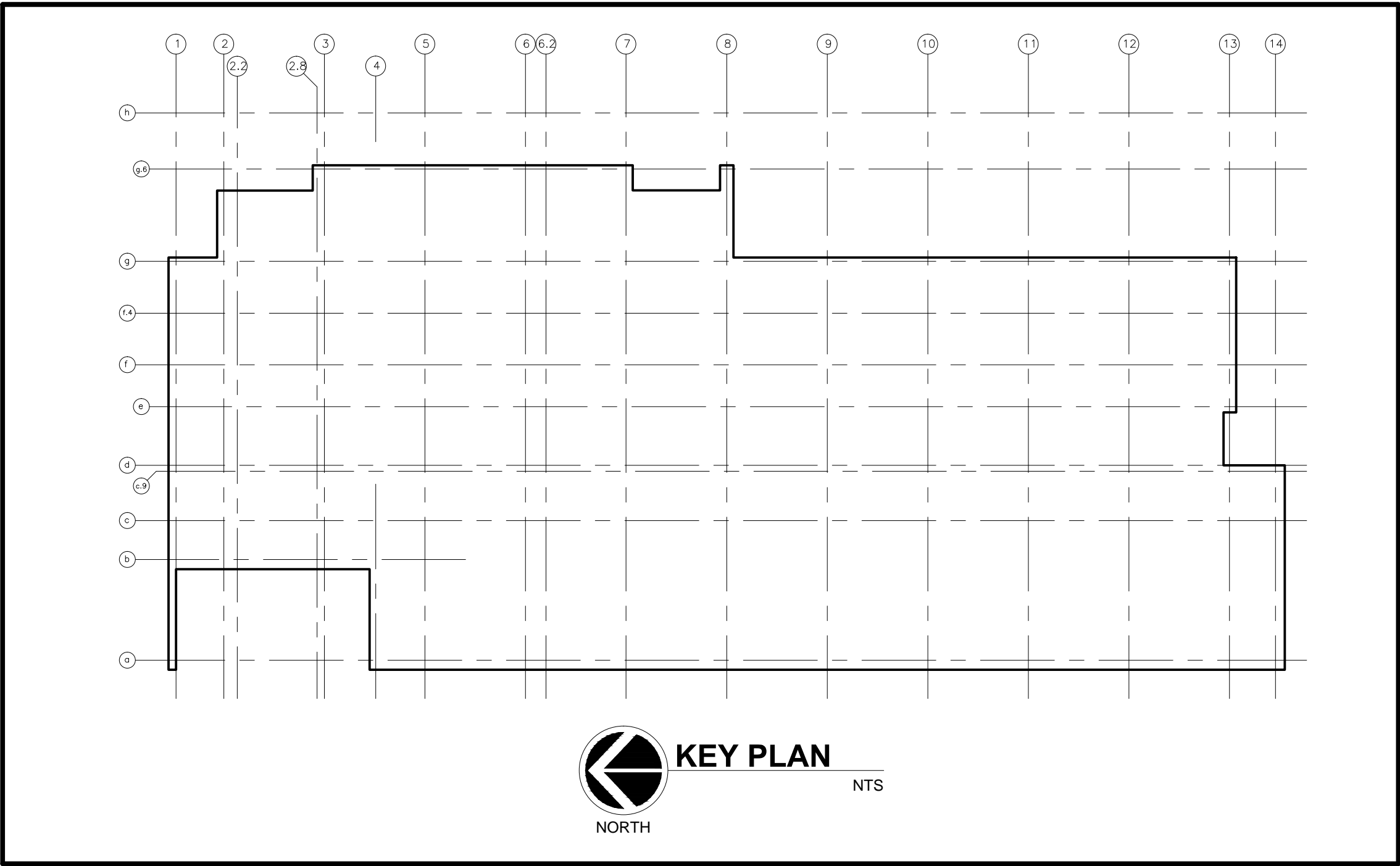




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5047 GULLEN MALL
DETROIT, MI 48202

GHAFARI Associates, L.L.C.
17101 Michigan Avenue
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Tel 313-441-3000
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ISSUED FOR: BID
DATE: 01/20/2015

[illegible]

AE	ARCHITECT/ENGINEER	FRP	FIBERGLASS REINFORCED
AB	ANCHOR BOLT		PANEL
ABV	ABOVE	FRT	FIRE-RETARDANT TREATED
ACM	ACRYLIC COMPOSITE	FSS	FLOOR SPOUNDER SEAT
	MATERIAL	FT	FIRE: FEET
ACOUS	ACOUSTICAL	FTG	FOOTING
ADDM	ADDENDUM	FURR	FURRING
ADJ	ADJACENT	FVC	FIRE VALVE CABINET
AFF	ABOVE FINISH FLOOR		
AHJ	AUTHORITY HAVING JURISDICTION	GA	GAUGE
AHU	AIR HANDLING UNIT	GAL	GALLON
ALT	ALTER	GALV	GALVANIZED
ALUM	ALUMINUM	GB	GRAB BAR
ANOD	ANODIZED	GC	GENERAL CONTRACTOR
AP	ACCESS PANEL	GR	GUARD RAIL
APC	ACCOUSTICAL PANEL CEILING	GL	GLASS
APPROX	APPROXIMATE (LY)	GLZ	GLAZING
ARCH	ARCHITECT	GND	GROUND
AWP	ACOUSTICAL WALL PANELS	GR	GRADE
		GYP	GYPSPUM
		GYP BD	GYPSPUM BOARD
B/B	BACK TO BACK	H	HIGH
BC	BOTTOM CHORD	HB	HOSE BIB
BD	BOARD	HM	HOLLOW METAL
BF	BARRIER FREE	HMD	HOLLOW METAL DOOR
BLDG	BUILDING	HMf	HOLLOW METAL FRAME
BLKG	BLOCKING	HORIZ	HORIZONTAL
BLW	BELOW	HP	HIGH POINT
BM	BEAM	HR	HOURS (FIRE-RESISTANT
BOT	BOTTOM		HEIGHT)
BRG	BEARING	HT	HEIGHT
BSMT	BASEMENT		
BTWN	BETWEEN	ID	INSIDE DIAMETER
BUR	BUILT-UP ROOF	IDF	INTERMEDIATE DISTRIBUTION
			FRAME
C/C	CENTER TO CENTER	IE	INVERT ELEVATION
C	COURSES	IN	INCH, INCHES
CB	CATCH BASIN	INFO	INFORMATION
CFLG	COUNTER FLASHING	INT	INTERIOR
CI	CAST IRON	INSUL	INSULATION, INSULATED
CJ	CONTROL JOINT		
CL	CENTERLINE	JC	JANITOR'S CLOSET
CLG	CEILING		
CLL	CONTRACT LIMIT LINE	kn	KILOMETER
CLO	CLOSET	km2	SQUARE KILOMETER
CLR	CLEAR		
CNU	CONCRETE MASONRY UNIT	L	LENGTH, LONG
CO	CLEAN OUT	LAV	LAVATORY
COL	COLUMN	LF	LINEAR FEET
CONC	CONCRETE	LL	LONG LEG
CONN	CONNECT (ED, ION, ING)	LLV	LONG LEG VERTICAL
CONSTR	CONSTRUCTION	LOH	LOW POINT
CONSTR JT	CONSTRUCTION JOINT	LT	LIGHT
CONT	CONTINUOUS (ATION)	LTG	LIGHTING
CONTR	CONTRACTOR		
COORD	COORDINATE	m	METER
CPT	CARPET	m2	SQUARE METER
CSMU	CALCIUM SILICATE MASONRY UNIT	MACH RM	MACHINE ROOM
CT	CERAMIC TILE	MARB	MARBLE
CW	CURTAIN WALL	MAS	MASONRY
		MAX	MAXIMUM
D	DEPTH/DEEP	MCR	MAIN COMMUNICATION ROOM
DEMO	DEMOLITION	MDF	MEDIUM DENSITY FIBERBOARD
DEPT	DEPARTMENT	MDf	MID DISTRIBUTION FRAME
DET	DETAIL	MECH	MECHANICAL
DF	DRINKING FOUNTAIN	MEZZ	MEZZANINE
DIA	DIAMETER	MFR	MANUFACTURER
DIAG	DIAGONAL	MH	MANHOLE
DIM	DIMENSION	MIN	MINIMUM
DL	DEAD LOAD	MIR	MIRROR
DN	DOWN	MKR BD	MARKER BOARD
DR	DOOR	mm	MILLIMETER
DWG	DRAWING	OPNG	OPENING
		MO	MASONRY OPENING
EA	EACH	MTD	MOUNTED
EJ	EXPANSION JOINT	MTG	MOUNTING
EL	ELEVATION	MTL	METAL
ELEC	ELECTRICAL		
ELEV	ELEVATOR	N	NORTH
EMER	EMERGENCY		NOT APPLICABLE
EMER SHR	EMERGENCY SHOWER	NC	NOT IN CONTRACT
ENGR	ENGINEER	NO	NOMINAL
EOS	EDGE OF SLAB	NTS	NOT TO SCALE
EPDM	ETHYLENE PROPYLENE DIENE MONOMER		
		O/O	OUT TO OUT
EQ	EQUAL	OA	OVERALL
EQUIP	EQUIPMENT	OC	ON CENTER
EWC	ELECTRICAL WATER COOLER	OD	OUTSIDE DIAMETER
EX	EXIST	OFCl	OWNER FURNISHED
EXP	EXPANSION		CONTRACTOR INSTALLED
EXP BT	EXPANSION BOLT	OFOl	OWNER FURNISHED OWNER
EXT	EXTERIOR		INSTALLED
		OH	OPPOSITE HAND
F/F	FACE TO FACE	OPNG	OPENING
FA	FIRE ALARM	ORD	OVERFLOW ROOF DRAIN
FBD	FIBERBOARD	OS	OVERFLOW SCUPPER
FD	FLOOR DRAIN		
FDTN	FOUNDATION	PBD	PARTICLE BOARD
FE	FIRE EXTINGUISHER	PH	PENTHOUSE
FEC	FIRE EXTINGUISHER CABINET	PL	PLATE
FF	FACTORY FINISH	PLAM	PLASTIC LAMINATE
FG	FIBERGLASS	PLAS	PLASTER
FGI	FIRE HOSE CABINET	PLYWD	PLYWOOD
FIN	FINISH (ED)	PNL(S)	PANEL(S)
FIN FL	FINISH FLOOR	PNT	PAINT, PAINTED
FIN GR	FINISH GRADE	PREFAB	PREFABRICATED
FIXT	FIXTURE	PREFIN	PREFINISHED
FLASH	FLASHING	PRELIM	PRELIMINARY
FLR	FLOOR	PREP	PREPARATION
FLR FIN	FLOOR FINISH	PROJ	PROJECT
FLR FLUOR	FLOURESCENT	PSF	POUNDS PER SQUARE FOOT
FR	FIRE RATING, FIRE RATED	PSI	POUNDS PER SQUARE INCH
FRMG	FRAMING	PT	PRESSURE TREATED

Governing Codes:		2012 Michigan Building Code 2012 International Mechanical Code 2012 Michigan Plumbing Code 2011 Michigan Electrical Code 2009 Michigan Uniform Energy Code	2012 Michigan Rehabilitation Code for Existing Buildings ICC/ANSI A117.1-2009 Barrier Free Design
Areas of Work Square Footage (SF):		Use Group Classification:	Code Section
Existing (Lower Level): (No Increase) 18,588		Business "B" (Educational Occupancy <12th Grade)	304.1
Area of Work (Lower Level): (Approx) 1,200			
Existing (Third Level): (No Increase) 20,022			
Area of Work (Third Level): (Approx) 230			
Existing (Fifth Level): (No Increase) 20,022			
Area of Work (Fifth Level): (Approx) 635			
Existing (Sixth Level): (No Increase) 14,275			
Area of Work (Sixth Level): (Approx) 2,600			
Height	"B" Use Group	6 story (No Increase)	
Area (SF)	"B" Use Group	20,022 (Building Footprint), 112,950 (Floor Area)	
Occupant Load	Existing Building	Existing occupancy tabulated = 201 (tabulated) 112,950 SF/100 SF per Occ. = 1130	Table 1004.1.2
Exit Access Corridor Width		44" If Occupant Load is > 50; 36" If Occupant Load is < 50	1018.2
Door Widths		32" Clear Minimum 48" Per Leaf Maximum	1008.1.1

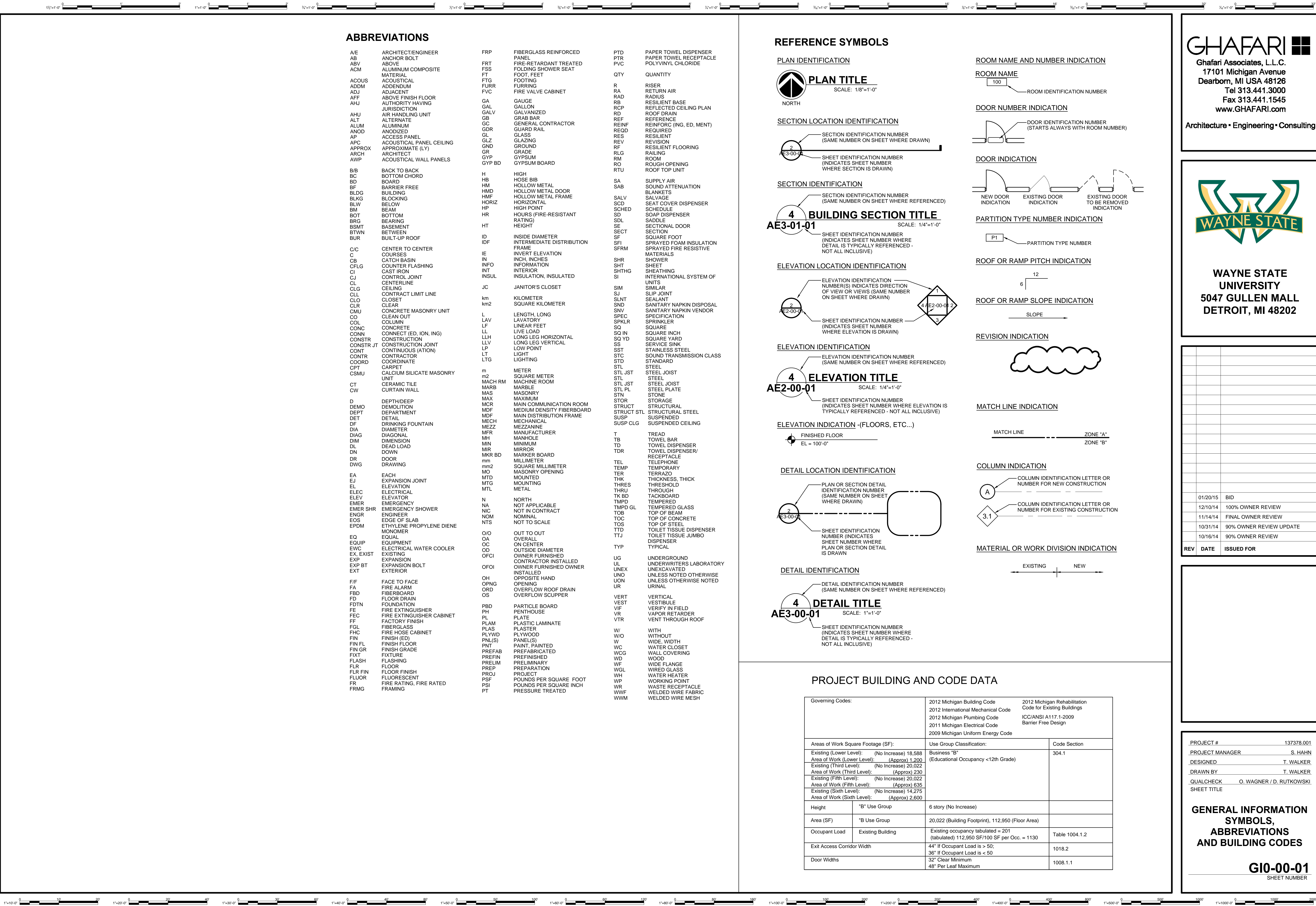
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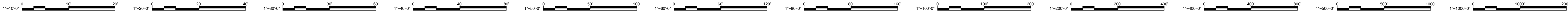
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PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	T. WALKER
DRAWN BY	T. WALKER
QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

GENERAL INFORMATION SYMBOLS, ABBREVIATIONS AND BUILDING CODES

G10-00-01
SHEET NUMBER





CONTRACTOR GENERAL CONDITIONS NOTES

ALL WORK IS TO BE COMPLETED IN ACCORDANCE WITH THE DOCUMENTS, WHICH INCLUDE THE DRAWINGS AND THE PROJECT SPECIFICATIONS CONTAINED IN THE PROJECT MANUAL.

- ALTERNATE #1**
- SEE SHEETS AE1-05-01, M1-05-01 AND EP1-05-02 FOR SUITE 5155 ALTERNATE.



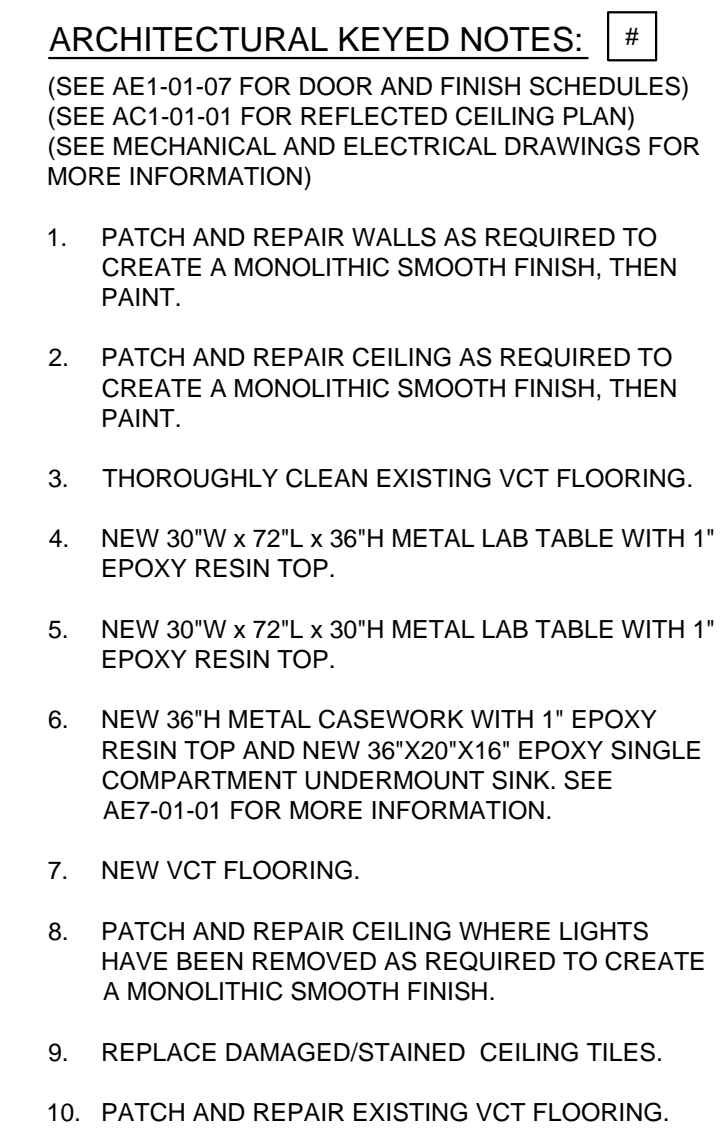
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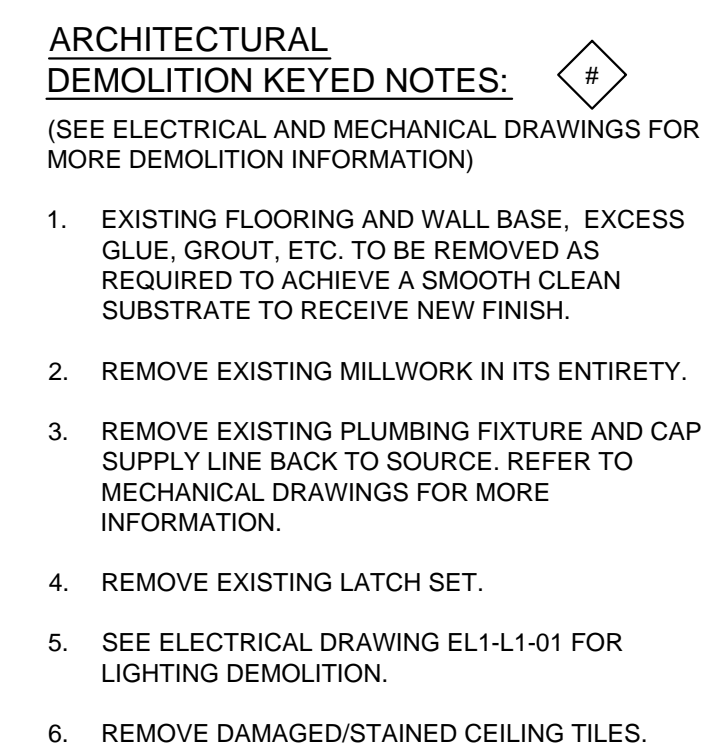
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PROJECT MANAGER	S. HAHN
DESIGNED	T. WALKER
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QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

ARCHITECTURAL GENERAL NOTES

AE0-00-01
SHEET NUMBER



 **NEW WORK FLOOR PLAN - MICROSCOPY**
SCALE: 1/4"=1'-0"



 **DEMOLITION FLOOR PLAN - MICROSCOPY** SCALE: 1/4"=1'-0"

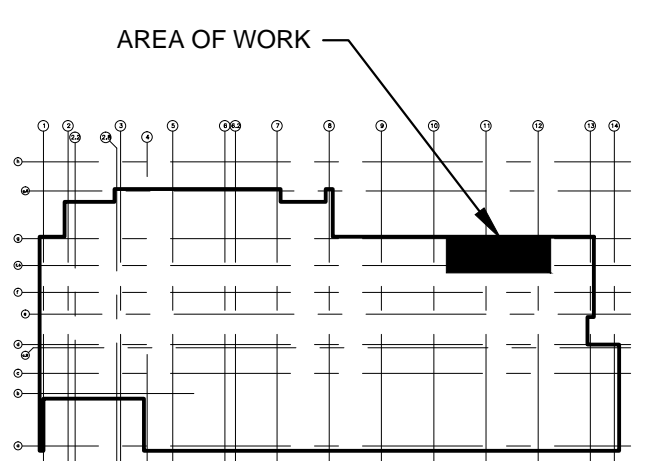
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17101 Michigan Avenue
Dearborn, MI USA 48126
Tel 313.441.3000
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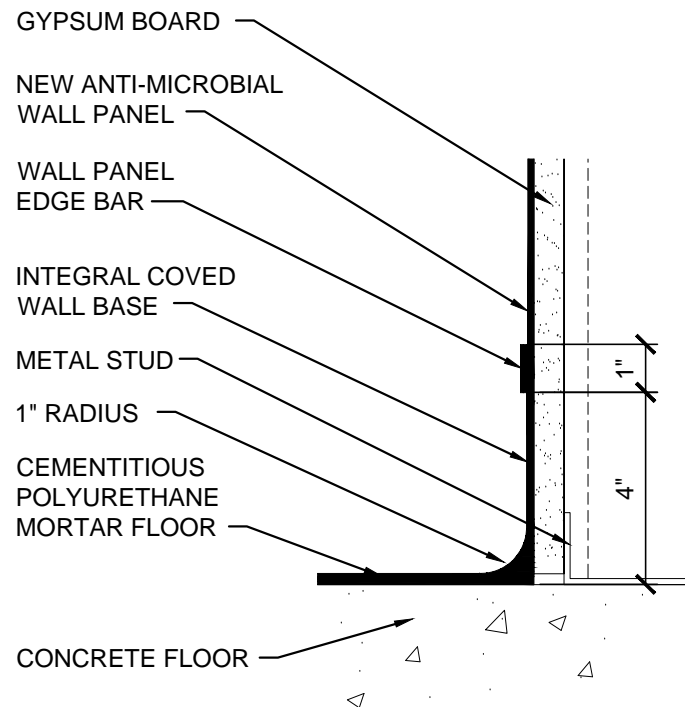
	01/20/15	BID
	12/10/14	100% OWNER REVIEW
	11/14/14	FINAL OWNER REVIEW
	10/31/14	90% OWNER REVIEW UPDATES
	10/16/14	90% OWNER REVIEW
REV	DATE	ISSUED FOR



PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	T. WALKER
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QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

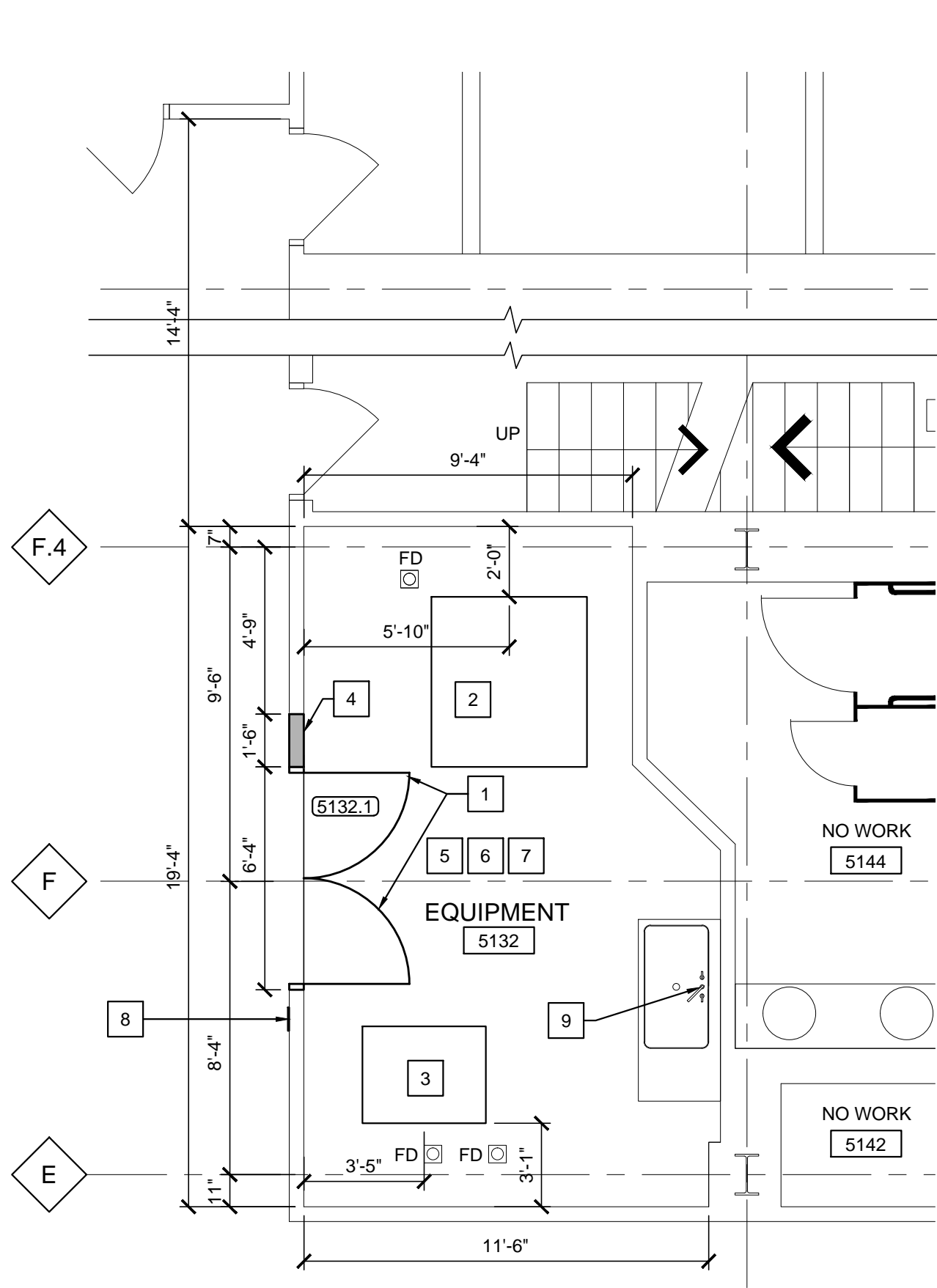
LOWER LEVEL FLOOR PLAN

AE1-L1-01
SHEET NUMBER



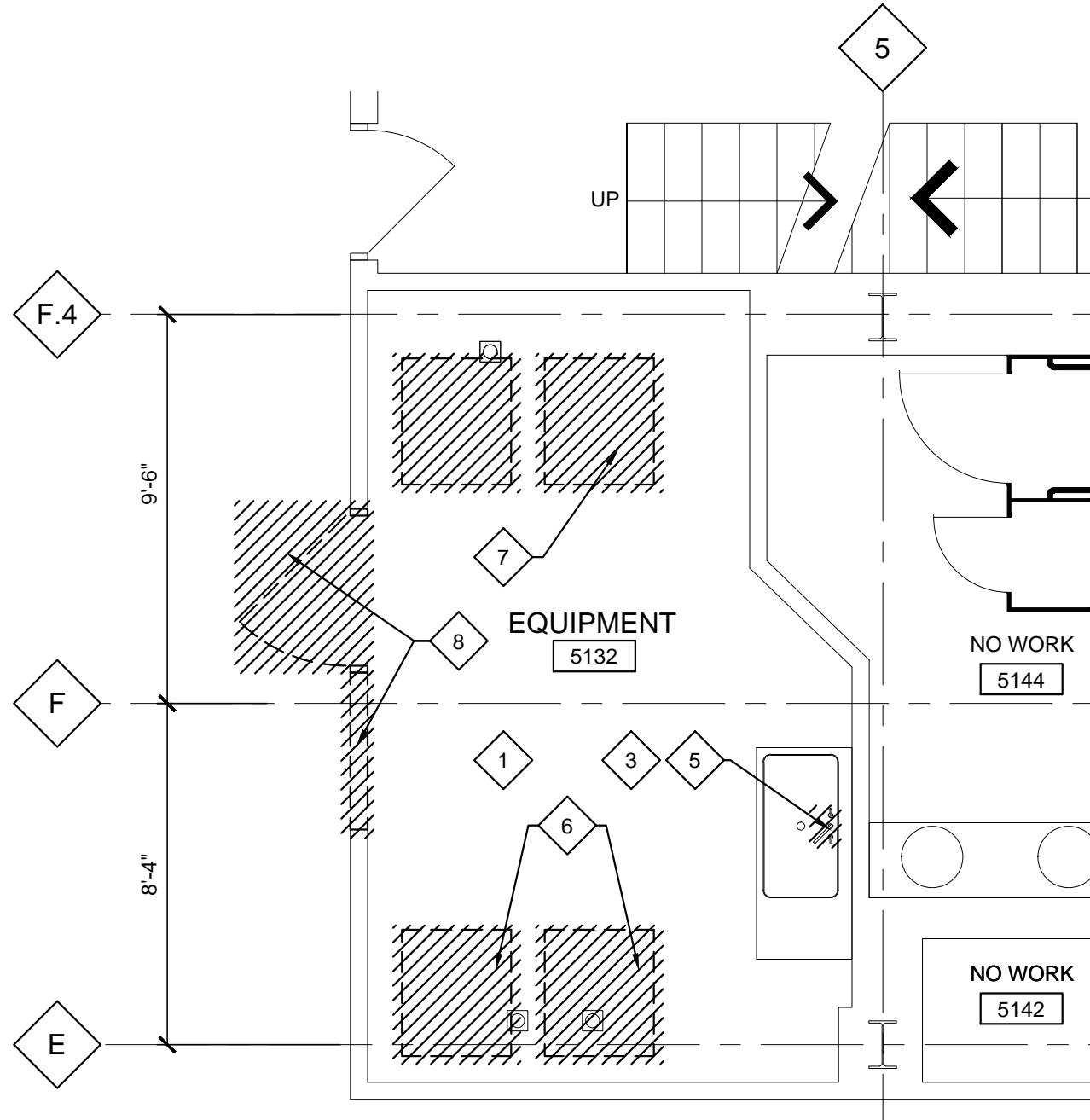
TYPICAL COVERED BASE
DETAIL AT EQUIP. ROOMS

SCALE: 3/4"=1'-0"



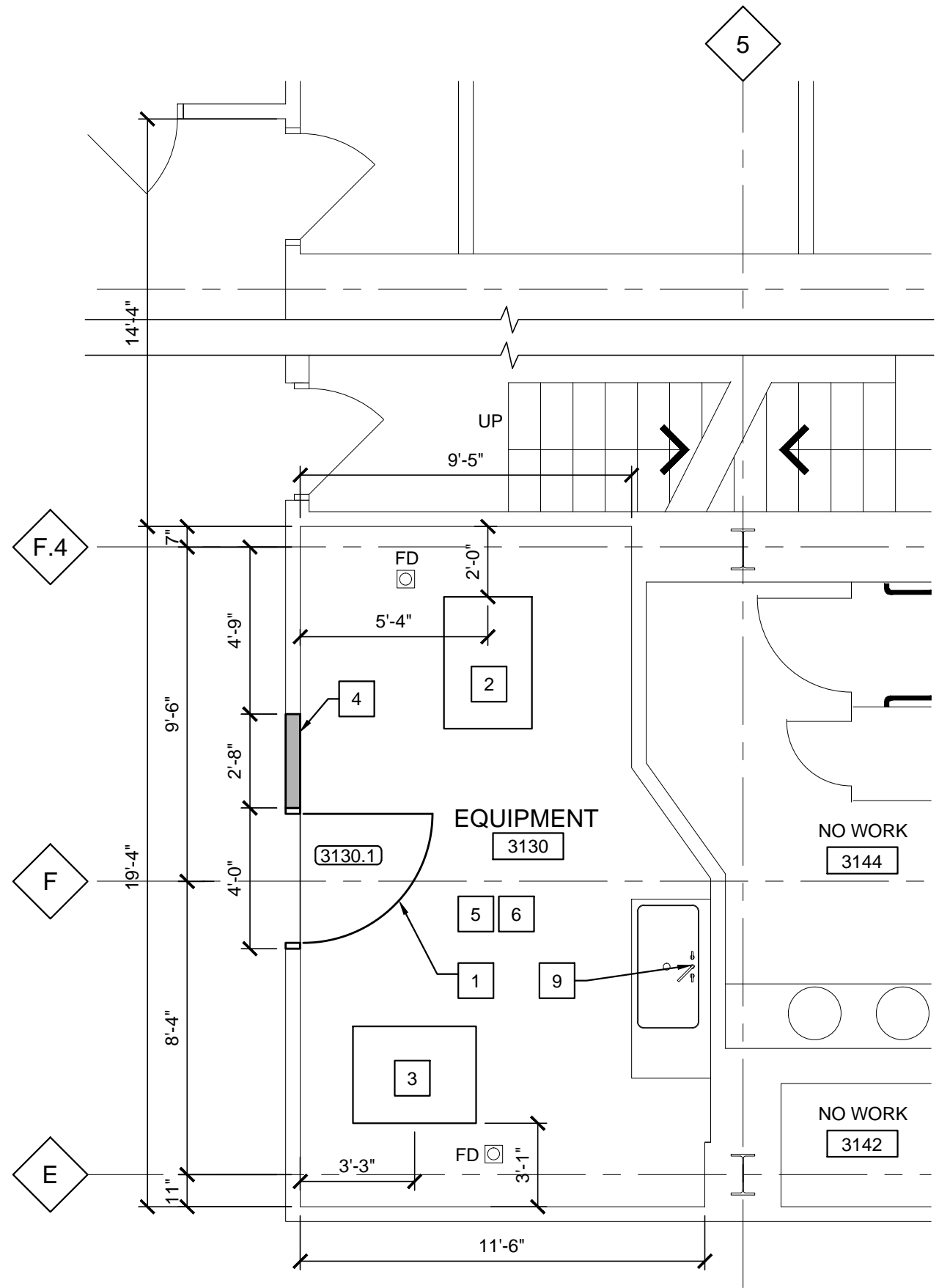
NEW WORK FLOOR PLAN
- EQUIPMENT ROOM (LEVEL 5)

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



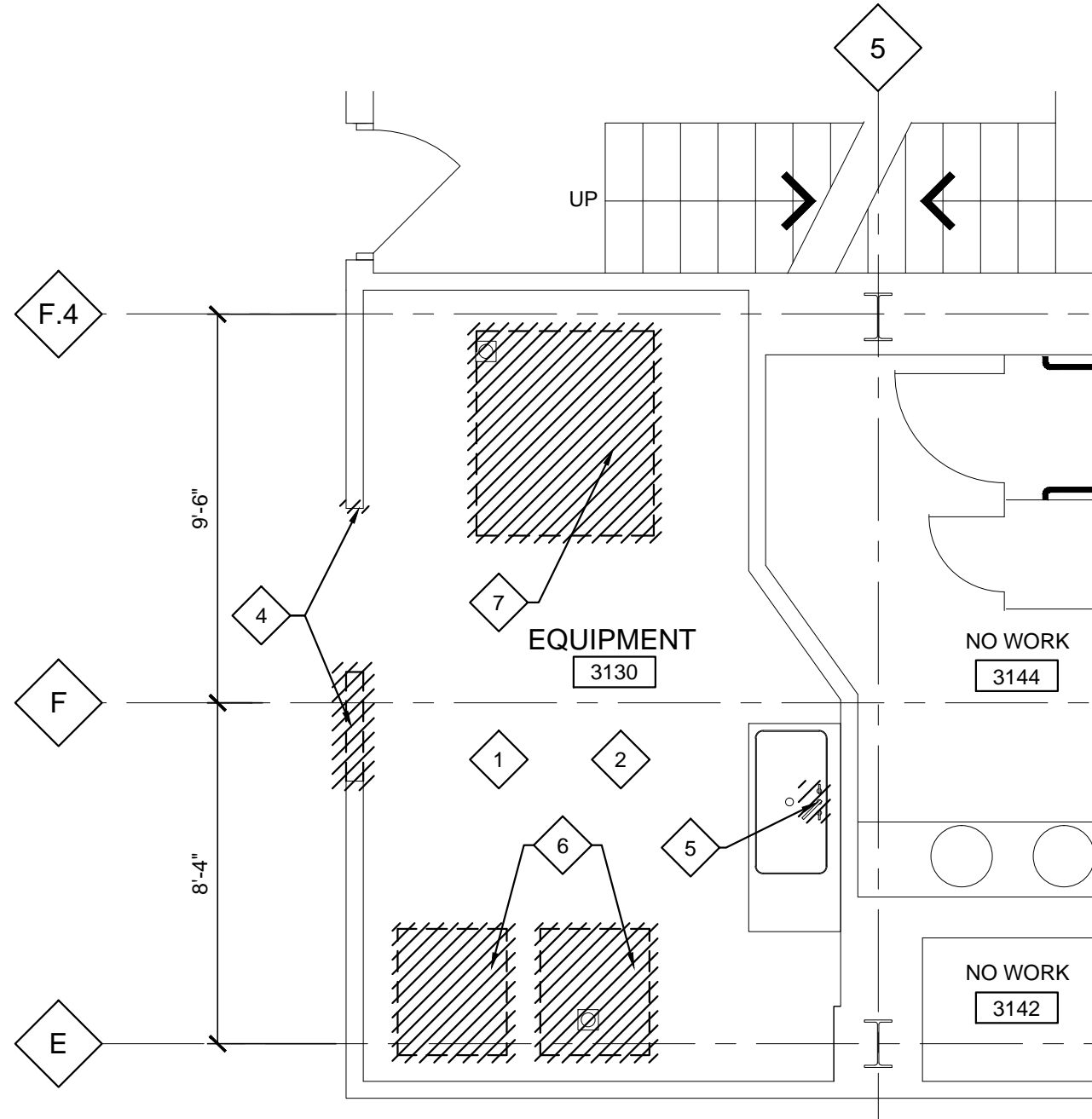
DEMOLITION FLOOR PLAN
- EQUIPMENT ROOM (LEVEL 5)

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



NEW WORK FLOOR PLAN
- EQUIPMENT ROOM (LEVEL 3)

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



DEMOLITION FLOOR PLAN
- EQUIPMENT ROOM (LEVEL 3)

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

EQUIPMENT SCHEDULE:

3130 - EQUIPMENT ROOM:
AUTOCLAVE - STERIS AMSCO LAB 250
GLASSWASHER - STERIS RELIANCE MODEL 400XLS

5132 - EQUIPMENT ROOM:
AUTOCLAVE - STERIS AMSCO CENTURY MEDIUM
GLASSWASHER - STERIS RELIANCE MODEL 400XLS

ARCHITECTURAL KEYED NOTES: #

(SEE AE1-01-07 FOR DOOR AND FINISH SCHEDULES)
(SEE AC1-01-01 FOR REFLECTED CEILING PLAN)
(SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR MORE INFORMATION)

1. NEW DOOR, FRAME AND HARDWARE. SEE DOOR SCHEDULE.
2. NEW AUTOCLAVE, INSTALL PER MANUFACTURER'S SPECIFICATIONS. SEE ELECTRICAL/MECHANICAL DRAWINGS FOR MORE INFORMATION. ROUGH LOCATION DIMENSIONS PROVIDED, CONFIRM EXACT LOCATION WITH OWNER.
3. NEW GLASS WASHER, INSTALL PER MANUFACTURER'S SPECIFICATIONS. SEE ELECTRICAL/MECHANICAL DRAWINGS FOR MORE INFORMATION. ROUGH LOCATION DIMENSIONS PROVIDED, CONFIRM EXACT LOCATION WITH OWNER.
4. NEW WALL, MATCH EXISTING WALL CONSTRUCTION AND MAINTAIN EXISTING CORRIDOR FIRE RATING. PAINT HALLWAY SIDE OF NEW WALL TO MATCH EXISTING FROM CORNER AT COLUMN LINE (E) EAST TO THE END OF WALL.
5. PREP AND INSTALL NEW ANTI-MICROBIAL WALL SYSTEM ON ALL WALLS.
6. INSTALL NEW CEMENTITIOUS POLYURETHANE MORTAR FLOOR WITH INTEGRAL 4" COVE BASE. FEATHER DOWN MORTAR AT DOOR SO THE MORTAR FLOOR IS LEVEL WITH THE EXISTING HALLWAY FLOOR.
7. INSTALL NEW WASHABLE, ANTI-MICROBIAL LAY-IN CEILING TILES AND GRID AT 8'-0" AFF.
8. INSTALL NEW ROOM SIGNAGE TO MATCH EXISTING WITH ACCURATE ROOM NAME AND NUMBER: 5132.
9. EXISTING SINK WITH NEW FAUCET WITH WRIST BLADE HANDLES.

ARCHITECTURAL

DEMOLITION KEYED NOTES: #

(SEE ELECTRICAL AND MECHANICAL DRAWINGS FOR MORE DEMOLITION INFORMATION)

1. EXISTING FLOORING AND WALL BASE, EXCESS GLUE, GROUT, ETC. TO BE REMOVED AS REQUIRED TO ACHIEVE A SMOOTH CLEAN SUBSTRATE TO RECEIVE NEW FINISH.
2. EXISTING CEILING TILES AND GRID TO REMAIN.
3. DEMO EXISTING LAY-IN CEILING AND GRID. LIGHTING TO REMAIN. SEE ELECTRICAL DRAWINGS FOR MORE INFORMATION.
4. DEMO EXISTING DOOR FRAME AND PORTION OF EXISTING WALL TO ACCOMMODATE NEW DOOR AND FRAME.
5. REMOVE AND DISPOSE OF EXISTING FAUCET.
6. REMOVE AND DISPOSE OF EXISTING GLASS WASHER.
7. REMOVE AND DISPOSE OF EXISTING AUTOCLAVE.
8. DEMO EXISTING DOOR AND FRAME IN ITS ENTIRETY AND PORTION OF EXISTING WALL TO ACCOMMODATE NEW DOOR AND FRAME.

LEGEND:

- EXISTING TO REMAIN
- EXISTING TO BE DEMOLISHED
- NEW CONSTRUCTION

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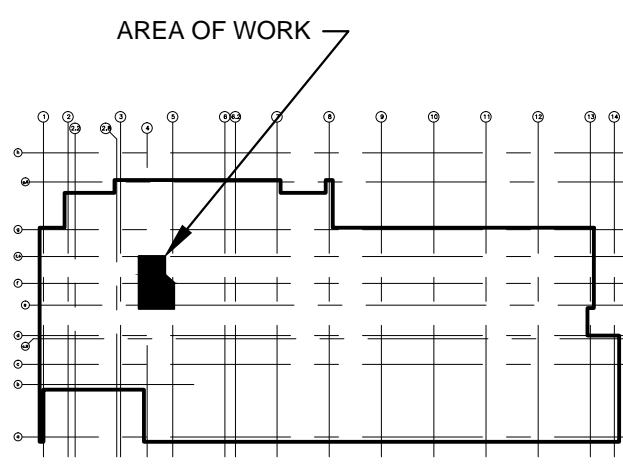
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17101 Michigan Avenue
Dearborn, MI USA 48126
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	10/16/14	90% OWNER REVIEW

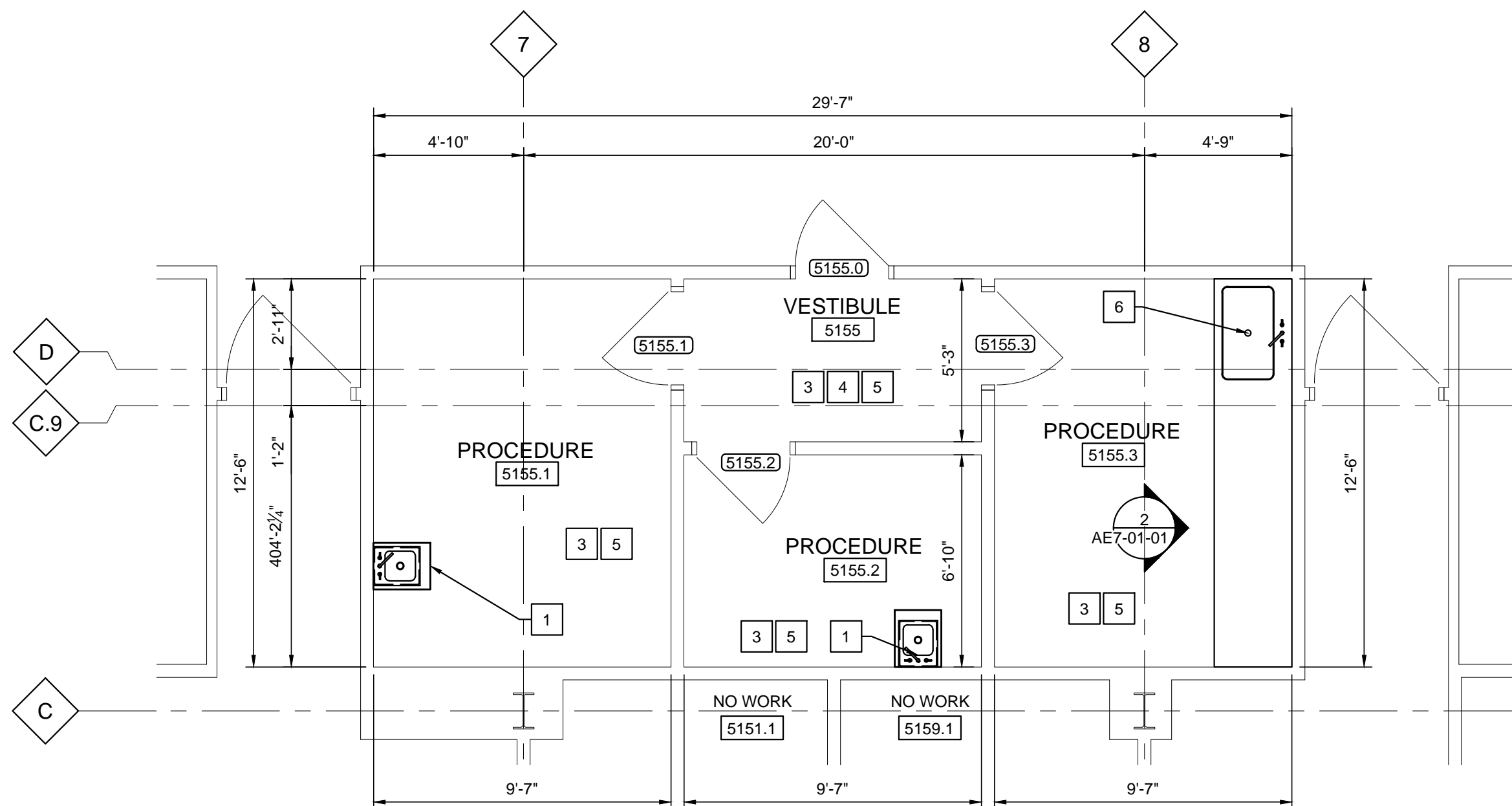
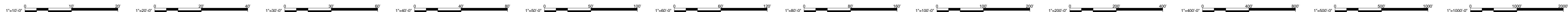


KEY PLAN
SCALE: NONE

PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	T. WALKER
DRAWN BY	T. WALKER
QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

LEVEL THREE / FIVE
FLOOR PLAN

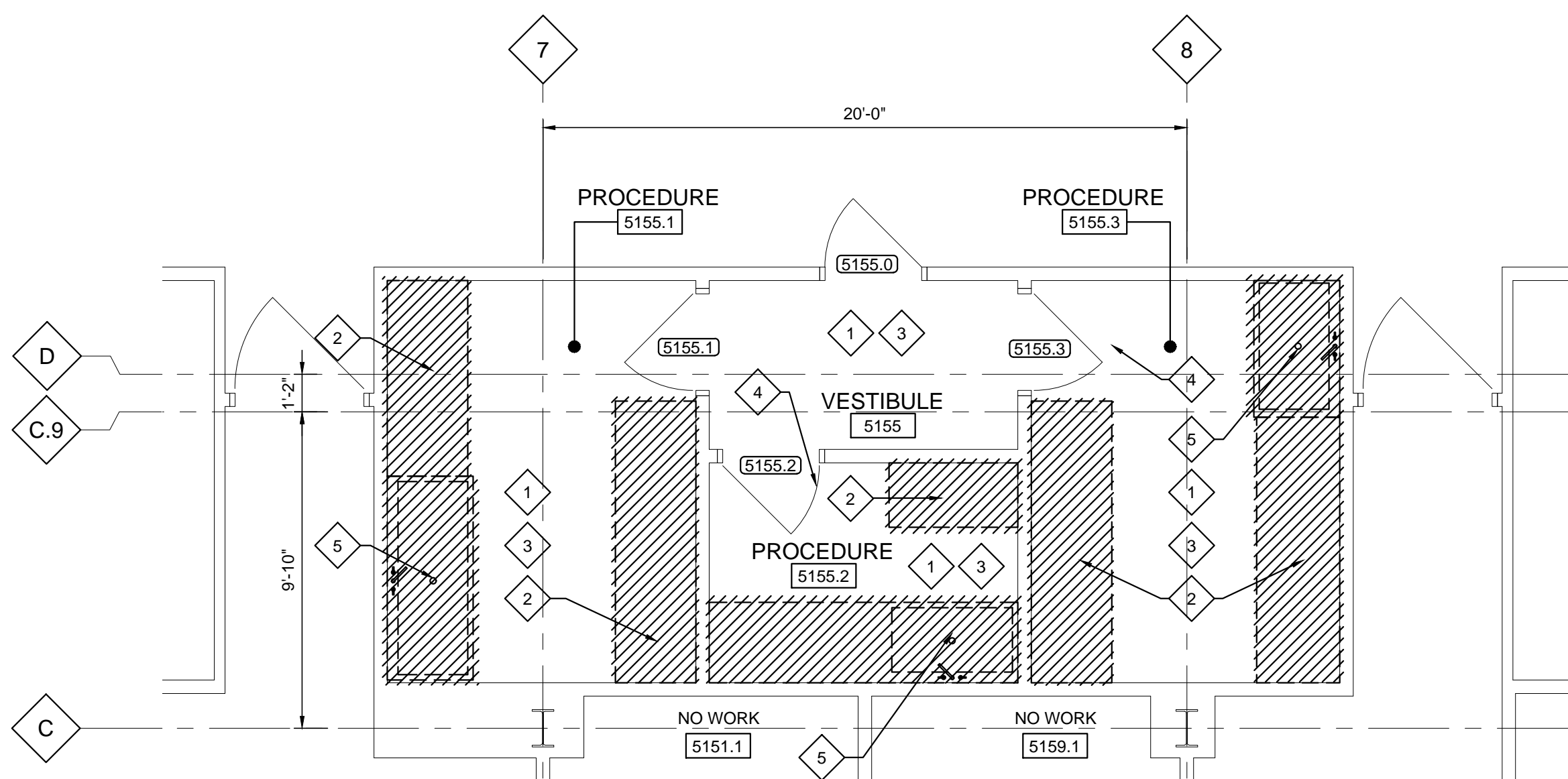
AE1-03-01
SHEET NUMBER



 **NEW WORK FLOOR PLAN - SUITE 5155**
SCALE: 1/4"=1'-0"

1. SEE ELECTRICAL DRAWINGS FOR LIGHT FIXTURE LEGEND, LIGHTING DEMO AND ADDITIONAL INFORMATION.
2. NEW LIGHT FIXTURES TO BE CENTERED IN ROOM, UNLESS NOTED OTHERWISE.

