

WAYNE STATE UNIVERSITY BIOLOGY BOND RENOVATIONS

WAYNE STATE UNIVERSITY
5047 GULLEN MALL
DETROIT, MI 48202

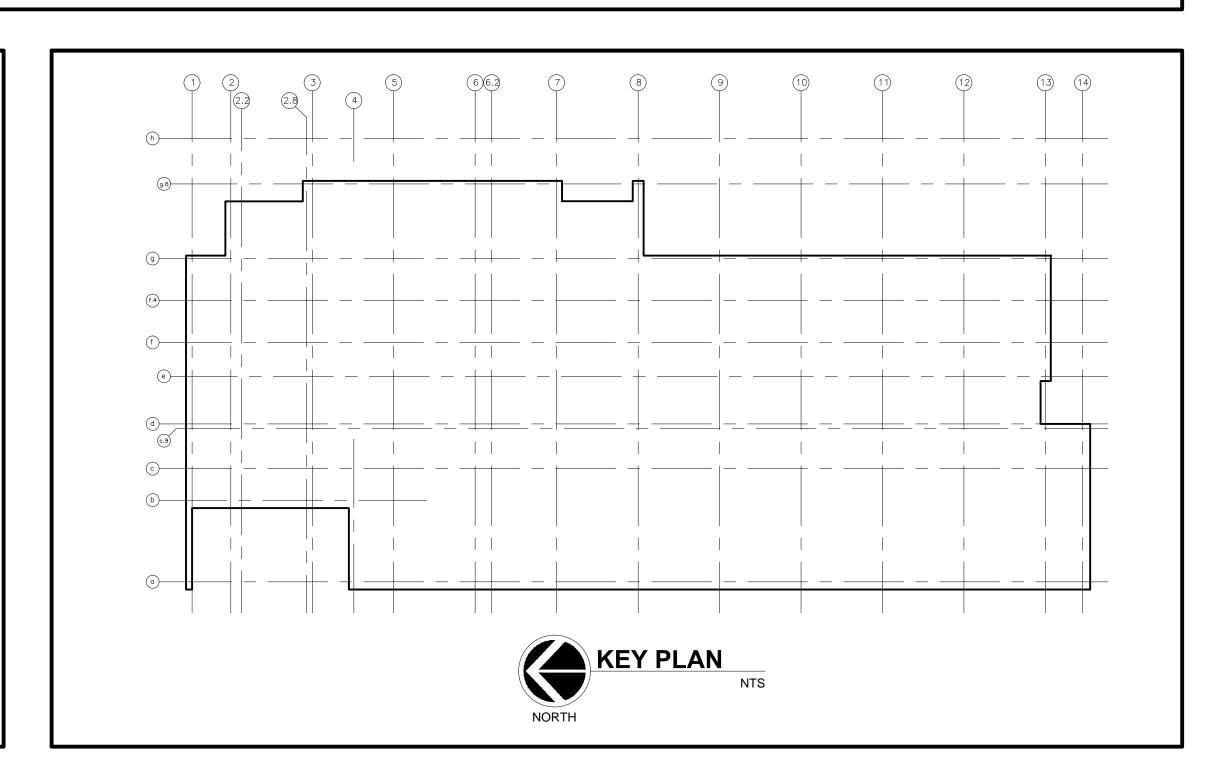


BIOLOGICAL SCIENCE BUILDING

WAYNE STATE UNIVERSITY

CAMPUS MAP

NTS



WSU PROJECT NO: 089-241040
GHAFARI PROJECT NO: 137378.001

ISSUED FOR: BID DATE: 01/20/2015

ISSUED FOR SHEET TITLE	E	ISSUED) FOR		SHEET TITLE	ISSUE	D FOR			SHEET TITLE	ISSUED FOR		SHEET TITLE I	SSUED FOR	SHEET TITLE
15 BID 14 100% OWNER REVIEW 14 90% OWNER REVIEW 15 90% OWNER REVIEW			\overline{v} $\overline{4}$ $\overline{2}$	4 4 4			1 1 1 1 1 1 1	 14 100% OWNER REVIEW 14 FINAL OWNER REVIEW 14 90% OWNER REVIEW UPDATE 	14 90% OWNER REVIEW		15 BID 14 100% OWNER REVIEW 14 FINAL OWNER REVIEW	14 90% OWNER REVIEW UPDATE		15 BID 14 100% OWNER REVIEW 14 FINAL OWNER REVIEW 14 90% OWNER REVIEW IPDATE	14 90% OWNER REVIEW
			01/20/7	0/31/			1/20/	12/10/14 11/14/14 10/31/14	0/16/		01/20/	0/31/		1/20/15 2/10/14 1/14/14	0/10/
			0 7 7	<u>- </u>	IRAI			<u> </u>			0 7 7	ELEC.	RICAL	MITSIX3	G DRAWINGS (FOR REFERENCE ONLY)
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐					ARCHITECTURAL GENERAL NOTES					MECHANICAL NOTES, ABBREV. AND SYMBOLS			ELECTRICAL LEGEND, ABBREVIATIONS AND SYMBOLS		A2.8 ROOF PLAN
● ● ● ● GI0-00-01 GENERAL INFORMATION, SYMBOLS, ABBREVIATION	IONS AND BUILDING CODES				LOWER LEVEL FLOOR PLAN		-	-		LOWER LEVEL MECHANICAL FLOOR PLANS DEMOLITION & NEW WORKS			ELECTRICAL GENERAL NOTES		A3.25 GREENHOUSE ELEVATION + SECTIONS
			• • •	● ● AE1-03-01	LEVEL THREE / FIVE FLOOR PLAN			• • •	M1-03-01	LEVEL THREE/FIVE MECHANICAL FLOOR PLANS DEMO. & NEW WORKS		● ● EP1-L1-0	LOWER LEVEL ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK	000	■ A3.26 GREENHOUSE DETAILS
			• • •	● ● AE1-05-01	LEVEL FIVE (ALTERNATE #1) PLANS			• • •	M1-05-01	ALTERNATE MECHANICAL FLOOR PLANS DEMOLITION & NEW WORKS	• • •	● EP1-03-0	LEVEL THREE ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK		
			• • •	● AE1-06-01	LEVEL SIX FLOOR PLAN			• • •	M1-06-01	LEVEL SIX MECHANICAL FLOOR PLANS DEMOLITION & NEW WORKS	• • •	● EP1-05-0	LEVEL FIVE ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK	SIEMEN	S DRAWINGS (FOR REFERENCE ONLY)
			• • •	● ● AE1-R1-01	GREENHOUSE ROOF PLAN			• • •	M1-R1-01	MECHANICAL ROOF PLANS DEMOLITION & NEW WORKS	• • •	● EP1-05-0	2 LEVEL FIVE (ALTERNATE #1) ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK		ABAC ANIXTER BUILDING AUTO. CABLES
			• • •	AE1-R1-02	ROOF FRAMING PLAN AND DETAILS				M7-00-01	MECHANICAL SCHEDULES		● EP1-06-0	LEVEL SIX ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK		AFTRM ALN/FLN/BACENT TERM. SPEC.
				AC1-01-01	REFLECTED CEILING PLANS, LL, LEVEL 3 & 5				M8-00-01	CONTROL DIAGRAMS		● EP1-R1-0	1 ELECTRICAL ROOF PLANS DEMOLITION & NEW WORK		PNL TYPICAL PANEL WIRING
					GREENHOUSE DETAILS							● EP6-00-0	ONE LINE DIAGRAM		QSST Q-SERIES SENSORS TERM. SPEC.
			• • •		SCHEDULES AND INTERIOR ELEVATIONS							● EL1-L1-0	LOWER LEVEL ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK		SPEC1 ELECTRICAL INSTALL SPEC.
												● EL1-06-0	LEVEL SIX ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK		SPEC2 ELECTRICAL INSTALL SPEC.
												● EL7-00-0	LUMINAIRE SCHEDULE		SPEC3 ELECTRICAL INSTALL SPEC.
															TTRM1 TX-I/O TERMINATION SPEC.
														•	TTRM2 TX-I/O TERMINATION SPEC. 2
															TWIR TX-I/O WIRING SPECIFICATION
															001 DDC COMMUNICATIONS RISER
															002A GREEN HOUSE CONTROL SYSTEM
															003A VAV W/ HW REHEAT CONTROL
															004A EX FAN CONTROL SYSTEM

ABBREVIATIONS

ABV

BOT

BRG

CLR

CO

COL

CPT

CT

DET

DIM

EXP

FBD

FIN

```
FRP
                                                  FIBERGLASS REINFORCED
                                                                                          PAPER TOWEL DISPENSER
          ARCHITECT/ENGINEER
          ANCHOR BOLT
                                                                                          PAPER TOWEL RECEPTACLE
                                                                                PVC
                                                 FIRE-RETARDANT TREATED
                                                                                          POLYVINYL CHLORIDE
          ABOVE
ACM
          ALUMINUM COMPOSITE
                                        FSS
                                                  FOLDING SHOWER SEAT
                                        FT
                                                                                QTY
                                                                                          QUANTITY
                                                  FOOT, FEET
          MATERIAL
ACOUS
                                        FTG
          ACOUSTICAL
                                                  FOOTING
                                        FURR
                                                  FURRING
                                                                                          RISER
ADDM
          ADDENDUM
                                        FVC
                                                                                          RETURN AIR
                                                 FIRE VALVE CABINET
          ADJACENT
                                                                                RAD
                                                                                          RADIUS
          ABOVE FINISH FLOOR
                                                 GAUGE
                                                                                          RESILIENT BASE
          AUTHORITY HAVING
                                        GAL
                                                  GALLON
                                                                                          REFLECTED CEILING PLAN
          JURISDICTION
                                        GALV
                                                 GALVANIZED
                                                                                          ROOF DRAIN
          AIR HANDLING UNIT
                                                  GRAB BAR
                                                                                REF
                                                                                          REFERENCE
          ALTERNATE
                                                  GENERAL CONTRACTOR
ALUM
                                                                                REINF
                                                                                          REINFORC (ING, ED, MENT)
          ALUMINUM
                                        GDR
                                                  GUARD RAIL
                                                                                REQD
ANOD
                                                                                          REQUIRED
          ANODIZED
                                                  GLASS
                                                                                RES
                                                                                          RESILIENT
          ACCESS PANEL
                                        GLZ
                                                 GLAZING
                                                                                REV
          ACOUSTICAL PANEL CEILING
                                                                                          REVISION
                                        GND
                                                  GROUND
                                                                                          RESILIENT FLOORING
APPROX
          APPROXIMATE (LY)
                                        GR
                                                  GRADE
                                                                                 RLG
                                                                                          RAILING
ARCH
          ARCHITECT
                                        GYP
                                                  GYPSUM
                                                                                          ROOM
AWP
          ACOUSTICAL WALL PANELS
                                                 GYPSUM BOARD
                                        GYP BD
                                                                                          ROUGH OPENING
          BACK TO BACK
                                                                                         ROOF TOP UNIT
                                                  HIGH
          BOTTOM CHORD
                                                 HOSE BIB
                                                                                          SUPPLY AIR
          BOARD
                                                 HOLLOW METAL
                                                                                SAB
                                                                                          SOUND ATTENUATION
          BARRIER FREE
                                                  HOLLOW METAL DOOR
                                        HMD
                                                                                          BLANKETS
BLDG
          BUILDING
                                                  HOLLOW METAL FRAME
                                                                                          SALVAGE
BLKG
          BLOCKING
                                        HORIZ
                                                 HORIZONTAL
                                                                                 SCD
                                                                                          SEAT COVER DISPENSER
          BELOW
                                                  HIGH POINT
                                                                                 SCHED
                                                                                          SCHEDULE
          BEAM
                                                  HOURS (FIRE-RESISTANT
                                                                                          SOAP DISPENSER
          BOTTOM
                                                 RATING)
                                                                                          SADDLE
          BEARING
                                                  HEIGHT
                                                                                          SECTIONAL DOOR
BSMT
          BASEMENT
                                                                                SECT
BTWN
                                                                                          SECTION
          BETWEEN
                                                  INSIDE DIAMETER
                                                                                          SQUARE FOOT
BUR
          BUILT-UP ROOF
                                                  INTERMEDIATE DISTRIBUTION
                                                                                          SPRAYED FOAM INSULATION
                                                                                          SPRAYED FIRE RESISTIVE
                                                  FRAME
          CENTER TO CENTER
                                                  INVERT ELEVATION
                                                                                          MATERIALS
          COURSES
                                                  INCH, INCHES
                                                                                          SHOWER
          CATCH BASIN
                                        INFO
                                                  INFORMATION
                                                                                 SHT
                                                                                          SHEET
CFLG
          COUNTER FLASHING
          CAST IRON
                                                  INTERIOR
                                                                                 SHTHG
                                                                                          SHEATHING
                                        INSUL
                                                  INSULATION, INSULATED
                                                                                          INTERNATIONAL SYSTEM OF
          CONTROL JOINT
          CENTERLINE
                                                  JANITOR'S CLOSET
                                                                                SIM
                                                                                          SIMILAR
          CEILING
          CONTRACT LIMIT LINE
                                                                                          SLIP JOINT
                                                  KILOMETER
                                                                                SLNT
                                                                                          SEALANT
          CLOSET
                                        km2
                                                  SQUARE KILOMETER
                                                                                 SND
                                                                                          SANITARY NAPKIN DISPOSAL
                                                                                 SNV
                                                                                          SANITARY NAPKIN VENDOR
          CONCRETE MASONRY UNIT
CMU
                                                  LENGTH, LONG
                                                                                 SPEC
                                                                                          SPECIFICATION
          CLEAN OUT
                                                  LAVATORY
                                                                                          SPRINKLER
          COLUMN
                                                  LINEAR FEET
                                                                                          SQUARE
CONC
          CONCRETE
                                                  LIVE LOAD
                                                                                 SQ IN
                                                                                          SQUARE INCH
          CONNECT (ED, ION, ING)
CONN
                                                  LONG LEG HORIZONTAL
                                        LLH
                                                                                SQ YD
                                                                                          SQUARE YARD
CONSTR
          CONSTRUCTION
                                        LLV
                                                  LONG LEG VERTICAL
          CONSTRUCTION JOINT
                                                                                          SERVICE SINK
CONSTR JT
                                                 LOW POINT
                                                                                 SST
                                                                                          STAINLESS STEEL
          CONTINUOUS (ATION)
                                                                                 STC
STD
          CONTRACTOR
                                                                                          SOUND TRANSMISSION CLASS
CONTR
                                                 LIGHTING
                                                                                          STANDARD
          COORDINATE
COORD
          CALCIUM SILICATE MASONRY
                                                                                 STL JST
                                                                                          STEEL JOIST
CSMU
                                                 SQUARE METER
                                                                                           STEEL
                                        MACH RM
                                                 MACHINE ROOM
          CERAMIC TILE
                                                                                 STL JST
                                                                                          STEEL JOIST
                                                  MARBLE
                                        MARB
          CURTAIN WALL
                                                                                 STL PL
                                                                                           STEEL PLATE
                                                  MASONRY
                                                                                 STN
                                                                                           STONE
                                        MAX
                                                  MAXIMUM
                                                                                          STORAGE
                                                                                 STOR
          DEPTH/DEEP
                                                  MAIN COMMUNICATION ROOM
                                        MCR
                                                                                 STRUCT
                                                                                          STRUCTURAL
DEMO
          DEMOLITION
                                        MDF
                                                  MEDIUM DENSITY FIBERBOARD
                                                                                 STRUCT STL STRUCTURAL STEEL
DEPT
          DEPARTMENT
                                        MDF
                                                  MAIN DISTRIBUTION FRAME
                                                                                           SUSPENDED
          DETAIL
                                        MECH
                                                  MECHANICAL
                                                                                SUSP CLG SUSPENDED CEILING
          DRINKING FOUNTAIN
                                        MEZZ
                                                 MEZZANINE
          DIAMETER
                                                  MANUFACTURER
                                        MFR
DIAG
          DIAGONAL
                                        MH
                                                  MANHOLE
                                                                                           TOWEL BAR
          DIMENSION
                                        MIN
                                                  MINIMUM
                                                                                           TOWEL DISPENSER
          DEAD LOAD
                                                  MIRROR
                                                                                           TOWEL DISPENSER/
          DOWN
                                                  MARKER BOARD
                                                                                           RECEPTACLE
          DOOR
                                                  MILLIMETER
                                                                                           TELEPHONE
          DRAWING
                                                  SQUARE MILLIMETER
                                                                                           TEMPORARY
                                                  MASONRY OPENING
                                                 MOUNTED
                                                                                 THK
                                                                                           THICKNESS, THICK
          EXPANSION JOINT
                                        MTG
                                                 MOUNTING
                                                                                 THRES
                                                                                           THRESHOLD
          ELEVATION
                                        MTL
                                                 METAL
                                                                                           THROUGH
          ELECTRICAL
                                                                                 TK BD
                                                                                           TACKBOARD
ELEV
          ELEVATOR
                                                  NORTH
                                                                                 TMPD
                                                                                           TEMPERED
EMER
          EMERGENCY
                                                 NOT APPLICABLE
                                                                                 TMPD GL
                                                                                           TEMPERED GLASS
EMER SHR
         EMERGENCY SHOWER
                                        NIC
                                                 NOT IN CONTRACT
                                                                                           TOP OF BEAM
ENGR
          ENGINEER
                                        NOM
                                                 NOMINAL
                                                                                 TOC
                                                                                           TOP OF CONCRETE
          EDGE OF SLAB
EOS
                                        NTS
                                                 NOT TO SCALE
                                                                                 TOS
                                                                                           TOP OF STEEL
EPDM
          ETHYLENE PROPYLENE DIENE
                                                                                           TOILET TISSUE DISPENSER
          MONOMER
                                                  OUT TO OUT
                                                                                          TOILET TISSUE JUMBO
          EQUAL
                                                  OVERALL
                                                                                           DISPENSER
EQUIP
          EQUIPMENT
                                                  ON CENTER
                                                                                          TYPICAL
          ELECTRICAL WATER COOLER
EWC
                                        OD
                                                 OUTSIDE DIAMETER
EX, EXIST
          EXISTING
                                                  OWNER FURNISHED
                                                                                           UNDERGROUND
          EXPANSION
                                                  CONTRACTOR INSTALLED
                                                                                           UNDERWRITERS LABORATORY
          EXPANSION BOLT
                                                 OWNER FURNISHED OWNER
                                                                                          UNEXCAVATED
                                                                                UNEX
          EXTERIOR
                                                  INSTALLED
                                                                                          UNLESS NOTED OTHERWISE
                                                                                UNO
                                                  OPPOSITE HAND
                                                                                UON
                                                                                          UNLESS OTHERWISE NOTED
          FACE TO FACE
                                        OPNG
                                                  OPENING
                                                                                UR
                                                                                          URINAL
          FIRE ALARM
                                                 OVERFLOW ROOF DRAIN
                                        ORD
          FIBERBOARD
                                                  OVERFLOW SCUPPER
                                                                                 VERT
                                                                                           VERTICAL
          FLOOR DRAIN
                                                                                VEST
                                                                                           VESTIBULE
FDTN
          FOUNDATION
                                        PBD
                                                  PARTICLE BOARD
                                                                                           VERIFY IN FIELD
          FIRE EXTINGUISHER
                                                 PENTHOUSE
                                                                                           VAPOR RETARDER
          FIRE EXTINGUISHER CABINET
                                                                                VTR
                                                                                          VENT THROUGH ROOF
          FACTORY FINISH
                                                  PLASTIC LAMINATE
          FIBERGLASS
                                        PLAS
                                                  PLASTER
                                                                                           WITH
          FIRE HOSE CABINET
                                                 PLYWOOD
                                        PLYWD
                                                                                W/O
                                                                                          WITHOUT
         FINISH (ED)
                                                 PANEL(S)
                                                                                           WIDE, WIDTH
          FINISH FLOOR
                                        PNT
                                                 PAINT, PAINTED
                                                                                          WATER CLOSET
FIN GR
          FINISH GRADE
                                        PREFAB
                                                 PREFABRICATED
                                                                                 WCG
                                                                                          WALL COVERING
FIXT
          FIXTURE
                                        PREFIN
                                                 PREFINISHED
                                                                                 WD
                                                                                           WOOD
          FLASHING
FLASH
                                        PRELIM
                                                  PRELIMINARY
                                                                                          WIDE FLANGE
                                        PREP
                                                  PREPARATION
                                                                                           WIRED GLASS
FLR FIN
          FLOOR FINISH
                                        PROJ
                                                 PROJECT
                                                                                           WATER HEATER
FLUOR
          FLUORESCENT
                                                  POUNDS PER SQUARE FOOT
                                                                                WP
                                                                                           WORKING POINT
          FIRE RATING, FIRE RATED
                                                  POUNDS PER SQUARE INCH
                                        PSI
                                                                                WR
                                                                                           WASTE RECEPTACLE
FRMG
          FRAMING
                                                 PRESSURE TREATED
                                                                                WWF
                                                                                           WELDED WIRE FABRIC
                                                                                WWM
                                                                                          WELDED WIRE MESH
```

REFERENCE SYMBOLS

PLAN IDENTIFICATION



SECTION LOCATION IDENTIFICATION

- SECTION IDENTIFICATION NUMBER (SAME NUMBER ON SHEET WHERE DRAWN) SHEET IDENTIFICATION NUMBER

(INDICATES SHEET NUMBER

WHERE SECTION IS DRAWN)

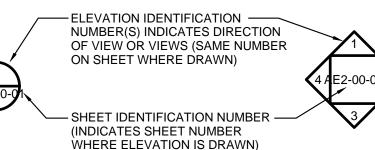
SECTION IDENTIFICATION

- SECTION IDENTIFICATION NUMBER (SAME NUMBER ON SHEET WHERE REFERENCED)

4 BUILDING SECTION TITLE AE3-01-01

- SHEET IDENTIFICATION NUMBER (INDICATES SHEET NUMBER WHERE DETAIL IS TYPICALLY REFERENCED -NOT ALL INCLUSIVE)

ELEVATION LOCATION IDENTIFICATION



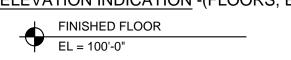
ELEVATION IDENTIFICATION

— ELEVATION IDENTIFICATION NUMBER (SAME NUMBER ON SHEET WHERE REFERENCED)

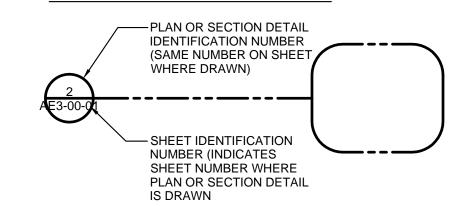
\ELEVATION TITLE AE2-00-0 SCALE: 1/4"=1'-0"

- SHEET IDENTIFICATION NUMBER (INDICATES SHEET NUMBER WHERE ELEVATION IS TYPICALLY REFERENCED - NOT ALL INCLUSIVE)

ELEVATION INDICATION -(FLOORS, ETC...)



DETAIL LOCATION IDENTIFICATION



DETAIL IDENTIFICATION

- DETAIL IDENTIFICATION NUMBER (SAME NUMBER ON SHEET WHERE REFERENCED) 4 \DETAIL TITLE **AE3-00-01** SCALE: 1"=1'-0"

-SHEET IDENTIFICATION NUMBER (INDICATES SHEET NUMBER WHERE DETAIL IS TYPICALLY REFERENCED -NOT ALL INCLUSIVE)

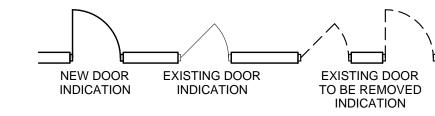
ROOM NAME AND NUMBER INDICATION

ROOM NAME 100 ROOM IDENTIFICATION NUMBER

DOOR NUMBER INDICATION



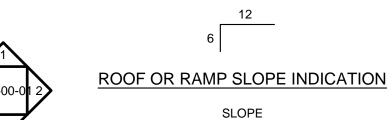
DOOR INDICATION



PARTITION TYPE NUMBER INDICATION



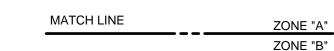
ROOF OR RAMP PITCH INDICATION



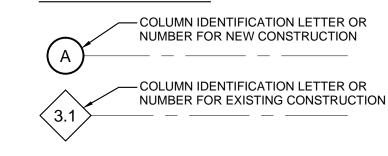
REVISION INDICATION



MATCH LINE INDICATION



COLUMN INDICATION



MATERIAL OR WORK DIVISION INDICATION

EXISTING	_ _	NEW	

PROJECT BUILDING AND CODE DATA

Governing Codes:	2012 International Mechanical Code Code for E	gan Rehabilitation kisting Buildings A117.1-2009 e Design	
Areas of Work Square Footage (SF):	Use Group Classification:	Code Section	
Existing (Lower Level): (No Increase) 18,588 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	Business "B" (Educational Occupancy <12th Grade)	304.1	
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	

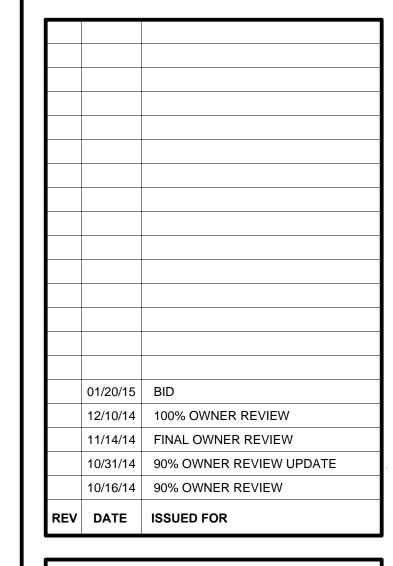


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Architecture - Engineering - Consulting



WAYNE STATE UNIVERSITY **5047 GULLEN MALL DETROIT**, **MI 48202**



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

GENERAL INFORMATION SYMBOLS, **ABBREVIATIONS** AND BUILDING CODES

> GI0-00-01 SHEET NUMBER

1. THE CONTRACTOR SHALL VISIT THE PROJECT SITE BEFORE SUBMITTING HIS BID.

SUBMITTING A BONA FIDE BID SHALL BE VERIFICATION AND ACKNOWLEDGEMENT BY

THE CONTRACTOR THAT A SITE VISIT WAS PERFORMED, THE EXISTING CONDITIONS

IN WHICH THE WORK IS TO BE PERFORMED ARE UNDERSTOOD BY THE CONTRACTOR

AND THE BID INCLUDES ALL ALLOWANCES (ADDITIVE AND DEDUCTIVE) TO COMPLETE

IN DETAIL ALL THE WORK INCLUDED IN THE CONTRACT DOCUMENTS FOR THE PRICE

SCHEDULE. THE CONTRACTOR SHALL NOT BE GRANTED ANY EXTENSIONS OF TIME

OR INCREASE IN PAYMENT DUE TO ANY CLAIM BY THE CONTRACTOR REGARDING ANY

DIMENSIONS BEFORE BEGINNING ANY CONSTRUCTION ACTIVITIES. THE CONTRACTOR

NOTIFY THE ARCHITECT IN WRITING OF ALL DISCREPANCIES OR OMISSIONS. FAILURE

RESPONSIBILITY AND ANY ADDITIONAL WORK RESULTING FROM THE CONTRACTORS

MATERIAL EXISTING AT THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR

SHALL NOTIFY THE OWNER IF ANY HAZARDOUS MATERIAL IS DISCOVERED DURING

FAILURE TO VERIFY FIELD DIMENSIONS SHALL BE AT THE CONTRACTORS EXPENSE

SHALL COMPARE FIELD DIMENSIONS WITH THE CONSTRUCTION DOCUMENTS AND

TO VERIFY FIELD DIMENSIONS SHALL NOT RELIEVE THE CONTRACTOR OF THIS

REMOVAL AND SUBSEQUENT EFFECTS TO THE PROJECT OF ANY HAZARDOUS

a. THE CONSTRUCTION AND SERVICES REQUIRED BY THE CONTRACT

DOCUMENTS, INCLUDING BUT NOT LIMITED TO: LABOR, MATERIALS,

EQUIPMENT, SUPERVISION, ETC, REQUIRED TO PROVIDE A COMPLETE

CHANGE TO THE SCOPE OF WORK OR WORK BEYOND THE LIMITS OF

CONSTRUCTION REQUIRES PRIOR APPROVAL BY THE ARCHITECT.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COMPLIANCE WITH ALL

INSTALLATION MEETING ALL REGULATORY REQUIREMENTS READY FOR

b. THE WORK IS LIMITED TO THE SCOPE OF WORK INDICATED ON THE CONTRACT DOCUMENTS AND TO THE "LIMITS OF CONSTRUCTION" INDICATED. ANY

CONTRACTOR SHALL SUBMIT WRITTEN NOTIFICATION TO THE ARCHITECT AND

OBTAIN APPROVAL FROM THE ARCHITECT BEFORE BEGINNING ANY WORK NOT

INCLUDED IN THE SCOPE OF WORK. ANY ADDITIONAL WORK INSTALLED

REGULATORY REQUIREMENTS, CODES, ORDINANCES ETC, INCLUDING APPLICATION,

6. OWNER SUPPLIED FURNISHINGS AND EQUIPMENT: CONTRACTOR SHALL NOT PROCEED

WITH ANY WORK REQUIRING COORDINATION WITH OWNER SUPPLIED FURNISHINGS AND

MEETINGS, COSTS, INSPECTIONS AND POSTING, UNLESS NOTED OTHERWISE.

WITHOUT PRIOR WRITTEN APPROVAL SHALL BE AT THE CONTRACTOR SOLE

INCLUDED IN THE BID AND WITHIN THE TIME ALLOTTED IN THE CONSTRUCTION

2. THE CONTRACTOR SHALL VISIT THE PROJECT SITE AND VERIFY ALL FIELD

WITH NO ADDITIONAL COMPENSATION.

THE OWNER ACCEPTS ALL RESPONSIBILITY FOR

3. HAZARDOUS MATERIALS:

CONSTRUCTION.

4. THE DEFINITION OF "WORK" IS:

OCCUPANCY.

RISK AND EXPENSE.

CONTRACTOR GENERAL CONDITIONS NOTES

CONCEALED CONDITIONS, INACCURACIES IN THE ORIGINAL DOCUMENTS, INACCESSIBLE LOCATIONS, UNRECORDED BUILDING ALTERATIONS AND OTHER CONFLICTING INFORMATION. INFORMATION OUTSIDE OF CONTRACT AREA IS RELATIVE AND FOR REFERENCE ONLY. ALWAYS VERIFY FIELD CONDITIONS

4. IF THE PRESENCE OF ANY HAZARDOUS, OR SUSPECTED HAZARDOUS MATERIAL IS ENCOUNTERED DURING THE PROCESS OF DEMOLITION OPERATIONS, NOTIFY OWNER IMMEDIATELY, AND COMPLY WITH OSHA REGULATIONS RELATED TO WORK IN THAT AREA.

5. IF SUSPECTED ASBESTOS CONTAINING MATERIAL (ACM) IS ENCOUNTERED, CEASE WORK IN THAT AREA AND NOTIFY THE GENERAL CONTRACTOR AND OWNER IMMEDIATELY.

LAWS INCLUDING THE ADA. SHOULD ANY CONTRACTOR NOTICE DRAWINGS OR WORK THAT HE/SHE BELIEVES IS NON-COMPLIANT, NOTIFY THE ARCHITECT IMMEDIATELY FOR REVIEW AND CORRECTIVE ACTION.

WORK. ALL NOTES ARE TO BE REVIEWED AND APPLIED TO RELATED BUILDING COMPONENTS. NOTES APPEAR ON VARIOUS SHEETS FOR DIFFERENT SYSTEMS AND MATERIALS. ALL SHEETS ARE TO BE REVIEWED AND NOTES ON ANY ONE SHEET ARE TO BE APPLIED ON RELATED DRAWINGS AND DETAILS.

MATERIALS FOR INFORMATION PERTINENT TO THEIR WORK. INFORMATION MAY OCCUR IN OTHER PORTIONS OF THE CONTRACT DOCUMENTS. REFER TO MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR ADDITIONAL GENERAL NOTES, ABBREVIATIONS, AND SYMBOLS.

ELECTRICAL AND PLUMBING DRAWINGS IN DEFINING THE WORK OF THE CONTRACT DOCUMENTS. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO COORDINATE WITH THE ARCHITECTURAL DRAWINGS BEFORE THE INSTALLATION OF MECHANICAL AND ELECTRICAL WORK. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.

10. DO NOT SCALE THE DRAWINGS. THE DRAWINGS ARE NOT NECESSARILY TO SCALE. THE CONTRACTOR SHALL LAY OUT ALL GRIDS AND/OR MAJOR DIMENSIONS PRIOR TO THE START OF CONSTRUCTION. IF DISCREPANCIES ARE FOUND, THE ARCHITECT SHALL BE NOTIFIED FOR CLARIFICATION BEFORE COMMENCEMENT OF THE WORK. EXPLICIT DIMENSIONS HAVE PRECEDENCE OVER SCALE. CONTRACTOR SHALL INSTALL THE WORK IN ACCORDANCE WITH DIMENSIONS INDICATED IN THE CONTRACT

11. MAINTAIN THE BUILDING ENVELOPE IN A WATER AND AIR TIGHT CONDITION AT ALL TIMES THROUGHOUT ALL PHASES OF CONSTRUCTION.

12. INTERIOR PARTITIONS ARE DIMENSIONED TO THE FACE OF PARTITIONS. CONTRACTOR SHALL COORDINATE FINAL DIMENSIONS WITH THE FINISH SCHEDULE WHEN CRITICAL TO THE INSTALLATION OF MILLWORK, CASEWORK,

13. REFER TO FINISH SCHEDULE FOR FINISHES.

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

GENERAL PROJECT NOTES

INCLUDE THE DRAWINGS AND THE PROJECT SPECIFICATIONS CONTAINED IN THE PROJECT MANUAL. 3. ALTHOUGH INTENDED TO CONVEY APPROPRIATE INFORMATION, THESE DRAWINGS HAVE BEEN PREPARED FROM ARCHIVAL BUILDING DRAWINGS. AS SUCH. DRAWINGS MAY CONTAIN DISCREPANCIES AND OMISSIONS DUE TO

BEFORE COMMENCING WORK. NOTIFY ARCHITECT/ENGINEER IF FIELD CONDITIONS CONFLICT WITH PROPOSED WORK.

6. IT IS THE INTENT THAT CONSTRUCTION COMPLY WITH ALL APPLICABLE CODES AND

7. CONTRACTOR IS RESPONSIBLE TO REVIEW ALL SHEETS AND MATERIAL RELATED TO

8. SUBCONTRACTORS FOR EACH TRADE ARE RESPONSIBLE TO REVIEW ALL SHEETS AND

9. THE ARCHITECTURAL DRAWINGS ARE OF EQUAL IMPORTANCE WITH THE MECHANICAL,

DOCUMENTS.

OR EQUIPMENT.

ALTERNATE #1

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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 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

> ARCHITECTURAL **GENERAL NOTES**

> > AE0-00-01

DEMOLITION NOTES

1. CONTRACTOR SHALL FIELD VERIFY ITEMS NOTED AS EXISTING TO REMAIN AND NOTIFY ARCHITECT OF ANY DISCREPANCIES FROM CONDITIONS INDICATED IN THE DRAWINGS. ITEMS NOTED AS EXISTING TO REMAIN INCLUDE BUT ARE NOT LIMITED TO: PARTITIONS.

2. DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. USE METHODS REQUIRED TO COMPLETE THE WORK WITHIN LIMITATIONS OF GOVERNING REGULATIONS. CONTRACTOR SHALL INCLUDE INCIDENTAL DEMOLITION AND CUTTING AS REQUIRED BY THE NEW CONSTRUCTION TO COMPLETE THE WORK AS INDICATED IN THE CONTRACT DOCUMENTS, AT NO ADDITIONAL COST TO OWNER OR ARCHITECT.

3. ALL MEASURES NECESSARY TO ASSURE SAFE DEMOLITION OF THE AREAS INDICATED ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

4. DO NOT CUT STRUCTURAL WORK IN A MANNER RESULTING IN A REDUCTION OF LOAD CARRYING CAPACITY OR LOAD/DEFLECTION RATIO. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ALL STRUCTURAL CUTS PRIOR TO EXECUTION SO THAT APPROVAL CAN BE OBTAINED FROM THE ARCHITECT OF STRUCTURAL ENGINEER.

CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING PLUMBING FIXTURES AND CASEWORK SUPPORTING PLUMBING FIXTURES, AS INDICATED IN THE CONTRACT DOCUMENTS. CAP ALL PLUMBING PIPING AS REQUIRED BY APPLICABLE CODES AND REGULATIONS. CAP FLOOR PIPING FLUSH WITH THE FLOOR SURFACE.

6. VISUAL REQUIREMENTS FOR DEMOLITION, CUTTING AND PATCHING: DO NOT CUT AND PATCH CONSTRUCTION IN A MANNER THAT RESULTS IN VISUAL EVIDENCE OF CUTTING AND PATCHING. DO NOT CUT AND PATCH CONSTRUCTION EXPOSED IN OCCUPIED SPACES IN A MANNER THAT WOULD, IN ARCHITECT'S OPINION, REDUCE THE BUILDING'S AESTHETIC QUALITIES. REMOVE AND REPLACE CONSTRUCTION THAT HAS BEEN CUT AND PATCHED IN A VISUALLY UNSATISFACTORY MANNER

DOCUMENT EXISTING CONDITIONS PRIOR TO, AND AFTER DEMOLITION, BY THOROUGHLY PHOTOGRAPHING AREAS WHERE WORK IS TO BE UNDERTAKEN. SUBMIT DATE-STAMPED PHOTOS TO ARCHITECT/OWNER.

8. CLEANING: CONTRACTOR SHALL PROVIDE DAILY AND FINAL CLEANING. CONDUCT CLEANING AND WASTE-REMOVAL OPERATIONS TO COMPLY WITH LOCAL LAWS AND ORDINANCES AND FEDERAL AND LOCAL ENVIRONMENTAL AND ANTIPOLLUTION REGULATIONS. EMPLOY EXPERIENCED WORKERS OR PROFESSIONAL CLEANERS FOR FINAL CLEANING. CLEAN EACH SURFACE OR UNIT TO CONDITION EXPECTED IN A BIOLOGY RESEARCH LABORATORY CLEANING AND MAINTENANCE PROGRAM. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

9. EMERGENCY EGRESS: MAINTAIN ACCESS TO EXISTING WALKWAYS, CORRIDORS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES. DO NOT CLOSE OR OBSTRUCT WALKWAYS, CORRIDORS, OR OTHER OCCUPIED OR USED FACILITIES WITHOUT WRITTEN PERMISSION FROM AUTHORITIES HAVING JURISDICTION.

10. THE OWNER OR OTHER TENANTS MAY OCCUPY PORTIONS OF BUILDING IMMEDIATELY ADJACENT TO SELECTIVE DEMOLITION AREA. CONDUCT SELECTIVE DEMOLITION SO OCCUPANTS OPERATIONS WILL NOT BE DISRUPTED. PROVIDE NOT LESS THAN (7) DAYS NOTICE TO OWNER OF ACTIVITIES THAT WILL AFFECT OWNER'S OPERATIONS. MAINTAIN ACCESS TO EXISTING WALKWAYS, CORRIDORS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES. DO NOT CLOSE OR OBSTRUCT WALKWAYS, CORRIDORS, OR OTHER OCCUPIED OR USED FACILITIES WITHOUT WRITTEN PERMISSION FROM AUTHORITIES HAVING JURISDICTION.

11. PROVIDE THERMAL AND MOISTURE PROTECTION OF THE EXISTING BUILDING/PORTIONS OF BUILDING WHICH HAVE BEEN EXPOSED AS A RESULT OF THE DEMOLITION PROCESS.

12. REMOVE CEILINGS AS INDICATED INCLUDING FRAMING AND SUPPORT MEMBERS. COORDINATE WITH OTHER TRADES TO CONFIRM SCOPE OF DEMOLITION FOR OTHER COMPONENTS. REFER TO MECHANICAL AND ELECTRICAL FOR ADDITIONAL INFORMATION.

13. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION WORK.

