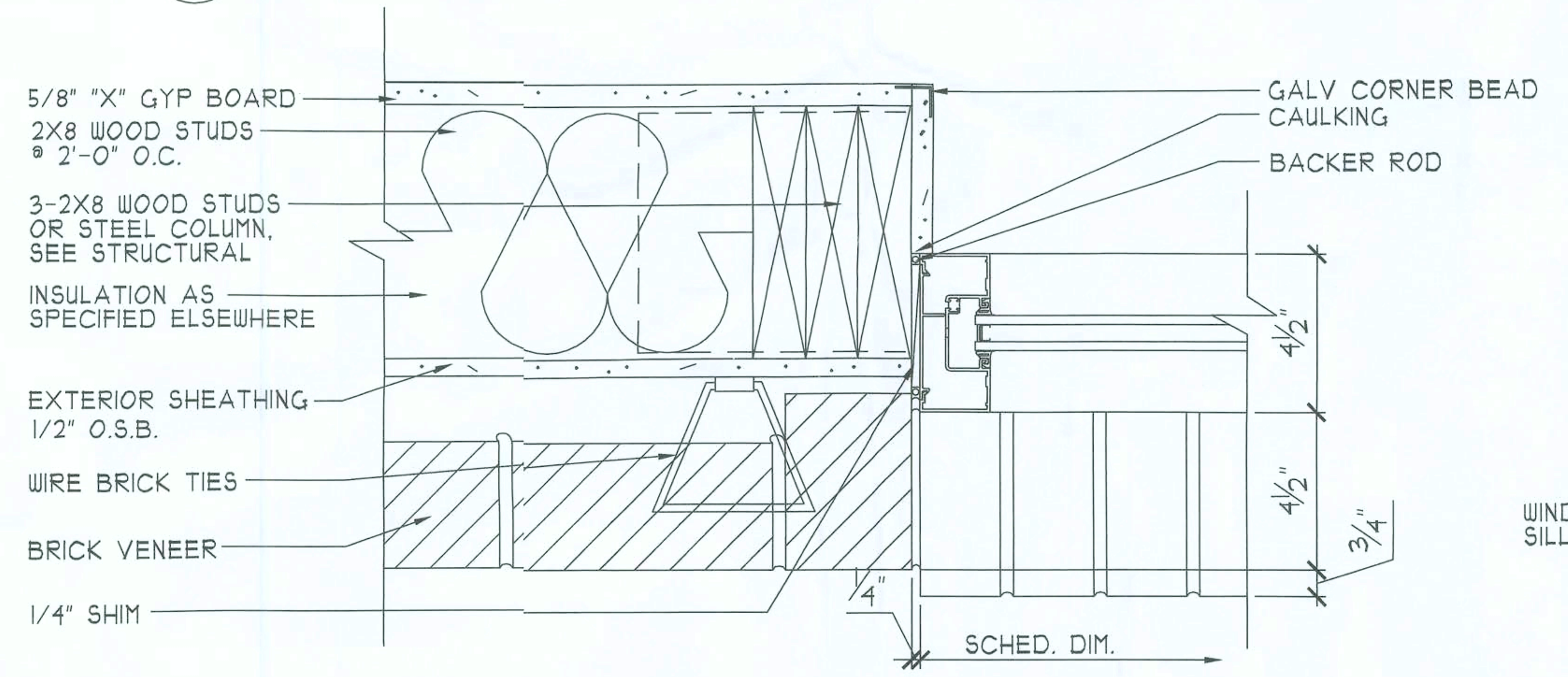
J-1A A7.2 STOREFRONT WINDOW JAMB @ WALL
SCALE: 3"=1'-0" FILE:--D82205



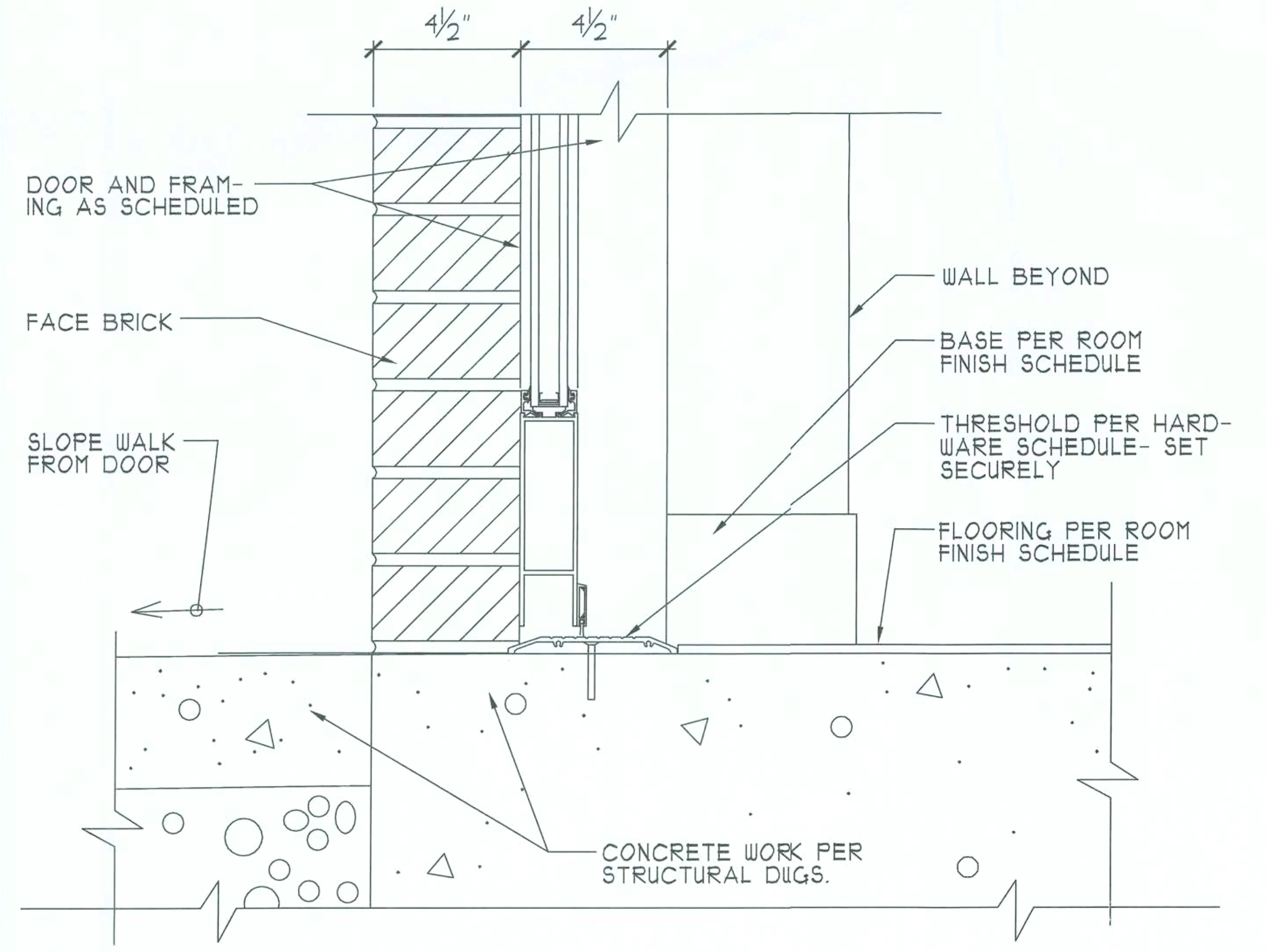
H-1 A7.2 STOREFRONT WINDOW HEAD
SCALE: 3"=1'-0" FILE:--D82201



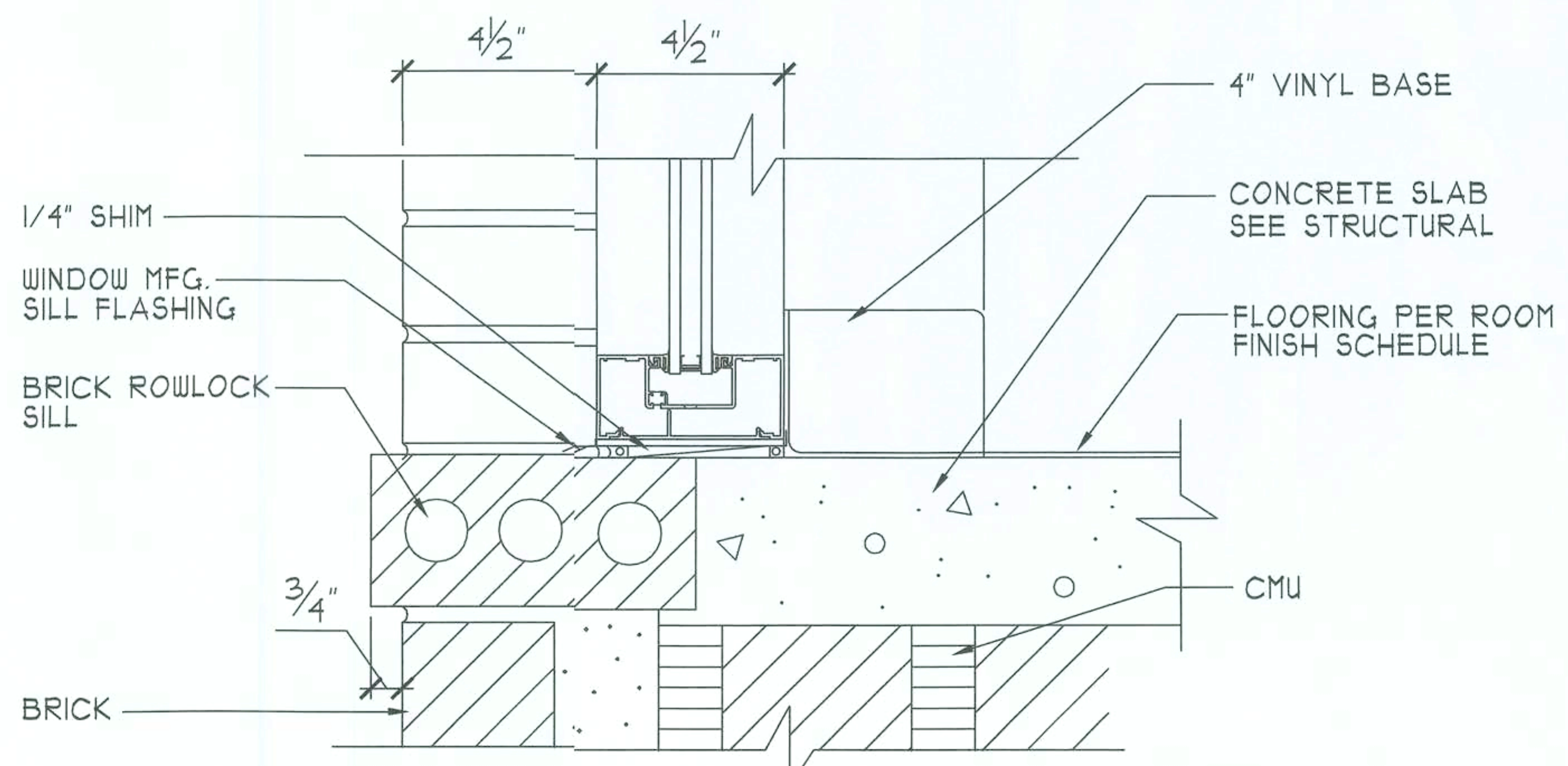
J-1B A7.2 STOREFRONT DOOR JAMB @ WALL
SCALE: 3"=1'-0" FILE:--D82206



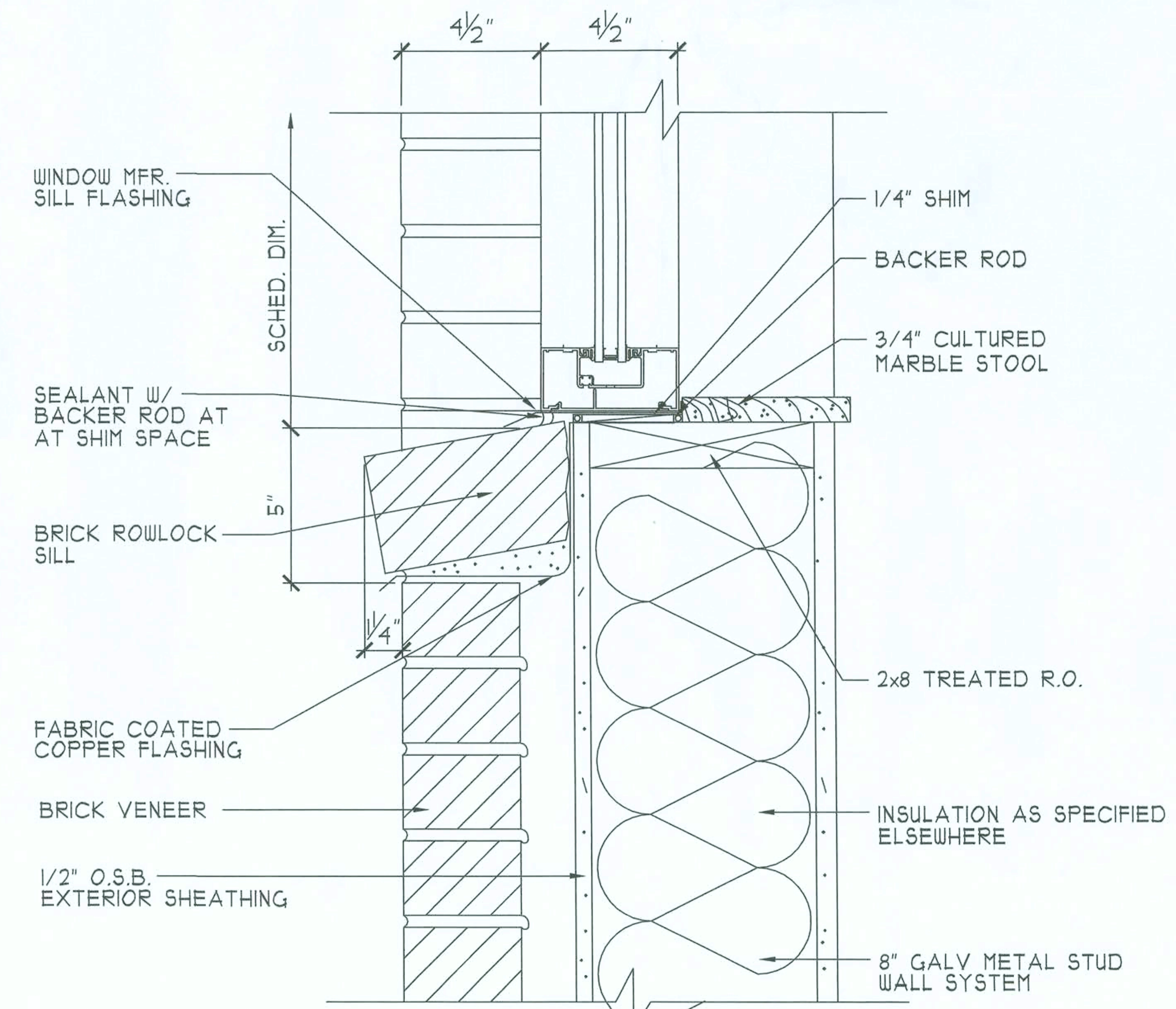
J-1C A7.2 STOREFRONT WINDOW JAMB
SCALE: 3"=1'-0" FILE:--D82207



S-1A A7.2 STOREFRONT DOOR SILL/THRESHOLD
SCALE: 3"=1'-0" FILE:--D82203



S-1B A7.2 STOREFRONT WINDOW SILL
SCALE: 3"=1'-0" FILE:--D82210



S-1C A7.2 STOREFRONT WINDOW SILL
SCALE: 3"=1'-0" FILE:--D82204

☐	PROGRESS PRINTS
☒	FOR APPROVAL
☐	FOR PRICING
☐	FOR PERMIT
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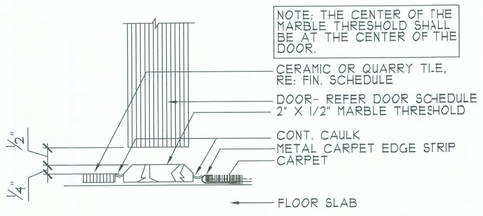
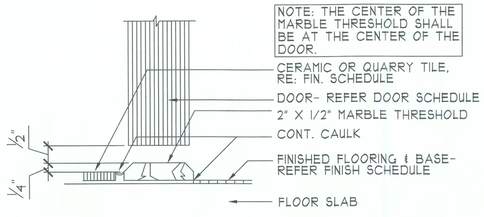
DATE 10/15/07
FILE NO 816A702-L
JOB NO 04-816
SHEET

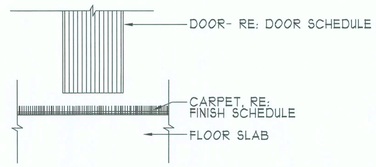
A7.2L



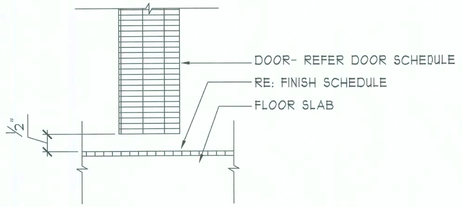
S-2 / A1.3 DOOR SILL
SCALE: 6"=1'-0" FILE:--D83008



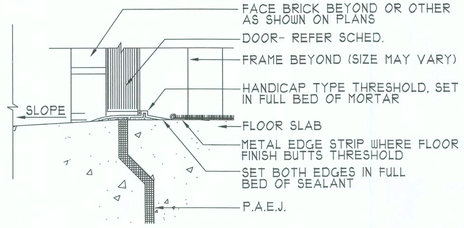
S-3 / A1.3 DOOR SILL
SCALE: 6"=1'-0" FILE:--D83012



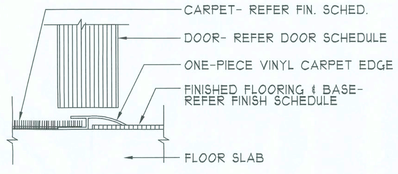
S-4 / A1.3 DOOR SILL
SCALE: 6"=1'-0" FILE:--D83008



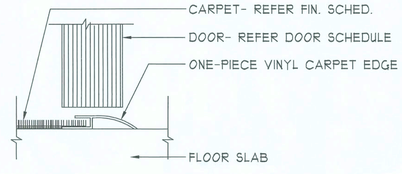
S-5 / A1.3 DOOR SILL
SCALE: 6"=1'-0" FILE:--D83007



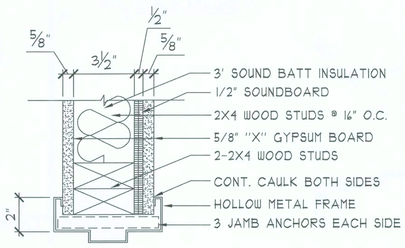
S-6 / A1.3 DOOR SILL
SCALE: 3"=1'-0" FILE:--D83006



S-1 / A1.3 DOOR SILL
SCALE: 6"=1'-0" FILE:--D83003

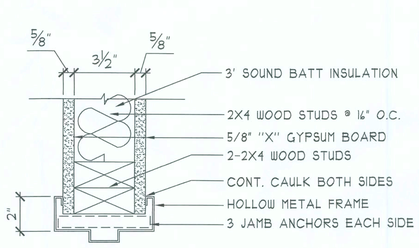


S-8 / A1.3 DOOR SILL
SCALE: 6"=1'-0" FILE:--D83004



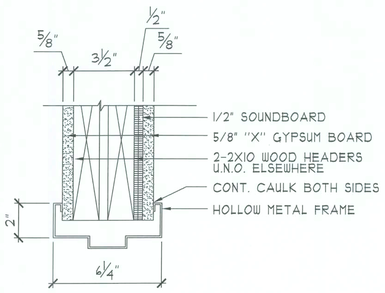
FORMED STEEL INTERIOR DOOR JAMB

J-2 / A1.3 SCALE: 3"=1'-0" FILE:--D82502A



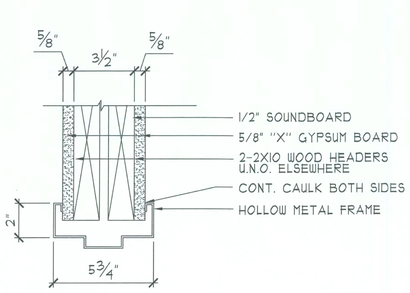
FORMED STEEL INTERIOR DOOR JAMB

J-3 / A1.3 SCALE: 3"=1'-0" FILE:--D82502



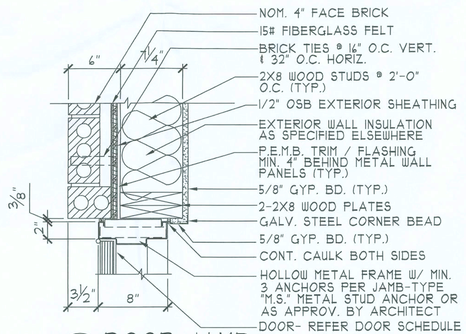
FORMED STEEL INTERIOR DOOR HEAD

H-2 / A1.3 SCALE: 3"=1'-0" FILE:--D82501A

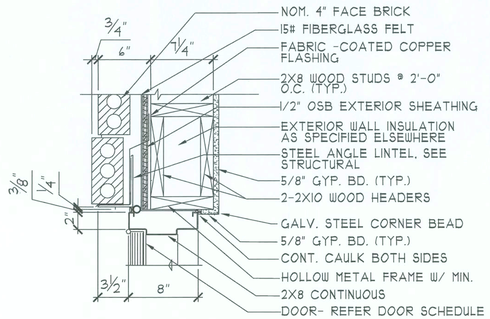


FORMED STEEL INTERIOR DOOR HEAD

H-3 / A1.3 SCALE: 3"=1'-0" FILE:--D82501



J-4 / A1.3 DOOR JAMB
SCALE: 1-1/2"=1'-0" FILE:--D82508A



H-4 / A1.3 DOOR HEAD
SCALE: 1-1/2"=1'-0" FILE:--D82507A

PROGRESS PRINTS
[X] FOR APPROVAL
FOR PRICING
FOR PERMIT
FOR CONSTRUCTION

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DRAWN	
CHECKED	
DATE	10/15/07
FILE NO	816A703-L
JOB NO	04-816
SHEET	A7.3L

LEGEND

C.M.U. = CONCRETE MASONRY UNIT
G.W.B. = GYPSUM WALL BOARD
V.W.C. = VINYL WALL COVERING
E.I.F.S. = EXTERIOR INSULATING FINISH SYSTEM
G.B. = GYPSUM BOARD

NOTES

1) CERAMIC TILE TO EXTEND INWARD FROM EXTERIOR DOOR AS SHOWN ON PLANS BELOW
2) SEE SECTION 1/A4.3 FOR DIFFERENT CEILING HEIGHT VARIATIONS
3) CEREMIC TILE TO 9'-0" @ RANGE, TO MINIMUM 18" EACH SIDE OF HOOD
4) SEE SECTION 1/A4.1 FOR DIFFERENT CEILING HEIGHT VARIATIONS
5) SEE SECTION 2/A4.1 FOR DIFFERENT CEILING HEIGHT VARIATIONS
6) SEE SECTION 1/A4.2 FOR DIFFERENT CEILING HEIGHT VARIATIONS
7) SEE SECTION 4/A4.3 FOR DIFFERENT CEILING HEIGHT VARIATIONS

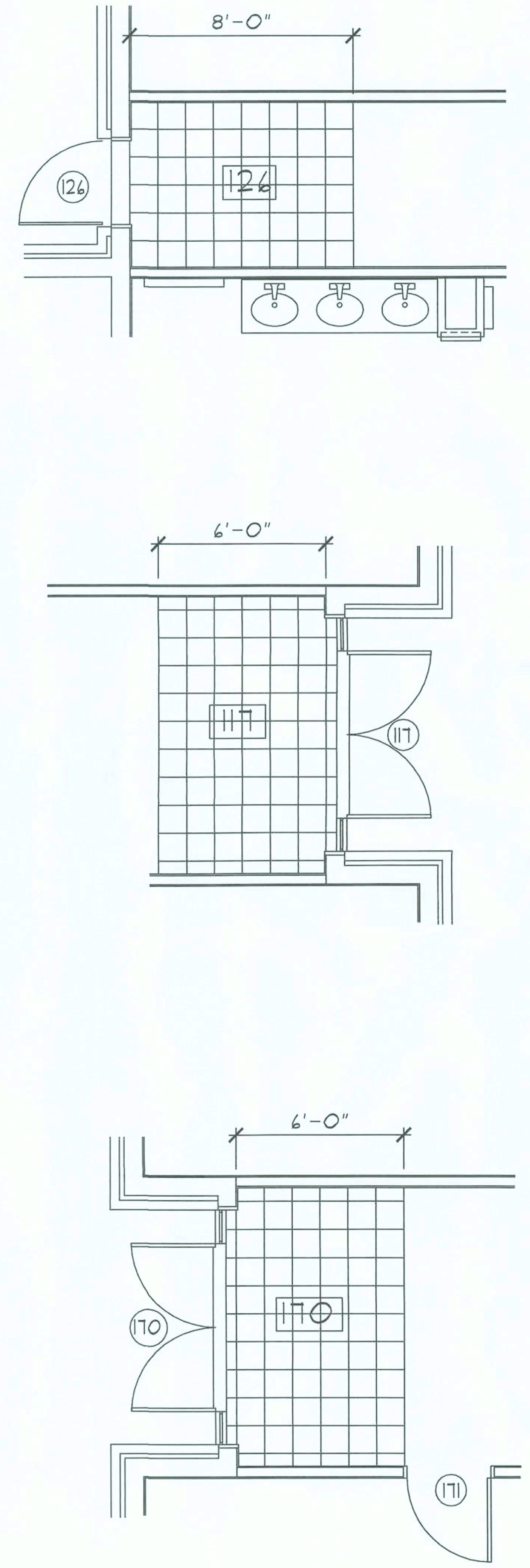
☐ PROGRESS PRINTS
☒ FOR APPROVAL
☐ FOR PRICING
☐ FOR PERMIT
☐ FOR CONSTRUCTION

REVISIONS	BY

FINISH SCHEDULE

		FLOOR								BASE					WALL							WAIN.				CEILING									
SPACE NUMBER	SPACE	CARPET	VINYL TILE	CONCRETE	QUARRY TILE	CERAMIC TILE	WOOD PARQUET	CONCRETE - EPOXY PAINTED	CONCRETE BROOM FINISH	VINYL	WOOD	CERAMIC TILE	QUARRY TILE	NONE	C.M.U. (PAINTED)	G.W.B. (PAINTED)	PANELING ON G.W.B.	V.W.C.	E.I.F.S.	BRICK	3/4" FIRERATED "B&C" PLYWOOD	CHAIR RAIL			CERAMIC TILE TO 6'-2"	ACOUSTICAL CEILING	G.W.B. (SPRAYED)	G.W.B. (PAINTED)	VINYL COATED G. B.	PAINTED STRUCTURE	E.I.F.S.	CEILING HEIGHT	NOTES		SPACE NUMBER
105A	TABLES & CHAIRS	O								O						O										O						10'-0"			105A
107	CORRIDOR	O								O						O										O						9'-6"			107
107A	FELLOWSHIP		O							O						O										O						10'-0"			107A
109	HALL	O								O						O										O						9'-0"			109
110	CLOSET	O								O						O										O						9'-0"			110
111	OFFICE	O								O						O										O						9'-0"			111
112	OFFICE	O								O						O										O						9'-0"			112
113	WORK ROOM	O								O						O										O						9'-0"			113
114	RECEPT.	O								O						O										O						9'-0"			114
115	PASTOR	O								O						O										O						9'-0"			115
116	STUDY	O								O						O										O						9'-0"			116
117	ENTRY					O				O						O										O						9'-6"	SEE NOTE #1		117
117A	COVERED DROP-OFF								O										O	O											O	14'-7" +/-	SEE NOTE #7		117A
118	CLASSROOM	O								O						O										O						9'-0"			118
119	CORRIDOR	O								O						O										O						9'-6"			119
120	CLASSROOM	O								O						O										O						9'-0"			120
121	WORSHIP	O								O						O										O		O				12'/10'	SEE NOTE #2		121
121A	CLOSET	O								O						O										O						8'-0"			121A
121B	CLOSET	O								O						O										O						8'-0"			121B
122	JANITOR		O							O						O													O			9'-0"			122
123	PLATFORM	O								O						O										O						9'-0"	SEE NOTE #3		123
124	ELECTRICAL							O		O											O								O			9'-0"			124
125	CHAIRS		O							O						O										O						9'-0"			125
126	ENTRY	O			O					O						O										O						9'-6"	SEE NOTE #1		126
127	WOMEN					O						O				O									O				O			9'-0"			127
128	MEN					O						O				O									O				O			9'-0"			128
131	TABLES & CHAIRS	O								O						O										O						10'-0"			131
132	PATIO							O		O						O													O			10'-0"			132
170	ENTRY					O				O						O										O						10'-0"	SEE NOTE #1		170

TILE LAYOUT SHALL ENSURE NOT LESS THAN 1/2 TILE
IS USED ALONG ANY TRANSITION WITH WALL OR CARPET



A / A7.3 ENLARGED PLANS @ ENTRIES
SCALE: 1/4"=1'-0"

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FILE NO 816A704-L
JOB NO 04-816
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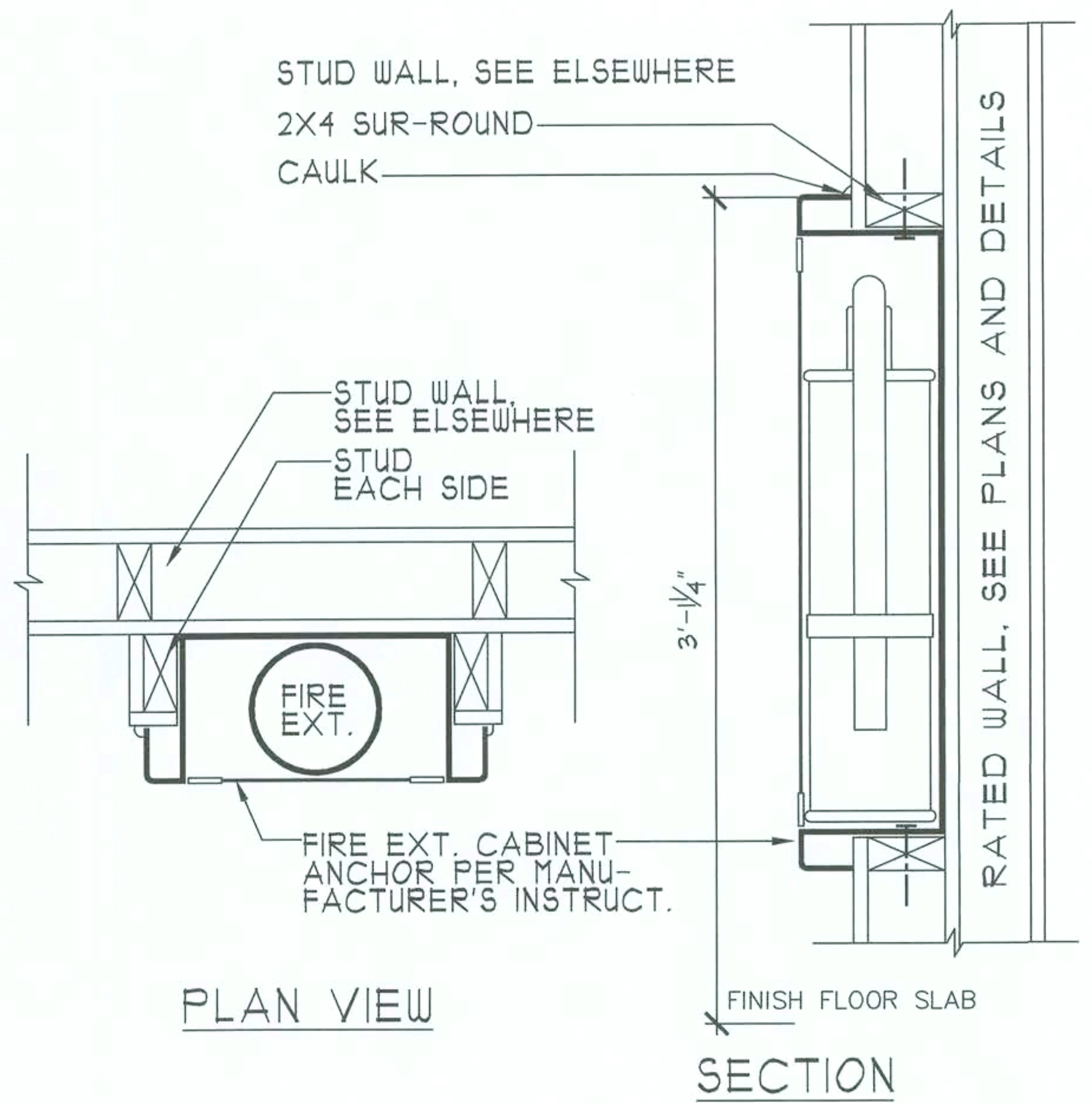
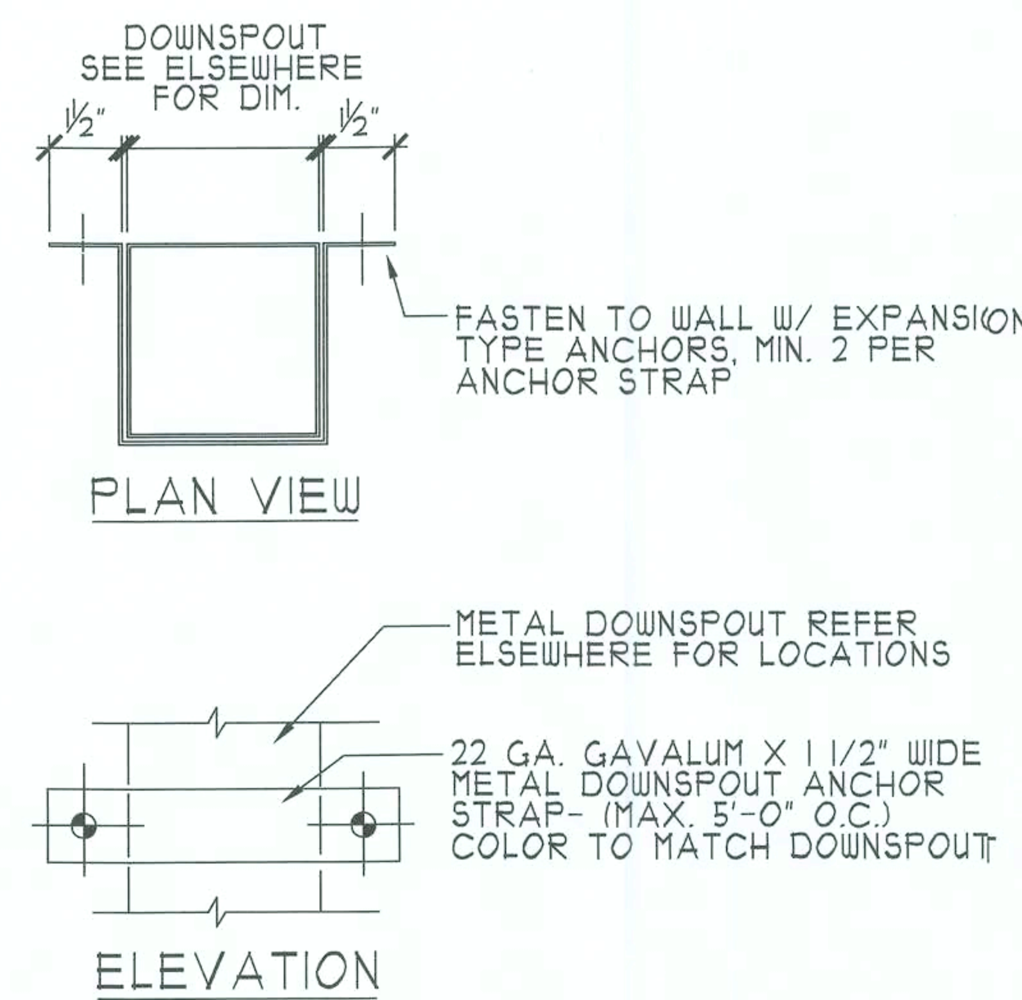
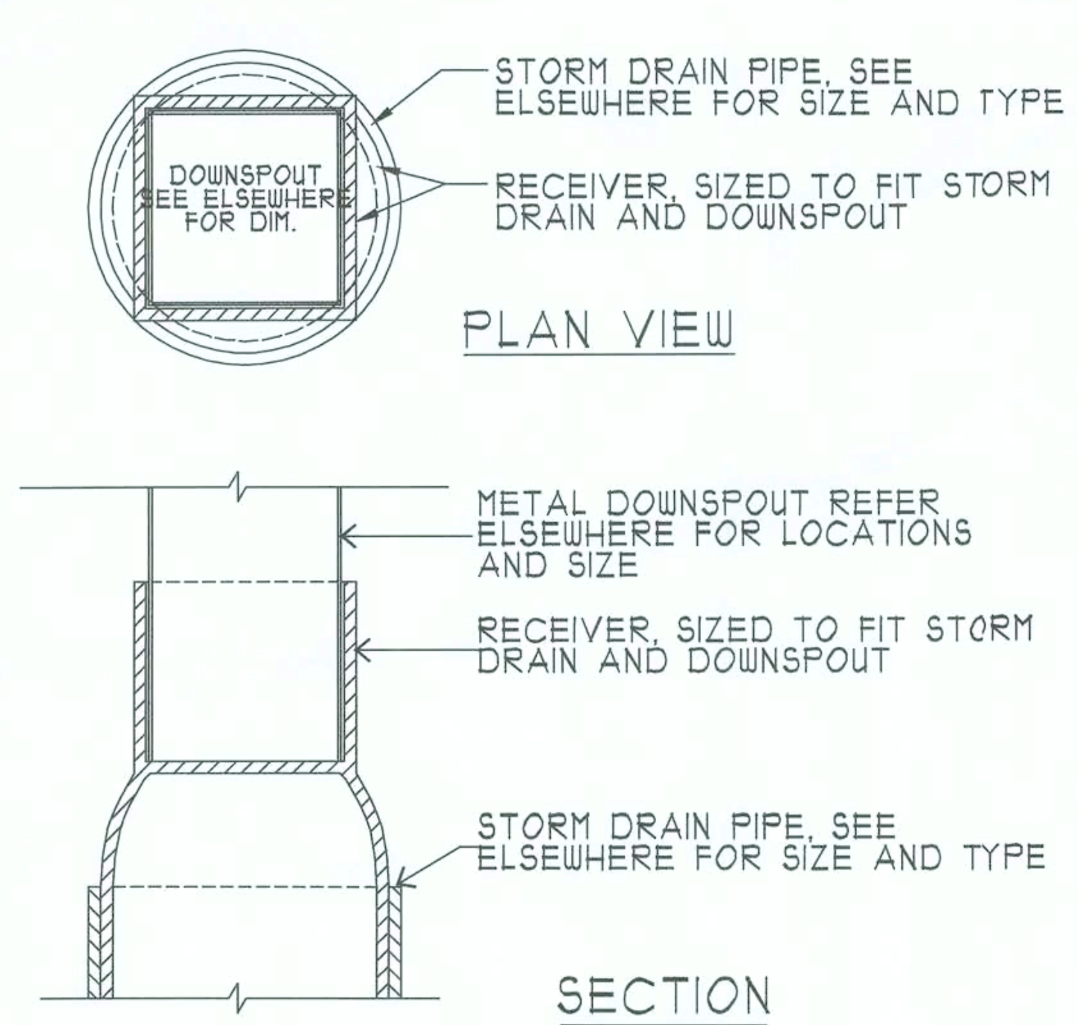
A7.4L



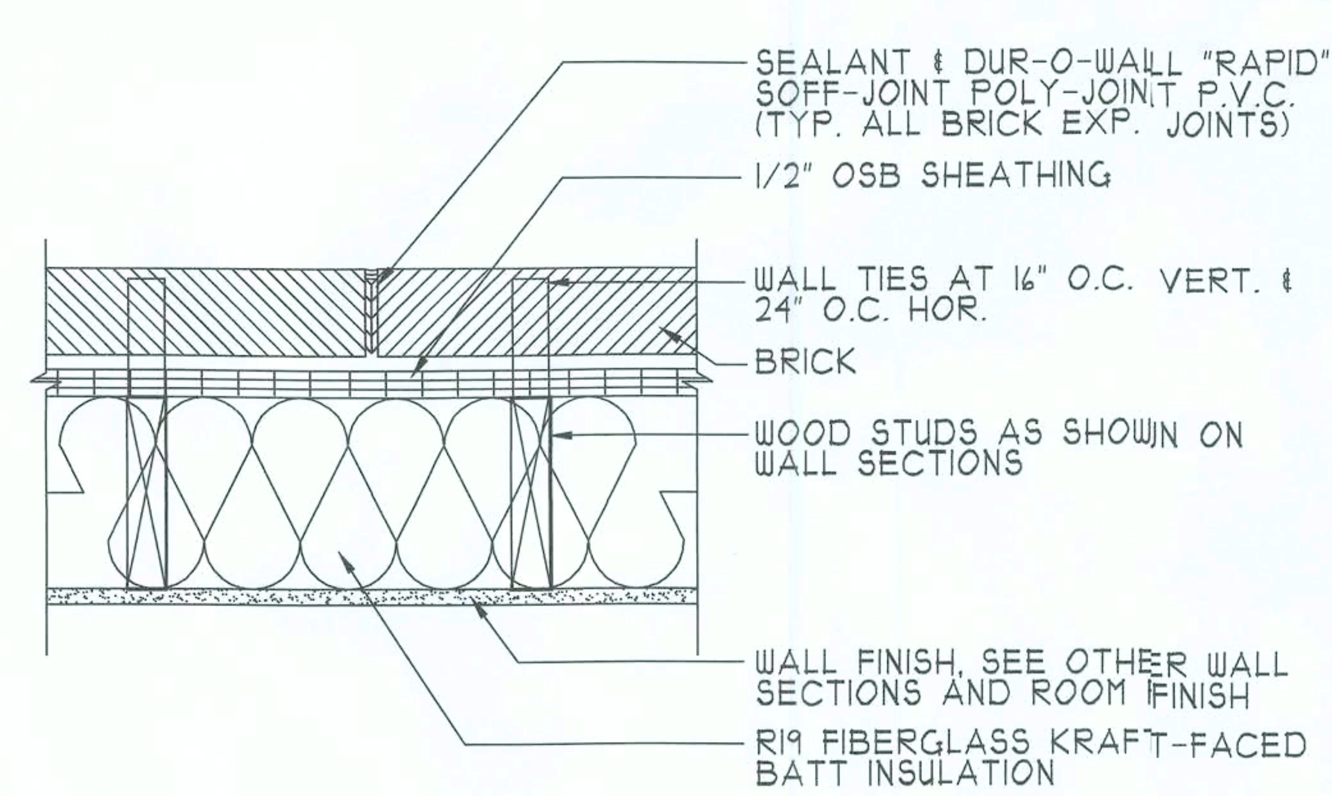
1/A8.1 FIRE EXT. CABINET DETAIL
SCALE 1-1/2"=1'-0" FILE: FEIC5202



2/A8.1 DOWNSPOUT ANCHORS STRAP
SCALE 3"=1'-0" FILE: ROA77102



3/A8.1 DOWNSPOUT RECIEVER DET.
SCALE 3"=1'-0" FILE: ROA77103



4/A8.1 EXTERIOR EXPANSION JOINT
SCALE 1-1/2"=1'-0" FILE: MAS42208 MODIFIED
NOTE: TYP @ VENEERED EXTERIOR STUD WALLS

GENERAL NOTES

1. All construction shall compy with the latest adopted edition of the following: FBC, ANSI 117, NFPA 101 and local codes. Any conflict shall be brought to the Architect's attertion before construction begins.
2. General conditions shall be AMERICAN INSTITUTE OF ARCHITECT DOCUMENT A201, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION. Except for modifications per the SUPPLEMENTARY GENERAL CONDITIONS.
3. All material and workmanship that go into the project shall be guaranteed to be satisfactory for one year after acceptance of the completed project. Air-Conditioning Compressors shall be guaranteed for five (5) years
4. Thicken walls where necessary to conceal plumbing.
5. All materials that go into the project shall be installed not less than the manufacturer's recommendations and the industry standards. Install above the manufacturer's recommendations and the industry standards where indicated on the drawings.
6. All door hardware shall be handicap accessible per ADA Code.
7. All openings in fire-rated walls shall have protective hardware including closures.
8. Where a detail or section is shown for one condition, it shall apply to all like or similar locations.
9. Handicapped toilet stalls, fixtures and accessories shall comply with ANSI-117-91and ADA, including locations and mountings. Minimun one (1) fixture each per toilet room shal be handicap accessible.
10. Interior floor finishes shal be Class I or II.
11. Interior wall and ceiling finsh shall be Class A for exits and Class B for other areas.
12. All structural steel shall comply with Section 5 of the Manufal of Steel Construction, latest edition (as amended) published by the A.I.S.C.