1. INSTALL NEW METAL HAND SINK WITH METAL BASE CABINET AND SPLASH GUARD. SEE AE7-01-01 AND MECHANICAL DRAWINGS FOR MORE INFORMATION.
2. INSTALL NEW WASHABLE, ANTI-MICROBIAL LAY-IN CEILING TILES AND GRID AT 8'-0" AFF.
3. PAINT ALL WALLS, DOORS AND FRAMES.
4. PATCH AND REPAIR CEILING, PAINT CEILING TO MATCH WALLS.
5. INSTALL NEW CEMENTITIOUS POLYURETHANE MORTAR FLOOR WITH INTEGRAL 4" COVE BASE. FEATHER DOWN MORTAR AT DOOR SO THE MORTAR FLOOR IS LEVEL WITH THE EXISTING HALLWAY FLOOR.
6. INSTALL NEW METAL CASEWORK WITH 1" EPOXY RESIN WORK TOP AND UNDERMOUNT EPOXY RESIN SINK. SEE AE7-01-01 FOR MORE INFORMATION.



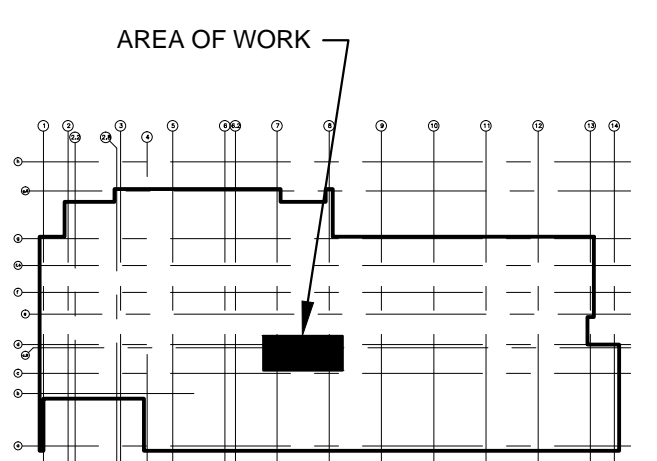
 **DEMOLITION FLOOR PLAN - SUITE 5155**
SCALE: 1/4"=1'-0"

1. EXISTING FLOORING AND WALL BASE, EXCESS GLUE, GROUT, ETC. TO BE REMOVED AS REQUIRED TO ACHIEVE A SMOOTH CLEAN SUBSTRATE TO RECEIVE NEW FINISH.
2. REMOVE EXISTING SHELVEING, CASE WORK TABLES.
3. DEMO EXISTING LIGHTING.
4. REMOVE EXISTING LATCH SET.
5. DEMO EXISTING SINK. SEE MECHANICAL DRAWINGS FOR MORE INFORMATION.

EXISTING GYPSUM
BOARD CEILING



	01/20/15	BID
	12/10/14	100% OWNER REVIEW
	11/14/14	FINAL OWNER REVIEW
	10/31/14	90% OWNER REVIEW UPDATE
	10/16/14	90% OWNER REVIEW
REV	DATE	ISSUED FOR



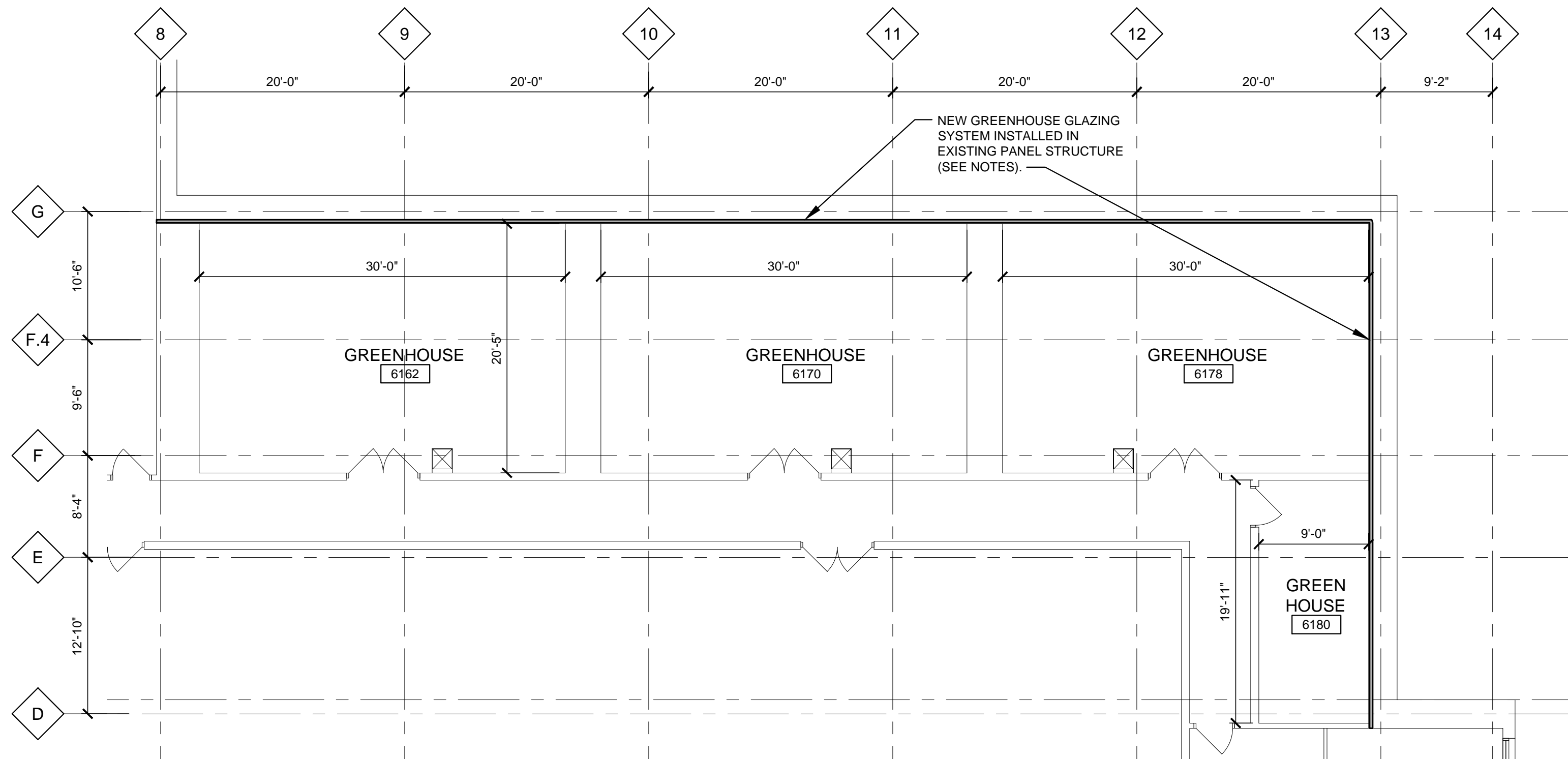
PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	T. WALKER
DRAWN BY	T. WALKER
QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

LEVEL FIVE (ALTERNATE #1) PLANS

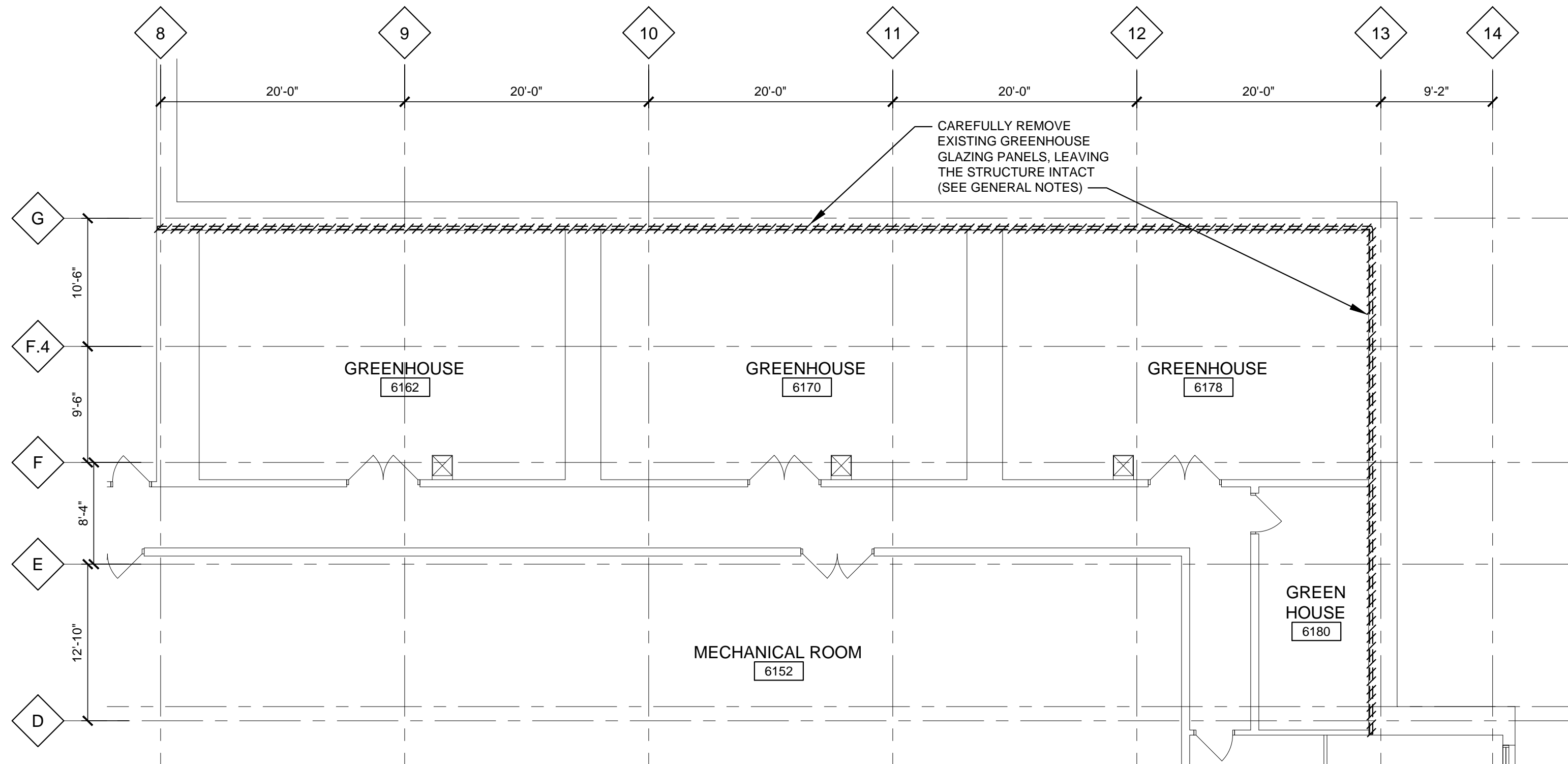
AE1-05-01
SHEET NUMBER

GENERAL NOTES:

1. SEE SHEETS AE1-R1-01 AND AE5-01-01 FOR DETAILS AND ADDITIONAL INFORMATION ON GREENHOUSE RENOVATION.
2. REFER TO THE REFERENCE DRAWINGS INCLUDED AS PART OF THIS SET FOR CURRENT GREENHOUSE CONDITIONS AND DETAILS.
3. GREENHOUSE ROOMS 6162, 6170, 6178 AND 6180 TO RECEIVE NEW GREENHOUSE GLAZING SYSTEM INSTALLED IN EXISTING PANEL STRUCTURE (SEE PROJECT SPECIFICATIONS FOR PERFORMANCE REQUIREMENTS AND ADDITIONAL INFORMATION).
4. GLAZING SUPPLIER/ CONTRACTOR TO SUPPLY ARCHITECT WITH ALL APPLICABLE DETAILS PRIOR TO FABRICATION.
5. SEE EL1-06-01 FOR LIGHTING LAYOUT.



NEW WORK FLOOR PLAN
SCALE: 1/8"=1'-0"
NORTH



DEMOLITION FLOOR PLAN
SCALE: 1/8"=1'-0"
NORTH

LEGEND:

- EXISTING TO REMAIN
- EXISTING TO BE DEMOLISHED
- NEW CONSTRUCTION

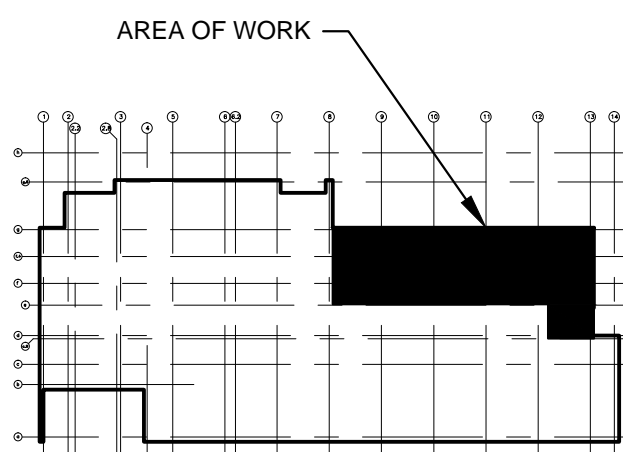
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Tel 313.441.3000
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10/31/14	90% OWNER REVIEW UPDATE

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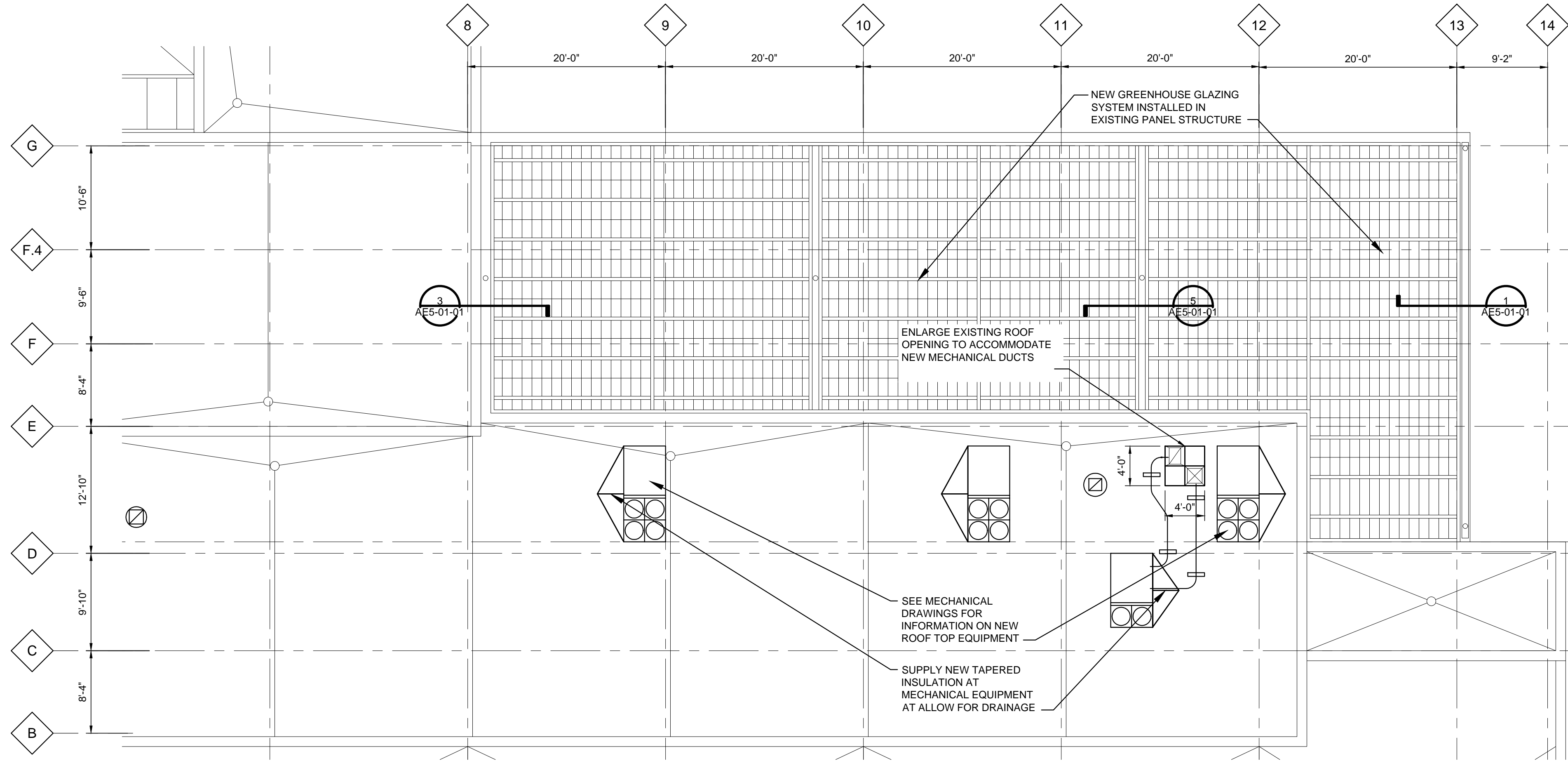


KEY PLAN
SCALE: NONE
NORTH

PROJECT # 137378.001
PROJECT MANAGER S. HAHN
DESIGNED T. WALKER
DRAWN BY T. WALKER
QUALCHECK O. WAGNER / D. RUTKOWSKI
SHEET TITLE

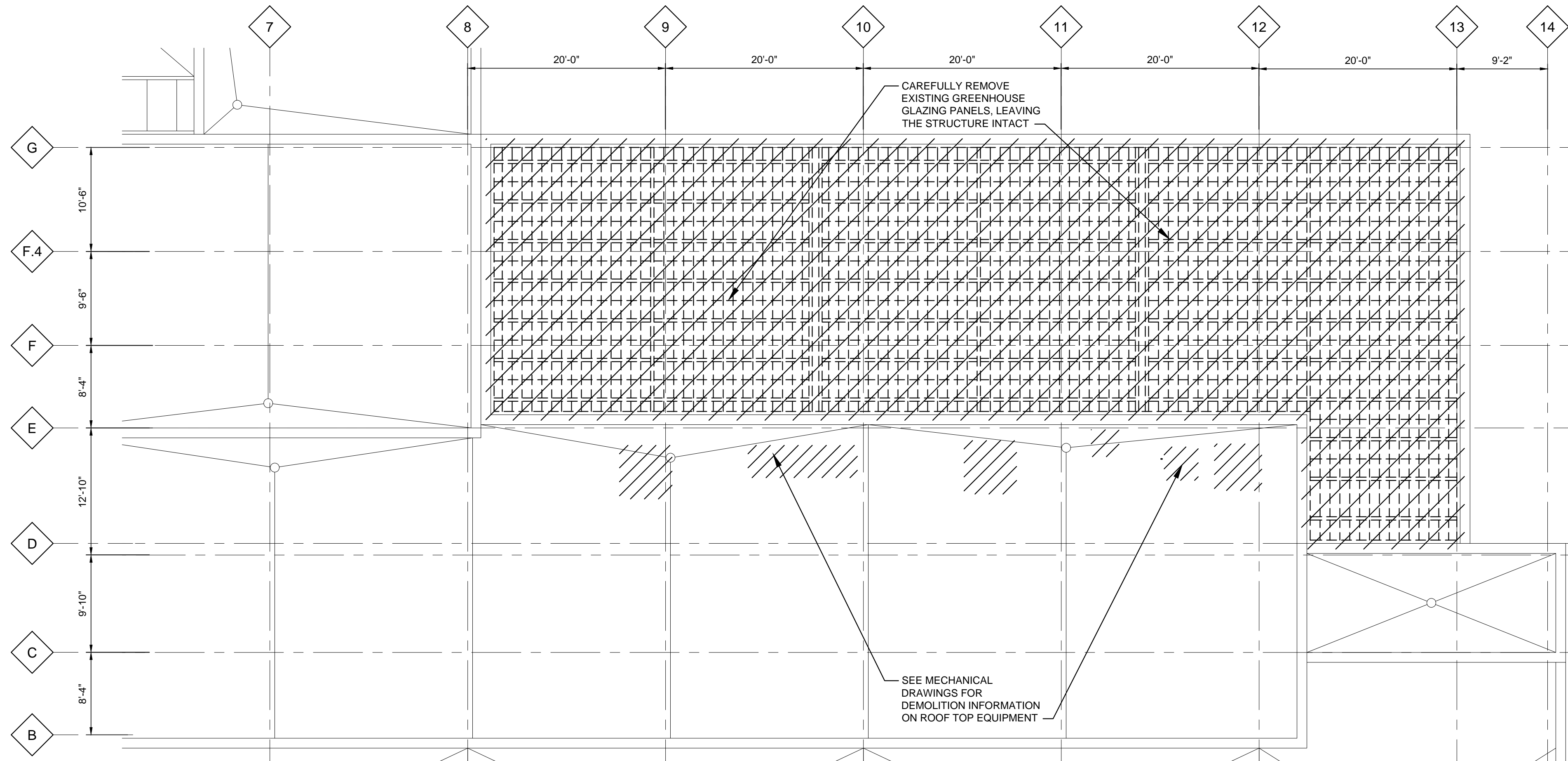
LEVEL SIX FLOOR PLAN

AE1-06-01
SHEET NUMBER



NEW WORK GREENHOUSE ROOF PLAN

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



DEMOLITION GREENHOUSE ROOF PLAN

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

LEGEND:

- EXISTING TO REMAIN
- EXISTING TO BE DEMOLISHED

GENERAL NOTES:

- SEE SHEETS AE1-06-01 AND AE5-01-01 FOR DETAILS AND ADDITIONAL INFORMATION ON GREENHOUSE RENOVATION.
- REFER TO THE REFERENCE DRAWINGS INCLUDED AS PART OF THIS SET FOR CURRENT GREENHOUSE CONDITIONS AND DETAILS.
- GREENHOUSE ROOMS 6162, 6170, 6178 AND 6180 TO RECEIVE NEW GREENHOUSE GLAZING SYSTEM INSTALLED IN EXISTING PANEL STRUCTURE (SEE PROJECT SPECIFICATIONS FOR PERFORMANCE REQUIREMENTS AND ADDITIONAL INFORMATION).
- GLAZING SUPPLIER/ CONTRACTOR TO SUPPLY ARCHITECT WITH ALL APPLICABLE DETAILS PRIOR TO FABRICATION.

GREENHOUSE PANEL SUPPLIER / CONTRACTOR:

- GLAZING SUPPLIER / CONTRACTOR IS TO READ GREENHOUSE PERFORMANCE REQUIREMENTS IN THE DRAWING SPECIFICATIONS MANUAL PRIOR TO PROPOSING A GLAZING SYSTEM. COORDINATE PROPOSED GLAZING SYSTEM WITH ARCHITECT PRIOR TO FABRICATION.
- CAREFULLY REMOVE AND DISPOSE OF EXISTING GREENHOUSE GLAZING PANELS (ROOF AND WALLS) IN THEIR ENTIRETY LEAVING THE EXISTING SUPPORT STRUCTURE INTACT.
- INSPECT THE INTEGRITY OF EXISTING PANEL STRUCTURE (ROOF AND WALLS) FOR AREAS OF DEGRADATION THAT MAY NEED TO BE REPLACED/REINFORCED. REPORT FINDINGS TO ARCHITECT PRIOR TO CONSTRUCTION. SEE SPECIFICATION SECTION 08-45-13 FOR MORE INFORMATION ON REPORTING FINDINGS.
- PREP EXISTING GREENHOUSE GLAZING PANEL STRUCTURE (ROOF AND WALLS) TO RECEIVE NEW GLAZING PANEL SYSTEM. REPAIR ANY DAMAGED AREAS OF THE EXISTING STRUCTURE AS REQUIRED TO ENSURE PROPER PERFORMANCE.
- NEW GREENHOUSE GLAZING SYSTEM TO UTILIZE THE EXISTING ROOF DRAINAGE SYSTEM. PATCH AND REPAIR AS NEEDED. SEE SHEET AE5-01-01 AND ATTACHED REFERENCE DRAWINGS FOR ADDITIONAL DETAILS.
- NEW GREENHOUSE GLAZING SYSTEM IS TO MAINTAIN A WATER TIGHT BARRIER AT EXISTING INTERNAL GUTTERS, CONNECTION AT EXISTING SILL WALL AND WHERE PANELS MEET EXISTING EXTERIOR WALLS. SEE SHEET AE5-01-01 AND ATTACHED REFERENCE DRAWINGS FOR DETAILS.

GENERAL ROOFING NOTES:

- NEW ROOF TOP EQUIPMENT TO UTILIZE EXISTING ROOF OPENINGS IF POSSIBLE. ROOFING AND MECHANICAL CONTRACTORS TO COORDINATE EXACT LOCATIONS IN FIELD FOR ANY NEW ROOF PENETRATIONS. SEE DETAILS ON AE1-R1-02 FOR TYP. ROOF CURB AND MECHANICAL EQUIPMENT STEEL SUPPORT FRAMING.
- INSTALL NEW ROOF DECK, INSULATION AND ROOF MEMBRANE WHERE EXISTING ROOF TOP EQUIPMENT IS BEING REMOVED AS SHOWN ON PLAN.
- ALL ROOF PATCHES, REPAIRS AND PENETRATIONS MUST BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE EXISTING WARRANTY AS TO NOT VOID THE WARRANTY.
- SEE MECHANICAL DRAWINGS FOR DEMOLITION INFORMATION ON ROOF TOP EQUIPMENT.

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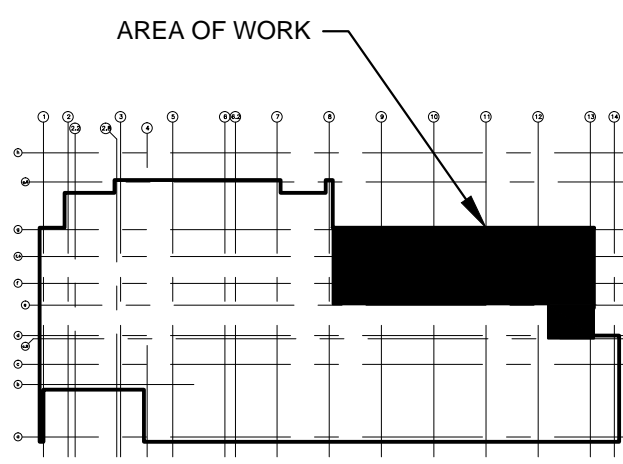
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01/20/15	BID
12/10/14	100% OWNER REVIEW
11/14/14	FINAL OWNER REVIEW
10/31/14	90% OWNER REVIEW UPDATE
10/16/14	90% OWNER REVIEW

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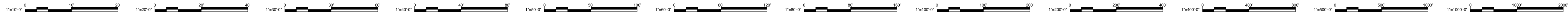
KEY PLAN

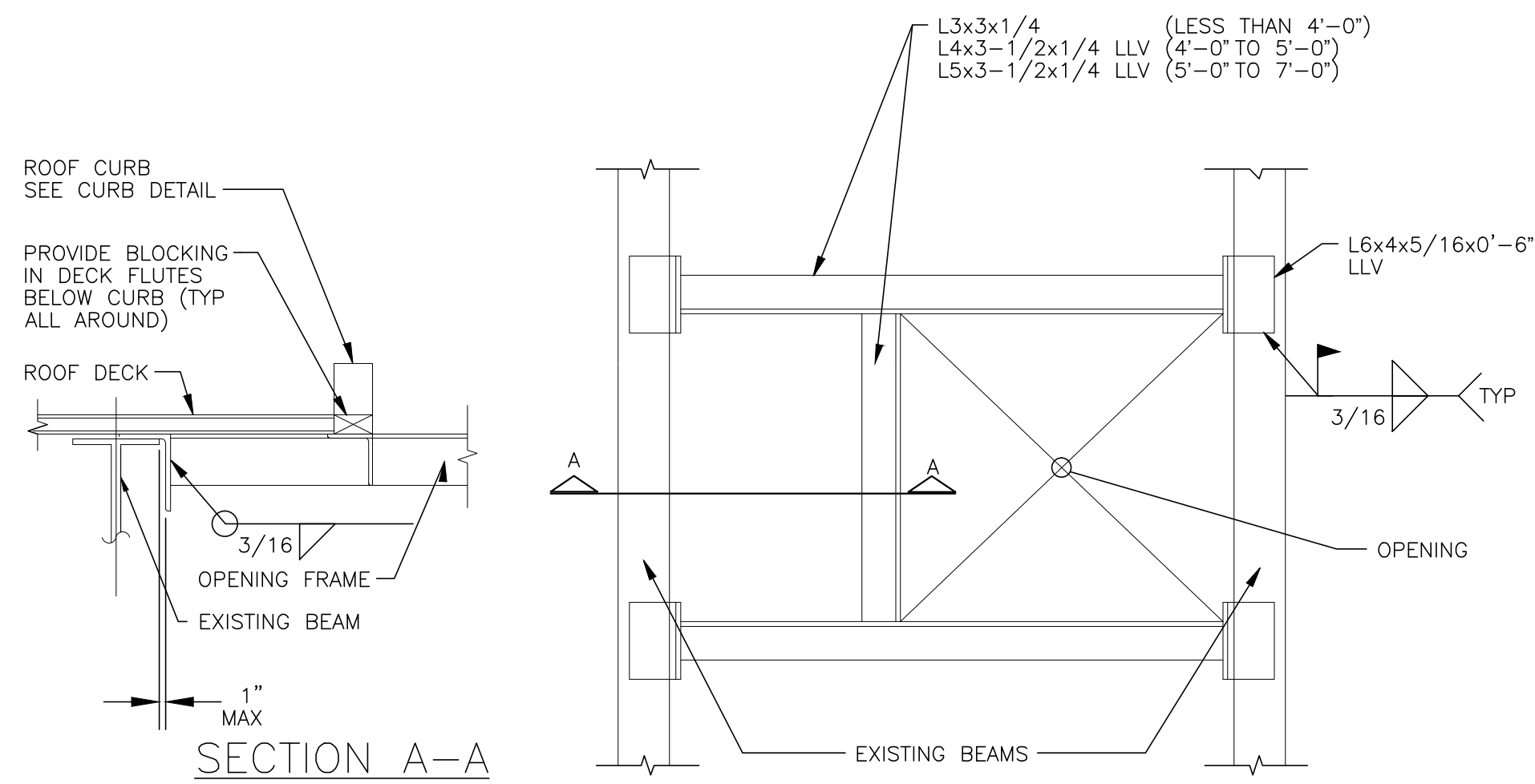
SCALE: NONE

PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	T. WALKER
DRAWN BY	T. WALKER
QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

**GREENHOUSE
ROOF PLAN**

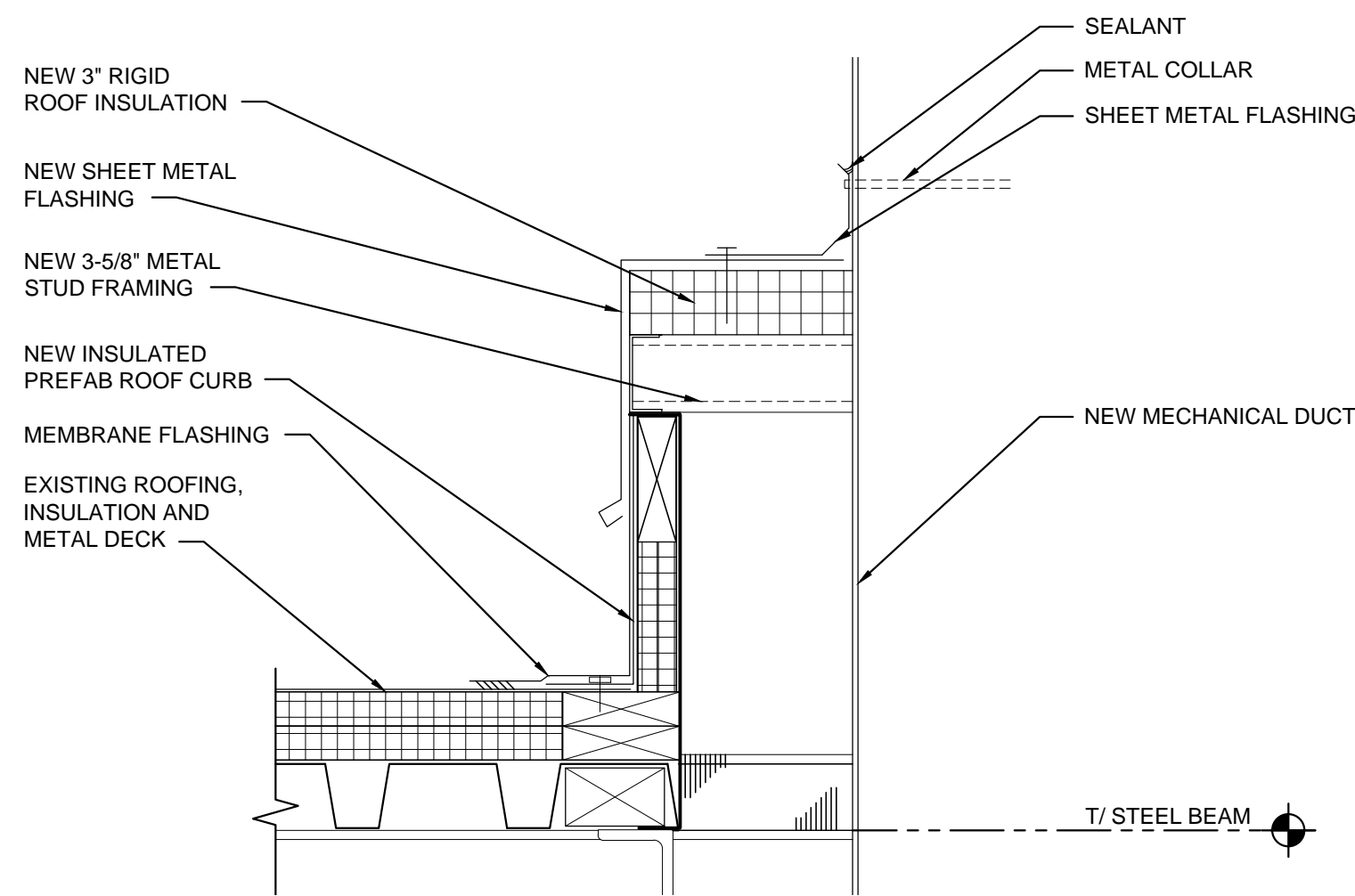
AE1-R1-01
SHEET NUMBER



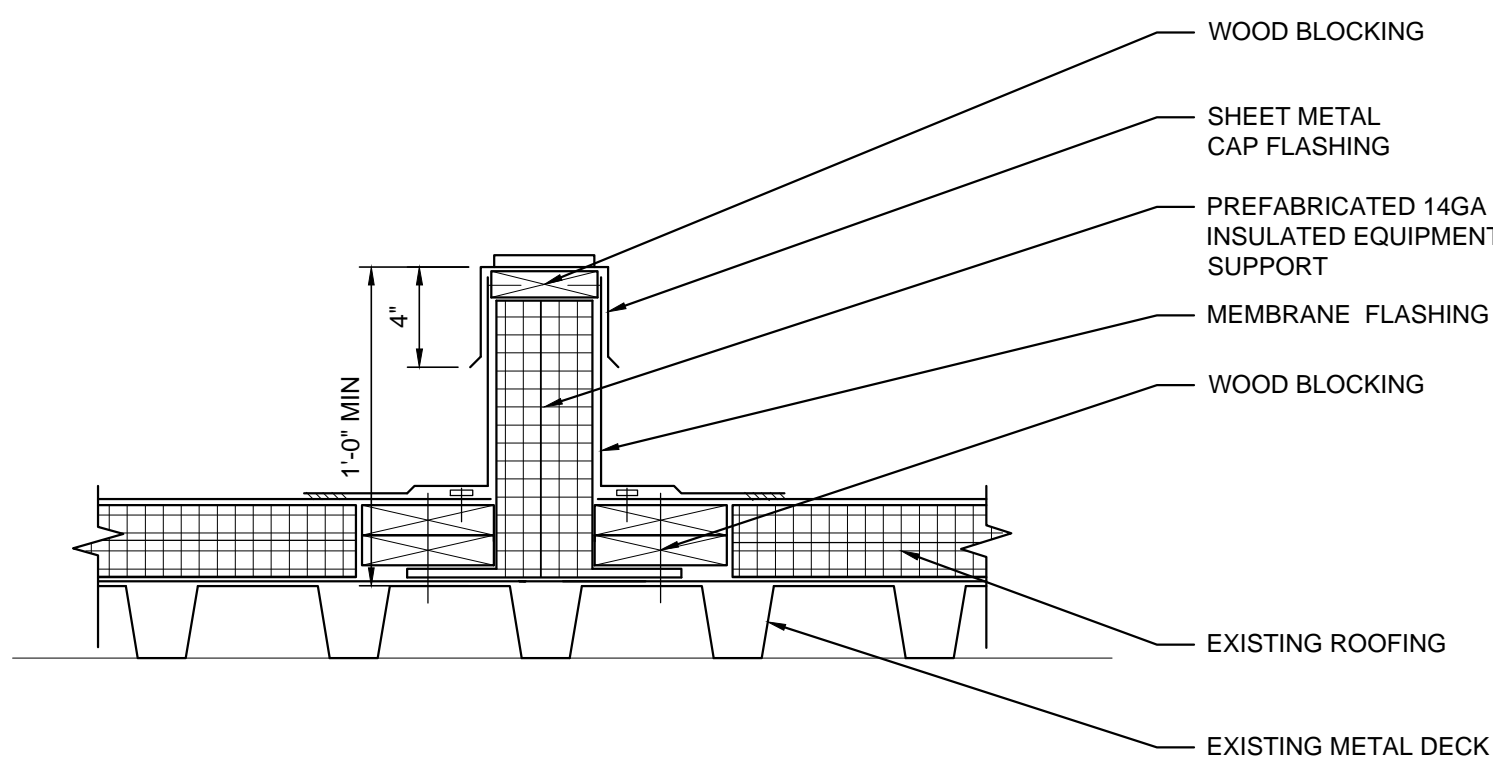


NOTE:
1. VERIFY NUMBER OF FRAMES, SIZE AND LOCATION WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.
2. SUPPORT FRAME TO BE USED WITH EQUIPMENT WEIGHING 2000 LBS OR LESS

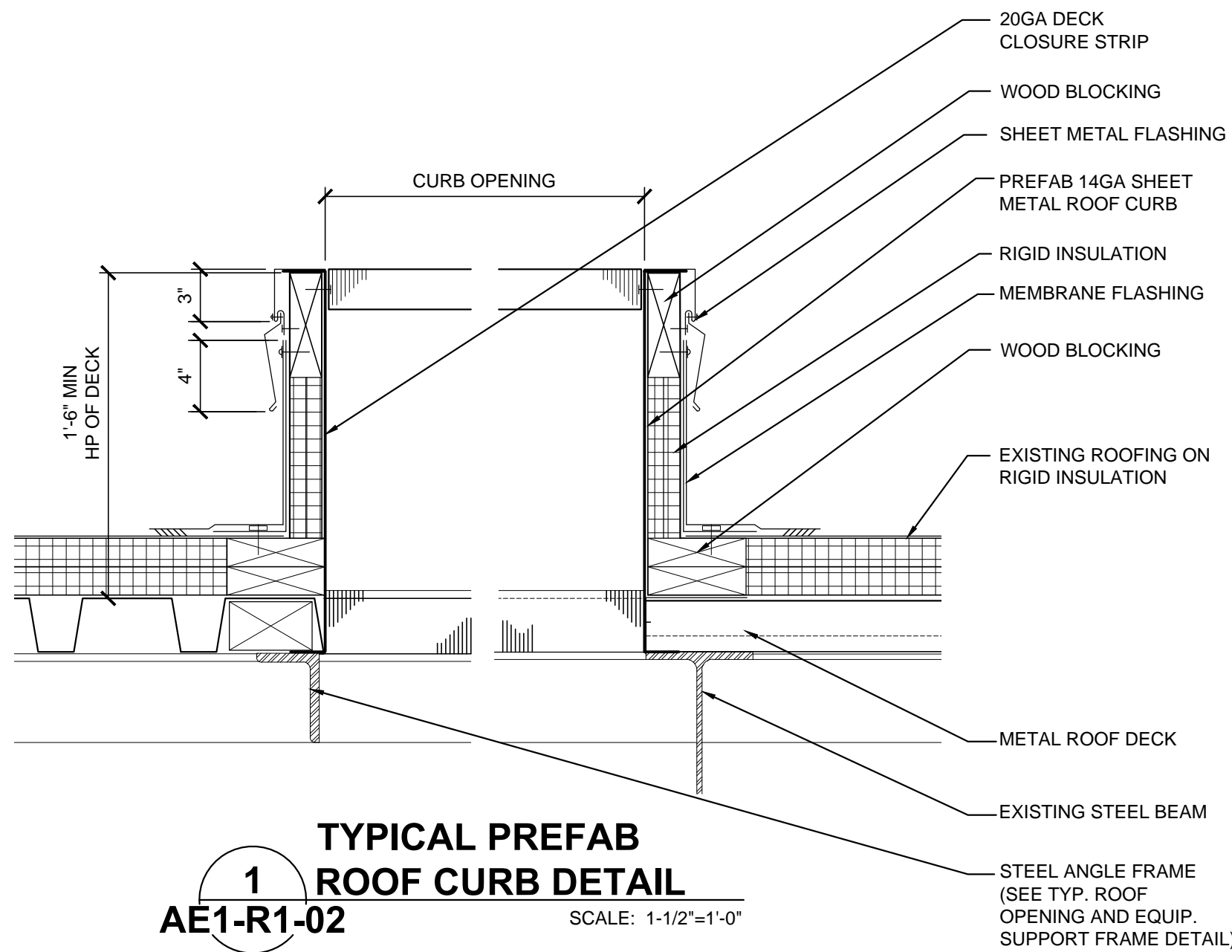
TYPICAL ROOF OPENING AND EQUIPMENT SUPPORT FRAME
NO SCALE



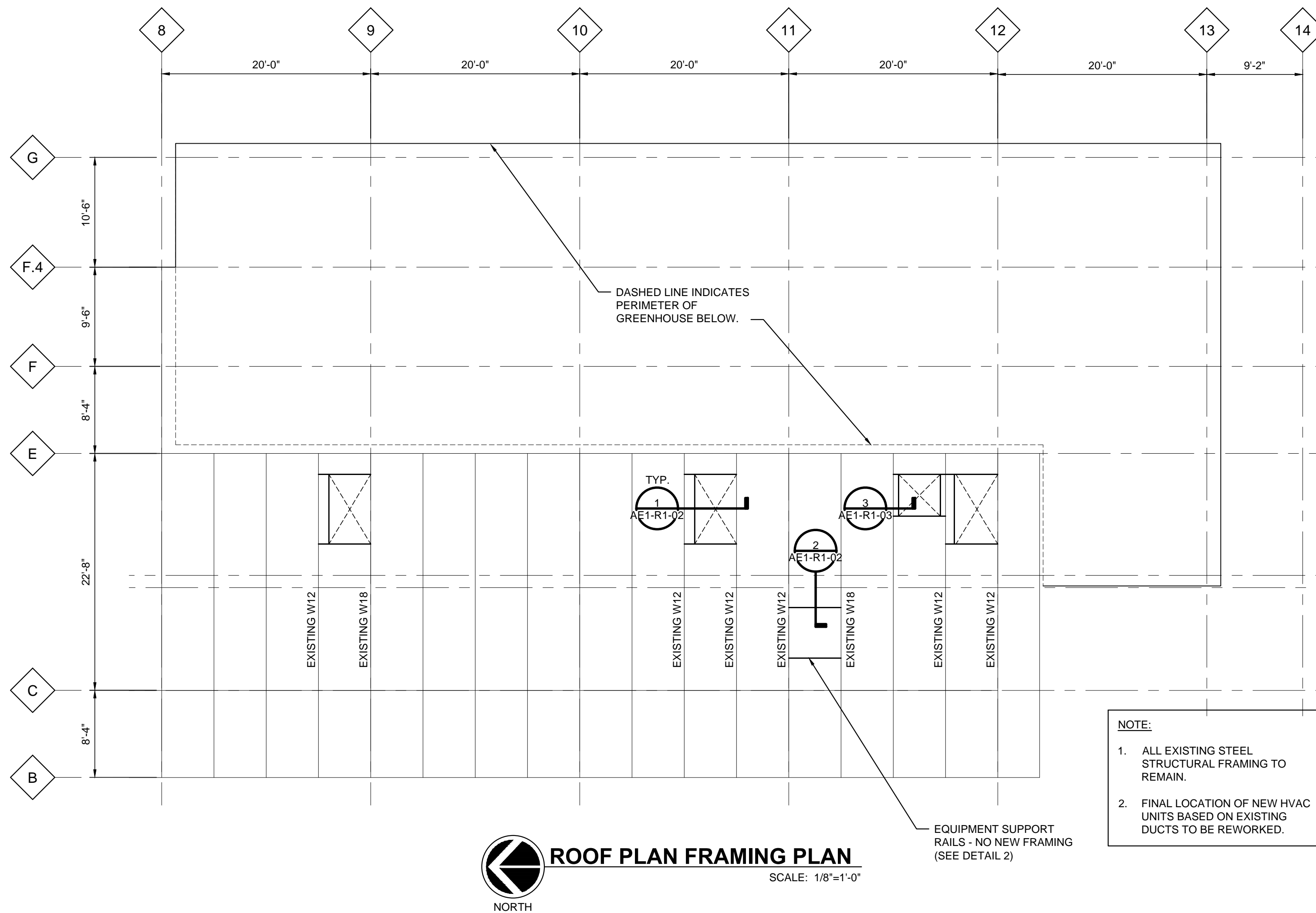
3 TYPICAL DETAIL AT DUCT PENETRATIONS
AE1-R1-02 SCALE: 1-1/2"=1'-0"



2 TYPICAL PREFAB EQUIPMENT SUPPORT DETAIL
AE1-R1-02 SCALE: 1-1/2"=1'-0"



1 TYPICAL PREFAB ROOF CURB DETAIL
AE1-R1-02 SCALE: 1-1/2"=1'-0"



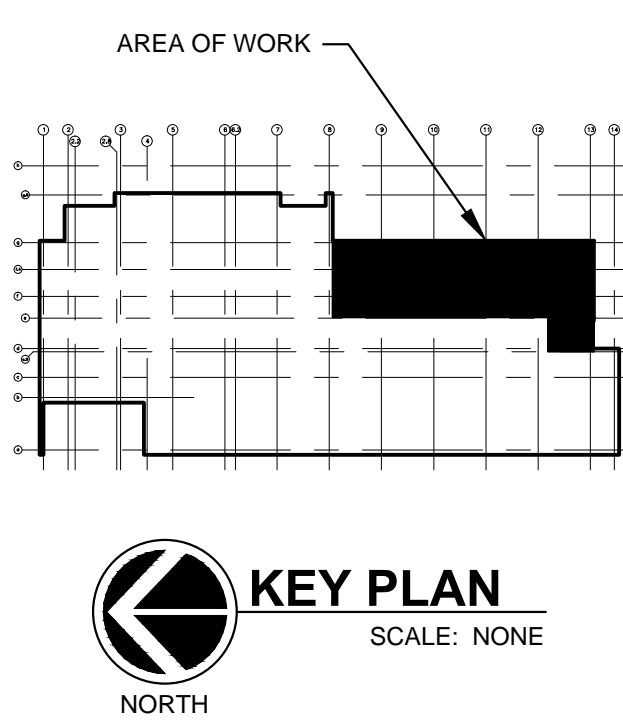
ROOF PLAN FRAMING PLAN
SCALE: 1/8"=1'-0"

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Dearborn, MI USA 48126
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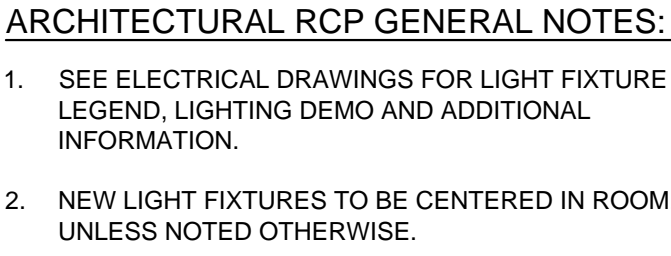
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	12/10/14	100% FINAL OWNER REVIEW
	11/14/14	FINAL OWNER REVIEW
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ROOF FRAMING PLAN AND DETAILS

AE1-R1-02
SHEET NUMBER



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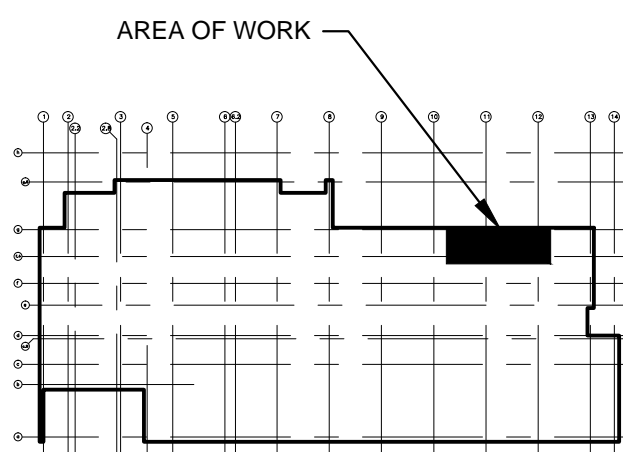
The floor plan shows the 1st floor layout with the following details:

- Grid System:** Columns 10, 11, and 12; Rows E, F, and G.
- Rooms and Dimensions:**
 - ELEC. MICRO 0370:** 20'-0" x 10'-6"
 - ELEC. MICRO 0372:** 20'-0" x 10'-6"
 - ELEC. MICRO 0374:** 20'-0" x 10'-6"
 - NO WORK 0376:** 20'-0" x 10'-6"
 - CORRIDOR NO WORK:** 9'-6" x 8'-4"
 - EQUIPMENT ROOM 0378:** 9'-6" x 8'-4"
 - NO WORK 0369:** 9'-6" x 8'-4"
 - DARK ROOM 0373:** 9'-8" x 9'-8"
 - NO WORK 0180:** 9'-8" x 9'-8"
- Other Features:**
 - Center Light in Room:** Located in the EQUIPMENT ROOM.
 - Lighting:** Indicated by a square symbol with a diagonal line.