14. REMOVE FURNISHINGS, EQUIPMENT AND SHELVING THAT HAS NOT BEEN REMOVED BY THE OWNER, INCLUDING BOTH WALL MOUNTED AND FREESTANDING ITEMS. REMOVE WALL MOUNTED SIGNAGE, PLAQUES, DISPLAY CASES, ETC.

15. IN AREAS WHERE CARPETING HAS BEEN INSTALLED OVER RESILIENT FLOORING, REMOVE BOTH ELEMENTS WHERE THIS CONDITION EXISTS UNLESS OTHERWISE NOTED. VERIFY IN FIELD.

16. REPAIR ALL REMAINING FIREPROOFING OR FIRE-RATED ASSEMBLIES DAMAGED DURING DEMOLITION TO CONFORM TO ORIGINAL FIRE PROTECTION REQUIREMENTS. CONTACT THE ARCHITECT TO VERIFY U.L. ASSEMBLIES TO BE USED FOR REPAIRS.

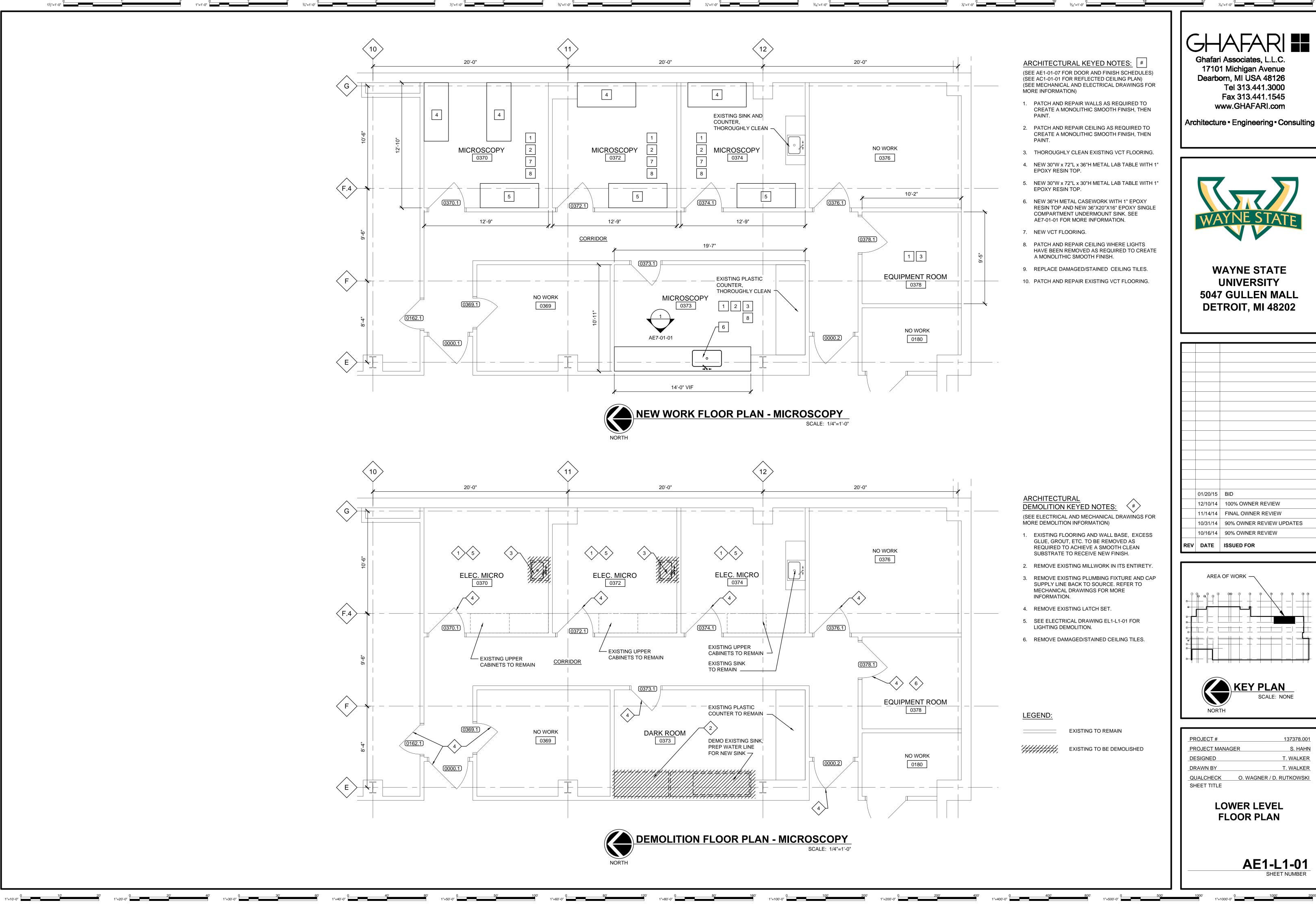
EQUIPMENT UNTIL SUBMITTALS HAVE BEEN RETURNED AFTER REVIEW BY THE OWNER AND ARCHITECT. CONTRACTOR SHALL COORDINATE AND ACCOMMODATE ALL OWNER SUPPLIED FURNISHINGS AND EQUIPMENT INDICATED IN THE CONTRACT DOCUMENTS INTO THE WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS RESULTING FROM THE CONTRACTORS FAILURE TO OBTAIN REVIEWS.

7. THE CONTRACTOR SHALL NOT KNOWINGLY PURCHASE OR ORDER ANY MATERIAL OR EQUIPMENT WHOSE DELIVERY SCHEDULE COULD CAUSE THE PROJECT TO BE DELAYED.

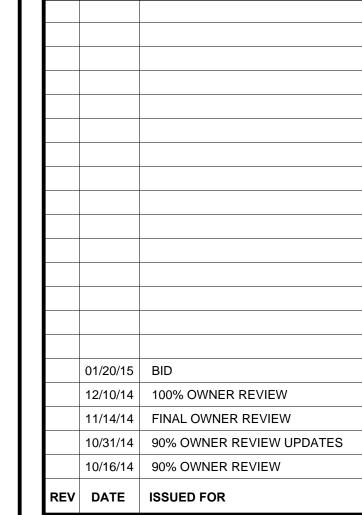
8. EXISTING CONDITIONS: CONTRACTOR SHALL BE RESPONSIBLE, AT NO ADDITIONAL COST, FOR CORRECTING EXISTING FINISHES THAT THEY DAMAGED AND DEFECTIVE FINISHES TO MATCH NEW FINISHES IN THE SCOPE OF WORK. INCLUDING BUT NOT LIMITED TO: GYPSUM BOARD PANELS ON WALLS AND CEILINGS, CONCRETE SUBSTRATES, ACOUSTICAL GRID AND CEILING PANELS. AND OTHER SIMILAR FINISH MATERIALS. PATCH ADJACENT SURFACES OR MATERIAL IN MANNER NECESSARY TO RESULT IN NO VISUAL DIFFERENCE BETWEEN EXISTING AND NEW SURFACE.

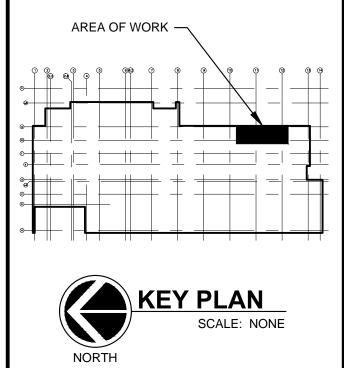
9. CLEANING: CONTRACTOR SHALL PROVIDE DAILY AND FINAL CLEANING. CONDUCT CLEANING AND WASTE-REMOVAL OPERATIONS TO COMPLY WITH LOCAL LAWS AND ORDINANCES AND FEDERAL AND LOCAL ENVIRONMENTAL AND ANTIPOLLUTION REGULATIONS. EMPLOY EXPERIENCED WORKERS OR PROFESSIONAL CLEANERS FOR FINAL CLEANING. CLEAN EACH SURFACE OR UNIT TO CONDITION EXPECTED IN AN AVERAGE COMMERCIAL BUILDING CLEANING AND MAINTENANCE PROGRAM. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.

10. CONTRACTOR SHALL COORDINATE ALL WORK SCHEDULES WITH OWNER. BUILDING WILL REMAIN FULLY OCCUPIED DURING CONSTRUCTION AND AS SUCH. ALL WORK RESULTING IN NOISE OR VIBRATION WILL BE COORDINATED WITH OWNER.



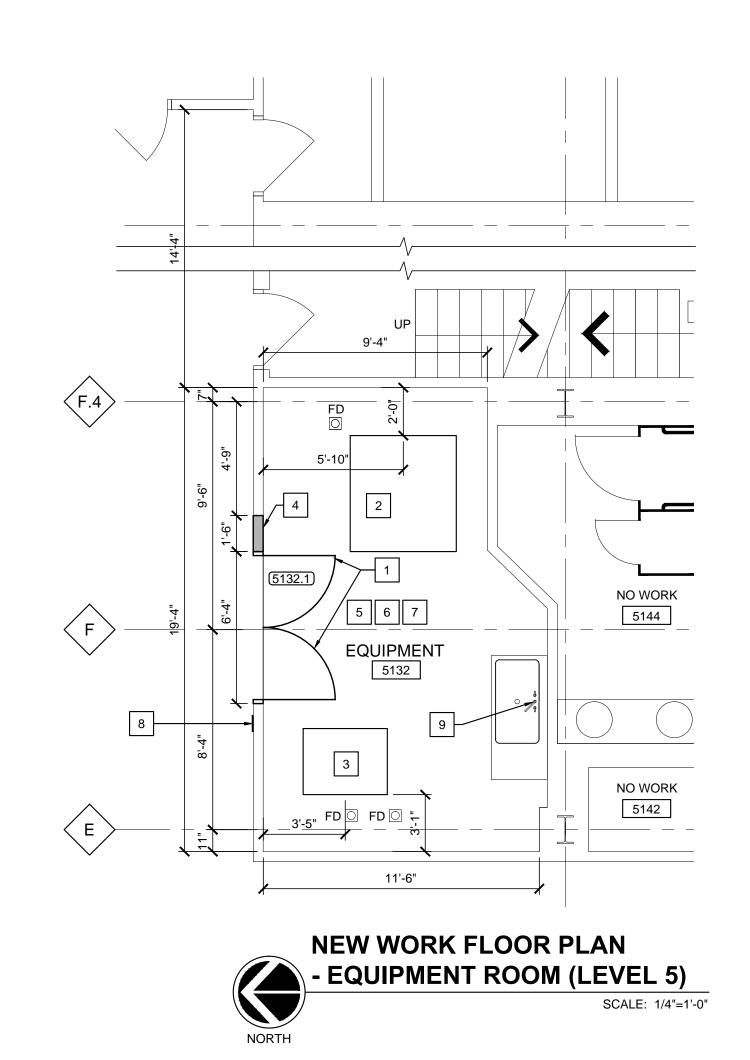






PROJECT#	137378.001
PROJECT MANA	GER S. HAHN
DESIGNED	T. WALKER
DRAWN BY	T. WALKER
QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

AE1-L1-01



GYPSUM BOARD -

WALL PANEL -

WALL PANEL

EDGE BAR —

WALL BASE METAL STUD-

1" RADIUS -

CEMENTITIOUS

POLYURETHANE

MORTAR FLOOR -

CONCRETE FLOOR —

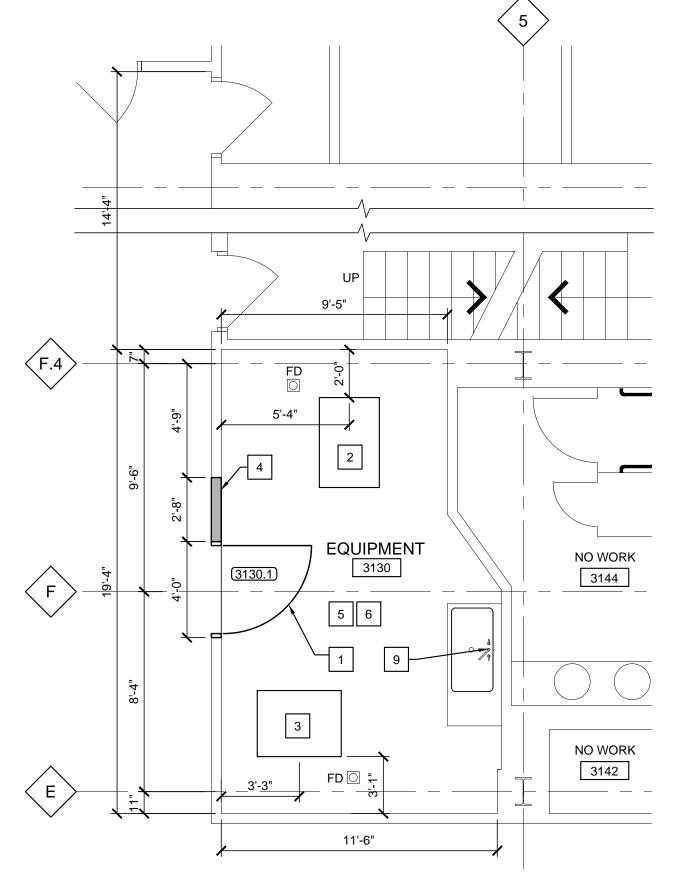
TYPICAL COVED BASE

DETAIL AT EQUIP. ROOMS

SCALE: 3"=1'-0"

INTEGRAL COVED

NEW ANTI-MICROBIAL



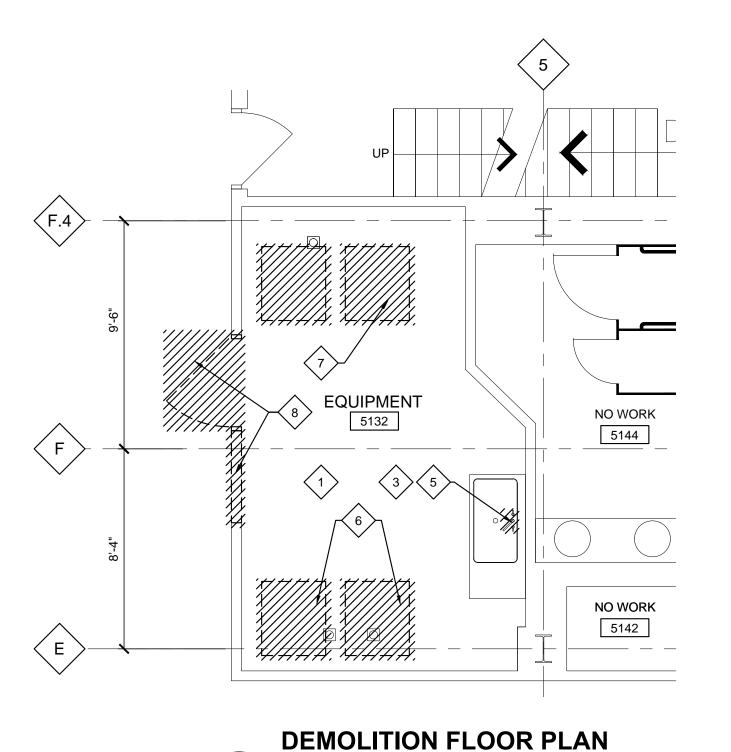


AUTOCLAVE - STERIS AMSCO LAB 250

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

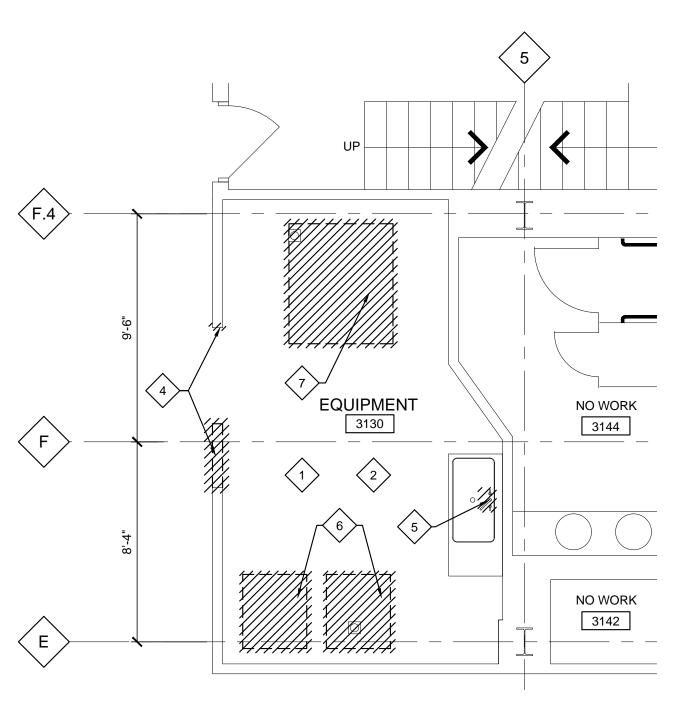
ARCHITECTURAL KEYED NOTES: # (SEE AE1-01-07 FOR DOOR AND FINISH SCHEDULES) (SEE AC1-01-01 FOR REFLECTED CEILING PLAN) (SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR MORE INFORMATION)

- 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
- 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
- 5. PREP AND INSTALL NEW ANTI-MICROBIAL WALL SYSTEM ON ALL WALLS.
- 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.



- EQUIPMENT ROOM (LEVEL 5)

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



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

AE1-03-01

O. WAGNER / D. RUTKOWSKI

137378.001

T. WALKER T. WALKER

S. HAHN

EQUIPMENT SCHEDULE:

3130 - EQUIPMENT ROOM: GLASSWASHER - STERIS RELIANCE MODEL 400XLS

> Tel 313.441.3000 Fax 313.441.1545 www.GHAFARI.com



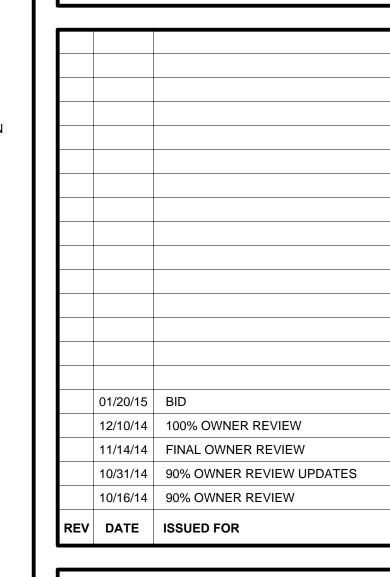
Ghafari Associates, L.L.C.

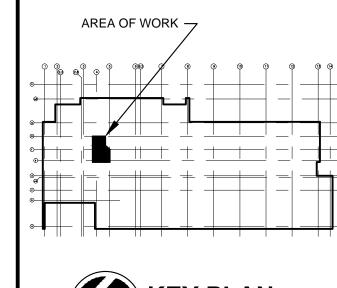
17101 Michigan Avenue

Dearborn, MI USA 48126

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LEVEL THREE / FIVE

FLOOR PLAN

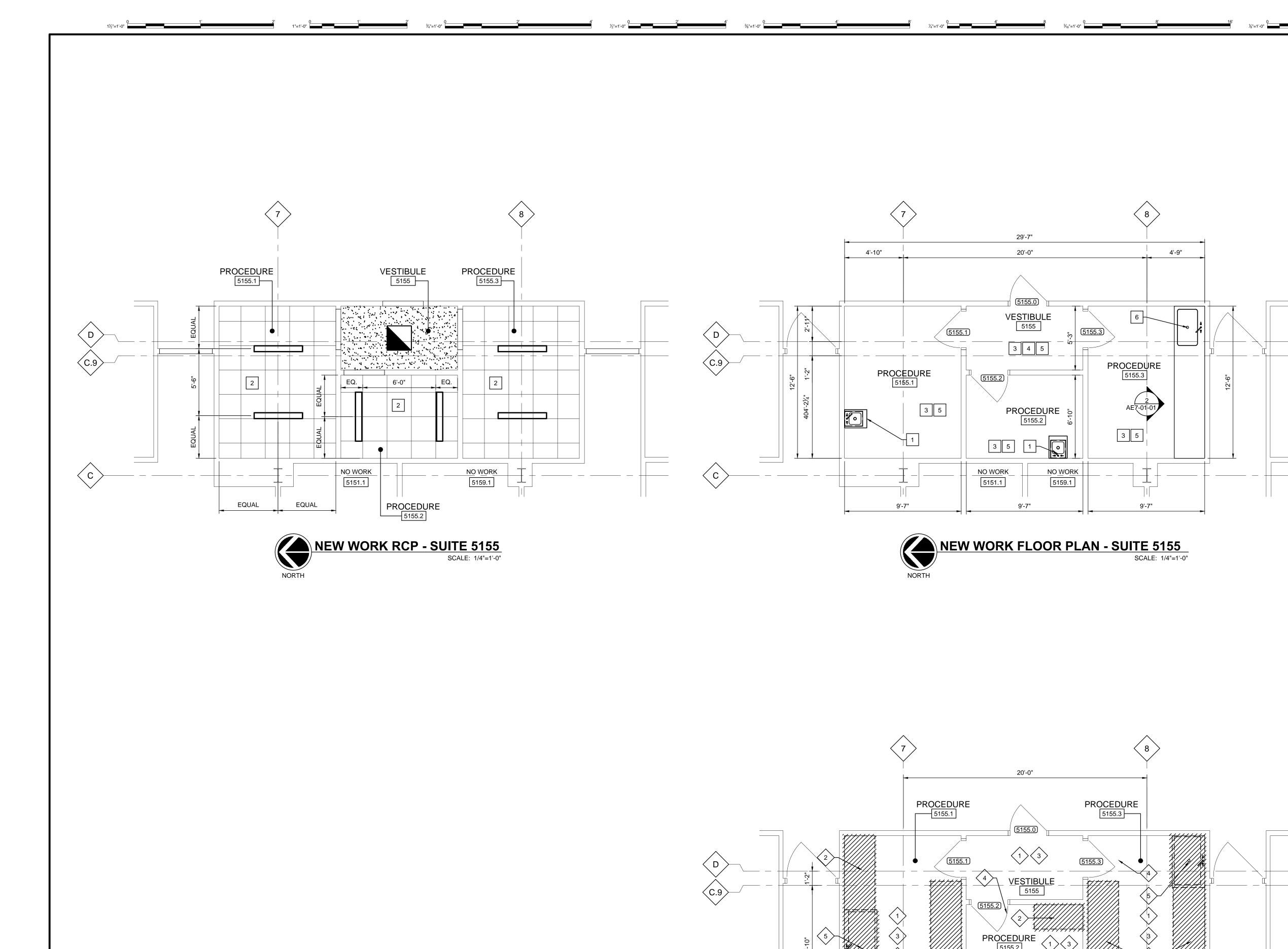
PROJECT #

DESIGNED

DRAWN BY

QUALCHECK SHEET TITLE

PROJECT MANAGER



ARCHITECTURAL RCP GENERAL NOTES:

1. SEE ELECTRICAL DRAWINGS FOR LIGHT FIXTURE LEGEND, LIGHTING DEMO AND ADDITIONAL INFORMATION.

MORE INFORMATION)

MORE INFORMATION.

MATCH WALLS.

HALLWAY FLOOR.

INFORMATION.

2. NEW LIGHT FIXTURES TO BE CENTERED IN ROOM, UNLESS NOTED OTHERWISE.

BASE CABINET AND SPLASH GUARD. SEE

2. INSTALL NEW WASHABLE, ANTI-MICROBIAL LAY-IN

4. PATCH AND REPAIR CEILING, PAINT CEILING TO

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

6. INSTALL NEW METAL CASEWORK WITH 1" EPOXY RESIN WORK TOP AND UNDERMOUNT EPOXY

RESIN SINK. SEE AE7-01-01 FOR MORE

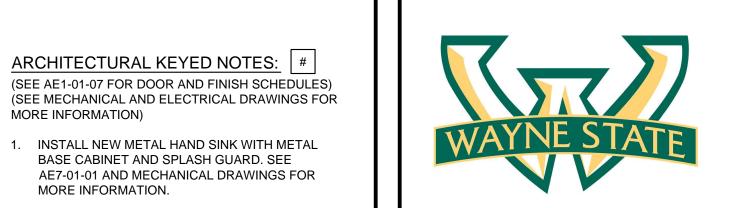
CEILING TILES AND GRID AT 8'-0" AFF.

3. PAINT ALL WALLS, DOORS AND FRAMES.



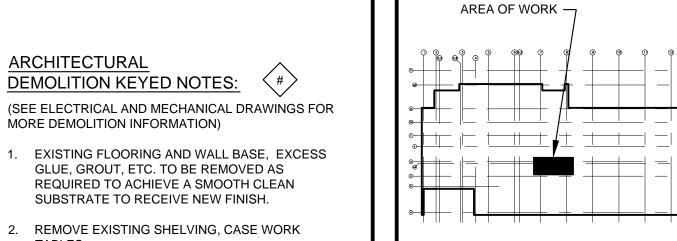
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01/20/15 BID 12/10/14 | 100% OWNER REVIEW 11/14/14 FINAL OWNER REVIEW 10/31/14 90% OWNER REVIEW UPDATE 10/16/14 90% OWNER REVIEW REV DATE ISSUED FOR





	PROJECT #	137378.00
	PROJECT MANA	GER S. HAHN
	DESIGNED	T. WALKER
	DRAWN BY	T. WALKER
	QUALCHECK	O. WAGNER / D. RUTKOWSK
	SHEET TITLE	

LEVEL FIVE (ALTERNATE #1) **PLANS**

> **AE1-05-01** SHEET NUMBER

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. REMOVE EXISTING SHELVING, CASE WORK TABLES.
- DEMO EXISTING LIGHTING.
- 4. REMOVE EXISTING LATCH SET.
- 5. DEMO EXISTING SINK. SEE MECHANICAL DRAWINGS FOR MORE INFORMATION.

LEGEND:

NO WORK

5159.1

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

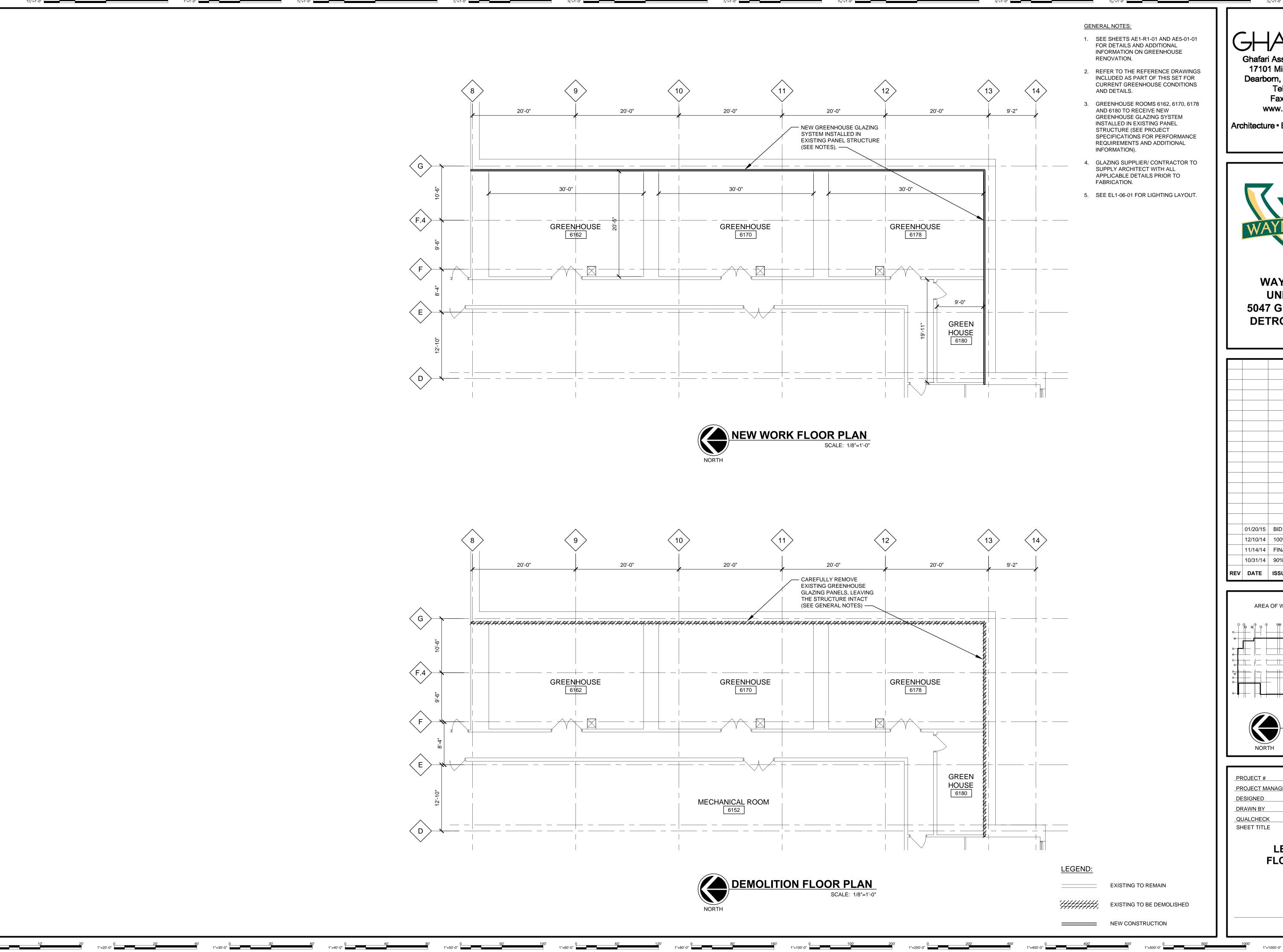
DEMOLITION FLOOR PLAN - SUITE 5155

EXISTING TO REMAIN

EXISTING TO BE DEMOLISHED

CEILING GRID

EXISTING GYPSUM **BOARD CEILING**



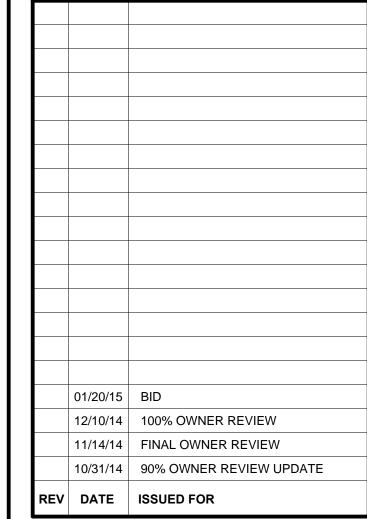


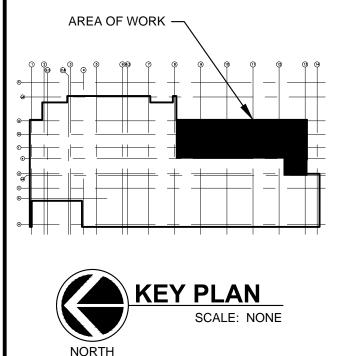
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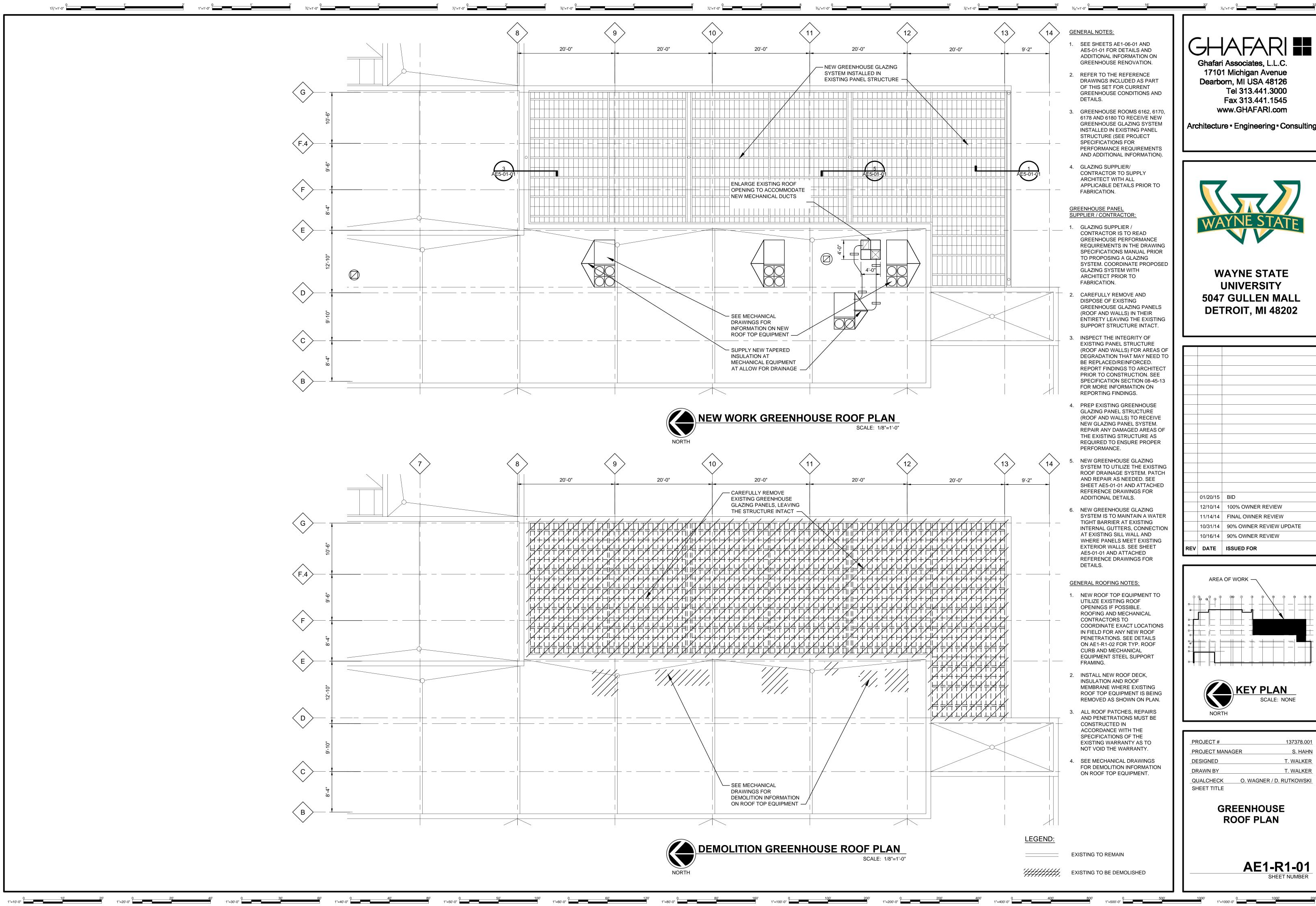




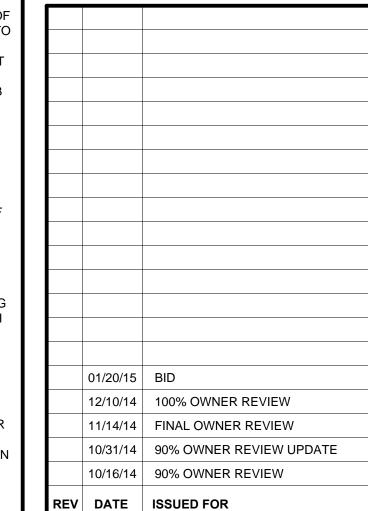
PROJECT #		137378.001
PROJECT MANA	GER	S. HAHN
DESIGNED		T. WALKER
DRAWN BY		T. WALKER
QUALCHECK	O. WAGNER	D. RUTKOWSKI
SHEET TITLE		

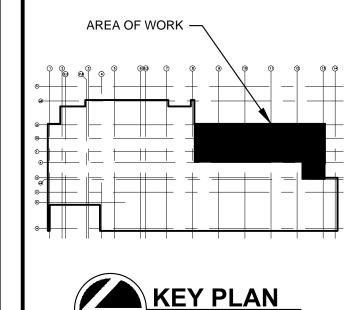
LEVEL SIX FLOOR PLAN

AE1-06-01



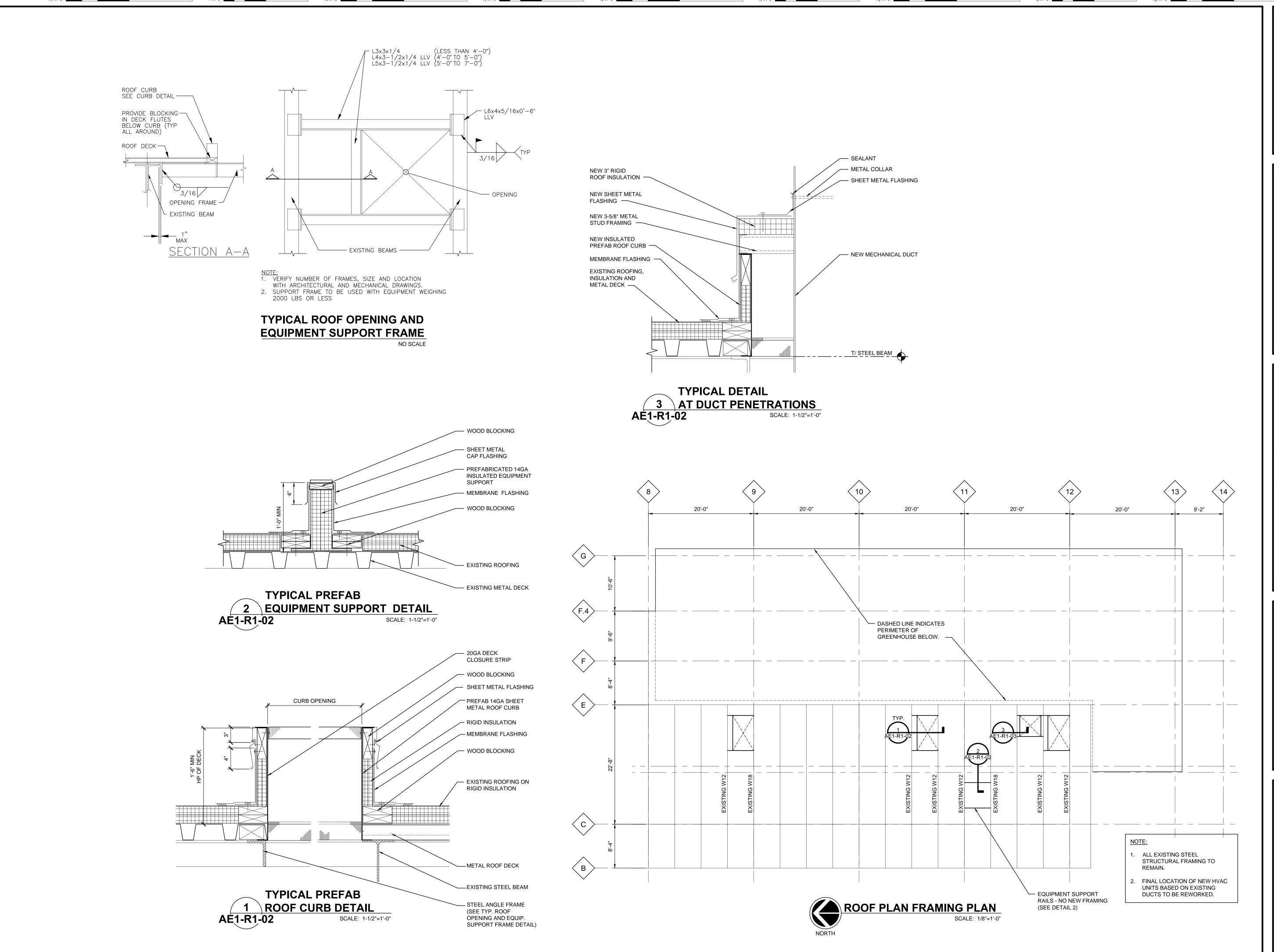






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QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