GENERAL NOTES

13. Provide 1-hr.rated walls and ceilings (UL-U305/U465) around the following rooms: As shown in schedule or on plans.
14. Insulate above ceilings with R-13 fiberglass batt insulation without kraft-back.
15. Interior P.T. Wood plates shall be anchored to floor with 9/64"x2 1/2" power driven at 16" o.c.
16. Provide solid blocking at 48" o.c. max. horizontal.
17. Provide 2 x 12 solid blocking behind lavatories, urinals, cabinets, grab bars and handrails.
18. Furr around pipes, columns, ducts and etc. that project from walls or ceilings with matching adjacent finishes.
19. Insulate all exterior stud walls with R-19 fiberglass kraft-faced insulation size to fit between studs.
20. All exterior wood wall studs shall be 2X8's @ 24" O.C.. Anchor P.T. 2X8 wood plates to floor slab with simpson 1/2"X8" TITEN HD heavy duty screws @ 4'-0" O.C.
21. Insulate all interior partitions with fiberglass R-11 insulation with Kraft-Back. Size to fit between studs.
22. Roof deck insulation shall be closed cell foam SPRAY - ON insulation R-18.
23. Install handicovers on all exposed domestic water and waste lines underneath sinks and lavatories.
24. Provide exposed aggregate finish at all handicap ramps and at entrance (s) to building at drives. Size of area shall be 36" deep by width of walk or drive.
25. All existing soils and new fills within building lines, under walks, at curbs and under pavement shall be compacted to not less than 2500 p.s.f. See Geotech and Structural Engineers report and drawings for requirements.
26. Where 1-hr. or 4-hr. rate walls and ceilings extend above unrated ceiling, write on the wall and ceiling of the rated construction every 12' in 3" letters the following: "1-hr. or 4-hr. construction" as appropriate.
27. Contractor shall be responsible for all cutting, fitting and patching, including excavation and backfill, requred to complete the work. Any damage to existing or new work already in place shall be replaced to match existing or previously installed materials ,by the contractor, at no cost to the Owner.
28. Where conflicts occur between codes, standards and construction documents, the most restrictive requirements shall govern.
29. The terms "provide" and "install" shall be considered synonymous with "furnish" and "install"
30. The submission of a bid or proposal will be construed as evidance that the contractor has familiarized himself / herself with the plans, specifi-cations and building site. Claims made subsequent to the proposal for materials and / or labor due to difficulties encountered will not be reco-nized, unless difficullities could not have been forseen even though proper examination was made.
31. The contractor shall maintain a clean work premis at all times and shall clean construction site of all his / her debris at job completion and be-fore final payment is made.
32. All fasteners that come in contact with pressure treated wood members shall be corrision resistant.

MATERIALS AND FINISHES

1. Treat all areas under building and along exterior wall with EPA approved chemical and accepted by the USDA for the control of termite infest-ation for a 5-yr. period from date of treatment and renewable on a year to year basis at the end of the five year period.
2. Curbs and walks shall be 3,000 p.s.i. concrete 1/2" P.A.E.J. at max. 30' o.c. Rub curbs to smooth texture finish. Wood float finish and slightly broom finish walks.
3. All concrete building slabs shall be 3,000 p.s.i. 28 days strength reinforced with 1.5lb. fibermesh per yard of concrete. Allowable tolerances: +/-1/8" in 10 feet. Provide .006 polyethylene vapor barrier under slab with joints lapped 8" min. See finishes for floor sealers.
4. Interior caulking shall meet Federal Specifications TT-C-598b, Grade I. Exterior caulking shall meet Federal Specifications TT-S-00230-C. Silicone one part rubber sealant. Use fire-rated caulk at fire rated walls or ceilings.
5. Roof sheathing shall be 5/8" "CDX" Plywood with clips @ midspan between trusses.
6. Roofing felt shall be 15# Fiberglass asphalt impregnated.
7. Roofing shingles shall be 40 Yr. Architectural.
8. Finishes: Areas as shsown in schedule or indicated elsewhere:
   - Floors:
     - A. Vinyl Resilient Tile-12"X12"X1/8" thick vinyl composition tile (V.C.T.), Armstrong standard excelon. imperial texture, color as selected. All vinyl floors to be cleaned and waxed with a commercial buffer prior to owner's occupancy. install per manufacturer's recommendations. Vinyl reducer strip-use between concrete/V.C.T. transition.
     - B. Concrete Sealer-Two coats of Majestic Sealer. Follow manufacturer's directions precisely.
     - C. Carpet
       1. Sanctuary RIO by Mohawk
       2. Other areas Associate by Mohawk
       3. Install per manufacturer's specilfications and recommendations for conditions.
     - D. Ceramic Tile:
       1. Crystal Flame unpolished 12" x 12"
       2. Install per manufacturer's specifications for conditions.
     - E. Marble:
       1. Shall meet ASTM C-503.
       2. Size 12" X 12".
       3. Install per manufacturer's specifications for conditions.
   - Vinyl Base: 4"X1/8" thick extruded rubber cove base with 5/8" butt toe base-color-as selected.
   - Paint: Prime all surfaces with required primer for surface applied to.
     - A. Drywall-2 coats semi-gloss latex-enamel paint. Paint all visible drywall.
     - B. Hollow Metal Doors and Frames-2 coats industrial enamel paint. Paint all visible metal work in finished areas.
     - C. Wood Doors-stain with transparent oil base stain color as selected by Owner-Apply two coats of sand/sealer, sanding lightly between coats with steel wool. Final coat to be satin polyurethane brush applied.
     - D. Restroom walls two coats of epoxy wall paint over drywall or masonry.
     - E. Mis. Metals-all miscellaneous metals to be shop primed. Sand to remove all rough surfaces prior to paint application. Two coats alkyd industrial enamel.
     - F. Hardwood, plywood, cabinet, exposed wood=stain/sealer and two coats urethane varnish.
     - G. Exterior wood=two coats industrial enamel.
     - H. Exterior concrete masonry units= two coats A100 Latex.
     - I. Traffic Markings= One coat Setfast Acrylic Water Borne Traffic Paint.
     - J. Wood shelving=two coats alkyd enamel.
     - K. Interior Concrete Masonry Units= one coat Classic 99 semi-gloss enamel.
   - Ceilings:
     - A. Acoustical Tile-Grid spacing as shown on plans 5/8" thick by Armstrong, Celotex or USG. Fire-rated where required.
       1. See schedule for finish.
     - B. Drywall
   - Walls & Ceilings:
     - Gypsum Board:
     - A. 5/8" "X" fire rated or as shown on drawings or in schedule. 4'0" wide X wall height.
     - B. Joint tape and compound shall be as standard with the wallboard manufacturer. Base coat as required and 3 finish coaats over tape and nailheads. sand smooth before painting or finishing.
     - C. 1"X1" galvanized steel corner bead, mudded in type.
     - D. Screws shall be type "S" (1 1/4") for steel and type "W" for wood framing. 12" o.c. in field and 8" o.c. along vertical edges.
9. Concrete Masonry Units:
   - A. Shall conform to ASTM C 90, Grade N, Type 2.
   - B. Mortar shall be type "S".
   - C. Joint reinforcement 3/16" side bars conforming to ASTM, A821-88 and 9 gauge crossbars, hot-dipped galvanized.
   - D. Sand shall conform to ASTM C 194-87.
10. Brick:
    - A. As selected by owner.
    - B. Mortar shall be Type "S".
    - C. Sand shall conform to ASTM C 144-87.
11. Wall Sheathing:
    1/2" OSB Board.
12. Exterior Insulation FinishSystem.
    - A. Sto " Next Generation"
    - B. 1" Styrofoam Insulation board
    - C. Install per manufacturers specifications, Instructions & Directions
13. Structural Steel shall conform to ASTM A36. Installation and connections shall be per AISC.
14. Built-in flashing not shown or indicataed otherwise shall be 5 oz.copper sheet bonded two layers of asphalt impregnated cotton fabric.
15. Use a firestopping compound at all penetrations thru fire rated walls & ceiling. Material shall be a gypsum based compound with a flame and and temperature rating per ASTM E-814.
16. Metal Door Frames shall be 16 gauge. Metal doors shall be 18 gauge. Exterior doors & frames shall be zinc-coated carbon steel with ASTM A 525-87, G60 Ainc coating.
17. Finish hardware is (US 26 Finish)
    - A. Hinges=Hager 1279, BB1279, BB1168, 1191, BB1199 as appropriate.
    - B. Locks=Saragent 8200 Series
    - C. Exit Devices=Precision 1100 Series
    - D. Door Closers=LCN 4010
    - E. Door Stops=Ives 402 \B or 436B as appropriate
    - F. Extension flush Bolts=Ives 457-1/2.
    - G. Weatherstripping=National Guard 134 NS
    - H. Pushs and Pulls=Rockwood
    - I. Thresholds=Aluminum conforming to Ga.120-3-3.
18. Fire Extinguishers: See plans for locations.
    - F.E.-1: 20 ABC, in semi recessed cabinet.
    - F.E.-2: 20 ABC
19. Toilet Accessories: Toilet accessories at handicap spaces shall be installed in accordance with the requirements of ADA, Ga. 120-3-3, Ga. 120-3-20 and ANSI 117. One of each shall be installed at all toilet fixtures.
    - A. At Lavatory (s)
      1. Paper towel dispenser: 0210 ASI
      2. Mirror: 0620 ASI
      3. Soap Dispenser: 0351 ASI
      4. Waste Receptacle: 0825 ASI (1 only per Restroom)
    - B. At Water Closets
      1. Toilet tissue dispenser: 0030 ASI
      2. Grab Bars: Type 01 ASI Length as indicated on plans.
    - C. At Toilet Stalls
      1. Robe hooks: 0740-Z ASI
20. Provide identification devices at all toilets (Men & Women), storage, electrical and mechanical rooms. Also, provide handicap symbols at toilet room doors. All ADA & Ga. 120-3-3 approved.
21. Provide & Install necessary handicap parking signs per ADA.

☐	PROGRESS PRINTS
☒	FOR APPROVAL
☐	FOR PRICING
☐	FOR PERMIT
☐	FOR CONSTRUCTION

REVISIONS	BY

ARCHITECTURE/PLANNING/URBAN DESIGN/1994, TMA INC., INTERNATIONAL CONSTRUCTION MANAGEMENT AIA/APA

"Faith is the substance of things hoped for, the evidence of things not seen. Hebrews 11.1"

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DATE	10/15/07
FILE NO	816A801-L
JOB NO	04-816
SHEET	A8.1L

DRAWING INFORMATION NOTES

A. ROUTE REFRIGERANT LINES & CONDENSATE DRAIN FROM ABOVE FINISHED CEILING TO AREA INSIDE EXTERIOR WALL TO GRADE LEVEL PENETRATION WITH SLEEVE; REFRIGERANT LINES SHALL CONNECT FROM AHU TO MATCHING HP SYSTEM AS SHOWN WITH CONDENSATE DRAIN ROUTED TO EARTH AREA APPROXIMATELY 3 FEET AWAY FROM BUILDING.

B. WALL INTAKE LOUVER SIZED AT 14"x14" EQUAL TO "OAL" NOTED IN SCHEDULES WITH BUG/BIRD SCREEN, VOLUME DAMPER & RUSKIN 24 VOLT LOW LEAKAGE DAMPER CONTROLLED BY ROOM CARBON DIOXIDE DETECTOR.

C. INSTALL EXHAUST AIR GRILLE IN SOFFIT OVERHANG OR HIGH IN EXTERIOR WALL AS REQUIRED; SEE ARCHITECT FOR ADDITIONAL DIRECTION; DEVICE SHALL BE "OAL" AS INDICATED IN SCHEDULES PAINTED TO MATCH SURROUNDINGS; PRODUCT TO BE SIZED AT 8"x8".

D. WALL MOUNTED CARBON DIOXIDE DETECTOR MOUNTED AT 54" AFF EQUAL TO CARRIER OR TELAIRE SET TO ACTIVATE AHU INTAKE DAMPERS SERVING MAIN ROOM UPON RISE ABOVE 700 PPM; PRODUCT SHALL OPEN DAMPERS TO FULL OPEN POSITION FOR AHU-1 THRU AHU-5 WITH FULLY CLOSED LEVEL ONCE SET-POINT HAS BEEN REACHED.

E. SAME AS NOTE "D" ABOVE FOR AHU-7.

F. RUSKIN 24 VOLT LOW LEAKAGE DAMPER SHALL OPEN TO FULL POSITION WHEN AHU-7 IS ACTIVATED WITH FULL CLOSE POSITION WHEN UNIT TURNS OFF. THIS SHALL ALLOW BUILDING TO OPERATE UNDER SLIGHT POSITIVE AIR PRESSURE DURING NORMAL OPERATION; MAIN RESTROOM FANS OPERATING FROM ROOM LIGHT SWITCH WILL BALANCE BUILDING PRESSURE WHEN USED IN INTERMINENTIALLY.

G. ROOF MOUNTED EXHAUST VENT CAP EQUAL TO GREENHECK WITH APPROVED PITCHED ROOF CURB, ALL ROOF EXPOSED PRODUCTS TO BE PAINTED, WITH APPROVED MATERIAL TO MATCH ROOF COLOR OR AS DETERMINED BY ARCHITECT; SEE DETAIL FOR ADDITIONAL INFORMATION.

H. SAME AS NOTE "G" ABOVE FOR OUTSIDE AIR INTAKE SYSTEM; PROVIDE & INSTALL AS SO INDICATED IN DETAIL & SPECS.

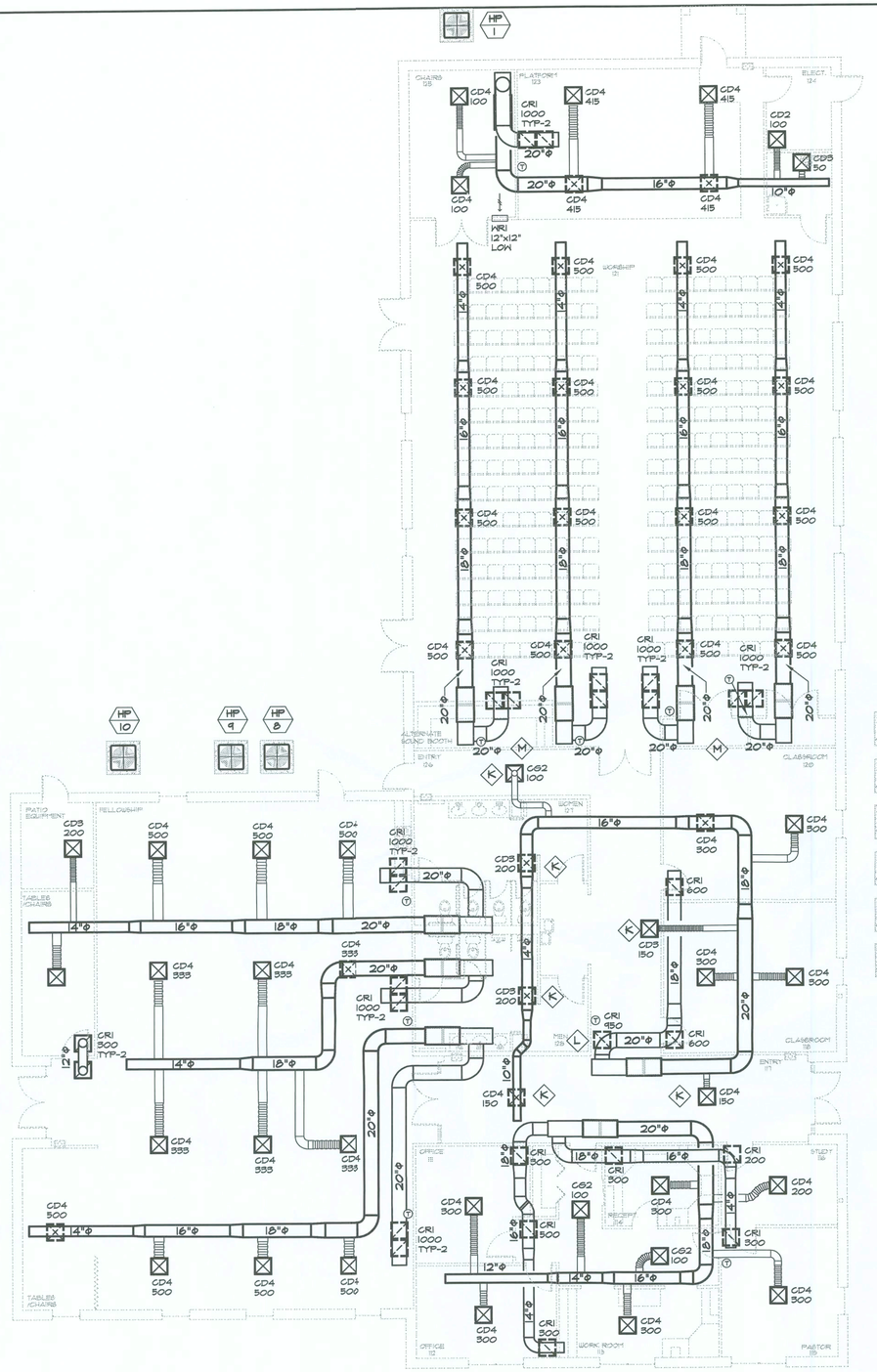
J. AHU SHALL BE MOUNTED ABOVE FINISHED CEILING AS SHOWN IN DETAIL & AS SET FORTH BY 2004 FMC; TYPICAL FOR ALL AHU'S; CONTRACTOR SHALL NOT SET UNIT ON PLATFORM AREAS ABOVE FINISHED CEILING.

K. ROUTE SUPPLY AIR DUCTS DOWN THRU PLATFORM AREA TO FIRE RATED CEILING WITH FIRE DAMPER & FLEXIBLE DUCT TO LAY-IN CEILING TYPE DIFFUSER; SEE DETAIL FOR ADDITIONAL REQUIREMENTS.

L. SAME AS NOTE "K" ABOVE WITH FIRE/SMOKE DAMPER; DAMPER SHALL BE CONNECTED TO BUILDING FIRE ALARM SYSTEM (IF AVAILABLE) WITH DAMPER TO CLOSE UPON DETECTION, SHUT-OFF ZONED AREA AHU & SIGNAL AUDIBLE SOUND PER NFPA GUIDELINES PRODUCT TO BE EQUAL TO RUSKIN AS SHOWN IN DETAIL PER UL555S.

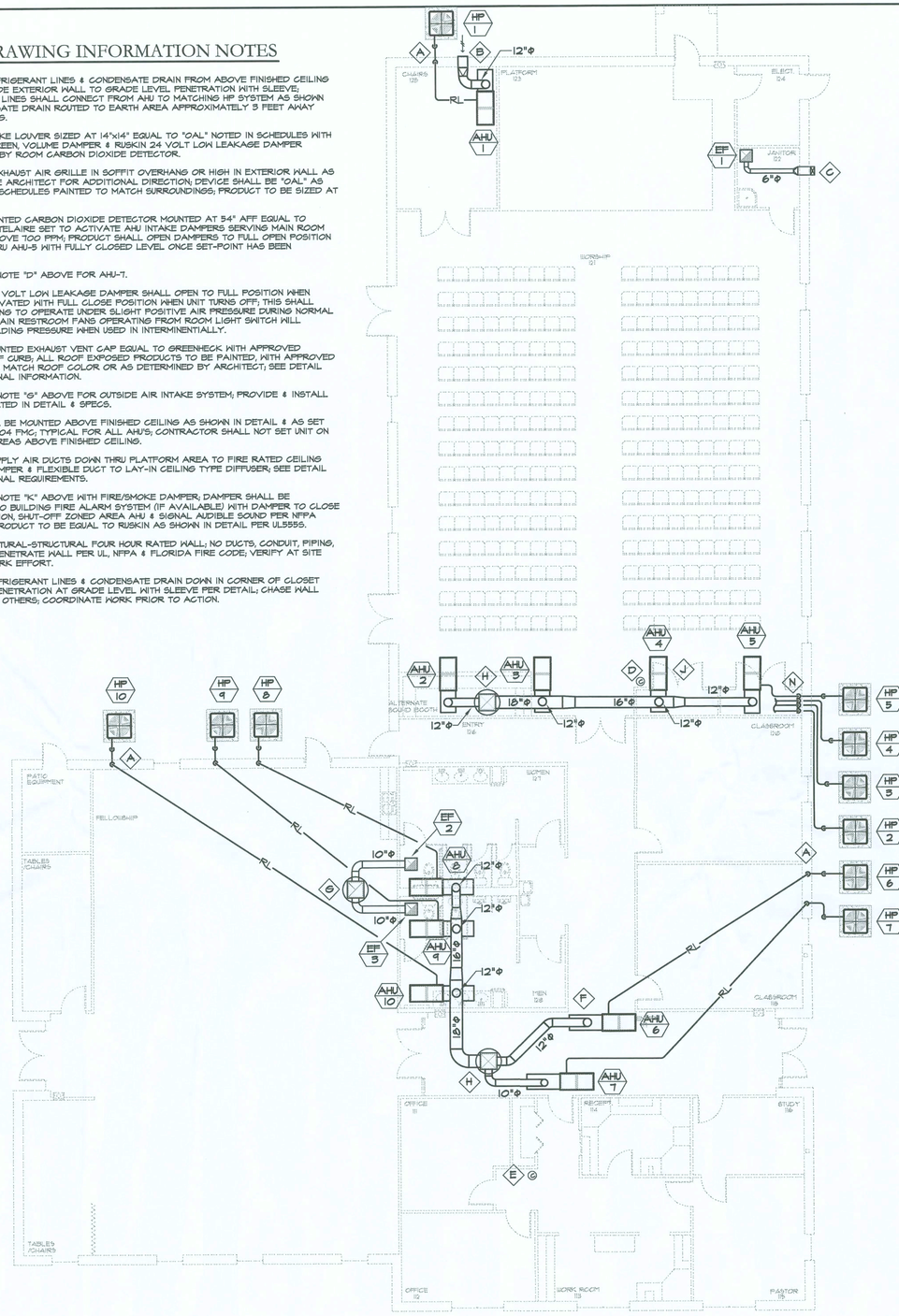
M. ARCHITECTURAL-STRUCTURAL FOUR HOUR RATED WALL; NO DUCTS, CONDUIT, PIPING, ETC. SHALL PENETRATE WALL PER UL, NFPA & FLORIDA FIRE CODE; VERIFY AT SITE PRIOR TO WORK EFFORT.

N. ROUTE REFRIGERANT LINES & CONDENSATE DRAIN DOWN IN CORNER OF CLOSET AREA WITH PENETRATION AT GRADE LEVEL WITH SLEEVE PER DETAIL; CHASE WALL SHALL BE BY OTHERS; COORDINATE WORK PRIOR TO ACTION.



OVERALL BUILDING HEATING & AIR COND. PLAN

SCALE 1/8"=1'-0"



OVERALL BUILDING VENTILATION & HVAC PIPING PLAN

SCALE 1/8"=1'-0"

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FILE NO	AEC
JOB NO	04-816
SHEET	M-1

James E. Burch 11.20.07

SPLIT HEAT PUMP UNIT SCHEDULE

AHU/HP NO.	AREA SERVED	MANUF.	AIR HANDLER MODEL #	HEAT PUMP MODEL #	SYSTEM RATINGS				AIR HANDLING UNIT DATA								HP UNIT DATA					CAPACITY (MBTU)			NOTES
					TONS	EER	COP	HSPF	TYPE	FACTORY DISCONNECT	V-Ph	CFM	ESP	HP	HTR KW	HTR MBH	OSA CFM	FIELD DISCONNECT	V-PH	MCA	MOCP	FUSE BKR	SEN COOL	TOTAL COOL	TOTAL HEAT	
1-10	SEE DWGS	CARRIER	FE4BNB006	25HCA360	5	14.0	3.74	8.2	HORIZONTAL DRAW THRU	YES	208-1	2000	.45"	3/4	11.3	38.5	SEE VENTILATION INFORMATION SCHEDULE THIS SHEET	YES	208-3	22.5	35	35	45	60	58.5	1,2,3,4, 5,6,7, 8,9,10

SYSTEM NOTES :
1. SEE MECHANICAL SPECIFICATIONS & DETAILS FOR ADDITIONAL REQUIREMENTS & INFORMATION
2. IN-LINE UL APPROVED SMOKE DETECTOR IN SUPPLY OR RETURN AIR PLENUM PER DETAILS & SPECIFICATIONS; ITEM TO BE INSTALLED REGARDLESS OF 2004 FMC REQUIREMENTS WITH CONNECTION TO BUILDING ALARM SYSTEM
3. WALL MOUNTED DIGITAL PROGRAMMABLE TYPE THERMOSTAT WITH SMART FAN CONTROL
4. OUTSIDE HP CONDENSING UNIT TO HAVE COIL GUARD PROTECTION
5. ONE INCH AIR FILTER AT UNIT TO BE CARBON PLEATED TYPE AS SO INDICATED IN PROJECT SPECIFICATIONS; TYPICAL FIBERGLASS THROWAWAY FILTERS ARE NOT APPROVED
6. FLEXIBLE SUPPLY DUCT CONNECTION PER DETAIL AT ALL AHUS
7. WALL MOUNTED HUMIDITY SENSOR FOR DEHUMIDIFICATION CONTROL IN EACH ZONE OR THERMIDISTAT (VERIFY LOCATION WITH ENGINEER AT SITE)
8. AIR HANDLING UNIT TO BE DIRECT DRIVE WITH VARIABLE SPEED BLOWER FOR DEHUMIDIFICATION CONTROL; DIP SWITCH FAN SPEED CONTROLLERS ARE NOT APPROVED
9. AHU SERVING OFFICE AREA SHALL BE ADJUSTED TO 180 CFM OSA WITH DAMPER AS INDICATED
10. UNIT INDICATED IN BASIS FOR DESIGN, OTHER APPROVED VENDORS ARE TRANE OR LENNOX

FAN SCHEDULE

FANS NO.	ROOM NAMES & NOS.	MANUF.	MODEL NO.	ACTUAL FAN LOCATION	FAN TYPE	BLOWER DATA				MOTOR DATA				SONES	BACKDRAFT DAMPER TYPE	FAN SPEED CONTROL	TIME DELAY ON BREAK	FAN CONTROL	FLEXIBLE DUCT CONNECTOR	FAN SUPPORT	NOTES
						CFM	ESP	TYPE	DRIVE	V-PH	WATTS/HP	AMPS	RPM								
EF-1	JANITOR CLOSET	GREENHECK	SPB50	MOUNTED IN SHEET-ROCK OR LAY-IN CEILING	CABINET EXHAUSTER	50	.125"	C.TR.	DRT	120-1	36 WATTS	0.50	625	1.7	SPRING	SOLID STATE CONTROL	NA	PROG. TIME CLOCK	OUTLET ONLY	THREADED RODS WITH NEOPRENE ISOLATORS	1,2
EF-2 & 3	REST ROOMS	GREENHECK	SPA410	MOUNTED IN SHEET-ROCK OR LAY-IN CEILING	CABINET EXHAUSTER	300	.25"	C.TR.	DRT	120-1	121 WATTS	1.74	1000	4.1	SPRING	SOLID STATE CONTROL	5 MINUTE	ROOM WALL LIGHT SWITCH	OUTLET ONLY	THREADED RODS WITH NEOPRENE ISOLATORS	2

FAN NOTES :
1. CONTROLLED BY PARAGON QUARTZ 7 DAY 24 HOUR TIME CLOCK WITH BATTERY BACK-UP LOCATED AT ELECTRICAL PANEL
2. WITH PERFORATED CEILING GRILLE AS INDICATED IN DETAIL

VENTILATION INFORMATION

ROOM NAME	APPROX ROOM SIZE (SQ.FT.)	VENTILATION REQUIREMENT				EST. MAX. VENTILATION RATE (CFM)			AHU OUTSIDE AIR CFM PER PERSON AS DESIGNED	OUTSIDE CFM PER AREA AS DESIGNED	REMARKS
		ASHRAE 62.1-2004 TABLE 2	2004 FMC 403.3 TABLES	OCCUPANCY AMOUNT PER ASHRAE	OCCUPANCY AMOUNT PER DESIGN	ASHRAE 62.1-2004 TABLE 2	2004 FMC 403.3 TABLES	OCCUPANCY AMOUNT PER DESIGN			
MAIN SANCT-UARY	2700	150/1000 15 CFM/PERSON	150/1000 15 CFM/PERSON	405 PEOPLE	222 PEOPLE	6075	6075	1845	7.5	1845	CALCULATED USING TYPICAL AUDITORIUM AREA CATEGORY PER ASHRAE 62-2001 & 2004 FMC SECTION 403.3; TIME LIMIT EXPOSURE OF LESS THAN 3 HOUR DURATION APPLIED (15 CFM/PERSON DIVIDED BY 2 = 7.5 CFM/PERSON); AHU-1 THRU AHU-5 RATED AT 369 CFM EACH
TYPICAL CLASSROOM AREA	688	5C/1000 15 CFM/PERSON	50/1000 15 CFM/PERSON	35 PEOPLE	35 PEOPLE	525	525	280	8	280	CALCULATED USING TYPICAL CLASSROOM ROOM CATEGORY PER ASHRAE 62.1-2004 & 2004 FMC SECTION 403.3; TIME LIMIT EXPOSURE OF LESS THAN 3 HOUR DURATION APPLIED (15 CFM/PERSON DIVIDED BY 2 = 7.5 CFM/PERSON); & CFM PERSON USED IN DESIGN AT AHU-6
OFFICE AREA	1187	7.1000 20 CFM/PERSON	7/1000 20 CFM/PERSON	9 PEOPLE	9 PEOPLE	180	180	180	20	180	CALCULATED USING TYPICAL OFFICE ROOM CATEGORY PER ASHRAE 62.1-2004 & 2004 FMC SECTION 403.3; ADJUST OUTSIDE AIR DUCT TO ZONE BASED ON REQUIREMENT WITH DEVICE CONTROLLED BY WALL CO2 SENSOR FOR AHU-7
FELLOW-SHIP HALL	2118	7C/1000 20 CFM/PERSON	70/1000 20 CFM/PERSON	149 PEOPLE	149 PEOPLE	2980	2980	1490	10	1490	CALCULATED USING TYPICAL DINING AREA CATEGORY PER ASHRAE 62-2001 & 2004 FMC SECTION 403.3; TIME LIMIT EXPOSURE OF LESS THAN 3 HOUR DURATION APPLIED (20 CFM/PERSON DIVIDED BY 2 = 10 CFM/PERSON); AHU-8 THRU AHU-10 RATED AT 497 CFM EACH

NOTES:
1) ASHRAE VENTILATION TABLES & ICC MECHANICAL CODE WERE USED AS BASIS FOR DESIGN.
2) RATES CALCULATED PER ANSI/ASHRAE 62.1-2004 VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY STANDARDS.
3) AREA REFLECTS LESS AMOUNT THAN ASHRAE GUIDELINES OR TABLE 403.3 FMC MECHANICAL CODE (2004); PEOPLE COUNT DETERMINED BY PROJECT ARCHITECT.

