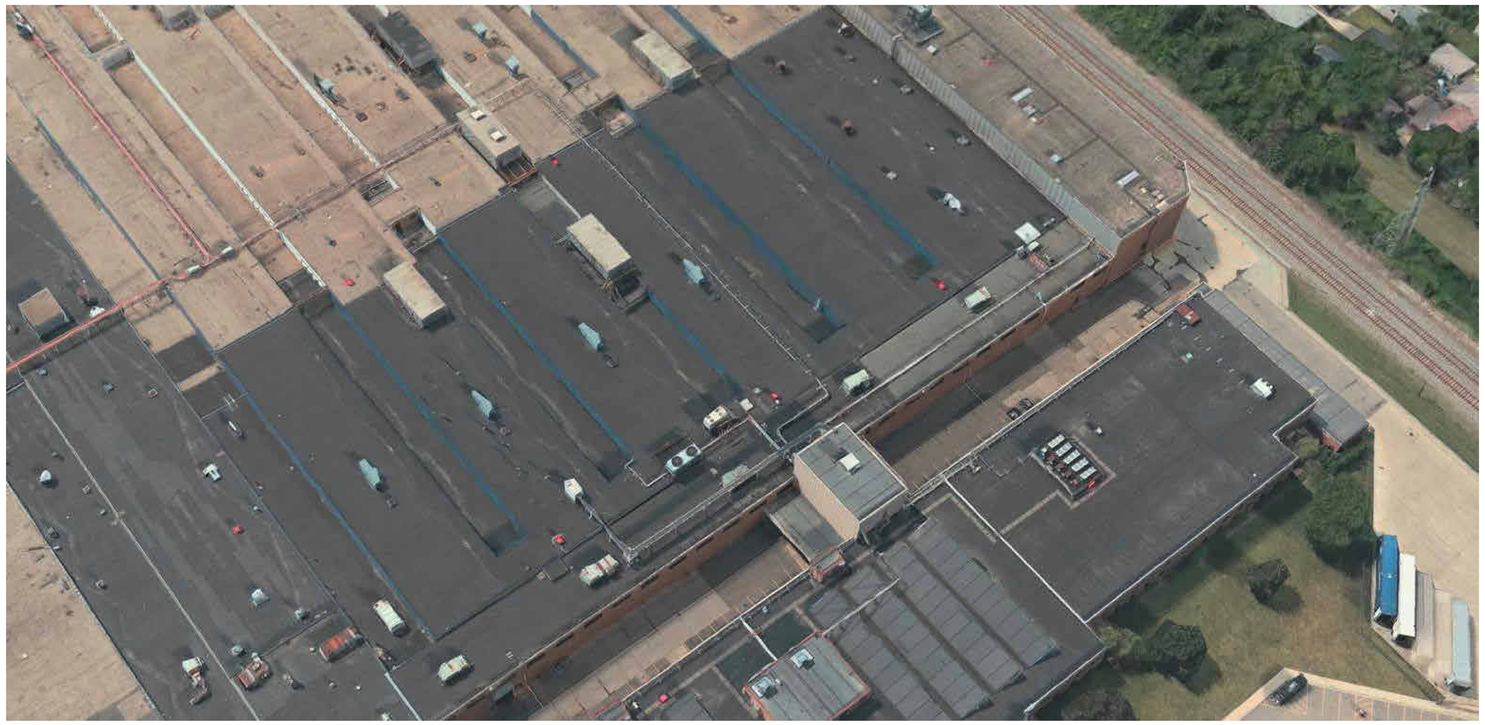
Detroit Diesel Corporation



Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Bids

04/24/2026

HED

CORE Design Group
Engineering / Consultants

2025-DD016-001

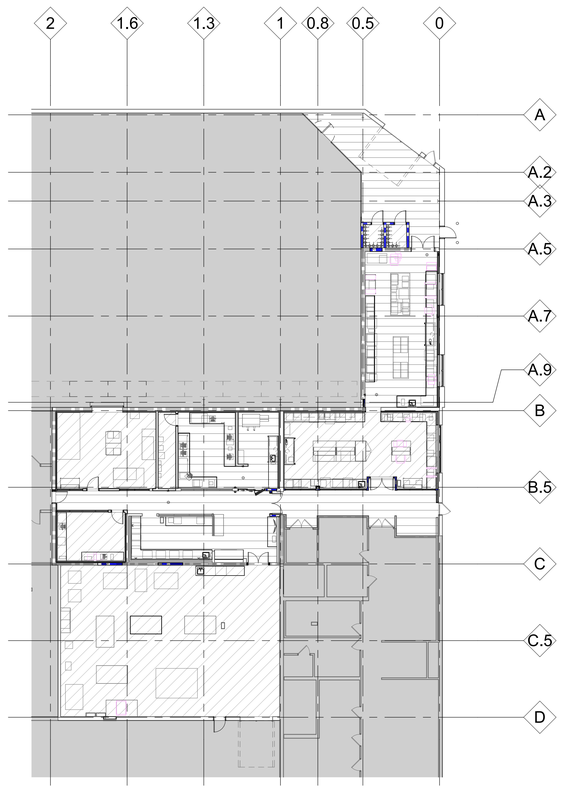
4/28/2026 10:11:17 AM

WORK AREA LEGEND

NO MODIFICATION TO BUILDING

LEVEL 1 ALTERATION (3,933 S.F.)

LEVEL 2 ALTERATION (3,085 S.F.)



1 LEVEL 1 DEMO PLAN - SECTOR A

1/16" = 1'-0"

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
2021 MICHIGAN MECHANICAL CODE INCORPORATING THE 2021 EDITION OF THE INTERNATIONAL MECHANICAL CODE WITH STATE AMENDMENTS, PART 9a RULES (IN EFFECT 3/12/2024)

ELECTRICAL CODE
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)

ACCESSIBILITY
2021 MICHIGAN BUILDING CODE INCLUDING MICHIGAN BARRIER FREE AND ICC/ANSI A117.1-2017

ENERGY CODE
2021 MICHIGAN ENERGY CODE, PART 10a INCORPORATING THE 2021 IECC AND ANSI/ASHRAE/IESNA 90.1-2019 (IN EFFECT 4/22/2025)

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

USE GROUP
B-BUSINESS/ F-1 FACTORY: NON SEPARATED MIXED USE
LOADING DOCK/SHIPPING & RECEIVING AREA, ACCESSORY STORAGE TO F-1

TYPE OF CONSTRUCTION
IIB - NONCOMBUSTIBLE / UNPROTECTED
FIRE PROTECTION SYSTEM PROVIDED FOR 100% OF BUILDING CONSTRUCTION

BUILDING AREA (SCOPE OF WORK)

CATEGORY	EXISTING	NEW	RENOVATED	TOTAL
OFFICE AREA	414,000 SF	0 SF	7,018 SF	414,000 SF
PLANT AREA	2,550,000 SF	0 SF	0 SF	2,550,000 SF
OUT BUILD'S	122,439 SF	0 SF	0 SF	122,439 SF.

PROJECT FLOOR AREA
ALTERATION LEVEL 2: 7,144 +/- G.S.F. OF 2,287,600 G.S.F. TOTAL (EXISTING)

PROJECT DESCRIPTION
THIS PROJECT INVOLVES THE RENOVATION OF APPROXIMATELY 7,144 S.F. OF METALLURGICAL AND CHEMISTRY LAB.

ALTERATION LEVEL
2021 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS.

ALTERATION LEVEL 1 (SECTION 503.1)

LEVEL 1 ALTERATIONS INCLUDE THE REMOVAL AND REPLACEMENT OR THE COVERING OF EXISTING MATERIALS, ELEMENTS, EQUIPMENTS, OR FIXTURES USING NEW MATERIALS. ELEMENTS, EQUIPMENT, OR FIXTURES THAT SERVE THE SAME PURPOSE.

ALTERATION LEVEL 2 (SECTION 504.1)

LEVEL 2 ALTERATIONS INCLUDE THE RECONFIGURATION OF SPACE, THE ADDITION OR ELIMINATION OF ANY DOOR OR WINDOW, THE RECONFIGURATION OR EXTENSION OF ANY SYSTEM OR THE INSTLLATION OF ANY ADDITIONAL EQUIPMENT.

OCCUPANT LOAD

THIS PROJECT DOES NOT ALTER THE EXISTING FACILITY OCCUPANT LOAD.

TRAVEL DISTANCE

250'-0" (MAXIMUM) WITH AUTOMATIC SPRINKLER SYSTEM (TABLE 1017.2)
100'-0" (MAXIMUM) COMMON PATH OF TRAVEL (TABLE 1006.2.1)

DEAD END CORRIDOR (SECTION 1020.4)

50'-0" (MAXIMUM)

FIRE EXTINGUISHERS (TABLE 906.3)

1 PER 11,250 SF
75'-0" (MAXIMUM) TRAVEL DISTANCE

ACCESSIBLE ROUTES (ICC A117.1-2009, CHAPTER 4)

403.5 CLEAR WIDTH:
THE CLEAR WIDTH OF AN ACCESSIBLE ROUTE SHALL BE 36 INCHES MINIMUM.

PLUMBING FIXTURE COUNT

PER 2015 MICHIGAN REHABILITATION CODE FOR EXISTING BUILDINGS SECTION 810, PLUMBING:

WHERE THE OCCUPANT LOAD OF THE STORY IS INCREASED BY MORE THAN 20 PERCENT, PLUMBING FIXTURES FOR THE STORY SHALL BE PROVIDED IN QUANTITIES SPECIFIED IN THE INTERNATIONAL PLUMBING CODE BASED ON THE INCREASED OCCUPANT LOAD.

NO ADDITIONAL FIXTURES REQUIRED.

AUTOMATIC FIRE SUPPRESSION

.ALL RENOVATED AREAS WITHIN THE PROJECT SCOPE ARE FULLY SPRINKLERED.

CONTROL AREAS

REFER TO MAQ AND CONTROL AREA PLAN FOR FIRST FLOOR.

GENERAL NOTES

1. 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.
2. 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.
3. 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.
4. 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.
5. WORK IS TO COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS IN FORCE AT THE TIME OF CONSTRUCTION.
6. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FEES FOR PERMITS PRIOR TO STARTING CONSTRUCTION. PERMITS ARE TO BE POSTED IN A CONSPICUOUS PLACE ON THE PROJECT SITE AS REQUIRED BY AUTHORITY HAVING JURISDICTION.
7. 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.
8. 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.
9. 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.
10. THE PROJECT MANUAL, WHICH INCLUDES THE GENERAL CONDITIONS, SUPPLEMENTAL CONDITIONS, AND TECHNICAL SPECIFICATIONS, AND THE DRAWINGS, ARE COMPLEMENTARY AND TOGETHER DESCRIBE THE PROJECT REQUIREMENTS. WHERE THERE ARE DISCREPANCIES BETWEEN THE PROJECT MANUAL AND THE DRAWINGS, THE CONTRACTOR SHALL ADVISE THE ARCHITECT OF SUCH AND REQUEST CLARIFICATION. IN GENERAL, THE PROJECT MANUAL TAKES PRECEDENCE OVER DRAWINGS. LARGE SCALE DETAILS TAKE PRECEDENCE OVER SMALL SCALE DETAILS.
11. 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.
12. ALL WORK NOTED "NIC" IS NOT IN CONTRACT. CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS ON SITE PER REQUIREMENT ESTABLISHED BY OWNER.
13. 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.
14. DRAWINGS ARE NOT TO BE SCALED. CONTRACTOR SHALL REFER TO THE DIMENSIONS INDICATED ON 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.
15. 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.
16. DIMENSIONS ON DOCUMENTS ARE TO FACE OF FINISH MATERIALS UNLESS OTHERWISE INDICATED.
17. 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 1/4".
18. 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.
19. FINISH FLOOR ELEVATIONS REFER TO TOP OF CONCRETE SLAB, UNLESS NOTED OTHERWISE. WHERE CONCRETE SLAB IS DEPRESSED TO ACCOMMODATE SETTING BEDS, RAISED ACCESS FLOOR, OR OTHER SIMILAR FLOOR ASSEMBLIES, FINISH FLOOR ELEVATIONS ARE TO TOP OF FINISH FLOOR ASSEMBLY INDICATED.
20. FIRE RATING "TAPES" INDICATED ON FLOOR PLANS SHOW EXTENT OF FIRE RATED PARTITIONS, BARRIERS AND FIRE WALLS. RATING IN A PARTITION SHALL BE CONTINUOUS AND SHALL CONTINUE OVER DOORS AND OVER AND BELOW WINDOWS WHETHER OR NOT THEY ARE SHOWN AS SUCH ON THE PLANS. REFER TO PARTITION DETAILS FOR REQUIREMENTS OF THE RATED ASSEMBLIES.
21. VERIFY 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.
22. 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.
23. PROVIDE PROTECTION FOR PEDESTRIANS OR OCCUPANTS OF ADJACENT AREAS OF THE BUILDING AS NECESSARY AND AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION.
24. MAINTAIN THE PREMISES CLEAN AND FREE OF TRASH AND DEBRIS. PROTECT PROJECT, THE SITE, AND PERSONAL PROPERTY FROM DAMAGE.
25. 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.
26. PROVIDE REQUIRED TEMPORARY UTILITIES, BRACING, SUPPORTS, SHORING, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN ADEQUACY AND SAFETY OF ERECTION.
27. CONTRACTOR SHALL MAINTAIN CURRENT UPDATED RECORD DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES.
28. 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.
29. METAL FABRICATIONS AND SUPPORT ASSEMBLIES WHETHER SHOWN OR NOT SHALL BE PROVIDED FOR THE STRUCTURAL SUPPORT OF MISCELLANEOUS ELEMENTS. GENERAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING ENGINEERED STRUCTURAL ASSEMBLIES AND CALCULATIONS SHOWING COMPLIANCE WITH CODE REQUIREMENTS AND ACCOUNTING FOR STATIC AND DYNAMIC LOADS INCLUDING ANY WIND OR SEISMIC LOADS, THERMAL MOVEMENT OF SUPPORTING STRUCTURE AND DIMENSIONAL TOLERANCES OF THE BUILDING.
30. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL STIFFENERS, BRACING, BACK-UP PLATES AND SUPPORTING BRACKETS REQUIRED FOR APPROPRIATE INSTALLATION OF ALL TOILET ROOM ACCESSORIES AND PARTITIONS, AND ALL WALL MOUNTED OR SUSPENDED MECHANICAL, ELECTRICAL OR MISCELLANEOUS EQUIPMENT.
31. PIPE SLEEVES IN MECHANICAL EQUIPMENT ROOMS EXTEND 2" ABOVE THE FLOOR LINE. FILL THE ANNULAR SPACES OF PIPE SLEEVES THROUGH THE FLOOR OR THROUGH RATED WALLS WITH FIRE SAFING AND SMOKE SEAL COMPOUND AS INDICATED ON THE SPECIFICATION, AND AS APPROVED BY THE AUTHORITY HAVING JURISDICTION.
32. SIZES OF MECHANICAL EQUIPMENT PADS AND BASES SHOWN ON PLAN ARE APPROXIMATE. CONTRACTOR SHALL VERIFY DIMENSIONS OF ALL PADS AND BASES WITH THE APPROPRIATE EQUIPMENT MANUFACTURERS. CONTRACTOR SHALL COORDINATE MOUNTINGS WITH APPROPRIATE EQUIPMENT MANUFACTURERS. PADS AND BASES SHALL BE INDICATED ON SUBMITTALS AND BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO LAY-OUT OF REINFORCING STEEL OR STEEL DECK.
33. PROVIDE ACCESS PANELS FOR MECHANICAL AND ELECTRICAL EQUIPMENT AS REQUIRED BY APPLICABLE CODES. ALL ACCESS PANELS IN GYP BOARD SHALL BE CONCEALED, MUD-IN TYPE. ELECTRICAL J-BOXES, PLUMBING CLEANOUTS, FIRE DAMPERS AND OTHER SIMILAR ITEMS REQUIRING ACCESS ARE NOT TO BE LOCATED ABOVE GYPSUM BOARD OR SIMILAR NON-ACCESSIBLE CEILING.

ABBREVIATIONS

ADJ	ADJACENT, ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
BLDG	BUILDING
CIP	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
DIM	DIMENSION
DN	DOWN
DWG	DRAWING
EA	EACH
EF	EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION (GRADE)
EWC	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
GA	GAUGE
GALV	GALVANIZED
GYP BD	GYPSUM 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
VIF	VERIFY IN FIELD
W/	WITH
W/O	WITHOUT

GENERAL		
SHEET NUMBER	SHEET NAME	ISSUED FOR
GENERAL		
G-000	Coversheet	Bids
G-011	Sheet Index	Bids

STRUCTURAL		
SHEET NUMBER	SHEET NAME	ISSUED FOR
STRUCTURAL		
S-101	Crane Framing Plan and Notes	Bids
S-102	Section and Details	Bids

ARCHITECTURAL		
SHEET NUMBER	SHEET NAME	ISSUED FOR
ARCHITECTURAL		
AC101	Level 1 Life Safety Plan	Bids
AD101	Level 1 Demo Plan - Overall	Bids
A-101	Partial First Floor Plan	Bids
A-121	Partial First Floor Ceiling Plan	Bids
A-141	First Finish Plan	Bids
A-191	Roof Plan - Overall	Bids
A-201	Exterior Elevations	Bids
A-571	Partition Types	Bids
A-601	Schedules	Bids

LABORATORY		
SHEET NUMBER	SHEET NAME	ISSUED FOR
LAB		
AQ-001	Lab Details	Bids
AQ-002	Lab Details	Bids
AQ-101A	First Floor Lab Area - A	Bids
AQ-101B	First Floor Lab Area - B	Bids
AQ-411	Lab Elevations	Bids
AQ-412	Lab Elevations	Bids
AQ-600	Lab Equipment Schedule - Overall W	Bids
AQ-601	Lab Equipment Schedule - Overall E	Bids
AQ-602	Lab Equipment Schedule	Bids

MECHANICAL		
SHEET NUMBER	SHEET NAME	ISSUED FOR
MECHANICAL		
M-001	Mechanical Notes, Legends & Abbreviations	Bids
MD101A	Level 1 Mechanical Demo Plan - Sector A	Bids
MD101B	Level 1 Mechanical Demo Plan - Sector B	Bids
MD191	Roof Mechanical Demo Plan - Overall	Bids
MH101	Level 1 HVAC Control and Pressurization Plan	Bids
MH101A	Level 1 HVAC Plan - Sector A	Bids
MH101B	Level 1 HVAC Plan - Sector B	Bids
MH191	Roof HVAC Plan	Bids
M-501	Mechanical Details	Bids
M-521	Mechanical Support Details	Bids
M-522	Mechanical Support Details	Bids
M-601	Mechanical Schedules	Bids
M-801	Control Diagrams	Bids
M-802	Control Diagrams	Bids

FIRE PROTECTION		
SHEET NUMBER	SHEET NAME	ISSUED FOR
FIRE PROTECTION		
F-001	Fire Protection General Notes	Bids
F-101	Level 1 Plan - Overall	Bids

PLUMBING		
SHEET NUMBER	SHEET NAME	ISSUED FOR
PLUMBING		
P-001	Plumbing Notes, Legends & Abbreviations	Bids
PD101A	Level 1 Demo Plan - Sector A	Bids
PD101B	Level 1 Demo Plan - Sector B	Bids
P-101A	Level 1 Plumbing Plan - Sector A	Bids
P-101B	Level 1 Plumbing Plan - Sector B	Bids
P-501	Plumbing Details	Bids
P-601	Plumbing Schedules	Bids

ELECTRICAL		
SHEET NUMBER	SHEET NAME	ISSUED FOR
ELECTRICAL		
E-001	Electrical General Notes & Abbreviations	Bids
E-002	Electrical Legends	Bids
E-003	Electrical Legends	Bids
ED101	Level 1 Demo Plan	Bids
EL101	Level 1 Lighting Plan	Bids
EP101	Level 1 Power Plan	Bids
EP102	Roof Demo & Power Plan	Bids
E-401	Enlarged Plans	Bids
E-501	Details, One Line Diagrams	Bids
E-502	Lighting Fixture Schedule and Control Matrix	Bids
E-601	Panel Schedules	Bids
E-801	Electrical Specifications	Bids
E-802	Electrical Specifications	Bids

REFERENCE - FIRE ALARM	
SHEET NUMBER	SHEET NAME
REFERENCE - FIRE ALARM	
MET-01	Drawing Index & Cover Sheet
MET-02	Partial System Riser M1 Lab Renovation Area
MET-03	SLC Wiring Details
MET-04	Duct Detector Details
MET-05	Strobe Power Supply (NAC) Detail
MET-06	Floor Plan Area -A
MET-07	Floor Plan Area -B

REFERENCE - GAS DETECTION	
SHEET NUMBER	SHEET NAME
REFERENCE - GAS DETECTION	
MET-GD	Gas Detection

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

2025-DD016-001

Sheet Index

G-011

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

GENERAL STRUCTURAL STEEL NOTES / Division 5

1. STRUCTURE STABILITY: The structure is designed to be stable and self-supporting ONLY after all components are completely installed. Erector is solely responsible for determining erection sequence and procedure to ensure stability during construction. This shall include all temporary shoring and bracing, to remain in place until all components are in place and complete.

2. STANDARDS: Fabrication, and erection of steel work shall conform to the latest edition AISC 'Specification for Structural Steel Buildings' (ANSI/AISC 360) – Allowable Stress Design; 'Code of Standard Practice (AISC 303); RCSC 'Specification for Structural Joints Using High Strength Bolts (AISC 348)'; and 'Structural Welding Code -Steel' (AWS D1.1).

3. MATERIALS: Miscellaneous steel and framing angles shall conform to ASTM A36: Wide flange steel shapes ASTM A992 (Fy=50 ksi): Hollow sections ASTM A500 Gr C (Fy=46 ksi for rounds, Fy=50 ksi for square and rectangular); High Strength Bolts ASTM F3125 Grade A325; Anchor Rods and Anchor Bolts ASTM F1554 Grade 36 or 55/51; Headed shear studs ASTM A1044, minimum 3/4"diameter, Nelson S3L for shear connectors, H4L for concrete anchors of Nelson Stud Welding, or approved equal.

4. STEEL DECKING (If required for Patching): Design, manufacture and erection of all steel deck shall be in accordance with the latest edition SDI 'Design Manual for Composite Decks, Form Decks and Roof Decks'. Material shall be minimum 20 gage (0.0358"), Fy=33 ksi, G30 galvanized material, unless noted otherwise. Roof decking shall be 1-1/2" wide rib (Type B) sized for (3) span condition. Fasten to steel supports per SDI guidelines with minimum (3) connections per section at each support, maximum 12" c/c (pattern 36/4) and (1) sidelap fastener per span. Sidelaps shall be nested. Provide weld washers for material less than 0.028" thick (24 gage). Fastener strength shall be equivalent to 5/8" diameter puddle welds at spacing noted. For galvanized deck use mechanical fasteners. Adjust spacing as required to maintain strengths noted.

5. CONNECTIONS: Shop connections shall be welded, field connections bolted. Work point shall be at intersection of member centerlines unless noted otherwise. Connections to existing steel shall be field drilled and bolted, u.n.o. Beam connections shall support minimum 15,000 Lb. capacity. Minimum (2) 3/4" diameter high strength bolts in bearing type connection with threads included in shear plane (type N). Extend bottom of connection below member centerline, with top of connection within 3" of the top of member, unless noted. All bolts shall have heavy hex nuts (ASTM A563) and hardened washers (ASTM F436) where required. Lock washers are NOT permitted. Provide minimum 3/8" thick material where single angle or plate connections are used.

6. BOLTS AND WELDS: Tighten bolts 'snug-tight', unless noted otherwise in bolt spec. Welding shall conform to AWS standards using certified operators, with E70xx electrode (u.n.o.). Minimum fillet weld size 3/16" for all strength welds unless otherwise indicated in reference specification. All welds shall be continuous unless noted otherwise. Exposed exterior construction shall have continuous seal welds at all joints in addition to strength welds. Obtain Owner approval and burn permit prior to field welding or cutting. Maintain continuous fire watch during all field welding and cutting operations.

7. CONCRETE ANCHORS: Minimum 3/4" diameter epoxy adhesive type or coarse thread screw anchor as indicated. Unless noted otherwise provide manufacturers standard embedment for each type; minimum 6 5/8" for epoxy type, or 4" for screw anchor type. Epoxy anchors 'HAS Standard rod with HVA Adhesive' or 'HIT HY-200; Coarse thread screw anchors Kwik HUS-EZ'. Products of Hilti Corporation, or approved equal. All anchors within 8" of an edge shall be epoxy type.

8. MASONRY ANCHORS: Hollow masonry wall face shell anchors minimum 3/4" diameter, 'HIT HY-70' of Hilti Corporation, or approved equal.

9. LEVELING BEDS: Grout miscellaneous items as required to level at proper elevation with cementitious non-shrink grout conforming to ASTM C-1107, grade C. Minimum 28-day compressive strength 7,000 psi; 'Five Star Grout' or 'Five Star Instant Grout' of Five Star Products., or approved equal.

10. OPENINGS: Frame free edges of all roof openings larger than 24" x 24" with C6x8.2 frame, u.n.o. Use L4x4x1/4 frame for smaller openings. Reinforce openings smaller than 12" per metal deck specifications. Coordinate with other trades for exact size and location prior to fabrication. As an alternate pre-fabricated deck support frames may be used as manufactured by 'QuickFrames' or approved equal.

11. MISCELLANEOUS FRAMING: Provide shelf angles at top of columns, spandrel beams and elsewhere as required to support free edges of metal deck. Refer to architectural and other trades drawings for additional clips and plates required for miscellaneous framing.

12. PREPARATION: Clean steel of all mill scale, loose rust, spatter, slag, and foreign matter per SSPC SP-2, SP-3 or SP-6 prior to painting. For exterior applications use SP-6 only. Lead paint removal and disposal at existing construction shall be performed per all federal and local regulations. Shop prime paint all structural steel except surfaces to be cast against concrete, with 2.0 mil minimum thickness of rust-inhibitive lead and chromate free primer paint, SSPC Paint 25, light grey or white, (PPG OAP-111). Coordinate with galvanizing applicator for additional requirements as required.

13. FABRICATION: Conform to tolerances of referenced specifications. All members shall be continuous for entire length between supports, u.n.o. NO members may be spliced without Engineer's written approval, and ONLY outside middle 1/3 of span. Fabricate members with the natural camber up. Cut member ends square. Compression members shall be milled for full contact at bearing ends. Double angles shall be long legs vertical (LLV), back to back. Holes shall be cut, punched or drilled perpendicular to surface, burning is NOT permitted.

14. DETAILING: Unless indicated otherwise use standard hole size and spacing for all connections. Holes shall be 13/16" diameter for 3/4" bolts, 11/16" diameter for 5/8" bolts. Space adjacent fasteners 3" center-center, on standard member gage lines. End distance 1 1/4".

15. FIELD WORK: Members shall NOT be altered in the field from that shown on design and fabrication drawings without Engineer's written approval. Mismatched holes shall be reamed to a larger diameter.

16. GALVANIZED FINISHES: Hot dip galvanize members all exterior and exposed members (including lintels in exterior walls) and where indicated (coordinate with architecture). ASTM A123 for fabricated steel products; ASTM A153 Class C hardware, ASTM B695 Class 50 for fasteners. Do NOT quench items noted to be painted after galvanizing. Touch up damaged galvanized surfaces with hand applied galvanizing repair paint, SSPC Paint 20.

17. FINISHING: Erector shall apply touch up paint after erection to areas where shop coating has been damaged, to all field bolts, welds, and other unpainted areas using same paint as shop coat. Finish members with minimum 2.0 mil thickness of full gloss alkyd-enamel paint, minimum (2) coats (FS-TT-E-489). Colors as selected by Owner from manufacturers' standard color charts. Unless otherwise directed, guarding shall be 'Safety Yellow', and other work shall match adjacent existing finishes.

18. QUESTIONS: Response will ONLY be made to written or email requests for information. Direct and route all questions to the Engineer and Owner's Agent;

ENGINEER: Mr. Frank Schwarzkopf FSchwarzkopf@COREdg.net 248.613.5091

CRANE SYSTEM SPECIFICATIONS / Division 14

1. SCOPE: Provide the following system including all splices, track, header steel, trolleys, connectors, cable, junction boxes, brackets, clamps, and end stops required for complete installation.

2. STANDARDS: Installation and testing shall comply with the latest requirements of CMAA Specification No. 74, ANSI/ASME HST Hoist Performance and B30 Safety Standards, ANSI/MMA MH 27.1 Underhung Crane and Monorail Standard Michigan OSHA and 29 CFR Part 1910 (General Industry) and Part 1926 (Construction).

3. SUBMITTALS: Catalog cuts of each component indicating clearances, weights, wheel loads and other pertinent data. Layout drawings of each system indicating locations of utility connections, track splices, and actual component travel for hook pickup.

4. FINISHING: Erector shall apply touch up paint after erection to areas where shop coating has been damaged, to all field bolts, welds, and other unpainted areas using same paint as shop coat. Finish members with minimum 2.0 mil thickness of full gloss alkyd-enamel paint, minimum (2) coats (FS-TT-E-489). Colors as selected by Owner from manufacturers' standard color charts to match adjacent existing finishes. On crane systems provide allowable rated load markings on all components clearly visible from operator position, each side of each runway and bridge girder,as required by referenced specifications. Typical finish colors;

Header Steel	White (PPG OAP-111)
Enclosed Rail Cranes	International Orange
Patented Track Runways	Manufacturer's standard Gray-Green

5. RATED CAPACITY: Designed for 1-Ton (2,200 Lb.) capacity.

PENDANT CONTROLS: (4) function electric pendant control (hoist up/down and system on/off switch) including an 'ON' indicator light and red colored emergency 'OFF' switch.

HOIST: Multiple speed, standard headroom, electric chain hoist with chain container (minimum Duty Class H3) and side open (Bullard) safety hook with self-closing gate. Minimum 16'-0" lift, top hook for mounting to clevis, 24/6 fpm lift speed, upper and lower limits, overload device, and pendant controls.
'Demag DC-Pro' series as manufactured by Terex or approved equal
Headroom = 26", Weight = 125 Lbs.

CARRIER: Plain manual trolley with bolts or clevis for hoist hook mount. Trolley wheels shall be compatible with track.

BRIDGE: Manual underhung single girder crane, with overhangs as indicated and double end stops plus safety cables each end, standard wheelbase bridge end trucks compatible with runways.
'CTA-8' Enclosed aluminum runway (8" @ 8.16 plf) with steel I-beam 'Strongback' cap
as manufactured by Unified Industries. Combined section weight 12.5 plf
Bridge overhang 22" each end.
End truck minimum wheelbase 12". Minimum overall end truck length 21". Weight 60 Lbs.

RUNWAY: Patented track with brackets for power supply as required, and double end stops with safety cables each end or where indicated. Supplier shall cut track to final length and punch holes for all end stops, splices, and electrification attachments. Holes for top flange and web connections shall be installed by final installation Contractor. Splice track ONLY at supports.
'Cleveland-Tramrail 'TARCA track series 5100 (12.5" @ 33 plf, Top Flange 8 1/2" x 1/2")

ELECTRICAL POWER: Provide flat cable and carriers as required along bridge and runway for component travel. Furnish terminal end connection at end of runway for connection to power supply furnished by Others. Coordinate with Owner for power requirements and location of disconnects.electrical

Arrange electrical power supply to allow for the following maximum hoist pickup areas:

North Crane – Maximize hoist pickup at North and West ends.
Power assumed to begin from NE runway end

South Crane – Maximize hoist pickup at South and East ends.
Power assumed to begin from SE runway end.
Crane hook must cover saw table shown on plan.

Both Cranes – Hoist hook coverage for both cranes shall overlap below common center runway to allow for parts drop and transfer between systems.

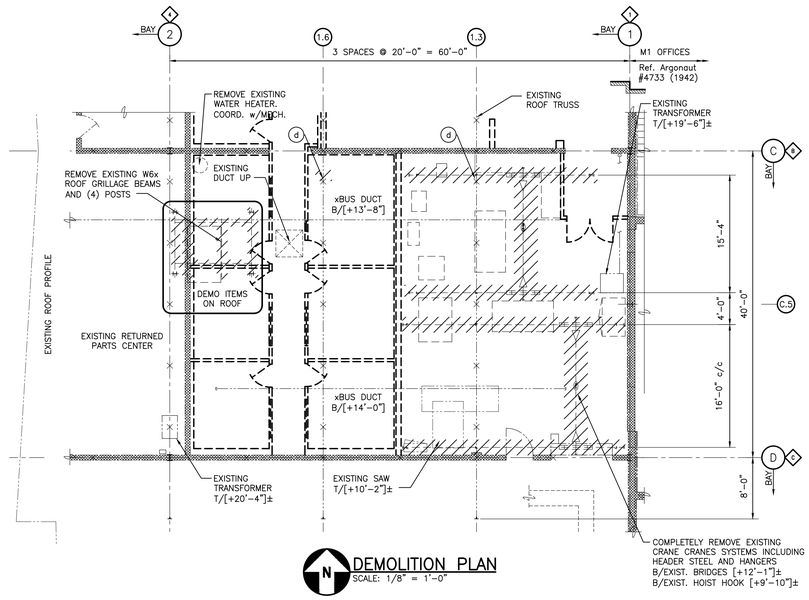
Disconnect – Provide disconnect per Owner's requirements at floor level assumed along South wall.

CRANE LOAD DATA

LIVE LOAD	Net System Rated Load	2,2000 Lbs. (1-Ton)	
DEAD LOADS	Hoist and Trolley	300 Lbs.	Estimated
	Total Bridge Self Weight	500 Lbs.	Estimated
VERTICAL IMPACT	Minimum 15% of applied load for powered components Design of supports is based on Loads indicated. Crane supplier shall adjust final design based on actual component loads unless noted otherwise.		

MATERIAL SCHEDULE

MARK	SHAPE	MATERIAL	TOP ELEV.	NOTES	Depth	Gage
B1	I	W8 x 28	+22'-10 3/4"	UPPER FILL. CLAMP TO B/xTRUSS	8"	3 1/2"
B2	I	W8 x 28	+22-2 3/4"	UPPER SPREADER. T/FLUSH w/BOT. B1		
B3	I	W8 x 28	+14'-8"	B/FLUSH w/TOP PT1. LOW HEADER (WEST)		
B4	I	W16 x 36	+14'-1 1/2"	DIRECTLY BOLTED TO xCOLUMNS. EAST LOW HEADER	15 7/8"	3 1/2"
PT1	T	Patented Track	+14'-0"	SEE Division 14 NOTES	12 1/2"	3 1/2"
H1 H2	+	(2)-L3x3x1/4		TYPICAL HANGER w/(2) ROWS HS BOLTS. DIRECT BOLT BOTTOM, CLAMP TOP FOR ADJUSTMENT	3"	1 3/4"
K1-K4	⌐	L3x3x1/4		TYPICAL DIAGONAL BRACING w/(1) HS BOLT EA. END		
RF1	[	C6 x 8.2		TYPICAL MISC. ROOF OPENING FRAME		
Note: HISTORIC SHAPE DESIGNATIONS USED FOR DETAILING AT EXISTING MEMBERS						
xP1	I	W10 x 15	+29'-5 3/4"± (HP)	TYPICAL ROOF PURLIN	–	–
xB12	I	W12 x 25	+27'-7"±	TYPICAL Line 1 SPANDREL BEAM	–	–
xB14	I	W14 x 30	–	B/+16'-0"± South B/+16'-6"± North	13 7/8"	3 1/2"
xT4 xT4α	ROOF TRUSS (RIVETED)		B/+18'-2 3/4"±	B/CHORD (2)-L4 x 3 1/2 x 3/8, LLV + PL 3/8 x 8 (Horiz), 24'-0" LONG (Centered) at Bottom		
xT6			B/+22'-10 3/4"±	B/CHORD (2)-L4 x 3 x 1/4, LLH		
xT8				B/CHORD (2)-L3 1/2 x 3 x 1/4, LLH		
xT9			B/+19'-5 3/4"±	B/CHORD (2)-L4 x 3 x 3/8, LLV + PL 3/8 x 8 (Horiz), 24'-0" LONG (Centered at Bottom)		



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

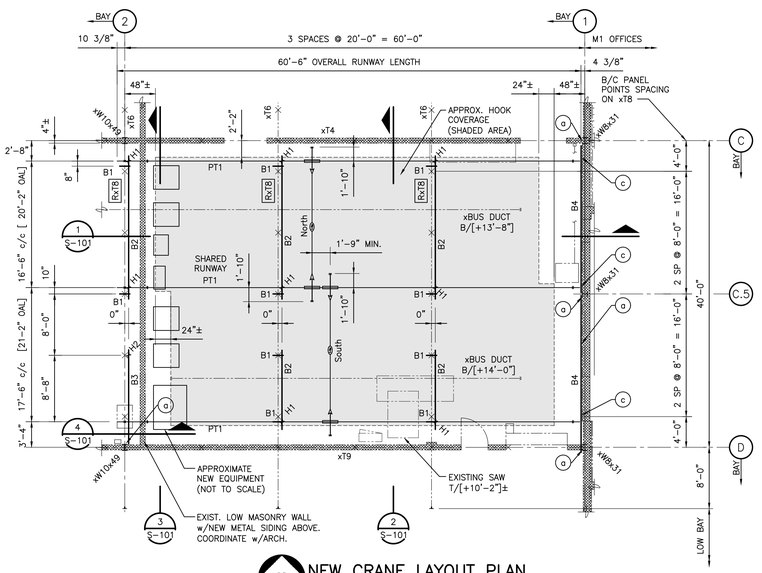
Note: EXISTING WALLS TO BE REMOVED ARE FOR REFERENCE ONLY. SEE ARCHITECTURAL FOR ACTUAL EXTENT.

LEGEND:

- COLUMN MARK ON ORIGINAL REFERENCE DRAWINGS, TYP.
- CURRENT COLUMN LINE DESIGNATION, TYPICAL
- 'x PREFIX = EXISTING CONSTRUCTION
- EXISTING CONSTRUCTION
- NEW CONSTRUCTION
- HIDDEN or DEMOLITION (AS NOTED)
- DEMOLITION
- TRUSS PANEL POINT
- BRIDGE GIRDER w/END TRUCK AND DOUBLE END STOPS
- HOIST ON BRIDGE GIRDER
- SECTION # ON SHEET
- TITLE
- SCALE: NONE
- SHEET WHERE CUT OR DRAWN

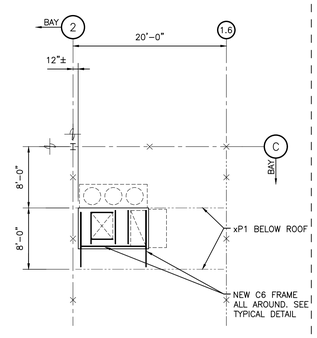
ABBREVIATIONS

AFF	ABOVE FINISH FLOOR
B/	BOTTOM OF....
c/c	CENTER TO CENTER
EL	ELEVATION
FS	FAR SIDE
FV	FIELD VERIFY
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
NIC	NOT IN CONTRACT
NS	NEAR SIDE
NTS	NOT TO SCALE
OAL	OVERALL LENGTH
T/	TOP OF.....
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
WP	WORK POINT



NEW CRANE LAYOUT PLAN
SCALE: 1/8" = 1'-0"

Notes:
1. ELEVATIONS NOTED [+ or -] FROM REFERENCE FINISH FLOOR ELEVATION 148'-6" = 0'-0" UNLESS NOTED OTHERWISE.
2. REFERENCE ORIGINAL Argonaut AEC JOB #1755 DATED 1937 FOR AREA WEST OF COLUMN LINE 1. SEE PLAN NOTE FOR M1 OFFICE AREAS EAST OF LINE 1.
3. EXISTING TRUSS B/CHORD ELEVATION [+22'-10 3/4"]± UNLESS NOTED OTHERWISE.
4. REFERENCE CORE Design Group JOB 17-120.DDC FOR EXISTING CRANES IN BAYS B2-C2.
5. NEW CRANE SYSTEMS DESIGNED FOR 1-Ton (2,200 Lb.) CAPACITY BASED ON Kellerin Equipment PROPOSAL 250403-3R DATED 16 April 2025.



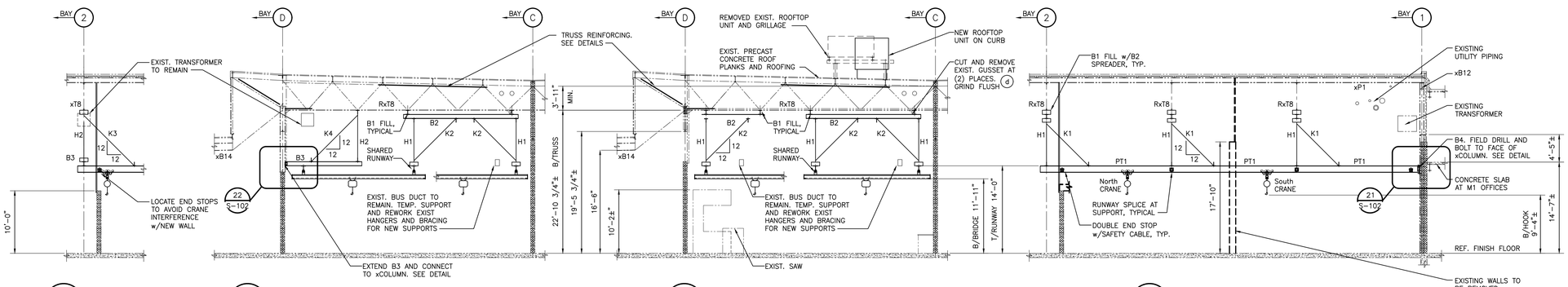
PARTIAL ROOF PLAN
SCALE: 1/8" = 1'-0"

New equipment design based on AAON 20 Ton AIR COOLED CONDENSING UNIT
MODEL RN-020-3-0-GAY-YO-21-000-A.
Footprint Area = 54" x 97"
Operating Weight = 2,885 Lbs.

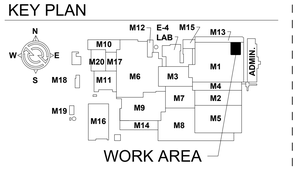
**COORDINATE FINAL SIZE AND LOCATION w/CERTIFIED EQUIPMENT DRAWINGS AND MECHANICAL.

PLAN KEY NOTE LEGEND

- (a) EXTEND HEADER AND CONNECT TO EXISTING COLUMN. SEE DETAIL
- (b) EXTEND HEADER AND CONNECT TO EXISTING COLUMN FLANGE. SEE DETAIL
- (c) EXTEND RUNWAY AND CONNECT TO WEB OF NEW HEADER. SEE DETAIL
- (d) CUT AND REMOVE EXISTING GUSSET PLATE AT B/TRUSS. SEE ELEVATION.



KEY PLAN



SECTION
S-101 SCALE: 1/8" = 1'-0"

ELEVATION LOOKING WEST AT LINE 2
S-101 SCALE: 1/8" = 1'-0"

ELEVATION LOOKING WEST
S-101 SCALE: 1/8" = 1'-0"

SECTION LOOKING NORTH
S-101 SCALE: 1/8" = 1'-0"

Note: DIAGONAL BRACES K1-K4 ARE TYPICAL AND SHALL BE PROVIDED AT EACH HANGER WHERE NOTED. MEMBERS ARE NOT SHOWN ON PLAN FOR CLARITY

GRAPHIC SCALES

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
04/24/2026	BIDS

CORE Design Group
Engineering / Consultants
30773 Milford Road / Suite 164
New Hudson, Michigan 48165-8566
Tel: 248.491.3234 / www.COREdg.net
Job #25-017.DDC / Structural Engineering

HED
125 West 6th Street
Royal Oak, Michigan
48067 USA
(248) 262-1500
WWW.HED.CO

©2025

2025-DD016-001

CRANE FRAMING PLAN AND NOTES

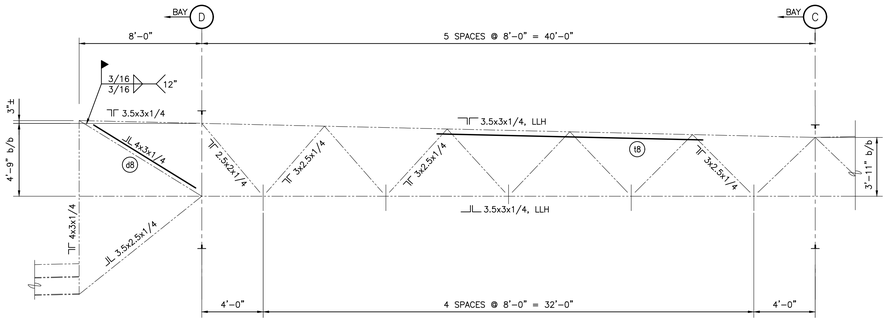
S-101

4/27/2026 10:39:19 AM

GENERAL NOTES FOR REINFORCING EXISTING TRUSSES

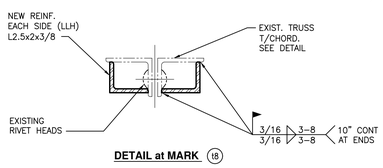
(WORK WITH GENERAL STEEL NOTES)

1. MEMBERS: All new reinforcing (plates and shapes) shall be (1) piece. For compression members mill ends at splices to provide full bearing area.
2. EXISTING LOADS: Before reinforcing existing members, remove all live load from the areas of influence.
3. PREPARATION: Before welding reinforcing to the existing members, thoroughly clean all surfaces to remove paint, dirt, and other foreign matter in the area of welding. Assume existing original paint is lead based. Include allowance for testing and abatement prior to commencing work.
4. EXECUTION: Weld reinforcing material to existing steel members before welding at joints. Material shall be continuous through joints. Where plate has to be stopped or slotted at existing gusset plates or web members, provide full penetration weld between new material and existing. In no case shall total area of steel be reduced at the joints.
5. TRUSS MEMBER ENDS: Add gusset plate to match existing where existing gusset plate is not long enough to provide required weld length on the new reinforcing or to develop the shear in the chord stem. Weld new material to existing, full length of contact, with full penetration groove or butt weld, minimum 6" long.
6. RIVET INTERFERENCE: Where existing rivet heads interfere with new reinforcement, new reinforcing shall be burned out as required to accommodate the rivet head. Weld burned area to existing steel.
7. SUBMITTALS: Fabricator shall submit shop drawings for each truss showing welding joint details for approval. Provide detail of existing end connections including work lines, bolt size, spacing and gage, and angle thickness to determine if reinforcement is required unless detailed otherwise

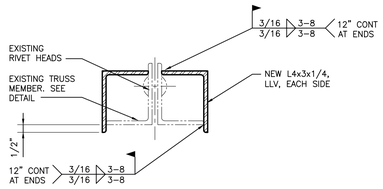


RxT8 REINFORCED TRUSS RxT8 – (3) LOCATIONS
SCALE: 1/4" = 1'-0"

NOTE: ALL MEMBERS ARE LLV, UNLESS NOTED OTHERWISE.
ALL WEB MEMBERS ll 2 1/2 x 2 x 3/16, LLV, U.N.O.

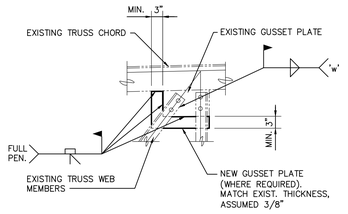


DETAIL at MARK (18)



DETAIL at MARK (d8)

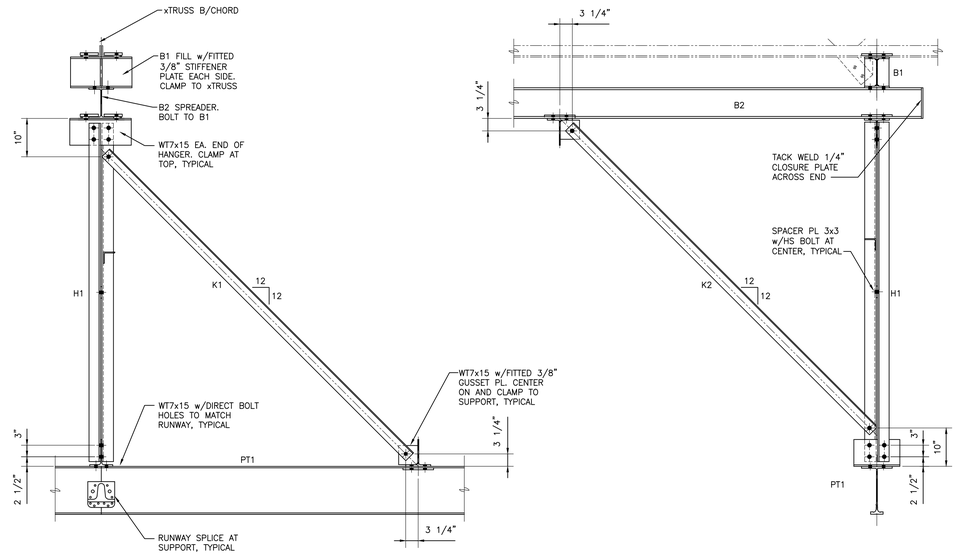
TRUSS MEMBER REINFORCING DETAILS
SCALE: 3" = 1'-0"



'w' = INDICATES CUMULATIVE WELD LENGTH (SUM OF HEAL and TOE WELDS AT ANGLE SHAPES) REQUIRED AT EACH END, OF EACH ANGLE FORMING THE EXISTING DIAGONAL OR VERTICAL TRUSS MEMBER. THE INDICATED WELD IS INTENDED TO REPLACE THE STRENGTH OF THE RIVETS.

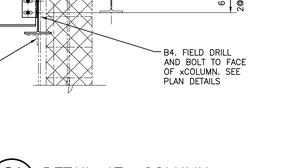
INSTALLER SHALL FIELD VERIFY EXISTING GUSSET PLATE DIMENSIONS PRIOR TO ERECTION

TYPICAL TRUSS MEMBER END REINFORCING DETAIL
SCALE: NONE



TYPICAL CLAMP HANGER AND BRACING CONNECTION DETAILS
SCALE: 3/4" = 1'-0"

Note: CONDITION AT H1 SHOWN, H2 SIMILAR
CUT pc W8 MAY BE SUBSTITUTED FOR WT7



CLAMP PLAN VIEW

CLAMP SECTION

FRAMING PERPENDICULAR TO SUPPORT CLAMP

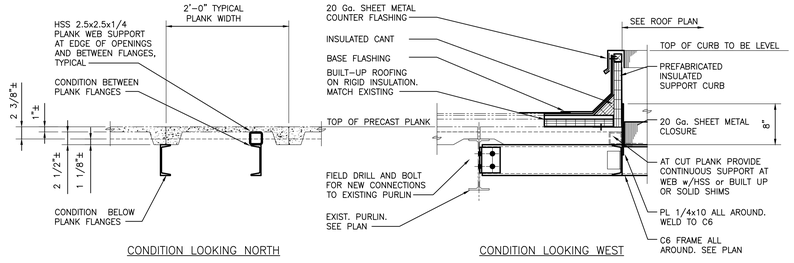
Note: CONDITION SIMILAR AT PATENTED TRACK RUNWAYS MAX. 1/16" CLEAR AND PROVIDE MANUF. SPLICE PLATES

TYPICAL CLAMP AND CONNECTION DETAILS
SCALE: 1 1/2" = 1'-0"

CLAMP SCHEDULE Note: ALL DIMENSIONS IN INCHES

MARK	SHAPE		FW	A	B	C	M	ROD ø	k1 or k
xT8	(2)–L3 1/2 x 3 x 1/4, LLH		7 1/2	4 3/8	3 1/4	1 3/4	1/4	3/8	11/16
–	W8 x 24	Gage = 3 1/2	6 1/2	3 7/8	3 1/4		3/8	1/2	9/16
–	W8 x 28	Gage = 3 1/2					7/16	1/2	9/16
–	xW10 x 15	Gage = 2 1/4	4	2 5/8	2 1/8		1/4	3/8	7/16

Clamp Schedule Notes:
1. ALL CLAMP PLATES 5/8" THICK, 8" WIDE UNLESS NOTED OTHERWISE
2. ALL DOUBLE 'L' MEMBERS 3/8" b/b
3. CLAMPS FOR LATERAL BRACING CONNECTIONS AND TOP BEARING CONNECTIONS MAY BE REDUCED TO MINIMUM 3/8" THICKNESS
4. SEE MATERIAL SCHEDULE FOR ADDITIONAL MEMBER SIZE INFORMATION.
5. HISTORIC SHAPE DESIGNATIONS INDICATED FOR DETAILING AT EXISTING MEMBERS.

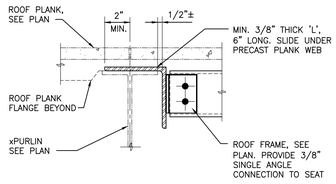


CONDITION LOOKING NORTH

CONDITION LOOKING WEST

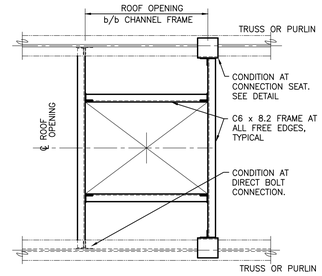
TYPICAL ROOF FRAME AND CURB DETAILS
SCALE: 1" = 1'-0"

Notes:
1. WITHIN LIMITS OF ROOF CURB BELOW NEW UNIT REMOVE ALL ROOFING AND INSULATION DOWN TO TOP OF EXISTING PRECAST CONCRETE PLANKS.
2. CUT OR DAMAGED EXISTING PRECAST CONCRETE ROOF PLANKS MAY BE REPLACED w/METAL ROOF DECK. PROVIDE ADDITIONAL INSULATION AS REQUIRED TO LEVEL TOP w/ADJACENT ROOF AREAS. SEE NOTES.
3. SEE GENERAL ROOF REPAIR NOTES ON SHEET S–2.



TYPICAL ROOF FRAME SEAT CONNECTION DETAIL
SCALE: 1 1/2" = 1'-0"

Note: TYPICAL EXISTING PRECAST CONCRETE ROOF PLANK 24" WIDE, APPROXIMATELY 3–3/4" THICK AT FLANGES, 1" THICK AT WEB.



TYPICAL FRAMED ROOF OPENING
SCALE: 1" = 1'-0"

Notes:
1. COORDINATE AND VERIFY FINAL SIZE AND LOCATION OF ALL OPENINGS WITH THE TRADE REQUIRING THE OPENING.
2. SEE GENERAL NOTES FOR ALTERNATE PRE–MANUFACTURED ROOF FRAME.

xCOLUMN CONNECTION PLAN DETAILS
SCALE: 3/4" = 1'-0"

22 S–101 DETAIL AT xCOLUMN D2
SCALE: 3/4" = 1'-0"

21 S–101 DETAIL AT xCOLUMN
SCALE: 3/4" = 1'-0"

KEY PLAN

WORK AREA

GRAPHIC SCALES

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
04/24/2026	BIDS

CORE Design Group
Engineering / Consultants
30773 Milford Road / Suite 144
New Hudson, Michigan 48165-8556
Tel: 248.491.3234 // www.COREdg.net
Job #25-017.DDC / Structural Engineering

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

©2025

2025-DD016-001

SECTIONS AND DETAILS

S-102

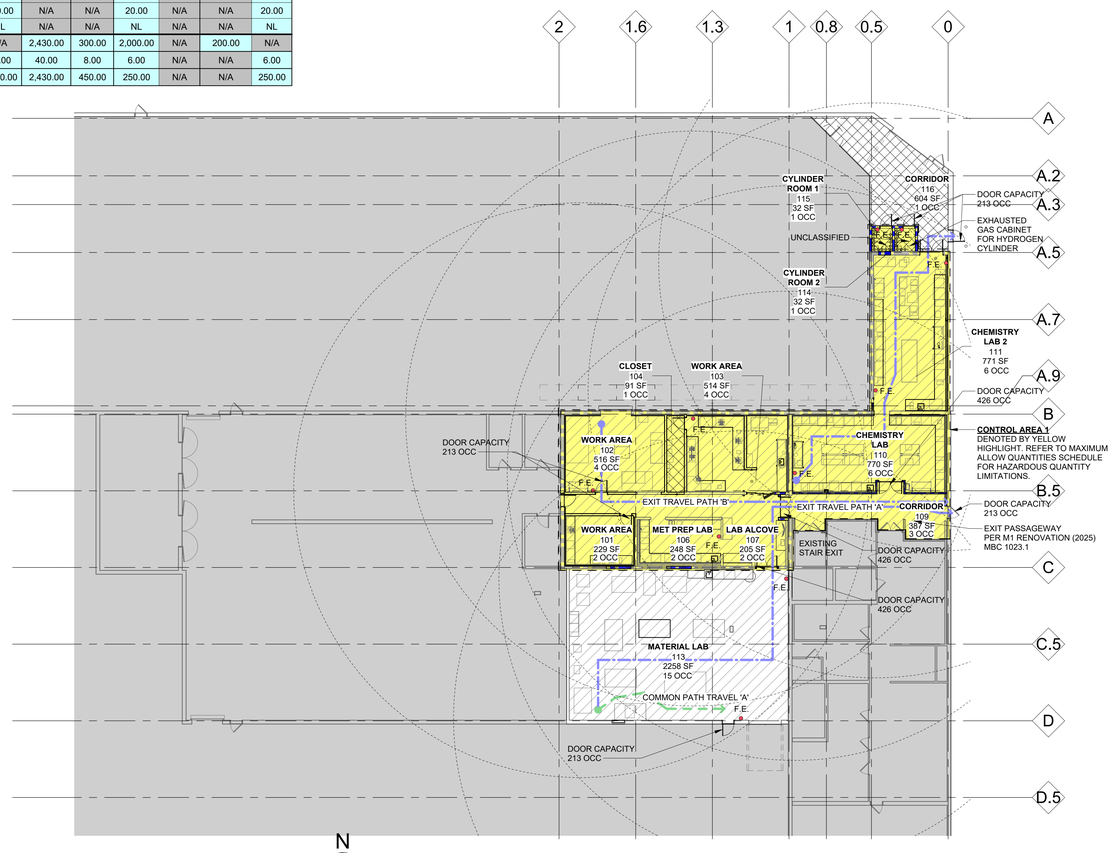
4/27/2026 10:39:49 AM

4/24/2026 3:56:55 PM

MAXIMUM ALLOWABLE HAZARDOUS MATERIALS PER CONTROL AREA (FIRST FLOOR)

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ONLY						USE-CLOSED CONTAINER SYSTEMS						USE-OPEN CONTAINER SYSTEMS			
			SOLID		LIQUID		GAS		SOLID		LIQUID		GAS		SOLID		LIQUID	
			lbs.	c.f.	gal.	lbs.	gaseous cubic ft	Liq cubic ft	lbs.	c.f.	gal.	lbs.	gaseous cubic ft	Liq cubic ft	lbs.	c.f.	gal.	lbs.
COMBUSTIBLE DUST	N/A	H-2	SEE 414.1.3		N/A		N/A	N/A	SEE 414.1.3		N/A		N/A	N/A	SEE 414.1.3		N/A	
COMBUSTIBLE LIQUID	II	H-2 or H-3	N/A		360.00	N/A	N/A	N/A	N/A		240.00	N/A	N/A	N/A	N/A		60.00	N/A
	IIIA	H-2 or H-3			990.00	N/A					660.00	N/A					110.00	N/A
	IIIB	N/A			NL	N/A					NL	N/A					NL	N/A
COMBUSTIBLE FIBER	LOOSE	H-3	N/A	100.00	N/A		N/A	N/A	N/A	100.00	N/A		N/A	N/A	N/A	20.00	N/A	
	BALED	H-3	N/A	1,000.00					N/A	1,000.00					N/A	200.00		
CONSUMER FIREWORKS	1.4g	H-3	250.00	N/A	N/A		N/A	N/A	N/A		N/A		N/A	N/A	N/A		N/A	
CRYOGENICS, FLAMMABLE	N/A	H-2	N/A		90.00	N/A	N/A	N/A	N/A		90.00	N/A	N/A	N/A	N/A		20.00	N/A
CRYOGENICS, INERT	N/A	N/A	N/A		N/A		NL	N/A	N/A		N/A		NL	N/A	N/A		N/A	
CRYOGENICS, OXIDIZING	N/A	H-3	N/A	N/A	90.00	N/A	N/A	N/A	N/A		90.00	N/A	N/A	N/A	N/A		20.00	N/A
EXPLOSIVES	Division 1.1	H-1	2.00	N/A	N/A	2.00	N/A	N/A	0.250	N/A	N/A	0.250	N/A	N/A	0.250	N/A	N/A	0.250
	Division 1.2	H-1	2.00	N/A	N/A	2.00	N/A	N/A	0.250	N/A	N/A	0.250	N/A	N/A	0.250	N/A	N/A	0.250
	Division 1.3	H-1 or H-2	10.00	N/A	N/A	10.00	N/A	N/A	1.000	N/A	N/A	1.000	N/A	N/A	1.000	N/A	N/A	1.000
	Division 1.4	H-3	100.00	N/A	N/A	100.00	N/A	N/A	50.00	N/A	N/A	50.00	N/A	N/A	N/A	N/A	N/A	N/A
	Division 1.4G	H-3	250.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Division 1.5	H-1	2.00	N/A	N/A	2.00	N/A	N/A	0.25	N/A	N/A	0.25	N/A	N/A	0.25	N/A	N/A	0.25
	Division 1.6	H-1	2.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FLAMMABLE GAS	GASEOUS	H-2	N/A		N/A	N/A	3,000.00	N/A	N/A		N/A	N/A	3,000.00	N/A	N/A		N/A	
	LIQUIFIED	H-2			N/A	450.00	N/A	N/A			N/A	450.00	N/A	N/A				
FLAMMABLE LIQUID	1A	H-2 or H-3	N/A		N/A	90.00	N/A	N/A	N/A		N/A	60.00	N/A	N/A	N/A		N/A	20.00
	1B	H-2 or H-3			N/A	360.00					N/A	240.00					N/A	60.00
	1C	H-2 or H-3			N/A	360.00					N/A	240.00					N/A	60.00
FLAMMABLE LIQUID COMBINATION (1A, 1B, 1C)	N/A	H-2 or H-3	N/A		N/A	360.00	N/A	N/A	N/A		N/A	240.00	N/A	N/A	N/A		N/A	60.00
FLAMMABLE SOLID	N/A	H-3	375.00	N/A	N/A		N/A	N/A	250.00	N/A	N/A		N/A	N/A	50.00	N/A	N/A	N/A
INERT GAS	GASEOUS	N/A	N/A		N/A		NL	N/A	N/A		N/A		NL	N/A	N/A		N/A	
	LIQUIFIED	N/A			N/A		NL	N/A			N/A		NL	N/A				
ORGANIC PEROXIDE	UD	H-1	2.00	N/A	N/A	2.00	N/A	N/A	0.25	N/A	N/A	0.25	N/A	N/A	0.25	N/A	N/A	0.25
	I	H-2	15.00	N/A	N/A	15.00			2.00	N/A	N/A	2.00			2.00	N/A	N/A	2.00
	II	H-3	150.00	N/A	N/A	150.00			100.00	N/A	N/A	100.00			20.00	N/A	N/A	20.00
	III	H-3	375.00	N/A	N/A	375.00			250.00	N/A	N/A	250.00			50.00	N/A	N/A	50.00
	IV	N/A	NL	N/A	N/A	NL			NL	N/A	N/A	NL			NL	N/A	N/A	NL
	V	N/A	NL	N/A	N/A	NL			NL	N/A	N/A	NL			NL	N/A	N/A	NL
OXIDIZER	4	H-1	1.00	N/A	N/A	2.00	N/A	N/A	0.25	N/A	N/A	0.25	N/A	N/A	0.25	N/A	N/A	0.25
	3	H-2 or H-3	30.00	N/A	N/A	30.00			4.00	N/A	N/A	4.00			4.00	N/A	N/A	4.00
	2	H-3	750.00	N/A	N/A	750.00			500.00	N/A	N/A	500.00			100.00	N/A	N/A	100.00
	1	N/A	NL	N/A	N/A	NL			NL	N/A	N/A	NL			NL	N/A	N/A	NL
OXIDIZING GAS	GASEOUS	H-3	N/A	N/A	N/A	N/A	4,500.00	N/A	N/A	N/A	N/A	N/A	4,500.00	N/A	N/A	N/A	N/A	N/A
	LIQUIFIED	H-3				450.00	N/A	N/A				450.00	N/A	N/A				
PYROPHORIC MATERIAL	N/A	H-2	8.00	N/A	N/A	8.00	100.00	N/A	1.00	N/A	N/A	1.00	20.00	N/A	0.00		0.00	
UNSTABLE (REACTIVE)	4	H-1	2.00	N/A	N/A	2.00	20.00	N/A	0.25	N/A	N/A	0.25	4.00	N/A	0.25	N/A	N/A	0.25
	3	H-1 or H-2	15.00	N/A	N/A	15.00	150.00	N/A	2.00	N/A	N/A	2.00	30.00	N/A	2.00	N/A	N/A	2.00
	2	H-3	150.00	N/A	N/A	150.00	750.00	N/A	100.00	N/A	N/A	100.00	750.00	N/A	20.00	N/A	N/A	20.00
	1	N/A	NL	N/A	N/A	NL	NL	N/A	NL	N/A	N/A	NL	NL	N/A	NL	N/A	N/A	NL
WATER REACTIVE	3	H-2	15.00	N/A	N/A	15.00	N/A	N/A	10.00	N/A	N/A	10.00	N/A	N/A	2.00	N/A	N/A	2.00
	2	H-3	150.00	N/A	N/A	150.00	N/A	N/A	100.00	N/A	N/A	100.00	N/A	N/A	20.00	N/A	N/A	20.00
	1	N/A	NL	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A	NL	N/A	N/A	NL
CORROSIVE	-	-	15,000.00	N/A	1,500.00	N/A	2,430.00	300.00	10,000.00	N/A	1,000.00	N/A	2,430.00	300.00	2,000.00	N/A	200.00	N/A
HIGHLY TOXIC	-	-	30.00	N/A	N/A	30.00	20.00	40.00	20.00	N/A	N/A	20.00	40.00	8.00	6.00	N/A	N/A	6.00
TOXIC	-	-	1,500.00	N/A	N/A	1,500.00	2,430.00	450.00	1,000.00	N/A	N/A	1,000.00	2,430.00	450.00	250.00	N/A	N/A	250.00

(N.A.) = NOT ALLOWED
N/A = NOT APPLICABLE
NL = NO LIMIT



N

LEVEL 1 LIFE SAFETY PLAN

1/16" = 1'-0"

FIRE RATING LEGEND

1 HR FIRE BARRIER (45 MIN / 60 MIN*)

WALL RATINGS SHOWN FOLLOWED BY OPENING PROTECTION REQUIREMENTS IN PARENTHESES

*60-MINUTE OPENING PROTECTIVES REQUIRED FOR DOORS SERVING 1-HOUR EXIT ENCLOSURES AND 1-HOUR SHAFTS

**45 MINUTE OPENING PROTECTIVES REQUIRED FOR DOORS ENCLOSING FIRE SERVICE ACCESS ELEVATOR LOBBIES

LIFE SAFETY PLAN LEGEND

N
TRUE NORTH
PROJECT NORTH

Name
101
150 SF
10 OCC
ROOM NAME
ROOM NUMBER
SQ FT
OCCUPANCY LOAD

EXIT SIGN

FE
FIRE EXTINGUISHER

FEC
FIRE EXTINGUISHER CABINET

COMMON EGRESS PATH

EXIT EGRESS PATH

FUNCTION OF SPACE LEGEND

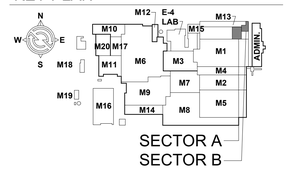
BUSINESS
(150 GSF/OCCUPANT)

STORAGE
(300 GSF/OCCUPANT)

LENGTH OF EXIT TRAVEL - MAX 250' - LEVEL 1	
EGRESS PATH	LENGTH
Exit Travel Path 'A'	145'-1"
Exit Travel Path 'B'	110'-3"

LENGTH OF COMMON PATH OF EGRESS TRAVEL - MAX 100' - LEVEL 1	
EGRESS PATH	LENGTH
Common Path of Travel 'A'	35'-1"

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
03/19/2026	Bid Set
04/24/2026	Bids

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

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

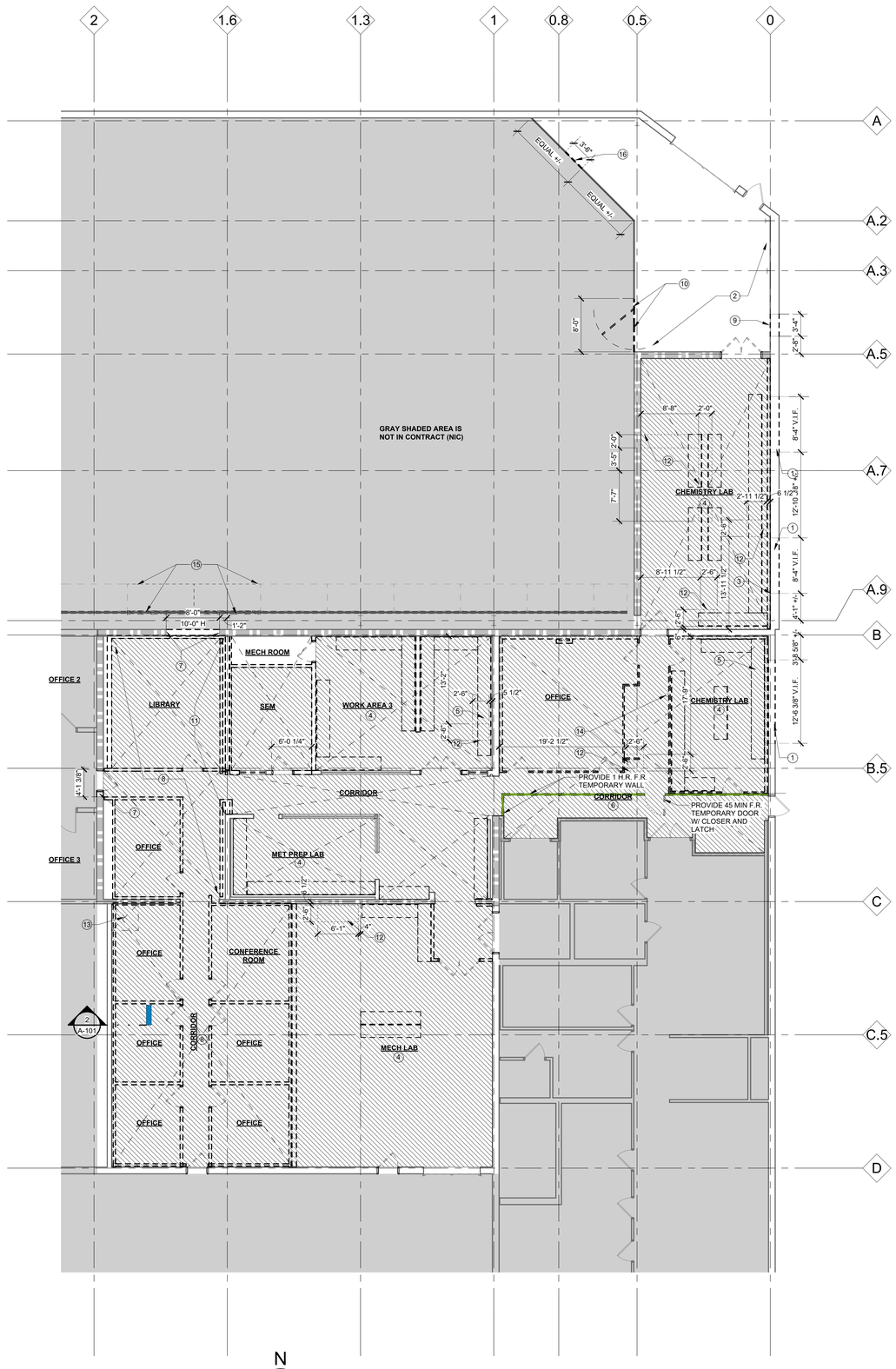
2025-DD016-001

Level 1 Life Safety Plan

AC101

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:56:57 PM



N

PARTIAL FIRST FLOOR DEMO PLAN

1/8" = 1'-0"

DEMOLITION PLAN KEY NOTES

1. SAWCUT AND REMOVE BRICK AND CMU BACK-UP STARTING AT 4'-11 3/8" A.F.F. THROUGH 11'-9 3/4" A.F.F. SHORE BRICK AND BACK-UP AS REQUIRED. PROVIDE LINTELS PRIOR TO REMOVAL OF CMU AND BRICK. EXISTING LINTELS AT FORMER OPENINGS REQUIRE INSPECTION TO DETERMINE IF RUST JACKING IS PRESENT. PROVIDE AN ALLOWANCE TO REMOVE AND REPLACE EXISTING LINTEL.
2. REMOVE MECHANICAL EQUIPMENT, FANS, CONDENSORS, PIPING AND ELECTRICAL BACK TO SOURCE.
3. REMOVE GAS LINE BACK TO SOURCE.
4. REMOVE CASEWORK, COUNTERTOPS, WIREMOLD (AND POWER BACK TO SOURCE), PAPER TOWEL DISPENSERS, DRYING RACKS, SOAP DISPENSER, AND FIRE EXTINGUISHER(S).
5. REMOVE FUMEHOOD AND ASSOCIATED SERVICES BACK TO SOURCE.
6. MAINTAIN CORRIDOR EGRESS DURING CONSTRUCTION.
7. SAWCUT AND REMOVE EXISTING MASONRY WALL TO ACCOMODATE NEW DOOR.
8. REMOVE WOOD PLATFORM AND SUPPORT FRAMING LOCATED ABOVE SUSPENDED CEILING SYSTEM. RETAIN WOOD PLATFORM AND FRAMING OVER ADJACENT OFFICE AREA (WEST).
9. SAWCUT AND REMOVE BRICK AND CMU BACK-UP TO ACCOMODATE NEW DOOR AND DOOR FRAME. RETAIN BRICK FOR JAMB TOOTH-IN. PROVIDE LINTELS PRIOR TO REMOVAL OF CMU AND BRICK.
10. REMOVE GATE AND WIRE MESH PARTITION TO THE NEAREST PANEL. RETAIN FOR REUSE.
11. REMOVE FULL HEIGHT MASONRY WALL CONCEALED BEHIND CONSTRUCTION.
12. SAWCUT AND REMOVE SLAB ON GRADE. COORDINATE DEPTH AND WIDTH OF WITH APPROPRIATE TRADES.
13. REMOVE AND RETAIN WATER HEATER AND DRAIN PAN FOR REINSTALLATION.
14. REMOVE VERTICAL PIPING AND INFILL ABANDONED UNDERGROUND PIPING WITH FLOWABLE GROUT.
15. DISASSEMBLE RACK SYSTEM TO ACCOMODATE INSTALLATION OF OVER HEAD COILING DOOR. REINSTALL RACK SYSTEM AFTER INSTALLATION OF OVER HEAD COILING DOOR. REWORK IN RACK FIRE SUPPRESSION SYSTEM TO ACCOMODATE INSTALLATION AND MAINTAIN SUPPRESSION SYSTEM WITH ADJACENT STORAGE RACK SYSTEM.
16. REMOVE FENCING FROM CENTER POST TO ACCOMODATE NEW OPENING FOR GATE.
17. SAWCUT CHANNEL TO ACCOMODATE PIPING OUT OF NEW PIT TO WADJACENT WALL.

