

SOUTH TEXAS VETERINARY CLINIC

ADDITION Beeville, Texas

ISSUE DATE	03.15.2017
RELEASED FOR	
Project Status	
EAB #	
SET #	
of	

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CODE REVIEW / NOTES

GENERAL INFORMATION

PROJECT DESCRIPTION: VETERINARY CLINIC: ADDITION
 HEIGHT: ONE STORY
 AREA: 6,941 SF

CODE REVIEW

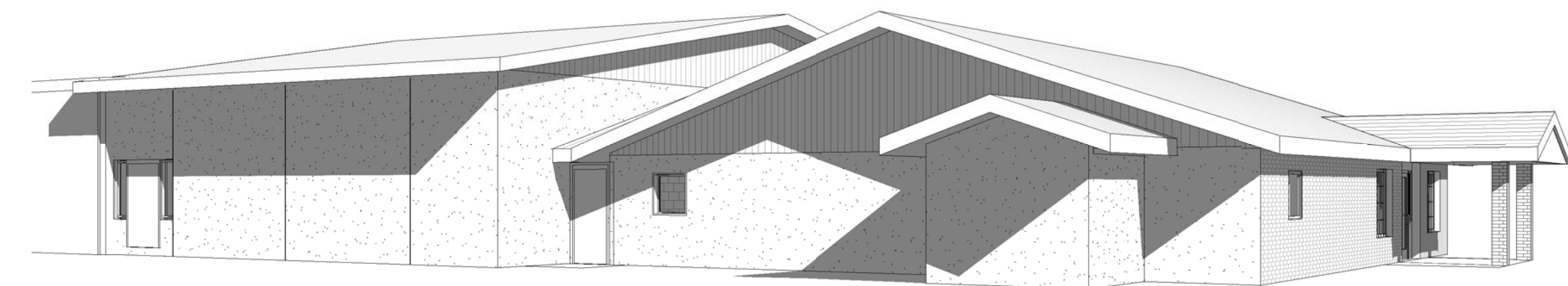
APPLICABLE CODES: 2009 INTERNATIONAL CODES
 2012 TEXAS ACCESSIBILITY STANDARDS

TYPE OF CONSTRUCTION: TYPE IIIB (REFER TABLE 601 FOR FIRE RESISTANCE RATINGS)
 PRIMARY OCCUPANCY: B - BUSINESS
 ALLOWABLE AREA: 19,000 SF

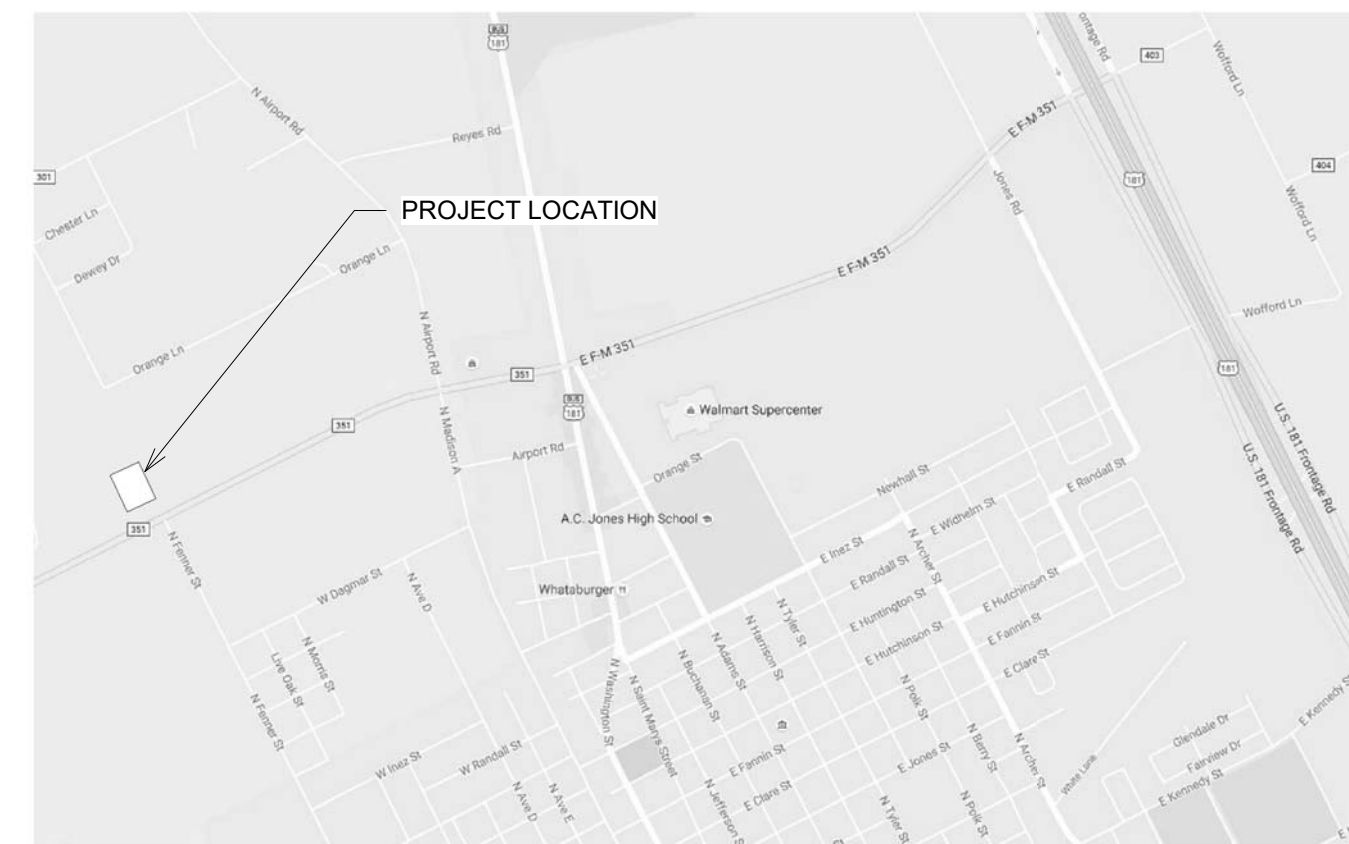
MEANS OF EGRESS:

OCCUPANCY	LOAD FACTOR	REQ'D CORR WIDTH	TRAVEL DIST.
BUSINESS	100 GROSS	44" OR 0.2" X OCC	200'

EXTERIOR



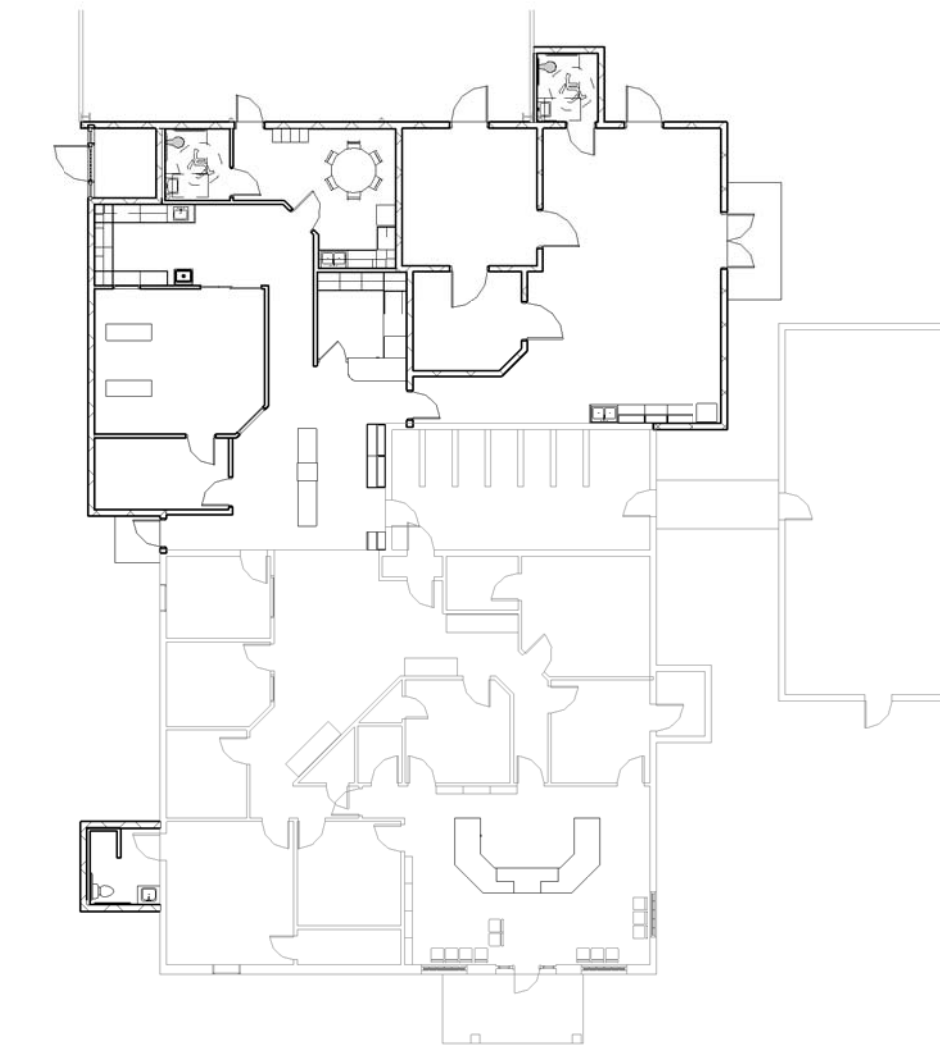
SITE MAP



SYMBOLS LEGEND

	BUILDING SECTION REFERENCE		WINDOW TYPE REFER TO SHEET A7.1 FOR ADDITIONAL INFORMATION
	INTERIOR ELEVATION REFERENCE		DOOR NUMBER REFER TO SHEET A7.1 FOR ADDITIONAL INFORMATION
	RESTROOM ACCESSORY REFER TO SHEET A2.1 FOR SCHEDULE		ENLARGED PLAN/ DETAIL REFERENCE
	MATERIAL REFERENCE REFER TO SHEET A4.1 FOR SCHEDULE		WALL TYPE REFER TO SHEET A1.1 FOR ADDITIONAL INFORMATION

LAYOUT



STRUCTURAL ENGINEER

DESIGN-BUILD CONTRACTOR

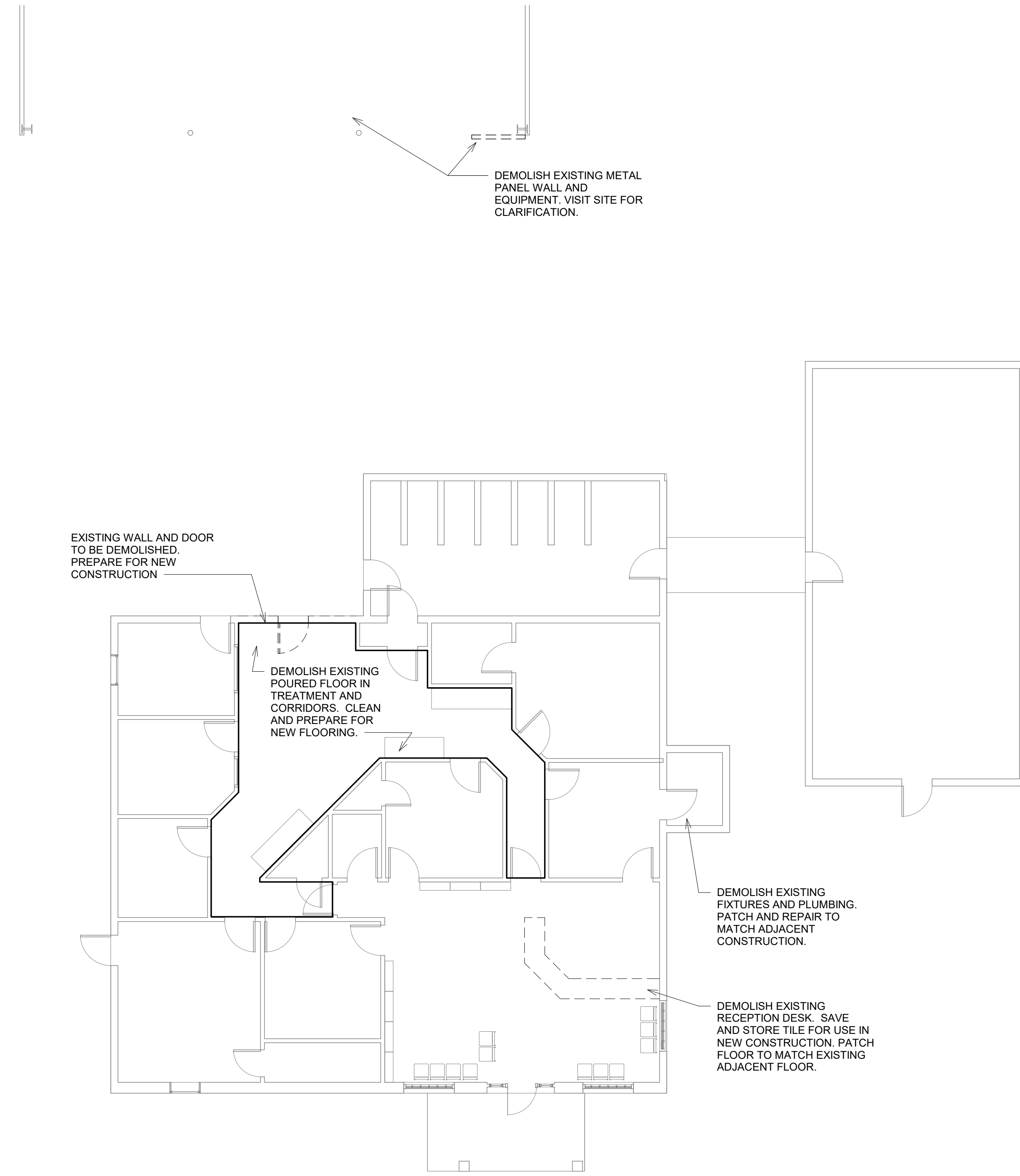
M.E.P. ENGINEER



2203 PORT LAVACA DRIVE • PO BOX 2146 • VICTORIA, TEXAS 77902
 361.576.0003 PHONE • 361.578.1626 FAX

WYCOFF ENGINEERING, INC.

361.771.3111
 1938 COUNTY RD 237
 GANADO, TEXAS 77962



1 Demo Plan
1/8" = 1'-0"

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DRAWING SCALE

1/8" = 1'-0"

DRAWN BY

Author

PAGE TITLE

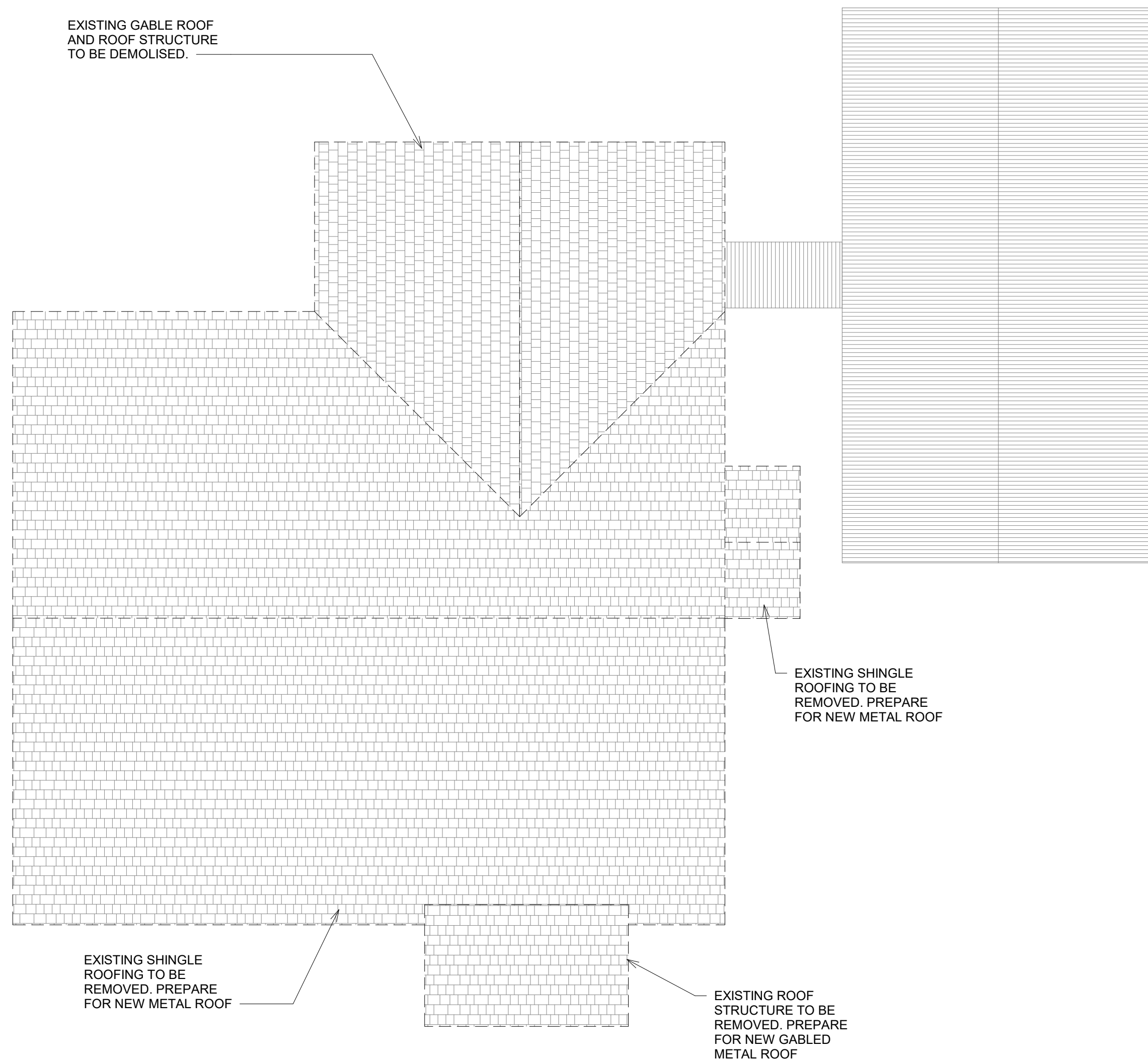
DEMOLITION PLAN

SHEET

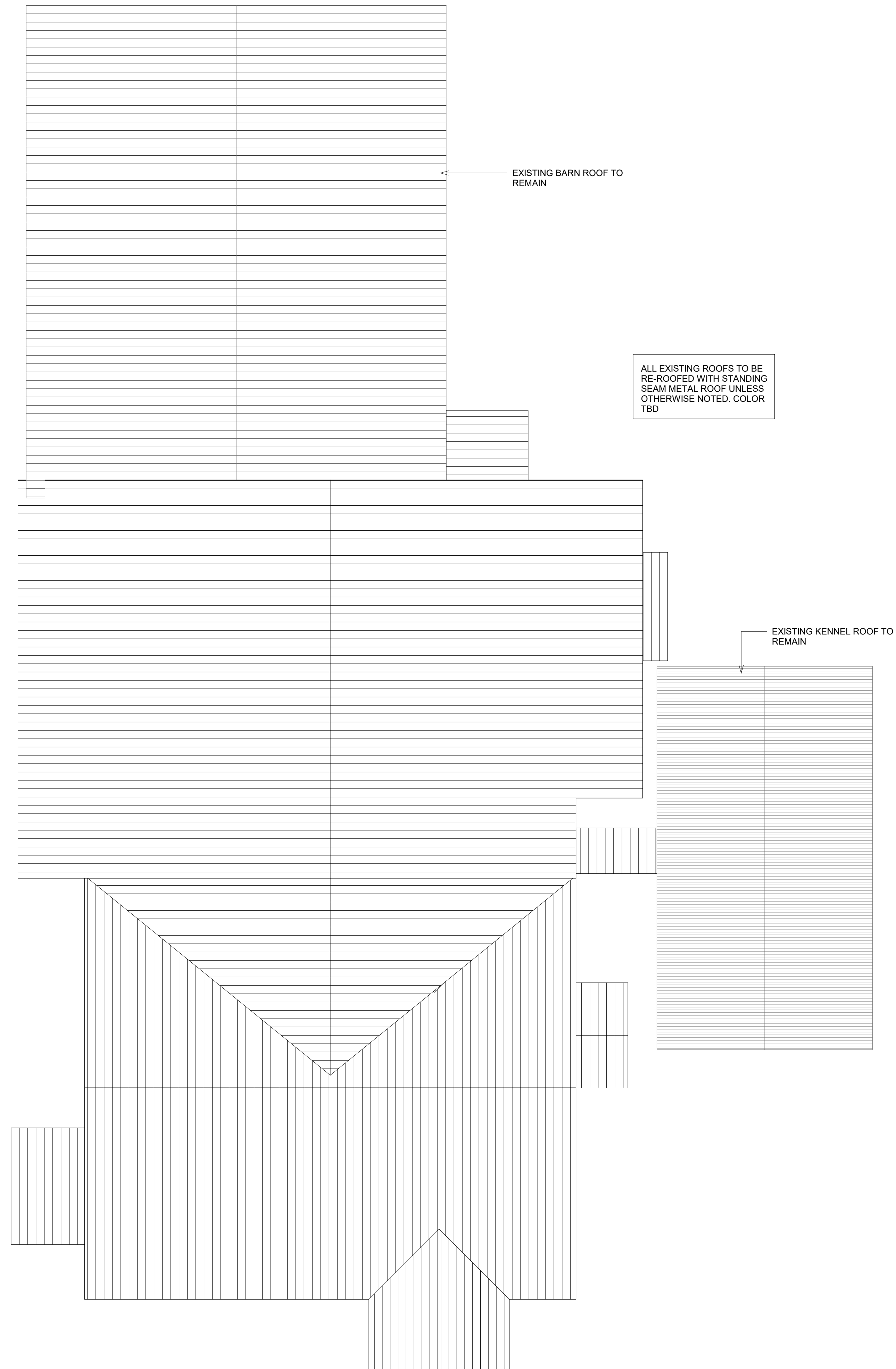
D1.0



EXISTING GABLE ROOF AND ROOF STRUCTURE TO BE DEMOLISHED.



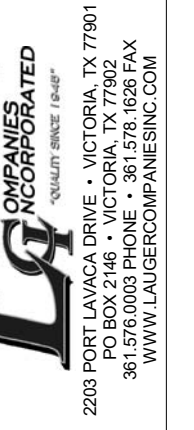
① DEMOLITION ROOF PLAN
1/8" = 1'-0"



② ROOF PLAN
1/8" = 1'-0"

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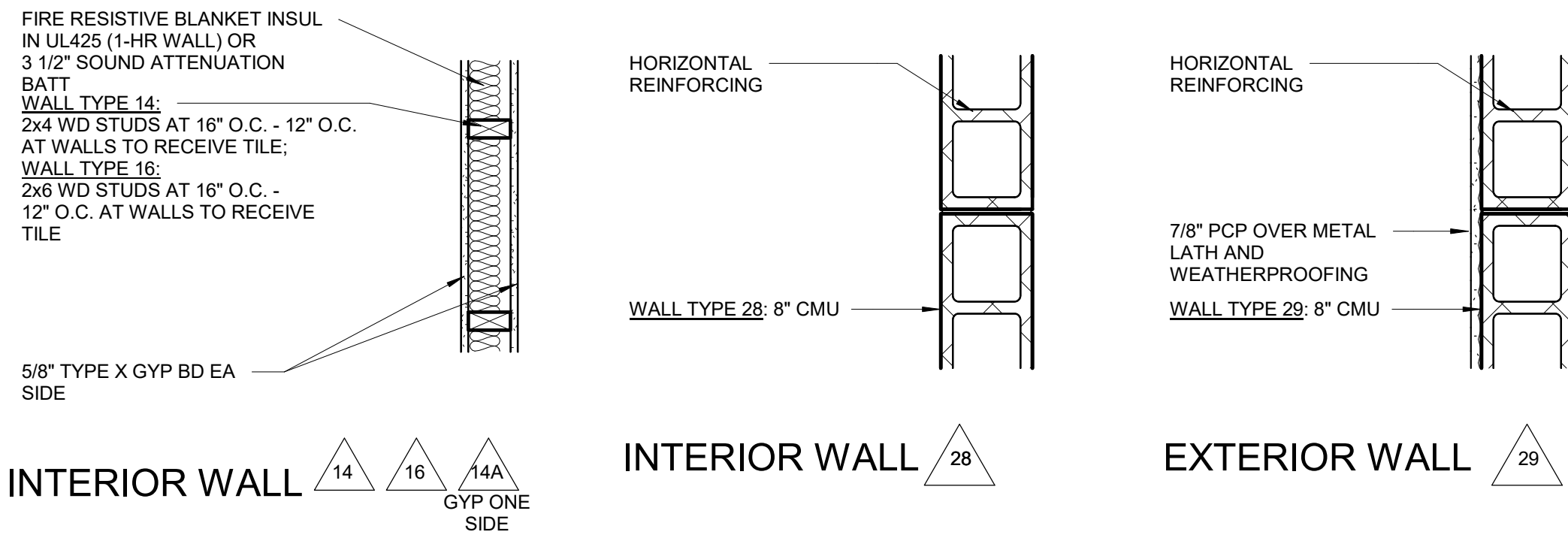
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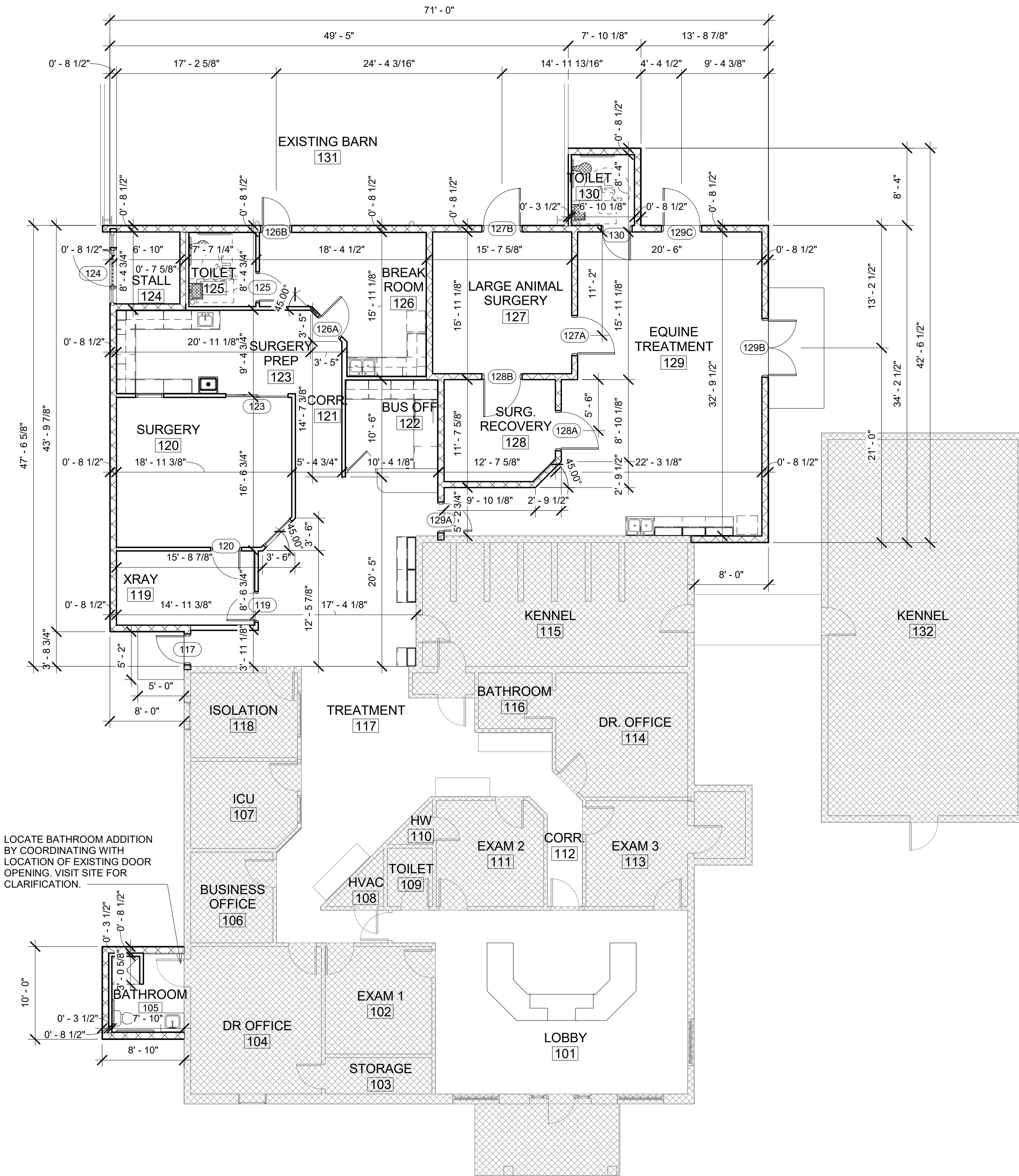
PAGE TITLE
ROOF PLAN

SHEET

A1.0



3 WALL TYPES
 1" = 1'-0"

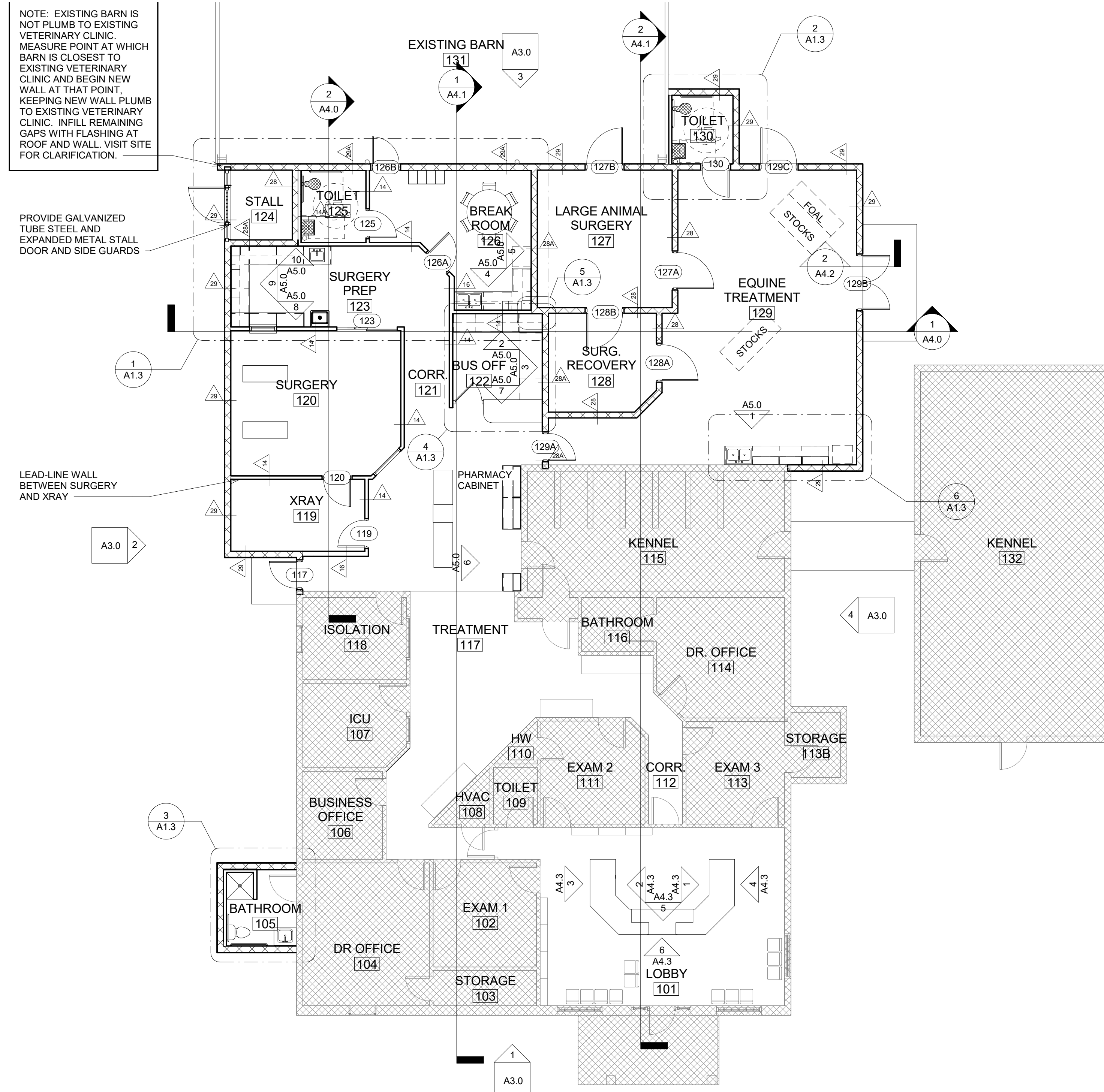


1 DIMENSIONED PLAN
 1/8" = 1'-0"

NOTE: EXISTING BARN IS NOT PLUMB TO EXISTING VETERINARY CLINIC. MEASURE POINT AT WHICH BARN IS CLOSEST TO EXISTING VETERINARY CLINIC AND BEGIN NEW WALL AT THAT POINT, KEEPING NEW WALL PLUMB TO EXISTING VETERINARY CLINIC. INFILL REMAINING GAPS WITH FLASHING AT ROOF AND WALL. VISIT SITE FOR CLARIFICATION.