AE1-R1-01



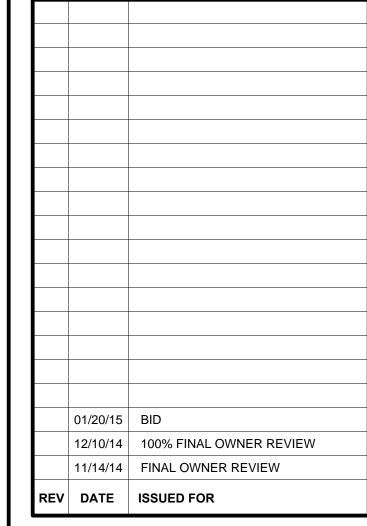


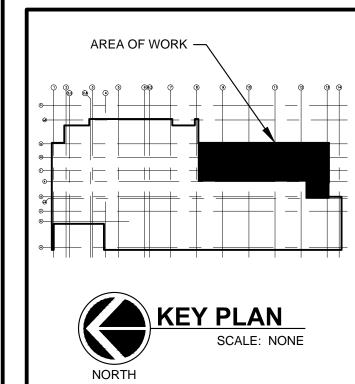
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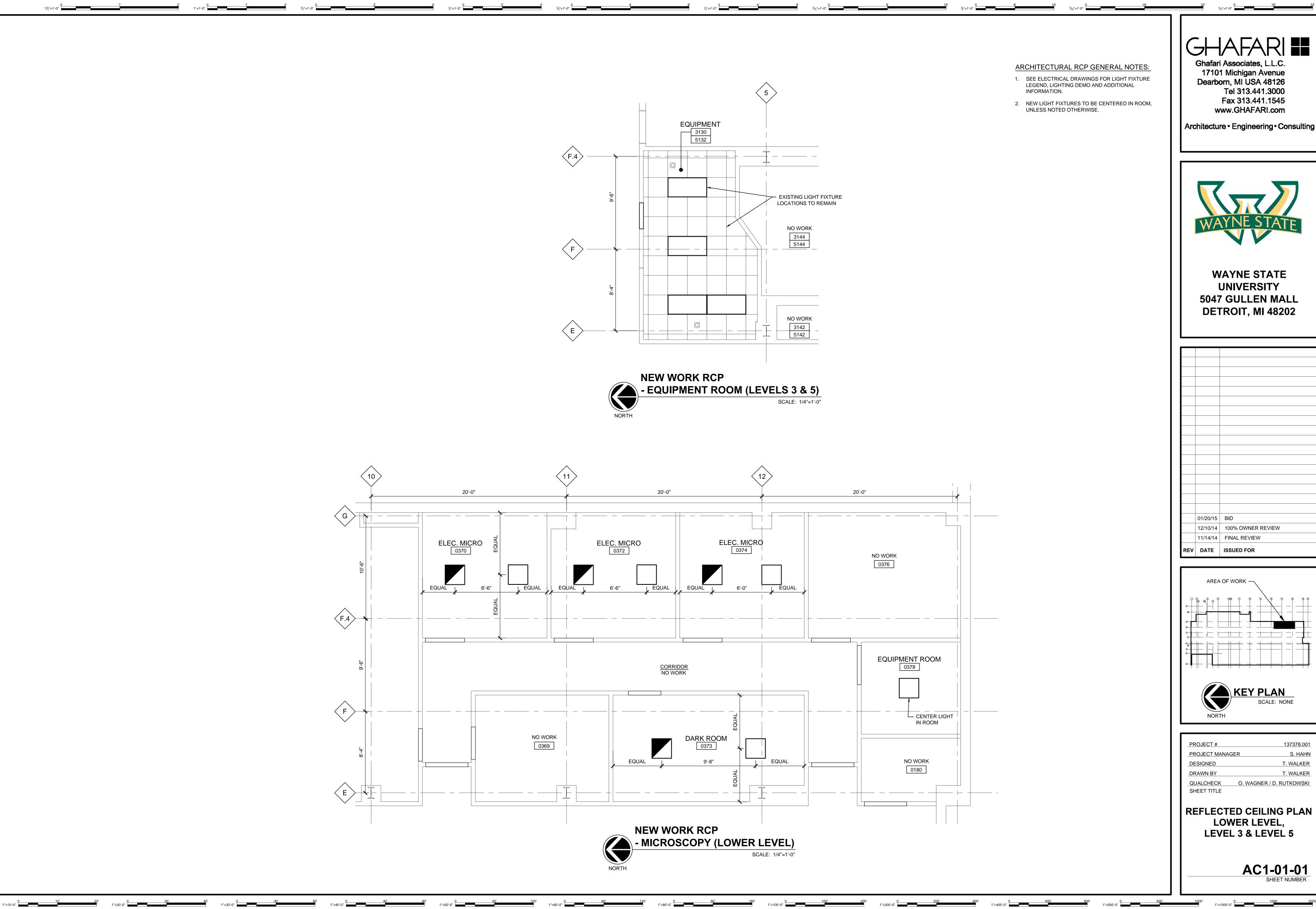




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SHEET TITLE	

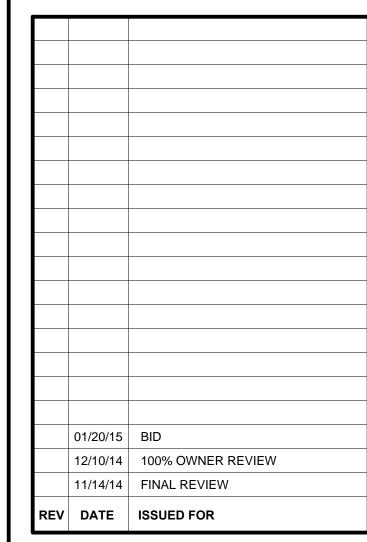
ROOF FRAMING PLAN AND DETAILS

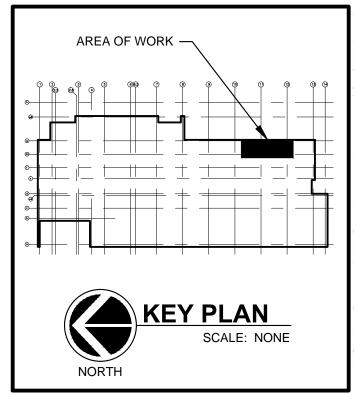
AE1-R1-02
SHEET NUMBER





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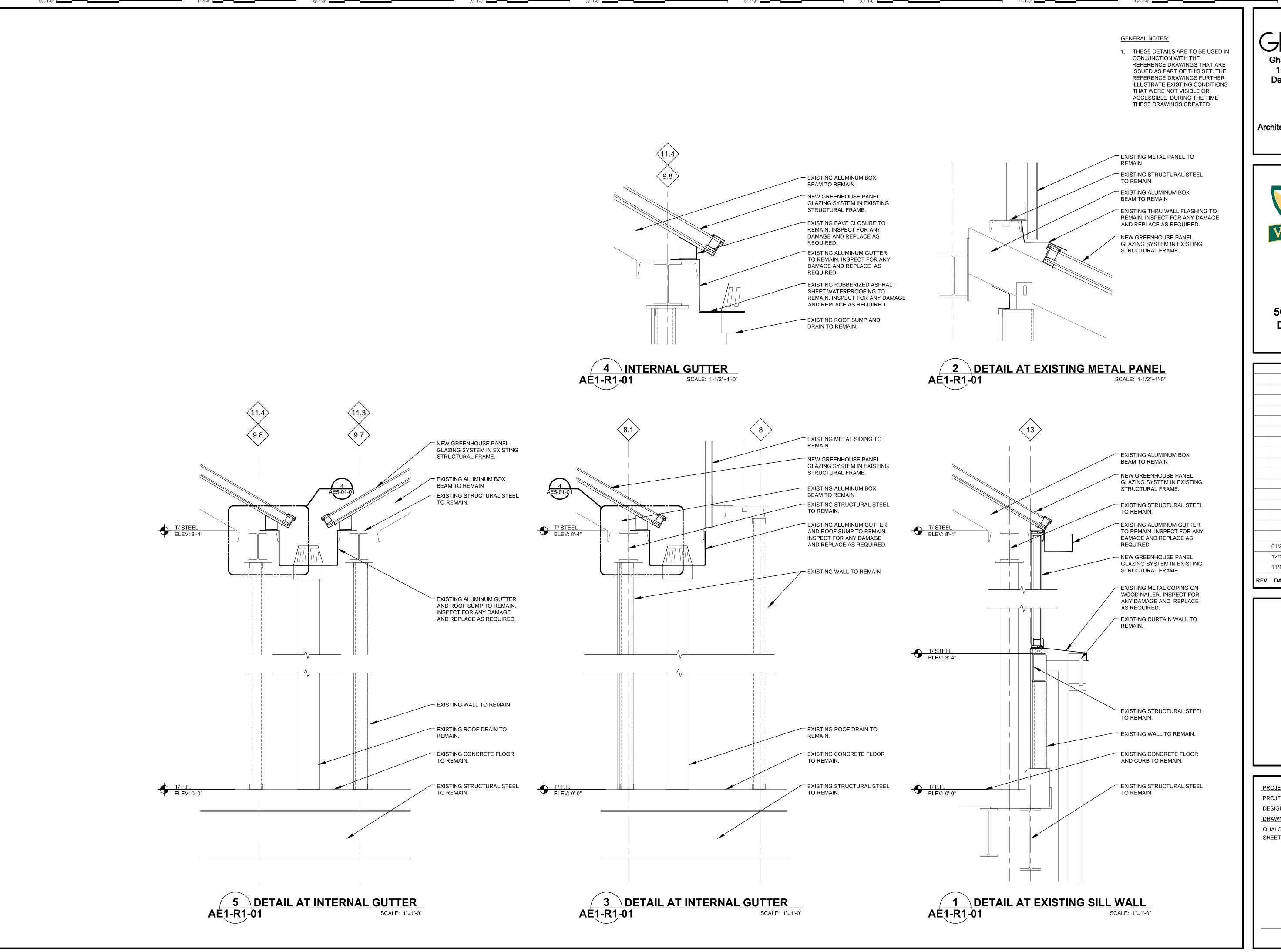




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DESIGNED	T. WALKER
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QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

REFLECTED CEILING PLAN LOWER LEVEL,

AC1-01-01
SHEET NUMBER



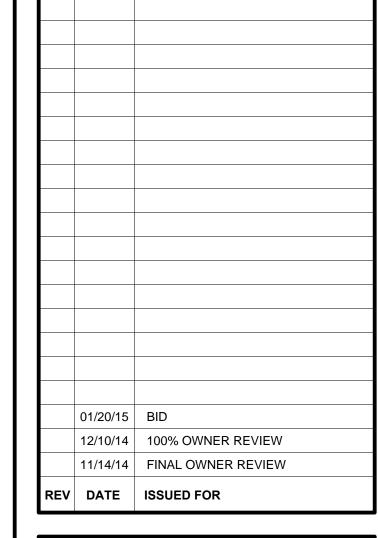
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DETROIT, MI 48202



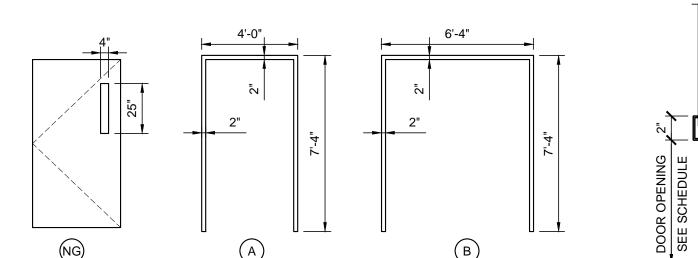
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QUALCHECK	O. WAGNER / D. RUTKOWSKI
SHEET TITLE	

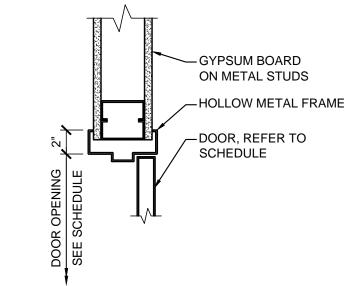
GREENHOUSE DETAILS

AE5-01-01
SHEET NUMBER

	DOOR AND FRAME SCHEDULE									
DOOR	WIDTH x HEIGHT		DOOR			FRAME		LABEL (MIN)	HARD- WARE	REMARKS
NO.		TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	(IVIIIV)	SET	
0000.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	2	1
0000.2	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	2	1
0162.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	3	1
0369.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	3	1
0370.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	3	1
0372.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	3	1
0373.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	3	1
0374.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	3	1
0376.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	3	1
0378.1	EXISTING	EXISTING	EXISTING	PT-2	EXISTING	EXISTING	PT-2	-	3	1
3130.1	3'-8" X 7'-0"	NG	STL	PT-3	А	STL	PT-3	1 HR	1	1
•										
5132.1	(2) 3'-0" X 7'-0"	NG	STL	PT-3	В	STL	PT-3	1 HR	5	1
		1	<u> </u>	ı	<u> </u>			İ	1	1
5155.0	EXISTING	EXISTING	EXISTING	PT-4	EXISTING	EXISTING	PT-4	-	4	1,2
5155.1	EXISTING	EXISTING	EXISTING	PT-4	EXISTING	EXISTING	PT-4	-	3	1,2
5155.2	EXISTING	EXISTING	EXISTING	PT-4	EXISTING	EXISTING	PT-4	-	3	1,2
5155.3	EXISTING	EXISTING	EXISTING	PT-4	EXISTING	EXISTING	PT-4	-	3	1,2

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





DOOR AND FRAME

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

TYP. DOOR HEAD / JAMB GYP.

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

ROOM FINISH SCHEDULE													
ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS	CEILING	REMARKS							
0370	MICROSCOPY	VCT-1	WB-1	PT-1	EXIST / PT-1	EXIST / PT-1 1,2,5							
0372	MICROSCOPY	VCT-1	WB-1	PT-1	EXIST / PT-1 1,2,5								
0373	DARK ROOM EXISTING EXISTING PT-1 EX												
0374	MICROSCOPY	VCT-1	WB-1	PT-1	EXIST / PT-1	1,2,5							
0378	EQUIPMENT ROOM	EXISTING	EXISTING	PT-1	EXIST / ACT-2	1,4,5							
3130	EQUIPMENT	CPM-1	CMP-1	WC-1	EXISTING	1,7							
5132	EQUIPMENT	CPM-1	CMP-1	WC-1	ACT-1	1							
5155	VESTIBULE	EPOXY-1	WB-1	PT-1	EXIST / PT-1	1,2,6							
5155.1	PROCEDURE	EPOXY-1	WB-1	PT-1	ACT-1	1,3,6							
5155.2	PROCEDURE	EPOXY-1	WB-1	PT-1	ACT-1	1,3,6							
5155.3 PROCEDURE EPOXY-1 WB-1 PT-1 ACT-1													

- 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.

ISHES

R TO SPECIFICATIONS FOR ADDITIONAL INFORMATION ON FINISHES)

		4'-0"	FINIS (REFER 1
			CEILI
		4	L ACT-1:
		- 4	GRID:
°	2'-11"	3'-0"	ACT-2: (USE TO I IN EXISTII
			FLOC
-			EPOXY-1:
			VCT-1:

ING SYSTEM:

WASHABLE ANIT-MICROBIAL LAY-IN TILES 2' x 2' MATCH EXISTING

REPLACE DAMAGED TILES TING CEILINGS TO REMAIN)

OR COVERING: CEMENTITIOUS POLYURETHANE MORTAR

EPOXY FLOOR RESIN VINYL COMPOSITE TILE

PT-2:

UNO)

PAINT:

SHERWIN WILLIAMS MATCH EXISTING BLUE (LOWER LEVEL DOORS/FRAMES)

SHERWIN WILLIAMS SW7003

TOQUE WHITE (ALL WALLS,

PT-3: SHERWIN WILLIAMS MATCH EXISTING RED (3RD AND 5TH FLOOR DOORS/FRAMES, UNO)

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

WALL BASE:

MATERIAL AND SIZE AS NOTED IN SPECIFICATIONS COLOR TO MATCH EXISTING

MATERIAL AS NOTED IN SPECIFICATIONS, SIZE TO MATCH BASE CABINET TOE KICK, COLOR TO MATCH NEW METAL BASE CABINETS

WALL COVERING:

WC-1: ANIT-MICROBIAL WALL SYSTEM

PROJECT#	137378.0
PROJECT MANA	GER S. HA
DESIGNED	T. WALK
DRAWN BY	T. WALK
QUALCHECK	O. WAGNER / D. RUTKOWS
SHEET TITLE	

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01/20/15 BID

REV DATE ISSUED FOR

12/10/14 | 100% OWNER REVIEW 11/14/14 FINAL OWNER REVIEW

10/16/14 90% OWNER REVIEW

10/31/14 90% OWNER REVIEW UPDATE

SCHEDULES AND INTERIOR ELEVATIONS

AE7-01-01

1"W x 4"H EPOXY RESIN BACK SPLASH 1" EPOXY RESIN WORK TOP BASE CABINET WB-2	FAUCET WITH WRIST BLADE HANDLES 4" EPOXY RESIN BACK SPLASH 1" EPOXY RESIN UNDERMOUNT SINK (36"x20"x16") METAL BASE CABINETS WB-2	3'-0"
TYPICAL EPOXY WORK TOP PROFI	4'-0" 2'-6" 3'-0" 3'-0" 12'-6" VIF PRIOR TO ORDERING 2 INTERIOR ELEVATION - RM 5155.3	
SOALE	FAUCET WITH WRIST BLADE HANDLES (CHROME WITH CLEAR EPOXY FINISH) 1" EPOXY RESIN ADJUSTABLE SHELVES (COORDINATE FINAL LOCATION WITH WSU)	
FAUCET WITH WRIST BLADE HANDLES 6" HIGH METAL SPLASH GUARD 18"x15"x7" METAL HAND SINK	4" EPOXY RESIN BACK SPLASH 1" EPOXY RESIN WORK TOP EPOXY RESIN UNDERMOUNT SINK (36"x20"x16")	4" 4" 4'-0"
METAL BASE CABINET (22" DEEP) WB-2 1'-6"	METAL BASE CABINETS WB-2 2'-6" 4'-0" 2'-6" 2'-6" 2'-6"	3'-0"
HAND SINK -	14'-0" VIF PRIOR TO ORDERING	

AE1-L1-01

1 INTERIOR ELEVATION - RM 0373

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

3 RM 5155.1 & 5155.2 AE1-01-05 (ALTERNATE #1) SCALE: 1/2"=1'-0"

MECHANICAL DIAGRAM SYMBOL LIST

E CAP
C ELBOW DOWN
O ELBOW UP
UNION
STRAINER
TRAP
BACKFLOW PREVENTER

PIPING SYMBOL LIST

THERMOSTAT

HUMIDISTAT

CA COMPRESSED AIR

DIR DEIONIZED WATER RETURN

DIS DEIONIZED WATER SUPPLY

NG NATURAL GAS

SC STEAM CONDENSATE

HPS STEAM HIGH PRESSURE

CW COLD WATER

HOT WATER

DUCTWORK SYMBOL LIST

NEW DUCTWORK

EXISTING DUCTWORK
TO BE REMOVED

EXISTING DUCTWORK
TO REMAIN

SUPPLY DUCT UP

SUPPLY DUCT DOWN

RETURN DUCT UP

RETURN DUCT DOWN

EXHAUST DUCT UP

EXHAUST DUCT DOWN

ROUND DUCT UP

ABBREVIATIONS

ABOVE FINISHED FLOOR **AFG** ABOVE FINISHED GRADE **ACCESS PANEL** ARCH ARCHITECT(URAL) BOP **BOTTOM OF PIPE** CONTR CONTRACTOR **CONTROL PANEL** DDC DIRECT DIGITAL CONTROL DIAMETER DRAWING **ELEVATION GPM GALLON PER MINUTE** HTG HEATING HTR HEATER

HVAC HEATING, VENTILATING AND AIR CONDITIONING

MECH MECHANICAL

MFR MANUFACTURER

N/A NOT APPLICABLE

OD OUTSIDE DIAMETER

PLBG PLUMBING

PSI POUNDS PER SQUARE INCH
SCHED SCHEDULE
SPEC SPECIFICATION
SQ FT SQUARE FEET
TOD TOP OF DUCT
TOS TOP OF STEEL

GENERAL MECHANICAL DEMOLITION NOTES:

- 1. REMOVE INDICATED PIPING BACK TO HEADER ISOLATION VALVES OR CONTROL VALVE WHERE INDICATED. CAP, PLUG, OR BACK FLANGE THE DOWNSTREAM SIDE OF HEADER ISOLATION VALVES OR CONTROL VALVE.
- 2. PROTECT FLOOR DRAINS FROM CONSTRUCTION DEBRIS BY SEALING DURING DEMOLITION. REMOVE PROTECTIVE COVER AFTER DEMOLITION IS COMPLETE.
- 3. CONTRACTOR SHALL FIELD VERIFY ITEMS NOTED AS EXISTING TO REMAIN AND NOTIFY ENGINEER OF ANY DISCREPANCIES FROM CONDITIONS INDICATED IN THE DRAWINGS.
- 4. DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. USE METHODS REQUIRED TO COMPLETE THE WORK WITHIN LIMITATIONS OF GOVERNING REGULATIONS. CONTRACTOR SHALL INCLUDE INCIDENTAL DEMOLITION AND CUTTING AS REQUIRED BY THE NEW CONSTRUCTION TO COMPLETE THE WORK AS INDICATED IN THE CONTRACT DOCUMENTS, AT NO ADDITIONAL COST TO OWNER.
- 5. REFER TO ARCHITECTURAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION, AND CONSTRUCTION WORK.
- 6. PROTECT ALL EXISTING EQUIPMENT FROM DAMAGE DUE TO DEMOLITION AND CONSTRUCTION.
- 7. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO REMOVE ALL DEMOLISHED EQUIPMENT, DUCTWORK AND PIPING.
- 8. ALTHOUGH INTENDED TO CONVEY APPROPRIATE INFORMATION, THESE DRAWINGS HAVE BEEN PREPARED FROM LIMITED FIELD MEASUREMENTS AND ARCHIVAL BUILDING DRAWINGS. AS SUCH, DRAWINGS MAY CONTAIN DISCREPANCIES AND OMISSIONS DUE TO THE CONCEALED CONDITION, INACCURACIES IN THE ORIGINAL DRAWINGS, INACCESSIBLE LOCATIONS, UNRECORDED BUILDING ALTERATIONS AND OTHER CONFLICTING INFORMATION. ALWAYS VERIFY FIELD CONDITIONS BEFORE COMMENCING WORK. NOTIFY ARCHITECT/ENGINEER IF FIELD CONDITIONS CONFLICT SUBSTANTIALLY WITH PROPOSED WORK.
- 9. REFER TO KEY NOTES ON ARCHITECTURAL DEMOLITION SHEETS AE1-L1-01, AE1-03-01 AND AE1-05-01.

GENERAL MECHANICAL NOTES

ARCHITECTURAL DRAWING AE1-R1-01.

1. THE FOLLOWING NOTES APPLY TO ALL MECHANICAL DRAWINGS UNLESS NOTED OTHERWISE.

2. REFER SIEMENS DRAWINGS INCLUDED WITH THE BID DOCUMENTS FOR CONTROLS.

- 3. DEMOLITION OF EACH SYSTEM SHALL INCLUDE ALL ACCESSORIES (DAMPERS, VALVES, AND OTHER COMPONENTS), PIPE, DUCT AND EQUIPMENT SUPPORTS, AS WELL AS ALL EXISTING ABANDONED EQUIPMENT AND MATERIALS WHERE SUCH ITEMS ARE NOT REQUIRED FOR THE PROPER OPERATION OF THE REVISED SYSTEMS.
- 4. FINAL ELECTRICAL POWER CONNECTIONS TO ALL MECHANICAL EQUIPMENT SHALL BE BY
- 5. FINAL GAS CONNECTIONS TO ALL MECHANICAL EQUIPMENT SHALL BE PROVIDED BY PLUMBING TRADE.
- 6. ALL FIELD CONTROL WIRING AND INTERLOCK WIRING SHALL BE FURNISHED AND INSTALLED BY TEMPERATURE CONTROL TRADES. FOR EXAMPLE, WIRING FROM CONTROL PANEL TO CONTROLLED DEVICE SHALL BE SHOWN AND INSTALLED BY TEMPERATURE CONTROL TRADES.
- 7. ALL ROOF CURBS FOR MECHANICAL EQUIPMENT ARE FURNISHED BY MECHANICAL TRADES (UNLESS NOTED OTHERWISE) AND INSTALLED BY ARCHITECTURAL TRADES. COORDINATE WITH
- 8. PROVIDE ALL ACCESS PANEL LOCATIONS REQ'D. FOR WALLS/DRYWALL CEILING AREAS TO GENERAL CONTRACTOR FOR EQUIPMENT INSTALLATION AND SERVICE.
- 9. KEEP ALL EXHAUST AIR AND SANITARY VENTS AWAY FROM OUTSIDE AIR INTAKE MINIMUM OF 10 FEET
- 10. MECHANICAL CONTRACTOR SHALL COORDINATE ALL OPENINGS IN MASONRY/PRE-CAST WALLS WITH MASONRY/PRE-CAST CONTRACTOR.
- 11. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL TRADES PAINTING OF ALL EXPOSED DUCTWORK, DIFFUSERS AND PIPING/INSULATION.
- 12. TEMPERATURE SENSORS (THERMOSTATS) MOUNTED ON EXTERIOR WALLS TO BE MOUNTED ON MIN. 1" THICK INSULATION.
- 13. ELECTRICAL TRADES WILL PROVIDE 120 VOLT ELECTRICAL JUNCTION BOXES IN THE MECHANICAL ROOM AND MEZZANINE ROOMS DEDICATED FOR MECHANICAL EQUIPMENT CONTROLS. TEMPERATURE CONTROL TRADES SHALL EXTEND CIRCUITS AS REQUIRED TO FEED THE VARIOUS CONTROL PANELS AND/OR ALL ASSOCIATED CONTROLS.
- 14. TEMPERATURE CONTROL TRADES SHALL PROVIDE STARTERS, POWER, DISCONNECT SWITCH, FEEDERS AND INTERLOCKS FOR ALL MOTORIZED DAMPERS.
- 15. ACCESS DOORS: PROVIDE ACCESS DOORS FOR ALL EQUIPMENT THAT REQUIRES ROUTINE MAINTENANCE OR SERVICE; AND THAT IS CONCEALED BEHIND NON-ACCESSIBLE WALL OR CEILING CONSTRUCTION. TYPICALLY ACCESS PANELS ARE NOT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND SIZING OF ACCESS DOORS TO PERMIT REQUIRED ACCESS FOR ROUTINE MAINTENANCE OPERATIONS. ACCESS PANELS ARE SHOWN ON THE DRAWINGS ONLY WHEN THEIR SIZE OR LOCATION MUST BE COORDINATED WITH ADJACENT CONSTRUCTION, OR IF THEY ARE TO BE CUSTOM MADE FOR THE PROJECT.
- 16. REFER TO KEY NOTES ON ARCHITECTURAL SHEETS AE1-L1-01, AE1-03-10, AE1-05-01 AND AE1-R1-01

GENERAL HVAC (SHEET METAL) NOTES

- THE FOLLOWING NOTES APPLY TO ALL MECHANICAL HVAC DRAWINGS UNLESS NOTED OTHERWISE.
- 2. ALL DUCTWORK DIMENSIONS NOTED ON PLANS REFER TO THE CLEAR INSIDE OPENING REQUIRED.
- 3. PROVIDE STRAIGHT HARD INLET DUCTWORK (3'-0" MIN.) TO ALL CONSTANT AIR VOLUME TERMINAL BOXES. NO FLEXIBLE DUCT IS ALLOWED. ALL MEDIUM PRESSURE RUNOUTS TO CAV BOXES SHALL BE SAME SIZE AS BOX INLET (U.N.O.) WHERE REQUIRED DIAMETER IS LARGER THAN MAIN, PROVIDE SQUARE TO ROUND TRANSITION AS SHOWN ON DUCT FITTING PROVISIONS SHEET.
- 4. PROVIDE TRANSITION FROM CAV OUTLET SIZE TO NOTED DISCHARGE DUCT SIZE.
- DUCT FITTINGS SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH "DUCT FITTING PROVISIONS" AS SHOWN ON DUCTWORK DETAIL SHEET AND THE LATEST SMACNA STANDARD.
- 6. INSTALL MANUAL VOLUME DAMPERS AT ALL SUPPLY AIR BRANCH DUCTS TO THE DIFFUSER, BRANCH RETURN AIR DUCT, EXHAUST AIR DUCT, AND OTHER LOCATIONS AS SHOWN ON PLANS, EXCEPT FOR THE AIR DEVICE FURNISHED WITH VOLUME DAMPER.
- 7. DUCT RUNOUTS TO ALL OVAL OR ROUND NECK AIR DEVICES TO BE THE SAME AS ROUND DEVICE NECK (OR ROUND EQUIVALENT TO OVAL, WITH TRANSITION) UNLESS NOTED OTHERWISE.
- 8. DUCTED EXHAUST AND RETURN GRILLES SHALL BE HARD DUCT CONNECTED.
- 9. MOUNT SPACE TEMPERATURE SENSOR/THERMOSTAT @ 48"± A.F.F., VERIFY EXACT LOCATION WITH ARCHITECT AND OWNER'S REPRESENTATIVE.
- 10. EXPOSED ROUND DUCTWORK SHALL BE SPIRAL DUCT WITH EXTERIOR INSULATION.
- 11. EXPOSED EXHAUST ROUND DUCTWORK SHALL BE UNINSULATED SPIRAL DUCTWORK UNLESS NOTED OTHERWISE.
- 12. CONCEALED ROUND DUCTWORK: FOR ROUND RUNOUTS TO CEILING DIFFUSERS AND CAV TERMINALS, REFER TO OTHER GENERAL HVAC NOTES THIS SECTION UNLESS NOTED OTHERWISE.

GENERAL HVAC (PIPING) NOTES

- 1. THE FOLLOWING NOTES APPLY TO ALL HVAC PIPING SHOWN ON PIPING DRAWINGS UNLESS NOTED OTHERWISE.
- 2. ALL HEATING AND CHILLED WATER SUPPLY AND RETURN PIPES AND CONDENSATION PIPES ARE TO BE ABOVE CEILING UNLESS NOTED OTHERWISE. PIPING IS TO BE INSULATED PER SPECIFICATION.
- 3. ALL BRANCH HWS & HWR RUNOUTS SHALL BE 3/4" U.N.O.
- 4. RUN ALL DRAIN LINES INDIRECT TO NEAREST FLOOR DRAIN WITH MIN. 1/8" PER FOOT SLOPE UNLESS NOTED OTHERWISE.
- 5. INSTALL AIR VENTS ON ALL UP-FEED HEATING WATER UNITS AT ALL SYSTEM HIGH POINTS, AND OTHER LOCATIONS AS SHOWN ON DRAWINGS.
- 6. INSTALL CALIBRATED VENTURI TYPE WATER BALANCING DEVICES WITH P & T PORT FOR ALL HEATING AND CHILLED WATER UNITS. INSTALL BALANCING VALVES AT MAINS AND BRANCHES OF EACH LOOP AND OTHER LOCATIONS AS CALLED OUT IN SPECIFICATION AND/OR AS SHOWN ON FLOW DIAGRAM AND DETAILS TO ACCOMPLISH A COMPLETE HYDRONIC SYSTEM BALANCING.
- 7. PROVIDE SHUT-OFF VALVES ON HWS & HWR PIPES AT ALL BRANCHES, MAINS AND EQUIPMENT CONNECTIONS FOR ISOLATION SERVICE.
- 8. INSTALL SLEEVES FOR ALL PIPES PASSING THROUGH WALLS. MAINTAIN FIRE STOPPING IN EXISTING
- 9. INSTALL VALVED DRAINS AT LOCAL LOW POINTS OF ALL WATER LINES.



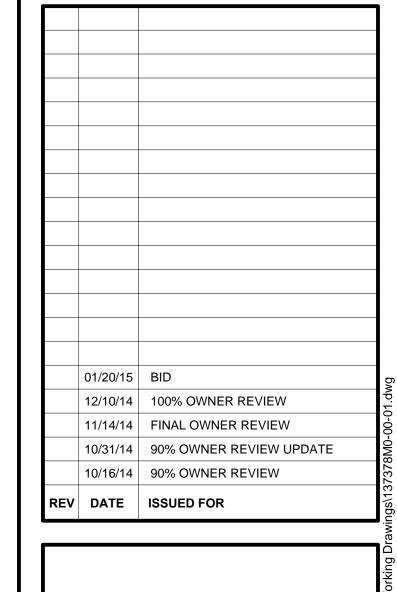
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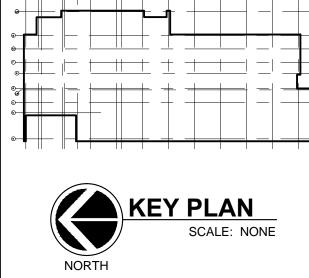
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PROJECT # 137378.001

PROJECT MANAGER S. HAHN

DESIGNED M. HUSSAIN

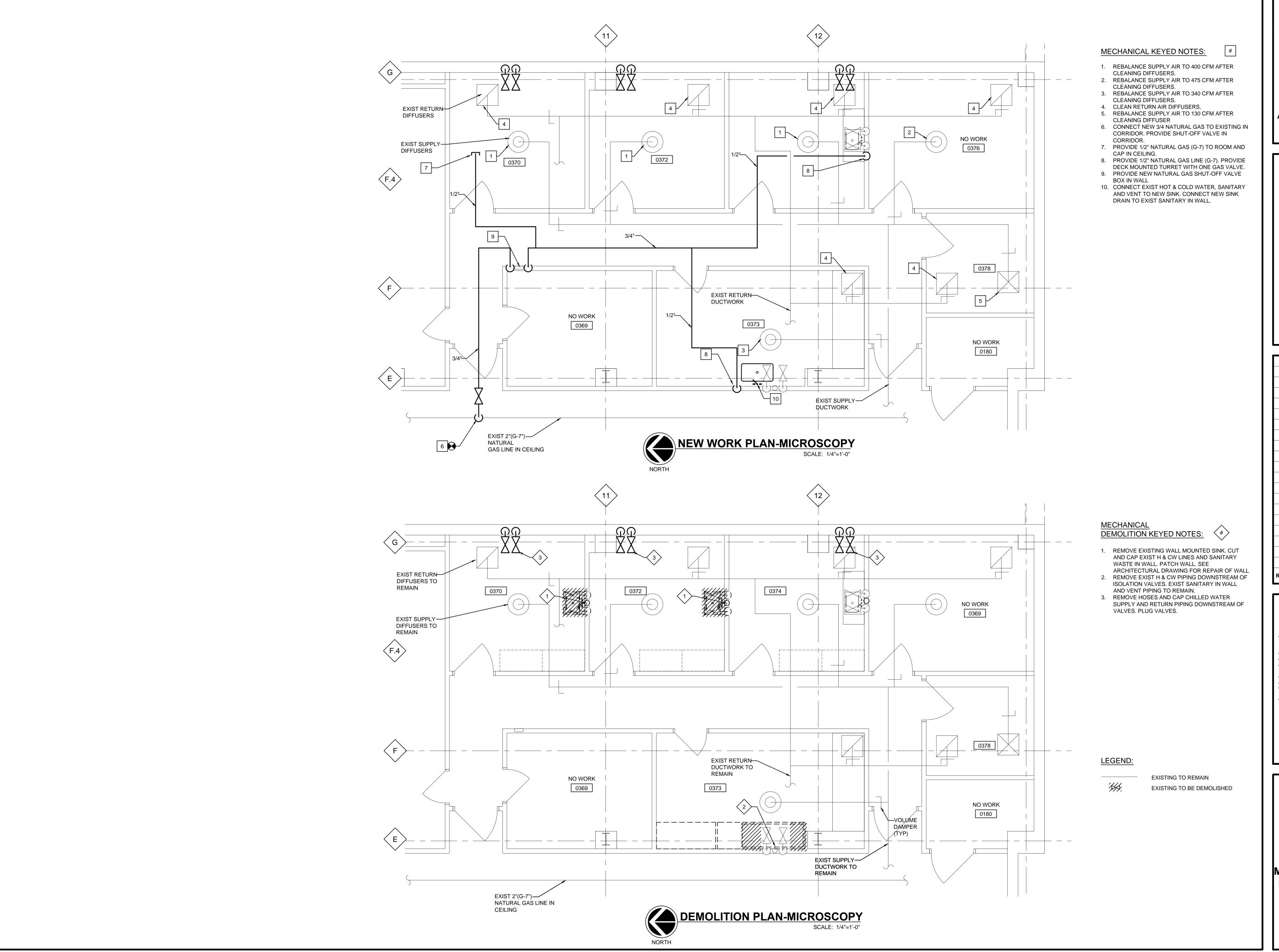
DRAWN BY D. DAHLKE

QUALCHECK M. PETTIT D. RUTKOWSKI

SHEET TITLE

MECHANICAL NOTES,
ABBREVIATIONS
AND SYMBOLS

M0-00-01 SHEET NUMBER



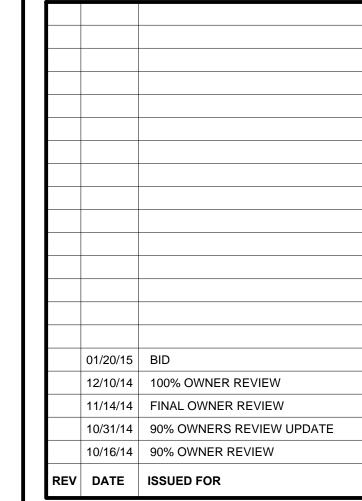


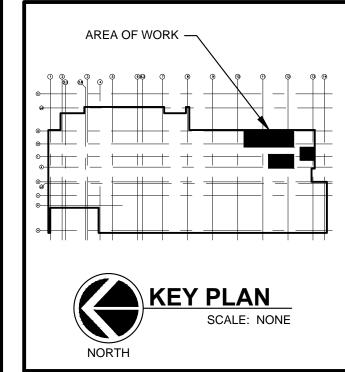
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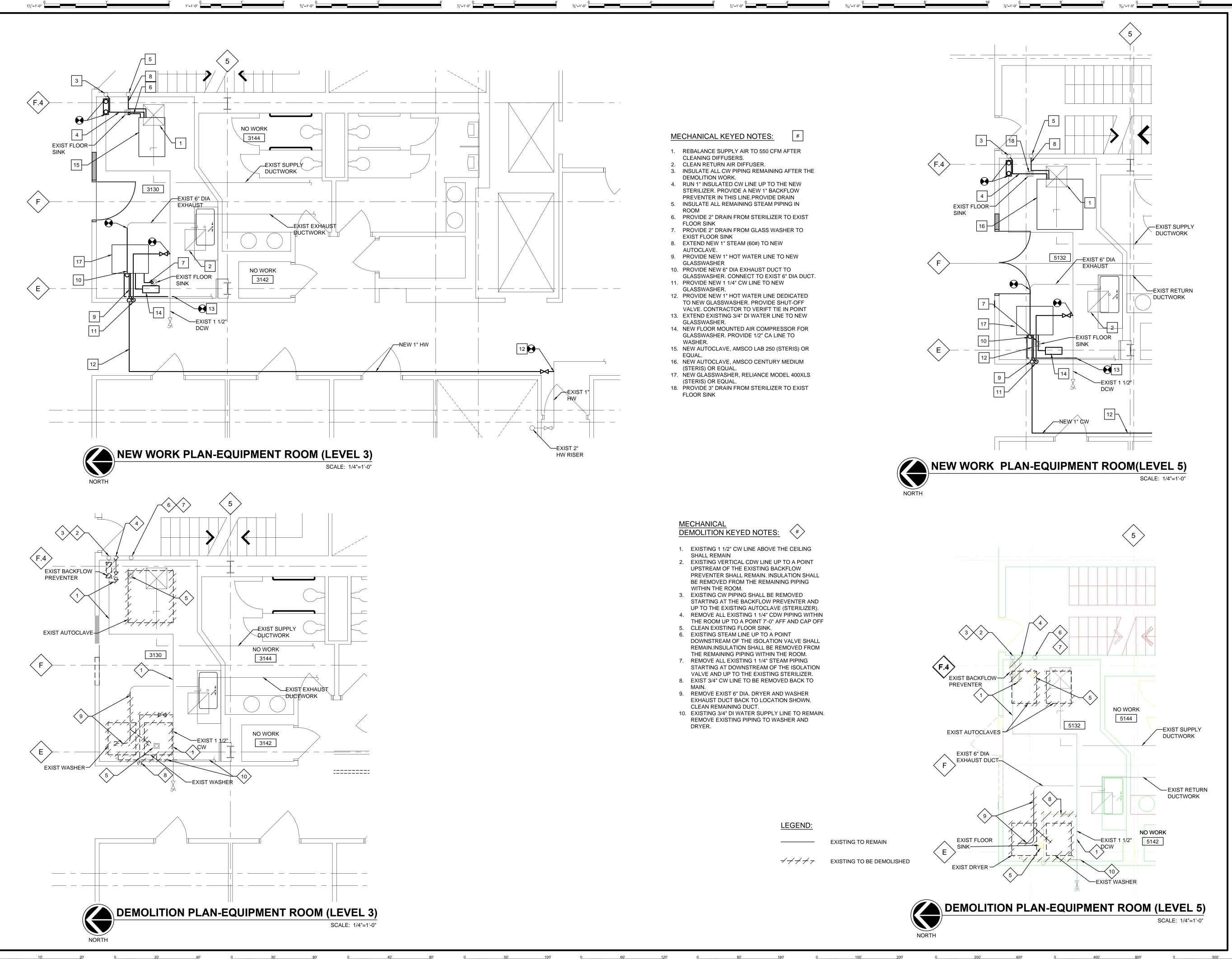