NEW WORK RCP
- MICROSCOPY (LOWER LEVEL)

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

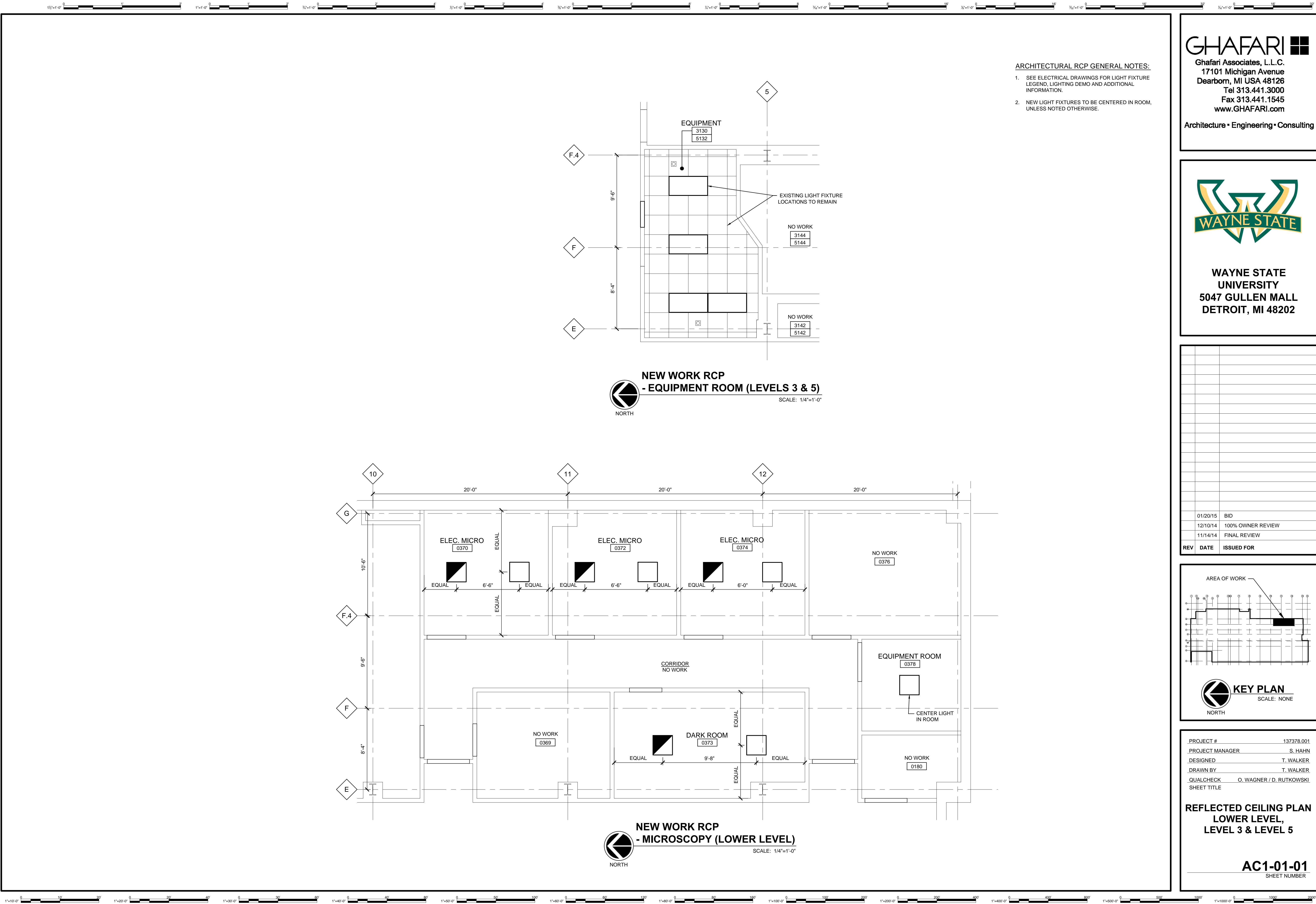
 NORTH



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PROJECT MANAGER	S. HAHN
DESIGNED	T. WALKER
DRAWN BY	T. WALKER
QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

**REFLECTED CEILING PLAN
LOWER LEVEL,
LEVEL 3 & LEVEL 5**

AC1-01-01
SHEET NUMBER



GENERAL NOTES:

1. THESE DETAILS ARE TO BE USED IN CONJUNCTION WITH THE REFERENCE DRAWINGS THAT ARE ISSUED AS PART OF THIS SET. THE REFERENCE DRAWINGS FURTHER ILLUSTRATE EXISTING CONDITIONS THAT WERE NOT VISIBLE OR ACCESSIBLE DURING THE TIME THESE DRAWINGS CREATED.

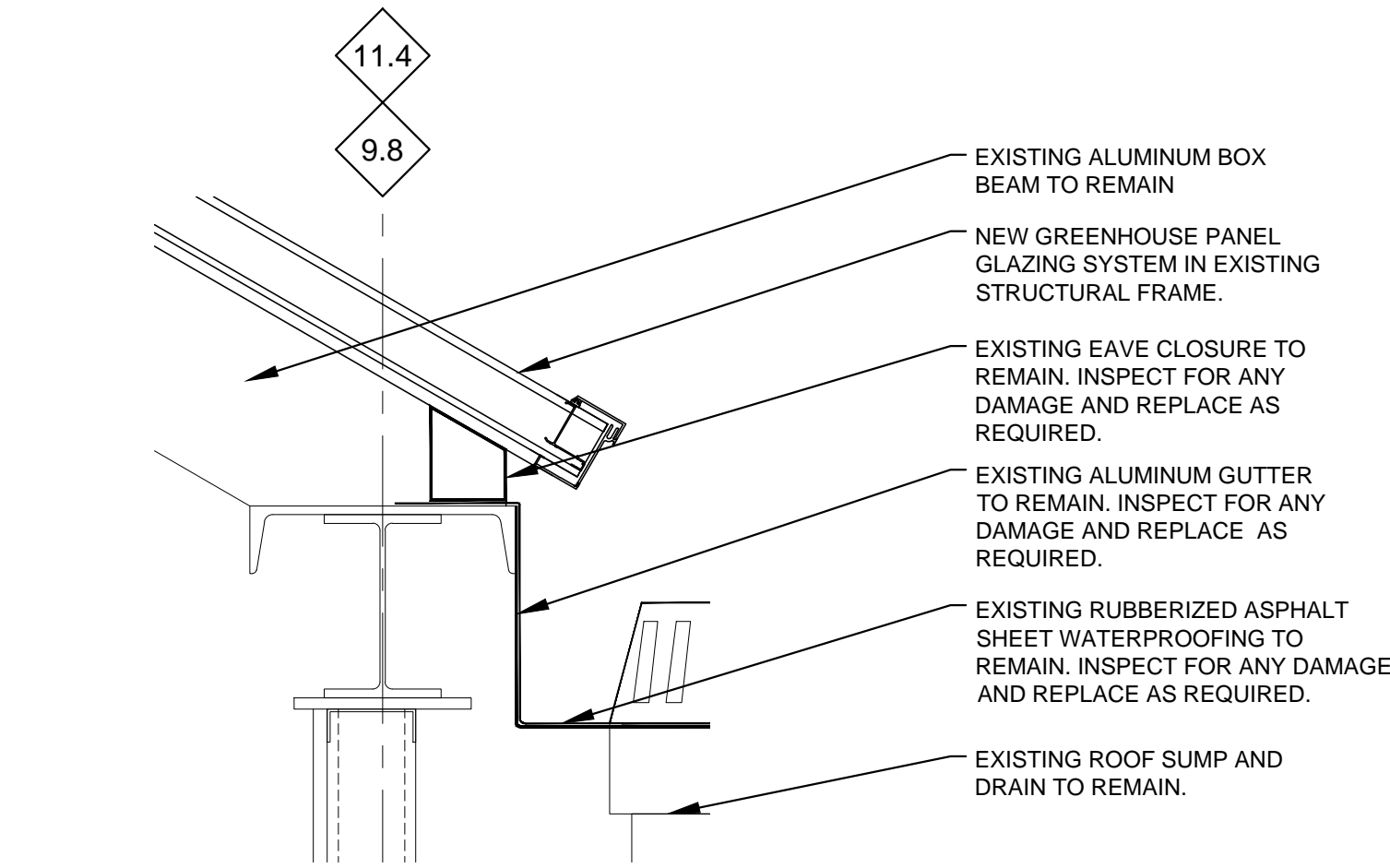
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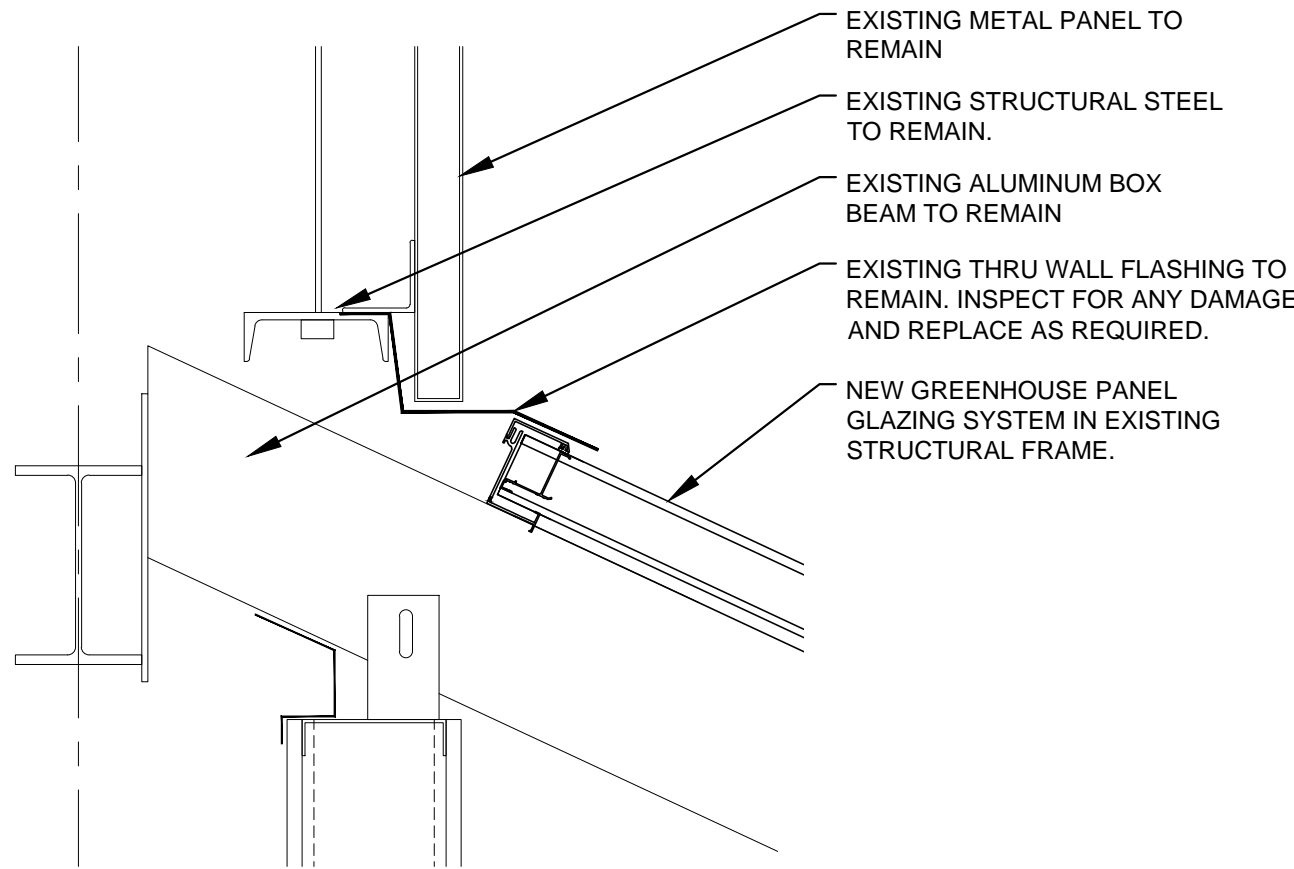
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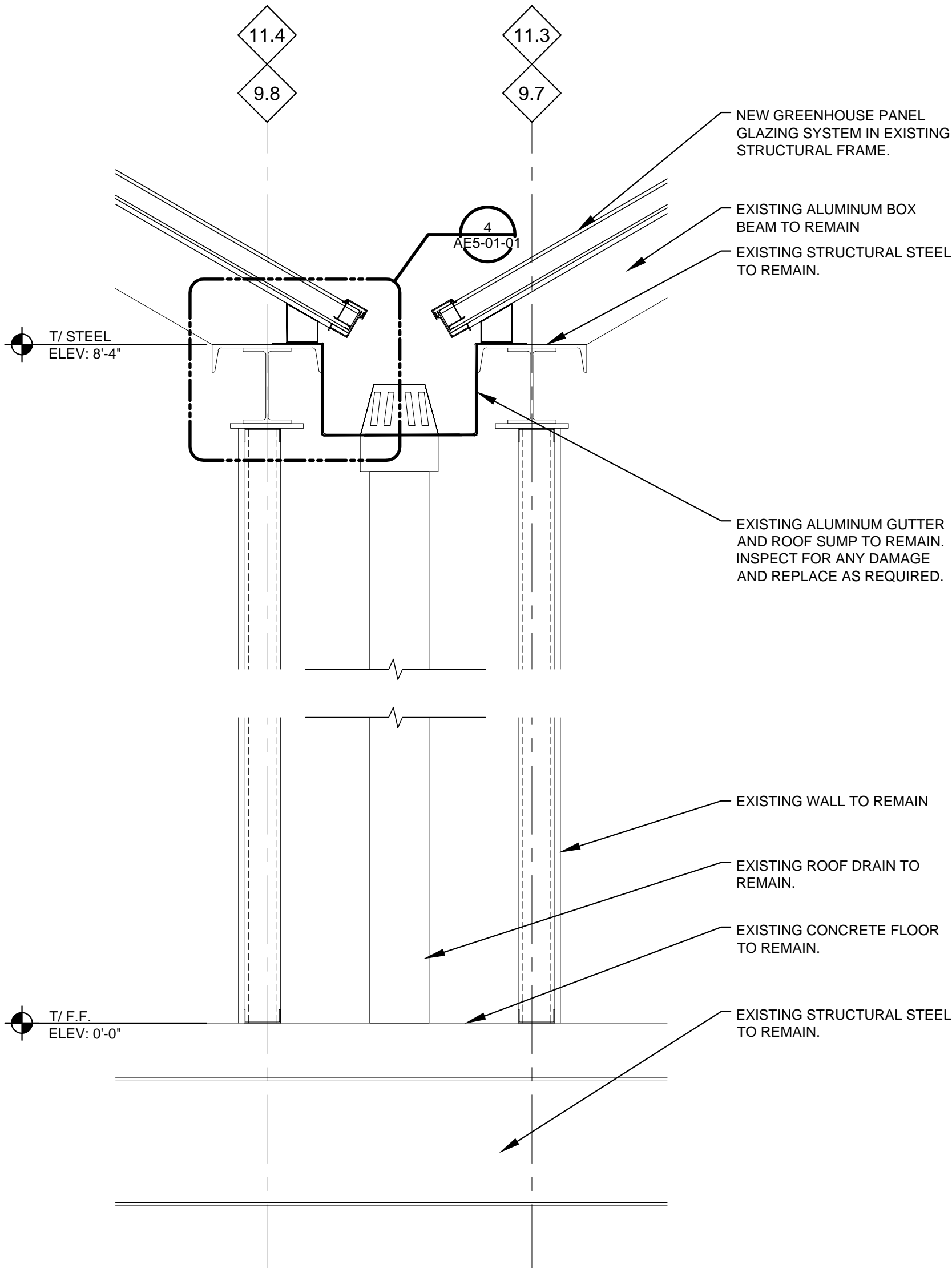
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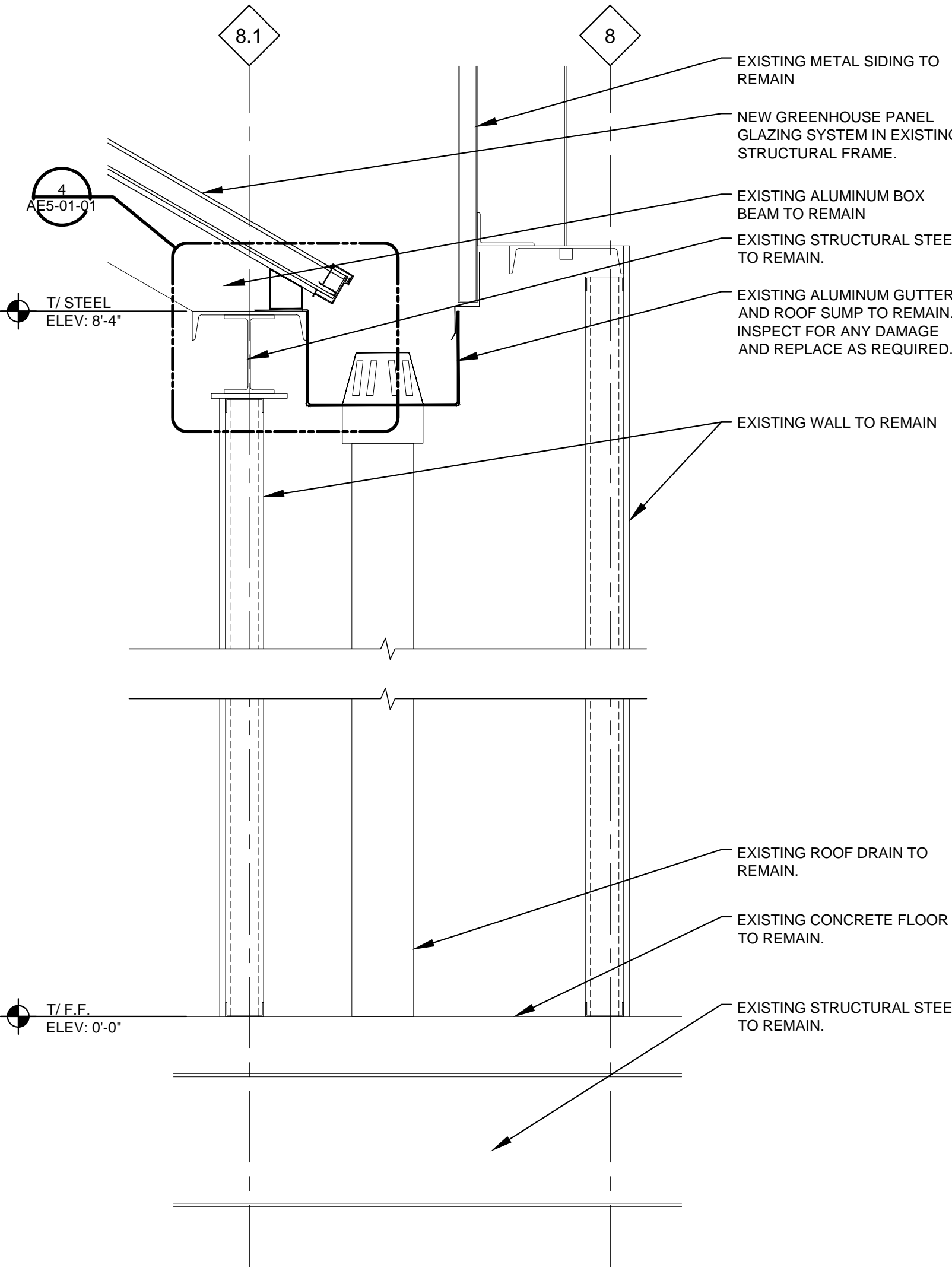
4 INTERNAL GUTTER
AE1-R1-01
SCALE: 1-1/2"=1'-0"



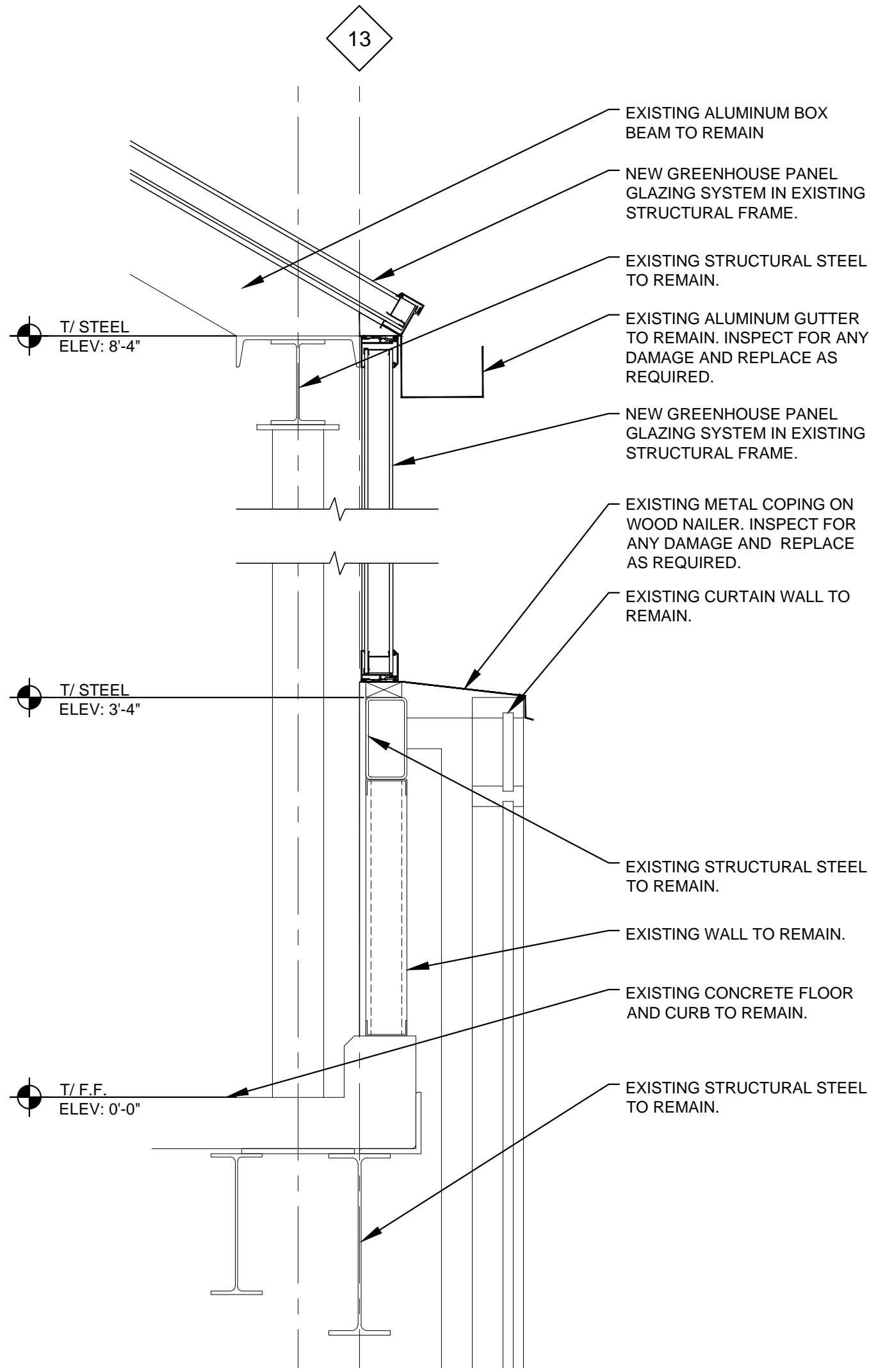
2 DETAIL AT EXISTING METAL PANEL
AE1-R1-01
SCALE: 1-1/2"=1'-0"



5 DETAIL AT INTERNAL GUTTER
AE1-R1-01
SCALE: 1"=1'-0"



3 DETAIL AT INTERNAL GUTTER
AE1-R1-01
SCALE: 1"=1'-0"



1 DETAIL AT EXISTING SILL WALL
AE1-R1-01
SCALE: 1"=1'-0"

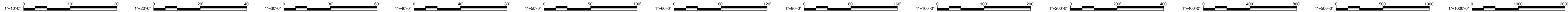
01/20/15	BID
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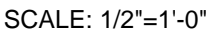
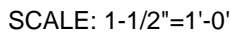
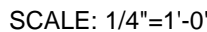
PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	T. WALKER
DRAWN BY	T. WALKER
QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

**GREENHOUSE
DETAILS**

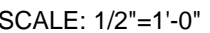
AE5-01-01
SHEET NUMBER



1. REFER TO SPECIFICATIONS FOR HARDWARE SETS
2. PART OF ALTERNATE #1.



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



1. REFER TO SPECIFICATIONS FOR MORE INFORMATION ON FINISHES.
2. PATCH AND REPAIR EXISTING GYPSUM BOARD CEILING THEN PAINT.
3. SET CEILING AT 8'-0" AFF.
4. PATCH AND REPAIR FLOOR AS NEEDED THEN THOROUGHLY CLEAN.
5. ALL VCT FLOORS TO BE CLEANED AND PREPPED PER OWNER REQUIREMENTS.
6. PART OF ALTERNATE #1
7. REPLACE DAMAGED CEILING TILES AS REQUIRED WITH ACT-1.

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION ON FINISHES)

VCT-1: VINYL COMPOSITE TILE

PT-4: SHERWIN WILLIAMS
MATCH EXISTING BEIGE
(SUITE 5155 DOORS/FRAMES, UNO)

WC-1: ANIT-MICROBIAL WALL SYSTEM

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[illegible]

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DESIGNED	T. WALKER
DRAWN BY	T. WALKER
QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

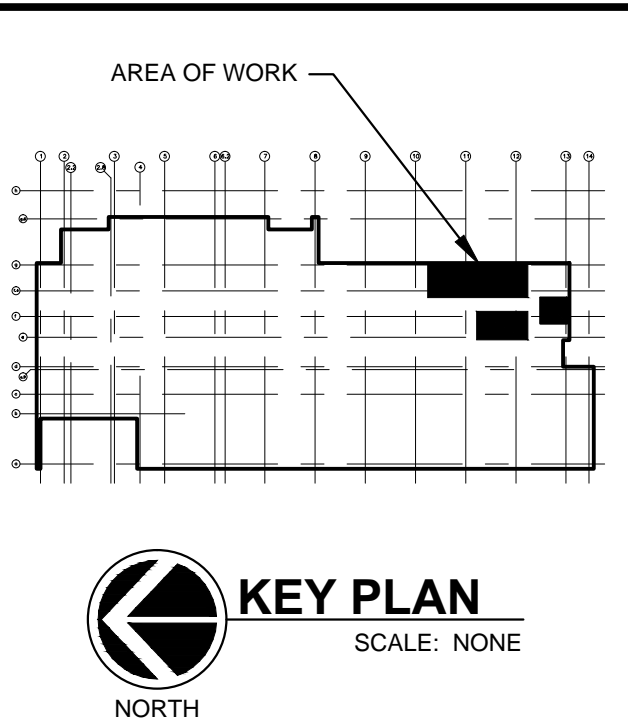
AE7-01-01
SHEET NUMBER





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	11/14/14	FINAL OWNER REVIEW
	10/31/14	90% OWNERS REVIEW UPDATE
	10/16/14	90% OWNER REVIEW



PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. HUSSAIN
DRAWN BY	W. WALKER
QUALCHECK	M. PETTIT D. RUTKOWSKI
SHEET TITLE	

**LOWER LEVEL
MECHANICAL FLOOR PLANS
DEMOLITION & NEW WORK**

M1-L1-01
SHEET NUMBER

MECHANICAL KEYED NOTES:

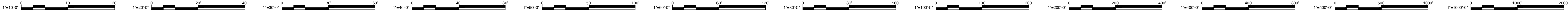
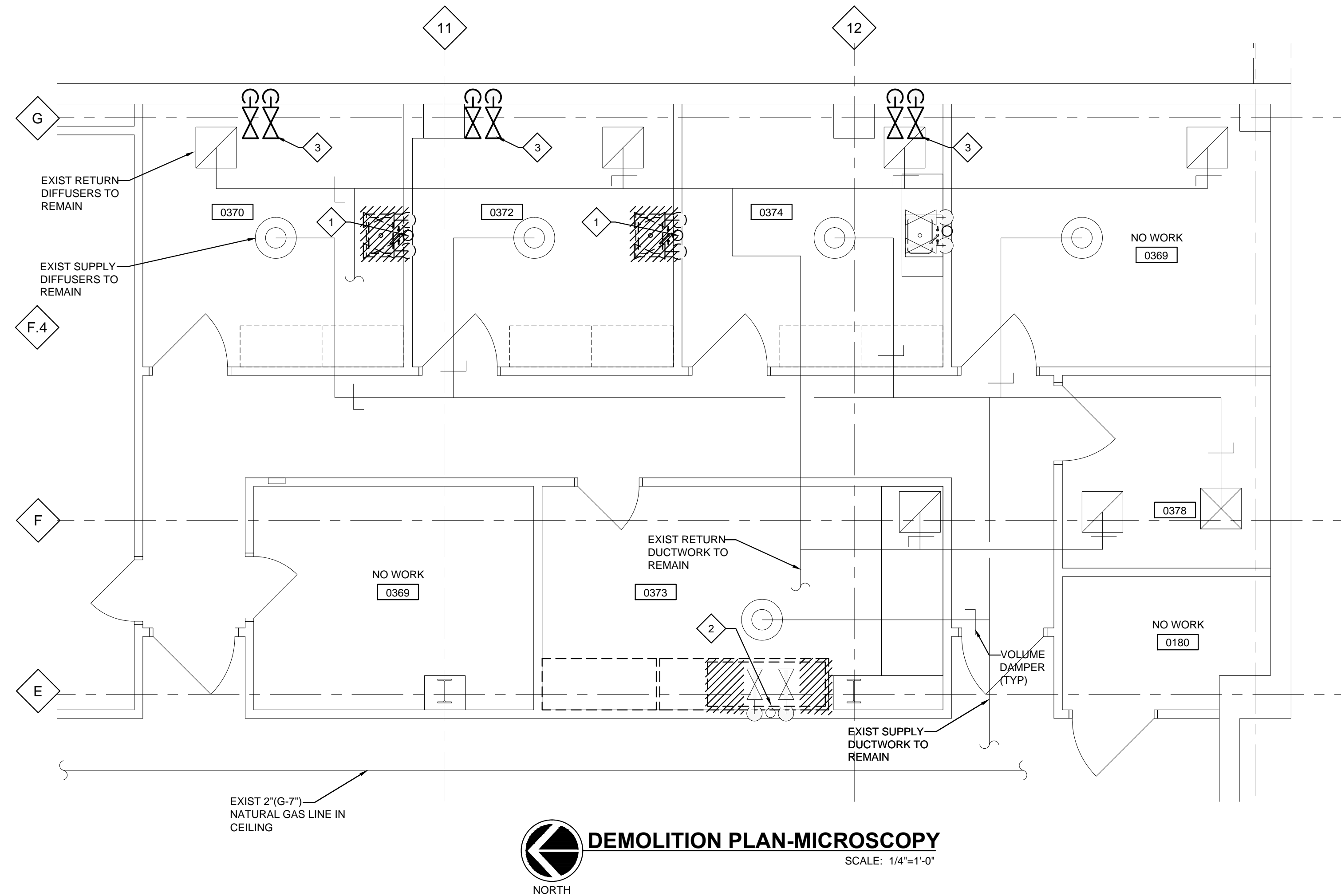
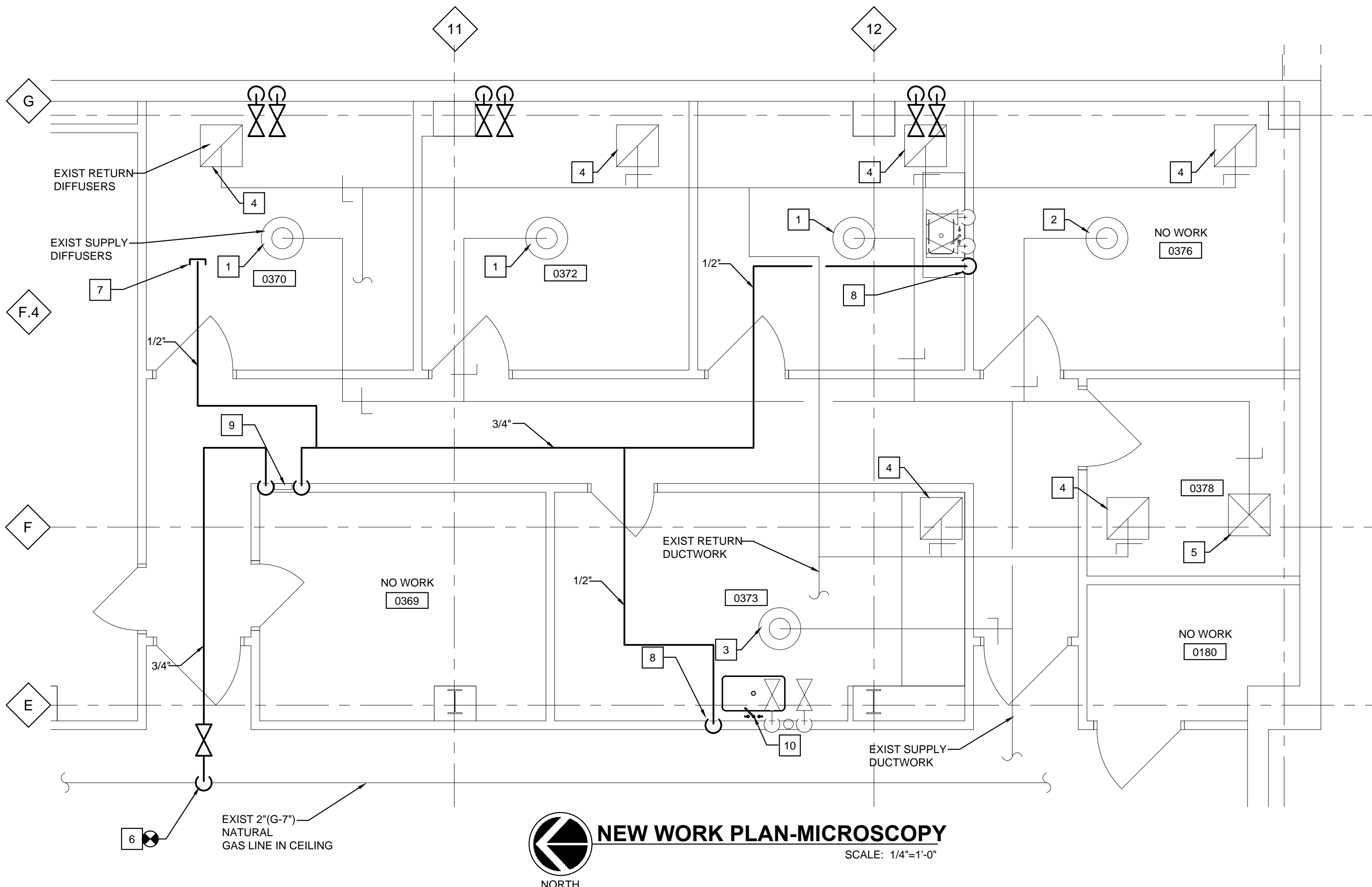
1. REBALANCE SUPPLY AIR TO 400 CFM AFTER CLEANING DIFFUSERS.
2. REBALANCE SUPPLY AIR TO 475 CFM AFTER CLEANING DIFFUSERS.
3. REBALANCE SUPPLY AIR TO 340 CFM AFTER CLEANING DIFFUSERS.
4. CLEAN RETURN AIR DIFFUSERS.
5. REBALANCE SUPPLY AIR TO 130 CFM AFTER CLEANING DIFFUSER
6. CONNECT NEW 3/4" NATURAL GAS TO EXISTING IN CORRIDOR. PROVIDE SHUT-OFF VALVE IN CORRIDOR.
7. PROVIDE 1/2" NATURAL GAS (G-7) TO ROOM AND CAP IN CEILING.
8. PROVIDE 1/2" NATURAL GAS LINE (G-7). PROVIDE DECK MOUNTED TURRET WITH ONE GAS VALVE.
9. PROVIDE NEW NATURAL GAS SHUT-OFF VALVE BOX IN WALL.
10. CONNECT EXIST HOT & COLD WATER, SANITARY AND VENT TO NEW SINK. CONNECT NEW SINK DRAIN TO EXIST SANITARY IN WALL.

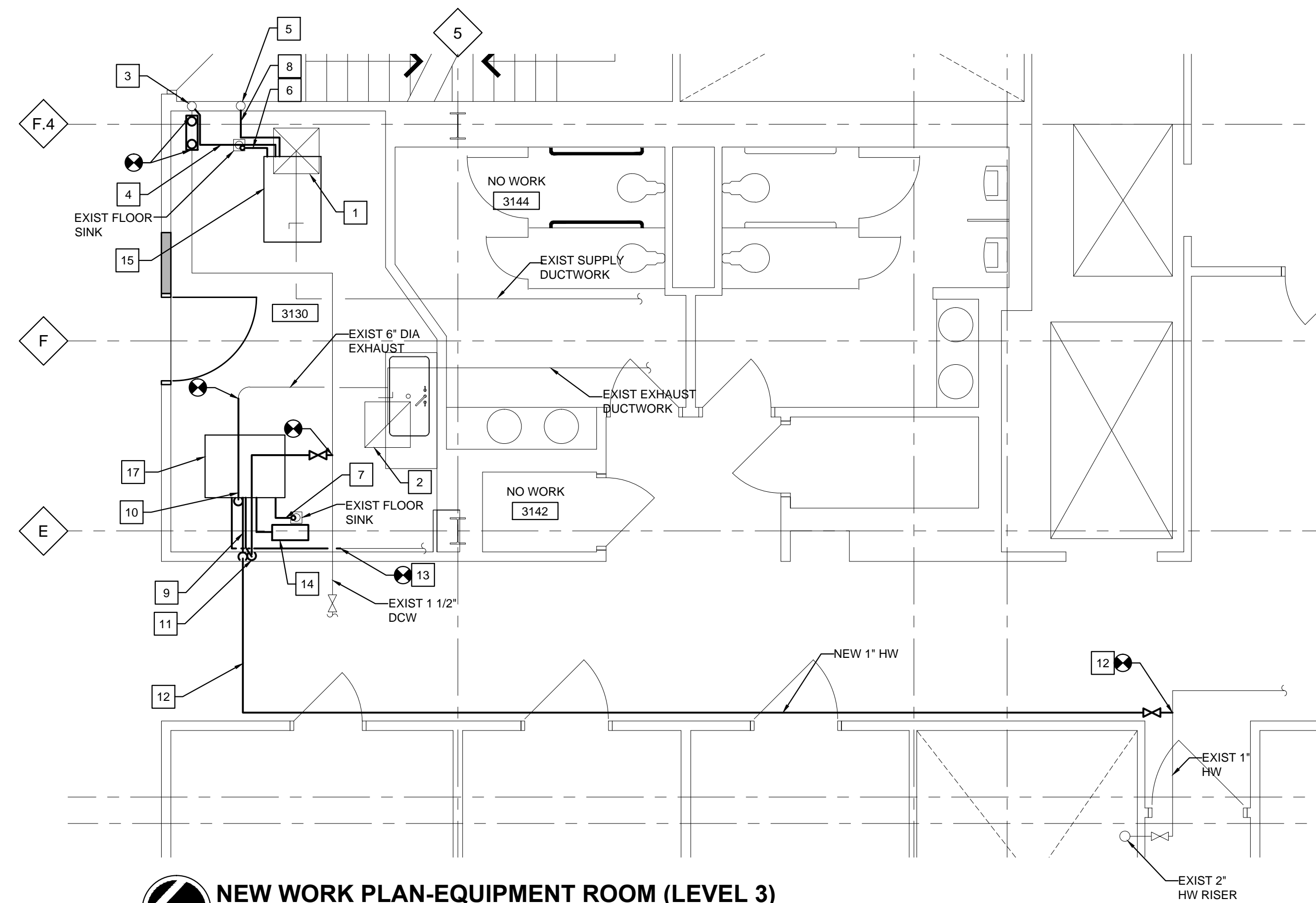
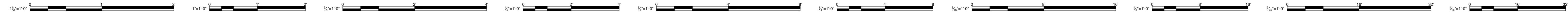
**MECHANICAL
DEMOLITION KEYED NOTES:**

1. REMOVE EXISTING WALL MOUNTED SINK. CUT AND CAP EXIST H & CW LINES AND SANITARY WASTE IN WALL. PATCH WALL. SEE ARCHITECTURAL DRAWING FOR REPAIR OF WALL.
2. REMOVE EXIST H & CW PIPING DOWNSTREAM OF ISOLATION VALVES. EXIST SANITARY IN WALL AND VENT PIPING TO REMAIN.
3. REMOVE HOSES AND CAP CHILLED WATER SUPPLY AND RETURN PIPING DOWNSTREAM OF VALVES. PLUG VALVES.

LEGEND:

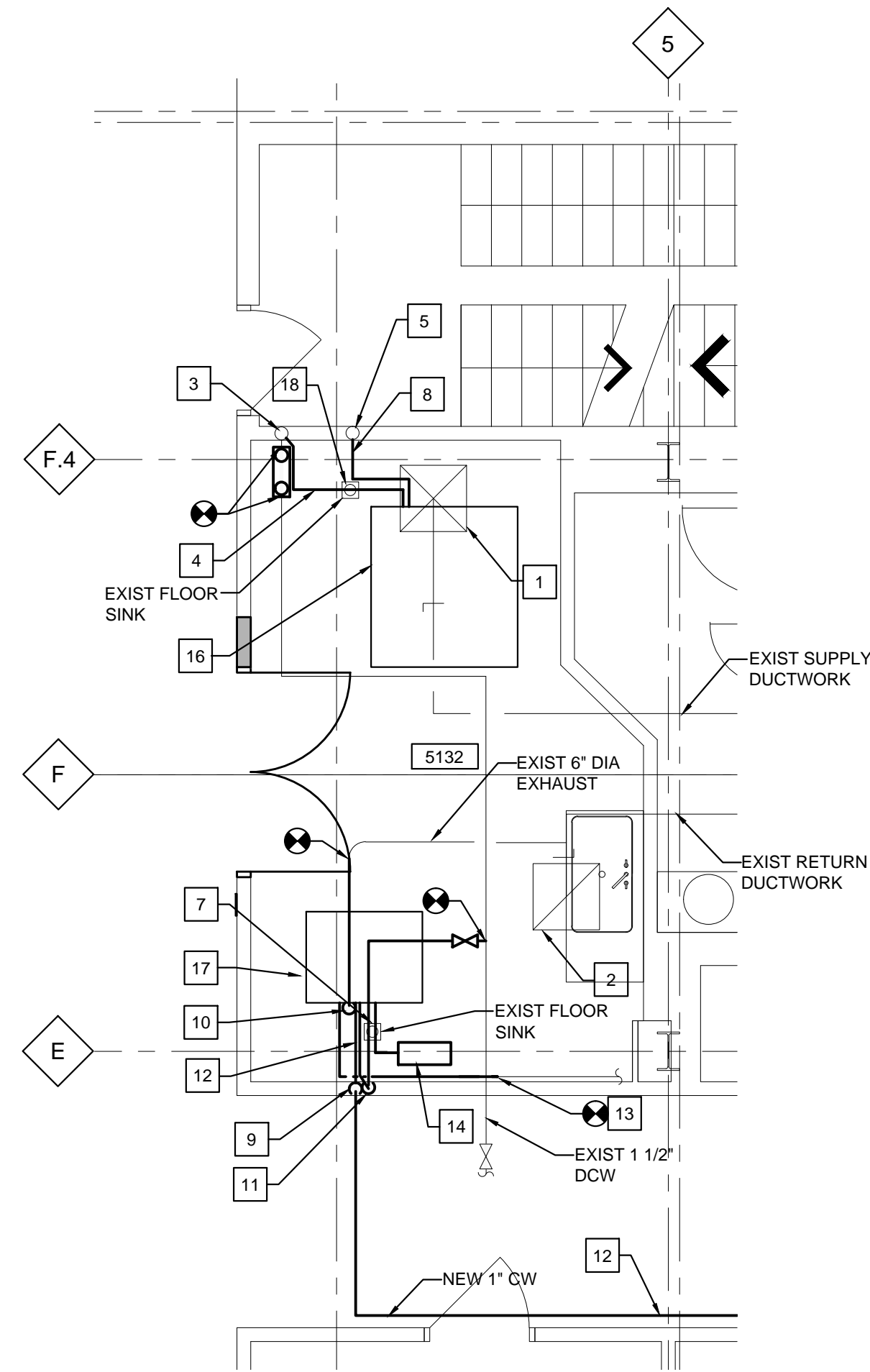
- EXISTING TO REMAIN
 EXISTING TO BE DEMOLISHED





NEW WORK PLAN-EQUIPMENT ROOM (LEVEL 3)
SCALE: 1/4"=1'-0"
NORTH

- MECHANICAL KEYED NOTES:**
1. REBALANCE SUPPLY AIR TO 550 CFM AFTER CLEANING DIFFUSERS.
 2. CLEAN RETURN AIR DIFFUSER.
 3. INSULATE ALL CW PIPING REMAINING AFTER THE DEMOLITION WORK.
 4. RUN 1" INSULATED CW LINE UP TO THE NEW STERILIZER. PROVIDE A NEW 1" BACKFLOW PREVENTER IN THIS LINE. PROVIDE DRAIN INSULATE ALL REMAINING STEAM PIPING IN ROOM.
 5. PROVIDE 2" DRAIN FROM STERILIZER TO EXIST FLOOR SINK.
 6. PROVIDE 2" DRAIN FROM GLASS WASHER TO EXIST FLOOR SINK.
 7. EXTEND NEW 1" STEAM (60#) TO NEW AUTOCLAVE.
 8. PROVIDE NEW 1" HOT WATER LINE TO NEW GLASSWASHER.
 9. PROVIDE NEW 6" DIA EXHAUST DUCT TO GLASSWASHER. CONNECT TO EXIST 6" DIA DUCT.
 10. PROVIDE NEW 1 1/4" CW LINE TO NEW GLASSWASHER.
 11. PROVIDE NEW 1" HOT WATER LINE DEDICATED TO NEW GLASSWASHER. PROVIDE SHUT-OFF VALVE. CONTRACTOR TO VERIFY TIE IN POINT.
 12. EXTEND EXISTING 3/4" DI WATER LINE TO NEW GLASSWASHER.
 13. NEW FLOOR MOUNTED AIR COMPRESSOR FOR GLASSWASHER. PROVIDE 1/2" CA LINE TO WASHER.
 14. NEW AUTOCLAVE, AMSCO LAB 250 (STERIS) OR EQUAL.
 15. NEW AUTOCLAVE, AMSCO CENTURY MEDIUM (STERIS) OR EQUAL.
 16. NEW GLASSWASHER, RELIANCE MODEL 400XLS (STERIS) OR EQUAL.
 17. PROVIDE 3" DRAIN FROM STERILIZER TO EXIST FLOOR SINK.



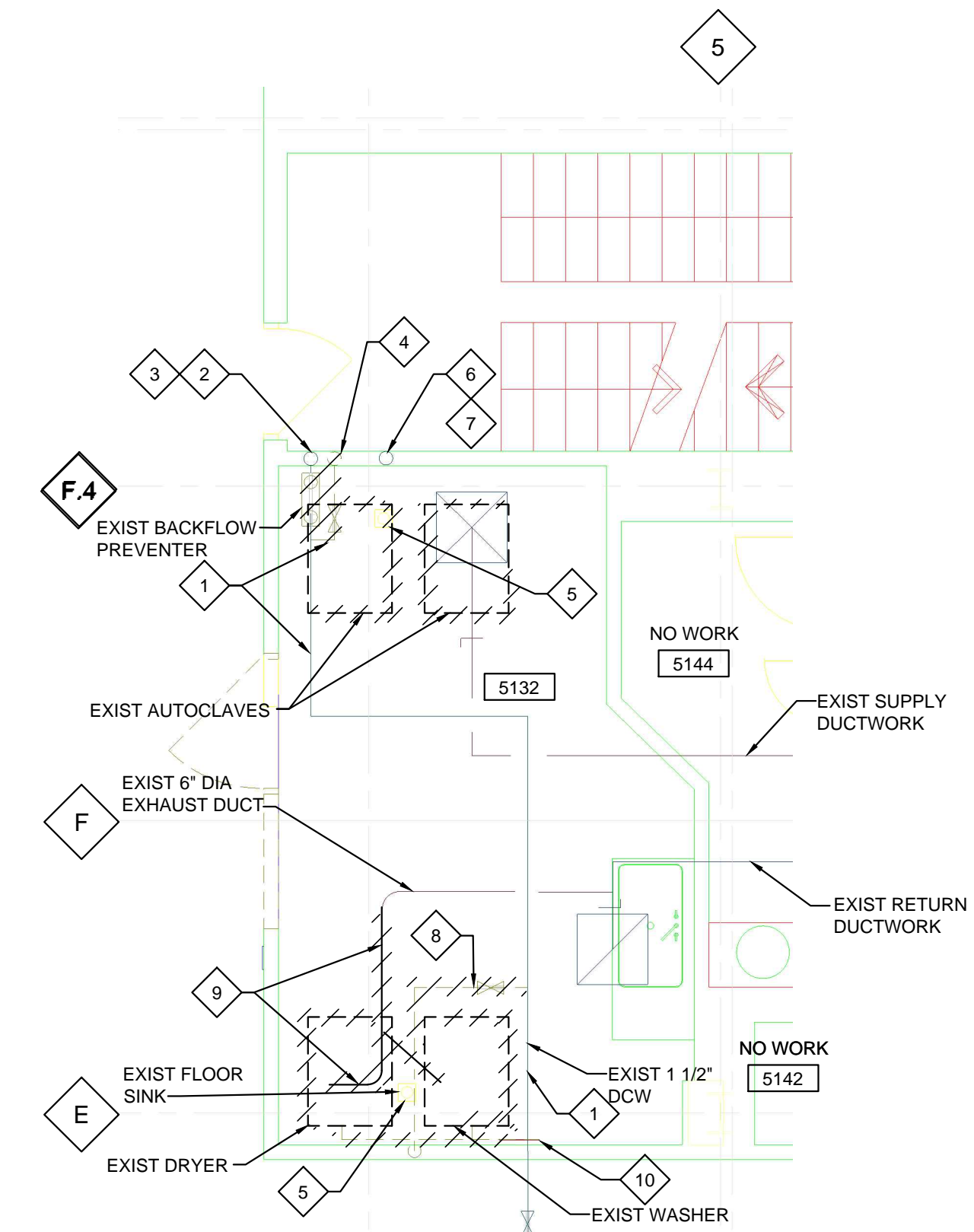
NEW WORK PLAN-EQUIPMENT ROOM (LEVEL 5)
SCALE: 1/4"=1'-0"
NORTH

- MECHANICAL DEMOLITION KEYED NOTES:**
1. EXISTING 1 1/2" CW LINE ABOVE THE CEILING SHALL REMAIN.
 2. EXISTING VERTICAL CDW LINE UP TO A POINT UPSTREAM OF THE EXISTING BACKFLOW PREVENTER SHALL REMAIN. INSULATION SHALL BE REMOVED FROM THE REMAINING PIPING WITHIN THE ROOM.
 3. EXISTING CW PIPING SHALL BE REMOVED STARTING AT THE BACKFLOW PREVENTER AND UP TO THE EXISTING AUTOCLAVE (STERILIZER).
 4. REMOVE ALL EXISTING 1 1/4" CDW PIPING WITHIN THE ROOM UP TO A POINT 7'-0" AFF AND CAP OFF.
 5. CLEAN EXISTING FLOOR SINK.
 6. EXISTING STEAM LINE UP TO A POINT DOWNSTREAM OF THE ISOLATION VALVE SHALL REMAIN. INSULATION SHALL BE REMOVED FROM THE REMAINING PIPING WITHIN THE ROOM.
 7. REMOVE ALL EXISTING 1 1/4" STEAM PIPING STARTING AT DOWNSTREAM OF THE ISOLATION VALVE AND UP TO THE EXISTING STERILIZER.
 8. EXIST 3/4" CW LINE TO BE REMOVED BACK TO MAIN.
 9. REMOVE EXIST 6" DIA. DRYER AND WASHER EXHAUST DUCT BACK TO LOCATION SHOWN. CLEAN REMAINING DUCT.
 10. EXISTING 3/4" DI WATER SUPPLY LINE TO REMAIN. REMOVE EXISTING PIPING TO WASHER AND DRYER.