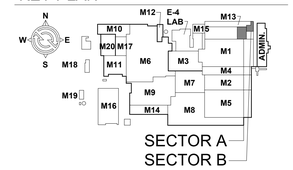
DEMOLITION PLAN NOTES

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, ASBESTOS PRODUCTS, POLYCHLORINATED BIPHENYL (PCB), LEAD PAINT OR OTHER TOXIC SUBSTANCES. THE FACT THAT THESE DOCUMENTS DO 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 AND ARE NOT REQUIRED TO BE REMOVED OR CONTAINED 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 WITHOUT THE EXPRESS CONSENT 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 DISRUPTING 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 AND WALL LOCATIONS AND FLOOR ELEVATIONS IN FIELD AND NOTIFY THE ARCHITECT OF DISCREPANCIES PRIOR TO START OF WORK.
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 REQUIRED 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 FLOORS WITH SUITABLE COVERING WHEN NECESSARY.
9. COVER AND PROTECT FURNITURE, EQUIPMENT, AND FIXTURES FROM SOILING OR DAMAGE WHEN DEMOLITION WORK IS PERFORMED IN AREAS WHERE SUCH ITEMS HAVE NOT 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, UNDOCUMENTED 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, INVESTIGATE, MEASURE AND DOCUMENT NATURE AND EXTENT OF CONFLICT AND NOTIFY ARCHITECT BEFORE PROCEEDING.
12. MAINTAIN EXISTING UTILITIES INDICATED TO REMAIN IN SERVICE AND PROTECT THEM AGAINST DAMAGE DURING DEMOLITION OPERATIONS. DO NOT INTERRUPT UTILITIES SERVING FUNCTIONING FACILITIES, EXCEPT WHEN AUTHORIZED IN WRITING BY AUTHORITIES HAVING JURISDICTION. PROVIDE TEMPORARY SERVICES ACCEPTABLE TO GOVERNING AUTHORITIES DURING INTERRUPTIONS TO EXISTING UTILITIES.
13. WHERE DEMOLITION IS REQUIRED BEYOND THE LIMITS OF THE CONTRACT TO ROUTE NEW DUCTWORK, PIPING, CONDUITS ETC., RATED WALLS AND SMOKE BARRIERS SHALL BE PATCHED BY CONTRACTOR MAKING PENETRATIONS. ALL 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 OPERATIONS. REPAIR ADJACENT CONSTRUCTION OR SURFACES SOILED 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. ERECT AND MAINTAIN 1 HOUR FIRE RESISTANCE RATED TEMPORARY PARTITIONS WHERE REQUIRED OR AS DIRECTED BY THE AHJ TO PROTECT EXISTING CONSTRUCTION AND ADJACENT OPERATIONS.
18. REMOVAL OF ITEMS NOTED INCLUDES REMOVAL OF ASSOCIATED ANCHORS, ADHESIVES, HARDWARE, CONDUIT, WIRE, PIPING, FASTENERS, BRACKETS, SUPPORTS, ETC. TO BARE EXISTING STRUCTURE.
19. NEW CEILING INSTALLATIONS ARE NOT TO REUSE COMPONENTS OF OLD OR REMOVED CEILING SYSTEMS. WHERE EXISTING CEILINGS ARE INDICATED TO BE DEMOLISHED, COMPLETELY REMOVE EXISTING CEILING AND SUSPENSION SYSTEM COMPONENTS, INCLUDING BRACKETS, SUPPORT WIRES, SPLAY WIRES, COMPRESSION STRUTS, AND ATTACHMENTS TO STRUCTURE.
20. 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 FACILITATE NEW CONSTRUCTION. SEE STRUCTURAL, MECHANICAL AND ELECTRICAL DEMOLITION DRAWINGS FOR ADDITIONAL SCOPE OF DEMOLITION WORK.
21. REFER TO FINISH PLANS/SCHEDULES FOR SELECTIVE DEMOLITION OF EXISTING FINISHES THAT MAY BE REQUIRED IN AREAS NOT INDICATED ON THESE DRAWINGS.
22. SELECTIVE LIMITED DEMOLITION OF CEILINGS ON LEVEL BELOW (NOT SHOWN) MAY BE REQUIRED TO ACCOMMODATE INSTALLATION OF NEW STRUCTURAL, MECHANICAL, PLUMBING OR ELECTRICAL WORK. RESTORE CEILINGS TO CONDITION PRIOR TO DEMOLITION.
23. REMOVE WALL COVERING AND BASE AT EXISTING WALLS SCHEDULED TO RECEIVE NEW FINISHES. PREP WALL TO RECEIVE SCHEDULED FINISH. REFER TO FINISH PLANS/SCHEDULES FOR EXTENT OF DEMOLITION.
24. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

DEMOLITION LEGEND

- EXISTING TO BE REMOVED
- EXISTING TO REMAIN
- FOR ENTIRE FLOOR IN SHADED AREA - COMPLETELY REMOVE ALL EXISTING FLOOR FINISHES (AT ROOMS AND/OR AREAS TO REMAIN AND RECEIVE NEW FLOOR FINISHES, LEAVE SUB-FLOOR CLEAN AND PREPARED FOR NEW WORK.) NOTE: CARPET LOCATIONS HAVE TWO FLOORS REQUIRING DEMOLITION [CARPET AND TILE].
- COMPLETELY REMOVE ALL EXISTING CEILINGS UON (EITHER LAY-IN, PLASTER, OR GYP BD INCLUDING ALL CURTAIN, CEILING MOUNTED EQUIPMENT, SUPPORTS, TRACKS ETC)

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

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

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

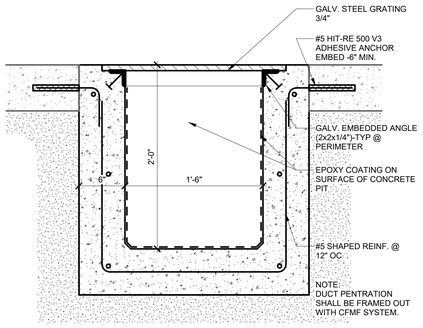
2025-DD016-001

Level 1 Demo Plan - Overall

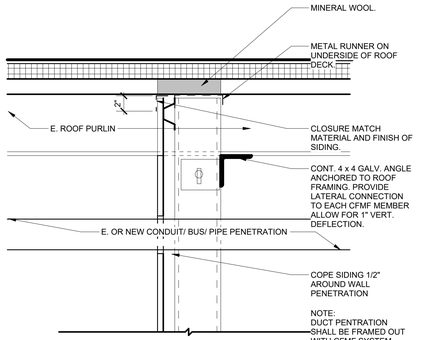
AD101

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

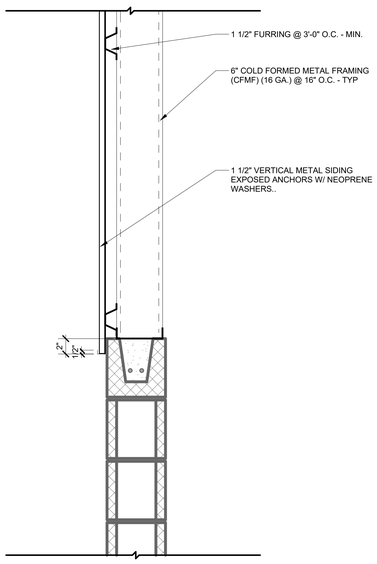
4/24/2026 3:56:45 PM



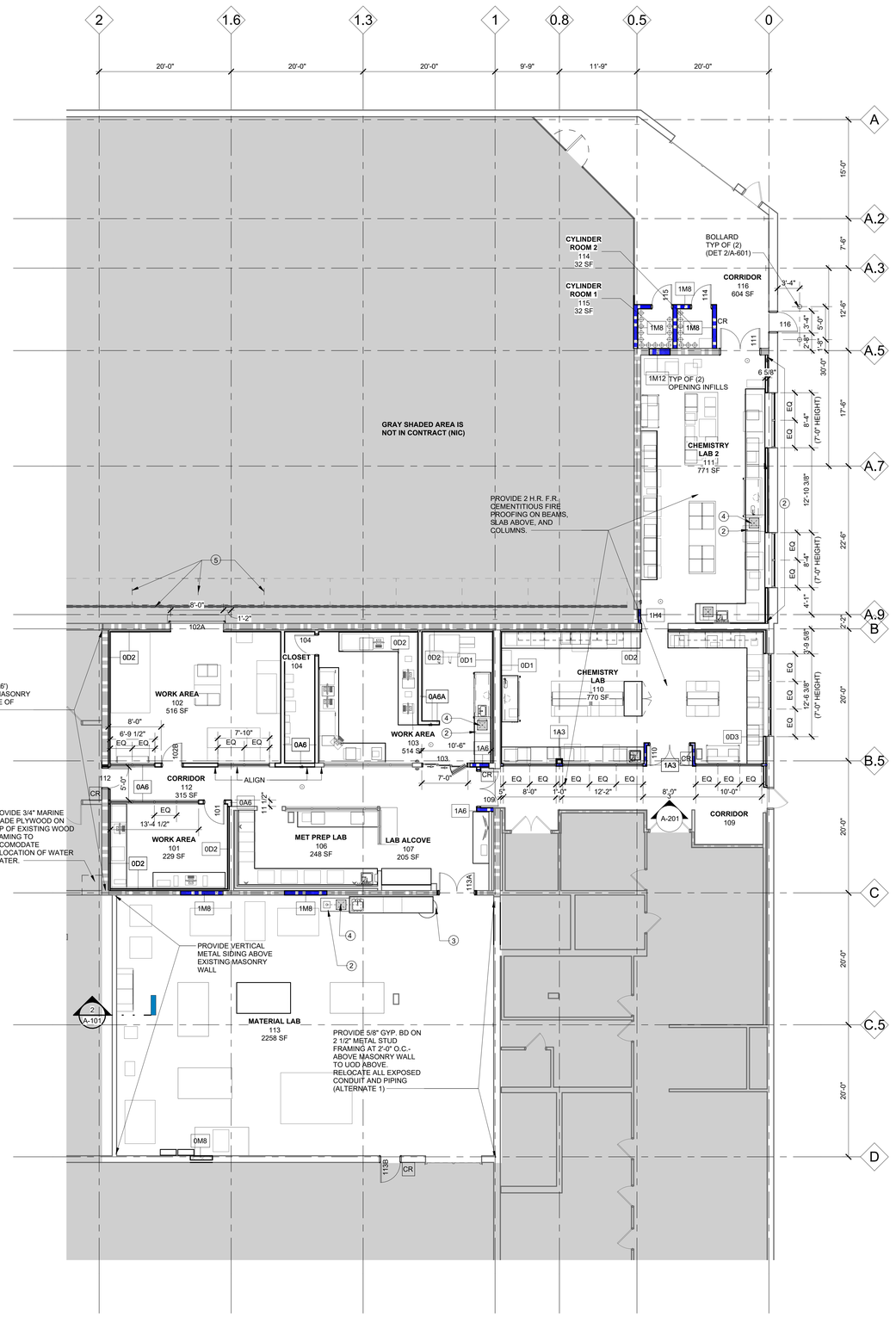
5 CONCRETE PIT DETAIL
1 1/2" = 1'-0"



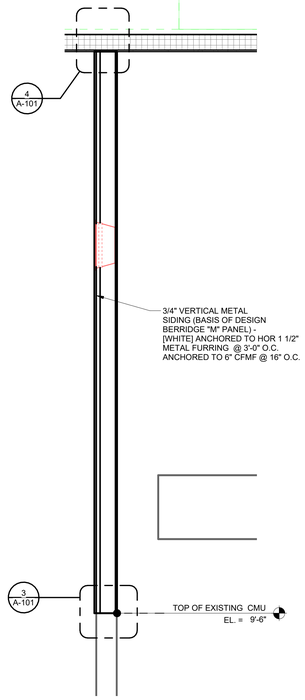
4 METAL SIDING - HEAD OF WALL DETAIL
1 1/2" = 1'-0"



3 METAL SIDING - SILL DETAIL
1 1/2" = 1'-0"



2 VERT. SIDING DETAIL
1/2" = 1'-0"



1 LEVEL 1 PLAN - OVERALL
1/8" = 1'-0"

FLOOR PLAN KEY NOTES

1. COORDINATE EXISTING STORM LINE CLEAN OUT.
2. INFILL TRENCH WITH CONCRETE.
3. INFILL EXISTING SUMP PIT W/ SAND AND PROVIDE 6" CONCRETE SLAB ALIGNED W/ ADJACENT FINISHED FLOOR PROVIDE #5 2' L. DOWELS W/ 1' EMBEDMENT MIN OF 4.
4. 18"x18"x 24"D SUMP PIT REFER TO DETAIL 5/A-101.
5. REINSTALL RACK STORAGE SYSTEM AND REWORK IN RACK SUPPRESSION SYSTEM AFTER O.H. DOOR INSTALLATION AND COMMISSIONING.

FLOOR PLAN NOTES

1. CONTRACTOR TO COORDINATE AND PROVIDE BACKING FOR ALL ITEMS IN CONTRACT, AS WELL AS ITEMS NOTED WHICH ARE IDENTIFIED AS NOT IN CONTRACT (NIC) OR ITEMS WHICH ARE OWNER-PROVIDED OR VENDOR-PROVIDED. SUCH ITEMS MAY INCLUDE, BUT ARE NOT LIMITED TO, SIGNAGE, VISUAL BOARD UNITS, CONFERENCING TRAYS, RAILS OR OTHER ACCESSORIES, BULLETIN BOARDS, DISPLAY CASES, COMPUTER OR TELEVISION DISPLAYS, MONITORS, SECURITY CAMERAS, WIRELESS ACCESS POINTS, LOCKERS, AND OTHER CASEWORK OR EQUIPMENT.
2. DO NOT SCALE DRAWINGS. USE DIMENSIONS INDICATED.
3. CONTRACTOR SHALL VERIFY BUILDING DIMENSIONS, PARTITION AND WALL LOCATIONS, AND FLOOR ELEVATIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO START OF WORK.
4. ALL EXISTING CONSTRUCTION REMAINING BUT AFFECTED BY THE WORK UNDER THIS CONTRACT SHALL BE RESTORED AND REFINISHED TO MATCH THE MATERIALS, FINISH AND ALIGNMENT OF THE EXISTING ADJACENT CONSTRUCTION.
5. COORDINATE QUANTITY, SIZE AND LOCATION OF ALL FLOOR, ROOF AND WALL OPENINGS FOR MECHANICAL AND ELECTRICAL WORK FOR A COMPLETE INSTALLATION. PROVIDE OPENINGS SHOWN OR REQUIRED FOR COMPLETION OF WORK.
6. COORDINATE SIZE AND LOCATION OF ALL ACCESS PANELS WITH APPROPRIATE TRADES.
7. ALL DIMENSIONS ARE TO FACE OF GYPSUM BOARD, NOMINAL FINISH FACE OF CONCRETE, OR NOMINAL FACE OF MASONRY UNLESS OTHERWISE NOTED.
8. DIMENSIONS IN ROOMS WITH WALL TILE ARE TO FACE OF TILE SURFACE TYPICAL, UNLESS OTHERWISE NOTED, WITH THICKNESS OF TILE AND SETTING BED BEING IDENTIFIED NOMINALLY AS ½". IF TILE AND SETTING BED IS THICKER THAN ½", PARTITION LAYOUT TO BE ADJUSTED ACCORDINGLY.
9. WHERE FIRE RATED PARTITIONS TERMINATE AT EXTERIOR WALLS, PROVIDE FIRE SAFING (UL LISTED) INSULATION FROM END OF PARTITION TO INTERIOR FACE OF EXTERIOR SHEATHING, 5" DEPTH X FULL HEIGHT OF CONSTRUCTION (TYPICAL).
10. WHERE SOUND INSULATED PARTITIONS TERMINATE AT EXTERIOR WALL ASSEMBLIES, EXTEND GYPSUM BOARD, ISOLATION CHANNELS, AND SOUND ATTENUATING INSULATION AS SCHEDULED, TO INSIDE FACE OF EXTERIOR SHEATHING, AND SEAL JOINT AT SHEATHING WITH ACOUSTICAL SEALANT.
11. FOR ADDITIONAL INTERIOR FINISHES WHICH MAY IMPACT DIMENSIONS, REFER TO FINISH PLANS/SCHEDULES.
12. WHERE INTERIOR PARTITIONS ABUT WINDOW SYSTEMS, ALIGN CENTERLINES OF PARTITIONS WITH CENTERLINES OF VERTICAL WINDOW MULLIONS, UNLESS OTHERWISE NOTED.
13. PROVIDE CONTINUOUS FIRE RATED CONSTRUCTION BEHIND RECESSED FIXTURES IN FIRE PARTITIONS, FIRE BARRIERS AND FIRE WALLS.
14. PROVIDE FIREPROOFING CONTINUITY WITH EXISTING CONDITIONS, USING LIKE SYSTEMS AS EXISTING, WHERE REQUIRED. VERIFY CONSTRUCTION OF EXISTING ELEMENTS IDENTIFIED AS FIRE RATED AND REPORT CONDITIONS NEGATIVELY IMPACTING RATING OF ELEMENT TO ARCHITECT.
15. PATCH AND REPAIR EXISTING PARTITIONS AT REMOVED RECESSED ITEMS AND AT NEW DOOR OPENINGS. CUT BACK EXISTING GYPSUM BOARD TO NEXT STUD. JOINT BETWEEN NEW AND EXISTING GYPSUM BOARD SHALL BE SECURED TO A COMMON OR SISTERED STUD.
16. PATCH AND REPAIR EXISTING CONCRETE SLAB AND/OR DECK AT REMOVED FLOOR DRAINS, WATER CLOSETS, DUCT PENETRATIONS AND OTHER REMOVED UTILITIES. PROVIDE CONCRETE IN THICKNESS REQUIRED TO MAINTAIN FIRE RATING OF FLOOR SLAB. REFER TO STRUCTURAL DRAWINGS FOR REQUIRED REINFORCEMENT OR ANCHORING. REPAIR OR INSTALL FIREPROOFING UNDER SLAB AS REQUIRED TO MATCH EXISTING CONSTRUCTION OR AS REQUIRED BY AHJ.
17. LEVEL AND SCARIFY EXISTING SLABS TO PROVIDE ACCEPTABLE SUBSTRATE FOR SCHEDULED FLOORING. REFER TO FINISH PLANS/SCHEDULES AND SPECIFICATIONS FOR PREPARATION OF FLOORS TO RECEIVE NEW FINISHES.
18. PATCH EXISTING OPENINGS THAT ARE NOT BEING UTILIZED FOR NEW SERVICES (I.E. PIPING, DUCTWORK, CABLETRAY, ETC...) WITH MATCHING ADJACENT CONSTRUCTION.
19. ALL CONDUIT AND PIPING SHALL BE RUN WITHIN PARTITIONS.

FLOOR PLAN LEGEND

- COL — EXISTING STRUCTURAL GRID LINE
- 101A — DOOR MARK; NEW DOOR; -5" TO DOOR OPENING - TYP (UON)
- EXISTING DOOR TO REMAIN
- TOUCHLESS DOOR ACTIVATION SWITCH
- CR — DOOR CARD READER
- HW9A — PARTITION TYPE (SEE PARTITION TYPES SHEET)
- ROOM NAME 101 — ROOM NAME & NUMBER
- FD — FLOOR DRAIN (FD)
- F.E.C. — FIRE EXTINGUISHER CABINET

FIRE RATING LEGEND

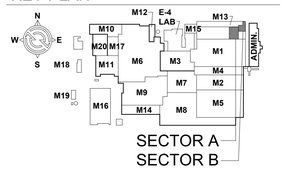
1 HR FIRE BARRIER (45 MIN / 60 MIN*)

WALL RATINGS SHOWN FOLLOWED BY OPENING PROTECTION REQUIREMENTS IN PARENTHESES

*60-MINUTE OPENING PROTECTIVES REQUIRED FOR DOORS SERVING 1-HOUR EXIT ENCLOSURES AND 1-HOUR SHAFTS

**45 MINUTE OPENING PROTECTIVES REQUIRED FOR DOORS ENCLOSING FIRE SERVICE ACCESS ELEVATOR LOBBIES

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

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

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

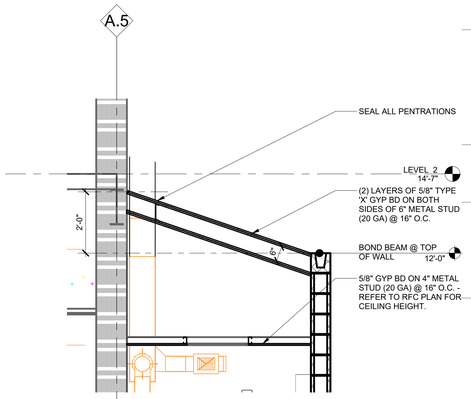
2025-DD016-001

Partial First Floor Plan

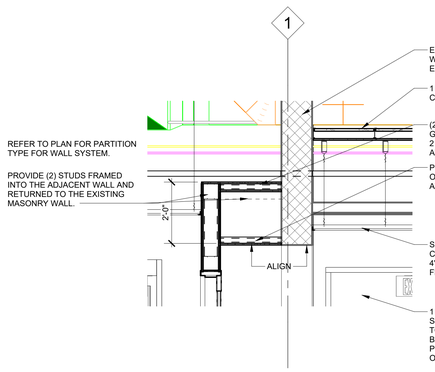
A-101

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

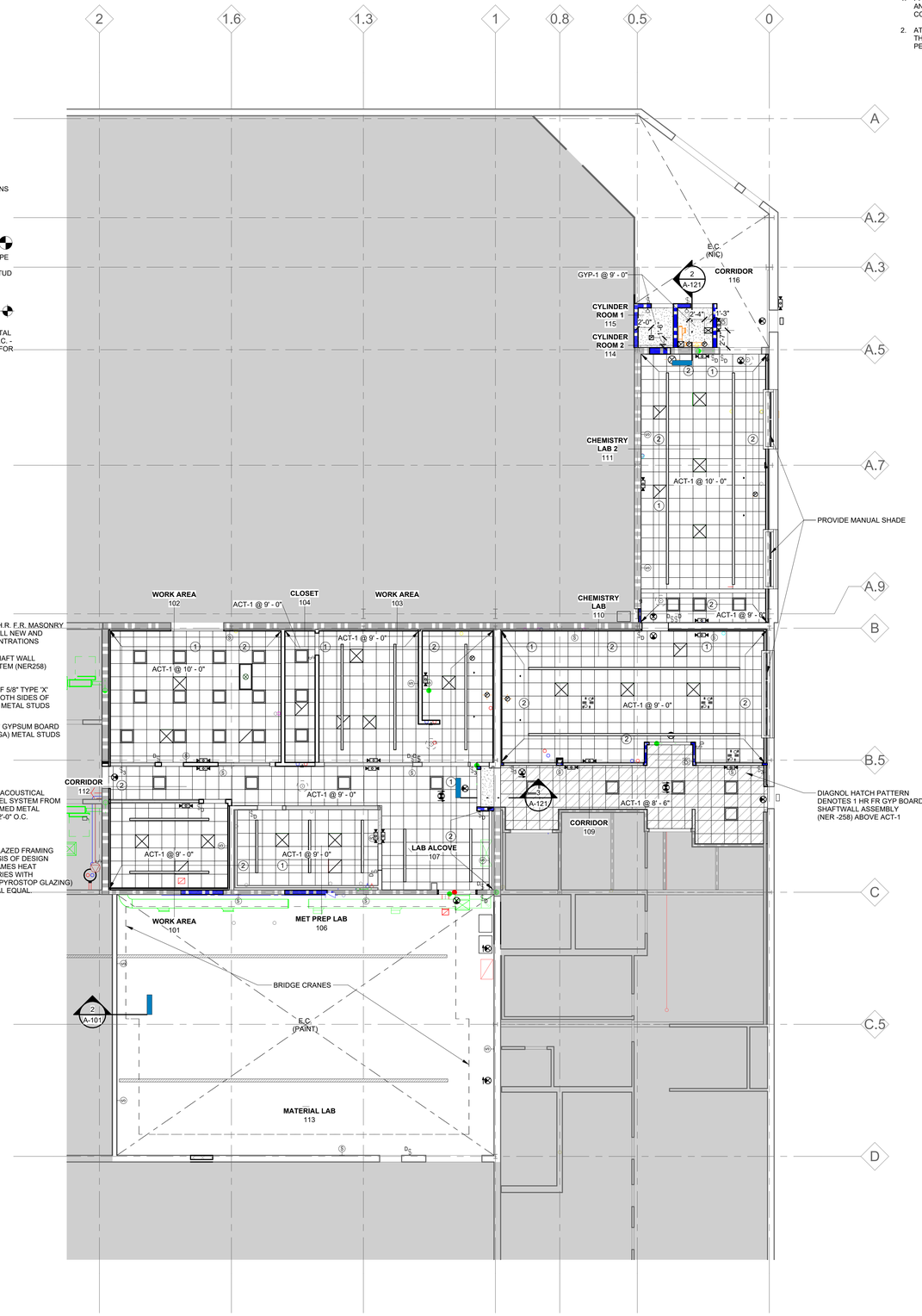
4/24/2026 3:56:47 PM



2 FIRE RATED SLOPED TOP DETAIL
1/2" = 1'-0"



3 RATED SOFFIT DETAIL
1/2" = 1'-0"



N
LEVEL 1 CEILING PLAN - SECTOR A
1/8" = 1'-0"

REFLECTED CEILING PLAN KEY NOTES (#)

1. PROVIDE MASONRY LINTEL AT NEW OPENINGS REQUIRED FOR CABLE TRAY AND DUCTWORK. COORDINATE WITH MECHANICAL AND ELECTRICAL TRADE CONTRACTORS.
2. AT ALL RATED PARTITIONS THAT ARE EXISTING PROVIDE UL APPROVED THROUGH PENTRATIONS AND PROVIDE UL APPROVED FIRE STOPPING PENTRATIONS / SLAG EDGE CONDITIONS.

CEILING NOTES

1. COORDINATE SIZE AND LOCATION OF ACCESS PANELS WITH TRADE REQUIRING SAME AND CONFIRM WITH ARCHITECT.
2. COORDINATE CEILING SUSPENSION SYSTEMS WITH OTHER CEILING SPACE EQUIPMENT SUPPORTING DEVICES.
3. CONTRACTOR SHALL MAINTAIN THE FIRE RATING INTEGRITY OF EXISTING PARTITIONS INDICATED AS FIRE RESISTANCE RATED. REPORT CONDITIONS NEGATIVELY IMPACTING RATING OF ELEMENT TO ARCHITECT.
4. CEILING PANELS TO BE CENTERED IN ROOM IN BOTH DIRECTIONS UNLESS OTHERWISE INDICATED.
5. NO CEILING PANEL TO BE CUT TO LESS THAN 6" WIDTH.
6. SPRINKLER HEADS TO BE LOCATED IN THE CENTER OF CEILING PANELS (TYPICAL).
7. VERIFY LOCATIONS OF SOFFIT AND CEILING CONTROL JOINTS WITH THE ARCHITECT PRIOR TO INSTALLATION.
8. COORDINATE ESCUTCHEON PLATES AT CEILING PANEL PENETRATIONS WITH ELECTRICAL AND MECHANICAL TRADES.
9. REFER TO ELECTRICAL DRAWINGS FOR FIXTURE TYPES.

CEILING PLAN LEGEND

	24" X 24" ACOUSTIC PANEL CEILING ON METAL CEILING SUSPENSION SYSTEM.
	5/8" GYPSUM BOARD CEILING ON METAL CEILING SUSPENSION SYSTEM/ METAL STUD FRAMING.
ACP-1 @ 8'-0"	CEILING TYPE & HEIGHT TAG
	WALL MOUNTED LIGHT SCONCE
S	WALL MOUNTED SPEAKER
S	SPEAKER (GRILLE)
	LIGHT FIXTURE (REFER ELEC. DWGS)
	WALL MOUNTED EMERGENCY LIGHT FIXTURE (REFER ELEC. DWGS)
	EXIT SIGN
$ D,3	WALL LIGHT SWITCH (DIMMER, THREE WAY)
	EXHAUST DIFFUSER
	SUPPLY AIR DIFFUSER
	RETURN AIR DIFFUSER
	CEILING SERVICE PANEL (CSP) REFER TO AQ SHEETS
AP	2'-0" X 2'-0" FRAMELESS ACCESS PANEL
	EMERGENCY SHOWER REFER TO AQ SHEETS

FIRE RATING LEGEND

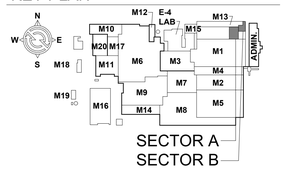
1 HR FIRE BARRIER (45 MIN / 60 MIN*)

WALL RATINGS SHOWN FOLLOWED BY OPENING PROTECTION REQUIREMENTS IN PARENTHESES

*60-MINUTE OPENING PROTECTIVES REQUIRED FOR DOORS SERVING 1-HOUR EXIT ENCLOSURES AND 1-HOUR SHAFTS

**45 MINUTE OPENING PROTECTIVES REQUIRED FOR DOORS ENCLOSING FIRE SERVICE ACCESS ELEVATOR LOBBIES

KEY PLAN



SECTOR A
SECTOR B

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

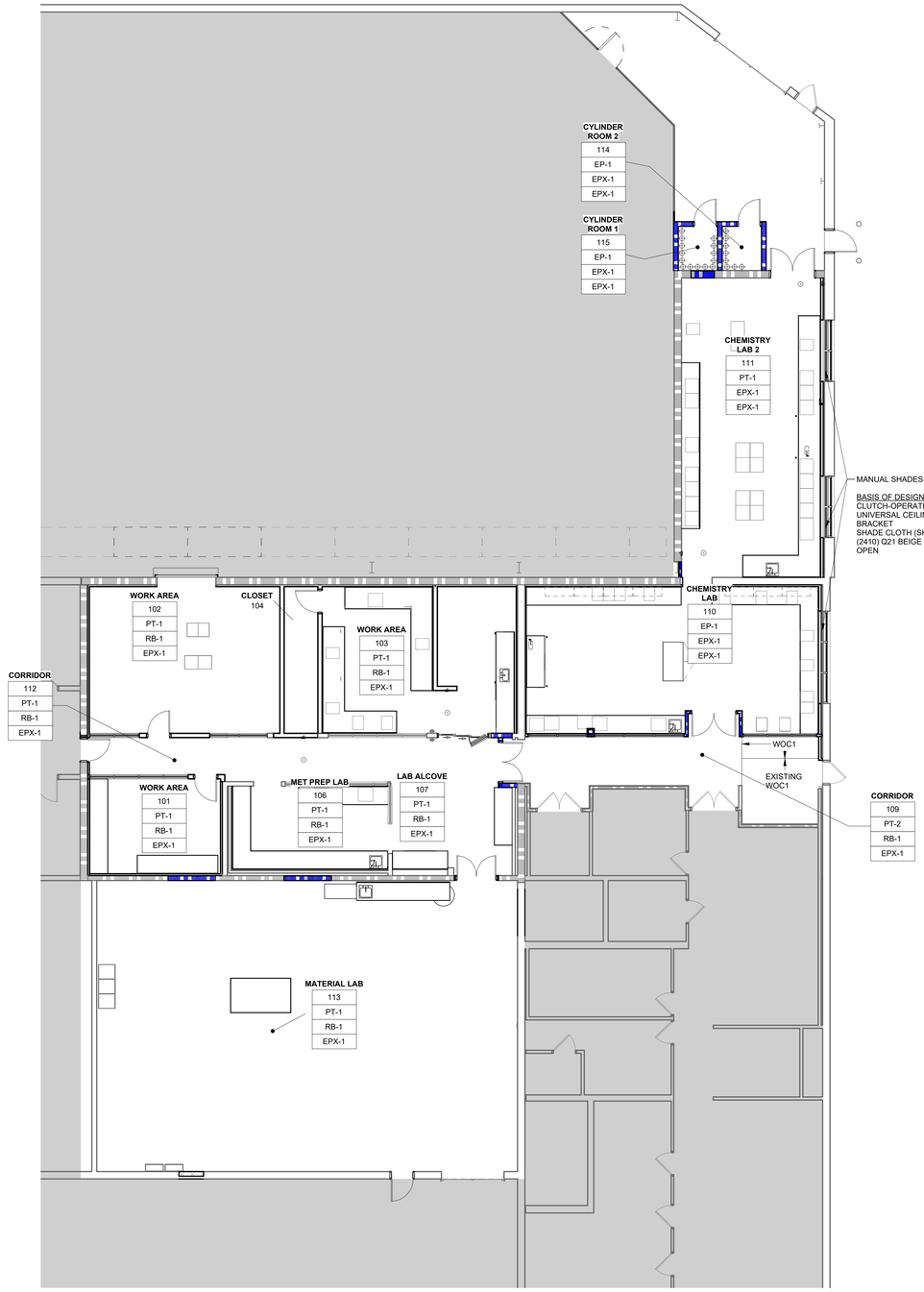
2025-DD016-001

Partial First Floor Ceiling Plan

A-121

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:56:48 PM



N

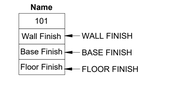
LEVEL 1 FINISH PLAN - SECTOR A

1/8" = 1'-0"

FINISH PLAN NOTES

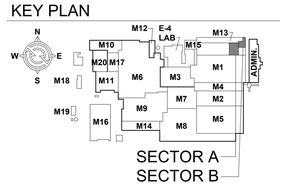
1. TRANSITION AND REDUCER STRIPS TO MATCH COLOR OF FLOORING, UNLESS OTHERWISE NOTED.
2. TRANSITION FLOOR FINISHES AT CENTER OF DOOR, UNLESS OTHERWISE NOTED.
3. FLOORS TO BE LEVELED AS REQUIRED TO ACCEPT FINISHES PER FINISH PLANS/SCHEDULE.
4. INSTALL ALL FLOORING IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. VERIFY LOCATION OF SEAMING AND TRANSITIONS WITH THE ARCHITECT.
5. RESILIENT TILE FLOORING TO BE SEALED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
6. RESILIENT BASE TO BE STRAIGHT AT CARPET FLOORING, COVED AT OTHER LOCATIONS.
7. RECESSED WIREWAYS, ACCESS PANELS, GRILLES, FIRE EXTINGUISHER CABINETS, ELECTRICAL PANELS, AND OTHER SUCH ARCHITECTURAL, ELECTRICAL, AND MECHANICAL DEVICES SHALL BE FINISHED TO MATCH ADJACENT WALL OR CEILING SURFACE, UNLESS OTHERWISE NOTED.
8. FINISH MATERIALS TO COMPLY WITH CODE REQUIRED FLAME SPREAD AND SMOKE DEVELOPED RATINGS.

FINISH PLAN LEGEND



- REFER TO MATERIALS FINISH LEGEND ON SHEET A-601.
- GRAPHICS DO NOT INDICATE FINISH DIRECTION.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

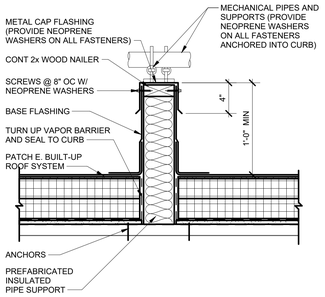
2025-DD016-001

First Finish Plan

A-141

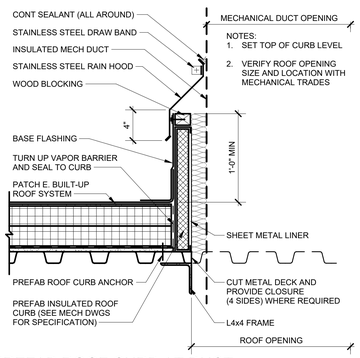
Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:56:50 PM



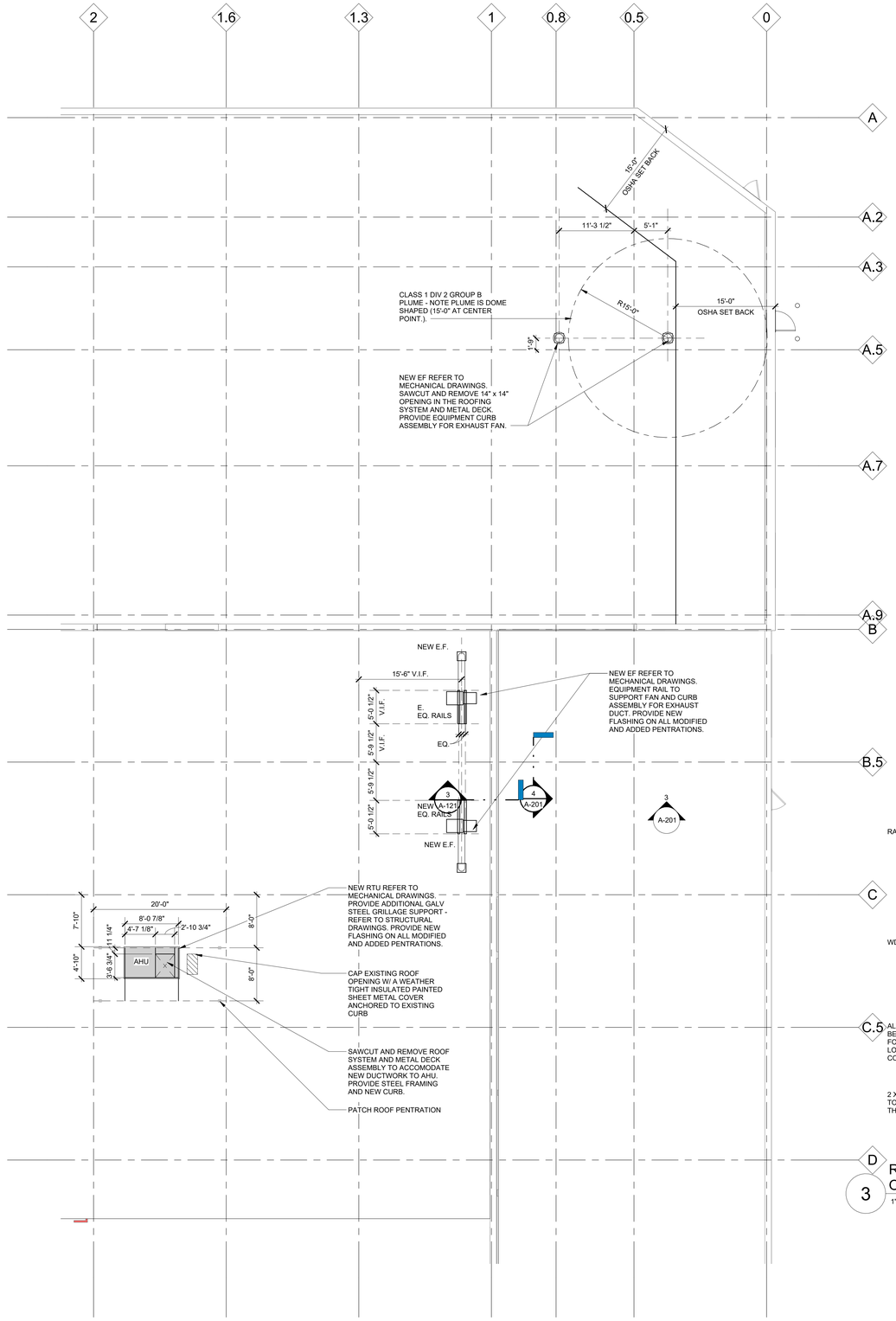
2 PIPE SUPPORT CURB (SINGLE-PLY ROOFING)

1 1/2" = 1'-0"



4 PREFAB ROOF CURB AT DUCT PENETRATION

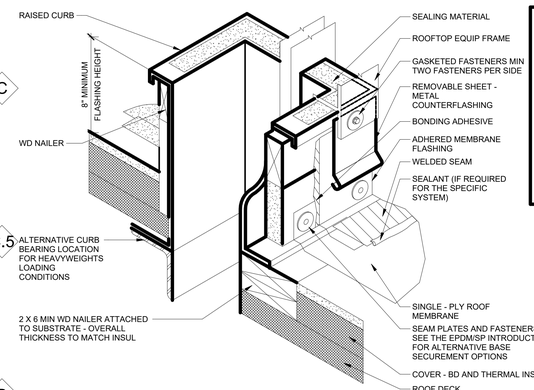
1 1/2" = 1'-0"



N

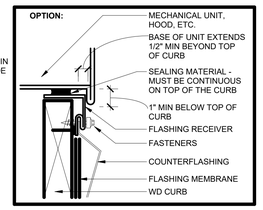
ROOF PLAN - OVERALL

1/8" = 1'-0"



3 ROOF CURB AT PENETRATION OPENING

1" = 1'-0"



NOTES:

1. THE CURBS, TOP WD NAILER AND SEAL STRIP ARE TO BE SUPPLIED BY THE CURB MANUFACTURER.
2. WHEN POSSIBLE, THE MECHANICAL UNITS SHOULD NOT BE SET UNTIL THE ROOF MEMBRANE AND FLASHING HAVE BEEN INSTALLED.
3. WHERE THE SKYLIGHT, SCUTTLE OR SMOKE VENT FRAME OVERLAPS THE BASE FLASHING AT LEAST 3 INCHES, THE REMOVABLE SHEET - METAL COUNTERFLASHING IS NOT REQUIRED.
4. REFER TO THE ARCHITECTURAL SHEET METAL SECTION OF THE NRCA ROOFING AND WATERPROOFING MANUAL JOINERY AND SECUREMENT OPTIONS FOR SHEET METAL.

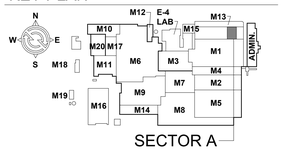
ROOF PLAN NOTES

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. PROVIDE POSITIVE SLOPE TO ALL ROOF DRAINS. ROOF SLOPE TO BE 1/4" PER FOOT MINIMUM.
5. TEMPORARY FALL PROTECTION IS NOT SHOWN AND SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
6. INSTALL ROOF FRAMES PRIOR TO CUTTING AND REMOVING ANY METAL DECK.

ROOF PLAN LEGEND

- EXHAUST FAN
- VTR — VENT THROUGH ROOF
- TBA — ROOF MOUNTED TIE-BACK ANCHOR
- HORIZONTAL LIFELINE CABLE SYSTEM
- DP — DAVIT PEDISTAL FOR 8'-6" DAVIT ARM
- TR — LIGHTNING PROTECTION ROOF PENETRATION PROVIDE STEPPED CONDUIT FLASHING (SEE DETAIL "TR" ON LIGHTNING PROTECTION DWGS)
- INDICATES SLOPE DIRECTION OF ROOF (MIN 1/4" PER FOOT)
- SURFACE MTD WEATHERPROOF RECEPTACLE/JUNCTION BOX (JB). SEAL BASE FLASHING PENETRATION PER ROOFING MANUFACTURER'S DIRECTION TO MEET WARRANTY REQUIREMENTS. PROVIDE SOLID WOOD BLOCKING BEHIND DEVICE TO ACCOMMODATE INSTALLATION. CONDUIT SHALL BE ROUTED IN STUD SPACE OF PARAPET. DO NOT SURFACE MOUNT CONDUIT.
- WALKWAY PADS - TYP
- ROOFING SYSTEM CRICKET
- RS OS — (RS) ROOF SUMP AND (OS) OVERFLOW ROOF SUMP

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

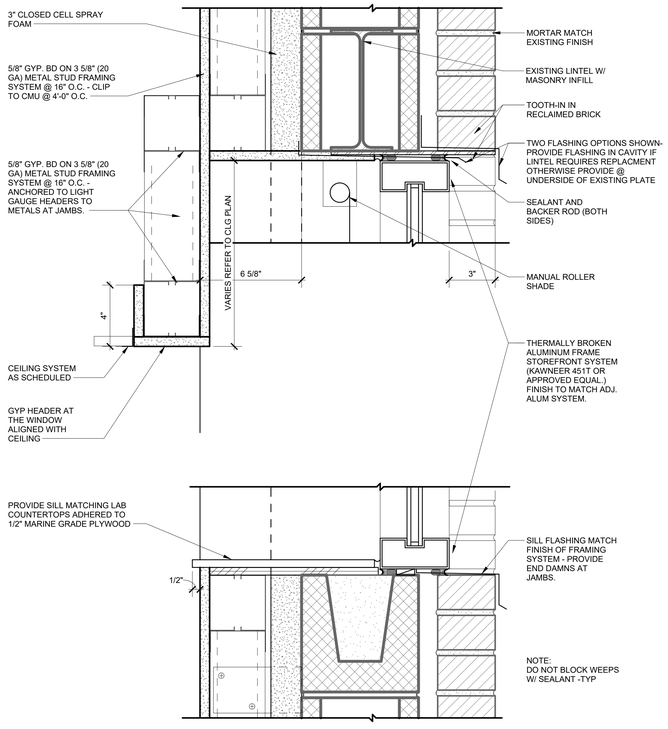
2025-DD016-001

Roof Plan - Overall

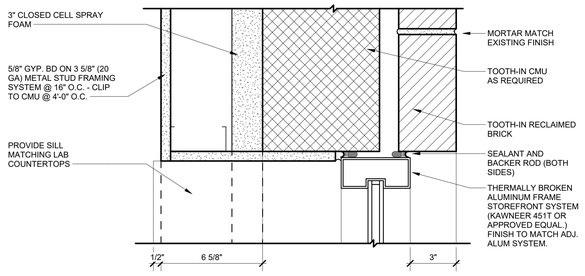
A-191

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

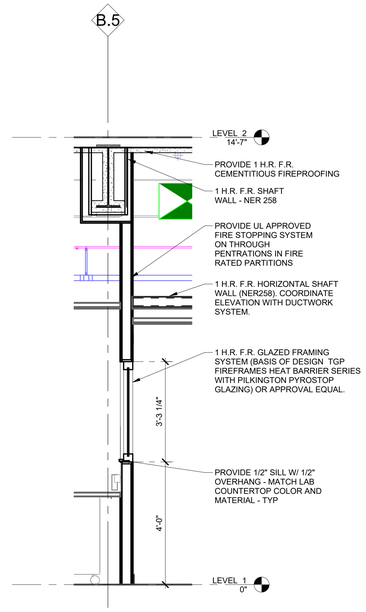
4/24/2026 4:25:12 PM



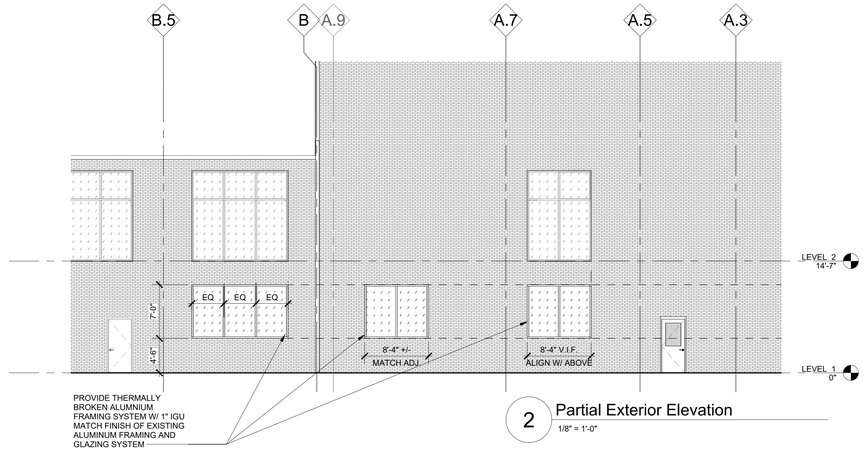
6 WINDOW HEAD AND SILL MASONRY
3" = 1'-0"



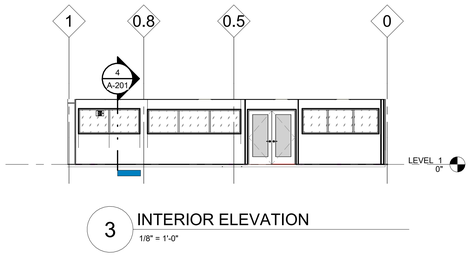
5 WINDOW JAMB MASONRY
3" = 1'-0"



4 CORRIDOR 109 PARTITION DETAIL
1/2" = 1'-0"

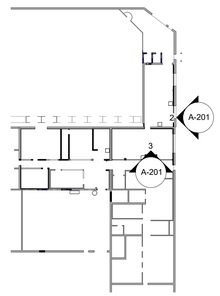


2 Partial Exterior Elevation
1/8" = 1'-0"



3 INTERIOR ELEVATION
1/8" = 1'-0"

KEYPLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

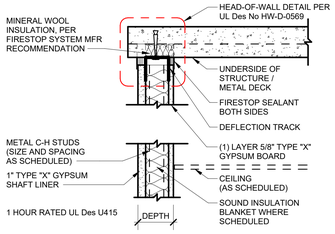
2025-DD016-001

Exterior Elevations

A-201

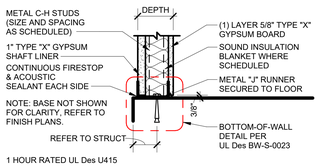
Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:56:53 PM

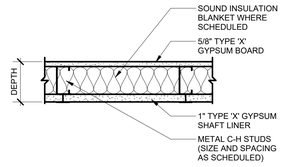


TYPE	DEPTH	FRAMING WIDTH	FRAMING SPACING (OC)	DETAILS BOTTOM	DETAILS TOP	INSUL THK	FIRE RATING	TESTED ASSEMBLY	STC RATING
1H4	4 5/8"	4"	24"	B01	T01		60	U415	40

H T01 PARTITION DETAIL H-T01
1 1/2" = 1'-0"

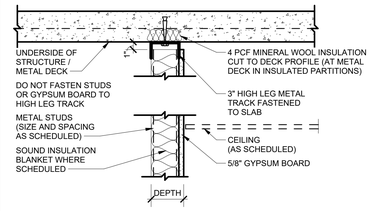


H B01 PARTITION DETAIL H-B01
1 1/2" = 1'-0"



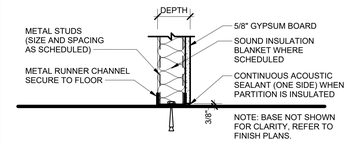
H PARTITION H
1 1/2" = 1'-0"

TYPE H

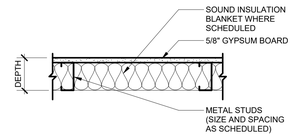


TYPE	DEPTH	FRAMING WIDTH	FRAMING SPACING (OC)	DETAILS BOTTOM	DETAILS TOP	INSUL THK	FIRE RATING	TESTED ASSEMBLY	STC RATING
0D1	2 1/8"	1 1/2"	16"	B01	T01				
0D2	3 1/8"	2 1/2"	16"	B01	T01				
0D3	4 1/4"	3 5/8"	16"	B01	T01				

D T01 PARTITION DETAIL D-T01
1 1/2" = 1'-0"

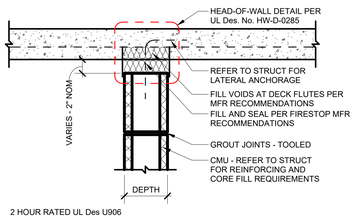


D B01 PARTITION DETAIL D-B01
1 1/2" = 1'-0"

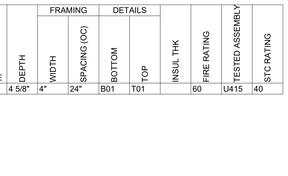


D PARTITION D
1 1/2" = 1'-0"

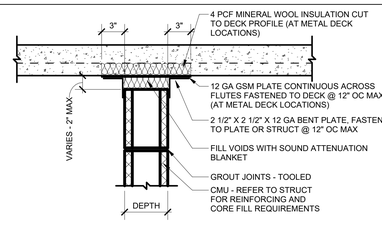
TYPE D



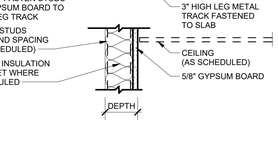
M T02 PARTITION DETAIL M-T02
1 1/2" = 1'-0"



M B02 PARTITION DETAIL M-B02
1 1/2" = 1'-0"

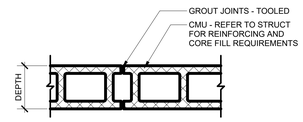


M B01 PARTITION DETAIL M-B01
1 1/2" = 1'-0"

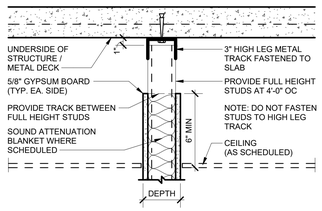


TYPE	DEPTH	FRAMING WIDTH	FRAMING SPACING (OC)	DETAILS BOTTOM	DETAILS TOP	INSUL THK	FIRE RATING	TESTED ASSEMBLY	STC RATING
0M8	7 5/8"	7 5/8"		B01	T01				55
1M8	7 5/8"	7 5/8"		B02	T02		60	U906	55
1M12	11 5/8"	11 5/8"		B02	T02		60	U906	55

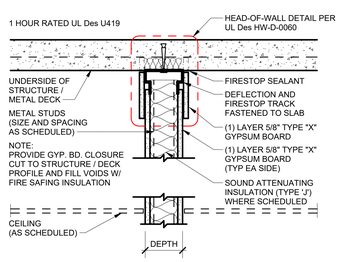
M PARTITION M
1 1/2" = 1'-0"



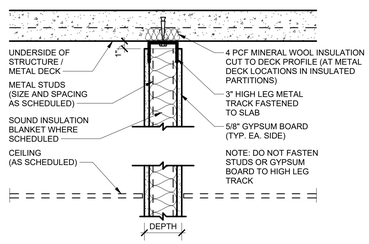
TYPE M



A T03 PARTITION DETAIL A-T03
1 1/2" = 1'-0"

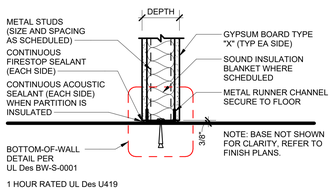


A T02 PARTITION DETAIL A-T02
1 1/2" = 1'-0"

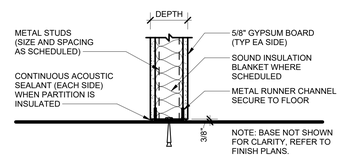


A T01 PARTITION DETAIL A-T01
1 1/2" = 1'-0"

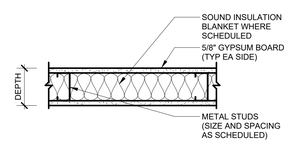
TYPE	DEPTH	FRAMING WIDTH	FRAMING SPACING (OC)	DETAILS BOTTOM	DETAILS TOP	INSUL THK	FIRE RATING	TESTED ASSEMBLY	STC RATING
0A6	7 1/4"	6"	16"	B01	T01				
0A6A	7 1/4"	6"	16"	B01	T01	6 1/4"			40
1A3	4 7/8"	3 5/8"	16"	B02	T03		60		
1A6	7 1/4"	6"	16"	B02	T03		60		



A B02 PARTITION DETAIL A-B02
1 1/2" = 1'-0"



A B01 PARTITION DETAIL A-B01
1 1/2" = 1'-0"



A PARTITION A
1 1/2" = 1'-0"

TYPE A

PARTITION NOTES

1. PROVIDE NON-COMPOSITE METAL FRAMING ASSEMBLIES OF METAL STUD DEPTH AND SPACING AS INDICATED FOR PROJECT SPECIFIC SPANS MEETING AN ALLOWABLE DEFLECTION OF L/240 WITH LATERAL LOAD OF AT LEAST 5 PSF FOR LIMITING HEIGHTS. PROVIDE 20 GA. STUDS (MINIMUM). PROVIDE HEAVIER GAUGE AND/OR WIDER FLANGE WIDTH TO MEET STATED PERFORMANCE REQUIREMENTS FOR LIMITING HEIGHTS. COMPLY WITH METAL FRAMING MANUFACTURER'S REQUIREMENTS FOR BRACING STUD FLANGES AND PROVIDING HORIZONTAL BRIDGING AT 48" O.C. MAXIMUM VERTICAL SPACING.
2. TO THE EXTENT POSSIBLE, FIRE RATED WALLS SHALL BE COMPLETELY AND CONTINUOUSLY CONSTRUCTED FIRST (EXCEPT FOR FINAL FINISH), WITH OTHER NON-RATED WALLS CONSTRUCTED TO THEM.
3. FIRE RATED WALLS EXTEND FULL HEIGHT TO STRUCTURE ABOVE AND SEAL TO DECK UNLESS DETAILED OTHERWISE.
4. USE GALVANIZED CORNER BEADS AND EDGE TRIM IN EXPOSED WORK.
5. MOVEMENT CONTROL:
   A. PROVIDE FOR VERTICAL MOVEMENT AT THE HEAD OF CONSTRUCTION AS INDICATED IN THE NOTES ON THE DRAWINGS. CONNECT HEAD RUNNER CHANNEL TO THE UNDERSIDE OF STRUCTURE AS INDICATED ON THE DRAWINGS; CUT STUDS SHORT TO ALLOW FOR VERTICAL MOVEMENT IN ACCORDANCE WITH NOTE BELOW, AND DO NOT FASTEN TO HEAD RUNNER CHANNEL; FASTEN GYPSUM BOARD TO STUDS ONLY.
   B. ALLOW FOR A MIN OF 1" VERTICAL MOVEMENT FOR PARTITIONS BELOW SLABS, BEAMS OR TRUSSES.
   C. ALLOW FOR ½" RACKING OF PARTITIONS BUILT NEXT TO VERTICAL ELEMENTS (I.E. COLUMNS, WALLS, EXTERIOR WALLS).
6. PROVIDE ABUSE RESISTANT GYPSUM BOARD AT STAIR SIDES OF STAIR ENCLOSURE PARTITIONS..
7. SOUND CONTROL:
   A. SEAL OPENINGS AT OUTLETS, SWITCHES, MECHANICAL OPENINGS AND PERIMETER CONDITIONS WITH ACOUSTIC SEALANT.
   B. PROVIDE SOUND ATTENUATION BLANKETS WHERE INDICATED.
8. PENETRATIONS AT SMOKE AND FIRE RATED ASSEMBLIES SHALL BE PROTECTED, SEALED AND DAMPERED, USING UL OR OTHER AHJ APPROVED METHODS, MATERIALS AND INSTALLATION, AS REQUIRED TO MAINTAIN THE ASSEMBLY'S RATING AND SMOKE RESISTANT REQUIREMENTS. ALL MATERIALS AND INSTALLATION DETAILS SHALL CONFORM TO UL LISTINGS FOR "THROUGH-PENETRATION FIRE STOP SYSTEMS" WHERE APPLICABLE. CONTRACTOR SHALL SUBMIT SHOP DRAWING DETAILS, FURNISHED BY THE MANUFACTURER, OF THE FIRE STOP MATERIAL, THAT SHOW COMPLETE CONFORMANCE TO THE UL LISTING AND SUCH DRAWINGS SHALL BE AVAILABLE TO AHJ INSPECTORS. THE DRAWINGS SHALL BE SPECIFIC FOR EACH PENETRATION TYPE.
9. WHERE IDENTIFIED ON DRAWINGS, SMOKE BARRIERS/PARTITIONS SHALL BE CONTINUOUS FROM INSIDE FACE OF SHEATHING OF OUTSIDE WALLS, FROM FIRE BARRIER TO FIRE BARRIER, FROM SMOKE BARRIER TO SMOKE BARRIER AND FROM FLOOR SLAB TO FLOOR OR ROOF SLAB ABOVE, THEREBY PROVIDING CONTINUITY THROUGH ALL CONCEALED SPACES. COMPLETELY SEAL ALL OPENINGS WHERE THE SMOKE BARRIER ABUTS OTHER SMOKE BARRIERS, FIRE BARRIERS, EXTERIOR WALLS, THE FLOOR BELOW AND THE FLOOR OR CEILING ABOVE.
10. LIGHT GAUGE METAL FRAMING SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ASTM 754, "STANDARD SPECIFICATIONS FOR INSTALLATION OF STEEL FRAMING MEMBERS".
11. WALL TYPES SHOW BASE WALL CONSTRUCTION. BASE, TILE, WOOD PANELING / TRIM, ACOUSTICAL PANELS, ETC. MAY OCCUR AS SCHEDULED OR DETAILED ELSEWHERE.
12. AT FULL- HEIGHT PARTITIONS WHERE DUCTWORK OR OTHER OBSTACLES PREVENT EXTENSION OF ALL STUDS TO DECK, FRAME STUDS AROUND OBSTACLES WITH HEADERS AND BRACING AS NECESSARY. PROVIDE DOUBLED STUDS AT ENDS OF OPENINGS TO DECK ABOVE..
13. LOCATE VERTICAL CONTROL JOINTS AT 30'-0" O.C.(MAX.) OR AS SHOWN ON PLANS OR NOTED AS "CJ" ON ELEVATIONS. CONFIRM CONTROL JOINT LOCATIONS WITH ARCHITECT PRIOR TO FRAMING.
14. PROVIDE 5/8" CEMENTITIOUS BACKER BOARD AT TILE (REFER TO ROOM FINISH PLANSSCHEDULES FOR LOCATIONS AND HEIGHT). AT CONTRACTOR'S OPTION, PROVIDE 5/8" FIBERGLASS MAT TILE BACKER BOARD AT PARTITIONS SCHEDULED TO RECEIVE TILE IN NON-WET AREAS. SHOWER AREAS AND AREAS WITH TERRAZZO BASE TO RECEIVE CEMENTITIOUS BACKER BOARD ONLY.
15. GYPSUM BOARD FINISH TO BE LEVEL 4 UON.

PARTITION TYPES - NAMING

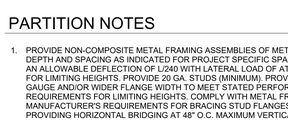


TABLE A - RATING/EXTENT OF PARTITION

DES.	CONDITION
0	NON-RATED, FULL-HEIGHT, BOTTOM 01/TOP 01
1, 2, 3	RATING IN HOURS, FULL HEIGHT, BOTTOM 02/TOP 02
C	FINISH 6" ABOVE CEILING, BOTTOM 01/TOP 03
U	PARTITION UNDER CEILING, BOTTOM 01/TOP 07
H	PARTIAL HEIGHT PARTITION BOTTOM 10/TOP 10

TABLE B - PARTITION ASSEMBLY SERIES

TYPE	SHEATHING	FRAMING	SHEATHING
A	1 LAYER	MTL C-STUD	1 LAYER
B	2 LAYERS	MTL C-STUD	2 LAYERS
C	1 LAYER	MTL C-STUD	2 LAYERS
D	1 LAYER	MTL C-STUD	NONE
E	2 LAYERS	MTL C-STUD	NONE
F	1 LAYER	HAT CHANNEL	NONE
G	2 LAYERS	HAT CHANNEL	NONE
H	1 LAYER	MTL C-H STUD	SHAFT LINER
J	2 LAYERS	MTL C-H STUD	SHAFT LINER
K	1 LAYER	2 MTL C-STUD	1 LAYER
L	2 LAYERS	2 MTL C-STUD	2 LAYERS
M	-	CMU	-
N	1 LAYER	WD STUD	1 LAYER
P	2 LAYERS	WD STUD	2 LAYERS
Q	1 LAYER	WD STUD	2 LAYERS
R	1 LAYER	WD STUD	NONE
S	2 LAYERS	WD STUD	NONE
T	1 LAYER	WD FURRING	NONE
U	2 LAYERS	WD FURRING	NONE
V	*RESERVED FOR PROJECT SPECIFIC ASSIGNMENT*		
W	*RESERVED FOR PROJECT SPECIFIC ASSIGNMENT*		
X	*RESERVED FOR PROJECT SPECIFIC ASSIGNMENT*		
Y	*RESERVED FOR PROJECT SPECIFIC ASSIGNMENT*		
Z	*RESERVED FOR PROJECT SPECIFIC ASSIGNMENT*		

TABLE C - FRAMING MEMBER SIZE

DES.	MTL STUD WIDTH	MTL C-H STUD WIDTH (NOM)	WD STUD WIDTH (NOM)	CMU WIDTH (NOM)
-		NO FRAMING		
0	7/8" HAT CH		1"	10"
1	1 1/2" HAT CH			
2	2 1/2"	2 1/2"	2"	12"
3	3 5/8"	-	-	
4	4"	4"	4"	4"
6	6"	6"	6"	6"
8	8"	-	8"	8"

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

2025-DD016-001

Partition Types

A-571

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:56:54 PM

FINISH MATERIALS LIST

NUMBER	MATERIAL	MANUFACTURER	STYLE	PRODUCT #	COLOR	COMMENTS
CEILING						
ACP-1	ACOUSTIC CEILING PANEL	ARMSTRONG	ULTIMA HEALTH ZONE, 70 NRC, SQUARE LAY-IN, GRID: 15/16" PRELUDE (WHITE)	1935	WHITE	24" x 24" x 3/4"
FLOORING						
EPX-1	EPOXY...	HOOVER WELLS	REZ-STONE	-	-	MATCH EXISTING COLOR AND...
WOC-1	WALK OFF CARPET	MILLIKEN	OBEX, CUTX/GRAIN	GRC154-119	DARK GREY	ASHLAR PATTERN - TOOTHIN AND MATCH EXISTING INSTALL
BASE						
EPX-1	EPOXY COVE BASE	HOOVER WELLS	REZ-STONE	-	-	MATCH FLOORING - 4" INTEGRAL COVE BASE
RB-1	RUBBER BASE	TARKETT/JOHNSONITE	MONUMENT	-	-	MATCH FINISH OF EXISTING BASE IN CORRIDOR 109.
WALL						
PT-1	PAINT	SHERWIN WILLIAMS	INTERIOR LATEX PAINT	SW 7008	ALABASTER...	
PT-2	PAINT	SHERWIN WILLIAMS	INTERIOR LATEX PAINT	SW 7646	FIRST STAR	MATCH EXISTING PAINT FINISH OF CORRIDOR 109
EP-1	PAINT	SHERWIN WILLIAMS	EPOXY PAINT	SW 7008	ALABASTER...	

DOOR SCHEDULE

MARK	DOORS SIZE WIDTH PANEL 1	PANEL 2	HEIGHT	TYPE - MTL	FINISH	GLAZING	FRAME TYPE-MTL	FINISH	GLAZING	FIRE RATING LABEL (MINS)	HEAD	JAMB	HW SET	NOTES
LEVEL 1														
101	3'-0"		7'-0"	FG-AL	FF	-	001-AL1	FF	-		3/A-601 (SIM.)	3/A-601		
102B	3'-0"		7'-0"	FG-AL	FF	-	001-AL1	FF	-		3/A-601 (SIM.)	3/A-601		
104	3'-0"		7'-0"	F-HM	PNT	-	001-HM1	PNT	-		3/A-601 (SIM.)	3/A-601		4
109	2'-8"	2'-8"	7'-0"	FG-AL	FF	-	001-AL1	FF	-	60	3/A-601 (SIM.)	3/A-601		1, 5
110	3'-0"	3'-0"	7'-0"	FG-AL	FF	-	001-AL1	FF	-	60	3/A-601 (SIM.)	3/A-601		1, 5
111	3'-0"	3'-0"	9'-0"	N-HM	PNT	-	001-HM1	PNT	-	45	4/A-601(SIM.)	4/A-601		1,4
112	3'-0"		7'-0"	G-AL	FF	-	001-AL1	FF	-	60	4/A-601(SIM.)	4/A-601		1, 5
113A	2'-8"	2'-8"	7'-0"	FG-AL	FF	-	001-AL1	FF	-	60	4/A-601(SIM.)	4/A-601		5
113B	3'-0"		7'-0"	F-HM	PNT	-	001-HM1	PNT	-		4/A-601(SIM.)	4/A-601		1,4
114	3'-0"		7'-0"	N-HM	PNT	-	001-HM1	PNT	-	45	4/A-601(SIM.)	4/A-601		4
115	3'-0"		7'-0"	N-HM	PNT	-	001-HM1	PNT	-	45	4/A-601(SIM.)	4/A-601		4
116	3'-0"		7'-0"	G-AL	FF	IGU	001-AL1	FF	-		5/A-601 (SIM.)	5/A-601		2

DOOR SCHEDULE NOTES

1. PROVIDE FOR A CARD READER COORDINATE WITH SECURITY CONTRACTOR.
2. PROVIDE BOLLARD. REFER TO DETAIL 2/A-601.
3. MANUAL OVERHEAD COILING DOOR.
4. PAINT IS PT-1.
5. GLAZING IS PILKINGTON PYROSTOP OR APPROVED EQUAL.

MATERIAL LEGEND

MATERIAL (MTL.)

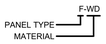
AL	ALUMINUM
EX	EXISTING
GL	GLASS
HM	HOLLOW METAL
SS	STAINLESS STEEL
STL	STEEL
WD	WOOD

FINISH

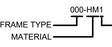
FF	FACTORY FINISH
PNT	PAINT (AS SCHEDULED)
CLR ANO	CLEAR ANODIZED ALUMINUM
PLAM	PLASTIC LAMINATE

NOTE: ALL DOORS ARE UNDERCUT 5/8". PROVIDE 3/4" UNDERCUT AT CLOSET 104.