		·
PROJECT#		137378.001
PROJECT MANA	AGER	S. HAHN
DESIGNED		M. HUSSAIN
DRAWN BY		W. WALKER
QUALCHECK	M. PETTIT	D. RUTKOWSKI
SHEET TITLE		

LOWER LEVEL
MECHANICAL FLOOR PLANS
DEMOLITION & NEW WORK

M1-L1-01
SHEET NUMBER



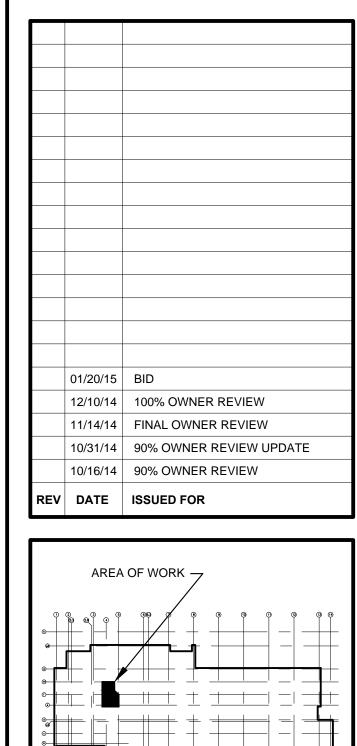
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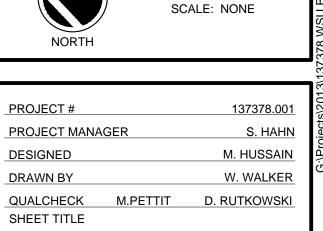
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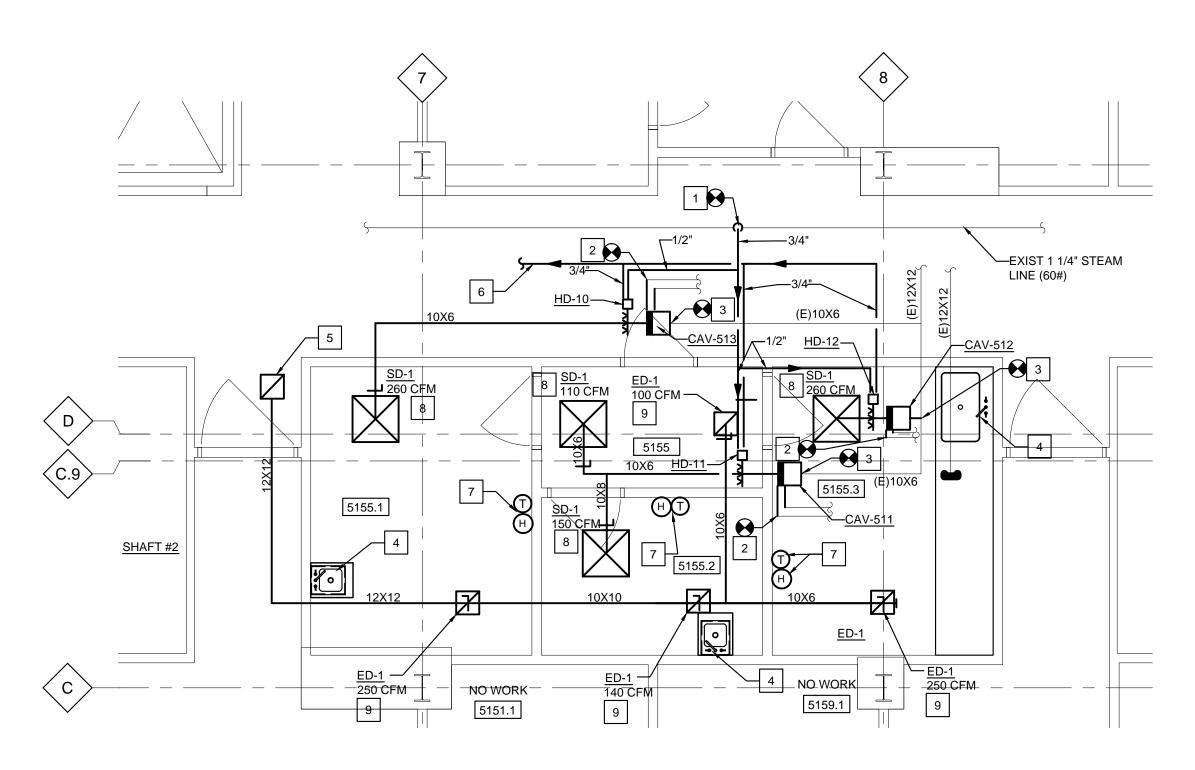




KEY PLAN

LEVEL THREE/FIVE
MECHANICAL FLOOR PLANS
DEMOLITION & NEW WORK

M1-03-01 SHEET NUMBER



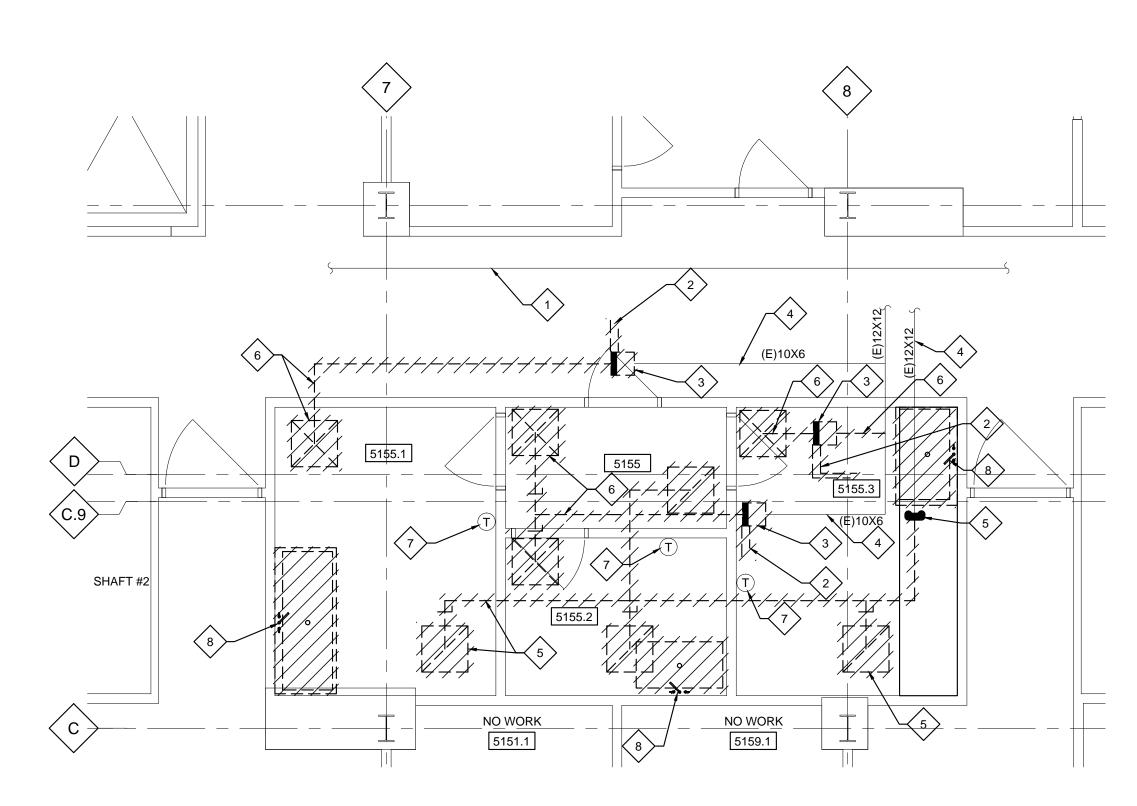
MECHANICAL KEYED NOTES:

- 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.
- 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 SHAL 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
- REMOVE EXISTING EXHAUST DUCTWORK AND DIFFUSERS. CAP EXHAUST DUCTWORK AT THIS
- EXISTING SUPPLY AIR DUCTWORK AND
 ASSOCATED SUPPLY DIFFUSERS TO BE
- REMOVED.
 7. REMOVE EXISTING THERMOSTAT AND ALL
- ASSOCIATED WIRING.

 8. REMOVE EXITING SINK AND ASSOCIATED PIPING.

REMOVE EXITING 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

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

ALTERNATE #1
MECHANICAL FLOOR PLANS
DEMOLITION & NEW WORK

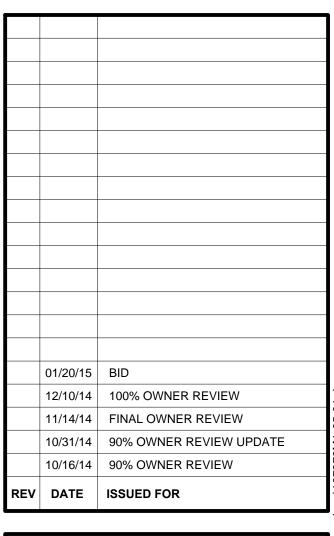
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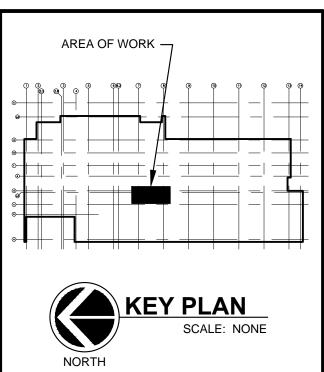


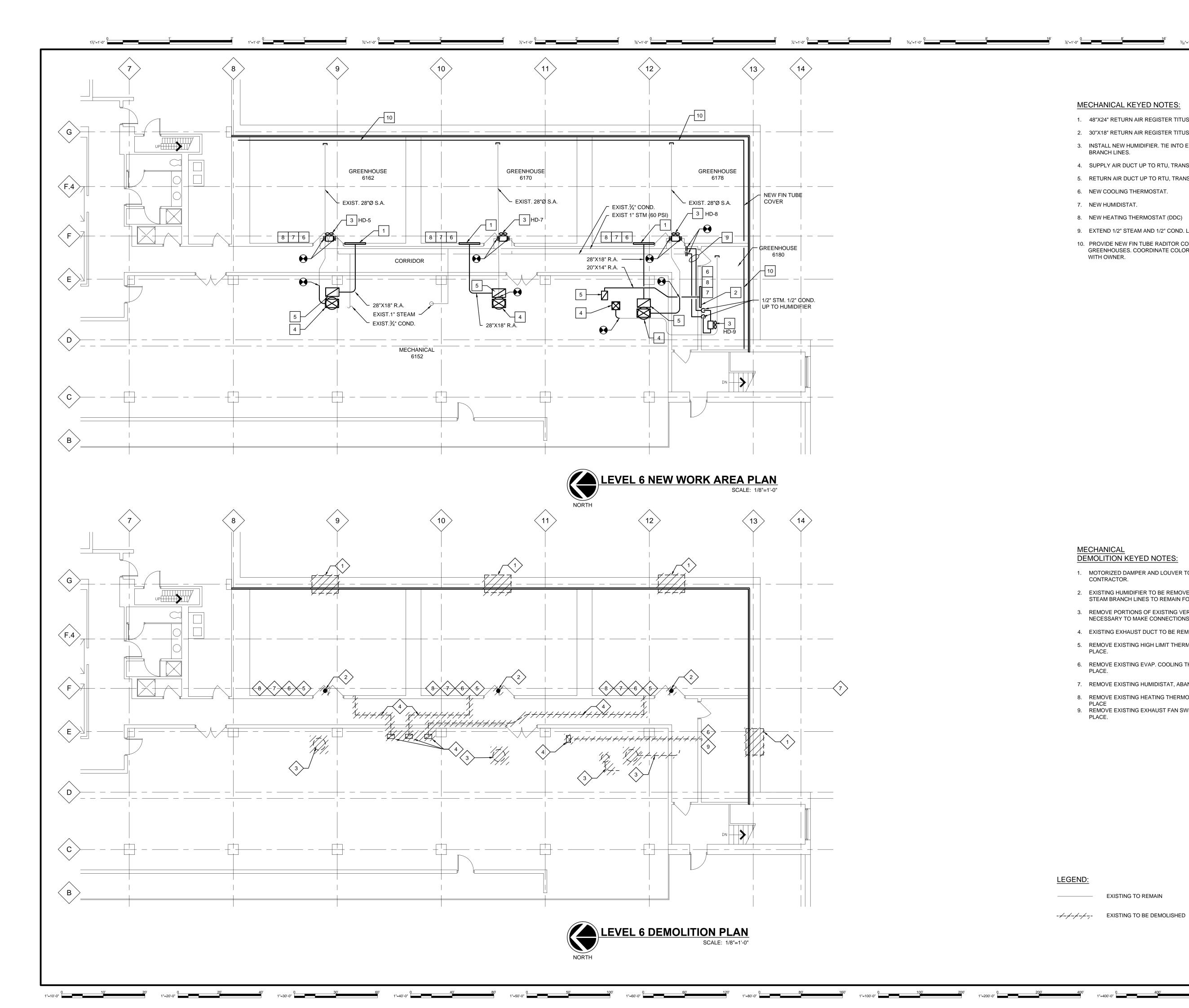




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- 1. 48"X24" RETURN AIR REGISTER TITUS MODEL 350RL OR EQUAL.
- 2. 30"X18" RETURN AIR REGISTER TITUS MODEL 350RL OR EQUAL.
- 3. INSTALL NEW HUMIDIFIER. TIE INTO EXISTING CONDENSATE AND BRANCH LINES.
- 4. SUPPLY AIR DUCT UP TO RTU, TRANSITION AS REQUIRED.
- 5. RETURN AIR DUCT UP TO RTU, TRANSITION AS REQUIRED.
- 6. NEW COOLING THERMOSTAT.
- NEW HUMIDISTAT.
- 8. NEW HEATING THERMOSTAT (DDC)

DEMOLITION KEYED NOTES:

4. EXISTING EXHAUST DUCT TO BE REMOVED.

EXISTING TO REMAIN

CONTRACTOR.

PLACE.

1. MOTORIZED DAMPER AND LOUVER TO BE REMOVED BY GLAZING

3. REMOVE PORTIONS OF EXISTING VERTICAL SUPPLY AIR DUCT AS NECESSARY TO MAKE CONNECTIONS TO THE NEW ROOFTOP UNIT.

5. REMOVE EXISTING HIGH LIMIT THERMOSTAT, ABANDON WIRING IN

7. REMOVE EXISTING HUMIDISTAT, ABANDON WIRING IN PLACE.

8. REMOVE EXISTING HEATING THERMOSTAT, ABANDON WIRING IN

9. REMOVE EXISTING EXHAUST FAN SWITCH, ABANDON WIRING IN

6. REMOVE EXISTING EVAP. COOLING THERMOSTAT, ABANDON WIRING IN

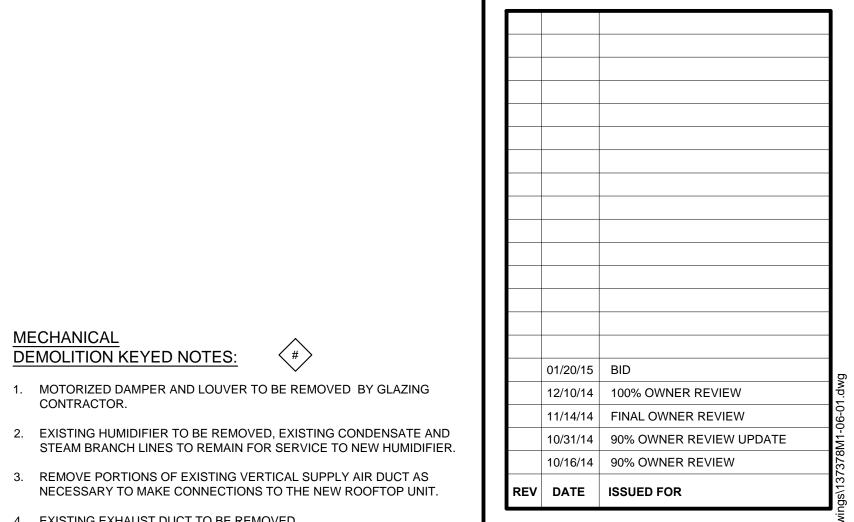
- 9. EXTEND 1/2" STEAM AND 1/2" COND. LINES UP TO HUMIDIFIER HD-9.
- 10. PROVIDE NEW FIN TUBE RADITOR COVER ALONG PERIMETER OF GREENHOUSES. COORDINATE COLOR OF FIN TUBE COVER WITH OWNER.

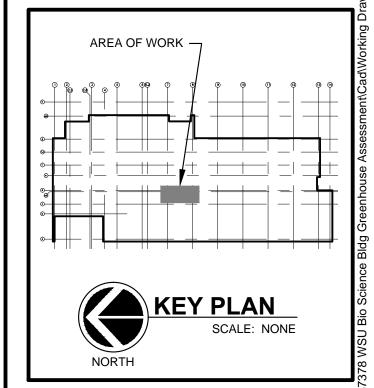
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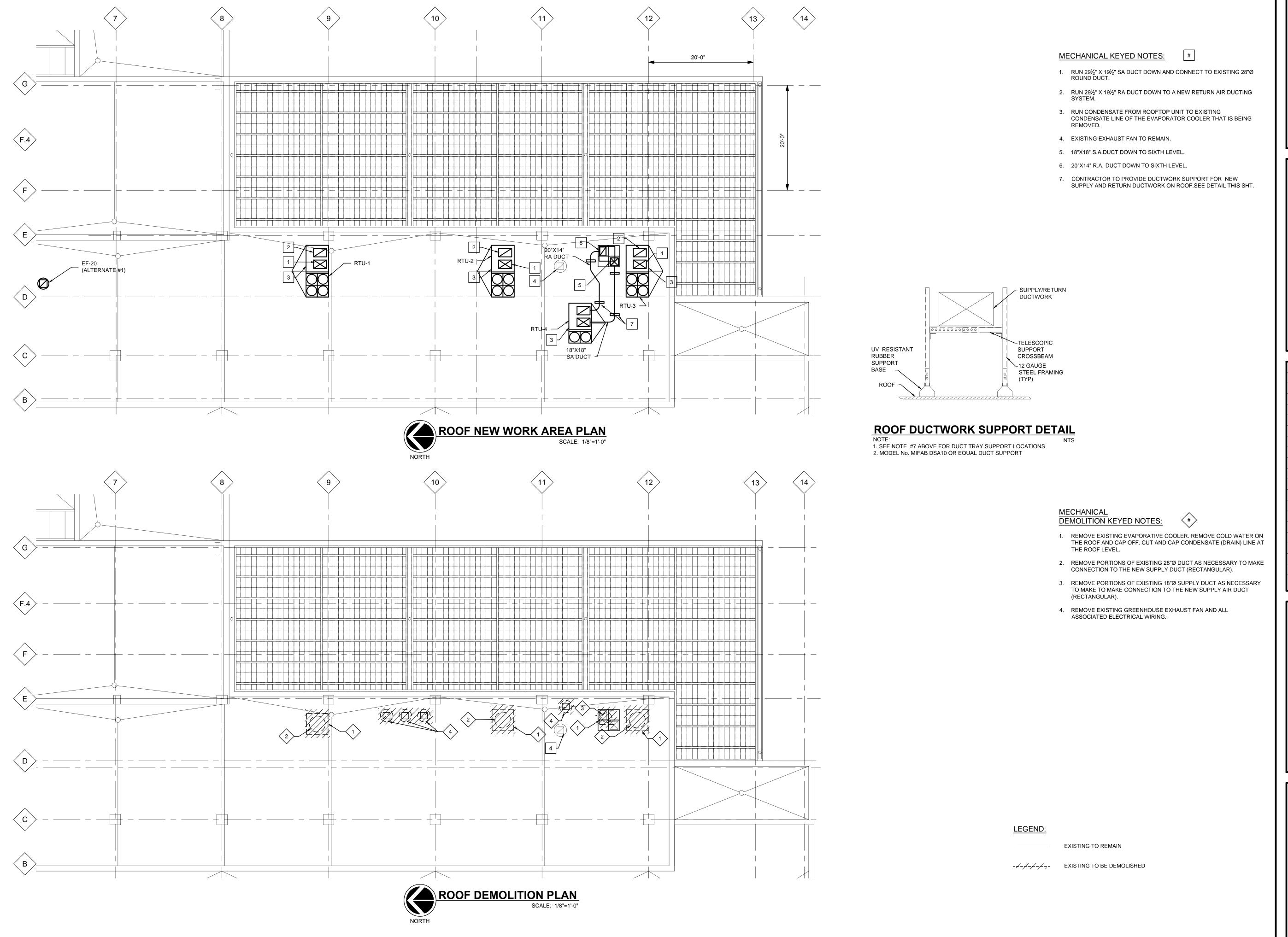




PROJECT#		137378.001
PROJECT MANA	AGER	S. HAHN
DESIGNED		M. HUSSAIN
DRAWN BY		W. WALKER
QUALCHECK	M. PETTIT	D. RUTKOWSKI
SHEET TITLE		

LEVEL SIX MECHANICAL FLOOR PLANS DEMOLITION & NEW WORK

> M1-06-01 SHEET NUMBER



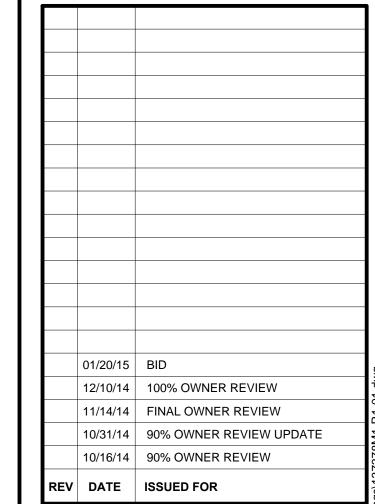


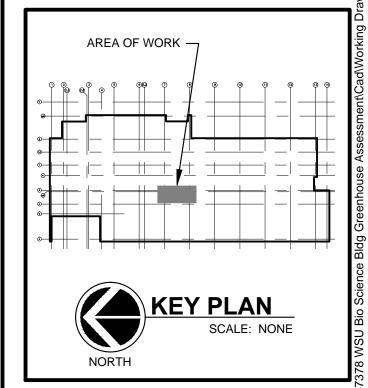
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PROJECT#		137378.001
PROJECT MANA	AGER	S. HAHN
DESIGNED		M. HUSSAIN
DRAWN BY		W. WALKER
QUALCHECK	M. PETTIT	D. RUTKOWSKI
SHEET TITLE		

ROOF LEVEL
MECHANICAL PLANS
DEMOLITION & NEW WORK

M1-R1-01 SHEET NUMBER

	ROOFTOP PACKAGE UNIT SCHEDULE																																			
		Ţ									S	UPPLY FAN DATA								COOLIN	IG COIL DATA					COMPRESSOR	DATA CONDENSER DATA					UNIT ELEC.	DATA			
MAR	RK LOCATION	AREA	AIR FLOW	MANUFACTURER	MODEL	EER AT ARI RATED	IEER AT ARI RATED	DESIGN	MINIMUM	SIATIC	TOTAL STATIC		NO. OF WHEELS/ FA	N MOTOI	R FILTER	ASHRAE MINIMUM	REFRIGERANT	AIR	MAX. COIL	ENTERI TEMPER		VING AIR PERATURI	E	CAPACITY	NO		FLA	LRA	NO OF	: HP FLA	AMBIENT		:USF EL	LECTRICAL I	APPROX.	REMARKS
		SERVED	ARRANGEMENT	(BASIS OF DESIGN)		CONDITIONS		CAP. (CFM)	OUTDOOR AIR (CFM)	PRESSURE (IN. WG.)	PRESSURE (IN. WG.)	FAN TYPE	DIAMETER RP		TYPE	MERV VALUE	ТҮРЕ	(CFM)	FACE VEL. (FPM)	DB (DEG F)	WB DB (DEG F	WB (DEG	1 (IONIS)	SENSIBLE (MBH)	OF V	OLT PHASE		EA) CFM	FANS		TEMP DEG	MCA .	SIZE	V/PH/HZ)	(LBS.)	
RTU-	-1 ROOF	GREENHOUSE 6162	BOTTOM SUPPLY BOTTOM RETURN	JOHNSON CONTROLS	J12ZHC00W4DZZ6	11.7	12.8	4,020	600	1.5	1.83	CENTRIFUGAL	1-15 13	29 5	2" T/A	8	R-410A	4,020	305	74.6	60.2 48.9	46.9	9 11.9	111	2	460 3	12.2	87 1400	0 4	1/3 0.8	95	40.5	50 4	460/3/60	1,370	SEE NOTES 1 THRU 7, 10 THRU 12
RTU-	-2 ROOF	GREENHOUSE 6170	BOTTOM SUPPLY BOTTOM RETURN	JOHNSON CONTROLS	J12ZHC00W4DZZ6	11.7	12.8	4,020	600	1.5	1.83	CENTRIFUGAL	1-15 13	29 5	2" T/A	8	R-410A	4,020	305	74.6	60.2 48.9	46.9	11.9	111	2	460 3	12.2	87 1400	0 4	1/3 0.8	95	40.5	50 4	460/3/60	1,370	SEE NOTES 1 THRU 7, 10 THRU 12
RTU-	-3 ROOF	GREENHOUSE 6178	BOTTOM SUPPLY BOTTOM RETURN	JOHNSON CONTROLS	J12ZHC00W4DZZ6	11.7	12.8	4,020	600	1.5	1.83	CENTRIFUGAL	1-15 13	29 5	2" T/A	8	R-410A	4,020	305	74.6	60.2 48.9	46.9	11.9	111	2	460 3	12.2	87 1400	0 4	1/3 0.8	95	40.5	50 4	460/3/60	1,370	SEE NOTES 1 THRU 7, 10 THRU 12
RTU-	·4 ROOF	GREENHOUSE 6180	SIDE SUPPLY SIDE	JOHNSON	1067HC00W41775	11.7	12.8	2.000	350	1.5	1.60	CENTRIFUGAL	1-12 11	75 2	2" T/A	8	R-410A	2.000	189	74.6	60.7 49.3	47.2	6.0	54	2	460 3	4.9	34 6700	0 2	1/3 0.8	95	18.2	20 4	460/3/60	1.065	SEE NOTES 1 THRU 5, & 8 THRU 12

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8			
8	Li		
8			
4		01/20/15	BID
4		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

			7
			13
PROJECT #		137378.001	S\2(
PROJECT MANA	AGER	S. HAHN	ject
DESIGNED		M. HUSSAIN	G:\Projects\2013\13
DRAWN BY		D. DAHLKE	G
QUALCHECK	M. PETTIT	D. RUTKOWSKI	

MECHANICAL SCHEDULES

SHEET TITLE

M7-00-01 SHEET NUMBER

2. SINGLE POINT POWER CONNECTION 3. PHASE MONITOR

1. NON-FUSED DISCONNECT SWITCH

NOTES:

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)

	EXHAUST FAN SCHEDULE														
	AREA			SCFM	SD @ 70 ⁰ E	EAN	DRIVE			MOT	OR		ROOF OPENING	DESIGN BASIS	
MARK	SERVED	LOCATION	TYPE	@ 70 °F	SP @ 70°F (IN WC)	RPM		BHP	HP	RPM	VOLT	PH	(IN)	MFR AND MODEL	REMARKS
EF- 20	ROOMS 5155, 5155.1, 5155.2 & 5155.3	ROOF	CENTRIFUGAL	740	0.75	2175	BELT	0.30	1/3	1750	120	1	14-1/2 X 14-1/2	GREENHECK MODEL GB-101HP-4	SEE NOTES 1 THRU 7
NOTEC:															

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.

	CONSTANT AIR VOLUME BOX SCHEDULE														
			С	FM			HOT	WATER HEA	ATING COIL	-					
MARK	AREA SERVED	INLET SIZE				AIR TE	MP°F		WATER	WATER	TEMP ° F	STATIC	PRESSURE DROP	DESIGN BASIS	REMARKS
IVV UNIX	ANCHOLINED	(IN)	MAX	MIN	CFM	ENT	LVG	HEATING CAPACITY (MBH)	FLOW RATE (GPM)	ENT	LVG	PRESSURE (IN. WC.)	(IN WC)	MFR./MODEL NO.	
CAV-511	ROOMS 5155 & 5155.2	6	260	260	260	55	75	5.6	0.56	200.0	180.0	1.5	0.12	TITUS MODEL DESV	SEE NOTES 1 THRU 6
CAV-512	ROOMS 5155.3	6	260	260	260	55	75	5.6	0.56	200.0	180.0	1.5	0.12	TITUS MODEL DESV	SEE NOTES 1 THRU 6
CAV-513	ROOM 5155.1	6	260	260	260	55	75	5.6	0.56	200.0	180.0	1.5	0.12	TITUS MODEL DESV	SEE NOTES 1 THRU 6

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.

	HUMIDIFIER SCHEDULE (STEAM)										
MARK	ROOM SERVED	TYPE	AIR FLOW CFM	ROOM RH	CAPACITY LBS/HR	STEAM PRESSURE (PSIG)	ORIFICE SIZE (INCH)	DISTRIBUTION MANIFOLD LENGTH (INCH)	ELECTRICAL VOLT/PH/HZ	DESIGN BASIS MFR./MODEL NO.	REMARKS
HD-5	GREENHOUSE 6162	DIRECT INJECTION		50	24	60	3/32		120/1/60	ARMSTRONG/FSA-91	SEE NOTES 1 THRU 6
HD-7	GREENHOUSE 6170	DIRECT INJECTION		50	24	60	3/32		120/1/60	ARMSTRONG/FSA-91	SEE NOTES 1 THRU 6
HD-8	GREENHOUSE 6178	DIRECT INJECTION		50	24	60	3/32		120/1 <i>/</i> 60	ARMSTRONG/FSA-91	SEE NOTES 1 THRU 6
HD-9	GREENHOUSE 6180	DIRECT INJECTION	2,000	50	14	60	3/32		120/1/60	ARMSTRONG/FSA-91	SEE NOTES 1 THRU 6
HD-10	ROOM 5155.1	DIRECT INJECTION	260	50	10	60	1/16	??		ARMSTRONG/SERIES 9000 SIZE 90	SEE NOTES 4 THRU 8
HD-11	ROOM 5155 & 5155.2	DIRECT INJECTION	260	50	10	60	1/16	??		ARMSTRONG/SERIES 9000 SIZE 90	SEE NOTES 4 THRU 8
HD-12	ROOM 5155.3	DIRECT INJECTION	260	50	10	60	1/16	??		ARMSTRONG/SERIES 9000 SIZE 90	SEE NOTES 4 THRU 8

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

	GLASSWARE WASHER SCHEDULE													
MARK	MAXIMUM WATER CONSUMPTION PER CYCLE (GAL)		HEAT LOSS				ACTERI	ISTICS	DESIGN BASIS	DIMENSIONS (IN)	OPERATING WEIGHT	REMARKS		
IVV U XIX	LOOMION	11112	HOT WATER	DI WATER	(BTU/HR)	VOLT	PH	HZ	FLA MCP		MFR AND MODEL	WXHXD	(LBS)	
GW-1	ROOM 3130	ELECTRIC	23.2	9.5	1,580	208	3	60	22	30	STERIS - MODEL RELIANCE 400XLS	42 X 80 X 33	1300	SEE NOTES 1 THRU 4
GW-2	ROOM 5132	ELECTRIC	23.2	9.5	1,580	208	3	60	22	30	STERIS - MODEL RELIANCE 400XLS	42 X 80 X 33	1300	SEE NOTES 1 THRU 4

1. SINGLE DOOR

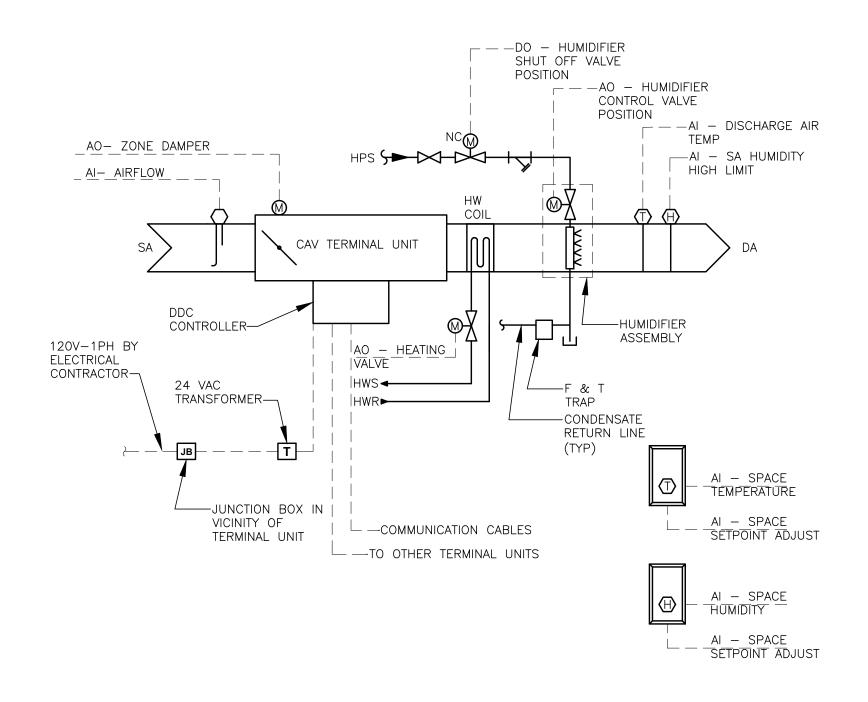
2. VENTED DRYING SYSTEM

3. DRAIN DISCHARGE COOL DOWN

4. AIR COMPRESSOR, OIL FREE, 100 PSIG, 1/3 HP, 115/1/60, 2 GAL TANK CAPACITY (SHIPPED SEPARATELY)

	STEAM STERILIZER (AUTOCLAVE) SCHEDULE																		
MARK	MARK LOCATION TYPE		MOUNTING	CONFIGURATION	STEAM REQUIREMENTS (BUILDING STEAM)		HEAT	ELECTRICAL REQUIREMENTS (CONTROLS)		ITS REQUIREMENTS			REMENT		DESIGN BASIS	DIMENSIONS (INCHES)	MAXIMUM OPERATING	REMARKS	
IVICATOR	LOCATION	ITE	INCONTING	CONFIGURATION	PRESSURE (PSIG)	TCONSUMPTIONT		VOLT	PH	HZ	AMPS	VOLT	PH	HZ	AMPS	MFR AND MODEL	WXHXD	WEIGHT (LBS)	KLIWAKKO
AC-1	ROOM 3130	STEAM	CABINET/FREESTANDING	GRAVITY	80	180	7,000	120	1	60	3.0					STERIS - MODEL AMSCO LAB LG-250	30 X 45 X 75	1235	SEE NOTE 1
AC-2	ROOM 5132	STEAM	CABINET/FREESTANDING	PREVACUUM	80	190	12,550	120	1	60	3.0	208	3	60	8.0	STERIS - AMSCO CENTURY MEDIUM	54 X 58 X 75	3800	SEE NOTE 1

1. SINGLE HINGED DOOR



CAV BOX CONTROL DIAGRAM

CONDENSING - MODULATING MOTORIZED OUTSIDE AIR REFRIGERATION CAPACITY AND RETURN **AIR DAMPERS** CONTROLLER (MS) ______ (TT2) SOLENOID-OUTSIDE AIR -VALVE SEE NOTE #2 SUPPLY RELIEF AIR_ SUPPLY AIR _ | | | | | -1 +1 +1RETURN AIR-1 1 1 1 BUILDING 1 1 1 1 ALARM 1111----**PANEL** MOUNTED MICRO-PROCESSOR CONTROL L-----PACKAGE **-**----HEAVY DUTY DISCONNECT SWITCH (SEE NOTE 2) -TRANSFORMER └ — — → TO BUILDING MANAGEMENT SYSTEM **ABBREVIATIONS:** POWER SUPPLY————————— DIFFERENTIAL PRESSURE SWITCH **HGBP HOT GAS BYPASS**

CONSTANT VOLUME ROOFTOP CONTROL DIAGRAM

SCALE: NONE

NOTES:

NORMALLY CLOSED NORMALLY OPEN REFRIGERANT LIQUID

ZONE THERMOSTAT

REFRIGERANT SUCTION SMOKE DETECTOR

TEMPERATURE TRANSMITTER

- 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.

SEQUENCE OF OPERATION — CONSTANT AIR VOLUME UNITS

(CAV-511, CAV-512 & CAV-513)

TERMINAL UNITS AND ASSOCIATED HVAC UNIT SHALL OPERATE AROUND THE CLOCK. THE BMS SHALL DETERMINE OPERATING MODE (HEATING AND COOLING) FOR THE TERMINAL UNITS AND HVAC UNIT.

THE ASSOCIATED EXHAUST FAN EF-20 SHALL BE STARTED BY THE BMS AND RUN CONTINUOUSLY.IF AFTER 90 SECONDS OF STARTUP, THE FAN OPERATION IS NOT CONFIRMED BY THE ASSOCIATED CURRENT SENSOR, AN "EXHAUST FAN FAILURE" ALARM SHALL BE INIATED AT THE BMS.

THE TERMINAL UNIT CONTROLLER SHALL MODULATE THE CONTROL DAMPER AS REQUIRED TO MAINTAIN A CONSTANT AIR—FLOW RATE SHALL BE FIELD ADJUSTABLE.

IF THE SPACE TEMPERATURE FALLS, THE HEATING HOT WATER CONTROL VALVE SHALL MODULATE OPEN TO MAINTAIN THE SPACE TEMPERATURE SETPOINT.

A WALL MOUNTED HUMIDISTAT SHALL MODULATE THE STEAM CONTROL VALVE (ELECTRIC) AS REQUIRED TO MAINTAIN THE SPACE HUMIDITY SETPOINT.

SEQUENCE OF OPERATION - RROFTOP UNITS RTU-1, RTU-2, RTU-3 & RTU-4

GENERAL:

THE HVAC UNIT SHALL BE STARTED BY THE BUILDING MANAGEMENT SYSTEM, AND RUN CONTINUOUSLY. UPON STARTUP, THE OUTSIDE AIR, RELIEF AIR, AND RETURN AIR DAMPERS SHALL BE POSITIONED FOR MINIMUM OUTSIDE AIR. UPON SHUTDOWN, DAMPERS SHALL FAIL TO THE SPECIFIED "NORMAL" POSITIONS.

ECONIMIZER:

THE UNIT SHALL AUTOMATICALLY UTILIZE OUTSIDE AIR FOR ECONOMIZER WHEN THE RETURN AIR DRY BULB TEMPERATURE (TT1) IS GREATER THAN THAT OF THE OUTSIDE AIR (TT2). THE RETURN AIR, RELIEF AIR, AND OUTSIDE AIR DAMPERS SHALL MODULATE TO MAINTAIN THE ZONE AIR TEMPERATURE (ZT1) SETPOINT OF 70°F (ADJ.)

COOLING:

WHEN THE OUTSIDE AIR DRY BULB TEMPERATURE IS GREATER THAN THAT OF THE RETURN AIR, THE OUTSIDE AIR, RELIEF AIR AND RETURN AIR DAMPERS SHALL BE POSITIONED FOR MINIMUM OUTSIDE AIR, AND THE MECHANICAL COOLING SYSTEM SHALL BE ENERGIZED. THE COMPRESSORS SHALL CYCLE AS REQUIRED, TO MAINTAIN THE ZONE AIR TEMPERATURE SETPOINT.