DIFFUSER, REGISTER, & GRILLE SCHEDULE

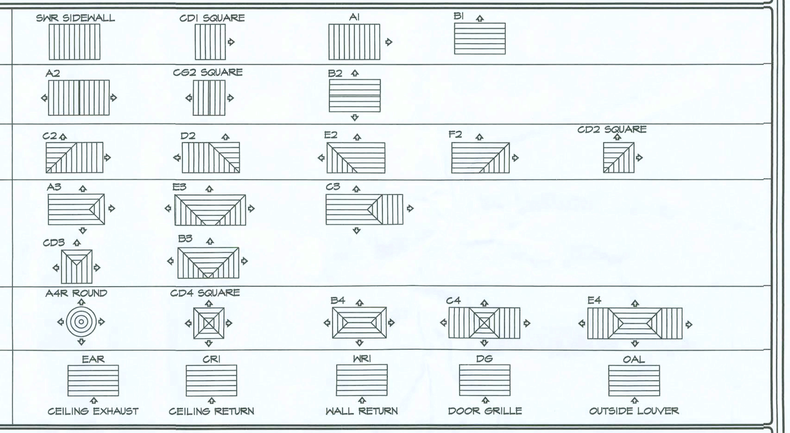
NO.	LOCATION	FUNCTION	SIZE (INCHES) FACE	SIZE (INCHES) NECK	AIR PATTERN	MANUFACTURER	TYPE MODEL NUMBER	DAMPER	COLOR FINISH	NOISE CRITERIA	AIR VELOCITY RANGE (FPM)	NOTES
CD4	CEILING	SUPPLY	SEE NOTE 1	SEE DWGS	4-WAY	METALAIRE	5500	OBDR	WHITE	15-20	400-600	1,2,3,4,5,6,7,8,10
CD3	CEILING	SUPPLY	SEE NOTE 1	SEE DWGS	3-WAY	METALAIRE	5500	OBDR	WHITE	15-20	400-600	1,2,3,4,5,6,7,8,10
CD2	CEILING	SUPPLY	SEE NOTE 1	SEE DWGS	2-WAY	METALAIRE	5500	OBDR	WHITE	15-20	400-600	1,2,3,4,5,6,7,8,10
CD1	CEILING	SUPPLY	SEE NOTE 1	SEE DWGS	1-WAY	METALAIRE	5500	OBDR	WHITE	15-20	400-600	1,2,3,4,5,6,7,8,10
CG2	CEILING	SUPPLY	SEE NOTE 1	SEE DWGS	2-WAY	METALAIRE	5500	OBDR	WHITE	15-20	500-600	1,2,3,4,5,6,7,10
GRI WRI	CEILING OR WALL	RETURN	SEE NOTE 1	SEE DWGS	1-WAY	METALAIRE	RH	OBDR	WHITE	15-20	400-500	1,2,3,4,5,6,7,10
EAR	CEILING OR WALL	EXHAUST	SEE NOTE 1	SEE DWGS	1-WAY	METALAIRE	RH	OBDR	ALM.	15-20	400-500	1,2,3,4,5,6,7,10
OAL	WALL *	EXHAUST-INTAKE	SEE NOTE 4	SEE DWGS	1-WAY	METALAIRE	OAL-4	OBDR	ALM.	15-20	400-500	4,7,9
DGI	DOOR	INTAKE	12"x12"	12"x12"	1-WAY	METALAIRE	300 DGDF	NONE	ALM.	15-20	300-400	4

NOTES:
1. GRILLE FACE SHALL BE INSTALLED AT ONE DIMENSIONAL SIZE UP FROM CONNECTING DUCT (I.E. 10" ROUND NECK TO HAVE 12"x12" GRILLE FACE)
2. PROVIDE ALL DEVICES WITH PROPER FRAME STYLE TO MATCH CEILING INDICATED BY PROJECT ARCHITECT; SEE ARCHITECTURAL DRAWINGS FOR REQUIREMENTS
3. ALL LAY IN TYPE PRODUCTS SHALL HAVE T-BARS WITH PANEL
4. DEVICES SHALL HAVE FACTORY FINISHES TO MATCH SURROUNDING DUCTS, DOOR, CEILING OR WALL AREAS; COORDINATE WITH ARCHITECT DRAWINGS PRIOR TO ORDER
5. BRANCH LINE SIZE SHOWN ON DRAWING TO BE ACTUAL LINE SERVING GRILLE DEVICE
6. RADIANT DAMPERS OR FIRE DAMPERS SHALL COMPLY WITH UL555 AND NFPA REQUIREMENTS; SEE ARCHITECTURAL DRAWINGS FOR RATED CEILINGS OR WALLS
7. NECK SIZE TO BE SAME AS BRANCH LINE INDICATED ON DRAWINGS
8. SUPPLY AIR DIFFUSER SHOWN TO BE 4-WAY THROW UNLESS OTHERWISE INDICATED ON DRAWING
9. INSTALL BACKDRAFT DAMPER AND OPPOSED BLADE DAMPER FOR OUTSIDE AIR INTAKE DEVICE
10. ALL CEILING SUPPLY, RETURN & EXHAUST AIR DIFFUSERS, GRILLES OR REGISTERS TO BE ALUMINUM IN WHITE FINISH UNLESS OTHERWISE NOTED FOR FIRE RATED CEILINGS

*INSTALL VENT IN OUTSIDE WALL AT OR IN SOFFIT

SPECIAL NOTE:
SOME OF THE DEVICES AND PRODUCTS INDICATED ABOVE MAY NOT APPEAR ON CONSTRUCTION DOCUMENTS; VERIFY ACTUAL ITEMS PRIOR TO INSTALLATION

AIR DIFFUSER PATTERNS



CFM RANGE & DUCT CONNECTION SCHEDULE

CFM RANGE	DUCT CONNECTION SIZE (INCHES) SUPPLY AIR	RETURN AIR	EXHAUST AIR	CFM RANGE	DUCT CONNECTION SIZE (INCHES) SUPPLY AIR	RETURN AIR	EXHAUST AIR
25-80	5"ø	6"ø	4"ø	311-400	12"ø	14"ø	12"ø
81-115	6"ø	8"ø	6"ø	401-475	12"ø	16"ø	14"ø
116-130	7"ø	9"ø	6"ø	476-600	14"ø	16"ø	14"ø
131-200	8"ø	10"ø	8"ø	601-800	16"ø	18"ø	16"ø
201-249	9"ø	10"ø	8"ø	801-1000	18"ø	20"ø	16"ø
250-310	10"ø	12"ø	10"ø	1000-1300	20"ø	20"ø	18"ø

DIFFUSER LEGEND

A4 — SEE DIFFUSER, REGISTER & GRILLE SCHEDULE & AIR DIFFUSER PATTERN SCHEDULE
400 — REQUIRED AIR QUANTITY (CFM) SEE CFM RANGE & DUCT CONNECTION SCHEDULE

MECHANICAL MATERIAL SCHEDULE

AIR DISTRIBUTION DUCTS		REFRIGERANT & CONDENSATE DRAIN PIPING			NATURAL GAS PIPING	PIPING INSULATION DATA				PIPE HANGERS	PIPE PENETRATIONS	FLEXIBLE DUCTS				EXTERNAL DUCT INSULATION WRAP						INTERNAL DUCT INSULATION ACOUSTIC LINER					
MATERIAL	SEALER	BELOW FINISHED FLOOR	CONDENSATE DRAIN	ABOVE FINISHED FLOOR	ABOVE FINISHED FLOOR	FITTINGS	JACKET	THICKNESS	LOCATION			MANUF.	SERIES	MAX. LENGTH	R-VALUE	MANUF.	SERIES	MIN. THICKNESS	MIN. R-VALUE	VAPOR BARRIER	SEALER	LOCATION	MANUF.	SERIES	MIN. THICKNESS	COATING	LOCATION	MIN-MAX. LENGTH
GLASS "G" GALVANIZED STEEL OR ROLLED STEEL IN COMPLIANCE WITH SMACNA LOW-MEDIUM PRESSURE DUCT STANDARDS, TESTED AT LESS THAN 1% AIR LEAKAGE	SEE DUCT INSULATION-WRAPPING DETAIL	COPPER TUBING-TYPE "K" SOFT ANNEALED TEMPER, NO JOINTS BELOW FLOOR	SCHEDULE 40 PVC WITH SOLVENT WELD PVC FITTINGS, IF APPROVED BY LOCAL CODES	COPPER TUBING-TYPE "L" HARD DRAWN TEMPER WITH WROUGHT COPPER FITTINGS & BRAZED JOINTS AT 1100 DEG F; FLUX MATERIAL NOT ALLOWED	SCHEDULE 40 BLACK IRON STEEL PER 2003 IFGC & LOCAL REQUIREMENTS	ZESTON FITTING COVERS	UNIVERSAL ALUMINUM JACKET AT OUTSIDE & EXPOSED AREAS	3/4" ARMAFLEX	REFRIGERANT SUCTION LINE CONDENSATE DRAIN IN ATTIC AREA	CLEVIS TYPE ON THREADED RODS IN COMPLIANCE WITH 2004 FLORIDA PLUMBING CODE SECTION 308	METACAULK UL-CAJ2134 UL-WL2136	THERMAFLEX	MKE	6 FT	8.0	JOHNS MANVILLE	MICROLITE	2.5"	8.5	FSK	SEE DUCT INSULATION-WRAPPING DETAIL	ALL SUPPLY, RETURN & EXHAUST AIR DUCTS	JOHNS MANVILLE	PERMACOTE LINACOUSTIC R300 RATED AT 6000 FPM	1"	WITH HOSPITAL MICROBIAL WHITE COATING	ALL SUPPLY, RETURN & EXHAUST AIR DUCTS AT EQUIPMENT	FROM EQUIPMENT OUT AT 5 FT FOR AHU's & 3 FT FOR EF'S

11.20.07

REVISIONS	BY

ARCHITECTURE/PLANNING/URBAN DESIGN/
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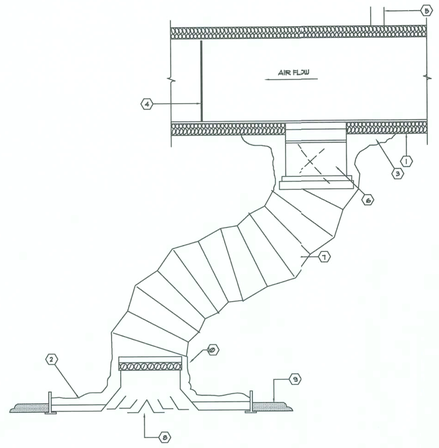
"Faith is the substance of things hoped for, the evidence of things not seen. Hebrews 11.1

GRACE COVENANT
LAKE CITY, FLORIDA

DRAWN	E.LOCKE
CHECKED	J.BURCH
DATE	NOVEMBER 2007
FILE NO	AEC
JOB NO	04-816
SHEET	M-2



DIFFUSER NOTES

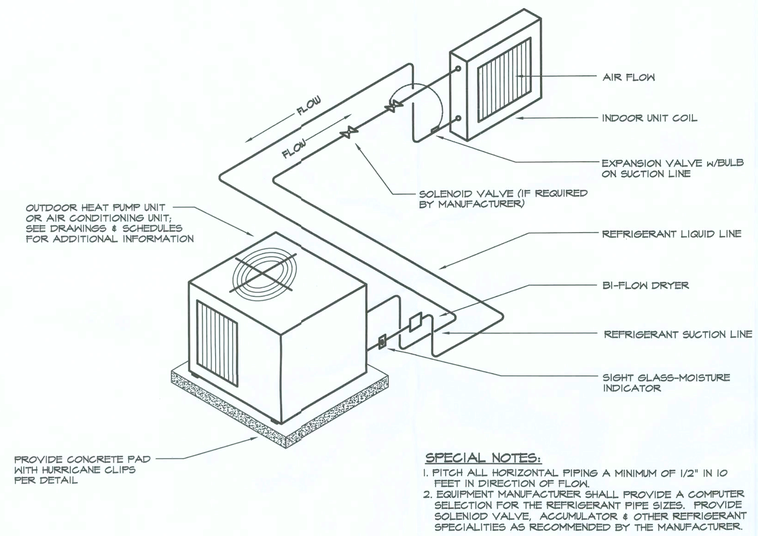
1. 2.5" (R-8.5) EXTERNAL INSULATION.
2. FOIL BACK FIBERGLASS INSULATION 2.5" (R-8.5) EXTERNAL. WRAP COMPLETELY AROUND TRUNK DUCT DROP AND GRILLE AS SHOWN. TAPE AND STAPLE PER DUCT INSULATION/WRAPPING DETAIL FOR ALL DUCTS.
3. SEAL ALL SEAMS AROUND CONNECTION WITH FASON (SMACNA APPROVED) ACRYLIC ALUMINUM REINFORCED DUCT TAPE....SQUEEGEE TAPE TO DUCT FOR SECURE BOND.
4. SEAL ALL DUCT JOINTS AND SEAMS, PAINT SMOOTH AND FILL ALL PIN HOLES ON ALL CONNECTIONS WITH SMACNA APPROVED DUCT SEALER; (USE DUCTMATE FITTINGS ON RECTANGULAR DUCTS).
5. ALL DUCTS SHALL BE SUPPORTED IN AN APPROVED MANNER; SEE DUCT HANGER DETAIL.
6. SPIN-IN EXTRACTOR WITH DAMPER, COASTLINE DISTRIBUTORS MODEL MSI-6 (WITHOUT AIR SCOOP).
7. FLEXIBLE DUCT, THERMAFLEX OR APPROVED EQUAL.
8. LAY-IN TYPE OR SHEET-ROCK CEILING DIFFUSERS. SEE "MECHANICAL SPEC'S" OR SCHEDULES FOR MANUFACTURER AND SERIES.
9. LAY-IN CEILING AND GRID, (BY OTHERS); ADDITIONAL T-BAR FOR LAY-IN PANEL BY OTHERS (VERIFY).
10. OPPOSED BLADE DAMPER.

LAY-IN DIFFUSER DETAIL
NTS

MECHANICAL LEGEND

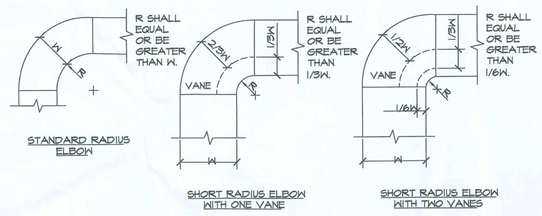
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
H	DIGITAL HUMIDISTAT CONTROL	D	DRAIN LINE	AC	AIR COND. UNIT	FCU	FAN COIL UNIT
T	DIGITAL ROOM THERMOSTAT (MOUNTED AT 54" AFF)	RL	REFRIGERANT LINES	AFF	ABOVE FINISHED FLOOR	MUA	MAKE-UP AIR
F	FIRESTAT (UL APPROVED TYPE)	G	GAS LINES	AHU	AIR HANDLING UNIT	NTS	NOT TO SCALE
S	SMOKE DETECTOR (IN-LINE TO ALARM SYSTEM)		PIPE TURN-UP	B	BOILER	OSA	OUTSIDE AIR
	RETURN AIR DUCT, GRILLE OR REGISTER		PIPE TURN-DOWN	BD	BALANCING DAMPER	P	PUMP
	SUPPLY AIR DUCT, DIFFUSER, GRILLE OR REGISTER		LONG RADIUS ELBOW	CD	CEILING DIFFUSER	RA	RETURN AIR
	EXHAUST AIR DUCT, GRILLE OR REGISTER		FLEXIBLE PIPE CONNECTOR	CR	CEILING RETURN	RAF	RETURN AIR FAN
	EXHAUST FAN (CEILING/CABINET TYPE)		SIGHT GLASS MOISTURE INDICATOR	CT	COOLING TOWER	RTU	ROOF TOP UNIT
	EXHAUST SUPPLY AIR FAN (IN LINE TYPE)		NEW DUCTS/AIR DISTRIBUTION	DG	DOOR GRILLE	SA	SUPPLY AIR
	EXHAUST/SUPPLY AIR FAN (WALL CENTR. MOUNTED TYPE)		EXISTING DUCTS/AIR DISTRIBUTION TO BE REMOVED PER EPA	DH	DUCT HEATER	SF	SUPPLY FAN
	EXHAUST/SUPPLY AIR FAN (WALL PROP. MOUNTED TYPE)		EXISTING DUCTS/AIR DISTRIBUTION TO REMAIN	EA	EXHAUST AIR	SHD	SIDEWALL DIFFUSER
	24"ø DRYWELL FOR CONDENSATE DRAIN		FLEXIBLE DUCT NOT TO EXCEED 6 FEET IN LENGTH	EAR	EXHAUST AIR REGISTER	UC	UNDER-CUT
	MOTORIZED DAMPER (RUSKIN LOW LEAKAGE 24VOLT)		MANUAL OPPOSED BLADE BALANCING DAMPER (RUSKIN)	EF	EXHAUST FAN	UH	UNIT HEATER
	FLEXIBLE DUCT CONNECTOR			FA	FRESH AIR INTAKE	GWS	COLD WATER SUPPLY
	FIRE DAMPER (RUSKIN) WITH ACCESS DOOR			HWR	HOT WATER RETURN	GWR	COLD WATER RETURN
	ROOF MOUNTED EXHAUST FAN		CEILING RETURN GRILLE/REGISTER WITH 18" OPEN-END BOOT	WR	WALL RETURN	HWS	HOT WATER SUPPLY
	ROOF MOUNTED MAKE-UP OR SUPPLY FAN		CEILING DIFFUSER WITH FLEXIBLE DUCT; DUCT NOT TO EXCEED 6 FEET IN LENGTH	(X)	VAV BOX TAG NUMBER	(X)	DRAWING INFORMATION NOTES
	FIRE/SMOKE DAMPER WITH ACCESS DOOR EQUAL TO RUSKIN WITH DC CURRENT		RECTANGULAR OR ROUND DUCT TRANSITION PER SMACNA	X / X	DETAIL NUMBER / SHEET ON WHICH DETAIL IS SHOWN	(X)	DIGITAL WALL THERMOSTAT WITH 24 VOLT ZONE DAMPER, TRANSFORMER & LOGIC CONTROLLER DEVICE EQUAL TO CARRIER "V V T" SYSTEM
	45° ELBOW W/AIR FOIL TURNING VANES	10"x8" / 8"x4"	RECTANGULAR OR ROUND DUCT. FIRST # INDICATES SIZE OF SIDE SHOWN. NET FREE DIMENSIONS IN INCHES				
	90° ELBOW W/AIR FOIL TURNING VANES		SIDEWALL, WALL OR SOFFIT EXHAUST, SUPPLY, RETURN, OR OUTSIDE AIR DIFFUSER, GRILLE, OR REGISTER.			XX / X	EQUIPMENT TYPE (EF, AHU, RTU, ETC.) SEE SCHEDULES FOR INFORMATION / UNIT NUMBER
	RECTANGULAR BRANCH DUCT OFF RECTANGULAR MAIN TRUNK DUCT WITH ADJUSTABLE AIR FOIL EXTRACTOR WITH ROD		RECTANGULAR BRANCH DUCT OFF RECTANGULAR MAIN TRUNK DUCT WITH VOLUME DAMPER (OPPOSED BLADE TYPE).	(X)	DIFFUSER, REGISTER OR GRILLE #. SEE SCHEDULE		

NOTE:
SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE USED ON THESE DRAWINGS.



SPECIAL NOTES:
1. PITCH ALL HORIZONTAL PIPING A MINIMUM OF 1/2" IN 10 FEET IN DIRECTION OF FLOW.
2. EQUIPMENT MANUFACTURER SHALL PROVIDE A COMPUTER SELECTION FOR THE REFRIGERANT PIPE SIZES. PROVIDE SOLENIOD VALVE, ACCUMULATOR & OTHER REFRIGERANT SPECIALITIES AS RECOMMENDED BY THE MANUFACTURER.

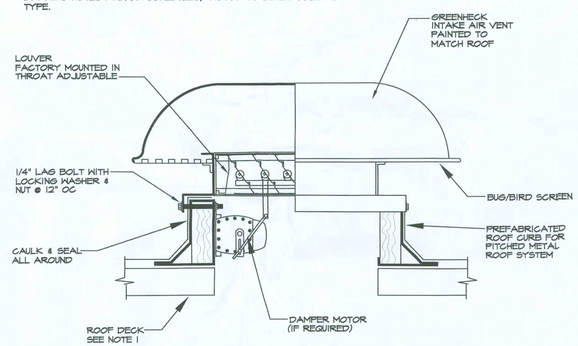
REFRIGERANT PIPING SCHEMATIC
NTS



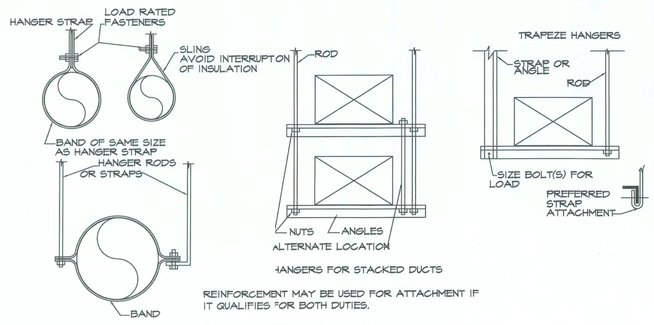
NOTE:
1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
2. ALL STANDARD RADIUS ELBOWS SHOWN ON FLOOR PLANS MAY BE MADE SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.
3. ALL SQUARE OR RECTANGULAR ELBOWS SHALL HAVE AIR FOIL TYPE TURING VANES.

DUCTWORK RADIUS ELBOWS DETAIL
NTS

SPECIAL NOTES:
1. VERIFY ROOF SYSTEM, TYPE, FINISH & PITCH PRIOR TO INSTALLATION; COORDINATE ROOF CURB REQUIREMENTS WITH METAL ROOF SYSTEM; IF REQUIRED CURB SHALL BE SUPPLIED BY METAL ROOF VENDOR.
2. ANCHOR ROOF CURB TO ROOF SYSTEM WITH APPROVED HURRICANE TIE DOWN CLIPS OR WELDED TO STRUCTURAL SYSTEM AS REQUIRED.
3. MOTORIZED DAMPER (IF REQUIRED) SHALL BE EQUAL TO RUSKIN LOW LEAKAGE TYPE WITH INTERLOCK CONTROL AS NOTED IN DRAWING NOTES AND/OR SCHEDULES; MOTOR TO BE 24 VOLT AC TYPE.



INTAKE OR EXHAUST AIR HOOD WITH MOTORIZED LOUVER DETAIL
N.T.S.

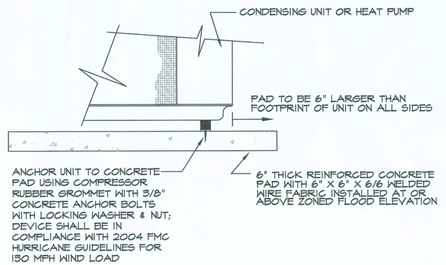


HANGERS FOR STACKED DUCTS

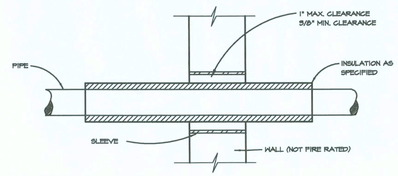
REINFORCEMENT MAY BE USED FOR ATTACHMENT IF IT QUALIFIES FOR BOTH DUTIES.

DO NOT EXCEED LOAD RATING FOR METHOD USED.

DUCT HANGER DETAILS
NTS



MOUNTING DETAIL - OUTDOOR UNIT
NO SCALE



PIPE PENETRATION OF NON-FIRE RATED WALL DETAIL
NOT TO SCALE

REVISIONS	BY

ARCHITECTURE/PLANNING/URBAN DESIGN/
CONSTRUCTION MANAGEMENT AIA/AIPA

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CHECKED	J.BURCH
DATE	NOVEMBER 2007
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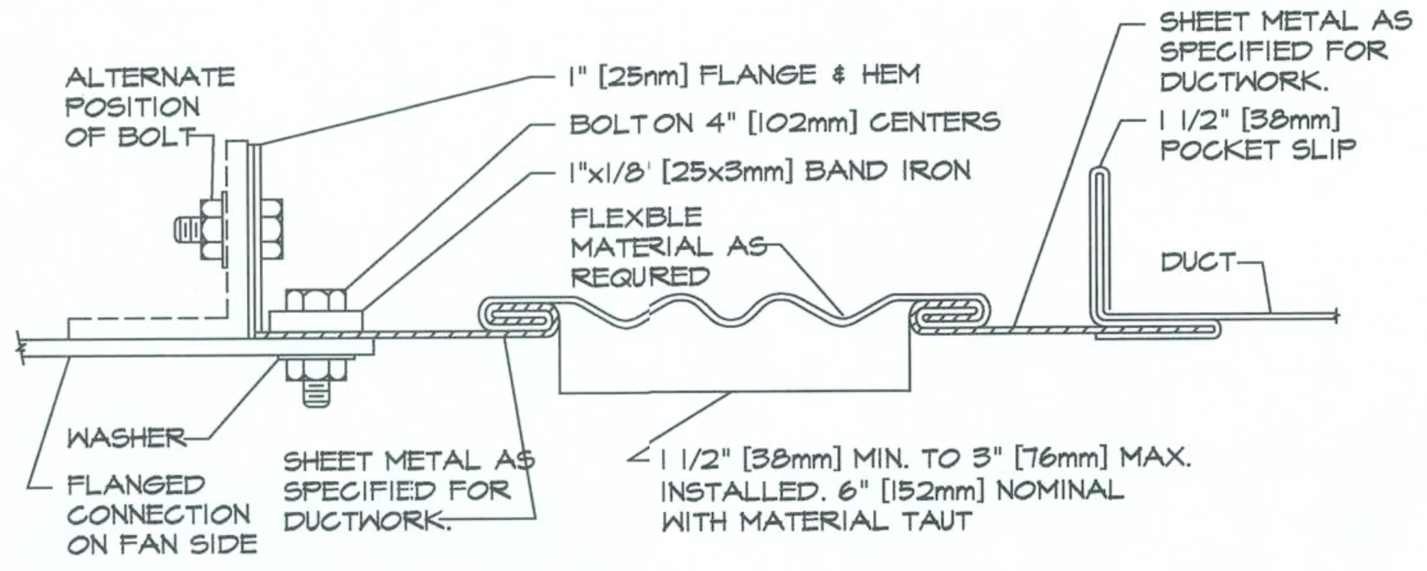
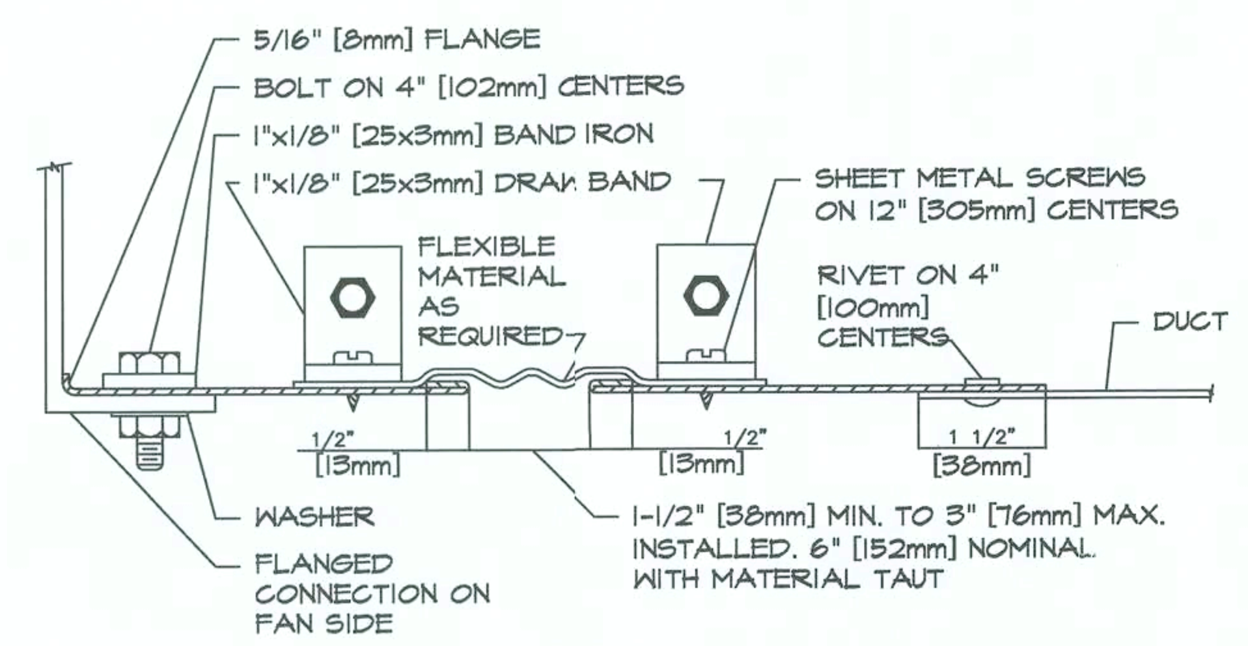
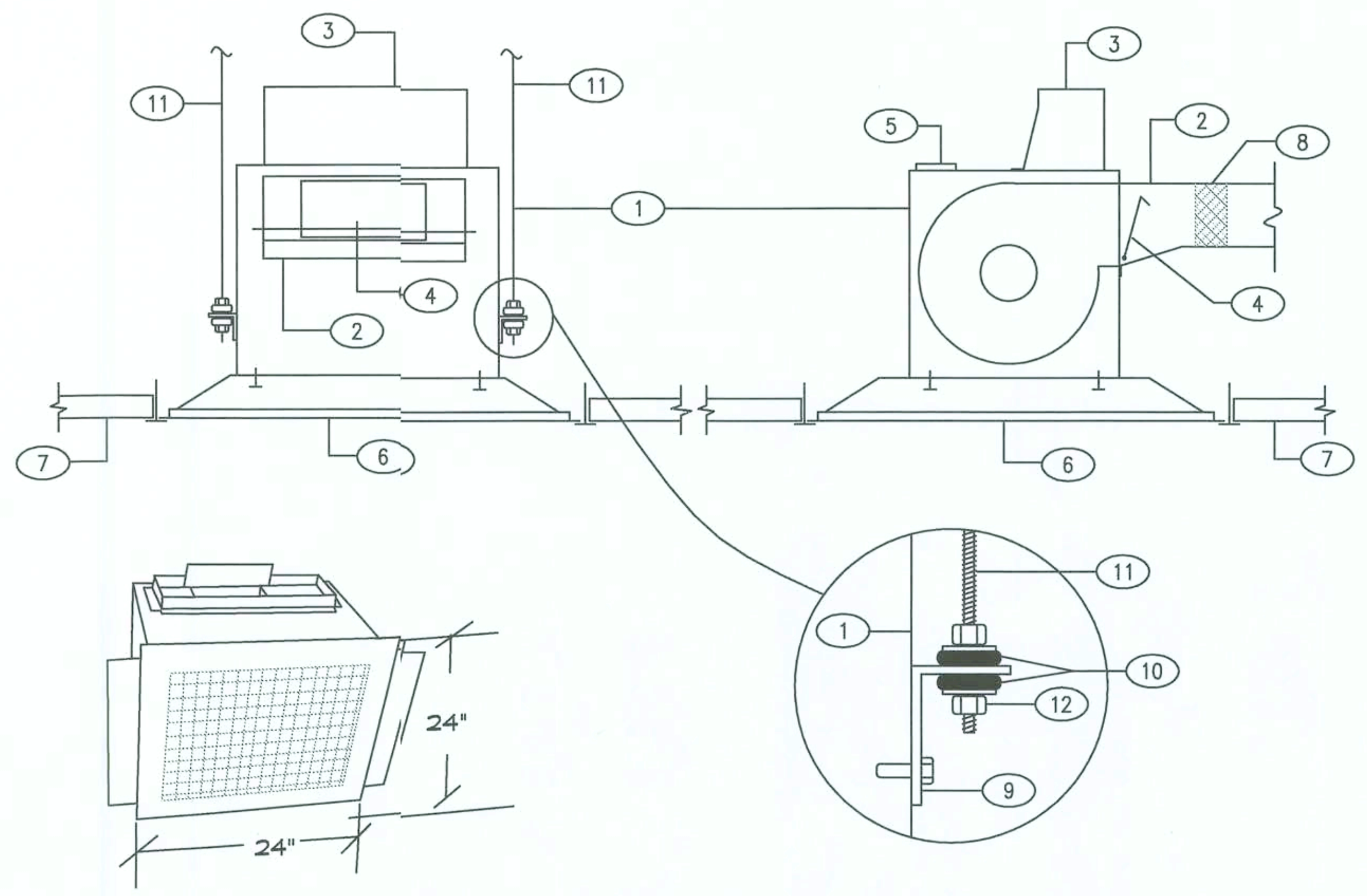
JOB NO	04-816
SHEET	M-3





RECTANGULAR AND ROUND FLEXIBLE CONNECTION DETAILS

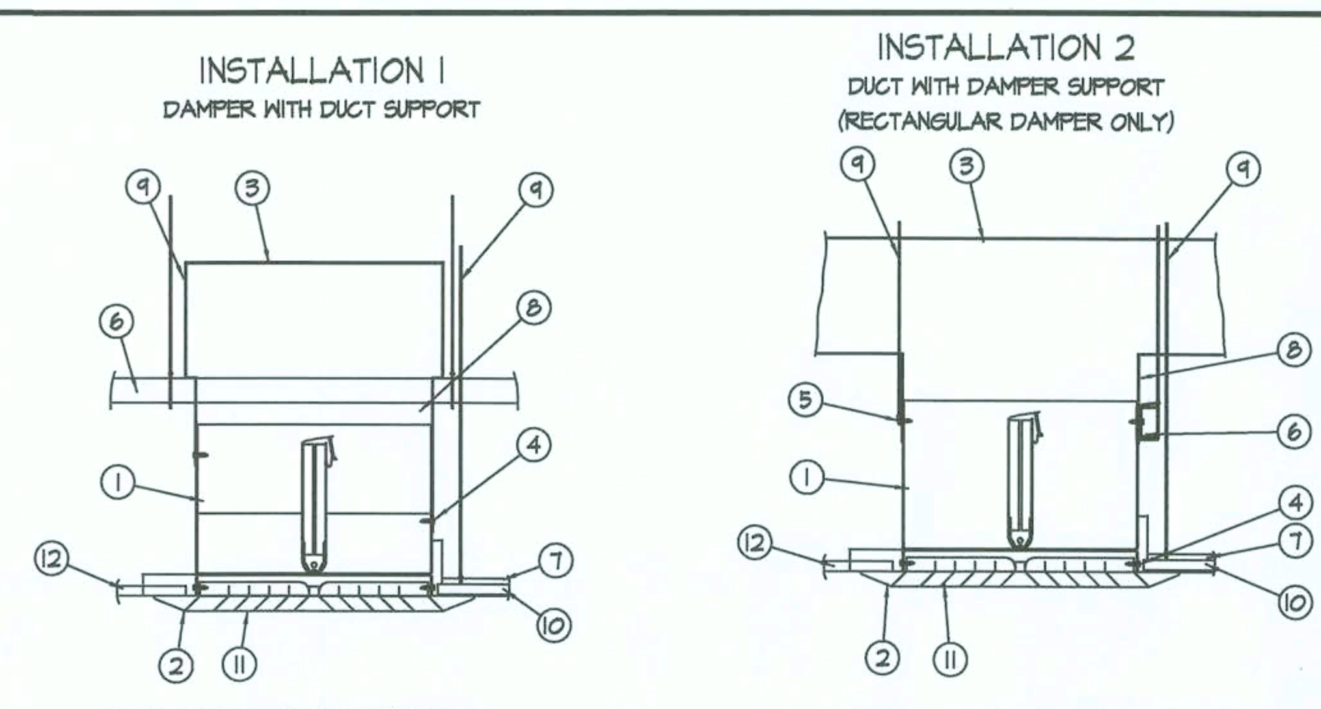
NTS



1. GALVANIZED STEEL HOUSING
2. HORIZONTAL DISCHARGE DUCT CONNECTION
3. OPTIONAL VERTICAL DISCHARGE
4. BACKDRAFT DAMPER
5. EXTERNAL ELECTRICAL ACCESS COVER
6. 24"x24" PERFORATED GRILLE
7. CEILING TILE
8. FLEXIBLE DUCT CONNECTOR
9. ADJUSTABLE MOUNTING FLANGE
10. VIBRATION ISOLATOR, TOP AND BOTTOM
11. 3/16" DIAMETER THREADED HANGER RODS, TOTAL OF FOUR, SUPPORT FROM BUILDING STRUCTURE. PROVIDE SECONDARY FRAMING AS NECESSARY
12. NUT AND WASHER

CEILING EXHAUST FAN DETAIL

NOT TO SCALE



STEEL DUCT WITH DUCT SUPPORT

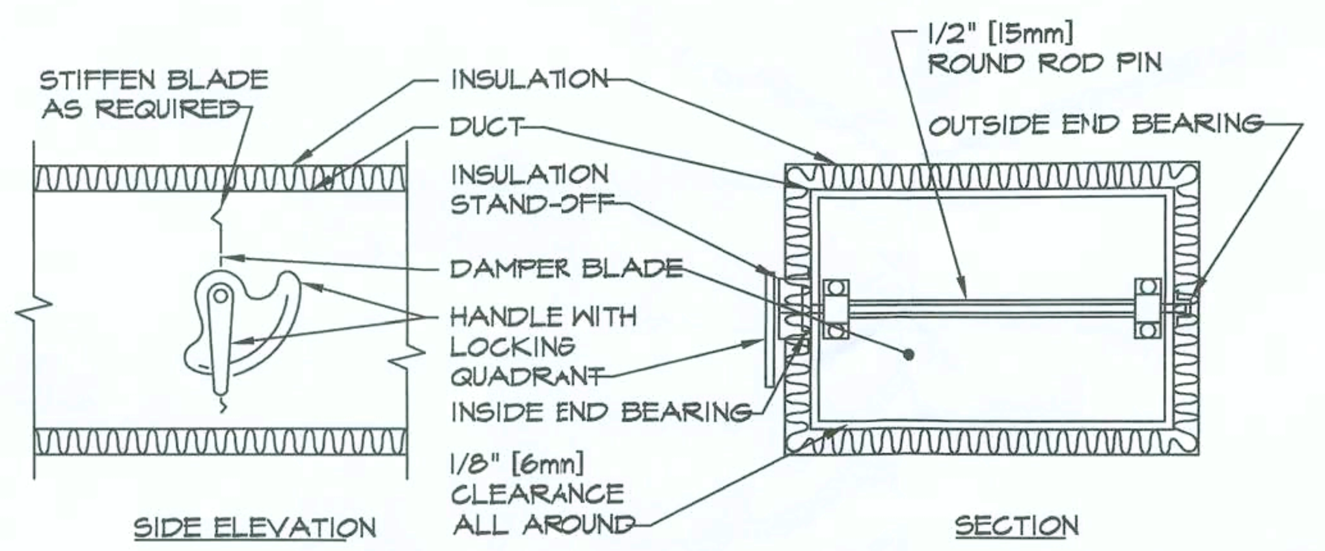
ITEM	DESCRIPTION
1.	DAMPER
2.	GRILLE FRAME (20 GA. MIN.)
3.	DUCT
4.	#8 SHEET METAL SCREW
5.	#10 SHEET METAL SCREW
6.	16 MSG X 1 1/2" CHANNEL
7.	CEILING GRID (UL CLASSIFIED)
8.	DUCT DROP
9.	12 SWG STEEL WIRE
10.	ACOUSTICAL LAY-IN PANELS (UL CLASSIFIED)
11.	DIFFUSER OR GRILLE CORE (METALLIC OR NON-METALLIC)
12.	RIGID GYPSUM WALL BOARD CEILING (UL CLASSIFIED)

STEEL DUCT WITH DAMPER SUPPORT

ITEM	DESCRIPTION
1.	DAMPER
2.	GRILLE FRAME (20 GA. MIN.)
3.	DUCT
4.	#8 SHEET METAL SCREW
5.	#10 SHEET METAL SCREW
6.	16 MSG X 1 1/2" CHANNEL
7.	CEILING GRID (UL CLASSIFIED)
8.	DUCT DROP
9.	12 SWG STEEL WIRE
10.	ACOUSTICAL LAY-IN PANELS (UL CLASSIFIED)
11.	DIFFUSER OR GRILLE CORE (METALLIC OR NON-METALLIC)
12.	RIGID GYPSUM WALL BOARD CEILING (UL CLASSIFIED)

CEILING RADIANT FIRE DAMPER DETAILS

NTS



NOTE:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

VOLUME DAMPER DETAIL

NTS

A. INSTALL CONDENSATE CONTROL DEVICE EQUAL TO TRENT TECHNOLOGIES "COSTGARD" TO INSULATED DRAIN WITH CLEANOUT; ROUTE TO DRY-WELL OR FLOOR DRAIN AS SO NOTED IN DRAWINGS & SPEC'S.

B. UL APPROVED IN-LINE SMOKE DETECTOR; SEE SPEC'S FOR ADDITIONAL INFORMATION.

C. ROUTE REFRIGERANT LINES TO MATCHING HP OR AC UNIT; SEE SPEC'S, DRAWINGS & PIPING SCHEMATIC FOR REQUIREMENTS.

D. AHU TO BE MOUNTED ON UNISTRUT STEEL SUPPORTS FROM ROOF STRUCTURE WITH THREADED RODS & SPRING TYPE VIBRATION ISOLATORS; AHU'S MOUNTED ABOVE CEILING ON EQUIPMENT PLATFORMS SHALL NOT HAVE THREADED RODS FROM ROOF STRUCTURE; PROVIDE 2" SOLID NEOPRENE 6" SQUARE PADS UNDER AHU INSIDE AUX. DRAIN PAN FOR VIBRATION ISOLATION IF MOUNTED ON EQUIPMENT PLATFORM; EE SPEC'S FOR ADDITIONAL REQUIREMENTS.