PROVIDE GALVANIZED TUBE STEEL AND EXPANDED METAL STALL DOOR AND SIDE GUARDS

LEAD-LINE WALL BETWEEN SURGERY AND XRAY

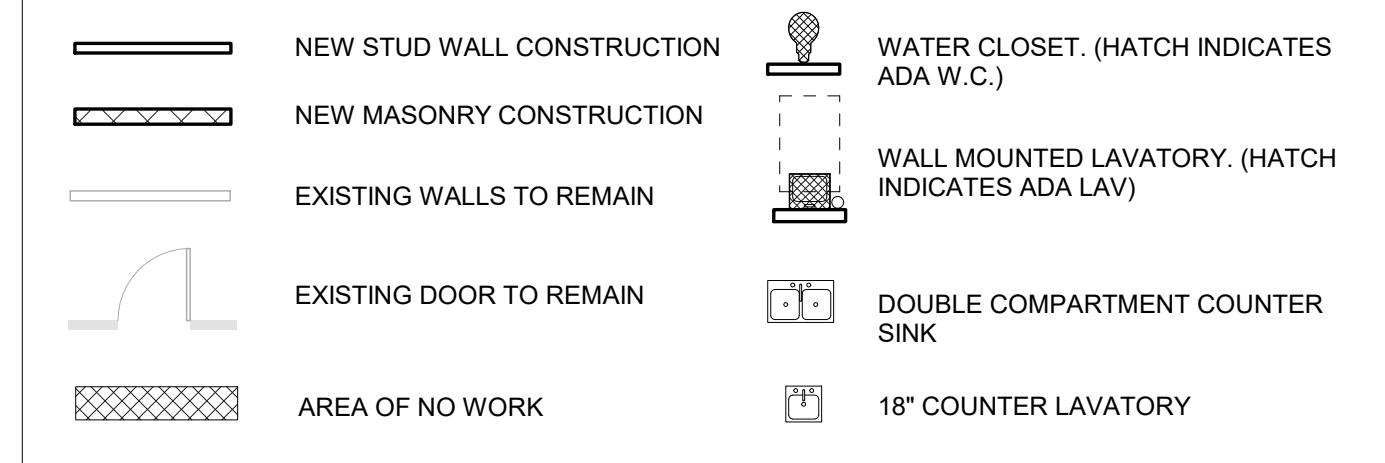


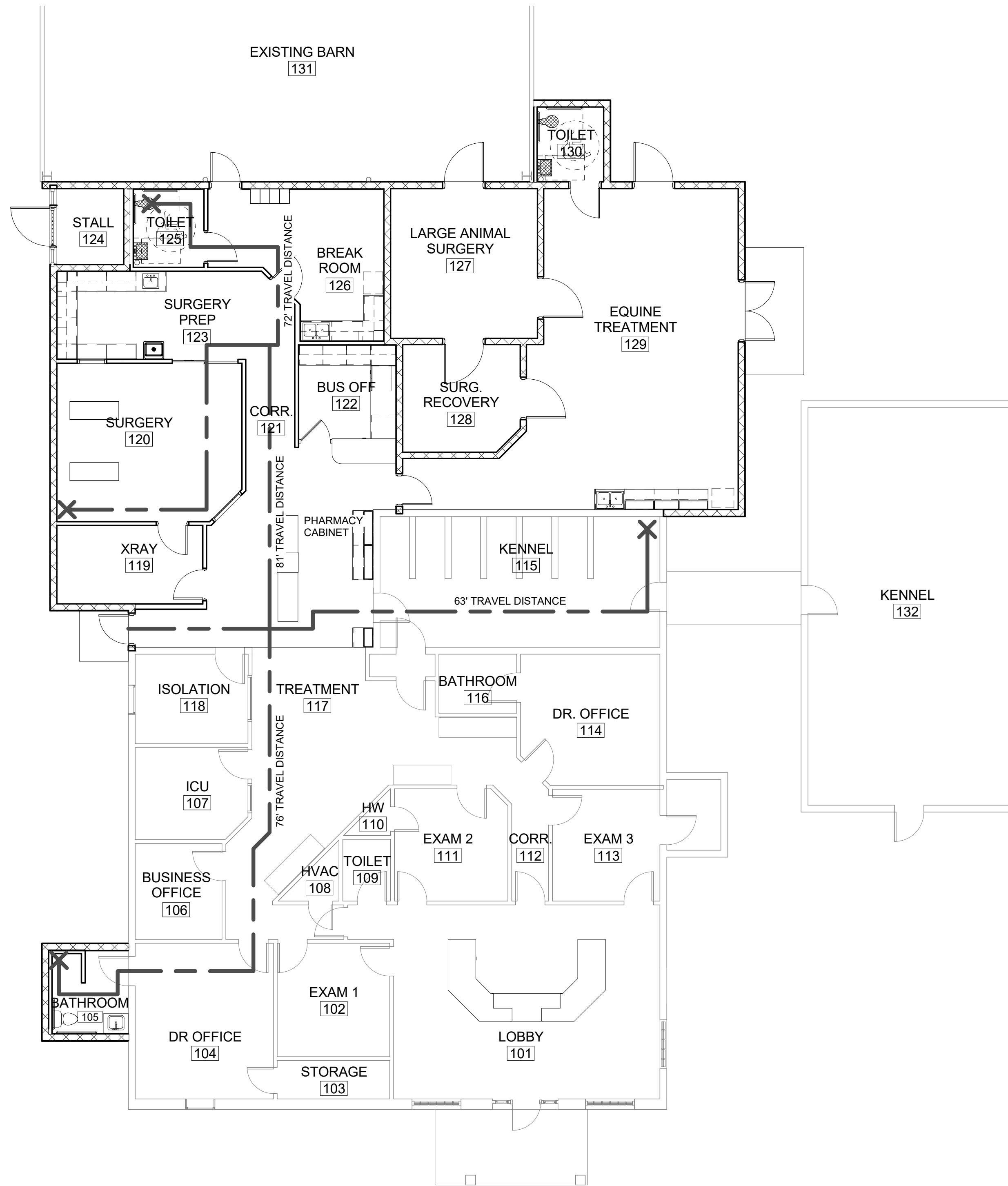
2 FLOOR PLAN
 1/8" = 1'-0"

GENERAL NOTES

- ALL DIMENSIONS TO EXISTING WALLS ARE FROM EXISTING FINISH FACE. ALL EXTERIOR DIMENSIONS ARE TO OUTSIDE FINISH FACE. ALL PLUMBING DIMENSIONS ARE FROM FINISH FACE. ALL OTHER WALL DIMENSIONS ARE TO FACE OF STUD OR CMU.
- FLOOR MATERIAL CHANGES BETWEEN ROOMS TO OCCUR UNDER DOOR (UON).
- PAINT ALL WALLS TO 6" ABOVE CEILING, TYP.
- PROVIDE CJS AT GYP BD CEILINGS AT 50'-0" O.C. MAX. (UON). PROVIDE CJS AT WALLS/BLKHDRS AT 30'-0" O.C. MAX. (UON)
- ALL SUSPENDED GYP BD TO BE PAINTED.

CONSTRUCTION LEGEND





PLUMBING COUNT

TYPE OF OCCUPANCY: B

TOTAL No OCCUPANTS: 70

No OF MALES: 35			No OF FEMALES: 35		
	REQD	PROVIDED		REQD	PROVIDED
1:25 TLTS	2	2	1:25 TLTS	2	2
URINALS-67%	[-]	-		-	-
1:40 LAVS	1	2	1:40 LAVS	1	2
TOTAL FIXTURES	3	4		3	4

UNISEX REQUIREMENTS (1109.2.1): N/A REQUIRED; 4 PROVIDED
(1 FOR # OF FIXTURES >6)

1:100 EWC's REQUIRED 1; PROVIDED AS WATER COOLER IN BREAK ROOM

EGRESS REQUIRED

70 OCCUPANTS 5 PROVIDED

2 EXITS REQUIRED: 202' PROVIDED

44' REQUIRED:

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LAUGER COMPANIES
INCORPORATED
2203 PORT LAVACA DRIVE • VICTORIA, TX 77901
PO BOX 216 • VICTORIA, TX 77902 • TX
361 LAUGERCOMPANIES.COM

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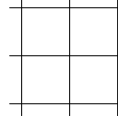
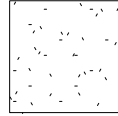

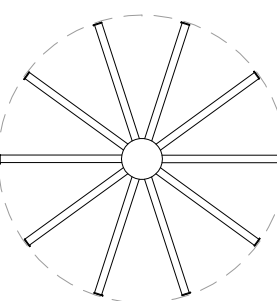
EGRESS & FIRE PLAN

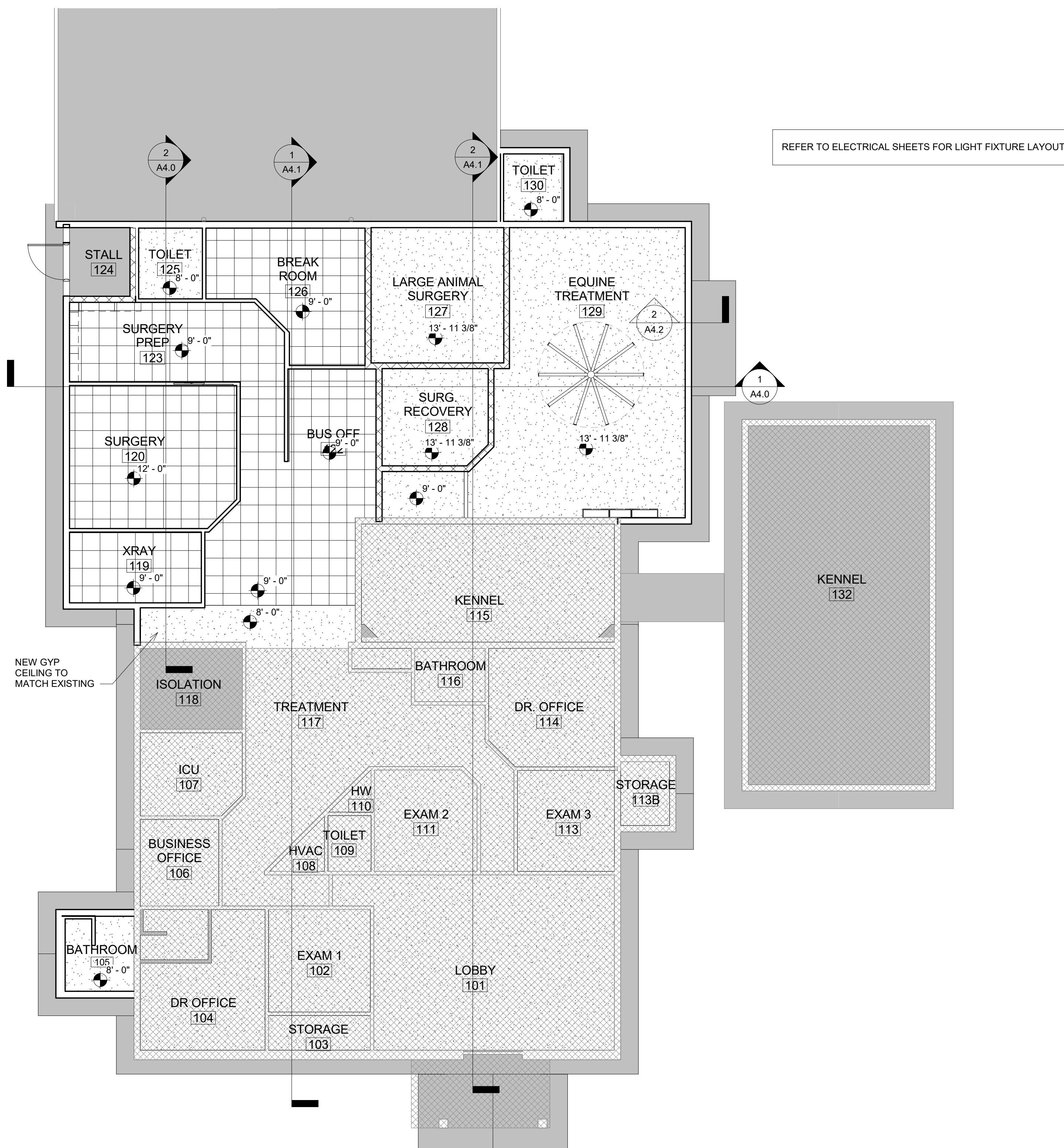
SHEET

A1.2

① EGRESS PLAN
1/8" = 1'-0"

RCP LEGEND

-  SUSPENDED ACOUSTICAL PANEL CEILING
-  SUSPENDED GYPSUM CEILING
-  OPEN TO STRUCTURE
-  12' FAN

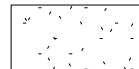
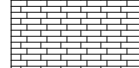


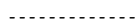


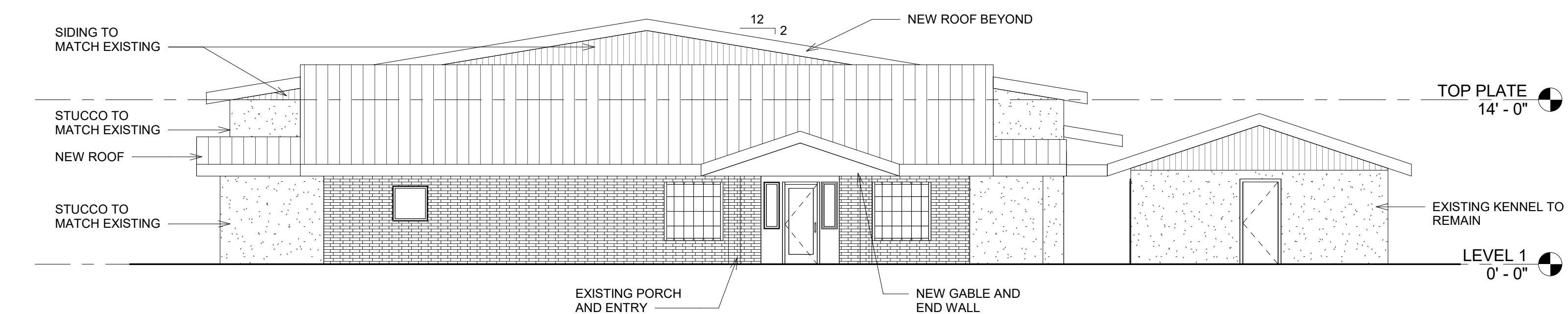
1 REFLECTED CEILING PLAN
 1/8" = 1'-0"



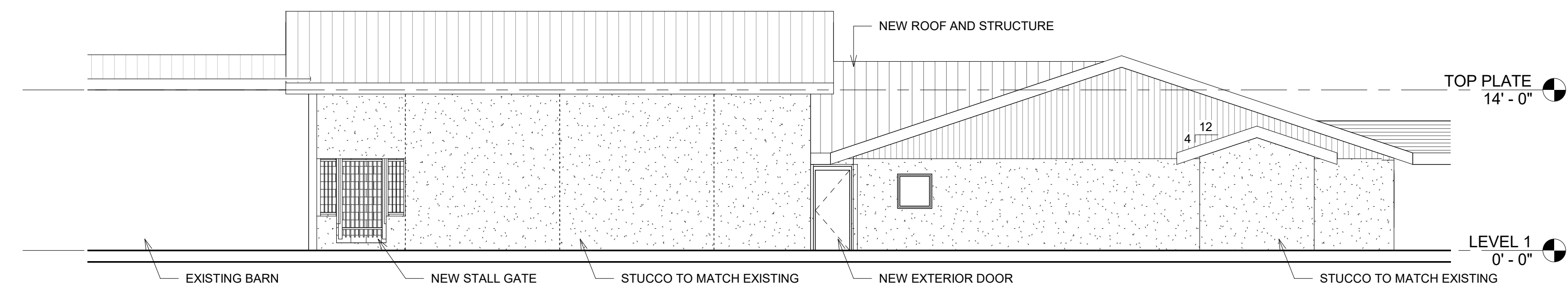
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ELEVATION LEGEND

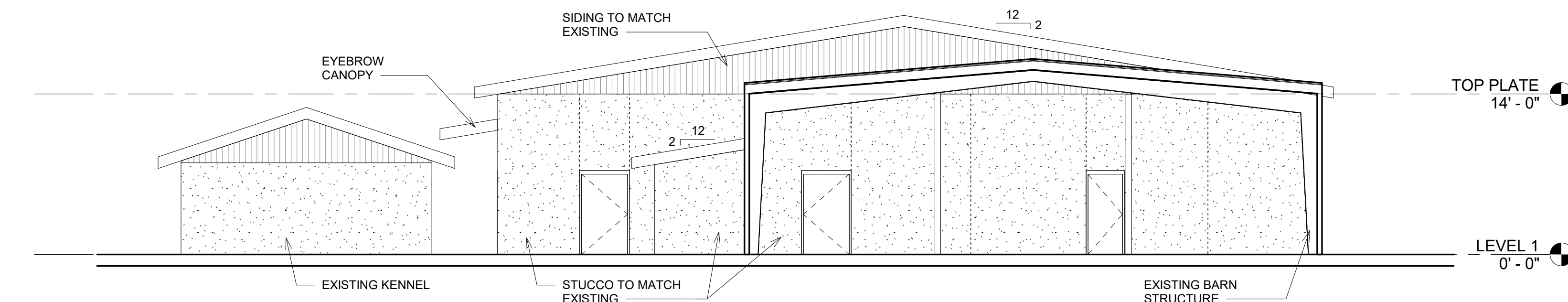
-  - PLASTER - PCP1
-  - BRICK - BK1 (KING SIZE), EXISTING
-  - STANDING SEAM METAL ROOF
-  - WOOD SIDING, PAINTED
-  - PLASTER CONTROL JOINT



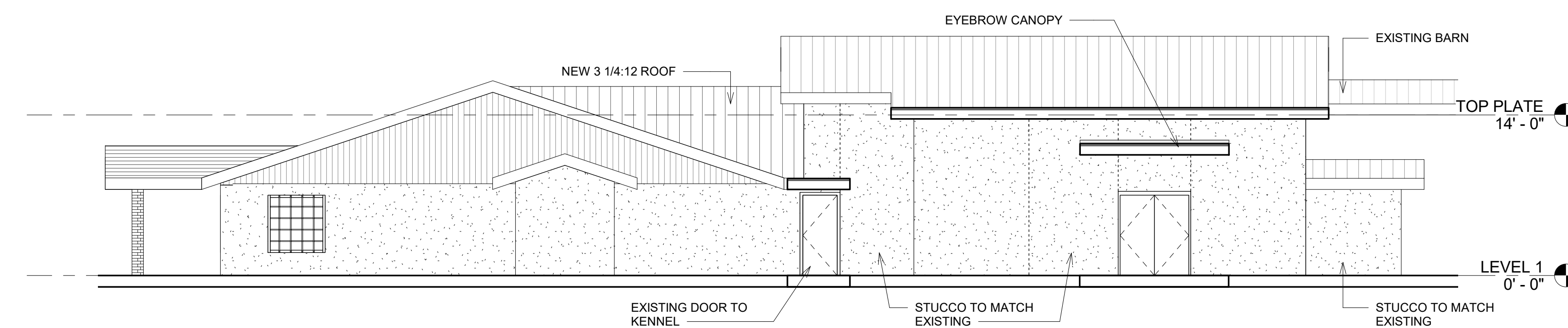
① SOUTH ELEVATION
1/8" = 1'-0"



② WEST ELEVATION
1/8" = 1'-0"



③ NORTH ELEVATION
1/8" = 1'-0"



④ EAST ELEVATION
1/8" = 1'-0"

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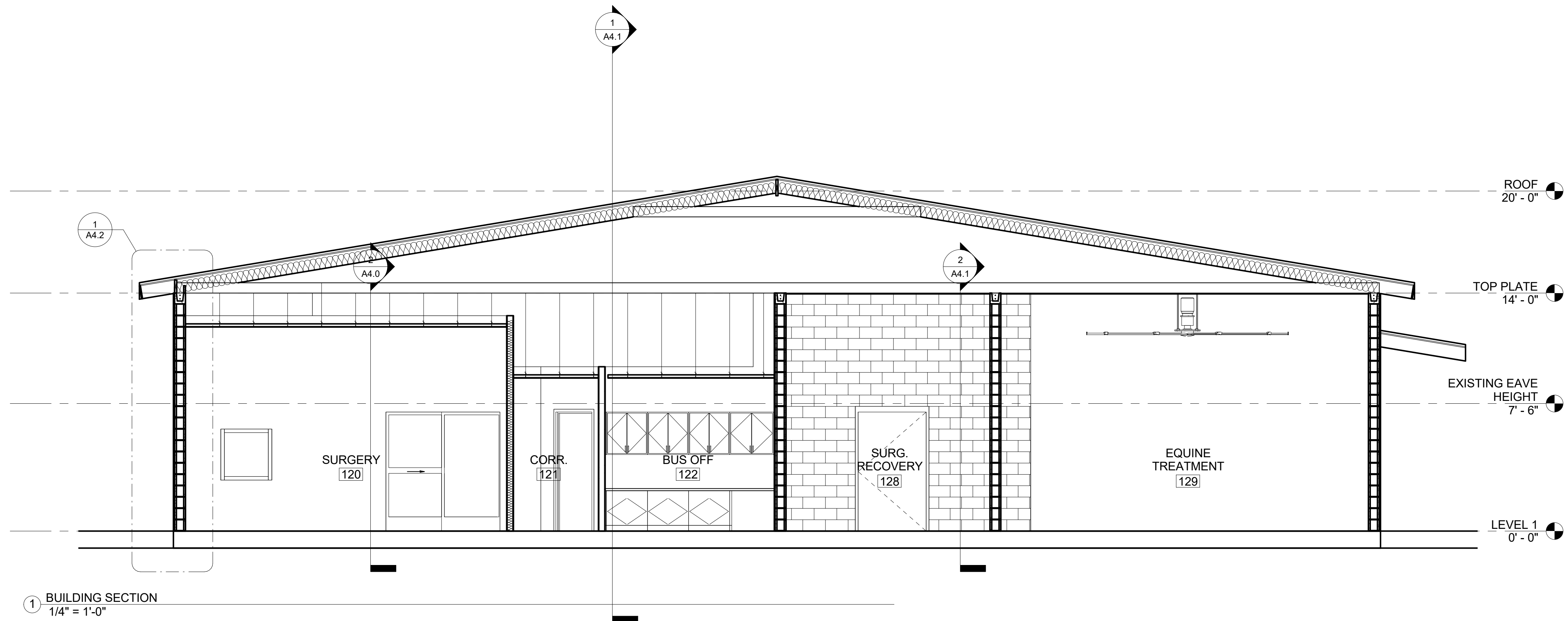
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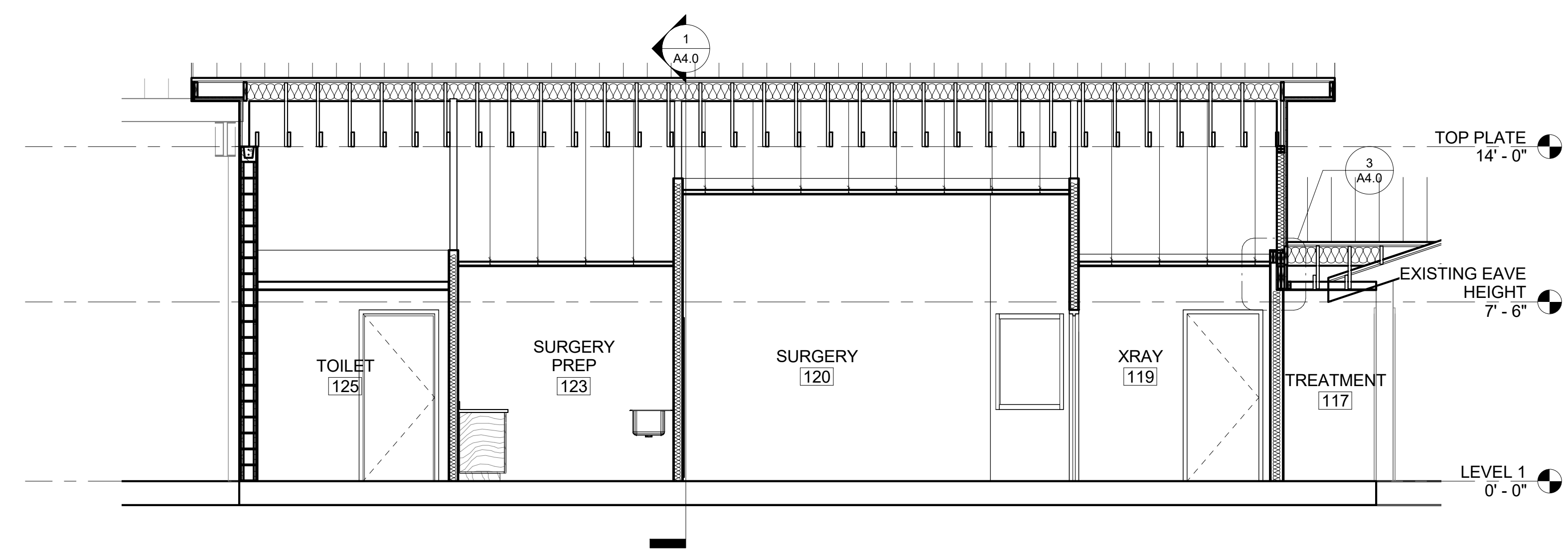
PAGE TITLE
BUILDING SECTIONS

SHEET

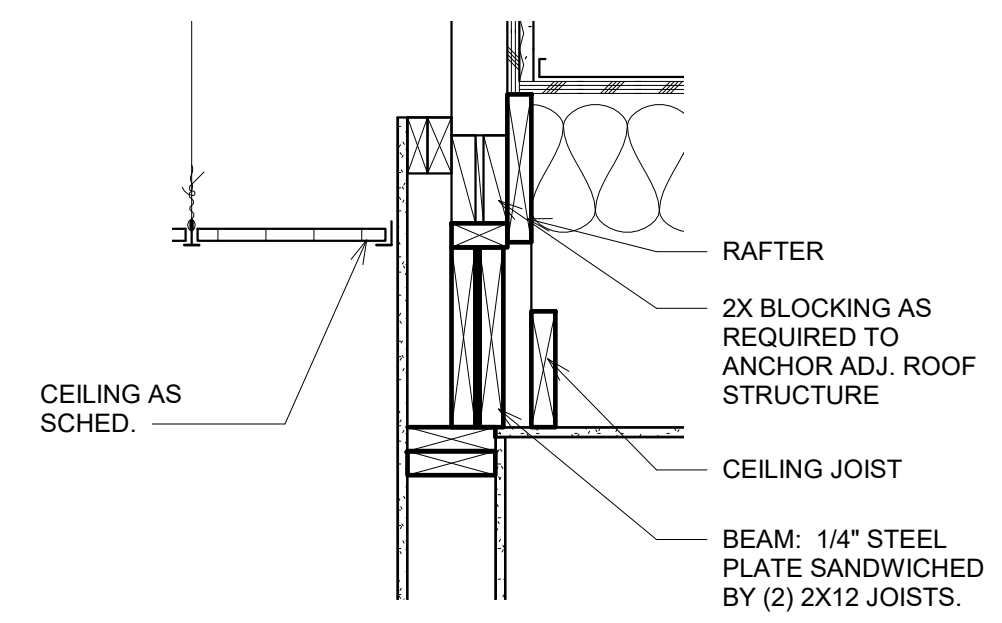
A4.0



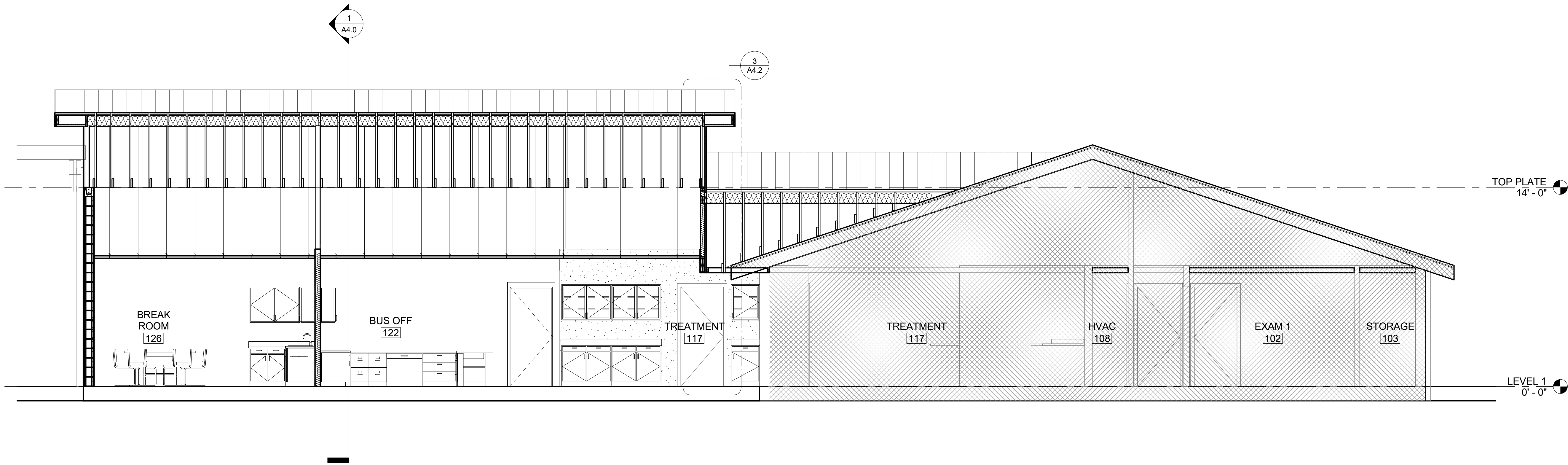
1 BUILDING SECTION
1/4" = 1'-0"



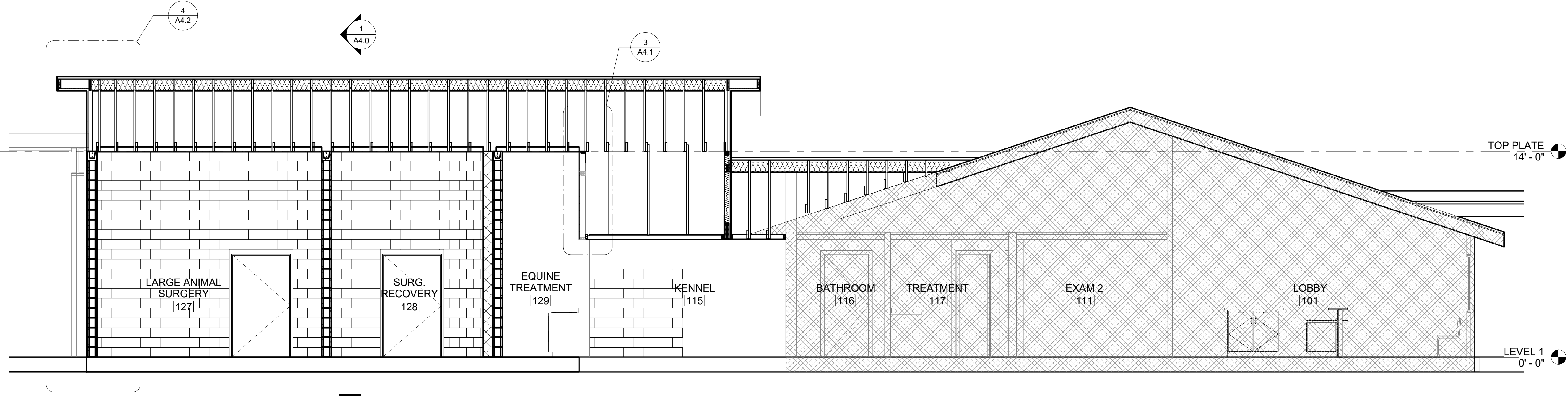
2 BUILDING SECTION
1/4" = 1'-0"