HOT GAS BYPASS SHALL PROVIDE PART LOAD CAPACITY WHEN COOLING LOADS ARE LESS THAN THE LOWEST STAGE OF MECHANICAL COOLING.

SAFETIES AND ALARMS:

FAN STATUS: A CURRENT SENSOR SHALL CONFIRM SUPPLY FAN OPERATION. IF AFTER 90 SECONDS OF UNIT STARTUP, SUPPLY FAN OPERATION HAS NOT BEEN CONFIRMED, A "SUPPLY FAN FAILURE" ALARM SHALL BE INITIATED.

AIR FILTER STATUS: A DIFFERENTIAL PRESSURE SWITCH (DPS) SHALL SIGNAL WHEN THE FILTER DIFFERENTIAL PRESSURE SETPOINT OF 0.7" W.G. (ADJ.) HAS BEEN REACHED. A "HIGH FILTER PRESSURE" ALARM SHALL BE INITIATED.

SMOKE DETECTION: UPON A DETECTION OF SMOKE IN THE SUPPLY DUCTS, AN ALARM SIGNAL SHALL BE SENT TO THE BUILDING FIRE ALARM SYSTEM AND, THROUGH INTERLOCK, THE UNIT SHALL SHUT DOWN. THE UNIT SHALL RESTART UPON MANUAL RESET OF THE FIRE ALARM CIRCUIT.

FIELD ADJUSTMENT:

ALL SYSTEM SETPOINTS SHALL BE FIELD ADJUSTABLE BY THE OWNER.

BMS INTERFACE:

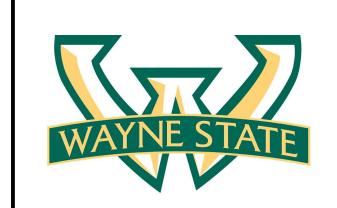
ALL UNIT MONITOR, CONTROL AND ALARM POINTS SHALL BE FULLY ACCESSIBLE THROUGH THE BUILDING MANAGEMENT SYSTEM (BMS).



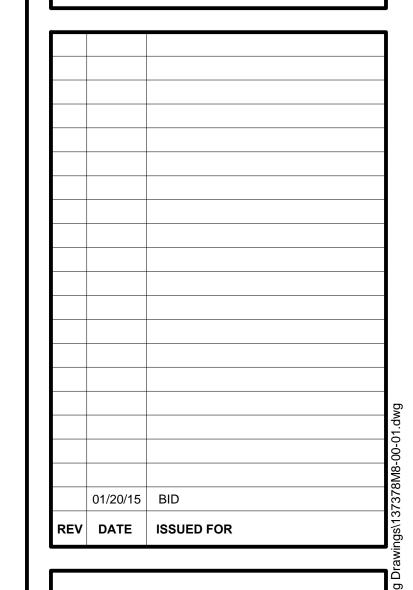
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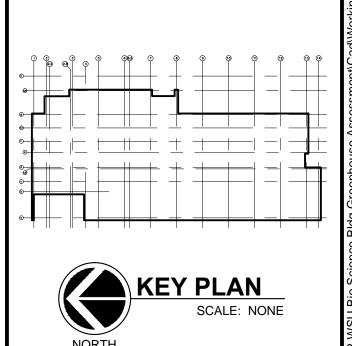
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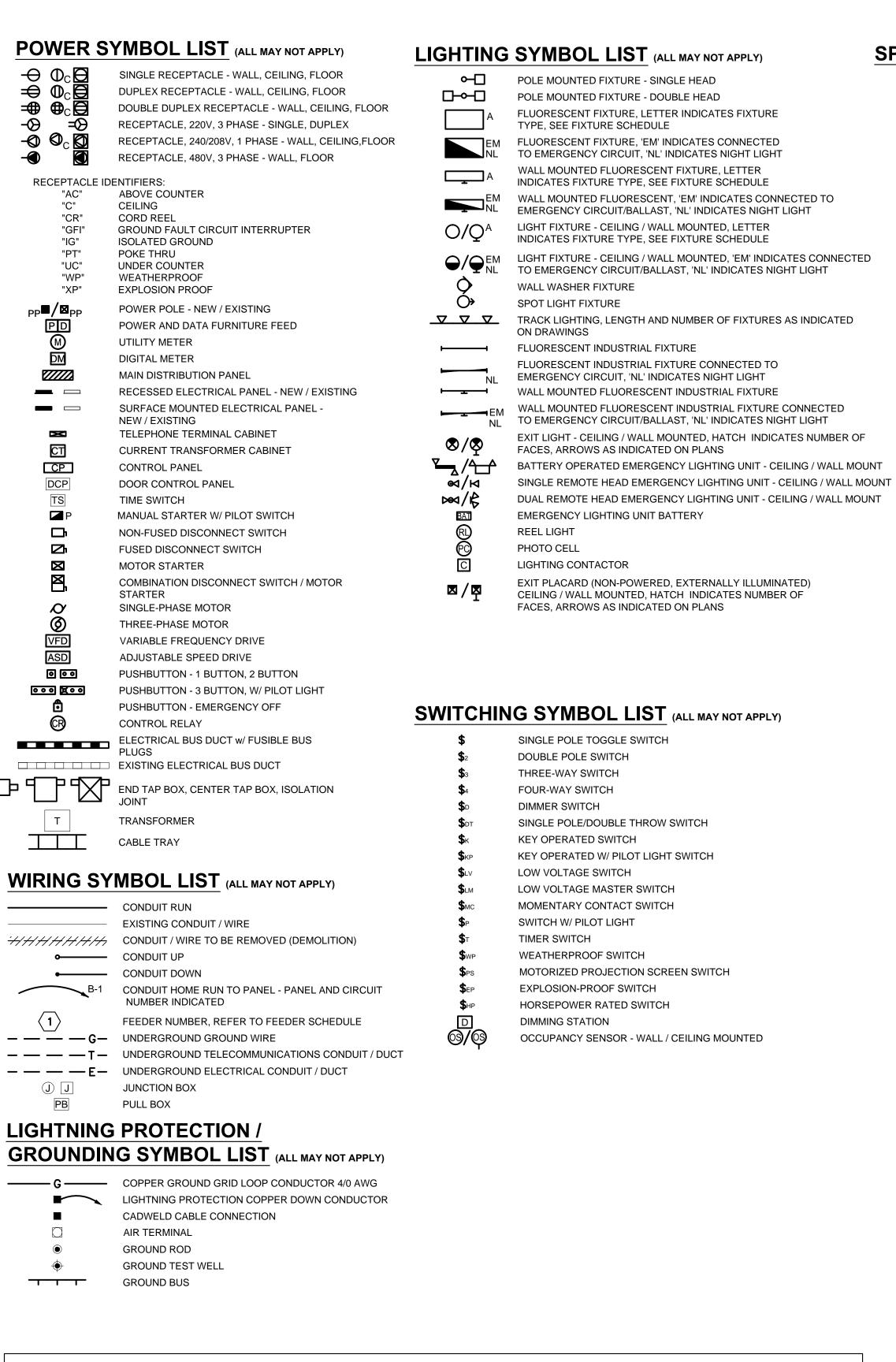




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PROJECT MANA	AGER	S. HAHI
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QUALCHECK	M. PETTIT	D. RUTKOWSK
SHEET TITLE		

CONTROL DIAGRAMS

M8-00-01 SHEET NUMBER



DWG. DRAWING

ETC.

FDR.

FIN.

I.D.

J.B.

EACH

ETC

GRD/GND GROUND

FEEDER

FINISHED FLOOR

HORSEPOWER

ELECTRICAL

ELEVATION

AMPERE OR AMPS

ABOVE FINISHED FLOOR

AMERICAN WIRE GAUGE

BOTTOM ELEVATION

ABOVE COUNTER

AUXILIARY

BREAKER

CATALOG

CONDUIT

CIRCUIT

COLUMN

CENTER LINE

DISCONNECT (SWITCH)

A.C.

A.F.F.

A.W.G.

AUX. B.E.

BRKR.

CAT.

CKT.

COL.

_			
<u>S</u>	PECIAL S	SYSTEMS SYMBOL LIST (ALL MA	Y NOT APPLY
	lacktriangledown	TELEPHONE OUTLET - WALL / FLOOR MOUNTED	
	abla	DATA OUTLET - WALL / FLOOR MOUNTED	
	$oldsymbol{ abla}$	TELEPHONE/DATA OUTLET - WALL / FLOOR MOUNTED	
	-(M) M	MICROPHONE OUTLET - WALL / FLOOR MOUNTED	
	<u>-(s)</u> (s)	SPEAKER - WALL / FLOOR MOUNTED	NOTES:
		PAGING SPEAKER - WALL / FLOOR MOUNTED	1 - USE THIS
	MH MH	HORN - WALL / CEILING MOUNTED	
	VC	VOLUME CONTROL	OVERCUF
	CT	CABLE TELEVISION OUTLET	DEVICE R
	PS PS	LOW PRESSURE SWITCH	(AMP
	FACP	FIRE ALARM CONTROL PANEL	15 20
	FAA	FIRE ALARM ANNUNCIATOR PANEL	25
	$\overline{\nabla}$	FIRE FIGHTER'S PHONE	30
	Ė	FIRE ALARM PULL STATION	35
	서비 서비	FIRE ALARM HORN - WALL / CEILING MOUNTED	40
		FIRE ALARM HORN/STROBE -	50
	DXH DX	WALL / CEILING MOUNTED	60
	\boxtimes H \boxtimes	FIRE ALARM STROBE - WALL / CEILING MOUNTED	70
	OF]	FIRE ALARM BELL	80
	$\langle F \rangle$	FLAME DETECTOR	90
	=	HEAT DETECTOR	110
	Ğ	GAS DETECTOR	125
	(H) G (S)	SMOKE DETECTOR	150
	$\overline{}$		175

SMOKE DETECTOR - DUCT MOUNTED

SMOKE DETECTORS

FLOW SWITCH

INTERCOM

DE

 Θ

TAMPER SWITCH

POST INDICATOR VALVE

END-OF-LINE RESISTOR

SECURITY CONTROL PANEL

CLOSED CIRCUIT TV CAMERA

CLOCK - WALL / CEILING MOUNT

ELECTRIC DOOR STRIKE

PUSH PAD FOR HANDICAPPED ACCESS

INFRARED DETECTOR

SECURITY KEYPAD

MOTION DETECTOR

DOOR CONTACT

MAGNETIC LOCK

CARD READER

DOOR ALARM

DOOR HOLDER

DOOR BUZZER

DOOR BELL

REMOTE STATION FOR DUCT MOUNTED

MASTER INTERCOM AND DIRECTORY UNIT

CCTV CABLE OUTLET AND POWER OUTLET

OVERCURRENT DEVICE RATING (AMPS)	FEEDER CODE	WIRE & CONDUIT SIZE (2 WIRE SYSTEM)	FEEDER CODE	WIRE & CONDUIT SIZE (3 WIRE SYSTEM)	FEEDER CODE	WIRE & CONDUIT SIZE (4 WIRE SYSTEM)
15	2F01	2#12 & 1#12GND IN 3/4"C	3F01	3#12 & 1#12GND IN 3/4"C	4F01	4#12 & 1#12GND IN 3/4"C
20	2F01	2#12 & 1#12GND IN 3/4"C	3F01	3#12 & 1#12GND IN 3/4"C	4F01	4#12 & 1#12GND IN 3/4"C
25	2F02	2#10 & 1#10GND IN 3/4"C	3F02	3#10 & 1#10GND IN 3/4"C	4F02	4#10 & 1#10GND IN 3/4"C
30	2F02	2#10 & 1#10GND IN 3/4"C	3F02	3#10 & 1#10GND IN 3/4"C	4F02	4#10 & 1#10GND IN 3/4"C
35	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
40	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
45	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
50	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
60	2F04	2#6 & 1#10GND IN 3/4"C	3F04	3#6 & 1#10GND IN 1"C	4F04	4#6 & 1#10GND IN 1"C
70	2F05	2#4 & 1#8GND IN 1"C	3F05	3#4 & 1#8GND IN 1"C	4F05	4#4 & 1#8GND IN 1-1/2"C
80	2F05	2#4 & 1#8GND IN 1"C	3F05	3#4 & 1#8GND IN 1"C	4F05	4#4 & 1#8GND IN 1-1/2"C
90	2F06	2#3 & 1#8GND IN 1"C	3F06	3#3 & 1#8GND IN 1-1/2"C	4F06	4#3 & 1#8GND IN 1-1/2"C
100	2F06	2#3 & 1#8GND IN 1"C	3F06	3#3 & 1#8GND IN 1-1/2"C	4F06	4#3 & 1#8GND IN 1-1/2"C
110	2F07	2#2 & 1#6GND IN 1"C	3F07	3#2 & 1#6GND IN 1-1/2"C	4F07	4#2 & 1#6GND IN 1-1/2"C
125	2F08	2#1 & 1#6GND IN 1-1/2"C	3F08	3#1 & 1#6GND IN 1-1/2"C	4F08	4#1 & 1#6GND IN 1-1/2"C
150	2F09	2#1/0 & 1#6GND IN 1-1/2"C	3F09	3#1/0 & 1#6GND IN 1-1/2"C	4F09	4#1/0 & 1#6GND IN 2"C
175	2F10	2#2/0 & 1#6GND IN 1-1/2"C	3F10	3#2/0 & 1#6GND IN 2"C	4F10	4#2/0 & 1#6GND IN 2"C
200	2F11	2#3/0 & 1#6GND IN 1-1/2"C	3F11	3#3/0 & 1#6GND IN 2"C	4F11	4#3/0 & 1#6GND IN 2"C
225	2F12	2#4/0 & 1#4GND IN 2"C	3F12	3#4/0 & 1#4GND IN 2"C	4F12	4#4/0 & 1#4GND IN 2-1/2"C
250	2F13	2-250 KCMIL & 1#4GND IN 2"C	3F13	3-250 KCMIL & 1#4GND IN 2-1/2"C	4F13	4-250 KCMIL & 1#4GND IN 2-1/2"C
300	2F14	2-350 KCMIL & 1#4GND IN 2-1/2"C	3F14	3-350 KCMIL & 1#4GND IN 3"C	4F14	4-350 KCMIL & 1#4GND IN 3"C
350	2F15	2-500 KCMIL & 1#3GND IN 3"C	3F15	3-500 KCMIL & 1#3GND IN 3"C	4F15	4-500 KCMIL & 1#3GND IN 3-1/2"C
400	2F15	2-500 KCMIL & 1#3GND IN 3"C	3F15	3-500 KCMIL & 1#3GND IN 3"C	4F15	4-500 KCMIL & 1#3GND IN 3-1/2"C
450	2F16	(2) 2#4/0 & 1#2GND IN 2"C	3F16	(2) 3#4/0 & 1#2GND IN 2"C	4F16	(2) 4#4/0 & 1#2GND IN 2-1/2"C
500	2F17	(2) 2-250 KCMIL & 1#2GND IN 2"C	3F17	(2) 3-250 KCMIL & 1#2GND IN 2-1/2"C	4F17	(2) 4-250 KCMIL & 1#2GND IN 2-1/2"C
600	2F18	(2) 2-350 KCMIL & 1#1GND IN 2-1/2"C	3F18	(2) 3-350 KCMIL & 1#1GND IN 3"C	4F18	(2) 4-350 KCMIL & 1#1GND IN 3"C
700	2F19	(2) 2-500 KCMIL & 1#1/0GND IN 3"C	3F19	(2) 3-500 KCMIL & 1#1/0GND IN 3"C	4F19	(2) 4-500 KCMIL & 1#1/0GND IN 3-1/2"C
800	2F19	(2) 2-500 KCMIL & 1#1/0GND IN 3"C	3F19	(2) 3-500 KCMIL & 1#1/0GND IN 3"C	4F19	(2) 4-500 KCMIL & 1#1/0GND IN 3-1/2"C
1000	2F20	(3) 2-500 KCMIL & 1#2/0GND IN 3"C	3F20	(3) 3-500 KCMIL & 1#2/0GND IN 3"C	4F20	(3) 4-500 KCMIL & 1#2/0GND IN 3-1/2"C
1200	2F21	(4) 2-350 KCMIL & 1#3/0GND IN 2-1/2"C	3F21	(4) 3-350 KCMIL & 1#3/0GND IN 3"C	4F21	(4) 4-350 KCMIL & 1#3/0GND IN 3"C
1600	2F22	(5) 2-500 KCMIL & 1#4/0GND IN 3"C	3F22	(5) 3-500 KCMIL & 1#4/0GND IN 3"C	4F22	(5) 4-500 KCMIL & 1#4/0GND IN 3-1/2"C
2000	2F23	(6) 2-500 KCMIL & 1-250KCMIL GND IN 3"C	3F23	(6) 3-500 KCMIL & 1-250KCMIL GND IN 3"C	4F23	(6) 4-500 KCMIL & 1-250KCMIL GND IN 3-1/2"C
2500	2F24	(7) 2-500 KCMIL & 1-350KCMIL GND IN 3"C	3F24	(7) 3-500 KCMIL & 1-350KCMIL GND IN 3"C	4F24	(7) 4-500 KCMIL & 1-350KCMIL GND IN 3-1/2"C
3000	2F25	(8) 2-500 KCMIL & 1-500KCMIL GND IN 3"C	3F25	(8) 3-500 KCMIL & 1-500KCMIL GND IN 3"C	4F25	(8) 4-500 KCMIL & 1-500KCMIL GND IN 3-1/2"C
3200	2F26	(9) 2-500 KCMIL & 1-500KCMIL GND IN 3"C	3F26	(9) 3-500 KCMIL & 1-500KCMIL GND IN 3"C	4F26	(9) 4-500 KCMIL & 1-500KCMIL GND IN 3-1/2"C
4000	2F27	(11) 2-500 KCMIL & 1-500KCMIL GND IN 3"C	3F27	(11) 3-500 KCMIL & 1-500KCMIL GND IN 3"C	4F27	(11) 4-500 KCMIL & 1-500KCMIL GND IN 3-1/2"

NOTES: 1 - USE THIS SCHEDI	ULE FOR FE	EEDERS AND BRANCH CIRCUIT SIZING.				
OVERCURRENT	FEEDER		FEEDER		FEEDER	
DEVICE RATING (AMPS)	CODE	WIRE & CONDUIT SIZE (2 WIRE SYSTEM)	CODE	WIRE & CONDUIT SIZE (3 WIRE SYSTEM)	CODE	WIRE & CONDUIT SIZE (4 WIRE SYSTEM)
15	2F01	2#12 & 1#12GND IN 3/4"C	3F01	3#12 & 1#12GND IN 3/4"C	4F01	4#12 & 1#12GND IN 3/4"C
20	2F01	2#12 & 1#12GND IN 3/4"C	3F01	3#12 & 1#12GND IN 3/4"C	4F01	4#12 & 1#12GND IN 3/4"C
25	2F02	2#10 & 1#10GND IN 3/4"C	3F02	3#10 & 1#10GND IN 3/4"C	4F02	4#10 & 1#10GND IN 3/4"C
30	2F02	2#10 & 1#10GND IN 3/4"C	3F02	3#10 & 1#10GND IN 3/4"C	4F02	4#10 & 1#10GND IN 3/4"C
35	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
40	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
45	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
50	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
60	2F04	2#6 & 1#10GND IN 3/4"C	3F04	3#6 & 1#10GND IN 1"C	4F04	4#6 & 1#10GND IN 1"C
70	2F05	2#4 & 1#8GND IN 1"C	3F05	3#4 & 1#8GND IN 1"C	4F05	4#4 & 1#8GND IN 1-1/2"C
80	2F05	2#4 & 1#8GND IN 1"C	3F05	3#4 & 1#8GND IN 1"C	4F05	4#4 & 1#8GND IN 1-1/2"C
90	2F06	2#3 & 1#8GND IN 1"C	3F06	3#3 & 1#8GND IN 1-1/2"C	4F06	4#3 & 1#8GND IN 1-1/2"C
100	2F06	2#3 & 1#8GND IN 1"C	3F06	3#3 & 1#8GND IN 1-1/2"C	4F06	4#3 & 1#8GND IN 1-1/2"C
110	2F07	2#2 & 1#6GND IN 1"C	3F07	3#2 & 1#6GND IN 1-1/2"C	4F07	4#2 & 1#6GND IN 1-1/2"C
125	2F08	2#1 & 1#6GND IN 1-1/2"C	3F08	3#1 & 1#6GND IN 1-1/2"C	4F08	4#1 & 1#6GND IN 1-1/2"C
150	2F09	2#1/0 & 1#6GND IN 1-1/2"C	3F09	3#1/0 & 1#6GND IN 1-1/2"C	4F09	4#1/0 & 1#6GND IN 2"C
175	2F10	2#2/0 & 1#6GND IN 1-1/2"C	3F10	3#2/0 & 1#6GND IN 2"C	4F10	4#2/0 & 1#6GND IN 2"C
200	2F11	2#3/0 & 1#6GND IN 1-1/2"C	3F11	3#3/0 & 1#6GND IN 2"C	4F11	4#3/0 & 1#6GND IN 2"C
225	2F12	2#4/0 & 1#4GND IN 2"C	3F12	3#4/0 & 1#4GND IN 2"C	4F12	4#4/0 & 1#4GND IN 2-1/2"C
250	2F13	2-250 KCMIL & 1#4GND IN 2"C	3F13	3-250 KCMIL & 1#4GND IN 2-1/2"C	4F13	4-250 KCMIL & 1#4GND IN 2-1/2"C
300	2F14	2-350 KCMIL & 1#4GND IN 2-1/2"C	3F14	3-350 KCMIL & 1#4GND IN 3"C	4F14	4-350 KCMIL & 1#4GND IN 3"C
350	2F15	2-500 KCMIL & 1#3GND IN 3"C	3F15	3-500 KCMIL & 1#3GND IN 3"C	4F15	4-500 KCMIL & 1#3GND IN 3-1/2"C
400	2F15	2-500 KCMIL & 1#3GND IN 3"C	3F15	3-500 KCMIL & 1#3GND IN 3"C	4F15	4-500 KCMIL & 1#3GND IN 3-1/2"C
450	2F16	(2) 2#4/0 & 1#2GND IN 2"C	3F16	(2) 3#4/0 & 1#2GND IN 2"C	4F16	(2) 4#4/0 & 1#2GND IN 2-1/2"C
500	2F17	(2) 2-250 KCMIL & 1#2GND IN 2"C	3F17	(2) 3-250 KCMIL & 1#2GND IN 2-1/2"C	4F17	(2) 4-250 KCMIL & 1#2GND IN 2-1/2"C
600	2F18	(2) 2-350 KCMIL & 1#1GND IN 2-1/2"C	3F18	(2) 3-350 KCMIL & 1#1GND IN 3"C	4F18	(2) 4-350 KCMIL & 1#1GND IN 3"C
700	2F19	(2) 2-500 KCMIL & 1#1/0GND IN 3"C	3F19	(2) 3-500 KCMIL & 1#1/0GND IN 3"C	4F19	(2) 4-500 KCMIL & 1#1/0GND IN 3-1/2"C
800	2F19	(2) 2-500 KCMIL & 1#1/0GND IN 3"C	3F19	(2) 3-500 KCMIL & 1#1/0GND IN 3"C	4F19	(2) 4-500 KCMIL & 1#1/0GND IN 3-1/2"C
1000	2F20	(3) 2-500 KCMIL & 1#2/0GND IN 3"C	3F20	(3) 3-500 KCMIL & 1#2/0GND IN 3"C	4F20	(3) 4-500 KCMIL & 1#2/0GND IN 3-1/2"C
1200	2F21	(4) 2-350 KCMIL & 1#3/0GND IN 2-1/2"C	3F21	(4) 3-350 KCMIL & 1#3/0GND IN 3"C	4F21	(4) 4-350 KCMIL & 1#3/0GND IN 3"C
1600	2F22	(5) 2-500 KCMIL & 1#4/0GND IN 3"C	3F22	(5) 3-500 KCMIL & 1#4/0GND IN 3"C	4F22	(5) 4-500 KCMIL & 1#4/0GND IN 3-1/2"C
2000	2F23	(6) 2-500 KCMIL & 1-250KCMIL GND IN 3"C	3F23	(6) 3-500 KCMIL & 1-250KCMIL GND IN 3"C	4F23	(6) 4-500 KCMIL & 1-250KCMIL GND IN 3-1/2"C
2500	2F24	(7) 2-500 KCMIL & 1-350KCMIL GND IN 3"C	3F24	(7) 3-500 KCMIL & 1-350KCMIL GND IN 3"C	4F24	(7) 4-500 KCMIL & 1-350KCMIL GND IN 3-1/2"C
3000	2F25	(8) 2-500 KCMIL & 1-500KCMIL GND IN 3"C	3F25	(8) 3-500 KCMIL & 1-500KCMIL GND IN 3"C	4F25	(8) 4-500 KCMIL & 1-500KCMIL GND IN 3-1/2"C
3200	2F26	(9) 2-500 KCMIL & 1-500KCMIL GND IN 3"C		(9) 3-500 KCMIL & 1-500KCMIL GND IN 3"C		(9) 4-500 KCMIL & 1-500KCMIL GND IN 3-1/2"C

BRANCH WIRING SCHEDULE

THIS SCHEDU	JLE FOR FE	EEDERS AND BRANCH CIRCUIT SIZING.	_		_	
RCURRENT CE RATING AMPS)	FEEDER CODE	WIRE & CONDUIT SIZE (2 WIRE SYSTEM)	FEEDER CODE	WIRE & CONDUIT SIZE (3 WIRE SYSTEM)	FEEDER CODE	WIRE & CONDUIT SIZE (4 WIRE SYSTEM)
15	2F01	2#12 & 1#12GND IN 3/4"C	3F01	3#12 & 1#12GND IN 3/4"C	4F01	4#12 & 1#12GND IN 3/4"C
20	2F01	2#12 & 1#12GND IN 3/4"C	3F01	3#12 & 1#12GND IN 3/4"C	4F01	4#12 & 1#12GND IN 3/4"C
25	2F02	2#10 & 1#10GND IN 3/4"C	3F02	3#10 & 1#10GND IN 3/4"C	4F02	4#10 & 1#10GND IN 3/4"C
30	2F02	2#10 & 1#10GND IN 3/4"C	3F02	3#10 & 1#10GND IN 3/4"C	4F02	4#10 & 1#10GND IN 3/4"C
35	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
40	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
45	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
50	2F03	2#8 & 1#10GND IN 3/4"C	3F03	3#8 & 1#10GND IN 3/4"C	4F03	4#8 & 1#10GND IN 3/4"C
60	2F04	2#6 & 1#10GND IN 3/4"C	3F04	3#6 & 1#10GND IN 1"C	4F04	4#6 & 1#10GND IN 1"C
70	2F05	2#4 & 1#8GND IN 1"C	3F05	3#4 & 1#8GND IN 1"C	4F05	4#4 & 1#8GND IN 1-1/2"C
80	2F05	2#4 & 1#8GND IN 1"C	3F05	3#4 & 1#8GND IN 1"C	4F05	4#4 & 1#8GND IN 1-1/2"C
90	2F06	2#3 & 1#8GND IN 1"C	3F06	3#3 & 1#8GND IN 1-1/2"C	4F06	4#3 & 1#8GND IN 1-1/2"C
100	2F06	2#3 & 1#8GND IN 1"C	3F06	3#3 & 1#8GND IN 1-1/2"C	4F06	4#3 & 1#8GND IN 1-1/2"C
110	2F07	2#2 & 1#6GND IN 1"C	3F07	3#2 & 1#6GND IN 1-1/2"C	4F07	4#2 & 1#6GND IN 1-1/2"C
125	2F08	2#1 & 1#6GND IN 1-1/2"C	3F08	3#1 & 1#6GND IN 1-1/2"C	4F08	4#1 & 1#6GND IN 1-1/2"C
150	2F09	2#1/0 & 1#6GND IN 1-1/2"C	3F09	3#1/0 & 1#6GND IN 1-1/2"C	4F09	4#1/0 & 1#6GND IN 2"C
175	2F10	2#2/0 & 1#6GND IN 1-1/2"C	3F10	3#2/0 & 1#6GND IN 2"C	4F10	4#2/0 & 1#6GND IN 2"C
200	2F11	2#3/0 & 1#6GND IN 1-1/2"C	3F11	3#3/0 & 1#6GND IN 2"C	4F11	4#3/0 & 1#6GND IN 2"C
225	2F12	2#4/0 & 1#4GND IN 2"C	3F12	3#4/0 & 1#4GND IN 2"C	4F12	4#4/0 & 1#4GND IN 2-1/2"C
250	2F13	2-250 KCMIL & 1#4GND IN 2"C	3F13	3-250 KCMIL & 1#4GND IN 2-1/2"C	4F13	4-250 KCMIL & 1#4GND IN 2-1/2"C
300	2F14	2-350 KCMIL & 1#4GND IN 2-1/2"C	3F14	3-350 KCMIL & 1#4GND IN 3"C	4F14	4-350 KCMIL & 1#4GND IN 3"C
350	2F15	2-500 KCMIL & 1#3GND IN 3"C	3F15	3-500 KCMIL & 1#3GND IN 3"C	4F15	4-500 KCMIL & 1#3GND IN 3-1/2"C
400	2F15	2-500 KCMIL & 1#3GND IN 3"C	3F15	3-500 KCMIL & 1#3GND IN 3"C	4F15	4-500 KCMIL & 1#3GND IN 3-1/2"C
450	2F16	(2) 2#4/0 & 1#2GND IN 2"C	3F16	(2) 3#4/0 & 1#2GND IN 2"C	4F16	(2) 4#4/0 & 1#2GND IN 2-1/2"C
500	2F17	(2) 2-250 KCMIL & 1#2GND IN 2"C	3F17	(2) 3-250 KCMIL & 1#2GND IN 2-1/2"C	4F17	(2) 4-250 KCMIL & 1#2GND IN 2-1/2"C
600	2F18	(2) 2-350 KCMIL & 1#1GND IN 2-1/2"C	3F18	(2) 3-350 KCMIL & 1#1GND IN 3"C	4F18	(2) 4-350 KCMIL & 1#1GND IN 3"C
700	2F19	(2) 2-500 KCMIL & 1#1/0GND IN 3"C	3F19	(2) 3-500 KCMIL & 1#1/0GND IN 3"C	4F19	(2) 4-500 KCMIL & 1#1/0GND IN 3-1/2"C
800	2F19	(2) 2-500 KCMIL & 1#1/0GND IN 3"C	3F19	(2) 3-500 KCMIL & 1#1/0GND IN 3"C	4F19	(2) 4-500 KCMIL & 1#1/0GND IN 3-1/2"C
1000	2F20	(3) 2-500 KCMIL & 1#2/0GND IN 3"C	3F20	(3) 3-500 KCMIL & 1#2/0GND IN 3"C	4F20	(3) 4-500 KCMIL & 1#2/0GND IN 3-1/2"C
1200	2F21	(4) 2-350 KCMIL & 1#3/0GND IN 2-1/2"C	3F21	(4) 3-350 KCMIL & 1#3/0GND IN 3"C	4F21	(4) 4-350 KCMIL & 1#3/0GND IN 3"C
1600	2F22	(5) 2-500 KCMIL & 1#4/0GND IN 3"C	3F22	(5) 3-500 KCMIL & 1#4/0GND IN 3"C	4F22	(5) 4-500 KCMIL & 1#4/0GND IN 3-1/2"C
2000	2F23	(6) 2-500 KCMIL & 1-250KCMIL GND IN 3"C	3F23	(6) 3-500 KCMIL & 1-250KCMIL GND IN 3"C	4F23	(6) 4-500 KCMIL & 1-250KCMIL GND IN 3-1/2"C
2500	2F24	(7) 2-500 KCMIL & 1-350KCMIL GND IN 3"C	3F24	(7) 3-500 KCMIL & 1-350KCMIL GND IN 3"C	4F24	(7) 4-500 KCMIL & 1-350KCMIL GND IN 3-1/2"C
3000	2F25	(8) 2-500 KCMIL & 1-500KCMIL GND IN 3"C	3F25	(8) 3-500 KCMIL & 1-500KCMIL GND IN 3"C	4F25	(8) 4-500 KCMIL & 1-500KCMIL GND IN 3-1/2"C
0000	0500	(O) O FOO KONAIL O A FOOKONAIL ONID INLOID	0500	(0) 0 500 KOMIII 0 4 500KOMIII OND IN 0110	4500	(0) 4 500 KOMB 0 4 500 KOMB 0 10 10 10 10

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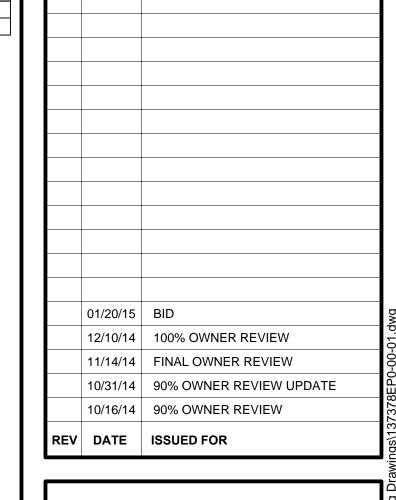
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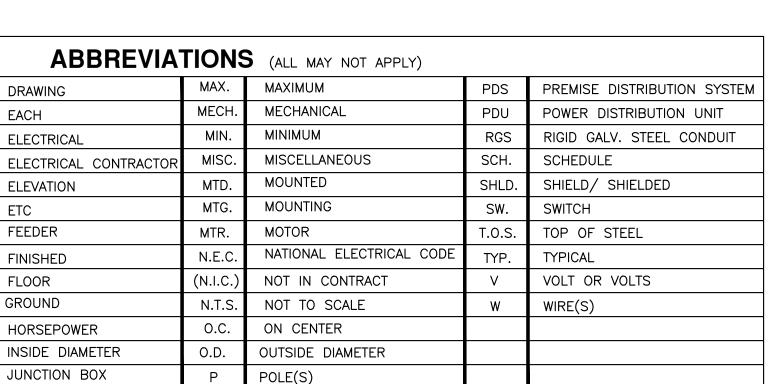
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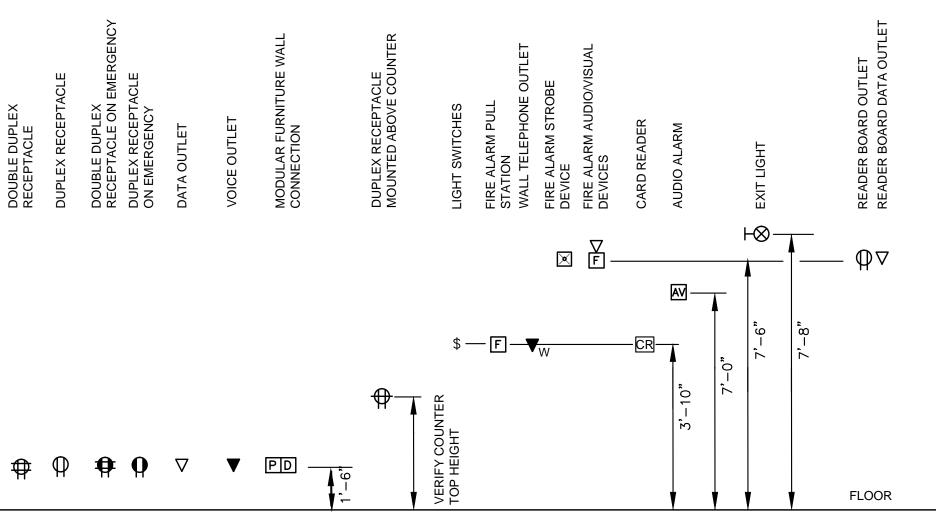


PROJECT#	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

ELECTRICAL LEGEND, ABBREVIATIONS AND SYMBOLS

E0-00-01





MOUNTING HEIGHTS

GENERAL ELECTRICAL NOTES

- 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.
- 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,
- I. 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.
- 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.
- 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 TERMINATION'S 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.
- 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
- 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.
- 4. 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.
- 9. DISCONNECTS: MECHANICAL EQUIPMENT ARE PROVIDED WITH FUSED DISCONNECT SWITCH, MOUNTED AND WIRE TO UNIT.

CONNECTIONS FOR EQUIPMENT SHIPPED IN MULTIPLE SECTIONS.

- 20. DISCONNECTS: FANS PROVIDED WITH DISCONNECT SWITCH, MOUNT AND WIRE TO
- 21. EQUIPMENT: PACKAGED EQUIPMENT SHIPPED WITH SEPARATE CONTROL PANELS, MOUNT AND WIRE PANELS TO EQUIPMENT AND SOURCE. PROVIDE ELECTRICAL
- 22. COMMUNICATION OUTLETS: INSTALL TWO (2) GANG, 3-1/2" DEEP WALL BOX WITH RAISED SINGLE PLASTER RING FOR ALL COMMUNICATION DEVICES. ROUTE 1" EMPTY CONDUIT UP TO ACCESSIBLE CEILING SPACE ABOVE. PROVIDE BUSHINGS AND PULL WIRES IN ALL EMPTY CONDUITS.

- 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.
- 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.
- 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
- 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
- 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
- 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

GENERAL LIGHTING NOTES

- 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" CONDUIT WITH DEDICATED NEUTRAL. HOME RUNS OVER 153 FEET SHALL BE #10 AWG. BRANCH LIGHTING CIRCUITS SHALL NOT EXCEED 3200 [1200]-WATTS PER CIRCUIT.
- 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.
- 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.
- ALL EXISTING LIGHT FIXTURES SHALL REMAIN, UNLESS OTHERWISE NOTED. EXISTING LIGHT FIXTURES, TO REMAIN, SHALL BE CLEANED, RE-LAMPED AND REFURBISHED 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.
- CONDUIT SUPPORT SHALL BE UNISTRUT OR KORN CLAMPS. NO "C"
 TYPE BEAM CLAMPS OR HANG ON TYPE CLAMPS SHALL BE USED.
- 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
- O. 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.
- 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 ¾ INCH METAL CHANNELS SPANNING AND SECURED TO THE CEILING TEES.
- 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 (EM/NL), 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" ABOVE FINISH FLOOR TO CENTER OF SWITCH.
- 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.
- 1. 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.