E. ROUTE 3/4" PAN DRAIN TO OUTSIDE AREA IN COMPLIANCE WITH LOCAL CODES.

F. FLEXIBLE DUCT CONNECTOR.

G. OPPOSED BLADE BALANCING DAMPER & BACKDRAFT DAMPER.

H. UL APPROVED BREAKER OR DISCONNECT FOR FAN & HEATER IN COMPLIANCE WITH NEC CODE & LOCAL REQUIREMENTS.

J. AIR FILTER & RACK; SEE SPEC'S FOR ADDITIONAL INFORMATION & REQUIREMENTS.

K. SUPPLY AIR DUCT WITH 1" LINER & INSULATION AS NOTED IN SPEC'S.

L. EXTERNAL INSULATED OUTSIDE AIR DUCT WITH BUG/BIRD SCREEN.

M. BUILDING RETURN AIR DUCT; DUCT TO BE INSULATED WITH 1" LINER & DUCT WRAP AS NOTED IN SPEC'S.

N. OPPOSED BLADE BALANCING DAMPER.

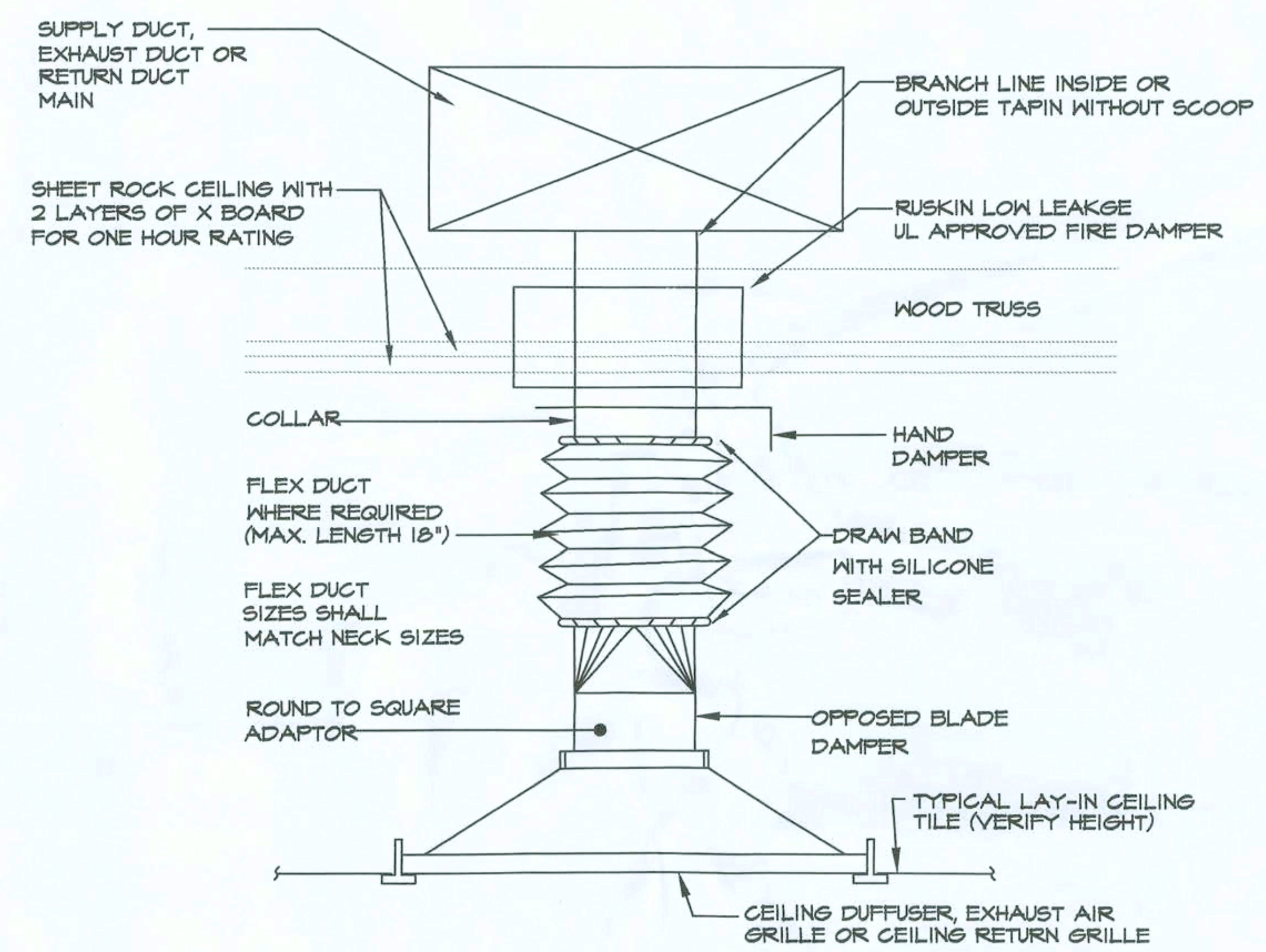
P. AIR HANDLING UNIT; SEE SCHEDULES, SPEC'S & DRAWINGS FOR ADDITIONAL REQUIREMENTS.

Q. MICRO SWITCH BOLTED TO DRAIN PAN WITH CONNECTION TO AHU LOW VOLTAGE HOT WIRE FOR SAFETY.

R. INSTALL GALVANIZED AUX. DRAIN PAN UNDER UNIT WITH ANGLE ATTACHMENTS TO UNIT SUPPORTS PER CODE.

S. METAL ANGLE SUPPORTS FOR AUX. DRAIN PAN AT EACH CORNER; PROVIDE ADDITIONAL SUPPORTS TO ASSURE PROPER PAN STRENGTH & DRAINAGE.

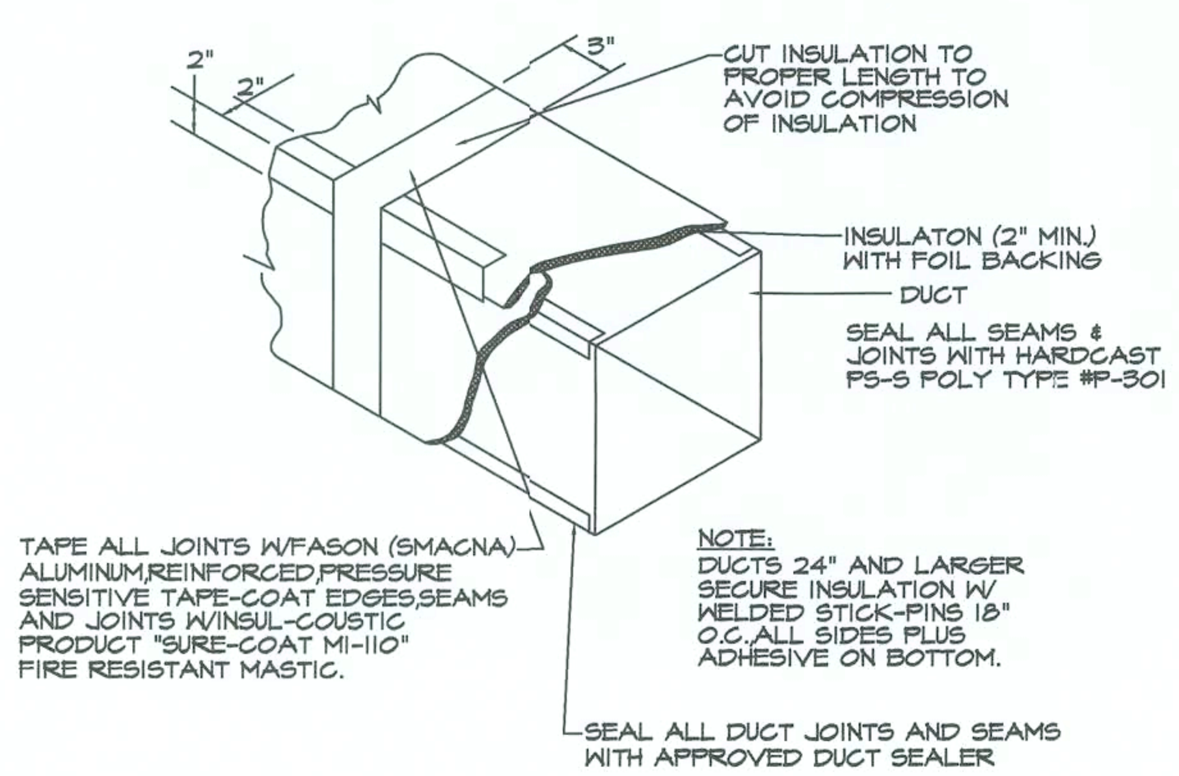
SEE SPECIFICATIONS, DETAILS, ETC. FOR ADDITIONAL INFORMATION RELATED TO DUCT WRAP, FIRE DAMPERS, FLEXIBLE DUCTS, DIFFUSERS, GRILLES, ETC.; THIS ACTION APPLIES TO ALL ITEMS FOR GATE HOUSE LAUNDRY ROOM, CORRIDORS, LOBBIES, ETC. FOR ENTIRE FACILITY



TYPICAL DIFFUSER-GRILLE CONNECTION

(WITH FIRE DAMPER & DROPPED CEILING)

NOT TO SCALE



DUCT INSULATION/WRAPPING DETAIL

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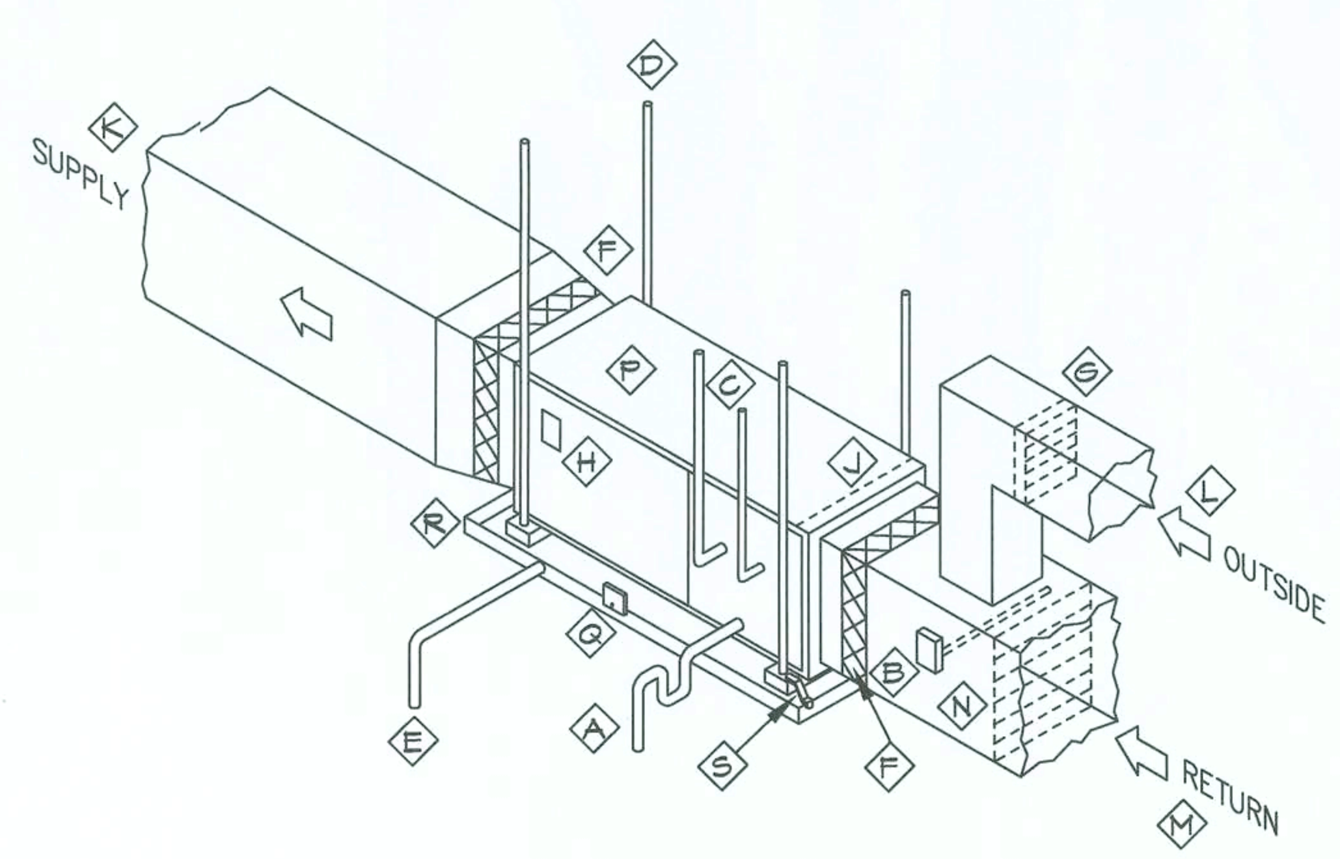
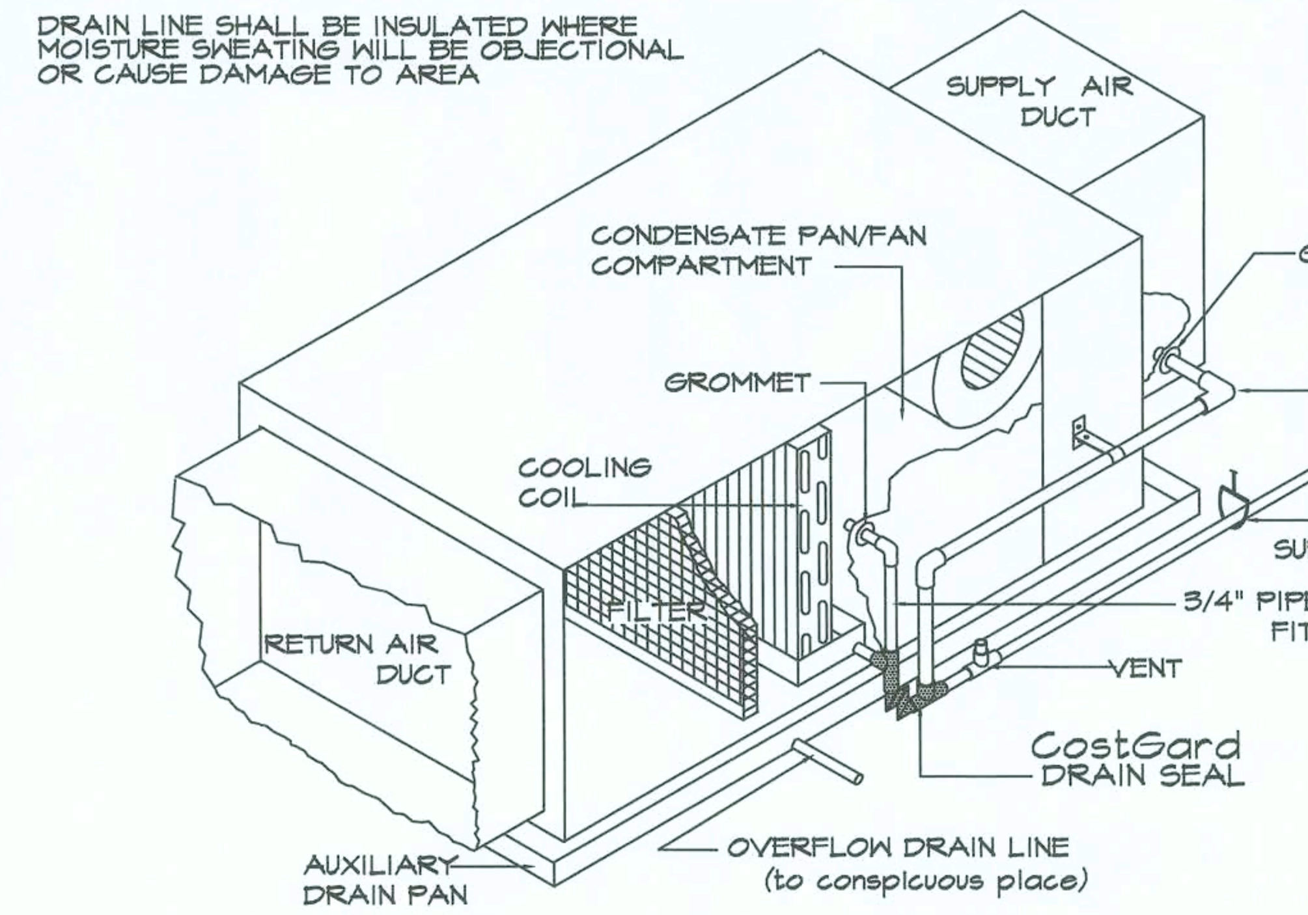


HORIZONTAL AIR HANDLING UNIT WITH WITH ATTACHED DUCT SYSTEM DETAIL

N.T.S.

NOTES:DO NOT ALLOW PIPES TO PROTRUDE THROUGH GROMMETS MORE THAN 3/4".

DRAIN LINE SHALL BE INSULATED WHERE MOISTURE SWEATING WILL BE OBJECTIONAL OR CAUSE DAMAGE TO AREA



COST-GARD CONDENSATE DRAIN DETAIL

NTS

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"Faith is the substance of things hoped for, the evidence of things not seen." Hebrews 11.1

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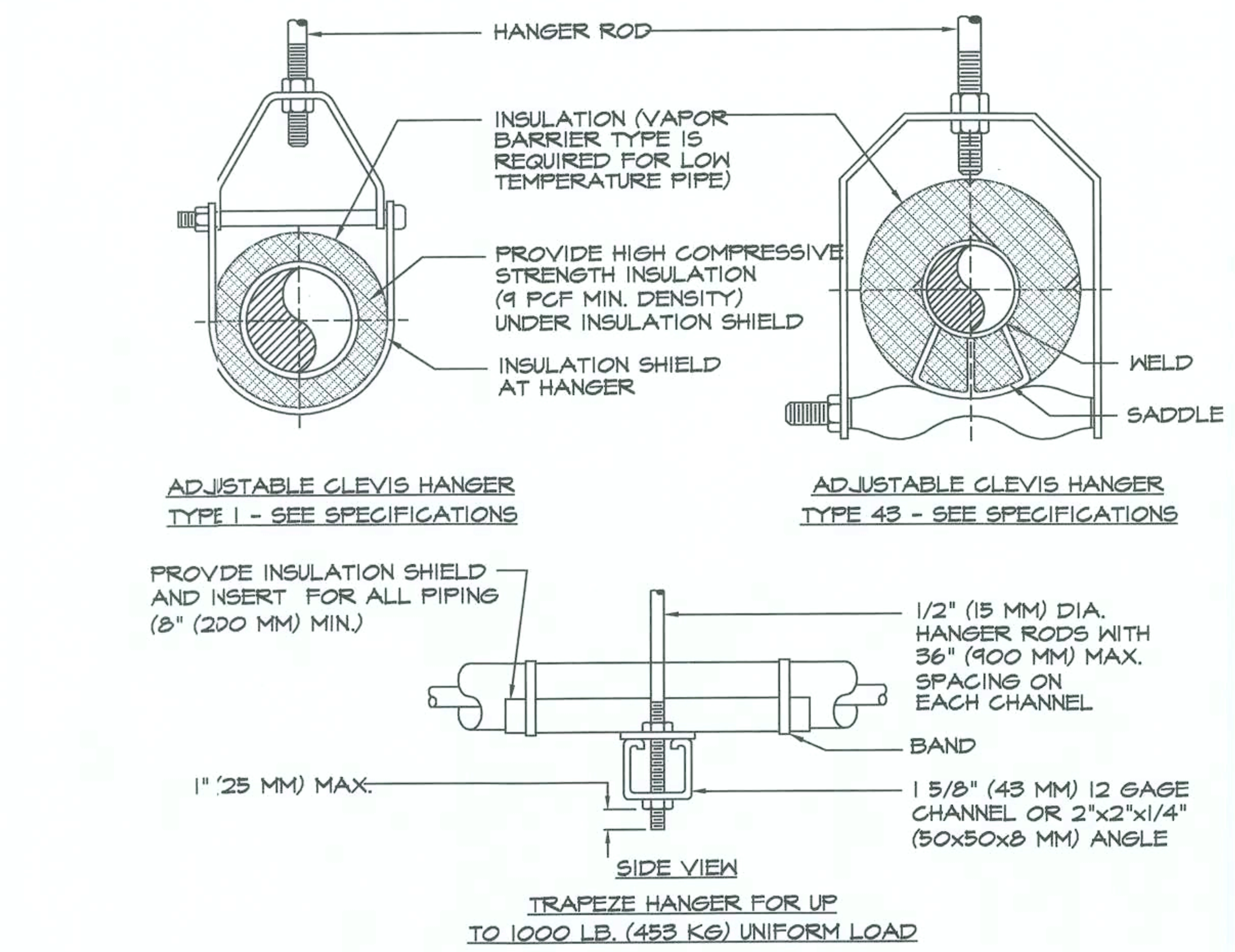
DRAWN E.LOCKE
CHECKED J.BURCH
DATE NOVEMBER 2007
FILE NO AEC
JOB NO 04-816
SHEET

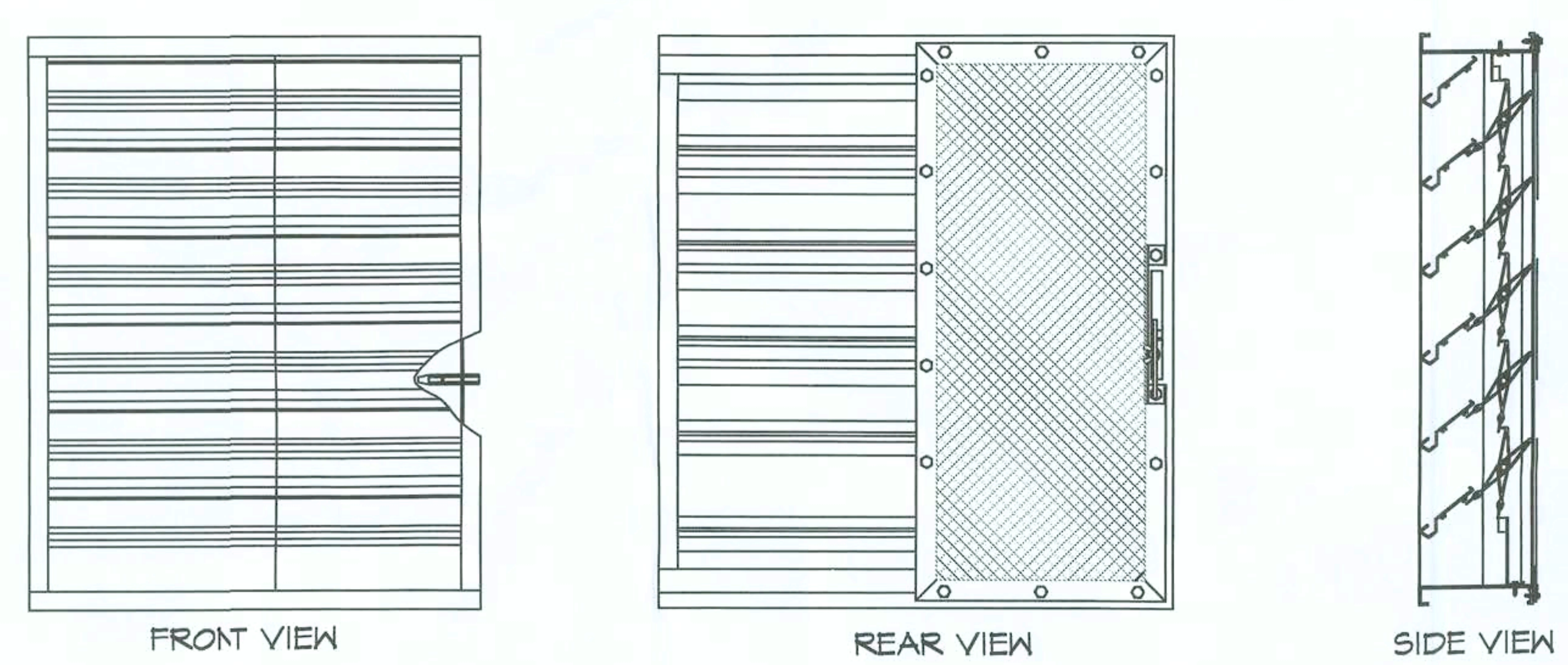
M-4

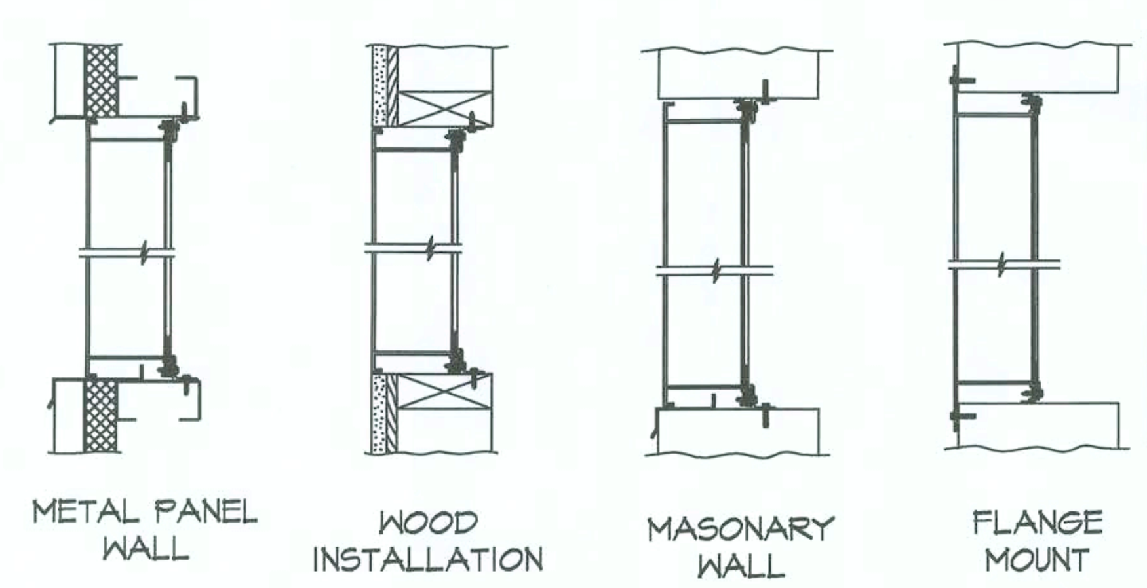


MAXIMUM PIPE/TUBING SUPPORT SPACING																			
NOM. SIZE	IN. (MM)	THRU 3/4 THRU (20)	1 (25)	1 1/4 (32)	1 1/2 (40)	2 (50)	2 1/2 (65)	3 (75)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)
PIPE	FT. (M)	7 (2.1)	7 (2.1)	7 (2.1)	9 (2.7)	10 (3.0)	11 (3.4)	12 (3.7)	14 (4.1)	16 (4.9)	17 (5.2)	19 (5.8)	22 (6.7)	23 (7.0)	25 (7.6)	27 (8.2)	28 (8.5)	30 (9.1)	32 (9.6)
TUBING	FT. (M)	5 FT 5 FT	6 (1.8)	7 (2.1)	8 (2.4)	8 (2.4)	9 (2.7)	10 (3.0)	12 (3.7)	13 (4.0)	14 (4.1)	16 (4.9)	- -	- -	- -	- -	- -	- -	- -
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.																			

TYPICAL PIPE HANGER DETAILS

NTS

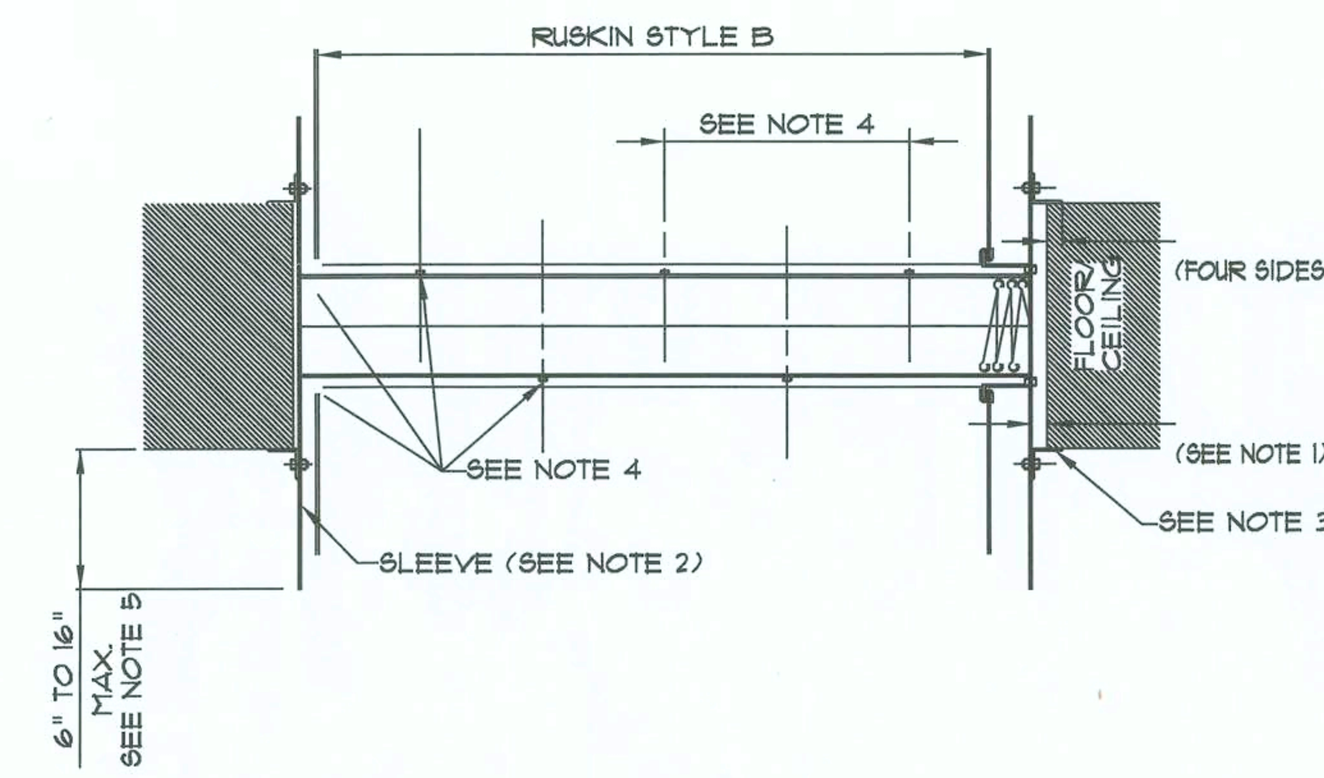




NOTES:
1. VERIFY WALL TYPE PRIOR TO ORDER.
2. OUTSIDE COLOR TO MATCH EXTERIOR WALL FINISH.
3. BUG/BIRD SCREEN TO COVER FULL INSIDE OPENING.
4. LOUVER TO BE RAIN-PROOF TYPE.
5. PROVIDE WITH BACKDRAFT DAMPER & VOLUME DAMPER.
6. USE BURGLAR BARS IF REQUIRED.

WALL MOUNTED LOUVER DETAIL

NOT TO SCALE



HORIZONTAL FIRE DAMPER DETAIL

(1-1/2 HOUR U.L. CLASSIFIED FILE NO. R5531 & R8039)

1. OPENING IN FLOOR SHALL BE A MINIMUM 1/8" PER FOOT LARGER THAN THE OVERALL DAMPER AND SLEEVE ASSEMBLY SIZE FOR GALVANIZED STEEL DAMPERS. MAXIMUM OPENING SIZE SHALL NOT EXCEED 1/8" PER FOOT PLUS 1" FOR GALVANIZED STEEL DAMPERS AND 3/16" PER FOOT. OPENING SHALL NOT BE LESS THAN 1/4" LARGER FOR ANY SIZE DAMPER AND SLEEVE ASSEMBLY.

2. DUCT TO DAMPER SLEEVE CONNECTIONS SHALL BE BREAKAWAY STYLE. RECTANGULAR DUCTS MUST USE ONE OR MORE OF THE FOLLOWING CONNECTIONS: PLAIN S-SLIP, HEMMED S-SLIP, STANDING S-SLIP, REINFORCED STANDING S-SLIP, INSIDE SLIP JOINT, DOUBLE S-SLIP, BREAKAWAY DUCTS MUST USE A 4" WIDE DRAWBAND CONNECTION. THESE CONNECTIONS ARE DEPICTED IN SMACNA FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE.

   DUCTS CONNECTING TO SLEEVES SHALL BE EQUAL TO OR LESS THAN THE SLEEVE THICKNESS. SLEEVE GAGE REQUIREMENTS ARE LISTED IN THE SMACNA FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE AND OUTLINED IN NFPA90A. IF ANY OTHER DUCT TO SLEEVE CONNECTIONS ARE USED, SLEEVE SHALL BE 16 GAGE MINIMUM FOR DAMPER UP TO 36"w x 24"h AND 14 GAGE IF DAMPER WIDTH EXCEEDS 36" OR HEIGHT EXCEEDS 24".

3. MOUNTING ANGLES SHALL BE MINIMUM OF 1-1/2"x1-1/2"x14 GAGE AND FASTENED TO SLEEVE WITH NO. 10 BOLTS OR SCREWS, 1/2" LONG WELDS, OR 3/16" RIVETS. SPACE FASTENERS 6" ON CENTER FOR STAINLESS STEEL DAMPERS AND GALVANIZED. A MINIMUM OF TWO CONNECTIONS ON EACH SIDE, TOP, AND BOTTOM ARE REQUIRED.

   MOUNTING ANGLES FOR GALVANIZED DAMPERS 50"w x 60"h OR 60"w x 50"h AND LESS CAN BE A MINIMUM OF 1-1/2"x1-1/2"x 16 GAGE. MAXIMUM FASTENER SPACING FOR 16 GAGE MOUNTING ANGLES IS 12" CENTER TO CENTER.

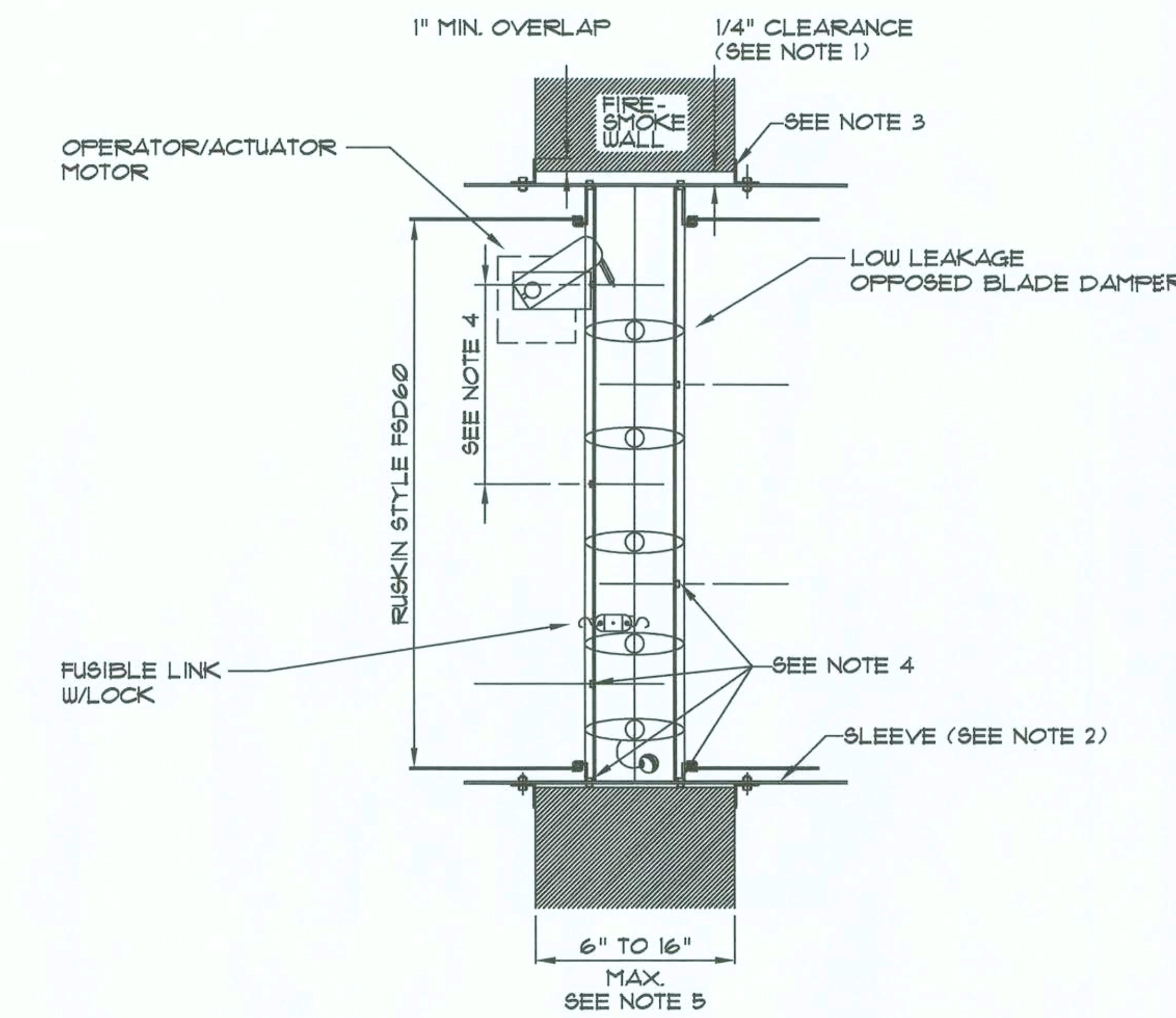
   MOUNTING ANGLES SHALL OVERLAP WALL A MINIMUM OF 1". DO NOT FASTEN OR WELD ANGLES TOGETHER AT CORNERS OF DAMPER. PICTURE FRAME MOUNTING ANGLES CAN BE USED AS SHOWN IN LIEU OF CONVENTIONAL MOUNTING ANGLES (IF APPROVED BY LOCAL OFFICAL).

4. WHEN MULTIPLE DAMPER ASSEMBLIES ARE JOINED OR WHEN FASTENING DAMPER TO SLEEVE, DAMPERS SHALL BE FASTENED WITH NO.10 (M5) BOLTS OR SCREWS, 3/16" RIVETS OR 1/2" LONG WELD STAGGERED INTERMITTENTLY, AND SPACED 12" MAXIMUM ON CENTER FOR GALVANIZED.

5. IF SLEEVES ARE TO BE FIELD SUPPLIED, THEY SHALL BE 10 GAGE TO 24 GAGE STEEL. THE FINAL SLEEVE ASSEMBLY SHALL HAVE INNER DIMENSIONS EQUAL TO THE DAMPER'S OUTER DIMENSIONS.

   DAMPER SLEEVE SHALL NOT EXTEND MORE THAN 6" BEYOND THE FIRE WALL OR PARTITION UNLESS DAMPER IS EQUIPPED WITH A FACTORY INSTALLED ACCESS DOOR. SLEEVE CAN EXTEND 16" BEYOND WALL ON ONE SIDE WHEN SLEEVE CONTAINS A FACTORY INSTALLED ACCESS DOOR. SLEEVE SHALL TERMINATE AT BOTH SIDES OF WALL WITHIN DIMENSION SHOWN.

6. THE STEEL PLATE MULLION SHALL BE SANDWICHED BETWEEN THE DAMPER FRAMES WITH 1/2" LONG WELDS STAGGERED INTERMITTENTLY SPACED 6" ON CENTER. THE MULLION PLATE BETWEEN THE DAMPERS SHALL BE 14 GAGE x 4-1/2" WIDE STEEL PLATE OF DAME MATERIAL AS DAMPERS. LENGTH SHALL BE EQUAL TO LENGTH (PARALLEL TO BLADE) OF TWO OR MORE ADJOINING DAMPERS. MULLIONS ARE NOT REQUIRED FOR ASSEMBLIES CONSISTING OF TWO DAMPERS ATTACHED END-TO-END OR UP TO THREE DAMPERS ATTACHED SIDE-TO-SIDE.