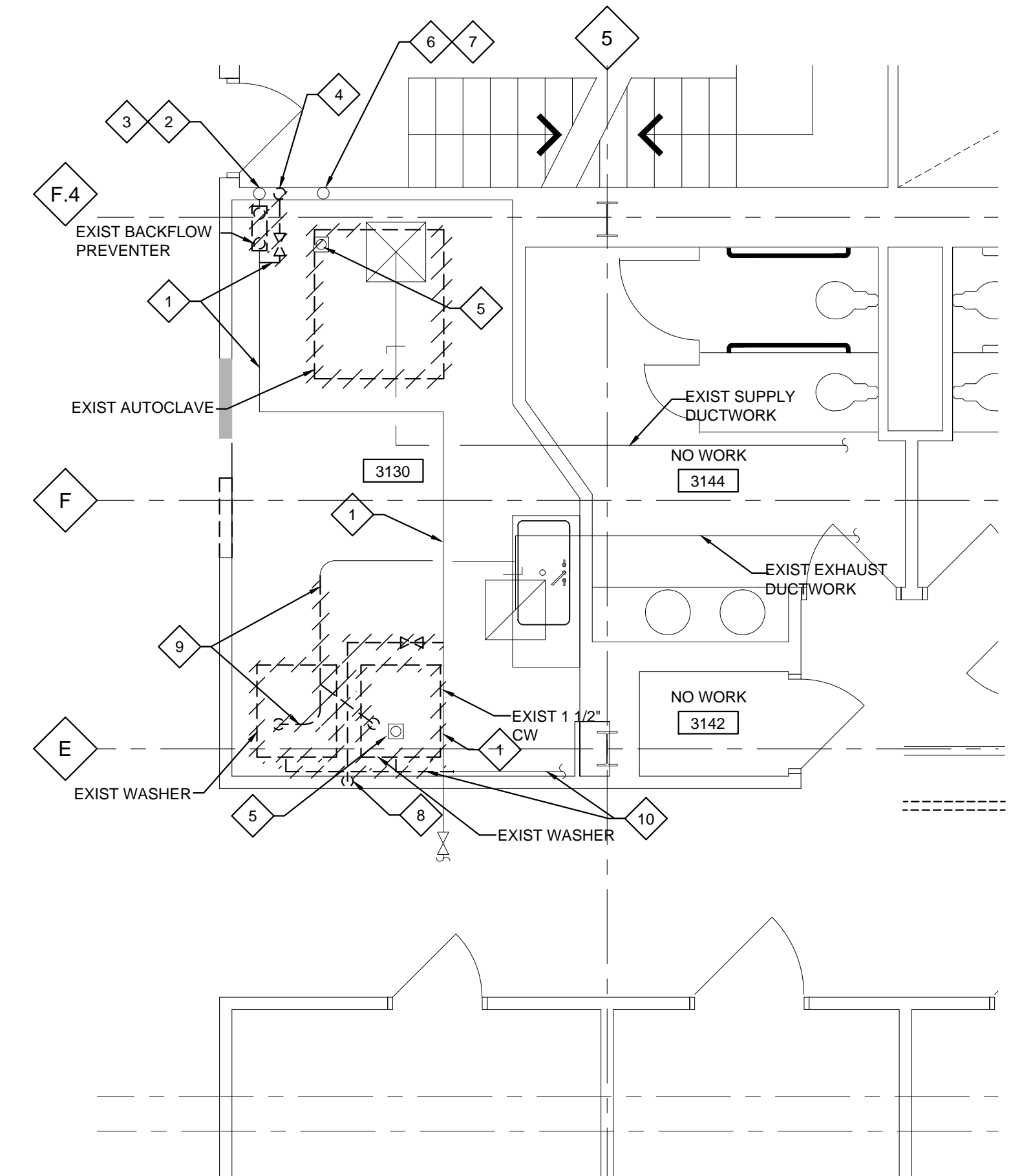
LEGEND:

— EXISTING TO REMAIN

--- EXISTING TO BE DEMOLISHED



DEMOLITION PLAN-EQUIPMENT ROOM (LEVEL 5)
SCALE: 1/4"=1'-0"
NORTH



DEMOLITION PLAN-EQUIPMENT ROOM (LEVEL 3)
SCALE: 1/4"=1'-0"
NORTH

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Ghafari Associates, L.L.C.
17101 Michigan Avenue
Dearborn, MI USA 48126
Tel 313.441.3000
Fax 313.441.1545
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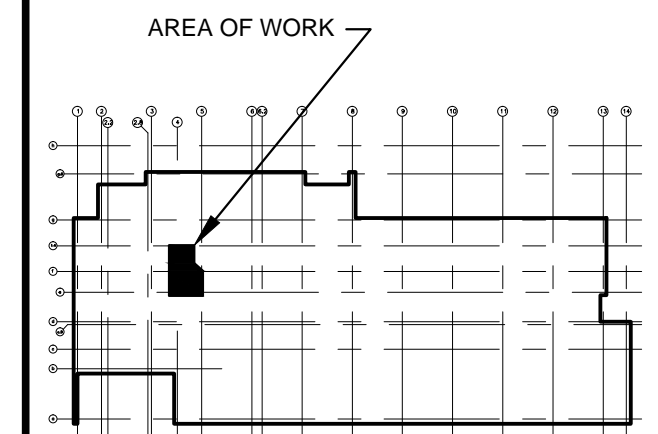
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10/31/14	90% OWNER REVIEW UPDATE
10/16/14	90% OWNER REVIEW

REV DATE ISSUED FOR



KEY PLAN
SCALE: NONE
NORTH

PROJECT # 137378.001
PROJECT MANAGER S. HAHN
DESIGNED M. HUSSAIN
DRAWN BY W. WALKER
QUALCHECK M. PETTIT D. RUTKOWSKI
SHEET TITLE

LEVEL THREE/FIVE MECHANICAL FLOOR PLANS DEMOLITION & NEW WORK

M1-03-01
SHEET NUMBER

1/16/2015 7:34:51 AM WALKER G:\Projects\2013\137378 WSU Bio Science Bldg Greenhouse Assessment\Cad\Working Drawings\137378M1-03-01.dwg

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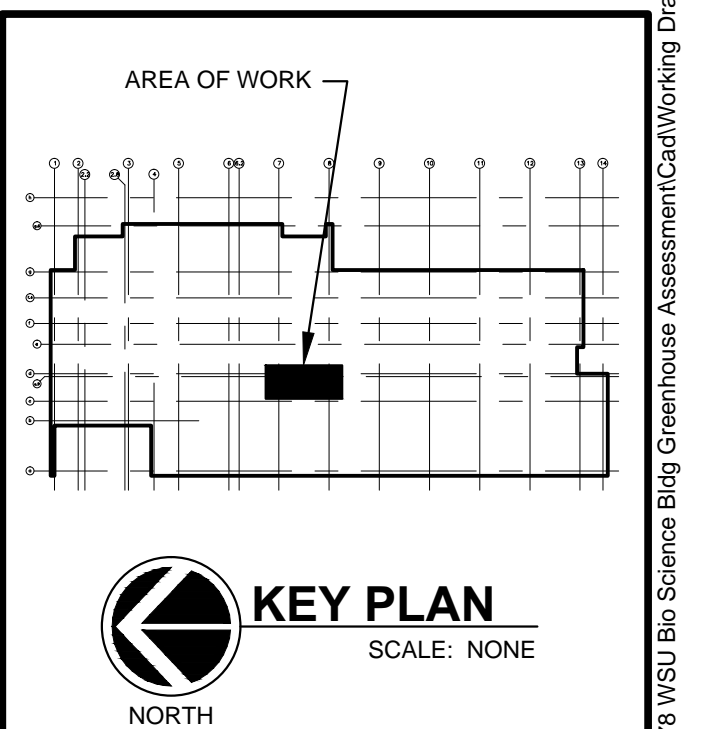
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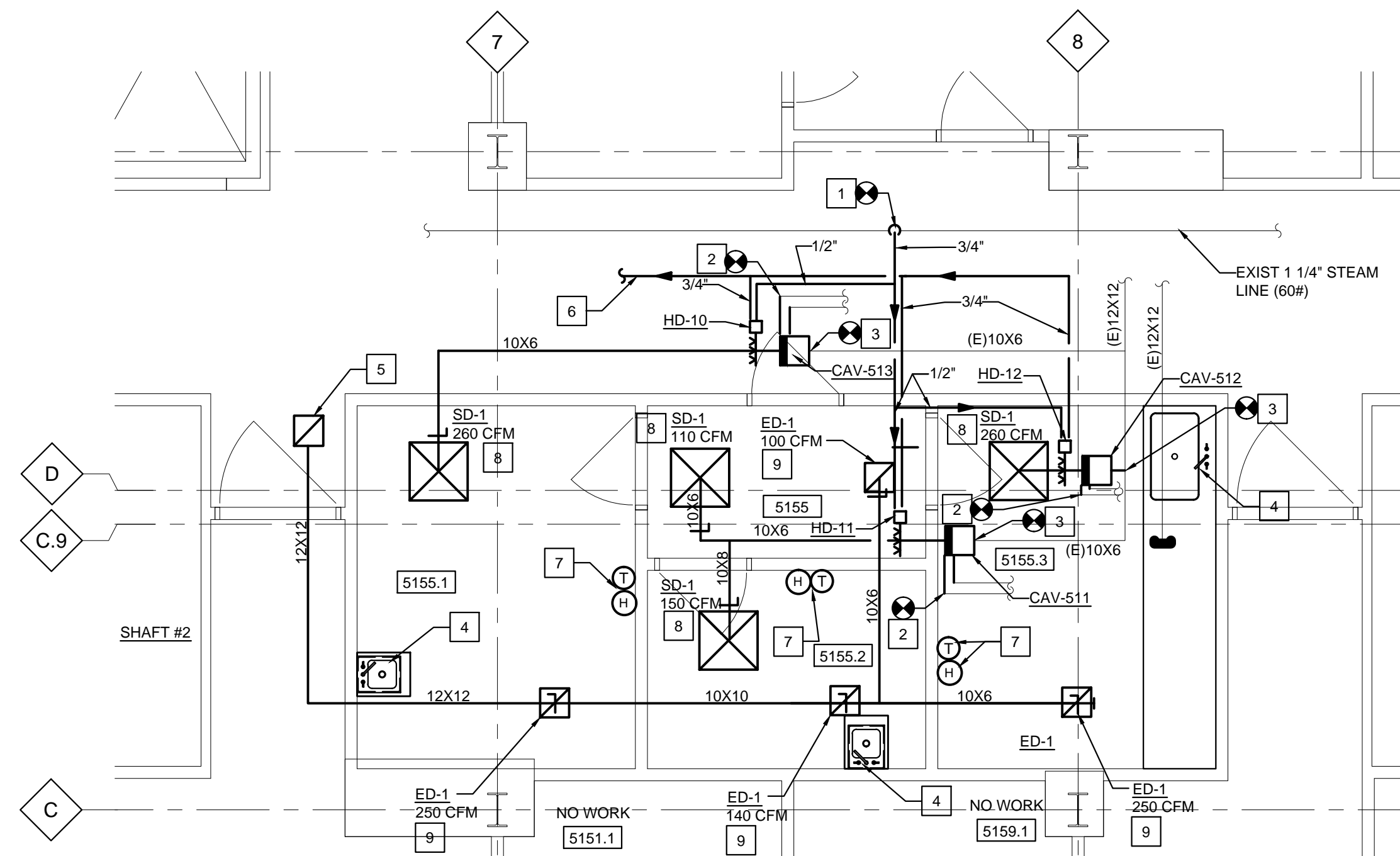
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	10/16/14	90% OWNER REVIEW



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PROJECT MANAGER	S. HAHN
DESIGNED	M. HUSSAIN
DRAWN BY	W. WALKER
QUALCHECK	M. PETTIT D. RUTKOWSKI
SHEET TITLE	

ALTERNATE #1
MECHANICAL FLOOR PLANS
DEMOLITION & NEW WORK

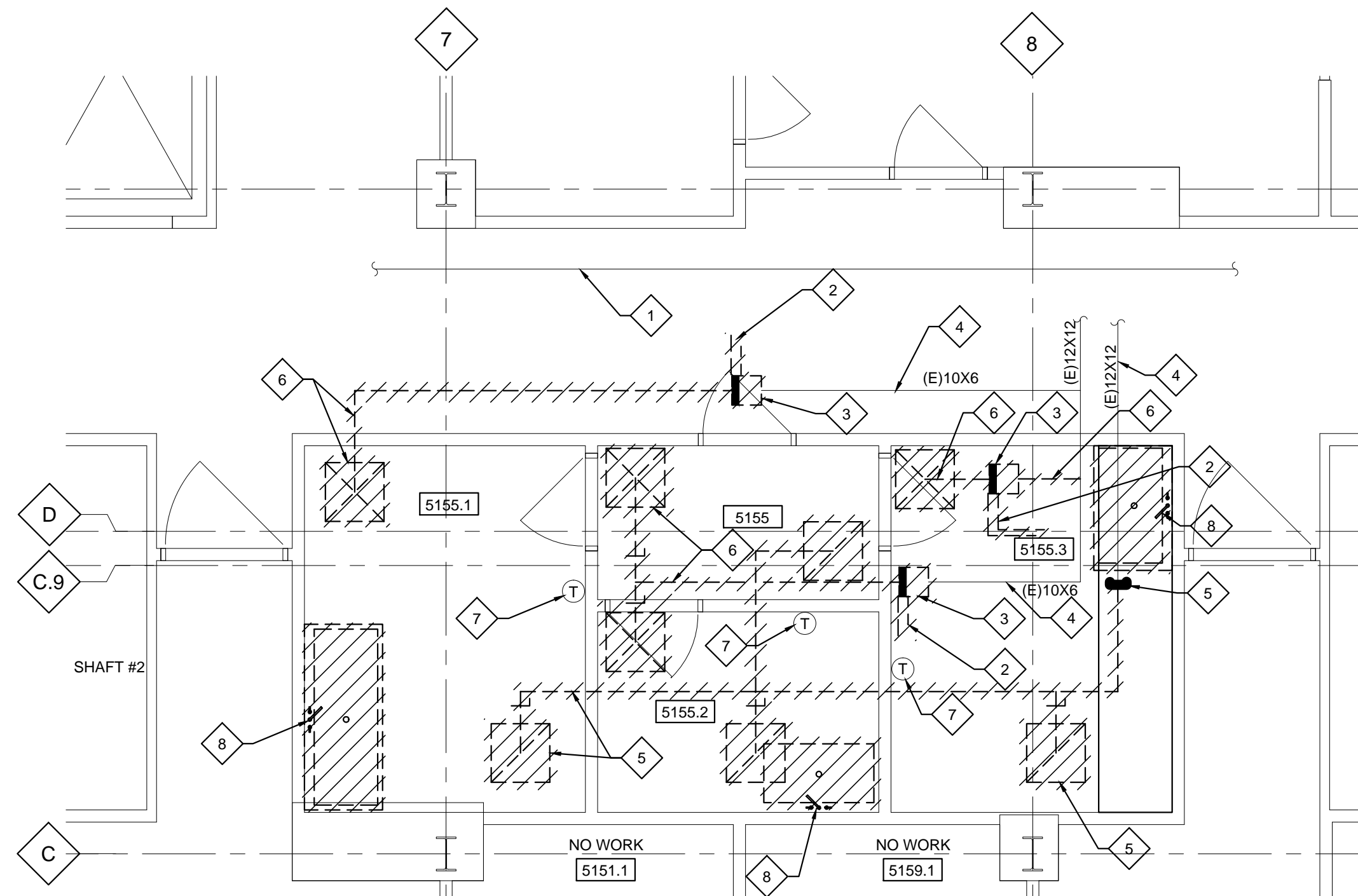
M1-05-01
SHEET NUMBER



NEW WORK PLAN-SUITE 5155
SCALE: 1/4"=1'-0"
NORTH

MECHANICAL KEYED NOTES:

1. TIE INTO EXIST 1 1/4" STM. LINE WITH NEW 3/4" (60#) FOR NEW HUMIDIFIERS.
2. RECONNECT NEW CONSTANT VOLUME BOX TO EXIST HEATING HOT WATER LINES.
3. CONNECT NEW CONSTANT VOLUME BOX TO EXIST DUCTWORK.
4. CONNECT NEW SINK TO EXIST H & CW, SAN AND VENT.
5. 12"X12" EXHAUST DUCT UP TO EF-20 ON ROOF. SEE SHT. M1-R1-01 FOR LOCATION.
6. PROVIDE NEW 3/4" CONDENSATE RETURN LINE. TIE NEW 3/4" LINE TO EXIST CONDENSATE RISER IN SHAFT #2.
7. PROVIDE NEW THERMOSTAT AND HUMIDISTAT AND ASSOCIATED WIRING.
8. SD-1 SHALL BE TITUS MODEL TLF-AA, 8" COLLAR, 24"X24" FACE C/W 95% DUST SPOT EFFICIENCY FILTER OR EQUIVALENT.
9. ED-1 SHALL BE TITUS MODEL 350RL, 8"X8" NECK OR EQUIVALENT.



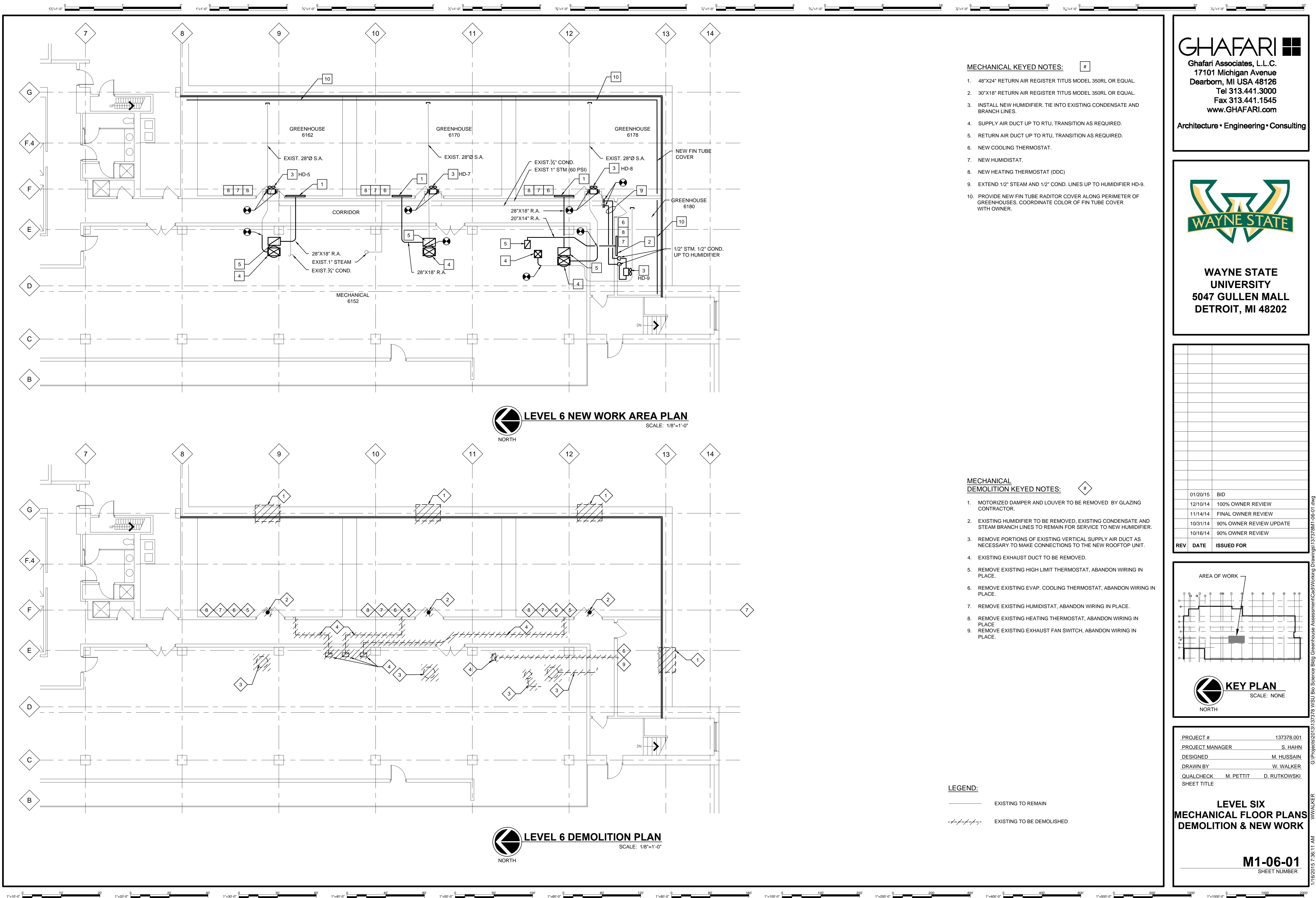
MECHANICAL
DEMOLITION KEYED NOTES:

1. EXISTING 1 1/4" STEAM LINE (60 PSI) TO REMAIN.
2. REMOVE EXISTING HEATING HOT WATER PIPING (SUPPLY & RETURN) SERVING THE EXISTING CONSTANT VOLUME BOX AND CAP TEMPORARILY.
3. REMOVE EXISTING CONSTANT VOLUME BOX. REMOVE DUCTWORK TO THE EXTENT REQUIRED.
4. EXISTING SUPPLY AND EXHAUST AIR DUCTS TO REMAIN.
5. REMOVE EXISTING EXHAUST DUCTWORK AND DIFFUSERS. CAP EXHAUST DUCTWORK AT THIS POINT.
6. EXISTING SUPPLY AIR DUCTWORK AND ASSOCIATED SUPPLY DIFFUSERS TO BE REMOVED.
7. REMOVE EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING.
8. REMOVE EXISTING SINK AND ASSOCIATED PIPING. EXISTING H & CW, SAN AND VENT TO REMAIN FOR INSTALLATION OF NEW SINKS. SEE ABOVE

LEGEND:

- EXISTING TO REMAIN
- - - - - EXISTING TO BE DEMOLISHED

DEMOLITION PLAN-SUITE 5155
SCALE: 1/4"=1'-0"
NORTH



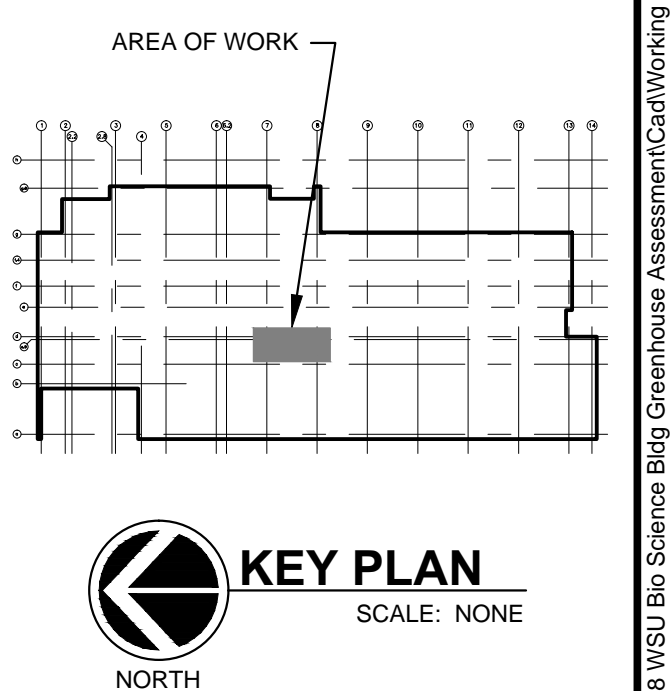
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Ghafari Associates, L.L.C.
17101 Michigan Avenue
Dearborn, MI USA 48126
Tel 313.441.3000
Fax 313.441.1545
www.GHAFAARI.com

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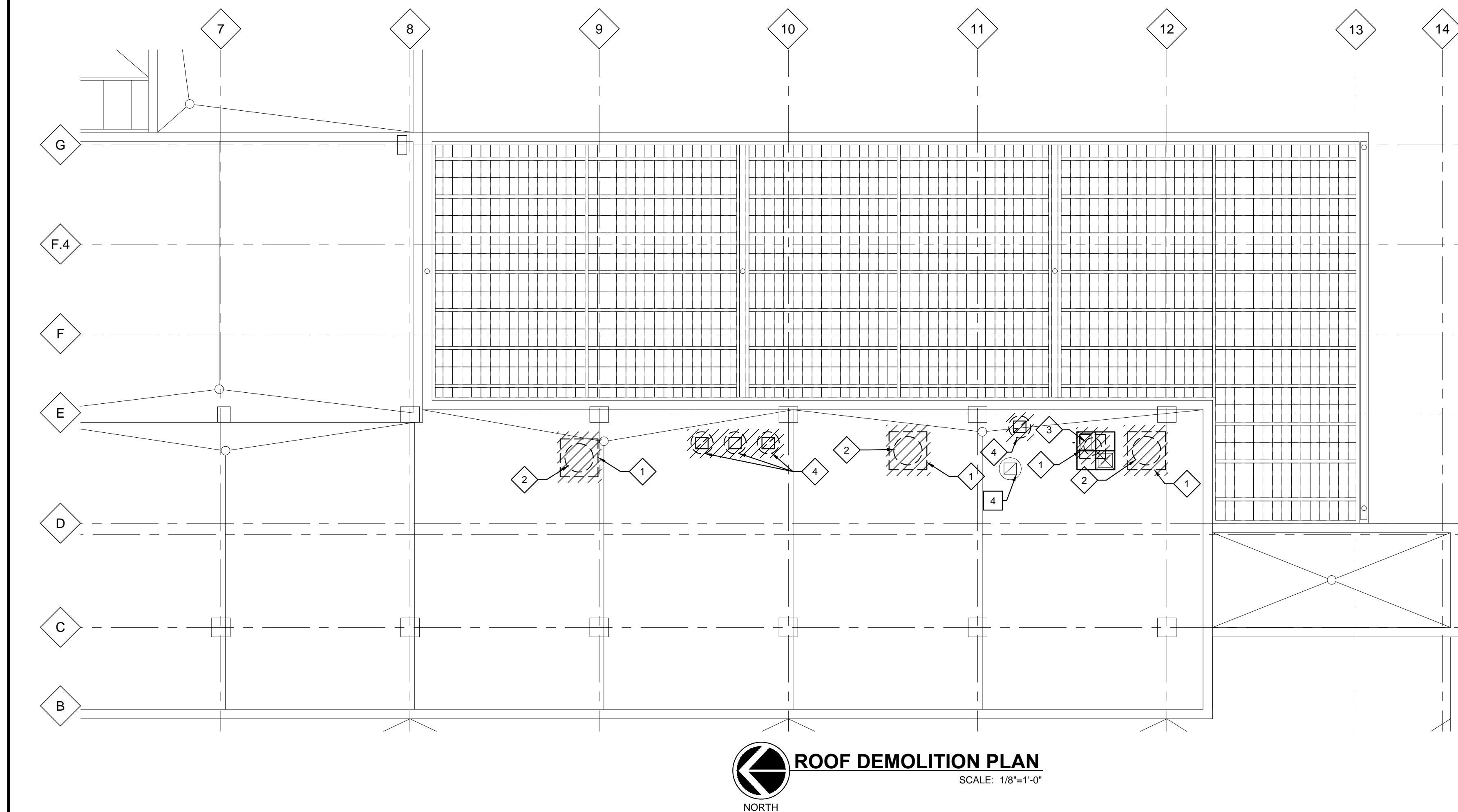
REV	DATE	ISSUED FOR
	01/20/15	BID
	12/10/14	100% OWNER REVIEW
	11/14/14	FINAL OWNER REVIEW
	10/31/14	90% OWNER REVIEW UPDATE
	10/16/14	90% OWNER REVIEW




PROJECT # 137378.001
PROJECT MANAGER S. HAHN
DESIGNED M. HUSSAIN
DRAWN BY W. WALKER
QUALCHECK M. PETTIT D. RUTKOWSKI
SHEET TITLE

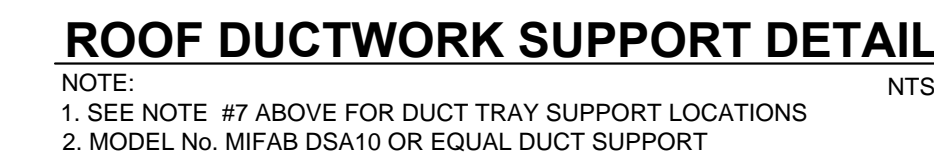
LEVEL SIX MECHANICAL FLOOR PLANS DEMOLITION & NEW WORK

M1-06-01
SHEET NUMBER



ROOF DEMOLITION PLAN
SCALE: 1/8"=1'-0"

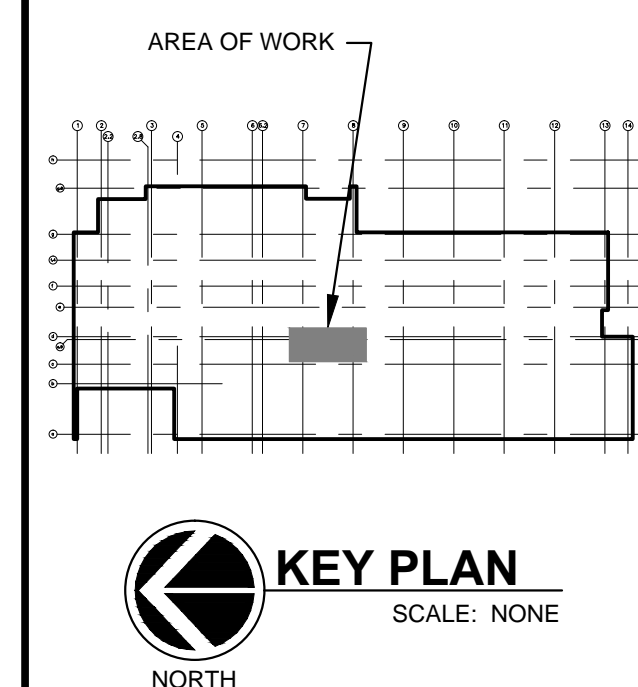
- ## MECHANICAL
- ### DEMOLITION KEYED NOTES:
- 
1. REMOVE EXISTING EVAPORATIVE COOLER. REMOVE COLD WATER ON THE ROOF AND CAP OFF. CUT AND CAP CONDENSATE (DRAIN) LINE AT THE ROOF LEVEL.
 2. REMOVE PORTIONS OF EXISTING 28" DUCT AS NECESSARY TO MAKE CONNECTION TO THE NEW SUPPLY DUCT (RECTANGULAR).
 3. REMOVE PORTIONS OF EXISTING 18" SUPPLY DUCT AS NECESSARY TO MAKE TO MAKE CONNECTION TO THE NEW SUPPLY AIR DUCT (RECTANGULAR).
 4. REMOVE EXISTING GREENHOUSE EXHAUST FAN AND ALL ASSOCIATED ELECTRICAL WIRING.



————— EXISTING TO REMAIN

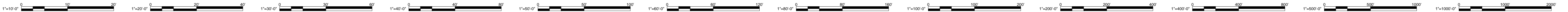
- - - - - EXISTING TO BE DEMOLISHED

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ROOF LEVEL MECHANICAL PLANS DEMOLITION & NEW WORK

M1-R1-01
SHEET NUMBER



NOTES :

1. NON-FUSED DISCONNECT SWITCH
2. SINGLE POINT POWER CONNECTION
3. PHASE MONITOR
4. HOT GAS BYPASS CAPACITY CONTROL
5. OPEN COMMUNICATIONS INTERFACE
6. ROOF CURB 14" HIGH
7. ECONOMIZER WITH BAROMETRIC RELIEF, POWER EXHAUST AND HOODS
8. ECONOMIZER OPTION WITHOUT BAROMETRIC RELIEF
9. POWER EXHAUST AND BAROMETRIC RELIEF FOR HORIZONTAL AIR FLOW
10. SEE DRAWING EP1-R1-01 FOR SMOKE DAMPERS
11. PROVIDE BACNET MS/TP INTERFACE CARD
12. DDC CONTROLS (BY SIEMENS)

NOTES:

1. FACTORY WIRED AND MOUNTED STARTERS & NEMA 3R NON-FUSED DISCONNECTS.
2. PREMIUM EFFICIENCY MOTOR.
3. ROOF CURB WITH RAISED CANTILEVER, NAILER STRIP, FG LINER AND NEOPRENE SEALER.
4. ALUMINUM BIRD SCREEN.
5. GRAVITY DAMPERS
6. VARIABLE SPEED DRIVE.
7. EXTENDED LUBE LINES.

NOTES: 1. DIGITAL CONTROL PACKAGE WITH THERMOSTAT (BY SIEMENS).
2. MULTI-POINT AVERAGING VELOCITY SENSOR (BY SIEMENS).
3. GALVANIZED STEEL HOUSING, GASKETED AND SEALED.
4. 1" INTERNAL LINER WITH FIBER FREE FACING.
5. MOUNTING BRACKETS.
6. INDUCED AIR FILTER.

NOTES:

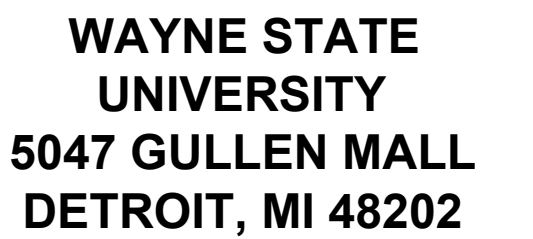
1. SOLENOID VALVE
2. FAN AND MOTOR
3. TEMPERATURE SWITCH
4. DDC HUMIDISTAT (BY SIEMENS)
5. "Y" TYPE STRAINER
6. INVERTED BUCKET TRAP
7. INTEGRAL OPERATOR

NOTES:
1. SINGLE DOOR
2. VENTED DRYING SYSTEM
3. DRAIN DISCHARGE COOL DOWN
4. AIR COMPRESSOR, OIL FREE, 100 PSIG, 1/3 HP, 115/1160, 2 GAL TANK CAPACITY (SHIPPED SEPARATELY)

NOTES:

1. SINGLE HINGED DOOR

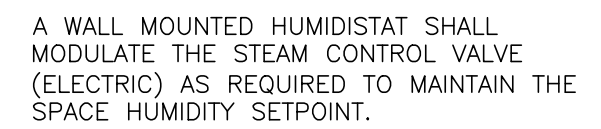
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MECHANICAL SCHEDULES

M7-00-01

SHEET NUMBER



SCALE: NONE



SCALE: NONE

1. ALL CONTROLS, NOT INCLUDING THOSE PROVIDED BY THE UNIT MANUFACTURER, SHALL BE BY SIEMENS.
2. DISCONNECT SWITCH SHALL MEET ALL REQUIREMENTS OF ELECTRICAL SPECIFICATIONS.



M8-00-01
SHEET NUMBER



GENERAL ELECTRICAL NOTES

1. CODES / NEC: ALL WORK SHALL BE INSTALLED PER THE LATEST ADOPTED EDITION OF THE NEC AND ALL STATE, LOCAL, OWNER AND SITE SPECIFIC CODES HAVING JURISDICTION, INCLUDING MICHIGAN ELECTRICAL CODE, PART 8.
2. DRAWINGS ARE DIAGRAMMATICAL AND INDICATE DESIGN INTENT. DO NOT SCALE DRAWINGS. FIELD VERIFY EXISTING CONDITIONS AND ACTUAL DIMENSIONS PRIOR TO START OF WORK.
3. THE ELECTRICAL CONTRACTOR MAY, AT THEIR OPTION, REUSE A PORTION OR ALL OF EXISTING MULTI-BRANCH CIRCUIT WIRING AND/OR CONDUIT(S) PROVIDED THEY MEET ALL THE REQUIREMENTS OF THE NEW INSTALLATIONS (I.E., APPROPRIATE ROUTING, CONDUIT SIZE, CONDUIT TYPE, WIRE SIZE FOR LENGTH WITH DERATING, ETC.).
4. THE DRAWINGS AND SPECIFICATIONS INCLUDED WITH THIS DOCUMENT INDICATES DESIGN INTENT AND MAY NOT SPECIFICALLY ADDRESS ALL CONDITIONS AND DETAILS THAT MAY BE ENCOUNTERED IN THE PROGRESSION OF THE WORK ON THIS PROJECT. ELECTRICAL WORK SHALL INCLUDE ALL REQUIRED LABOR, MATERIALS AND INSTALLATIONS THAT ARE NECESSARY TO COMPLETE THE CONSTRUCTION AS INDICATED, AND ALSO SATISFY ALL CODE REQUIREMENTS. IF THE DESIGN INTENT IS UNCLEAR, OR IF THERE IS AN OBVIOUS ERROR OR AN OMISSION IS FOUND, CONTACT WSU PURCHASING AS REQUIRED FOR CLARIFICATION OF INFORMATION AND RESOLVING THE CONDITION PRIOR TO BIDS.
5. INFORMATION GIVEN IN THIS DOCUMENT IS INTENDED TO SUPPLEMENT THE EQUIPMENT MANUFACTURER'S DIRECTIONS, DRAWINGS AND SCHEDULES. REFER TO THE MANUFACTURER'S LITERATURE FOR ALL SPECIFIC INFORMATION ON THE EQUIPMENT INSTALLATION AND WIRING. PROVIDE ALL REQUIRED WIRE, CABLES AND RACEWAYS WITH TERMINATIONS NECESSARY TO COMPLETE THE INSTALLATION OF THE INDICATED SYSTEM AND EQUIPMENT. UPON COMPLETION OF THE WORK, ALL EQUIPMENT SHALL BE FULLY OPERATIONAL WITH PROPER ELECTRICAL INTERFACING OF ACCESSORIES AND COMPONENTS.
6. PLAN AND COORDINATE INSTALLATIONS TO COINCIDE WITH THE WORK OF OTHERS TO ALLOW FOR TIMELY COMPLETION OF THE WORK OF EACH TRADE. PREDETERMINE EXACT LOCATION OF EQUIPMENT, CONNECTION POINTS, OBSTRUCTIONS AND CLEAR ROUTING PATHS BY FIELD OBSERVATION PRIOR TO MAKING INSTALLATIONS. COORDINATE ANY REQUIRED BUILDING, WALL OR FLOOR OPENINGS WITH ARCHITECTURAL AND STRUCTURAL TRADES. TO AVOID INTERFERENCE'S, CROWDED SPACES AND UNTIMELY INSTALLATIONS, DESIGNATE WHICH TRADES WILL OCCUPY SPACE ON A GENERAL SCALE AND NOTIFY CONCERNED PARTIES WHEN A DEVIATION IS NECESSARY. TAILOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FOR MAINTENANCE ACCESS, TO CONFORM TO THE EXISTING FACILITY CONDITIONS AND TO MAINTAIN PROPER/ REQUIRED CLEARANCES.
7. COORDINATE INSTALLATION WORK WITH EQUIPMENT SHOP DRAWINGS AND LITERATURE TO ENSURE PROPER SIZING AND MATCHING OF MATERIALS AND COMPONENTS, LOCATIONS OF CONNECTION POINTS AND LOCATING RELATED BOXES AND CONDUIT RUNS. REFER TO MECHANICAL DRAWINGS FOR INSTALLATION AND CONNECTION OF CONTROLS FOR THEIR EQUIPMENT. UNLESS OTHERWISE NOTED, PROVIDE ALL REQUIRED RACEWAYS, INSTALL ALL POWER AND CONTROL WIRING (UNLESS OTHERWISE NOTED) AND MAKE ALL REQUIRED TERMINATIONS FOR THE COMPLETE INSTALLATION OF THE EQUIPMENT SHOWN ON THE DRAWINGS OF ALL TRADES.
8. CONDUIT AND RACEWAY RUNS SHOWN ARE SCHEMATIC ONLY AND ARE NOT INTENDED TO INDICATE AN EXACT ROUTE. RACEWAYS SHALL BE SECURED TO THE BUILDING WALLS, STRUCTURAL FRAMING, JOISTS, STUDS, ETC. AND RUN PERPENDICULAR OR HORIZONTAL TO THE WALLS AND FLOORS. ROUTE CONDUITS IN PROTECTED LOCATIONS, ABOVE/ON STRUCTURAL MEMBERS, COLUMN WEBS AND IN CONCEALED LOCATIONS TO THE EXTENT POSSIBLE. SECURE CONDUIT TO STRUCTURAL FRAMING AT VERTICAL DROPS TO DEVICES, EQUIPMENT AND OTHER LOADS. PRIOR TO MAKING INSTALLATIONS, VERIFY SPECIFICATIONS OF ALL EQUIPMENT AND MATERIALS TO BE INSTALLED FOR COMPATIBILITY, CONNECTION POINTS, SUITABILITY OF USE IN THE AREA AND ENVIRONMENT WHERE INSTALLED. VERIFY THAT ALL MATERIALS WILL BE APPROPRIATE FOR THE USE INTENDED AND COMPLIANT WITH ALL LOCAL AND NATIONAL CODES.
9. PROVIDE/UPDATE ALL PANELBOARD CIRCUIT DIRECTORY CARDS AND LABELING TO REFLECT ALL NEW WORK. VERIFY LABELING AND IDENTIFICATION TAG INFORMATION WHERE PROVIDED BY THE MANUFACTURER WITH EQUIPMENT. REVISE/REPLACE ANY NON-CONFORMING INFORMATION. PROVIDE ALL SIGNAGE AND IDENTIFICATION AS REQUIRED FOR SAFETY AND LOCKOUT PROCEDURES, ACCESSIBILITY, MAINTENANCE, ETC.. BALANCE LOADS ACROSS ALL THREE PHASES PER WAYNE STATE UNIVERSITY STANDARDS.
10. PROVIDE ALL REQUIRED MATERIALS TO COMPLETE THE INSTALLATION FOR INDICATED EQUIPMENT AND DEVICES WITH ALL REQUIRED HARDWARE, SUPPORTS, HANGERS AND PROTECTION. TAILOR ALL INSTALLATIONS TO SUIT THE NEW CONDITIONS, AND FOR FUTURE MAINTENANCE ACCESSIBILITY. BE COMPLIANT WITH LOCAL AND NATIONAL CODES AND THE INTENDED REQUIREMENTS OF THESE DRAWINGS AND SPECIFICATIONS. PRIOR TO ENERGIZING SYSTEMS AND EQUIPMENT, AND UNDER THE SUPERVISION OF THE OWNER'S REPRESENTATIVE, INSPECT AND TEST THE FINAL ASSEMBLY OF ALL ELECTRICAL INSTALLATIONS TO ENSURE THAT THEY ARE ELECTRICALLY COMPLETE, FULLY FUNCTIONAL AND CONFORMING TO THEIR SPECIFICATIONS, MANUFACTURERS' AND INDUSTRY STANDARDS FOR SUCH INSTALLATIONS.
11. PROVIDE FIELD LABELING OF ALL NEW BRANCH CIRCUITS AND ALL EXISTING RECEPTACLE DEVICES TO INDICATE PANEL BOARD AND CIRCUIT NUMBER OF SOURCE. PROVIDE LABELING ON DEVICE COVER PLATE AND JUNCTION BOX COVER.
12. PANEL SCHEDULES: PROVIDE NEATLY TYPED PANEL DIRECTORIES TO THE OWNER FOR ALL PANELBOARDS (EXISTING) MODIFIED. DESIGNATE LOAD SERVED BY EACH CIRCUIT. REQUIRED INFORMATION SHALL BE COMPLETED FOR EACH CIRCUIT IN EACH PANEL.
13. WIRE: ALL 20 AMP, 120 VOLT CIRCUITS ARE 3/4\"C, 2-#12 & #12G WITH DEDICATED NEUTRALS. HOMERUNS OVER 100 FEET SHALL BE #10AWG.
14. BRANCH RECEPTACLE LOADS FOR 20 AMP, 120 VOLT CIRCUIT SHALL NOT EXCEED SIX (6) DUPLEX RECEPTACLES PER CIRCUIT.
15. WIRE: REFER TO ONE LINE DIAGRAM AND PANELBOARD SCHEDULES FOR CONDUIT AND WIRE SIZES.
16. CONDUIT ROUTING: CONCEAL CONDUITS IN WALLS, FLOORS OR ABOVE CEILINGS FOR FINISHED AREAS. EXPOSED WORK IN UNFINISHED AREA SHALL BE INSTALLED PERPENDICULAR OR PARALLEL TO WALLS, CEILINGS, OR STRUCTURAL MEMBERS.
17. CIRCUIT NUMBERS INDICATED ARE REPRESENTATIVE OF AVAILABLE CIRCUIT BREAKER POSITION IN EXISTING PANEL BOARD. CONNECT TO EXISTING AVAILABLE CIRCUIT BREAKER IN PANEL BOARD OR PROVIDE NEW. PROVIDE AS-BUILT DOCUMENTATION IDENTIFYING ALL ACTIVE BRANCH CIRCUITS AND LOADS.
18. BOX DEPTH: COORDINATE WALL BOX DEPTH WITH OTHER TRADES FOR PROPER PLACEMENT DUE TO WALL COVERING THICKNESS.
19. DISCONNECTS: MECHANICAL EQUIPMENT ARE PROVIDED WITH FUSED DISCONNECT SWITCH, MOUNTED AND WIRE TO UNIT.
20. DISCONNECTS: FANS PROVIDED WITH DISCONNECT SWITCH, MOUNT AND WIRE TO FAN.
21. EQUIPMENT: PACKAGED EQUIPMENT SHIPPED WITH SEPARATE CONTROL PANELS, MOUNT AND WIRE PANELS TO EQUIPMENT AND SOURCE. PROVIDE ELECTRICAL CONNECTIONS FOR EQUIPMENT SHIPPED IN MULTIPLE SECTIONS.
22. COMMUNICATION OUTLETS: INSTALL TWO (2) GANG, 3-1/2\"

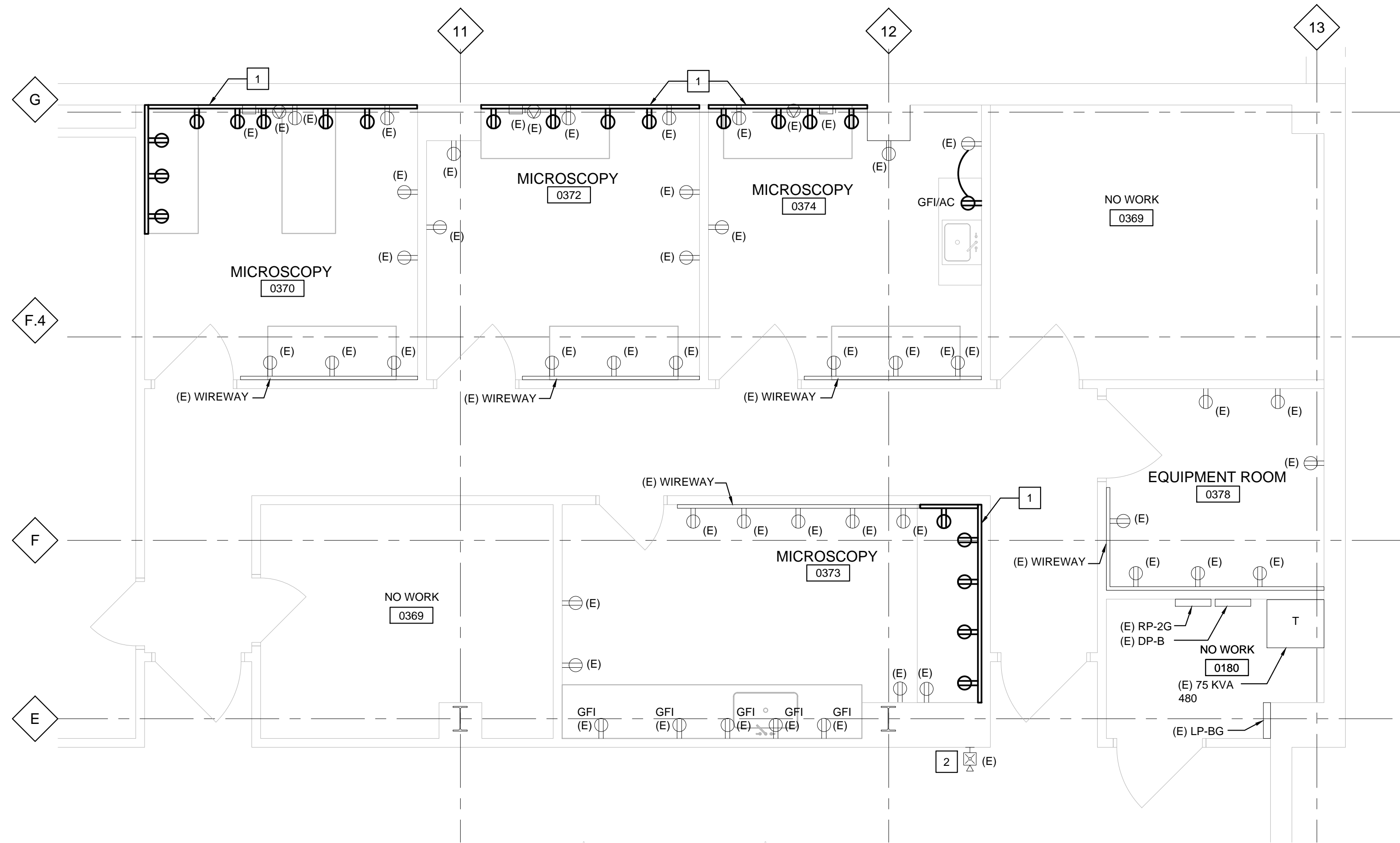
23. SMOKE DETECTORS: PROVIDE SMOKE DETECTORS FOR HVAC EQUIPMENT FOR UNIT SHUTDOWN AND CONNECT TO BUILDING FIRE ALARM SYSTEM. CONNECT TO CONTROL PANEL AND FIRE ALARM SYSTEM PER MANUFACTURERS REQUIREMENTS.
24. GROUNDING: PROVIDE GROUNDING AND BONDING PER NEC ART. 250.