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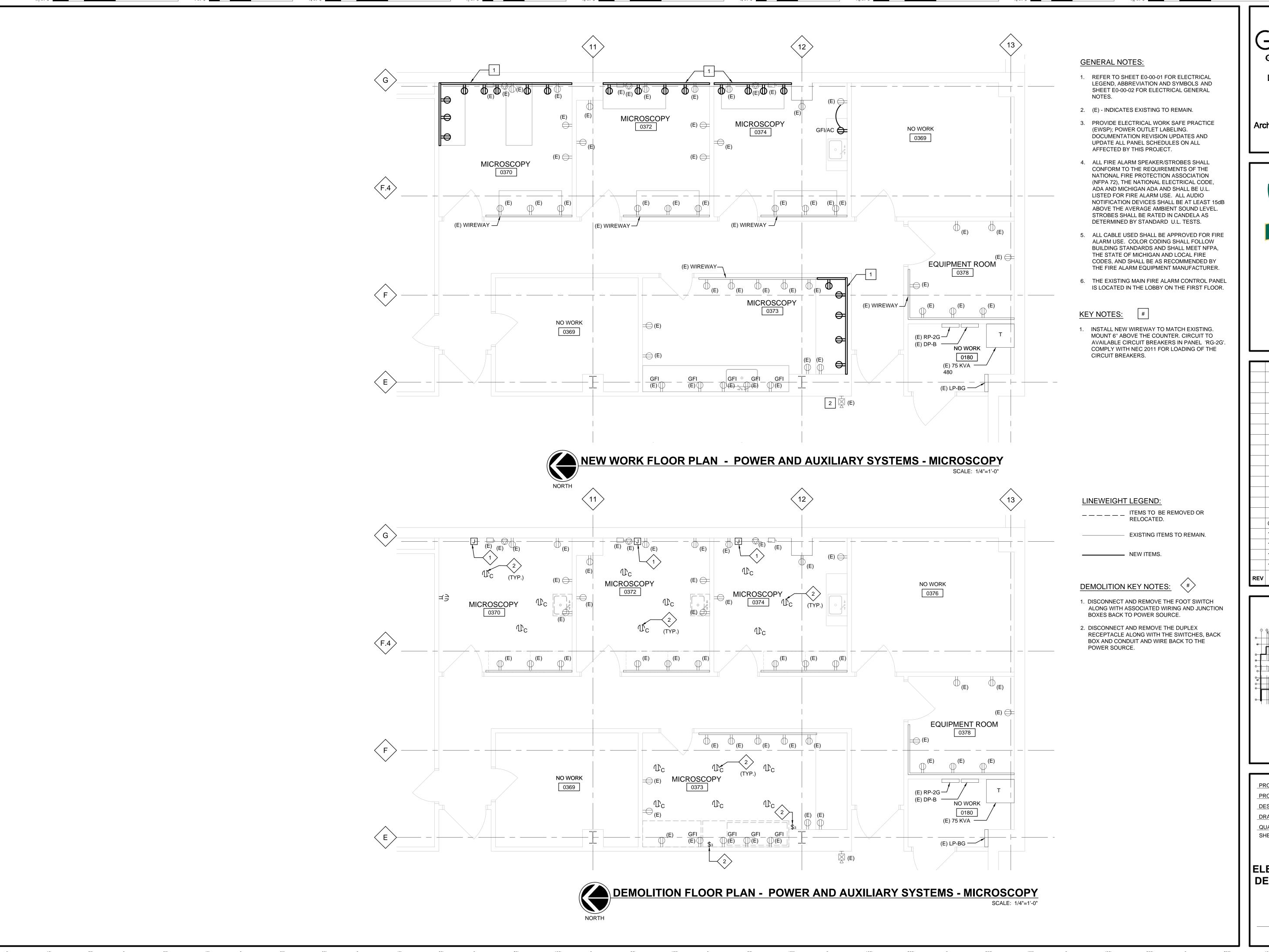
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01/20/15 BID
12/10/14 100% OWNER REVIEW
11/14/14 FINAL OWNER REVIEW
10/31/14 OWNER REVIEW UPDATE
10/16/14 90% OWNER REVIEW
REV DATE ISSUED FOR

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

ELECTRICAL GENERAL NOTES

E0-00-02SHEET NUMBER



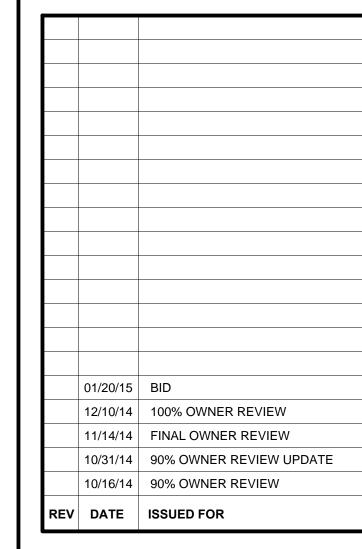


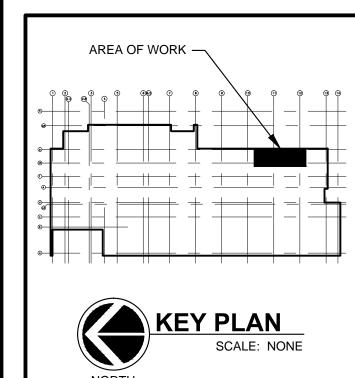
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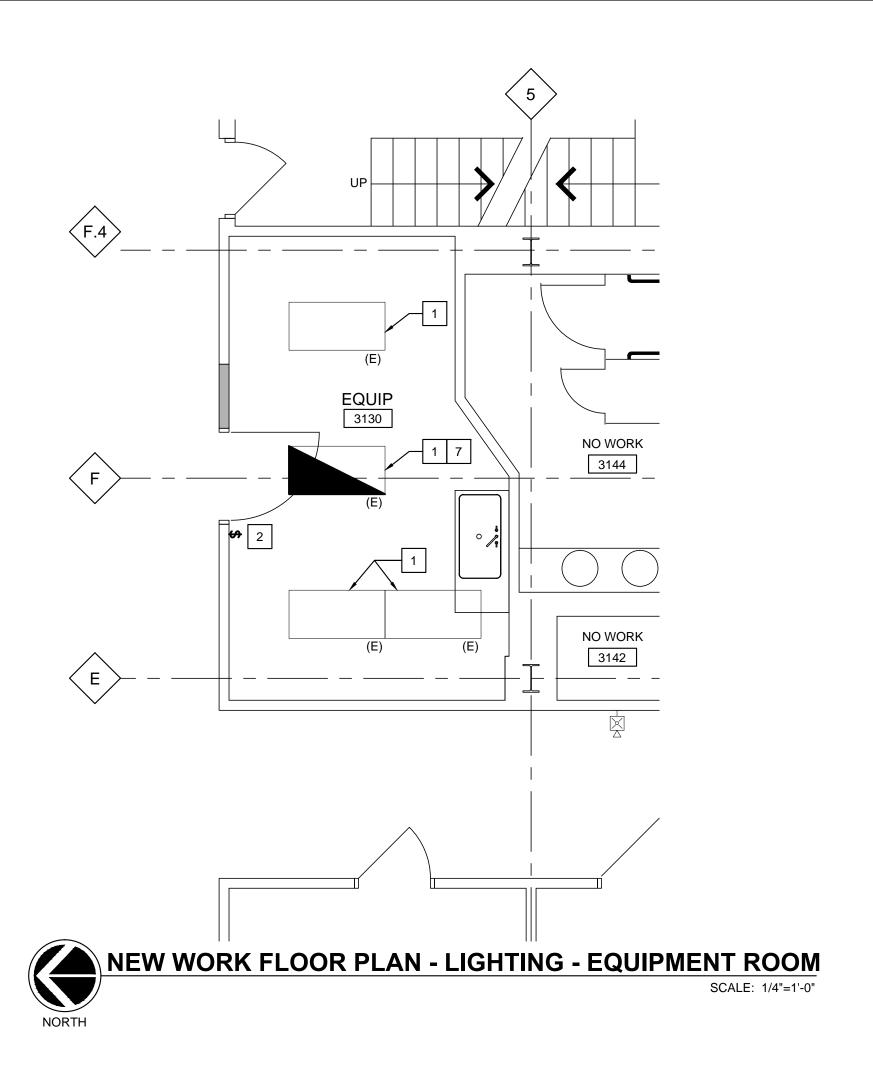


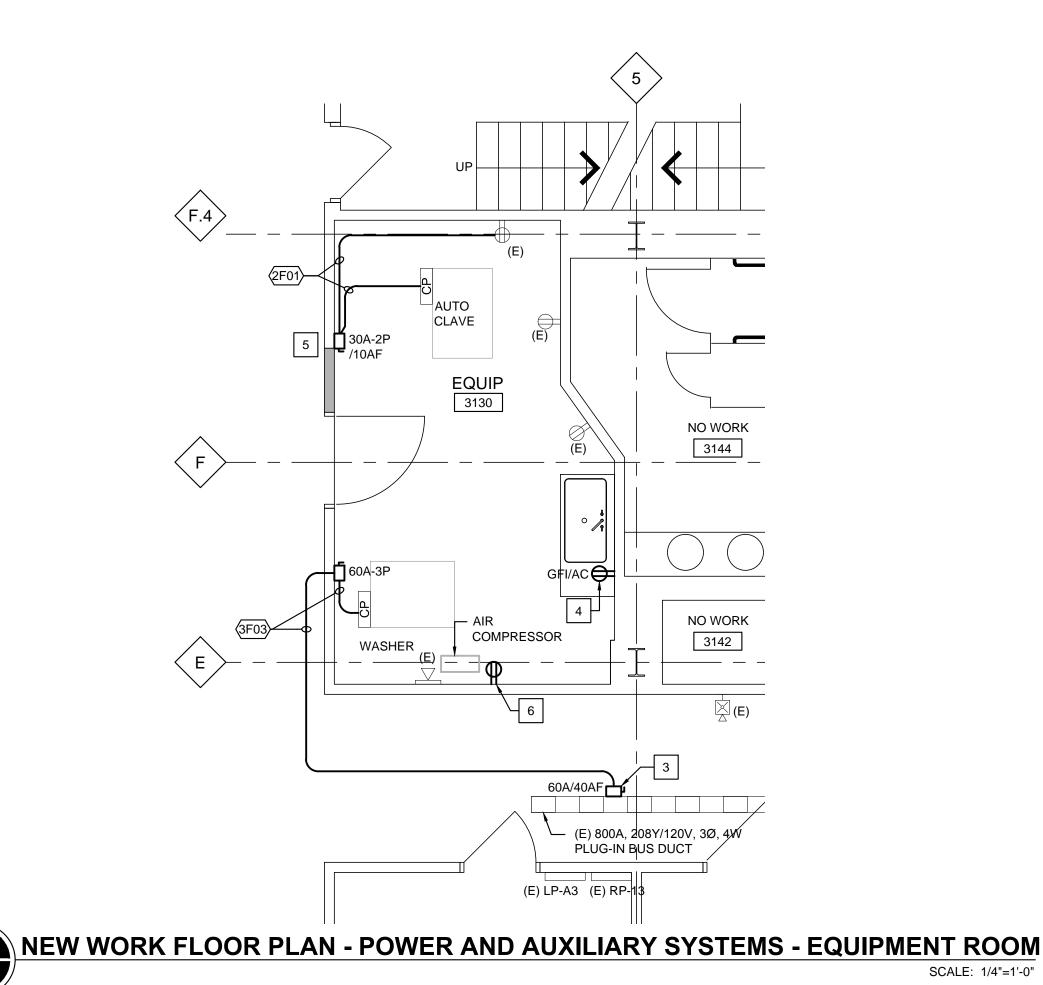


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SHEET TITLE	

LOWER LEVEL
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK

EP1-L1-01





DEMOLITION FLOOR PLAN - EQUIPMENT ROOM

GENERAL NOTES:

- 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.



- REPLACE EXISTING LENS WITH A NEW, 0.125" THICK ACRYLIC PRISMATIC LENS. CLEAN AND RE-LAMP THE LUMINAIRE.
- EXTEND EXISTING CIRCUIT FROM THE JUNCTION BOX IN THE CEILING SPACE, WITH NEW CONDUIT AND WIRE TO THE NEW SWITCH.
- 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 'RP-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

DEMOLITION KEY NOTES:



- 1. DISCONNECT AND REMOVE SWITCH ALONG WITH BACK BOX AND CONDUIT AND WIRING BACK TO FIRST ACTIVE JUNCTION BOX IN THE CEILING SPACE. RETAIN WIRING IN JUNCTION BOX FOR REUSE.
- DISCONNECT AND REMOVE SAFETY SWITCH ALONG WITH CONDUIT AND WIRE FROM THE DISHWASHER AND TO THE POWER SOURCE LABEL SOURCE 'SPARE'.
- 3. DISCONNECT AND REMOVE RECEPTACLE RETAIN BACK BOX AND WIRING FOR REUSE.

LINEWEIGHT LEGEND:

_____ ITEMS TO BE REMOVED OR RELOCATED.

—————— EXISTING ITEMS TO REMAIN.

NEW ITEMS.

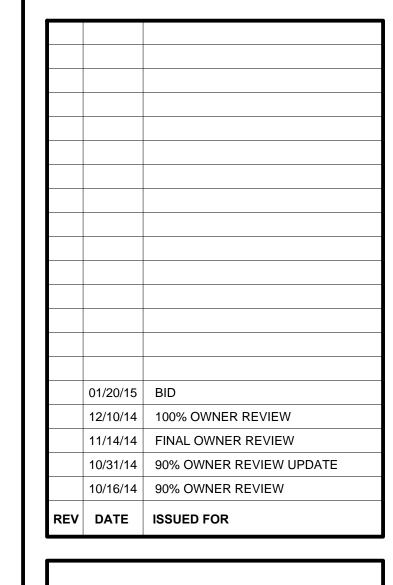
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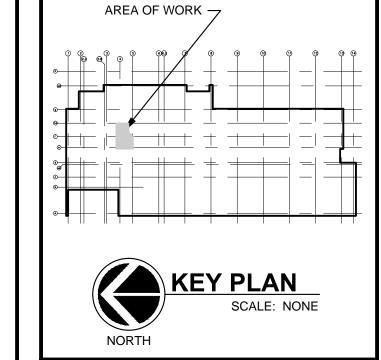
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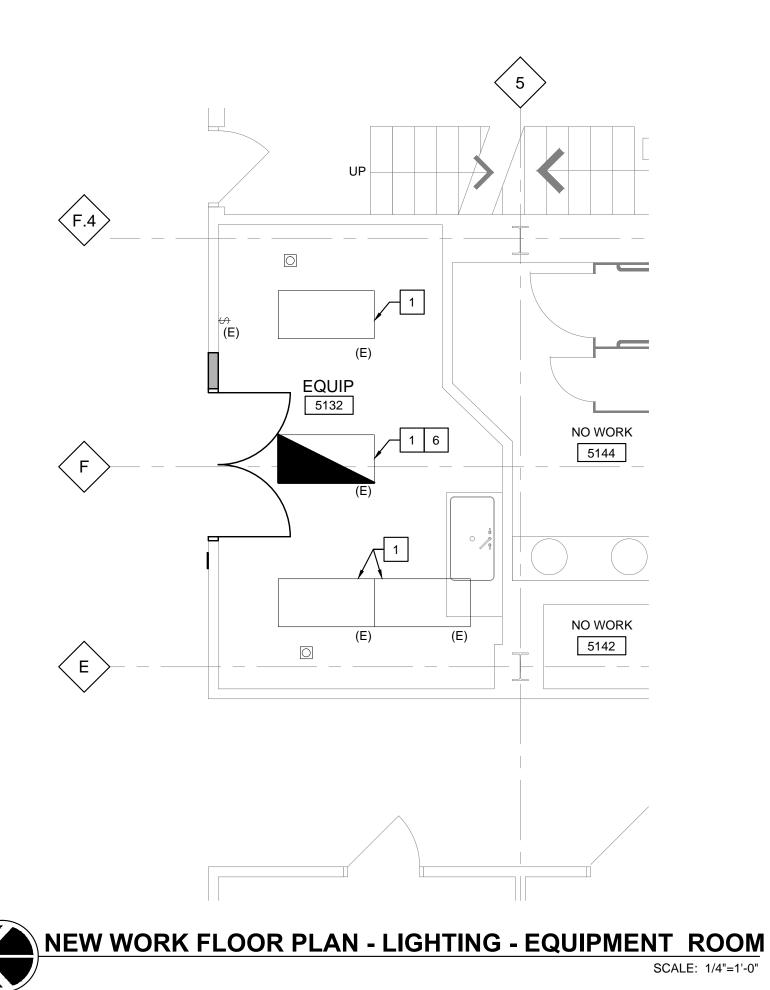


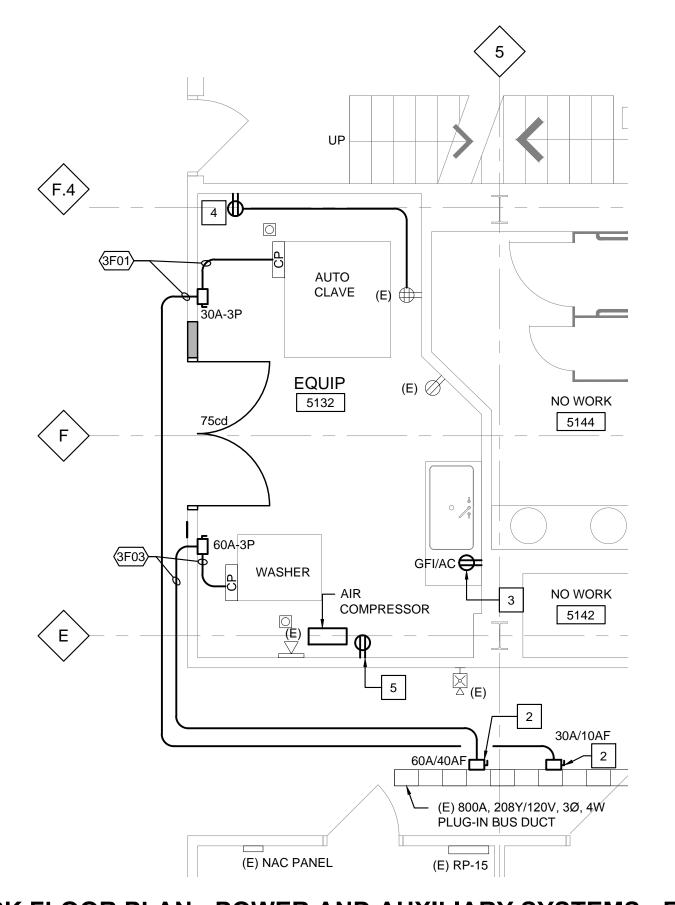


PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
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SHEET TITLE	

LEVEL THREE
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK

EP1-03-01 SHEET NUMBER





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

$\langle F.4 \rangle$ **EQUIP** 5132 NO WORK 5144 NO WORK 5142 (E) 800A, 208Y/120V, 3Ø, 4W PLUG-IN BUS DUCT



(E) NAC PANEL

GENERAL NOTES:

- 1. REFER TO SHEET E0-00-01 FOR ELECTRICAL LEGEND, ABBREVIATION AND SYMBOLS AND SHEET E0-00-02 FOR ELECTRICAL GENERAL
- 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.



- 1. REPLACE EXISTING LENS WITH A NEW, 0.125" THICK ACRYLIC PRISMATIC LENS. CLEAN AND RE-LAMP THE LUMINAIRE.
- 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
- 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 LOCAL LIGHTING SWITCH IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

DEMOLITION KEYED NOTES:



- DISCONNECT AND REMOVE SAFETY SWITCH ALONG WITH CONDUIT AND WIRE FROM THE DISHWASHER AND TO THE POWER SOURCE LABEL SOURCE 'SPARE'.
- 2. DISCONNECT AND REMOVE RECEPTACLE RETAIN BACK BOX AND WIRING FOR REUSE.
- 3. PROVIDE SUPPORT FOR THE EXISTING LUMINAIRES WHILE THE CEILING GRID AND CEILING TILES ARE REPLACED.
- 4. DISCONNECT AND REMOVE THE MANUAL STARTERS / SWITCHES ALONG WITH BACK BOX, AND CONDUIT AND WIRE BACK TO THE POWER SOURCE. LABEL SOURCE "SPARE" IF NOT BEING

LINEWEIGHT LEGEND:

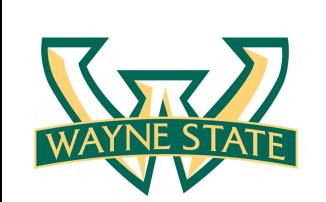
_ _ _ _ _ ITEMS TO BE REMOVED OR RELOCATED.

EXISTING ITEMS TO REMAIN.

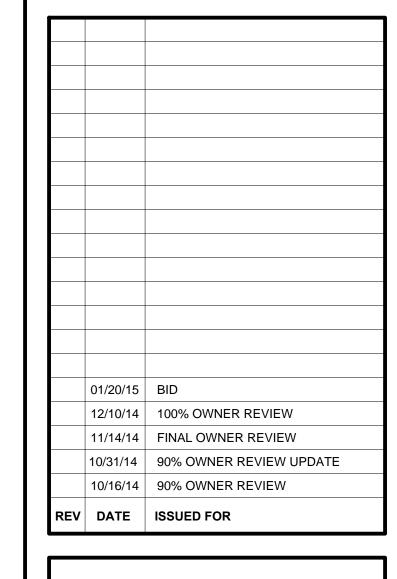
NEW ITEMS.

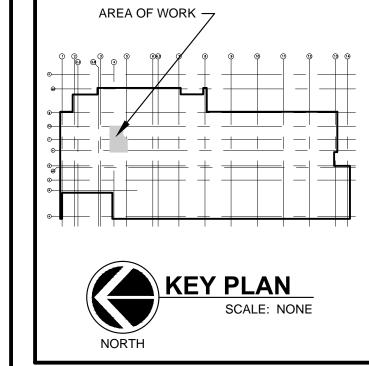
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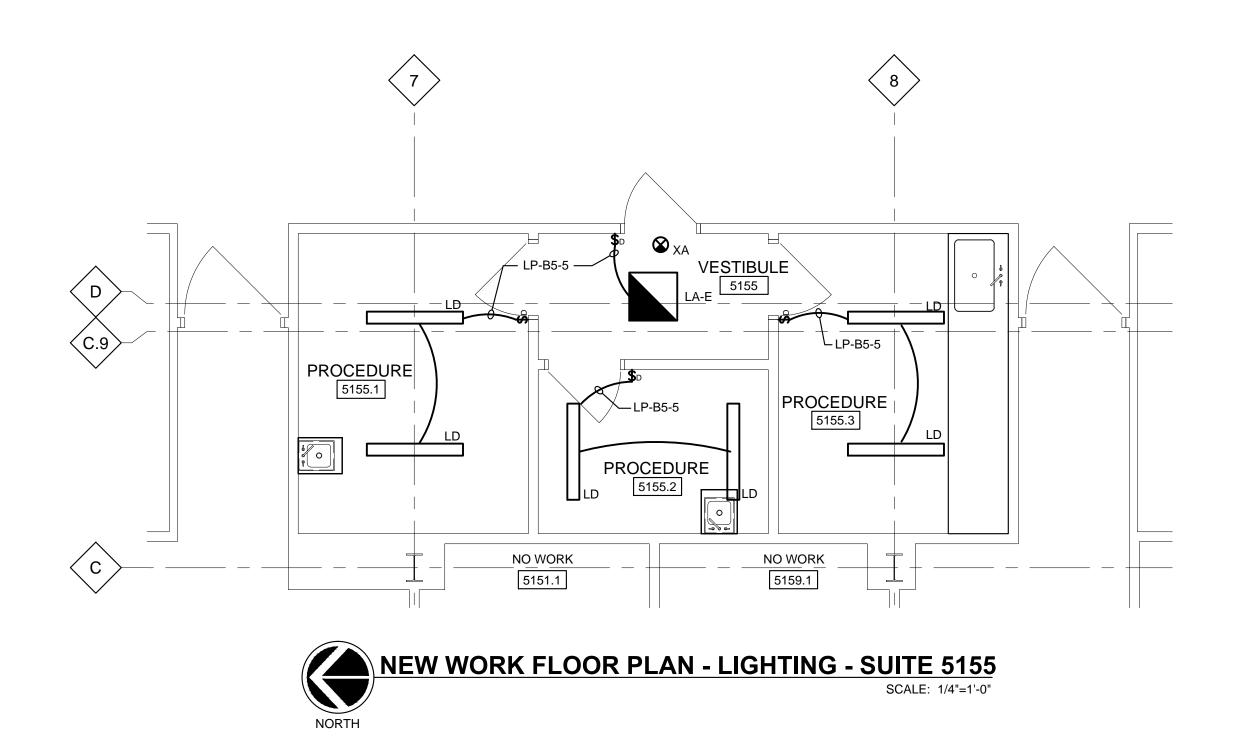


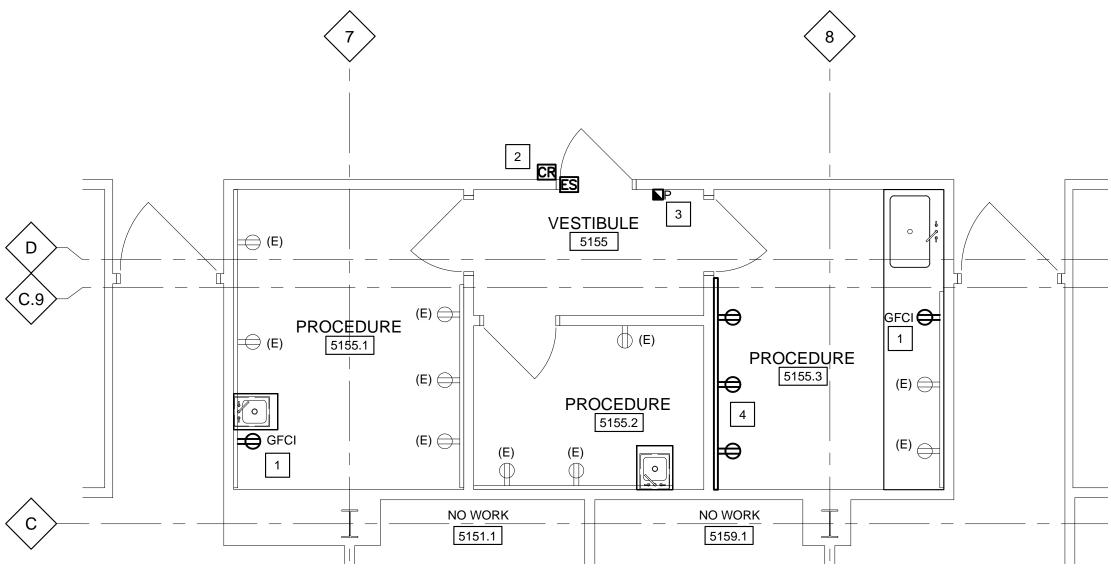


	PROJECT #	137378.001
	PROJECT MANAGER	S. HAHN
	DESIGNED	M. SABAPATHY
	DRAWN BY	J. JASSAL
	QUALCHECK	D. RUTKOWSKI
	SHEET TITLE	
ı		

LEVEL FIVE ELECTRICAL FLOOR PLANS DEMOLITION & NEW WORK

> EP1-05-01 SHEET NUMBER





NEW WORK FLOOR PLAN - POWER AND AUXILIARY SYSTEMS - SUITE 5155

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

GENERAL NOTES:

- 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.



Ghafari Associates, L.L.C.

17101 Michigan Avenue Dearborn, MI USA 48126

Tel 313.441.3000

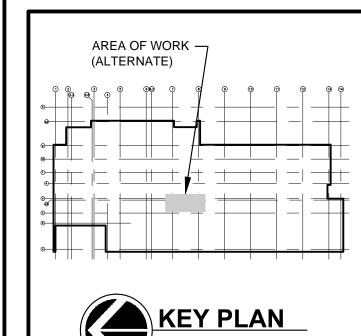
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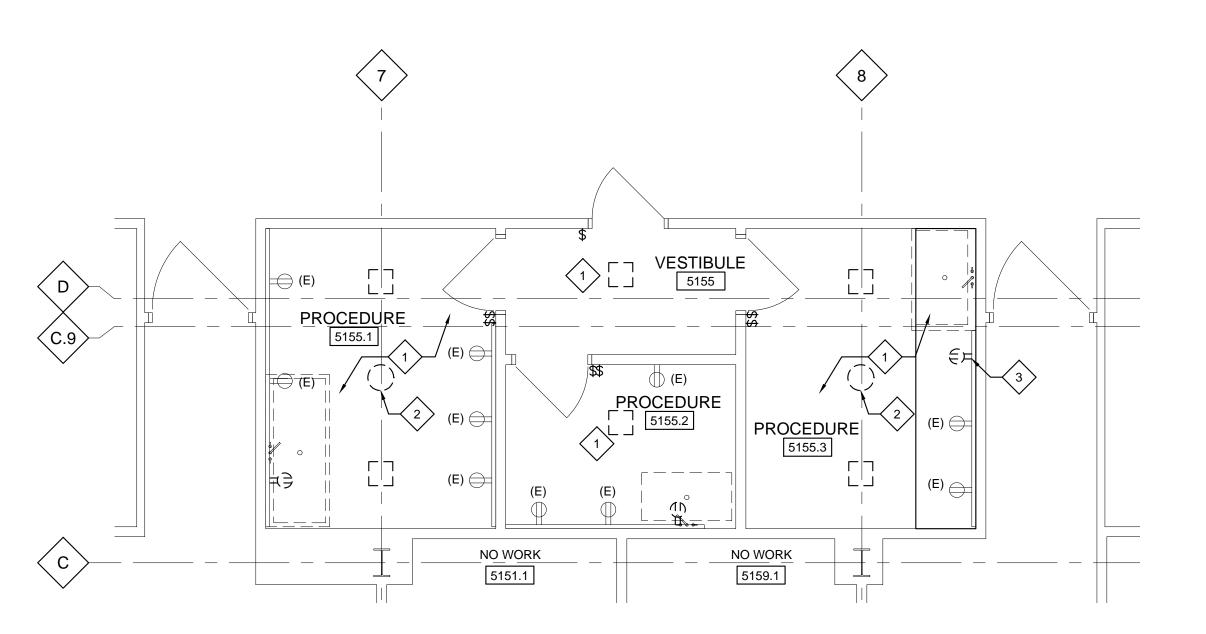
01/20/15 BID
12/10/14 100% OWNER REVIEW
11/14/14 FINAL OWNER REVIEW
10/31/14 90% OWNER REVIEW UPDATE
10/16/14 90% OWNER REVIEW
REV DATE ISSUED FOR



١.		
	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

EP1-05-02SHEET NUMBER





 INSTALL A NEW GFCI RECEPTACLE IN THE WIREWAY AND CONNECT TO THE EXISTING CIRCUIT.

KEY NOTES:

- 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 KEY NOTES: (#)

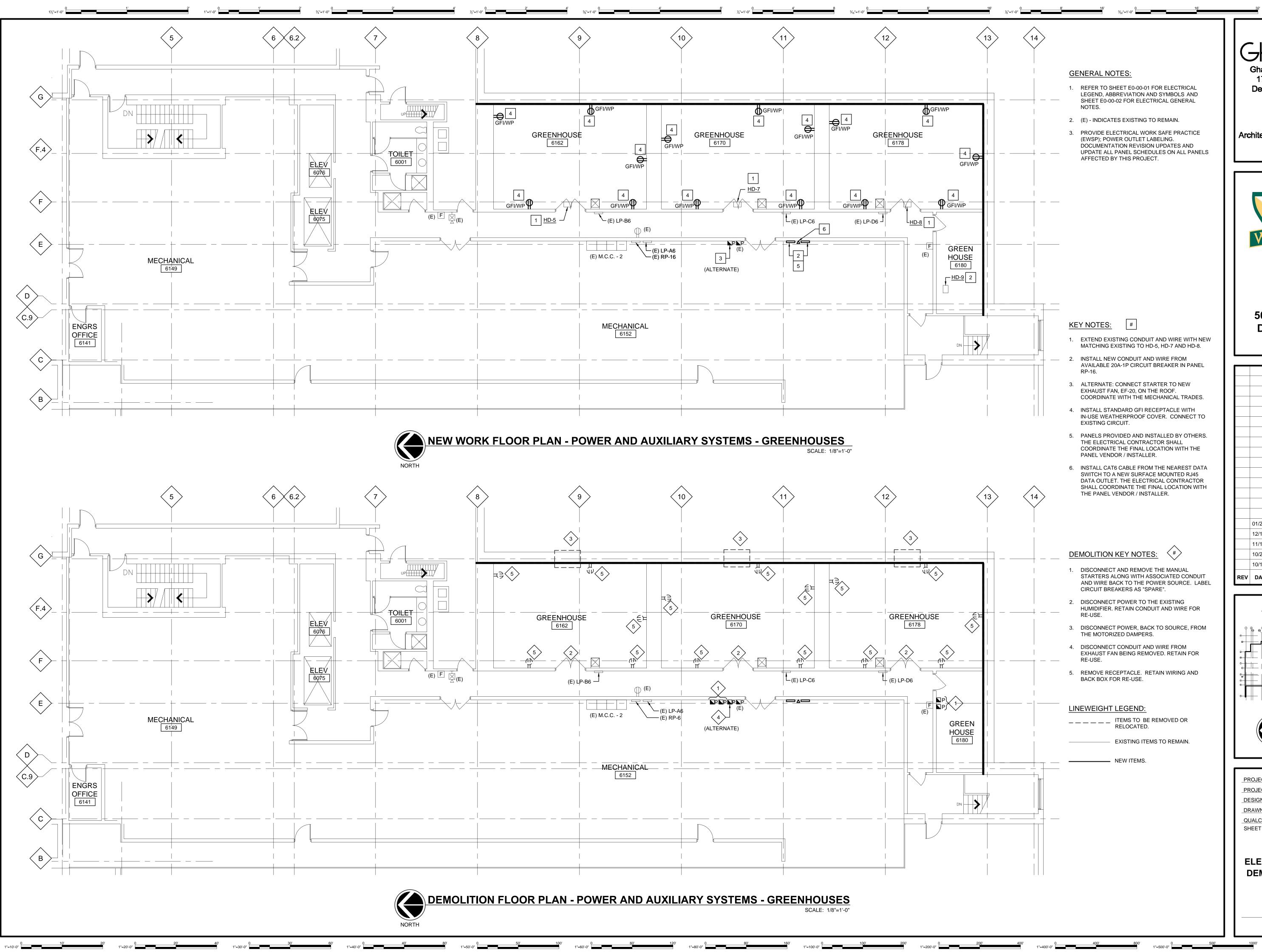
- DISCONNECT AND REMOVE THE EXISTING
 LUMINAIRES ALONG WITH THE ASSOCIATED
 SWITCHES. RETAIN BACK BOX AND WIRING FOR

 PELLISE
- 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.
- DISCONNECT AND REMOVE RECEPTACLE FROM WIREWAY. LEAVE WIRING IN PLACE FOR RE-USE.

LINEWEIGHT L	<u> EGEND:</u>
	TEMS TO BE REMOVED OR RELOCATED.

————— EXISTING ITEMS TO REMAIN.

NEW ITEMS.



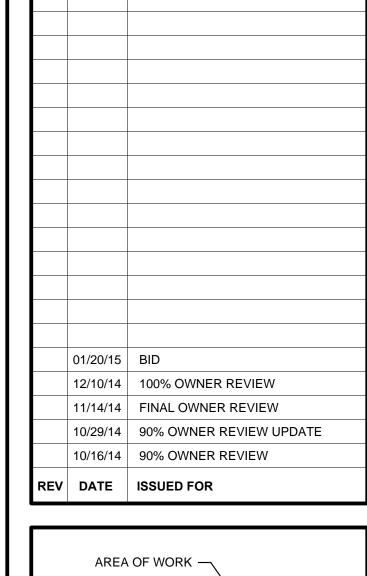
| GHAFARI

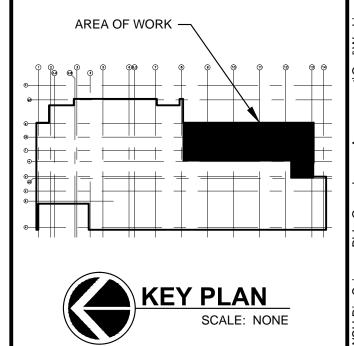
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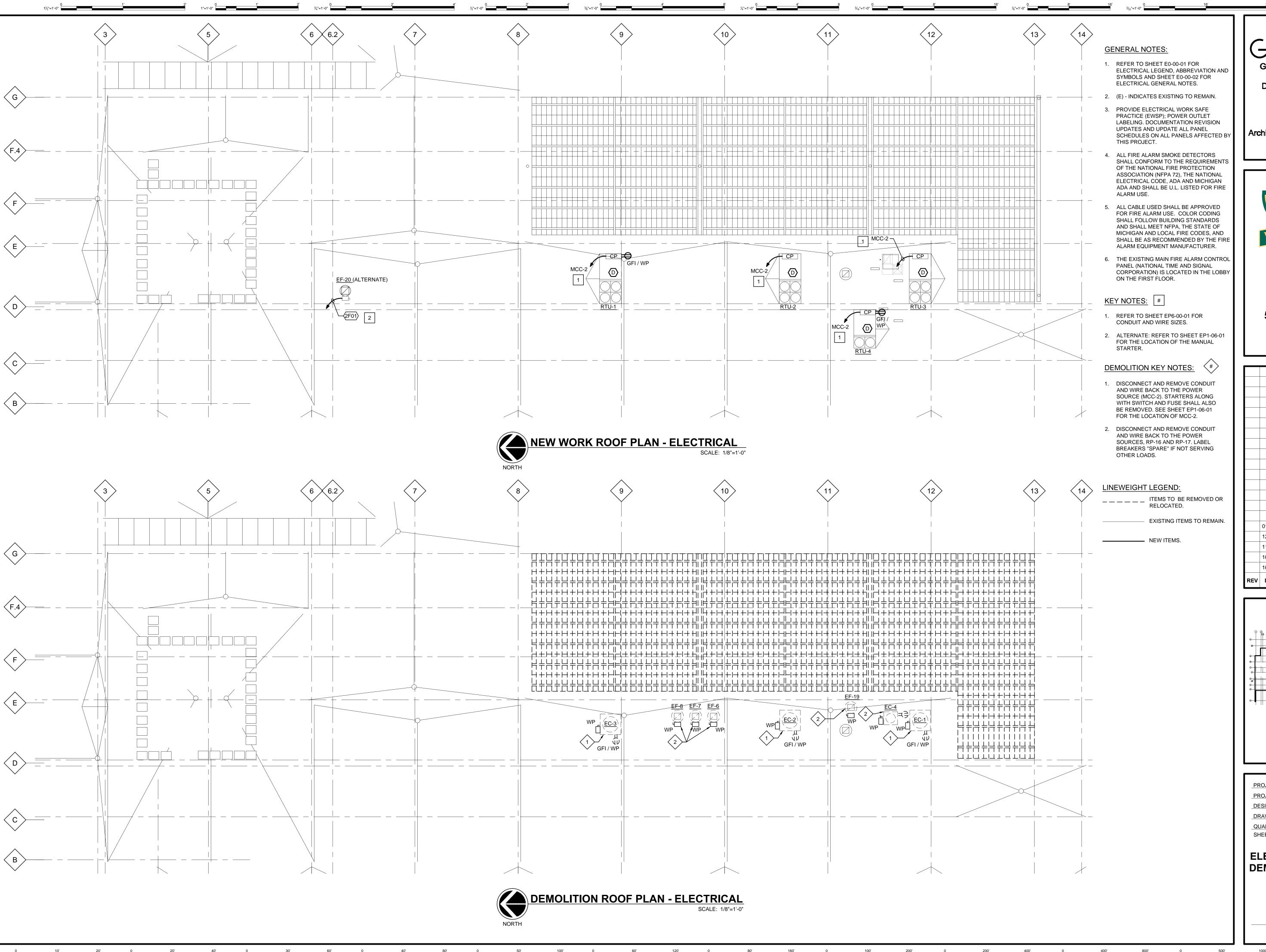




) 13
PROJECT #	137378.001	s\2
PROJECT MANAGER	S. HAHN	ject
DESIGNED	M. SABAPATHY	G:\Projects\201
DRAWN BY	J. JASSAL	۳
QUALCHECK	D. RUTKOWSKI	
SHEET TITLE		_