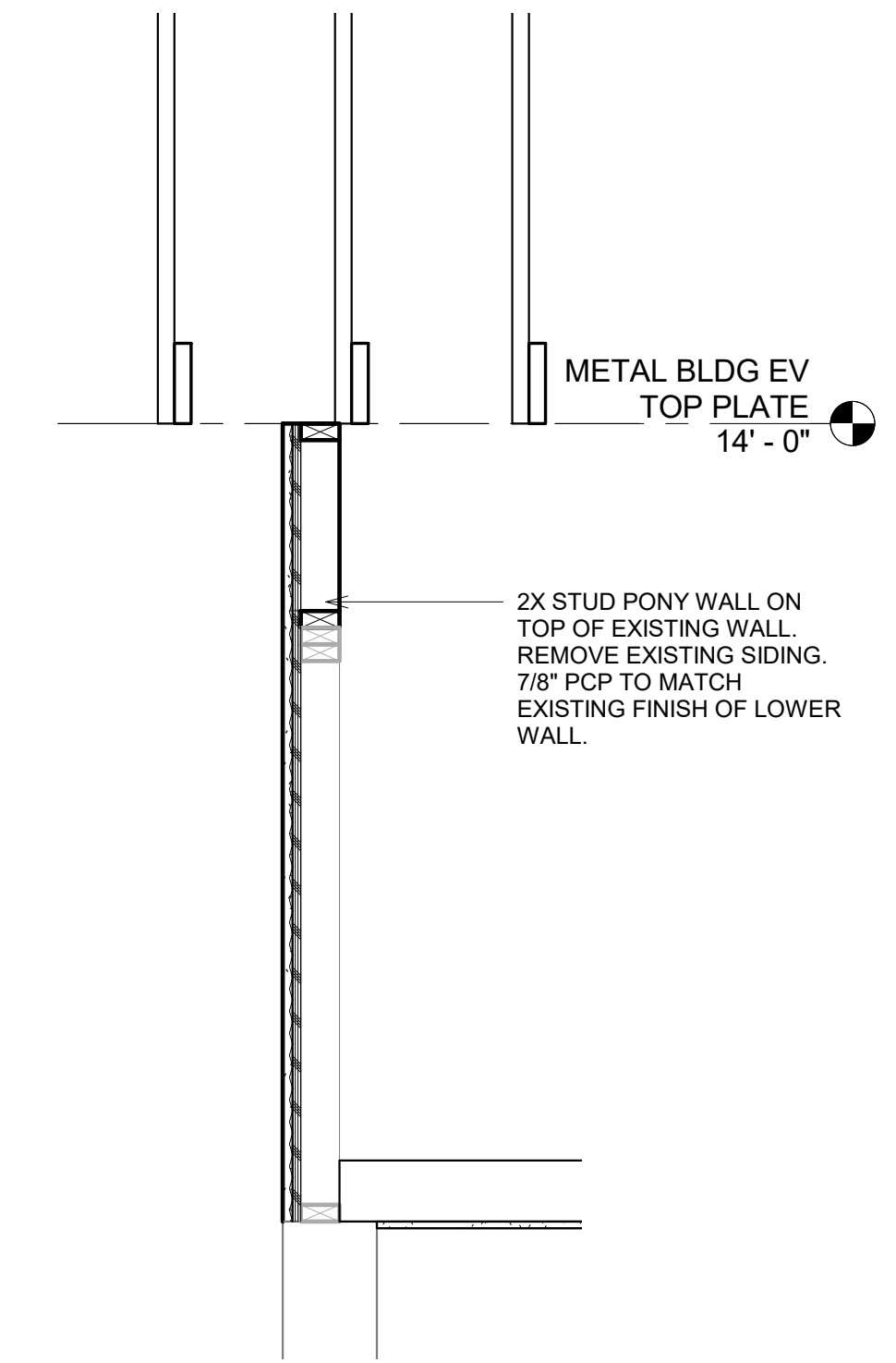
3 DETAIL
1" = 1'-0"



1 BUILDING SECTION
1/4" = 1'-0"



2 BUILDING SECTION
1/4" = 1'-0"



3 SECTION DETAIL
3/4" = 1'-0"

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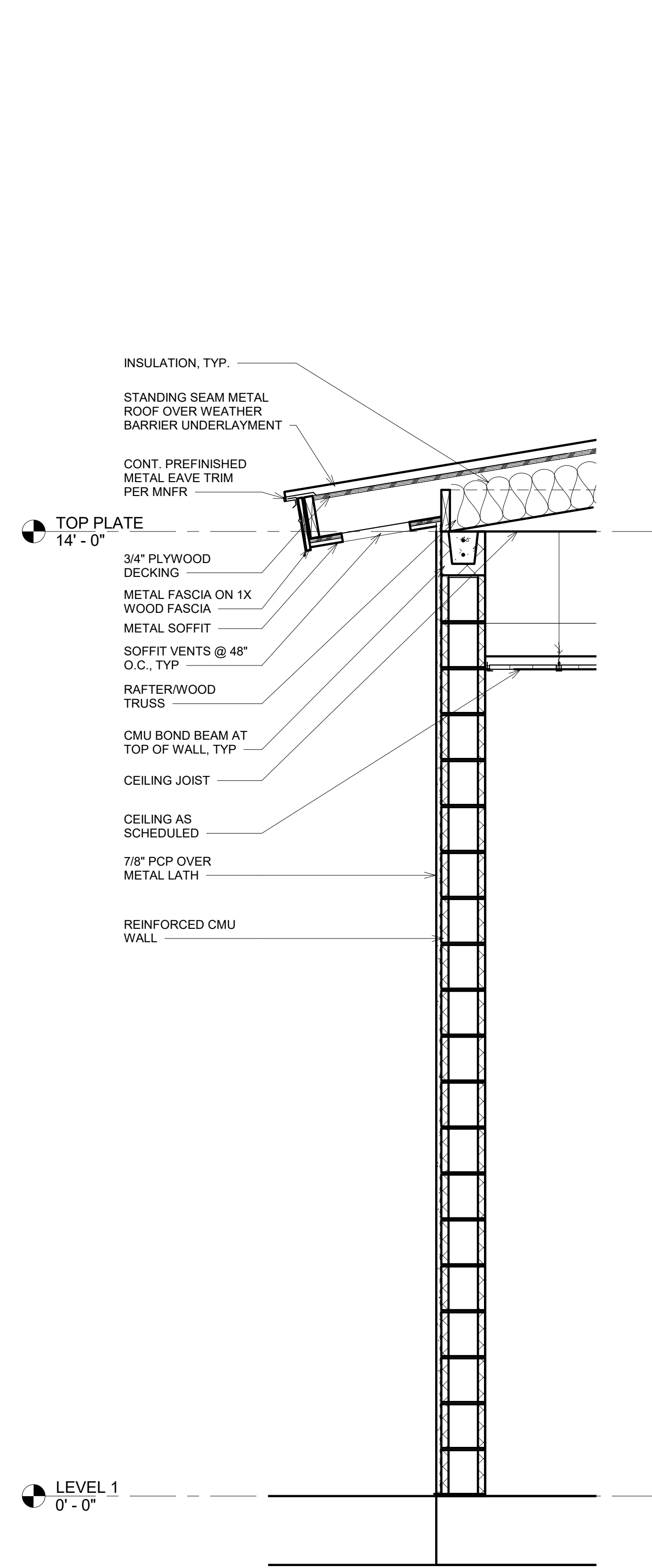
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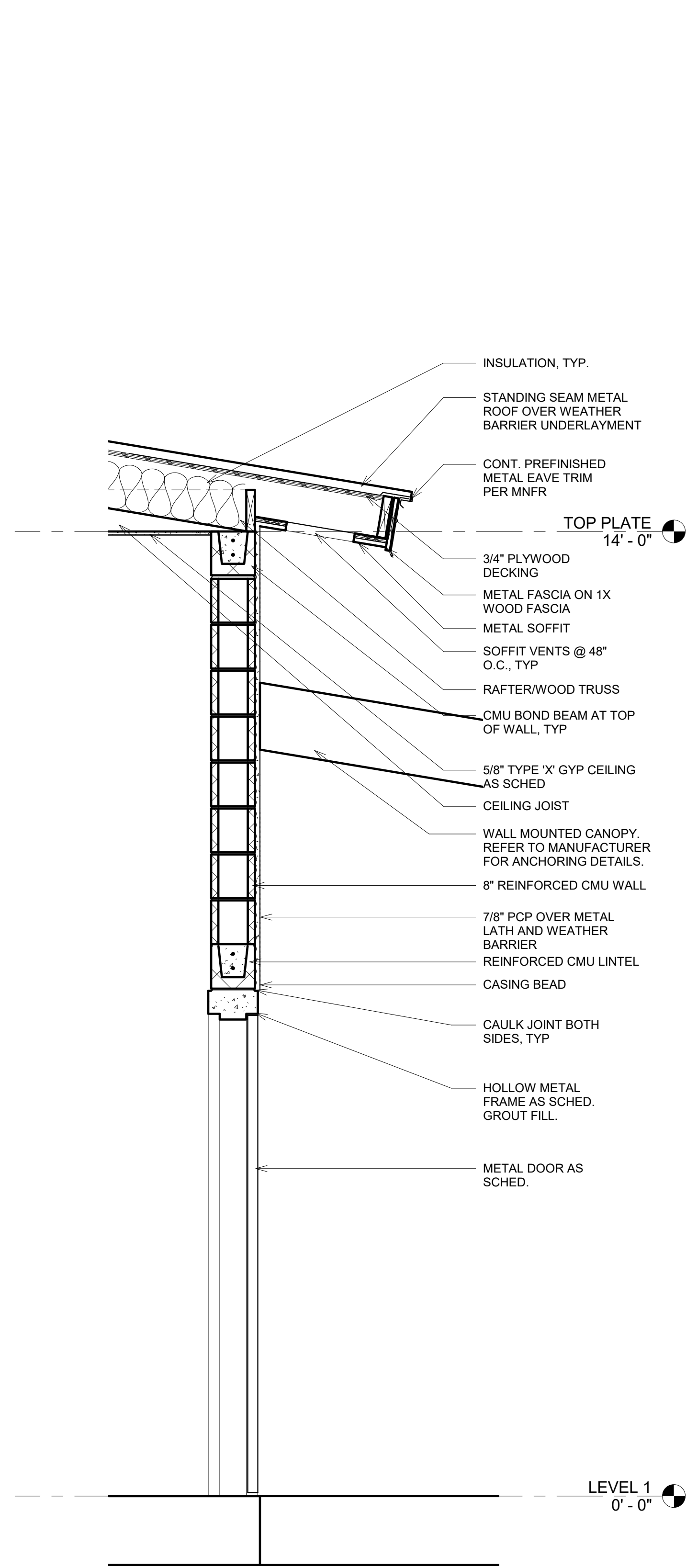
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BUILDING SECTIONS

SHEET

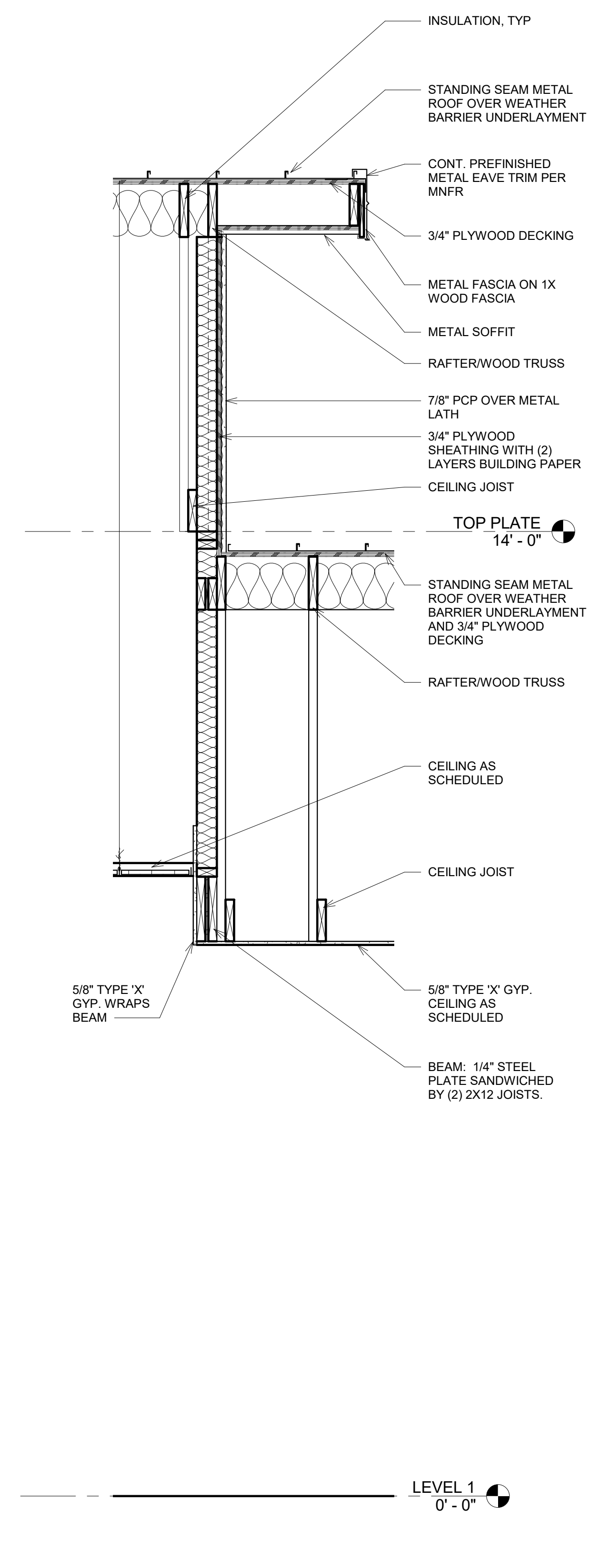
A4.1



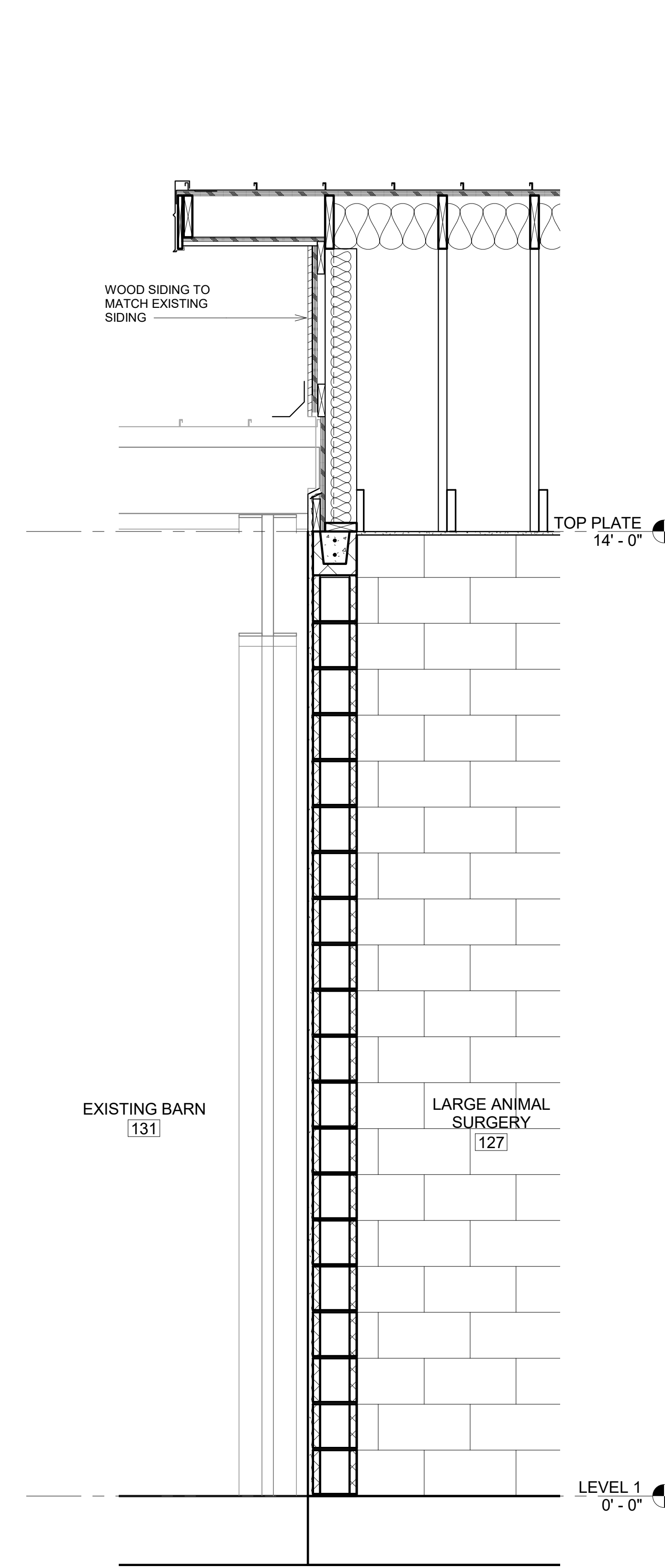
1 WALL SECTION
3/4" = 1'-0"



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

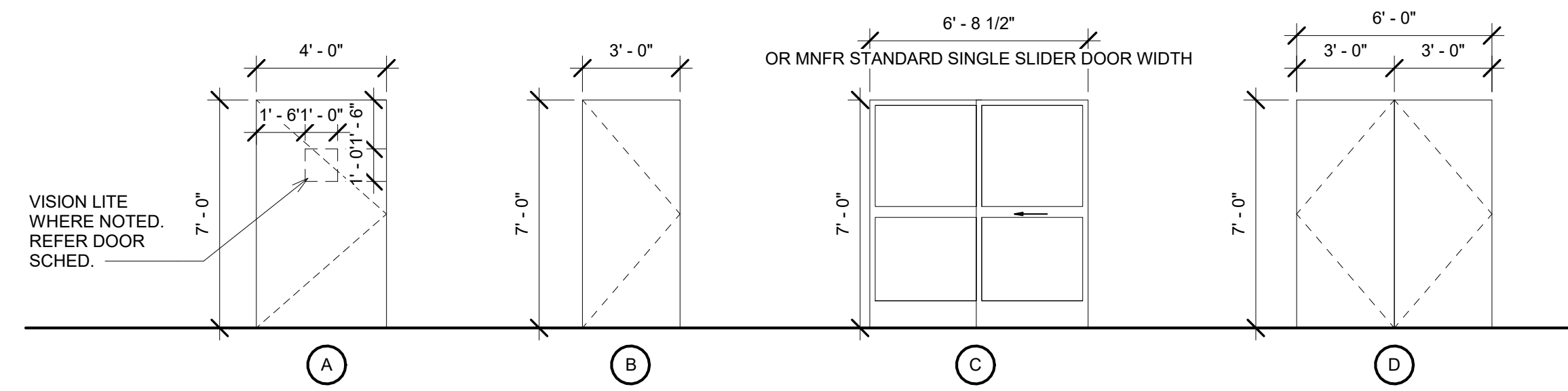


3 WALL SECTION
3/4" = 1'-0"

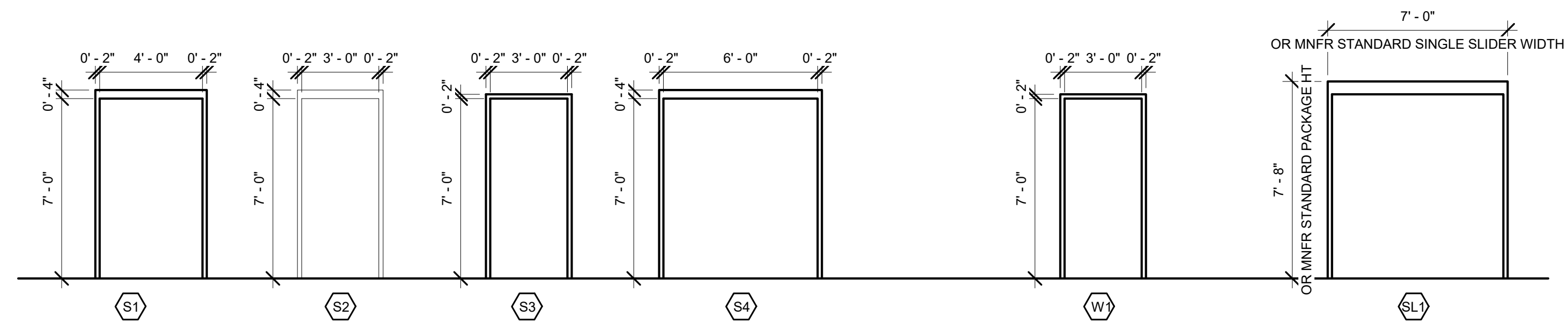


4 WALL SECTION
3/4" = 1'-0"

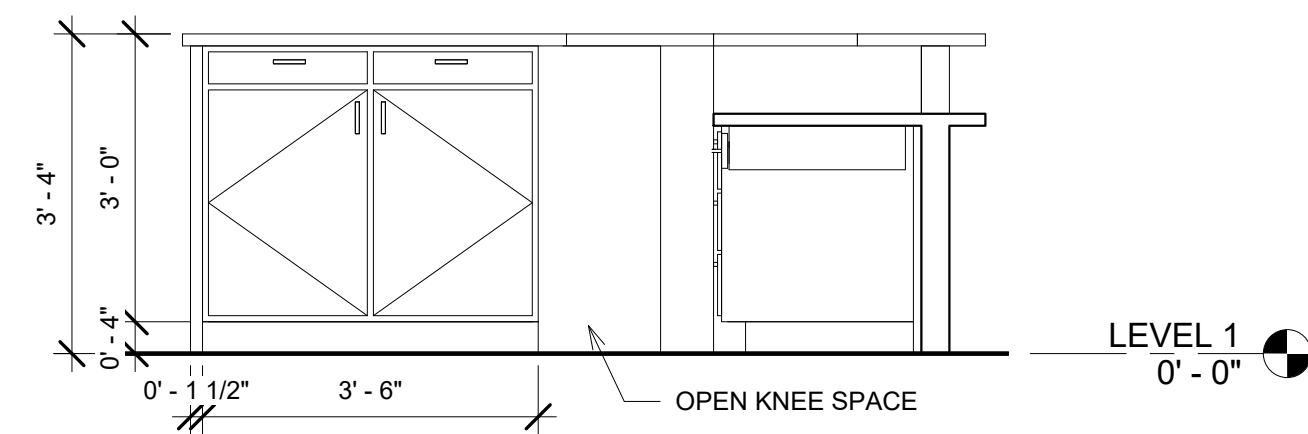
DOOR SCHEDULE								
MARK	DOOR TYPE	WIDTH	HEIGHT	THICKNESS	DOOR MATERIAL	FRAME TYPE	FRAME MATERIAL	NOTES
117	A	3'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	
119	B	3'-0"	7'-0"	0'-1 3/4"	STL	S3	STL	
120	B	3'-0"	7'-0"	0'-1 3/4"	STL	S3	STL	
123	C	6'-8 1/2"	7'-0"	0'-1 3/4"	ALUM/GLASS	SL1	ALUM	PROVIDE STANDARD SINGLE SLIDER WIDTH AND HT
125	B	3'-0"	7'-0"	0'-1 3/4"	WD	W1	WD	
126A	B	3'-0"	7'-0"	0'-1 3/4"	WD	W1	WD	
126B	A	3'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	
127A	A	4'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	
127B	A	4'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	
128A	A	4'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	PROVIDE VISION LITE
128B	A	4'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	
129A	A	3'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	
129B	D	6'-0"	7'-0"	0'-1 3/4"	STL	S4	STL	
129C	A	4'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	
130	A	3'-0"	7'-0"	0'-1 3/4"	STL	S1	STL	



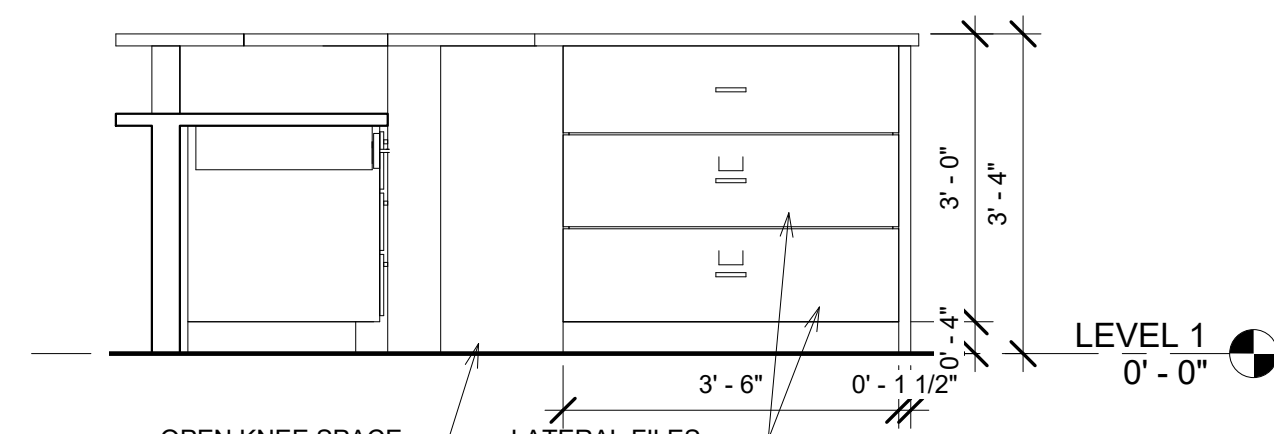
DOOR ELEVATIONS
1/4" = 1'-0"



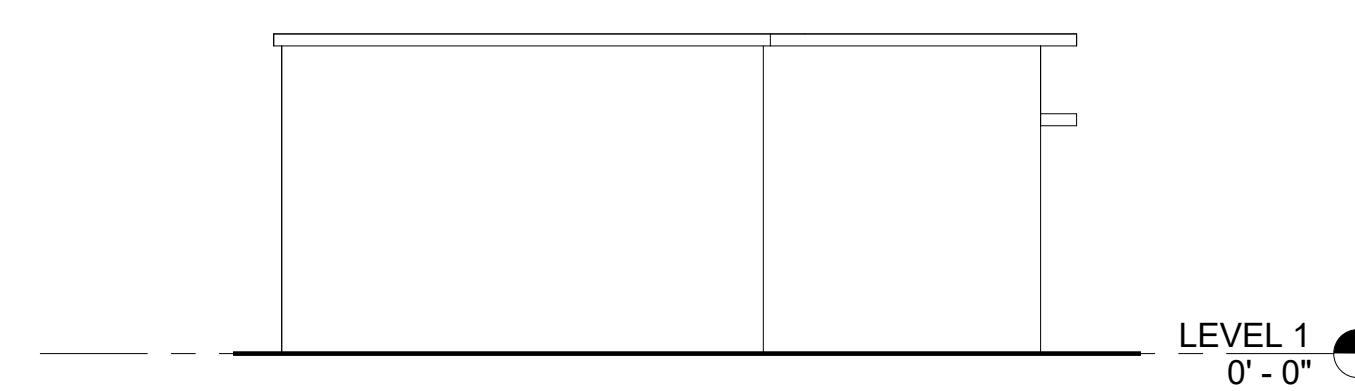
FRAME TYPES
1/4" = 1'-0"



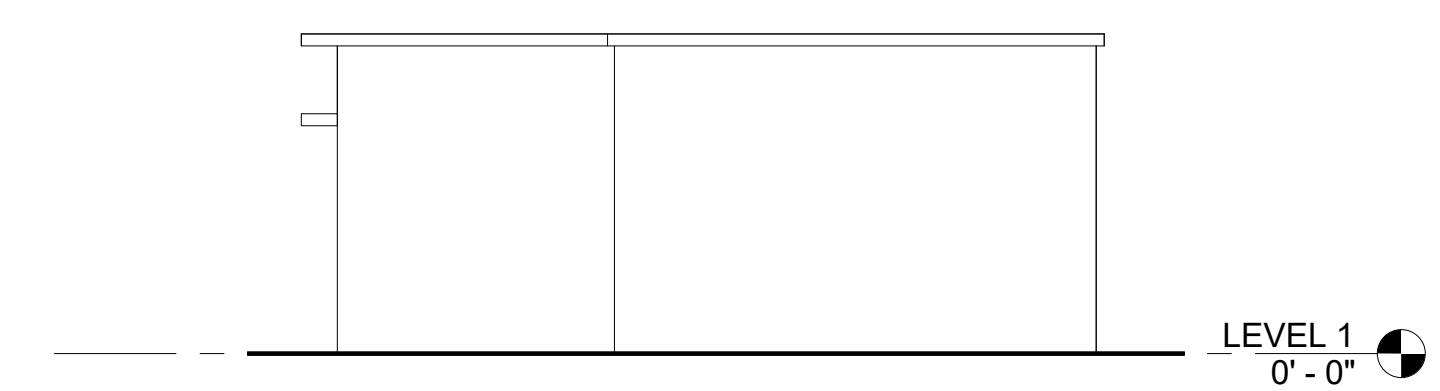
1 RECEPTION EAST
1/2" = 1'-0"



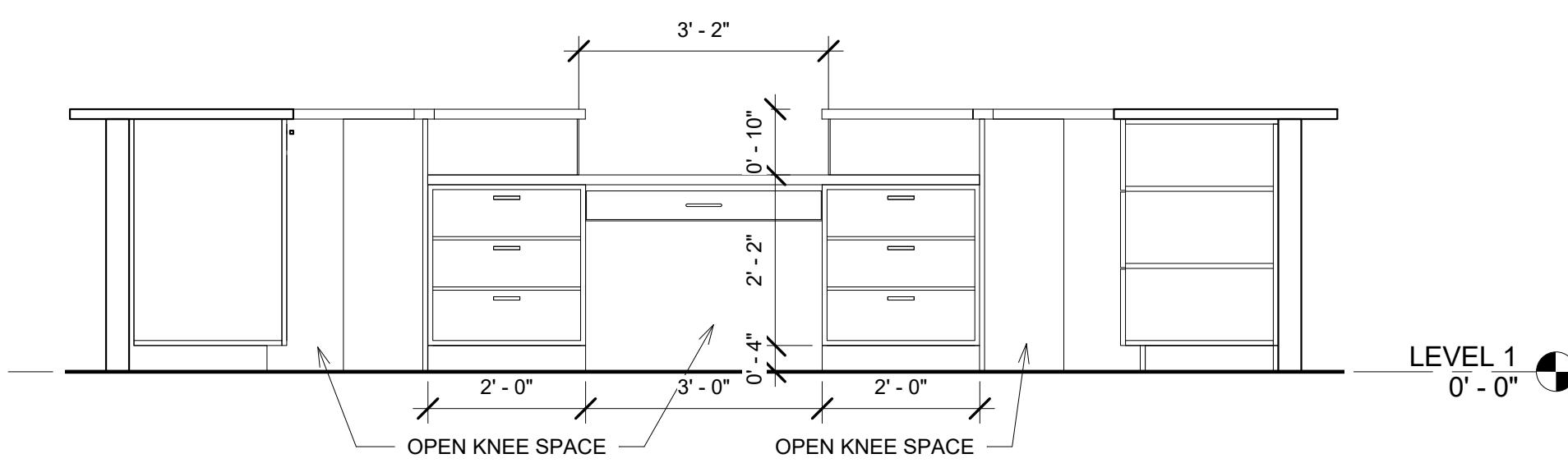
2 RECEPTION WEST
1/2" = 1'-0"



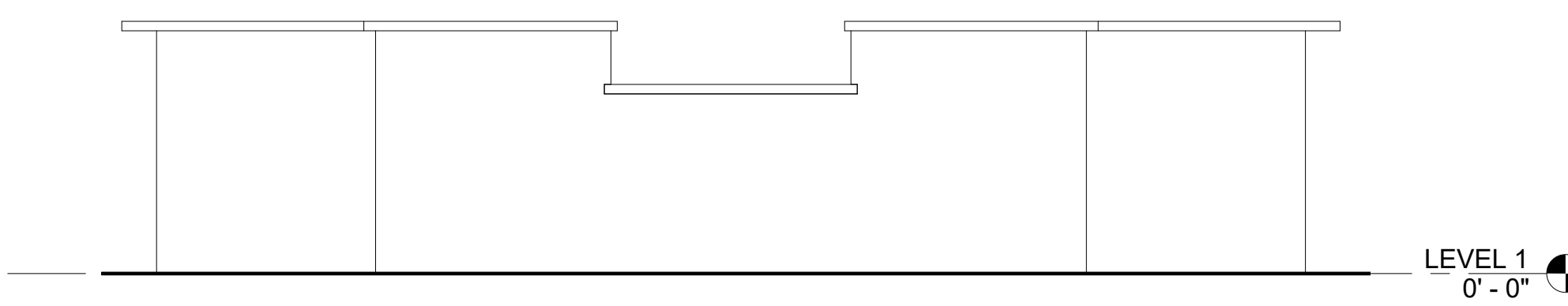
3 RECEPTION CUSTOMER WEST
1/2" = 1'-0"



