

Detroit Diesel Corporation



Detroit Diesel Substation M1C
Replacement

13400 Outer Dr W
Redford Township, MI 48239

Bids

07/30/2026

HED

2026-DD016-001



ABBREVIATIONS

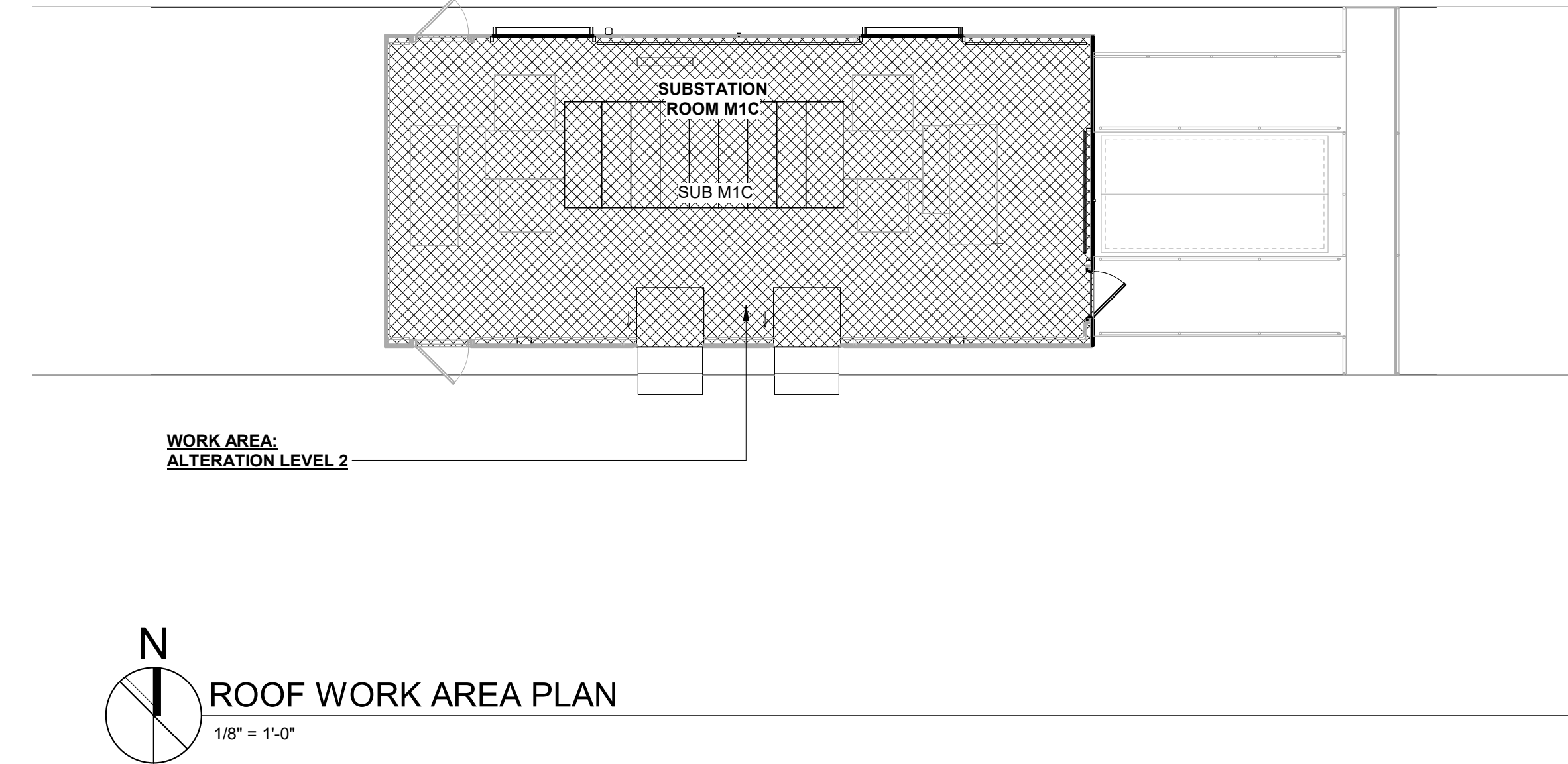
ADJ	ADJACENT, ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
BLDG	BUILDING
OP	CAST-IN-PLACE
CJ	CONSTRUCTION JOINT, CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR, CLEARANCE
CMU	CONCRETE MASONRY UNIT(S)
COL	COLUMN
CONC	CONCRETE
DET	DETAIL
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DM	DIMENSION
DN	DOWN
DWG	DRAWING
EA	EACH
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION (GRADE)
EW	ELECTRIC WATER COOLER
EXIST	EXISTING
EXP	EXPOSED
EXT	EXTERIOR
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FFE	FURNITURE, FIXTURES & EQUIPMENT
FIN	FINISH, FINISHED
FR	FIRE RATED, FIRE RETARDANT
FRTW	FIRE RETARDANT TREATED WOOD
GALV	GALVANIZED
GYP BD	GYPSPUM BOARD
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HIGH POINT
INT	INTERIOR
LP	LOW POINT
MAX	MAXIMUM
MFR	MANUFACTURER
MIN	MINIMUM
MO	MASONRY OPENING
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OPPOSITE HAND
OPP	OPPOSITE
OS	OVERFLOW ROOF SUMP
PL	PROPERTY LINE
PPT	PRESERVATIVE PRESSURE TREATED
PR	PAIR
PSF	PER SQUARE FOOT
RD	ROOF DRAIN
RS	ROOF SUMP
SC	SCUPPER
SF	SQUARE FOOT
SIM	SIMILAR
SPEC	SPECIFICATIONS
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORIES
UON	UNLESS OTHERWISE NOTED
VERT	VERTICAL
VF	VERIFY IN FIELD
WI	WITH
W/O	WITHOUT

GENERAL NOTES

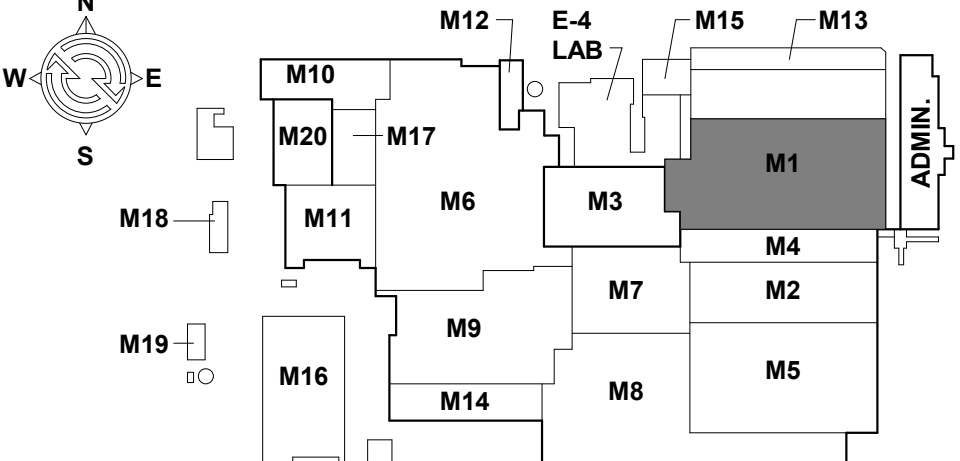
- THE CONSTRUCTION CONTRACT IS FOR A COMPLETE AND FULLY FUNCTIONING INSTALLATION. THESE DOCUMENTS DESCRIBE THE DESIGN INTENT AND SPECIFIC REQUIREMENTS OF THE INSTALLATION. THE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY ALL. THESE DOCUMENTS ARE NOT MEANT TO SHOW EVERY ITEM REQUIRED TO CONSTRUCT THE WORK. ITEMS SUCH AS, BUT NOT LIMITED TO, FASTENERS, CONNECTORS, FILLERS, MISCELLANEOUS CLOSURE ELEMENTS, ANCILLARY CONTROL WIRING AND POWER WHERE REQUIRED FOR THE CONTROL, OR OPERATION OF THE PROVIDED EQUIPMENT, ETC. ARE NOT ALWAYS SHOWN BUT ARE CONSIDERED TO BE INCLUDED IN THE SCOPE OF THE WORK. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE A FULLY FUNCTIONING INSTALLATION WHICH MEETS THE DESIGN INTENT, INCLUDING BUT NOT LIMITED TO THE SPECIFIC REQUIREMENTS IN THESE DOCUMENTS.
- THESE DOCUMENTS DESCRIBE WORK UNDER A SINGLE CONSTRUCTION CONTRACT. THE USE OF SUB-CONTRACTORS IS THE ELECTION OF THE GENERAL CONTRACTOR. IT IS NOT THE INTENT OF THE DOCUMENTS TO DIVIDE THE WORK AMONG SUB-CONTRACTORS. WHERE THE DOCUMENTS IDENTIFY WORK WITH SUCH NOTES AS "NOT IN MECHANICAL WORK" OR "NOT IN ELECTRICAL WORK" OR "SEE STRUCTURAL DRAWINGS," IT MEANS THAT THE WORK IS NOT FURTHER DESCRIBED OR SPECIFIED ON THE DRAWING WHERE SUCH NOTES APPEAR. IT DOES NOT PRECLUDE THE CONTRACTOR FROM DELEGATING THE WORK TO ENTITIES OF HIS ELECTION. IN ADDITION, THE DIVISION OF THE CONTRACT DOCUMENTS INTO ARCHITECTURAL, STRUCTURAL, ELECTRICAL AND MECHANICAL OR OTHER DESIGN DISCIPLINES IS FOR CONVENIENCE ONLY, AND IS NOT INTENDED TO DIVIDE THE WORK AMONG VARIOUS SUB-CONTRACTORS, OR IMPLY THAT ALL OF THE WORK FOR A PARTICULAR TRADE IS SHOWN ONLY IN THOSE DRAWINGS OR SPECIFICATIONS.
- REFERENCE TO "CONTRACTOR" IN THESE DOCUMENTS SHALL BE INTERPRETED AS REFERRING TO THE GENERAL CONTRACTOR OR TO ANY SUB-CONTRACTOR TO THE GENERAL CONTRACTOR, COLLECTIVELY OR AS INDIVIDUAL ENTITIES. FURTHER, REFERENCE TO A PARTICULAR SUB-CONTRACTOR IS FOR CONVENIENCE ONLY, AND IS NOT INTENDED TO LIMIT THE SCOPE OF THE WORK TO THAT TRADE OR LIMIT THE RESPONSIBILITIES OF THE GENERAL CONTRACTOR TO COORDINATE THE WORK OF ALL TRADES AS DEFINED BY THE OWNER/CONTRACTOR AGREEMENT.
- THE DRAWINGS AND PROJECT MANUAL ESTABLISH DETAILED MINIMUM REQUIREMENTS FOR THE DESIGN AND CONSTRUCTION OF THE PROJECT. PARTIAL OR OUTDATED SETS OF CONTRACT DOCUMENTS SHOULD NOT BE DISTRIBUTED OR UTILIZED.
- WORK IS TO COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS IN FORCE AT THE TIME OF CONSTRUCTION.
- UNLESS SPECIFICALLY NOTED AS BEING RE-USED, MATERIALS FURNISHED AT THE JOB SITE SHALL BE NEW AND FREE FROM DEFECTS, AND SHALL BE STORED AT THE SITE IN SUCH A MANNER AS TO PROTECT THEM FROM DAMAGE. ALL WORK SHALL BE BEST PRACTICE OF EACH TRADE.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETELY COORDINATE WORK AS REQUIRED TO MEET THE DESIGN INTENT AS DEFINED BY THE DOCUMENTS. THE CONTRACTOR SHALL LAY OUT AND SEQUENCE THE INSTALLATION OF WORK SO THAT THE DIFFERENT SYSTEMS DO NOT OBSTRUCT INSTALLATION OF SUBSEQUENT WORK. IN GENERAL, SYSTEMS INSTALLED FIRST SHOULD BE AS HIGH AND AS TIGHT TO THE STRUCTURE AS POSSIBLE TO ALLOW SPACE FOR SYSTEMS WHICH FOLLOW.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND SUB-CONTRACTORS TO REVIEW DRAWINGS, PROJECT MANUAL, ADDENDA, BULLETINS, ETC. IN ORDER TO ENSURE COMPLETE COORDINATION OF WORK. FAILURE TO REVIEW AND COORDINATE ALL CONTRACT DOCUMENTS BY THE GENERAL CONTRACTOR WITH THE SUB-CONTRACTORS FOR APPLICABLE PORTIONS OF THE WORK DOES NOT RELIEVE ANY PARTY FROM PROVIDING MATERIALS AND WORK REQUIRED FOR A COMPLETE INSTALLATION.
- THE GENERAL CONTRACTOR AND SUB-CONTRACTORS SHALL VISIT THE SITE PRIOR TO BIDDING IN ORDER TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE IMPACT OF THE PROPOSED WORK INDICATED ON THE DRAWINGS AND SPECIFICATIONS ON THESE CONDITIONS. ANY QUESTIONS REGARDING THE COORDINATION OF NEW WORK WITH EXISTING CONDITIONS MUST BE SUBMITTED TO THE ARCHITECT IN WRITING PRIOR TO THE BID SUBMISSION AND WITH ADEQUATE TIME FOR RESPONSE TO ALL BIDDERS. THE ARCHITECT WILL RESPOND TO TIMELY QUESTIONS WITH A WRITTEN RESPONSE TO ALL BIDDERS.
- ALL WORK NOTED "NIC" IS NOT IN CONTRACT. CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS ON SITE PER REQUIREMENT ESTABLISHED BY OWNER.
- EXISTING DIMENSIONS AND CONDITIONS INDICATED IN THESE DOCUMENTS ARE FROM ELECTRONIC CAD INFORMATION PROVIDED BY THE OWNER AND ARE ASSUMED TO BE ACCURATE AS SHOWN. THE CONTRACTOR SHALL VERIFY THE ACCURACY OF SUCH INFORMATION PRIOR TO THE START OF CONSTRUCTION, AND ADVISE THE ARCHITECT OF ANY DEVIATIONS OR CONFLICTS WITH THE INFORMATION SHOWN ON THE DRAWINGS.
- DRAWINGS ARE NOT TO BE SCALED. CONTRACTOR SHALL REFER TO THE DIMENSIONS INDICATED OR THE ACTUAL SIZES OF CONSTRUCTION ITEMS, WHERE NO DIMENSION OR METHODS OF DETERMINING A LOCATION EXISTS, VERIFY DIMENSION WITH ARCHITECT PRIOR TO LAYOUT AND INSTALLATION.
- THE DRAWINGS AND REFERENCED DETAILS HAVE BEEN DIMENSIONED IN ORDER TO ESTABLISH THE CONTROL AND GUIDELINES FOR FIELD LAYOUT. WHERE DISCREPANCIES EXIST BETWEEN THE DRAWINGS AND FIELD CONDITIONS THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OF SUCH PRIOR TO START OF WORK.
- DIMENSIONS ON DOCUMENTS ARE TO FACE OF FINISH MATERIALS UNLESS OTHERWISE INDICATED.
- WHERE DIMENSIONS INDICATED ARE NOTED AS VERIFY IN FIELD (VIF) THE DIMENSION SHOWN IS THE BASIS OF DESIGN, BUT MAY DIFFER FROM ACTUAL CONDITIONS. CONTRACTOR SHALL VERIFY THESE DIMENSIONS WHILE LAYING OUT THE WORK AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO PROCEEDING. WHERE DIMENSIONS ARE NOTED AS "+/-" FIELD DIMENSIONS MAY VARY FROM THE NOTED DIMENSIONS BY MINOR AMOUNTS. DISCREPANCIES OF MORE THAN 1" SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CONFIRMATION. DIMENSIONS NOTED AS "HOLD" OR "CLEAR" ARE TO BE ACCURATE TO WITHIN 3/4".
- DETAILS ARE KEYED TO THE PLANS AT TYPICAL LOCATIONS. TYPICAL DETAILS APPLY TO ALL LOCATIONS WHICH ARE SIMILAR BUT ARE NOT NECESSARILY KEYED TO EVERY LOCATION TO WHICH THEY APPLY. CONTRACTOR IS RESPONSIBLE TO COORDINATE THE LOCATION OF ALL TYPICAL DETAILS AND INSTALL THE WORK INDICATED. FEATURES NOT SHOWN IN THEIR ENTIRETY SHALL BE COMPLETELY PROVIDED AS IF SHOWN IN FULL. IF DISCREPANCIES EXIST, CONTRACTOR IS TO REQUEST CLARIFICATION BY THE ARCHITECT OF SUCH CONDITIONS.
- DETAILS AND COORDINATE SIZES, LOCATION AND MOUNTING REQUIREMENTS OF ALL EQUIPMENT AND FIXTURES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE REQUIRED BLOCKING, BACKING, SLEEVES, ETC. FOR A COMPLETE, NEAT INSTALLATION. COORDINATE INSTALLATION OF ALL SLEEVES AND OPENINGS AS REQUIRED THROUGH ALL EXISTING OR NEW CONSTRUCTION.
- DETAILS INDICATE DESIGN INTENT OF WORK IN PLACE. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB CONDITIONS OR DIMENSIONS AND ARE TO BE INCLUDED AS PART OF THE WORK.
- PROVIDE PROTECTION FOR PEDESTRIANS OR OCCUPANTS OF ADJACENT AREAS OF THE BUILDING AS NECESSARY AND AS REQUIRED BY THE OWNER.
- MAINTAIN THE PREMISES CLEAN AND FREE OF TRASH AND DEBRIS. PROTECT PROJECT, THE SITE, AND PERSONAL PROPERTY FROM DAMAGE.
- PROTECT WORK AREAS AND EXISTING ADJACENT AREAS, INCLUDING EXISTING UTILITIES, FROM DAMAGE. REPAIR, REPLACE, OR PATCH ANY DAMAGE DUE TO CONSTRUCTION. REPAIRED CONSTRUCTION IS SUBJECT TO REVIEW AND ACCEPTANCE BY ARCHITECT.
- PROVIDE REQUIRED TEMPORARY UTILITIES, BRACING, SUPPORTS, SHORING, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN ADEQUACY AND SAFETY OF ERECTION.
- CONTRACTOR SHALL MAINTAIN CURRENT UPDATED RECORD DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES.
- CONTRACTOR IS RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO SITE SAFETY AND SECURITY FOR WORKERS AND GENERAL MEMBERS OF THE PUBLIC.
- THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL STIFFENERS, BRACING, BACK-UP PLATES AND SUPPORTING BRACKETS REQUIRED FOR APPROPRIATE INSTALLATION OF ALL WALL MOUNTED OR SUSPENDED MECHANICAL, ELECTRICAL OR MISCELLANEOUS EQUIPMENT.

PLAN REVIEW DATA	
BUILDING CODE	2021 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL EXISTING BUILDING CODE (IN EFFECT 4/9/2025)
	PLUMBING CODE
	2021 MICHIGAN PLUMBING CODE INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL PLUMBING CODE WITH STATE AMENDMENTS, PART 7 RULES (IN EFFECT 3/12/2024)
	MECHANICAL CODE
ELECTRICAL CODE	2021 MICHIGAN MECHANICAL CODE INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL MECHANICAL CODE WITH STATE AMENDMENTS, PART 9a RULES (IN EFFECT 3/12/2024)
	2023 MICHIGAN ELECTRICAL CODE INCORPORATING THE 2023 EDITION OF THE NATIONAL ELECTRICAL CODE, NFPA 70 WITH STATE AMENDMENTS, PART 8 RULES (IN EFFECT 3/12/2024)
FIRE CODE	
2021 INTERNATIONAL FIRE CODE AS REFERENCED IN THE 2021 MICHIGAN BUILDING CODE WITH LOCAL AMENDMENTS	
FIRE ALARM	
2019 EDITION OF NFPA 72 AS REFERENCED IN THE 2021 MICHIGAN BUILDING CODE	
FIRE SUPPRESSION	
2019 EDITION OF NFPA 13 AS REFERENCED IN THE 2021 MICHIGAN BUILDING CODE	
ACCESSIBILITY	
2021 MICHIGAN BUILDING CODE INCLUDING MICHIGAN BARRIER FREE AND ICC/ANSI A117.1-2017	
USE GROUP	
B - BUSINESS / F - FACTORY: NON SEPARATED MIXED USE	
CONSTRUCTION TYPE	
TYPE IIB (NONCOMBUSTIBLE/ UNPROTECTED)	
PROJECT FLOOR AREA (GROSS)	
857 SF (RENOVATION)	
AREA OF WORK	
REFER TO SHEET G-011 AREA OF WORK PLANS FOR ADDITIONAL INFORMATION	
SCOPE OF WORK:	
THE DEMOLITION WORK SCOPE: INCLUDES THE DEMOLITION OF ELECTRICAL AND MECHANICAL EQUIPMENT AT SUBSTATION M1C.	
THE NEW WORK SCOPE: INCLUDES THE ADDITION AND REPLACEMENT OF ELECTRICAL AND MECHANICAL EQUIPMENT. THIS INCLUDES, BUT NOT LIMITED TO, NEW ELECTRICAL SUBSTATION, MECHANICAL LOUVER/DAMPER/HEATER/FANS AND ADDITIONAL STRUCTURAL SUPPORT FRAMING FOR NEW OPENINGS.	
EXISTING BUILDING CODE SCOPING REQUIREMENTS & ALTERATION LEVEL:	
GENERAL REQUIREMENTS	
PORTION OF AN EXISTING BUILDING UNDERGOING REPAIR, ALTERATION, ADDITION, OR A CHANGE OF OCCUPANCY ARE SUBJECT TO THE REQUIREMENTS OF THE MICHIGAN REHABILITATION CODE. IN GENERAL, EXISTING MATERIALS AND CONDITIONS CAN REMAIN PROVIDED THEY WERE INSTALLED IN ACCORDANCE WITH THE CODE AT THE TIME OF ORIGINAL INSTALLATION. ALL NEW WORK ASSOCIATED WITH ANY CHANGE IN USE, ADDITION, OR RENOVATION PROJECT SHOULD CONFORM TO THE SPECIFIED "NEW CONSTRUCTION" REQUIREMENTS OF THE MICHIGAN REHABILITATION CODE. ALTERATION TO EXISTING BUILDINGS ARE NOT PERMITTED TO REDUCE THE LEVEL OF SAFETY CURRENTLY PROVIDED WITHIN THE BUILDING UNLESS THE PORTION ALTERED COMPLIES WITH THE MICHIGAN REHABILITATION CODE.	
COMPLIANCE METHOD AND CLASSIFICATION OF WORK	
THE WORK AREA METHOD HAS BEEN SELECTED FOR USE ON THIS PROJECT (MRCEB 301.1). THE PROJECT INCLUDES THE ADDITION AND REPLACEMENT OF ELECTRICAL AND MECHANICAL EQUIPMENT, AS WELL AS, ADDITIONAL SUPPORT STEEL. THE PLANNED WORK IS INDIVIDUALLY CLASSIFIED AS NOTED BELOW.	
ALTERATION - LEVEL 2 (SECTION 603)	
LEVEL 2 ALTERATIONS INCLUDE THE ADDITION OR ELIMINATION OF ANY DOOR OR WINDOW, THE RECONFIGURATION OR EXTENSION OF ANY SYSTEM, OR THE INSTALLATION OF ANY ADDITIONAL EQUIPMENT, AND SHALL APPLY WHERE THE WORK AREA IS EQUAL TO OR LESS THAN 50 PERCENT OF THE BUILDING AREA.	

GENERAL SHEET INDEX		
SHEET NUMBER	SHEET NAME	ISSUED FOR
GENERAL		
G-000	Coversheet	Bids
G-011	Code Analysis and Sheet Index	Bids
STRUCTURAL SHEET INDEX		
SHEET NUMBER	SHEET NAME	ISSUED FOR
STRUCTURAL		
S-1	M1C SUBSTATION LAYOUT PLAN AND DETAILS	Bids
ARCHITECTURAL SHEET INDEX		
SHEET NUMBER	SHEET NAME	ISSUED FOR
ARCHITECTURAL		
A-191	Roof Demolition & New Work Plan	Bids
A-411	Elevations & Details	Bids
MECHANICAL SHEET INDEX		
SHEET NUMBER	SHEET NAME	ISSUED FOR
MECHANICAL		
M-001	Mechanical Notes, Legends & Abbreviations	Bids
M-191	Substation M1C Penthouse - Mechanical Plans	Bids
M-601	Mechanical Schedules & Control Diagrams	Bids
ELECTRICAL SHEET INDEX		
SHEET NUMBER	SHEET NAME	ISSUED FOR
ELECTRICAL		
E-001	Electrical General Notes & Abbreviations	Bids
EC101	Partial Plant Level Composite Plan - M1	Bids
ED151	M1C Penthouse Demo Plans	Bids
EP151	M1C Penthouse Plans	Bids
E-701	Electrical One-Line Diagrams - Demo	Bids
E-702	Electrical One-Line Diagrams - New	Bids
E-801	Electrical Specifications	Bids



KEY PLAN



Detroit Diesel Corporation

13400 Outer Dr W
Redford Township, MI 48239

Detroit Diesel Substation M1C Replacement

Date	Issued For
05/06/2026	Progress Set
05/15/2026	Final Review
06/18/2026	Final Review
07/30/2026	Bids



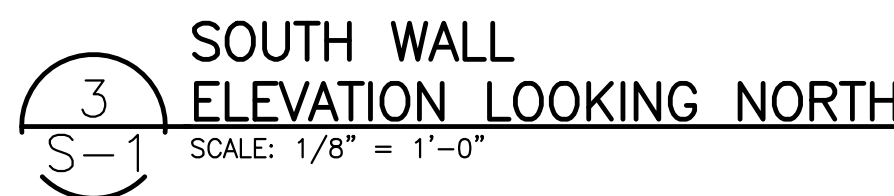
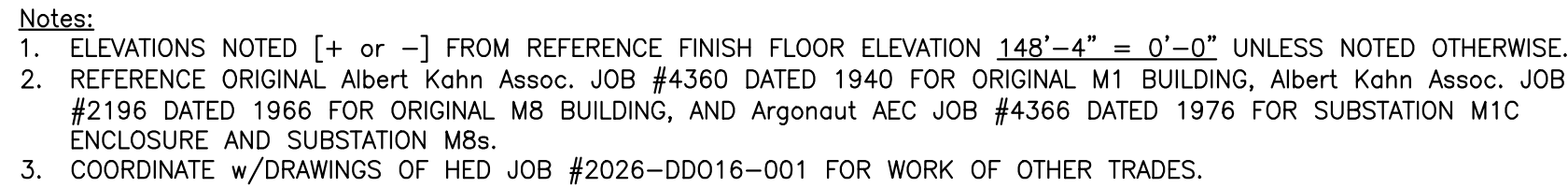
125 West 5th St
Royal Oak, Michigan
48067 USA
(248) 262-1500
WWW.HED.CO

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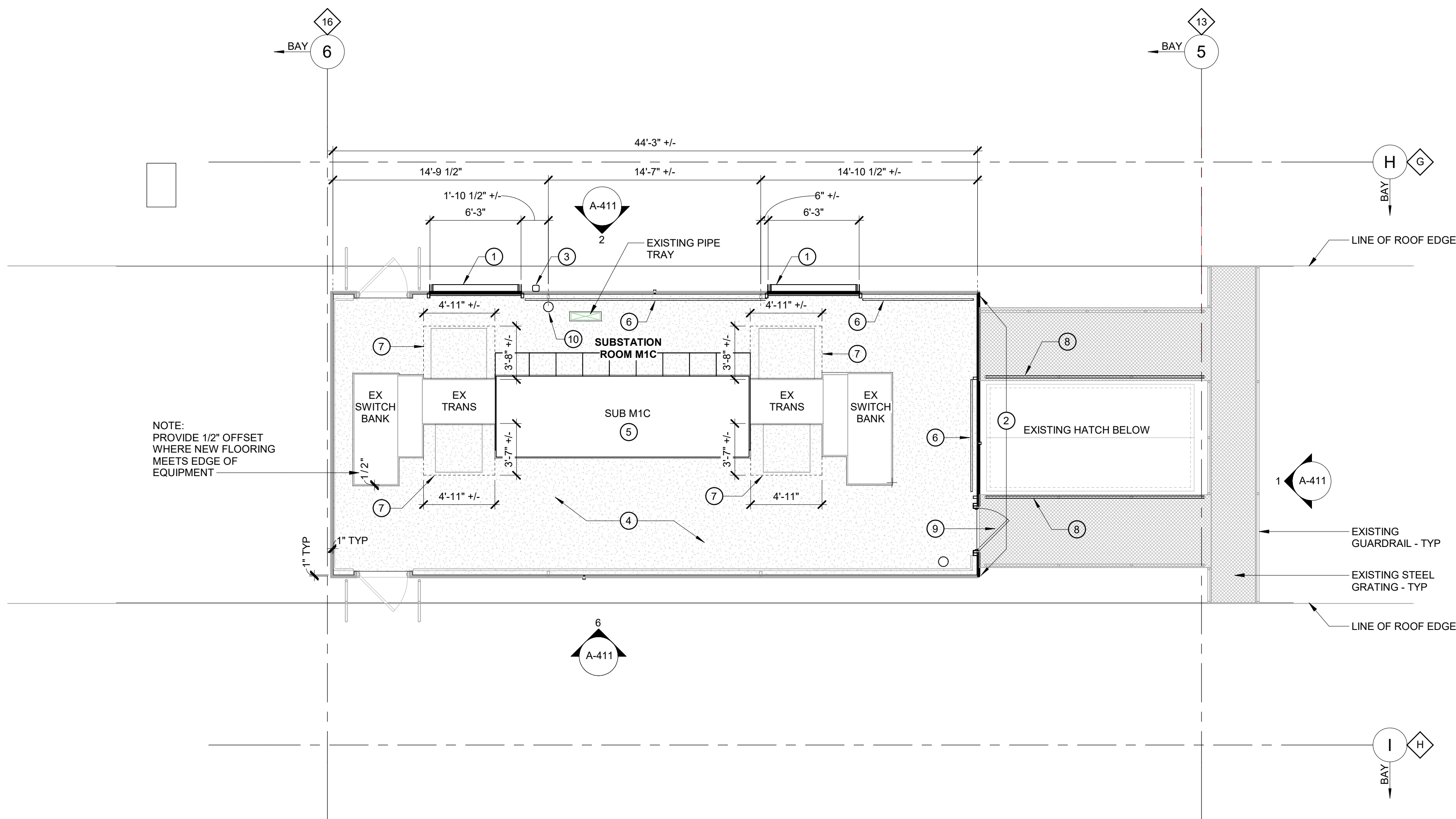
Code Analysis and Sheet Index

G-011

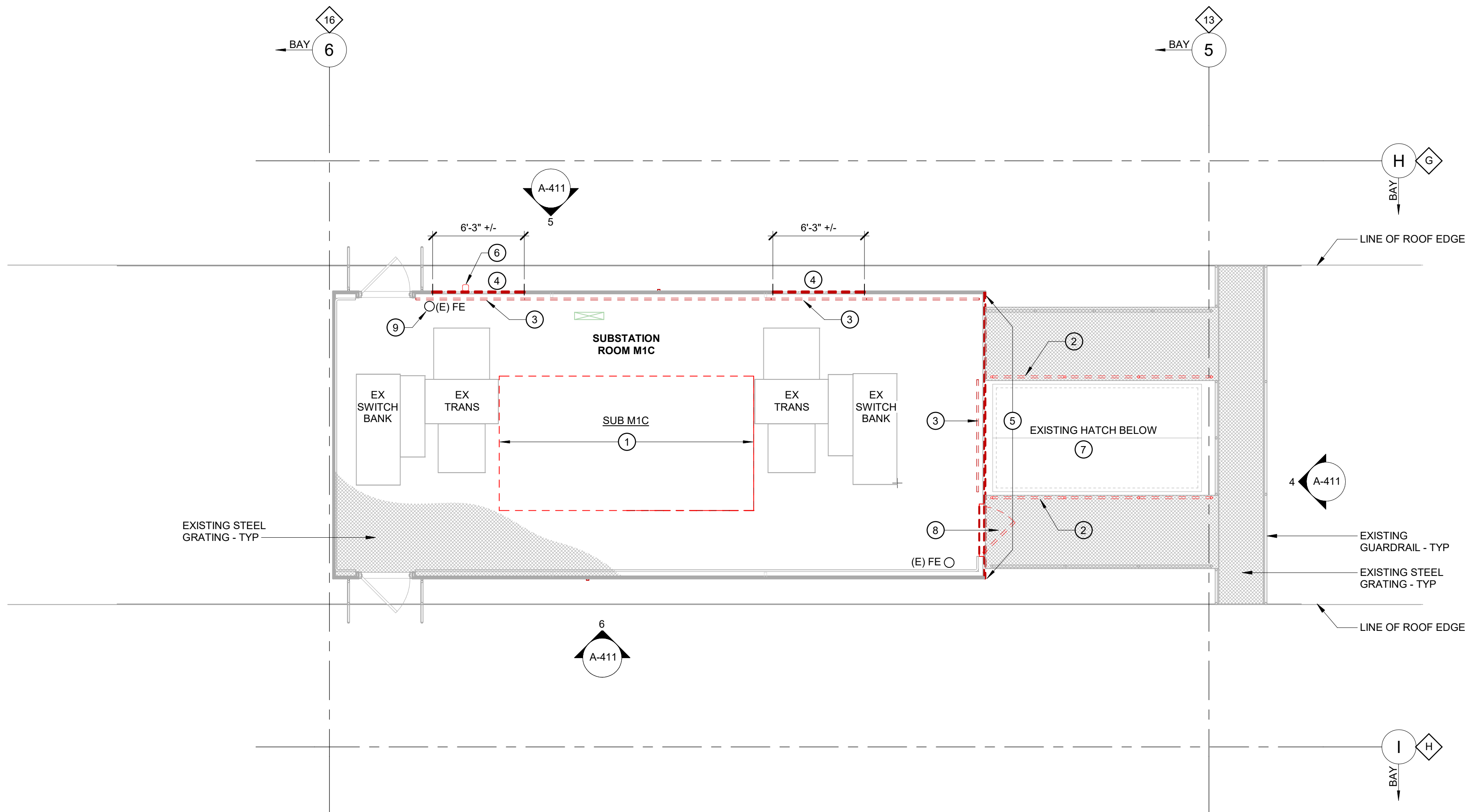
ENGINEER: Mr. Frank Schwarzkopf FSchwarzkopf@COREdg.net 248.613.5091
OWNER: Mr. Clark Adams Clark.Adams@DaimlerTruck.com



BUILDING No.		M1	BAY	H5
TITLE				
M1c SUBSTATION LAYOUT PLAN AND DETAILS				
SCALE		NOTED	DRAWN BY	TLS
DATE		CHECKED BY	F. Schwarzkopf	
DDC DRAWING NUMBER		SHEET No.		