LEVEL SIX
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK

EP1-06-01



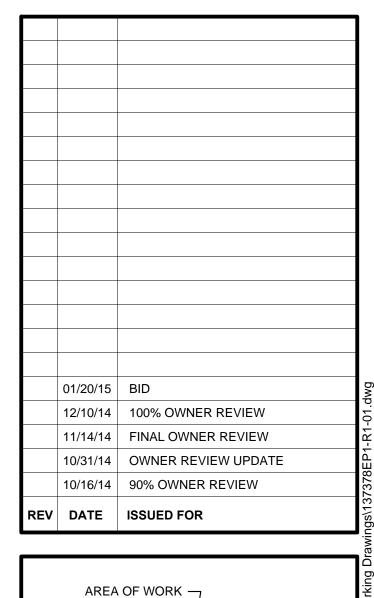
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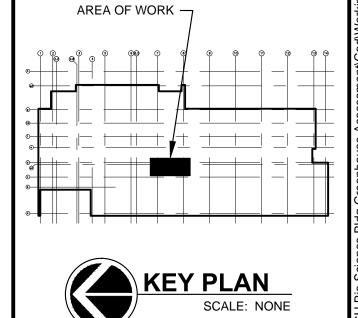
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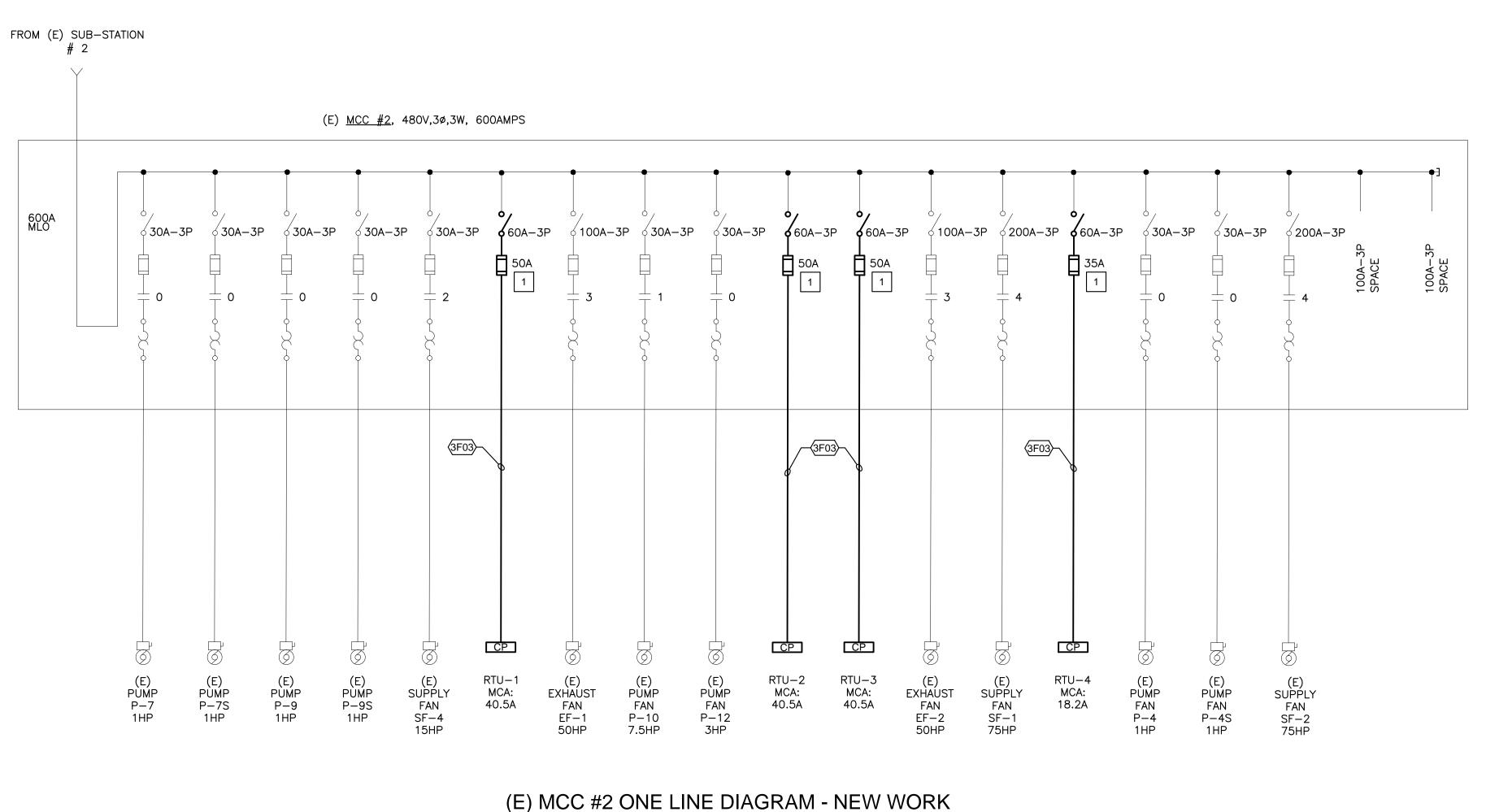




PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J, JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

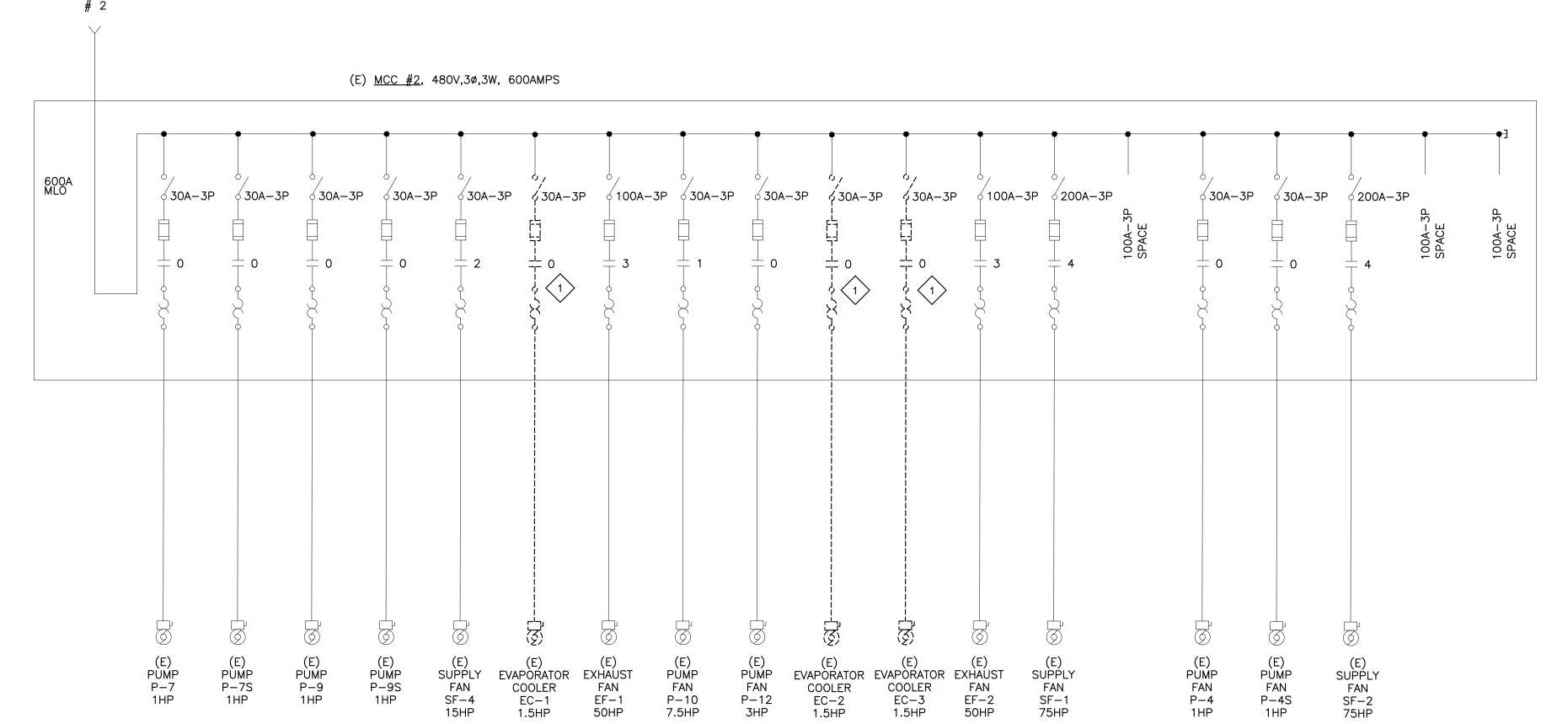
ELECTRICAL ROOF PLANS DEMOLITION & NEW WORK

EP1-R1-01



(E) MCC #2 ONE LINE DIAGRAM - NEW WORK

FROM (E) SUB-STATION
2



(E) MCC #2 ONE LINE DIAGRAM - DEMOLITION SCALE: NONE

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 E0-00-01 FOR THE BRANCH WIRING SCHEDULE.

KEY NOTES:

1. INSTALL A FUSIBLE SWITCH FUSE UNIT WITH FUSES AS SHOWN. UNIT SHALL BE COMPATIBLE WITH THE EXISTING GENERAL ELECTRIC 8000 LINE MOTOR CONTROL CENTER.

LINEWEIGHT LEGEND:

ITEMS TO BE REMOVED OR RELOCATED.

- EXISTING ITEMS TO REMAIN.

——— NEW ITEMS.

DEMOLITION KEY NOTES: (#>

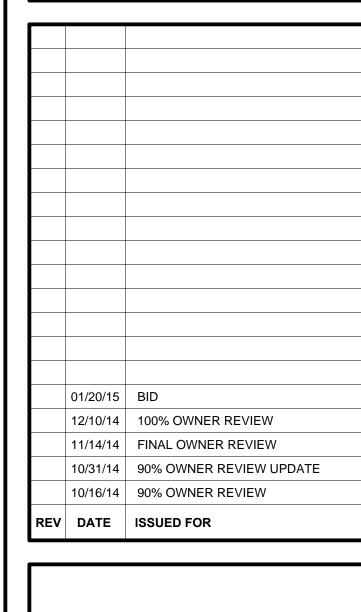
1. DISCONNECT AND REMOVE THE FUSIBLE SWITCH FUSE UNIT ALONG WITH THE CONTACTOR AND HEATER. RETAIN COMPARTMENT FOR RE-USE.

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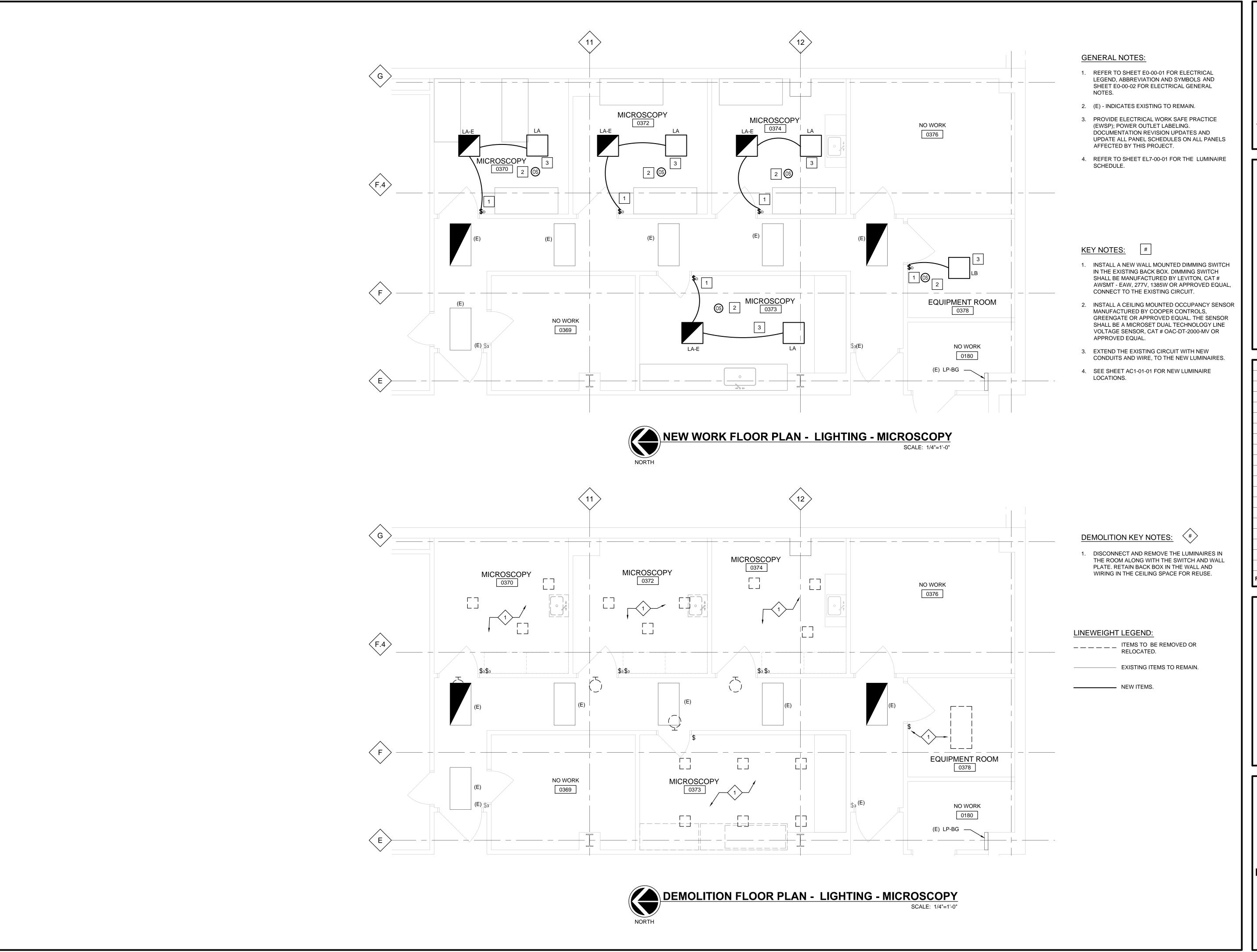
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	PROJECT#	137378.001
	PROJECT MANAGER	S. HAHN
	DESIGNED	M. SABAPATHY
	DRAWN BY	J. JASSAL
	QUALCHECK	D. RUTKOWSKI
	SHEET TITLE	

ONE LINE DIAGRAM

EP6-00-01



CTRICAL
OLS AND
ENERAL

Dearborn, MI USA 48126
Tel 313.441.3000
Fax 313.441.1545

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SCALE: NONE

PROJECT # 137378.001

PROJECT MANAGER S. HAHN

PROJECT MANAGER

DESIGNED

M. SABAPATHY

DRAWN BY

J. JASSAL

QUALCHECK

SHEET TITLE

LOWER LEVEL
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK

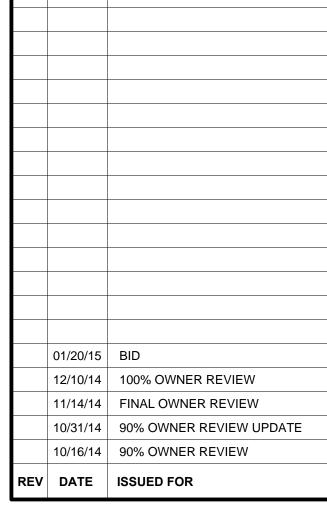
EL1-L1-01
SHEET NUMBER

Ghafari Associates, L.L.C.
17101 Michigan Avenue

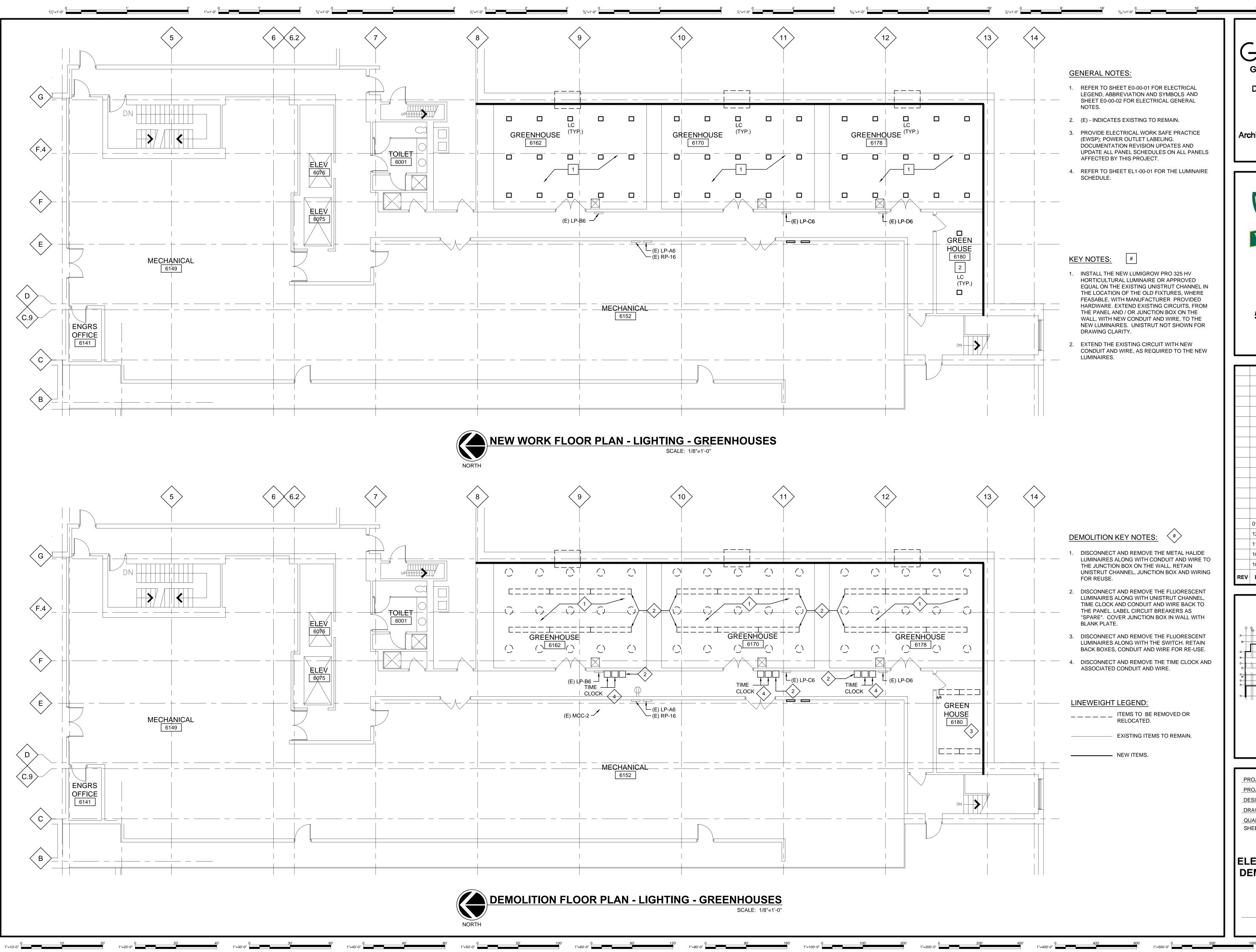
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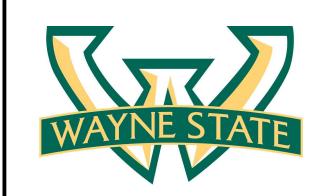
AREA OF WORK —



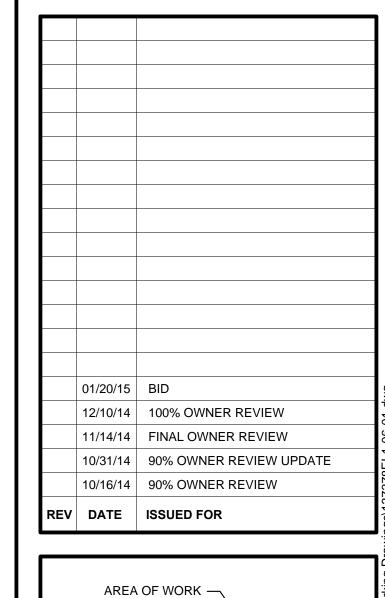
GHAFARI **#**

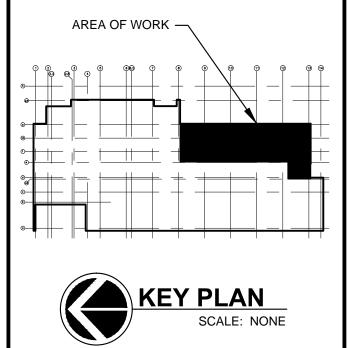
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PROJECT #	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

LEVEL SIX
ELECTRICAL FLOOR PLANS
DEMOLITION & NEW WORK

EL1-06-01
SHEET NUMBER

TYPE	DESCRIPTION	LAMPS	VOLTAGE	MANUFACTURER	CATALOG NUMBER	BALLAST / DRIVER	REMARKS
	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		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
	LIGHT-WEIGHT, STRONG POWER COATED ALUMINUM. IP67 RATED WATERPROOF FIXTURE.						SURFACE MOUNTED. PROVIDE ALL ACCESSORIES NECESSARY FOR A CLEAN AND COMPLETE INSTALLATION. INCLUDE THE LUMIGROW SMARTPAR LIGHT MANAGEMENT SERVICE. CONTACT:

LUMIBAR PRO LED STRIP

LIGHT OR APPROVED EQUAL LED DRIVER

EDGR 2 RMR EL SD LED DRIVER

LUMIGROW LUMIBAR PRO LED STRIP LIGHT OR

LITHONIA LIGHTING - LED EDGE LIT EXIT

COOPER LIGHTING - SURE-LITE

APPROVED EQUAL

SCOTT FEINSTEIN

LUMIGROW, INC.

612.396.9664 CELL

800.514.0487 EXT.112

SCOTT@LUMIGROW.COM WWW.LUMIGROW.COM

SENIOR ACCOUNT EXECUTIVE

33 COMMERCIAL BLVD., NOVATO, CA 94949

CLEAN AND COMPLETE INSTALLATION

MOUNTING KIT AS NECESSARY (RECESSED, TOP, BACK, END) FOR A

ALUMINUM, IP67 RATED WATERPROOF FIXTURE.

LD POWER SUPPLY. INDIVIDUALLY ADJUSTABLE 3-

XA VIEWING DISTANCE RATING, BASED ON UL924

MANAGEMENT SERVICE

CHANNEL KNOBS FOR PRECISE CONTROL.

INCLUDE THE LUMIGROW SMARTPAR LIGHT

SMART VOLT AUTO-SWITCHING AND REGULATING

EXTRUDED ALUMINUM FINISH CANOPY COVERING THE RECESSED, SELF-CONTAINED ELECTRONICS. CLEAR THERMOPLASTIC PANELS WITH PRECISION OUTLINE ENGRAVED LETTERS, WITH 100 FT

STANDARDS. MIRRORED SEPARATOR PANEL TO SIMULATE CLEAR BACKGROUND. DUAL VOLTAGE, NICKEL-CADMIUM BATTERY, SELF-DIAGNOSTICS

LUMINAIRE SCHEDULE



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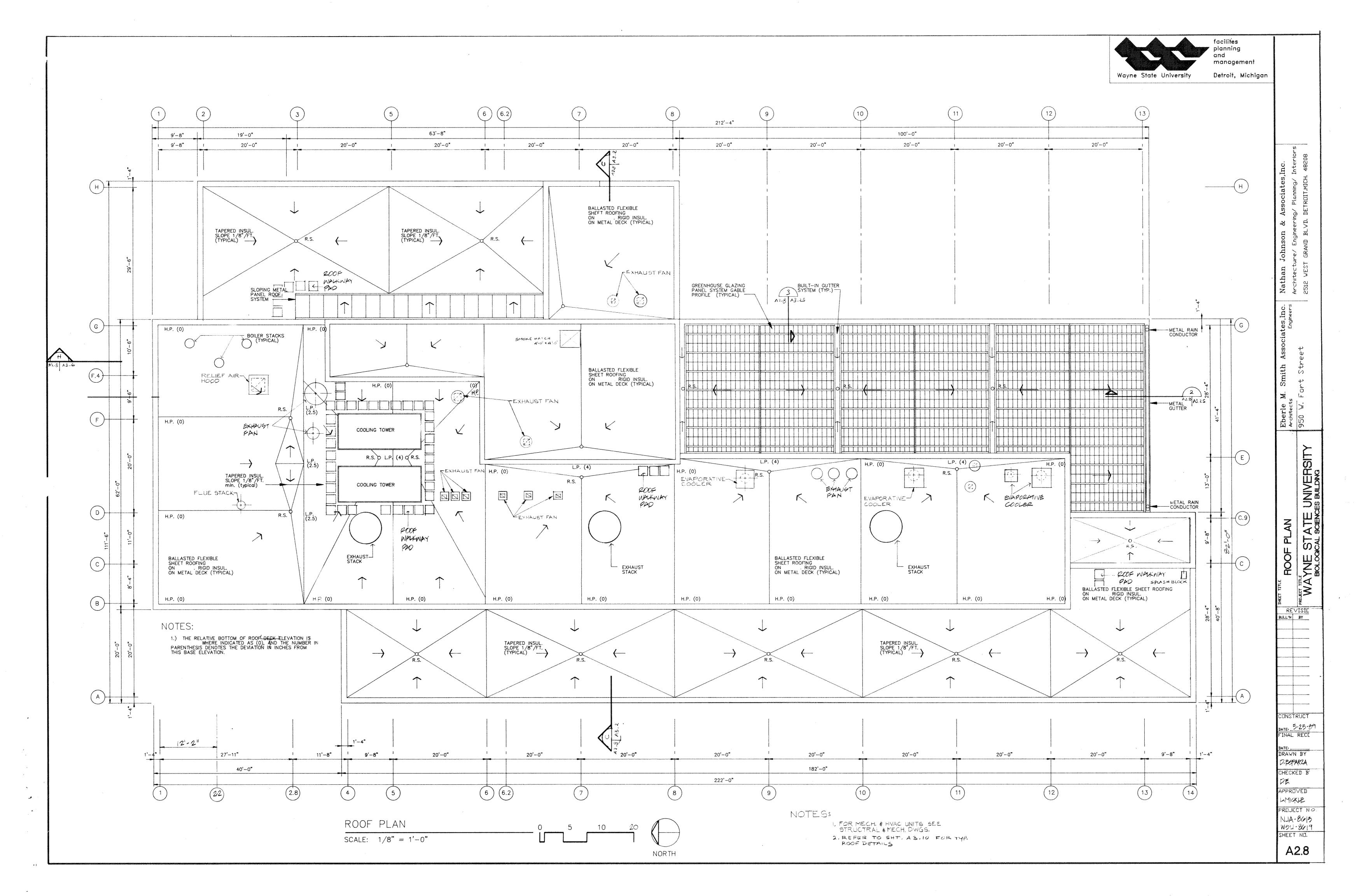
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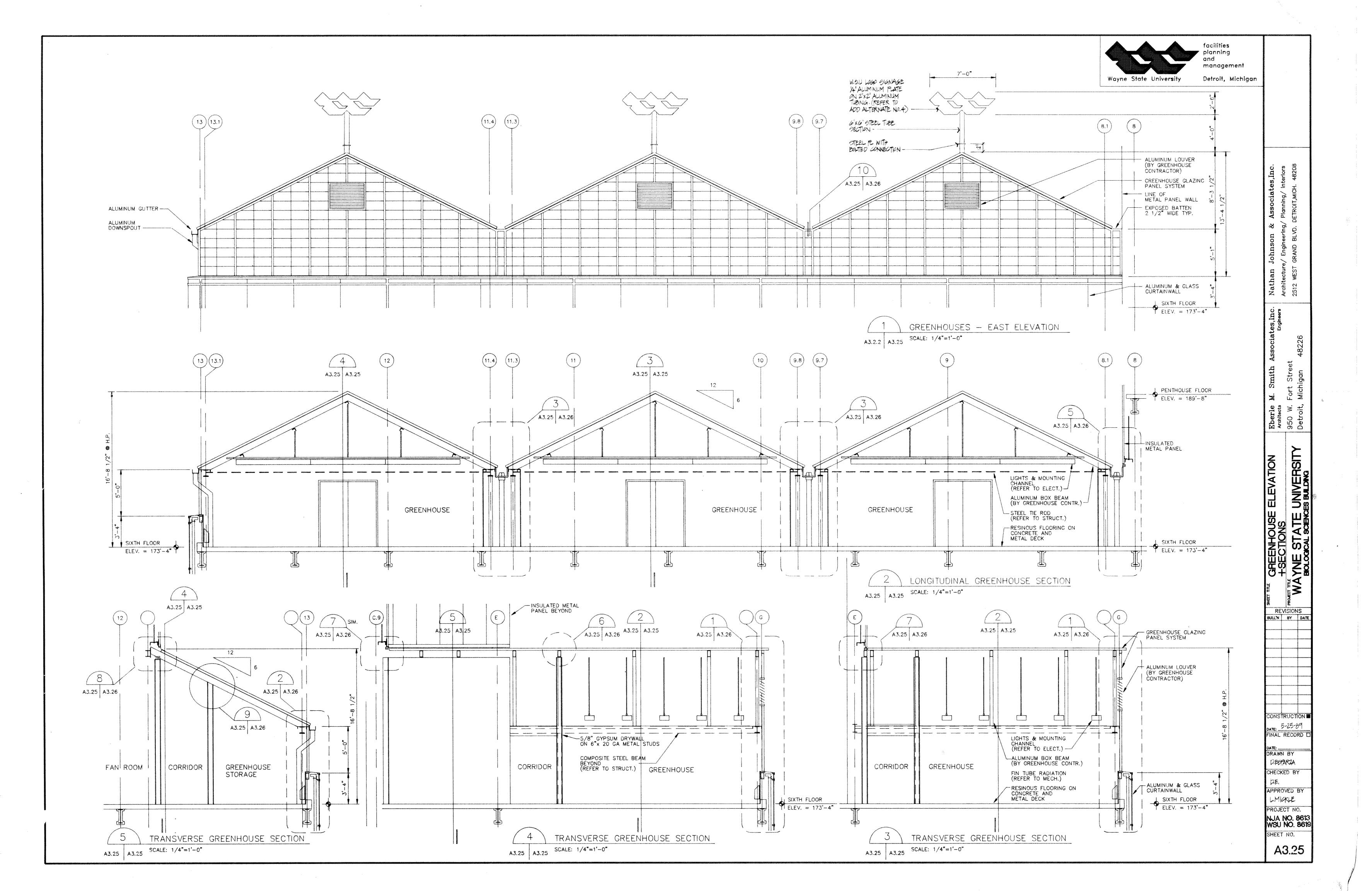
DATE	ISSUED FOR
10/16/14	90% OWNER REVIEW
10/31/14	90% OWNER REVIEW UPDATE
11/14/14	FINAL OWNER REVIEW
12/10/14	100% OWNER REVIEW
01/20/15	BID

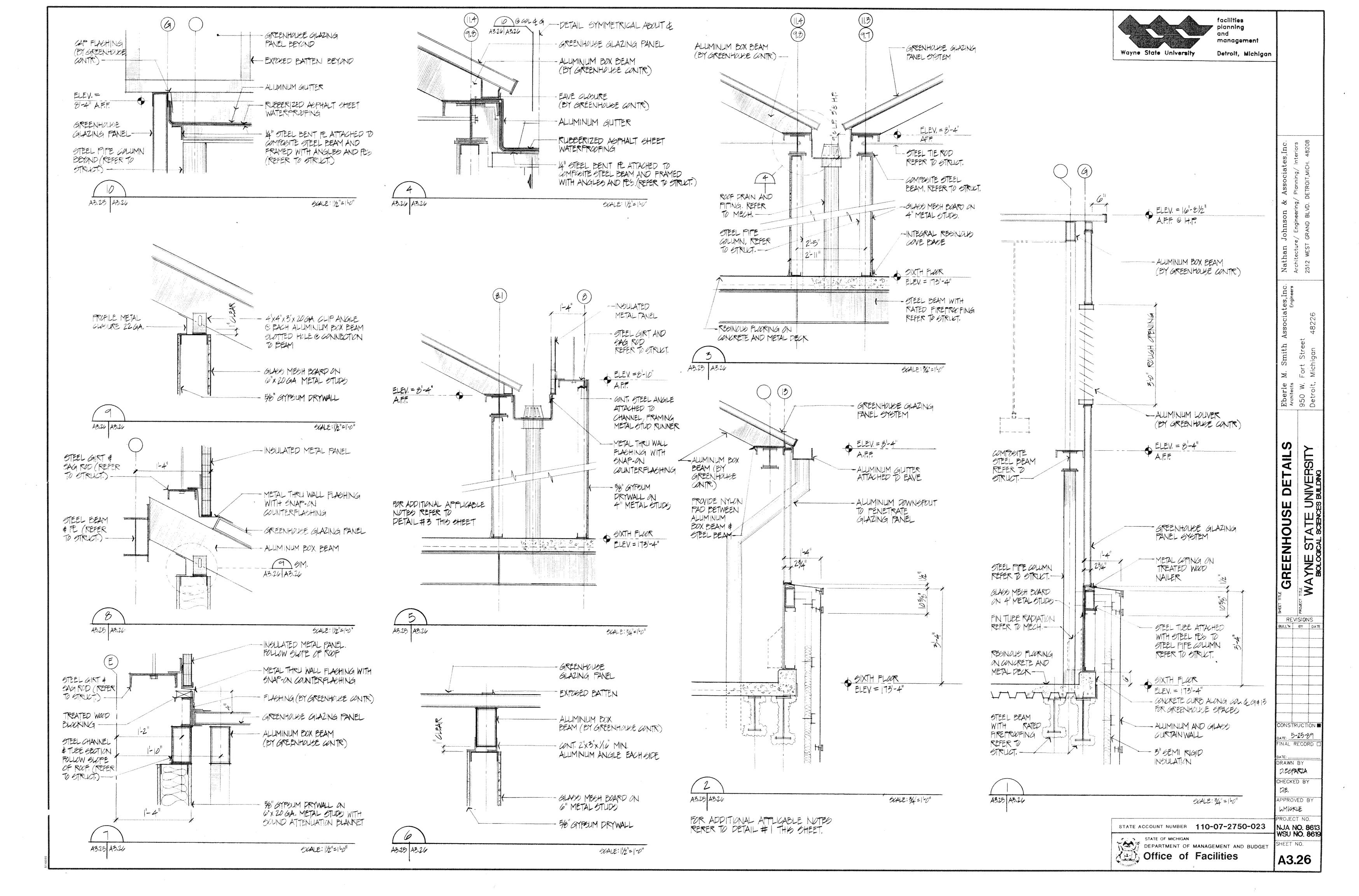
PROJECT#	137378.001
PROJECT MANAGER	S. HAHN
DESIGNED	M. SABAPATHY
DRAWN BY	J. JASSAL
QUALCHECK	D. RUTKOWSKI
SHEET TITLE	

LUMINAIRE SCHEDULE

EL7-00-01
SHEET NUMBER







Anixter Building Automation Cables Non-Plenum Print Legend SBT Part Number Description NORTHFLEX ® H-TP20-CM "DI, DO, AI, AO" (Mfg E#) 20AWG 1P 75°C CM (UL) C(UL) 20AWG,STR,1TP,CM,BLUE JACKET H-TP20-CM NORTHFLEX ® H-3C20-CM "TEC V/D" (Mfg E#) 20 AWG-3C 75°C CM (UL) C(UL) 20AWG,STR,3COND,CM,BLUE JACKET H-3C20-CM NORTHFLEX ® H-TP18-CMR "DI, DO, AL AO" (Mfg E#) 18AWG 1P 75°C CMR (UL) C(UL) 18AWG,STR, 1TP, CMR, BLUE JACKET H-TP18-CMR NORTHFLEX ® H-3C18-CMR "TEC V/D" (Mfg E#) 18 AWG 3C 75°C CMR (UL) C(UL) H-3C18-CMR 18AWG.STR.3COND.CMR.BLUE-JACKET H-2C14-CL3R "L-V POWER" (Mfg E#) 14 AWG 2C 75°C CL3R (UL) C(UL) 14AWG,STR,2COND,CL3R,DARK BLUE JACKET H-2C14-CL3R H-B-TSP24LC-CM "BLN" (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL) H-B-TSP24LC-CM BLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET NORTHFLEX ® H-F-TSP24LC-CM "FLN" (Mfg E#) 24 AWG 1P 75°C CM (UL) C(UL) FLN24AWG,STR,TSP,LOCAP,CM,ORANGE JACKET W/ BLUE STRIPE> H-F-TSP24LC-CM NORTHFLEX ® H-3P24-CMR "TEC STAT" (Mfg E#) 24 AWG 3P 75°C CMR (UL) C(UL) H-3P24-CMR 24AWG,SOL,3P,CMR,BLUE JACKET NORTHFLEX (DEON-1P22-CM "LON FLN" (Mfg E#) 22AWG 1P 750 C CM (UL) C(UL) 22AWG,STR,1PAIR,CM,ORANGE JACKET WHWHITE STRIPE LON-1P22-CM NORTHFLEX ® LON-2P22-CM-"LON FLN" (Mfg E#) 22AWG 2P 750 C CM (UL) C(UL) 22AWG,STR,2PAIR,CM,ORANGE JACKET W/ WHITE STRIPE LON-2P22-CM NORTHFLEX ® LON-1PS22-CM "LON FLN" (MIG E#) 22AWG 1P 750 C CM (UL) C(UL) 22AWG,STR,1PAIR,0AS,CM,ORANGE JACKET W/ WHITE STRIPE LON-1PS22-CM NORTHFLEX ® LON-2PS22-CM "LON FLN" (Mfg E#) 22AWG 2P 750 C CM (UL) C(UL) 22AWG,STR,2PAIR,OAS,CM,ORANGE JACKET W/ WHITE STRIPE LON-2PS22-CM NORTHFLEX ® E-4TP24CAT5-CM "ETHERNET" (Mfg E#) 24AWG 4P 75Q.C CM (UL C(UL) 24AWG,SOL,4TP,CAT5,CM E-4TP24CAT5-CM NORTHFLEX ® H-A-1.5TSP24LC-CM "ALN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (MIG E#) ALN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM H-A-1.5TSP24LC-CM NORTHFLEX ® H-A-1.5TSP24LC-CM "FLN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#) H-E-4:5TSP24LC-CM FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CM Plenum Print Legend Description SBT Part Number NORTHFLEX ® H-TP20-CMP "DI, DO, AI, AO" (Mfg E#) 20 AWG 2C 75°C CMP (UL) C(UL) 20AWG,STR,1TP,CMP,BLUE JACKET H-TP20-CMP NORTHFLEX ® H-3C20-CMP "TEC V/D" (Mfg E#) 20 AWG 3C 75°C CMP (UL) C(UL) H-3C20-CMP 20AWG.STR.3COND.CMP.BLUE JACKET NORTHFLEX ® H-TP18-CMP "DI, DO, AI, AO" (Mfg E#) 18 AWG 2C 75°C CMP (UL) C(UL) 18AWG,STR,1TP,CMP,BLUE JACKET H-TP18-CMP NORTHFLEX ® H-3C18-CMP "TEC V/D" (Mfg E#) 18 AWG 3C 75°C CMP (UL) C(UL) H-3C18-CMF 18AWG, STR, 3COND, CMP, BLUE JACKET NORTHFLEX ® H-2C14-CL3P "LV POWER" (Mfg E#) 14 AWG 2C 75°C CL3P (UL) C(UL) 14AWG,STR,2COND,CL3P,DARK BLUE JACKET H-2C14-CL3P NORTHFLEX ® H-B-TSP24LC-CMP "BLN" (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL) BLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET H-B-TSP24LC-CMP NORTHFLEX ® H-F-TSP24LC-CMP "FLN" (Mfg E#) 24 AWG TSP 75°C CMP (UL) C(UL) FLN24AWG,STR,TSP,LOCAP,CMP,ORANGE JACKET W/ BLUE STRIPE H-F-TSP24LC-CMP NORTHFLEX ® H-3P24-CMP "TEC STAT" (Mfg E#) 24 AWG 3P 75°C CMP (UL) C(UL) H-3P24-CMP 24AWG,SOL,3PAIR,CMP,BLUE JACKET NORTHFLEX ® LON-1P22-CMP "LON FLN" (Mfg E#) 22AWG 1P 750 C CMP (UL) C(UL) 22AWG,STR,1PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE LON-1P22-CMP NORTHFLEX ® LON-2P22-CMP "LON FLN" (Mfg E#) 22AWG 2P 75O C CMP (UL) C(UL) 22AWG,STR,2PAIR,CMP,ORANGE JACKET W/ WHITE STRIPE LON-2P22-CMP NORTHFLEX ® LON-1PS22-CMP "LON FLN" (Mfg E#) 22AWG 1P 750 C CMP (UL) C(UL) 22AWG,STR,1PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE LON-1PS22-CMP NORTHFLEX ® LON-2PS22-CMP "LON FLN" (Mfg E#) 22AWG 2P 750 C CMP (UL) C(UL) 22AWG,STR,2PAIR,OAS,CMP,ORANGE JACKET W/ WHITE STRIPE LON-2PS22-CMP NORTHFLEX ® E-4TP24CAT5-CMP "ETHERNET" (Mfg E#) 24AWG 4P 750 C CMP (UL E-4TP24CAT5-CMP 24AWG,SOL,4TP,CAT5,CMP NORTHFLEX ® H-A-1.5TSP24LC-CM "ALN485" 24 AWG 1P+1C 75°C CM (UL) C(UL) (Mfg E#) H-A-1.5TSP24LC-CMP ALN485, 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#) FLN485, 24AWG, STR, TP+1C, OAS, LOCAP, CMP H-F-1.5TSP24LC-CMP **Assemblies** Print Legend Description SBT Part Number CABLE ASSEMBLY TEC TO SSB 3 POS 10 FT NVA 550-827 NVA CABLE ASSEMBLY TEC TO SSC 3 POS 10 FT 550-828 **WSU Bio Science REVISION HISTORY SIEMENS**

Siemens Industry, Inc.