PANEL TYPES

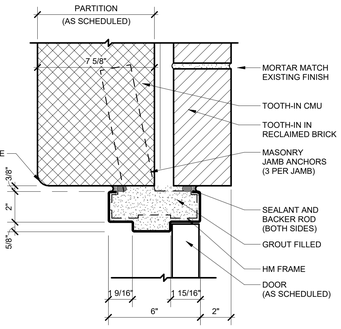


FRAME TYPES

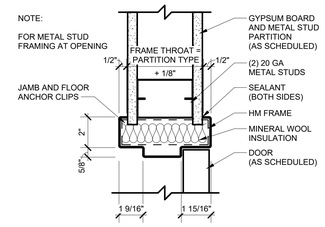


UNIT DOOR SCHEDULE

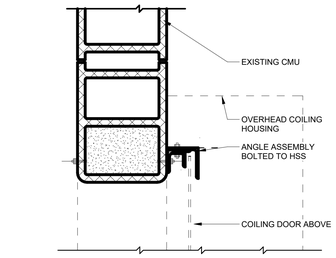
DESCRIPTION	DOOR SIZE WIDTH	HEIGHT	THK	TYPE-MTL	TYPE-MTL 2	FINISH	GLAZING	DOOR FRAME TYPE-MTL	FINISH	GLAZING	FIRE RATING LABEL (MIN)	HEAD	JAMB	HW SET	COMMENTS
	8'-0"	10'-0"	1/4"	OHC-101-STL		<By Category>	-	1101-STL1	<By Category>	-	45	6/A-601	7/A-601		3
	4'-5"	7'-0"	1 3/4"	-		<By Category>	-		<By Category>	-					1



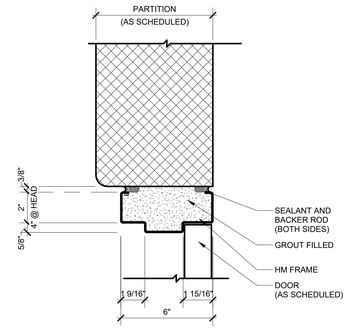
5 DOOR JAMB MASONRY
3" = 1'-0"



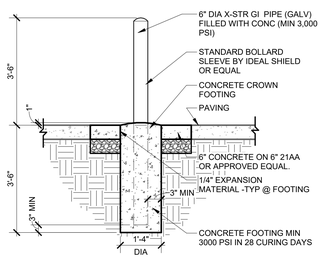
3 DOOR JAMB
3" = 1'-0"



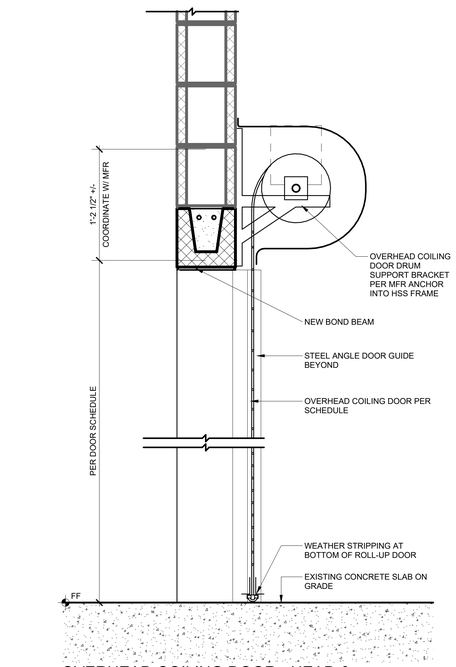
7 OVERHEAD COILING DOOR - JAMB
1 1/2" = 1'-0"



4 DOOR JAMB CMU
3" = 1'-0"

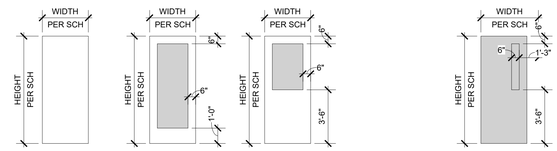


2 STEEL PIPE BOLLARD WITH SLEEVE
1/2" = 1'-0"

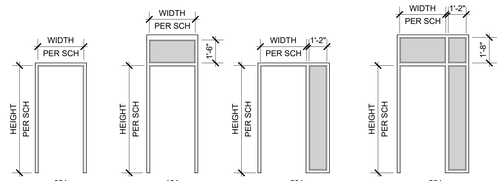


6 OVERHEAD COILING DOOR - HEAD & SILL
1 1/2" = 1'-0"

PANEL TYPES



FRAME TYPES



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

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

STAMP AND SEAL, LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

2025-DD016-001

Schedules

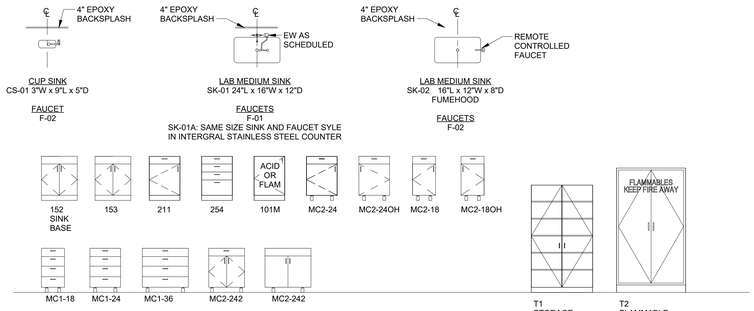
A-601

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

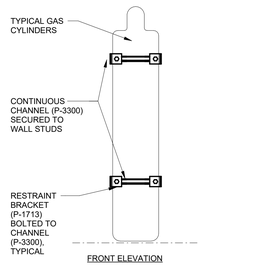
4/24/2026 4:09:05 PM

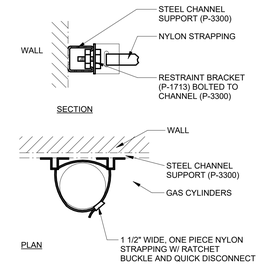
NOTE: SEE SPECIFICATION SECTION 12 3553 FOR FIXTURE TYPE
EW: LOCATIONS TAGGED WITH AN 'EW' INDICATE EYE WASH AT THAT LOCATION

SINK SIZES ARE GENERIC. PROVIDE SINKS AT MANUFACTURERS STANDARD SIZE CLOSEST TO THOSE SHOWN (EXCEPT WHERE NOTED AS CUSTOM) IN MATERIALS AND CONFIGURATION AS INDICATED



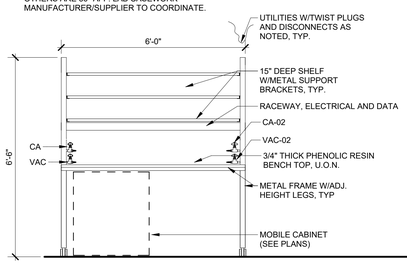
CASEWORK MATERIAL
MTL = METAL POWDER COATED

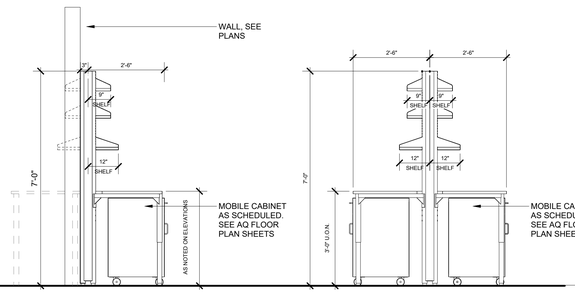


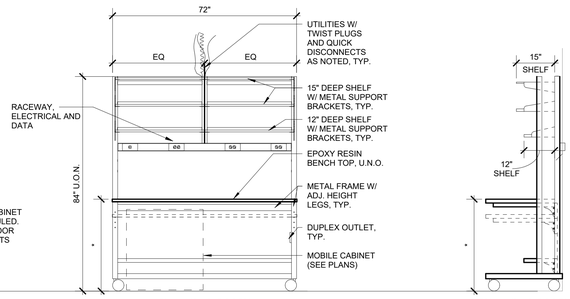


GAS CYLINDER RACK DETAIL

CASEWORK LEGEND







-TOPS ARE 30" DEEP FRONT TO BACK U.O.N. INSTALL TOPS AT 36" HEIGHT, U.O.N.*
(TOPS ARE TO BE ADJUSTABLE IN HEIGHT FROM 30" TO 36" ON ADJUSTABLE HEIGHT FRAMES)

FLEX BENCH ELEVATION

FLEXIBLE BENCHING MOBILE

LAB ABBREVIATIONS

A	COMPRESSED AIR
AFF	ABOVE FINISHED FLOOR
AR	ARGON
B	STANDING HEIGHT BASE CABINET
BOC	BOTTOM OF CEILING
BSC	BIOLOGICAL SAFETY CABINET
BTFMS	DEDICATED WIRED LAB EQUIPMENT MONITORING SYSTEM FOR BT GROUP
C	CORROSIVE CABINET
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CG	CORNER GUARD
CHW	CHILLED WATER
CO2	CARBON DIOXIDE
CS	CUP SINK
CSP	CEILING SERVICE PANEL
CW	COLD WATER
DC	DEDICATED CIRCUIT
DD	DOWNDRAFT, TYPE
DH	DRENCH HOSE
DI	DEIONIZED WATER, MEGAOHMS
DR	DRY RACK
(E)	EXISTING
E	UPS 3 CIRCUITS
ER	EPOXY RESIN
ES	EMERGENCY SHOWER
EW	EYE WASH
F	FLAMMABLE STORAGE CABINET
FC,FB	FLEXIBLE CART/BENCH, FT, ELEC, MATERIAL
FE	FIRE EXTINGUISHER (SURFACE MTD.)
FD	FLOOR DRAIN
FH	FUME HOOD
FMS	GENERAL WIRED LAB MONITORING SYSTEM
FP	FOOT PANEL
G	NATURAL GAS
H	STANDING HEIGHT SUSPENDED CABINET
H2O PUR	WATER PURIFIER
HE	HELIUM
HF	HANDS FREE
HW	HOT WATER
ICW	INDUSTRIAL COLD WATER
IHW	INDUSTRIAL HOT WATER
JR	JACKET RECEPTACLE
K	SITTING HEIGHT SUSPENDED CABINET
KS	KNEE SPACE
L	SITTING HEIGHT BASE CABINET
LF	LAB FURNISHINGS
LFC	LAB FURNISHINGS CONTRACTOR
LN2	LIQUID NITROGEN
LPC	LAB PLUMBING CONTRACTOR
MT	METAL
MC	MOBILE CABINET
MR	MOISTURE RESISTANT
(N)	NEW
N, N2	NITROGEN
NTS	NOT TO SCALE
O	OXYGEN
OFOI	OWNER FURNISHED OWNER INSTALLED
PGB	PEGBOARD
PD	PENCIL DRAWER
PH	PHENOLIC RESIN
PLAM	PLASTIC LAMINATE
PT	PAPER TOWEL DISPENSER
PW	PURIFIED WATER
RO	REVERSE OSMOSIS
SC-XX	SERVICE CARRIER, TYPE
S	SITTING HEIGHT SUSPENDED CABINET
SG	SPECIALTY GAS
SK	SINK, SINK CABINET
SST	STAINLESS STEEL
S.S.	SAFETY SHOWER
SU	SHELF UNIT
SNR	SNORKEL, TYPE
TCO	TELECOMMUNICATIONS CONNECTION OUTLET
UCF	UNDER COUNTER FREEZER
UCFS	UNDER COUNTER FREEZER SPACE
UCGS	UNDER COUNTER GLASSWASHER SPACE
UCR	UNDER COUNTER REFRIGERATOR (OFOI)
UCRS	UNDER COUNTER REFRIGERATOR SPACE
UMB	UMBILICAL PANELBOARD
UON	UNLESS OTHERWISE NOTED
T.O."X"	TABLES
T	TALL CABINET
V	VACUUM
VB	VACUUM BREAKER
VLE	VACUUM LINE ENCLOSURE
"X"V	VALVE GASES
W	WALL CABINET
WFMS	GENERAL WIRELESS LAB EQUIPMENT MONITORING SYSTEM
WR	WASTE RECEPTACLE
WP	WALL PHONE

LABORATORY FIT OUT GENERAL NOTES

1. CASEWORK & ARCHITECTURAL CONTRACTOR(S) SHALL CAREFULLY EXAMINE THE DRAWINGS AND SPECIFICATIONS TO PROPERLY DETERMINE CONTRACTUAL RESPONSIBILITIES.
2. FOR ACTUAL ROOM DIMENSIONS REFER TO FLOOR A-SERIES PLANS. CONTRACTOR SHALL FIELD CHECK ALL DIMENSIONS BEFORE FABRICATION.
3. OVERALL LENGTH OF TOPS SHALL BE DETERMINED BY CASEWORK DIMENSIONS AS INDICATED ON PLANS. SUCH LENGTHS SHALL REMAIN CONSTANT REGARDLESS OF SUCCESSFUL BIDDER'S STANDARDS. TOPS SHALL OVERHANG 1" AT EACH END AND 1" FROM THE FRONT OF BASE CABINET. WHEN OVERALL DIMENSIONS ARE GIVEN, 1" OVERHANG IS NOT INCLUDED.
4. OVERALL HEIGHT OF BASE CABINET TOPS MUST BE MAINTAINED AS SHOWN ON CABINET SCHEDULE.
5. INSTALLATION OF CASEWORK SHALL BEGIN AT THE HIGH POINT OF THE ROOM WITH THE LEVELERS IN AS FAR AS POSSIBLE.
6. COUNTERTOPS AND SPLASHES SHALL BE SCRIBED TO MATCH IRREGULARITIES AND CONTOURS OF WALLS.
7. CASEWORK SHALL BE INSTALLED ON TOP OF FINISHED FLOORING WHERE FLOOR FINISHES ARE SCHEDULED.
8. PROVIDE FINISHED BACK & END PANELS TO COMPLETE THE ENCLOSURE OF ALL CABINETRY TO WALLS AND ADJACENT CABINETRY. ALL FIXED CASEWORK TO HAVE REMOVABLE BACKS
9. REFER TO ELECTRICAL GENERAL NOTES, FOR ADDITIONAL INFORMATION.
10. PROVIDE EQUAL SIZED FILLERS AT WALLS WHERE CONTINUOUS RUN OF CASEWORK ABUTS TWO WALLS.
11. PROVIDE BRACKET AT ANY COUNTER OR SHELF SPANNING MORE THAN 4'-0" UNSUPPORTED. BRACKET SHALL BE A MAX OF 6" FROM ALL ENDS.
12. ALL SHELVING OVER 36" WIDE SHALL BE 1" THICK.
13. SEE INTERIOR ELEVATIONS AND CASEWORK LEGEND FOR LOCKING CONFIGURATIONS AND LOCATIONS.
14. ALL ISLAND/PENINSULA BENCHTOPS SHALL BE 34" DEEP U.O.N.
15. ALL BENCHES AND TABLES SHALL BE 36" HIGH U.O.N.
16. ALL BENCH/TABLE TOPS TO BE 1" THICK EPOXY RESIN U.O.N.
17. ALL BACK AND SIDE SPLASHES TO BE 3/4" THICK AND 4" HIGH, PIPEDROP CURBS TO BE 3/4" THICK AND 4" HIGH U.O.N.
18. PROVIDE SIDESPLASHES AT ALL BENCH TOPS AGAINST FUME HOODS, TALL CASEWORK, AND/OR ADJACENT WALLS.
19. ALL CASEWORK, FUME HOODS AND ANY OTHER FURNISHINGS WITH EXPOSED-TO-VIEW BACKS AND SIDES SHALL BE FINISHED. PROVIDE REMOVABLE CLOSURE PANELS AT ALL KNEE SPACES AND CHASE ENDS.
20. INSTALL CLOSURE PANELS BETWEEN BACK OF HOODS AND WALLS AT EXPOSED ENDS AND BETWEEN BASE CABINETS AND/OR HOODS THAT ARE SET BACK TO BACK. FOR BASE CABINETS, PROVIDE EXTENDED ENDS AT THESE LOCATIONS.
21. ALL PENETRATIONS THROUGH BENCHTOP SHALL BE SEALED WITH SEALANT.
22. BACKS OF COUNTERTOPS AND SPLASHES AGAINST WALLS SHALL BE SEALED TO THE WALL WITH SEALANT.
23. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION.
24. ARCHITECT WILL SELECT COLORS FOR ALL COMPONENTS OF PROJECT INDICATED ON THESE DRAWINGS. COLOR SELECTION WILL BE FROM THE CASEWORK MANUF STANDARD COLOR LINE.
25. FREE STANDING SHELVING AND CASEWORK LESS THAN 18" DEEP SHALL BE SECURED TO PREVENT TIPPING. SUBMIT SHOP DRAWINGS OF ATTACHMENT PRIOR TO INSTALLATION.
26. SAFETY SHOWER/EYEWASH UNITS SHALL COMPLY WITH ANSI STANDARDS FOR USABILITY BY THE PHYSICALLY DISABLED. SAFETY SHOWER/EYEWASH UNITS SHALL BE FURNISHED UNDER DIVISION 11 FOR INSTALLATION UNDER DIVISION 22.
27. FOR LABORATORY SERVICE FITTING TYPES, LOCATIONS, SEE LABORATORY SINK SCHEDULE AND SPECIFICATION SECTIONS 12 3553 (METAL LABORATORY CASEWORK)
28. LOCATION OF EQUIPMENT, SUCH AS FUME HOODS ANY OTHER ITEMS THAT MAY INTERFERE WITH LIGHTING, STRUCTURAL OR MECHANICAL SYSTEMS, SHALL BE CAREFULLY COORDINATED. NOTIFY OWNER'S REPRESENTATIVE OF DISCREPANCIES PRIOR TO PROCEEDING WITH WORK.
29. UNLESS OTHERWISE NOTED, ALL MISCELLANEOUS CHANNELS, BRACKETS. AND FITTINGS INDICATED ON ALL LABORATORY FURNISHINGS DRAWINGS SHALL BE SUPPLIED, INSTALLED AND PAINTED UNDER DIVISION 11.
30. CONTRACTOR SHALL EXAMINE ALL LABORATORY FURNISHINGS PLANS AND COORDINATE WITH REFLECTED CEILING PLANS FOR PROPER CEILING HEIGHTS AND PIPE DROP ENCLOSURE HEIGHTS AND LOCATIONS.
31. STRUCTURALLY ANCHORED AND SUSPENDED DEVICES WHICH REQUIRE COORDINATION WITH OTHER TRADES SHALL BE THE RESPONSIBILITY OF THE LABORATORY SUB CONTRACTOR TO COORDINATE WITH THE CONTRACTOR AND OTHER TRADES. U.O.N. ADDITIONAL FRAMING MAY BE REQUIRED TO ACCOMMODATE ANCHORAGE AROUND DUCTWORK OR OTHER OBSTRUCTIONS.
32. SERVICE FITTINGS SHOWN ON THE PLAN 'AQ' PLAN DRAWINGS ARE FOR LOCATION ONLY. REFER TO DETAILS AND SPECIFICATIONS FOR ACTUAL FITTINGS.
33. ELECTRICAL DEVICES SHALL BE PROVIDED UNDER DIVISION 26. ELECTRICAL DEVICES SHOWN ON THE 'AQ' DRAWINGS ARE FOR THE LOCATION OF CASEWORK CUTOUTS. DEVICES SHOWN AT FUME HOODS SHALL BE PROVIDED BY THE EQUIPMENT SUPPLIER.
34. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ITEMS RELATED TO REPAIRS NEEDED FOR EXISTING FUME HOOD CONTROLS AND OPERATION

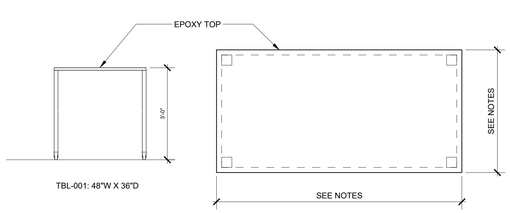


TABLE MOBILE - LOCKABLE CASTERS

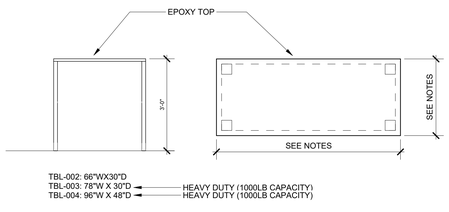
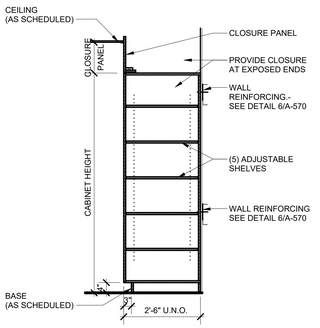
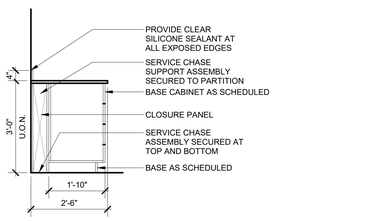


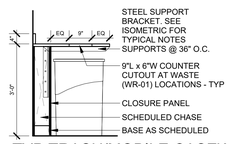
TABLE 2 GLIDE FEET



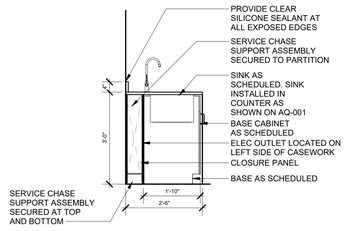
TALL CABINET SECTION -LAB PPE



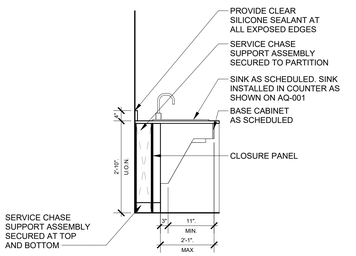
TYP BASE CASEWORK SECTION



TYP TRASH/MOBILE CASEWORK SECTION

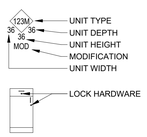


TYP SINK BASE SECTION



TYP ADA BASE SINK

CASEWORK LEGEND



UNIT TYPE AS DEFINED BY CDS (AWI/NAAWI CABINET DESIGN SERIES NUMBER)

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

2025-DD016-001

Lab Details

AQ-001

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:57:03 PM

HOOD SCHEDULE											
HOOD DESIGNATION	FACE VELOCITY (FPM)	CFM (AT 19 1/2" SASH OPENING)	MIN CFM	STATIC PRESSURE	EXHAUST COLLAR STYLE	SASH TYPE	SASH OPENING (OPERATION/SETUP)	CUP SINKS	SERVICES	NOTES	Type Comments
CH-5	80 FPM	1178	159	55	Round 10"	Vertical	14"/28"		VAC, CA		Fumehood
CO-3	80 FPM	1178	159	55	Round 10"	Combination	14"/28"	SK-02	VAC, CA, WATER		Fumehood
MS-10	80 FPM	1178	159	55	Round 10"	Combination	14"/28"	CS-01	VAC, CA, WATER		Fumehood

LAB GENERAL CFCI ACCESSORIES SCHEDULE			
Equip. No	Type	Furnished/ Installed By	Comments
HD-001	Hand Dryer World Dryer SMARTdri Series stainless steel K– 973P	CFCI	

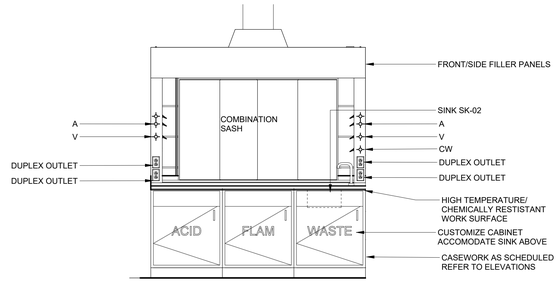
GENERAL NOTES

1. CONTRACTOR SHALL REVIEW AQ PLANS TO CONFIRM ALL QUANTITIES.
2. RESPONSIBILITY MATRIX:

DESCRIPTION	FURNISH	INSTALLED
A. METAL UTILITY PANEL	LAB SUPPLIER	LAB SUPPLIER
B. LAB SERVICE QUICK DISCONNECT	LAB SUPPLIER	LAB SUPPLIER
C. UTILITY PANEL HOLD DOWN CLIPS	LAB SUPPLIER	LAB SUPPLIER
D. JBOX FOR ELECTRICAL	ELEC. CONTRACTOR	ELEC. CONTRACTOR
E. FLEXIBLE SERVICE POWER	ELEC. CONTRACTOR	ELEC. CONTRACTOR
F. RIGID AIR/VAC/N2 PIPING BRANCHES	PLUMBING CONTRACTOR	PLUMBING CONTRACTOR

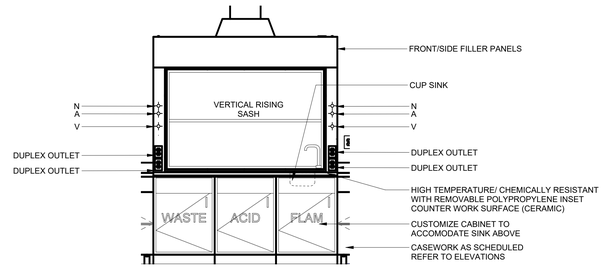
LAB SYMBOLS

- R — REGULAR BASE CABINET (UNDER HOOD)
- A/B — ACID/BASE CABINET
- V — VACUUM CABINET
- F — FLAMMABLE CABINET

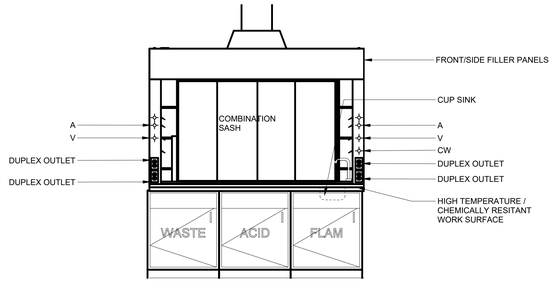


MET LAB 7FT FUME HOOD MS-10
(2100mm) WINDOW SIDE PANEL,
BOTH SIDES

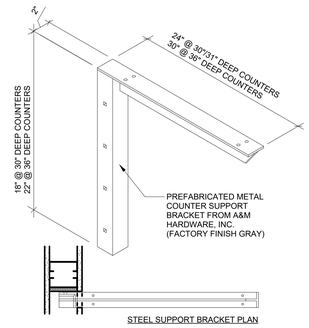
NOTE:
MANUFACTURER'S STANDARD ARRANGEMENT OF CONTROLS AT THE BOTTOM OF THE HOOD IS ACCEPTABLE.



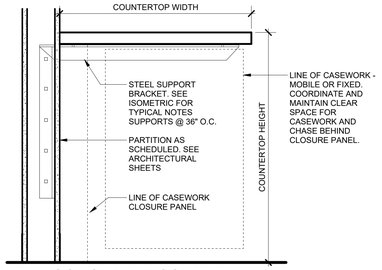
CHEM LAB 2 6FT FUME HOOD CH-5
(1800mm), WINDOW SIDE PANEL,
BOTH SIDES



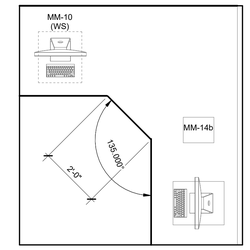
CHEM LAB 7FT FUME HOOD CO-3
(2100mm), WINDOW SIDE PANEL,
BOTH SIDES



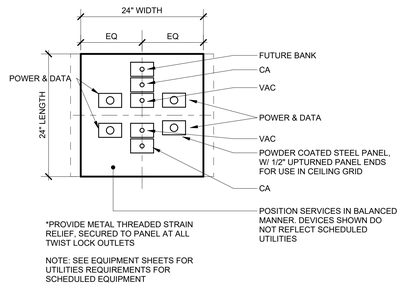
STEEL SUPPORT BRACKET PLAN



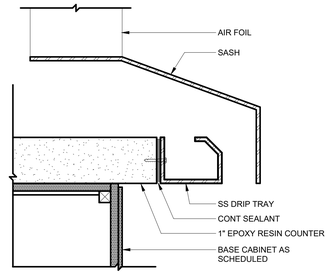
6 PREFAB CONCEALED COUNTER SUPPORT BRACKET
1 1/2" = 1'-0"



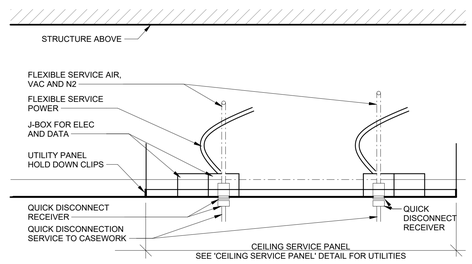
5 INTERNAL CORNER COUNTER DETAIL
1/2" = 1'-0"



4 CEILING SERVICE PANEL (CSP-01)
1" = 1'-0"



3 AIRFOIL DRIP TRAY
1 1/2" = 1'-0"



SECTION @ CEILING SERVICE PANEL

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

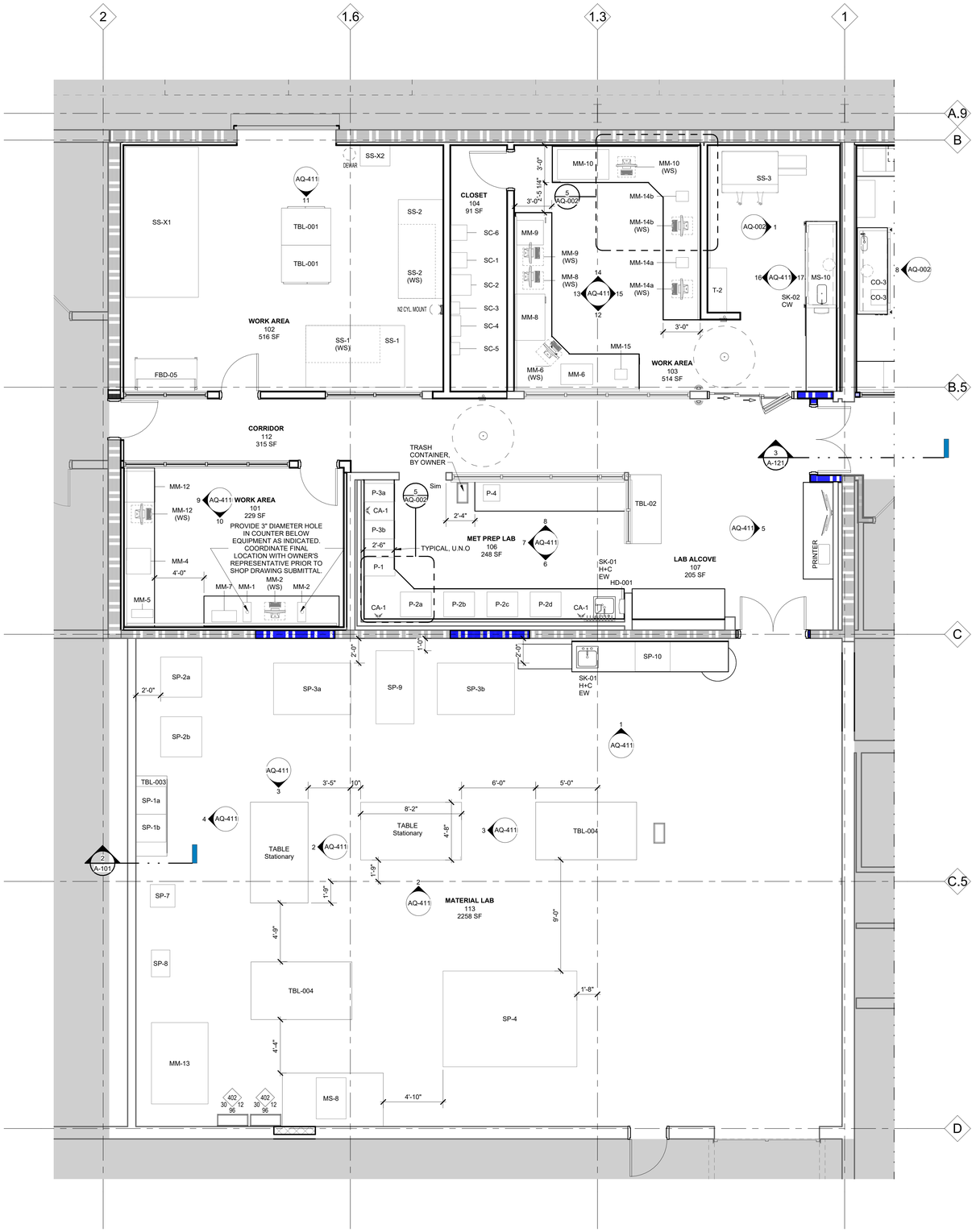
2025-DD016-001

Lab Details

AQ-002

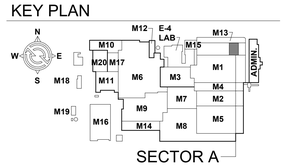
Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:57:05 PM



1 First Floor Plan Lab Area - A
1/4" = 1'-0"

KEY PLAN



SECTOR A

DETROIT

Detroit Diesel
Corporation

Detroit Diesel M1
Met Lab
Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL
LOCATION WHEN
JURISDICTION
STAMP
AT TOP

©2025

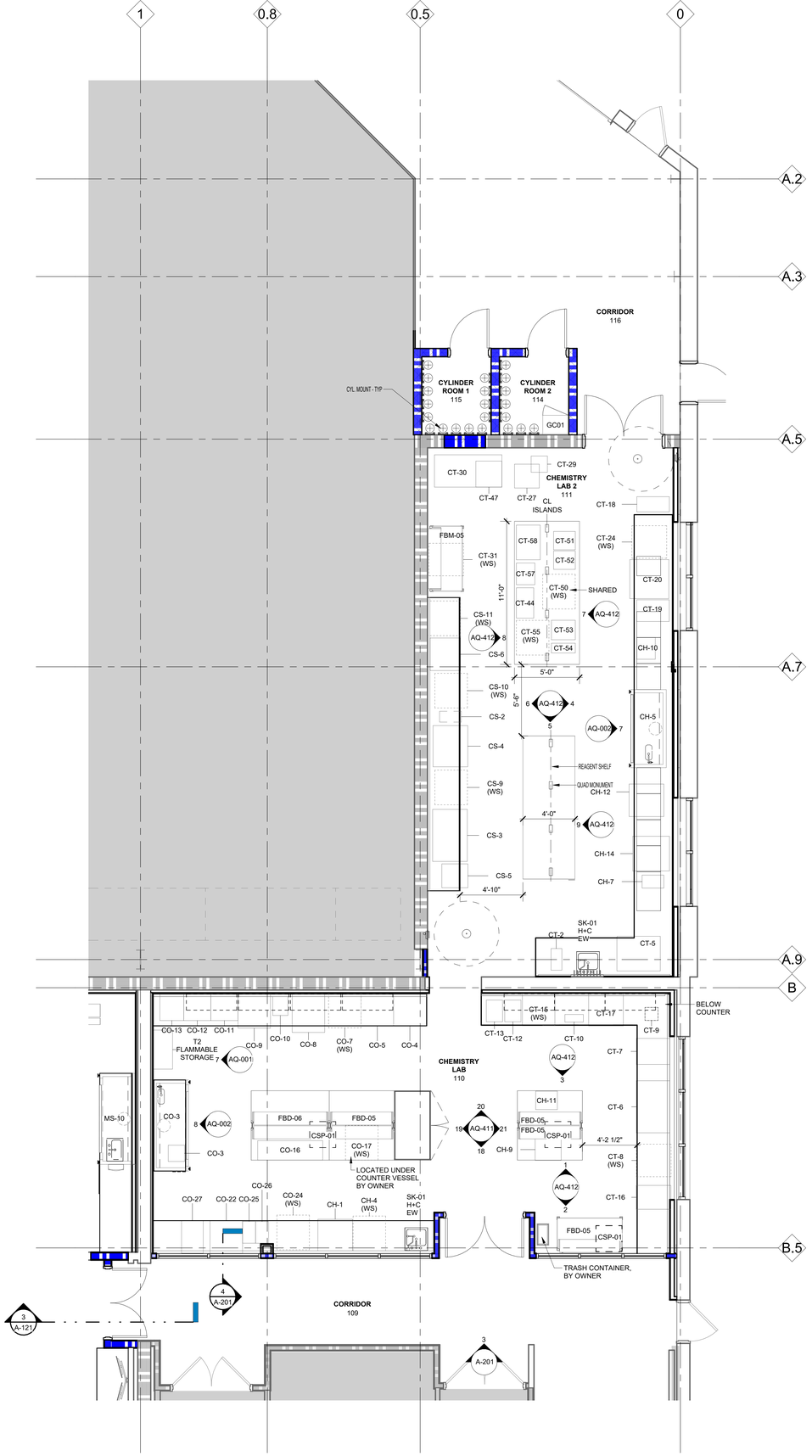
2025-DD016-001

First Floor Lab
Area - A

AQ-101A

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:57:07 PM



1 First Floor Plan Lab Area - B

1/4" = 1'-0"

DETROIT

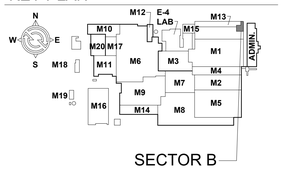
Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

KEY PLAN



SECTOR B

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

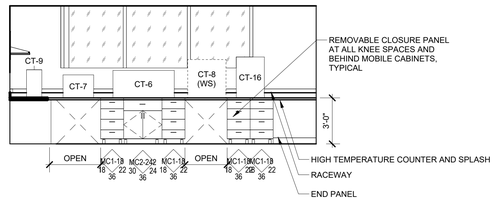
2025-DD016-001

First Floor Lab Area - B

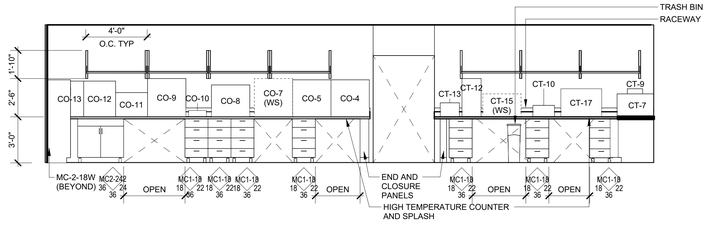
AQ-101B

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

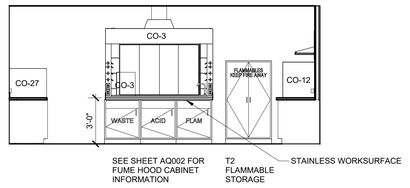
4/24/2026 3:57:12 PM



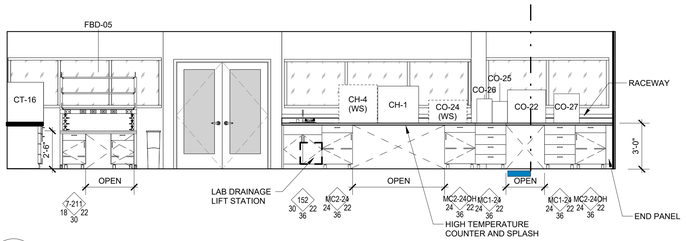
21 E Chemistry Lab 1
1/4" = 1'-0"



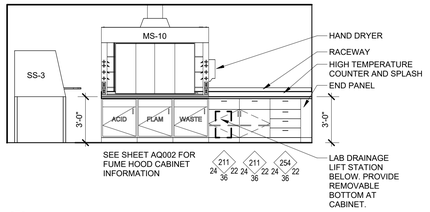
20 N Chemistry Lab 1
1/4" = 1'-0"



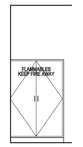
19 W Chemistry Lab 1
1/4" = 1'-0"



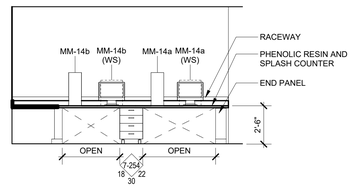
18 S Chemistry Lab 1
1/4" = 1'-0"



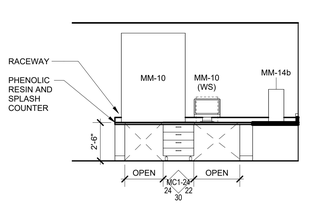
17 E Work Area 3
1/4" = 1'-0"



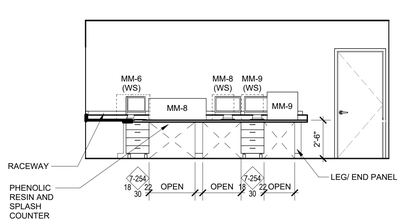
16 W Right Work Area 3
1/4" = 1'-0"



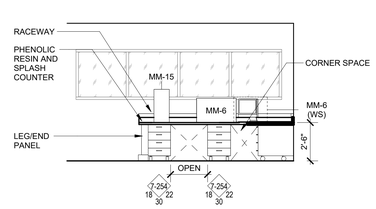
15 Center W Work Area 3
1/4" = 1'-0"



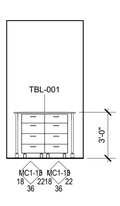
14 N Work Area 3
1/4" = 1'-0"



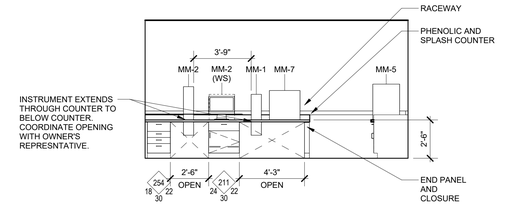
13 W Work Area 3
1/4" = 1'-0"



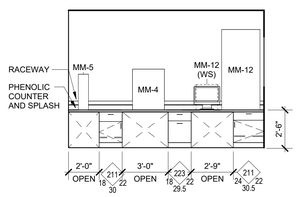
12 S Work Area 3
1/4" = 1'-0"



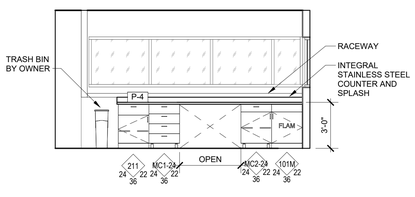
11 Center Work Area 2 -TYPICAL
1/4" = 1'-0"



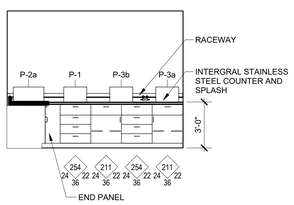
10 S Work Area 1
1/4" = 1'-0"



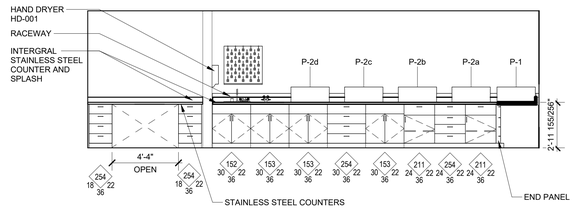
9 W Work Area
1/4" = 1'-0"



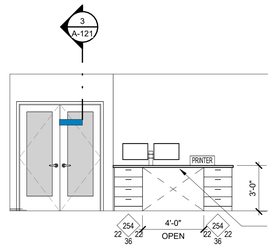
8 N Existing Met Prep Lab
1/4" = 1'-0"



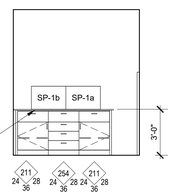
7 W Existing Met Preb Lab
1/4" = 1'-0"



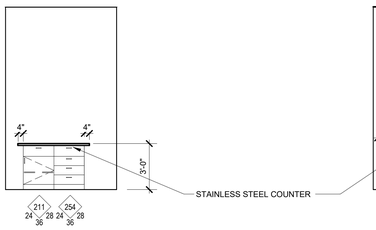
6 S Existing Met Prep Lab
1/4" = 1'-0"



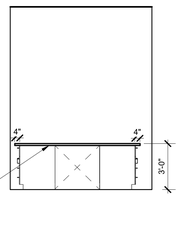
5 E Lab Alcove
1/4" = 1'-0"



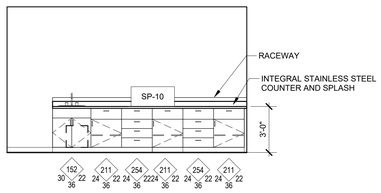
4 W Mechanical Lab
1/4" = 1'-0"



3 Central Mechanical Lab 2
1/4" = 1'-0"



2 Central Mechanical Lab
1/4" = 1'-0"



1 N Mechanical Lab
1/4" = 1'-0"

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

2025-DD016-001

Lab Elevations

AQ-411

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 3:57:15 PM

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

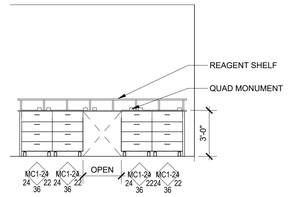
DETROIT

Detroit Diesel Corporation

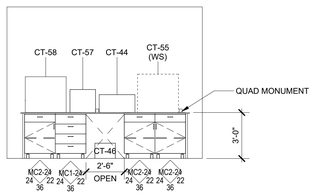
Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

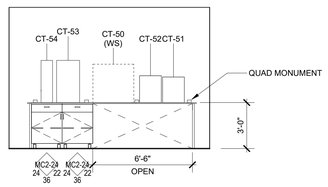
Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids



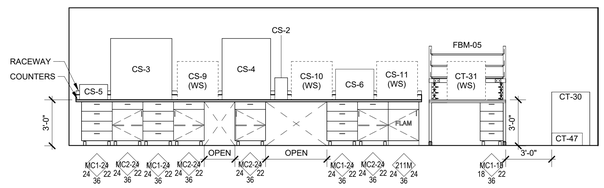
9 Chemistry Lab Central S
1/4" = 1'-0"



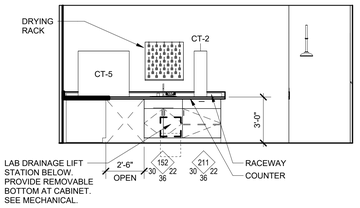
8 Chemistry Lab Central W
1/4" = 1'-0"



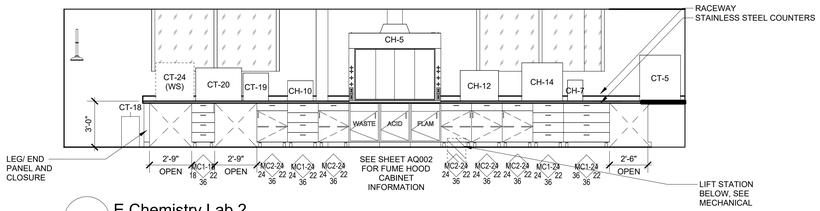
7 Chemistry Lab Central E
1/4" = 1'-0"



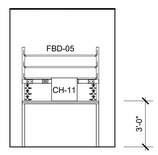
6 W Chemistry Lab 2
1/4" = 1'-0"



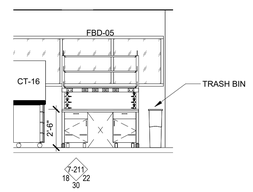
5 S Chemistry Lab 2
1/4" = 1'-0"



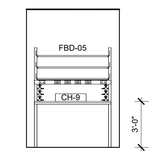
4 E Chemistry Lab 2
1/4" = 1'-0"



3 Central Chemistry Lab N
1/4" = 1'-0"



2 S Corner Chemistry Lab
1/4" = 1'-0"



1 Central Chemistry Lab S
1/4" = 1'-0"

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

2025-DD016-001

Lab Elevations

AQ-412

Lab Equipment Schedule - W

| IDENTIFICATION | | | | SPECIFICATION | | STATUS | | | OWNER (O) / CONTR (C) | | SIZE (INCHES/LBS) | | | | CLEARANCE (INCHES) | | | | | SPECIALTY REQUIREMENTS | | | ELECTRICAL | | | | | | | | | | | | | | | | TECH | | PLUMBING | | | | | | | | | | | | MECHANICAL | | UTILITIES | | | | | | | | | LAB EQUIPMENT GENERAL NOTES: |
|---|---|---

Lab Equipment Schedule - E

| IDENTIFICATION | | | | SPECIFICATION | | STATUS | | | OWNER (O) / CONTR (C) | | LOCATION | SIZE (INCHES/LBS) | | | | CLEARANCE (INCHES) | | | | | SPECIALTY REQUIREMENTS | | | ELECTRICAL | | | | | | | | | | | | | | | TECH | | PLUMBING | | | | | | | | | | MECHANICAL | | UTILITIES | | | | | | | | | LAB EQUIPMENT GENERAL NOTES: |
|---|---|---

4/24/2026 3:57:24 PM

Lab Equipment Schedule - WORKSTATIONS

IDENTIFICATION				SPECIFICATION		STATUS			OWNER (O) / CONTR (C)		SIZE (INCHES/LBS)				CLEARANCE (INCHES)					SPECIALTY REQUIREMENTS			ELECTRICAL												TECH		PLUMBING									MECHANICAL		UTILITIES								
ROOM NAME	ROOM #	EQ #	EQUIPMENT NAME	MANUFACTURER	MODEL	QUANTITY	EXISTING	NEW	FURNISH	INSTALL	LOCATION	WIDTH	LENGTH	HEIGHT	WEIGHT	TOP	LEFT	BACK	RIGHT	FRONT	SEISMIC	VIBRATION FREQUENCY (HZ)	RF/ RAD/ LASER SHIELDING	VOLTAGE	PHASE	AMPERAGE	WATTS	EMERGENCY POWER	UPS	DISCONNECT REQUIRED	HARDWIRED REQUIRED	CORD/PLUG REQUIRED	NEMA CONFIGURATION	DATA	AUDIO/ VISUAL	COLD	CHILLED	HOT	TEMPERATURE	STEAM	DRAIN	DISTILLED	PURIFIED WATER	EXHAUST	BTU	AIR (PSI)	LIQUID NITROGEN	NATURAL GAS	VACUUM	CO2	FLAMMABLE GAS	INERT GAS	SPECIALTY GAS	
CHEMISTRY LAB																																																							
CHEMISTRY LAB	110	CT-8 (WS)	FT-IR Workstation	N/A	Computer, Monitor, Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110, 110, 110	1	3, 0.5, 3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each, 1 Plug/ Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB	110	CH-4 (WS)	New TAN Workstation	N/A	Computer, Monitor, Ethernet Box	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110, 110	1	3, 0.5, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each, 1 Plug/ Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB	110	CO-17 (WS)	Oil Express Workstation	N/A	Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB	110	CT-15 (WS)	Rancimat/PC Workstation	N/A	Computer, Monitor, Monitor	1						2'-6"	2'-8"	1'-6"		0"	0"	0"	0"	0"				110, 110, 110	1	3, 0.5, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each, 1 Plug/ Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB	110	CO-7 (WS)	Viscometer Workstation	N/A	Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB 2																																																					
CHEMISTRY LAB 2	111	CS-11 (WS)	CHN Analyzer Workstation	N/A	Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB 2	111	CS-10 (WS)	GC-FID 2 Workstation	N/A	Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB 2	111	CS-9 (WS)	GC/MS & FID 1 Workstation	N/A	Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110,110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB 2	111	CT-50 (WS)	HPLC (MS) Workstation	N/A	Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB 2	111	CT-55 (WS)	HPLC/IC Workstation	N/A	Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB 2	111	CT-31 (WS)	Spectro ICP Workstation	N/A	Computer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	1'-3"	0"	1'-3"	0"				110, 110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
CHEMISTRY LAB 2	111	CT-24 (WS)	Thermo ICP Workstation	N/A	Conmputer, Monitor	1						2'-6"	2'-8"	2'-6"		0"	0"	0"	0"	0"				110, 110	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA																																																					
WORK AREA	101	MM-2 (WS)	Hardness Tester Workstation MM2 2	Nikon	Computer, Monitor	1						1'-5"	1'-8"	1'-8"		0"	0"	0"	0"	0"				115,115	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	101	MM-12 (WS)	Instron Work Station	Various	Computer, Monitor	1						1'-5"	1'-8"	1'-8"		0"	0"	0"	0"	0"				115, 115	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	102	SS-2 (WS)	FE SEM (Workstation with computer)	Various	Computer, Monitor	1						6'-0"	3'-0"	4'-2"		0"	0"	0"	0"	0"				115,115	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	102	SS-1 (WS)	SEM S-3400N Workstation	Various	Computer, Monitor	1						6'-0"	3'-0"	4'-2"		0"	0"	0"	0"	0"				115,115	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	103	MM-10 (WS)	Camera Station Work Station	Nikon	Computer, Monitor	1						1'-5"	1'-8"	1'-8"		0"	0"	0"	0"	0"				115, 115	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	103	MM-6 (WS)	Cleanliness Micro Workstation	Various	Computer, Monitor	1						1'-5"	1'-8"	1'-8"		0"	0"	0"	0"	0"				115, 115	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	103	MM-14a (WS)	Nikon Digital Stereoscope Workstation	Nikon	Computer, Monitor	1						1'-5"	1'-8"	1'-8"		0"	0"	0"	0"	0"				115, 115, 115, 115		N/A, 3,0.5,0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each, 1 Plug/ Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	103	MM-14b (WS)	Nikon Digital Stereoscope Workstation_b	Nikon		1						1'-5"	1'-8"	1'-8"		0"	0"	0"	0"	0"				115, 115, 115, 115		N/A, 3,0.5,0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each, 1 Plug/ Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	103	MM-9 (WS)	Nikon Eclipse MA200 Workstation	Nikon	Computer, Monitor	1						1'-5"	1'-8"	1'-8"		0"	0"	0"	0"	0"				115,115	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION
WORK AREA	103	MM-8 (WS)	Nikon Epiphot 200 Workstation	Nikon	Computer, Monitor	1						1'-5"	1'-8"	1'-8"		0"	0"	0"	0"	0"				115,115	1	3, 0.5						1 Plug/Receptacle Each, 1 Plug/Receptacle Each	NEMA 5-20R	YES	No				-														_WORKSTATION

LAB EQUIPMENT GENERAL NOTES:

1. FINAL PIPING CONNECTIONS AND PLUG CONFIGURATIONS TO BE COORDINATED BY EQUIPMENT VENDOR AND OWNDER PRIOR TO DELIVERY AND INSTALLATION.

2. HED IS NOT RESPONSIBLE FOR COORDINATION OF DETAILS OF CUSTOM INSTRUMENTATION FURTHER THAN IS INDICATED IN THIS SCHEDULE.

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
06/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

STAMP AND SEAL LOCATION WHEN JURISDICTION STAMP AT TOP

©2025

2025-DD016-001

Lab Equipment Schedule

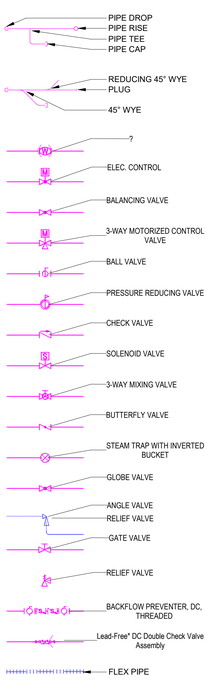
AQ-602

4/24/2026 7:33:34 AM

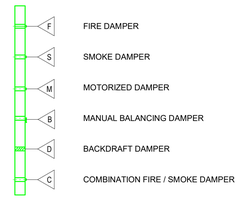
MECHANICAL PIPE SYSTEMS LEGEND

CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CD	CONDENSATE DRAIN
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
REF	REFRIGERANT
STM	STEAM

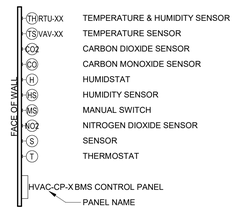
VALVE SYMBOLS



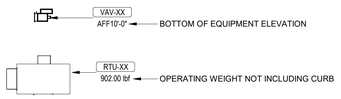
DAMPER LEGEND



SENSOR LEGEND

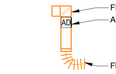


MECHANICAL EQUIPMENT LEGEND

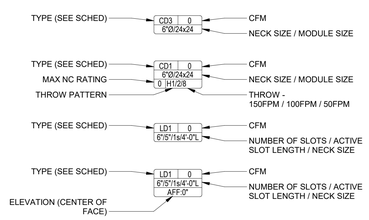


DUCT LEGEND

16"x8"	RECTANGULAR DUCT SIZE TAG (WIDTH x HEIGHT)
16"/8"	OVAL DUCT SIZE TAG (WIDTH/HEIGHT)
16"Ø	ROUND DUCT SIZE TAG (DIAMETER)
(E)16"x8"	EXISTING DUCT TAG
16"x8"	DUCT BEING DEMOLISHED
16"x8" S/A	SUPPLY AIR
16"x8" S-O/A	CONDITIONED OUTSIDE AIR
16"x8" O/A	OUTSIDE AIR
16"x8" R/A	RETURN AIR
16"x8" T/A	TRANSFER AIR
16"x8" E/A	EXHAUST AIR
16"x8" GE/A	GREASE EXHAUST AIR
16"x8" SE/A	SMOKE EXHAUST AIR
16"x8" FLUE	EXHAUST GAS FLUE
16"x8" C/A	COMBUSTION AIR
DROP	RETANGULAR SUPPLY/OUTSIDE AIR DUCT RISE
DROP	ROUND SUPPLY/OUTSIDE AIR DUCT RISE
DROP	RECTANGULAR RETURN/TRANSFER AIR DUCT RISE
DROP	ROUND RETURN/TRANSFER AIR DUCT RISE
DROP	RECTANGULAR EXHAUST/RELIEF AIR DUCT RISE
DROP	ROUND EXHAUST/RELIEF AIR DUCT RISE



AIR TERMINAL LEGEND



DUCTWORK CONSTRUCTION & APPLICATION TABLE

GENEREAL SUPPLY / RETURN / TRANSFER / EXHAUST

DUCT	PRESSURE CLASS (IN WG)	SMACNA SEAL CLASS	ASHRAE LEAK CLASS	MATERIAL	NOTES
SUPPLY FROM AHU TO ATU	+6	A	3	G-90	---
SUPPLY DOWNSTREAM FROM ATU	+2	A	N/A	G-90	---
RETURN IN SHAFTS TO RF	-3	A	3	G-90	---
RETURN BRANCHES	-2	C	N/A	G-90	---
TOILET & GENERAL EXHAUST	+3	C	3	G-90	---
ISOLATION RM EXHAUST	-2	A	3	G-90	---
DISCHARGE OF GENERAL EXHAUST ON ROOF	+/-3	A	3	G-90	---
PLENUMS	+/-6	A	3	SAME AS DUCTS SERVED	---
ISOLATION EXHAUST STACKS	+3	WELDED	0	316L S.S	1
ALL OTHER SUPPLY/RETURN/EXHAUST NOT SPECIFICALLY IDENTIFIED	+/-2	C	N/A	G-90	---

DUCT SIZING TABLE

SERVICE	MAXIMUM VELOCITY (FPM)	MAXIMUM PRESSURE DROP (IN WC / 100')
UNIT CONNECTION	2500	0.25
DUCT IN CURB	2200	0.2
RISER	2000	0.2
MAIN	1800	0.2
FLOOR BRANCH	1500	0.1
RUNOUT TO AIR TERMINAL	700	0.1

HYDRONIC PIPING SIZING TABLE

PIPE SIZE (IN)	FLOW RANGE (GPM)
1/2	NA
3/4	0.5 - 3.4
1	3.5 - 7.0
1-1/4	7.25 - 12.0
1-1/2	12.25 - 20.0
2	20.25 - 40.0
2-1/2	40.25 - 74.0
3	74.25 - 131.0
4	131.25 - 240.0
6	240.25 - 500.0

MECHANICAL ABBREVIATIONS

ACTYL	ACETYLENE
AR	ARGON
CO2	CARBON DIOXIDE
CA	COMPRESSED AIR
O2	OXYGEN
BFP	NATURAL GAS
BTU	BRITISH THERMAL UNIT
CC	COOLING COIL
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CV	CONSTANT VOLUME
CWP	CONDENSER WATER PUMP
CAV	CONSTANT AIR VOLUME
D	DRAIN
Db	DECIBELS
DB	DRY BULB TEMPERATURE
DDC	DIRECT DIGITAL CONTROL
DX	DIRECT EXPANSION
(E)	EXISTING
EA	EXHAUST
EF	EXHAUST FAN
EG	EXHAUST GRILLE
FCU	FAN COIL UNIT
FLR DRN	FLOOR DRAIN
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
F/S DPR	FIRE/SMOKE DAMPER
HC	HEATING COIL
HP	HORSE POWER
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
IN WG	INCHES OF WATER GAUGE
LPS	LOW PRESSURE STEAM
LPR	LOW PRESSURE CONDENSATE RETURN
MD	MOTORIZED DAMPER
MA	MIXED AIR
MVD	MANUAL VOLUME DAMPER
OA	OUTSIDE AIR
PD	PRESSURE DROP
PF	PRE-FILTER
PH	PHASE
POC	POINT OF CONNECTION
POD	POINT OF DISCONNECTION
PSI	POUNDS PER SQUARE INCH
RA	RETURN AIR
RG	RETURN GRILLE
RR	RETURN REGISTER
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SD	SMOKE DAMPER
SF	SUPPLY FAN
SP	STATIC PRESSURE
TG	TRANSFER GRILLE
TSTAT	THERMOSTAT
TU	TERMINAL UNIT
TYP	TYPICAL
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VSD	VARIABLE SPEED DRIVE
WB	WET BULB TEMPERATURE
WCU	WATER CHILLING UNIT
WH	WATER HEATER

MECHANICAL PIPING GENERAL NOTES

1. LOCATE ALL HOT WATER DUCT COILS AND TERMINAL UNITS OVER ACCESSIBLE CEILINGS. PROVIDE ACCESS PANELS WHERE NOT POSSIBLE. COORDINATE LOCATION OF ALL ACCESS PANELS WITH THE A/E FIELD REPRESENTATIVE OR OWNER.
2. DO NOT ROUTE ANY PIPING OVER ELECTRICAL EQUIPMENT OR THROUGH ELECTRICAL EQUIPMENT ROOMS UNLESS IT TERMINATES WITHIN AND SERVES THE ROOM.
3. PROVIDE ANCHORS AND PIPE GUIDES AT LOCATIONS SHOWN ON THE PLANS.
4. PROVIDE DIRT LEG AND STEAM TRAP AT ALL STEAM PIPE RISERS AND AT THE END OF MAINS AS SPECIFIED AND AS REQUIRED.
5. COORDINATE THE LOCATIONS AND SIZES OF ALL HOUSEKEEPING PADS.
6. NO PIPING OR EQUIPMENT SHALL BE REMOVED, DISCONNECTED OR SHUT DOWN WITHOUT PRIOR REVIEW WITH THE OWNER TO CONFIRM

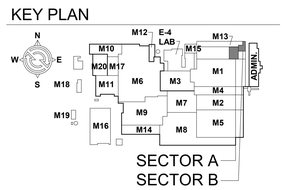
HVAC GENERAL NOTES

1. DUCTWORK UPSTREAM OF VAV/CV BOX SHALL MATCH THE BOX INLET, DOWNSTREAM OF A VAV/CV BOX SHALL MATCH THE BOX OUTLET (U.O.N.)
2. PROVIDE MINIMUM 18" CLEARANCE ON THE SIDE OF ALL TERMINAL UNITS FOR ACCESS CLEARANCE TO CONTROLLER.
3. PROVIDE TERMINAL UNITS WITH COIL CONNECTIONS AND CONTROLLER ON THE SAME SIDE.
4. LOCATE ALL DUCT COILS AND TERMINAL UNITS OVER ACCESSIBLE CEILINGS. PROVIDE ACCESS PANELS WHERE NOT POSSIBLE. COORDINATE LOCATION OF ALL ACCESS PANELS WITH A/E FIELD REPRESENTATIVE.
5. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH THE EQUIPMENT SUPPLIER AND PROVIDE ALL FINAL CONNECTIONS AS REQUIRED.
6. DO NOT ROUTE ANY DUCTWORK OVER ELECTRICAL EQUIPMENT OR THROUGH THE ELECTRICAL EQUIPMENT ROOMS UNLESS IT TERMINATES WITHIN AND SERVES THE ROOM.
7. FLEX DUCT SIZE SHALL MATCH NECK SIZE OF AIR INLET/OUTLET.
8. PROVIDE MANUAL VOLUME DAMPER WITH LOCKING QUADRANT IN BRANCH RUNOUT TO EACH SUPPLY, RETURN AND EACH EXHAUST GRILLE.
9. C.F.C.I. = "CONTRACTOR FURNISHED, CONTRACTOR INSTALLED". O.F.C.I. = "OWNER FURNISHED, CONTRACTOR INSTALLED". O.F.O.I. = "OWNER FURNISHED, OWNER INSTALLED".
10. ALL DUCTWORK ABOVE INACCESSIBLE CEILINGS SHALL BE RIGID STEEL; FLEXIBLE DUCT IS NOT ACCEPTABLE.
11. BOTTOM OF ALL DUCTWORK EXCLUDING RUNOUT TO AIR INLET/OUTLET SHALL BE A MINIMUM 6" ABOVE THE CEILING GRID.
12. SHADED AREA PORTIONS OF SUPPLY AIR DIFFUSERS INDICATE "NO THROW"
13. THE ARRANGEMENT OF EQUIPMENT AND DUCTWORK 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 AND SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OR ERECTION OF EQUIPMENT AND SYSTEMS. THIS INCLUDES ALL 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.
14. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN ITEMS INDICATED ON DRAWINGS AND SPECIFICATIONS WITH CODE REQUIREMENTS, THE MORE STRINGENT STANDARD SHALL PREVAIL.

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. REPLACE ANY EXISTING MATERIALS WHICH ARE DAMAGED DURING THE COURSE OF THE WORK.
3. DISRUPTION OF EXISTING SERVICES TO OTHER AREAS OF THE BUILDING MUST BE SCHEDULED AND COORDINATED TO MEET THE OWNERS REQUIREMENTS. WHEN WORKING IN OR ADJACENT TO OCCUPIED SPACES CONTRACTOR SHALL INCLUDE THE NECESSARY MEANS TO ISOLATE THE WORK AREA TO KEEP DUST AND DIRT WITHIN THE CONSTRUCTION AREA.
4. PATCH ADJACENT FINISHED SURFACES AND BUILDING COMPONENTS DISTURBED OR DAMAGED BY THE REMOVAL OF EXISTING MATERIALS USING NEW MATERIALS TO MATCH SIMILAR INSTALLATION AS OUTLINED THE SPECIFICATIONS. INSTALLATION SHALL BE BY EXPERIENCED INSTALLERS QUALIFIED UNDER SPECIFICATION REQUIREMENTS.
5. UNLESS NOTED OTHERWISE, REMOVE ALL HVAC, PLUMBING, PIPING, TEMPERATURE CONTROLS, COMPONENTS AND DISTRIBUTION SYSTEM IN THE PROJECT AREA. CAP ALL SERVICES AT MAINS.
6. REMOVE ALL HANGERS AND SUPPORTS FOR DEMOLISHED ITEMS.
7. DEMOLITION OF DUCTWORK AND PIPING MAY EXTEND BEYOND THE PROJECT BOUNDARIES TO FACILITATE CAPPING AT MAINS. REMOVE AND REINSTALL CEILING AS REQUIRED. REPLACE DAMAGED CEILING COMPONENTS, MATCH EXISTING TYPE.
8. REMOVE SPRINKLERS AND BRANCH PIPING TO SUPPORT NEW LAYOUT. INSTALL UPRIGHT SPRINKLERS DURING CONSTRUCTION.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

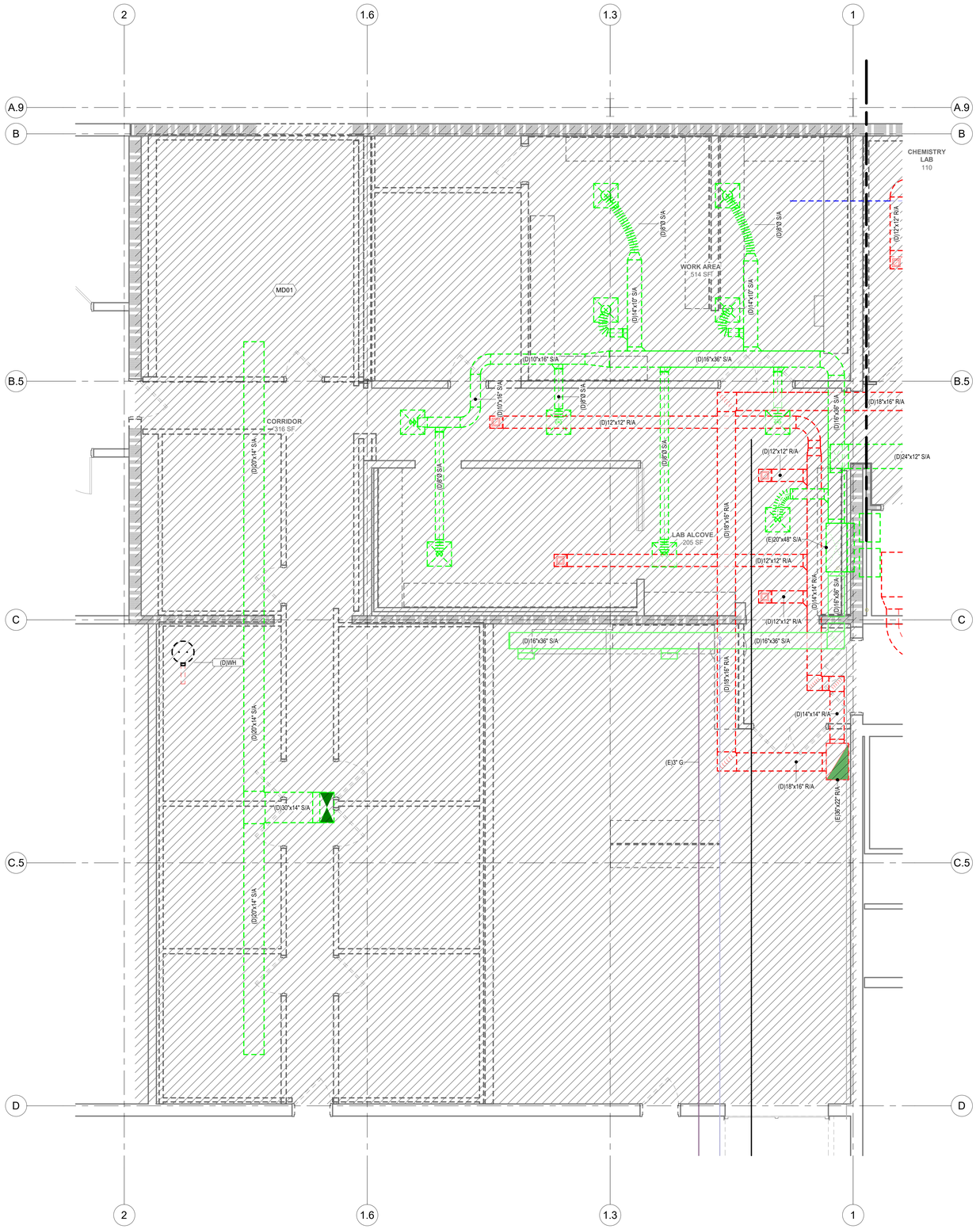
Mechanical Notes, Legends & Abbreviations

M-001

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:36 AM

MECHANICAL DEMOLITION KEYNOTES	
Key Value	Keynote Text
MD01	REMOVE EXISTING HVAC DUCTWORK, DIFFUSERS, TERMINAL DEVICES, AND ASSOCAITED CONTROLS WITHIN PROJECT SCOPE. NOTE: ALL DUCTWORK AND APPURTENANCES ARE NOT SHOWN ON PLAN, IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO MAKE THEMSELVES FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BID.

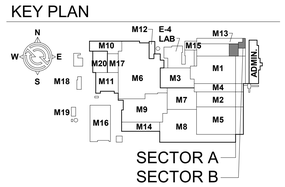


N

LEVEL 1 MECHANICAL DEMO PLAN - SECTOR A

1/4" = 1'-0"

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

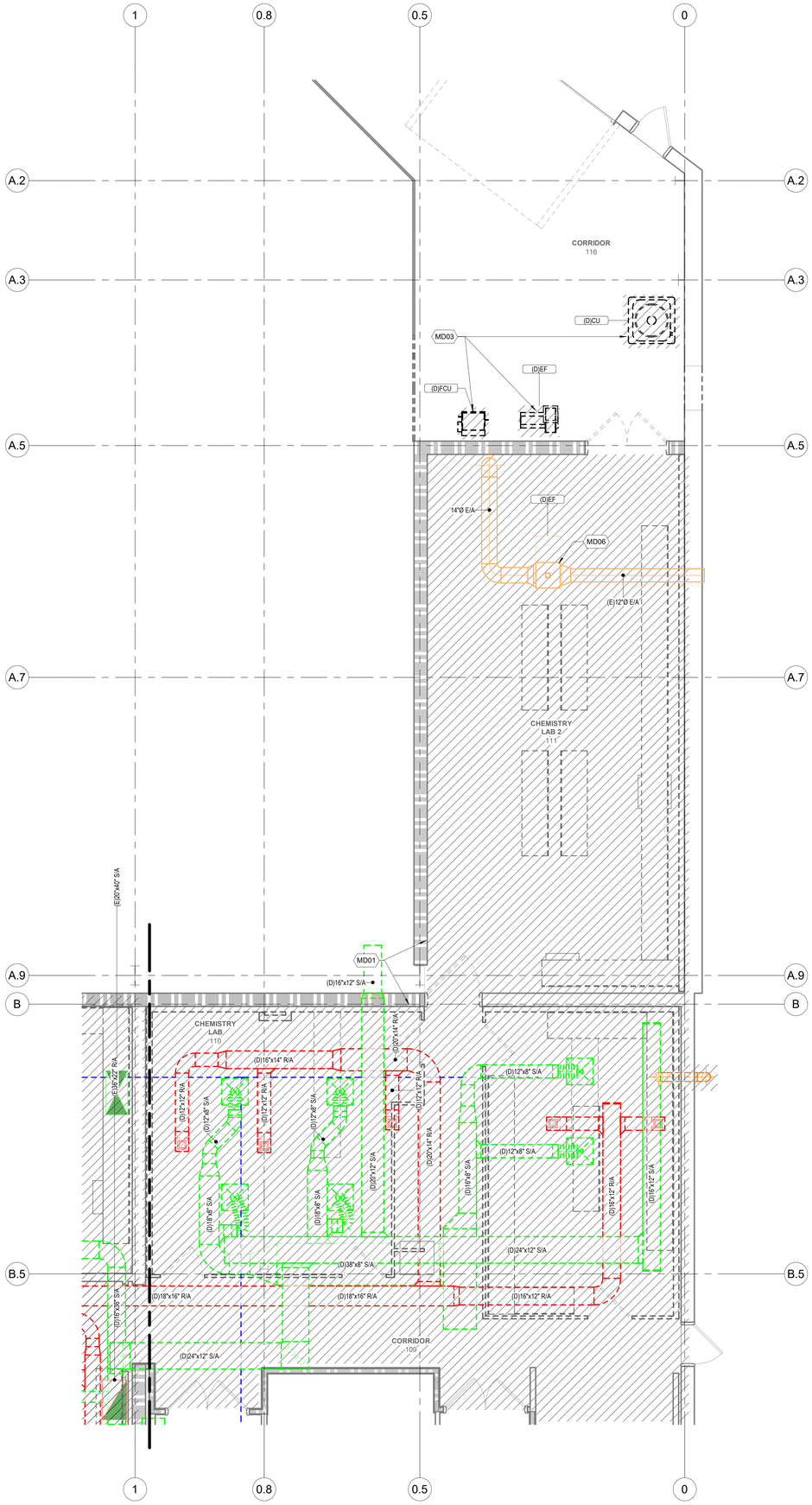
2025-DD016-001

Level 1 Mechanical Demo Plan - Sector A

MD101A

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:37 AM



LEVEL 1 MECHANICAL DEMO PLAN - SECTOR A

1/4" = 1'-0"

MECHANICAL DEMOLITION KEYNOTES	
Key Value	Keynote Text
MD01	REMOVE EXISTING HVAC DUCTWORK, DIFFUSERS, TERMINAL DEVICES, AND ASSOCAITED CONTROLS WITHIN PROJECT SCOPE. NOTE: ALL DUCTWORK AND APPURTENANCES ARE NOT SHOWN ON PLAN, IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO MAKE THEMSELVES FAMILIAR WITH EXISTING CONDITIONS PRIOR TO BID.
MD03	REMOVE EXISITNG CONDENSING UNIT AND ASSOCIATED PIPING, PAD, AND CONTROLS.
MD06	EXISTING EXHAUST FAN AND ASSOCIATED DUCTWORK TO REMAIN.

DETROIT

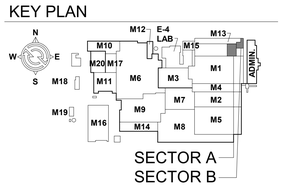
Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

KEY PLAN



SECTOR A
SECTOR B

©2025

2025-DD016-001

Level 1 Mechanical Demo Plan - Sector B

MD101B

HED

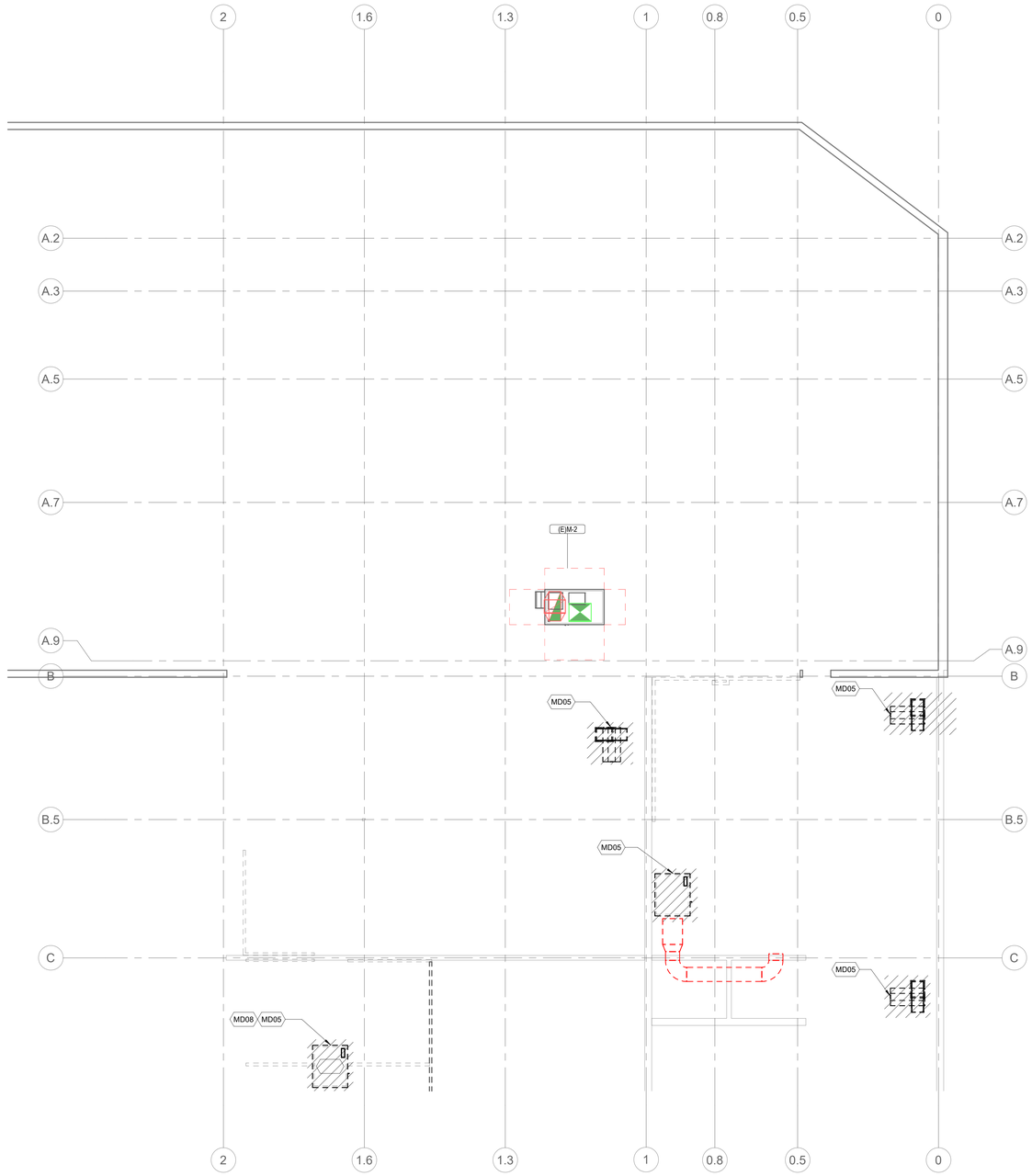
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:37 AM



MECHANICAL DEMOLITION KEYNOTES	
Key Value	Keynote Text
MD05	REMOVE EXISTING AIR VENTS IN EAVE SOFFIT. PATCH OPENING. REFER TO ARCHITECTURAL DRAWINGS.
MD08	CONTRACTOR SHALL REMOVE (E) RTU, PROTECT, PALLETIZE, AND RETURN TO OWNER.

N

ROOF MECHANICAL DEMO PLAN - OVERALL

1/8" = 1'-0"

DETROIT

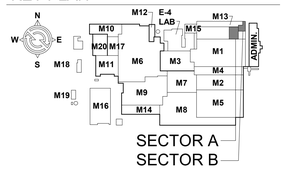
Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

KEY PLAN



©2025

2025-DD016-001

Roof Mechanical Demo Plan - Overall

MD191

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/28/2026 1:23:41 PM

N

LEVEL 1 COMPOSITE PLAN - OVERALL

1/4" = 1'-0"

SPACE CONTROL DIAGRAM LOCATION

- M-802-1
- M-802-1/M-802-3
- M-802-2

MECHANICAL KEYNOTES	
Key Value	Keynote Text
MH04	MOUNT H2 SENSOR AT CEILING LEVEL. SEE CONTROL DIAGRAM ON M-802. REFER TO GAS DETECTION DEVICE NETWORK ARCHITECTURE ON SHEET: MET-GD.
MH05	MOUNT O2 SENSOR AT 60" AFF. SEE CONTROL DIAGRAM ON SHEET M-802. REFER TO GAS DETECTION DEVICE NETWORK ARCHITECTURE ON SHEET: MET-GD.

N

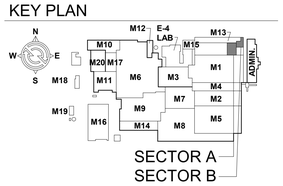
LEVEL 1 COMPOSITE PLAN - OVERALL

1/4" = 1'-0"

SPACE CONTROL DIAGRAM LOCATION

- M-802-1
- M-802-1/M-802-3
- M-802-3

KEY PLAN



SECTOR A
SECTOR B

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

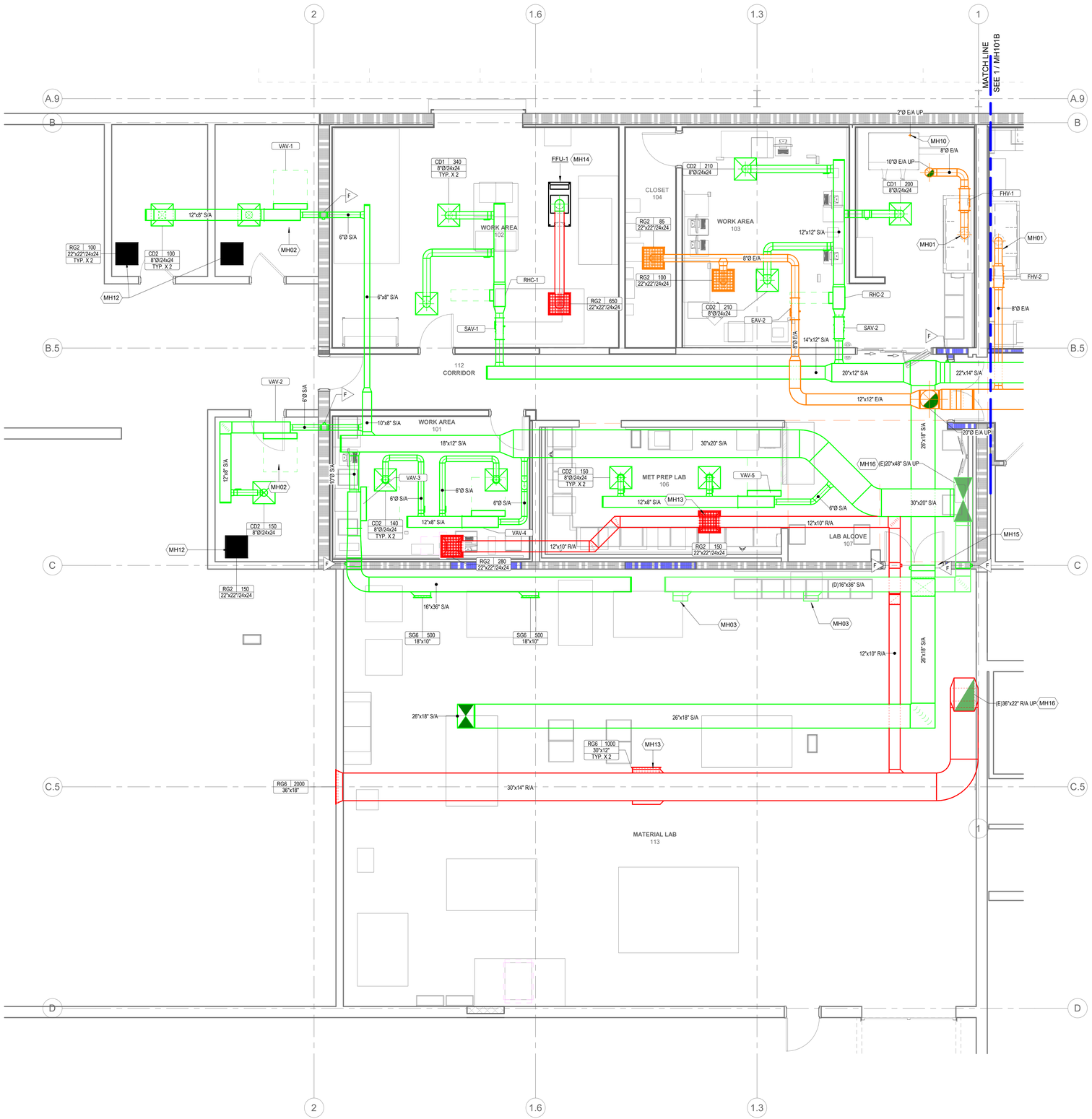
2025-DD016-001

Level 1 HVAC Control and Pressurization Plan

MH101

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:43 AM



N

LEVEL 1 HVAC PLAN - SECTOR A

1/4" = 1'-0"

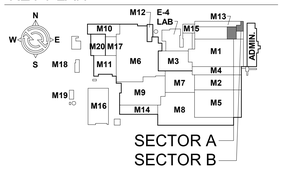
HVAC GENERAL NOTES

1. DUCTWORK UPSTREAM OF VAV/CV BOX SHALL MATCH THE BOX INLET. DOWNSTREAM OF A VAV/CV BOX SHALL MATCH THE BOX OUTLET (U.O.N.)
2. PROVIDE MINIMUM 18" CLEARANCE ON THE SIDE OF ALL TERMINAL UNITS FOR ACCESS CLEARANCE TO CONTROLLER.
3. PROVIDE TERMINAL UNITS WITH COIL CONNECTIONS AND CONTROLLER ON THE SAME SIDE.
4. LOCATE ALL DUCT COILS AND TERMINAL UNITS OVER ACCESSIBLE CEILINGS. PROVIDE ACCESS PANELS WHERE NOT POSSIBLE. COORDINATE LOCATION OF ALL ACCESS PANELS WITH A/E FIELD REPRESENTATIVE.
5. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH THE EQUIPMENT SUPPLIER AND PROVIDE ALL FINAL CONNECTIONS AS REQUIRED.
6. DO NOT ROUTE ANY DUCTWORK OVER ELECTRICAL EQUIPMENT OR THROUGH THE ELECTRICAL EQUIPMENT ROOMS UNLESS IT TERMINATES WITHIN AND SERVES THE ROOM.
7. FLEX DUCT SIZE SHALL MATCH NECK SIZE OF AIR INLET/OUTLET.
8. PROVIDE MANUAL VOLUME DAMPER WITH LOCKING QUADRANT IN BRANCH RUNOUT TO EACH SUPPLY, RETURN AND EACH EXHAUST GRILLE.
9. C.F.C.I. = "CONTRACTOR FURNISHED, CONTRACTOR INSTALLED". O.F.C.I. = "OWNER FURNISHED, CONTRACTOR INSTALLED". O.F.O.I. = "OWNER FURNISHED, OWNER INSTALLED".
10. ALL DUCTWORK ABOVE INACCESSIBLE CEILINGS SHALL BE RIGID STEEL; FLEXIBLE DUCT IS NOT ACCEPTABLE.
11. BOTTOM OF ALL DUCTWORK EXCLUDING RUNOUT TO AIR INLET/OUTLET SHALL BE A MINIMUM 6" ABOVE THE CEILING GRID.
12. SHADED AREA PORTIONS OF SUPPLY AIR DIFFUSERS INDICATE "NO THROW"
13. THE ARRANGEMENT OF EQUIPMENT AND DUCTWORK 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 AND SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OR ERECTION OF EQUIPMENT AND SYSTEMS. THIS INCLUDES ALL 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.
14. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN ITEMS INDICATED ON DRAWINGS AND SPECIFICATIONS WITH CODE REQUIREMENTS, THE MORE STRINGENT STANDARD SHALL PREVAIL.