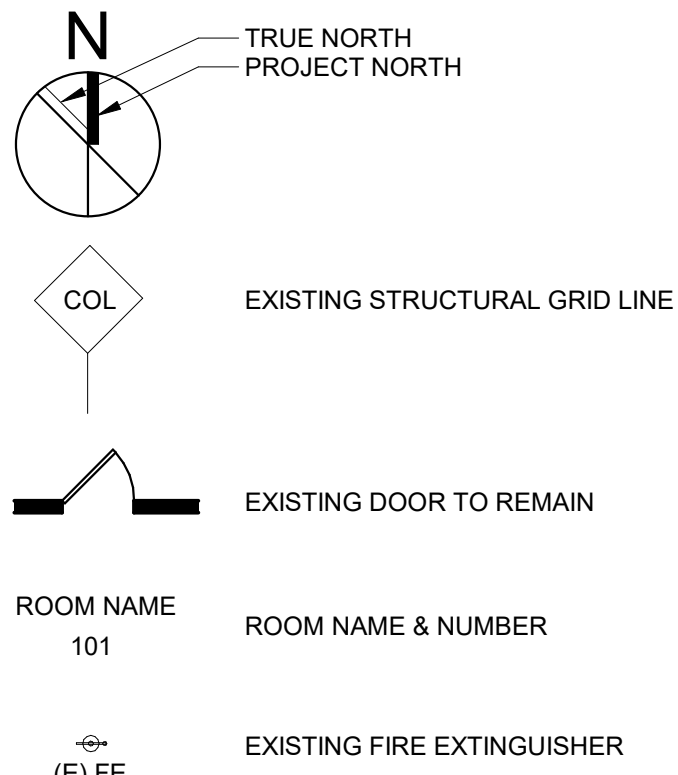


N
M1C PENTHOUSE PLAN
3/16" = 1'-0"



N
DEMOLITION M1C PENTHOUSE PLAN
3/16" = 1'-0"

PLAN LEGEND



ROOF PLAN NOTES

1. ROOFING CONTRACTOR TO VERIFY ALL ROOF DETAILS COMPLY WITH APPROVED ROOFING SYSTEM. IT IS THE RESPONSIBILITY OF THE ROOF CONTRACTOR TO SUPPLY ANY ADDITIONAL DETAILS AND/OR MATERIALS TO ENSURE COMPLIANCE WITH WARRANTY.
2. COORDINATE SIZES AND FINAL LOCATIONS OF ALL EQUIPMENT SUPPORTS WITH THE APPROPRIATE EQUIPMENT MANUFACTURER.
3. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ALL PIPES, CURBS, VENTS, DUCTS, CONDUITS AND OTHER FEATURES EXTENDING THROUGH ROOF SURFACES WHICH REQUIRE FLASHING AND COORDINATE SIZE AND LOCATION OF SAME.
4. INSTALL ROOF FRAMES PRIOR TO CUTTING AND REMOVING ANY METAL DECK.

ROOF PLAN KEYNOTES

1. NEW 72" x 72" MECHANICAL COMBINATION LOUVER/DAMPER ANCHOR TO NEW STRUCTURAL STEEL, REFER TO STRUCTURAL/MECHANICAL/ELECTRICAL DRAWING FOR ADDITIONAL INFORMATION
2. REINSTALL METAL PANEL WALL ASSEMBLY, TRIM AND ASSOCIATED HARDWARE, REFER TO ELEVATION FOR ADDITIONAL INFORMATION, COORDINATE FLAT SCOP WITH MECHANICAL, ELECTRICAL AND STRUCTURAL PLANS.
3. INSTALL SALVAGED DOWNSPOUT AND COORDINATE LOCATION IN FIELD. REFER TO ELEVATION FOR ADDITIONAL NOTES.
4. PROVIDE FIBERGLASS PLATE FLOORING OVER EXISTING METAL GRATING TO EXTEND TO EDGE OF EXISTING EQUIPMENT/PROFILE PANEL AND SECURE WITH 1/2" MANUFACTURER PERMANENT FASTENER ASSEMBLY. PROVIDE 1/2" SPACING AT ANCHORS AS PER MANUFACTURER RECOMMENDED SPACING. ALL CUT EDGES TO COMPLY WITH MANUFACTURERS REQUIREMENTS AND SPECIFICATIONS.
BASIS OF DESIGN: FIBERGLASS PLATE FLOORING
PRODUCT: 3/8" FIBERPLATE FLOOR PLATE
COLOR: GREY
CLIP ASSEMBLY DETAIL: 7/A-411
5. NEW ELECTRICAL SUBSTATION, REFER TO ELECTRICAL DRAWINGS FOR FULL WORK SCOPE AND INSTALLATION PHASING PLAN.
6. NEW REMOVABLE RAILING, SUPPORTS AND ANCHORS TO BE PROVIDED TO MATCH EXISTING WALLING. PROVIDE POST SLEEVES AS REQUIRED.
7. PROVIDE 4" OF HEIGHT CUSTOM GALVANIZED STEEL TRIM PAINT ON FIBERGLASS FLOOR PANELS, REMOVE SEAMS AND TIE INTO (2) EXISTING TRANSFORMER ASKAREL CATCHES.
BASIS OF DESIGN: ALLIED VENTILATION
PRODUCT: GALVANIZED STEEL TRIM PAINT
COLOR: CUSTOM, VERIFY IN FIELD
8. REINSTALL SALVAGED RAILING, SUPPORTS AND ANCHORS.
9. INSTALL SALVAGED DOOR AND FRAME.
10. INSTALL SALVAGED FIRE EXTINGUISHER AND MOUNTING PLATE.

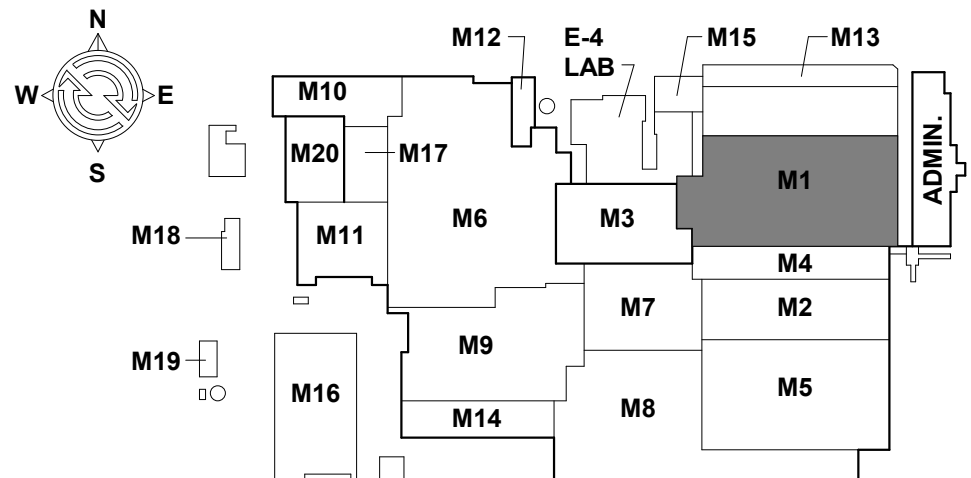
DEMOLITION KEYNOTES

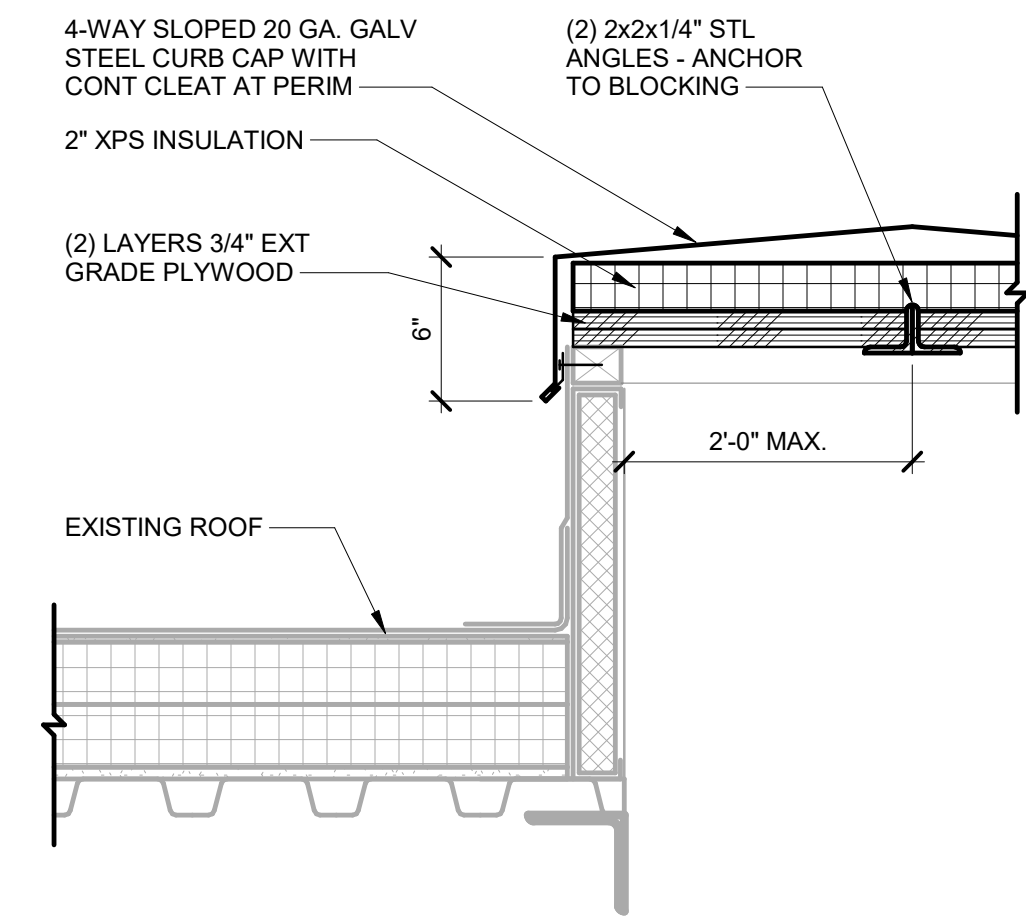
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|--|---|
| <p>1. REMOVE ELECTRICAL SUBSTATION AND, IF APPLICABLE, REMOVE THE ASSOCIATED CONDUIT AND ELECTRICAL DRAWINGS FOR FULL WORK SCOPE AND PHASING PLAN FOR REMOVAL.</p> <p>2. REMOVE AND SALVAGE RAILING AND ANY ASSOCIATED SUPPORTS AND ANCHORS REQUIRED FOR REMOVAL/INSTALLATION OF MECHANICAL EQUIPMENT.</p> <p>3. COMPLETELY REMOVE RAILING DOWN TO SUPPORT BEAM.</p> <p>4. REMOVE PORTION OF METAL PANEL WALL ASSEMBLY AND ALL ASSOCIATED HARDWARE FOR NEW MECHANICAL LOUVERS. COORDINATE OPENING WITH ARCHITECT FOR SHOP DRAWINGS. SEE DEMO ELEVATION FOR ADDITIONAL INFORMATION.</p> <p>5. REMOVE AND SALVAGE METAL PANEL WALL ASSEMBLY, TRIM AND ASSOCIATED HARDWARE FOR INSTALLATION OF NEW ELECTRICAL SUBSTATION. REFER TO DEMO ELEVATION FOR ADDITIONAL INFORMATION. COORDINATE FULL DEMO SCOPE WITH MECHANICAL, ELECTRICAL AND STRUCTURAL PLANS.</p> <p>6. REMOVE VERTICAL DOWNSPOUT AND ANY CONNECTORS ASSOCIATED WITH THE DRAINAGE TO THE LOWER ROOF. SALVAGE PIECES FOR MODIFICATION AND REINSTALLATION. COORDINATE IN FIELD.</p> <p>7. TEMPORARILY REMOVE EXISTING HATCH COVER, AS REQUIRED, FOR THE REMOVAL OF EQUIPMENT FROM BELOW.</p> <p>8. REMOVE DOOR, FRAME AND ASSOCIATED HARDWARE. SALVAGE FOR REINSTALLATION.</p> <p>9. SALVAGE FIRE EXTINGUISHER, MOUNTING PLATE AND ASSOCIATED HARDWARE FOR REINSTALLATION IN NEW LOCATION.</p> | <p>1. THE ARCHITECT HAS NO RESPONSIBILITY FOR THE DISCOVERY, PRESENCE, HANDLING, REMOVAL, OR DISPOSAL OF, OR EXPOSURE OF PERSONS TO, HAZARDOUS MATERIALS OR TOXIC SUBSTANCES IN ANY FORM AT THE PROJECT SITE, INCLUDING BUT NOT LIMITED TO ASBESTOS, LEAD, PCB'S, PROJECTS, POLYCHLORINATED BIPHENYL (PCB), LEAD PAINT OR OTHER TOXIC SUBSTANCES. THE ARCHITECT HAS NO RESPONSIBILITY FOR THE DISCOVERY, PRESENCE, HANDLING, REMOVAL, OR DISPOSAL OF, OR EXPOSURE OF PERSONS TO, HAZARDOUS MATERIALS OR TOXIC SUBSTANCES. THE ARCHITECT HAS NO INTENTION TO INDICATE THAT THESE MATERIALS OR SUBSTANCES, AMONG OTHERS, ARE NOT PRESENT OR THAT THE PROJECT IS NOT FULLY COMPLIANT CONTAINED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.</p> <p>2. PORTIONS OF THE BUILDING IMMEDIATELY ADJACENT TO THE PROJECT AREA WILL BE OCCUPIED DURING SELECTIVE DEMOLITION. WORK SHALL NOT DISTURB NORMAL OPERATIONS OF THE BUILDING. THE ARCHITECT HAS NO INTENTION TO INDICATE THAT THESE MATERIALS OR SUBSTANCES, AMONG OTHERS, ARE NOT PRESENT OR THAT THE PROJECT IS NOT FULLY COMPLIANT CONTAINED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.</p> <p>3. CONDUCT WORK IN MANNER THAT WILL MINIMIZE NEED FOR DISRUPTION OF NORMAL OPERATIONS. PROVIDE MINIMUM 72 HOURS ADVANCE NOTICE OF DEMOLITION ACTIVITIES DISRUPTING OPERATIONS IN AREAS AROUND THE WORK INCLUDING ALL LEVELS ABOVE OR BELOW AS APPLICABLE.</p> <p>4. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION TO PROTECT STAFF FROM FALLING AND GENERATE PUBLIC FROM FALLING DURING SELECTIVE DEMOLITION WORK.</p> <p>5. CONTRACTOR SHALL VERIFY EXISTING BUILDING DIMENSIONS, PARTITION AND WALL LOCATIONS AND FLOOR ELEVATIONS IN FIELD AND NOTIFY THE ARCHITECT OF DISCREPANCIES PRIOR TO START OF WORK.</p> |
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DEMOLITION NOTES

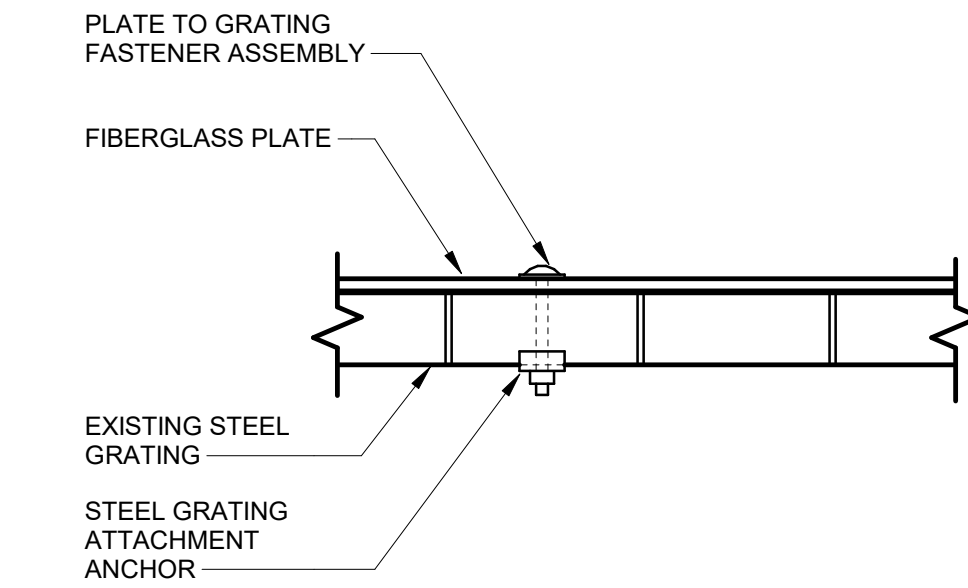
1. THE ARCHITECT HAS NO RESPONSIBILITY FOR THE DISCOVERY, PRESENCE, HANDLING, REMOVAL, OR DISPOSAL OF, OR EXPOSURE OF PERSONS TO, SUBSTANCES OR MATERIALS THAT MAY BE PRESENT IN OR ON THE PROJECT SITE, INCLUDING BUT NOT LIMITED TO, ASBESTOS, ASBESTOS PRODUCTS, POLYCHLORINATED BIPHENYL (PCB), LEAD PAINT OR OTHER TOXIC SUBSTANCES. THE FACT THAT THE DOCUMENT DOES NOT INDICATE THE PRESENCE OF OR REMOVAL OR CONTAINMENT OF THE FOREGOING IS NOT INTENDED TO INDICATE THAT THESE MATERIALS OR SUBSTANCES, AMONG OTHERS, ARE NOT PRESENT OR THAT THE PROJECT IS NOT BEING CONDUCTED IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
2. PORTIONS OF THE BUILDING IMMEDIATELY ADJACENT TO THE PROJECT AREA WILL BE OCCUPIED DURING SELECTIVE DEMOLITION. WORK SHALL NOT DISTURB NORMAL OPERATIONS ADJACENT TO AREAS IDENTIFIED FOR SELECTIVE DEMOLITION. OPERATIONS ARE REQUIRED TO BE OF PARTIES AFFECTED. DISTURBANCE MAY INCLUDE, WITHOUT LIMITATION, DUST, DIRT, DEBRIS, NOISE, ODORS, ETC.
3. CONDUCT WORK IN MANNER THAT WILL MINIMIZE NEED FOR DISRUPTION OF NORMAL OPERATIONS. PROVIDE MINIMUM 72 HOURS ADVANCE NOTICE OF DEMOLITION ACTIVITIES. SCHEDULE OPERATIONS IN AREAS AROUND THE WORK, INCLUDING ON LEVELS ABOVE OR BELOW AS APPLICABLE.
4. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION TO PROTECT STAFF PERSONNEL AND GENERAL PUBLIC FROM INJURY DURING SELECTIVE DEMOLITION WORK.
5. CONTRACTOR SHALL VERIFY EXISTING BUILDING DIMENSIONS, PARTITION WALL LOCATIONS AND FLOOR ELEVATIONS IN FIELD AND NOTIFY THE ARCHITECT OF DISCREPANCIES.
6. CONTRACTOR TO DOCUMENT EXISTING CONDITIONS PRIOR TO START OF WORK USING PHOTOGRAPHS, VIDEOS, OR OTHER MEANS WHICH CAN BE READILY SHARED. SUCH DOCUMENTATION WILL BE MADE AVAILABLE TO ARCHITECT AS REQUESTED BELOW.
7. PROTECT FROM DAMAGE EXISTING FINISH WORK THAT IS TO REMAIN IN PLACE AND IS EXPOSED DURING DEMOLITION OPERATIONS. RESTORE ANY DAMAGED FINISHES TO CONDITION PRIOR TO START OF WORK.
8. PROTECT FLOOR AND ROOF WITH SUITABLE COVERING WHEN NECESSARY.
9. COVER AND PROTECT FURNITURE, EQUIPMENT, AND FIXTURES FROM SOLING OR DAMAGE DURING DEMOLITION WORK. IF PERFORMED IN AREAS WHERE SUCH ITEMS HAVE BEEN REMOVED, RESTORE ANY SUCH ELEMENTS THAT ARE DAMAGED TO CONDITION PRIOR TO DEMOLITION WORK.
10. PRIOR TO CUTTING EXISTING CONSTRUCTION, LOCATE AND VISIBLY MARK SERVICES TO REMAIN IN OPERATION, INCLUDING FLOOR PENETRATIONS, DISCONTINUED CONDITIONS, UTILITY RISERS, ETC., AND WALLS THAT CONTAIN VERTICAL RISERS THAT REMAIN IN OPERATION DURING THE DEMOLITION WORK.
11. IF UNANTICIPATED MECHANICAL, ELECTRICAL, OR STRUCTURAL ELEMENTS THAT CONFLICT WITH INTENDED FUNCTION OF DESIGN ARE ENCOUNTERED, REQUEST AN AS-BUILT DOCUMENT NATURE AND EXTENT OF CONFLICT AND NOTIFY OWNER BEFORE PROCEEDING.
12. MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING DEMOLITION OPERATIONS. DO NOT INTERRUPT UTILITIES SERVING FUNCTIONAL ACTIVITIES, EXCEPT WHEN REQUIRED BY WRITTEN ORDER. PROVIDE TEMPORARY SERVICES ACCEPTABLE TO GOVERNING AUTHORITIES DURING INTERRUPTIONS TO EXISTING UTILITIES.
13. WHERE DEMOLITION IS REQUIRED BEYOND THE LIMITS OF THE CONTRACT TO REMOVE NEW DUCTWORK, PIPING, CONDUTITS ETC., RATED WALLS AND SMOKE SHUTTERS, THERE MUST BE A PROTECTIVE WALL, WITH STANDING MECHANICAL FINISHES DAMAGED BY THE WORK. SHALL BE RESTORED TO THEIR CONDITION PRIOR TO START OF WORK.
14. REPAIR DEMOLITION IN EXCESS OF THAT REQUIRED. RETURN ELEMENTS OF CONSTRUCTION AND SURFACES TO REMAIN TO CONDITION PRIOR TO START OF WORK. REPAIRS TO CONSTRUCTION OR CONSTRUCTION OR SURFACES SOLED OR DAMAGED BY SELECTIVE DEMOLITION.
15. PROVIDE SHORING, BRACING OR OTHER MEANS REQUIRED TO PROTECT AND MAINTAIN THE SAFETY, INTEGRITY AND STABILITY OF EXISTING AND NEW CONSTRUCTION, WHEN REQUIRED. DESIGN OF THESE MEANS AND METHODS SHALL BE BY A LICENSED PROFESSIONAL, ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
16. IF ROOFING, GLAZING, FLASHING, COPING OR PORTIONS OF EXTERIOR WALLS ARE REMOVED OR OPENED, SUITABLE THERMAL AND/OR MOISTURE OR VAPOR PROTECTION SHALL BE PROVIDED AND MAINTAINED FOR THE DURATION SUCH ELEMENTS OR PORTIONS OF THE BUILDING ARE OPEN TO WEATHER.
17. REMOVAL OF ITEMS NOTED INCLUDES REMOVAL OF ASSOCIATED ANCHORS, SHORING, DOWELS, BRACKETS, BOLTS, WELDMENTS, FASTENERS, BRACKETS, SUPPORTS, ETC. TO BARE EXISTING STRUCTURE.
18. SCOPE OF DEMOLITION WORK REQUIRED IS NOT NECESSARILY LIMITED TO WHAT IS SHOWN ON THE DEMOLITION PLANS. THE INTENT IS TO REMOVE ALL MECHANICAL, ELECTRICAL AND ARCHITECTURAL ITEMS AS REQUIRED TO ELABORATE THE CONSTRUCTION OF THE BUILDING. MECHANICAL AND ELECTRICAL DEMOLITION DRAWINGS FOR ADDITIONAL SCOPE OF DEMOLITION WORK.
19. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

KEY PLAN

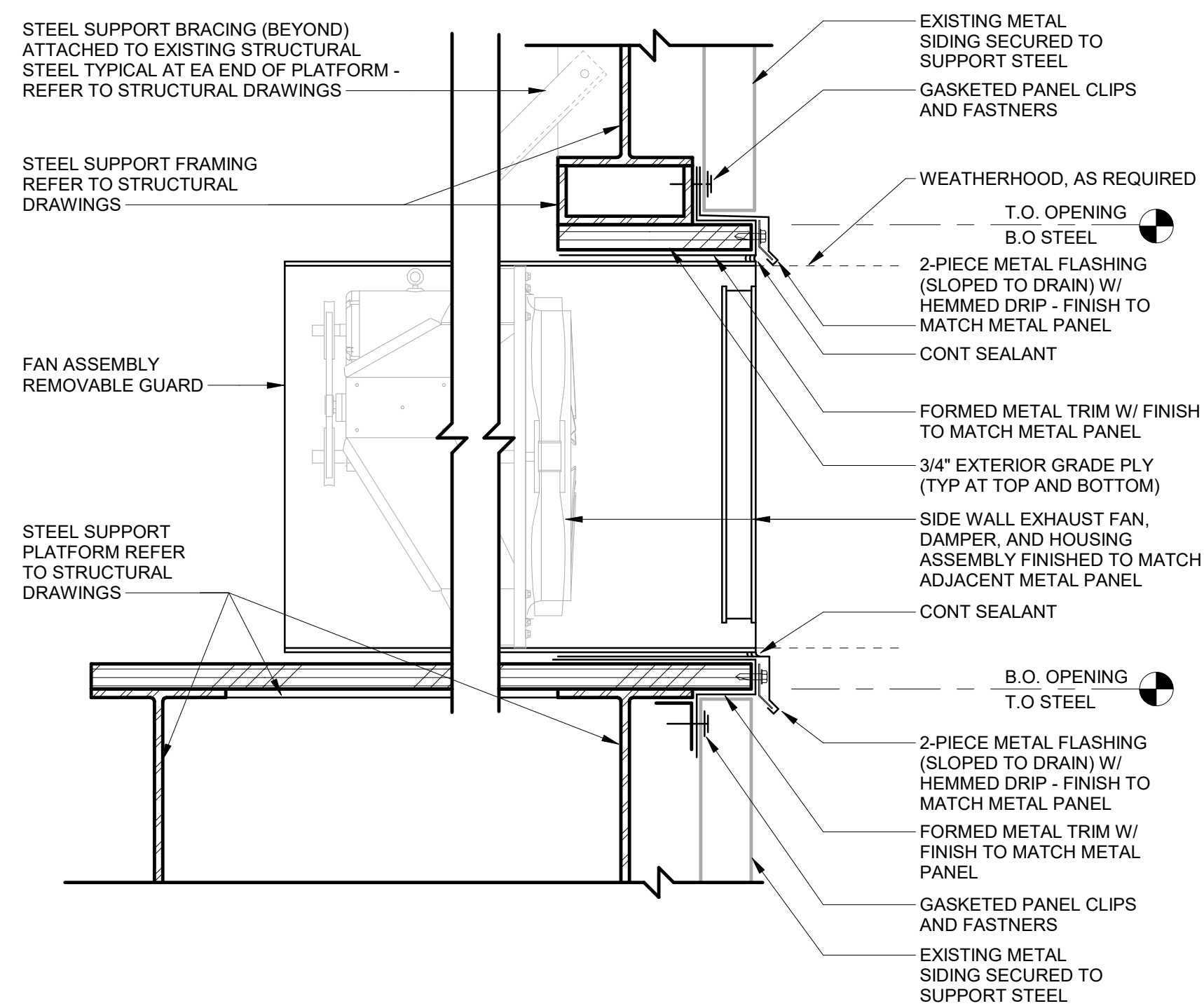




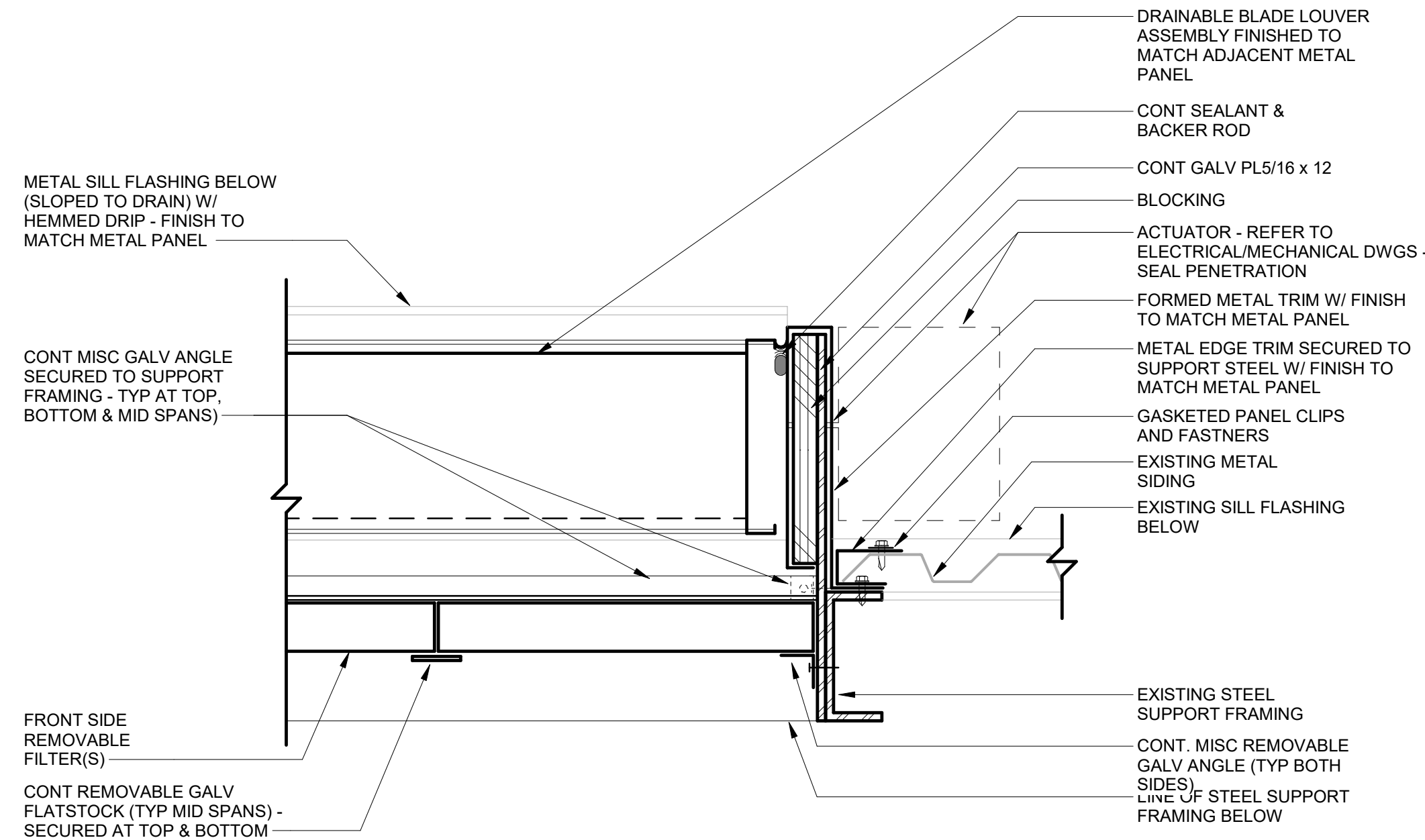
11 TYP. EXISTING CURB CAP DETAIL
1 1/2" = 1'-0"



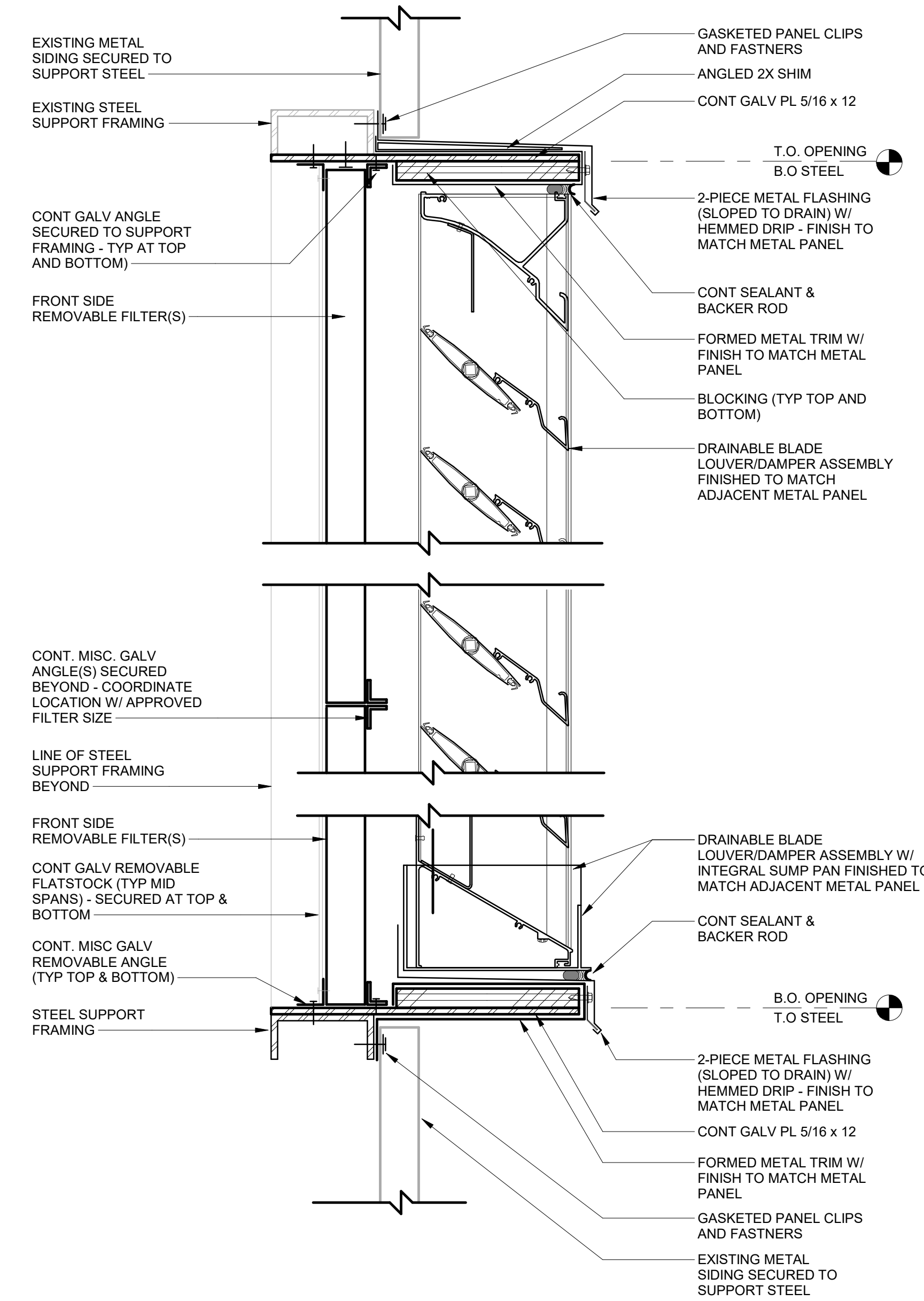
9 PLATE TO GRATING DETAIL
3" = 1'-0"