GENERAL DEMOLITION NOTES

1. SCOPE OF WORK: ELECTRICAL DEMOLITION WORK SHALL INCLUDE DISCONNECTION OF LIGHTING FIXTURES, RECEPTACLES, WIRING, CONDUIT, BOXES, ETC. IN THE AREA OF RENOVATION CONSTRUCTION.
2. SITE SURVEY: ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMISSION OF HIS BID TO EXAMINE THE EXISTING CONDITIONS AND THE EXTENT OF DEMOLITION WORK.
3. COORDINATION WITH OTHER TRADES: THE ELECTRICAL CONTRACTOR SHALL EXAMINE ALL DRAWINGS BY OTHER TRADES TO BE FAMILIAR WITH DEMOLITION REQUIREMENTS BY OTHER TRADES. PROVIDE ALL INCIDENTAL ELECTRICAL DEMOLITION OF AND/OR RELOCATION OF ELECTRICAL SYSTEMS TO FACILITATE THE DEMOLITION WORK FROM OTHER TRADES WHETHER OR NOT SHOWN ON THE DRAWINGS.
4. COORDINATION: THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE DEMOLITION WITH THE NEW WORK, FOR THE EXTENT OF ALL DEMOLITION WORK.
5. RACEWAYS: REMOVE ALL UNUSED EXPOSED CONDUIT; WIRE, RACEWAY, JUNCTION BOXES, HANGERS AND CLAMPS BACK TO THE PANELBOARDS. WHERE CONDUITS ARE CONCEALED IN WALL CAVITIES, CUT AND REMOVE THE CONDUITS ABOVE EXISTING WALL LEADING INTO AN ACCESSIBLE CEILING OR TRUSS SPACE. REMOVE ALL SURFACE MOUNTED ELECTRICAL DEVICES, BOXES AND RELATED CONDUITS.
6. HATCHING: REMOVE ALL CROSSHATCHED ELECTRICAL EQUIPMENT AND/OR DEVICES AS SHOWN ON PLANS INCLUDING ALL FEEDERS, BRANCH CIRCUITRY, CONDUITS, JUNCTION AND WALL BOXES BACK TO SOURCE OR TO NEAREST ACTIVE JUNCTION BOX, UNLESS OTHERWISE NOTED.
7. PANEL SCHEDULES: PROVIDE UP TO DATE PANEL SCHEDULES FOR ALL PANELS TO REMAIN. SHOW ACTIVE CIRCUITS AND LOADS. IDENTIFY CONDUITS AND LABEL CIRCUITS FOR FUTURE RELOCATION.
8. CONDUIT STATUS: CONTRACTOR SHALL FIELD VERIFY STATUS OF ALL CONDUITS IN THE CEILING SPACE AND DETERMINE IF CONDUITS ARE TO REMAIN OR BE REMOVED. WHERE APPLICABLE AND NOT SPECIFICALLY INDICATED OTHERWISE, EXISTING IN PLACE CONDITIONS ABOVE CEILINGS OR IN WALLS, JUNCTION BOXES, PULL BOXES AND HANGERS ABOVE CEILINGS, TRUSS SPACE OR IN WALLS MAYBE REUSED FOR NEW WIRING.
9. ACTIVE CIRCUITS: ACTIVE CIRCUITS TO REMAIN EXIST IN WORK AREAS. WHERE REMOVAL OF CONDUIT AND WIRING AFFECTS THE OPERATION "UP-STREAM" AND/OR "DOWN-STREAM" OF ELECTRICAL EQUIPMENT, WHICH IS NOT INDICATED TO BE REMOVED, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN AND PROVIDE ALL REQUIRED CONDUITS AND WIRING TO RESTORE THE "UP-STREAM" AND/OR "DOWN-STREAM" OF ELECTRICAL EQUIPMENT TO ITS NORMAL OPERATION IN ADDITION TO COORDINATING WITH OWNER AND ALL ASSOCIATED PARTIES.
10. FEEDERS: REMOVE ALL FEEDS FOR ARCHITECTURAL OR MECHANICAL EQUIPMENT BEING REMOVED. COORDINATE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND CONTRACTORS FOR FULL SCOPE OF WORK. REMOVE ALL DISCONNECTS, JUNCTION BOXES AND CONTROL STATIONS. RETURN TO OWNER USABLE EQUIPMENT.
11. MECHANICAL EQUIPMENT: REMOVE ALL ELECTRICAL FEEDS TO MECHANICAL EQUIPMENT BEING REMOVED.
12. ABANDONED ITEMS: REMOVE EXISTING CONDUIT, WIRE AND LIGHTING CONTACTORS FOR LIGHTING, BRANCH CIRCUITS AND EQUIPMENT FEEDS "CUT-OFF" AND ABANDONED IN PLACE.
13. SUPPORT: RE-SUPPORT ITEMS WHERE WALLS AND SUPPORTS ARE SCHEDULED FOR REMOVAL.
14. LOW VOLTAGE CABLING: REMOVE ALL UNUSED DATA/COMMUNICATIONS CONDUITS AND CABLING COMING FROM TELEPHONE AND DATA CLOSETS. CONDUITS TO REMAIN ARE TAGGED AS SUCH.
15. PROTECTION: PROTECT EXISTING ITEMS TO REMAIN FROM DAMAGE BY OTHER DEMOLITION ACTIVITIES.
16. TEMPORARY POWER: PROVIDE TEMPORARY FEEDS FOR POWER AND EMERGENCY/NIGHT LIGHTING CROSSING CONSTRUCTION BOUNDARIES.
17. FIRE ALARM: MODIFICATION SHALL INCLUDE THE ADDITION OF EXISTING FIRE ALARM SYSTEM DEVICES IN THE AREA OF RENOVATION OR NEW WORK. COORDINATE DEVICE ADDITION WITH OWNER'S REPRESENTATIVE. MAINTAIN FLOW SWITCHES ACTIVE IN SYSTEM. NOTIFY SITE SECURITY AND/OR OWNER MINIMUM 48 HOURS PRIOR TO PERFORMING MODIFICATIONS TO EXISTING FIRE ALARM SYSTEM.
18. CARD READERS: MODIFICATION SHALL INCLUDE ADDITION TO EXISTING CARD READER SYSTEM DEVICES IN THE AREA OF RENOVATION OR NEW WORK. COORDINATE DEVICE ADDITION WITH OWNER'S REPRESENTATIVE. NOTIFY SITE SECURITY AND/OR OWNER MINIMUM 48 HOURS PRIOR TO PERFORMING MODIFICATIONS TO EXISTING CARD READER SYSTEM.
19. MATERIAL: MATERIAL THAT IS REMOVED (WIRING DEVICES: CONDUITS ETC.) SHALL BECOME THE PROPERTY OF THE CONTRACTOR, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND PROPER DISPOSAL OF SAID MATERIALS.

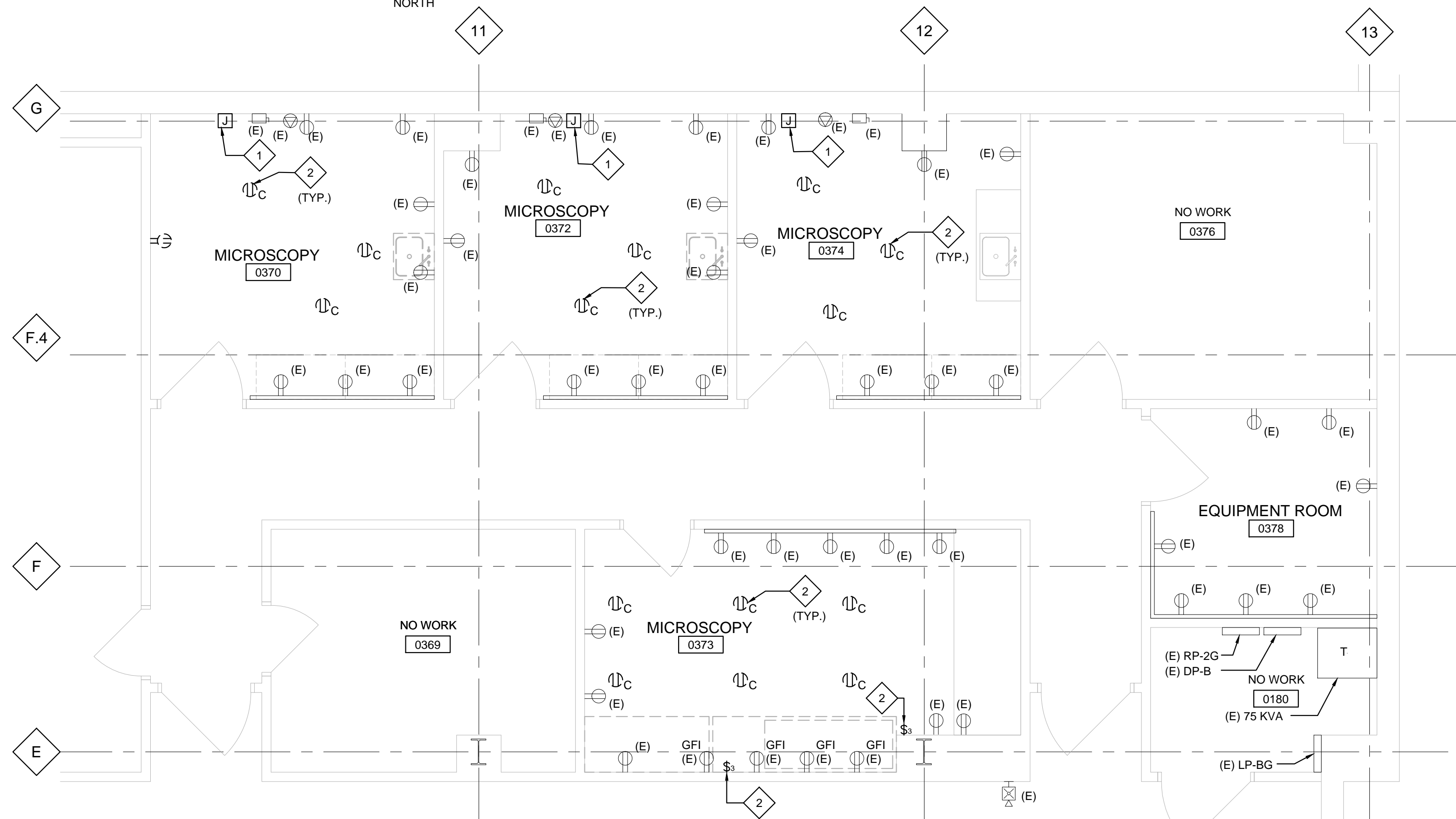
GENERAL LIGHTING NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODES, (LATEST EDITION) AND MICHIGAN ELECTRICAL CODE, PART 8.
2. ALL BRANCH LIGHTING CIRCUITS SHALL BE 20 AMP, 277 VOLT AC [120 VOLT AC], 2#12+1#12 GRD, 3/4\"
3. ALL LIGHT FIXTURES SHALL BE LAMPED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. FLUORESCENT LAMPS SHALL BE PHILIPS. UNLESS OTHERWISE NOTED.
4. PROVIDE ALL MISCELLANEOUS STRUCTURAL AND SUPPORT STEEL REQUIRED FOR MOUNTING AND HANGING ELECTRICAL EQUIPMENT.
5. ALL LIGHT FIXTURES SHALL BE FURNISHED, INSTALLED AND WIRED FOR A COMPLETE LIGHTING SYSTEM. ALL LAMPS SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR. SEE LIGHT FIXTURE SCHEDULE ON DRAWINGS FOR ALL REQUIREMENTS.
6. ALL EXISTING LIGHT FIXTURES SHALL REMAIN, UNLESS OTHERWISE NOTED. EXISTING LIGHT FIXTURES, TO REMAIN, SHALL BE CLEANED, RE-LAMPED AND REFURNISHED IN RENOVATED AREAS OF CONSTRUCTION AS NEEDED.
7. CONDUIT INSTALLATION: ALL WORK IN FINISHED AREAS SHALL BE CONCEALED IN WALLS AND ABOVE CEILINGS, UNLESS OTHERWISE NOTED. EXPOSED WORK, UNFINISHED AREAS, MANUFACTURING PLANT SHALL BE INSTALLED PERPENDICULAR OR PARALLEL TO WALLS, CEILING AND STRUCTURE MEMBERS.
8. CONDUIT SUPPORT SHALL BE UNISTRUT OR KORN CLAMPS. NO "C" TYPE BEAM CLAMPS OR HANG ON TYPE CLAMPS SHALL BE USED.
9. PULL BOXES AND JUNCTION BOXES IN GENERAL LAB AREAS SHALL BE NEMA 1 ENCLOSURE OF SIZE TO SUIT APPLICATION AND SHALL BE HOT-DIP GALVANIZED SHEET METAL BOX WITH WELDED SEAMS, CAPTIVATED STAINLESS STEEL COVER WITH OIL-RESISTANT ADHESIVE GASKET.
10. WIRE SHALL BE SINGLE CONDUCTOR, STRANDED ANNEALED COPPER INSULATED FOR 600 VOLTS AC, TYPE XHHW, MINIMUM SIZE OF NO. 12 AWG FOR POWER CIRCUITS AND MINIMUM OF NO. 14 AWG FOR CONTROL CIRCUITS.
11. BRANCH FEEDER SHALL NOT BE SPLICED.
12. GROUND WIRE SHALL BE INSTALLED IN ALL CONDUITS.
13. BRANCH CIRCUIT NUMBERS INDICATED ARE REPRESENTATIVE OF AVAILABLE CIRCUIT BREAKER POSITIONS IN EXISTING PANELBOARDS. CONNECT TO EXISTING AVAILABLE CIRCUIT BREAKER IN PANELBOARD OR PROVIDE NEW. PROVIDE AS-BUILT DOCUMENTATION IDENTIFYING ALL ACTIVE BRANCH CIRCUITS AND LOADS.
14. PROVIDE LIGHTING CONTROLS TO MEET MICHIGAN UNIFORM ENERGY CODE REQUIREMENTS.
15. SUPPORT RECESSED AND SEMI-RECESSED LIGHT FIXTURES FROM STRUCTURAL ABOVE. INSTALL A MINIMUM OF FOUR WIRES FOR EACH FIXTURE AND LOCATE AT CORNER OF THE CEILING GRID WHERE FIXTURE IS LOCATED. DO NOT SUPPORT FIXTURES BY CEILING ACOUSTICAL PANELS.
16. SUPPORT DOWNLIGHTS WITH AT LEAST TWO 3/4\"
17. HARDWARE: WALL PLATES FOR ALL ELECTRICAL DEVICES SHALL BE STAINLESS TYPE 302 IN FINISHED AREAS. MANUFACTURED BY HUBBELL OR EQUAL. WALL PLATES FOR SURFACE MOUNTED DEVICES IN UNFINISHED AREAS SHALL BE ROUNDED CORNER GALVANIZED SHEET PLATE TO MATCH AND MATE WIRING DEVICES.
18. ALL EMERGENCY/NIGHT LIGHTS (EMNL), EMERGENCY LIGHTS (EM), EXIT LIGHTS AND EMERGENCY BATTERY LIGHTS SHALL BE CONNECTED TO THE HOT 'LEG' AHEAD OF AREA SWITCHING.
19. ALL LIGHT SWITCHES SHALL BE MOUNTED 46\"
20. USE MODULAR WIRING SYSTEM FOR LIGHTING. MINIMUM WIRE SIZE SHALL BE 12 AWG. PROVIDE SYSTEM SUPPLIER WIRING AND LAYOUT DRAWINGS FOR APPROVAL AND AS BUILT CONDITIONS.
21. SWITCHES: SWITCHES SHALL BE INDUSTRIAL-INSTITUTIONAL HEAVY DUTY, SPECIFICATION GRADE WITH ABUSE RESISTANT TOGGLE, QUIET TYPE, SILVER CADMIUM OXIDE CONTACTS, BACK AND SIDE WIRED, FULLY ENCLOSED IN COMPOSITION CASE, ONE-PIECE RIVET LESS SPRING CONTACT ARM, 120/277 VOLT A.C. WITH GROUNDING SCREW. TERMINAL SCREWS ON CONTACTS SHALL BE ABLE TO ACCOMMODATE UP TO #10 SOLID CONDUCTOR WIRE AND 2 BACK WIRE ENTRY POINTS PER TERMINAL. ALL SWITCHES SHALL BE RATED FOR 20 AMPERES. MANUFACTURE IDENTITY AND RATING SHALL BE PROVIDED ON STRAP. COLOR : WHITE.
22. PROVIDE SWITCHES OF SAME SERIES FOR THREE-WAYS, FOUR-WAYS, KEY TYPE, PILOT LIGHT, ETC.
23. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR FINAL LOCATION OF ALL LUMINAIRES.



NEW WORK FLOOR PLAN - POWER AND AUXILIARY SYSTEMS - MICROSCOPY

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



DEMOLITION FLOOR PLAN - POWER AND AUXILIARY SYSTEMS - MICROSCOPY

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

GENERAL NOTES:

1. REFER TO SHEET E0-00-01 FOR ELECTRICAL LEGEND, ABBREVIATION AND SYMBOLS. AND SHEET E0-00-02 FOR ELECTRICAL GENERAL NOTES.
2. (E) - INDICATES EXISTING TO REMAIN.
3. PROVIDE ELECTRICAL WORK SAFE PRACTICE (EWSP); POWER OUTLET LABELING. DOCUMENTATION REVISION UPDATES AND UPDATE ALL PANEL SCHEDULES ON ALL AFFECTED BY THIS PROJECT.
4. ALL FIRE ALARM SPEAKER/STROBES SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 72), THE NATIONAL ELECTRICAL CODE, ADA AND MICHIGAN ADA AND SHALL BE U.L. LISTED FOR FIRE ALARM USE. ALL AUDIO NOTIFICATION DEVICES SHALL BE AT LEAST 15dB ABOVE THE AVERAGE AMBIENT SOUND LEVEL. STROBES SHALL BE RATED IN CANDELA AS DETERMINED BY STANDARD U.L. TESTS.
5. ALL CABLE USED SHALL BE APPROVED FOR FIRE ALARM USE. COLOR CODING SHALL FOLLOW BUILDING STANDARDS AND SHALL MEET NFPA, THE STATE OF MICHIGAN AND LOCAL FIRE CODES, AND SHALL BE AS RECOMMENDED BY THE FIRE ALARM EQUIPMENT MANUFACTURER.
6. THE EXISTING MAIN FIRE ALARM CONTROL PANEL IS LOCATED IN THE LOBBY ON THE FIRST FLOOR.

KEY NOTES:

1. INSTALL NEW WIREWAY TO MATCH EXISTING. MOUNT 6" ABOVE THE COUNTER. CIRCUIT TO AVAILABLE CIRCUIT BREAKERS IN PANEL. RG-2G. COMPLY WITH NEC 2011 FOR LOADING OF THE CIRCUIT BREAKERS.

LINEWEIGHT LEGEND:

- ITEMS TO BE REMOVED OR RELOCATED.
- EXISTING ITEMS TO REMAIN.
- NEW ITEMS.

DEMOLITION KEY NOTES:

1. DISCONNECT AND REMOVE THE FOOT SWITCH ALONG WITH ASSOCIATED WIRING AND JUNCTION BOXES BACK TO POWER SOURCE.
2. DISCONNECT AND REMOVE THE DUPLEX RECEPTACLE ALONG WITH THE SWITCHES, BACK BOX AND CONDUIT AND WIRE BACK TO THE POWER SOURCE.

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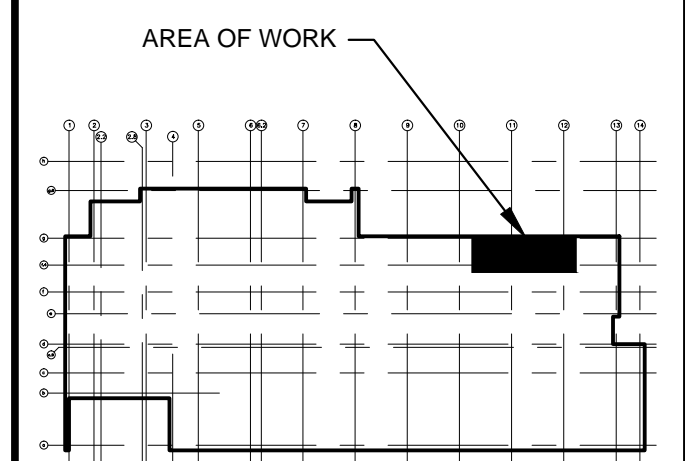
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11/14/14	FINAL OWNER REVIEW	
10/31/14	90% OWNER REVIEW UPDATE	
10/16/14	90% OWNER REVIEW	

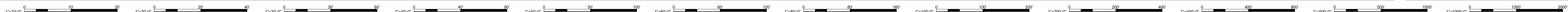


KEY PLAN
SCALE: NONE

PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

**LOWER LEVEL
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK**

EP1-L1-01
SHEET NUMBER

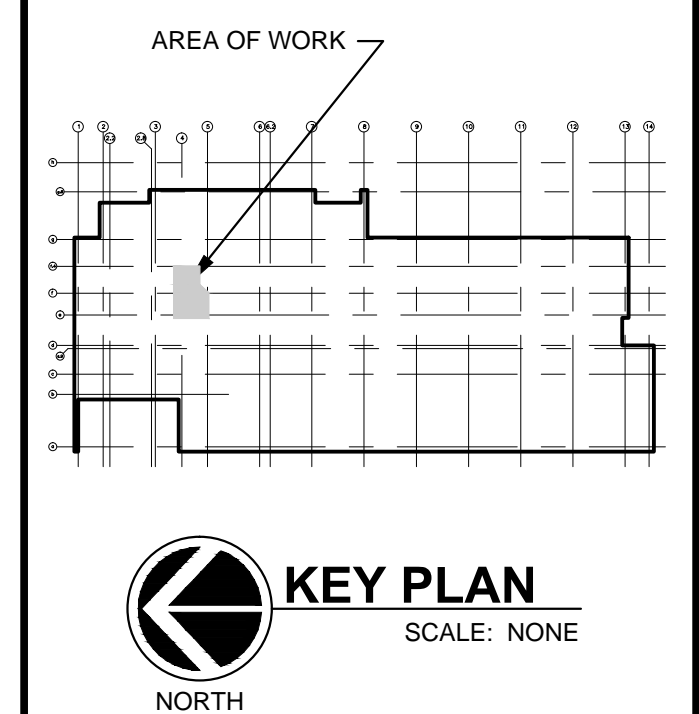


- ## KEY NOTES:
- | |
|---|
| # |
|---|
1. REPLACE EXISTING LENS WITH A NEW, 0.125" THICK ACRYLIC PRISMATIC LENS. CLEAN AND RE-LAMP THE LUMINAIRE.
 2. EXTEND EXISTING CIRCUIT FROM THE JUNCTION BOX IN THE CEILING SPACE, WITH NEW CONDUIT AND WIRE TO THE NEW SWITCH.
 3. INSTALL PLUG-IN FUSIBLE SWITCH UNIT OR CIRCUIT BREAKER COMPATIBLE WITH THE EXISTING BUS DUCT.
 4. INSTALL A GFCI DUPLEX RECEPTACLE IN THE EXISTING BACK BOX. CONNECT TO THE EXISTING WIRING.
 5. EXTEND EXISTING CIRCUIT, WITH NEW CONDUIT AND WIRE, TO THE NEW SAFETY SWITCH.
 6. CIRCUIT TO AVAILABLE CIRCUIT BREAKER IN PANEL #P-13. COMPLY WITH NEC 2011 FOR LOADING OF THE CIRCUIT BREAKER.
 7. INSTALL A NEW EMERGENCY BATTERY PACK MANUFACTURED BY PHILIPS BODINE, CAT # B30ST. CONNECT THE BATTERY PACK AHEAD OF THE LOCAL LIGHTING SWITCH IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

- LINEWEIGHT LEGEND:**
- ITEMS TO BE REMOVED OR
RELOCATED.
- EXISTING ITEMS TO REMAIN
- NEW ITEMS.



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[illegible]

PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

LEVEL THREE
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK

EP1-03-01
SHEET NUMBER



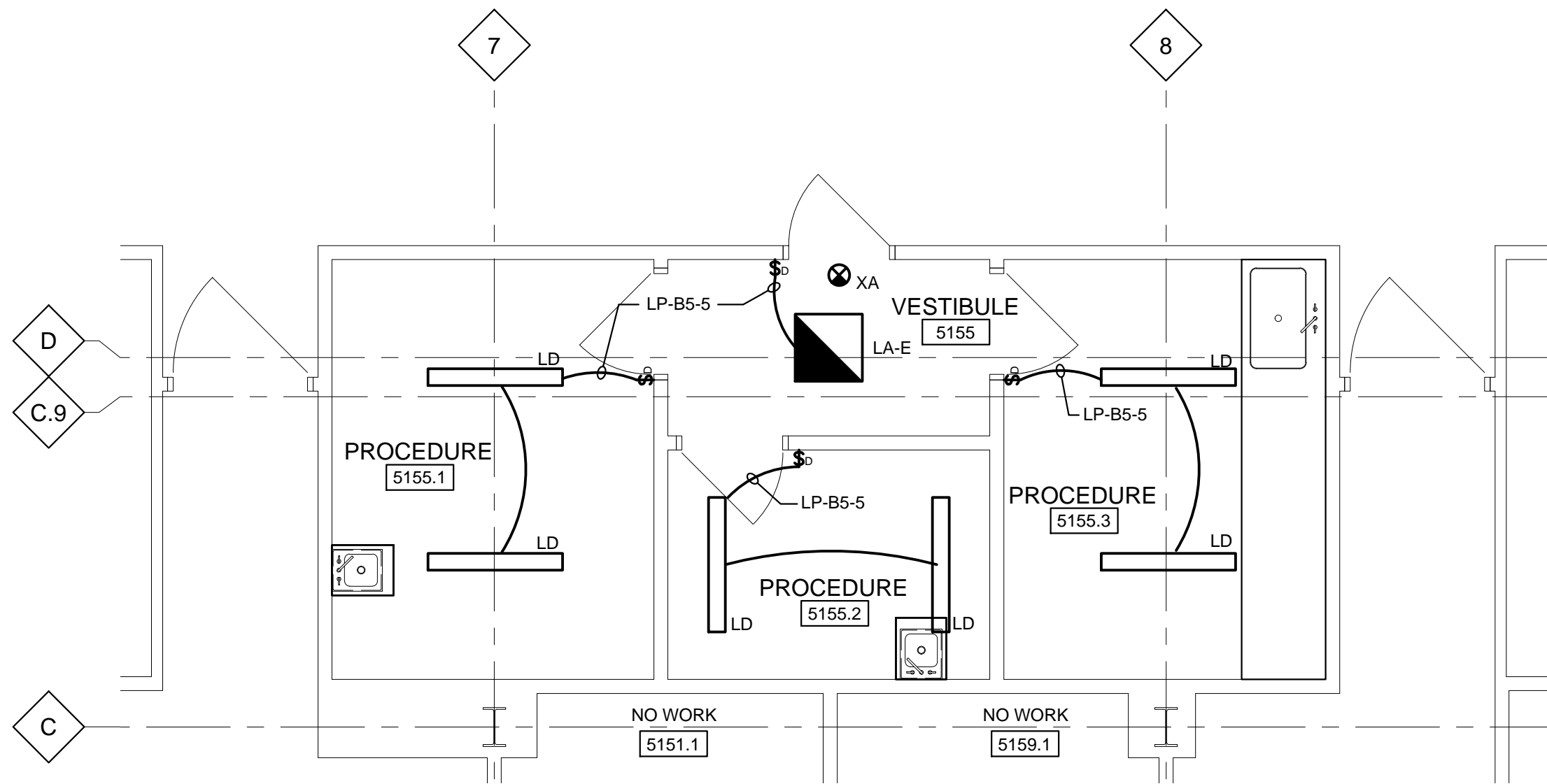
- ## KEY NOTES:
- | |
|---|
| # |
|---|
1. REPLACE EXISTING LENS WITH A NEW, 0.125" THICK ACRYLIC PRISMATIC LENS. CLEAN AND RE-LAMP THE LUMINAIRE.
 2. INSTALL PLUG-IN FUSIBLE SWITCH UNIT OR CIRCUIT BREAKER COMPATIBLE WITH THE EXISTING BUS DUCT.
 3. INSTALL A GFCI DUPLEX RECEPTACLE IN THE EXISTING BACK BOX. CONNECT TO THE EXISTING WIRING.
 4. EXTEND EXISTING CIRCUIT TO THE NEW RECEPTACLE.
 5. CIRCUIT TO AVAILABLE CIRCUIT BREAKER IN PANEL 'RP-15'. COMPLY WITH NEC 2011 FOR LOADING OF THE CIRCUIT BREAKER.
 6. INSTALL A NEW EMERGENCY BATTERY PACK MANUFACTURED BY PHILIPS BODINE, CAT # B30ST. CONNECT THE BATTERY PACK AHEAD OF THE LED LIGHTING SWITCH IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

- LINEWEIGHT LEGEND**
- ITEMS TO BE RELOCATED
- EXISTING ITEMS
- NEW ITEMS

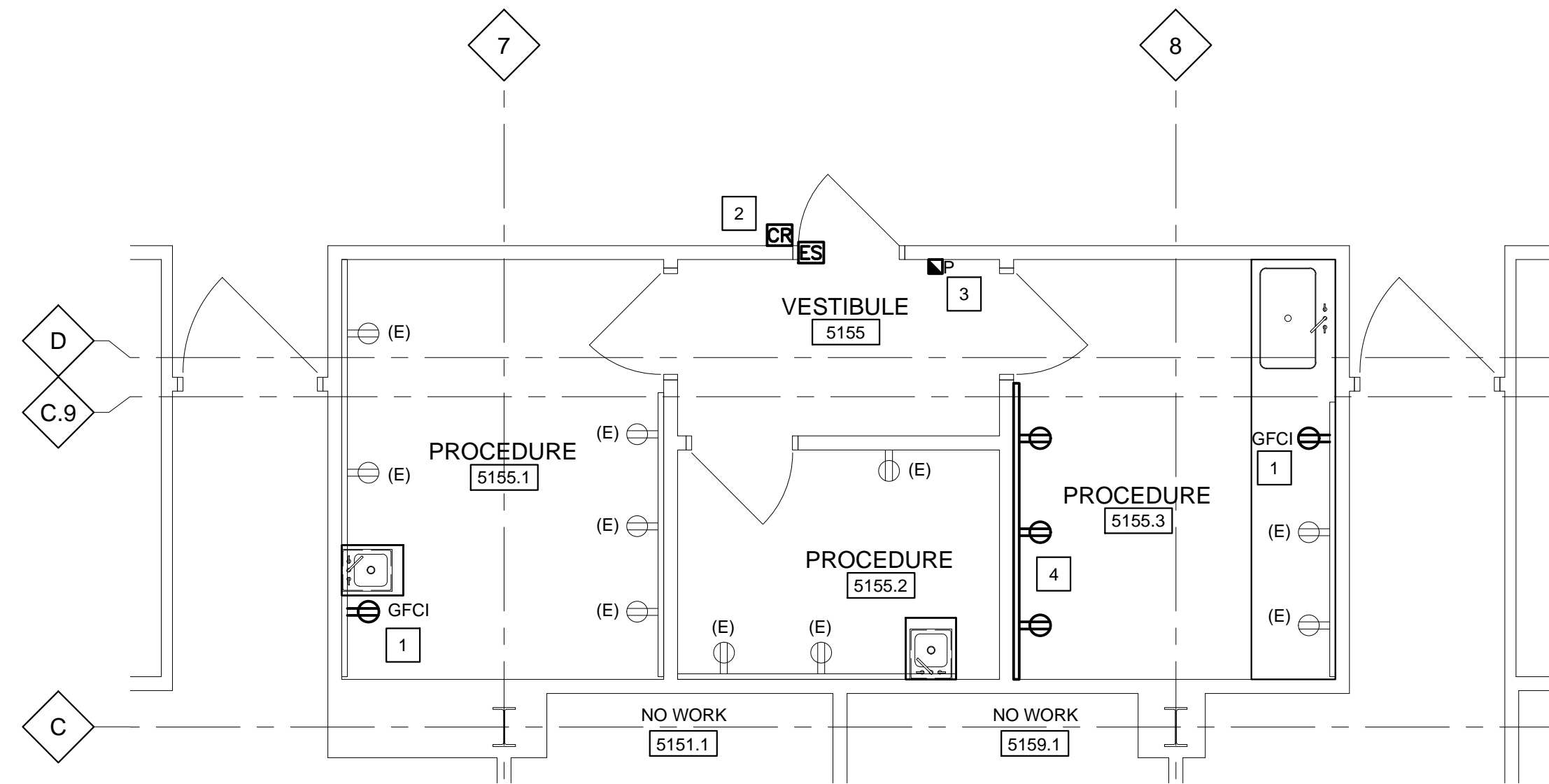
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LEVEL FIVE ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK

EP1-05-01
SHEET NUMBER



NEW WORK FLOOR PLAN - LIGHTING - SUITE 5155
SCALE: 1/4"=1'-0"



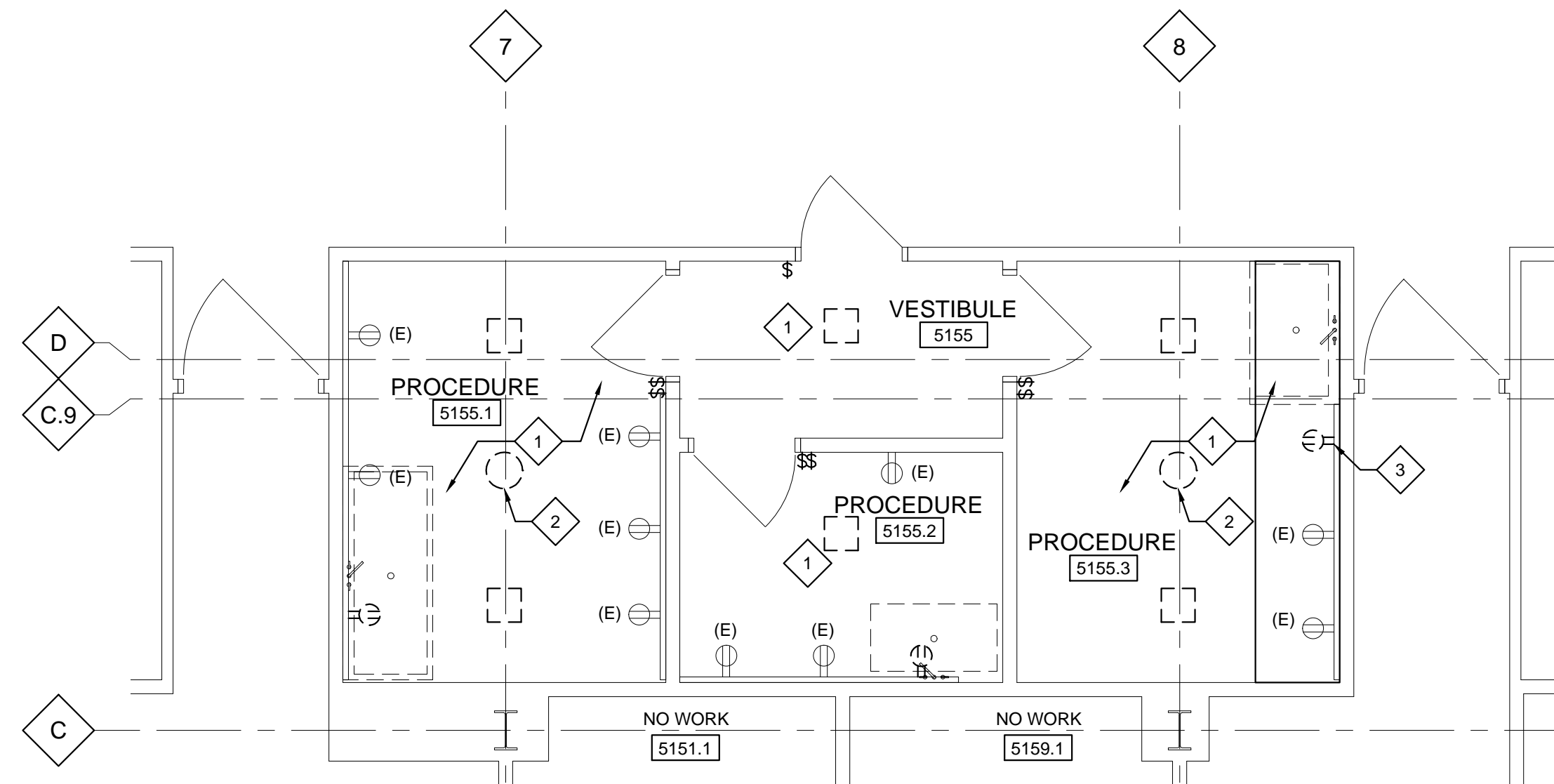
NEW WORK FLOOR PLAN - POWER AND AUXILIARY SYSTEMS - SUITE 5155
SCALE: 1/4"=1'-0"

GENERAL NOTES:

1. REFER TO SHEET E0-00-01 FOR ELECTRICAL LEGEND, ABBREVIATION AND SYMBOLS AND SHEET E0-00-02 FOR ELECTRICAL GENERAL NOTES.
2. (E) - INDICATES EXISTING TO REMAIN.
3. PROVIDE ELECTRICAL WORK SAFE PRACTICE (EWSP); POWER OUTLET LABELING. DOCUMENTATION REVISION UPDATES AND UPDATE ALL PANEL SCHEDULES ON ALL PANELS AFFECTED BY THIS PROJECT.

KEY NOTES:

1. INSTALL A NEW GFCI RECEPTACLE IN THE WIREWAY AND CONNECT TO THE EXISTING CIRCUIT.
2. ELECTRICAL CONTRACTOR SHALL INSTALL NEW CONDUIT AND WIRING FOR POWER FROM THE NEAREST 120V POWER SOURCE, AND DATA FOR NEW ONECARD READER. COORDINATE WITH WSU SECURITY CONTRACTOR FOR FINAL LOCATION OF THE CARD READER. ALL DEVICE INSTALLATION AND FINAL TERMINATIONS SHALL BE BY WSU SECURITY CONTRACTOR.
3. MANUAL STARTER FOR EXHAUST FAN, EF-20, CONNECT TO AVAILABLE CIRCUIT BREAKER IN PANEL RP-15. REFER TO THE MECHANICAL PLANS FOR THE LOCATION OF THE EXHAUST FAN.
4. INSTALL NEW WIREWAY TO MATCH EXISTING. CIRCUIT TO AVAILABLE CIRCUIT BREAKER IN PANEL RP-15. MOUNT WIREWAY 6" ABOVE THE COUNTER.



DEMOLITION FLOOR PLAN - SUITE 5155
SCALE: 1/4"=1'-0"

DEMOLITION KEY NOTES:

1. DISCONNECT AND REMOVE THE EXISTING LUMINAIRES ALONG WITH THE ASSOCIATED SWITCHES, RETAIN BACK BOX AND WIRING FOR RE-USE.
2. DISCONNECT AND REMOVE THE LUMINAIRE ALONG WITH ASSOCIATED CONDUIT AND WIRING BACK TO THE FIRST ACTIVE JUNCTION BOX. COORDINATE PATCHING OF OPENING WITH THE ARCHITECTURAL TRADES.
3. DISCONNECT AND REMOVE RECEPTACLE FROM WIREWAY. LEAVE WIRING IN PLACE FOR RE-USE.

LINEWEIGHT LEGEND:

- ITEMS TO BE REMOVED OR RELOCATED.
- EXISTING ITEMS TO REMAIN.
- NEW ITEMS.

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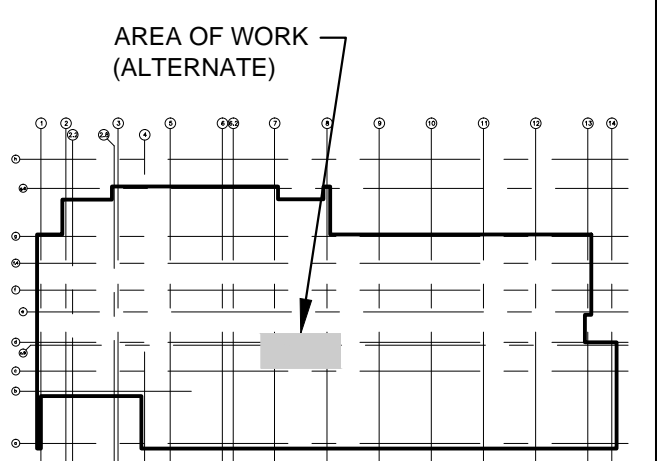
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	10/31/14	90% OWNER REVIEW UPDATE
	10/16/14	90% OWNER REVIEW

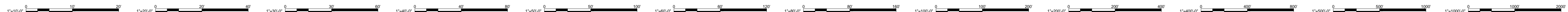


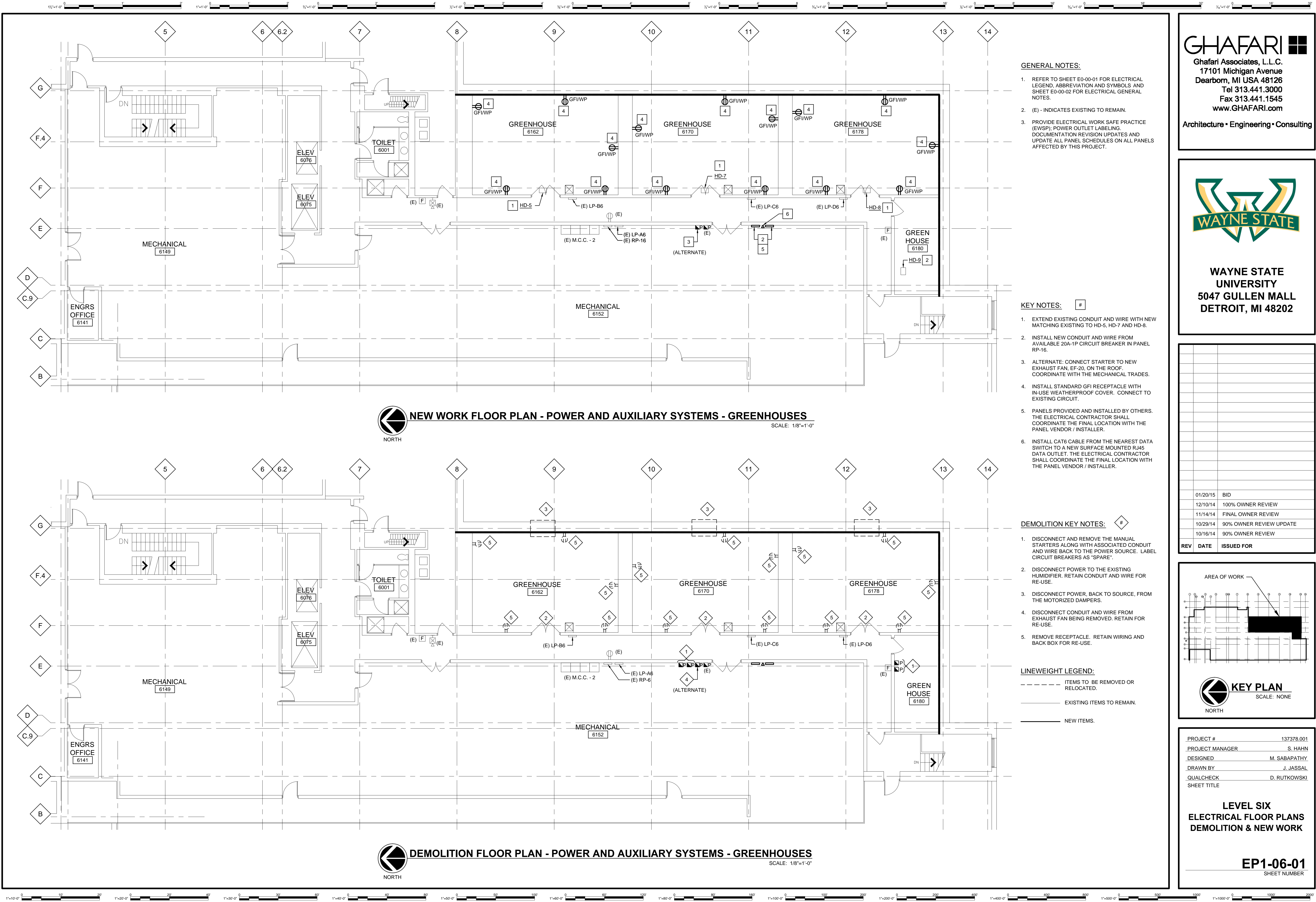
KEY PLAN
SCALE: NONE

PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

**LEVEL FIVE (ALTERNATE #1)
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK**

EP1-05-02
SHEET NUMBER





GENERAL NOTES:

- 1. REFER TO SHEET E0-00-01 FOR ELECTRICAL LEGEND, ABBREVIATION AND SYMBOLS. AND SHEET E0-00-02 FOR ELECTRICAL GENERAL NOTES.
- 2. (E) - INDICATES EXISTING TO REMAIN.
- 3. PROVIDE ELECTRICAL WORK SAFE PRACTICE (EWSP); POWER OUTLET LABELING. DOCUMENTATION REVISION UPDATES AND UPDATE ALL PANEL SCHEDULES ON ALL PANELS AFFECTED BY THIS PROJECT.

KEY NOTES:

- 1. EXTEND EXISTING CONDUIT AND WIRE WITH NEW MATCHING EXISTING TO HD-5, HD-7 AND HD-8.
- 2. INSTALL NEW CONDUIT AND WIRE FROM AVAILABLE 20A-1P CIRCUIT BREAKER IN PANEL RP-16.
- 3. ALTERNATE: CONNECT STARTER TO NEW EXHAUST FAN, EF-20, ON THE ROOF. COORDINATE WITH THE MECHANICAL TRADES.
- 4. INSTALL STANDARD GFI RECEPTACLE WITH IN-USE WEATHERPROOF COVER. CONNECT TO EXISTING CIRCUIT.
- 5. PANELS PROVIDED AND INSTALLED BY OTHERS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE FINAL LOCATION WITH THE PANEL VENDOR / INSTALLER.
- 6. INSTALL CAT6 CABLE FROM THE NEAREST DATA SWITCH TO A NEW SURFACE MOUNTED RJ45 DATA OUTLET. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE FINAL LOCATION WITH THE PANEL VENDOR / INSTALLER.

DEMOLITION KEY NOTES:

- 1. DISCONNECT AND REMOVE THE MANUAL STARTERS ALONG WITH ASSOCIATED CONDUIT AND WIRE BACK TO THE POWER SOURCE. LABEL CIRCUIT BREAKERS AS 'SPARE'.
- 2. DISCONNECT POWER TO THE EXISTING HUMIDIFIER. RETAIN CONDUIT AND WIRE FOR RE-USE.
- 3. DISCONNECT POWER, BACK TO SOURCE, FROM THE MOTORIZED DAMPERS.
- 4. DISCONNECT CONDUIT AND WIRE FROM EXHAUST FAN BEING REMOVED. RETAIN FOR RE-USE.
- 5. REMOVE RECEPTACLE. RETAIN WIRING AND BACK BOX FOR RE-USE.

LINEWEIGHT LEGEND:

- ITEMS TO BE REMOVED OR RELOCATED.
- EXISTING ITEMS TO REMAIN.
- NEW ITEMS.