FIRE-SMOKE DAMPER DETAIL

(1-1/2 HOUR U.L. CLASSIFIED FILE NO. R5531 & R8039)

1. OPENING IN WALL SHALL BE A MINIMUM 1/8" PER FOOT LARGER THAN THE OVERALL DAMPER AND SLEEVE ASSEMBLY SIZE FOR GALVANIZED STEEL DAMPERS AND A MINIMUM 3/16" PER FOOT. MAXIMUM OPENING SIZE SHALL NOT EXCEED 1/8" PER FOOT PLUS 1" FOR GALVANIZED STEEL DAMPERS AND 3/16" PER FOOT. OPENING SHALL NOT BE LESS THAN 1/4" LARGER FOR ANY SIZE DAMPER AND SLEEVE ASSEMBLY.

2. DUCT TO DAMPER SLEEVE CONNECTIONS SHALL BE BREAKAWAY STYLE. RECTANGULAR DUCTS MUST USE ONE OR MORE OF THE FOLLOWING CONNECTIONS: PLAIN S-SLIP, HEMMED S-SLIP, STANDING S-SLIP, REINFORCED STANDING S-SLIP, INSIDE SLIP JOINT, DOUBLE S-SLIP, BREAKAWAY DUCTS MUST USE A 4" WIDE DRAWBAND CONNECTION. THESE CONNECTIONS ARE DEPICTED IN SMACNA FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE.

   DUCTS CONNECTING TO SLEEVES SHALL BE EQUAL TO OR LESS THAN THE SLEEVE THICKNESS. SLEEVE GAGE REQUIREMENTS ARE LISTED IN THE SMACNA FIRE, SMOKE AND RADIATION DAMPER INSTALLATION GUIDE AND OUTLINED IN NFPA90A. IF ANY OTHER DUCT TO SLEEVE CONNECTIONS ARE USED, SLEEVE SHALL BE 16 GAGE MINIMUM FOR DAMPER UP TO 36"w x 24"h AND 14 GAGE IF DAMPER WIDTH EXCEEDS 36" OR HEIGHT EXCEEDS 24".

3. MOUNTING ANGLES SHALL BE MINIMUM OF 1-1/2"x1-1/2"x14 GAGE AND FASTENED TO SLEEVE WITH NO. 10 BOLTS OR SCREWS, 1/2" LONG WELDS, OR 3/16" RIVETS. SPACE FASTENERS 6" ON CENTER FOR STAINLESS STEEL DAMPERS AND 12" ON CENTER FOR GALVANIZED. A MINIMUM OF TWO CONNECTIONS ON EACH SIDE, TOP, AND BOTTOM ARE REQUIRED.

   MOUNTING ANGLES FOR GALVANIZED DAMPERS 50"w x 60"h OR 60"w x 50"h AND LESS CAN BE A MINIMUM OF 1-1/2"x1-1/2"x 16 GAGE. MAXIMUM FASTENER SPACING FOR 16 GAGE MOUNTING ANGLES IS 12" CENTER TO CENTER.

   MOUNTING ANGLES SHALL OVERLAP WALL A MINIMUM OF 1". DO NOT FASTEN OR WELD ANGLES TOGETHER AT CORNERS OF DAMPER. PICTURE FRAME MOUNTING ANGLES CAN BE USED AS SHOWN IN LIEU OF CONVENTIONAL MOUNTING ANGLES.

4. WHEN MULTIPLE DAMPER ASSEMBLIES ARE JOINED OR WHEN FASTENING DAMPER TO SLEEVE, DAMPERS SHALL BE FASTENED WITH NO.10 (M5) BOLTS OR SCREWS, 3/16" RIVETS OR 1/2" LONG WELD STAGGERED INTERMITTENTLY, AND SPACED 12" MAXIMUM ON CENTER FOR GALVANIZED.

5. IF SLEEVES ARE TO BE FIELD SUPPLIED, THEY SHALL BE 10 GAGE TO 24 GAGE STEEL. THE FINAL SLEEVE ASSEMBLY SHALL HAVE INNER DIMENSIONS EQUAL TO THE DAMPER'S OUTER DIMENSIONS.

   DAMPER SLEEVE SHALL NOT EXTEND MORE THAN 6" BEYOND THE FIRE WALL OR PARTITION UNLESS DAMPER IS EQUIPPED WITH A FACTORY INSTALLED ACCESS DOOR. SLEEVE CAN EXTEND 16" BEYOND WALL ON ONE SIDE WHEN SLEEVE CONTAINS A FACTORY INSTALLED ACCESS DOOR. SLEEVE SHALL TERMINATE AT BOTH SIDES OF WALL WITHIN DIMENSION SHOWN.

6. FIRE-SMOKE DAMPER TO BE EQUAL TO RUSKIN MODEL FSD60 PER UL555S WITH:
   A) UL LISTED OPERATOR/ACTUATOR MOTOR EQUAL TO FIRE ALARM SYSTEM
   B) AUXILLARY OPERATING JACK SHAFT
   C) FUSIBLE LINK WITH LOCK
   D) NEGATOR SPRING
   E) MOUNTING ANGLES
   F) S-JOINT SLEEVE TO DUCT
   G) LOW LEAKAGE OPPOSED BLADE DAMPERS

REVISIONS	BY

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"Faith is the substance of things hoped for, the evidence of things not seen." Hebrews 11.1

GRACE COVENANT

LAKE CITY, FLORIDA

DRAWN: E.LOCKE
CHECKED: J.BURCH
DATE: NOVEMBER 2007
FILE NO: AEC
JOB NO: 04-816
SHEET: M-5

SECTION 15100-MECHANICAL & PLUMBING SPECIFICATIONS

1.1 SUMMARY:

A. Mechanical Specifications provided in this section and on construction documents are in conjunction to other specifications and documents; when conflict occurs between those noted in bid documents or specifications the most restrictive compliance is required.

B. WARNING: These plans and specifications are each part of an integrated design system. Any modifications, alterations, changes, deletions, additions or substitutions, of or to any specifications(s) or construction document could result in failure of systems designed or property damage, injury, and even death, and requires a full review of the entire system by a licensed professional engineer. Any unauthorized modification of this document may constitute unlicensed practice as a professional engineer and may constitute a felony as set forth by state law.

1.2 QUALITY ASSURANCE:

A. The Contractor shall not fabricate or order any equipment, air distribution, piping or materials until he/she has verified that sufficient clearances are available for the installation of HVAC systems or plumbing materials considering requirements for piping, light fixtures, ceiling systems, floor systems, foundations, and/or structures.

B. During the construction document phase Engineer has attempted to obtain all the data necessary for adequate design of facility mechanical, HVAC, plumbing, piping systems, etc. However, some of the required floor plans, elevations, civil-site data, wall details, construction sections, building framing systems and fire rated information were not available. Therefore, it is the expressed requirement that no systems be fabricated, ordered, installed or manufactured until site has been visited and sufficient clearances are field verified for satisfactory installation. Any individual or firm not exercising this effort will place complete financial responsibility on themselves or others with no reimbursable expense or approved change orders for said action.

C. Drawings are diagrammatic and indicative of work to be furnished and installed under this contract; refer to architectural, structural, civil and foundations documents for all dimensions.

D. The terms "provide" and "install" shall be considered synonymous with "furnish" and "install".

E. All work shall be installed in a workmanlike manner by experienced tradesmen with at least 5 years experience in this type project.

F. The submission of a bid or proposal will construed as evidence that the Contractor has familiarized himself/herself with the plans, specifications and building site. Claims made subsequent to the proposal for materials and or labor due to difficulties encountered will not be recognized, unless difficulties could not have been foreseen even though proper examination had been made.

G. Equipment, fixtures, ductwork, dampers, louvers, grilles, registers, diffusers, piping and/or other items noted shall conform to the latest editions of the following:

1. ASHRAE
2. 2004 Florida Mechanical Code with Amendments
3. SMACNA
4. NFPA
5. AMCA Standard Handbook 99
6. Air Diffusion Council Test Code 1062R3
7. ANSI
8. ASME
9. AGA
10. UL Fire Resistance Directory
11. 2004 Florida Plumbing Code with Amendments
12. Governing Health Regulations
13. Environmental Regulations
14. BOCA Codes
15. Any Local Governing Regulations

H. Deviation from materials, methods and procedures set forth herein must be approved in writing by the Engineer. Approval will not be given unless the Engineer is satisfied that the proposed systems is superior in performance, durability, longevity, and reliability to that specified.

I. Approvals of equipment or systems, by the Engineer, must be in written form no less than ten (10) working days prior to project bid date. Any contractor, sub-contractor, manufacturer or representative wishing to bid equal products must comply with this mandatory requirement. Failure to get pre-approval of systems or products prior to this date will result in immediate "NOT APPROVED" signature from Engineer during shop drawing review phase.

J. Systems on schedules, specifications and construction documents are basis for design only; other systems and manufacturers may be approved at review by Engineer.

K. Contractor and sub-contractors must pre-qualify with the Engineer prior to bidding project. Qualifications will be reviewed based on contractors/sub-contractors experience with systems proposed, type of facility, time in trade, quality of workmanship, and experience with the Engineer.

L. Contractor or Owner shall not operate HVAC systems, equipment or fans during construction. Failure to comply with this specification item will result in complete cleaning of all fans, blowers, filters, ducts and air distribution systems with approval by Certified Indoor Air Quality Professional.

M. All air distribution systems, piping, equipment, fans, hoods, etc. shall be properly supported from building structural system in compliance with architect and structural engineer requirements; products may NOT be supported from knee trusses or bottom cord-frame wood or steel systems without written approval.

N. In order to comply with Indoor Air Quality standards building mechanical systems may be operated for facility "off-gasing" procedures once Owners have obtained professional services of Certified Indoor Air Quality Professional. If professional is not obtained systems shall not be operated as so noted above.

O. Contractor shall maintain a clean and healthy work premise at all times and shall clean construction site of all his/her debris at the completion of the job or as requested by Owner's representative; this is required prior to release of final project payment to contractor.

1.3 GUARANTEE/WARRANTY:

A. All work and materials shall be guaranteed/warranted (parts and labor) for a period of one year from date of FINAL acceptance by Owner. An additonal warranty (parts only) shall be included for a period of four (4) years on all compressors and nine (9) years on all heat exchangers.

1.4 SUBMITTALS/PROJECT MANUALS:

A. Contractor shall supply, to the Engineer, five (5) sets of submittals (in three binder form) for approval on the following:

1. Air Distribution Materials (turning vanes, extractors, spin-in, diffusers, grilles, registers, louvers, etc.)
2. Heating, Ventilation and Air Conditioning equipment
3. Dampers
4. Fans
5. Insulation Materials
6. Controls
7. Plumbing Fixtures
8. Valves, Arrestors, Supports, Circuit Setters, etc.
9. Isolation Devices and Materials
10. Hangers
11. Pumps

B. All submittals must be APPROVED, in writing, by the Engineer prior to contractor ordering or project delivery.

C. Contractor shall provide a complete set of reproducible (sepia) "as-built" documents of all equipment, systems, air distribution, controls, piping, etc. This documents shall be provided at the completion of the project and prior to Owner acceptance. As-built documents shall include the location of all cleanouts, shut-off valves, balancing valves, dampers, extractors, etc. with the dimensional location of all exterior utilities. Failure to comply with item will result in Architects/Engineers completing effort with professional services payable by this contractor. Marked-up blueprints by contractor will not constitute compliance with this specification.

D. Operation Instructions/Manuals:

a) Upon completion of work contractor shall supply to the Owner a minimum of four bound sets of all work, tests and necessary instructions for the complete operation and maintenance of all equipment and products installed.

b) Contractor must provide at least a forty-eight (48) hours notice to Owner of training task for Owner personnel on operation and basic maintenance all systems installed; training period shall not be less than one (1) eight work day.

c) Manufacturer's advertising information or catalogs will not be accepted for operating and maintenance manuals.

d) Operation and Maintenance Manuals shall include:

1. maintenance and operating instructions for all equipment and products installed at this job
2. characteristics and curves of all equipment
3. date on all the equipment and products installed to include item, make, model, capacity, electrical characteristics, etc.
4. name, address and telephone number of service agent

1.5 TEST AND BALANCE:

A. A complete certified test and balance report shall supplied by an independent certified test and balance agency per AABC Test and Balance Report Manual (latest edition); this action must take effect prior to Owners final acceptance of the facility. This agency shall actually be an active member, with at least 5 years membership, certified and in good standing with AABC or NEBB national organizations. Licensed professional engineer (PE) working as certified firm agent will not be approved as qualification for this effort.

B. Once Owners have occupied facility agency shall again re-visit site and re-adjust systems based on actual space usage. If this event occurs during one season (cooling or heating) agency shall make an additional adjustment during other remaining season (heating or cooling), as required.

C. Testing shall be for all air distribution, hydronic systems, equipment, fans, controls, dampers, etc.

D. Air distribution devices shall be in compliance with construction documents; Test and Balance agency shall provide all sizes, quantities, and "velocities" noted in documents; air velocities (FPM) not indicated in bid documents shall still be recorded at each device for Engineer review; failure to record both CFM's & FPM's will result in complete system retesting and balance; each air device indicated in documents will include the following typical information at either actual product or as so indicated in schedules:

*Product Face Size Type & Air Pattern
15"x 15" - CD-4
Quantity (CFM's) Velocity (FPM's)
300 - 550
Branch duct size serving air device
w/10"

*does not include T-bar panel or framing

E. Actual air velocities (FPM) and sound levels MUST be accurately tested and recorded at each air distribution device. See Diffuser, Grille & Register Schedule for additional information. The purpose of this action is to determine if the sound waves and air moving qualities are performing as designed-engineered. Failure to provide this requirement will result in rejection and not-approved status of certified report.

F. Certified Test and Balance agency shall be approved by the Engineer, prior to bidding project.

G. All domestic hot water systems shall also be tested and adjusted to meet design requirements as required by governing codes or as so noted in specifications.

H. All building structures shall have air balance systems to assure slight positive air pressure via designed mechanical systems; this effort shall be field verified by either digital manometer or blower door method; readings to be recorded during typical occupied building usage; additional building spaces maybe required to be tested at request of project Engineer.

1.6 EQUIPMENT/SCHEDULES/FIXTURES:

A. All equipment schedules, fixtures and construction document information notes are hereby noted in specifications and construction documents.

B. All roof curbs for fans, outside air intakes, exhaust and equipment shall be provided and installed by this contractor; coordinate with roofing contractor for all roof systems.

C. Equipment foundations for HP units shall be reinforced concrete 6" thick with pad 6" wider and longer than unit; provide 12" pea-gravel trench, framed in 2" x 12" treated lumber (12" in depth) around entire concrete pad for system defrost and drainage.

D. AHUs shall have spring type vibration isolators as manufactured by Mason Industries; isolator products shall properly sized with minimum of one inch deflection.

E. Materials and products specified shall be listed by the Underwriters Laboratories (UL) or National Electrical Manufacturer's Association (NEMA).

F. All AHU's shall have one inch "carbon-pleated" air filters at units equal to American Air Filter (Amair/C) or Precisionaire (Pre-Pleat AC) with carbon rated at MERV 6 per ASHRAE 52.2-1999; fiberglass throw-away type filters are NOT acceptable; provide one extra set of filters to Owner after final acceptance.

G. Locate all equipment which must be serviced, operated and/or maintained in fully accessible position based on manufacturer recommendations, code requirements, or as so indicated in drawings. Contractor shall review equipment vendor installation instructions for compliance and guidelines to assure proper air movement, component replacement, etc. Doors for access to electric heating coils shall have disconnect switch to break circuits as door is opened. Furnish all doors/panels in accordance with local codes and manufacturer's recommendations for each control valve, control, damper, motor, or other device requiring service.

1.7 REFRIGERANT PIPING:

A. All piping sizes shown are clear net inside dimensions.

B. Refrigerant piping shall be sized and installed in strict accordance with the manufacturer's recommendations for liquid, vapor horizontal and vapor risers. If piping is not indicated on drawing documents then contractor shall immediately assume that corresponding AHU and HP numbers shall match with piping routed above finished ceiling areas to inside cavity of outside walls. Routing must be sloped, pitched, trapped (with double suction risers) in compliance with manufacturer recommendations. Place steel or metal guard over any piping subject to structural framing nails, anchors and screws.

C. Refrigerant tubing shall be installed with a moisture indicator sight glass located in the liquid line adjacent to the outdoor unit.

D. Thoroughly clean refrigerant pipe and fittings before assembly. All joints are to be made with silver alloy braze with melting above 1100 F. No acid flux shall be used on any joint or pipe.

E. Refrigerant piping under slab floors or below grade shall be installed in PVC schedule 3034 material; piping shall be sized sufficient to allow installation of refrigerant piping, with insulation; seal open ends with proper sealant material and slope per manufacturer recommendations.

F. Brazing Materials: Comply with SFA-5.8, Section II, ASME Boiler and Pressure Vessel Code for brazing filler metal materials appropriate for the materials being joined.

G. All refrigerant piping materials shall be of the following:

1. Refrigerant Piping
   a. below floor-type "L" soft copper
   b. above floor-type "L" hard copper
2. Insulation
   a. refrigerant piping shall be equal to Armaflex (3/4" thickness) with aluminum jacket and plastic "Zeston" fitting covers
3. Pipe Hangers
   a. pipe hanger spacing and sizing shall be in accordance with Section 308 of International Code Congress Standard Plumbing Code (2006); hanger strap or bands will not be permitted

1.8 PLUMBING/CONDENSATE DRAIN PIPING:

A. All condensate drains shall terminate to earth area, indirect waste drains, dry-wells or french drains with concrete pipe minimum 24" in diameter at 24" height filled with pea gravel and 12" sand bed bottom approximately 36" in diameter with approved lid cover and anchored drainpipe not less than 6" below grade; provide through condensate control device as manufactured by Trent Technologies, in Tyler, Texas called "CostGard"; deep seal P-traps with cleanouts are NOT acceptable for condensate drains at equipment.

B. Unless otherwise noted, all water piping shall be routed above sheet-rock ceilings and/or in walls or chases with offsets, as required, to miss obstacles; coordinate with other trades prior to installation.

C. No PVC piping or other materials shall be routed or installed in return air plenums or free pulling mechanical rooms; insulate vent stacks with PVC materials in these areas with 2" external R-6 duct wrap with FSK foil backing and vapor seal with SMACNA approved tape.

D. Water piping below slab floor and finished grade shall be sleeved with 3/4" Armaflex tubing insulation; insulation minimum length shall be three feet; piping shall be tested at 300 PSI prior to earth fill and covering.

E. Water hammer arrestors shall be installed at all water closets, urinals, drinking fountains, washing machines, dishwashers, & tubs/showers in accordance with PDI-WH201 & ANSI/ASEE-1010-1996 as manufactured by Wade or Sioux Chief. Devices to be installed within 6 feet of valve served in hot & cold water lines. Size shall be "A" unless noted otherwise. Vent stacking is not permitted for water hammer arrestors.

F. All copper pressure piping for potable water and condensate drains shall be soldered entirely with silver solder with less than 0.2% lead per ICC-SBCCI Standard Plumbing Code.

G. All water piping must be disinfected in accordance with ICC-SBCCI Standard Plumbing Code and verified by written report from the local and State Boards of Health.

H. Utility connections indicated on documents are the best information available to the design engineer and shall be field verified by the contractor prior to installation.

I. All piping inverts will be established after finished floor elevations and utility sewer inverts are determined.

J. Prior to cover-up or back-fill of soil-waste-vent piping (below finished grade/floor areas) systems shall be filled with water and tested at ten (10) foot head with all fittings and joints open for review by Engineer and/or local building inspection department. Any piping not inspected will be removed with damages to be fully repaired by this contractor. After plumbing fixtures have been set and their traps filled with water the entire sanitary sewer system shall be tested with air pressure of not more than 0.1 inches of water column and smoke peppermint test. Perform the air an smoke test with an approved smoke testing machine which will show a clear passage of smoke and air throughout the entire system. The system shall be proven absolutely tight under such test.

K. All water piping shall be tested at a minimum of 150 PSI for 2 hours, with no leaks, prior to insulation or connections to local utilities; review of test shall be by Engineer or local utility official.

L. Route all temperature-pressure relief lines to outside per ICC-SBCCI Standard Plumbing Code.

M. Route all vent lines to common stacks in order to limit roof penetrations; roof penetrations shall be routed to backside of roof at all times; verity locations and slopes at site.

N. All piping sizes shown are clear net inside dimensions.

O. All piping materials shall be of the following:

1. Soil-Waste-Vent Piping
   a. schedule 40 PVC (solid) with solvent welding; thin-wall or core type walls (coextruded core) are NOT accepted except for venting systems only
2. Potable Water Piping
   a. below floor-type "K" soft copper (pressure tested) in compliance with ASTM-B.88
   b. above floor-type "L or M" hard drawn copper with ANSI-B16.8 & ASME-B16.22 soldered joint fittings with 95TA tin-antimony soldering; may use Rigid Viega ProPress fitting system in accordance with manufactuere's published instructions
   c. stop valves shall be bronze ball valves with stainless steel balls & Teflon packing & gaskets
   d. contractor may use cpvc material in compliance with ASTM-D2846 & SDR11 above finished floor for lines up to 2" with schedule 80 cpvc for lines above 2"; all must be approved by local Authority Having Jurisdiction
3. Condensate Piping
   a. copper type "L or M" hard drawn or
   b. schedule 40 PVC with solvent welding
4. Insulation
   a. ALL potable water piping, including hot water, hot water return and cold water piping (in non-conditioned areas and outside walls) shall be 1" thick fiberglass insulation (ASTM C547) with Universal jacket (secured with Foster 85-75); provide protection blocking & shields at each hanger; fittings shall be furnished with "Zeston" plastic fitting covers; all joints shall be finished with Foster 30-36 & reinforced with 20x20 glass fabric; Armaflex, RubaTex or similar tubing insulation is NOT approved
   b. All roof drains shall be insulated with 3/4" Armaflex tubing type material for rated plenum systems from roof drain areas to vertical lines inside insulated walls
5. Pipe Hangers
   a. pipe hanger spacing and sizing shall be in accordance with Section 308 of Florida Plumbing Code 2004 edition with Admendments; hanger strap or bands will not be permitted
   b. hangers shall be Fee & Mason Figure 364 with Figure 227 adjustable for copper pipe
   c. hangers for horizontal sanitary piping shall be expansion ring or clevis type spaced no more than 5 feet apart; vertical pipe passing thru slabs shall be supported with Fee & Mason Figure 241 riser clamps
6. Cleanouts
   a. floor cleanouts (FCO) to be equal to Wade #W-6030-SV-2TS
   b. outside cleanouts (COTG) to be equal to Wade #W-6030-SV-2 in 18" square by 6" thick concrete pad flush with finished grade
   c. wall cleanout (WCO) to be equal to J.R. Smith #4420
7. Valves
   a. ball valves equal to Hammond #806
   b. check valves equal to Hammond #915
8. Meters
   a. water meter/regulators equal to Hays Model MT Series in underground vault with traffic lid per local code
9. Backflow Preventors
   a. equal to Watts Model 909QT in underground vault with traffic lid per local code

P. All water piping, outside building, shall be buried minimum of 18" below finished grade for freeze protection in accordance with 2004 Florida Plumbing Code.

Q. All floor drains or floor sinks serving ice machines or similar products shall be insulated with sealed 1/2" Armaflex tubing material from drain to a minimum of 10 feet down stream; purpose is to prevent possible condensation issues; actual length maybe increased if so deemed necessary by Engineer.

R. All trap primers for floor drains shall be sloped to allow proper water discharge for primers to floor drain unit.

S. Upon completion of project contractor shall fill all floor drain traps with liquid mineral oil for air tight seal.

1.9 PIPING SPECIALTIES:

A. Escutcheons: Chrome-plated, stamped steel, hinged, split-ring escutcheon, with set screw. Inside diameter shall closely fit pipe outside diameter, or outside of pipe insulation where pipe is insulated. Outside diameter shall completely cover the opening in floors, walls, or ceilings. All exposed pipes, refrigerant lines and/or water piping & drains under cabinets or counters shall have escutcheons installed; this action also applies to piping systems installed in mechanical rooms, outside structures or other exposed areas.

B. Unions: Malleable-iron, Class 150 for low pressure service and class 250 for high pressure service; hexagonal stock, with ball-and-socket joints, metal-to-metal bronze seating surfaces; female threaded ends.

C. Dielectric Unions: Provide dielectric unions with appropriate end connections for pipe materials in which installed (screwed, soldered, or flanged), which effectively isolate dissimilar metals, to prevent galvanic action, and stop corrosion.

D. Dielectric Waterway Fittings: Electroplated steel or brass nipple, with an inert and non-corrosive, thermoplastic lining.

E. Y-Type Strainers: Provide strainers full line size of connecting piping, with ends matching piping system materials. Screens shall be Type 304 stainless steel, with 3/64" perforations at 233 per square inch.

F. Sleeves:

1. Sheet-Metal Sleeves; 10 gage, galvanized sheet metal, round tube closed with welded longitudinal joint.
2. Steel Sleeves: Schedule 40 galvanized, welded steel pipe, ASTM A53, Grade A.

G. Mechanical Sleeve Seals: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

H. P-Traps and water piping underneath handicapped lavatories, sinks and drinking fountains shall be wrapped with "HANDI LAV-GUARD" kits per American With Disabilities Act, as manufactured by Truebro, Inc.

I. Contractor shall maintain the integrity of all fire walls, structures, ceilings and floor systems with "METACAULK" approved fire system materials per UL-CAJ2134 (ceiling-floor systems) or UL-WL2135 (wall systems); verify actual ratings with architectural construction documents; contact manufacturer "RECTORSEAL" at 800-231-3345 for additional information.

1.10 AIR DISTRIBUTION:

A. All air distribution shall be air tight and free of leaks, and must be inspected for leaks prior to installation of fan units or finished ceiling/floor systems; ductwork shall be sealed with air duct sealer per SMACNA Standards and UL ratings.

B. All supply, return, exhaust and outside air ducts shall be galvanized metal with 2.3" external insulation having vapor, retarding jacket (FSK type) with R-8.5 value equal to Johns Manville "Microlite"(formaldehyde-free product). Insulation shall comply with UL 181 and must have flame spread rating of 25 and a smoke developed rating no higher than 50. Apply white mastic fire rated duct insulation sealer to all joints and seams per SMACNA Standards.

C. No ducts shall be internally insulated, unless otherwise noted.

D. Fibrous Ductboard systems are NOT approved.

E. Install flexible duct connectors at all fans, air handling units, roof-top-units, package units and other air moving equipment.

F. All ducts are to have air extractors (adjustable type) on square or rectangular take-offs with spin-in volume dampers (no scoops) on round or oval take-offs.

G. Square or rectangular 90 degree and 45 degree elbows shall have "air-foil" type turning vanes, installed per SMACNA Standards.

H. Flexible ducts must comply with UL 181 and shall not exceed six feet in length; remaining branch line shall be galvanized metal with R-6 external insulation and white fire mastic sealant; flexible ducts are to have foil backing (FSK type).

I. The interior face of all ductwork housing supply, return and exhaust air diffusers, registers or grilles shall be painted "flat-black" so when viewed from below and above nothing beyond surface of air device is visible.

J. Wherever the depth of a trunk duct is less the round runout duct diameter noted contractor shall provide transition fittings (manufactured) of equivalent area to the round duct.

K. All exhaust (including plumbing vents) shall be separated at least ten (10) feet from air intakes.

L. Fire dampers shall be rated at a minimum of 2 hours per UL555, equal to RUSKIN, with approved access doors (insulated); dampers shall be FREE area type.

M. Install backdraft dampers, volume dampers, insect screens and approved weather proof wall louvers or door grilles on all outside air intakes.

N. All duct sizes shown are clear net inside dimensions.

O. Ducts shall be properly supported from structure per SMACNA Standards.

P. All square or rectangular ducts 24" wide or larger shall be connected using "Ductmate" type fittings; bar locks, "S" locks, etc. for larger ducts will NOT be accepted for joints; joints smaller than 24" shall be screwed bar lock type with drives & mastic duct sealer.

Q. Galvanized metal ducts must be constructed in compliance with SMACNA "HVAC Duct Construction" manual 2nd edition (1995) with Addendum No. 1 (11/97) for G90 material using US Steel products; other galvanized metal from other countries (outside the USA) shall be constructed of the following minimum gauge requirements using either cross-breaking, bead construction or mechanical stiffeners:

1) 10" & down. . . . . 26 gauge
2) 11"-18" . . . . 26 gauge
3) 19"-20" . . . . 24 gauge
4) 21"-24" . . . . 22 gauge
5) 25"-26" . . . . 20 gauge
6) 27"-36" . . . . 18 gauge
7) 37"-48" . . . . 16 gauge
6) 49" & up. . . . . must verify with Engineer

Failure to comply with this requirement will result in complete product removal and replacement at no additional cost to owner.

R. Provide 1" duct liner as indicated in Mechanical Material Schedule for all AHU's & EF's for acoustics using Johns-Manville "Permacote Linacoustic R-300"; material shall be properly applied, clipped and sealed per SMACNA Standards; products to have hospital sealer with biological treatment; apply lining to both supply and return ducts but NOT outside air intakes.

S. All supply, return & exhaust air ducts shall have galvanized elbows with 2.3" (R-8.5) external duct insulation at diffusers, grilles or registers; this requirement is to prevent air restrictions caused by typical flexible duct materials.

T. All supply main trunk ducts shall extend minimum of 24" beyond last air distribution device for "cushion-head" air balance effect; failure to comply with this request will demand field adjustment by installing contractor at each branch line with new control products and additional re-testing by certified test-n-balance agent.

1.11 SPECIAL PROJECT NOTES:

A. Entire building shall be pressure tested during certified test-n-balance effort to assure positive building pressure of at least 2.5 pascal. Other rooms in building shall also tested based on the following requirements:

1. toilet rooms, lockers, kitchens, outside storage or electrical rooms shall be under negative air pressure from 0.0 to -.1 pascal
2. office areas, work rooms, sanctuary rooms, class rooms, etc. shall be under positive room pressure from 0.00 to 2.5 pascal

Certified room map testing and recording shall be submitted with certified system report by project approved certified test and balance contractor. Project will not be accepted until this effort has been approved by project engineer.

B. Facility materials used during the construction and operation of building shall in compliance with government regulations for indoor air quality contaminants. Typical levels shall not exceed time weight averages (TWA) for CO (carbon monoxide) of 9 parts per million for 8-hour sampling, CO2 (carbon dioxide) 1000 ppm (TWA) or formaldehyde 0.1 ppm (TWA).

C. Water and sewer systems shall connect to local utilities; verify at site prior to installation and connection; if existing systems are not adequate to handle additional load requirements then contractor shall immediately notify Owners and Engineers.

D. Water heaters shall be mounted in steel pans with drain routed to outside area per code.

E. Provide 7-day, 24-hour PARRAGON quartz time clocks, with battery back-up, for all water heaters and exhaust fans; locate clock at each device for easy programming and set-up.

F. Install chrome drainage pipe at all sinks, lavatories and water coolers from P-traps with tail-piece to wall sleeve; material to be same size, gauge and type as device specified; PVC products shall not be used for any exposed components (unless otherwise noted).

REVISIONS	BY

ARCHITECTURE/PLANNING/URBAN DESIGN/
CONSTRUCTION MANAGEMENT AIA/APA

"Faith is the substance of things hoped for, the evidence of things not seen." Hebrews 11.1

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TMA
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INTERNATIONAL

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CHECKED	J.BURCH
DATE	NOVEMBER 2007
FILE NO	AEC
JOB NO	04-816
SHEET	MP-1

11-20-07

G. Some supply, return or exhaust air diffusers, grilles or registers are shown on drawings directly below main air trunk ducts for information only; these lines must be routed in such manner as to prevent direct sound noise from main trunk ducts by either side line tap-in with 3 foot flexible duct extensions or bottom drops with same length flexible ducts; verify exact requirements in field with finished ceilings prior to installation.

H. Water piping over 50 feet in "straight" length shall have pipe expansion joint to prevent leaks due to building & thermal movement; expansion joint loop maybe used in lieu of mechanical fitting if approved by project engineer.

I. All domestic hot water piping in facility shall be delivered at 140 degrees F to last fixture from tank unit unless otherwise noted; this is a mandatory requirement in an attempt to control bacteria growth inside systems such as Legionella; tempered mixing valves shall be installed at each point-of-use in compliance with the American Society of Safety Engineers section 1016 for all showers, bath-tubs, lavatories and sinks; these devices shall be Type T/P for control of both temperature and pressure as noted in ASSE 1016 with water tempered for delivery at 110 degrees F.

J. Back side of all ceiling diffusers, return air grilles and exhaust air registers shall have factory applied foil-faced, R-6 insulation with 181 UL rating formed to fit contour of product back; insulation shall be continuously glued and sealed around outer perimeter of outer cone to form vapor tight seal; contractor shall seal insulation on connecting duct at product to form a vapor tight seal at duct connection; approved sealant or foil-faced UL approved duct tape maybe used with fire rated mastic as noted in specifications.

K. Contractor may use "air admittance valve" in soil-waste-vent plumbing systems as approved by local code for venting systems; products shall be as manufactured by Studor for models: Mini-vent, Maxi-vent, Redi-vent or Tec-vent (plenum systems) with no approved equals. Vents must be checked or serviced in compliance with vendor requirements; submit revised SWV plumbing riser indicating items if not so indicated in current documents; products must be installed as recommended by installation and technical manuals from Studor; verify approval prior to bid effort.

L. During the entire construction phase of project HVAC contractor shall make every effort to maintain a clean and healthy duct or air distribution system. This action shall include, but not be limited to, completely capping each open duct end, including branch ducts and intakes, with minimum 6 mil plastic material. Failure to comply with this requirement may result in complete duct/system cleaning, flushing and inspection by engineer approved certified agents with associated cost paid by project HVAC-mechanical contractor. The purpose of this effort is to assure overall system indoor air quality.

M. Extra effort was made during design to determine building room height requirements and available space. The documents provided herein are "not" shop or fabrication drawings and shall not be treated as such. It is the bidding contractors responsibility to review all drawings, specs, addendum, details, etc. prior to bid effort. Once contract has been awarded, and after engineer has approved submittal package, contractor may start shop drawing effort. These documents MUST be submitted to architect, structural engineer, general contractor and project mechanical engineer for review. Any fabrication without site visit for verification of available space will not be approved.

1.12 APPROVED MANUFACTURERS

A. The following manufacturers are approved for products specified on construction documents:

1. PLUMBING SYSTEMS
   a) Water Closets: Kohler, American Standard or Mansfield
   b) Urinals: Kohler, American Standard or Mansfield
   c) Lavatories: Kohler, American Standard, Elkay or Dayton
   d) Sinks: Kohler, American Standard, Elkay, Silver Cast or Dayton
   e) Floor Drains: J.R.Smith or Zurn
   f) Floor Sinks: J.R.Smith or Zurn
   g) Cleanouts: Wade or Zurn
   h) Valves: Hammonds or Chicago
   i) Faucets: Kohler, American Standard, Mansfield, Delta or Chicago
   j) Water Coolers: Oasis or Hawsley Taylor
   k) Water Heaters: A.O.Smith, Rheem/Ruud or State

2. HEATING & AIR CONDITIONING
   a) Carrier, Trane, or Lennox

3. VENTILATION
   a) Greenheck, Acme, Penn or Cook

4. AIR DISTRIBUTION
   a) Metalaire, Carnes or Titus

1.13 IDENTIFICATION:

A. Equipment and piping identification marking shall be black stenciled 3/4" high letters applied over finished painting and shall comply with ANSI specifications, local codes or as herein described. Identification must include unit number, area served, flow direction (air, water, refrigerant, gas, etc.) and material type (supply air, return air, exhaust air, chilled water supply, chilled water return, etc.). All valve tags are to be applied to valves controlling main, risers and branches. Valve tags shall be plastic not less than 7-1/2" wide with 3/4" high stamped numbers and coded lettering.

B. All equipment, air distribution and piping shall be properly identified and labeled for easy understanding of systems and flows.

C. Water and refrigerant piping shall be labeled with painted color stencils (minimum 1" high) indicated material type (hot, cold, discharge, liquid, etc.) with flow direction.

D. Duct systems (supply, exhaust, and return) to be labeled (same as piping) with directional arrow for air flow; labeling must be at equipment and every 20 feet of systems.

1.14 ELECTRICAL/CONTROLS:

A. All air handling units (AHUs) shall have in-line smoke detector installed in supply air plenum, as so noted in construction documents; detectors shall be type as manufactured by "Honeywell", "Johnson-Controls" or approved equal for photoelectric-ionization type for 24 volts DC; units shall automatically sound audible alarm, turn-off fans and send signal to fire control alarm panel per NFPA72; contractor must provide and install detectors, compatible with fire alarm system, with necessary wiring, controls and transformers; if detectors and wiring are provided by fire alarms contractor then HVAC contractor shall install detectors in ducts; if detectors are not compatible with fire alarm system contractor shall purchase correct units to maintain fire alarm system certification and warranty; all system smoke detectors to have remote indicator light systems located in ceiling area directly above room thermostats served by controlled unit (verify exact location prior to installation).

B. All controls, wiring, relays, transformers, starters, disconnects and accessories for HVAC systems and equipment shall be under this contractor for a complete heating, ventilation and air conditioning system.

C. Room thermostats shall be equal to Carrier Model "thermidistat" mounted at 54 inches above finished floor; thermostats to be programmable type with night set-up/set-back and 7-day clock functions with battery back-up; digital thermostat controls shall be with bi-metallic actuated adjustment sensing elements and have internal mounting plate and tamper proof blank cover plate in lieu of locking cover device; if manufacturer can not provide tamper proof product then locking cover product maybe substituted (with approval from Engineer); heat pump units shall have outdoor thermostats; all indoor fans shall be cycled "on" (SMART fan control) during normal occupancy for facility air balance with system operating at "auto" fan position during unoccupied periods; heating and cooling cycles must be AUTO switched type; control contractor shall guarantee the control system installed to be free from defects and must provide service for one full year after date of final acceptance by Owner.

D. All control wiring shall be plenum rated cable; wiring in walls & exposed locations shall be installed in EMT per latest edition of the National Electrical Code, with correct turns and pull-boxes.

E. Motor starters shall be supplied by HVAC Contractor and installed by Electrical Contractor; motor starters must be approved with automatic controls capable of making frequent starts as device demands; horsepower rating each starter shall not be less than the motor it controls; each starter shall be equipped with a TwinBreak type contact for each ungrounded line to motor.

1.15 PIPING INSTALLATIONS:

A. Ream ends of pipes and tubes, and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag and dirt for both inside and outside of piping and fittings before assembly.

C. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade of floors, unless indicated otherwise.

D. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.

E. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated on the construction documents.

F. Install piping tight to slabs, beams, joists, columns, walls and other permanent elements of the building. Provide space to permit insulation applications, with 1" clearance outside the insulation. Allow sufficient space above removable ceiling panels to allow for panel removal.

G. Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.

H. Install drains at low points in mains, risers and branch lines consisting of a tee fitting, 3/4" ball valve, and a short 3/4" threaded nipple and cap.

I. Wall Penetrations: Seal all pipe penetrations through interior and exterior walls using sleeves and mechanical sleeve seals. Pipe sleeves smaller than 6" shall be steel; pipe sleeves 6" and larger shall be sheet metal.

J. Fire Barrier Penetrations: Where pipes pas through fire rated walls, partitions, ceilings, or floors, the fire rated integrity shall be maintained with "Metacaulk" material.