4 RECEPTION CUSTOMER EAST
1/2" = 1'-0"



5 RECEPTION SOUTH
1/2" = 1'-0"



6 RECEPTION CUSTOMER SOUTH
1/2" = 1'-0"

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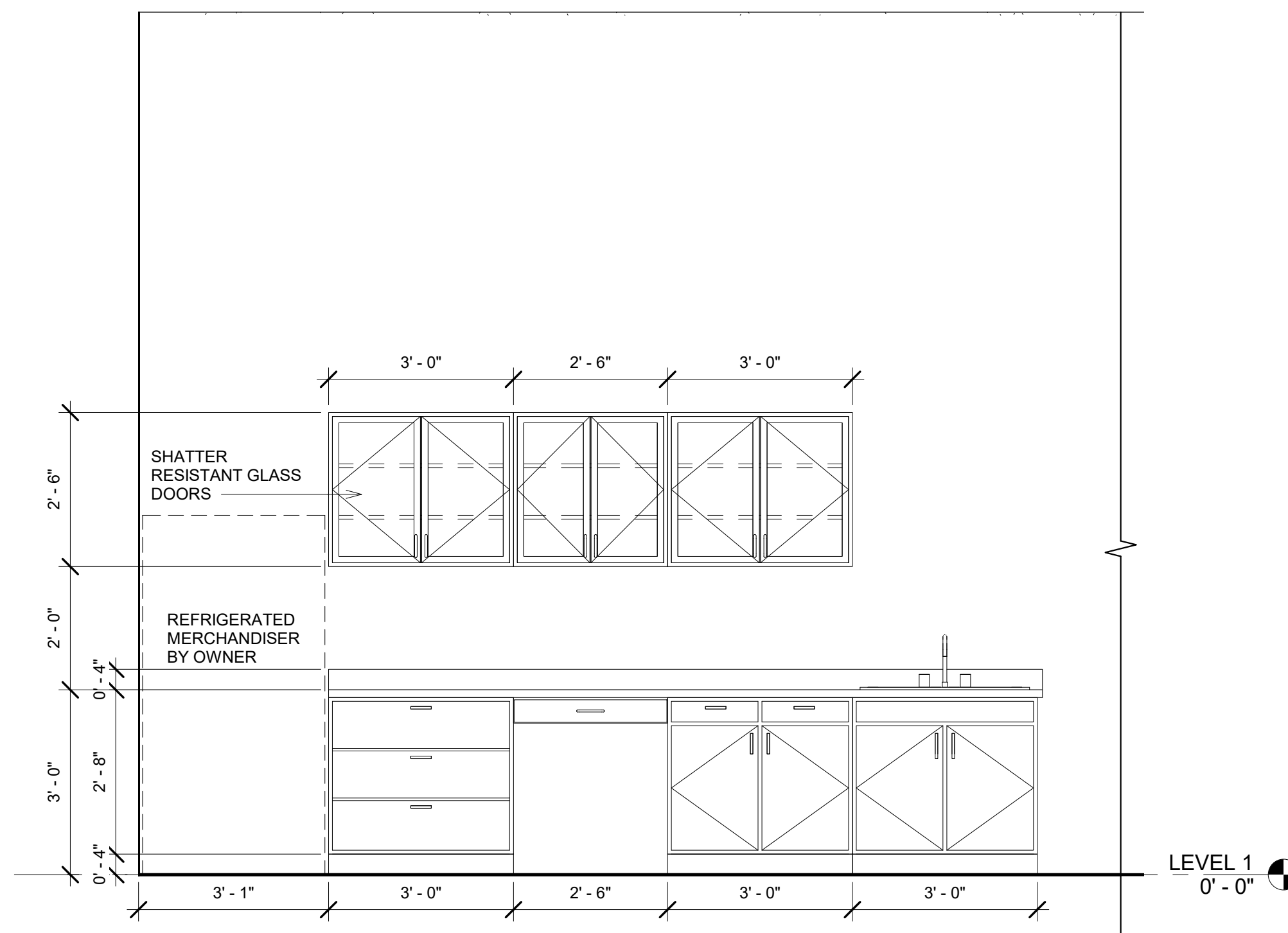
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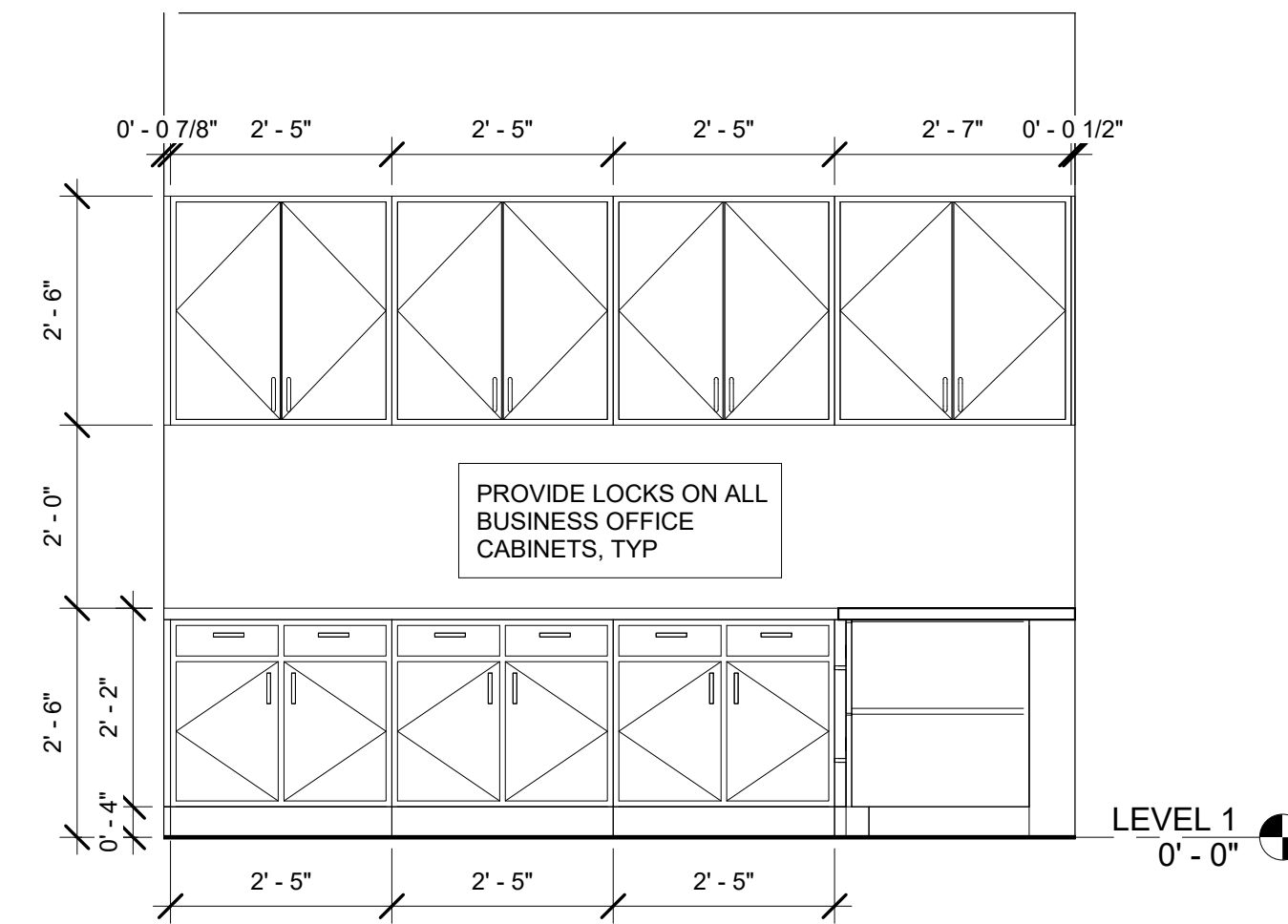
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DOORS, DOOR SCHEDULES, AND WINDOW ELEVATIONS

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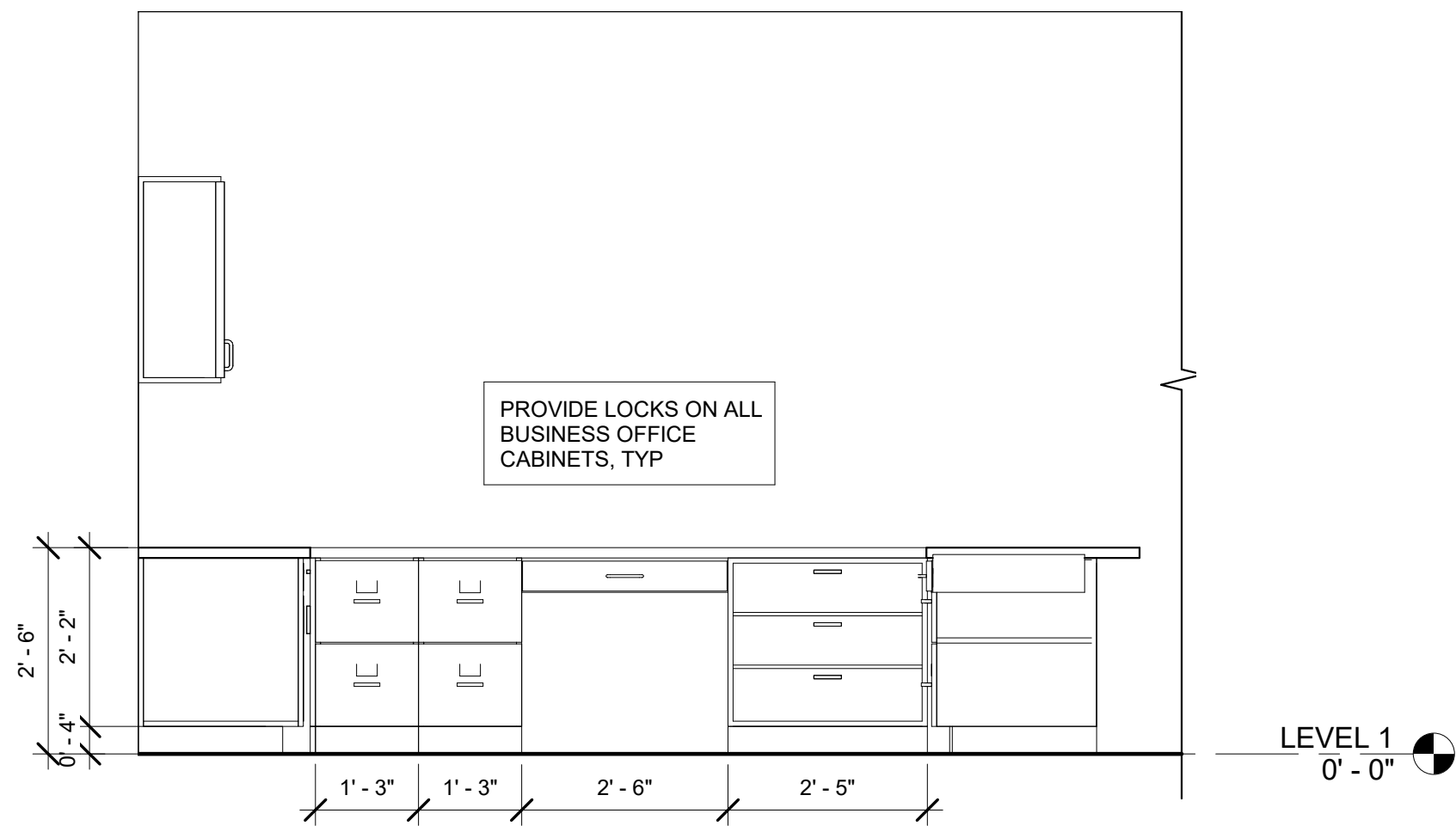
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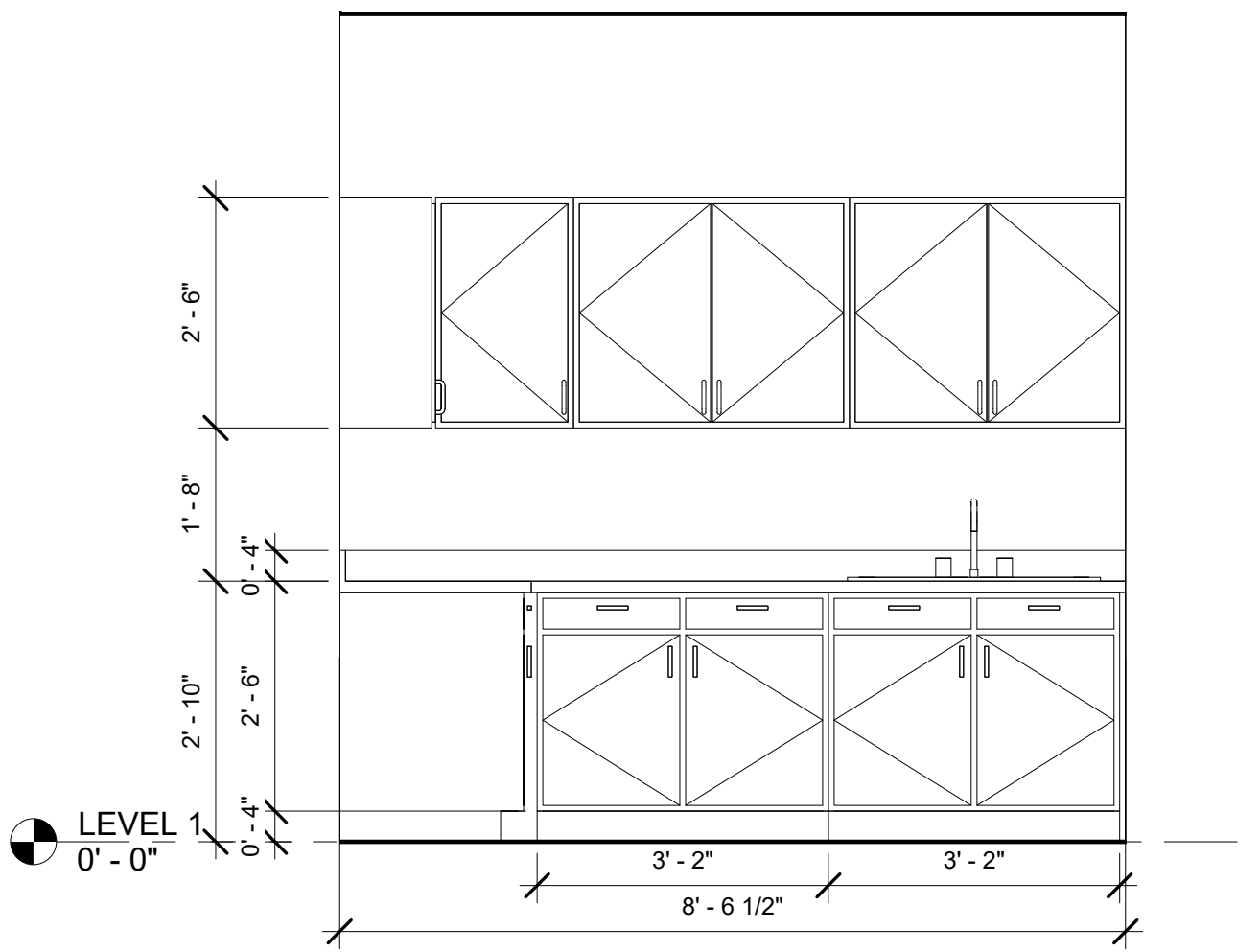
1 EQUINE PREP
1/2" = 1'-0"



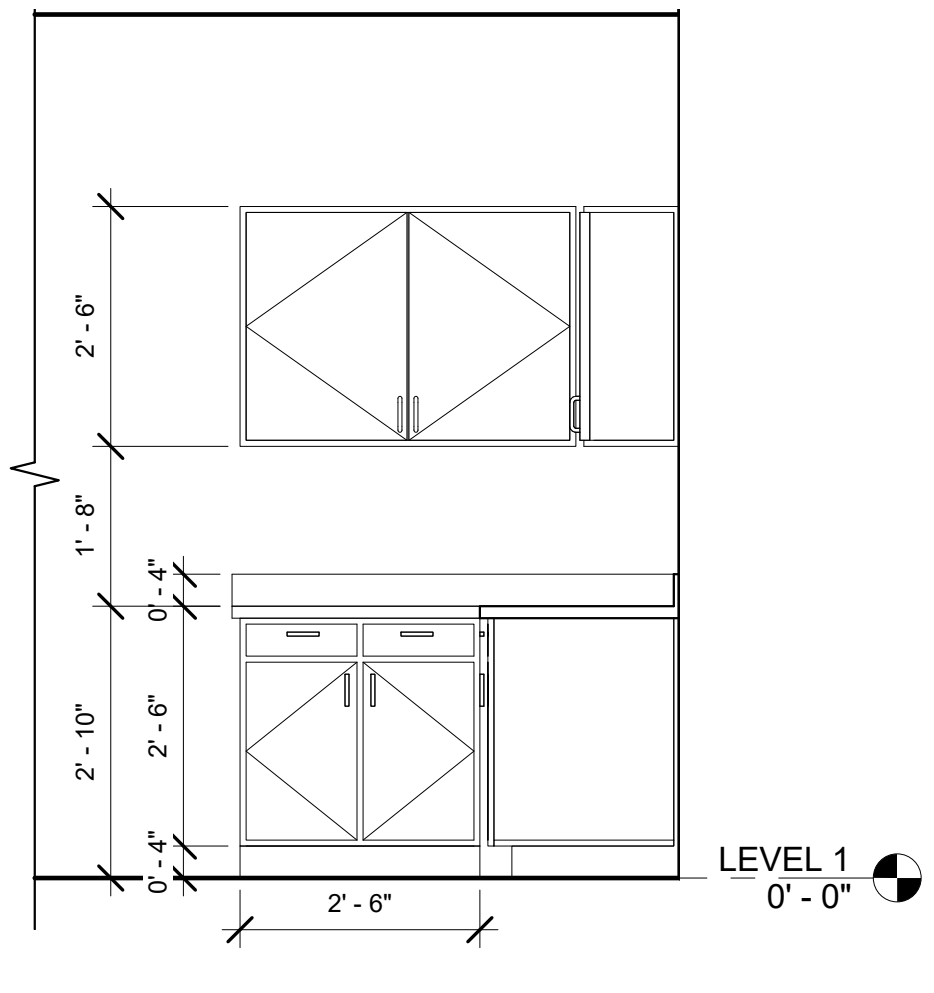
2 BUSINESS OFFICE NORTH
1/2" = 1'-0"



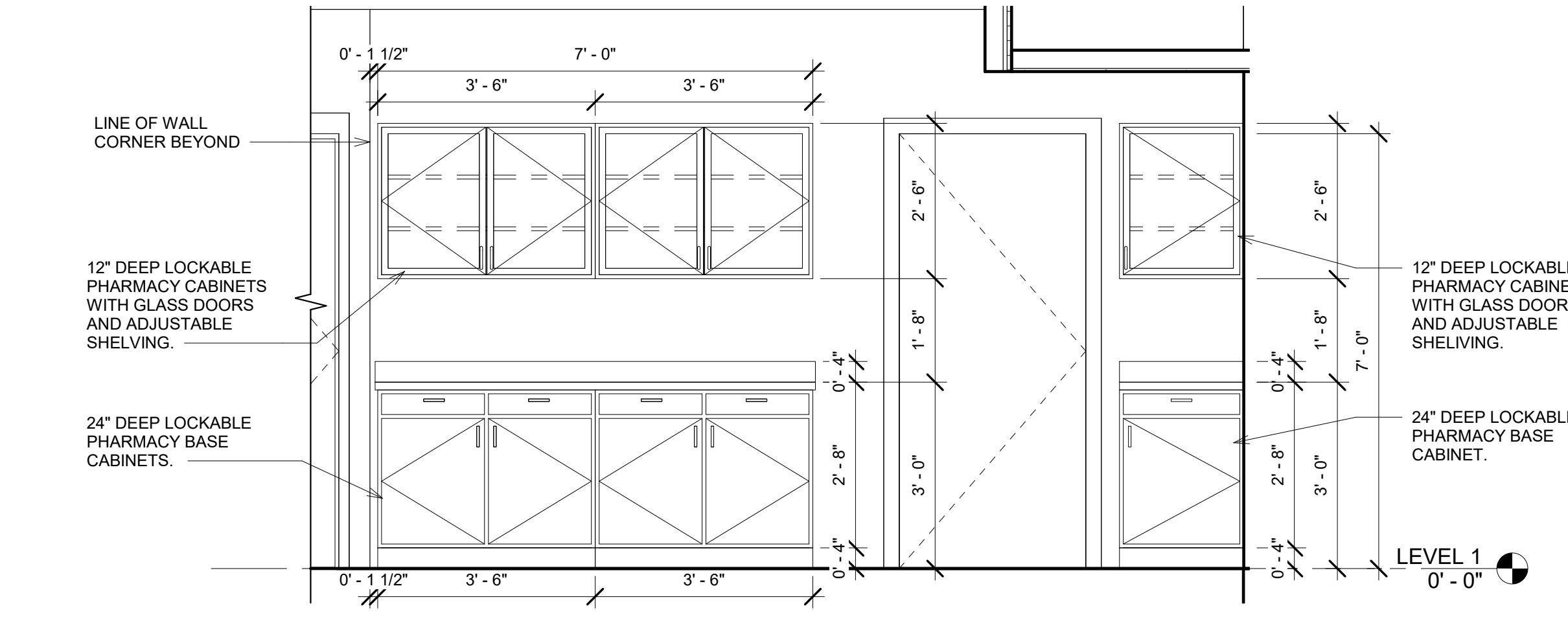
3 BUSINESS OFFICE EAST
1/2" = 1'-0"



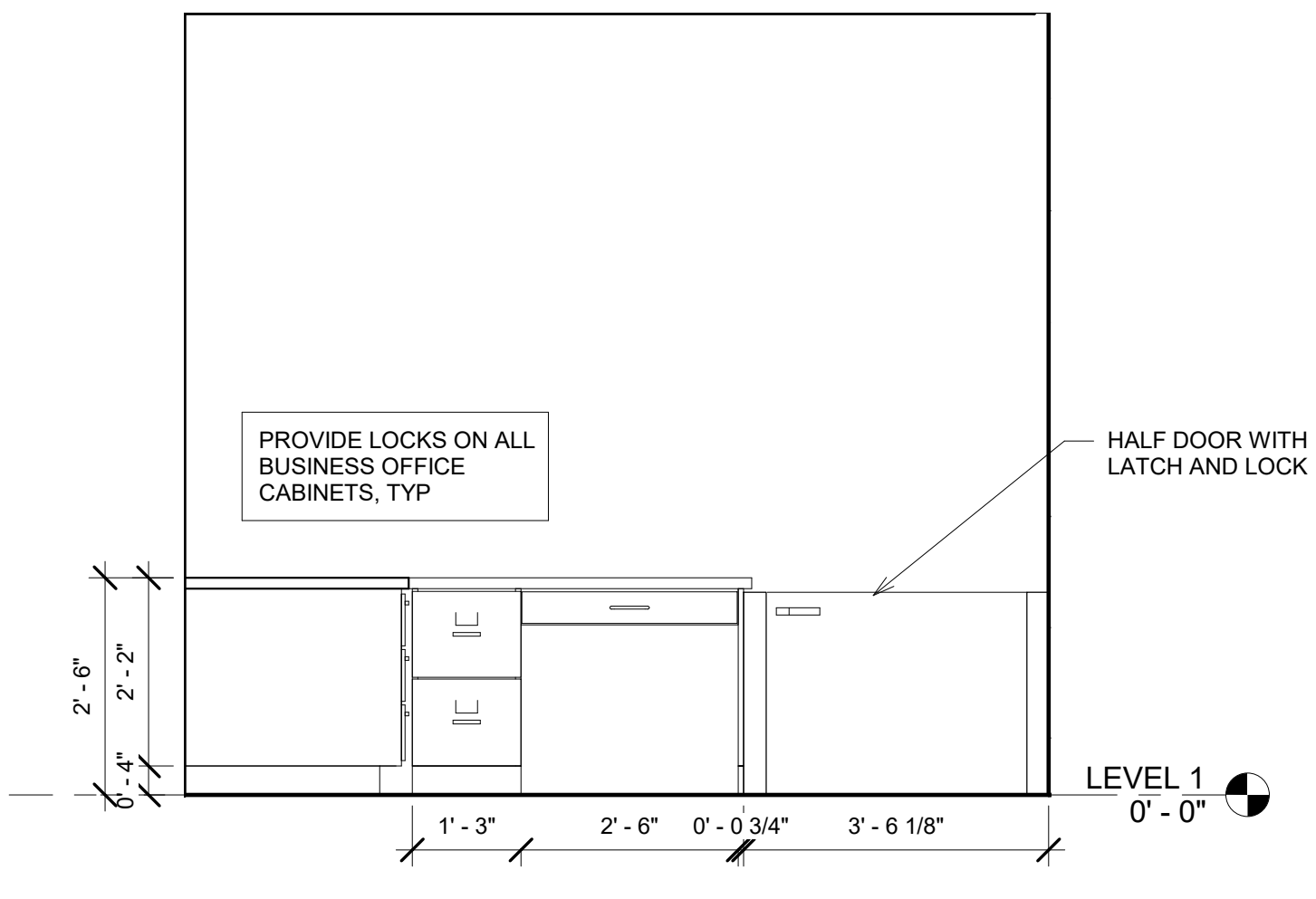
4 BREAK ROOM SOUTH
1/2" = 1'-0"



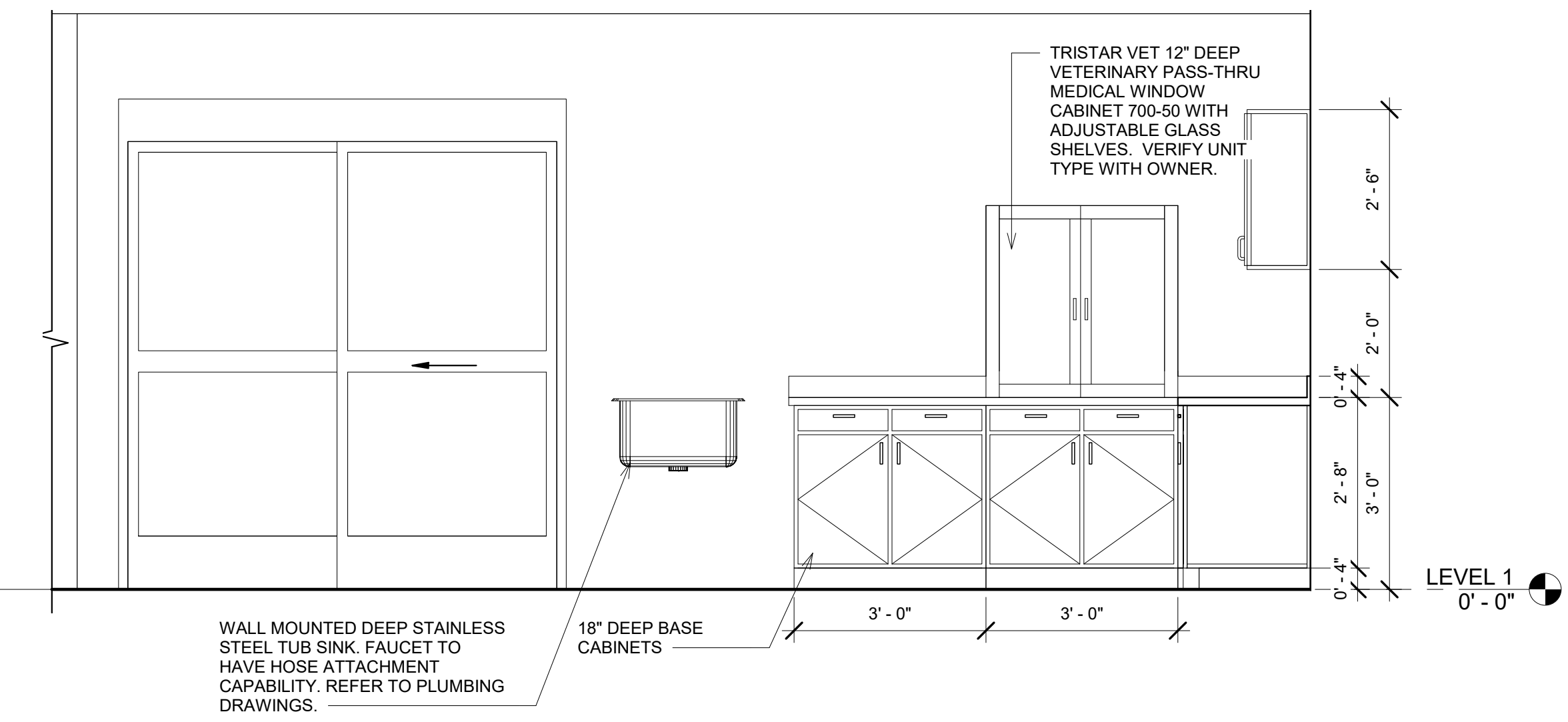
5 BREAK ROOM EAST
1/2" = 1'-0"



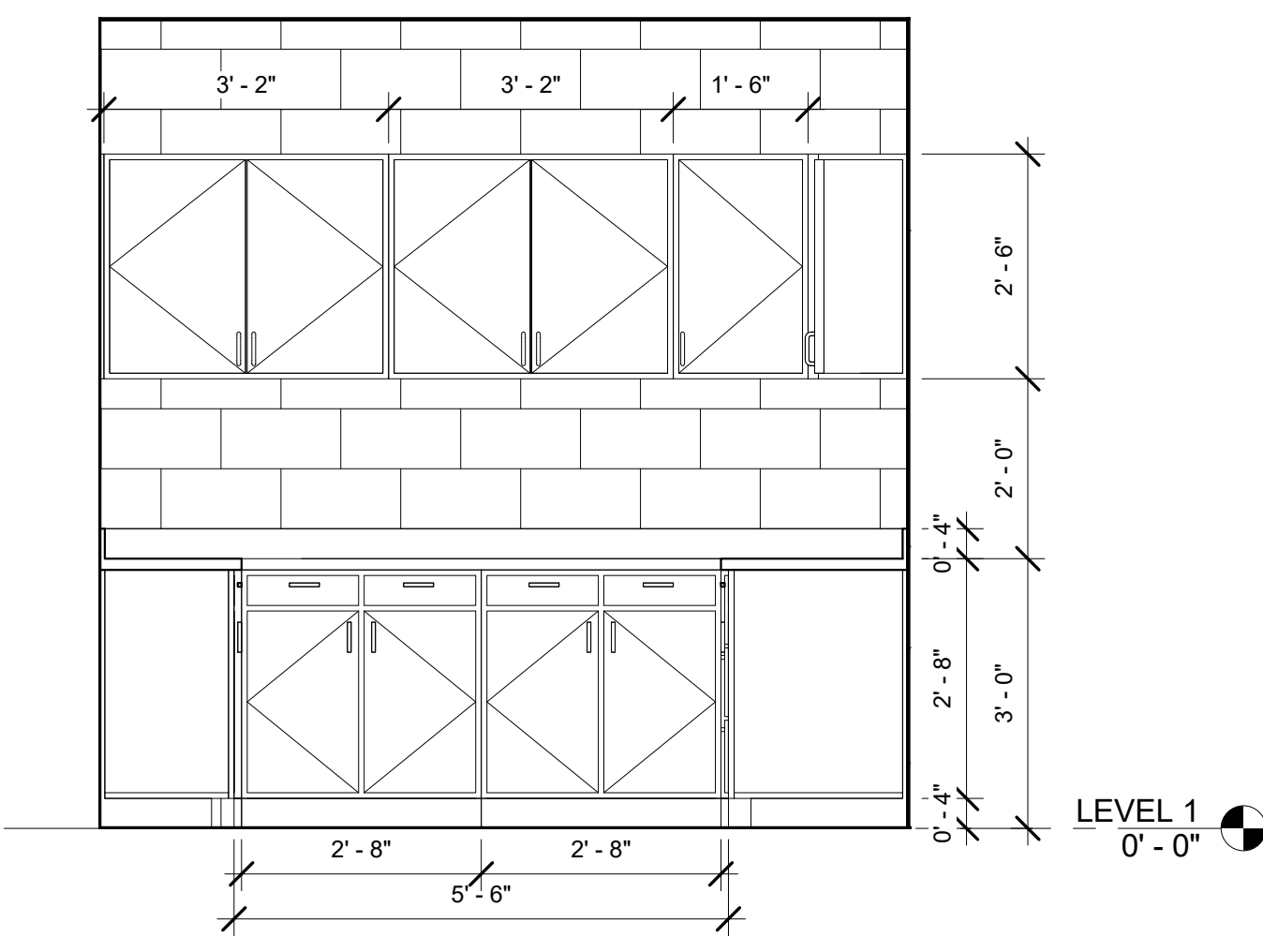
6 PHARMACY CABINET
1/2" = 1'-0"