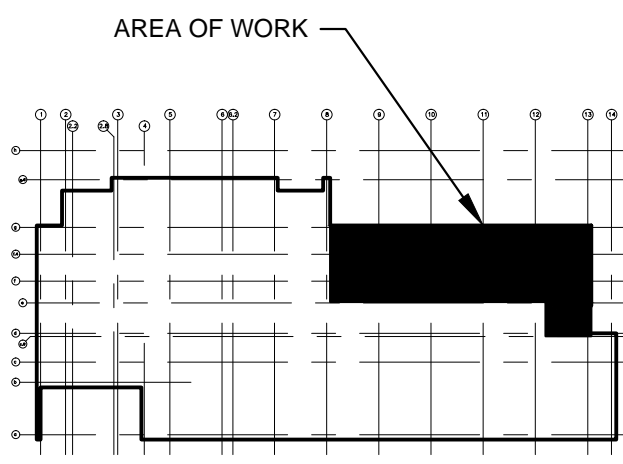
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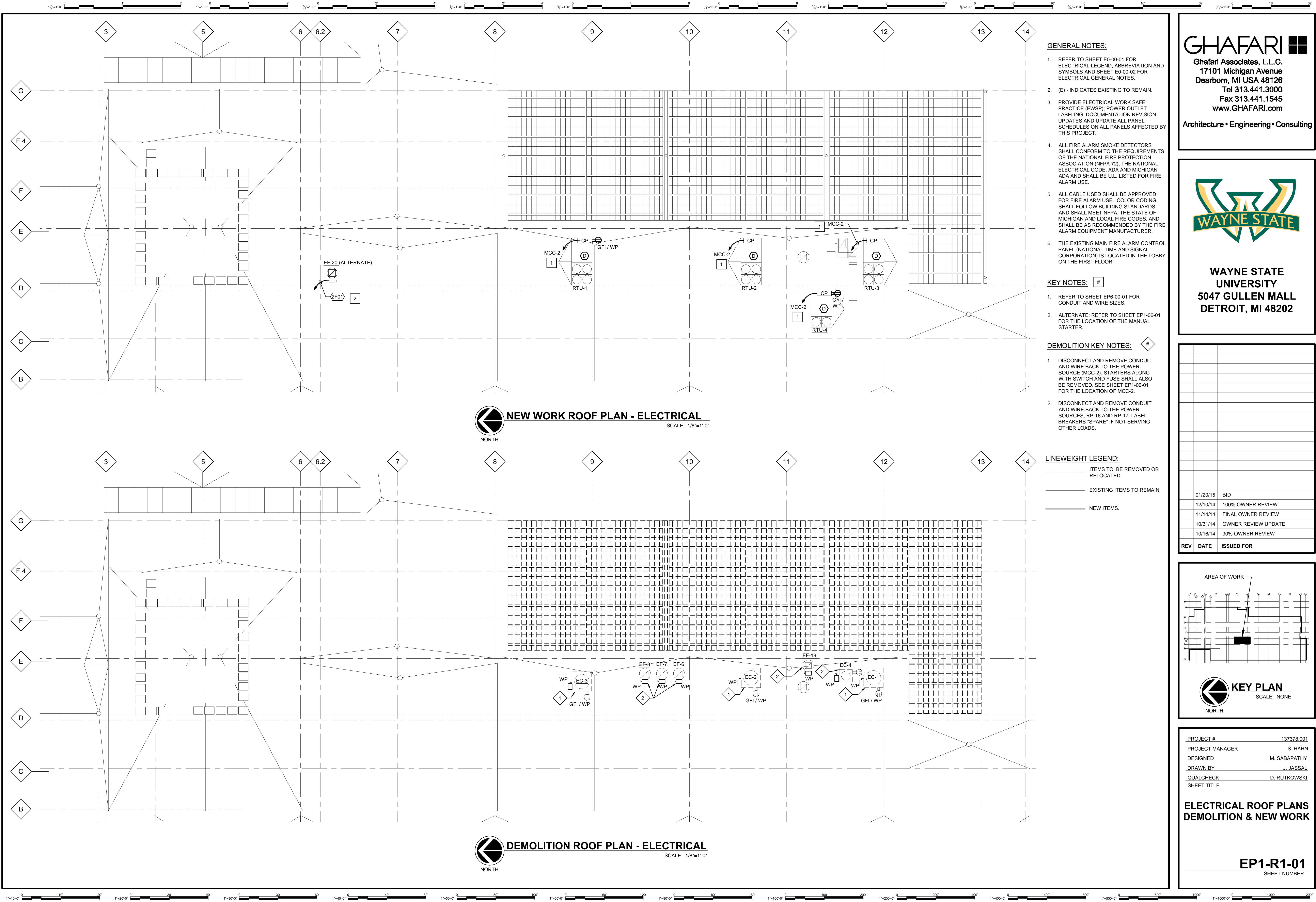


KEY PLAN
SCALE: NONE

PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

LEVEL SIX
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK

EP1-06-01
SHEET NUMBER



GENERAL NOTES:

1. REFER TO SHEET E0-00-01 FOR ELECTRICAL LEGEND, ABBREVIATION AND SYMBOLS AND SHEET E0-00-02 FOR ELECTRICAL GENERAL NOTES.
2. (E) - INDICATES EXISTING TO REMAIN.
3. PROVIDE ELECTRICAL WORK SAFE PRACTICE (EWSF), POWER OUTLET LABELING, DOCUMENTATION REVISION UPDATES AND UPDATE ALL PANEL SCHEDULES ON ALL PANELS AFFECTED BY THIS PROJECT.
4. ALL FIRE ALARM SMOKE DETECTORS SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 72), THE NATIONAL ELECTRICAL CODE, ADA AND MICHIGAN ADA AND SHALL BE U.L. LISTED FOR FIRE ALARM USE.
5. ALL CABLE USED SHALL BE APPROVED FOR FIRE ALARM USE. COLOR CODING SHALL FOLLOW BUILDING STANDARDS AND SHALL MEET NFPA, THE STATE OF MICHIGAN AND LOCAL FIRE CODES, AND SHALL BE AS RECOMMENDED BY THE FIRE ALARM EQUIPMENT MANUFACTURER.
6. THE EXISTING MAIN FIRE ALARM CONTROL PANEL (NATIONAL TIME AND SIGNAL CORPORATION) IS LOCATED IN THE LOBBY ON THE FIRST FLOOR.

KEY NOTES: #

1. REFER TO SHEET EP6-00-01 FOR CONDUIT AND WIRE SIZES.
2. ALTERNATE: REFER TO SHEET EP1-06-01 FOR THE LOCATION OF THE MANUAL STARTER.

DEMOLITION KEY NOTES: #

1. DISCONNECT AND REMOVE CONDUIT AND WIRE BACK TO THE POWER SOURCE (MCC-2). STARTERS ALONG WITH SWITCH AND FUSE SHALL ALSO BE REMOVED. SEE SHEET EP1-06-01 FOR THE LOCATION OF MCC-2.
2. DISCONNECT AND REMOVE CONDUIT AND WIRE BACK TO THE POWER SOURCES, RP-16 AND RP-17. LABEL BREAKERS "SPARE" IF NOT SERVING OTHER LOADS.

LINEWEIGHT LEGEND:

- ITEMS TO BE REMOVED OR RELOCATED.
- EXISTING ITEMS TO REMAIN.
- NEW ITEMS.

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	11/14/14	FINAL OWNER REVIEW
	10/31/14	OWNER REVIEW UPDATE
	10/16/14	90% OWNER REVIEW
REV	DATE	ISSUED FOR

AREA OF WORK

KEY PLAN
SCALE: NONE

PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

**ELECTRICAL ROOF PLANS
DEMOLITION & NEW WORK**

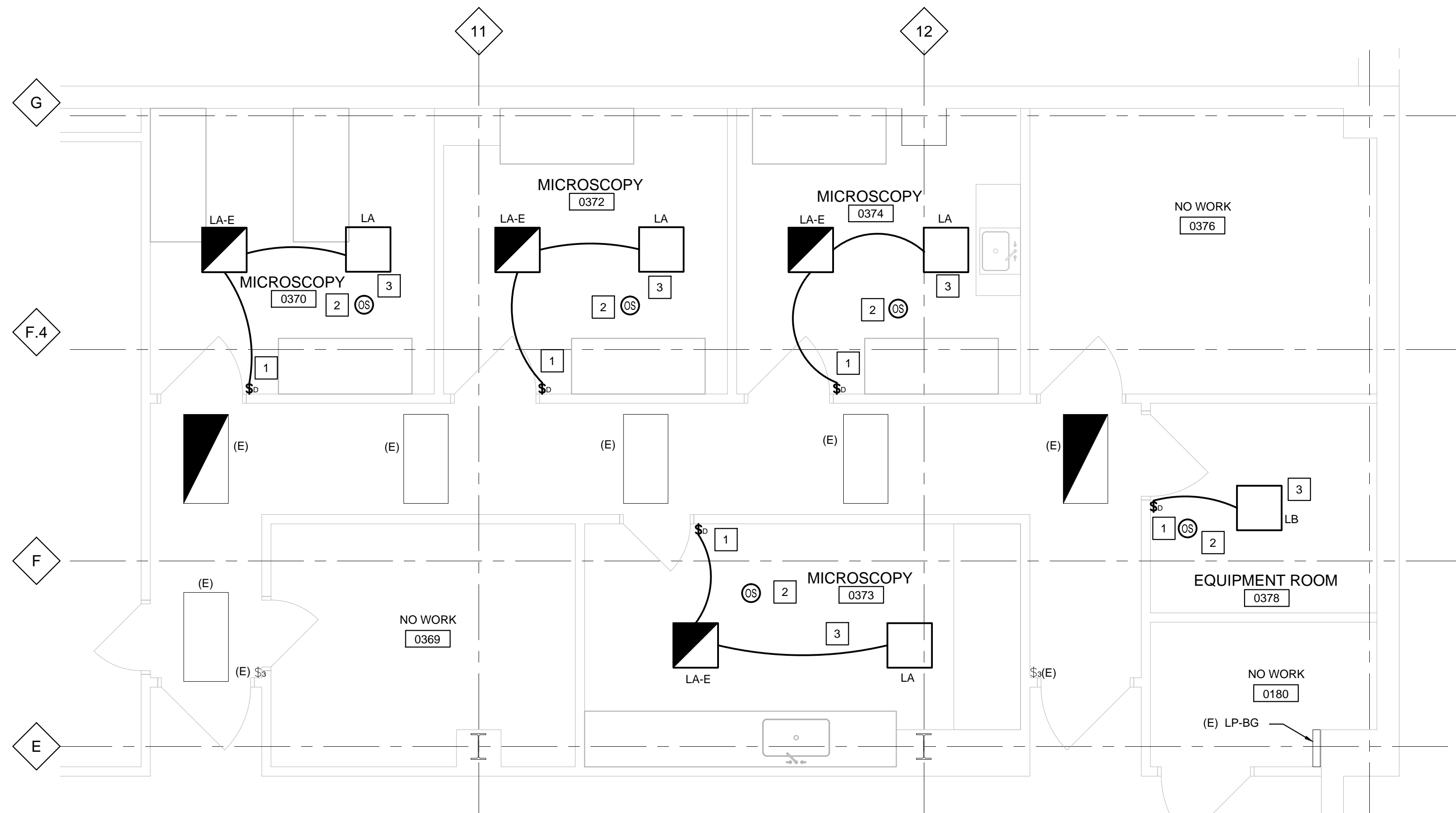
EP1-R1-01
SHEET NUMBER



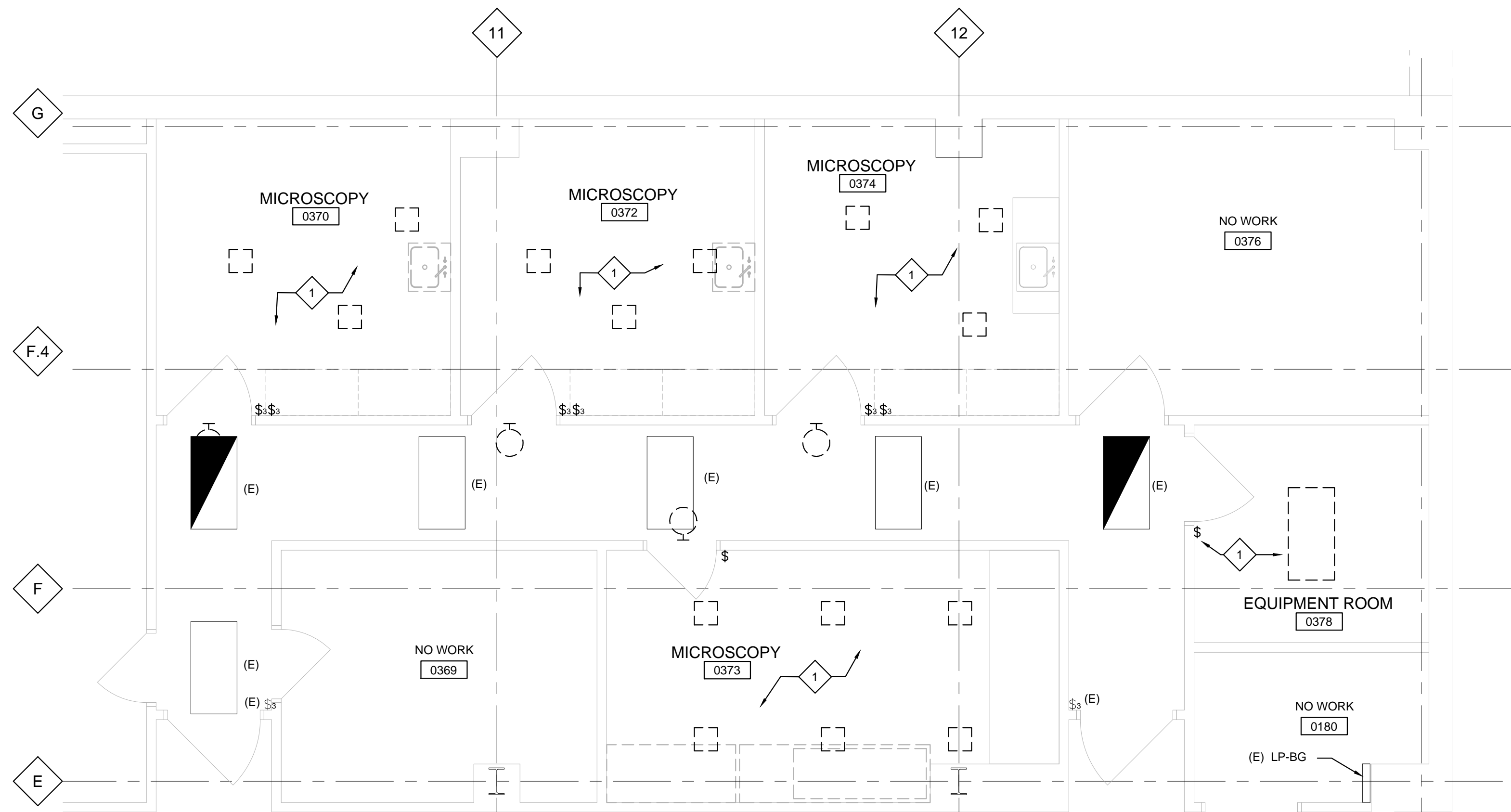
1. DISCONNECT AND REMOVE THE FUSIBLE SWITCH FUSE UNIT ALONG WITH THE CONTACTOR AND HEATER. RETAIN COMPARTMENT FOR RE-USE.

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SHEET NUMBER



NEW WORK FLOOR PLAN - LIGHTING - MICROSCOPY
SCALE: 1/4"=1'-0"



DEMOLITION FLOOR PLAN - LIGHTING - MICROSCOPY
SCALE: 1/4"=1'-0"

GENERAL NOTES:

1. REFER TO SHEET E0-00-01 FOR ELECTRICAL LEGEND, ABBREVIATION AND SYMBOLS AND SHEET E0-00-02 FOR ELECTRICAL GENERAL NOTES.
2. (E) - INDICATES EXISTING TO REMAIN.
3. PROVIDE ELECTRICAL WORK SAFE PRACTICE (EWSP); POWER OUTLET LABELING. DOCUMENTATION REVISION UPDATES AND UPDATE ALL PANEL SCHEDULES ON ALL PANELS AFFECTED BY THIS PROJECT.
4. REFER TO SHEET EL7-00-01 FOR THE LUMINAIRE SCHEDULE.

KEY NOTES:

1. INSTALL A NEW WALL MOUNTED DIMMING SWITCH IN THE EXISTING BACK BOX. DIMMING SWITCH SHALL BE MANUFACTURED BY LEVITON, CAT # AWSMT - EAW, 277V, 1385W OR APPROVED EQUAL, CONNECT TO THE EXISTING CIRCUIT.
2. INSTALL A CEILING MOUNTED OCCUPANCY SENSOR MANUFACTURED BY COOPER CONTROLS, GREENGATE OR APPROVED EQUAL. THE SENSOR SHALL BE A MICROSET DUAL TECHNOLOGY LINE VOLTAGE SENSOR, CAT # OAC-DT-2000-MV OR APPROVED EQUAL.
3. EXTEND THE EXISTING CIRCUIT WITH NEW CONDUITS AND WIRE, TO THE NEW LUMINAIRES.
4. SEE SHEET AC1-01-01 FOR NEW LUMINAIRE LOCATIONS.

DEMOLITION KEY NOTES:

1. DISCONNECT AND REMOVE THE LUMINAIRES IN THE ROOM ALONG WITH THE SWITCH AND WALL PLATE. RETAIN BACK BOX IN THE WALL AND WIRING IN THE CEILING SPACE FOR REUSE.

LINEWEIGHT LEGEND:

- ITEMS TO BE REMOVED OR RELOCATED.
- EXISTING ITEMS TO REMAIN.
- NEW ITEMS.

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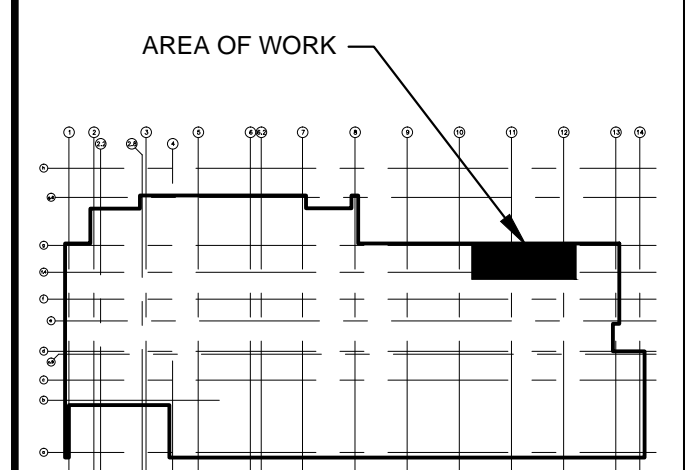
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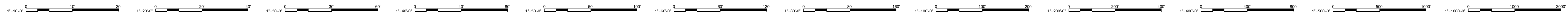


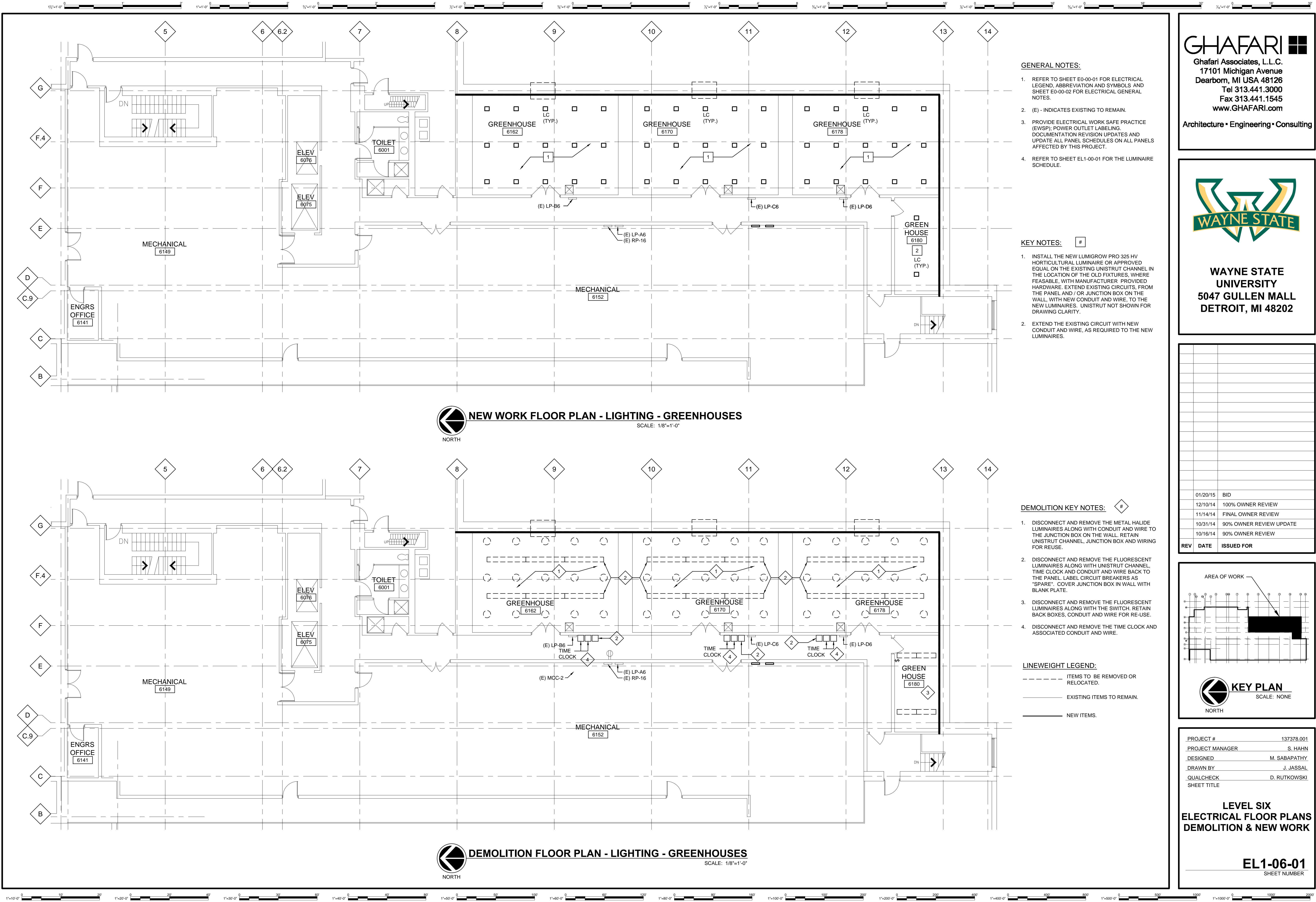
KEY PLAN
SCALE: NONE

PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

**LOWER LEVEL
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK**

EL1-L1-01
SHEET NUMBER





GENERAL NOTES:

- REFER TO SHEET E0-00-01 FOR ELECTRICAL LEGEND, ABBREVIATION AND SYMBOLS AND SHEET E0-00-02 FOR ELECTRICAL GENERAL NOTES.
- (E) - INDICATES EXISTING TO REMAIN.
- PROVIDE ELECTRICAL WORK SAFE PRACTICE (EWSP); POWER OUTLET LABELING. DOCUMENTATION REVISION UPDATES AND UPDATE ALL PANEL SCHEDULES ON ALL PANELS AFFECTED BY THIS PROJECT.
- REFER TO SHEET EL1-00-01 FOR THE LUMINAIRE SCHEDULE.

KEY NOTES:

- INSTALL THE NEW LUMIGROW PRO 325 HV HORTICULTURAL LUMINAIRE OR APPROVED EQUAL ON THE EXISTING UNISTRUT CHANNEL IN THE LOCATION OF THE OLD FIXTURES, WHERE FEASIBLE, WITH MANUFACTURER PROVIDED HARDWARE. EXTEND EXISTING CIRCUITS, FROM THE PANEL AND / OR JUNCTION BOX ON THE WALL, WITH NEW CONDUIT AND WIRE, TO THE NEW LUMINAIRES. UNISTRUT NOT SHOWN FOR DRAWING CLARITY.
- EXTEND THE EXISTING CIRCUIT WITH NEW CONDUIT AND WIRE, AS REQUIRED TO THE NEW LUMINAIRES.

DEMOLITION KEY NOTES:

- DISCONNECT AND REMOVE THE METAL HALIDE LUMINAIRES ALONG WITH CONDUIT AND WIRE TO THE JUNCTION BOX ON THE WALL. RETAIN UNISTRUT CHANNEL, JUNCTION BOX AND WIRING FOR REUSE.
- DISCONNECT AND REMOVE THE FLUORESCENT LUMINAIRES ALONG WITH UNISTRUT CHANNEL, TIME CLOCK AND CONDUIT AND WIRE BACK TO THE PANEL. LABEL CIRCUIT BREAKERS AS "SPARE". COVER JUNCTION BOX IN WALL WITH BLANK PLATE.
- DISCONNECT AND REMOVE THE FLUORESCENT LUMINAIRES ALONG WITH THE SWITCH. RETAIN BACK BOXES, CONDUIT AND WIRE FOR RE-USE.
- DISCONNECT AND REMOVE THE TIME CLOCK AND ASSOCIATED CONDUIT AND WIRE.

LINEWEIGHT LEGEND:

- ITEMS TO BE REMOVED OR RELOCATED.
- EXISTING ITEMS TO REMAIN.
- NEW ITEMS.

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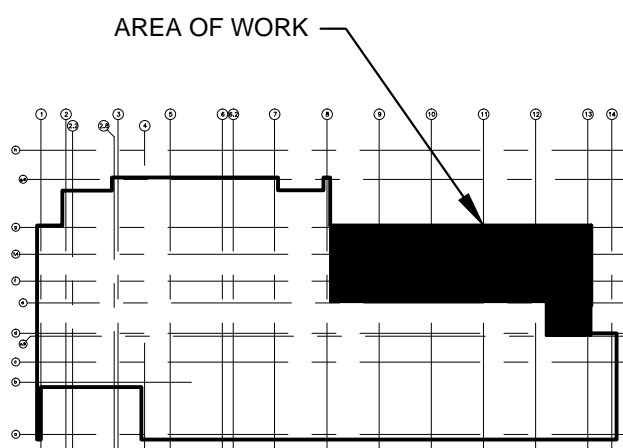
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10/31/14	90% OWNER REVIEW UPDATE
10/16/14	90% OWNER REVIEW

REV DATE ISSUED FOR

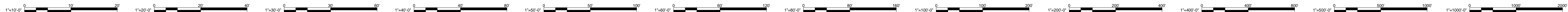


KEY PLAN
SCALE: NONE
NORTH

PROJECT # 137378.001
PROJECT MANAGER S. HAHN
DESIGNED M. SABAPATHY
DRAWN BY J. JASSAL
QUALCHECK D. RUTKOWSKI
SHEET TITLE

**LEVEL SIX
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK**

EL1-06-01
SHEET NUMBER



LUMINAIRE SCHEDULE							
TYPE	DESCRIPTION	LAMPS	VOLTAGE	MANUFACTURER	CATALOG NUMBER	BALLAST / DRIVER	REMARKS
LA	2'X2' LED SHALLOW 3.25" LOW PROFILE HOUSING OF EXTRUDED ALUMINUM FRAME AND INJECTED MOLDED COMPOSITE END PLATES.	25W, 2600 LUMENS 4000 DEG. K	277	COOPER LIGHTING - METALUX 22EN LED SERIES OR LITHONIA LIGHTING EQUIVALENT	22EN-LD1-25-UNV-L840-CD1-U-MS-SR-22 OR APPROVED EQUAL	0-10V CONTINUOUS DIMMING LED DRIVER	COORDINATE THE CEILING THICKNESS WITH THE ARCHITECTURAL TRADES. PROVIDE ALL ACCESSORIES NECESSARY FOR A CLEAN AND COMPLETE INSTALLATION. SURFACE MOUNTED.
LA-E	2'X2' LED SHALLOW 4.75" LOW PROFILE HOUSING OF EXTRUDED ALUMINUM FRAME AND INJECTED MOLDED COMPOSITE END PLATES.	25W, 2600 LUMENS 4000 DEG. K	277	COOPER LIGHTING - METALUX 22EN LED SERIES OR LITHONIA LIGHTING EQUIVALENT	22EN-LD1-25-UNV-EL14-L840-CD1-U-MS-SR-22 OR APPROVED EQUAL	0-10V CONTINUOUS DIMMING LED DRIVER WITH A PHILIPS BODINE BSL722 EMERGENCY LED DRIVER OR APPROVED EQUAL	COORDINATE THE CEILING THICKNESS WITH THE ARCHITECTURAL TRADES. PROVIDE ALL ACCESSORIES NECESSARY FOR A CLEAN AND COMPLETE INSTALLATION. SURFACE MOUNTED.
LC	LIGHT-WEIGHT, STRONG POWER COATED ALUMINUM, IP23 RATED FIXTURE. SMART VOLT AUTO-SWITCHING AND REGULATING POWER SUPPLY. INDIVIDUALLY ADJUSTABLE 3-CHANNEL KNOBS FOR PRECISE CONTROL. INCLUDE THE LUMIGROW SMARTPAR LIGHT MANAGEMENT SERVICE	325W	277	LUMIGROW PRO SERIES LED OR APPROVED EQUAL	PRO 325 HV OR APPROVED EQUAL	LED DRIVER	COORDINATE MOUNTING HEIGHT AND LOCATION WITH OWNER AND ARCHITECTURAL TRADES. PROVIDE ALL ACCESSORIES NECESSARY FOR A CLEAN AND COMPLETE INSTALLATION. INCLUDE THE LUMIGROW SMARTPAR LIGHT MANAGEMENT SERVICE. CONTACT: SCOTT FEINSTEIN SENIOR ACCOUNT EXECUTIVE LUMIGROW, INC. 33 COMMERCIAL BLVD., NOVATO, CA 94949 800.514.0487 EXT.112 612.396.9664 CELL SCOTT@LUMIGROW.COM WWW.LUMIGROW.COM
LD	LIGHT-WEIGHT, STRONG POWER COATED ALUMINUM, IP67 RATED WATERPROOF FIXTURE. SMART VOLT AUTO-SWITCHING AND REGULATING POWER SUPPLY. INDIVIDUALLY ADJUSTABLE 3-CHANNEL KNOBS FOR PRECISE CONTROL. INCLUDE THE LUMIGROW SMARTPAR LIGHT MANAGEMENT SERVICE	185W	277	LUMIGROW LUMIBAR PRO LED STRIP LIGHT OR APPROVED EQUAL	LUMIBAR PRO LED STRIP LIGHT OR APPROVED EQUAL	LED DRIVER	SURFACE MOUNTED. PROVIDE ALL ACCESSORIES NECESSARY FOR A CLEAN AND COMPLETE INSTALLATION. INCLUDE THE LUMIGROW SMARTPAR LIGHT MANAGEMENT SERVICE. CONTACT: SCOTT FEINSTEIN SENIOR ACCOUNT EXECUTIVE LUMIGROW, INC. 33 COMMERCIAL BLVD., NOVATO, CA 94949 800.514.0487 EXT.112 612.396.9664 CELL SCOTT@LUMIGROW.COM WWW.LUMIGROW.COM
XA	EXTRUDED ALUMINUM FINISH CANOPY COVERING THE RECESSED, SELF-CONTAINED ELECTRONICS. CLEAR THERMOPLASTIC PANELS WITH PRECISION OUTLINE ENGRAVED LETTERS, WITH 100 FT VIEWING DISTANCE RATING, BASED ON UL924 STANDARDS. MIRRORRED SEPARATOR PANEL TO SIMULATE CLEAR BACKGROUND. DUAL VOLTAGE, NICKEL-CADMIUM BATTERY, SELF-DIAGNOSTICS FEATURE	LED	120/277	LITHONIA LIGHTING - LED EDGE LIT EXIT COOPER LIGHTING - SURE-LITE	EDGR 2 RMR EL SD	LED DRIVER	MOUNTING KIT AS NECESSARY (RECESSED, TOP, BACK, END) FOR A CLEAN AND COMPLETE INSTALLATION

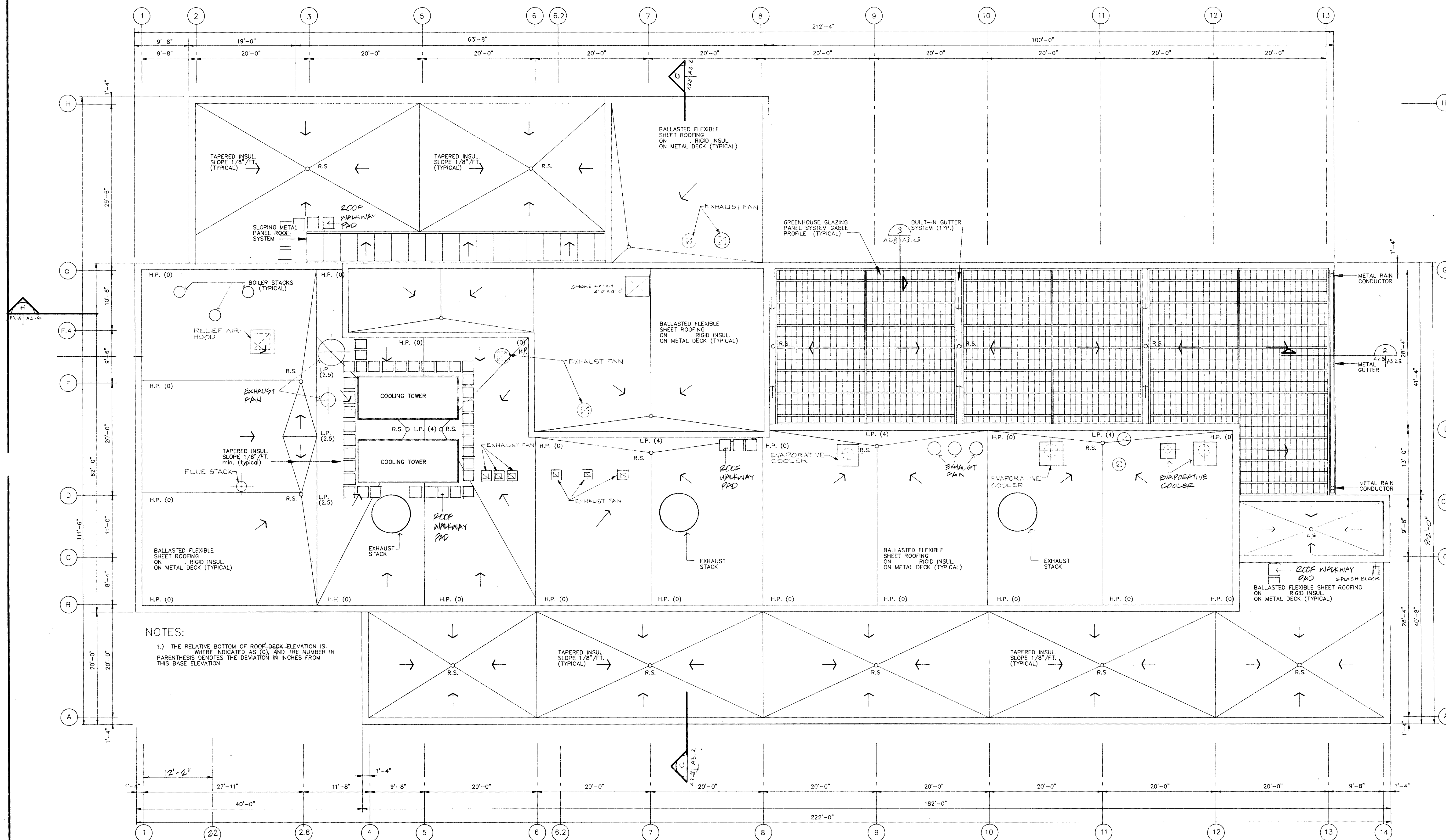
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REV	DATE	ISSUED FOR
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LUMINAIRE SCHEDULE

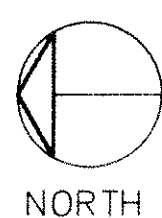
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SHEET NUMBER

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ROOF PLAN

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



NOTES:

- FOR MECH. & HVAC UNITS SEE STRUCTURAL & MECH. DWGS.
- REFER TO SHT. A3.10 FOR TYP. ROOF DETAILS
- FOR MECH. & HVAC UNITS SEE STRUCTURAL & MECH. DWGS.

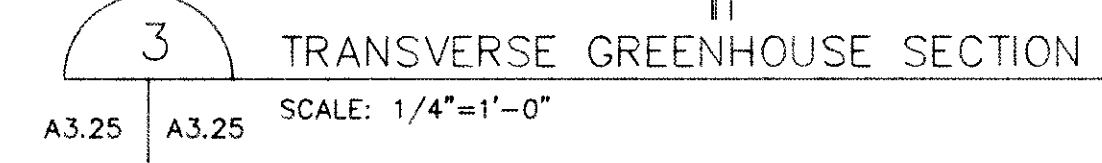
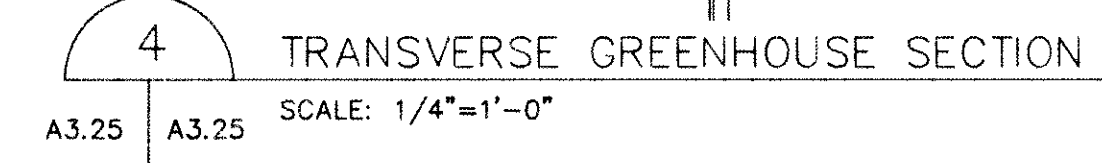
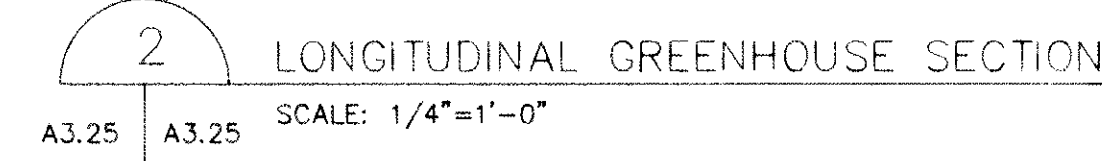
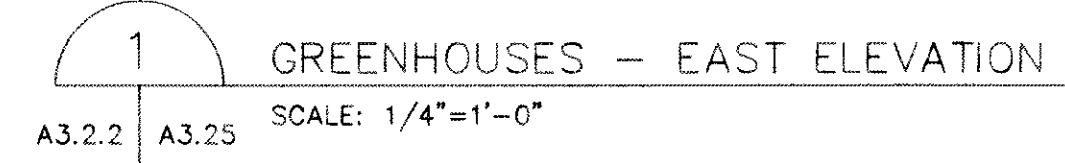
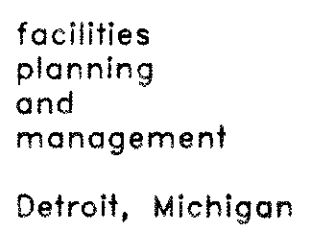
Nathan Johnson & Associates, Inc.
Architecture/ Engineering/ Planning/ Interiors
2512 WEST GRAND BLVD. DETROIT, MICH. 48208