K. Use pipe fittings for all changes in directions and all branch connections.

L. Remake leaking joints using new materials.

M. Install strainers on the supply side of each piping control valve, pressure reducing or regulating valve; solenoid valve, and elsewhere as required.

N. Install unions adjacent to each valve, and at the final connection to each piece of equipment and plumbing fixture having 2" and smaller connections, and elsewhere as required.

O. Install flanges in piping 2-1/2" and larger, adjacent to each valve, at the final connections.

P. Install dielectric unions to connect piping materials of dissimilar metals in dry and wet piping systems (water, steam, gas, compressed air, vacuum).

Q. Refrigerant lines under slab floors or below grade shall be installed in PVC schedule 3034; seal open ends with proper slope per manufacturer recommendations.

R. All underground piping shall be painted with a minimum of two coats of black asphaltum; material embedded in concrete need not be painted. Pipes protruding through concrete floors shall be bitumastic coated at the point of breach.

1.16 SEQUENCE OF OPERATIONS FOR HVAC SYSTEMS:

A. All heat pump systems whether split remote type or package shall perform as follows:
   1) room thermostats shall be digital programmable type with auto change over for heat-cool mode
   2) upon pre-determined time of day, approximately one hour before facility scheduled opening, indoor fan shall cycle to "on" position for continued ventilation with room temperature to maintain comfort level between 70-73 degrees F for cooling mode and 68-72 degrees F for heat set-point
   3) at the end of scheduled day when building occupants have vacated facility systems shall continue to operate for approximately one additional hour at occupied set-points for both auto changeover and fan ventilation to assure structure purging
   4) during occupied and unoccupied periods system dehumidification shall be controlled by wall mounted digital humidistat or thermostat with built-in humidity control component; set-point for this device shall be set at 55% dehumidification or as so noted in construction documents; products shall maintain facility dehumidification requirement by energizing HVAC equipment via hot gas reheat or "heat-pipe" technology; electric re-heat method is not acceptable method for this feature
   5) after facility is vacated mechanical system thermostats shall cycle indoor fans to "auto" position with indoor temperatures allowed to rise to 80 degrees F for cooling mode and drop to 55 degrees F for heating mode
   6) if systems are designed using "Demand Control Ventilation" (DCV) as provided by Carrier Corporation with remote room sensor, products shall be set to open outside air dampers to full open position upon rise in room carbon-dioxide levels above 700ppm with dampers closing completely or minimum damper setting as so noted in documents
   7) effort should be made to program system start-up in morning or occupied period allowing units to be staggered to limit building electric demand charge; this cycle maybe approximately 15 minutes apart or as determined by local utility
   8) electric heaters used for auxiliary or secondary heat shall only be energized upon call for system defrost cycle to limit cold air discharge by indoor blowers during heating cycle or when outdoor air temperatures demand based on factory set-point; room thermostat shall have outdoor thermostat to assure this compliance
   9) all electric heaters weather used for primary or secondary heat shall be staged in compliance with state energy codes

B. Systems with outdoor air for ventilation shall have low leakage 24 volt motorized dampers at louvers, vent caps or hoods controlled by interlock relay at AHU, RTU or PAC units with volume noted in document schedules. These dampers shall open to set position upon activation of indoor fans. Systems using carbon-dioxide detectors for control shall open to minimum damper position when unit indoor fans are energized with full open position from room CO2 detectors. Once room levels have been satisfied by room CO2 sensor then dampers shall move back to minimum setting with products in full closed once indoor fans cycle off.

C. Minimum damper settings shall be adjusted based on building pressure as indicated in specifications. Contractor shall have certified test-n-balance firm assure compliance with this requirement to prevent building from operating under negative pressure.

D. If construction documents demand economizer package with either powered exhaust or barometric relief then effort should be made to operate components based on enthalpy controller as required by vendor manufacturer. Contractor to connect CO2 functions to economizer package for building ventilation as so required by vendor manufacturer.

E. Building systems using natural gas as primary heat source shall be programmed as so noted in this section with heat exchangers staged for low AND high heat depending on facility-space load requirements. Single rooms served by several units (ie. church sanctuary, fellowship hall, auditorium, etc.) shall have gas heating systems set to low heat, unless otherwise noted, to prevent over-heating of space

F. All facility exhaust fans, make-up air fans, supply fans and/or fly fans shall be controlled as so noted in schedules. Effort shall include time of day programming for 24-hour, 7-day function as stated with actual building operation determined by owner. Fans controlled by room light switch with time delay on break shall energize room fan when space lights are turned "on" with fans continuing to operate approximately 5 minutes after room light is turned off to purge space of any un-wanted odors.

1.17 OPERATIONS & MAINTENANCE:

A. The requirements of this section must comply with ASHRAE 62.1-2004 for all mechanical and ventilation systems installed and/or renovated at this facility. The ventilation systems shall be operated and maintained at a minimum in accordance with the provisions of noted standard.

B. Ventilation system design, operation and maintenance shall be reevaluated when changes in building use or occupancy category, significant building alterations, significant changes in occupancy density, or other changes inconsistent with system design assumptions are made.

C. An operation and maintenance manual, either written or electronic, shall be developed and maintained on site or in a centrally accessible location for working life of the applicable mechanical and ventilation systems. This manual shall be updated as necessary. The manual shall include, at a minimum, the operation and maintenance procedures, final design drawings, operations and maintenance schedules and any changes made thereto, and maintenance requirements and frequencies detailed in ASHRAE 62.1-2004.

D. Mechanical and natural ventilation systems shall be operated and maintained in a manner consistent with the Operations and Maintenance Manual or as required by Table 8-1 "Minimum Maintenance Activity and Frequency" per ASHRAE 62.1-2004.

E. Filters and air cleaning devices shall be replaced or maintained at a minimum of every 30 days during initial start-up with additional cycle of 60-90 days depending on actual building usage and traffic patterns. Additional cleaning and/or replacement may be required as set forth in Operations and Maintenance Manual as recommended by manufacturer.

F. Outdoor air intake dampers, controls, actuators and indoor fan motors must be checked once every three months. These devices shall be visually inspected or remotely monitored to verify that the are functioning in accordance with Operation and Maintenance manuals. Physical damage to louvers, vent caps, screens, etc. shall be repaired if such damage impairs their function in preventing contaminant entry. The total quantity of outside air to air handling equipment shall be measured and verified once every five years with tolerance rate of 5%+-.

G. Dehumidification coils (AC coils) shall be visually inspected for cleanliness and microbial growth no less than once a year or as specified in Operation and Maintenance manuals and shall be thoroughly cleaned when fouling or microbial growth is observed.

H. Drain pans shall be visually inspected for cleanliness and microbial growth at a minimum of once per year during the cooling season and must be cleaned if necessary. Areas adjacent to drain pans that were subjected to wetting shall be investigated, cleaned if necessary, and the cause of unintended wetting rectified.

I. Outdoor intake louvers, bird-bug screens, mist eliminators, and adjacent areas shall be visually inspected for cleanliness and integrity at a minimum of once every six months and cleaned as needed. When visible debris or visible biological material is observed, it shall be removed. Physical damage to louvers, screens, or mist eliminators shall be repaired if such damage impairs their function in preventing contaminant entry.

J. Sensors whose primary function is dynamic minimum outdoor air control, such as demand control ventilation, carbon-dioxide detectors, flow stations, etc. as well as heating and cooling shall have their accuracy verified at a minimum of every six months. A sensor or control failing to meet the accuracy specified shall be recalibrated or replaced.

K. Outdoor air flow verification shall be checked every five years. If measured minimum air flow rates are less than the design minimum rate (+-10% balancing tolerance) then they shall be adjusted or modified to bring them to the minimum design rate or evaluated to determine if the measured rates are in compliance with standard ASHRAE 62.1-2004.

L. The space provided around mechanical equipment shall be kept clear for routine maintenance, repairs and inspections.

M. Floor drains in mechanical rooms must be installed and maintained to prevent transport of contaminants from the floor drain to the mechanical room in both ducted and plenum type spaces.

N. ANY visible microbial contamination shall be investigated and rectified immediately.

O. Water intrusion or accumulation in ventilation and air conditioning systems or components such as ducts, plenums, air handlers, equipment, etc. shall be investigated and immediately rectified.

P. All pumps, controls, timers, flow switches, circuit setters, mixing values, etc. for water heating systems shall be visually inspected once a year to assure original design performance. Items not functioning properly shall be recalibrated or replaced to maintain compliance.

Q. Water heaters, expansion tanks, etc. shall be inspected and verified a minimum of once every six months. This effort shall include adjustments to assure temperature settings in compliance with design and maintenance manuals. Components not performing must be recalibrated or replaced immediately.

R. All floor drain traps shall be filled with mineral oil semi-annually to prevent sewer gas from leaking into conditioned space.

1.18 EXECUTION:

A. Contractor shall pay for all inspection permits, certificates, meters, connection fees, systems charges and license fees in connection with his/her work.

END OF SECTION 15100

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GRACE COVENANT

LAKE CITY, FLORIDA

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DATE
NOVEMBER 2007
FILE NO
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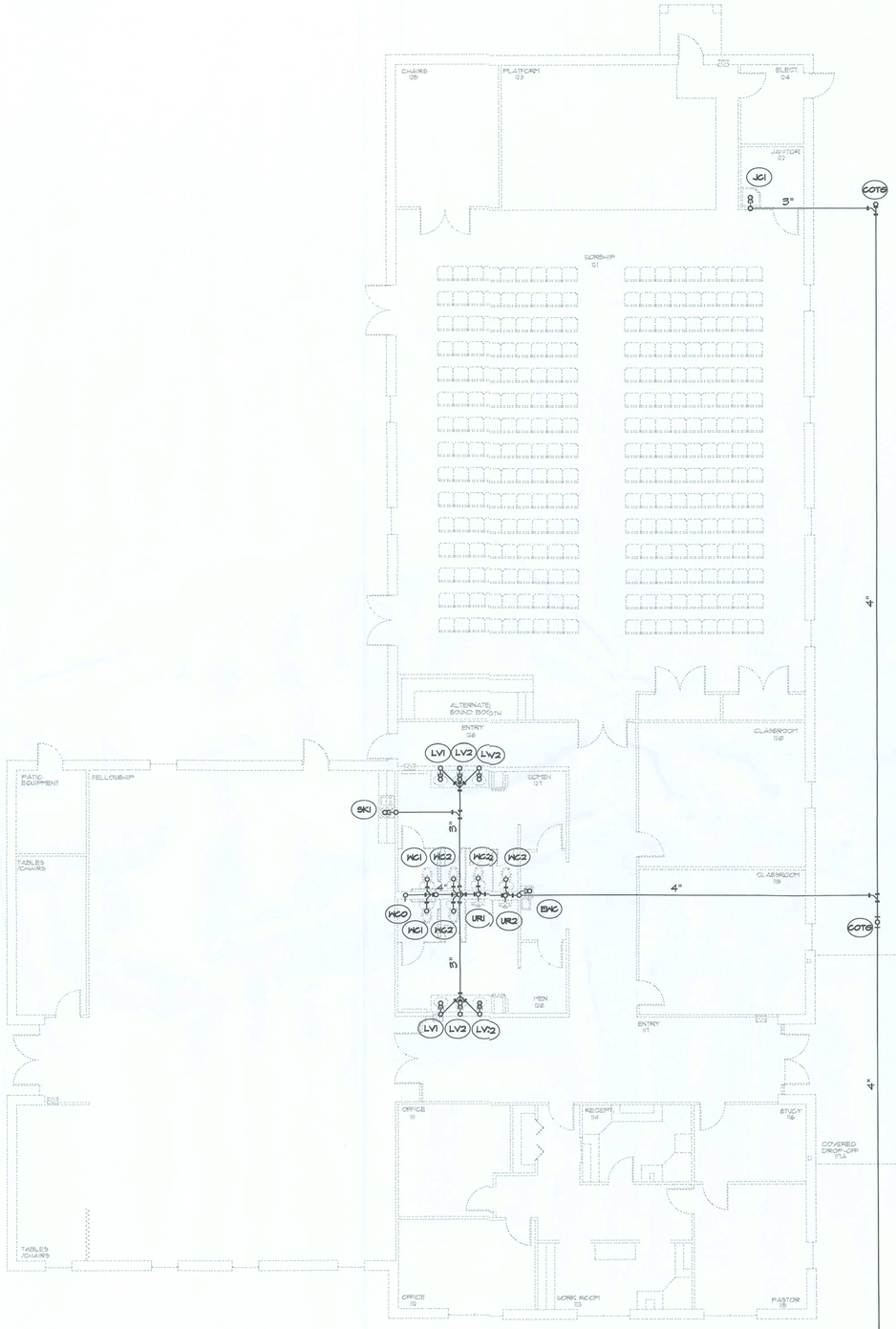
JOB NO
04-816
SHEET

MP-2



OVERALL BUILDING SWV PLUMBING PLAN

SCALE 1/8"=1'-0"

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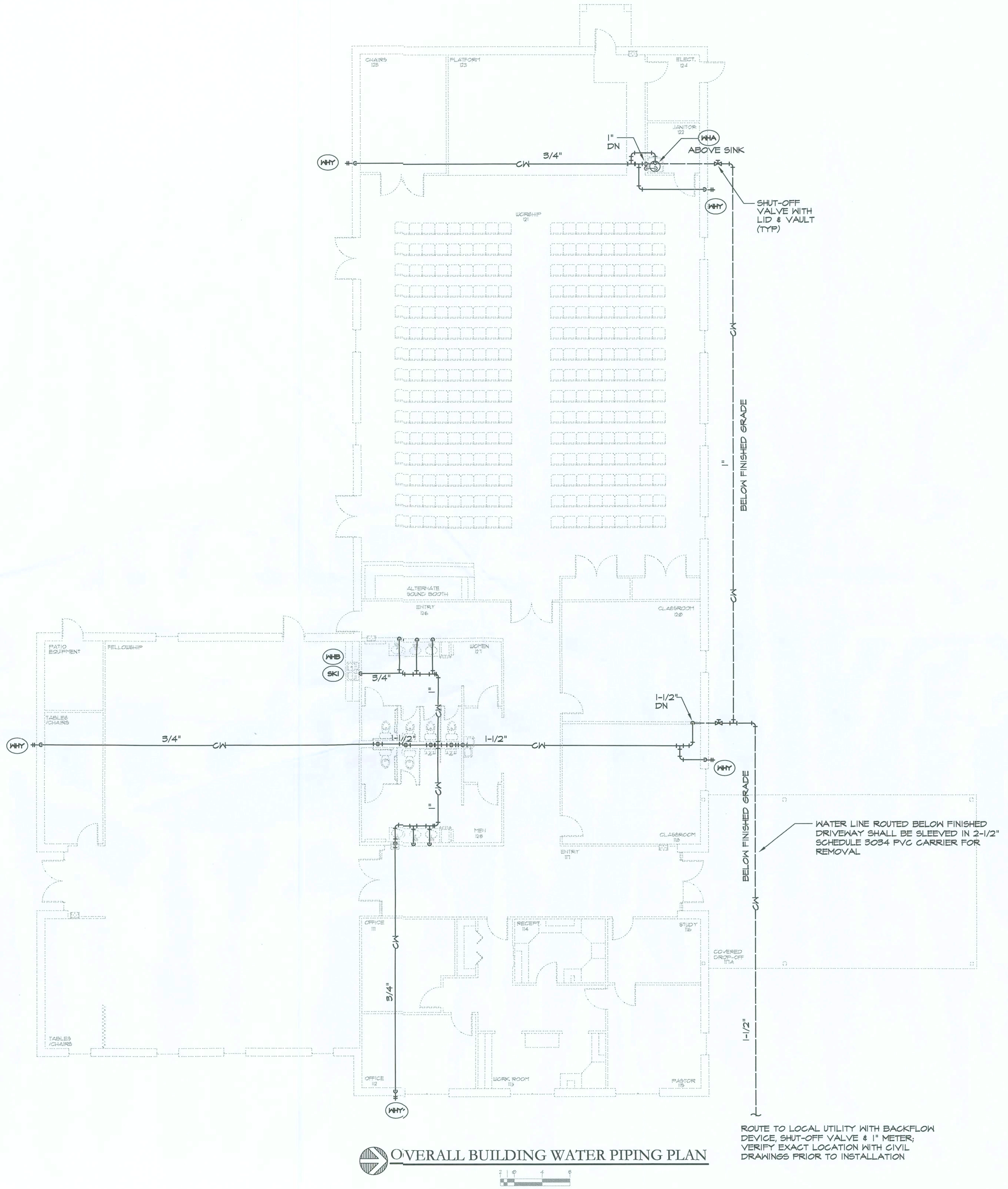

OVERALL BUILDING WATER PIPING PLAN

SCALE 1/8"=1'-0"

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OVERALL BUILDING SWV PLUMBING RISER

NTS

James R Burch
11.20.07

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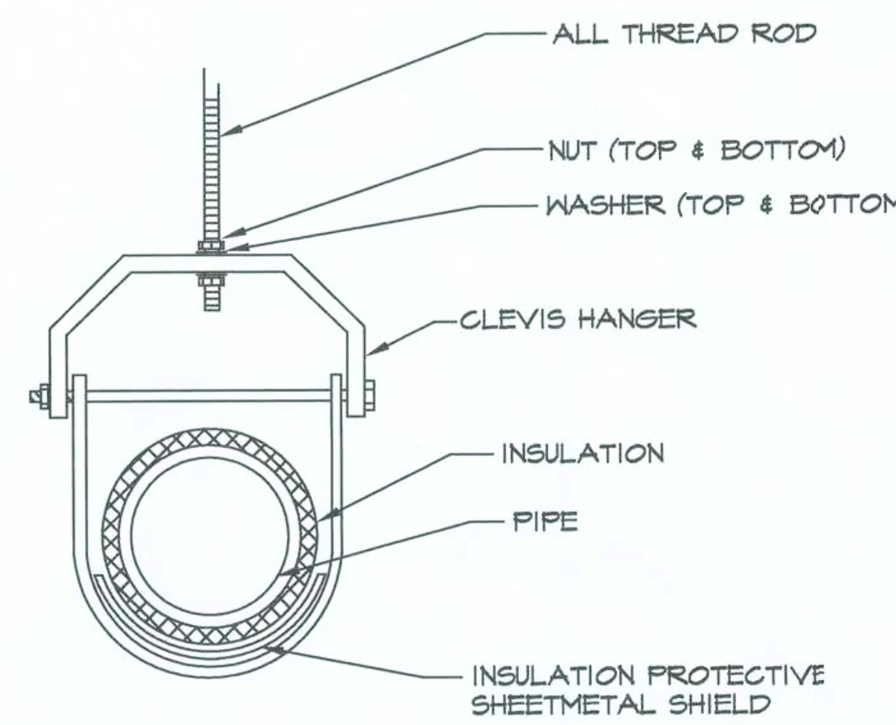
SHEET
P-3

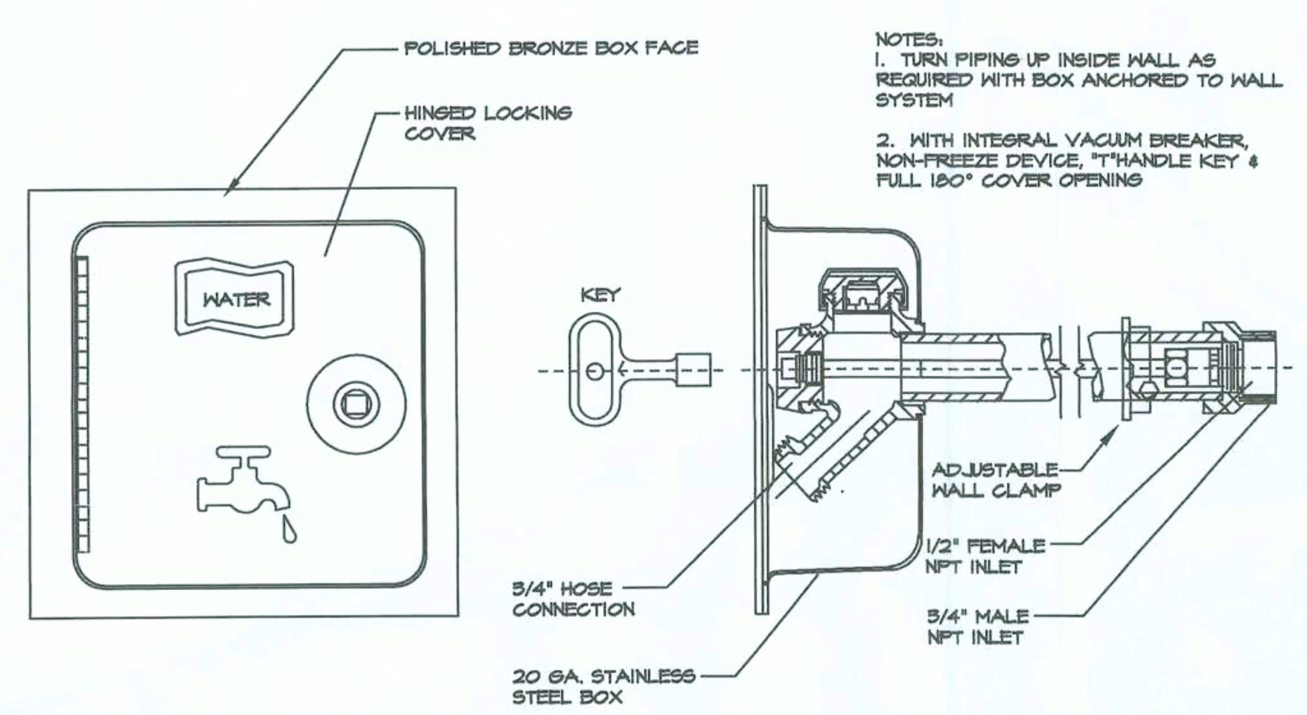
PLUMBING LEGEND

Symbol	Description	Symbol	Description	Symbol	Description	Symbol	Description
G	GAS METER		BALANCING VALVE	FCO	FLOOR CLEANOUT		END OF PIPE; SEE CONTINUATION
HWRC	HOT WATER RECIRCULATED		CHECK VALVE	COTG	CLEANOUT TO GRADE		TEE FITTING
HWR	HOT WATER RETURN		GLOBE VALVE/BALL VALVE	WCO	WALL CLEANOUT		ELBOW FITTING (90 DEGREE)
HWS	HOT WATER SUPPLY		IN LINE PUMP	CO	END OF LINE CLEANOUT		WYE FITTING
CWR	CHILLED WATER RETURN	O	OXYGEN	VTR	VENT THRU ROOF		ELBOW FITTING (45 DEGREE)
CWS	CHILLED WATER SUPPLY	NO	NITROUS OXIDE	NTS	NOT TO SCALE	WH	WATER HEATER
CW	COLD WATER	V	VACUUM	RWL	RAIN WATER LINE		P-TRAP
HW	HOT WATER	A	COMPRESSED AIR	R-1	SOIL/WASTE/VENT RISER NUMBER		DOUBLE WYE FITTING
WHY	WALL HYDRANT	R	TEMPERED WATER RETURN		DETAIL SHEET NUMBER	P-1	PLUMBING FIXTURE NUMBER
HB	HOSE BIBB	TWR	TEMPERED WATER	W-1	WATER RISER NUMBER		GARBAGE DISPOSAL
	UNION	+	180° F HOT WATER		FLUSH VALVE WATER CLOSET		WALL MOUNTED URINAL
	GATE VALVE	HWR	HOT WATER RECIRCULATED		TANK TYPE WATER CLOSET		DOUBLE COMPARTMENT SINK
	SOIL OR WASTE	G	NATURAL GAS LINE		FAUCET FOR SINK OR LAVATORY		WALL MOUNTED SINK OR LAVATORY
	VENT	BFG	BELOW FINIHSED GRADE		COUNTER MOUNTED SINK OR LAVATORY		FLOOR MOUNTED JANITOR SERVICE SINK
CW	COLD WATER	BFF	BELOW FINISHED FLOOR		COUNTER MOUNTED LAVATORY		DRINKING FOUNTAIN OR WATER COOLER
HW	HOT WATER	AFC	ABOVE FINISHED CEILING		TUB UNIT		SHOWER OR CAN WASH W/FLOOR DRAIN
GL	GREASE LINE		P-TRAP				
	WATER HAMMER ARRESTER	SS	SANITARY SEWER				
FD	FLOOR DRAIN	M	WATER METER				
FS	FLOOR SINK		PIPE TURNED DOWN				
HD	HUB DRAIN		PIPE TURNED UP				



CLEVIS HANGER DETAIL

NOT TO SCALE



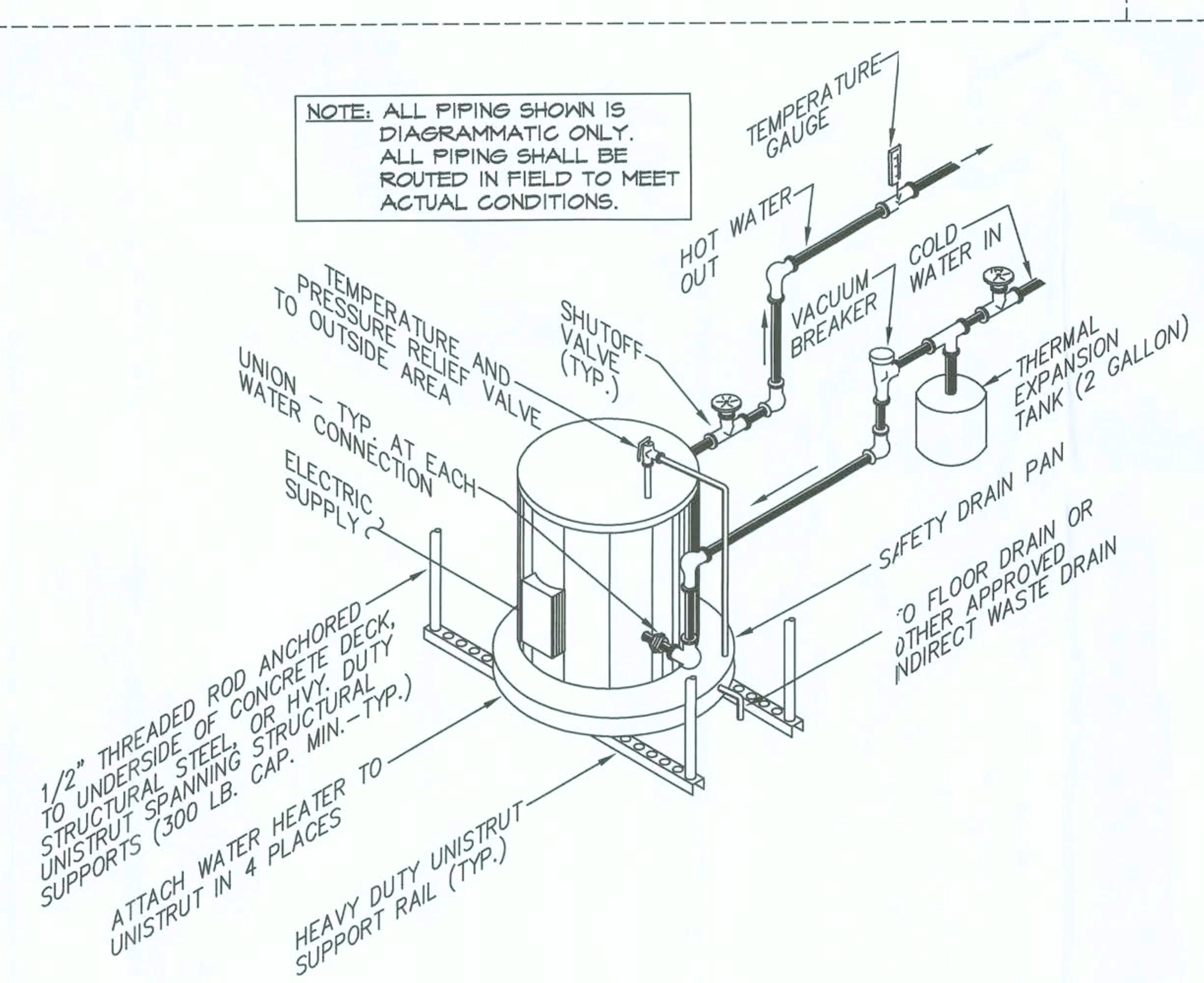
TYPICAL WALL HYDRANT DETAIL

NTS

PLUMBING FIXTURE SCHEDULE

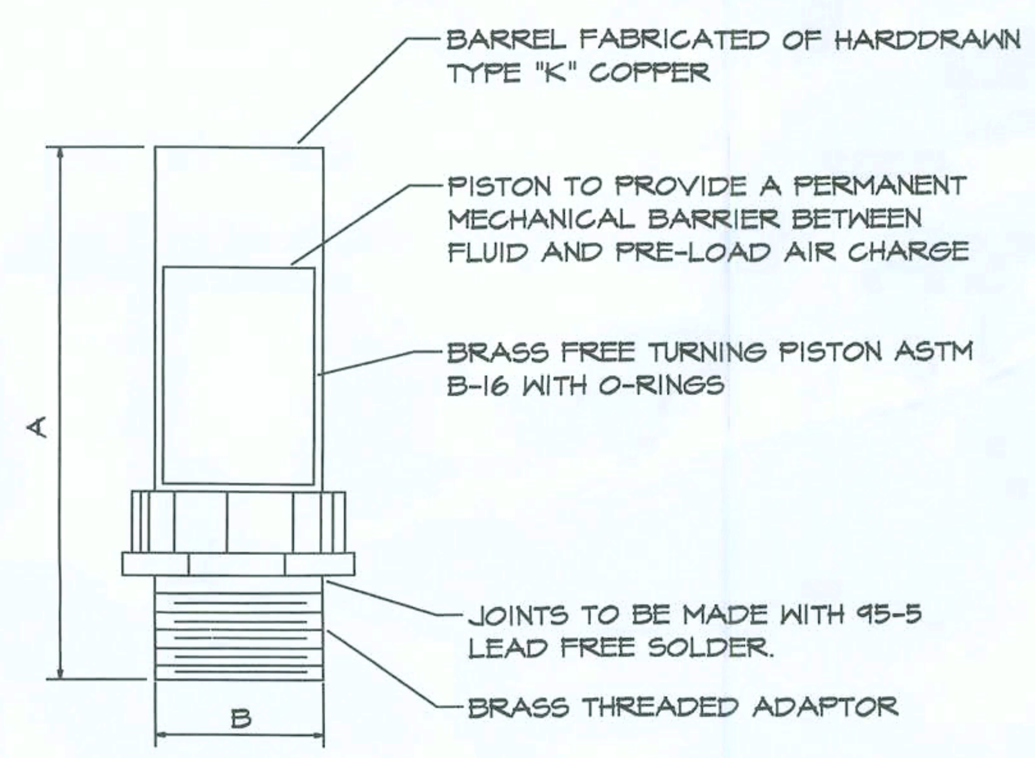
SYMBOL	DESCRIPTION	MANUF.	MODEL NO.	CW	HW	WASTE	VENT	ADA/ANSI HEIGHT	MAX. WATER USAGE	COLOR FINISH	REMARKS
WC1	FLOOR MOUNTED HANDICAPPED WATER CLOSET	KOHLER BEMISS	K-3493 1955SSC	1/2"		3"	2"	17-19" AFF	1.6 GPF	WHITE	FLOOR MOUNTED UNIT WITH PRESSURE ASSISTED TANK, BED PAN LUGS & OPEN FRONT SEAT; INSTALL PER ADA/ANSI-A117.1 & STATE HANDICAPPED CODE
WC2	FLOOR MOUNTED WATER CLOSET	KOHLER BEMISS	K-3505 1955SSC	1/2"		3"	2"		1.6 GPF	WHITE	FLOOR MOUNTED UNIT WITH PRESSURE ASSISTED TANK, BED PAN LUGS & OPEN FRONT SEAT
UR1	HANDICAPPED WALL HUNG URINAL	KOHLER SLOAN	K-4960ET 186	3/4"		2"	1-1/2"	17" AFF	1.0 GPF	WHITE	WALL MOUNTED UNIT WITH SLOAN FLUSH VALVE & J.R. SMITH WALL CARRIER; INSTALL PER ADA/ANSI-A117.1 & STATE HANDICAPPED CODE
UR2	STANDARD WALL HUNG URINAL	KOHLER SLOAN	K-4960ET 186	3/4"		2"	1-1/2"		1.0 GPF	WHITE	WALL MOUNTED UNIT WITH SLOAN FLUSH VALVE & J.R. SMITH WALL CARRIER
LV1	HANDICAPPED COUNTER LAVATORY	KOHLER	K-2196 K-15592F	1/2"		2"	1-1/4"	34" TO RIM	2.2 GAL/MIN	WHITE	HANDICAPPED COUNTER MOUNTED LAVATORY WITH CHROME STOPS/SUPPLIES, P-TRAP WITH TAILPIECE, ETC.; INSTALLATION & FIXTURE SHALL COMPLY WITH ADA/ANSI-A117.1 HANDICAPPED CODE
LV2	STANDARD WALL LAVATORY	KOHLER	K-2196 K-15592F	1/2"		2"	1-1/4"		2.2 GAL/MIN	WHITE	STANDARD COUNTER MOUNTED LAVATORY WITH CHROME STOPS/SUPPLIES, P-TRAP WITH TAILPIECE, ETC.
WHA	6 GALLON WATER HEATER	A.O. SMITH	DEL6	1/2"	1/2"						ELECTRIC HEATER RATED AT 120V-1PH-2000 WATTS WITH 7 DAY 24 HOUR PARRAGON QUARTZ TIME CLOCK & BATTERY BACK-UP; LOCATE ABOVE JANITOR CLOSET NEAR FINISHED CEILING
WHB	INSTANTANEOUS WATER HEATER	EEMAX	SP2412	1/2"	1/2"						INSTANTANEOUS UNDER COUNTER ELECTRIC WATER HEATER RATED AT 115V-1PH-2400 WATTS AS REQUIRED PER MANUF.; INSTALL NEOPRENE ISOLATION PAD BETWEEN HEATER & WALL
JC1	JANITOR CLOSET	KOHLER	K-6710	1/2"	1/2"	3"	2"		3.0 GAL/MIN	WHITE	6FT. HOSE, SPRAY NOZZLE, WALL BRACKET, RIM GUARD, WALL FAUCET & VACUUM BREAKER; SEE DETAIL FOR INFORMATION
WHY	WALL HYDRANT	WOODFORD	B65	3/4"					3.0 GAL/MIN	BRASS	FREEZE PROTECTION & VACUUM BREAKER
SK1	TWO COMPARTMENT KITCHEN SINK	ELKAY	DLR251910 LKE4161FCR (2)LK-99	1/2"	1/2"	2"	1-1/2"		2.2 GAL/MIN	STAINLESS STEEL	COUNTER MOUNTED FIXTURE WITH CHROME STOPS/SUPPLIES, P-TRAP WITH TAILPIECE, ETC.
EWC	HANDICAPPED ELECTRIC WATER COOLER	ELKAY	EZOSTL8C	1/2"		2"	1-1/4"	36" TO BUBBLER	2.2 GAL/MIN	STAINLESS STEEL	CHROME STOPS/SUPPLIES WITH J.R. SMITH WALL CARRIER; EWC TO BE HANDICAPPED MOUNTING HEIGHT PER ADA/ANSI-A117 & STATE HANDICAPPED CODE

SPECIAL NOTES:
1. WSFU = WATER SIZING FIXTURE UNITS
2. DFU = DRAINAGE FIXTURE UNITS
3. GPF = GALLON PER FLUSH
4. GAL/MIN= GALLON PER MINUTE
5. OTHER APPROVED VENDOR PRODUCTS FOR NOTED MANUFACTURERS ARE: MANSFIELD, ELJER, DAYTON, RHEEM/RUUD, WADE, ZURN, SILVER CAST, ELKAY, AND AMERICAN STANDARD



ELECTRIC WATER HEATER DETAIL - SUSPENDED FROM CEILING/ROOF STRUCTURE ON UNISTRUT SUPPORTS

NOT TO SCALE

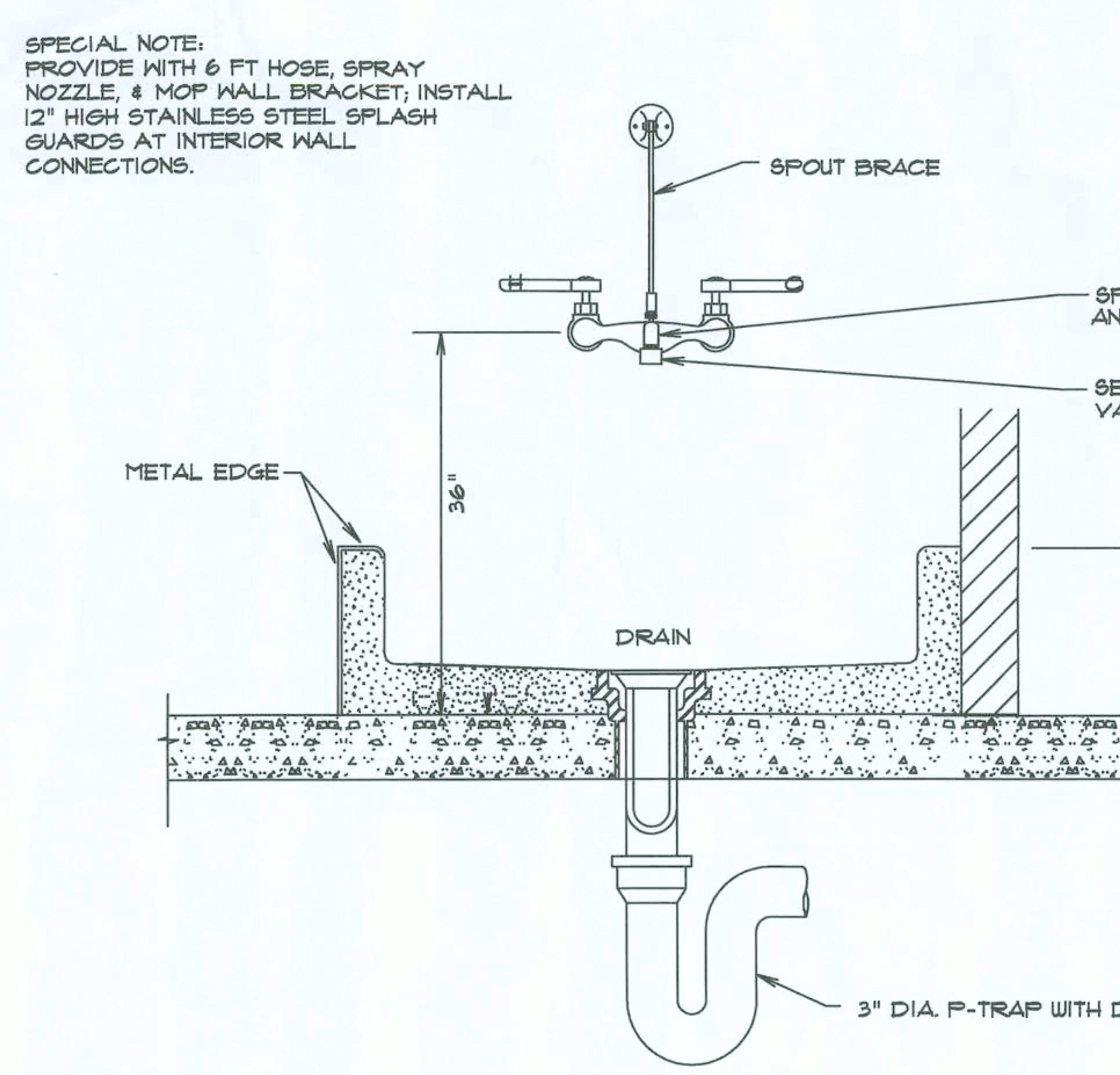


PPP SIZE	P.D.I. SYMBOL	FIXTURE UNIT RATINGS	A SIZE	B SIZE
1/2"	A	1 - 11	5"	1/2"
3/4"	B	12 - 32	5"	3/4"
1"	C	33 - 60	7"	1"
1-1/4"	D	61 - 113	7"	1-1/4"
1-1/2"	E	114 - 154	9"	1-1/2"
2"	F	155 - 330	9"	2"

SPECIAL NOTES:
ALL RAPID CLOSING CW/HW VALVES & FIXTURES SHALL HAVE WATER HAMMER ARRESTORS INSTALLED, UNLESS NOTED OTHERWISE, WITH SIZES NOTED IN THIS DETAIL; WATER HAMMER ARRESTORS MUST BE INSTALLED AT WATER HEATERS, WASHING MACHINES, ICE MAKERS, COFFEE/JUICE CONNECTIONS, DRINKING FOUNTAINS, WATER CLOSETS, URINALS, ETC.