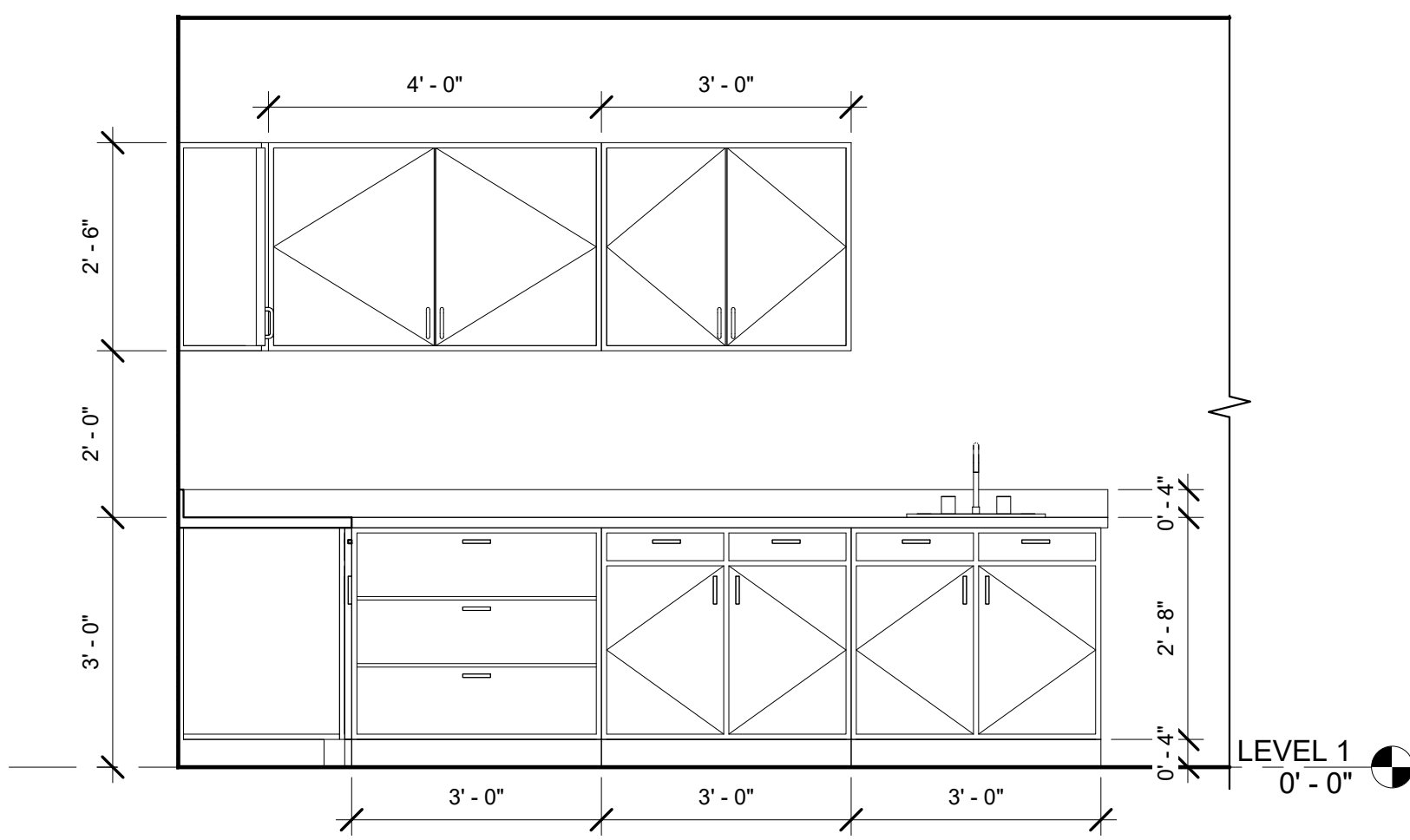
7 BUSINESS OFFICE SOUTH
1/2" = 1'-0"



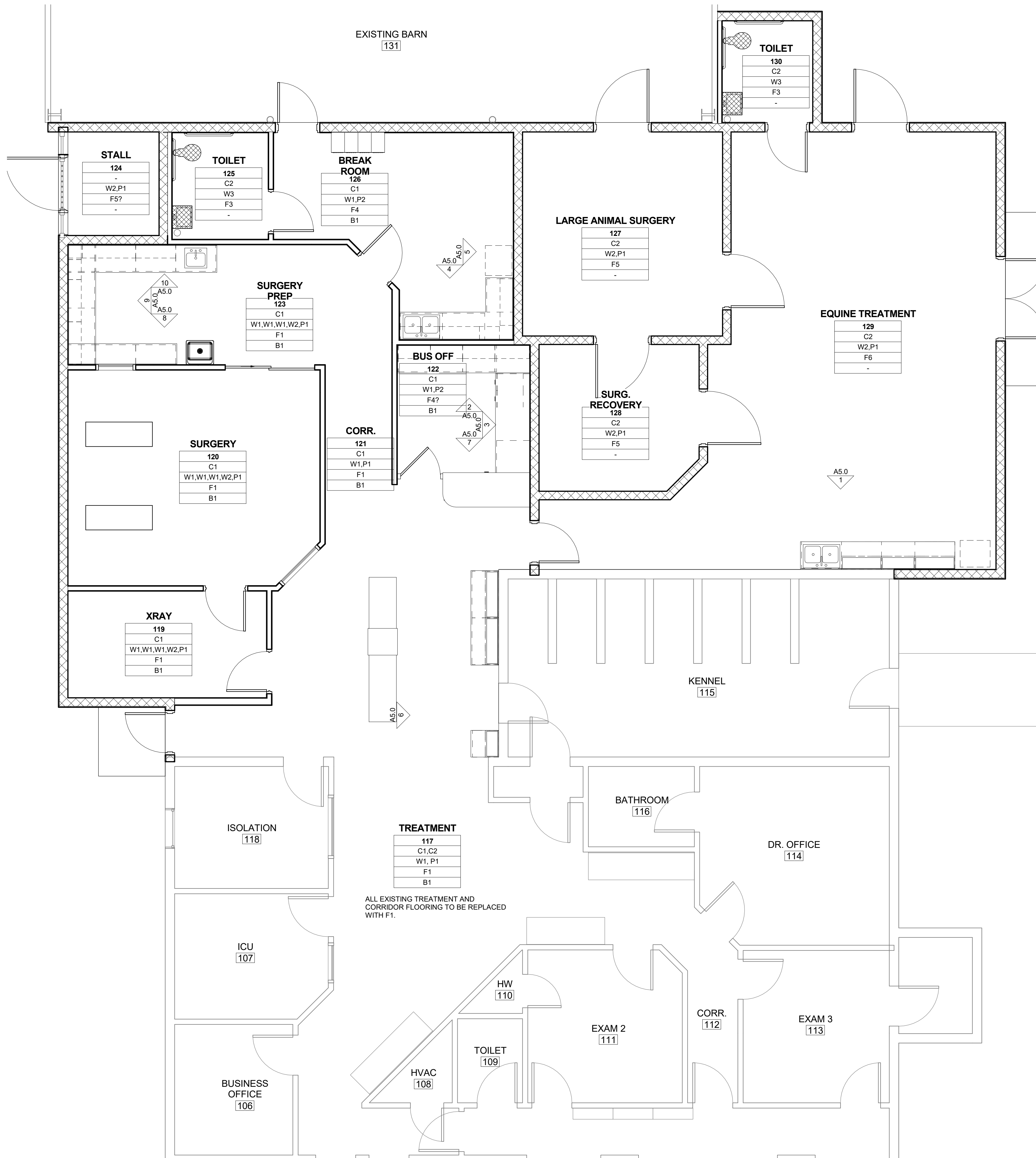
8 SURGERY PREP SOUTH
1/2" = 1'-0"



9 SURGERY PREP WEST
1/2" = 1'-0"



10 SURGERY PREP NORTH
1/2" = 1'-0"



EXISTING BARN
131

TOILET
130
C2
W3
F3
-

STALL
124
-
W2,P1
F5?

TOILET
125
C2
W3
F3
-

BREAK ROOM
126
C1
W1,P2
F4
B1

LARGE ANIMAL SURGERY
127
C2
W2,P1
F5
-

EQUINE TREATMENT
129
C2
W2,P1
F6
-

SURGERY PREP
123
C1
W1,W1,W1,W2,P1
F1
B1

BUS OFF
122
C1
W1,P2
F4?
B1

SURG. RECOVERY
128
C2
W2,P1
F5
-

SURGERY
120
C1
W1,W1,W1,W2,P1
F1
B1

CORR.
121
C1
W1,P1
F1
B1

XRAY
119
C1
W1,W1,W1,W2,P1
F1
B1

KENNEL
115

BATHROOM
116

DR. OFFICE
114

ISOLATION
118

TREATMENT
117
C1,C2
W1,P1
F1
B1

ICU
107

BUSINESS OFFICE
106

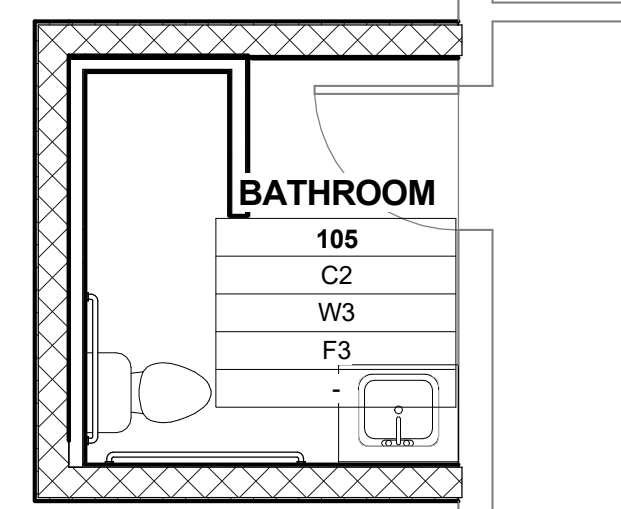
HVAC
108

TOILET
109

EXAM 2
111

CORR.
112

EXAM 3
113



2 FINISH PLAN
1/4" = 1'-0"

1 FINISH PLAN
1/4" = 1'-0"

Material Schedule			
TYPE	MARK	MATERIAL	LOCATION
BASE	B1	COLOR TBD.	
BASE	B2	COLOR TBD.	
CEILING FINISH	C1	ACOUSTICAL CEILING TILE--MOISTURE RESISTANT	
CEILING FINISH	C2	GYPSON BOARD	
FLOORING	F1	RUBBER FLOORING	
FLOORING	F2	EXPOSED CONCRETE	
FLOORING	F3	CERAMIC TILE	
FLOORING	F4	LVT	
FLOORING	F5	EQUI-TURF RUBBER FLOORING, THICKNESS AND COLOR TBD.	
FLOORING	F6	LINEAR RUBBER SOFT STALL MATS. COLOR TBD.	
PAINT	P1	SHERWIN WILLIAMS. COLOR TBD	
PAINT	P2	SHERWIN WILLIAMS. COLOR TBD	
PLASTIC LAMINATE	PL1	COLOR TBD	
PLASTIC LAMINATE	PL2	COLOR TBD	
WALL FINISH	W1	GYPSON BOARD	
WALL FINISH	W2	SEALED, PAINTED CMU	
WALL FINISH	W3	CERAMIC TILE	

REVISIONS

DESIGN-BUILD CONTRACTOR

LAUGER COMPANIES
2203 PORT LAVACA DRIVE - VICTORIA, TX 77901
PO BOX 216 - VICTORIA, TX 77902
WWW.LAUGERCOMPANIES.COM

CLIENT

SOUTH TEXAS VETERINARY CLINIC

SOUTH TEXAS VETERINARY CLINIC ADDITION
Beeville, Texas

PAGE TITLE
FINISH PLAN & MATERIALS SCHEDULE

ISSUE DATE
03.15.2017

PROJECT NUMBER
0716 002

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

DRAWN BY
Author

SHEET
A5.1

REVISIONS

ELECTRICAL SPECIFICATIONS

1. ALL WORK TO BE DONE IN ACCORDANCE WITH LATEST EDITIONS OF INTERNATIONAL BUILDING CODE, NATIONAL ELECTRICAL CODE AND LOCAL ELECTRICAL CODE. OBTAIN PERMITS AND REQUEST INSPECTIONS FROM LOCAL AUTHORITY.
2. ALL CONDUCTORS SHALL BE #12 AWG MINIMUM, UNLESS OTHERWISE NOTED. USE 10 AWG FOR 20AMP, 120 VOLT CIRCUITS LONGER THAN 100 FT. AND FOR 208 VOLT CIRCUITS LONGER THAN 150 FT. UNLESS OTHERWISE NOTED.
3. SEE REFLECTED CEILING PLANS FOR EXACT LOCATION OF EQUIPMENT MOUNTED IN SUSPENDED CEILING.
4. THE CONTRACTOR SHALL CONFIRM COMPATIBILITY BETWEEN CEILING TYPE AS DEFINED ON ARCHITECTURAL ROOM FINISH SCHEDULE AND THE LIGHT FIXTURE TRIM AS DEFINED ON THE FIXTURE SCHEDULE PRIOR TO PURCHASING AND INSTALLING LIGHT FIXTURES. PROVIDE TRIM MOUNTING HARDWARE COMPATIBLE WITH THE CEILING CONSTRUCTION.
5. SEE MECHANICAL AND PLUMBING DRAWINGS FOR EXACT LOCATION OF MECHANICAL AND PLUMBING EQUIPMENT.
6. LIGHTING FIXTURES IN MECHANICAL ROOMS SHALL BE ADJUSTED IN THE FIELD FOLLOWING INSTALLATION OF MECHANICAL AND ELECTRICAL EQUIPMENT.
7. EACH MOTOR BEING INSTALLED ON THIS CONTRACT SHALL BE PROVIDED WITH THERMAL PROTECTION IN EITHER A MANUAL OR MAGNETIC STARTER, WHETHER SHOWN OR NOT. THERMAL ELEMENTS SHALL BE SIZED AND INSTALLED ACCORDING TO THE FLA OF THE MOTOR.
8. REMOTE MOUNTED MOTORS SHALL BE PROVIDED WITH RECEPTACLES AND OR DISCONNECT SWITCHES TO BE COMPATIBLE WITH THE TYPE OF CONSTRUCTION AND NEC.
9. THE CONTRACTOR SHALL RELOCATE TO THE PROPER SIDE OF THE DOOR, ANY SWITCH, RECEPTACLES, OR DEVICE BEING EFFECTED BY ANY CHANGE IN DIRECTION OF DOOR SWINGS AS SHOWN ON THE ARCHITECTURAL FLOOR PLAN.
10. IN ALL AREAS, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION BETWEEN THE ELECTRICAL AND MECHANICAL TRADES TO PROVIDE CLEARANCE ABOVE CEILING BETWEEN RECESSED LIGHTING FIXTURES AND THERMAL INSULATION OR DUCT WORK IN ACCORDANCE WITH NEC, PARAGRAPH 410-66.
11. ALL RECEPTACLES WITHIN 6'-0" OF ANY SINK, AND ON THE EXTERIOR OF THE BUILDING SHALL BE PROVIDED WITH GROUND FAULT PROTECTION. EXTERIOR RECEPTACLES SHALL BE INSTALLED IN A WEATHERPROOF BOX WITH WEATHER-PROOF COVER PLATE.
12. MECHANICAL EQUIPMENT SIZES ARE AS DESIGNED, BREAKERS, CONDUIT, STARTERS, CONDUCTORS, ETC. SHALL BE ADJUSTED TO THE EQUIPMENT SUBMITTED AND APPROVED FOR INSTALLATION OF THIS PROJECT.
13. ALL BATTERY BACK-UP LIGHT FIXTURES SHALL BE CONNECTED TO LIGHTING BRANCH CIRCUIT INDICATED, BUT AHEAD OF ANY LOCAL CONTROL SWITCHES. THE CONTRACTOR SHALL PROVIDE ADDITIONAL WIRING AS REQUIRED TO CONNECT BATTERY UNIT TO UNSWITCHED POWER.
14. CONTRACTOR SHALL COORDINATE SPECIAL EQUIPMENT (I.E. COPY, WELDERS, SHOP EQUIPMENT, ETC.) RECEPTACLES NEMA CONFIGURATION WITH EQUIPMENT SUPPLIER PRIOR TO INSTALLATION. BRANCH CIRCUIT SHALL BE PROVIDED AS REQ'D. IF NEMA CONFIGURATION DIFFERS FROM WHAT IS INDICATED.
15. THE CONDUIT SYSTEM FOR ALL EXTERIOR BUILDING WALL PACK LIGHTING SHALL BE CONCEALED.
16. DISCONNECT SWITCHES, MANUAL STARTERS, ETC., ASSOCIATED WITH EXTERIOR MOUNTED EQUIPMENT SHALL BE RATED NEMA 3R.
17. ALL EMPTY J-BOXES SHALL BE PROVIDED WITH WHITE FINISH COVER PLATE.
18. PROVIDE NUMBER OF CONDUCTORS, AND SWITCH LEG CONDUCTORS REQ'D. TO ACCOMPLISH LIGHTING CONTROL SCHEMES INDICATED.
19. NUMBERS OF EACH TYPE OF LIGHT FIXTURE SHOWN ON LIGHTING PLAN AND PANEL SCHEDULES IS APPROXIMATE ONLY. CONTRACTOR SHALL PROVIDE THE FIXTURES AS SHOWN ON THE PLAN.
20. ALL WIRING (EXCEPT HVAC CONTROL WIRING) TO BE RUN IN CONDUIT. CONDUIT INSIDE BUILDING TO BE EMT. EXPOSED CONDUIT ON BUILDING EXTERIOR TO BE RIGID STEEL. BURIED CONDUIT TO BE SCH. 40 PVC. MINIMUM CONDUIT SIZE SHALL BE 1/2". ALL EMT CONDUCTORS TO BE STEEL COMPRESSION TYPE. NO SET SCREW TYPE ALLOWED.
21. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND PRESENT A NEAT APPEARANCE. ROUTE EXPOSED CONDUIT AND CONDUIT ABOVE ACCESSIBLE CEILINGS PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING. ARRANGE CONDUIT SUPPORTS TO PREVENT DISTORTION OF ALIGNMENT BY WIRE PULLING OPERATIONS. FASTEN CONDUIT USING GALVANIZED STRAPS, LAY-IN ADJUSTABLE HANGERS, CLEVIS HANGERS, OR BOLTED SPLIT STAMPED GALVANIZED HANGERS. DO NOT FASTEN CONDUIT WITH WIRE OR PERFORATED PIPE STRAPS. REMOVE ALL WIRE USED FOR TEMPORARY CONDUIT SUPPORT DURING CONSTRUCTION. BEFORE CONDUCTORS ARE PULLED, SUPPORT CONDUIT AT A MAXIMUM OF 7 FEET ON CENTER.
22. WHERE CONDUIT PENETRATES FIRE-RATED WALLS AND CEILINGS, SEAL OPENING AROUND CONDUIT WITH UL LISTED FOAMED SILICONE ELASTOMER COMPOUND.
23. BUILDING WIRE AND CABLE
 - A. DESCRIPTION: SINGLE CONDUCTOR INSULATED WIRE.
 - B. CONDUCTOR: COPPER.
 - C. INSULATION VOLTAGE RATING: 600 VOLTS.
 - D. INSULATION: ANSI/NFPA 70, TYPE THHN/THWN. ANSI/NFPA 70, TYPE THW IS ACCEPTABLE FOR GROUNDING CONDUCTORS.
24. OUTLET BOXES
 - A. FLUSH DEVICE BOXES: PROVIDE GALVANIZED STEEL BOXES OF SUFFICIENT SIZE TO ACCOMMODATE WIRING DEVICES TO BE INSTALLED AT OUTLET. PROVIDE AN EXTENSION RING FOR THE DEVICE TO BE INSTALLED. SQUARE OR RECTANGULAR BOXES MAY BE SUPPLIED. UNLESS OTHERWISE NOTED, PROVIDE 1-1/2 INCH DEEP BY 4 INCH BOX.
 - B. EXPOSED DEVICE BOXES: PROVIDE FS OR FD CAST BOXES FOR SURFACE MOUNTING IN AREAS HAVING EXPOSED RIGID METAL CONDUIT SYSTEMS.
 - C. BOXES FOR LIGHTING FIXTURES: PROVIDE GALVANIZED STEEL OCTAGONAL BOXES WITH FIXTURE STUD SUPPORTS AND ATTACHMENTS AS REQUIRED TO PROPERLY SUPPORT CEILING AND BRACKET-TYPE LIGHTING FIXTURES. UNLESS OTHERWISE NOTED, PROVIDE 1-1/2 INCH DEEP BY 4 INCH BOX.
 - D. MASONRY BOXES: PROVIDE GALVANIZED STEEL, 3-1/2 INCH DEEP MASONRY BOXES, FOR ALL DEVICES INSTALLED IN MASONRY WALLS.
 - E. LISTING: UL 514.
 - F. ACCEPTABLE MANUFACTURERS: APPLINGTON, BOWERS, CROUSE-HINDS, EFCOR, MIDWEST, OZ/GEDNEY/RACO, STEEL CITY, T & B.
 - G. DO NOT INSTALL BOXES BACK-TO-BACK IN WALLS. PROVIDE MINIMUM 6 INCH SEPARATION, EXCEPT PROVIDE MINIMUM 24 INCH SEPARATION IN ACOUSTIC RATED WALLS.
25. WALL SWITCHES
 - A. WALL SWITCHES FOR LIGHTING CIRCUITS AND MOTOR LOADS UNDER 1/2" HP: NEMA WD; 1 AC GENERAL USE SNAP SWITCH WITH TOGGLE HANDLE, RATED 20 AMPERES AND 120/277 VOLTS AC. HANDLE: WHITE PLASTIC.
 - B. PILOT LIGHT TYPE: LIGHTED HANDLE.
26. RECEPTACLES
 - A. CONVENIENCE AND STRAIGHT-BLADE RECEPTACLES: NEMA WD 1; SPECIFICATION GRADE.
 - B. LOCKING-BLADE RECEPTACLES: NEMA WD 5.
 - C. CONVENIENCE RECEPTACLE CONFIGURATION: NEMA WD 1; TYPE 5-20R, WHITE PLASTIC FACE.
 - D. SPECIFIC-USE RECEPTACLE CONFIGURATION: NEMA WD 1 OR WD 5; TYPE AS INDICATED ON DRAWINGS. WHITE PLASTIC FACE.
 - E. GFCI RECEPTACLES: DUPLEX CONVENIENCE RECEPTACLE WITH INTEGRAL GROUND FAULT CURRENT INTERRUPTER.
27. WALL PLATES
 - A. DECORATIVE COVER PLATE: WHITE PLASTIC.
 - B. WEATHERPROOF COVER PLATE: GASKETED CAST METAL WITH HINGED GASKETED DEVICE COVERS.
28. INSTALLATION
 - A. INSTALL WALL SWITCHES 48 INCHES ABOVE FLOOR, (OFF POSITION DOWN) OR HEIGHT SHOWN ON STANDARD T&M MOUNTING HEIGHT DRAWING OR ARCHITECTURAL PLANS, IF DIFFERENT.
 - B. INSTALL CONVENIENCE RECEPTACLES 18 INCHES ABOVE FLOOR, 6 INCHES ABOVE COUNTERS, GROUNDING POLE ON BOTTOM.
 - C. INSTALL SPECIFIC-USE RECEPTACLES AT HEIGHTS SHOWN ON CONTRACT DRAWINGS.
 - D. INSTALL DECORATIVE PLATES ON SWITCH, RECEPTACLE, AND BLANK OUTLETS IN FINISHED AREAS, USING JUMBO SIZE PLATES FOR OUTLETS INSTALLED IN MASONRY WALLS.
 - E. INSTALL GALVANIZED STEEL PLATES ON OUTLET BOXES AND JUNCTION BOXES IN UNFINISHED AREAS, ABOVE ACCESSIBLE CEILINGS, AND ON SURFACE-MOUNTED OUTLETS.
 - F. INSTALL DEVICES AND WALL PLATES FLUSH AND LEVEL.
29. DISCONNECT SWITCHES
 - A. FUSIBLE SWITCH ASSEMBLIES: NEMA KS 1; TYPE GD, QUICK-MAKE, QUICK-BREAK, LOAD INTERRUPTER ENCLOSED KNIFE SWITCH WITH EXTERNALLY OPERABLE HANDLE INTERLOCKED TO PREVENT OPENING FRONT COVER WITH SWITCH IN ON POSITION. HANDLE LOCKABLE IN OFF POSITION. FUSE CLIPS: DESIGNED TO ACCOMMODATE CLASS R FUSES.
 - B. NONFUSIBLE SWITCH ASSEMBLIES: NEMA KS 1; TYPE GD, QUICK-MAKE, QUICK-BREAK, LOAD INTERRUPTER ENCLOSED KNIFE SWITCH WITH EXTERNALLY OPERABLE HANDLE INTERLOCKED TO PREVENT OPENING FRONT COVER WITH SWITCH IN ON POSITION. HANDLE LOCKABLE IN OFF POSITION.
 - C. ENCLOSURES: NEMA KS 1; TYPE AS INDICATED ON DRAWINGS.
 - D. DISCONNECT SWITCHES ON BUILDING EXTERIOR TO BE NEMA 3R.
30. ACCEPTABLE MANUFACTURERS - DISCONNECT SWITCHES
 - A. WESTINGHOUSE/CHALLENGER
 - B. SQUARE D
 - C. GENERAL ELECTRIC
 - D. ITE
31. MAIN AND DISTRIBUTION PANELBOARDS
 - A. PANELBOARDS: NEMA PB 1; CIRCUIT BREAKER TYPE (NO LOAD CENTERS).
 - B. ENCLOSURE: NEMA PB 1; TYPE 1.
 - C. PROVIDE CABINET FRONT WITH SCREW COVER, AND HINGED DOOR WITH FLUSH LOCK. FINISH IN MANUFACTURER'S STANDARD GRAY ENAMEL.
 - D. PROVIDE PANELBOARDS WITH COPPER BUS, RATINGS AS SCHEDULED ON DRAWINGS. PROVIDE COPPER GROUND BUS IN ALL PANELBOARDS.
 - E. MINIMUM INTEGRATED SHORT CIRCUIT RATING: 10,000 AMPERES RMS SYMMETRICAL FOR 240 VOLT PANELBOARDS; 14,000 AMPERES RMS SYMMETRICAL FOR 480 VOLT PANELBOARDS; OR AS SHOWN ON DRAWINGS.
 - F. MOLDED CASE CIRCUIT BREAKERS: NEMA AB 1; PROVIDE CIRCUIT BREAKERS WITH INTEGRAL THERMAL AND INSTANTANEOUS MAGNETIC TRIP IN EACH POLE. PROVIDE CIRCUIT BREAKERS UL LISTED AS TYPE HACR FOR AIR CONDITIONING EQUIPMENT BRANCH CIRCUITS.
32. BRANCH CIRCUIT PANELBOARDS
 - A. LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARDS: NEMA PB 1; CIRCUIT BREAKER TYPE (NO LOAD CENTERS).
33. INSTALLATION
 - A. INSTALL PANELBOARDS PLUMB, IN CONFORMANCE WITH NEMA PB 1.1.
 - B. HEIGHT: 6 FT.
 - C. PROVIDE FILLER PLATES FOR UNUSED SPACES IN PANELBOARDS.
 - D. PROVIDE TYPE CIRCUIT DIRECTORY FOR EACH BRANCH CIRCUIT PANELBOARD. REVISE DIRECTORY TO REFLECT CIRCUITING CHANGES REQUIRED TO BALANCE PHASE LOADS.
 - E. STUB 3 EMPTY ONE INCH CONDUITS TO ACCESSIBLE LOCATION ABOVE CEILING OUT OF EACH RECESSED PANELBOARD.
34. FIELD QUALITY CONTROL
 - A. MEASURE STEADY STATE LOAD CURRENTS AT EACH PANELBOARD FEEDER. SHOULD THE DIFFERENCE AT ANY PANELBOARD BETWEEN PHASES EXCEED 20 PERCENT, REARRANGE CIRCUITS IN THE PANELBOARD TO BALANCE THE PHASE LOADS WITHIN 20 PERCENT. TAKE CARE TO MAINTAIN PROPER PHASING FOR MULTI-WIRE BRANCH CIRCUITS.
 - B. VISUAL AND MECHANICAL INSPECTION: INSPECT FOR PHYSICAL DAMAGE, PROPER ALIGNMENT, ANCHORAGE, AND GROUNDING. CHECK PROPER INSTALLATION AND TIGHTNESS OF CONNECTIONS FOR CIRCUIT BREAKERS, FUSIBLE SWITCHES, AND FUSES.
35. ACCEPTABLE MANUFACTURERS - PANELBOARDS
 - A. WESTINGHOUSE/CHALLENGER
 - B. SQUARE D
 - C. GENERAL ELECTRIC
 - D. ITE
36. SECONDARY GROUNDING
 - A. GROUND THE ELECTRICAL SERVICE SYSTEM NEUTRAL AT SERVICE ENTRANCE EQUIPMENT TO GROUNDING ELECTRODE AND BUILDING FRAME.
 - B. GROUND EACH SEPARATELY-DERIVED SYSTEM NEUTRAL TO SEPARATE GROUND ELECTRODE.
 - C. PROVIDE COMMUNICATIONS SYSTEM GROUNDING CONDUCTOR AT POINT OF SERVICE ENTRANCE AND CONNECT TO SEPARATE GROUND ELECTRODE.
 - D. BOND TOGETHER SYSTEM NEUTRALS, SERVICE EQUIPMENT ENCLOSURES, EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT, METAL RACEWAY SYSTEMS, GROUNDING CONDUCTOR IN RACEWAYS AND CABLES, RECEPTACLE GROUND CONNECTORS, AND PLUMBING SYSTEMS.
 - E. GROUND RODS: COPPER-ENCASED STEEL, 3/4 INCH DIAMETER, MINIMUM LENGTH 10 FEET.
 - F. PROVIDE A SEPARATE, INSULATED EQUIPMENT GROUNDING CONDUCTOR IN FEEDER AND BRANCH CIRCUITS. TERMINATE EACH END ON A GROUNDING LUG, BUS OR BUSHING.
 - G. USE MINIMUM 6 AWG COPPER CONDUCTOR FOR COMMUNICATIONS SERVICE GROUNDING CONDUCTOR. LEAVE 10 FEET SLACK CONDUCTOR AT TERMINAL BOARD.
 - H. INSPECT GROUNDING AND BONDING SYSTEM CONDUCTORS AND CONNECTIONS FOR TIGHTNESS AND PROPER INSTALLATION.
 - I. MEASURE GROUND RESISTANCE FROM SYSTEM NEUTRAL CONNECT AT SERVICE ENTRANCE TO CONVENIENT GROUND REFERENCE POINT USING SUITABLE GROUND TESTING EQUIPMENT. RESISTANCE SHALL NOT EXCEED 10 OHMS.
37. PACKAGED ELECTRIC GENERATING PLANT
 - PART 1 GENERAL
 - 1.01 SCOPE
 - A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF A PACKAGED ELECTRIC GENERATING PLANT FOR STANDBY SERVICE.
 - 1.02 REFERENCE STANDARDS
 - A. ANSI/NEMA MG 1 - MOTORS AND GENERATORS
 - 1.03 SUBMITTALS PRIOR TO MANUFACTURE
 - A. BROCHURES. SUBMIT BROCHURES ON ENGINE, GENERATOR, MUFFLER, BATTERY, BATTERY CHARGER, CONTROL PANEL, AND ANY ACCESSORY EQUIPMENT SHOWING RATINGS, CONSTRUCTION FEATURES, AND PERFORMANCE CHARACTERISTICS. INDICATE FUEL CONSUMPTION AT FULL LOAD.
 - B. DIMENSIONAL DRAWINGS. SUBMIT DIMENSIONAL DRAWINGS OF PACKAGED UNIT AND ANY SEPARATELY MOUNTED ACCESSORY EQUIPMENT SUCH AS BATTERIES AND CHARGER. INCLUDE WEIGHT OF THE PACKAGED UNIT.
 - C. ELECTRICAL DIAGRAMS. SUBMIT SCHEMATIC AND WIRING DIAGRAMS OF THE ELECTRICAL SYSTEM SHOWING ALL FACTORY WIRING AND CLEARLY INDICATING ALL WIRING CONNECTIONS TO BE MADE IN THE FIELD. INCLUDE INTERNAL WIRING DIAGRAMS OF ANY PACKAGED CONTROLLERS. INDICATE WATTAGE AND VOLTAGE OF ANY ELECTRICAL STRIP HEATERS. ALSO SUBMIT FULLY DETAILED INTERCONNECTION DRAWINGS INDICATING EACH INDIVIDUAL CONNECTION TO ANY REMOTE EQUIPMENT, INCLUDING A SEPARATE CONNECTION DRAWING TO SHOW POINT-TO-POINT ELECTRICAL WIRING CONNECTIONS.
 - 1.04 SUBMITTALS AFTER MANUFACTURE
 - A. FACTORY AND FIELD TESTS. DELIVER TO THE ENGINEER THREE COPIES OF EACH FACTORY AND FIELD TEST REPORT ON THE ACTUAL PACKAGED ELECTRIC GENERATING PLANT PROVIDED, INDICATING RESULTS FOR ALL TESTS DESCRIBED HEREIN.
 - B. OPERATION AND MAINTENANCE MANUALS. TWO WEEKS PRIOR TO FINAL INSPECTION, DELIVER TO THE ENGINEER THREE SETS OF THE MANUFACTURER'S OPERATION AND MAINTENANCE MANUALS PERTAINING DIRECTLY TO THE UNIT PROVIDED. BIND EACH SET IN A SUBSTANTIAL BINDER, WITH EACH ITEM PROPERLY INDEXED. INCLUDE THE FOLLOWING INFORMATION:
 1. PROVIDE RECORD DRAWINGS CLEARLY INDICATING OPERATING FEATURES AND INCLUDING AS-BUILT SHOP DRAWINGS, OUTLINE DRAWINGS, AND SCHEMATIC AND WIRING DIAGRAMS.
 2. INSTRUCTIONS FOR ERECTION, ALIGNMENT INCLUDING TOLERANCES, AND PREPARATION FOR USE.
 3. COMPLETE DESCRIPTION OF SAFETY EQUIPMENT, SAFETY PROCEDURES, AND SAFETY PRECAUTIONS.
 4. STARTING, NORMAL RUNNING, EMERGENCY AND SHUTDOWN PROCEDURES.
 5. NORMAL MAINTENANCE, INSPECTION AND LUBRICATION PROCEDURES.
 6. RECOMMENDED SPARE PARTS LIST.
 - 1.05 ACCEPTABLE MANUFACTURERS
 - A. ONAN
 - B. GENERAC
 - C. KOHLER
 - PART 2 PRODUCTS
 - 2.01 DESCRIPTION
 - A. PROVIDE A COMPLETE, PACKAGED, PROPANE GAS ENGINE - ELECTRIC GENERATING PLANT WHICH IS PREWIRED, PREPARED, ASSEMBLED AND ALIGNED ON A SINGLE SKID-TYPE BASE. MAKE THE PACKAGED SYSTEM OF NEW UNUSED EQUIPMENT OF THE MANUFACTURER'S LATEST DESIGN. INCLUDE ALL NECESSARY INSTRUMENTS, DEVICES, SWITCHES, AND OTHER APPURTENANCES FOR PROPER OPERATION OF THE UNIT. SUPPLY STEEL SAFETY GUARDS AROUND ALL EXTERNAL ROTATING PARTS. PROVIDE A UNIT ON WHICH ADJUSTMENTS, REPAIRS AND NORMAL MAINTENANCE ARE POSSIBLE WITHOUT THE USE OF SPECIAL TOOLS. PROVIDE AN OVERALL WEATHERPROOF HOUSING AS FURTHER DESCRIBED IN THIS SECTION. THE SUPPLIER WILL BE RESPONSIBLE FOR THE PROPER PERFORMANCE OF THE COMPLETE UNIT AND SUPPORT SYSTEM.
 - 2.02 ENGINE
 - A. TYPE. PROVIDE A STATIONARY, LIQUID COOLED, SPARK IGNITED ENGINE, EITHER NATURALLY ASPIRATED OR TURBOCHARGED.
 - B. RATING. PROVIDE AN ENGINE WITH BRAKE HORSEPOWER NOT LESS THAN 10 PERCENT GREATER THAN REQUIRED BY THE FULL LOAD RATING OF THE GENERATOR, INCLUDING LOSSES, AND WITH ALL ACCESSORIES ATTACHED.
 - C. SPEED. MAKE ENGINE SPEED SUITABLE FOR DIRECT CONNECTION TO THE GENERATOR WITHOUT EXCEEDING ENGINE MANUFACTURER'S PUBLISHED CURVES. SPEED MUST NOT EXCEED 10 RPM. PROVIDE GOVERNOR OF THE FULL HYDRAULIC TYPE, WOODWARD PSC OR AN APPROVED EQUAL, TO MAINTAIN FREQUENCY STABILITY OF ANY CONSTANT LOAD, INCLUDING NO LOAD, WITHIN PLUS OR MINUS 1/4 PERCENT, AND TO MAINTAIN FREQUENCY REGULATION BETWEEN NO LOAD STEADY-STATE AND FULL LOAD STEADY-STATE WITH 3 PERCENT.
 - D. ACCESSORIES. PROVIDE ALL ACCESSORIES, DEVICES AND APPURTENANCES NECESSARY FOR PROPER OPERATION, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 1. LUBRICATION SYSTEM.
 - a. POSITIVE DISPLACEMENT MECHANICAL LUBE OIL PUMP.
 - b. FULL FLOW REPLACEABLE ELEMENT OIL FILTER.
 2. AIR SYSTEM.
 - a. REPLACEABLE DRY ELEMENT AIR INTAKE FILTER.
 3. STARTING SYSTEM.
 - a. HEAVY-DUTY, BATTERY-DRIVEN ELECTRIC STARTER MOTOR.
 - b. FULLY CHARGED, LEAD CALCIUM, IMPACT RESISTANT, PLASTIC CASED, STORAGE BATTERY OR BATTERIES MOUNTED ON THE UNIT OR IN A SEPARATE CORROSION-PROOF RACK NEAR THE UNIT. MAKE BATTERY CAPACITY SUFFICIENT FOR FOUR CRANKING CYCLES AT FIRING SPEED OF 30 SECONDS DURATION EACH WITH 15-SECOND REST PERIODS. PROVIDE ALL BATTERY CABLES, CONNECTIONS, ELECTROLYTE, WATER AND A HYDROMETER.
 - c. STATIC, SOLID-STATE TYPE BATTERY CHARGER UNIT WHICH AUTOMATICALLY CONTROLS THE CHARGE RATE AND WHICH HAS AN ADJUSTABLE CHARGING RATE. INCLUDE A CHARGING RATE AMMETER, A VOLTMETER, AND A MANUAL RESET, THERMAL OVERLOAD CIRCUIT BREAKER TO PROTECT THE RECTIFIER ASSEMBLY AND TRANSFORMER. SELECT A CHARGER SUITABLE FOR OPERATION AT 120 VOLTS, SINGLE PHASE, 60 HERTZ. MAKE CHARGING TIME BE 24 HOURS MAXIMUM. MOUNT CHARGER ON UNIT, USING ADEQUATE VIBRATION DEVICES.
 - d. ENGINE-DRIVEN ALTERNATOR WITH FULL-WAVE RECTIFIER AND TRANSISTORIZED VOLTAGE REGULATOR FOR CHARGING BATTERY WHEN ENGINE IS RUNNING.
 4. COOLANT SYSTEM.
 - a. CLOSED, LIQUID COOLANT SYSTEM COMPLETE WITH RADIATOR, FAN, COOLANT MANIFOLD, COOLANT EXPANSION CHAMBER (OVERFLOW TANK), TEMPERATURE CONTROL VALVE, AND ENGINE-DRIVEN COOLANT CIRCULATING PUMP. PROVIDE A THERMOSTATICALLY CONTROLLED, CORROSION-RESISTANT, 120-VOLT A-C, ENGINE JACKET COOLANT HEATER WITH LEADS BROUGHT OUT TO A SCREW TERMINAL BLOCK AND SUITABLY IDENTIFIED. FILL THE SYSTEM WITH ENGINE COOLANT WHICH IS A SOLUTION OF AT LEAST 50 PERCENT ETHYLENE GLYCOL IN WATER.
 5. EXHAUST SYSTEM.
 - a. RESIDENTIAL-GRADE MUFFLER WITH MAXIMUM SILENCING CAPACITY MOUNTED HORIZONTALLY ON TOP OF UNIT. INCLUDE AN 18-INCH LENGTH OF FLEXIBLE STAINLESS STEEL EXHAUST TUBING FOR MOUNTING ON OUTLET SIDE OF MUFFLER. PROVIDE EXHAUST CONDENSATION TRAP AND A RAIN CAP ON EXHAUST END OF TUBING.
 6. FUEL SYSTEM.
 - a. PROVIDE PROPANE GAS REGULATORS AS REQUIRED FOR PROPER OPERATION.
 7. REMOTE ANNUNCIATOR.
 - a. 14 LIGHT (MIN.) TO BE LOCATED WHERE DIRECTED BY OWNER.
 - 2.03 GENERATOR
 - A. TYPE. FURNISH A DIRECT-COUPLED, SYNCHRONOUS, BRUSHLESS-TYPE GENERATOR WITH AMORTISSEUR WINDINGS, REVOLVING FIELD, EXCITER, AND BUILT-IN STATIC RECTIFIER AND STATICALLY REGULATED EXCITATION SYSTEM. PROVIDE EXTENDED STACK ALTERNATOR FOR FULL SET RATED KW AT 1.0 POWER FACTOR.
 - B. RATING.
 1. VOLTAGE. 120/240V, SINGLE PHASE, THREE WIRE.
 2. FREQUENCY. 60 HERTZ.