Eberle M. Smith Associates, Inc.
Architects
950 W. Fort Street

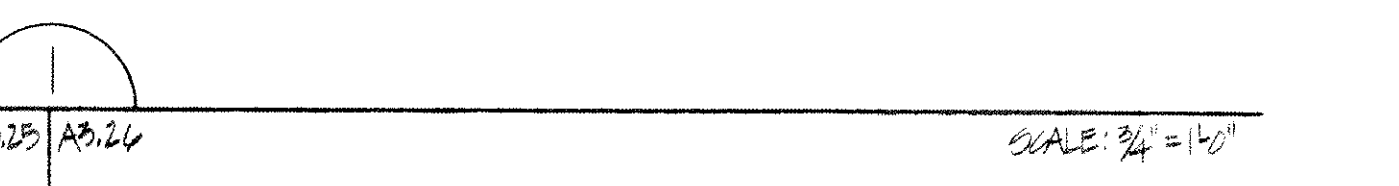
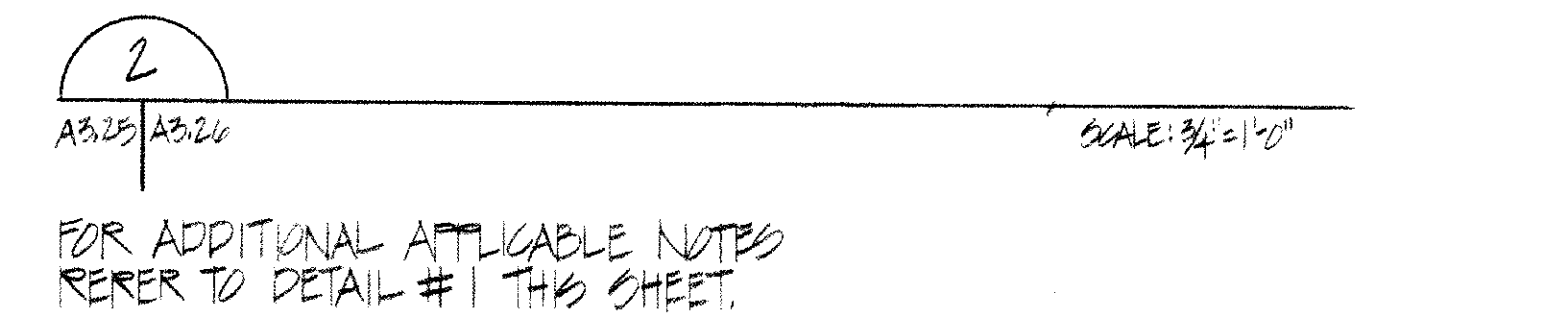
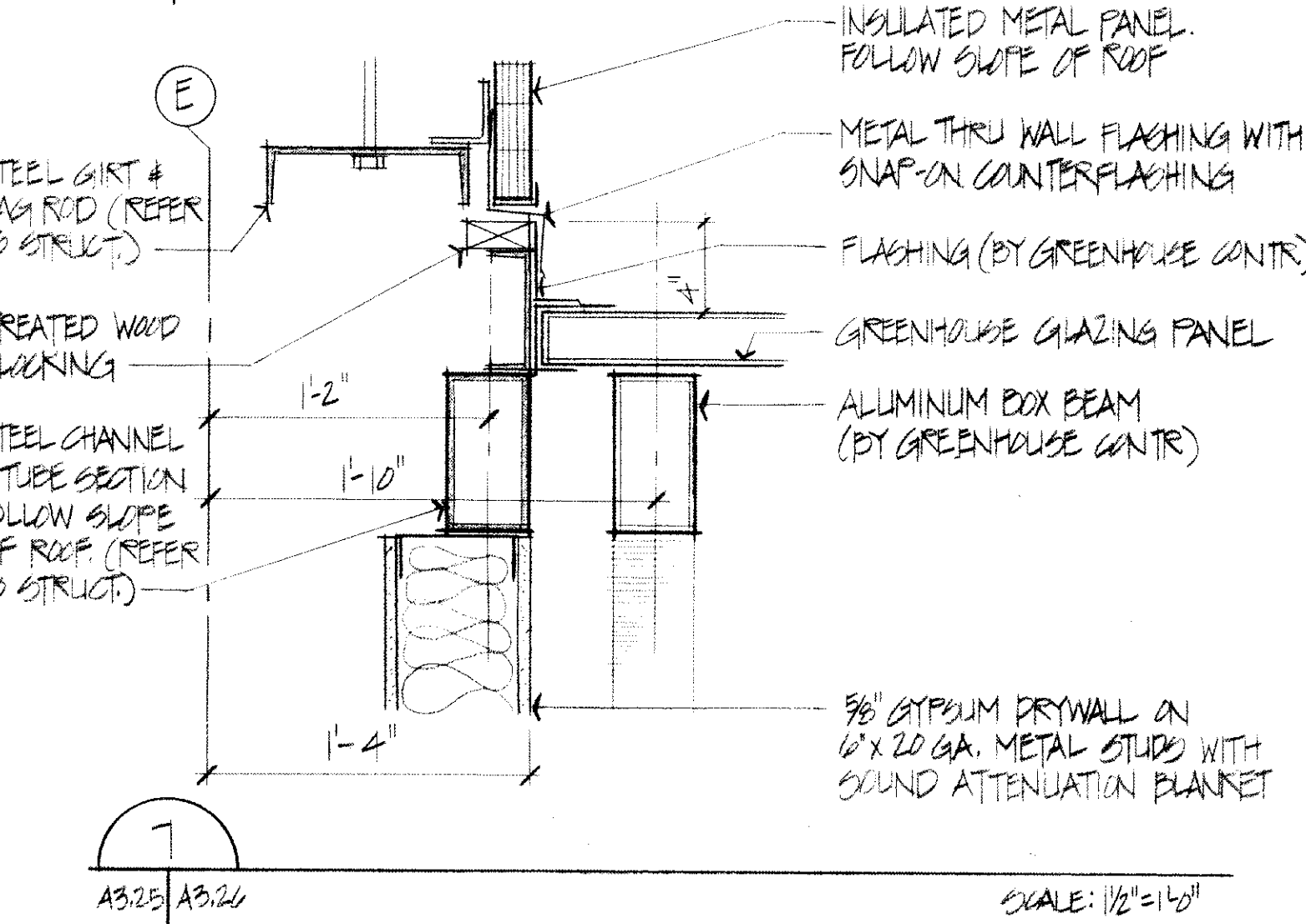
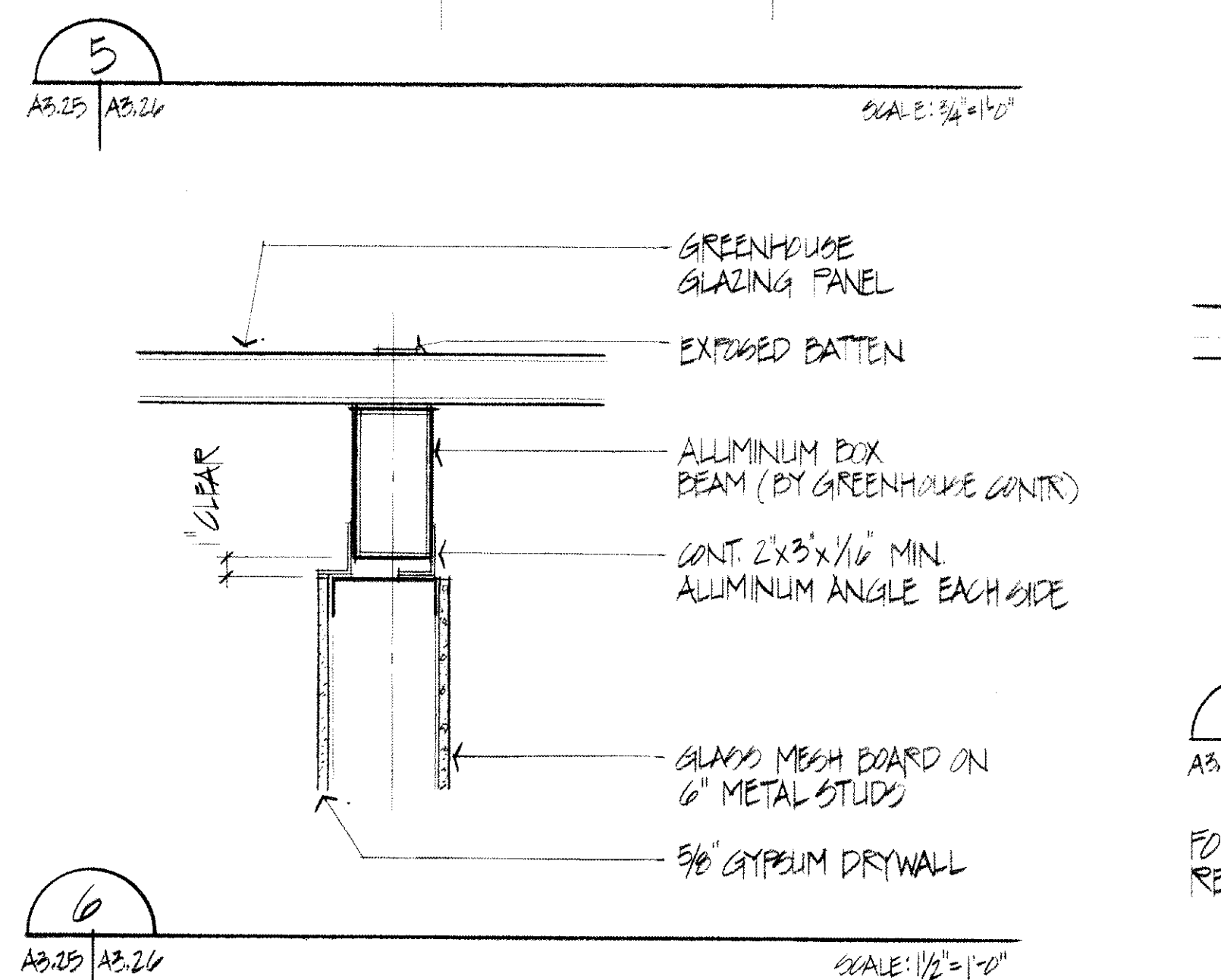
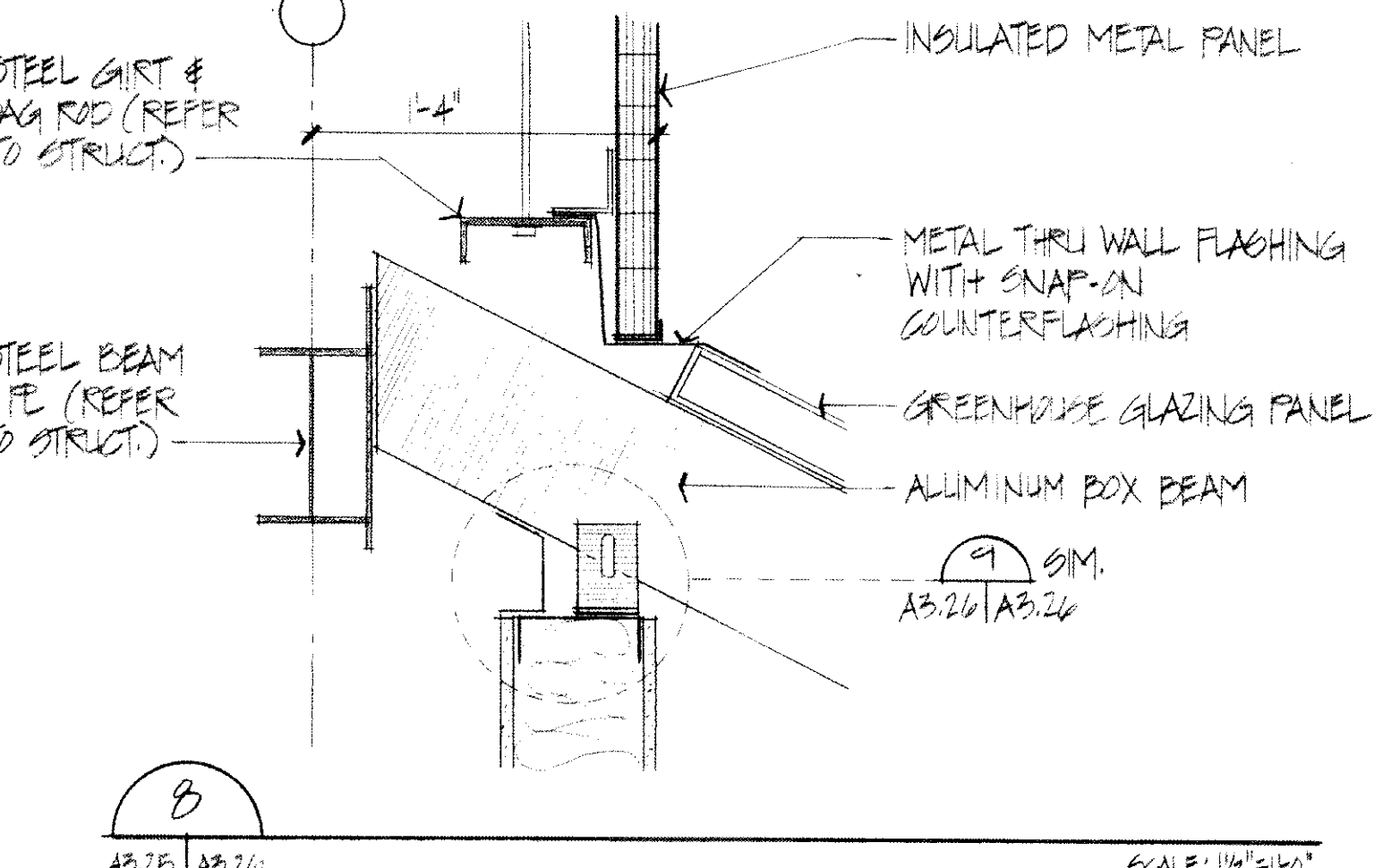
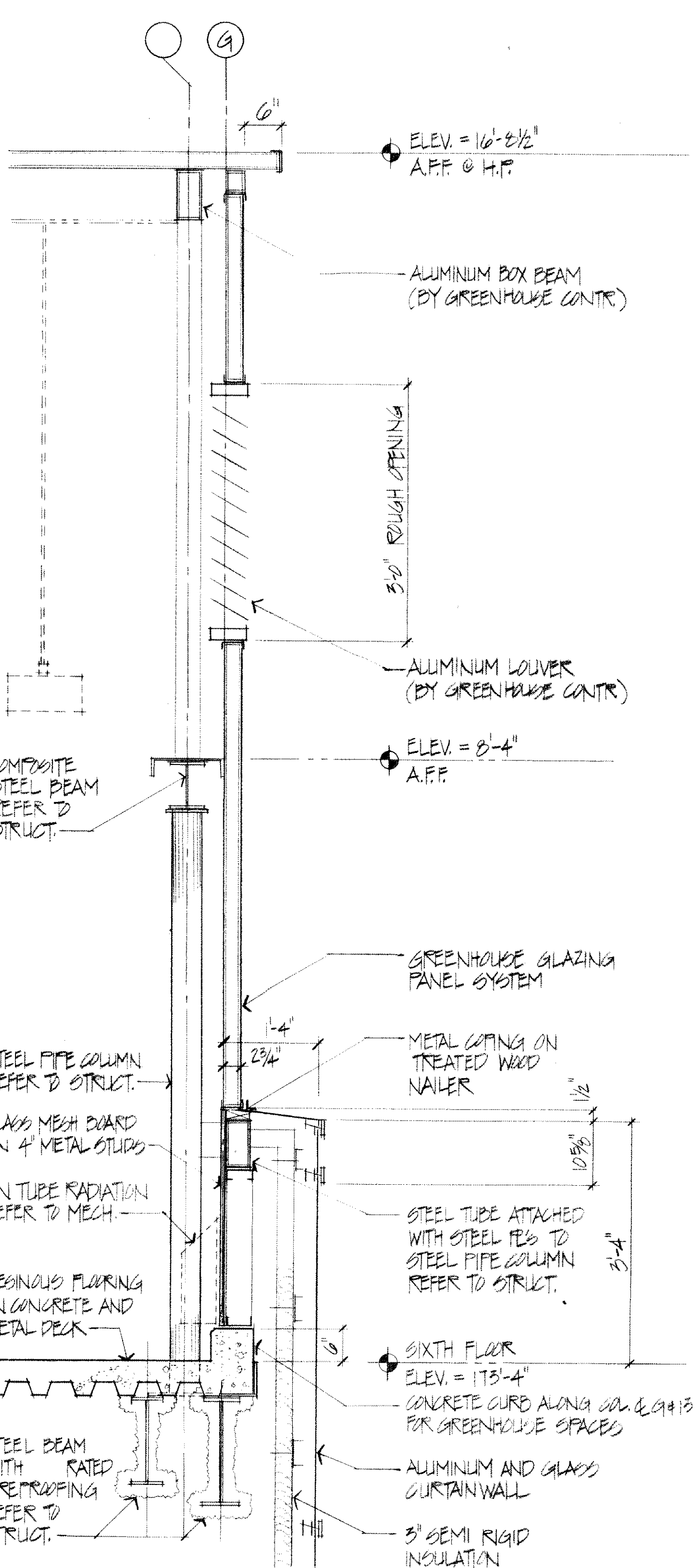
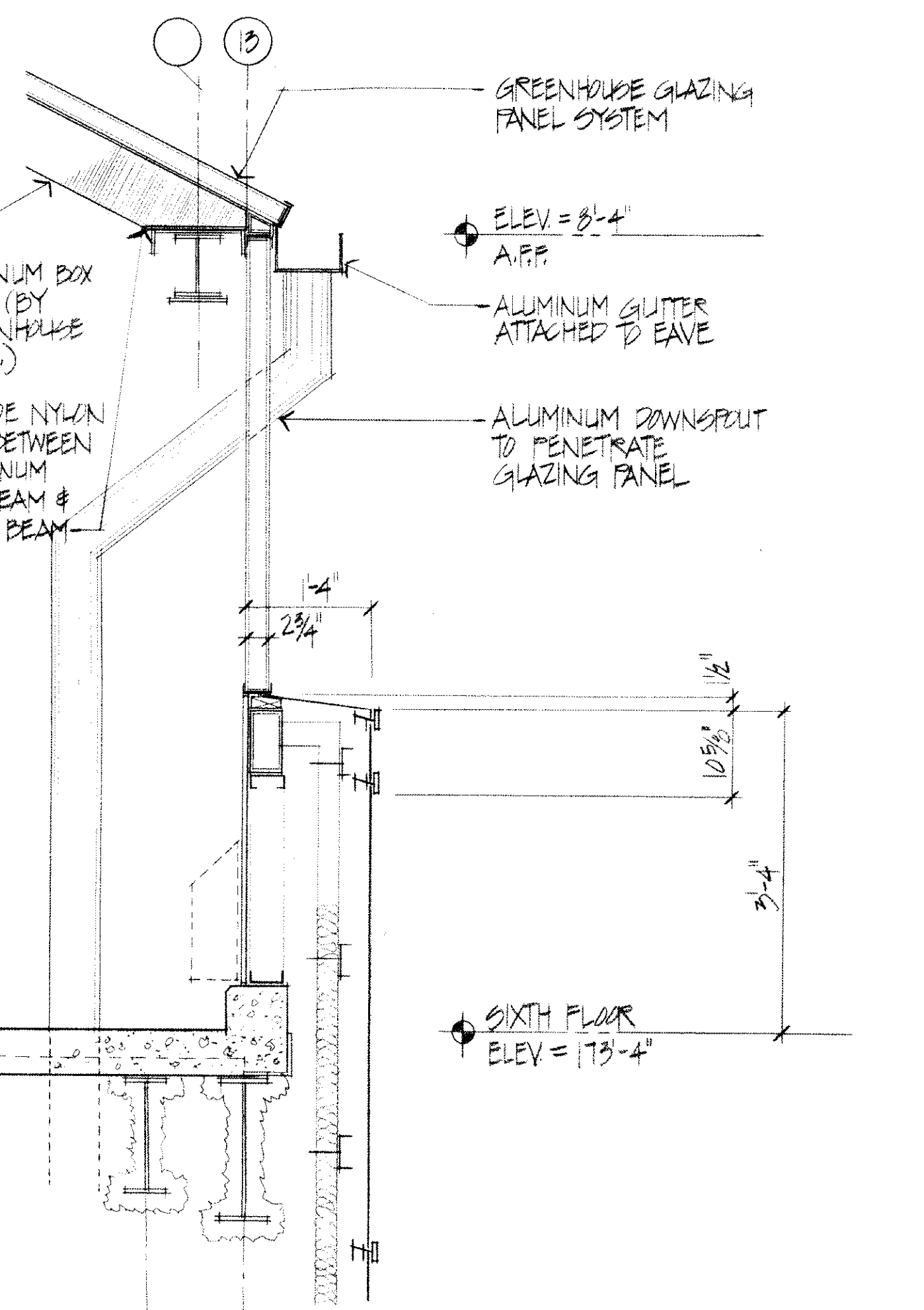
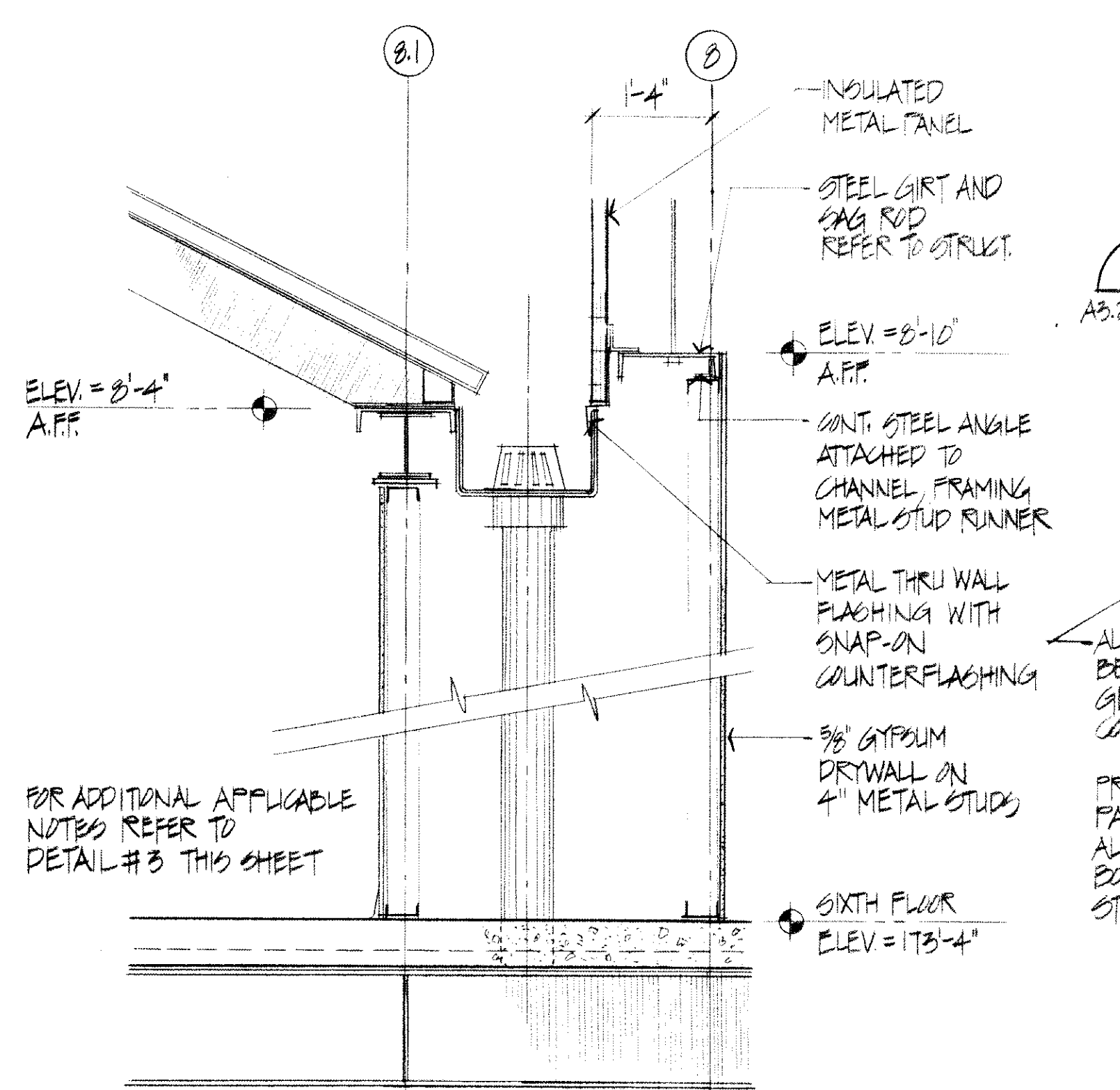
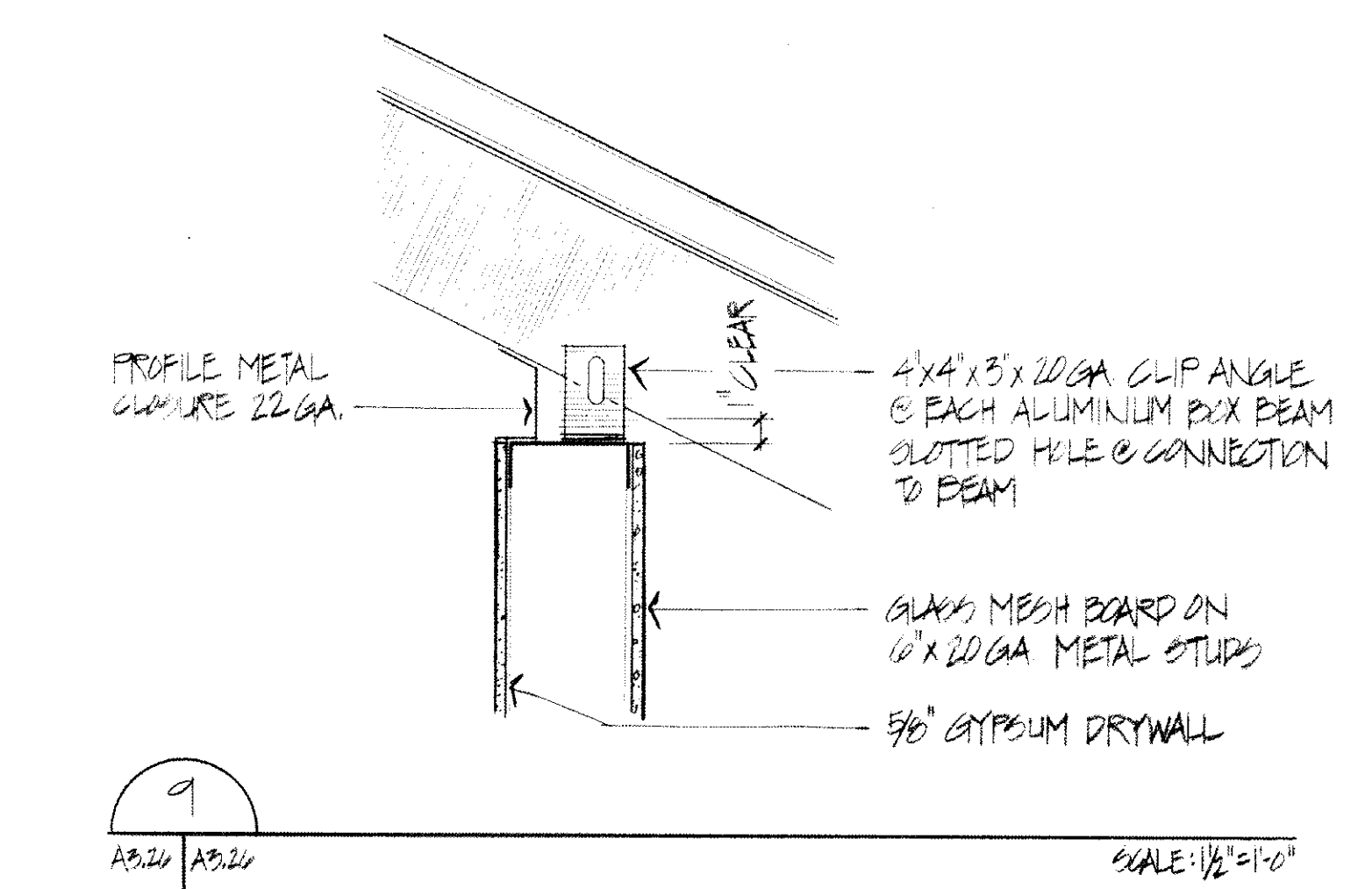
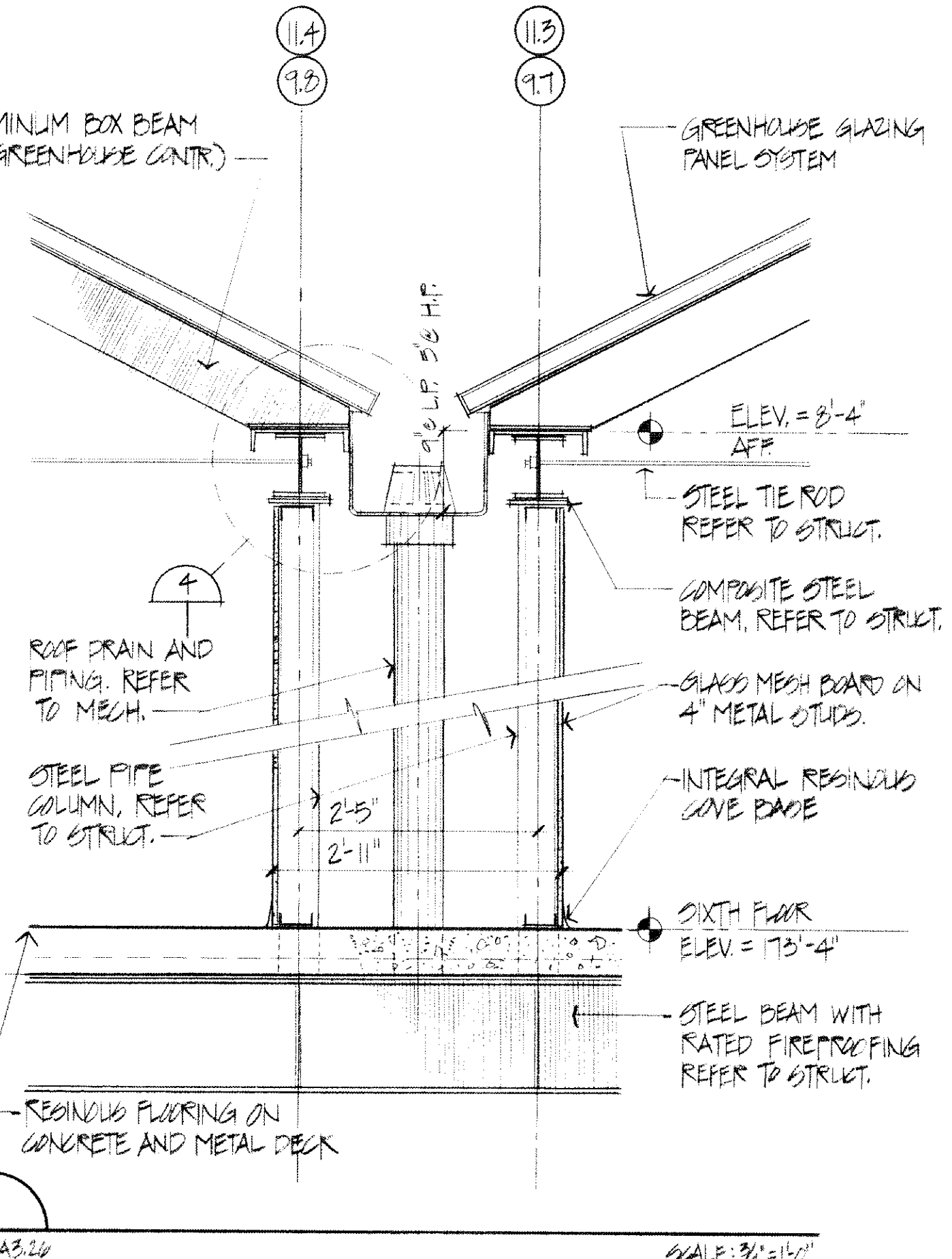
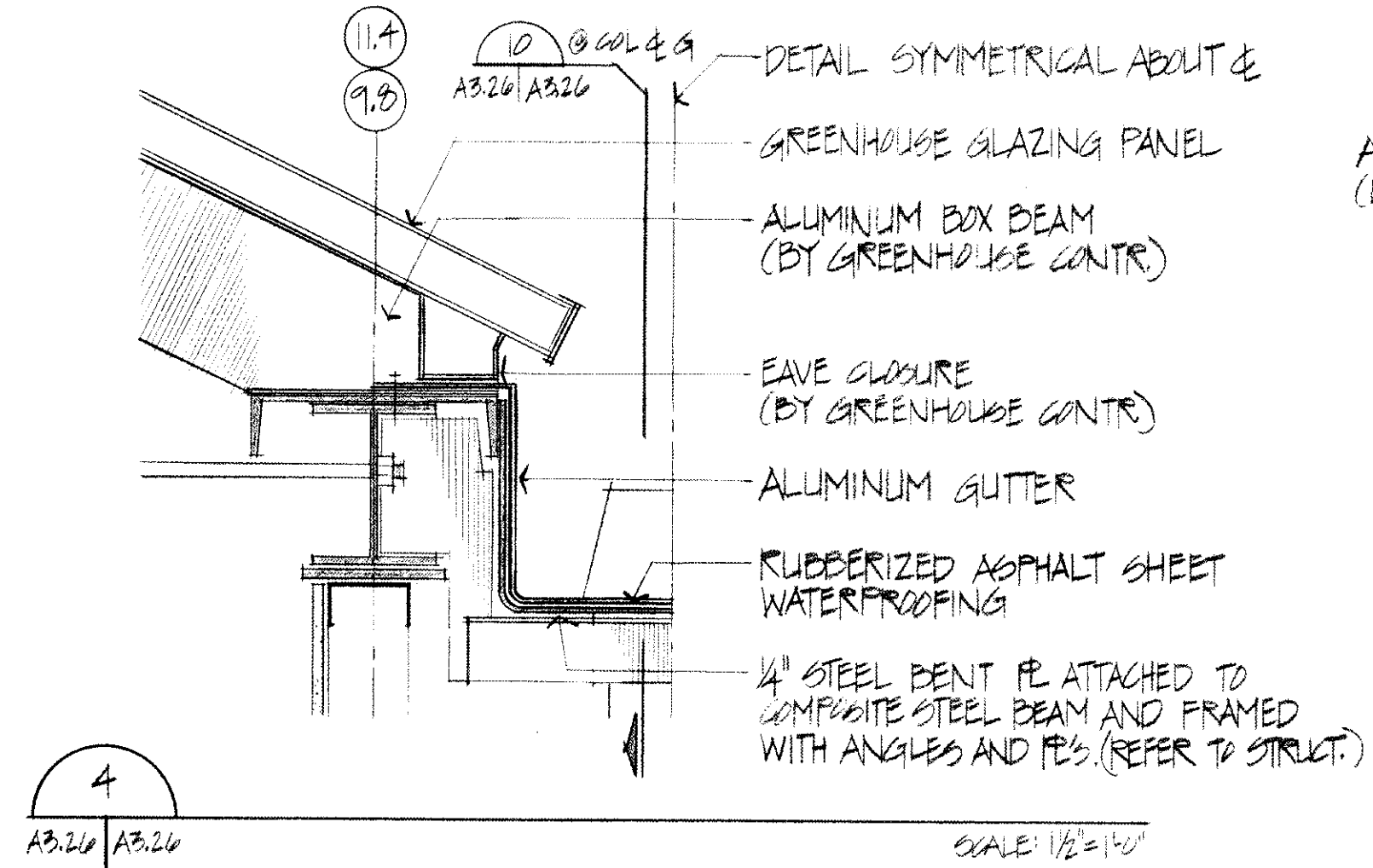
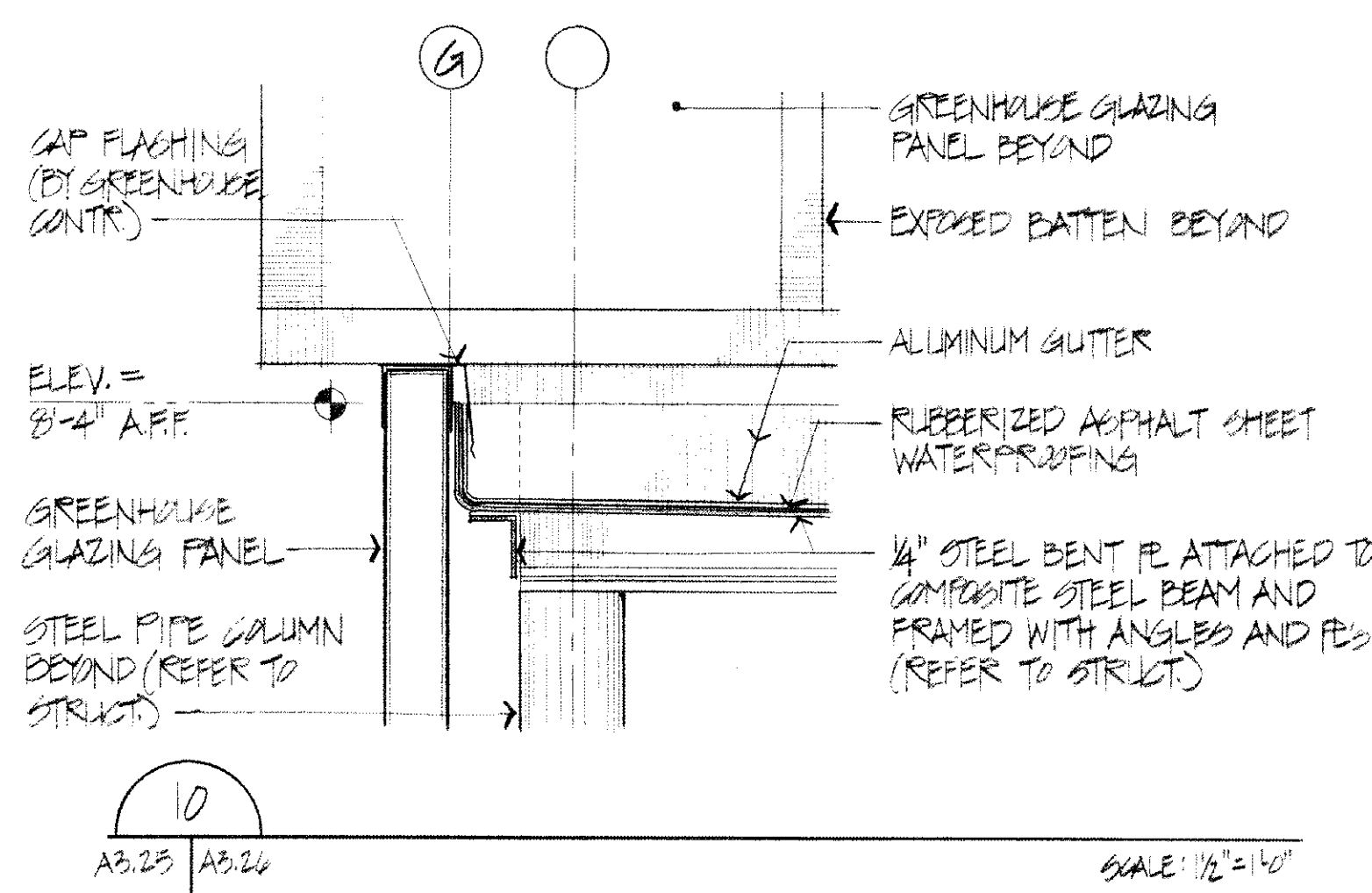
ROOF PLAN
WAYNE STATE UNIVERSITY
BIOLOGICAL SCIENCES BUILDING

REVISION	DATE	BY
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2		DR
3		DR
4		DR
5		DR
6		DR
7		DR
8		DR
9		DR
10		DR
11		DR
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A2.8



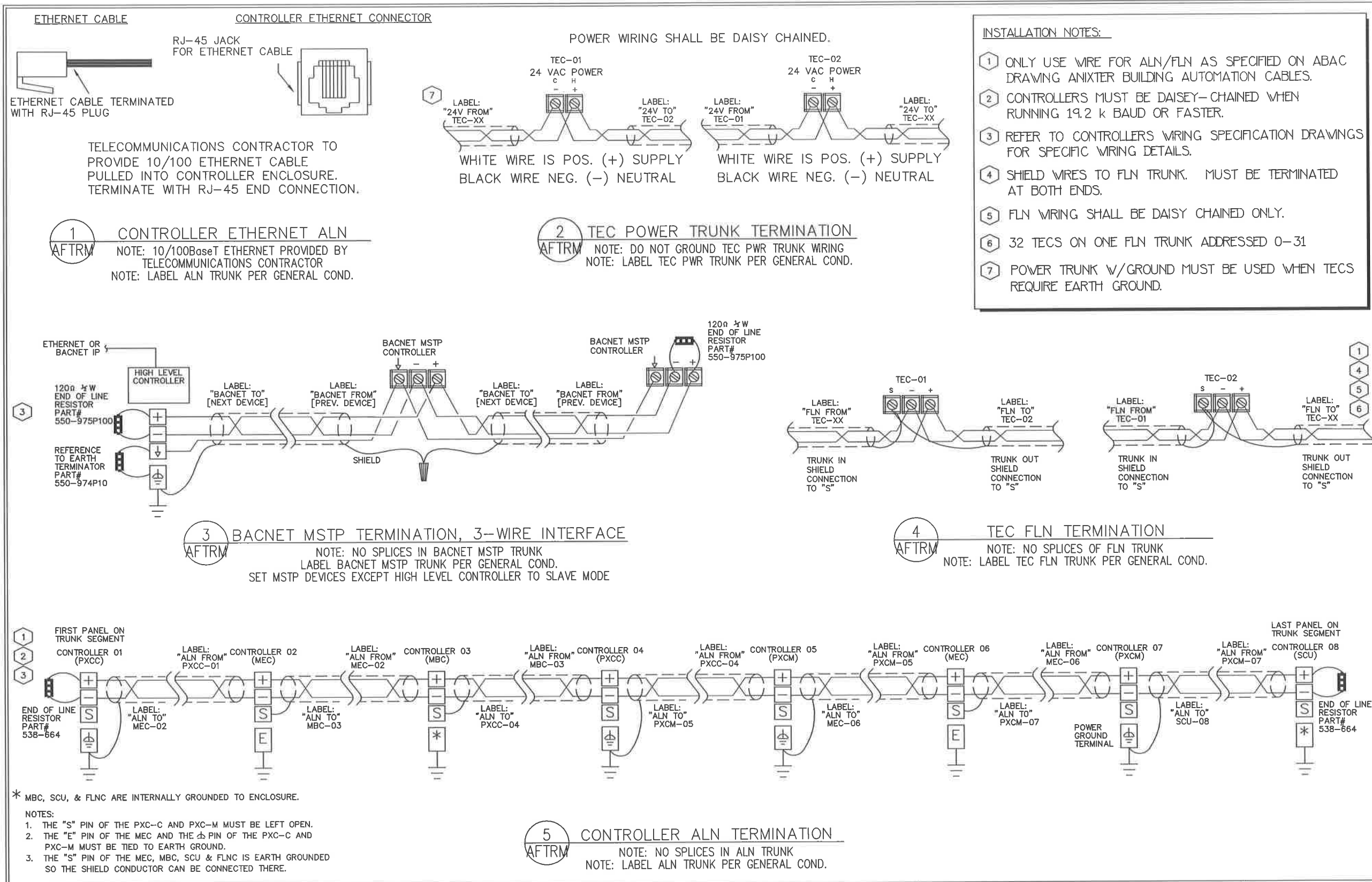
REVISIONS		
BULL'N'	BY	DATE
CONSTRUCTION ■		
DATE:	<u>5-25-89</u>	
FINAL RECORD □		
DATE:		
DRAWN BY	DEBARRIA	
CHECKED BY	DE.	
APPROVED BY	LMICKLE	
PROJECT NO.	NJJA NO. 8613 WSU NO. 8619	
SHEET NO.	A3.25	



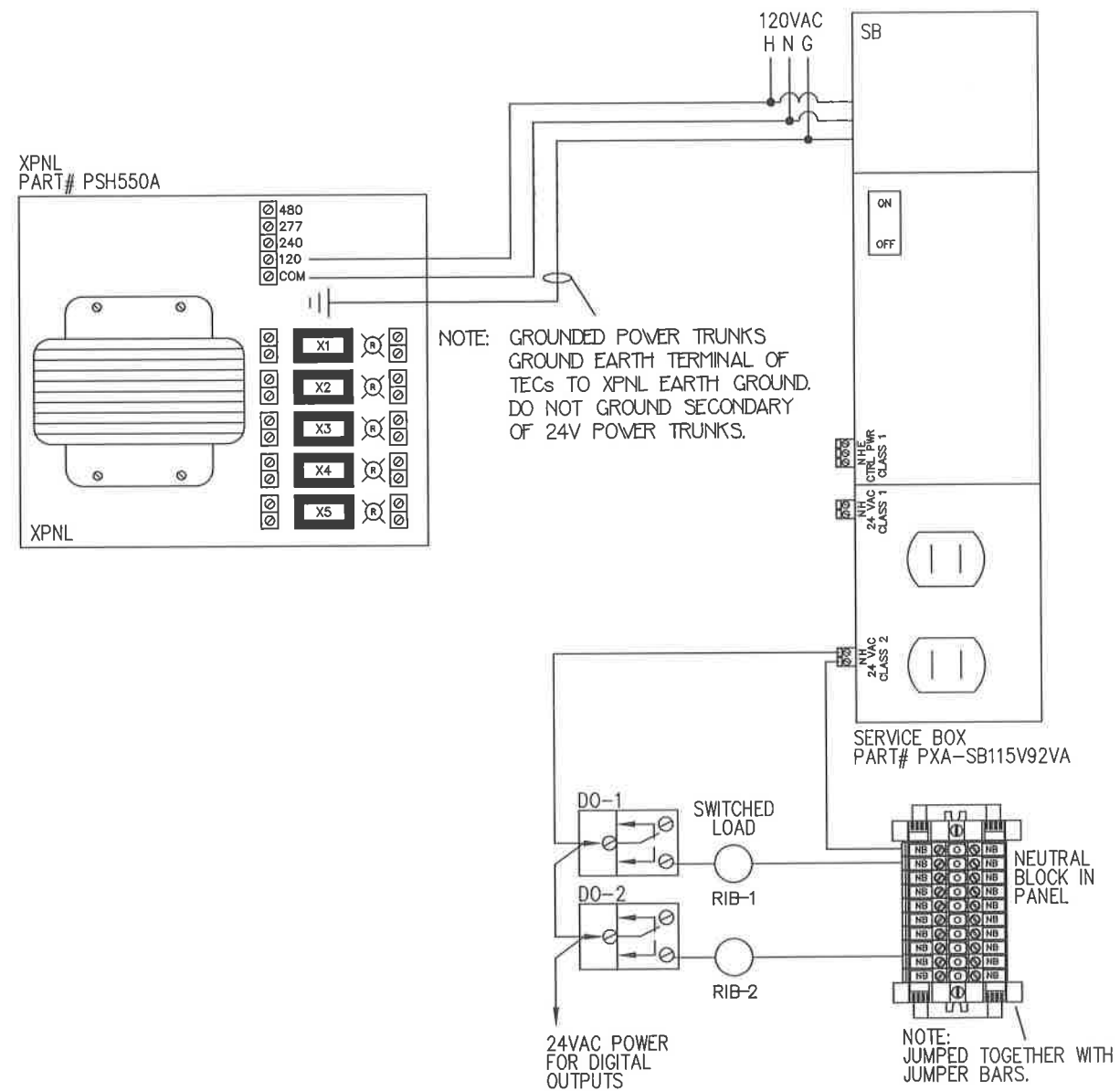
FOR ADDITIONAL APPLICABLE NOTES REFER TO DETAIL #1 THIS SHEET.

Anixter Building Automation Cables				
Non-Plenum				
SBT Part Number		Description	Print Legend	
H-TP20-CM	20AWG,STR,1TP,CM,BLUE JACKET	NORTHFLEX ® H-TP20-CM "DI, DO, AI, AO" (Mfg E#) 20AWG 1P 75°C CM (UL) C(UL)		
H-3C20-CM	20AWG,STR,3COND,CM,BLUE JACKET	NORTHFLEX ® H-3C20-CM "TEC V/D" (Mfg E#) 20 AWG 3C 75°C CM (UL) C(UL)		
H-TP18-CMR	18AWG,STR,1TP,CMR,BLUE JACKET	NORTHFLEX ® H-TP18-CMR "DI, DO, AI, AO" (Mfg E#) 18AWG 1P 75°C CMR (UL) C(UL)		
H-3C18-CMR	18AWG,STR,3COND,CMR,BLUE JACKET	NORTHFLEX ® H-3C18-CMR "TEC V/D" (Mfg E#) 18 AWG 3C 75°C CMR (UL) C(UL)		
H-2C14-CL3R	14AWG,STR,2COND,CL3R,DARK BLUE JACKET	H-2C14-CL3R "LV POWER" (Mfg E#) 14 AWG 2C 75°C CL3R (UL) C(UL)		
H-B-TSP24LC-CM	BLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET	H-B-TSP24LC-CM "BLN" (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL)		
H-F-TSP24LC-CM	FLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET W/ BLUE STRIPE	NORTHFLEX ® H-F-TSP24LC-CM "FLN" (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL)		
H-3P24-CMR	24AWG,SOL,3P,CMR,BLUE JACKET	NORTHFLEX ® H-3P24-CMR "TEC STAT" (Mfg E#) 24 AWG 3P 75°C CMR (UL) C(UL)		
LON-1P22-CM	22AWG,STR,1PAIR,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1P22-CM "LON FLN" (Mfg E#) 22AWG 1P 75O C CM (UL) C(UL)		
LON-2P22-CM	22AWG,STR,2PAIR,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2P22-CM "LON FLN" (Mfg E#) 22AWG 2P 75O C CM (UL) C(UL)		
LON-1PS22-CM	22AWG,STR,1PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1PS22-CM "LON FLN" (Mfg E#) 22AWG 1P 75O C CM (UL) C(UL)		
LON-2PS22-CM	22AWG,STR,2PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2PS22-CM "LON FLN" (Mfg E#) 22AWG 2P 75O C CM (UL) C(UL)		
E-4TP24CAT5-CM	24AWG,SOL,4TP,CAT5,CM	NORTHFLEX ® E-4TP24CAT5-CM "ETHERNET" (Mfg E#) 24AWG 4P 75O C CM (UL) C(UL)		
H-A-1.5TSP24LC-CM	ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM	NORTHFLEX ® H-A-1.5TSP24LC-CM "ALN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)		
H-F-1.5TSP24LC-CM	FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM	NORTHFLEX ® H-A-1.5TSP24LC-CM "FLN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)		
Plenum				
SBT Part Number		Description	Print Legend	
H-TP20-CMP	20AWG,STR,1TP,CMP,BLUE JACKET	NORTHFLEX ® H-TP20-CMP "DI, DO, AI, AO" (Mfg E#) 20 AWG 2C 75°C CMP (UL) C(UL)		
H-3C20-CMP	20AWG,STR,3COND,CMP,BLUE JACKET	NORTHFLEX ® H-3C20-CMP "TEC V/D" (Mfg E#) 20 AWG 3C 75°C CMP (UL) C(UL)		
H-TP18-CMP	18AWG,STR,1TP,CMP,BLUE JACKET	NORTHFLEX ® H-TP18-CMP "DI, DO, AI, AO" (Mfg E#) 18 AWG 2C 75°C CMP (UL) C(UL)		
H-3C18-CMP	18AWG,STR,3COND,CMP,BLUE JACKET	NORTHFLEX ® H-3C18-CMP "TEC V/D" (Mfg E#) 18 AWG 3C 75°C CMP (UL) C(UL)		
H-2C14-CL3P	14AWG,STR,2COND,CL3P,DARK BLUE JACKET	NORTHFLEX ® H-2C14-CL3P "LV POWER" (Mfg E#) 14 AWG 2C 75°C CL3P (UL) C(UL)		
H-B-TSP24LC-CMP	BLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET	NORTHFLEX ® H-B-TSP24LC-CMP "BLN" (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL)		
H-F-TSP24LC-CMP	FLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET W/ BLUE STRIPE	NORTHFLEX ® H-F-TSP24LC-CMP "FLN" (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL)		
H-3P24-CMP	24AWG,SOL,3PAIR,CMP,BLUE JACKET	NORTHFLEX ® H-3P24-CMP "TEC STAT" (Mfg E#) 24 AWG 3P 75°C CMP (UL) C(UL)		
LON-1P22-CMP	22AWG,STR,1PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1P22-CMP "LON FLN" (Mfg E#) 22AWG 1P 75O C CMP (UL) C(UL)		
LON-2P22-CMP	22AWG,STR,2PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2P22-CMP "LON FLN" (Mfg E#) 22AWG 2P 75O C CMP (UL) C(UL)		
LON-1PS22-CMP	22AWG,STR,1PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-1PS22-CMP "LON FLN" (Mfg E#) 22AWG 1P 75O C CMP (UL) C(UL)		
LON-2PS22-CMP	22AWG,STR,2PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE	NORTHFLEX ® LON-2PS22-CMP "LON FLN" (Mfg E#) 22AWG 2P 75O C CMP (UL) C(UL)		
E-4TP24CAT5-CMP	24AWG,SOL,4TP,CAT5,CMP	NORTHFLEX ® E-4TP24CAT5-CMP "ETHERNET" (Mfg E#) 24AWG 4P 75O C CMP (UL)		
H-A-1.5TSP24LC-CMP	ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP	NORTHFLEX ® H-A-1.5TSP24LC-CM "ALN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)		
H-F-1.5TSP24LC-CMP	FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP	NORTHFLEX ® H-A-1.5TSP24LC-CM "FLN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#)		
Assemblies				
SBT Part Number		Description	Print Legend	
550-827	CABLE ASSEMBLY TEC TO SSB 3 POS 10 FT	N/A		
550-828	CABLE ASSEMBLY TEC TO SSC 3 POS 10 FT	N/A		

REVISION HISTORY		SIEMENS		WSU Bio Science		0	
		Siemens Industry, Inc. Building Technologies Division		45470 Commerce Ctr. Dr Plymouth Twp., MI 48170 USA PHONE: 734.456.3800 FAX: 866.815.0749		Detroit, MI	
				ENGINEER JJK		DRAFTER JJK	
				CHECKED BY		INITIAL RELEASE 01/09/15	
						LAST EDIT DATE 01/09/15	
				Anixter Building Auto. Cables		ABAC	

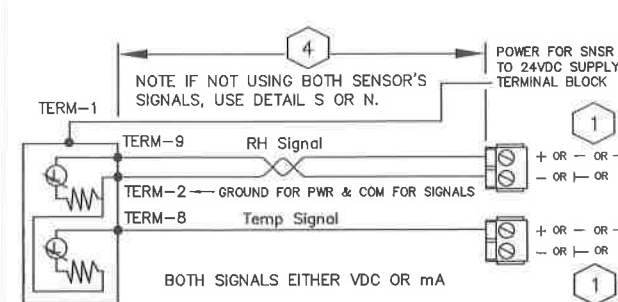


- INSTALLATION NOTES:
- 1 ALL WIRING TO MEET REQUIREMENTS OF STANDARD WIRING SPECIFICATIONS DRAWINGS.
 - 2 TERMINATE DEVICE NEUTRALS ON NEUTRAL BLOCK LOCATED IN PANEL.

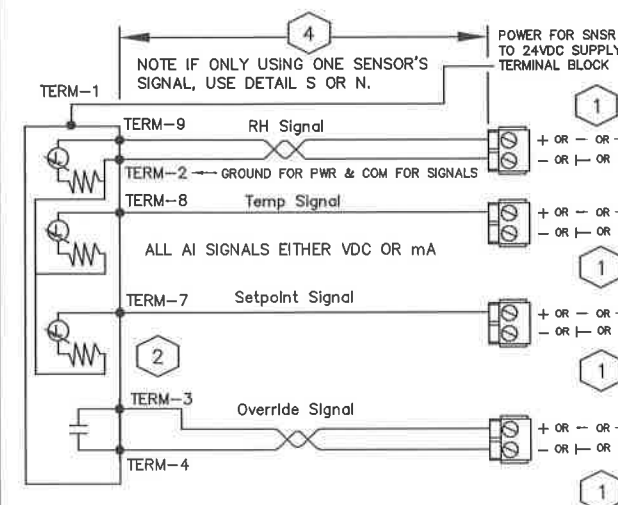


1 WIRE CONTROLLER POWER WIRING

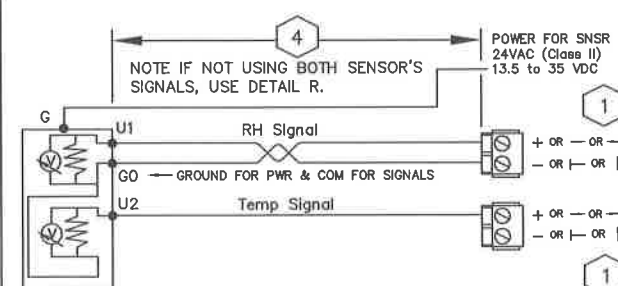
REVISION HISTORY	<div>SIEMENS</div> <div>45470 Commerce Ctr. Dr Plymouth Twp., MI 48170 USA PHONE: 734.466.3800 FAX: 866.815.0749</div> <div>Siemens Industry, Inc. Building Technologies Division</div>	WSU Bio Science Detroit, MI					0 PNL
		ENGINEER JJK	DRAFTER JJK	CHECKED BY	INITIAL RELEASE 01/09/15	LAST EDIT DATE 01/09/15	
		TYPICAL PANEL WIRING					



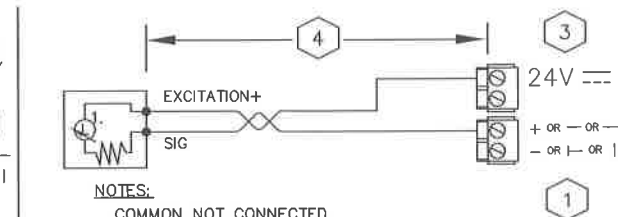
G 00 2 ANALOG INPUT (AI) VDC & mA
4-WIRE For Siemens QFA-series Room Combo Sensor
Note, both signals are active type (either V or Amp).
RH and Temp. Only



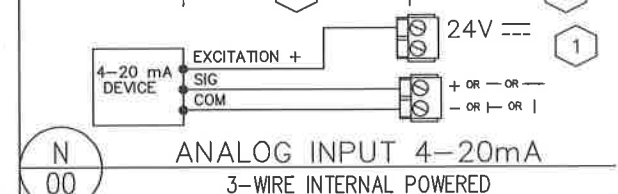
K 00 3 ANALOG INPUT (AI) & 1 DIGITAL INPUT (DI)
7-WIRE For Siemens QFA-series Room Combo Sensor
Note, all AI signals are active type (either V or Amp).
RH, Temp., Setpoint, and Override



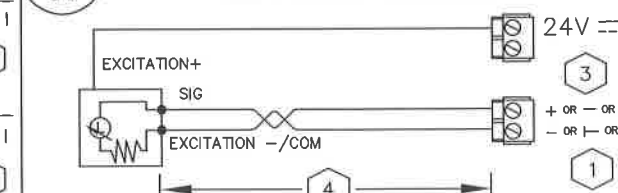
L 00 2 ANALOG INPUT (AI) VDC
4-WIRE For Siemens QFM-series Combo Sensor and QFA-series Outside Air Combo sensor
Note, both signals are active type
RH and Temp.



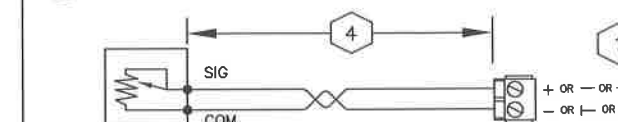
M 00 ANALOG INPUT 4-20 mA
2-WIRE INTERNAL POWERED



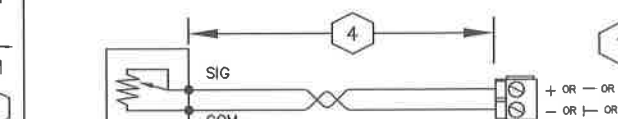
N 00 ANALOG INPUT 4-20mA
3-WIRE INTERNAL POWERED



S 00 ANALOG INPUT 0-10 VDC
3-WIRE INTERNAL POWERED



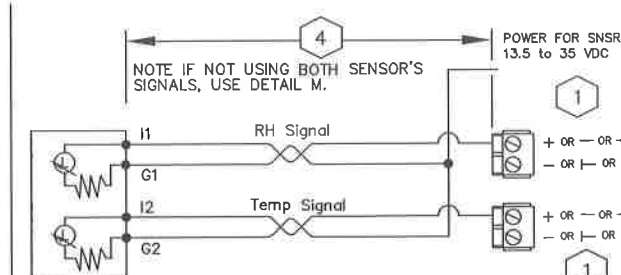
V 00 ANALOG INPUT RTD



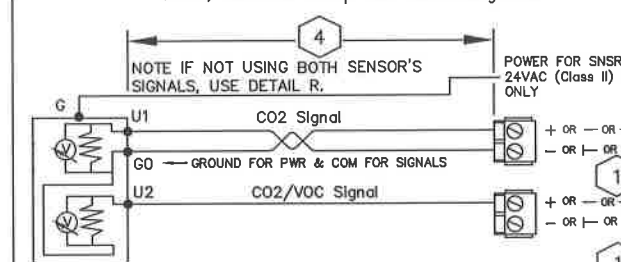
W 00 ANALOG INPUT THERMISTOR

NOTES:

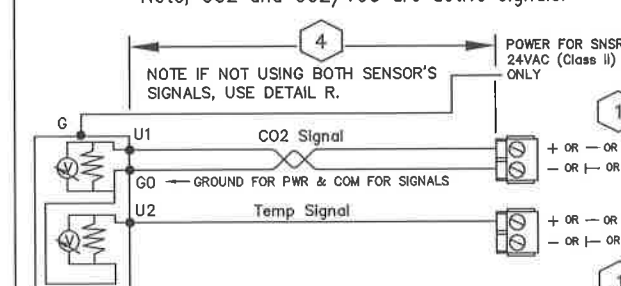
1. 10 KOHM NTC TYPE 2
2. 10 KOHM NTC TYPE 3



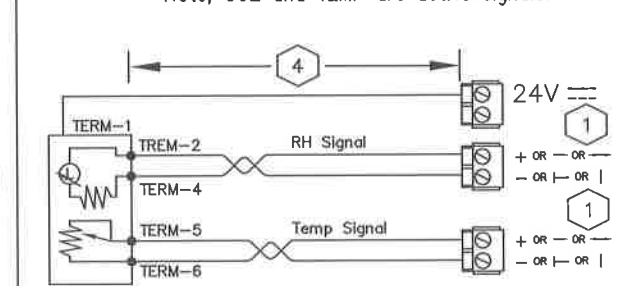
X 00 2 ANALOG INPUT (AI) mA
5-WIRE For Siemens QFM-series COMBO SENSOR and QFA-series Outside Air Combo sensor
Note, RH and Temp are active signals.



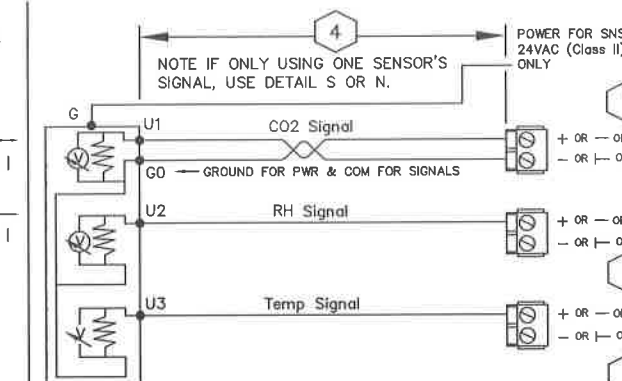
Y 00 2 ANALOG INPUT (AI) VDC
4-WIRE For Siemens QPA-series Combo Sensor and QPM-series Combo sensor
Note, CO2 and CO2/VOC are active signals.



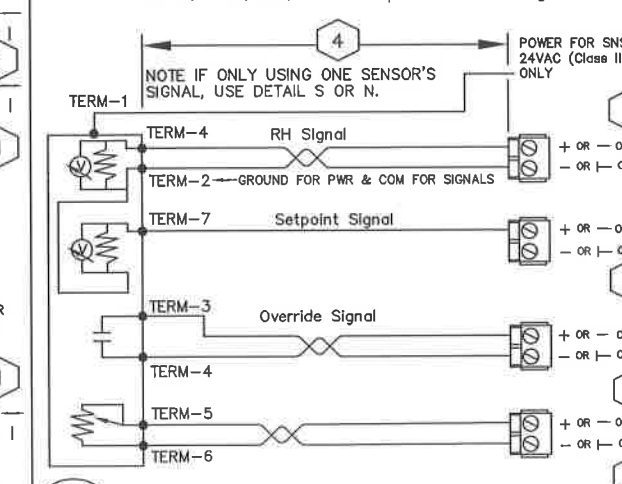
Z 00 2 ANALOG INPUT (AI) VDC
4-WIRE For Siemens QPA-series Combo Sensor and QPM-series Combo sensor
Note, CO2 and TEMP are active signals.