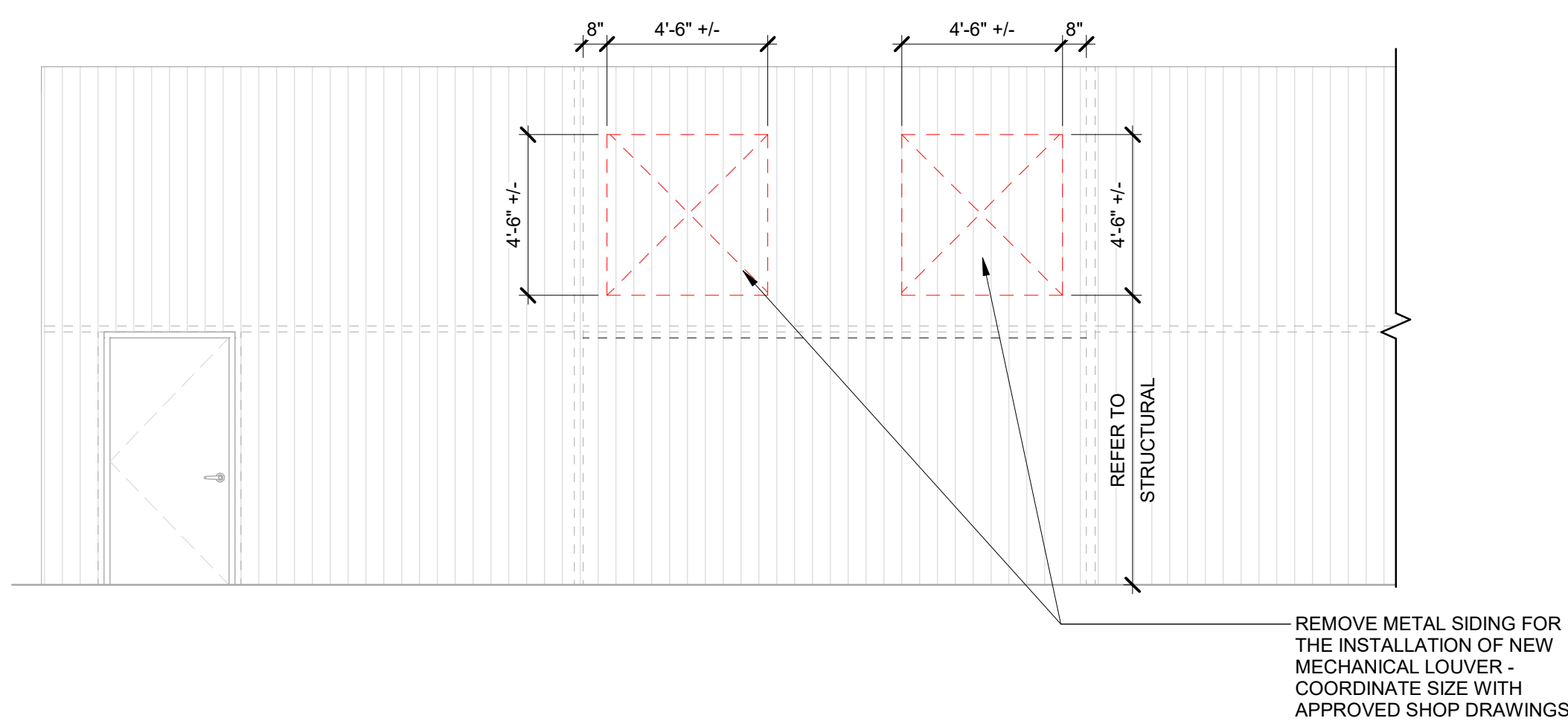
10 EXHAUST FAN ASSEMBLY HEAD & SILL DETAIL (JAMB SIM)



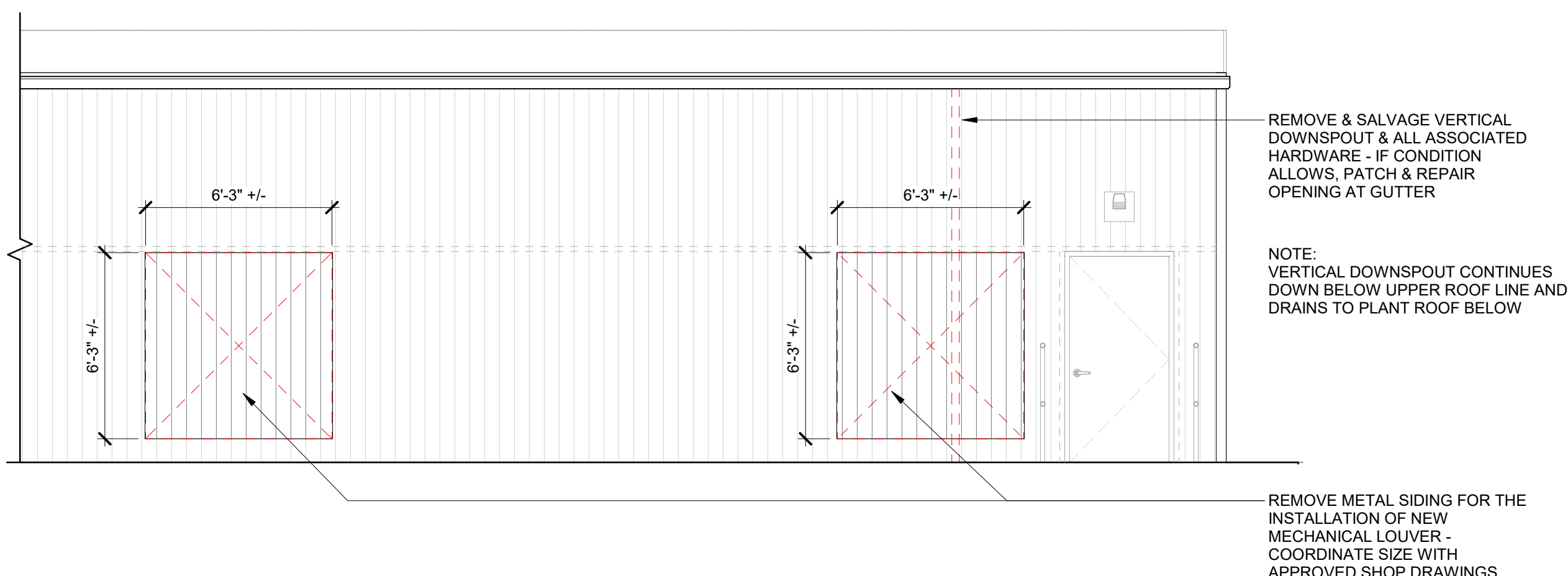
8 LOUVER/DAMPER ASSEMBLY JAMB
DETAIL
3" = 1'-0"



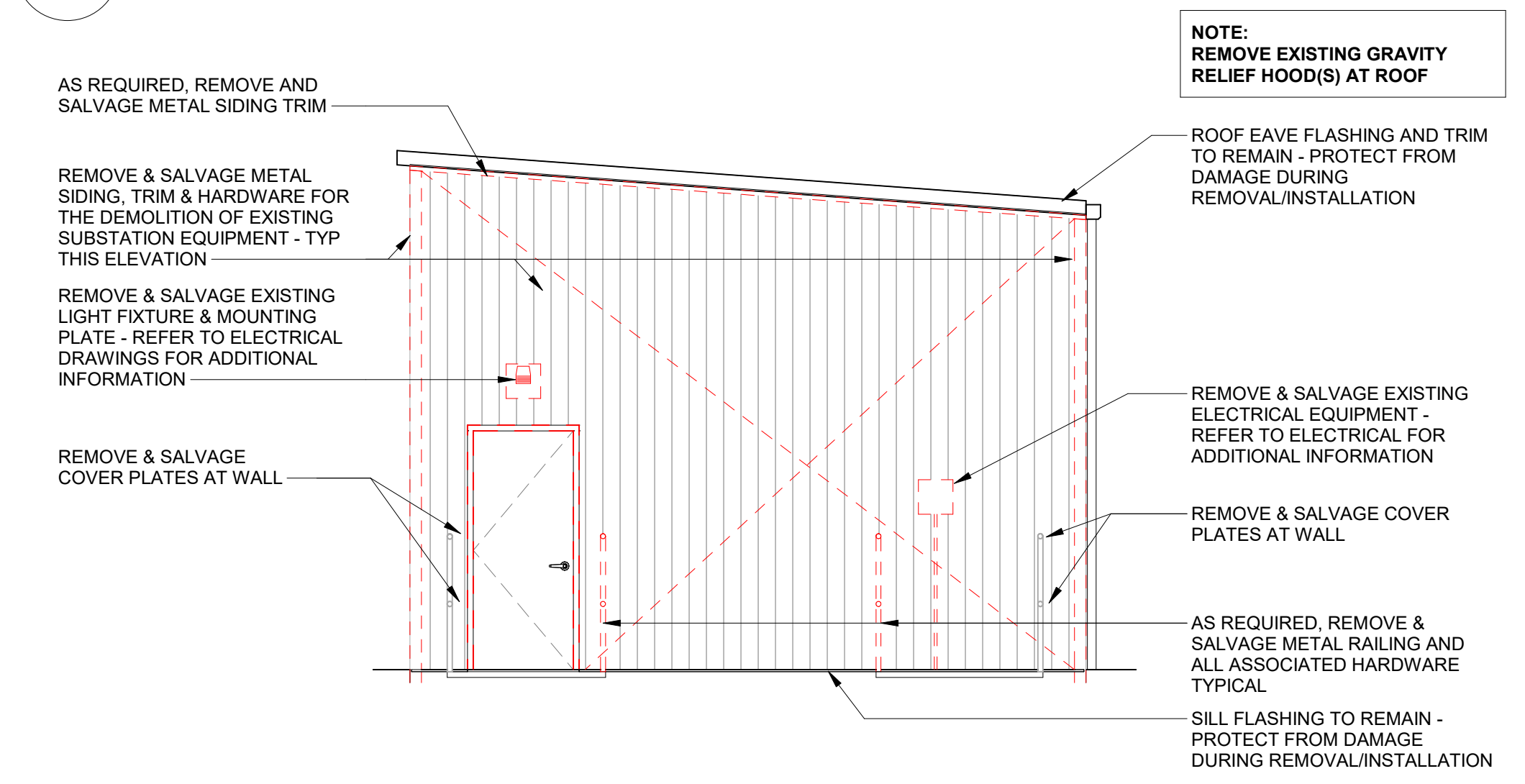
7 LOUVER/DAMPER ASSEMBLY HEAD & SILL DETAIL
3" = 1'-0"



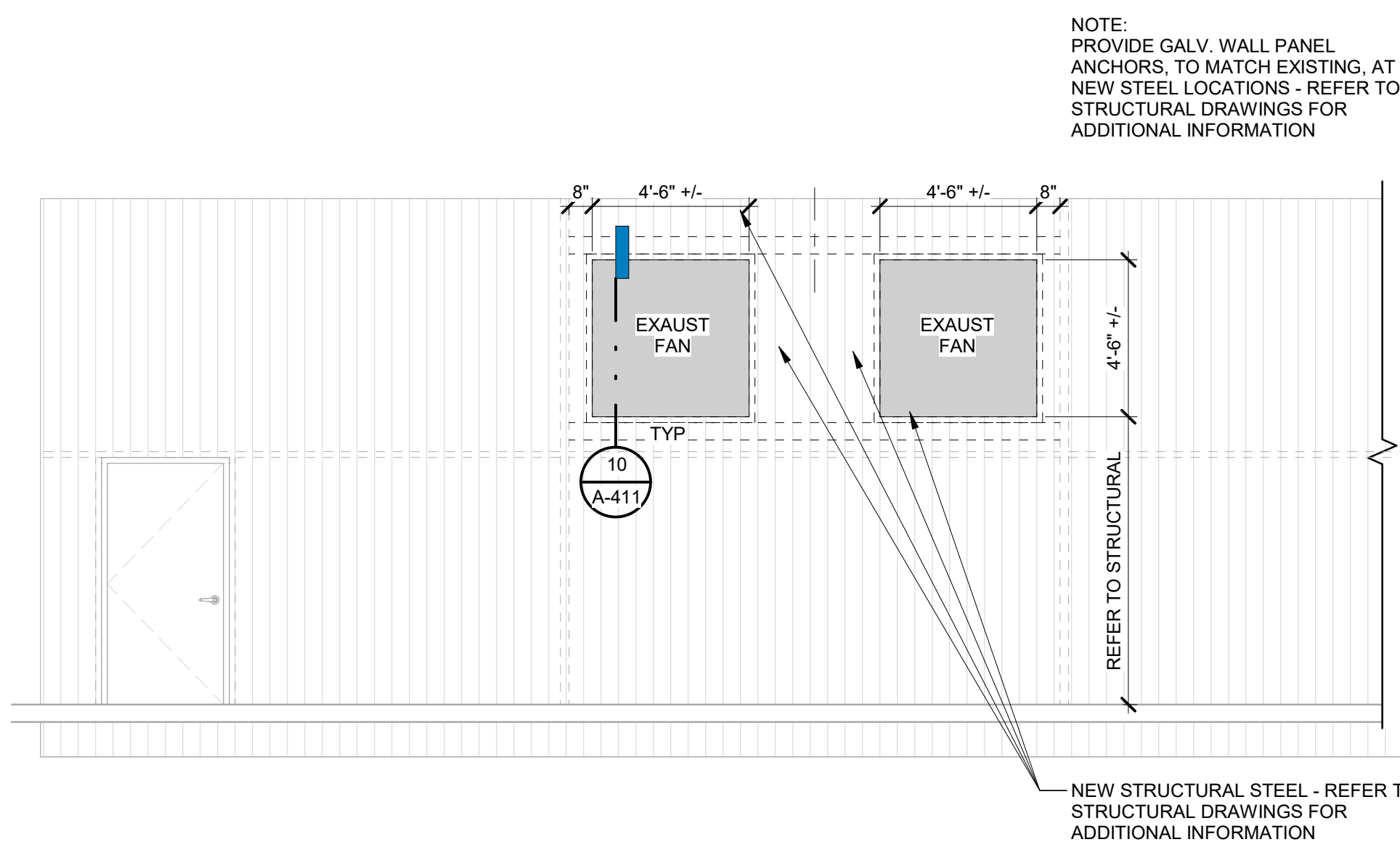
6 EXTERIOR ELEVATION - DEMOLITION
1/4" = 1'-0"



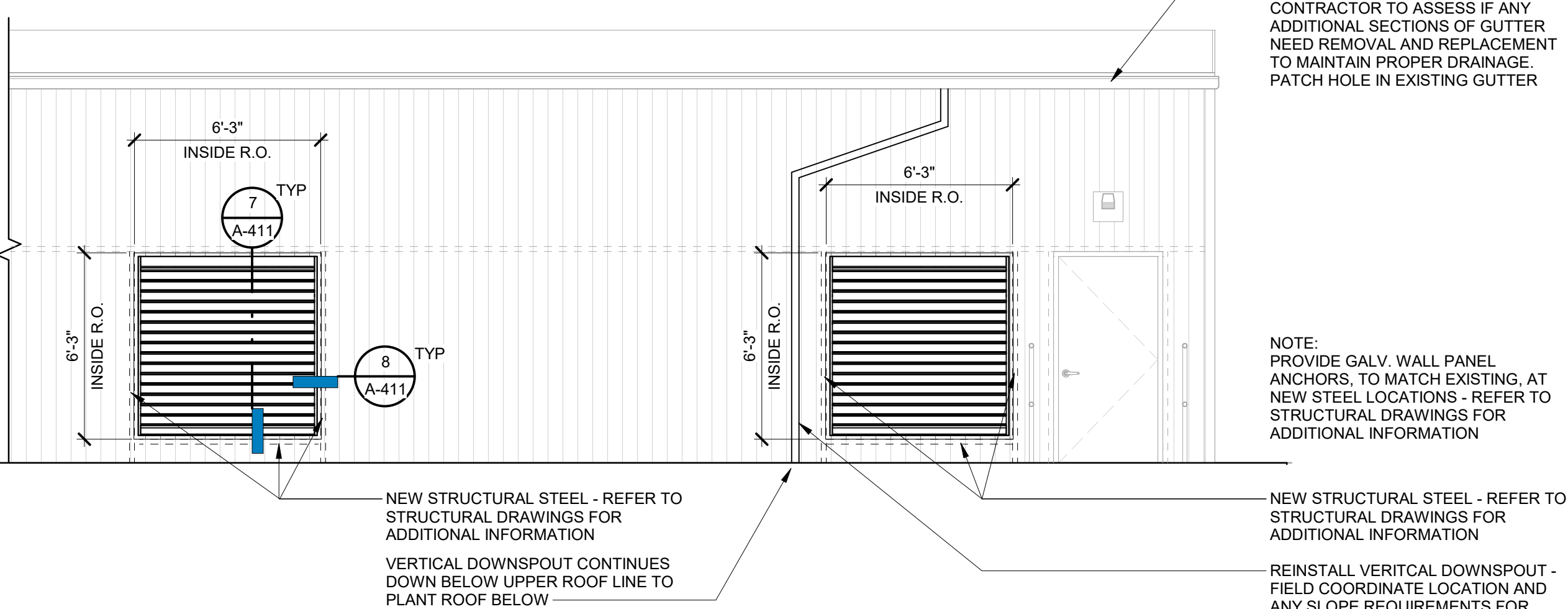
5 EXTERIOR ELEVATION - DEMOLITION
1/4" = 1'-0"



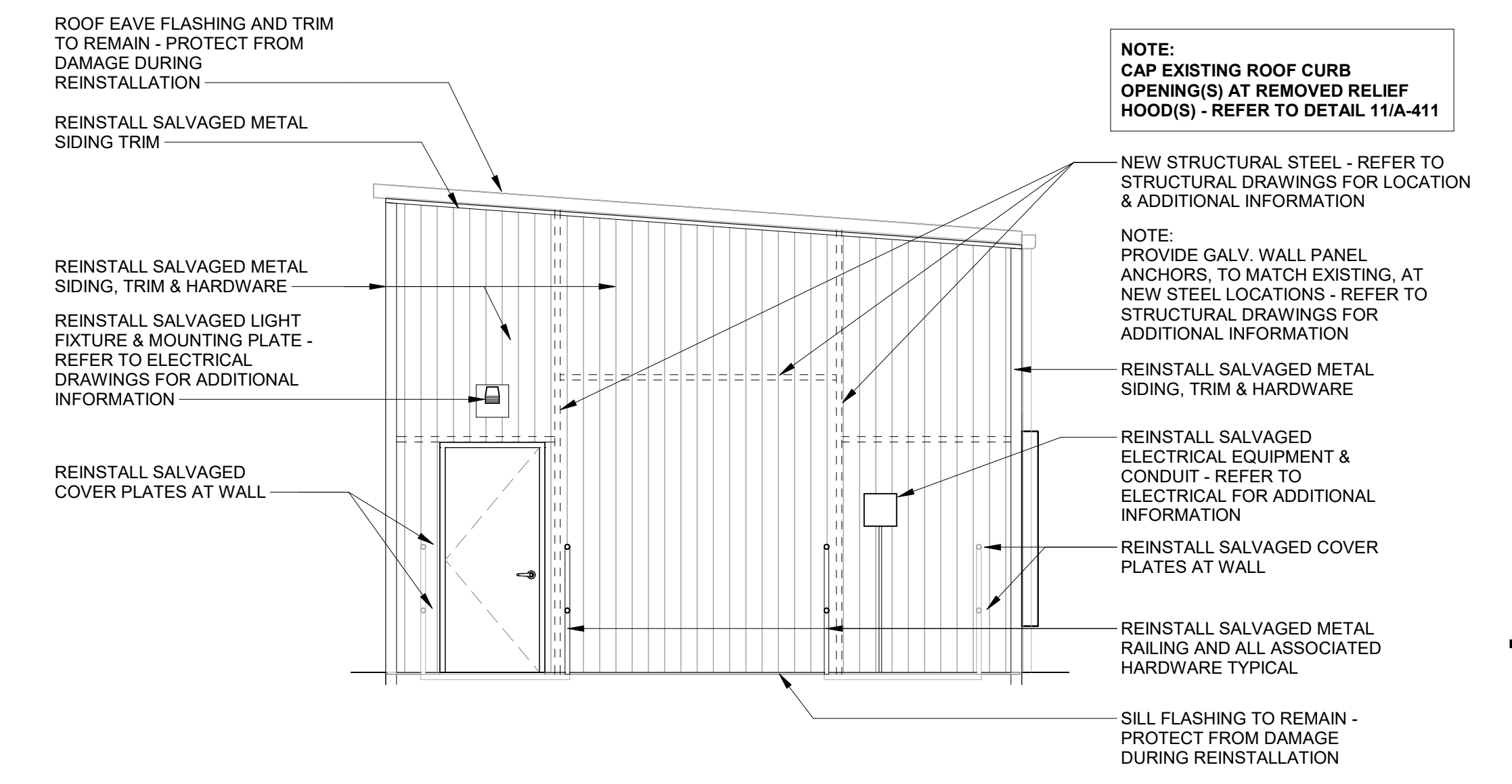
4 EXTERIOR ELEVATION - DEMOLITION



3 EXTERIOR ELEVATION



2 EXTERIOR ELEVATION



1 EXTERIOR ELEVATION

DUCT LEGEND

	RECTANGULAR DUCT SIZE TAG (WIDTH x HEIGHT)
	OVAL DUCT SIZE TAG (WIDTH/HEIGHT)
	ROUND DUCT SIZE TAG (DIAMETER)
	EXISTING DUCT TAG
	DUCT BEING DEMOLISHED
	SUPPLY AIR
	CONDITIONED OUTSIDE AIR
	OUTSIDE AIR
	RETURN AIR
	TRANSFER AIR
	EXHAUST AIR
	GREASE EXHAUST AIR
	SMOKE EXHAUST AIR
	EXHAUST GAS FLUE
	COMBUSTION AIR
	RECTANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
	ROUND SUPPLY/OUTSIDE AIR DUCT RISE
	RECTANGULAR RETURN/TRANSFER AIR DUCT RISE
	ROUND RETURN/TRANSFER AIR DUCT RISE
	RECTANGULAR EXHAUST/RELIEF AIR DUCT RISE
	ROUND EXHAUST/RELIEF AIR DUCT RISE
	FITTING WITH TURN VANES
	ACCESS DOOR
	FLEX DUCT

DAMPER LEGEND

	FIRE DAMPER
	SMOKE DAMPER
	MOTORIZED DAMPER
	MANUAL BALANCING DAMPER
	BACKDRAFT DAMPER
	COMBINATION FIRE / SMOKE DAMPER

SENSOR LEGEND

	TEMPERATURE & HUMIDITY SENSOR
	TEMPERATURE SENSOR
	CARBON DIOXIDE SENSOR
	CARBON MONOXIDE SENSOR
	HUMIDSTAT
	HUMIDITY SENSOR
	MANUAL SWITCH
	NITROGEN DIOXIDE SENSOR
	SENSOR
	THERMOSTAT
	HVAC-CP-X BMS CONTROL PANEL
	PANEL NAME

AIR TERMINAL TAG LEGEND

TYPE (SEE SCHED)		CFM	NECK SIZE / MODULE SIZE
	CD3 0 6'0"24x24		
TYPE (SEE SCHED)		CFM	NUMBER OF SLOTS / ACTIVE SLOT LENGTH / NECK SIZE
	LD1 0 6'5'11x4'0"L		

DESIGN CRITERIA			
WEATHER STATION	725370	DETROIT METRO, MI	
ELEVATION	192 FEET		
CLIMATE ZONE	5A		
DESIGN HEATING 99.6%	3.2 °F DB		
DESIGN COOLING 0.4%	90.3 °F DB / 74.1 °F MCWB		
N = 20 YEARS	MIN	MAX	
	DB	-14.8 °F	98.6 °F
	WB	-15.3 °F	83.7 °F
SEISMIC DESIGN CATEGORY	II		
SEISMIC RISK CATEGORY	B		
MECHANICAL CODE	2021 MMC		
PLUMBING CODE	2021 MPC		
ENERGY CODE	2021 IECC		
CLIENT STANDARD	---		
NOTES: INFORMATION LISTED ABOVE IS NOT INTENDED TO BE FULLY ENCOMPASSING OF ALL CODES / STANDARDS / REQUIREMENTS APPLICABLE TO THE PROJECT.			

MECHANICAL ABBREVIATIONS

AC	AIR CONDITIONING UNIT (DX TYPE)
ACS DR	ACCESS DOOR
AFMS	AIR FLOW MEASURING STATION
C/C	COOLING COIL
CAV	CONSTANT AIR VOLUME
CLG DIFF	CEILING DIFFUSER
CV	CONSTANT VOLUME
Db	DECIBELS
DB	DRY BULB TEMPERATURE
DX	DIRECT EXPANSION
ECM	ELECTRONICALLY COMMUTATED MOTOR
EG	EXHAUST GRILLE
EXH	EXHAUST
EXH FN	EXHAUST FAN
EXIST	EXISTING
F/S DPR	FIRE/SMOKE DAMPER
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FDMPR	FIRE DAMPER
FF	FINAL FILTER
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
HC	HEATING COIL
HP	HORSE POWER
IN WG	INCHES OF WATER GAUGE
LPCR	LOW PRESSURE CONDENSATE RETURN
MD	MOTORIZED DAMPER
MVD	MANUAL VOLUME DAMPER
OA	OUTSIDE AIR
PD	PRESSURE DROP
PF	PRE-FILTER
POC	POINT OF CONNECTION
POD	POINT OF DISCONNECTION
RG	RETURN GRILLE
RLL	REFRIGERANT LIQUID
RR	RETURN REGISTER
RSL	REFRIGERANT SUCTION
SDMPR	SMOKE DAMPER
ST PR	STATIC PRESSURE
TSTAT	THERMOSTAT
TU	TERMINAL UNIT
WBT	WETBULB TEMPERATURE

MECHANICAL DEMOLITION GENERAL NOTES

1. THE DEMOLITION DRAWINGS ARE INTENDED TO CONVEY A GENERAL DESCRIPTION OF AREAS AND SYSTEMS TO BE DEMOLISHED. CONDUCT A COMPLETE AND THOROUGH INVESTIGATION OF THE SITE TO CONFIRM THE SCOPE OF DEMOLITION REQUIRED AND INCLUDE ALL PERTINENT COSTS IN BID. EXISTING EQUIPMENT AND/OR MATERIAL AND ASSOCIATED SYSTEMS TO REMAIN ARE SHOWN.
2. MEASURES SHALL BE TAKEN TO ENSURE ALL SURFACES, INCLUDING BUT NOT LIMITED TO FINISHED FLOORS, WINDOWS, ELEVATORS, AND INTERIOR WALLS, ARE PROTECTED DURING DEMOLITION. EQUIPMENT INGRESS, AND OTHER MATERIAL MOVEMENTS, REPLACE AND EXISTING MATERIALS WHICH ARE DAMAGED DURING THE COURSE OF WORK AT NO COST TO THE OWNER.
3. REMOVE ALL HANGERS AND SUPPORTS FOR DEMOLISHED ITEMS.
4. CONTRACTOR SHALL OBTAIN APPROVAL FROM OWNER AND ENGINEER PRIOR TO REMOVING MATERIALS OUTSIDE OF SPACE IN PROJECT SCOPE. DEMOLITION OF DUCTWORK AND PIPING MAY EXTEND BEYOND THE PROJECT BOUNDARIES TO FACILITATE CAPPING AT MAINS. REMOVE AND REINSTALL CEILINGS AS REQUIRED. REPLACE DAMAGED CEILING COMPONENTS, MATCHING EXISTING TYPES.
5. PROVIDE TEMPORARY ENCLOSURES / PROTECTION / BARRICADES AND WARNINGS PRIOR TO THE START OF DEMOLITION, AND REMOVE WHEN CONSTRUCTION IS COMPLETE. THESE REQUIREMENTS SHALL BE INCLUDED IN THE BASE BID.
6. NO EQUIPMENT, PIPING, VALVES, ETC. SHALL BE REMOVED, DISCONNECTED OR SHUT DOWN WITHOUT PRIOR REVIEW WITH THE OWNER AND ENGINEER TO CONFIRM THAT AREAS TO REMAIN IN OPERATION WILL NOT BE AFFECTED. IF ANY AREAS NOT WITHIN THE SCOPE OF WORK ARE AFFECTED BY ANY SHUTDOWN, MINIMUM ONE (1) WEEK ADVANCE NOTICE SHALL BE GIVEN TO THE OWNER. SHUTDOWNS DURATIONS SHALL BE COORDINATED WITH OWNER IN ADVANCE.
7. ALL EQUIPMENT, MATERIAL, ETC. THAT IS BEING DEMOLISHED WILL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE NOTED. ALL SUCH ITEMS WILL BE REMOVED FROM THE BUILDING SITE BY THE CONTRACTOR IN A PROPER AND LEGAL MANNER. NO ITEM WHICH IS BEING REMOVED UNDER THE DEMOLITION CONTRACT MAY BE REUSED UNDER THE NEW WORK CONTRACT UNLESS NOTED ON THE DRAWINGS. ALL ITEMS TO BE TURNED OVER TO THE OWNER SHALL BE STORED PER THE OWNER'S INSTRUCTION.
8. SEQUENCE OF ALL DEMOLITION WORK SHALL BE IN STRICT ACCORDANCE WITH THE CONTRACT DOCUMENTS AND/OR AS DIRECTED BY THE OWNER. ALL SHUTDOWNS OF EXISTING SYSTEMS SHALL BE SCHEDULED AND APPROVED BY THE OWNER.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL LABOR AND MATERIAL REQUIRED TO PATCH ALL OPENINGS IN EXISTING WALLS, FLOORS, AND FIRE SEPARATIONS CREATED BY THE REMOVAL OF EACH TRADE'S MATERIAL AND EQUIPMENT WHERE THESE OPENINGS ARE NOT TO BE REUSED. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR AT AREAS THAT MECHANICAL EQUIPMENT WAS REMOVED BACK TO ITS ORIGINAL CONDITION INCLUDING ALL DRYWALL, PLASTER, PAINTING, ETC. CONTRACTOR SHALL EMPLOY TRADES EXPERIENCED IN GENERAL CONSTRUCTION TO PATCH ALL OPENINGS. TOOTH IN MASONRY USING WHOLE UNITS TO MATCH EXISTING MASONRY CONSTRUCTION.