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ADDITION
BEEVILLE, TEXAS

ISSUE DATE	03-23-2015
DRAWING SCALE	3/16" = 1'-0"
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DRAWN BY	LAUGER

PAGE TITLE
ELECTRICAL
SPECIFICATIONS

ELECTRICAL SPECIFICATIONS -- CONTINUED

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WYCOFF ENGINEERING, INC.
TBPE CERTIFICATE OF REGISTRATION # F-98
ROBERT E. WYCOFF, P.E.
TX. NO. 27452

Table with 2 columns: REVISIONS, and empty rows for revision tracking.

DESIGN-BUILD CONTRACTOR

LAUGER ENGINEERING, INC.
2800 PORTLAND AVENUE, SUITE 100, DALLAS, TEXAS 75235
(972) 242-1000 FAX (972) 242-1001

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VETERINARY CLINIC

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ADDITION
BEEVILLE, TEXAS

Table with 2 columns: ISSUE DATE, DRAWING SCALE, PROJECT NO., DRAWN BY, LAUGER

PAGE TITLE
ELECTRICAL SPECIFICATIONS

SHEET

E-4.0

- 3. KILOWATTS. 50.
4. POWER FACTOR. 0.8.
5. DUTY. STANDBY.
C. INSULATION SYSTEM. CLASS F, 105 C RISE OVER A 40 C AMBIENT.
D. TEMPERATURE RISE. CORRESPONDING TO A CLASS B (80 C RISE) INSULATION SYSTEM.
E. INSTANTANEOUS VOLTAGE DIP. LESS THAN 20 PERCENT WHEN FULL LOAD IS APPLIED TO THE UNIT.
F. VOLTAGE STABILITY. MAINTAIN WITHIN PLUS OR MINUS 1/2 PERCENT OF RATED VOLTAGE AT ANY CONSTANT LOAD FROM NO LOAD TO FULL LOAD.
G. VOLTAGE REGULATION. THREE PERCENT MAXIMUM.
H. ENCLOSURE. OPEN DRIP-PROOF.
I. COUPLING. FROM ENGINE, DRIVE ROTOR THROUGH A SEMI-FLEXIBLE COUPLING TO ENSURE PERMANENT ALIGNMENT.
J. SPACE HEATERS. PROVIDE THERMOSTATICALLY CONTROLLED, LOW SURFACE TEMPERATURE SPACE HEATERS TO PREVENT CONDENSATION. SIZE HEATERS SO THAT KW RATING IS NOT LESS THAN TWICE THE VALUE GIVEN IN THE APPENDIX TO IEEE STANDARD 43, PARAGRAPH A1.3.
2.04 CONTROL PANEL
A. GENERAL. PROVIDE A CONTROL PANEL MOUNTED ON UNIT WHICH INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING INSTRUMENTS AND PROTECTIVE DEVICES.
B. CONTROL PANEL TO BE ONAN STANDARD FEATURES.
C. PROVIDE MAIN LINE CIRCUIT BREAKER.
2.05 ENGINE START-STOP CONTROLS
A. PROVIDE CONTROLS IN THE CONTROL PANEL FOR STARTING AND STOPPING THE ENGINE, INCLUDING THE FOLLOWING:
1. THREE-POSITION SELECTOR SWITCH. MOUNT ON FRONT OF THE CONTROL PANEL WITH THE FOLLOWING POSITIONS LABELED.
a. HAND. TO PERMIT STARTING AND STOPPING THE ENGINE FROM THE PANEL-MOUNTED START-STOP PUSHBUTTONS FOR TEST PURPOSES, WITHOUT LOAD TRANSFER.
b. OFF. TO STOP ENGINE AND DISCONNECT CONTROL FOR PREVENTION OF START DURING MAINTENANCE AND TO RESET AUTOMATIC CONTROLS. PROVIDE EXTRA CONTACT FOR REMOTE ALARM.
c. AUTOMATIC. TO SET UP CIRCUITS FOR AUTOMATIC START AND STOP ON DEMAND OF REMOTE MOUNTED TRANSFER SWITCH.
2. AUTOMATIC CRANKING.
a. CRANK CONTROL AND TIME DELAY RELAYS TO PROVIDE A MINIMUM OF FOUR INTERMITTENT CRANK PERIODS. USE A CRANK LIMITER TO LIMIT TOTAL CRANK TIME PLUS REST TIME TO 45 SECOND MAXIMUM. USE ADEQUATE REST PERIODS FOR BATTERY PROVIDED.
b. MAKE CRANKING CYCLE TERMINATE IMMEDIATELY ON ENGINE START-UP BY A FUEL PRESSURE SWITCH OR SOME OTHER ACCEPTABLE MEANS.
3. COOL DOWN PERIOD. AN ADJUSTABLE FROM 5 TO 30 MINUTE TIME DELAY FOR UNLOADED RUNNING OF THE ENGINE GENERATOR AFTER RETRANSFER OF THE LOAD TO THE NORMAL SOURCE.
4. EXERCISER. AN ADJUSTABLE EXERCISER TO AUTOMATICALLY RUN THE UNIT UNLOADED FROM 10 TO 60 MINUTES EVERY 7 DAYS. DESIGN EXERCISER SO THAT NO INTERRUPTION OF NORMAL POWER TO THE LOAD WILL OCCUR.
2.06 BASE
A. MOUNT THE ASSEMBLE PACKAGED UNIT ON A SKID BASE OF WELDED STRUCTURAL STEEL, BOX-TYPE CONSTRUCTION. USE VIBRATION ISOLATORS OF EITHER STEEL SPRING OR NEOPRENE CONSTRUCTION. PRIME ALL EXPOSED METAL PARTS WITH A RUST INHIBITOR AND FINISH IN DURABLE MACHINERY ENAMEL. BASE TO INCLUDE DUAL-WALL FUEL TANK.
2.07 WEATHERPROOF HOUSING
A. CONSTRUCTION. PROVIDE AN OVERALL WEATHER-PROTECTIVE HOUSING WITH REMOVABLE SIDE PANELS AND A HINGED, PADLOCKABLE METER PANEL DOOR TO MAKE THE ENGINE GENERATING PLANT SUITABLE FOR OUTDOOR INSTALLATION UNDER ALL WEATHER CONDITIONS.
B. PAINTING. PRIME ALL EXPOSED METAL PARTS WITH A SUITABLE RUST INHIBITOR APPLIED TO THE CLEAN, BARE METAL FOLLOWED BY TWO COATS OF AN EPOXY PAINT FOR EXTERIOR WEATHER CONDITIONS.
C. ACOUSTICAL TREATMENT. COVER THE INTERIOR OF ALL HOUSING SHEET METAL WITH A 1/32 INCH LAYER OF "SHEILD" ACOUSTICAL MATERIAL AS MANUFACTURED BY COMINCO, LTD., OAKVILLE, ONTARIO, CANADA, OR AN APPROVED EQUAL.
D. OPENING SCREENS. COVER ALL OPENINGS IN THE HOUSING WITH 1/4-INCH GALVANIZED HARDWARE CLOTH TO KEEP OUT BIRDS AND SMALL ANIMALS.
2.08 FACTORY TESTS
A. BEFORE DELIVERY TO THE JOB SITE, HAVE THE ENGINE GENERATING PLANT SATISFACTORILY TESTED AS DESCRIBED IN THE FOLLOWING PARAGRAPHS AND IN ACCORDANCE WITH THE MANUFACTURER'S DESIGN PARAMETERS.
1. SHUTDOWN TESTS. BRING THE ENGINE GENERATOR TO STABLE OPERATION AND THEN CREATE THE FOLLOWING CONDITIONS IN TURN TO CAUSE ALARM AND SHUTDOWN.
a. HIGH ENGINE TEMPERATURE.
b. LOW ENGINE TEMPERATURE.
c. LOW OIL PRESSURE.
d. ENGINE OVERSPEED.
2. VOLTAGE AND FREQUENCY STABILITY TESTS. HAVE THE ENGINE GENERATOR CARRY RATED KW LOAD AT 0.8 POWER FACTOR FOR 1 HOUR. DURING THIS TEST, FREQUENCY AND VOLTAGE MUST NOT VARY MORE THAN PARAMETERS STATED IN PARAGRAPHS 2.02C AND 2.03G OF THIS SECTION.
3. FULL LOAD TESTS. START THE GENERATOR UNDER NO LOAD AND THEN HAVE FULL RATED KW AT 0.8 POWER FACTOR APPLIED IN A SINGLE INCREMENT WITHIN 10 SECONDS OF START-UP. REMOVE THE LOAD FROM THE UNIT 5 MINUTES AFTER START-UP AND THEN REAPPLY FULL RATED KW AT 0.8 POWER FACTOR 30 SECONDS LATER. RUN THE UNIT AN ADDITIONAL 5 MINUTES UNDER LOAD BEFORE SHUTDOWN. DURING THIS TEST, THE INSTANTANEOUS VOLTAGE DIP MUST NOT EXCEED THAT STATED IN PARAGRAPH 2.03E OF THIS SECTION, AND FREQUENCY AND VOLTAGE REGULATION MUST NOT VARY MORE THAN PARAMETERS STATED IN PARAGRAPHS 2.02C AND 2.03G OF THIS SECTION.
2.09 WARRANTY
A. PROVIDE MANUFACTURER'S 2-YEAR STANDBY POWER WARRANTY.
PART 3 EXECUTION
3.01 FOUNDATION PAD
A. INSTALL PACKAGED ELECTRIC GENERATING PLANT ON A CONCRETE PAD AS SHOWN ON DRAWINGS.
3.02 INSTALLATION
A. FOLLOW MANUFACTURER'S INSTALLATION PROCEDURES. HAVE INSTALLATION SUPERVISED AND APPROVED BY A QUALIFIED REPRESENTATIVE OF THE UNIT MANUFACTURER.
3.03 ENGINE EXHAUST
A. INSTALL AN 18-INCH LENGTH OF THE SPECIFIED EXHAUST TUBING BETWEEN ENGINE EXHAUST OUTLET AND MUFFLER INLET. TURN MUFFLER TAILPIPE UP AND TERMINATE WITH RAIN CAP.

- 3.04 FIELD TESTS
A. PERFORM FIELD TESTS AT THE SITE AFTER INSTALLATION IS COMPLETE AND IN THE PRESENCE OF THE ENGINEER.
1. MANUFACTURER'S REPRESENTATIVE. HAVE THE ENGINE GENERATOR MANUFACTURER FURNISH A REPRESENTATIVE TO OPERATE THE UNIT DURING THE FIELD TESTS, TO CHECK ALL DETAILS OF THE INSTALLATION, AND TO INSTRUCT THE OPERATORS. INCLUDE, AT NO ADDITIONAL COST TO THE OWNER, THE SERVICES OF THE REPRESENTATIVE.
2. PREPARATION FOR TESTING. HAVE THE ENGINE GENERATOR SYSTEM COMPLETED AND READY FOR OPERATION AT THE TIME FIELD TESTS ARE TO BE RUN. PROVIDE ALL NECESSARY LUBE OIL AND COOLANT, AND INSTALL NEW, UNUSED OIL AND AIR FILTER ELEMENTS.
3. INSTRUMENTS. PROVIDE ALL INSTRUMENTS NECESSARY TO CONDUCT THE TESTS.
4. 6-HOUR TEST. NOTIFY ENGINEER 2 DAYS BEFORE TEST. THEN COMPLETE A 6-HOUR, FULL-LOAD TEST USING CONTRACTOR-SUPPLIED LOAD BANK AS A CONDITION FOR FINAL ACCEPTANCE. READ AND RECORD ALL GAGES AND METERS BEFORE STARTING THE TEST, THEN EVERY 10 MINUTES DURING THE FIRST HOUR, AND THEN EVERY HALF HOUR DURING THE REMAINDER OF THE 6-HOUR PERIOD. REMOVE LOAD AND RUN ENGINE GENERATOR AT NO LOAD FOR 15 MINUTES; THEN SHUT UNIT DOWN AND IMMEDIATELY MAKE ONE LAST RECORDING OF ALL GAGE AND METER INDICATIONS. HAVE RECORDINGS FIELD WITNESSED DURING TEST BY THE ENGINEER. DELIVER THREE COPIES OF SUCH WITNESSED RECORDINGS TO THE ENGINEER WITHIN ONE WEEK OF THE TEST.
5. ACTUAL PLANT LOAD TESTS.
a. AFTER THE SUCCESSFUL 6-HOUR, FULL-LOAD TEST DESCRIBED ABOVE, MAKE ADDITIONAL ON-SITE TESTS USING ACTUAL AVAILABLE PLANT LOADS IN THE PRESENCE OF THE ENGINEER TO DEMONSTRATE SATISFACTORY PERFORMANCE OF THE COMPLETE ENGINE GENERATOR SYSTEM. INCLUDE DIFFERENT SEQUENCED START-UPS OF THE VARIOUS SPECIFIED LOADS, AS DIRECTED BY THE ENGINEER.
b. AS A FINAL TEST, AFTER ALL OTHER TESTS HAVE BEEN SUCCESSFULLY COMPLETED, OPERATE THE ENGINE GENERATOR SYSTEM UNDER ACTUAL AVAILABLE PLANT LOAD FOR 4 HOURS OF SUCCESSFUL OPERATION.
38. AUTOMATIC TRANSFER SWITCH
PART 1 GENERAL
1.01 SCOPE
A. THIS SECTION SPECIFIES THE FURNISHING AND INSTALLATION OF AN AUTOMATIC TRANSFER SWITCH.
1.02 SCOPE
A. ANSI/UL 1008 - AUTOMATIC TRANSFER SWITCHES.
B. NEMA ICS 1-109 - TESTS.
C. NEMA ICS 2-447 - A-C AUTOMATIC TRANSFER PANELS.
1.03 SUBMITTALS
A. INFORMATION. INCLUDE THE FOLLOWING INFORMATION IN SUBMITTAL:
1. RATED CURRENT, VOLTAGE AND FREQUENCY.
2. NUMBER OF POLES.
3. SUMMETRICAL RMS AMPERES WITHSTAND CURRENT AT 0.2 POWER FACTOR AND AT RATED VOLTAGE.
4. PHYSICAL DIMENSIONS.
5. NEMA ENCLOSURE TYPE.
6. ITEMIZED LIST OF ACCESSORIES.
7. SCHEMATIC DIAGRAM (SHOW WIRING AND ONLY THOSE COMPONENTS WHICH ARE PART OF SWITCH).
8. SHOW ALL FACTORY WIRING ON WIRING DIAGRAM AND CLEARLY INDICATE ALL WIRING AND CONNECTIONS TO REMOTE DEVICES WHICH ARE TO BE MADE IN THE FIELD. (SHOW ONLY THAT WIRING WHICH PERTAINS TO SWITCH AND REMOTE DEVICES).
PART 2 PRODUCTS
2.01 TYPE
A. PROVIDE A SWITCH WHICH IS ELECTRONICALLY OPERATED AND MECHANICALLY HELD IN EACH DIRECTION, AND WHICH IS TRUE DOUBLE-THROW WITH NO INTERMEDIATE POSITION.
2.02 RATING
A. RATING SHALL BE 400 AMPS, 1 PHASE, 3 WIRE, WITH SOLID NEUTRAL.
2.03 OPERATION
A. GENERAL. THE OPERATING TRANSFER TIME IN EITHER DIRECTION SHALL NOT EXCEED 10 CYCLES. PROVIDE ALL ACCESSORIES REQUIRED TO ACCOMPLISH FUNCTIONS AS FOLLOWS.
B. SENSORS.
1. PROVIDE SOLID-STATE SENSORS TO MONITOR ALL PHASES OF THE NORMAL POWER SOURCE FROM LINE TO LINE. THE PICKUP VOLTAGE SHALL BE ADJUSTABLE FROM 85 PERCENT TO 100 PERCENT OF NOMINAL, AND THE DROPOUT VOLTAGE SHALL BE ADJUSTABLE FROM 75 PERCENT TO 98 PERCENT OF PICKUP VALUE. SET SENSORS SO THAT TRANSFER TO EMERGENCY WILL BE INITIATED UPON REDUCTION OF NORMAL VOLTAGE TO 85 PERCENT OF NOMINAL AND RETRANSFER TO NORMAL WILL OCCUR WHEN NORMAL VOLTAGE IS RESTORED TO 95 PERCENT OF NOMINAL.
2. PROVIDE SOLID-STATE SENSORS TO MONITOR ALL PHASES OF THE EMERGENCY POWER SOURCE FROM LINE TO LINE. THE PICKUP VOLTAGE SHALL BE ADJUSTABLE FROM 85 PERCENT TO 100 PERCENT OF NOMINAL, AND FACTORY SET AT 90 PERCENT.
3. PROVIDE SOLID-STATE SENSORS TO MONITOR THE FREQUENCY OF THE EMERGENCY POWER SOURCE. SET SENSOR PICKUP FREQUENCY AT 90 PERCENT OF NORMAL.
C. TIME DELAYS
1. PROVIDE A TIME DELAY TO OVERRIDE MOMENTARY NORMAL SOURCE OUTAGES TO DELAY ALL TRANSFER SWITCH AND ENGINE STARTING SIGNALS. THE TIME DELAY SHALL BE ADJUSTABLE FROM 0.5 TO 6 SECONDS AND FACTORY SET AT 1 SECOND.
2. PROVIDE A TIME DELAY ON RETRANSFER TO THE NORMAL SOURCE. THE TIME DELAY SHALL BE ADJUSTABLE FROM 0 TO 30 MINUTES AND FACTORY SET AT 10 MINUTES. THE TIME DELAY SHALL BE AUTOMATICALLY BYPASSED IF THE EMERGENCY SOURCE FAILS AND THE NORMAL SOURCE IS AVAILABLE.
3. PROVIDE A TIME DELAY ON TRANSFER TO EMERGENCY. THE TIME DELAY SHALL BE ADJUSTABLE FROM 0 TO 5 MINUTES AND FACTORY SET AT 0 UNLESS OTHERWISE INDICATED.
D. CONTACTS
1. PROVIDE A CONTACT THAT CLOSSES WHEN NORMAL SOURCE FAILS, RATED 10 AMPERES, 32 VOLTS D-C.
2. PROVIDE A CONTACT THAT OPENS WHEN NORMAL SOURCE FAILS, RATED 10 AMPERES, 32 VOLTS D-C.
3. PROVIDE AN AUXILIARY CONTACT THAT IS CLOSED WHEN THE TRANSFER SWITCH IS CONNECTED TO THE NORMAL SOURCE, RATED 10 AMPERES, 480 VOLTS A-C.
4. PROVIDE AN AUXILIARY CONTACT THAT IS CLOSED WHEN THE TRANSFER SWITCH IS CONNECTED TO THE EMERGENCY SOURCE, RATED 10 AMPERES, 480 VOLTS A-C.
E. PILOT LIGHTS
1. USE 10-WATT, 230-VOLT, 1056 LAMPS OPERATED AT 115 VOLTS.
2. PROVIDE A WHITE SIGNAL LIGHT TO INDICATE WHEN TRANSFER SWITCH IS CONNECTED TO THE NORMAL SOURCE.
3. PROVIDE A YELLOW SIGNAL LIGHT TO INDICATE WHEN TRANSFER SWITCH IS CONNECTED TO THE EMERGENCY SOURCE.
F. EMERGENCY DISCONNECT SWITCH
1. PROVIDE A SWITCH WHICH WILL PREVENT TRANSFER SWITCH FROM OPERATING WHEN NORMAL POWER SUPPLY IS MANUALLY TURNED OFF.
G. TEST SWITCH. PROVIDE A 2-POSITION, MOMENTARY CONTACT, SPRING RETURN TO NORMAL TEST SWITCH WITH NAMEPLATE ("NORMAL-TEST") TO SIMULATE NORMAL SOURCE FAILURE.

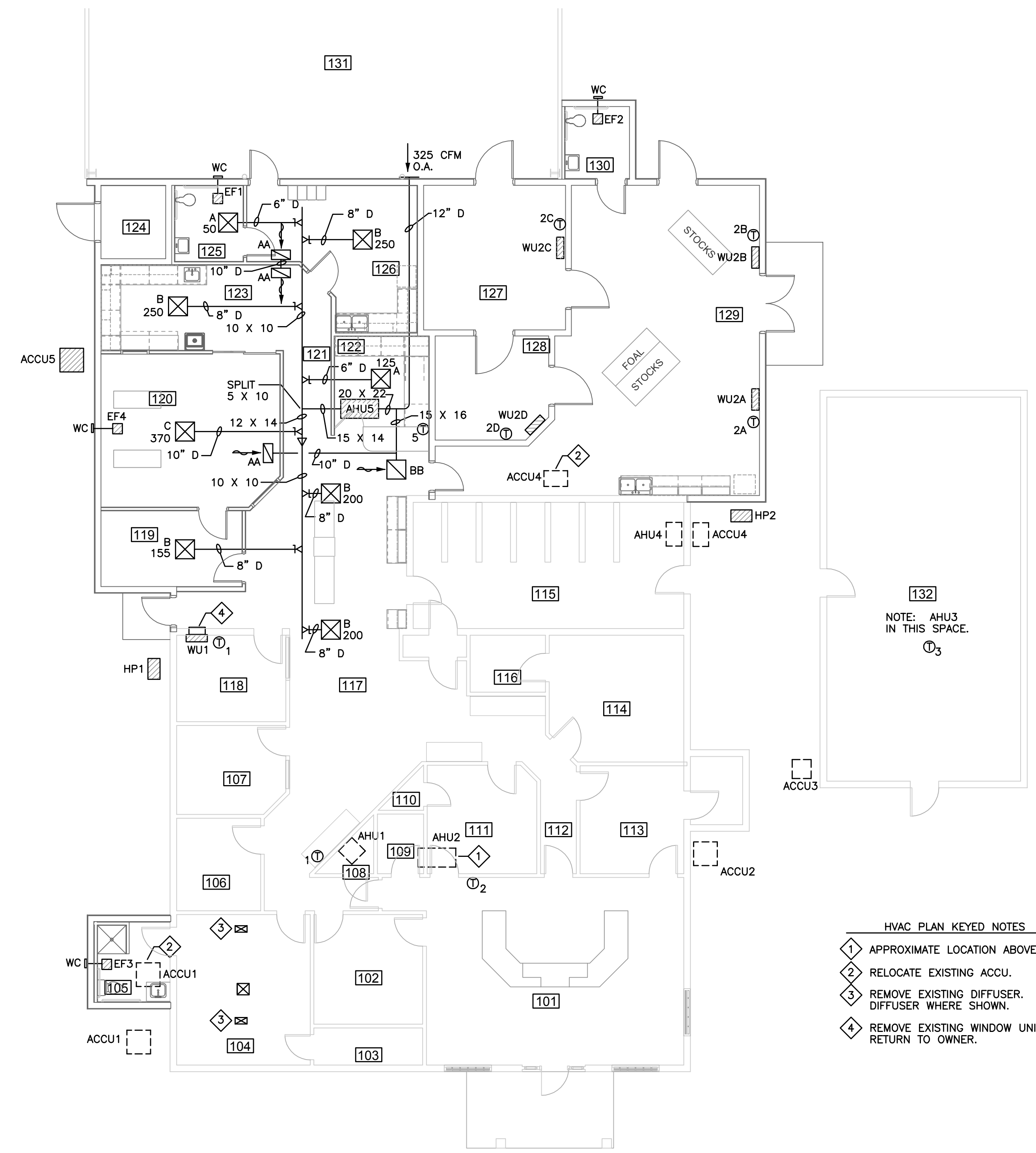
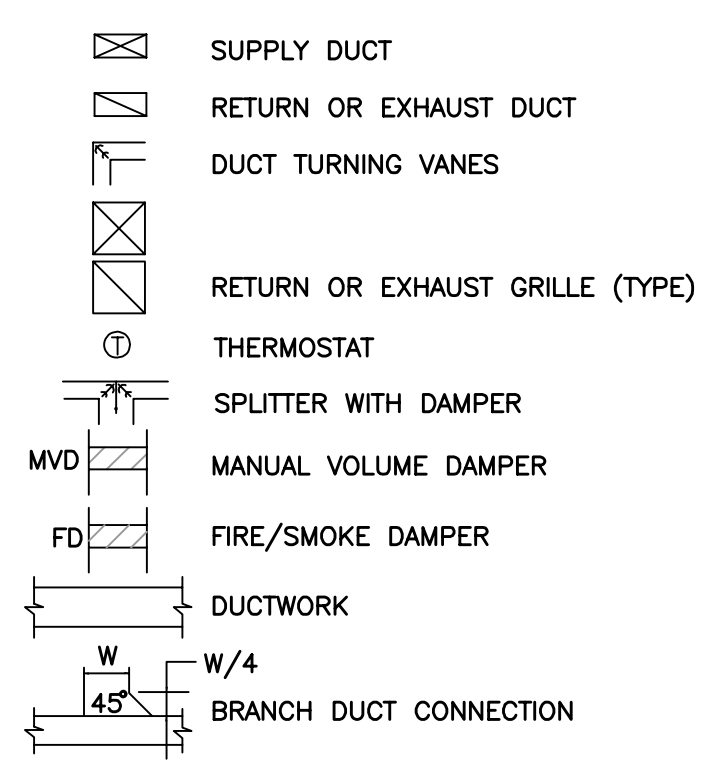
- 2.04 MAIN CONTACT PROTECTION
A. PROTECT MAIN CONTACTS BY PROVIDING ARC BARRIERS ON EACH CONTACT, AND ON SWITCHES RATED ABOVE 300 AMPERES BY PROVIDING SEPARATE ARCING CONTACT.
2.05 NEUTRAL BAR
A. PROVIDE A NEUTRAL BAR WITH THE SAME CAPACITY AS THE AMPERE RATING OF THE SWITCH.
2.06 ACCESSIBILITY
A. PROVIDE A SWITCH ON WHICH ALL PARTS MAY BE INSPECTED OR REPLACED FROM THE FRONT OF THE SWITCH WITHOUT MAJOR DISASSEMBLY, DISCONNECTION OF POWER CONDUCTORS, OR REMOVAL OF THE SWITCH FROM THE ENCLOSURE.
2.07 ENCLOSURE
A. PROVIDE NEMA 4X SWITCH ENCLOSURE SUITABLE FOR WALL MOUNTING.
2.08 PRODUCT DATA
A. PERMANENTLY ATTACH WIRING DIAGRAMS AND MAINTENANCE INSTRUCTIONS ON THE INSIDE OF ENCLOSURE DOOR IN A MOUNTING DESIGNED TO HOLD THE DATA.
2.09 LISTING
A. UP 1008 - AUTOMATIC TRANSFER SWITCH.
2.10 ACCEPTABLE MANUFACTURERS
A. ACCEPTABLE MANUFACTURER'S ARE ASCO 940 SERIES, RUSSELECTRIC RMT SERIES, ZENITH ZTS SERIES, ONAN OTII SERIES.
B. PROVIDE MANUFACTURER'S 2-YEAR WARRANTY.
PART 3 EXECUTION
3.01 INSTALLATION
A. INSTALL THE TRANSFER SWITCH AS SHOWN ON THE DRAWINGS. MAKE THE INSTALLATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3.02 PAINTING
A. RESTORE ANY MARRED SURFACES TO FACTORY FINISH.
3.03 TESTING
A. TEST THE SWITCH WITH THE PACKAGED ELECTRIC GENERATOR SET IN OPERATING CONDITION. DEMONSTRATE TO THE ENGINEER THAT THE AUTOMATIC TRANSFER SWITCH PERFORMS ALL REQUIRED FUNCTIONS.