CC 00 ANALOG INPUT 0-10 VDC
5-wire For Siemens QPA-series Combo Sensor
Note, RH signal is active and Temp is passive.



AA 00 3 ANALOG INPUT (AI) VDC
5-WIRE For Siemens QPA-series Combo Sensor and QPM-series Combo sensor
Note, CO2, RH, and Temp. are active signals.



BB 00 2 ACTIVE, 1 PASSIVE & 1 DIGITAL
8-WIRE Siemens QFA-series Room Combo Sensor and QPM-series Combo sensor
Note, RH is either V or Amp, Setpoint is V.
Temp is a passive signal.

NOTES:

1. REFER TO SPECIFIC PANEL TERMINATION DRAWINGS FOR DETAILED INFORMATION ON TERMINATIONS
2. TO REDUCE WIRING, YOU MAY JUMPER TERMINALS 3 AND 2, HOWEVER, THE INPUTS ON YOUR CONTROLLER MUST BE REFERENCED TO THE SAME GROUND THAT IS POWERING YOUR SENSOR
3. REFER TO CONTROLLER DRAWING FOR MAXIMUM CURRENT PROVIDED BY THE PXCC 24VDC SENSOR SUPPLY.
4. 50mA OR LESS - 750ft/230m
50mA TO 100mA - 375ft/115m

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		Siemens Industry, Inc. Building Technologies Division		ENGINEER JJK DRAFTER JJK CHECKED BY INITIAL RELEASE 01/09/15 LAST EDIT DATE 01/09/15			
				Q-Series Sensors Term. Spec.			

900 – ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Division 23, Common Work Results for mechanical requirements apply to this section and will require the contractor participation on the Above Ceiling Coordination Program.

1.2 GENERAL INFORMATION

- A. This specification section shall include all electrical responsibilities required for the installation & wiring of all temperature controls, as outlined on job plans, specification and temperature control drawings. Specifically, this contractor shall provide pricing direct to those general or mechanical contractors (bid to prime on project) contractors bidding this work, and will be responsibilities for installation & wiring of all automatic temperature control devices furnished by Siemens Building Technologies as outlined below and as may be required per the project plans & specifications.
- B. Siemens Building Technologies, Inc. will provide the following equipment for the building automation system as shown in the temperature control drawings Bill of Materials to include but not limited to:
 - 1. Terminal Equipment Controllers (TEC's)
 - 2. Auxilliary TEC power panels
 - 3. Room Temperature Sensors
 - 4. Damper actuators
 - 5. Relays
 - 6. Low Voltage Transformers

The Electrical Installation & Wiring Contractor (EIWC) shall be responsible for installation of all preceding devices as applicable to this project. This list shall not be considered complete and all bidders should refer to temperature control drawings for specific equipment quantities and locations.
- C. During the bidding process, the EIWC shall address all questions relative to the Siemens temperature control drawings in writing (RFI) through the tier of bidding contractors. Siemens shall respond in writing through the tier of bidding contractors.
- D. EIWC shall install all control equipment provided by Siemens. The EIWC shall furnish, install, and terminate all necessary wiring, conduit, hangers, etc. to provide a complete control system installation. All controls to be installed and adjusted by a Siemens qualified electrician in the full time employ of the EIWC.

- E. The EIWC must have full time project superintendent who shall attend all construction meetings after notification that their services are required onsite.
- F. Upon completion of all installation and wiring by the EIWC, Siemens Building Technologies will conduct verification of point to point wiring and any pneumatic tubing. The EIWC will be responsible to make any necessary wiring corrections. At the completion of the point to point verification, approval shall be made by the Owner's Construction Inspection Department and Siemens Building Technologies, Inc.
- G. Upon approval by the Owners Construction Inspection Department, Siemens shall program all DDC panels, create necessary graphics and provide any interface between the building automation system and the campus environmental control system.
- H. Upon completion of the aforementioned, a performance test shall be conducted as specified in the commissioning section of the specifications.
- I. Upon a successful conclusion of the final checkout, performance test and the Owner's acceptance, the EIWC's responsibility reverts to a standard warranty (12 months) for labor and material installed by the EIWC and labor only for equipment supplied by others.
- J. Siemens assumes the manufacturers warranty for all equipment supplied to the EIWC for installation on this project.
- K. Siemens services to include the following: Design engineering labor required to interface with WSU and the consulting engineer to design the temperature control system. Supervision of the EIWC installation and final checkout and approval.
- L. Equipment provided by others may require specific cable type and terminations. It is up to EWIC to provide cable and terminations needed for a complete working system.

1.3 DEFINITIONS

- A. DDC: Direct digital control.
- B. I/O: Input/output.
- C. BACnet: A control network technology platform for designing and implementing interoperable control devices and networks.
- D. MS/TP: Master slave/token passing.
- E. PC: Personal computer.
- F. PID: Proportional plus integral plus derivative.
- G. RTD: Resistance temperature detector.

ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

26 0900 1

ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

26 0900 2

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				<table><tr><td>ENGINEER</td><td>DRAFTER</td><td>CHECKED BY</td><td>INITIAL RELEASE</td><td>LAST EDIT DATE</td></tr><tr><td>JJK</td><td>JJK</td><td></td><td>01/09/15</td><td>01/09/15</td></tr></table>						ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE	JJK	JJK	
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		Siemens Industry, Inc. Building Technologies Division		ELECTRICAL INSTALL SPEC.													

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Plymouth Twp., MI 48170
USA
PHONE: 734.456.3800
FAX: 866.815.0749

Wayne State University		Wayne State University	
1.4 PRODUCTS & SERVICES PROVIDED BY OTHERS		1.8 QUALITY ASSURANCE	
A. Mechanical Contractor: Installation of flow switches, temperature or thermometer sensor wells, gage taps, pressure sensor pipe taps, final valves & tubing into pipe pressure taps and variable frequency drives.		A. Installer Qualifications: EIWC contractor must be able to provide references, upon request, for similar projects (in size & scope) that were completed satisfactorily, in Michigan. Project names, owner contacts and companies who awarded this work to you shall all be provided upon request to WSU and/or the AE of record. EIWC contractor must be prepared to submit a minimum of three (3) satisfactorily completed projects, annually, for the past five (5) years.	
B. Electrical Contractor: Provide 120/60 VAC power to all DDC panels, wire power to all VFD's. Furnish & install 4" x 4" trough above all control panels. Furnish & install conduit up maximum ten feet from all 4" x 4" troughs. Installation all required nipples between electrical panels and through.		B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.	
C. Sheetmetal Contractor: Installing all terminal units, airflow stations and dampers.		C. Comply with ASHRAE 135 for DDC system components.	
1.5 PRODUCTS INSTALLED BY THE EIWC BUT NOT FURNISHED UNDER THIS SECTION		1.9 SEQUENCING AND SCHEDULING	
A. Connect control components, as shown on the plans, factory supplied as part of equipment controlled.		A. Sequence work to ensure installation of components is complimentary to installation of similar components in other systems.	
1.6 RELATED SECTIONS		B. Coordinate work with other Contractors and subcontractors to ensure system is completed and commissioned by the Date of Substantial Completion.	
A. Division 23 – General Mechanical Requirements.		C. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.	
B. Division 23 – Instrumentation and controls for HVAC.		1.10 WARRANTY	
C. Division 23 – Indoor Air Handling Units.		A. Provide as pre project general conditions.	
D. Division 23 – Air Terminal Units.		1.11 CONTROL WIRING	
E. Division 23 – Testing and Balancing for HVAC.		A. The EIWC is required to use the cable below. Refer to temperature control drawing ABAC Building Automation Cable Specification Catalog. If a wire type is required that is not referenced on the ABAC sheet then it is up to the EWIC to provide the appropriate wire for the application.	
F. Division 23 – Commissioning of HVAC.		B. The EIWC is required to tag all wiring. Wiring that is used for DDC control points should be tagged with abbreviated DDC point name from control submittal. If wire is to be demo'd make sure the wire is labeled "spare" or "not in use".	
G. Division 26 – Electrical Work.		1.12 INSTALLATION	
H. Standard Specifications and Codes: In addition to the requirements shown or specified, comply with the following applicable standard specifications, codes or ordinances:		A. Refer to project plans and DDC temperature control drawings for control wiring required and equipment locations.	
1. NFPA – National Fire Protection Association.		B. Install control devices per installation requirements of control device. Before installing, always refer to local codes.	
2. UL – Underwriter's Laboratories.			
3. Rules and Regulations of the Michigan Department of Fire Prevention and Safety.			
G. Include all items of labor and material required to comply with such standards, codes or ordinances in accordance with the contract documents. Where quantities, sizes, or other requirements indicated on the drawings or herein specified are in excess of the standard or code requirements, the specification and drawings shall govern.			
1.7 QUALIFICATIONS FOR THE EIWC			
A. Controls Installation Contractor: The EIWC's will be pre approved by WSU prior to bidding this project.			
ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS		ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS	

REVISION HISTORY		SIEMENS		WSU Bio Science					0 SPEC2		
				Detroit, MI							
		Siemens Industry, Inc. Building Technologies Division		45470 Commerce Ctr. Dr Plymouth Twp., MI 48170 USA PHONE: 734.456.3800 FAX: 888.815.0749		ENGINEER	DRAFTER	CHECKED BY		INITIAL RELEASE	LAST EDIT DATE
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						ELECTRICAL INSTALL SPEC.					

- 1.1ELECTRICAL WIRING INSTALLATION BY THE EIWC (Project Plans and Specifications Prevail)
- A.

Furnish and install ALL wiring and interlock wiring as specified and as shown on the project plans DDC temperature control drawings. Connect controls in accordance with DDC temperature control drawings.
- B.

Installation minimum requirements:

1. Mechanical Rooms & Penthouses Areas: EMT up ten feet, then exposed plenum I/O point wiring

2. TEC Space Sensors: All cables furnished by Siemens, installed within wall construction without EMT.

3. Other Space Sensors: I/O point wire in EMT for all non-accessible walls, approved plenum open wire in accessible walls.

4. Ceiling Returns (accessible, permanent, acoustical): Approved plenum rated cable.

5. Ceiling Returns (non-accessible) and all other inaccessible areas: All wiring in EMT.

6. Power and low voltage wiring shall not be run in the same conduit.
- 2.0ON-SITE TESTING
- A.

Provide Owner-approved operation and acceptance testing of the complete system. The following shall witness the performance test:

1. The EIWC – Electrical (controls) Installation & wiring contractor

2. The equipment manufacturers representative

3. The Owner's agent

4. The Owner

5. Architect/Engineer
- B.

Field Test: When installation of the system is complete, all systems shall be tested to their sequence of operation including all safety circuits.

END OF SECTION 26 0900

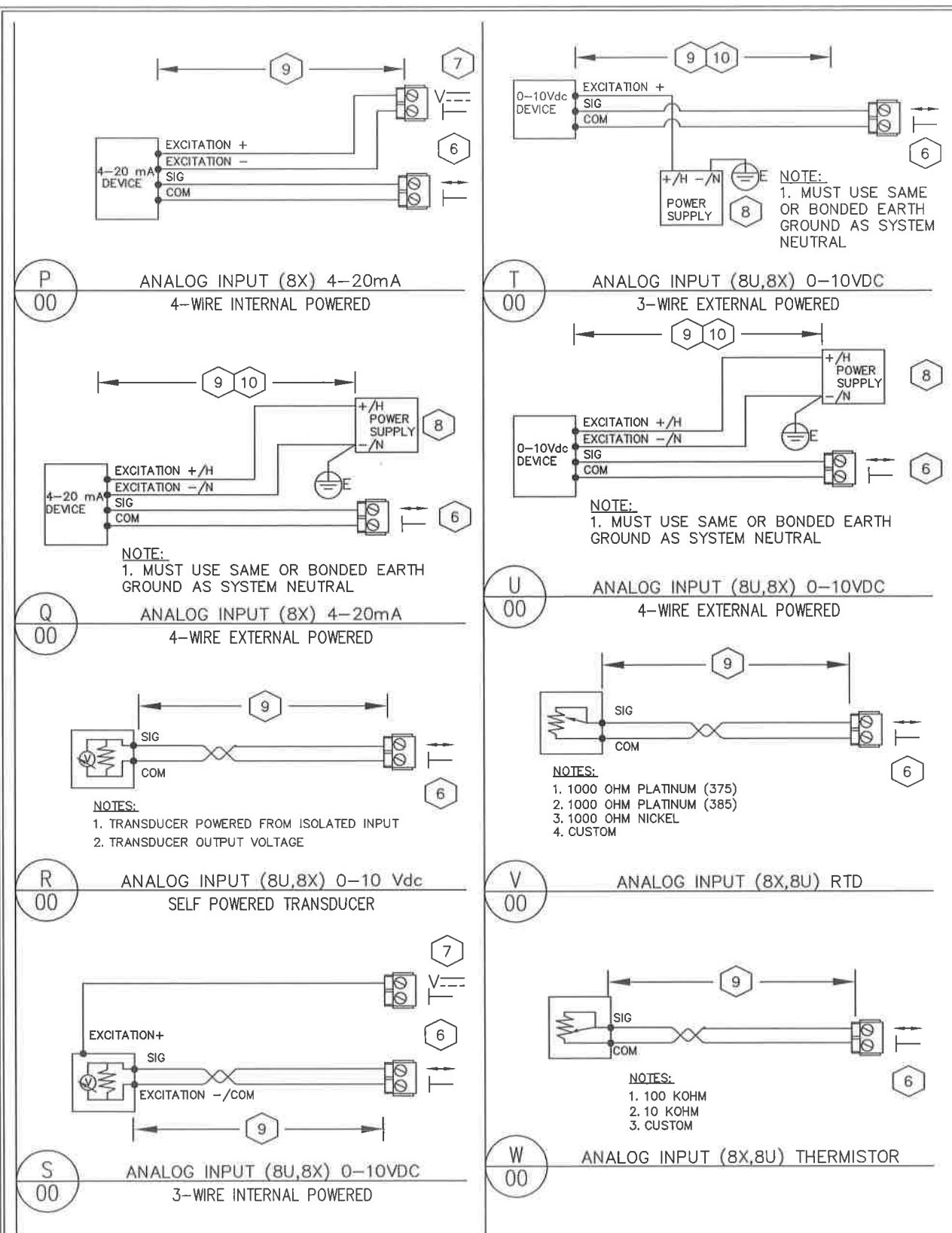
ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

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			ENGINEER JKK	DRAFTER JKK	CHECKED BY	INITIAL RELEASE 01/09/15	LAST EDIT DATE 01/09/15	
			ELECTRICAL INSTALL SPEC.					



3 MAXIMUM CONTACT CLOSURE RATE IS
10 PER SECOND
8D, 16d EXCITATION = 24VDC, 8mA
8U, 8X EXCITATION = 24VDC, 8mA,
20ms, 100mA

12 WHERE REQUIRED, N TERMINAL BRANCH CURRENT MUST BE EXTERNALLY LIMITED BY AN NEC APPROVED MEANS.



TXM1 TERMINATION TABLES

1. ALL TXM1 TERMINALS (MEASURING, NEUTRAL, RELAY, SUPPLY) ARE CONNECTED IN THE PLUG-IN I/O MODULE, NOT IN THE TERMINAL BUS.

TXM1.8D, TXM1.16D								
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL ¹	1	3	5	7	9	11	13	15
DIGITAL INPUT	2	4	6	8	10	12	14	16

1. NEUTRAL CAN BE CONNECTED TO ANY NEUTRAL TERMINAL ON SAME MODULE AND SEVERAL CAN SHARE SAME NEUTRAL TERMINAL.

TXM1.16D								
I/O POINT	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
SYSTEM NEUTRAL	18	20	22	24	26	28	30	32
DIGITAL INPUT ¹	19	21	23	25	27	29	31	33

1. NO PULSE ACCUMULATOR

TXM1.8U, TXM1.8U-ML								
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL	2	6	10	14	19	23	27	31
UNIVERSAL I/O	4	8	12	16	21	25	29	33
24V AC/DC ACTUATOR SUPPLY ¹	7			15		24		32

1. 24V DC ONLY AVAILABLE WITH BUS CONNECTOR MODULE (BCM) POWERED EXTERNALLY BY DC SUPPLY.

TXM1.8X, TXM1.8X-ML								
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SYSTEM NEUTRAL	2	6	10	14	19	23	27	31
UNIVERSAL I/O	4	8	12	16	21	25	29	33
24V AC/DC ACTUATOR SUPPLY ²	7			15		24		32
24V DC SENSOR SUPPLY ³	3		11		20		28	

1. 4-20 mA OUTPUT AVAILABLE ON POINTS 5-8 ONLY.

2. 24V DC ONLY AVAILABLE WITH BUS CONNECTOR MODULE (BCM) POWERED EXTERNALLY BY DC SUPPLY.

3. MAY POWER EXTERNAL SENSORS 0.6w (25mA) OR 1.2w (50mA) PER TERMINATION UP TO 2.4w (100mA) MAXIMUM FOR ALL TERMINATIONS.

TXM1.6R, TXM1.6R-M						
I/O POINT	(1)	(2)	(3)	(4)	(5)	(6)
COMMON ¹	3	9	15	20	26	32
NORMALLY CLOSED	4	10	16	19	25	31
NORMALLY OPEN	2	8	14	21	27	33

1. COMMONS ARE NOT INTERNALLY CONNECTED.

NOTE: REFER TO TERMINATION SHEET #1 FOR INSTALLATION DETAILS.

REVISION HISTORY

SIEMENS

Siemens Industry, Inc.
Building Technologies Division

45470 Commerce Ctr. Dr
Plymouth Twp., MI 48170
USA
PHONE: 734.456.3800
FAX: 866.815.0749

WSU Bio Science
Detroit, MI

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TX-I/O Termination Spec. 2

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TTRM2

PXC MODULAR WIRING TYPE AND GAUGE REQUIREMENTS

TABLE 1

CIRCUIT TYPE	CLASS	WIRE TYPE	MAX. DISTANCE	CONDUIT SHARING ²
AC LINE POWER ¹	POWER	#12-14 THHN	REFER TO NEC	CHECK LOCAL CODES
DIGITAL OUTPUT	1 & 2	TP not required, check job specs & local codes #18 to #24 AWG	SEE TABLE 3	CHECK LOCAL CODES
DIGITAL INPUT	2	TP not required, check job specs & local codes #18 to #24 AWG	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT ⁴ 100K/10K Thermistor	2	#18-#24 TP ^{3,8} or TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT ⁴ 1K NI OR RTD	2	#18-#24 TP ^{3,8} or TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT 0-10 V	2	#18-#24 TP ^{3,8} or TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT 4-20 mA	2	#18-#24 TP ^{3,8} or TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG OUTPUT 0-10 V	2	#18-#24 TP ^{3,8} or TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG OUTPUT 4-20 mA	2	#18-#24 TP ^{3,8} or TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ETHERNET ALN	2	#24 (4) TP ⁶ CAT5 OR BETTER	295ft (90 m)	CHECK LOCAL CODES
ALN TRUNK	2	#24 TSP	SEE TABLE 4	CHECK LOCAL CODES

- WHEN DAISY-CHAINING 24VAC POWER TO CONTROLLERS USE #14 WIRE.
- CONDUIT SHARTING RULES: ONLY WHERE LOCAL CODES PERMIT. BOTH CLASS1 AND CLASS 2 WIRING CAN BE RUN TO THE PXCC PROVIDED THE CLASS 2 WIRE IS UL LISTED 300V 75°C(167°F) OR HIGHER OR THE CLASS 2 WIRE IS NEC TYPE CM (FT4) (75°C OR HIGHER) OR CMP(FT6) (75°C OR HIGHER). NEC TYPE CL2 AND CL2P IS NOT ACCEPTABLE UNLESS ALSO UL LISTED AND MARKED 300V 75°C (167°F) OR HIGHER
- TWISTED PAIR, NON-JACKETED UL LISTED 75°C(167°F) AND 300V, CABLE CAN BE USED IN PLACE OF CM(FT4) OR CMP(FT6)(BOTH MUST BE RATED 75°C OR HIGHER) CABLE WHEN CONTAINED IN CONDUIT PER LOCAL CODES. SEE THE FIELD PURCHASING GUIDE FOR WIRE.
- WIRE LENGTH AFFECTS POINT INTERCEPT ENTRY. ADJUST INTERCEPT ACCORDINGLY FOR EACH WIRE GAUGE AND SENSOR TYPE.
- SHIELDED TWISETED PAIR (TSP) IS NOT REQUIRED FOR ELECTRICAL NOISE LEVELS UPTO 10 V/M. AT HIGHER LEVELS TSP MAY BE NEEDED.TERMINATE SHIELD ON ENCLOSURE AND TAPE BACK ON POINT END.
- FOR 24AWG INSTALL CATEGORY5 OR BETTER CABLE PER ANSI/TIA/EIA-568-B.1 OR HIGHER. USE SOLID COPPER BETWEEN JACK BOXES. USE STRANDED COPPER PATCH CABLES 13ft (4m) TO CONNECT PXCC AND 20ft (6m) TO CONNECT SWITCH OR HUB.

PXCM WIRE SPECIFICATIONS TABLE 2

	LOW-VOLTAGE POINT APPLICATIONS	POINT USAGE	ALN TRUNK	EALN
CABLE CONFIGURATION	TWISTED PAIR OR TSP	TWSTED PAIR (UNJACKETED) OR TSP	TWISTED SHIELDED PAIR	(4) TWISTED PAIR
GAUGE	#18 TO #22 AWG (STRANDED)	#18 TO #22 AWG (STRANDED)	24 AWG (STRANDED)	24AWG(STRANDED)
CAPACITANCE	n.a.	n.a.	12.5 pf/ft OR LESS	13 pf/ft OR LESS
TWSTS PER FOOT	6 MINIMUM	6 MINIMUM	6 MINIMUM	CATEGORY 5 Min
SHIELDS	NOT REQUIRED (IN CASE OF TSP, 100% FOIL W/ DRAIN WIRE)	NOT REQUIRED (IN CASE OF TSP, 100% FOIL W/ DRAIN WIRE)	100% FOIL W/ DRAIN WIRE	NOT REQUIRED
NEC CLASS	CM, CMP (75°C OR HIGHER)	NOT SPECIFIED	CM, CMP (75°C OR HIGHER)	MM, MMP
CEC CLASS	FT4, FT6 (75°C OR HIGHER)	NOT SPECIFIED	FT4, FT6 (75°C OR HIGHER)	NOT SPECIFIED
UL VOLTAGE RATING	NOT SPECIFIED	300 VAC ²	NOT SPECIFIED	NOT SPECIFIED
UL TEMP. RATING	NOT SPECIFIED	75°C (167°F)	NOT SPECIFIED	NOT SPECIFIED

- UL RECOGNIZED WIRE (LABELED WITH A BACKWARDS 'RU') IS NOT FIELD INSTALLABLE. USE ONLY UL-LISTED WIRE.
- 300 VAC WIRE CAN BE USED IN FIELD PANELS CONTAINING VOLTAGES BELOW 150 VAC.

MAXIMUM DO WIRE RUN LENGHTS

TABLE 3

NOMINAL INRUSH	STARTER SIZE	WIRE SIZE		
		#18	#16	#14
200 VA	0	500ft (152m)	900ft (274m)	1400ft (427m)
550 VA	1	200ft (61m)	300ft (91m)	500ft (152m)
1150 VA	2	100ft (30m)	150ft (46m)	250ft (76m)
1500 VA	3	70ft (21m)	100ft (30m)	200ft (61m)

TABLE 3 NOTES:

- DISTANCES SHOWN ASSURE LESS THAN 10% VOLTAGE DROP ACROSS THE WIRE FOR A TYPICAL STARTER.
- PXCM DO CONTACT RATINGS
4A @ 250VAC & 30VDC
SIZE 4 MOTOR STARTER

MAXIMUM NUMBER HSTIE IN SERIES ON ALN TRUNK

TABLE 4

SPEED	1200 BAUD	4800 BAUD	9600 - 38.4K BAUD	57.6K - 115.2K BAUD
SERIES TIE'S	10	7	6	6
ALN TRUNK DISTANCE	4000ft (1.2km)	4000ft (1.2km)	4000ft (1.2km)	3280ft (1km)

- THE MUST BE USED TO ISOLATE ALN BETWEEN PXCM CONNECTED TO DIFFERENT SERVICE GROUNDS OR ON BOTH SIDES OF THE ALN CABLE THAT EXITS BUILDING.
- THE MAX ALN DISTANCE APPLIES TO EACH SIDE OF THE TIE.

GENERAL NOTES:

- COMPLY WITH LOCAL BUILDING CODES
- SIZE WIRE FOR LOAD, CURRENT, AND VOLTAGE.
- ALL WIRE TO BE APPROVED OR LISTED FOR THE INTENDED APPLICATION BY AGENCIES SUCH AS UL, NEC, CSA.
- ALWAYS REFER TO LOCAL CODES FOR CONDUIT SHARING.
- WIRING MUST HAVE INSULATION RATED FOR HIGHEST VOLTAGE CIRCUIT IN CONDUIT.
- THE ALN TRUNK MUST BE AN UNINTERRUPTED RUN BETWEEN CABINETS. NO SPLICES ALLOWED.
- CM/CMP/MM/MMP WIRE IS NOT USABLE FOR CLASS 1 CIRCUITS.
- FOR EXTENDED TEMPERATURE INSTALLATIONS USE ONLY COPPER WIRE LISTED FOR 90°C OR HIGHER

ENCLOSURE H x W x D (IN)
PXA-ENC-19 19 x 22 x 5 3/4
PXA-ENC-34 34 x 22 x 5 3/4
PXA-ENC-18 18 x 22 x 6

KNOCKOUT TYPES

A= 1" & 1-1/4"
B= 3/4" & 1"
C= 1/2" & 3/4"

T1
00

PXCM CONDUIT PENETRATIONS

SERVICE BOX MAX POWER SOURCE REQUIREMENTS	
VOLTAGE:	102-132 VAC 204-264 VAC
LINE FREQUENCY:	50 / 60 Hz
115V OUTLETS:	200 VA (MAX.)
PXA-SB115V384VA *	440 VA (MAX.)
PXA-SB115V192VA *	220 VA (MAX.)
PXA-SB230V384VA	440 VA (MAX.)
PXA-SB230V192VA	220 VA (MAX.)

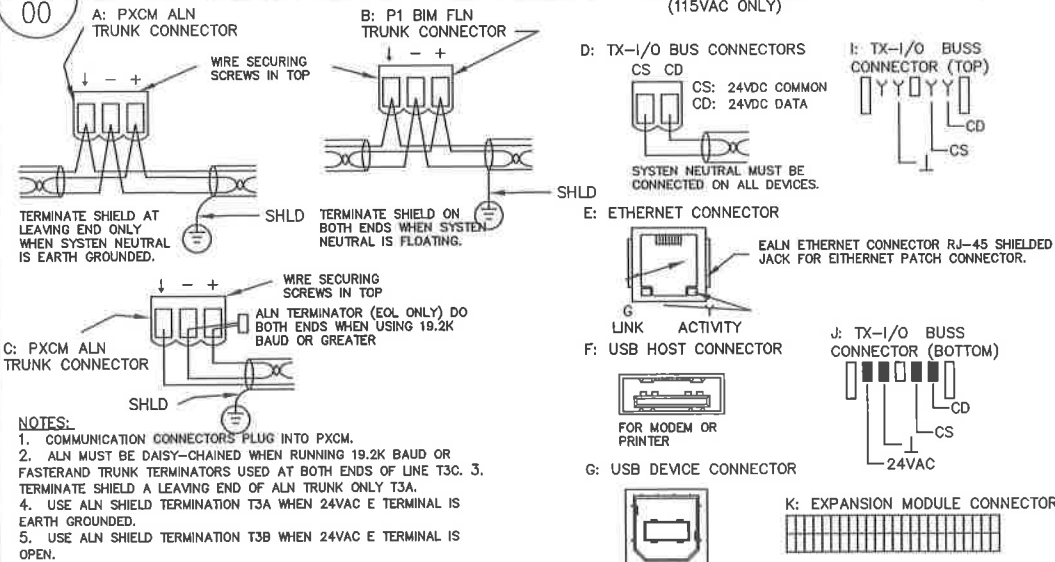
PXCM FAMILY VA RATINGS & SENSOR SUPPLY			
PRODUCT	24VDC (W)	24VAC INPUT VA	24VAC OUTPUT VA
PXC00-X	0	24	0
PXC100-X	0	24	0
TXB1.P1	14.4	125	96
TXS1.12F4	28.8	150	96
TXS1.EF4	0	96	96
TX-I/O MODULE	24VDC LOAD (W) MAX.		
TXM1.8D	1.1		
TXM1.16D	1.4		
TXM1.8U	1.5		
TXM1.8U-ML	1.8		
TXM1.8X	2.2		
TXM1.8X-ML	2.3		
TXM1.6R	1.7		
TXM1.6R-M	1.9		

NOTES:

- NO MORE THAN THREE (3) 384VA OR FIVE (5) 192VA FULLY LOADED PXA CABINETS ALLOWED ON A SINGLE 3-WIRE 115V, 15A CIRCUIT.
- RECEPTACLE IS PREWIRED AND MOUNTED IN FACTORY, FOR 115VAC SERVICE BOX ONLY.
- DC INPUT/OUTPUT ONLY AVAILABLE ON BUSS CONNECTION MODULES.

T2
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PXCM POWER WIRING

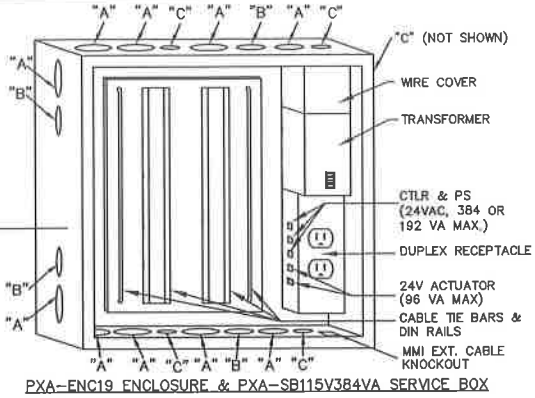


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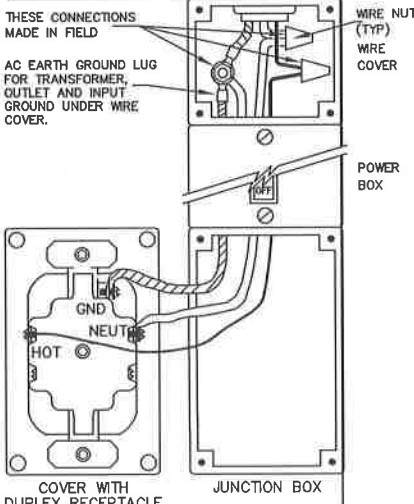
- COMMUNICATION CONNECTORS PLUG INTO PXCM.
- ALN MUST BE DAISY-CHAINED WHEN RUNNING 19.2K BAUD OR FASTER AND TRUNK TERMINATORS USED AT BOTH ENDS OF LINE T3C.
- TERMINATE SHIELD A LEAVING END OF ALN TRUNK ONLY T3A.
- USE ALN SHIELD TERMINATION T3A WHEN 24VAC E TERMINAL IS EARTH GROUNDED.
- USE ALN SHIELD TERMINATION T3B WHEN 24VAC E TERMINAL IS OPEN.

T3
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PXCM & P1 BIM COMMUNICATION TERMINATIONS
FOR PXC MODULAR, SERIES CONTROLLERS
AND SUPPLY MODULES



PXA ENCLOSURE AND SERVICE BOX



REVISION HISTORY

SIEMENS

Siemens Industry, Inc.
Building Technologies Division

45470 Commerce Ctr. Dr
Plymouth Twp., MI 48170
USA
PHONE: 734.456.3800
FAX: 866.815.0749

WSU Bio Science
Detroit, MI

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TX-I/O Wiring Specification

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Reference Only

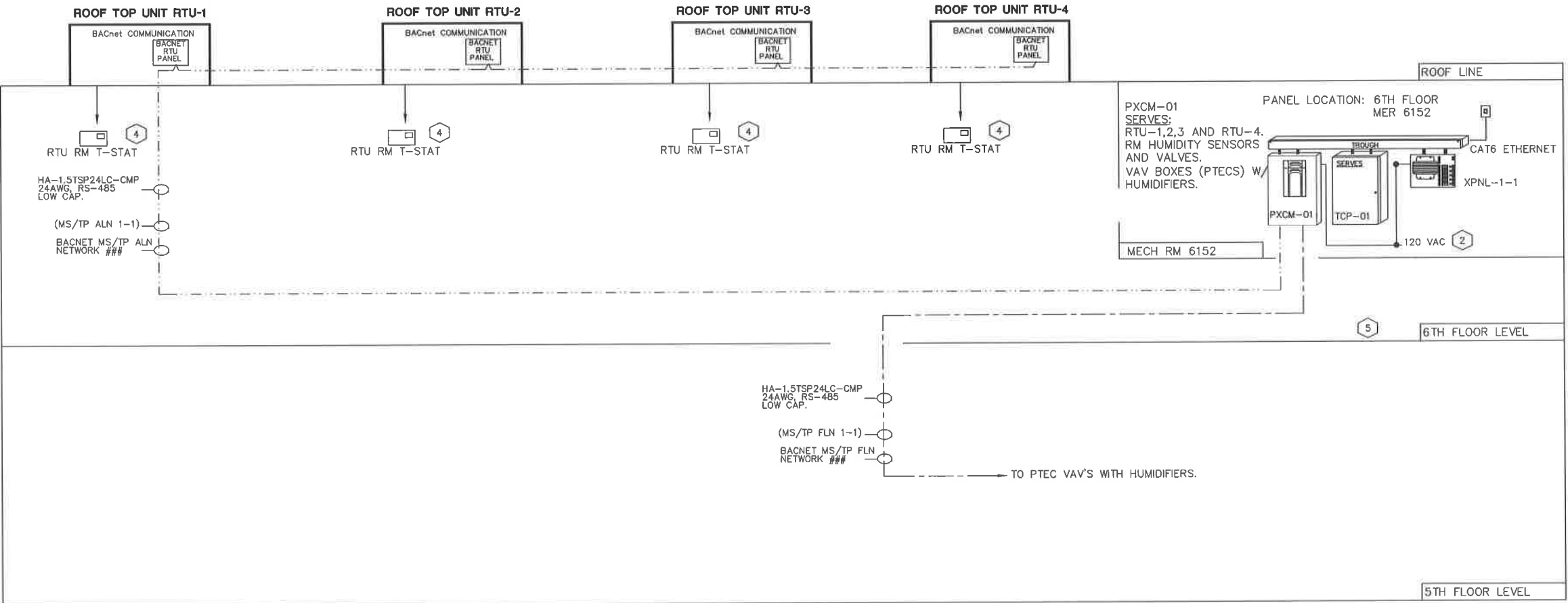
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PANEL INSTALLATION NOTES:

- *DDC PANELS PROVIDED BY SIEMENS.
- *TROUGH PROVIDED BY INSTALLING ELECTRICAL CONTRACTOR.
- *120VAC CIRCUITS PROVIDED INSTALLING ELECTRICAL CONTRACTOR.
- *SEE JOB DOCUMENTS FOR CIRCUIT LOCATIONS AND NUMBERS.
- *120VAC SHALL BE WIRE INTO THE PANELS WITHOUT RUNNING IN THE WIRING TROUGH.
- *HIGH VOLTAGE & LOW VOLTAGE CABLE SHALL NOT MIX IN WIRING TROUGH.
- *DDC PANELS TO BE MOUNTED AND TERMINATED BY INSTALLING ELECTRICAL CONTRACTOR.
- *INSTALLING ELECTRICAL CONTRACTOR TO PROVIDE MINIMUM OF (2) 1" NIPPLES BETWEEN EACH PANEL AND TROUGH.
- *REFER TO ALTRM DRAWING FOR WIRING TAGGING REQUIREMENTS.
- *USE ONLY SIEMENS APPROVED WIRING.

INSTALLATION NOTES:

- 1 USE SIEMENS APPROVED WIRING FOR ALN/ETHERNET/BACnet NETWORK.
- 2 INSTALLING ELECTRICAL CONTRACTOR TO PROVIDE 120 VAC POWER.
- 3 DO NOT INSTALL 120 VAC CIRCUITS IN WIRING TROUGH. SEPERATION OF HIGH/LOW VOLTAGE WIRING MUST BE MAINTAINED.
- 4 REFERENCE CONTRACT DOCUMENTS FOR FINAL ROOF TOP UNIT ROOM TEMPERATURE SENSOR LOCATIONS AND TOTALS.
- 5 REFERENCE CONTRACTS DOCUMENTS FOR FINAL SENSOR LOCATIONS AND TOTALS.



WSU BIO SCIENCE BUILDING

001

WSU Bio Science
Detroit, MI
ENGINEER: JJK
DRAFTER: JJK
CHECKED BY: JJK
LAST EDIT DATE: 01/09/15
DDC COMMUNICATIONS RISER

45470 Commerce Ctr. Dr
Plymouth Twp. MI 48170
USA
PHONE: 734.456.3800
FAX: 866.815.0748

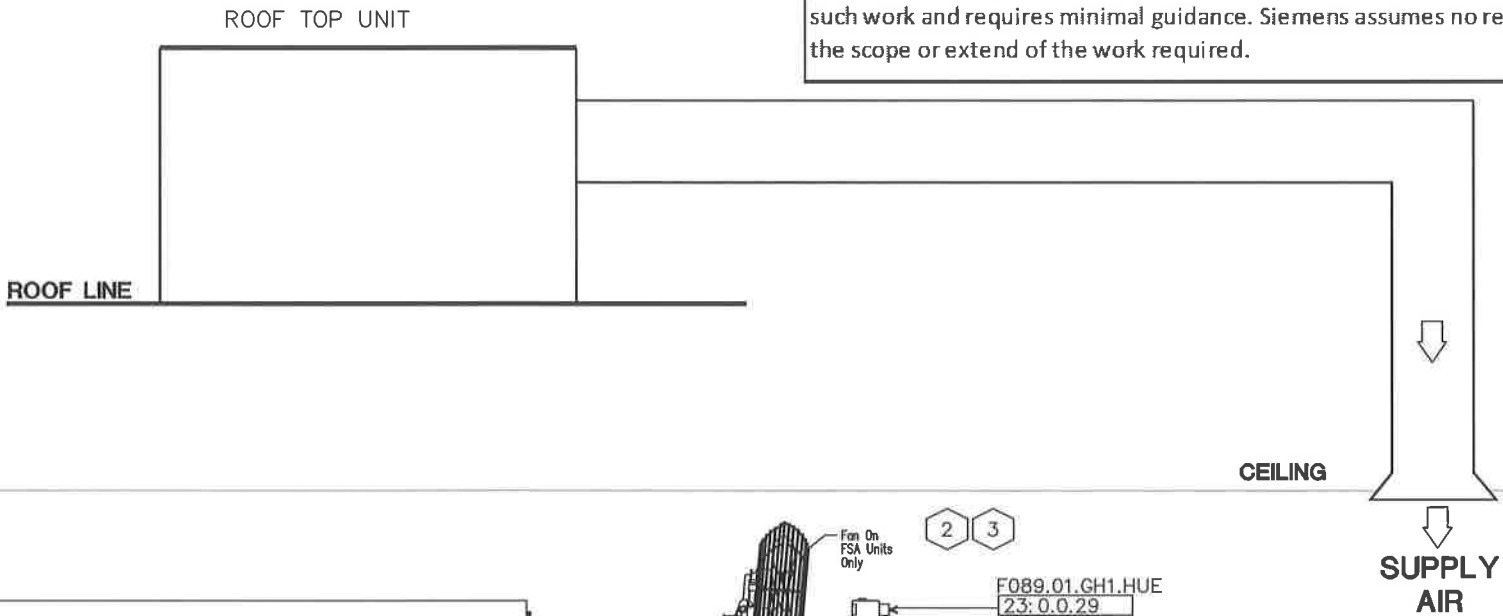
SIEMENS
Siemens Industry, Inc.
Building Technologies Division

REVISION HISTORY

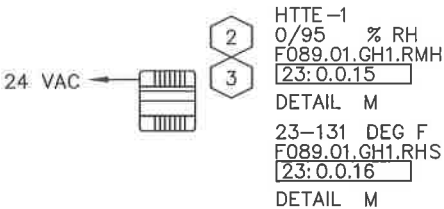
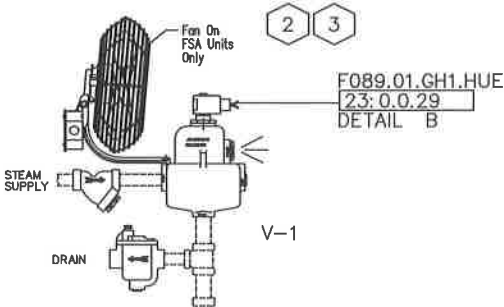
ROOF TOP UNIT NOTES:
ROOF TOP UNIT TO BE INTEGRATED VIA BACNET MS/TP.
ROOF TOP UNIT MANUFACTURE WILL PROGRAM THE UNIT TO MEET THE DESIGN INTENT.

DDC WILL CYCLE UNIT ON AND OFF PER A TIME OF DAY SCHEDULE,
DDC WILL MONITOR ALL TRANE ROOF TOP POINTS VIA BACNET MS/TP.

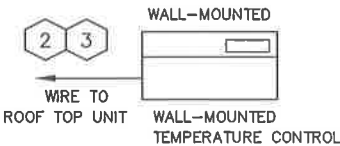
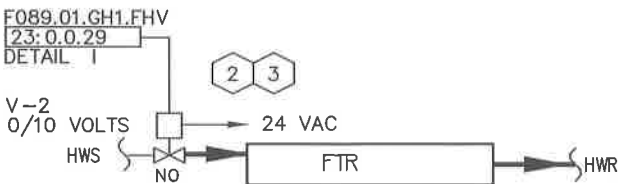
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- INSTALLATION NOTES:
- 1 ALL EQUIPMENT/START-UP PROVIDED BY MECHANICAL CONTRACTOR.
 - 2 REFERENCE CONTRACT DOCUMENTS FOR QUAINITIES AND LOCATIONS.
 - 3 LOCATE AS SHOWN ON FLOOR PLANS/CONTRACT DOCUMENTS.



1 GREEN HOUSE CONTROL SYSTEM
002A
LOCATION: GREEN HOUSE LABS
SERVES: GREEN HOUSES



REVISION HISTORY

SIEMENS

Siemens Industry, Inc.
Building Technologies Division

45470 Commerce Ctr. Dr
Plymouth Twp., MI 48170
USA
PHONE: 734.456.3800
FAX: 866.815.0749

WSU Bio Science
Detroit, MI

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
JKK	JKK		01/09/15	01/09/15

GREEN HOUSE CONTROL SYSTEM

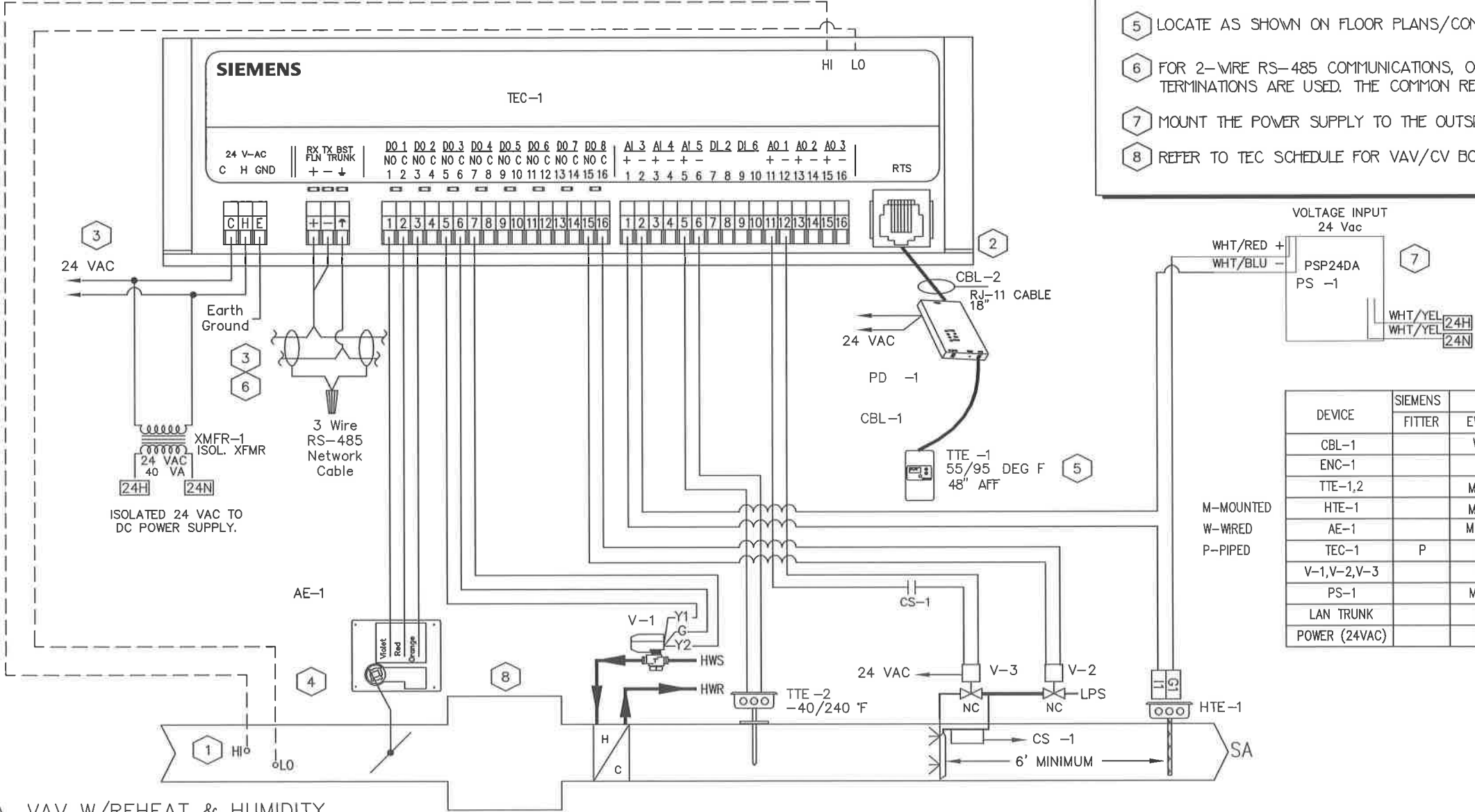
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002A

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INSTALLATION NOTES:

- 1 VAV BOX INSTALLED BY MECHANICAL CONTRACTOR WITH 3 TO 5 STRAIGHT DUCT DIAMETERS UPSTREAM OF BOX TO PROVIDE PROPER FLOW SENSING.
- 2 TEC-1 TO BE MOUNTED IN MANUFACTURER SUPPLIED CONTROLLER ENCLOSURE.
- 3 REFER TO TEC SCHEDULE FOR 24 VAC POWER AND MS/TP TRUNKS.
- 4 MOUNT ACTUATOR WITH DAMPER IN FULL OPEN POSITION. VERIFY TEC-1 AND ACTUATOR REQUIREMENT WITH THE BOX MANUFACTURER.
- 5 LOCATE AS SHOWN ON FLOOR PLANS/CONTRACT DOCUMENTS.
- 6 FOR 2-WIRE RS-485 COMMUNICATIONS, ONLY THE SIGNAL (+,-) TERMINATIONS ARE USED. THE COMMON REFERENCE WIRE IS NOT USED.
- 7 MOUNT THE POWER SUPPLY TO THE OUTSIDE OF ENCLOSURE.
- 8 REFER TO TEC SCHEDULE FOR VAV/CV BOX SIZES AND FLOW SETTINGS.



DEVICE	SIEMENS FITTER	EWIC	MANUFACTURER	DIVISION 15
CBL-1		W		
ENC-1			M	
TTE-1,2		M,W		
HTE-1		M,W		
AE-1		M,W		
TEC-1	P	M		
V-1,V-2,V-3		W		M
PS-1		M,W		
LAN TRUNK		W		
POWER (24VAC)		W		

1 VAV W/REHEAT & HUMIDITY
003A LOCATION: SEE CONTRACT DOCUMENTS

REVISION HISTORY

SIEMENS

Siemens Industry, Inc.
Building Technologies Division

45470 Commerce Ctr. Dr
Plymouth Twp., MI 48170
USA
PHONE: 734.456.3800
FAX: 866.815.0749

WSU Bio Science
Detroit, MI

ENGINEER JJK	DRAFTER JJK	CHECKED BY	INITIAL RELEASE 01/09/15	LAST EDIT DATE 01/09/15
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VAV W/ HW REHEAT CONTROL

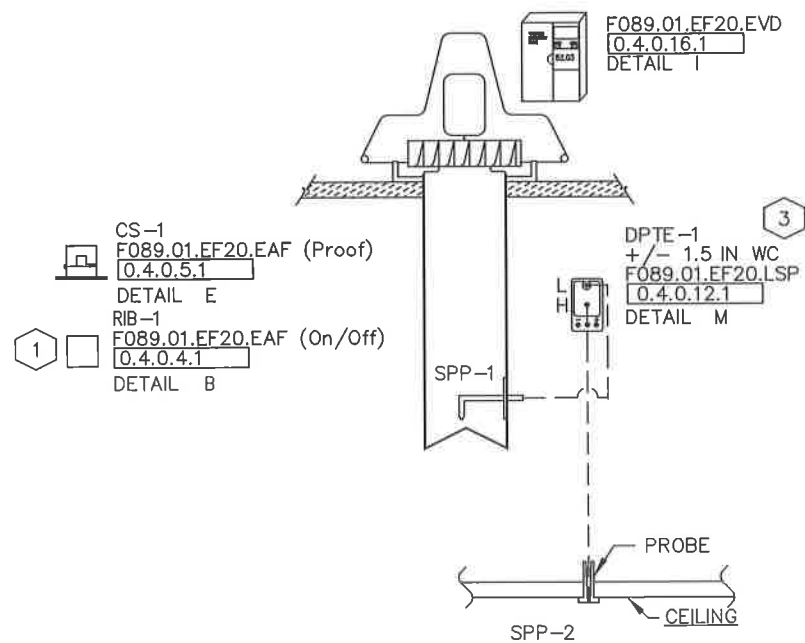
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INSTALLATION NOTES:

- 1 RELAY LOCATED AT FAN STARTER.
- 2 POINTS TO BE WIRED TO PXC1-1 PANEL.
- 3 DEVICE TO BE MOUNTED IN RESPECTIVE TEMPERATURE CONTROL PANEL.



1 EXHAUST FAN EF-20
LOCATION: BIO SCIENCE ROOF
SERVES: 5155, 5155.1, 5155.2 AND 5155.3

REVISION HISTORY

SIEMENS

Siemens Industry, Inc.
Building Technologies Division

45470 Commerce Ctr. Dr
Plymouth Twp., MI 48170
USA
PHONE: 734.456.3800
FAX: 866.815.0749

WSU Bio Science
Detroit, MI

ENGINEER	DRAFTER	CHECKED BY	INITIAL RELEASE	LAST EDIT DATE
JJK	JJK		01/09/15	01/09/15

EX FAN CONTROL SYSTEM

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004A