MECHANICAL KEYNOTES

Key Value	Keynote Text
MH01	10" CONNECTION TO 7" FUME HOOD - 735 CFM
MH02	VAV BOX SERVING OFFICE SPACE IN ADJACENT HIGH BAY AREA. PROVIDE CEILING SUPPLY DIFFUSER SD-1 AND THERMOSTAT IN EACH SPACE.
MH03	EXISTING GRILLE. BALANCE TO 500 CFM
MH10	GLOVE BOX PURGE DUCT. PROVIDE BACKDRAFT DAMPER PROTECTION.
MH12	PROVIDE RETURN BOOT ABOVE OFFICE TO OPEN AREA.
MH13	RETURN REGISTERS AND GRILLES SHALL HAVE MANUAL BALANCE DAMPERS FOR BALANCING IN ALL SPACES.
MH14	FAN FILTER UNIT SHALL HAVE RETURN DUCT CONNECTED TO INLET. FAN FILTER UNIT SHALL RECIRCULATE AIR WITHIN SPACE DURING OCCUPIED HOURS (ADJ.). HANG FROM ABOVE USING ALL THREAD ROD, PROVIDE ROD STIFFENERS FOR SUSPENSIONS LONGER THAN 8'.
MH15	REFER TO ARCHITECTURAL AND STRUCTURAL FOR PENETRATIONS THROUGH BLOCK WALL DETAIL. TYP.
MH16	DUCTWORK TO (E) M2 UNIT, CONNECT DUCT AT SECOND FLOOR LEVEL.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

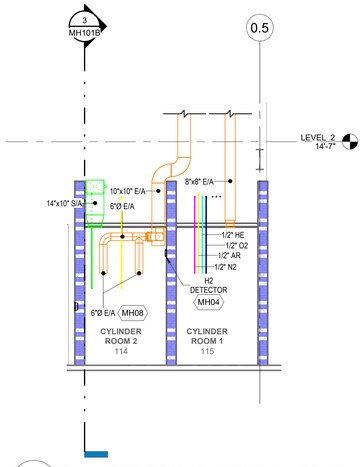
2025-DD016-001

Level 1 HVAC Plan - Sector A

MH101A

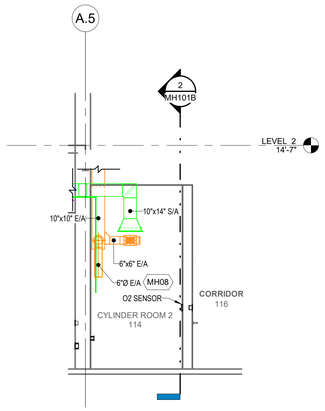
Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:46 AM



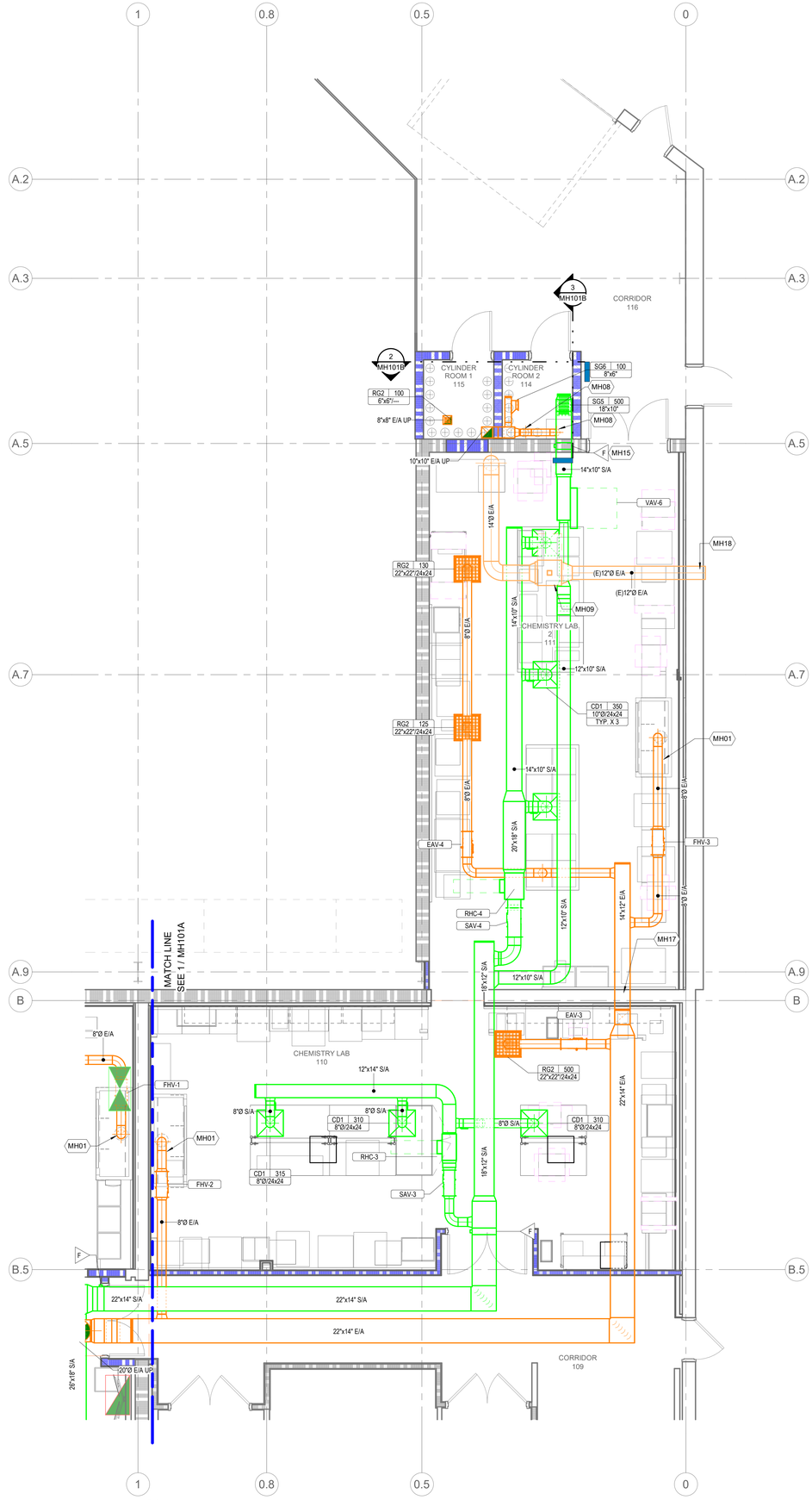
2 CYLINDER ROOMS - SECTION SOUTH

1/4" = 1'-0"



3 CYLINDER ROOM 2 - SECTION WEST

1/4" = 1'-0"



N

LEVEL 1 HVAC PLAN - SECTOR B

1/4" = 1'-0"

HVAC GENERAL NOTES

1. DUCTWORK UPSTREAM OF VAV/CV BOX SHALL MATCH THE BOX INLET. DOWNSTREAM OF A VAV/CV BOX SHALL MATCH THE BOX OUTLET (U.O.N.)
2. PROVIDE MINIMUM 18" CLEARANCE ON THE SIDE OF ALL TERMINAL UNITS FOR ACCESS CLEARANCE TO CONTROLLER.
3. PROVIDE TERMINAL UNITS WITH COIL CONNECTIONS AND CONTROLLER ON THE SAME SIDE.
4. LOCATE ALL DUCT COILS AND TERMINAL UNITS OVER ACCESSIBLE CEILINGS. PROVIDE ACCESS PANELS WHERE NOT POSSIBLE. COORDINATE LOCATION OF ALL ACCESS PANELS WITH A/E FIELD REPRESENTATIVE.
5. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH THE EQUIPMENT SUPPLIER AND PROVIDE ALL FINAL CONNECTIONS AS REQUIRED.
6. DO NOT ROUTE ANY DUCTWORK OVER ELECTRICAL EQUIPMENT OR THROUGH THE ELECTRICAL EQUIPMENT ROOMS UNLESS IT TERMINATES WITHIN AND SERVES THE ROOM.
7. FLEX DUCT SIZE SHALL MATCH NECK SIZE OF AIR INLET/OUTLET.
8. PROVIDE MANUAL VOLUME DAMPER WITH LOCKING QUADRANT IN BRANCH RUNOUT TO EACH SUPPLY, RETURN AND EACH EXHAUST GRILLE.
9. C.F.C.I. = "CONTRACTOR FURNISHED, CONTRACTOR INSTALLED". O.F.C.I. = "OWNER FURNISHED, CONTRACTOR INSTALLED". O.F.O.I. = "OWNER FURNISHED, OWNER INSTALLED".
10. ALL DUCTWORK ABOVE INACCESSIBLE CEILINGS SHALL BE RIGID STEEL; FLEXIBLE DUCT IS NOT ACCEPTABLE.
11. BOTTOM OF ALL DUCTWORK EXCLUDING RUNOUT TO AIR INLET/OUTLET SHALL BE A MINIMUM 6" ABOVE THE CEILING GRID.
12. SHADED AREA PORTIONS OF SUPPLY AIR DIFFUSERS INDICATE "NO THROW"
13. THE ARRANGEMENT OF EQUIPMENT AND DUCTWORK 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 AND SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OR ERECTION OF EQUIPMENT AND SYSTEMS. THIS INCLUDES ALL 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.
14. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN ITEMS INDICATED ON DRAWINGS AND SPECIFICATIONS WITH CODE REQUIREMENTS, THE MORE STRINGENT STANDARD SHALL PREVAIL.

MECHANICAL KEYNOTES	
Key Value	Keynote Text
MH01	10" CONNECTION TO 7' FUME HOOD - 735 CFM
MH04	MOUNT H2 SENSOR AT CEILING LEVEL. SEE CONTROL DIAGRAM ON M-802.
MH08	6" EXHAUST TO VENTILATED CYLINDER CABINET - 250 CFM
MH09	EXISTING EXHAUST FAN AND DUCTWORK - 360 CFM
MH15	REFER TO ARCHITECTURAL AND STRUCTURAL FOR PENETRATIONS THROUGH BLOCK WALL DETAIL. TYP.
MH17	COORDINATE WALL OPENINGS WITH ARCHITECTURAL PLANS. DUCT PENETRATION SHALL BE FRAMED, AND SEALED TIGHT. TYP.
MH18	TERMINATE DUCT APPROX. 13' ABOVE FINISHED GRADE. PROVIDE STAINLESS STEEL BIRDSCREEN AND WALL ESCUTCHEON.

DETROIT

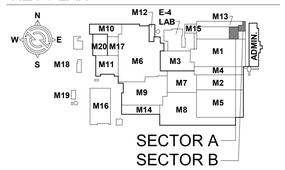
Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

KEY PLAN



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

©2025

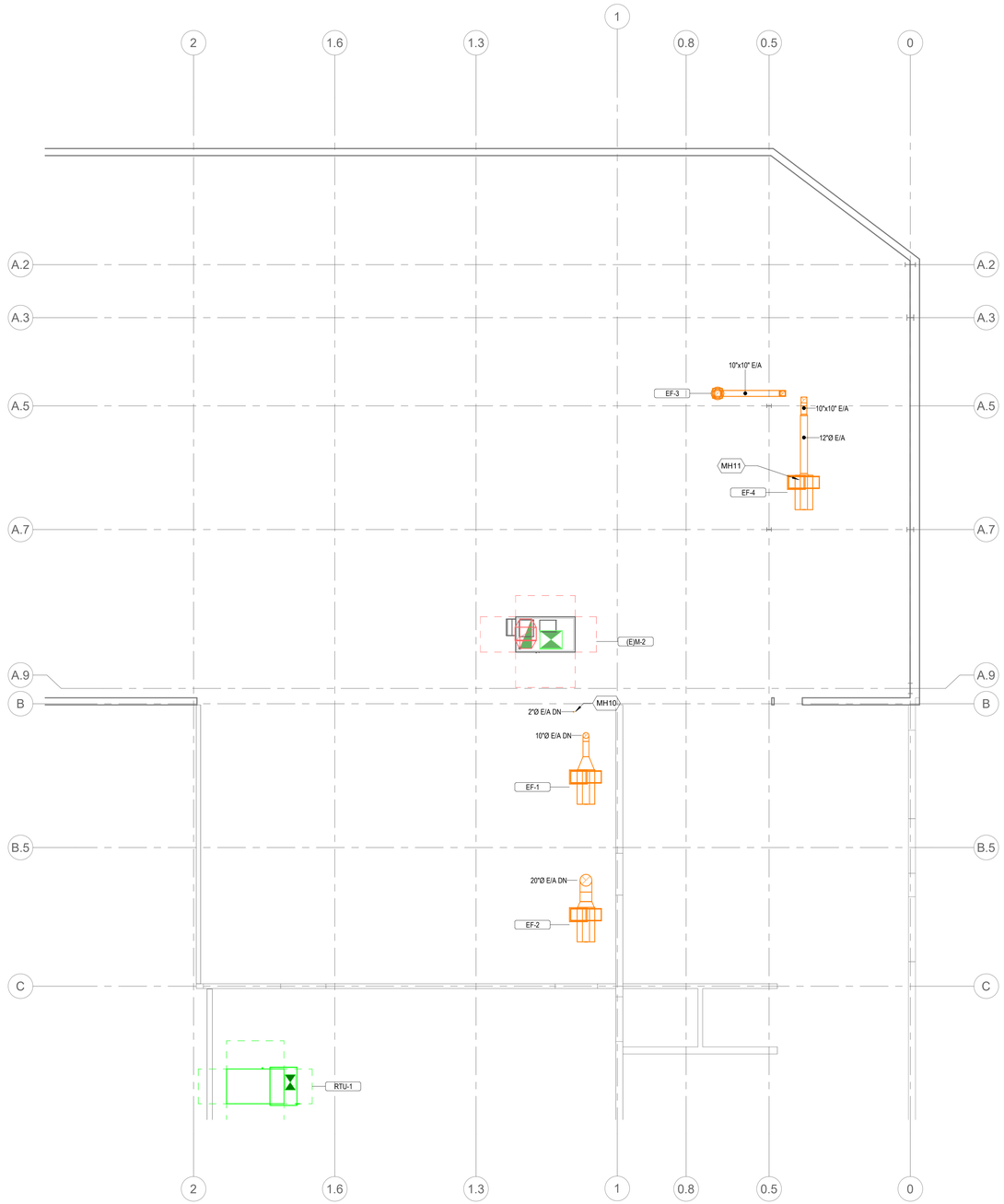
2025-DD016-001

Level 1 HVAC Plan - Sector B

MH101B

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:47 AM



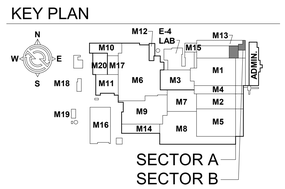
N

ROOF HVAC PLAN

1/8" = 1'-0"

00_Keynotes-Mechanical	
Key Value	Keynote Text
MH10	GLOVE BOX PURGE DUCT. PROVIDE BACKDRAFT DAMPER PROTECTION.
MH11	PROVIDE 15' CLEARANCE AROUND EF-4 TO MECHANICAL / ELECTRICAL EQUIPMENT.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

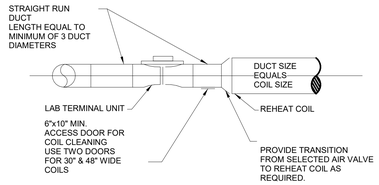
2025-DD016-001

Roof HVAC Plan

MH191

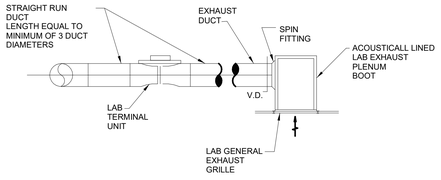
Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:48 AM



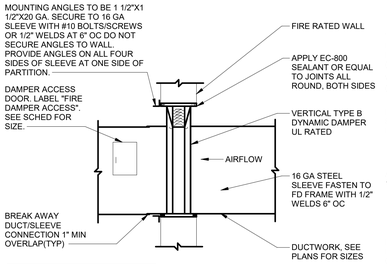
15 TYPICAL LAB SUPPLY TERMINAL UNIT DETAIL

NTS



14 TYPICAL LAB EXHAUST TERMINAL UNIT DETAIL

NTS



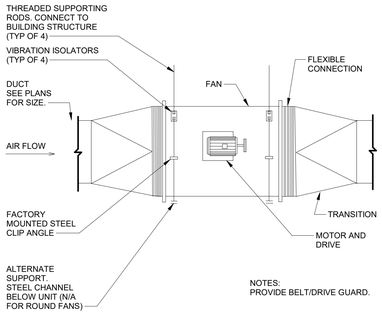
ACCESS DOOR PANEL SCHED	
DUCT WIDTH	PANEL WIDTH
UP TO 12"	6"X12"
13 TO 24"	12"X12"
25" & OVER	18"X12"

NOTE:
INSTALL FIRE DAMPER IN ACCORDANCE WITH NFPA 90A AND NFPA 80.

PROVIDE ACCESS PANELS WHERE FIRE RATED DAMPERS ARE INSTALLED ABOVE HARD CEILINGS. COORDINATE LOCATIONS WITH REFLECTED CEILING PLAN AND ARCHITECTURAL TRADES.

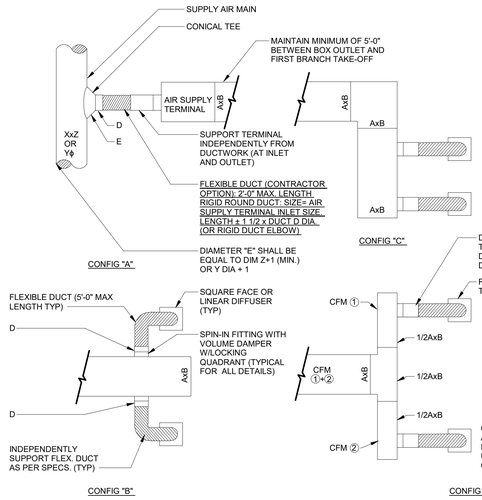
7 VERTICAL FIRE DAMPER AT WALL

NOT TO SCALE



4 INLINE FAN

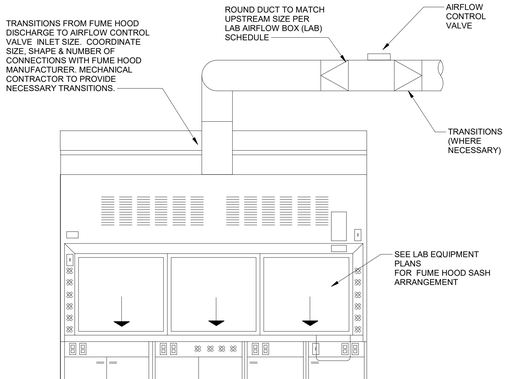
NOT TO SCALE



NOTE:
1. AXB = OUTLET SIZE OF TERMINAL BOX PER MANUFACTURER AND CFM (PER DRAWINGS). EXTEND AXB DUCT FROM BOX FOR FULL LENGTH OF LOW PRESSURE DUCT, UNLESS OTHERWISE NOTED ON PLANS.

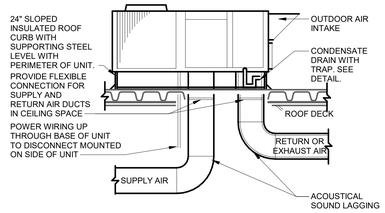
12 SUPPLY AIR TERMINAL DUCT CONNECTIONS

NOT TO SCALE



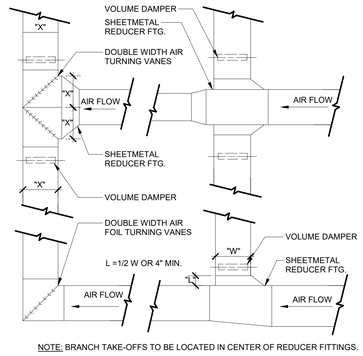
13 TYPICAL FUME HOOD EXHAUST CONNECTION DETAIL

NTS



6 ROOF TOP UNIT

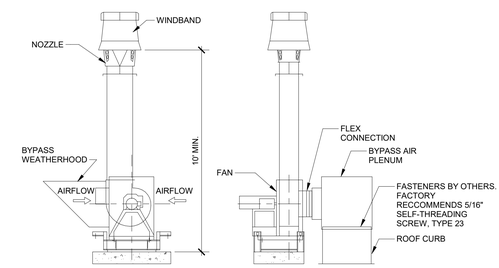
NOT TO SCALE



NOTE: BRANCH TAKE-OFFS TO BE LOCATED IN CENTER OF REDUCER FITTINGS.

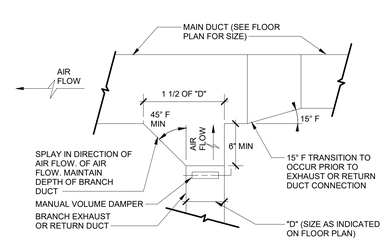
3 SUPPLY AIR DUCT CONNECTION DETAILS

NOT TO SCALE



11 LAB FUME EXHAUST FAN DETAIL

NOT TO SCALE



9 EXHAUST OR RETURN AIR BRANCH DUCT CONNECTION DETAIL

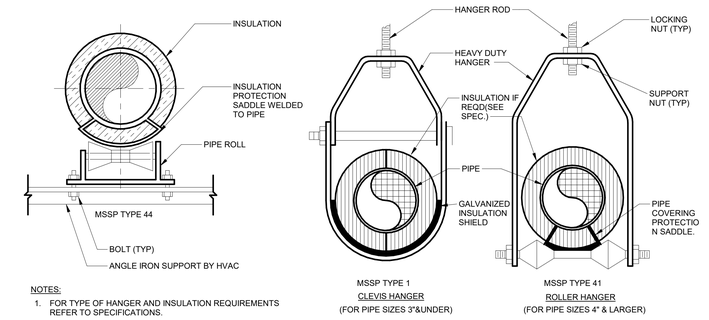
NOT TO SCALE

5 ROOF EXHAUST FAN

NOT TO SCALE

2 DUCT ACCESS DOORS & PRESSURE RELIEF DOORS

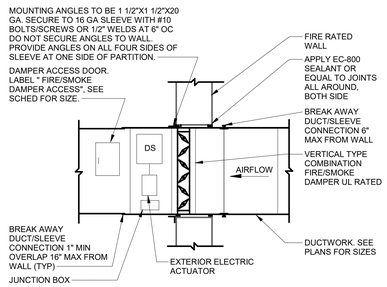
NOT TO SCALE



NOTES:
1. FOR TYPE OF HANGER AND INSULATION REQUIREMENTS REFER TO SPECIFICATIONS.

10 PIPE HANGER DETAILS

NOT TO SCALE

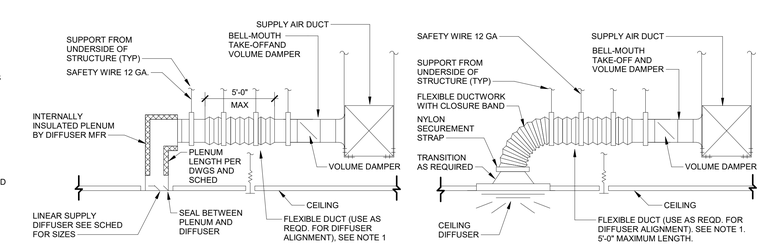


ACCESS DOOR PANEL SCHED	
DUCT WIDTH	PANEL WIDTH
UP TO 12"	6"X12"
13 TO 24"	12"X12"
25" & OVER	18"X12"

NOTE:
INSTALL FIRE DAMPER IN ACCORDANCE WITH NFPA 90A AND NFPA 80.

8 VERITCAL FIRE-SMOKE DAMPER AT WALL

NOT TO SCALE



NOTES:
1. MAXIMUM SAG 1/2" PER FOOT FOR ALL FLEXIBLE DUCTWORK. INFORMATION GIVEN ON EACH TYPE OF INSTALLATION SHALL BE CONSIDERED TYPICAL FOR BOTH UNLESS SPECIFICALLY STATED OTHERWISE.

1 TYPICAL DIFFUSER CONNECTIONS

NOT TO SCALE

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

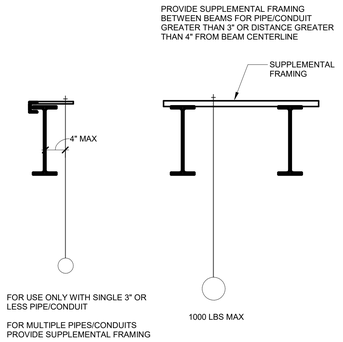
2025-DD016-001

Mechanical Details

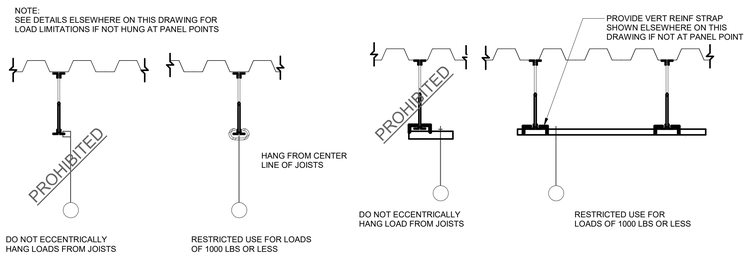
M-501

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:48 AM



12 TYPICAL HANGER SUPPORT
NOT TO SCALE

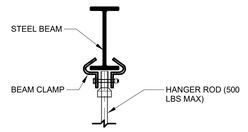


10 TYPICAL HANGER TO STEEL JOIST
NOT TO SCALE

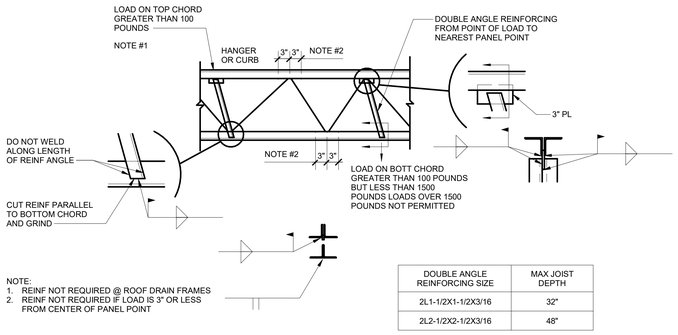
7 TYPICAL HANGER SUPPORT @ STEEL JOIST BOTTOM CHORD
NOT TO SCALE

HANGERS TO STEEL BEAMS AND JOISTS:

A. LOADS INDICATED REFER TO THE SUMMATION OF ALL TRADES (CONDUITS, PIPING, DUCTS, ETC).
B. LOADS INDICATED ARE THE TOTAL FOR ALL TRADES PER JOISTS PANEL.
C. ECCENTRIC HANGERS TO BE USED ONLY AS INDICATED.
D. JOISTS FOR EXISTING STRUCTURES:
   a. DO NOT HANG AT LOCATIONS OTHER THAN PANEL POINTS.
      - EXCEPTION: WHERE A REINFORCING STRAP IS PROVIDED. LOADS MAY BE SUPPORTED BETWEEN PANEL POINTS.
E. JOISTS FOR NEW CONSTRUCTION:
   a. DO NOT HANG LOADS GREATER THAN 250 LBS AT LOCATIONS OTHER THAN PANEL POINTS.
      - EXCEPTION: WHERE A REINFORCING STRAP IS PROVIDED. LOADS IN EXCESS OF 250 LBS MAY BE SUPPORTED BETWEEN PANEL POINTS.
F. DO NOT USE "C" CLAMPS AT JOISTS OR BEAMS.

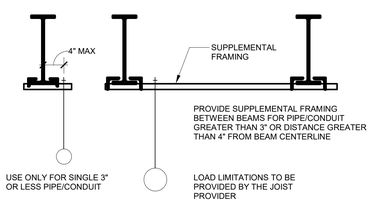


3 TYPICAL HANGER TO STEEL BEAM
NOT TO SCALE

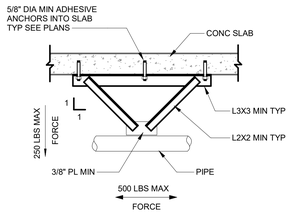


DOUBLE ANGLE REINFORCING SIZE	MAX JOIST DEPTH
2L1-1/2X1-1/2X3/16	32"
2L2-1/2X2-1/2X3/16	48"

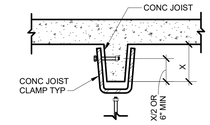
15 TYPICAL JOIST REINFORCING STRAP DETAIL AT CONCENTRATED LOADS
NOT TO SCALE



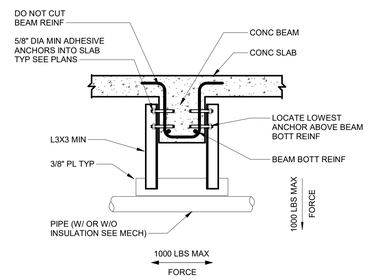
11 TYPICAL HANGER SUPPORT
NOT TO SCALE



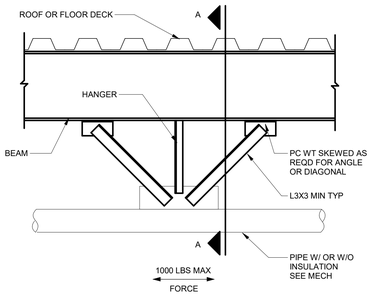
9 TYPICAL PIPE ANCHORAGE TO CONCRETE SLAB
NOT TO SCALE

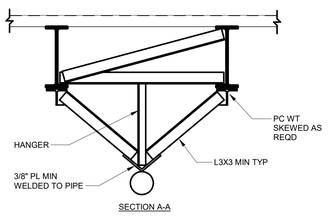


6 TYPICAL ANCHORAGE
NOT TO SCALE

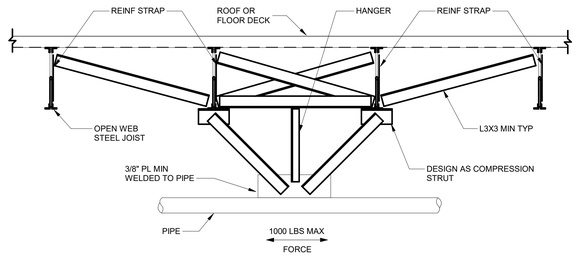


2 TYPICAL PIPE ANCHORAGE TO CONCRETE BEAM
NOT TO SCALE

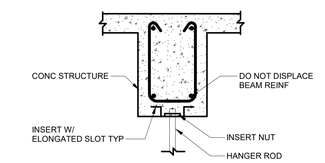




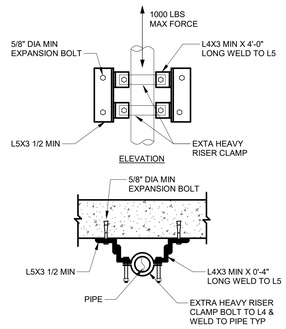
14 TYPICAL PIPE ANCHORAGE W/ BEAM PARALLEL TO PIPE RUN
NOT TO SCALE



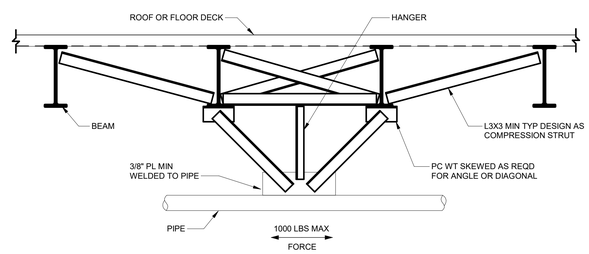
8 TYPICAL HANGER ANCHORAGE W/ JOIST PERPENDICULAR TO PIPE RUN
NOT TO SCALE



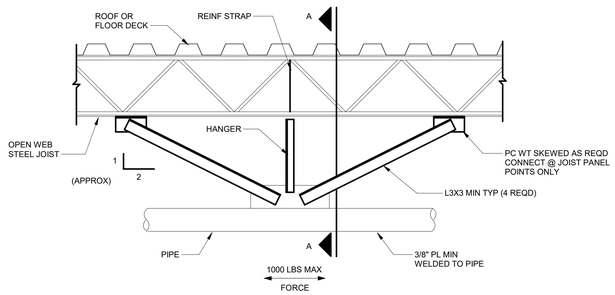
5 TYPICAL PIPE/DUCT HANGER INSERT
3/4" = 1'-0"



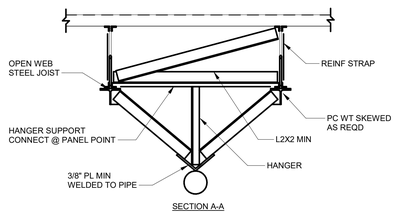
1 TYPICAL PIPE ANCHORAGE TO VERTICAL WALL
3/4" = 1'-0"



13 TYPICAL PIPE ANCHORAGE W/ BEAM PERPENDICULAR TO PIPE RUN
NOT TO SCALE



4 TYPICAL HANGER ANCHORAGE W/ JOISTS PARALLEL TO PIPE RUN
NOT TO SCALE



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

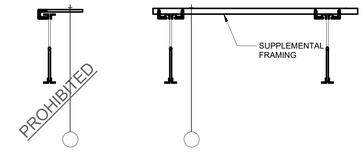
2025-DD016-001

Mechanical Support Details

M-521

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:49 AM

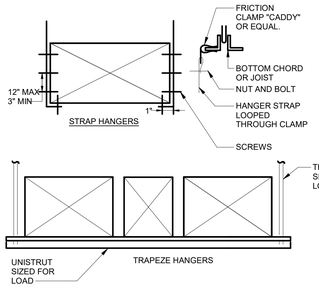


DO NOT ECCENTRICALLY HANG LOAD FROM JOISTS

RESTRICTED USE FOR LOADS OF 1000 LBS OR LESS

4 TYPICAL HANGER SUPPORT @ STEEL JOIST TOP CHORD

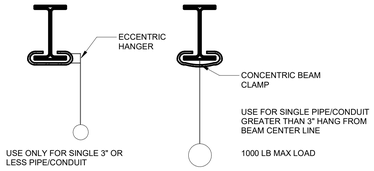
NOT TO SCALE



NOTE TO DESIGNER:
COORDINATE WITH ARCHITECT AND STRUCTURAL ENGINEER PRIOR TO USING THIS DETAIL.

7 LOW PRESSURE DUCT HANGING

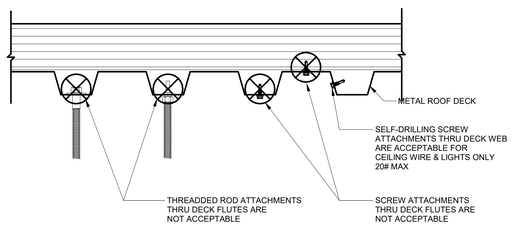
NOT TO SCALE



3 TYPICAL HANGER TO STEEL BEAM

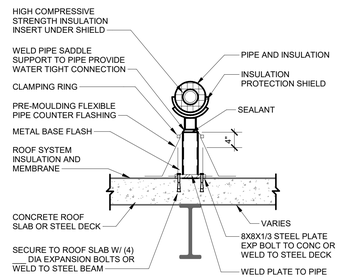
NOT TO SCALE

REFER TO STRUCTURAL GENERAL NOTES FOR LOAD LIMITATIONS



6 TYPICAL SCREW ATTACHMENT TO UNDERSIDE OF ROOF DECK

NOT TO SCALE

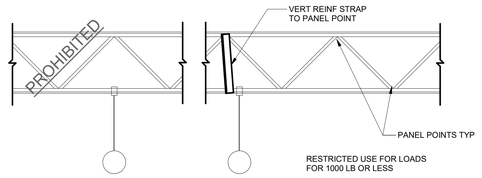


NOTES:

1. DO NOT USE MERO SUPPORTS WITHOUT CONSULTING WITH STRUCTURAL.
2. 1 PSI = 144 PSF

2 TYPICAL PIPE SUPPORT ON ROOF

NOT TO SCALE

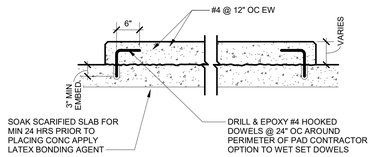


5 TYPICAL HANGER SUPPORT EXISTING STEEL JOIST CONSTRUCTION

NOT TO SCALE

NOTES:

1. ROUGHEN SURFACE TO 1/4" AMPLITUDE
2. ALL HEIGHTS WIDTHS AND LENGTHS TO BE COORDINATED W/ ARCH MECH AND ELEC AS REQUIRED



1 TYPICAL CONCRETE EQUIPMENT PAD

NOT TO SCALE

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Mechanical Support Details

M-522

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:51 AM

AIR HANDLING UNIT SCHEDULE - PART 1

ID	LOCATION	PRODUCT TYPE	VENTILATION	SUPPLY FAN							EVAPORATOR COOLING COIL								REFRIGERANT		
									MOTOR (EA)			CAPACITY		AIRSIDE							
			DESIGN FLOW	DESIGN AIRFLOW	QTY	ESP	RPM	DRIVE TYPE	POWER	BHP	RPM	TOTAL (MBH)	SENSIBLE (MBH)	DESIGN FLOW	EAT (db)	EAT (wb)	LAT (db)	LAT (wb)	FV	TYPE	NO OF CIRCUITS	CHARGE PER CIRCUIT (OZ)
RTU-1	ROOF	Vertical	4000 CFM	4000 CFM	1	3.00 in-wg	1615	DIRECT	7.5 hp	4.6	1427	254.6	150.0	4000 CFM	90 °F	74 °F	54 °F	54 °F	201 FPM	R-454B	2	290.00

AIR HANDLING UNIT SCHEDULE - PART 2

ID	GAS-FIRED HEAT EXCHANGER							AFUE	PRE-FILTER		FINAL FILTER		UNIT WEIGHT	ELECTRICAL DATA						BASIS OF DESIGN		
	INPUT (MBH)	HEATING CAPACITY (MBH)	EFFICIENCY	CONTROL	FUEL		AIRSIDE							MOCP	MCA	FLA	SCCR	VOLT	PH	MANUFACTURER	MODEL	NOTES
					TYPE	PRSSURE		EAT (db)	LAT (db)		TYPE	EFF	TYPE	EFF		EER	IEER							
						MINIMUM	MAXIMUM																	
RTU-1	405.0	328.1	81.01%	MODULATING	NG	6.00 in-wg	10.50 in-wg	2 °F	80 °F	80.00%	2" PLEATED	MERV-8	4" PLEATED	MERV-13	2885 lb	11.66	14.99	60 A	52 A	48 A	65 kA	480 V	3	AAON	RNA-020-C-A-3	1, 2, 3, 4

1. PROVIDE 8 PSI TO 8 IN.WG. PRESSURE REGULATOR. SEE DETAIL ON SHEET M-501.
2. SINGLE POINT POWER. DISCONNECT TO BE PROVIDED BY ELECTRICAL CONTRACTOR.
3. PROVIDE WITH FACTORY WIRED 115V CONVENIENCE OUTLET.
4. PROVIDE WITH NATURAL GAS REGULATOR AT ROOF TO 14" W.C. PER MANUFACTURER.

LAB AIR VALVE SCHEDULE

ID	LOCATION		INLET SIZE	DESIGN AIRFLOW	VALVE OPERATIONAL RANGE		BASIS OF DESIGN		NOTES
	NAME	NO			Max Airflow	Min Airflow	MANUFACTURER	MODEL	
EAV-2	WORK AREA	103	8"	185 CFM	700 CFM	35 CFM	ANTEC	VV	1
EAV-3	CHEMISTRY LAB	110	8"	500 CFM	700 CFM	35 CFM	ANTEC	VV	1
EAV-4	CHEMISTRY LAB 2	111	8"	255 CFM	700 CFM	35 CFM	ANTEC	VV	1
FHV-1	WORK AREA	103	10"	735 CFM	1000 CFM	50 CFM	ANTEC	VV	1,2
FHV-2	CHEMISTRY LAB	110	10"	735 CFM	1000 CFM	50 CFM	ANTEC	VV	1,2
FHV-3	CHEMISTRY LAB 2	111	10"	735 CFM	1000 CFM	50 CFM	ANTEC	VV	1,2
SAV-1	WORK AREA	102	8"	675 CFM	1300 CFM	35 CFM	ANTEC	VV	1
SAV-2	WORK AREA	103	10"	840 CFM	1000 CFM	50 CFM	ANTEC	VV	1
SAV-3	CHEMISTRY LAB	110	10"	945 CFM	1000 CFM	50 CFM	ANTEC	VV	1
SAV-4	CHEMISTRY LAB 2	111	12"	1200 CFM	1500 CFM	90 CFM	ANTEC	VV	1

1. PROVIDE 120V TO 24V CONTROL POWER TRANSFORMER.
2. PROVIDE FUME HOOD CONTROLLER AND SASH POSITION SENSOR WITH SIDEWALL FACE VELOCITY SENSOR.

ELECTRIC REHEAT COIL SCHEDULE

ID	LOCATION		INLET SIZE	OUTLET HEIGHT	OUTLET WIDTH	REHEAT REQUIRED	CAPACITY	AIR SIDE			QTY	FLA	MCA	VOLTAGE	PH	CONTROL TYPE	WEIGHT	BASIS OF DESIGN			NOTES
	NAME	NO						DESIGN FLOW	EAT (db)	LAT (db)								MANUFACTURER	MODEL	SIZE	
RHC-1	WORK AREA	102	10"	14"	13"	6.4 kW	11.4 kW	675 CFM	55 °F	85 °F	1	14 A	17 A	460 V	3	SCR	38 lb	ANTEC	QUZ	110	1
RHC-2	WORK AREA	103	10"	14"	13"	5.9 kW	11.4 kW	620 CFM	55 °F	85 °F	1	14 A	17 A	460 V	3	SCR	38 lb	ANTEC	QUZ	110	1
RHC-3	CHEMISTRY LAB	110	10"	14"	13"	9.0 kW	11.4 kW	945 CFM	55 °F	85 °F	1	14 A	17 A	460 V	3	SCR	38 lb	ANTEC	QUZ	110	1
RHC-4	CHEMISTRY LAB 2	111	14"	20"	18"	10.0 kW	16.2 kW	1050 CFM	55 °F	85 °F	1	19 A	24 A	460 V	3	SCR	62 lb	ANTEC	QUZ	114	1

1. PROVIDE FACTORY WIRED 460V TO 24V CONTROL POWER TRANSFORMER

FAN SCHEDULE

ID	LOCATION	FAN								SOUND PRESS LEVEL (dBA)	UNIT WEIGHT	ELECTRICAL DATA				BASIS OF DESIGN		REMARKS
						WHEEL		MOTOR										
	NAME	TYPE	DESIGN AIRFLOW	ESP	RPM	TYPE	DRIVE TYPE	POWER	CONTROL TYPE			FLA	VOLT	PH	H	MANUFACTURER	MODEL	
EF-1	ROOF	Utility Fan	800 CFM	2.00 in-wg	1730	BI	DIRECT	1.0 hp	Single Point	78	64.00 lb	1.3 A	480 V	3	60 Hz	PLASTEC	V25XT0M04P075	1
EF-2	ROOF	Utility Fan	4000 CFM	3.15 in-wg	1866	BI	DIRECT	7.5 hp	Single Point	72	1437.00 lb	7.6 A	480 V	3	60 Hz	GREENHECK	VK-MH-18-85-15	1
EF-3	ROOF	Downblast Fan	100 CFM	0.33 in-wg	1486	BI	DIRECT	0.2 hp	Single Point	43	35.00 lb	1.5 A	208 V	1	60 Hz	GREENHECK	G-060-VG	1
EF-4	ROOF	Utility Fan	600 CFM	0.50 in-wg	1267	BI	DIRECT	0.3 hp	Single Point	66	170.00 lb	2.1 A	208 V	1	60 Hz	GREENHECK	FJ-08-B7-VG	1, 2

1. PROVIDE ROOF CURB AND BACKDRAFT DAMPER
2. PROVIDE SPARK-B RESISTANT FAN.

VAV WITH ELECTRIC REHEAT SCHEDULE

ID	LOCATION		AREA SERVED	INLET SIZE	DESIGN SUPPLY AIRFLOW	AIRFLOW		ELECTRIC HEATING COIL	ELECTRIC HEATING COIL										WEIGHT	BASIS OF DESIGN			NOTES
											AIRSIDE												
	NAME	NO				MAX	MIN	Heating Design	REHEAT REQUIRED	COIL CAPACITY	DESIGN FLOW	EAT (db)	LAT (db)	PD	QTY	FLA	V	PH	CONTROL TYPE		MANUFACTURER	MODEL	
VAV-1			OFFICE	6"	200 CFM	400 CFM	105 CFM	Electric Heat	1.4 kW	2.5 kW	150 CFM	55 °F	85 °F	0.00 in-wg	1	12 A	208 V	1	SCR	50 lb	Titus	DESV	1
VAV-2			OFFICE	6"	150 CFM	400 CFM	105 CFM	Electric Heat	1.4 kW	2.5 kW	150 CFM	55 °F	85 °F	0.00 in-wg	1	12 A	208 V	1	SCR	50 lb	Titus	DESV	1
VAV-3	WORK AREA	101	MATERIAL LAB 113	10"	1000 CFM	1100 CFM	300 CFM	Electric Heat	9.5 kW	10.5 kW	1000 CFM	55 °F	85 °F	0.00 in-wg	1	29 A	208 V	3	SCR	62 lb	Titus	DESV	1
VAV-4	WORK AREA	101	WORK AREA 101	6"	280 CFM	400 CFM	105 CFM	Electric Heat	2.7 kW	4.5 kW	280 CFM	55 °F	85 °F	0.00 in-wg	1	12 A	208 V	3	SCR	50 lb	Titus	DESV	1
VAV-5	MET PREP LAB	106	MET PREP LAB 106	6"	300 CFM	400 CFM	105 CFM	Electric Heat	2.8 kW	4.5 kW	300 CFM	55 °F	85 °F	0.00 in-wg	1	12 A	208 V	3	SCR	50 lb	Titus	DESV	1
VAV-6	CHEMISTRY LAB 2	111	CYLINDER ROOM 2 114	8"	500 CFM	700 CFM	190 CFM	Electric Heat	4.7 kW	6.5 kW	500 CFM	55 °F	85 °F	0.00 in-wg	1	18 A	208 V	3	SCR	52 lb	Titus	DESV	1

1. PROVIDE 208V TO 24V CONTROL POWER TRANSFORMER

LAB AIR BALANCE SCHEDULE

NAME	NUMBER	AREA	HEIGHT	VOLUME	OCCUPIED			UNOCCUPIED		AIRFLOW OFFSET	Unoccupied Air Change Rate
					SUPPLY	EXHAUST	AIR CHANGE RATE	SUPPLY	EXHAUST		
WORK AREA	102	516 SF	10'-0"	5060 CF	675 CFM	0 CFM	8	675 CFM	0 CFM	675 CFM	8
WORK AREA	103	514 SF	9'-0"	4630 CF	620 CFM	920 CFM	8	435 CFM	735 CFM	-300 CFM	6
CHEMISTRY LAB	110	770 SF	9'-0"	6930 CF	935 CFM	1235 CFM	8	460 CFM	735 CFM	-300 CFM	4
CHEMISTRY LAB 2	111	771 SF	10'-0"	7630 CF	1050 CFM	1350 CFM	8	520 CFM	735 CFM	-300 CFM	4

GRILLES, REGISTERS & DIFFUSERS SCHEDULE

ID	MATERIAL	FINISH	MANUFACTURER	MODEL
CD1	Aluminum	White Enamel	Titus	RADIA-TEC AL
CD2	Aluminum	White Enamel	Titus	OMNI-AA
RG2	Aluminum	White Enamel	Titus	50F
RG6	Aluminum	White Enamel	Titus	301F
SG5	Aluminum	White Enamel	Titus	300F
SG6	Aluminum	White Enamel	Titus	301F

FAN FILTER UNIT SCHEDULE

ID	AIRFLOW	WATTS AT MAX CFM	INLET SIZE	MANUFACTURER	MODEL	NOTES
FFU-1	750 CFM	210	10"	Price Industries	FFU RSR	1

1. UNIT AIRFLOW BASED ON CLEAN HEPA FILTER.

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

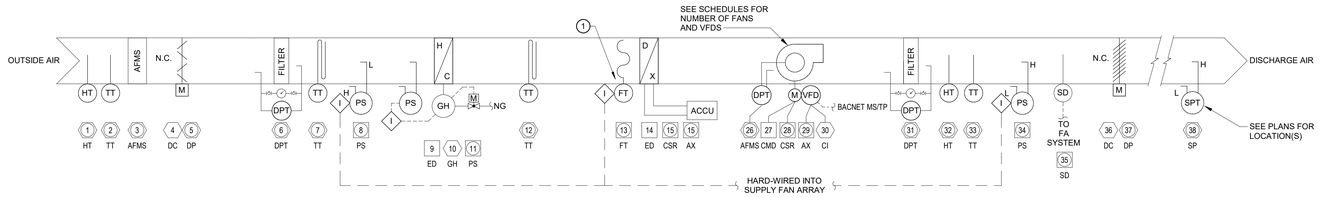
2025-DD016-001

Mechanical Schedules

M-601

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:53 AM



2 RTU CONTROLS DIAGRAM

1/8" = 1'-0"

SEQUENCE OF OPERATION

GENERAL

RTU-1 IS A PACKAGED VARIABLE AIR VOLUME (VAV) ROOF TOP AIR HANDLING UNIT TO SERVE THE LABS AND SUPPORT AREAS ON THE FIRST FLOOR.

THE H-O-A SWITCH WILL BE KEPT IN THE "AUTO" POSITION. "HAND" AND "OFF" POSITIONS WILL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF" ITS RESPECTIVE OUTSIDE AIR SHALL FULLY CLOSE AND THE SUPPLY FANS SHALL BE STOPPED. WHEN THE UNIT IS COMMANDED ON, THE OUTSIDE AIR DAMPER SHALL OPEN TO ITS MINIMUM POSITION. WHEN THE ISOLATION DAMPER IS PROVEN OPEN THROUGH ITSEND SWITCHE, THE SUPPLY FANS ARE STARTED AT MINIMUM SPEED AND PLACED UNDER SPEED CONTROL AS DESCRIBED IN THE "SUPPLY FAN SPEED CONTROL" PORTION OF THIS SEQUENCE. ONCE THE FANS ARE UNDER SPEED CONTROL AND ARE MAINTAINING THEIR RESPECTIVE PRESSURE & AIRFLOW SETPOINTS.

ALL SETPOINTS AND TIME OF DAY SCHEDULES SHALL BE COORDINATED WITH THE OWNER.

SUPPLY FAN SPEED CONTROL

THE SUPPLY FANS WILL OPERATE TO MAINTAIN DISCHARGE AIR STATIC PRESSURE (DaPress) IN THE SUPPLY AIR DUCT AT THE DISCHARGE AIR STATIC PRESSURE SETPOINT (DAPressSp). SEE PLANS FOR LOCATION(S) OF STATIC PRESSURE SENSOR(S). THE DAPressSp WILL INITIALLY BE SET AT 1.5" WG AND VERIFIED DURING TEST & BALANCING. AS THE DAPress FALLS BELOW THE DAPressSp, THE SPEED OF THE SUPPLY FANS WILL INCREASE. AS THE DAPress FALLS BELOW DAPressSp, THE SPEED OF THE SUPPLY FAN ARRAY WILL DECREASE.

A DAPressSp RESET SEQUENCE WILL BE INCORPORATED TO REDUCE FAN ENERGY. THE DDC WILL RESET THE DAPressSp TO MAINTAIN THE MINIMUM STATIC PRESSURE REQUIRED TO SATISFY THE CRITICAL ZONE AIRFLOW (WORSE CASE OR FURTHEST OPEN TERMINAL UNIT DAMPER). THE BMS SHALL CONTINUOUSLY POLL EACH INDIVIDUAL TERMINAL UNIT TO DETERMINE WHICH UNIT HAS THE FURTHEST OPEN DAMPER. THE DDC WILL RESET THE UNIT'S DAPressSp DOWNWARD BY 0.05" WG (ADJ) PER 5 MINUTES (ADJ) UNTIL ANY ONE TERMINAL UNIT DAMPER IS 90% OPEN. WHEN ANY TERMINAL UNIT DAMPER REACHES 95% OR MORE OPEN, THE BMS WILL RESET THE DAPressSp UPWARDS TOWARDS THE INITIAL PROGRAMMED DAPressSp AT THE SAME RATE AS IT WAS DECREASED.

WHEN THE RTU ADVANCED APPLICATION SPECIFIC CONTROLLER (AASC) LOSES COMMUNICATION TO THE BMS OVER THE NETWORK, THE AASC WILL DEFAULT TO THE INITIAL PROGRAMMED DAPressSp DETERMINED DURING TEST & BALANCING.

DISCHARGE AIR TEMPERATURE CONTROL

THE INITIAL PROGRAMMED DISCHARGE AIR TEMPERATURE SETPOINT (DaTempSp) WILL BE 55°F (ADJ). THE DaTempSp) WILL INCREMENTALLY RESET BETWEEN THE INITIAL PROGRAMMED DaTempSp AND 65°F (ADJ). THE DaTempSp WILL RESET TO SATISFY THE SPACE TEMPERATURE IN THE SPACES SERVED BY THE UNITS.

THE BMS SHALL CONTINUOUSLY POLL EACH INDIVIDUAL SPACE TEMPERATURE SENSOR IN THE SPACES SERVED BY THE AHU'S. WHEN ALL ZONES SERVED BY AHU'S ARE WITHIN THEIR ALLOWABLE DEADBAND TEMPERATURE RANGES, THE DaTempSp SHALL RESET UPWARDS BY INCREASING 0.5°F (ADJ) EVERY FIVE MINUTE (ADJ) TOWARDS THE HIGH LIMIT RESET SET-POINT (ADJ). IF ANY THREE (ADJ) ZONES ARE ABOVE THE ALLOWABLE DEADBAND TEMPERATURE RANGE, THE DaTempSp WILL INCREMENTALLY RESET DOWN TOWARDS THE INITIAL PROGRAMMED DaTempSp AT THE SAME RATE IT WAS INCREASED.

WHEN THE DaTemp FALLS BELOW DaTempSp FOR A TIME PERIOD OF 120 SECONDS (ADJ), THE GAS-FIRED HEATER WILL BE ENABLED (GhCmd) AND WILL MODULATE OUTPUT TO MAINTAIN DaTempSp.

WHEN THE DaTemp RISES ABOVE DaTempSp FOR A TIME PERIOD OF 120 SECONDS (ADJ), THE DX COIL COMPRESSOR WILL BE ENABLED (CmpEna) AND WILL MODULATE OUTPUT TO MAINTAIN DaTempSp.

DEHUMIDIFICATION CONTROL

IF RaHum RISES ABOVE THE RETURN AIR RELATIVE HUMIDITY HIGH LIMIT SETPOINT (RaHlmtHumSp) OF 60% RH (ADJ), THE DaTempSp RESET LOGIC SHALL BE OVERRIDDEN AND THE DaTempSp SHALL RETURN TO THE INITIAL PROGRAMMED DaTempSp. IN ADDITION, THE GhCmd AND CmpEna WILL BE RELEASED FROM ANY LOCKOUT AND THE CmpEna WILL BE ENABLED TO MAINTAIN DX COIL LEAVING AIR TEMPERATURE (CcoilLaTemp) AT DaTempSp MINUS 5°F. GhCmd WILL OPEN AND MODULATE TO MAINTAIN DaTempSp. ONCE RaHum FALLS TO 5% (ADJ) BELOW THE RaHlmtHumSp, DEHUMIDIFICATION MODE SHALL BE DISABLED AND THE UNIT WILL RETURN TO ITS APPROPRIATE ECONOMIZER AND DAMPER MODE OF OPERATION.

SAFETIES AND ALARMS

THE SUPPLY FANS AND THE ASSOCIATED DISCHARGe AIR SMOKE ISOLATION DAMPERS (DaIsoDmprCmd SHALL BE INTERLOCKED WITH THE FIRE ALARM SYSTEM THROUGH A CONTROL MODULE (CM). THE CONTROL MODULE SHALL BE HARD-WIRED INTERLOCKED TO CONTROL THE FANS AND DaIsoCmprCmd IN THE "HAND" AND "AUTO" OPERATING MODES. THE DUCT SMOKE DETECTORS LOCATED IN THE SUPPLY AIR OF EACH UNIT WILL BE MONITORED BY THE FIRE ALARM SYSTEM. WHEN PRODUCTS OF COMBUSTION ARE SENSED BY ONE OF THE SUPPLY DUCT SMOKE DETECTORS, THE CONTROL MODULE SHALL STOP THE FANS, CLOSING THE ASSOCIATED SMOKE/ISOLATION DAMPERS WHILE IN THE "HAND" AND "AUTO" OPERATING MODES.

WHEN THE LOW LIMIT PRESSURE SWITCH (LstPLmtSw) TRIPS, THE SUPPLY FAN SHALL BE STOPPED, THE DAMPERS WILL RETURN TO THEIR NORMAL POSITIONS AND AN ALARM SHALL BE GENERATED THROUGH THE BMS. THE LstPLmtSw SHALL BE SET TO TRIP AT -4"WG (ADJ). ONCE TRIPPED, THE SWITCH MUST BE MANUALLY RESET AT ITS RESPECTIVE LOCATION.

WHEN A FREEZE CONDITION OCCURS AT THE FREEZESTAT (LowLmtTemp), THE SUPPLY FAN SHALL BE STOPPED, THE DAMPERS WILL RETURN TO THEIR NORMAL POSITIONS AND AN ALARM SHALL BE GENERATED AT THE BMS. THE LowLmtTemp SHALL BE SET TO TRIP AT 36°F (ADJ) AND MUST BE MANUALLY RESET AT ITS RESPECTIVE LOCATION.

PRESSURE DIFFERENCE INDICATORS, LOCATED AT THE FILTERS, SHALL INDICATE THE DIFFERENTIAL PRESSURE ACROSS THE FILTERS. WHEN THE PRESSURE EXCEEDS AN ADJUSTABLE LIMIT BASED ON MANUFACTURER'S RECOMMENDATIONS TO DENOTE A DIRTY FILTER, AN ALARM SIGNAL WILL BE GENERATED THROUGH THE BMS.

CURRENT RELAYS SHALL BE USED TO MONITOR THE STATUS OF THE FANS AND THE DX AIR-COOLED COMPRESSOR. IF THE STATUS INDICATED DOES NOT MATCH THE COMMANDED OUTPUT, AN ALARM SHALL BE GENERATED THROUGH THE BMS

IF THE DaTemp FALLS OUT OF THE ALLOWABLE OFFSET RANGE FOR A TIME PERIOD OF 5 MINUTES (ADJ), AN ALARM SHALL BE GENERATED AT THE BMS.

1 LABORATORY EXHAUST FAN CONTROL

1/8" = 1'-0"

SEQUENCE OF OPERATION

GENERAL

THE LAB EXHAUST SYSTEM IS COMPRISED OF ONE HIGH VELOCITY EXHAUST FAN.

THE LAB EXHAUST FAN IS STARTED/STOPPED AUTOMATICALLY THROUGH THE DDC, OR MANUALLY THROUGH THE VFD'S H-O-A SWITCH.

FAN CONTROL

WHEN ENABLED, THE FAN WILL START AND BE FORCED TO ITS MINIMUM VFD SPEED. MINIMUM VFD SPEED WILL BE DETERMINED BY THE FREQUENCY AT WHICH THE OUTLET VELOCITY IS 3000 FT/MIN. VFD SPEED SHALL NOT DROP BELOW THIS MINIMUM VALUE. ONCE STABLE, THE FAN WILL SLOWLY RAMP UP ITS SPEED (LEaFan#Spd) TO MAINTAIN THE WORST CASE (FURTHEST FROM SETPOINT).EXHAUST AIR STATIC PRESSURE (EaPress) AT THE EXHAUST STATIC PRESSURE SETPOINT (EaPressSp). THE EaPressSp SHALL BE DETERMINED BY THE AIR BALANCER.

AS THE EaPress FALLS BELOW EaPressSp AT THE STATIC PRESSURE SENSOR(S), THE LEaFan#Spd SHALL BE INCREASED TO MAINTAIN EaPressSp.

IF THE FAN IS AT MINIMUM LEaFan#Spd AND THE EaPress REMAINS ABOVE EaPressSp, THE DDC SHALL LOCK LEaFan#Spd AT THE MINIMUM SPEED AND THE BYPASS DAMPER (LEaFan#BypDmprCmd) SHALL OPEN AND MODULATE TO MAINTAIN EaPressSp.

ALL SETPOINTS AND TIME OF DAY SCHEDULES SHALL BE COORDINATED WITH THE OWNER.

EXHAUST FAN BYPASS DAMPER CONTROL

THE LABORATORY EXHAUST FAN DDC CONTROLLER SHALL MODULATE THE OPERATIONAL FAN BYPASS DAMPER AS REQUIRED TO MAINTAIN PROPER DILUTION, DISCHARGE VELOCITY AT THE FAN EXITS, AND MAINTAIN STATIC PRESSURE AT THE STATIC PRESSURE SENSORS.

IF THE LAB EXHAUST FAN IS AT MINIMUM SPEED AND THE EaPress IS GREATER THAN THE EaPressSp, THE DDC SHALL LOCK OUT THE LEaFan#Spd CONTROL AT MINIMUM SPEED AND MODULATE THE OPERATIONAL FAN LEaFan#BypDmprCmd IN UNISON TO MAINTAIN EaPressSp. ONCE THE OPERATIONAL FAN BYPASS DAMPER POSITION (LEaFan#BypDmprPos) IS FULLY CLOSED THE DDC SHALL RELEASE THE LEaFan#Spd AND ALLOW IT TO MODULATE TO MAINTAIN EaPressSp.

AIR HANDLING UNIT FAILURE MODE OF OPERATION

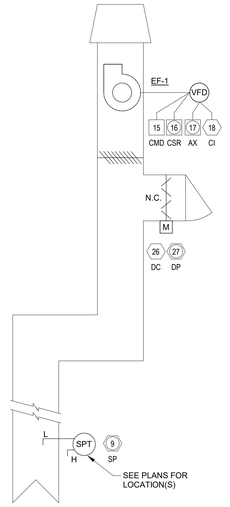
IN THE EVENT THAT THE SPACE AIR HANDLING UNIT (AHU-1) IS SHUTDOWN, THE OPERATING LAB EXHAUST FANS IS MODULATED TO A MINIMUM SPEED THAT WILL ENSURE THE BUILDING WILL NOT BE BELOW THE NEGATIVE PRESSURE THAT WILL VIOLATE THE EGRESS THRESHOLD FOR EXITING (30# OF BREAK FORCE TO OPEN AN EXTERIOR DOOR).

WHEN ALL AHU SUPPLY FANS ARE READY FOR NORMAL OPERATION, THE SYSTEM IS INDEXED INTO AUTOMATIC MODE BY THE USER THROUGH THE OWS.

SAFETIES AND ALARMS

THE DDC WILL MONITOR THE STATUS OF THE FAN THROUGH CURRENT SENSING RELAYS. IF THE STATUS INDICATED DOES NOT MATCH THE COMMANDED OUTPUT, THE FAILED FAN SHALL BE DISABLED, AND AN ALARM WILL BE GENERATED THROUGH THE BMS. ONCE THE FAILED FAN HAS BEEN REPAIRED, AND THE ALARM HAS BEEN CLEARED AT THE OWS, THE FAILED FAN SHALL BE ENABLED.

IF A FAILURE IS SENSED ON A FAN, THE ASSOCIATED ISOLATION DAMPER SHALL CLOSE AND AN ALARM WILL BE GENERATED AT THE BMS. ONCE THE CONDITION CAUSING THE FAILURE IS CORRECTED AND THE ALARM IS RESET, THE FAN SHALL ENERGIZE, THE ISOLATION DAMPER SHALL OPEN AND THE FAN WILL RESUME NORMAL OPERATION.



MECHANICAL CONTROLS GENERAL NOTES

A. THESE DRAWINGS CONTAIN THE GENERAL CONTROL REQUIREMENTS. THESE STRATEGIES WILL BE CLARIFIED AND MODIFIED THROUGH PROGRAMMING MEETINGS BETWEEN THE COMMISSIONING AUTHORITY, OWNER AND ENGINEER PRIOR TO IMPLEMENTATION. AT THAT TIME INITIAL SET POINTS AND RESET SCHEDULES WILL BE FINALIZED BEFORE PROGRAMMING. AFTER THE SYSTEM IS OPERATIONAL, TRENDING WILL BE REQUIRED TO VERIFY THE ACCURACY AND ADEQUACY OF THE SEQUENCE OF CONTROL. PROVIDE ADDITIONAL FINE TUNING OR CHANGES IN STRATEGY IN ORDER TO OPTIMIZE BUILDING OPERATION AS DIRECTED DURING THESE MEETINGS. PROVIDE PROGRAMMING FOR ADDITIONAL ALARMS AS REQUESTED BY THE OWNER OR ENGINEER OR COMMISSIONING AUTHORITY. ALL SET POINTS SHALL BE OPERATOR ADJUSTABLE THROUGH THE BMS AT THE OPERATOR'S WORKING STATION (OWS).

B. THESE DIAGRAMS ARE INTENDED TO DEMONSTRATE THE SYSTEM CONFIGURATION REQUIREMENTS WITH RELATIVE PLACEMENT OF THE CONTROL RELATED DEVICES AND INSTRUMENTATION. IT SHOULD BE NOTED THAT ADDITIONAL ELEMENTS SUCH AS GENERAL VALVES OR OTHER NON-ACTIVELY CONTROLLED DEVICES MAY NOT SHOWN. REFER TO THE DETAILS, PROJECT PLANS, AND SPECIFICATIONS FOR ADDITIONAL DEVICES AND CONSTRUCTION THAT IS REQUIRED IN THE CONSTRUCTION OF THESE SYSTEMS

C. SEE SPECIFICATIONS FOR MINIMUM CLEARANCE OF ALL MECHANICAL EQUIPMENT, PIPING, DUCTWORK, AND DEVICES OF IN ALL GENERAL AND PUBLIC ACCESS AREAS. MAINTAIN ACCEPTABLE CLEARANCE IN ALL AREAS REQUIRED FOR SERVICE AND ACCESS OF MECHANICAL EQUIPMENT AS PER ANY APPLICABLE CODES AND/OR MANUFACTURER RECOMMENDATIONS.

D. MAINTAIN CODE-REQUIRED MINIMUM CLEARANCES ABOVE AND IN FRONT OF ALL ELECTRICAL PANELS, INCLUDING THOSE INCLUDED AS A PART OF MECHANICAL EQUIPMENT.

E. EDIT THE LOADING AND UNLOADING SEQUENCES TO COMPLY WITH MANUFACTURER'S RECOMMENDATIONS FOR TIME DELAYS BETWEEN STAGING ON/OFF COMPONENTS.

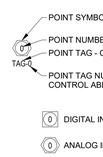
F. ALL POINTS LISTED (DIRECT & NETWORK) SHALL BE INCLUDED ON GRAPHICS.

G. ALL CONTROL POINTS ARE TRENDABLE.

H. ANY DEVICES SHOWN IN THE DIAGRAM THAT ARE NOT PROVIDED BY THE UNIT MANUFACTURER SHALL BE PROVIDED BY THE TEMPERATURE CONTROLS CONTRACTOR UNLESS NOTED OTHERWISE.

I. ALL NUMERICAL INPUTS FOR SETPOINTS AND ALARMING SHALL BE MADE TO BE ADJUSTABLE THROUGH THE OWS AND FINALIZED DURING START-UP AND/OR COMMISSIONING.

J. SEE PLANS AND SCHEDULES FOR PARENT/CHILD AIR HANDLING UNIT AND TERMINAL UNIT RELATIONSHIPS.



BMS - HVAC CONTROLS M-801 POINT FUNCTION SCHEDULE

	TAG	POINT NAME	POINT DEFINITION	POINT TYPE	FAIL MODE: FAIL OFF (CLOSED)	FAIL MODE: FAIL MODE ON (OPEN)	FAIL MODE: LAST COMMANDED STATE	FAIL MODE: LOCAL DEFAULT	SOFTWARE: CALCULATED POINT	SOFTWARE: DIRECT DIGITAL CONTROL	SOFTWARE: NETWORK POINT	SOFTWARE: PROGRAM START/STOP	SOFTWARE: RUN TIME	SOFTWARE: SOFTWARE INTERLOCKS	SOFTWARE: SETPOINT ADJUSTMENT	SOFTWARE: UNOCCUPIED SETPOINT	SOFTWARE: SETBACK SETPOINT	SOFTWARE: TREND	TREND INTERVAL	UNITS	ALARMING: ENHANCED ALARM	ALARMING: CRITICAL ALARM	ALARMING: MAINTENANCE ALARM	HIGH LIMIT	LOW LIMIT	NOTES
LAB EXHAUST FANS																										
9	SP	EaPress1	EXHAUST STATIC PRESSURE 1	AI						■	■				■			■	NUMERIC	IN WC	■			0 IN WC (ADJ)	-4 IN WC (ADJ)	
15	CMD	LEaFan1Cmd	LEF-1 COMMAND	DO	■					■	■			■				■	COV			■				
16	CSR	LEaFan1Sts	LEF-1 STATUS	DI							■		■					■	COV		■					
17	AX	LEaFan1VfdAlm	LEF-1 VFD ALARM STATUS	DI							■							■	COV		■					
18	CI	LEaFan1Spd	LEF-1 SPEED CONTROL	AO						■	■			■				■	NUMERIC	%						
26	DC	LEaFan1BypDmprCmd	LEF-1 BYPASS DAMPER COMMAND	AO	■					■	■				■			■	COV	%						TYPICAL OF EACH BYPASS DAMPER
27	DP	LEaFan1BypDmprPos	LEF-1 BYPASS DAMPER POSITION	AI					■	■	■				■			■	NUMERIC	%						TYPICAL OF EACH BYPASS DAMPER
MUA-1																										
1	HT	OaHum	OUTSIDE AIR HUMIDITY	AI						■	■				■			■	NUMERIC	% RH						
2	TT	OaTemp	OUTSIDE AIR TEMPERATURE	AI						■	■					■		■	NUMERIC	°F						
3	AFMS	OaFlow	OUTSIDE AIRFLOW	AI						■	■					■		■	NUMERIC	CFM						
4	DC	OaDmprCmd	OUTSIDE AIR DAMPER COMMAND	AO	■					■	■				■			■	NUMERIC	%						
5	DP	OaDmprPos	OUTSIDE AIR DAMPER POSITION	AI					■	■	■				■			■	NUMERIC	%						
6	DPT	PreFilDifPr	PREFILTER DIFFERENTIAL PRESSURE	AI							■							■	NUMERIC	IN WC		■				
7	TT	MaTemp	MIXED AIR TEMPERATURE	AI						■	■					■		■	NUMERIC	°F						
8	PS	LstPLmtSw	LOW LIMIT PRESSURE SWITCH	DI						■				■				■	COV						-4" WG (ADJ)	
9	ED	GhCmd	GAS-FIRED HEATER ENABLE/DISABLE	DO	■					■				■				■	COV							TYPICAL OF EACH STAGE OF HEAT
10	GH	GhOutput	GAS-FIRED HEATER OUTPUT	AO	■					■	■				■			■	NUMERIC	%						
11	PS	GhFlSw	GAS-FIRED HEATER FLOW SWITCH	DI						■				■				■	COV							SAFETY PROVIDED BY HEATER MANUFACTURER
12	TT	HcoilLaTemp	HEATING COIL LEAVING AIR TEMPERATURE	AI						■	■					■		■	NUMERIC	°F						
13	FT	LowLmtTemp	LOW LIMIT FREEZESTAT	DI							■		■					■	COV			■			36°F (ADJ)	
14	ED	CcoilVlvCmd	COOLING COIL VALVE COMMAND	DO		■				■	■							■	NUMERIC	%						
15	CSR	CCoilVlvPos	COOLING COIL VALVE POSITION	DI					■	■	■				■			■	NUMERIC	%						
15	AX	CCoilVlvPos	COOLING COIL VALVE POSITION	DI					■	■	■				■			■	NUMERIC	%						
26	AFMS	SaFlow	SUPPLY AIRFLOW	AI						■	■					■		■	NUMERIC	CFM						TYPICAL OF EACH FAN
27	CMD	SaFanCmd	SUPPLY FAN COMMAND	DO	■					■	■				■			■	COV							TYPICAL OF EACH FAN
28	CSR	SaFanSts	SUPPLY FAN STATUS	DI							■		■					■	COV		■					TYPICAL OF EACH FAN
29	AX	SaFanVfdAlm	SUPPLY FAN VFD ALARM STATUS	DI							■							■	COV		■					TYPICAL OF EACH VFD
30	CI	SaFanSpd	SUPPLY FAN SPEED CONTROL	AO						■	■				■			■	NUMERIC	%						TYPICAL OF EACH VFD
31	DPT	FinFilDifPr	FINAL FILTER DIFFERENTIAL PRESSURE	AI							■							■	NUMERIC	IN WC		■				
32	HT	DaHum	DISCHARGE AIR HUMIDITY	AI						■	■				■			■	NUMERIC	% RH						TYPICAL OF 2 PER UNIT
33	TT	DaTemp	DISCHARGE AIR TEMPERATURE	AI						■	■					■		■	NUMERIC	°F						
34	PS	HstPLmtSw	HIGH LIMIT PRESSURE SWITCH	DI						■				■				■	COV					4" WC (ADJ)		
35	SD	SaSmkDet	SUPPLY AIR SMOKE DETECTOR	DI	■					■	■				■			■	COV							
36	DC	DaIsoDmprCmd	DISCHARGE AIR ISOLATION DAMPER COMMAND	AO	■					■	■				■			■	COV	%						
37	DP	DaIsoDmprPos	DISCHARGE AIR ISOLATION DAMPER POSITION	AI					■	■	■				■			■	NUMERIC	%						
38	SP	DaPress	DISCHARGE AIR STATIC PRESSURE	AI						■	■				■			■	NUMERIC	IN WC	■			4 IN WC (ADJ)	0 IN WC (ADJ)	

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

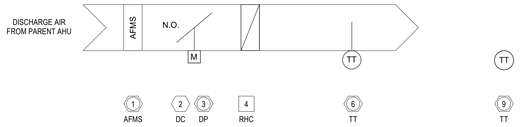
2025-DD016-001

Control Diagrams

M-801

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/28/2026 1:23:41 PM



2 TYPE B - SINGLE DUCT VAV TERMINAL UNIT W/ REHEAT

1/8" = 1'-0"

SEQUENCE OF OPERATION

GENERAL

THE TERMINAL UNIT APPLICATION SPECIFIC CONTROLLER (ASC) MONITORS THE AIR VELOCITY SENSOR AND ZONE TEMPERATURE SENSOR THROUGH THE PROPORTIONAL AND INTEGRAL ALGORITHM.

THE SINGLE DUCT VAV TERMINAL UNITS SHALL BE CONTROLLED WITHIN THE DEFINED MAXIMUM AND MINIMUM SUPPLY AIR VOLUMES AS SCHEDULED.