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GENERAL HVAC NOTES

- MOUNT ALL THERMOSTATS 48" ABOVE FINISH FLOOR.
- LOCATE ALL CEILING AIR DEVICES IN ACCORDANCE WITH REFLECTED CEILING PLAN. COORDINATE LOCATIONS WITH OTHER TRADES. CONTRACTOR SHALL COORDINATE DIFFUSER FRAMES WITH REFLECTED CEILING PLAN TO DETERMINE TYPE OF FRAME REQUIRED, GYP-BOARD MOUNTING OR LAY-IN TYPE.
- RUN CONDENSATE LINES FROM EACH AIR HANDLING UNIT TO A TRAPPED SANITARY SEWER DRAIN. ALL CHANGES IN DIRECTION SHALL BE MADE WITH TEES HAVING THREADED PLUGS IN UNUSED OPENINGS TO FACILITATE CLEANING. DRAINS SHALL BE PVC PIPE WITH SOCKET WELD FITTINGS. SIZE AS SHOWN ON DRAWINGS. INSULATE DRAIN LINES WITH 3/8" THICK CLOSED CELL FOAM INSULATION. SEAL ALL JOINTS AND SEAMS WITH INSULATION ADHESIVE.
- INSTALL A MINIMUM 4" WIDE FLEXIBLE CONNECTION ON THE SUPPLY AND RETURN CONNECTION OF EACH AIR HANDLING UNIT. FLEXIBLE CONNECTION SHALL BE NEOPRENE IMPREGNATED GLASS FABRIC CLOSURE TO PREVENT AIR LEAKAGE. INSTALL GASKET AT CONNECTION TO AIR HANDLING UNIT OUTLET. INSULATE FLEXIBLE CONNECTOR.
- DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.
- SEAL ALL JOINTS AND SEAMS OF ALL DUCTWORK WITH RECTROSEAL "AIRLOCK" OR EQUAL DUCT SEALER.
- MAXIMUM ALLOWABLE LENGTH OF FLEXIBLE DUCT SHALL BE 3'-0". SUPPORT FLEXIBLE DUCT PROPERLY TO PREVENT REDUCTION OF CROSS-SECTIONAL AREA.
- VERIFY SIZE AND LOCATION OF ALL ROOF & WALL PENETRATIONS PRIOR TO INSTALLATION. COORDINATE LOCATION WITH OTHER TRADES.
- HVAC CONTRACTOR SHALL FURNISH AND INSTALL ALL CONTROL AND INTERLOCK WIRING. WIRING SHALL BE INSTALLED IN ACCORDANCE WITH DIV. 16. CONTROL WIRING RUN IN RETURN AIR SPACE SHALL BE PLENUM RATED WIRE.
- INSTALL REFRIGERANT LINES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. INSULATE REFRIGERANT SUCTION LINES WITH 1/2" CLOSED CELL FOAM INSULATION. SEAL ALL JOINTS AND SEAMS WITH INSULATION ADHESIVE. INSULATION EXPOSED TO OUTDOORS SHALL BE COVERED WITH ALUMINUM OR STAINLESS STEEL JACKET.
- WRAP ALL SUPPLY AND RETURN AIR DUCTS WITH 2" FOIL BACKED INSULATION.
- PROVIDE MANUAL OPPOSED BLADE DAMPER IN RETURN AND OUTSIDE AIR DUCT NEAR AHU.
- RUNOUTS TO CEILING DIFFUSERS SHALL BE CONNECTED TO RECTANGULAR DUCT WITH BELL MOUTH SPIN IN FITTING WITH ADJUSTABLE BUTTERFLY DAMPER. PROVIDE TURNING VANES AT EACH CHANGE IN SUPPLY DUCT DIRECTION.
- PROVIDE SEALANT, CAULKING, GASKETS, FLASHINGS AS NECESSARY TO PROVIDE A COMPLETELY WEATHERPROOF INSTALLATION.
- PROVIDE ELECTRONIC THERMOSTATS.
- PLACE 3/4" THICK VIBRATION PADS BETWEEN CONDENSING UNITS AND CONCRETE PADS.
- PAINT DUCTWORK VISIBLE BEHIND RETURN AIR GRILLS MATTE BLACK.

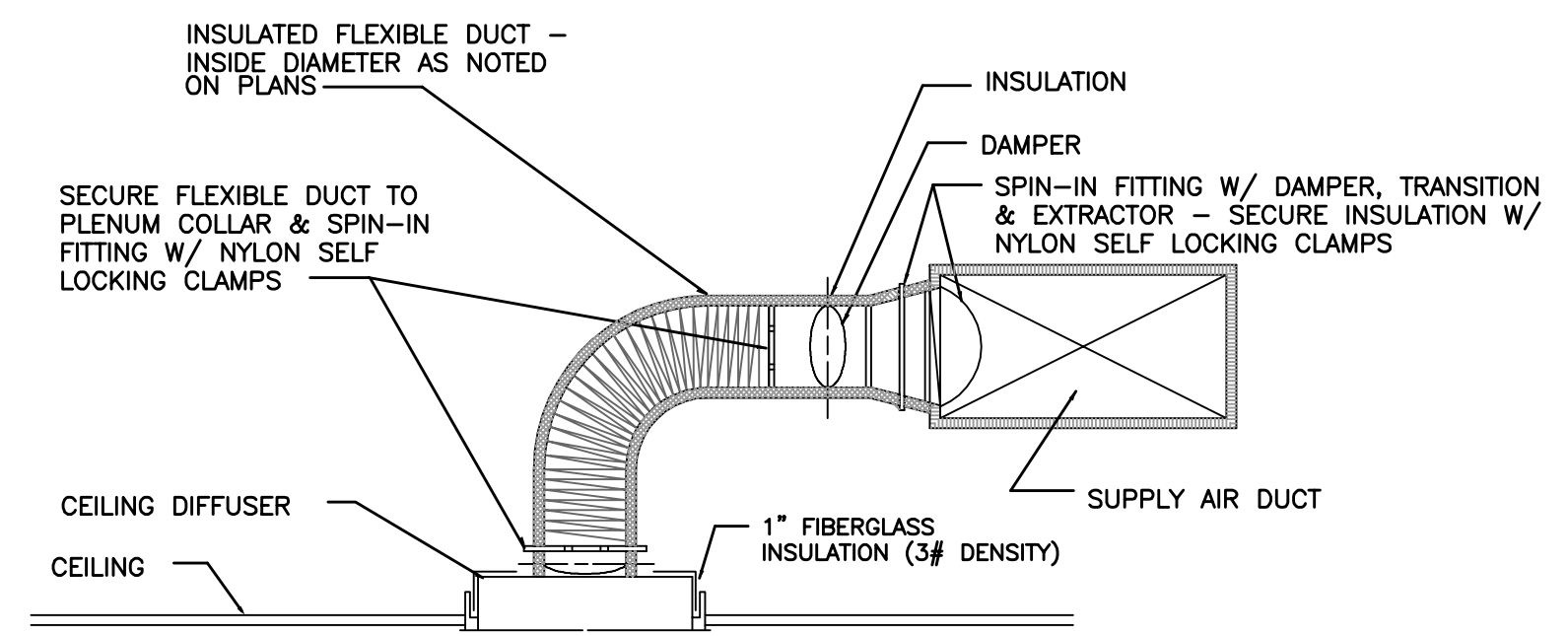
HVAC SYMBOLS



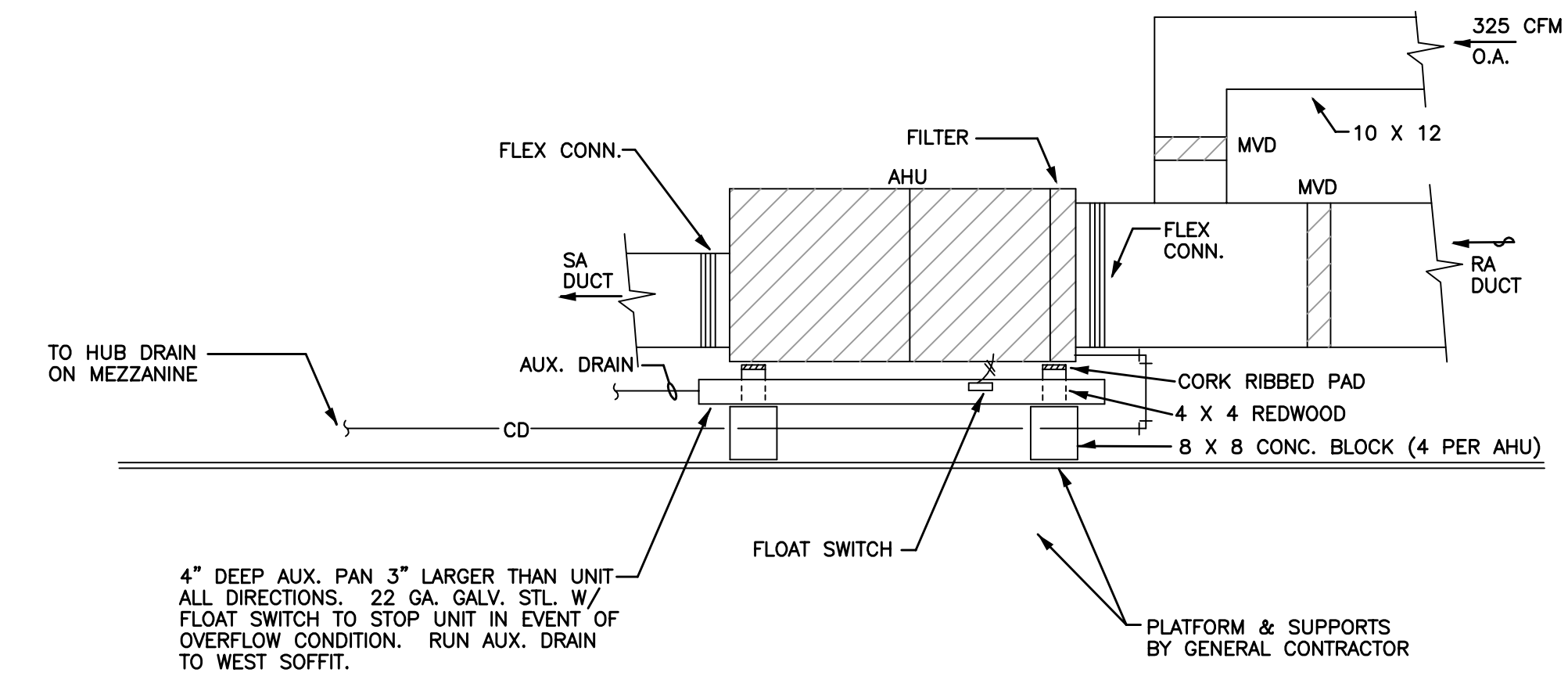
- HVAC PLAN KEYED NOTES
- APPROXIMATE LOCATION ABOVE CEILING.
 - RELOCATE EXISTING ACCU.
 - REMOVE EXISTING DIFFUSER. INSTALL NEW DIFFUSER WHERE SHOWN.
 - REMOVE EXISTING WINDOW UNIT AND RETURN TO OWNER.

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

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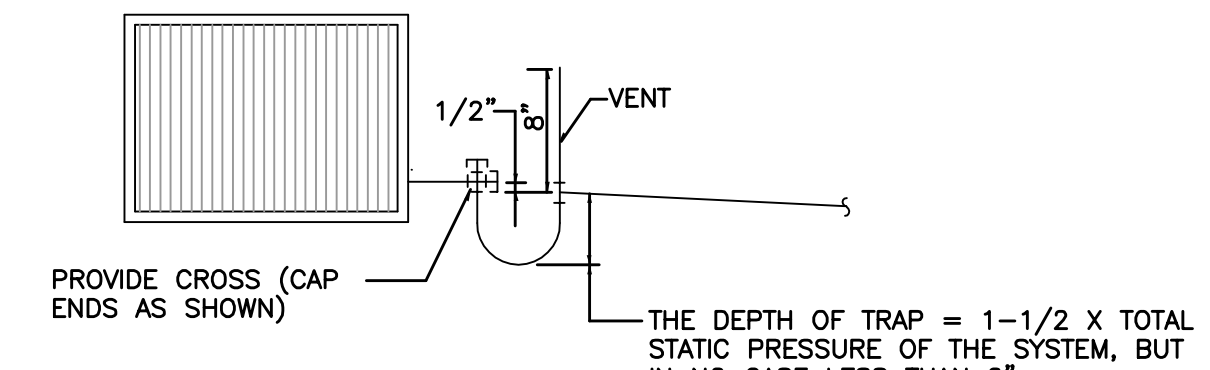
1 CEILING DIFFUSER CONNECTION DETAIL
 SCALE: N.T.S.



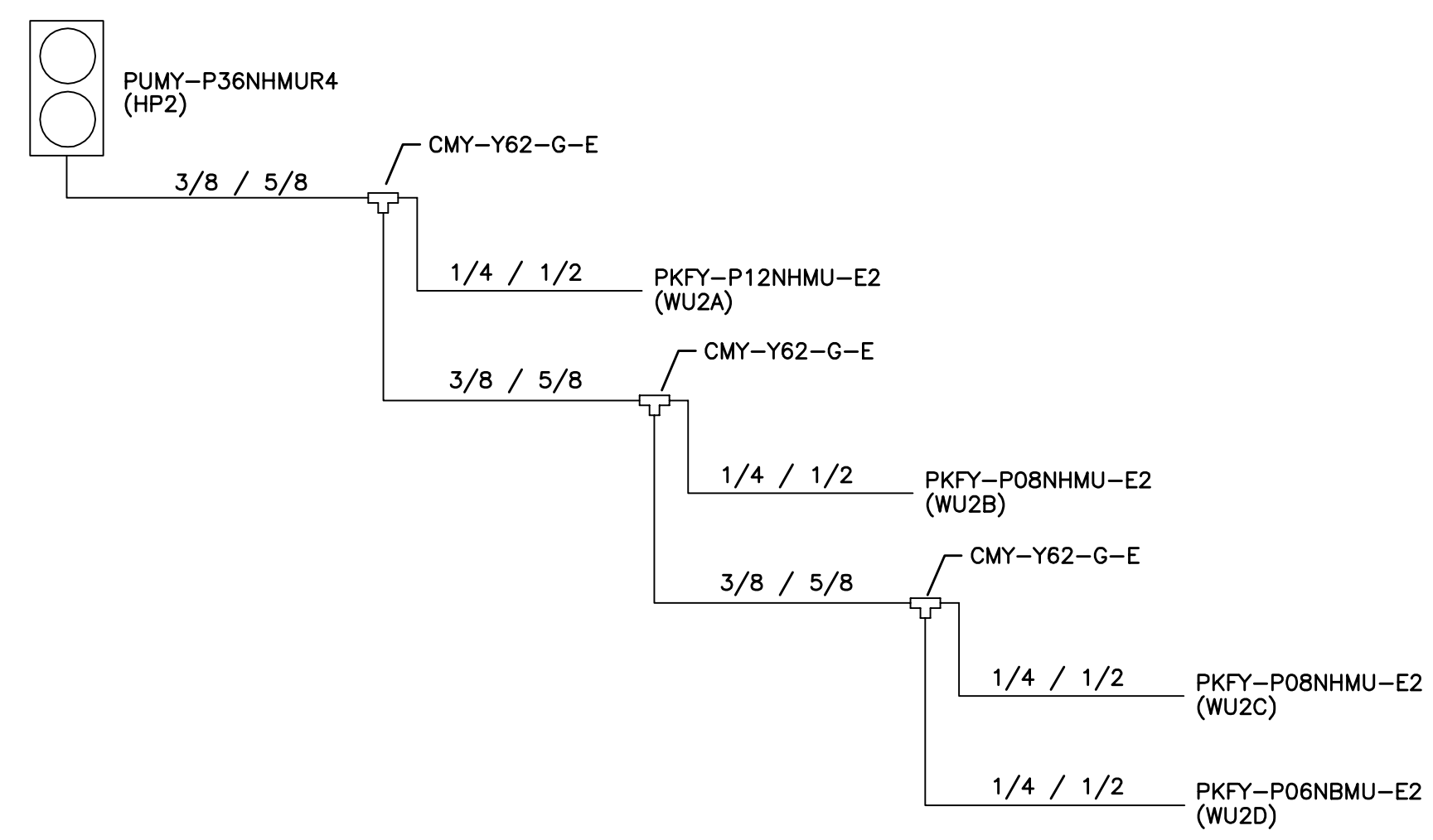
4 HORIZONTAL AHU DETAIL
 SCALE: N.T.S.

DIFFUSER, GRILL & INTAKE SCHEDULE

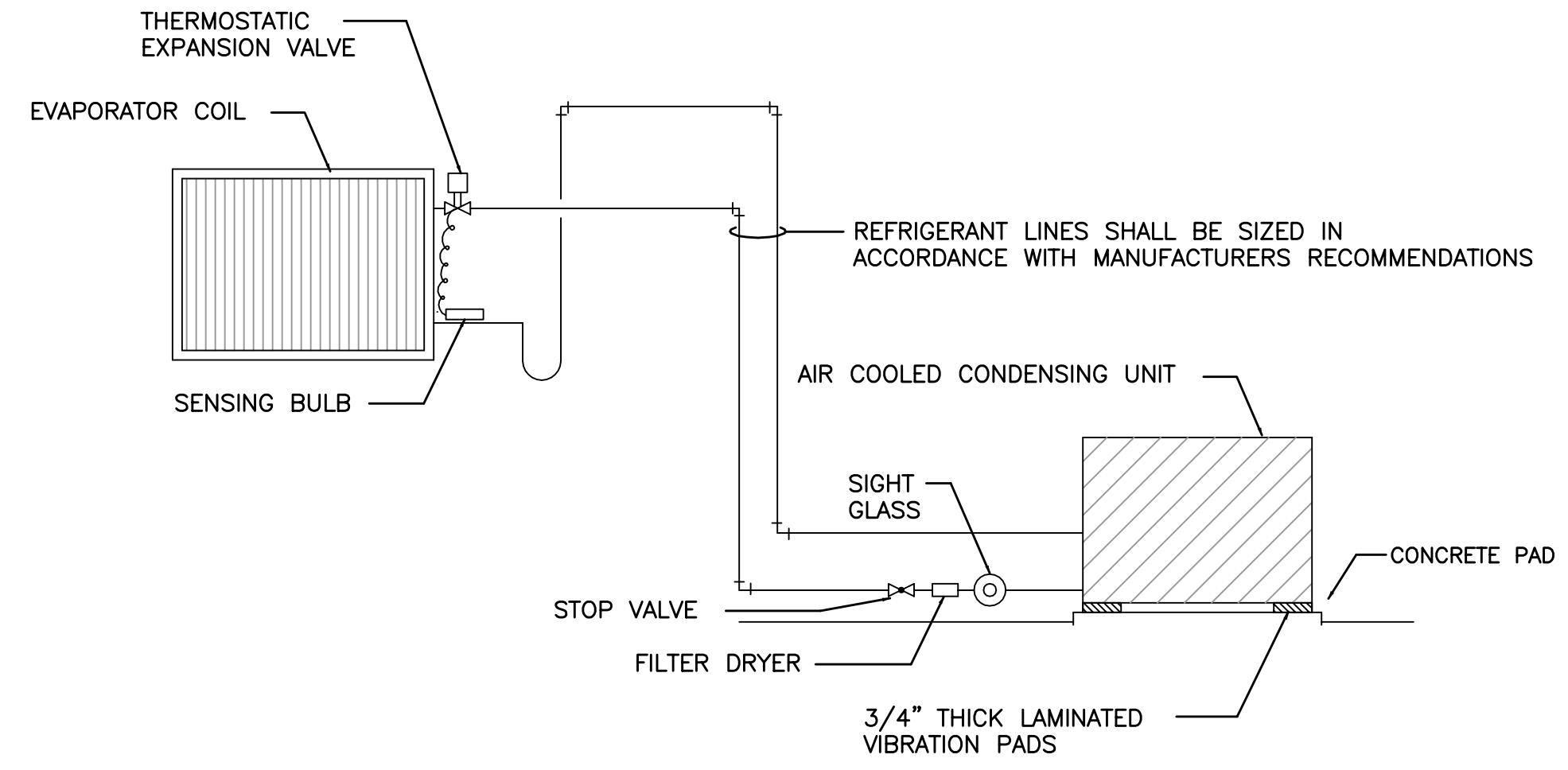
MARK	CFM RANGE	SUPPLY	RETURN	EXHAUST	TYPE	DUCT CONNECTION SIZE	PATTERN	REMARKS
A	50 - 150	●	●	●	CEILING DIFFUSER	6" DIA.	4-WAY	TITUS MODEL TDC BORDER #1 OR #3
B	151 - 300	●	●	●	CEILING DIFFUSER	8" DIA.	4-WAY	TITUS MODEL TDC BORDER #1 OR #3
C	301 - 450	●	●	●	CEILING DIFFUSER	10" DIA.	4-WAY	TITUS MODEL TDC BORDER #1 OR #3
AA	150 - 800	●	●	●	CEILING R/A GRILL	12 X 24	---	TITUS MODEL 50F BORDER #3
BB	801 - 1600	●	●	●	CEILING R/A GRILL	24 X 24	---	TITUS MODEL 50F BORDER #1 OR #3
CC	650	●	●	●	OUTSIDE AIR LOUVER	18 X 18	---	RUSKIN MODEL ELF375X W/ #8 INSECT SCREEN



2 CONDENSATE DRAIN DETAIL
 SCALE: N.T.S.



5 HP2 REFRIGERANT PIPING DIAGRAM
 SCALE: N.T.S.



3 REFRIGERANT PIPING SCHEMATIC
 SCALE: N.T.S.

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE

UNIT	TOTAL AIR, CFM	OUTSIDE AIR, CFM	S.P. H ₂ O	ELECTRICAL	COOLING			HEATING		MANUFACTURER/ MODEL	
					MIN. BTUH	SENS. BTUH	EER/ SEER	TYPE	OUTPUT BTUH		KW
ACU5	1,600	325	0.5	240/1/60	46,000	32,900	12.0	ELEC. STRIP	---	15	CARRIER 24ABB3483 CARRIER FX4DNF0490015
HP1	----	----	--	240/1/60	9,000	----	24.6	HEAT PUMP	10,900	---	MITSUBISHI MUZ-GLO9NA-U1
HP2	----	----	--	240/1/60	36,000	----	14.3	HEAT PUMP	40,000	---	MITSUBISHI PUMY-P36NHMUR4

- NOTES:
- CAPACITIES AT ARI CONDITIONS, 95 DEGREES FDB OUTDOOR & 67 DEGREES FWB, 80 DEGREES FDB INDOOR.
 - FURNISH UNIT ACU5 W/ THE FOLLOWING:
 - ELECTRONIC THERMOSTAT, TWO STAGE COOLING, TWO STAGE HEATING.
 - CRANKCASE HEATER.
 - PRE-COATED CONDENSER COILS.
 - CONDENSER COIL GRILL PACKAGE.
 - NOMINAL HEATING KW @ 240V.

WALL UNIT HEAT PUMP SCHEDULE

UNIT	TOTAL AIR, CFM	OUTSIDE AIR, CFM	S.P. H ₂ O	ELECTRICAL	COOLING		HEATING		MANUFACTURER/ MODEL
					MIN. BTUH	TOTAL BTUH	OUTPUT BTUH	KW	
WU1	250	----	--	240/1/60	9,000	10,900	---	---	MITSUBISHI MSZ-GLO9NA-U1
WU2A	413	----	--	240/1/60	12,000	13,500	---	---	MITSUBISHI PKFY-P12NHMU-E2
WU2B	413	----	--	240/1/60	8,000	9,000	---	---	MITSUBISHI PKFY-P08NHMU-E2
WU2C	413	----	--	240/1/60	8,000	9,000	---	---	MITSUBISHI PKFY-P08NHMU-E2
WU2D	208	----	--	240/1/60	6,000	6,700	---	---	MITSUBISHI PKFY-P06NHMU-E2

- NOTES:
- EACH WALL UNIT TO HAVE A WIRED REMOTE CONTROLLER.

FAN SCHEDULE

MARK	SERVICE	TYPE	CFM	SP H ₂ O	MOTOR WATTS OR HP	FAN RPM	CONTROL	REMARKS
EF1	EXHAUST	CENT.	88	0.125	50W	700	LIGHT SWITCH	GREENHECK SP-B90-QD
EF2	EXHAUST	CENT.	88	0.125	50W	700	LIGHT SWITCH	GREENHECK SP-B90-QD
EF3	EXHAUST	CENT.	88	0.125	50W	700	LIGHT SWITCH	GREENHECK SP-B90-QD
EF4	EXHAUST	CENT.	405	0.125	121W	1000	FAN SWITCH	GREENHECK SP-A410-QD

BIG ASS FAN - MODEL F-ES2-1201S34, 12 FT., DIAMETER, 240V., 1 PH. W/ WALL CONTROL.

CLIENT

SOUTH TEXAS VETERINARY CLINIC

SOUTH TEXAS VETERINARY CLINIC
 ADDITION
 BEEVILLE, TEXAS

ISSUE DATE
 03-23-2015
 DRAWING SCALE
 3/16" = 1'-0"
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PAGE TITLE
 HVAC SCHEDULES, NOTES
 AND DETAILS

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REVISIONS	

HVAC SPECIFICATIONS

- MOUNT ALL THERMOSTATS 48" ABOVE FINISH FLOOR.
 - LOCATE ALL CEILING AIR DEVICES IN ACCORDANCE WITH REFLECTED CEILING PLAN. COORDINATE LOCATIONS WITH OTHER TRADES. CONTRACTOR SHALL COORDINATE DIFFUSER FRAMES WITH REFLECTED CEILING PLAN TO DETERMINE TYPE OF FRAME REQUIRED, GYP-BOARD MOUNTING OR LAY-IN TYPE.
 - INSTALL A MINIMUM 4" WIDE FLEXIBLE CONNECTION ON THE SUPPLY AND RETURN CONNECTION OF EACH AIR HANDLING UNIT. FLEXIBLE CONNECTION SHALL BE NEOPRENE IMPREGNATED GLASS FABRIC CLOSURE TO PREVENT AIR LEAKAGE. INSTALL GASKET AT CONNECTION TO AIR HANDLING UNIT OUTLET. INSULATE FLEXIBLE CONNECTOR.
 - SEAL ALL JOINTS AND SEAMS OF ALL DUCTWORK WITH RECTROSEAL "AIRLOCK" OR EQUAL DUCT SEALER.
 - MAXIMUM ALLOWABLE LENGTH OF FLEXIBLE DUCT SHALL BE 3'-0". SUPPORT FLEXIBLE DUCT PROPERLY TO PREVENT REDUCTION OF CROSS-SECTIONAL AREA.
 - VERIFY SIZE AND LOCATION OF ALL ROOF & WALL PENETRATIONS PRIOR TO INSTALLATION. COORDINATE LOCATION WITH OTHER TRADES.
 - INSTALL A DUCT DETECTOR IN THE RETURN AIR OF AIR HANDLING UNITS AHU2 THRU AHU6 AHEAD OF THE OUTSIDE AIR DUCT CONNECTION TO SHUT DOWN THE UNIT IN THE EVENT OF DETECTION OF SMOKE. DUCT DETECTORS ARE FURNISHED BY DIV. 16 AND WILL BE INSTALLED BY DIV. 15.
 - HVAC CONTRACTOR SHALL FURNISH AND INSTALL ALL CONTROL AND INTERLOCK WIRING. WIRING SHALL BE INSTALLED IN ACCORDANCE WITH DIV. 16.
 - OUTSIDE AIR INTAKES FOR AIR HANDLING UNITS SHALL HAVE MANUAL VOLUME DAMPERS.
 - RUNOUTS TO CEILING DIFFUSERS SHALL BE CONNECTED TO RECTANGULAR DUCT WITH BELL MOUTH SPIN IN FITTING WITH ADJUSTABLE BUTTERFLY DAMPER.
 - PROVIDE SEALANT, CAULKING, GASKETS, FLASHINGS AS NECESSARY TO PROVIDE A COMPLETELY WEATHERPROOF INSTALLATION.
 - PROPOSED PRODUCTS LIST: INCLUDE ALL PRODUCTS SPECIFIED.
 - SUBMIT SHOP DRAWINGS AND PRODUCT DATA GROUPED TO INCLUDE COMPLETE SUBMITTALS OF RELATED SYSTEMS, PRODUCTS, AND ALL ACCESSORIES IN A SINGLE SUBMITTAL.
 - CONFORM TO INTERNATIONAL BUILDING CODE.
 - CONFORM TO INTERNATIONAL ENERGY CODE.
 - OBTAIN PERMITS, AND REQUEST INSPECTIONS FROM AUTHORITIES HAVING JURISDICTION.
 - AS-BUILT DRAWINGS. PREPARE AS-BUILT PRINTS SHOWING ALL CHANGES IN THE WORK.
- DUCTWORK INSULATION
- APPLICATOR: COMPANY SPECIALIZING IN DUCTWORK INSULATION APPLICATION WITH THREE YEARS MINIMUM EXPERIENCE.
 - MATERIALS: UL LISTED; FLAME SPREAD/FUEL CONTRIBUTED/SMOKE DEVELOPED RATING IN ACCORDANCE WITH ASTM E84, NFPA 255, UL 723.
 - SUBMITTALS: INCLUDE PRODUCT DESCRIPTION, LIST OF MATERIALS AND THICKNESS FOR EACH SERVICE, AND LOCATIONS.
 - OWEN-CORNING
 - MANVILLE
 - KNAUF
 - TYPE A: FLEXIBLE GLASS FIBER; ANSI/ASTM C612; COMMERCIAL GRADE; "K" VALUE OF 0.29 AT 75 DEGREES F; 0.002 INCH FOIL SCRIM FACING FOR AIR CONDITIONING DUCTS.
 - ADHESIVES: WATERPROOF FIRE-RETARDANT TYPE.
 - IMPALE ANCHORS: GALVANIZED STEEL, 12 GAGE, SELF-ADHESIVE PAD.
 - JOINT TAPE: GLASS FIBER CLOTH, OPEN MESH.
 - INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - PROVIDE INSULATION WITH VAPOR BARRIER WHEN AIR CONVEYED MAY BE BELOW AMBIENT TEMPERATURE.
 - EXTERIOR INSULATION (TYPE A) APPLICATION:
 - SECURE INSULATION WITH VAPOR BARRIER WITH WIRES AND SEAL JACKET JOINTS WITH VAPOR BARRIER ADHESIVE OR TAPE TO MATCH EXISTING JACKET.
 - INSTALL WITHOUT SAG ON UNDERSIDE OF DUCTWORK. USE ADHESIVE OR MECHANICAL FASTENERS WHERE NECESSARY TO PREVENT SAGGING. SEAL VAPOR BARRIER PENETRATIONS BY MECHANICAL FASTENERS WITH VAPOR BARRIER ADHESIVE. STOP AND POINT INSULATION AROUND ACCESS DOORS AND DAMPER OPERATORS TO ALLOW OPERATION WITHOUT DISTURBING WRAPPING.
 - CONTINUE INSULATION WITH VAPOR BARRIER THROUGH PENETRATIONS.
 - SCHEDULE

- DUCTWORK
- DUCT SIZES: INSIDE CLEAR DIMENSIONS.
 - LOW PRESSURE: THREE PRESSURE CLASSIFICATIONS: 1/2 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE AND VELOCITIES LESS THAN 2,000 FPM; 1 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE AND VELOCITIES LESS THAN 2,500 FPM AND 2 INCH WG POSITIVE OR NEGATIVE STATIC PRESSURE AND VELOCITIES LESS THAN 2,500 FPM.
 - REGULATORY REQUIREMENTS: CONSTRUCT DUCTWORK TO NFPA 90B, AND NFPA 96 STANDARDS.
 - GENERAL: NON-COMBUSTIBLE OR CONFORMING TO REQUIREMENTS FOR CLASS 1 AIR DUCT MATERIALS, OR UL 181.
 - STEEL DUCTS: ASTM A525 GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY, HAVING ZINC COATING OF 1.25 OZ. PER SQ. FT. FOR EACH SIDE IN CONFORMANCE WITH ASTM A90.
 - INSULATED FLEXIBLE DUCTS: FLEXIBLE DUCT WRAPPED WITH FLEXIBLE GLASS FIBER WITH ALUMINUM FOIL, GLASS SCRIM AND KRAFT OR PLASTIC JACKET VAPOR BARRIER; MAX. 0.23 K VALUE AT 75 DEGREES F.
 - FASTENERS: RIVETS, BOLTS, OR SHEET METAL SCREWS.
 - SEALANT: NON-HARDENING, WATER RESISTANT, FIRE RESISTIVE, COMPATIBLE WITH MATING MATERIALS; LIQUID USED ALONE OR WITH TAPE, HEAVY MASTIC.
 - HANGER ROD: GALVANIZED; THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUSLY THREADED, OR 20 GA. X 1" GALVANIZED STRAP.
 - FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS AND ASHRAE HANDBOOKS, EXCEPT AS INDICATED. PROVIDE DUCT MATERIAL, GAGES, REINFORCING, AND SEALING FOR OPERATING PRESSURE INDICATED.
 - SIZE ROUND DUCTS INSTALLED IN PLACE OF RECTANGULAR DUCTS IN ACCORDANCE WITH ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY WRITTEN PERMISSION.
 - CONSTRUCT T'S, BENDS, AND ELBOWS WITH RADIUS OF NOT LESS THAN 1-1/2 TIMES WIDTH OF DUCT ON CENTERLINE. WHERE NOT POSSIBLE AND WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE SINGLE THICKNESS TURNING VANES WITH TRAILING EDGES.
 - INCREASE DUCT SIZES GRADUALLY. NOT EXCEEDING 15 DEGREES DIVERGENCE WHEREVER POSSIBLE. DIVERGENCE UPSTREAM OF EQUIPMENT SHALL NOT EXCEED 30 DEGREES; CONVERGENCE DOWN-STREAM SHALL NOT EXCEED 45 DEGREES.
 - PROVIDE FLEXIBLE CONNECTIONS AT INLET AND OUTLET TO ALL AIR MOVING EQUIPMENT.
 - LOCATE DUCTS WITH SUFFICIENT SPACE AROUND EQUIPMENT TO ALLOW NORMAL OPERATING AND MAINTENANCE ACTIVITIES.
 - CONNECT DIFFUSERS TO LOW PRESSURE DUCTS WITH 3 FEET MAX. LENGTH OF FLEXIBLE DUCT.
 - DURING CONSTRUCTION PROVIDE TEMPORARY CLOSURES OF METAL OR TAPED POLYETHYLENE ON OPEN DUCTWORK TO PREVENT CONSTRUCTION DUCT FROM ENTERING DUCTWORK SYSTEM.
 - | <u>AIR SYSTEM</u> | <u>MATERIAL</u> |
|--|-----------------|
| LOW PRESSURE SUPPLY & RETURN | STEEL |
| <ol style="list-style-type: none"> CLEAN DUCT SYSTEM AND FORCE AIR AT HIGH VELOCITY THROUGH DUCT TO REMOVE ACCUMULATED DUST. TO OBTAIN SUFFICIENT AIR, CLEAN HALF THE SYSTEM AT A TIME. PROTECT EQUIPMENT WHICH MAY BE HARMED BY EXCESSIVE DIRT WITH TEMPORARY FILTERS, OR BY-PASS DURING CLEANING. CLEAN DUCT SYSTEMS WITH HIGH POWER VACUUM MACHINES. PROTECT EQUIPMENT WHICH MAY BE HARMED BY EXCESSIVE DIRT WITH FILTERS, OR BY-PASS DURING CLEANING. PROVIDE ADEQUATE ACCESS INTO DUCTWORK FOR CLEANING PURPOSES. | |
 - FABRICATE IN ACCORDANCE WITH SMACNA HVAC METAL DUCT STANDARDS, AND AS INDICATED.
 - FABRICATE SPLITTER DAMPERS OF MATERIAL SAME GAGE AS DUCT TO 24 INCHES SIZE IN EITHER DIRECTION, AND TWO GAGES HEAVIER FOR SIZES OVER 24 INCHES.
 - GRAVITY BACKDRAFT DAMPERS, SIZE 18 X 18 INCHES OR SMALLER, FURNISHED WITH AIR MOVING EQUIPMENT, MAY BE AIR MOVING EQUIPMENT MANUFACTURERS STANDARD CONSTRUCTION.
 - MULTI-BLADE DEVICE WITH RADIUS BLADES ATTACHED TO PIVOTING FRAME AND BRACKET, STEEL CONSTRUCTION, WITH PUSH-PULL OPERATOR STRAP.
 - ACCEPTABLE MANUFACTURERS - FLEXIBLE DUCT CONNECTIONS
 - VENT FABRICS
 - DURO DYNE
 - SUBSTITUTIONS: UNDER PROVISIONS OF DIVISION 1.