Building Technologies Division

45470 Commerce Ctr. Dr

Plymouth Twp., MI 48170

PHONE: 734.456.3800

FAX: 866.815.0749

Detroit, MI

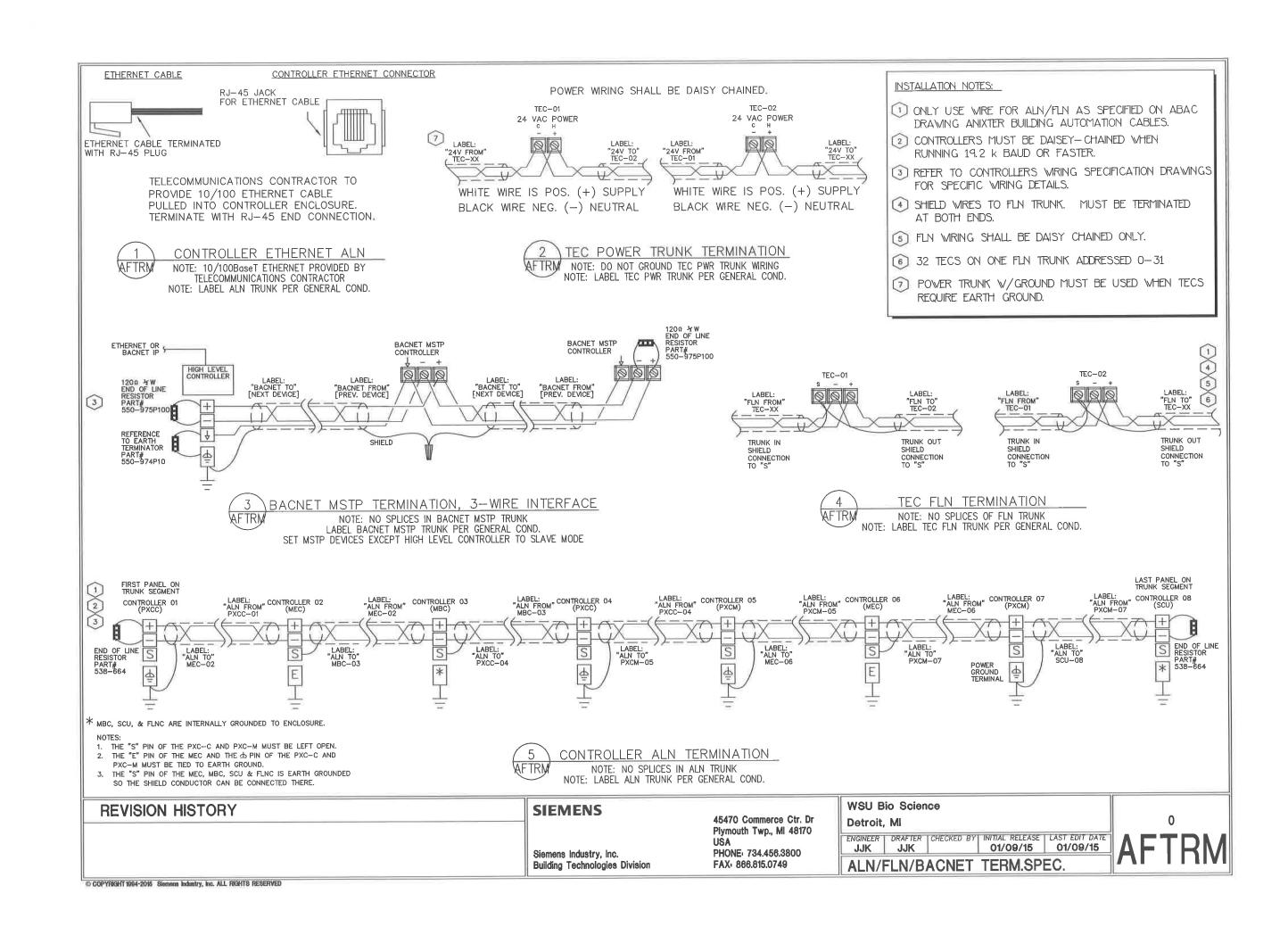
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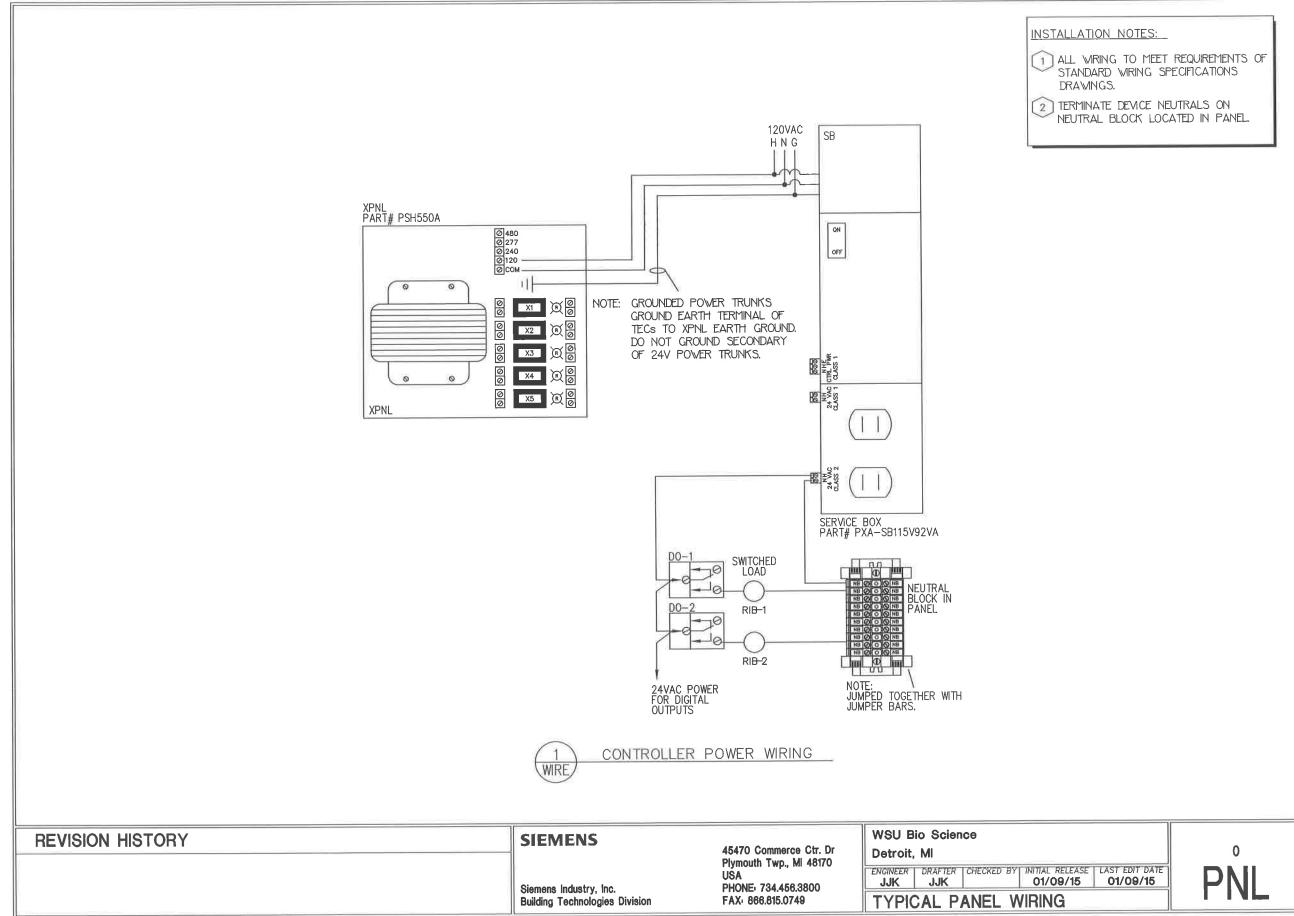
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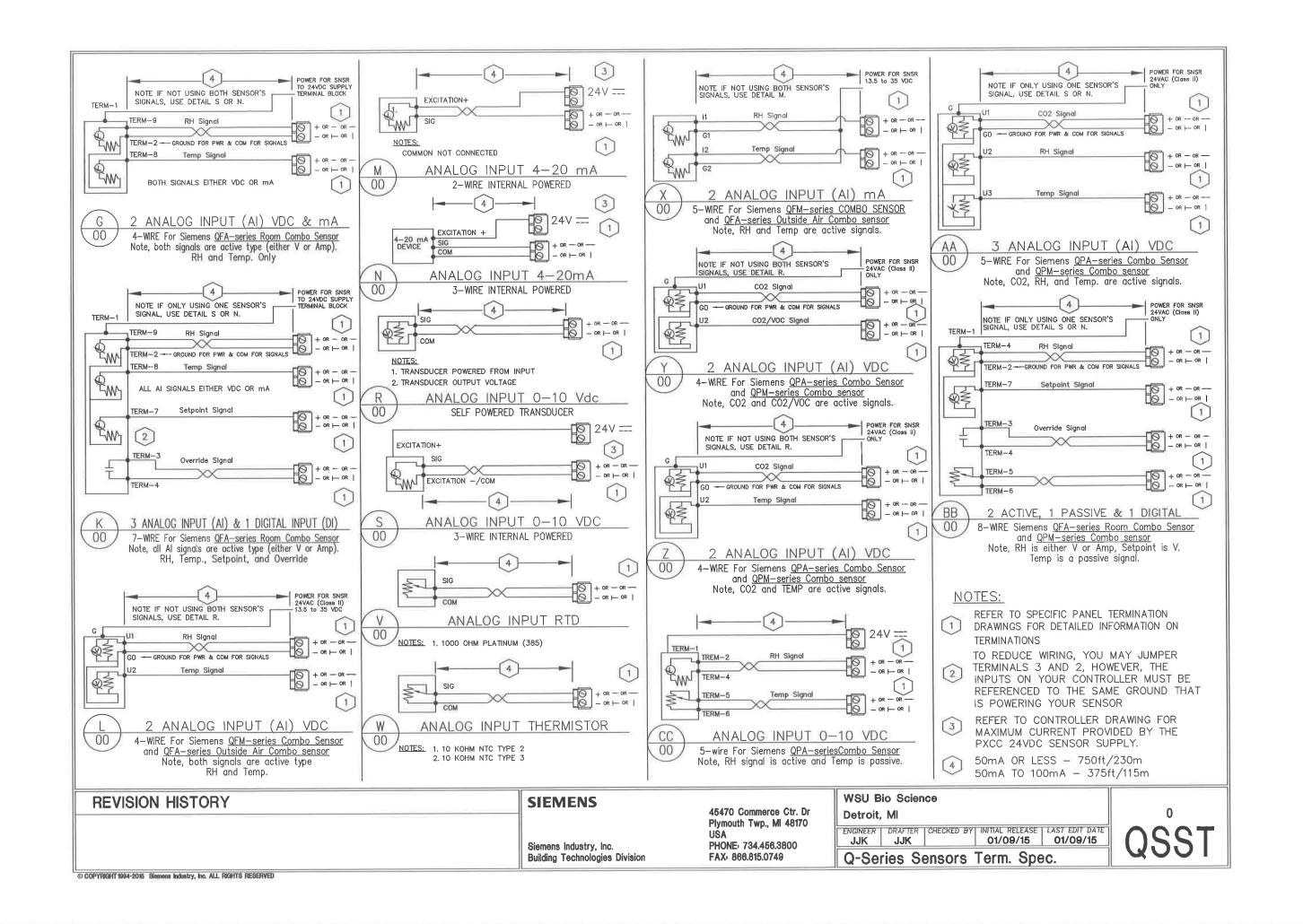
Anixter Building Auto. Cables

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Wayne State University

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

GENERAL PART 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

- 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.
- 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.

- 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.
- 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.

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- The EIWC must have full time project superintendent who shall attend all construction meetings after notification that their services are required onsite.
- 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.
- 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.
- Upon completion of the aforementioned, a performance test shall be conducted as specified in the commissioning section of the specifications.
- 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.
- Siemens assumes the manufacturers warranty for all equipment supplied to the EIWC for installation on this project.
- 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.
- 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
- 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

FLECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

26 0900 2

REVISION HISTORY

SIEMENS

Siemens Industry, Inc.

Building Technologies Division

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

WSU Bio Science Detroit, MI

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1.4 PRODUCTS & SERVICES PROVIDED BY OTHERS

- 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.
- 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.
- C. Sheetmetal Contractor: Installing all terminal units, airflow stations and dampers.
- 1.5 PRODUCTS INSTALLED BY THE EIWC BUT NOT FURNISHED UNDER THIS SECTION
 - A. Connect control components, as shown on the plans, factory supplied as part of equipment controlled.
- 1.6 RELATED SECTIONS
 - A. Division 23 General Mechanical Requirements.
 - B. Division 23 Instrumentation and controls for HVAC.
 - C. Division 23 Indoor Air Handling Units.
 - D. Division 23 Air Terminal Units.
 - E. Division 23 Testing and Balancing for HVAC.
 - F. Division 23 Commissioning of HVAC.
 - G. Division 26 Electrical Work.
 - Standard Specifications and Codes: In addition to the requirements shown or specified, comply with the following applicable standard specifications, codes or ordinances:
 - . NFPA National Fire Protection Association.
 - 2. UL Underwriter's Laboratories.
 - 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.

1.8 QUALITY ASSURANCE

- 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 contactor must be prepared to submit a minimum of three (3) satisfactorily completed projects, annually, for the past five (5) years.
- 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. Comply with ASHRAE 135 for DDC system components.

1.9 SEQUENCING AND SCHEDULING

- A... Sequence work to ensure installation of components is complimentary to installation of similar components in other systems.
- B. Coordinate work with other Contractors and subcontractors to ensure system is completed and commissioned by the Date of Substantial Completion.
- Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.

1:10 WARRANTY

Provide as pre project general conditions.

1.11 CONTROL WIRING

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.

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".

1.12 INSTALLATION

- A. Refer to project plans and DDC temperature control drawings for control wiring required and equipment locations.
- B. Install control devices per installation requirements of control device. Before installing, always refer to local codes.

ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

26 0900 1

ELECTRICAL INSTALLATION AND WIRING FOR HVAC TEMPERATURE AND LAB CONTROLS

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ELECTRICAL INSTALL SPEC.

SPEC2

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- 1.1 ELECTRICAL 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_e 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.

ON-SITE TESTING

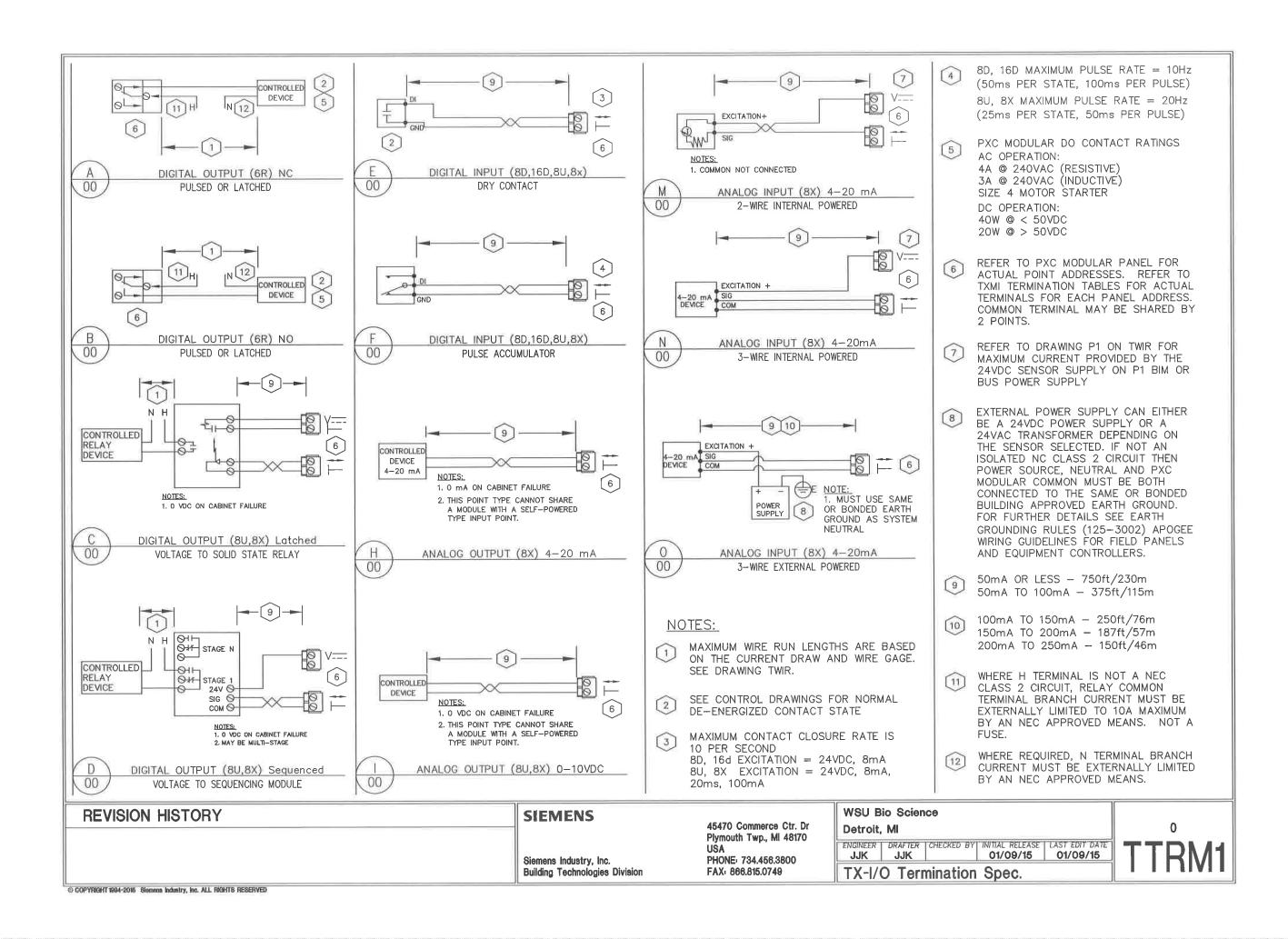
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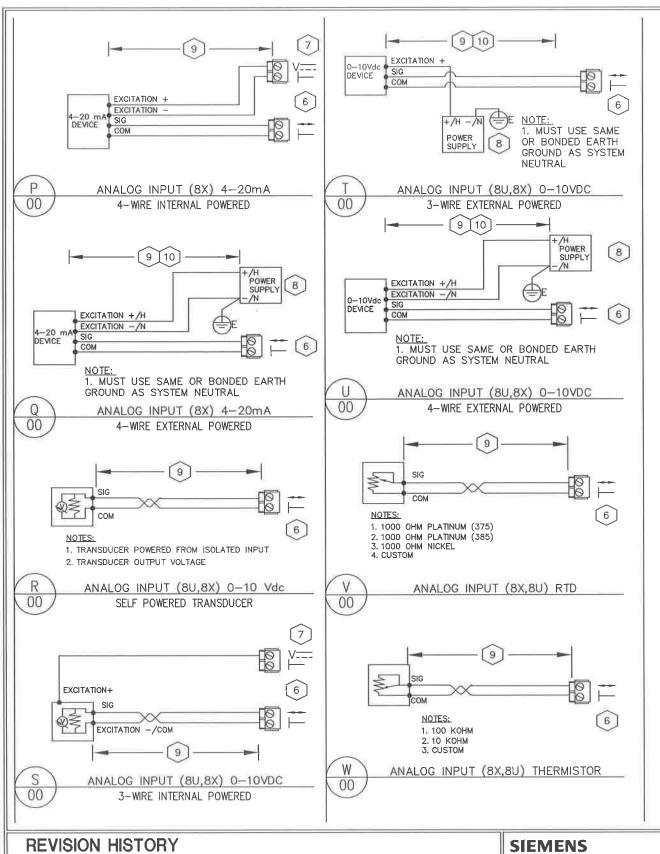
- A. Provide Owner—approved operation and acceptance testing of the complete system. The following shall witness the performance test:
 - 1. The EIWC Electrical (controls) installation & wiring contractor
 - 2. The equipment manufacturers representative
 - 3. The Owner's agent
 - 4. The Owner
 - 5. Architect/Engineer
- 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

REVISION HISTORY SIEMENS 45470 Commerce Ctr. Dr Plymouth Twp., MI 48170 USA Siemens Industry, Inc. Building Technologies Division SIEMENS 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 O1/09/15 O1/09/15 O1/09/15 SPECS





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 NEUTRAL1 (-)	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	(+)	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 SUPPLY1 =		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 \gtrsim		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.

			T)	KM1.6	SR,	TXM1	.6R-	М
I/O POINT			(1)	(2)	(3)	(4)	(5)	(6)
COMMON 1		(c)	3	9	15	20	26	32
NORMALLY CLOSED	ń	(NC)	4	10	16	19	25	31
NORMALLY OPEN	1	(NO)	2	8	14	21	27	33

1. COMMONS ARE NOT INTERNALLY CONNECTED

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

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		ONE: 734.456.3800 K: 866.815.0749	TX-I/O Termination Spec. 2	I I RIVIZ

PXC MODULAR WIRING TYPE AND GAUGE REQUIREMENTS TABLE 1

CIRCUIT TYPE	CLASS	WRE 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		CHECK LOCAL CODES
ANALOG INPUT ⁴ 100K/10K Thermistor	2	#18-#24 TP ^{3,6} r TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT [€] 1K Ni OR RTD	2	#18-#24 TP ^{3,6} r TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT 0-10 V	2	#18-#24 TP ^{3,6} r TSP ⁵ CM(FT4) or CMP(FT6)	750ft (230 m)	CHECK LOCAL CODES
ANALOG INPUT 4-20 mA	2	#18-#24 TP ^{3,8} r TSP ⁵ CM(FT4) or CMP(FT6)	(230 m)	CHECK LOCAL CODES
ANALOG OUTPUT 0-10 V	2	#18-#24 TP ^{3,6} r TSP ⁵ CM(FT4) or CMP(FT6)		CHECK LOCAL CODES
ANALOG OUTPUT 4-20 mA	2	#18-#24 TP 5 or TSP 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

- 2. 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
- 3. TWISTED PAIR, NON-JACKETED UL LISTED 75°C(167°F) AND 300V, CABLE ALL WIRE TO BE APPROVED OR LISTED FOR THE INTENDED 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
- 4. WIRE LENGTH AFFECTS POINT INTERCEPT ENTRY. ADJUST INTERCEPT ACCORDINGLY FOR EACH WIRE GAUGE AND SENSOR TYPE.
- 5. 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. ● CM/CMP/MM/MMP WIRE IS NOT USABLE FOR CLASS 1
- 6. FOR 24AWG INSTALL CATEGORY5 OR BETTER CABLE PER ANSI/TIA/EIA-568-B.1 OR HIGHER. USE SOLID COPPER BETWEEN JACK BOXÉS. ÚSE STRANDED COPPER PATCH CABLES 13ft (4m) TO CONNECT COPPER WIRE LISTED FOR 90°C OR HIGHER PXCC AND 20ft (6m) TO CONNECT SWITCH OR HUB.

MAXIMUM DO WIRE RUN LENGHTS TABLE 3

NOMINAL	STARTER	WRE SIZE					
INRUSH	SIZE	#18	#16	#14			
200 VA	0 1	500ft (152m)	900ft (274m)	1400ft (427m)			
550 VA	2	200ft (61m)	300ft (91m)	500ft (152m)			
1150 VA	3	100ft (30m)	150ft (46m)	250ft (76m)			
1500 VA	4	70ft (21m)	100ft (30m)	200ft (61m)			

TABLE 3 NOTES:

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

SIZE 4 MOTOR STARTER MAXIMUM NUMBER HSTIE IN SERIES ON ALN TRUNK

	TABLE 4									
SPEED	1200	4800	9600 - 38.4K	57.6K - 115.2K						
	BAUD	BAUD	BAUD	BAUD						
SERIES TIE'S	10	7	6	6						
ALN TRUNK	4000ft	4000ft	4000ft	3280ft						
DISTANCE	(1.2km)	(1.2km)	(1.2km)	(1km)						

- 1. WHEN DAISY—CHAINING 24VAC POWER TO CONTROLLERS USE #14 WIRE. TIE 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:

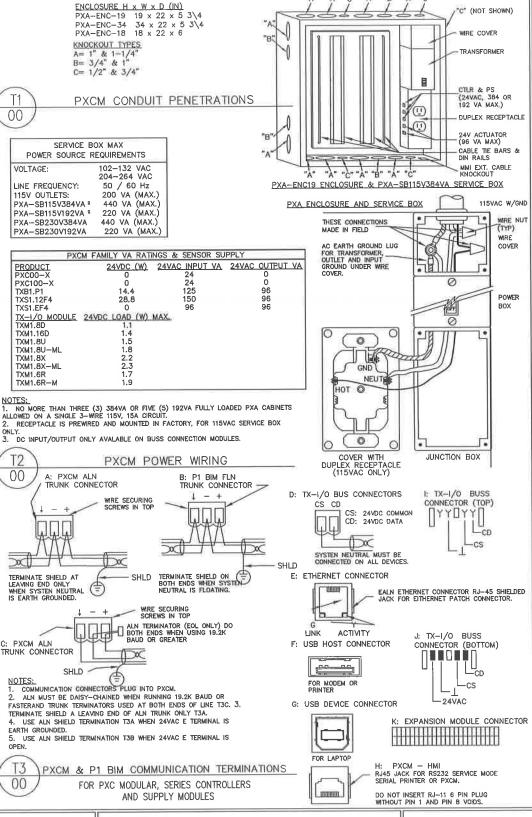
- COMPLY WITH LOCAL BUILDING CODES
- SIZE WIRE FOR LOAD, CURRENT, AND VOLTAGE.
- APPLICATION BY AGENCIES SUCH AS UL, NEC, CSA.
- ALWAYS REFER TO LOCAL CODES FOR CONDUIT SHARING.
- WIRING MUST HAVE INSULATION RATED FOR HIGHEST VOLTAGE CIRCUIT IN CONDUIT.
- THE ALN TRUNK MUST BE AN UNINTERRUPTED RUN BETWEEN CABINETS. NO SPLICES ALLOWED.
- FOR EXTENDED TEMPERATURE INSTALLATIONS USE ONLY

PXCM WIRE SPECIFICATIONS

	LOW-VOLTAGE POINT APPLICATIONS	POINT USAGE	ALN TRUNK	EALN
CABLE CONFIGURATION	TWISTED PAIR OR TSP	TWISTED 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
TWISTS PER FOOT	6 MINIMUM	6 MINIMUM	6 MINIMUM	CATEGORY 5 Min
SHIELDS		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

1. UL RECOGNIZED WIRE (LABELED WITH A BACKWARDS 'RU') IS NOT FIELD INSTALLABLE. USE ONLY UL-LISTED WIRE.

2. 300 VAC WIRE CAN BE USED IN FIELD PANELS CONTAINING VOLTAGES BELOW 150 VAC.



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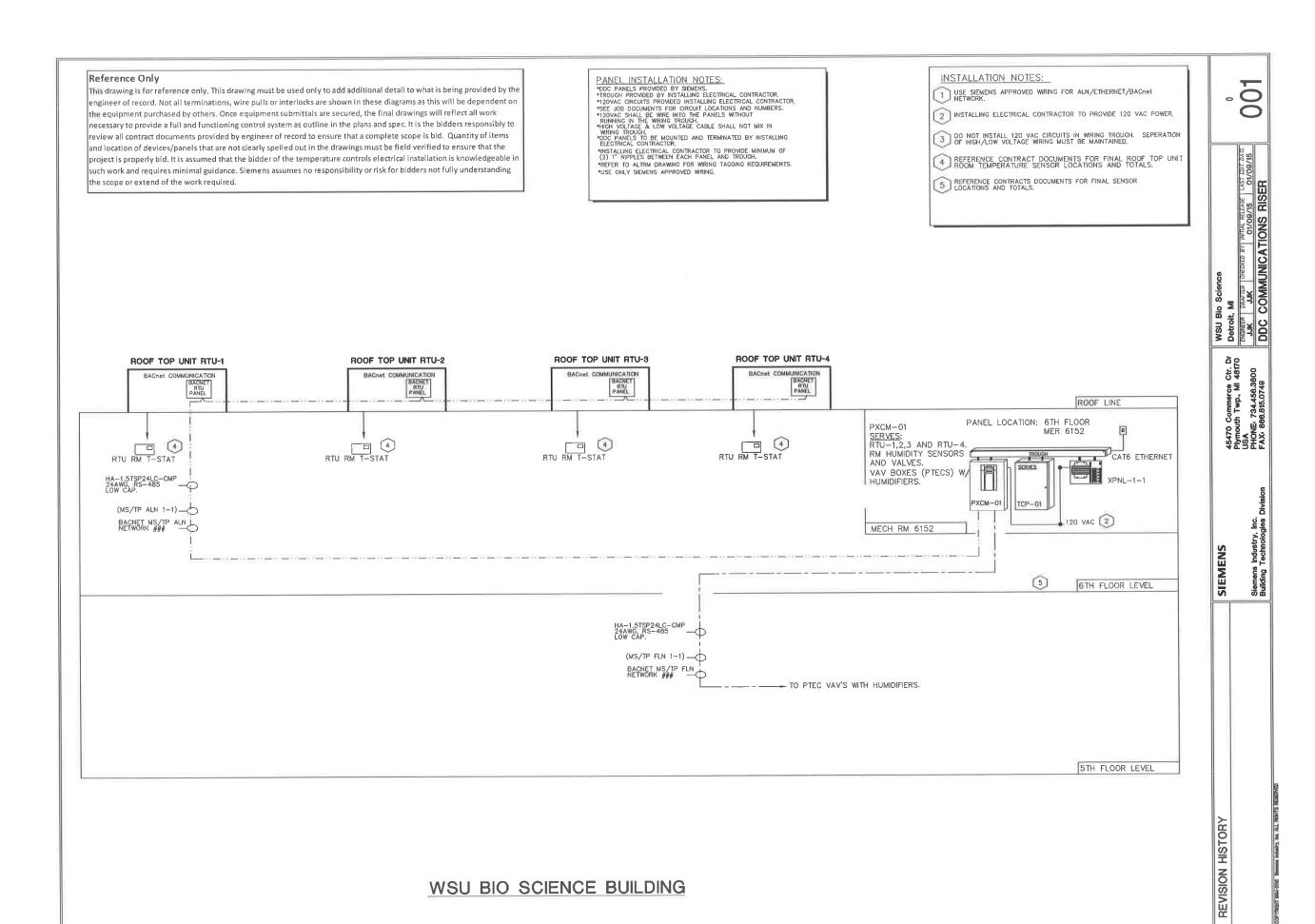
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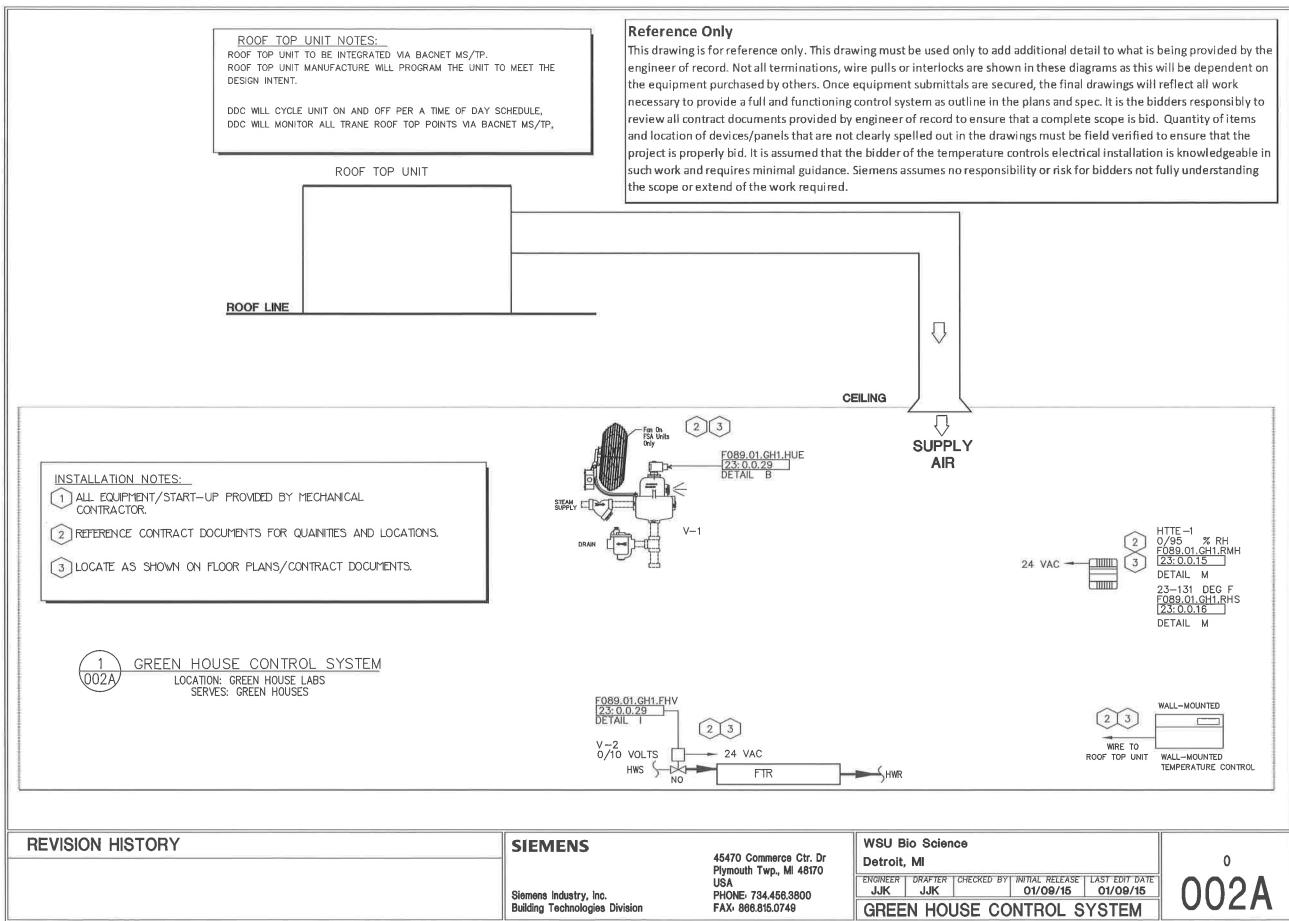
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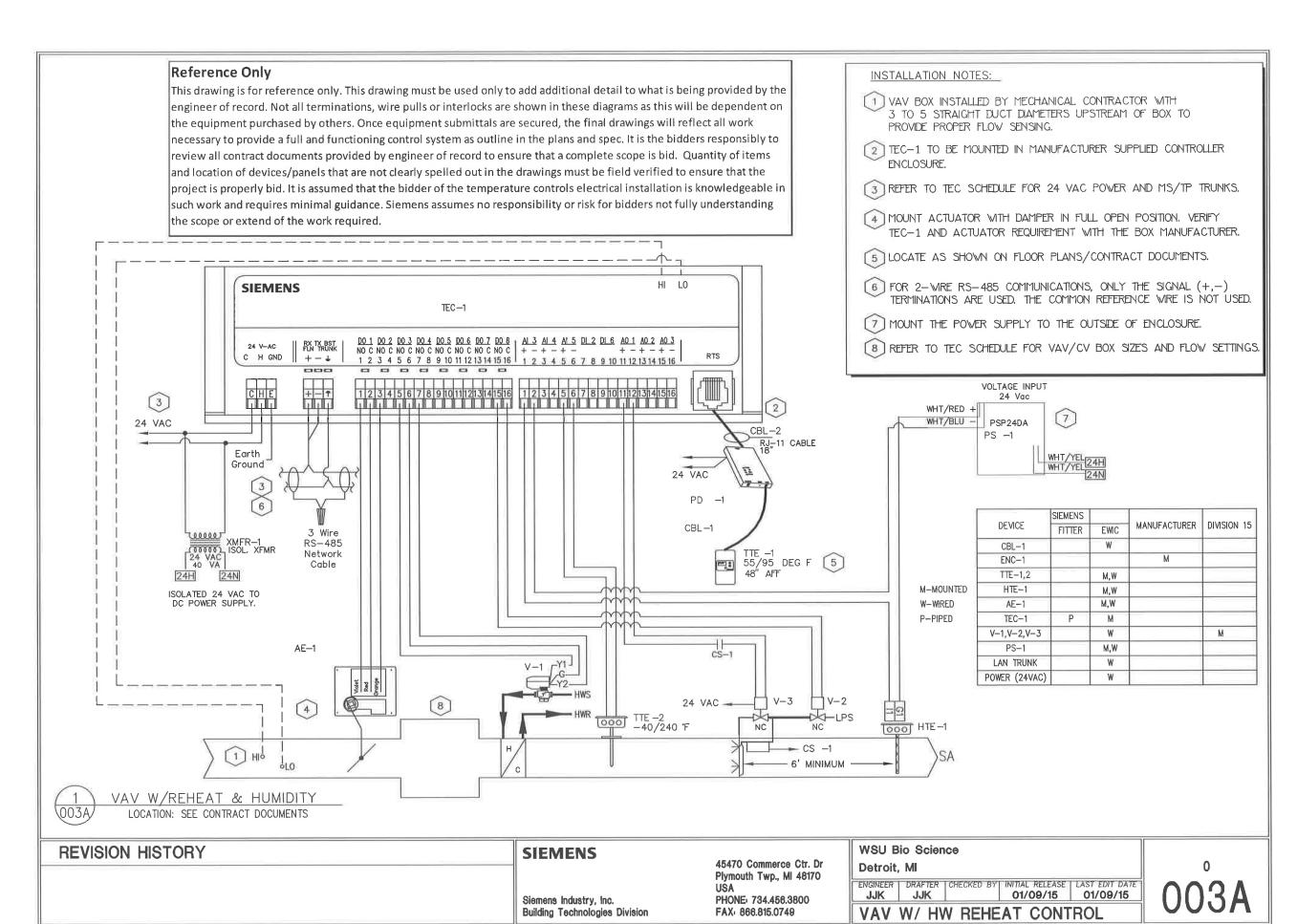
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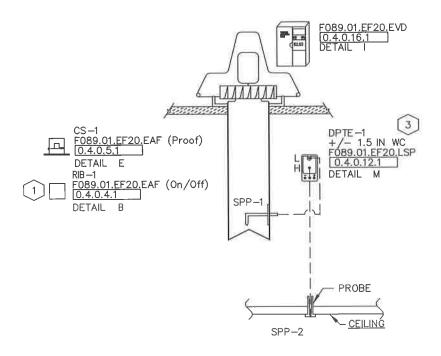






Reference Only

This drawing is for reference only. This drawing must be used only to add additional detail to what is being provided by the engineer of record. Not all terminations, wire pulls or interlocks are shown in these diagrams as this will be dependent on the equipment purchased by others. Once equipment submittals are secured, the final drawings will reflect all work necessary to provide a full and functioning control system as outline in the plans and spec. It is the bidders responsibly to review all contract documents provided by engineer of record to ensure that a complete scope is bid. Quantity of items and location of devices/panels that are not clearly spelled out in the drawings must be field verified to ensure that the project is properly bid. It is assumed that the bidder of the temperature controls electrical installation is knowledgeable in such work and requires minimal guidance. Siemens assumes no responsibility or risk for bidders not fully understanding the scope or extend of the work required.



EXHAUST FAN EF-20

LOCATION: BIO SCIENCE ROOF SERVES: 5155, 5155.1,5155.2 AND 5155.3

INSTALLATION NOTES:

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

REVISION HISTORY

SIEMENS

004A

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

EX FAN CONTROL SYSTEM

004A