MECHANICAL GENERAL NOTES

1. THE ARRANGEMENT OF EQUIPMENT AND PIPING SHOWN ON THE DRAWINGS IS BASED UPON INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME OF DESIGN AND IS NOT INTENDED TO SHOW EXACT DIMENSIONS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS FOR REVIEW PRIOR TO FABRICATION OR ERECTION OF EQUIPMENT AND SYSTEMS. THIS INCLUDES ALL ASSOCIATED ITEMS THAT MAY NOT BE SHOWN ON MECHANICAL DRAWINGS BUT ARE NECESSARY FOR INSTALLATION AND OPERATION, SUCH AS EQUIPMENT PADS AND HANGERS, AMONG OTHERS. IF FIELD CONDITIONS DIFFER SIGNIFICANTLY FROM THOSE SHOWN ON THE DRAWINGS AND AFFECT MECHANICAL WORK, INFORM ENGINEER OF RECORD IMMEDIATELY AND CONFIRM FURTHER DIRECTION BEFORE PROCEEDING WITH THE WORK IN THAT AREA.
2. AT THE TIME OF ROUGH INSTALLATION AND DURING STORAGE ON THE CONSTRUCTION SITE, ALL DUCTWORK, PIPING, AND OTHER RELATED DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEET-METAL, OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST, WATER, AND DEBRIS WHICH MAY ENTER THE SYSTEM.
3. SUPPORT ALL SUSPENDED MECHANICAL EQUIPMENT WITH FULLY THREADED RODS AND VIBRATION ISOLATORS PER THE ASHRAE HANDBOOK OF HVAC APPLICATIONS. UNLESS ALTERNATIVE INSTALLATION DETAILS ARE PROVIDED IN THE MECHANICAL OR STRUCTURAL DRAWINGS.
4. CONTRACTOR SHALL COORDINATE ALL NEW EQUIPMENT DESIGNATIONS WITH OWNER.
5. AS A DELEGATED DESIGN PROVIDE STEEL SUPPORTS FOR ALL WORK AS REQUIRED FOR A COMPLETE INSTALLATION IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS. PROVIDE SUPPLEMENTARY FRAMING AS REQUIRED FOR ATTACHMENT OF HANGERS, SUPPORTS, AND ANCHORS. DESIGN SUPPLEMENTAL FRAMING UNDER DIRECT SUPERVISION OF A STRUCTURAL ENGINEER AND SUBMIT TO DESIGN TEAM FOR REVIEW.
6. CONTRACTOR SHALL COORDINATE AND PROVIDE STRUCTURAL MOUNTING FOR ALL EQUIPMENT.
7. ALL COILS, EQUIPMENT AND OTHER COMPONENTS NEEDING SERVICE SHALL BE LOCATED IN ACCESSIBLE LOCATIONS AND NOT BLOCKED BY PIPING, CEILINGS, WALLS OR OTHER BUILDING COMPONENTS. WHERE UNAVOIDABLE PROVIDE ACCESS PANELS FOR COMPONENTS LOCATED IN INACCESSIBLE LOCATIONS. INCLUDE LOCATION OF ACCESS PANELS IN SUBMITTALS FOR REVIEW.
8. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH THE EQUIPMENT SUPPLIER AND PROVIDE ALL FINAL CONNECTIONS AS REQUIREMENT.
9. IN THE EVENT OF A CONFLICT BETWEEN CONTRACT DOCUMENTS (SUCH AS, BUT NOT LIMITED TO, PLANS, SPECIFICATIONS, OWNER DESIGN GUIDES, BUILDING CODES), THE MOST STRINGENT REQUIREMENT SHALL BE INCLUDED IN THE BASE BID. THE DESIGN TEAM AND OWNER SHALL BE NOTIFIED OF THE DISCREPANCY PRIOR TO COMMENCEMENT OF WORK VIA WRITTEN REQUEST FOR INFORMATION (RFI). IF WORK IS COMPLETED WITHOUT WRITTEN RESPONSE THE WORK SHALL BE CONSIDERED AT-RISK AND IN NON-CONFORMANCE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID AND THOROUGHLY FAMILIARIZE THEMSELVES WITH THE EXISTING FIELD CONDITIONS, INCLUDING BUT NOT LIMITED TO DIMENSIONS, THE EXISTING INSTALLATIONS, POINTS OF (DIS)CONNECTION, AND REQUIRED CLEARANCES. CONTRACTOR SHALL MAKE ANY MINOR ADJUSTMENTS NECESSARY TO AVOID CONFLICTS WITH THE BUILDING STRUCTURE AND THE WORK OF OTHER TRADES. THIS SHALL BE VERIFIED PRIOR TO BID SUBMITTAL. START OF CONSTRUCTION, AND/OR FABRICATION OF MATERIALS. BY THE ACT OF SUBMITTING A BID, THE CONTRACTOR ACCEPTS THE GIVEN WORKING CONDITIONS.
10. IF ANY EQUIPMENT SUBMITTED BY THE CONTRACTOR IS DIFFERENT FROM THE WHAT IS SPECIFIED ON THE DRAWINGS AND EQUIPMENT SCHEDULES, CHANGES SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR APPROVAL. SUBMITTALS SHALL INDICATE ANY RESULTING CREDIT, ADDED COST, AND/OR ADJUSTMENT IN LEAD TIME. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PAYMENT OF ALL CHARGES RESULTING FROM ADDITIONS OR CHANGES IN THE WORK OF OTHER TRADES THAT ARE NECESSARY TO ACCOMMODATE THE REQUESTED SUBSTITUTION, UNLESS OTHERWISE APPROVED BY OWNER. CONTRACTOR WILL PROCEED AT THEIR OWN RISK IF CHANGES OCCUR WITHOUT PRIOR APPROVAL.
11. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH THE EQUIPMENT SUPPLIER AND PROVIDE ALL FINAL CONNECTIONS AS REQUIRED.
12. ALL PENETRATIONS OF DUCTWORK, PIPING, CONDUITS, AND VENTS THROUGH NON-RATED CONSTRUCTION SHALL BE PROPERLY AND GENEROUSLY CALULCED WITH SOUND-RESISTANT AND NON-HARDENING MATERIAL, SUCH AS SILICONE. ALL PENETRATIONS SHALL INCLUDE SLEEVES.
13. COORDINATE WITH OWNER'S ROOFING CONTRACTOR PRIOR TO MAKING ANY PENETRATIONS THROUGH ROOF. ROOF WARRANTIES SHALL BE MAINTAINED. ALL FLASHING, COUNTER-FLASHING AND ROOF MEMBRANE PATCHES AT ALL ROOF OPENING SHALL BE IN ACCORDANCE WITH THE EXISTING ROOFING SYSTEM WARRANTY.
14. CONTRACTOR SHALL COORDINATE MOVEMENT AND STORAGE OF EQUIPMENT AND ALL OTHER COMPONENTS, INCLUDING TAKING ALL NECESSARY PRECAUTIONS TO COVER ALL EQUIPMENT/COMPONENTS TO PROTECT THEM FROM EXPOSURE TO OUTDOOR ELEMENTS, CONDITIONS OUTSIDE OF MANUFACTURER'S STORAGE CONDITIONS, AND CONSTRUCTION DEBRIS.
15. ANY AREA OUTSIDE THE SCOPE OF WORK THAT MAY BE IMPACTED BY CONSTRUCTION DEBRIS SHALL BE PROTECTED FROM SAID DEBRIS AND CLEANED ON A DAILY BASIS, UNLESS DIRECTED OTHERWISE BY THE OWNER.
16. NOT ALL SYMBOLS AND/OR ABBREVIATIONS SHOWN ON THIS SHEET MAY BE USED IN THIS PROJECT.



Detroit Diesel Corporation

13400 Outer Dr W
Redford Township, MI 48239

Detroit Diesel Substation Replacement Package 1

Date	Issued For
05/06/2026	Progress Set
05/15/2026	Final Review
06/18/2026	Final Review
07/30/2026	Bids

125 West 5th St
Royal Oak, Michigan
48067 USA

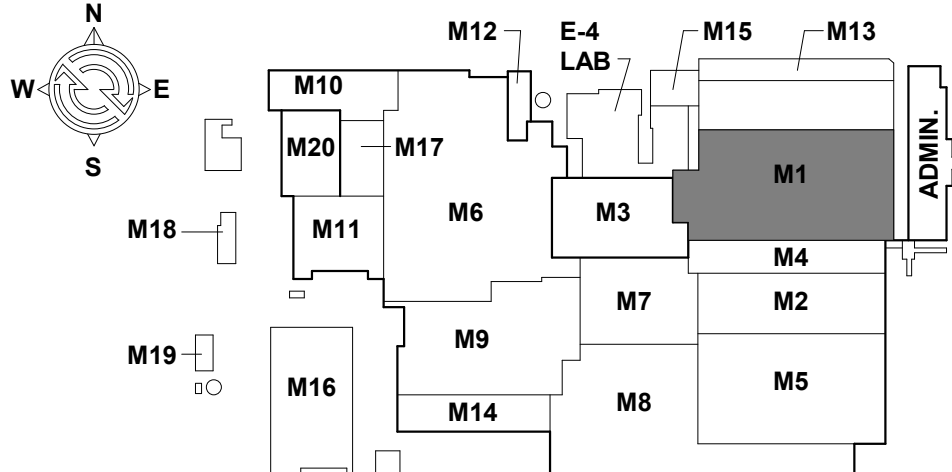
(248) 262-1500

WWW.HED.CO

Mechanical Notes, Legends & Abbreviations

M-001

KEY PLAN





Detroit Diesel Corporation

13400 Outer Dr W
Redford Township, MI 48239

Detroit Diesel
Substation
Replacement
Package 1

Date	Issued For
05/06/2026	Progress Set
05/15/2026	Final Review
06/18/2026	Final Review
07/30/2026	Bids

FAN SCHEDULE

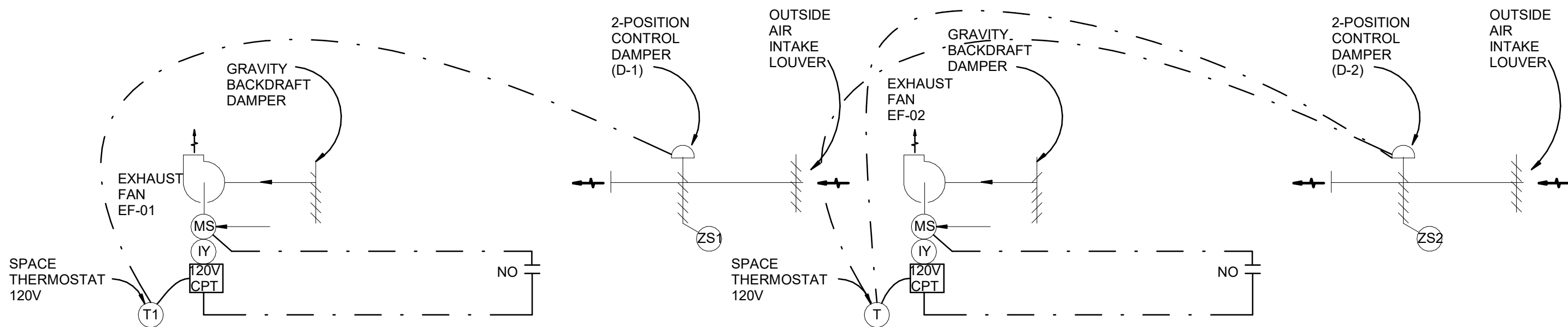
MARK	TYPE	SYSTEM SERVED	FLOW (CFM)	S.P. (IN. W.G.)	CLASS	MIN DIA. (IN.)	MIN EFF(%)	DRIVE	MAX. BHP	MOTOR HP	VOLTS/ PHASE	WEIGHT (LBS)	MANUFACTURER AND MODEL NUMBER	REMARKS
EF-01	SIDEWALL PROP	ELECT PENTHOUSE	15,000	0.618	1	42	49	BELT	3.13	5	460/3	563	GREENHECK BAER-42	ALL
EF-02	SIDEWALL PROP	ELECT PENTHOUSE	15,000	0.618	1	42	49	BELT	3.13	5	460/3	563	GREENHECK BAER-42	ALL

NOTES:
1. PROVIDE FAN HOUSINF, GRAVITY BACKDRAFT DAMPER, WEATHER HOOD.
2. FAN WEIGHT INCLUDES WEIGHT OF ACCESSORIES.

ELECTRIC INFRARED HEATER SCHEDULE

MARK	CAPACITY (MBH)	MOUNTING HT (FT)	WATTS/SQFT AT 9 FT MOUNT	WEIGHT (LBS)	TOTAL KW	ELETRICAL			ENCLOSURE			MANUFACTURER AND MODEL NUMBER	REMARKS
IH-01	20.5	9	33.6	26	6	VOLTS	PHASE	AMPS	LENGTH (IN)	WIDTH (IN.)	HEIGHT (IN.)	CHROMALOX CHROMASTAR MODEL: STAR-06A-43-F	ALL
IH-02	20.5	9	33.6	26	6	480	3	7.2	32.5	10.5	11.5	CHROMALOX CHROMASTAR MODEL: STAR-06A-43-F	ALL

NOTES:
1. PROVIDE MANUALLY ACTIVATED TIMER.
2. DISCONNECT AND CONTACTOR BY DIVISION 26.



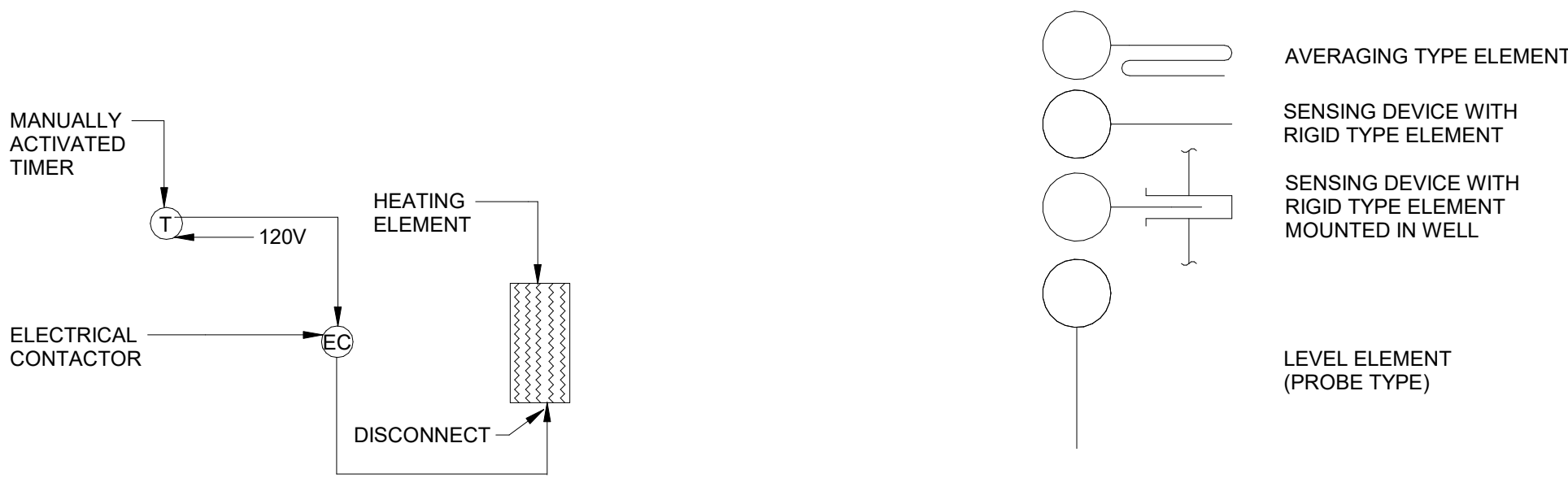
EQUIPMENT ROOM EXHAUST FAN CONTROL DIAGRAM
NO SCALE

SEQUENCE OF OPERATION

DIVISION 26 TO PROVIDE HAND OFF AUTO SWITCH. IN AUTOMATIC MODE, FAN SYSTEM WILL BE ACTIVATED BY TEMPERATURE. EACH FAN AND INTAKE DAMPER IS ACTIVATED BY A MECHANICAL THERMOSTAT (T1). LEAD EXHAUST FAN SHALL CYCLE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT (ADJUSTABLE). SECOND THERMOSTAT (T2) SHALL BE SET 3 DEG F (ADJUSTABLE) ABOVE LEAD FAN THERMOSTAT. IF THE SPACE TEMPERATURE RISES TO T2 SETPOINT, THE LAG EXHAUST FAN SHALL START.

UPON STARTUP, THE THERMOSTAT SHALL SIGNAL THE INTAKE DAMPER (D1 OR D2) TO OPEN. THE FAN SHALL START ONLY AFTER CONTROL DAMPER ASSOCIATED WITH FAN ARE FULLY OPEN, AS DETERMINED BY THEIR DAMPER END SWITCH (EF-01 INTERLOCK WITH SWITCHES ZS-1, EF-02 INTERLOCK WITH Z). THE FANS CAN ALTERNATE LEAD LAG OPERATION BY ADJUSTING SETPOINTS ON T1 AND T2.
UPON SHUTDOWN, THE FAN SHALL STOP AND THE ASSOCIATED CONTROL DAMPERS (D-1, Z) SHALL CLOSE.

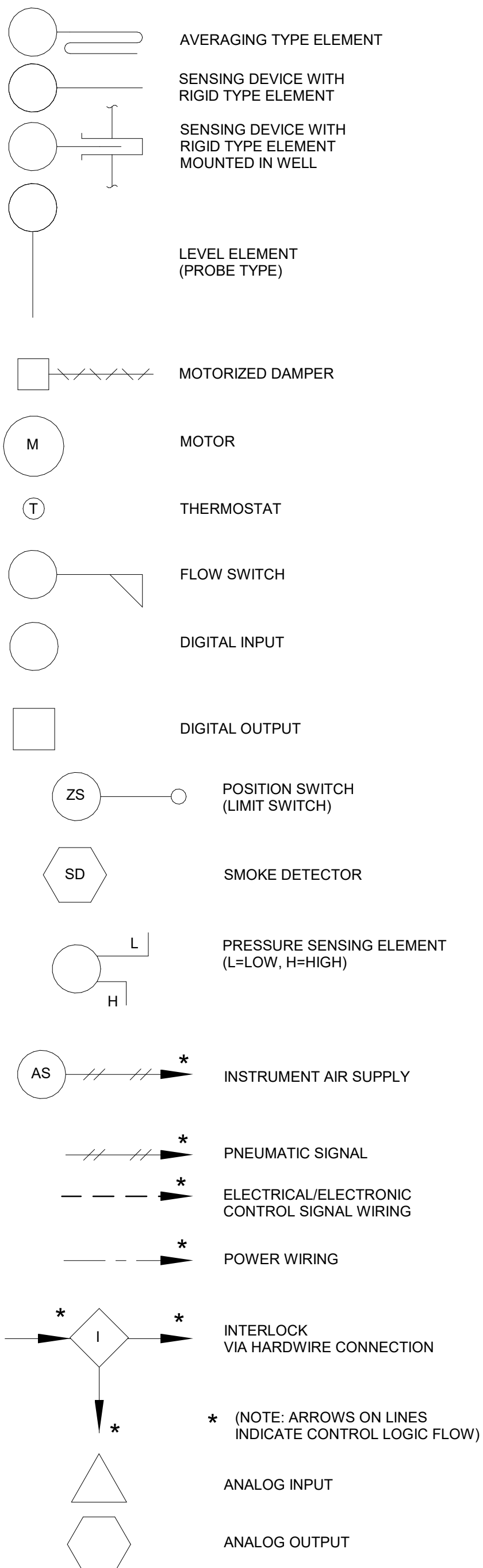
1 EQUIPMENT ROOM EXHAUST FAN CONTROL DIAGRAM
NTS



SEQUENCE OF OPERATION:

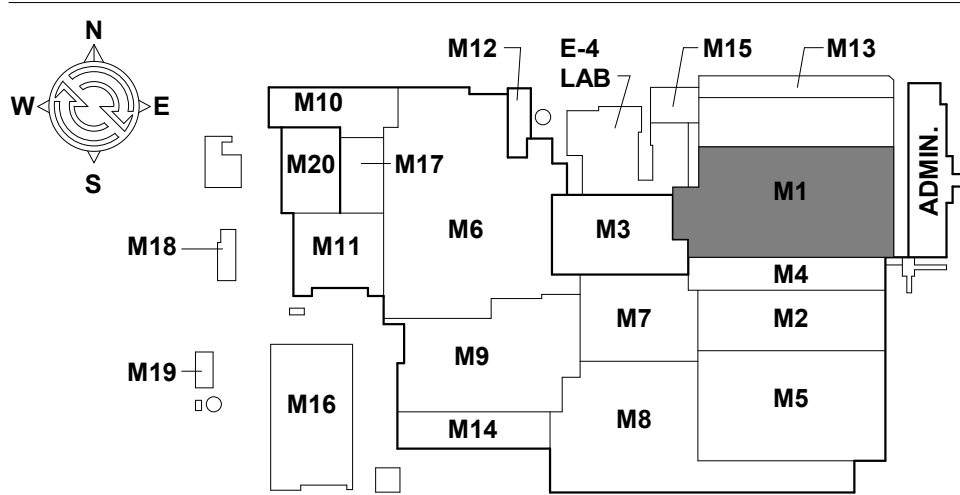
THE MANUAL TIMER SHALL CYCLE THE INFRARED HEAT HEATING ELEMENTS ON FOR 1 HOUR (ADJ) WHEN ACTIVATED. AFTER 1 HOUR, HEATING ELEMENTS SHALL DE-ENERGIZE.

2 ELECTRIC INFRARED HEATER CONTROL DIAGRAM
NTS



CONTROL SYMBOLS

KEY PLAN



ONE-LINE SCHEMATIC SYMBOL LEGEND

STRESS CONE

POT HEAD

GROUND FAULT SENSOR AND RELAY

END CAP

EQUIPMENT CONNECTION

WYE

LOAD CONNECTOR

SPICE

MEDIUM VOLTAGE DRAWOUT CIRCUIT BREAKER

DRAWOUT MEDIUM VOLTAGE STARTER

GROUND CONNECTION - SYSTEM AND/OR EQUIPMENT

3-PHASE, 3-WIRE DELTA CONNECTION

3-PHASE, 4-WIRE WYE CONNECTION (GROUNDED NEUTRAL)

LOW VOLTAGE DRAWOUT TYPE CIRCUIT BREAKER

LOW VOLTAGE DRAWOUT TYPE CIRCUIT BREAKER W/ CURRENT LIMITING FUSE

FUSED CUT OUTS

DISCONNECT SWITCH

FUSED DISCONNECT SWITCH

LIGHTNING ARRESTOR & GROUNDING TO PROTECT ALL PHASES

NETWORK PROTECTOR

MOTOR / ELECTRIC OPERATOR FOR CIRCUIT BREAKERS OR SWITCHES

CAPACITOR

CONTACT: NORMALLY OPEN (NO), NORMALLY CLOSED (NC)

CIRCUIT BREAKER ONE-LINE DESIGNATIONS:
AF = FRAME SIZE
AT = TRIP SIZE
AS = SWITCH SIZE OR SENSOR RATING (CIRCUIT BREAKER)
L = LONG TIME
S = SHORT TIME
I = INSTANTANEOUS TRIP
G = GROUND FAULT
A = GROUND FAULT INDICATION/ALARM
Z = ZONE SELECTING INTERLOCKING

SHUNT TRIP
120V - INDICATES COIL VOLTAGE

THERMAL ELEMENT

KIRK KEY INTERLOCK SYSTEM
K2 = RELATED KIRK KEYS

POTENTIAL TRANSFORMER
3 - INDICATES QUANTITY

POTENTIAL TRANSFORMER (FUSED)
3 - INDICATES QUANTITY

CURRENT TRANSFORMER
3 = INDICATES QUANTITY
400-5A = INDICATES RATIO

RESISTOR

CUSTOMER METERING, MICROPROCESSOR-BASED

MULTIFUNCTIONAL METER

MULTIFUNCTIONAL RELAY

UTILITY RELAY

VARMETER

TRANSFORMER, DRY TYPE, UON

POWER LINE REACTOR

SURGE PROTECTIVE DEVICE

PILOT LIGHT
X = INDICATES COLOR
R = RED
G = GREEN
Y = YELLOW

SHIELDED CABLE

GROUND

FUSE

PANEL BOARD

MONITOR AND PROTECTION DEVICES

RECTIFIER (UPS)

INVERTER (UPS)

BATTERY

STATIC SWITCH

AUTOMATIC TRANSFER SWITCH

AUTOMATIC TRANSFER SWITCH W/ MAINTENANCE BY-PASS

GENERATOR

RECESSED CIRCUIT BREAKER
SURFACED MOUNTED CIRCUIT BREAKER

WIRE MOLD

RESISTOR

CUSTOMER METERING, MICROPROCESSOR-BASED

MULTIFUNCTIONAL METER

MULTIFUNCTIONAL RELAY

UTILITY RELAY

VARMETER

TRANSFORMER, DRY TYPE, UON

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AUTOMATIC TRANSFER SWITCH W/ MAINTENANCE BY-PASS

GENERATOR

RECESSED CIRCUIT BREAKER
SURFACED MOUNTED CIRCUIT BREAKER

WIRE MOLD

MOTOR LEGEND

COMB MOTOR STARTER (FUSED)

SAFETY DISC SW (NON-FUSED)

SAFETY DISC SW (FUSED)

RELAY

PUSH BUTTON

POWER POLE (OPEN OFFICE STYLE)

SURGERY SERVICE COLUMN

STATIC GROUND RECEPTACLE

UTILITY SERVICE POWER POLE

MOTOR
XX-1 → IDENTITY, SEE SCH

EXISTING TO REMAIN

RELOCATED

DEMOLISHED

TRANSFORMER

BUS DUCT W/ PLUG IN DISCONNECT

CABLE TAP BOX

GENERAL NOTES - CONDUIT AND WIRE SCHEDULES

- UNLESS OTHERWISE INDICATED, CONDUIT SIZING SHALL MATCH THE SIZE INDICATED FOR THE APPLICABLE OVERCURRENT DEVICE. PROVIDE LARGER CONDUCTORS AND RACEWAY WHERE INDICATED.
- PROVIDE TYPE AND MINIMUM SIZE OF RACEWAY OR CABLE AS INDICATED IN SPECIFICATIONS OR ON THE DRAWINGS.
- PROVIDE NEUTRAL IN CIRCUIT UNLESS DEVICE SERVED DOES NOT HAVE PROVISIONS FOR A NEUTRAL CONNECTION.
- MINIMUM SIZE CONDUIT FOR SCHEDULE 80 OR ENT IS ONE STANDARD ELECTRICAL SIZE LARGER THAN INDICATED IN THE SCHEDULE. PROVIDE LARGER CONDUIT WHERE SPECIFICALLY INDICATED OTHERWISE. DO NOT INSTALL PVC INDOORS.
- PROVIDE SEPARATE, INSULATED EQUIPMENT GROUNDING CONDUCTOR WITH EACH FEEDER AND BRANCH CIRCUIT.
- PROVIDE SEPARATE INDIVIDUAL NEUTRALS FOR ALL CIRCUITS EXCEPT LIGHTING CIRCUITS. PROVIDE A DEDICATED NEUTRAL FOR GFCI OR AFCI CIRCUITS.
- CIRCUIT SIZING BASED ON 600 VOLT 90°C RATED INSULATION. INTERIOR TYPE THHN/THWN-2 OR XHHW-2 (LARGER THAN SIZE #6). FOR EXTERIOR OR BELOW GRADE UTILIZE RHW-2/USE-2 IN CONDUIT ONE SIZE LARGER. SIZING BASED ON 80°C AMPACITIES FOR 100A OR LESS AND 75°C AMPACITIES OVER 100A.
- FOR SERVICE ENTRANCE CONDUCTORS (IT IS NOT REQUIRED TO INSTALL THE GROUNDING CONDUCTOR, THE NEUTRAL (GROUNDED) CONDUCTOR IS BONDED TO THE GROUNDING ELECTRODE CONDUCTOR AT THE TRANSFORMER AND THE SERVICE DISCONNECT. MINIMUM SIZE IS #20 COPPER FOR SERVICES WITH NO NEUTRAL LOAD PER NEC 250.24(C) AND 250.30. PROVIDE FULL SIZE NEUTRAL WHERE THERE IS NEUTRAL LOAD, UNLESS OTHERWISE INDICATED.
- CONDUCTORS INSTALLED UNDERGROUND SHALL BE SIZED BASED ON NEHER-MCGRATH HEAT CALCULATIONS AND SHALL NOT BE BASED ON OVERHEAD CIRCUIT SIZING. THE FOLLOWING ARE THE UNDERGROUND FEEDER DESIGN PARAMETERS:
 - EARTH RHO = XXX RHO
 - EARTH TEMP = XX °C
 - LOAD FACTOR = 100%
 - DUCT BANK = AS INDICATED ON THE DRAWINGS
- CONDUCTORS IN CABLE TRAY SHALL BE CABLE TRAY RATED. EXPOSED CONDUCTORS SHALL NOT HAVE A NYLON JACKET. USE TYPE XHHW, DLO OR SIMILAR CONDUCTOR INSULATION. REFER TO SPECIFICATIONS.

CIRCUIT SCHEDULE NOTES AND SYMBOL LEGEND

XXXX MAXIMUM CIRCUIT AMPACITY

ZZ = 3 PHASE, 3 WIRE
N = 3 PHASE, 4 WIRE
V = VFD CABLE ASSEMBLY
2N = 200% NEUTRAL
IG = ISOLATED GROUND, [GREEN INSULATION WITH YELLOW STRIPE]
COPPER = CU, ALUMINUM = AL

YY

S = SERVICE - 3 PHASES, GROUNDED CONDUCTOR - REFER TO NOTE #8, THIS SHEET.

UG = UNDERGROUND FEEDER - REFER TO UNDERGROUND CIRCUIT SCHEDULE AND NOTE #9, THIS SHEET.

CT = CONDUCTORS IN CABLE TRAY - REFER TO NOTE #10, THIS SHEET.

CB = CABLE BUS - SIZE ENGINEERED BY VENDOR FOR AMPACITY INDICATED AND A MAXIMUM 3% VOLTAGE DROP.

MC = METAL CLAD CABLE ASSEMBLY.

GENERAL NOTES

- ALL OPENINGS AROUND CONDUITS PASSING THROUGH FIRE RATED WALLS, CEILINGS, FLOORS, ETC. SHALL BE PACKED AND SEALED TO CONFORM WITH THE FIRE RATING OF THE PENETRATED STRUCTURE.
- ANY FEEDERS AND BRANCH CIRCUITS SHALL CARRY A GROUND WIRE, SIZED PER N.E.C ARTICLE 250.
- FIELD VERIFY EXISTING CONDITIONS AND ACTUAL DIMENSIONS PRIOR TO START OF WORK.
- THOROUGHLY COORDINATE ELECTRICAL WORK WITH OTHER TRADES TO AVOID PHYSICAL CONFLICTS AND CONFLICTS WITH WORK SEQUENCE.
- MOUNTING HEIGHTS OF ELECTRICAL DEVICES ARE TO CENTER OF DEVICE UNLESS OTHERWISE NOTED.
- WHERE ELECTRICAL DEVICES ARE INDICATED ON A COLUMN, THE DEVICE SHALL BE CENTERED ON THE COLUMN SURFACE
- WHERE GFCI PROTECTION IS INDICATED, A GFCI TYPE RECEPTACLE SHALL BE PROVIDED AT EACH LOCATION. LOAD SIDE PROTECTION OF DOWN STREAM DEVICES WILL NOT BE ACCEPTABLE.
- MINIMUM WIRE SIZE SHALL BE #12 AWG. BRANCH CIRCUITS OF 120 VOLTS EXCEEDING 75'-0", OR 277 VOLTS EXCEEDING 150'-0" IN LENGTH SHALL BE #10 AWG MINIMUM.
- REFER TO ONE LINE DIAGRAM(S) FOR FEEDER CONDUIT AND WIRE SIZES.
- ALL EMPTY CONDUITS SHALL BE DE-BURRED, CLEANED, TAGGED AND PROVIDED WITH A NYLON PULL STRING. PROVIDE CONDUIT CONNECTOR OR BUSHING ON END OF CONDUIT FOR ALL CONDUIT STUB OFFS.
- ELECTRICAL LAYOUT AND DESIGN HAVE BEEN BASED ON PRELIMINARY INFORMATION PRE-PURCHASE EQUIPMENT SUBMITTALS. ELECTRICAL TRADES SHALL OBTAIN FINAL EQUIPMENT INSTALLATION INFORMATION FROM APPROVED SHOP DRAWINGS PRIOR TO SYSTEM INSTALLATION.
- ELECTRICAL CONTRACTOR TO COORDINATE FINAL EQUIPMENT AND PANEL NAMES FROM THE OWNERS REPRESENTATIVE PRIOR TO IDENTIFICATION AND LABELING IN FIELD AND FABRICATION OF NAMEPLATES.

DEMOLITION NOTES

- THIS CONTRACTOR SHALL DISCONNECT ALL EXISTING ELECTRICAL WORK, WHETHER SHOWN OR NOT IN THE AREA OF NEW CONSTRUCTION AS REQUIRED FOR REMOVAL BY THE GENERAL CONTRACTOR. THIS CONTRACTOR SHALL ALSO RELOCATE ANY ELECTRICAL WORK, WHETHER SHOWN OR NOT, THAT INTERFERES WITH NEW WORK OR ANY TRADE.
- JUNCTION BOXES, CONDUITS AND WIRING FEEDING DEVICES AND EQUIPMENT TO BE REMOVED SHALL ALSO BE REMOVED UP TO THE NEXT ACTIVE PULL BOX, JUNCTION BOX OR PANEL. ALL OPEN HOLES IN DUCTS, BOXES, PANELS AND KNUCK OUTS SHALL BE CLOSED WITH SUITABLE PLUGS OR FILLER PLATES.
- EXISTING ELECTRICAL EQUIPMENT TO REMAIN SHALL BE KEPT IN SERVICE AND BE PROTECTED. PROVIDE TEMPORARY SERVICE AS REQUIRED. ALL DOWN TIMES SHALL BE MINIMUM AND SHALL BE COORDINATED WITH THE BUILDING OWNER AND SHALL BE SUBJECT TO THEIR APPROVAL.
- REMOVAL OF EQUIPMENT SERVING LOCATIONS BEYOND THE RENOVATED AREAS SHALL BE CONFIRMED WITH THE ARCHITECT/ENGINEER PRIOR TO START OF WORK.
- THE BUILDING OWNER SHALL BE GRANTED THE RIGHT OF FIRST REFUSAL ON ALL EQUIPMENT TO BE REMOVED. ANY EQUIPMENT WAIVED BY THE BUILDING OWNER SHALL BE LEGALLY DISPOSED OF OFF THE SITE BY THE CONTRACTOR.
- WHERE EXISTING ELECTRICAL EQUIPMENT TO REMAIN IS SUPPORTED ON WALLS OR CEILINGS TO BE REMOVED, THE EQUIPMENT SHALL BE RE-SUPPORTED AS REQUIRED.
- ALL DEMOLITION WORK SHALL BE DONE IN A NEAT, WORKMANLIKE MANNER USING CARE NOT TO DAMAGE ANY OF THE EXISTING STRUCTURE.
- PROVIDE NEW CONDUIT AND WIRING TO REPLACE EXISTING CONDUIT AND WIRING REQUIRING RELOCATION.
- WHERE WORK IS REQUIRED IN OCCUPIED SPACES, THE WORK SHALL BE SCHEDULED "OFF HOURS" AND BE SUBJECT TO THE BUILDING OWNER'S APPROVAL.