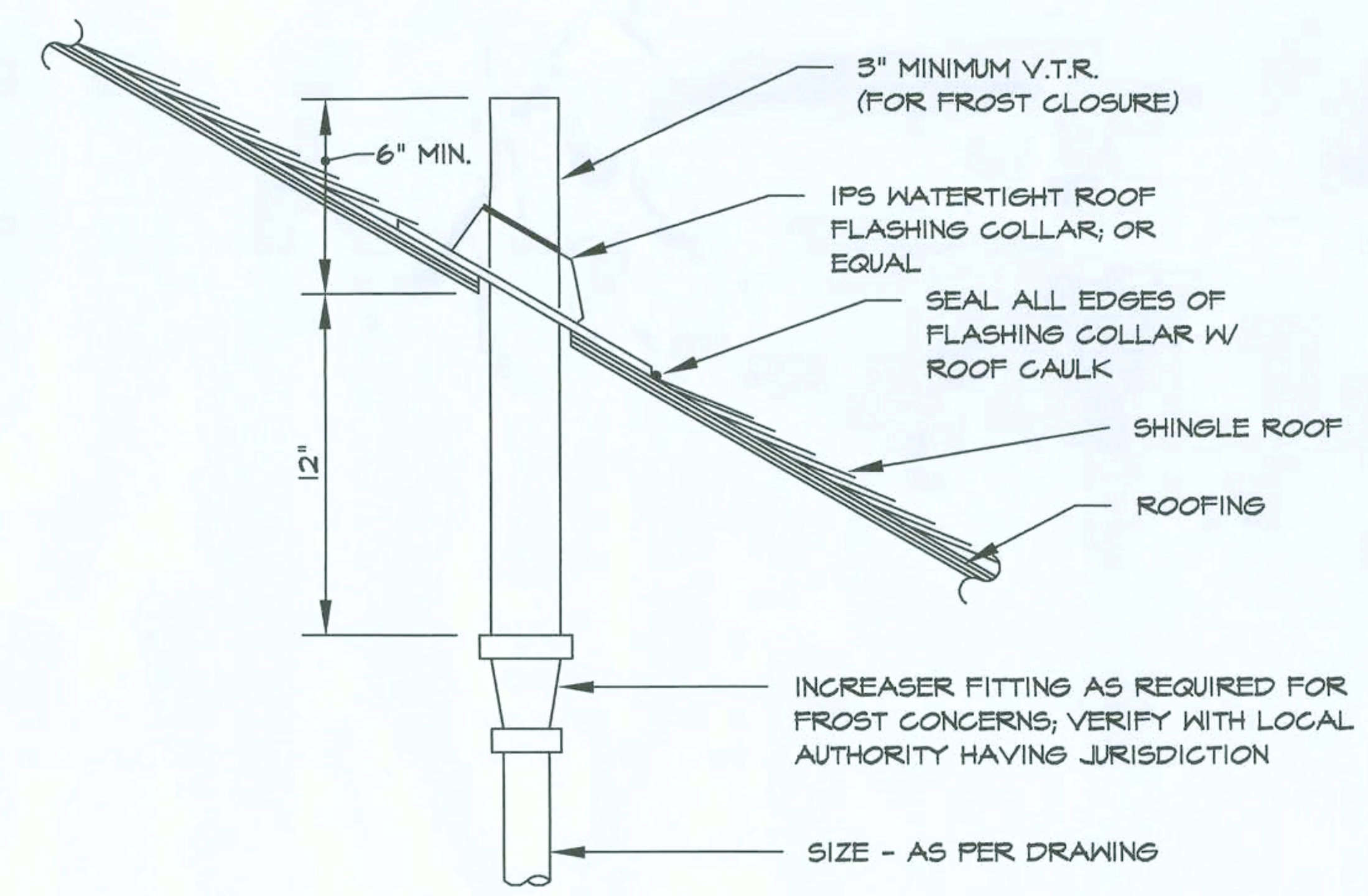
WATER HAMMER ARRESTOR DETAIL

NOT TO SCALE



JANITOR MOP SINK DETAIL

N.T.S.



PLUMBING VENT THROUGH PITCHED ROOF DETAIL

NOT TO SCALE

PLUMBING MATERIAL SCHEDULE

SOIL, WASTE, VENT PIPING	WATER PIPING: BELOW FINISHED FLOOR	WATER PIPING: BELOW GRADE-OUTSIDE	WATER PIPING: ABOVE FINISHED FLOOR	INSULATION DATA: FITTINGS	INSULATION DATA: JACKET	INSULATION DATA: THICKNESS	INSULATION DATA: LOCATION
SOLID SCHEDULE 40 PVC WITH SOLVENT WELD PVC FITTINGS EQUAL TO CHARLOTTE PIPE & FOUNDRY; CORE-EXTRUDED OR THIN WALL TYPE MATERIALS ARE NOT APPROVED	COPPER TUBING-TYPE "K" SOFT ANNEALED TEMPER NO JOINTS BELOW FLOOR	SCHEDULE 40 PVC WITH SOLVENT WELD PVC FITTINGS; IF APPROVED BY LOCAL CODES	COPPER TUBING-TYPE "L" HARD DRAWN TEMPER; WROIGHT COPPER FITTINGS; SOLDER JOINTS / MAY USE SCHEDULE 80 CPVC FOR HOT & COLD WATER IN LIEU OF COPPER IN APPROVED BY AHJ	ZESTON	UNIVERSAL	1" FIBERGLASS	ALL HOT WATER, COLD WATER & RECIRCULATING PIPE SYSTEMS

CLEANOUT DATA: FLOOR (FCO) MANUF.	FLOOR (FCO) MODEL NO.	WALL (WCO) MANUF.	WALL (WCO) MODEL NO.	OUTSIDE (COTG) MANUF	OUTSIDE (COTG) MODEL NO.	WATER HAMMER ARRESTORS: MANUF.	MODEL	TYPE	LOCATION
WADE	W-6030-SV-2TS	J.R. SMITH	4420 W/STAINLESS STEEL COVER	WADE	W-6030-SV-2	PRECECISION	SC500	"A"	WATER CLOSETS, URINALS, SINKS, LAVATORIES OR WATER COOLERS

VALVES: BALL MANUF.	BALL MODEL NO.	GATE MANUF.	GATE MODEL NO.	CHECK MANUF.	CHECK MODEL NO.	PIPE HANGERS	BACKFLOW DEVICE	WATER METER	PIPE PENETRATIONS	NATURAL GAS PIPING: 2 PSI	NATURAL GAS PIPING: 0.5 IN WATER	HOT WATER MIXING VALVES AT LAVATORIES & SINKS	REMARKS
HAMMOND	806	NIBCO	T113 S113	HAMMOND	915	IN COMPLIANCE WITH 2004 FLORIDA PLUMBING CODE SECTION 308	WILKINS 350A	HAYS MT SERIES	HILTI CORP UL-FA2053 UL-WL5029	AS REQ'D PER NFPA & LOCAL CODES	SCHEDULE 40 BLACK IRON STEEL	SYMMONS MODEL 5110CK-3/8" 5120-1/2" 5130-3/4" 5140-1"	VERIFY LOCAL UTILITIES PRIOR TO INSTALLATION; SEE CIVIL DRAWINGS

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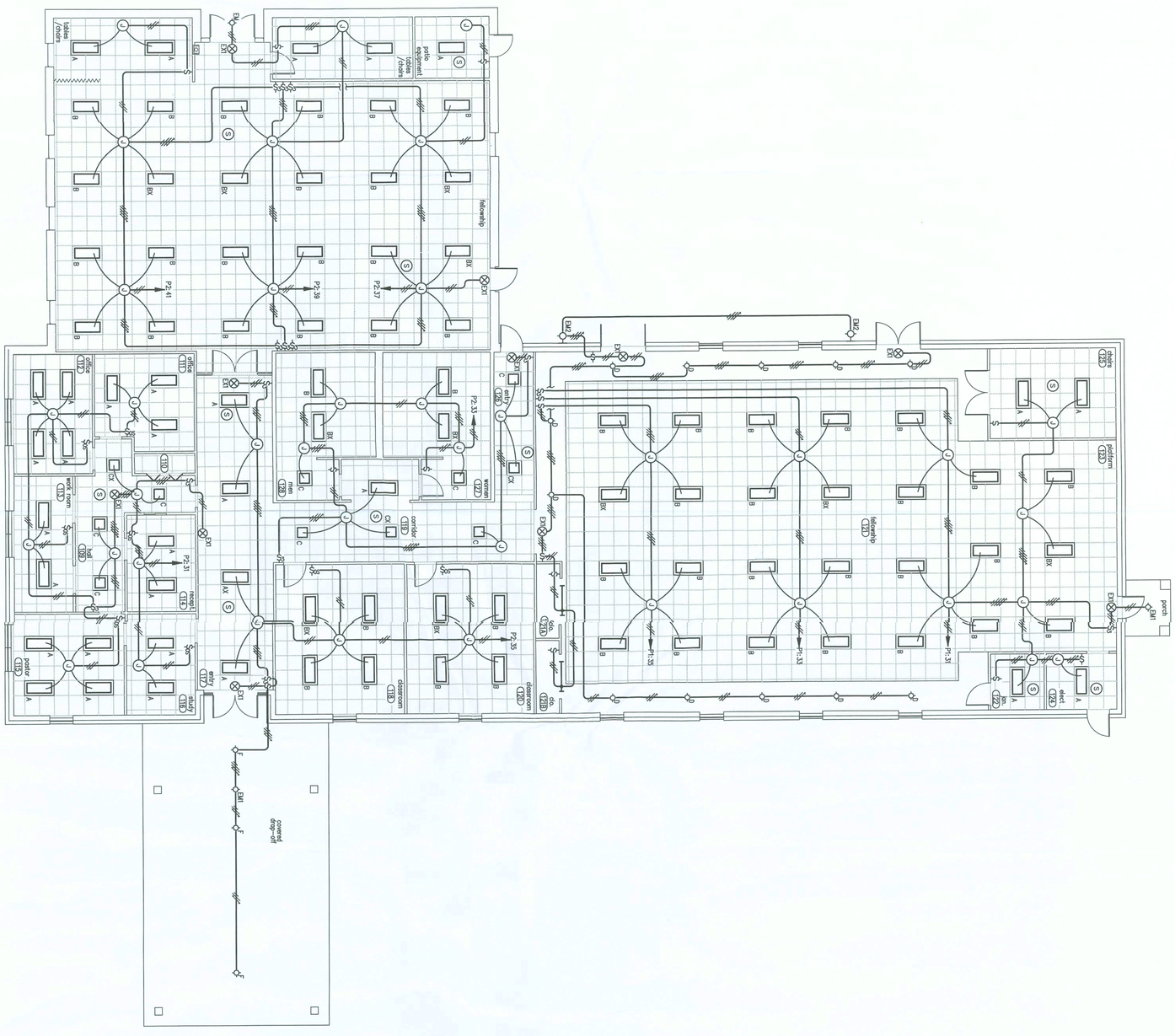

ELECTRICAL LIGHTING PLAN

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

ADVANCED ENGINEERING CONSULTANTS
(229) 881 3803

SEAL:

11-20-07

DRAWN: J. BURCH

CHECKED: J. BURCH

DATE: 13 NOV 2007

FILE: 04-816

JOB NO: 04-816

SHEET: E-1

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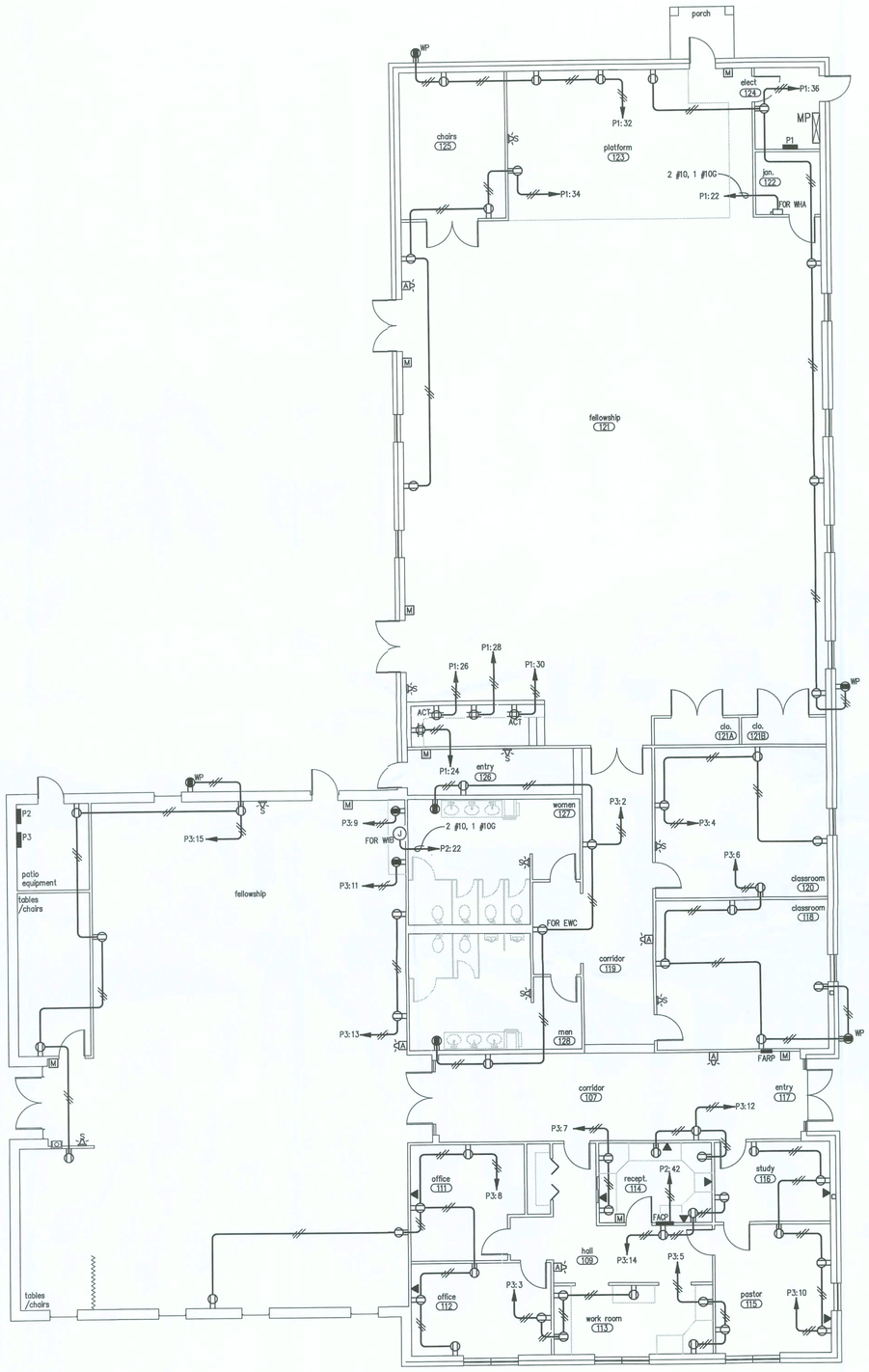
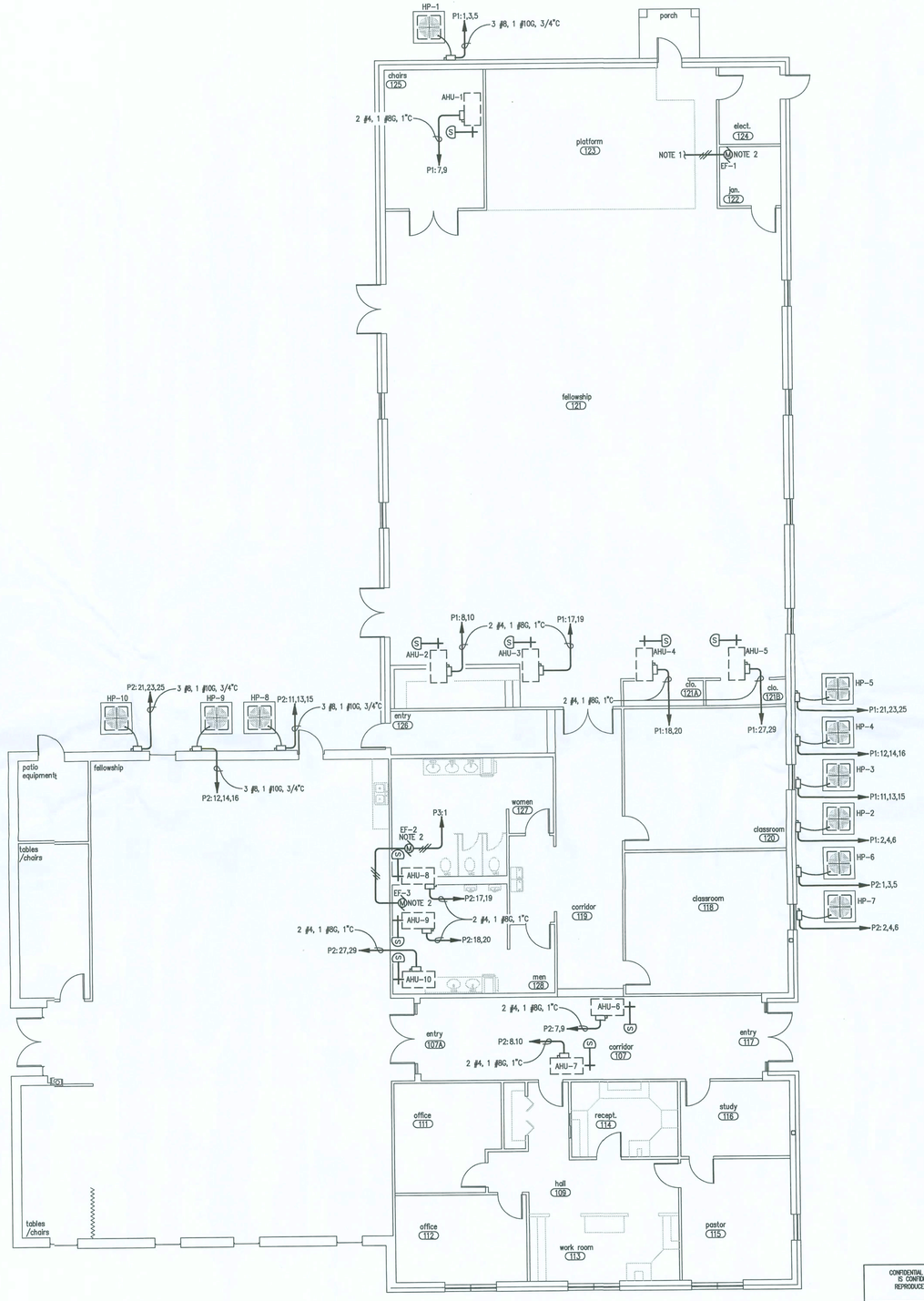


N

ELECTRICAL POWER PLAN

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



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MECHANICAL SYSTEMS POWER PLAN

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

NOTES:

1. CONNECT TO ROOM LIGHTING CIRCUIT.
2. SEE FAN SCHEDULE ON SHEET M-2 FOR FAN CONTROL REQUIREMENTS.

ADVANCED ENGINEERING CONCEPTS
(229) 861 3803

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DATE	13 NOV 2007
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SHEET	E-2

LIGHTING FIXTURE SCHEDULE

MARK	MANUFACTURER	CATALOG NUMBER	LAMPS	VOLT.	WATTS/FIXT	MOUNTING	REMARKS
A	METALUX	2GR8 232 A	2–F32 T8	120	70	LAY–IN	NOTE 1, 2
B	METALUX	2GR8 332 A	3–F32 T8	120	105	LAY–IN	NOTE 1, 2
C	METALUX	2GR8 417 A	4–F17 T8	120	70	LAY–IN	NOTE 1, 2
D	METALUX	SN 132	1–F32 T8	120	35	SURFACE	NOTE 2
E	PORTFOLIO	C7042–7450	1–CF42 TTT	120	45	RECESSED	NOTE 2
F	HALO	M200T–740–120P	1–100W MH	120	115	RECESSED	–
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
EM1	SHUR–LITES	H274–EM	1 CF13 DTT	120	15	RECESSED	PROVIDE WITH HALO 73PS LENS
EM2	LUMARK	PLIP–T–42	1–CF42 TTT	120	45	WALL	MOUNT 8' AFF
EX1	SHUR–LITES	LPX–70–RWH	–	120	–	UNIVERSAL	–

NOTES:
1. "X" SUFFIX ON FIXTURE MARK INDICATES FIXTURE SHALL BE PROVIDED WITH FLUORESCENT EMERGENCY BALLAST.
2. PROVIDE FIXTURES WITH ELECTRONIC BALLAST.

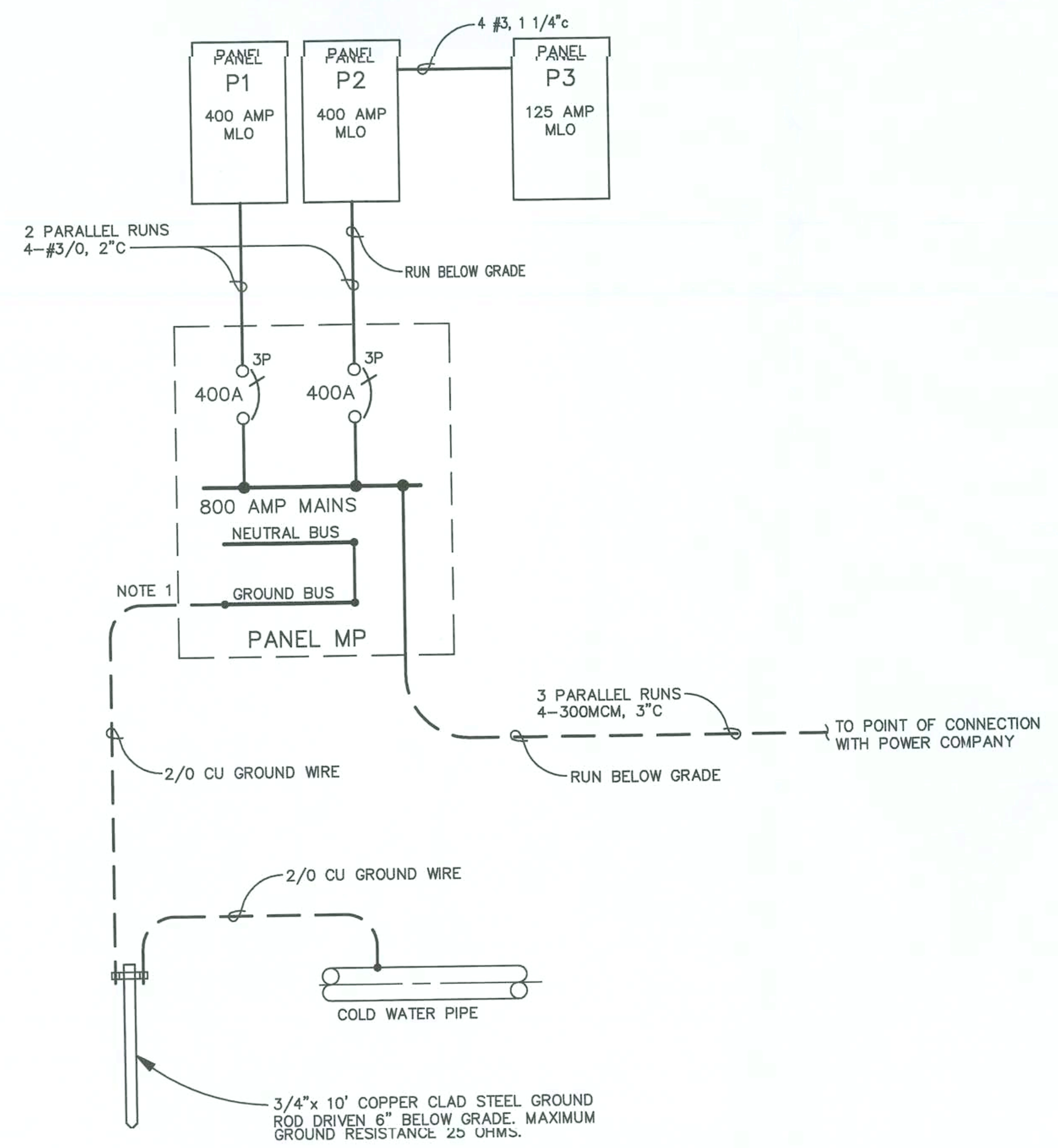
PANEL MP CIRCUIT SCHEDULE

MAIN LUGS ONLY SPACES –
VOLTS 208Y/120 AMPS 800 PHASE 3 WIRE 4
MOUNTING SURFACE TYPE "I–LINE" HCW PANELBOARD

CKT	SERVING	BRKR AMPS	KVA LGT	KVA REC	KVA MISC	ø	KVA MISC	KVA REC	KVA LGT	BRKR AMPS	SERVING	CKT
1	PANEL P1	400	3.7	6.0	97.0	A	96.4	11.5	6.4	400	PANEL P2	2
3		25KAIC				B				25KAIC		4
5						C						6
7	–	–	–	–	–	A	–	–	–	–	–	8
9	–	–	–	–	–	B	–	–	–	–	–	10
11	–	–	–	–	–	C	–	–	–	–	–	12

LOAD SUMMARY: CONNECTED / DEMAND — 219.7 / (0.208)(1.73) = 610.3 x 1.25 = 762.8
LIGHTING: 10.1 x 1.25 = 12.6
RECEPTACLES: 17.5 (10 + 3.7) = 13.7
MISCELLANEOUS: 193.4 — 193.4
TOTAL (KVA) 219.7

FEEDER BREAKER: NONE
FEEDER SIZE: 3 PARALLEL RUNS 4–300MCM, 2 1/2"C



NOTES:
1. PROVIDE A #2/0 BARE COPPER GROUNDING ELECTRODE CONDUCTOR FROM THE GROUND BUS IN PANEL "MP" TO A BONDING POINT ON THE FOLLOWING:
   A. COLD WATER PIPE.
   B. A 3/4"x 10' COPPER CLAD GROUND ROD DRIVEN TO 6" BELOW GRADE.
2. PROVIDE ADDITIONAL GROUND RODS AS REQUIRED TO ACHEIVE MAXIMUM GROUND RESISTANCE OF 25 OHMS.

ELECTRICAL RISER DIAGRAM

NO SCALE

PANEL P1 CIRCUIT SCHEDULE

MAIN LUGS ONLY SPACES 42
VOLTS 208Y/120 AMPS 400 PHASE 3 WIRE 4
MOUNTING SURFACE TYPE "QO" LOAD CENTER

CKT	SERVING	BRKR AMPS	KVA LGT	KVA REC	KVA MISC	ø	KVA MISC	KVA REC	KVA LGT	BRKR AMPS	SERVING	CKT
1	HP–1	35			6.9	A	6.9			35	HP–2	2
3						B						4
5						C						6
7	AHU–1	70			12.1	A	12.1			70	AHU–2	8
9						B						10
11	HP–3	35			6.9	C	6.9			35	HP–4	12
13						A						14
15						B						16
17	AHU–3	70			12.1	C	12.1			70	AHU–4	18
19						A						20
21	HP–5	35			6.9	B	2.0			30	WHA	22
23						C		1.0		20	SOUND BOOTH REC.	24
25						A		1.0		20	SOUND BOOTH REC.	26
27	AHU–5	70			12.1	B		1.0		20	SOUND BOOTH REC.	28
29						C		1.0		20	SOUND BOOTH REC.	30
31	PLATFORM LIGHTS	20	1.4			A		1.0		20	PLATFORM/FELLOWSHIP REC.	32
33	FELLOWSHIP LIGHTS	20	0.8			B		1.0		20	PLATFORM/FELLOWSHIP REC.	34
35	FELLOWSHIP LIGHTS	20	1.5			C	–	–	–	–	–	36
37	–	–	–	–	–	A	–	–	–	–	–	38
39	–	–	–	–	–	B	–	–	–	–	–	40
41	–	–	–	–	–	C	–	–	–	–	–	42

LOAD SUMMARY: CONNECTED / DEMAND — 107.6 / (0.208)(1.73) = 298.9 x 1.25 = 373.6
LIGHTING: 3.7 x 1.25 = 4.6
RECEPTACLES: 6.0 (10 + X) = 6.0
MISCELLANEOUS: 97.0 — 97.0
TOTAL (KVA) 107.6

FEEDER BREAKER: 400 AMP
FEEDER SIZE: 2 PARALLEL RUNS 4 #3/0, 2"C

PANEL P2 CIRCUIT SCHEDULE

MAIN LUGS ONLY SPACES 42
VOLTS 208Y/120 AMPS 400 PHASE 3 WIRE 4
MOUNTING SURFACE TYPE "QO" LOAD CENTER

CKT	SERVING	BRKR AMPS	KVA LGT	KVA REC	KVA MISC	ø	KVA MISC	KVA REC	KVA LGT	BRKR AMPS	SERVING	CKT
1	HP–6	35			6.7	A	6.7			35	HP–7	2
3						B						4
5						C						6
7	AHU–6	70			12.0	A	12.0			70	AHU–7	8
9						B						10
11	HP–8	35			6.7	C	6.7			35	HP–9	12
13						A						14
15						B						16
17	AHU–8	70			12.0	C	12.0			70	AHU–9	18
19						A						20
21	HP–10	35			6.7	B	2.4			30	WHB	22
23						C	–	–	–	–	–	24
25						A	–	–	–	–	–	26
27	AHU–10	70			12.0	B	–	–	–	–	–	28
29						C	–	–	–	–	–	30
31	OFC AREA LIGHTS	20	1.5			A	–	–	–	–	–	32
33	TOILET RM/CORR. LIGHTS	20	0.8			B	–	–	–	–	–	34
35	CLASSRM/CORR. LIGHTS	20	1.2			C	0.5	11.5		100	PANEL P3	36
37	FELLOWSHIP LIGHTS	20	0.9			A						38
39	FELLOWSHIP LIGHTS	20	1.0			B						40
41	FELLOWSHIP LIGHTS	20	1.0			C	0.5			20	FACP	42

LOAD SUMMARY: CONNECTED / DEMAND — 115.1 / (0.208)(1.73) = 319.7 x 1.25 = 399.6
LIGHTING: 6.4 x 1.25 = 8.0
RECEPTACLES: 11.5 (10 + 0.7) = 10.7
MISCELLANEOUS: 96.4 — 96.4
TOTAL (KVA) 115.1

FEEDER BREAKER: 400 AMP
FEEDER SIZE: 2 PARALLEL RUNS 4 #3/0, 2"C

PANEL P3 CIRCUIT SCHEDULE

MAIN LUGS ONLY SPACES 20
VOLTS 208Y/120 AMPS 125 PHASE 3 WIRE 4
MOUNTING SURFACE TYPE "QO" LOAD CENTER

CKT	SERVING	BRKR AMPS	KVA LGT	KVA REC	KVA MISC	ø	KVA MISC	KVA REC	KVA LGT	BRKR AMPS	SERVING	CKT
1	EF–2, EF–3	20			0.5	A		1.0		20	TOILET RM REC.	2
3	WORK RM REC.	20		0.8		B		0.7		20	CLASSROOM REC.	4
5	WORK RM REC.	20		0.8		C		0.8		20	CLASSROOM REC.	6
7	RECEPTION REC.	20		0.9		A		0.8		20	OFC 111,112 REC.	8
9	FELLOWSHIP REC.	20		0.9		B		0.8		20	PASTOR REC.	10
11	FELLOWSHIP REC.	20		0.9		C		0.8		20	RECEPTION REC.	12
13	FELLOWSHIP REC.	20		0.5		A		0.8		20	RECEPTION REC.	14
15	FELLOWSHIP REC.	20		1.0		B	–	–	–	–	–	16
17	–	–	–	–	–	C	–	–	–	–	–	18
19	–	–	–	–	–	A	–	–	–	–	–	20

LOAD SUMMARY: CONNECTED / DEMAND — 11.2 / (0.208)(1.73) = 31.1 x 1.25 = 38.9
LIGHTING: 0.0 x 1.25 = 0.0
RECEPTACLES: 11.5 (10 + 0.7) = 10.7
MISCELLANEOUS: 0.5 — 0.5
TOTAL (KVA) 11.2

FEEDER BREAKER: 100 AMP
FEEDER SIZE: 4 #3, 1 1/4"C

GENERAL ELECTRICAL NOTES

1. All electrical work provided for this project shall comply with the requirements of the National Electrical Code (NFPA–70), local codes, and the following criteria:
   a. Trade size conduit smaller than 1/2" shall not be used.
   b. Conduit above grade and not exposed to weather shall be Electrical Metallic Tubing (EMT). Fittings shall be compression type.
   c. Conduit below grade shall be schedule 40 PVC except turns and penetrations at grade shall be galvanized rigid steel.
   d. Conduit above grade and exposed to weather shall be galvanized rigid or intermediate metal conduit.
   e. Wire size smaller than #12 AWG shall not be used for power and lighting circuits.
   f. All wiring provided by the electrical contractor shall be copper.
   g. All conductors shall have a minimum temperature rating of 75 degrees C. (type THW or type THWN).
   h. Where possible, except when shown otherwise on the drawings, all conduit shall be run concealed below grade, within walls or above ceiling.
   j. Conductors #14 AWG and smaller shall be solid. Conductors #10 AWG and larger shall be stranded. Conductors #12 AWG may be solid or stranded, except that only #12 AWG solid or only #12 AWG stranded shall be used.
   k. There shall be no more than 270 degrees total turn or 150 feet between pull points in conduit runs.
2. The electrical contractor shall be responsible for all construction permits for electrical work and for scheduling electrical inspections.
3. The electrical contractor shall arrange for and make necessary connections for temporary power as required for construction. If temporary power requirements are not clearly defined in the contract documents, then the change order procedure will be used to define the work.
4. The electrical contractor shall make arrangements with the electric utility company for service connections.
5. Some safety disconnect switches may be provided by the mechanical contractor but installed and connected by the electrical contractor. This work shall be co–ordinated with the mechanical contractor.
6. Conduit which penetrates the roof or exterior wall shall be flashed and sealed watertight.
7. Burried conduit not under slab shall have a minimum cover of 24 inches.
8. For each panel, provide a typed circuit schedule, to be placed inside the panel door.
9. Unless noted otherwise:
   a. Light switches shall be centered 44 inches AFF.
   b. Receptacles shall be centered 19 inches AFF.
   c. Conduit shall be 1/2 inch.
   d. Wiring shall be #12 AWG.
   e. Disconnect switches shall be heavy duty, non–fused, NEMA 1, 30 Amp, 3 Pole.
10. Receptacles mounted on opposite sides of a wall shall be separated by a minimum of 24".
11. All light fixtures shall be provided with lamps, and all lamps shall be operable at time of final inspection.
12. Verify door swings before roughing in light switches to assure proper switch location.
13. All cover plates for wall switches, receptacles, etc. shall be brushed stainless steel.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
N	LAY–IN FLUORESCENT LIGHT FIXTURE; LETTER DENOTES MARK IN LIGHTING FIXTURE SCHEDULE.
N	RECESSED CEILING MOUNTED LIGHT FIXTURE; LETTER DENOTES MARK IN LIGHTING FIXTURE SCHEDULE.
N	STRIP FLUORESCENT LIGHT FIXTURE; LETTER DENOTES MARK IN LIGHTING FIXTURE SCHEDULE.
N	WALL MOUNTED FLUORESCENT LIGHT FIXTURE; LETTER DENOTES MARK IN LIGHTING FIXTURE SCHEDULE.
N	WALL MOUNTED INCANDESCENT LIGHT FIXTURE; LETTER DENOTES MARK IN LIGHTING FIXTURE SCHEDULE.
⊗EX1	EXIT LIGHT; SEE LIGHTING FIXTURE SCHEDULE.
$	FLUSH MOUNTED SINGLE POLE WALL SWITCH, RATED 20 AMP.
$3	FLUSH MOUNTED THREE WAY WALL SWITCH, RATED 20 AMP.
$OS	FLUSH MOUNTED OCCUPANCY SENSING WALL SWITCH, "WATT STOPPER" CATALOG No. WI–200 OR EQUAL.
	NEMA 5–15R DUPLEX WALL RECEPTACLE; MOUNT AT 19" AFF UNLESS NOTED OTHERWISE.
	GFCI NEMA 5–15R DUPLEX WALL RECEPTACLE MOUNTED ACT OR AT 44" UNLESS NOTED OTHERWISE.
	NEMA 5–15R DOUBLE DUPLEX WALL RECEPTACLE; MOUNT AT 19" AFF UNLESS NOTED OTHERWISE.
	ELECTRICAL DISCONNECT SWITCH; SEE ELECTRICAL NOTES.
(J)	JUNCTION BOX, 4"x4" WITH COVER.
▶	TELEPHONE OUTLET, SINGLE GANG WALLBOX AND COVER, WITH 3/4" CONDUIT STUBBED OUT ABOVE CEILING.
(M)	MOTOR; SEE MECHANICAL FOR SPECIFICATIONS.
[M]	FIRE ALARM SYSTEM MANUAL PULL STATION; MOUNT AT 44" AFF.
[A]	FIRE ALARM SYSTEM COMBINATION STROBE LIGHT AND HORN; SEMI–RECESSED, MOUNT AT 80" AFF.
S	FIRE ALARM SYSTEM STROBE LIGHT, MOUNT AT 80" AFF.
(S)	FIRE ALARM SYSTEM SMOKE DETECTOR, PHOTOELECTRIC TYPE UNLESS SPECIFIED OTHERWISE.
(S)	FIRE ALARM SYSTEM DUCT SMOKE DETECTOR, IONIZATION TYPE UNLESS SPECIFIED OTHERWISE.
FACP	FIRE ALARM SYSTEM CONTROL PANEL
FARP	FIRE ALARM SYSTEM REMOTE INDICATOR PANEL
MP	ELECTRICAL PANEL, LETTERING IDENTIFIES PANEL.
MP:4	2 #12, 1 #12G, 1/2" C TO PANEL MP, CIRCUIT 4. SHORT HASH MARK INDICATES GROUND WIRE, LONG HASH MARKS INDICATE CONDUCTORS, ARROW INDICATES HOME RUN TO PANEL AND CIRCUIT SHOWN.
	FLAGGED HASHMARK ON CONDUIT RUN INDICATES SWITCHED CONDUCTOR.
WP	WEATHERPROOF.
AFF	ABOVE FINISHED FLOOR
ACT	ABOVE COUNTER TOP
EWC	ELECTRIC WATER COOLER

ADVANCED ENGINEERING CONCEPTS
(229) 861 3803

SEAL: James L Burch 11.20.07

REVISIONS | BY

ARCHITECTURE/PLANNING/URBAN DESIGN/
CONSTRUCTION MANAGEMENT AIA/APA

"Faith is the substance of things hoped for, the evidence of things not seen." Hebrews 11.1

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DRAWN J. BURCH
CHECKED J. BURCH
DATE 13 NOV 2007
FILE NO AEC
JOB NO 04–816
SHEET E–3

ELECTRICAL SPECIFICATION

PART ONE – GENERAL

1.01 DESCRIPTION

A. Work included: Provide complete electrical installation where shown on the Drawings, as specified herein, and as needed for complete and proper installation including, but not necessarily limited to:

1. Service entrance, in conduit, from the point of connection with the power company;
2. Feeder system, in conduit, to branch circuit panels;
3. Branch circuit wiring system, in conduit, for lighting, motors, receptacles, junction boxes, and similar uses;
4. Panelboards and load centers, complete with circuit breakers as shown on the drawings;
5. Lighting fixtures and lamps;
6. Wall switches, receptacles, and similar items;
7. Hangers, anchors, sleeves, chases, supports, for fixtures, and other electrical materials and equipment in association therewith;
8. Wiring system, in conduit, up to and including safety switches, for equipment and controls provided under other sections of these Specifications;
9. Other items and services required to complete the systems.