OCCUPANCY MODE SHALL BE DETERMINED THROUGH A COMBINATION OF TIME OF DAY SCHEDULE COORDINATED WITH THE OWNER AND OCCUPANCY STATUS VIA AN OCCUPANCY SENSOR LOCATED IN THE ZONE AS PART OF THE LIGHTING CONTROLS SYSTEM. REFER TO THE ELECTRICAL DRAWINGS FOR LOCATION(S) AND TYPE OF OCCUPANCY SENSOR. WHEN A SINGLE DUCT VAV TERMINAL UNIT SERVES MULTIPLE ROOMS WITHIN A SINGLE ZONE, WHENEVER OCCUPANCY IS SENSED IN ANY ONE OF THE MULTIPLE ROOMS, THE ASC SHALL PLACE THE SINGLE DUCT VAV TERMINAL UNIT INTO OCCUPIED MODE.

IF THE TIME OF DAY SCHEDULE INDICATES THAT THE BUILDING IS SCHEDULED TO BE OCCUPIED AND THE SPACE OCCUPANCY SENSOR SENSES OCCUPANCY, THE UNIT SHALL BE PLACED IN OCCUPIED MODE.

OCCUPIED ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS: COOLING: 76°F (ADJ), HEATING: 68°F (ADJ) WITH A 5°F DEADBAND.

IF THE TIME OF DAY SCHEDULE INDICATES THAT THE BUILDING IS SCHEDULED TO BE OCCUPIED AND THE OCCUPANCY SENSOR DOES NOT SENSE OCCUPANCY FOR 15 MINUTES (ADJ), THE UNIT SHALL BE PLACED INTO STAND-BY MODE UNTIL OCCUPANCY IS SENSED.

STAND-BY ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS: COOLING: 78°F (ADJ), HEATING: 66°F (ADJ) WITH A 12°F DEADBAND.

UNOCCUPIED MODE SHALL OCCUR DURING TIME PERIODS OPPOSITE OF THE OCCUPIED TIME OF DAY SCHEDULE.

UNOCCUPIED ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS: COOLING: 82°F (ADJ), HEATING: 62°F (ADJ) WITH A 20°F DEADBAND.

ANY TIME THE OCCUPANCY SENSOR SENSES OCCUPANCY IN THE SPACE, THE UNIT SHALL BE OVERRIDDEN TO OCCUPIED MODE.

THE EFFECTIVE HEATING SETPOINT (EffHeatSp) AND EFFECTIVE COOLING SETPOINT (EffCoolSp) ARE THE INSTANTANEOUS HEATING AND COOLING SETPOINTS BASED ON OCCUPANCY MODE. THE ASC WILL DETERMINE THE EffHeatSp AND EffCoolSp GIVEN INPUT FROM THE DDC/BMS ON PARENT AIR HANDLING UNIT SUPPLY FAN STATUS AND STATUS OF THE ZONE OCCUPANCY SENSOR (ZoneOcc).

WHEN COMMUNICATION IS LOST BETWEEN THE DDC/BMS AND THE ASC, THE ASC SHALL DEFAULT TO OCCUPIED MODE.

ALL SETPOINTS AND TIME OF DAY SCHEDULES SHALL BE COORDINATED WITH THE OWNER.

TEMPERATURE CONTROL OPERATION

THE ZONE TEMPERATURE SENSOR, THROUGH THE ASC, MODULATES THE SINGLE DUCT VAV TERMINAL UNIT DAMPER (DmprCmd) AND REHEAT COIL (RhtCmd) TO MAINTAIN THE EFFECTIVE COOLING AND EFFECTIVE HEATING TEMPERATURE SETPOINTS.

THE ADJUSTABLE TOLERANCE OF +/- 0.5°F HAS BEEN SELECTED TO PREVENT DAMPER HUNTING.

THE HIGH LIMIT DISCHARGE AIR TEMPERATURE SETPOINT (DaTempSp) SHALL BE LIMITED TO NO GREATER THAN 20°F ABOVE THE ZONE EFFECTIVE HEATING SETPOINT (EffHeatSp).

WHEN ZONE TEMPERATURE (ZoneTemp) IS WITHIN THE HEATING AND COOLING DEADBAND AND THERE IS NO CALL FOR HEATING OR COOLING, THE UNIT SHALL MAINTAIN MINIMUM AIRFLOW SETPOINT AND THE RhtCmd SHALL BE FULLY OFF.

ON A RISE IN ZoneTemp ABOVE THE EFFECTIVE COOLING SETPOINT (EffCoolSp), THE RhtCmd SHALL TURN OFF (IF NOT ALREADY) AND THE DmprCmd SHALL MODULATE TOWARDS THE MAXIMUM SCHEDULED AIRFLOW POSITION TO MAINTAIN EffCoolSp.

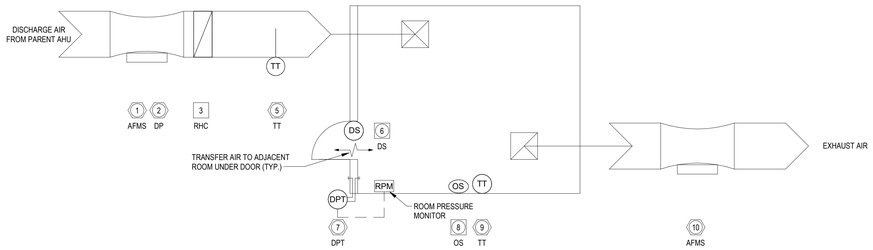
ON A FALL IN ZoneTemp BELOW THE EffHeatSp, THE UNIT SHALL DECREASE ITS DmprCmd TO MAINTAIN MINIMUM AIRFLOW SETPOINT (IF NOT ALREADY) AND THE, THE RhtCmd SHALL ENERGIZE AND MODULATE TO MAINTAIN A DISCHARGE AIR TEMPERATURE SETPOINT (DaTempSp).

IF THE ZoneTemp REMAINS BELOW EffHeatSp AFTER A 10 MINUTE TIME DELAY (ADJ), THE DmprCmd SHALL MODULATE OPEN TOWARDS THE MAXIMUM SCHEDULED AIRFLOW POSITION TO MAINTAIN ZONE EffHeatSp AND THE RhtCmd SHALL CONTINUE TO MODULATE TO MAINTAIN DaTempSp. ONCE ZoneTemp RISES ABOVE EffHeatSp, THE RhtCmd SHALL REDUCE OUTPUT IN THE REVERSE ORDER.

SAFETIES AND ALARMS

THE DDC SHALL MONITOR THE SINGLE DUCT VAV TERMINAL UNIT DAMPER POSITION (DmprPos), REHEAT COIL (RhtCmd), PERCENT ENERGIZED VALUES AND REPORT THE POSITION FOR AIRSIDE DIFFERENTIAL PRESSURE AND/OR TEMPERATURE RESET LOGIC.

THE DDC SHALL PERFORM A FAULT ANALYSIS FOR EACH HEATING COIL COMPARING THE DaTemp TO THE RhtPos. IF THE DaTemp DOES NOT MATCH THE THEORETICAL CALCULATED TEMPERATURE, AN ALARM SHALL BE GENERATED THROUGH THE BMS.



1 LAB CONTROLS DIAGRAM

1/8" = 1'-0"

SEQUENCE OF OPERATION

GENERAL

THE SUPPLY AIR VALVE (SAV) TERMINAL UNIT APPLICATION SPECIFIC CONTROLLER (ASC) MONITORS THE AIRFLOW FEEDBACK SIGNAL AND THE ZONE TEMPERATURE SENSOR THROUGH THE PROPORTIONAL AND INTEGRAL ALGORITHM. THE TERMINAL UNIT AIRFLOW FEEDBACK SIGNAL IS BASED ON THE CALIBRATED POSITIONER STATE. THE ASC FOR THE AIR VALVES SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE AIR VALVE. SO LONG AS THE DIFFERENTIAL PRESSURE ACROSS AN VALVE IS WITHIN A 0.3" TO 3" WC RANGE, THE AIRFLOW POSITION FEEDBACK SHALL BE ACCEPTABLE AS THE ACTUAL AIRFLOW MEASUREMENT THROUGH THE AIR VALVE. DIFFERENTIAL PRESSURE SHALL BE MEASURED ACROSS THE SUPPLY AIR VALVE (SaVlvDiffPress) TO INFORM PARENT AHU DISCHARGE AIR STATIC PRESSURE RESET LOGIC.

OCCUPANCY MODE SHALL BE DETERMINED THROUGH A COMBINATION OF TIME OF DAY SCHEDULE COORDINATED WITH THE OWNER AND OCCUPANCY STATUS VIA AN OCCUPANCY SENSOR LOCATED IN THE ZONE AS PART OF THE LIGHTING CONTROLS SYSTEM. REFER TO THE ELECTRICAL DRAWINGS FOR LOCATION(S) AND TYPE OF OCCUPANCY SENSOR. WHEN A SINGLE DUCT VAV TERMINAL UNIT SERVES MULTIPLE ROOMS WITHIN A SINGLE ZONE, WHENEVER OCCUPANCY IS SENSED IN ANY ONE OF THE MULTIPLE ROOMS, THE ASC SHALL PLACE THE SINGLE DUCT VAV TERMINAL UNIT INTO OCCUPIED MODE.

IF THE TIME OF DAY SCHEDULE INDICATES THAT THE BUILDING IS SCHEDULED TO BE OCCUPIED AND THE SPACE OCCUPANCY SENSOR SENSES OCCUPANCY, THE UNIT SHALL BE PLACED IN OCCUPIED MODE.

OCCUPIED ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS: COOLING: 76°F (ADJ), HEATING: 68°F (ADJ) WITH A 5°F DEADBAND.

IF THE TIME OF DAY SCHEDULE INDICATES THAT THE BUILDING IS SCHEDULED TO BE OCCUPIED AND THE OCCUPANCY SENSOR DOES NOT SENSE OCCUPANCY FOR 15 MINUTES (ADJ), THE UNIT SHALL BE PLACED INTO STAND-BY MODE UNTIL OCCUPANCY IS SENSED.

STAND-BY ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS: COOLING: 78°F (ADJ), HEATING: 66°F (ADJ) WITH A 12°F DEADBAND.

UNOCCUPIED MODE SHALL OCCUR DURING TIME PERIODS OPPOSITE OF THE OCCUPIED TIME OF DAY SCHEDULE.

UNOCCUPIED ZONE TEMPERATURE SETPOINTS SHALL BE AS FOLLOWS: COOLING: 82°F (ADJ), HEATING: 62°F (ADJ) WITH A 20°F DEADBAND.

THE EFFECTIVE HEATING SETPOINT (EffHeatSp) AND EFFECTIVE COOLING SETPOINT (EffCoolSp) ARE THE INSTANTANEOUS HEATING AND COOLING SETPOINTS BASED ON OCCUPANCY MODE. THE ASC WILL DETERMINE THE EffHeatSp AND EffCoolSp GIVEN INPUT FROM THE DDC/BMS ON PARENT AIR HANDLING UNIT SUPPLY FAN STATUS AND STATUS OF THE ZONE OCCUPANCY SENSOR (ZoneOcc).

WHEN COMMUNICATION IS LOST BETWEEN THE DDC/BMS AND THE ASC, THE ASC SHALL DEFAULT TO OCCUPIED MODE.

ALL SETPOINTS AND TIME OF DAY SCHEDULES SHALL BE COORDINATED WITH THE OWNER.

TEMPERATURE CONTROL OPERATION

THE ZONE TEMPERATURE SENSOR, THROUGH THE ASC, MODULATES THE SUPPLY AIRFLOW (SaFlow) AND REHEAT COIL (RhtCmd) TO MAINTAIN THE EFFECTIVE COOLING AND EFFECTIVE HEATING TEMPERATURE SETPOINTS.

THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE LIMITED TO NO GREATER THAN 20°F ABOVE THE ZONE EFFECTIVE HEATING SETPOINT (EffHeatSp).

WHEN ZONE TEMPERATURE (ZoneTemp) IS WITHIN THE HEATING AND COOLING DEADBAND AND THERE IS NO CALL FOR HEATING OR COOLING, THE SAV SHALL MAINTAIN MINIMUM AIRFLOW SETPOINT AND THE RhtCmd SHALL BE FULLY OFF.

TEMPERATURE CONTROL OPERATION (CONT.)

ON A RISE IN ZoneTemp ABOVE THE EFFECTIVE COOLING SETPOINT (EffCoolSp), THE RhtsCmd SHALL FULLY ENERGIZE (IF NOT ALREADY) AND THE AIR VALVE SHALL INCREASE SaFlow TOWARDS THE MAXIMUM SCHEDULED AIRFLOW TO MAINTAIN EffCoolSp +/- 0.5°F.

ON A FALL IN ZoneTemp BELOW THE EffHeatSp, THE UNIT SHALL DECREASE ITS SaFlow TO THE MINIMUM AIRFLOW SETPOINT (IF NOT ALREADY) AND THE RhtCmd SHALL ENERGIZE AND MODULATE TO MAINTAIN EffHeatSp +/- 0.5°F WITH THE DaTempSp LIMITING THE RhtCmd.

IF THE ZoneTemp REMAINS BELOW EffHeatSp AFTER A 10 MINUTE TIME DELAY (ADJ) WITH THE DISCHARGE AIR TEMPERATURE (DaTemp) AT THE DaTempSp, THE DmprCmd SHALL MODULATE OPEN TOWARDS THE MAXIMUM SCHEDULED HEATING AIRFLOW POSITION TO MAINTAIN ZONE EffHeatSp +/- 0.5°F AND THE RhtCmd SHALL CONTINUE TO MODULATE TO MAINTAIN DaTempSp.

THE ADJUSTABLE TOLERANCE OF +/- 0.5°F HAS BEEN SELECTED TO PREVENT VALVE HUNTING.

AIRFLOW/PRESSURE CONTROL

THE SAV AND EXHAUST AIR VALVE (EAV) TERMINAL UNITS SHALL BE CONTROLLED WITHIN THE DEFINED MAXIMUM AND MINIMUM AIR VOLUMES AS SCHEDULED.

THE SAV TERMINAL UNIT SHALL OPERATE TO MAINTAIN ZoneTemp WITHIN THE EffCoolSp AND EffHeatSp DEADBAND RANGE AS PRESCRIBED IN THE "TEMPERATURE CONTROL OPERATION" PORTION OF THIS SEQUENCE.

THE EAV TERMINAL UNIT SHALL OPERATE TO MAINTAIN THE FOLLOWING AIRFLOW VALUE: SUPPLY AIRFLOW - FIXED OFFSET. THE FIXED OFFSET SHALL BE DETERMINED DURING TEST AND BALANCE TO MAINTAIN 0.02" WC (ADJ) POSITIVE ZONE PRESSURE (ZonePress) RELATIVE TO THE ADJACENT SPACE(S) MEASURED BY THE DIFFERENTIAL PRESSURE TRANSDUCER(S). SEE MH SERIES PLANS AND SCHEDULES FOR INITIAL FIXED OFFSET VALUES, REQUIRED PRESSURE RELATIONSHIPS, AND THE NUMBER OF DIFFERENTIAL PRESSURE TRANSDUCERS.

A ROOM PRESSURE MONITOR DISPLAY SHALL BE PROVIDED TO ALERT OCCUPANTS WHEN THE ZonePress DROPS BELOW THE POSITIVE OR NEGATIVE PRESSURE REQUIREMENT AS DETERMINED BY THE WORST CASE (LOWEST) ZonePress READING. DOOR CONTACT SWITCHES SHALL BE FURNISHED TO MONITOR THE STATUS OF OPEN DOORS. WHENEVER ANY DOOR CONTACT SWITCH BETWEEN THE ZONE AND THE ADJACENT SPACES SENSES THAT THE DOOR IS OPEN, ALL ROOM PRESSURE ALARMS SHALL BE PAUSED UNTIL ALL DOORS HAVE BEEN CLOSED FOR 30 SECONDS (ADJ).

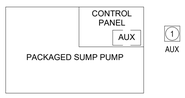
SAFETIES AND ALARMS

THE DDC SHALL MONITOR SaVlvDiffPress AND THE REHEAT COIL VALVE POSITION (RhtVlvPos) PERCENT OPEN VALUES AND REPORT FOR AIRSIDE AND HYDRONIC SYSTEMS DIFFERENTIAL PRESSURE AND/OR TEMPERATURE RESET LOGIC. IF SaVlvDiffPress FALLS BELOW 0.3" WC (ADJ), A SIGNAL SHALL BE SENT TO THE BMS FOR THE PARENT AHU DISCHARGE AIR STATIC PRESSURE SETPOINT TO BE INCREASED. IF THE SaVlvDiffPress RISES ABOVE 3" WC (ADJ), A SIGNAL SHALL BE SENT THROUGH THE BMS FOR THE PARENT AHU DISCHARGE AIR STATIC PRESSURE SETPOINT TO BE DECREASED.

IF THE SaVlvDiffPress EITHER EXCEEDS 3" WC (ADJ) OR FALLS BELOW 0.3" WC (ADJ) CONTINUOUSLY FOR 15 MINUTES (ADJ), AN ALARM SHALL BE GENERATED THROUGH THE BMS.

THE DDC SHALL MONITOR THE ZonePress AT THE DIFFERENTIAL PRESSURE TRANSDUCER(S) (DPT). IF THE ZonePress FALLS BELOW 0.0" WC (ADJ) WITH ALL DOORS CLOSED FOR 5 MINUTES (ADJ), AN ALARM SHALL BE GENERATED THROUGH THE BMS.

THE DDC SHALL PERFORM A FAULT ANALYSIS FOR EACH HYDRONIC COIL COMPARING THE DaTemp TO THE RhtVlvPos. IF THE DaTemp DOES NOT MATCH THE THEORETICAL CALCULATED TEMPERATURE, AN ALARM SHALL BE GENERATED THROUGH THE BMS.



4 SUMP PUMP MONITORING

NOT TO SCALE

SEQUENCE OF OPERATION

GENERAL

THE PACKAGED SUMP PUMP ASSEMBLY SHALL BE MONITORED BY THE DDC. ANY ALARM INITIATED BY THE SUMP PUMP PACKAGE ASSEMBLY CONTROL PANEL IS REPORTED TO THE BMS.

THE BMS SHALL MONITOR THE HIGH LEVEL TROUBLE ALARM FROM EACH SUMP PUMP.

3 ROOM GAS MONITORING

NOT TO SCALE

SEQUENCE OF OPERATION

GENERAL

THE DDC SHALL MONITOR THE OXYGEN AND HYDROGEN LEVELS IN THE ROOM. IF OXYGEN LEVELS FALL BELOW AN ADJUSTABLE LOW LIMIT SETPOINT (19% , ADJ.), OR ABOVE AN ADJUSTABLE HIGH LIMIT SETPOINT (21%, ADJ.), AN ALARM SHALL BE GENERATED THROUGH THE BMS, AND THE EXHAUST FAN SHALL BE ENERGIZED IF NOT ALREADY. IF HYDROGEN LEVEL RAISE ABOVE A HIGH LEVEL SETPOINT (0.4%, ADJ.), AN ALARM SHALL BE GENERATED THROUGH THE BMS. SEE PLANS TO CONFIRM GAS MONITORING REQUIRED FOR EACH CYLINDER ROOM.

CONTROLS CONTRACTOR TO PERFORM INSTALLATION PER HONEYWELL DESIGN DRAWINGS. HONEYWELL TO PROVIDE PROGRAMMING AND COMPONENTS. REFER TO HONEYWELL DESIGN DRAWINGS, CONTRACT NUMBER: MET-01. HONEYWELL PROJECT MANAGER: MIKE STEGER; TEL: 248-376-2725.

BMS - HVAC CONTROLS M-802 POINT FUNCTION SCHEDULE

	TAG	POINT NAME	POINT DEFINITION	POINT TYPE	FAIL MODE: FAIL OFF (CLOSED)	FAIL MODE: FAIL MODE ON (OPEN)	FAIL MODE: LAST COMMANDED STATE	FAIL MODE: LOCAL DEFAULT	SOFTWARE: CALCULATED POINT	SOFTWARE: DIRECT DIGITAL CONTROL	SOFTWARE: NETWORK POINT	SOFTWARE: PROGRAM START/STOP	SOFTWARE: RUN TIME	SOFTWARE: SOFTWARE INTERLOCKS	SOFTWARE: SETPOINT ADJUSTMENT	SOFTWARE: UNOCCUPIED SETPOINT	SOFTWARE: SETBACK SETPOINT	SOFTWARE: TREND	TREND INTERVAL	UNITS	ALARMING: ENHANCED ALARM	ALARMING: CRITICAL ALARM	ALARMING: MAINTENANCE ALARM	HIGH LIMIT	LOW LIMIT	NOTES
LAB																										
1	AFMS	SaFlow	SUPPLY AIRFLOW	AI						■	■						■	■	NUMERIC	CFM						
2	DP	SaVlvDiffPress	SUPPLY AIR VALVE DIFFERENTIAL PRESSURE	AI					■	■					■		■	NUMERIC	IN WC	■			3 IN WC (ADJ)	0.3 IN WC (ADJ)	
3	RHC	RhtCmd	REHEAT COIL COMMAND	DO		■			■	■							■	NUMERIC	%						
5	TT	DaTemp	DISCHARGE AIR TEMPERATURE	AI					■	■						■	■	NUMERIC	°F				EffHeatSp + 20°F		
6	DS	DoorStsOpen	DOOR STATUS OPEN	DI					■	■							■	COV							ONE PER DOOR
7	DPT	ZonePress	ZONE DIFFERENTIAL PRESSURE	AI					■	■					■		■	NUMERIC	IN WC	■				0.0" WC (ADJ)	
8	OS	ZoneOcc	ZONE OCCUPANCY	DI				■	■	■					■		■	COV							
9	TT	ZoneTemp	ZONE TEMPERATURE	AI					■	■					■		■	NUMERIC	°F	■			EffCoolSp + 5°F (ADJ)	EffHeatSp - 5°F (ADJ)	
10	AFMS	EaFlow	EXHAUST AIRFLOW	AI						■						■	■	NUMERIC	CFM						
ROOM GAS MONITORING																										
1	O2	ZoneO2	ZONE OXYGEN	AI						■	■				■		■	NUMERIC	%	■			23.5%	19.5%	
2	H2	ZoneH2	ZONE HYDROGEN	AI						■	■				■		■	NUMERIC	%	■			10% LEL		
SINGLE DUCT VAV TERMINAL UNIT W/ HYDRONIC REHEAT																										
1	AFMS	Flow	AIRFLOW	AI						■	■					■	■	NUMERIC	CFM						
2	DC	DmprCmd	DAMPER COMMAND	AO		■			■	■					■		■	NUMERIC	%						
3	DP	DmprPos	DAMPER POSITION	AI				■	■	■					■		■	NUMERIC	%						
4	RHC	RhtVlvCmd	REHEAT COIL VALVE COMMAND	DO		■			■	■							■	NUMERIC	%						
6	TT	DATemp	DISCHARGE AIR TEMPERATURE	AI					■	■						■	■	NUMERIC	°F				EffHeatSp + 20°F		
9	TT	ZoneTemp	ZONE TEMPERATURE	AI					■	■					■		■	NUMERIC	°F	■			EffCoolSp + 5°F (ADJ)	EffHeatSp - 5°F (ADJ)	
SUMP PUMP MONITORING																										
1	AUX	AuxConSts	AUXILIARY CONTACT STATUS	DI						■	■		■				■	COV		■					

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Control Diagrams

M-802

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

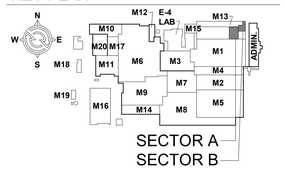
4/24/2026 7:33:30 AM

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

FIRE PROTECTION GENERAL NOTES

1. THE PROJECT AREA SHALL BE FULLY SPRINKLERED. PROVIDE A WET SPRINKLER SYSTEM THROUGHOUT THE PROJECT AREA(S).
2. SPRINKLER SYSTEM SHALL BE DESIGN-BUILD CONFORMING TO NFPA 2. 13 & 14 (ENFORCED EDITIONS) AND UNDER THE ENFORCED CODES OF THE STATE OF MICHIGAN, INSURANCE UNDERWRITER AND OWNER STANDARDS.
3. CONDUCT A WATER MAIN FLOW TEST. HYDRAULICALLY CALCULATE AND DESIGN THE MODIFICATIONS TO THE AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH THE FLOW TEST DATA.
4. MAINTAIN SPRINKLER COVERAGE IN PROJECT AREAS DURING CONSTRUCTION. PROVIDE UPRIGHT HEADS DURING CONSTRUCTION.
5. PAY FOR AND OBTAIN ALL APPROVALS AND PERMITS.
6. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES.
7. LOCATE SPRINKLERS IN CENTER OF TILES.
8. UNLESS OTHERWISE NOTED, PROVIDE QUICK RESPONSE, 155°F RATED HEADS, SEMI-RECESSED TYPE IN ALL AREAS.
9. REFER TO SPRINKLER COVERAGE NOTES FOR DESIGN DENSITIES.
10. EXISTING FIRE PROTECTION MAINS SHOWN FOR REFERENCE. FEILD VERIFY LOCATION OF EXISITNG FIRE PROTECTION MAINS WITHIN PROJECT AREA.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

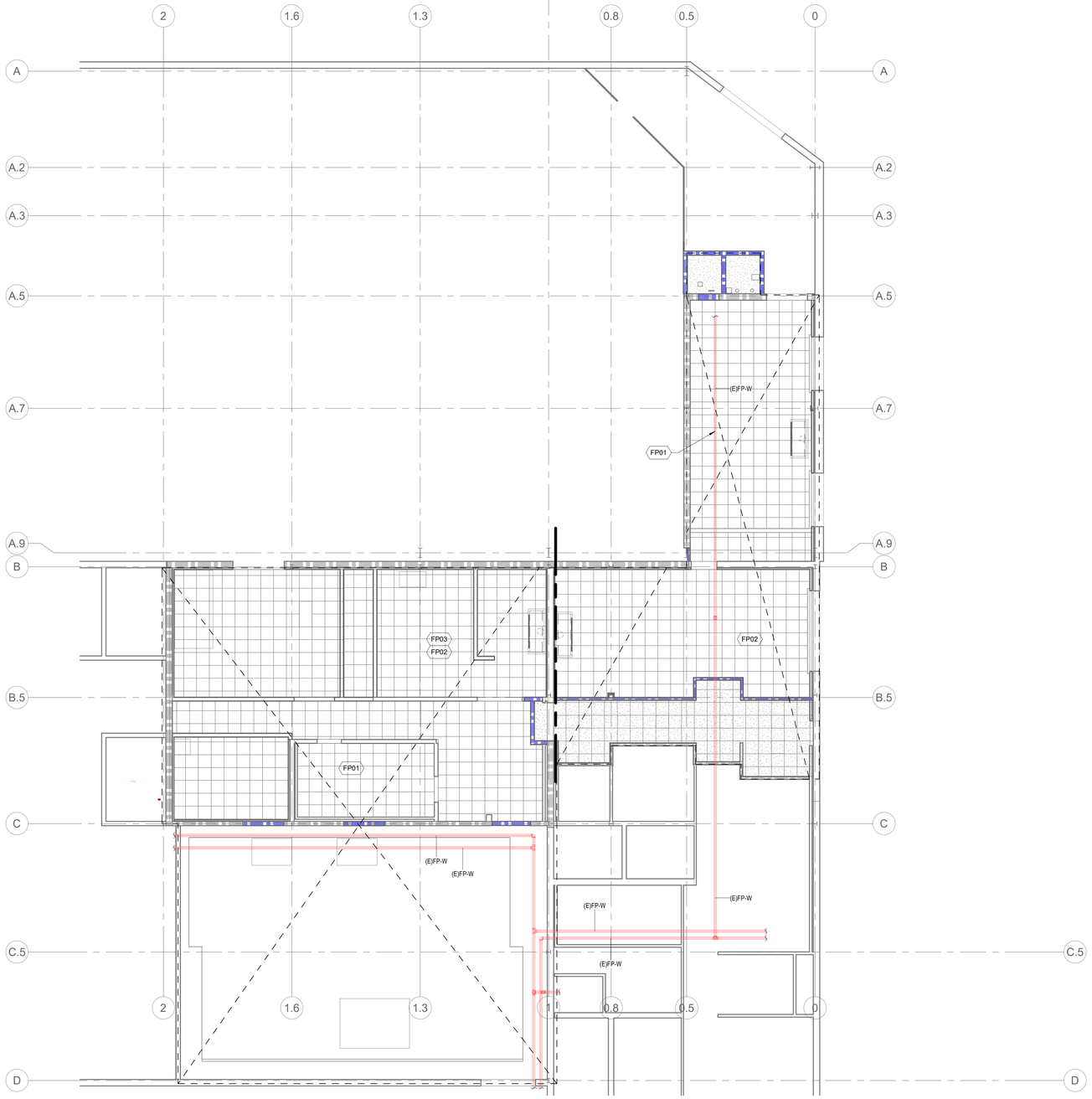
©2025

2025-DD016-001

Fire Protection General Notes

F-001

4/24/2026 7:33:30 AM



N

LEVEL 1 PLAN - OVERALL

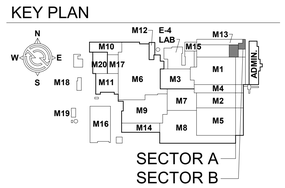
1/8" = 1'-0"

FIRE PROTECTION KEYNOTES	
Key Value	Keynote Text
FP01	WET PIPE SPRINKLER SYSTEM ZONE. ORDINARY HAZARD GROUP 2: 0.2 GPM/SF DENSITY OVER THE MOST REMOTE 1500 SF.
FP02	AREA HAS DOUBLE LAYER WET PIPE FIRE PROTECTION SYSTEM. UPPER LAYER FIRE PROTECTION PIPING SHALL BE DEMOLISHED BACK TO MAINS AND CAPPED.
FP03	DOUBLE HEIGHT SPACE HAS FIRE SPRINKLER COVERAGE IN TWO ZONES. FIRE PROTECTION CONTRACTOR SHALL DEMOLISH FIRE PROTECTION PIPING AT HIGH ELEVATION BACK TO MAIN, AND MODIFY LOWER ELEVATION WET PIPE SPRINKLER SYSTEM TO COVERAGE AS INDICATED. TYP.

FIRE PROTECTION GENERAL NOTES

1. THE PROJECT AREA SHALL BE FULLY SPRINKLERED. PROVIDE A WET SPRINKLER SYSTEM THROUGHOUT THE PROJECT AREA(S).
2. SPRINKLER SYSTEM SHALL BE DESIGN-BUILD CONFORMING TO NFPA 2, 13 & 14 (ENFORCED EDITIONS) AND UNDER THE ENFORCED CODES OF THE STATE OF MICHIGAN, INSURANCE UNDERWRITER AND OWNER STANDARDS.
3. CONDUCT A WATER MAIN FLOW TEST. HYDRAULICALLY CALCULATE AND DESIGN THE MODIFICATIONS TO THE AUTOMATIC WET PIPE SPRINKLER SYSTEM IN ACCORDANCE WITH THE FLOW TEST DATA.
4. MAINTAIN SPRINKLER COVERAGE IN PROJECT AREAS DURING CONSTRUCTION. PROVIDE UPRIGHT HEADS DURING CONSTRUCTION.
5. PAY FOR AND OBTAIN ALL APPROVALS AND PERMITS.
6. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES.
7. LOCATE SPRINKLERS IN CENTER OF TILES.
8. UNLESS OTHERWISE NOTED, PROVIDE QUICK RESPONSE, 155°F RATED HEADS, SEMI-RECESSED TYPE IN ALL AREAS.
9. REFER TO SPRINKLER COVERAGE NOTES FOR DESIGN DENSITIES.
10. EXISTING FIRE PROTECTION MAINS SHOWN FOR REFERENCE. FEILD VERIFY LOCATION OF EXISITNG FIRE PROTECTION MAINS WITHIN PROJECT AREA.

KEY PLAN



SECTOR A
SECTOR B

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

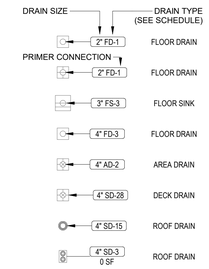
Level 1 Plan - Overall

F-101

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:56 AM

PLUMBING SYMBOL LEGEND

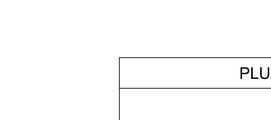


PLUMBING PIPE SYSTEMS LEGEND

CDR	CONDENSATE RETURN
CWV	COMBINATION WASTE & VENT
CA	COMPRESSED AIR
CW	DOMESTIC COLD WATER
S-CW	SOFT COLD WATER
RO	REVERSE OSMOSIS WATER
HW	DOMESTIC HOT WATER
HW 140°	DOMESTIC HOT WATER 140°
HW-R	DOMESTIC HOT WATER RECIRCULATION
HW-R 140°	DOMESTIC HOT WATER RECIRCULATION 140°
H2	HYDROGEN
H/AR	FORMING GAS (3% HYDROGEN / ARGON)
PROCW	PROCESS WASTE
IW	INDIRECT WASTE
V	SANITARY VENT
SAN	SANITARY SEWER
ST	STORM DRAINAGE
OSD	OVERFLOW STORM DRAINAGE
G	NATURAL GAS

SEE ASHRAE, 2021 FUNDAMENTALS, CHAPTER 39

PLUMBING SYMBOL LEGEND



PLUMBING GENERAL NOTES

1. REFER TO PLUMBING FIXTURE PIPE SIZING SCHEDULE FOR PIPES SIZE TO INDIVIDUAL FIXTURES.
2. REFER TO ARCHITECTURAL ELEVATIONS AND PLANS FOR LOCATIONS OF PLUMBING FIXTURES AND EQUIPMENT WITH PLUMBING CONNECTIONS.
3. C.F.C.I.= "CONTRACTOR FURNISHED, CONTRACTOR INSTALLED".
   O.F.C.I.= "OWNER FURNISHED, CONTRACTOR INSTALLED"
   O.F.O.I.= "OWNER FURNISHED, OWNER INSTALLED".
4. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH EQUIPMENT PROVIDER. PROVIDE FINAL CONNECTION. PROVIDE BALL VALVE AT ROUGH-IN LOCATION.
5. DO NOT ROUTE ANY PIPING OVER ELECTRICAL EQUIPMENT OR THROUGH ELECTRICAL EQUIPMENT ROOMS.
6. UNLESS NOTED OTHERWISE, ALL STORM AND SANITARY DRAINAGE PIPING SHALL BE SLOPED:
   1/4" PER FOOT FOR PIPING 2-1/2" AND SMALLER
   1/8" PER FOOT FOR PIPING 3" AND LARGER
7. INSTALL ALL SLOPED PIPING TIGHT TO STRUCTURAL AS POSSIBLE. MAINTAIN REQUIRED SLOPE.
8. REFER TO ARCHITECTURAL DETAILS FOR SHOWER AND FLOOR DRAINS.
9. PROVIDE TRAP PRIMER FOR ALL FLOOR DRAINS. TRAP SEAL IS ACCEPTABLE IN LIEU OF A TRAP PRIMER WHERE ALLOWED BY THE LOCAL CODE.
10. PROVIDE BACKFLOW PREVENTERS AT CONNECTION TO ALL ICE MACHINES AND COFFEE MACHINES. ROUTE DRAIN TO NEAREST FLOOR DRAIN OR SINK.
11. PROVIDE SHUT-OFF VALVE FOR EACH PIPING SYSTEM IN THE SUPPLY AND RETURN MAINS AND BRANCH LINES AT LOCATIONS FOR SUITABLE SERVICE.
12. PROVIDE ALL NECESSARY OFFSETS.
13. 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 AND SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OR ERECTION OF EQUIPMENT AND SYSTEMS. THIS INCLUDES ALL ALL ASSOCIATED ITEMS THAT MAY NOT BE SHOW ON PLUMBING DRAWINGS BUT ARE NECESSARY FOR INSTALLATION AND OPERATION, SUCH AS EQUIPMENT PADS AND HANGERS, AMONG OTHERS.
14. FOR LAB GAS CONENCTIONS TO EQUIPMENT, PROVIDE SHUT OFF VALVE AND QUICK-CONNECT TERMINATION IN ACCESSIBLE LOCATION FOR EQUIPMENT CONNECTION. COORDIANTE WITH EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS.

PLUMBING 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. REPLACE ANY EXISTING MATERIALS WHICH ARE DAMAGED DURING THE COURSE OF THE WORK.
3. DISRUPTION OF EXISTING SERVICES TO OTHER AREAS OF THE BUILDING MUST BE SCHEDULED AND COORDINATED TO MEET THE OWNER'S REQUIREMENTS. WHEN WORKING IN OR ADJACENT TO OCCUPIED SPACES CONTRACTOR SHALL INCLUDE THE NECESSARY MEANS TO ISOLATE THE WORK AREA TO KEEP DUST AND DIRT WITHIN THE CONSTRUCTION AREA.
4. PATCH ADJACENT FINISHED SURFACES AND BUILDING COMPONENTS DISTURBED OR DAMAGED BY THE REMOVAL OF EXISTING MATERIALS USING NEW MATERIALS TO MATCH SIMILAR INSTALLATION AS OUTLINED THE SPECIFICATIONS. INSTALLATION SHALL BE BY EXPERIENCED INSTALLERS QUALIFIED UNDER SPECIFICATION REQUIREMENTS.
5. UNLESS NOTED OTHERWISE, REMOVE ALL PLUMBING, PIPING, TEMPERATURE CONTROLS, COMPONENTS AND DISTRIBUTION SYSTEM IN THE PROJECT AREA. CAP ALL SERVICES AT MAINS.
6. REMOVE ALL HANGERS AND SUPPORTS FOR DEMOLISHED ITEMS.
7. DEMOLITION OF PIPING MAY EXTEND BEYOND THE PROJECT BOUNDARIES TO FACILITATE CAPPING AT MAINS. REMOVE AND REINSTALL CEILING AS REQUIRED. REPLACE DAMAGED CEILING COMPONENTS, MATCH EXISTING TYPE.
8. REMOVE SPRINKLERS AND BRANCH PIPING TO SUPPORT NEW LAYOUT. INSTALL UPRIGHT SPRINKLERS DURING CONSTRUCTION.

PLUMBING FIXTURE PIPE SIZING TABLE

FIXTURE	OVERHEAD RUNOUT PIPE SIZE (IN)			PIPE SIZE IN WALL (IN)				
	CW	HW	TW	CW	HW	TW	WASTE	VENT
ELECTRIC WATER COOLER (EWC)	3/4	NA	NA	1/2	NA	NA	1-1/2	1-1/2
EMERGENCY EYEWASH (EW)	3/4	NA	NA	3/4	NA	NA	NA	NA
EMERGENCY SHOWER (ES)	1-1/2	1-1/2	1-1/2	NA	NA	1	NA	NA
LAVATORY (L)	3/4	3/4	NA	1/2	1/2	NA	1-1/2	1-1/2
SERVICE SINK (SS)	3/4	3/4	NA	1/2	1/2	NA	3	1-1/2
SHOWER (SH)	3/4	3/4	NA	1/2	1/2	NA	2	1-1/2
SINK (S)	3/4	3/4	NA	1/2	1/2	NA	1-1/2	1-1/2
URINAL (UR)	1	NA	NA	3/4	NA	NA	2	2
WATER CLOSET (WC)	1-1/4	NA	NA	1-1/4	NA	NA	4	2

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

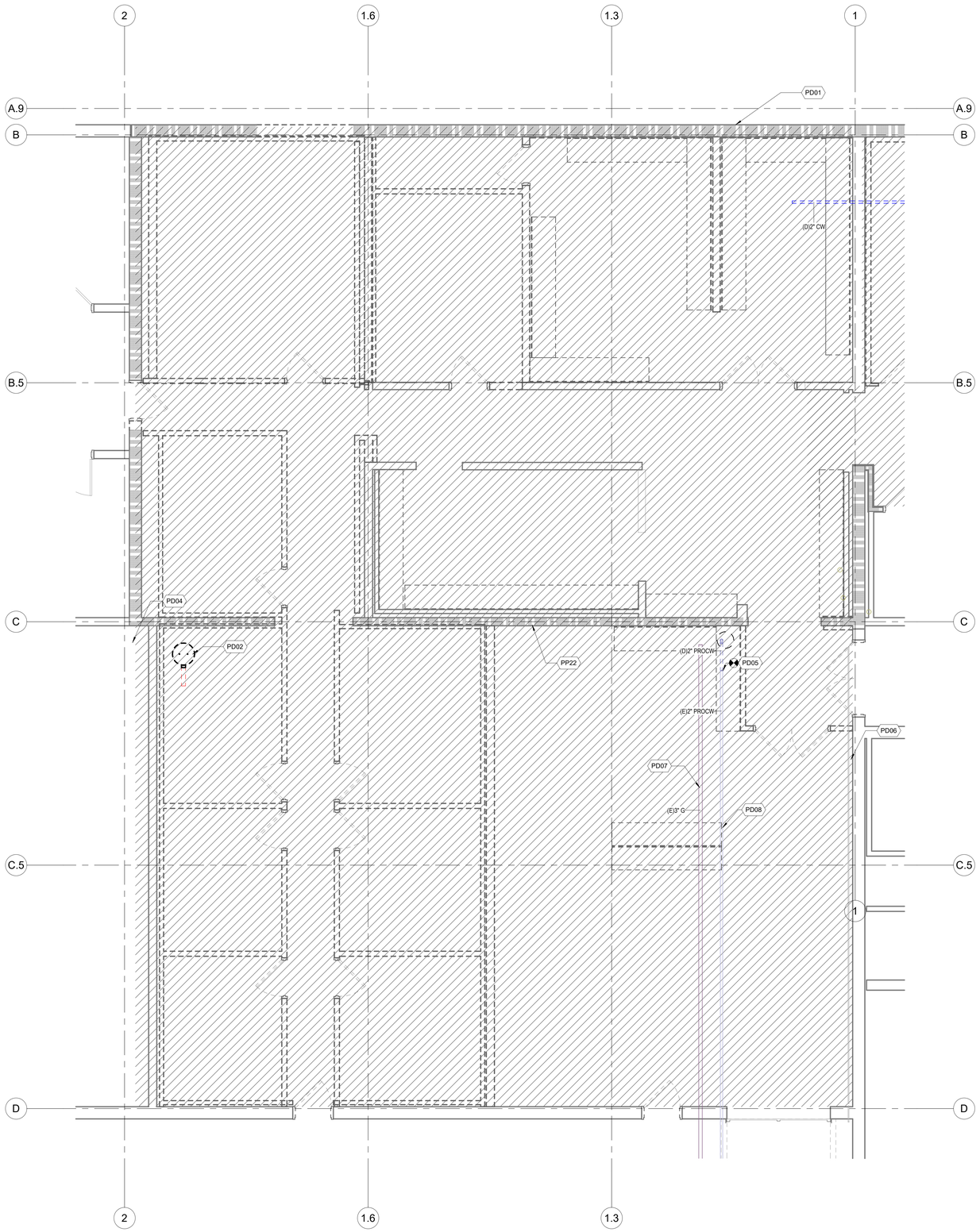
2025-DD016-001

Plumbing Notes, Legends & Abbreviations

P-001

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:57 AM



N

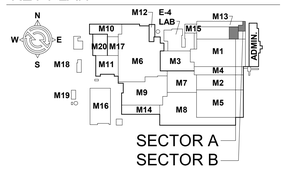
LEVEL 1 DEMO PLAN - SECTOR A

1/4" = 1'-0"

PLUMBING DEMOLITION KEYNOTES

Key Value	Keynote Text
PD01	DISCONNECT AND REMOVE EXISTING PLUMBING FIXTURES WITHIN WORK AREA. REMOVE BRANCH PIPING BACK TO EXISTING MAIN AND CAP. CUT AND CAP SANITARY AT FLOOR AND PATCH.
PD02	DISCONNECT AND REMOVE EXISTING HOT WATER HEATER FOR RELOCATION. SEE NEW WORK PLAN FOR NEW LOCATION.
PD04	DISCONNECT AND REMOVE EXISTING SUMP, PIT TO REMAIN FOR NEW PUMP INSTALLATION. SEE NEW WORK PLAN.
PD05	REMOVE ACID WASTE PIPING UP TO GRAVITY MAIN AND CAP FOR FUTURE CONNECTION.
PD06	DISCONNECT AND REMOVE EXISTING COMPRESSED AIR OUTLETS WITHIN WORK AREA. REMOVE BRANCH PIPING BACK TO EXISTING MAIN AND CAP.
PD07	EXISTING NATURAL GAS PIPING TO REMAIN.
PD08	EXISTING LAB WASTE MAIN AT SPACE CEILING TO REMAIN.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

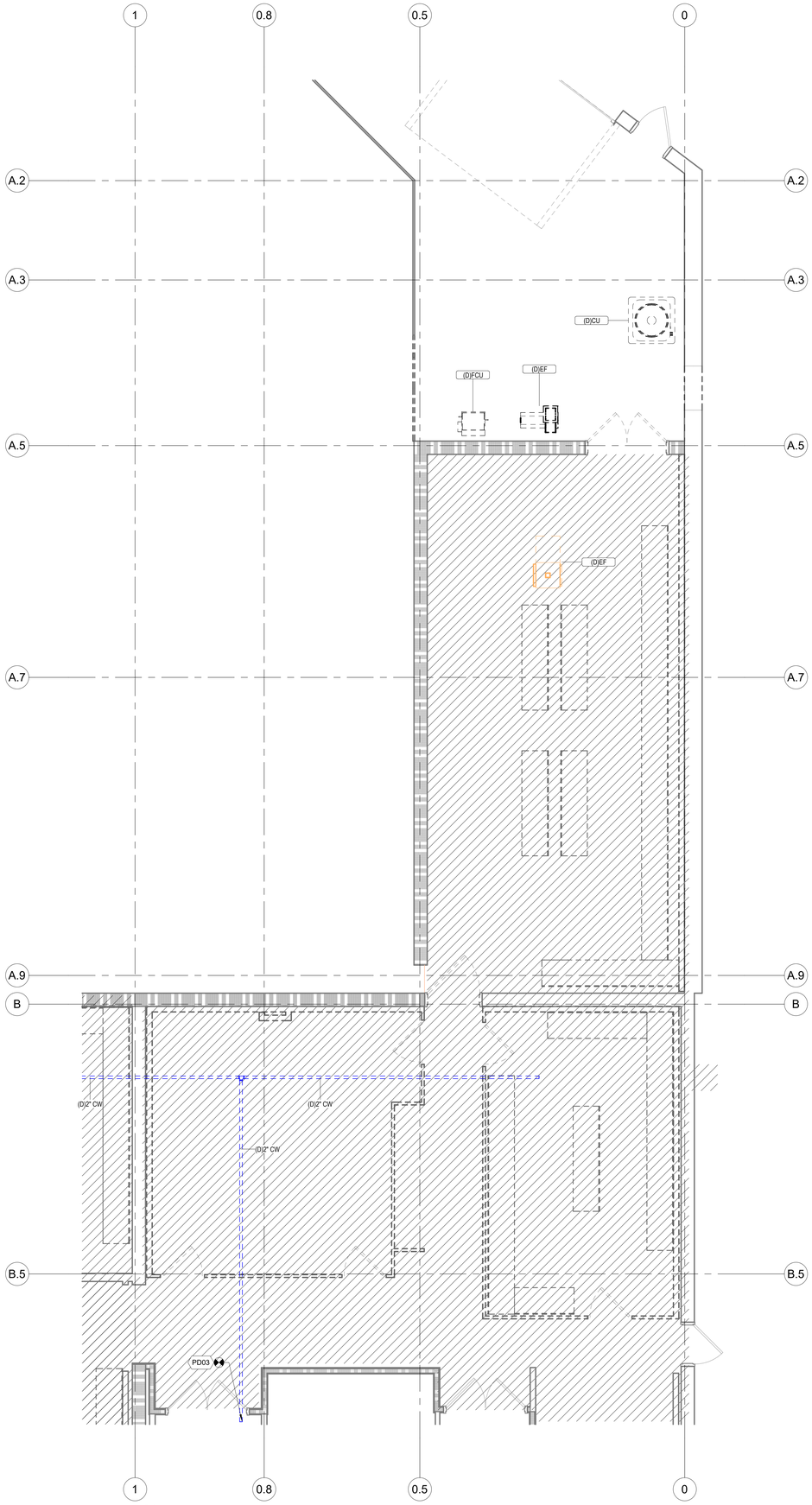
2025-DD016-001

Level 1 Demo Plan - Sector A

PD101A

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:57 AM



N

LEVEL 1 DEMO PLAN - SECTOR A

1/4" = 1'-0"

PLUMBING DEMOLITION KEYNOTES	
Key Value	Keynote Text
PD03	DISCONNECT AND REMOVE EXISTING COLD WATER MAIN. CAP FOR FUTURE CONNECTION.

DETROIT

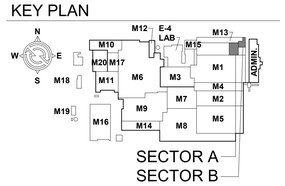
Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

KEY PLAN



HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

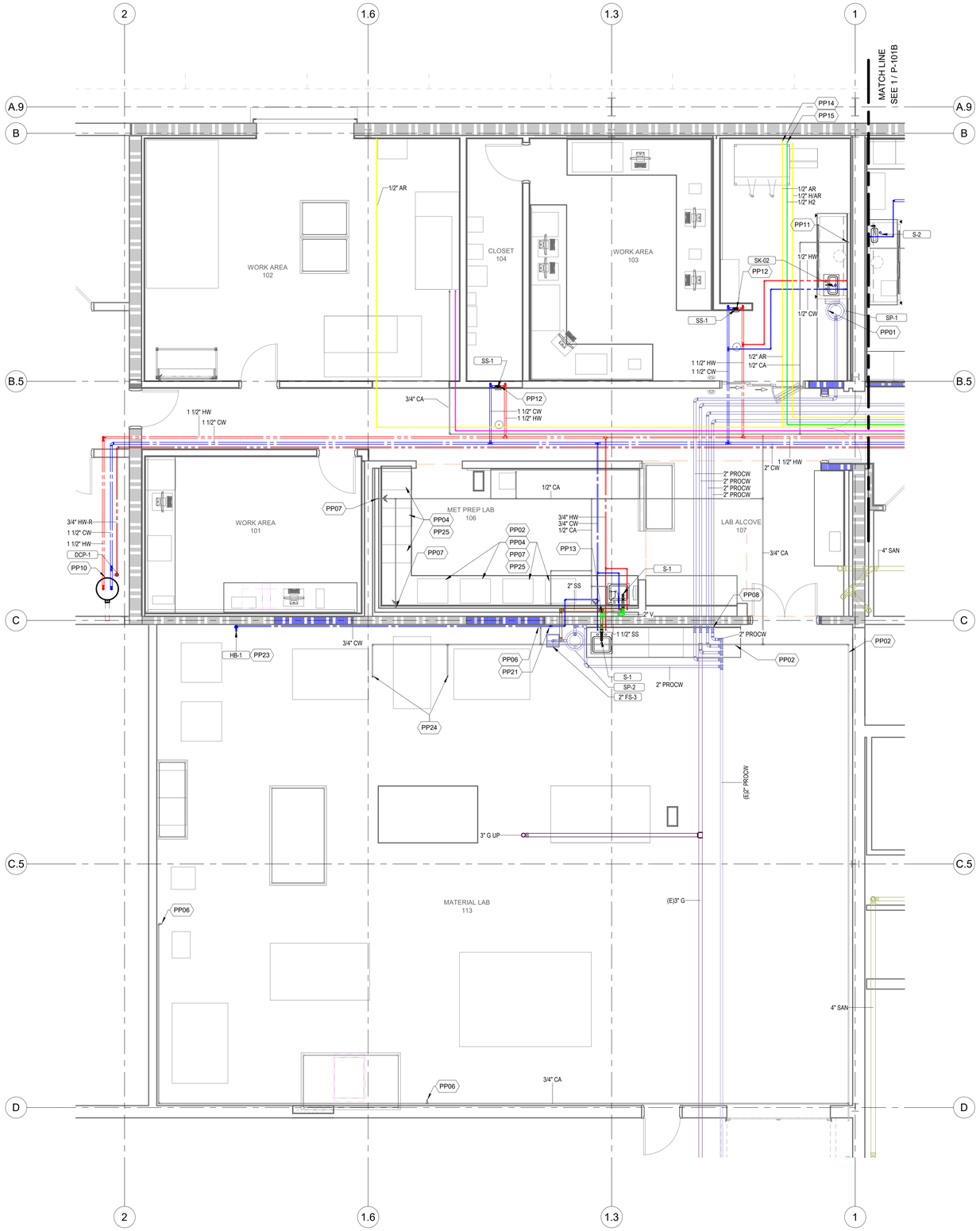
2025-DD016-001

Level 1 Demo Plan - Sector B

PD101B

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:33:59 AM



N

LEVEL 1 PLUMBING PLAN - SECTOR A

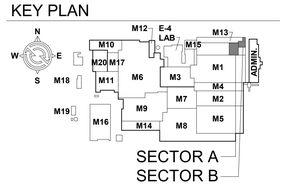
1/4" = 1'-0"

PLUMBING KEYNOTES	
Key Value	Keynote Text
PP01	UNDERCOUNTER LIFT STATION. PROVIDE ACID RESISTANT PLASTIC PIPING. SEE DETAIL ON P-501
PP02	RECONNECT TO EXISTING LAB WASTE PIPING
PP04	3/4" CW TO WATER POLISHER
PP06	PROVIDE 50' 3/4" CA TO HOSE REEL WITH ISOLATION BALL VALVE AT SERVICE.
PP07	3/4" CA DOWN TO OUTLET. SEE LAB DRAWINGS.
PP08	2" LIFTED DRAIN UP TO EXISTING MAIN (TYP).
PP10	RELOCATED DOMESTIC WATER HEATER LOCATED ON MEZZANINE.
PP11	VAC AND CA TO FUME HOOD. SEE LAB DRAWINGS
PP12	THERMOSTATIC MIXING VALVE. SEE DETAIL ON P-501
PP13	CONNECT TO EXISITNG VENT SYSTEM. FIELD VERIFY LOCATION OF NEAREST EXISTING VENT.
PP14	1/2" HYDROGEN DOWN TO EQUIPMENT. SEE LAB DRAWINGS
PP15	1/2" ARGON DOWN TO EQUIPMENT. SEE LAB DRAWINGS
PP21	PROVIDE INLINE CHECK VALVE BFP DEVICE.
PP23	REPLACE WATER HOSE REEL THIS LOCATION.
PP24	PROVIDE CONNECTION TO EQUIPMENT WITH REGULATOR AND ISOLATION BALL VALVE.
PP25	PROVIDE EQUIPMENT DRAIN TO SANITARY IN WALL.

PLUMBING GENERAL NOTES

1. REFER TO PLUMBING FIXTURE PIPE SIZING SCHEDULE FOR PIPES SIZE TO INDIVIDUAL FIXTURES.
2. REFER TO ARCHITECTURAL ELEVATIONS AND PLANS FOR LOCATIONS OF PLUMBING FIXTURES AND EQUIPMENT WITH PLUMBING CONNECTIONS.
3. C.F.C.I.= "CONTRACTOR FURNISHED, CONTRACTOR INSTALLED".
   O.F.C.I.= "OWNER FURNISHED, CONTRACTOR INSTALLED"
   O.F.O.I.= "OWNER FURNISHED, OWNER INSTALLED".
4. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH EQUIPMENT PROVIDER. PROVIDE FINAL CONNECTION. PROVIDE BALL VALVE AT ROUGH-IN LOCATION.
5. DO NOT ROUTE ANY PIPING OVER ELECTRICAL EQUIPMENT OR THROUGH ELECTRICAL EQUIPMENT ROOMS.
6. UNLESS NOTED OTHERWISE, ALL STORM AND SANITARY DRAINAGE PIPING SHALL BE SLOPED:
   1/4" PER FOOT FOR PIPING 2-1/2" AND SMALLER
   1/8" PER FOOT FOR PIPING 3" AND LARGER
7. INSTALL ALL SLOPED PIPING TIGHT TO STRUCTURAL AS POSSIBLE. MAINTAIN REQUIRED SLOPE.
8. REFER TO ARCHITECTURAL DETAILS FOR SHOWER AND FLOOR DRAINS.
9. PROVIDE TRAP PRIMER FOR ALL FLOOR DRAINS. TRAP SEAL IS ACCEPTABLE IN LIEU OF A TRAP PRIMER WHERE ALLOWED BY THE LOCAL CODE.
10. PROVIDE BACKFLOW PREVENTERS AT CONNECTION TO ALL ICE MACHINES AND COFFEE MACHINES. ROUTE DRAIN TO NEAREST FLOOR DRAIN OR SINK.
11. PROVIDE SHUT-OFF VALVE FOR EACH PIPING SYSTEM IN THE SUPPLY AND RETURN MAINS AND BRANCH LINES AT LOCATIONS FOR SUITABLE SERVICE.
12. PROVIDE ALL NECESSARY OFFSETS.
13. 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 AND SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OR ERECTION OF EQUIPMENT AND SYSTEMS. THIS INCLUDES ALL ALL ASSOCIATED ITEMS THAT MAY NOT BE SHOW ON PLUMBING DRAWINGS BUT ARE NECESSARY FOR INSTALLATION AND OPERATION, SUCH AS EQUIPMENT PADS AND HANGERS, AMONG OTHERS.
14. FOR LAB GAS CONENCTIONS TO EQUIPMENT, PROVIDE SHUT OFF VALVE AND QUICK-CONNECT TERMINATION IN ACCESSIBLE LOCATION FOR EQUIPMENT CONNECTION. COORDIANTE WITH EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

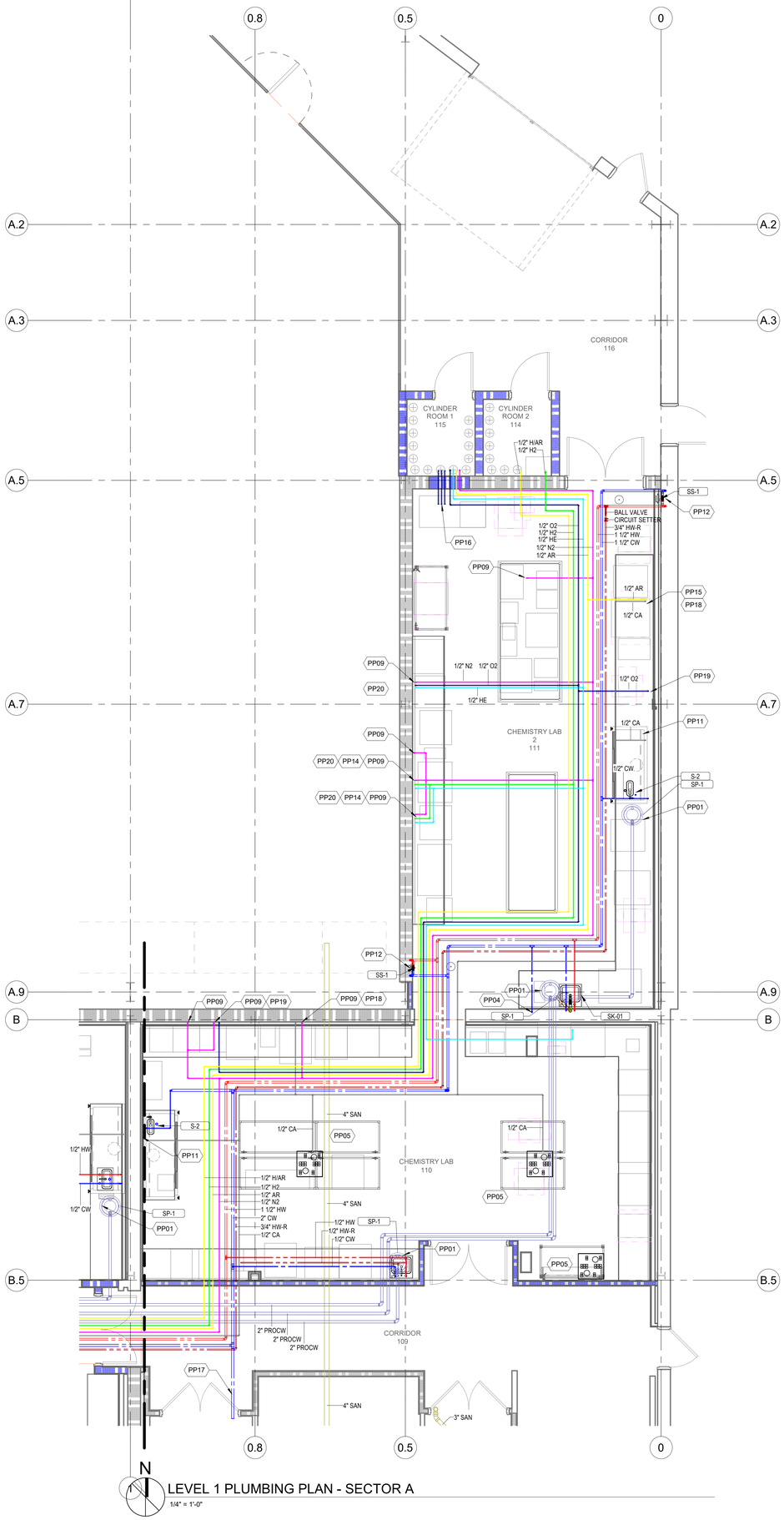
2025-DD016-001

Level 1 Plumbing Plan - Sector A

P-101A

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:34:01 AM

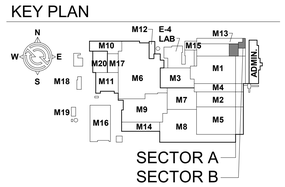


PLUMBING KEYNOTES	
Key Value	Keynote Text
PP01	UNDERCOUNTER LIFT STATION. PROVIDE ACID RESISTANT PLASTIC PIPING. SEE DETAIL ON P-501
PP04	3/4" CW TO WATER POLISHER
PP05	GAS SERVICE PIPING TO SERVICE PANEL. 2 OUTLETS PER SERVICE. SEE LAB DRAWINGS
PP09	1/2" NITROGEN DOWN TO EQUIPMENT. SEE LAB DRAWINGS
PP11	VAC AND CA TO FUME HOOD. SEE LAB DRAWINGS
PP12	THERMOSTATIC MIXING VALVE. SEE DETAIL ON P-501
PP14	1/2" HYDROGEN DOWN TO EQUIPMENT. SEE LAB DRAWINGS
PP15	1/2" ARGON DOWN TO EQUIPMENT. SEE LAB DRAWINGS
PP16	1/2" LAB GAS PIPING CAPPED ON BOTH ENDS FOR FUTURE GAS CONNECTIONS (TYP 3)
PP17	CONNECT TO EXISTING CW MAIN.
PP18	1/2" CA DOWN TO EQUIPMENT. SEE LAB DRAWINGS
PP19	1/2" O2 DOWN TO EQUIPMENT. SEE LAB DRAWINGS
PP20	1/2" HELIUM DOWN TO EQUIPMENT. SEE LAB DRAWINGS

PLUMBING GENERAL NOTES

1. REFER TO PLUMBING FIXTURE PIPE SIZING SCHEDULE FOR PIPES SIZE TO INDIVIDUAL FIXTURES.
2. REFER TO ARCHITECTURAL ELEVATIONS AND PLANS FOR LOCATIONS OF PLUMBING FIXTURES AND EQUIPMENT WITH PLUMBING CONNECTIONS.
3. C.F.C.I.= "CONTRACTOR FURNISHED, CONTRACTOR INSTALLED".
   O.F.C.I.= "OWNER FURNISHED, CONTRACTOR INSTALLED"
   O.F.O.I.= "OWNER FURNISHED, OWNER INSTALLED".
4. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH EQUIPMENT PROVIDER. PROVIDE FINAL CONNECTION. PROVIDE BALL VALVE AT ROUGH-IN LOCATION.
5. DO NOT ROUTE ANY PIPING OVER ELECTRICAL EQUIPMENT OR THROUGH ELECTRICAL EQUIPMENT ROOMS.
6. UNLESS NOTED OTHERWISE, ALL STORM AND SANITARY DRAINAGE PIPING SHALL BE SLOPED:
   1/4" PER FOOT FOR PIPING 2-1/2" AND SMALLER
   1/8" PER FOOT FOR PIPING 3" AND LARGER
7. INSTALL ALL SLOPED PIPING TIGHT TO STRUCTURAL AS POSSIBLE. MAINTAIN REQUIRED SLOPE.
8. REFER TO ARCHITECTURAL DETAILS FOR SHOWER AND FLOOR DRAINS.
9. PROVIDE TRAP PRIMER FOR ALL FLOOR DRAINS. TRAP SEAL IS ACCEPTABLE IN LIEU OF A TRAP PRIMER WHERE ALLOWED BY THE LOCAL CODE.
10. PROVIDE BACKFLOW PREVENTERS AT CONNECTION TO ALL ICE MACHINES AND COFFEE MACHINES. ROUTE DRAIN TO NEAREST FLOOR DRAIN OR SINK.
11. PROVIDE SHUT-OFF VALVE FOR EACH PIPING SYSTEM IN THE SUPPLY AND RETURN MAINS AND BRANCH LINES AT LOCATIONS FOR SUITABLE SERVICE.
12. PROVIDE ALL NECESSARY OFFSETS.
13. 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 AND SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION OR ERECTION OF EQUIPMENT AND SYSTEMS. THIS INCLUDES ALL ALL ASSOCIATED ITEMS THAT MAY NOT BE SHOW ON PLUMBING DRAWINGS BUT ARE NECESSARY FOR INSTALLATION AND OPERATION, SUCH AS EQUIPMENT PADS AND HANGERS, AMONG OTHERS.
14. FOR LAB GAS CONENCTIONS TO EQUIPMENT, PROVIDE SHUT OFF VALVE AND QUICK-CONNECT TERMINATION IN ACCESSIBLE LOCATION FOR EQUIPMENT CONNECTION. COORDIANTE WITH EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED
125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

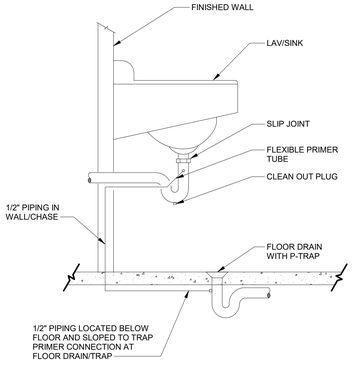
2025-DD016-001

Level 1 Plumbing Plan - Sector B

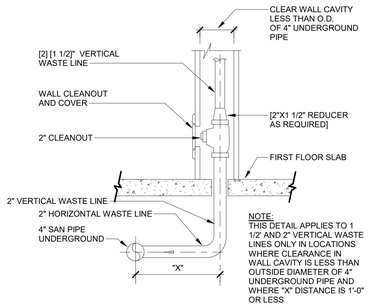
P-101B

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

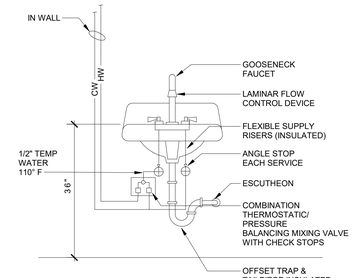
4/24/2026 7:34:02 AM



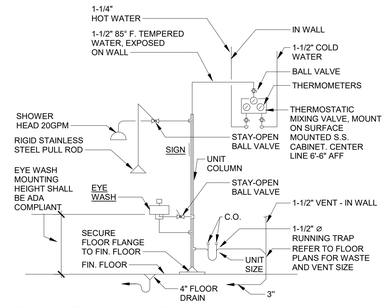
8 WATER SAVER TRAP PRIMER DETAIL
NOT TO SCALE



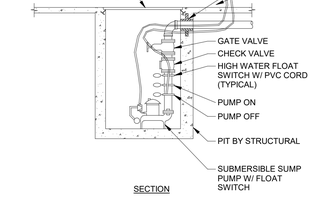
4 SANITARY SIZE REDUCTION AT FIRST FLOOR SLAB DETAIL
NOT TO SCALE



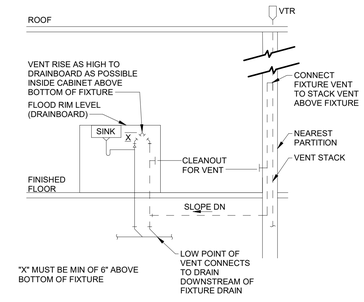
7 ROUGH-IN FOR BARRIER FREE LAVATORY
NOT TO SCALE



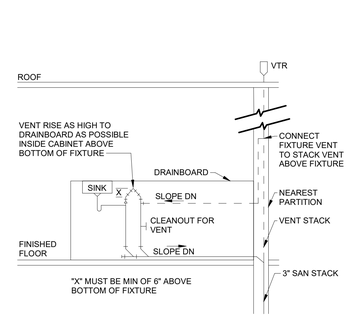
3 EXPOSED EMERGENCY EYEWASH/SHOWER
NTS



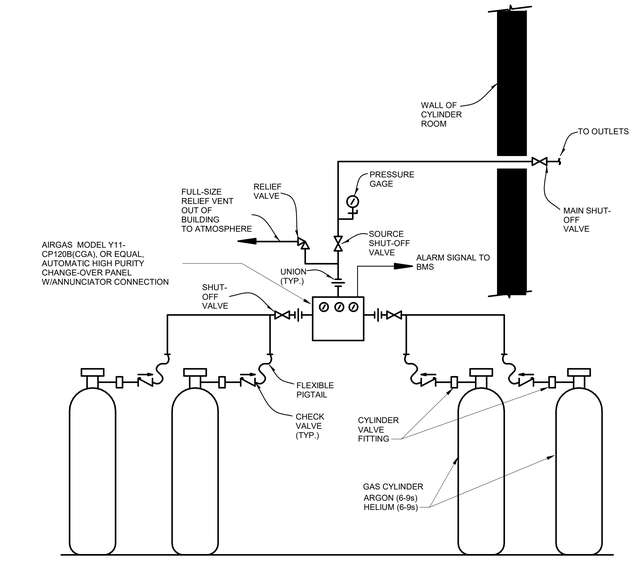
10 SUMP PUMP DETAIL
1 1/2" = 1'-0"



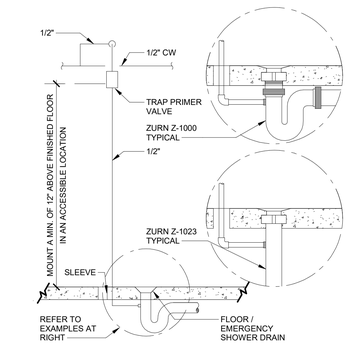
6 ISLAND SINK PIPING DETAIL
NOT TO SCALE



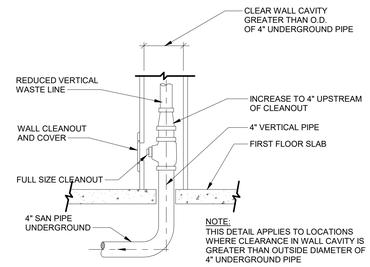
2 PENINSULA SINK PIPING DETAIL
NOT TO SCALE



9 CYLINDER MANIFOLD DETAIL
NTS



5 TRAP PRIMER DETAIL
NOT TO SCALE



1 4IN SANITARY SIZE REDUCTION AT FIRST FLOOR SLAB DETAIL
NOT TO SCALE

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Plumbing Details

P-501

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 7:34:02 AM

DRAIN SCHEDULE

ID	DESCRIPTION	MATERIAL DESCRIPTION		PRIMER CONNECTION	MANUFACTURER	MODEL	REMARKS
		DRAIN BODY	STRAINER				
FD-1	FLOOR DRAIN	CAST IRON	NICKEL BRONZE	No	WATTS	FD-100-A	
FD-3	FLOOR DRAIN	CAST IRON	NICKEL BRONZE	No	WATTS	FD-100-M	
FS-3	FLOOR SINK	CAST IRON	ALUMINUM		WATTS	Fs-730	

DOMESTIC FIXTURE SCHEDULE

ID	DESCRIPTION	WATER FLOW	REMARKS
HB-1	HOSE BIBB	2.5 GPM	1
S-1	Sink	1 GPM	1
S-2	FUME HOOD INTEGRAL CUP SINK	0.5 GPM	1
SK-02	Sink	1 GPM	1
SS-1	SAFETY SHOWER	20 GPM	1

1. SEE SPECIFICATIONS FOR FIXTURE MODEL INFORMATION.

SINK LIFT STATION SCHEDULE

ID	LOCATION		TYPE	NO OF PUMPS		PUMP (EA)		MOTOR (EA)		BASIN		UNIT WEIGHT	FLA	MCA	MOCP	VOLT	PH	MANUFACTURER	MODEL	REMARKS
	NAME	NO		TOTAL	STANDBY	DESIGN FLOW	HEAD	POWER	RPM	DIA	HEIGHT									
SP-1	CHEMISTRY LAB	110	PACKAGED UNDERCOUNTER	1	0	34 GPM	25.00 FT	0.4 hp	1550	15 3/4"	15 1/2"	48.00 lb	8.5 A	11 A	20 A	120 V	1	ZOELLER	135-0005	
SP-1	CHEMISTRY LAB 2	111	PACKAGED UNDERCOUNTER	1	0	34 GPM	25.00 FT	0.4 hp	1550	15 3/4"	15 1/2"	48.00 lb	8.5 A	11 A	20 A	120 V	1	ZOELLER	135-0005	
SP-1	CHEMISTRY LAB 2	111	PACKAGED UNDERCOUNTER	1	0	34 GPM	25.00 FT	0.4 hp	1550	15 3/4"	15 1/2"	48.00 lb	8.5 A	11 A	20 A	120 V	1	ZOELLER	135-0005	
SP-1	WORK AREA	103	PACKAGED UNDERCOUNTER	1	0	34 GPM	25.00 FT	0.4 hp	1550	15 3/4"	15 1/2"	48.00 lb	8.5 A	11 A	20 A	120 V	1	ZOELLER	135-0005	
SP-2	MATERIAL LAB	113	SIMPLEX	1	0	34 GPM	25.00 FT	0.5 hp	1550	15 3/4"	15 1/2"	48.00 lb	9.4 A	11 A	20 A	120 V	1	ZOELLER	BN98-0001	

DOMESTIC CIRCULATOR PUMP SCHEDULE

ID	SYSTEM	TYPE	PUMP		MOTOR		UNIT WEIGHT	OPTIONS		ELECTRICAL		MANUFACTURER	MODEL	REMARKS
			DESIGN FLOW	HEAD	POWER	CONTROL		AQUASTAT	TIMER KIT	VOLT	PH			
DCP-1	HW-R 2	INLINE	1 GPM	10.00 FT	28 W	TEMPERATURE SENSOR	6 lb			120 V	1	BELL & GOSSETT	ECOCIRC e3-6V	

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/25	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Plumbing Schedules

P-601

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:10:53 AM

DEMOLITION NOTES

1. 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 OF ANY TRADE.
2. 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 KNOCK OUTS SHALL BE CLOSED WITH SUITABLE PLUGS OR FILLER PLATES.
3. 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.
4. REMOVAL OF EQUIPMENT SERVING LOCATIONS BEYOND THE RENOVATED AREAS SHALL BE CONFIRMED WITH THE ARCHITECT/ENGINEER PRIOR TO START OF WORK.
5. 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.
6. WHERE EXISTING ELECTRICAL EQUIPMENT TO REMAIN IS SUPPORTED ON WALLS OR CEILINGS TO BE REMOVED, THE EQUIPMENT SHALL BE RE-SUPPORTED AS REQUIRED.
7. ALL DEMOLITION WORK SHALL BE DONE IN A NEAT, WORKMANLIKE MANNER USING CARE NOT TO DAMAGE ANY OF THE EXISTING STRUCTURE.
8. CONCEAL ALL CONDUIT IN EXISTING FINISHED AREAS IN EITHER THE CEILING SPACE ABOVE OR BY CHANNELING THE EXISTING WALLS.
9. PROVIDE NEW CONDUIT AND WIRING TO REPLACE EXISTING CONDUIT AND WIRING REQUIRING RELOCATION.
10. WHERE WORK IS REQUIRED IN OCCUPIED SPACES, THE WORK SHALL BE SCHEDULED "OFF HOURS" AND BE SUBJECT TO THE BUILDING OWNER'S APPROVAL.
11. EXISTING TELEPHONE DEVICES WITHIN THE DEMOLITION AREA SHALL BE REMOVED BY THE CONTRACTOR.
12. EXISTING TELEPHONE CABLES AND DATA CABLES SHALL BE REMOVED BY THE CONTRACTOR.