MECHANICAL AND PLUMBING EQUIP. NOTES

- FIELD COORDINATE EXACT LOCATION OF ALL MECHANICAL EQUIPMENT PRIOR TO THE ROUGH-IN OF THE ELECTRICAL WORK FOR MECHANICAL EQUIPMENT.
- ALL OVERCURRENT PROTECTIVE DEVICES AND FEEDER AMPACITIES FOR THE MECHANICAL EQUIPMENT SHALL BE VERIFIED WITH APPROVED MECHANICAL SHOP DRAWINGS PRIOR TO ROUGH-IN OF THE ELECTRICAL WORK AND ORDERING OF MATERIALS FOR MECHANICAL WORK. ALL DISCREPANCIES SHALL BE BROUGHT UP TO THE ATTENTION OF THE ENGINEER AND ARCHITECT PRIOR TO ROUGH-IN OF ELECTRICAL WORK.
- INCLUDE ALL COST FOR ANY REVISIONS IN MECHANICAL EQUIPMENT, OVERCURRENT PROTECTIVE DEVICES AND FEEDER AMPACITIES, CONTROL WIRING, RELAYS, OUTLETS, ETC., WHERE THE SPECIFIED MECHANICAL EQUIPMENT ARE SUBSTITUTED WITH EQUIPMENT WITH DIFFERENT ELECTRICAL REQUIREMENTS.
- FURNISH AND INSTALL ALL LINE AND LOW VOLTAGE CONDUIT, CONDUCTORS, DEVICES, OUTLETS FOR HEATING, VENTILATING, AIR CONDITIONING AND PLUMBING EQUIPMENT PER MECHANICAL DRAWINGS AND SPECIFICATIONS.

ABBREVIATIONS - GENERAL ELECTRICAL

AC	ABOVE COUNTER	MAX	MAXIMUM
ACS	ACCESS CONTROL SYSTEM	MC	MAIN CROSS-CONNECT
AMP	AMPERE FRAME	MCB	MAIN CIRCUIT BREAKER
AFF	ABOVE FINISH FLOOR	MCC	MOTOR CONTROL CENTER
AHU	AUTHORITY HAVING JURISDICTION	MDP	MAIN DISTRIBUTION FRAME
AHU	AIR HANDLING UNIT	MECH	MECHANICAL
AIC	AMPERES INTERRUPTING CAPACITY	MGB	MAIN GROUNDING BUS
AL	ALUMINUM	MAN	MANUAL
AP	AMPERE PLUG	MIN	MINIMUM
ARF	ABOVE RASSED FLOOR	ML	MAIN LUG ONLY
AS	AMPERE SWITCH	MM	MULTIMODE FIBER
AT	AMPERE TRIP	MNS	MASS NOTIFICATION SYSTEM
ATS	AUTOMATIC TRANSFER SWITCH	MON	MONITOR
AV	AUDIO VISUAL	MSB	MAIN SWITCHBOARD
AWG	AMERICAN WIRE GAUGE	MTD	MOUNTED
		MTG	MOUNTING
		MTR	MOTOR
		MTS	MANUAL TRANSFER SWITCH
BCC	BACKBONE COPPER CABLE	NC	NORMALLY CLOSED
BKBD	BACKBOARD	NEC	NATIONAL ELECTRICAL CODE
BKR	BREAKER	NIC	NOT IN CONTRACT
BLDG	BUILDING	NO	NORMALLY OPENED
		NTS	NOT TO SCALE
C	CONDUIT	OF	OWNER FURNISHED OWNER
CAB	CABINET	OFCI	OWNER FURNISHED
CAT	4-PAIR, UTP CABLE	OCF	CONTRACTOR INSTALLED
CATV	COMMUNITY ANTENNA TELEVISION	OICF	CONTRACTOR INSTALLED
CB	CIRCUIT BREAKER	OSP	OCCUPANCY SENSOR
CB	CANDELA	OS	OUTSIDE PLANT
CD	CIRCUIT		
CLG	CEILING OR CEILING MOUNTED		
CLST	CLOSET		
CMH	COMMUNICATIONS MAINTENANCE HOLE		
COAX	COAXIAL		
COMM	COMMUNICATIONS		
CP	CONTROL PANEL		
CRGB	COMPUTER ROOM GROUND BUS		
CT	CABLE TRAY		
CU	COPPER		
		P	POLE
DC	DIRECT CURRENT	PB	PULL BOX
DEG	DEGREE	PC	PHOTOCELL
DEMO	DEMOLITION	PD	POWER DISTRIBUTION
DEPT	DEPARTMENT	PTD	POWER TRANSFER UNIT
DIA	DIAMETER	PH	PHASE
DISC	DISCONNECT	PL	PILOT LIGHT
DIST	DISTRIBUTION	PNL	PANEL
DN	DOWN	PON	PASSIVE OPTICAL NETWORK
DP	DISTRIBUTION PANELBOARD	PP	POWER PANELBOARD
DWG	DRAWING	PT	POKE-THRU
E	EXISTING	PTD	POWER TRANSFER DEVICE
EACH	EACH	PTZ	PAN, TILT, ZOOM
ELEC	ELECTRICAL CONTRACTOR	PV	PHOTOVOLTAIC
ELEC	ELECTRICAL CONTRACTOR	PVC	POLYVINYL CHLORIDE
ELEV	ELEVATOR	PWR	POWER
EMT	ELECTRIC METALLIC TUBING	R	RELOCATED
ENL	EXISTING NEW LOCATION	RECEPT	RECEPTACLE
EQUIP	EQUIPMENT	RQMT	REQUIREMENT
ER	EQUIPMENT ROOM	RM	ROOM
ERMS	ENERGY REDUCTION MAINTENANCE SWITCH	RMS	RIGID METAL CONDUIT
ESS	ELECTRONIC SAFETY & SECURITY	RP	RECEPTACLE PANEL
ETM	EXISTING TO MOVE	RPP	REMOTE POWER PANEL
ETRB	EXISTING TO BE REMOVED	RSPS	RECEPTACLE PANEL WITH INTEGRAL SURGE SUPPRESSION
EWC	ELECTRIC WATER COOLER	RACK UNIT	RACK UNIT
EWVH	ELECTRIC WATER HEATER		
FA	FIRE ALARM	SAF	SUPPLY AIR FAN
FAA	FIRE ALARM ANNUNCIATOR	SCTP	SCREENED TWISTED PAIR
FACP	FIRE ALARM CONTROL PANEL	SD	SMOKE DETECTOR
FCU	FAN COIL UNIT	SF	SQUARE FEET
FLA	FULL LOAD AMPERES	SM	SINGLEMODE FIBER
FLR	FLOOR	SPEC	SPECIFICATIONS
FMT	FLEXIBLE METALLIC TUBING	SRD	SURGE SUPPRESSION DEVICE
FOC	FIBER OPTIC CABLE	STD	STANDARD
FU	FUSE	STS	STATIC TRANSFER SWITCH
		STP	SHIELDED TWISTED PAIR
		SUB	SUBSTATION
		SW	SWITCH
GANN	GENERATOR ANNUNCIATOR	SWBD	SWITCHBOARD
GEN	GENERATOR	SWGR	SWITCHGEAR
GFCI	GROUND FAULT CIRCUIT INTERRUPTOR		
GND	GROUND	TBL	TABLE
		TC	TIME CLOCK
HC	HORIZONTAL CROSS-CONNECT	TEL	TELEPHONE
HCB	HAND-TO-TO	TGB	TELECOM GROUNDING BUS BAR
HOA	HAND-OFF-AUTO	TL	TWIST LOCK
HP	HORSE POWER	TMBG	TELECOM MAIN GROUNDING BUS BAR
HTR	HEATER	TR	TELECOM ROOM
I	IN ACCORDANCE WITH	TV	TELEVISION
IAC	INTERNATIONAL BUILDING CODE	TYP	TYPICAL
IC	INTERMEDIATE CROSS-CONNECT		
IDC	INSULATION DISPLACEMENT CONNECTOR	UG	UNDERGROUND
IDF	INTERMEDIATE DISTRIBUTION FRAME	UH	UNIT HEATER
IDS	INTRUSION DETECTION SYSTEM	UL	UNDERWRITERS LABORATORIES
IG	ISOLATED GROUND	INC	INC.
INV	INVERTER	UNO	UNLESS OTHERWISE NOTED
IMC	INTERMEDIATE METAL CONDUIT	UPS	UNINTERRUPTIBLE POWER SUPPLY
IP	INTERNET PROTOCOL	UTP	UNSHIELDED TWISTED PAIR
IPP	ISOLATED POWER PANEL	UV	UNIT VENTILATOR
		V	VOLT
JB	JUNCTION BOX	VA	VOLT AMPS
JC	JANITOR CLOSET	VAV	VARIABLE AIR VOLUME
		VOIP	VOICE OVER INTERNET
KCMIL	THOUSAND CIRCULAR MILLS	VP	VIDEO
KVA	KILOVOLT AMPERE	VSS	VIDEO SURVEILLANCE SYSTEM
KW	KILOWATT		
KWH	KILOWATT HOUR	W	WATT
LAN	LOCAL AREA NETWORK	W	WITH
LCP	LIGHTING CONTROL PANEL	WAP	WIRELESS ACCESS POINT
LFACP	LOCAL FIRE ALARM CONTROL PANEL	WG	WIRE GUARD
LI	LONG TIME, INSTANTANEOUS	WH	WATER HEATER
LP	LIGHTING PANELBOARD	WP	WATERPROOF
LRA	LOCKED ROTOR AMPERE		
LSI	LONG TIME, SHORT TIME, INSTANTANEOUS	XFMR	TRANSFORMER
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, GROUND FAULT LIGHTING	XP	EXPLOSION PROOF
LTG		ZSI	ZONE SELECTIVE INTERLOCK
		3R	NEMA 3R ENCLOSURE
		4X	NEMA 4X ENCLOSURE



Detroit Diesel Corporation

13400 Outer Dr W
Redford Township, MI 48239

Sub M1C Replacement

Date Issued For
05/15/2026 Final Review
05/18/2026 Final Review
07/30/2026 Bids

ELECTRICAL SHEET INDEX			
SHEET NUMBER	SHEET NAME	CURRENT REVISION DATE	CURRENT REVISION
E-001	Electrical General Notes & Abbreviations	07/30/2026	Bids
EC01	Partial Plant Level Composite Plan - M1	07/30/2026	Bids
ED151	M1C Penthouse Demo Plans	07/30/2026	Bids
EP151	M1C Penthouse Plans	07/30/2026	Bids
E-701	Electrical One-Line Diagrams - Demo	07/30/2026	Bids
E-702	Electrical One-Line Diagrams - New	07/30/2026	Bids
E-801	Electrical Specifications	07/30/2026	Bids
COUNT: 7			

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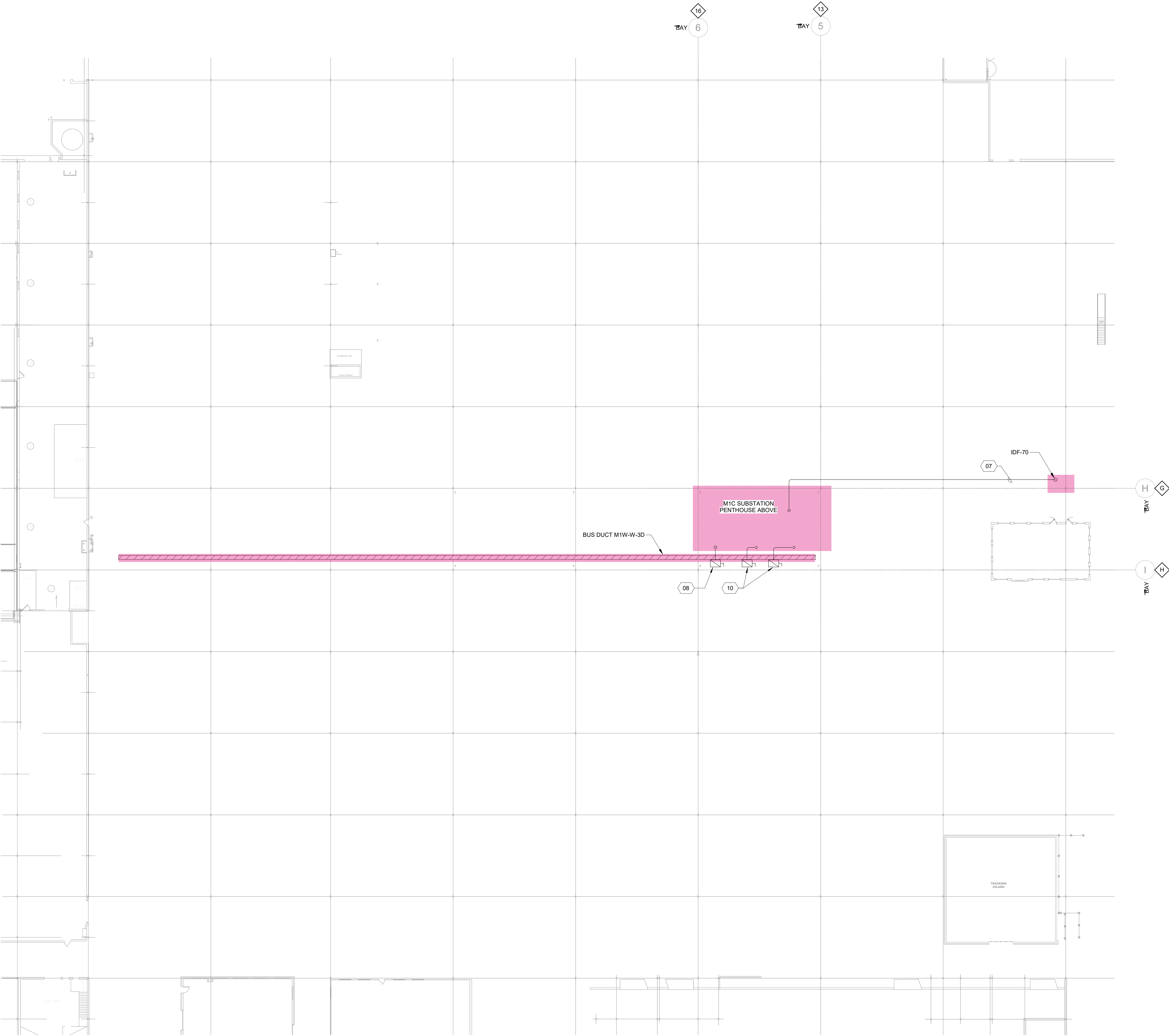
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Royal Oak, Michigan
48067 USA

(248) 262-1500

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Electrical General Notes & Abbreviations

E-001



1 PARTIAL PLANT LEVEL COMPOSITE PLAN - M1
3/8" = 1'-0"

GENERAL SHEET NOTES

1. SEE DRAWING E-001 FOR GENERAL NOTES & ABBREVIATIONS ELECTRICAL SYMBOL LEGENDS, TYPICAL MOUNTING HEIGHT INFORMATION, AND CONDUCTOR & CONDUIT SCHEDULES.
2. SEE DRAWINGS E-701 & E-702 FOR ELECTRICAL ONE-LINE DIAGRAM.
3. SEE DRAWING E-801 FOR ELECTRICAL SPECIFICATIONS.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
07	PROVIDE 1-1/4" CONDUIT PATHWAY FROM IDF-70 IN PLANT TO M1C SUBSTATION PENTHOUSE FOR NEW NETWORK CABLING. EXTEND PATHWAY TO NEW M1C SWITCHGEAR, COORDINATE FINAL LOCATION WITH APPROVED SUBMITTALS. PROVIDE AND INSTALL TWO (2) RUNS OF PLENUM RATED CATEGORY 6 CABLE (MANUFACTURED BY COMMSCOPE, PURPLE IN COLOR) ALONG WITH ONE (1) PULL STRING.
08	INSTALL 480/277V 60AS/60AF 3P 4W WESTINGHOUSE POW-R-WAY BUS PLUG PROVIDED BY OWNER ON EXISTING BUS DUCT.
10	INSTALL 480V 30AS/30AF 3P 3W WESTINGHOUSE POW-R-WAY BUS PLUG PROVIDED BY OWNER ON EXISTING BUS DUCT.

Detroit Diesel
Corporation

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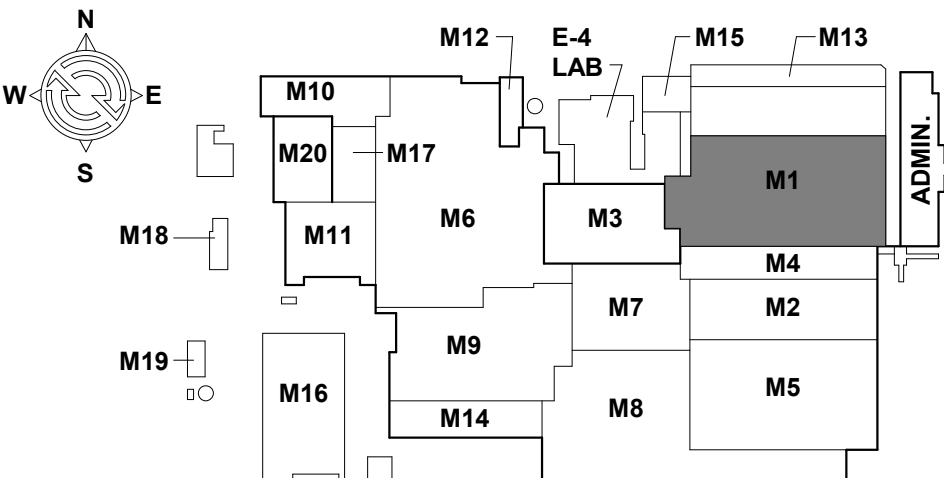
Sub M1C
Replacement

Date	Issued For
05/15/2026	Final Review
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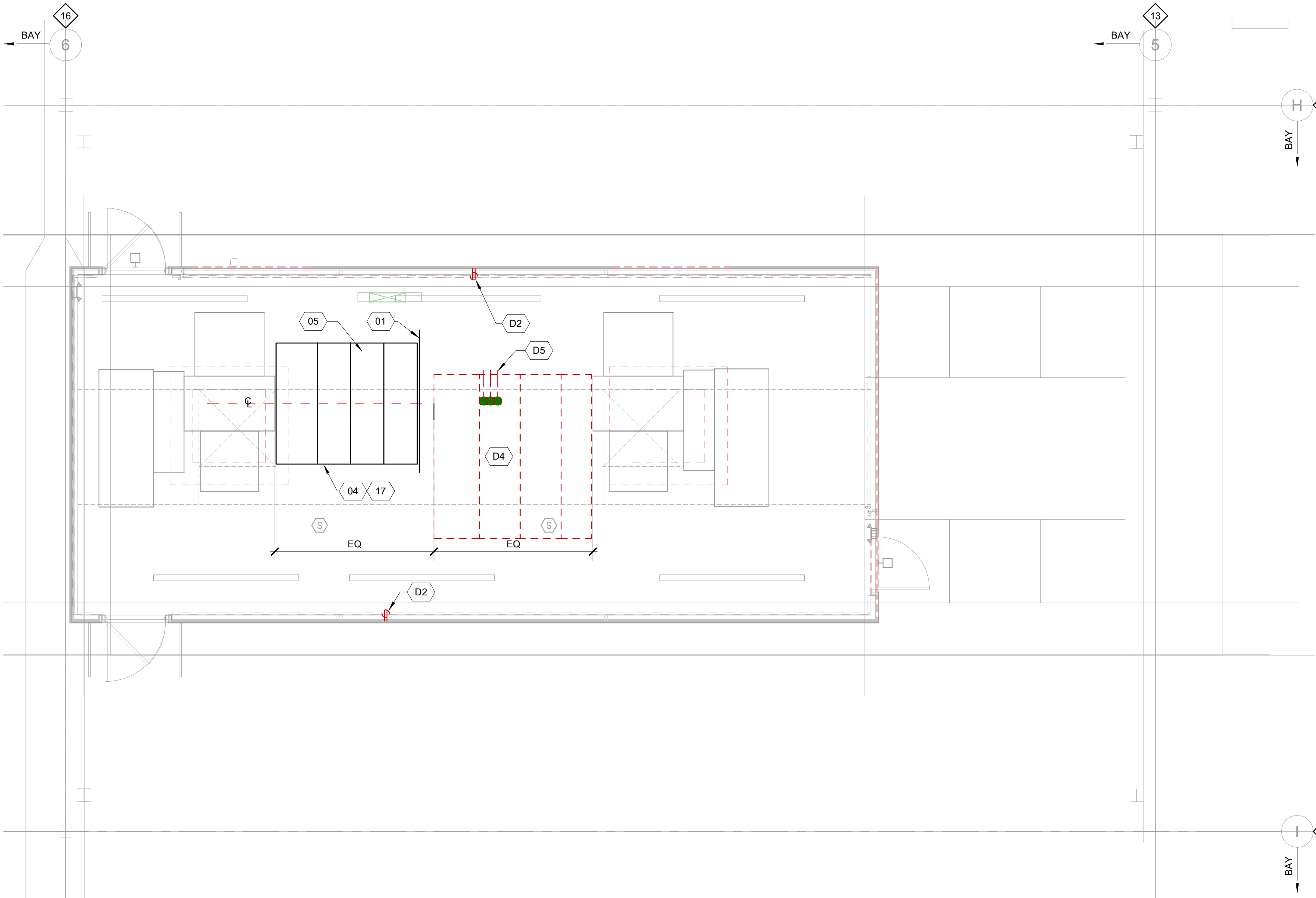
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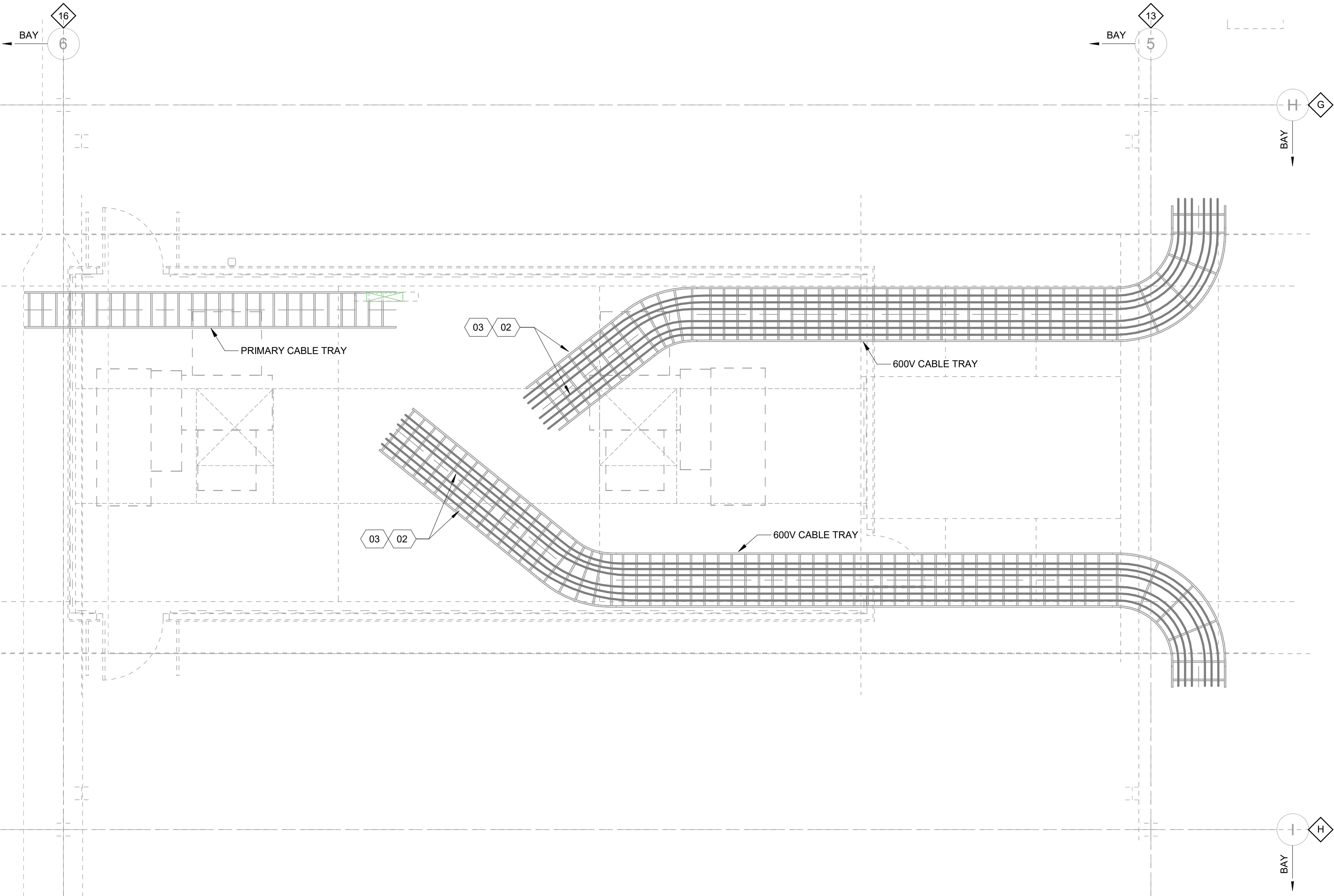
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Partial Plant
Level Composite
Plan - M1