B. Related work described elsewhere:

1. Provide all required electrical connections and service to items described in all other Sections of these Specifications.

1.02 QUALITY ASSURANCE

A. Codes and Standards:–All work, equipment and apparatus will conform to the folowing requirements:

1. National Electrical Code of the National Fire Protection Association.
2. National Electrical Manufacturers Association.
3. Underwriters Laboratories, Inc.
4. Governmental agencies having jurisdiction.

B. Qualifications of installers: For the actual fabrication, installation, and testing of the work of this Section, use only thoroughly trained and experienced workmen completely familiar with the items required and with the manufacturers' recommended methods of installation. In acceptance or rejection of the installed work, no allowance will be made for lack of skill on the part of workmen.

C. Without additional cost to the OWNER, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of the governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

1.03 SUBMITTALS

A. Submit:

1. A complete list of all materials proposed to be furnished and installed under this Section.
2. Manufacturers' specifications and catalog cuts as required to demonstrate compliance with the specified requirements.
3. Manufacturers' recommended installation procedures which, when approved by the ARCHITECT, will become the basis for accepting or rejecting actual installation procedures used on the Work.

B. Record Drawing: During progress of the Work, maintain an accurate record of the installation of all items.

C. Manual: Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the ARCHITECT four copies of an operation and maintenance manual. Include in the manual:

1. Copy of the approved record documents for this portion of the Work;
2. Copies of circuit directories;
3. Copies of warranties and guarantees.

1.04 PRODUCT HANDLING

A. Protection: Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the work and materials of all other trades.

B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the ARCHITECT and at no additional cost to the OWNER.

PART TWO – PRODUCTS

2.01 GENERAL

A. Provide only materials that are new, of the type and quality specified. Where Underwriters' Laboratories, Inc. have established standards for such materials, provide only materials bearing the UL label.

B. Temporary Power: provide temporary power as required for construction.

C. Grounding: Provide grounding as indicated and specified herein. The following are included as required grounding:

1. Conduits and other conductor enclosures;
2. Neutral or identified conductor of interior wiring system;
3. Panelboards and load centers;
4. Non–current carrying parts of fixed equipment, such as motors and starters.

D. Identification

1. Identify all panelboards, load centers, cabinets, safety switches, and other apparatus used for operation and control of circuits, appliances, and equipment.
2. Provide plastic laminate nameplates black face with white core letters, showing proper and complete identification.

2.02 PANELBOARDS AND LOAD CENTERS:

A. Standard dead front circuit breaker panels with Main Circuit Breaker or Main Lugs Only as shown.

B. Bus shall be of the ampere rating called for, arranged for voltage, phase and number of wires indicated on the Drawings.

C. Front shall be complete with door and flush or surface mounted as indicated. The cabinet shall be not less than 14" wide. Proper trim shall be furnished for each panel.

D. Branch circuit breakers shall be toggle type, quick make, quick break, thermal–magnetic bolt on or plug–in breakers. All multi–pole breakers shall be single–handle, common trip type.

E. Minimum circuit breaker installed in load centers shall be type QO with 10,000 amp interrupting capacity at 120 volts AC.

2.03 CONDUIT AND FITTINGS

A. Use and locations of Types of Conduits:

1. Thick wall rigid steel galvanized shall be used for all conduit runs buried in the earth, embedded in concrete or run exposed to the outside weather conditions.
2. Schedule 40 rigid PVC, where permitted, may be used underground for feeders and branch circuits, except penetrations at grade or concrete and all turns shall be rigid steel.
3. Aluminum rigid or EMT may be used in all indoor dry locations.
4. IMC is acceptable where permitted by the National Electric Code under Art. 345
5. Galvanized steel EMT shall be used in all locations except where other types are listed as mandatory or permissive above.
6. Type MC cable may be used where permitted by the National Electrical Code, except the cable shall be held in place by fastening devices approved for use with type MC cable. The cable shall be run parallel or perpendicular to building lines.
7. Electrical non–metallic tubing may not be used.
8. Flexible metal conduit shall be aluminum or galvanized steel spiral interlocked type for connection to vibrating equipment or machinery. Bends shall be with radius large enough to prevent strain on the interlocking joints and permit complete flexibility.
   a. Machinery connections shall not exceed 20 times nominal trade diameter.
   b. Provide bond wire inside flexible conduit and non–metallic conduits.
9. Where PVC raceways are indicated they shall be Schedule 40. PVC shall be joined with solvent glue and the fittings used shall be standard products as supplied by the manufacturer.
10. Pull boxes shall be provided as require by the NEC.
11. Individual runs shall be anchored in place by means of straps or clamps specifically designed for the purpose. Wire, pipe straps, or nails shall not be used. Do not strap piping. Multiple runs shall be supported by assemblies, individual or trapeze type hanger to provide a rigid installation. Support runs on masonry walls by means of toggle bolts or expansion anchors; on structural steel by means of pipe clamps. Plastic insert anchors shall not be used.

2.04 CONDUCTORS

A. Conductors shall be copper (aluminum may be used only where indicated by note) installed in continuous system and, unless otherwise indicated, shall be as follows:

1. All general building wire shall have THHN insulation.
2. Sizes No. 14 and smaller shall be solid.
3. Size No. 12 may be solid or stranded, except that only stranded or only solid may be used.
4. Sizes No. 10 and larger shall be stranded.
5. Terminal lugs shall be used for connecting conductors larger than No. 10 and for all multiple connections to terminals.
6. Minimum size conductor for branch circuits shall be No. 12 AWG.

2.05 BOXES

A. Outlet Boxes used in the conduit system shall be galvanized sheet steel, 2 1/8" x 4" or 4" square or 4" octagon depending upon the use. Device boxes in the wall shall be "Tile" boxes with square covers. Boxes containing wiring devices shall be fitted with a raised plaster ring to set flush with the wall service.

1. Where lighting switches are shown inside doorways, they shall be minimum of 4" and a maximum of 8" from edge of opening. Outlet boxes shall be set with 4" dimension vertical.

B. Exposed Boxes shall be cast aluminum.

C. Boxes shall meet NEC requirements for size to contain conductors.

D. Pull boxes shall be used in conduit system as indicated in the NEC and shall be sized according to the NEC.

2.06 WIRING DEVICES

A. Switches: Wall switches shall be quiet type with integral metal plaster ears and shall be totally enclosed in molded plastic base. All switches shall be white "decora" series with matching plastic wall plates. All ratings shall be 15 amp.

approved manufacturers:

a. Single pole: Hubbell cat. no. 1221I or equal.
b. Three–way: Hubbell cat. no. 1223I or equal.
c. Four–way Hubbell cat. no. 1224I or equal.

2.07 RECEPTACLES

A. Receptacles shall be molded plastic. Slot configuration shall be standard NEMA type as specified or shown. All receptacles shall be white white standard with matching wall plate.

1. Unless noted otherwise, all duplex receptacles shall be 3–pole grounding type, 125 volt, 15 amp duplex – NEMA 5–15R.

B. Ground fault interrupter receptacles shall be duplex type and have self contained circuit to open circuit when any fault current exceeding 5 milliamps flows to ground. Device shall have trip indicator, test button and reset button. This type shall be used for all outdoor receptacles. An upline ground fault receptacle may protect standard units farther down the line.

C. Weatherproof receptacles shall have gasketed die–cast aluminum cover with spring loaded, hinged door over each receptacle.

2.08 DEVICE PLATES

A. All wiring device plates on finished walls shall be brushed stainless steel, standard size. Plates for devices in surface mounted boxes shall be designed to fit box and device without protruding sharp edges.

B. Device plates for receptacles and switches marked "WP" shall be die–cast aluminum with spring hinged, gasketed covers.

2.09 SAFETY AND DISCONNECT SWITCHES

All switches shall be quick–make, quick–break, with interlocked cover. Switches shall be of the ampere rating with number of poles and fuses shown. Enclosures for outdoor locations shall be NEMA 3R.

2.10 FUSES

All fuses shall be dual element time delay type. All motor circuits shall be fused at not less than 125% of motor nameplate amperes or as manufacturer recommends. Ratings shall be 250 volt.

2.11 BRANCH CIRCUITS

A. Circuits shall be provided as indicated. The circuit numbers indicated are the panel breaker numbers as shown in the panel schedule.

B. Circuits shall be 3 wire for single phase and 3 or 4 wire, as indicated, for 3 phase.

C. All circuits shall be run in continuous conduit as per the NEC. All conduits shall be as specified herein. Minimum size conduit shall be 1/2" nominal trade size.

D. All circuits shall be run concealed except as indicated. Minimum bury of branch circuit outside building shall be 24".

2.12 LOAD BALANCE

The connected single phase loads shall be connected at the panelboards to balance as near as possible the current flow in each phase conductor.

2.13 LIGHTING

A. General: Provide complete fixtures and lamps of types and sizes as indicated in Lighting Fixture Schedule shown on the Drawings, complete with supports and mounting accessories.

B. Fluorescent Ballasts: Rapid start, high power factor, ETL and CBM certified, high frequency electronic type.

C. Emergency lighting:

1. General: Emergency light shall be capable of remaining in service during a power failure for 90 minutes or longer. Batteries shall automatically recharge when normal power is restored.
2. Batteries shall be sealed, maintenance free, long life, with 3 year unconditional warranty and additional 3 year pro rata warranty. the battery shall be 6 or 12 volts.
3. Transfer switch shall be solid state type which instantly energizes the lamps upon power failure. It shall have a battery protection circuit which automatically shuts down the lamp load when the battery is discharged to 87.5% of its normal capacity.
4. The battery charger shall be solid state type capable of recharging the fully discharged battery in 12 to 24 hours and maintain the battery at full charge until needed. It shall be current limiting and short circuit proof. Units shall meet UL specifications.
5. Controls shall be test switch, high charge light, and AC check and ready light. Lights shall be visible from the floor below the unit.

D. Exit Lights:

1. Batteries shall meet the requirements described above.
2. Exit signs shall be as indicated in the Lighting Fixture Schedule on the Drawings and specified herein. Comply with UL 1571 and NFPA–101.
   a. Minimum height of letters shall be 6".
   b. Minimum stroke width shall be 3/4".
   c. Minimum width of each letter shall be 2".
   d. Minimum spacing shall be 3/8".
   e. Luminance of face in normal operation and after one minute operation in emergency mode shall be equivalent to the viability of a reference sign illuminated to five footcandles.

E. Fluorescent Light Emergency Packs:

1. Batteries shall meet the requirements described above.
2. The inverter shall be all solid state, 87% minimum efficiency. Power output shall be capable of illuminating a fluorescent lamp to 500 to 600 lumens.
3. The unit shall be located in the fixture ballast channel. It shall be connected to an unswitched circuit conductor feeding the normal lighting.
4. Indicator lights on the pack shall be visible from the floor below the light.

2.14 OTHER MATERIALS

All other materials, not specifically described but required for a complete and proper installation of the work of this Section, shall be selected by the Contractor subject to the approval of the ARCHITECT.

PART THREE – EXECUTION

3.01 INSPECTION

Examine the areas and conditions under which the work of this Section will be installed. Correct condition detrimental to the proper and timely completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Coordination:

1. Coordinate installation of electrical items with the schedules for other work, to prevent unnecessary delays in the total Work.
2. Where lighting fixtures and other electrical items are shown in conflict with locations of structural members and mechanical or other equipment, provide all required supports and wiring to clear the encroachment.

B. Accuracy of data: The data indicated on the Drawings and in these Specifications are as exact as could be secured, but their absolute accuracy is not guaranteed. Exact locations, distances, levels, and other conditions will be governed by the building. Use the Drawings and these Specifications for guidance, and secure the ARCHITECT's approval of all changes in location.

C. Measurements: Verify all measurements at the site. No extra compensation will be made because of differences between locations shown on the Drawings and measurements at the building.

D. Circuiting: The branch circuits and arrangement of home runs are to be designed for maximum economy consistent with sizes for voltage drop and other considerations.

3.03 INSTALLATION OF RACEWAYS AND FITTINGS

A. Concealment: Conceal all conduit in walls or ceiling space unless otherwise specifically approved by the ARCHITECT or indicated on the Drawings. Where conduit is allowed to be exposed, install the conduit parallel with or at right angles to structural members, walls, and lines of the building.

B. Installation:

1. Keep all conduit at least 6" away from the covering on hot water pipes.
2. Keep ends of conduit closed with approved conduit seals during construction of the building. Use conduit unions where union joints are required. Do not use running threads.
3. Where conduit is installed in concrete slabs, on the ground, underground, or exposed to the weather, make all joints liquidtight and goastight. Bury all underground conduit to a depth of 2'–0" below finished grade unless otherwise shown on the Drawings.

3.05 INSTALLATION OF LIGHTING FIXTURES

A. Install all lighting fixtures complete and ready for service, in accordance with the Fixture Schedule on the Drawings.

B. Provide all lamps as shown on the Fixture Schedule.

3.06 INSTALLATION OF POWER EQUIPMENT

Provide all power and control wiring required for the work of other trades as described on the Drawings and in the various Sections of these Specifications, except where the furnishing and installing of such wiring is specified elsewhere.

3.07 INSTALLATION OF CONDUCTORS

Install conductors in accordance with the National Electrical Code.

3.08 INSTALLATION OF PANELS

A. Installation: Unless otherwise indicated on the Drawings, install all panels with the top of the trim 6'–0" above the finished floor. Panels located where they are not visible to the public may be surface mounted, if space permits.

B. Directories: Mount a typewritten directory behind glass or plastic on the inside of each panel door. On the directory, show the circuit number and complete description of all outlets on each circuit.

3.09 GROUND FAULT BREAKERS

Install ground fault interruption system or breakers for all circuits required by the National Electrical Code or shown on the Drawings.

3.09 TESTING

Upon completion of this portion of the Work, test all parts of the electrical system in the presence of the ARCHITECT. Demonstrate that all equipment furnished, installed, and/or connected under this Section of these Specifications functions electrically in the required manner.

END OF ELECTRICAL SPECIFICATION

James R. Burch 11-20-07

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ARCHITECTURE/PLANNING/URBAN DESIGN/
CONSTRUCTION MANAGEMENT AIA/ APA

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DRAWN	J. BURCH
CHECKED	J. BURCH
DATE	SEPTEMBER 2007
FILE NO	AEC
JOB NO	04–816
SHEET	ES–1

FIRE ALARM SYSTEM SPECIFICATION

PART ONE – GENERAL
1.01 SCOPE:

A. The contractor shall furnish, install and place in good operating condition a fire detection and alarm system in accordance with the following specifications and as shown on the accompanying drawings.

B. The work described in this specification includes all labor, materials, equipment and services necessary to install and test the complete system. Any material not specifically mentioned in this specification, or not shown on drawings but required for proper performance and operation of the prescribed system, shall be furnished and installed

C. The work covered by this specification shall be coordinated with related work specified elsewhere in the project documents.

D. The final system connections and testing shall be done under the direct supervision of the system supplier or a factory trained representative. The contractor shall provide the services of a factory trained technician to demonstrate the entire system to the complete satisfaction of the Owner's representative and to make all necessary adjustments to system operation as required by the Owner.

E. This specification establishes the requirements for the installation of a complete analog–addressable fire detection and alarm system. The system shall include, but not be limited to; Fire Alarm Control (FACP), Remote Operations and Display Unit (FARP), alarm initiating and signaling devices, enclosures and all other equipment necessary to furnish a fully operational system.

F. All equipment shall be the products of a single manufacture.

1. It is the contractor's responsibility to meet the entire intent of the specifications. Approved submittal of substitute equipment shall only allow the contractor to proceed with installing the substitute equipment. Substitute equipment shall not be considered equal until final acceptance of the installed system. All costs of removal, relocation or replacing the substitute equipment shall be at the risk of the contractor.

2. In the case of substitutions of the equipment specified it shall be the contractor's obligation to submit sufficient information to evaluate the substitute equipment as equal to that specified.

1.02 STANDARDS

A. The equipment and the installation shall comply with the current provisions of the following standards;

1. NFPA 72 National Fire Alarm Code
2. NFPA 70 National Electrical Code, Article 760
3. NFPA 101 Life Safety Code, Section 7–6 and Section 17–3.4
4. Applicable Local/State Building Code
5. American's with Disabilities Act, Public Law 101–336

B. The equipment and all components shall be U.L. listed for use in fire protective signaling systems.

1.03 DOCUMENTATION

A. The contractor shall submit three (3) complete sets of documentation within 30 calendar days after notice to proceed. All equipment referenced in the documentation shall be subject to approval. Documents shall include;

1. Detailed component and equipment list with manufacture's mode designations and part numbers.
2. Product sheets for each item of equipment.
3. Written confirmation that a factory trained representative will provide job site supervision during the system installation, perform all final testing and instruct operating personnel on system operation.
4. Standby battery calculations showing system power requirements and formulas used to calculate power requirements.
5. Detailed point–to–point equipment connection diagrams.

B. Upon completion of the project the contractor shall provide two (2) copies of the following documentation within 30 calendar days of system acceptance;

1. Operation and Installation Manual
2. As–Built wiring diagrams for the installed system
3. Name, address and telephone number of the authorized factory service organization.

1.04 FUNCTIONAL REQUIREMENTS

A. FIRE ALARM CONTROL PANEL (FACP)

1. FACP shall support the required number of addressable devices as shown on the drawings, and shall be expandable to 125% (minimum) of the requirements of the building as shown on the drawings.
2. After proper passcode clearance, an operator shall be able to control outputs, review and acknowledge outstanding events, review the FACP event log and review FACP status.

B. SYSTEM OPERATION

1. GENERAL

a. The fire detection and alarm system shall detect all changes in status of monitored points and shall initiate appropriate actions to alert and/or evacuate occupants, provide event annunciation and actuate auxiliary controls as specified herein.

b. The system shall accept, process and evaluate the following types of signals;

(1) Automatic smoke detectors
(2) Automatic heat detectors
(3) Manual alarm stations
(4) Sprinkler waterflow switches
(5) Sprinkler tamper switches
(6) Other supervisory type inputs
(7) Control relay response confirmations
(8) Detector sensitivity data

c. Analog type smoke detectors shall have their sensitivity continuously monitored. The control equipment shall evaluate the sensitivity data for determination of sensitivity change and shall automatically provide environmental compensation to maintain constant detector sensitivity. It shall be possible to automatically or manually adjust analog detection sensitivity.

(1) The Fire Alarm Control Panel (FACP) shall communicate with field devices over one or more Style 6 analog–addressable signaling line circuits. These circuits shall have the following characteristics;

(a) Circuit fault monitoring, including:

1) Signaling line circuit open condition
2) Signaling line circuit short condition
3) Excessive electrical "noise" on the signaling line circuit
4) Ability to identify the location of short and open circuit conditions
5) Detector or device missing condition
6) Improper device type at a specific address
7) Un–configured device at an address
8) Multiple devices at the same address

(b) Provide a single point address polling function that shall cause repeated polling of a selected device for system troubleshooting. Single device polling of a smoke detector shall cause the detector's LED to illuminate steady allowing for ease of locating the detector or detectors when more then one device is mistakenly programmed at the same address.

(c) Provide a circuit wiring distance of up to 1 mile.

(2) Sub–circuits from addressable input/output modules, used to interface input or output devices (i.e. bells, conventional fire detectors, tampers, etc) shall be supervised. Initiating circuits shall be wired for Style B operation and indicating circuits wired for Style Y operation. Supervision shall include open circuit, short circuit and ground fault. Modules requiring external power for operation of two–wire conventional detector sub–circuits and initiating device circuits shall supervise the presence of external power. Equipment requiring external supervisory relays shall not be acceptable.

(3) The system shall be capable of providing a summary output to a printer port, initiated by operator command, that include as a minimum the following information;

(a) Analog values of all points including instantaneous value and long term average value
(b) Points isolated
(c) Points tested/failed test
(d) Points out of sensitivity compensation
(e) Event log contents

(4) Each FACP shall be on site programmed. The programming software shall provide the following automated reports for owner review;

(a) Project history (changes made to the system, with date stamp)
(b) List of authorized system programmers
(c) Full system configuration data

(5) The system shall provide point isolation by single point or group of points. The system shall ignore signals from input devices when isolated. The system shall annunciate and remain in a trouble state while any device is isolated.

(6) The system shall provide identification of point type, location and status. Each addressable and analog device shall have a field assigned 20 character zone identification message and a unique 20 character device location message.

(7) The system shall provide standby batteries for complete system operation during AC power outages.

(a) A fault condition shall be indicated when the system is operating on standby battery. When AC power is restored the system shall revert back to AC power without operator intervention or manual restart.

(b) Each FACP shall be equipped with a battery charging circuit sufficient to recharge depleted batteries to within 70% of maximum capacity within 12 hours. Standby batteries shall be capable of supplying the system under full supervision for 24 hours. Following the 24 hour period, the system shall supply 100% general evacuation alarm output for a minimum of 5 minutes.

3. SYSTEM ALARM OPERATION

a. The manual or automatic operation of an alarm initiating device shall cause the FACP to transmit an appropriate signal including:

(1) Sound an alarm signal in all locations within the affected building.
(2) The alarm signal shall consist of audible horn until silenced or reset.
(3) Activate all visual alarm strobes. Upon operation of system silence, audible signals shall silence while visual signals shall continue to operate until the system is reset.
(4) The alarm condition shall be visually and audibly indicated at the FACP as follows;

(a) Illuminate a red "system fire alarm" LED indicator.
(b) Illuminate a red "zone fire alarm" LED indicator. The indicator shall flash until the system is silenced. After the system is silenced, the zone alarm LED shall change from flashing to steady and remain illuminated until the system is reset.
(c) Continuously sound an audible buzzer at the FACP that shall sound until the system is silenced. After silenced, the alarm buzzer shall change from a steady tone to a pulsed tone and remain active until the system is reset. It shall be possible to silence the FACP audible buzzer without causing building audible alarms to silence.
(d) Display specific information about the alarm condition on the LCD as follows;

1) Type of event
2) Numeric identification of point and zone in alarm
3) 20 character text message unique to the specific point in alarm
4) 20 character text message associated with the zone in alarm
5) An indication of the number of outstanding events in the system.

(5) The system shall display the alarm condition at its remote operations and display unit.

(6) Operation of the system silence switch shall silence all connected audible appliances. All displays shall remain illuminated until the system has been cleared and reset. In the event of a subsequent alarm after system silence, the FACP shall resound the building alarm signals. All audible appliances that had been previously silenced shall resound and all audible appliances programmed to respond to the new alarm condition shall activate.

(7) Each event shall be individually acknowledged before the system can be returned to normal operation. Access to the acknowledge function shall be passcode restricted such that only authorized personnel may operate.

b. Upon activation of any smoke sensor, the system shall reset the detector for a period of 15 seconds. After reset, a second detector activation during the verification period shall initiate the alarm response as described previously with the addition of the following actions;

(1) The system shall direct the HVAC system fans to shut down in accordance with relevant local, state and national codes.
(2) The system shall recall building elevators in accordance with relevant local, state and national codes and standards.

PART TWO – PRODUCTS
2.01 GENERAL

A. Manufacturers: Subject to compliance with this specification, provide products from the following:

1. Siemens 600 fire alarm system to match existing campus standard

2.02 FIRE ALARM CONTROL PANEL (FACP)

A. The Fire Alarm Control Panel (FACP) shall be microprocessor based.

B. The FACP shall be housed in a system enclosure consisting of a power supply/battery charger unit, batteries and all electronics required to meet functional requirements.

C. As a minimum, the FACP shall provide the following operator controls and indicators;

1. Operators keypad.
2. 4 by 20 character back–lit LCD.
3. System power, alarm, trouble and supervisory LED indicators.
4. System reset, silence, panel silence, drill and lamp test switches.

D. The FACP shall be of dead front construction housed in a modular metal enclosure, surface mounted, with capability for expansion.

2.03 REMOTE OPERATIONS AND DISPLAY UNITS (FARP)

A. Remote Operations and Display Units shall be provided as shown on the drawings. Each Fire Alarm Control Panel (FACP) shall be capable of supporting the indicated remote units.

B. As a minimum, each remote unit shall be equipped with LED indicators for system power, alarm and trouble. There shall also be a key operated silence switch.

C. Remote Operations and Display Units may be powered locally or from the FACP and shall be fully supervised by the FACP. In the event of loss of local power or a failure in communications to a remote unit, both the FACP and remote unit(s) shall audibly and visually annunciate the fault condition.

D. Remote units shall be able to be located up to 1,000 feet away from the FACP over twisted pair cabling.

2.05 AUXILIARY RELAYS

A. As required to conform to this specification, auxiliary relays shall be installed within the FACP for interface with HVAC equipment, elevators, dampers and other auxiliary equipment.

B. Relays shall be provided on relay modules. Each module shall have the following characteristics;

1. Relay contacts shall be on site arranged for either normally open or normally closed operation.
2. Relay contacts shall be rated for 3.0 Amp at 120/240VAC and 30VDC.
3. The module shall provide one LED per relay that indicates relay status.
4. Each module shall have a "power on" LED indicating that operating power is present at the module.

C. Remote auxiliary relays shall mount in a dedicated, U.L. listed enclosure designed for the purpose or in a remote operation and display unit. Remote relays shall be connected to the FACP via a twisted pair serial data line operating at distances up to 4,000 feet from the FACP.

2.06 ANALOG–ADDRESSABLE DETECTORS

A. Analog–addressable smoke detectors shall be furnished and installed where shown on the drawings.

B. Smoke detector assemblies shall consist of a detector base with removable head. Analog–addressable detectors shall have a unique address associated with the base. Detectors that have the address associated with the removable head will not be accepted.

C. Analog–addressable detector addressing shall be by means of a coded card or switches. The address of the detector shall be visible from the floor without removing the detector head.

D. In order to minimize the life–cycle cost of the system and to reduce disruption of normal activities, analog–addressable smoke detectors shall be capable of being serviced from the floor without the need for ascending a ladder for access to the detector. Service functions from the floor shall include routine functional test per NFPA requirements, identifying the analog–addressable detector's address and removal of the detector head for cleaning or replacement.

E. Analog–addressable detectors shall be equipped with a visual status indicator and an output for a remote LED indicator.

F. Photoelectric Smoke Detectors: Analog–addressable photoelectric detectors shall be provided where indicated on the drawings. Photoelectric detectors shall have an asymmetrical sampling chamber for ease of smoke entry while reducing nuisance alarm possibility from dust contamination. The detector sensing chamber shall be protected by an insect screen. It shall be possible to adjust detector sensitivity, from 0.5 to 4.0 percent per foot obscuration, from the Fire Alarm Control Panel (FACP).

G. Detector Base: Smoke detectors shall be provided with a twist–lock base. The base shall be directly interchangeable with ionization and photoelectric type detector heads. Wiring shall be connected to terminals. Use of wire nuts is not acceptable.

H. All detectors shall be equipped with a tamper resistant screw to keep the detector from being removed from the base by unauthorized personnel.

2.07 ADDRESSABLE FIELD MODULES

A. Addressable modules shall be designed for surface or flush installation using standard electrical mounting hardware.

B. Each module assembly shall include a cover plate of "Bayblend" alloy material. With the exception of the mini–module described below, all modules shall have the following characteristics;

1. A visual indicator that displays active status and alarm condition.
2. Screw terminals for termination of field wiring. Each module shall include separate input/output terminals for the signaling line circuit and separate terminal connections for a spur circuit ("T"–tapping) to be used as necessary.

C. Addressable Contact Monitor Module: The contractor shall furnish and install addressable contact monitoring modules used to monitor normally open and normally closed type contact devices, including manual alarm stations, heat detectors, waterflow alarm devices and sprinkler tamper switches.

1. The module shall communicate with the FACP via the signaling line circuit, providing information of identity, location and status. The contact monitor module shall require one address on the signaling line circuit.
2. The module shall interface to the contact device via a supervised, Style B sub–circuit. The sub–circuit shall be supervised for opens and grounds. All contact devices attached to the sub–circuit shall report their status as a single identity.

D. Addressable Contact Monitor Mini–Module: The contractor shall furnish and install addressable contact monitor mini–modules to monitor a single contact device.

1. The mini–module shall be designed to install inside the same electrical box to which the contact device is mounted and shall not require its own electrical box.
2. The module shall have wire leads for field termination with wire nuts.
3. The mini–module shall be used to monitor normally open type contact devices, including manual alarm stations, heat detectors, waterflow alarm devices, sprinkler tamper switches and other auxiliary contact type devices.
4. The module shall communicate with the FACP via the signaling line, circuit, providing information of identity, location and status. The contact monitor mini–module shall require one address on the signaling line circuit.
5. The module shall interface to the contact device via a supervised, Style B sub–circuit. The sub–circuit shall be supervised for opens and grounds.

E. Addressable Detector Monitor Module: The Contractor shall furnish and install, as required, addressable detector monitor modules, used to connect conventional two–wire detectors to the signaling line circuit.

1. The module shall monitor and signal alarms from a sub–circuit of up to 20 conventional two–wire detectors.
2. The detector monitor module shall be U.L. compatibility listed with any two–wire conventional detectors encountered on this project. The module shall interface to the compatible detectors via a supervised, Style B sub–circuit. The sub–circuit shall be supervised for opens and grounds. All detectors attached to the sub–circuit shall report their status as a single identity.
3. Each conventional detection circuit shall be user selective to operate an alarm verification sequence in accordance with UL standard 864.
4. The module shall communicate with the FACP via the signaling line circuit, providing information of identity, location and status. The detector monitor module shall require one address on the signaling line circuit.
5. The detector monitor module shall provide separate terminals for connection to detector operating power from a UL listed 24VDC power supply. The module shall use this 24VDC source as detector operating power, and shall supervise the presence of this power.
6. When the FACP is reset, the module shall automatically reset the two–wire detectors on its sub–circuit.

F. Addressable Relay Module: The Contractor shall furnish and install, as required, addressable relay modules used to provide one volt–free changeover, Form "C" relay contact for auxiliary control.

1. The addressable relay shall be controlled by command from the FACP via the signaling line circuit, providing information of identity, location and status. The addressable relay module shall require one address on the signaling line circuit.
2. The relay state shall be continuously monitored and any change shall be reported to the FACP.
3. The relay contact shall be rated 1.0 Amp at 24VDC.

2.08 MANUAL PULL STATIONS

A. Double–action type, fabricated of metal or plastic, and finished in red with molded raised letter operating instructions of contrasting color. Stations requiring the breaking of a glass panel or a concealed glass rod are not acceptable.

1. Reset: Key or wrench operated reset station switch, double pole, double throw, and rated for the voltage and current at whhich they operate. Provide stations with screw terminals for connections.
2. Provide an addressable contact monitor module in each station.

2.09 ALARM INDICATING DEVICES

A. Equip alarm indicating devices for mounting as indicated, with terminal blocks for system connections.

1. Fire Alarm Horns: Electric vibrating polarized type, operating on 24–V d.c., with provisions for housing the operating mechanism behind a surface–mounted grille. Provide horns with a sound pressure level of 90 dB, measured 10 ft. from the source.
2. Visual Alarm Signals: Strobe lights utilizing high–intensity, clear, optic lens and xenon flash tube operating at 24–V d.c. Provide luminaires having their lenses mounted on an aluminum face plate. Provide the word "FIRE" engraved in minimum 1–inch–*high* letters displayed on the unit. Provide strobe lamps with listed intensity of 75 candela. Strobe leads shall be factory–connected to screw terminals.
3. Combination Signals: Provide factory–combined audible and visible alarm units of type indicated in a single mounting unit where indicated.

2.11 SYSTEM COMMISSIONING AND SERVICE REQUIREMENTS

A. SYSTEM PROGRAMMING

1. The system shall be software configured via an IBM compatible PC. The complete software configuration shall be constructed on the computer without the need for connection to the system.
2. The fire detection and alarm system shall permit all system revision and expansion to be completed on site. Under no circumstances shall the system's site specific configuration program be required to be returned to the manufacturer for modification as a result of system expansion or revision.
3. The configuration shall be stored on standard floppy disk for subsequent downloading to the Fire Alarm Control Panel (FACP). The floppy disk configuration file shall contain the installation name and specific configuration revision number. The revision number shall allow for tracking of system modifications throughout the life of the system.
4. Each revision of the system configuration on floppy disk shall include the following information;

a. The date/time of the modifications to the configuration.
b. A description of the changes made to the system.
c. Identification of the programmer who input the program revisions.

5. It shall be possible to request and view the configuration revision on the FACP display after entry of the appropriate passcode.
6. The configuration software shall provide the ability to compare any two revisions of the site configuration and provide a printed report of the differences in the two revisions. This function shall allow the user to readily identify the areas necessary to be re–tested to insure the full integrity of the system after any program changes or additions. Change reports shall be generated and submitted to the Authority Having Jurisdiction (AHJ), showing all changes. In addition, a test report shall be submitted, showing evidence that the changes were tested and verified. Systems that do not have this capability must include cost of testing the complete system by the equipment manufacturer to meet NFPA standards, after each change is made to the system.
7. The manufacturer shall provide evidence showing that the configuration software has been submitted and approved by UL for use with the FACP. Configuration software that does not meet this requirement shall not be considered equal.
8. The configuration software shall provide logic functions that shall permit logical ANDing, ORing and NOTing of system points in order to meet all current and future site requirements.
9. The configuration software shall include the ability to enable and disable groups of points upon event, that shall allow for the definition of functions such as, but not limited to, day/night enable/disable operation.
10. The configuration software shall provide software counters, that shall allow for the definition of functions such as, but not limited to, cross–zoning of smoke detectors.

B. The system shall allow, with entry of an appropriate password, selection of a commissioning mode function. In this mode, the system shall annunciate any fault condition within 7 seconds, in order to reduce commissioning and service time.

C. SOLO TEST OPERATION

1. The system shall have a Solo Test function that shall allow a single service technician to perform scheduled tests of initiating devices such as smoke detectors and pull stations.
2. The system shall allow the technician to select individual devices, a zone of devices or all initiating devices for solo test. While in the solo test mode, the technician shall be able to activate initiating devices without generating evacuation alarms. The system shall log the device or zone that has been activated.
3. When solo test is active, if an input is received from an initiating device that is not in a selected solo test zone or group, then the system shall interpret the event as real and shall perform the programmed annunciation and output response.
4. The system shall allow the technician to select Solo Test of selected indicating appliance circuits. While in this mode, the system shall pulse the selected indicating appliance circuits for 2 seconds every 30 seconds, allowing the technician to walk through the facility and verify proper operation of indicating appliances. Systems that require activation of initiating devices to test indicating circuits and appliances, or that only provide evacuation signal output during indicating appliance testing will not acceptable.

D. For smoke detectors that have been programmed for alarm verification, the system shall maintain individual records of the number of times specific detectors have entered the alarm verification cycle.

1. A technician shall be able to request an alarm verification report that shall indicate any specific analog–addressable smoke detector or conventional detector zone that have experienced at least one verification cycle including the number of verification cycles that each detector/zone has experienced.
2. It shall be possible to set a verification cycle overflow threshold from 2 to 31. If a particular detector or zone of detectors exceeds this threshold, the system shall annunciate the address and the verification cycle overflow condition.

E. The system shall have a service reminder function that can be programmed to remind the Owner that the system requires scheduled maintenance. This function shall be programmable to activate the service reminder yearly, monthly, and/or weekly.

F. The system shall allow the service technician to selectively turn on any of the system outputs, by group, zone and individually, from the FACP keypad.

G. The system shall be programmable for automatic adjustment of smoke detector sensitivity, based on time of day, day of week and specific days of the year (holidays).

H. The system shall allow isolation of specific devices or zones of devices. The system shall not respond to inputs from isolated input devices or operate isolated outputs. The system shall remain in a fault condition while devices are isolated.

I. The system shall have a programmable timed alarm/trouble reminder that shall periodically annunciate if any silenced troubles or alarms exist in the system.

PART THREE – EXECUTION
3.01 GENERAL

A. INSTALLATION

1. The contractor shall furnish and install in accordance with the manufacturers instructions all wiring, conduit and fixture boxes required.
2. Wiring shall meet the requirements of NEC, Article 760. All wires shall be color–coded to correspond with the shop drawings and shall be sized as recommended by the manufacturer of the fire alarm control unit.

a. The FACP and all alarm initiating, alarm indicating and signaling line circuits shall be U.L. Listed for Power Limited application.
b. Fire alarm system wires in junction boxes shall be permanently tagged and identified. Each junction box capacity shall be 40% greater than that required for associated fire alarm wires.
c. There shall be no splicing.

3.02 TEST AND INSPECTION REQUIREMENTS

A. Prior to making the final connections to any remote notification device(s), the system manufacturer or a trained representative shall furnish the Owner with a one year Fire Alarm Inspection and Test Agreement that shall provide at least 4 scheduled inspection/test visits during the warranty period. Any defective material shall be replaced at no additional charge to the owner during the first year. Any devices activated during the testing that require replacement shall be provided at no cost.

B. Each manual alarm station shall be tested at least twice annually. During quarterly tests of the system, at least one alarm initiating device shall be actuated/tested for each alarm circuit and a report of results forwarded to the owner.

C. All detectors associated with the fire alarm system shall be tested once every twelve months, with 25% of the total number being tested in each quarter.

D. Self–restoring detectors shall be exposed either to heat or smoke to test their ability to initiate an alarm and then properly restore to normal condition.

E. Quarterly test reports shall include the following;

1. Date
2. Name and location of test sight
3. Number of initiating devices tested and results
4. Total number of initiating devices
5. Condition of emergency standby power supply
6. Name of testing authority
7. Name and signature of person conducting test

3.03 WARRANTEE

The contractor shall guarantee all equipment and wiring free from inherent mechanical and electrical defects for a period of one year from the date of beneficial use.

REVISIONS	BY

ARCHITECTURE/PLANNING/URBAN DESIGN/
CONSTRUCTION MANAGEMENT AIA/APA

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"Faith is the substance of things hoped for, the evidence of things not seen." Hebrews 11.1

GRACE COVENANT
LAKE CITY, FLORIDA

DRAWN	J. BURCH
CHECKED	J. BURCH
DATE	SEPTEMBER 2007
FILE NO	AEC
JOB NO	04–816
SHEET	ES–2