LIGHTING NOTES

1. LIGHT FIXTURES SHALL BE INDEPENDENTLY SUPPORTED.
2. FOR SECURITY PURPOSES CORRIDOR LIGHTING SHALL NOT HAVE WALL SWITCH OVERRIDE WHERE APPLICABLE OR WHERE NO LOCAL CONTROL DEVICE IS SHOWN ON PLAN.
3. SEE LIGHTING FIXTURE SCHEDULE FOR LUMINAIRE TYPES AND DESCRIPTIONS.
4. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF LUMINAIRES.
5. NIGHT LIGHTS ARE DEFINED AS LUMINAIRES ON EMERGENCY POWER THAT ARE INTENDED TO OPERATE 24 HOURS/DAY, 7 DAYS/WEEK, 356 DAYS/YEAR. EMERGENCY LIGHTS ARE DEFINED AS LUMINAIRES ON EMERGENCY POWER THAT CAN BE CONTROLLED EITHER VIA MANUAL CONTROLS OR BY AUTOMATIC CONTROLS.
6. ALL LUMINAIRES MOUNTED IN LAY-IN CEILING SHALL BE FURNISHED WITH SAFETY T-BAR CLIPS AND MOUNTING HARDWARE AS NECESSARY TO ACCOMMODATE THE LAY-IN GRID TYPE BEING USED AT EACH FIXTURE LOCATION.
7. ELECTRICAL TRADES SHALL PROVIDE TO THE CEILING TILE INSTALLER APPROVED SHOP DRAWINGS FOR ALL FIXTURES REQUIRED TO BE CUT INTO THE LAY-IN CEILING TILES. ALL LOCATIONS SHALL BE COORDINATED WITH THE CEILING TILE MANUFACTURER.
8. UNLESS OTHERWISE SHOWN ON DRAWING, CIRCUIT ALL LUMINAIRES OF THE SAME TYPE IN A ROOM TO THE SAME SWITCH.
9. ALL FIXTURES AND ASSOCIATED COMPONENTS SHALL BE UL LISTED FOR THEIR USE.
10. PROVIDE EXIT SIGNS WITH DIRECTIONAL ARROWS AS INDICATED ON PLANS.
11. SWITCHES SHALL BE MOUNTED TO AVOID THE AREA OF THE DOOR SWING. SWITCHES SHALL CLEAR DOOR SWING BY 6" MINIMUM. COORDINATE WITH ARCHITECTURAL TRADES.
12. ALL SUSPENDED CONTINUOUS LINEAR RUNS OF LUMINAIRES, AND ALL SUSPENDED LUMINAIRES SHOWN ON PLANS AS BEING ORRIENTED IN ROWS, SHALL BE ALIGNED TO BE STRAIGHT, PLUMB, AND LEVEL. CONTRACTOR SHALL MOCK UP ONE BAY OF LUMINAIRES FOR APPROVAL FROM ARCHITECT, ENGINEER AND OWNERS REPRESENTATIVE PRIOR TO INSTALLATION OF LUMINAIRES.

LIGHTING CONTROL NOTES

1. MOTION SENSORS ARE TO BE WIRED DOWNSTREAM OF DAYLIGHTING CONTROLS AND LUMINAIRES.
2. PROVIDE QUANTITY AND TYPE OF SWITCHES NOTED ON PLAN.
3. UNLESS OTHERWISE SHOWN ON DRAWING, CIRCUIT ALL LUMINAIRES OF THE SAME TYPE IN A ROOM TO THE SAME SWITCH.
4. MOTION SENSORS AND PHOTOCELLS SHOWN ON PLANS ARE FOR SCHEMATIC PURPOSES ONLY. FINAL LAYOUT OF MOTION SENSORS AND PHOTOCELLS FOR THE DAYLIGHTING SYSTEM SHALL BE PROVIDED BY THE VENDORS OF SAID PRODUCT.
5. WALL SWITCH TYPE MOTION SENSORS SHALL BE SET TO "MANUAL-ON/AUTO-OFF" OPERATION. WHERE SUCH A SENSOR IS SHOWN IN A ROOM WITH AN EXTERIOR WINDOW, THE WALL SWITCH MOTION SENSOR SHALL INCLUDE AN INTEGRATED PHOTOCELL FOR DAYLIGHTING CONTROL.
6. CEILING MOUNTED OCCUPANCY SENSORS WITHIN ENCLOSED ROOMS MAY NOT HAVE BEEN SHOWN "CONNECTED" FOR DRAWING LEGIBILITY. CEILING MOUNTED OCCUPANCY SENSORS HAVE BEEN SHOWN "CONNECTED" WHERE NECESSARY TO DEFINE THE OVERALL AREA OF COVERAGE. (IE. CORRIDORS AND WAITING AREA).
7. WHERE MULTIPLE CEILING MOUNTED OCCUPANCY SENSORS ARE INDICATED WITHIN A ROOM, THEY SHALL BE INTERCONNECTED TO COMMON CONTROL.
8. CONNECT WALL SWITCH(S) DOWN STREAM OF AREA OCCUPANCY SENSOR OR POWER PACK CONTROL WITHIN A DESIGNATED AREA OR ROOM.
9. CONNECT ALL ROOM LIGHTING, INCLUDING FIXED MOUNTED TASK LIGHTING TO OCCUPANCY SENSOR(S) OR POWER PACK CONTROLLER(S), EXCEPT WHERE ALTERNATE METHOD OF AUTOMATIC CONTROL IS INDICATED (IE TIMER, PHOTOCELL OR PROGRAM SCHEDULED RELAY)
10. PROVIDE TWO CIRCUIT POWER PACK AND/OR ADDITIONAL SLAVE POWER PACK UNIT(S) WHERE NECESSARY FOR CONTROL OF MULTIPLE CIRCUITS, WITHIN A CONTROL ZONE OR FOR INTERCONNECTION TO THE BUILDING MANAGEMENT SYSTEM (WHERE INDICATED).
11. MOTION SENSORS IN CORRIDORS SHALL BE SET TO "AUTO-ON" OPERATION.
12. PROVIDE DIMMABLE LED DRIVERS. CONNECT DIMMABLE FIXTURES TO DAYLIGHTING SYSTEM WHERE SPECIFIED TO DO SO.
13. EACH LAB SPACE SHALL BE CONTROLLED BY A SERIES OF OCCUPANCY SENSORS, LOCAL OVERRIDE SWITCHES, AND DAYLIGHT HARVESTING TECHNOLOGY (WHERE APPLICABLE).
14. ALL CONTROLS AND ASSOCIATED COMPONENTS SHALL BE UL LISTED FOR THEIR USE.
15. OCCUPANCY SENSOR TIME DELAY SHALL BE COORDINATED WITH OWNER AND LIGHTING CONTROL VENDOR. TIME DELAY SHALL NOT BE LESS THAN 10 MINUTES AND SHALL NOT BE GREATER THAN 30 MINUTES.
16. CONTRACTOR SHALL VERIFY DIMMING SWITCH COMPATIBILITY WITH SPECIFIED LUMINAIRES PRIOR TO ORDERING DIMMING SWITCHES AND LUMINAIRES.
17. THE CONTRACTOR OR LIGHTING CONTROL MANUFACTURER SHALL SUBMIT A NARRATIVE DESCRIBING THE OPERATION OF THE SYSTEM AS PART OF THE SHOP DRAWING PROCESS. THIS NARRATIVE SHALL DESCRIBE TYPICAL ROOM FUNCTIONALITY FOR SIMILAR ROOMS, AND SHALL INDICATE MANUAL CONTROLS, AUTOMATIC CONTROLS, AND SCHEDULE/TIME DELAY INTERVALS. NARRATIVE SHOULD ACCOUNT FOR ALL ASPECTS OF THE LIGHTING CONTROL SYSTEM AS DESCRIBED IN THESE DRAWINGS.
18. LIGHTING CONTROL DEVICES SHOWN ON PLANS ARE TO ILLUSTRATE INTENT OF CONTROL AND AREA OF CONTROL. COMBINING MULTIPLE CONTROL DEVICES IN A SPACE SHOWN ON THE PLANS INTO A SINGLE DEVICE IS ACCEPTABLE PROVIDED THE FOLLOWING CONDITIONS ARE MET:
    A. ALL OF THE FUNCTIONALITY OF THE ORIGINAL SPECIFIED PRODUCT MUST BE PROVIDED.
    B. THE PROPOSED DEVICES ARE OF AN APPROVED LIGHTING CONTROL MANUFACTURE LISTED IN THE SPECIFICATIONS.
    C. THE CONTRACTOR MUST SUBMIT ALTERNATE DEVICE AND LAYOUT TO THE ENGINEER FOR APPROVAL AS PART OF THE SUBMITTAL/SHOP-DRAWING PROCESS.
    D. THE CONTRACTOR ADHERES TO ALL REQUIREMENTS LISTED IN THE SPECIFICATION RELATED TO SUBMITTING SUBSTITUTIONS.

DAYLIGHT CONTROL NOTES

1. ALL LUMINAIRES WITHIN PRIMARY AND SECONDARY DAYLIT ZONES AS IDENTIFIED ON PLANS SHALL BE CONTROLLED BY A DAYLIGHTING SYSTEM.
2. LABORATORIES CONTROLLED BY A DAYLIGHTING CONTROL SYSTEM SHALL MAINTAIN A MINIMUM LEVEL OF 50 FOOTCANDLES AT 36" AFF.
3. DAYLIGHTING SYSTEM SHALL BE FULLY DESIGNED BY THE LIGHTING CONTROL VENDOR. VENDOR SHALL PROVIDE SHOP DRAWINGS AS PART OF THE LIGHTING CONTROL SUBMITTAL PRIOR TO INSTALLATION. DAYLIGHTING SENSORS SHOWN ON DRAWINGS ARE FOR SCHEMATIC PURPOSES ONLY. FINAL DESIGN FROM DAYLIGHTING SYSTEM VENDOR SHALL DEPEND ON TYPE OF SENSING SYSTEM (OPEN-LOOP OR CLOSED-LOOP), VENDOR SPECIFIC TECHNOLOGY, ETC.
4. DAYLIGHTING SYSTEM SHALL PROVIDE DIMMING AND "ON/OFF" CONTROL FOR ASSOCIATED LUMINAIRES.
5. SEE ARCHITECTURAL DRAWINGS FOR GLASS LOCATIONS AND ARCHITECTURAL MATERIAL SYMBOL LIST.
6. SEE ARCHITECTURAL ELEVATIONS.
7. REFER TO THE ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING AND LUMINAIRE HEIGHT.
8. SEE ARCHITECTURAL SPECIFICATION FOR GLAZING SCHEDULE.
9. MANUFACTURER SHALL PROVIDE FULL COMMISSIONING OF DAYLIGHTING SYSTEM, INCLUDING (BUT NOT LIMITED TO) ADJUSTMENT OF DAYLIGHTING SETPOINTS, DEADBAND, AND SYSTEM PROGRAMMING.

GENERAL NOTES

1. ELECTRICAL OUTLET BOXES INSTALLED IN RATED WALLS SHALL NOT BE LESS THAN 24" FROM OUTLETS IN THE OPPOSITE WALL SURFACE. BACK AND SIDE OF BOXES SHALL BE COMPLETELY WRAPPED BY LOWERY #10 PUTTY PADS. BOXES SHALL BE CAULKED AT THE PERIMETER OF THE BOX WHERE IT MATES WITH THE DRYWALL.
2. 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.
3. THE MECHANICAL, ELECTRICAL AND PLUMBING CONTRACTORS SHALL COORDINATE THEIR INSTALLATIONS PRIOR TO THE PERMANENT INSTALLATION OF ANY DUCTWORK, CONDUIT OR PIPING. UNLESS DECIDED BY THE GENERAL CONTRACTOR, DUCTWORK SHALL TAKE PRECEDENCE. COSTS TO CORRECT CONFLICTS SHALL BE NO COST TO THE OWNER.
4. ANY FEEDERS AND BRANCH CIRCUITS SHALL CARRY A GROUND WIRE, SIZED PER N.E.C ARTICLE 250.
5. FIELD VERIFY EXISTING CONDITIONS AND ACTUAL DIMENSIONS PRIOR TO START OF WORK.
6. THOROUGHLY COORDINATE ELECTRICAL WORK WITH OTHER TRADES TO AVOID PHYSICAL CONFLICTS AND CONFLICTS WITH WORK SEQUENCE.
7. REFER TO ARCHITECTURAL DRAWINGS FOR WALLS WITH SPECIAL WALL FINISHES AND MILLWORK. COORDINATE OVERALL WALL COVERING THICKNESS AND MILLWORK DEPTH AND PROVIDE PLASTER RING WITH APPROPRIATE DEPTH. COORDINATE CUTTING OF MILLWORK PANELS WITH MILLWORK TRADES AND INSTALL DEVICE COVERPLATES ON MILLWORK SURFACE.
8. COORDINATE WITH ARCHITECTURAL TRADES FOR WALLS TO BE PROVIDED WITH INSULATION FOR ACOUSTICAL PURPOSES.
9. ALL CONDUIT AND WIRING SHALL BE CONCEALED IN WALL OR CEILING CAVITY EXCEPT WHERE NOTED OTHERWISE ON THE DRAWINGS.
10. IN ALL AREAS WITH GYPSUM BOARD CEILINGS THE ELECTRICAL TRADES SHALL ROUTE CONDUIT AND POSITION PULL / JUNCTION BOXES TO ALLOW ACCESS THRU ACCESS PANELS BY ARCHITECTURAL TRADES, WHERE POSSIBLE. WHERE ADDITIONAL ACCESS PANELS ARE REQUIRED FOR ELECTRICAL EQUIPMENT, THE ELECTRICAL TRADES SHALL INCLUDE THE ACCESS PANEL IN THE BID. ACCESS PANEL SHALL BE INSTALLED BY THE CEILING INSTALLER. ADDITIONAL ACCESS PANEL LOCATIONS SHALL BE APPROVED BY THE ARCHITECT.
11. MOUNTING HEIGHTS OF ELECTRICAL DEVICES ARE TO CENTER OF DEVICE UNLESS OTHERWISE NOTED.
12. IN GENERAL, ELECTRICAL DEVICES, WHICH ARE INDICATED ON THE PLAN MAY BE SCALED AND MOUNTED TO THE NEAREST STUD EXCEPT WHERE DIMENSIONED OR ADDITIONAL LAYOUT CRITERIA IS INDICATED AT CRITICAL LOCATIONS. DEVICES SHOWN ON ARCHITECTURAL ELEVATIONS SHALL BE POSITIONED AT THE LOCATIONS INDICATED (PROVIDE DOUBLE STUD ADJUSTABLE BRACKETS WHERE NECESSARY).
13. ELECTRICAL DEVICE OUTLETS SHALL NOT BE LOCATED BACK TO BACK WITHIN THE SAME STUD SPACE IN INTERIOR WALLS, WHICH ARE INSULATED. THE DEVICES IN ONE ROOM SHALL BE OFFSET TO THE NEXT STUD SPACE.
14. MULTI GANG DEVICES SHALL BE GANGED UNDER SINGLE MULTI GANG COVER PLATE.
15. WHERE ELECTRICAL DEVICES ARE INDICATED ON A COLUMN, THE DEVICE SHALL BE CENTERED ON THE COLUMN SURFACE.
16. 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.
17. 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.
18. REFER TO ONE LINE DIAGRAM(S) FOR FEEDER CONDUIT AND WIRE SIZES.
19. 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.
20. ELECTRICAL LAYOUT AND DESIGN HAVE BEEN BASED ON PRELIMINARY INFORMATION FROM "DESIGN BASIS" MANUFACTURERS OF MAJOR EQUIPMENT. ELECTRICAL TRADES SHALL OBTAIN FINAL EQUIPMENT INSTALLATION INFORMATION FROM APPROVED SHOP DRAWINGS PRIOR TO SYSTEM INSTALLATION. WHERE SUBSTITUTION OF OTHER LISTED APPROVED MANUFACTURERS ARE PROVIDED BY THE CONTRACTOR, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION OR DESIGN REVISIONS FROM ALL DISCIPLINES OR TRADES NECESSARY TO ACCOMMODATE THE SUBSTITUTED EQUIPMENT.
21. ELECTRICAL TRADES TO VERIFY DIRECT LINE HORIZONTAL DISTANCE OF RECEPTACLES TO EDGE OF SINK & PROVIDE GFCI DEVICE WHERE LOCATED WITHIN 6'-0".
22. PROVIDE FIRESTOP PUTTY PADS AROUND THE BACK BOXES IN FIRE RATED WALLS TO MAINTAIN WALL FIRE RATING. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF FIRE RATED WALLS
23. ELECTRICAL CONTRACTOR TO COORDINATE FINAL EQUIPMENT AND PANEL NAMES FROM THE OWNER'S REPRESENTATIVE PRIOR TO IDENTIFICATION AND LABELING IN FIELD AND FABRICATION OF NAMEPLATES.
24. GROUND FLAMMABLE (OSHA) ACID & SOLVENT STORAGE CABINETS. UNLESS NOTED OTHERWISE, EXTEND A #10 AWG GREEN INSULATED COPPER CONDUCTOR FROM EACH OSHA STORAGE CABINET TO THE NEAREST ELECTRICAL GROUND BUS.

FIRE ALARM NOTES

1. ELECTRICAL CONTRACTOR TO PERFORM FIRE ALARM INSTALLATION PER HONEYWELL DESIGN DRAWINGS. HONEYWELL TO PROVIDE PROGRAMMING AND PARTS. REFER TO HONEYWELL DESIGN DRAWINGS, CONTRACT NUMBER: MET-01. HONEYWELL PROJECT MANAGER: MIKE STEGER; TEL: 248-376-2725.
2. COMPLETE INSTALLATION SHALL CONFORM TO APPLICABLE SECTIONS OF NFPA-72, STATE FIRE CODE, STATE BUILDING CODE AND STATE ELECTRICAL CODE.
3. FIRE ALARM PANEL, ANNUNCIATOR, SMOKE DETECTORS SHALL BE ANALOG AND ADDRESSABLE.
4. ADDRESSABLE MANUAL PULL STATIONS SHALL BE DUAL ACTION WITH A KEYED RESET. KEY SHALL MATCH LOCAL FACP.
5. ALL FIRE ALARM WIRING SHALL BE IN CONDUIT. MINIMUM SIZE OF CONDUIT IS 3/4" CONDUIT.
6. ALL JUNCTION BOXES SHALL BE SIZED IN ACCORDANCE WITH NEC. AND PAINTED RED IN COLOR.
7. ALL 120V AC POWER REQUIREMENTS FOR THE FIRE ALARM SYSTEM SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR AND SHALL MEET ALL REQUIREMENTS
8. MECHANICAL UNITS THAT HAVE 2000 CFM AND OVER SHALL BE SHUT DOWN BY THE FIRE ALARM SYSTEM.
9. ELECTRICAL CONTRACTOR TO OBTAIN FIRE ALARM PERMIT.

MECHANICAL AND PLUMBING EQUIP. NOTES

1. FIELD COORDINATE EXACT LOCATION OF ALL MECHANICAL EQUIPMENT PRIOR TO THE ROUGH-IN OF THE ELECTRICAL WORK FOR MECHANICAL EQUIPMENT.
2. 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.
3. 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.
4. 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
ACS	ACCESS CONTROL SYSTEM
AF	AMPERE FRAME
AFF	ABOVE FINISH FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AIC	AMPERES INTERRUPTING CAPACITY
AL	ALUMINUM
AP	AMPERE PLUG
ARF	ABOVE RAISED FLOOR
AS	AMPERE SWITCH
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BCC	BACKBONE COPPER CABLE
BKBD	BACKBOARD
BKR	BREAKER
BLDG	BUILDING
C	CONDUIT
CAB	CABINET
CAT	4-PAIR, UTP CABLE
CATV	COMMUNITY ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CD	CANDELA
CKT	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
CUH	CABINET UNIT HEATER
DC	DIRECT CURRENT
DEG	DEGREE
DEMO	DEMOLITION
DEPT	DEPARTMENT
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DN	DOWN
DP	DISTRIBUTION PANELBOARD
DWG	DRAWING
E	EXISTING
EA	EACH
EC	ELECTRICAL CONTRACTOR
EGB	ELECTRICAL GROUND BUS
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
EMT	ELECTRIC METALLIC TUBING
ENL	EXISTING NEW LOCATION
EQUIP	EQUIPMENT
ER	EQUIPMENT ROOM
ERMS	ENERGY REDUCTION MAINENANCE SWITCH
ESS	ELECTRONIC SAFETY & SECURITY
ETM	EXISTING TO MOVE
ETBR	EXISTING TO BE REMOVED
EUH	ELECTRIC UNIT HEATER
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
FA	FIRE ALARM
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FLA	FULL LOAD AMPERES
FLR	FLOOR
FMT	FLEXIBLE METALLIC TUBING
FOC	FIBER OPTIC CABLE
FU	FUSE
GANN	GENERATOR ANNUNCIATOR
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTOR
GND	GROUND
HC	HORIZONTAL CROSS-CONNECT
HH	HANDHOLE
HOA	HAND-OFF-AUTO
HP	HORSE POWER
HTR	HEATER
IAW	IN ACCORDANCE WITH
IBC	INTERNATIONAL BUILDING CODE
IC	INTERMEDIATE CROSS-CONNECT
IDC	INSULATION DISPLACEMENT CONNECTOR
IDF	INTERMEDIATE DISTRIBUTION FRAME
IDS	INTRUSION DETECTION SYSTEM
IG	ISOLATED GROUND
INV	INVERTER
IMC	INTERMEDIATE METAL CONDUIT
IP	INTERNET PROTOCOL
IPP	ISOLATED POWER PANEL
JB	JUNCTION BOX
JC	JANITOR CLOSET
KCMIL	THOUSAND CIRCULAR MILLS
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LAN	LOCAL AREA NETWORK
LCP	LIGHTING CONTROL PANEL
LFACP	LOCAL FIRE ALARM CONTROL PANEL
LI	LONG TIME, INSTANTANEOUS
LP	LIGHTING PANELBOARD
LRA	LOCKED ROTOR AMPERE
LSI	LONG TIME, SHORT TIME, INSTANTANEOUS
LSIG	LONG TIME, SHORT TIME, INSTANTANEOUS, GROUND FAULT
LTG	LIGHTING
MAX	MAXIMUM
MC	MAIN CROSS-CONNECT
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDF	MAIN DISTRIBUTION FRAME
MECH	MECHANICAL
MGB	MAIN GROUND BUS
MH	MANHOLE
MIN	MINIMUM
MLO	MAIN LUG ONLY
MM	MULTIMODE FIBER
MNS	MASS NOTIFICATION SYSTEM
MON	MONITOR
MSB	MAIN SWITCHBOARD
MTD	MOUNTED
MTG	MOUNTING
MTR	MOTOR
MTS	MANUAL TRANSFER SWITCH
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NF	NOT FUSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPENED
NTS	NOT TO SCALE
OFC	OPTICAL FIBER CABLE
OFOI	OWNER FURNISHED OWNER INSTALLED
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OICF	OWNER INSTALLED CONTRACTOR FURNISHED
OS	OCCUPANCY SENSOR
OSP	OUTSIDE PLANT
P	POLE
PB	PULL BOX
PC	PHOTOCELL
PDP	POWER DISTRIBUTION PANELBOARD
PDU	POWER DISTRIBUTION UNIT
PH	PHASE
PL	PILOT LIGHT
PNL	PANEL
PON	PASSIVE OPTICAL NETWORK
PP	POWER PANELBOARD
PR	PAIR
PT	POKE-THRU
PTD	POWER TRANSFER DEVICE
PTZ	PAN, TILT, ZOOM
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
PWR	POWER
R	RELOCATED
RECEPT	RECEPTACLE
REQMT	REQUIREMENT
RM	ROOM
RMC	RIGID METAL CONDUIT
RMS	ROOT MEAN SQUARE
RP	RECEPTACLE PANEL
RPP	REMOTE POWER PANEL
RPSS	RECEPTACLE PANEL WITH INTEGRAL SURGE SUPRESSION
RU	RACK UNIT
SAF	SUPPLY AIR FAN
SCTP	SCREENED TWISTED PAIR
SD	SMOKE DETECTOR
SF	SQUARE FEET
SM	SINGLEMODE FIBER
SPEC	SPECIFICATIONS
SPD	SURGE SUPPRESSION DEVICE
STD	STANDARD
STS	STATIC TRANSFER SWITCH
STP	SHIELDED TWISTED PAIR
SUB	SUBSTATION
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TBL	TABLE
TC	TIME CLOCK
TEL	TELEPHONE
TGB	TELECOM GROUNDING BUS BAR
TL	TWIST LOCK
TMGB	TELECOM MAIN GROUNDING BUS BAR
TR	TELECOM ROOM
TV	TELEVISION
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES INC.
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED PAIR
UV	UNIT VENTILATOR
V	VOLT
VA	VOLT AMPS
VAV	VARIABLE AIR VOLUME
VOIP	VOICE OVER INTERNET PROTOCOL
VSS	VIDEO SURVELLANCE SYSTEM
W	WATT
W/	WITH
WAP	WIRELESS ACCESS POINT
WG	WIRE GUARD
WH	WATER HEATER
WP	WATERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION PROOF
ZSI	ZONE SELECTIVE INTERLOCK
3R	NEMA 3R ENCLOSURE
4X	NEMA 4X ENCLOSURE

ELECTRICAL SHEET INDEX

SHEET NUMBER	SHEET NAME	ISSUED FOR
E-001	Electrical General Notes & Abbreviations	Bids
E-002	Electrical Legends	Bids
E-003	Electrical Legends	Bids
ED101	Level 1 Demo Plan	Bids
EL101	Level 1 Lighting Plan	Bids
EP101	Level 1 Power Plan	Bids
EP102	Roof Demo & Power Plan	Bids
E-401	Enlarged Plans	Bids
E-501	Details, One Line Diagrams	Bids
E-502	Lighting Fixture Schedule and Control Matrix	Bids
E-601	Panel Schedules	Bids
E-801	Electrical Specifications	Bids
E-802	Electrical Specifications	Bids

Count: 13

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Electrical General Notes & Abbreviations

E-001

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:10:56 AM

ONE-LINE SCHEMATIC SYMBOL LEGEND

- STRESS CONE
- POT HEAD
- GROUND FAULT SENSOR AND RELAY
- END CAP
- EXISTING EQUIPMENT CONNECTION
- WYE
- LOAD CONNECTOR
- SPLICE
- 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

CONDUIT / FEEDER TAG LEGEND

CIRCUIT SIZE NUMBER

XXX

CA = UNLESS OTHERWISE INDICATED, CONDUCTOR SIZING SHALL MATCH THE SIZE INDICATED FOR THE APPLICABLE OVERCURRENT DEVICE. PROVIDE LARGER CONDUCTORS AND RACEWAY WHERE INDICATED.

CB = PROVIDE TYPE AND MINIMUM SIZE OF RACEWAY OR CABLE AS INDICATED IN SPECIFICATIONS OR ON THE DRAWINGS.

CC = PROVIDE NEUTRAL IN CIRCUIT UNLESS DEVICE SERVED DOES NOT HAVE PROVISIONS FOR A NEUTRAL CONNECTION.

CD = MINIMUM SIZE CONDUIT FOR SCHEDULE 80 OR EMT IS ONE STANDARD ELECTRICAL SIZE LARGER THAN INDICATED IN THE SCHEDULE. PROVIDE LARGER CONDUIT WHERE SPECIFICALLY INDICATED OTHERWISE. DO NOT INSTALL PVC INDOORS.

CE = PROVIDE SEPARATE, INSULATED EQUIPMENT GROUNDING CONDUCTOR WITH EACH FEEDER AND BRANCH CIRCUIT.

CF = PROVIDE ADDITIONAL ISOLATED GROUND CONDUCTOR SAME SIZE AS THE EQUIPMENT GROUND, IN CIRCUITS TO ISOLATED GROUND PANELS OR DEVICES, GREEN WITH YELLOW STRIPE.

CG = FOR PANELS WITH 200% NEUTRAL PROVIDE 200% NEUTRAL USING TWO PHASE SIZED CONDUCTORS OF SIZE #1/0 OR LARGER, OTHERWISE PROVIDE A SINGLE CONDUCTOR SIZE FOR THE EQUIVALENT CIRCULAR MIL AREA OF TWO PHASE CONDUCTORS.

CH = PROVIDE SEPARATE INDIVIDUAL NEUTRALS FOR ALL CIRCUITS EXCEPT LIGHTING CIRCUITS. PROVIDE A DEDICATED NEUTRAL FOR GFCI OR AFCI CIRCUITS.

CL = 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 60°C AMPACITIES FOR 100A OR LESS AND 75°C AMPACITIES OVER 100A.

CJ = 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 #2/0 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.

CK = 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 = 120 RHO
-EARTH TEMP = 20 C
-LOAD FACTOR = 100%
-DUCT BANK = AS INDICATED ON THE DRAWINGS

CL = 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

OUTLET LEGEND

- SINGLE RECEPT
- DUPLEX RECEPT
- 48" (DESIGNATES SPECIFIC MOUNTING HEIGHT) DUPLEX RECEPT
- GFI DUPLEX RECEPT
- WP GFI WEATHERPROOF RECEPT
- CONTROLLED DUPLEX RECEPT
- DUPLEX RECEPT ON EMERG CIRCUIT
- DUPLEX RECEPT ON UPS CIRCUIT
- FLOOR DUPLEX RECEPT
- CEILING DUPLEX RECEPT
- DOUBLE DUPLEX RECEPT
- DOUBLE DUPLEX RECEPT ON EMERGENCY CIRCUIT
- 240V RECEPTACLE
- RECEPT ON CORD REEL
- SPECIAL RECEPTACLE
- JUNCTION BOX
- FLOOR JUNCTION BOX
- CEILING JUNCTION BOX
  CLG
- WIRE MOLD

MOTOR LEGEND

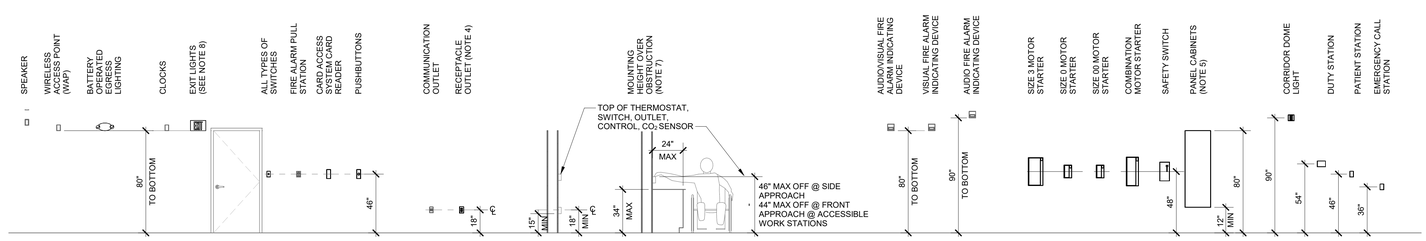
- COMB MOTOR STARTER (NON-FUSED)
- SAFETY DISC SW (NON-FUSED)
- SAFETY DISC SW (FUSED)
- RELAY
- PUSH BUTTON
- POWER POLE (OPEN OFFICE STYLE)
- SURGERY SERVICE COLUMN
- STATIC GROUND RECEPTACLE
- UTILITY SERVICE POWER POLE

XX-1 MOTOR
XX-1 IDENTITY, SEE SCH

EXISTING TO REMAIN XX-1
RELOCATED XX-1
DEMOLISHED XX-1

- TRANSFORMER
- BUS DUCT W/ PLUG IN DISCONNECT
- CABLE TAP BOX

MOUNTING HEIGHT LEGEND



LIGHTING LEGEND

- LIGHTING FIXTURES, TYPICAL, SEE LUMINAIRE SCHEDULE FOR MOUNTING.
- LINEAR LIGHTING FIXTURE, TYPICAL, SEE LUMINAIRE SCHEDULE FOR WIDTH AND MOUNTING. CONTRACTOR SHALL FIELD MEASURE FOR LENGTH
- LIGHTING FIXTURES, TYPICAL, CHEVRON INDICATES WALL WASH, SEE LUMINAIRE SCHEDULE FOR MOUNTING.
- LIGHTING FIXTURES, TYPICAL, CHEVRON INDICATES WALL WASH, SEE LUMINAIRE SCHEDULE FOR MOUNTING.
- WALL-MOUNTED FIXTURES, TYPICAL
- STRIP FIXTURE
- DIRECTIONAL LIGHT, TRACK FLOOD
- LINEAR LIGHT TAPE LIGHT, SEE LUMINAIRE SCHEDULE FOR WIDTH AND MOUNTING. CONTRACTOR SHALL FIELD MEASURE FOR LENGTH AND COORDINATE DRIVER LOCATION.
- EMERGENCY LIGHTING UNIT, CEILING-MOUNTED, INTEGRAL BATTERY
- EMERGENCY LIGHTING UNIT, CEILING-MOUNTED, REMOTE BATTERY
- EMERGENCY LIGHTING UNIT, WALL-MOUNTED, INTEGRAL BATTERY
- EMERGENCY LIGHTING UNIT, WALL-MOUNTED, REMOTE BATTERY
- EXIT LIGHT, CEILING-MOUNTED, SHADING AND ARROWS INDICATE FACES AND DIRECTION
- EXIT LIGHT, WALL-MOUNTED, SHADING AND ARROWS INDICATE FACES AND DIRECTION
- EXIT/ELU COMBO
- POLE/AREA LIGHTS
- POST-TOP AREA LIGHT
- BOLLARD LIGHT
- DIAGONAL HATCH INDICATES LIGHT ON A CRITICAL CIRCUIT
- SOLID HATCH INDICATES LIGHT ON AN EMERGENCY OR LIFE SAFETY CIRCUIT

SWITCH AND SENSORS LEGEND

- SINGLE POLE SWITCH
- 3-WAY SWITCH
- 4-WAY SWITCH
- KEYED SWITCH
- SWITCH W/ PILOT
- DIMMER SWITCH
- OCCUPANCY SENSOR
- OCCUPANCY SENSOR W/ MANUAL SWITCH
- OCCUPANCY SENSOR W/ DIMMER SWITCH
- OCCUPANCY SENSOR
- TIMER SWITCH
- TIME DELAY SWITCH
- TIME CONTROL SWITCH
- LOW VOLTAGE SWITCH
- LIGHT LEVEL SENSOR
- PHOTOCELL

MOUNTING HEIGHT NOTES

1. MOUNTING HEIGHTS ARE TYPICAL, UNLESS OTHERWISE INDICATED ON ARCHITECTURAL OR ELECTRICAL DRAWINGS.
2. FIRE ALARM VISUAL AND COMBINATION AUDIO VISUAL DEVICES INSTALLED ON WALLS SHALL BE MOUNTED PER NFPA 72, SUCH THAT THE ENTIRE LENS IS NOT LESS THAN 80 INCHES AND NOT GREATER THAN 96 INCHES ABOVE FINISH FLOOR.
3. FIRE ALARM AUDIO DEVICES INSTALLED ON WALLS SHALL BE MOUNTED PER NFPA 72, SUCH THAT THE TOP OF THE DEVICES IS NOT LESS THAN 90 INCHES ABOVE FINISH FLOOR AND NOT LESS THAN 6 INCHES BELOW FINISH CEILING.
4. RECEPTACLES MOUNTING HEIGHTS IN UNFINISHED AREAS SHALL BE 36 INCHES ABOVE FINISH FLOOR TO CENTERLINE OF OUTLET BOX.
5. WHERE REQUIRED, 12" MINIMUM SHALL BE MAINTAINED BETWEEN THE FLOOR AND BOTTOM OF PANELBOARD. PANEL SHALL BE ADJUSTED AS NECESSARY TO ACHIEVE THE 12" FROM THE FLOOR. ALL PANELS SHALL HAVE OPERATING HANDLES OF SWITCHES AND CIRCUIT BREAKERS, WHEN IN THE HIGHEST POSITION, NO MORE THAN 6' - 7" ABOVE FINISH FLOOR.
6. COORDINATE ADDITIONAL MOUNTING REQUIREMENTS WITH ARCHITECTURAL TRADES.
7. ELECTRICAL OUTLETS, SWITCHES, AND SIMILAR CONTROLS SHALL BE MOUNTED A MAXIMUM OF 48" ABOVE FINISHED FLOOR, MEASURED TO THE TOP OF THE ELECTRICAL BOX RATHER THAN THE CENTERLINE. THE MINIMUM MOUNTING HEIGHT FOR SWITCHES AND OUTLETS IS 15" ABOVE FINISHED FLOOR, MEASURED TO THE BOTTOM OF THE ELECTRICAL BOX RATHER THAN THE CENTER LINE. (CBC SECTION 1117B.6.5)
8. FOR BRACKET EXIT SIGNS, MOUNT 6'-8" TO BOTTOM OF LUMINAIRE FOR CEILINGS UP TO 9'-0" AFF. MOUNT AT 8'-0" TO BOTTOM FOR CEILINGS HIGHER THAN 9'-0" AFF. FOR RECESSED EXIT SIGNS, WHEN ABOVE DOOR LOCATE MIDWAY BETWEEN TOP OF DOOR FRAME AND CEILING IF CEILING HEIGHT IS 8'-0" AFF OR 9'-0" AFF. FOR HIGHER CEILINGS, MOUNT 12" ABOVE DOOR.

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Electrical Legends

E-002

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:10:59 AM

CONDUCTOR & CONDUIT SCHEDULE (COPPER)

CIRCUIT SYMBOL	3-PHASE VFD CABLE ASSEMBLY (XXXX CU V)		3-PHASE, 4-WIRE + GROUND, 200% NEUTRAL (XXXX CU 2N)		3-PHASE, 4-WIRE + ISOLATED GROUND (XXXX CU IG)	
	CONDUIT	VFD CABLE ASSEMBLY IN EACH CONDUIT [NOTE #1]	CONDUIT	CONDUCTORS IN EACH CONDUIT	CONDUIT	CONDUCTORS IN EACH CONDUIT
20	1"	(3) #12 PHASE & (3) #14G				
25	1"	(3) #10 PHASE & (3) #14G				
30	1"	(3) #10 PHASE & (3) #14G				
35	1-1/2"	(3) #8 PHASE & (3) #14G				
40	1-1/2"	(3) #8 PHASE & (3) #14G				
45	1-1/2"	(3) #6 PHASE & (3) #12G				
50	1-1/2"	(3) #6 PHASE & (3) #12G				
60	1-1/2"	(3) #4 PHASE & (3) #12G			1-1/4"	(4) #4 & (2) #8G
70	1-1/2"	(3) #4 PHASE & (3) #12G			1-1/4"	(4) #4 & (2) #8G
80	2"	(3) #3 PHASE & (3) #10G			1-1/4"	(4) #3 & (2) #8G
90	2"	(3) #3 PHASE & (3) #10G			1-1/4"	(4) #3 & (2) #8G
100	2"	(3) #1 PHASE & (3) #10G	1-1/2"	(3) #1, (1) #3/0N & (1) #8G	1-1/2"	(4) #1 & (2) #8G
		↑ 60°C CONDUCTOR TEMPERATURE RATING ↑				
		↓ 75°C CONDUCTOR TEMPERATURE RATING ↓				
125	2"	(3) #1/0 PHASE & (3) #10G	2"	(3) #1/0, (2) #1/0N & (1) #6G	2"	(4) #1/0 & (2) #6G
150	2"	(3) #1/0 PHASE & (3) #10G	2"	(3) #1/0, (2) #1/0N & (1) #6G	2"	(4) #1/0 & (2) #6G
175	2"	(3) #2/0 PHASE & (3) #10G	2"	(3) #2/0, (2) #2/0N & (1) #6G	2"	(4) #2/0 & (2) #6G
200	2"	(3) #3/0 PHASE & (3) #8G	2-1/2"	(3) #3/0, (2) #3/0N & (1) #6G	2"	(4) #3/0 & (2) #6G
225	2-1/2"	(3) #4/0 PHASE & (3) #8G	2-1/2"	(3) #4/0, (2) #4/0N & (1) #4G	2-1/2"	(4) #4/0 & (2) #4G
250	2-1/2"	(3) #250 PHASE & (3) #8G	3"	(3) #250, (2) #250N & (1) #4G	3"	(4) #250 & (2) #4G

COPPER CONDUCTOR NOTES:

1. VFD CABLE BASED UPON SERVICE WIRE Co. COPPER 2kV WITH XHHW/RHW INSULATION, CONCENTRIC GROUND, SHEILDED CABLE ASSEMBLY.
2. WHERE DISCONNECT SWITCH IS INSTALLED BETWEEN THE VARIABLE FREQUENCY DRIVE AND THE MOTOR, PROVIDE 2#14 AWG, 600V RATED WIRES TO BE CONNECTED TO THE EARLY BREAK CONTACTS ON THE DISCONNECT SWITCH. REFER TO ONE LINE DIAGRAM FOR ADDITIONAL INFORMATION.

SINGLE PHASE CONDUCTOR & CONDUIT SCHEDULE (COPPER)

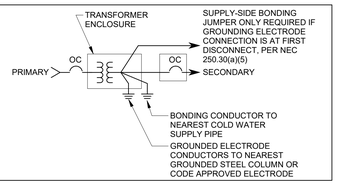
CIRCUIT SYMBOL	1-PHASE, NEUTRAL + GROUND (1P-XX CU N)		1-PHASE, 2-WIRE + GROUND (2P-XX CU)		1-PHASE, 2-WIRE, NEUTRAL + GROUND (2P-XX CU N)	
	CONDUIT	CONDUCTORS IN EACH CONDUIT	CONDUIT	CONDUCTORS IN EACH CONDUIT	CONDUIT	CONDUCTORS IN EACH CONDUIT
20	3/4"	(1) #12, (1) #12N & (1) #12G	3/4"	(2) #12 & (1) #12G	3/4"	(2) #12, (1) #12N & (1) #12G
25	3/4"	(1) #10, (1) #10N & (1) #10G	3/4"	(2) #10 & (1) #10G	3/4"	(2) #10, (1) #10N & (1) #10G
30	3/4"	(1) #10, (1) #10N & (1) #10G	3/4"	(2) #10 & (1) #10G	3/4"	(2) #10, (1) #10N & (1) #10G
35	3/4"	(1) #8, (1) #8N & (1) #10G	3/4"	(2) #8 & (1) #10G	3/4"	(2) #8, (1) #8N & (1) #10G
40	3/4"	(1) #8, (1) #8N & (1) #10G	3/4"	(2) #8 & (1) #10G	3/4"	(2) #8, (1) #8N & (1) #10G
45	3/4"	(1) #6, (1) #6N & (1) #10G	3/4"	(2) #6 & (1) #10G	3/4"	(2) #6, (1) #6N & (1) #10G
50	3/4"	(1) #6, (1) #6N & (1) #10G	3/4"	(2) #6 & (1) #10G	3/4"	(2) #6, (1) #6N & (1) #10G
60	1"	(1) #4, (1) #4N & (1) #10G	1"	(2) #4 & (1) #10G	1"	(2) #4, (1) #4N & (1) #10G
70	1"	(1) #4, (1) #4N & (1) #8G	1"	(2) #4 & (1) #8G	1"	(2) #4, (1) #4N & (1) #8G
80	1"	(1) #3, (1) #3N & (1) #8G	1"	(2) #3 & (1) #8G	1-1/4"	(2) #3, (1) #3N & (1) #8G
90	1"	(1) #3, (1) #3N & (1) #8G	1"	(2) #3 & (1) #8G	1-1/4"	(2) #3, (1) #3N & (1) #8G
100	1-1/4"	(1) #1, (1) #1N & (1) #8G	1-1/4"	(2) #1 & (1) #8G	1-1/4"	(2) #1, (1) #1N & (1) #8G

480ΔV PRIMARY - 208Y/120V SECONDARY TRANSFORMER FEEDER SCHEDULE

XFMR ID	kVA RATING	480V, PRIMARY (Δ) 3PH, 3W		208Y/120 SECONDARY 3PH, 4W		TRANSFORMER SECONDARY FEEDER		GROUNDING ELECTRODE CONNECTIONS (COPPER) NEC TABLE 250.66	BONDING CONDUCTOR (COPPER) NEC 250.102(C)(1)
		OC PROT	TAG	OC PROT	TAG	CONDUIT	CONDUCTORS IN EACH CONDUIT		
T9	9	20A	20	30A	T30 N	3/4"	(4) #10 & (1) #8G	3/4"C - 1#8, EACH	#8
T15	15	30A	30	60A	T60 N	1"	(4) #4 & (1) #8G	3/4"C - 1#8, EACH	#8
T30	30	60A	60	100A	T100 N	1 1/2"	(4) #1 & (1) #6G	3/4"C - 1#6, EACH	#6
T45	45	80A	80	150A	T150 N	2"	(4) #1/0 & (1) #6G	3/4"C - 1#6, EACH	#6
T75	75	150A	150	250A	T250 N	2 1/2"	(4) #250 & (1) #2G	3/4"C - 1#2, EACH	#2
T112.5	112.5	200A	200	400A	T400 N	(2) 2 1/2"	(4) #3/0 & (1) #2G	3/4"C - 1#2, EACH	#2
T150	150	225A	225	600A	T600 N	(2) 3 1/2"	(4) #350 & (1) #2/0G	1"C - 1#2/0, EACH	#2/0
T225	225	400A	400	800A	T800 N	(2) 3 1/2"	(4) #600 & (1) #3/0G	1"C - 1#3/0, EACH	#3/0
T300	300	600A	600	1000A	T1000 N	(3) 3 1/2"	(4) #500 & (1) #3/0G	1"C - 1#3/0, EACH	#3/0
T500	500	800A	800	2000A	T2000 N	(5) 3 1/2"	(4) #600 & (1) #3/0G	1"C - 1#3/0, EACH	#3/0

TRANSFORMER FEEDER SCHEDULE NOTES:

1. OVERCURRENT PROTECTIVE DEVICE (O.C.) CAN BE A CIRCUIT BREAKER OR FUSE AS REQUIRED BY DESIGN.
2. PROVIDE TYPE AND MINIMUM SIZE OF RACEWAY OR CABLE, FROM THIS CHART OR OTHER CHARTS ON THIS PAGE, AS INDICATED BY DESIGNATOR.
3. GROUNDING ELECTRODE CONDUCTOR SIZED PER NEC TABLE 250.66.
4. SUPPLY SIDE BONDING JUMPER SIZED PER NEC TABLE 250.102(c)(1) FOR EACH RACEWAY BASED ON PHASE CONDUCTORS IN EACH RACEWAY.



CONDUCTOR & CONDUIT SCHEDULE (COPPER)

CIRCUIT SYMBOL	FEEDER MAXIMUM AMPACITY	3-PHASE, 3-WIRE + GROUND (XXXX CU)		3-PHASE, 4-WIRE + GROUND (XXXX CU N)	
		CONDUIT	CONDUCTORS IN EACH CONDUIT	CONDUIT	CONDUCTORS IN EACH CONDUIT
20	20	3/4"	(3) #12 & (1) #12G	3/4"	(4) #12 & (1) #12G
25	30	3/4"	(3) #10 & (1) #10G	3/4"	(4) #10 & (1) #10G
30	30	3/4"	(3) #10 & (1) #10G	3/4"	(4) #10 & (1) #10G
35	40	3/4"	(3) #8 & (1) #10G	3/4"	(4) #8 & (1) #10G
40	40	3/4"	(3) #8 & (1) #10G	3/4"	(4) #8 & (1) #10G
45	55	1"	(3) #6 & (1) #10G	1"	(4) #6 & (1) #10G
50	55	1"	(3) #6 & (1) #10G	1"	(4) #6 & (1) #10G
60	70	1"	(3) #4 & (1) #8G	1-1/4"	(4) #4 & (1) #8G
70	70	1-1/4"	(3) #4 & (1) #8G	1-1/4"	(4) #4 & (1) #8G
80	85	1-1/4"	(3) #3 & (1) #8G	1-1/4"	(4) #3 & (1) #8G
90	95	1-1/4"	(3) #2 & (1) #8G	1-1/4"	(4) #2 & (1) #8G
100	110	1-1/2"	(3) #1 & (1) #8G	1-1/2"	(4) #1 & (1) #8G
		↑ 60°C CONDUCTOR TEMPERATURE RATING ↑			
		↓ 75°C CONDUCTOR TEMPERATURE RATING ↓			
125	150	1-1/2"	(3) #1/0 & (1) #6G	1-1/2"	(4) #1/0 & (1) #6G
150	150	1-1/2"	(3) #1/0 & (1) #6G	1-1/2"	(4) #1/0 & (1) #6G
175	175	2"	(3) #2/0 & (1) #6G	2"	(4) #2/0 & (1) #6G
200	200	2"	(3) #3/0 & (1) #6G	2"	(4) #3/0 & (1) #6G
225	230	2-1/2"	(3) #4/0 & (1) #4G	2-1/2"	(4) #4/0 & (1) #4G
250	255	2-1/2"	(3) #250 & (1) #4G	3"	(4) #250 & (1) #4G
300	310	3"	(3) #350 & (1) #3G	3"	(4) #350 & (1) #3G
350	380	3"	(3) #500 & (1) #3G	3"	(4) #500 & (1) #3G
400	380	3"	(3) #500 & (1) #3G	3"	(4) #500 & (1) #3G
450	460	(2) 2-1/2"	(3) #4/0 & (1) #2G	(2) 2-1/2"	(4) #4/0 & (1) #2G
500	510	(2) 2-1/2"	(3) #250 & (1) #2G	(2) 3"	(4) #250 & (1) #2G
600	620	(2) 3"	(3) #350 & (1) #1G	(2) 3"	(4) #350 & (1) #1G
800	760	(2) 3"	(3) #500 & (1) #1/0G	(2) 3-1/2"	(4) #500 & (1) #1/0G
1000	1140	(3) 3"	(3) #500 & (1) #2/0G	(3) 3-1/2"	(4) #500 & (1) #2/0G
1200	1260	(3) 3-1/2"	(3) #600 & (1) #3/0G	(3) 4"	(4) #600 & (1) #3/0G
1600	1680	(4) 3-1/2"	(3) #600 & (1) #4/0G	(4) 4"	(4) #600 & (1) #4/0G
2000	2100	(5) 3-1/2"	(3) #600 & (1) #250G	(5) 4"	(4) #600 & (1) #250G
2500	2520	(6) 3-1/2"	(3) #600 & (1) #350G	(6) 4"	(4) #600 & (1) #350G
3000	3040	(8) 4"	(3) #500 & (1) #400G	(8) 4"	(4) #500 & (1) #400G
3200	3360	(8) 4"	(3) #600 & (1) #500G	(8) 4"	(4) #600 & (1) #500G
4000	4200	(10) 4"	(3) #600 & (1) #500G	(10) 4"	(4) #600 & (1) #500G

GROUND CONDUCTOR CIRCUIT SCHEDULE (COPPER)

CIRCUIT SYMBOL	GROUND WIRE SIZE / TYPE	CONDUIT SIZE
G8	#8 AWG BARE STRANDED COPPER	3/4"
G6	#6 AWG BARE STRANDED COPPER	3/4"
G4	#4 AWG BARE STRANDED COPPER	3/4"
G2	#2 AWG BARE STRANDED COPPER	3/4"
G1	#1 AWG BARE STRANDED COPPER	3/4"
G10	#1/0 AWG BARE STRANDED COPPER	3/4"
G20	#2/0 AWG BARE STRANDED COPPER	3/4"
G30	#3/0 AWG BARE STRANDED COPPER	3/4"
G40	#4/0 AWG BARE STRANDED COPPER	3/4"
G250	250 kCMIL BARE STRANDED COPPER	3/4"
G300	300 kCMIL BARE STRANDED COPPER	1"
G350	350 kCMIL BARE STRANDED COPPER	1"
G400	400 kCMIL BARE STRANDED COPPER	1"
G500	500 kCMIL BARE STRANDED COPPER	1-1/4"
G600	600 kCMIL BARE STRANDED COPPER	1-1/4"
G750	750 kCMIL BARE STRANDED COPPER	1-1/2"

VOLTAGE DROP SCHEDULE (COPPER)

MAXIMUM LOAD [VA]	#12 - MAXIMUM LENGTH [FT]	#10 - MAXIMUM LENGTH [FT]	#8 - MAXIMUM LENGTH [FT]
120V CIRCUIT CONDUCTOR SIZE - MAX LENGTH			
800	155	245	390
1000	125	195	310
1200	105	165	260
1400	90	140	220
1600	80	125	195
1800	70	110	175
277V CIRCUIT CONDUCTOR SIZE - MAX LENGTH			
2000	330	525	830
2500	265	420	665
3000	220	350	555
3500	190	300	475
4000	165	260	415

VOLTAGE DROP NOTE:

MAXIMUM LOAD IS BASED ON 3% VOLTAGE DROP FOR BRANCH CIRCUITS AND 2% ON FEEDER CIRCUITS, THE LOAD IN VOLT-AMPS, AND THE CIRCUIT LENGTH IN FEET TO CENTER OF LOAD, ADJUST SIZE OF BRANCH CIRCUIT CONDUCTORS AS INDICATED ON THE VOLTAGE DROP CHART.

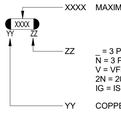
SPECIAL RECEPTACLE SCHEDULE

TAG	NEMA CONFIGURATION	DEVICE RATING	CIRCUIT BREAKER	CONDUIT	BRANCH CIRCUIT
1	5-30R	30A, 125V, 1PH., 2W+G	30A - 1P	3/4"	(2) #10 & (1) #10G
2	5-50R	50A, 125V, 1PH., 2W+G	50A - 1P	1"	(2) #6 & (1) #10G
3	6-15R	15A, 250V, 1PH., 2W+G	15A - 2P	3/4"	(2) #12 & (1) #12G
4	6-20R	20A, 250V, 1PH., 2W+G	20A - 2P	3/4"	(2) #12 & (1) #12G
5	6-30R	30A, 250V, 1PH., 2W+G	30A - 2P	3/4"	(2) #10 & (1) #10G
6	6-50R	50A, 250V, 1PH., 2W+G	50A - 2P	1"	(2) #6 & (1) #10G
7	14-15R	15A, 125/250V, 1PH., 3W+G	15A - 2P	3/4"	(3) #12 & (1) #12G
8	14-20R	20A, 125/250V, 1PH., 3W+G	20A - 2P	3/4"	(3) #12 & (1) #12G
9	14-30R	30A, 125/250V, 1PH., 3W+G	30A - 2P	3/4"	(3) #10 & (1) #10G
10	14-50R	50A, 125/250V, 1PH., 3W+G	50A - 2P	1"	(3) #6 & (1) #10G
11	14-60R	60A, 125/250V, 1PH., 3W+G	60A - 2P	1"	(3) #6 & (1) #10G
12	15-15R	15A, 250V, 3PH., 3W+G	15A - 3P	3/4"	(3) #12 & (1) #12G
13	15-20R	20A, 250V, 3PH., 3W+G	20A - 3P	3/4"	(3) #12 & (1) #12G
14	15-30R	30A, 250V, 3PH., 3W+G	30A - 3P	3/4"	(3) #10 & (1) #10G
15	15-50R	50A, 250V, 3PH., 3W+G	50A - 3P	1"	(3) #6 & (1) #10G
16	15-60R	60A, 250V, 3PH., 3W+G	60A - 3P	1"	(3) #6 & (1) #10G
17	L5-15R	15A, 125V, 1PH., 2W+G, TWIST LOCK	15A - 1P	3/4"	(2) #12 & (1) #12G
18	L5-20R	20A, 125V, 1PH., 2W+G, TWIST LOCK	20A - 1P	3/4"	(2) #12 & (1) #12G
19	L5-30R	30A, 125V, 1PH., 2W+G, TWIST LOCK	30A - 1P	3/4"	(2) #10 & (1) #10G
20	L6-15R	15A, 250V, 1PH., 2W+G, TWIST LOCK	15A - 2P	3/4"	(2) #12 & (1) #12G
21	L6-20R	20A, 250V, 1PH., 2W+G, TWIST LOCK	20A - 2P	3/4"	(2) #12 & (1) #12G
22	L6-30R	30A, 250V, 1PH., 2W+G, TWIST LOCK	30A - 2P	3/4"	(2) #10 & (1) #10G
23	L7-20R	20A, 277V, 1PH., 2W+G, TWIST LOCK	20A - 1P	3/4"	(2) #12 & (1) #12G
24	L7-30R	30A, 277V, 1PH., 2W+G, TWIST LOCK	30A - 1P	3/4"	(2) #10 & (1) #10G
25	L14-20R	20A, 125/250V, 1PH., 3W+G, TWIST LOCK	20A - 2P	3/4"	(3) #12 & (1) #12G
26	L14-30R	30A, 125/250V, 1PH., 3W+G, TWIST LOCK	30A - 2P	3/4"	(3) #10 & (1) #10G
27	L15-20R	20A, 250V, 3PH., 3W+G, TWIST LOCK	20A - 3P	3/4"	(3) #12 & (1) #12G
28	L15-30R	30A, 250V, 3PH., 3W+G, TWIST LOCK	30A - 3P	3/4"	(3) #10 & (1) #10G
29	L16-20R	20A, 480V, 3PH., 3W+G, TWIST LOCK	20A - 3P	3/4"	(3) #12 & (1) #12G
30	L16-30R	30A, 480V, 3PH., 3W+G, TWIST LOCK	30A - 3P	3/4"	(3) #10 & (1) #10G
31	L21-20R	20A, 125/250V, 3PH., 4W+G, TWIST LOCK	20A - 3P	1"	(4) #12 & (1) #12G
32	L21-30R	30A, 125/250V, 3PH., 4W+G, TWIST LOCK	30A - 3P	1"	(4) #10 & (1) #10G
33	L22-20R	20A, 277/480V, 3PH., 4W+G, TWIST LOCK	20A - 3P	1"	(4) #12 & (1) #12G
34	L22-30R	30A, 277/480V, 3PH., 4W+G, TWIST LOCK	30A - 3P	1"	(4) #10 & (1) #10G

GENERAL NOTES - CONDUIT AND WIRE SCHEDULES

1. UNLESS OTHERWISE INDICATED, CONDUCTOR SIZING SHALL MATCH THE SIZE INDICATED FOR THE APPLICABLE OVERCURRENT DEVICE. PROVIDE LARGER CONDUCTORS AND RACEWAY WHERE INDICATED.
2. PROVIDE TYPE AND MINIMUM SIZE OF RACEWAY OR CABLE AS INDICATED IN SPECIFICATIONS OR ON THE DRAWINGS.
3. PROVIDE NEUTRAL IN CIRCUIT UNLESS DEVICE SERVED DOES NOT HAVE PROVISIONS FOR A NEUTRAL CONNECTION.
4. 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.
5. PROVIDE SEPARATE, INSULATED EQUIPMENT GROUNDING CONDUCTOR WITH EACH FEEDER AND BRANCH CIRCUIT.
6. PROVIDE SEPARATE INDIVIDUAL NEUTRALS FOR ALL CIRCUITS EXCEPT LIGHTING CIRCUITS. PROVIDE A DEDICATED NEUTRAL FOR GFCI OR AFCI CIRCUITS.
7. 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 60°C AMPACITIES FOR 100A OR LESS AND 75°C AMPACITIES OVER 100A.
8. 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 #2/0 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.
9. 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 = ***XX*** RHO
   - EARTH TEMP = ***XX*** C
   - LOAD FACTOR = 100%
   - DUCT BANK = AS INDICATED ON THE DRAWINGS
10. 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]

YY COPPER = CU, ALUMINUM = AL

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.

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

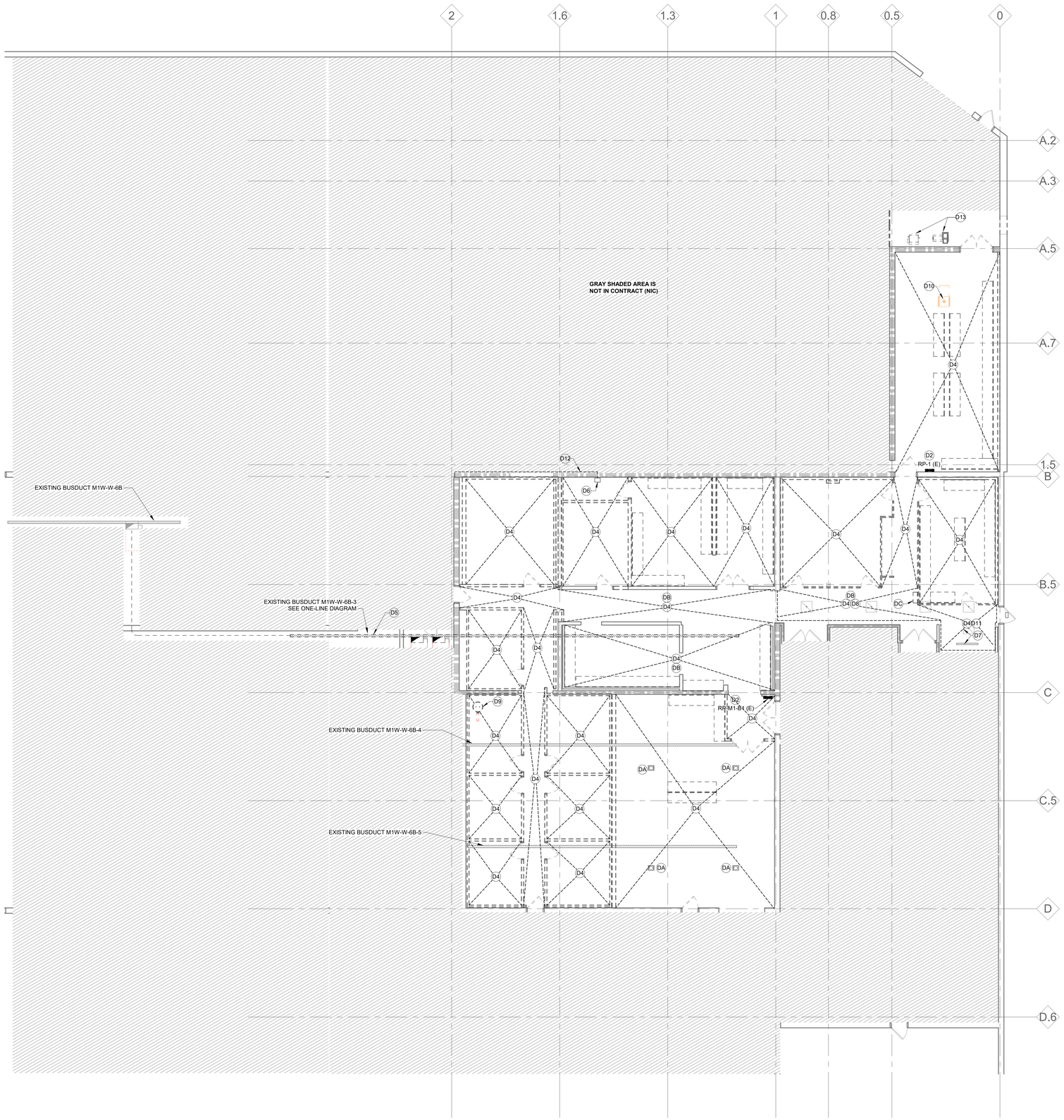
2025-DD016-001

Electrical Legends

E-003

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:11:00 AM



N

LEVEL 1 DEMO PLAN

1/8" = 1'-0"

DEMOLITION SHEET NOTES:

1. SEE DRAWING E-001 FOR GENERAL NOTES.
2. SEE DRAWING E-002 FOR ELECTRICAL SYMBOL LEGEND AND TYPICAL MOUNTING HEIGHT INFORMATION.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
D2	REMOVE EXISTING PANELBOARD. DEMO EXISTING CONDUIT AND WIRING. REWIRE ALL EXISTING TO REMAIN FEEDERS AND BRANCH CIRCUITS WITH NEW RIGID CONDUIT AND NEW THHN WIRING.
D4	REMOVE ALL ELECTRICAL EQUIPMENT AND DEVICES IN THIS AREA INCLUDING BUT NOT LIMITED TO: RECEPTACLES, LIGHT FIXTURES, SWITCHES, WALL PLATES, BACKBOXES, JUNCTION BOXES, FIRE ALARM, TELECOM, SPEAKERS, AUTO DOOR OPENERS, INCLUDING CONDUIT AND CABLING, UNLESS INDICATED OTHERWISE. REMOVE CONDUIT AND CONDUCTORS BACK TO THE PANEL. ANY CIRCUITS FEEDING A DEVICE IN THIS AREA AND AN AREA THAT IS NOT BEING DEMOLISHED SHALL BE RECONNECTED TO CONTINUE FEEDING THE DEVICE OR EQUIPMENT THAT IS NOT BEING REMOVED. DEMO ALL WIREMOLD RACEWAY BACK TO SOURCE.
D5	REMOVE TAP BOX, BUSDUCT, SUPPORTS, CONDUIT AND CONDUCTORS BACK TO BUSDUCT M192-1. BUSPLUG TO REMAIN IN M192-1. FROM BUSDUCT BEING DEMOED, REMOVE AND RESERVE (2) BUSPLUGS FEEDING EXISTING EQUIPMENT TO REMAIN; REINSTALL BUSPLUGS ON EXISTING TO REMAIN BUSDUCT, REWORK CONDUIT AND REWIRE EQUIPMENT WITH NEW WIRING. REFER TO ONE-LINE DIAGRAMS ON SHEET E-501 FOR ADDITIONAL INFORMATION.
D6	EXISTING 5KVA 208V - 100V SINGLE PHASE TRANSFORMER FEEDING SEM. REMOVE TRANSFORMER AND SAVE FOR REUSE DURING NEW CONSTRUCTION.
D7	EXISTING FIXTURE TO BE REMOVED AND SAFELY STORED FOR REUSE DURING NEW CONSTRUCTION. REFER TO SHEET "EL-101 - LEVEL 1 LIGHTING PLAN" FOR ADDITIONAL INFORMATION.
D8	NO DEMO WORK TO BE PERFROMED ON THE SOUTH WALL IN THIS AREA. REMOVE, RETAIN, AND REINSTALL TWO (2) EBU'S PRESENT IN THIS AREA. REFER TO SHEET EL101 FOR NEW LOCATIONS.
D9	EXISTING WATER HEATER ON UPPER LEVEL TO BE RELOCATED. DISCONNECT EXISTING ELECTRICAL CIRCUIT AND SAVE FOR REUSE DURING NEW CONSTRUCTION.
D10	EXISTING MECHANICAL EQUIPMENT TO REMAIN. EXISTING SERVICE SHALL BE RECONNECTED TO NEW INFRASTRUCTURE.
D11	DO NOT DEMO WALL DEVICES ON SOUTH WALL, EAST WALL, OR WEST WALL OF THIS AREA.
D12	REMOVE CONDUIT ALONG NORTH SIDE OF WALL FEEDING SEM EQUIPMENT, SEE KEYED NOTE D6, FOR THE CREATION OF NEW OVERHEAD DOOR WALL OPENING. REMOVE CONDUIT COMPLETE BACK TO SOURCE OR SUITABLE JUNCTION POINT. COORDINATE WITH NEW CONSTRUCTION PLANS FOR OVERHEAD DOOR OPENING AND NEW LOCATION FOR REINSTALLED SEM EQUIPMENT.
D13	EXISTING MECHANICAL EQUIPMENT TO BE DEMOLISHED. REMOVE ELECTRICAL CONNECTION, CONDUIT AND WIRE COMPLETE BACK TO SOURCE.
DA	REMOVE (4) HOLOPHANE TYPE PHZ LIGHTING FIXTURES AND TURN OVER TO OWNER.
DB	REMOVE ALL 2'x2' LIGHTING FIXTURES AND TURN OVER TO OWNER.
DC	DEMO CARD ACCESS PANEL AND ALL WIRING

DETROIT

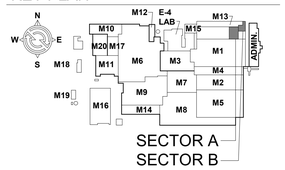
Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

KEY PLAN



HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

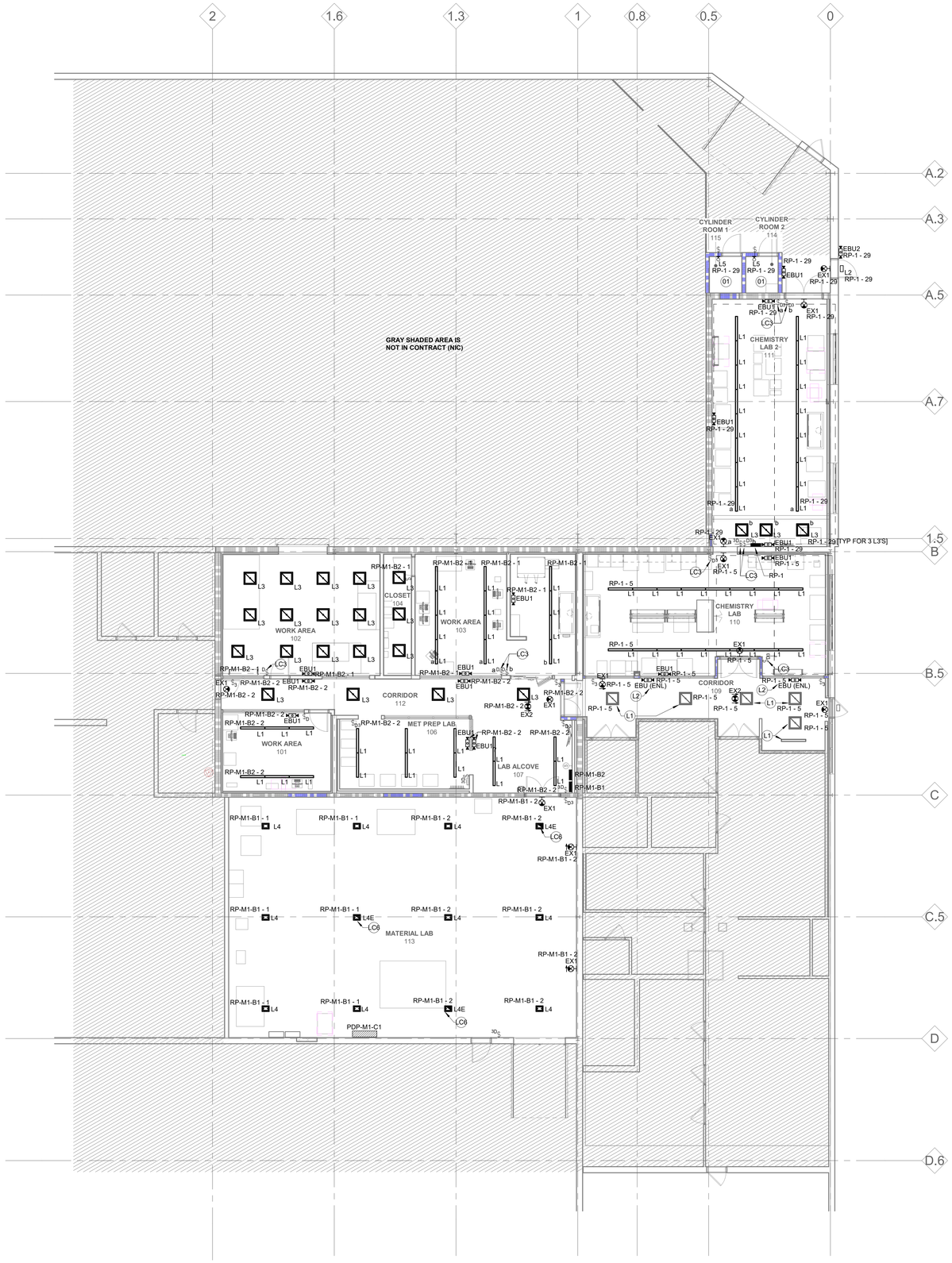
2025-DD016-001

Level 1 Demo Plan

ED101

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:11:02 AM



N

LEVEL 1 LIGHTING PLAN

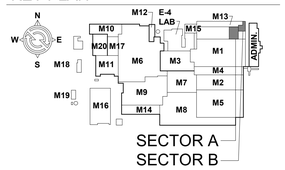
1/8" = 1'-0"

LIGHTING SHEET NOTES:

1. SEE DRAWING E-001 FOR GENERAL NOTES.
2. SEE DRAWING E-002 FOR ELECTRICAL SYMBOL LEGEND AND TYPICAL MOUNTING HEIGHT INFORMATION.
3. SEE DRAWING E-502 FOR LIGHTING FIXTURE SCHEDULE & LIGHTING CONTROL MATRIX.
4. WIRE ALL EXIT SIGNS (EX1, EX2) AND BETTERY UNITS (EBU1) TO CIRCUIT INDICATED ON PLAN AHEAD OF ALL LOCAL SWITCHING.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
L1	REINSTALL EXISTING LIGHT FIXTURE THAT WAS REMOVED DURING DEMOLITION. COORDINATE EXACT LOCATION WITH OWNER. SWITCH WITH NEW LIGHT FIXTURES IN CORRIDOR 109
L2	REINSTALL EBU REMOVED DURING DEMO.
LC3	INSTALL WALL SWITCH WITH 0-10V DIMMING. nLIGHT #nPODM-DX OR EQUIVALENT. CONNECT EACH SWITCH TO INDICATED SWITCHING SYSTEM(S). IF NO SWITCHING SYSTEM(S) IS INDICATED, CONNECT TO ALL LIGHTS WITHIN ROOM.
LC6	FOR TYPE L4E LIGHT FIXTURES WITH INTEGRAL EMERGENCY BATTERY BACK UP. PROVIDE BOTH AN UNSWITCHED POWER FEED AND A SWITCHED POWER FEED FROM LOCAL LIGHTING CONTROL DEVICE, FROM THE SAME BRANCH CIRCUIT AS INDICATED ON PLAN.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

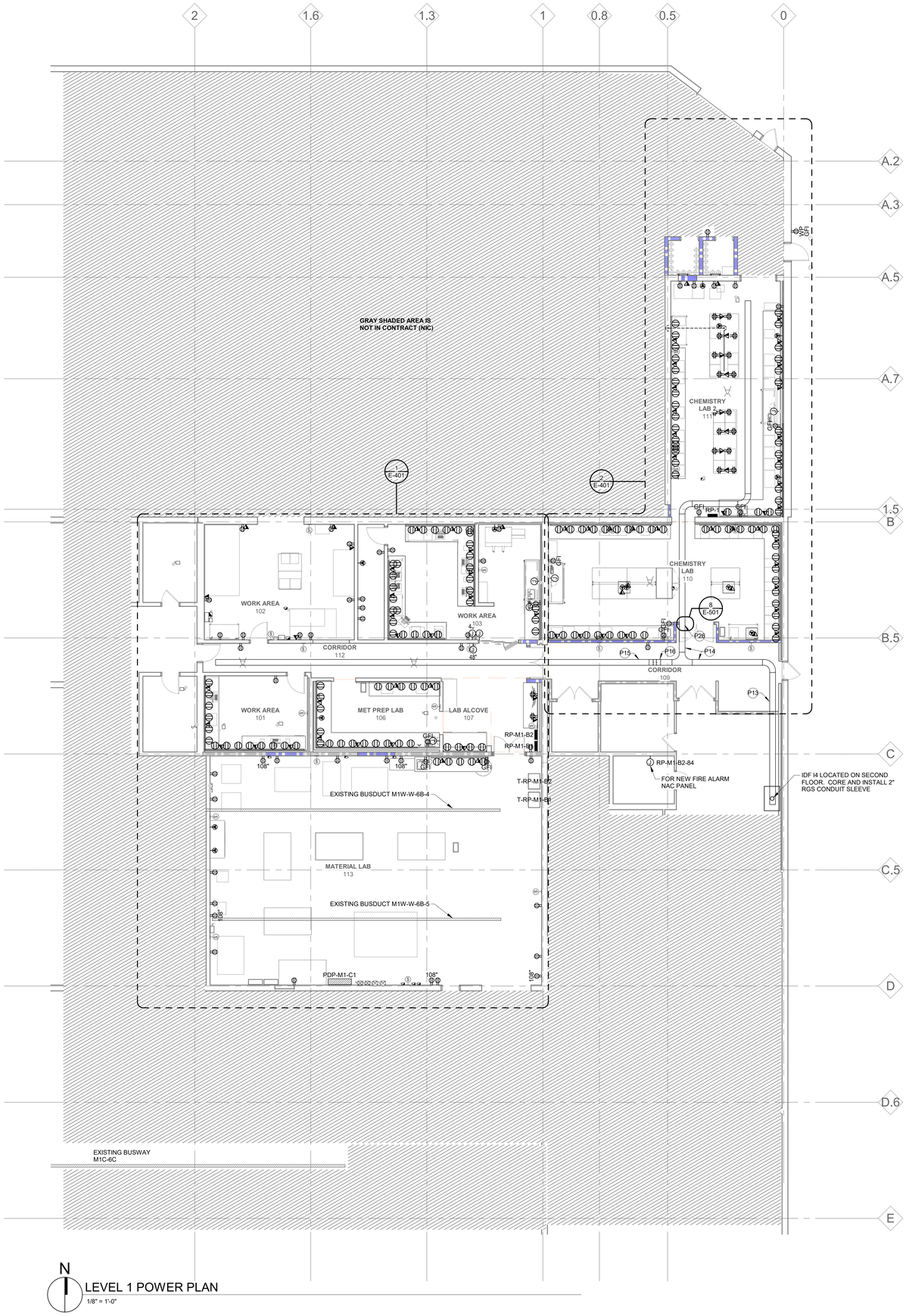
2025-DD016-001

Level 1 Lighting Plan

EL101

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:11:03 AM



N

LEVEL 1 POWER PLAN

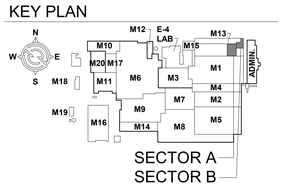
1/8" = 1'-0"

POWER SHEET NOTES:

1. SEE DRAWING E-001 FOR GENERAL NOTES.
2. SEE DRAWING E-002 FOR ELECTRICAL SYMBOL LEGEND AND TYPICAL MOUNTING HEIGHT INFORMATION.
3. SEE ARCHITECTURAL PLANS AND DETAILS FOR DIMENSIONAL INFORMATION REGARDING PLACEMENT OF EQUIPMENT AND DEVICES.
4. HOMERUNS SHOWN WITH MULTIPLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.
5. COORDINATE ALL FINAL ELECTRICAL CONNECTIONS WITH EQUIPMENT MANUFACTURER INSTALLATION LITERATURE.