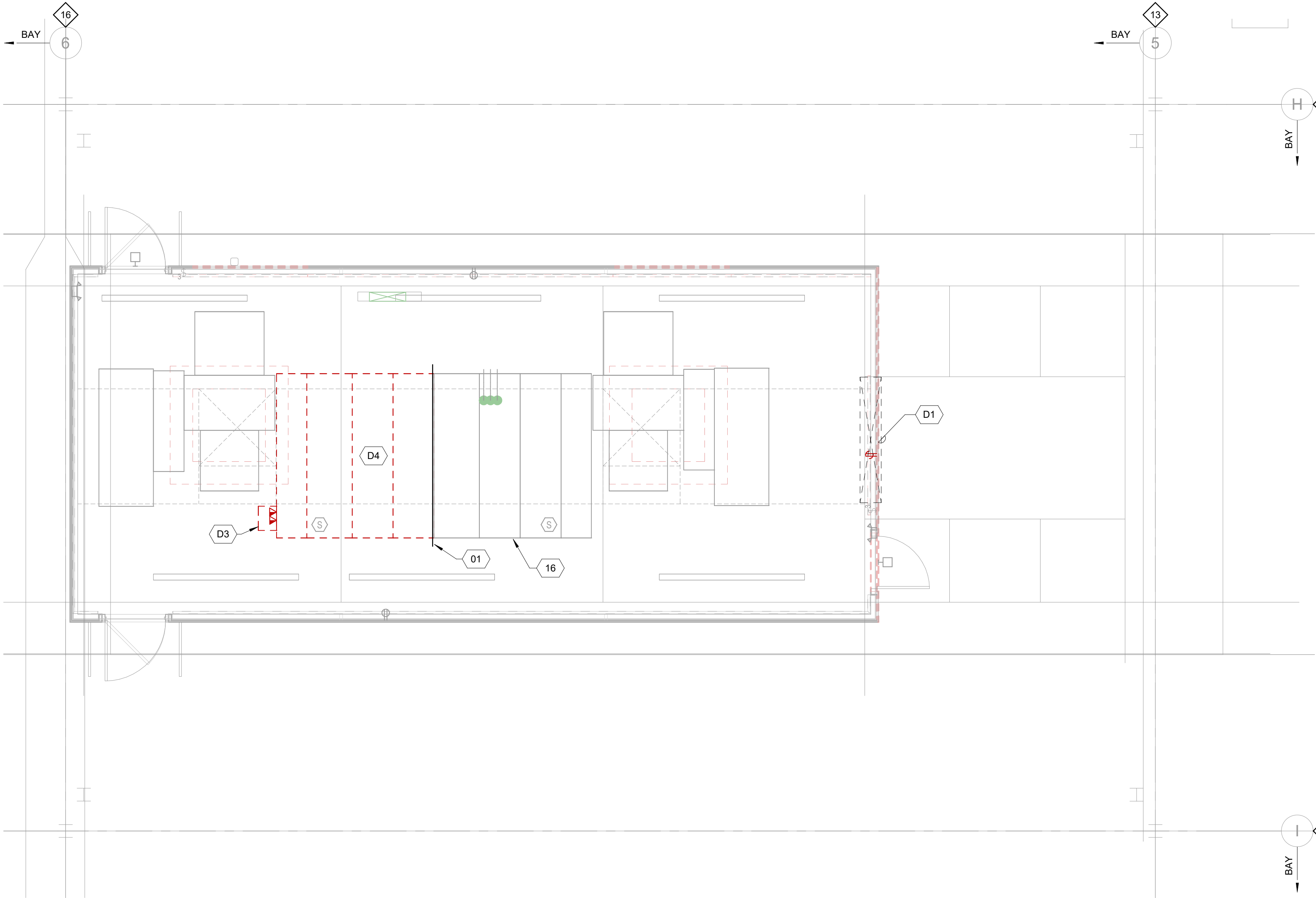
EC101



2 SUBSTATION M1C PENTHOUSE DEMO PLAN - RIGHT SIDE SECOND
1/4" = 1'-0"



3 BELOW SUBSTATION M1C PENTHOUSE PLAN
1/4" = 1'-0"



1 SUBSTATION M1C PENTHOUSE DEMO PLAN - LEFT SIDE FIRST
1/4" = 1'-0"

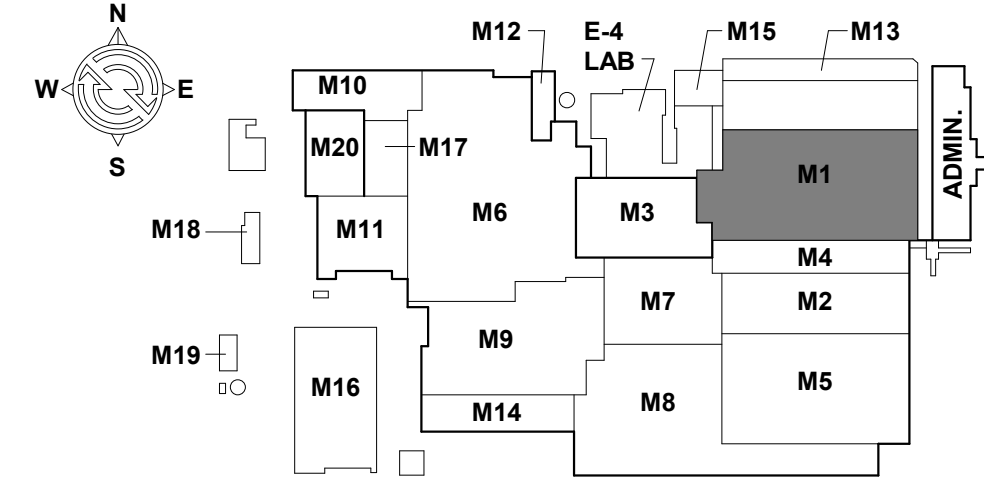
GENERAL SHEET NOTES

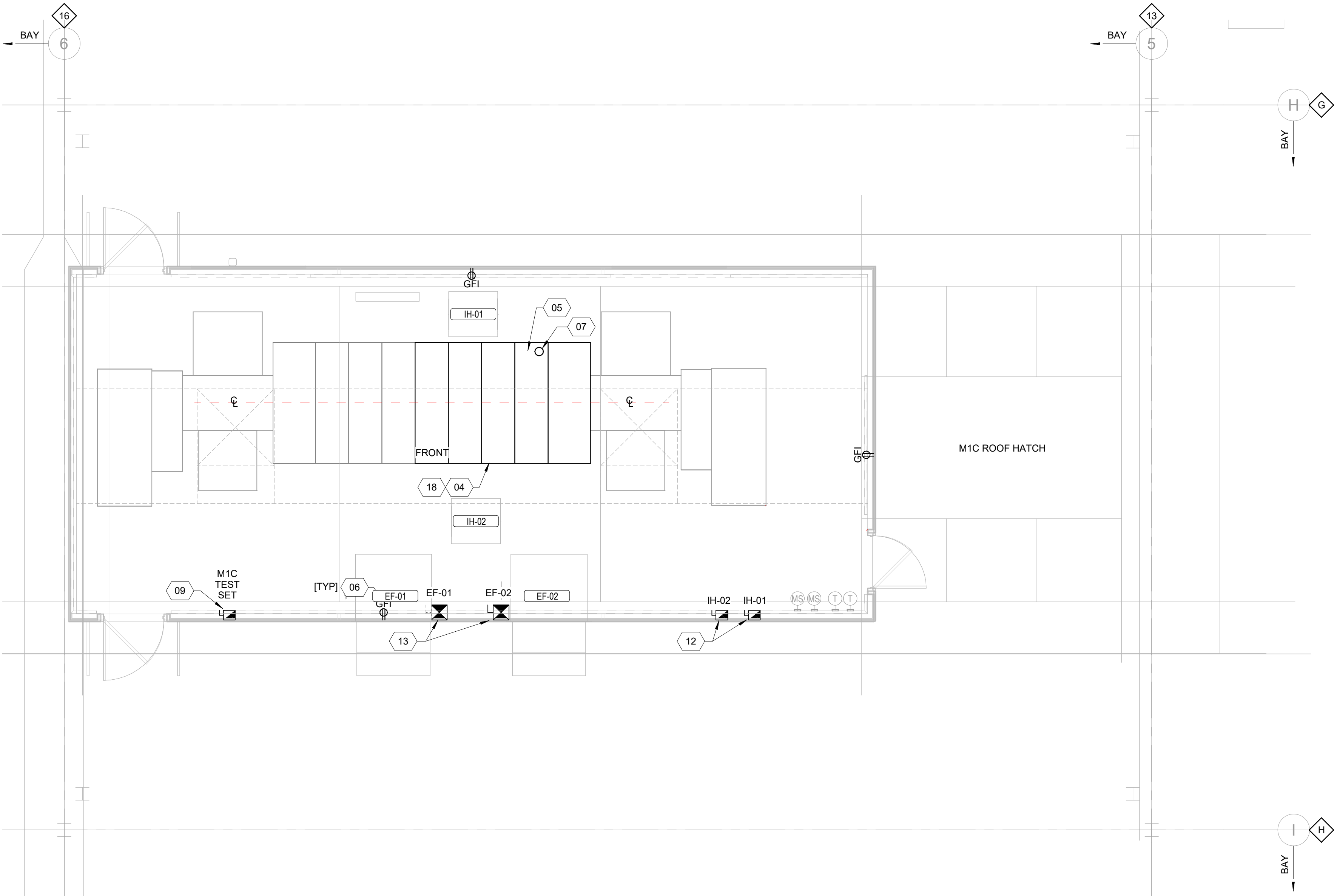
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- SEE DRAWINGS E-701 & E-702 FOR ELECTRICAL ONE-LINE DIAGRAMS.
- SEE DRAWING E-801 FOR ELECTRICAL SPECIFICATIONS.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
01	PROVIDE TEMPORARY BARRIER ON EXISTING AND/OR NEW EQUIPMENT FOR PROTECTION WHERE INDICATED.
02	REMOVE BOTTOM ENTRY INTERLOCKED ARMORED CABLE AND RELOCATE TO NEW POSITION INDICATED. PROVIDE OUTDOOR RATED INTERLOCKED ARMORED CABLE EXTENSIONS AS NEEDED WITH STAGGERED INLINE WEATHERTIGHT SPLICE KIT (3M 5730 SERIES). EXISTING CABLES ARE INSTALLED IN CABLE TRAY WITHIN DEPRESSED ROOF SPACE BELOW SUBSTATION PENTHOUSE. REARRANGE CABLES WITHIN CABLE TRAYS AS NECESSARY AND PROVIDE OUTDOOR RATED TEMPORARY STRAPPING. PROVIDE PERMANENT STRAPPING WHEN CABLES ARE IN THEIR FINAL INSTALLED POSITIONS.
03	RETURN FEEDERS TO FINAL SWITCHGEAR BREAKER POSITIONS AS SHOWN. DEMO THE INTERLOCKED ARMORED CABLE EXTENSIONS COMPLETE, OR CUT BACK PORTION AS REQUIRED FOR FINAL INSTALLATION LOCATIONS IN NEW BREAKER POSITIONS AND SUPPORT IN CABLE TRAY.
04	INSTALL NEW PRE-PURCHASED SWITCHGEAR IN COORDINATION WITH APPROVED RECORD SUBMITTALS. SHOP DRAWINGS SHOWING TRANSITIONS SECTIONS AND PLACEMENT OF SWITCHGEAR IN RELATION TO TRANSFORMERS CENTERLINE ARE FORTHCOMING. HED AND OWNER TO REVIEW AND APPROVE PRIOR TO SWITCHGEAR INSTALLATION. PROVIDE ALL NECESSARY RIGGING SERVICES UTILIZING THE EXISTING M1C PENTHOUSE ROOF HATCH. COORDINATE ALL REQUIRED STAGING, SPACE REQUIREMENTS AND SCHEDULE WITH OWNER. TAKE CARE TO AVOID ALL EXISTING OVERHEAD UTILITIES IN PENTHOUSE NOT SHOWN ON DRAWINGS INCLUDING BUT NOT LIMITED TO, LOW VOLTAGE, AND 600V CONDUIT AND WIRING. 600V AND MEDIUM VOLTAGE CABLE AND CABLE TRAY CONTRACTOR SHALL PLACE NEW SWITCHGEAR ON TOP OF EXISTING STEEL GRATING AND ANCHOR NEW SWITCHGEAR AT MANUFACTURER'S RECOMMENDED LOCATIONS THROUGH THE STEEL GRATING USING 1/2-INCH GRADE 5 BOLTS AND HARDENED WASHERS AND LOCK WASHERS AS PER THE MANUFACTURER RECOMMENDATIONS.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
05	CUT THE EXISTING FLOOR GRATING WHERE NECESSARY, ALIGNED WITH NEW SWITCHGEAR BOTTOM ENTRY WINDOWS PROVIDE PIECES OF PLATE STEEL WITHIN CONDUIT WINDOWS FOR THE TERMINATION OF INTERLOCKED ARMORED CABLE CONNECTOR FITTINGS.
16	MODIFY THE GROUND FAULT SENSING IF A COMPENSATING GROUND SENSING ARRANGEMENT IS EXISTING FOR TEMPORARY SINGLE ENDED CONFIGURATION AFTER INITIAL DEMOLITION.
17	COORDINATE WITH SCHNEIDER ELECTRIC FOR MANUFACTURER'S START-UP FIELD SERVICES AT INTERIM PHASE WHICH INCLUDES VISUAL INSPECTION, ELECTRICAL ACCEPTANCE TESTING (PER ATP 1910081302-120213) AND BREAKER TRIP UNIT SETTING PRIOR TO ENERGIZING EQUIPMENT, AS WELL AS TEMPORARY MODIFICATION OF GROUND FAULT SENSING DUE TO INCOMPLETE SUBSTATION ARRANGEMENT.
D1	REMOVE ALL WALL DEVICES, CONDUIT AND WIRING FROM AREA OF WALL TO BE TEMPORARILY REMOVED FOR THE REPLACEMENT OF SWITCHGEAR. REINSTALL ALL NEW WALL DEVICES, CONDUIT AND WIRING IN SAME PLACE AFTER WALL IS REINSTALLED.
D2	REMOVE EXISTING RECEPTACLE DEVICES AND REPLACE, SEE KEYED NOTE 06.
D3	REMOVE COMMUNICATION/MONITORING CABINET ENCLOSURE, EXISTING M1C CIRCUIT BREAKER MONITORING POINT CABLES, AND TWO (2) NETWORK CABLES COMPLETE. OWNER'S HONEYWELL NIAGRA PANEL TO BE REMOVED AND REINSTALLED.
D4	REMOVE LOW VOLTAGE SWITCHGEAR DISTRIBUTION SECTIONS COMPLETE. EXISTING PRIMARY SWITCHES AND SUBSTATION TRANSFORMERS TO REMAIN IN PLACE. REFER THE SUBSTATION M1C PHASING NOTES FOR ADDITIONAL INFORMATION.
D5	REMOVE (3) ABANDONED IN PLACE CONDUITS BACK TO SUITABLE POINT.

KEY PLAN





1 M1C PENTHOUSE NEW WORK PLAN
1/4" = 1'-0"

GENERAL SHEET NOTES

- 1. SEE DRAWING E-001 FOR GENERAL NOTES & ABBREVIATIONS ELECTRICAL SYMBOL LEGENDS, TYPICAL MOUNTING HEIGHT INFORMATION, AND CONDUCTOR & CONDUIT SCHEDULES.
- 2. SEE DRAWINGS E-701 & E-702 FOR ELECTRICAL ONE-LINE DIAGRAMS.
- 3. SEE DRAWING E-801 FOR ELECTRICAL SPECIFICATIONS.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
04	INSTALL NEW PRE-PURCHASED SWITCHGEAR IN COORDINATION WITH APPROVED RECORD SUBMITTALS. SHOP DRAWINGS SHOWING TRANSITIONS SECTIONS AND PLACEMENT OF SWITCHGEAR IN RELATION TO TRANSFORMERS CENTERLINE ARE FORTHCOMING. HED AND OWNER TO REVIEW AND APPROVE PRIOR TO SWITCHGEAR INSTALLATION. PROVIDE ALL NECESSARY RIGGING SERVICES UTILIZING THE EXISTING M1C PENTHOUSE ROOF HATCH. COORDINATE ALL REQUIRED STAGING, SPACE REQUIREMENTS AND SCHEDULE WITH OWNER. TAKE CARE TO AVOID ALL EXISTING OVERHEAD UTILITIES IN PENTHOUSE NOT SHOWN ON DRAWINGS INCLUDING BUT NOT LIMITED TO, LOW VOLTAGE, AND 600V CONDUIT AND WIRING. 600V AND MEDIUM VOLTAGE CABLE AND CABLE TRAY. CONTRACTOR SHALL PLACE NEW SWITCHGEAR ON TOP OF EXISTING STEEL GRATING AND ANCHOR NEW SWITCHGEAR AT MANUFACTURER RECOMMENDED LOCATIONS THROUGH THE STEEL GRATING USING 1/2-INCH GRADE 5 BOLTS AND HARDENED WASHERS AND LOCK WASHERS AS PER THE MANUFACTURER RECOMMENDATIONS.
05	CUT THE EXISTING FLOOR GRATING WHERE NECESSARY, ALIGNED WITH NEW SWITCHGEAR BOTTOM ENTRY WINDOWS PROVIDE PIECES OF PLATE STEEL WITHIN CONDUIT WINDOWS FOR THE TERMINATION OF INTERLOCKED ARMORED CABLE CONNECTOR FITTINGS.
06	REPLACE ALL EXISTING 120V SERVICE RECEPTACLES WITH NEW 120V 20A COMMERCIAL GRADE GFCI DEVICES WITH NEW METALLIC COVER PLATE.
07	PROVIDE 1-1/4" CONDUIT PATHWAY FROM IDF-70 IN PLANT TO M1C SUBSTATION PENTHOUSE FOR NEW NETWORK CABLEING. EXTEND PATHWAY TO NEW M1C SWITCHGEAR. COORDINATE FINAL LOCATION WITH APPROVED SUBMITTALS. PROVIDE AND INSTALL TWO (2) RUNS OF PLENUM RATED CATEGORY 6 CABLE MANUFACTURED BY COMMSCOPE, PURPLE IN COLOR) ALONG WITH ONE (1) PULL STRING.
09	PROVIDE NEW 480/277V 60A 3PH 4W NEMA 12 FUSIBLE DISCONNECT SWITCH MOUNTED TO WALL WITH SUPPLEMENTAL STRUT CHANNEL FRAMING AS REQUIRED IN M1C PENTHOUSE FOR NEW M1C TEST SET.
12	PROVIDE NEW 480V 30AS/10AF 3PH 3W NEMA 12 FUSIBLE DISCONNECT SWITCH MOUNTED TO WALL WITH SUPPLEMENTAL STRUT CHANNEL FRAMING AS REQUIRED IN M1C PENTHOUSE.
13	PROVIDE NEW 480V 3-POLE NEMA SIZE 1 NON-REVERSING COMBINATION STARTER FUSIBLE DISCONNECT SWITCH WITH H-O-A, 120V COIL, 480V-120V CONTROL TRANSFORMER, CAPABLE OF POWERING 120V INTAKE DAMPER. PROVIDE INTERCONNECTING PATHWAYS TO AND FROM THE COMBINATION DISCONNECT, THERMOSTAT, AND INTAKE DAMPER. MOUNT UNIT TO WALL WITH SUPPLEMENTAL STRUT CHANNEL FRAMING AS REQUIRED. PROVIDE ONE COMBINATION STARTER UNIT FOR EACH EXHAUST FAN (TWO TOTAL). REFER TO MECHANICAL CONTROL DIAGRAM FOR SEQUENCE OF OPERATION. REFER TO SPEC #42 ON SHEET E-801.
18	COORDINATE WITH SCHNEIDER ELECTRIC FOR MANUFACTURER'S START-UP FIELD SERVICES AT FINAL PHASE WHICH INCLUDES VISUAL INSPECTION, ELECTRICAL ACCEPTANCE TESTING (PER ATP 1910DB1302-120213) AND BREAKER TRIP UNIT SETTING PRIOR TO ENERGIZING EQUIPMENT, AS WELL AS MODIFICATION OF GROUND FAULT SENSING FOR FINAL ARRANGEMENT AFTER INTERIM PHASE MODIFICATIONS.



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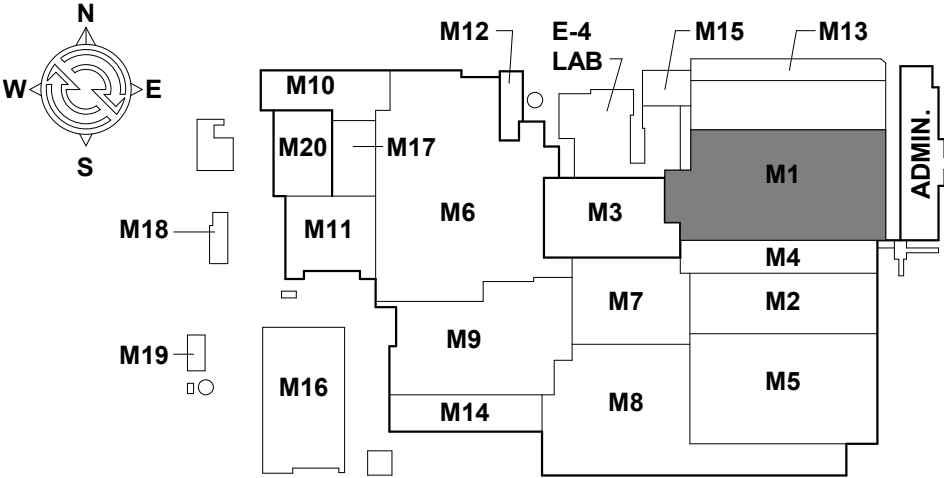
Sub M1C Replacement

Date	Issued For
05/15/2026	Final Review
06/18/2026	Final Review
07/30/2026	Bids

HED

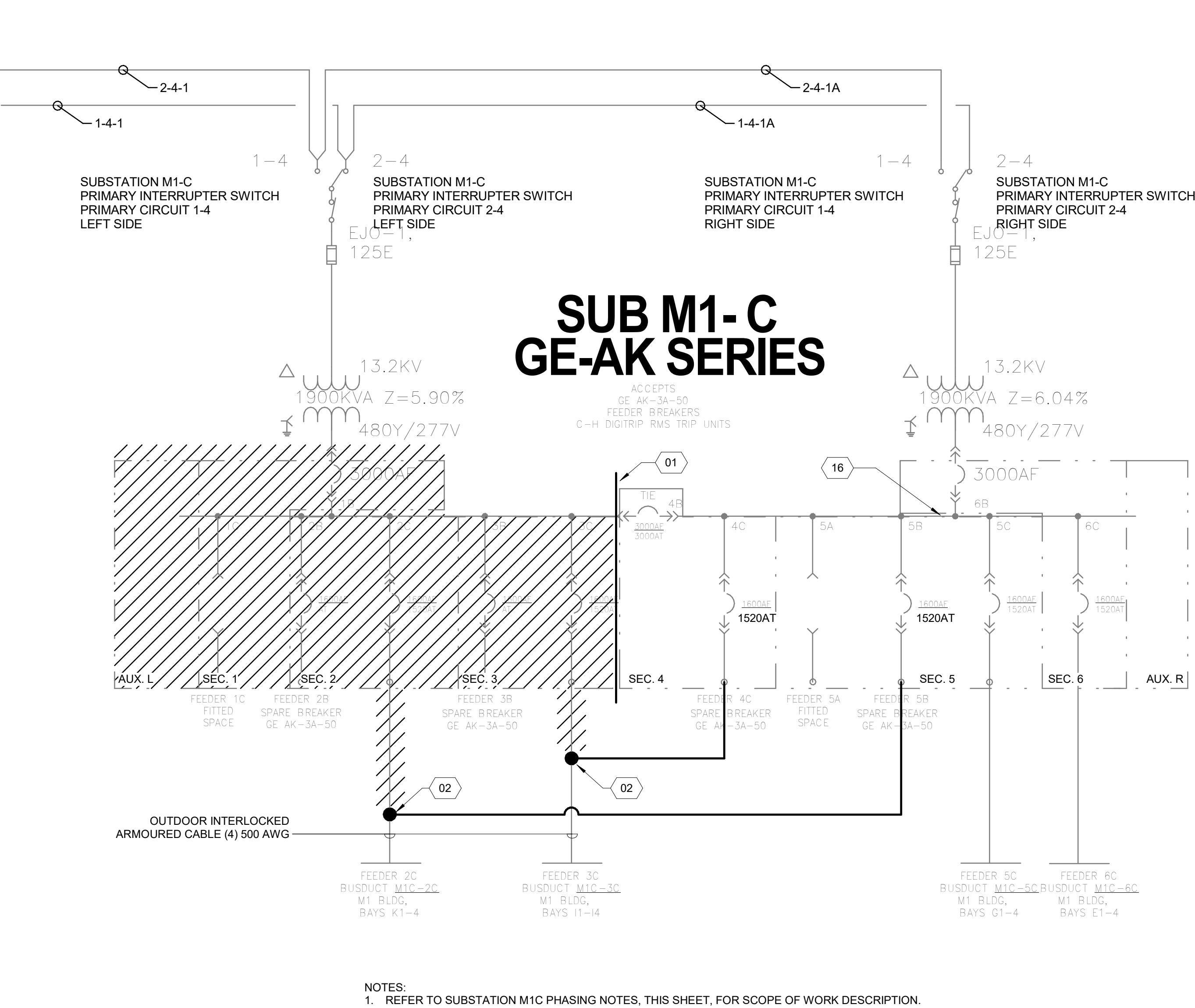
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KEY PLAN



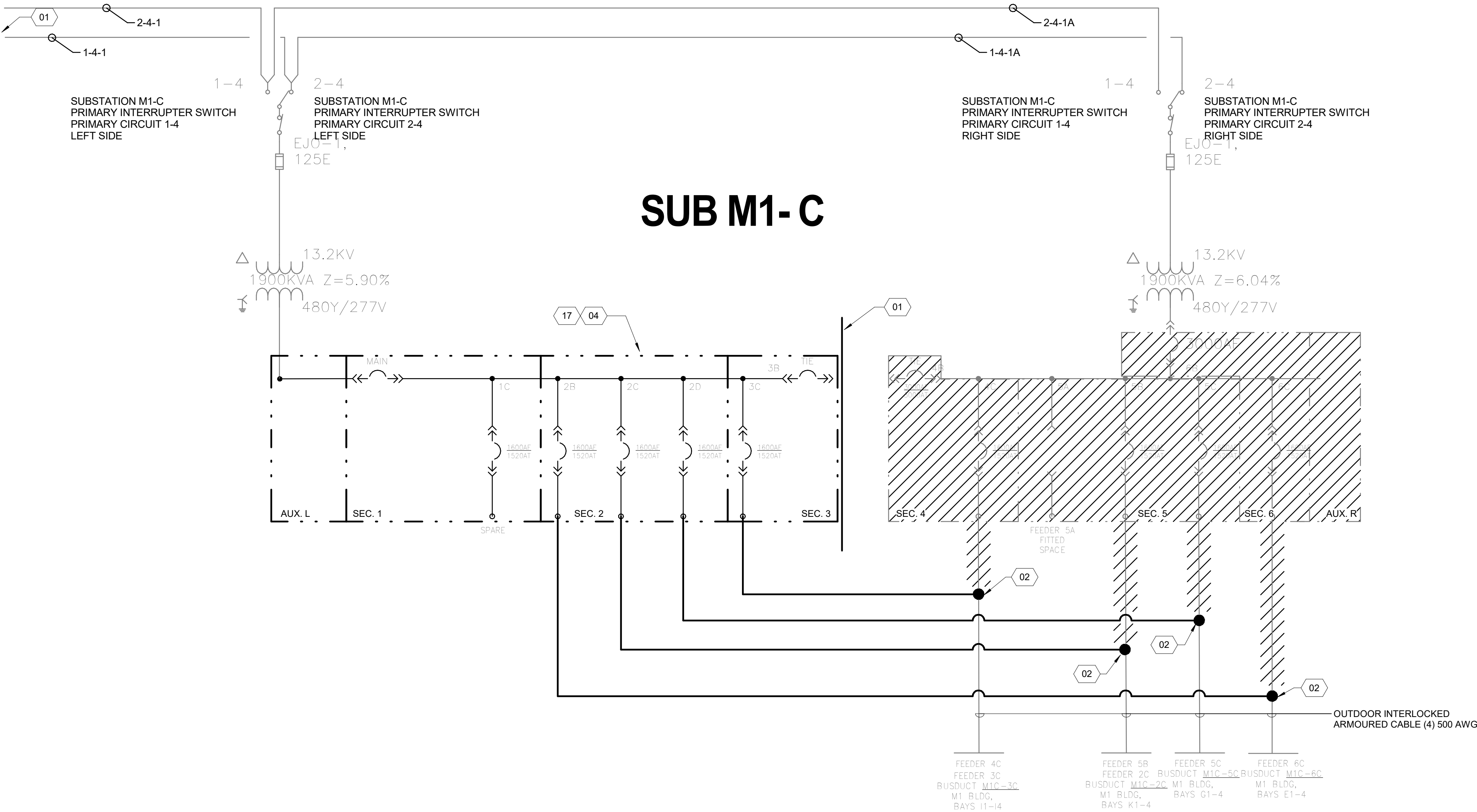
M1C Penthouse Plans

EP151



NOTES:
1. REFER TO SUBSTATION M1C PHASING NOTES, THIS SHEET, FOR SCOPE OF WORK DESCRIPTION.

1 EXISTING ONE-LINE DIAGRAM SUBSTATION M1-C - LEFT SIDE DEMO
NOT TO SCALE



NOTES:
1. REFER TO SUBSTATION M1C PHASING NOTES, THIS SHEET, FOR SCOPE OF WORK DESCRIPTION.
2. NEW LEFT SIDE OF LOW VOLTAGE SWITCHGEAR IS SHOWN HERE AS DIAGRAMATIC FOR REFERENCE ONLY. REFER TO NEW WORK ONE-LINE DIAGRAM SUBSTATION M1-C 1/E-702.

2 EXISTING ONE-LINE DIAGRAM SUBSTATION M1-C - RIGHT SIDE DEMO
NOT TO SCALE

SUBSTATION M1C PHASING NOTES

1. REMOVE SERVICE CORRIDOR FROM EXISTING SWITCHGEAR AS REQUIRED TO FACILITATE THE PHASED REPLACEMENT OF EQUIPMENT.
2. SCHEDULE AND COORDINATE ALL REQUIRED SHUTDOWNS WITH OWNER. PROVIDE ITEMIZED LIST OF WORK TO BE COMPLETED DURING SHUTDOWN WITHIN A PREDETERMINED SHUTDOWN DURATION TO OWNER. PERFORM ALL INTENDED WORK DURING SHUTDOWN WITH AS MANY CREWS AS NECESSARY TO COMPLETE INTENDED WORK DURING SHUTDOWN. EMERGENCY EXTENSION REQUEST OF SHUTDOWN PERIOD TO COMPLETE INTENDED WORK IS NOT ACCEPTABLE.
3. MOVE TWO (2) EXISTING LOADS (BUSDUCT M1C-2C AND M1C-3C) FROM LEFT SIDE OF SWITCHGEAR TO AVAILABLE POSITIONS IN RIGHT SIDE OF SWITCHGEAR.
4. ENSURE EXISTING TIE BREAKER IS OPEN AND DEMO LEFT SIDE OF EXISTING SWITCHGEAR (SECTIONS AUX. L, SEC. 1, SEC. 2 & SEC. 3). COORDINATE SHUTDOWN AND DURATION WITH OWNER IF COMPLETE SHUTDOWN IS REQUIRED FOR THE DISCONNECTION OF TIE BREAKER AND LEFT SIDE OF SWITCHGEAR.
5. INSTALL NEW RIGHT SIDE OF SWITCHGEAR, INCLUDING TIE BREAKER. COORDINATE SHUTDOWN AND DURATION WITH OWNER IF COMPLETE SHUTDOWN IS REQUIRED FOR THE FINAL CONNECTION OF LEFT AND RIGHT SIDE TIE BREAKERS.
6. MOVE ALL FOUR (4) EXISTING LOADS FROM EXISTING RIGHT SIDE TO AVAILABLE POSITIONS IN NEW LEFT SIDE OF SWITCHGEAR.
7. DEMO RIGHT SIDE OF EXISTING SWITCHGEAR SECTIONS (SEC. 4, SEC. 5, SEC. 6 & AUX. R)
8. INSTALL NEW RIGHT SIDE OF SWITCHGEAR, INCLUDING TIE BREAKER. COORDINATE SHUTDOWN AND DURATION WITH OWNER IF COMPLETE SHUTDOWN IS REQUIRED FOR THE FINAL CONNECTION OF LEFT AND RIGHT SIDE TIE BREAKERS.
9. MOVE TWO (2) ORIGINAL RIGHT SIDE LOADS (BUSDUCT M1C-5C AND M1C-6C) BACK TO THE RIGHT SIDE OF SWITCHGEAR.
10. ENERGIZE THE COMPLETE SWITCHGEAR. COORDINATE WITH OWNER ON SCHNEIDER ELECTRIC FIELD SERVICES FOR FINAL START UP.
11. CONTRACTOR TO RETAIN SHERMCO TO UPDATE THE FACILITY SHORT CIRCUIT AND ARC FLASH CALCULATIONS AND PREPARE NEW LABELS.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
01	PROVIDE TEMPORARY BARRIER ON EXISTING AND/OR NEW EQUIPMENT FOR PROTECTION WHERE INDICATED.
02	REMOVE BOTTOM ENTRY INTERLOCKED ARMORED CABLE AND RELOCATE TO NEW POSITION INDICATED. PROVIDE OUTDOOR RATED INTERLOCKED ARMORED CABLE EXTENSIONS AS NEEDED WITH STAGGERED INLINE WEATHERTIGHT SPLICE KIT [3M 5730 SERIES]. EXISTING CABLES ARE INSTALLED IN CABLE TRAY WITHIN DEPRESSED ROOF SPACE BELOW SUBSTATION PENTHOUSE. REARRANGE CABLES WITHIN CABLE TRAYS AS NECESSARY AND PROVIDE OUTDOOR RATED TEMPORARY STRAPPING. PROVIDE PERMANENT STRAPPING WHEN CABLES ARE IN THEIR FINAL INSTALLED POSITIONS.
04	INSTALL NEW PRE-PURCHASED SWITCHGEAR IN COORDINATION WITH APPROVED RECORD SUBMITTALS. SHOP DRAWINGS SHOWING TRANSITIONS SECTIONS AND PLACEMENT OF SWITCHGEAR IN RELATION TO TRANSFORMERS CENTERLINE ARE FORTHCOMING. HED AND OWNER TO REVIEW AND APPROVE PRIOR TO SWITCHGEAR INSTALLATION. PROVIDE ALL NECESSARY RIGGING SERVICES UTILIZING THE EXISTING M1C PENTHOUSE ROOF HATCH. COORDINATE ALL REQUIRED STAGING, SPACE REQUIREMENTS AND SCHEDULE WITH OWNER. TAKE CARE TO AVOID ALL EXISTING OVERHEAD UTILITIES IN PENTHOUSE NOT SHOWN ON DRAWINGS INCLUDING BUT NOT LIMITED TO, LOW VOLTAGE, AND 600V CONDUIT AND WIRING, 600V AND MEDIUM VOLTAGE CABLE AND CABLE TRAY. CONTRACTOR SHALL PLACE NEW SWITCHGEAR ON TOP OF EXISTING STEEL GRATING AND ANCHOR NEW SWITCHGEAR AT MANUFACTURER RECOMMENDED LOCATIONS THROUGH THE STEEL GRATING USING 1/2-INCH GRADE 5 BOLTS AND HARDENED WASHERS AND LOCK WASHERS AS PER THE MANUFACTURER RECOMMENDATIONS.
16	MODIFY THE GROUND FAULT SENSING IF A COMPENSATING GROUND SENSING ARRANGEMENT IS EXISTING FOR TEMPORARY SINGLE ENDED CONFIGURATION AFTER INITIAL DEMOLITION.
17	COORDINATE WITH SCHNEIDER ELECTRIC FOR MANUFACTURERS START-UP FIELD SERVICES AT INTERIM PHASE WHICH INCLUDES VISUAL INSPECTION, ELECTRICAL ACCEPTANCE TESTING PER ATP 1910DB1302-120213) AND BREAKER TRIP UNIT SETTING PRIOR TO ENERGIZING EQUIPMENT, AS WELL AS TEMPORARY MODIFICATION OF GROUND FAULT SENSING DUE TO INCOMPLETE SUBSTATION ARRANGEMENT.



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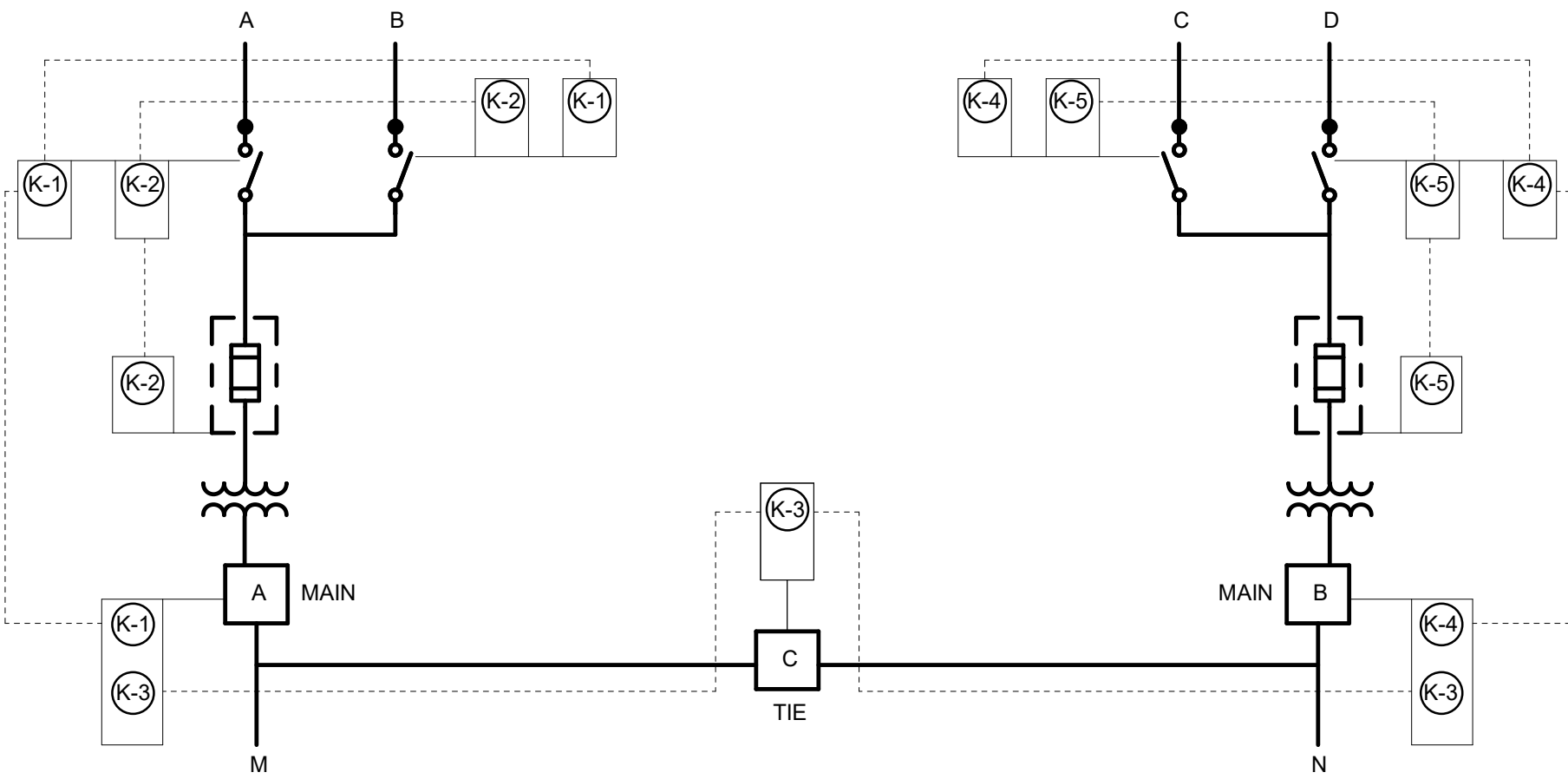
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Electrical
One-Line
Diagrams - Demo

E-701

MODBUS REMOTE MONITORING POINTS MATRIX										
EQUIPMENT	CURRENT (AMPS) PER OA, ØB, ØC	VOLTAGE L-L V _{ab} , V _{bc} , V _{ca}	VOLTAGE L-N V _{an} , V _{bn} , V _{cn}	POWER (kW)	POWER (kVA)	POWER FACTOR	kVA DEMAND TOTAL	kWhr		
SUB M1-C SEC. 1 DIGITAL METERING UNIT	X	X	X	X	X	X	X	X		
SUB M1-C SEC. 7 DIGITAL METERING UNIT	X	X	X	X	X	X	X	X		
TYPICAL MAIN CIRCUIT BREAKER TRIP UNIT	X	X	X	X	X	X	X	X		
TYPICAL TIE CIRCUIT BREAKER TRIP UNIT	X	X	X	X	X	X	X	X		
TYPICAL FEEDER CIRCUIT BREAKER TRIP UNIT	X	X	X	X	X	X	X	X		

NOTES



KEY INTERLOCKING SEQUENCE-DUPLEX SWITCHES A & B:

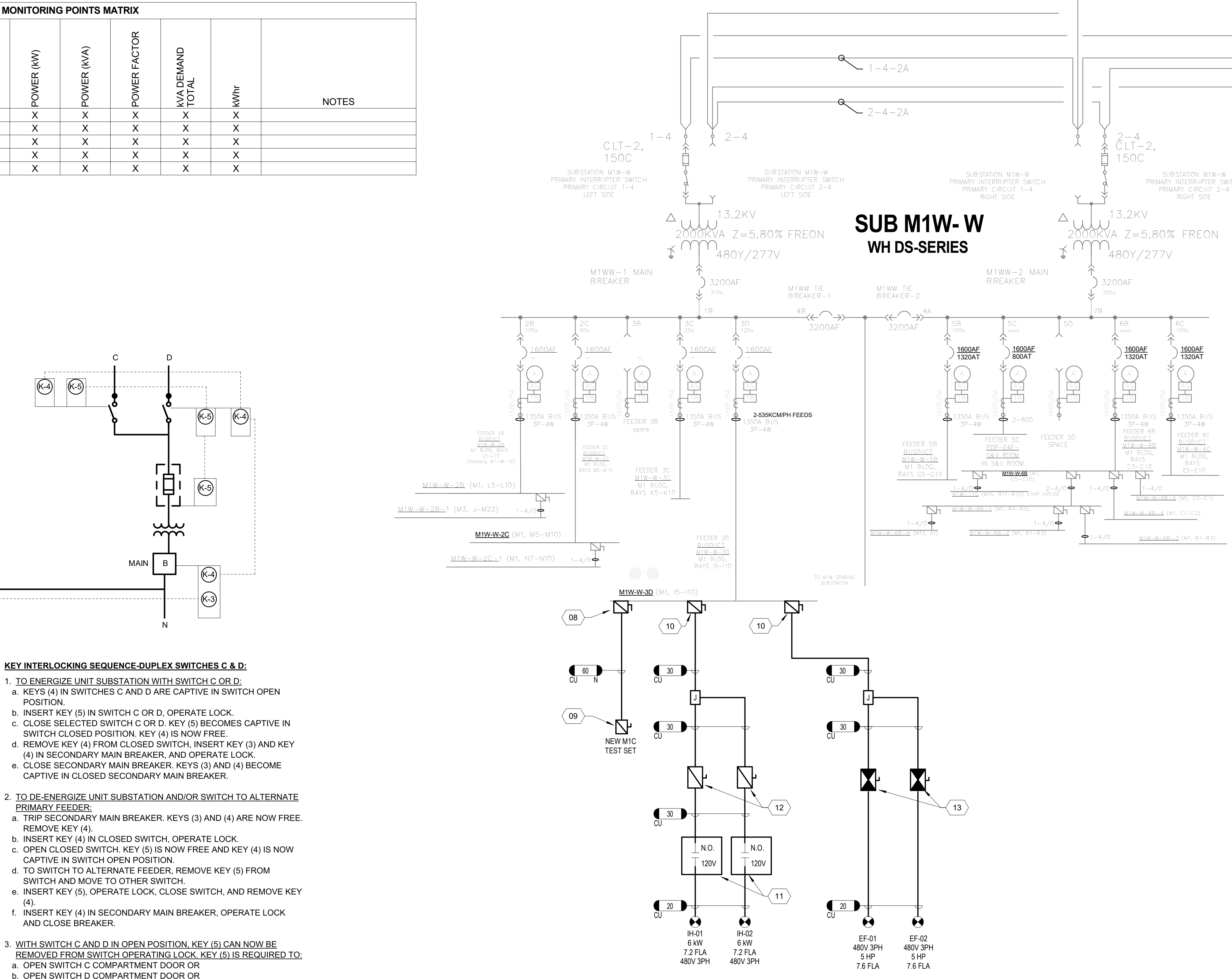
- TO ENERGIZE UNIT SUBSTATION WITH SWITCH A OR B:
 - KEYS (1) IN SWITCHES A AND B ARE CAPTIVE IN SWITCH OPEN POSITION.
 - INSERT KEY (2) IN SWITCH A OR B. OPERATE LOCK.
 - CLOSE SELECTED SWITCH A OR B. KEY (2) BECOMES CAPTIVE IN SWITCH CLOSED POSITION. KEY (1) IS NOW FREE.
 - REMOVE KEY (1) FROM CLOSED SWITCH. INSERT KEY (1) AND KEY (3) IN SECONDARY MAIN BREAKER. AND OPERATE LOCK.
 - CLOSE SECONDARY MAIN BREAKER. KEYS (1) AND (3) BECOME CAPTIVE IN CLOSED SECONDARY MAIN BREAKER.
- TO DE-ENERGIZE UNIT SUBSTATION AND/OR SWITCH TO ALTERNATE PRIMARY FEEDER:
 - TRIP SECONDARY MAIN BREAKER. KEYS (1) AND (3) ARE NOW FREE. REMOVE KEY (1).
 - INSERT KEY (1) IN CLOSED SWITCH. OPERATE LOCK.
 - OPEN CLOSED SWITCH. KEY (2) IS NOW FREE AND KEY (1) IS NOW CAPTIVE IN SWITCH OPEN POSITION.
 - TO SWITCH TO ALTERNATE FEEDER, REMOVE KEY (2) FROM SWITCH AND MOVE TO OTHER SWITCH.
 - INSERT KEY (2). OPERATE LOCK, CLOSE SWITCH, AND REMOVE KEY (1).
 - INSERT KEY (1) IN SECONDARY MAIN BREAKER. OPERATE LOCK AND CLOSE BREAKER.
- WITH SWITCH A AND B IN OPEN POSITION. KEY (2) CAN NOW BE REMOVED FROM SWITCH OPERATING LOCK. KEY (2) IS REQUIRED TO:
 - OPEN SWITCH A COMPARTMENT DOOR OR
 - OPEN SWITCH B COMPARTMENT DOOR OR
 - OPEN FUSE COMPARTMENT DOOR.
- TO CLOSE TIE BREAKER:
 - TRIP SECONDARY MAIN BREAKER. KEY (3) IS NOW FREE.
 - REMOVE KEY (3) FROM MAIN BREAKER.
 - SECONDARY MAIN BREAKER IS NOW LOCKED IN THE OPEN POSITION.
 - INSERT KEY (3) IN TIE BREAKER. OPERATE LOCK.
 - CLOSE TIE BREAKER. KEY (3) BECOMES CAPTIVE IN CLOSED TIE BREAKER.