- FABRICATE IN ACCORDANCE WITH SMACNA HVAC METAL DUCT CONSTRUCTION STANDARDS, AND AS INDICATED.
- INSTALL ACCESSORIES IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
 - PROVIDE BALANCING DAMPERS AT POINTS ON LOW PRESSURE SUPPLY, RETURN, AND EXHAUST SYSTEMS WHERE BRANCHES ARE TAKEN FROM LARGER DUCTS AS REQUIRED FOR AIR BALANCING. USE SPLITTER DAMPERS ONLY WHERE INDICATED.
 - PROVIDE FLEXIBLE CONNECTIONS IMMEDIATELY ADJACENT TO EQUIPMENT IN DUCTS ASSOCIATED WITH FANS AND MOTORIZED EQUIPMENT.
- ACCEPTABLE MANUFACTURERS - CEILING DIFFUSERS/REGISTERS/GRILLES
 - RUSKIN
 - ANEMOSTAT
 - CARNES
 - TITUS
- INSTALL ITEMS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - CHECK LOCATION OF OUTLETS AND INLETS AND MAKE NECESSARY ADJUSTMENTS IN POSITION TO CONFORM WITH ARCHITECTURAL FEATURES, SYMMETRY, AND LIGHTING ARRANGEMENT.
 - INSTALL DIFFUSERS TO DUCTWORK WITH AIR TIGHT CONNECTION.
 - PROVIDE BALANCING DAMPERS ON DUCT TAKE-OFF TO DIFFUSERS, AND GRILLES AND REGISTERS, REGARDLESS OF WHETHER DAMPERS ARE SPECIFIED AS PART OF THE DIFFUSER, OR GRILLE OR REGISTER ASSEMBLY.
- TESTING, ADJUSTING AND BALANCING
- SECTION INCLUDES TESTING, ADJUSTMENT AND BALANCING OF AIR SYSTEMS BY CONTRACTOR.
- REFERENCES
 - ASHRAE - 2004 APPLICATIONS HANDBOOK; CHAPTER 37, TESTING ADJUSTING AND BALANCING.
 - NEBB - PROCEDURAL STANDARDS FOR TESTING, BALANCING AND ADJUSTING OF ENVIRONMENTAL SYSTEMS.
- REPORT FORMS: SUBMIT REPORTS ON NEBB FORMS.
- QUALITY ASSURANCE: TOTAL SYSTEM BALANCE SHALL BE PERFORMED IN ACCORDANCE WITH NEBB PROCEDURAL STANDARDS FOR TESTING, BALANCING AND ADJUSTING OF ENVIRONMENTAL SYSTEMS.
- INSTALLATION TOLERANCES: ADJUST AIR HANDLING SYSTEMS TO PLUS OR MINUS 5 PERCENT FOR SUPPLY SYSTEMS AND PLUS OR MINUS 10 PERCENT FOR RETURN AND EXHAUST SYSTEMS FROM FIGURES INDICATED.
- ADJUSTING
 - ADJUST WORK TO PROVIDE REQUIRED QUANTITIES.
 - RECORDED DATA SHALL REPRESENT ACTUALLY MEASURED, OR OBSERVED CONDITION.
 - PERMANENTLY MARK SETTINGS OF DAMPERS, AND OTHER ADJUSTMENT DEVICES ALLOWING SETTINGS TO BE RESTORED. SET AND LOCK MEMORY STOPS.
 - AFTER ADJUSTMENT, TAKE MEASUREMENTS TO VERIFY BALANCE HAS NOT BEEN DISRUPTED OR THAT SUCH DISRUPTION HAS BEEN RECTIFIED.
 - LEAVE SYSTEMS IN PROPER WORKING ORDER, REPLACING BELT GUARDS, CLOSING ACCESS DOORS, CLOSING DOORS TO ELECTRICAL SWITCH BOXES, AND RESTORING THERMOSTATS TO SPECIFIED SETTINGS, AS PROVIDED BY OWNER.
- AIR SYSTEM PROCEDURE
 - ADJUST AIR HANDLING AND DISTRIBUTION SYSTEMS TO PROVIDE REQUIRED OR DESIGN SUPPLY, RETURN, AND EXHAUST AIR QUANTITIES.
 - MAKE AIR QUANTITY MEASUREMENTS IN DUCTS BY PITOT TUBE TRAVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT.
 - MEASURE AIR QUANTITIES AT AIR INLETS AND OUTLETS.
 - ADJUST DISTRIBUTION SYSTEM TO OBTAIN UNIFORM SPACE TEMPERATURE FREE FROM OBJECTIONABLE DRAFTS AND NOISE.
 - USE VOLUME CONTROL DEVICES TO REGULATE AIR QUANTITIES ONLY TO EXTENT THAT ADJUSTMENTS DO NOT CREATE OBJECTIONABLE AIR MOTION OR SOUND LEVELS. EFFECT VOLUME CONTROL BY DUCT INTERNAL DEVICES SUCH AS DAMPERS AND SPLITTERS.
 - VARY TOTAL SYSTEM SCHEMATIC WITH REQUIRED AND ACTUAL AIR QUANTITIES RECORDED AT EACH OUTLET AND INLET.
 - PROVIDE SYSTEM SCHEMATIC WITH REQUIRED AND ACTUAL AIR QUANTITIES RECORDED AT EACH OUTLET AND INLET.
 - MEASURE STATIC AIR PRESSURE CONDITIONS ON AIR SUPPLY UNITS, INCLUDING FILTER AND COIL PRESSURE DROPS, AND TOTAL PRESSURE ACROSS THE FAN. MAKE ALLOWANCES FOR 50 PERCENT LOADING OF FILTERS.
 - ADJUST OUTSIDE AIR AUTOMATIC DAMPERS, OUTSIDE AIR, RETURN AIR, AND EXHAUST DAMPERS FOR DESIGN CONDITIONS.

- MEASURE TEMPERATURE CONDITIONS ACROSS OUTSIDE AIR, RETURN AIR AND EXHAUST DAMPER TO CHECK LEAKAGE.
 - WHERE MODULATING DAMPERS ARE PROVIDED, TAKE MEASUREMENTS AND BALANCE AT EXTREME CONDITIONS, BALANCE VARIABLE VOLUME SYSTEMS AT MAX. AIR FLOW RATE, AND AT MIN. AIR FLOW RATE.
 - MEASURE BUILDING STATIC PRESSURE AND ADJUST SUPPLY, RETURN, AND EXHAUST AIR SYSTEMS TO PROVIDE REQUIRED RELATIONSHIP BETWEEN EACH TO MAINTAIN
43. SCHEDULE
- | | | |
|------------------------------------|-----|-------------|
| SPLIT SYSTEM HEATING/COOLING UNITS | YES | AIR BALANCE |
| AIR INLETS AND OUTLETS | YES | |
| OUTSIDE AIR | YES | |
- END

DUCTWORK	TYPE	INSULATION THICKNESS
SUPPLY DUCTS	A	2"
RETURN DUCTS	A	2"



CLIENT
 SOUTH TEXAS VETERINARY CLINIC
 VETERINARY CLINIC

SOUTH TEXAS VETERINARY CLINIC
 ADDITION
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 HVAC SPECIFICATIONS

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REVISIONS

DESIGN-BUILD CONTRACTOR
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 ENGINEERS ARCHITECTS
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 PLUMBING PLAN

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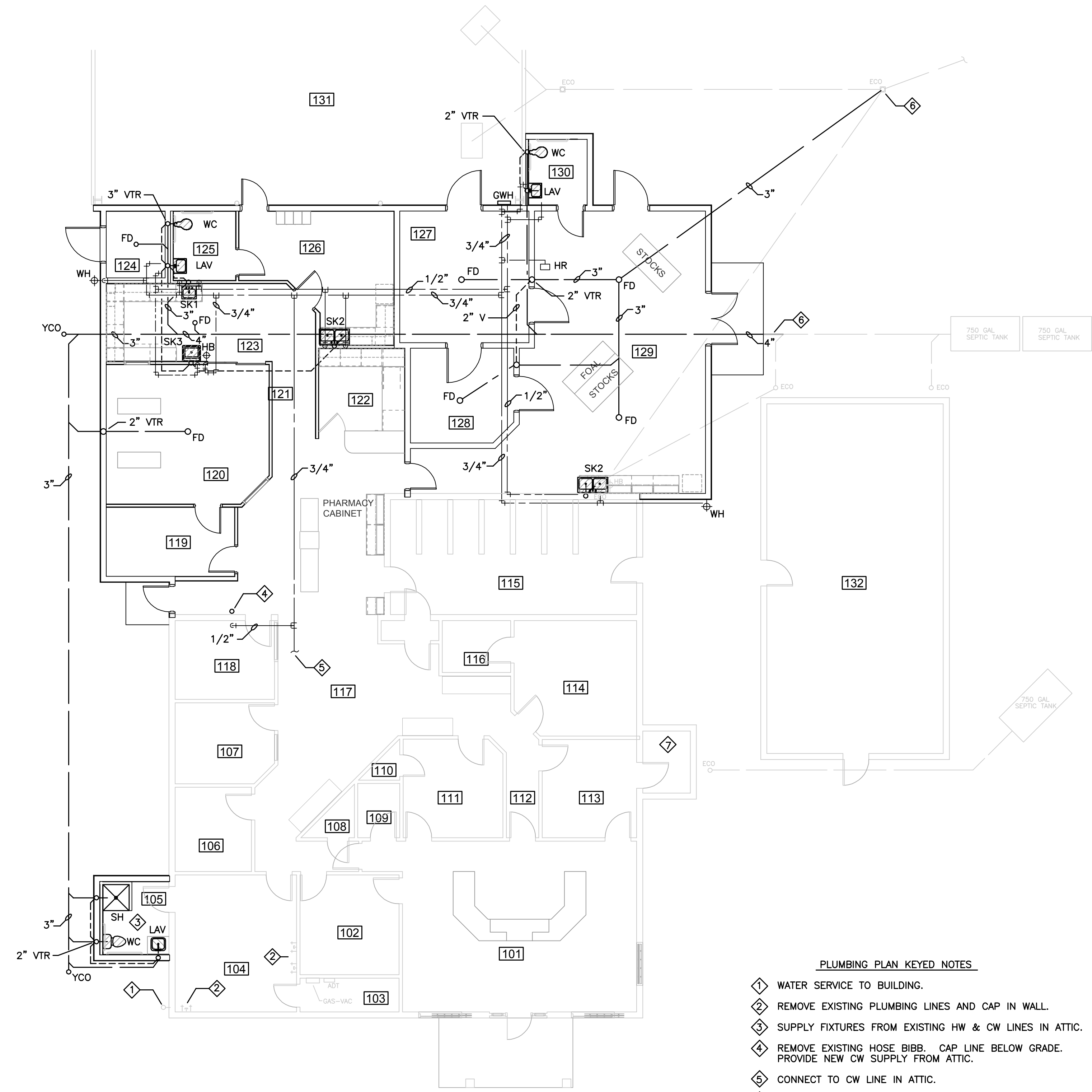
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PLUMBING SPECIFICATIONS

1. ALL WORK TO BE DONE IN STRICT ACCORDANCE WITH THE FOLLOWING CODES:
 CITY OF VICTORIA PLUMBING CODE
 INTERNATIONAL PLUMBING CODE
 INTERNATIONAL FUEL GAS CODE
2. DETERMINE ELEVATION OF WATER LINES AND VENTS WITH REGARD TO AIR CONDITIONING EQUIPMENT AND DUCTWORK. COORDINATE WITH OTHER TRADES.
3. SANITARY SEWER LINES SHALL HAVE A MINIMUM FALL OF 1/8" PER FOOT.
4. INSTALL FULL-SIZED 18" AIR CHAMBER AT EACH WATER CONNECTION.
5. MAINTAIN MINIMUM 10' CLEARANCE BETWEEN ALL PLUMBING VENT TERMINATIONS AND OUTSIDE AIR INTAKES OF AIR HANDLING UNITS.
6. CONNECT ALL VENT LINES ABOVE CEILINGS TO VENTS THRU ROOF AS SHOWN.
7. INSULATE HOT AND COLD WATER PIPING AND P-TRAPS BELOW LAVATORIES AND SINKS (WHERE EXPOSED).
8. SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING
 - A. CAST IRON PIPE: ASTM A74 SERVICE WEIGHT. FITTINGS: CAST IRON. JOINTS: HUB-AND-SPIGOT, CISPI HSN COMPRESSION TYPE WITH ASTM C564 NEOPRENE GASKETS OR LEAD AND OAKUM.
 - B. PVC PIPE: SCHEDULE 40 PVC-DWV, ASTM 2665-78. FITTINGS: PVC. JOINTS: SOLVENT WELD.
9. SANITARY SEWER PIPING, ABOVE GRADE
 - A. CAST IRON PIPE: ASTM A74, SERVICE WEIGHT. FITTINGS: CAST IRON. JOINTS: HUB-AND-SPIGOT, CISPI HSN COMPRESSION TYPE WITH ASTM C564 NEOPRENE GASKETS OR LEAD AND OAKUM.
 - B. CAST IRON PIPE: CISPI 301, HUBLESS, SERVICE WEIGHT. FITTINGS: CAST IRON. JOINTS: NEOPRENE GASKETS AND STAINLESS STEEL CLAMP-AND-SHIELD ASSEMBLIES.
 - C. COPPER PIPE: ASTM B306, DWV. FITTINGS: ANSI-ASME B16.3, CAST BRONZE, OR ANSI/ASME B16.29, WROUGHT COPPER. JOINTS: ANSI-ASTM
 - D. PVC PIPE: SCHEDULE 40 PVC-DWV, WITH SOLVENT WELD JOINTS.
10. WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING
 - A. COPPER TUBING: ASTM B88, TYPE L, HARD DRAWN. FITTINGS: ANSI/ASME B16.29, WROUGHT COPPER. JOINTS: ANSI/ASTM B32, SOLDER, GRADE 95TA OR AWS A5.8, BCUP SILVER BRAZE.
11. WATER PIPING, ABOVE GRADE
 - A. COPPER TUBING: ASTM B88, TYPE L OR K, HARD DRAWN. FITTINGS: ANSI/ASME B16.23, CAST BRASS, OR ANSI/ASME B16.29, WROUGHT COPPER. JOINTS: ANSI/ASTM B32, SOLDER, GRADE 95TA.
12. PROPANE GAS PIPING, BURIED BEYOND 5 FEET OF BUILDING
 - A. STEEL PIPE: ASTM A53 OR A120, SCHEDULE 40 BLACK. FITTINGS: ASTM A234, FORGED STEEL WELDED TYPE, WITH ANSI/AWWA C105 POLYETHYLENE JACKET OR DOUBLE LAYER, HALF-LAPPED 10 MIL POLYETHYLENE TAPE. JOINTS: ANSI/AWS D1.1, WELDED.
13. PROPANE GAS PIPING, BURIED WITHIN 5 FEET OF BUILDING
 - A. STEEL PIPE: ASTM A53 OR A120, SCHEDULE 40 BLACK. FITTINGS: ASTM A234, FORGED STEEL WELDED TYPE, WITH ANSI/AWWA C105 POLYETHYLENE JACKET OR DOUBLE LAYER, HALF-LAPPED 10 MIL POLYETHYLENE TAPE. JOINTS: ANSI/AWS D1.1, WELDED.
14. PROPANE GAS PIPING, ABOVE GRADE
 - A. STEEL PIPE: ASTM A53 OR A120, SCHEDULE 40 BLACK. FITTINGS: ASTM B16.3, MALLEABLE IRON. JOINTS: SCREWED FOR PIPE TWO INCHES AND UNDER.
15. OXYGEN PIPING
 - A. COPPER TUBING: ASTM B88, TYPE L, HARD DRAWN. FITTINGS: ANSI/ASME B16.29, WROUGHT COPPER. JOINTS: ANSI/ASTM B32, SOLDER, GRADE 95TA OR AWS A5.8, BCUP SILVER BRAZE.
16. WASTE GAS PIPING (VACUUM)
 - A. PVC PIPE: SCHEDULE 40 PVC-DWV, WITH SOLVENT WELD JOINTS.
17. BALL VALVES
 - A. UP TO 2 INCHES: BRONZE BODY, STAINLESS STEEL BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE, THREADED ENDS.
 - B. OVER 2 INCHES: CAST STEEL BODY, CHROME PLATED STEEL BALL, TEFLON SEAT AND STUFFING BOX SEALS, LEVER HANDLE, FLANGED.
18. ALL HOT AND COLD WATER LINES TO BE RUN ABOVE FIRST FLOOR CEILING AND TO BE INSULATED AS FOLLOWS:
 - A. HOT WATER. GLASS FIBER INSULATION, 1" THICK, ANSI/ASTM C547, 'K' VALUE OF 0.24 AT 75 DEGREES F WITH CANVAS JACKET.
 - B. COLD WATER. CLOSED CELL PLASTIC INSULATION, 1/2" THICK, RUBATEX OR EQUAL.
19. PROVIDE 6" LONG SUPPORT SHIELDS BETWEEN INSULATION AND PIPING HANGERS. HANGERS TO BE SPACED AT 6" O.C. MAXIMUM.
20. FLASH VENT PIPES PROJECTING 3 INCHES MINIMUM ABOVE FINISHED ROOF SURFACE WITH LEAD WORKED ONE INCH MINIMUM INTO HUB, 8 INCHES MINIMUM CLEAR ON SIDES WITH 24 X 24 INCHES SHEET SIZE. FOR PIPES THROUGH OUTSIDE WALLS, TURN FLANGES BACK INTO WALL AND CAULK, METAL COUNTERFLASH AND SEAL.
21. ALL DRYERS TO HAVE TYPE B FLUE WITH BREIDERT CAP.

PLUMBING SYMBOLS

—	SANITARY SEWER
- - -	VENT LINE
—	DOMESTIC COLD WATER
—	DOMESTIC HOT WATER
P	PROPANE
O	OXYGEN
V	VACUUM
—o—HD	HUB DRAIN
—o—FD	FLOOR DRAIN (TRAPPED)
—o—	KENNEL DRAIN (NO TRAP)
o	VENT THRU ROOF
□	YARD CLEANOUT
○	FLOOR CLEANOUT
— —	BALL VALVE
— —	GATE VALVE
— —	GAS COCK



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

- PLUMBING PLAN KEYED NOTES
- ① WATER SERVICE TO BUILDING.
 - ② REMOVE EXISTING PLUMBING LINES AND CAP IN WALL.
 - ③ SUPPLY FIXTURES FROM EXISTING HW & CW LINES IN ATTIC.
 - ④ REMOVE EXISTING HOSE BIBB. CAP LINE BELOW GRADE. PROVIDE NEW CW SUPPLY FROM ATTIC.
 - ⑤ CONNECT TO CW LINE IN ATTIC.
 - ⑥ CONNECT TO EXISTING SAN. SEWER.
 - ⑦ REMOVE EXISTING FIXTURES AND CAP ALL WATER AND SEWER LINES.

REVISIONS

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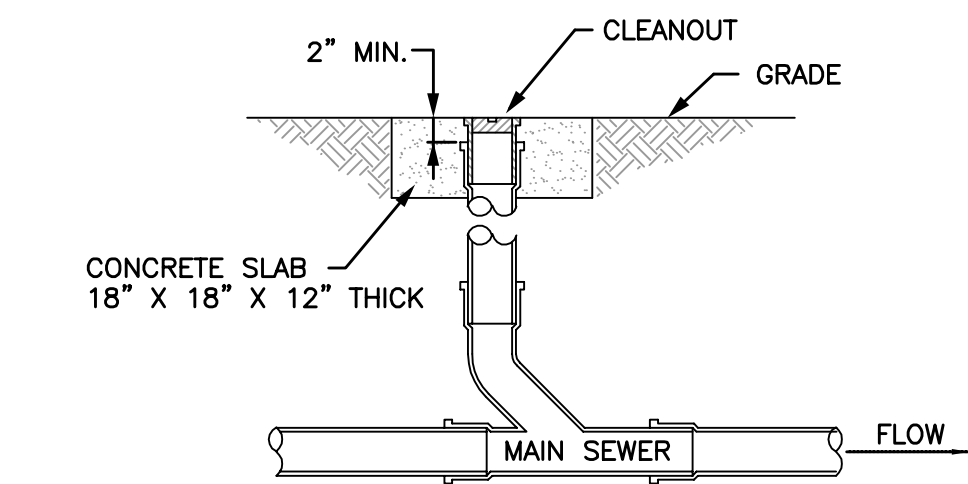
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PLUMBING FIXTURE SCHEDULE				
FIXTURE	MANUFACTURER	TYPE/MODEL NUMBER	TRIM	REMARKS
WATER CLOSET (WC)	AMERICAN STANDARD	CADET 16-1/2" H 2998.012	SEAT-CHURCH 295	
LAVATORY (LAV)	AMERICAN STANDARD	LUCERNE 0355.012	MONTERREY 5502.170.002	ZURN CARRIER Z-1231 MOUNT RIM @ 34"
SINK (SK1)	ELKAY	PSR1517-3 20 GA.	FAUCET LK-230-BH-5	
SINK (SK2)	ELKAY	PSR2522-3 20 GA.	FAUCET LK-230-BH-5	
SINK (SK3)	VSSI	SCRUB SINK 106-1133-14	INFRARED FAUCET THERMOSTATIC MIXING VALVE	
SHOWER (SH)	---	---	AMERICAN STANDARD 1480.501 CONTROL W/ HEAD	
GAS WATER HEATER (GWH)	NORITZ	N-084	HEAT-FAB SAFTVENT EZ SEAL & GAS REGULATOR	PROPANE
HOSE REEL (HR)	REELCRAFT	MODEL FD9375 OLPBW W/ 75' 3/4" DIA. HOSE	H.B. SHERMAN MODEL 181-C TRIGGER NOZZLE	MOUNT REEL HIGH AS POSSIBLE ON WALL
HOSE BIBB (HB)	WOODFORD	MODEL NO. 24		
WALL HYDRANT (WH)	WOODFORD	MODEL NO. 14	---	FREEZELE
FLOOR DRAIN (FD)	JOSAM	5A-3	NIKALOY STRAINER	
FLOOR CLEANOUT (FCO)	JOSAM	SERIES 58360	S.F. NIKALOY TOP	
YARD CLEANOUT (YCO)	JOSAM	SERIES 56040	C.I. TOP	

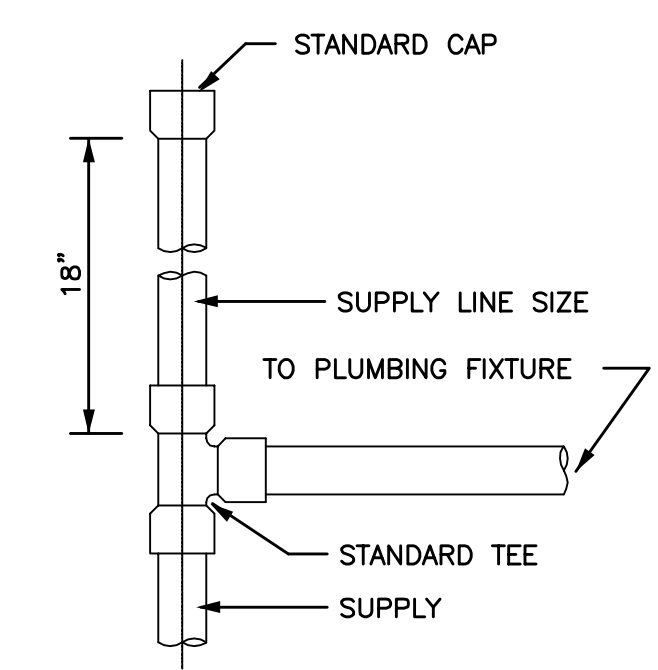
PLUMBING FIXTURE SCHEDULE NOTES

- ALL FIXTURES TO BE WHITE, EXCEPT SINKS TO BE STAINLESS STEEL.
- ALL FIXTURE MOUNTING HEIGHTS AND LOCATIONS TO BE IN ACCORDANCE WITH ADA/TAS REQUIREMENTS.
- PROVIDE CHROME PLATED BRASS SUPPLIES, STOP, P-TRAPS & WASTE FOR LAVS AND SINKS.
- PROVIDE INSULATED COVERS FOR EXPOSED SINK & LAVATORY SUPPLIES AND DRAINS.
- FIELD VERIFY ROUGH-IN DIMENSION BEFORE ORDERING.

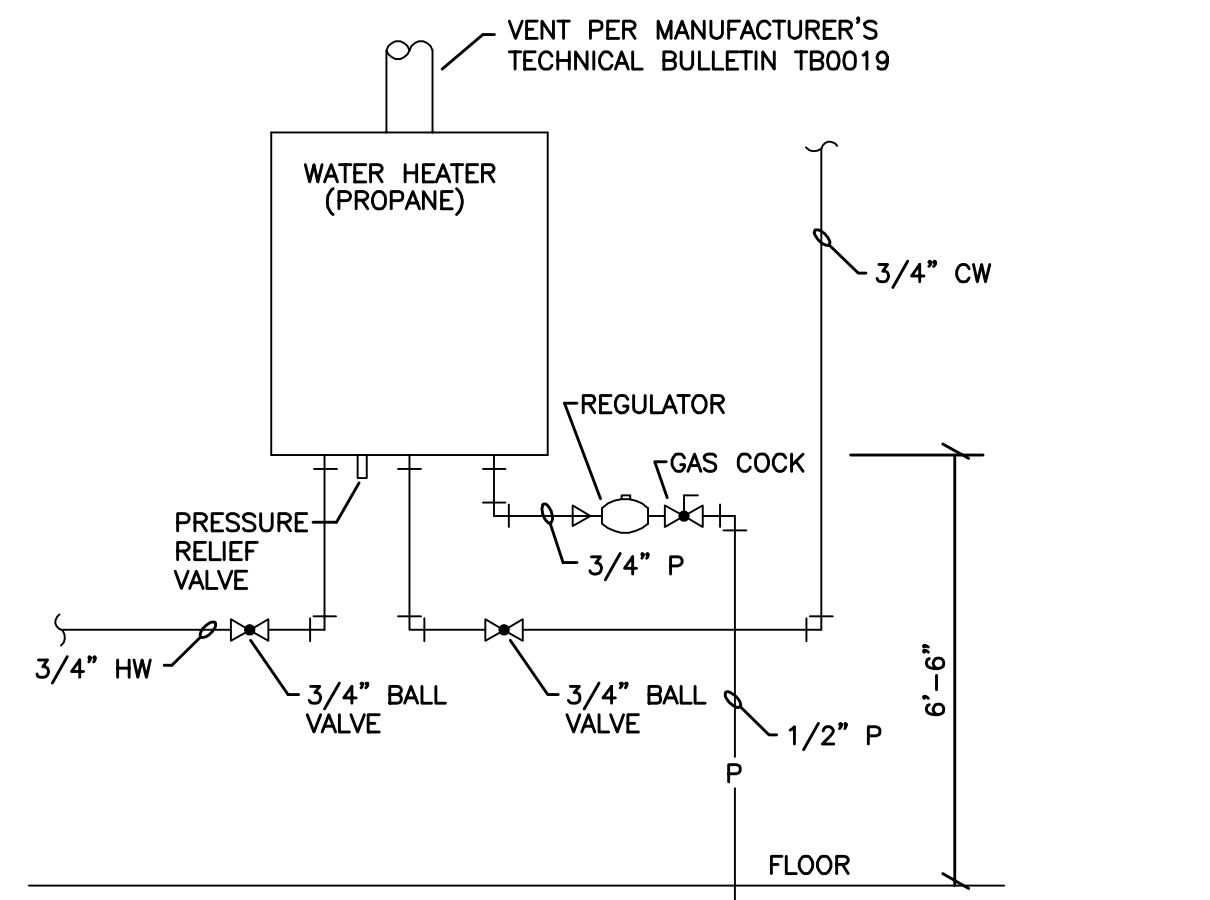
FIXTURE CONNECTION SCHEDULE				
FIXTURE	HW	CW	DRAIN	VENT
WATER CLOSET	---	1/2"	4"	3"
LAVATORY	1/2"	1/2"	1-1/2"	1-1/4"
SINK	1/2"	1/2"	2"	1-1/2"
SHOWER	1/2"	1/2"	2"	1-1/2"
WALL HYDRANT	---	3/4"	---	---
WATER HEATER	3/4"	3/4"	3/4"	---
HUB DRAIN	---	---	3"	---
HOSE REEL	---	3/4"	---	---
HOSE BIBB	---	3/4"	---	---
FLOOR DRAIN	---	---	3"	---



1 EXTERIOR CLEANOUT DETAIL
 SCALE: N.T.S.



2 TYPICAL FIXTURE AIR CHAMBER
 SCALE: N.T.S.



3 GAS WATER HEATER DETAIL
 SCALE: N.T.S.