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
P13	12" x 4" WIRE BASKET CABLE TRAY [LEGRAND | B-LINE]. BOND CABLE TRAY AS REQUIRED.
P14	CABLE TRAY MOUNTED AT 10'-6" AFF. FIELD COORDINATE EXACT HEIGHT WITH EXISTING AND NEW EQUIPMENT IN CEILING.
P15	CABLE TRAY MOUNTED AT 10'-3" AFF. FIELD COORDINATE EXACT HEIGHT WITH EXISTING AND NEW EQUIPMENT IN CEILING.
P16	TRANSITION CABLE TRAY FROM 10'-6" AFF TO 10'-3" AFF. FIELD COORDINATE EXACT HEIGHT WITH EXISTING AND NEW EQUIPMENT IN CEILING.
P26	PROVIDE CABLE TRAY FIRESTOP PILLOW INSTALLATION THROUGH RATED WALL.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

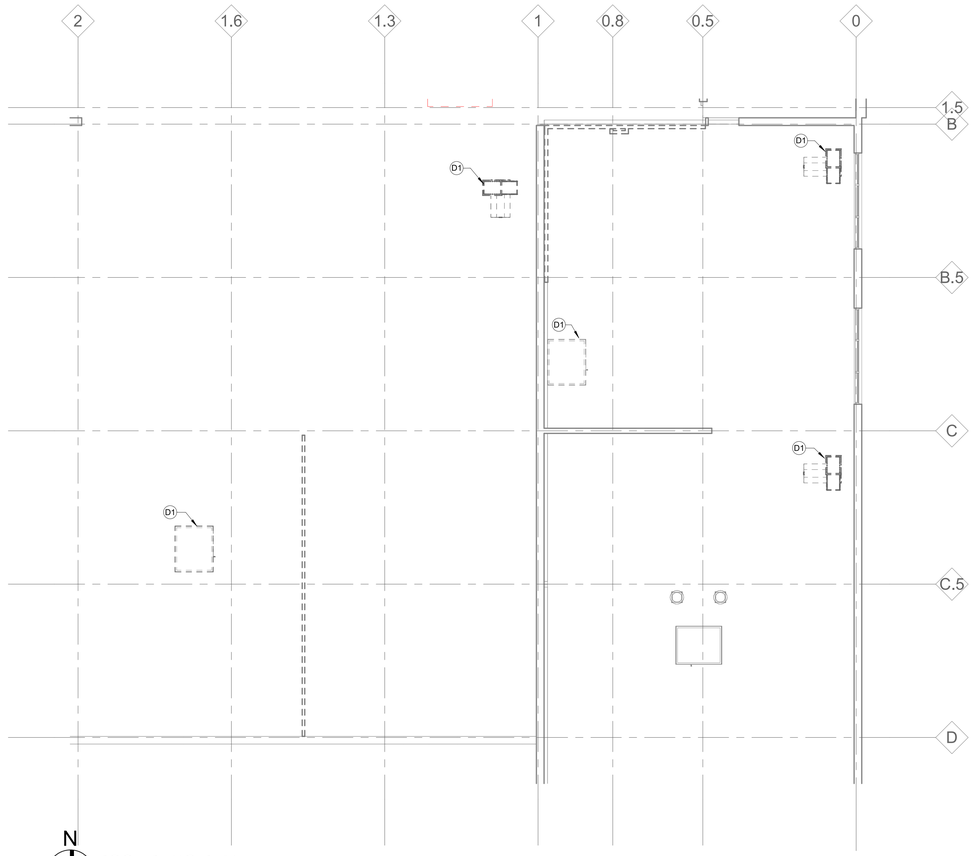
Level 1 Power Plan

EP101

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:11:04 AM

Autodesk Docs://2025-DD0016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD0016-001_Arch_HED.rvt



N

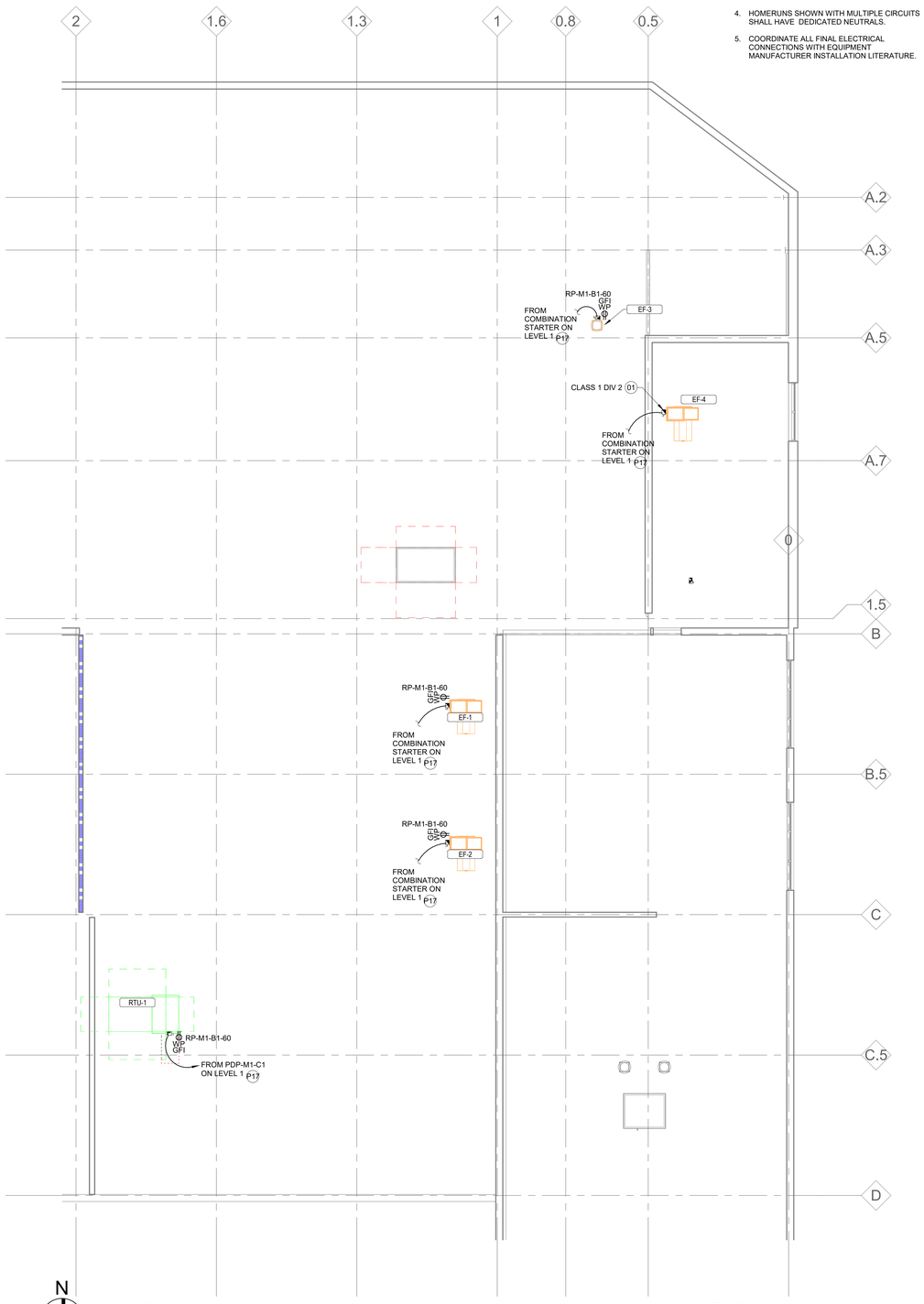
ROOF DEMO PLAN

1/8" = 1'-0"

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
D1	REMOVE FEED TO MECHANICAL UNIT INCLUDING ALL CONDUIT, CONDUITORS, SUPPORTS, DISCONNECTS, DEVICES, BOXES AND ANY OTHER ASSOCIATED MATERIALS THAT ARE NOT NEEDED ONCE THE UNIT IS REMOVED. FEED SHALL BE REMOVED BACK TO THE SOURCE OF POWER. PATCH ROOF HOLES AS NEEDED.

POWER SHEET NOTES:

1. SEE DRAWING E-001 FOR GENERAL NOTES.
2. SEE DRAWING E-002 FOR ELECTRICAL SYMBOL LEGEND AND TYPICAL MOUNTING HEIGHT INFORMATION.
3. SEE ARCHITECTURAL PLANS AND DETAILS FOR DIMENSIONAL INFORMATION REGARDING PLACEMENT OF EQUIPMENT AND DEVICES.
4. HOMERUNS SHOWN WITH MULTIPLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.
5. COORDINATE ALL FINAL ELECTRICAL CONNECTIONS WITH EQUIPMENT MANUFACTURER INSTALLATION LITERATURE.



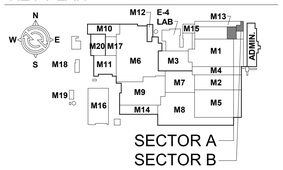
N

ROOF POWER PLAN

1/8" = 1'-0"

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
01	THIS SPACE CONTAINS A HAZARDOUS AREA CLASSIFICATION. SEE ARCHITECTURAL DRAWINGS AC101 AND A-191 FOR IDENTIFICATION AND ADDITIONAL INFORMATION ON HAZARDOUS AREA CLASSIFICATION. PROVIDE AND INSTALL APPROPRIATELY RATED AND LISTED ELECTRICAL EQUIPMENT.
P17	REFER TO ONE-LINE ON DRAWING E-501 FOR ADDITIONAL INFORMATION.

KEY PLAN



DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Roof Demo & Power Plan

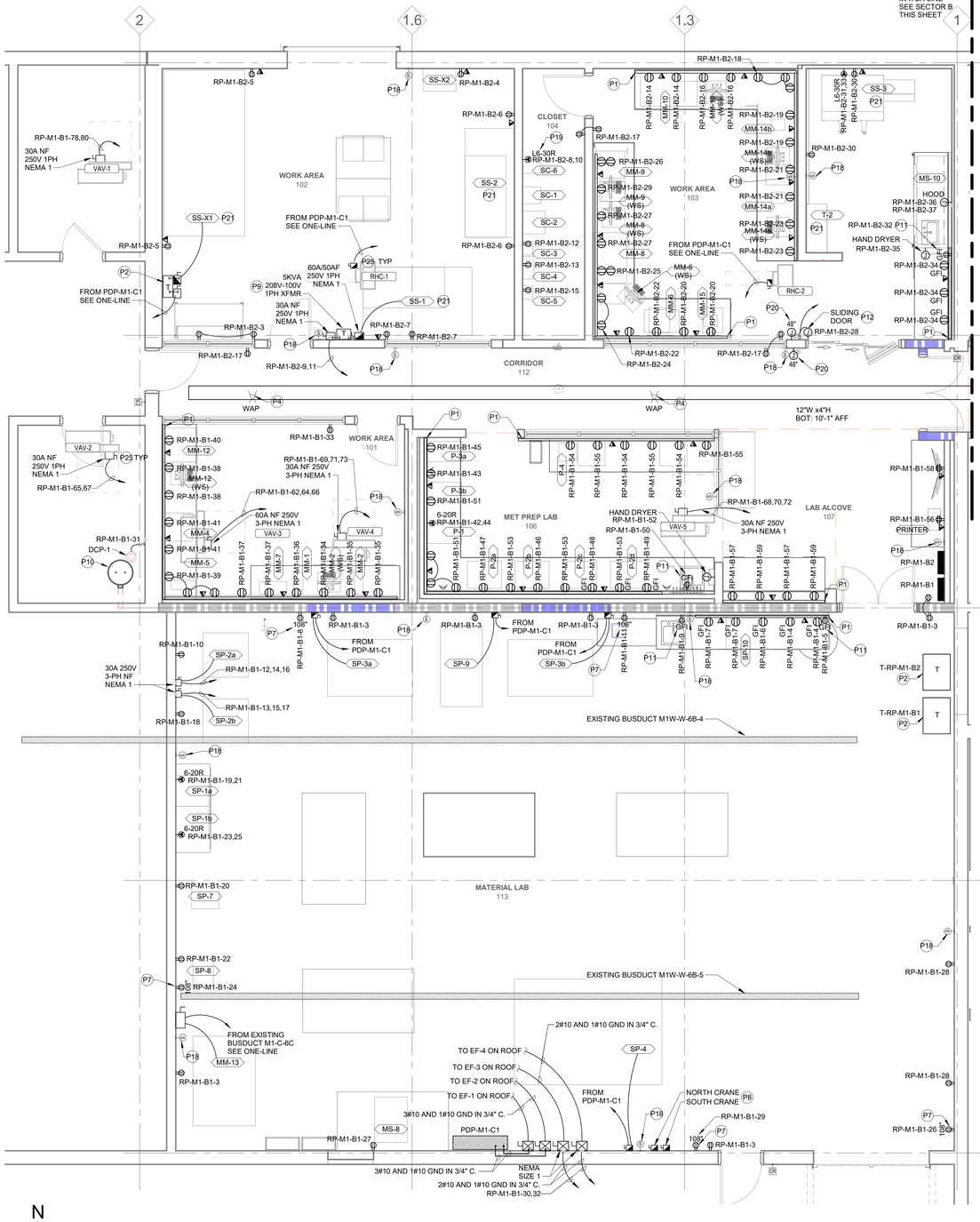
EP102

4/24/2026 10:11:08 AM

SHEET KEYED NOTES	
NUMBER	DESCRIPTION
01	THIS SPACE CONTAINS A HAZARDOUS AREA CLASSIFICATION. SEE ARCHITECTURAL DRAWINGS AC101 AND A-191 FOR IDENTIFICATION AND ADDITIONAL INFORMATION ON HAZARDOUS AREA CLASSIFICATION. PROVIDE AND INSTALL APPROPRIATELY RATED AND LISTED ELECTRICAL EQUIPMENT.
P1	SURFACE MOUNTED STEEL 6" TWO COMPARTMENT TWIN COVER WIREWAY (LEGRAND 4000 SERIES). WIREWAY TO BE GRAY IN COLOR, WITH GRAY DEVICES. MOUNT ABOVE COUNTER BACKSPLASH PER DETAIL 5 ON SHEET E-501. PROVIDE ALL REQUIRED COVERPLATES, SUPPORTS, BRACKETS, COVERS, ELBOWS, END CAPS, AND ALL OTHER MATERIALS REQUIRED FOR A COMPLETE AND FUNCTIONAL INSTALLATION.
P2	SUSPEND TRANSFORMER 12'-0"AFF. SECONDARY FEEDERS SHALL NOT BE GREATER THAN 25'0". COORDINATE EXACT LOCATION WITH OTHER TRADES AND EXISTING EQUIPMENT.
P3	PROVIDE NEW NEMA L14-20R. PROVIDE NEW NEMA L14-20P CORD END AND INSTALL ON OWNER'S EQUIPMENT CH-7.
P4	FOR LOCATION REFERENCE ONLY. WIFI (TYPE 4) CIRCUIT WITH CAT6 CABLE BACK TO IDF ROOM I4 LOCATED ON SECOND FLOOR BY OWNER.
P5	ROUTE CONDUITS INDICATED DOWN WALL AND UNDER SLAB TO SPACE BETWEEN LAB BENCHES TO SERVICE DEVICES IN MONUMENT BOXES MOUNTED ON TABLE TOP (SEE KEYNOTE P22). SAW CUT SLAB AS REQUIRED IN APPROXIMATE AREA SHOWN. CONTINUE CONDUITS AS SHOWN BETWEEN LAB BENCHES AND MONUMENT BOXES AS REQUIRED, COORDINATE WITH LAB CASEWORK INSTALL.
P6	NEMA L14-20 125/250V 3-POLE 4-WIRE GROUNDING RECEPTACLE MOUNTED IN CEILING SERVICE PANEL FOR WORKSTATION POWER DROP . REFER TO SHEET AQ002 DETAIL 4 FOR ADDITIONAL INFORMATION.
P7	WALL MOUNTED RECEPTACLE FOR INSTALLATION OF RETRACTABLE ELECTRICAL CORD REEL, GLEASON #GCA12345-DR (CONTAINS INTEGRAL GFCI) . PROVIDE WALL MOUNT PIVOT BASE RC-WP AT 8'-0" AFF.
P8	COORDINATE LOCATION OF FEED FOR CRANE WITH CRANE INSTALLER.
P9	EXISTING EQUIPMENT TO BE REUSED.
P10	RELOCATED WATER HEATER ON LEVEL ABOVE. EXTEND CIRCUIT FEEDER CONDUIT FROM CURRENT LOCATION, RELOCATE DISCONNECTING MEANS AS REQUIRED, AND PROVIDE NEW CONDUCTORS FROM NEAREST JUNCTION POINT.
P11	RECEPTACLE FOR SUMP PUMP MOUNTED AT 18" AFF, LOCATED IN BACK OF CASEWORK.
P12	COORDINATE EXACT LOCATION OF CONNECTION POINT WITH DOOR INSTALLER. SWITCH TO BE LOCATED AT 10'-0" AFF, ABOVE THE FINISHED CEILING.
P18	PROVIDE AND INSTALL A FEDERAL SIGNAL PA SPEAKER, REFER TO DETAIL 6/E-501 FOR ADDITIONAL INFORMATION. COORDINATE EXACT MOUNTING LOCATIONS WITHIN EACH SPACE WITH OWNER. MOUNT AT 8'-0" AFF. PROVIDE FLUSH MOUNTED 4-SQUARE BACK BOX, NO PLASTER RING, WITH 1" KO'S. PROVIDE 1"C STUBBED UP WALL TO ACCESSIBLE CEILING SPACE, REFER TO DETAIL 3/E-501.
P19	EXISTING UPS TO BE RELOCATED.
P20	DOUBLE GANG BACK BOX FOR TOUCH DOOR SWITCH. INSTALL 3/4" CONDUIT FROM BOX TO ABOVE ACCESSIBLE CEILING.
P21	INSTALL #6 GROUND WIRE FROM CABINET/EQUIPMENT/ELECTRICL GROUND BAR (EGB) TO BUILDING STEEL. OR INSTALL #6 GORUND WIRE FROM CABINET/EQUIPEMNT TO NEAREST EGB.
P22	ELECTRICAL MONUMENT BOXES PROVIDED BY LAB CASEWORK PROVIDER, ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL ELECTRICAL CONDUIT, CABLING, RECEPTACLE AND DEVICE COVERPLATE AS REQUIRED. DATA CABLING AND DEVICES BY OWNER.
P23	REFEED EXISTING EXHAUST FAN FROM AVAILABLE CIRCUIT IN RP-1. REUSE EXISTING DISCONNECT SWITCH.
P24	UTILIZE THE EXISTING RECESSED PANEL TUB AS JUNCTION BOX AND PROVIDE/FABRICATE COVER PLATE. EXTEND ALL EXISTING FEEDERS AND BRANCH CIRCUITS REMAINING TO NEW PANELBOARD AS REQUIRED.
P25	FOR ALL VAV AND RHC MECHANICAL EQUIPMENT, COORDINATE THE INSTALL OF DISCONNECT SWITCH WITH MOUNTING EQUIPMENT OF MECHANICAL UNIT. DISCONNECT SHALL BE INDEPENDANTLY MOUNTED FROM THE MECHANICAL UNIT, MOUNTING TO THE UNIT IS NOT ACCEPTABLE. FINAL CONNECTION TO NEW MECHANICAL EQUIPMENT SHALL BE MADE UTILIZING FLEXIBLE METAL CONDUIT. COORDINATE FINAL TERMINATION POINT ON EQUIPMENT WITH MECHANICAL SUBMITTALS.

POWER SHEET NOTES:

1. SEE DRAWING E-001 FOR GENERAL NOTES.
2. SEE DRAWING E-002 FOR ELECTRICAL SYMBOL LEGEND AND TYPICAL MOUNTING HEIGHT INFORMATION.
3. SEE ARCHITECTURAL PLANS AND DETAILS FOR DIMENSIONAL INFORMATION REGARDING PLACEMENT OF EQUIPMENT AND DEVICES.
4. HOMERUNS SHOWN WITH MULTIPLE CIRCUITS SHALL HAVE DEDICATED NEUTRALS.
5. COORDINATE ALL FINAL ELECTRICAL CONNECTIONS WITH EQUIPMENT MANUFACTURER INSTALLATION LITERATURE.



N

ENLARGED POWER PLAN - SECTOR A

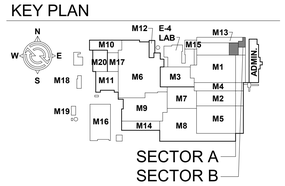
1/4" = 1'-0"

N

ENLARGED POWER PLAN - SECTOR B

1/4" = 1'-0"

KEY PLAN



SECTOR A
SECTOR B

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

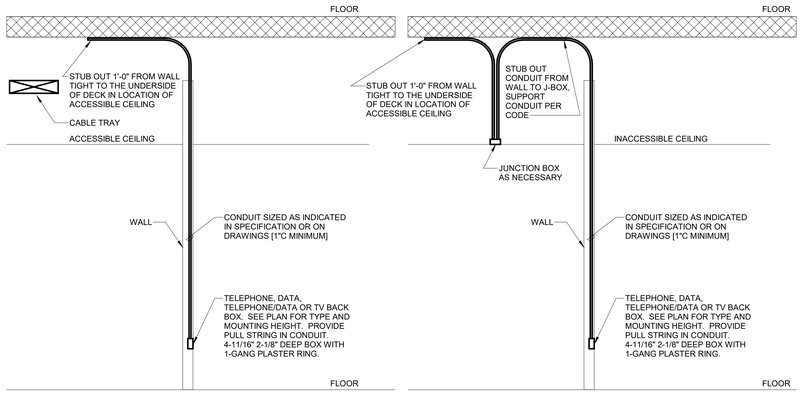
2025-DD016-001

Enlarged Plans

E-401

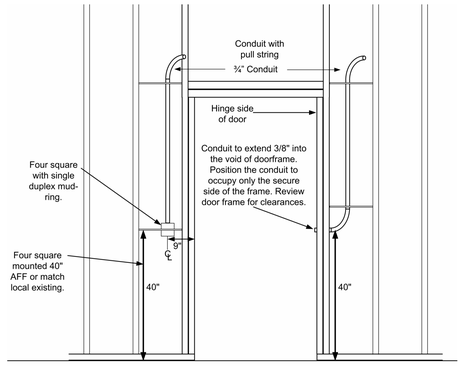
Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:11:10 AM



3 CONDUIT STUB DETAIL

NOT TO SCALE

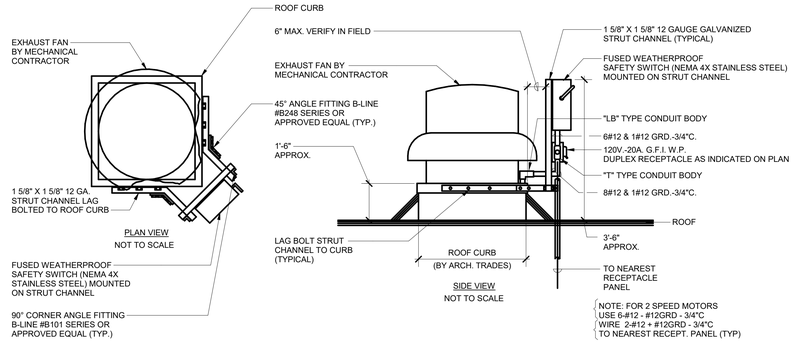


Secure Side of (Right Hand) Door Rough in.

GENERAL NOTES:
1. DETAIL PROVIDED FOR ROUGH-IN SCOPE ONLY. REFER TO PLANS FOR REQUIRED DEVICE QUANTITY, AND LOCATION. CONFIRM AND PROVIDE FINAL ROUGH-IN REQUIREMENTS WITH OWNER'S VENDOR.

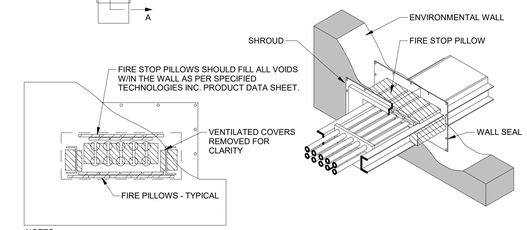
7 CARD READER ROUGH IN DETAIL

NOT TO SCALE



4 TYPICAL DISCONNECT MOUNTING FOR ROOF TOP EXHAUST FAN

NOT TO SCALE

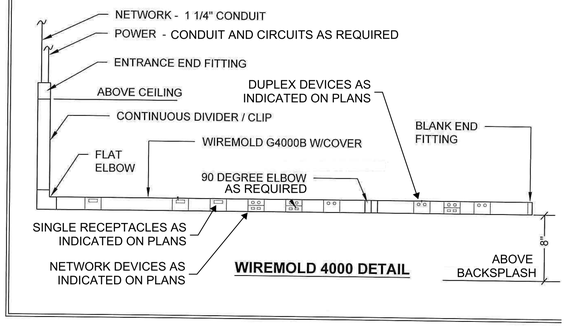


FIRESTOP PILLOW NOMINAL SIZES:
SSB14 1"X4"X9"
SSB24 2"X4"X9"
SSB26 2"X6"X9"

NOTES:
A. INSTALL PER MANUFACTURER'S REQUIREMENTS TO MEET WALL FIRE RATING (F#) AND PROVIDE A HOT/COLD SMOKE SEAL L RATING (LESS THAN 0.75 CFM/SF). FLOOR SEALS AND EXTERIOR EXPOSED SEALS SHALL HAVE A W WATER SEAL RATING.

8 CABLE TRAY FIRESTOP PILLOW INSTALLATION

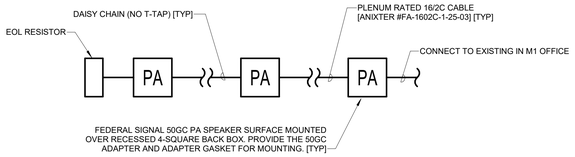
NOT TO SCALE



GENERAL NOTES:
1. DETAIL PROVIDED FOR INTENT ONLY. REFER TO PLANS FOR REQUIRED DEVICE QUANTITY, TYPE, AND CIRCUITS REQUIRED. PROVIDE ALL REQUIRED PARTS, PIECES, FITTINGS AND COVERS, COORDINATE WITH MANUFACTURER.

5 WIREMOLD DETAIL

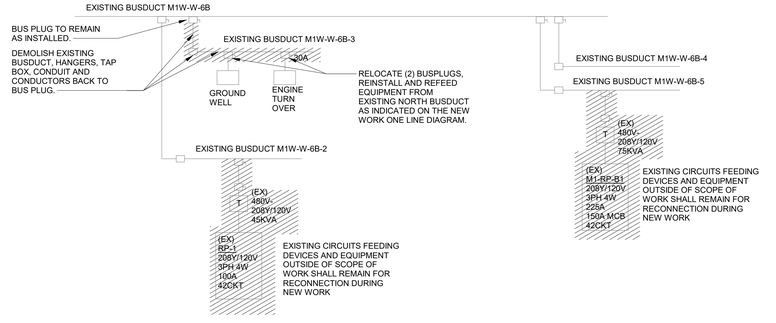
NOT TO SCALE



GENERAL NOTES:
1. DETAIL PROVIDED FOR ROUGH-IN SCOPE ONLY. REFER TO PLANS FOR REQUIRED DEVICE QUANTITY, AND LOCATION. CONFIRM AND PROVIDE FINAL ROUGH-IN REQUIREMENTS WITH OWNER'S VENDOR.

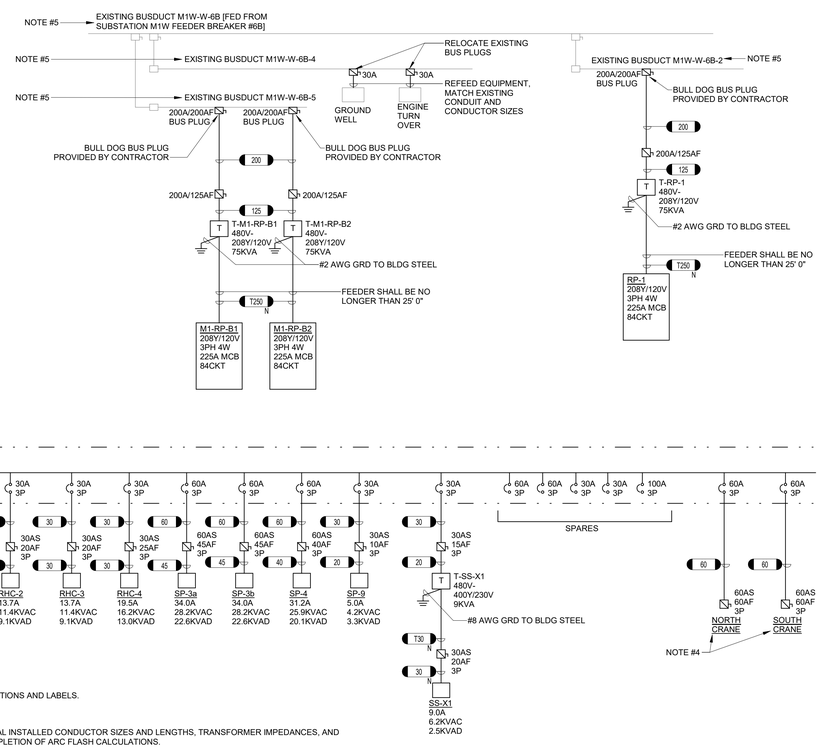
6 OWNER'S PA SPEAKER DIAGRAM

NOT TO SCALE



1 DEMO ONE LINE DIAGRAMS

NOT TO SCALE



NEW WORK ONE-LINE NOTES:
1. CONTRACTOR TO RETAIN SHERMCO TO PREPARE NEW ARC FLASH CALCULATIONS AND LABELS.
2. CONTRACTOR SHALL INSTALL NEW ARC FLASH LABELS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SHERMCO WITH FINAL INSTALLED CONDUCTOR SIZES AND LENGTHS, TRANSFORMER IMPEDANCES, AND ANY ADDITIONAL INFORMATION AS REQUESTED BY SHERMCO FOR THE COMPLETION OF ARC FLASH CALCULATIONS.
4. COORDINATE FINAL INSTALLATION REQUIREMENTS AND LOCATIONS WITH OWNER FURNISHED NORTH CRANE AND SOUTH CRANE.
5. ELECTRICAL CONTRACTOR TO PERFORM 30-DAY METERING IN ACCORDANCE WITH NEC 220.87. METER TO BE INSTALLED AT ALL PHASE CONDUCTORS TO OBTAIN PEAK LOAD DATA. SUBMIT RECORDED DATA IN ELECTRONIC FORMAT WITH HIGHLIGHTED PEAK VALUE TO ENGINEER AND CODE OFFICIAL.

2 NEW WORK ONE LINE DIAGRAMS

NOT TO SCALE

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Details, One Line Diagrams

E-501

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:11:11 AM

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MFR	CATALOG NUMBER	LAMP	CRI	CCT	LUMENS UP	LUMENS DOWN	BALLAST/DRIVER	Voltage	W	W/FT	NOTES
L1	SUSPENDED 4" APERATURE LINEAR LED FICTURE, DIRECT/INDIRECT DISTRIBUTION, FLUSH DOWNLIGHT 95 LOW GLOSS WHITE REFLECTORS, SINGLE CIRCUIT, FLAT ENDCAP, SIGNAL WHITE FINISH	FINELITE	HP-4-P-ID-4ft-B-V-840-96LG-120-FC-1%-SW	INTEGRAL LED	80	4000 K	2167 lm	3690 lm	LED DRIVER, 0-10V DIMMING TO 1%	120 V	56 W	14 W	MOUNT AT 8' 0" AFF IF 9' CEILING, MOUNT AT 8' 6" AFF IF 10' CEILING
L2	WALL MOUNTED AREA LED. P2 PERFORMANCE PACKAGE TYPE, VISUAL COMFORT FORWARD THROW DISTRIBUTION, WALL BRACKET MOUNTING WITH SURFACE CONDUIT BOX, INTEGRAL PHOTOCELL AND BI-LEVEL MOTION SENSOR. DARK BRONZE FINISH	LITHONIA	WPX1 LED P2-40K-MVOLT-PE-DDBXD	INTEGRAL LED	80	4000 K	0 lm	2900 lm	LED DRIVER	120 V	24 W		MOUNT AT 8' 0" ABOVE GRADE, ABOVE DOOR, COORDINATE WITH ARCH EXTERIOR ELEVATIONS; MATCH HEIGHT OF SIMILAR TYPE ADJACENT FIXTURES WHEN APPLICABLE
L3	RECESSED 2'X2' LED, ACRYLLIC LINEAR PRISMATIC DIFFUSER	LITHONIA	2VTL2-40L-ADP-LP840	INTEGRAL LED	80	4000 K	0 lm	4139 lm	LED DRIVER, 0-10V DIMMING TO 1%	120 V	33 W		--
L4	PENDANT MOUNT HIGH-BAY LED FIXTURE, WITH UPLIGHT, WIDE DISTRIBUTION, CAST ALUMINUM HOUSING, WHITE FINISH, ADJUSTABLE OUTPUT	HOLOPHANE	HOLO1-24000LM-WD-MVOLT-40K-80 CRI-PM-UPL-DWHXD-AO	INTEGRAL LED	80	5000 K	3664 lm	24515 lm	LED DRIVER, 0-10V DIMMING TO 10%	120 V	162 W		MOUNT AT 25'-0" AFF
L4E	PENDANT MOUNT HIGH-BAY LED FIXTURE, WITH UPLIGHT, WIDE DISTRIBUTION, CAST ALUMINUM HOUSING, WHITE FINISH, ADJUSTABLE OUTPUT, EM BATTERY	HOLOPHANE	HOLO1-24000LM-WD-MVOLT-40K-80 CRI-PM-IE30WCPHER-UPL-DWHXD-AO	INTEGRAL LED	80	5000 K	3664 lm	24515 lm	LED DRIVER, 0-10V DIMMING TO 10%, BATTERY-BACKED	120 V	162 W		MOUNT AT 25'-0" AFF, INCLUDES EMERGENCY BATTERY PACK
L5	CLASS 1 DIV 2 WALL SCONCE; CORROSION RESISTANT POLYESTER THERMOPLASTIC HOUSING; IMPACT RESISTANT TEMPERED GLASS GLOBE WITH PLASTIC GUARD; NEOPRENE GASKET SEAL; GRAY HOUSING COLOR, CLEAR LENS, WALL MOUNT, 120V	SOLAS RAY LIGHTING	HBVT-016-50-U-C-WM	INTEGRAL LED	80	5000 K	0 lm	1150 lm	LED DRIVER	120 V	16 W		MOUNT AT 7' 6" AFF

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MFR	CATALOG NUMBER	LAMP	Voltage	W	NOTES
EBU1	COMPACT, LOW-PROFILE, ARCHITECTURAL EMERGENCY LIGHT; WHITE TEXTURED, DIE-CAST ALUMINUM HOUSING, INTERNAL LI-IRON PHOSPHATE BATTERY, UVOLT, SELF-DIAGNOSTICS, WIDE THROW	LITHONIA	AFF-OEL-DWHGXD-UVOLT-LTP-SDRT-WT	INTEGRAL LED	120 V	2 W	MATCH EXISTING M1 OFFICE; MOUNT AT 7' 6" AFF
EBU2	EXTERIOR, COMPACT, LOW-PROFILE, WALL MOUNT, ARCHITECTURAL EMERGENCY LIGHT; DARK BRONZE FINISH, DIE-CAST ALUMINUM HOUSING, INTERNAL LI-IRON PHOSPHATE BATTERY, UVOLT, SELF-DIAGNOSTICS, WIDE THROW	LITHONIA	AFF-OEL-DDBTXD-UVOLT-LTP-SDRT-WT	INTEGRAL LED	120 V	2 W	MOUNT AT 8' 0" ABOVE GRADE, ABOVE DOOR, COORDINATE WITH ARCH EXTERIOR ELEVATIONS; MATCH HEIGHT OF SIMILAR TYPE ADJACENT FIXTURES WHEN APPLICABLE
EX1	WALL OR CEILING MOUNTED LED EXIT LIGHTING FIXTURE WITH WHITE THERMOPLASTIC HOUSING, 6" HIGH RED LETTERS, ONE-SIDED. NICKLE CADMIUM BATTERY, SELF DIAGNOSTICS. CHEVRONS AS INDICATED ON DRAWING. INCLUDE BATTERY BACK-UP AND SELF DIAGNOSTICS	LITHONIA	LQM-S-W-R-MVOLT-EL-SD	INTEGRAL LED	120 V	5 W	CEILING OR WALL MOUNTED AS INDICATED ON PLANS; WALL MOUNT AT 7' 6" AFF OR ABOVE DOOR WITH REQUIRED CLEARANCE. MATCH EXISTING M1 OFFICE.
EX2	WALL OR CEILING MOUNTED LED EXIT LIGHTING FIXTURE WITH WHITE THERMOPLASTIC HOUSING, 6" HIGH RED LETTERS, TWO-SIDED. NICKLE CADMIUM BATTERY, SELF DIAGNOSTICS. CHEVRONS AS INDICATED ON DRAWING. INCLUDE BATTERY BACK-UP AND SELF DIAGNOSTICS	LITHONIA	LQM-S-W-R-MVOLT-EL-SD	INTEGRAL LED	120 V	5 W	CEILING OR WALL MOUNTED AS INDICATED ON PLANS; MOUNT AT 7' 6" AFF. MATCH EXISTING M1 OFFICE.

LIGHT FIXTURE SCHEDULE NOTES:

1. FIXTURES REQUIRING DIMMING CAPABILITY (INDICATED ON FIXTURE SCHEDULE OR ON THE LIGHTING PLANS BY CONNECTION TO DIMMING LIGHT SWITCHES) SHALL BE PROVIDED WITH FACTORY INSTALLED DRIVERS ABLE TO DIM TO 1%.
2. CONTRACTOR IS RESPONSIBLE TO VERIFY CEILING TYPE PRIOR TO PURCHASING FIXTURES.
3. ALL LUMINAIRES, DRIVERS, AND LED BOARDS SHALL HAVE A MINIMUM 5 YEAR WARRANTY FROM THE MANUFACTURER.
4. PROVIDE A DRIVER DISCONNECT PLUG AND FUSING FOR EACH LUMINAIRE.
5. LUMINAIRES CONNECTED TO A DIMMING SWITCH SHALL BE EQUIPPED WITH A MANUFACTURER TESTED AND APPROVED COMBINATION OF DRIVER AND SWITCH. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THE CORRECT DIMMING SWITCH FOR EACH DRIVER TO ENSURE THAT IT PROVIDES THE FULL RANGE OF DIMMING INDICATED ON THE LUMINAIRE SCHEDULE WITHOUT FLICKER.
6. PROVIDE EARTHQUAKE CLIPS FOR ALL LUMINAIRES INSTALLED IN A LAY-IN GRID.
7. ALL LED'S SHALL BE RATED FOR A MINIMUM OF 50,000 HOURS OF USE AT 70% LUMEN MAINTENANCE.
8. PROVIDE ALL NECESSARY COMPONENTS, EQUIPMENT AND CABLES REQUIRED FOR A COMPLETE AND FUNCTIONAL INSTALLATION.
9. ALL LIGHTING CONTROLS, LIGHTING FIXTURES AND THEIR COMPONENTS SHALL BE PURCHASED THROUGH A LOCAL DISTRIBUTOR AND SHALL HAVE LOCAL MANUFCTURER REPRESENTATIVE SUPPORT.

LIGHTING CONTROL COMPLIANCE MATRIX

SPACE TYPE	MANDATORY REQUIREMENTS (SEE ASHRAE 90.1-2019, TABLE 9.6.1): LOCAL MANUAL CONTROL	RESTRICTED TO MANUAL ON	RESTRICTED TO PARTIAL AUTOMATIC ON	BILEVEL LIGHTING CONTROL	AUTOMATIC DAYLIGHT RESPONSIVE CONTROLS FOR SIDELIGHTING	AUTOMATIC DAYLIGHT RESPONSIVE CONTROLS FOR TOP LIGHTING	AUTOMATIC PARTIAL OFF	AUTOMATIC FULL OFF	SCHEDULED SHUTOFF	OPTIONAL ADDITIONAL CONTROL METHOD (SEE ASHRAE 90.1-2019, TABLE 9.6.3): MANUAL, CONTINUOUS DIMMING CONTROL OR PROGRAMMABLE MULTILEVEL DIMMING CONTROL	PROGRAMMABLE MULTILEVEL DIMMING CONTROL USING PROGRAMMABLE TIME SCHEDULING	OCCUPANCY SENSORS CONTROLLING THE DOWNLIGHT COMPONENT OF WORKSTATION SPECIFIC LUMINAIRES WITH CONTINUOUS DIMMING TO OFF CAPABILITIES	OCCUPANCY SENSORS CONTROLLING THE DOWNLIGHT COMPONENT OF WORKSTATION SPECIFIC LUMINAIRES WITH CONTINUOUS DIMMING TO OFF OPERATION, IN CONJUNCTION WITH A CENTRAL CONTINUOUS DIMMING CONTROL OF DOWNLIGHT ILLUMINATION BY WORKSTATION OCCUPANT	COMMENTS
CORRIDOR/ TRANSITION - FOR MANUFACTURING FACILITY	X				NOTE 2	NOTE 3	X	X						Corridor 109, 112
ELECTRICAL/ MECHANICAL	X				NOTE 2	NOTE 3								Closet 104, Cylinder Room 114, 115
LABORATORY - FOR MEDICAL/INDUSTRIAL/RESEARCH	X	X		X	NOTE 1	NOTE 3		X						Work Area 101, 102, 103, Met Prep Lab 106, Lab Alcove 107, Chem Lab 110, 111, Material Lab 113

NOTE 1: SPACE TYPE HAS INSTANCES WHERE SOME ROOMS HAVE WINDOWS AND/OR TOPLIGHTS AND OTHER INSTANCES WHERE NO WINDOWS AND OR TOPLIGHTS ARE PRESENT. FOR SPACES WITH WINDOWS OR TOPLIGHTS WHERE DAYLIGHT RESPONSE CONTROLS ARE REQUIRED, DAYLIGHT RESPONSE CONTROL WILL BE PROVIDED.

NOTE 2: SELECT SPACES HAVE EITHER NO WINDOWS OR NO WINDOWS WITH VIEWS TO THE EXTERIOR WITHIN PRIMARY DAYLIGHTING ZONE. THEREFORE, DAYLIGHT RESPONSE CONTROL FOR SIDELIGHTING IS NOT REQUIRED.

NOTE 3: SELECT SPACES HAVE NO TOPLIGHTING. THEREFORE, DAYLIGHT RESPONSE CONTROL FOR TOPLIGHTING IS NOT REQUIRED.

NOTE 4: SCHEDULED SHUTOFF IN SELECT AREAS ARE EXEMPT DUE TO SECURITY AND SAFETY REQUIREMENTS OF THE OWNER (SEE ASHRAE 90.1-2019, SECTION...

NOTE 5: AUTOMATIC PARTIAL SHUTOFF IS COMPLIED WITH BY PROVIDING AUTOMATIC FULL SHUTOFF, PER ASHRAE 90.1-2019, SECTION 9.4.1.1.g.

NOTE 6: OCCUPANCY SENSORS IN THE SPACE SHALL BE CONFIGURED BY LIGHTING CONTROL SYSTEM TO UTILIZE AUTOMATIC PARTIAL OFF DURING NORMALLY OCCUPIED HOURS OF OPERATION, AND AUTOMATIC FULL OFF DURING NORMALLY UNOCCUPIED HOURS OF OPERATION.

NOTE 7: SPACES USING LESS THAN 150W OF LIGHTING ARE EXEMPT FROM SIDELIGHTING AND TOPLIGHTING DAYLIGHT RESPONSE CONTROLS, PER ASHRAE 90.1-2019 SECTION 9.4.1.1.e & 9.4.1.1.f.

NOTE 8: SELECT SPACES EXEMPT FROM REQUIRING "RESTRICTED TO MANUAL ON" CONTROL WHERE DOING SO WOULD ENDANGER THE SAFETY OR SECURITY OF THE ROOM OR BUILDING OCCUPANTS, PER ASHRAE 90.1-2019 SECTION 9.4.1.1.b.

LIGHTING POWER DENSITY CALCULATION
Detroit Diesel M1 Met Lab Renovation

CALCULATION METHOD	Space by Space 90.1-2019	
INTERIOR:		
TOTAL SQ. FT.	6399	ft2
TOTAL INSTALLED	6.296	kW
TOTAL ALLOWED BASED ON ANSI/ASHRAE/IESNA 90.1-2019	7.707	kW
NET DIFFERENCE	1.411	kW
PERCENT REDUCTION	18.31%	
AVERAGE LIGHTING POWER DENSITY	0.984	W/ft2
TOTAL ALLOWED LIGHTING POWER DENSITY	1.204	W/ft2
EXTERIOR:		
TOTAL TRADABLE INSTALLED	0.015	kW
TOTAL TRADABLE ALLOWED BASED ON ANSI/ASHRAE/IESNA 90.1-2019	0.063	kW
NET TRADABLE DIFFERENCE	0.048	kW
PERCENT REDUCTION: TRADABLE	76.19%	

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
07/18/2025	D.D. 50%
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

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

©2025

2025-DD016-001

Lighting Fixture Schedule and Control Matrix

E-502

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:11:12 AM

PANEL BOARD: RP-1

VOLTS: 208Y/120	**MAINS TYPE:** MAIN CB	**A.I.C. RATING:** 22,000 AMPS...	**SUPPLY FROM:** BUSWAY M1AAC-4C
PHASE: 3	**MAINS RATING:** 225 A	**NEUTRAL RATING:** 100%	**MOUNTING:** SURFACE
WIRE: 4	**MCB RATING:** 225 A	**GROUND BUS:** Yes	**LOCATION:** CHEMISTRY LAB 2 111

CKT	POLES	TRIP	LOAD TYPE	BKR TYPE	LOAD NAME	A	B	C	LOAD NAME	BKR TYPE	LOAD TYPE	TRIP	POLES	CKT
1	1	20	R		CHEM LAB 110 RECEPTACLES	360 / 910			CHEM LAB 110 CT-6 FT-IR		R	20	1	2
3	1	20	R		CHEM LAB 110 CT-8 WS		720 / 960		CHEM LAB 110 CT-12 & CT-13 RANCIMAT		R	20	1	4
5	1	20	L		LIGHTING CHEM LAB 110, CORRIDOR 109			1053 / 0	SPARE		--	20	1	6
7	1	20	R		CHEM LAB 110 CT-15 WS; CT-10 PART ACCESS; CT-17...	1080 / 1920			CHEM LAB 110 CT-16 DISTILLATION		R	20	1	8
9	2	20	R		CHEM LAB 110 CSP FBM-05		1664 / 0		SPARE		--	20	1	10
11								1664 / 0	SPARE		--	20	1	12
13	1	20	R		CHEM LAB 110 RECEPTACLES	900 / 0			SPARE		--	20	1	14
15	1	20	R		CHEM LAB 111 CS-3 GC/MS & FID 1		480 / 500		CHEM LAB 111 HOOD CH-5		E	20	1	16
17	1	20	R		CHEM LAB 111 CS-4 GC-FID 2			480 / 0						18
19	1	20	E		CHEM LAB 111 HOOD CH-5	500 / 0								20
21	1	20	R		CHEM LAB 111 SUMP PUMP		1020 / 1090		CHEM LAB 111 CS-2 GCMS PUMP		R	20	1	22
23	1	20	R		CHEM LAB 111 CS-11 WS			720 / 1000	CHEM LAB 111 CT-12 MICROWAVE		R	20	1	24
25	1	20	R		CHEM LAB 111 CH-5 SUMP PUMP	1020 / 1320			CHEM LAB 111 CT-18 THERMO ICP CHILLER		R	20	1	26
27	1	20	R		CHEM LAB 111 CH-14 OVEN		1680 / 1800		CHEM LAB 111 CH-10 BOMB CAL		R	20	1	28
29	1	20	L		LIGHTING - CHEM LAB 111, CYLINDER RM 114 & 115			1068 / 1600	CHEM LAB 111 CS-6 CHN ANALYZER		R	20	1	30
31	1	20	R		CHEM LAB 111 CS-3 GC/MS & FID 1	1920 / 1040			CHEM LAB 111 CT-58 MASS SPEC		R	30	2	32
33	1	20	R		CHEM LAB 111 RECEPTACLES		360 / 1040							34
35	1	20	R		CHEM LAB 111 CS-5 GC PRYROPROBE			1800 / 936	CHEM LAB 111 CH-7 MUFFLE FURNACE		R	20	2	36
37	1	20	R		CHEM LAB 111 RECEPTACLES	360 / 936								38
39	2	30	R		CHEM LAB 111 CT-47 SPECTRO ICP PWR SUPPLY		2496 / 550		CHEM LAB 111 CT-2 RO WATER		R	20	1	40
41								2496 / 360	CHEM LAB 111 RECEPTACLES		R	20	1	42
43	1	20	R		CHEM LAB 111 CT-19 THERMO AUTOSAMPLER	550 / 720			CHEM LAB 111 CT-51 & CT-52 HPLC/IC STACK 1 & 2		R	20	1	44
45	1	20	R		CHEM LAB 111 CT-57 HPLC MS STACK 1 & 2 COMBO		720 / 720		CHEM LAB 111 CT-24 WS		R	20	1	46
47	1	20	R		CHEM LAB 111 CT-27 SPECTRO ICP...			550 / 720	HOUSEKEEPING RECEPTACLES CHEM LAB 111		R	20	1	48
49	1	20	R		CHEM LAB 111 CS-9 WS	720 / 1440			CHEM LAB 111 CT-50 WS		R	20	1	50
51	1	20	R		CHEM LAB 111 CT-44 HPLC (MS) STACK 3, CT-55 WS		900 / 1440		CHEM LAB 111 RECEPTACLES		R	20	1	52
53	1	20	R		CHEM LAB 111 CT-31 WS			720 / 900	CHEM LAB 111 RECEPTACLES		R	20	1	54
55	1	20	R		CHEM LAB 111 CS-3 GC/MS & FID 1	1920 / 1664			CHEM LAB 110 CSP FBD-05		R	20	2	56
57	1	20	R		CHEM LAB 111 CS-3 GC/MS & FID 1		1920 / 1664							58
59	1	20	R		CHEM LAB 111 RECEPTACLES			1440 / 1920	CHEM LAB 111 CS-4 GC-FID 2		R	20	1	60
61	2	20	--		SPARE	0 / 0			SPARE		--	20	1	62
63							0 / 0		SPARE		--	20	1	64
65	2	20	R		CHEM LAB 111 CT-20 THERMO ICP			1664 / 0	SPARE		--	20	1	66
67						1664 / 0			SPARE		--	20	1	68
69	1	20	--		SPARE		0 / 0		SPARE		--	20	1	70
71	1	20	--		SPARE			0 / 0	SPARE		--	20	1	72
73	1	20	--		SPARE	0 / 0			SPARE		--	20	1	74
75	1	20	--		SPARE		0 / 0		SPARE		--	20	1	76
77	1	20	--		SPARE			0 / 0	SPARE		--	20	1	78
79	1	20	--		SPARE	0 / 0			SPARE		--	20	1	80
81	1	20	--		SPARE		0 / 0		SPARE		--	20	1	82
83	1	20	--		SPARE			0 / 0	SPARE		--	20	1	84
					Total Load:	20944 VA	21724 VA	21091 VA						
					Total Amps:	175 A	181 A	176 A						

LOAD TYPE KEY	BKR TYPE KEY	LOAD TYPE	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
L = LIGHTING	BLANK = STANDARD	L	2121 VA	100.00%	2121 VA		
R = RECEPTACLE	G = GFCI	R	60638 VA	58.25%	35319 VA	**TOTAL CONN. LOAD:**	63.76 kVA
E = EQUIPMENT	A = AFCI	E	1000 VA	80.00%	800 VA	**TOTAL EST. DEMAND:**	38.24 kVA
K = KITCHEN	AF - ARC FAULT					**TOTAL CONN. CURRENT:**	177 A
H = HVAC	LH = LOCKING HASP					**TOTAL EST. DEMAND CURRENT:**	106 A
M = MECHANICAL	HT = HANDLE TIE						
	ST = SHUNT TRIP						

Notes:

PANEL BOARD: RP-M1-B1

VOLTS: 208Y/120	**MAINS TYPE:** MAIN CB	**A.I.C. RATING:** 22,000 AMPS...	**SUPPLY FROM:** BUSWAY M1-W-6B
PHASE: 3	**MAINS RATING:** 225 A	**NEUTRAL RATING:** 100%	**MOUNTING:** SURFACE
WIRE: 4	**MCB RATING:** 225 A	**GROUND BUS:** Yes	**LOCATION:** LAB ALCOVE 107

CKT	POLES	TRIP	LOAD TYPE	BKR TYPE	LOAD NAME	A	B	C	LOAD NAME	BKR TYPE	LOAD TYPE	TRIP	POLES	CKT
1	1	20	L		LIGHTING MATERIAL LAB 113	972 / 986			LIGHTING MATERIAL LAB 113		L	20	1	2
3	1	20	R		HOUSEKEEPING PLUGS MATERIAL LAB 113		1260 / 360		RECEPTACLES NORTH MATERIAL LAB 113		R	20	1	4
5	1	20	R		SUMP PUMP MATERIAL LAB 113			1128 / 1150	MATERIAL LAB 113 SP-10 K-ZOO SANDER		R	20	1	6
7	1	20	R		RECEPTACLES NORTH MATERIAL LAB 113	360 / 360			CORD REEL NORTH MATERIAL LAB 113		R	20	1	8
9	1	20	R		SUMP PUMP MATERIAL LAB 113		1020 / 720		SP-2 (1) DISCOTOM 120V MATERIAL LAB 113		R	20	1	10
11	1	20	R		CORD REEL NORTH MATERIAL LAB 113			360 / 961	SP-2a DISCOTOM 208V MATERIAL LAB 113		E	20	3	12
13	3	20	E		SP-2b DISCOTOM 208V MATERIAL LAB 113	961 / 961								14
15							961 / 961							16
17								961 / 720	SP-2 (2) DISCOTOM 120V MATERIAL LAB 113		R	20	1	18
19	2	20	R		SP-1 (1) ACCUTOM MATERIAL LAB 113	946 / 1200			SP-7 BELT & DISC FINISHER MATERIAL LAB 113		R	20	1	20
21							946 / 1680		SP-8 VERTICAL BAND SAW MATERIAL LAB 113		R	20	1	22
23	2	20	R		SP-1 (2) ACCUTOM MATERIAL LAB 113			946 / 360	CORD REEL WEST MATERIAL LAB 113		R	20	1	24
25						946 / 360			CORD REEL EAST MATERIAL LAB 113		R	20	1	26
27	1	20	R		MS-8 BINDER OVEN MATERIAL LAB 113		1680 / 360		RECEPTACLES EAST MATERIAL LAB 113		R	20	1	28
29	1	20	R		CORD REEL SOUTH MATERIAL LAB 113			360 / 374	EF-3, EF-4		E	20	2	30
31	1	20	E		DCP-1	28 / 374								32
33	1	20	R		HSKP PLUGS WK AREA 101, LAB 106, 107		180 / 540		MM-2 WS WORK AREA 101		R	20	1	34
35	1	20	R		MM-2 HARDNESS TESTER WORK AREA 101			420 / 360	MM-1 HARDNESS TESTER WORK AREA 101		R	20	1	36
37	1	20	R		MM-7 HARDNESS TESTER WORK AREA 101	1000 / 720			MM-12 WS WORK AREA 101		R	20	1	38
39	1	20	R		MM-5 CAMERA WORK AREA 101		720 / 750		MM-12 INSTRON WORK AREA 101		R	20	1	40
41	1	20	R		MM-4 CAMERA WORK AREA 101			540 / 946	P-1 POLISHER MET PREP LAB 106		R	20	2	42
43	1	20	R		P-3b POLISHER MET PREP LAB 106	1560 / 946								44
45	1	20	R		P-3a POLISHER MET PREP LAB 106		1560 / 1100		P-2b POLISHER MET PREP LAB 106		R	20	1	46
47	1	20	R		P-2a POLISHER MET PREP LAB 106			1100 / 1100	P-2c POLISHER MET PREP LAB 106		R	20	1	48
49	1	20	R		P-2d POLISHER MET PREP LAB 106	1100 / 1020			SUMP PUMP MET PREP LAB 106		R	20	1	50
51	1	20	R		RECEPTACLES MET PREP LAB 106		720 / 1200		HAND DRYER MET PREP LAB 106	LH	E	20	1	52
53	1	20	R		RECEPTACLES MET PREP LAB 106			540 / 540	RECEPTACLES MET PREP LAB 106		R	20	1	54
55	1	20	R		RECEPTACLES MET PREP LAB 106	540 / 1200			PRINTER LAB ALCOVE 107		R	20	1	56
57	1	20	R		RECEPTACLES LAB ALCOVE 107		360 / 540		WORK STATION LAB ALCOVE 107		R	20	1	58
59	1	20	R		RECEPTACLES LAB ALCOVE 107			360 / 720	ROOF SERVICE RECEPTACLES(EF-1-4, RTU-1)		R	20	1	60
61	1	20	--		SPARE	0 / 3483			VAV-3		E	40	3	62
63	1	20	--		SPARE		0 / 3483							64
65	2	20	E		VAV-2			1248 / 3483						66
67						1248 / 1441			VAV-5		E	20	3	68
69	3	20	E		VAV-4		1441 / 1441							70
71								1441 / 1441						72
73						1441 / 0			SPARE		--	20	1	74
75	3	30	E		VAV-6		2162 / 0		SPARE		--	20	1	76
77								2162 / 1248	VAV-1		E	20	2	78
79						2162 / 1248								80
81	1	20	--		SPARE		0 / 0		SPARE		--	20	1	82
83	1	20	--		SPARE			0 / 0	SPARE		--	20	1	84
					Total Load:	27582 VA	26144 VA	24968 VA						
					Total Amps:	231 A	219 A	208 A						

LOAD TYPE KEY	BKR TYPE KEY	LOAD TYPE	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
L = LIGHTING	BLANK = STANDARD	L	1958 VA	100.00%	1958 VA		
R = RECEPTACLE	G = GFCI	R	38404 VA	63.02%	24202 VA	**TOTAL CONN. LOAD:**	78.67 kVA
E = EQUIPMENT	A = AFCI	E	38312 VA	80.00%	30650 VA	**TOTAL EST. DEMAND:**	56.81 kVA
K = KITCHEN	AF - ARC FAULT					**TOTAL CONN. CURRENT:**	218 A
H = HVAC	LH = LOCKING HASP					**TOTAL EST. DEMAND CURRENT:**	158 A
M = MECHANICAL	HT = HANDLE TIE						
	ST = SHUNT TRIP						

Notes:

PANEL BOARD: RP-M1-B2

VOLTS: 208Y/120	**MAINS TYPE:** MAIN CB	**A.I.C. RATING:** 22,000 AMPS...	**SUPPLY FROM:** BUSWAY M1-W-6B
PHASE: 3	**MAINS RATING:** 225 A	**NEUTRAL RATING:** 100%	**MOUNTING:** SURFACE
WIRE: 4	**MCB RATING:** 225 A	**GROUND BUS:** Yes	**LOCATION:** LAB ALCOVE 107

CKT	POLES	TRIP	LOAD TYPE	BKR TYPE	LOAD NAME	A	B	C	LOAD NAME	BKR TYPE	LOAD TYPE	TRIP	POLES	CKT
1	1	20	L		LIGHTING WORK AREA 102, 103	1170 / 1046			LITES WORK 101, METLAB 106, ALCOVE 107, CORR. 112		L	20	1	2
3	1	20	R		RECEPTACLES SOUTH WORK AREA 102		360 / 360		SS-X2 ION POLISHER WORK AREA 102		R	20	1	4
5	1	20	R		RECEPTACLES WEST, NORTH WORK AREA 102			360 / 360	RECEPTACLES EAST WORK AREA 102		R	20	1	6
7	1	20	R		RECEPTACLES SOUTH WORK AREA 102	360 / 2496			SC-6 UPS CLOSET 104		R	30	2	8
9	2	30	E		SS-1 208-100V XFMR WORK AREA 102		1000 / 2496							10
11								1000 / 1044	SC-3 FE SEM AIR CLOSET 104		R	20	1	12
13	1	20	R		SC-4 SEM VACUUM CLOSET 104	672 / 720			MM-10 CAMERA WORK AREA 103		R	20	1	14
15	1	20	R		SC-5 SEM AIR CLOSET 104		840 / 720		MM-10 WS WORK AREA 103		R	20	1	16
17	1	20	R		HSKP RCPT CORRIDOR 112, WK AREA 103, CLOSET 104			900 / 540	MM-14 STEREOSCOPE WORK AREA 103		R	20	1	18
19	1	20	R		MM-14b WS WORK AREA 103	720 / 720			MM-15 SMARTZOOM WORK AREA 103		R	20	1	20
21	1	20	R		MM-14a STEREOSCOPE WORK AREA 103		360 / 480		MM-6 CAMERA WORK AREA 103		R	20	1	22
23	1	20	R		MM-14a WS WORK AREA 103			720 / 720	MM-6 WS WORK AREA 103		R	20	1	24
25	1	20	R		MM-8 CAMERA WORK AREA 103	360 / 360			MM-9 CAMERA WORK AREA 103		R	20	1	26
27	1	20	R		MM-8 WS WORK AREA 103		1080 / 1200		SLIDING DOOR WORK AREA 103		E	20	1	28
29	1	20	R		MM-9 WS WORK AREA 103			540 / 360	RECEPTACLES WORK AREA 103		R	20	1	30
31	2	30	R		SS-3 GLOVE BOX WORK AREA 103	1664 / 1020			SUMP PUMP WORK AREA 103		R	20	1	32
33							1664 / 540		RECEPTACLES WORK AREA 103		R	20	1	34
35	1	20	E	LH	HAND DRYER WORK AREA 103			1200 / 500	HOOD MS-10 WORK AREA 103		E	20	1	36
37	1	20	E		HOOD MS-10 WORK AREA 103	500 / 360			CHEM LAB 110 CO-3 SUMP PUMP		R	20	1	38
39	1	20	E		CHEM LAB 110 HOOD CO-3		500 / 1200		CHEM LAB 110 CO-12 AUTO DSC; CO-13 DSC CHILLER		R	20	1	40
41	1	20	E		CHEM LAB 110 HOOD CO-3			500 / 1140	CHEM LAB 110 CO-9 TGA WS; CO-11 pDSC		R	20	1	42
43	1	20	R		CHEM LAB 110 CO-7 WS; CO-10 MICRO BALANCE	900 / 1200			CHEM LAB 110 CO-4 40C VISCOMETER		R	20	1	44
45	1	20	R		CHEM LAB 110 CO-8 TGA		1320 / 1664		CHEM LAB 110 CSP FBD-06		R	20	2	46
47	1	20	R		CHEM LAB 110 CO-5 100C VISCOMETER			1200 / 1664						48
49	2	20	R		CHEM LAB 110 CSP FBD-05	1664 / 1020			CHEM LAB 110 SUMP PUMP		R	20	1	50
51							1664 / 1080		CHEM LAB 110 CH-4 WS; CO-24 WS		R	20	1	52
53	1	20	R		HOUSEKEEPING RCPTS CHEM LAB 110, CORRIDOR...			360 / 1100	CHEM LAB 110 CH-1 TAN		R	20	1	54
55	1	20	R		CHEM LAB 110 CO-25 ANALY BALANCE; CO-26 OLD TAN	360 / 0			SPARE		--	20	1	56
57	1	20	R		CHEM LAB 110 CO-22 TBN		690 / 0		SPARE		--	20	1	58
59	1	20	R		CHEM LAB 110 CO-27 KF TITRATOR			930 / 0	SPARE		--	20	1	60
61	1	20	--		SPARE	0 / 0			SPARE		--	20	1	62
63	1	20	--		SPARE		0 / 0		SPARE		--	20	1	64
65	1	20	--		SPARE			0 / 0	SPARE		--	20	1	66
67	1	20	--		SPARE	0 / 0			SPARE		--	20	1	68
69	1	20	--		SPARE		0 / 0		SPARE		--	20	1	70
71	1	20	--		SPARE			0 / 0	SPARE		--	20	1	72
73	1	20	--		SPARE	0 / 0			SPARE		--	20	1	74
75	1	20	--		SPARE		0 / 0		SPARE		--	20	1	76
77	1	20	--		SPARE			0 / 0	SPARE		--	20	1	78
79	1	20	--		SPARE	0 / 0			SPARE		--	20	1	80
81	1	20	--		SPARE		0 / 0		SPARE		--	20	1	82
83	1	20	--		SPARE			0 / 1200	NEW FIRE ALARM NAC PANEL		E	20	1	84
					Total Load:	17311 VA	19218 VA	16338 VA						
					Total Amps:	146 A	161 A	136 A						

LOAD TYPE KEY	BKR TYPE KEY	LOAD TYPE	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
L = LIGHTING	BLANK = STANDARD	L	2215 VA	100.00%	2215 VA		
R = RECEPTACLE	G = GFCI	R	43052 VA	61.61%	26526 VA	**TOTAL CONN. LOAD:**	52.87 kVA
E = EQUIPMENT	A = AFCI	E	7600 VA	80.00%	6080 VA	**TOTAL EST. DEMAND:**	34.82 kVA
K = KITCHEN	AF - ARC FAULT					**TOTAL CONN. CURRENT:**	147 A
H = HVAC	LH = LOCKING HASP					**TOTAL EST. DEMAND CURRENT:**	97 A
M = MECHANICAL	HT = HANDLE TIE						
	ST = SHUNT TRIP						

Notes:

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Panel Schedules

E-601

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

4/24/2026 10:11:13 AM

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 ARCHITECT 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 ORDNANCES 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 OTHER'S 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 THE 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, CONNECTION POINTS AND WIRING TERMINATIONS. EQUIPMENT SHALL BE TAGGED TO MATCH SUB-ASSEMBLIES, CONNECTION POINTS AND WIRING TERMINATIONS.

16 PROJECT RECORD DOCUMENTS:

PROVIDE A COMPLETE SET OF AS-BUILT DRAWINGS ON ALL WORK DONE. PROJECT RECORD DOCUMENTS ARE REQUIRED UPON COMPLETION OF THE WORK AND BEFORE FINAL PAYMENT IS MADE.

17 CHARACTER OF WORK:

THE INSTALLATION SHALL BE SO MADE THAT ITS MANY COMPONENT PARTS WILL FUNCTION TOGETHER AS A WORKABLE SYSTEM. IT SHALL BE COMPLETE WITH ALL ACCESSORIES NECESSARY FOR ITS OPERATION, AND SHALL BE LEFT WITH ALL EQUIPMENT PROPERLY ADJUSTED AND IN WORKING ORDER.

EXECUTE THE WORK IN CONFORMITY WITH THE BEST PRACTICES, SO AS TO CONTRIBUTE TO EFFICIENCY OF OPERATION, MINIMIZE MAINTENANCE, PROVIDE ACCESSIBILITY, AND NOT BE OBTRUSIVE OR UNSIGHTLY. EXECUTE SO THAT THE INSTALLATION WILL CONFORM AND ACCOMMODATE ITSELF TO THE BUILDING STRUCTURE, THE AREA OR ROOM, ITS EQUIPMENT AND ITS USAGE.

18 GUARANTEE:

THE COMPLETE ELECTRICAL SYSTEM OR SYSTEMS FURNISHED AND INSTALLED SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THE WORK AGAINST DEFECTIVE MATERIALS 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.

19 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 NEGLECT 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 ALL LUMINAIRES, DISTRIBUTION EQUIPMENT, MOTOR CONTROL, ALARM AND COMMUNICATION SYSTEMS AND COMPONENTS, AND POWER GENERATION SYSTEMS. SUBMITTALS SHALL BE MADE SUFFICIENTLY IN ADVANCE OF THE REQUIRED ORDER RELEASE DATE, TO ALLOW THE ENGINEER AMPLE 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.

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 TEMPORARY SERVICE:

THIS CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY ELECTRICAL SERVICES FOR TEMPORARY LIGHTING, TEMPORARY NON-ELECTRIC HEAT, TEMPORARY ELEVATOR, POWER TOOLS, INCLUDING TEMPORARY PANELS, FEEDERS, BRANCH CIRCUITS, GFCI PROTECTED RECEPTACLE, ETC. AS IS APPROPRIATE FOR THE CONSTRUCTION OF ALL TRADES, AND REMOVAL OF SUCH TEMPORARY SERVICES AT THE PROJECT COMPLETION.

24 EXCAVATION AND BACKFILL:

PROVIDE ALL EXCAVATION AND BACKFILL REQUIRED FOR THE ELECTRICAL WORK.

25 MOUNTING HEIGHTS:

MOUNT OUTLET BOXES AND EQUIPMENT AS INDICATED BELOW, UNLESS OTHERWISE INDICATED ON THE DRAWINGS. MOUNTING HEIGHTS, IN GENERAL, ARE ABOVE FINISHED FLOOR TO CENTERLINE OF OUTLET BOX OR EQUIPMENT.

- BRACKET EXIT LIGHT FIXTURE: 6'-8" TO BOTTOM OF FIXTURE FOR CEILINGS UP TO 9-FEET. MOUNT AT 8'-0" TO BOTTOM FOR CEILINGS HIGHER THAN 9-FEET.
- CARD READERS, KEYPADS, OR OTHER ACCESS SECURITY DEVICES AT A DOOR - 46".
- SWITCHES: 46".
- RECEPTACLES - FINISHED AREAS: 18".
- VOICE/DATA OUTLETS - DESK MOUNTED: 18".
- VOICE/DATA OUTLETS - WALL MOUNTED: 18".
- VOICE OUTLETS - FOR PHONE CARD AND COIN OPERATED WALL DEVICES: 48" TO CARD OR COIN INSERTION FOR BARRIER FREE.
- SAFETY SWITCHES: 48".
- MOTOR STARTERS: 48".
- PANEL CABINETS: 6'-8" TO THE TOP, PROVIDING BOTTOM OF CABINET IS NOT LESS THAN 12" ABOVE FLOOR.
- PUSH BUTTONS: 46".
- EPO, SEO, EMERGENCY OFF PUSHBUTTON: 54".

REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS BEFORE INSTALLING ANY OF THE ABOVE OUTLETS OR EQUIPMENT FOR INTERFERENCES, AND ADJUST HEIGHTS TO AVOID INTERFERENCES THAT WOULD OCCUR. IF DEVIATIONS ARE REQUIRED, OBTAIN APPROVAL OF THE OWNER BEFORE PROCEEDING WITH INSTALLATION.

26 GROUNDING:

MATERIALS:

BARE GROUNDING CONDUCTORS: STRANDED ANNEALED COPPER.

INSULATED GROUNDING CONDUCTORS: PER "WIRES AND CABLES".

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.

27 CONDUIT:

MATERIALS:
ELECTRICAL METALLIC TUBING: ZINC-COATED STEEL PER ANSI C80.3 "SPECIFICATION FOR ELECTRICAL TUBING, ZINC-COATED". MANUFACTURERS: ALLIED, REPUBLIC OR WHEATLAND.

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: FULL 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.

RIGID NON-METALLIC CONDUIT, ELBOWS AND COUPLINGS: SMOOTH-WALL POLYVINYLCHLORIDE (PVC), 90 DEGREE C, UL LISTED AND IN COMPLIANCE WITH THE TESTING REQUIREMENTS DEFINED IN NEMA WTC-2, NEMA TC-3, UL-651, AND UL-514 (FITTINGS). MANUFACTURERS: SCHEDULE 40 - PRIME CONDUIT OR CANTEX, SCHEDULE 80 - PRIME CONDUIT OR CANTEX.

EXPLOSION PROOF FLEXIBLE METAL CONDUIT: APPROVED FOR USE IN CLASS 1, GROUP A, B, C, AND D AREAS AND NOT REQUIRING A BONDING JUMPER. MANUFACTURERS: APPLETON, CROUSE-HINDS, O-Z/GEDNEY OR THOMAS & BETTS.

METHOD:
HAZARDOUS LOCATIONS: RIGID STEEL CONDUIT.

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

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

INDOOR, EXPOSED:
- UNDER 2": RIGID STEEL CONDUIT
- 2" AND LARGER: ELECTRICAL METALLIC TUBING

INDOOR, CONCEALED IN WALLS OR ABOVE CEILINGS: ELECTRICAL METALLIC TUBING.

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: RIGID STEEL CONDUIT, 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 CONDUIT 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. USE 1/2-INCH FIXTURE STEMS OPTIONALLY, UNLESS OTHERWISE NOTED.

USE EMT IN CONCEALED DRY LOCATIONS UP TO 4-INCHES IN DIAMETER WHERE CONDUITS ARE NOT SUBJECT TO MECHANICAL DAMAGE.

CONCEAL ALL CONDUIT IN FINISHED AREAS EITHER ABOVE CEILINGS OR IN WALLS. 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 VENT 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 STEEL CONDUIT SHALL BE USED FOR ALL FINAL CONNECTIONS TO CEILING MOUNTED EQUIPMENT SUCH AS LUMINAIRES AND SMOKE DETECTORS.

LIQUID TIGHT FLEXIBLE STEEL CONDUIT SHALL BE USED FOR ALL FINAL CONNECTIONS TO TRANSFORMERS, VIBRATING EQUIPMENT SUCH AS MOTORS, UNDER RAISED ACCESS FLOORING, AND FINAL CONNECTIONS TO EQUIPMENT CHAMBERS.

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

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.

SEAL-OFF FITTINGS FOR HAZARDOUS AREAS: UL LISTED FOR USE IN CLASS 1, GROUP A, B, C, OR D AREAS AS APPLICABLE.

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

29 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 RISER CONDUIT AT EACH FLOOR LEVEL BY APPROVED CLAMP HANGERS.

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.

30 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 CONDUCTORS.

31 OUTLET BOXES:

MATERIALS:
SHEET STEEL BOXES: GALVANIZED STOCK NOT LESS THAN 14 GAUGE, WITH KNOCKOUT OPENINGS, SINGLE OR MULTIPLE GANG, WITH EXTENSIONS, ADAPTERS, PLASTER RINGS, 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.

HAZARDOUS LOCATIONS: ALL BOXES INSTALLED IN HAZARDOUS LOCATION AREAS SHALL BE GALVANIZED, CAST OR MALLEABLE IRON, WITH THREADED HUBS AND THREADED COVERS, APPROVED FOR USE IN CLASS 1, GROUP A, B, C OR D AREAS AS APPLICABLE. MANUFACTURERS: APPLETON, CROUSE-HINDS, O-Z/GEDNEY 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.

USE 4-INCH OCTAGON BOXES WITH 3/8-INCH STUD FOR LUMINAIRES.

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.

PROVIDE ISOLATING PARTITION BETWEEN 277 VAC SWITCHES.

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

32 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.

33 WIREWAYS:

PAINTED STEEL ENCLOSURE NEMA 1 WITH SCREWED FASTENED COVER, BENDS, ELBOWS, TEES, CROSSES, ADAPTERS AND ACCESSORIES AS REQUIRED FOR A COMPLETE SYSTEM. PROVIDE SIZES PER NEC REQUIREMENTS FOR WIRING SPACES, EXCEPT WHERE LARGER SIZES ARE INDICATED. FURNISH GASKETS WHEN LOCATED IN AREAS REQUIRING GASKETS. MANUFACTURERS: WIREMOLD.

INSTALL WIREWAYS COMPLETE WITH ALL REQUIRED COUPLINGS, END CLOSURES, ETC., AS REQUIRED. TAPS AND SPLICES ARE PERMITTED WITH THE WIREWAY, BUT SHALL BE LIMITED TO THE REQUIREMENTS OF NEC.

34 PULL ROPE:

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

35 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.

36 CONDUIT EXPANSION FITTINGS:

DROPOUTS, ADAPTERS AND OTHER ACCESSORIES DESIGNED FOR USE EXCLUSIVELY WITH THE TRAY. CABLE TRAY SHALL BE UL LISTED.

TRAY SHALL BE HIGH STRENGTH STEEL WIRE WELDED INTO A MESH NO LARGER THAN 2-INCH BY 4-INCH. ALL WELDS AND EDGES SHALL BE SMOOTH AND FREE OF BURRS AND SHARP EDGES.

MANUFACTURERS: COOPER B-LINE

INSTALLATION:
CABLE TRAY SUPPORT SYSTEM SHALL BE CENTER HUNG BRACKET.

INSTALL CABLE TRAY SUPPORTS AT INTERVALS NOT GREATER THAN 10-FEET IN STRAIGHT HORIZONTAL RUNS WITH ADDITIONAL SUPPORTS AT FITTINGS. INSTALL SUPPORTS AT INTERVALS NOT GREATER THAN 5-FEET IN VERTICAL RUNS.

SECURE CABLES AGAINST TRAY WITH NYLON CABLE TIES EVERY 5-FEET ON HORIZONTAL RUNS AND EVERY 18-INCHES ON VERTICAL RUNS.