NOTES:

- KIRK-KEY INTERLOCK SYSTEM PROVIDED AS PART OF PRE-PURCHASE PACKAGE. THIS CONTRACTOR SHALL REVIEW THE KIRK-KEY INTERLOCK SCOPE OF WORK AND THE FIELD SERVICES PROVIDED BY SCHNEIDER ELECTRIC WITH OWNER. IF REQUIRED, PROVIDE THE INSTALLATION OF KIRK-KEY INTERLOCK COMPONENTS PROVIDED.

3 KIRK KEY DIAGRAM & NOTES

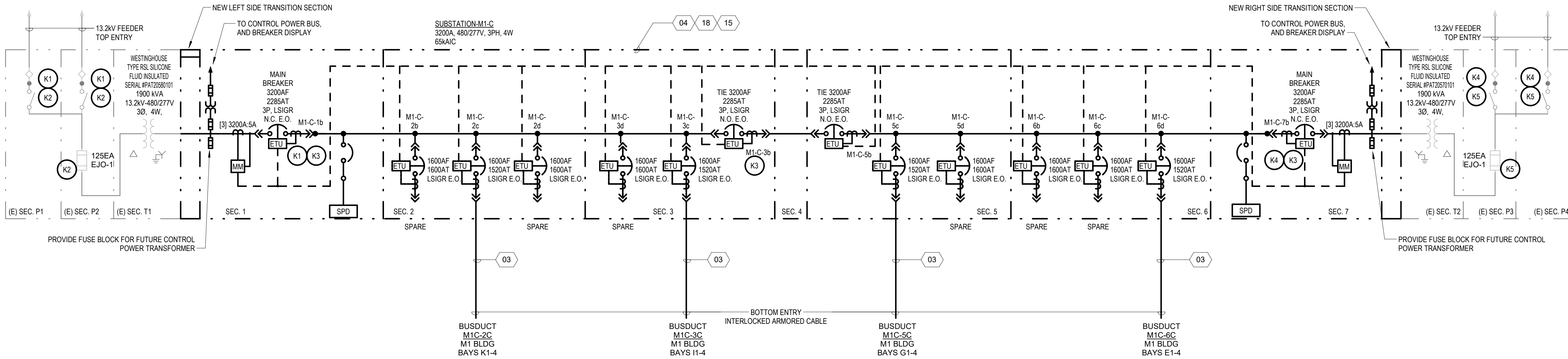
NOT TO SCALE



SUB M1W-W WH DS-SERIES

2 EXISTING ONE-LINE DIAGRAM SUBSTATION M1-W - NEW WORK

NOT TO SCALE



NOTES:

- THIS ONE-LINE DIAGRAM REPRESENTS THE FINAL INSTALLED CONDITION OF NEW LOW VOLTAGE SWITCHGEAR IN SUBSTATION. REFER TO SUBSTATION M1C PHASING NOTES AND DEMOLITION DIAGRAMS SHEET E-701.

1 ONE-LINE DIAGRAM SUBSTATION M1-C - NEW WORK

NOT TO SCALE

SUBSTATION M1C PHASING NOTES

- REMOVE SERVICE CORRIDOR FROM EXISTING SWITCHGEAR AS REQUIRED TO FACILITATE THE PHASED REPLACEMENT OF EQUIPMENT.
- SCHEDULE AND COORDINATE ALL REQUIRED SHUTDOWNS WITH OWNER. PROVIDE ITEMIZED LIST OF WORK TO BE COMPLETED DURING SHUTDOWN WITHIN A PREDETERMINED SHUTDOWN DURATION TO OWNER. PERFORM ALL INTENDED WORK DURING SHUTDOWN WITH AS MANY CREWS AS NECESSARY TO COMPLETE INTENDED WORK DURING SHUTDOWN. EMERGENCY EXTENSION REQUEST OF SHUTDOWN PERIOD TO COMPLETE INTENDED WORK IS NOT ACCEPTABLE.
- MOVE TWO (2) EXISTING LOADS (BUSDUCT M1C-2C AND M1C-3C) FROM LEFT SIDE OF SWITCHGEAR TO AVAILABLE POSITIONS IN RIGHT SIDE OF SWITCHGEAR.
- ENSURE EXISTING TIE BREAKER IS OPEN AND DEMO LEFT SIDE OF EXISTING SWITCHGEAR (SECTIONS AUX. L, SEC. 1, SEC. 2 & SEC. 3). COORDINATE SHUTDOWN AND DURATION WITH OWNER IF COMPLETE SHUTDOWN IS REQUIRED FOR THE DISCONNECTION OF THE BREAKER AND LEFT SIDE OF SWITCHGEAR.
- INSTALL PRE-PURCHASED LEFT SIDE OF NEW SWITCHGEAR COMPLETE INCLUDING LEFT TIE BREAKER. ENERGIZE NEW LEFT SIDE. COORDINATE WITH OWNER ON SCHNEIDER ELECTRIC FIELD SERVICES FOR PARTIAL START UP.
- MOVE ALL FOUR (4) EXISTING LOADS FROM EXISTING RIGHT SIDE TO AVAILABLE POSITIONS IN NEW LEFT SIDE OF SWITCHGEAR.
- DEMO RIGHT SIDE OF EXISTING SWITCHGEAR SECTIONS (SEC. 4, SEC. 5, SEC. 6 & AUX. R)
- INSTALL NEW RIGHT SIDE OF SWITCHGEAR INCLUDING TIE BREAKER. COORDINATE SHUTDOWN AND DURATION WITH OWNER IF COMPLETE SHUTDOWN IS REQUIRED FOR THE FINAL CONNECTION OF LEFT AND RIGHT SIDE TIE BREAKERS.
- MOVE TWO (2) ORIGINAL RIGHT SIDE LOADS (BUSDUCT M1C-6C AND M1C-6C) BACK TO THE RIGHT SIDE OF SWITCHGEAR.
- ENERGIZE THE COMPLETE SWITCHGEAR. COORDINATE WITH OWNER ON SCHNEIDER ELECTRIC FIELD SERVICES FOR FINAL START UP.
- CONTRACTOR TO RETAIN SHERMCO TO UPDATE THE FACILITY SHORT CIRCUIT AND ARC FLASH CALCULATIONS AND PREPARE NEW LABELS.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
03	RETURN FEEDERS TO FINAL SWITCHGEAR BREAKER POSITIONS AS SHOWN. DEMO THE INTERLOCKED ARMORED CABLE EXTENSIONS COMPLETE. OR CUT BACK PORTION AS REQUIRED FOR FINAL INSTALLATION LOCATIONS IN NEW BREAKER POSITIONS AND SUPPORT IN CABLE TRAY.
04	INSTALL NEW PRE-PURCHASED SWITCHGEAR IN COORDINATION WITH APPROVED RECORD SUBMITTALS. SHOP DRAWINGS SHOWING TRANSITIONS SECTIONS AND PLACEMENT OF SWITCHGEAR IN RELATION TO TRANSFORMERS CENTERLINE ARE FORTHCOMING. HED AND OWNER TO REVIEW AND APPROVE PRIOR TO SWITCHGEAR INSTALLATION. PROVIDE ALL NECESSARY RIGGING SERVICES UTILIZING THE EXISTING M1C PENTHOUSE ROOF HATCH. COORDINATE ALL REQUIRED STAGING, SPACE REQUIREMENTS AND SCHEDULE WITH OWNER. TAKE CARE TO AVOID ALL EXISTING OVERHEAD UTILITIES IN PENTHOUSE NOT SHOWN ON DRAWINGS INCLUDING BUT NOT LIMITED TO, LOW VOLTAGE, AND 600V CONDUIT AND WIRING. 600V AND MEDIUM VOLTAGE CABLE AND CABLE TRAY. CONTRACTOR SHALL PLACE NEW SWITCHGEAR ON TOP OF EXISTING STEEL GRATING AND ANCHOR NEW SWITCHGEAR AT MANUFACTURER RECOMMENDED LOCATIONS THROUGH THE STEEL GRATING USING 1/2-INCH GRADE 5 BOLTS AND HARDENED WASHERS AND LOCK WASHERS AS PER THE MANUFACTURER RECOMMENDATIONS.
08	INSTALL 480/277V 60AS/60AF 3P 4W WESTINGHOUSE POW-R-WAY BUS PLUS PROVIDED BY OWNER ON EXISTING BUS DUCT.
09	PROVIDE NEW 480/277V 60A 3PH 4W NEMA 12 FUSIBLE DISCONNECT SWITCH MOUNTED TO WALL WITH SUPPLEMENTAL STRUT CHANNEL FRAMING AS REQUIRED IN M1C PENTHOUSE FOR NEW M1C TEST SET.
10	INSTALL 480V 30AS/30AF 3P 3W WESTINGHOUSE POW-R-WAY BUS PLUS PROVIDED BY OWNER ON EXISTING BUS DUCT.
11	PROVIDE HOFFMAN STYLE SCREW COVER METAL ENCLOSURE WITH A NON-REVERSING DEFINITE PURPOSE MAGNETIC CONTACTOR 480VAC 3-POLE NORMALLY OPEN, MINIMUM 20 AMP RESISTIVE LOAD RATING, 120VAC NOMINAL COIL VOLTAGE. MOUNT IN M1C PENTHOUSE ADJACENT TO LOCAL DISCONNECTING MEANS. 120V COIL CONTROL VOLTAGE FROM TIMER (BY DIV 23). EXTEND EXISTING 120V RECEPTACLE AND LIGHTING CIRCUIT PRESENT IN M1C PENTHOUSE TO TIMER. PROVIDE ALL CONDUIT, WIRING AND BOX FOR TIMER INSTALLATION AND CONTROL VOLTAGE TO CONTACTOR.
12	PROVIDE NEW 480V 30AS/10AF 3PH 3W NEMA 12 FUSIBLE DISCONNECT SWITCH MOUNTED TO WALL WITH SUPPLEMENTAL STRUT CHANNEL FRAMING AS REQUIRED IN M1C PENTHOUSE.
13	PROVIDE NEW 480V 3-POLE NEMA SIZE 1 NON-REVERSING COMBINATION STARTER FUSIBLE DISCONNECT SWITCH WITH H-0-A, 120V COIL, 480V-120V CONTROL, TRANSFORMER, CAPABLE OF POWERING 120V INTAKE DAMPER. PROVIDE INTERCONNECTING PATHWAYS TO AND FROM THE COMBINATION DISCONNECT, THERMOSTAT, AND INTAKE DAMPER MOUNT UNIT TO WALL WITH SUPPLEMENTAL STRUT CHANNEL FRAMING AS REQUIRED. PROVIDE ONE COMBINATION STARTER UNIT FOR EACH EXHAUST FAN (TWO TOTAL). REFER TO MECHANICAL CONTROL DIAGRAM FOR SEQUENCE OF OPERATION. REFER TO SPEC #42 ON SHEET E-801.
15	FOR NEW SWITCHGEAR MONITORING POINTS SHOWN IN MODBUS REMOTE MONITORING POINTS MATRIX, ENGAGE SYNERGY ENGINEERING TO INTEGRATE POINTS INTO DDC EOS SYSTEM. SYNERGY ENGINEERING CONTACT: MARILUS ADOMONIS (MARILUS.ADOMONIS@SYNERGY.US) (696) 983-4189.
18	COORDINATE WITH SCHNEIDER ELECTRIC FOR MANUFACTURERS START-UP FIELD SERVICES AT FINAL PHASE WHICH INCLUDES VISUAL INSPECTION, ELECTRICAL ACCEPTANCE TESTING (PER ATP 1810DB1302-120213) AND BREAKER TRIP UNIT SETTING PRIOR TO ENERGIZING EQUIPMENT. AS WELL AS MODIFICATION OF GROUND FAULT SENSING FOR FINAL ARRANGEMENT AFTER INTERIM PHASE MODIFICATIONS.



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2026-DD016-001

Electrical
One-Line
Diagrams - New

E-702

ELECTRICAL SPECIFICATIONS:

- 1 GENERAL NOTES:

READ AND BE BOUND BY OTHER TRADES SPECIFICATIONS AS SAME APPLY.

2 SCOPE OF WORK:

INCLUDE ALL ELECTRICAL WORK REQUIRED FOR A COMPLETE INSTALLATION AS OUTLINED ON THESE DRAWINGS AND SPECIFIED HEREINAFTER OR AS REQUIRED TO COMPLETE THE WORK.

3 ORDINANCES AND CODES:

THE ENTIRE INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF APPLICABLE FEDERAL, STATE AND LOCAL CODES, ORDINANCES AND REGULATIONS. INSTALLATION SHALL MEET ALL THE STANDARDS AND REQUIREMENTS OF THE OWNER.

WHERE DRAWINGS AND SPECIFICATIONS CONFLICT WITH SUCH LAWS AND ORDINANCES, NOTIFY THE ENGINEER BEFORE SUBMISSION OF THE BID. AFTER ENTERING INTO THE CONTRACT, THE CONTRACTOR WILL BE HELD RESPONSIBLE TO COMPLETE ALL WORK IN STRICT ACCORDANCE WITH ALL GOVERNING REGULATIONS, CODES, AND ORDINANCES WITHOUT ADDITIONAL COST TO THE OWNER.

4 PERMITS:

CONTRACTOR IS RESPONSIBLE TO OBTAIN AND PAY FOR ALL REQUIRED PERMITS.

5 INSPECTIONS:

GIVE ALL REQUIRED NOTICES OF INSPECTIONS REQUIRED BY THE LAW OR OTHER REGULATIONS AND PAY ALL FEES IN CONNECTION THEREWITH.

FINAL ELECTRICAL INSPECTION IS REQUIRED BY THE LOCAL OR STATE INSPECTION AUTHORITY. FORWARD A COPY OF THE FINAL APPROVAL TO THE FIRE MARSHALL DIVISION, LOCAL FIELD OFFICE.

6 STANDARDS:

ALL EQUIPMENT SHALL BE NEW AND SHALL CONFORM IN ALL RESPECTS TO THE LATEST APPROVED STANDARDS OF THE IEEE, ANSI, NEMA, UNDERWRITERS' LABORATORIES, INC. AND, IF APPLICABLE, OWNER ELECTRICAL STANDARDS.

PROVIDE MATERIALS LISTED BY THE UNDERWRITERS' LABORATORIES, INC., AND BEARING THEIR LABEL WHERE SUCH SERVICE IS AVAILABLE FOR THE TYPE OF EQUIPMENT SPECIFIED.

7 COOPERATION WITH OTHER TRADES:

PRIOR TO PROCEEDING WITH INSTALLATION OF WORK, CHECK WITH OTHER TRADES AND PROJECT DRAWINGS TO COORDINATE WORK AND AVOID INTERFERENCE.

WHEN INTERFERENCES EXIST WITH THE WORK OF OTHER TRADES, NOTIFY THE OWNER BEFORE PROCEEDING WITH THE INSTALLATION OF THE WORK. IF ADDITIONAL WORK IS REQUIRED TO REARRANGE INTERFERING EQUIPMENT OR SYSTEM AND THE CONTRACTOR HAS FAILED TO NOTIFY THE OWNER OF THE INTERFERENCE, THEN THE CORRECTIVE WORK REQUIRED TO MODIFY THE INTERFERENCE WILL BE DONE AT NO ADDITIONAL EXPENSE TO THE OWNER.

NO EXTRAS WILL BE ALLOWED FOR ANY ADDITIONAL LABOR AND/OR MATERIALS NECESSARY DUE TO CONDITIONS WHICH CAREFUL EXAMINATION OF THE DRAWINGS OF ALL TRADES COULD HAVE AVOIDED.

8 EQUIPMENT CONNECTIONS:

MAKE CONNECTIONS TO EQUIPMENT, FIXTURES, ETC., IN ACCORDANCE WITH SHOP DRAWINGS AND ROUGH-IN MEASUREMENTS FURNISHED BY THE MANUFACTURERS.

9 EQUIPMENT BY OWNER AND OTHERS:

CERTAIN ITEMS OF EQUIPMENT WILL BE PURCHASED BY THE OWNER OR OTHERS BUT SET AND INSTALLED IN PLACE WITH CONDUIT, WIRING AND ALL CONNECTIONS PROVIDED AS PART OF THE ELECTRICAL SCOPE OF WORK. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO RECEIVE, UNLOAD, UNCRATE, HANDLE, ASSEMBLE, INSTALL AND CONNECT THE OWNER'S OR OTHERS' FURNISHED EQUIPMENT.

10 DRAWINGS:

THE DRAWINGS SHOW THE GENERAL ARRANGEMENT, GENERAL DESIGN AND EXTENT OF THE VARIOUS ELECTRICAL SYSTEMS AND ARE DIAGRAMMATIC. THEY ARE NOT INTENDED TO BE SCALED FOR ROUGH-IN MEASUREMENTS NOR TO SERVE AS SHOP DRAWINGS.

THE CONDUIT RUNS OF FEEDERS AND BRANCH CIRCUITS AS SHOWN ON THE DRAWINGS ARE SCHEMATIC ONLY AND ARE NOT INTENDED TO SHOW THE EXACT ROUTING. FINAL DETERMINATION AS TO ROUTING SHALL BE GOVERNED BY STRUCTURAL CONDITIONS, INTERFERENCES, CIRCUITING, ETC.

11 OMISSIONS:

THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO INCLUDE ALL WORK AND MATERIAL FOR THE ENTIRE COMPLETION OF WORK. ANY ITEM OF MATERIAL OR LABOR REQUIRED FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AND OMITTED FROM EITHER THE DRAWINGS OR SPECIFICATIONS, OR BOTH, BUT OBVIOUSLY REQUIRED, SHALL BE FURNISHED AS PART OF THE CONTRACT WITHOUT ADDITIONAL COST.

12 DAMAGE TO OTHER WORK:

REPAIR AND PAY FOR ALL DAMAGE DONE TO EXISTING OR NEW WORK BY ELECTRICAL TRADES WORKMEN.

13 CUTTING AND PATCHING:

FOR ALL ELECTRICAL WORK: ALL CUTTING AND PATCHING OF NON-STRUCTURAL PARTS SHALL BE DONE BY THE ELECTRICAL TRADES.

14 CLEANING:

CLEAN UP ALL ELECTRICAL WORK AT COMPLETION.

15 RECORD DRAWINGS FOR EQUIPMENT RE-ASSEMBLY:

ELECTRICAL TRADES SHALL PROVIDE RECORD DRAWINGS OF EQUIPMENT DISCONNECTED FOR USE BY THE OWNER TO RECONNECT THE EQUIPMENT AT A LATER DATE. DRAWINGS SHALL INDICATE ALL SUB-ASSEMBLIES AND/OR WORKMANSHIP. UPON RECEIPT OF NOTICE OF FAILURE OF ANY PART OF THE WORK DURING THE GUARANTEE PERIOD, THE AFFECTED PART OR PARTS SHALL BE REPLACED PROMPTLY AT NO ADDITIONAL COST TO THE OWNER, INCLUDING ANY DAMAGE DONE TO THE WORK OF OTHERS CAUSED BY THE FAILURE OF THE ELECTRICAL SYSTEM OR SYSTEMS.

16 EXAMINATION OF SITE:

THIS CONTRACTOR MUST EXAMINE EXISTING SITE AND BE THOROUGHLY AWARE OF CONDITIONS UNDER WHICH HE MUST WORK. ADVISE ENGINEERS OF ANY CONTINGENCIES BEFORE SUBMITTING BIDS. NO EXTRAS OR ALLOWANCES WILL BE MADE FOR ANY CHANGES THAT MAY BE REQUIRED DUE TO FAILURE OR NEGLIGENCE TO MAKE SUCH EXAMINATION OF EXISTING CONDITIONS.

20 SUBMITTALS:

PRIOR TO RELEASING ANY ORDER FOR MATERIAL FOR THIS PROJECT, THE CONTRACTOR SHALL SUBMIT FOR REVIEW, DETAILED SHOP DRAWINGS AND/OR EQUIPMENT CUT SHEETS, INDICATING DIMENSIONS, SIZES, WEIGHTS, ELECTRICAL RATINGS AND OPERATING CHARACTERISTICS, CAPACITIES, MATERIALS, COLORS, AND ROUGH-IN REQUIREMENTS, FOR DISTRIBUTION EQUIPMENT. SUBMITTALS SHALL BE MADE SUFFICIENTLY IN ADVANCE OF THE REQUIRED ORDER RELEASE DATE, TO ALLOW THE ENGINEER TIME TO REVIEW SUCH INFORMATION. MULTIPLE COMPONENTS INTENDED TO FUNCTION AS A SYSTEM SHALL BE COORDINATED AND SUBMITTED AS A UNIT. UPON AWARD OF THE CONTRACT, THE CONTRACTOR SHALL PROVIDE A SCHEDULE FOR SUBMISSION OF THE SHOP DRAWINGS TO THE ENGINEER.

- 21 DEMOLITION AND REMOVAL WORK:

PROVIDE DEMOLITION AND REMOVAL WORK AS INDICATED. ITEMS FOR REUSE OR TO BE TURNED OVER TO OWNER SHALL BE CAREFULLY REMOVED, DISMANTLED AND STORED TO PREVENT DAMAGE TO SAME. WHERE EQUIPMENT IS TO BE REMOVED, ASSOCIATED CIRCUIT INCLUDING BOXES, CONDUIT AND WIRING SHALL ALSO BE REMOVED BACK TO THE SOURCE. ITEMS NOT NOTED TO BE REUSED OR TURNED OVER TO THE OWNER SHALL BECOME PROPERTY OF CONTRACTOR AND SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED.

WHEN RELOCATING OR REMOVING LUMINAIRE(S), RECEPTACLE(S) OR OTHER ELECTRICAL DEVICE(S), BUT NOT OTHER DEVICES ON THE SAME CIRCUIT, CIRCUIT SHALL BE RECONNECTED FOR CONTINUED SERVICE TO REMAINING ITEMS ON CIRCUIT. THIS SAME STIPULATION APPLIES TO LOW VOLTAGE SYSTEMS, INCLUDING BUT NOT LIMITED TO FIRE ALARM, NURSE CALL, SECURITY, PAGING, AND TELEVISION.

ELECTRICAL WORK INTERFERING WITH AND REQUIRING RELOCATION OR MODIFICATION FOR NEW WORK SHALL BE DISCONNECTED, REMOVED AND RE-ROUTED TO SUIT FINAL INSTALLATION.

22 EXISTING BUILDING WORK:

THIS CONTRACTOR SHALL ALSO RELOCATE ANY ELECTRICAL WORK, WHETHER SHOWN OR NOT, THAT INTERFERES WITH NEW WORK OF ANY TRADE.

PERFORM ALL NECESSARY CUTTING AND PATCHING OF FLOORS, WALLS AND CEILINGS. RESTORE ALL CUT WORK TO ITS ORIGINAL CONDITION.

ALL DIRT AND RUBBISH RESULTING FROM THIS WORK SHALL BE REMOVED FROM THE PREMISES.

ALL DOWN TIMES SHALL BE MINIMAL AND SHALL BE COORDINATED WITH THE BUILDING OWNER AND SHALL BE SUBJECT TO THEIR APPROVAL.

23 NOT USED

24 GROUNDING:

MATERIALS:
BARE GROUNDING CONDUCTORS: STRANDED ANNEALED COPPER.
INSULATED GROUNDING CONDUCTORS: PER "WIRES AND CABLES".

POWER SYSTEM GROUND BUS: BARE, ANNEALED, TINNED COPPER BAR 1/4" THICK BY 2" WIDE BY LENGTH AS INDICATED. STAND-OFF INSULATORS SHALL BE 600 VAC (MIN) RATED, 1-1/2" FACE DIAMETER, 2" HIGH WITH THREADED INSERTS. MANUFACTURER - GROUND BUS: HARGER #CB-14-2-XXX-N SERIES OR THOMPSON LIGHTNING PROTECTION #37216 SERIES. MANUFACTURER - BUS INSULATOR: HARGER #R4150-S4 OR THOMPSON LIGHTNING PROTECTION #38316.

EXOTHERMIC-WELDED CONNECTIONS: USE FOR CONNECTIONS TO STRUCTURAL STEEL AND FOR UNDERGROUND CONNECTIONS.

EQUIPMENT GROUNDING CONDUCTOR TERMINATIONS: USE BOLTED PRESSURE CLAMPS.

INSTALLATION:
ALL ELECTRICAL EQUIPMENT SHALL BE GROUNDED.

PROVIDE AN INSULATED, 600 VOLT, COLOR-CODED GREEN STRANDED GROUNDING CONDUCTOR IN EACH FEEDER AND BRANCH CIRCUIT. REFER TO "WIRES AND CABLES".

SECONDARY NEUTRAL AND TRANSFORMER ENCLOSURE: INTERCONNECT AND CONNECT TO GROUNDING CONDUCTOR.

25 CONDUIT:

MATERIALS:
RIGID STEEL CONDUIT, ELBOWS AND COUPLINGS: ZINC-COATED THREADED STEEL PER ANSI C80.1 "SPECIFICATION FOR RIGID STEEL CONDUIT, ZINC-COATED". EACH LENGTH OF CONDUIT SHALL BE THREADED ON BOTH ENDS. MANUFACTURERS: ALLIED, REPUBLIC OR WHEATLAND.

FLEXIBLE STEEL CONDUIT: PULL WALL, ZINC-COATED STEEL PER UL-1, "FLEXIBLE STEEL CONDUIT". MANUFACTURERS: AFC CABLE SYSTEM, ELECTRI-FLEX, OR INTERNATIONAL METAL HOSE.

LIQUID-TIGHT FLEXIBLE STEEL CONDUIT: PER UL-360, "LIQUID TIGHT FLEXIBLE STEEL CONDUIT, ELECTRICAL". MANUFACTURERS: AFC CABLE SYSTEM, ALFLEX, "SEALTITE", ELECTRI-FLEX OR INTERNATIONAL METAL HOSE.

METHOD:
OUTDOOR, EXPOSED: GALVANIZED RIGID STEEL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

OUTDOOR, CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND MOTOR DRIVEN EQUIP): LIQUID-TIGHT FLEXIBLE STEEL CONDUIT.

INDOOR, EXPOSED: GALVANIZED RIGID STEEL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

INDOOR, CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND MOTOR DRIVEN EQUIPMENT): FLEXIBLE STEEL CONDUIT, EXCEPT IN WET OR DAMP LOCATIONS USE LIQUID-TIGHT FLEXIBLE STEEL CONDUIT.

INDOOR, DAMP OR WET LOCATIONS: GALVANIZED RIGID STEEL OR LIQUID-TIGHT FLEXIBLE STEEL CONDUIT.

INSTALLATION:
ALL CONDUITS TO BE INSTALLED PARALLEL TO OR AT RIGHT ANGLE TO WALLS AND IN AN ORDERLY MANNER.

INSTALL CONDUITS SIZES AS INDICATED. WHERE CONDUIT SIZES ARE NOT INDICATED, INSTALL SIZES PER NEC REQUIREMENTS, EXCEPT DO NOT USE CONDUITS SMALLER THAN 3/4-INCH UNLESS OTHERWISE NOTED.

ALL CONDUIT INSTALLED IS EXPOSED AND SURFACE MOUNTED. CONDUIT SHALL NOT BE INSTALLED IN FLOORS OR IN SLABS ON GRADE, UNLESS INDICATED ON THE DRAWINGS.

DO NOT INSTALL CONDUIT ACROSS OR PERPENDICULAR TO DUCT SHAFTS, PIPE SHAFTS OR FURT DUCT OPENINGS.

SECURE CONDUIT IN PLACE BY TWO LOCKNUTS AND TERMINATE WITH A BUSHING WHEN CONDUIT ENTERING SHEET METAL ENCLOSURE AND OUTLET BOXES AND NOT TERMINATED IN A THREADED HUB.

COMPLETE INSTALLATION OF ELECTRICAL RACEWAYS BEFORE STARTING INSTALLATION OF CONDUCTORS WITHIN THE RACEWAYS.

ALL CONDUITS SHALL BE INSTALLED IN THE CEILING SPACE OF THE FLOOR IT SERVES, UNLESS OTHERWISE INDICATED. CONDUIT BENEATH THE SLAB ON GRADE IS UNACCEPTABLE, UNLESS EXPRESSLY INDICATED ON THE DRAWINGS.

FLEXIBLE CONDUIT SHALL BE USED FOR ALL FINAL CONNECTIONS TO TRANSFORMERS AND VIBRATING EQUIPMENT SUCH AS MOTORS

INSTALL CONDUIT A MINIMUM OF 12-INCHES FROM HOT WATER OR STEAM PIPES AND 3-INCHES FROM OTHER MECHANICAL PIPING.

- 26 CONDUIT FITTINGS:

FITTINGS FOR RIGID STEEL CONDUIT: CAST OR MALLEABLE IRON BODIES, CADMIUM OR ZINC-PLATED, WITH TAPER THREADS, AND SCREW ATTACHED COVER PLATE. PROVIDE GASKETS WHEN LOCATED IN AREAS REQUIRING GASKETS.

FITTINGS FOR FLEXIBLE STEEL CONDUIT: MALLEABLE IRON OR STEEL, ZINC OR CADMIUM PLATED, SECURING THE CONDUIT BY CLAMPING ACTION AROUND THE PERIPHERY OF THE CONDUIT. DO NOT FURNISH FITTINGS THAT ANCHOR THE CONDUIT BY MEANS OF SET SCREWS.

MANUFACTURERS: APPLETON, O-Z / GEDNEY, THOMAS & BETTS, STEEL CITY, RACO OR CROUSE-HINDS.

27 CONDUIT SUPPORTS:

DO NOT SUPPORT CONDUIT FROM PIPES, HANGERS, OR EXTENSION OF INSTALLATION OF OTHER TRADES, UNLESS NECESSARY DUE TO CEILING SPACE CONSTRAINTS, BUT OBTAIN WRITTEN APPROVAL BY THE STRUCTURAL ENGINEER BEFORE PROCEEDING WITH INSTALLATION.

INSTALL SUPPORTS TO SECURELY AND PERMANENTLY FASTEN CONDUIT SYSTEM.

DO NOT SUPPORT 1-1/2 INCH AND LARGER CONDUIT RUNS ABOVE SUSPENDED CEILING FROM CEILING MEMBERS. SUPPORT SUCH CONDUIT FROM STRUCTURAL SUPPORT SYSTEM.

INSTALL INDIVIDUAL AND MULTIPLE HANGERS AND RISER CLAMPS TO SUPPORT CONDUITS. PROVIDE U-BOLTS, CLAMPS, ATTACHMENTS, AND OTHER HARDWARE NECESSARY FOR HANGER ASSEMBLIES AND FOR SECURING HANGER RODS AND CONDUITS. INSTALL CLEVIS TYPE HANGERS FOR INDIVIDUAL CONDUIT NOT SUPPORTED ON PIPE STRAPS.

SUPPORT PARALLEL RUNS OF HORIZONTAL CONDUITS TOGETHER ON TRAPEZE- OR BRACKET-TYPE HANGERS.

SUPPORT INDIVIDUAL HORIZONTAL CONDUITS WITH SEPARATE, MALLEABLE-IRON PIPE HANGERS OR CLAMPS. LIMIT ANCHOR TO SUPPORT OF 1-1/2 INCH CONDUIT OR SMALLER. USE OF PERFORATED STRAP OR WIRE IS NOT ACCEPTABLE.

SUPPORT EXPOSED CONDUIT AND OUTLET BOXES BY APPROVED HANGERS, CLAMPS OR CLIPS FASTENED BY MACHINE SCREWS TO EXPANSION ANCHORS, LEAD ANCHORS ARE NOT APPROVED FOR USE. SUPPORT CONDUIT ON BOTH SIDES OF BENDS.

BEAM CLAMPS FOR SUPPORT OF CONDUIT SHALL BE MALLEABLE IRON WITH HOOK RODS TO GRIP BEAM FLANGE. C-CLAMPS ARE NOT ACCEPTABLE.

SUPPORT CONDUIT EVERY 8-FEET ON CENTER (MIN) IF SMALLER THAN 2-INCHES AND EVERY 10-FEET ON CENTER (MIN) IF 2-INCHES OR LARGER.

DO NOT EXCEED LOADING LIMITS OF STRUCTURAL SYSTEMS WHERE GROUPS OF CONDUITS ARE SUPPORTED ON COMMON HANGERS.

MANUFACTURERS: SAME AS LISTED FOR CONDUITS, PLUS B-LINE, KINDORF, MIDLAND-ROSS, RACO, OZ / GEDNEY, STEEL CITY, THOMAS & BETTS, OR UNISTRUT.

28 BUSHINGS:

FOR 1-INCH CONDUIT AND SMALLER: INSULATING PLASTIC TYPE OF NON-BURNABLE THERMOSETTING PHENOLIC, CONFORMING TO UL REQUIREMENTS. DO NOT FURNISH NON-RIGID PLASTIC BUSHINGS.

FOR 1-1/4 INCH AND LARGER: MALLEABLE IRON OR STEEL, ZINC OR CADMIUM PLATED, WITH INSULATING INSERT OF THERMOSETTING PLASTIC AS SPECIFIED FOR SMALLER CONDUIT BUSHINGS, MOLDED AND LOCKED INTO THE BUSHING RING.

INSTALL INSULATING BUSHINGS ON CONDUIT ENDS BEFORE THE INSTALLATION OF ANY CONDUITS.

29 OUTLET BOXES:

MATERIALS:
SHEET METAL BOXES: GALVANIZED STOCK NOT LESS THAN 14 GAUGE, WITH KNOCKOUT OPENINGS, SINGLE OR MULTIPLE GANG, WITH EXTENSIONS, ADAPTERS, PLASTER GRIPS, TILE COVERS, FIXTURE STUDS AND COVER PLATES. MANUFACTURERS: APPLETON, O-Z/GEDNEY, RACO OR STEEL CITY.

CAST OR MALLEABLE IRON BOXES: GALVANIZED OR CADMIUM PLATED, SINGLE OR MULTIPLE GANG, WITH TAPER THREADED HUBS, ADAPTERS AND COVER PLATES. MANUFACTURERS: APPLETON, CROUSE-HINDS OR THOMAS & BETTS.

INSTALLATION:
IN GENERAL, USE OUTLET BOXES NOT LESS THAN 4-INCHES SQUARE, AT LEAST 2-1/2 INCHES DEEP AND OF SUFFICIENT SIZE TO ACCOMMODATE THE WIRING DEVICES TO BE INSTALLED. FLUSH MOUNTED BOXES FOR MULTIPLE OUTLETS SHALL BE GANG TYPE. BOXES SHALL NOT BE LESS THAN 3-INCH DEEP FOR CEILING BOXES.

WHERE SHOWN ON THE DRAWINGS AND NOTED IN THESE SPECIFICATIONS, USE THREADED-HUB CAST METAL OUTLET BOXES FOR EXPOSED CONDUIT SYSTEMS OR FOR WEATHERPROOF DEVICES SUITABLE FOR THE WIRING DEVICES TO BE INSTALLED.

USE OUTLET BOXES WITH PLASTER RING COVERS FOR WIRING DEVICES IN FINISHED WALLS WHERE PRACTICABLE, TO BRING BOX OPENINGS FLUSH WITH FINISHED WALL OR NOT MORE THAN 1/4-INCH BACK OF SAME.

WHERE MOUNTING HEIGHT OR LOCATION OF OUTLET IS NOT SHOWN OR SPECIFIED, LOCATE THE OUTLET AS BEST SUITED FOR THE EQUIPMENT CONNECTED OR AS DIRECTED.

SECURELY FASTEN OUTLET BOXES. ATTACH EXPOSED OUTLET BOXES TO PERMANENT INSERTS OR EXPANSION ANCHOR WITH MACHINE SCREWS OR THREADED RODS.

CLOSE UNUSED OPENINGS IN OUTLET BOXES WITH KNOCKOUT COVERS MANUFACTURED FOR THE PURPOSE.

FOR CONCEALED VOICE/DATA OUTLETS INSTALL 4-11/16 INCH SQUARE TYPE OUTLET BOXES WITH PLASTER COVER AND BUSHED 3/8-INCH OPENING COVERPLATE.

30 PULL AND JUNCTION BOXES:

MATERIALS:
FOR BOXES NOT OVER 100 CUBIC INCHES: USE 4-11/16 INCH SQUARE BY 1-1/2 INCH (MIN) DEEP OUTLET BOXES.

FOR BOXES OVER 100 CUBIC INCHES: SHEET METAL BOXES, CODE GAUGE, GALVANIZED STEEL, FULL SEAM WELDED WITH BENT-IN FLANGES SEAM WELDED AT CORNER JOINTS, SCREW FASTENED GALVANIZED COVER OF SAME GAUGE AS BOX. FASTEN COVER WITH BRASS MACHINE SCREWS. PROVIDE SIZES CONFORMING TO NEC REQUIREMENTS FOR WIRING SPACE, EXCEPT WHERE BOXES OF LARGER SIZE ARE INDICATED. FURNISH GASKETS WHEN LOCATED IN AREAS REQUIRING GASKETS. MANUFACTURER: COOPER B-LINE, HOFFMAN, OR WIEGMANN.

INSTALLATION:
INSTALL PULL AND JUNCTIONS BOXES AT LEAST EVERY 100-FEET IN LONG CONDUIT RUNS. INSTALL PULL OR JUNCTION BOX SO THAT CONDUIT RUNS DO NOT EXCEED (3) 90 DEGREE BENDS BETWEEN BOXES.

31 PULL ROPE:

INSTALL 1/8-INCH DIAMETER NYLON PULLING ROPE WITH WOODEN BLOCKS AND IDENTIFICATION FASTENED TO BOTH ENDS OF ALL EMPTY ELECTRICAL AND VOICEDATA CONDUITS.

SLEEVES:

INSTALL SLEEVES AS NOTED. WHERE CONDUITS ARE TO PASS THROUGH FLOOR SLABS, AND PIPE SLOTS ARE NOT PROVIDED, INSTALL RIGID STEEL CONDUIT SLEEVES FOR CONDUIT SIZES AS INDICATED. INSTALL SLEEVES WITH BOTTOM OF SLEEVES FLUSH WITH SLAB AND TOP OF SLEEVE 3-INCHES ABOVE FINISHED FLOOR.

CLOSE AND MAKE WATERTIGHT ALL OPEN SPACES AROUND INSTALLED CONDUIT WITH OAKUM AND APPROVED MASTIC. SUPPORT CONDUIT AT EACH FLOOR, PROVIDE APPROVED MASTIC FOR FIRE STOP AT ALL FIRE RATED WALL OR FLOOR PENETRATIONS.

32 CONDUIT EXPANSION FITTINGS:

INSTALL A CONDUIT EXPANSION FITTING IN EACH CONDUIT RUN WHEREVER IT CROSSES AN EXPANSION JOINT IN THE STRUCTURE. INSTALL A CONDUIT EXPANSION FITTING IN EACH CONDUIT RUN WHICH IS MECHANICALLY ATTACHED TO SEPARATE STRUCTURES. INSTALL A BONDING JUMPER OR GROUND CLAMP TO CONNECT THE CONDUITS.

- 33 WIRES AND CABLES:

MATERIALS:
WIRE AND CABLE SHALL BE PER STANDARD SPECIFICATIONS ESTABLISHED FOR SUCH MATERIAL AND CONSTRUCTION BY ASTM, ANSI, IPCEA AND NEMA, WHERE APPLICABLE. CONDUCTORS FURNISHED SHALL BE COPPER OF 98% CONDUCTIVITY. ALL CONDUCTORS FURNISHED SHALL BE NOT LESS THAN #12 AWG, EXCEPT CONTROL WHICH MAY BE #14 AWG. PROVIDE CONDUCTOR SIZES AS INDICATED. PROVIDE STRANDED CONDUCTORS FOR #12 AWG AND LARGER. PROVIDE SOLID CONDUCTORS FOR #14 AWG AND SMALLER.

WIRE FOR GENERAL INTERIOR OR ABOVE-GRADE EXTERIOR WORK: SINGLE CONDUCTOR, ANNEALED COPPER, RATED 600 VOLTS AS TO INSULATION. PROVIDE CLASS R REJECTION TYPE FUSE CLIPS FOR 600 VAC. PROVIDE CLASS R REJECTION TYPE FUSE CLIPS FOR 600 VAC. PROVIDE CLASS R REJECTION TYPE FUSE CLIPS FOR 600 VAC.
- NEC TYPE "THHN", RATED 90 DEG C, DRY AND DAMP LOCATIONS.
- NEC TYPE "XHHW", RATED 90 DEG C, DRY AND DAMP LOCATION AND 75 DEG C, WET LOCATION.
- NEC TYPE "XHHW-2", RATED 90 DEG C, DRY AND WET LOCATION.

MANUFACTURERS: AMERICAN INSULATED WIRE, GENERAL CABLE, OKONITE, SOUTHWIRE OR ESSEX.

INSTALLATION:
INSTALL WIRING IN ACCORDANCE WITH NEC OR PER ANY OTHER CODES THAT TAKE PRECEDENCE.

INSTALL CONDUCTORS CONTINUOUS, WITHOUT SPLICES, BETWEEN EQUIPMENT, WHERE POSSIBLE. WHERE SPLICES ARE REQUIRED, MAKE UP SPLICES IN BOXES; DO NOT USE FITTINGS FOR SAME.

INSTALL PHASE AND NEUTRAL CONDUCTORS OF EACH BRANCH OR FEEDER CIRCUIT IN A SINGLE CONDUIT.

RUN A SEPARATE NEUTRAL WIRE FOR EACH SINGLE PHASE LOAD. THE NEUTRAL WIRE SHALL NOT BE SHARED BETWEEN PHASES IN 3 PHASE, 4 WIRE SYSTEM, AND IN THE CASE OF 120/240 VOLT AC SYSTEM, THE NEUTRAL SHALL NOT BE SHARED BETWEEN THE LINES.

CONTINUOUSLY LUBRICATE CABLES AT THE PULL-IN POINT OF CONDUIT SYSTEMS WITH AN APPROVED COMPOUND COMPATIBLE WITH CONDUCTOR INSULATION OR JACKET.

INSTALL CONDUCTORS IN SUCH A MANNER THAT THE BENDING RADIUS OF ANY WIRE OR CABLE IS NOT LESS THAN THE MINIMUM RECOMMENDED BY IPCEA AND/OR THE MANUFACTURER, DO NOT EXCEED MANUFACTURER'S RECOMMENDED VALUES FOR MAXIMUM PULLING TENSION APPLIED TO ANY WIRE OR CABLE.

CONNECT ALL POWER WIRING TO EQUIPMENT, SUCH THAT PHASING SHALL BE A-B-C-A LEFT TO RIGHT, TOP TO BOTTOM AND FRONT TO BACK, WHERE POSSIBLE, AND PERMANENTLY IDENTIFY PHASING ON THE STRUCTURE OR HOUSING ADJACENT TO BUS. PHASE IDENTIFICATION A-B-C IS EQUIVALENT TO TRANSFORMER PHASE IDENTIFICATION X1-X2-X3 AND H1-H2-H3.

PROVIDE AN APPROPRIATELY SIZED GREEN GROUND WIRE FOR EVERY FEEDER AND BRANCH CIRCUIT.

34 CONNECTORS FOR SPLICING COPPER CONDUCTORS:

CONNECTORS FOR STRAIGHT SPLICING CONDUCTORS UP TO AND INCLUDING #10 AWG: SOLDERLESS COMPRESSION TYPE. MANUFACTURER: THOMAS & BETTS' "STA-KON" OR BURNDY "HYDENT".

TWIST-ON CONNECTORS FOR PIGTAIL SPLICING UP TO AND INCLUDING #10 AWG: METAL WIRE SPRING PRESSURE TYPE CONNECTOR WITH THERMOPLASTIC INSULATED COVER WITH POSITIVE GRIP DESIGN AND VOLTAGE RATING OF 600 VAC. MANUFACTURER: 3M "SCOTCHLOK" OR IDEAL "WIRE-NUT".

CRIMP CONNECTORS FOR PIGTAIL SPLICING CONDUCTORS UP TO AND INCLUDING #10 AWG: SOLDERLESS TYPE WITH A METALLIC INSERT CRIMP CONNECTOR WITHIN A PLASTIC INSULATING COVER RATED 600 VAC. MANUFACTURER: BUCHANAN #2011S (CRIMP) AND #2014 (INSULATOR) OR IDEAL #4111 (CRIMP) AND #4117 (INSULATOR).

CONNECTOR FOR STRAIGHT SPLICING CONDUCTORS #8 AWG AND LARGER: SOLDERLESS COMPRESSION 2-WAY TYPE. MANUFACTURER: THOMAS & BETTS' "54500 SERIES", BURNDY TYPE "YS-L", OR LISCO "CT" OR "CTL".

CONNECTORS FOR 3-WAY SPLICING CONDUCTORS #8 AWG AND LARGER: SOLDERLESS COMPRESSION TYPE. MANUFACTURER: THOMAS & BETTS' "54700 SERIES" OR BURNDY "YS-T".

CONNECTION TO PIGTAIL CONNECTORS SHALL BE USED FOR #10 AWG AND SMALLER NOT SUBJECT TO MOVEMENT AND VIBRATIONS. THEY SHALL NOT BE USED FOR CONNECTION TO ROTATING EQUIPMENT. CRIMP PIGTAIL CONNECTORS SHALL BE USED FOR #10 AWG AND SMALLER FOR CONNECTIONS TO ROTATING EQUIPMENT, OR WHERE SUBJECT TO MOVEMENT AND VIBRATION.

35 LUGS FOR TERMINATING COPPER CONDUCTORS:

LUGS FOR TERMINATING POWER CONDUCTORS UP TO AND INCLUDING #8 AWG: TIN PLATED, SOLDERLESS TYPE, MANUFACTURERS STANDARD, UNLESS OTHERWISE SPECIFIED.

LUGS FOR TERMINATING POWER CONDUCTORS #8 AWG AND LARGER: HIGH CONDUCTIVE WROUGHT COPPER, TIN PLATED, SOLDERLESS COMPRESSION TYPE, ONE HOLE, SINGLE INDENT FOR #6 AWG THROUGH #4/0 AWG INCLUSIVE, AND TWO HOLE, LONG BARREL, DOUBLE INDENT FOR LARGER SIZES. LUGS FOR #4/0 AWG AND LARGER SHALL BE SIZED FOR THE SPECIFIC CABLE SIZE. MULTI-RANGE LUGS ARE NOT ACCEPTABLE. MANUFACTURER: BURNDY TYPE "YAL", THOMAS & BETTS' "SERIES 54000", OR LISCO "CN", OR 3M COMPANY.

36 CONDUCTOR COLOR CODING:

MATCH EXISTING COLOR SCHEME.

37 CONDUCTOR IDENTIFICATION:

WIRE LABELS FOR IDENTIFICATION OF CONDUCTORS SHALL BE FLAME RESISTING, ADHESIVE TYPE. MANUFACTURER: BRADY, GARDNER BENDER, IDEAL, OR 3M COMPANY.

PROVIDE UNIQUE LABELING OF ALL BRANCH CIRCUIT CONDUCTORS AND ASSOCIATED NEUTRAL CONDUCTORS. IN ALL TERMINAL CABINETS, PANELBOARDS, DISTRIBUTION, CONTROL AND LOAD CENTERS, PULL BOXES AND WHEREVER CONDUIT RUN IS BROKEN, MARK THE WIRE WITH MARKING STRIP OF ALL CONTROL TERMINAL BLOCKS WITH THE SAME IDENTIFICATION AS THE CONNECTING WIRE IN PERMANENT BLACK INK.

ALL CONDUCTORS SHALL BE TAGGED AT THEIR POINT OF ORIGIN, IN ALL JUNCTION AND PULL BOXES AND AT THEIR POINT OF TERMINATION.

38 INSULATING TAPE:

FOR GENERAL USE: SCOTCH 33 PLUS OR OKONITE TYPE CLF SERIES 602-20.

FOR HIGH TEMPERATURE AREAS: SCOTCH 27.

FOR OUTDOOR USE: SCOTCH 88.

39 FUSES:

FUSES FOR POWER FEEDERS AND/OR BRANCH CIRCUITS RATED 600 AMPERE OR LOWER: UL CLASS RK1, DUAL ELEMENT, TIME DELAY, CURRENT LIMITING TYPE WITH REPLACEMENT FUSE INDICATOR (WHERE AVAILABLE) AND 200,000 AMPERE INTERRUPTING RATING. BUSSMANN LPN-RK SP (250V), LPN-RK SP (600V) OR FERRAZ SHAWMUT A2D-R (250V), A6D-R (600V).

SPARE FUSES: PROVIDE ONE SPARE SET OF THREE FOR EACH SIZE AND TYPE OF FUSES INSTALLED.

INSTALL FUSES IN FUSIBLE DEVICES. ARRANGE FUSES SO REPLACEMENT FUSE INDICATOR AND RATING INFORMATION IS READABLE WITHOUT REMOVING FUSE.

ALL FUSES SHALL BE OF THE SAME MANUFACTURER, INCLUDING SPARES.

40 DISCONNECT SWITCH:

HEAVY DUTY SAFETY SWITCH, NEMA 12 INDOOR, STAINLESS STEEL OUTDOOR, 600 VAC RATED, QUICK-MAKE, QUICK-BREAK, NON-ROTARY, VISIBLE BLADE, WITH VIEWING WINDOW AND FULL COVER INTERLOCK. FUSIBLE OR NON-FUSIBLE AS INDICATED ON DRAWINGS. PROVISION FOR PADLOCKING IN THE OPEN POSITION. EQUIP SWITCHES WITH CLASS R REJECTION TYPE CLIPS AND CLASS R FUSES TO OBTAIN A SHORT CIRCUIT RATING OF 50,000 A.I.C. MINIMUM. PROVIDE A NEMA 12 STAINLESS STEEL ENCLOSURE WHEN INSTALLED OUTDOORS OR IN DAMP AREAS.

MANUFACTURER: SQUARE D, SIEMENS, OR ABB.

41 FUSIBLE PLUG-IN BUS DISCONNECT SWITCH:

FUSIBLE DISCONNECT SWITCH SHALL HAVE AN EXTERNAL OPERATING HANDLE ARRANGED FOR BOTH MANUAL AND HOOK-STICK OPERATING AND INTERLOCKED WITH THE COVER DOOR SUCH THAT THE DOOR CANNOT BE OPENED UNLESS THE SWITCH IS OPENED OR "OFF". OPERATING MECHANISM MUST CLEARLY INDICATE "ON" AND "OFF" POSITION AND HAVE PROVISIONS FOR PADLOCKING IN THE OPEN POSITION. PROVIDE 3 POLE, VISIBLE BLADE, QUICK-MAKE, QUICK-BREAK, NON-ROTARY TYPE SWITCH RATED 600 VAC. PROVIDE CLASS R REJECTION TYPE FUSE CLIPS FOR SIZE FUSE AS INDICATED ON THE DRAWINGS.

PLUG-IN DEVICE SHALL BE SECURELY ATTACHED TO THE BUS DUCT WITH HEAVY METAL CLIPS FIRMLY LOCKED IN PLACE BY AT LEAST 4 HEAVY DUTY STEEL WIRE DEVICES WITH LOCKING PARTS CAPTIVE. SELF-TAPPING SCREWS WILL NOT BE PERMITTED FOR SECURING DEVICES TO THE BUS DUCT. PROVIDE ADDITIONAL SUPPORT FOR LARGE BUS PLUGS PER MANUFACTURER'S RECOMMENDATION.

PLUG-IN BUS DISCONNECT SWITCHES WILL BE PROVIDED BY THE OWNER AND INSTALLED BY THE CONTRACTOR, AS INDICATION ON PLANS. OTHERWISE, CONTRACTOR SHALL PROVIDE.

MANUFACTURER'S: MATCH EXISTING. SEE ONE-LINE DIAGRAMS.

- 42 COMBINATION STARTER DISCONNECT SWITCH:

MATERIALS:
GENERAL: THREE PHASE, 600 VAC, COMBINATION TYPE CONSISTING OF A FUSIBLE SWITCH, FULL VOLTAGE MAGNETIC STARTER, THERMAL OVERLOADS, CONTROL TRANSFORMER, HAND-OFF-AUTO SELECTOR SWITCH, PILOT LIGHT AND ANY ADDITIONAL CONTROL DEVICES AS REQUIRED, ALL MOUNTED IN A NEMA 1 ENCLOSURE.

MANUFACTURER: ALLEN-BRADLEY (A-B)

STARTER: SIZE STARTER IN ACCORDANCE WITH NEMA STANDARDS FOR THE HORSE-POWER OF THE MOTOR. DO NOT FURNISH STARTERS SMALLER THAN NEMA SIZE 1. PROVIDE COILS FOR OPERATION ON 120V, UNLESS OTHERWISE NOTED. EQUIP EACH STARTER WITH A MINIMUM OF TWO SPARE CONVERTIBLE AUXILIARY CONTACTS.

THERMAL OVERLOADS: ONE IN EACH PHASE WIRE, EXTERNALLY MANUAL RESET TYPE. SELECT OVERLOADS AFTER FINAL INSTALLED HORSEPOWER OF MOTORS IS DETERMINED. DO NOT USE RATINGS EXCEEDING 100% OF MOTOR FULL LOAD CURRENT ADJUSTED FOR AMBIENT TEMPERATURES. COORDINATE SIZE WITH THE APPROVED MANUFACTURERS SHOP DRAWINGS PRIOR TO INSTALLATION OF OVERLOADS.

CONTROL TRANSFORMER: PROVIDE A 480-120 VOLT CONTROL TRANSFORMER (OR OTHER SPECIFIED VOLTAGE) WITH PRIMARY FUSING IN EACH INDIVIDUAL STARTER UNIT. FUSE AND GROUND THE SECONDARY WINDINGS. WHERE DAMPERS, INDICATING LIGHTS, SOLENOID VALVES OR OTHER CONTROL COMPONENTS ARE TO BE ENERGIZED BY THE CONTROL TRANSFORMER, THE CONTROL TRANSFORMER SHALL BE OF SUFFICIENT CAPACITY TO OPERATE CONNECTED INDICATING LIGHTS, SOLENOID VALVES, CONTROL DEVICES, AND INTAKE DAMPER MOTORS, PLUS 100% SPARE CAPACITY.

INDICATING LIGHTS: PROVIDE COLORED "LED" OR HEAVY-DUTY, OIL-TIGHT TYPE WITH 6 VOLT LAMP INTEGRAL 120-6 VAC TRANSFORMER, PUSH-TO-TEST FEATURE, COLOR CAP AND LEGEND PLATE AS INDICATED. COLOR CODING SHALL BE RED FOR "RUN" AND GREEN FOR "POWER ON".

MANUFACTURER: SQUARE D, SIEMENS, OR ALLEN-BRADLEY (A-B)

43 CIRCUIT BREAKERS FOR EXISTING PANELBOARDS:

PROVIDE ANY ADDITIONAL CIRCUIT BREAKERS IN EXISTING PANELBOARDS AS REQUIRED. CIRCUIT BREAKER SHALL MATCH EXISTING BREAKER MANUFACTURER, TYPE, AND AIC RATINGS.

44 WIRING DEVICES:

RECEPTACLES:
DUPLEX CONVENIENCE RECEPTACLE: STRAIGHT BLADE, 2 POLE, 3 WIRE, NEMA 5-20R, RATED 20 AMPS, 120 VOLT AC, SPECIFICATION GRADE, AND WHITE IN COLOR. HUBBELL #HBL5362 SERIES, LEVITON #5362 SERIES, BRYANT #BRY5362 SERIES, PAS #5362-A SERIES, OR COOPER #4H5362 SERIES.

GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE: STRAIGHT BLADE, 2 POLE, 3 WIRE, NEMA 5-20R, RATED 20 AMPERE, 120 VAC, WEATHER-RESISTANT, TAMPER-RESISTANT, TEST & RESET, PUSH-BUTTONS, LED NOTIFICATION OF TRIP, SPECIFICATION GRADE, AND WHITE IN COLOR. HUBBELL #GFR20W, LEVITON #012-W7899-TRW, BRYANT #CF82WTR-SERIES, PAS #20599TRWR SERIES, OR COOPER #TWRVGF20W-SP SERIES.

RECEPTACLES FED BY GENERATOR SHALL BE RED IN COLOR.

SPECIAL OUTLETS: PROVIDE ALL RECEPTACLES INDICATED TO SERVICE THE PURPOSE INTENDED.

DEVICE PLATES:
GANG TOGETHER ALL SWITCHES LOCATED IN ONE LOCATION AND COVER WITH ONE CUSTOM-MADE WALL PLATE. SELECT THE CORRECT COMBINATION AND TYPE OF OPENINGS.

DEVICE PLATES IN FINISHED AREAS SHALL BE SMOOTH, BRUSHED STAINLESS STEEL NO. 302/304 FINISH.

DEVICE PLATES IN ALL OTHER AREAS SHALL BE METAL, NO PLASTIC DEVICE PLATES SHALL BE ALLOWED.

WEATHERPROOF COVER DEVICE:
NEUTRAL UL LISTED, "WEATHERPROOF WHILE IN USE". SINGLE GANG, DIECAST COPPER-FREE ALUMINUM, PAD LOCKABLE, HORIZONTAL MOUNTING. HUBBELL #WP26MH, COOPER #WUWH-1, PAS #WUIC10CAH, CARLON #ME9UHMG, INTERMATIC #WP1010HMC, RED DOT #CKMG, TAY MAC #MX3300.

INSTALLATION:
INSTALL WIRING DEVICES VERTICALLY, UNLESS OTHERWISE INDICATED.

INSTALL GROUND PIN OF VERTICALLY MOUNTED RECEPTABLES UP AND ON HORIZONTALLY MOUNTED RECEPTABLES TO THE LEFT (NEUTRAL BLADE AT TOP).

FOR MULTIPLE GFCI RECEPTACLE INSTALLATION, DO NOT INSTALL STANDARD RECEPTABLES AND PROVIDE DOWNSTREAM GFCI PROTECTION FROM A SINGLE GFCI RECEPTACLE. EACH GFCI RECEPTACLE SHALL BE A DEDICATED GFCI TYPE DEVICE.

45 VOICE/DATA SYSTEM:

ELECTRICAL TRADES SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, AND SERVICES AND PERFORM ALL OPERATIONS REQUIRED FOR INSTALLATION OF OUTLET BACK BOXES AND CONDUIT STUB-UPS (TO 6 INCHES ABOVE FINISHED WALLS) FOR THE VOICEDATA OUTLETS. PROVIDE PLASTIC BUSHING ON CONDUIT END AND A PULL CORD IN THE CONDUIT.

ELECTRICAL TRADES SHALL FURNISH AND INSTALL VOICE/DATA CABLE, JACKS, COVER PLATES, AND WIRE TERMINATIONS PER OWNER'S STANDARDS. VERIFY EXACT LOCATIONS OF AREA VOICE/DATA CLOSETS WITH OWNER'S I.T. PERSONNEL.

46 STRUCTURAL SUPPORT CHANNELS:

SUPPORT CHANNELS FOR EQUIPMENT AND RACEWAYS SHALL BE A MINIMUM OF 1/4 GAUGE, MANUFACTURERS STANDARD PAINTED STEEL, 1-1/2 INCH BY 1-1/2 INCH CROSS SECTION WITH 3/4 INCH SLOT WIDTH AND DESIGNED FOR MAXIMUM DEFLECTION OF 1/360 OF SPAN OR SIZE AS INDICATED. SUPPORT SYSTEM SHALL BE COMPLETE INCLUDING COUPLINGS, HANGERS, FITTINGS AND ACCESSORIES. MANUFACTURER: COOPER B-LINE, KINDORF OR UNISTRUT.

47 EQUIPMENT IDENTIFICATION:

IDENTIFY ALL PANELS, CONTROL POINTS, CONTROL CENTERS, EQUIPMENT, BREAKERS, DISCONNECT SWITCHES, ETC., AS APPROVED IN ACCORDANCE WITH THE IDENTIFICATION MARKINGS SHOWN OF THE DRAWINGS AND/OR AS DIRECTED.

IDENTIFY EQUIPMENT WITH SUITABLE SIZED ENGRAVED PLASTIC LAMINATE PHENOLIC WHITE EQUIPMENT FED FROM THE GENERATOR POWER SYSTEM, PROVIDE A RED BACKGROUND WITH WHITE LETTERING.

DISCONNECT SWITCHES (INDIVIDUALLY OR PANEL MOUNTED), COMBINATION STARTERS AND TRANSFORMERS SHALL BE IDENTIFIED BY NAME, SOURCE OF POWER AND EQUIPMENT SERVED. PROVIDE NEW NAMEPLATES FOR REVISIONS TO EXISTING EQUIPMENT AFFECTED BY WORK IN THIS CONTRACT.

PANELBOARDS SHALL HAVE TYPED CIRCUIT DIRECTORIES IDENTIFYING EACH LOAD AND LOCATION. UPDATE ALL EXISTING PANEL SCHEDULES WITH NEW TYPED SCHEDULES FOR PANELS AFFECTED BY WORK IN THIS CONTRACT INCLUDING ADDITIONS OR DELETIONS TO EXISTING PANELS.

CONDUCTORS SHALL BE IDENTIFIED WITH WIRE MARKERS IDENTIFICATION THE CIRCUIT NUMBER, WIRE NUMBER OR PHASE LETTER AT EVERY TERMINAL POINT OR SPLICE. PROVIDE CIRCUIT IDENTIFICATION OF EVERY UN-SPLICED CONDUCTOR WITHIN EACH JUNCTION BOX OR PULL BOX.

48 ARC FLASH LABELING:

AN ARC FLASH STUDY FOR ALL NEW EQUIPMENT SHALL BE PERFORMED BY SHERMCO (TED.THEODOSIUS@SHERMCO.COM 469.938.6743), LOCATED IN LIVONIA MICHIGAN. THE CONTRACTOR TO SUBCONTRACT SHORT CIRCUIT, COORDINATION AND ARC FLASH STUDY FOR NEW AND REVISED SYSTEM PER DETROIT DIESEL STANDARDS AND FIELD INSTALL ARC FLASH LABELS AT NEW EQUIPMENT OR EXISTING EQUIPMENT WITH REVISED INCIDENT ENERGY LEVELS.

ELECTRICAL CONTRACTOR SHALL GATHER AND PROVIDE ANY DATA (INVASIVE OR NON-INVASIVE) REQUESTED BY SHERMCO AS NEEDED TO PERFORM THE REQUESTED SERVICES.

49 TESTING:

PERFORM TESTS REQUIRED TO ENSURE THE PROPER AND DESIRED OPERATION OF ALL ELECTRICAL EQUIPMENT, SYSTEMS AND WIRING AT THE COMPLETION OF THE WORK AND IN THE PRESENCE OF THE OWNER OR THEIR AUTHORIZED REPRESENTATIVE.

CONTRACTOR TO PROVIDE THE FOLLOWING:
1. INSULATION TESTING USING MEGOHMMETER OF NEW FEEDER AND POWER EQUIPMENT PRIOR TO ENERGIZING.
2. VERIFY AND ADJUST PHASE ROTATION.
3. COORDINATE AND SCHEDULE MANUFACTURER'S CHECK, TEST AND STARTUP, AND LOAD TESTING OF SWITCHGEAR BY SCHNEIDER ELECTRIC PER THE PRE-PURCHASE BY OWNER WITH UNIT PER TERMS OF OWNER'S BILL OF MATERIAL.

FURNISH ALL TESTING EQUIPMENT AND PERSONNEL REQUIRED TO CONDUCT THESE TESTS. CORRECT OR REPLACE ANY FAULTS OR DEFECTS FOUND IN MATERIALS AND/OR WORKMANSHIP DURING THESE TESTS TO THE SATISFACTION OF THE ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.



Detroit Diesel Corporation

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Sub M1C Replacement

Date	Issued For
05/15/2026	Final Review
08/18/2026	Final Review
07/30/2026	Bids

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Electrical Specifications

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