PROVIDE CABLE TRAY DIVIDER STRIPS WHERE INDICATED.

INSTALL TRAYS LEVEL AND PLUMB ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. WHERE ELEVATIONS CHANGES ARE REQUIRED IN A HORIZONTAL RUN TO CLEAR OBSTRUCTIONS, PROVIDE VERTICAL OFF-SETS.

PROPERLY SIZE SLOTS OR OPENINGS THROUGH WALLS OR FLOORS FOR CABLE TRAY. AFTER CABLE TRAY IS INSTALLED AND CABLES PULLED AND FASTENED IN PLACE, SEAL FIRE BARRIER WALLS, SMOKE BARRIER WALLS AND FLOOR SLOT OPENINGS WITH FIREPROOF MATERIALS.

PROVIDE AND MAINTAIN SUFFICIENT SPACE ABOVE CABLE TRAYS TO PERMIT ADEQUATE ACCESS FOR INSTALLING AND MAINTAINING THE CABLES.

INSTALL EXPANSION CONNECTIONS WHERE TRAY CROSSES A BUILDING EXPANSION JOINTS AND IN TRAY RUNS THAT EXCEED 90-FEET.

GROUND TRAY AT THE BEGINNING AND END OR EACH RUN USING MANUFACTURER'S RECOMMENDED GROUND FITTING. PROVIDE GROUNDING JUMPERS AT ALL EXPANSION JOINT ASSEMBLIES. GROUNDING OF THE TRAY SHALL BE BY THE CABLE TRAY INSTALLING CONTRACTOR.

INSTALL LOW VOLTAGE TRAYS AND ASSOCIATED CONDUITS A MINIMUM DISTANCE FROM THE FOLLOWING SYSTEMS:
- 36-INCHES PERPENDICULAR DISTANCE FROM MEDIUM VOLTAGE CABLES.
- 72-INCHES PARALLEL DISTANCE FROM MEDIUM VOLTAGE CABLES.
- 12-INCHES PERPENDICULAR DISTANCE FROM 600 VAC CABLES.
- 24-INCHES PARALLEL DISTANCE FROM 600 VAC CABLES.
- 48-INCHES FROM MOTORS OR TRANSFORMERS.
- 6-INCHES FROM LUMINAIRES.

37 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. ALL 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 FOLLOWS:
- NEC TYPE "THHN" RATED 90

4/24/2026 10:11:14 AM

48 VARIABLE FREQUENCY DRIVE:

PROVIDE SOLID STATE VARIABLE FREQUENCY DRIVES TO CONVERT **480V/208V**, 3PH, 60 HZ POWER TO ADJUSTABLE VOLTAGE AND FREQUENCY, 3 PHASE, AC POWER FOR STEPLESS MOTOR CONTROL FROM 10% TO 110% OF BASE SPEED. THE VFD SHALL BE OF VARIABLE TORQUE DESIGN AND SHALL MATCH MOTOR CHARACTERISTICS.

THE VFD SHALL UTILIZE DIGITAL 6 PULSE WIDTH MODULATION USING INTEGRATED GATE BIPOLAR TRANSISTORS FOR SPEED CONTROL.

EQUIP VFD WITH DOOR MOUNTED OPERATOR CONTROLS, INCLUDING AUTO/MANUAL SWITCH, START/STOP (RESET) SWITCH AND MANUAL SPEED CONTROL. IN THE AUTO MODE, THE VFD SHALL FOLLOW AN EXTERNAL SIGNAL (4-20MA) AND RESPOND TO REMOTE START/STOP. PROVIDE DOOR MOUNTED DISPLAY OR INDICATORS TO INDICATE POWER ON, VFD FAULT, EXTERNAL FAULT, OVERLOAD, OVERUNDER VOLTAGE, GROUND FAULT AND OVERTEMPERATURE. PROVIDE A DRY CONTACT FOR INDICATION OF VFD FAULT CONDITION.

UNITS SHALL HAVE NOT LESS THAN 65,000 AIC. INTERRUPTING RATING SHALL BE INDICATED ON VFD UNIT NAMEPLATE.

VFD SHALL BE MOUNTED IN A METAL NEMA 1 ENCLOSURE. PROVIDE A NEMA 3R ENCLOSURE WHEN INSTALLED OUTDOORS OR IN DAMP AREAS.

FOR SINGLE MOTOR APPLICATIONS, A MINIMUM OF CLASS-20 I2T ELECTRONIC MOTOR OVERLOAD PROTECTION SHALL BE PROVIDED.

PROVIDE FACTORY MOUNTED LINE REACTORS BETWEEN THE LOAD-BREAK DISCONNECT OF THE UNIT AND THE DRIVE'S ELECTRONIC COMPONENTS. IMPEDANCE OF THE INPUT LINE REACTORS SHALL BE 5%, WITH OUTPUT FILTERS.

VFD'S FOR USE WITH AIR HANDLING EQUIPMENT SHALL INTERFACE WITH AHU FAIL-SAFE EP SWITCHES. WITH THE VFD ENABLED, A CONTACT SHALL CLOSE TO ENERGIZE THE EP CONTROL CIRCUIT; THE RESPECTIVE DAMPERS SHALL OPEN AND THE RESPECTIVE END SWITCHES SHALL CLOSE, THEREBY PERMITTING THE VFD TO OPERATE THE AHU FANS.

PROVIDE VFD WITH MANUAL BYPASS WITH MAGNETIC CONTACTORS. BYPASS SHALL INCLUDE SELECTOR SWITCH FOR "VFD-OFF-BYPASS", BYPASS MODE PILOT LIGHT AND AN INDICATOR TO INDICATE WHEN AN EXTERNAL SAFETY OR OVERLOAD DEVICE HAS SHUT DOWN THE MOTOR. BYPASS SHALL ALLOW POWERING OF THE VFD WITH THE MOTOR OFF OR OPERATING IN BYPASS MODE FOR TESTING, TROUBLESHOOTING AND PROGRAMMING. OVERLOAD PROTECTION SHALL BE SUPPLIED IN BYPASS MODE, AND SHALL CONSIST OF MINIMUM CLASS 20 PROTECTION AS WELL AS ADJUSTABLE CURRENT SETTING FOR COMPLETE MOTOR PROTECTION WHEN OPERATING ON LINE POWER. OVERLOADS THAT ARE NEITHER CLASS 20 NOR CURRENT SELECTABLE ARE NOT ACCEPTABLE.

PROVIDE OVERCURRENT CLASS J FUSES TO MEET CLASS 2 PROTECTION OF VFD COMPONENTS. FUSES SHALL BE SIZED PER THE MANUFACTURER'S RECOMMENDATION FOR THE SPECIFIC MOTOR HORSEPOWER.

PROVIDE ONE SPARE CIRCUIT BOARD FOR EACH DRIVE INSTALLED.

ADDITIONAL FEATURES:
- INPUT DISCONNECT, TO REMOVE POWER FROM THE VFD AND ITS BYPASS CIRCUIT
- ADJUSTABLE AUTO RESTART.
- MOTOR OVERLOAD.
- MOTOR WINDING THERMOSTAT INPUT (MAKE CONNECTION BETWEEN MOTOR AND DRIVE).
- SPEED CONTROL.
- COOLING FANS.
- CONTROL TRANSFORMER.
- REMOTE INDICATION INTERFACE.
- OUTPUT SIGNAL INTERFACE.
- EXTERNAL COMMUNICATIONS INTERFACE.
- MAIN INPUT MOTOR RATED FUSES SHALL BE PROVIDED TO PROTECT THE ENTIRE VFD PACKAGE.

VFD START-UP SERVICE:
THE VFD MANUFACTURER SHALL PROVIDE START-UP COMMISSIONING OF THE VFD. SERVICE SHALL BE PERFORMED BY A FACTORY AUTHORIZED SERVICE REPRESENTATIVE EXPERIENCED IN START-UP AND REPAIR SERVICES. START-UP SERVICES AND COMMISSIONING SHALL INCLUDE CHECKING FOR PROPER OPERATION AND INSTALLATION OF THE VFD, AND IT'S INTERFACE TO THE BUILDING MANAGEMENT SYSTEM (BMS).

MANUFACTURER: SQUARE D, EATON, ABB, DANFOSS, OR YASKAWA.

49 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 BOLTS PER DEVICE WITH ALL 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.

MANUFACTURER: MATCH EXISTING BUS DUCT TYPE

50 LIGHTING SYSTEMS:

PROVIDE ALL LUMINAIRES AS INDICATED ON THE DRAWINGS AND SCHEDULES. LUMINAIRES SHALL BE COMPLETE WITH LAMPS, CANOPIES, SUSPENSION ACCESSORIES, REFLECTORS, DRIVERS, LENS, LOUVERS, PLASTER FRAMES, ETC.

SELF-CONTAINED EMERGENCY LIGHTING UNITS SHALL INCLUDE BUILT-IN BATTERIES, CHARGER, TRANSFER RELAY, AND LOW BATTERY DISCONNECT. SUCH EQUIPMENT SHALL BE CONNECTED TO THE NORMAL OR NIGHT LIGHT CIRCUIT IN THE SPACE, BUT AHEAD OF ANY LOCAL SWITCHES.

LUMINARIES (LAY-IN TYPE AND RECESSED DOWNLIGHTS) SHALL NOT RELY ON THE CEILING SUSPENSION SYSTEM FOR MOUNTING, BUT SHALL ALSO BE SUPPORTED FROM THE STRUCTURE BY A MINIMUM OF (2) TIE WIRES.

PROVIDE LED DRIVERS WITH A MINIMUM FIVE YEAR WARRANTY.

INSTALL ALL EXIT AND EGRESS LIGHTING CIRCUITS IN SEPARATE CONDUITS AND CONNECT TO A DEDICATED CIRCUIT BREAKER.

51 DISTRIBUTION PANELBOARDS - CIRCUIT BREAKER TYPE:

GENERAL: DEAD-FRONT SAFETY TYPE, RATED 480V, 480/277V, 208V, 208/120V, 3 PHASE, 3 OR 4 WIRE, AND AMPERAGE AS INDICATED ON DRAWINGS. PANELS SHALL BE FABRICATED OF 98% COPPER BUSSING WITH SOLID NEUTRAL, AND GROUND BUS WITH MAIN LUGS OR MAIN CIRCUIT BREAKER AS INDICATED AND BRANCH CIRCUIT BREAKERS. MAIN BUS BARS SHALL EXTEND FULL HEIGHT OF ENCLOSURE, REGARDLESS OF QUANTITY OF BRANCH CIRCUIT POSITIONS INDICATED ON THE DRAWINGS. MULTI-SECTION PANELS SHALL BE FULL CAPACITY BUS OR CABLE CONNECTED. PANEL SHALL BE BRACED FOR 65,000 AIC MINIMUM.

CIRCUIT BREAKERS: BOLT-ON MOLDED CASE, 1,2 OR 3 POLE, QUICK-MAKE, QUICK-BREAK, WITH COMMON TRIP FOR 2 AND 3 POLE BREAKERS, TRIP INDICATION AND A MINIMUM RATING OF 65,000 AIC AT 277 VAC FOR 1 POLE BREAKERS AND AT 480 VAC FOR 2 AND 3 POLE BREAKERS, UNLESS OTHERWISE NOTED ON DRAWINGS. INCORPORATE MEANS FOR PADLOCKING THE OPERATING HANDLE IN THE "OFF" POSITION. BREAKERS SHALL BE STANDARD RATED (80%), UNLESS OTHERWISE INDICATED ON THE DRAWINGS. BREAKERS SHALL BE THERMAL MAGNETIC, UNLESS OTHERWISE NOTED ON THE DRAWINGS. PROVIDE BREAKER WITH INDEPENDENTLY ADJUSTABLE (LI), (LSI), (LSIG), (LIG) TRIP SETTINGS WHEN INDICATED ON THE DRAWINGS.

CABINET: NEMA 1, FLUSH OR SURFACE MOUNTED AS INDICATED. PROVIDE NEMA 3R ENCLOSURE WHEN INSTALLED OUTDOORS OR DAMP AREAS.

MANUFACTURER: SQUARE D "I-LINE".

52 PANELBOARDS - LIGHTING AND RECEPTACLE CIRCUIT BREAKER TYPE:

GENERAL: DEAD-FRONT SAFETY TYPE, RATED 480/277V, 208/120V, 3 PHASE, 4 WIRE, AND AMPERAGE AS INDICATED ON DRAWINGS. PANELS SHALL BE FABRICATED OF 98% COPPER BUSSING WITH SOLID NEUTRAL, AND GROUND BUS WITH MAIN LUGS OR MAIN BREAKER AS INDICATED AND BRANCH CIRCUIT BREAKERS. PANEL SHALL BE BRACED FOR 14,000 AIC MINIMUM.

CIRCUIT BREAKER: BOLT-ON MOLDED CASE TYPE, THERMAL MAGNETIC, 1, 2, OR 3 POLE, QUICK-MAKE, QUICK-BREAK, WITH COMMON TRIP FOR 2 AND 3 POLE BREAKERS AND TRIP INDICATION. WHERE LIGHTING CIRCUITS ARE CONTROLLED ONLY FROM THE PANEL BREAKERS, PROVIDE "SWITCHING DUTY" RATED BREAKERS. PROVIDE "HACR", "GFCI" AND "SHUNT TRIP" RATED BREAKERS WHERE NOTED OR REQUIRED. BRANCH BREAKERS FOR 480/277V PANELBOARDS SHALL BE RATED 14,000 AIC MINIMUM. BRANCH BREAKERS FOR 208/120V PANELBOARDS SHALL BE RATED 22,000 AIC MINIMUM. PROVIDE 3 POLE, 2 POLE AND 1 POLE CIRCUIT BREAKERS AS INDICATED. PROVIDE HANDLE LOCKING DEVICES FOR NIGHT LIGHTING, EMERGENCY LIGHTING AND OTHER DESIGNATED CIRCUITS.

CABINET: NEMA 1, FLUSH OR SURFACE MOUNTED AS INDICATED. PROVIDE ONE PIECE SCREW ON TRIM WITH HINGED DOOR OVER THE BRANCH CIRCUIT BREAKER AREA AND FLUSH TYPE LOCKABLE DOOR LATCHES. PROVIDE NEMA 3R ENCLOSURE WHEN INSTALLED OUTDOORS OR DAMP AREAS.

MANUFACTURER: FOR 480/277V PANELBOARDS: SQUARE D "NF". FOR 208/120V PANELBOARDS: SQUARE D "NQ".

53 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.

54 DRY TYPE TRANSFORMERS:

GENERAL: TRANSFORMERS SHALL BE INDOOR VENTILATED, RATED FOR 150 DEG C RISE, AT PRIMARY AND SECONDARY VOLTAGE AND KVA AS INDICATED ON DRAWINGS. TRANSFORMER SHALL CONTAIN COPPER WINDINGS, (2) 2.5% FULL CAPACITY TAPS ABOVE AND (2) 2.5% FULL CAPACITY TAPS BELOW NORMAL VOLTAGE ON THE PRIMARY SIDE. TRANSFORMER SHALL MEET NEMA TP-1 2000 STANDARD FOR ENERGY EFFICIENCY. IN-RUSH CURRENT SHALL NOT EXCEED 12 TIMES THE PRIMARY FULL LOAD AMPS OF THE TRANSFORMER.

TRANSFORMER SHALL BE RATED FOR CONTINUOUS OPERATION AT RATED KVA IN AN AMBIENT TEMPERATURE WITHOUT FAN ASSISTED COOLING.

PROVIDE K-RATED TRANSFORMERS WHERE INDICATED ON THE DRAWINGS.

MANUFACTURER: SQUARE D.

ADJUST TRANSFORMER TAPS AS REQUIRED, TO PROVIDE SECONDARY TERMINAL VOLTAGES WITHIN PLUS 10% AND MINUS 5% OF NAMEPLATE VOLTAGE, AT FULL RATED LOAD.

55 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, P&S #5362-A SERIES, OR COOPER #AH5362 SERIES.

GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE: STRAIGHT BLADE, 2 POLE, 3 WIRE, NEMA 5-20R, RATED 20 AMPS, 120 VAC, WEATHER-RESISTANT, TAMPER-RESISTANT, TEST & RESET PUSHBUTTONS, LED NOTIFICATION OF TRIP, SPECIFICATION GRADE, AND WHITE IN COLOR. HUBBELL #GFTR20W, LEVITON #012-W7899-TRW, BRYANT #CF82WTR-SERIES, P&S #2059TRWR SERIES, OR COOPER #TWRVGF20W-SP SERIES.

TAMPER RESISTANT RECEPTACLE: DUPLEX, 2 POLE, 3 WIRE, NEMA 5-20R, RATED 20 AMPS, 120 VAC, AND WHITE IN COLOR. RECEPTACLE SHALL NOT OPERATE IF AN OBJECT IS INSERTED INTO ONLY ONE BLADE OPENINGS. HUBBELL #BR20WHITR SERIES, P&S #R63W SERIES, OR COOPER #TRBR20 SERIES.

TAMPER RESISTANT RECEPTACLE WITH INTEGRAL USB CHARGER - DECORATOR STYLE: DUPLEX, 2 POLE, 3 WIRE, NEMA 5-20R, RATED 20 AMPS, 120 VAC, AND WHITE IN COLOR. RECEPTACLE SHALL NOT OPERATE IF AN OBJECT IS INSERTED INTO ONLY ONE BLADE OPENINGS. DUAL USB CHARGING PORTS, 5 VOLTS DC, 3 AMPERE (MINIMUM). HUBBELL #USB20WHITR SERIES, P&S #TR5362USB SERIES, OR LEVITON #T5832 SERIES.

SINGLE FLUSH TWIST-LOCK RECEPTACLE: TWIST-LOCK TYPE, HEAVY DUTY CONSTRUCTION, SPECIFICATION GRADE, GROUNDING TYPE, OF THE VOLTAGE AND CURRENT CHARACTERISTICS REQUIRED FOR THE EQUIPMENT INDICATED.
- 20A, 120V, 1PH, 3W: NEMA L5-20R. HUBBELL #HBL2310.
- 20A, 208V, 1PH, 3W: NEMA L6-20R. HUBBELL #HBL2320.
- 30A, 208V, 1PH, 3W: NEMA L6-30R. HUBBELL #HBL2620.
- 15A, 277V, 1PH, 3W: NEMA L7-15R. HUBBELL #HBL4760
- 20A, 277V, 1PH, 3W: NEMA L7-20R. HUBBELL #HBL2330
- 20A, 120/208V, 1PH, 4W: NEMA L14-20R. HUBBELL #HBL2410.
- 30A, 120/208V, 1PH, 4W: NEMA L14-30R. HUBBELL #HBL2710.
- 20A, 208V, 3PH, 4W: NEMA L15-20R. HUBBELL #HBL2420.
- 30A, 208V, 3PH, 4W: NEMA L15-30R. HUBBELL #HBL2720.
- 20A, 120/208V, 3PH, 5W: NEMA L21-20R. HUBBELL #HBL2510.
- 30A, 120/208V, 3PH, 5W: NEMA L21-30R. HUBBELL #HBL2810.

OR EQUAL BY LEVITON, BRYANT, P&S, OR COOPER.

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

LIGHTING CONTROLS:

DIMMER SWITCHES: 0-10V DIGITAL DIMMER SWITCHES. SWITCH SHALL BE TESTED BY THE MANUFACTURER TO BE COMPATIBLE WITH THE LUMINAIRE IT CONTROLS.

MANUFACTURERS: N-LIGHT

OCCUPANCY SENSORS: PROVIDE DUAL TECHNOLOGY SENSORS WITH COVERAGE AS REQUIRED FOR THE AREA. SENSOR SHALL BE CONFIGURED TO SHUT OFF WITH IN 20 MINUTES OF THE SPACE BECOMING UNOCCUPIED. PROVIDE ALL REQUIRED POWER PACKS AND ASSOCIATED EQUIPMENT FOR A FULLY FUNCTIONAL SYSTEM.

MANUFACTURERS: N-LIGHT

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 DEVICE COVER:
NEC AND UL LISTED, "WEATHERPROOF WHILE IN USE", SINGLE GANG, DIECAST COPPER-FREE ALUMINUM, PAD LOCKABLE, HORIZONTAL MOUNTING. HUBBELL #WP26MH, COOPER #WIUMH-1, P&S #WIUC10CAGH, CARLON #ME9UHMG, INTERMATIC #WP1010HMC, RED DOT #CKMG, TAY MAC #MX3300.

INSTALLATION:
INSTALL WIRING DEVICES VERTICALLY, UNLESS OTHERWISE INDICATED.

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

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

INSTALL WALL SWITCHES 6-INCHES FROM DOOR FRAME AT STRIKE SIDE OF DOORS, UNLESS OTHERWISE INDICATED ON DRAWINGS.

56 MULTI-OUTLET RACEWAY SYSTEMS - TWO COMPARTMENT:

MULTI-OUTLET RACEWAY SYSTEM SHALL BE PROVIDED AT EACH LOCATION INDICATED ON THE DRAWINGS. THE MULTI-OUTLET RACEWAY SYSTEM SHALL BE A TWO COMPARTMENT SYSTEM, SURFACE MOUNTED. RACEWAY SHALL BE STEEL. RACEWAY SHALL BE APPROXIMATELY 2 INCH DEEP BY 6 INCH HIGH AND SHALL CONTAIN A STEEL BARRIER DIVIDING THE HEIGHT INTO TWO EQUAL COMPARTMENTS. RACEWAY SHALL BE UL LISTED SPECIFICALLY AS A MULTI-OUTLET ASSEMBLY. PROVIDE MULTI OUTLET COVERS WITH OPENINGS LOCATED AS INDICATED ON THE DRAWINGS, BENDS, ELBOWS, TEES, CROSSES, ADAPTERS AND ACCESSORIES AS REQUIRED FOR A COMPLETE SYSTEM. PROVIDE SIZES PER NEC REQUIREMENTS FOR WIRING SPACES, EXCEPT WHERE LARGER SIZES ARE INDICATED.

MANUFACTURERS: LEGRAND WIRMOLD 4000 SERIES.

57 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 FOR THE VOICE/DATA OUTLETS. REFER TO DETAIL 3/E-501 FOR CONDUIT STUB DETAIL. PROVIDE 1"C STUB WITH PLASTIC BUSHING ON CONDUIT END AND A PULL CORD IN THE CONDUIT TO 4-11/16" SQUARE BOX, 2-1/8" DEEP, WITH 1-GANG PLASTER RING (COORDINATE WITH ARCH PLANS FOR WALL COVERING THICKNESS).

58 STRUCTURAL SUPPORT CHANNELS:

SUPPORT CHANNELS FOR EQUIPMENT AND RACEWAYS SHALL BE A MINIMUM OF 14 GAGE, 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.

59 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 BACKGROUND WITH BLACK LETTERING AND ATTACH WITH SHEET METAL SCREWS. FOR EQUIPMENT FED FROM THE EMERGENCY 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.

60 ARC FLASH LABELING:

PROVIDE PROPER ARC FLASH LABELING ON ALL NEW ELECTRICAL DEVICES THAT REQUIRE SUCH LABELING PER THE NATIONAL ELECTRICAL CODE. REFER TO SCOPE NOTES ON E-501 REGARDING UPDATES TO OWNER'S SHORT CIRCUIT ARC FLASH STUDY.

61 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.

FURNISH ALL TESTING EQUIPMENT AND PERSONNEL REQUIRED TO CONDUCT THESE TESTS.

PROPERLY ADJUST ALL MOTOR OVERLOADS PROTECTIVE DEVICES AND CHECK EACH MOTOR FOR CORRECT ROTATION.

CORRECT OR REPLACE ANY FAULTS OR DEFECTS FOUND IN MATERIALS AND/OR WORKMANSHIP DURING THESE TESTS TO THE SATISFACTION OF THE ARCHITECT/ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.

DETROIT

Detroit Diesel Corporation

Detroit Diesel M1 Met Lab Renovation

12200 Telegraph Rd
Redford Charter Twp, MI 48239

Date	Issued For
10/03/2025	C.D. 75%
12/12/2025	C.D. 100%
03/19/2026	Bid Set
04/24/2026	Bids

HED

125 West 5th St
Royal Oak, Michigan
48067 USA

(248) 262-1500

WWW.HED.CO

©2025

2025-DD016-001

Electrical Specifications

E-802

Autodesk Docs://2025-DD016-001_Detroit Diesel M1 Met Lab Renovation/2025-DD016-001_Arch_HED.rvt

K:\DATA\JOBS\B9470H50\DETROITD
1-/28/2006 - 11:33
Cover

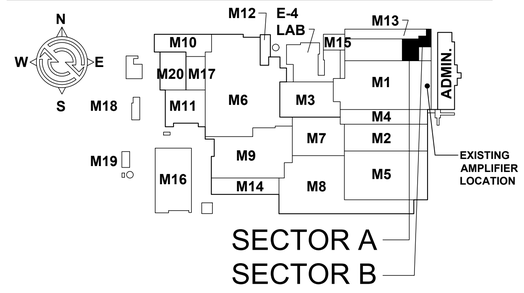
DETROIT DIESEL
M1 Met Lab Renovation
Existing XLS-140 FACP
New Speaker & Strobes

13400 Outer Drive
Detroit, MI 48239-4001

DRAWING INDEX:

Drawing Number	Sheet Number	Description	Rev	Date
MET-01	1	Drawing Index & Cover Sheet	-	12/10/2025
MET-02	2	Partial System Riser M1 Lab Renovation Area	-	12/10/2025
MET-03	3	SLC Wiring Details	-	12/10/2025
MET-04	4	Duct Detector Details	-	12/10/2025
MET-05	5	Strobe Power Supply (NAC) Detail	-	12/10/2025
MET-06	6	Floor Plan Area-A	-	12/10/2025
MET-07	7	Floor Plan Area-B	-	12/10/2025

KEY PLAN



Honeywell
HOME & BUILDING CONTROL

HONEYWELL OFFICE

2100 Apollo Drive
Brookpark, Oh. 44142
TEL: 248-376-2725 FAX:

CONTRACT NUMBER: MET-01
SALES: Katie Dehrmann
PROJECT MANAGEMENT: Mike Steger
COMMISSIONING: Fabin MenDez
DESIGN: Chuck Vantine NICET-3, 98067
DRAFTING: CV

SYSTEMS PROVIDED
Existing XLS-140

PROJECT DESIGN

TEL: FAX:

DESIGN CONSULTANT
HED
125 West 5t St.
Royal Oak, Michigan 48067

TEL: 248-262-1500 FAX:

CONTRACTOR

TEL: FAX:

REV D		BY	Honeywell *ExpertISE* ©
REV C		BY	Title Sheet and Drawing Index
REV B		BY	DETROIT DIESEL M1 Met Lab Renovation 13400 Outer Drive
REV A		BY	FILE: Cover DATE: 12/10/25 SHEET: 1
APPROVED BY:			DRAWING NUMBER MET-01 REV

K:\DATA\JOBS\B9190H50\DETROITD\20247\EXACT\20247-06

SYMBOLS LIST

- L — SPEAKER/STROBE, WALL
- FS — SPEAKER/STROBE, CEILING
- L — STROBE, WALL
- S — SMOKE DETECTOR
- F — DUCT DETECTOR
- F — PULL STATION
- FS — FLOW SWITCH
- CM — CONTROL MODULE-NAC
- CR — CONTROL RELAY
- MM — MONITOR MODULE
- RT — REMOTE TEST STATION
- AMP — AMPLIFIER PANEL
- NACPS — POWER SUPPLY
- FACP — FIRE ALARM PANEL

EXISTING FIRE ALARM SYSTEM SEQUENCE OF OPERATION MATRIX

System Inputs	CONTROL UNIT ANNUNCIATION										NOTIFICATION										REQUIRED SAFETY CONTROL									
System Outputs	ACTIVATE COMMON ALARM SIGNAL INDICATOR	ACTIVATE AUDIBLE ALARM SIGNAL	ACTIVATE COMMON SUPERVISORY SIGNAL INDICATOR	ACTIVATE AUDIBLE SUPERVISORY SIGNAL	ACTIVATE COMMON TROUBLE SIGNAL INDICATOR	ACTIVATE AUDIBLE TROUBLE SIGNAL					ACTIVATE ALL BUILDING FIRE ALARM SPEAKER/STROBES	TRANSMIT FIRE ALARM SIGNAL TO SUPERVISING STATION	TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION	TRANSMIT TROUBLE SIGNAL TO SUPERVISING STATION						RECALL ELEVATORS TO PRIMARY RECALL FLOOR	RECALL ELEVATORS TO ALTERNATE RECALL FLOOR	SHUTDOWN ASSOCIATED AHU	ACTIVATE ELEVATOR SHUNT	ACTIVATE ELEVATOR FIREFIGHTER HAT					
MANUAL FIRE ALARM BOXES	X	X									X	X																		
AREA SMOKE DETECTORS	X	X									X	X																		
SMOKE DETECTORS - 1st FLOOR ELEVATOR LOBBY	X	X									X	X										X								
SMOKE DETECTORS - 2nd FLOOR ELEVATOR LOBBY	X	X									X	X									X									
DUCT SMOKE DETECTORS			X	X									X										X							
ELEVATOR EQUIP. ROOM SMOKE DETECTOR	X	X									X	X													X					
ELEVATOR EQUIP. ROOM HEAT DETECTOR	X	X									X	X													X	X				
SPRINKLER WATERFLOW	X	X									X	X																		
SPRINKLER TAMPER VALVE			X	X									X																	
DEVICE NO RESPONSE					X	X								X																
FIRE ALARM AC POWER FAILURE					X	X								X																
FIRE ALARM SYSTEM LOW BATTERY					X	X								X																
OPEN CIRCUIT					X	X								X																
GROUND FAULT					X	X								X																
PANEL NOTIFICATION APPLIANCE CIRCUIT SHORT					X	X								X																
BOOSTER POWER SUPPLY TROUBLE					X	X								X																

XLS SYSTEM WIRING SCHEDULE

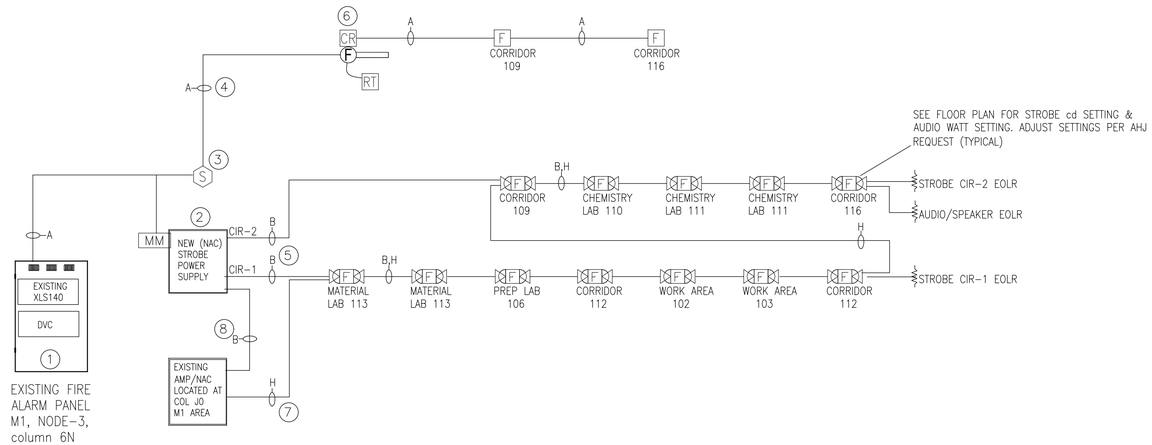
CABLE DESIGNATION	RECOMMENDED WIRE TYPE	TYPICAL CABLE USAGE
A	2-CONDUCTOR, #16 AWG SOLID TWISTED CABLE	FIRE ALARM ADDRESSABLE INITIATING DEVICES (SLC)
B	2-CONDUCTOR, #14 AWG SOLID THHN	NOTIFICATION APPLIANCE CIRCUITS (NAC): - H HORN ONLY - HS HORN / STROBE - SR STROBES
C	2-CONDUCTOR, #18TWP UNSHIELDED FPL GENESIS 4050	DIGITAL AUDIO LOOP (DAL) MAX DISTANCE = 1000FT
	2-CONDUCTOR, #18TWP UNSHIELDED FPL BELDEN 5320UJ	DIGITAL AUDIO LOOP (DAL) MAX DISTANCE = 1900FT
P	2-CONDUCTOR, #16 AWG SOLID THHN	24VDC POWER CIRCUIT
H	2-CONDUCTOR, #16 AWG SOLID TWISTED SHIELDED	70VAC AUDIO NOTIFICATION APPLIANCE CIRCUIT
U	2-CONDUCTOR, #12 AWG SOLID THHN	BATTERY CONNECTIONS

NOTES:

1. NOT ALL CABLE TYPES MAY APPLY TO THIS PROJECT.

BILL OF MATERIALS

Qty	Part#	Description
Field Devices		
12	SPSCWLED	Hon: Speaker/strobe, ceiling, white
2	S464G1107	Hon: Pull station
1	TC809A1059	Hon: Monitor module
1	DNR	Hon: Duct Detector housing
1	TC806DNR3000	Hon: Duct Detector Photo Smk
1	DST10	Hon: Duct Detector sampling tube
1	RTS151KEY	Hon: Remote test station
1	TC810R1024	Hon: Control module Relay
1	TC810N1013	Hon: Control module NAC
1	HPF-PS10	Hon: Strobe power supply
2	SLA1080	Interstate: Battery for HPF-PS10, 12V, 7.5AH
1	DTK-120HW	Hon: 120vac surge protection



(X) RISER NOTES:

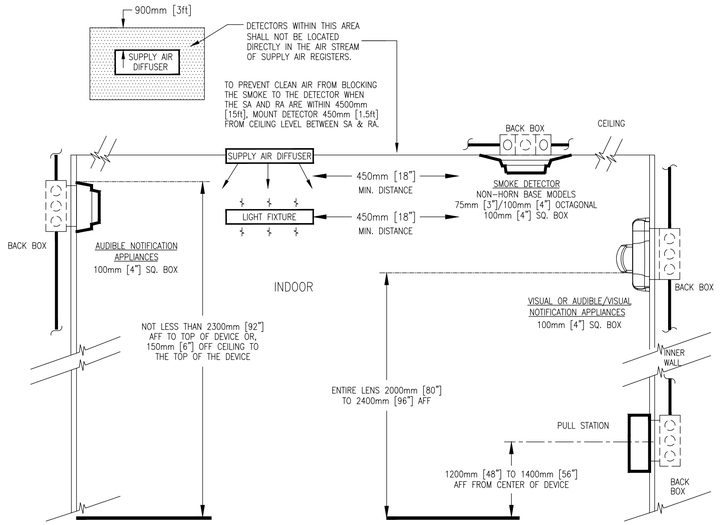
1 EXISTING FACP. AND DVC.
2 INSTALL NEW POWER SUPPLY (NAC) AND PANEL IN M1. COORDINATE LOCATION WITH HONEYWELL OWNER.
3 NEW SMOKE DETECTOR AT (NAC) PANEL LOCATION.
4 EXTEND AREA SLC TO NEW ADDRESSABLE DEVICES. COORDINATE WITH LOCAL HONEYWELL TECH. FOR NEW DEVICE ADDRESSES.
5 NEW AUDIO/SPEAKER CIRCUIT TO ALL NEW SPEAKERS IN AREA OF WORK.
6 LOCATE SHUTDOWN MODULE (CR) NEXT TO FAN STARTER.
7 NEW AUDIO/SPEAKER CIRCUIT FROM EXISTING AMPLIFIER TO ALL NEW SPEAKERS. LOCATED AT COL-J0, 1ST FLOOR. INSTALLED DURING M1 PROJECT.
8 NEW SYNC-SIGANL FROM EXISTING NAC LOCATED AT COL-J0, 1ST FLOOR. INSTALLED DURING M1 PROJECT.

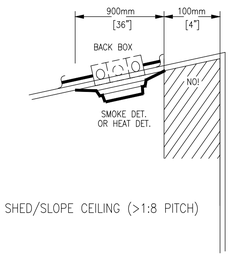
M1 MET Renovation
RISER DIAGRAM

REV D		BY	Honeywell ExpertISE ©
REV C		BY	4263 Monroe St.,Toledo, OH.43606
REV B		BY	Detroit Diesel M1 Met Lab Renovation 13400 Outer Drive, Detroit, MI.
REV A		BY	FILE: Riser | DATE: 12/10/25 | SHEET: 2 of
APPROVED BY:			DRAWING NUMBER MET-02 | REV

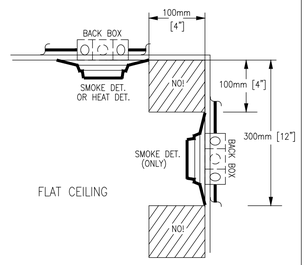
Riser

K:\DATA\JOBS\B9190H50\DETROITD\





SHED/SLOPE CEILING (>1:8 PITCH)



FLAT CEILING

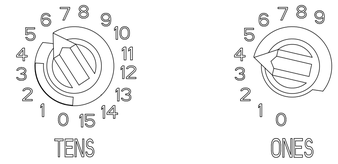
SMOKE & HEAT DETECTOR PLACEMENT

GENERAL NOTES:

A. DO NOT APPLY POWER TO ANY DEVICE UNTIL AUTHORIZED BY A HONEYWELL REPRESENTATIVE.
B. SEE RISERS FOR ALL DEVICE LOCATIONS, DEVICE COUNTS, AND DEVICE ADDRESSES.
C. FOLLOW DEVICE INSTALLATION INSTRUCTIONS INCLUDED WITH DEVICES.
D. END-OF-LINE DEVICES MOUNTED IN SEPERATE BOXES AT 1800mm [72"] AFF.
E. DETECTOR GUIDELINES:
NO SMOKE DETECTORS ALLOWED IN GARAGES.
NO SMOKE DETECTORS ALLOWED IN UNFINISHED ATTICS.
NO SMOKE DETECTORS ALLOWED IN AREAS WITH TEMPERATURE >38°C OR <4.5°C.
ION SMOKE DETECTORS MUST BE > 6100mm [20ft] FROM COOKING APPLIANCES.
(PHOTO SMOKE DETECTORS ALLOWED <6100mm [20ft] FROM COOKING APPLIANCE).
NO SMOKE DETECTORS WITHIN 914mm [3ft] HORIZONTAL FROM CEILING FAN BLADE TIP.

1/3 TYPICAL FIELD DEVICE INSTALLATION GUIDELINES

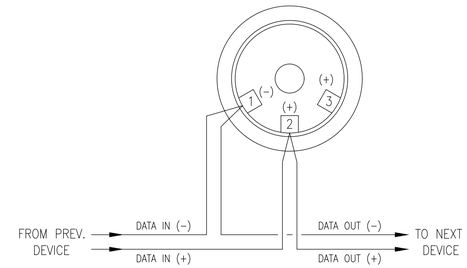
TO SET POINT NUMBER (ADDRESS)



NOTES:

1) DO NOT SET MORE THAN ONE MODULE OR ONE SENSOR WITH THE SAME ADDRESS ON THE SAME SLC.
2) A SENSOR AND A MODULE CAN HAVE THE SAME ADDRESS ON THE SAME SLC.
3) THE ABOVE EXAMPLE SHOWS THE DEVICE POINT ADDRESS (MODULE OR DETECTOR) AS 064.
4) MODULE POINT ADDRESSES RANGE FROM 001 THRU 159 (PREFIXED WITH 'M' ON DRAWINGS).
5) SENSOR POINT ADDRESSES RANGE FROM 001 THRU 159 (PREFIXED WITH 'D' ON DRAWINGS).

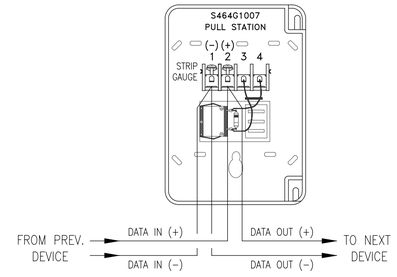
2/3 SENSOR & MODULE ADDRESS DIAL SETTINGS



MOUNTING:

3-1/2" OR 4" OCTAGON x 1-1/2" DEEP ELECTRICAL BOX
4" SQUARE x 1-1/2" DEEP ELECTRICAL BOX W/ MUD RING
SINGLE GANG ELECTRICAL BOX WITH 1-1/2" MINIMUM DEPTH

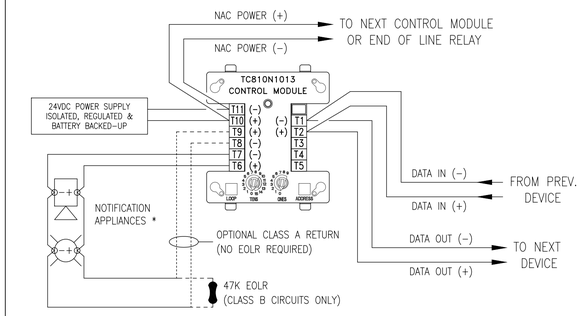
3/3 B300-6 LOW PROFILE INTELLIGENT BASE
DATA WIRING FOR SMOKE & THERMAL SENSORS



MOUNTING:

SINGLE GANG OR DOUBLE GANG 2-3/4" DEEP ELECTRICAL BOX
4" SQUARE OR 4-11/16" ELECTRICAL BOX WITH PLASTER RING
SB-10 OR SB-I/O ELECTRICAL BOX FOR SURFACE MOUNTING

4/3 S464G1007 PULL STATION WIRING
ADDRESSABLE MANUAL PULL STATION



* DEVICE POLARITIES SHOWN IN ALARM CONDITION

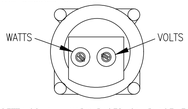
MOUNTING:

4" SQUARE x 2-1/8" DEEP ELECTRICAL BOX

5/3 TC810N1013 CONTROL MODULE WIRING
SUPERVISED CONTROL MODULE

VOLTAGE AND POWER SELECTION

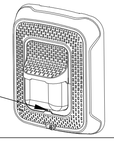
SET THE POWER AND VOLTAGE DIALS ON THE REAR OF THE DEVICE TO THE DESIRED SETTING

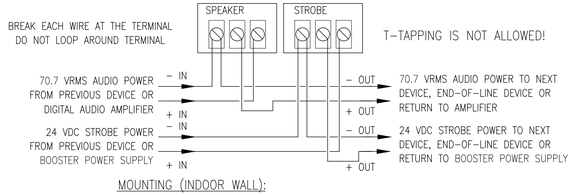


SETTINGS WILL VARY BASED ON PLACEMENT

STROBE CANDELLA SELECTION

SLIDE SWITCH ON REAR OF PRODUCT. SETTING SHOWS ON FRONT OF UNIT





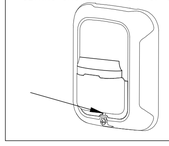
MOUNTING (INDOOR WALL):

4" SQUARE x 2-1/8" DEEP ELECTRICAL BOX
SEE PRODUCT INSTALLATION SHEET FOR MOUNTING INSTRUCTIONS

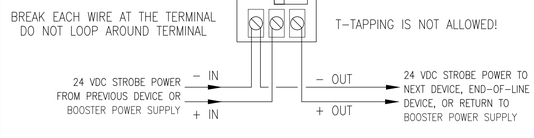
6/3 SYSTEM SENSOR SPSRL SPEAKER/STROBES
SELECTABLE OUTPUT WALL MOUNT SPEAKER STROBE

STROBE CANDELA SELECTION

SLIDE SWITCH ON REAR OF PRODUCT, SETTING SHOWS ON FRONT OF UNIT



SHORTING SPRING PROVIDED FOR INSTALLATION AND TESTING. SPRING WILL DISENGAGE WHEN INSTALLED TO ENABLE SUPERVISION.



MOUNTING OPTIONS:

MOUNT ON SINGLE OR DOUBLE GANG ELECTRICAL BOX WITH MOUNTING PLATE
SEE PRODUCT INSTALLATION SHEET FOR MOUNTING INSTRUCTIONS

7/3 SYSTEM SENSOR SRL CLEAR STROBES
SELECTABLE OUTPUT INDOOR WALL MOUNT STROBES

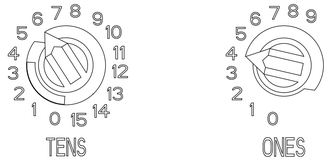
XLS3000 Field Wiring Details

REV D		BY	Honeywell ExpertISE ©
REV C		BY	4263 Monroe St.,Toledo, OH.43606
REV B		BY	Detroit Diesel M1 Met Lab 13400 Outer Drive, Detroit, MI.
REV A		BY	FILE: Details | DATE: 12/10/25 | SHEET: 3 of
APPROVED BY:			DRAWING NUMBER MET-03 | REV

Riser

K:\DATA\JOBS\B9190H50\DETROITD\

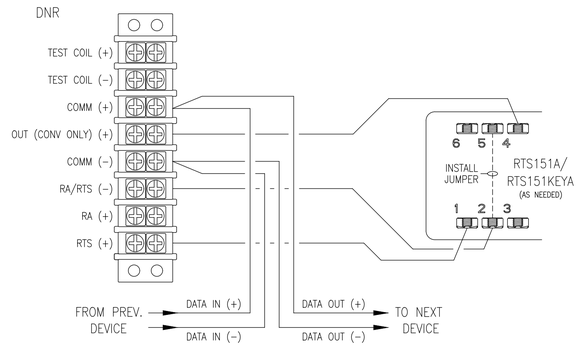
TO SET POINT NUMBER (ADDRESS)



NOTES:

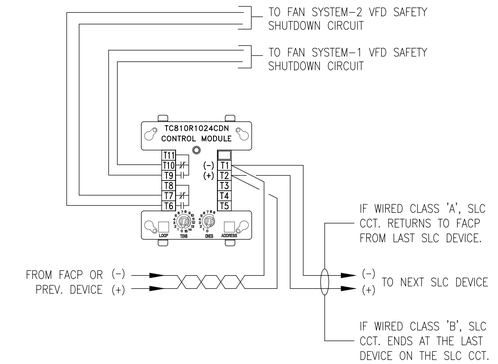
1) DO NOT SET MORE THAN ONE MODULE OR ONE SENSOR WITH THE SAME ADDRESS ON THE SAME SLC.
2) A SENSOR AND A MODULE CAN HAVE THE SAME ADDRESS ON THE SAME SLC.
3) THE ABOVE EXAMPLE SHOWS THE DEVICE POINT ADDRESS (MODULE OR DETECTOR) AS 064.
4) MODULE POINT ADDRESSES RANGE FROM 001 THRU 159 (PREFIXED WITH 'M' ON DRAWINGS).
5) SENSOR POINT ADDRESSES RANGE FROM 001 THRU 159 (PREFIXED WITH 'D' ON DRAWINGS).

1/4 SENSOR & MODULE ADDRESS DIAL SETTINGS

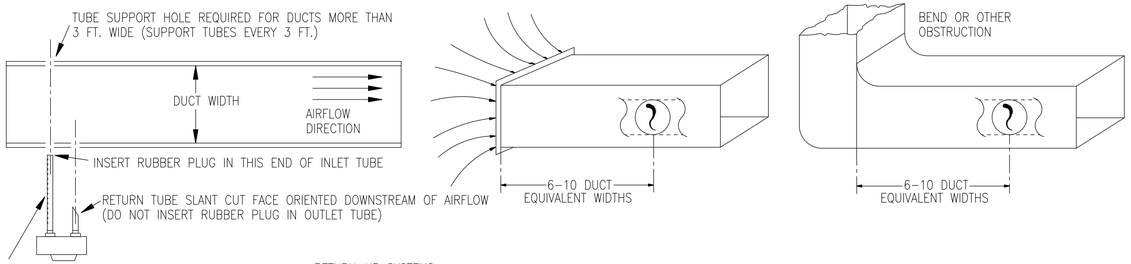


MOUNTING:
SEE INSTALLATION INSTRUCTIONS INCLUDED WITH DEVICES.

2/4 DNR DUCT SMOKE DETECTOR DATA WIRING W/OPTIONAL RTS151(KEY) REMOTE TEST STATION



3/4 HVAC FAN SHUTDOWN CONTROL WIRING



RETURN AIR SYSTEMS:
SMOKE DETECTORS SHALL BE INSTALLED IN RETURN AIR SYSTEMS WITH A DESIGN CAPACITY GREATER THAN 2000 CFM (0.09 m/s) IN THE RETURN AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS, EXHAUST AIR CONNECTIONS, OUTDOOR AIR CONNECTIONS OR DECONTAMINATION EQUIPMENT AND APPLIANCES.

COMMON SUPPLY AND RETURN AIR SYSTEMS:
WHERE MULTIPLE AIR HANDLING SYSTEMS SHARE COMMON SUPPLY OR RETURN AIR DUCTS OR PLENUMS WITH A COMBINED DESIGN CAPACITY GREATER THAN 2000 CFM (0.9m3/s), THE RETURN AIR SYSTEM SHALL BE PROVIDED WITH SMOKE DETECTORS.

RETURN AIR RISERS:
WHERE RETURN AIR RISERS SERVE TWO OR MORE STOREYS AND SERVE ANY PORTION OF A RETURN AIR SYSTEM HAVING A DESIGN CAPACITY GREATER THAN 15000 CFM (7.1m3/s), SMOKE DETECTORS SHALL BE INSTALLED AT EACH STOREY. SUCH SMOKE DETECTORS SHALL BE LOCATED UPSTREAM OF THE CONNECTION BETWEEN THE RETURN AIR RISER AND ANY AIR DUCTS OR PLENUMS

SUPPLY AIR SMOKE DETECTORS:
IF INSTALLED, SUPPLY AIR SMOKE DETECTORS SHALL BE MOUNTED IN THE DUCT DOWNSTREAM OF BOTH THE FAN AND THE FILTERS. ADDITIONAL SMOKE DETECTORS IN THE SUPPLY AIR SYSTEM ARE NOT REQUIRED WHERE THE AIR PASSES THROUGH OTHER SMOKE COMPARTMENTS.

SMOKE DAMPERS THAT ARE PART OF A SMOKE BARRIER SHALL BE INSTALLED IN THE PLANE OF THE FIRE PARTITION AND NOT AFTER THE FIRST AIR DUCT INLET OR OUTLET, WHICHEVER IS CLOSER TO THE SMOKE BARRIER. IF THE SMOKE DAMPER IS CONTROLLED BY AND AIR SYSTEM SMOKE DETECTOR IT SHALL BE LOCATED UPSTREAM OF THE SMOKE DAMPER BUT AFTER ANY INLET OR OUTLET IN THAT DUCT.

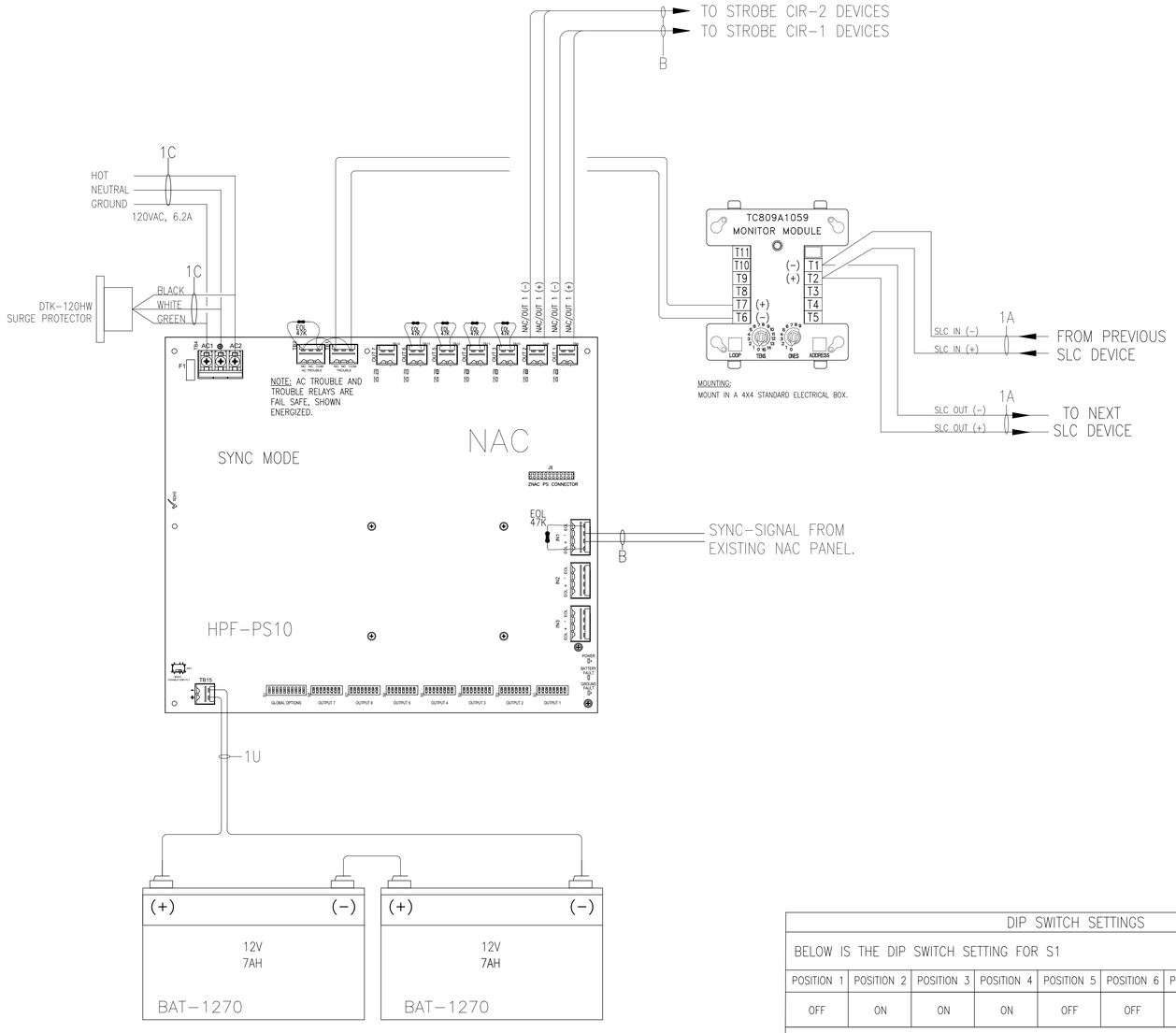
WHERE IN–DUCT SMOKE DETECTORS ARE INSTALLED IN CONCEALED LOCATIONS MORE THAN 10ft ABOVE THE FINISHED FLOOR, OR IN ARRANGEMENTS WHERE THE DETECTOR'S ALARM LIGHT IS NOT READILY VISIBLE TO RESPONDING PERSONNEL, THE DETECTOR SHALL BE PROVIDED WITH REMORE ALARM INDICATORS TO BE INSTALLED IN A READILY ACCESSIBLE LOCATION AND SHALL BE CLEARLY LABELED TO INDICATE BOTH THEIR FUNCTION AND THE AIR HANDLING UNIT(S) ASSOCIATED WITH EACH DETECTOR. (EXCEPTION: WHERE THE SPECIFIC DETECTOR IN ALARM IS INDICATED AT THE CONTROL UNIT)

4/4 DUCT SMOKE DETECTOR INSTALLATION GUIDE LINES

Duct Detector Wiring Details

REV D		BY	Honeywell *ExpertISE* ©
REV C		BY	
REV B		BY	Detroit Diesel M1 Met Lab 13400 Outer Drive, Detroit, MI.
REV A		BY	FILE: DuctDet | DATE: 12/10/25 | SHEET: 4
APPROVED BY:			DRAWING NUMBER MET–04 | REV

Details



1/5 STROBE POWER SUPPLY (NAC)
LOCATION: COORDINATE WITH HONEYWELL & OWNER

POWER SUPPLY/BATTERY SIZING CALCULATIONS

NAC-1 Power Supply 1st Floor MET Lab

LOAD	QTY		STANDBY CURRENT (mA)	TOTAL STANDBY CURRENT (mA)	ALARM CURRENT (mA)	TOTAL ALARM CURRENT (mA)
Circuit-1 MET Lab Strobes West	1	x	1	1	238	238
Circuit-2 MET Lab Strobe North	1	x	1	1	154	154
Circuit-3 Spare	1	x	1	1	0	0
Circuit-4 Spare	1	x	1	1	0	0
Circuit-5 Spare	1	x	1	1	0	0
SUPERVISION CURRENT IN ALARM						215.00
TOTAL mA				80.0		607.0
TOTAL AMPS			(A)	0.08	(B)	0.61

POWER SUPPLY RATING: 6.0 AMPS CIRCUIT RATING: 2.5 AMPS

BATTERY CALCULATION

SUPERVISORY HOURS 24 (C) ALARM MINUTES 15 (D)

BATTERY CAPACITY (A.H.) = 1.2 [(A x C) + 1.25x((A+B) x D/60)] A.H.= 2.56

A minimum of 2.56 Amp Hours of battery backup will supervise the system for 24 hours and operate the system in alarm state at least 15 minutes.

1 SET OF 7.0 AMP HOUR BATTERIES WILL BE PROVIDED.

Note: strobes sized at 110% of current draw and horns sized at 120% of current draw
Note: battery aging factor is 1.2
Note: Factor for alarm at end of standby is 1.25

Voltage Drop Calculations NAC

Circuit 1 Cir-1 MET

Minimum supply voltage = 20.4 V
Minimum required voltage at device 16.0 v

Num Devices	Device Current	Dist/ Device	Wire awg	Res/ 1000ft	Res Added	Voltage at Device
1	70 ma	60 ft	14	3.07	0.37	20.31 V
2	70 ma	49 ft	14	3.07	0.30	20.26 V
3	18 ma	55 ft	14	3.07	0.34	20.23 V
4	18 ma	47 ft	14	3.07	0.29	20.21 V
5	22 ma	24 ft	14	3.07	0.15	20.20 V
6	22 ma	43 ft	14	3.07	0.26	20.19 V
7	18 ma	14 ft	14	3.07	0.09	20.18 V
8		0 ft	14	3.07	0.00	20.18 V
9		0 ft	14	3.07	0.00	20.18 V
10		0 ft	14	3.07	0.00	20.18 V
11		0 ft	14	3.07	0.00	20.18 V
12		0 ft	14	3.07	0.00	20.18 V
13		0 ft	14	3.07	0.00	20.18 V
14		0 ft	14	3.07	0.00	20.18 V
15		0 ft	14	3.07	0.00	20.18 V
16		0 ft	14	3.07	0.00	20.18 V
17		0 ft	14	3.07	0.00	20.18 V
18		0 ft	14	3.07	0.00	20.18 V
19		0 ft	14	3.07	0.00	20.18 V
20		0 ft	14	3.07	0.00	20.18 V
21		0 ft	14	3.07	0.00	20.18 V
22		0 ft	14	3.07	0.00	20.18 V
23		0 ft	14	3.07	0.00	20.18 V
24		0 ft	14	3.07	0.00	20.18 V
25		0 ft	14	3.07	0.00	20.18 V
Total	**0.24 A**	**292 ft**			**1.79**	**0.22 V drop**

Circuit 2 Cir-2 MET

Minimum supply voltage = 20.4 V
Minimum required voltage at device 16.0 v

Num Devices	Device Current	Dist/ Device	Wire awg	Res/ 1000ft	Res Added	Voltage at Device
1	18 ma	60 ft	14	3.07	0.37	20.34 V
2	70 ma	30 ft	14	3.07	0.18	20.34 V
3	22 ma	33 ft	14	3.07	0.20	20.31 V
4	22 ma	38 ft	14	3.07	0.23	20.28 V
5	22 ma	31 ft	14	3.07	0.19	20.27 V
6		0 ft	14	3.07	0.00	20.27 V
7		0 ft	14	3.07	0.00	20.27 V
8		0 ft	14	3.07	0.00	20.27 V
9		0 ft	14	3.07	0.00	20.27 V
10		0 ft	14	3.07	0.00	20.27 V
11		0 ft	14	3.07	0.00	20.27 V
12		0 ft	14	3.07	0.00	20.27 V
13		0 ft	14	3.07	0.00	20.27 V
14		0 ft	14	3.07	0.00	20.27 V
15		0 ft	14	3.07	0.00	20.27 V
16		0 ft	14	3.07	0.00	20.27 V
17		0 ft	14	3.07	0.00	20.27 V
18		0 ft	14	3.07	0.00	20.27 V
19		0 ft	14	3.07	0.00	20.27 V
20		0 ft	14	3.07	0.00	20.27 V
21		0 ft	14	3.07	0.00	20.27 V
22		0 ft	14	3.07	0.00	20.27 V
23		0 ft	14	3.07	0.00	20.27 V
24		0 ft	14	3.07	0.00	20.27 V
25		0 ft	14	3.07	0.00	20.27 V
Total	**0.15 A**	**192 ft**			**1.18**	**0.13 V drop**

DIP SWITCH SETTINGS

BELOW IS THE DIP SWITCH SETTING FOR S1

POSITION 1	POSITION 2	POSITION 3	POSITION 4	POSITION 5	POSITION 6	POSITION 7	POSITION 8	POSITION 9	POSITION 10
OFF	ON	ON	ON	OFF	OFF	ON	ON	OFF	OFF

BELOW IS THE DIP SWITCH SETTING FOR S2 TO S3

POSITION 1	POSITION 2	POSITION 3	POSITION 4	POSITION 5	POSITION 6	POSITION 7	POSITION 8
OFF	OFF	ON	OFF	ON	OFF	OFF	OFF

BELOW IS THE DIP SWITCH SETTING FOR S4 TO S8

POSITION 1	POSITION 2	POSITION 3	POSITION 4	POSITION 5	POSITION 6	POSITION 7	POSITION 8
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

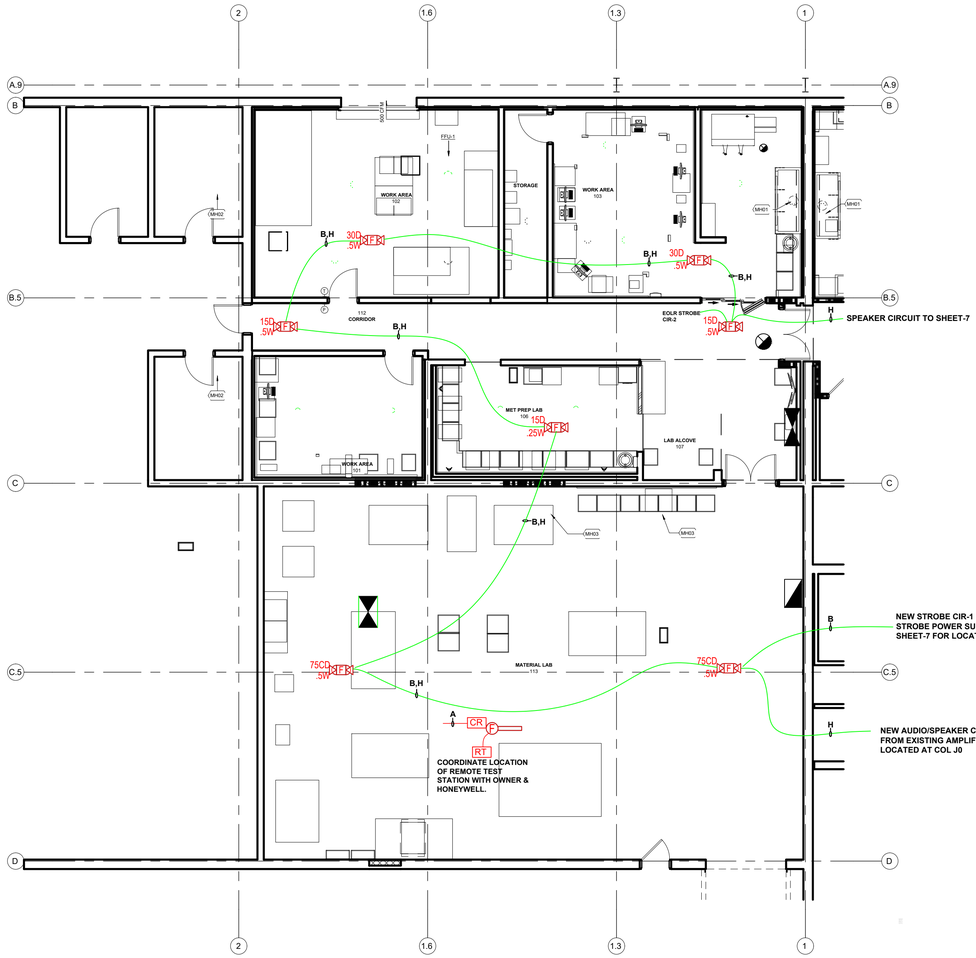
DIP SWITCH SETTINGS FOR SYNC FOLLOW
SEE INSTALLATION MANUAL FOR STAND ALONE SWITCH SETTINGS

Important: If an output circuit is overloaded, the output will shut off and generate a trouble signal. If this happens, the Power Supply will need to be manually reset. Either reset circuits configurations by toggling switch S1 position 10 to the OFF position for a minimum of five seconds, or turn off primary and secondary power and reapply.

Strobe Power Supply NAC

REV D		BY	Honeywell ExpertISE ©
REV C		BY	
REV B		BY	Detroit Diesel M1 Met Lab 13400 Outer Drive, Detroit, MI.
REV A		BY	FILE: NAC DATE: 12/10/25 SHEET: 5 of
APPROVED BY:			DRAWING NUMBER MET-05 REV

K:\DATA\JOBS\B9190H50\DETROITD\



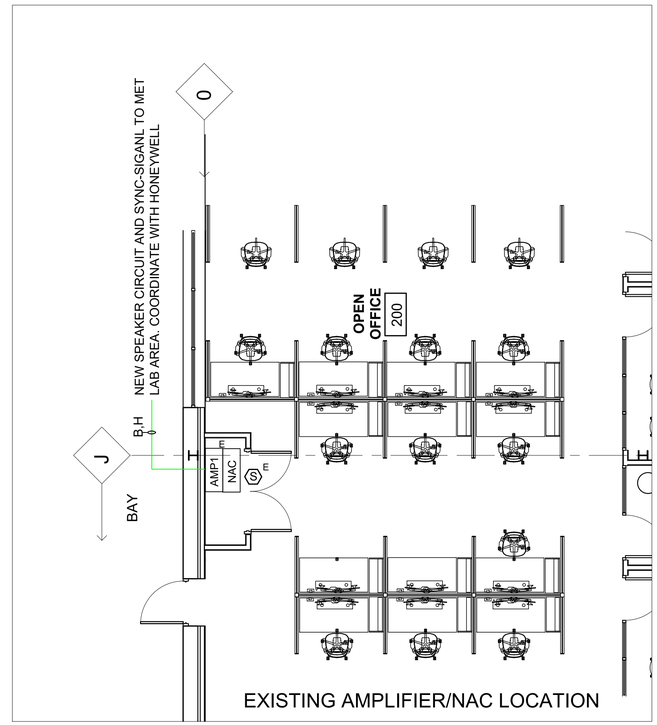
N

LEVEL 1 HVAC PLAN - SECTOR A

1/8" = 1'-0"

SYMBOL LEGEND

FACP	FIRE ALARM PANEL
NAC–X	POWER SUPPLY NOTIFICATION DEVICES
F	SPEAKER/STROBE CEILING
F	MANUAL PULL STATION
S	AREA SMOKE DETECTOR
F	DUCT MOUNTED SMOKE DETECTOR
CR	ADDRESSABLE CONTROL RELAY MODULE
MM	MONITOR MODULE
RT	REMOTE TEST, DUCT DETECTOR

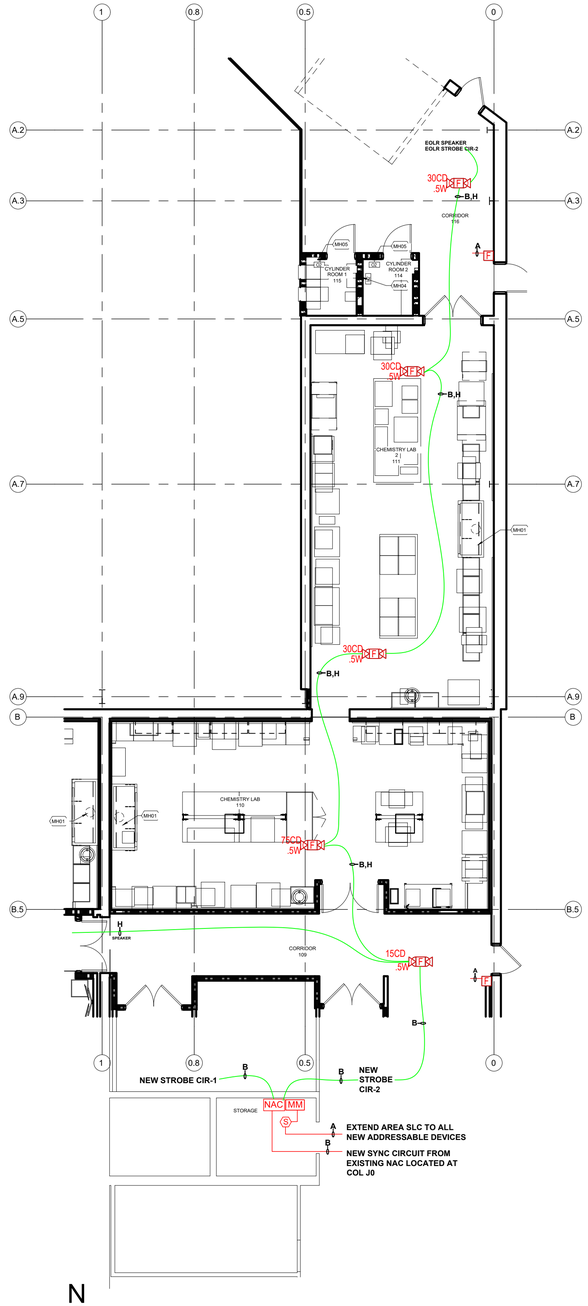


M1 MET Lab

REV D		BY	Honeywell ExpertISE ©
REV C		BY	4263 Monroe St.,Toledo, OH.43606
REV B		BY	Detroit Diesel M1 Met Lab 13400 Outer Drive, Detroit, MI.
REV A		BY	FILE: Details | DATE: 12/10/25 | SHEET: 6 of 7
APPROVED BY:			DRAWING NUMBER MET–06 | REV

FlrPlan

K:\DATA\JOBS\B9190H50\DETROITD\



N

LEVEL 1 HVAC PLAN - SECTOR B

1/8" = 1'-0"

SYMBOL LEGEND

FACP	FIRE ALARM PANEL
NAC–X	POWER SUPPLY NOTIFICATION DEVICES
F	SPEAKER/STROBE CEILING
F	MANUAL PULL STATION
S	AREA SMOKE DETECTOR
F	DUCT MOUNTED SMOKE DETECTOR
CR	ADDRESSABLE CONTROL RELAY MODULE
MM	MONITOR MODULE
RT	REMOTE TEST, DUCT DETECTOR

M1 MET Lab

REV D		BY	Honeywell ExpertISE ©
REV C		BY	4263 Monroe St.,Toledo, OH.43606
REV B		BY	Detroit Diesel M1 Met Lab 13400 Outer Drive, Detroit, MI.
REV A		BY	FILE: FlrPlan DATE: 12/10/25 SHEET: 7 of 7
APPROVED BY:			DRAWING NUMBER MET–07 REV

FlrPlan

NETWORK DIAGRAM

LOCATE WITHIN SPACE, UNLESS DIRECTED OTHERWISE (TYPICAL)

VERIFY CONTROLLER LOCATION WITH OWNER & ENGINEER.

VA301C-DLC

24 V DC
M-600400

J22 V+ V- V+ V- J23 A1 B1 A2 B2 SHD SHD A3 B3 A4 B4 J24

ZONE A
CYLINDER RM-1

STROBE & HORN P2V-P LENS-A

E3-O2 — NEUTRAL — 24V DC

E3-O2: J1 V- V+ | SHD B A | J2

Channel #1 B1 A1 V+ V-

ZONE B
CYLINDER RM-2

STROBE & HORN P2V-P LENS-A

E3-O2 — NEUTRAL — 24V DC

E3-O2: J1 V- V+ | SHD B A | J2

E3-H2: J1 V- V+ | SHD B A | J2

ZONE C
CHEM LAB-111

STROBE & HORN P2V-P LENS-A

E3-O2 — NEUTRAL — 24V DC

E3-O2: J1 V- V+ | SHD B A | J2

E3-H2: J2 | SHD B A | J1 V- V+ EOL

ZONE D
CHEM LAB-110

STROBE & HORN P2V-P LENS-A

E3-O2 — NEUTRAL — 24V DC

E3-O2: J1 V- V+ | SHD B A | J2

Channel #2 B2 A2 V+ V-

M-600400
24 V DC

ZONE E
WORK AREA 103

STROBE & HORN P2V-P LENS-A

E3-O2 — NEUTRAL — 24V DC

E3-O2: J1 V- V+ | SHD B A | J2

E3-H2: J1 V- V+ | SHD B A | J2

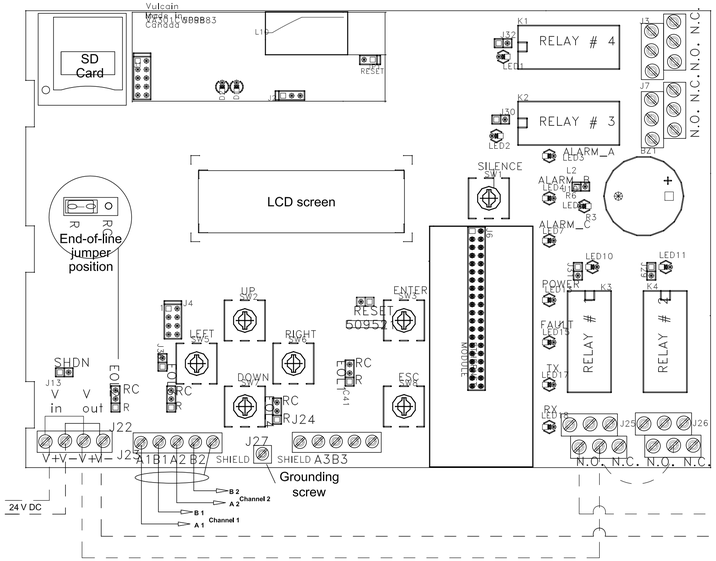
ZONE F
WORK AREA 101

STROBE & HORN P2V-P LENS-A

E3-H2 — NEUTRAL — 24V DC

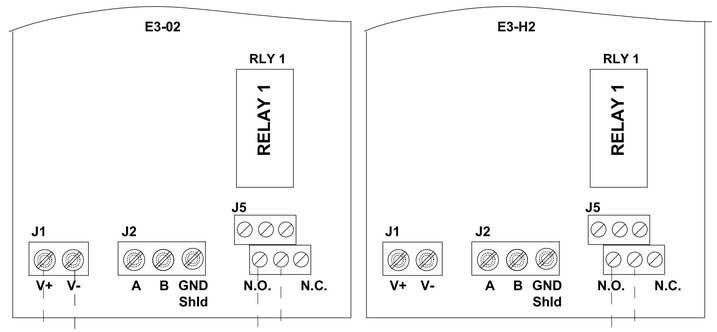
E3-H2: J2 | SHD B A | J1 V- V+ EOL

TYPICAL INSTALLATION HEIGHT
OXYGEN: 3-5' FROM FLOOR
HYDROGEN: 1' FROM CEILING



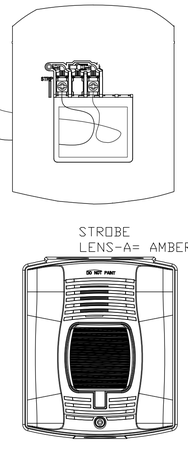
TO HVAC SYSTEM
START EXHAUST FAN
WHEN IN ALARM

TYPICAL ZONE STROBE WIRING



24V DC

PARALLEL CONTACTS
EITHER GAS SENSOR ACTIVATES AMBER STROBE



See the wiring details on the sheets included.
Consult the user guide for complete information.
The Honeywell products must be easy to access for maintenance.

Type of gas:	O2 Oxygen	H2 HYDROGEN	x	Oxygen Range	Hydrogen Range
Alarm level A	19.5 % LEL	25 % LEL		0-25%	0-100%
Alarm level B	22 % LEL	50 % LEL			
Alarm level C	22.5 % LEL	90 % LEL			

VA301C	
relay 1:	ALARM LEVEL A
relay 2:	ALARM LEVEL B
relay 3:	SPARE
relay 4:	FAULT

Wiring VA301C

Channel	Wire gage	Distance (ft)
1	14 AWG	1000
2	14 AWG	1000
3	14 AWG	1000

Communication Wire Gauge: 24-2 AWG (Genesis)
Twisted and shielded cable 2000 feet (600 m) per channel
NOTE: CONDUIT ENTRIES ARE LOCATED AT THE BOTTOM OF THE ENCLOSURES.

HONEYWELL JOB NUMBER Detroit Diesel MET Lab

Project:	MET Lab
Client:	Detroit Diesel
Drawing number:	MET-GD
Rev. -	Date: 12/12/25
Drawn by:	
# Command: N/A	Page: (1/1)

Honeywell Analytics
405 Barclay Boulevard
Lincolnshire, IL
60069
Tel.: 1-800-563-2967
Fax.:1-888-967-9938
www.honeywellanalytics.com